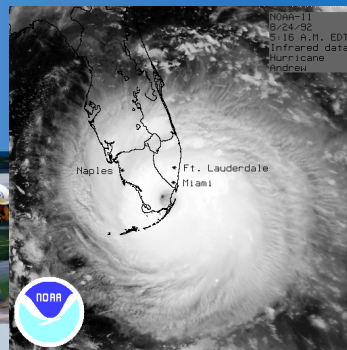


# Collier County

## Multi-Jurisdictional Local Mitigation Strategy

March 31, 2020



**Collier County**  
**Multi-Jurisdictional Local Mitigation Strategy**  
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**Collier County**  
**Multi-Jurisdictional Local Mitigation Strategy**  
**EXECUTIVE SUMMARY**

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Collier County is threatened by several different types of natural, technological and man-made hazards. These hazards endanger the health and safety of the people of the county, jeopardize its economic vitality, and imperil the quality of the natural environment. Because of the importance of avoiding or minimizing the County's vulnerability to these hazards, the public and private sector interests of Collier County have joined together to undertake a comprehensive planning process that has culminated in the publication of this document: "The Collier County Multi-Jurisdictional Local Mitigation Strategy."

This private sector and public sector partnership, named the Collier County Multi-Jurisdictional Local Mitigation Strategy Working Group (hereafter known as the LMSWG), has conducted detailed studies to identify the hazards threatening Collier County and to estimate the relative risks posed to the community by those hazards. This information has been used by the LMSWG to assess the vulnerability of the public facilities and neighborhoods of Collier County to the impacts of future disasters involving those hazards. With these identified, the LMSWG has worked to identify proposed projects and programs that will avoid or minimize these vulnerabilities to make the communities of Collier County much more resistant to the impacts of future disasters.

These projects and programs to reduce the impacts of future disasters are also called "mitigation initiatives" in this document. Mitigation initiatives have been developed and will continue to be developed by the LMSWG for implementation whenever the resources to do so become available. As the mitigation initiatives identified in this plan are implemented, Collier County will become a more "disaster resistant" community.

This document details the work of the LMSWG over the past several years to develop the planning organization, to undertake the needed technical analyses, and to coordinate the mitigation initiatives that have been proposed by the participating jurisdictions and organizations. Additionally, this strategy contains the jurisdictional Floodplain Management Plans when required or developed. Through publication of this Local Mitigation Strategy, the LMSWG continues to solicit the involvement of the entire community to make the people, neighborhoods, businesses and institutions of Collier County safer from the impacts of future disasters.

## SUMMARY OF CHANGES

THIS PAGE WILL INDICATE WHERE CHANGES HAVE BEEN MADE BEFORE THE COLLIER COUNTY BOARD OF COUNTY COMMISSIONERS ADOPTS THE LOCAL MITIGATION STRATEGY ON MARCH 10, 2015. SOME ANNEXES, WHERE INDICATED, CHANGE FREQUENTLY SINCE THEY ARE A REPOSITORY OF INFORMATION BASED ON ACTIONS OF THE LOCAL MITIGATION STRATEGY WORKING GROUP AT PROPERLY NOTICED PUBLIC MEETINGS AND THEREFORE THE READER MUST GO TO THE ANNEX TO SEE THE MOST RECENT INFORMATION.

SECTION 1 PURPOSE ...	CHANGE	COMMENTS/PURPOSE	DATE
PARA 1.3.1	ADDED "NOTE"	DIRECTED READER TO ANNEX J FOR FLOODPLAIN MANAGEMENT INFO.	1/26/2010
PARA 1.2.1 & PARA 1.3.1	SEE YELLOW HIGHLIGHTS	NECESSARY CHANGE FOR SCHOOL DISTRICT ADOPTION	7/19/2013

SECTION 2 HIRA	CHANGE	COMMENTS/PURPOSE	DATE
PARA 2.5, 2.7, & 2.8.4	SEE YELLOW HIGHLIGHTS	NECESSARY CHANGE FOR SCHOOL DISTRICT ADOPTION	7/19/2013
TOTAL REVISION	TOTAL REVISION ADDED	REWRITE	2/20/2020

SECTION 3 GOALS & OBJs	CHANGE	COMMENTS/PURPOSE	DATE
<p>IN 2007, THE LMS <b>WORKING GROUP VOTED</b> TO ADD TWO PARAGRAPHS (4.1.4 &amp; 4.1.5) IN ORDER TO ACCOUNT FOR GOOD MITIGATION INITIATIVES WHICH COULD NOT BE QUANTIFIED ON THE SCORE SHEET BUT SHOULD BE ACCEPTED AS A PROJECTS THAT ACHIEVES OUR MITIGATION GOALS (PARA 4.1.1). PARA 4.1.5 WAS ADDED BECAUSE WE DID NOT HAVE, AT THE TIME , A MECHANISM TO JUMP THE INITIATIVE PRIORITY LISTING SHOULD THE WORKING GROUP FEEL THAT AN INITIATIVE NEEDED TO BE GIVEN HIGHER PRIORITY BASED ON THE DISASTER EVENT FOR WHICH HMGP MONIES WERE ALLOCATED,E.G., FOR A WIND-EVENT DISASTER, THE LMSWG MIGHT FEEL THAT WIND-INITIATIVES WOULD BE A BETTER FOCUS FOR A VULNERABLE COMMUNITY THAN A HIGHER PRIORITY PROJECT ON THE LISTING WHICH ADDRESSES FLOODING OR WILDFIRE.</p>			

SECTION 4 PROJECT PRIORITIZATION	CHANGE	COMMENTS/PURPOSE	DATE
PARA 4.1.2.1	REPLACED A SENTENCE	FORMALIZED THE PROCESS AND DATE TO HAVE A SPECIFIC TIME TO KNOW WHEN AGENCIES WILL NOTIFY THE LMSWG THAT THEY WILL APPLY FOR A SPECIFIC HMGP OPPORTUNITY	11/30/2012

SECTION 5 FUNDING SOURCES	CHANGE	COMMENTS/PURPOSE	DATE
PARA 5.2.2	ELIMINATED A SENTENCE.	ELIMINATED AN INCONSISTENCY WITH ANNEX I	11/30/2012

SECTION 6 MONITORING & EVAL	CHANGE	COMMENTS/PURPOSE	DATE
PAGE 3, PARA. 6.1.5	ADDED NOTE EXPLAINING THE CURRENT LMS APPROVAL PROCESS & ADDED DATE FOR ANNEX A'S APPROVAL	CLARIFIED THE APPROVAL PROCESS AND ADDED THE OMITTED DATE WHERE INDICATED.	1/20/2010

ANNEX A - REMOVED	CHANGE	COMMENTS/PURPOSE	DATE
ATTACHMENT 1 ADDED	ADDED ATTACHMENT 1	PER FEMA REQUEST, ADDED INFORMATION REGARDING THE "EXTENT" OF THE HAZARDS ADDRESSED.	4/9/10
RISK SUMMARY TABLE	SEE YELLOW HIGHLIGHTS	NECESSARY CHANGE FOR SCHOOL DISTRICT ADOPTION	7/19/2013

ANNEX B – RE-LETTERED TO A MAPS	CHANGE	COMMENTS/PURPOSE	DATE
RENUMBERED MAPS AND INSERTED MAPS 4 AND 4A	ADDED EVERGLADES CITY CURRENT AND FUTURE LAND USE MAPS	WEREN'T AVAILABLE AT THE TIME THE BCC ADOPTED THE LMS	11 FEB 2010

ANNEX C– RE-LETTERED TO B RESOLUTIONS	CHANGE	COMMENTS/PURPOSE	DATE
ADDED CITY RESOLUTION	ADDED MARCO ISLAND'S RESOLUTION TO ADOPT THE LMS		7/13/2010
ADDED FIRE DEPT. RESOLUTION	ADDED NN FIRE CONTROL & RESCUE DISTRICT RESOLUTION		7/19/2013
ADDED JURISDICTION RESOLUTION	ADDED SCHOOL DISTRICT RESOLUTION		10/22/2013
ADDED JURISDICTION RESOLUTION	ADDED BOARD OF COUNTY COMMISSIONERS RESOLUTION		3/16/15
ADDED JURISDICTION RESOLUTION	ADDED SCHOOL DISTRICT RESOLUTION		4/17/15
ADDED JURISDICTION RESOLUTION	ADDED MARCO ISLANDS RESOLUTION		4/8/15
ADDED JURISDICTION RESOLUTION	ADDED NAPLES RESOLUTION		4/1/15
ADDED JURISDICTION RESOLUTION	ADDED EVERGLADES CITY'S RESOLUTION		7/14/2015
ADDED JURISDICTION RESOLUTION	ADDED COLLIER COUNTY MOSQUITO CONTROL DISTRICT RESOLUTION		3/28/2019
ADDED JURISDICTION	ADDED GREATER NAPLES		4/16/2019

RESOLUTION	FIRE RESCUE DISTRICT RESOLUTION		
ADDED JURISDICTION RESOLUTION	ADDED NORTH COLLIER FIRE & RESCUE DISTRICT'S RESOLUTION		4/17/2019
ADDED JURISDICTION RESOLUTION	ADDED IMMOKALEE FIRE CONTROL DISTRICT'S RESOLUTION		4/22/2019
ADDED COMMUNITY DEVELOPMENT DIST RESOLUTION	ADDED HERITAGE BAY CDD'S RESOLUTION		10/19/2019

ANNEX D— RE-LETTERED TO C PUBLIC INVOLVEMENT	CHANGE	COMMENTS/PURPOSE	DATE
ADDED ATTACHMENTS	ADDED PUBLIC NOTICE SAMPLE AND SOCIAL MEDIA SAMPLE	TO INCLUDE UPDATED WAYS WE TRY TO INVOLVE THE PUBLIC	7/22/2019

ANNEX E— RE-LETTERED TO D GRANT FUNDING SOURCES	CHANGE	COMMENTS/PURPOSE	DATE
UPDATED SPREADSHEET	ADDED FEMA ONE-STOP GRANT SEARCH SITE.	MAKE SEARCHING FOR A GRANT EASIER.	7/18/2014

ANNEX F— RE-LETTERED TO E PRIORITIZE PROJ. LIST	THIS ANNEX CHANGES FREQUENTLY BASED ON ACTIONS/INITIATIVES OF THE LMSWG		
NOTE SINCE THE BCC JAN. 2010 ADOPTION	ADDED PREAMBLE COMMENTS HIGHLIGHTING THE FACT THAT SOME PROJECTS ADOPTED FOR CERTAIN HAZARDS ALSO MITIGATE THE EFFECTS OF OTHER THREATS.		

7/16/2010 - ADDED APPROVED PROJECTS AND RENUMBERED PRIORITIES	ADDED PROJ #22 (WIND RETROFIT NNFIRE STATION) & #23 (CC LEACHATE STORAGE TANK AND LIFT STA. UPGRADE). RENUMBERED PROJECT ORDER TO ACCOMMODATE ADDITIONS.
8/12/2010 ADDED/REMOVED APPROVED PROJECTS AND RENUMBERED PRIORITIES	ADDED PROJ #10 (THE WIND PROTECTION FOR THE N. COLLIER WTP.) ADDITIONALLY REMOVED COMPLETED PROJECT FOR THE SHADOWLAWN DR. ETC. DRAINING IMPROVEMENTS AND MOVED IT TO THE "COMPLETED" SECTION.
4/4/2011 TRANSFERRED APPROVED PROJECT TO THE COMPLETED SECTION & RENUMBERED PRIORITIES	COLLIER COUNTY'S WIND RETROFIT OF ITS SCALE-HOUSE AT THE LANDFILL WAS COMPLETED AND MOVED TO THE COMPLETED SECTION.
4/15/2011 TRANSFERRED APPROVED PROJECT TO THE COMPLETED SECTION & RENUMBERED PRIORITIES	THE FOLLOWING PROJECTS WERE MOVED TO THE COMPLETED LISTING: <ul style="list-style-type: none"> <li>• MARCO ISLAND'S WASTE WATER TREATMENT PLANT WIND PROTECTION</li> <li>• CAT FACILITY WIND RETROFIT</li> <li>• IMMOKALEE SPORTS COMPLEX &amp; GOLDEN GATE CMTY CENTER WIND RETROFIT.</li> </ul>
1/20/2012 TRANSFERRED APPROVED PROJECT TO THE COMPLETED SECTION & RENUMBERED PRIORITIES	THE FOLLOWING PROJECTS WERE MOVED TO COMPLETED: <ul style="list-style-type: none"> <li>• INSTALL GENERATOR AT IMMOKALEE HIGH SCHOOL</li> <li>• E. NAPLES COMMUNITY CENTER WIND RETROFIT</li> </ul>
10/19/2012	THE FOLLOWING PROJECTS WERE MOVED TO COMPLETED: <ul style="list-style-type: none"> <li>• PURCHASE REPETITIVE LOSS PROPERTY</li> </ul>
11/30/2012	- UPDATED PROJECT DATES AND ORGANIZATIONAL ASSIGNMENTS DUE TO RESTRUCTURING - ADDED/UPDATED THE FOLLOWING PROJECTS TO THE PROJECT PRIORITY LISTING AND

	<p>ADJUSTED THE PRIORITIES ACCORDINGLY.</p> <ul style="list-style-type: none"> <li>• PUBLIC UTILITIES OPS CTR HURRICANE DOOR HARDENING</li> <li>• SCHOOLS- PORTABLE GENERATOR CABLE PASS-THRU AND ANCHORING PAD</li> <li>• NAPLES – WIND RETROFIT CITY HALL</li> <li>• N. NAPLES FIRE DEPT STA 43- WIND RETROFIT</li> <li>• LCEC – MARCO SUBSTATION VAULT REPLACEMENT AND ELEVATION</li> <li>• LCEC – WOOD POLE REPLACEMENT</li> <li>• SCHOOLS – GENERATOR FOR CORKSCREW MS/ES</li> <li>• SCHOOLS – GENERATOR FOR CYPRESS PALM MS/SABAL PALM ES</li> </ul>
7/19/2013	NECESSARY CHANGE FOR SCHOOL DISTRICT ADOPTION. SEE YELLOW HIGHLIGHTS
7/19/2013	<p>-MOVED TWO PROJECTS TO “COMPLETED” SECTION</p> <p>-ADDED YMCA WIND RETROFIT PROJECT TO BOTTOM OF PROJECT LISTING</p> <p>- MOVED RETROFIT SW FLA.S PROJECT UP THE PROJECT LISTING.</p>
8/30/13	- UPDATED COST ESTIMATES FOR PROJECT #'S 22 AND 23.
1/17/14	- LCEC’S TWO PROJECTS (CONCRETE POLES AND RELAY STATION) WERE PULLED AND MOVED TO THE “DELETE SECTION”
18 OCT 2014	<p>- COLLIER SCHOOL DISTRICT WITHDRAWS PROJECT #16 FROM THE PROJECT LISTING AND WILL COMPLETE THE PROJECT WITH ITS RESOURCES.</p> <p>- CITY OF NAPLES (NEW PROJECT #16) WILL DEFER THIS WIND PROTECTION PROJECT TO A LATER DATE.</p>
20 JAN 2017	REVALIDATED THE PROJECT PRIORITY LISTING, ADDED PROJECTS AND DELETED OBSOLETE PROJECTS.
20 OCTOBER 2017	REMOVED TWO PROJECTS (RETROFIT SW FLA & MARCO ISLAND FIRE STATION) AND RENUMBERED THE PRIORITY LISTING
1 FEBRUARY 2018	ADDED PROJECTS REVIEWED ON 22 AND 26 JANUARY 2018.
15 MARCH 2018	ADDED PROJECTS REVIEWED ON 5 & 7 MARCH 2018
30 MARCH 2018	ADDED PROJECTS REVIEWED ON 29 MARCH 2018
18 MAY 2018	ADDED/UPDATED PROJECTS
8 JUNE 2018	ADDED CMCD PROJECTS FOR TWO GENSETS AND TWO SIDE-BY-SIDE 4X4s & ADDED REBUILD NW FLORIDA RESIDENTIAL RETROFITS
12 SEPT 2018	ADDED COLLIER IT’S 800MHZ OPTIC CABLE REDUNDANCY PROJECT AND ADJUSTED THE COST OF NAPLES ROOF PROJECT
19 OCT 2018	ADDED UPGRADES TO MAKE THE FIELD HOUSE OF THE SPORTS & ENTERTAINMENT

	COMPLEX AN ALL-HAZARDS PSN SHELTER FOR A CAT 5+ HURRICANE.
18 JAN 2019	DURING ANNUAL PROJECT VALIDATION, PROJECT SPONSORS WANTED THE FOLLOWING PROJECTS REMOVED: #5 – CONSTRUCT RESIDENTIAL SAFE-ROOM #27 – PURCHASE TWO SIDE-BY-SIDE SURVEILLANCE VEHS. FOR MOSQ. CONTROL #38 – ACQUIRE FUEL TRUCK FOR XFER OF DIESEL & GAS #66 – IMPROVE DRAINAGE SYSTEM ON SAN MARCO RD #57 – IMPROVE 800 MHZ RADIO SYSTEM WITH FIBER OPTIC CONNECTIVITY ADDED A PROJECT – WIND RETROFIT W/SCREEN PROTECTION FOR MI FIRE STA #51. MADE CHANGES/UPDATED SECTION 4.0 PROCEDURES FOR PRIORITIZING HAZARD MITIGATION INITIATIVES MADE CHANGES/UPDATED ANNEX I INITIATIVE SCORING CRITERIA
8 FEB 2019	COLLIER DISTRICT SCHOOLS ENGINEER WANTED ALL 10 OF THEIR PROJECTS REMOVED FROM THE PRIORITY LISTING.
18 JUL 2019	ADDED A MARCO ISLAND/COLLIER COUNTY WATERMAIN INTERCONNECT PROJECT.
17 JAN 2020	ADDED GNFD STAS. 23 & 90 HARDENING ADDED COLLIER COUNTY STORMWATER IMMOKALEE DRAINAGE PROJECTS FOR EDEN GARDEN AND NORTH 3 <sup>RD</sup> STREET)
31 JAN 2020	COMPLETED YEARLY PROJECT VALIDATION AND UPDATED THE ANNEX BASED ON THE RESULTS.

ANNEX G— RE-LETTERED TO F MEETING MINUTES	THIS ANNEX CHANGES FREQUENTLY AS IT CONTAINS BOTH THE PRIOR YEAR’S AND CURRENT YEAR’S MEETING MINUTES AND WILL DIRECT YOU TO THE LOCATION OF THE PAST MEETING MINUTES. MINUTES ARE PURGED YEARLY.
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ANNEX H— RE-LETTERED TO G MEMBERSHIP	THIS ANNEX CHANGES FREQUENTLY BASED ON ACTIONS/INITIATIVES OF THE LMSWG
NOTE SINCE THE BCC JAN. 2010 ADOPTION	A STATEMENT WAS ADDED IN THE PREAMBLE CLARIFYING THE FACT THAT THIS ANNEX REPRESENTS CURRENT VOTING MEMBERSHIP AND NOT JUST THE MEMBERSHIP OF THOSE INVITED TO PARTICIPATE IN 2003.
21 OCT 2011	UPDATED THIS SECTION TO UPDATE THE LISTING TO ADD/REMOVE VOTING MEMBERS &

	CHANGED BILL JONES'S AFFILIATION TO "INTERESTED RESIDENT".
27 JUL 2012	UPDATED MEMBERSHIP INFORMATION
4 DEC 2013	UPDATED MEMBERSHIP INFO, REFORMATTED ANNEX BASE ON LMSWG MEETING IN OCT 13.
17 JAN 2014	UPDATED MEMBER STATUS AND ADDED MEMBERS.
18 OCTOBER 2014	ROBERT WILEY AND J. VON RINTELN RESIGNED. CHRIS SPARACINO ELECTED VICE CHAIR. ALTERNATES TO PRIMARY MEMBERS LISTED ( LIZ GOSSELIN, WILLIAM LANG & CAROLINE CELIK)
2 FEBRUARY 2018	MEMBERS CHANGED/ADDED FROM EVERGLADES CITY AND COLLIER COUNTY PUBLIC SCHOOLS AND AN INTERESTED CITIZEN
18 MAY 2018	ADDED/REMOVED MEMBERS
8 JUN 2018	ADDED LCEC'S BOB ATKINS AND REMOVED PEGGY BOLDISSAR.
12 SEPT 2018	ADDED FFS MITIGATION SPECIALIST MELINDA AVNI
18 JAN 2019	REMOVED THE FOLLOWING AS VOTING MEMBERS DUE TO THEIR LACK OF ATTENDANCE: CHRIS NIFORATOS ROOSEVELT LEONARD EVERILDO YBACETA JAMES PRICE ADDED NEW MEMBER – MARK GRAJEWSKI
18 JUL 2019	REMOVED THE FOLLOWING FOR EITHER CHANGE OF JOBS OR LACK OF REGULAR ATTENDANCE: SAMANTHA QUINN C. CILEK H. CRITCHFIELD J. JOHNSON ADDED NEW MEMBERS: A. JONES, R. GREENBERG, S. D'ANGELO, W. MARTIN & A. McLAUGHLIN
19 OCTOBER 2019	ADDED TWO MEMBERS FROM THE HERITAGE BAY COMMUNITY DEVELOPMENT DISTRICT: DENNIS GAGNE & JACK ARCURI
17 JAN 2020	LISA OIEN RESIGNED DUE TO JOB TRANSFER.

IN LATE 2009, THE LMSWG VOTED TO AMEND THE MITIGATION STRATEGY (PARA. B) TO ADDRESS HOW THE INITIATIVES CAN GET ON THE PRIORITY LISTING BETWEEN THE QUARTERLY WORKING GROUP MEETING DATES IN ORDER TO BE ABLE TO SUBMIT AN APPLICATION FOR A "SHORT-NOTICED" GRANT OPPORTUNITY.

ANNEX I— RE-LETTERED	CHANGE	COMMENTS/PURPOSE	DATE
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TO H FLOODPLAIN PLANS			
CLARIFICATION	IN THE COST SECTION #5, CLARIFIED/DEFINED REPETITIVE LOSS	THERE WAS CONFUSION FROM THE APPLICANTS AS TO WHAT WAS MEANT BY REP. LOSS. THIS CHANGE FIXED IT.	7/16/2010
ON THE SCORE SHEET, SECTION "COST" #5	ADD "NA" TO THE BOTTOM OF THE SCORE SECTION.	THIS WILL GIVE "NO SCORE" OPTION TO A PROJECT THAT DOESN'T HAVE FLOOD INSURANCE.	11/30/2012

ANNEX J— RE-LETTERED TO I	THIS ANNEX CONTAINS JURISDICTIONAL FLOODPLAIN PLANS AND WILL EITHER CONTAIN OR DIRECT YOU TO THE MOST CURRENT PLAN. NFIP PARTICIPATION REQUIREMENTS ADDED FOR THE CONVENIENCE OF THE READER.		
15_Apr_2016	MARCO ISLAND ANNUAL PROGRESS REPORT ADDED.		

## **1.0 PURPOSE, ORGANIZATION & OUTREACH**

### **1.1 PURPOSE**

Initial development of the Collier County Multi-Jurisdictional Local Mitigation Strategy (hereafter known as LMS) was funded, in part, by the Florida Department of Community Affairs (FDCA) with Federal Emergency Management Agency (FEMA) funds earmarked for the development of comprehensive mitigation planning. The purpose of the Collier County Multi-Jurisdictional Local Mitigation Strategy is to develop a unified approach among county and municipal governments, along with inputs and participation from the private sector, for dealing with identified hazard and hazard management problems in the Collier County area. This strategy will serve as a tool to direct the county and municipal governments in their ongoing efforts to reduce vulnerability to the impacts produced by both natural and man-made hazards. The strategy will also help establish funding priorities for currently proposed mitigation projects and develop priority mitigation projects to be completed with such disaster assistance funds as may be made available after a disaster.

### **1.2 PROGRAM ORGANIZATION & MITIGATION STRATEGY PREPARATION PROCESS**

Key to the organizational effectiveness of the LMS and the basis for achieving broad community participation is through LMS meetings and *ad hoc* committees. The original LMS was written throughout the year, 2004, solely by the Emergency Management Division's staff with inputs solicited from the public in the course of its development. In the plan's development, staff reviewed other plans, e.g., the County's Comprehensive Plan, as well as post-disaster after action reports, etc. During that process several public meetings occurred in order to secure Local Mitigation Strategy Working Group (hereafter known as LMSWG) membership. Once the LMSWG was formed the team continued and drafted the Local Mitigation Strategy which ultimately was adopted by the County, its cities and later the Collier County Public Schools. During the year 2019, LMSWG membership increased by adding three Independent Fire Districts (Immokalee, North Collier and Greater Naples) and two Special Taxing Districts (Collier County Mosquito Control and Heritage Bay Community Development District). Since the adoption, changes to the plan were made by the LMSWG as needed, mainly in the areas of project scoring, project priority listing updates and membership updates. We reserve a portion of every quarterly meeting to address "Monitoring, Evaluating and/or Updating the LMS". All members of the working group at the quarterly meetings participate in the ongoing review process. The only comments received over the years typically dealt with membership and the project worksheet. Changes are reflected the "Summary of Changes" section of the current LMS. For several years the LMSWG has had a Homepage on the worldwide web, <http://bit.ly/2Br1j3Z>, and continues to solicit comments as well as posts mitigation grant opportunities, etc., when known.

For the 2010 5-year plan update cycle, the Chair contracted the Southwest Florida Regional Planning Council to develop/update the county's Risk Assessment and Vulnerability Analyses. Members of the LMSWG worked with the Chair to update the rest of the plan throughout CY 2009. (See minutes on the LMSWG Home Page)

For the 2015 five-year plan update cycle, the LMS continued to remain visible to the public for comments, etc., through its homepage, a specially designed page to contain the 2015 DRAFT documents and through the media announced public meetings. The floodplain manager contracted the flooding hazards analysis, including storm surge, for this planning cycle and the

Florida Forest Service has updated the wildfire hazards analysis. The remainder of the LMS will be adjusted to reflect the minor changes that have occurred since the last update.

For the 2020 five-year update cycle, the working group's changes were made to the project score sheet and the mitigation goals were reviewed and updated. Throughout the last year of this update cycle, the quarterly meeting announcements, via public notices and social media, solicited comments from the public of the Local Mitigation Strategy update. Additionally, to get the widest opportunities for interested people to participate, the LMS home page has a comment largely visible at the top of the page as a "note seeking public comment" during the review process and at every LMS meeting announced by a press release, there is an agenda item asking for comments and recommendations about the existing strategy.

### **1.2.1 Local Mitigation Strategy Working Group Membership & Quorum for Business**

The LMSWG is organized under the Collier County Citizens Corps. It serves as the policy development body for the Local Mitigation Strategy program. The role of this LMSWG is to advise and assist in the formulation, implementation, administration and refinement of the Collier County Multi-Jurisdictional Local Mitigation Strategy.

Membership on the LMS is not limited. However, as a multi-jurisdictional plan/strategy FEMA requires the following jurisdictions to adopt the LMS and to actively participate in the LMSWG in order to be eligible for project grants under FEMA hazard mitigation assistance programs:

- Collier Country Government, under the Board of County Commissioners (BCC)
- City of Marco Island,
- City of Naples,
- Everglades City,
- Collier County Public Schools,
- Collier Mosquito Control District,
- North Collier Fire Control and Rescue District
- Immokalee Fire Control District, and
- Greater Naples Fire Rescue District

Regarding voting: Voting members must be a resident of Collier County or have a business interest in the County like the LCEC or employment in Collier County. Private nonprofit organizations are not considered governmental entities and therefore need not adopt the LMS. Private citizens, businesses and private-non-profit organizations are encouraged to participate as voting members in the process. To have a vote on the LMSWG any individual can make the request to be a "participating member" at a LMSWG meeting and the working group votes on the request. Voting representatives can send designated alternates to attend committee meetings and to participate in discussions, program policy, administration, plan revisions, project prioritization and endorsement, etc. When votes are required to establish project priorities for an announced mitigation grant opportunity each participating jurisdiction shall get only one vote.

Regarding non-voting participants: No one is excluded from attending the LMS meetings, both Quarterly and Special ones. All meeting are announced publicly, via press release, and posted on the LMS webpage along with the agenda and past meeting minutes: <http://bit.ly/2Br1j3Z>. Local and regional agencies involved in hazard mitigation activities and those agencies that have the authority to regulate development are especially welcome to attend the meetings.

Non-resident/voting participants are welcome to attend meetings as well and address/interact with the working group.

The LMSWG has a designated Chair and Vice-Chair. They will be voted into their positions every year by the LMSWG membership. Positions may be reelected. The LMS Chair will not cast a vote on issues unless there is a tie vote on the floor. The LMS Vice-Chair has a vote unless this person is acting as the Chair.

Responsibilities of the “participating (voting) members”:

- Attend and “actively” participate in all regularly scheduled LMSWG meetings. Send a “qualified designated alternate” to the meeting should the regular voting member not be able to attend. When alternate attends for an agency the absence of the primary will not be counted.
- Furnish all information required by the LMSWG in the timeframe established by it.
- Update/maintain information in the LMS as it relates to your jurisdiction.

Quorum for LMS business: A minimum of **five** voting members must be present at the meeting. Upon meeting that requirement, a simple majority vote is all that is necessary to consummate business.

Revoking “voting membership” status: Failure of a “designated participating jurisdiction”, without having any designated alternates attending in the primary’s place, to attend two properly “noticed/announced” meetings within a calendar year will be grounds to remove that jurisdiction from the LMSWG. When a jurisdiction is cautioned about its removal from the working group, the LMS Chair will notify the member of the pending action. Should the attendance matter not be corrected, the Chair will notify the City Manager, Collier County Public Schools Superintendent, District Director or Fire Chief that they are no longer eligible ability to apply for FEMA mitigation grants until active “participating membership” gets reestablished. Although there is no restriction on attendance or the ability to speak during a meeting, the ability to vote on any issue will be limited to those approved by the membership. Non-jurisdictional voting members, e.g., members from the public or from private-nonprofit agencies, who miss three consecutive “properly noticed” meetings without an excuse will be considered for having their voting status revoked by the Chair and the matter being brought before the LMSWG for vote. Voting privileges can be reinstated by a majority vote of the LMSWG. This action is necessary to assure the membership maintains currency on all matters evolving from the working group.

Comments received prior to the meeting from members not able to attend the meeting or from the public will be addressed at the meeting and entered into the record.

### **1.2.2 Local Mitigation Strategy Working Group’s Committees**

The Chair of the LMSWG is authorized to establish committees as needed to further the goals and objectives of the LMS. Committee members need not be LMSWG members but may be an individual able to provide special expertise and knowledge about specific concerns addressed in the LMS.

Three such Committees were established in the early stages of the Local Mitigation Strategy to assist with initial program and plan development. They included: The Vulnerability Analysis Committee, the Finance & Outreach Committee, and the Community Rating System (CRS) Committee. Over time, since 2004, those committees evolved into two ad hoc sub-committees:

**Community Rating System and Wildfire Mitigation.** The Chair may call for Special Meetings to address any issue raised by the working group. When a Special Meeting is needed a public notice of the meeting is announced no later than 10 days prior to the meeting.

### **1.2.3 Conflict Resolution**

For any issue opposed by less than 50% of the LMSWG, resolution will be attempted utilizing the following:

A separate meeting will be scheduled with only those opposed to the issue (other interested parties may also attend; however, attendance is not required). The meeting will focus on identifying the root cause(s) of the opposition and determine whether compromise is possible.

If a resolution appears possible, but further discussion is needed, a subsequent meeting may be scheduled between a representative of the Board of County Commissioners (BCC) and a Mayor or representative of the City Council of the municipalities opposed. A representative from the state may also be invited to this meeting if deemed appropriate.

The last informal attempt at resolution will be a meeting with the entire BCC and the councils/commissions involved. This step will only be used when a very small minority of the LMSWG remains opposed to an issue.

Opposition to issues from non-governmental entities will be handled in a similar manner.

Upon inability to reach a compromise or the unsuccessful completion of the process, the full Collier County Citizen Corps will be consulted. If 75% of the Citizen Corps recommends that additional attempts at resolving the issues be made, the Conflict Resolution Process of the Southwest Florida Regional Planning Council shall be utilized. If 75% of the Citizen Corps recommends that the mediation be discontinued, the issue will be tabled.

Under Florida's Government in the Sunshine, all meeting of the Local Mitigation Strategy Working Group, its subcommittees, and the Citizen Corps are open to the public and are duly advertised.

## **1.3 LOCAL MITIGATION STRATEGY OUTREACH, PARTICIPATION & MEETING REQUIREMENTS**

At this time there are no participation requirements for others except for those set for the "Participating Jurisdictions" and for other voting members unable to attend an alternate can attend to act on their behalf, but not vote unless the membership allows. The LMSWG will meet at least quarterly. Additional meetings may occur upon reasonable notice through the Collier County Communications & Customer Relations Division and being posted on the LMS web page ([bit.ly/2Br1j3Z](http://bit.ly/2Br1j3Z)) in order to give the public the maximum opportunity to participate. If formed, subcommittees will set their own schedule, properly "notice" the scheduled meeting time/place; and, report results to the LMSWG.

Meeting minutes are maintained on the internet through the LMS web site ([bit.ly/2Br1j3Z](http://bit.ly/2Br1j3Z)). Should anyone require "hard-copies" of the minutes, the Emergency Management Division staff will provide them.

### **1.3.1 Participating Jurisdictions:**

For a jurisdiction to be eligible for Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Severe Repetitive Loss (SRL) and Pre-Disaster Mitigation (PDM) funding programs, they must have an adopted by resolution or interlocal agreement the Local Mitigation Strategy and demonstrated active participation in the LMSWG. **Annex B** will include the Board of County Commissioners agenda item summary along with a copy of all resolutions/interlocal agreements of the jurisdictions that have formally adopted the LMS. The underlined jurisdictions are the original “Participating Jurisdictions” since the original 2005 plan was drafted and adopted. They are also participating in the National Flood Insurance Program’s (NFIP) Community Rating System (CRS)\* except for Everglades City. The following are the current Participating Jurisdictions:

- Collier County Government represents all unincorporated Collier County, including Golden Gate Estates, Golden Gate City, Ave Maria community and Immokalee)
- Everglades City
- City of Naples
- City of Marco Island
- Collier County Public Schools
- Collier County Mosquito Control District
- Greater Naples Fire Rescue District
- Immokalee Fire Control District
- North Collier Fire Control and Rescue District

(\*NOTE: See Annex I for information related to how Collier County and its jurisdictions remain compliant with the National Floodplain Insurance Program, NFIP, as well as jurisdictional Floodplain Plans, as required/provided. When Community Rating System (CRS) communities have a Floodplain management plan, actions and initiatives above-and-beyond the basic plan NFIP requirements are addressed in the Plans.)

#### Participating Jurisdiction Responsibilities:

- Select a primary and alternate to attend and “actively” participate in all regularly scheduled LMSWG meetings. (NOTE: Your nominees should possess the full support of the jurisdiction’s chief executive in order to obtain the most accurate and timely information required for the hazard mitigation planning effort.)
- Furnish all information required by the LMSWG in the timeframe established by that Group.
- Update/maintain information in the LMS as it relates to your jurisdiction.
- Ratify the final LMS adopted by the Board of County Commissioners, by resolution or other legal device, to indicate participation and acceptance of the mitigation strategy.

### **1.3.2 Non-Governmental Organizations (NGO’s) and other Governmental Entities**

In order to qualify for LMS grant sponsorship, NGO’s and other governmental entities should adhere to the meeting participation standards outlined in the previous section.

Adjacent counties and the Seminole Tribe are invited to attend via their emergency management offices. These external jurisdictions are invited to all LMSWG meetings along with

the public both via e-mail and public notice disseminated via the Collier County Communications and Customer Relations Division.

### **1.3.3 The Public and Private Sector**

Participation by private organizations and the general public is strictly voluntary, but their attendance, comments, and contributions will be encouraged, monitored and fully documented. Initially in 2004, the broadly cast public invitation to participate was disseminated via newspaper, broadcast facsimile (to over 900 businesses, condos, mobile home parks, private schools, etc.), E-mail distribution list groupings (to over 1,000 addresses), worldwide web announcements ([bit.ly/2Br1j3Z](#)), etc., and a targeted invitation was sent to the following:

Each City (Naples, Marco Island, Everglades City)	Immokalee Friendship House
Collier County Sheriff	South Florida Water Management District
Collier County Clerk of Courts	Naples Community Hospital
Collier County Property Appraiser	Florida Department of Health
American Red Cross	Florida Division of Law Enforcement
Florida Gulf Coast University	Florida Forest Service
Collier County Public Schools	Immokalee Independent Fire District
International College (now Hodges Univ.)	North Collier Fire Control and Rescue District
Florida Power & Light	Greater Naples Fire Rescue District
Lee County Electric Cooperative	Florida Department of Agriculture
Southwest Florida Regional Planning Council	Florida Division of Emergency Mgt.
Naples Chamber of Commerce	Naples Airport Authority

In the years since the initial meeting, regular meeting invitations go out to an e-mail distribution listing which has been amended to/from the original list described above, are posted on the LMS web page and are made through the County's "Public Notice" process. Draft minutes and meeting agendas are attached to the announced regular meeting invitations. See Annex D, Procedures to Ensure Public Involvement, for the current invitation methodology and Annex G for evidence of the community's participation.

The current targeted email distribution list goes to the individuals in the following jurisdictions:

- City of Naples
  - Police Department – Capt. Barkley
  - Fire Department – Chief DiMaria
  - Floodplain Manager – Christa Carrera
- City of Marco Island – Chris Byrne, Incident Commander
  - Fire Department – Chief Murphy
  - Police Department – Capt. Dave Baer
  - Floodplain Manager – Kelli Defedericis
- Everglades City
  - Terry Smallwood, Building Official
- Collier Board of County Commissioner Agencies
  - Public Utilities – Alister Burnett, Manager, Environmental Compliance
  - Parks & Recreation – Ilonka Washburn, Operations
  - Floodplain Coordinator- Chris Mason
- Collier County Sheriff – Jose Carrillo, Sheriff Liaison & Special Ops.

- Lee County Public Safety – Lee Mayfield, Director
- Hendry County Emergency Management – Brian Newhouse, Director
- Collier County Public Schools – Marc Rouleau, Exec. Dir. Of Facilities Mgt.
- Collier Mosquito Control District – Stacy Welch, Director of Admin.
  - Mark Grazewski, Accounting Specialist
- Immokalee Fire Department – Chief Choate
  - Rita Greenberg, Deputy Chief
- North Collier Fire Control and Rescue Department – Chief Ricardo
  - Sal D’Angelo, Executive Director
- Greater Naples Fire Rescue Department – Chief Schuldt
  - Wayne Martin, Deputy Director-Planning
- Florida Division of Emergency Management – Jodie Fiske, Region 6 Coordinator
- Florida Forest Service – Sean Allen, Caloosahatchee Forestry Center Manager
  - Melinda Avni, Wildfire Mitigation Specialist
- Lee County Electric Cooperative – Tricia Dorn, Collier Account Manager
- The Salvation Army – Ashley Jones, dir. Of Social Services/Disaster Recovery
- South Florida Water Mgmt District – Lisa Koehler, Big Cypress Basin Administrator
- Saint Matthews House – Gary Bruton, VP Operations
- David Lawrence Center – David Warnken, Chief Planning & Business Development
- Hodges University – Skip Camp, Safety & Facilities Director
- Heritage Bay Community Development District – Dennis Gagne, Supervisor

For each meeting, a meeting summary, attendance list, public invite, public comments and all other solicitation efforts concerning public comments will be posted on the LMS web page.

#### **1.4 JURISDICTIONAL ADOPTION OF THE LOCAL MITIGATION STRATEGY**

All jurisdictions wishing to participate in and share in the benefits deriving from the LMS program at the local, state, and federal levels must complete and file a fully executed resolution or an interlocal agreement located in **Annex B**, which conforms with the adoption standards as jointly established and amended by the Collier County Board of County Commissioners and the LMSWG.

#### **1.5 NEW JURISDICTIONS/ENTITIES**

In the event of restructuring which duly adds, deletes, or merges jurisdictions within the county, the LMS will appropriately adjust its voting member rolls and require any newly defined jurisdictions to provide all documentation necessary for participation in the program.

## 2 Hazard Identification & Risk Assessment

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## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

**Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.**

**Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type...of all natural hazards that can affect the jurisdiction.**

**Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.**

**44 CFR Subsection D §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. Plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:**

A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B): An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; and

(C): Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

### 2.1 OVERVIEW

This section describes the Hazard Identification and Risk Assessment process for the development of the Collier County Local Mitigation Strategy. It describes how the County met the following requirements from the 10-step planning process:

- ▶ Planning Step 4: Assess the Hazard
- ▶ Planning Step 5: Assess the Problem

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. “It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.”

This hazard risk assessment covers all of Collier County, including the unincorporated County and all incorporated jurisdictions participating in this plan.

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of the potential risk to natural hazards in the county and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events. This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:



Data collected through this process has been incorporated into the following sections of this plan:

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

- ▶ **Section 2.2: Hazard Identification** identifies the natural and human-caused hazards that threaten the planning area.
- ▶ **Section 2.3: Risk Assessment Methodology and Assumptions**
- ▶ **Section 2.4: Asset Inventory** details the population, buildings, and critical facilities at risk within the planning area.
- ▶ **Section 2.5: Hazard Profiles, Analysis, and Vulnerability** discusses the threat to the planning area, describes previous occurrences of hazard events and the likelihood of future occurrences, and assesses the planning area's exposure to each hazard profiled; considering assets at risk, critical facilities, and future development trends.
- ▶ **Section 2.6: Conclusions on Hazard Risk** summarizes the results of the Priority Risk Index and defines each hazard as a Low, Medium, or High-Risk hazard.

### 2.2 HAZARD IDENTIFICATION

To identify hazards relevant to the planning area, the LMS working group began with a review of the list of hazards identified in the 2018 State Hazard Mitigation Plan and the 2015 Collier County Local Mitigation Strategy (LMS) as summarized in Table 2.1. The LMS working group used these lists to identify a full range of hazards for potential inclusion in this plan update and to ensure consistency across these planning efforts. All hazards listed below were evaluated for inclusion in this plan update.

Table 2.1 – Full Range of Hazards Evaluated

Hazard	Included in 2018 State HMP?	Included in 2015 Collier County LMS?
Flood	Yes	Yes
Tropical Cyclones	Yes	Yes (Storm Surge)
Severe Storms and Tornadoes	Yes	Yes
Wildfire	Yes	Yes
Coastal Erosion	Yes	Yes
Drought	Yes	No
Extreme Heat	Yes	No
Sea Level Rise and other Climate Change Characteristics	Yes	Yes
Sink holes	Yes	No
Winter Storms and Freeze	Yes	No
Earthquake	Yes	No
Tsunami	Yes	No
Major Transportation Incidents	Yes	No
Pandemic Outbreak	Yes	No
Hazardous Materials	Yes	No
Coastal Oil Spills	Yes	No
Nuclear Power Plant	Yes	No
Terrorism	Yes	No
Mass Migration Incident	Yes	No
Civil Disturbance	Yes	No
Critical Infrastructure Disruption (Cyber)	Yes	No

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

Hazard	Included in 2018 State HMP?	Included in 2015 Collier County LMS?
Special Events (Dignitary visits or events of national significance)	No	No
Red Tide/Algae Bloom	No	No

The LMS working group evaluated the above list of hazards using existing hazard data, past disaster declarations, local knowledge, and information from the 2018 State Plan and the 2015 Collier County Plan to determine the significance of these hazards to the planning area. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage.

One key resource in this effort was the National Oceanic and Atmospheric Administration's National Center for Environmental Information (NCEI), which has been tracking various types of severe weather since 1950. Their Storm Events Database contains an archive by county of destructive storm or weather data and information which includes local, intense and damaging events. NCEI receives storm data from the National Weather Service (NWS), which compiles their information from a variety of sources, including but not limited to: county, state and federal emergency management officials; local law enforcement officials; SkyWarn spotters; NWS damage surveys; newspaper clipping services; the insurance industry and the general public, among others. The NCEI database contains 366 records of severe weather events that occurred in Collier County in the 20-year period from 2000 through 2019. Table 2.2 summarizes these events.

**Table 2.2 – NCEI Severe Weather Reports for Collier County, 2000 – 2019**

Type	# of Events	Property Damage	Crop Damage	Deaths	Injuries
Coastal Flood	9	\$71,000	0	0	0
Dense Fog	4	0	0	0	0
Drought	64	0	0	0	0
Extreme Cold/Wind Chill	7	0	\$34,030,000	0	0
Flash Flood	6	\$300,000	0	0	0
Flood	11	\$43,500	0	0	0
Frost/Freeze	22	0	\$301,030,000	0	0
Funnel Cloud	25	0	0	0	0
Hail	39	0	0	0	0
Heavy Rain	5	\$60,000	0	0	0
High Wind	2	\$5,000	0	0	0
Hurricane (Typhoon)	4	\$2,500,000	0	1	0
Lightning	27	\$4,773,000	0	3	11
Rip Current	1	0	0	0	6
Storm Surge/Tide	5	\$6,060,000	0	0	0
Thunderstorm Wind	54	\$200,500	0	0	0
Tornado	24	\$786,590	0	0	1
Tropical Storm	7	\$70,000	0	0	0
Waterspout	6	0	0	0	0
Wildfire	17	\$5,428,000	0	0	1
<b>Total:</b>	<b>366</b>	<b>\$20,297,590</b>	<b>\$335,060,000</b>	<b>4</b>	<b>19</b>

Source: National Center for Environmental Information Storm Events Database, September 2019

Note: Losses reflect totals for all impacted areas for each event.

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

The LMS working group also researched past events that resulted in a federal and/or state emergency or disaster declaration for Collier County in order to identify significant hazards. Federal and/or state disaster declarations may be granted when the Governor certifies that the combined local, county and state resources are insufficient, and that the situation is beyond their recovery capabilities. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state government capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

Records of designated counties for FEMA major disaster declarations start in 1964. Since then, Florida has been designated in 69 major disaster declarations, and Collier County, including the Immokalee Indian Reservation, has been designated in 25 major disaster declarations, as detailed in Table 2.3, and 9 emergency declarations, as detailed in Table 2.4. Two such designations are for Hurricane Dorian – one for Collier County and one for the Immokalee Reservation.

**Table 2.3 – FEMA Major Disaster Declarations, Collier County**

Disaster #	Dec. Date	Incident Type	Event Title	Individual Assistance Applications Approved	Total Individual and Households Program Dollars Approved	Total Public Assistance Grant Dollars Obligated
4341	9/27/2017	Hurricane	Hurricane Irma Seminole Tribe	3	\$9,674.92	\$3,794,477.53
4337	9/10/2017	Hurricane	Hurricane Irma	774,691	\$1,020,968,233.16	\$1,825,881,275.84
4084	10/18/2012	Hurricane	Hurricane Isaac	--	--	\$22,292,837.45
4068	7/3/2012	Tropical Storm	Tropical Storm Debby	6,757	\$27,791,929.44	\$47,913,435.25
1785	8/24/2008	Tropical Storm	Tropical Storm Fay	5,383	\$19,216,129.55	\$98,200,979.98
1609	10/24/2005	Hurricane	Hurricane Wilma	227,320	\$342,239,388.43	\$1,491,325,871.49
1602	8/28/2005	Hurricane	Hurricane Katrina	--	--	\$188,865,729.15
1561	9/26/2004	Hurricane	Hurricane Jeanne	180,826	\$398,620,293.65	\$520,360,976.27
1551	9/16/2004	Hurricane	Hurricane Ivan	79,390	\$164,517,307.53	\$695,021,414.57
1545	9/4/2004	Hurricane	Hurricane Frances	229,577	\$411,815,685.98	\$682,789,667.24
1539	8/13/2004	Severe Storm(s)	Hurricane Charley and Tropical Storm Bonnie	116,769	\$208,970,753.97	\$611,396,718.48
1393	9/28/2001	Tropical Storm	Tropical Storm Gabrielle	--	--	\$22,990,447.07
1359	2/5/2001	Freeze	Severe freeze	--	--	--
1345	10/4/2000	Severe Storm(s)	Heavy rains and flooding	--	--	\$288,481,152.48
1306	10/20/1999	Hurricane	Hurricane Irene	--	--	\$106,261,560.28
1223	6/18/1998	Fire	Extreme Fire Hazard	--	--	--
1195	1/6/1998	Tornado	Tornadoes	--	--	--
1069	10/4/1995	Hurricane	Hurricane Opal	--	--	--
982	3/13/1993	Severe Storm(s)	Tornadoes, flooding, high winds, tides, freezing	--	--	--
955	8/24/1992	Hurricane	Hurricane Andrew	--	--	--
851	1/15/1990	Freeze	Severe freeze	--	--	--
732	3/18/1985	Freeze	Severe freeze	--	--	--
526	1/31/1977	Severe Storm(s)	Severe winter weather	--	--	--

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

Disaster #	Dec. Date	Incident Type	Event Title	Individual Assistance Applications Approved	Total Individual and Households Program Dollars Approved	Total Public Assistance Grant Dollars Obligated
304	3/15/1971	Freeze	Freeze	--	--	--
209	9/14/1965	Hurricane	Hurricane Betsy	--	--	--

Source: FEMA Disaster Declarations Summary, January 2020

Note: Number of applications approved, and all dollar values represent totals for all counties included in disaster declaration.

**Table 2.4 – FEMA Emergency Declarations, Collier County**

Disaster #	Dec. Date	Incident Type	Event Title/Description
3419/3420	8/31/2019	Hurricane	Hurricane Dorian
3385	9/5/2017	Hurricane	Hurricane Irma
3288	8/21/2008	Tropical Storm	Tropical Storm Fay
3131	9/25/1998	Hurricane	Hurricane Georges
3259	9/20/2005	Tropical Storm	Tropical Storm Rita
3220	9/5/2005	Hurricane	Hurricane Katrina Evacuation
3150	10/15/1999	Hurricane	Hurricane Irene
3139	4/27/1999	Fire	Fire Hazard

Source: FEMA Disaster Declarations Summary, January 2020

Using the above information and additional discussion, the LMS working group evaluated each hazard's significance to the planning area in order to decide which hazards to include in this plan update. Some hazard titles have been updated either to better encompass the full scope of a hazard or to assess closely related hazards together. Table 2.5 summarizes the determination made for each hazard.

**Table 2.5 – Hazard Evaluation Results**

Hazard	Included in this plan update?	Explanation for Decision
<b>Natural Hazards</b>		
Flood	Yes	The 2015 Collier County plan and 2018 State plan addressed this hazard. As a coastal county, over 95 percent of the county is within the 100-year-floodplain, and the county is also vulnerable to localized and stormwater flooding.
Tropical Cyclones	Yes	Both the 2015 Collier County plan and the 2018 State plan addressed Tropical Cyclones. Since 1965, the county has received 14 Major Disaster declarations from FEMA for Hurricanes/Tropical storms.
Severe Storms and Tornadoes	Yes	The 2015 Collier County plan profiled these hazards together. The County experienced 78 thunderstorm and tornado events causing close to \$1m in damages.
Wildfire	Yes	The 2015 Collier County plan as well as the 2018 State plan addressed this hazard. According to NCEI, in the past 20 years Collier County has had 17 wildfire events.
Coastal Erosion	Yes	The 2015 Collier County Floodplain Management Plan classified erosion as a priority hazard with a high likelihood of future occurrence.
Drought	Yes	Although drought was excluded from the 2015 LMS, NCEI records 64 drought events between 2000-2019. The LMS working group decided this hazard was worth assessment.
Extreme Heat	Yes	The 2015 Collier County plan did not address this hazard, however the LMS working group decided to include it in this plan update.

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

Hazard	Included in this plan update?	Explanation for Decision
Sea Level Rise and other Climate Change Characteristics	Yes	Sea Level Rise and Climate Change were addressed in the 2015 Collier County floodplain management plan as well as the 2018 State plan. NOAA's Sea Level Rise Viewer shows the County will experience impacts from even just one foot of sea level rise.
Sink Holes	Yes	The 2015 Collier County plan did not address Sink Holes, but the 2018 State plan did. The LMS working group chose to include it in this update.
Winter Storms and Freeze	No	The 2015 Collier County plan did not address Winter Storms and Freeze, but the 2018 State plan did. The LMS working group chose to include it in this update.
Earthquake	Yes	The 2015 Collier County plan did not address Earthquake, but the 2018 State plan did. The LMS working group chose to include it in this update.
Tsunami	Yes	The 2015 Collier County plan did not address Tsunami, but the 2018 State plan did. The LMS working group chose to include it in this update.
<b>Technological and Human-Caused Hazards &amp; Threats</b>		
Major Transportation Incidents	Yes	The 2015 Collier County plan did not address this hazard, but the LMS working group chose to include it in this plan update. The plan area has many bridges and major transportation routes.
Pandemic Outbreak	Yes	The 2015 Collier County plan did not address Pandemic Outbreak, but the 2018 State plan did. The LMS working group chose to include it in this update.
Hazardous Materials	Yes	The 2015 Collier County plan did not address Hazardous Materials, but the 2018 State plan did. The LMS working group chose to include it in this update. The County has 13 sites listed on the Toxic Release Inventory.
Coastal Oil Spills	Yes	The 2015 Collier County plan did not address Coastal Oil Spills, but the 2018 State plan did. The LMS working group chose to include it in this update.
Nuclear Power Plant	Yes	The 2015 Collier County plan did not address Nuclear Power Plant incidents, but the 2018 State plan did. The LMS working group chose to include it in this update. The southeastern corner of the County is in the Turkey Point Nuclear Power Facility Ingestion Exposure Pathway.
Terrorism	Yes	The 2015 Collier County plan did not address Terrorism, but the 2018 State plan did. The LMS working group chose to include it in this update.
Mass Migration Incident	Yes	The 2015 Collier County plan did not address Mass Migration Incident, but the 2018 State plan did. The LMS working group chose to include it in this update.
Civil Disturbance	Yes	The 2015 Collier County plan did not address Civil Disturbance, but the 2018 State plan did. The LMS working group chose to include it in this update.
Critical Infrastructure Disruption (Cyber)	Yes	The 2015 Collier County plan did not address Critical Infrastructure Disruption, but the 2018 State plan did. The LMS working group chose to include it in this update.

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

Hazard	Included in this plan update?	Explanation for Decision
Special Events (Dignitary visits or events of national significance)	Yes	The 2015 Collier County plan did not address Special Events, but the 2018 State plan did. The LMS working group chose to include it in this update.
Red Tide/Algae Bloom	Yes	The 2015 Collier County plan did not address Red Tide/Algae Bloom, but the 2018 State plan did. The LMS working group chose to include it in this update.

### 2.3 RISK ASSESSMENT METHODOLOGY AND ASSUMPTIONS

The Disaster Mitigation Act of 2000 requires that the LMS working group evaluate the risks associated with each of the hazards identified in the planning process. Each hazard was evaluated to determine its probability of future occurrence and potential impact. A vulnerability assessment was conducted for each hazard using either quantitative or qualitative methods depending on the available data, to determine its potential to cause significant human and/or monetary losses. A consequence analysis was also completed for each hazard.

Each hazard is profiled in the following format:

#### Hazard Description

This section provides a description of the hazard, including discussion of its speed of onset and duration, as well as any secondary effects followed by details specific to the Collier County planning area.

#### Location

This section includes information on the hazard's physical extent, with mapped boundaries where applicable.

#### Extent

This section includes information on the hazard extent in terms of magnitude, describe how the severity of the hazard can be measured. Where available, the most severe event on record used as a frame of reference.

#### Historical Occurrences

This section contains information on historical events, including the location and consequences of all past events on record within or near the Collier County planning area.

#### Probability of Future Occurrence

This section gauges the likelihood of future occurrences based on past events and existing data. The frequency is determined by dividing the number of events observed by the number of years on record and multiplying by 100. This provides the percent chance of the event happening in any given year according to historical occurrence (e.g. 10 winter storm events over a 30-year period equates to a 33 percent chance of experiencing a severe winter storm in any given year). The likelihood of future occurrences is categorized into one of the classifications as follows:

- ▶ **Highly Likely** – Near or more than 100 percent chance of occurrence within the next year
- ▶ **Likely** – Between 10 and 100 percent chance of occurrence within the next year (recurrence interval of 10 years or less)

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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- ▶ **Possible** – Between 1 and 10 percent chance of occurrence within the next year (recurrence interval of 11 to 100 years)
- ▶ **Unlikely** – Less than 1 percent chance of occurrence within the next 100 years (recurrence interval of greater than every 100 years)

### Climate Change

Where applicable, this section discusses how climate change may or may not influence the risk posed by the hazard on the planning area in the future.

### Vulnerability Assessment

This section quantifies, to the extent feasible using best available data, assets at risk to natural hazards and potential loss estimates. People, properties and critical facilities, and environmental assets that are vulnerable to the hazard are identified. Future development is also discussed in this section, including how exposure to the hazard may change in the future or how development may affect hazard risk.

The vulnerability assessments followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (August 2001). The vulnerability assessment first describes the total vulnerability and values at risk and then discusses vulnerability by hazard. Data used to support this assessment included the following:

- ▶ Geographic Information System (GIS) datasets, including building footprints, topography, aerial photography, and transportation layers;
- ▶ Hazard layer GIS datasets from state and federal agencies;
- ▶ Written descriptions of inventory and risks provided by the 2018 Florida Enhanced State Hazard Mitigation Plan;
- ▶ Written descriptions of inventory and risks provided by the 2015 Collier County Local Mitigation Strategy and the 2015 Collier County Floodplain Management Plan;
- ▶ Exposure and vulnerability estimates derived using local parcel and building data; and
- ▶ Crop insurance claims by cause from USDA's Risk Management Agency.

Two distinct risk assessment methodologies were used in the formation of the vulnerability assessment. The first consists of a quantitative analysis that relies upon best available data and technology, while the second approach consists of a qualitative analysis that relies on local knowledge and rational decision making. The quantitative analysis involved the use of FEMA's Hazus-MH, a nationally applicable standardized set of models for estimating potential losses from earthquakes, floods, and hurricanes. Hazus uses a statistical approach and mathematical modeling of risk to predict a hazard's frequency of occurrence and estimated impacts based on recorded or historic damage information. The Hazus risk assessment methodology is parametric, in that distinct hazard and inventory parameters—such as wind speed and building type—were modeled using the Hazus software to determine the impact on the built environment. Collier County's GIS-based risk assessment was completed using data collected from local, regional and national sources that included Collier County, Florida DEM, and FEMA.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Other information can be collected regarding the hazard area, such as the location of critical facilities, historic structures, and valued natural resources (e.g., an identified wetland or endangered species habitat). Together, this information conveys the vulnerability of that area to that hazard.

### Priority Risk Index

The conclusions drawn from the hazard profiling and vulnerability assessment process can be used to prioritize all potential hazards to the Collier County planning area. The Priority Risk Index (PRI) was applied for this purpose because it provides a standardized numerical value so that hazards can be compared against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk was assigned a value (1 to 4) and a weighting factor as summarized in Table 2.6.

PRI ratings by category for the planning area as a whole are provided throughout each hazard profile. Ratings specific to each jurisdiction are provided at the end of each hazard profile. The results of the risk assessment and overall PRI scoring are provided in Section 2.6 Conclusions on Hazard Risk.

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Table 2.6 – Priority Risk Index

RISK ASSESSMENT CATEGORY	LEVEL	DEGREE OF RISK CRITERIA	INDEX	WEIGHT
<b>PROBABILITY</b> What is the likelihood of a hazard event occurring in a given year?	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10 & 100% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	100% ANNUAL PROBABILITY	4	
<b>IMPACT</b> In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR > 1 DAY	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR > 1 WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES > 30 DAYS.	4	
<b>SPATIAL EXTENT</b> How large of an area could be impacted by a hazard event? Are impacts localized or regional?	NEGLECTIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4	
<b>WARNING TIME</b> Is there usually some lead time associated with the hazard event? Have warning measures been implemented?	MORE THAN 24 HRS	SELF DEFINED	1	10%
	12 TO 24 HRS	SELF DEFINED	2	
	6 TO 12 HRS	SELF DEFINED	3	
	LESS THAN 6 HRS	SELF DEFINED	4	
<b>DURATION</b> How long does the hazard event usually last?	LESS THAN 6 HRS	SELF DEFINED	1	10%
	LESS THAN 24 HRS	SELF DEFINED	2	
	LESS THAN 1 WEEK	SELF DEFINED	3	
	MORE THAN 1 WEEK	SELF DEFINED	4	

The sum of all five risk assessment categories equals the final PRI value, demonstrated in the equation below (the highest possible PRI value is 4.0).

$$PRI = [(PROBABILITY \times .30) + (IMPACT \times .30) + (SPATIAL EXTENT \times .20) + (WARNING TIME \times .10) + (DURATION \times .10)]$$

The purpose of the PRI is to categorize and prioritize all potential hazards for the Collier County planning area as high, moderate, or low risk. The summary hazard classifications generated using the PRI allows for the prioritization of those high and moderate hazard risks for mitigation planning purposes. Mitigation actions are not necessarily developed for hazards identified as low risk through this process.

## 2.4 ASSET INVENTORY

An inventory of assets within Collier County was compiled to identify those structures potentially at risk to the identified hazards and assess the level of vulnerability. Assets include elements such as buildings, property, business/industry goods, and civil infrastructure. Building footprint, foundation type, and building value data were provided by Collier County. By identifying the type and number of assets that exist and where they are in relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed.

### 2.4.1 Building Exposure

The properties identified to be at risk include all improved properties in Collier County and its incorporated jurisdictions according to parcel and building footprint data provided by Collier County. The information is provided in Table 2.7.

**Table 2.7 – Collier County Building Exposure by Jurisdiction and Occupancy**

Occupancy	Estimated Parcel Count	Structure Value	Estimated Content Value	Total Value
<b>Everglades City</b>	<b>559</b>	<b>\$63,766,737</b>	<b>\$41,405,956</b>	<b>\$105,172,693</b>
Commercial	40	\$6,532,698	\$6,532,698	\$13,065,396
Education	2	\$5,970,494	\$5,970,494	\$11,940,988
Government	12	\$4,201,718	\$4,201,718	\$8,403,436
Industrial	10	\$677,235	\$1,015,853	\$1,693,088
Religious	4	\$985,794	\$985,794	\$1,971,588
Residential	491	\$45,398,798	\$22,699,399	\$68,098,197
<b>Immokalee Reservation</b>	<b>1</b>	<b>\$32,843,815</b>	<b>\$16,421,908</b>	<b>\$49,265,723</b>
Residential	1	\$32,843,815	\$16,421,908	\$49,265,723
<b>Marco Island</b>	<b>18,938</b>	<b>\$8,456,653,079</b>	<b>\$4,321,417,171</b>	<b>\$12,778,070,250</b>
Commercial	271	\$110,002,047	\$110,002,047	\$220,004,094
Education	2	\$21,217,449	\$21,217,449	\$42,434,898
Government	22	\$18,316,045	\$18,316,045	\$36,632,090
Industrial	15	\$3,884,325	\$5,826,488	\$9,710,813
Religious	9	\$28,877,072	\$28,877,072	\$57,754,144
Residential	18,619	\$8,274,356,141	\$4,137,178,071	\$12,411,534,212
<b>Naples</b>	<b>19,648</b>	<b>\$15,061,447,248</b>	<b>\$8,031,303,248</b>	<b>\$23,092,750,496</b>
Commercial	406	\$684,149,867	\$684,149,867	\$1,368,299,734
Education	7	\$71,175,419	\$71,175,419	\$142,350,838
Government	79	\$154,495,988	\$154,495,988	\$308,991,976
Industrial	22	\$26,951,820	\$40,427,730	\$67,379,550
Religious	23	\$37,434,333	\$37,434,333	\$74,868,666
Residential	19,111	\$14,087,239,821	\$7,043,619,911	\$21,130,859,732
<b>Unincorporated Collier County</b>	<b>166,272</b>	<b>\$52,057,903,949</b>	<b>\$28,524,521,680</b>	<b>\$80,582,425,629</b>
Agriculture	535	\$89,139,393	\$89,139,393	\$178,278,786
Commercial	2,109	\$2,126,531,891	\$2,126,531,891	\$4,253,063,782
Education	77	\$875,549,728	\$875,549,728	\$1,751,099,456
Government	344	\$539,499,844	\$539,499,844	\$1,078,999,688
Industrial	894	\$546,290,183	\$819,435,275	\$1,365,725,458
Religious	132	\$267,838,189	\$267,838,189	\$535,676,378
Residential	162,181	\$47,613,054,721	\$23,806,527,361	\$71,419,582,082

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Occupancy	Estimated Parcel Count	Structure Value	Estimated Content Value	Total Value
<b>Countywide Total</b>	<b>205,418</b>	<b>\$75,672,614,828</b>	<b>\$40,935,069,962</b>	<b>\$116,607,684,790</b>
Agriculture	535	\$89,139,393	\$89,139,393	\$178,278,786
Commercial	2,826	\$2,927,216,503	\$2,927,216,503	\$5,854,433,006
Education	88	\$973,913,090	\$973,913,090	\$1,947,826,180
Government	457	\$716,513,595	\$716,513,595	\$1,433,027,190
Industrial	941	\$577,803,563	\$866,705,345	\$1,444,508,908
Religious	168	\$335,135,388	\$335,135,388	\$670,270,776
Residential	200,403	\$70,052,893,296	\$35,026,446,648	\$105,079,339,944

Source: Collier County parcel data, 2019

Note: Content value estimations are generally based on the FEMA Hazus methodology of estimating value as a percent of improved structure values by property type. The residential property type assumes a content replacement value equal to 50% of the building value. Agricultural and commercial property types assume a content replacement value equal to 100% of the building value. The industrial property type assumes a content replacement value equal to 150% of the building value.

### 2.4.2 Critical Facilities and Infrastructure Exposure

Of significant concern with respect to any disaster event is the location of critical facilities and infrastructure in the planning area. Critical facilities are often defined as those essential services and lifelines that, if damaged during an emergency event, would result in severe consequences to public health, safety, and welfare. Critical facility information is regularly updated by the County. Critical facilities and infrastructure in Collier County are listed by type in Table 2.8. A detailed list of critical facilities is provided in each jurisdictional annex. These facilities were identified and verified by the LMS working group.

**Table 2.8 – Critical Facilities and Infrastructure in Collier County**

Jurisdiction	Schools	Fire & EMS	Government	Hazardous Materials	Health	Police Dept.	Public Works	Utilities	Transportation	Water	Total
Unincorporated Collier County	47	56	1	101	54	2	20	21	12	15	329
Everglades City	1	2	1	3	-	-	1	-	1	-	9
Immokalee Reservation	-	-	-	-	-	-	-	1	-	-	1
Marco Island	2	3	1	4	2	1	1	2	2	2	20
Naples	5	11	1	8	12	4	1	2	2	-	46
<b>Countywide Total</b>	<b>55</b>	<b>72</b>	<b>4</b>	<b>116</b>	<b>68</b>	<b>7</b>	<b>23</b>	<b>26</b>	<b>17</b>	<b>17</b>	<b>405</b>

Source: Collier County

### 2.5 HAZARD PROFILES, ANALYSIS, AND VULNERABILITY

#### 2.5.1 Flood

##### Hazard Description

Flooding is defined by the rising and overflowing of water onto normally dry land. As defined by FEMA, a flood is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties. Flooding can result from an overflow of inland waters or an unusual accumulation or runoff of surface waters from any source.

Flooding is the most frequent and costly of all natural hazards in the United States and has caused more than 10,000 deaths since 1900. Approximately 90 percent of presidentially declared disasters result from flood-related natural hazard events. Taken as a whole, more frequent, localized flooding problems that do not meet federal disaster declaration thresholds ultimately cause most damages across the United States.

##### Sources and Types of Flooding

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Per the 2012 Flood Insurance Study (FIS), flooding results from two major sources in Collier county. Coastal areas are subject to inundation from ocean surges, whereas inland areas can become flooded when rainfall accumulates in low, flat areas. Rainfall primarily occurs during thunderstorms in the summer months, with additional rainfall resulting from the passage of hurricanes. A transition region near the coast is vulnerable to both rainfall and ocean surge flooding. Coastal lands typically lie below an elevation of 9 feet, North America Vertical Datum of 1988 (NAVD88), and are subject to flooding from hurricanes and tropical storms.

The general topography of Collier County is extremely flat, with land slopes on the order of 1 foot per mile to 0.5 foot per mile in the interior regions. There are no major natural streams, such as those found in areas of steeper topography. Rather, flow occurs over wide, flat areas, in sloughs, and through manmade canal systems. Natural, well-drained channels are apparent only close to the coast. The lack of steep slopes precludes rapid runoff; therefore, water accumulates in ponded areas and slowly infiltrates the groundwater system or sluggishly drains over the land.

**Coastal Tidal Flooding:** All lands bordering the Gulf Coast are susceptible to tidal effects and flooding. Coastal land such as sand bars, barrier islands and deltas provide a buffer zone to help protect human life and real property relative to the sea much as flood plains provide a buffer zone along rivers and other bodies of water. Coastal floods usually occur because of abnormally high tides or tidal waves, storm surge and heavy rains in combination with high tides, tropical storms and hurricanes.

**Overland Sheet Flow:** Due to the relative flatness of Collier County's topography, historical water flow has always been shallow overland sheet flow during the wet season, when this flow enters sloughs and the man-made canal system.

**Shallow Ponding:** Because much of the County is flat, whatever rainfall doesn't she flow from an area tends to pond and percolate into the ground, causing water tables to rise during the wet season to within a foot or less of the ground in most of Collier County, so there is little soil storage.

Other forms of flooding in the county might include:

**Flash or Rapid Flooding:** A flash flood occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, possibly from slow-moving intense thunderstorms and sometimes combined with saturated soil, or impermeable surfaces. Flash flooding can happen in Special Flood Hazard Areas (SFHAs) as delineated by the National Flood Insurance Program (NFIP) and can also happen in areas

not associated with floodplains. Flash flood hazards caused by surface water runoff are most common in urbanized areas, where greater population density generally equates to more impervious surface (e.g., pavement and buildings) which increases the amount of surface water generated.

Flash flooding is a dangerous form of flooding which can reach full peak in only a few minutes. Rapid onset allows little or no time for protective measures. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding.

**Localized/Stormwater Flooding:** Localized stormwater flooding can occur throughout Collier County. Localized stormwater flooding occurs when heavy rainfall and an accumulation of runoff overburden the stormwater drainage system. The cause of localized stormwater flooding in Collier County can be attributed to its generally flat topography, among other factors.

Localized flooding may be caused by the following issues:

- ▶ **Inadequate Capacity** – An undersized/under capacity pipe system can cause water to back-up behind a structure which can lead to areas of ponded water and/or overtopping of banks.
- ▶ **Clogged Inlets** – Debris covering the asphalt apron and the top of grate at catch basin inlets may contribute to an inadequate flow of stormwater into the system. Debris within the basin itself may also reduce the efficiency of the system by reducing the carrying capacity.
- ▶ **Blocked Drainage Outfalls** – Debris blockage or structural damage at drainage outfalls may prevent the system from discharging runoff, which may lead to a back-up of stormwater within the system.
- ▶ **Improper Grade** – Poorly graded asphalt around catch basin inlets may prevent stormwater from entering the catch basin as designed. Areas of settled asphalt may create low spots within the roadway that allow for areas of ponded water.

While localized flooding may not be as destructive as coastal flooding, it is a chronic problem. The repetitive damage caused by such flooding can add up. Sewers may back up, yards can be inundated, and homes, businesses and vehicles can be flooded. Drainage and sewer systems not design to carry the capacity currently needed to handle increased storm runoff can cause water to back into basements and damage mechanical systems. These impacts, and other localized flooding impacts, can create public health and safety concerns.

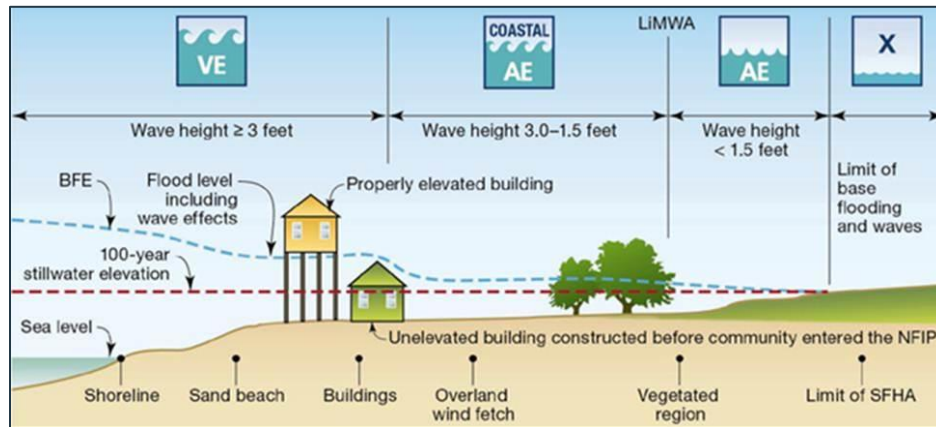
In addition to these different types of flooding, flooding in Collier County is a factor of the amount and timing of rainfall and the tide cycle elevation. The amount of rainfall occurring in March would not have the same flooding effect if the same amount occurred in September. During the dry season, the water table elevation typically drops to several feet below natural ground elevations. This allows for larger storage volume in the soil, lakes, canals, ditches, and swales. During the wet season, however, the water table elevation is often near the natural ground surface, lakes are filled, and ditches are flowing. The rainfall added to such conditions creates more stormwater runoff.

### Flooding and Floodplains

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In coastal areas, flooding occurs due to high tides, tidal waves, storm surge, or heavy rains. In these areas, flood hazards typically include the added risk of wave action delineated by the VE Zone and Coastal AE Zone. Wave height and intensity decreases as floodwaters move inland. Figure 2.1 shows the typical coastal floodplain and the breakdown of flood zones in these settings. These flood zones are discussed further in Table 2.9

Figure 2.1 – Characteristics of a Coastal Floodplain



Source: FEMA

In its common usage, the floodplain most often refers to that area that is inundated by the “100-year flood,” which is the flood that has a 1% chance in any given year of being equaled or exceeded. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

The 100-year flood, which is the minimum standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. Participation in the NFIP requires adoption and enforcement of a local floodplain management ordinance which is intended to prevent unsafe development in the floodplain, thereby reducing future flood damages. Participation in the NFIP allows for the federal government to make flood insurance available within the community as a financial protection against flood losses. Since floods have an annual probability of occurrence, have a known magnitude, depth and velocity for each event, and in most cases, have a map indicating where they will likely occur, they are in many ways often the most predictable and manageable hazard.

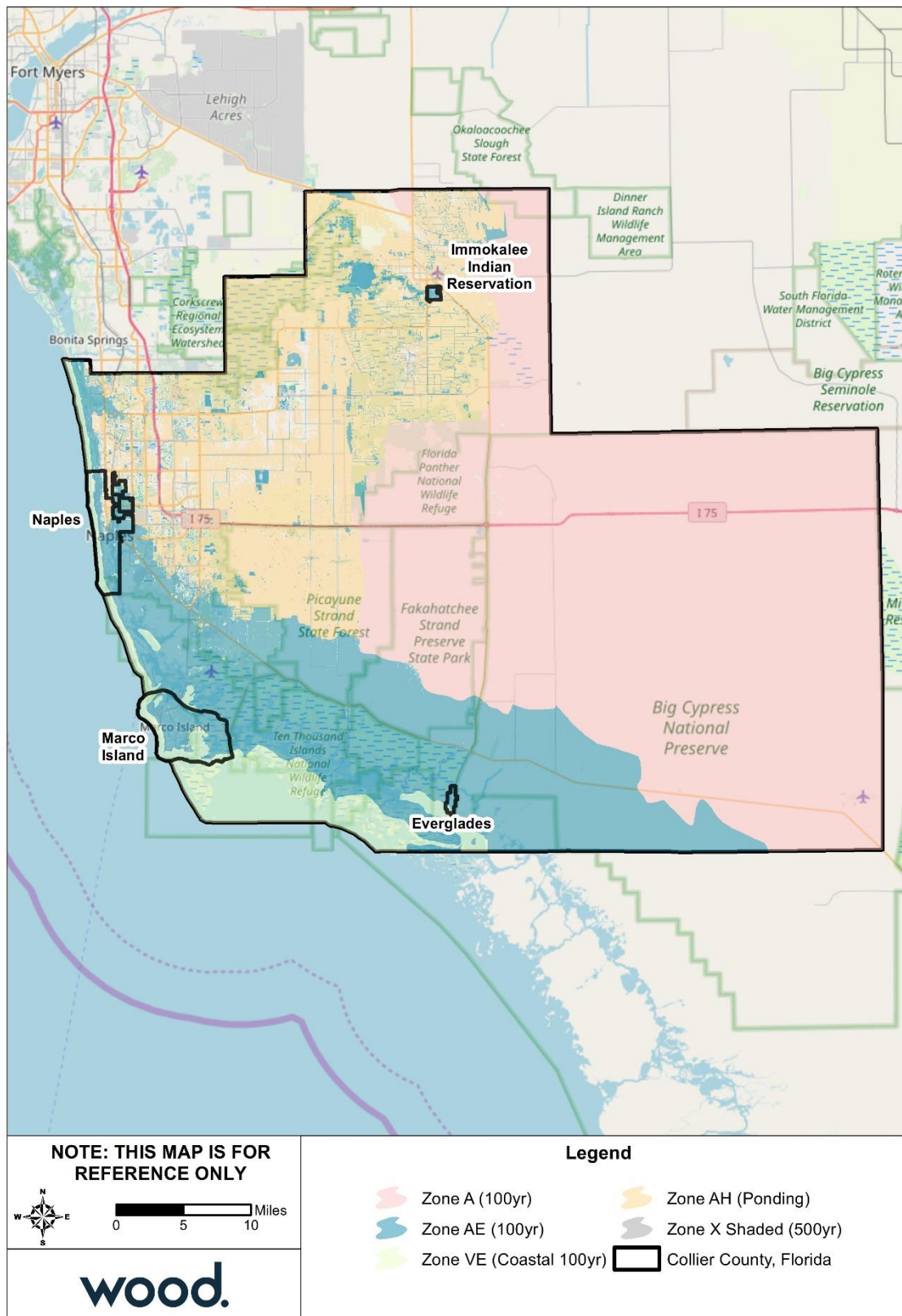
*Warning Time: 3 – 6 to 12 hours*

*Duration: 3 – Less than 1 week*

### Location

Figure 2.2 reflects the effective mapped flood insurance zones for Collier County. Maps for each participating jurisdiction are provided in the jurisdictional annexes.

Figure 2.2 – FEMA Flood Hazard Areas in Collier County



Source: FEMA Effective DFIRM

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### Extent

Flood extent can be defined by the amount of land in the floodplain and the potential magnitude of flooding as measured by flood height and velocity.

Regulated floodplains are illustrated on inundation maps called Flood Insurance Rate Maps (FIRMs). It is the official map for a community on which FEMA has delineated both the Special Flood Hazard Areas (SFHAs) and the risk premium zones applicable to the community. SFHAs represent the areas subject to inundation by the 100-year flood event. Structures located within the SFHA have a 26-percent chance of flooding during the life of a standard 30-year mortgage. Flood prone areas were identified within Collier County using the Effective FIRMs, dated May 16, 2012. Table 2.9 summarizes the flood insurance zones identified by the Digital FIRM (DFIRM).

**Table 2.9 – Mapped Flood Insurance Zones within Collier County**

Zone	Description
<b>VE</b>	Also known as the coastal high hazard areas. They are areas subject to high velocity water including waves; they are defined by the 1% annual chance (base) flood limits (also known as the 100-year flood) and wave effects 3 feet or greater. The hazard zone is mapped with base flood elevations (BFEs) that reflect the combined influence of stillwater flood elevations, primary frontal dunes, and wave effects 3 feet or greater.
<b>AE</b>	AE Zones, also within the 100-year flood limits, are defined with BFEs that reflect the combined influence of stillwater flood elevations and wave effects less than 3 feet. The AE Zone generally extends from the landward VE zone limit to the limits of the 100-year flood from coastal sources, or until it reaches the confluence with riverine flood sources. The AE Zones also depict the SFHA due to riverine flood sources, but instead of being subdivided into separate zones of differing BFEs with possible wave effects added, they represent the flood profile determined by hydrologic and hydraulic investigations and have no wave effects. The Coastal AE Zone is differentiated from the AE Zone by the Limit of Moderate Wave Action (LiMWA) and includes areas susceptible to wave action between 1.5 to 3 feet.
<b>AH</b>	Areas subject to inundation by 1% -annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone.
<b>A</b>	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
<b>0.2% Annual Chance (shaded Zone X)</b>	Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones. (Zone X (shaded) is used on new and revised maps in place of Zone B.)
<b>Zone X (unshaded)</b>	Minimal risk areas outside the 1-percent and .2-percent-annual-chance floodplains. No BFEs or base flood depths are shown within these zones. Zone X (unshaded) is used on new and revised maps in place of Zone C.

Over 95 percent of Collier County falls within the SFHA. Table 2.10 provides a summary of the County's total area (excluding open water) by flood zone on the 2012 effective DFIRM. Figure 2.3 shows the depth of flooding predicted from a 1% annual chance flood.

Table 2.10 – Flood Zone Acreage in Collier County

Flood Zone	Acreage	Percent of Total (%)
<b>Everglades City</b>		
A	0.0	0.0%
AE	608.4	80.3%
AH	0.0	0.0%
VE	147.6	19.5%
Unshaded X	0.0	0.0%
0.2% Annual Chance Flood Hazard	1.2	0.2%
<b>Total</b>	<b>757.3</b>	<b>--</b>
<b>SFHA Total</b>	<b>756.0</b>	<b>99.8%</b>
<b>Immokalee Reservation</b>		
A	0.0	0.0%
AE	519.3	86.6%
AH	2.1	0.4%
VE	0.0	0.0%
Unshaded X	61.1	10.2%
0.2% Annual Chance Flood Hazard	17.2	2.9%
<b>Total</b>	<b>599.6</b>	<b>--</b>
<b>SFHA Total</b>	<b>521.4</b>	<b>86.9%</b>
<b>Marco Island</b>		
A	0.0	0.0%
AE	9,858.1	62.5%
AH	0.0	0.0%
VE	5,623.2	35.7%
Unshaded X	235.5	1.5%
0.2% Annual Chance Flood Hazard	51.2	0.3%
<b>Total</b>	<b>15,768.0</b>	<b>--</b>
<b>SFHA Total</b>	<b>15,481.3</b>	<b>98.2%</b>
<b>Naples</b>		
A	0.0	0.0%
AE	7,198.0	59.9%
AH	449.7	3.7%
VE	2,998.3	25.0%
Unshaded X	772.5	6.4%
0.2% Annual Chance Flood Hazard	597.0	5.0%
<b>Total</b>	<b>12,015.5</b>	<b>--</b>
<b>SFHA Total</b>	<b>10,646.0</b>	<b>88.6%</b>
<b>Unincorporated Collier County</b>		
A	660,494.5	49%
AE	294,133.9	21.8%
AH	280,605.8	20.8%
VE	55,582.8	4.1%
Unshaded X	19,963.0	1.5%
0.2% Annual Chance Flood Hazard	37,174.7	2.8%
<b>Total</b>	<b>1,347,954.7</b>	<b>--</b>
<b>SFHA Total</b>	<b>1,290,817.0</b>	<b>95.8%</b>

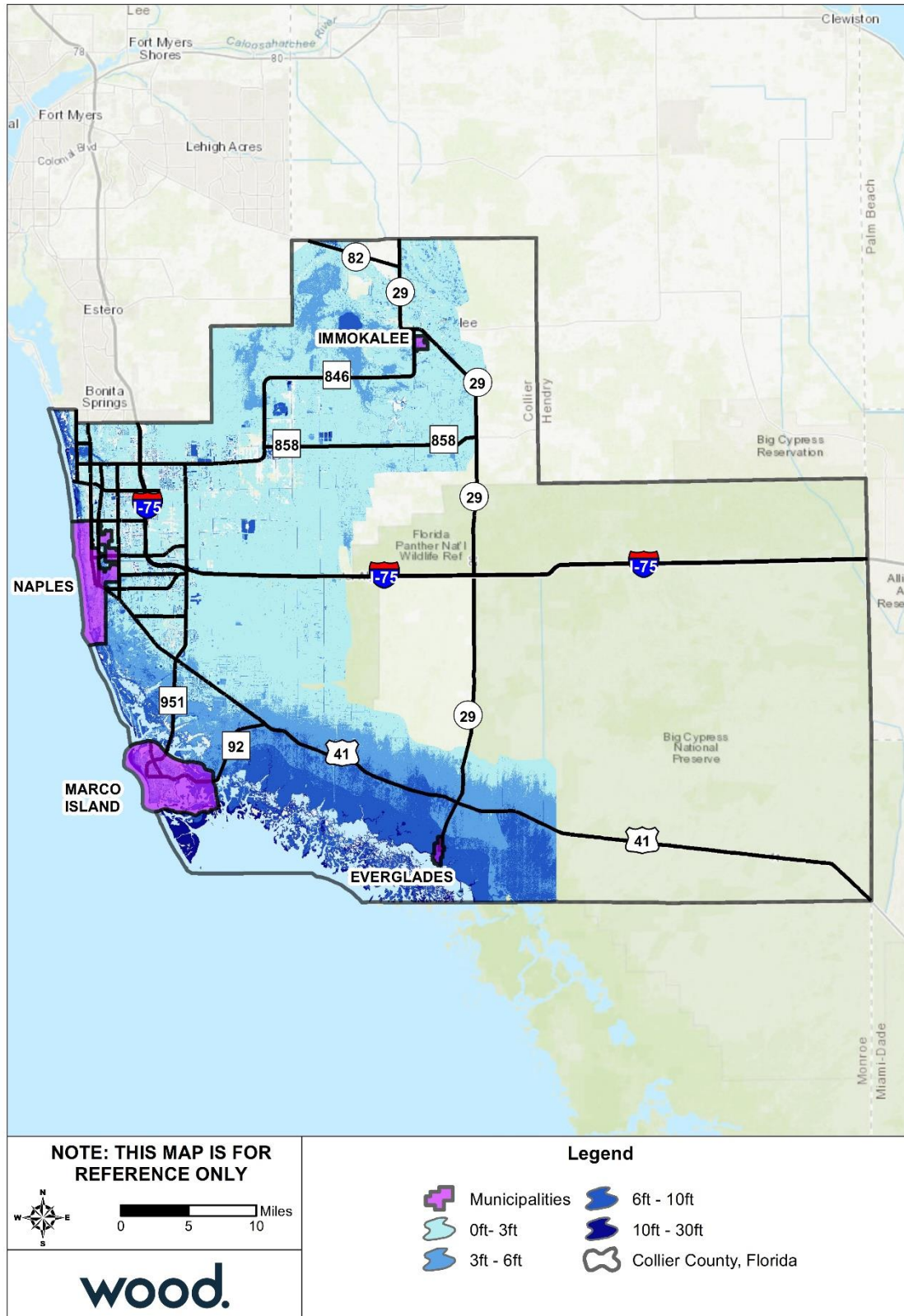
## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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Flood Zone	Acreage	Percent of Total (%)
<b>Collier County Total</b>		
A	660,494.5	48.0%
AE	312,317.7	22.7%
AH	281,057.6	20.4%
VE	64,351.9	4.7%
Unshaded X	38,243.8	2.8%
0.2% Annual Chance Flood Hazard	20,629.6	1.5%
<b>Total</b>	1,377,095.0	--
<b>SFHA Total</b>	<b>1,318,221.7</b>	<b>95.7%</b>

Source: FEMA Effective DFIRM

Figure 2.3 – Flood Depth, 100-Year Floodplain, Collier County



Source: FEMA Effective DFIRM

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The NFIP utilizes the 100-year flood as a basis for floodplain management. The Flood Insurance Study (FIS) defines the probability of flooding as flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 100-year period (recurrence intervals). Considered another way, properties in a 100-year flood zone have a one percent probability of flooding during any given year. Mortgage lenders require that owners of properties with federally-backed mortgages located within SFHAs purchase and maintain flood insurance policies on their properties. Consequently, newer and recently purchased properties in the community are typically insured against flooding.

*Impact: 3 – Critical*

*Spatial Extent: 3 – Moderate*

### Historical Occurrences

Table 2.11 details the historical occurrences of flooding identified from 2000 through 2019 by NCEI Storm Events database. It should be noted that only those historical occurrences listed in the NCEI database are shown here and that other, unrecorded or unreported events may have occurred within the planning area during this timeframe.

**Table 2.11 – NCEI Records of Flooding, 2000-2019**

Type	Event Count	Deaths/ Injuries	Reported Property Damage
Coastal Flood	9	0/0	\$71,000
Flash Flood	6	0/0	\$300,000
Flood	11	0/0	\$43,500
Heavy Rain	4	0/0	\$60,000
Storm Surge	5	0/0	\$6,060,000
<b>Total</b>	<b>35</b>	<b>0/0</b>	<b>\$6,534,500</b>

Source: NCEI

According to NCEI, 35 recorded flood events affected the planning area from 2000 to 2019 causing an estimated \$6,534,500 in property damage, with no fatalities, injuries, or crop damage.

Table 2.12 provides a summary of this historical information by location. It is important to note that many of the events attributed to the county are countywide or include incorporated areas. Similarly, though some events have a starting location identified, the event may have covered a larger area including multiple jurisdictions. Still, this list provides an indication of areas that may be particularly flood prone.

**Table 2.12 – Summary of Historical Flood Occurrences by Location, 2000-2019**

Location	Event Count	Deaths/Injuries	Property Damage
Immokalee Reservation	2	0/0	\$0
Marco Island	5	0/0	\$193,000
Naples	10	0/0	\$50,500
Unincorporated/Countywide	18	0/0	\$6,291,000
<b>Total</b>	<b>35</b>	<b>0/0</b>	<b>\$6,534,500</b>

Source: NCEI

The following event narratives are provided in the NCEI Storm Events Database and illustrate the impacts of flood events on the county:

**July 23, 2001** – At least four residences and 20 vehicles were damaged by flood waters on Marco Island and in East Naples. 48-hour rainfall amounts of 4 to 10 inches of rain were measured over southwest Florida as a trough of low pressure stalled in the eastern Gulf of Mexico. Radar estimated 8-12 inches of

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rain fell over a 96-hour period in Marco Island. Strong onshore winds caused some minor tidal flooding of streets.

**September 29, 2003** – Very heavy rainfall fell across southwest Florida with radar estimated amount of 8 to 10 inches. Naples measured a record 6.99 inches. The resulting flood closed numerous roads in Collier County. Numerous cars were stalled. Houses and businesses, including a shopping mall, suffered minor flood damage.

**October 24, 2005** – Hurricane Wilma produced a maximum measured storm tide of 8 feet at the USGS tide gauge at the Turner River near Chokoloskee in southern Collier County, with a storm surge of 7 feet after subtracting a 1-foot astronomical tide. Significant damage to structures close to the water was observed in Chokoloskee, along with some washing out of part of the road leading to the town. A storm tide of 7 feet was estimated in Marco Island by Collier County Emergency Management, along with significant beach erosion. An NWS survey team estimated a storm tide of 4 feet in Everglades City based on debris line heights, with little structural damage. The NOS tide gauge in Naples recorded a maximum storm tide of 4.8 feet, with a storm surge of 3.8 feet after considering astronomical tide levels.

**July 16, 2008** – A low pressure area over the eastern Gulf of Mexico provided a moist southwest flow across South Florida, leading to heavy rain bands which set up along portions of the Southwest Florida gulf coast. A combination of 6 to 8 inches of rain over a short period of time and high tide caused flooding on Marco Island. Coconuts, palm fronds, and plastic bags also clogged storm drains at some locations, exacerbating the flooding. One towing company in Marco Island pulled out 35 to 40 cars alone. Water reached around 2 feet deep in some roadways and a few inches deep in some residences. Several roads were closed, including the main bridge connecting Marco Island to the Mainland.

**August 27, 2012** – Tropical Storm Isaac moved west-northwest across the Florida Straits south of the Florida Keys on August 26<sup>th</sup>. The northern edge of the wind and rain area associated with Isaac affected the South Florida peninsula throughout the day on the 26<sup>th</sup>. Severe beach erosion and coastal flooding occurred in Collier County on Monday, August 27<sup>th</sup> as the center of the storm moved into the Gulf of Mexico. A storm surge of 2.05 feet was measured at the Naples pier. Farther east along the coast, inundation depths as high as 3 feet were reported in Goodland and Everglades city. Inundation in the Naples area was about 1 foot. Most damage from coastal flooding was to infrastructure in Goodland and Everglades City areas and was estimated at \$400,000. Severe beach erosion in the Naples and Marco Island areas led to damaged estimated at \$5.6 million.

**August 4, 2014** – Intense rainfall associated with several bands of thunderstorms developed across much of the Naples area during the early afternoon. The band moved little between 1230 and 1500 EDT with the training of cells leading to copious rain amounts and severe street flooding in parts of Naples and Golden Gate. The first report stated that at least two feet of water was on roads near Airport Road and Mercantile Avenue with cars stalled out. The Collier County Sheriff's Office reported at around 1510 EDT that there was severe flooding and stalled vehicles from Collier Blvd. to Tamiami Trail with some roads closed. Rainfall totals included 7 inches at Naples Beach Hotel and Club with 6.73 inches at the Naples Municipal Airport. A trained spotter measured 4.21 inches in just under an hour in the area of Airport and Pine Ridge Roads. A few businesses had water enter their structures, with one business estimating \$12,000 in damage. Over 300 cars were towed from area streets due to stalling in deep water. Damage total indicated in this report is estimated and based on number of cars stalled as well as the damage to businesses from water intrusion.

**June 6, 2017** – A disturbance meandering across the Gulf of Mexico in combination with an upper level system across the western Gulf of Mexico lead to nearly a week of heavy rainfall across South Florida. The heaviest rainfall fell in the corridor from Marco Island and southern Collier county northeast into Broward

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and southern Palm Beach counties. Many locations in this swath saw rainfall amounts in excess of 9 to 10 inches in a single day, and as high as almost 15 inches on the heaviest day, resulting in event totals of 15 to 20 inches in this area. This rainfall forced the closure of numerous roads across South Florida, especially in Collier and Broward counties where cars were trapped at times in the flood waters.

Multiple streets in Marco Island were closed due to flooding, including Bald Eagle Road from Bayport to San Marco Roads and South Collier Boulevard near Winterberry Drive. Multiple cars were stalled in the middle of the road at the time of call. Marco Island had received 6 to 8 inches of rainfall in 6 to 12 hours, with a storm total of up to 15 inches over a 3-day period. Flooding across central and eastern Collier County resulted in the closure of Gulf Coast Visitor Center of Everglades National Park, in Everglades City, the Everglades City Airport, as well as Big Cypress National Preserve from June 6th through June 7th. Pictures received from the National Park Service show flooding of numerous access roads, trails, campgrounds, and bridges around the park, along with widespread areas of higher than normal water across the park, including flooding of normally dry forest. The Ochopee Post Office was flooding during the event, with water encroaching on Tamiami Trail (US 41) in places where it bisects the park. County Road 29 south of Tamiami Trail (US 41), which is used to access many of these areas, was also closed.

**August 25-27, 2017** – A slow moving tropical disturbance first moved west across South Florida, then northeast across Central and North Florida as a frontal boundary dropped into the state. This system would develop into Potential Tropical Cyclone 10 as it moved up the east coast, leaving a trailing trough that would bring additional heavy rainfall through Aug 29th. Significant flooding was reported over three days across Collier County, especially across the Naples area, with multiple roadways and intersections closed and standing water across the city. Flood waters entered a guest home along Trail Terrace, along with stranding vehicles along 10<sup>th</sup> Street south of 5<sup>th</sup> Avenue. As rain continued to fall, there was additional flooding along Logan Boulevard as well as Vanderbilt beach, with several sections impassable due to flooding.

**September 10, 2017** – Major Hurricane Irma made landfall in Southwest Florida on Marco Island as a Category 3 hurricane around 3:30 PM EDT on September 10th. The storm traveled north through southwest Florida through the evening. Effects from Irma were felt across South Florida from September 9th through September 11th. Irma brought a significant storm surge on both coasts of South Florida and widespread rainfall and some flooding across the region. From the period between 8 AM September 9th and 8 AM September 11th, 8 to 15 inches of rain were measured over interior portions of Southwest Florida. This rainfall near the end of a wet summer led to significant flooding.

Storm surge across Collier County ranged from 4 to 8 feet, highest in the Chokoloskee and Everglades City area and lowest at the northern Collier County coast. Impacts were most severe in Chokoloskee, Everglades City, Plantation Island and Goodland where numerous homes were flooded and suffered major to catastrophic damage. Storm survey and data from USGS rapid deployment gauges indicated highest inundation from storm surge in Chokoloskee with up to 8 feet at waterfront, approximately 8 feet above Mean Higher High Water (MHHW), as well as 3-5 feet of inundation across the island. In Everglades City, there was a maximum 6 ft of inundation at the Everglades National Park Gulf Visitor Center, with 2-4 feet across the town and as high as 5 feet in a few areas. USGS high water mark data showed 1-2 feet of inundation as far inland as Tamiami Trail between State Road 29 and Collier-Seminole State Park. In Goodland, maximum storm tide was about 5.5 ft above MHHW, translating to between 5-6 ft of inundation at the waterfront and 3-4 ft across most of town. In Marco Island, storm tide was as high as 4.5 feet above MHHW, translating to between 2-4 ft inundation mainly over south and east parts of the island. Inland penetration was generally less than a half-mile. In Naples, NOS tide gauge at Naples Pier measured maximum storm tide of 5.14 feet above MHHW. Between 3-4 feet of inundation was noted along the Gulf beachfront within 1 block of beach, with less than a half-mile of inland penetration. Along

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Naples Bay, a maximum storm tide of about 2-3 ft above MHHW resulted in inundation of 1 to 2 feet on west side of bay just south of Tamiami Trail. This led to flooding of restaurants and shops.

**October 9, 2018** – The high October astronomical tides, King tides, in combination with the strong winds and minor surge from Hurricane Michael in the Gulf of Mexico brought a couple days of minor saltwater flooding along both the Atlantic and Gulf coasts of South Florida. NBC2 in Fort Myers reported water covering County Road 92A between Marco Island and Goodland. Videos and photos shared via social media shows abnormally high tide moving into and above sand dunes at Naples Beach as well as water over topping the seawall and approaching the backs of residences in the Isles of Capri neighborhood.

### Probability of Future Occurrence

By definition of the 100-year flood event, SFHAs are defined as those areas that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. Properties located in these areas have a 26 percent chance of flooding over the life of a 30-year mortgage.

The 500-year flood area is defined as those areas that will be inundated by the flood event having a 0.2-percent chance of being equaled or exceeded in any given year; it is not the flood that will occur once every 500 years.

While exposure to flood hazards vary across jurisdictions, all jurisdictions have at least some area of land in FEMA flood hazard areas. Additionally, there is risk of localized and stormwater flooding as well as severe wind-driven surge in areas outside the SFHA and at different intervals than the 1% annual chance flood. Based on these considerations as well as the 35 flood-related events recorded by NCEI over the last 20 years, the probability of flooding is considered highly likely (100% annual probability) for all jurisdictions.

*Probability: 4 – Highly Likely*

### Climate Change

Per the Fourth National Climate Assessment, frequency and intensity of heavy precipitation events is expected to increase across the country. More specifically, it is “very likely” (90-100% probability) that most areas of the United States will exhibit an increase of at least 5% in the maximum 5-day precipitation by late 21st century. Additionally, increases in precipitation totals are expected in the Southeast. The mean change in the annual number of days with rainfall over 1 inch for the Southeastern United States is 0.5 to 1.5 days. Therefore, with more rainfall falling in more intense incidents, the region may experience more frequent flash flooding. Increased flooding may also result from more intense tropical cyclone; researchers have noted the occurrence of more intense storms bringing greater rainfall totals, a trend that is expected to continue as ocean and air temperatures rise.

### Vulnerability Assessment

#### Methodologies and Assumptions

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Wood conducted a Level 2 Hazus Flood Simulation by leveraging the 100-year (Zone AE, VE & AH) flood boundaries from the effective FEMA Flood Insurance Study dated 5/26/2012. Base Flood Elevations were converted to a depth raster using LiDAR topography obtained from USGS. Wood also leveraged the 2019 parcel data provided by Collier County for the loss determination. Parcels that were potentially at risk of flooding from the three 100-year flood zones listed above were selected for analysis. From there, Wood excluded all parcels for which a LOMC determination was made following the effective FIS date of 5/26/2012; this removed approx. 7,400 parcels from the loss estimation.

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Losses were derived in Hazus using USACE depth damage functions, shown in Table 2.13. Flood damage is directly related to the depth of flooding by the application of a depth damage curve. In applying the curve, a specific depth of water translates to a specific percentage of damage to the structure, which translates to the same percentage of the structure's replacement value. Figure 2.3 depicts the depth of flooding that can be expected within the Collier County planning area during the 100-year flood event.

**Table 2.13 – Depth Damage Percentages**

Depth (ft)	Percent Damaged (%)						
	Agricultural	Commercial	Education	Government	Industrial	Religious	Residential
0	0	1	0	0	1	0	18
1	6	9	5	5	10	10	22
2	11	14	7	8	12	11	25
3	15	16	9	13	15	11	28
4	19	18	9	14	19	12	30
5	25	20	10	14	22	12	31
6	30	23	11	15	26	13	40
7	35	26	13	17	30	14	43
8	41	30	15	19	35	14	43
9	46	34	17	22	29	15	45
10	51	38	20	26	42	17	46
11	57	42	24	31	48	19	47
12	63	47	28	37	50	24	47
13	70	51	33	44	51	30	49
14	75	55	39	51	53	38	50
15	79	58	45	59	54	45	50
16	82	61	52	65	55	52	50
17	84	64	59	70	55	58	51
18	87	67	64	74	56	64	51
19	89	69	69	79	56	69	52
20	90	71	74	83	57	74	52
21	92	74	79	87	57	78	53
22	93	76	84	91	57	82	53
23	95	78	89	95	58	85	54
24	96	80	94	98	58	88	54

Source: Hazus

Building foundation types were not available in the parcel or building data provided by Collier County but are required for Hazus. Therefore, based on local knowledge and experience, Wood made the assumption that 90% of the foundations in Collier County are slab on grade, 5% are crawl space and 5% are elevated. Number of stories was also not provided so by default Hazus assumes all buildings are one story. Finally, 49 parcels had to be removed from the Hazus analysis because they fell outside the Hazus census tract extent.

Loss numbers are based on improved parcel values listed in the 2019 parcel data from Collier County. Content value estimations are based on Hazus methodologies of estimating value as a percent of improved structure values by property type. Table 2.14 shows the breakdown of the different property types and their estimated content replacement value percentages.

**Table 2.14 – Content Replacement Factors**

Property Type	Content Replacement Values
Residential	50%
Commercial	100%
Educational	100%
Government	100%
Religious	100%
Industrial/Agriculture	150%

Source: Hazus

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## **People**

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Certain health hazards are common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where farm animals are kept or where their wastes are stored can contribute polluted waters to the receiving streams.

Debris also poses a risk both during and after a flood. During a flood, debris carried by floodwaters can cause physical injury from impact. During the recovery process, people may often need to clear debris out of their properties but may encounter dangers such as sharp materials or rusty nails that pose a risk of tetanus. People must be aware of these dangers prior to a flood so that they understand the risks and take necessary precautions before, during, and after a flood.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as E. coli and other disease-causing agents.

The second type of health problem arises after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a City water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and personal belongings destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Floods can also result in fatalities. Individuals face high risk when driving through flooded streets. According to NCEI records, however, there have been no deaths in Collier County caused by flood events.

An estimate of population at risk to flooding was developed based on the assessment of residential property at risk. Counts of residential buildings at risk were multiplied by a household factor for each jurisdiction, derived from a weighted average of the 2014-2018 American Community Survey's average

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household size for owner- and renter-occupied housing. The resulting estimates of population at risk are shown in Table 2.15. Overall, approximately 75,289 people live in high-risk flood zones.

**Table 2.15 – Collier County Population at Risk to Flood**

Jurisdiction	Residential Parcels at Risk	Household Factor	Population at Risk
Everglades City	367	1.96	719
Immokalee Reservation	-	4.43	-
Marco Island	7,667	2.08	15947
Naples	6,770	1.96	13269
Unincorporated Collier County	77,395	2.55	197357
<b>Total</b>	<b>92,199</b>	<b>--</b>	<b>227,293</b>

Source: FEMA; U.S. Census Bureau 2014-2018 ACS 5-Year Estimates; Collier County 2019 parcel data

### Property

Residential, commercial, and public buildings, as well as critical infrastructure such as transportation, water, energy, and communication systems may be damaged or destroyed by flood waters.

Table 2.16 details the estimated losses for the 100-year flood event, calculated using the methodology and assumptions described above. The total damage estimate value is based on damages to the total of improved building value and contents value. Land value is not included in any of the loss estimates as generally land is not subject to loss from floods.

**Table 2.16 – Estimated Building Damage and Content Loss for 1% Annual Chance Flood**

Occupancy Type	Total Parcels with Loss	Total Value (Building & Contents)	Estimated Building Damage	Estimated Content Loss	Estimated Total Damage	Loss Ratio
<b>Everglades City</b>						
Agriculture	0	\$0	\$0	\$0	\$0	0%
Commercial	23	\$7,556,456	\$90,345	\$421,163	\$511,508	7%
Educational	1	\$438,142	\$167	\$900	\$1,066	0%
Government	7	\$4,408,010	\$75,771	\$524,045	\$599,816	14%
Industrial	5	\$950,048	\$6,077	\$45,458	\$51,535	5%
Religious	0	\$0	\$0	\$0	\$0	0%
Residential	391	\$50,958,570	\$3,552,298	\$1,915,671	\$5,467,969	11%
<b>Total</b>	<b>427</b>	<b>\$64,311,226</b>	<b>\$3,724,658</b>	<b>\$2,907,237</b>	<b>\$6,631,895</b>	<b>10%</b>
<b>Immokalee Reservation</b>						
Agriculture	0	\$0	\$0	\$0	\$0	0%
Commercial	0	\$0	\$0	\$0	\$0	0%
Educational	0	\$0	\$0	\$0	\$0	0%
Government	1	\$65,687,630	\$4,401,540	\$25,491,022	\$29,892,562	46%
Industrial	0	\$0	\$0	\$0	\$0	0%
Religious	0	\$0	\$0	\$0	\$0	0%
Residential	0	\$0	\$0	\$0	\$0	0%
<b>Total</b>	<b>1</b>	<b>\$65,687,630</b>	<b>\$4,401,540</b>	<b>\$25,491,022</b>	<b>\$29,892,562</b>	<b>46%</b>

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Occupancy Type	Total Parcels with Loss	Total Value (Building & Contents)	Estimated Building Damage	Estimated Content Loss	Estimated Total Damage	Loss Ratio
<b>Marco Island</b>						
Agriculture	0	\$0	\$0	\$0	\$0	0%
Commercial	177	\$125,701,074	\$2,941,386	\$10,551,105	\$13,492,491	11%
Educational	0	\$0	\$0	\$0	\$0	0%
Government	9	\$6,694,338	\$434,624	\$2,670,976	\$3,105,600	46%
Industrial	13	\$5,791,493	\$133,714	\$557,344	\$691,057	12%
Religious	1	\$16,400,542	\$860,168	\$5,066,961	\$5,927,129	36%
Residential	9,589	\$5,826,797,939	\$641,340,871	\$398,199,393	\$1,039,540,264	18%
<b>Total</b>	<b>9,789</b>	<b>\$5,981,385,385</b>	<b>\$645,710,763</b>	<b>\$417,045,777</b>	<b>\$1,062,756,540</b>	<b>18%</b>
<b>Naples</b>						
Agriculture	0	\$0	\$0	\$0	\$0	0%
Commercial	284	\$591,654,328	\$18,961,978	\$55,415,850	\$74,377,827	13%
Educational	0	\$0	\$0	\$0	\$0	0%
Government	41	\$103,954,242	\$2,299,546	\$14,887,922	\$17,187,468	17%
Industrial	11	\$16,584,525	\$113,808	\$329,072	\$442,879	3%
Religious	8	\$12,358,250	\$428,326	\$2,915,657	\$3,343,983	27%
Residential	16,105	\$18,582,524,955	\$3,021,725,462	\$1,845,367,142	\$4,867,092,604	26%
<b>Total</b>	<b>16,449</b>	<b>\$19,307,076,300</b>	<b>\$3,043,529,120</b>	<b>\$1,918,915,642</b>	<b>\$4,962,444,762</b>	<b>26%</b>
<b>Unincorporated Collier County</b>						
Agriculture	169	\$49,803,960	\$1,484,657	\$5,626,798	\$7,111,455	14%
Commercial	1,012	\$1,277,354,130	\$16,099,459	\$62,896,829	\$78,996,288	6%
Educational	6	\$142,789,728	\$6,279,973	\$42,796,184	\$49,076,157	34%
Government	106	\$158,837,654	\$4,842,582	\$29,444,865	\$34,287,447	22%
Industrial	167	\$308,890,810	\$1,266,269	\$4,192,617	\$5,458,886	2%
Religious	33	\$40,506,780	\$1,432,249	\$8,882,215	\$10,314,464	25%
Residential	84,719	\$37,233,992,061	\$3,368,889,584	\$2,042,320,159	\$5,411,209,743	15%
<b>Total</b>	<b>86,212</b>	<b>\$39,212,175,123</b>	<b>\$3,400,294,774</b>	<b>\$2,196,159,667</b>	<b>\$5,596,454,441</b>	<b>14%</b>
<b>Countywide Totals</b>						
Agriculture	169	\$49,803,960	\$1,484,657	\$5,626,798	\$7,111,455	14%
Commercial	1,496	\$2,002,265,988	\$38,093,168	\$129,284,946	\$167,378,115	8%
Educational	7	\$143,227,870	\$6,280,140	\$42,797,084	\$49,077,224	34%
Government	164	\$339,581,874	\$12,054,064	\$73,018,829	\$85,072,893	25%
Industrial	196	\$332,216,875	\$1,519,867	\$5,124,490	\$6,644,357	2%
Religious	42	\$69,265,572	\$2,720,744	\$16,864,832	\$19,585,576	28%
Residential	110,804	\$61,694,273,525	\$7,035,508,214	\$4,287,802,365	\$11,323,310,580	18%
<b>Total</b>	<b>112,878</b>	<b>\$64,630,635,664</b>	<b>\$7,097,660,855</b>	<b>\$4,560,519,345</b>	<b>\$11,658,180,200</b>	<b>18%</b>

Source: Hazus

The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all buildings located within the 100-year floodplain) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator a community may have more difficulties recovering from a flood. Loss ratios for all participating jurisdictions are at or above 10%. Therefore, in the event of a flood with a magnitude of the 1%-annual-chance event or greater, the planning area would face extreme difficulty in recovery. Even smaller, more probabilistic floods may also result in the county having difficulty recovering. Estimated loss ratios are greatest in Immokalee

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Reservation and the City of Naples, therefore these jurisdictions may face the greatest potential impacts from a flood event.

Across the planning area there are 244 critical facilities located in the AE, A, and AH zones and 2 facilities located in the VE zone which may be at risk to damages. Table 2.17 details these critical facilities at risk to flooding by type. Table 2.18 lists each critical facility at risk to flood and the flood zone and estimated 100-year flood depth at that location.

**Table 2.17 – Summary of Critical Facilities at Risk to Flood, 1% Annual Chance Event**

Facility Type	Critical Facility Count by SFHA Zone				Total Facilities at Risk
	Zone A	Zone AE	Zone AH	Zone VE	
Schools	-	11	4	-	15
Fire & EMS	2	26	17	-	45
Government	-	3	-	-	3
Hazmat	6	37	38	1	82
Health	-	19	19	-	38
Law Enforcement	-	5	1	-	6
Public Works	2	8	5	-	15
Transportation	3	7	2	1	13
Utilities	-	8	9	-	17
Water	2	7	3	-	12
<b>Total</b>	<b>15</b>	<b>131</b>	<b>98</b>	<b>2</b>	<b>246</b>

**Table 2.18 – Critical Facilities at Risk to Flood, 1% Annual Chance Event**

Facility Type	Facility Name	Jurisdiction	Flood Zone	100-Yr Flood Depth (NAVD Ft)
Fire & EMS	Medic Rescue 60	Everglades	AE	5.7
Fire & EMS	Greater Naples Fire Station 60	Everglades	AE	5.7
Fire & EMS	Medic 50	Marco Island	AE	2.1
Fire & EMS	Marco Island Station 50 & Fire HQ	Marco Island	AE	3.4
Fire & EMS	Marco Island Station 51	Marco Island	AE	2.8
Fire & EMS	Medic 1	Naples	AE	2.3
Fire & EMS	HOC Medflight 1/BC 83	Naples	AE	1.0
Fire & EMS	Medic 24	Naples	AE	0.1
Fire & EMS	Naples Fire Station 1	Naples	AE	2.3
Fire & EMS	Naples Fire Department HQ	Naples	AE	0.8
Fire & EMS	Naples Fire Station 3	Naples	AE	0.1
Fire & EMS	Greater Naples Fire & Safety Office	Naples	AE	0.1
Fire & EMS	Naples Fire Station 2	Naples	AH	1.3
Fire & EMS	Greater Naples Fire Station 24	Naples	AE	0.1
Fire & EMS	North Collier Fire Station 47	Naples	AE	0.1
Fire & EMS	Medic 90	Unincorp. Collier County	AE	1.5
Fire & EMS	Medic 23/Als Eng 23	Unincorp. Collier County	AE	1.9
Fire & EMS	Medic 21	Unincorp. Collier County	AE	0.1
Fire & EMS	Medic 81	Unincorp. Collier County	AE	0.1
Fire & EMS	EOC & EMS Logistics & HQ	Unincorp. Collier County	AH	0.1
Fire & EMS	Medic 25	Unincorp. Collier County	AH	0.1

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Facility Type	Facility Name	Jurisdiction	Flood Zone	100-Yr Flood Depth (NAVD Ft)
Fire & EMS	Medic 22	Unincorp. Collier County	AE	0.1
Fire & EMS	Medic 20	Unincorp. Collier County	AH	0.1
Fire & EMS	Medic 75/BC 80	Unincorp. Collier County	AH	0.1
Fire & EMS	Medic 76	Unincorp. Collier County	AH	0.1
Fire & EMS	Medic 44/BC 81	Unincorp. Collier County	AE	0.1
Fire & EMS	Medic 42	Unincorp. Collier County	AH	0.4
Fire & EMS	Medic 48	Unincorp. Collier County	AH	0.1
Fire & EMS	Greater Naples Fire Station 66 (Logistics)	Unincorp. Collier County	AE	3.8
Fire & EMS	Greater Naples Fire Station 90	Unincorp. Collier County	AE	2.0
Fire & EMS	Greater Naples Fire Station 23	Unincorp. Collier County	AE	1.9
Fire & EMS	Greater Naples Fire Station 21	Unincorp. Collier County	AE	0.1
Fire & EMS	Greater Naples Fire Maintenance	Unincorp. Collier County	AE	0.1
Fire & EMS	Greater Naples Fire Station 22	Unincorp. Collier County	AE	0.1
Fire & EMS	Greater Naples Fire Station 20	Unincorp. Collier County	AH	0.1
Fire & EMS	Greater Naples Fire Station 75	Unincorp. Collier County	AH	0.1
Fire & EMS	Greater Naples Fire Station 72	Unincorp. Collier County	AH	1.3
Fire & EMS	Als Res 63	Unincorp. Collier County	A	0.1
Fire & EMS	Greater Naples Fire Station 63	Unincorp. Collier County	A	0.1
Fire & EMS	Greater Naples Fire Station 71	Unincorp. Collier County	AH	2.0
Fire & EMS	North Collier Fire Station 45 & HQ	Unincorp. Collier County	AH	0.1
Fire & EMS	North Collier Fire Station 42	Unincorp. Collier County	AH	0.4
Fire & EMS	North Collier Fire Station 48	Unincorp. Collier County	AH	0.1
Fire & EMS	FPL	Unincorp. Collier County	AH	0.1
Fire & EMS	North Collier Fire Station 12	Unincorp. Collier County	AH	1.9
Government	Everglades City Hall	Everglades	AE	6.5
Government	Marco Island City Hall	Marco Island	AE	0.1
Government	Naples Town Hall	Naples	AE	0.6
Hazardous Materials	City of Everglades City - WWTP	Everglades	AE	5.3
Hazardous Materials	Embarq-Everglades Central	Everglades	AE	7.0
Hazardous Materials	City of Everglades City - Booster WTP	Everglades	AE	4.9
Hazardous Materials	Marco Island - Reverse Osmosis Facility	Marco Island	AE	0.8
Hazardous Materials	Embarq - Marco Island Central Office	Marco Island	AE	3.4
Hazardous Materials	Comcast of the South - 28624	Marco Island	AE	2.0
Hazardous Materials	Marco Island Wastewater Treatment Facility	Marco Island	AE	2.8
Hazardous Materials	Embarq - Midway South Naples	Naples	AE	3.1
Hazardous Materials	Embarq - Naples---28863	Naples	AH	0.1
Hazardous Materials	Naples Beach Hotel and Golf Club	Naples	AE	6.5
Hazardous Materials	Sears Roebuck Auto Center - 6065	Naples	AH	1.8
Hazardous Materials	Embarq - Naples Mooring Central Office	Naples	AH	1.2
Hazardous Materials	Comcast of the South - 28623	Naples	AE	1.0
Hazardous Materials	Embarq - North Naples---28862	Naples	VE	6.8
Hazardous Materials	City of Everglades City - Lee Cypress Pump Station	Unincorp. Collier County	AE	2.1
Hazardous Materials	City of Everglades City - Water Plant	Unincorp. Collier County	AE	2.6

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Facility Type	Facility Name	Jurisdiction	Flood Zone	100-Yr Flood Depth (NAVD Ft)
Hazardous Materials	Port of The Islands WWTP/WTP	Unincorp. Collier County	AE	0.2
Hazardous Materials	Farm Op - Farm 7 Pump Station 01	Unincorp. Collier County	AE	2.4
Hazardous Materials	Farm Op - Farm 7 Pump Station 03	Unincorp. Collier County	AE	3.3
Hazardous Materials	Farm Op - Farm 7 Pump Station 02	Unincorp. Collier County	AE	3.2
Hazardous Materials	Embarq-Corporation - Naples - Lake Park Boulevard	Unincorp. Collier County	AE	1.4
Hazardous Materials	Gargiulo - Farm 7	Unincorp. Collier County	AE	2.8
Hazardous Materials	Farm Op - Farm 7 Greenhouse / Pump Station 9	Unincorp. Collier County	AE	1.0
Hazardous Materials	Farm Op - Farm 7 Pump Station 04	Unincorp. Collier County	AE	1.8
Hazardous Materials	Farm Op - Farm 7 Pump Station 05	Unincorp. Collier County	AE	1.2
Hazardous Materials	Farm Op - Farm 7 Pump Station 15	Unincorp. Collier County	AE	1.3
Hazardous Materials	Deseret Farms	Unincorp. Collier County	AE	0.1
Hazardous Materials	Farm Op - Farm 7 Pump Station 10	Unincorp. Collier County	AE	1.1
Hazardous Materials	Farm Op - Farm 7 Pump Station 7	Unincorp. Collier County	AE	1.9
Hazardous Materials	Farm Op - Farm 7 Pump Station 14	Unincorp. Collier County	AE	1.0
Hazardous Materials	Farm Op - Farm 7 Pump Station 8	Unincorp. Collier County	AE	1.1
Hazardous Materials	Farm Op - Farm 7 Pump Station 06	Unincorp. Collier County	AE	0.1
Hazardous Materials	Comcast of the South - 28622	Unincorp. Collier County	AE	3.0
Hazardous Materials	Farm Op - Farm 7 Pump Station 11	Unincorp. Collier County	AH	1.4
Hazardous Materials	Farm Op - Farm 7 Pump Station 17	Unincorp. Collier County	AH	1.5
Hazardous Materials	Farm Op - Farm 7 Pump Station 13	Unincorp. Collier County	AE	0.5
Hazardous Materials	Embarq - Eagle Creek Rls	Unincorp. Collier County	AE	0.1
Hazardous Materials	Farm Op - Farm 7 Pump Station 12	Unincorp. Collier County	AE	0.6
Hazardous Materials	F G U A - Golden Gate WWTP - 2188	Unincorp. Collier County	A	0.1
Hazardous Materials	Collier County Utilities - South Regional WTP	Unincorp. Collier County	A	0.1
Hazardous Materials	Emarq - Naples Southeast Central Office	Unincorp. Collier County	AE	3.8
Hazardous Materials	F G U A - Golden Gate WTP - 2184	Unincorp. Collier County	A	0.1
Hazardous Materials	Collier County Utilities - Pelican Bay Water Rec Facility	Unincorp. Collier County	AH	0.1
Hazardous Materials	Golf Turf Applications - Royal Palm Country Club	Unincorp. Collier County	AH	0.1
Hazardous Materials	Golf Turf Applications	Unincorp. Collier County	AH	0.8
Hazardous Materials	Embarq - Naples---28864	Unincorp. Collier County	AH	0.1
Hazardous Materials	Qwest - Naples Pop	Unincorp. Collier County	AH	0.3
Hazardous Materials	Embarq - Golden Gate Central Office	Unincorp. Collier County	AH	0.9
Hazardous Materials	Garguilo, Inc. Superior Plant Co.	Unincorp. Collier County	AH	1.5
Hazardous Materials	Embarq - Naples---28870	Unincorp. Collier County	AH	1.3
Hazardous Materials	Golf Turf Applications - Kathleen Court	Unincorp. Collier County	AH	0.2
Hazardous Materials	Haleakala Construction	Unincorp. Collier County	AH	0.8
Hazardous Materials	Collier County Utilities - Carica Repump Station	Unincorp. Collier County	AH	0.6
Hazardous Materials	City of Naples - WWTP	Unincorp. Collier County	AE	2.9
Hazardous Materials	Embarq - Naples Central Office	Unincorp. Collier County	AH	0.1

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Facility Type	Facility Name	Jurisdiction	Flood Zone	100-Yr Flood Depth (NAVD Ft)
Hazardous Materials	North Regional Water Reclamation Facility	Unincorp. Collier County	AE	0.1
Hazardous Materials	Collier County Utilities - North Regional Water Reclamation Facility	Unincorp. Collier County	AH	0.1
Hazardous Materials	Pacific Tomato Growers---2373	Unincorp. Collier County	AH	1.6
Hazardous Materials	Comcast of the South - 28627	Unincorp. Collier County	AE	0.1
Hazardous Materials	Pacific Tomato Growers---2373	Unincorp. Collier County	AH	1.2
Hazardous Materials	Ag Mart Produce - Farm 12	Unincorp. Collier County	AH	0.1
Hazardous Materials	Farm Op - Farm 8	Unincorp. Collier County	A	0.1
Hazardous Materials	Everglades Farms	Unincorp. Collier County	A	0.1
Hazardous Materials	Resource Conservation Systems - Mediterra Corso Circle	Unincorp. Collier County	AE	0.1
Hazardous Materials	Resource Conservation Systems - Messina Lane	Unincorp. Collier County	AH	0.1
Hazardous Materials	Barnett Farms	Unincorp. Collier County	A	0.1
Hazardous Materials	Immokalee Groves	Unincorp. Collier County	AH	0.4
Hazardous Materials	Immokalee Groves	Unincorp. Collier County	AH	0.3
Hazardous Materials	Ag Mart Produce - Immokalee Farm	Unincorp. Collier County	AH	1.8
Hazardous Materials	Manatee Fruit - Naples Farm	Unincorp. Collier County	AH	1.0
Hazardous Materials	Gargiulo - Bhn Research	Unincorp. Collier County	AH	0.1
Hazardous Materials	Troyer Brothers Agri	Unincorp. Collier County	AH	0.1
Hazardous Materials	B W J Farms - Lake Trafford Division	Unincorp. Collier County	AH	0.1
Hazardous Materials	Immokalee Water and Sewer District - Jerry V Warden WTP	Unincorp. Collier County	AH	1.7
Hazardous Materials	Immokalee Water and Sewer District - Jerry V Warden WTP	Unincorp. Collier County	AH	0.1
Hazardous Materials	Immokalee Water and Sewer District - WWTP	Unincorp. Collier County	AH	0.0
Hazardous Materials	U A P Distribution - Immokalee	Unincorp. Collier County	AH	0.8
Hazardous Materials	Howard Fertilizer - Immokalee	Unincorp. Collier County	AH	2.7
Hazardous Materials	Farmers Supply	Unincorp. Collier County	AH	2.0
Hazardous Materials	Helena Chemical - Immokalee	Unincorp. Collier County	AH	0.6
Hazardous Materials	Immokalee Water and Sewer District - Carson Road WTP	Unincorp. Collier County	AH	0.2
Hazardous Materials	Immokalee Water and Sewer District - Airport Road WTP	Unincorp. Collier County	AH	0.1
Health	Marco Urgent Care (239-394-8234)	Marco Island	AE	0.1
Health	Nch Downtown Naples Hospital	Naples	AE	1.2
Health	Naples Medical Center / Millennium Physician Group (239-261-5511)	Naples	AH	0.1
Health	Advanced Medical of Naples (239-330-9809)	Naples	AE	0.9
Health	Lakeside Pavilion Rehabilitation and Nursing Home	Naples	AH	0.1
Health	Moorings Park Oakstone At Grey Oaks	Naples	AE	0.1
Health	Naples Care Alf	Unincorp. Collier County	AE	1.0
Health	Simelant Adult Family Care Home	Unincorp. Collier County	AE	0.4

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Facility Type	Facility Name	Jurisdiction	Flood Zone	100-Yr Flood Depth (NAVD Ft)
Health	Willough At Naples (Priv.)	Unincorp. Collier County	AE	0.1
Health	Tuscany Villa of Naples	Unincorp. Collier County	AE	0.1
Health	Arlington of Naples, The	Unincorp. Collier County	AH	0.1
Health	Physicians Regional Hosp - Collier	Unincorp. Collier County	AH	0.1
Health	Barrington Terrace of Naples	Unincorp. Collier County	AE	0.1
Health	Manorcare at Lely Palms	Unincorp. Collier County	AH	0.1
Health	Discovery Village at Naples Llc	Unincorp. Collier County	AH	0.1
Health	Manorcare at Lely Palms	Unincorp. Collier County	AH	0.1
Health	Manorcare Nursing & Rehab Ctr	Unincorp. Collier County	AE	0.1
Health	Hogar Dulce Hogar	Unincorp. Collier County	AH	0.1
Health	Villa at Terracina Grand	Unincorp. Collier County	AH	0.1
Health	Gardens at Terracina Grand	Unincorp. Collier County	AH	0.1
Health	Beach House Naples Alf	Unincorp. Collier County	AE	0.1
Health	David Lawrence Mental Health Ctr	Unincorp. Collier County	AH	0.1
Health	Glenview At Pelican Bay	Unincorp. Collier County	AE	2.4
Health	Angels for The Golden Years of Naples Inc	Unincorp. Collier County	AH	0.1
Health	Cove at Marbella, The	Unincorp. Collier County	AE	7.1
Health	Vanderbilt Beach Assisted Living	Unincorp. Collier County	AH	0.1
Health	Landmark Hospital	Unincorp. Collier County	AE	0.1
Health	Naples Urgent Care (239-597-8000)	Unincorp. Collier County	AE	0.1
Health	Pointe Medical Facility (239-598-1250)	Unincorp. Collier County	AE	0.1
Health	Gaviota Care Inc.	Unincorp. Collier County	AH	0.1
Health	Naples Green Village	Unincorp. Collier County	AH	0.1
Health	Nch North Naples Hospital	Unincorp. Collier County	AE	0.6
Health	Watercrest (To Be Built)	Unincorp. Collier County	AH	0.1
Health	Juniper Village of Naples	Unincorp. Collier County	AE	0.1
Health	Keystoneplace at Naples Preserve	Unincorp. Collier County	AH	0.1
Health	Bayshore Memory Care	Unincorp. Collier County	AE	0.1
Health	All Seasons in Naples	Unincorp. Collier County	AH	0.1
Health	Golden Retreat of Nap	Unincorp. Collier County	AH	0.1
Law Enforcement	Marco Island Police HQ	Marco Island	AE	0.4
Law Enforcement	Naples Police HQ	Naples	AE	1.5
Law Enforcement	Naples Police Dispatch	Naples	AE	0.1
Law Enforcement	Collier Sheriff'S Spec Opns	Naples	AE	1.2
Law Enforcement	Collier Sheriff'S 911 & Dispatch	Unincorp. Collier County	AH	0.1
Law Enforcement	Collier Sheriffs HQ & Jail	Unincorp. Collier County	AE	0.1
Public Works	Everglades City, City Of - WWTF	Everglades	AE	7.2
Public Works	Marco Island WWTF & Reclaimed Water Service Area	Marco Island	AE	2.1
Public Works	Naples, City Of - WWTP I	Naples	AE	0.7
Public Works	Goodland Isles Estates	Unincorp. Collier County	AE	5.8
Public Works	Port of The Islands WWTP	Unincorp. Collier County	AE	1.1
Public Works	Marco Island, City Of - Ro Plant	Unincorp. Collier County	AE	0.1
Public Works	Marco Shores Utilities	Unincorp. Collier County	AE	0.1
Public Works	I-75 Big Cypress Rest Stop	Unincorp. Collier County	A	0.1
Public Works	Pelican Bay Sewage Treat Plant	Unincorp. Collier County	AE	0.6

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Facility Type	Facility Name	Jurisdiction	Flood Zone	100-Yr Flood Depth (NAVD Ft)
Public Works	Collier County North Regional WRF	Unincorp. Collier County	AH	0.7
Public Works	Sunniland Mine - Florida Rock	Unincorp. Collier County	A	0.1
Public Works	Orange Tree WWTP	Unincorp. Collier County	AH	0.1
Public Works	Immokalee WWTF	Unincorp. Collier County	AH	0.1
Public Works	Davis Oil Company - Davis Service Ctr	Unincorp. Collier County	AH	0.6
Public Works	Handy Food Store #91	Unincorp. Collier County	AH	0.1
School	Everglades City	Everglades	AE	0.7
School	Tommie Barfield	Marco Island	AE	1.1
School	Marco Island Charter	Marco Island	AE	0.3
School	Parkside	Unincorp. Collier County	AE	0.1
School	Avalon	Unincorp. Collier County	AE	0.5
School	Shadowlawn	Unincorp. Collier County	AE	1.3
School	Alternative Schools	Unincorp. Collier County	AE	0.3
School	Lorenzo Walker Institute	Unincorp. Collier County	AE	0.1
School	Walker Institute of Technology	Unincorp. Collier County	AE	0.1
School	East Naples	Unincorp. Collier County	AE	0.2
School	Mike Davis	Unincorp. Collier County	AH	0.1
School	Palmetto	Unincorp. Collier County	AH	0.1
School	Pine Ridge	Unincorp. Collier County	AH	0.1
School	Naples Park	Unincorp. Collier County	AE	0.1
School	North Naples	Unincorp. Collier County	AH	0.1
Transportation	Everglades Airpark	Everglades	VE	8.8
Transportation	Goodland Bridge (SR-92)	Marco Island	AE	13.1
Transportation	Jolley Bridge	Marco Island	AE	12.1
Transportation	Naples Hospital	Naples	AE	1.5
Transportation	Naples Muni	Naples	AE	1.0
Transportation	Oasis Ranger Station-U.S. Government	Unincorp. Collier County	A	0.1
Transportation	Dade-Collier Training and Transition	Unincorp. Collier County	A	0.1
Transportation	Us 41/State 90 And County 29	Unincorp. Collier County	AE	2.0
Transportation	Isles of Capri Fire Dept	Unincorp. Collier County	AE	3.2
Transportation	Marco Island	Unincorp. Collier County	AE	0.5
Transportation	I-75 & State 29	Unincorp. Collier County	A	0.1
Transportation	Naples Grand Golf Resort	Unincorp. Collier County	AH	0.1
Transportation	Immokalee	Unincorp. Collier County	AH	0.1
Utilities	LCEC-Immokalee	Immokalee	AH	0.1
Utilities	LCEC-Fred H. Smith	Marco Island	AE	0.6
Utilities	LCEC-Marco	Marco Island	AE	2.5
Utilities	Naples	Naples	AE	2.3
Utilities	LCEC-Carnestown	Unincorp. Collier County	AE	2.5
Utilities	LCEC-Belle Meade	Unincorp. Collier County	AE	1.3
Utilities	FPL-Capri	Unincorp. Collier County	AE	2.6
Utilities	Substation Dist 5 E Tamiami Trl	Unincorp. Collier County	AE	0.1
Utilities	FPL	Unincorp. Collier County	AE	0.1
Utilities	Substation Dist 3 E Naples	Unincorp. Collier County	AH	0.0
Utilities	FPL	Unincorp. Collier County	AH	0.1
Utilities	Alligator	Unincorp. Collier County	AH	0.1
Utilities	FPL	Unincorp. Collier County	AH	0.3

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Facility Type	Facility Name	Jurisdiction	Flood Zone	100-Yr Flood Depth (NAVD Ft)
Utilities	Substation Dist 4 Estates	Unincorp. Collier County	AH	0.1
Utilities	LCEC-Ave Maria South	Unincorp. Collier County	AH	0.1
Utilities	FPL	Unincorp. Collier County	AH	0.8
Utilities	LCEC-North Immokalee	Unincorp. Collier County	AH	0.1
Water	City of Marco Island	Marco Island	AE	4.8
Water	City of Marco Island	Marco Island	AE	0.7
Water	Oasis Ranger Station	Unincorp. Collier County	A	0.1
Water	Everglades Shores/Big Cypress Pres.	Unincorp. Collier County	AE	3.7
Water	Lee Cypress Co-Op	Unincorp. Collier County	AE	2.9
Water	Port of The Islands Water Plant	Unincorp. Collier County	AE	0.7
Water	Trees Camp WTP	Unincorp. Collier County	AE	1.7
Water	Marco Shores Utilities	Unincorp. Collier County	AE	3.9
Water	I-75 Reststop & Recreat. Area	Unincorp. Collier County	A	0.1
Water	Collier County Regional WTP	Unincorp. Collier County	AH	0.9
Water	Immokalee Water	Unincorp. Collier County	AH	2.2
Water	S.W. Florida Research Ed. Ctr.	Unincorp. Collier County	AH	1.1

### Repetitive Loss Analysis

A repetitive loss property is a property for which two or more flood insurance claims of more than \$1,000 have been paid by the NFIP within any 10-year period since 1978. An analysis of repetitive loss was completed to examine repetitive losses within the planning area.

According to 2019 NFIP records, there are a total of 75 repetitive loss properties within the Collier County planning area including 11 mitigated properties and 64 unmitigated properties. Of the unmitigated properties, 34 (53%) are insured. Overall, approximately 77% of all repetitive loss properties in the County are residential, and 23% are non-residential. There are five properties on the list classified as severe repetitive loss properties. A severe repetitive loss property is classified as such if it has four or more separate claim payments of more than \$5,000 each (including building and contents payments) or two or more separate claim payments (building only) where the total of the payments exceeds the current value of the property.

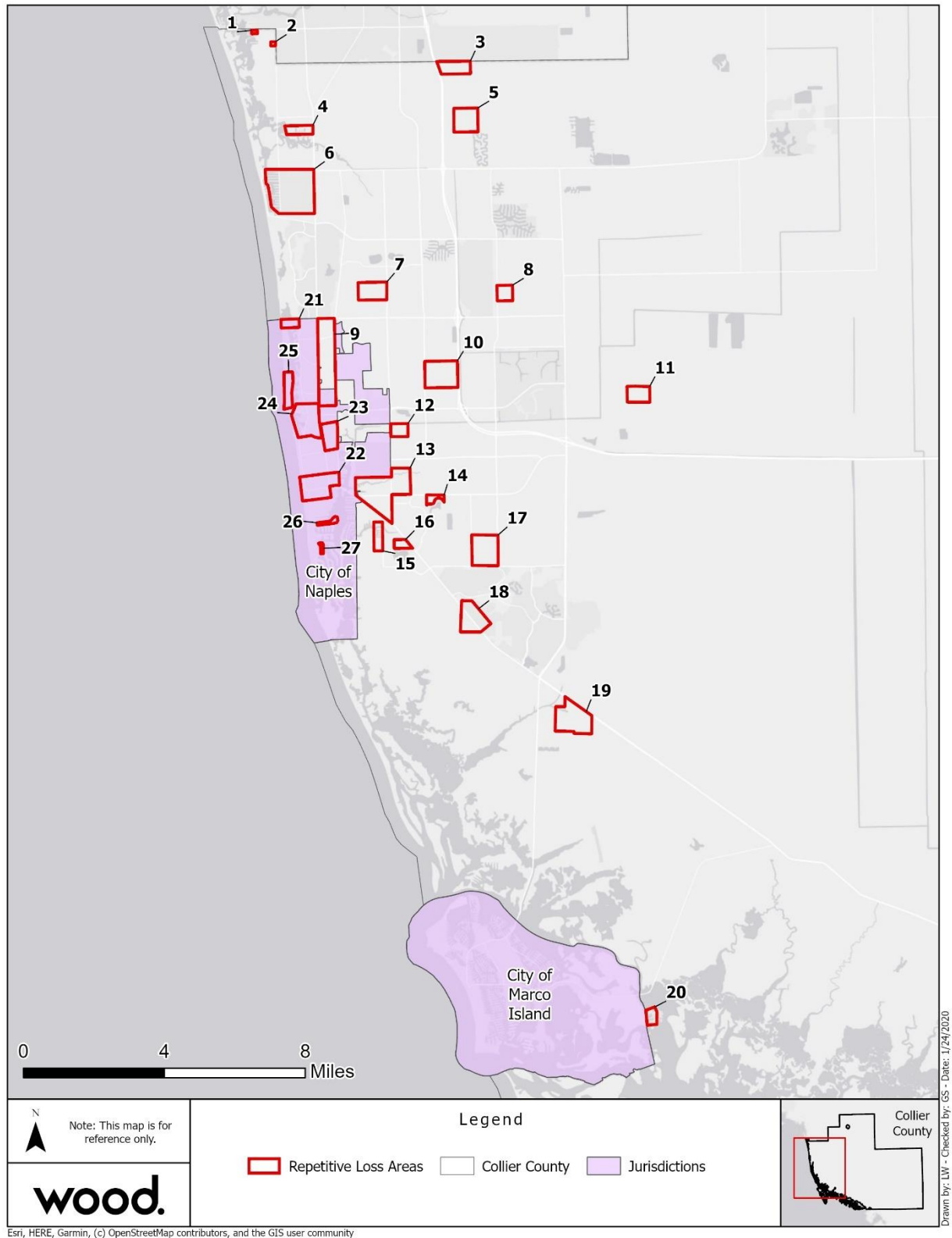
Table 2.19 summarizes repetitive loss properties by jurisdiction in Collier County as identified by FEMA through the NFIP. Figure 2.4 shows the general areas where repetitive losses have occurred throughout the planning area. Note that repetitive loss areas are not mapped for Marco Island because addresses were not made available for these properties.

**Table 2.19 – Repetitive Loss Properties by Jurisdiction**

Jurisdiction	Property Count	Total Number of Losses	Occupancy		% Insured	Total Amount of Claims Payments	Average Claim Payment	SRL Count
			Res	Non-Res				
Marco Island	3	9	2	1	67%	\$266,310	\$88,770	0
Naples	19	45	16	3	68%	\$1,695,605	\$41,353	0
Collier County	53	146	40	13	51%	\$2,623,149	\$19,065	5
<b>Total</b>	<b>75</b>	<b>200</b>	<b>58</b>	<b>17</b>	<b>56%</b>	<b>\$4,585,064</b>	<b>\$49,729</b>	<b>5</b>

Source: FEMA/ISO; Note: SRL = Severe Repetitive Loss; Res = Residential, Non-Res = Non-Residential

Figure 2.4 – Repetitive Loss Areas



Source: FEMA/ISO

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### Environment

During a flood event, chemicals and other hazardous substances may end up contaminating local water bodies. Flooding kills animals and in general disrupts the ecosystem. Snakes and insects may also make their way to the flooded areas.

Floods can also cause significant erosion, which can alter streambanks and deposit sediment, changing the flow of streams and rivers and potentially reducing the drainage capacity of those waterbodies.

### Consequence Analysis

Table 2.20 summarizes the potential detrimental consequences of flood.

**Table 2.20 – Consequence Analysis - Flood**

Category	Consequences
Public	Localized impact expected to be severe for incident areas and moderate to light for other adversely affected areas.
Responders	First responders are at risk when attempting to rescue people from their homes. They are subject to the same health hazards as the public. Flood waters may prevent access to areas in need of response or the flood may prevent access to the critical facilities themselves which may prolong response time. Damage to personnel will generally be localized to those in the flood areas at the time of the incident and is expected to be limited.
Continuity of Operations (including Continued Delivery of Services)	Floods can severely disrupt normal operations, especially when there is a loss of power. Damage to facilities in the affected area may require temporary relocation of some operations. Localized disruption of roads, facilities, and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities and Infrastructure	Buildings and infrastructure, including transportation and utility infrastructure, may be damaged or destroyed. Impacts are expected to be localized to the area of the incident. Severe damage is possible.
Environment	Chemicals and other hazardous substances may contaminate local water bodies. Wildlife and livestock deaths possible. The localized impact is expected to be severe for incident areas and moderate to light for other areas affected by the flood or HazMat spills.
Economic Condition of the Jurisdiction	Local economy and finances will be adversely affected, possibly for an extended period. During floods (especially flash floods), roads, bridges, farms, houses and automobiles are destroyed. Additionally, the local government must deploy firemen, police and other emergency response personnel and equipment to help the affected area. It may take years for the affected communities to be re-built and business to return to normal.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery are not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes flood hazard risk by jurisdiction. Flood risk due to storm surge, high tide flooding, flash flooding, and stormwater flooding exists across the entire county. All participating jurisdictions have over 85% of their area in the SFHA and thus have a high degree of exposure to flooding; given that other sources of flooding and other levels of flooding may occur beyond these areas, the spatial extent was considered large for all jurisdictions. Impact ratings were based upon Hazus loss estimates as well as the overall risk of death or injury; all jurisdictions were rated with an impact of critical. All communities also face a uniform probability of flooding.

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	4	3	4	3	3	3.5	H
Immokalee Reservation	4	3	4	3	3	3.5	H
Marco Island	4	3	4	3	3	3.5	H
Naples	4	3	4	3	3	3.5	H
Unincorporated Collier County	4	3	4	3	3	3.5	H

### 2.5.2 Tropical Cyclones

#### Hazard Description

Hurricanes and tropical storms are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a “safety-valve,” limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. Most hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in the Atlantic basin is about six.

While hurricanes pose the greatest threat to life and property, tropical storms and depressions also can be devastating. A tropical disturbance can grow to a more intense stage through an increase in sustained wind speeds. The progression of a tropical disturbance is described below.

- ▶ **Tropical Depression:** A tropical cyclone with maximum sustained winds of 38 mph (33 knots) or less.
- ▶ **Tropical Storm:** A tropical cyclone with maximum sustained winds of 39 to 73 mph (34 to 63 knots).
- ▶ **Hurricane:** A tropical cyclone with maximum sustained winds of 74 mph (64 knots) or higher. In the western North Pacific, hurricanes are called typhoons; similar storms in the Indian Ocean and South Pacific Ocean are called cyclones.
- ▶ **Major Hurricane:** A tropical cyclone with maximum sustained winds of 111 mph (96 knots) or higher, corresponding to a Category 3, 4 or 5 on the Saffir-Simpson Hurricane Wind Scale.

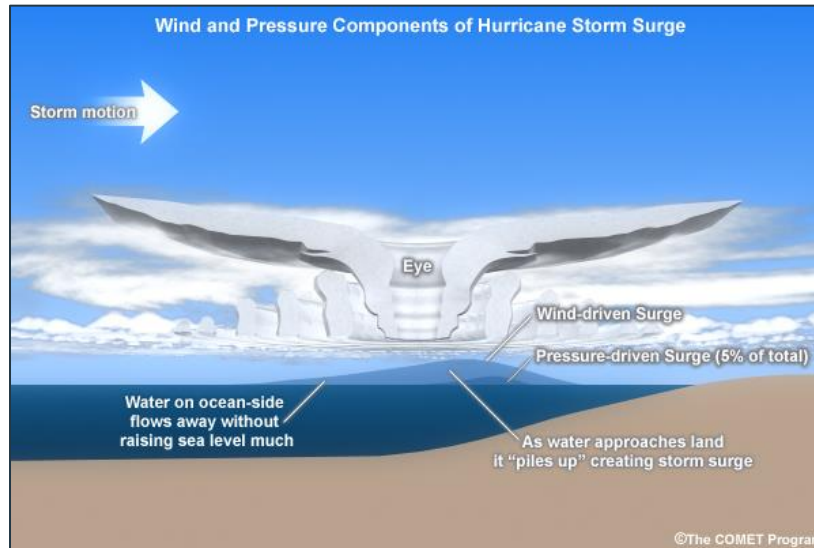
As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricanes are given a classification based on the Saffir-Simpson Scale; this scale is reproduced in Table 2.21.

The greatest potential for loss of life related to a hurricane is from the storm surge. Storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm as shown in Figure 2.5. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level to heights impacting roads, homes and other critical infrastructure. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with the normal high tides.

The maximum potential storm surge for a location depends on several different factors. Storm surge is a very complex phenomenon because it is sensitive to the slightest changes in storm intensity, forward speed, size (radius of maximum winds-RMW), angle of approach to the coast, central pressure (minimal

contribution in comparison to the wind), and the shape and characteristics of coastal features such as bays and estuaries. Other factors which can impact storm surge are the width and slope of the continental shelf and the depth of the ocean bottom. A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves. A shallow slope, as is found off the coast of Collier County, will produce a greater storm surge than a steep shelf.

**Figure 2.5 – Components of Hurricane Storm Surge**



Source: NOAA/The COMET Program

Damage during hurricanes may also result from inland flooding from associated heavy rainfall.

Like hurricanes, nor'easters are ocean storms capable of causing substantial damage to coastal areas in the Eastern United States due to their strong winds and heavy surf. Nor'easters are named for the winds that blow in from the northeast and drive the storm up the East Coast along the Gulf Stream. They are caused by the interaction of the jet stream with horizontal temperature gradients and generally occur during the fall and winter months when moisture and cold air are plentiful.

Nor'easters are known for dumping heavy amounts of rain and snow, producing hurricane-force winds, and creating high surf that causes severe beach erosion and coastal flooding. There are two main components to a nor'easter: (1) a Gulf Stream low-pressure system (counter-clockwise winds) generated off the southeastern U.S. coast, gathering warm air and moisture from the Atlantic, and pulled up the East Coast by strong northeasterly winds at the leading edge of the storm; and (2) an Arctic high-pressure system (clockwise winds) which meets the low-pressure system with cold, arctic air blowing down from Canada. When the two systems collide, the moisture and cold air produce a mix of precipitation and can produce dangerously high winds and heavy seas. As the low-pressure system deepens, the intensity of the winds and waves increases and can cause serious damage to coastal areas as the storm moves northeast.

*Warning Time: 1 – More than 24 hours*

*Duration: 3 – Less than 1 week*

### Location

Hurricanes and tropical storms can occur anywhere within the Collier County planning area. While coastal areas are most vulnerable to hurricanes, their wind and rain impacts can be felt hundreds of miles inland.

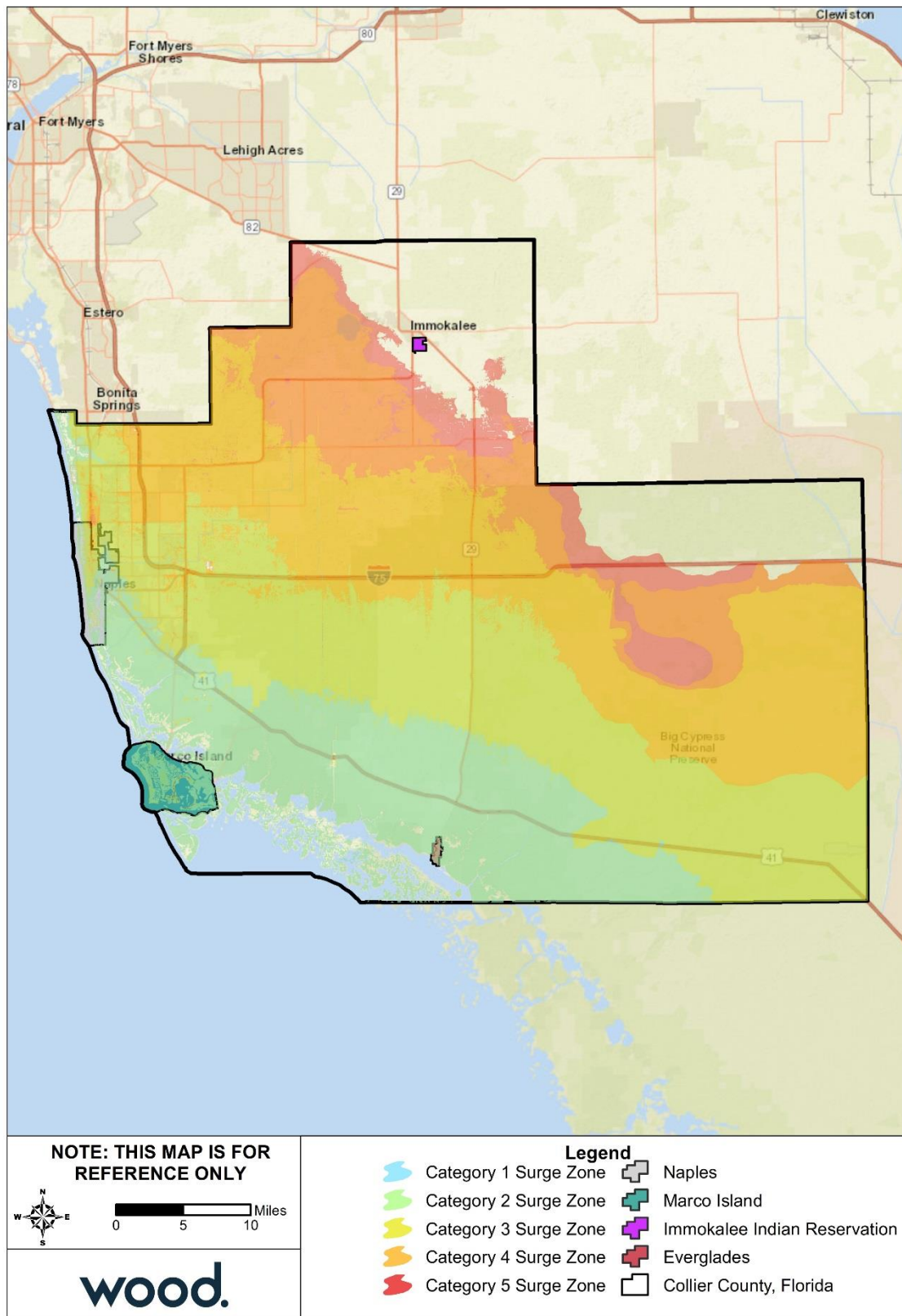
## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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Storm surge impacts are more limited, affecting areas along coastal and estuarine shorelines and reaching further inland depending on the height of the surge. All of Collier County is vulnerable to hurricane and tropical storm surge, but to varying degrees, with areas closer to the coast and water bodies that drain into the coast facing greater risk.

Figure 2.6 shows the estimated extent of surge by storm category according to NOAA Sea, Lake, and Overland Surges from Hurricanes (SLOSH) data. the SLOSH model is a computerized numerical model developed by the NWS to estimate storm surge heights resulting from historical, hypothetical, or predicted hurricanes by considering the atmospheric pressure, size, forward speed, and track data. The model creates outputs for all different storm simulations from all points of the compass. Each direction has a MEOW (maximum envelope of water) for each category of storm (1-5), and all directions combined result in a MOMs (maximum of maximums) set of data. Note that the MOM does not illustrate the storm surge that will occur from any given storm but rather the full potential extent of surge from all possible storms. As shown in these maps, Collier County is vulnerable to storm surge impacts from all storm categories. Marco Island, Everglades City, and much of Naples are likely to be impacted from storms rated as Category 1 and greater.

Figure 2.6 – Storm Surge Inundation for All Categories



Source: NOAA SLOSH Data

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

### Extent

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (Table 2.21), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

**Table 2.21 – Saffir-Simpson Scale**






Category	Maximum Sustained Wind Speed (MPH)	Types of Damage
1	74–95	Very dangerous winds will produce some damage; Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96–110	Extremely dangerous winds will cause extensive damage; Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	111–129	Devastating damage will occur; Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130–156	Catastrophic damage will occur; Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 +	Catastrophic damage will occur; A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: National Hurricane Center

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds and barometric pressure, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as “major” hurricanes and, while hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, they account for over 70 percent of the damage in the United States. Table 2.22 describes the damage that could be expected for each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

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**Table 2.22 – Hurricane Damage Classifications**

Storm Category	Damage Level	Description of Damages	Photo Example
<b>1</b>	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
<b>2</b>	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
<b>3</b>	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
<b>4</b>	EXTREME	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
<b>5</b>	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Source: National Hurricane Center; Federal Emergency Management Agency

The Saffir-Simpson scale provides a measure of extent of a hurricane. The county is susceptible to the full force of every category of hurricane.

*Impact: 4 – Catastrophic*

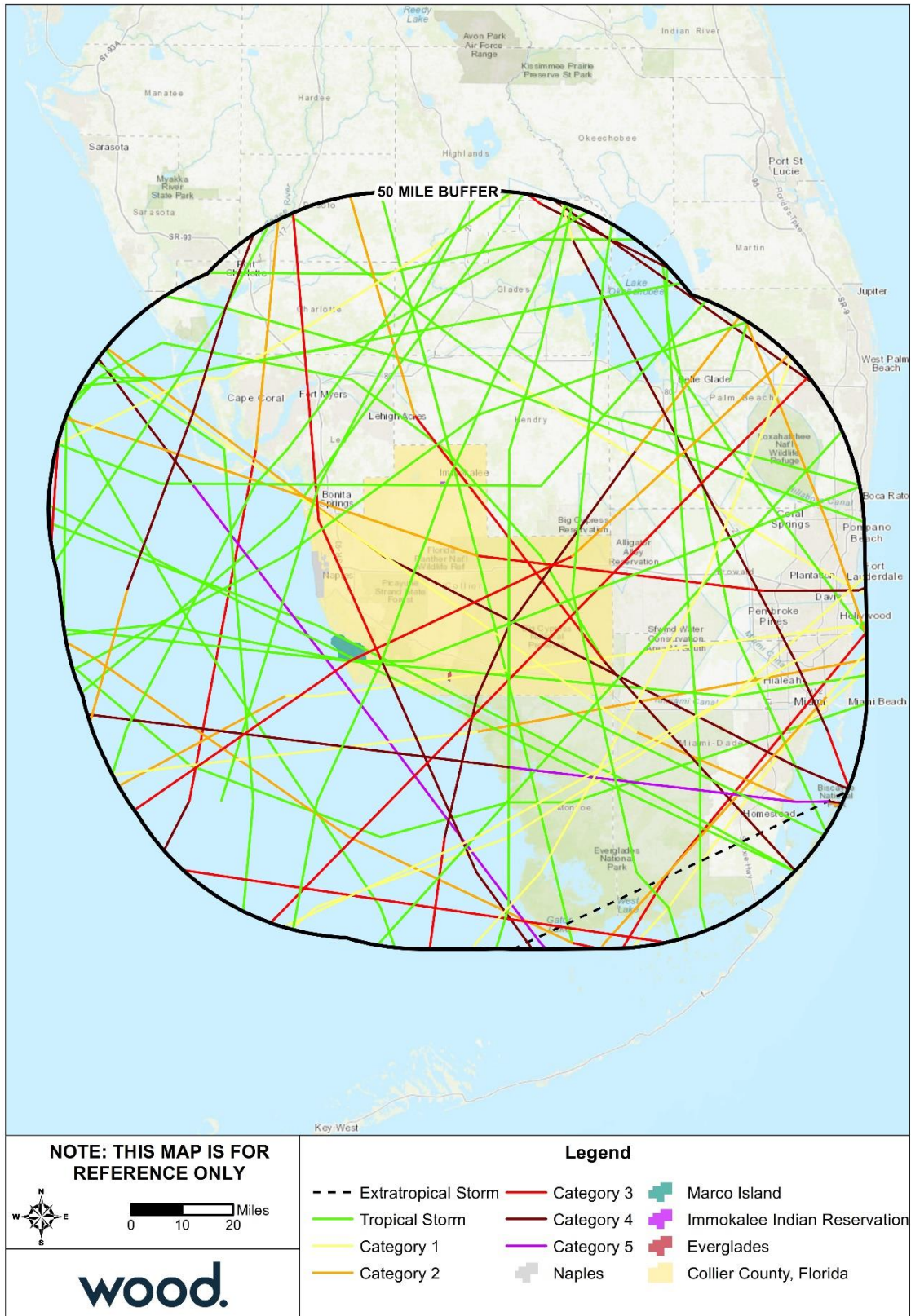
*Spatial Extent: 4 – Large*

### Historical Occurrences

According to the Office of Coastal Management’s Tropical Cyclone Storm Segments data, which is a subset of the International Best Track Archive for Climate Stewardship (IBTrACS) dataset, 59 hurricanes and tropical storms passed within 50 miles of Collier County between 1900 and 2016. These storm tracks are shown in Figure 2.7. The date, storm name, storm category, and maximum wind speed of each event are detailed in Table 2.23. It should be noted that Hurricane Irma made landfall in Collier County on September 10, 2017, but Irma was not included in updated data sets at the time this report was made. Irma was a category 3 hurricane when it hit the County with max wind speeds of 115 miles per hour.

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Figure 2.7 – Hurricane/Tropical Storm Tracks within 50 miles of Collier County, 1900-2016



Source: NOAA Office of Coastal Management

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Table 2.23 – Tropical Cyclone Tracks Passing within 50 Miles of Collier County, 1900-2017

Date	Storm Name	Max Storm Category*	Max Wind Speed (mph)
8/10/1901	Unnamed	Tropical Storm	46
9/11/1903	Unnamed	Category 1	86
10/17/1904	Unnamed	Category 1	81
6/17/1906	Unnamed	Category 1	86
10/18/1906	Unnamed	Category 3	121
6/28/1909	Unnamed	Tropical Storm	52
8/29/1909	Unnamed	Tropical Storm	52
10/17/1910	Unnamed	Category 4	132
5/14/1916	Unnamed	Tropical Storm	46
8/25/1916	Unnamed	Tropical Storm	46
11/15/1916	Unnamed	Extratropical Storm	63
10/20/1924	Unnamed	Category 2	104
12/1/1925	Unnamed	Tropical Storm	63
9/18/1926	Unnamed	Category 4	144
8/13/1928	Unnamed	Tropical Storm	69
9/17/1928	Unnamed	Category 4	144
9/28/1929	Unnamed	Category 3	115
8/30/1932	Unnamed	Tropical Storm	63
7/31/1933	Unnamed	Tropical Storm	58
9/3/1935	Unnamed	Category 5	184
11/4/1935	Unnamed	Category 2	98
6/15/1936	Unnamed	Tropical Storm	46
7/29/1936	Unnamed	Tropical Storm	63
10/6/1941	Unnamed	Category 2	98
10/19/1944	Unnamed	Category 3	115
9/4/1945	Unnamed	Tropical Storm	40
9/15/1945	Unnamed	Category 4	132
9/17/1947	Unnamed	Category 4	132
10/12/1947	Unnamed	Category 1	92
9/22/1948	Unnamed	Category 4	132
10/5/1948	Unnamed	Category 2	104
8/27/1949	Unnamed	Category 4	132
10/18/1950	King	Category 4	132
10/2/1951	How	Tropical Storm	63
10/9/1953	Hazel	Category 1	86
10/16/1956	Unnamed	Tropical Storm	63
10/18/1959	Judith	Tropical Storm	63
9/10/1960	Donna	Category 4	144
9/24/1960	Florence	Tropical Storm	40
8/27/1964	Cleo	Category 2	104
10/14/1964	Isbell	Category 3	127
9/8/1965	Betsy	Category 3	127
6/4/1968	Abby	Tropical Storm	69
10/2/1969	Jenny	Tropical Storm	46
8/19/1976	Dottie	Tropical Storm	40
8/17/1981	Dennis	Tropical Storm	40
7/23/1985	Bob	Tropical Storm	46
10/11/1990	Marco	Tropical Storm	58

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Date	Storm Name	Max Storm Category*	Max Wind Speed (mph)
8/24/1992	Andrew	Category 5	167
11/16/1994	Gordon	Tropical Storm	52
11/5/1998	Mitch	Tropical Storm	63
8/21/1999	Harvey	Tropical Storm	58
10/15/1999	Irene	Category 1	81
8/13/2004	Charley	Category 4	150
8/25/2005	Katrina	Category 1	81
10/24/2005	Wilma	Category 3	127
8/30/2006	Ernesto	Tropical Storm	46
8/19/2008	Fay	Tropical Storm	69
7/23/2010	Bonnie	Tropical Storm	40
9/10/2017	Irma**	Category 4	132

\*Reports the most intense category that occurred within 50 miles of Collier County, not for the storm event overall.

\*\*Hurricane Irma is listed on this table, but the Hurricane's track is not shown in Figure 2.7.

Source: Office of Coastal Management, 2020. <https://marinecadastre.gov/data/>

The above map of storms is not an exhaustive list of hurricanes that have affected Collier County. Several storms have passed further than 50 miles away from the Region yet had strong enough wind or rain impacts to cause impacts. NCEI records hurricane and tropical storm events across the region by county and zone; therefore, one event that impacts multiple jurisdictions may be recorded multiple times. During the 20-year period from 2000 through 2019, NCEI records 12 hurricane and tropical storm reports across 9 separate days. These events are summarized in Table 2.24. This table only represents those events reported to NCEI as a Hurricane or Tropical Storm. Where property damage estimates were broken out by type, NCEI reports only the value of wind-related damages. While there are no records for wind related damages from Hurricane Irma and no reported damages due to storm surge in the NCEI database, it had significant impact on the County. Following the storm, it was reported that \$320 million in damages occurred in unincorporated areas of the County alone, a number which is likely much higher when considering Naples, Marco Island, and Everglades City all experienced damage as well. In total, 50 Florida counties were included in the disaster declaration and eligible for individual assistance. FEMA has approved over \$1 billion individual and household program dollars across these counties.

**Table 2.24 – Recorded Hurricanes and Typhoons in Collier County, 2000-2019**

Date	Storm	Deaths/ Injuries	Property Damage	Crop Damage
9/16/2000	Tropical Storm Gordon	0/0	\$0	\$0
9/13/2001	Tropical Storm Gabrielle	0/0	\$50,000	\$0
8/13/2004	Hurricane Charley	0/0	\$2,500,000	\$0
9/4/2004	Hurricane Frances	0/0	\$0	\$0
7/8/2005	Hurricane Dennis	0/0	\$0	\$0
10/24/2005	Hurricane Wilma	1/0	\$0	\$0
8/30/2006	Tropical Storm Ernesto	0/0	\$0	\$0
8/18/2008	Tropical Storm Fay	0/0	\$20,000	\$0
8/26/2012	Tropical Storm Isaac	0/0	\$0	\$0
<b>Total</b>		<b>0/0</b>	<b>\$2,570,000</b>	<b>\$0</b>

Source: NCEI

### Storm Surge

Collier County is also vulnerable to Storm Surge caused by Hurricanes and Tropical Storms. Although previously summarized in Section 2.5.1, Table 2.25 further details Storm Surge events that have impacted

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

Collier County in the 20-year period from 2000 to 2019. Event narratives following this table provide a fuller scope of the impacts from selected events.

**Table 2.25 – Recorded Storm Surge events in Collier County, 2000-2019**

Date	Storm	Deaths/ Injuries	Property Damage	Crop Damage
10/24/2005	Hurricane Wilma	0/0	\$0	\$0
8/18/2008	Tropical Storm Fay	0/0	\$60,000	\$0
8/26/2012	Tropical Storm Isaac	0/0	\$6,000,000	\$0
6/6/2016	Tropical Storm Colin	0/0	\$0	\$0
9/10/2017	Hurricane Irma	0/0	\$0	\$0
<b>Total</b>		<b>0/0</b>	<b>\$2,570,000</b>	<b>\$0</b>

**September 16, 2000** – Tropical Storm Gordon formed in the Gulf of Mexico about 375 miles west of Naples late on September 15<sup>th</sup>. It moved northeast, briefly intensified to hurricane strength, then moved ashore in the Big Bend area of Florida as a tropical storm late on September 17<sup>th</sup>. The outer fringes of Gordon moved across south Florida, producing 3-6 inches of rain, numerous funnel clouds and waterspouts, and at least three tornadoes.

**September 13, 2001** – Tropical storm Gabrielle formed in the eastern Gulf of Mexico from a trough of low pressure that had lingered over Florida since September 8. Gabrielle moved east northeast at 7 to 12 mph with the center crossing the Florida west coast near Venice at noon on September 14. The minimum central pressure in Collier County was 999.4 mb at Naples. Maximum winds in Collier County were at Everglades City with sustained winds of 44 knots and peak gusts of 61 knots. Storm surge values of 3 to 5 feet were observed along much of the Collier County coast which caused some coastal flooding and minor to moderate beach erosion. The estimate to repair the beach erosion was \$3 million. Flooding by rainfall of 2 to 5 inches along with the storm surge damaged 60 to 70 residences and 12,500 customers lost electrical power.

**August 13, 2004** – Early on August 13, Hurricane Charley intensified to Category 4 status and turned to a north-northeast direction before making landfall near Port Charlotte around 3 PM EDT. The first outer rain band, with wind gusts estimated up to 60 mph, impacted the south Florida Peninsula between midnight and 2 AM EDT. In Collier County, a peak wind gust of 84 mph was measured at 2:50 PM EDT on the top of a condominium at Vanderbilt Beach before the equipment failed. The Naples ASOS equipment failed well before the maximum winds or minimum pressure occurred. Wind gusts at La Belle were estimated at 80 mph. Rainfall in most locations in Collier County was around two inches with an unofficial amount of 7.5 inches reported in North Naples. Radar local rainfall estimates of 8 to 10 inches were made in North Naples. Flooding was mostly minimal.

The highest Storm Tide along the southwest Florida Coast was estimated at three feet near Wiggins Pass with heights of one to two feet from Naples to Marco Island to Everglades City. Tidal flooding was minimal. Lake Okeechobee levels increased up to three feet above normal along the north and northeast shores. Hurricane wind damage was greatest in North Naples and Vanderbilt Beach with numerous power poles, trees and signs blown down, and a few roofs damaged. Damage also occurred to screened porches throughout the Naples-Marco Island metropolitan areas. Damage occurred to Gulf-side structures along most of the coastline but beach erosion was mostly minor. Four persons in Naples suffered minor injuries when their vehicle was touched by a downed power line during the storm. Three persons in Collier County died from indirect causes after the hurricane. An estimated 130,000 customers in Collier County lost power. About 2,500 people took refuge in six shelters.

**October 24, 2005** – Wilma was a classic October hurricane which struck South Florida as a Category 3 hurricane on October 24th, 2005. The hurricane made landfall as a category 3 storm shortly before 7 AM Monday, October 24th on the southwest Florida coast between Everglades City and Cape Romano with maximum sustained winds of 125 mph and an estimated minimum central pressure of 950 mb. Wilma exhibited a very large 55- to 65-mile-wide eye while crossing the state, and the eye covered large portions of South Florida, including the eastern two-thirds of Collier County. Sustained hurricane force winds (74 mph or greater) were observed over most areas. The highest recorded gusts were in the 100-120 mph range. Rainfall amounts across South Florida generally ranged from 2 to 4 inches across southern sections of the peninsula to 4 to 6 inches across western Collier county and around Lake Okeechobee. A storm surge of around 8 feet was estimated in Marco Island, with 4 feet in Everglades City. One confirmed tornado was observed in rural Collier County around 2:30 AM on the 24th, moving rapidly northwest from the intersection of U.S. 41 and State Road 29 to the town of Copeland three miles to the north. An F1 intensity was assigned to the tornado as it caused snapped power poles, uprooted large trees, and significantly damaged mobile homes.

In Collier, winds caused one direct fatality. While no monetary impacts were reported in NCEI for Collier County, total damage estimates across South Florida range from \$9 to \$12 billion. Damage was widespread, with large trees and power lines down virtually everywhere, causing widespread power outages. Structural damage was heaviest in Broward and Palm Beach counties where roof damage and downed or split power poles were noted in some areas. High-rise buildings suffered considerable damage, mainly in the form of broken windows. This was observed mainly along the southeast metro areas, but also in Naples, which underscores the higher wind speeds with height commonly observed in hurricanes.

**August 18, 2008** - The center of Tropical Storm Fay moved across Key West early in the evening of the 18th and into the mainland of South Florida at Cape Romano shortly before 5 AM on the 19th. Maximum sustained winds were estimated to be around 52 knots (60 MPH) at landfall, however a maximum wind gust of 69 knots (79 MPH) was recorded on a South Florida Water Management gauge on Lake Okeechobee as the storm passed. Wind gusts to tropical storm force were felt area-wide, with sustained tropical storm force winds experienced over portions Collier County. Wind damage was most significant in the areas affected by tropical storm force sustained winds, primarily around Lake Okeechobee and interior sections of southwest Florida, with only minor wind damage elsewhere. Rainfall ranged 6-8 inches in southwest Florida. The height of the storm tide was around 5 feet in the Everglades City and Chokoloskee areas. Minimal storm surge was noted elsewhere. All the associated effects of Tropical Storm Fay in South Florida resulted in 1 fatality, 4 injuries, and \$3.949 million in property damage. In Collier County, total wind damages were reported to be \$20,000 and total surge damages at \$60,000.

**August 26, 2012** – The center of Tropical Storm Isaac moved over the Florida Straits south of the Florida Keys on Sunday, August 26th, passing just south of Key West. Rain bands and winds on the north side of the circulation of Isaac affected Southeast Florida throughout the day of the 26th and part of the 27th. Maximum storm tide values were observed at 4.9 feet at Naples, with estimates of 5 to 7 feet along the southern Collier County coast from Goodland to Everglades City. Highest estimated inundation values of up to 3 feet above ground level were noted in Goodland and Everglades City. Major beach erosion was also observed along the Collier County beaches. Flooding caused by storm tides along the coast in Collier County resulted in about \$400,000 in damage. Damage from beach erosion in Collier and Broward counties was estimated at \$6 million.

**September 10, 2017** – Major Hurricane Irma made landfall in Southwest Florida on Marco Island as a Category 3 hurricane around 330 PM EDT on September 10th. The strength and size of Hurricane Irma allowed for impacts to be felt across all of South Florida. Irma brought widespread wind damage, heavy rainfall and storm surge to all areas. Hurricane-force sustained wind were measured in much of Collier

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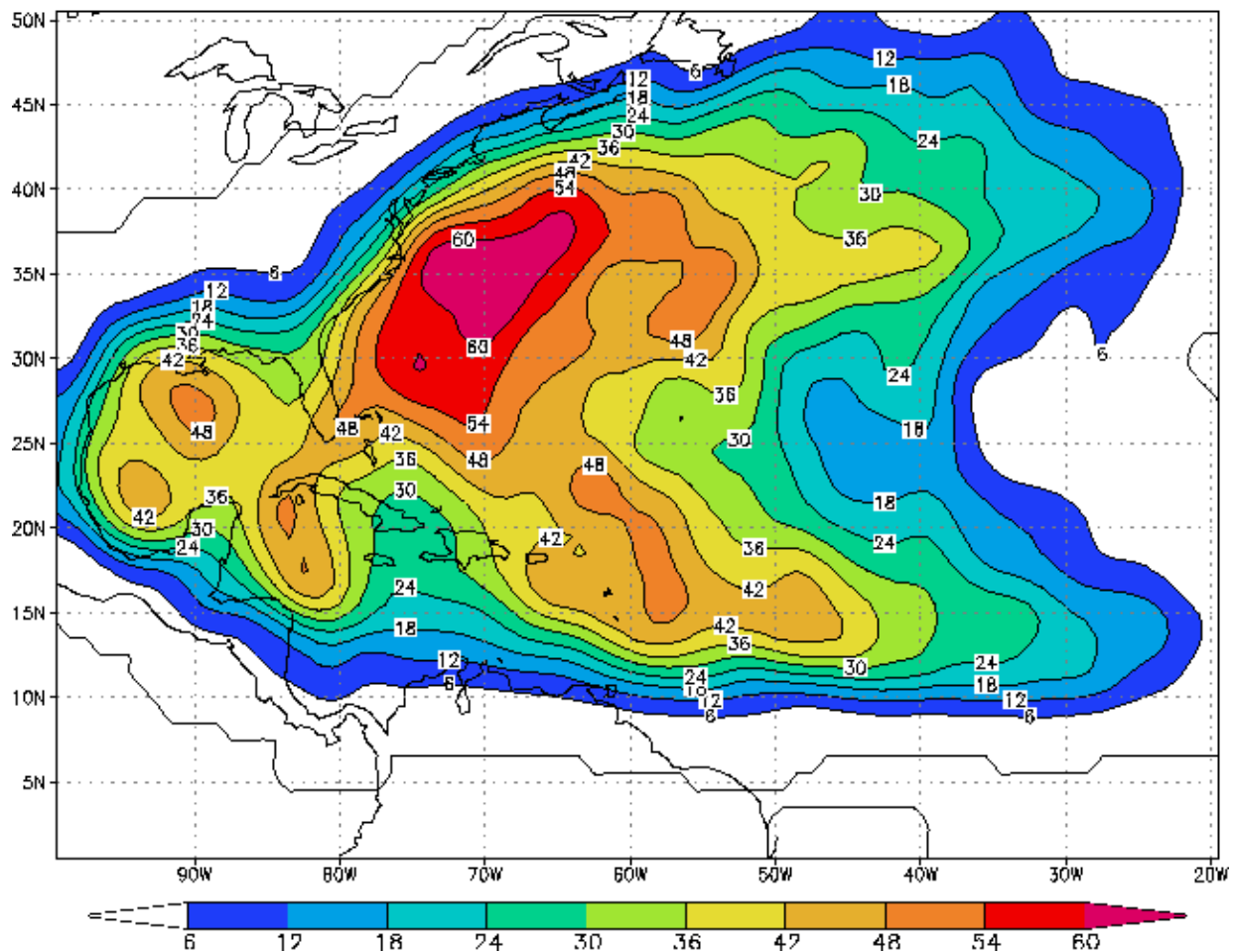
County. Gusts to hurricane force were felt over all South Florida, with the maximum measured wind gust of 142 mph in Naples. Widespread tree damage and some structural damage occurred across all of South Florida, with most structural damage on the minor side. Hurricane Irma brought widespread rainfall and some flooding across the region. From the period between 8 AM EDT September 9th and 8 AM EDT September 11th, 8 to 15 inches of rain were measured over interior portions of Southwest Florida. This rainfall near the end of a wet summer led to significant flooding over these areas. 5 to 10 inches of rain were noted elsewhere across South Florida, with areas of minor to moderate flooding. \$222.5 million in damage came in from Collier County. Details about storm surge from Hurricane Irma can be found in section 2.5.1.

### Probability of Future Occurrence

In the 20-year period from 2000 through 2019, 9 hurricanes and tropical storms have impacted Collier County, which equates to a 45 percent annual probability of hurricane winds impacting the planning area in any given year. This probability does not account for impacts from hurricane rains or storm surge, which may also be severe. The probability of a hurricane or tropical storm impacting Collier County is likely.

Figure 2.8 shows, for any location, the chance of a hurricane or tropical storm affecting the area sometime during the Atlantic hurricane season. The figure was created by the National Oceanic and Atmospheric Administration's (NOAA) Hurricane Research Division, using data from 1944 to 1999. The figure shows the number of times a storm or hurricane was located within approximately 100 miles (165 kilometers) of a given spot in the Atlantic basin.

Figure 2.8 – Empirical Probability of a Named Hurricane or Tropical Storm



Source: National Oceanic and Atmospheric Administration, Hurricane Research Division

Florida has over 8,000 miles of coastline that often gets hit by direct storms. The state is very vulnerable to the impacts of hurricanes and tropical storms as detailed in this section. Substantial hurricane damage is typically most likely to be expected in the coastal counties of the state; however, hurricane and tropical storm-force winds have significantly impacted areas far inland.

*Probability: 3 – Likely*

#### Climate Change

Collier County's coastal location makes it a prime target for hurricane landfalls and changing climate and weather conditions may increase the number and frequency of future hurricane events. Hurricanes and other coastal storms may result in increased flooding, injuries, deaths, and extreme property loss. According to the US Government Accountability Office, national storm losses from changing frequency and intensity of storms is projected to increase anywhere from \$4-6 billion soon.

According to NOAA, weather extremes will likely cause more frequent, stronger storms in the future due to rising surface temperatures. NOAA models predict that while there may be less frequent, low-category storm events (Tropical Storms, Category 1 Hurricanes), there will be more, high-category storm events (Category 4 and 5 Hurricanes) in the future. This means that there may be fewer hurricanes overall in any

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given year, but when hurricanes do form, it is more likely that they will become large storms that can create massive damage.

### Vulnerability Assessment

#### People

The very young, the elderly and the handicapped are especially vulnerable to harm from hurricanes. For those who are unable to evacuate for medical reasons, there should be provision to take care of special-needs patients and those in hospitals and nursing homes. Many of these patients are either oxygen-dependent, insulin-dependent, or in need of intensive medical care. There is a need to provide ongoing treatment for these vulnerable citizens, either on the coast or by air evacuation to upland hospitals. The stress from disasters such as a hurricane can result in immediate and long-term physical and emotional health problems among victims.

Individuals in mobile homes are more vulnerable to hurricane winds, especially if their unit does not have tie downs and other wind safety measures. Overall, there are 10,696 mobile home units in Collier County. Over 20 percent of the housing stock in Everglades City is mobile home units. Additionally, there are over 10,000 mobile home units in unincorporated Collier County. These communities may face more severe impacts from hurricane events as a result. Table 2.26 shows mobile home units by jurisdiction.

**Table 2.26 – Mobile Home Units by Jurisdiction, 2018**

Jurisdiction	Total Housing Units	Mobile Home Units	Mobile Home Units, Percent of Total
Everglades City	351	74	21.1%
Marco Island	18,742	9	0.1%
Naples	19,801	140	0.7%
Unincorporated Collier County	171,931	10,473	6.1%
<b>Total</b>	<b>210,825</b>	<b>10,696</b>	<b>5.1%</b>

Source: American Community Survey 5-Year Estimates, 2018

Note: Census data is not available for the Immokalee Reservation.

#### Property

Hurricanes can cause catastrophic damage to coastlines and several hundred miles inland. Hurricanes can produce winds exceeding 157 mph as well as tornadoes and microbursts. Additionally, hurricanes often bring intense rainfall that can result in flash flooding. Floods and flying debris from the excessive winds are often the deadly and most destructive results of hurricanes.

Hazus level 1 analysis was used to determine hurricane risk based on probabilistic parameters for the 100-year and 500-year return periods. This analysis produced estimates of the likelihood of varying levels of damage as well as building-related economic losses. Note that Hazus only assesses hurricane wind and does not account for any other hazards associated with hurricane.

Table 2.27 and Table 2.28 provide the likelihood of damage at varying levels of severity by occupancy type. During the probabilistic hurricane event with a 100-year return period, it's estimated that more than 77% of buildings in the county are likely to sustain damages. During the 500-year return period event, over 90% of the county's buildings are likely to be damaged.

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**Table 2.27 – Likelihood of Damage by Severity and Occupancy, 100-year Hurricane Event**

Occupancy	Buildings at Risk	Value at Risk	Likelihood of Damage (%)				
			None	Minor	Moderate	Severe	Destruction
Agriculture	477	\$168,071,000	20.38%	29.43%	26.19%	18.62%	5.38%
Commercial	7,201	\$5,628,144,000	21.04%	21.77%	33.59%	23.04%	0.56%
Education	173	\$195,401,000	22.68%	21.83%	29.91%	25.56%	0.02%
Government	108	\$104,192,000	27.02%	20.24%	28.56%	24.16%	0.01%
Industrial	1,903	\$951,068,000	22.64%	20.74%	29.46%	26.27%	0.89%
Religion	610	\$495,399,000	21.92%	28.23%	29.65%	20.15%	0.05%
Residential	115,440	\$35,361,568,000	24.39%	36.10%	28.92%	8.44%	2.15%
<b>Total</b>	<b>125,912</b>	<b>\$42,903,843,000</b>	<b>22.87%</b>	<b>25.48%</b>	<b>29.47%</b>	<b>20.89%</b>	<b>1.29%</b>

Source: Hazus

**Table 2.28 – Likelihood of Damage by Severity and Occupancy, 500-year Hurricane Event**

Occupancy	Buildings at Risk	Value at Risk	Likelihood of Damage (%)				
			None	Minor	Moderate	Severe	Destruction
Agriculture	476	\$168,071,000	5.94%	14.45%	27.49%	38.83%	13.30%
Commercial	7,201	\$5,628,144,000	5.98%	9.06%	26.95%	54.60%	3.42%
Education	173	\$195,401,000	6.62%	9.05%	24.17%	59.55%	0.61%
Government	105	\$104,192,000	10.56%	9.74%	22.72%	56.53%	0.45%
Industrial	1,902	\$951,068,000	6.31%	8.15%	22.61%	60.41%	2.52%
Religion	610	\$495,399,000	5.91%	12.07%	28.39%	51.98%	1.64%
Residential	115,445	\$35,361,568,000	6.47%	18.40%	32.74%	29.45%	12.94%
<b>Total</b>	<b>125,912</b>	<b>\$42,903,843,000</b>	<b>6.83%</b>	<b>11.56%</b>	<b>26.44%</b>	<b>50.19%</b>	<b>4.98%</b>

Source: Hazus

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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Table 2.29 details estimated property damages from the 100-year and 500-year hurricane wind events by occupancy type.

**Table 2.29 – Estimated Property Damages, 100-year and 500-year Hurricane Wind Events**

Area	Residential	Commercial	Industrial	Others	Total
<b>100-year Hurricane Event</b>					
Building	\$5,040,731,990	\$689,821,610	\$116,145,490	\$99,295,360	\$5,945,994,450
Content	\$1,578,194,070	\$435,101,930	\$89,414,120	\$60,901,580	\$2,163,611,700
<b>Total</b>	<b>\$6,618,926,060</b>	<b>\$1,124,923,540</b>	<b>\$205,559,610</b>	<b>\$160,196,940</b>	<b>\$8,109,606,150</b>
<b>500-year Hurricane Event</b>					
Building	\$13,872,612,770	\$1,903,830,650	\$326,316,600	\$270,330,950	\$16,373,090,960
Content	\$5,441,640,710	\$1,417,126,940	\$286,011,350	\$191,043,810	\$7,335,822,810
<b>Total</b>	<b>\$19,314,253,480</b>	<b>\$3,320,957,590</b>	<b>\$612,327,950</b>	<b>\$461,374,760</b>	<b>\$23,708,913,770</b>

Source: Hazus

Estimated property damages for the 100-year hurricane wind event total \$8,109,606,150, which equates to a loss ratio of approximately 19 percent. Estimated property damages for the 500-year event total \$23,708,913,770, which represents a loss ratio of over 55 percent. FEMA considers a loss ratio of 10 percent or more to be an indicator that a community will have significant difficulty recovering from an event. The 500-year event will cause significant difficulties for recovery. Damages from an actual hurricane event would likely also involve flood impacts that would raise the damage total. Therefore, even a 100-year hurricane event may cause more serious damages than what is reported here from Hazus.

Due to the limitations of a Hazus level 1 analysis, damage estimates for critical facilities could not be calculated.

### Environment

Aquatic species within the lake will either be displaced or destroyed. The velocity of the flood wave will likely destroy riparian and instream vegetation and destroy wetland function. The flood wave will likely cause erosion within and adjacent to the stream. Deposition of eroded deposits may choke instream habitat or disrupt riparian areas. Sediments within the lake bottom and any low oxygen water from within the lake will be dispersed, potentially causing fish kills or releasing heavy metals found in the lake sediment layers.

### Consequence Analysis

Table 2.30 summarizes the potential negative consequences of hurricanes and tropical storms.

**Table 2.30 – Consequence Analysis – Hurricane and Tropical Storm**

Category	Consequences
Public	Impacts include injury or death, loss of property, outbreak of diseases, mental trauma and loss of livelihoods. Power outages and flooding are likely to displace people from their homes. Water can become polluted such that if consumed, diseases and infection can be easily spread. Residential, commercial, and public buildings, as well as critical infrastructure such as transportation, water, energy, and communication systems may be damaged or destroyed, resulting in cascading impacts on the public.
Responders	Localized impact expected to limit damage to personnel in the inundation area at the time of the incident.
Continuity of Operations (including Continued Delivery of Services)	Damage to facilities/personnel from flooding or wind may require temporary relocation of some operations. Operations may be interrupted by power outages. Disruption of roads and/or utilities may postpone delivery of some services.

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Category	Consequences
	Regulatory waivers may be needed locally. Fulfillment of some contracts may be difficult. Impact may reduce deliveries.
Property, Facilities and Infrastructure	Structural damage to buildings may occur; loss of glass windows and doors by high winds and debris; loss of roof coverings, partial wall collapses, and other damages requiring significant repairs are possible in a major (category 3 to 5) hurricane.
Environment	Hurricanes can devastate wooded ecosystems and remove all the foliage from forest canopies, and they can change habitats so drastically that the indigenous animal populations suffer as a result. Specific foods can be taken away as high winds will often strip fruits, seeds and berries from bushes and trees. Secondary impacts may occur; for example, high winds and debris may result in damage to an above-ground fuel tank, resulting in a significant chemical spill.
Economic Condition of the Jurisdiction	Local economy and finances adversely affected, possibly for an extended period, depending on damages. Intangible impacts also likely, including business interruption and additional living expenses.
Public Confidence in the Jurisdiction's Governance	Likely to impact public confidence due to possibility of major event requiring substantial response and long-term recovery effort.

### Hazard Summary by Jurisdiction

The following table summarizes extreme heat hazard risk by jurisdiction. Due to its coastal geography, the entire county is susceptible to the impacts of hurricanes, tropical storms, and the associated storm surges and flooding. While hurricanes have the possibility of being catastrophic across all jurisdictions, certain areas have higher vulnerability. Impacts may be greater in more highly developed areas with greater amounts of impervious surface and higher exposure in terms of both property and population density. Areas with more mobile homes are also more vulnerable to damage, while areas with higher property values have greater overall exposure and potential for damages. Despite these differences, all jurisdictions have the possibility for catastrophic impacts.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	3	4	4	1	3	3.3	H
Immokalee Reservation	3	4	4	1	3	3.3	H
Marco Island	3	4	4	1	3	3.3	H
Naples	3	4	4	1	3	3.3	H
Unincorporated Collier County	3	4	4	1	3	3.3	H

### 2.5.3 Severe Storms and Tornadoes

#### Hazard Description

##### Thunderstorm Winds

Thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at earth's surface and causes strong winds associated with thunderstorms.

There are four ways in which thunderstorms can organize: single cell, multi-cell cluster, multi-cell lines (squall lines), and supercells. Even though supercell thunderstorms are most frequently associated with severe weather phenomena, thunderstorms most frequently organize into clusters or lines. Warm, humid conditions are favorable for the development of thunderstorms. The average single cell thunderstorm is approximately 15 miles in diameter and lasts less than 30 minutes at a single location. However, thunderstorms, especially when organized into clusters or lines, can travel intact for distances exceeding 600 miles.

Thunderstorms are responsible for the development and formation of many severe weather phenomena, posing great hazards to the population and landscape. Damage that results from thunderstorms is mainly inflicted by downburst winds, large hailstones, and flash flooding caused by heavy precipitation. Stronger thunderstorms can produce tornadoes and waterspouts. While conditions for thunderstorm conditions may be anticipated within a few hours, severe conditions are difficult to predict. Regardless of severity, storms generally pass within a few hours.

*Warning Time: 4 – Less than six hours*

*Duration: 1 – Less than six hours*

##### Lightning

Lightning is a sudden electrical discharge released from the atmosphere that follows a course from cloud to ground, cloud to cloud, or cloud to surrounding air, with light illuminating its path. Lightning's unpredictable nature causes it to be one of the most feared weather elements.

All thunderstorms produce lightning, which often strikes outside of the area where it is raining and is known to fall more than 10 miles away from the rainfall area. When lightning strikes, electricity shoots through the air and causes vibrations creating the sound of thunder. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start building fires and wildland fires, and damage electrical systems and equipment.

The watch/warning time for a given storm is usually a few hours. There is no warning time for any given lightning strike. Lightning strikes are instantaneous. Storms that cause lightning usually pass within a few hours.

*Warning Time: 4 – minimal or no warning time (less than 6 hours warning)*

*Duration: 1 – less than six hours*

### Hail

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere causing them to freeze. The raindrops form into small frozen droplets and then continue to grow as they encounter super-cooled water which will freeze on contact with the frozen rain droplet. This frozen rain droplet can continue to grow and form hail. If the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow.

At the time when the updraft can no longer support the hailstone, it will fall to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 mph, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 mph. The largest hailstone recorded in the United States was found in Vivian, South Dakota on July 23, 2010; it measured eight inches in diameter, almost the size of a soccer ball. While soccer-ball-sized hail is the exception, but even small pea sized hail can do damage.

Hailstorms in Florida cause damage to property, crops, and the environment, and kill and injure livestock. In the United States, hail causes more than \$1 billion in damage to property and crops each year. Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are the other things most commonly damaged by hail. Hail has been known to cause injury to humans; occasionally, these injuries can be fatal.

The onset of thunderstorms with hail is generally rapid. However, advancements in meteorological forecasting allow for some warning. Storms usually pass in a few hours.

*Warning Time: 4 – Less than 6 hours*

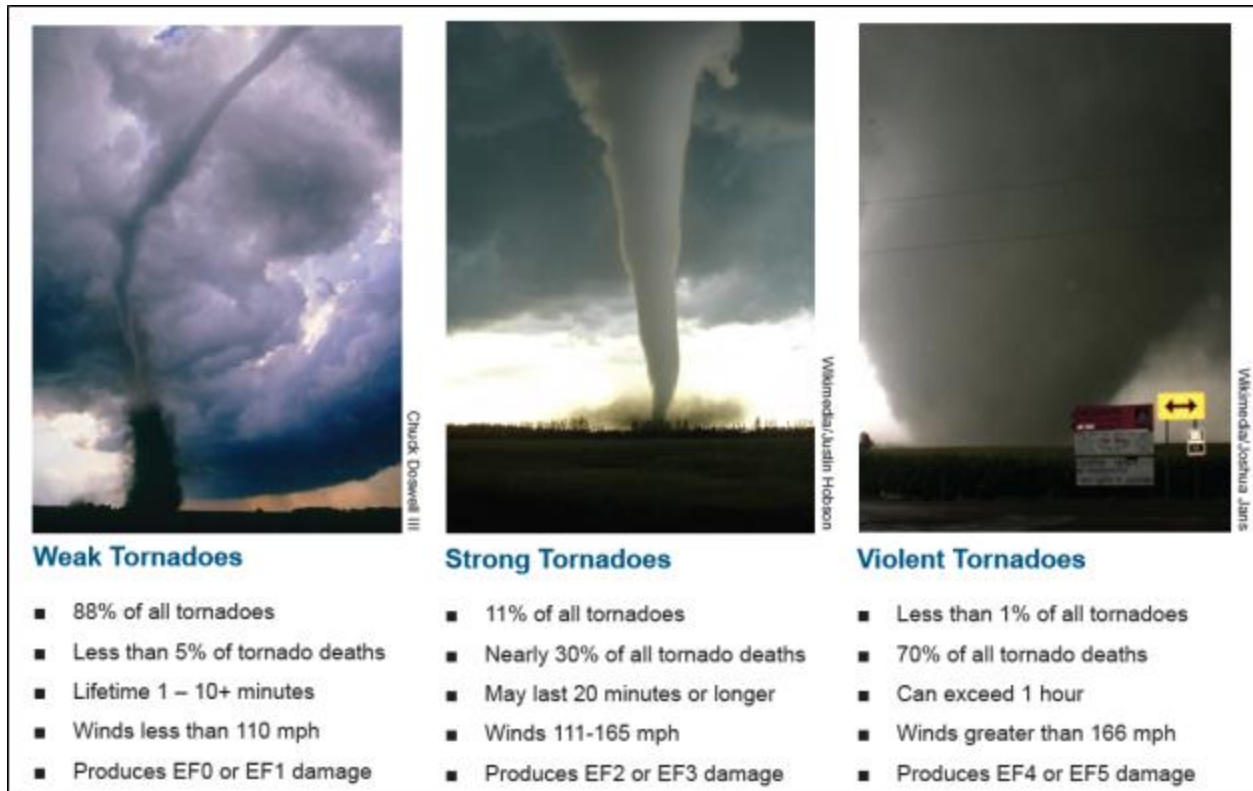
*Duration: 1 – Less than 6 hours*

### Tornado

According to the Glossary of Meteorology (AMS 2000), a tornado is "a violently rotating column of air, pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a funnel cloud." Tornadoes can appear from any direction. Most move from southwest to northeast, or west to east. Some tornadoes have changed direction amid path, or even backtracked.

Tornadoes are commonly produced by land falling tropical cyclones. Those making landfall along the Gulf coast traditionally produce more tornadoes than those making landfall along the Atlantic coast. Tornadoes that form within hurricanes are more common in the right front quadrant with respect to the forward direction but can occur in other areas as well. According to the NHC, about 10% of the tropical cyclone-related fatalities are caused by tornadoes. Tornadoes are more likely to be spawned within 24 hours of landfall and are usually within 30 miles of the tropical cyclone's center.

Tornadoes have the potential to produce winds in excess of 200 mph (EF5 on the Enhanced Fujita Scale) and can be very expansive – some in the Great Plains have exceeded two miles in width. Tornadoes associated with tropical cyclones, however, tend to be of lower intensity (EF0 to EF2) and much smaller in size than ones that form in the Great Plains.



*Warning Time: 4 – Less than 6 hours*

*Duration: 1 – Less than 6 hours*

According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas and Florida respectively. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of “tornado alley”), Florida experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). The below Figure 2.9 shows tornado activity in the United States based on the number of recorded tornadoes per 1,000 square miles.

Figure 2.9 – Tornado Activity in the U.S.

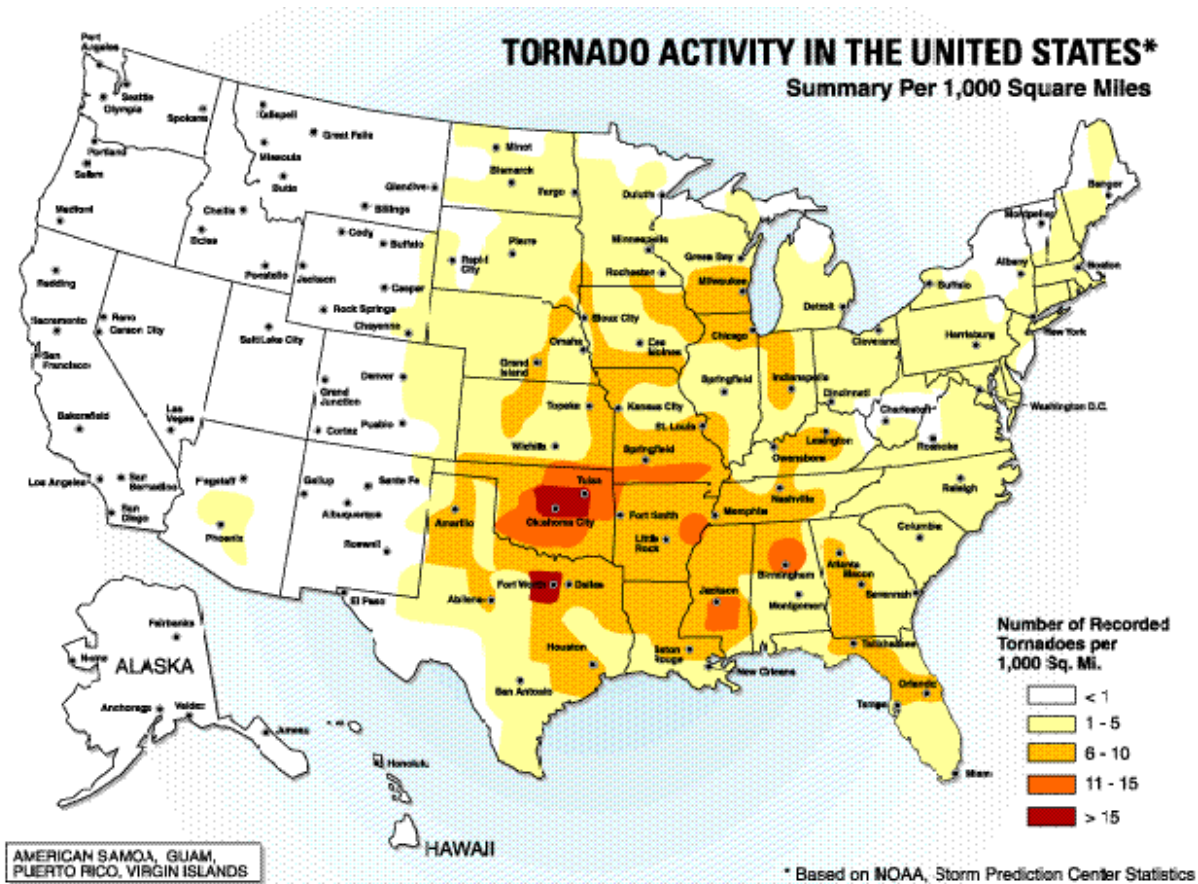


Figure 1.1 The number of tornadoes recorded per 1,000 square miles

Source: American Society of Civil Engineers

### Location

Thunderstorm wind, lightning, and hail events do not have a defined vulnerability zone. The scope of lightning and hail is generally confined to the footprint of its associated thunderstorm. The entirety of Collier County shares equal risk to the threat of severe weather.

According to the Vaisala 2019 Annual Lightning Report, Florida had 228 lightning events per square mile, more than any other state. According to Vaisala's flash density map, shown in Figure 2.10, Collier County is in an area that experiences 20 to 28 lightning flashes per square mile per year.

It should be noted that future lightning occurrences may exceed these figures.

Figure 2.10 – Lightning Flash Density (2008-2017)

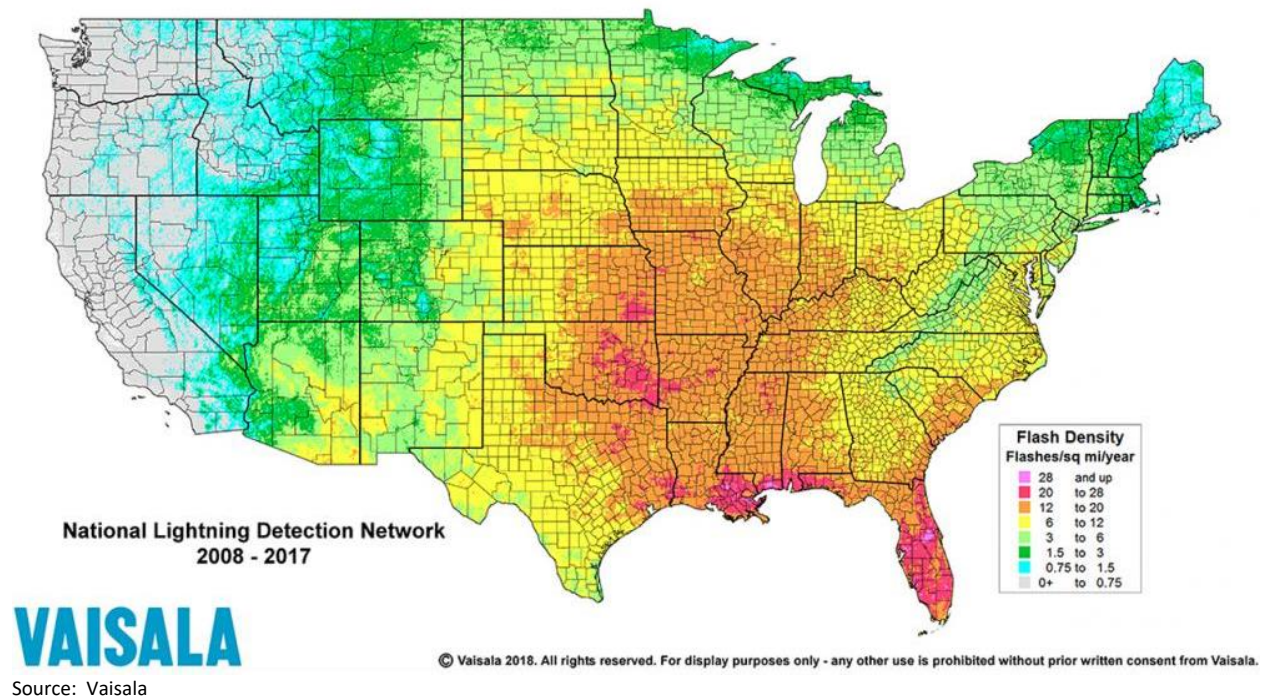
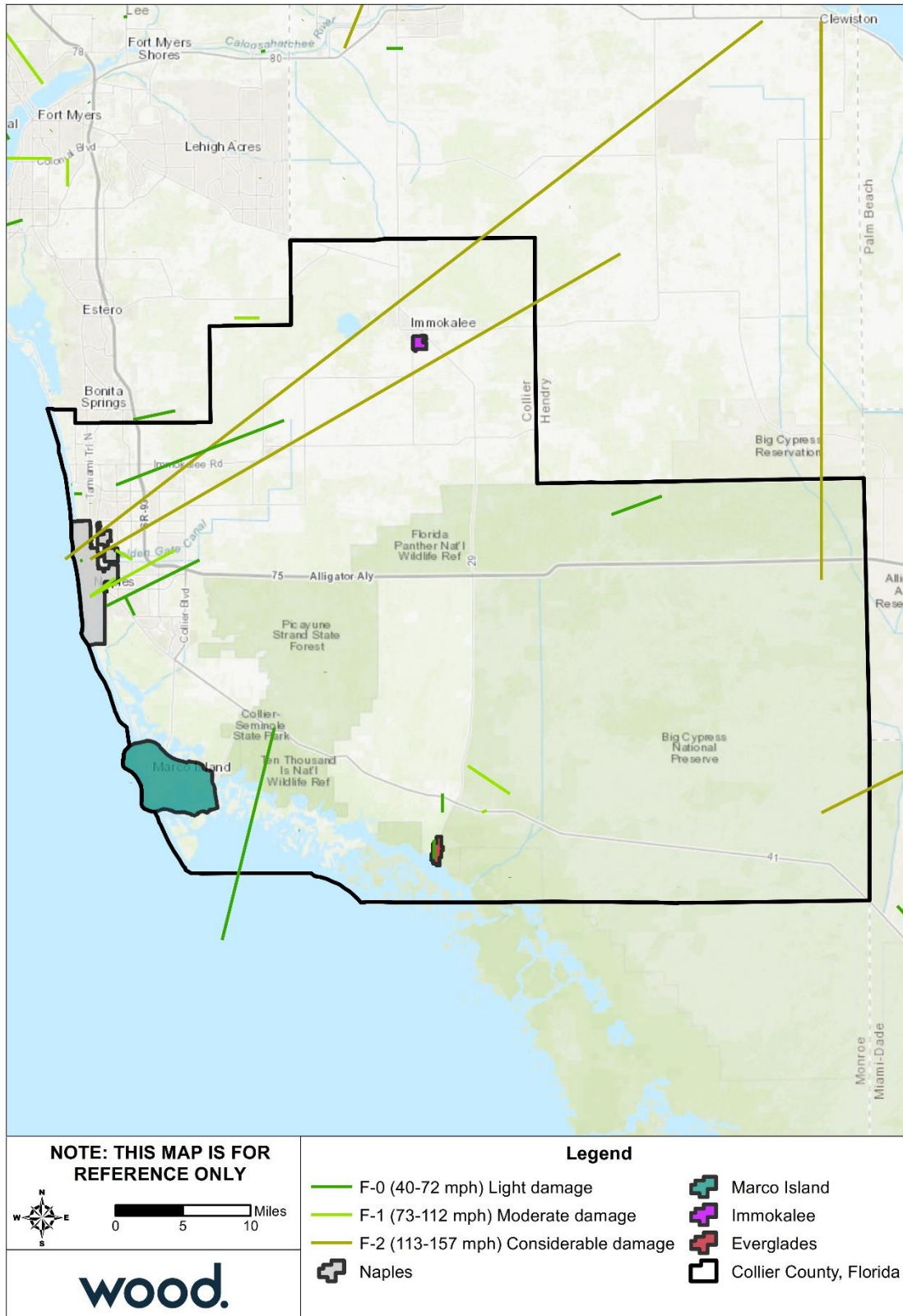


Figure 2.11 reflects the tracks of past tornados that passed through Collier County from 1950 through 2017 according to data from the NOAA/NWS Storm Prediction Center.

Tornados can occur anywhere in the County. Tornadoes typically impact a small area, but damage may be extensive. Tornado locations are completely random, meaning risk to tornado isn't increased in one area of the county versus another. All of Collier County is uniformly exposed to this hazard.

Figure 2.11 – Tornado Paths Through Collier County, 1950-2017



Source: NOAA/NWS Storm Prediction Center

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

### Extent

#### Thunderstorm Winds

The magnitude of a thunderstorm event can be defined by the storm's maximum wind speed and its impacts. NCEI divides wind events into several types including High Wind, Strong Wind, Thunderstorm Wind, Tornado and Hurricane. For this severe weather risk assessment, High Wind, Strong Wind and Thunderstorm Wind data was collected. Hurricane Wind and Tornadoes are addressed as individual hazards. The following definitions come from the NCEI Storm Data Preparation document.

- ▶ **High Wind** – Sustained non-convective winds of 40mph or greater lasting for one hour or longer or winds (sustained or gusts) of 58 mph for any duration on a widespread or localized basis.
- ▶ **Strong Wind** – Non-convective winds gusting less than 58 mph, or sustained winds less than 40 mph, resulting in a fatality, injury, or damage.
- ▶ **Thunderstorm Wind** – Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 58 mph, or winds of any speed (non-severe thunderstorm winds below 58 mph) producing a fatality, injury or damage.

The strongest recorded thunderstorm wind event in the county occurred on January 17, 2016 with a measured gust of 90 mph in Naples and estimated gusts of 79 to 82 mph elsewhere across the county. The event reportedly caused no fatalities, injuries, or damages.

*Impact: 2 – Limited*

*Spatial Extent: 4 – Large*

#### Lightning

Lightning is measured by the Lightning Activity Level (LAL) scale, created by the NWS to define lightning activity into a specific categorical scale. The LAL is a common parameter that is part of fire weather forecasts nationwide. The scale is shown in Table 2.31.

**Table 2.31 – Lightning Activity Level Scale**

Lightning Activity Level Scale	
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground lightning strikes in a five-minute period
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a five-minute period
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a five-minute period
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a five-minute period
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag warning

Source: National Weather Service

With the right conditions in place, the entire county is susceptible to each lightning activity level as defined by the LAL. Most lightning strikes cause limited damage to specific structures in a limited area, and cause very few injuries or fatalities, and minimal disruption on quality of life.

While the total area vulnerable to a lightning strike corresponds to the footprint of a given thunderstorm, a specific lightning strike is usually a localized event and occurs randomly. It should be noted that while lightning is most often affiliated with severe thunderstorms, it may also strike outside of heavy rain and might occur as far as 10 miles away from any rainfall. All of Collier County is exposed to lightning.

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*Impact: 1 – Minor*

*Spatial Extent: 1 – Negligible*

### Hail

The NWS classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 2.32 indicates the hailstone measurements utilized by the NWS.

**Table 2.32 – Hailstone Measurement Comparison Chart**

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf ball
2.0 inch	Hen egg
2.5 inch	Tennis ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

The Tornado and Storm Research Organization (TORRO) has further described hail sizes by their typical damage impacts. Table 2.33 describes typical intensity and damage impacts of the various sizes of hail.

**Table 2.33 – Tornado and Storm Research Organization Hailstorm Intensity Scale**

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > softball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University

Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity.

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

The average hailstone size recorded between 2000 and 2019 in Collier County was a little under 1" in diameter; the largest hailstone recorded was 1.5", recorded on April 6, 2012 and June 26, 2014. The largest hailstone ever recorded in the U.S. fell in Vivian, SD on June 23, 2010, with a diameter of 8 inches and a circumference of 18.62 inches.

*Impact: 1 – Minor*

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. Collier County is uniformly exposed to severe thunderstorms; therefore, the entire planning area is equally exposed to hail which may be produced by such storms. However, large-scale hail tends to occur in a more localized area within the storm.

*Spatial Extent: 2 – Small*

### Tornado

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita (EF) scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis, better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. Table 2.34 shows the wind speeds associated with the enhanced Fujita scale ratings and the damage that could result at different levels of intensity.

**Table 2.34 – Enhanced Fujita Scale**

EF Number	3 Second Gust (mph)	Damage
0	65-85	<b>Light damage.</b> Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
1	96-110	<b>Moderate damage.</b> Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
2	111-135	<b>Considerable damage.</b> Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
3	136-165	<b>Severe damage.</b> Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
4	166-200	<b>Devastating damage.</b> Well-constructed houses and whole frame houses completely leveled; cars thrown, and small missiles generated.
5	Over 200	<b>Incredible damage.</b> Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly in excess of 100 m; high-rise buildings have significant structural deformation; incredible phenomena will occur.

The most intense tornado to pass through Collier County in the past 20 years was an EF1 in Ochopee on September 9, 2017. While NCEI reports no property damage occurred, narratives of the event say that it occurred simultaneous to Hurricane Irma and caused damage to multiple trees along its path. The tornado was 0.25 miles long and 50 yards wide.

*Impact: 3 – Critical*

*Spatial Extent: 2 – Small*

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

### Historical Occurrences

#### Thunderstorm Winds

Between January 1, 2000 and December 31, 2019, the NCEI recorded 54 separate incidents of thunderstorm winds, occurring on 35 separate days. These events caused \$200,500 in recorded property damage, but no crop damages, injuries, or fatalities were reported. The recorded gusts averaged 54.6 miles per hour, with the highest gusts recorded at 89.8 mph, recorded on January 17, 2016. Of these events, 15 caused property damage. Wind gusts with property damage recorded averaged \$11,794 in damage, with one gust causing a reported \$50,000 in damage (in East Naples on August 9, 2006). These incidents are aggregated by the date the events occurred and are recorded in Table 2.35 below:

**Table 2.35 – Recorded Thunderstorm Winds with Property Damages, Collier County, 2000-2019**

Location	Date	Wind Speed (mph)	Fatalities	Injuries	Property Damage
Vanderbilt Beach	6/26/2001	81	0	0	\$50,000
Naples	7/17/2002	58	0	0	\$0
Naples	2/22/2003	63	0	0	\$0
Vanderbilt Beach	7/4/2003	75	0	0	\$0
Golden Gate	4/12/2004	63	0	0	\$10,000
Immokalee	6/4/2004	62	0	0	\$0
Marco Island	8/13/2004	63	0	0	\$0
Everglades City	4/7/2005	58	0	0	\$5,000
Golden Gate	7/16/2005	58	0	0	\$1,000
East Naples	8/9/2006	81	0	0	\$50,000
Naples	8/19/2006	63	0	0	\$0
Jerome	39207	64	0	0	\$0
Immokalee	39208	70	0	0	\$10,000
(Apf)Naples Muni Arp	5/14/2007	60	0	0	\$0
Golden Gate	6/8/2007	70	0	0	\$1,000
East Naples	6/25/2007	64	0	0	\$500
(Apf)Naples Muni Arp	9/17/2007	62	0	0	\$20,000
Sunniland	6/7/2009	60	0	0	\$0
Naples Park	4/26/2010*	58	0	0	\$2,000
Immokalee	6/15/2011*	86	0	0	\$40,000
(Apf)Naples Muni Arp	4/6/2012	60	0	0	\$2,000
Immokalee	5/24/2013	60	0	0	\$0
East Naples	3/6/2014*	60	0	0	\$0
Corkscrew	3/29/2014	60	0	0	\$0
Golden Gate	6/15/2014	60	0	0	\$0
Golden Gate	6/11/2015*	60	0	0	\$0
(Apf)Naples Muni Arp	9/29/2015	64	0	0	\$0
Naples	1/17/2016*	90	0	0	\$0
Marco Island Arpt	2/16/2016	60	0	0	\$0
Goodland	1/23/2017	60	0	0	\$0
(Apf)Naples Muni Arp	7/31/2017	58	0	0	\$2,000
(Apf)Naples Muni Arp	12/9/2017	59	0	0	\$0
Marco Island	3/20/2018	61	0	0	\$0
East Naples	5/30/2018	49	0	0	\$5,000
Marco Island	10/19/2019*	45	0	0	\$2,000
<b>Total</b>			<b>0</b>	<b>0</b>	<b>\$200,500</b>

Source: NCEI; Note: \*Multiple events occurred on these dates. Injury, fatality, and damage stats are totaled; wind speed is highest reported.

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In addition to recorded thunderstorm wind events, NCEI reports 2 high wind and strong wind events during this same period that caused \$5,000 in property damage. Of all 60 wind events during this period, there were no incidents that directly caused deaths or injuries.

### Lightning

According to NCEI data, there were 27 lightning strikes reported between 2000 and 2019. Of these, 17 recorded property damage totaling over \$4.7 million. The highest rate of property damage recorded for a single incident was \$2,000,000. Three events caused fatalities, and seven events caused a total of 11 injuries. Event narratives indicate in some cases that property damage occurred but was not estimated; therefore, actual property damage amounts are higher. No crop damage was recorded by these strikes. It should be noted that lightning events recorded by the NCEI are only those that are reported; it is certain that additional lightning incidents have occurred in Collier County. Table 2.36 details NCEI-recorded lightning strikes from 2000 through 2019.

**Table 2.36 – Recorded Lightning Strikes in Collier County, 2000-2019**

Location	Date	Time	Fatalities	Injuries	Property Damage
Naples Park	6/18/2001	18:30	0	0	\$2,000
Immokalee	4/28/2003	13:30	1	2	\$0
Naples	8/5/2003	14:00	0	1	\$5,000
Lelyland	8/7/2006	12:45	0	1	\$500,000
Golden Gate	8/15/2006	14:00	0	1	\$0
North Naples	7/27/2007	18:55	0	0	\$40,000
Collier City	9/17/2008	20:00	0	0	\$75,000
Corkscrew	6/23/2009	12:50	0	2	\$0
Naples	7/14/2010	14:15	0	0	\$10,000
Naples Park	9/26/2010	14:30	0	0	\$1,000
Golden Gate	9/23/2011	16:50	0	0	\$600
Corkscrew	6/26/2013	12:35	1	0	\$0
Marco	7/9/2013	14:00	0	0	\$0
Marco	8/18/2013	16:30	0	0	\$0
North Naples	9/2/2013	12:10	0	0	\$2,000,000
East Naples	9/6/2013	19:30	0	0	\$2,000
Vanderbilt Beach	9/7/2013	15:45	0	0	\$30,000
Golden Gate	4/17/2014	14:55	0	0	\$0
East Naples	7/15/2014	10:20	0	0	\$5,000
Naples	6/22/2015	17:00	0	0	\$2,000,000
Naples Park	7/1/2015	18:00	0	0	\$2,000
North Naples	7/1/2015	18:30	0	0	\$10,000
East Naples	8/15/2015	14:00	0	1	\$0
Golden Gate	5/28/2016	14:00	1	0	\$0
Marco Island	8/24/2016	13:50	0	3	\$0
North Naples	6/30/2017	17:00	0	0	\$10,000
Naples Park	7/18/2019	12:30	0	0	\$80,000
<b>Total</b>			<b>3</b>	<b>11</b>	<b>\$4,772,600</b>

Source: NCEI

The following are a selection of narrative descriptions recorded in NCEI for lightning events that occurred in Collier County:

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**April 28, 2003** – A 52-year-old was killed while working near a ditch at a farm two miles from Oil Well Road. Two other men standing about 10 feet away were injured by the same lightning strike. It was raining heavily at the time.

**June 23, 2009** – Two truck drivers were shocked by a nearby lightning strike as they were loading a dump truck in the Golden Gate Estates area. Both men received minor burns on their thighs and complained that their feet were stinging and burning. The injuries were not believed to be serious. One of the men was 22 years old and the other's age was unclear.

**June 26, 2013** – Lightning fatally struck a 35-year-old male construction worker who was working on the exterior of a single-family home on scaffolding.

**May 28, 2016** – OSHA reported a fatality due to a lightning strike to a construction worker who was struck while working on a roof. The date of death was reported to be the following day, May 29th, 2016.

**August 24, 2016** – A family visiting from out of town was leaving the south beach area of Marco Island as storms approached when lightning struck near their location. A 15-year-old male, as well as his brother and another female fell into the sand. All three were able to recover, but the 15-year-old male reported numbness in the chest, legs, and arms. All three victims and was taken to a local hospital and later released with minor injuries.

### Hail

NCEI records 39 separate hail incidents across 30 days between January 1, 2000 and December 31, 2019 in Collier County. Of these, no events were reported to have caused property damage and none caused death, injury or crop damage. However, this damage estimate may be under reported, as damage was reported in the narratives of many events but was not recorded in terms of a monetary value. The largest diameter hail recorded in the County was 1.5 inches, which occurred on two occasions: in Golden Gate on April 6, 2012 and in North Naples on June 26, 2014. The average hail size of all events in the County was just under one inch in diameter. Table 2.37 shows the summary of hail occurrences.

**Table 2.37 – Summary of Hail Occurrences by Location**

Location	Number of Occurrences	Average Hail Diameter
Copeland	1	1.00"
Everglades City	1	0.75"
Golden Gate	13	0.96"
Immokalee	3	0.88"
Jerome	1	1.00"
Marco Island	3	0.96"
Miles City	1	1.00"
Monroe Station	1	0.75"
Naples	6	0.84"
Naples Park	4	0.85"
North Naples	4	1.13"
Royal Palm	1	1.00"
<b>Total</b>	<b>42</b>	<b>0.93"</b>

Source: NCEI

The following narratives provide detail on select hailstorms from the above list of NCEI recorded events:

**April 6, 2012** – A strong cold front produced a line of strong to severe thunderstorms that moved across South Florida during the morning and early afternoon. Approximately 4,000 customers lost power in

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Collier County, with an estimated 5,800 in Broward and Miami-Dade counties. Hail of 1.5-inch diameter was reported near Golden Gate Boulevard about one mile east of Collier Blvd.

**June 26, 2014** – A moist and unstable airmass resulted in scattered late afternoon and evening showers and thunderstorms. A Facebook picture showed a 1.5-inch hail diameter in Wilshire Lakes just north of Vanderbilt Beach Road and east of I-75.

**June 11, 2018** – Morning storms once again developed along the east coast with the Atlantic sea breeze, with numerous storms across the interior and Gulf coast as sea breeze moved west and collided with the Gulf breeze along the Gulf coast during the afternoon hours. Shower and storm development along these boundaries were enhanced by a lingering upper level low across the northern Florida and the eastern Gulf of Mexico, allowing several strong storms to develop. Hail and a funnel cloud were reported in Palm Beach County with the morning activity, along with a lightning-induced fatality in Broward County. Hail was reported in Collier County during the afternoon hours. A video received via social media shows approximately dime sized hail falling in the Palm River area of North Naples. Time is estimated based on video post time and radar.

### Tornado

NCEI storm reports were reviewed from 2000 through 2019 to assess whether recent trends varied from the longer historical record. According to NCEI, Collier County experienced 24 tornado incidents between 2000 and 2019, causing 1 injury, almost \$800 thousand in property damage and no fatalities or crop damage. However, this damage estimate may be under reported, as damage was reported in the narratives of many events but was not recorded in terms of a monetary value. Table 2.38 shows historical tornadoes in Collier County during this time period.

**Table 2.38 – Recorded Tornadoes in Collier County, 2000-2019**

Location	Date	Time	Magnitude	Deaths/Injuries	Property Damage	Crop Damage
Naples	6/16/2001	16:45	F0	0/0	\$2,000	\$0
Naples	3/27/2003	14:20	F1	0/0	\$50,000	\$0
Ochopee	3/27/2003	15:00	F0	0/0	\$0	\$0
Ochopee	7/15/2003	17:59	F0	0/0	\$0	\$0
Monroe Station	10/29/2003	13:20	F0	0/0	\$0	\$0
Golden Gate	4/12/2004	17:45	F1	0/0	\$100,000	\$0
North Naples	7/10/2004	17:00	F0	0/0	\$5,000	\$0
East Naples	9/19/2004	15:15	F1	0/0	\$75,000	\$0
East Naples	9/19/2004	15:20	F0	0/0	\$10,000	\$0
Naples	9/27/2005	16:27	F0	0/0	\$0	\$0
Copeland	10/24/2005	13:30	F1	0/0	\$40,000	\$0
Jerome	9/22/2007	19:00	EF0	0/0	\$0	\$0
North Naples	12/21/2007	20:10	EF0	0/0	\$15,000	\$0
Everglades City	2/12/2008	21:45	EF0	0/0	\$444,590	\$0
Naples	4/6/2012	20:43	EF0	0/0	\$10,000	\$0
East Naples	6/23/2012	14:35	EF0	0/0	\$35,000	\$0
Naples Park	6/23/2012	15:00	EF0	0/1	\$0	\$0
Goodland	6/24/2012	10:10	EF0	0/0	\$0	\$0
Golden Gate	6/24/2012	11:00	EF0	0/0	\$0	\$0
Corkscrew	6/24/2012	11:25	EF0	0/0	\$0	\$0
Vanderbilt Beach	9/29/2015	21:00	EF0	0/0	\$0	\$0
Sunniland	2/16/2016	17:10	EF0	0/0	\$0	\$0

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Location	Date	Time	Magnitude	Deaths/Injuries	Property Damage	Crop Damage
Ochopee	9/9/2017	11:20	EF1	0/0	\$0	\$0
Corkscrew	11/22/2017	16:40	EF0	0/0	\$0	\$0
<b>Total</b>				<b>0/1</b>	<b>\$786,590</b>	<b>\$0</b>

Source: NCEI

Narratives from NCEI illustrate that damage occurred in many of these incidents even if a monetary value was not recorded. Specific incidents with some level of impact include:

**April 12, 2004** – A tornado associated with a squall line touched down near I-75 and Santa Barbara Boulevard and lifted near the Golden Gate Parkway. The tornado caused minor roof damage to houses, destroyed sheds and uprooted trees. Minor damage was also reported at Naples Municipal Airport.

**September 19, 2004** – A tornado touched down in a vacant construction site just south of the Imperial Wilderness Mobile Home Park then moved northwest through the MHP. Damage was sustained to twenty homes with six suffering major damage.

**February 12, 2008** – An EF0 Tornado touched down at the Everglades City Airport, flipping two Cessna Aircrafts while moving northeast. The tornado then moved across western sections of Everglades City producing roof and minor structural damage to a condo, school, and storage building and downing trees and power poles and damaging fences before dissipating on the north side of town.

**June 23, 2012** – The outer bands from Tropical Storm Debby located in the northeast Gulf of Mexico spawned two tornadoes in the Naples area both with EF0 intensity. A brief tornado touchdown occurred at the North Collier Hospital in North Naples on the corner of Immokalee and Goodlette-Frank Roads. Damage was reported to trees and light poles broken off, but no structural damage to the hospital. One person was struck by a downed tree limb and was treated on-site. The tornado was likely spawned by the same storm that produced the earlier tornado in East Naples.

### Probability of Future Occurrence

Based on historical occurrences recorded by NCEI for the 20-year period from 2000 through 2019, Collier County averages 2.7 thunderstorm wind events per year. Over this same period, 24 lightning events were reported as having caused death, injury, or property damage, which equates to an average of 1.2 damaging lightning strikes per year.

The average hail storm in Collier County occurs in the afternoon and has a hail stone with a diameter of just under one inch. Over the 20-year period from 2000 through 2019, Collier County experienced 39 reported hail incidents; this averages just under two reported incidents per year somewhere in the planning area, or a 100% chance that the County will experience a hail incident each year.

Based on these historical occurrences, there is a 100% chance that the County will experience severe weather each year. The probability of a damaging impacts is highly likely.

In a twenty-year span between 2000 and 2019, Collier County experienced 24 separate tornado incidents over 19 separate days. This correlates to over a 100 percent annual probability that the Region will experience a tornado somewhere in its boundaries. None of these past tornado events was a magnitude EF2 or greater; therefore, the annual probability of a significant tornado event is less than 1 percent.

*Probability: 4 – Highly Likely*

### Climate Change

Higher temperatures and humidity may increase atmospheric variability associated with the origination of severe thunderstorms and tornadoes. Decreases in vertical wind shear can result in fewer or weaker

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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severe thunderstorms and tornadoes. However, this decrease is most likely to occur when convective available potential energy is high in spring and summer, which could result in more frequent severe storms. There has been a surge in the number of severe storms reported over the past 50 years, but this increase could at least be partially attributed to technological developments that allow for better identification and reporting of such storms.

### Vulnerability Assessment

#### People

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People and populations exposed to the elements are most vulnerable to severe weather. A common hazard associated with wind events is falling trees and branches. Risk of being struck by lightning is greater in open areas, at higher elevations, and on the water.

Lightning can also cause cascading hazards, including power loss. Loss of power could critically impact those relying on energy to service, including those that need powered medical devices. Additionally, the ignition of fires is always a concern with lightning strikes.

The availability of sheltered locations such as basements, buildings constructed using hail-resistant materials and methods, and public storm shelters, all reduce the exposure of the population. Residents living in mobile homes are more vulnerable to hail events due to the lack of shelter locations and the vulnerability of the housing unit to damages. Overall, the housing stock in Collier County includes 10,696 mobile home units, as detailed in Table 2.26 in Section 2.5.2. Over 20 percent of the housing stock in Everglades City is comprised of mobile home units. Additionally, there are over 10,000 mobile home units in unincorporated Collier County, comprising over 6 percent of the housing stock. These communities may face more severe impacts from hurricane events as a result.

Since 2000, the NCEI records 3 fatalities and 11 injuries attributed to lightning in Collier County. NCEI records no fatalities and no injuries attributed to wind events in Collier County. There are no injuries or fatalities attributed to hail.

People and populations exposed to the elements are most vulnerable to tornados. Since 2000, the NCEI database records no fatalities and one injury attributed to tornadoes in Collier County.

#### Property

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All property, including residential and commercial buildings as well as critical facilities and infrastructure, are vulnerable to impacts from severe storms and tornadoes.

Property damage caused by lightning usually occurs in one of two ways – either by direct damages through fires ignited by lightning, or by secondary impacts due to power loss. According to data collected on lightning strikes in Collier County, most recorded property damage was due to structure fires.

NCEI records lightning impacts over 20 years (2000-2019), with \$4,772,600 in property damage recorded (no incidents were recorded in 2000, 2002, 2004, 2005, 2012, or 2018). Based on these records, the planning area experiences an annualized loss of \$238,630 in property damage. The average impact from lightning per incident in Collier County is \$176,763.

General damages to property from hail are direct, including destroyed windows, dented cars, and building, roof and siding damage in areas exposed to hail. Hail can also cause enough damage to cars to cause them to be totaled. The level of damage is commensurate with both a material's ability to withstand hail impacts, and the size of the hailstones that are falling. Construction practices and building codes can help maximize the resistance of the structures to damage. Large amounts of hail may need to be physically

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cleared from roadways and sidewalks, depending on accumulation. Hail can cause other cascading impacts, including power loss.

During a 20-year span between January 1, 2000 and December 31, 2019 in Collier County, NCEI reported no property damage as a direct result of hail. It should be noted that property damage due to hail is usually insured loss, with damages covered under most major comprehensive insurance plans. Because of this, hail losses are notoriously underreported by the NCEI. It is difficult to find an accurate repository of hail damages in Collier County, thus the NCEI is still used to form a baseline.

Wind events reported in NCEI for the 20-year period from 2000 through 2019 totaled \$200,500 in property damage, which equates to an annualized loss of \$10,025 across the planning area.

General damages to property are both direct (what the tornado physically destroys) and indirect, which focuses on additional costs, damages and losses attributed to secondary hazards spawned by the tornado, or due to the damages caused by the tornado. Depending on the size of the tornado and its path, a tornado is capable of damaging and eventually destroying almost anything. Construction practices and building codes can help maximize the resistance of the structures to damage.

Secondary impacts of tornado damage often result from damage to infrastructure. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a tornado put tremendous strain on a community. In the immediate aftermath, the focus is on emergency services.

Since 2000, damaging tornadoes in the County are directly responsible for nearly \$786,600 worth of damage to property according to NCEI data. This equates to an annualized loss of \$39,330.

### Environment

The main environmental impact from wind is damage to trees or crops. Wind events can also bring down power lines, which could cause a fire and result in even greater environmental impacts. Lightning may also result in the ignition of wildfires. This is part of a natural process, however, and the environment will return to its original state in time.

Hail can cause extensive damage to the natural environment, pelting animals, trees and vegetation with hailstones. Melting hail can also increase both river and flash flood risk.

Tornadoes can cause massive damage to the natural environment, uprooting trees and other debris within the tornado's path. This is part of a natural process, however, and the environment will return to its original state in time.

### Consequence Analysis

Table 2.39 summarizes the potential negative consequences of severe weather.

**Table 2.39 – Consequence Analysis – Severe Weather**

Category	Consequences
Public	Injuries; fatalities
Responders	Injuries; fatalities; potential impacts to response capabilities due to storm impacts
Continuity of Operations (including Continued Delivery of Services)	Potential impacts to continuity of operations due to storm impacts; delays in providing services
Property, Facilities and Infrastructure	Possibility of structure fire ignition; potential for disruptions in power and communications infrastructure; destruction and/or damage to any exposed property, especially windows, cars and siding; mobile homes see increased risk.

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Category	Consequences
	The weakest tornadoes, EF0, can cause minor roof damage, while strong tornadoes can destroy frame buildings and even badly damage steel reinforced concrete structures. Buildings are vulnerable to direct impact from tornadoes and from wind borne debris. Mobile homes are particularly susceptible to damage during tornadoes.
Environment	Potential fire ignition from lightning; hail damage to wildlife and foliage. Potential devastating impacts in storm's path.
Economic Condition of the Jurisdiction	Lightning damage contingent on target; can severely impact/destroy critical infrastructure and other economic drivers. Contingent on tornado's path; can severely impact/destroy critical infrastructure and other economic drivers.
Public Confidence in the Jurisdiction's Governance	Public confidence is not generally affected by severe weather events if response and recovery are not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes severe weather hazard risk by jurisdiction. Most aspects of severe storm risk do not vary substantially by jurisdiction; however, mobile home units are more vulnerable to wind damage. Over 21 percent of the housing units in Everglades City are mobile home units. Additionally, there are over 10,400 mobile home units in unincorporated Collier County, comprising over 6 percent of the housing stock. These communities may therefore face more severe impacts from wind. Where priority ratings vary between thunderstorm wind, lightning, and hail for impact and spatial extent, these scores represent an average rating with greater weight given to thunderstorm wind because it occurs much more frequently.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	4	2	3	4	1	2.7	H
Immokalee Reservation	4	1	3	4	1	2.4	M
Marco Island	4	1	3	4	1	2.4	M
Naples	4	1	3	4	1	2.4	M
Unincorporated Collier County	4	2	3	4	1	2.7	H

### 2.5.4 Wildfire

#### Hazard Description

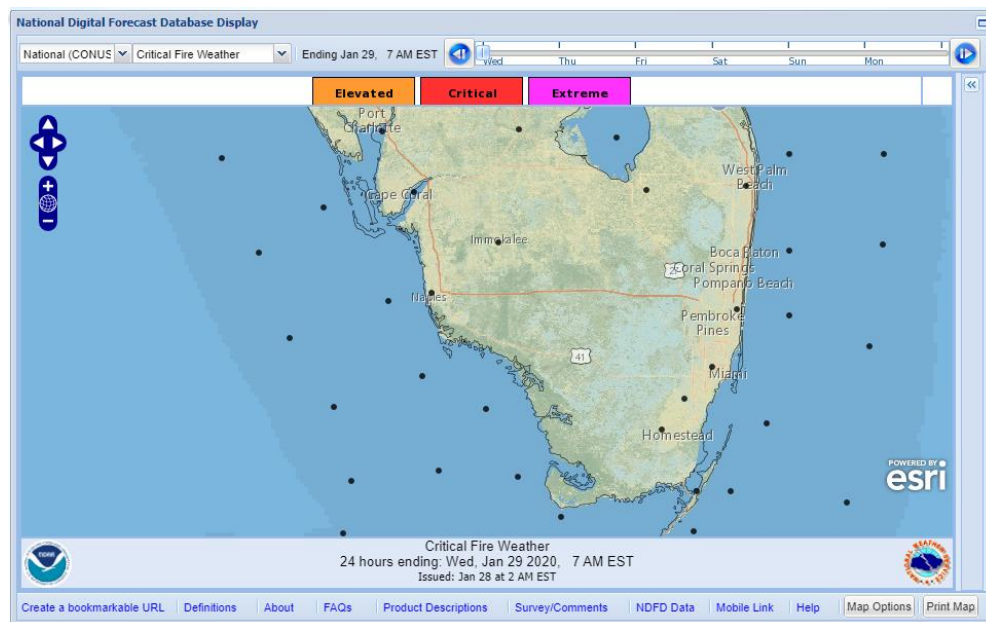
A wildfire is an uncontained fire that spreads through the environment. Wildfires can consume large areas, including infrastructure, property, and resources. When massive fires, or conflagrations, develop near populated areas, evacuations possibly ensue. Not only do the flames impact the environment, but the massive volumes of smoke spread by certain atmospheric conditions also impact the health of nearby populations. There are three general types of fire spread that are recognized.

- ▶ **Ground fires** – burn organic matter in the soil beneath surface litter and are sustained by glowing combustion.
- ▶ **Surface fires** – spread with a flaming front and burn leaf litter, fallen branches and other fuels located at ground level.
- ▶ **Crown fires** – burn through the top layer of foliage on a tree, known as the canopy or crown fires. Crown fires, the most intense type of fire and often the most difficult to contain, need strong winds, steep slopes and a heavy fuel load to continue burning.

Generally, wildfires are started by humans, either through arson or carelessness. Fire intensity is controlled by both short-term weather conditions and longer-term vegetation conditions. During intense fires, understory vegetation, such as leaves, small branches, and other organic materials that accumulate on the ground, can become additional fuel for the fire. The most explosive conditions occur when dry, gusty winds blow across dry vegetation.

Weather plays a major role in the birth, growth and death of a wildfire. In support of forecasting for fire weather, the NWS Fire Weather Program emerged in response to a need for weather support to large and dangerous wildfires. This service is provided to federal and state land management agencies for the prevention, suppression, and management of forest and rangeland fires. As shown in Figure 2.12, the NWS Miami-South Florida Forecast Office provides year-round fire weather forecasts for the region.

**Figure 2.12 – Fire Weather Forecast, Collier County Area**



Source: National Weather Service

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Weather conditions favorable to wildfire include drought, which increases flammability of surface fuels, and winds, which aid a wildfire's progress. The combination of wind, temperature, and humidity affects how fast wildland fires can spread. Rapid response can contain wildfires and limit their threat to property.

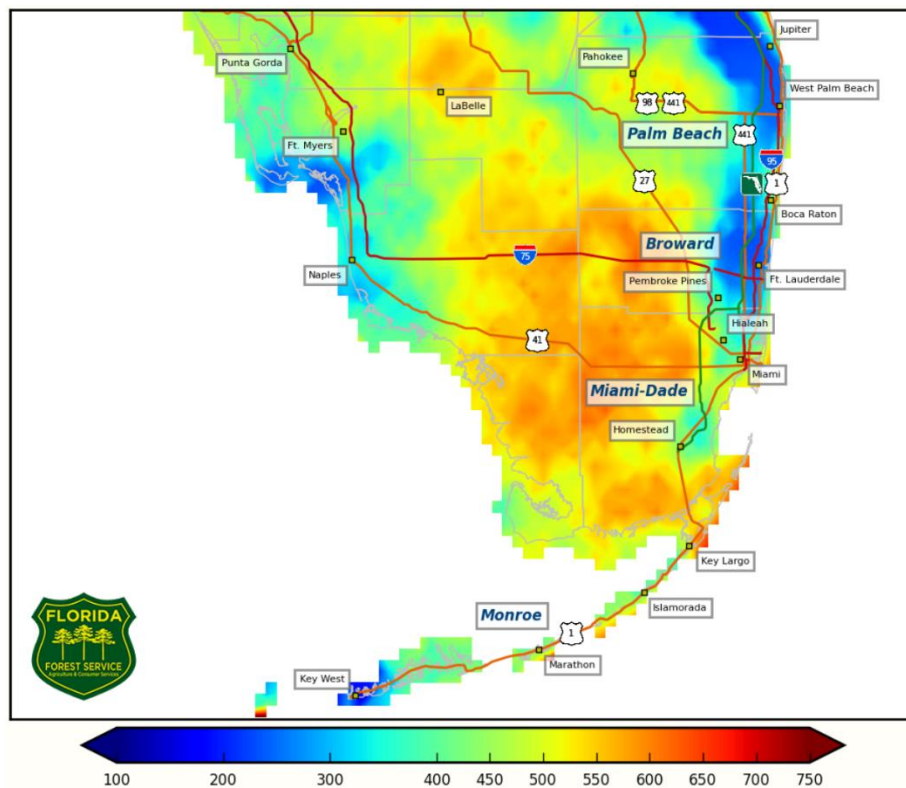
Collier County experiences a variety of wildfire conditions found in the Keetch-Byram Drought Index, which is described in Table 2.40. The Keetch-Byram Drought Index (KBDI) for January 20, 2020 is shown in Figure 2.13 along with a Daily Fire Danger Estimate Adjective Rating for certain points across the state. The KBDI for Collier County and the surrounding areas at this time was between 300 and 600.

**Table 2.40 – Keetch-Byram Drought Index Fire Danger Rating System**

KBDI	Description
0-200	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with enough sunlight and wind, cured grasses and some light surface fuels will burn in sports and patches.
200-400	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
400-600	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600-800	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Source: United State Forest Service Wildland Fire Assessment System

**Figure 2.13 – Keetch-Byram Drought Index, January 2020**



Source: Florida Department of Agriculture and Consumer Services

*Warning Time: 4 – Less than 6 hours*

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*Duration: 3 – Less than 1 week*

### Location

The location of wildfire risk can be defined by the acreage of Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels, and thus demarcates the spatial extent of wildfire risk. The WUI is essentially all the land in the county that is not heavily urbanized. The Southern Wildfire Risk Assessment (SWRA) estimates that 91.4 percent of the Collier County population lives within the WUI. The expansion of residential development from urban centers out into rural landscapes increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. Population growth within the WUI substantially increases the risk of wildfire.

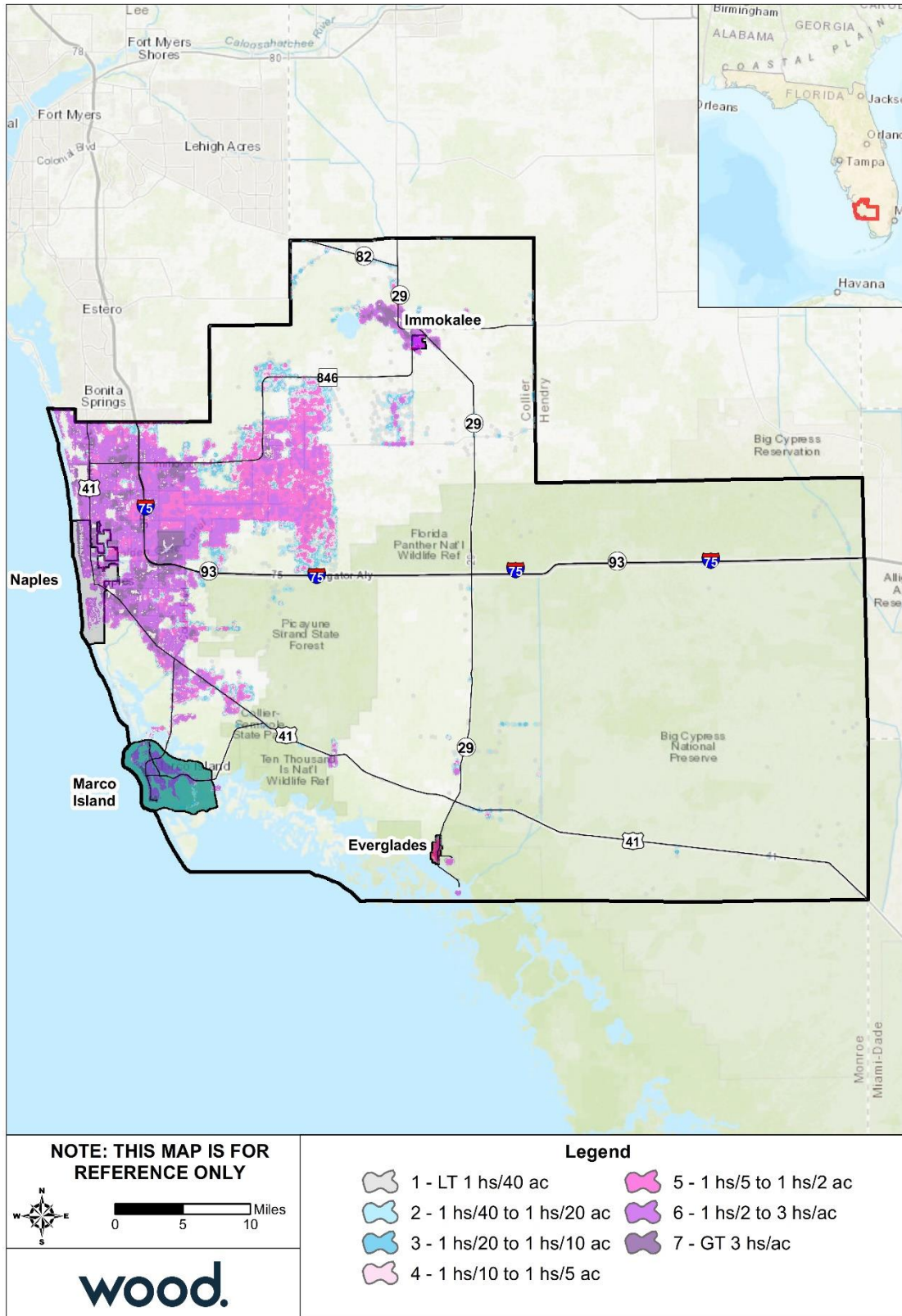
Table 2.41 details the extent of the WUI in Collier County, and Figure 2.14 maps the WUI. It is important to note that as the second largest county in Florida by area, 86.7 percent of the county is classified as outside the WUI and the remaining 13.3 percent is detailed below.

**Table 2.41 – Wildland Urban Interface, Population and Acres**

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	448	0.2 %	25,836	13.1 %
	1hs/40ac to 1hs/20ac	461	0.2 %	10,613	5.4 %
	1hs/20ac to 1hs/10ac	1,235	0.4 %	14,386	7.3 %
	1hs/10ac to 1hs/5ac	3,313	1.1 %	17,263	8.8 %
	1hs/5ac to 1hs/2ac	22,088	7.5 %	43,798	22.3 %
	1hs/2ac to 3hs/1ac	132,491	45.1 %	68,461	34.8 %
	GT 3hs/1ac	133,981	45.6 %	16,251	8.3 %
	<b>Total</b>	<b>294,017</b>	<b>100.0 %</b>	<b>196,618</b>	<b>100.0 %</b>

Source: Southern Wildfire Risk Assessment

Figure 2.14 – Wildland Urban Interface, Collier County



Source: Southern Wildfire Risk Assessment

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### Extent

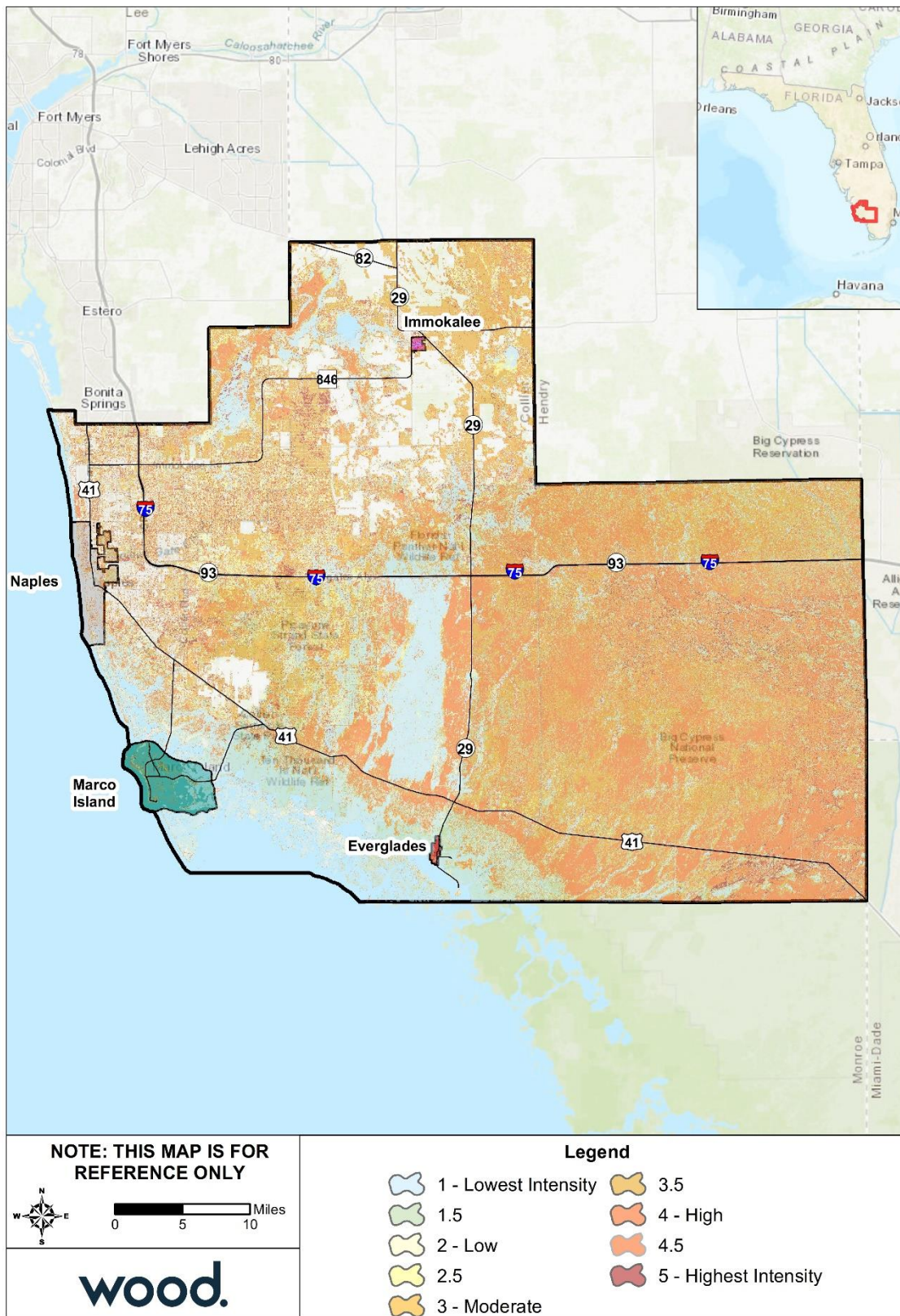
Wildfire extent can be defined by the fire's intensity and measured by the Characteristic Fire Intensity Scale, which identifies areas where significant fuel hazards which could produce dangerous fires exist. Fire Intensity ratings identify where significant fuel hazards and dangerous fire behavior potential exist based on fuels, topography, and a weighted average of four percentile weather categories. The Fire Intensity Scale consists of five classes, as defined by Southern Wildfire Risk Assessment and is shown in Table 2.42. Figure 2.15 shows the potential fire intensity within the WUI across Collier County.

**Table 2.42 – Fire Intensity Scale**

Class	Description
<b>1, Very Low</b>	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
<b>2, Low</b>	Small flames, usually less than two feet long; small amount of very short-range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
<b>3, Moderate</b>	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
<b>4, High</b>	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
<b>5, Very High</b>	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Source: Southern Wildfire Risk Assessment

Figure 2.15 – Characteristic Fire Intensity, Collier County



Source: Southern Wildfire Risk Assessment

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A significant portion, approximately 29.7 percent, of Collier County may experience a Class 4 or higher Fire Intensity, which poses significant harm or damage to life and property. However, the areas with greatest potential fire intensity are largely outside the WUI. Over 21 percent of the county may experience Class 3 or 3.5 Fire Intensity, which has potential for harm to life and property but is easier to suppress with dozer and plows. The remainder of the region is either non-burnable (22.3%) or would face a Class 1 or Class 2 Fire Intensity (26.4%), which are easily suppressed.

*Impact: 2 – Limited*

*Spatial Extent: 3 – Moderate*

### Historical Occurrences

NCEI records the following 17 wildfires for Collier County within the 20 year period from 2000 through 2019.

**Table 2.43 – Wildfires in Collier County, 2000-2019**

Location	Date	Fatalities	Injuries	Property Damage
Golden Gate	4/9/2000	0	0	\$200,000
Golden Gate	5/19/2001	0	0	\$0
Unknown	5/4/2007	0	0	\$0
Unknown	5/7/2007	0	0	\$75,000
Unknown	6/1/2007	0	0	\$0
Unknown	5/29/2008	0	0	\$850,000
Unknown	4/22/2009	0	0	\$0
Unknown	5/1/2009	0	0	\$0
Unknown	5/8/2009	0	0	\$65,000
Unknown	4/26/2011	0	0	\$80,000
Unknown	5/1/2011	0	0	\$80,000
Unknown	3/5/2017	0	0	\$578,000
Unknown	3/18/2017	0	0	\$0
Unknown	3/30/2017	0	0	\$0
Unknown	4/20/2017	0	1	\$3,500,000
Unknown	4/20/2017	0	0	\$0
Unknown	3/23/2018	0	0	\$0
<b>Total</b>		<b>0</b>	<b>1</b>	<b>\$5,428,000</b>

Source: NCEI

Almost \$5.5 million in property damage was accrued in Collier County over 20 years, giving an average of \$271,400 per year. The Florida Department of Agriculture and Consumer Services records 40 wildfires throughout the entire State during the same 20-year time period with over one million acres burned, or just over 50,500 acres burned per year.

The Florida Department of Agriculture and Consumer Services maintains records of acreage burned and number of fires within the State of Florida. Between January 1<sup>st</sup> and January 26<sup>th</sup>, 2020, there were 93 wildfires across the State with a total of 701 acres burned.

Florida participates in the national Ready, Set, Go! program which helps prepare first responders to best address wildfires when they occur. This program is also used as outreach to help citizens understand their risk and how to be prepared. Collier County has addressed fire hazards in their building codes and

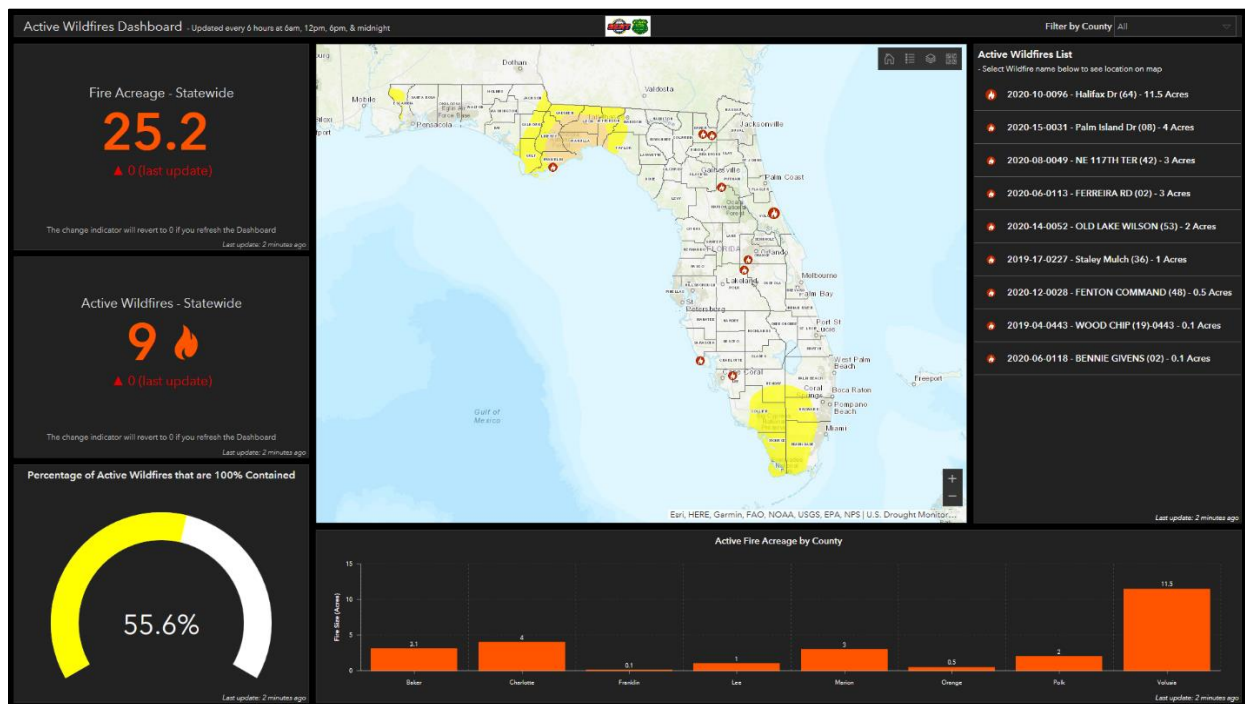
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comprehensive plan. Additionally, The State of Florida created a State Wildfire Mitigation Plan, in which Collier County is a part of the Caloosahatchee Forestry Center Wildfire Mitigation Plan.

According to the Caloosahatchee Forestry Center Wildfire Mitigation Plan, Collier County is home to many prescribed burn programs due to its abundance of public parks and forests. The largest wildfire hazard area in Collier County is Golden Gates Estates because of its density and location in heavily wooded areas. Between 2005 and 2015, lightning was the main cause of wildfires in the County accounting for 39 percent of the 810 wildfires. One of the many goals of the Wildfire Mitigation Plan is to complete a Community Wildfire Protection Plan for Collier County.

As seen in Figure 2.16, over half of Collier County was abnormally dry at the time this data was collected. The State of Florida uses this Active Wildfires Dashboard to communicate to others where the currently burning wildfires are located.

Figure 2.16 – Active Wildfires, January 27, 2020



Source: Florida Forest Service

The region experienced prolonged periods of severe drought in 1998 and 2001, as well as extreme drought in 2010 to 2012, and again in 2017. These periods of drought may explain some of the annual variation in fires and acreage burned.

On average, Collier County experiences almost 1 fire annually from fires reported by the NCEI database. Actual number of fires is likely higher because smaller fires within jurisdictional boundaries are managed by local fire departments.

### Probability of Future Occurrence

The Southern Wildfire Risk Assessment provides a Burn Probability analysis which predicts the probability of an area burning based on landscape conditions, weather, historical ignition patterns, and historical fire prevention and suppression efforts. Burn Probability data is generated by simulating fires under different weather, fire intensity, and other conditions. Values in the Burn Probability (BP) data layer indicate, for

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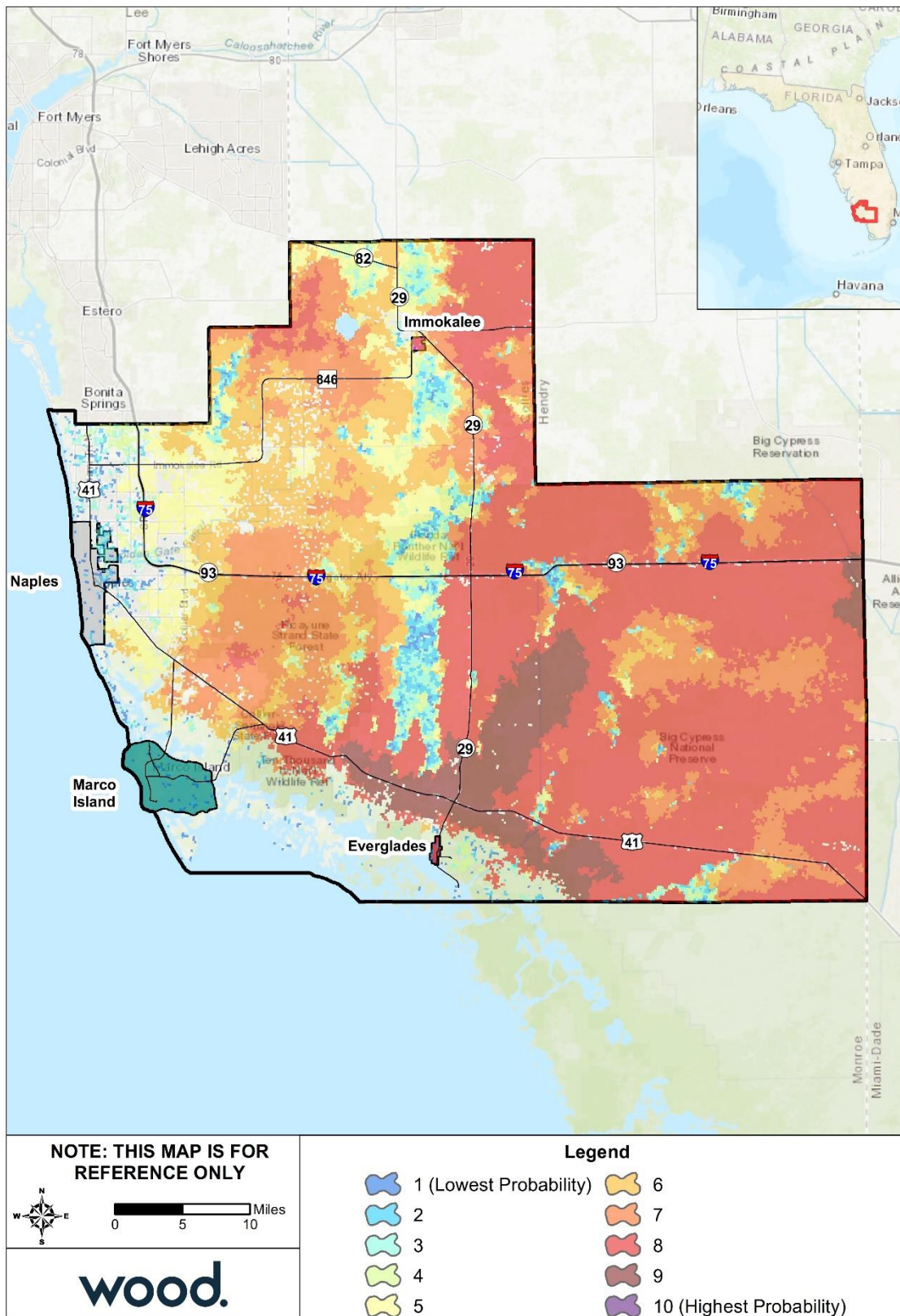
each pixel, the number of times that cell was burned by a modeled fire, divided by the total number of annual weather scenarios simulated. The simulations are calibrated to historical fire size distributions. The Burn Probability for Collier County is presented in Table 2.44 and illustrated in Figure 2.17.

**Table 2.44 – Burn Probability, Collier County**

	Class	Acres	Percent
	1	11,259	1.0%
	2	25,400	2.2%
	3	36,911	3.2%
	4	28,732	2.5%
	5	91,133	8.0%
	6	152,164	13.3%
	7	236,992	20.7%
	8	482,972	42.2%
	9	79,369	6.9%
	10	0	0.0%
	<b>Total</b>	<b>1,144,932</b>	<b>100.0%</b>

Source: Southern Wildfire Risk Assessment

Figure 2.17 – Burn Probability, Collier County



Source: Southern Wildfire Risk Assessment

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Over 50 percent of Collier County has a burn probability between 6 and 8. The areas of higher burn probability are located along U.S. Highway 41 near Everglades and in the Big Cypress National Preserve. The northwestern corner of the county and areas surrounding lakes have a burn probability of 1 to 5. The probability of wildfire across the county is considered likely, defined as between a 10% and 100% annual chance of occurrence. Everglades, Marco Island, and Naples are largely non-burnable or contain only small areas of very low burn probability. The communities containing a higher burn probability, as noted, have a comparatively higher probability of occurrence.

*Probability: 3 – Likely*

### Climate Change

Climate change could cause increased frequency or intensity of extreme heat or drought events which could affect wildfire behavior. If vegetation type changes, such as reducing moisture of vegetation, soil, or decomposing matter, flammability could increase. Florida currently has weather patterns that create a wet season and a dry season each year. Climate change could cause either season, or both seasons, to increase in occurrence or magnitude.

### Vulnerability Assessment

#### People

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Wildfire can cause fatalities and human health hazards. Ensuring procedures are in place for rapid warning and evacuation are essential to reducing vulnerability.

Based on 2012 housing density data, Southern Wildfire Risk Assessment (SWRA) estimates that 294,017 people or 91.4% of the total planning area population live within the WUI and are therefore at risk to wildfire.

#### Property

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Wildfire can cause direct property losses, including damage to buildings, vehicles, landscaped areas, agricultural lands, and livestock. Construction practices and building codes can increase fire resistance and fire safety of structures. Techniques for reducing vulnerability to wildfire include using street design to ensure accessibility to fire trucks, incorporating fire resistant materials in building construction, and using landscaping practices to reduce flammability and the ability for fire to spread.

During the 20-year period from 2000 through 2019, the planning area experienced 17 wildfires causing an annualized loss of \$271,400.

Information of critical facility risk to wildfire was not available.

#### Environment

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Wildfires have the potential to destroy forest and forage resources and damage natural habitats. Wildfire can also damage agricultural crops on private land. Wildfire is part of a natural process, however, and the environment will return to its original state in time.

#### Consequence Analysis

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Table 2.45 summarizes the potential detrimental consequences of wildfire.

**Table 2.45 – Consequence Analysis - Wildfire**

Category	Consequences
Public	In addition to the potential for fatalities, wildfire and the resulting diminished air quality pose health risks. Exposure to wildfire smoke can cause serious health

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Category	Consequences
	problems within a community, including asthma attacks and pneumonia, and can worsen chronic heart and lung diseases. Vulnerable populations include children, the elderly, people with respiratory problems or with heart disease. Even healthy citizens may experience minor symptoms, such as sore throats and itchy eyes.
Responders	Public and firefighter safety is the first priority in all wildland fire management activities. Wildfires are a real threat to the health and safety of the emergency services. Most fire-fighters in rural areas are 'retained'. This means that they are part-time and can be called away from their normal work to attend to fires.
Continuity of Operations (including Continued Delivery of Services)	Wildfire events can result in a loss of power which may impact operations. Downed trees, power lines and damaged road conditions may prevent access to critical facilities and/or emergency equipment.
Property, Facilities and Infrastructure	Wildfires frequently damage community infrastructure, including roadways, communication networks and facilities, power lines, and water distribution systems. Restoring basic services is critical and a top priority. Efforts to restore roadways include the costs of maintenance and damage assessment teams, field data collection, and replacement or repair costs. Direct impacts to municipal water supply may occur through contamination of ash and debris during the fire, destruction of aboveground distribution lines, and soil erosion or debris deposits into waterways after the fire. Utilities and communications repairs are also necessary for equipment damaged by a fire. This includes power lines, transformers, cell phone towers, and phone lines.
Environment	Wildfires cause damage to the natural environment, killing vegetation and animals. The risk of floods and debris flows increases after wildfires due to the exposure of bare ground and the loss of vegetation. In addition, the secondary effects of wildfires, including erosion, landslides, introduction of invasive species, and changes in water quality, are often more disastrous than the fire itself.
Economic Condition of the Jurisdiction	Wildfires can have significant short-term and long-term effects on the local economy. Wildfires, and extreme fire danger, may reduce recreation and tourism in and near the fires. If aesthetics are impaired, local property values can decline. Extensive fire damage to trees can significantly alter the timber supply, both through a short-term surplus from timber salvage and a longer-term decline while the trees regrow. Water supplies can be degraded by post-fire erosion and stream sedimentation.
Public Confidence in the Jurisdiction's Governance	Wildfire events may cause issues with public confidence because they have very visible impacts on the community. Public confidence in the jurisdiction's governance may be influenced by actions taken pre-disaster to mitigate and prepare for impacts, including the amount of public education provided; efforts to provide warning to residents; response actions; and speed and effectiveness of recovery.

### Hazard Summary by Jurisdiction

The following table summarizes flood hazard risk by jurisdiction. Wildfire warning time and duration do not vary by jurisdiction. Spatial extent ratings were estimated based on the proportion of area within the WUI; all jurisdictions have between 10% and 50% of their area in the WUI and were assigned a spatial extent rating of 3, except for the City of Everglades which has close to 100% of its area in the WUI and was thus given a rating of 4. Impact ratings were based on fire intensity data from SWRA. Jurisdictions with significant clusters of moderate to high fire intensity were assigned a rating of 3; all other jurisdictions were assigned a rating of 2. Probability ratings were determined based on burn probability data from SWRA. Jurisdictions with clusters of moderate burn probability or higher were assigned a rating of 3; the remaining jurisdictions have minimal to no burn probability and were assigned a probability of 1.

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	1	3	4	4	3	2.7	H
Immokalee Reservation	2	3	3	4	3	2.8	H
Marco Island	1	2	3	4	3	2.2	M
Naples	1	2	3	4	3	2.2	M
Unincorporated Collier County	3	3	3	4	3	3.1	H

### 2.5.5 Coastal Erosion

#### Hazard Description

##### Coastal Erosion

Coastal erosion is a process whereby large storms, flooding, strong wave action, sea level rise, and human activities, such as inappropriate land use, alterations, and shore protection structures, wear away the beaches and bluffs along the coast. Erosion undermines and often destroys homes, businesses, and public infrastructure and can have long-term economic and social consequences. According to NOAA, coastal erosion is responsible for approximately \$500 million per year in coastal property loss in the United States, including damage to structures and loss of land. To mitigate coastal erosion, the federal government spends an average of \$150 million each year on beach nourishment and other shoreline erosion control measures.

Coastal erosion has both natural causes and causes related to human activities. Gradual coastal erosion and accretion results naturally from the impacts of tidal longshore currents. Severe coastal erosion can occur over a short period when the state is impacted by hurricanes, tropical storms and other weather systems. Sand is continually removed by longshore currents in some areas, but it is also continually replaced by sand carried in by the same type of currents. Structures such as piers or sea walls, jetties, and navigational inlets may interrupt the movement of sand. Sand can become “trapped” in one place by these types of structures. The currents will, of course, continue to flow, though depleted of sand trapped elsewhere. With significant amounts of sand trapped in the system, the continuing motion of currents (now deficient in sand) results in erosion. In this way, human construction activities that result in the unnatural trapping of sand have the potential to result in significant coastal erosion.

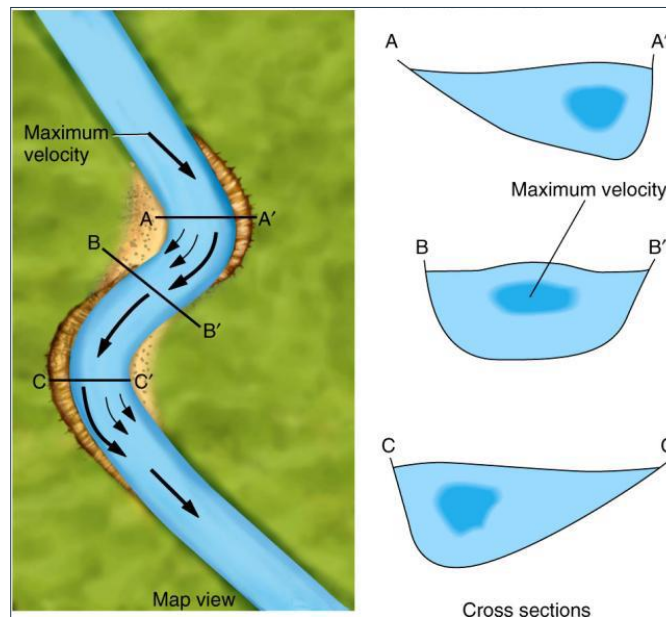
Erosion rates and potential impacts are highly localized. Severe storms can remove wide beaches, along with substantial dunes, in a single event. In undeveloped areas, these high recession rates are not likely to cause significant concern, but in some heavily populated locations, one or two feet of erosion may be considered catastrophic (NOAA, 2014).

Estuaries are partially enclosed, coastal water bodies where freshwater meets saltwater from the ocean. They are influenced by tides but still protected from the full force of ocean waves. Estuaries are often referred to as bays or sounds. Estuarine coastlines can experience erosion through short-term processes, such as tides, storms, wind, and boat wakes, as well as long-term processes, such as sea level rise. Many variables determine the rate of estuarine erosion including shoreline type, geographic location and size of the associated estuary, the type and abundance of vegetation, and the frequency and intensity of storms. Estuarine erosion is problematic as more development occurs along estuarine shorelines.

##### Stream Bank Erosion

Stream banks erode by a combination of direct stream processes, like down cutting and lateral erosion, and indirect processes, like mass-wasting accompanied by transportation. When the channel bends, water on the outside of the bend (the cut-bank) flows faster and water on the inside of the bend (the point) flows slower as shown in Figure 2.18 This distribution of velocity results in erosion occurring on the outside of the bend and deposition occurring on the inside of the bend.

Figure 2.18 – Stream Meanders



Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. Stream bank erosion processes, although complex, are driven by two major components: stream bank characteristics (erodibility) and hydraulic/gravitational forces. Many land use activities can affect both components and lead to accelerated bank erosion. The vegetation rooting characteristics can protect banks from fluvial entrainment and collapse and provide internal bank strength. When riparian vegetation is changed from woody species to annual grasses and/or forbs, the internal strength is weakened, causing acceleration of mass wasting processes. Stream bank aggradation or degradation is often a response to stream channel instability. Since bank erosion is often a symptom of a larger, more complex problem, the long-term solutions often involve much more than just bank stabilization. Numerous studies have demonstrated that stream bank erosion contributes a large portion of the annual sediment yield.

Determining the cause of accelerated streambank erosion is the first step in solving the problem. When a stream is straightened or widened, streambank erosion increases. Accelerated streambank erosion is part of the process as the stream seeks to re-establish a stable size and pattern. Damaging or removing streamside vegetation to the point where it no longer provides for bank stability can cause a dramatic increase in bank erosion. A degrading streambed results in higher and often unstable, eroding banks. When land use changes occur in a watershed, such as clearing land for agriculture or development, runoff increases. With this increase in runoff the stream channel will adjust to accommodate the additional flow, increasing streambank erosion. Addressing the problem of streambank erosion requires an understanding of both stream dynamics and the management of streamside vegetation.

*Warning Time: 1 – More than 24 hours*

*Duration: 3 – Less than 1 week*

#### Location

Erosion can occur along any shoreline in the region. Erosion is likely to be more frequent and severe along the Atlantic coast, but erosion of estuarine and streambank shorelines can also occur. In Collier County,

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erosion is typically caused by coastal tides, ocean currents, and storm events. Erosion rates are dependent on many characteristics, including soil type. According to the existing Collier County Hazard Mitigation Plan, coastal soils are composed of fine-grained particles such as sand while inland soils tend to have greater organic matter content. This makes coastal areas more susceptible to erosion. More developed areas, such as Marco Island and the City of Naples, are more susceptible to erosion.

### Extent

The magnitude of erosion can be measured as a rate of change from a measured previous condition. Erosion rates can vary significantly across the region due to several factors including fetch, shoreline orientation, and soil composition. To account for these variations, long-term erosion can also be measured by land cover changes and increases in open water. While a small fraction of the shoreline may exhibit accretion over a short period of time, cumulative impacts can still indicate an overall loss of estuarine coastline and marsh habitat. Table 2.46 provides from the NOAA Coastal Change Analysis Program (C-CAP) Land Cover Atlas showing land cover changes in the Region from 1996 to 2010.

**Table 2.46 – Land Cover Changes, 1996-2010**

Land Cover Type	Collier Net Change
Developed, High Intensity	11.16 sq. mi
Developed, Low Intensity	12.95 sq. mi
Developed, Open Space	10.83 sq. mi
Grassland/Herbaceous	1.42 sq. mi
Agriculture	-18.02 sq. mi
Forested	0.56 sq. mi
Scrub/Shrub	-5.15 sq. mi
Woody Wetland	-29.18 sq. mi
Emergent Wetland	7.82 sq. mi
Bare Land	2.05 sq. mi
Open Water	5.56 sq. mi

Source: <https://coast.noaa.gov/digitalcoast/data/ccapregional.html>

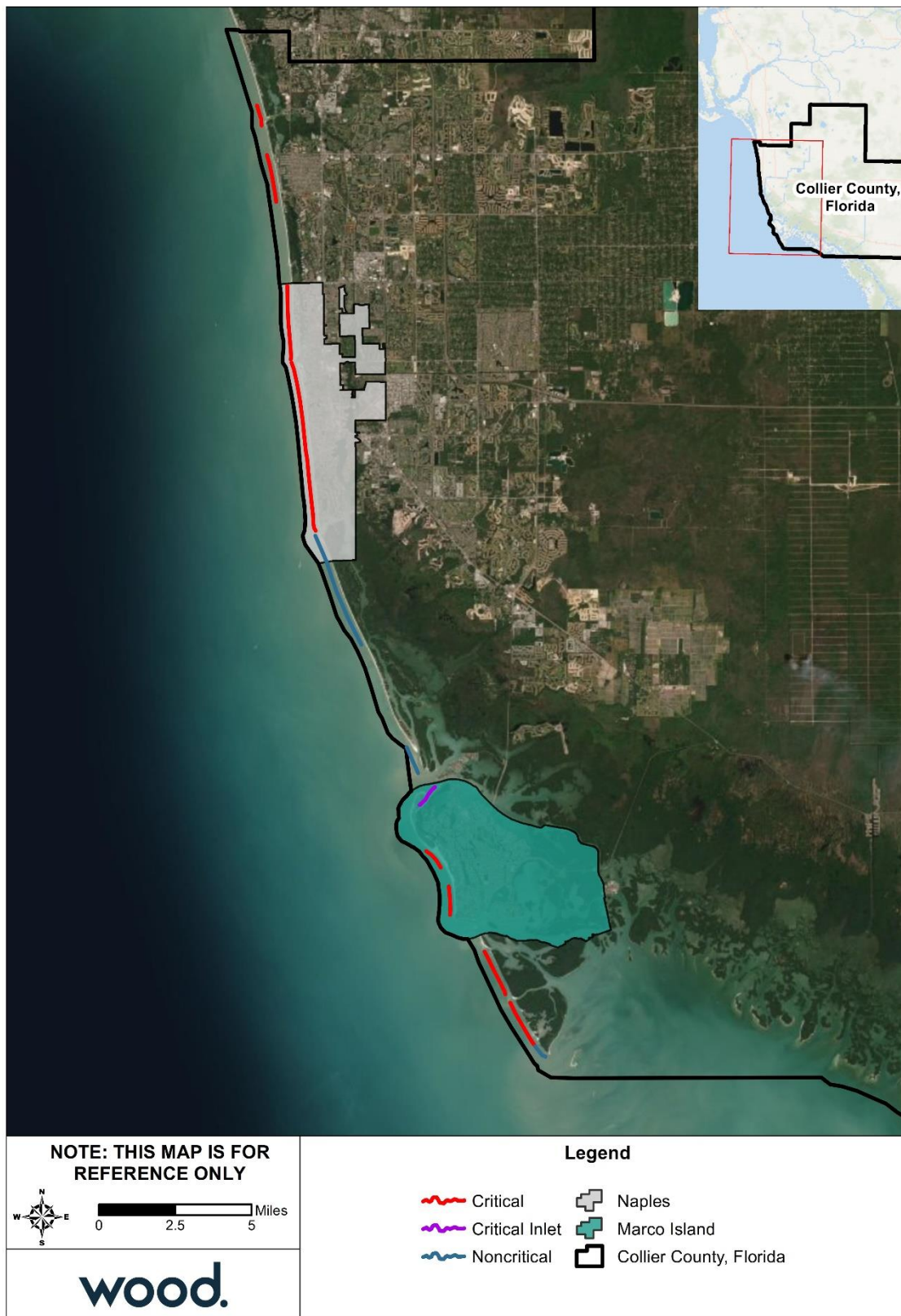
The C-CAP data indicates a net increase in open water, a smaller net increase in forested land, and an overall net decrease in wetlands in the County. Additionally, Collier County saw a large increase in development. Increases in developed land likely result in increased impervious surfaces, which may increase stormwater runoff, alter drainage patterns, and further exacerbate erosion and flood issues.

In terms of the magnitude of impacts, erosion may cause property damage when severe but is unlikely to cause injury or death.

*Impact: 2 – Limited*

*Spatial Extent: 2 – Small*

Figure 2.19 – Erosional Hotspots, Collier County



Source: NOAA

### Historical Occurrences

As Figure 2.19 shows, shoreline erosion is occurring along ocean coastlines throughout Collier County. Erosion is typically an ongoing process; however, it can be intensified during storm events, particularly hurricane storm tides. Per an examination of event narratives in NCEI records for hurricanes, tropical storms, storm surges, and coastal floods, the following instances of major erosion are noted in Collier County:

**September 13, 2001** (Tropical Storm) – Tropical Storm Gabrielle crossed the west Florida coast near Venice on September 14<sup>th</sup>. Storm surge values of 3 to 5 feet were observed along much of the Collier County coast, causing some coastal flooding and minor to moderate beach erosion

**October 24, 2005** (Storm Surge) – Hurricane Wilma produced a maximum measured storm tide of 8 feet at the USGS tide gauge at the Turner River near Chokoloskee in southern Collier County, equating to a storm surge of 7 feet after subtracting a one-foot astronomical tide. A storm tide estimated at 7 feet Marco Island was estimated to cause significant beach erosion by Collier County Emergency Management.

**September 19, 2008** (Tropical Storm) – Due to Fay remaining at tropical storm strength and the rather limited nature of its wind field, storm surge and coastal flooding impacts were rather minor. The highest storm tide was estimated to be in the Everglades City/Chokoloskee areas, where the maximum storm tide was in the 5 foot range according to tide gauge data and estimates from local officials. Minimal storm surge was noted elsewhere, although moderate to locally severe beach erosion occurred in Naples.

**August 26-27, 2012** (Tropical Storm) – The center of Tropical Storm Isaac moved over the Florida Straits south of the Florida Keys on Sunday, August 26<sup>th</sup>, passing just south of Key West. Severe beach erosion and coastal flooding occurred on Monday, August 27<sup>th</sup> as the center of Tropical Storm Isaac moved into the Gulf of Mexico. Maximum storm tide values were observed at 4.9 feet at Naples, with estimates of 5 to 7 feet along the southern Collier County coast from Goodland to Everglades City. Highest estimated inundation values of up to 3 feet above ground level were noted in Goodland and Everglades City. Major beach erosion was also observed along the Collier County beaches. Severe beach erosion in the Naples and Marco Island areas led to damage estimated at \$5.6 million.

### Probability of Future Occurrence

Erosion and accretion are natural processes that are likely to continue to occur. The likelihood of significant instances of erosion will likely be tied to the occurrence of hurricane, tropical storm, and nor'easter events. According to NCEI, 7 events caused reported erosion in the region over the 20-year span between 1999-2018. This equates to a 35 percent chance of erosion occurring every year. Additionally, drawing from the likelihood of hurricanes, tropical storms, and Nor'easters, erosion is likely to occur.

*Probability: 3 – Likely*

### Climate Change

As discussed under Climate Change in Section 2.5.2, climate change is expected to make heavy rain events and tropical storms and hurricanes more frequent and intense. As a result, the erosion typically caused by these storms can be expected to occur more frequently. Coastal erosion is also expected to increase as a result of rising seas. A 2018 study found that globally, between 1984 and 2015 erosion outweighed accretion. However, the study could not conclude the degree to which erosion during this period is attributed to climate changes or increased coastal development. Nonetheless, increases in erosion have been observed and are expected to continue.

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### Vulnerability Assessment

#### People

Erosion is unlikely to have any direct impact on the health or safety of individuals. However, it may cause indirect harm by weakening structures and by changing landscapes in ways that increase risk of other hazard impacts. For example, erosion of dune systems causes areas protected by those dunes to face higher levels of risk.

#### Property

Property damage due to erosion typically only results in conjunction with large storm events which also bring wind and water damages. These events can cause scour and weaken foundations, which may undermine affected buildings' structural integrity.

Data is not available on specific property or critical facility risk to erosion.

#### Environment

Erosion can change the shape and characteristics of coastal shorelines and riverine floodplains. Eroded material may clog waterways and decrease drainage capacity. Erosion can also negatively impact water quality by increasing sediment loads in waterways.

#### Consequence Analysis

Table 2.47 summarizes the potential negative consequences of erosion.

**Table 2.47 – Consequence Analysis – Erosion**

Category	Consequences
Public	Erosion is unlikely to impact public health and safety.
Responders	Erosion is unlikely to require immediate response or rescue operations.
Continuity of Operations (including Continued Delivery of Services)	Erosion is unlikely to impact public continuity of operations.
Property, Facilities and Infrastructure	Erosion can result in property damage if it is severe enough or if scour occurs that undermines the integrity of structural foundations.
Environment	Erosion can increase sediment loads in waterbodies and change riverine and coastal topography.
Economic Condition of the Jurisdiction	Beach re-nourishment projects to counter erosion are extremely costly. Water dependent industries may suffer from lost shoreline and degraded water quality.
Public Confidence in the Jurisdiction's Governance	Erosion is unlikely to impact public confidence.

#### Hazard Summary by Jurisdiction

The following table summarizes erosion hazard risk by jurisdiction. Exposure to erosion varies across jurisdictions, therefore probability and spatial extent are dependent upon the area at risk. Jurisdictions with shoreline at risk were assigned a probability of 3 (likely), an impact of 2 (limited), and a spatial extent of 2 (small). Jurisdictions with little to no shoreline at risk were assigned a probability score of 1 (unlikely), an impact of 1 (minor), and a spatial extent of 1 (negligible). Warning time and duration are inherent to the hazard and remain constant across jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	3	2	2	1	3	2.3	M

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Immokalee Reservation	1	1	1	1	3	1.2	L
Marco Island	3	2	2	1	3	2.3	M
Naples	3	2	2	1	3	2.3	M
Unincorporated Collier County	3	2	2	1	3	2.3	M

## 2.5.6 Drought

### Hazard Description

Drought is a deficiency in precipitation over an extended period. It is a normal, recurrent feature of climate that occurs in virtually all climate zones. The duration of a drought varies widely. There are cases when drought develops relatively quickly and lasts a very short period, exacerbated by extreme heat and/or wind, and there are other cases when drought spans multiple years, or even decades. Studying the paleoclimate record is often helpful in identifying when long-lasting droughts have occurred. Common types of drought are detailed below in Table 2.48.

**Table 2.48 – Types of Drought**

Type	Details
<b>Meteorological Drought</b>	Meteorological Drought is based on the degree of dryness (rainfall deficit) and the length of the dry period.
<b>Agricultural Drought</b>	Agricultural Drought is based on the impacts to agriculture by factors such as rainfall deficits, soil water deficits, reduced ground water, or reservoir levels needed for irrigation.
<b>Hydrological Drought</b>	Hydrological Drought is based on the impact of rainfall deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.
<b>Socioeconomic Drought</b>	Socioeconomic drought is based on the impact of drought conditions (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related deficit in water supply.

The wide variety of disciplines affected by drought, its diverse geographical and temporal distribution, and the many scales drought operates on make it difficult to develop both a definition to describe drought and an index to measure it. Many quantitative measures of drought have been developed in the United States, depending on the discipline affected, the region being considered, and the application. Several indices developed by Wayne Palmer, as well as the Standardized Precipitation Index, are useful for describing the many scales of drought.

The U.S. Drought Monitor provides a summary of drought conditions across the United States and Puerto Rico. Often described as a blend of art and science, the Drought Monitor map is updated weekly by combining a variety of data-based drought indices and indicators and local expert input into a single composite drought indicator.

The **Palmer Drought Severity Index (PDSI)** devised in 1965, was the first drought indicator to assess moisture status comprehensively. It uses temperature and precipitation data to calculate water supply and demand, incorporates soil moisture, and is considered most effective for unirrigated cropland. It primarily reflects long-term drought and has been used extensively to initiate drought relief. It is more complex than the Standardized Precipitation Index (SPI) and the Drought Monitor.

The **Standardized Precipitation Index (SPI)** is a way of measuring drought that is different from the Palmer Drought Severity Index (PDSI). Like the PDSI, this index is negative for drought, and positive for wet conditions. But the SPI is a probability index that considers only precipitation, while Palmer's indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff).

The State of Florida adopted a Drought Action Plan in 2007 that specifies response strategies to varying levels of declared drought. These rules provide the framework to coordinate statewide response to drought.

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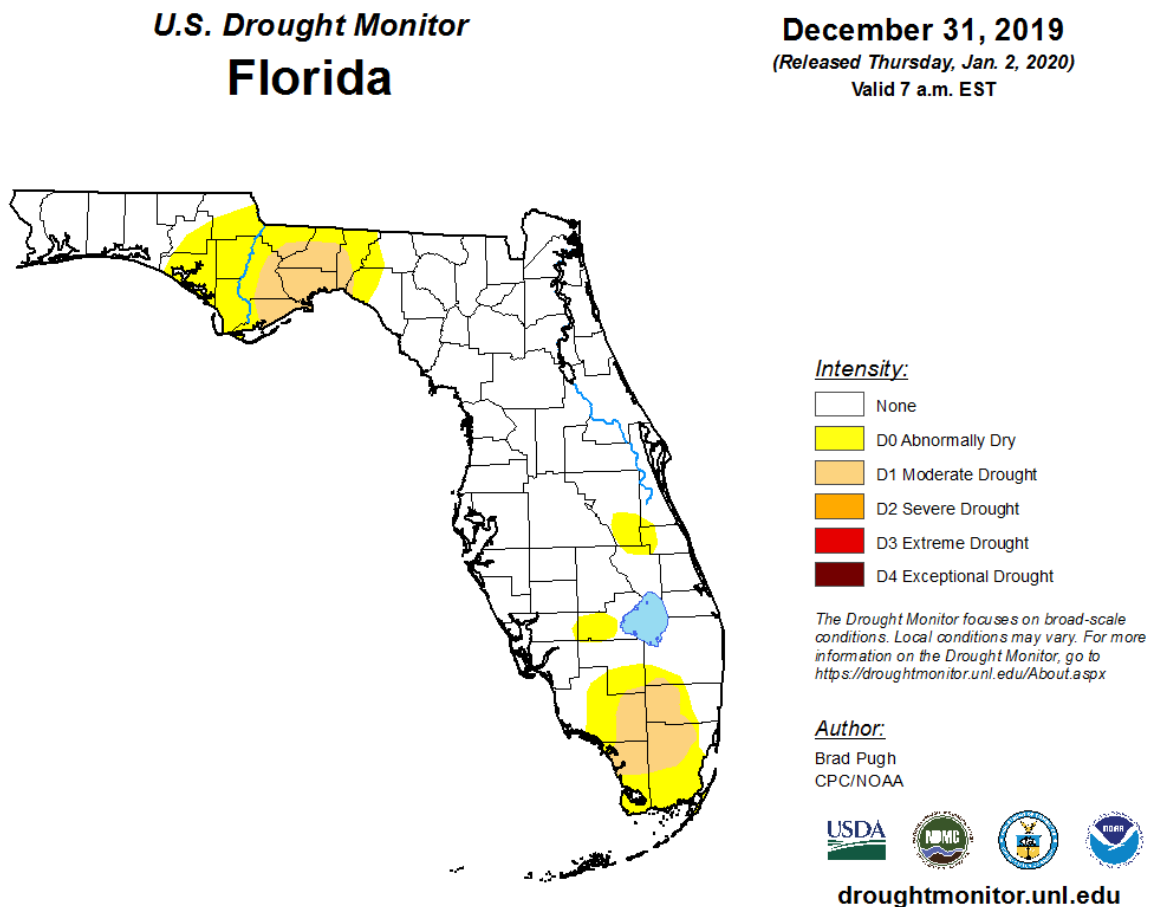
*Warning Time: 1 – More than 24 hours*

*Duration: 4 – More than one week*

### Location

Drought is a regional hazard that can cover an entire the entire planning area, and in some cases the entire state. Figure 2.20 below notes the U.S. Drought Monitor's drought ratings for Florida as of December 31, 2019; as of that date, Collier County was experiencing some abnormally dry land and moderate drought on the eastern side of the county.

**Figure 2.20 – US Drought Monitor for Week of December 31, 2019**



Source: U.S. Drought Monitor

### Extent

Drought extent can be defined in terms of intensity, using the U.S. Drought Monitor scale. The Drought Monitor Scale measures drought episodes with input from the Palmer Drought Severity Index, the Standardized Precipitation Index, the Keetch-Byram Drought Index, soil moisture indicators, and other inputs as well as information on how drought is affecting people. Figure 2.21 details the classifications used by the U.S. Drought Monitor. A category of D2 (severe) or higher on the U.S. Drought Monitor Scale can typically result in crop or pasture losses, water shortages, and the need to institute water restrictions.

**Figure 2.21 – US Drought Monitor Classifications**

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: <ul style="list-style-type: none"> <li>▪ short-term dryness slowing planting, growth of crops or pastures</li> </ul> Coming out of drought: <ul style="list-style-type: none"> <li>▪ some lingering water deficits</li> <li>▪ pastures or crops not fully recovered</li> </ul>	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	<ul style="list-style-type: none"> <li>▪ Some damage to crops, pastures</li> <li>▪ Streams, reservoirs, or wells low, some water shortages developing or imminent</li> <li>▪ Voluntary water-use restrictions requested</li> </ul>	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	<ul style="list-style-type: none"> <li>▪ Crop or pasture losses likely</li> <li>▪ Water shortages common</li> <li>▪ Water restrictions imposed</li> </ul>	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	<ul style="list-style-type: none"> <li>▪ Major crop/pasture losses</li> <li>▪ Widespread water shortages or restrictions</li> </ul>	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	<ul style="list-style-type: none"> <li>▪ Exceptional and widespread crop/pasture losses</li> <li>▪ Shortages of water in reservoirs, streams, and wells creating water emergencies</li> </ul>	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Source: US Drought Monitor

Drought in Florida occurs on a regular, cyclical basis. The different areas of Florida are randomly affected and sometimes equally affected. Counties that are expected to experience the most weeks of drought each year are the northern and central counties.

*Impact: 1 – Minor*

*Spatial Extent: 4 – Large*

### Historical Occurrences

The worst drought in Florida’s recorded history was from 1954-1956. Lots of crops and timber were lost. The Northern Counties got the worst part of the drought but most of the State was in drought for all of 1956. Another major drought occurred in 1981-1982 when rain was scarce, and Lake Okeechobee reached the lowest water level ever recorded. All the State was in moderate or severe drought, but many regions were out of drought by the end of 1981.

Florida had a severe drought from 1998 to 2001. During this, crops were destroyed, lake levels were at an all-time low, and wildfires raged. This drought caused the water management districts to restrict water use, municipalities to hike water rates, and many restaurants were ordered to stop serving water except for to customers who asked. Several wildfires also occurred in 2007 because of a drought from 2006 to 2007. This period saw the largest rainfall deficit since the 1950s and was considered a one in 25-year drought event.

From 2010 to 2012, the State saw a drought that affected most counties, but the northern central and Panhandle regions were classified as in “extreme drought” for an extended period. Again in 2016, drought conditions developed and lasted into 2017 causing many wildfires.

There has never been a Presidential Major Disaster Declaration for drought in Florida. However, the USDA has declared agricultural disasters because of drought. Disaster designations help producers get loans and emergency assistance in these situations.

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U.S. Drought Monitor records drought intensity weekly throughout the country. Table 2.49 presents the number of weeks that Collier County spent in drought by intensity over the period from 2000 through 2019, for which the Drought Monitor has records for 1,043 weeks.

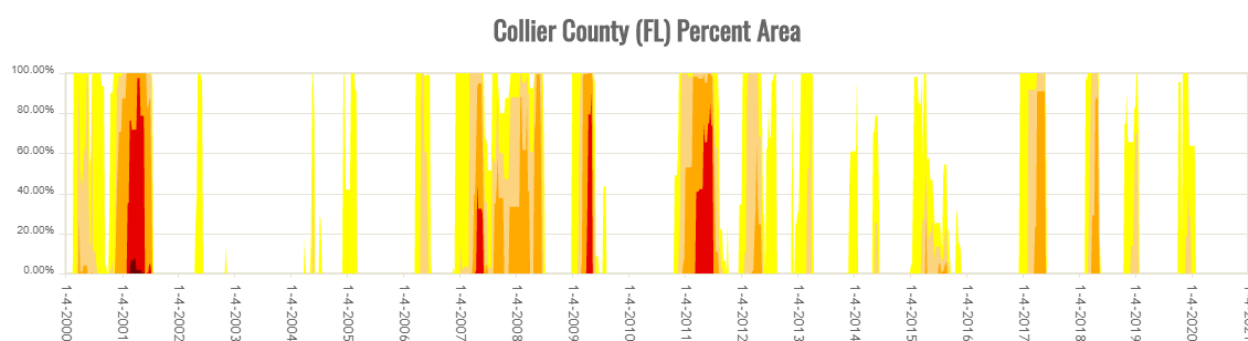
**Table 2.49 – Weeks in Drought, 2000-2019**

County	Weeks in Drought						% of time in Severe Drought or Worse
	Total	D0	D1	D2	D3	D4	
Collier	415	195	100	83	37	0	28.9%

Source: U.S. Drought Monitor History

Figure 2.22 shows the historical periods where the State was considered in some level of drought condition. The color key shown in Figure 2.21 indicates the intensity of the drought.

**Figure 2.22 – US Drought Monitor Historical Trends, Collier County**



Source: U.S. Drought Monitor

The National Drought Mitigation Center (NDMC), located at the University of Nebraska in Lincoln, provides a clearinghouse for information on the effects of drought, based on reports from media, observers, impact records, and other sources.

According to the National Drought Mitigation Center's Drought Impact Reporter, during the 10-year period from 2010 through 2019, 389 county level drought impacts were noted for the State of Florida, of which 36 were reported to affect Collier County. Table 2.50 summarizes the number of impacts reported by category and the years impacts were reported for each category. Note that the Drought Impact Reporter assigns multiple categories to each impact.

**Table 2.50 – Drought Impacts Reported for Collier County, January 2010 through 2019**

Category	Impacts	Years Reported
Agriculture	5	2010, 2011, 2015, 2017
Business & Industry	2	2010, 2011
Fire	18	2010, 2011, 2016, 2017, 2018, 2019
Plants & Wildlife	8	2011, 2012, 2013, 2017, 2018
Relief, Response & Restrictions	22	2010, 2011, 2012, 2015, 2016, 2017, 2018, 2019
Society & Public Health	3	2011, 2012, 2018
Tourism & Recreation	1	2012
Water Supply & Quality	12	2011, 2012, 2013, 2017

Source: Drought Impact Reporter, <http://droughtreporter.unl.edu>

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### Probability of Future Occurrence

Over the 20-year period, for which the U.S. Drought Monitor reported on 1,043 weeks, from 2000 to 2019, Collier County had 415 weeks of drought conditions ranging from abnormally dry to exceptional drought. This equates to a 40 percent chance of drought in any given week. Of this time, approximately 120 weeks were categorized as a severe (D2) drought or greater; which equates to a 12 percent chance of severe drought in any given week.

Central and southern Florida is likely to experience 0 to 13 weeks of drought each year. This hazard was determined to occur about every 5 to 10 years.

*Probability: 3 – Likely*

### Climate Change

The Fourth National Climate Assessment reports that average and extreme temperatures are increasing across the country and average annual precipitation is decreasing in the Southeast. Heavy precipitation events are becoming more frequent, meaning that there will likely be an increase in the average number of consecutive dry days. As temperature is projected to continue rising, evaporation rates are expected to increase, resulting in decreased surface soil moisture levels. Together, these factors suggest that drought will increase in intensity and duration in the Southeast.

### Vulnerability Assessment

#### People

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Drought can affect people's physical and mental health. For those economically dependent on a reliable water supply, drought may cause anxiety or depression about economic losses, reduced incomes, and other employment impacts. Conflicts may arise over water shortages. People may be forced to pay more for water, food, and utilities affected by increased water costs.

Drought may also cause health problems due to poorer water quality from lower water levels. If accompanied by extreme heat, drought can also result in higher incidents of heat stroke and even loss of human life.

#### Property

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Drought is unlikely to cause damages to the built environment, including private property or critical facilities. However, in areas with shrinking and expansive soils, drought may lead to structural damages.

Drought may cause severe property loss for the agricultural industry in terms of crop and livestock losses. The USDA's Risk Management Agency (RMA) maintains a database of all paid crop insurance claims, however no claims were made in Collier County between 2007-2018 as a result of drought.

#### Environment

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Drought can affect local wildlife by shrinking food supplies and damaging habitats. Sometimes this damage is only temporary, and other times it is irreversible. Wildlife may face increased disease rates due to limited access to food and water. Increased stress on endangered species could cause extinction.

Another concern during a drought is that contaminants such as pesticides and fertilizers may concentrate in the soil as precipitation wanes and then enter waterways during heavy rains and flooding. Given the cultural and economic importance of water access in Collier County, any increase in contaminant load of the river could adversely affect the planning area.

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Drought conditions can also provide a substantial increase in wildfire risk. As plants and trees die from a lack of precipitation, increased insect infestations, and diseases—all of which are associated with drought—they become fuel for wildfire. Long periods of drought can result in more intense wildfires, which bring additional consequences for the economy, the environment, and society. Drought may also increase likelihood of wind and water erosion of soils.

### Consequence Analysis

Table 2.51 summarizes the potential negative consequences of drought.

**Table 2.51 – Consequence Analysis - Drought**

Category	Consequences
Public	Can cause anxiety or depression about economic losses, conflicts over water shortages, reduced incomes, fewer recreational activities, higher incidents of heat stroke, and fatality.
Responders	Impacts to responders are unlikely. Exceptional drought conditions may impact the amount of water immediately available to respond to wildfires.
Continuity of Operations (including Continued Delivery of Services)	Drought would have minimal impacts on continuity of operations due to the relatively long warning time that would allow for plans to be made to maintain continuity of operations.
Property, Facilities and Infrastructure	Drought has the potential to affect water supply for residential, commercial, institutional, industrial, and government-owned areas. Drought can reduce water supply in wells and reservoirs. Utilities may be forced to increase rates.
Environment	Environmental impacts include strain on local plant and wildlife; increased probability of erosion and wildfire.
Economic Condition of the Jurisdiction	Farmers may face crop losses or increased livestock costs. Businesses that depend on farming may experience secondary impacts. Extreme drought has the potential to impact local businesses in landscaping, recreation and tourism, and public utilities.
Public Confidence in the Jurisdiction's Governance	When drought conditions persist with no relief, local or State governments must often institute water restrictions, which may impact public confidence.

### Hazard Summary by Jurisdiction

The following table summarizes drought hazard risk by jurisdiction. Drought risk is uniform across the planning area. Warning time, duration, and spatial extent are inherent to the hazard and remain constant across jurisdictions. Most damages that result from drought are to crops and other agriculture-related activities as well as water-dependent industries; therefore, the magnitude of the impacts is typically greater in unincorporated areas. In more heavily developed areas, the magnitude of drought is less severe, with lawns and local gardens affected and potential impacts on local water supplies during severe, prolonged drought.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	3	1	4	1	4	2.5	H
Immokalee Reservation	3	1	4	1	4	2.5	H
Marco Island	3	1	4	1	4	2.5	H
Naples	3	1	4	1	4	2.5	H
Unincorporated Collier County	3	1	4	1	4	2.5	H

### 2.5.7 Extreme Heat

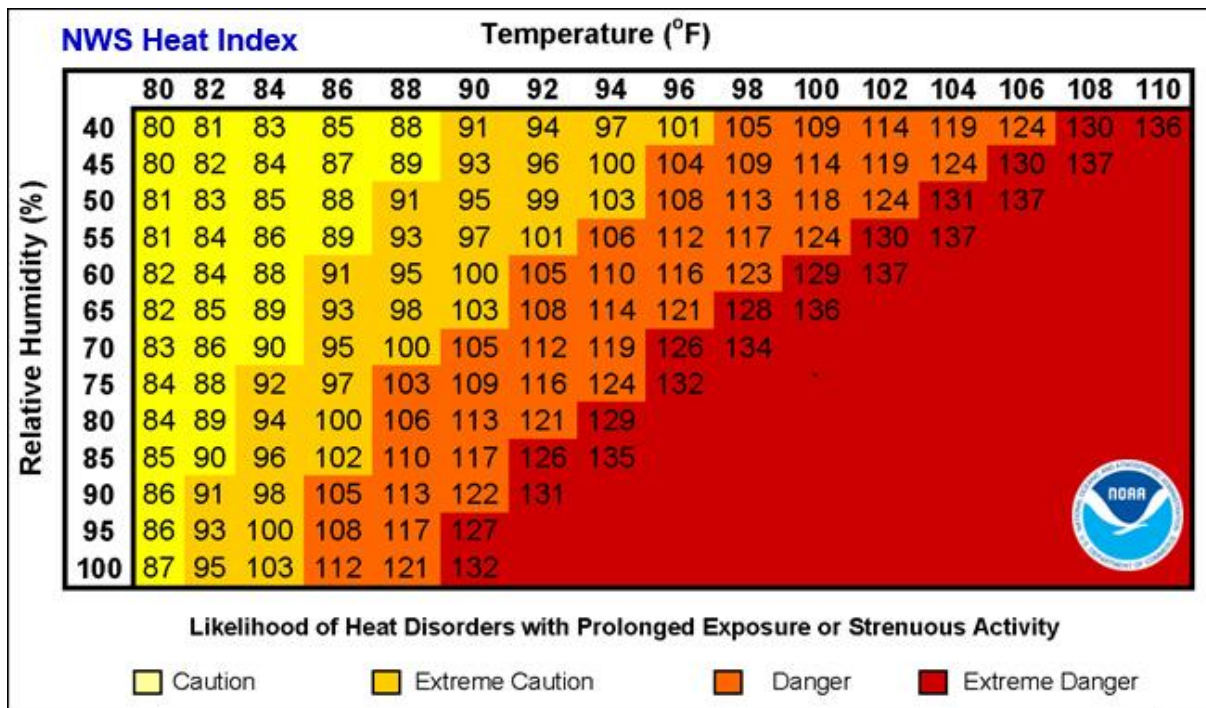
#### Hazard Description

Per information provided by FEMA, in most of the United States extreme heat is defined as a long period (2 to 3 days) of high heat and humidity with temperatures above 90 degrees. In extreme heat, evaporation is slowed, and the body must work extra hard to maintain a normal temperature, which can lead to death by overwork of the body. Extreme heat often results in the highest annual number of deaths among all weather-related disasters. Per Ready.gov:

- Extreme heat can occur quickly and without warning
- Older adults, children, and sick or overweight individuals are at greater risk from extreme heat
- Humidity increases the feeling of heat as measured by heat index

Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index Chart in Figure 2.23 uses both factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Figure 2.23 – Heat Index Chart



Source: National Weather Service (NWS) <https://www.weather.gov/safety/heat-index>

Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a heat index that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

During these conditions, the human body has difficulties cooling through the normal method of the evaporation of perspiration. Health risks rise when a person is overexposed to heat. The most dangerous place to be during an extreme heat incident is in a permanent home, with little or no air conditioning. Those at greatest risk for heat-related illness include people 65 years of age and older, young children, people with chronic health problems such as heart disease, people who are obese, people who are socially isolated, and people who are on certain medications, such as tranquilizers, antidepressants, sleeping pills, or drugs for Parkinson's disease. However, even young and healthy individuals are susceptible if they

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participate in strenuous physical activities during hot weather or are not acclimated to hot weather. Table 2.52 lists typical symptoms and health impacts of heat exposure.

**Table 2.52 – Typical Health Impacts of Extreme Heat**

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program, [www.weather.gov/os/heat/index.shtml](http://www.weather.gov/os/heat/index.shtml)

The NWS has a system in place to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F) and the night time minimum Heat Index is 80°F or above for two or more consecutive days. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees.

Impacts of extreme heat are not only focused on human health, as prolonged heat exposure can have devastating impacts on infrastructure as well. Prolonged high heat exposure increases the risk of pavement deterioration, as well as railroad warping or buckling. High heat also puts a strain on energy systems and consumption, as air conditioners are run at a higher rate and for longer; extreme heat can also reduce transmission capacity over electric systems.

*Warning Time: 1 – More than 24 hours*

*Duration: 3 – Less than one week*

### Location

The entire planning area is susceptible to high temperatures and incidents of extreme heat.

### Extent

The extent of extreme heat can be defined by the maximum apparent temperature reached. Apparent temperature is a function of ambient air temperature and relative humidity and is reported as the heat index. The NWS Southern Region sets the following criteria for heat advisory and excessive heat warning:

- ▶ **Heat Advisory** – Heat Index of 108°F or higher or temperature of 103°F or higher
- ▶ **Excessive Heat Warning** – Heat Index of 113°F or higher for any duration or temperature of 103°F or higher

Table 2.53 notes the highest temperature on record at nine weather stations in Collier County according to the Southeast Regional Climate Center, which maintains temperature records for the highest maximum temperature each month.

**Table 2.53 – Highest Temperature by Location**

Temperature	Location	Date
99°F	Chokoloskee	June 2007
100°F	Everglades	May 1991
102°F	Immokalee	June 1998
98°F	Marco Island	July 2011
99°F	Miles City Twr	May 1967

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Temperature	Location	Date
99°F	Naples	September 1986
98°F	Naples Municipal Airport	June 2019
103°F	Oasis Ranger Station	June 1981
97°F	Sunniland	May 1953

Source: Southeast Regional Climate Center

*Impact: 2 – Limited*

*Spatial Extent: 4 – Large*

### Historical Occurrences

NCEI records zero incidents of heat or excessive heat for Collier County between 2000-2019.

Heat index records maintained by the North Carolina Climate Office for the Southeastern United States indicate that the Region regularly experiences heat index temperatures above 100°F. Table 2.54 provides counts of heat index values by threshold recorded from 2002-2019, the only year for which data was available, at the Naples Municipal Airport weather station (KAPF). This location is used as an indicator for Collier County overall. Counts are provided as the number of hours in a given year where the heat index reached or exceeded 100°F.

**Table 2.54 – Historical Heat Index Counts, Naples Municipal Airport (KAPF), 2002-2019**

Year	Heat Index Value				Total
	100-104°F	105-109°F	110-114°F	≥115°F	
2002	171	4	0	0	175
2003	133	2	0	0	135
2004	253	23	0	0	276
2005	141	10	0	0	151
2006	94	2	0	0	96
2007	249	26	0	0	275
2008	110	5	0	0	115
2009	319	36	0	0	355
2010	407	109	3	0	519
2011	273	24	0	0	297
2012	190	4	0	0	194
2013	131	14	2	0	147
2014	300	100	18	0	418
2015	288	64	5	2	359
2016	273	26	0	0	299
2017	240	21	1	0	262
2018	370	112	15	0	497
2019	467	182	21	2	672
<b>Sum</b>	<b>4,409</b>	<b>764</b>	<b>65</b>	<b>4</b>	<b>5,242</b>
<b>Average</b>	<b>245</b>	<b>42</b>	<b>4</b>	<b>0</b>	<b>291</b>

Source: North Carolina Climate Office, Heat Index Climatology Tool

According to this data, Collier County averages approximately 291 hours per year with heat index values above 100°F.

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### Probability of Future Occurrence

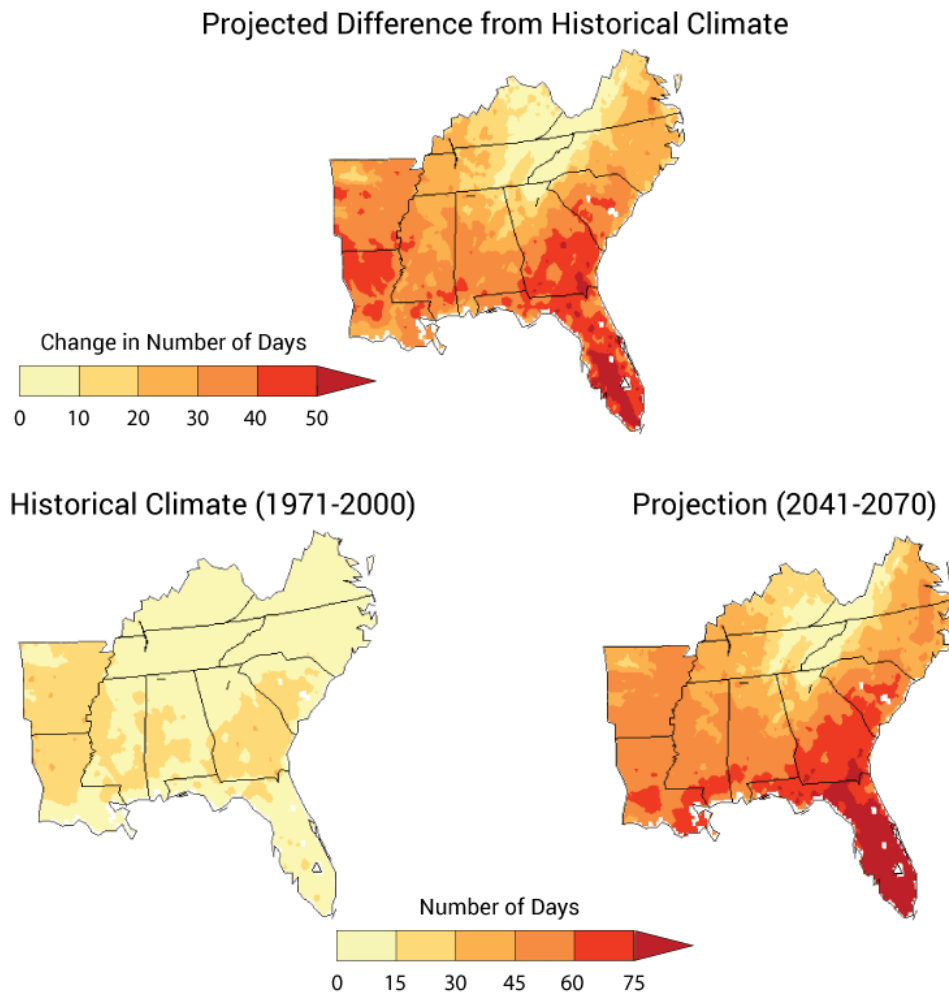
Data was gathered from the North Carolina State Climate Office's Heat Index Climatology Tool using the Naples Municipal Airport weather station as an approximation for Collier County. Based on 17 years of available data, the Region averages 291 hours per year with heat index temperatures above 100°F. Heat index temperatures surpassed 100°F every year, occurring for at least 94 hours per year.

*Probability: 4 – Highly Likely*

### Climate Change

Research shows that average temperatures will continue to rise in the Southeast United States and globally, directly affecting Collier County. Per the Fourth National Climate Assessment, "extreme temperatures are projected to increase even more than average temperatures. Cold waves are projected to become less intense and heat waves more intense." The number of days over 95°F is expected to increase by between 20 and 30 days annually, as shown in Figure 2.24.

**Figure 2.24 – Projected Change in Number of Days Over 95°F**



Source: NOAA NCDC from 2014 National Climate Assessment

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### Vulnerability Assessment

#### Methodologies and Assumptions

No data is available to assess the vulnerability of people or property in the planning area to extreme heat.

#### People

Extreme heat can cause heat stroke and even loss of human life. The elderly and the very young are most at risk to the effects of heat. People who are isolated are also more vulnerable to extreme heat.

#### Property

Extreme heat is unlikely to cause significant damages to the built environment. However, road surfaces can be damaged as asphalt softens, and concrete sections may buckle under expansion caused by heat. Train rails may also distort or buckle under the stress of heat induced expansion. Power transmission lines may sag from expansion and if contact is made with vegetation the line may short out causing power outages. Additional power demand for cooling also increases power line temperature adding to heat impacts.

Extreme heat can also cause significant agricultural losses. Between 2007-2018, the USDA Risk Management Agency reports one crop insurance claim due to heat in Collier County in the amount of \$39,330. This equates to an average annual loss of \$3,278.

#### Environment

Wild animals are vulnerable to heat disorders like humans, including mortality. Vegetation growth will be stunted, or plants may be killed if temperatures rise above their tolerance extremes.

#### Consequence Analysis

Table 2.55 summarizes the potential negative consequences of extreme heat.

**Table 2.55 – Consequence Analysis – Extreme Heat**

Category	Consequences
Public	Extreme heat may cause illness and/or death.
Responders	Consequences may be greater for responders if their work requires exertion and/or wearing heavy protective gear.
Continuity of Operations (including Continued Delivery of Services)	Continuity of operations is not expected to be impacted by extreme heat because warning time for these events is long.
Property, Facilities and Infrastructure	Minor impacts may occur, including possible damages to road surfaces and power lines.
Environment	Environmental impacts include strain on local plant and wildlife, including potential for illness or death.
Economic Condition of the Jurisdiction	Farmers may face crop losses or increased livestock costs.
Public Confidence in the Jurisdiction's Governance	Extreme heat is unlikely to impact public confidence.

#### Hazard Summary by Jurisdiction

The following table summarizes extreme heat hazard risk by jurisdiction. Extreme heat risk does not vary significantly by jurisdiction.

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	4	2	4	1	3	3.0	H
Immokalee Reservation	4	2	4	1	3	3.0	H
Marco Island	4	2	4	1	3	3.0	H
Naples	4	2	4	1	3	3.0	H
Unincorporated Collier County	4	2	4	1	3	3.0	H

### **2.5.8 Sea Level Rise and other Climate Change Characteristics**

#### **Hazard Description**

Sea level rise is the increase in sea levels as a result of atmospheric and oceanic warming which causes water expansion as well as ice melt from ice sheets and glaciers. Sea level rise is a result of global climate change. Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2014). Climate change is a natural occurrence in which the earth has warmed and cooled periodically over geologic time. The recent and rapid warming of the earth over the past century has been cause for concern, as this warming is very likely due to the accumulation of human-caused greenhouse gases, such as CO<sub>2</sub>, in the atmosphere (IPCC, 2007). This warming is occurring almost everywhere in the world which suggests a global cause rather than changes in localized weather patterns. In 2018, the Intergovernmental Panel on Climate Change (IPCC) reported with high confidence that warming due to such emissions will cause long-term changes in the climate system such as sea level rise and its associated impacts.

There are generally two separate mechanics involved in global sea level rise. The first is directly attributed to global temperature increases, which warm the oceans waters and cause them to expand. The second is attributed to the melting of ice over land which simply adds water to the oceans. Global sea level rise is likely caused by a combination of these two mechanics and can be exasperated on the local level by factors such as erosion and subsidence. The rate of sea level rise has varied throughout geologic history, and studies have shown that global temperature and sea level are strongly correlated.

Due to sea-level rise projected throughout the 21st century and beyond, coastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding, and coastal erosion. The population and assets projected to be exposed to coastal risks as well as human pressures on coastal ecosystems will increase significantly in the coming decades due to population growth, economic development, and urbanization (IPCC, 2014). Collier County is particularly vulnerable to the effects of sea level rise, due to its coastal location, subtropical environment, low topography and tourism economy.

*Warning Time: 1 – More than 24 hours*

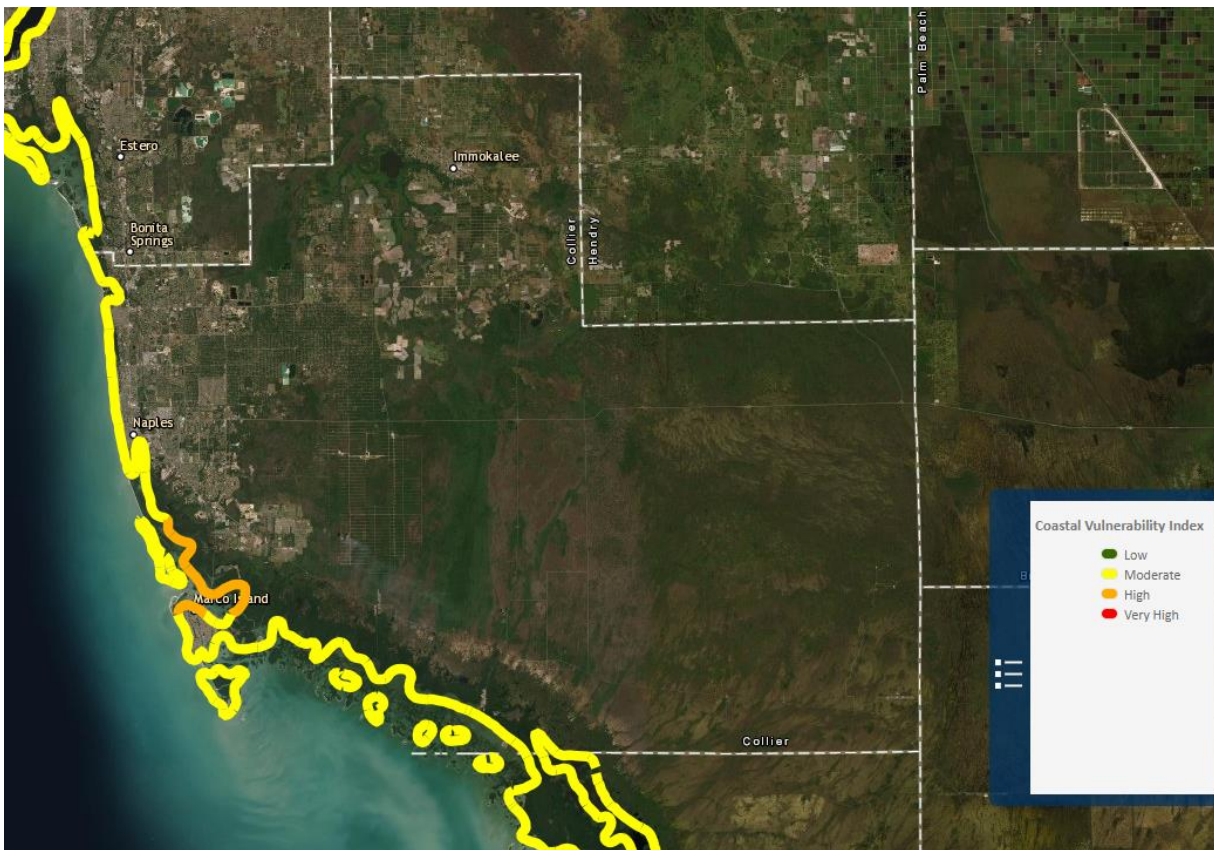
*Duration: 4 – More than one week*

#### **Location**

Sea level rise can occur anywhere along the coast and along major waterways in Collier County. The Coastal Vulnerability Index (CVI), developed by United States Geological Survey (USGS), provides a preliminary overview of the relative susceptibility of the United States coast to sea level rise. The CVI is based on geomorphology, regional coastal slope, tide range, wave height, relative sea level rise, and shoreline erosion and acceleration rates. For each study area, each variable is scored on a 1-5 scale based on defined parameters, where “1” indicates low contribution to coastal vulnerability and “5” indicates high contribution to vulnerability. These scores are then aggregated into a single index through a mathematical formula. The resulting index gives an overview of where physical changes may occur due to sea-level rise.

Figure 2.25 shows the CVI for Collier County. The Gulf of Mexico Coastline between Naples and Marco Island is the most vulnerable area in the region, rated high. Shorelines along the remainder of the Coastline are all rated moderate vulnerability.

Figure 2.25 – Coastal Vulnerability Index, Collier County

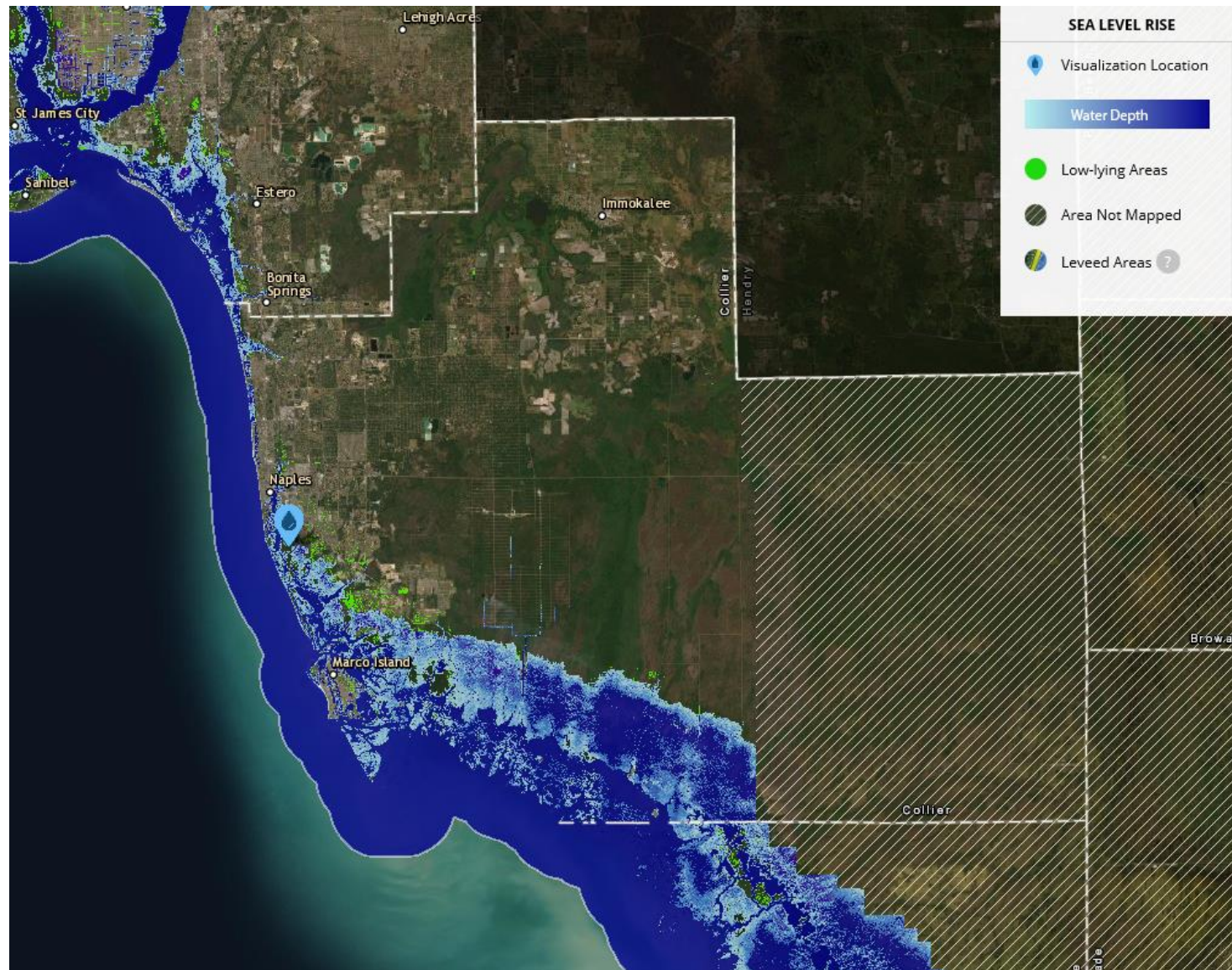


Source: USGS Coastal Change Hazards Portal

### Extent

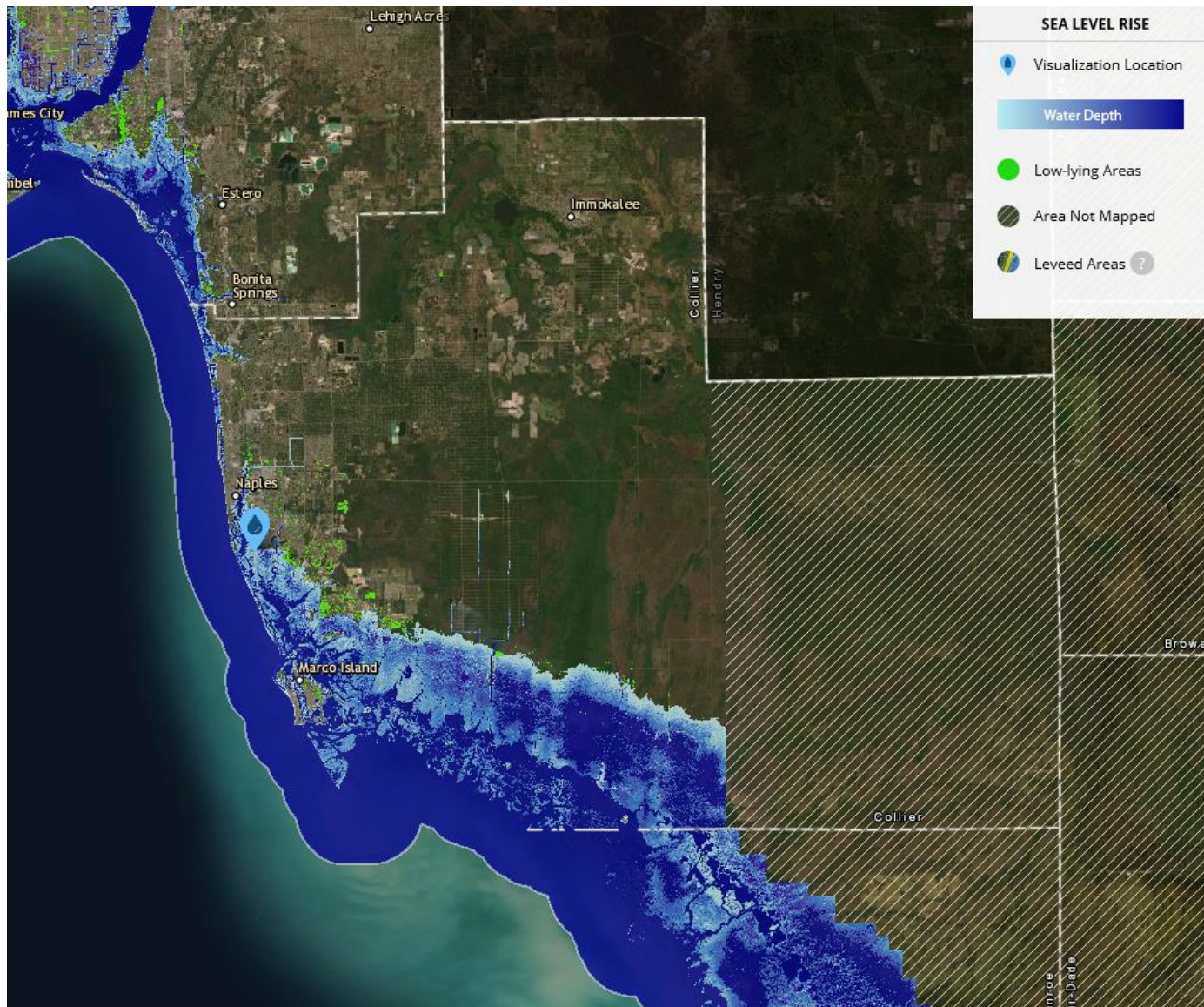
Sea level rise is measured by the number of feet of relative rise and the areas that such rise would inundate. The estimated impacts of 1-foot, 2-foot, and 3-foot, sea level rise (SLR) are shown in Figure 2.26 through Figure 2.28. The SLR estimate maps show inundation above mean higher high water (the average of each day's higher high tide line). SLR will likely affect coastal marsh lands as well as land along rivers, canals, and their tributaries. Additionally, SLR will likely increase future risk of flooding from the other flood hazards discussed later in this plan, as more land will have a lower elevation relative to sea level. For example, with much of the barrier islands and wetlands inundated, inland areas will lose their natural protection and may become susceptible to coastal flooding with velocity wave action.

Figure 2.26 – Estimated Impact of 1 Foot SLR on Collier County



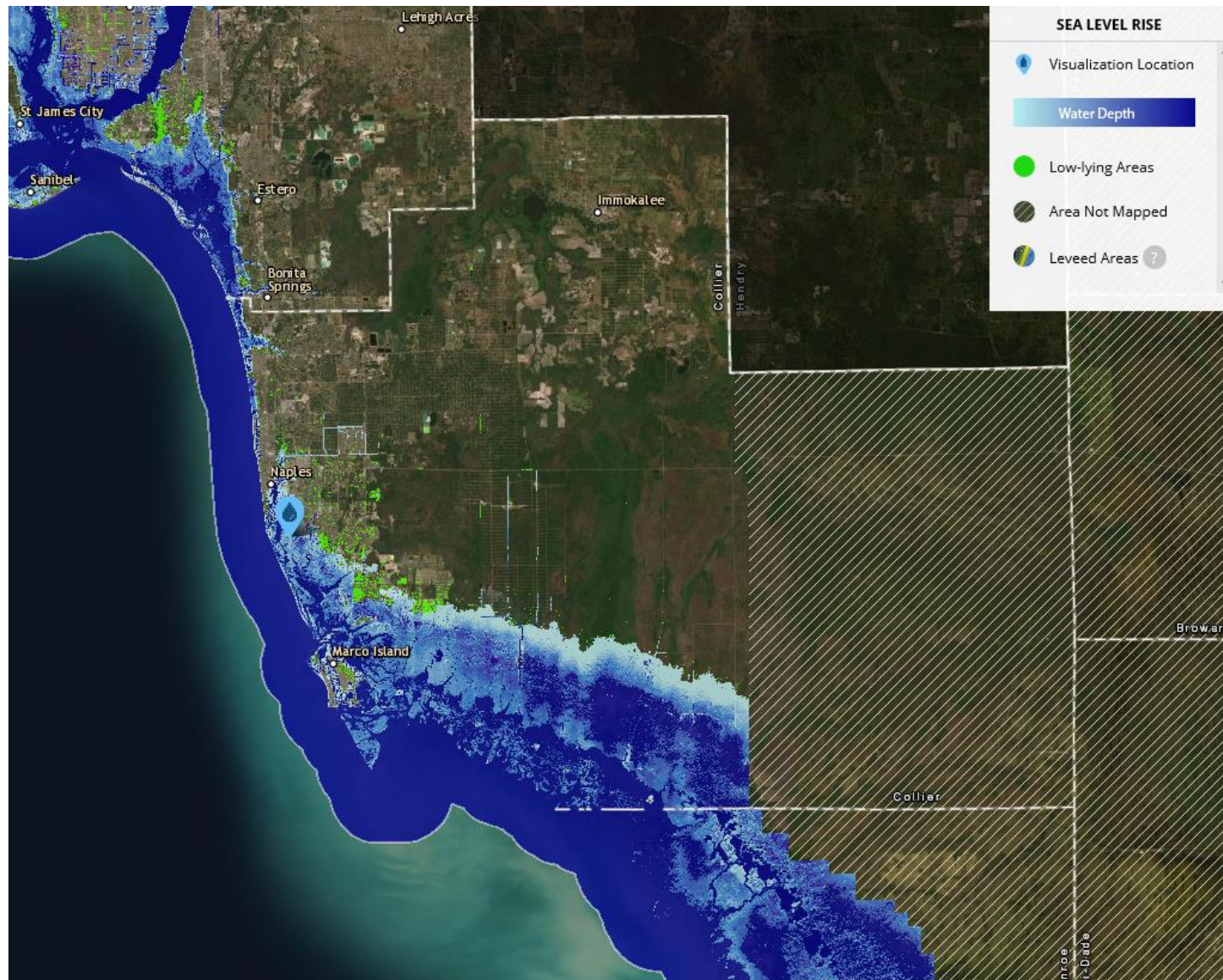
Source: NOAA Sea Level Rise View

Figure 2.27 – Estimated Impact of 2 Foot SLR on Collier County



Source: NOAA Sea Level Rise Viewer

Figure 2.28 – Estimated Impact of 3 Foot SLR on Collier County



Source: NOAA Sea Level Rise Viewer

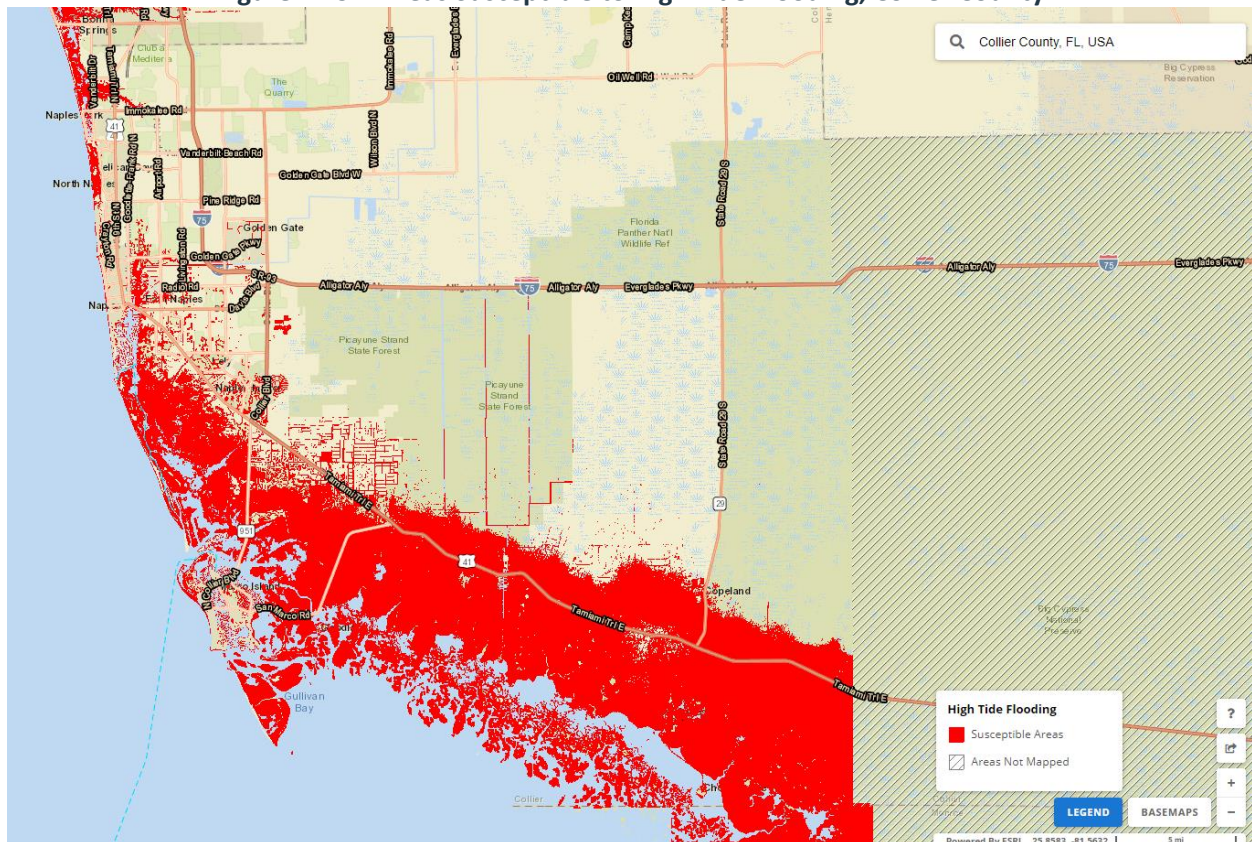
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Sea level rise is a slow onset hazard, and because the full extent of anticipated sea level rise has not yet been realized, the effects of sea level rise have not yet been fully felt. However, sea level rise has already begun to cause “clear sky” or “nuisance” flooding, which is brought on by high tides rather than storm or rain events. Tidal flooding causes temporary inundation of low-lying areas during high-tide events. While tidal flooding is not caused by sea level rise itself, a 2015 tidal flooding report published by NOAA notes that tidal flood rates are steadily increasing, and daily highest tides surpass fixed elevations increasingly frequently, due in part to sea level rise. According to NOAA, annual occurrences of high tide flooding have increased 5- to 10-fold since the 1960s. Sea level rise may cause flooding to occur more frequently and last for longer durations of time. Climate Central’s Surging Seas Risk Finder data will be very useful to the County while planning for sea level rise. As sea level continues to rise, tidal flooding will continue to occur more frequently and over a greater inland area. Figure 2.29 shows areas in Collier County that are susceptible to high tide flooding as defined by NOAA based on derived national flood thresholds from [NOAA Technical Report NOS CO-OPS 086: Patterns and Projections of High Tide Flooding along the U.S. Coastline Using a Common Impact Threshold](#).

*Impact: 3 – Critical*

*Spatial Extent: 3 – Moderate*

**Figure 2.29 – Areas Susceptible to High Tide Flooding, Collier County**



Source: NOAA Coastal Flood Exposure Mapper

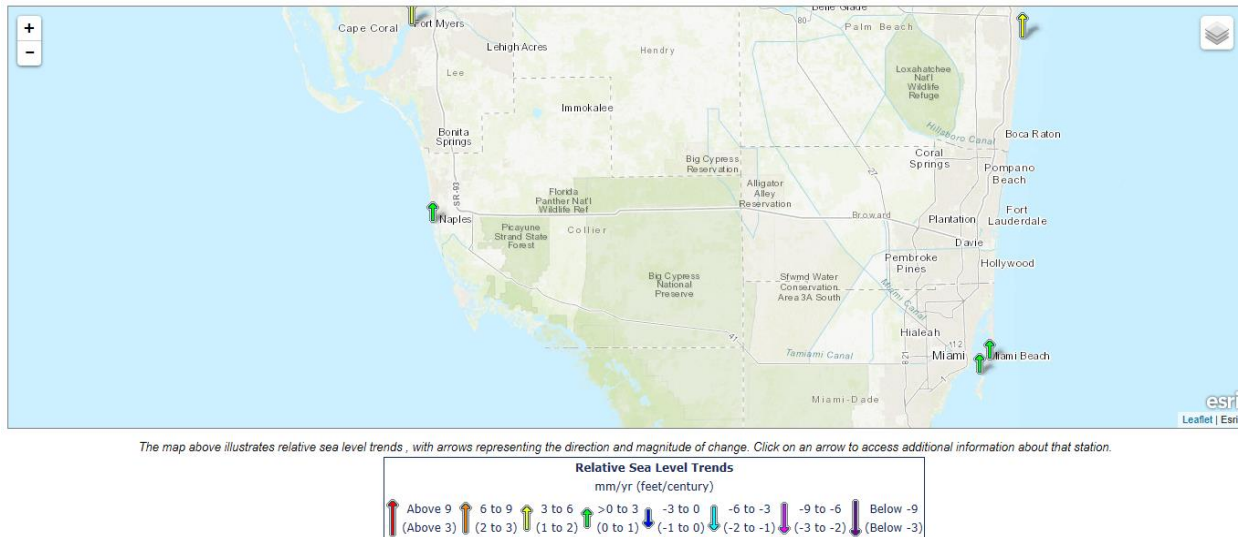
### Historical Occurrences

Historic trends in local MSL are best determined from tide gauge records. The Center for Operational Oceanographic Products and Services (CO-OPS) has been measuring sea level for over 150 years, with tide stations operating on all U.S. coasts. Changes in Mean Sea Level (MSL), either a sea level rise or sea level

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fall, have been computed at 128 long-term water level stations using a minimum span of 30 years of observations at each location. These measurements have been averaged by month to remove the effect of higher frequency phenomena (e.g. storm surge) in order to compute an accurate linear sea level trend. Figure 2.30 illustrates regional trends in sea level from NOAA. At the Naples, FL station (indicated by the green arrow in Collier County), the relative sea level trend is 2.85 mm/year with a 95% confidence interval of  $\pm 0.44$  mm/year based on monthly mean sea level data from 1965 to 2018 which is equivalent to a change of 0.94 feet in 100 years.

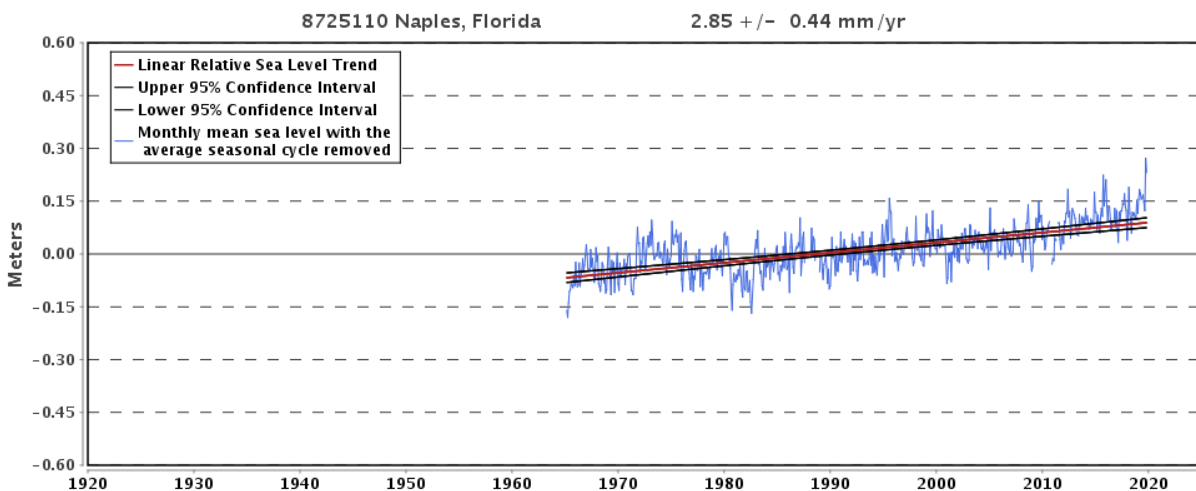
**Figure 2.30 – Sea Level Trends, Collier County**



Source: <http://tidesandcurrents.noaa.gov/sltrends/sltrends.shtml>

Figure 2.31 shows the monthly mean sea level at NOAA's Naples, FL station without the regular seasonal fluctuations due to coastal ocean temperatures, salinities, winds, atmospheric pressures, and ocean currents. The long-term linear trend is also shown, including its 95% confidence interval. The plotted values are relative to the most recent [Mean Sea Level datum established by CO-OPS](#).

**Figure 2.31 – Mean Sea Level Trends, Naples, FL**

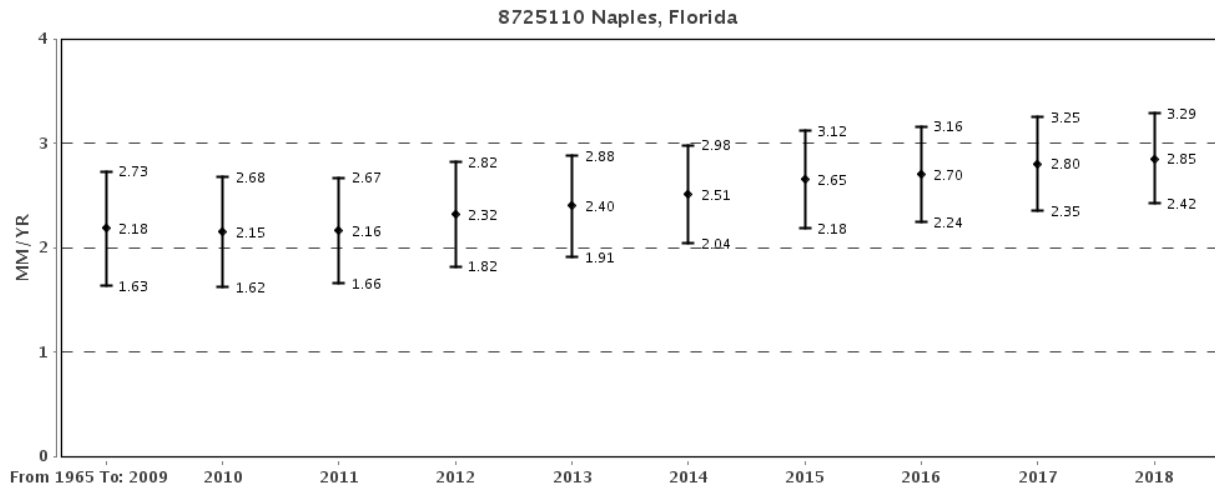


Source: NOAA Tides and Currents, January 2020

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Figure 2.32 shows this trend compared with previous mean sea level trends. The values indicate the trend of the entire data period up to the given year. As such, each year's trend estimate is more precise than previous years' estimates. The sea level trend through 2018 at the Naples, FL tide gauge is 2.85 mm/year with a 95% confidence interval of 2.42 mm/year to 3.29 mm/year.

**Figure 2.32 – Previous Mean Sea Level Trends for Naples, FL**



Source: NOAA Tides and Currents, January 2020

### Probability of Future Occurrence

The U.S. Army Corps of Engineers (USACE) has provided guidance to evaluate designs over a project's life cycle in order to account for the rise of global mean sea level (USACE, 2014). The USACE guidance is based on original guidance by the National Research Council (NRC, 1987). The 1987 NRC report recommended that feasibility studies for coastal projects consider the high probability of accelerating global mean sea level (GMSL) rise and provided three different acceleration scenarios through the year 2100. The NRC committee provided an equation for calculating sea level rise and recommended "projections be updated approximately every decade to incorporate additional data."

The USACE guidance adjusted the NRC equation to include the historic GMSL change rate of 1.7 mm/year as presented by the IPCC (IPCC, 2007) and the start date of 1992 (which corresponds to the midpoint of the National Tidal Datum Epoch of 1983-2001), instead of 1986 (the start date for NRC's equation). These changes resulted in values for the variable  $b$  being equal to  $2.71\text{E-}5$  for modified NRC Curve I,  $7.00\text{E-}5$  for modified NRC Curve II, and  $1.13\text{E-}4$  for modified NRC Curve III. The resulting equation is as follows:

$$E(t) = 0.0017\text{m/yr} \cdot t + bt^2$$

In the above equation,  $t$  represents years,  $b$  is a constant, and  $E(t)$  is the relative sea-level change, in meters, as a function of  $t$ . The three updated GMSL rise acceleration scenarios are depicted in Figure 2.33 on the following page.

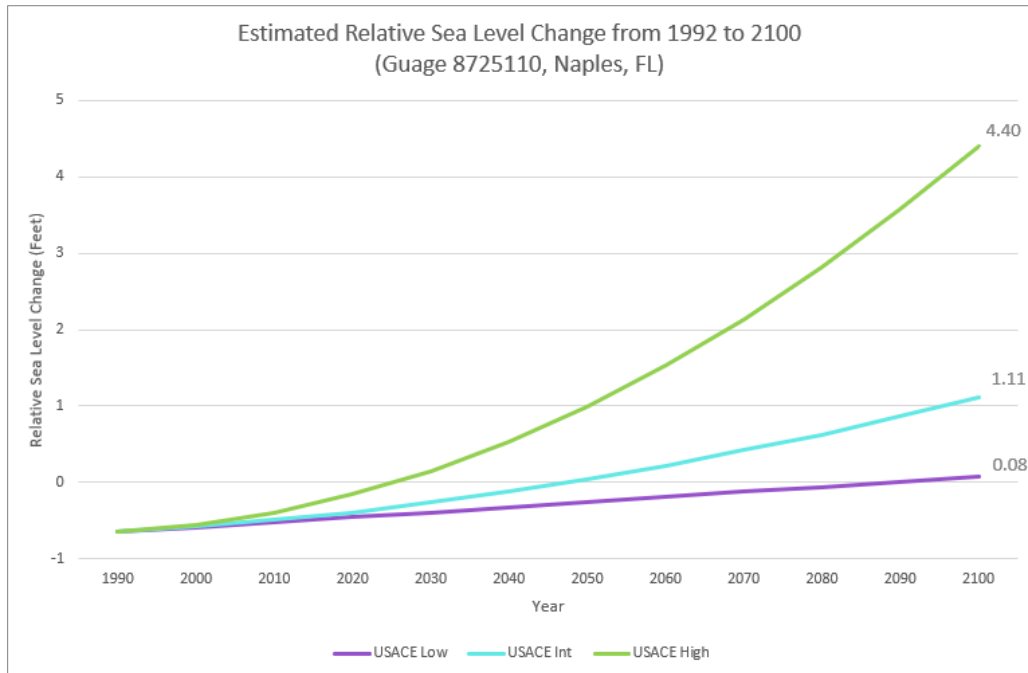
Based on the USACE guidance and data from the Oregon Inlet Marina, NC NOAA gauge, a projected sea level rise to be used for future planning decisions can be calculated. Figure 2.33 shows sea level rise projections for three scenarios from the USACE. The USACE Low curve uses the historic rate of sea level change as the rate, the USACE Intermediate curve uses the NRC Curve I modified by recent IPCC low emissions projections and the local rate of vertical land movement, and the USACE High curve uses the NRC Curve II modified by recent IPCC higher emissions projections and the local rate of vertical land movement. Given that the USACE Low curve does not consider further climate change, the USACE

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Intermediate and High curves are more likely. However, which of the curves is the more likely scenario depends on future emissions levels. Based on the more conservative estimate of the Intermediate curve, Collier County should plan for 0.04 feet of sea level rise from 1992 levels by 2050.

*Probability: 3 – Likely*

**Figure 2.33 – Sea Level Rise Projections for Collier County (1992-2100)**



Source: USACE, 2020

### Climate Change

Sea level rise is a direct result of global climate change. Estimates for sea level rise are based on projected greenhouse gas emission levels and their associated impacts on global temperature change. Most sea level rise models do not fully account for ice melt, and therefore actual sea level rise may be significantly higher than current estimates suggest. As such, these projections contain substantial variability but are nonetheless important to consider when planning for coastal areas because they indicate where flooding can be expected should actual sea level rise meet estimated levels.

### Vulnerability Assessment

#### Methodologies and Assumptions

Vulnerability to Sea Level Rise was assessed based on past occurrences nationally and internationally as well as data from NOAA, USGS, the Intergovernmental Panel on Climate Change (IPCC), and other sources.

In addition to the data presented below, the forthcoming Southeast Coastal Assessment from the USACE South Atlantic Division will provide supplementary data and details through a comprehensive coastal shoreline risks and needs assessment. This tool will look at four hazards (hurricanes and storms, long-term erosion, flooding, and potential sea level rise) and how they will impact population, the built environment, and the natural environment.

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### People

Sea level rise will lead to increased flooding and the associated harms to humans, such as illness, or injury or death from driving into flooded waters and drowning.

### Property

The increased number of flood days and general encroachment of shoreline associated with sea level rise will likely cause property damage, although it is unclear exactly what this will look like. Homes, businesses and vehicles will be susceptible to increased water damage. Homes within the areas that may be inundated will potentially be uninhabitable. Additionally, rising seas, and associated increased flood days, can overwhelm and undermine the effectiveness of stormwater drainage system and other infrastructure, such as roads and bridges.

Data was not available to estimate potential property and critical facility losses as a result of sea level rise.

### Environment

Sea level rise can have numerous negative consequences on the environment including increased erosion and all impacts associated with that. Another concern is the inundation of normally dry land, which could lead to the loss of marshes and wetlands and the positive benefits associated with those areas. These areas buffer against waves and storm surge, protect from erosion and even encourage accretion, and provide natural wildlife habitats. Finally, sea level rise may lead to saltwater intrusion as the groundwater table may also rise, potentially leading to contaminated drinking and agriculture water.

### Consequence Analysis

Table 2.56 summarizes the potential negative consequences of Sea Level Rise.

**Table 2.56 – Consequence Analysis – Sea Level Rise**

Category	Consequences
Public	Sea Level Rise may cause increased flooding which may lead to illness, injury, or death. Additionally, sea level rise may cause psychological stress from loss of home, economy, and culture.
Responders	Sea Level Rise induced flooding may cause increased burden on responders.
Continuity of Operations (including Continued Delivery of Services)	As sea levels rise and cause more regular, chronic flooding, continuity of operations, such as delivery of services may be interrupted due to localized disruption of roads, facilities, and/or utilities.
Property, Facilities and Infrastructure	Sea level rise can cause damage to property as flooding becomes more regular in the short term and as sea levels continue to rise in the long term. SLR can also compromise infrastructure such as drainage systems and roads.
Environment	Sea level rise can lead to increased erosion, salt water intrusion, and inundation of wetlands and previous dry land.
Economic Condition of the Jurisdiction	Sea level rise can severely disrupt the economy, particularly in a region that relies so heavily on tourism.
Public Confidence in the Jurisdiction's Governance	Sea level rise is unlikely to impact public confidence.

### Hazard Summary by Jurisdiction

The following table summarizes sea level rise risk by jurisdiction. Most jurisdictions face at least some risk from sea level rise, but coastal and waterfront areas have greater exposure. Spatial extent was varied by jurisdiction depending on the area exposed to sea level rise impacts, with a rating of negligible for Immokalee Reservation, large for Marco Island and Naples, and moderate for the remaining jurisdictions.

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	3	3	3	1	4	2.9	H
Immokalee Reservation	3	3	1	1	4	2.5	H
Marco Island	3	3	4	1	4	3.1	H
Naples	3	3	4	1	4	3.1	H
Unincorporated Collier County	3	3	3	1	4	2.9	H

### 2.5.9 Sink Holes

#### Hazard Background

Sinkholes are a natural and common geologic feature in areas with underlying limestone and other rock types that are soluble in natural water. Most limestone is porous, allowing the acidic water of rain to percolate through their strata, dissolving some limestone and carrying it away in solution. Over time, this persistent erosional process can create extensive underground voids and drainage systems in much of the carbonate rocks. Collapse of overlying sediments into the underground cavities produces sinkholes.

The three general types of sinkholes are: subsidence, solution, and collapse. Collapse sinkholes are most common in areas where the overburden (the sediments and water contained in the unsaturated zone, surficial aquifer system, and the confining layer above an aquifer) is thick, but the confining layer is breached or absent. Collapse sinkholes can form with little warning and leave behind a deep, steep sided hole. Subsidence sinkholes form gradually where the overburden is thin and only a veneer of sediments is overlying the limestone. Solution sinkholes form where no overburden is present, and the limestone is exposed at land surface.

Sinkholes occur in many shapes, from steep-walled holes to bowl or cone shaped depressions. Sinkholes are dramatic because the land generally stays intact for a while until the underground spaces get too big. If there is not enough support for the land above the spaces, then a collapse of the land surface can occur. Under natural conditions, sinkholes form slowly and expand gradually. However, human activities such as dredging, constructing reservoirs, diverting surface water, and pumping groundwater can accelerate the rate of sinkhole expansions, resulting in the abrupt formation of collapse sinkholes.

Although a sinkhole can form without warning, specific signs can signal potential development:

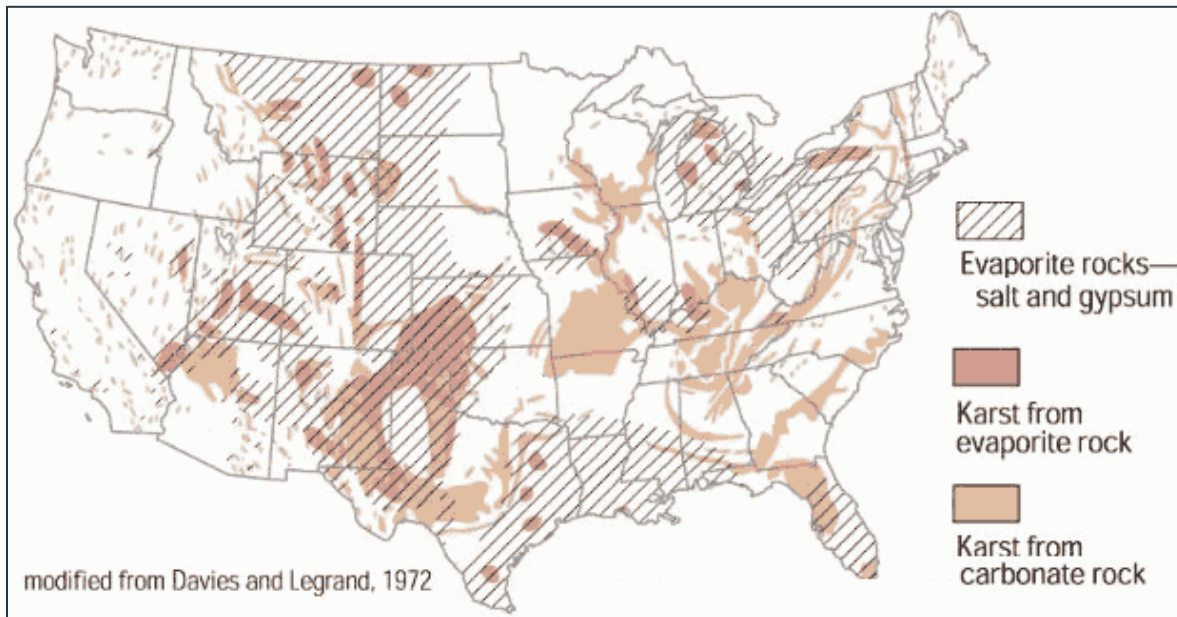
- ▶ Slumping or falling fenceposts, trees, or foundations;
- ▶ Sudden formation of small ponds;
- ▶ Wilting vegetation;
- ▶ Discolored well water; and/or
- ▶ Structural cracks in walls, floors.

Sinkhole formation is aggravated and accelerated by urbanization. Development increases water usage, alters drainage pathways, overloads the ground surface, and redistributes soil. According to FEMA, the number of human-induced sinkholes has doubled since 1930, insurance claims for damages as a result of sinkholes has increased 1,200 percent from 1987 to 1991, costing nearly \$100 million.

*Warning Time: 4 – Less than six hours*

*Duration: 4 – More than 1 week*

Figure 2.34 – Rock Formations in the United States



Source: USGS Groundwater Information

#### Location

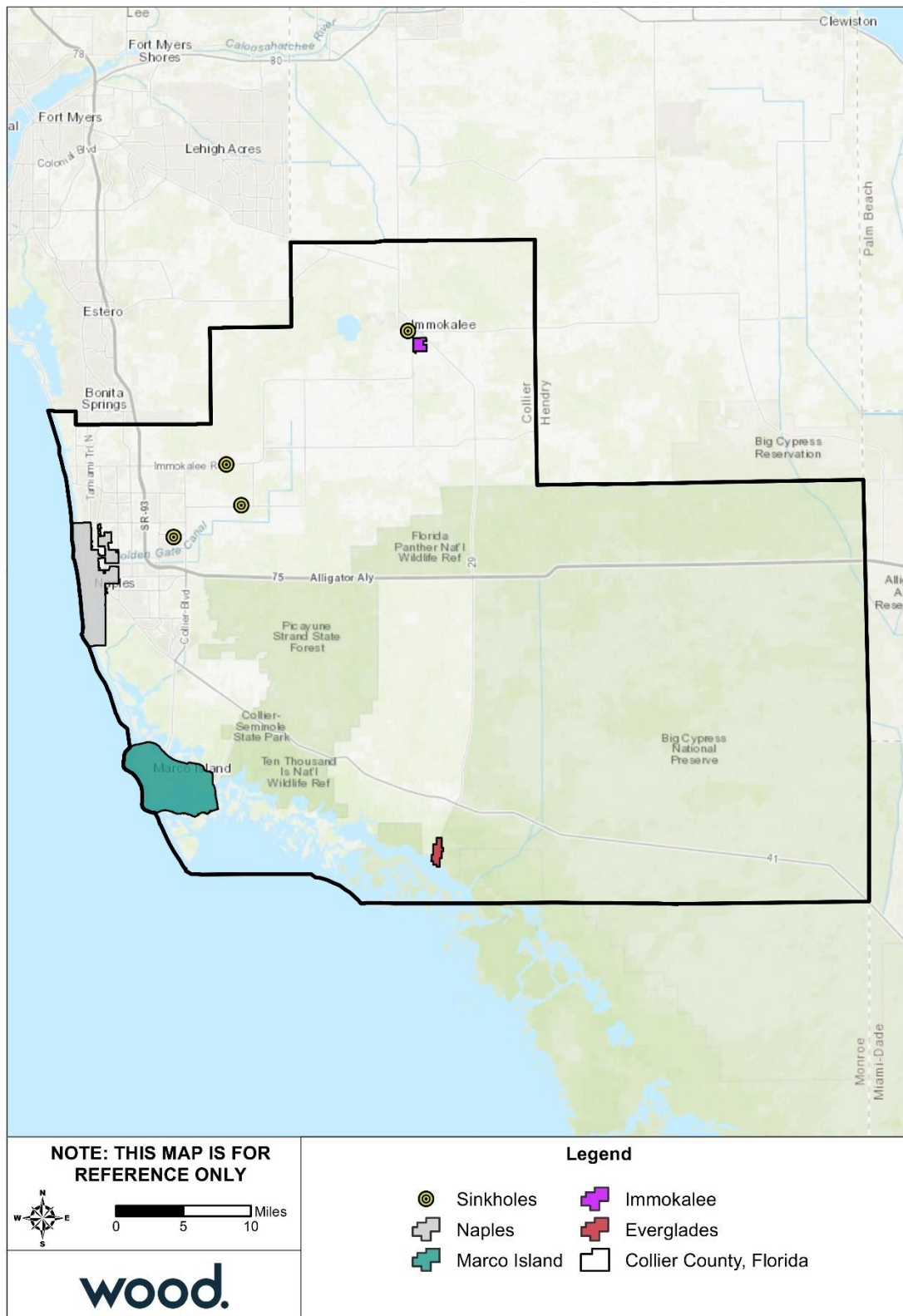
Existing soil types in Collier County are conducive to the formation of natural sinkholes. Limestone, which is easily eroded away and can create sinkholes, is prevalent in Collier County. There is also a potential for soil piping and/or erosion caused by leakage from drainage pipes, collapsed water mains or sewer lines, failed culverts and the effects of other human infrastructure activity. The extent of sinkhole activity is measured in terms of the dimensions of the sinkhole. There have been four recorded sinkholes in Collier County and only three subsidence events between 2000 and 2019. The largest known sinkhole in the County was 12 feet deep recorded in 2000. Past subsidence incidents reported by the Florida Geological Survey for Collier County are recorded below in Table 2.57.

Table 2.57 – Sink Holes in Collier County, 2000-2019

Date	Location	Length	Width	Depth	Note
7/18/2000	Immokalee	4 ft	4 ft	12 ft	No structures threatened. Sink hole appears to be stable.
2/23/2003	Collier County	5 ft	6 ft	4 ft	Sink hole developed in roadway after a sprinkler system malfunction.
3/22/2017	Collier County	4 ft	4 ft	1 ft	Sink hole is in swale maintained by the County.
9/3/2018	Collier County	1 ft	1 ft	0 ft	N/A

Source: Florida Geological Survey

Figure 2.35 – Sink Hole Locations in Collier County



Source: Florida Geological Survey

### Extent

Sinkholes are relatively unpredictable, causing greater impacts when they do occur. They can range dramatically in size, from a few feet wide to hundreds of acres wide and from less than 1 foot to more than 100 feet deep. Sinkholes can also vary in shape. Some are shaped like shallow bowls or saucers while others have vertical walls. In Florida, sinkholes sometimes hold water and form natural ponds. There is no formal scale for measuring the extent of sinkholes.

Sinkholes can have dramatic effects if they occur in urban settings, particularly when infrastructure, such as roads, or buildings are on top of the cavity, causing catastrophic damage. They can also contaminate water resources and have been known to swallow up vehicles, swimming pools, parts of roadways, and even buildings.

In some cases, sinkholes in Florida have measured up to 35 feet in depth with similar widths.

*Impact: 2 – Limited*

*Spatial Extent: 1 – Negligible*

### Past Occurrences

Collier County has experienced sinkhole activity in the past; however, these events are uncommon occurrences and very few have caused any reported property damages. In May 2000, there was an increase in sinkhole development which was believed to be caused by lowered groundwater as a result of the 1998 drought. The most recent reported sinkhole occurred in September 2018 but was small and no information was given on the situation. Local news reports from 2018 claim that there was a large sinkhole in July 2018 that formed from a pipe burst and caused a roadway, U.S. 41 in East Naples, to collapse.

Many underground pipes may be vulnerable to cracks and leaks due to age, which could cause erosion, subsidence, or sinkholes.

### Probability of Future Occurrence

Sinkholes remain a possible occurrence in localized areas of Collier County and are caused by both human activity and as naturally occurring events. Impacts from such events would likely cause minimal localized damage, though potentially significant service interruptions caused by infrastructure damage and road closures.

*Probability: 1 – Unlikely*

### Climate Change

Direct effects from global warming and climate change such as an increase in droughts, floods and hurricanes could contribute to an increase in sinkholes. Climate change raises the likelihood of extreme weather, meaning the torrential rain and flooding conditions which often lead to the exposure of sinkholes are likely to become increasingly common. Certain events such as a hurricane following a period of drought can trigger a sinkhole due to low levels of groundwater combined with a heavy influx of rain. As discussed in Sections 2.5.6 Drought, 2.5.1 Flood, and 2.5.2 Tropical Cyclones, potential increases in these contributing events are possible. Therefore, an increase in the occurrence of sinkholes in the future is possible.

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### Vulnerability Assessment

#### People

A person's vulnerability is directly related to the speed in which the sinkhole opens and the person being above the sinkhole. Records exist for deaths associated with sinkholes opening beneath homes while occupants were present or from motor vehicle deaths when drivers could not avoid driving into the sinkhole before protective barriers were in place.

#### Property

Like people, property vulnerability to a sinkhole is dependent on a variety of factors including the speed at which the sinkhole develops. Property above a large sinkhole that collapses can suffer catastrophic damages ranging from cracked foundations to damaged roadways and totaled vehicles.

Data was not available to estimate potential property or critical facility losses from sink holes.

#### Environment

Sinkholes are generally naturally occurring events; thus, a sinkhole is unlikely to cause substantial impacts to the natural environment. Natural areas that are damaged will recover quickly.

#### Consequence Analysis

Table 2.58 summarizes the potential negative consequences of sinkhole.

**Table 2.58 – Consequence Analysis – Sinkhole**

Category	Consequences
Public	Impacts are expected to be minimal to the larger population. Impacts for those effected could cause anxiety or depression about economic and property losses and personal injury.
Responders	First responders will be impacted similarly to other events that have no advance warning.
Continuity of Operations (including Continued Delivery of Services)	Continuity of operations is generally not disrupted by sinkholes.
Property, Facilities and Infrastructure	Although sinkhole extents are localized, buildings located on or adjacent to a sinkhole are susceptible to foundation damage or building collapse. If the building is located close enough to the sinkhole it can be destroyed or in worst cases, completely collapse into the sinkhole. Remediation costs can be high due to costly foundation shoring or cost of stabilization of the sinkhole itself.
Environment	Sinkholes are natural occurring process and local plants and animals adjust quickly. Many naturally occurring sinkholes fill with rainwater creating new aquatic habitat.
Economic Condition of the Jurisdiction	Sinkholes located in open areas or that impact only small numbers of buildings, while having a high impact to the local property owner, do not have substantial impacts to the economy. Sinkholes that open in major traffic thoroughfares can include significant impact to daily work traffic and flow of goods.
Public Confidence in the Jurisdiction's Governance	Sinkholes are relatively unpredictable, however if a sinkhole occurs after a recent inspection and causes harm to people or property, the public may lose confidence in the jurisdiction's ability to manage a future sinkhole event.

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### Hazard Summary by Jurisdiction

The following table summarizes sinkhole hazard risk by jurisdiction. Sinkhole hazard risk does not vary substantially by jurisdiction.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	1	2	1	4	4	1.9	L
Immokalee Reservation	1	2	1	4	4	1.9	L
Marco Island	1	2	1	4	4	1.9	L
Naples	1	2	1	4	4	1.9	L
Unincorporated Collier County	1	2	1	4	4	1.9	L

### 2.5.10 Winter Storms and Freeze

#### Hazard Description

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings.

All winter storm events have the potential to present dangerous conditions to the affected area. Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of 4 or more inches in 12 hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of 35 miles per hour or more, which reduces visibility to a quarter mile or less for at least 3 hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm. Such freeze events are particularly hazardous as they create treacherous surfaces.

Ice storms are defined as storms with significant amounts of freezing rain and are a result of cold air damming (CAD). CAD is a shallow, surface-based layer of relatively cold, stably-stratified air entrenched against the eastern slopes of the Appalachian Mountains. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes. In the former case, super-cooled droplets can freeze on impact (freezing rain), while in the latter case, the re-frozen water particles are ice pellets (or sleet). Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces. All the winter storm elements – snow, low temperatures, sleet, ice, etcetera – have the potential to cause significant hazard to a community. Even small accumulations can down power lines and trees limbs and create hazardous driving conditions and disrupt communication and power for days.

Advancements in meteorology and forecasting usually allow for mostly accurate forecasting a few days in advance of an impending storm. Most storms have a duration of a few hours; however, impacts can last a few days after the initial incident until cleanup is completed.

*Warning Time: 1 – More than 24 hours*

*Duration: 3 – Less than 1 week*

#### Location

Severe winter storms are usually a countywide or regional hazard, impacting the entire county at the same time. The risk of a severe winter storm occurring is uniform across Collier County.

#### Extent

NOAA uses the Regional Snowfall Index (RSI) to assess the societal impact of winter storms in the six easternmost regions in the United States. The index makes use of population and regional differences to assess the impact of snowfall. It is shown in Table 2.59. For example, areas which receive very little snowfall on average may be more adversely affected than other regions, resulting in a higher severity. For central and southern Florida, a Winter Storm Warning is issued when any snow or sleet amount to more than a half inch. However, amounts as small as 0.1 inch can significantly impact transportation and

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agriculture among other things. According to official National Weather Service records, there has never been any snowfall or accumulation of snow in Collier County, Florida.

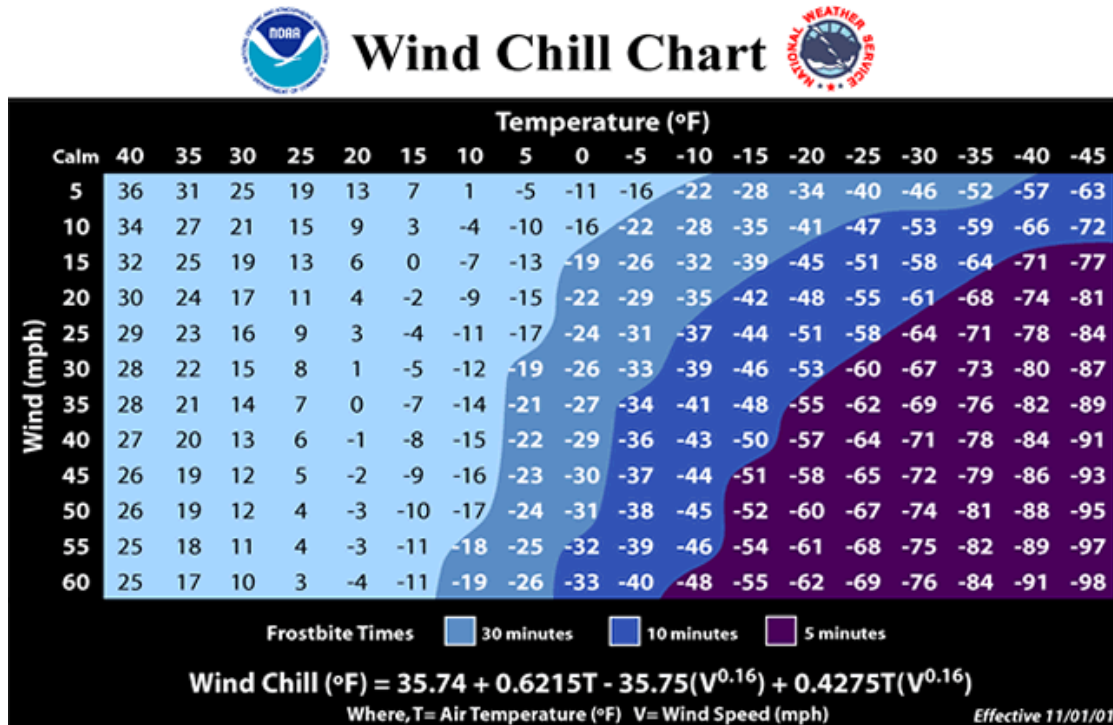
**Table 2.59 – Regional Snowfall Index (RSI) Values**

Category	RSI Value	Description
1	1-3	Notable
2	3-6	Significant
3	6-10	Major
4	10-18	Crippling
5	18+	Extreme

Source: NOAA

Severe winter storms often involve a mix of hazardous weather conditions. The magnitude of an event can be defined based on the severity of each of the involved factors, including precipitation type, precipitation accumulation amounts, temperature, and wind. The NWS Wind Chill Temperature Index, shown in Figure 2.36, provides a formula for calculating the dangers of winter winds and freezing temperatures.

**Figure 2.36 – NWS Wind Chill Temperature Index**



Source: <http://www.nws.noaa.gov/om/winter/windchill.shtml>

*Impact: 2 – Limited*

*Spatial Extent: 4 – Large*

The entirety of Florida is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Collier County is not

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accustomed to severe winter weather conditions and often receives little to no winter weather during the winter months. Given the atmospheric nature of the hazard, the entire County has uniform exposure to a winter storm.

### Historical Occurrences

To get a full picture of the range of impacts of a severe winter storm, data for the following weather types as defined by the National Weather Service (NWS) and tracked by NCEI were collected:

- **Blizzard** – A winter storm which produces the following conditions for 3 consecutive hours or longer: (1) sustained winds or frequent gusts 30 knots (35 mph) or greater, and (2) falling and/or blowing snow reducing visibility frequently to less than 1/4 mile.
- **Cold/Wind Chill** – Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory conditions of 0°F to -14°F with wind speeds 10 mph (9 kt) or greater.
- **Extreme Cold/Wind Chill** – A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria, defined as wind chill -15°F or lower with wind speeds 10 mph (9 kt) or greater.
- **Frost/Freeze** – A surface air temperature of 32°F or lower, or the formation of ice crystals on the ground or other surfaces, for a period long enough to cause human or economic impact, during the locally defined growing season.
- **Heavy Snow** – Snow accumulation meeting or exceeding 12 and/or 24-hour warning criteria of 3 and 4 inches, respectively.
- **Ice Storm** – Ice accretion meeting or exceeding locally/regionally defined warning criteria of ¼ inch or greater resulting in significant, widespread power outages, tree damage and dangerous travel. Issued only in those rare instances where just heavy freezing rain is expected and there will be no "mixed bag" precipitation meaning no snow, sleet or rain.
- **Sleet** – Sleet accumulations meeting or exceeding locally/regionally defined warning criteria of ½ inch or more.
- **Winter Storm** – A winter weather event that has more than one significant hazard and meets or exceeds locally/regionally defined 12 and/or 24-hour warning criteria for at least one of the precipitation elements. Defined by NWS Raleigh Forecast Office as snow accumulations 3 inches or greater in 12 hours (4 inches or more in 24 hours); Freezing rain accumulations ¼ inch (6 mm) or greater; Sleet accumulations ½ inch (13 mm) or more. Issued when there is at least a 60% forecast confidence of any one of the three criteria being met.
- **Winter Weather** – A winter precipitation event that causes a death, injury, or a significant impact to commerce or transportation, but does not meet locally/regionally defined warning criteria.

Table 2.60 summarizes the recorded severe winter storm events that have impacted Collier County according to the NCEI Storm Events Database for the 20-year period from 2000 through 2019. As reported in NCEI, severe winter weather did not cause any fatalities, injuries, or property damage, but did cause some crop damage. Some of these types of impacts may not have been reported and are possible in future events. Impacts in Collier County by incident are recorded in Table 2.61.

**Table 2.60 – Total Severe Winter Storm Impacts in Collier County, 2000-2019**

Event Type	Number of Recorded Incidents	Total Fatalities	Total Injuries	Total Property Damage	Total Crop Damage
Extreme Cold/ Wind Chill	7	0	0	\$0	\$34,030,000
Frost/Freeze	22	0	0	\$0	\$301,030,000
<b>Total</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>\$0</b>	<b>\$335,060,000</b>

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Source: NCEI

**Table 2.61 – Recorded Severe Winter Storm Impacts in Collier County, 2000-2019**

Location	Date	Event Type	Fatalities/ Injuries	Property Damage	Crop Damage
Inland Collier (Zone)	12/21/2000	Extreme Cold/Wind Chill	0/0	\$0	\$0
Inland Collier (Zone)	12/31/2000	Extreme Cold/Wind Chill	0/0	\$0	\$0
Inland Collier (Zone)	1/1/2001	Extreme Cold/Wind Chill	0/0	\$0	\$30,000
Inland Collier (Zone)	1/5/2001	Extreme Cold/Wind Chill	0/0	\$0	\$34,000,000
Inland Collier (Zone)	1/10/2001	Extreme Cold/Wind Chill	0/0	\$0	\$0
Inland Collier (Zone)	12/27/2001	Extreme Cold/Wind Chill	0/0	\$0	\$0
Inland Collier (Zone)	1/9/2002	Extreme Cold/Wind Chill	0/0	\$0	\$0
Inland Collier (Zone)	1/19/2003	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	1/24/2003	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	12/21/2003	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	1/24/2005	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	2/12/2005	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	1/8/2006	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	2/14/2006	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	2/17/2007	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	2/19/2007	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	1/3/2008	Frost/Freeze	0/0	\$0	\$20,000
Inland Collier (Zone)	1/22/2009	Frost/Freeze	0/0	\$0	\$50,000
Inland Collier (Zone)	2/5/2009	Frost/Freeze	0/0	\$0	\$0
Coastal Collier (Zone)	2/5/2009	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	1/6/2010	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	1/10/2010	Frost/Freeze	0/0	\$0	\$300,000,000
Coastal Collier (Zone)	1/10/2010	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	12/7/2010	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	12/14/2010	Frost/Freeze	0/0	\$0	\$0
Coastal Collier (Zone)	12/15/2010	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	12/28/2010	Frost/Freeze	0/0	\$0	\$960,000
Coastal Collier (Zone)	12/28/2010	Frost/Freeze	0/0	\$0	\$0
Inland Collier (Zone)	1/3/2012	Frost/Freeze	0/0	\$0	\$0
<b>Total</b>			<b>0/0</b>	<b>\$0</b>	<b>\$335,060,000</b>

Source: NCEI

According to NOAA, 2 people died from exposure to the cold in 2009 and 2 more in 2010 within the State of Florida. This does not include additional deaths related to carbon monoxide poisoning from using improper heating sources. A freeze in January 2010 led to agricultural losses of over \$200 million. The USDA declared 59 out of 67 counties in a state of natural disaster for agricultural production during this freeze. Storm impacts from NCEI are summarized below:

**January 5, 2001** – A freeze occurred throughout the interior sections of south Florida, causing damage to certain crops. Hardest hit were certain vegetable crops with 75% losses in Hendry and east Collier counties and 30% losses in the farming areas of south Miami-Dade County. Other crops that were damaged included newly planted sugar cane, ornamentals, and tropical fruits. A heavy frost occurred in the western suburbs of Miami-Dade, Broward and Palm Beach metropolitan areas. Several daily minimum temperature records were broken. Selected minimum temperatures included 27 degrees at Belle Glade,

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29 degrees in the Homestead agricultural area, 31 degrees in Naples, 39 degrees at Miami International Airport and 43 degrees in Miami Beach.

**January 22, 2009** – An arctic cold front moved through South Florida on January 20th. High pressure of arctic origin settled over the region behind the cold front, bringing freezing temperatures to much of South Florida on the mornings of January 21 and 22. Temperatures dropped to below freezing over most of interior South Florida on the morning of January 22. Temperatures bottomed out as low as the mid-20s over portions of Glades, Hendry and Collier counties where a hard freeze was noted, with a low of 22 recorded at Palmdale in Glades County. Readings in the upper 20s to around 30 were observed over inland sections of Palm Beach county, with near freezing temperatures of 30-32 degrees over inland sections of Broward and Miami-Dade counties. In addition to the freezing temperatures, widespread heavy frost formed over most of interior and northern sections of South Florida. Crop damage was extensive in some areas, with total losses to bean and corn crops in parts of western Palm Beach county. Losses to tomato and strawberry crops were also noted in Hendry and Collier counties.

**December 28, 2010** – Temperatures across inland sections of Collier County fell into the upper 20s to low 30s with the coldest temperatures reported across far north and east sections on the morning of the 28th. The coldest temperatures during this period were: The Florida Panther NWR 26, Golden Gate Estates 27, and Immokalee hit 29. Extensive damage to crops was reported. Frost was also reported. What cold sensitive crops were left in the area from the previous two events faced more severe damage with some crops being frozen out in the Immokalee area. Crop damage amount estimate of \$0.96 million is for all of Collier County and represents the combined total of all three December freeze events.

Collier County has never received an emergency declaration for incidents related to severe winter storms. As a state, Florida has also never received any disaster declarations related to severe winter storms.

### Probability of Future Occurrence

NCEI records 29 severe winter storm related events during the 20-year period from 2000 through 2019, which is an average of 1.45 events per year or about a 145 percent probability in any given year.

It is concluded that a freeze may be expected in Florida every one to two years. Severe freezes in which the most crops are lost can be expected about once every five years. Southern Florida is likely to have between 2 and 4 days of winter weather annually.

*Probability: 3 – Likely*

### Climate Change

Climate change is not expected to increase the frequency or magnitude of winter storms and freezes in Florida. However, climate change does not mean that winter storms would not continue to occur in the State. Climate change could cause more variability in daily temperature and thus create a prolonged winter storm or freeze.

### Vulnerability Assessment

#### People

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Winter storms are considered deceptive killers because most deaths are indirectly related to the storm event. The leading cause of death during winter storms is from automobile or other transportation accidents due to poor visibility and/or slippery roads. Additionally, exhaustion and heart attacks caused by overexertion may result from winter storms.

Power outages during very cold winter storm conditions can also create potentially dangerous situations. Elderly people account for the largest percentage of hypothermia victims. In addition, if the power is out

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for an extended period, residents are forced to find alternative means to heat their homes. The danger arises from carbon monoxide released from improperly ventilated heating sources such as space or kerosene heaters, furnaces, and blocked chimneys. House fires also occur more frequently in the winter due to lack of proper safety precautions when using an alternative heating source.

### Property

No property damage was reported in association with any winter weather events recorded by the NCEI between 2000 and 2019 for Collier County. Therefore, no annualized loss estimate could be calculated for this hazard. However, \$335,060,000 in crop damage was reported over the 20-year period, which equates to an average annual loss estimate of \$16,753,000.

### Environment

Winter storm events may include ice or snow accumulation on trees which can cause large limbs, or even whole trees, to snap and potentially fall on buildings, cars, or power lines. This potential for winter debris creates a dangerous environment to be outside in; significant injury or fatality may occur if a large limb snaps while a local resident is out driving or walking underneath it.

### Consequence Analysis

Table 2.62 summarizes the potential negative consequences of severe winter storm.

**Table 2.62 – Consequence Analysis – Severe Winter Storm**

Category	Consequences
Public	Localized impact expected to be severe for affected areas and moderate to light for other less affected areas.
Responders	Adverse impact expected to be severe for unprotected personnel and moderate to light for trained, equipped, and protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Localized disruption of roads and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities and Infrastructure	Localized impact to facilities and infrastructure in the areas of the incident. Power lines and roads most adversely affected.
Environment	Environmental damage to trees, bushes, crops, etc.
Economic Condition of the Jurisdiction	Local economy and finances may be adversely affected, depending on damage.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes severe winter storm hazard risk by jurisdiction. Severe winter storm risk does not vary substantially by jurisdiction because these events are typically regional in nature.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	3	2	4	1	3	2.7	H
Immokalee Reservation	3	2	4	1	3	2.7	H
Marco Island	3	2	4	1	3	2.7	H
Naples	3	2	4	1	3	2.7	H
Unincorporated Collier County	3	2	4	1	3	2.7	H

### 2.5.11 Earthquake

#### Hazard Description

An earthquake is a movement or shaking of the ground. Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes are typically found along borders of the Earth's 10 tectonic plates. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rocks' strength a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

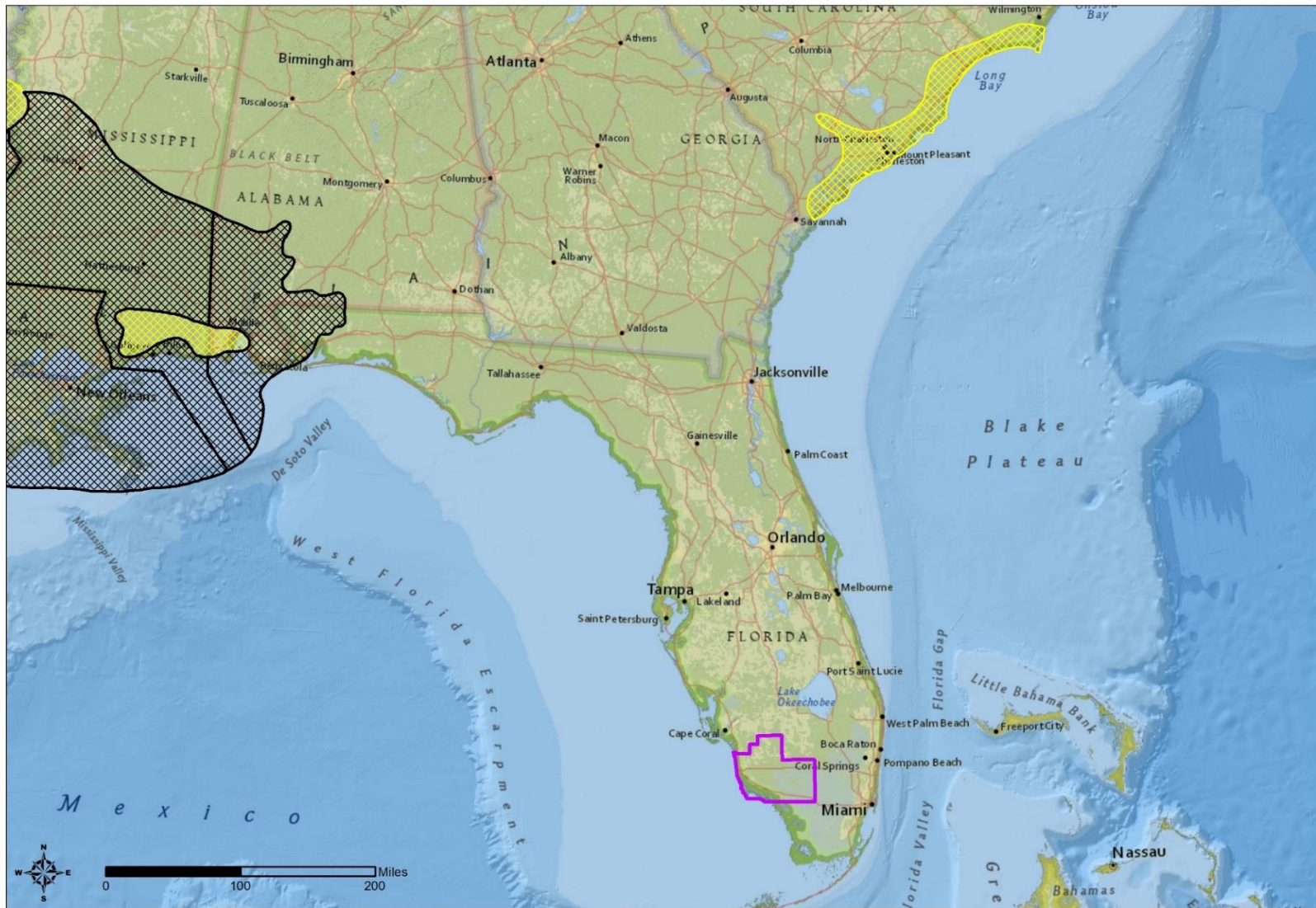
*Warning Time: 4 – Less than 6 hours*

*Duration: 1 – Less than 6 hours*

#### Location

The United State Geological Survey's Quaternary faults database was consulted to define the location of potential earthquakes within range of Collier County. Quaternary faults are active faults recognized at the surface which have evidence of movement in the past 2.58 million years. The Gulf-Margin normal faults, the Charleston liquefaction feature, and the Wiggins uplift are the closest to Collier County and they are 450 miles, 415 miles, and 485 miles away respectively. These three fault areas could potentially produce an earthquake affecting Collier County. Figure 2.37 reflects the location of these three faults in relation to Collier County based on data from the USGS Earthquake Hazards Program. Additionally, there is a fault about the same distance south of Florida on the Caribbean Plate.

Figure 2.37 – US Quaternary Faults



Source: USGS U.S. Quaternary Faults

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All of Florida is subject to earthquakes, with the northwestern region most vulnerable to a damaging earthquake. The state is affected by the Charleston liquefaction feature in South Carolina, the Gulf-Margin normal faults stretching from the edge of Florida through Louisiana, and the Wiggins uplift in Alabama and Mississippi. The Charleston Liquefaction feature has generated an earthquake greater than 8.0 on the Richter Scale in the last 200 years.

### Extent

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude. A detailed description of the Richter Scale is given in Table 2.63. Although the Richter scale is usually used by the news media when reporting the intensity of earthquakes and is the scale most familiar to the public, the scale currently used by the scientific community in the United States is called the Modified Mercalli Intensity (MMI) scale. The MMI scale is an arbitrary ranking based on observed effects. Table 2.64 shows descriptions for levels of earthquake intensity on the MMI scale compared to the Richter scale. Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

**Table 2.63 – Richter Scale**

Magnitude	Effects
Less than 3.5	Generally, not felt, but recorded.
3.5 – 5.4	Often felt, but rarely causes damage.
5.4 – 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 – 6.9	Can be destructive in areas up to 100 kilometers across where people live.
7.0 – 7.9	Major earthquake. Can cause serious damage over larger areas.
8.0 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: FEMA

**Table 2.64 – Comparison of Richter Scale and Modified Mercalli Intensity (MMI) Scale**

MMI	Richter Scale	Felt Intensity
I	0 – 1.9	Not felt. Marginal and long period effects of large earthquakes.
II	2.0 – 2.9	Felt by persons at rest, on upper floors, or favorably placed.
III	3.0 – 3.9	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	4.0 – 4.3	Hanging objects swing. Vibration like passing of heavy trucks. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink the upper range of IV, wooden walls and frame creak.
V	4.4 – 4.8	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Pendulum clocks stop, start.
VI	4.9 – 5.4	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Books, etc., fall off shelves. Pictures fall off walls. Furniture moved. Weak plaster and masonry D cracked. Small bells ring. Trees, bushes shaken.
VII	5.5 – 6.1	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices. Some cracks in masonry C. Waves on ponds. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	6.2 – 6.5	Steering of motor cars is affected. Damage to masonry C; partial collapse. Some damage to masonry B. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory

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MMI	Richter Scale	Felt Intensity
		stacks, monuments, towers, elevated tanks. Frame houses moved on foundations. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	6.6 – 6.9	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations.) Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X	7.0 – 7.3	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	7.4 – 8.1	Rails bent greatly. Underground pipelines completely out of service.
XII	> 8.1	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown in the air.

Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces. Masonry B: Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces. Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces. Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.

Source: Oklahoma State Hazard Mitigation Plan.

The most severe earthquake to impact Florida measured a VIII on the Modified Mercalli Intensity Scale.

*Impact: 2 – Limited*

*Spatial Extent: 3 – Moderate*

### Historical Occurrences

The USGS Earthquake Hazards Program maintains a database of historical earthquakes of a magnitude 2.5 and greater from 1973 to 2019. Collier County has no history of earthquakes or damage from earthquakes. No earthquakes have had epicenters in Florida and there are no documented faults in the State.

The National Geophysical Data Center maintains a database of all earthquakes from 1638 to 1985 including the maximum intensity for each locality that felt the earthquake. Since 1985, no major earthquake events have impacted the planning area. The largest earthquake to be felt in Florida was the Charleston earthquake of 1886, which registered an MMI of VIII in Savannah. Table 2.65 shows historic seismic events felt in Florida. No earthquake epicenters have occurred in Collier County.

**Table 2.65 – Historical Seismic Events Felt in Florida, 1886-2016**

Date	Description
August 31, 1886	Known as the “great earthquake,” a severe earthquake hit Charleston, South Carolina. It was so powerful that shaking was felt in St. Augustine and Tampa. There were also several aftershocks in the months after the quake that were felt in Florida.
January 5, 1945	Shaking was felt in Volusia County. Windows in a De Land courthouse shook violently.
October 27, 1973	A shock was felt in Seminole, Volusia, Orange, and Brevard counties with a maximum intensity of MM V.
January 13, 1978	Two shocks were felt in Polk County, each lasting about 15 seconds and one minute apart. It rattled doors and windows, but there were no injuries or damages.
November 13, 1978	A shock was felt in northwest Florida. The seismic station estimated that it originated in the Atlantic Ocean.

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Date	Description
September 10, 2006	A strong quake was felt in Florida and other Gulf Coast states. USGS determined it was magnitude 6 quake originating in the Gulf of Mexico, 250 miles southwest of the Apalachicola area.
July 16, 2016	Some felt small shakes in Florida and USGS rated it as a 3.7 magnitude. It was later discovered that the “quake” was actually an experimental explosion in the ocean by the US Navy.

Source: USGS

### Probability of Future Occurrence

Ground motion is the movement of the earth’s surface due to earthquakes or explosions. It is produced by waves generated by a sudden slip on a fault or sudden pressure at the explosive source and travels through the earth and along its surface. Ground motion is amplified when surface waves of unconsolidated materials bounce off or are refracted by adjacent solid bedrock. The probability of ground motion is depicted in USGS earthquake hazard maps by showing, by contour values, the earthquake ground motions (of a frequency) that have a common given probability of being exceeded in 50 years.

Figure 2.38 reflects the seismic hazard for Collier County based on the national USGS map of peak acceleration with two percent probability of exceedance in 50 years. To produce these estimates, the ground motions being considered at a given location are those from all future possible earthquake magnitudes at all possible distances from that location. The ground motion coming from a particular magnitude and distance is assigned an annual probability equal to the annual probability of occurrence of the causative magnitude and distance. The method assumes a reasonable future catalog of earthquakes, based upon historical earthquake locations and geological information on the recurrence rate of fault ruptures. When all the possible earthquakes and magnitudes have been considered, a ground motion value is determined such that the annual rate of its being exceeded has a certain value.

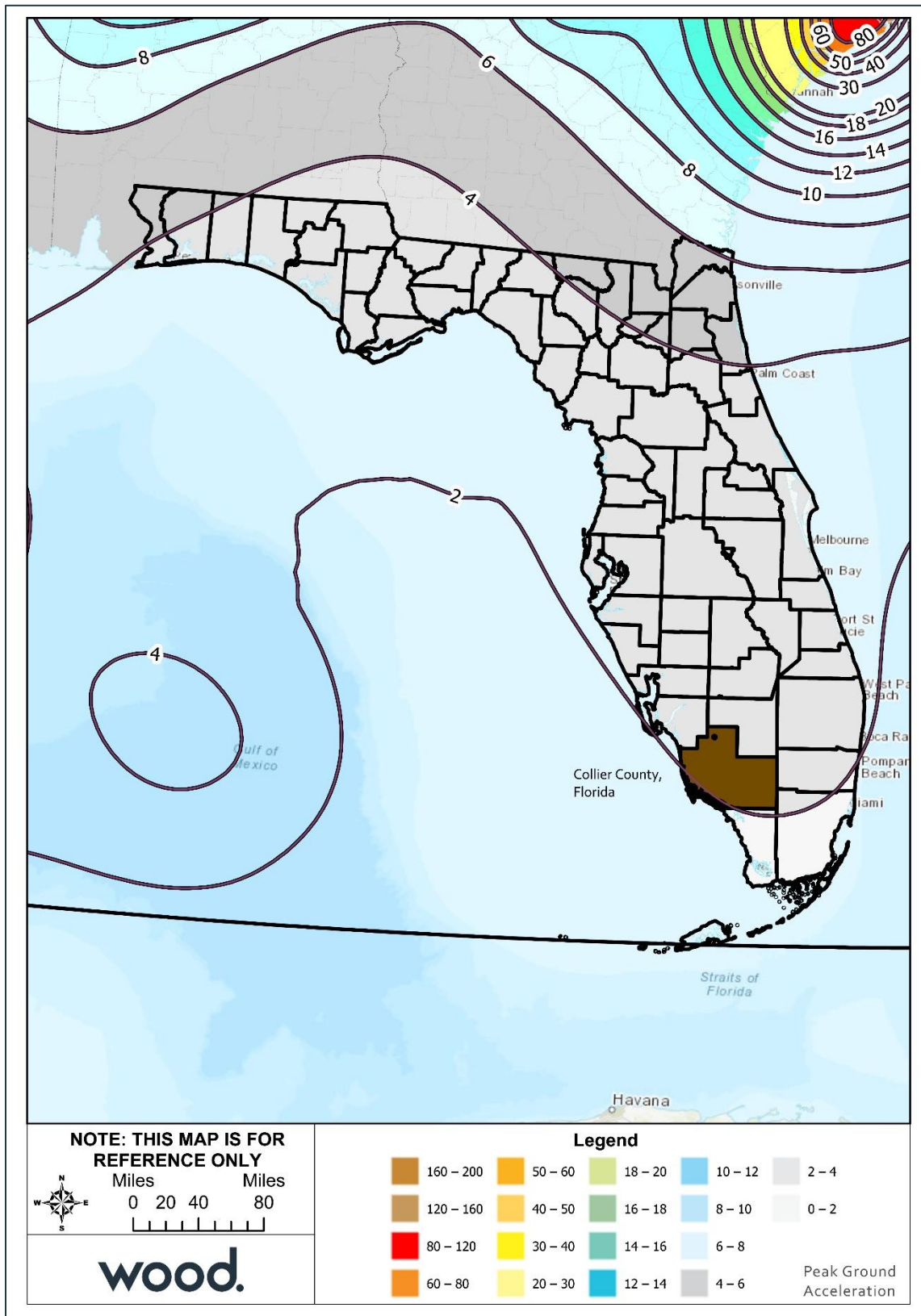
Therefore, for the given probability of exceedance, two percent, the locations shaken more frequently will have larger ground motions. All of Collier County is located within zones with peak acceleration of 0-2% g.

There have been no past occurrences of earthquakes in Collier County. Using past occurrence as an indicator of future probability, there is a low chance of an earthquake causing some building damage.

Based on this data, it can be reasonably assumed that an earthquake event affecting Collier County is possible but unlikely.

*Probability: 1 – Unlikely*

Figure 2.38 – Seismic Hazard Information for Collier County



Source: USGS Earthquake Hazards Program

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### Climate Change

Scientists are beginning to believe there may be a connection between climate change and earthquakes. Changing ice caps and sea-level redistribute weight over fault lines, which could potentially have an influence on earthquake occurrences. However, currently no studies quantify the relationship to a high level of detail, so recent earthquakes should not be linked with climate change. While not conclusive, early research suggest that more intense earthquakes and tsunamis may eventually be added to the adverse consequences that are caused by climate change.

### Vulnerability Assessment

#### People

Earthquake events in Collier County are unlikely to produce more than moderate ground shaking; therefore, injury or death is unlikely. Objects falling from shelves generally pose the greatest threat to safety.

A 2,500-year event was estimated using Hazus because a 2,500-year event is the “maximum considered earthquake” and is used for building codes. It has a 2-percent probability of being exceeded in 50 years.

Hazus estimates that the 2,500-year earthquake would result in complete damage of 115,442 residential structures. With these estimates, potential population at risk was calculated using the American Community Survey 2018 5-Year Estimates for household factor, the average number of individuals per occupied household. The household factor for Collier County is 2.68, therefore there are an estimated 309,385 individuals are at severe risk to the 2,500-year earthquake event.

#### Property

In a severe earthquake event, buildings can be damaged by the shaking itself or by the ground beneath them settling to a different level than it was before the earthquake (subsidence). Buildings can even sink into the ground if soil liquefaction occurs. If a structure (a building, road, etc.) is built across a fault, the ground displacement during an earthquake could seriously damage that structure.

Earthquakes can also cause damages to infrastructure, resulting in secondary hazards. Damages to dams or levees could cause failures and subsequent flooding. Fires can be started by broken gas lines and power lines. Fires can be a serious problem, especially if the water lines that feed the fire hydrants have been damaged as well. Impacts of earthquakes also include debris clean-up and service disruption.

Collier County has not been impacted by an earthquake, so major damage to the built environment is unlikely. However, if an earthquake were to occur, there is potential for impacts to certain masonry buildings, as well as environmental damages with secondary impacts on structures.

Table 2.66 details the estimated buildings impacted by 2,500-year earthquake event based on a Hazus level 1 analysis. Note that building value estimates are inherent to Hazus and do not necessarily reflect damages to the asset inventory provided by the County’s parcel and building data.

**Table 2.66 – Estimated Buildings Impacted by 2,500-Year Earthquake Event**

Occupancy Type	Estimated Building Damage	Estimated Content Loss	Estimated Total Damage
Residential	\$35,361,570,000	\$6,630,180,000	\$41,991,750,000
Commercial	\$5,628,150,000	\$2,225,650,000	\$7,853,800,000
Industrial	\$951,070,000	\$442,910,000	\$1,393,980,000
Other	\$963,070,000	\$378,580,000	\$1,341,650,000
<b>Total</b>	<b>\$42,903,860,000</b>	<b>\$9,677,320,000</b>	<b>\$52,581,180,000</b>

Source: Hazus

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### Environment

An earthquake is unlikely to cause substantial impacts to the natural environment in Collier County. Impacts to the built environment (e.g. ruptured gas line) could damage the surrounding environment. However, this type damage is unlikely based on historical occurrences.

### Consequence Analysis

Table 2.67 summarizes the potential negative consequences of earthquake.

**Table 2.67 – Consequence Analysis - Earthquake**

Category	Consequences
Public	Impact expected to be severe for people who are unprotected or unable to take shelter; moderate to light impacts are expected for those who are protected.
Responders	Responders may be required to enter unstable structures or compromised infrastructure. Adverse impacts are expected to be severe for unprotected personnel and moderate to light for protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Damage to facilities/personnel in the area of the incident may require relocation of operations and lines of succession execution. Disruption of lines of communication and destruction of facilities may extensively postpone delivery of services.
Property, Facilities and Infrastructure	Damage to facilities and infrastructure in the area of the incident may be extensive for facilities, people, infrastructure, and HazMat.
Environment	May cause extensive damage, creating denial or delays in the use of some areas. Remediation may be needed.
Economic Condition of the Jurisdiction	Local economy and finances expected to be adversely affected, possibly for an extended period.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery are not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes earthquake hazard risk by jurisdiction. Despite minor differences in peak acceleration probabilities, earthquake risk is uniform across the planning area.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	1	2	3	4	1	2.0	M
Immokalee Reservation	1	2	3	4	1	2.0	M
Marco Island	1	2	3	4	1	2.0	M
Naples	1	2	3	4	1	2.0	M
Unincorporated Collier County	1	2	3	4	1	2.0	M

### 2.5.12 Tsunami

#### Hazard Description

A tsunami is a series of large ocean waves formed as a result of an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite. Earthquakes are the most common cause of tsunamis. Tsunami waves radiate in all directions from the site of the disturbance, traveling as fast as 450 mph and slowing as they reach shallow waters. As the waves slow, they draw together and grow in height. The resulting phenomenon appears as a constant wall of water and can resemble hurricane storm surge when it reaches the shore.

There can be as many as 60 miles between peaks of each wave series and be as far as one hour apart. Tsunamis have a much smaller amplitude (wave height) offshore, and a very long wavelength (often hundreds of kilometers long), which is why they generally pass unnoticed at sea, forming only a passing "hump" in the ocean. The number of arrivals and the amplitudes of each wave will vary depending on the coastal properties, the exact travel direction, and other specifics of how the tsunami was generated. They will vary from place to place and event to event. In the largest tsunamis, surge can continue for many hours and more than a day.

Scientists cannot predict when and where the next tsunami will strike. However, since earthquakes are often a cause of tsunamis, an earthquake felt near a body of water may be considered an indication that a tsunami could shortly follow. Tsunami Warning Centers monitor which earthquakes are likely to generate tsunamis and can issue warning messages when a tsunami is possible. The National Tsunami Warning Center in Palmer, Alaska, serves the continental United States, Alaska, Puerto Rico, and Virgin Islands and Canada.

The first part of a tsunami to reach land is a trough rather than a crest of the wave. The water along the shoreline may recede dramatically, exposing areas that are normally submerged. This can serve as an advance warning of the approaching crest of the tsunami, although the crest typically arrives seconds to minutes later.

Tsunamis are often referred to as tidal waves; however, oceanographers discourage this misnomer because tsunamis are not impacted by tides.

*Warning Time: 3 – 6 to 12 hours*

*Duration: 3 – Less than 1 week*

#### Location

Tsunamis can strike any coastal area but are most commonly associated with the Pacific Coast where there is a higher probability of them occurring due to the number of subduction zones and high probability of earthquakes. Tsunamis on the east coast are more likely to occur as a result of landslides or slumping associated with local earthquakes, though these events are rare. The most at-risk areas are those less than 25 feet above sea level and within 1 mile of the coastline. Per the 2018 Florida State Hazard Mitigation Plan, the past 150 years of tsunami records shows that the most frequent and destructive tsunamis to affect the U.S. have occurred along the coasts of California, Oregon, Washington, Alaska, and Hawaii.

Earthquakes are frequently the cause for tsunami events, and because the location and timing of future earthquake events are unpredictable, the 2018 Florida State Hazard Mitigation Plan concludes that all geographic areas of Florida that border the Atlantic Ocean or Gulf of Mexico are at risk. Additionally, sediment deposits in the Gulf of Mexico may lead to underwater landslide activity.

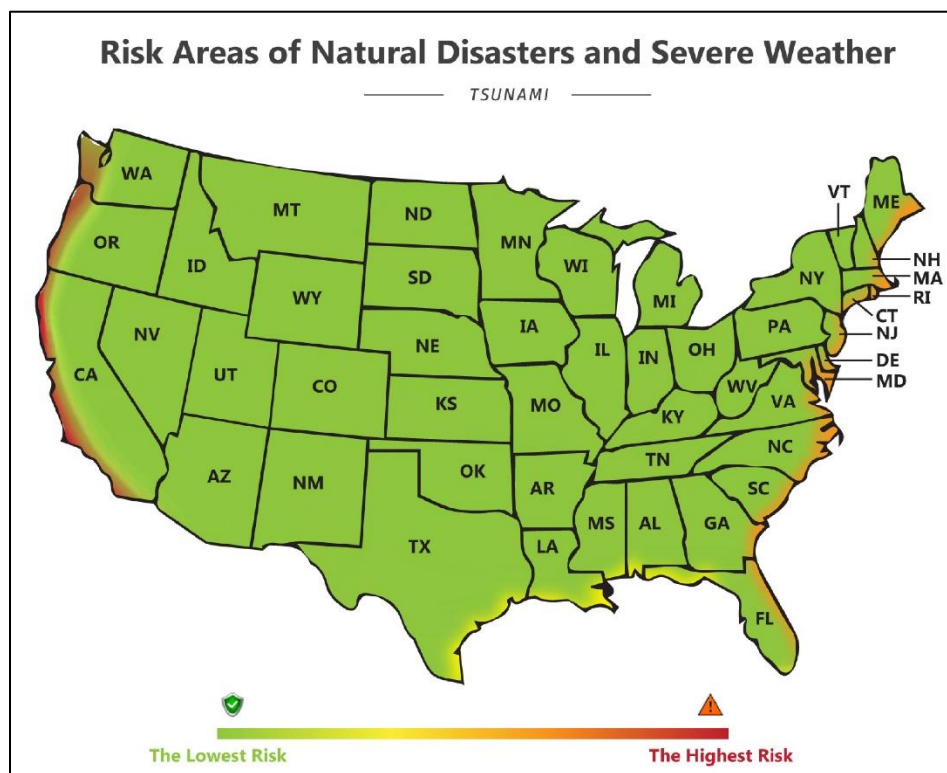
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A Report to the National Tsunami Hazard Mitigation Program titled “Regional Assessment of Tsunami Potential in the Gulf of Mexico” by Brink, et al. concludes that “there are no significant earthquake sources within the Gulf of Mexico that are likely to generate tsunamis...” and “Tsunami propagation from significant earthquake sources outside the Gulf of Mexico... shows that wave amplitude is greatly attenuated by the narrow and shallow passages into the gulf, and as a result, these tsunami sources do not constitute a tsunami hazard to the Gulf of Mexico coast” (2009). However, the report does confirm that submarine landslides pose a tsunami hazard to the Gulf of Mexico coast.

Per the County’s previous LMS, the actual tsunami hazard in Collier County, potentially caused by an earthquake or a seafloor landslide on the northern side of the Caribbean plate, is likely low. An earthquake of record-breaking magnitude in the northwest Caribbean could potentially cause a rise of 1-2 feet in the Gulf, as reported by Robert Molleda of the Miami Weather Office. Still, seismic events are unpredictable and there is some possibility for a tsunami in Collier County. Particularly, low lying areas of Naples, Marco Island, Everglades City, and unincorporated coastal areas of Collier County might also be at risk due to the flat low-lying areas. The low slope to the Continental shelf makes Naples, Marco Island, Everglades City and unincorporated areas of coastal Collier County more susceptible to a potential Tsunami event.

Figure 2.39 shows the at-risk areas for tsunamis in the United States.

**Figure 2.39 – Tsunami Risk Areas in the United States**



Source: Envista Forensics, National Weather Service

### Extent

The Regional Assessment of Tsunami Potential in the Gulf of Mexico report by Brink, et al. indicates that submarine landslides have occurred in the Gulf of Mexico that were of sufficient volume to cause destructive tsunamis. Sediment supply from the Mississippi River may cause further landslide activity; however, future landslides on the northern Gulf continental slope would not be large enough to pose a

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tsunami hazard (Brink, et al., 2009). Although future probability is uncertain, this research concludes that Gulf of Mexico landslide sources could realistically produce potential maximum tsunami runup of 4 meters above mean sea level. Thus, if a submarine landslide in the Gulf of Mexico were to produce a tsunami, the impacts could be catastrophic depending on the origination point and the size and force of the waves.

*Impact: 4 – Catastrophic*

*Spatial Extent: 4 – Large*

### Historical Occurrences

There have been 4 reported tsunami events in the history of Florida. All 4 of these tsunamis occurred on the Atlantic Coast. Below are the causes of these tsunamis.

- ▶ 1 was caused by an Atlantic Coast earthquake
- ▶ 1 was caused by a non-Atlantic earthquake
- ▶ 2 were caused by a Caribbean earthquake

While no known tsunamis have ever affected the Florida Gulf Coast, a tsunami in that location is unlikely but not impossible.

### Probability of Future Occurrence

Based on a historical analysis, the frequency of prior tsunami events from around the world, and current research on the geologic potential for Gulf of Mexico tsunamis, it has been concluded that future tsunami events affecting Collier County are unlikely.

*Probability: 1 – Unlikely*

### Climate Change

Climate change is not expected to affect the occurrence of tsunamis in Florida.

### Vulnerability Assessment

#### People

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Many of the effects of tsunamis on people are the same as those for other types of coastal flooding, described in Sections 2.5.1 and 2.5.2. The greatest threat to people during a tsunami is drowning. There may be injury or death. Rescue missions may be life-threatening for rescuers if buildings are not structurally stable or if rescuing from waters of unknown depth. If a structure were severely damaged or flooded, operations would be disrupted.

#### Property

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If a major tsunami were to occur in Florida, many structures and critical infrastructure would be severely damaged from the force of the waters and from flooding effects.

Data on potential tsunami extent is not available; therefore, potential loss estimates for property and critical facilities could not be generated.

#### Environment

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The coast could be altered, including intra-coastal areas, beaches, mangroves, etc. Vegetation would likely be damaged and severe erosion would occur.

#### Consequence Analysis

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The consequence analysis for tsunami hazards is shown in Table 2.68.

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**Table 2.68 – Consequence Analysis – Tsunami**

Category	Consequences
Public	There may be injury or death.
Responders	Responders face similar risks as the general public but a heightened potential for life-threatening rescue missions if buildings are not structurally sound or if water depth is unknown.
Continuity of Operations (including Continued Delivery of Services)	Operations would likely be disrupted as a result of damages to buildings, roads, transportation infrastructure, communications infrastructure, utilities, and other key lifelines.
Property, Facilities and Infrastructure	Many structures and critical infrastructure would be severely damaged from the force of the water and flooding effects.
Environment	The coast, beaches, mangroves, etc. could be altered.
Economic Condition of the Jurisdiction	Many businesses would be damaged and forced to close causing loss of revenue and loss of jobs.
Public Confidence in the Jurisdiction's Governance	As with other hazards, public confidence could be affected by the speed of response and recovery efforts.

### Hazard Summary by Jurisdiction

The following table summarizes tsunami hazard risk by jurisdiction. Tsunami hazard is not expected to change much by jurisdiction.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	1	4	4	3	2	2.8	H
Immokalee Reservation	1	3	3	3	2	2.3	M
Marco Island	1	4	4	3	2	2.8	H
Naples	1	4	4	3	2	2.8	H
Unincorporated Collier County	1	4	4	3	2	2.8	H

### 2.5.13 Major Transportation Incidents

#### Hazard Background

Collier County depends on several key bridges, roads, and ferry crossings for access and services. This infrastructure is integral to the functioning of the communities in the planning area and would cause major disruptions should they become inaccessible. Damage to any of this infrastructure could result from most of the natural and human-caused hazards described in this plan. In addition to a secondary or cascading impact from another primary hazard, infrastructure can fail as a result of faulty equipment, lack of maintenance, degradation over time, or accidental damage such as a barge colliding with a bridge support.

Building and construction standards along with regular inspection and maintenance can provide a degree of certainty as to the capacity of infrastructure to withstand some damages. However, accidental damage is unpredictable. Moreover, any damages that take a road or bridge out of service will likely require significant repairs that could take weeks or months to complete.

*Warning Time: 4 – Less than six hours*

*Duration: 4 – More than one week*

#### Location

The primary transportation systems in the region are shown in Figure 2.40. The Florida Department of Transportation maintains a list of bridges in Florida. There are 211 bridges built in 1989 or prior, listed below in Table 2.69. Due to their age, these bridges may be deteriorating and in need of maintenance, repair, or replacement. Aging infrastructure may also be more vulnerable to impacts from other natural or technological hazards.

**Table 2.69 – Bridges Built in 1989 or Prior**

Bridge Number	Route	Crossing	Year Built	Age (years)
30102	US-41 (SR-90)	Canal 102	1940	80
30092	US-41 (SR-90)	Canal 092	1941	79
30136	CR 846	DRAINAGE CANAL	1948	72
30137	CR 846	DRAINAGE CANAL	1948	72
30138	CR 846	DRAINAGE CNL	1948	72
30139	CR-846	DRAINAGE CANAL	1948	72
30140	CR 846	DRAINAGE CANAL	1948	72
30141	CR 846	DRAINAGE CNL	1948	72
30079	US-41 (SR-90)	Canal 079	1949	71
30083	US-41 (SR-90)	Turner River	1949	71
30087	US-41 (SR-90)	Canal 087	1949	71
30088	US-41 (SR-90)	Canal 088	1949	71
30091	US-41 (SR-90)	Canal 091	1949	71
30093	US-41 (SR-90)	K.S. STROUD CANAL	1949	71
30094	US-41 (SR-90)	NEW RIVER STRAND CANAL	1949	71
30095	US-41 (SR-90)	BYPASS CANAL	1949	71
30097	US-41 (SR-90)	Canal 097	1949	71
30098	US-41 (SR-90)	Canal 098	1949	71
30099	US-41 (SR-90)	Canal 099	1949	71
30100	US-41 (SR-90)	Canal 100	1949	71
30101	US-41 (SR-90)	Canal 101	1949	71
30103	US-41 (SR-90)	Canal 103	1949	71

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Bridge Number	Route	Crossing	Year Built	Age (years)
30104	US-41 (SR-90)	Canal 104	1949	71
30105	US-41 (SR-90)	Canal 105	1949	71
30106	US-41 (SR-90)	Canal 106	1949	71
30107	US-41 (SR-90)	Canal 107	1949	71
30108	US-41 (SR-90)	Canal 108	1949	71
30109	US-41 (SR-90)	Canal 109	1949	71
30110	US-41 (SR-90)	Canal 110	1949	71
30114	US-41 (SR-90)	Canal 114	1949	71
30115	US-41 (SR-90)	Canal 115	1949	71
30116	US-41 (SR-90)	Canal 116	1949	71
30117	US-41 (SR-90)	Canal 117	1949	71
30032	WAGON WHEEL RD.	DEEP LAKE STRAND	1950	70
30060	US-41 (SR-90)	Canal 060	1950	70
30078	US-41 (SR-90)	Canal 078	1950	70
30111	US-41 (SR-90)	Canal 111	1950	70
30142	SR-82	Canal 142	1950	70
30143	SR-82	Canal 143	1950	70
30112	US-41 (SR-90)	Canal 112	1951	69
30113	US-41 (SR-90)	Canal 113	1951	69
30153	CR 858	OKALOACOOCHEE SLOUGH	1951	69
30154	CR 858	OKALOACOOCHEE SLOUGH	1951	69
30155	CR 858	OKALOACOOCHEE SLOUGH	1951	69
30156	CR-858	OKALOACOOCHEE SLOUGH	1951	69
30061	US-41 (SR-90)	Canal 061	1952	68
30065	US-41 (SR-90)	Canal 065	1952	68
30066	US-41 (SR-90)	Canal 066	1952	68
30067	US-41 (SR-90)	Canal 067	1952	68
30068	US-41 (SR-90)	Canal 068	1952	68
30069	US-41 (SR-90)	Canal 069	1952	68
30070	US-41 (SR-90)	Canal 070	1952	68
30072	US-41 (SR-90)	Canal 072	1952	68
30073	US-41 (SR-90)	Canal 073	1952	68
30074	US-41 (SR-90)	Canal 074	1952	68
30075	US 41 (SR 90)	Canal 075	1952	68
30077	US-41 (SR-90)	Canal 077	1952	68
30071	US-41 (SR-90)	Canal 071	1953	67
30081	US-41 (SR-90)	Canal 081	1953	67
30158	CR 858	OBIE CANAL	1953	67
30047	US-41	DRAINAGE CANAL 047	1954	66
30049	US-41	DRAINAGE CANAL 049	1954	66
30059	US-41 (SR-90)	Canal 059	1954	66
30076	US-41 (SR-90)	Canal 076	1954	66
30082	US-41 (SR-90)	Canal 082	1954	66
30085	US-41 (SR-90)	Canal 085	1954	66
30089	US-41 (SR-90)	Canal 089	1954	66
30951	US-41	Canal 951	1954	66
30039	US-41 (SR-45)	DRAINAGE CANAL 039	1955	65
30042	US-41 (SR-45)	DRAINAGE CANAL 042	1955	65
30043	US-41 (SR-45)	DRAINAGE CANAL 043	1955	65

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Bridge Number	Route	Crossing	Year Built	Age (years)
30044	US-41 (SR-45)	DRAINAGE CANAL 044	1955	65
30045	US-41 (SR-45)	DRAINAGE CANAL 045	1955	65
30046	US-41 (SR-45)	DRAINAGE CANAL 046	1955	65
30048	US-41	DRAINAGE CANAL 048	1955	65
30050	US-41	DRAINAGE CANAL 041	1955	65
30052	US-41	DRAINAGE CANAL 052	1955	65
30054	US-41	DRAINAGE CANAL 054	1955	65
30055	US-41	DRAINAGE CANAL 055	1955	65
30057	US-41	Canal 057	1955	65
30058	US-41	Canal 058	1955	65
30080	US-41 (SR 90)	Canal 080	1955	65
30086	US-41 (SR-90)	Canal 086	1955	65
30157	CR-837	FAKAHATCHEE STRAND	1955	65
30160	CR-846	GATOR CANAL	1955	65
30940	US-41 (SR-90)	Canal 940	1955	65
30941	US-41(SR-45/SR-90)	Canal 941	1955	65
30090	US-41 (SR-90)	Canal 090	1956	64
34101	PARK SHORE DR	MOORING BAY	1957	63
30165	CR837 WAGON WHL RD	DEEP LAKE STRAND	1959	61
30166	TURNER RIVER ROAD	COPELAND PRAIRIE	1960	60
34014	GREEN BLVD.	GOLDEN GATE CANAL	1960	60
34032	WILSON BLVD.	CYPRESS CANAL	1960	60
34046	PALM RIVER BLVD	PALM RIVER CANAL	1960	60
30084	US-41 (SR-90)	Park Canal	1961	59
30168	CR 839	EAST HINSON MARSH	1962	58
30169	CR839 TURNER RIVRD	EAST HINSON MARSH	1962	58
34111	PALM DRIVE	CANAL	1962	58
30172	GOLDEN GATE PKWY	GORDON RIVER	1963	57
30122	CR-29	BARRON RIVER	1964	56
34037	CR 846	DRAINAGE CANAL	1964	56
30006	I-75 SB/SR-93	NUNYA CREEK	1965	55
30007	I-75 SB (SR-93)	FIREBIRD CANAL	1965	55
30019	SR-29	Canal 019	1965	55
30062	US-41 (SR-90)	Canal 062	1965	55
34012	SW 25TH AVE.	CR-951 CANAL	1965	55
34019	32ND AVE. SW	SHELL CANAL	1965	55
34030	GOLDEN GATE BLVD	FAKA UNION CANAL	1965	55
34042	18th AVENUE NE	GOLDEN GATE CANAL	1965	55
34044	18TH AVE. NE	GOLDEN GATE DRAIN CANAL	1965	55
34048	RANDALL BLVD.	GOLDEN GATE MAIN CANAL	1965	55
34050	RANDALL BLVD.	FAKA UNION CANAL	1965	55
34052	43RD AVE. NE	FAKA UNION CANAL	1965	55
34054	56TH AVE NE	CIA DRAIN CANAL	1965	55
35250	HARBOUR DRIVE	MOORING BAY	1965	55
30001	I-75 (SR-93) SB	GOLDEN GATE CANAL	1966	54
30002	I-75 (SR-93) SB	FAKA UNION CANAL	1966	54
30003	I-75 SB (SR-93)	Canal 003	1966	54
30011	I-75 SB (SR-93)	Canal 011	1966	54
30033	CR 846	DRAINAGE CANAL	1966	54

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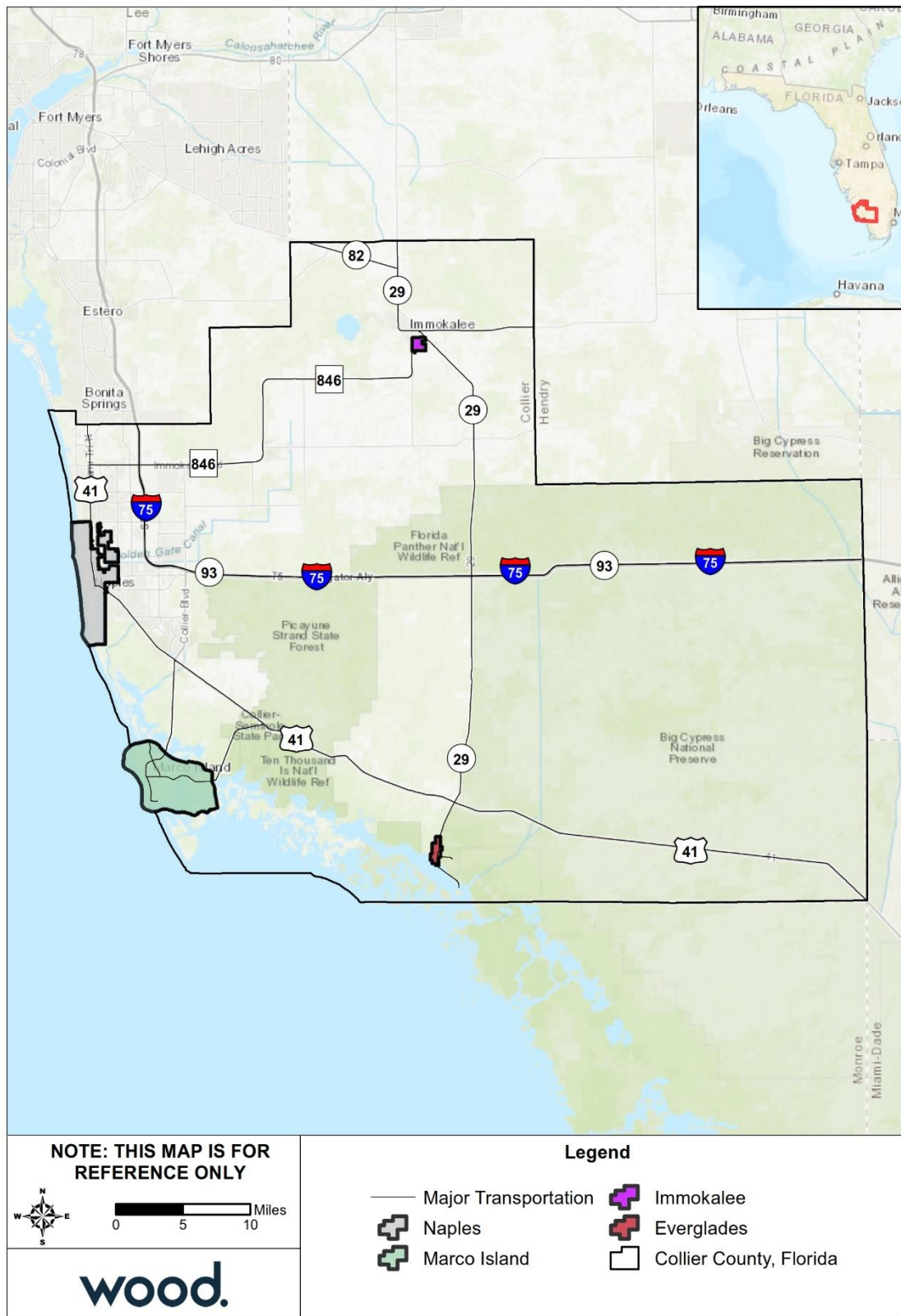
Bridge Number	Route	Crossing	Year Built	Age (years)
30038	CR-846	DRAINAGE CANAL	1966	54
30063	US-41 (SR-90)	Canal 063	1966	54
30064	US-41 (SR-90)	Canal 064	1966	54
30150	CR-858	FAKA UNION CANAL	1966	54
30251	I-75 SB (SR-93)	EAST HINSON SLOUGH	1966	54
34036	CYPRESS WAY	COCOHATCHEE CANAL	1966	54
30012	I-75 SB (SR-93)	Canal 012	1967	53
30027	I-75 SB (SR-93)	Canal 027	1967	53
30028	I-75 SB (SR-93)	Canal 028	1967	53
30029	I-75 SB (SR-93)	Canal 029	1967	53
30030	I-75 SB (SR-93)	Canal 030	1967	53
34006	STEWART BLVD.	PICAYUNE STRAND	1967	53
34008	STEWART BLVD.	DRAINAGE CANAL	1967	53
34103	CORONADO PKWY WB	CORONADO CANAL	1967	53
34105	SUNSHINE BLVD.	GREEN CANAL	1967	53
34106	20TH PLACE SW	HUNTER CANAL	1967	53
34113	WINTERBERRY DRIVE	SMOKEHOUSE CREEK	1967	53
34122	TED CURCIE ROAD	DRAINAGE CANAL	1967	53
30021	I-75 SB (SR-93)	REST AREA CANAL	1968	52
30022	CR 850	PRIVATE CANAL	1968	52
30119	IMMOKALEE RD	COCOHATCHEE RIVER	1968	52
34108	18TH AVENUE SW	GREEN CANAL	1968	52
34123	CR-890	RELIEF CANAL	1968	52
30145	US-41 NB	FAKA UNION CANAL	1969	51
30146	US-41 SB	FAHKA UNION CANAL	1969	51
30148	SR-951 NB(COLLIER)	BIG MARCO PASS	1969	51
30149	BLUEBILL AVE CR846	NAPLES PARK CANAL	1969	51
30017	US 41 SB (SR 45)	COCOHATCHEE RIVER	1970	50
30037	US-41 (SR-90)	DRAINAGE CANAL 037	1970	50
30123	GLDN GT PKWY CR886	SANTA BARBARA CNL	1971	49
30147	BIRDON RD - CR-841	HALFWAY CREEK	1971	49
30920	US-41 (SR-90)	Canal 920	1971	49
34102	CORONADO PKWY EB	CORONADO CANAL	1972	48
34116	GOLDENROD AVE.	SMOKEHOUSE BAY	1972	48
34117	KENDALL DR	CLAM BAY	1972	48
34118	HERNANDO DRIVE	CLAM BAY	1972	48
34119	BLACKMORE COURT	CLAM BAY	1972	48
34120	KENDALL DR	COLLIER BAY	1972	48
30174	CR951/COLLIER BLVD	BIG CYPRESS BASIN CANAL	1973	47
34112	CAXAMBAS COURT	ROBERTS BAY	1973	47
30181	US-41 (SR-45)	DUNRUSS CREEK	1974	46
30125	MOORINGLINE DRIVE	DOCTOR PASS INLET	1975	45
30184	CR-92 SAN MARCO RD	MARCO CHANNEL	1975	45
30183	US 41NB TAMIAMI TR	HALDEMAN RIVER	1976	44
30193	US-41SB TAMIAMI TR	TAYLOR GLEAM CANAL	1976	44
30194	US 41 (SR 90)	GATOR HOLE	1976	44
30185	AIRPORT PULLING RD	BIG CYPRESS BASIN CANAL	1978	42
34011	TROPICANA BLVD. NB	TROPICANA CANAL	1978	42
34017	TROPICANA BLVD. SB	TROPICANA CANAL	1978	42

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Bridge Number	Route	Crossing	Year Built	Age (years)
30186	AIRPORT RD.(CR-31)	ROCK CREEK	1979	41
30207	N COLLIER BLVD	CLAM BAY	1979	41
30189	I-75 SB (SR93)	ROCK CANAL	1980	40
30190	I-75 NB (SR93)	ROCK CANAL	1980	40
34107	SUNSET ROAD	SUNSHINE CANAL	1980	40
30200	I-75 SB (SR 93)	CR 896/PINE RIDGE RD	1983	37
30201	I-75 NB (SR 93)	CR 896/PINE RIDGE RD	1983	37
30202	I-75 SB (SR 93)	CR862(VANDERBILT BCH RD)	1983	37
30203	I-75 NB (SR 93)	CR862(VANDERBILT BCH RD)	1983	37
34132	SANTA BARBARA BLVD	GOLDEN GATE CANAL	1983	37
34133	CR-896(PINE RIDGE)	GORDON CANAL	1983	37
34135	TOWER RD	EAGLE CREEK	1983	37
30195	I-75 NB (SR-93)	SR-951	1984	36
30196	I-75 SB (SR-93)	SR-951	1984	36
30197	I-75 SB (SR-93)	GOLDEN GATE CANAL	1984	36
30198	I-75 NB (SR-93)	GOLDEN GATE CANAL	1984	36
30199	CR886(GLDN GT PKY)	I-75 AND CANAL C-1	1984	36
30205	SANTA BARBARA BLVD	I-75 (SR 93)	1984	36
30210	W PLANTATION PKWY	EVERGLADES DRAIN CANAL	1985	35
34124	CR-31(BAYSHORE DR)	HALDERMAN CREEK	1985	35
30211	SR-29	Canal 211	1986	34
30212	SR-29	Canal 212	1986	34
30213	SR-29	Canal 213	1986	34
34126	SANDHILL ST.	TIDAL CANAL	1986	34
34127	SOUTH SEAS COURT	TIDAL CANAL	1986	34
30290	SR-84 (Davis Blvd)	Canal	1988	32
34823	OAKES BLVD	DRAINAGE CANAL	1988	32
30221	I-75/SR-93 SB	PENNINGTON CAMP WC X 4	1989	31
30222	I-75/SR-93 NB	PENNINGTON CAMP WC X 4	1989	31
30223	I-75/SR-93 NB	KOJAK CREEK	1989	31
30224	I-75/SR-93 SB	WILDLIFE CROSSING NO-6	1989	31
30225	I-75 NB	WILDLIFE CROSSING NO-6	1989	31
30226	I-75 SB (SR-93)	WILDLIFE CROSSING NO-7	1989	31
30227	I-75 NB (SR-93)	WILDLIFE CROSSING NO-7	1989	31
30228	I-75 SB (SR-93)	WILDLIFE CROSSING NO-8	1989	31
30229	I-75 NB (SR-93)	WILDLIFE CROSSING NO-8	1989	31
30230	I-75 NB (SR-93)	NUNYA CREEK	1989	31
30231	I-75 SB (SR-93)	SLOANS CROSSING WC-10	1989	31
30232	I-75 NB (SR-93)	SLOANS CROSSING WC-10	1989	31
30233	I-75 NB (SR-93)	FIREBIRD CANAL	1989	31
30234	I-75 SB (SR-93)	SHANNAS CROSSING WC 12	1989	31
30235	I-75 NB (SR-93)	SHANNAS CROSSING WC 12	1989	31
30102	US-41 (SR-90)	Canal 102	1940	80

Source: Florida Department of Transportation, updated January 2020

Figure 2.40 – Key Transportation Routes in the Planning Area



Source: Collier County

### Extent

The significance of any transportation infrastructure failure will vary depending on the location and nature of the infrastructure itself. The loss of a local road may have only minor impacts limited to the immediate area. However, the loss of a major highway or key bridge could cause significant disruption across the Region. Depending on time of day and the onset of the failure, significant casualties are also possible: the 1967 Silver Bridge collapse between Point Pleasant, West Virginia and Gallipolis, Ohio and the 1980 Sunshine Skyway Bridge collapse outside St. Petersburg, Florida killed 46 and 35 people respectively. If a bridge or key route were closed or failed during a hurricane evacuation, it could put thousands of residents and visitors at risk.

*Impact: 3 – Critical*

*Spatial Extent: 2 – Small*

### Historical Occurrences

A 2014 analysis of bridge failure rates by Dr. Wesley Cook of Utah State University found that an average of 128 bridges collapse every year in the U.S.; 53% of bridges that collapsed had been rated as structurally deficient prior to their collapse. Only 4% of bridge collapses resulted in loss of life.

### Probability of Future Occurrence

The likelihood of a major transportation infrastructure failure occurring in Collier County is difficult to quantify. The continuing age and deterioration of America's transportation infrastructure, coupled with increasing traffic and declining public investment in maintaining our infrastructure, indicate that road and bridge failures are likely to be more common in future decades than they have in the past. The American Society of Civil Engineers (ASCE) has estimated that \$2.2 trillion would be needed to bring the nation's infrastructure up to a condition that meets the needs of the current population (note that this total includes non-transportation infrastructure). The potential for accidents and failures from infrastructure operating beyond its intended lifespan or with insufficient maintenance thus continues to increase.

According to the Federal Highway Administration (FHA), Florida ranks 50<sup>th</sup> among the 50 states in having the most roads in poor condition (1.3 percent) and 44<sup>th</sup> in terms of number of bridges rated as structurally deficient (2.6 percent), making Florida rank 49<sup>th</sup> overall for worst roads (or 2<sup>nd</sup> out of 50 for best road infrastructure).

*Probability: 2 – Possible*

### Climate Change

Climate change could cause more major infrastructure incidents in some cases. As sea level rises, bridges may be more vulnerable to flooding or scour, roads could be flooded as well, and other types of transportation could be hindered.

### Vulnerability Assessment

The impacts of transportation failures vary widely by the type of system, as well as the time of day and season of the failure.

### Methodologies and Assumptions

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Vulnerability to transportation infrastructure failures was assessed based on past occurrences nationally and internationally as well as publicly available information on infrastructure vulnerability.

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### People

People can be injured or killed during transportation infrastructure failures. As noted above, the U.S. averages five fatality-causing bridge collapses per year, although data on the number of fatalities involved was not available. Numbers of non-fatal injuries was also not available.

Aside from direct injuries and fatalities, transportation failures can result in significant losses of time and money as individuals and commercial shipments are detoured or blocked. Disruption of transportation systems can limit the ability of emergency services and utility work crews to reach affected areas and can put some members of the public at severe risk if they are unable to reach needed medical services, such as dialysis patients.

In extreme cases, a transportation failure could leave residents stranded without power, food, or other emergency supplies. Residents at a public meeting in Buxton expressed concern that a road or bridge washout following a major storm will leave them stranded for an extended period without emergency supplies or an alternative route off the island.

### Property

The primary property damage from transportation infrastructure failures is to the infrastructure itself, as well as to privately-owned automobiles.

### Environment

Transportation infrastructure failures can result in oil spills or other hazardous materials releases that can severely impact the environment in the surrounding area.

### Consequence Analysis

Table 2.70 summarizes the potential consequences of a transportation infrastructure failure.

**Table 2.70 – Consequence Analysis – Transportation Infrastructure Failure**

Category	Consequences
Public	Potential injuries and fatalities.
Responders	Potential injuries and fatalities, as well as potentially significant delays to response times.
Continuity of Operations (including Continued Delivery of Services)	Loss of key roads or bridges can affect delivery of services.
Property, Facilities and Infrastructure	In addition to the loss of transportation infrastructure itself, sustained road closure can impact supply chain deliveries to other critical facilities.
Environment	Potential for oil spills or other hazardous materials releases.
Economic Condition of the Jurisdiction	Delays in movement of commuters, as well as good and services
Public Confidence in the Jurisdiction's Governance	Can cause loss of confidence in government's ability to maintain other critical infrastructure

### Hazard Summary by Jurisdiction

The following table summarizes major transportation incident risk by jurisdiction. Risk is not expected to change substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	2	3	1	4	4	2.5	H

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Immokalee Reservation	2	3	1	4	4	2.5	H
Marco Island	2	3	1	4	4	2.5	H
Naples	2	3	1	4	4	2.5	H
Unincorporated Collier County	2	3	1	4	4	2.5	H

### 2.5.14 Pandemic Outbreak

#### Hazard Description

Public health emergencies can take many forms—disease epidemics, large-scale incidents of food or water contamination, or extended periods without adequate water and sewer services. There can also be harmful exposure to chemical, radiological, or biological agents, and largescale infestations of disease-carrying insects or rodents. The first part of this section focuses on emerging public health concerns and potential pandemics, while the second part addresses natural and human-caused air and water pollution.

Public health emergencies can occur as primary events by themselves, or they may be secondary to another disaster or emergency, such as tornado, flood, or hazardous material incident. For more information on those particular incidents, see Sections 2.5.2 (Tornado), 2.5.1 (Flood), and 2.5.15 (Hazardous Materials). The common characteristic of most public health emergencies is that they adversely impact, or have the potential to adversely impact, many people. Public health emergencies can be worldwide or localized in scope and magnitude.

The Florida Department of Health in Collier County has partnered with Collier Emergency Management and the local Red Cross chapter to plan and prepare for public health emergencies. The Department of Health provides resources and guidance in support of business, community, faith-based organization, health care provider, and individual preparedness.

The primary communicable, or infectious, disease addressed within this plan is influenza:

**Influenza** - Whether natural or manmade, health officials say the threat of a dangerous new strain of influenza (flu) virus in pandemic proportions is a very real possibility in the years ahead. Unlike most illnesses, the flu is especially dangerous because it is spread through the air. A classic definition of influenza is a respiratory infection with fever. Each year, flu infects humans and spreads around the globe. There are three types of influenza virus: Types A, B, and C. Type A is the most common, most severe, and the primary cause of flu epidemics. Type B cases occur sporadically and sometimes as regional or widespread epidemics. Type C cases are quite rare and hence sporadic, but localized outbreaks have occurred. Seasonal influenza usually is treatable, and the mortality rate remains low. Each year, scientists estimate which strain of flu is likely to spread, and they create a vaccine to combat it. A flu pandemic occurs when the virus suddenly changes or mutates and undergoes an —antigenic shift, permitting it to attach to a person’s respiratory system and leave the body’s immune system defenseless against the invader.

Additional diseases of public health concern include tuberculosis, Smallpox, St. Louis Encephalitis, Meningitis, Lyme disease, West Nile, SARS, Zika, and Ebola. These communicable diseases are introduced within this plan, but full vulnerability analyses are not included at this time.

**Tuberculosis** - Tuberculosis, or TB, is the leading cause of infectious disease worldwide. It is caused by a bacteria called *Mycobacterium tuberculosis* that most often affects the lungs. TB is an airborne disease spread by coughing or sneezing from one person to another. The World Health Organization (WHO) estimates that one-third of the world's population, approximately two billion people, has latent TB, which means people have been infected by TB bacteria but are not yet ill with the disease and cannot transmit the disease. In 2015, 10.4 million people fell ill with TB and 1.8 million died from the disease (including 0.4 million among people with HIV). Over 95% of TB deaths occur in low- and middle- income countries.

**Smallpox** - Smallpox is a contagious, sometimes fatal, infectious disease. There is no specific treatment for smallpox disease, and the only prevention is vaccination. Smallpox is caused by the variola virus that emerged in human populations thousands of years ago. It is generally spread by face- to-face contact or by direct contact with infected bodily fluids or contaminated objects (such as bedding or clothing). A

person with smallpox is sometimes contagious with onset of fever, but the person becomes most contagious with the onset of rash. The rash typically develops into sores that spread over all parts of the body. The infected person remains contagious until the last smallpox scab is gone. Smallpox outbreaks have occurred periodically for thousands of years, but the disease is now largely eradicated after a worldwide vaccination program was implemented. After the disease was eliminated, routine vaccination among the general public was stopped. The last case of smallpox in the United States was in 1949.

**St. Louis Encephalitis** - In the United States, the leading type of epidemic flaviviral Encephalitis is St. Louis encephalitis (SLE), which is transmitted by mosquitoes that become infected by feeding on birds infected with the virus. SLE is the most common mosquito-transmitted pathogen in the United States. There is no evidence to suggest that the virus can be spread from person to person.

**Meningitis** - Meningitis is an infection of fluid that surrounds a person's spinal cord and brain. High fever, headache, and stiff neck are common symptoms of meningitis, which can develop between several hours to one to two days after exposure. Meningitis can be caused by either a viral or bacterial infection; however, a correct diagnosis is critically important, because treatments for the two varieties differ. Meningitis is transmitted through direct contact with respiratory secretions from an infected carrier. Primary risk groups include infants and young children, household contact with patients, and refugees. In the United States, periodic outbreaks continue to occur, particularly among adolescents and young adults. About 2,600 people in the United States get the disease each year. Generally, 10 to 14 percent of cases are fatal, and 11 to 19 percent of those who recover suffer from permanent hearing loss, mental retardation, loss of limbs, or other serious effects. Two vaccines are available in the United States.

**Lyme Disease** - Lyme disease was named after the town of Lyme, Connecticut, where an unusually large frequency of arthritis-like symptoms was observed in children in 1977. It was later found that the problem was caused by bacteria transmitted to humans by infected deer ticks, causing an average of more than 16,000 reported infections in the United States each year (however, the disease is greatly under-reported). Lyme disease bacteria are not transmitted from person to person. Following a tick bite, 80 percent of patients develop a red —bulls-eye|| rash accompanied by tiredness, fever, headache, stiff neck, muscle aches, and joint pain. If untreated, some patients may develop arthritis, neurological abnormalities, and cardiac problems, weeks to months later. Environmental issues addressed in this profile focus on air and water pollution, because contamination of those media can have widespread impacts on public health and devastating consequences. Issues of primary concern associated with sources of air and water pollution change over time depending on recent industrial activity, economic development, enforcement of environmental regulations, new scientific information on adverse health effects of particular contaminants or concentrations, and other factors. Lyme disease is rarely fatal. During early stages of the disease, oral antibiotic treatment is generally effective, while intravenous treatment may be required in more severe cases.

**West Nile Virus** - West Nile virus is a flavivirus spread by infected mosquitoes and is commonly found in Africa, West Asia, and the Middle East. It was first documented in the United States in 1999. Although it is not known where the U.S. virus originated, it most closely resembles strains found in the Middle East. It is closely related to St. Louis encephalitis and can infect humans, birds, mosquitoes, horses, and other mammals.

Most people who become infected with West Nile virus will have either no symptoms or only mild effects. However, on rare occasions, the infection can result in severe and sometimes fatal illness. There is no evidence to suggest that the virus can be spread from person to person.

An abundance of dead birds in an area may indicate that West Nile virus is circulating between the birds and mosquitoes in that area. Although birds are particularly susceptible to the virus, most infected birds

survive. The continued expansion of West Nile virus in the United States indicates that it is permanently established in the Western Hemisphere.

**Severe Acute Respiratory Syndrome** - Severe acute respiratory syndrome (SARS) is a respiratory illness that has recently been reported in Asia, North America, and Europe. Although the cause of SARS is currently unknown, scientists have detected in SARS patients a previously unrecognized coronavirus that appears to be a likely source of the illness. In general, humans infected with SARS exhibit fevers greater than 100.4 F, headaches, an overall feeling of discomfort, and body aches. Some people also experience mild respiratory symptoms. After two to seven days, SARS patients may develop a dry cough and have trouble breathing. The primary way that SARS appears to spread is by close person-to-person contact; particularly by an infected person coughing or sneezing contaminated droplets onto another person, with a transfer of those droplets to the victim's eyes, nose, or mouth.

**Zika Virus** - Discovered in the Zika forest of Uganda in 1947, the Zika virus is a member of the flavivirus family. It is transmitted to humans through the bite of an infected *Aedes* species mosquito (*Ae. aegypti* and *Ae. albopictus*). Zika virus can also be transmitted from an infected pregnant woman to her baby during pregnancy and can result in serious birth defects, including microcephaly. Less commonly, the virus can be spread through intercourse or blood transfusion. However, most people infected with the Zika virus do not become sick.

**Ebola** - previously known as Ebola hemorrhagic fever, is a rare and deadly disease caused by infection with one of the Ebola virus species. It was first discovered in 1976 near the Ebola River in what is now the Democratic Republic of the Congo. Since then, outbreaks have appeared sporadically in Africa.

Additional environmental concerns addressed in this hazard profile focus on air and water pollution, because contamination of those media can have widespread impacts on public health and devastating consequences. Issues of primary concern associated with sources of air and water pollution change over time depending on recent industrial activity, economic development, enforcement of environmental regulations, new scientific information on adverse health effects of contaminants or concentrations, and other factors.

*Warning Time: 1 – More than 24 hours*

*Duration: 4 – More than one week*

### Location

Infectious disease outbreaks can occur anywhere in the planning area, especially where there are groups of people in close quarters.

### Extent

When on an epidemic scale, diseases can lead to high infection rates in the population causing isolation, quarantine, and potential mass fatalities. An especially severe influenza pandemic or other major disease outbreak could lead to high levels of illness, death, social disruption, and economic loss. Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines.

Table 2.71 describes the World Health Organization's six main phases to a pandemic flu as part of their planning guidance.

**Table 2.71 – World Health Organization's Pandemic Flu Phases**

Phase	Description
1	No animal influenza virus circulating among animals have been reported to cause infection in humans.
2	An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is therefore considered a specific potential pandemic threat.
3	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people but has not resulted in human-to-human transmission sufficient enough to sustain community-level breakouts.
4	Human-to-human transmission of an animal or human-animal influenza reassortant virus able to sustain community-level breakouts has been verified.
5	The same identified virus has caused sustained community-level outbreaks in two or more countries in one WHO region.
6	In addition to the criteria defined in Phase 5, the same virus has caused sustained community-level outbreaks in at least one other country in another WHO region.
Post-Peak Period	Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.
Post-Pandemic Period	Levels of influenza activity have returned to levels seen for seasonal influenza in most countries with adequate surveillance.

Source: World Health Organization

*Impact: 3 – Critical*

*Spatial Extent: 3 – Moderate*

#### Historical Occurrences

#### Public Health Emergencies – Influenza Pandemics

Since the early 1900s, four lethal pandemics have swept the globe: Spanish Flu of 1918-1919; Asian Flu of 1957-1958; Hong Kong Flu of 1968-1969; and Swine Flu of 2009-2010. The Spanish Flu was the most severe pandemic in recent history. The number of deaths was estimated to be 50-100 million worldwide and 675,000 in the United States. Its primary victims were mostly young, healthy adults. The 1957 Asian Flu pandemic killed about 70,000 people in the United States, mostly the elderly and chronically ill. The 1968 Hong Kong Flu pandemic killed 34,000 Americans. The 2009 Swine Flu caused 12,469 deaths in the United States. These historic pandemics are further defined in the following paragraphs along with several “pandemic scares”.

#### *Spanish Flu (H1N1 virus) of 1918-1919*

In 1918, when World War I was in its fourth year, another threat began that rivaled the war itself as the greatest killer in human history. The Spanish Flu swept the world in three waves during a two-year period, beginning in March 1918 with a relatively mild assault.

The first reported case occurred at Camp Funston (Fort Riley), Kansas, where 60,000 soldiers trained to be deployed overseas. Within four months, the virus traversed the globe, as American soldiers brought the virus to Europe. The first wave sickened thousands of people and caused many deaths (46 died at Camp Funston), but it was considered mild compared to what was to come. The second and deadliest wave struck in the autumn of 1918 and killed millions. At Camp Funston alone, there were 14,000 cases and 861 deaths reported during the first three weeks of October 1918.

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Outbreaks caused by a new variant exploded almost simultaneously in many locations including France, Sierra Leone, Boston, and New York City, where more than 20,000 people died that fall. The flu gained its name from Spain, which was one of the hardest hit countries. From there, the flu went through the Middle East and around the world, eventually returning to the United States along with the troops.

Of the 57,000 Americans who died in World War I, 43,000 died as a result of the Spanish Flu. At one point, more than 10 percent of the American workforce was bedridden. By a conservative estimate, a fifth of humans suffered the fever and aches of influenza between 1918 and 1919 and 20 million people died. At the height of the flu outbreak during the winter of 1918-1919, at least 20% of North Carolinians were infected by the disease. Ultimately, 10,000 citizens of the state succumbed to this disease.

### *Asian Flu (H2N2 virus) of 1957-1958*

This influenza pandemic was first identified in February 1957 in the Far East. Unlike the Spanish Flu, the 1957 virus was quickly identified, and vaccine production began in May 1957. A number of small outbreaks occurred in the United States during the summer of 1957, with infection rates highest among school children, young adults, and pregnant women; however, the elderly had the highest rates of death. A second wave of infections occurred early the following year, which is typical of many pandemics.

### *Hong Kong Flu (H3N2 virus) of 1968-1969*

This influenza pandemic was first detected in early 1968 in Hong Kong. The first cases in the United States were detected in September 1968, although widespread illness did not occur until December. This became the mildest pandemic of the twentieth century, with those over the age of 65 the most likely to die. People infected earlier by the Asian Flu virus may have developed some immunity against the Hong Kong Flu virus. Also, this pandemic peaked during school holidays in December, limiting student-related infections.

### *Pandemic Flu Threats: Swine Flu of 1976, Russian Flu of 1977, and Avian Flu of 1997 and 1999*

Three notable flu scares occurred in the twentieth century. In 1976, a swine-type influenza virus appeared in a U.S. military barracks (Fort Dix, New Jersey). Scientists determined it was an antigenically drifted variant of the feared 1918 virus. Fortunately, a pandemic never materialized, although the news media made a significant argument about the need for a Swine Flu vaccine.

In May 1977, influenza viruses in northern China spread rapidly and caused epidemic disease in children and young adults. By January 1978, the virus, subsequently known as the Russian Flu, had spread around the world, including the United States. A vaccine was developed for the virus for the 1978–1979 flu season. Because illness occurred primarily in children, this was not considered a true pandemic.

In March 1997, scores of chickens in Hong Kong’s rural New Territories began to die—6,800 on three farms alone. The Avian Flu virus was especially virulent and made an unusual jump from chickens to humans. At least 18 people were infected, and six died in the outbreak. Chinese authorities acted quickly to exterminate over one million chickens and successfully prevented further spread of the disease. In 1999, a new avian flu virus appeared. The new virus caused illness in two children in Hong Kong. Neither of these avian flu viruses started pandemics.

### *Swine Flu (H1N1 virus) of 2009–2010*

This influenza pandemic emerged from Mexico in 2009. The first U.S. case of [H1N1, or Swine Flu](#), was diagnosed on April 15, 2009. The U.S. government declared H1N1 a public health emergency on April 26. By June, approximately 18,000 cases of H1N1 had been reported in the United States. A total of 74 countries were affected by the pandemic.

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The CDC estimates that 43 million to 89 million people were infected with H1N1 between April 2009 and April 2010. There were an estimated 8,870 to 18,300 H1N1 related deaths. On August 10, 2010, the [World Health Organization \(WHO\) declared an end to the global H1N1 flu pandemic](#).

### Public Health Emergencies – Other Pandemics

#### *St. Louis Encephalitis, 1964-2005*

Between 1964 and 2005, there were 4,651 confirmed cases of SLE in the United States. In 1990 alone, there were 223 cases in Florida. It should be noted, however, that less than 1 percent of SLE infections are clinically apparent, so most infections remain undiagnosed. Illnesses range from mild headaches and fever to convulsions, coma, and paralysis. The last major outbreak of SLE occurred in the Midwest from 1974 to 1977, when over 2,500 cases were reported in 35 states. The most recent outbreak of St. Louis encephalitis was in 1999 in New Orleans, Louisiana, with 20 reported cases. The disease is generally milder in children than in adults, with the elderly at highest risk for severe illness and death. Approximately 3 to 30 percent of cases are fatal; no vaccine against SLE exists. In 2014, two U.S. cases were reported and were the first human cases since 2002.

#### *Meningitis, 1996-1997, 2005*

During 1996 and 1997, 213,658 cases of meningitis were reported, along with 21,830 deaths, in Africa. Between 2005 and 2014, Florida reported 354 cases of meningitis.

#### *Lyme Disease, 2015*

In the United States, Lyme disease is mostly found in the northeastern, mid-Atlantic, and upper north-central regions, and in several counties in northwestern California. In 2015, 95-percent of confirmed Lyme Disease cases were reported from 14 states: Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and Wisconsin. Lyme disease is the most commonly reported vector-borne illness in the United States. In 2015, it was the sixth most common [nationally notifiable disease](#), even though it does not occur nationwide.

#### *Severe Acute Respiratory Syndrome, 2003*

During November 2002-July 2003, a total of 8,098 probable SARS cases were reported to the World Health Organization (WHO) from 29 countries. In the United States, only 8 cases had laboratory evidence of infection. There were no confirmed cases in Florida. Since July 2003, when SARS transmission was declared contained, active global surveillance for SARS disease has detected no person-to-person transmission. CDC has therefore archived the case report summaries for the 2003 outbreak.

#### *Zika Virus, 2015*

In May 2015, the Pan American Health Organization issued an alert noting the first confirmed case of a Zika virus infection in Brazil. Since that time, Brazil and other Central and South America countries and territories, as well as the Caribbean, Puerto Rico, and the U.S. Virgin Islands have experienced ongoing Zika virus transmission. In August 2016, the Centers for Disease Control and Prevention (CDC) [issued guidance](#) for people living in or traveling to a 1-square-mile area in Miami, Florida, identified by the Florida Department of Health as having mosquito-borne spread of Zika. In October 2016, the transmission area was expanded to include a 4.5-square-mile area of Miami Beach and a 1-square mile area of Miami-Dade County. In addition, all Miami-Dade County was identified as a cautionary area with an unspecified level of risk. As of the end of 2018, the CDC reported 74 cases of Zika across the United States.

### *Ebola, 2014-2016*

Most recently, in March 2014, West Africa experienced the largest outbreak of Ebola in history. Wide spread transmission was found in Liberia, Sierra Leone, and Guinea with the number of cases totaling 28,616 and the number of deaths totaling 11,310. In the United States, four cases of Ebola were confirmed in 2014 including a medical aid worker returning to New York from Guinea, two healthcare workers at Texas Presbyterian Hospital who provided care for a diagnosed patient, and the diagnosed patient who traveled to Dallas, Texas from Liberia. All three healthcare workers recovered. The diagnosed patient passed away in October 2014.

In March 2016, the WHO terminated the public health emergency for the Ebola outbreak in West Africa.

### Probability of Future Occurrence

It is impossible to predict when the next pandemic will occur or its impact. The CDC continually monitors and assesses pandemic threats and prepares for an influenza pandemic. Novel influenza A viruses with pandemic potential include Asian lineage avian influenza A (H5N1) and (H7N9) viruses. These viruses have all been [evaluated](#) using the [Influenza Risk Assessment Tool \(IRAT\)](#) to assess their potential pandemic risk. Because the CDC cannot predict how severe a future pandemic will be, advance planning is needed at the national, state and local level; this planning is done through public health partnerships at the national, state and local level.

Today, a much larger percentage of the world's population is clustered in cities, making them ideal breeding grounds for epidemics. Additionally, the explosive growth in air travel means the virus could literally be spread around the globe within hours. Under such conditions, there may be very little warning time. Most experts believe we will have just one to six months between the time that a dangerous new influenza strain is identified and the time that outbreaks begin to occur in the United States. Outbreaks are expected to occur simultaneously throughout much of the nation, preventing shifts in human and material resources that normally occur with other natural disasters. These and many other aspects make influenza pandemic unlike any other public health emergency or community disaster.

### *Probability: 2 – Possible*

### Climate Change

According to the U.S. Global Change Research Program, the influences of climate change on public health are significant and varied. The influences range from the clear threats of temperature extremes and severe storms to less obvious connections related to insects. Climate and weather can also affect water and food quality in particular areas, with implications for public health.

Hot days can be unhealthy—even dangerous. High air temperatures can cause heat stroke and dehydration and affect people's cardiovascular and nervous systems. Florida is heavily influenced by tropical moisture since the state is surrounded by the Atlantic Ocean and the Gulf of Mexico. The heat index can get dangerously high, especially in the summer. In recent decades, severe heat waves have killed hundreds of people across the Southeast. Heat stress is expected to increase as climate change brings hotter summer temperatures and more humidity. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor.

Higher temperatures and wetter conditions tend to increase mosquito and tick activity, leading to an increased risk of zoonotic diseases. Mosquitos are known to carry diseases such as West Nile virus (WNV), La Crosse/California encephalitis, Jamestown Canyon virus, St. Louis encephalitis, and Eastern equine encephalitis. The two major concerns associated with warmer and wetter conditions are that the

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mosquito species already found in Florida and the diseases that they carry will become more prevalent, and that new species carrying unfamiliar diseases will start to appear for the first time.

Warmer winters with fewer hard freezes in areas that already see WNV-carrying mosquitos are likely to observe both a higher incidence of WNV and a longer WNV season, ultimately leading to an increase in human cases. Non-native mosquito species may move into Florida if the climate becomes more suitable for them, bringing with them diseases such as Jamestown Canyon virus, Chikungunya, and Dengue Fever.

Ticks are also well-known disease vectors in Florida, carrying pathogens such as Lyme disease, anaplasmosis, Ehrlichiosis, Powassan virus, and Babesiosis. Warmer, wetter weather can lead to an increase in algal blooms and declining beach health. An increase in flood events may also be associated with an increased incidence of mold problems in homes and businesses, as well as contamination of wells and surface waters due to sewer overflows and private septic system failures.

If these predictions come true, communities must contend with the human health impacts related to the increased prevalence of infectious diseases, heat waves, and changes in air and water quality. Public health officials will need to focus on spreading information and enacting pest and disease reduction. Flood prone communities will need to focus on continuously improving flood controls and mitigation strategies, including restricting building and chemical storage in floodplains, upgrading well and septic requirements, and providing water testing kits to residents.

### Vulnerability Assessment

#### People

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Disease spread and mortality is affected by a variety of factors, including virulence, ease of spread, aggressiveness of the virus and its symptoms, resistance to known antibiotics and environmental factors. While every pathogen is different, diseases normally have the highest mortality rate among the very young, the elderly or those with compromised immune systems. As an example, the unusually deadly 1918 H1N1 influenza pandemic had a mortality rate of 20%. If an influenza pandemic does occur, it is likely that many age groups would be seriously affected. The greatest risks of hospitalization and death—as seen during the last two pandemics in 1957 and 1968 as well as during annual outbreaks of influenza—will be to infants, the elderly, and those with underlying health conditions. However, in the 1918 pandemic, most deaths occurred in young adults. Few people, if any, would have immunity to a new virus.

Approximately twenty percent of people exposed to West Nile Virus through a mosquito bite develop symptoms related to the virus; it is not transmissible from one person to another. Preventive steps can be taken to reduce exposure to mosquitos carrying the virus; these include insect repellent, covering exposed skin with clothing and avoiding the outdoors during twilight periods of dawn and dusk, or in the evening when the mosquitos are most active.

#### Property

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For the most part, property itself would not be impacted by a human disease epidemic or pandemic. However, as concerns about contamination increase, property may be quarantined or destroyed as a precaution against spreading illness. Furthermore, staffing shortages could affect the function of critical facilities.

#### Environment

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A widespread pandemic would not have an impact on the natural environment unless the disease was transmissible between humans and animals. However, affected areas could result in denial or delays in the use of some areas, and may require remediation.

### Consequence Analysis

Table 2.72 summarizes the potential consequences of infectious disease.

**Table 2.72 – Consequence Analysis – Infectious Disease**

Category	Consequences
Public	Adverse impact expected to be severe for unprotected personnel and moderate to light for protected personnel.
Responders	Adverse impact expected to be severe for unprotected personnel and uncertain for trained and protected personnel, depending on the nature of the incident.
Continuity of Operations (including Continued Delivery of Services)	Danger to personnel in the area of the incident may require relocation of operations and lines of succession execution. Disruption of lines of communication and destruction of facilities may extensively postpone delivery of services.
Property, Facilities and Infrastructure	Access to facilities and infrastructure in the area of the incident may be denied until decontamination completed.
Environment	Incident may cause denial or delays in the use of some areas. Remediation needed.
Economic Condition of the Jurisdiction	Local economy and finances adversely affected, possibly for an extended period.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes pandemic outbreak risk by jurisdiction. This risk is not expected to change substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	2	3	3	1	4	2.6	H
Immokalee Reservation	2	3	3	1	4	2.6	H
Marco Island	2	3	3	1	4	2.6	H
Naples	2	3	3	1	4	2.6	H
Unincorporated Collier County	2	3	3	1	4	2.6	H

### 2.5.15 Hazardous Materials

#### Hazard Description

A hazardous substance is any substance that may cause harm to persons, property, or the environment when released to soil, water, or air. Chemicals are manufactured and used in increasing types and quantities. Each year over 1,000 new synthetic chemicals are introduced and as many as 500,000 products pose physical or health hazards and can be defined as “hazardous chemicals”. Hazardous substances are categorized as toxic, corrosive, flammable, irritant, or explosive. Hazardous material incidents generally affect a localized area.

#### Fixed Hazardous Materials Incident

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A fixed hazardous materials incident is the accidental release of chemical substances or mixtures during production or handling at a fixed facility.

#### Transportation Hazardous Materials Incident

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A transportation hazardous materials incident is the accidental release of chemical substances or mixtures during transport. Transportation Hazardous Materials Incidents in the Eno-Haw Region can occur during highway or air transport. Highway accidents involving hazardous materials pose a great potential for public exposures. Both nearby populations and motorists can be impacted and become exposed by accidents and releases. If airplanes carrying hazardous cargo crash, or otherwise leak contaminated cargo, populations and the environment in the impacted area can become exposed.

#### Pipeline Incident

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A pipeline transportation incident occurs when a break in a pipeline creates the potential for an explosion or leak of a dangerous substance (oil, gas, etc.) possibly requiring evacuation. An underground pipeline incident can be caused by environmental disruption, accidental damage, or sabotage. Incidents can range from a small, slow leak to a large rupture where an explosion is possible. Inspection and maintenance of the pipeline system along with marked gas line locations and an early warning and response procedure can lessen the risk to those near the pipelines.

*Warning Time: 4 – Less than six hours*

*Duration: 2 – Less than 24 hours*

#### Location

The Toxics Release Inventory (TRI) Program run by the U.S. Environmental Protection Agency (EPA) maintains a database of industrial facilities across the country and the type and quantity of toxic chemicals they release. The program also tracks pollution prevention activities and which facilities are reducing toxic releases. The Toxic Release Inventory reports 13 sites reporting hazardous materials in Collier County. These sites are shown in Figure 2.41 and detailed in Table 2.73.

**Table 2.73 – Toxic Release Inventory Facilities**

Facility Name	Facility Location
Arthrex Manufacturing, Inc. <sup>1</sup>	6875 Arthrex Commerce Drive, Ave Maria, FL 34142
Cemex Ave Maria	4811 Ave Maria Boulevard, Ave Maria, FL 34142
Cemex East Trail	15555 East Tamiami Trail, Naples, FL 34114
Cemex Prospect	3728 Prospect Avenue, Naples, FL 34103
Cemex Wiggins Pass	1425 Wiggins Pass Road East, Naples, FL 34110
Cemex Shirley Street	6100 Shirley Street, Naples, FL 34109

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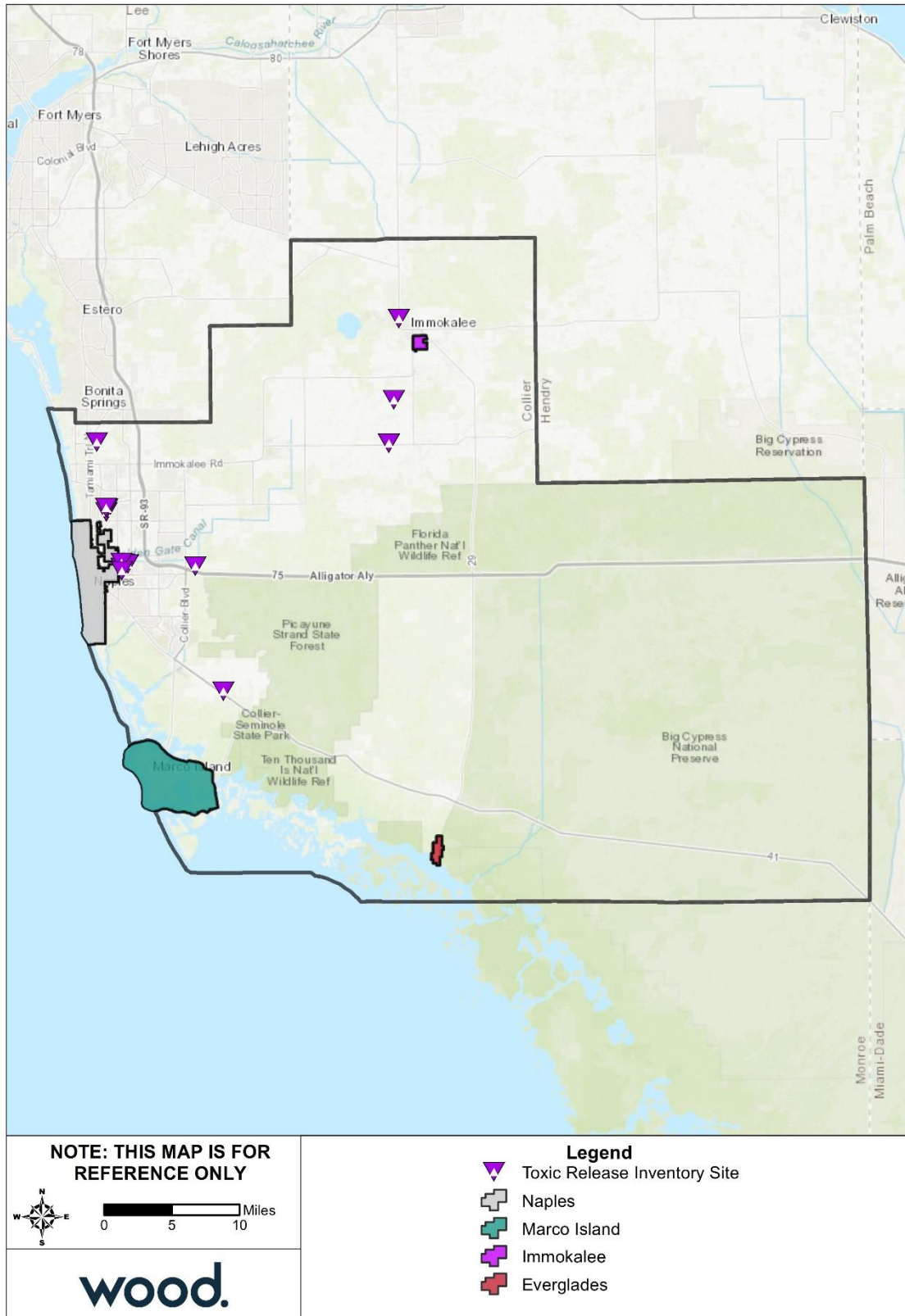
Facility Name	Facility Location
Commercial Refrigeration, Inc.	1901 J and C Boulevard, Naples, FL 34109
Florida Rock Industries, Inc. Naples Ready Mix Plant	4406 Progress Avenue, Naples, FL 34104
Interiors Cultured Marble, Inc.	1734 Trade Center Way, Naples, FL 34109
Naples Marble Co.	3963 Progress Avenue, Naples, FL 34104
Parker Hannifin Corporation	3580 Shaw Boulevard, Naples, FL 34117
Progress Rail Services	3581 Mercantile Avenue, Naples, FL 34104
SMI Florida Fabricators Naples	3684 Enterprise Avenue, Naples, FL 34104

Source: U.S. EPA Toxics Release Inventory, 2018

<sup>1</sup>This facility is listed in the TRI for three types of chemicals.

The U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) maintains an inventory of the location of all gas transmission and hazardous liquid pipelines as well as liquid natural gas plants and hazardous liquid breakout tanks. Collier County has no gas transmission pipelines or hazardous liquid pipelines as of January 2020 according to the public viewer of the National Pipeline Mapping System.

Figure 2.41 – Toxic Release Inventory Sites in Collier County



Source: EPA Toxic Release Inventory

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

### Extent

The magnitude of a hazardous materials incident can be defined by the material type, the amount released, and the location of the release. The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA), which records hazardous material incidents across the country, defines a “serious incident” as a hazardous materials incident that involves:

- ▶ a fatality or major injury caused by the release of a hazardous material,
- ▶ the evacuation of 25 or more persons as a result of the release of a hazardous material or exposure to fire,
- ▶ a release or exposure to fire which results in the closure of a major transportation artery,
- ▶ the alteration of an aircraft flight plan or operation,
- ▶ the release of radioactive materials from Type B packaging,
- ▶ the release of over 11.9 galls or 88.2 pounds of a severe marine pollutant, or
- ▶ the release of a bulk quantity (over 199 gallons or 882 pounds) of a hazardous material.

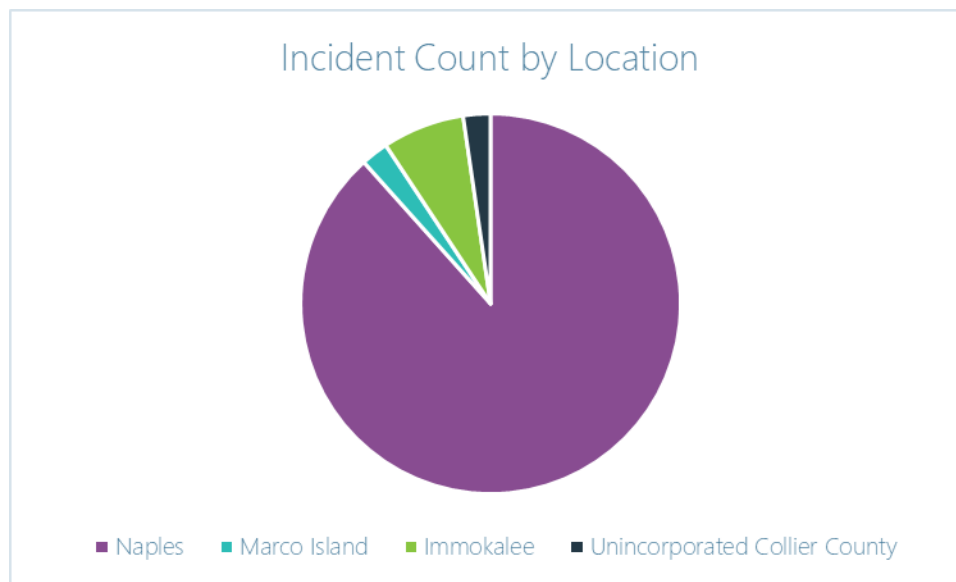
*Impact: 1 – Minor*

*Spatial Extent: 1 – Negligible*

### Historical Occurrences

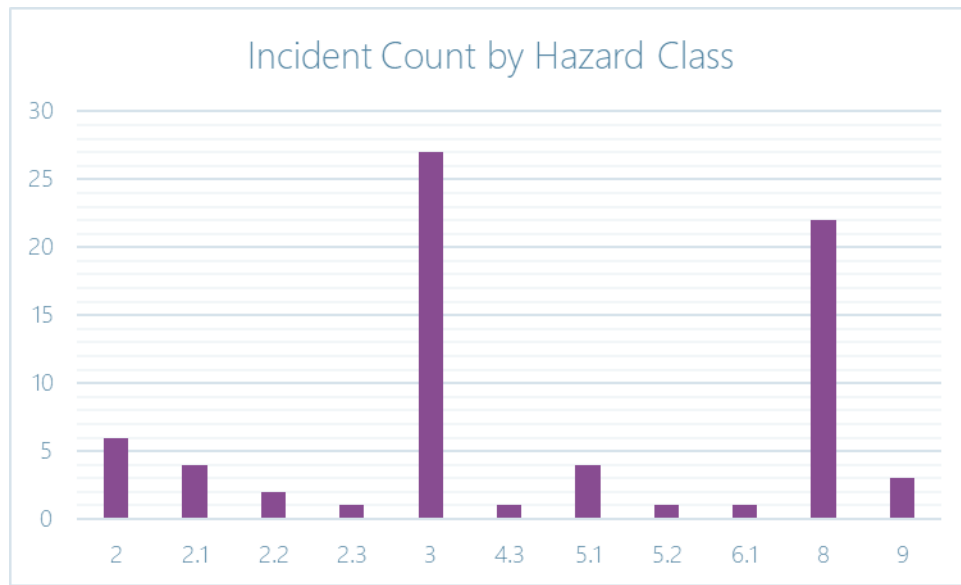
The USDOT’s PHMSA maintains a database of reported hazardous materials incidents, which are summarized below in Figure 2.42 by location and in Figure 2.43 hazardous material class. According to PHMSA records, there were 43 recorded releases in Collier County in the 20-year period from 2000 through 2019. None of these events were considered serious incidents; however, 12 events had serious impacts, including nine serious bulk releases; one event flagged for serious evacuation, two minor injuries, and five events resulting in the closure of major transportation arteries.

**Figure 2.42 – Count of Hazardous Materials Release Incidents by Location, 2000-2019**



Source: PHMSA Incident Reports, Office of Hazardous Materials Safety, Incident Reports Database Search, data as of Feb. 13, 2020.

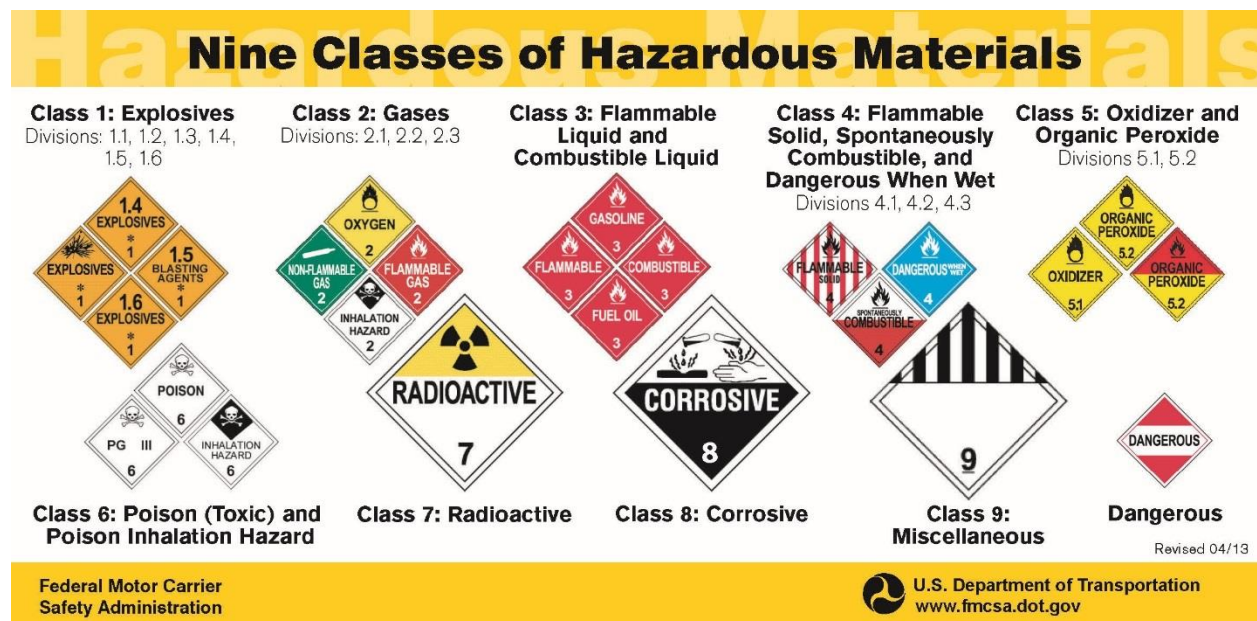
Figure 2.43 – Count of Hazardous Materials Release Incidents by Hazard Class, 2000-2019



Source: PHMSA Incident Reports, Office of Hazardous Materials Safety, Incident Reports Database Search, data as of Feb. 13, 2020.

The most common materials spilled in the planning area are Class 3 (Flammable and Combustible Liquids) and Class 8 (Corrosives). Figure 2.44 describes all nine hazard classes.

Figure 2.44 – Hazardous Materials Classes



Source: U.S. Department of Transportation

### Probability of Future Occurrence

Based on historical occurrences recorded by PHMSA, there have been 43 hazardous materials releases in the 20-year period from 2000 through 2019, 12 of which had serious impacts. Using historical occurrences as an indication of future probability, there is a 60 percent annual probability of a serious hazardous materials incident occurring.

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*Probability: 3 – Likely*

### Climate Change

Climate change is not expected to impact hazardous materials incidents.

### Vulnerability Assessment

#### People

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Hazardous materials incidents can cause injuries, hospitalizations, and even fatalities to people nearby. People living near hazardous facilities and along transportation routes may be at a higher risk of exposure, particularly those living or working downstream and downwind from such facilities. For example, a toxic spill or a release of an airborne chemical near a populated area can lead to significant evacuations and have a high potential for loss of life. Individuals working with or transporting hazardous materials are also at heightened risk.

In addition to the immediate health impacts of releases, a handful of studies have found long term health impacts such as increased incidence of certain cancers and birth defects among people living near certain chemical facilities. However there has not been enough research done on the subject to allow detailed analysis.

The primary economic impact of hazardous material incidents results from lost business, delayed deliveries, property damage, and potential contamination. Large and publicized hazardous material-related events can deter tourists and could potentially discourage residents and businesses. Economic effects from major transportation corridor closures can be significant.

#### Property

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The impact of a fixed hazardous facility, such as a chemical processing facility is typically localized to the property where the incident occurs. The impact of a small spill (i.e. liquid spill) may also be limited to the extent of the spill and remediated if needed. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to property.

Impacts of hazardous material incidents on critical facilities are most often limited to the area or facility where they occurred, such as at a transit station, airport, fire station, hospital, or railroad. However, they can cause long-term traffic delays and road closures resulting in major delays in the movement of goods and services. These impacts can spread beyond the planning area to affect neighboring counties, or vice-versa. While cleanup costs from major spills can be significant, they do not typically cause significant long-term impacts to critical facilities.

#### Environment

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Hazardous material incidents may affect a small area at a regulated facility or cover a large area outside such a facility. Widespread effects occur when hazards contaminate the groundwater and eventually the municipal water supply, or they migrate to a major waterway or aquifer. Impacts on wildlife and natural resources can also be significant.

#### Consequence Analysis

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Table 2.74 summarizes the potential detrimental consequences of hazardous materials incident.

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

**Table 2.74 – Consequence Analysis – Hazardous Materials Incident**

Category	Consequences
Public	Contact with hazardous materials could cause serious illness or death. Those living and working closest to hazardous materials sites face the greatest risk of exposure. Exposure may also occur through contamination of food or water supplies.
Responders	Responders face similar risks as the general public but a heightened potential for exposure to hazardous materials.
Continuity of Operations (including Continued Delivery of Services)	A hazardous materials incident may cause temporary road closures or other localized impacts but is unlikely to affect continuity of operations.
Property, Facilities and Infrastructure	Some hazardous materials are flammable, explosive, and/or corrosive, which could result in structural damages to property. Impacts would be highly localized.
Environment	Consequences depend on the type of material released. Possible ecological impacts include loss of wildlife, loss of habitat, and degradation of air and/or water quality.
Economic Condition of the Jurisdiction	Clean up, remediation, and/or litigation costs may apply. Long-term economic damage is unlikely.
Public Confidence in the Jurisdiction's Governance	A hazardous materials incident may affect public confidence if the environmental or health impacts are enduring.

### Hazard Summary by Jurisdiction

The following table summarizes hazardous materials hazard risk by jurisdiction. With the exception of probability, based on past occurrences, this risk is not expected to vary substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	2	2	1	4	2	2.0	M
Immokalee Reservation	2	2	1	4	2	2.0	M
Marco Island	2	2	1	4	2	2.0	M
Naples	3	2	1	4	2	2.3	M
Unincorporated Collier County	2	2	1	4	2	2.0	M

### 2.5.16 Coastal Oil Spills

#### Hazard Description

As defined in the 2018 Florida State Hazard Mitigation Plan, an oil spill is the release of crude oil, or liquid petroleum, into the environment. Usually associated with marine spills, they are caused by the release of oil from offshore platforms, drilling rigs, tankers, ships that have sunk, and any vehicle used to transport crude oil, over the water or land. These spills have major effects including continual damage to the environment and a financial loss to communities affected.

As of January 2020, there are 22 operating rigs in the Gulf of Mexico, 21 drilling for crude oil and 1 drilling for natural gas. While there are currently no drilling rigs on the east coast of Florida, the U.S. Chamber of Commerce predicts that rigs could be seen in the future as exploration estimates roughly 4.72 billion barrels of recoverable oil and 37.51 trillion cubic feet of recoverable natural gas from Maine to Florida. As of January 2020, Florida produced about 5 thousand barrels of crude oil a day, or about 1.83 million barrels a year.

An oil spill could have severe detrimental impacts on the natural environment, primarily impacting shorelines and beaches. Given Collier County's dependence on tourism, which relies heavily on beach access, an oil spill could have a catastrophic impact on the county's economy. In Collier County, tourism is the leading employer and the primary economic engine. The tourism industry provides over 38,500 jobs in Collier County. In 2018, Collier County had over 2 million tourists visit the state, spending an estimated \$1.5 billion, resulting in a total economic impact of over \$2.1 billion to Collier County.

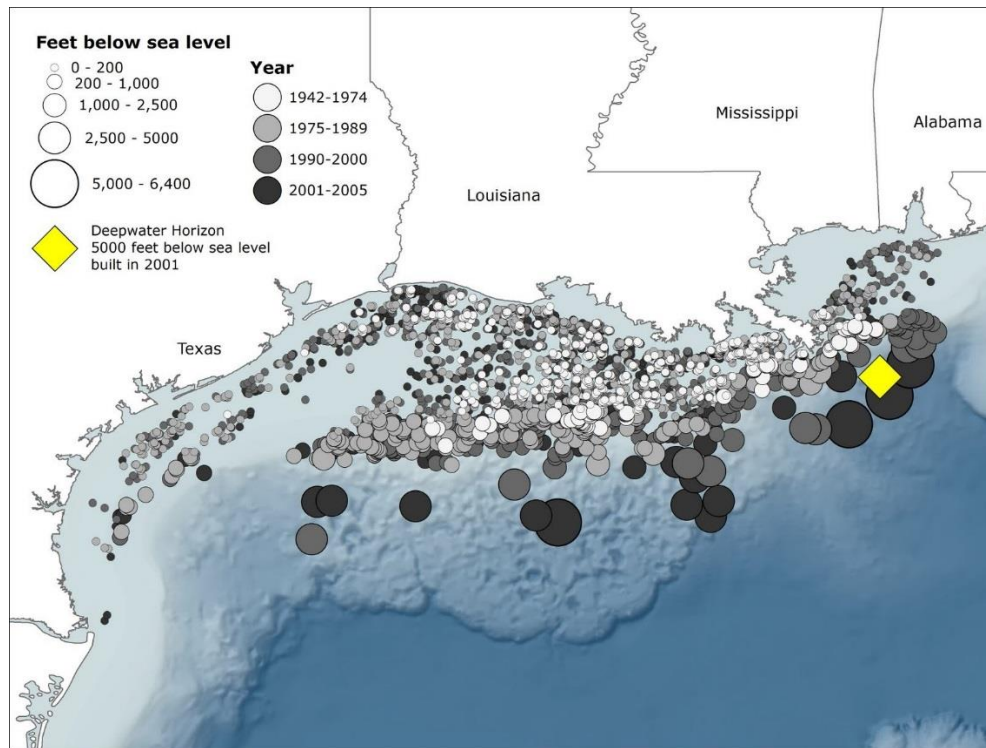
*Warning Time: 3 – 6 to 12 hours*

*Duration: 4 – More than 1 week*

#### Location

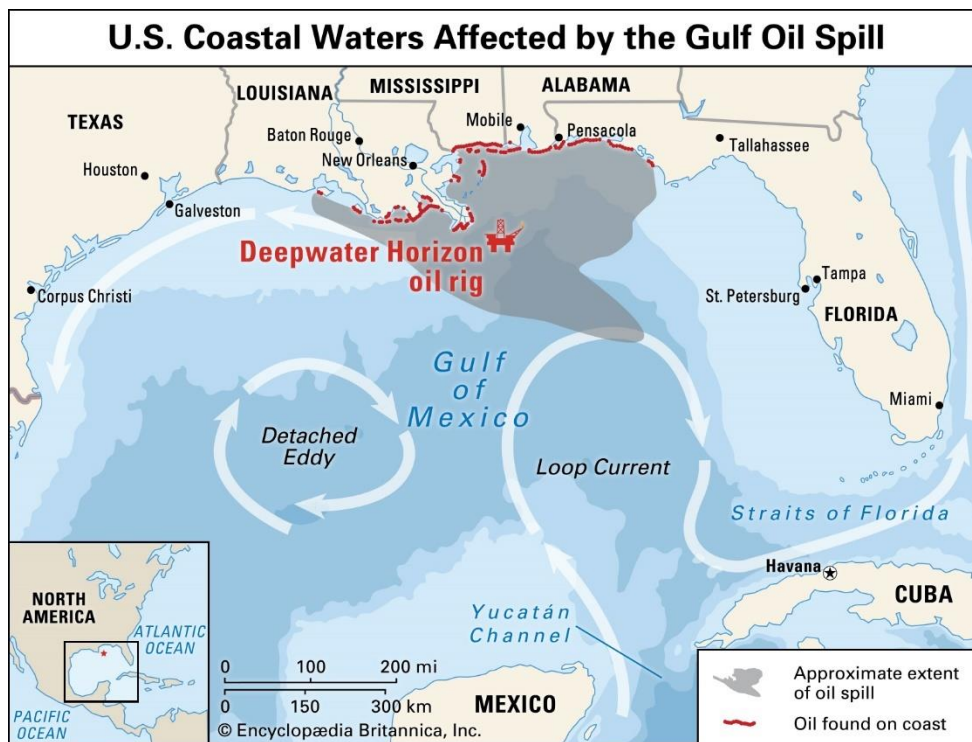
While there are no drilling rigs off the coast of Collier County, Figure 2.45 shows the location of oil drilling rigs in the Gulf of Mexico by feet below sea level and year. It also shows the location of the Deepwater Horizon accident. Figure 2.46 shows the extent of the most devastating oil spill in the Gulf of Mexico to date, Deepwater Horizon, detailed in the historical occurrences section below.

Figure 2.45 – Location of Oil Drilling Rigs in the Gulf of Mexico



Source: DeepSeaNews.com

Figure 2.46 – Extent of the Deepwater Oil Spill



Source: Encyclopedia Britannica

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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### Extent

The extent of coastal oil spills can vary greatly. On average, 1.3 million gallons of petroleum are spilled in U.S. waters every year. The Deepwater Horizon spill released 210 million gallons. The consequential extent, or the extent of organisms, mammals, and the environment that are negatively affected can be huge. However, given the lack of oil rigs off the coast of Collier County, current extent is limited. Oil spills could still result from tankers while oil is being transported.

*Impact: 2 – Limited*

*Spatial Extent: 2 – Small*

### Historical Occurrences

The following information on the Deepwater Horizon spill was reported in the 2018 State Hazard Mitigation Plan:

In April 2010, an explosion occurred on BP's Macondo Prospect drilling rig in the Gulf of Mexico causing the largest marine oil spill in history. This was named the Deepwater Horizon oil spill. The Florida impacts of the 2010 Deepwater Horizon incident were mostly limited and contained, but the predictions at the time of potential impacts were severe. Moody's Analytics released a report which stated, should a significant amount of oil wash onto Florida's shores, the economic impact from tourism-related tax revenue and job losses could rival that of the ongoing recession and simulate a double dip recession. Following the lawsuits, Florida received over 200 million dollars in a settlement for lost tourism income.

In addition to economic impacts, an oil spill in Florida or off its shores could have severe consequences for wildlife, ecosystems, and the ecology. The Deepwater Horizon spill affected the wildlife populations of numerous species of turtles, birds, bottlenose dolphins, whales, and fish. Gulf states saw a decrease in bottlenose reproduction and a rise in deaths, the Kemp's Ridley sea turtle, already endangered, saw a massive drop in numbers, and scientists estimate the habitats on the bottom of the Gulf could take anywhere from multiple decades to hundreds of years to fully recover. The spill lasted for five months though some reports say that it had been leaking for so long, that it could have been a 14-year long oil spill. Eleven people were killed and another seventeen were injured from the wellhead blowout that caused the leak.

As a result of the Deepwater Horizon spill, Florida began funding remediation projects with settlements from the spill, including with non-operating investors. There are 131 projects which include stormwater management, habitat restoration, unpaved roads and wetland initiatives, water quality improvements. Three of these projects are just north of Collier in Lee and Charlotte Counties. The website [floridadep.gov/wra/deepwater-horizon](http://floridadep.gov/wra/deepwater-horizon) details the Deepwater Horizon Program and links to a story map highlighting all the projects.

### Probability of Future Occurrence

Since the U.S. is reliant on fossil fuels such as oil, and accidents happen, it is highly likely that another oil spill in the Gulf of Mexico will occur again. However, the probability of an oil spill impacting the Collier County coast is lower.

*Probability: 2 – Possible*

### Climate Change

Climate change is not expected to impact coastal oil spills. Though climate change in addition to a coastal oil spill could be detrimental for environmental, animal, and human health.

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

### Vulnerability Assessment

Oil spill damage is directly related to the amount of oil spilled in which locations and the movement of the currents.

#### People

Some injuries but no human deaths have been recorded from an oil spill. However, there were a total of eleven deaths and seventeen injuries from the explosion that caused the Deepwater Horizon oil spill.

#### Property

Oil spills can cause severe property damage to oil rigs, pipeline infrastructure, and beaches and cost lots of money for clean-up.

#### Environment

Oil spills can be one of the most harmful hazards for the environment. Many aquatic ecosystems can be destroyed and take hundreds of years to replenish. There are often huge numbers of dead or sick aquatic life after oil spills. It is estimated that only 2% of the marine life carcasses from the Deepwater Horizon spill were found or washed up.

### Consequence Analysis

Table 2.75 details the consequences of a coastal oil spill.

**Table 2.75 – Consequence Analysis – Coastal Oil Spills**

Category	Consequences
Public	Localized impact expected to be severe for affected areas and moderate to light for other less affected areas.
Responders	Adverse impact expected to be severe for unprotected personnel and moderate to light for trained, equipped, and protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Localized disruption of trade or ferry routes and higher demand of petroleum, therefore creating a price increase) caused by incident may postpone delivery or use of some services.
Property, Facilities and Infrastructure	Localized impact to facilities and infrastructure in the areas of the incident. Beaches most adversely affected.
Environment	Environmental damage to beaches, marine life, aquatic ecosystems, and other life forms who get sustenance from the water.
Economic Condition of the Jurisdiction	Local economy and finances may be adversely affected, depending on damage. The tourism industry could take a large hit.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery is not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes coastal oil spill hazard risk by jurisdiction. Jurisdictions with shoreline at risk were assigned a probability of 2 (possible), an impact of 2 (limited), and a spatial extent of 2 (small). Jurisdictions with little to no shoreline at risk were assigned a probability score of 1 (unlikely), an impact of 1 (minor), and a spatial extent of 1 (negligible). Warning time and duration are inherent to the hazard and remain constant across jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	2	2	2	3	4	2.3	M

## SECTION 2: HAZARD IDENTIFICATION & RISK ASSESSMENT

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Immokalee Reservation	1	1	1	3	4	1.5	L
Marco Island	2	2	2	3	4	2.3	M
Naples	2	2	2	3	4	2.3	M
Unincorporated Collier County	2	2	2	3	4	2.3	M

### 2.5.17 Nuclear Power Plant

#### Hazard Background

A radiological incident is an occurrence resulting in the release of radiological material at a fixed facility (such as power plants, hospitals, laboratories, etc.) or in transit.

Radiological incidents related to transportation are described as an incident resulting in a release of radioactive material during transportation. Transportation of radioactive materials through Florida over the interstate highway system is considered a radiological hazard. The transportation of radioactive material by any means of transport is licensed and regulated by the federal government. As a rule, there are two categories of radioactive materials that are shipped over the interstate highways:

- ▶ Low level waste consists primarily of materials that have been contaminated by low level radioactive substances but pose no serious threat except through long-term exposure. These materials are shipped in sealed drums within placarded trailers. The danger to the public is no more than a wide array of other hazardous materials.
- ▶ High level waste, usually in the form of spent fuel from nuclear power plants, is transported in specially constructed casks that are built to withstand a direct hit from a locomotive.

Radiological emergencies at nuclear power plants are divided into classifications. Table 2.76 shows these classifications, as well as descriptions of each.

**Table 2.76 – Radiological Emergency Classifications**

Emergency Classification	Description
Notification of Unusual Event (NOUE)	Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.
Alert	Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) Protective Action Guides (PAGs)
Site Area Emergency (SAE)	Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or hostile action that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
General Emergency	Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

*Warning Time: 4 – Less than 6 hours*

*Duration: 4 – More than one week*

### Location

Turkey Point Nuclear Generating Station, located in the south of Miami-Dade County and southeast of the planning area, is a twin reactor nuclear power station. It has three currently operating units including two 802-megawatt units (units 3 and 4) and one 1,150-megawatt unit (unit 5). There are two retired 404-megawatt units (units 1 and 2) still on-site. Commercial operation began in 1967 and the most recent unit was completed in 2007. Units 3 and 4 are pressurized water reactors and unit 5 is a combined-cycle gas-fired unit. As the sixth largest power plant in the United States and third largest in Florida, it serves all of southern Florida. The plant is operated with a very high level of security. This is the location from which the most catastrophic nuclear accident might occur and will be the focal point of the nuclear analysis in this plan.

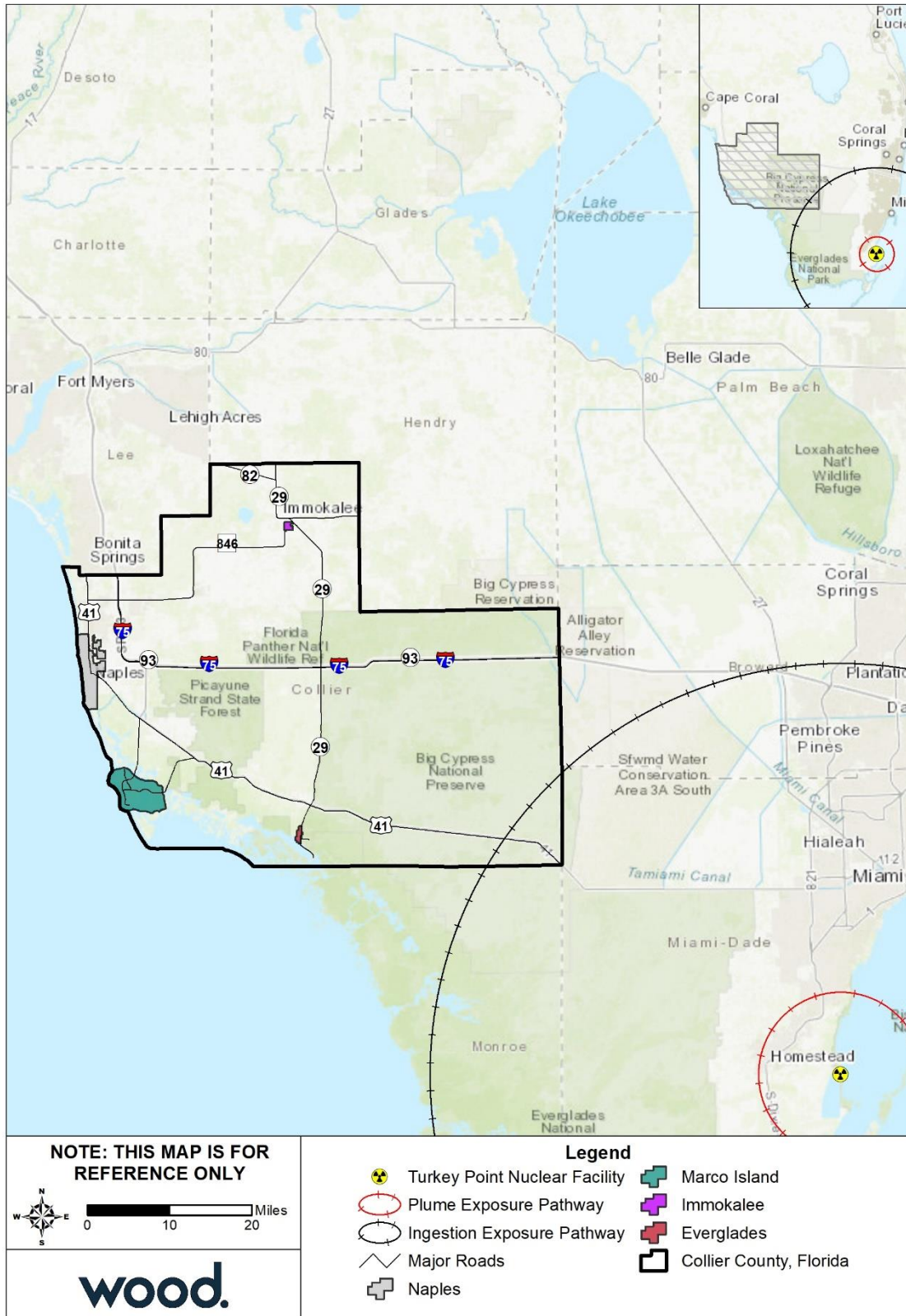
The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants:

- ▶ **Emergency Planning Zone (EPZ)** – The EPZ is a 10-mile radius around nuclear facilities. It is also known as the Plume Exposure Pathway. Areas located within this zone are at highest risk of exposure to radioactive materials. Within this zone, the primary concern is exposure to and inhalation of radioactive contamination. Predetermined action plans within the EPZ are designed to avoid or reduce dose from such exposure. Residents within this zone would be expected to evacuate in the event of an emergency. Other actions such as sheltering, evacuation, and the use of potassium-iodide must be taken to avoid or reduce exposure in the event of a nuclear incident.
- ▶ **Ingestion Pathway Zone (IPZ)** – The IPZ is delineated by a 50-mile radius around nuclear facilities as defined by the federal government. Also known as the Ingestion Exposure Pathway, the IPZ has been designated to mitigate contamination in the human food chain resulting from a radiological accident at a nuclear power facility. Contamination to fresh produce, water supplies, and other food produce may occur when radionuclides are deposited on surfaces.

Figure 2.47 shows the location of Turkey Point Nuclear Generating Station and the approximate 10-mile Emergency Planning Zone (EPZ) buffer and 50-mile Ingestion Pathway Zone (IPZ) around the plant. While none of the counties or communities in the planning area fall into the 10-mile EPZ, the southeast corner of Collier County is included in the 50-mile IPZ.

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Figure 2.47 – Turkey Point Nuclear Generating Station Location in Relation to Planning Area



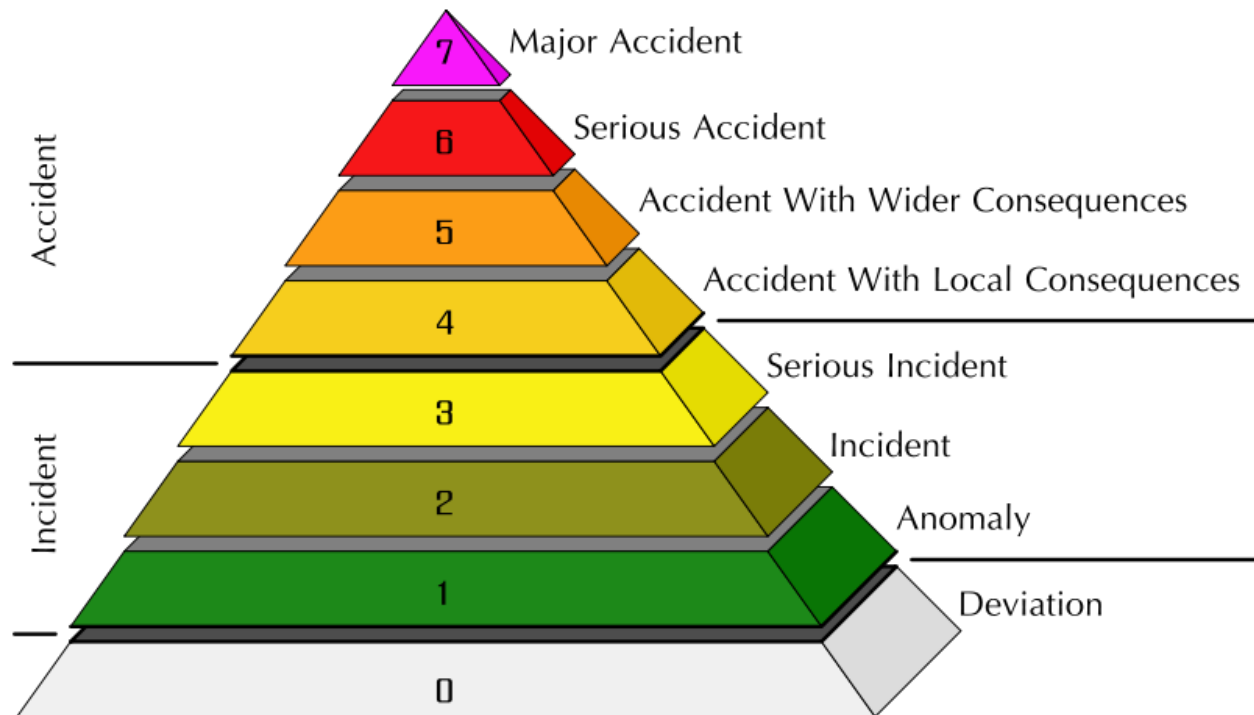
Source: U.S. Energy Information Administration

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The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. All areas of the county that are located within this 50-mile radius that are still considered to be at risk from a nuclear incident.

### Extent

The International Atomic Energy Association (IAEA) developed the International Nuclear and Radiological Event Scale to quantify the magnitude of radiological events. This scale is logarithmic, meaning each increasing level represents a 10-fold increase in severity compared to the previous level.



Source: International Atomic Energy Association

*Impact: 4 – Catastrophic*

*Spatial Extent: 2 – Small*

### Historical Occurrences

**May 8, 1974** – During a routine test, it was discovered that two of the three Emergency Feedwater pumps which served unit 3 failed due to overtightened packing. The third pump also failed but was caused by a malfunction in the turbine. These failures, had they not been found and corrected, could have led to a nuclear disaster if other failures had occurred simultaneously.

**August 24, 1992** – Category 5 Hurricane Andrew hit Turkey Point causing damage to many systems. The fire protection systems were partly disabled, two raw water tanks were destroyed, a third was drained, and the smokestack on unit 1 cracked. Offsite power was lost so onsite generators had to be operated for numerous days.

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**February 26, 2008** – The loss of offsite power prompted both reactors to shut down which lead to a widespread power outage affecting 700,000 customers and a total of 2.5 million people. The originating event was an overheated voltage switch that caught fire in a substation 23 miles away from Turkey Point. Power was restored within 5 hours of the blackout. Large commercial locations such as Walt Disney World, Orlando International Airport, and Miami International Airport were affected.

**March 18, 2017** – An electrical fault happened in unit 3 causing the loss of a safety system and a reactor trip. This fault caused an arc flash which minorly burned one plant worker. All other safety systems were operational so there was no threat to the community or environment.

### Probability of Future Occurrence

Radiological hazards are highly unpredictable. Nuclear reactors present the possibility of catastrophic damages, yet the industry is highly regulated and historical precedence suggests an incident is unlikely.

*Probability: 1 – Unlikely*

### Climate Change

Climate change is not projected to have any impact on a potential nuclear power plant incident.

### Vulnerability Assessment

#### People

People within the 50-mile EPZ are at risk of exposure through ingestion of contaminated food and water. Low levels of radiation are not considered harmful, but a high exposure to radiation can cause serious illness or death.

#### Property

A radiological incident could cause severe damage to the power station itself but would not cause direct property damage outside the station, especially with the distance between the reactor and the planning area. However, property values could drop substantially if a radiological incident resulted in contamination of nearby areas.

#### Environment

A radiological incident could result in the spread of radioactive material into the environment, which could contaminate water and food sources and harm animal and plant life. These impacts are lessened the further an area is to the plant site.

### Consequence Analysis

Table 2.77 summarizes the potential detrimental consequences of radiological incident.

**Table 2.77 – Consequence Analysis – Radiological Incident**

Category	Consequences
Public	High levels of radiation could cause serious illness or death. Those living and working closest to the nuclear plant would face the greatest risk of exposure.
Responders	Responders face potential for heightened exposure to radiation, which could cause severe chronic illness and death.
Continuity of Operations (including Continued Delivery of Services)	An incident at the nuclear plant could interrupt power generation and cause power shortages. Regular operations would likely be affected by the response effort an event would require.

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Category	Consequences
Property, Facilities and Infrastructure	The plant itself could be damaged by a radiological incident. Nearby property and facilities could be affected by contamination.
Environment	Water supplies, food crops, and livestock within 50 miles of the nuclear plant could be contaminated by radioactive material in the event of a major incident.
Economic Condition of the Jurisdiction	The local economy could be affected if a radiological incident caused contamination of nearby areas. Property values and economic activity could decline as a result.
Public Confidence in the Jurisdiction's Governance	A radiological incident would likely cause severe loss of public confidence given that the hazard is human-caused and highly regulated. Public confidence can also be affected by false alarms.

### Hazard Summary by Jurisdiction

The following table summarizes nuclear power plant risk by jurisdiction. Jurisdictions overlapping the Ingestion Pathway Zone of the closest nuclear power plant were given an impact of 4 (catastrophic) and a spatial extent of 2 (small). Jurisdictions further away from the IPZ were given an impact of 3 (critical) and a spatial extent of 1 (negligible). Probability, warning time, and duration are uniform across jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	1	3	1	4	4	2.2	M
Immokalee Reservation	1	3	1	4	4	2.2	M
Marco Island	1	3	1	4	4	2.2	M
Naples	1	3	1	4	4	2.2	M
Unincorporated Collier County	1	4	2	4	4	2.7	H

### 2.5.18 Terrorism

#### Hazard Description

There is no universal globally agreed-upon definition of terrorism. In a broad sense, terrorism is the use of violence and threats to intimidate or coerce, especially against civilians, in the pursuit of political aims. Terrorism is defined in the United States by the Code of Federal Regulations as “the unlawful use of force or violence against persons or property to intimidate or coerce a government, civilian population, or any segment thereof, in furtherance of political or social objectives.”

For this analysis, this hazard encompasses the following sub-hazards: enemy attack, biological terrorism, chemical terrorism, conventional terrorism, and radiological terrorism. These hazards can occur anywhere and demonstrate unlawful force, violence, and/or threat against persons or property causing intentional harm for purposes of intimidation, coercion or ransom in violation of the criminal laws of the United States. These actions may cause massive destruction and/or extensive casualties. The threat of terrorism, both international and domestic, is ever present, and an attack can occur when least expected.

Enemy attack is an incident that could cause massive destruction and extensive casualties throughout the world. Some areas could experience direct weapons’ effects: blast and heat; others could experience indirect weapons’ effect. International political and military activities of other nations are closely monitored by the federal government and the State of Florida would be notified of any escalating military threats.

The use of biological agents against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom can be described as biological terrorism. Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point of line sources such as munitions, covert deposits and moving sprayers. Biological agents vary in the amount of time they pose a threat. They can be a threat for hours to years depending upon the agent and the conditions in which it exists.

Chemical terrorism involves the use or threat of chemical agents against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Effects of chemical contaminants are like those of biological agents.

Use of conventional weapons and explosives against persons or property in violation of the criminal laws of the United States for purposes of intimidations, coercion, or ransom is conventional terrorism. Hazard effects are instantaneous; additional secondary devices may be used, lengthening the time duration of the hazard until the attack site is determined to be clear. The extent of damage is determined by the type and quantity of explosive. Effects are generally static other than cascading consequences and incremental structural failures. Conventional terrorism can also include tactical assault or sniping from remote locations.

Radiological terrorism is the use of radiological materials against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion or ransom. Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point of line sources such as munitions, covert deposits and moving sprayers or by the detonation of a nuclear device underground, at the surface, in the air or at high altitude.

Electronic attack using one computer system against another in order to intimidate people or disrupt other systems is a cyber-attack. All governments, businesses and citizens that conduct business utilizing computers face these threats. Cyber-security and critical infrastructure protection are among the most important national security issues facing our country today. The Florida Department of Law Enforcement

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Computer Crime Center helps law enforcement across the State solve sophisticated crimes involving digital evidence. Cyber attack is discussed in greater detail in Section 2.5.21.

Mass demonstrations, or direct conflict by large groups of citizens, as in riots and non-peaceful strikes, are examples of public disorder. These are assembling of people together in a manner to substantially interfere with public peace to constitute a threat, and with use of unlawful force or violence against another person, or causing property damage or attempting to interfere with, disrupting, or destroying the government, political subdivision, or group of people. Labor strikes and work stoppages are not considered in this hazard unless they escalate into a threat to the community. Vandalism is usually initiated by a small number of individuals and limited to a small target or institution. Most events are within the capacity of local law enforcement. Civil disturbance is discussed in greater detail in Section 2.5.20.

The Southern Poverty Law Center (SPLC) reports 75 active hate groups in Florida, shown in Table 2.78. The SPLC defines a hate group as any group with “beliefs or practices that attack or malign an entire class of people – particularly when the characteristics being maligned are immutable.” It is important to note that inclusion on the SPLC list is not meant to imply that a group advocates or engages in violence or other criminal activity.

**Table 2.78 – Hate Groups Active in Florida**

Group	Type	Location
Legal Immigrants for America	Anti-Immigrant	Winter Springs
American College of Pediatricians	Anti-LGBT	Gainesville
D. James Kennedy Ministries	Anti-LGBT	Fort Lauderdale
Liberty Counsel	Anti-LGBT	Orlando
Stedfast Baptist Church	Anti-LGBT	Jacksonville
ACT for America	Anti-Muslim	Heathrow
ACT for America	Anti-Muslim	Jacksonville
Citizens for National Security	Anti-Muslim	Boca Raton
Citizens' Action Group of South Florida	Anti-Muslim	Hollywood
Cultures In Context Incorporated/Turning Point Project	Anti-Muslim	Immokalee
Florida Family Association	Anti-Muslim	Tampa
Soldiers of Odin	Anti-Muslim	N/A
Straight Way and More, The	Anti-Muslim	Venice
United West, The	Anti-Muslim	Lake Worth
Army of Israel	Black Nationalist	Orlando
Great Millstone	Black Nationalist	Miami
Great Millstone	Black Nationalist	Tampa
Israel United In Christ	Black Nationalist	Orlando
Israel United In Christ	Black Nationalist	Tallahassee
Israel United In Christ	Black Nationalist	Miami
Israel United In Christ	Black Nationalist	Jacksonville
Israelite Church of God in Jesus Christ, The	Black Nationalist	West Palm Beach
Israelite School of Universal Practical Knowledge	Black Nationalist	Jacksonville
Israelite School of Universal Practical Knowledge	Black Nationalist	Tampa
Nation of Islam	Black Nationalist	Tampa
Nation of Islam	Black Nationalist	Saint Petersburg
Nation of Islam	Black Nationalist	Pensacola
Nation of Islam	Black Nationalist	Miami
Nation of Islam	Black Nationalist	Jacksonville
Nation of Islam	Black Nationalist	Fort Lauderdale

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Group	Type	Location
Nation of Islam	Black Nationalist	Orlando
Nation of Kings and Priests	Black Nationalist	Orlando
New Black Panther Party for Self Defense	Black Nationalist	Tampa Bay
New Black Panther Party for Self Defense	Black Nationalist	Jacksonville
New Black Panther Party for Self Defense	Black Nationalist	Tallahassee
Sicarii 1715	Black Nationalist	Orlando
Christogenea	Christian Identity	Panama City
Gallows Tree Wotansvolk Alliance	General Hate	N/A
American Guard	General Hate	N/A
Bill Keller Ministries	General Hate	St. Petersburg
Insight USA	General Hate	Longwood
Proud Boys	General Hate	Jacksonville
Proud Boys	General Hate	Tampa
Proud Boys	General Hate	DeLand
Proud Boys	General Hate	Miami
Sharkhunters International	General Hate	Hernando
American Christian Dixie Knights of the Ku Klux Klan	Ku Klux Klan	N/A
International Keystone Knights of the Ku Klux Klan	Ku Klux Klan	N/A
Loyal White Knights of the Ku Klux Klan	Ku Klux Klan	N/A
Traditionalist American Knights of the Ku Klux Klan	Ku Klux Klan	N/A
Identity Dixie	Neo-Confederate	N/A
League of the South	Neo-Confederate	Lake City
League of the South	Neo-Confederate	Hialeah
League of the South	Neo-Confederate	Panama City
League of the South	Neo-Confederate	Ocala
League of the South	Neo-Confederate	Jacksonville
League of the South	Neo-Confederate	N/A
Atomwaffen Division	Neo-Nazi	N/A
Creativity Alliance, The	Neo-Nazi	N/A
Endangered Souls RC/Crew 519	Neo-Nazi	N/A
National Socialist Movement	Neo-Nazi	N/A
Traditionalist Worker Party	Neo-Nazi	N/A
Confederate Hammerskins	Racist Skinhead	N/A
Crew 38	Racist Skinhead	N/A
Firm 22	Racist Skinhead	N/A
United Southern Skins	Racist Skinhead	N/A
Vinlanders Social Club	Racist Skinhead	N/A
American Freedom Party	White Nationalist	Lakewood Ranch
American Freedom Party	White Nationalist	Bradenton
Identity Evropa	White Nationalist	Gainesville
Identity Evropa	White Nationalist	Lakeland
Patriot Front	White Nationalist	N/A
Real Republic of Florida	White Nationalist	Tallahassee
Stormfront	White Nationalist	West Palm Beach
The Right Stuff	White Nationalist	N/A

Source: Southern Poverty Law Center, 2018, <https://www.splcenter.org/hate-map>

One hate group identified by the SPLC has a known footprint in Collier County: Cultures in Context Incorporated/ Turning Point Project in Immokalee.

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*Warning Time: 4 – Less than 6 hours*

*Duration: 1 – Less than 6 hours*

Generally, no warning is given for specific acts of terrorism. Duration is dependent on the vehicle used during the terrorist attack. This score considers a prolonged scenario with continuous impacts.

### Location

A terror threat could occur at any location in the County, but are more likely to target highly populated areas, critical infrastructure, or symbolic locations. Any of the critical facilities identified by the LMS working group could be targeted. Per the 2015 Local Mitigation Strategy, the LMS working group chose not to analyze the risks associated with terrorist attacks given the low probability of occurrence.

### Extent

The extent of a terrorist incident is tied to many factors, including the attack vector, location, time of day, and other circumstances; for this reason, it is difficult to put assess a single definition or conclusion of the extent of “terrorism.” As a general rule, terrorism incidents are targeted to where they can do the most damage and have the maximum impact possible, though this impact is tempered by the weapon used in the attack itself.

*Impact: 4 – Catastrophic*

*Spatial Extent: 1 – Negligible*

### Historical Occurrences

As noted in the previous Collier County Local Mitigation Strategy, there have been no major terror events in the County, thus the hazard risk had not previously been analyzed. There is still, however, some possibility that one could occur in the future given the incidents that have occurred in the United States in the past and the facilities and locations in the county that could be potential targets.

### Probability of Future Occurrence

While difficult to estimate when a deliberate act like terrorism may occur, it can be inferred that the probability of a terrorist attack in any one area in the County is very low at any given time. When identified, credible threats may increase the probability of an incident; these threats are generally tracked by law enforcement.

*Probability: 1 – Unlikely*

### Climate Change

Climate change is not expected to influence terrorism. However, climate change could cause more protests, gatherings, or votes which could be targets for terrorism.

### Vulnerability Assessment

#### **Methodologies and Assumptions**

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Vulnerability to terrorism was assessed through hypothetical scenarios. These scenarios were modeled using the Electronic Mass Casualty Assessment and Planning Scenarios (EMCAPS) tool developed by the Johns Hopkins Office of Critical Event Preparedness and Response, Johns Hopkins Applied Physics Laboratory, the U.S. Department of Homeland Security, and the National Center for the Study of Preparedness and Catastrophic Event Response.

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### People

People can suffer death or illness as a result of a terrorist attack. Symptoms of illness from a biological or chemical attack may go undetected for days or even weeks. Local healthcare workers may observe a pattern of unusual illness or early warning monitoring systems may detect airborne pathogens. People will face increased risk if a biological or chemical agent is released indoors, as this may result in exposure to a higher concentration of pathogens, whereas agents that are released outdoors would disperse in the direction of the wind. Physical harm from a weapons attack or explosive device is not dependent on location, but risk is greater in areas where higher numbers of people may gather. People could also be affected by an attack on food and water supply. In addition to impacts on physical health, any terrorist attack could cause significant stress and anxiety.

### Property

The potential for damage to property is highly dependent on the type of attack. Buildings and infrastructure may be damaged by an explosive device or by contamination from a biological or chemical attack. Impacts are generally highly localized to the target of the attack.

### Environment

Environmental impacts are also dependent on the type of attack. Impacts could be negligible or could require major clean-up and remediation.

### Consequence Analysis

Table 2.79 summarizes the potential detrimental consequences of a terror threat.

**Table 2.79 – Consequence Analysis – Terrorism**

Category	Consequences
Public	Illness, injury, or fatality are possible; these impacts would be highly localized to the attack. Widespread stress and psychological suffering may occur.
Responders	Responders face increased risks during an effort to stop an attack or rescue others while an attack is underway.
Continuity of Operations (including Continued Delivery of Services)	Critical infrastructure may be targeted by an attack; therefore, continuity of operations may be affected. Long-term issues may arise if transportation or utility infrastructure is severely damaged.
Property, Facilities and Infrastructure	Impacts depend of the type of attack. Buildings and infrastructure could be unaffected or completely destroyed.
Environment	Water and food supply could be contaminated by a biological or chemical attack. Remediation could be required.
Economic Condition of the Jurisdiction	The local economy could be disrupted, depending on the location and scale of an attack.
Public Confidence in the Jurisdiction's Governance	Loss of public confidence likely should an attack be carried out; additional loss of confidence and trust may result if response and recovery are not swift and effective

### Hazard Summary by Jurisdiction

The following table summarizes terrorism hazard risk by jurisdiction. This risk is not expected to change substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	1	4	1	4	1	2.2	M

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Immokalee Reservation	1	4	1	4	1	2.2	M
Marco Island	1	4	1	4	1	2.2	M
Naples	1	4	1	4	1	2.2	M
Unincorporated Collier County	1	4	1	4	1	2.2	M

### 2.5.19 Mass Migration Incident

#### Hazard Description

Florida is the closest State to the Caribbean Basin, and Collier County's location on the Gulf Coast and the southern-most tip of the peninsula makes it a possible point of entry for a massive influx of immigrants and refugees wishing to enter the United States. Immigrants and refugees in Florida typically come from the Caribbean, Mexico, and South America. Their arrival can threaten the health, safety, and welfare of citizens as well as of their own if they are detained for a long period. The state of Florida has developed a federal Mass Immigration Annex with the federal government which covers the gap between the federal Mass Immigration Plan and the National Response Framework. Enforcement of immigration laws remains the responsibility of the federal government; however, Collier County officials may need to coordinate with state and federal agencies in response to a mass migration event.

#### Mass Migration

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Mass migration, according to U.S. Code, is defined as "a migration of undocumented aliens that is of such magnitude and duration that it poses a threat to the national security of the United States, as determined by the President." This is most often an event or multiple events which can happen over several years. It can be driven by an event that is economic, social, or political, causing the desire of people to leave one country for another. A continuous and high-volume flow of migrants over a period of time could exceed the normal capabilities of the local offices of the United States Coast Guard and Customs and Border Protection. Undocumented individuals may find it difficult to assimilate without affecting local economies and infrastructure that are already strained. The Pew Research Center estimates that in fiscal year 2014, Florida had an influx of 850,000 (+/- 40,000) undocumented migrants and that the state experienced growth in undocumented population at the national average of 250%.

#### Unaccompanied Minors

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Unaccompanied minors are children who arrive in the United States alone or who are required to appear in immigration court on their own. An unaccompanied alien child (UAC) is a technical term for a child who doesn't have immigration status in the U.S., is not yet 18 years of age, and who has no parent or legal guardian in the U.S., or whose parent or legal guardian in the U.S. is unable to provide care and physical custody. These children often leave their home countries and join some of their family already in the U.S. They move for any number of reasons which could include to escape abuse, persecution or exploitation in their home country or to seek employment or educational opportunities in the United States. Unaccompanied children are especially vulnerable to human trafficking, exploitation, and abuse since they are young and often traveling alone. When an unaccompanied child is picked up by immigration authorities, the child is transferred to the care and protection of the Office of Refugee Resettlement (ORR). Federal law requires that ORR feed, shelter, and provide medical care for unaccompanied children until they can release them to safe settings with sponsors (usually family members), while they await immigration proceedings. According to the U.S. Department of Health & Human Services, Collier County had a total of 186 unaccompanied minors released to sponsors in 2017.

#### Mass Immigration

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Immigration is defined as the movement of people to another country, where they are not natives or citizens, in order to live there. The U.S. Code defines an immigrant or alien as an applicant for admission into the United States at a port-of-entry or a person apprehended in international or U.S. waters and brought into the U.S. by any means in any location. Migration or immigration was the primary source of Florida's population growth in 2015 with 86% of the growth due to net migration and immigration. Miami-

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Dade County, which borders Collier, saw one quarter of Florida's foreign immigrants between 2005 and 2009. An influx of immigrants to Collier County could overwhelm the local economy and infrastructure.

*Warning Time: 3 – 6 to 12 hours*

*Duration: 4 – More than 1 week*

### Location

A mass migration incident could affect the entire County though the likely point of entry is along the coast line. Collier County is in proximity to islands such as Cuba, Puerto Rico, Dominican Republic and Haiti, and the Gulf Coast is within proximity of Mexico. Mass migration can also occur domestically due to an impending hazard causing large groups of people to evacuate.

### Extent

A mass migration event could affect the entirety of Collier County though migrants are likely to settle in areas of the County with existing populations of their same origin.

*Impact: 3 – Critical*

*Spatial Extent: 3 – Moderate*

### Historical Occurrences

While there are no documented historical occurrences of mass migration to or within Collier County, the County does have a documented immigrant population. According to the U.S. Census Bureau's 2013-2017 American Community Survey, Collier County is home to 19,300 immigrants from Mexico and 29,000 immigrants from the Caribbean. These immigration statistics could be the result of previous migration events.

### Probability of Future Occurrence

There's no real way to predict mass migration events since most occur without warning. However, we can assume there is a high likelihood of future occurrence due to Collier County's geographic location on the coast. Political unrest in the Caribbean region or Mexico could be an early indicator. As stated above, Collier County already has an immigrant population from the Caribbean and Mexico and it will likely be the destination during future migrations.

*Probability: 2 – Possible*

### Climate Change

Climate change will most likely affect mass migration indirectly by causing more severe storms, sea level rise, drought and increased earthquakes that may cause specific areas around the world to become uninhabitable. Climate change refugees may be forced to leave uninhabitable locations.

### Vulnerability Assessment

#### **People**

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A mass migration incident could result in loss of life or, injury to those involved in the migration. Also, fear of going to law enforcement can lead to undocumented individuals not seeking help or evacuating in the event of a hazard. If undocumented individuals do evacuate, the additional population numbers may result in congestion and overpopulation of shelters. Migrant people may also have limited resources available to them such as food, school, water, work, translators, and housing.

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Public safety resources could be strained or depleted causing community wide problems. Local law enforcement is affected with added population and confrontation with undocumented individuals.

### Property

A mass migration may cause strain on detention facilities if there is an intervention. Undocumented families can place a strain on local schools and facilities within a community, and Social services may be strained to accommodate incoming immigrants/migrants and unaccompanied children.

### Environment

According to the Center for Immigration Studies, immigration-driven population growth impacts the environment in the following ways:

- Loss of biodiversity and species extinction: overpopulation threatens animal species through consumption of resources, loss of habitat and environmental pollution.
- Water shortages: immigration places an increased demand on water supply which may already be limited due to drought conditions.
- Urban sprawl: the expansion of cities leads to reduced farmlands and grassland which results in reduced habitat for animal species. Furthermore, increased development likely results in flooding and water pollution due to an increase in runoff.
- Overcrowding and carbon emissions: overcrowding places a strain on public utilities and mass transit. Furthermore, immigration transfers carbon emissions from likely more rural areas to more populated areas which already sustain higher levels of carbon emissions per person.

### Consequence Analysis

Table 2.80 shows the consequences of a mass migration incident.

**Table 2.80 – Consequence Analysis – Mass Migration Incident**

Category	Consequences
Public	Loss of life, injury, and limited food, water, or shelter available.
Responders	Impacts expected to be severe for unprotected personnel and moderate to light for trained, equipped, and protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Localized disruption of public safety resources and public services because of overwhelming numbers of migrants and lack of resources.
Property, Facilities and Infrastructure	Localized impact to facilities and infrastructure in the areas of migration. Lack of housing available.
Environment	Environmental damage to locations seeing large impacts from migration.
Economic Condition of the Jurisdiction	Local economy and finances may be affected, depending on number of migrants.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes mass migration incident hazard risk by jurisdiction. This risk is not expected to change substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	2	3	3	3	4	2.8	H

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Immokalee Reservation	2	3	3	3	4	2.8	H
Marco Island	2	3	3	3	4	2.8	H
Naples	2	3	3	3	4	2.8	H
Unincorporated Collier County	2	3	3	3	4	2.8	H

### 2.5.20 Civil Disturbance

#### Hazard Background

Civil disorder is a term that generally refers to groups of people purposely choosing not to observe a law, regulation, or rule, usually in order to bring attention to a cause, concern, or agenda. Civil disorder can take the form of small gatherings or large groups blocking or impeding access to a building or disrupting normal activities by generating noise and intimidating people. They can range from a peaceful sit-in to a full-scale riot in which a mob burns or otherwise destroys property and terrorizes individuals. Even in its more passive forms, a group that blocks roadways, sidewalks, or buildings interferes with public order. In the 1990s abortion clinics, for example, were targets for these disruptive-type activities.

Throughout this country's history, incidents that disrupted the public peace have figured prominently. The constitutional guarantees allow for ample expression of protest and dissent, and in many cases collide with the preamble's requirement of the government "to ensure domestic tranquility." Typical examples of such conflicting ideology include the protest movements for civil rights in the late 1960s and the Vietnam War protest demonstrations in the early 1970s. The balance between an individual's and group's legitimate expression of dissent and the right of the populace to live in domestic tranquility requires the diligent efforts of everyone to avoid such confrontations in the future.

In modern society, laws have evolved that govern the interaction of its members to peacefully resolve conflict. In the United States, a crowd itself is constitutionally protected under "the right of the people to peacefully assemble." However, assemblies that are not peaceable are not protected, and this is generally the dividing line between crowds and mobs. The laws that deal with disruptive conduct are generally grouped into offenses that disturb the public peace. They range from misdemeanors, such as blocking sidewalks or challenging another to fight, to felonies, such as looting and rioting.

It is important to note that civil unrest is not synonymous with peaceful assembly or peaceful protest; Americans are guaranteed a right to assemble peacefully under the First Amendment to the Constitution.

#### Types of Crowds

A crowd may be defined as a casual, temporary collection of people without a strong, cohesive relationship. Crowds can be classified into four general categories:

**Casual Crowd** — A casual crowd is merely a group of people who happen to be in the same place at the same time. Examples of this type include shoppers and sightseers. The likelihood of violent conduct is all but nonexistent.

**Cohesive Crowd** — A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity, such as worshiping, dancing, or watching a sporting event. Although they may have intense internal discipline (e.g., rooting for a team), they require substantial provocation to arouse to action.

**Expressive Crowd** — An expressive crowd is one held together by a common commitment or purpose. Although they may not be formally organized, they are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest something.

**Aggressive Crowd** — An aggressive crowd is made up of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt authorities. They tend to be impulsive and highly emotional and require only minimal stimulation to arouse them to violence. Examples of this type of crowd include demonstrations and strikers.

### Types of Mobs

A mob can be defined as a large disorderly crowd or throng. Mobs are usually emotional, loud, tumultuous, violent, and lawless. Like crowds, mobs have different levels of commitment and can be classified into four categories:

**Aggressive Mob**—An aggressive mob is one that attacks, riots, and terrorizes. The object of violence may be a person, property, or both. An aggressive mob is distinguished from an aggressive crowd only by lawless activity. Examples of aggressive mobs are the inmate mobs in prisons and jails, mobs that act out their frustrations after political defeat, or violent mobs at political protests or rallies.

**Escape Mob**—An escape mob is attempting to flee from something such as a fire, bomb, flood, or other catastrophe. Members of escape mobs have lost their capacity to reason and are generally impossible to control. They are characterized by unreasonable terror.

**Acquisitive Mob**—An acquisitive mob is one motivated by a desire to acquire something. Riots caused by other factors often turn into looting sprees. This mob exploits a lack of control by authorities in safeguarding property. Examples of acquisitive mobs would include the looting in South Central Los Angeles in 1992, or food riots in other countries.

**Expressive Mob**—An expressive mob is one that expresses fervor or revelry following some sporting event, religious activity, or celebration. Members experience a release of pent up emotions in highly charged situations. Examples of this type of mob include the June 1994 riots in Canada following the Stanley Cup professional hockey championship, European soccer riots, and those occurring after other sporting events in many countries, including the United States.

Although members of mobs have differing levels of commitment, as a group they are far more committed than members of a crowd. As such, a “mob mentality” sets in, which creates a cohesiveness and sense of purpose that is lacking in crowds. Thus, any strategy that causes individual members to contemplate their personal actions will tend to be more effective than treating an entire mob as a single entity.

*Warning Time: 4 – Less than six hours*

*Duration: 3 – Less than one week*

### Location

Civil disorder can arise from several causes for a variety of reasons. Circumstances may be spontaneous or may result from escalating tensions. Civil disorder can erupt anywhere, but the most likely locations are those areas with large population groupings or gatherings. Sites that are attractive for political or other rallies should be considered as probable locations for the epicenter of civil disorder events; arenas and stadiums are another type of venue where civil disorder can occur. Civil disorder can also occur in proximity to locations where a “trigger event” occurred.

### Extent

The ultimate extent of any civil disorder incident will depend on the magnitude of that event and its location. The more widespread an incident is, the greater the likelihood of excessive injury, loss of life and property damage; additional factors, such as the ability of law enforcement to contain the event, are also critical in minimizing damages.

*Impact: 2 – Limited*

*Spatial Extent: 2 – Small*

### Historical Occurrences

There are documented events that indicate that Florida and the southern peninsula region in particular are not immune to riots, protests, and social upheaval. Some brief examples of civil unrest near Collier County are provided below.

The Miami Riot of 1968 occurred at the Vote Power building in the Liberty City neighborhood in August. A group of black organizations called for this rally in order to make known the unfair systems at play throughout the nation. This date overlapped with the Republican National Convention in Miami Beach. Things got aggressive once a white reported was forcibly kicked out and the police showed up. One passer-by had his car stoned and multiple bottles thrown at him for having a republican political sticker on his car. He fled his car which was then overturned and set on fire. The following day, the police responded to what they thought was sniper fire as the rioters were terrorizing shops. The police killed three residents and left a bullet wound in a fourth only to find no weapons close by. The riot ended when the Florida National Guard responded, imposed a curfew, and heavy rains kept people inside.

The 1980 Miami riots were race riots that began on May 18, 1980. The event that triggered the riots was the clearing of four Dade County Public Safety Department officers. They had been previously been tried for the manslaughter of Arthur McDuffie, a black salesman who passed away from wounds suffered during a high-speed chase in which these four white officers were involved. The riot broke out in the Liberty City and Overtown neighborhoods. After filing a civil lawsuit against County officials, McDuffie's family received a settlement of \$1.1 million from Dade County. These were the deadliest riots between the 1960s and the 1992 Los Angeles riots.

The 1990 Wynwood riot began in the Wynwood neighborhood in Miami after six officers had been acquitted for the death of Leonardo Mercado. Mercado was a Puerto Rican and suspected drug dealer. Puerto Ricans were unhappy during this time since they felt they had no representation in any positions of authority. Six undercover officers in the Street Narcotics Unit of the Miami Police Department met with Mercado outside of his apartment in 1988. After forcing him back inside, they beat him to death. They were charged with conspiracy and three counts of civil rights violations. After their acquittal, a mob became violent for about three hours causing \$3 million in property damage before order was restored by 200 patrolmen.

The 1996 St. Petersburg riots began after the death of an unarmed black, male teenage driver which occurred during a police traffic stop. There were two other people at the scene, one was the shooting policeman's partner, and the other was the passenger in the teenage male's car. Additionally, there were multiple witnesses, and everyone had a slightly different story of what happened. Immediately following the shooting, a crowd gathered and became frustrated when police didn't release any information. The crowd began throwing rocks and bottles at police officers. The riot continued through other areas of the city resulting in 20 people arrested, 28 arson fires, 11 injured, and multiple stores were looted. After the two original responding police officers were cleared of any charges a few week later, more rioting occurred.

Since 2010, civil unrest has again trended toward race relations as a cause. From controversial shootings of African American men by white police officers to the resulting Black Lives Matter movement, these trends may continue as the country finds ways to improve race relations. Florida has experienced specific incidents of racial unrest and violence as part of this trend and may continue to see these types of incidents in the future.

Specific incidents occurring in a single jurisdiction can cause civil unrest nationally; the Michael Brown shooting incident in Ferguson, MO is an example of this. On November 25, 2014, CNN reported that

thousands of people in more than 170 U.S. cities rallied to protest the grand jury decision not to indict the officer involved.

Another recent trend is the destruction, defacement, and/or removal of statues and other memorials dedicated to the Confederacy during the Civil War. Areas near Collier County have experienced incidents of this nature, including the vandalization and subsequent removal of a confederate monument in West Palm Beach in August 2017, the removal and renaming of streets in Hollywood in April 2018, and the removal of the Robert E. Lee's bust in Fort Meyers in March 2019. As the country continues to debate whether monuments to the Confederacy are appropriate, these types of incidents may continue to occur.

### Probability of Future Occurrence

In their article on "Understanding Riots" published in the *Cato Journal* (Vol. 14, No 1), David D. Haddock and Daniel D. Polsby note that a large crowd itself is not an incipient riot merely because it assembles a great many people. Haddock and Polsby explain that "starting signals" must occur for civil disorder to erupt; these starting signals include certain kinds of high-profile events. With any conventional triggering event, such as news of an assassination or unpopular jury verdict, crowds form spontaneously in various places as word of the incident spreads, without any one person having to recruit them. But since not every crowd threatens to evolve into a riot, the authors reason that a significant number of people must expect and desire that the crowd will become riotous. In addition, "someone has to serve as a catalyst" The authors conclude that once someone has taken a risk to get things started, the rioting will begin and spread until civil authorities muster enough force to make rioters believe they face a realistic prospect of arrest.

Collier County will likely experience future episodes of marches, protests, demonstrations, and gatherings that could lead to some type of disruptive civil disorder. However, based on the general history of civil disturbance and the various human factors noted above, the probability that such incidents will develop into full-scale, widespread riots is considered low.

Should the planning area experience future incidents of disruptive civil disorder or rioting, the severity of a given event could range from low to high, depending on many factors. Civil disturbances may result in arrests, damage to property (police vehicles with broken windows, etc.), injuries, fatalities and manpower/overtime costs for police, fire, and other response services.

*Probability: 2 – Possible*

### Climate Change

As a human-caused hazard, any changes in climate would not have a direct impact on civil disorder. Far more relevant, though, could be the implications of future climate change as a cause for civil disorder. Climate change impact forecasts include increasingly extreme weather patterns that exacerbate issues of drought, flooding, severe weather and other weather hazards globally that could affect whole ecosystems. Incidents of civil disobedience could be a secondary result related to societal unrest as a result of other climate-impacted hazards.

### Vulnerability Assessment

As discussed above, the impacts from civil disorder vary greatly depending on the nature, severity, and success of the attack.

When rioting does break out, it generally proves extremely difficult for first-responder law enforcement authorities to quell the mob promptly. The rules of constitutional law set stringent limits on how police officers can behave toward the people they try to arrest. Restraint also plays a crucial part in avoiding any action that "fans the flames." Initial police presence is often undermined because forces may be staffed

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below the peak loads needed to bring things back under control. At a result, the riot may continue until enough state police or National Guard units arrive to bolster the arrest process and subsequently restore order. In many cases, damage to life and property may already be extensive.

### People

Injuries and fatalities can occur during civil unrest.

### Property

Should a large gathering of people turn violent, damage to property and infrastructure can result, as well as looting of property.

### Environment

Environmental impacts could occur if the civil unrest occurs in an outdoor or environmentally sensitive area. These impacts would be tied to the parameters of the incident.

### Consequence Analysis

Table 2.81 summarizes the potential consequences of civil unrest.

**Table 2.81 – Consequence Analysis – Civil Unrest**

Category	Consequences
Public	Possible injuries and fatalities can occur during civil unrest. The location of the unrest will be inaccessible to those who live or work in that area.
Responders	Localized impact expected to be severe for unprotected personnel and moderate to light for protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Damage to facilities/personnel in the area of the incident may require temporary relocation of operations; localized disruption of lines of communication and destruction of facilities may postpone delivery of some services.
Property, Facilities and Infrastructure	Localized impact to facilities and infrastructure in the area of the incident. Some severe damage possible.
Environment	May cause extensive damage in isolated cases and some denial or delays in the use of some areas. Remediation needed.
Economic Condition of the Jurisdiction	Local economy and finances adversely affected, possibly for an extended period, depending on damage.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

### Hazard Summary by Jurisdiction

The following table summarizes civil disturbance risk by jurisdiction. Risk is not expected to change substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	2	2	2	4	3	2.3	M
Immokalee Reservation	2	2	2	4	3	2.3	M
Marco Island	2	2	2	4	3	2.3	M
Naples	2	2	2	4	3	2.3	M

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Unincorporated Collier County	2	2	2	4	3	2.3	M

### 2.5.21 Critical Infrastructure Disruption

#### Hazard Background

Critical infrastructure disruptions include threats such as cyber-attacks. Cyber-attacks are commonly defined as “deliberate attacks on information technology systems in an attempt to gain illegal access to a computer, or purposely cause damage.” Cyber-attacks use malicious code to alter computer operations or data. The vulnerability of computer systems to attacks is a growing concern as people and institutions become more dependent upon networked technologies. The Federal Bureau of Investigation (FBI) reports that “cyber intrusions are becoming more commonplace, more dangerous, and more sophisticated,” with implications for private- and public-sector networks.

There are many types of cyber-attacks. Among the most common is a direct denial of service, or DDoS attack. This is when a server or website will be queried or pinged rapidly with information requests, overloading the system and causing it to crash.

Malware, or malicious software, can cause numerous problems once on a computer or network, from taking control of users’ machines to discreetly sending out confidential information. Ransomware is a specific type of malware that blocks access to digital files and demands a payment to release them. Hospitals, school districts, state and local governments, law enforcement agencies, businesses, and even individuals can be targeted by ransomware.

Cyber spying or espionage is the act of illicitly obtaining intellectual property, government secrets, or other confidential digital information, and often is associated with attacks carried out by professional agents working on behalf of a foreign government or corporation. According to cybersecurity firm Symantec, in 2016 “...the world of cyber espionage experienced a notable shift towards more overt activity, designed to destabilize and disrupt targeted organizations and countries.”

Major data breaches - when hackers gain access to large amounts of personal, sensitive, or confidential information - have become increasingly common. The Symantec report says more than seven billion identities have been exposed in data breaches over the last eight years. In addition to networked systems, data breaches can occur due to the mishandling of external drives, as has been the case with losses of some state employee data.

Cybercrime can refer to any of the above incidents when motivated primarily by financial gain or other criminal intent.

The most severe type of attack is cyber terrorism, which aims to disrupt or damage systems in order to cause fear, injury, and loss to advance a political agenda.

*Warning Time: 4 – Less than six hours*

*Duration: 3 – Less than one week*

#### Location

Our society is highly networked and interconnected. Cyber disruption events can occur and/or impact virtually any location in the county where computing devices are used. Incidents may involve a single location or multiple geographic areas. A disruption can have far-reaching effects beyond the location of the targeted system; disruptions that occur far outside the region can still impact people, businesses, and institutions within the region. Depending on the attack vector and parameters, a cyber-attack could impact all of Collier County and its associated municipal jurisdictions.

### Extent

The extent or magnitude/severity of a cyber disruption event is variable depending on the nature of the event. A disruption affecting a small, isolated system could impact only a few functions/processes. Disruptions of large, integrated systems and especially systems related to the functionality of critical facilities could impact many functions/processes, as well as many individuals that rely on those systems.

There is no universally accepted scale to quantify the severity of cyber-attacks. The strength of a DDoS attack is sometimes explained in terms of a data transmission rate. One of the largest DDoS disruptions ever, which brought down some of the internet's most popular sites on October 21, 2016, peaked at 1.2 terabytes per second. Data breaches are often described in terms of the number of records or identities exposed.

*Impact: 3 – Critical*

*Spatial Extent: 4 – Large*

### Historical Occurrences

The cyber security company Symantec reports there were a total of 1,209 data breaches worldwide in 2016, 15 of which involved the theft of more than 10 million identities. While the number of breaches has remained relatively steady, the average number of identities stolen has increased to almost one million per incident. The report also found that one in every 131 emails contains malware, and the company's software blocked an average of 229,000 web attacks every day.

The Privacy Rights Clearinghouse, a nonprofit organization based in San Diego, maintains a timeline of 9,361 data breaches, of which at least 2,792 were acts of computer hacking, in the United States from 2005-2019. The database lists 465 total data breaches, including 108 hacking events in Florida, totaling over 400 million impacted records. One attack was recorded in Naples, and others almost certainly included information on individuals who live in the region. Similarly, some residents in the region were likely affected by national and international data breaches. Media reports indicate an uptick in cyber-attacks across the state.

In 2018, Collier County was scammed out of \$184,000 according to local news reports. Money from County offices was wire transferred to a fraudulent contractor unknowingly. The fraud originated abroad. Money was recovered from insurance carriers and the correct contractor was paid in full.

### Probability of Future Occurrence

Cyber-attacks occur daily, but most have negligible impacts at the local or regional level. The possibility of a larger disruption affecting systems within the area is a constant threat, but it is difficult to quantify the exact probability due to such highly variable factors as the type of attack and intent of the attacker. Minor attacks against business and government systems have become a commonplace occurrence but are usually stopped with minimal impact. Similarly, data breaches impacting the information of residents of the Collier County area are almost certain to happen in coming years. Major attacks or breaches specifically targeting systems in the area are less likely but cannot be ruled out.

*Probability: 2 – Possible*

### Climate Change

Climate change is not expected to affect critical infrastructure disruption.

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### Vulnerability Assessment

As discussed above, the impacts from a cyber-attack vary greatly depending on the nature, severity, and success of the attack.

#### People

Cyber-attacks can have a significant cumulative economic impact. Symantec reports that in the last three years, businesses have lost \$3 billion due to spear-phishing email scams alone though phishing rates have declined from 1 in 2,995 emails in 2017 to 1 in 3,207 emails in 2018. A major cyber-attack has the potential to undermine public confidence and build doubt in their government's ability to protect them from harm.

Injuries or fatalities from cyber-attacks would generally only be possible from a major cyber terrorist attack against critical infrastructure.

#### Property

Short of a major cyber terrorist attacks against critical infrastructure, property damage from cyber-attacks is typically limited to computer systems.

#### Environment

Short of a major cyber terrorist attacks against critical infrastructure, property damage from cyber-attacks is typically limited to computer systems. A major cyber terrorism attack could potentially impact the environment by triggering a release of a hazardous materials, or by causing an accident involving hazardous materials by disrupting traffic-control devices.

#### Consequence Analysis

Table 2.82 summarizes the potential consequences of a cyber threat.

**Table 2.82 – Consequence Analysis – Cyber Threat**

Category	Consequences
Public	Cyber-attacks can impact personal data and accounts. Injuries or fatalities could potentially result from a major cyber terrorist attack against critical infrastructure.
Responders	Injuries or fatalities could potentially result from a major cyber terrorist attack against critical infrastructure.
Continuity of Operations (including Continued Delivery of Services)	Agencies that rely on electronic backup of critical files are vulnerable. The delivery of services can be impacted since governments rely, to a great extent, upon electronic delivery of services.
Property, Facilities and Infrastructure	Rare. Most attacks affect only data and computer systems. Sabotage of utilities and infrastructure from a major cyber terrorist attacks could potentially result in system failures that damage property on a scale equal with natural disasters. Facilities and infrastructure may become unusable as a result of a cyber-attack.
Environment	Rare. A major attack could theoretically result in a hazardous materials release.
Economic Condition of the Jurisdiction	Could greatly affect the economy. In an electronic-based commerce society, any disruption to daily activities can have disastrous impacts to the economy. It is difficult to measure the true extent of the impact.
Public Confidence in the Jurisdiction's Governance	The government's inability to protect critical systems or confidential personal data could impact public confidence. An attack could raise questions regarding the security of using electronic systems for government services.

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### Hazard Summary by Jurisdiction

The following table summarizes critical infrastructure disruption risk by jurisdiction. Risk is not expected to change substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	2	3	4	4	3	3.3	H
Immokalee Reservation	2	3	4	4	3	3.3	H
Marco Island	2	3	4	4	3	3.3	H
Naples	2	3	4	4	3	3.3	H
Unincorporated Collier County	2	3	4	4	3	3.3	H

### 2.5.22 Special Events

#### Hazard Description

Special events are defined as events of national significance or important visitors. Important visitors can include dignitaries among others. Many issues can arise because of these events including civil disturbance, terrorism, and criminal activity.

The U.S. Department of Homeland Security deem events that could be potential targets for terrorism or other criminal activity National Special Security Events (NSSE). These events can include but are not limited to summits of world leaders, meetings of international organizations, presidential nominating conversations, and presidential nominations. These events mostly occur in a specific location for a specific amount of time.

In order to determine what qualifies as a special event or an NSSE, there are several factors to consider. Table 2.83 below shows some common factors that would cause an event to be a special or NSSE event.

**Table 2.83 – Special Event Factors to Consider**

Factor	Description
Dignitary Attendance	Events attended by U.S. officials or foreign dignitaries may cause federal interest to guarantee the event occurs without incident, or at least that resources are available in the case that an incident occurs.
Size	More attendees and participants in an event cause more security measures to be needed. Larger events typically attract more attention of terrorists or criminals and may see weapons of mass destruction.
Significance	An event that has historical, political, cultural, or symbolic significance may attract criminal or terrorist activity.
Duration	If an even lasts several days or weeks, it is unlikely local and state law enforcement alone will be able to control the security of said event. Federal assistance may be required.
Availability of State and Local Resources	If state and local jurisdictions don't have the expertise, experience, or manpower to ensure protection of those at an event, federal assistance may be required.
Number of Jurisdictions	Multiple jurisdictions are sometimes required to coordinate law enforcement and public safety agencies. It could be helpful to include an agency to oversee the coordination.
Threat Assessments	When there is anticipated terrorism or criminal activity.

Source: U.S. Department of Homeland Security, National Special Security Event (NSSE)

Though these events are typically planned, issues could pop up at any moment giving little forewarning. Mobs or other types of civil disturbance can easily occur at or in response to special events.

*Warning Time: 4 – Less than 6 Hours*

*Duration: 2 – Less than 24 Hours*

#### Location

While special events could happen anywhere, they are most likely to occur at convention centers, political buildings, concert halls, and other locations of state, national, or international importance. Some locations in Collier County that would be ideal for special events include but are not limited to the following:

- ▶ Golf and Country Clubs
  - Naples Lakes Country Club

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- Tiburón Golf Club
- Golf Club of the Everglades
- Cypress Woods Golf and Country Club
- Heritage Bay Golf and Country Club
- ▶ Hotels and Resorts
  - Inn of Naples
  - Lely Resort
  - Hyatt House
  - Hilton Marco Island Beach Resort
  - The Ritz-Carlton Golf Resort
  - Bayfront Inn
  - Hilton Naples
  - Edgewater Beach Hotel and Club
  - Naples Beach Hotel and Golf Club
  - LaPlaya Beach and Golf Resort
  - JW Marriott Marco Island
- ▶ Restaurants
  - Seasons 52
  - Shula's Steak House
- ▶ Other
  - Naples Zoo
  - Venue Naples
  - Marco Island Yacht Club
  - Marco Island Princess
  - Seminole Casino

### Extent

Special events tend to be in a small area which will be most impacted. In some cases, road closures may be expected for high volume traffic purposes.

*Impact: 1 – Minor*

*Spatial Extent: 1 – Negligible*

### Historical Occurrences

As detailed in the Civil Disturbance hazard in Section 2.5.20, the Miami Riot of 1968 occurred as a result of the Republican National Convention, a special event being held in Miami. While not in Collier County, it was nearby in Miami-Dade County.

### Probability of Future Occurrence

Collier County's beaches and proximity to Big Cypress National Preserve and Everglades National Park make it a popular destination for several special events. Therefore, it is likely that more special events will occur in the County in the future.

*Probability: 3 – Likely*

### Climate Change

Climate change is not expected to impact special event hazards. However, there could be more climate change summits or perhaps politically charged protests in the future which would require special security and preparation.

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### Vulnerability Assessment

#### People

Special events by nature will congregate a group of people together, however large. Having a group of people in the same space can cause logistical problems. This leads to the possibility of injury or death, though death is unlikely unless there is a concurrent hazard such as terrorism, civil disturbance, or a natural disaster.

#### Property

Any damages to property are likely to be localized to the event space. Anytime people gather in the same space, there is a possibility of property damage.

#### Environment

Any damages to the environment are likely to be localized around an event. There is a low possibility of environmental damage without a simultaneous natural or human caused disaster.

#### Consequence Analysis

Table 2.84 shows the consequences for special events.

**Table 2.84 – Consequence Analysis – Special Events**

Category	Consequences
Public	Localized impact expected to be moderate for affected areas and moderate to light for other less affected areas without a concurrent hazard or disaster.
Responders	Adverse impact expected to be moderate for unprotected personnel and moderate to light for trained, equipped, and protected personnel.
Continuity of Operations (including Continued Delivery of Services)	Localized disruption of roads caused by incidents may postpone delivery of some services.
Property, Facilities and Infrastructure	Localized impact to facilities and infrastructure in the areas of the incident. Roads most adversely affected.
Environment	Environmental damage to trees, bushes, beaches, etc. possible but unlikely.
Economic Condition of the Jurisdiction	Local economy and finances may be adversely affected, depending on damage.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

#### Hazard Summary by Jurisdiction

The following table summarizes special event hazard risk by jurisdiction. This hazard is not expected to change substantially between jurisdictions.

Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	3	1	1	4	2	2.0	M
Immokalee Reservation	3	1	1	4	2	2.0	M
Marco Island	3	1	1	4	2	2.0	M
Naples	3	1	1	4	2	2.0	M
Unincorporated Collier County	3	1	1	4	2	2.0	M

### 2.5.23 Red Tide / Algae Bloom

#### Hazard Description

Red tide is a harmful type of algal bloom which are caused by colonies of algae growing out of control in aquatic environments. The name can be misleading since the blooms can be red, brown, blue, green, or yellow. Algae colonies themselves are not harmful until they are in excess. When they're out of control, they produce toxins that can harm humans, fish, shellfish, marine mammals, and birds. Algae have a seasonal growth cycle causing them to grow more in the spring and summer months, and they can often disappear in the winter months. Temperature, day length, and rainfall also affect their growth. The red tide organism, which is most commonly causing issues in Florida, *Karenia brevis*, is monitored by the Florida Fish and Wildlife Conservation Commission (FWC). They take daily samples in multiple locations to determine the level of red tide at any time.

The FWC measures the number of *Karenia brevis* cells in sample locations to determine the level of red tide present in a given area. Table 2.85 below shows the measurement categories and possible effects of *K. brevis*.

**Table 2.85 – Measurement and Effects of *Karenia Brevis***

Description	<i>K. brevis</i> abundance	Possible effects
Not present-background	Background levels of 1,000 cells or less	No effects anticipated
Very low	Greater than 1,000 to 10,000 cells per liter	Possible respiratory irritation Shellfish harvesting closures when cell abundance equals or exceeds 5,000 cells per liter
Low	Greater than 10,000 to 100,000 cells per liter	Respiratory irritation Shellfish harvesting closures Possible fish kills Probable detection of chlorophyll by satellites at upper range of cell abundance
Medium	Greater than 100,000 to 1,000,000 cells per liter	Respiratory irritation Shellfish harvesting closures Probable fish kills Detection of surface chlorophyll by satellites
High	Greater than 1,000,000 cells per liter	Respiratory irritation Shellfish harvesting closures Probable fish kills Detection of surface chlorophyll by satellites Water discoloration

Source: Florida Fish and Wildlife Conservation Commission

The measurement system above is the legend key for Figure 2.48 and Figure 2.49 which show Florida *K. brevis* concentrations in October 2017 and November 2018, and December 2019 respectively. Watch as the concentration of the organism increases and then decreases on the coast of Florida.

*Warning Time: 1 – More than 24 hours*

*Duration: 4 – More than 1 week*

Figure 2.48 – Red Tide Status Map, 2017-2018

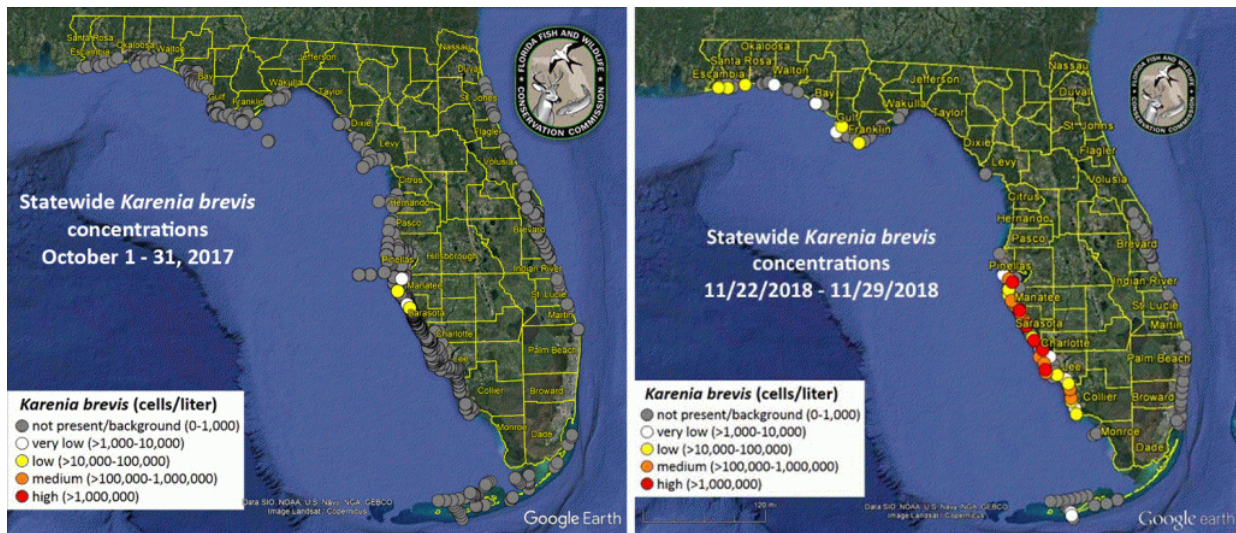
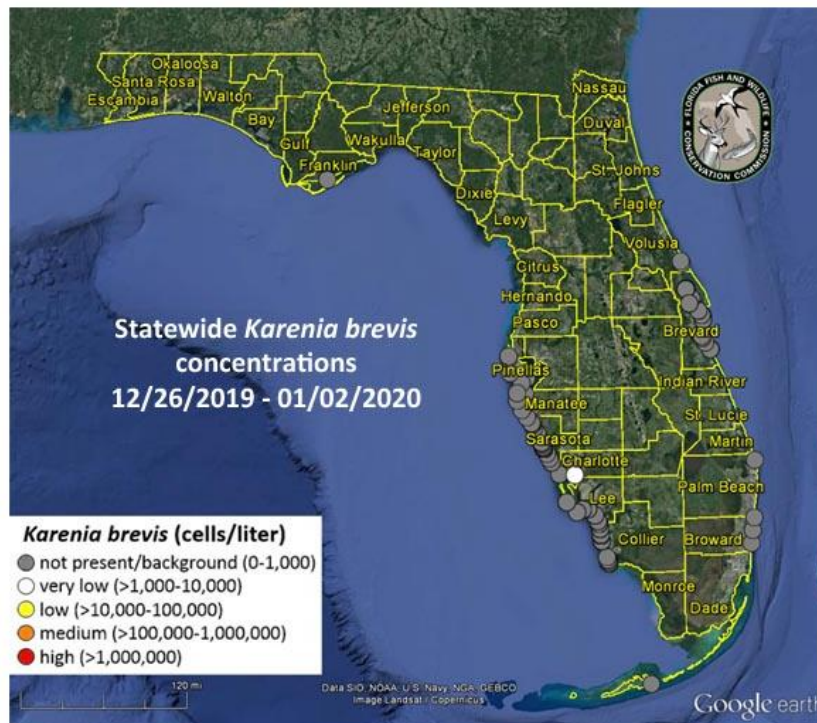


Figure 2.49 – Red Tide Status Map, 2019-2020

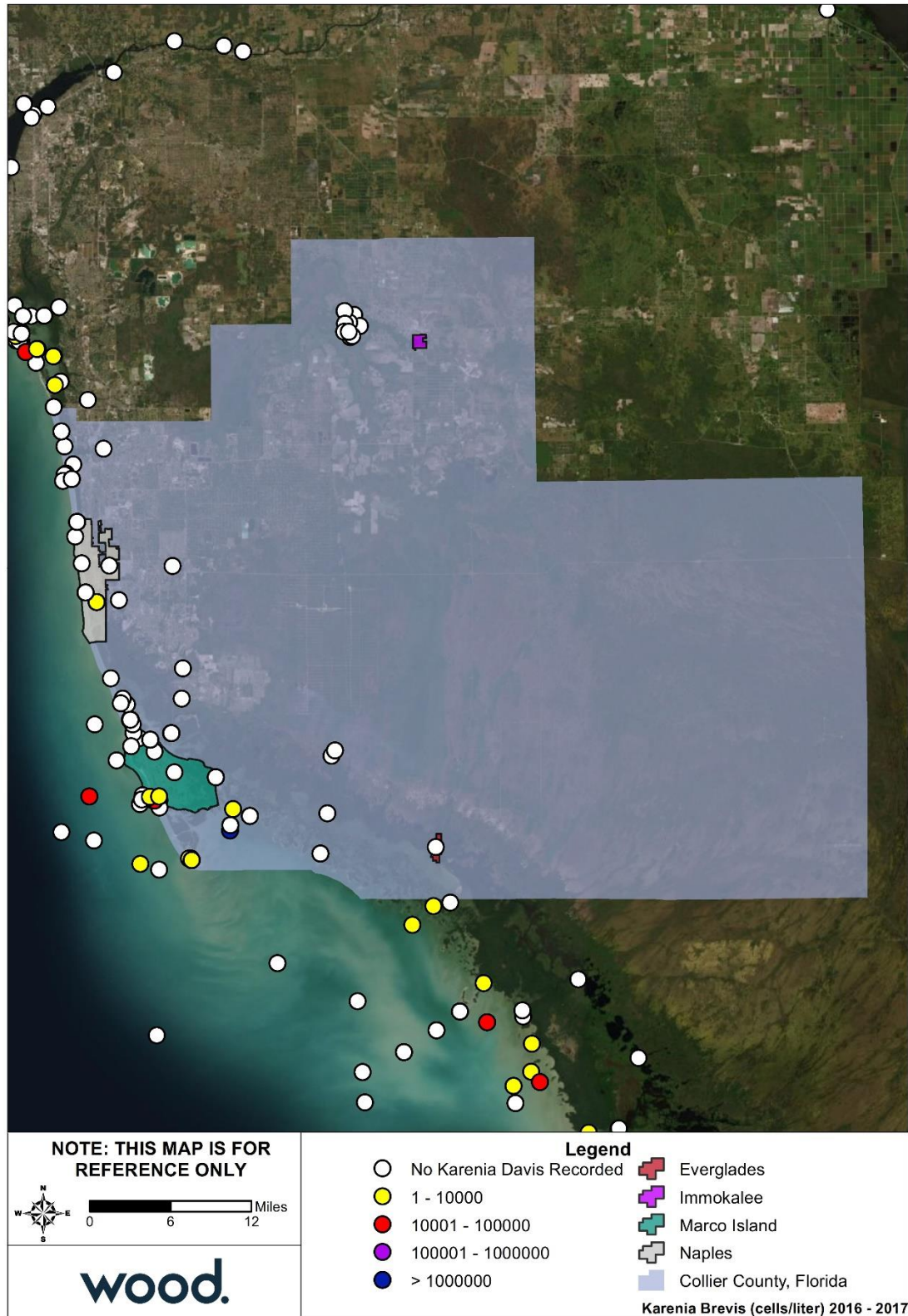


### Location

In late 2019 and early 2020, scientists and researchers have discovered little to no red tide around Florida. However, since *Karenia brevis* occurs naturally in the Gulf of Mexico, it's unlikely that red tide is gone for good.

Figure 2.50 shows where red tide was found close to Collier County between 2016 and 2017.

Figure 2.50 – *Karenia Brevis* Cells per Liter, 2016-2017



Source: Florida Fish and Wildlife Conservation Commission

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Most of the sampling locations in early January 2020 showed little to no (less than 1,000) *K. brevis* cells in southern Florida. The highest concentration was located just off the coast of Collier County and was rated as “low,” between 10,000 and 100,000 cells.

### Extent

*Karenia brevis* is native to the Gulf of Mexico and is therefore found in the Gulf, often close to shorelines. Most of the red tide found in or off the coast of Florida occur on the western coast. However, red tide is also found on the eastern coast. This is due to the Florida Current which carries organisms from the Gulf of Mexico around the southern edge of Florida to the Atlantic Ocean. The Florida Current then joins with the Antilles Current to become the Gulf Stream.

Red tide can get as large as 10,000 square miles anywhere throughout the water column. This makes it very impractical to irradiate. Additionally, any current method of removing the toxins from the blooms or water could cause irreversible damage to ecosystems.

*Impact: 2 – Limited*

*Spatial Extent: 3 – Moderate*

### Historical Occurrences

The first accounts of red tide in Florida came from the Spanish explorers thousands of years ago and the first sufficiently documented account came from 1844. It has only become well-known and studied in the past 60 years. A grant program called the Red Tide Control and Mitigation Program began in 2007 with the goal of finding new ways to control or mitigate the effects of red tide. It funded 12 projects that included outreach and public information.

The current Florida red tide began in October 2017. Even though blooms have only been monitored since 1954, few blooms have lasted longer than the current one. It has devastated the Gulf Coast from October 2017 to early 2019, killing millions of pounds of marine life and shutting down tourism, real estate, and recreational fishing in much of Lee, Collier, and Charlotte Counties.

### Probability of Future Occurrence

Considering that the bloom from 2017 is still present in early 2020, and based on historical occurrences, it is safe to say that red tide will likely occur in the future. Scientists and researchers are working on ways to control and mitigate it. It is expected that there will be another great bloom in the future.

*Probability: 3 – Likely*

### Climate Change

Climate change is expected to severely affect our ability to control blooms. Algal blooms thrive in higher air and ocean temperatures. In combination with fertilizer runoff which is nitrogen-rich, red tide has gotten harder to control even in recent years. It could become impossible to control in the future. *K. brevis* tends to thrive in water temperatures of 83 degrees Fahrenheit but can grow faster in hotter temperatures if there is more carbon dioxide. Atmospheric carbon dioxide has been on the rise for a long time and that trend will continue if society continues to burn fossil fuel.

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### Vulnerability Assessment

#### People

*K. brevis* puts off brevetoxins which can cause respiratory issues and irritation of the throat or skin in humans. Exposure can also occur through contamination of food or water supply. Seafood from a contaminated area may be unsafe to eat.

#### Property

Toxins could seep into land close to the ocean or other affected areas. Damages to property are highly unlikely.

#### Environment

The environment is likely to be affected because red tide is so toxic. There could be loss of life including birds, fish, shellfish, and aquatic animals. Additionally, water quality could be negatively affected.

#### Consequence Analysis

Table 2.86 summarizes the potential consequences of red tide.

**Table 2.86 – Consequence Analysis – Red Tide / Algae Bloom**

Category	Consequences
Public	Exposure to brevetoxins can cause respiratory issues and irritation. Those who encounter water with high <i>K. brevis</i> concentrations may have skin and eye irritation or rashes. Those living and working closest to sites with <i>K. brevis</i> face the greatest risk of exposure. Exposure may also occur through contamination of food or water supplies.
Responders	Responders face similar risks as the general public but a heightened potential for exposure to toxins.
Continuity of Operations (including Continued Delivery of Services)	A red tide incident may cause temporary localized impacts but is unlikely to affect continuity of operations.
Property, Facilities and Infrastructure	Damages to property are highly unlikely other than for ocean-side beaches. Impacts would be highly localized.
Environment	Possible ecological impacts include loss of wild and aquatic life, loss of habitat, and degradation of water quality.
Economic Condition of the Jurisdiction	Annual tourist, sales, health, and clean-up costs. Red tides are estimated to cost \$20 million in tourist-related losses in Florida each year. Clean-up costs are around \$163,000 annually.
Public Confidence in the Jurisdiction's Governance	A red tide incident may affect public confidence if the environmental or health impacts are enduring.

#### Hazard Summary by Jurisdiction

The following table summarizes red tide algae bloom hazard risk by jurisdiction. Risk is not expected to change substantially between jurisdictions. Jurisdictions with shoreline at risk were assigned a probability of 3 (likely), an impact of 2 (limited), and a spatial extent of 2 (small). Jurisdictions with little to no shoreline at risk were assigned a probability score of 1 (unlikely), an impact of 1 (minor), and a spatial extent of 1 (negligible). Warning time and duration are inherent to the hazard and remain constant across jurisdictions.

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Jurisdiction	Probability	Impact	Spatial Extent	Warning Time	Duration	Score	Priority
Everglades City	3	2	2	1	4	2.4	H
Immokalee Reservation	1	1	1	1	4	1.3	L
Marco Island	3	2	2	1	4	2.4	H
Naples	3	2	2	1	4	2.4	H
Unincorporated Collier County	3	2	2	1	4	2.4	H

**2.6 CONCLUSIONS ON HAZARD RISK**
**Priority Risk Index**

As discussed in Section 2.2 Hazard Identification, the Priority Risk Index was used to rate each hazard on a set of risk criteria and determine an overall standardized score for each hazard. The conclusions drawn from this process are summarized below.

Table 2.87 summarizes the degree of risk assigned to each identified hazard using the PRI method.

**Table 2.87 – Summary of PRI Results**

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
<b>Natural Hazards</b>						
Flood	Highly Likely	Critical	Large	6 to 12 hours	Less than 1 week	3.5
Tropical Cyclones	Likely	Catastrophic	Large	More than 24 hrs	Less than 1 week	3.3
Severe Storms <sup>1, 2</sup> (Thunderstorm)	Highly Likely	Limited	Large	Less than 6 hrs	Less than 6 hrs	3.1
Severe Storms <sup>1</sup> (Lightning)	Highly Likely	Minor	Negligible	Less than 6 hrs	Less than 6 hrs	2.2
Severe Storms <sup>1</sup> (Hail)	Highly Likely	Minor	Small	Less than 6 hrs	Less than 6 hrs	2.4
Severe Storms <sup>1, 2</sup> (Tornado)	Highly Likely	Critical	Small	Less than 6 hrs	Less than 6 hrs	3.0
Wildfire <sup>2</sup>	Likely	Critical	Moderate	Less than 6 hrs	Less than 1 week	3.1
Coastal Erosion <sup>2</sup>	Likely	Limited	Small	More than 24 hrs	Less than 1 week	2.3
Drought	Likely	Minor	Large	More than 24 hrs	More than 1 week	2.5
Extreme Heat	Highly Likely	Limited	Large	More than 24 hrs	Less than 1 week	3.0
Sea Level Rise and other Climate Change Characteristics <sup>2</sup>	Likely	Critical	Moderate	More than 24 hrs	More than 1 week	2.9
Sink holes	Unlikely	Limited	Negligible	Less than 6 hrs	More than 1 week	1.9
Winter Storms and Freeze	Likely	Limited	Large	More than 24 hrs	Less than 1 week	2.7
Earthquake	Unlikely	Limited	Moderate	Less than 6 hrs	Less than 6 hrs	2.0
Tsunami <sup>2</sup>	Unlikely	Catastrophic	Large	6 to 12 hrs	Less than 24 hrs	2.8
<b>Technological and Human-Caused Hazards &amp; Threats</b>						
Major Transportation Incidents	Possible	Critical	Negligible	Less than 6 hrs	More than 1 week	2.5
Pandemic Outbreak	Possible	Critical	Moderate	More than 24 hrs	More than 1 week	2.6
Hazardous Materials	Likely	Minor	Negligible	Less than 6 hrs	Less than 24 hrs	2.0
Coastal Oil Spills <sup>2</sup>	Possible	Limited	Small	6 to 12 hrs	More than 1 week	2.3
Nuclear Power Plant <sup>2</sup>	Unlikely	Catastrophic	Small	Less than 6 hours	More than 1 week	2.3
Terrorism	Unlikely	Catastrophic	Negligible	Less than 6 hrs	Less than 6 hrs	2.2
Mass Migration Incident	Possible	Critical	Moderate	6 to 12 hrs	More than 1 week	2.8
Civil Disturbance	Possible	Limited	Small	Less than 6 hrs	Less than 1 week	2.3
Critical Infrastructure Disruption	Possible	Critical	Large	Less than 6 hrs	Less than 1 week	3.3
Special Events	Likely	Minor	Negligible	Less than 6 hrs	Less than 24 hrs	2.0
Red Tide/Algae Bloom <sup>2</sup>	Likely	Limited	Small	More than 24 hrs	More than 1 week	2.2

<sup>1</sup>Severe Storms and Tornadoes hazards average to a score of 2.76 and are therefore considered together as a high-risk hazard.

<sup>2</sup>Note: These risks varied by jurisdiction, so the most severe score is shown.

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The results from the PRI have been classified into three categories based on the assigned risk value which are summarized in Table 2.88:

- ▶ **High Risk** – Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread.
- ▶ **Medium Risk** – Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- ▶ **Low Risk** – Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal. This is not a priority hazard.

**Table 2.88 – Summary of Hazard Risk Classification**

<b>High Risk (&gt; 2.4)</b>	Flood Tropical Cyclones Severe Storms (Thunderstorm, Lightning, Hail, Tornado) Wildfire Drought Extreme Heat Sea Level Rise Winter Storms and Freeze Tsunami Major Transportation Incidents Pandemic Outbreak Mass Migration Incident Civil Infrastructure Disruption
<b>Moderate Risk (2.0 – 2.4)</b>	Coastal Erosion Earthquake Hazardous Materials Coastal Oil Spills Nuclear Power Plant Terrorism Civil Disturbance Civil Infrastructure Disruption Red Tide/Algae Bloom Special Events
<b>Low Risk (&lt; 2.0)</b>	Sink Holes

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### 3.0 LOCAL MITIGATION STRATEGY GOALS AND OBJECTIVES

The Local Mitigation Strategy Working Group (LMSWG) developed these goals and objectives based on their communities' comprehensive plans and codes. The LMSWG adopted these as the Local Mitigation Strategy (LMS) goals. They are up for review annually and can be modified based on a quorum vote of LMSWG members. (NOTE: See also Annex I of this LMS, for the Collier County Floodplain Management Plan. In that plan see paragraph 7.8 (Setting Goals) for a more detailed listing of goals adopted by the Floodplain Management Planning Committee specific to reducing the County's flood hazards exposure.)

Since the 2015 LMS was approved, the priorities have not changed and recently the LMS working group added the cyber and sea level rise threats.

**DEFINITION: "Collier County" used in this section means all cities, other participating jurisdictions and certain eligible private-non-profit agencies under the Board of County Commissioners (BCC).**

#### GOAL 1

Collier County shall pursue efforts to reduce the vulnerability and exposure of its residents and guests by protecting lives and property from the effects of natural, man made and technological disasters.

Objective 1.1: Maximize the protection of the public's health, safety and welfare from natural, manmade and technological disasters.

- Hazard Mitigated: All Hazards

Objective 1.2: Reduce the potential loss of personal and public property caused by natural, manmade and technological disasters.

- Hazard Mitigated: All Hazards

Objective 1.2.1: Collier County BCC and the municipalities shall pursue efforts to reduce the number of repetitive loss properties within its boundary.

- Hazard Mitigated: Flood, Tropical Cyclone, Sea Level Rise

Objective 1.2.1.1: Acquire the repetitive loss properties through funding structured for such purposes.

- Hazard Mitigated: Flood, Tropical Cyclone, Sea Level Rise

Objective 1.2.1.2: Elevate the repetitive loss properties through financial incentive programs that are developed for such purposes.

- Hazard Mitigated: Flood, Tropical Cyclone, Sea Level Rise

Objective 1.3: Protect natural resources (such as environmentally sensitive lands and aquifers) to maximize their survivability and to safeguard them from damages caused by natural, manmade or technological disasters.

- Hazard Mitigated: All Hazards

Objective 1.4: Ensure the Land Development Codes and Ordinances are enough to protect public safety and property.

- Hazard Mitigated: All Hazards

Objective 1.5: Develop and maintain evacuation plans for the safe evacuation of residents from coastal storm surges, inland flooding, terrorist acts, hazardous material incidents and wildland fires.

- Hazard Mitigated: All Hazards

Objective 1.6: Protect dune systems and coastal/marine resources from the adverse effects of coastal development.

- Hazard Mitigated: Tropical Cyclone, Sea Level Rise

Objective 1.7: Ensure that mitigation measures are adequately addressed in the comprehensive system of coordinated planning, management and land acquisition.

- Hazard Mitigated: All Hazards

Objective 1.8: Encourage land and water uses which are compatible with the protection of environmentally sensitive lands and coastal resources.

- Hazard Mitigated: Flood, Tropical Cyclone, Sea Level Rise

Objective 1.9: Prohibit development and other activities which negatively impact coastal dune systems and promote the restoration of dune systems that have been damaged.

- Hazard Mitigated: Tropical Cyclone, Sea Level Rise

Objective 1.10: Expand shelter spaces for the growing number of People with Special Needs (PSN) population. The shelters for the PSN community should include hardened facilities equipped with generator(s) sufficiently sized to meet the electrical needs to power the PSN's medical devices, facility air conditioning as well as provide power to the sewage lift-stations.

- Hazard Mitigated: All Hazards

## GOAL 2

The Collier County Emergency Management Division will take a pro-active role in ensuring intra-governmental coordination within Collier County Government and inter-governmental coordination with other government agencies to enhance hazard mitigation planning activities.

Objective 2.1: Coordinate state and federal disaster training programs with all government agencies in Collier County.

- Hazard Mitigated: All Hazards

Objective 2.2: Coordinate the essential flow of information before, during and after a disaster.

- Hazard Mitigated: All Hazards

Objective 2.3: Encourage cooperation and participation of all public and private agencies in mitigation planning.

- Hazard Mitigated: All Hazards

Objective 2.4: Ensure that the Collier County Hazard Mitigation Annex to the Comprehensive Emergency Management Plan incorporates appropriate mitigation measures as reflected in each agency's Emergency Support Function Annex or Standard Operating Procedures.

- Hazard Mitigated: All Hazards

Objective 2.5: Adopt and use the National Incident Management System (NIMS) of Incident Command and the Florida Incident Command System for disaster management.

- Hazard Mitigated: All Hazards

## GOAL 3

Reduce the vulnerability of critical and public facilities from the effects of terrorism, natural, man made and technological disasters.

Objective 3.1: Encourage designing and installing wind and/or water proofing components and target hardening for all designated ~~proposed government-owned~~ critical facilities.

- Hazard Mitigated: Flood, Tropical Cyclone

Objective 3.2: Develop and maintain fuel, energy, communications and preparedness plans that will be both practical and effective during periods of disrupted energy and communication events.

- Hazard Mitigated: Flood, Tropical Cyclone, Cyber Attack

Objective 3.3: Incorporate hazard mitigation measures such as wind/flood proofing and target hardening during any rehabilitation of existing public facilities.

- Hazard Mitigated: Flood, Tropical Cyclone

Objective 3.4: Harden shelter facilities, proposed and existing, from the hazards they are vulnerable to as well as tying the sewage lift stations to generator backup power.

- Hazard Mitigated: All Hazards

Objective 3.5: Continue to install backup power to all community sewage lift stations.

- Hazard Mitigated: All Hazards

Objective 3.6: Support all governmental and quasi-governmental initiatives to assure Continuity of Government (COG) through enhancing individual agency Continuity of Operations Planning (COOP).

- Hazard Mitigated: All Hazards

#### GOAL 4

Strengthen Post-Disaster, Recovery and Mitigation Plans.

Objective 4.1: Annually, analyze, review and update Post-Disaster, Recovery, and Mitigation Plans and Ordinances.

- Hazard Mitigated: All Hazards

Objective 4.2: Work with other federal, state and local government agencies to strengthen post-disaster, recovery, mitigation plans and ordinances.

- Hazard Mitigated: All Hazards
- 

Objective 4.3: Work with other federal, state and local government agencies in both pre- and post-disaster recovery establishing contracts to facilitate timely restoration of public and private infrastructure

- Hazard Mitigated: All Hazards
- 

#### GOAL 5

Improve coordination of disaster preparedness information through the broadcast, social and print media to increase public awareness and participation in preparedness, response, recovery and mitigation activities.

Objective 5.1: Develop and maintain a comprehensive multi-media, multi-lingual public education program of disaster preparedness, response, recovery and mitigation.

- Hazard Mitigated: All Hazards

Objective 5.2: Conduct educational programs and research to meet local, state, regional planning, growth management and hazard mitigation needs or concerns.

- Hazard Mitigated: All Hazards

Objective 5.3: Work with media representatives to establish a standardized format for use in dissemination of information to the media during all phases of a disaster.

- Hazard Mitigated: All Hazards

Objective 5.4: Develop and maintain intergovernmental/coordinated information and uniform procedures for public information offices during periods of potential disaster situations.

- Hazard Mitigated: All Hazards

## GOAL 6

Collier County and local Municipalities shall make every reasonable effort to protect water resources, unique natural habitats and ecologically sensitive areas such as wetlands, waterways and hardwood hammocks, and restore, to the maximum extent feasible, degraded natural systems to their original state.

Objective 6.1: Conserve and protect wetlands and coastal natural features to maintain their economic, aesthetic and recreational values.

- Hazard Mitigated: All Hazards

Objective 6.2: Acquire, retain, manage and inventory public lands to provide conservation and related public benefits.

- Hazard Mitigated: Flood & Tropical Cyclone

Objective 6.3: Promote the use of agricultural and horticultural practices which are compatible with the protection of natural systems.

- Hazard Mitigated: Flood, Tropical Cyclone

Objective 6.4: Protect and restore the ecological functions of wetland systems to ensure their long-term environmental, economic and recreational values.

- Hazard Mitigated: Flood, Tropical Cyclone

Objective 6.5: Protect and enhance water sources, public utilities, wetlands, natural habitats from potential natural (wildfire and weather), manmade and terrorist acts.

- Hazard Mitigated: Flood, Tropical Cyclone

## 4.0 Procedures for Prioritizing Hazard Mitigation Initiatives

### 4.1 SCORING

4.1.1 Changes made since the last LMS update: Since the 2015 LMS approval, the main change to priorities, dealt with how the working group establishes its project priorities for each new HMGP opportunity. Paragraph 4.1.3.1, below describes how projects are prioritized so as to be fair to the participating jurisdictions.

4.1.2 Annex E contains a listing of those projects & action items identified by the participating jurisdictions in Collier County as necessary for the successful implementation of the hazard mitigation process. Initiative(s) submitted by a participating municipality will go on the prioritized project/initiative listing (Annex E, of LMS: [bit.ly/2nU3zO9](https://bit.ly/2nU3zO9)). However, its placement on the list in Annex E will depend on the score received on the "Mitigation Initiatives Evaluation Score Sheet in Annex H. Each participating jurisdiction/agency has submitted initiatives that are intended to mitigate the identified hazards as they may impact that jurisdiction/agency. Upon submittal, the individual initiative is scored using the criteria identified by the participants as being the most reflective of the mitigation needs of Collier County. Included in this listing are the three review criteria deemed by FEMA as important: Cost effectiveness (represented by the benefit-cost ratio), technical feasibility, and environmental soundness.

4.1.3 The submitting jurisdiction/agency scores each initiative and completes the "simplified benefit-cost analysis (BCA)" prior to electronic submittal in MS Word format to the LMSWG via the Collier County Emergency Management Office. The simplified BCA will utilize reasonable costs for anticipated losses, and not just the total replacement cost of all facilities and equipment. Additionally, the submitting entity must make a presentation to the assembled LMSWG describing the mitigation project, its impact and support the presentation with graphics and/or mapping to give the group an idea of the project's location. The LMSWG reviews the initiative and the recommended scoring. Upon review, the initiative is then placed on the Prioritized Listing of Mitigation Action Items (Annex E).

**4.1.3.1 SPECIAL RULES FOR PRIORITIZING HAZARD MITIGATION GRANT PROGRAM (HMGP) PROJECTS:** Following each disaster in the State of Florida, FEMA makes hazard mitigation grant monies available via the HMGP program. The local LMSWG will establish a project priority listing for each HMGP opportunity. **PROCESS:** After each disaster the LMSWG Chair will notify each agency having a project on the project listing and determine their intent to apply for an HMGP grant. Upon receipt of the "Notification of Funds Availability (NOFA)", the Chair will issue a letter to all those having a project in Annex E, Prioritized Listing of Mitigation Action Items, stating they have 30 days from the date of the NOFA to let the Chair of the LMSWG know of their intentions to apply for that grant. For those who do not intend to apply, no further action is necessary on their part. For those who intend to apply, each jurisdiction will prioritize their projects intended to be submitted to FEMA for funding. Once all jurisdictions have their projects prioritized, the jurisdictions will be ordered alphabetically e.g., A, B, C, etc., by a means agreed upon by the Working Group. Then the #1 project of "A", is first on the priority listing to the State/FEMA, and project #1 of "B" will be second on the list to the State/FEMA, etc. until all the projects meant to go forward are prioritized. Approved project score sheets received after the "announced project prioritizing date" will be added to the bottom of the prioritized listing in the order received by the emergency management office. (NOTE: Not all HMGP projects submitted to the State/FEMA may be funded; however, for any project to be

considered for funding as it becomes available, it must have an application submitted before the closing date indicated on the NOFA.) The applicant must provide the Chair with documentation of commitment to the local share funding by the applicant's governing body. The Chair will furnish each potential applicant a letter to submit along with their grant application package that shows that the project complies with the county's mitigation strategy and where it ranks.

4.1.4 For purposes of this section, jurisdictions will conduct a preliminary BCA for each project prior to submittal to the working group. (Another BCA, using FEMA guidelines for federal grants is required for actual grant application submission\*.)

\* **NOTE:** A Benefit-Cost Analysis (BCA) is required for all mitigation projects; however, a BCA is not required for planning activities and some acquisition projects. Florida Division of Emergency Management Mitigation staff will perform the official FEMA BCA for all hazard mitigation projects. However, the applicant can try to do one just to get an idea about the project's eligibility or to get an idea about what documents/proof you may need to provide to the State's mitigation project officer. Mitigation projects with a benefit-cost ratio less than 1.0 will not be considered for the for a FEMA hazard mitigation grant.

Applicants and Sub-applicants are strongly encouraged to use FEMA's BCA software for their analyses. The software can be obtained free from FEMA by contacting the BCA hotline: 1-866-222-3580. Applicants may use programs or mechanisms other than the FEMA benefit-cost model to determine the benefit-cost ratio; however, the methodology used must be consistent with the FEMA benefit-cost model and must be approved in advance by FEMA. More information about the FEMA's BCA program and guidelines can be found at: <https://www.fema.gov/benefit-cost-analysis>.

4.1.5 **RULE FOR INITIATIVES THAT CAN NOT BE SCORED, BUT ACHIEVES A GOAL OF THE LMS:** There have been times where some initiatives cannot be scored or quantified because their nature, e.g. road elevation to facilitate evacuations, conduct hurricane seminars in the community, etc. In these cases, if the applicants want the initiatives on the priority listing, they will automatically be placed at the end of the listing in the order received and approved. Should the project later be completely scored on the worksheet, the projects position may change on the priority chart.

4.1.6 **PROJECT & INITIATIVE VALIDATION:** In order to keep the priority listing "fresh", the Chair, LMSWG may contact the agencies responsible for projects or initiatives to determine their validity annually.

4.1.7 **APPLICANT'S PROJECT WORKSHEET WEIGHTING:** The following is the score weighting for each element of the project worksheet. This is to achieve better neutrality/objectivity for each project scored.

### **Local Mitigation Strategy Prioritization Matrix**

<b>Suitability = 25%</b>
--------------------------

Parameter		Weighting Factor	Percent	Points	
SUITABILITY SUBTOTAL		25%	100%	25	
RISK REDUCTION SUBTOTAL		50%	100%	50	
COST SUBTOTAL		25%	100%	25	
TOTAL		100%		100	

Parameter		Weighting Factor	Scoring Criteria	Score	Points
1	Appropriateness of the Measure	40%	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth.	5	200
			<b>3- Medium:</b> Needed, but doesn’t tie to identified vulnerability.	3	120
			<b>1- Low:</b> Inconsistent with LMS goal or plans.	1	40
2	Community Acceptance	15%	<b>5- High:</b> Endorsed by most communities.	5	75
			<b>3- Medium:</b> Endorsed by most; may create burdens.	3	45
			<b>1- Low:</b> Not likely to be endorsed by the communities.	1	15
3	Environmental Impact	15%	<b>5- Positive</b> effect on the environment.	5	75
			<b>3- No effect</b>	3	45
			<b>1- Adverse</b> effect on the environment.	1	15
4	Legislation	15%	<b>5- High:</b> Consistent with the existing laws and regulations.	5	75
			<b>3- Medium:</b> New legislation or policy change.	3	45
			<b>1- Low:</b> Conflicts with existing laws and regulations.	1	15
5	Consistent with Existing Plans and Priorities.	15%	<b>5- High:</b> Consistent with existing plans.	5	75
			<b>3- Medium:</b> Somewhat consistent.	3	45
			<b>1- Low:</b> Conflicts with existing plans and policies.	1	15
Parameter Subtotal		100%	Sum of the parameter scores; max = 500		500
Suitability Subtotal		(sum of parameter scores) / (maximum possible score)			100%

**Risk = 50%**

Parameter		Weighting Factor	Scoring Criteria	Score	Points
1	Scope of Benefits	15%	<b>5- High:</b> Benefits all municipalities and unincorporated areas directly or indirectly	5	75
			<b>3- Medium:</b> Benefits half or more not all of all the municipalities and/or the unincorporated area.	3	45
			<b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.	1	15
2	Potential to protect human lives	35%	<b>5- High:</b> More than 1,000 lives	5	175
			<b>3- Medium:</b> Up to 1,000 lives	3	105
			<b>0- Low:</b> No lifesaving potential.	0	0
3	Importance of Benefits	15%	<b>5- High:</b> Need for essential services.	5	75
			<b>3- Medium:</b> Need for other services.	3	45
			<b>1- Low:</b> No significant implications.	1	15
4	Inconvenience of Problem Correction	10%	<b>5- None:</b> Causes no problems.	5	50
			<b>3- Moderate:</b> Causes few problems.	3	30

			<b>1- Significant:</b> Causes much inconvenience (i.e.traffic jams, loss of power, delays).	1	10
5	Economic Effect or Loss (Effect of implementing the project on local economy)	10%	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (minimal disruption). <b>1- Significant:</b> Economic loss (businesses closed, jobs affected).	5 3 1	50 30 10
6	Number of People to Benefit	15%	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000	5 3 1	75 45 30
Parameter Subtotal		100%	Sum of the parameter scores; max = 500		500
<b>Risk Subtotal</b>		<b>(sum of parameter scores) / (maximum possible score)</b>			<b>100%</b>
<b>Cost = 25%</b>					
Parameter		Weighting Factor	Scoring Criteria	Score	Points
1	Initial Cost	15%	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million	5 3 1	75 45 15
2	Maintenance /Operating Costs	5%	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.	5 3 1	25 15 5
3	Environmental Cost Impact	40%	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	5 3 1	200 120 40
4	Financing Availability	10%	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified	5 3 1	50 30 10
5	Repetitive <u>FLOOD</u> damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	30%	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>0</b> - Not an NFIP insured structure	5 3 1 0	150 90 30 0
Parameter Subtotal		100%	Sum of the parameter scores; max = 500		500
<b>Cost Subtotal</b>		<b>(sum of parameter scores) / (maximum possible score)</b>			<b>100%</b>

**Benefit to Cost Ratio multiplied by the Final Score on the Project Score Sheet will provide the final score for the Project Priority Listing.**

## **5.0 APPLICATION PROCESS & FUNDING SOURCES**

### **5.1 PURPOSE**

This section will address the process for seeking the funding for projects that mitigate the disaster's effects and how to be included on the County's LMS project priority listing in Annex E.

### **5.2 THE PROCESS**

5.2.1 Upon identification of a "ready to go" mitigation initiative, it is up to the entity that will have ultimate responsibility for implementation to bring the project and potential funding source(s), if not contained in Annex D (Potential Grant Funding Sources) to the attention of the LMSWG via either a scheduled meeting or by submitting it to the Collier County Emergency Management Division who will put it on a LMS meeting agenda. The submittal should include a brief summary of the project, estimated costs, benefit-cost analysis, identification of matching funds (if available), the potential sources of funds and a completed scoring sheet. (See Annex H)

5.2.2 Using the project scoring sheet (see Annex H), each project will then be evaluated and compared to the funding source by the LMSWG. Annex H also addresses the special procedures for evaluating projects. This review can take place via email, over the phone or in person, as availability and time allows. Alternative or additional sources of funds may be identified if necessary.

5.2.3 It is the ultimate responsibility of the applicant to implement, manage and submit progress reports for the project.

## **6.0 Monitoring, Evaluating & Updating the Plan and Incorporation of Local Mitigation Strategy into Existing Plans**

### **6.1 Monitoring & Evaluating the Plan**

6.1.1 The Collier County Local Mitigation Strategy is recognized to be a living document and not simply a planning document. In recognition of this fact, continual monitoring, review and updating of the contents of the Collier County Local Mitigation Strategy are necessary. As a minimum, during the last quarter of each calendar year, the Chair urges the members to review/evaluate the plan in order to obtain the necessary votes to furnish the State the plan's updates by the end of January each year. However, voting members and the public are encouraged to constantly monitor and evaluate "the plan's" effectiveness and make recommendations for changes at any time; paying attention to changing risks and validity of the prioritized projects. The LMS Chair is responsible for scheduling meetings and appointing *ad hoc* committees to review recommendations and report findings back to the entire Local Mitigation Strategy Working Group (LMSWG) for consideration and/or a vote. Additionally, at the annual Floodplain Management Plan's public outreach meetings the public is also reminded of the LMSWG, the County's Local Mitigation Strategy and the need for their input and participation. The current electronic version of the Local Mitigation Strategy will be maintained at each of the Floodplain Managers' offices (City of Naples, Marco Island and Unincorporated Collier County), in the Emergency Management Office and in the Office of the Mayor of Everglades City. Additionally, the most current Local Mitigation Strategy will be posted on-line through the following URL: [bit.ly/2nU3zO9](https://bit.ly/2nU3zO9). An electronic version of the plan may be obtained through the Emergency Management Office (8075 Lely Cultural Parkway, Naples, FL 34113).

6.1.2 The Local Mitigation Strategy Working Group shall hold quarterly meetings to monitor and evaluate the effectiveness of the Local Mitigation Strategy and update the local government's Local Mitigation Strategy initiatives as necessary. The participating local governments/agencies shall present new initiative projects they have identified at the quarterly meetings. These initiatives shall be evaluated, prioritized, and incorporated into the Local Mitigation Strategy at these meetings. Those mitigation initiatives that have been completed will be identified and moved to the Success Section of the Local Mitigation Strategy. Initiatives that have not been completed shall be re-evaluated for further consideration for inclusion in the Local Mitigation Strategy. The Mitigation Initiatives Evaluation Scoring Sheet shall be used to evaluate each new initiative. In addition, following a disaster event, the lessons learned or applicable comments from any post-event interagency hazard mitigation reports shall be incorporated into the Local Mitigation Strategy. In addition to evaluating projects, the LMSWG shall continually review & comment on the effectiveness of various documents that have impacts on mitigation activities, i.e.:

- Ordinances under review/revision that deal with the hazard mitigation.
- The Collier County Growth Management Plan contains policies and goals to be reviewed this to insure consistency with the Local Mitigation Strategy. Specific elements of the plan are:
  - Conservation & Coastal Management Element
  - Drainage Sub-Element
  - Solid Waste Sub-Element
  - Housing Element
  - Future Land Use Element
  - Urban Future Land Use Designation, Urban Coastal Fringe Sub-District, Density Rating System, Affordable Housing Residential In-Fill Transfer of Development Rights Bayshore Gateway Triangle Redevelopment Overlay
  - Golden Gate Area Master Plan Element

6.1.3 Commencing in January 2005 and every January thereafter, the Chair of the Collier County Local Mitigation Strategy Working Group shall report to the Collier County Citizen Corps Advisory Committee the effectiveness of the Local Mitigation Strategy to date in meeting the hazard/disaster mitigation needs of the county. The report will also include the distribution of revised/updated mitigation initiatives and other sections of the Local Mitigation Strategy, as needed.

6.1.4 **Public Involvement:** The Collier County Emergency Management Department shall be responsible for the scheduling and providing reasonable notice of all meeting LMS Working Group meetings. Such reasonable notice shall be issued in advance of the meeting date in order to give the public the opportunity to participate. At a minimum, the posting and distribution of meeting notices will be conducted through the Collier County Communications and Customer Relations Department which is responsible for the distribution of information for the County and includes news releases and posting on the County web site calendar. Special meetings of any of the County's LMS committees may be called by any member should events significantly change or negate parts of the Local Mitigation Strategy; however, again, reasonable notice shall be given to the public in order to participate. Additionally, annually, at the Floodplain Management Plan public outreach evening meetings (i.e. a series of meetings strategically located throughout the County in an effort to maximize public accessibility), the Chair of the LMSWG will invite attendees to the Local Mitigation Strategy Working Group (LMSWG) meetings and discuss the purpose and objectives of the Local Mitigation Strategy.

6.1.5 **Updating the Plan:** Every five years, the Collier County Local Mitigation Strategy shall undergo a formal 5-year cycle formal update process. The review of the Local Mitigation Strategy should be completed six (6) months prior to the 5-year anniversary date of the FEMA-approval letter. The Local Mitigation Strategy Working Group (LMSWG) may appoint a sub-committee to conduct an audit/review of the overall Collier County Local Mitigation Strategy, assessing its effectiveness of the current Local Mitigation Strategy and identifying those revisions necessary to meet the disaster/ hazard mitigation needs of the county. If formed, the sub-committee shall report to the full Local Mitigation Strategy Working Group at its next scheduled quarterly meeting. This was the case beginning in late 2007 and continuing through 2009. A portion of each meeting was dedicated to reviewing the progress of updating the Hazard Mitigation Plan. Members of the LMSWG each took portions of the then current Hazard Mitigation Plan and evaluated the effectiveness of that portion and made recommendation to the Chair for presentation to the LMSWG for a vote. The LMSWG then will report to the Collier County Citizens Corps. The chart below represents the final evaluation and review status of the updated LMS. The report shall also be provided to the elected officials of all participating local governments for review and comment by their LMSWG respective representative. In conducting this review, the following six items, suggested by FEMA, shall consider whether:

- The goals and objectives address current and expected conditions;
- The nature or magnitude of risks has changed;
- The current resources are appropriate for implementing the Local Mitigation Strategy;
- There are implementation problems, such as technical, political, legal, or coordination issues with other agencies;
- The outcomes have occurred as expected; and
- The agencies and other partners participated as proposed.

<b>ITEM REVIEWED/APPROVED</b>	<b>LMSWG</b>
(Note: The LMSWG approved the sections when indicated. All meetings were advertised for public participation & comment. The Collier County Citizens Corps, parent advisory group for the LMSWG and at a publicly advertised meeting, approved the LMS and directed the LMSWG Chair to have the LMS presented to the Collier County Board of County Commissioners (BCC) for adoption at the January 12, 2010 BCC meeting with the understanding that the State and FEMA may require editorial adjustments later which will be made upon approval of the LMSWG.)	
Executive Summary	18 Oct 2019
Sec. 1 – Purpose, Organization & Outreach	18 Oct 2019
Sec. 2 – Hazard Identification & Vulnerability Analysis	20 Feb 2020
Sec. 3 – LMS Goals & Objectives	18 Oct 2019
Sec. 4 – Procedures for Prioritizing Hazard Mitigation Initiatives	18 Oct 2019
Sec. 5 – Application Process & Funding Sources	18 Oct 2019
Sec. 6 – Monitoring, Evaluating & Updating the Plan and Incorporation of the Local Mitigation Strategy into Existing Plans	17 Jan 2020
Annex A – Maps	18 Oct 2019
Annex B – Resolutions	Added as received
Annex C – Procedures to Assure Public Involvement	18 Oct 2019
Annex D – Potential Grant Funding Sources	18 Oct 2019
Annex E – Prioritized Listing of Mitigation Action Items	18 Oct 2019
Annex F – Meeting Minutes	18 Oct 2019
Annex G – LMS Membership	18 Oct 2019
Annex H – Initiative Scoring Criteria	18 Oct 2019
Annex I – Collier County’s Floodplain Plans	18 Oct 2019

6.1.6 Prior to the five-year anniversary of the adoption of the Local Mitigation Strategy, the Local Mitigation Strategy Working Group (LMSWG) shall vote to transmit the draft report to the Collier County Citizens Corps, who will in turn, transmit it to the State Hazard Mitigation Officer, Division of Emergency Management, Florida Department of Community Affairs. Upon receipt of comments for the State and subsequent revisions, the document shall be submitted to the Collier County Board of County Commissioners, through the Citizens Corps. The Board shall vote to accept the Report and after review and discussion, vote to adopt those revisions recommended by the LMSWG for inclusion in the Collier County Local Mitigation Strategy.

6.1.7 During the following quarter, the LMSWG shall meet to review, endorse, and/or revise the report. During this process, the LMSWG shall also take into consideration the comments of participating local governments and other interested agencies/parties.

6.1.8 In addition to the Five-Year Update, the Local Mitigation Strategy may be submitted to the Collier County Board of County Commissioners and participating City/Town Councils/ Commissions for amendment following a major disaster/hazard event which may result in a substantial revision, as moved by a vote of Local Mitigation Strategy Working Group, to the Collier County Local Mitigation Strategy.

## 6.2 Incorporation of Local Mitigation Strategy into Existing Plans

To ensure the full and complete implementation of the Collier County Local Mitigation Strategy, all participating local governments have attempted to incorporate references to the Local Mitigation Strategy into their respective comprehensive plans and other documents containing guiding principles as the opportunities present themselves in order to make us a more disaster resistant community. We originally accomplished this by taking the advantage when our County Planning department invited comments during the various plan and ordinance reviews during the intervening years. Attachment 1 to this section shows how mitigation activities have been incorporated in such documents as Collier County's Growth Management (Comprehensive) Plan, Post-Disaster Ordinance and the Comprehensive Emergency Management Plan.

6.2.1 For the future, each jurisdiction says it will follow the process described below:

### 6.2.1.1 **Unincorporated Collier County:** ***Changes in Development since 2015:***

There was an overall decrease in the Urban Residential and Urban Coastal Fringe future land use designations and an overall increase in commercial and mixed-use designations. With the decreases in the coastal areas and increase in non-coastal areas, growth, both residential and commercial, are positive and their vulnerability is reduced due to the more stringent building codes in recent years.

#### ***Existing Authorities:***

See Attachment 1 to Section 6.

Coordinators in the Emergency Management Office, the Floodplain Manager and members of the Comprehensive Planning Section will weigh the goals and objectives of the LMS against each plan and/or ordinance being reviewed at the time determined for each document. The LMSWG will assess Goal 12 in the Conservation and Coastal Management Element (CCME) of the GMP, which contains policy 12.1.9 which references the Hazard Mitigation Plan, would include an assessment by the county that we needed to modify this element to meet the specifics of any current mitigation requirements. Additionally, where opportunities present themselves, the responsible agency will seek the LMSWG's support in amending the appropriate documents.

#### ***Future Plans:***

# Will update Collier CEMP as changes are made to the LMS

# Lobbying for a Growth Management Department senior planner to as to more easily take advantage of opportunities to infuse more mitigation initiatives in the Growth Management Plan and other planning activities.

# Will continue to attend Floodplain Management Committee meetings to actively participate in the Collier Floodplain Planning process.

### 6.2.1.2 **The City of Naples:** ***Changes in Development since 2015:***

The City of Naples is essentially a built-out community, mostly focusing on redevelopment. In 2018, the City completed a Stormwater Master Plan update and currently the City is overseeing a Sea Level Rise Study that should be completed in 2020 focusing on the city's infrastructure vulnerability. Redevelopment projects that consist of larger commercial and/or mixed use developments are now being required to provide for mitigation actions that may deal with open space,

stormwater management and/or water quality issues. The City considers these new mitigations efforts to have a positive effect on the community.

***Existing Authorities:***

- # Comprehensive Plan
- # Emergency Management Plan
- # General Code
  - ## 2012 Floodplain Management
  - ## 2018 Building and Technical Codes
  - ## 2010 Waterways
- # Land Development Code
  - ## Resource Protection Standards
    - ### 1995 Marine Turtle Regulations
    - ### 2019 Fertilizer Use and Maintenance of Urban Landscapes
  - ## Zoning
    - ### Conservation and Transitional Conservation Districts
- # 2018 Stormwater Master Plan

***Future Plans:*** The City of Naples is currently working on expanding some of these plans by adding a Climate Change Vulnerability Assessment study to address mitigation of the city's most crucial and critical assets.

The Floodplain Coordinator and staff from the Planning Department are currently working to incorporate the LMS plan into the Comprehensive Plan. Staff will continue to emphasize the mitigation process in all areas of government and community development. The Comprehensive Emergency Management Plan (adopted 9/4/13 resolution 13-13325) and the Flood Damage Prevention Ordinance adopted 6/13/12 resolution 12-13138 has been reviewed to ensure incorporation of the LMS plan and will continue to make amendments as necessary.

### 6.2.1.3

**The City of Marco Island:**

***Changes in Development since 2015:***

The City of Marco Island has experienced improvements to existing developments and new developments since 2015 in accordance with predicted growth projections. To manage development and growth of the community the City has advanced several initiatives since 2015. Staff additions to the Community Affairs Divisions of Building and Growth Management have enhanced the comprehensive and efficient review of proposed development and building permits. Improvements to record management systems through advancements in technology has provided for the electronic review and response recording of staff and contractor communication. All records are now digital, backed up and stored on the cloud. Allowing for safer storage and remote access in case of a disaster. Most older plans and files have been scanned and stored on the cloud as well.

Redevelopment projects that consist of larger commercial and/or mixed-use developments are now being required to provide for mitigation actions that may deal with open space, stormwater management and/or water quality issues. The City of

Marco Island Strategic Plan was completed in 2019. The Strategic Plan clearly prioritized to Control Growth and Development / Redevelopment and to Protect the Pristine Natural Environment and Water Quality. The Plan provides objectives for the Control Growth and Development / Redevelopment including the updates to the Comprehensive Plan, Land Development Code and Infrastructure Master Plans.

The City's Growth Management Division is charged with providing both current and long-range planning, environmental, and zoning services. Planning staff works with the development community on proposed projects, site plan review, staff analysis of land use petitions and variance requests, interpretation and enforcement of the City's Land Development Code, and provides staff services to the Planning Board, Beach and Coastal Resources Advisory Committee, and City Council. Long-range planning efforts focus on implementing policies contained in the adopted Comprehensive Plan and the review and critique of the Land Development Code for changes consistent with the Comprehensive Plan. City Council approved funding for the 2019/20 fiscal year budget to update the Comprehensive Plan, addressing development, resiliency, and the City's level of service.

Significant to managing the City's recent development growth has been the mandated participation in the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II Permit. The MS4 program is designed to maintain a functioning efficient stormwater system by reducing the amount of pollutants that enter the City's waterbodies. The requirements of the MS4 program are enacted through the City's Stormwater Management Program, adopted in May 2015, was designed to address six elements; Public Education and Outreach as to Stormwater Impacts, Public Involvement/Public Participation, Illicit Discharge Detection and Elimination, Construction Site Stormwater Runoff Control, Post-Construction Stormwater Management in New Development and Redevelopment and Pollution Prevention/Good Housekeeping for Municipal Operations. The City's participation in the MS4 program has reduced the City's vulnerability to natural disasters by maintaining a quality managed stormwater drainage system to prevent flooding and subsequent damage to residential and commercial properties.

Floodplain Management is another component improved by the City to manage growth and development. With ninety-nine percent (99%) of the City being in a Special Flood Hazard area it is the City's responsibility to promote public awareness of natural disasters and the continuing participation in the Community Rating System (CRS) program through the National Flood Insurance Program (NFIP). Participating in the CRS program allows each resident on the Island to purchase flood insurance through the NFIP. City staff works jointly with; residents, contractors, businesses, local, state, and federal agencies to facilitate cooperation and the exchange of information on floodplain management. Currently, the City of Marco Island has a CRS class rating of 5, warranting an automatic 25% discount on NFIP policies. The Floodplain Management staff provides plan review of improvements to existing developments and new developments specific to design flood elevation compliance, elevation of finish floor, machinery elevation, wet and dry floodproofing measures and compliance to the FEMA 50% rule. The actions of

the Floodplain Management staff contribute to the reduction of vulnerability of the City's existing and new developments.

The City has enacted nine (9) hazard mitigation projects aimed to improve street drainage, harden essential critical facilities and improve emergency power capabilities for sewer lift stations and reverse osmosis wells. These mitigation efforts improve the City's resiliency to tropical cyclone disaster events.

Currently, the Army Corps of Engineers is conducting a Collier County Coastal Storm Risk Management Feasibility Study to promote resiliency and reduce the risk of coastal storm damage.

Many commercial, residential and multi-family structures were damaged during Hurricane Irma. The repair and restoration of these buildings in accordance with current Florida Building codes resulted in mitigation improvements such as the protection of openings with impact rated doors / windows, floodproofing for substantially damaged structures and use of resilient roof construction methods and materials on reroofs. Our damage assessment software is now cloud based. Thus, damage assessment activities can be coordinated remotely from any location and the data can be viewed from a central location in real time, allowing for better coordination, quicker response and reporting in case of a disaster.

The City of Marco Island considers the operational improvements, short- and long-term planning and ongoing mitigations efforts described herein to have a positive effect on the community.

***Existing Authorities:***

- # City of Marco Island Comprehensive Plan
  - ## See Attachment 2 to Section 6. Planned 2020 update will address mitigation
- # City of Marco Island Code of Ordinances
  - ## Chapter 6 – Building Code
  - ## Chapter 6 - Post-Disaster Redevelopment Plan
  - ## Chapter 18 – Fertilizer Regulations
  - ## Chapter 18 – Stormwater Regulations
  - ## Chapter 18 – Endangered, Threatened or Listed Species Protection
  - ## Chapter 22 – Hazardous Materials Recovery
  - ## Chapter 26 - Floodplain Management
  - ## Chapter 38 – Planning
  - ## Chapter 46 - Telecommunications
  - ## Chapter 52 - Utilities
  - ## Chapter 54 - Waterways and Beaches
- # City of Marco Island Land Development Code
- # City of Marco Island Stormwater Management Plan
- # City of Marco Island Comprehensive Emergency Management Plan

***Currently in revision, will expand mitigation efforts***

- # Multi-Jurisdictional Local Hazard Mitigation Strategy Work Group
- # City's Community Rating System (CRS) Premium Reduction Credit
- # Flood Warning System
- # Insurance Services Office's (ISO) Building Code Effectiveness Grading Schedule (BCEGS) rating system
- # Water & Sewer Emergency Response Plan
- # FlaWARN

The Growth Management Director, Chief Building Official and Floodplain Coordinator

(CFM) and the staff from the Growth Management Planning Division are currently amending the City's Comprehensive Plan to include various Local Mitigation Strategy (LMS) initiatives. Staff will continue to emphasize the goals and objectives of the mitigation process in all area of government regarding regulation and development inside and outside the floodplain. Attachment 2 shows ways the city may incorporate the LMS in existing plans.

#### **6.2.1.4 Everglades City:**

##### ***Changes in Development since 2015:***

The City of Everglades City is a small coastal community with a year-round population of 410 people. Future land development in our city is subject to the current carrying capacity of our wastewater treatment plant. We are currently studying future designs for a new wastewater treatment facility that could be constructed to allow land development. Our area has become increasingly vulnerable to coastal flooding especially during king tide and tropical storm events. We are working with the Southwest Florida Regional Resiliency Compact to address the impacts of climate change and develop ways to improve our resiliency.

##### ***Existing Authorities:***

# Everglades City Comprehensive Plan - Goals, Objectives, Policies, Programs, which will be consistent with those adopted by Collier County, Southwest Florida Regional Planning Council (SWFRPC), State of Florida.

# City of Everglades Land Development Code

# Flood Ordinance

##### ***Future Plans:***

On behalf of City residents, the Mayor and City Council will serve as an Everglades City Local Mitigation Strategy Working Group (ECLMSWG) acting as the responsible agency facilitating applications for grants designed to fund mitigation initiatives. As the responsible agency, the Mayor and Council will assist applicants in submitting a Mitigation Initiative Evaluation Score Sheet to the Collier County Local Mitigation Strategy Working Group (CCLMSWG) for its consideration at regularly scheduled CCLMSWG meetings.

- 6.2.1.4.1.1 The Mitigation Initiative Evaluation Score Sheet will provide a description of the project's impact and value to the community supported by a benefit-cost analysis (BCA) to be completed by the applicant.
- 6.2.1.4.1.2 As the responsible agency, the Everglades City LMSWG, will be prepared to assist in developing a presentation about Everglades City mitigation initiatives to the CCLMSWG at one of its scheduled meetings.
- 6.2.1.4.1.3 A representative of the ECLMSWG will be charged with representing the City at regular or special meetings of the CCLMSWG and reporting the outcome of each meeting to the Mayor of Everglades City and the Office of the City Clerk.
- 6.2.1.4.1.4 Goal Achieved: Provides a mechanism for assisting City residents and businesses in acquiring professional assistance and funding to mitigate well-documented hazards.

#### **6.2.1.5 Special Districts such as the Collier Mosquito Control District, North Collier Fire and**

**Rescue District, Greater Naples Fire Rescue District, Immokalee Fire Control District, Collier County Public Schools and Heritage Bay Community Development District.**

These “jurisdictions” are “special districts” and they have adopted and will adopt the LMS as they have participated in the planning process and working group. These districts don’t have the same type of capabilities as municipalities. They all have the capability to identify vulnerabilities and have the capacity to manage a grant to mitigate their vulnerabilities.

## **ATTACHMENT 1 to SECTION 6**

### **PART I**

#### **COLLIER COUNTY COMPREHENSIVE PLAN EXCERPTS PERTAINING TO HAZARD MITIGATION (<https://www.colliercountyfl.gov/home/showdocument?id=84610>)**

(NOTE: These excerpts are examples of hazard mitigation. Should you need to cite one of these examples or need further information related to any of these, go to the cited URL, open the referenced PDF document and then use the “Control – F” to search for all current and related information for your search.)

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#### **FUTURE LAND USE ELEMENT**

##### **C. UNDERLYING CONCEPTS**

###### **Management of Coastal Development**

Two major coastal development issues in Collier County are the protection of natural resources and the balancing of risk in natural hazard areas.

Extensive populated areas in Collier County are vulnerable to periodic salt-water inundation from tropical storms or hurricanes. It is extremely important that an acceptable balance between at-risk population and evacuation capability be achieved. In addition, public and private investment in such vulnerable areas must be carefully considered.

This issue is addressed here and in the Conservation and Coastal Management Element through several measures. A Coastal High Hazard Area is identified on the Future Land Use Map essentially as all lands seaward of US 41. This line is based on the close fit to the storm Category 1 SLOSH area (potential for saltwater flooding from 1 storm in 12 years) and evacuation planning areas. Within the Coastal High Hazard Area maximum permissible residential density is limited in recognition of the level of risk, the existing deficiency of evacuation shelter space and existing patterns of density. The Coastal High Hazard Area is also identified in the Conservation and Coastal Management Element and policies are provided therein. Finally, coastal natural hazards are addressed through Land Development Regulations already in effect relating to coastal building standards, per Chapter 161, Florida Statutes, and protection of structures from floods, per County participation in the FEMA Flood Insurance Program.

**OBJECTIVE 1:** Unless otherwise permitted in this Growth Management Plan, new or revised uses of land shall be consistent with designations outlined on the Future Land Use Map. The Future Land Use Map and companion Future Land Use Designations, Districts and Sub-districts shall be binding on all Development Orders effective with the adoption of this Growth Management Plan. Standards and permitted uses for each Future Land Use District and Subdistrict are identified in the Designation Description Section. Through the magnitude, location and configuration of its components, the Future Land Use Map is designed to coordinate land use with the natural environment including topography, soil and other resources; promote a sound economy; coordinate coastal population densities with the Regional Hurricane Evacuation Plan; and discourage unacceptable levels of urban sprawl.

##### **FUTURE LAND USE DESIGNATION DESCRIPTION SECTION**

The following section describes the land use designations shown on the Future Land Use Map. These designations generally indicate the types of land uses for which zoning may be requested. However, these land use designations do not guarantee that a zoning request will be approved. Requests may be denied by the Board of County Commissioners based on criteria in the Land Development Code or on special studies completed for the County.

##### **I. URBAN DESIGNATION**

Urban Designated Areas on the Future Land Use Map include two general portions of Collier County: areas with the greatest residential densities, and areas in close proximity, which have or are projected to receive future urban support facilities and services. It is intended that Urban Designated Areas accommodate most of the population growth and that new intensive land uses be located within them. Accordingly, the Urban Area will accommodate residential uses and a variety of non-residential uses. The Urban Designated Area, which includes Immokalee and Marco Island represents less than 10% of Collier County’s land area.

The boundaries of the Urban Designated Areas have been established based on several factors, including: patterns of

existing development; patterns of approved, but unbuilt, development; natural resources; water management; hurricane risk; existing and proposed public facilities; population projections and the land needed to accommodate the projected population growth.

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**(IV)(XI)(XV)(XXI) 3. Urban Coastal Fringe Subdistrict:**

The purpose of this Subdistrict is to provide transitional densities between the Conservation designated area (primarily located to the south of the Subdistrict) and the remainder of the Urban designated area (primarily located to the north of the Subdistrict). The Subdistrict comprises those Urban areas south of US 41, generally east of the City of Naples, and generally west of the Rural Fringe Mixed Use District Neutral Lands, but excludes Section 13, Township 51 South, Range 26 East, and comprises approximately 11,354 acres and 10% of the Urban Mixed Use District. The entire Subdistrict is located seaward of the Coastal High Hazard Area Boundary. In order to facilitate hurricane evacuation and to protect the adjacent environmentally sensitive Conservation designated area, residential densities within the Subdistrict shall not exceed a maximum of 4 dwelling units per acre, except as allowed in the Density Rating System to exceed 4 units per acre through provision of Affordable Housing and Transfers of Development Rights, and except as allowed by certain FLUE Policies under Objective 5, and except as provided in the Bayshore Gateway Triangle Redevelopment Overlay. New rezones to permit mobile home development within this Subdistrict are prohibited. Rezones are recommended to be in the form of a Planned Unit Development.

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**(IX) B. Rural Fringe Mixed Use District**

The Rural Fringe Mixed Use District is identified on Future Land Use Map. This District consists of approximately 93,600 acres, or 7% of Collier County's total land area. Significant portions of this District are adjacent to the Urban area or to the semi-rural, rapidly developing, large-lot North Golden Gate Estates platted lands. Agricultural land uses within the Rural Fringe Mixed Use District do not represent a significant portion of the County's active agricultural lands. As of the date of adoption of this Plan Amendment, the Rural Fringe Mixed Use District consists of more than 5,550 tax parcels, and includes at least 3,835 separate and distinct property owners. Alternative land use strategies have been developed for the Rural Fringe Mixed Use District, in part, to consider these existing conditions.

The Rural Fringe Mixed Use District provides a transition between the Urban and Estates Designated lands and between the Urban and Agricultural/Rural and Conservation designated lands farther to the east. The Rural Fringe Mixed Use District employs a balanced approach, including both regulations and incentives, to protect natural resources and private property rights, providing for large areas of open space, and allowing, in designated areas, appropriate types, density and intensity of development. The Rural Fringe Mixed Use District allows for a mixture of urban and rural levels of service, including limited extension of central water and sewer, schools, recreational facilities, commercial uses and essential services deemed necessary to serve the residents of the District. In order to preserve existing natural resources, including habitat for listed species, to retain a rural, pastoral, or park-like appearance from the major public rights-of-way within this area, and to protect private property rights, the following innovative planning and development techniques are required and/or encouraged within the District.

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**(IX)1. Transfer of Development Rights (TDR), and Sending, Neutral, and Receiving Designations:** The primary purpose of the TDR process within the Rural Fringe Mixed Use District is to establish an equitable method of protecting and conserving the most valuable environmental lands, including large connected wetland systems and significant areas of habitat for listed species, while allowing property owners of such lands to recoup lost value and development potential through an economically viable process of transferring such rights to other more suitable lands. Within the Rural Fringe Mixed Use District, residential density may be transferred from lands designated as Sending Lands to lands designated as Receiving Lands on the Future Land Use Map, subject to the provisions below. Residential density may not be transferred either from or into areas designated as Neutral Lands through the TDR process.

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**IX) A) Receiving Lands:** Receiving Lands are those lands within the Rural Fringe Mixed Use District that have been identified as being most appropriate for development and to which residential development units may be transferred from areas designated as Sending Lands. Based on the evaluation of available data, these lands have a lesser degree of environmental or listed species habitat value than areas designated as Sending and generally have been disturbed through development, or previous or existing agricultural operations. Various incentives are employed to direct development into Receiving Lands and away from Sending Lands, thereby maximizing native vegetation and habitat preservation and restoration. Such incentives include, but are not limited to: the TDR process; clustered development; density bonus incentives; and, provisions for central sewer and water. Within Receiving Lands, the following standards shall apply, except for those modifications that are identified in the North Belle Meade Overlay:

#### 4. Emergency Preparedness:

a) In order to reduce the likelihood of threat to life and property from a tropical storm or hurricane event, community facilities, schools, or other public buildings shall be designed to serve as storm shelters if located outside of areas that are likely to be inundated during storm events, as indicated on the Sea, Lake, and Overland Surge from Hurricane Map for Collier County. Impacts on evacuation routes, if any, must be considered as well. Applicants for new residential or mixed use developments proposed for Receiving Lands shall work with the Collier County Emergency Management staff to develop an Emergency Preparedness Plan to include provisions for storm shelter space, a plan for emergency evacuation, and other provisions that may be deemed appropriate and necessary to mitigate against a potential disaster.

b) Applicants for new developments proposed for Receiving Lands shall work with the Florida Division of Forestry, Collier County Emergency Management staff, and the Managers of any adjacent or nearby public lands, to develop a Wildfire Prevention and Mitigation Plan that will reduce the likelihood of threat to life and property from wildfires. This plan will address, at a minimum: project structural design; the use of materials and location of structures so as to reduce wildfire threat; firebreaks and buffers; water features; and, the impacts of prescribed burning on adjacent or nearby lands.

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## V. OVERLAYS AND SPECIAL FEATURES

### (XV) A. Area of Critical State Concern Overlay

The Big Cypress Area of Critical State Concern (ACSC) was established by the 1974 Florida Legislature. The Critical Area is displayed on the Future Land Use Map as an overlay area. The Critical Area encompasses lands designated Conservation, Agricultural/Rural, Estates and Urban (Port of the Islands, Plantation Island and Copeland). The ACSC regulations notwithstanding, there is an existing Development Agreement between Port of the Islands, Inc. and the State of Florida Department of Community Affairs, approved in July 1985, which regulates land uses in the Port of the Islands Urban area; and, there is an Agreement between the Board of County Commissioners and the Florida Department of Community Affairs, approved in April 2005, pertaining to development in Plantation Island. Chokoloskee is excluded from the Big Cypress Area of Critical State Concern. All Development Orders within the Critical Area shall comply with Chapter 28-25, Florida Administrative Code, "Boundary and Regulations for the Big Cypress Area of Critical State Concern". Those regulations include the following:

#### 1. Site Alteration

b. Any non-permeable surface greater than 20,000 square feet shall provide for release of surface run off, collected or uncollected, in a manner approximating the natural surface water flow regime of the area.

e. Fill areas and related dredge or borrow ponds shall be aligned substantially in the direction of local surface water flows and shall be separated from other fill areas and ponds by unaltered areas of vegetation of comparable size. Dredge or borrow ponds shall provide for the release of storm water as sheet flow from their downstream end into unaltered areas of vegetation. Access roads to and between fill areas shall provide for the passage of water in a manner approximating the natural flow regime and designed to accommodate the 50-year storm. Fill areas and related ponds shall not substantially retain or divert the total flow in or to a slough or strand or significantly impeded tidal action in any portion of the estuarine zone.

**2. Drainage**

- a. Existing drainage facilities shall not be modified so as to discharge water to any coastal waters, either directly or through existing drainage facilities. Existing drainage facilities shall not be expanded in capacity or length except in conformance with paragraph (2) below; however, modifications may be made to existing facilities that will raise the ground water table or limit saltwater intrusion.
- b. New drainage facilities shall release water in a manner approximating the natural local surface flow regime, through a spreader pond or performance equivalent structure or system, either on site or to a natural retention, or natural filtration and flow area. New drainage facilities shall also maintain a ground water level sufficient to protect wetland vegetation through the use of weirs or performance equivalent structures or systems. Said facilities shall not retain, divert, or otherwise block or channel the naturally occurring flows in a strand, slough or estuarine area.
- c. New drainage facilities shall not discharge water into any coastal waters either directly or through existing drainage facilities.
- d. This rule shall not apply to drainage facilities modified or constructed in order to use land for agricultural purposes or to convert land to such use.

**3. Transportation**

- a. Transportation facilities which would retain, divert or otherwise block surface water flows shall provide for the re-establishment of sheet flow through the use of interceptor spreader systems or performance equivalent structures and shall provide for passage of stream, strand, or slough water through the use of bridges, culverts, piling construction or performance equivalent structures or systems.
- b. Transportation facilities shall be constructed substantially parallel to the local surface flow, and shall maintain a historic ground water level sufficient to protect wetland vegetation through the use of weirs or performance equivalent structures or systems and as feasible, the flows in such works shall be released to natural retention filtration and flow areas.
- c. Transportation facility construction sites shall provide for siltation and run-off control through the use of settling ponds, soil fixing or performance equivalent structures or systems.

**4. Structure Installation**

- a. Placement of structures shall be accomplished in a manner that will not adversely affect surface water flow or tidal action.
- b. Minimum lowest floor elevation permitted for structures shall be at or above the 100-year flood level, as established by the Administrator of the Federal Flood Insurance Administration. The construction of any structure shall meet additional Federal Flood Insurance Land Management and Use Criteria (24 CFR 1910), as administered by the appropriate local agency.

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**(VII) Policy 5.6**

For those lands that are not voluntarily included in the Rural Lands Stewardship program, Collier County shall direct non-agricultural land uses away from high functioning wetlands by limiting direct impacts within wetlands. A direct impact is hereby defined as the dredging or filling of a wetland or adversely changing the hydroperiod of a wetland. This policy shall be implemented as follows:

1. There are two (2) major wetlands systems within the RLSA, Camp Keais, Strand and the Okaloacoochee Slough. These two systems have been mapped and are designated as FSA"s. Policy 5.1 prohibits certain uses within the FSA"s, thus preserving and protecting the wetlands functions within those wetland systems.

2. The other significant wetlands within the RLSA are WRA "s as described in Policy 3.3. These areas are protected by existing SFWMD wetlands permits for each area.

3. FSAs, HSAs and WRAs, as provided in Policy 5.3, and the ACSC have stringent site clearing and alteration limitations, nonpermeable surface limitations, and requirements addressing surface water flows which protect wetland functions within the wetlands in those areas. Other wetlands within the RLSA are isolated or seasonal wetlands. These wetlands will be protected based upon the wetland functionality assessment described below, and the final permitting requirements of the South Florida Water Management District.

g. Wetland preservation, buffer areas, and mitigation areas shall be identified or platted as separate tracts. In the case of a Planned Unit Development (PUD), these areas shall also be depicted on the PUD Master Plan. These areas shall be maintained free from trash and debris and from Category I invasive exotic plants, as defined by the Florida Exotic Pest Plant Council. Land uses allowed in these areas shall be limited to those listed above (3.e.iv.) and shall not include any other activities that are detrimental to drainage, flood, control, water conservation, erosion control or fish and wildlife habitat conservation and preservation.

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## **TRANSPORTATION ELEMENT**

### **(VI) OBJECTIVE 5:**

The County shall coordinate the Transportation System development process with the Future Land Use Map.

### **(IV)(VI) Policy 5.8:**

Should the TIS for a proposed development reflect that it will impact either a constrained roadway link and/or a deficient roadway link within a TCMA by more than a de minimis amount (more than 1% of the maximum service volume at the adopted LOS), yet continue to maintain the established percentage of lanes miles indicated in Policy 5.7 of this Element, a congestion mitigation payment shall be required as follows:

**(VI) d.** No impact will be de minimis if it exceeds the adopted LOS standard of any affected designated hurricane evacuation routes within a TCMA. Hurricane routes in Collier County are shown on Map TR7. Any impact to a hurricane evacuation route within a TCMA shall require a congestion mitigation payment provided the remaining LOS requirements of the TCMA are maintained.

### **(VI) OBJECTIVE 10:**

The County shall encourage safe and efficient mobility for the rural public.

### **(VI) Policy 10.1:**

The County shall examine the maintenance and operational needs of the rural roadway system, addressing the mobility needs of rural residents to include the availability of roads for rural-to-urban travel, travel within the rural area, and for emergency evacuation purposes.

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## **CONSERVATION AND COASTAL ZONE MANAGEMENT ELEMENT**

### **(II) OBJECTIVE 1.3:**

Pursuant to Administration Commission Final Order AC-99-002 dated June 22, 1999, the County has completed the phased delineation, data gathering, management guidelines and implementation of the Natural Resource Protection Area (NRPA) program as part of the required Collier County Rural and Agricultural Assessment. Through this Assessment, the County has determined that the NRPA program is not the only mechanism to protect significant environmental systems. Accordingly, within the Rural Lands Stewardship Area Overlay in the Future Land Use Element, the County has delineated Stewardship Sending Areas that will function to protect large environmental systems. Pursuant to the following policies, the County shall protect identified environmental systems through the NRPA and Rural Lands Stewardship programs.

### **(II) Policy 1.3.3:**

Continue with management guidelines as defined within the County LDC that provide for the management and conservation of the habitats, species, natural shoreline and dune systems for the undeveloped coastal barrier and estuarine natural resources protection area.

**(VI) Objective 2.1:**

By January 2008, the County shall complete the prioritization and begin the process of preparing Watershed Management Plans, which contain appropriate mechanisms to protect the County's estuarine and wetland systems...

**(VI) Policy 2.1.4:**

All Watershed Management Plans shall address the following concepts:

g. The effects on natural flood plains, stream channels, native vegetative communities and natural protective barriers which are involved in the accommodation of flood waters;

**OBJECTIVE 2.3:**

All estuaries shall meet all applicable federal, state and local water quality standards.

**Policy 2.3.5:**

Continue to have staff coordinate with the City of Naples staff regarding coordinated and cooperative planning, management, and funding programs for limiting specific and cumulative impacts on Naples Bay and its watershed.

At a minimum, this agreement includes the following:

- a. Insure adequate sites for water dependent uses,
- b. Prevent estuarine pollution,
- c. Control run-off,
- d. Protect living marine resources,
- e. Reduce exposure to natural hazards,
- f. Ensure public access,
- g. Provide a continuing monitoring program.

**(II)(III)(VI) Objective 6.1:**

The County shall protect native vegetative communities through the application of minimum preservation requirements. The following policies provide criteria to make this objective measurable. These policies shall apply to all of Collier County except for that portion of the County which is identified on the Countywide Future Land Use Map (FLUM) as the Rural Lands Stewardship Area Overlay.

**(II)(III)(VI) Policy 6.1.1:**

For the County's *Urban Designated Area, Estates Designated Area, Conservation Designated Area, and Agricultural/Rural Mixed Use District, Rural-Industrial District and Rural-Settlement Area District* as designated on the FLUM, native vegetation shall be preserved through the application of the following preservation and vegetation retention standards and criteria, unless the development occurs within the Area of Critical State Concern (ACSC) where the ACSC standards referenced in the Future Land Use Element shall apply. Notwithstanding the ACSC requirements, this policy shall apply to all non-agricultural development except for single-family dwelling units situated on individual parcels that are not located within a watershed management conservation area identified in a Watershed Management Plan developed pursuant to policies supporting Objective 2.1 of this Element.

	Coastal High Hazard Area		Non-Coastal High Hazard Area	
Residential and Mixed Use Development	Less than 2.5 acres	10%	Less than 5 acres.	10%
	Equal to or greater than 2.5 acres	25%	Equal to or greater than 5 acres and less than 20 acres.	15%
			Equal to or greater than 20 ac.	25%
Golf Course		35%		35%
Commercial and Industrial Development	Less than 5 acres.	10%	Less than 5 acres.	10%
	Equal to or greater than 5 acres.	15%	Equal to or greater than 5 acres.	15%
Industrial Development (Rural-Industrial District only)	50%, not to exceed 25% of the project site.		50%, not to exceed 25% of the project site.	

**(II)(III)(VI) Policy 6.1.2:**

For the *County's Rural Fringe Mixed Use District*, as designated on the FLUM, native vegetation shall be preserved on site through the application of the following preservation and vegetation retention standards and criteria:

Preservation and Native Vegetation Retention Standards:

f. In order to ensure reasonable use and to protect the private property rights of owners of smaller parcels of land within lands designated Rural Fringe Mixed Use District on the Future Land Use Map, including nonconforming lots of record which existed on or before June 22, 1999, for lots, parcels or fractional units of land or water equal to or less than five (5) acres in size, native vegetation clearing shall be allowed, at 20% or 25,000 square feet of the lot or parcel or fractional unit, whichever is greater, exclusive of any clearing necessary to provide for a 15-foot wide access drive up to 660 feet in length. For lots and parcels greater than 5 acres but less than 10 acres, up to 20% of the parcel may be cleared. This allowance shall not be considered a maximum clearing allowance where other provisions of this Plan allow for greater clearing amounts. These clearing limitations shall not prohibit the clearing of brush or under-story vegetation within 200 feet of structures in order to minimize wildfire fuel sources.

(6) A management plan shall be submitted for all preserve areas identified by specific criteria in the land development regulations to identify actions that must be taken to ensure that the preserved areas will function as proposed. The plan shall include methods to address control and treatment of invasive exotic species, fire management, stormwater management (if applicable), and maintenance of permitted facilities. If applicable, a listed species monitoring program shall be submitted pursuant to Policy 7.1.2 (2)(i).

**(II)(III)(VI) Policy 6.1.8: [re-numbered to reflect merger of Ordinance No. 2002-32 and 2002-54]**

An Environmental Impact Statement (EIS), or submittal of appropriate environmental data as specified in the County's land development regulations, is required, to provide a method to objectively evaluate the impact of a proposed development, site alteration, or project upon the resources and environmental quality of the project area and the community and to insure that planning and zoning decisions are made with a complete understanding of the impact of such decisions upon the environment, to encourage projects and developments that will protect, conserve and enhance, but not degrade, the environmental quality and resources of the particular project or development site, the general area and the greater community. The County's land development regulations shall establish the criteria for determining the type of proposed development requiring an EIS, including the size and nature of the proposed

development, the location of the proposed development in relation to existing environmental characteristics, the degree of site alterations, and other pertinent information.

**(II)(III)(VI) Objective 6.2:**

The County shall protect and conserve wetlands and the natural functions of wetlands pursuant to the appropriate policies under Goal 6. The following policies provide criteria to make this objective measurable. The County's wetland protection policies and strategies shall be coordinated with the Watershed Management Plans as required by Objective 2.1 of this Element.

**(II)(III)(VI) Policy 6.2.6: *[re-numbered to reflect merger of Ordinance No. 2002-32 and 2002-54]***

Within the *Urban Designation and the Rural Fringe Mixed Use District*, required wetland preservation areas, buffer areas, and mitigation areas shall be dedicated as conservation and common areas in the form of conservation easements and shall be identified or platted as separate tracts; and, in the case of a Planned Unit Development (PUD), these areas shall also be depicted on the PUD Master Plan. These areas shall be maintained free from trash and debris and from Category I invasive exotic plants, as defined by the Florida Exotic Pest Plant Council. Land uses allowed in these areas shall be limited to those listed in Policy 6.2.5(5)d of this element and shall not include any other activities that are detrimental to drainage, flood control, water conservation, erosion control or fish and wildlife habitat conservation and preservation.

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**(IV) OBJECTIVE 10.1:**

Priorities for shoreline land use shall be given to water dependent uses over water related land uses and shall be based on type of water-dependent use, adjacent land use, and surrounding marine and upland habitat considerations. The Collier County Manatee Protection Plan (NR-SP-93-01) May 1995 restricts the location of marinas and may limit the number of wet slips, the construction of dry storage facilities, and boat ramps, based upon the Plan's marina siting criteria.

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**(VI) Policy 10.1.6:**

All new marinas, water-dependent and water-related uses that propose to destroy viable, naturally functioning marine wetlands shall be required to perform a fiscal analysis in order to demonstrate the public benefit and financial feasibility of the proposed development.

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**OBJECTIVE 10.3:**

Undeveloped coastal barriers shall be maintained predominantly in their natural state and their natural function shall be protected, maintained and enhanced.

**(VI) Policy 10.3.6:**

Prohibit construction of structures seaward of the Coastal Construction Setback Line on undeveloped coastal barriers. Exception shall be for passive recreational structures, access crossovers, and where enforcement would not allow any reasonable economic utilization of such property. In the latter event, require construction that minimizes interference with natural function of such coastal barrier system.

**Policy 10.3.7:**

Participate in and encourage Regional and State programs to acquire naturally functioning, undeveloped coastal barrier systems to insure the preservation of their natural function.

**(VI) Policy 10.3.13:**

Substantial alteration of the natural grade on undeveloped coastal barriers, through filling or excavation shall be prohibited except as part of an approved dune and/or beach restoration program, or as part of an approved public development plan for one or more of the uses allowed by Policy 10.3.4, above.

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**OBJECTIVE 10.4:**

Developed coastal barriers and developed shorelines shall be continued to be restored and then maintained, when appropriate by establishing mechanisms or projects which limit the effects of development and which help in the restoration of the natural functions of coastal barriers and affected beaches and dunes.

**Policy 10.4.1:**

Promote environmentally acceptable and economically feasible restoration of the developed coastal barriers and the urban beach and dune systems.

**Policy 10.4.2:**

Prohibit further shore hardening projects except where necessary to protect existing structures, considering the total beach system and adjacent properties.

**(VI) Policy 10.4.3:**

Collier County shall prohibit activities which would result in man-induced shoreline erosion beyond the natural beach erosion cycle or that would deteriorate the beach and dune system. Implementation of this policy will be based upon available scientific/coastal engineering literature/studies that have established benchmarks for natural rates of beach erosion.

**Policy 10.4.4:**

Require dune stabilization and restoration improvements in land development projects along beach areas.

**Policy 10.4.5:**

Initiate and support beach and dune restoration and preservation programs where appropriate.

**Policy 10.4.6:**

Require native vegetation as landscaping in development activities in developed coastal barrier systems and on the beach and dune systems.

**(VI) Policy 10.4.7:**

Collier County shall prohibit construction seaward of the Coastal Construction Setback Line except where such construction would be permitted pursuant to the provisions of the Florida Coastal Zone Protection Act of 1985, where such prohibition would result in no reasonable economic utilization of the property in question, or for safety reasons. In such cases, construction will be as far landward as is practicable and effects on the beach and dune system and the natural functions of the coastal barrier system shall be minimized.

**(VI) Policy 10.4.8:**

Collier County shall allow construction seaward of the Coastal Construction Setback Line for public access and protection and activities related to restoration of beach resources. Such construction shall not interfere with sea turtle nesting, will utilize native vegetation for dune stabilization, will maintain the natural beach profile, will minimize interference with natural beach dynamics, and, where appropriate, will restore the historical dunes with native vegetation.

**(VI) Policy 10.4.9:**

Collier County shall prohibit seawall construction on properties fronting the Gulf of Mexico except in instances where erosion poses an imminent threat to existing buildings.

**(VI) Policy 10.4.10:**

The County shall prohibit vehicles on beaches and dunes except for the following:

1. Emergency vehicles responding to incidents.
2. Vehicles associated with environmental maintenance, environmental monitoring, or conservation purposes.
3. Vehicles limited to set-up and removal of equipment of permitted events, in conjunction with permanent concession facilities, or permitted uses of commercial hotels.
4. Beach raking or beach cleaning.

5. Vehicles needed for beach nourishment or inlet maintenance
6. Vehicles necessary for construction that cannot otherwise access a site from an upland area.

**Policy 10.4.12:** In permitting the repair and/or reconstruction of shore parallel engineered stabilization structures, require, where appropriate, at a minimum:

- a. All damaged seawalls will be replaced with, or fronted by,
- b. Where appropriate, repaired structures will be redesigned

**Policy 10.4.13:** Development and redevelopment proposals shall consider the implications of potential rise in sea level.

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**OBJECTIVE 10.5:**

For undeveloped shorelines, provide improved opportunities for recreational, educational, scientific, and esthetic enjoyment of coastal resources by protecting beaches and dunes and by utilizing or where necessary establishing construction standards, which will minimize the impact of manmade structures on the beach and dune systems.

**Policy 10.5.1:**

Recreation that is compatible with the natural functions of beaches and dunes is the highest and best land use.

**Policy 10.5.2:**

Prioritize acquisition efforts in order to meet the projected need for additional public beaches.

**Policy 10.5.3:**

Prohibit activities which would result in man induced shoreline erosion beyond the natural beach erosion cycle or that would deteriorate the beach dune system.

**(VI) Policy 10.5.4:**

Prohibit construction of any structure seaward of the Coastal Construction Setback Line. Exception shall be for passive recreational structures, access crossovers, and where enforcement would not allow any reasonable economic utilization of such property. In the latter event, require construction that minimizes interference with natural function of such beaches and dunes.

**(VI) Policy 10.5.5:**

The County shall prohibit vehicles on the beaches and dunes except for emergency, environmental monitoring and environmental maintenance purposes.

**Policy 10.5.6:**

Regulate activities so that they will not threaten the stability of the dunes or the beach itself.

**Policy 10.5.7:**

Pursue the acquisition of undeveloped beaches and dunes as the first alternative to development.

**Policy 10.5.8:**

Prohibit shoreline armoring processes and encourage non-structural methods for stabilizing beaches and dunes.

**(VI) Policy 10.5.9:**

Prohibit construction seaward of the Coastal Construction Setback Line except as follows:

- a. Construction will be allowed for public access;
- b. For protection and restoration of beach resources;
- c. In cases of demonstrated land use related hardship or safety concerns as specified in The 1985 Florida Coastal Zone Protection Act, there shall be no shore armoring allowed except in cases of public safety.

**Policy 10.5.10:**

Construction activities shall not interfere with the sea turtle nesting, shall preserve or replace any native vegetation

on the site, and shall maintain the natural beach profile and minimize interference with the natural beach dynamics and function.

**(VI) Policy 10.5.11:**

The County will waive all other non-safety related setback requirements and site planning requirements before allowing construction seaward of the Coastal Construction Setback Line.

**Policy 10.5.12:**

For all beach front land development related projects require dune stabilization and restoration improvements, the removal of exotic vegetation, and replacement with native vegetation, as appropriate.

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**(I) OBJECTIVE 10.6:**

The County shall conserve the habitats, species, natural shoreline and dune systems contained within the County's coastal zone.

**(I)(VI) Policy 10.6.1:**

In addition to those applicable policies supporting Objectives 10.1, 10.2, 10.3, 10.4, and 10.5, development within the County's coastal zone shall also meet the following criteria:

1. Densities on the following undeveloped coastal barriers shall not exceed 1 unit per 5 acres;
  - a. Wiggins Pass Unit FL-65P,
  - b. Clam Pass Unit FL-64P,
  - c. Keywaydin Island Unit P-16,
  - d. Cape Romano Unit P-15.
2. Site alterations shall be concentrated in disturbed habitats thus avoiding undisturbed pristine habitats (Reference Policy 10.1.4).
3. Beachfront developments shall restore dune vegetation.
4. Projects on coastal barriers shall be landscaped with native Southern Floridian species.
5. Boathouses, boat shelters and dock facilities shall be located and aligned to stay at least 10 feet from any existing seagrass beds except where a continuous bed of seagrass exists off of the shore of the property, in which case facility heights shall be at least 3.5 feet NGVD, terminal platforms shall be less than 160 square feet and access docks shall not exceed a width of four (4) feet.
6. The requirements of this policy identify the guidelines and performance standards for undeveloped coastal barriers and estuarine areas that are contained within the County's coastal barrier and estuarine area Natural Resource Protection Area (NRPA – reference CCME Policy 1.3.1). These guidelines and standards therefore satisfy the requirements of CCME Policy 1.3.1.

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**(I)(VI) OBJECTIVE 12.1:**

The County will maintain hurricane evacuation clearance times as required by state law. An evacuation clearance time shall be defined as having residents and visitors in an appropriate refuge away from storm surge prior to the arrival of sustained Tropical Storm force winds, i.e., winds equal to or greater than 39 mph. To further these objectives, for future mobile home developments located outside of the storm surge zone, such development shall include on-site sheltering or retrofitting of an adjacent facility. The Collier County Emergency Management Department shall seek opportunities to increase shelter facilities and associated capacities under the direction of the Department of the Florida Division of Emergency Management.

**(VI) Policy 12.1.1:**

Collier County will develop and maintain a comprehensive public awareness program. The program will be publicized prior to May 30th of each year. Evacuation zones, public shelters and evacuation routes shall be printed in each local newspaper, displayed on the Collier County Emergency Management website, and the availability of this information will be discussed on local television newscasts. This information shall also be made readily available to all hotel/motel guests.

**(I) Policy 12.1.2:**

Land use plan amendments in the Category 1 hurricane vulnerability zone shall only be considered if such increases in densities provide appropriate mitigation to reduce the impacts of hurricane evacuation times.

**(VI) Policy 12.1.3:**

The County shall continue to identify and maintain shelter space for 32,000 persons by 2006 and 45,000 by 2010. Shelter space capacity will be determined at the rate of 20 square feet per person.

**(VI) Policy 12.1.4:**

The County shall continue to maintain hurricane shelter requirements and standards for all new mobile home parks and mobile home subdivisions, or existing mobile home parks and mobile home subdivisions in the process of expanding, which accommodate or contain 26 units or more. Such mobile home parks or mobile home subdivisions shall be required to provide emergency shelter space on-site, or to provide funding to enhance one or more existing public shelters off-site. The building which provides the on-site shelter space (if this option is chosen) will be of such a size as to provide shelter to park or subdivision residents at the rate of 20 square feet per person. For the purposes of this policy, the size of the on-site shelter structure shall be determined by estimating the park or subdivision population during the June-November time frame, based upon methodologies utilized by the Collier County Emergency Management Department.

**(VI) Policy 12.1.5:**

On-site shelters within mobile home parks or mobile home subdivisions shall be elevated to a minimum height equal to or above the worst case Category 3 hurricane flooding level, based upon the most current National Oceanic and Atmospheric Administration's storm surge model, known as Sea, Lake, and Overland Surges from Hurricanes (SLOSH). The wind load criteria for buildings and structures designated as "essential facilities" in the latest Florida Building Code, shall guide the design and construction of the required shelters. Shelters shall be constructed with emergency electrical power and potable water supplies; shall provide glass protection by shutters or other approved material/device; and shall provide for ventilation, sanitary facilities and first aid equipment. A telephone, automatic external defibrillator (AED) and battery-operated radio are also required within the shelter.

**(VI) Policy 12.1.6:**

The Directors of the Transportation Planning and Emergency Management Departments will review, at least annually, evacuation route road improvement needs to ensure that necessary improvements are reflected within Table A, the Five-Year Schedule of Capital Improvements, as contained within the Capital Improvement Element of this Growth Management Plan.

**(VI) Policy 12.1.7:**

The County shall update the hurricane evacuation portion of the Collier County Comprehensive Emergency Management Plan prior to June 1st of each year by integrating all appropriate regional and State emergency plans in the identification of emergency evacuation routes.

**(VI) Policy 12.1.8:**

The County's land development regulations include mitigation policies addressing flood plains, beach and dune alteration and storm water management.

**(I)(VI) Policy 12.1.9:**

Collier County shall annually update its approved Hazard Mitigation Plan, formerly known as the "Local Hazard Mitigation Strategy" through the identification of new or ongoing local hazard mitigation projects and appropriate funding sources for such projects.

**(I)(VI) Policy 12.1.10:**

All new Public Safety facilities in Collier County will be flood-resistant and designed to meet 155 mph wind load requirements and shall have provisions for back-up generator power.

**(I)(VI) Policy 12.1.11:**

The County will continue to coordinate with Collier County Public Schools to ensure that all new public schools outside of the Coastal High Hazard Area are designed and constructed to meet the Public Shelter Design Criteria, as

contained in “State Requirements for Educational Facilities” (1999).

**(I)(VI) Policy 12.1.12:**

The County will continue to work with the Board of Regents of the State University System to ensure that all new facilities in the State University System that are located outside of the Coastal High Hazard Area are designed and constructed to meet the Public Shelter Design Criteria, as contained in “State Requirements for Educational Facilities” (1999) and the Florida Building Code.

**(I)(VI) Policy 12.1.13:**

The County will continue to mitigate previously identified shelter deficiencies through mitigation from Developments of Regional Impact, Emergency Management Preparedness and Enhancement grants, Hazard Mitigation and Pre-disaster Mitigation Grant Programs funding, and from funds identified in the State’s annual shelter deficit studies.

**(VI) Policy 12.1.14:**

Prior to adoption of the 2007 Annual Update and Inventory Report (A.U.I.R.), Collier County shall evaluate whether to include hurricane shelters in the 5-year schedule of Capital Improvements.

**(I)(VI) Policy 12.1.15:**

All new nursing homes and assisted living facilities that are licensed for more than 15 clients will have a core area to shelter residents and staff on site. The core area will be constructed to meet the Public Shelter Design Criteria that is required for new public schools and public community colleges and universities (“State Requirements for Educational Facilities,” 1999). Additionally this area shall be capable of ventilation or air conditioning provided by back-up generator for a period of no less than 48 hours.

**(I)(VI) Policy 12.1.16:**

The County will coordinate with the Florida Department of Transportation on its plans to one-way evacuation routes on State maintained roads that are primary evacuation routes for vulnerable populations.

**(VI) Policy 12.1.17:**

Collier County is conducting a Hurricane Evacuation Study. If warranted by the results of that study, further restriction on development may be proposed.

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**(VI) OBJECTIVE 12.2:**

The County shall ensure that publicly funded buildings and publicly funded development activities are carried out in a manner that demonstrates best practice to minimize the loss of life, property, and re-building cost from the affects from hurricanes, flooding, natural and technological disaster events. Best practice efforts may include, but are not limited to:

- a. Construction above the flood plain;
- b. maintaining a protective zone for wildfire mitigation;
- c. installation of on-site permanent generators or temporary generator emergency connection points;
- d. beach and dune restoration, re-nourishment, or emergency protective actions to minimize the loss of structures from future events;
- e. emergency road repairs;
- f. repair and/or replacement of publicly owned docking facilities, parking areas, and sea walls, etc.

**(VI) Policy 12.2.1:**

The Hazard Mitigation section of the Collier County Comprehensive Emergency Management Plan (CEMP) shall continue to be reviewed and updated every four (4) years beginning in 2005. This periodic update of the CEMP shall include a review and update (as may be necessary) of the County’s hurricane evacuation and sheltering procedures.

**(VI) Policy 12.2.2:**

Within the coastal high hazard area, the calculated needs for public facilities, as represented in the Annual Update and Inventory Report (A.U.I.R.) and Five-Year Schedule of Capital Improvements, will be based on the County’s

adopted level of service standards and projections of future growth allowed by the Future Land Use Element.

**Policy 12.2.3:**

The County shall participate in the National Flood Insurance Program (NFIP).

**(VI) Policy 12.2.4:**

The County shall maintain requirements for structural wind resistance as stated in the latest edition of the Florida Building Code.

**(I)(VI) Policy 12.2.5:**

The County shall consider the Coastal High Hazard Area as a geographical area lying within the Category 1 storm surge zone as presently defined in the 2001 Southwest Florida Regional Planning Council's Hurricane Evacuation Study, or subsequently authorized storm surge or evacuation planning studies coordinated by the Collier County Emergency Management Department and approved by the Board of County Commissioners.

**Policy 12.2.6:**

The County shall require that all new sanitary sewer facilities in the coastal high-hazard flood area be flood proofed, be designed to reduce leakage of raw sewage during flood events to the maximum extent practicable and new septic tanks shall be fitted with back-flow preventers.

**(VI) Policy 12.2.7:**

The County shall continue to assess all undeveloped property within the coastal high hazard area and make recommendations on appropriate land use.

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**OBJECTIVE 12.3:**

The County shall develop and maintain a task force that will plan and guide a unified County response to post-hurricane disasters.

**Policy 12.3.1:**

The Comprehensive Emergency Management Plan shall comply with the policies under this objective, and shall contain step-by-step details for post disaster recovery.

**Policy 12.3.2:**

After a hurricane that necessitated an evacuation, the Board of County Commissioners shall meet to hear preliminary damage assessments. This will be done prior to re-entry of the population. At that time, the Commission will activate the recovery task force and consider a temporary moratorium on building activities not necessary for the public health, safety and welfare.

**(VI) Policy 12.3.3:**

The Recovery Task Force shall include the Sheriff of Collier County, the Community Development and Environmental Services Division Administrator, the Comprehensive Planning Director, the Zoning and Land Development Review Director, the Emergency Management Director and other members as directed by the Board of County Commissioners. The Board should also include representatives from municipalities within Collier County that have received damage from the storm to become members of the Recovery Task Force.

**(VI) Policy 12.3.4:**

The Collier County Recovery Task Force responsibilities shall be identified in the Code of Laws and Ordinances.

**Policy 12.3.5:**

Immediate repair and clean-up actions needed to protect the public health and safety include repairs to potable water, wastewater, and power facilities, debris removal, stabilization or removal of structures that are in danger of collapsing, and minimal repairs to make dwellings habitable. These actions shall receive first priority in permitting decisions.

**Policy 12.3.6:**

Structures in the coastal high-hazard area which have suffered damage to pilings, foundations, or load-bearing walls on one or more occasion shall be required to rebuild landward of their current location or to modify the structure to mitigate any recurrence of repeated damage.

**(VI) Policy 12.3.7:**

The County has developed, adopted and maintains a Post-disaster Recovery, Reconstruction and Mitigation Ordinance, for the purpose of evaluating options for damaged public facilities including abandonment (demolition), repair in place, relocation, and reconstruction with structural modifications. The process described within the Ordinance considers these options in light of factors such as cost to construct, cost to maintain, recurring damage, impacts on land use, impacts on the environment and public safety.

**Policy 12.3.8:**

Within 30 days of a hurricane resulting in disaster the County shall identify non-public structures in the coastal high-hazard area, inventory their assessed value, judge the utility of the land for public access and make recommendations for acquisition during post-disaster recovery.

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**(VI) OBJECTIVE 12.4:**

The County shall make every reasonable effort to meet the emergency preparedness requirements of people with special needs such as the elderly, handicapped, the infirmed and those requiring transportation from a threatened area. In the event of a countywide emergency, such as a hurricane or other large-scale disaster, the County Emergency Management Department shall open and operate one or more refuges for persons listed on the County's Special Needs Registry and their caregivers. Medical and support equipment at such refuges will include, but not necessarily be limited to, respirators, oxygen tanks, first aid equipment, disaster cots and blankets, and defibrillators.

**Policy 12.4.1:**

All new hospitals, nursing homes, and adult congregate living facilities shall prepare an emergency preparedness plan for approval by the Emergency Management Department prior to receiving a final development order.

**Policy 12.4.2:**

The County, in cooperation with other public agencies and public service groups, shall make a reasonable effort to provide for the emergency transportation needs of people having limited mobility that do not reside in licensed institutions serving people with special needs.

**Policy 12.4.3:**

The County, in cooperation with the Collier County Health Department and other public service groups shall make a reasonable effort to provide basic medical services in selected shelters designated as special needs shelters.

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## **CAPITAL IMPROVEMENTS ELEMENT**

**(VIII) Policy 1.2:**

The quantity of public facilities that is needed to eliminate existing deficiencies and to meet the needs of future growth shall be determined for each public facility by the following calculation:

$$Q = (S \times D) - I.$$

Where: "Q" is the quantity of public facility needed,

"S" is the standard for level of service,

"D" is the demand, such as the population, and

"I" is the inventory of existing facilities.

A. The calculation will be used for existing demand in order to determine existing deficiencies. The calculation will be used for projected demand in order to determine needs of future growth. The estimates of projected demand will account for demand that is likely to occur from previously issued development orders as well as future growth.

Management and Future Land Use Elements of this Growth Management Plan.

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**(VIII)(X) OBJECTIVE 3 (PUBLIC EXPENDITURES: COASTAL HIGH HAZARD AREA):**

Effective with plan implementation, limit public expenditures in the coastal high hazard area to those facilities, as described in Policy 1.1 above, needed to support new development to the extent permitted in the Future Land Use Element.

**(VIII)(X) Policy 3.1:**

The County shall continue to expend funds within the coastal high hazard area for the replacement and maintenance of public facilities identified in the Conservation and Coastal Management Element including, but not limited to arterial and collector roads, sanitary sewer service - wastewater treatment systems, potable water supply systems, surface water – stormwater management systems, solid waste collection and disposal systems, natural groundwater aquifer recharge areas, and park and recreation facilities.

**(VIII) Policy 3.2:**

Within the coastal high hazard area, the calculated needs for public facilities, as represented in the Schedule of Capital Improvements, will be based on the County's adopted level of service standards and projections of future growth allowed by the Future Land Use Element.

**(III)(VIII)(X) Policy 3.3:**

The County shall continue to support public access to beaches, shores and waterways. Such support shall include public expenditures for the maintenance of existing public facilities and beach renourishment, and may include public expenditure for beach, shore and waterway access.

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**(VIII) Policy 4.7:**

The County shall ensure that publicly funded buildings and publicly funded development activities are carried out in a manner that demonstrates best practice to minimize the loss of life, property, and re-building cost from the effects from hurricanes, flooding, natural and technological disaster events. Best practice efforts may include, but are not be limited to:

- a. Construction above the flood plain;
- b. Maintaining a protective zone for wildfire mitigation;
- c. Installation of on-site permanent generators or temporary generator emergency connection points;
- d. Beach and dune restoration, re-nourishment, or emergency protective actions to minimize the loss of structures from future events;
- e. Emergency road repairs; and,
- f. Repair and/or replacement of publicly owned docking facilities, parking areas, and sea walls.

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## **HOUSING ELEMENT**

**(II) OBJECTIVE 4:**

Collier County and the City of Naples will conduct a comprehensive housing survey, every three years or sooner, for the purpose of identifying substandard dwelling units. Through continued enforcement of County housing codes, and the provision of housing rehabilitation or replacement programs, the number of substandard units (associated with a lack of plumbing and/or kitchen facilities) throughout the County shall be reduced by 5% per year through rehabilitation or demolition.

### **JOINT CITY/COUNTY POLICIES**

**(II) Policy 4.4:**

In the event of a natural disaster, replacement housing shall comply with all applicable federal, state and local codes and shall consider factors such as, but not limited to, commercial accessibility, public facilities, places of employment, and housing income.

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**(II) OBJECTIVE 7:**

Although mobile home developments currently exist within the coastal areas of Collier County, as a result of the coastal community's susceptibility to flooding and storm surges, no new rezone to permit mobile home development will be allowed within the Coastal High Hazard Area, as depicted on the countywide Future Land Use Map.

**CITY POLICIES**

**\* Policy 7.2:**

Additional mobile home developments will not be permitted in the city limits due to the City's low elevation, susceptibility to flooding, storm surges and high winds in hurricane and tropical storms and that mobile homes are particularly vulnerable to damage.

**COUNTY POLICIES**

**(II) \* Policy 7.3:**

The County has numerous sites where mobile homes are a permitted use and these sites will continue to be available for mobile home developments. However, due to the low lying elevations, susceptibility to flooding, storm surges and high winds from hurricanes and tropical storms, and that mobile homes are particularly vulnerable to damage, no additional sites will be zoned for mobile home development within the Coastal High Hazard Area, as depicted on the countywide Future Land Use Map.

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**GOLDEN GATE AREA MASTER PLAN**

**(VIII) OBJECTIVE 6.3:**

In planning and constructing road improvements within Golden Gate Estates and Golden Gate City, Collier County shall coordinate with local emergency services officials to ensure that the access needs of fire department, police and emergency management personnel and vehicles are met.

**(VIII) Policy 6.3.1:**

Beginning in 2005, the Collier County Transportation Planning Department shall hold at least one annual public meeting with Golden Gate Area emergency services providers and the local civic association in order to ensure that emergency needs are addressed during the acquisition of right-of-way for design and construction of road improvements.

**(VIII) Policy 6.3.2:**

Beginning in 2005, the Collier County Transportation Planning Department shall coordinate with Golden Gate Area emergency services providers to prioritize necessary road improvements related to emergency evacuation needs.

**(VIII) GOAL 7:**

**THE LIVES AND PROPERTY OF THE RESIDENTS OF THE GREATER GOLDEN GATE AREA, AS WELL AS THE HEALTH OF THE NATURAL ENVIRONMENT, WILL BE PROTECTED THROUGH THE PROVISION OF EMERGENCY SERVICES THAT PREPARE FOR, MITIGATE, AND RESPOND TO, NATURAL AND MANMADE DISASTERS.**

**(VIII) OBJECTIVE 7.1:**

The Collier County Bureau of Emergency Services, Collier County Sheriff's Department, Golden Gate Fire Control and Rescue District, and other appropriate agencies, will continue to maintain and implement public information programs to inform residents and visitors of the Greater Golden Gate Area regarding the means to prevent, prepare for, and cope with, disaster situations.

**(VIII) Policy 7.1.1:**

The County, fire districts that serve the Golden Gate area, and other appropriate agencies, shall embark on an education program to assist residents in knowing and understanding the value and need for prescribed burning on public lands in high risk fire areas.

**(VIII) Policy 7.1.2:**

The Golden Gate Fire Control and Rescue District and Collier County Bureau of Emergency Services shall actively promote the Firewise Communities Program through public education in Golden Gate Estates.

**(VIII) Policy 7.1.3:**

By 2005, the Collier County Community Development and Environmental Services Division shall evaluate the Land Development Code for Golden Gate Estates and shall eliminate any requirements that are found to be inconsistent with acceptable fire prevention standards. This evaluation process shall be coordinated with the Golden Gate Fire Control and Rescue District and the Collier County Bureau of Emergency Services.

**(VIII) Policy 7.1.4:**

The Golden Gate Fire Control and Rescue District and the Collier County Bureau of Emergency Services shall hold one or more annual “open house” presentations in the Golden Gate Area emphasizing issues related to wildfires, flooding, emergency access and general emergency management.

**(VIII) OBJECTIVE 7.2:**

Capital improvement projects within the Golden Gate Area shall be coordinated with all applicable emergency services providers to ensure that the needs of these entities are included in the overall public project design.

**(VIII) Policy 7.2.1:**

Preparation of Collier County’s annual Schedule of Capital Improvements for projects within the Golden Gate Area shall be coordinated with the Fire Districts, public and private utilities, Emergency Medical Services Department and the Collier County Sheriff’s Department to ensure that public project designs are consistent with the needs of these agencies.

**(VIII) Policy 7.2.2:**

The Golden Gate Fire Control and Rescue District, Collier County Emergency Medical Services Department and the Collier County Sheriff’s Department shall receive copies of pre-construction plans for capital improvement projects in the Golden Gate Area and shall be invited to review and comment on plans for the public projects.

**(VIII) OBJECTIVE 7.3:**

While the County Transportation Planning Department is in the process of developing strategies for the enhancement of roadway interconnection within Golden Gate City and the Estates Area, interim measures to assure interconnection shall be developed.

**(VIII) Policy 7.3.1:**

By 2006, the Collier County Bureau of Emergency Services, the Collier County Transportation Division, Golden Gate Fire Control and Rescue District, and other appropriate Federal, State or local agencies, shall begin establishing one or more of the following routes for emergency evacuation purposes:

- a. An I-75 Interchange at Everglades Boulevard.
- b. Improved emergency access from Everglades Boulevard to I-75.
- c. Construction of a north-south bridge on 23rd Street, SW, between White Boulevard and Golden Gate Boulevard.

**(VIII) Policy 7.3.2:**

All new residential structures shall comply with NFPA (National Fire Protection Association, Incorporated) 299 Standard for Protection of Life and Property from Wildfire, 1997 Edition, as adopted by reference in the Florida Fire Code or the most recent edition.

**(VIII) Policy 7.3.3:**

Modified portions of existing structures shall meet NFPA Standards through the adoption of appropriate regulations in the County Building Codes.

**(VIII) Policy 7.3.4:**

Beginning in 2006, County-owned property within Golden Gate Estates shall be subject to an active, on-going management plan to reduce the damage caused by wildfires originating from County-owned properties.

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#### **(X) LAND USE DESIGNATION DESCRIPTION SECTION**

The following section describes the three land use designations shown on the Golden Gate Area Future Land Use Map. These designations generally indicate the types of land uses for which zoning may be requested. However, these land use designations do not guarantee that a zoning request will be approved. Requests may be denied by the Board of County Commissioners based on criteria in the Land Development Code or in special studies completed for the County.

#### **(X) 1. URBAN DESIGNATION: URBAN MIXED-USE DISTRICT AND URBAN COMMERCIAL DISTRICT**

Urban Designated Areas on the Future Land Use Map include two general portions of Collier County: areas with the greatest residential densities and areas in close proximity, which have or are projected to receive future urban support facilities and services. It is intended that Urban Designated areas accommodate the majority of population growth and that new intensive land uses be located within them. The boundaries of the Urban Designated areas have been established based on several factors including:

- patterns of existing development,
- patterns of approved but unbuilt development,
- natural resources, water management, and hurricane risk,
- existing and proposed public facilities,
- population projections, and
- land needed to accommodate growth.

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## **PART II**

### **CODE OF LAWS & ORDINANCES (EXCERPTS)**

**(<http://www.municode.com/library/clientCodePage.aspx?clientID=5149>)**

#### **Chapter 38 – Civil Emergencies**

#### **Article I – Post- Disaster Recovery**

#### **Sec. 38-4. - Establishment of the post-disaster recovery task force.**

The post-disaster recovery task force (task force) is hereby established as a post-disaster response management team consisting of community organizations and county and municipal personnel to provide an efficient recovery response to catastrophic disasters as provided for in Chapter 252, Florida Statutes. Upon direction of the Collier County Board of County Commissioners (BCC), the county manager shall schedule meetings to discuss specific roles and responsibilities of the task force in accordance with this article, and relative issues associated with recovery, emergency temporary repairs, and reconstruction processes following a disaster.

- (1) The membership of the task force shall be composed of the following:
  - a. The county manager, or designee.
  - b. The community development and environmental services administrator, or designee.
  - c. The City Manager, or designee, for the City of Naples.
  - d. The City Manager, or designee, for the City of Marco Island.
  - e. The Mayor, or designee, for Everglades City.
  - f. The county transportation administrator, or designee.
  - g. The county public utilities administrator, or designee.
  - h. The county public services administrator, or designee.
  - i. The county health department director, or designee.
  - j. The county emergency management director, or designee.

- k. The county human services director, or designee.
- l. The county fire code official, or designee.
- m. The county emergency medical services director, or designee.
- n. The county communications and customer relations director, or designee.
- o. A representative from the American Red Cross.
- p. A representative from the school district of the county.
- q. A representative from the Collier Building Industry Association, Inc.
- r. A representative from the American Specialty Contractors of Florida, Inc.
- s. A representative from the county sheriff's office.
- t. A representative from the clerk of the circuit court.
- u. A representative from the county's property appraiser's office.
- v. Chair, or vice chair, of the local mitigation strategy working group.
- w. The County Solid and Hazardous Waste or Director or Designee

(2) Duties of the post-disaster recovery task force shall include, but shall not be limited to the following:

- a. Review all planning associated with the recovery and reconstruction process as described in the Collier County Comprehensive Emergency Management Plan (CEMP) and associated plans dealing with implementation of post-disaster moratoria and build-back policies;
- b. Provide recommendations to the BCC for direction on recovery priorities and goals, and to coordinate and prioritize the recovery and reconstruction process with the construction industry;
- c. Initiate recommendations to the BCC for the enactment, repeal or extension of emergency ordinances, resolutions and proclamations for its consideration;
- d. Recommend to the BCC the imposition of any building moratoria that may be warranted as a result of the disaster;
- e. Review the nature of damages, identify and evaluate alternate program objectives for repairs and reconstruction, and formulate recommendations to guide the community in its recovery;
- f. Coordinate and implement strategies for temporary housing efforts if recommended by the U.S. Department of Homeland Security of the Federal Emergency Management Agency, U.S. Department of Housing and Urban Development and the state emergency response team;
- g. Receive and review damage reports and other analysis of post-disaster circumstances, and to compare these circumstances with mitigation opportunities identified prior to the disaster to determine appropriate areas for post-disaster change and innovation; and, where needed, the task force may review alternative mechanisms to bring about such changes and recommend the coordination of internal and external resources for achieving these ends including consultant or contract labor;
- h. Recommend to the BCC land areas and land use types that will receive priority in recovery;
- i. Recommend to the BCC blanket reductions in non-vital zoning regulations and development standards (e.g., buffering, open space, side setbacks, etc.) to minimize the need for individual variances or compliance determinations prior to reconstruction; and
- j. Evaluate damaged public facilities and formulate alternative mitigation options (i.e., repair, replacement, modification or relocation).

Sec. 38-5. - Establishment of emergency review board.

(2) The duties and authority of the emergency review board include, but are not limited to: Decisions rendered by the emergency review board may be appealed to the board through the normal administrative appeals process provided for in subsection 10.02.02.F.5.b. of the LDC.

- a. Serve as an advisory committee to the task force;
- b. Review all planning activities associated with the recovery and reconstruction process as described in the comprehensive emergency plan and associated plans dealing with post-disaster moratoria, build-back policies, emergency permitting and zoning, condemnation of buildings for structural and electrical deficiencies, enforcement and application of the LDC affecting setbacks, parking, buffering, open space, temporary signage, use of recreational vehicles for temporary living purposes, and other associated land development regulations;
- c. Establish and define criteria for emergency repairs, determine the duration of the build-back period for build-back permitting activities and implement emergency permitting policies and procedures;
- d. Supervise preliminary damage and detailed assessments; and
- e. Consider grants of administrative variances, waivers or deviations to effectuate the buildback policy.

f. Assist in the implementation of local mitigation plans.

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### **PART III**

#### **COLLIER COUNTY COMPREHENSIVE EMERGENCY MANAGEMENT PLAN (CEMP) ([HTTPS://WWW.COLLIERCOUNTYFL.GOV/YOUR-GOVERNMENT/DIVISIONS-A-E/EMERGENCY-MANAGEMENT/DRAFT-2016-CEMP](https://www.colliercountyfl.gov/your-government/divisions-a-e/emergency-management/draft-2016-CEMP) OR [bit.ly/2Eu44oS](https://www.colliercountyfl.gov/your-government/divisions-a-e/emergency-management/draft-2016-CEMP))**

Mitigation is discussed throughout the CEMP. When you open the “Basic Plan” pdf document, plug in the word “mitigation” into the “Ctrl –F” Find-function. Section G of the Basic Plan is devoted to the mitigation activities.

#### **Attachment 2 to Section 6 Marco Island’s LMS Implementation Strategy**

#### **Section I (Future Land Use Element)**

Objective 1.2: The Future Land Uses depicted on the Future Land Use Map shall be compatible and coordinated with existing topographic, soil, base flood, and infrastructure services.

Policy 1.2.1: Proposed changes to the Future land Use Map will be thoroughly reviewed for compatibility and coordination with underlying topographic, soil, flooding probability, and existing infrastructure services to ensure the development envisioned in the proposed change can be accommodated without adverse impacts or severe limitations due to topographic, soil, or infrastructure services.

Measurement: Number of Map changes approved after thorough analysis of the above mentioned site characteristics.

Objective 1.3: The City shall refrain from approving any project or development that would exceed prescribed densities or the overall desire to maintain a maximum net density of less than four (4) units per acre if such project or development could negatively impact hurricane evacuation plans, routes, or shelter facilities.

Policy 1.3.1: Any request to change the Future Land Use Map shall be thoroughly reviewed, and denied if such change would negatively impact hurricane evacuation plans, routes, or shelter facilities.

Measurement: Number of desired Map changes denied due to hurricane evacuation factors.

Policy 1.3.3: The City shall continue to implement and update the approved post-disaster redevelopment ordinance pursuant to Policies 3.3.1 and 3.3.2 of the Conservation and Coastal Management Element.

Objective 1.4: Upon receipt of a valid hazard mitigation report from an authorized agency, the City shall review and eliminate or reduce such uses consistent with the

hazard threat identified in the report.

Policy 1.4.1: Should the City receive a valid hazard mitigation report from an authorized agency, the City shall review such report and take prudent action toward the elimination or reduction of such uses consistent with the threat identified in the report.

Measurement: Consideration of the elimination or reduction of uses identified in a valid hazard mitigation report, when and if such report is issued.

\*\*\*      \*\*\*      **TEXT BREAK**      \*\*\*      \*\*\*

#### **Section IV (INFRASTRUCTURE ELEMENT)**

Objective 1.4: The City will ensure thoughtful, thorough, pre- and post-storm planning to ensure minimal disruption in service to customers

Measurement: Development by potable water service provider of detailed hurricane/emergency operation and recovery plan.

Policy 1.4.1: To provide the public with essential information concerning plans in the event of a storm event, the Public Works Department will prepare a detailed hurricane and/or emergency operation plan.

Measurement: Plan presentation, approval, and public distribution.

Policy 1.4.2: The City will seek full recovery of service within two (2) weeks of any category 3 hurricane for 80% of their customers on Marco Island.

Measurement: Progress toward the goal of two-week recovery from any category 3 hurricane.

\*\*\*      \*\*\*      **TEXT BREAK**      \*\*\*      \*\*\*

**Section V (coastal management element)** talks about our post disaster redevelopment program.

**GOAL 3: TO MINIMIZE HUMAN AND PROPERTY LOSS DUE TO TROPICAL STORMS AND HURRICANES,**

Objective 3.1: Reduce the threat of loss of life and property resulting from tropical storms and hurricanes through diligent, cooperative preparation planning, improved evacuation and sheltering facilities, and public education.

Policy 3.1.0.5: As virtually the entire Island is an evacuation zone for a Category One hurricane future development and redevelopment shall be limited to and not exceed the densities and/or intensities identified on the Future Land Use Map. This policy shall not preclude reconstruction of structures as authorized under Policy 3.3.3 or the subsequent Post-Disaster Redevelopment Plan.

Measurement: Issuance of development orders for new projects consistent with the densities prescribed on the Future Land Use Map.

Policy 3.1.1: The City shall maintain and enforce building codes at least as stringent as required by Florida law to limit the potential damage of structures from hurricanes and tropical storms. These codes shall include wind-resistance commensurate with the risk of a coastal environment and building elevation requirements that conform with federal laws and Flood Insurance Rate Maps.

Measurement: The City shall adopt the new Florida Building Code pursuant to the prescribed implementation schedule.

\*\*\*\*Policy 3.1.2: The City will continue to actively participate and interact with the County's Local Emergency Management Planning (LEMP) organization to foster enhanced emergency planning with special emphasis on maintaining or reducing hurricane evacuation times from Marco Island.\*\*\*\*

\*\*\*\*Measurement: City representatives will actively participate in LEMP meetings.\*\*\*\*

Policy 3.1.3: The City will develop a local hurricane plan, which will be annually reviewed and revised before June 1st.

Measurement: Annual review of local hurricane plans

Policy 3.1.5: The City will work through the County staff to ensure that hurricane evacuation shelters meet or exceed Red Cross standards, and that facilities are provided to meet the needs of elderly and disabled persons.

Policy 3.1.6: Upon plan adoption the City will conduct at least one public hurricane preparation meeting before hurricane season, and seek the assistance of local groups and associations to distribute pertinent materials on hurricane preparation and evacuation.

Measurement: Annual public hurricane preparation information meeting

\*\*\*      \*\*\*      **TEXT BREAK**      \*\*\*      \*\*\*

## **Section VII (INTERGOVERNMENTAL COORDINATION ELEMENT)**

Objective 1.1: The City of Marco Island will provide opportunities for planning partners and affected entities to review and comment on the Comprehensive Plan prior to formal adoption or amendment.

## ANNEX A

### Maps

#### **Collier County Maps:**

Source: Collier County Growth Mgt. Plan (<http://bit.ly/35TyfjQ>)

Current Collier County Land Use - 1 (Abbreviations= <http://bit.ly/2Byq8LI>)

Future Collier County Land Use - 2

#### **City of Naples Maps**

Source: City of Naples Comprehensive Plan (<https://www.naplesgov.com/planning>)

Naples Current Land Use – 3

Naples Future Land Use – 4

Historic District of Naples – 4a

#### **Everglades City Maps**

Source: Everglades City Planning & Zoning Cmte. (<http://bit.ly/323ft6D>)

Everglades City (EGC) Future Land Use Map Index - 5

(EGC Maps # - 1 through # - 12 follows)

Everglades City Land Use Map – 5a

#### **City of Marco Island Maps**

Source: City Comprehensive Plan (<http://bit.ly/2BVSAY9>)

Marco Island Current Land Use - 6

Marco Island Future Land Use – 7

#### **Other Maps**

Collier County Storm Surge Map – 8 (from Hurricane Ctr SLOSH model)

Collier County Flood Map - 9 (from CC Growth Mgmt. Dept.)

Historical Structures Map – 10 (from State Historic Office)

Emergency Facilities Map – 11 (from Critical Facility listing)

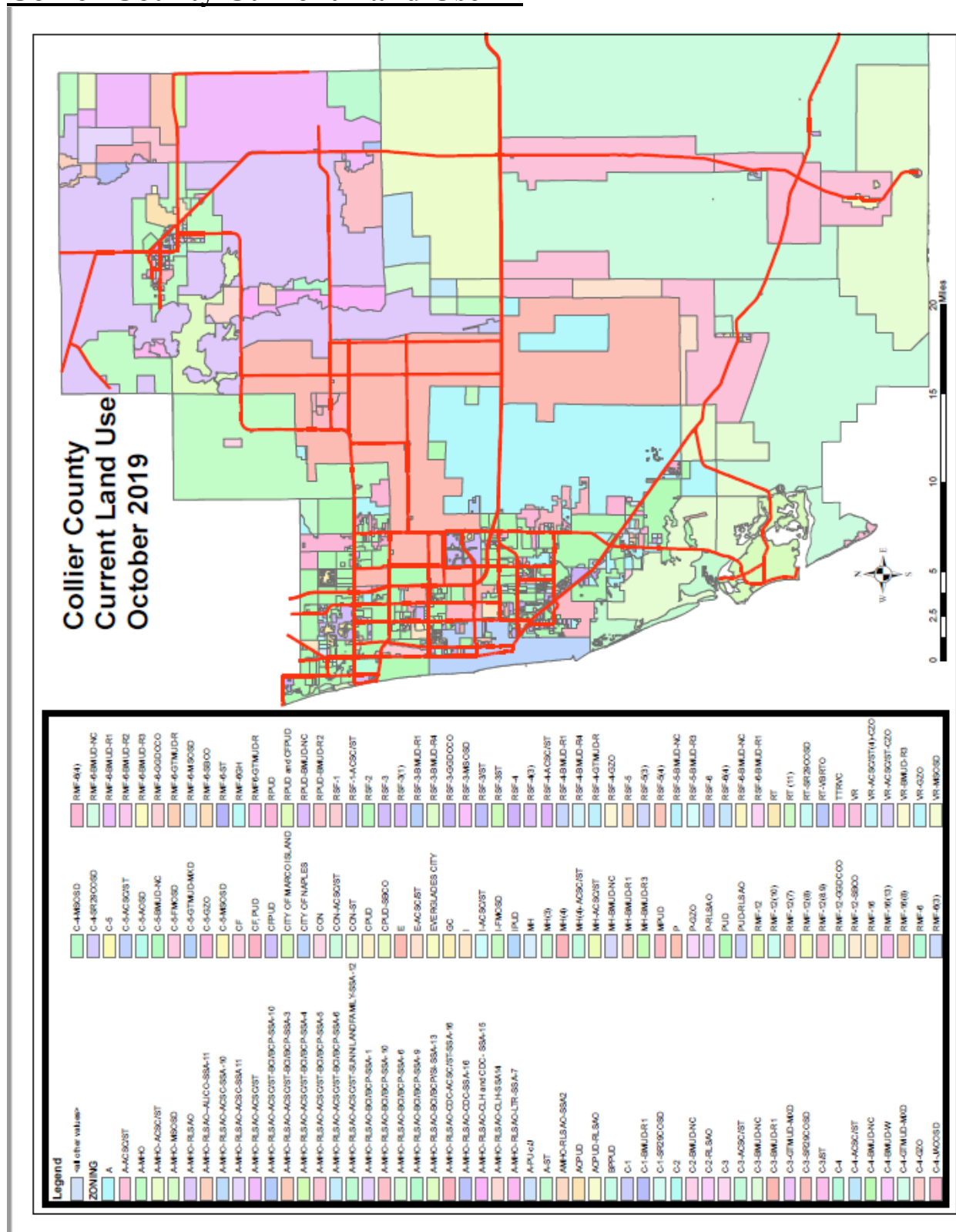
Key Utilities Map – 12 (from Critical Facility listing)

Manufactured Home and RV Map – 13 (from CC Growth Mgmt. Dept.)

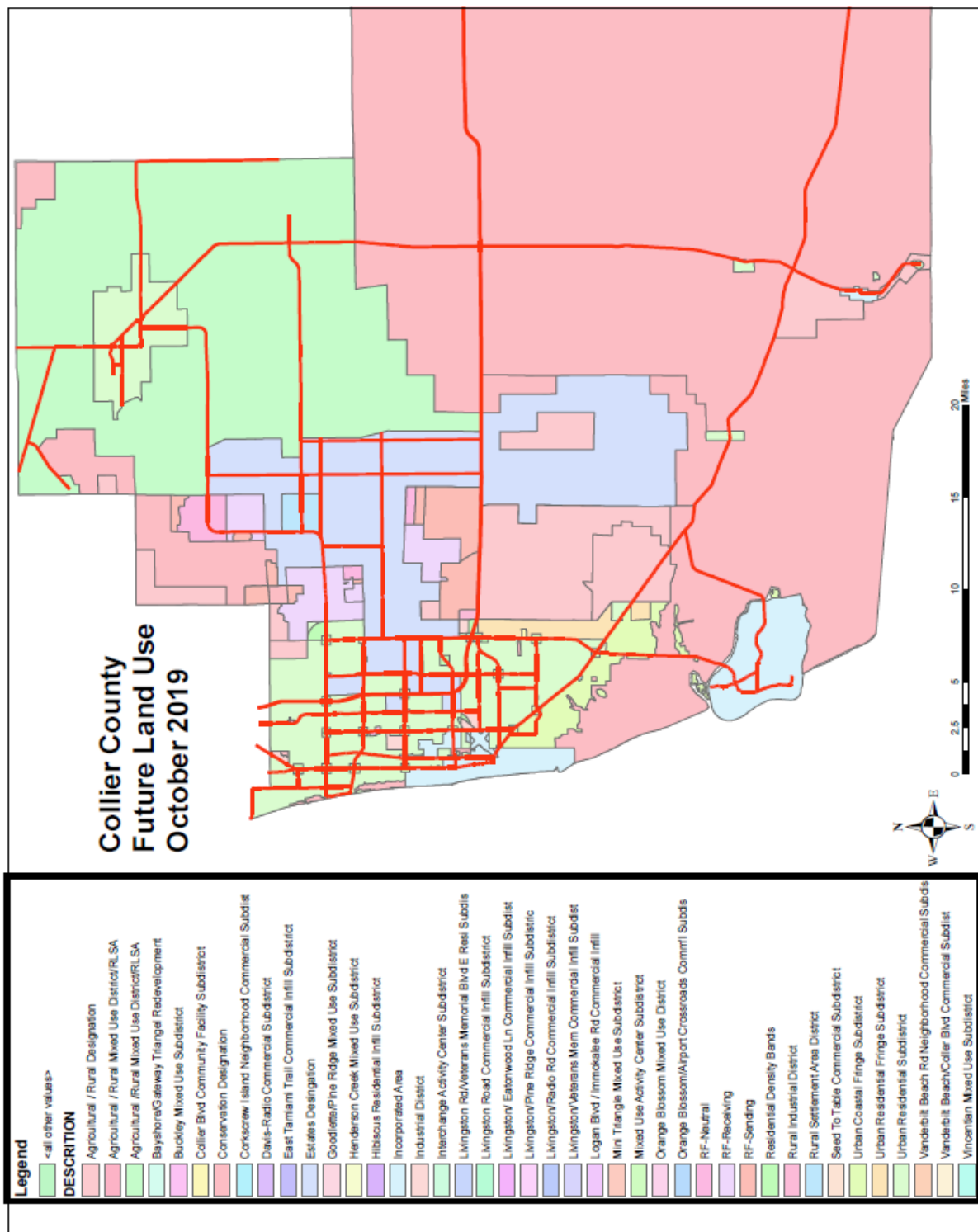
Hazardous Materials Map – 14 (from the Local Emergency Plng Cmte)

Assisted Living, Nursing & Care Facilities – 15 (from Critical Facility listing)

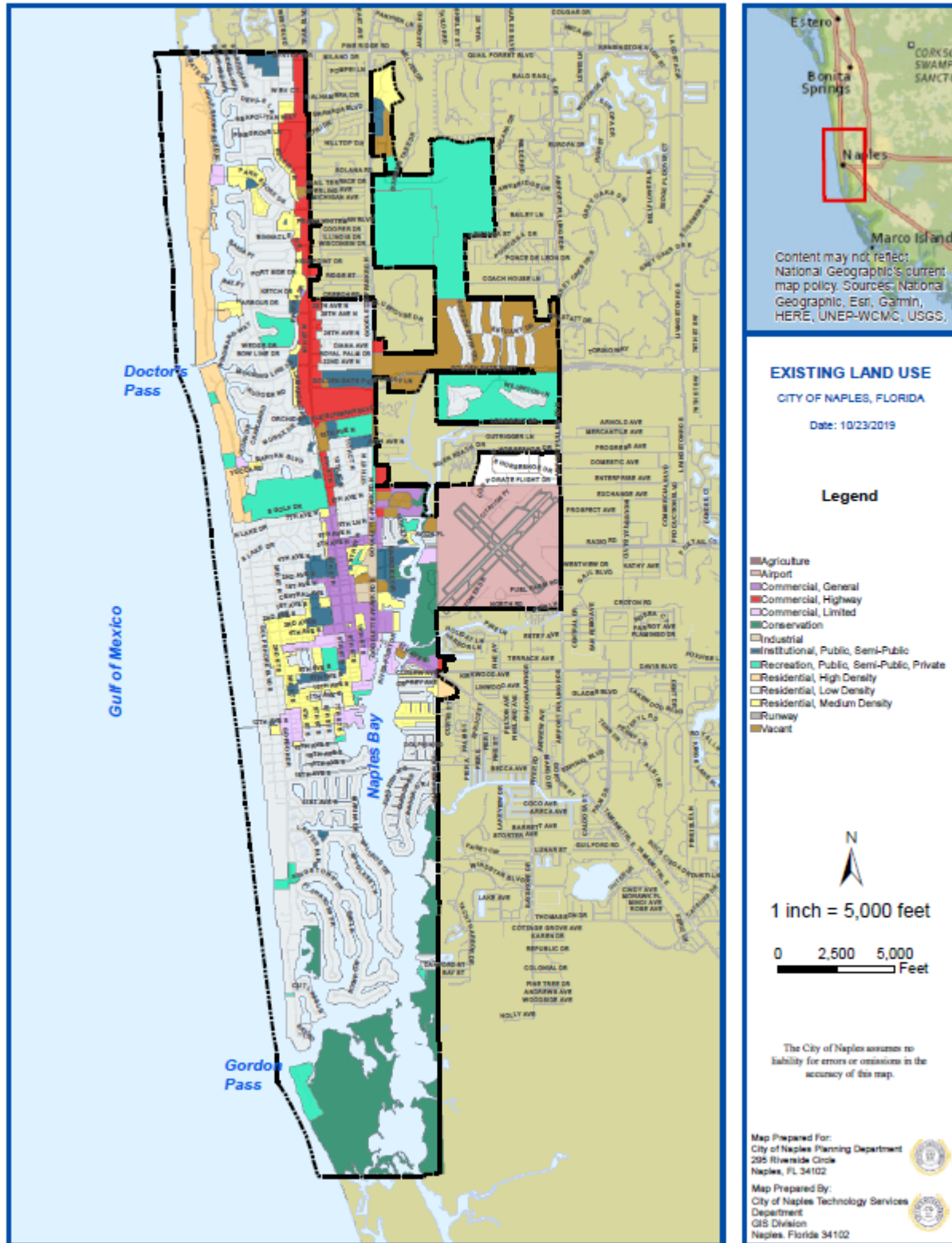
## Collier County Current Land Use #1



## Collier County Future Land Use #2



## Naples Current Land Use - 3



**FUTURE LAND USE**  
CITY OF NAPLES, FLORIDA

Date: 10/23/2019

**Legend**

- Coastal High Hazard
- Coastal Construction Control Line
- Coastal Building Zone Line
- Airport
- Beach Front Setback
- Commercial, Business Park
- Commercial, Highway, Highway
- Commercial, Limited
- Conservation
- Downtown, Mixed Use
- Institutional, Public, Semi-Public
- Recreation, Public, Semi-Public, Private
- Residential, High Density High Rise
- Residential, High Density Low-Rise Coastal Sands
- Residential, High Density Low-Rise Mornings
- Residential, High Density Mid-Rise
- Residential, High Density Tower
- Residential, Low Density
- Residential, Medium Density
- Residential, Single Home
- Residential, Senior Living
- Runway
- Waterfront, Mixed Use

1 inch = 5,000 feet

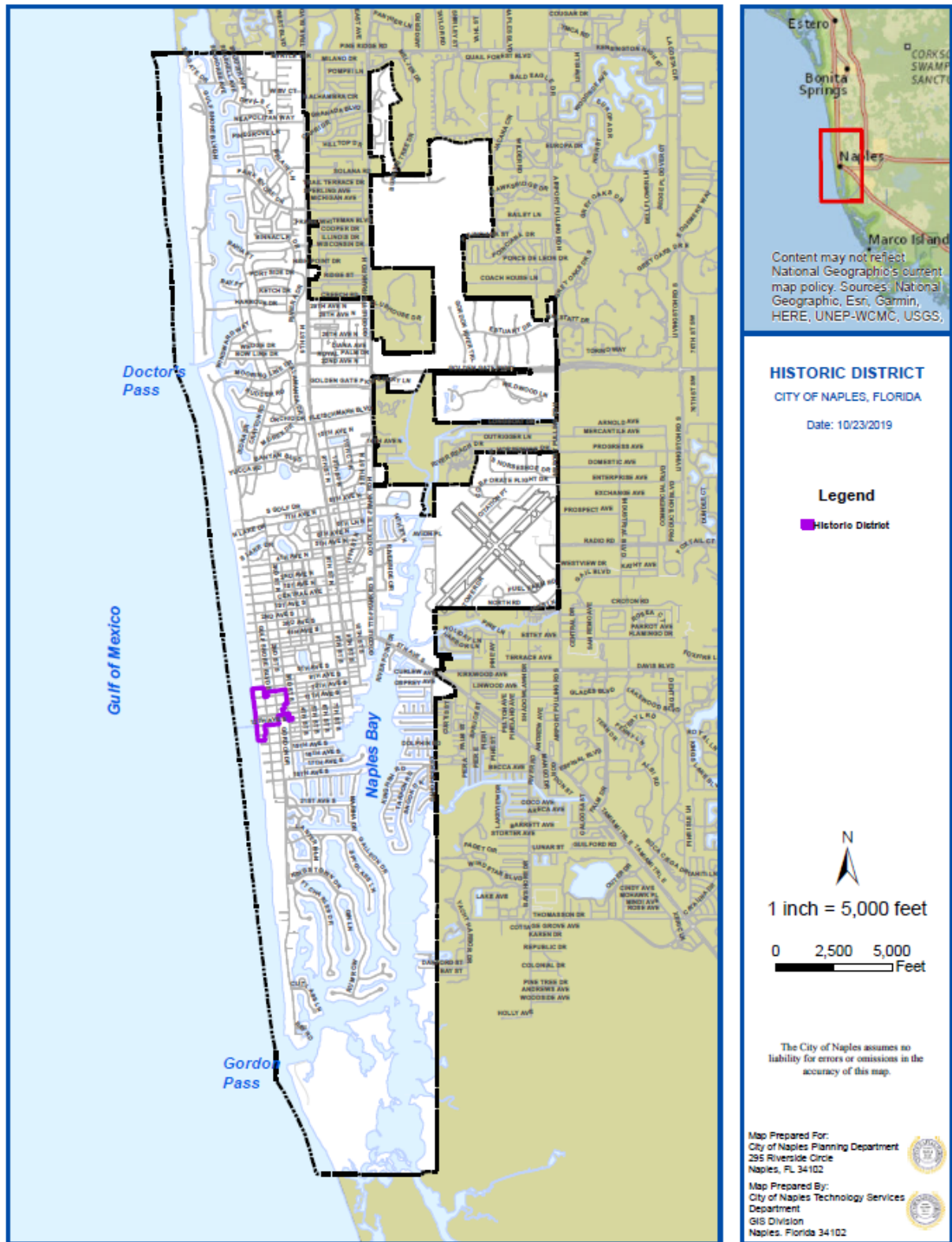
0 2,500 5,000 Feet

The City of Naples assumes no liability for error or omissions in the accuracy of this map.

Map Prepared For:  
City of Naples Planning Department  
295 Riverside Circle  
Naples, FL 34102

Map Prepared By:  
City of Naples Technology Services  
Department  
GIS Division  
Naples, Florida 34102

## Historic District of Naples - 4a



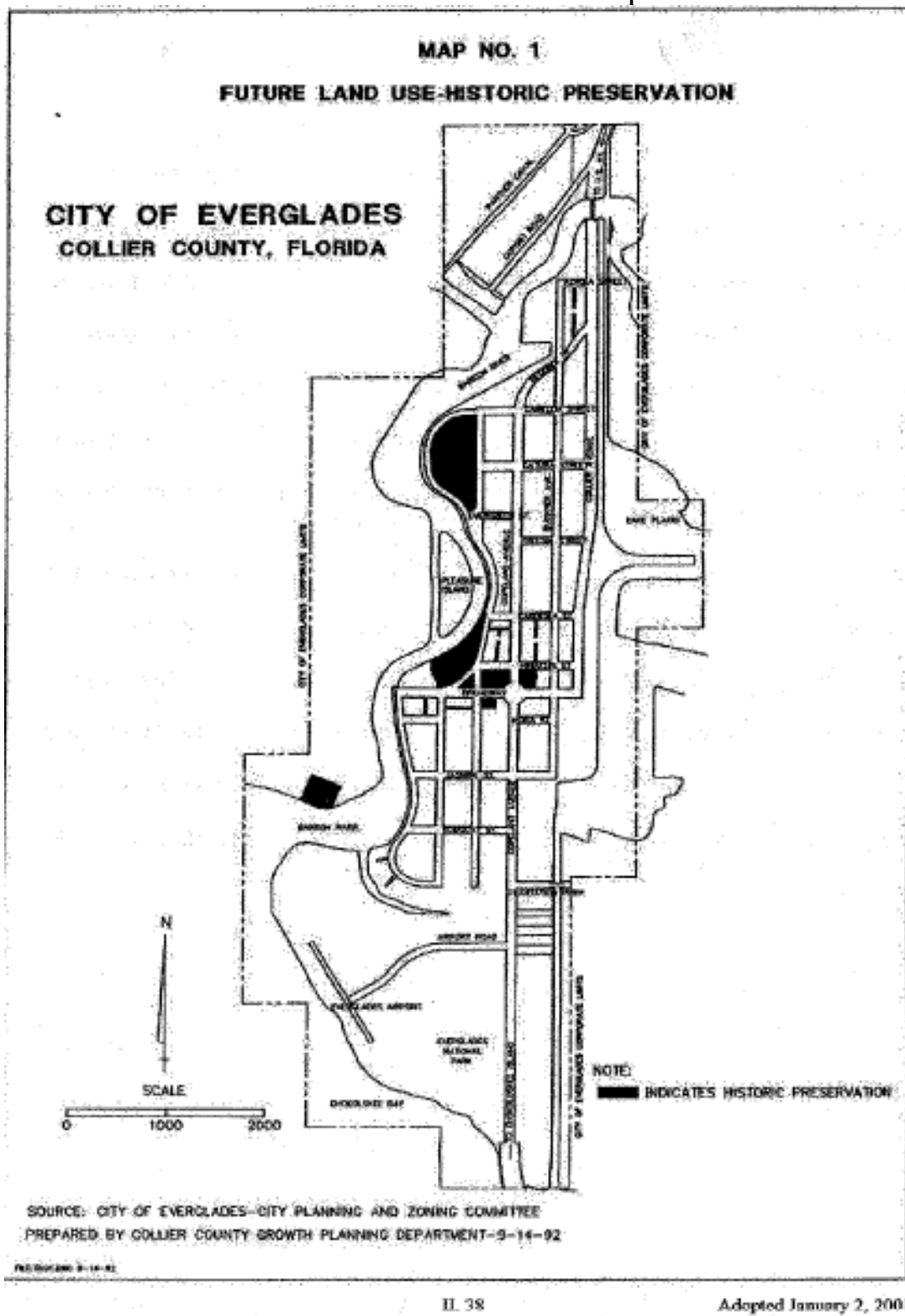
L:\GIS\_Internal\Maps\Planning\COMP PLAN MAPS\Comp\_Plan\_2017\Comp\_Plan\_Existing\_Land\_Use.mxd

## Everglades City (EGC) Future Land Use – 5

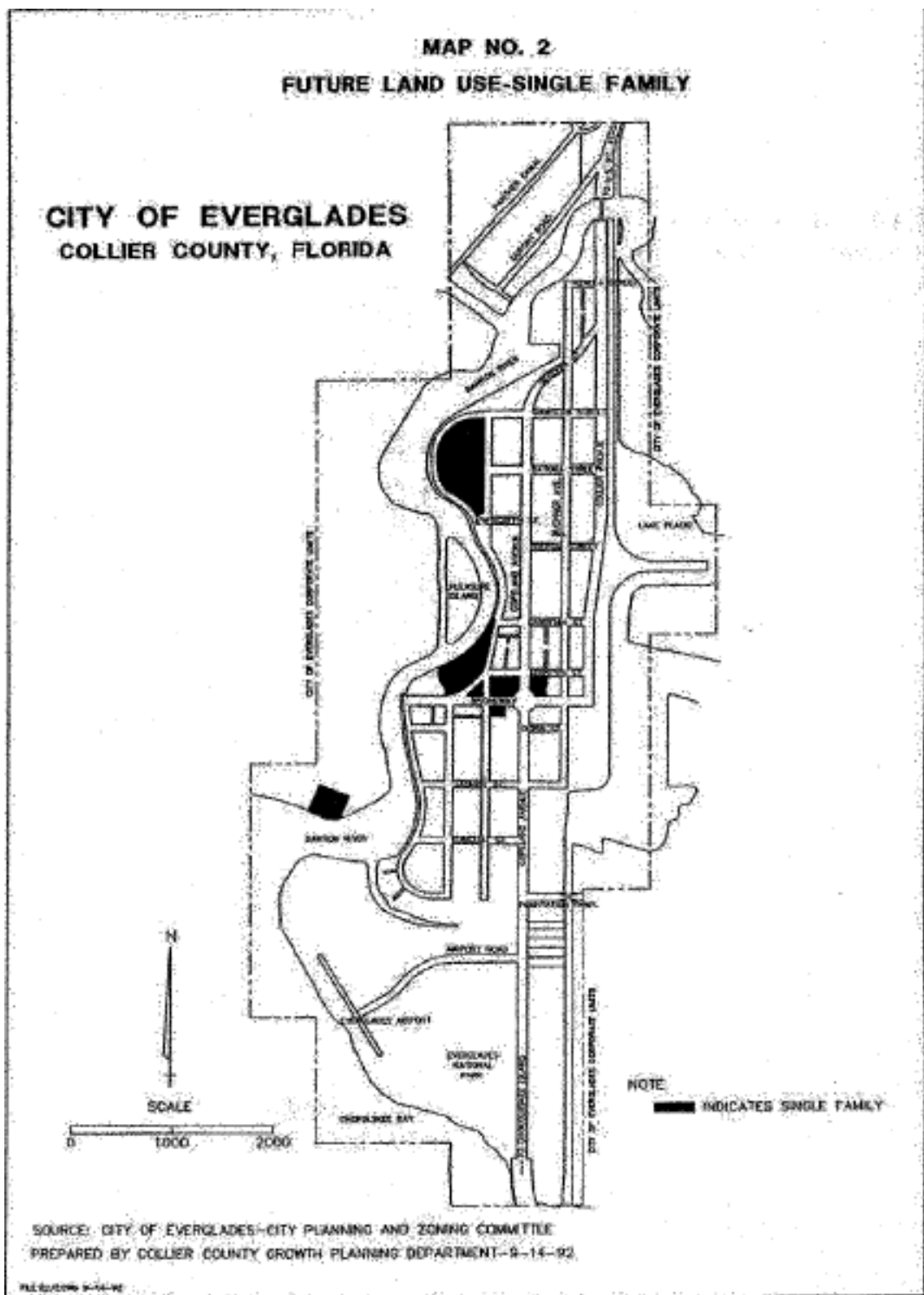
### MAPS

Map No. 1	Future Land Use – Historic Preservation	ELU1.DWG 9-14-92
Map No. 2	Future Land Use – Single Family	ELU2.DWG 9-14-92
Map No. 3	Future Land Use – Multi-Family	ELU3.DWG 9-14-92
Map No. 4	Future Land Use – Residential Tourist	ELU4.DWG 9-14-92
Map No. 4A	Future Land Use – Residential Tourist	ELU4A.DWG 9-14-92
Map No. 5	Future Land Use – Mobile Home Rental Park	ELU5.DWG 9-14-92
Map No. 6	Future Land Use – Travel Trailer Recreational Park (Now Recreational Vehicle/Mobile Home Park)	ELU6.DWG 9-16-92
Map No. 7	Future Land Use – Village Commercial	ELU7.DWG 9-14-92
Map No. 8	Future Land Use – Condensed Commercial	ELU8.DWG 9-14-92
Map No. 9	Future Land Use – Commercial Fishing	ELU9.DWG 9-14-92
Map No. 10	Future Land Use – Mandatory Preservation	ELU10.DWG 9-14-92
Map No. 11	Future Land Use – Big Cypress Acquisition	ELU11.DWG 9-14-92
Map No. 12	Coastal Management: Existing Water Dependent and Water Related Land Uses	ELU12.DWG 9-29-92

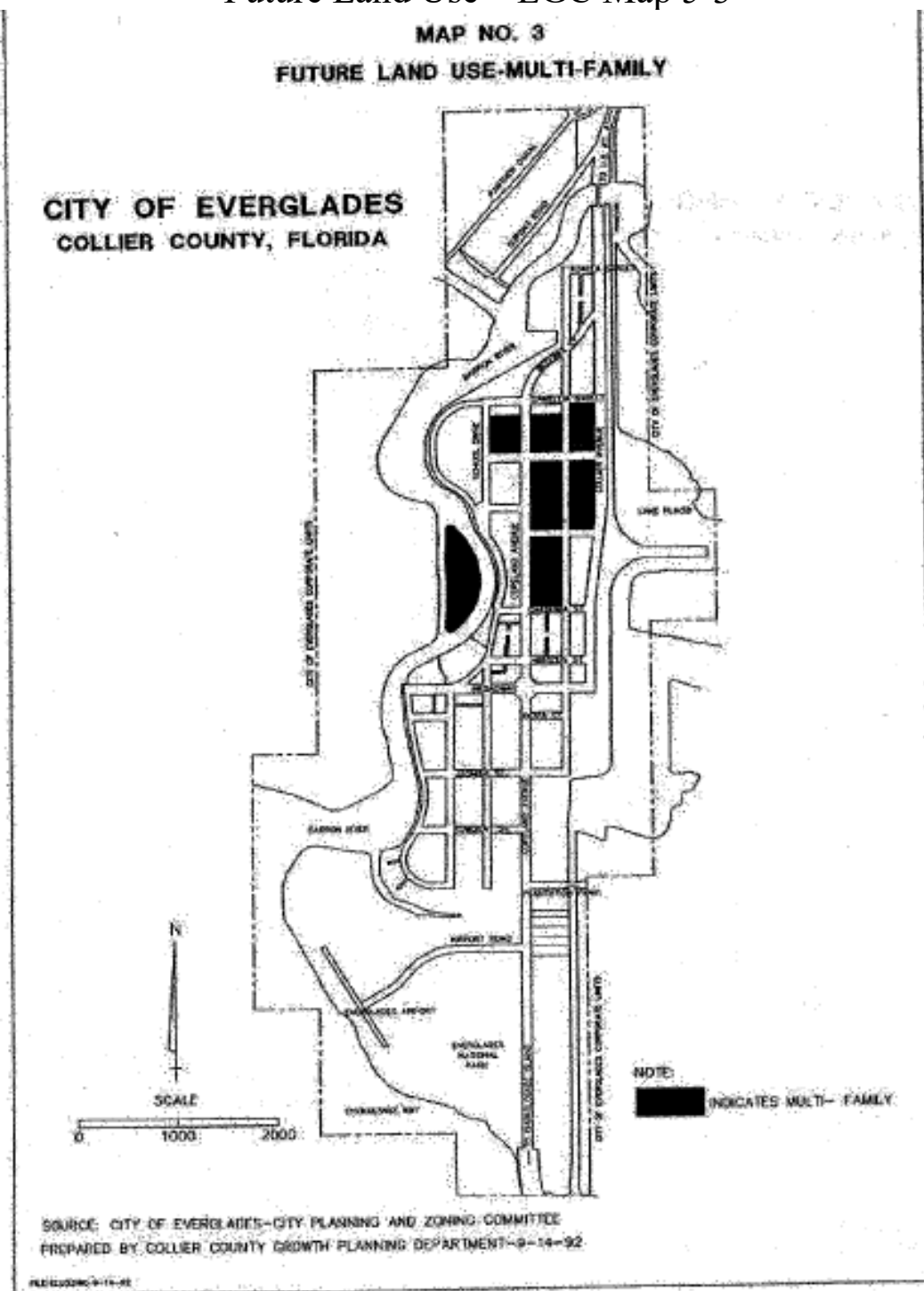
## Future Land Use – EGC Map 5-1



## Future Land Use – EGC Map 5-2



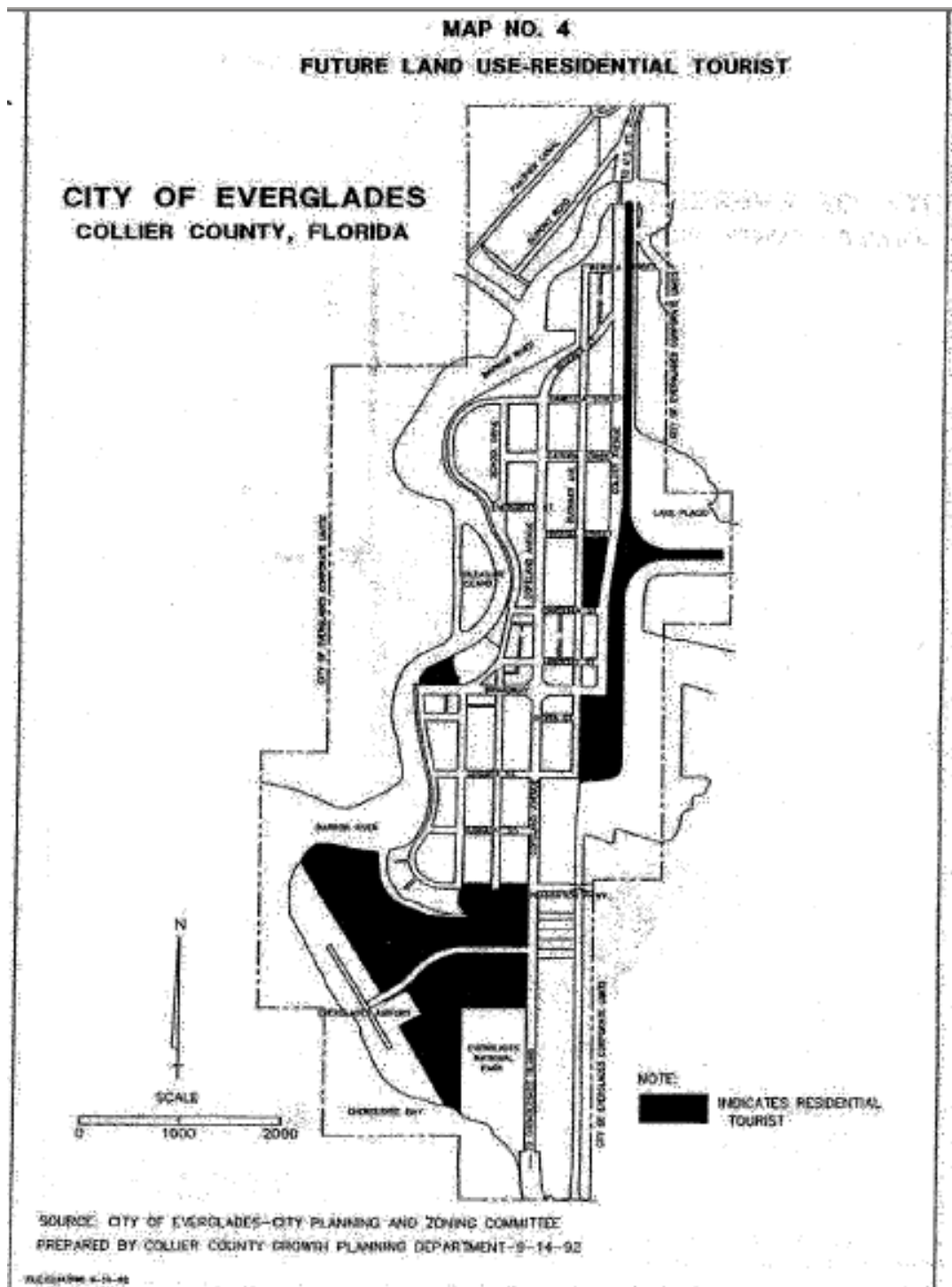
## Future Land Use – EGC Map 5-3



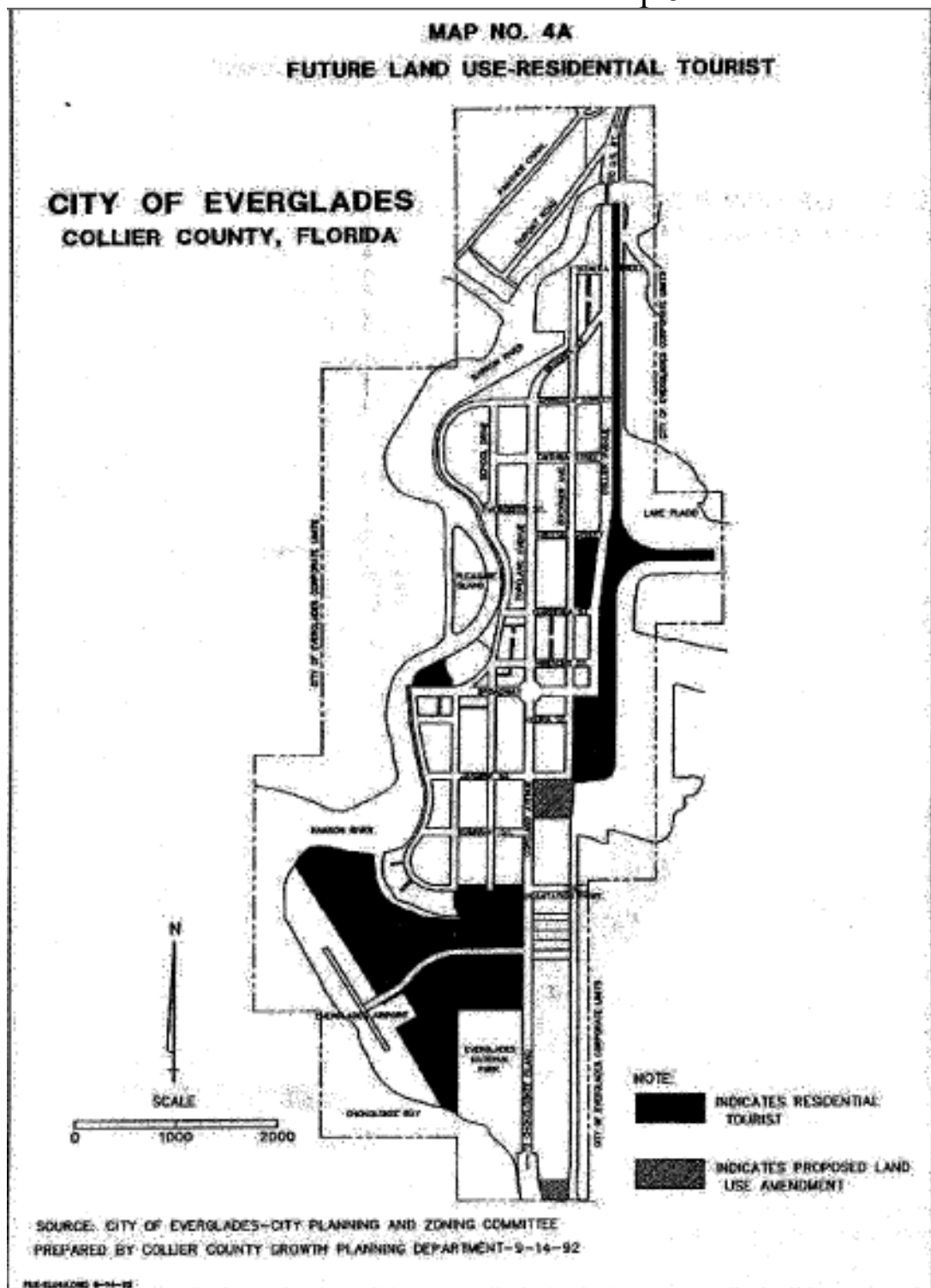
II. 40

Adopted January 2, 2001  
Ordinance No. 2000-05

## Future Land Use – EGC Map 5-4



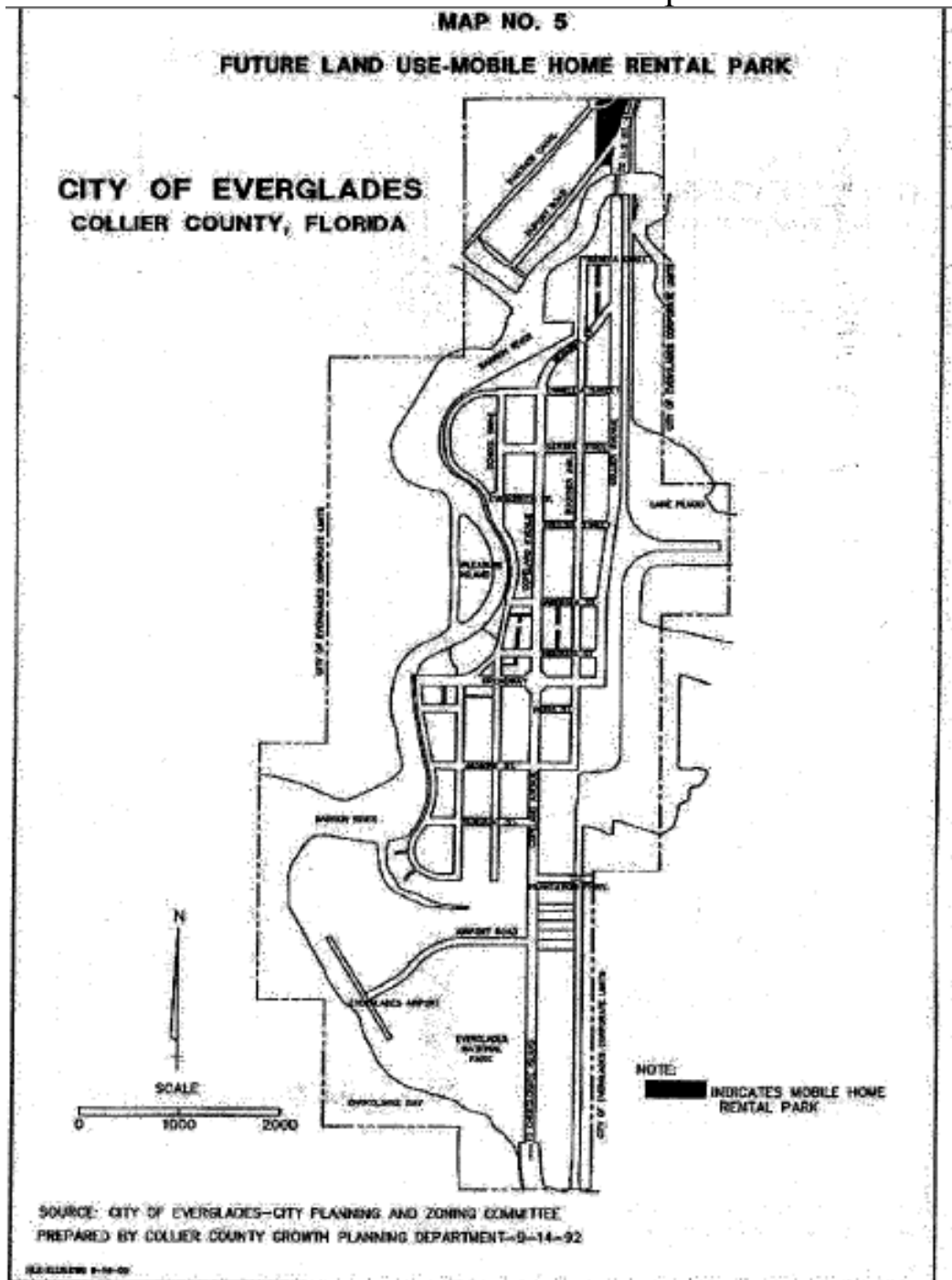
## Future Land Use – EGC Map 5-4a



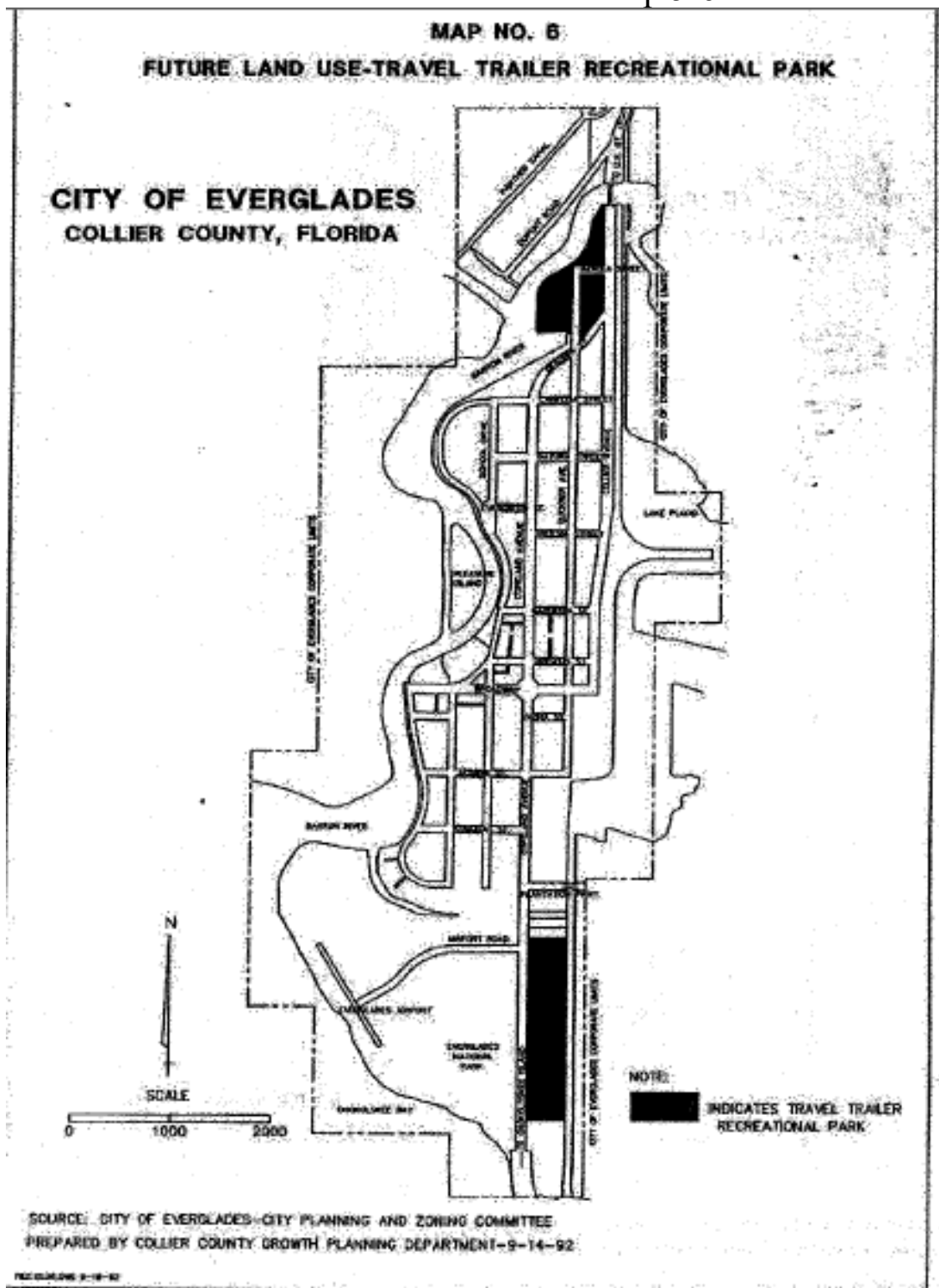
II. 42

Adopted January 2, 2001  
Ordinance No. 2000-05

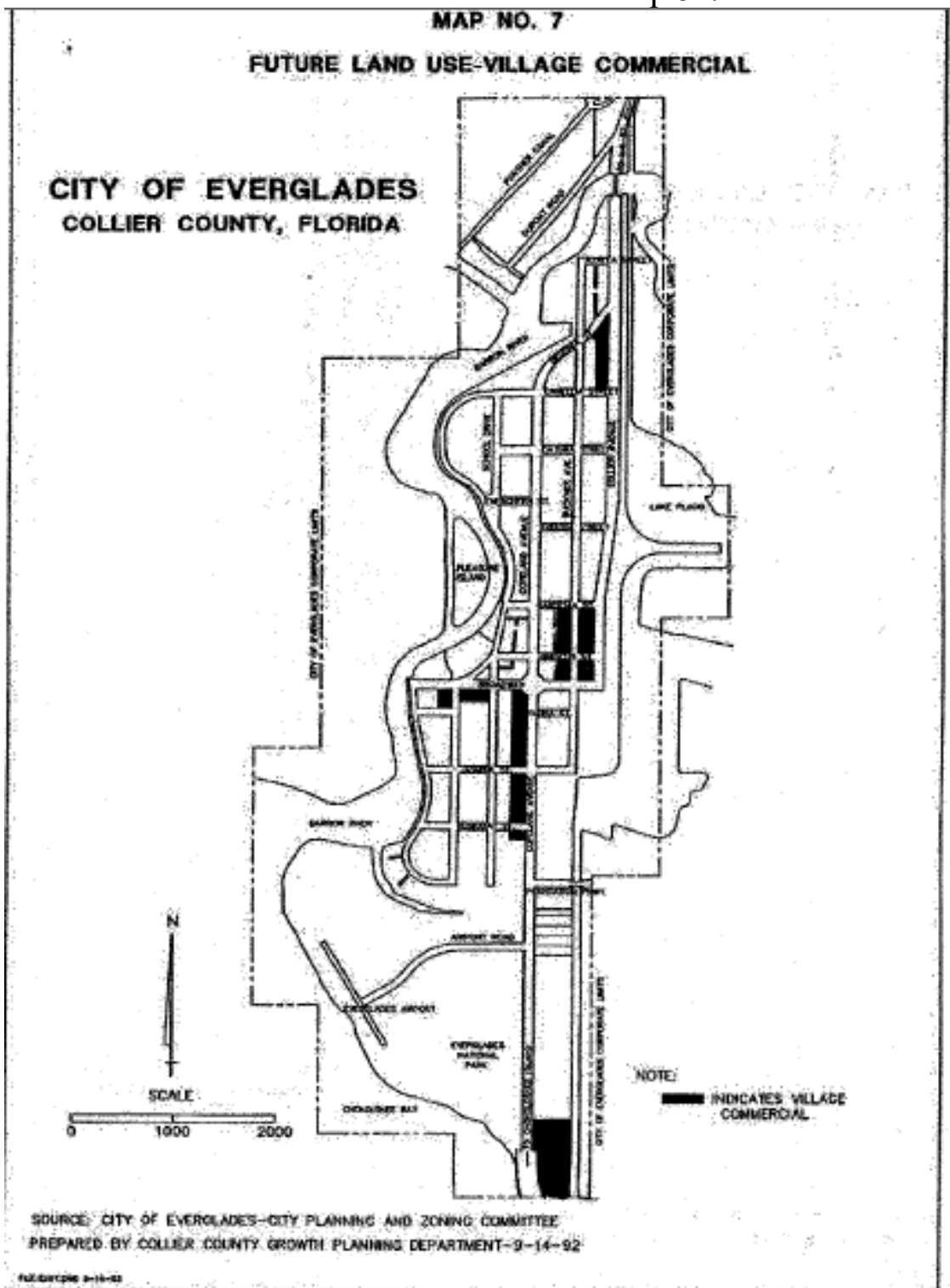
## Future Land Use – EGC Map 5-5



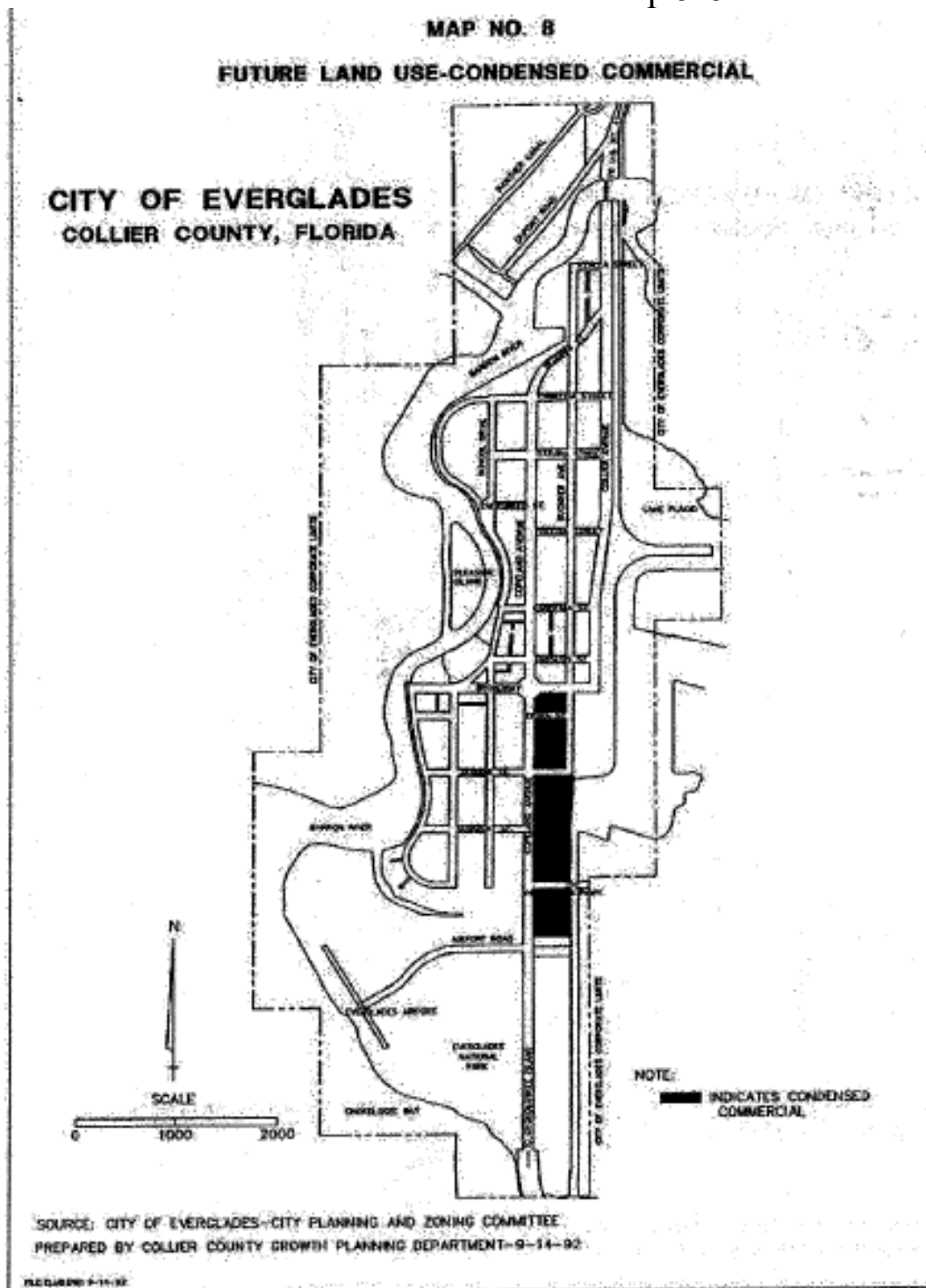
## Future Land Use – EGC Map 5-6



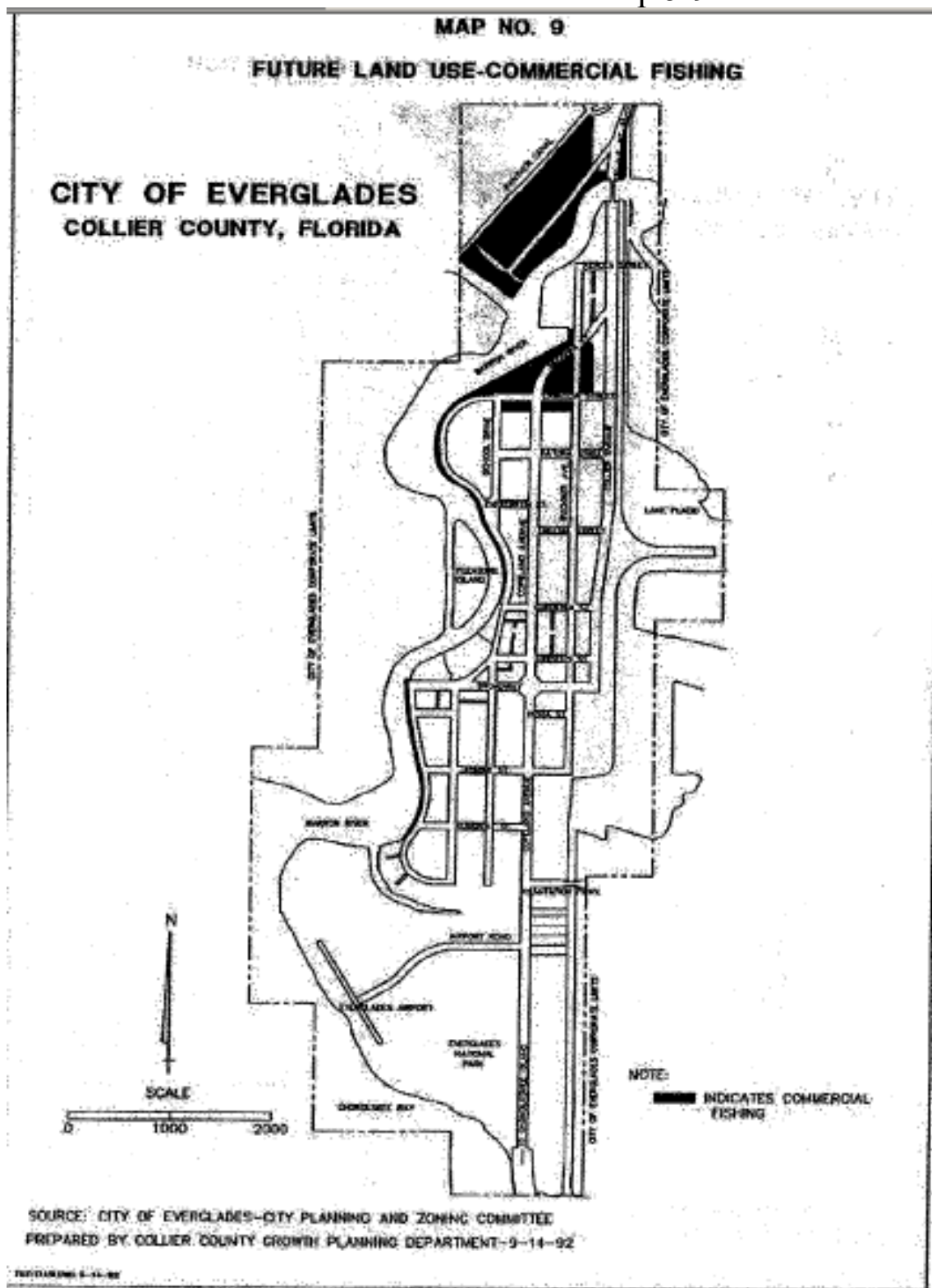
## Future Land Use – EGC Map 5-7



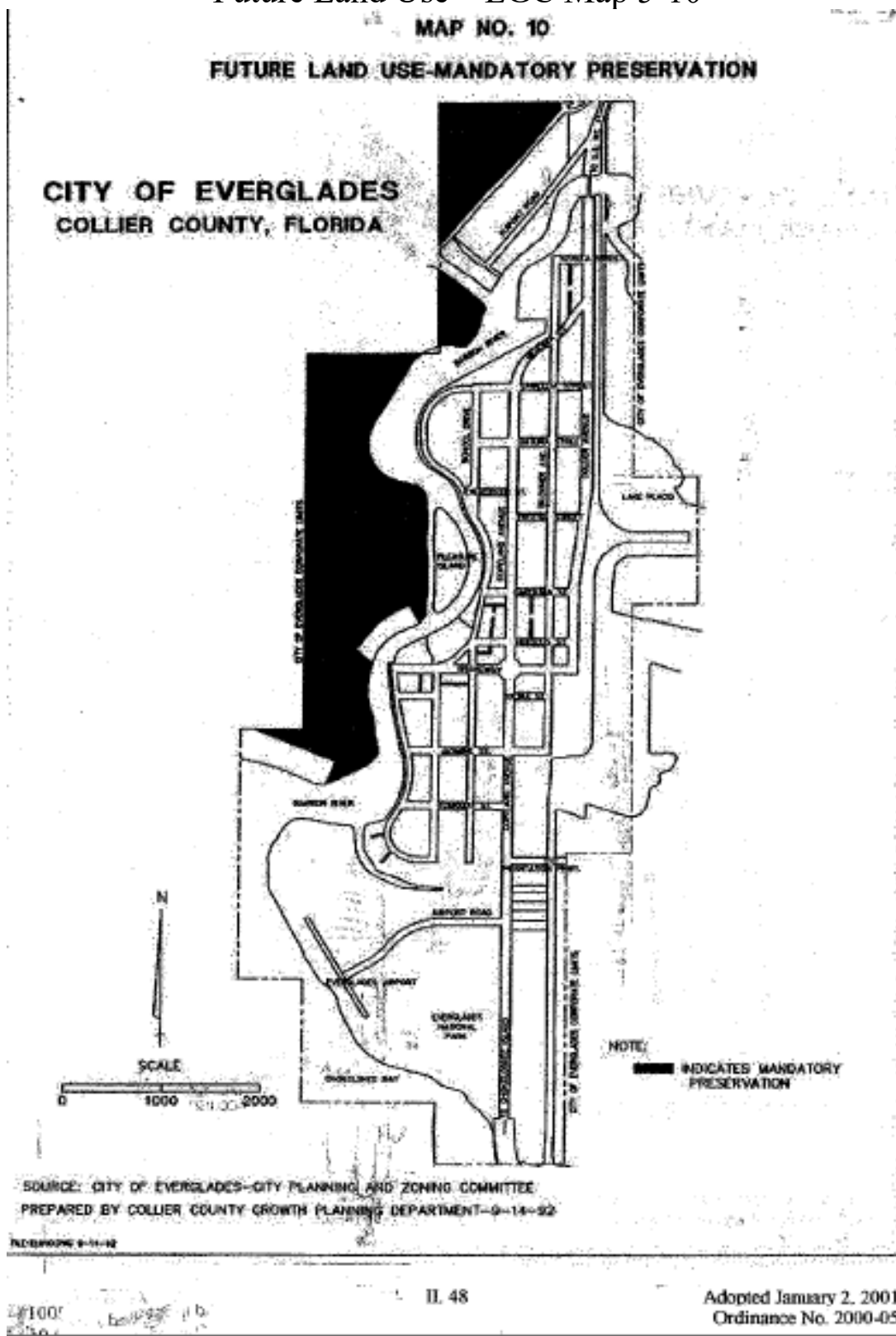
## Future Land Use – EGC Map 5-8



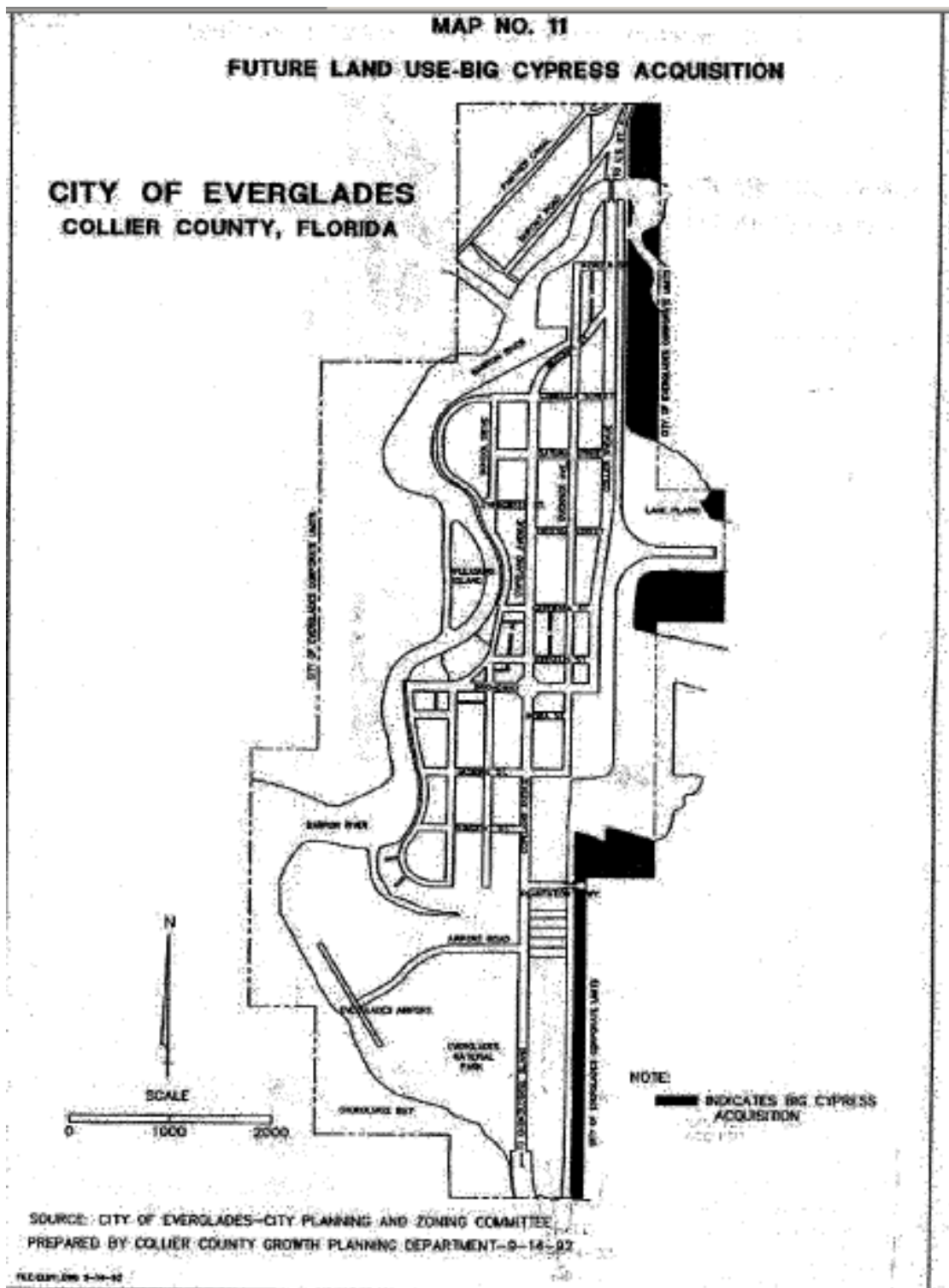
## Future Land Use – EGC Map 5-9



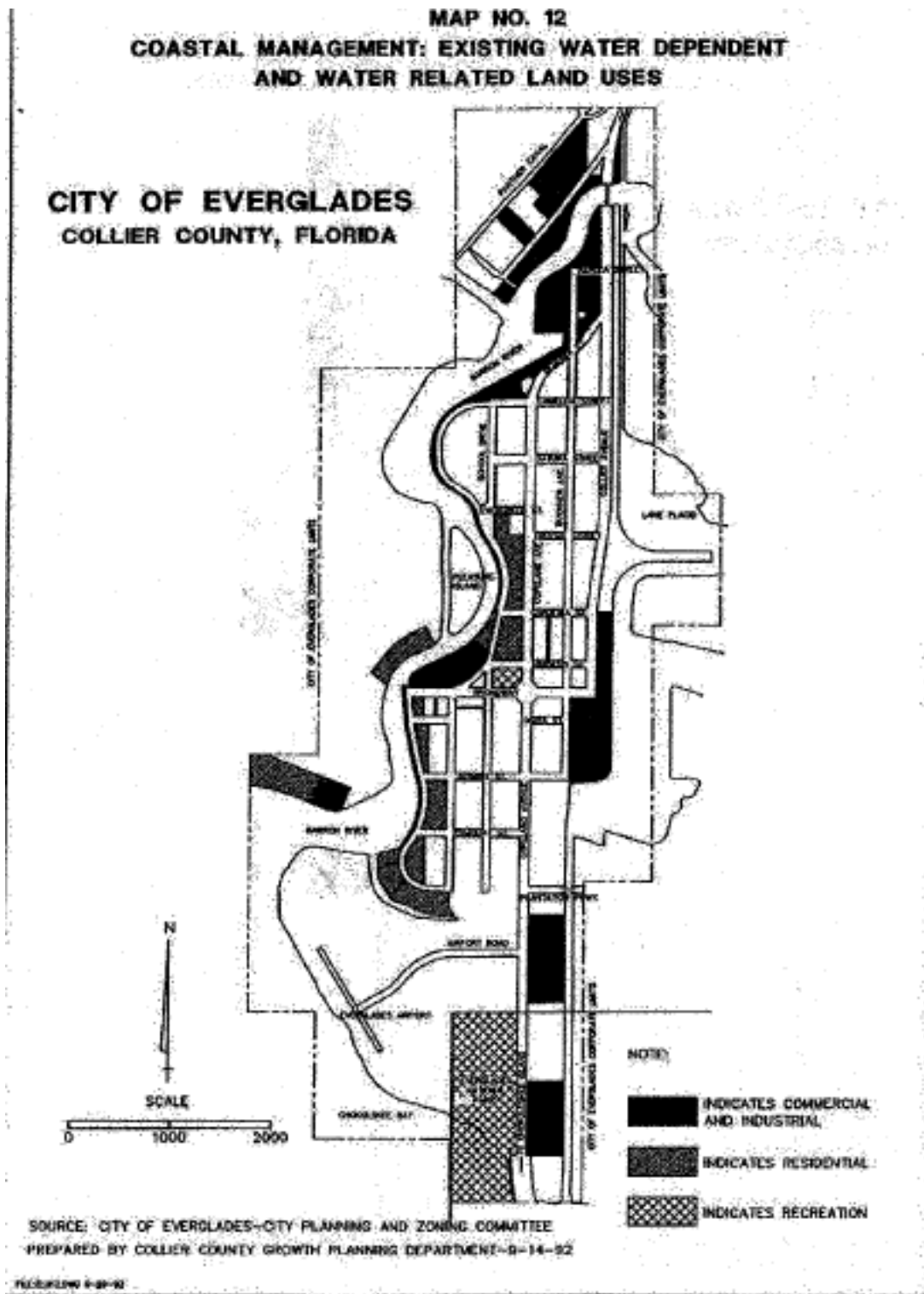
## Future Land Use – EGC Map 5-10



## Future Land Use – EGC Map 5-11



## Future Land Use – EGC Map 5-12

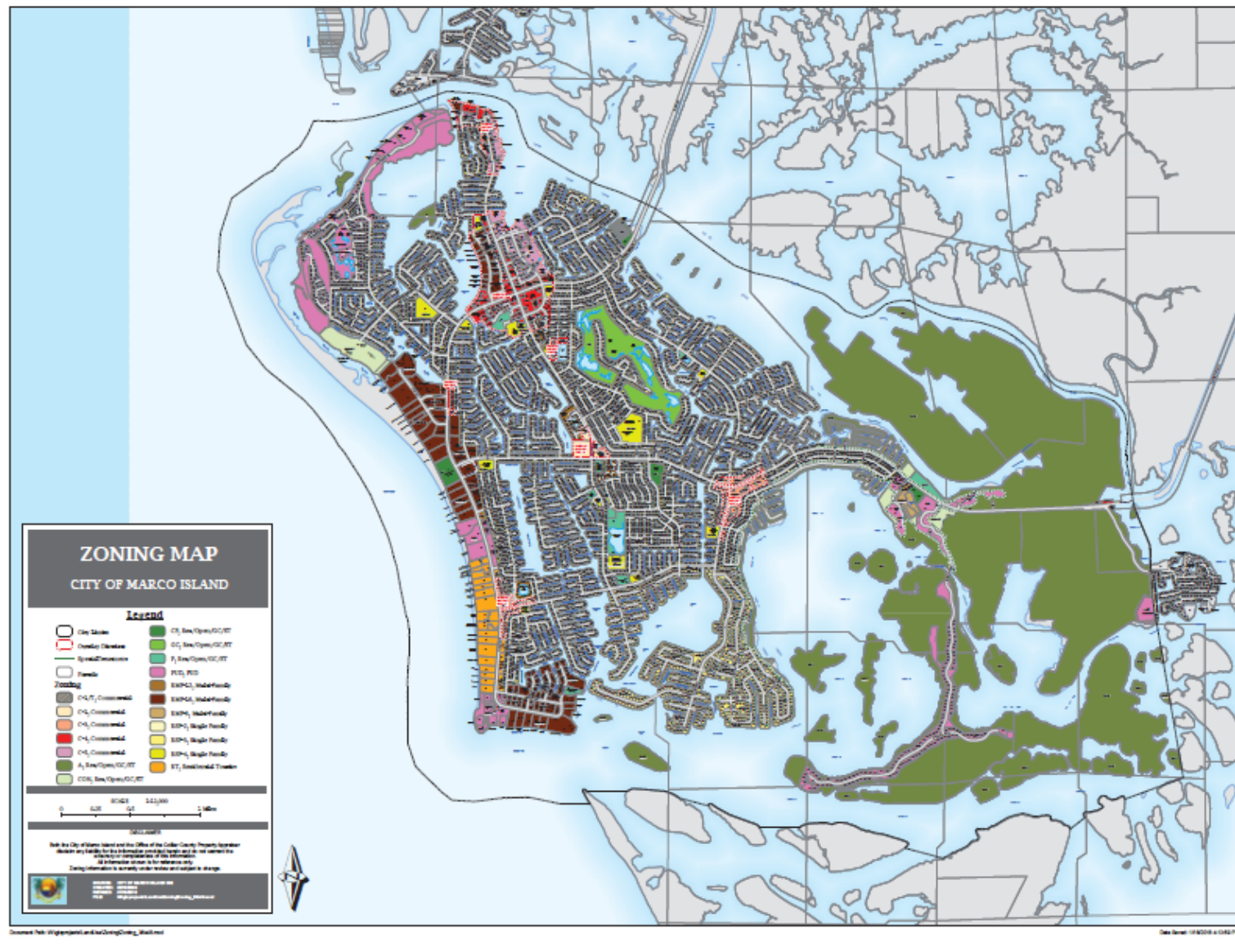


## Everglades City Land Use – Map 5a

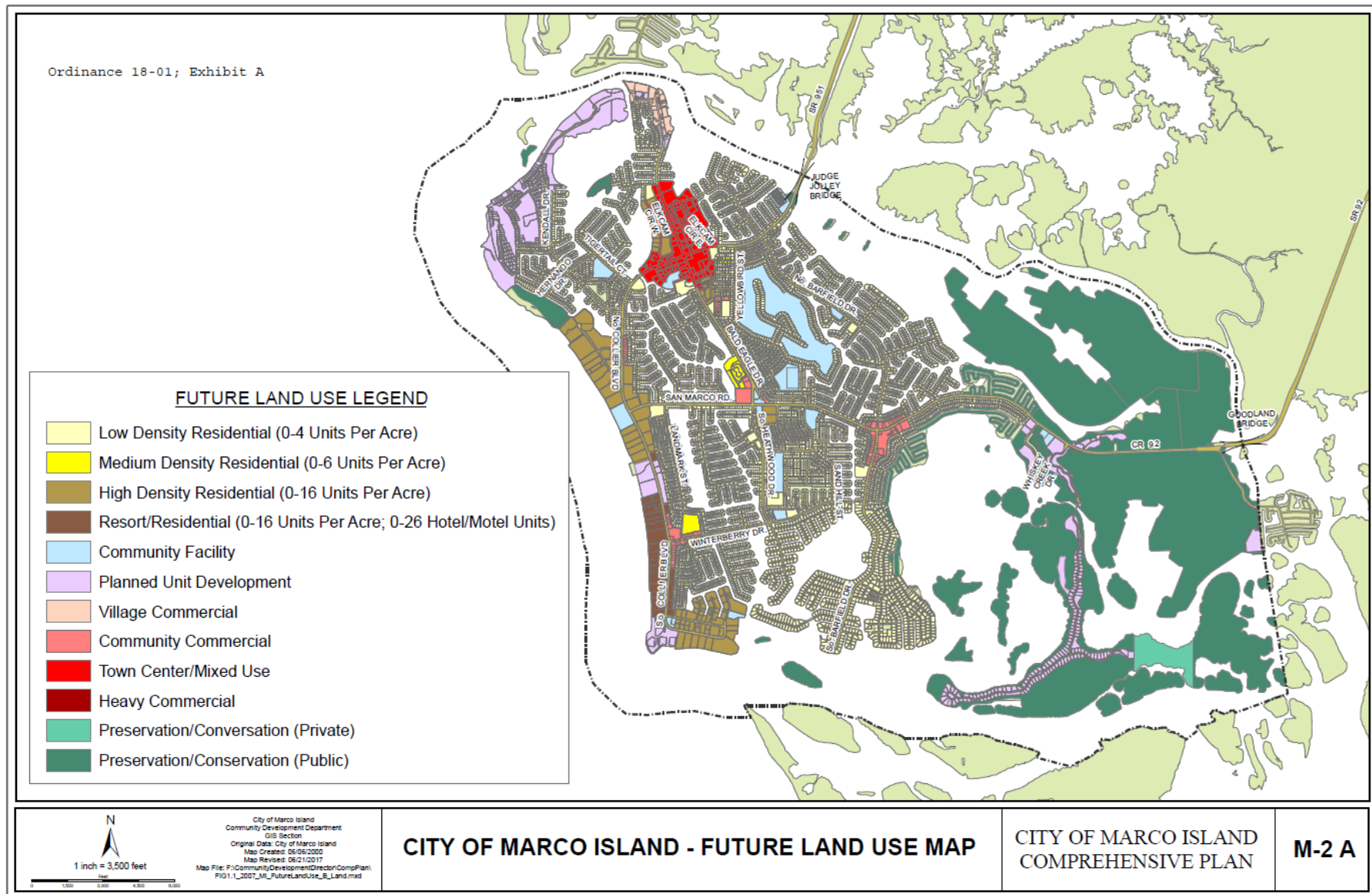




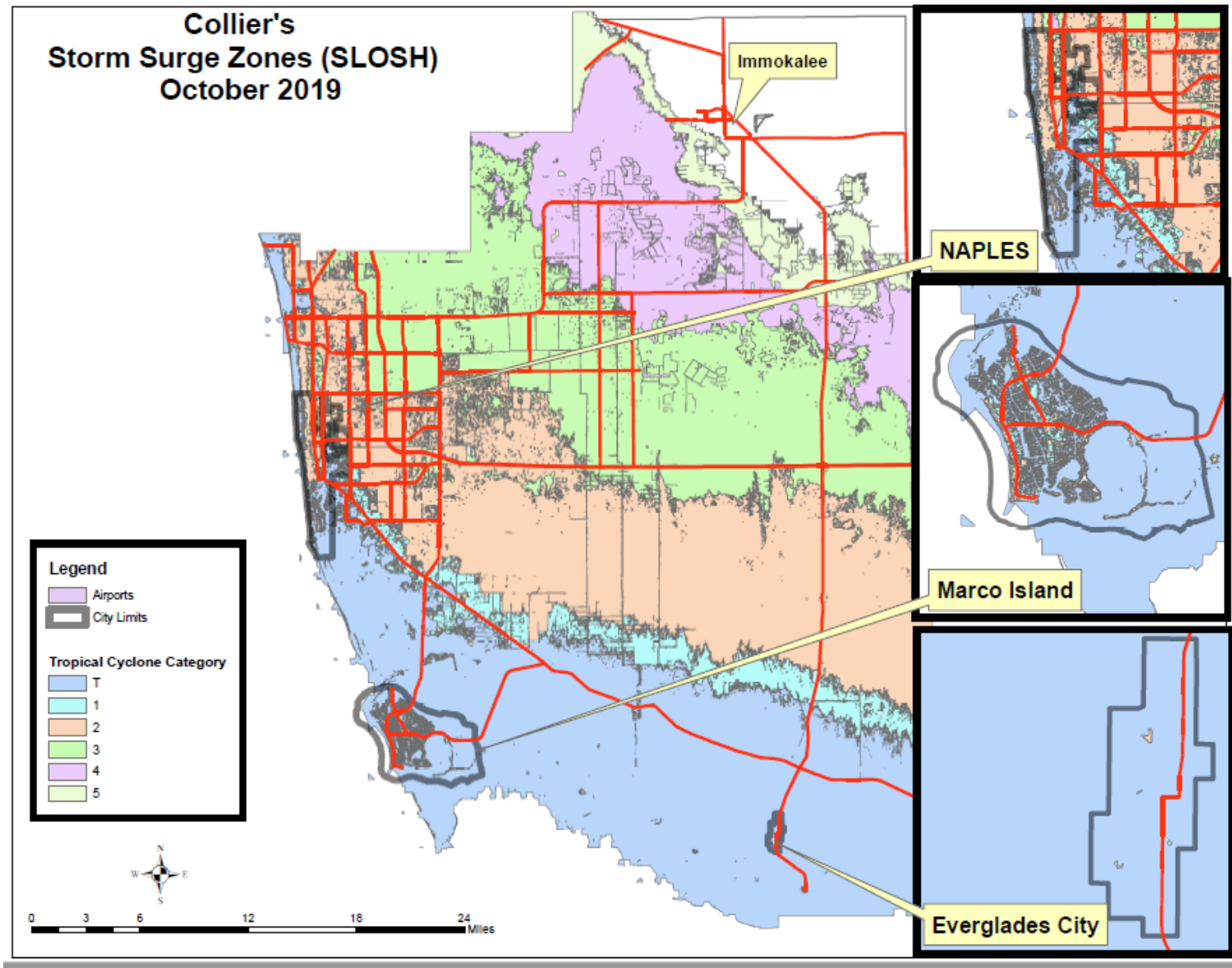
## Marco Island Current Land Use - 6



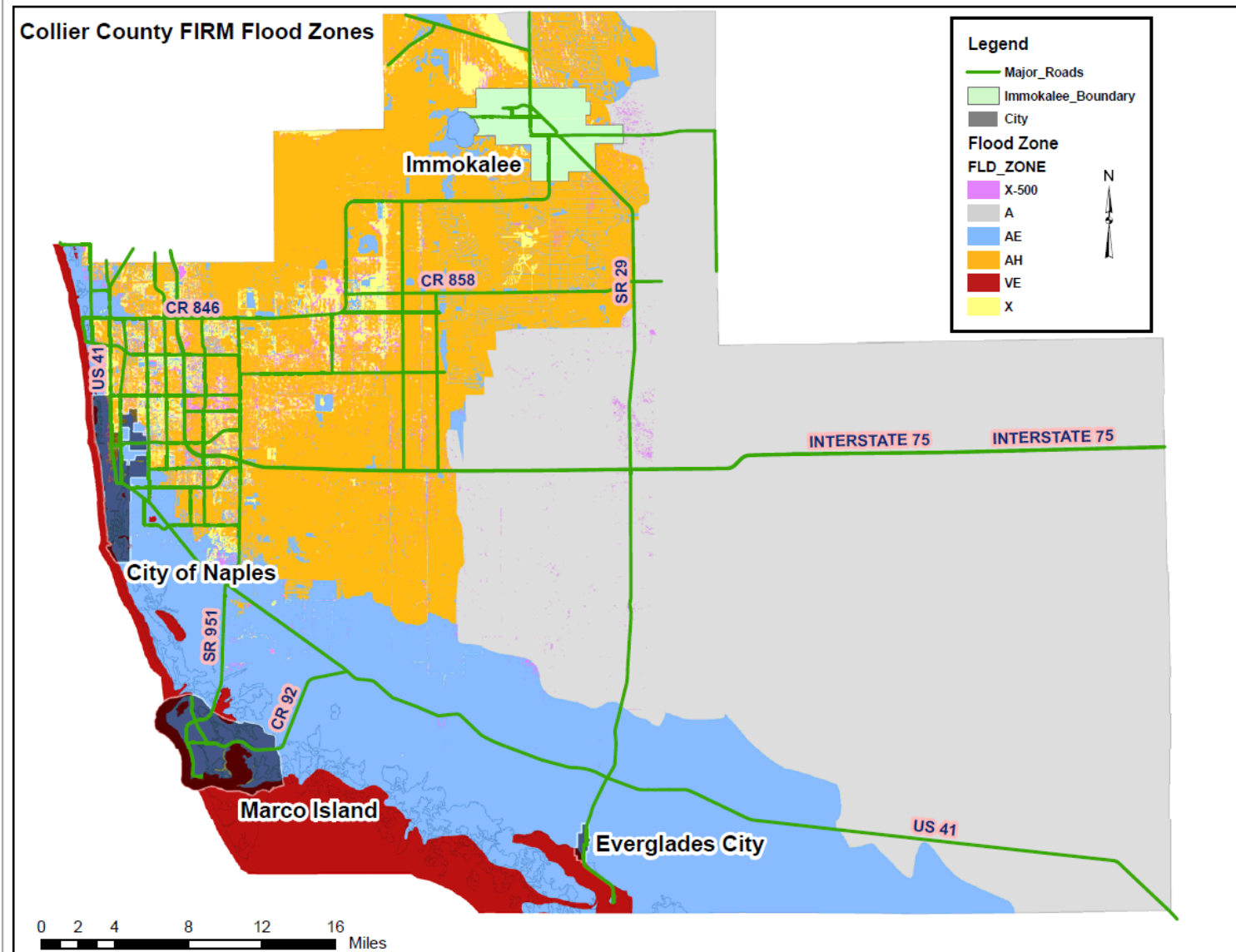
## Marco Island Future Land Use – 7



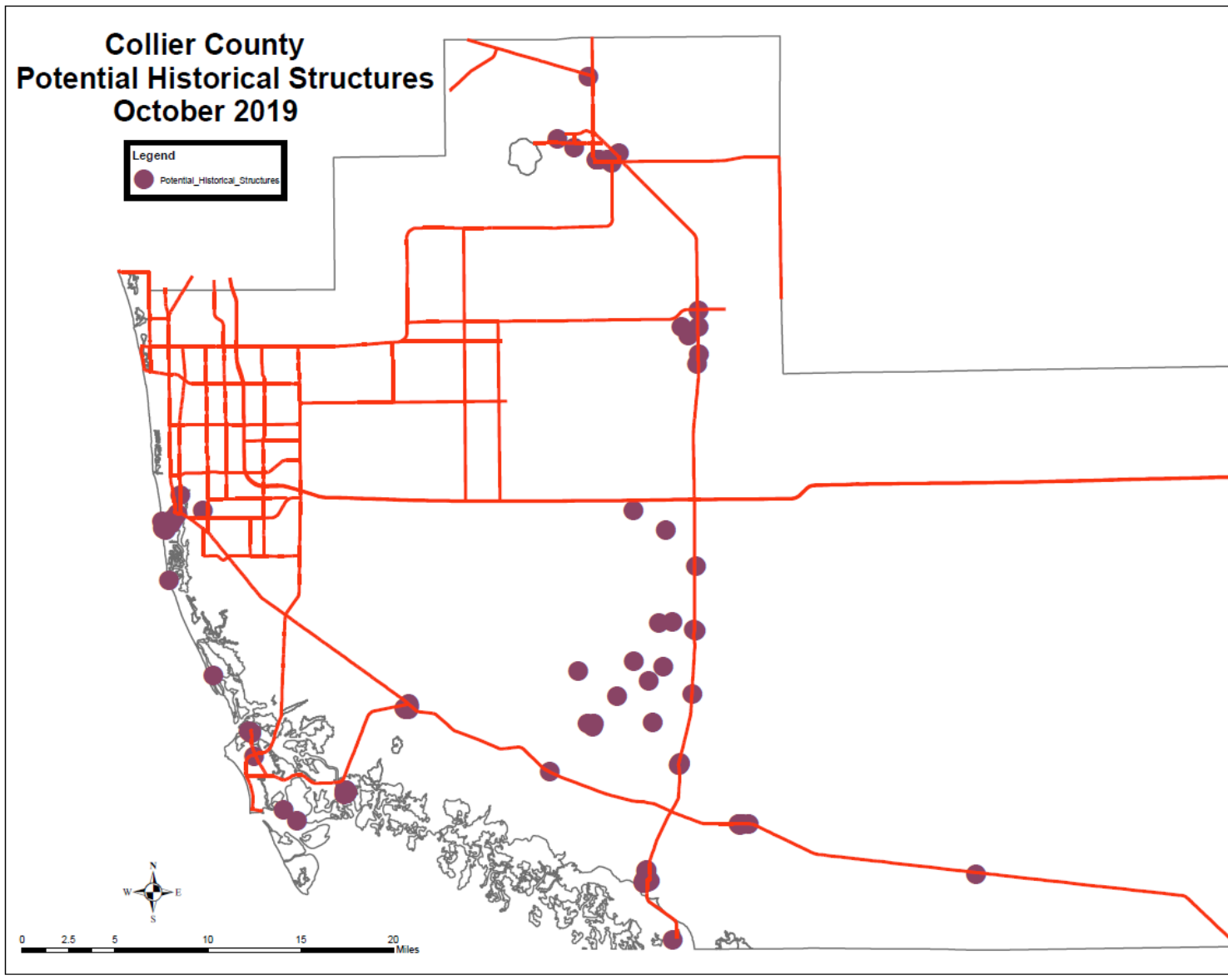
## Collier County Storm Surge Map – 8



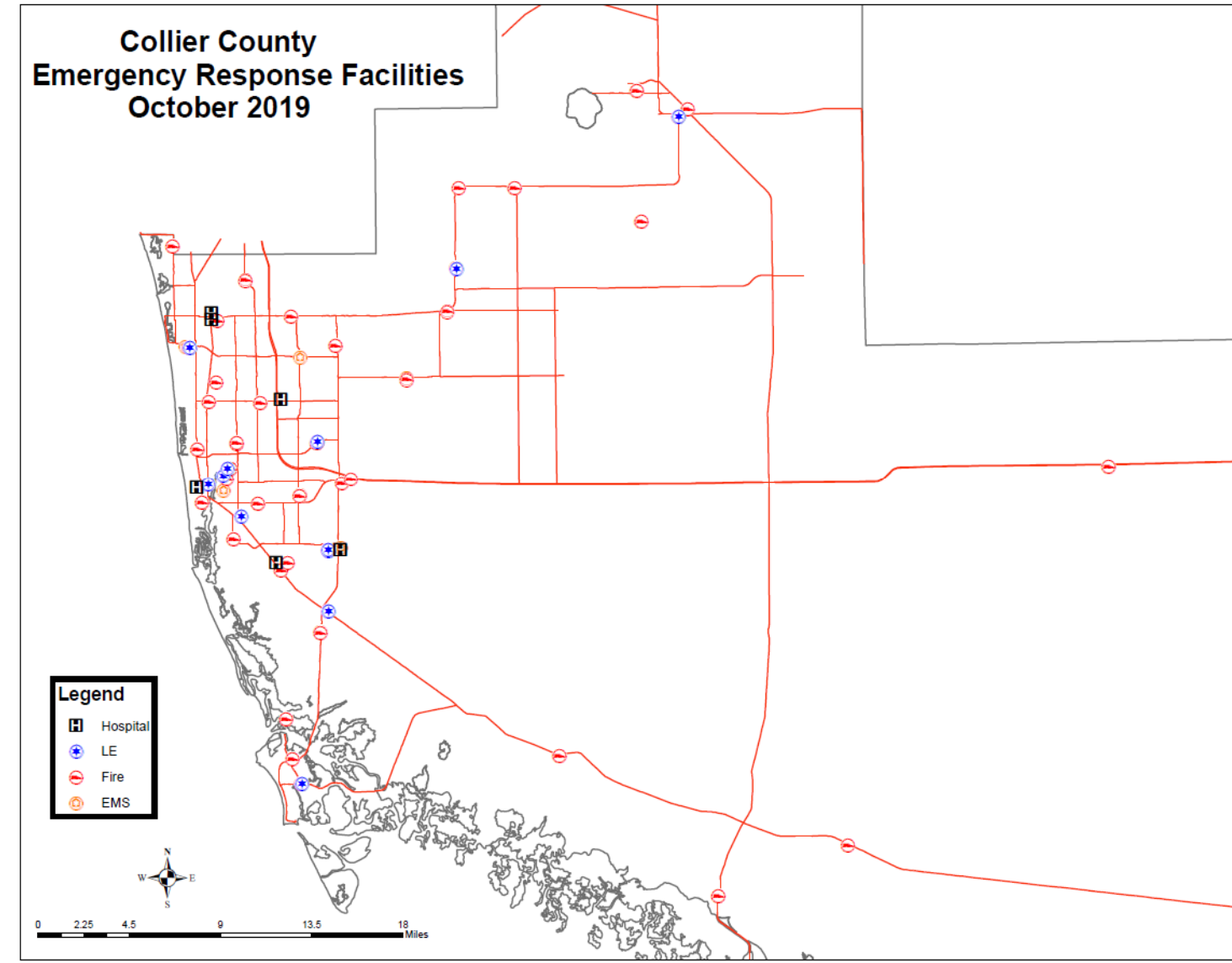
## Collier Flood Zones – 9



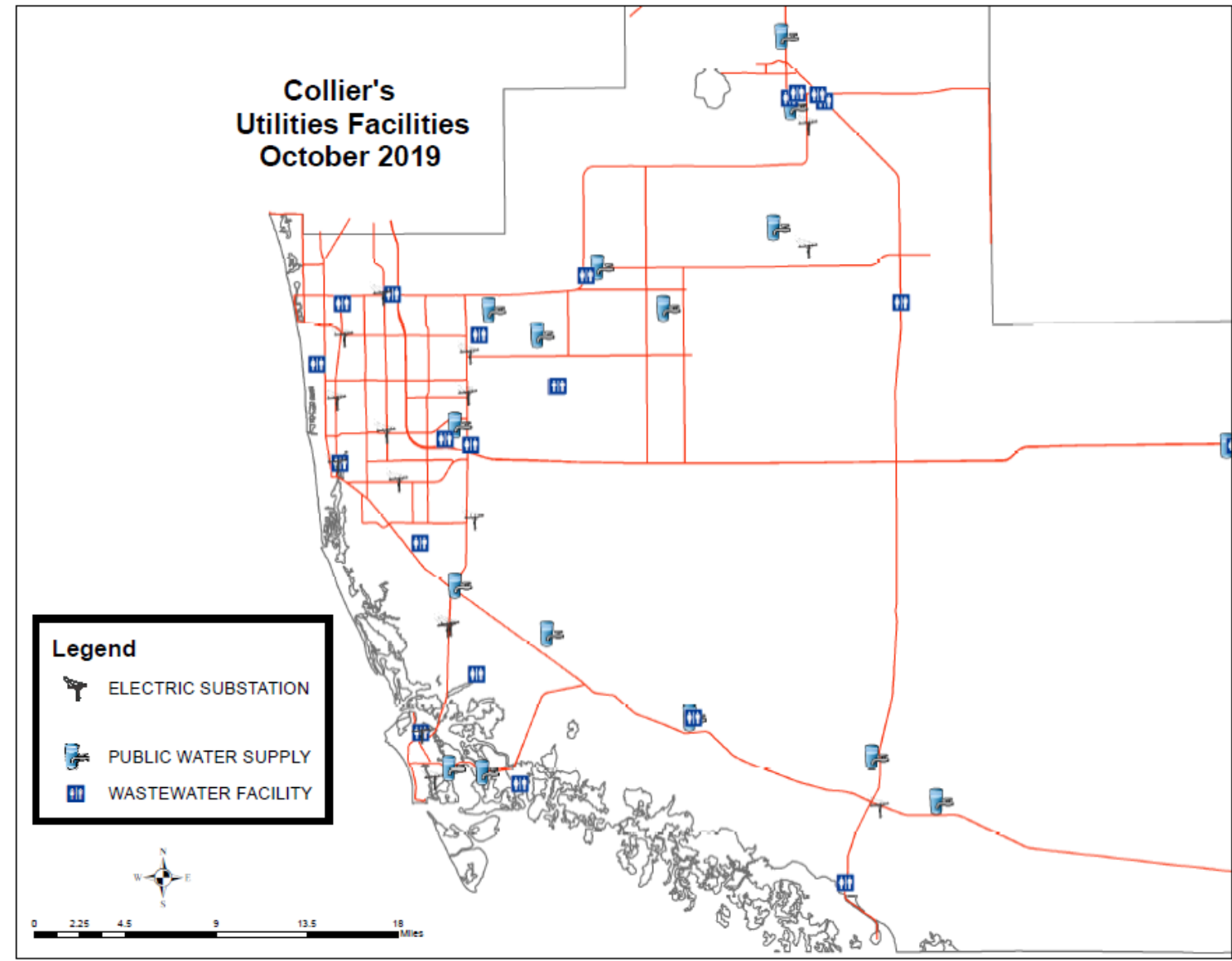
## Historical Structures Map - 10



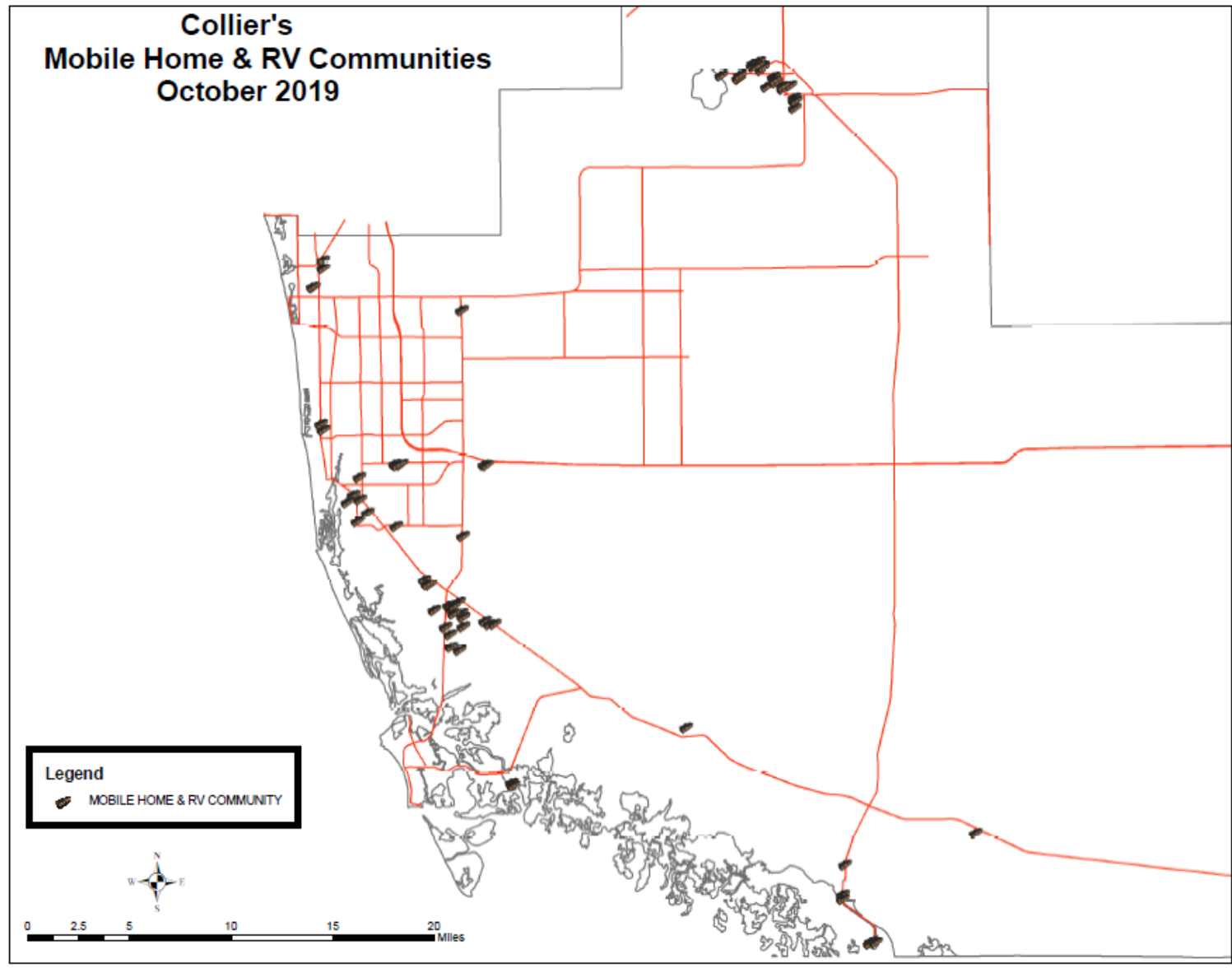
## Emergency Facilities – 11



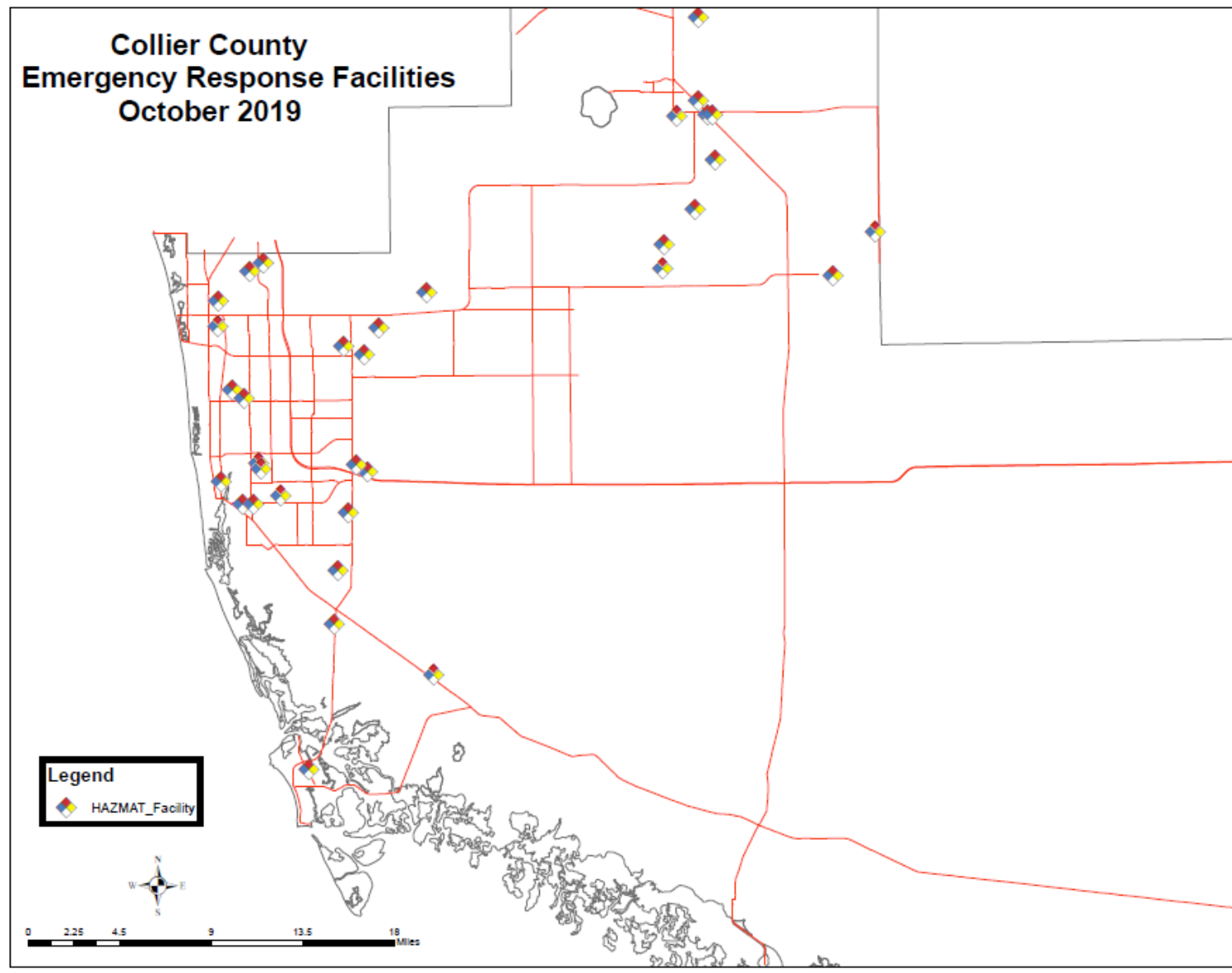
## Major Utilities – 12



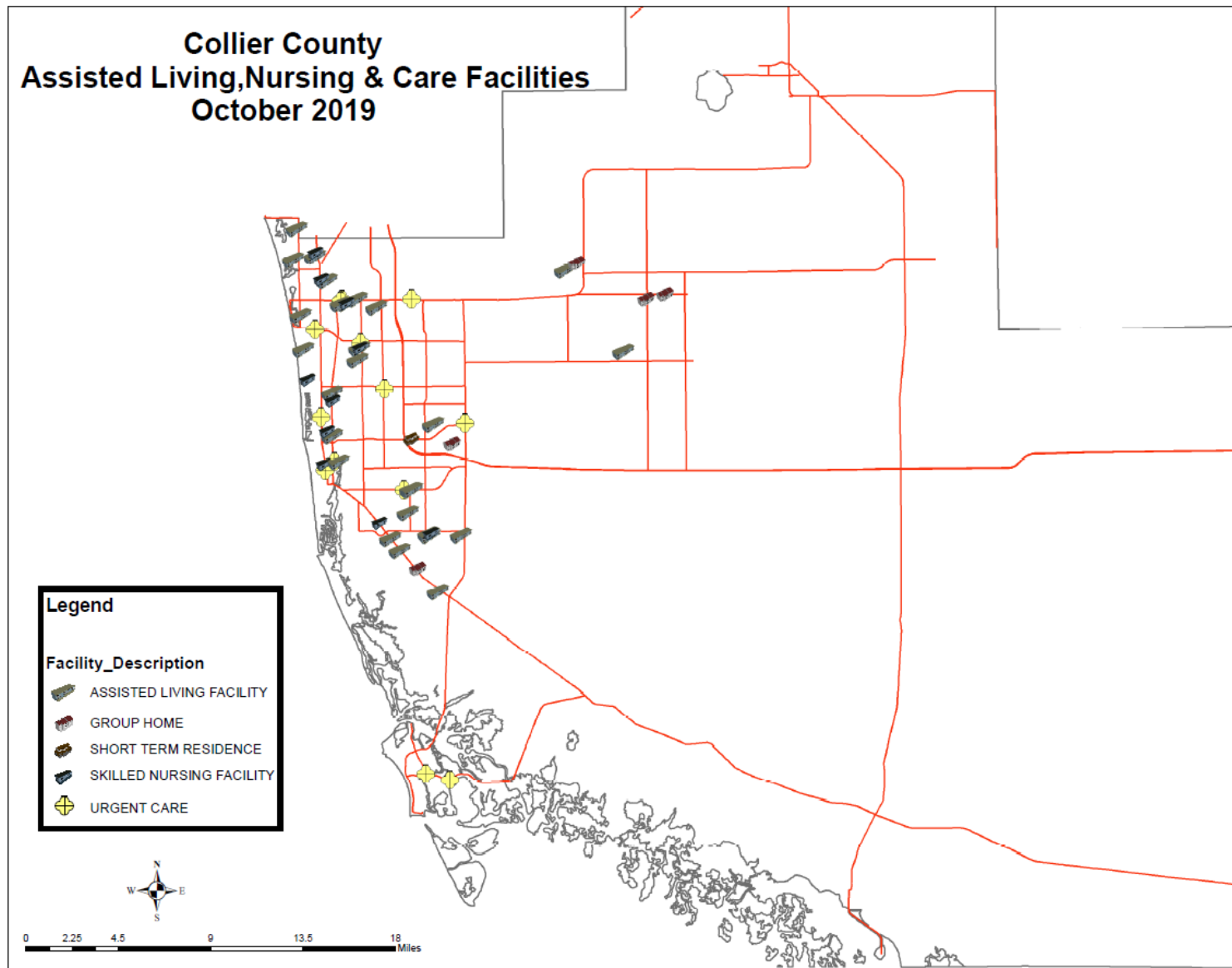
## Manufactured Home & RV Communities – 13



## Hazardous Materials Facilities – 14



## Assisted Living, Nursing &amp; Care Facilities – 15



**ANNEX B****Formal Adoption of Local Mitigation Strategy:  
Resolutions of Participating Communities**

Resolutions from Collier County's four participating jurisdictions formally adopting the updated Collier County Local Mitigation Strategy will be incorporated into this section following approval of the revised document by the Florida Division of Emergency Management and Federal Emergency Management Agency. In fulfillment of the requirements of 44 CFR 201.6(b)(1), each participating jurisdiction provided a description of the procedures to be followed in the adoption of their respective LMS resolutions. Letters of participation are included in this section.

**Collier Board of County Commissioners' Resolution****Everglades City****Collier Mosquito  
Control District****Immokalee Fire  
Control District****City of Naples****North Collier Fire and  
Rescue District****City of Marco Island****Collier County Public  
Schools****Greater Naples Fire  
Rescue District**



600 North Road | Naples, FL 34104-3464 | P 239.436.1000 | F 239.436.1005

**RESOLUTION #7 – 2019-2020**

**A RESOLUTION APPROVING, ADOPTING AND DEMONSTRATING PARTICIPATION IN THE UPDATED AND REVISED COLLIER COUNTY MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY BY THE COLLIER MOSQUITO CONTROL DISTRICT; AND PROVIDING AN EFFECTIVE DATE**

WHEREAS, the Federal Emergency Management Agency (“FEMA”) and other agencies require special districts to have a FEMA-approved local mitigation plan to reduce the risk from hurricanes and other hazards, disasters and emergencies or to demonstrate their participation in another local government’s FEMA-approved mitigation plan to be eligible for grants under the FEMA hazard mitigation assistance programs and other post-disaster funding opportunities; and

WHEREAS, Collier County has developed and maintains a FEMA-approved Collier County Multi-Jurisdictional Local Mitigation Strategy which was updated and revised on or about March 31, 2020 (collectively the “LMS”); and

WHEREAS, Collier Mosquito Control District, a political subdivision of the State of Florida (the “District”), desires to approve, adopt and demonstrate its active participation in the LMS to become eligible for grants under the FEMA hazard mitigation assistance programs and other post-disaster funding opportunities and to further its commitment to provide coordination and cooperation with Collier County during hurricanes and other hazards, disasters and emergencies; and

WHEREAS, the approval, adoption and participation in the LMS and the ability to become eligible for grants under FEMA’s hazard mitigation assistance programs and other post-disaster funding opportunities is in the health, safety and welfare interest of the District; and

WHEREAS, because the LMS is voluminous, it is maintained by the District and Collier County on-line (currently available at: <https://www.colliercountyfl.gov/your-government/divisions-a-e/emergency-management/local-mitigation-strategy-2020-draft>) prior to the adoption of this Resolution and will continue to be maintained after adoption of this Resolution; and

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF THE DISTRICT that:

1. The LMS is hereby approved and adopted by the District;
2. The District shall actively participate in the LMS as the local mitigation plan of the District;  
and
3. This Resolution shall take effect immediately upon adoption.

DONE, ORDERED AND RESOLVED IN REGULAR SESSION OF THE BOARD OF COMMISSIONERS OF THE DISTRICT THIS 21ST DAY OF APRIL, 2020.

**COLLIER MOSQUITO CONTROL DISTRICT,**  
a political subdivision of the State of Florida

By: John Johnson  
John E. Johnson, Chair

ATTEST:

Stacy J. Welch  
Stacy J. Welch, Clerk to the Board

RESOLUTION NO. 20 - 69

**A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF COLLIER COUNTY, FLORIDA, APPROVING AND ADOPTING THE MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY FOR COLLIER COUNTY.**

WHEREAS, post-disaster funding will be received more quickly by pre-identifying mitigation projects; and

WHEREAS, communities with a mitigation plan will be entitled to receive Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant Program & Flood Mitigation Assistance Grant Program funding; and

WHEREAS, substantial savings will be realized because the costs of mitigation are less than the costs of recovery and rebuilding; and

WHEREAS, On December 14, 2004 the Board of County Commissioners approved Resolution No. 2004-390 thereby approving the Hazard Mitigation Plan; and

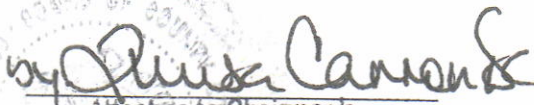
WHEREAS, the Hazard Mitigation Plan will expire on April 13, 2020 and it is necessary to approve an updated Local Mitigation Strategy in order for Collier County to continue to be eligible to receive the aforementioned benefits.

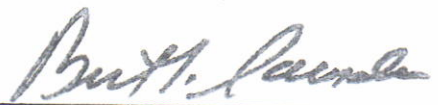
**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF COLLIER COUNTY, FLORIDA** that the Local Mitigation Strategy, attached as Exhibit "A" is hereby approved and adopted by reference.

This Resolution adopted after motion, second and majority vote in favor of adoption this 28<sup>th</sup> day of April, 2020.

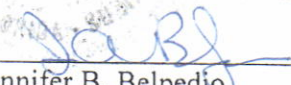
ATTEST:  
CRYSTAL K. KINZEL, CLERK


BOARD OF COUNTY COMMISSIONERS  
OF COLLIER COUNTY, FLORIDA

  
Attest as to Chairman's  
signature only.

By:   
BURT L. SAUNDERS, CHAIRMAN

Approval for form and legality:

  
Jennifer B. Belpedio  
Assistant County Attorney

I, Crystal K. Kinzel, Clerk of Courts in and for Collier County, do hereby certify that the above instrument is a true and correct copy of the original filed in Collier County, Florida.  
By:   
Date: 5/5/2020

CAC



## **RESOLUTION 20-007**

### **APPROVING THE COLLIER COUNTY LOCAL MITIGATION STRATEGY FOR HAZARD PREPARATION AND MANAGEMENT; PROVIDING FOR AN EFFECTIVE DATE**

**WHEREAS**, the Board of Fire Commissioners of the North Collier Fire Control and Rescue District recognizes that the North Collier Fire Control and Rescue District geographical area is subject to natural and man-made disasters, including hurricanes, tornadoes, floods, fires, and chemical releases, and faces potential loss of life and damages to property, natural resources and the local economy; and

**WHEREAS**, the Federal Emergency Management Agency and the Florida Department of Community Affairs have made funds available for statewide comprehensive local hazard mitigation planning; and

**WHEREAS**, Collier County accepted an Agreement with the State of Florida Department of Community Affairs to develop a county-wide Local Mitigation Strategy; and

**WHEREAS**, communities with an adopted Local Mitigation Strategy will be entitled to apply for future grant funding available through the Hazard Mitigation Grant Program, the Pre-Disaster Mitigation Grant Program, and the Flood Mitigation Assistance Grant Program; and

**WHEREAS**, post-disaster funding will be received more quickly by pre-identifying mitigation projects through the local mitigation planning process; and

**WHEREAS**, the implementation of a Local Mitigation Strategy will result in substantial savings to both the public and private sector because costs of mitigation are less than costs of recovery and rebuilding following a disaster; and

**WHEREAS**, the Local Mitigation Strategy Working Group consists of employees and community members of Collier County, the City of Naples, the City of Marco Island, Everglades City and is open for participation to any and all interested parties; and

**WHEREAS**, the Working Group has conducted meetings and identified local hazards and has assessed county-wide vulnerability and risk to these hazards; and

**WHEREAS**, the Working Group has identified and prioritized mitigation initiatives that would reduce local vulnerability to these identified hazards; and

**WHEREAS**, initiatives identified in the Local Mitigation Strategy Initiative List are given more consideration by state-managed funding programs such as the Hazard Mitigation Grant Program and the Community Development Block Grant program; and

**WHEREAS**, the Collier County Board of Commissioners approved Resolution 2015-43 on March 10, 2015 establishing a Local Mitigation Strategy, replacing an earlier Hazard Mitigation Plan, and Collier County continues to be eligible to receive benefits from the aforementioned grant programs; and

**WHEREAS**, the Local Mitigation Strategy is scheduled for adoption every five (5) years hereafter, per stipulations set forth in the Disaster Mitigation Act of 2000 by the Federal Emergency Management Agency; and

**WHEREAS**, because the plan as written is voluminous, the Local Mitigation Strategy for Collier County and the County's municipalities and other interest agencies is maintained by the Collier County Office of Emergency Management; and

**WHEREAS**, the Local Mitigation Strategy provides the consistent framework for future pre-disaster mitigation efforts and post-disaster redevelopment, regardless of the type of future threat by the community; and

**WHEREAS**, the Board of Fire Commissioners of the North Collier Fire Control and Rescue District finds that the approval and adoption of the Local Mitigation Strategy adopted by Collier County Resolution is in the best interest of the citizens and residents of the North Collier Fire Control and Rescue District regarding their safety, health and well-being to adopt a Local Mitigation Strategy in order that the North Collier Fire Control and Rescue District will be entitled to receive funding from the Hazard Mitigation Grant Program, the Pre-Disaster Mitigation Grant Program and the Flood Mitigation Assistance Grant Program.

**NOW, THEREFORE, BE IT RESOLVED** BY THE BOARD OF FIRE COMMISSIONERS OF THE NORTH COLLIER FIRE CONTROL AND RESCUE DISTRICT that the that the aforementioned Local Mitigation Strategy is hereby adopted.

This Resolution shall be effective immediately upon adoption.

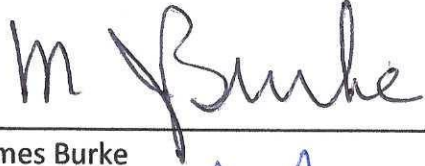
The foregoing Resolution was offered by Commissioner *B. Calamari*, who moved its adoption.

The motion was seconded by Commissioner *Crossan*, and the Vote was as follows:

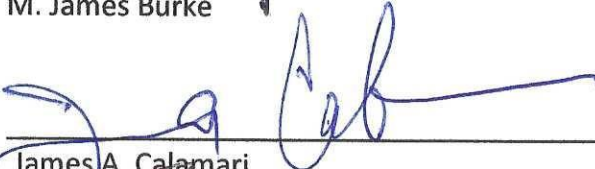
Commissioner	Vote
Commissioner M. James Burke	<i>yay</i>
Commissioner James A. Calamari	<i>yay</i>
Commissioner Christopher L. Crossan	<i>yay</i>
Commissioner Norman E. Feder	<i>yay</i>
Commissioner J. Christopher Lombardo	<i>yay</i>

Duly passed on this 23rd day of April, 2020 by the Board of Fire Commissioners of the North Collier Fire Control and Rescue District.

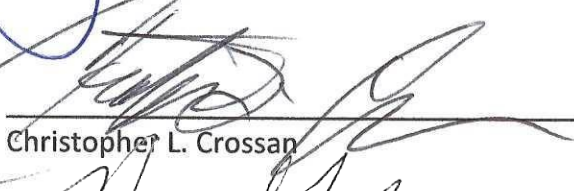
**NORTH COLLIER FIRE CONTROL AND RESCUE DISTRICT**




M. James Burke



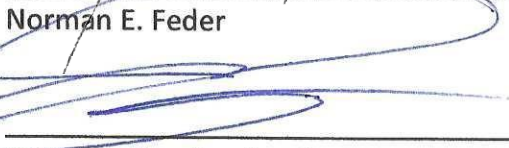
James A. Calamari



Christopher L. Crossan



Norman E. Feder



J. Christopher Lombardo

**Agenda Item 6.A.  
Meeting of 4/15/20****RESOLUTION 2020-14474****A RESOLUTION APPROVING A LOCAL MITIGATION STRATEGY FOR THE CITY OF NAPLES; AND PROVIDING AN EFFECTIVE DATE.**

**WHEREAS,** the Federal Emergency Management Agency and the Florida Department of Community Affairs have made funds available for a statewide Mitigation Strategy; and

**WHEREAS,** Collier County accepted an agreement with the State of Florida, Department of Community Affairs to develop a county-wide Mitigation Strategy; and

**WHEREAS,** post-disaster funding will be received more quickly by pre-identifying mitigation projects; and

**WHEREAS,** communities with a mitigation plan will be entitled to receive Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant Program, and Flood Mitigation Assistance Grant Program funding; and

**WHEREAS,** substantial savings will be realized because costs of mitigation are less than costs of recovery and rebuilding; and

**WHEREAS,** on March 18, 2015 the City Council of the City of Naples approved Resolution 15-13625 thereby approving the Local Mitigation Strategy; and

**WHEREAS,** the Local Mitigation Strategy will expire, and it is necessary to approve an updated Local Mitigation Strategy in order to continue to be eligible to receive the aforementioned benefits; and

**WHEREAS,** because the Local Mitigation Strategy is voluminous and is a working document it is maintained by the Collier County Division of Emergency Management and is available online prior to the adoption of this resolution and will continue to be maintained and available online after the adoption of this resolution;

**NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF NAPLES, FLORIDA:**

**Section 1.** That the Local Mitigation Strategy is hereby approved, a copy of which is on file in the City Clerk's Office.

**Section 2.** That this resolution shall take effect immediately upon adoption.

Resolution 2020-14474

Page 2

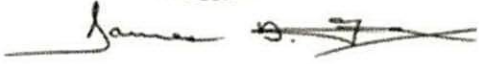
**PASSED IN OPEN AND REGULAR SESSION OF THE CITY COUNCIL OF THE CITY OF  
NAPLES, FLORIDA, THIS 15TH DAY OF APRIL 2020.**

Attest:

  
  
\_\_\_\_\_  
Patricia L. Rambosk, City Clerk

  
\_\_\_\_\_  
Teresa L. Heitmann, Mayor

Approved as to form and legality:

  
\_\_\_\_\_  
James D. Fox, City Attorney

Date filed with City Clerk: 4-24-20



## **RESOLUTION 2020-07**

### **RESOLUTION TO ADOPT THE COLLIER COUNTY LOCAL MITIGATION STRATEGY**

**WHEREAS,** The undersigned, as the duly authorized authority of GREATER NAPLES FIRE RESCUE DISTRICT (referred to as the “District”), a State of Florida Independent Special District organized and existing under the laws of the State of Florida, does hereby certify that the following is a true and correct copy of a Resolution adopted by the Board of Fire Commissioners of the District through a Resolution with unanimous written consent and that the Resolution remains in full force and effect:

**WHEREAS,** the District is located in an area that is vulnerable to natural and man-made disasters; and

**WHEREAS,** the District supports reasonable efforts to make the community better prepared for future disasters and better able to recover after disaster strikes; and

**WHEREAS,** by adopting the Collier County Local Mitigation Strategy, the framework for future mitigation efforts and post disaster recovery may be made easier and faster; and

**WHEREAS,** the Federal Emergency Management Agency and The Florida Department of Community Affairs have made funds available for statewide comprehensive local hazard mitigation projects and require local LMS adoption;

**WHEREAS,** the Board of Fire Commissioner of the Greater Naples Fire District finds that the approval and adoption of the 2020 Local Mitigation Strategy adopted by Collier County Resolution is in the best interest of the citizens and residents of the Greater Naples Fire Rescue District regarding their safety, health and well-being to adopt a Local Mitigation Strategy in order for the District to receive funding any approved grant program, such as the Hazard Mitigation Grant, the Pre-Disaster Mitigation Grant Program and the Flood Mitigation Assistance Grant Program , to name a few,

**NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF FIRE COMMISSIONERS OF THE GREATER NAPLES FIRE RESCUE DISTRICT** that the aforementioned Local Mitigation Strategy is hereby adopted.

This resolution shall be effective immediately upon adoption.

The forgoing resolution was offered by Commissioner Gerrity, who moved its adoption.

The motion was seconded by Commissioner Cottiers.

**IN WITNESS WHEREOF**, Adopted by the Greater Naples Fire Rescue District Board of Commissioners this 14th day of April, 2020. The foregoing Resolution was duly adopted at said meeting by the affirmative vote of 5 members, and opposed by 0 members, and that said Resolution has been duly recorded in the Official Records and is in full force and effect.

Jeffrey Page  
Chairman Jeff Page

Kevin Gerrity  
Commissioner Kevin Gerrity

Charles Cottiers  
Commissioner Charles Cottiers

Tom Henning  
Commissioner Tom Henning

David Stedman  
Commissioner David Stedman

**RESOLUTION 2020-004**

**A RESOLUTION OF THE BOARD OF FIRE  
COMMISSIONERS OF THE IMMOKALEE FIRE  
CONTROL DISTRICT OF COLLIER COUNTY, FLORIDA  
SUPPORTING AND ADOPTING THE COLLIER COUNTY  
LOCAL MITIGATION STRATEGY**

The undersigned, being all of the Fire Commissioners of the Board of Fire Commissioners of the Immokalee Fire Control District, a governmental entity, by this instrument at a meeting of the Board of Fire Commissioners, hereby consent to the following resolutions:

**WHEREAS**, the Immokalee Fire Control District is located in an area that is vulnerable to natural and man-made disasters; and

**WHEREAS**, the Immokalee Fire Control District supports reasonable efforts to make the community better prepared for future disasters and better able to recover after disaster strikes; and

**WHEREAS**, the State of Florida has stipulated that a Local Mitigation Strategy is the first step in the process of making a community better prepared to manage disasters; and

**WHEREAS** by adopting the Collier County Local Mitigation Strategy adopted by Collier County Board of Commissioners March 31, 2015, in compliance with the local hazard mitigation requirements of Section 322 of the Disaster Mitigation Act of 2000 as implemented in 44 C.F.R., Part 201.

**NOW THEREFORE**, be it resolved by the Board of Fire Commissioners of the Immokalee Fire Control District that the Immokalee Fire Control District does hereby approve and adopt the Collier County Local Mitigation Strategy,

**THE FOREGOING RESOLUTION WAS OFFERED BY COMMISSIONER**  
Brister **WHO MOVED THE RESOLUTION'S ADOPTION. THE MOTION**  
**WAS SECONDED BY COMMISSIONER** Olesky **AND, UPON BEING PUT**

**TO A VOTE, THE VOTE WAS AS FOLLOWS:**

Commissioner Patricia Anne Goodnight  
Commissioner Joseph Brister  
Commissioner Edward Olesky  
Commissioner Bonnie Keen  
Commissioner Robert Halman

Pat  
JB  
EO  
BK  
RH

Duly passed and adopted on this 16th day of April, 2020.

Board of Commissioners of the  
Immokalee Fire Control District

By: PA Goodnight  
Patricia Anne Goodnight, Chair

Attest by: Olivia Rosa Valladares  
Witness

## **RESOLUTION 20-10**

### **A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MARCO ISLAND, FLORIDA, APPROVING THE COLLIER COUNTY LOCAL MITIGATION STRATEGY (LMS) FOR HAZARD PREPARATION AND MANAGEMENT; AND PROVIDING FOR AN EFFECTIVE DATE.**

**WHEREAS**, the City Council of the City of Marco Island, Florida ("City Council") recognizes that the City of Marco Island, Florida is subject to natural and man-made disasters including hurricanes, tornadoes, floods, fires, and chemical releases and faces potential loss of life and damages to property, natural resources and the local economy; and

**WHEREAS**, the Federal Emergency Management Agency and the Florida Department of Emergency Management have made funds available for statewide comprehensive local hazard mitigation planning; and

**WHEREAS**, Collier County accepted an agreement with the State of Florida Department of Emergency Management to develop a Multi-Jurisdictional Local Mitigation Strategy; and

**WHEREAS**, communities with an adopted Local Mitigation Strategy will be entitled to apply for grant funding available through the Hazard Mitigation Grant Program, the Pre-Disaster Mitigation Grant Program, and the Flood Mitigation Assistance Grant Program; and

**WHEREAS**, post-disaster funding will be received more quickly by pre-identifying mitigation projects through the local mitigation planning process; and

**WHEREAS**, the implementation of a Local Mitigation Strategy will result in substantial savings to both the public and private sector, because costs of mitigation are less than costs of recovery and rebuilding following a disaster; and

**WHEREAS**, the Local Mitigation Strategy Working Group ("Working Group") consists of staff and community members of Collier County and the City of Naples, Everglades City, and the City of Marco Island and is open for participation to any and all interested parties; and

**WHEREAS**, the Working Group has conducted meetings and identified local hazards, and has assessed county-wide vulnerability and risk to these hazards; and

**WHEREAS**, the Working Group has identified and prioritized mitigation initiatives that would reduce local vulnerability to these identified hazards; and

**WHEREAS**, initiatives identified in the Local Mitigation Strategy Initiatives List are given more consideration by state-managed funding programs such as the Hazard Mitigation Grant Program and the Community Development Block Grant program; and

**WHEREAS**, initiatives identified in the Local Mitigation Strategy Initiatives List are given more consideration by state-managed funding programs such as the Hazard Mitigation Grant Program and the Community Development Block Grant program; and

**WHEREAS**, the Local Mitigation Strategy is scheduled for adoption every five (5) years hereafter, per stipulations set forth in the Disaster Mitigation Act of 2000 ("DMA2K") by the Federal Emergency Management Agency (FEMA); and

**WHEREAS**, the Local Mitigation Strategy provides the consistent framework for future pre-disaster mitigation efforts and post-disaster redevelopment, regardless of the type of future threat faced by the community; and

**WHEREAS**, the City Council finds that the approval and adoption of the Local Mitigation Strategy is in the best interest of the citizens and residents of the City of Marco Island, Florida.

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARCO ISLAND, FLORIDA, AS FOLLOWS:**


**Section 1.** The above recitals are true and correct and incorporated herein.

**Section 2.** The City Council hereby approves the Local Mitigation Strategy is hereby approved and adopted, and a copy shall be placed on file in the City Clerk's Office.

**Section 3.** This Resolution shall take effect immediately upon its adoption.

**PASSED AND APPROVED BY THE CITY COUNCIL OF THE CITY OF MARCO ISLAND, FLORIDA, THIS 6<sup>TH</sup> DAY OF APRIL 2020.**

**ATTEST:**


  
\_\_\_\_\_  
Laura M. Litzan, City Clerk

**CITY OF MARCO ISLAND, FLORIDA**

By: 

\_\_\_\_\_  
Erk Brechnitz, Chairman

Approved as to form and legal sufficiency:

  
\_\_\_\_\_  
Alan L. Gabriel, City Attorney

# ANNEX C

## Procedures to Assure Public Involvement

Pursuant to Section 44 CFR 201.6(b), the following describes the on-going processes that should achieve maximum public-private participation. We make every effort to solicit the public's involvement/participation. The following describes the various vehicles we use to accomplish this. Our goal is to have some means readily available for the public to communicate with us.

### **Web Presence** – Local Mitigation Strategy Working Group (LMSWG) Home Page: ([bit.ly/2Br1j3Z](http://bit.ly/2Br1j3Z))

Firstly, in the meta-data for this Home Page, we included many key words which will cause search-engines to draw those interested to Collier County's mitigation initiatives.

Secondly, the Home Page is always there (24 X 7), used to:

- Describe Collier County's Hazard Mitigation Program
- Provide references, e.g., "How-To" guides, and citations for those interested in mitigation activities.
- Announcements about grant opportunities.
- Information about Collier County's Floodplain Management program
- Hyperlink to the current Local Mitigation Strategy
- LMS Meeting announcements
- Past minutes for LMS meetings

**Public & Stakeholder Meeting Announcements** – All meetings are formally "announced" via our public affairs process. Announcements via this process go to all Collier County's media outlets. Attachment 1 – Sample Press Release. In addition to the public notice of the meeting the LMS Stakeholders will also get a direct notice of the meetings when they're called. Attachment 4 shows the reader the screenshot of a public notice and a reply from a stakeholder about the meeting. This reply shows the other stakeholders who were addressed. The screenshot is the evidence of these announcements being made, After the screenshots is a PDF conversion to MS Word in order to read the messages.

**Annual Floodplain Management Outreach Meetings:** The Collier County Floodplain Management Section conducts outreach to homeowner associations, condominium associations, civic groups, professional organizations, and other specific groups regarding the following information:

- Benefits of the Community Rating System program
- History of the National Flood Insurance Program
- Flood insurance
- Elevation certificate information
- Building and construction standards within the floodplain

**Emergency Management Hurricane Seminars and Community Emergency Response Team (CERT) Training Programs** – At these presentations the Local Mitigation Strategy and the variety of disaster mitigation programs are introduced to the audiences.

**Social Media (Facebook & Twitter)** – The Emergency Management Division maintains these social media accounts to keep the public aware of the various disaster programs initiatives. Attachment 2 – social media examples

**Public Comments** – The members of the public attending a “properly noticed meeting” have their names recorded in the minutes. Attachment 3 contains member and public comments and formal change recommendations when made outside a formal meeting to be discussed later.



# Collier County Government

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Communication & Customer Relations Division  
3299 Tamiami Trail E., Suite 102  
Naples, Florida 34112-5746

[colliercountyfl.gov](http://colliercountyfl.gov)  
[twitter.com/CollierPIO](https://twitter.com/CollierPIO)  
[facebook.com/CollierGov](https://facebook.com/CollierGov)  
[youtube.com/CollierGov](https://youtube.com/CollierGov)

April 3, 2019

## FOR IMMEDIATE RELEASE

### *Notice of Public Meeting*

## **Collier County Local Mitigation Strategy (LMS) Working Group Meeting Collier County, Florida**

**Friday, April 19, 2019  
9:30 a.m.**

*Notice is hereby given that the **Collier County Local Mitigation Strategy Working Group** will meet at **9:30 a.m. Friday, April 19**, at the South Regional Library, 8065 Lely Cultural Parkway, Naples, Florida 34113. The purpose of this meeting is to update the current Local Mitigation Strategy and seek public input for the it. This meeting will focus on Collier's mitigation goals and review the draft project worksheet and changes to the working group's voting membership requirements.*

### **About the public meeting:**

Two or more members of the Board of County Commissioners may be present and may participate at the meeting. The subject matter of this meeting may be an item for discussion and action at a future Board of County Commissioners meeting.

All interested parties are invited to attend, and to register to speak. All registered public speakers will be limited to three minutes unless permission for additional time is granted by the chairman.

Collier County Ordinance No. 2004-05 requires that all lobbyists shall, before engaging in any lobbying activities (including, but not limited to, addressing the Board of County Commissioners, an advisory board or quasi-judicial board), register with the Clerk to the Board at the Board Minutes and Records Department.

Anyone who requires an auxiliary aid or service for effective communication, or other reasonable accommodations to participate in this proceeding, should contact the Collier County Facilities Management Division, located at 3335 Tamiami Trail E., Suite 101, Naples, Florida 34112, or (239) 252-8380, as soon as possible, but no later than 48 hours before the scheduled event. Such reasonable accommodations will be provided at no cost to the individual.

For more information, call the Richard Zyvoloski at 239-252-3603.

###

## Attachment 2

### Social Media

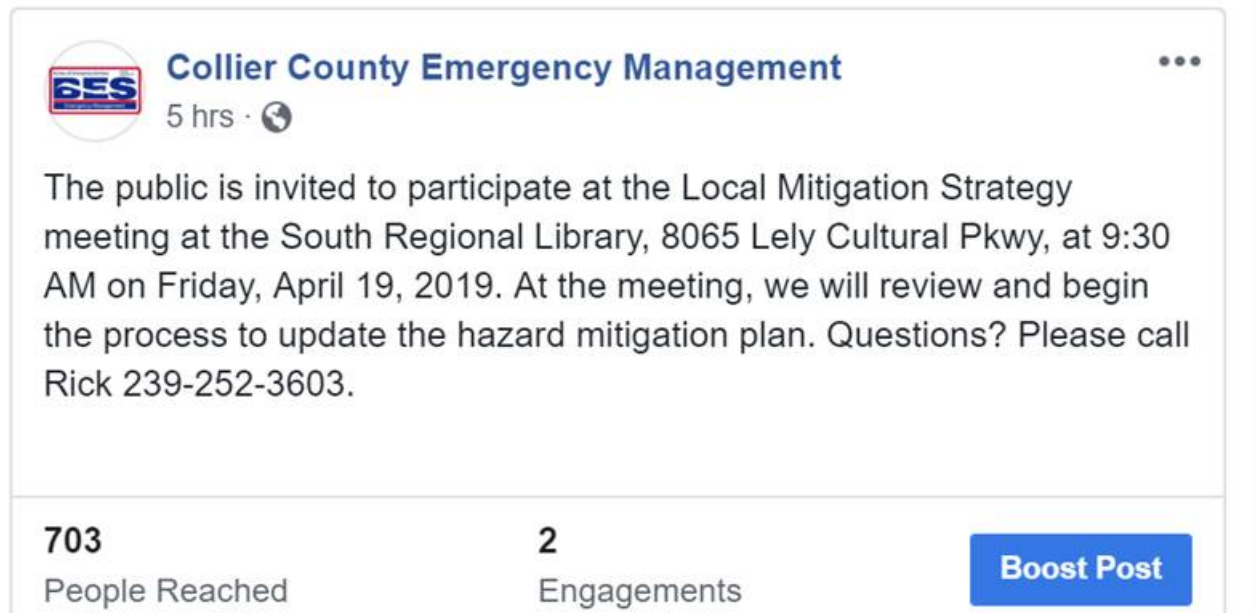
#### Twitter:



The screenshot shows the Twitter profile for Collier County Emergency Management (@CollierEM). The profile picture is a circular logo with the text "Bureau of Emergency Services" and "Collier County, FL" around the "BES" logo. The bio states: "Official Twitter of Collier Co Emergency Mgmt. This page is not monitored around the clock. Use 911 for real emergencies. Monitor local media & weather radios." The stats show 3,358 tweets, 62 following, 6,934 followers, 95 likes, and 2 lists. A tweet from 5 hours ago is visible, inviting the public to a Local Mitigation Strategy meeting at the S. Regional Library, 8065 Lely Cultural Pkwy, at 9:30 AM on Friday, April 19, 2019. The tweet has 2 retweets and 1 like. On the right, there is a "New to Twitter?" section with a "Sign up" button.

#### Facebook:

##### Posts



The screenshot shows a Facebook post from Collier County Emergency Management, posted 5 hours ago. The post text is: "The public is invited to participate at the Local Mitigation Strategy meeting at the South Regional Library, 8065 Lely Cultural Pkwy, at 9:30 AM on Friday, April 19, 2019. At the meeting, we will review and begin the process to update the hazard mitigation plan. Questions? Please call Rick 239-252-3603." The post has 703 people reached and 2 engagements. There is a "Boost Post" button in the bottom right corner.

## Attachment 3

What follows is a collection of comments and recommendations from the public and members.

---

### Para 1.2.3

If a resolution appears possible, but further discussion is needed, a subsequent meeting may be scheduled between a representative of the Board of County Commissioners (BCC) and a Mayor or representative of the City Council of the municipalities opposed. A representative from the state may also be invited to this meeting if deemed appropriate.

Section 3, paras: 1.2.1, 1.2.1.1, 1.2.1.2, 1.6, 1.8, 1.9 – add Sea Level Rise as a hazard

Goal 6, 1<sup>st</sup> sentence - Collier County and local Municipalities shall make....

### Section 6, para 6.2.1.3

#### The City of Marco Island:

The Growth Management Director, Chief Building Official and Floodplain Coordinator (CFM) and the staff from the Growth Management Planning Division are currently amending the City's Comprehensive Plan to include various Local Mitigation Strategy (LMS) initiatives. Staff will continue to emphasize the goals and objectives of the mitigation process in all area of government with regard to regulation and development inside and outside the floodplain. Attachment 2 shows ways the city may incorporate the LMs in existing plans.

---

1. In Section 1.2.1 the paragraph discussing revoking voting membership status generally sounds good, but I thought that the revocation also applied to the individual sections represented in the participating jurisdictions. For example, if nobody from Stormwater attends at least 2 of the quarterly meetings then Stormwater can be voted for removal. However, that would not mean that Collier County is removed from the LMSWG. Is that your understanding? If so, perhaps there should be some additional verbiage to better identify sub-units within the participating jurisdictions. Also, in that same paragraph, the second highlighted text should probably say "members from the public or from private non-profit" instead of "members from the public or form private non-profit".
2. In Section 4.1.5 I thought the LMSWG agreed for an annual update rather every two years. I'm probably wrong on this but thought it worth checking.
3. Annex C on the DRAFT 2020 LMS web page needs to have a closing parenthesis at the end of the Board of County Commissioners line.
4. Annex D Public Meeting Announcements paragraph has a typo in that the word "formerly" should be "formally".
5. Annex D Annual Flood Plain Outreach Meetings needs to be consistent in how the term "floodplain" is spelled. While it should be one word, there are two places where is spelled with two words.
6. Annex D Emergency Management Hurricane Seminars and Community Emergency Response Team paragraph seems to have a typo in that it doubles the "Local Mitigation Strategy" term when perhaps something else was intended to be included.
7. Annex D Social Media (Facebook & Twitter) paragraph should reference the location of the social media account samples as being in Attachment 2.
8. Annex E – Excel Spreadsheet has cells A3 thru G3 blank when it appears there should be some text to identify the program. Note that I did not check the links.

9. Annex F could perhaps benefit by indicating the effective date of the project priority listing. That way everyone knows when priority revisions are made by the LMSWG.
  10. Annex H listing of membership needs to be updated to reflect membership changes identified in the Summary of Changes document.
  11. Annex I needs to be checked to ensure all criteria have been updated as discussed at the last few LMSWG meetings.
- 

**Section One.** Recommend the following changes: paragraph 1.2 change “Pubic School District” to “Collier County Public Schools”, paragraph 1.2.1 change “School Superintendent” to “Collier County Public Schools Superintendent”, paragraph 1.2.1, change “District Schools of Collier County” to “Collier County Public Schools”, paragraph 1.3.1 change “District School Board of Collier County” to “Collier County Public Schools”.

**Sections three, four, and five:** No changes recommended.

**Annex C.** Change “Collier District Public Schools” to “Collier County Public Schools”.

---

**LMS Update Annex A:** Page 2 of 9

Listed below are the potential hazards which may affect Collier County and its communities. Please note that a detailed analysis for some hazards are contained in the Collier County Floodplain Management Plan (FMP): <https://www.colliercountyfl.gov/home/showdocument?id=58898>

The Collier County Floodplain Management Plan will not be repeated in this document. Hazard analyses not found in the FMP are addressed here by either noting a low probability of occurrence to a detail analysis of the event, via appendices to this annex. Many of these hazards have a low impact status or are too random in nature and do not represent a significant threat, therefore a thorough analysis was not performed.

**LMS Update Annex D:** Annual Floodplain Outreach Meetings

**Annual Floodplain Management Outreach Meetings:** The Collier County Floodplain Management Section conducts outreach to homeowner associations, condominium associations, civic groups, professional organizations, and other specific groups regarding the following information:

- Benefits of the Community Rating System program
- History of the National Flood Insurance Program
- Flood insurance
- Elevation certificate information
- Building and construction standards within the floodplain

**LMS Update Annex J:** Collier County’s Floodplain Plans (Update)

Unincorporated Collier County has a Floodplain Management Plan. The City of Marco Island and the City of Naples do not possess a Floodplain Management Plan, nor are they required to adopt one. The Floodplain Management Plan is a part of the Collier County multi-jurisdictional, multi-hazard mitigation plan which addresses the jurisdictional flooding hazards. They are written according to FEMA regulations and Section 511 and 512 of the CRS Coordinator’s Manual.

All jurisdictions are active participants in the NFIP. To ensure continued compliance with the NFIP, each participating community will:

1. Continue to enforce their adopted Floodplain Management Ordinance requirements, which include regulating all new development and substantial improvements in Special Flood Hazard Areas (SFHA).
2. Continue to maintain all records pertaining to floodplain development, which shall be available for public inspection
3. Continue to notify the public when there are proposed changes to the floodplain ordinance or Flood Insurance Rate Maps.
4. Maintain the map and Letter of Map Change repositories.
5. Continue to promote Flood Insurance for all properties.
6. Continue their Community Rating System outreach programs.

## **SUMMARY OF JURISDICTIONAL CRS PROGRAMS**

**Collier County:** Collier County's NFIP participation commitments meet or exceed the following minimum requirements as set for by the NFIP.

- Issuance or denial of floodplain development/building permits
- Inspection of all development to assure compliance with the local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of floodplain maps
- Aid residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures

The County's Building Plan Review & Inspection Division (BPRID) is the agency responsible for the review and approval of all development order applications to the County. The application review process includes analysis for compliance with the County's Land Development Code, the County's Code of Laws and Ordinances (which includes the Floodplain Management Ordinance), the Florida Building Code, the South Florida Water Management District permitting rules (when applicable), the County's Growth Management Plan, and other related regulations for development compliance. The development and building permit approval processes consist of extensive reviews of the submitted applications to determine compliance before a recommendation for approval is given. Once a development project begins actual construction, there are periodic on-site inspections performed by trained inspection staff to ensure compliance before the construction can proceed toward completion. All documents submitted to the County become part of the project's public record file and are available for the public to review upon request. Copies can be ordered if requested. Once a project is completed, the file is closed and archived and is available for record retrieval. The BPRID is also active in the preparation and revision of Flood Insurance Rate Maps (FIRM) and maintains the record of all map revisions and changes received from FEMA. As a part of the services offered to the public, the BPRID provides FIRM information, flood insurance program information, flooding hazards, and proper construction methods within the special flood hazard area. The BPRID also oversees the County's participation in the Community Rating System (CRS) program. The County is currently designated as a CRS Class 5 rated community for its efforts to promote activities that make the community more resistant to flood damage.

Collier County is currently in the process of producing a new Digital Flood Insurance Rate Map (DFIRM) series through a CTP Partnership Agreement with the City of Naples, the South Florida Water Management District, and FEMA. On January 9, 2019 the County adopted a new

Floodplain Management Ordinance that is compliant with the current State of Florida “Model” Flood Ordinance. The County has an active Floodplain Management Planning Committee to oversee the development and updating of the County’s Floodplain Management Plan. As part of the CRS program the County provides flood hazard and flood insurance information to the public through a newsletter, mailings, and the internet.

**Appendix 1** - Wildfires has seen no significant change in wildfire incidence type, though the acreage for each has adjusted due the 30<sup>th</sup> Ave and Lee Williams Road fires in 2017 and the Greenway complex in 2018. I did send out an email today for the GGE CWPP which needs signing in order to incorporate it into the LMS in addition to or in place of Appendix 1. I shall continue to prod ‘the bear’ as it were to get that in time for our deadline.

North Collier Fire Control and Rescue District's acknowledgement of reviewing the Draft 2020 LMS plan. The only change for us is to correct our Legal name to match our enabling legislation (currently the word **Control** is missing):

North Collier Fire Control and Rescue District.

- Page 6-1, edits corresponding with highlights on below excerpt: 1) “C”; 2) remove hyphen – it is all one word; 3) & 4) insert “density bonus”; “R”; 6) insert “density bonus”; 7) replace “-“ with “/”; 8) remove “s”.
- **Ordinances under review/revision that deal with the hazard mitigation.**
- **The Collier County Growth Management Plan contains policies and goals to be reviewed to insure consistency with the Local Mitigation Strategy. Specific elements of the plan are:**
  - Conservation & Coastal Management Element
  - Drainage Sub-Element
  - Solid Waste Sub-Element
  - Housing Element
  - Future Land Use Element
  - Urban Future Land Use Designation, Urban coastal Fringe Sub-district, Density System, Affordable Housing, Residential In-Fill, Transfer of Development Bayshore-Gateway Triangle Redevelopment Overlay
  - Golden Gates Area Master Plan Element

## Section 6 - 1

- Page 6-4, see below edits in red. I struck thru the EAR text because: 2011 is past, and the EAR process required in F.S. has been gutted – we now only review for any changes in F.S. not reflected in our GMP whereas previously we would conduct a detailed re-evaluation of the GMP.

**6.2.1.1 Unincorporated Collier County:** Coordinators in the Emergency Management Office, the Floodplain Manager and members of the Comprehensive Planning Section ~~Department~~ will weigh the goals and objectives of the LMS against each plan and/or ordinance being

reviewed at the time determined for each document. The LMSWG will assess Goal 12 in the Conservation and Coastal Management Element (CCME) of the GMP, which contains policy 12.1.9 which references the Hazard Mitigation Plan, would include an assessment by the county that we needed to modify this element to meet the specifics of any current mitigation requirements. Additionally, where opportunities present themselves, the responsible agency will seek the LMSWG's support in amending the appropriate documents.

- Page 6-6: Text is out of order – re-arrange as shown below:

#### **FUTURE LAND USE ELEMENT**

##### **C. UNDERLYING CONCEPTS**

##### **Management of Coastal Development**

Two major coastal development issues in Collier County are the protection of natural resources and the balancing of risk in natural hazard areas.

Extensive populated areas in Collier County are vulnerable to periodic salt-water inundation from tropical storms or hurricanes. It is extremely important that an acceptable balance between at-risk population and evacuation capability be achieved. In addition, public and private investment in such vulnerable areas must be carefully considered.

This issue is addressed here and in the Conservation and Coastal Management Element through several measures. A Coastal High Hazard Area is identified on the Future Land Use Map essentially as all lands seaward of US 41. This line is based on the close fit to the storm Category 1 SLOSH area (potential for saltwater flooding from 1 storm in 12 years) and evacuation planning areas. Within the Coastal High Hazard Area maximum permissible residential density is limited in recognition of the level of risk, the existing deficiency of evacuation shelter space and existing patterns of density. The Coastal High Hazard Area is also identified in the Conservation and Coastal Management Element and policies are provided therein. Finally, coastal natural hazards are addressed through Land Development Regulations already in effect relating to coastal building standards, per Chapter 161, Florida Statutes, and protection of structures from floods, per County participation in the FEMA Flood Insurance Program.

**OBJECTIVE 1:** Unless otherwise permitted in this Growth Management Plan, new or revised uses of land shall be consistent with designations outlined on the Future Land Use Map. The Future Land Use Map and companion Future Land Use Designations, Districts and Sub-districts shall be binding on all Development Orders effective with the adoption of this Growth Management Plan. Standards and permitted uses for each Future Land Use District and Subdistrict are identified in the Designation Description Section. Through the magnitude, location and configuration of its components, the Future Land Use Map is designed to coordinate land use with the natural environment including topography, soil and other resources; promote a sound economy; coordinate coastal population densities with the Regional Hurricane Evacuation Plan; and discourage unacceptable levels of urban sprawl.

##### **FUTURE LAND USE DESIGNATION DESCRIPTION SECTION**

The following section describes the land use designations shown on the Future Land Use Map. These designations generally indicate the types of land uses for which zoning may be requested. However, these land use designations do not guarantee that a zoning request will be approved. Requests may be denied by the Board of County Commissioners based on criteria in the Land Development Code or on special studies completed for the County.

- Pages 6-6 thru 6-23: 1) Because the GMP has been amended several times since the last LMS update, I suggest removing all GMP excerpts and replacing with the same from the current GMP. 2) I suggest placing a text break whenever skipping from one GMP provision to another so as to make it clear to the reader that the text from one section is not a continuation from the prior section. See below example from page 6-7.

existing development; patterns of approved, but unbuilt, development; natural resources; water management; hurricane risk; existing and proposed public facilities; population projections and the land needed to accommodate the projected population growth.

\*\*\*      \*\*\*      **TEXT BREAK**      \*\*\*      \*\*\*

**(IV)(XI)(XV)(XXI) 3. Urban Coastal Fringe Subdistrict:**

The purpose of this Subdistrict is to provide transitional densities between the Conservation designated area (primarily located to the south of the Subdistrict) and the remainder of the Urban designated area (primarily located to the north of the Subdistrict). The Subdistrict comprises those Urban areas south of US 41, generally east of the City of Naples, and generally west of the Rural Fringe Mixed Use District Neutral Lands, but excludes Section 13, Township 51 South, Range 26 East, and comprises approximately 11,354 acres and 10% of the Urban Mixed Use District. The entire Subdistrict is located seaward of the Coastal High Hazard Area Boundary. In order to facilitate hurricane evacuation and to protect the adjacent environmentally sensitive Conservation designated area, residential densities within the Subdistrict shall not exceed a maximum of 4 dwelling units per acre, except as allowed in the Density Rating System to exceed 4 units per acre through provision of Affordable Housing and Transfers of Development Rights, and except as allowed by certain FLUE Policies under Objective 5, and except as provided in the Bayshore Gateway Triangle Redevelopment Overlay. New rezones to permit mobile home development within this Subdistrict are prohibited. Rezones are recommended to be in the form of a Planned Unit Development.

\*\*\*      \*\*\*      **TEXT BREAK**      \*\*\*      \*\*\*

**(IX) B. Rural Fringe Mixed Use District**

The Rural Fringe Mixed Use District is identified on Future Land Use Map. This District consists of approximately 93,600 acres, or 7% of Collier County's total land area. Significant portions of this District are adjacent to the Urban area or to the semi-rural, rapidly developing, large-lot North Golden Gate Estates platted lands. Agricultural land uses within the Rural Fringe Mixed Use District do not represent a significant portion of the County's active agricultural lands. As of the date of adoption of this Plan Amendment, the Rural Fringe Mixed Use District consists of more than 5,550 tax parcels, and includes at least 3,835 separate and distinct property owners. Alternative land use strategies have been developed for the Rural Fringe Mixed Use District, in part, to consider these existing conditions.

## **Attachment 4**

Evidence of a public announcement to LMS stakeholders and members of the public at large are shown below. So, you can read them, these messages were converted from PDF format to MS Word in order to attach it to this document.

zyvoloski r

From: Rag Buxton <Rag@nagbuxton.com>  
 Sent: Monday, July 3, 2017 11:19 AM  
 To: zyvoloski r  
 Subject: RE: Connected E-Mail TITLE/Message RE: Draft Meeting Minutes from 21 July Meeting - next meeting...

2 man, I will be in Boca at MPO meeting please mark me as excused enjoy the 4<sup>th</sup>

From: zyvoloski r [mailto:Richard.Zyvoloski@colliergov.net]  
 Sent: Monday, July 3, 2017 9:56 AM  
 To: (Peggy.bolduan@colliergov.net); BelpediceJennifer; BurnesAllister; CCSD-Tim Kutz [kutz@colliernschools.com]; Chris Nifontas [Chris.Nifontas@colliernschools.com]; ClerkCaroline; CritchfieldHoward; Dom, Tricia; EGG-Raquel Pineda [rpineda2@colliergov.net]; Francesa@northcolliernschools.com [francesa@northcolliernschools.com]; SainvilJames; Jim von Rinteln [jvon@colliernschools.com]; Jose Carilla [jose.carilla@colliernschools.com]; KurtGerald; LangWilliam; LeonardBroosevelt; LMS-Jeff Johnson [jeffj2756@gmail.com]; LMS-Rag Buxton [Rag@nagbuxton.com]; MacDonald, Marc; Marco, Flood-Kell Defederick [kelldefederick@cityofmarcoisland.com]; Marco-Jason Smalley [jmsalley@cityofmarcoisland.com]; Marco-Lee Lowmer [lowmer@cityofmarcoisland.com]; Micort-Russ & Pat Rainey [rainey214@comcast.net]; NAP-Christa Carrera [CCarrera@NaplesGov.com]; OlenLisa; PriokJames; Quinn, Samantha; SPWMD-Lisa Koehler [lkoehler@spwmd.gov]; SummenDan; WashburnLinda; Weston, Michael; WileyRobert; YacostaVerlido  
 Subject: Connected E-Mail TITLE/Message RE: Draft Meeting Minutes from 21 July Meeting - next meeting...

Oops, Our next LMS working group meeting is Friday, 21 July at the S. Regional Library. Agenda to come out soon... In the interim, please let me know if I captured everything you heard in the April meeting.

Thank you. Have a safe & happy 4<sup>th</sup>.  
 Rick

\*\*\*\*\*  
 Richard A. Zyvoloski Jr., FRFR, CFR  
 Coordinator  
 Collier County Bureau of Emergency Services Division - Emergency Mgt.  
 8875 Lely Cultural Parkway, Suite 445  
 Naples, FL 34113  
 PH: 239-252-3683  
 FAX: 239-252-6735

[Richard.Zyvoloski@collierngov.net](mailto:Richard.Zyvoloski@collierngov.net)  
[www.collierngov.net](http://www.collierngov.net)

COLLIERFL

From: zyvoloski r  
 Sent: Monday, July 03, 2017 9:36 AM  
 To: (Peggy.bolduan@collierngov.net); BelpediceJennifer; BurnesAllister; CCSD-Tim Kutz [kutz@colliernschools.com]; ClerkCaroline; Chris Nifontas [Chris.Nifontas@colliernschools.com]; EGG-Raquel Pineda [rpineda2@colliernschools.com]; Francesa@northcolliernschools.com [francesa@northcolliernschools.com]; Jim von Rinteln [jvon@colliernschools.com]; Jose Carilla [jose.carilla@colliernschools.com]; KurtGerald; LangWilliam; LeonardBroosevelt; LMS-Jeff Johnson [jeffj2756@gmail.com]; LMS-Rag Buxton [Rag@nagbuxton.com]; MacDonald, Marc; Marco, Flood-Kell Defederick [kelldefederick@cityofmarcoisland.com]; Marco-Jason Smalley [jmsalley@cityofmarcoisland.com]; Marco-Lee Lowmer [lowmer@cityofmarcoisland.com]; Micort-Russ & Pat Rainey [rainey214@comcast.net]; NAP-Christa Carrera [CCarrera@NaplesGov.com]; OlenLisa; PriokJames; Quinn, Samantha; SPWMD-Lisa Koehler [lkoehler@spwmd.gov]; SummenDan; WashburnLinda; Weston, Michael; WileyRobert; YacostaVerlido  
 Subject: Draft Meeting Minutes from 21 Apr Meeting - next meeting...

Our next LMS working group meeting is Friday, 21 April at the S. Regional Library. Agenda to come out soon... In the interim, please let me know if I captured everything you heard in the April meeting.

Thank you. Have a safe & happy 4<sup>th</sup>.  
 Rick

Under Florida Law, e-mail addresses are public records. If you do not want your e-mail address released in response to a public records request, do not send electronic mail to this entity. Instead, contact this office by telephone or in writing.

 Virus-free. [www.avg.com](http://www.avg.com)

zyvoloski r

From: PIO-Collier County Government  
 Sent: Wednesday, July 5, 2017 12:44 PM  
 To: SheffieldMichael; AlberDate  
 Subject: Collier County News Releases (4)

## Collier County Government

Communication & Customer Relations Division  
 3299 Tamiami Trail E., Suite 102  
 Naples, Florida 34112-5746

[collierngov.net](http://collierngov.net)  
[twitter.com/CollierPIO](https://twitter.com/CollierPIO)  
[facebook.com/CollierGov](https://facebook.com/CollierGov)  
[youtube.com/CollierGov](https://youtube.com/CollierGov)

July 5, 2017

### FOR IMMEDIATE RELEASE

#### Collier County Makes Inspection Changes to Reduce Wait Times

To reduce the inconvenience to the property owner and to facilitate the issuance of a certificate of completion in a timely manner, the Collier County Building Review & Inspection Division has introduced a new program for air conditioning changeout inspections.

Under the new program, homeowners will be assigned a one hour time window that lets them know about when the inspector will be on site to look at their air conditioning unit.

The air conditioning changeout inspection schedule is available under the [Daily Scheduled Inspections Tab](#) on the County's Building Review webpage. When you click on the link for the schedule, a table pops up that includes the inspector's name, time of inspection, permit number and inspection address. The new inspection lists are posted the afternoon of the day before the scheduled inspection.

For more information, contact Operations Coordinator Brooke Bond at (239) 252-2398 or [brookebond@collierngov.net](mailto:brookebond@collierngov.net).

\*\*\*

#### Notice of Public Meeting Collier County Hearing Examiner Collier County, Florida

Thursday, July 13, 2017  
 9 a.m.

1

Anyone who requires an auxiliary aid or service for effective communication, or other reasonable accommodations in order to participate in this proceeding, should contact the Collier County Facilities Management Division, located at 3335 Tamiami Trail E., Suite 101, Naples, Florida 34112, or (239) 252-8380, as soon as possible, but no later than 48 hours before the scheduled event. Such reasonable accommodations will be provided at no cost to the individual.

For more information, call Pelican Bay Services Division at (239) 597-1749.

\*\*\*

#### Notice of Public Meeting Collier County Local Mitigation Strategy Working Group Collier County, Florida

Friday, July 21, 2017  
 9:30 a.m.

Notice is hereby given that the Collier County Local Mitigation Strategy Working Group will hold its regular public meeting at 9:30 a.m. on Friday, July 21, at the South Regional Library, Community Room, 8065 Lely Cultural Parkway, Naples, Florida 34113.

The purpose of the Collier County Local Mitigation Strategy is to develop a unified approach among county and municipal governments, along with input and participation from the private sector, for dealing with identified hazard and hazard management problems in the Collier County area.

About the public meeting:

Two or more members of the Board of County Commissioners may be present and may participate at the meeting. The subject matter of this meeting may be an item for discussion and action at a future Board of County Commissioners meeting.

All interested parties are invited to attend, and to register to speak. All registered public speakers will be limited to three minutes unless permission for additional time is granted by the chairman.

Collier County Ordinance No. 2004-05 requires that all lobbyists shall, before engaging in any lobbying activities (including, but not limited to, addressing the Board of County Commissioners, an advisory board or quasi-judicial board), register with the Clerk to the Board at the Board Minutes and Records Department.

Anyone who requires an auxiliary aid or service for effective communication, or other reasonable accommodations in order to participate in this proceeding, should contact the Collier County Facilities Management Division, located at 3335 Tamiami Trail E., Suite 101, Naples, Florida 34112, or (239) 252-8380, as soon as possible, but no later than 48 hours before the scheduled event. Such reasonable accommodations will be provided at no cost to the individual.

For more information, call Rick Zyvoloski at (239) 252-3603.

\*\*\*

3

**This message is a response to the LMS Chair's announcement to the LMS stakeholders of the July 2017 quarterly meeting.**

**From:** Reg buxton <Reg@regbuxton.com>  
**Sent:** Monday, July 3, 2017 11:19 AM  
**To:** zyvoloski\_r <RichardZyvoloski@colliergov.net>  
**Subject:** RE: Corrected E-Mail TITLE/Message RE: Draft Meeting Minutes from 21 July Meeting - next meeting....

Z man , I will be in Boca at MPO meeting please mark me un excused enjoy the 4<sup>th</sup>

**From:** zyvoloski\_r [<mailto:RichardZyvoloski@colliergov.net>]  
**Sent:** Monday, July 3, 2017 9:56 AM  
**To:** (Peggy.boldissar@lcec.net) ; BelpedioJennifer ; BurnettAlister ; CCSD-Tim Kutz ([kutzt@collierschools.com](mailto:kutzt@collierschools.com)) ; Chris Niforatos ([Chris.niforatos@kimley-horn.com](mailto:Chris.niforatos@kimley-horn.com)) ; CilekCaroline ; CritchfieldHoward ; Dorn, Tricia ; EGC-Raquel Pines ([rpines2@aol.com](mailto:rpines2@aol.com)) ; fmessana@northcollierfire.com ([fmessana@northcollierfire.com](mailto:fmessana@northcollierfire.com)) ; SainvilusJames ; Jim von Rinteln ([vonr@comcast.net](mailto:vonr@comcast.net)) ; Jose Carrillo ([jose.carrillo@colliersheriff.org](mailto:jose.carrillo@colliersheriff.org)) ; KurtzGerald ; LangWilliam ; LeonardRoosevelt ; LMS-Jeff Johnson ([jeffj12756@gmail.com](mailto:jeffj12756@gmail.com)) ; LMS-Reg Buxton ([Reg@regbuxton.com](mailto:Reg@regbuxton.com)) ; MacDonald, Marc ; Marco\_Flood-Kelli Defedericis ([kdefedericis@cityofmarcoisland.com](mailto:kdefedericis@cityofmarcoisland.com)) ; Marco-Jason Smalley ([JSmalley@cityofmarcoisland.com](mailto:JSmalley@cityofmarcoisland.com)) ; Marco-Lee Loewer ([lloewer@cityofmarcoisland.com](mailto:lloewer@cityofmarcoisland.com)) ; MIcert-Russ & Pat Rainey ([rrainey214@comcast.net](mailto:rrainey214@comcast.net)) ; NAP-Christa Carrera ([CCarrera@NaplesGov.com](mailto:CCarrera@NaplesGov.com)) ; OienLisa ; PriceJames ; Quinn, Samantha ; SFWMD-Lisa Koehler ([lkoehler@sfwmd.gov](mailto:lkoehler@sfwmd.gov)) ; SummersDan ; WashburnIlonka ; Weston, Michael ; WileyRobert ; YbacetaEverildo  
**Subject:** Corrected E-Mail TITLE/Message RE: Draft Meeting Minutes from 21 July Meeting - next meeting....

Oops. Our next LMS working group meeting is Friday, 21 July at the S. Regional Library. Agenda to come out soon.... In the interim, please let me know if I captured everything you heard in the April meeting.

Thank you. Have a safe & happy 4<sup>th</sup>.  
rick

\*\*\*\*\*

Richard A. Zyvoloski Jr., FPEM, CFM  
Coordinator  
Collier County Bureau of Emergency Services Division - Emergency Mgt.  
8075 Lely Cultural Pkwy., Suite 445  
Naples, FL 34113  
PH: 239-252-3603  
FAX: 239-252-6735

[RichardZyvoloski@CollierGov.net](mailto:RichardZyvoloski@CollierGov.net)  
[www.CollierEM.org](http://www.CollierEM.org)



**From:** zyvoloski\_r

**Sent:** Monday, July 03, 2017 9:38 AM

**To:** (Peggy.boldissar@lcec.net) <Peggy.boldissar@lcec.net>; BelpedioJennifer <JenniferBelpedio@colliergov.net>; BurnettAlister <AlisterBurnett@colliergov.net>; CCSD-Tim Kutz (kutzt@collierschools.com) <kutzt@collierschools.com>; Chris Niforatos (Chris.niforatos@kimley-horn.com) <Chris.niforatos@kimley-horn.com>; CilekCaroline <CarolineCilek@colliergov.net>; CritchfieldHoward <HowardCritchfield@colliergov.net>; Dorn, Tricia <Tricia.Dorn@lcec.net>; EGC-Raquel Pines (rpines2@aol.com) <rpines2@aol.com>; fmessana@northcollierfire.com (fmessana@northcollierfire.com) <fmessana@northcollierfire.com>; Imm\_CRA-James Sainvilus (JamesSainvilus@colliergov.net) <JamesSainvilus@colliergov.net>; Jim von Rinteln (vonr@comcast.net) <vonr@comcast.net>; Jose Carrillo (jose.carrillo@colliersheriff.org) <jose.carrillo@colliersheriff.org>; KurtzGerald <GeraldKurtz@colliergov.net>; LangWilliam <WilliamLang@colliergov.net>; LeonardRoosevelt <RooseveltLeonard@colliergov.net>; LMS-Jeff Johnson (jeffj12756@gmail.com) <jeffj12756@gmail.com>; LMS-Reg Buxton (Reg@regbuxton.com) <Reg@regbuxton.com>; MacDonald, Marc <macdom1@collierschools.com>; Marco\_Flood-Kelli Defedericis (kdefedericis@cityofmarcoisland.com) <kdefedericis@cityofmarcoisland.com>; Marco-Jason Smalley (JSmalley@cityofmarcoisland.com) <JSmalley@cityofmarcoisland.com>; Marco-Lee Loewer (lloewer@cityofmarcoisland.com) <lloewer@cityofmarcoisland.com>; MICert-Russ & Pat Rainey (rrainey214@comcast.net) <rrainey214@comcast.net>; NAP-Christa Carrera (CCarrera@NaplesGov.com) <CCarrera@NaplesGov.com>; OienLisa <LisaOien@colliergov.net>; PriceJames <JamesPrice@colliergov.net>; Quinn, Samantha <Samantha.Quinn@freshfromflorida.com>; SFWMD-Lisa Koehler (lkoehler@sfwmd.gov) <lkoehler@sfwmd.gov>; SummersDan <DanielSummers@colliergov.net>; WashburnIlonka <IlonkaWashburn@colliergov.net>; Weston, Michael <Michael.Weston@freshfromflorida.com>; WileyRobert <RobertWiley@colliergov.net>; YbacetaEverildo <EverildoYbaceta@colliergov.net>

**Subject:** Draft Meeting Minutes from 21 Apr Meeting - next meeting....

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Thank you. Have a safe & happy 4<sup>th</sup>.  
rick

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Under Florida Law, e-mail addresses are public records. If you do not want your e-mail address released in response to a public records request, do not send electronic mail to this entity. Instead, contact this office by telephone or in writing.

Virus-free. [www.avg.com](http://www.avg.com)**From:** PIO-Collier County Government <PIO-CollierCountyGovernment@colliergov.net>**Sent:** Wednesday, July 5, 2017 12:44 PM**To:** SheffieldMichael <MichaelSheffield@colliergov.net>; AlbersKate <KateAlbers@colliergov.net>**Subject:** Collier County News Releases (4)

The message below contains the announcement of an upcoming LM S meeting. I reduced the font-size of the other public notices/announcements since they were irrelevant.

# Collier County Government

**Communication & Customer Relations Division****3299 Tamiami Trail E., Suite 102****Naples, Florida 34112-5746**[colliergov.net](http://colliergov.net)[twitter.com/CollierPIO](https://twitter.com/CollierPIO)[facebook.com/CollierGov](https://facebook.com/CollierGov)[youtube.com/CollierGov](https://youtube.com/CollierGov)**July 5, 2017****FOR IMMEDIATE RELEASE**

## Collier County Makes Inspection Changes to Reduce Wait Times

To reduce the inconvenience to the property owner and to facilitate the issuance of a certificate of completion in a timely manner, the Collier County Building Review & Inspection Division has introduced a new program for air conditioning changeout inspections.

Under the new program, homeowners will be assigned a one hour time window that lets them know about when the inspector will be on site to look at their air conditioning unit.

The air conditioning changeout inspection schedule is available under the [Daily Scheduled Inspections Tab](#) on the County's Building Review webpage. When you click on the link for the schedule, a table pops up that includes the inspector's name, time of inspection, permit number and inspection address. The new inspection lists are posted the afternoon of the day before the scheduled inspection.

For more information, contact Operations Coordinator Brooke Bond at (239) 252-2398 or [BrookeBond@colliergov.net](mailto:BrookeBond@colliergov.net).

###

### *Notice of Public Meeting Collier County Hearing Examiner Collier County, Florida*

*Thursday, July 13, 2017  
9 a.m.*

Notice is hereby given that the *Collier County Hearing Examiner* will meet at **9 a.m.** on **Thursday, July 13**, at the Growth Management Department Planning & Regulation building in conference room 610, 2800 N. Horseshoe Drive, Naples, Florida 34104.

The agenda is available on the Collier County Government website at <http://www.colliergov.net/index.aspx?page=7176>.

In regard to the public meeting:

All interested parties are invited to attend and to register to speak. All registered public speakers will be limited to five minutes unless permission for additional time is granted by the Hearing Examiner.

Collier County Ordinance No. 2004-05 requires that all lobbyists shall, before engaging in any lobbying activities (including, but not limited to, addressing the Board of County Commissioners, an advisory board or quasi-judicial board), register with the Clerk to the Board at the Board Minutes and Records Department.

Anyone who requires an auxiliary aid or service for effective communication, or other reasonable accommodations in order to participate in this proceeding, should contact the Collier County Facilities Management Division, located at 3335 Tamiami Trail E., Suite 101, Naples, Florida 34112, or (239) 252-8380, as soon as possible, but no later than 48 hours before the scheduled event. Such reasonable accommodations will be provided at no cost to the individual.

For more information, call Kathy Crotteau at (239) 252-6052.

###

***Notice of Public Meeting  
Landscape & Safety Committee of the Pelican Bay Services Division  
Collier County, Florida***

***Tuesday, July 18, 2017  
10:15 a.m.***

***Notice is hereby given that the Landscape and Safety Committee of the Pelican Bay Services Division will meet at 10:15 a.m. on Tuesday, July 18, at the Community Center at Pelican Bay, located at 8960 Hammock Oak Drive, Naples, Florida 34108.***

In regard to the public meeting:

Two or more members of the Board of County Commissioners may be present and may participate at the meeting. The subject matter of this meeting may be an item for discussion and action at a future Board of County Commissioners meeting.

**All interested parties are invited to attend, and to register to speak. All registered public speakers will be limited to three minutes unless permission for additional time is granted by the chairman.**

Collier County Ordinance No. 2004-05 requires that all lobbyists shall, before engaging in any lobbying activities (including, but not limited to, addressing the Board of County Commissioners, an advisory board or quasi-judicial board), register with the Clerk to the Board at the Board Minutes and Records Department.

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For more information, call Pelican Bay Services Division at (239) 597-1749.

###

**Notice of Public Meeting  
Collier County Local Mitigation Strategy Working Group  
Collier County, Florida**

**Friday, July 21, 2017  
9:30 a.m.**

Notice is hereby given that the ***Collier County Local Mitigation Strategy Working Group*** will hold its regular public meeting at ***9:30 a.m. on Friday, July 21***, at the South Regional Library, Community Room, 8065 Lely Cultural Parkway, Naples, Florida 34113.

The purpose of the Collier County Local Mitigation Strategy is to develop a unified approach among county and municipal governments, along with inputs and participation from the private sector, for dealing with identified hazard and hazard management problems in the Collier County area.

### About the public meeting:

Two or more members of the Board of County Commissioners may be present and may participate at the meeting. The subject matter of this meeting may be an item for discussion and action at a future Board of County Commissioners meeting.

**All interested parties are invited to attend, and to register to speak. All registered public speakers will be limited to three minutes unless permission for additional time is granted by the chairman.**

Collier County Ordinance No. 2004-05 requires that all lobbyists shall, before engaging in any lobbying activities (including, but not limited to, addressing the Board of County Commissioners, an advisory board or quasi-judicial board), register with the Clerk to the Board at the Board Minutes and Records Department.

Anyone who requires an auxiliary aid or service for effective communication, or other reasonable accommodations in order to participate in this proceeding, should contact the Collier County Facilities Management Division, located at 3335 Tamiami Trail E., Suite 101, Naples, Florida 34112, or (239) 252-8380, as soon as possible, but no later than 48 hours before the scheduled event. Such reasonable accommodations will be provided at no cost to the individual.

For more information, call Rick Zyvoloski at (239) 252-3603.

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Under Florida Law, e-mail addresses are public records. If you do not want your e-mail address released in response to a public records request, do not send electronic mail to this entity. Instead, contact this office by telephone or in writing.

## ANNEX D

### Potential Grant Funding Sources

#### EXCEL SPREADSHEET

(<https://www.colliercountyfl.gov/home/showdocument?id=89031> or  
<http://bit.ly/2AFZtfh> )

**Collier County Local Mitigation Strategy  
Funding Sources**

Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
<b>Federal &amp; State Grant Locator Site</b> Hurricane Loss Mitigation Program		<b>FEMA</b>  State of Florida	One-stop search site for Federal Grants	Varies	Variety of Uses	Varies	Varies  \$7.0M	Varies	Varies  None	Varies  Varies. Email HLMP@em.myflorida.com to request being added to announcements in funding opportunities.	<a href="http://www.fema.gov/grants">http://www.fema.gov/grants</a> <a href="https://floridadisaster.org/dem/mitigation/hurricane-loss-mitigation-program/">https://floridadisaster.org/dem/mitigation/hurricane-loss-mitigation-program/</a>	Varies  Go to website to see the current project manager's info.	Varies  Activities that promote property resiliency through retrofits made to residential, commercial, and mobile home properties, the promotion of public education and public information, and through hurricane research activities.	Needs to be checked first...
Airport Improvement Program	AIP	United States Department of Transportation/Federal Aviation Administration	Fund activities that promote property resiliency through retrofits made to residential, commercial, and mobile home properties, the promotion of public education and public information, and through hurricane research activities.  To assist sponsors, owners, or operators of public-use airports in the development of a nationwide system of airports adequate to meet the needs of civil aeronautics.	Governmental entities, nonprofit organizations, and qualified for-profit organizations. (individual homeowners are ineligible to apply)  States, counties, municipalities, U.S. Territories and possessions, and other public agencies, including an Indian tribe	Projects/initiatives must be aimed at minimizing damages caused by hurricanes.  Grants can be made for integrated airport system planning in a specific area; and airport master planning, construction, or rehabilitation at a public-use airport or a portion thereof	Promote property resiliency through retrofits made to residential, commercial, and mobile home properties, the promotion of public education and public information, and through hurricane research activities.  Project Grants; Advisory Services and Counseling	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.faa.gov/airp/arp/home.htm">http://www.faa.gov/airp/arp/home.htm</a>	800 Independence Avenue, SW, Room 600, East Washington, DC 20591 (202) 267-3831	This program is the primary federal funding source for improvements and expansions of medium-scale to large-scale airports. As such, it is a valuable mitigation program for potential disasters related to airport and civil aviation operations.	
Alcohol, Tobacco and Firearms Training Assistance	None	United States Department of the Treasury/Bureau of Alcohol, Tobacco and Firearms	To help participants identify the laws relating to alcohol, tobacco, firearms and explosives; to provide training in specific investigative skills and techniques; and, to help State, county, and local law enforcement officers improve their law enforcement capabilities in the organized crime area, including arson, undercover, firearms and explosives investigations.	State, county, and local law enforcement agencies. Participation is limited to non-uniformed police personnel engaged in firearms and arson investigations, or are in the process of being assigned or promoted to such non-uniformed assignments	Training programs in areas of: Identification of the Firearms Problem; Motives and Analysis of Applicable Federal, State and Local Laws; Laboratory Capability; Sources of Information; Interviewing; Investigative Techniques; and Case Management.	Grants, Specialized Services	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.atf.treas.gov/welcome.htm">http://www.atf.treas.gov/welcome.htm</a>	Building 67, Federal Law Enforcement Training Center, Glyncro, GA 31524 (912) 267-2251	This is a good training program for local police agencies. Training, in this instance, would serve as mitigation for civil unrest, violent crime, and terrorist acts	
Assistance to Firefighters Grants Program	AFG	United States Department of Homeland Security/Federal Emergency Management Agency/United States Fire Administration	To help rural, urban and suburban fire departments better train, prepare and equip themselves; primary goal is to provide assistance to meet fire departments' firefighting and emergency response needs. This program seeks to support departments that lack the tools and resources necessary to protect the health and safety of the public and their firefighting personnel with respect to fire and all other hazards they may face.	Fire departments of a State, which are an agency or organization that has a formally recognized arrangement with a State, territory, local, or tribal authority (city, county, parish, fire district, township, town, or other governing body) A municipality or fire district may submit an application on behalf of a fire department when the fire department lacks the legal status to do, but when a municipality or fire district submits an application on behalf of a fire department, the fire department is precluded from submitting an additional application on its own.	May submit only one application per program year.	Grants	\$ 750,000,000.00	Ranged from \$6,000 to \$250,000 in previous years; limits vary according to activity	Minimum match is 10% for both Ochopee and Isles of Capri based on population served being less than 50,000; no in-kind may count as match; match must be cash match; match not required at time of application and may be spent last, match must be new money	April each year	<a href="http://www.usfa.fema.gov/inside-usfa/media/2004releases/021204a.shtm">http://www.usfa.fema.gov/inside-usfa/media/2004releases/021204a.shtm</a> and/or <a href="http://www.ojp.usdoj.gov/odp">www.ojp.usdoj.gov/odp</a>	Vicki Murphy, Fire Program Specialist, (229) 225-4518, vicki.murphy@dhs.gov	Improvement to fire operations and safety, fire prevention and acquisition of firefighting vehicles all contribute to fire departments' ability to respond to and mitigate against incidents of hazardous materials and natural disaster.	
Automated Flood Warning Systems Program	AFWS	United States Department of Commerce/National Oceanic and Atmospheric Administration/National Weather Service	Provides capital funds for creation, refurbishment or enhancement of automated flood warning systems.	Colleges, nonprofits, state, local tribal govt	Must have significant flood and flash flood risk, ability to operate AFWS, make data available to NWS without restrictions	Grants	\$ 500,000.00	\$100,000 or less	None, but applicant commitment will be considered more competitive	10/21/04	<a href="http://fedgrants.gov/EPData/DOC/Synopses/1250/11450AFWS071404/AFWS%26%2332%3BFFO%26%2332%3BFY05.pdf">http://fedgrants.gov/EPData/DOC/Synopses/1250/11450AFWS071404/AFWS%26%2332%3BFFO%26%2332%3BFY05.pdf</a>	John Bradley, NOAA/NWS 1325 East-West Highway Room 13396; Silver Spring, Maryland 20910-3283, or by phone at 301-713-0624 ext. 154, or fax to 301-713-1520	Allows communities to develop or maintain warning systems to warn residents and businesses to prepare for flooding	
Brownfields Assessment, Revolving Loan Fund and Cleanup Grants	Brownfields Program	United States Environmental Protection Agency/Office of Brownfields Cleanup and Redevelopment	Assessment grants provide funding for a grant recipient to inventory, characterize, assess, and conduct cleanup and redevelopment planning and community involvement related to brownfield sites; Revolving Loan Fund (RLF) grants provide funding for a grant recipient to capitalize a revolving loan fund and to provide subgrants to carry out cleanup activities at brownfield sites; Cleanup grants provide funding for a grant recipient to carry out cleanup activities at brownfield sites.	Entities, including nonprofit organizations, that own the property they wish to clean up	Specific criteria apply to each program; check website for details	Grants and loans	\$100,000,000 estimate in FY 05 for all programs; approximately 200 grants will be awarded	Assessment - up to \$400,000 if doing communitywide and site specific; Revolving Loan - up to \$1,000,000; Cleanup up to \$200,000 per site	The Brownfields Law requires a 20 percent cost share for revolving loan fund (RLF) and cleanup grants. There is no cost share requirement for assessment grants.	11/12/2004	<a href="http://www.epa.gov/brownfields/pg/guidelines_2005.htm#overview">http://www.epa.gov/brownfields/pg/guidelines_2005.htm#overview</a>	Atlanta Federal Center, 61 Forsyth Street, Atlanta, GA 30303, Phone (404) 562-8682, Fax (404) 562-8628. jennings.wanda@epa.gov	Source of funds for clean up and redevelopment of sites which may have been impacted by toxic pollutants.	

**Collier County Local Mitigation Strategy  
Funding Sources**

Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Brownfields Training, Research and Technical Assistance Grants	Brownfields Program	United States Environmental Protection Agency/Office of Brownfields Cleanup and Redevelopment	Financial assistance to facilitate "the inventory of brownfield sites, site assessments, remediation of brownfield sites, community involvement and site preparation" to focus brownfields programmatic (goals) attention on the environmental and human health conditions in low income communities and socio-economically disadvantaged communities unable to draw on alternative sources of funding for assessment or cleanup of brownfields and their subsequent redevelopment and to provide technical assistance to communities which will enable them to stimulate economic and other beneficial reuses.	Governmental applicants and non-profit organizations; public and non-profit private universities are eligible as well.	Must emphasize: 1) Community Involvement in Low-income and Socio-Economically Disadvantaged Communities, 2) Integrated Approaches to Brownfields Cleanup and Redevelopment in Low-income and Socio-Economically Disadvantaged Communities, and 3) How the Economics of Brownfields Cleanup and Redevelopment Impact Low-income and Socio-Economically Disadvantaged Communities	Cooperative agreement	\$ 800,000.00	\$ 100,000.00	None, however leveraging of other funding is considered during ranking process	11/16/2004	<a href="http://www.epa.gov/brownfields">www.epa.gov/brownfields</a>	Sven-Erik Kaiser, U.S. EPA Office of Brownfields Cleanup and Redevelopment, Office of Solid Waste and Emergency Response, 1200 Pennsylvania Avenue N.W., Mail code 5105 T, Washington, D.C. 20004, phone: 202-566-2753	Source of funds for clean up and redevelopment of sites which may have been impacted by toxic pollutants.	
Capitalization Grants for Clean Water State Revolving Funds	None	United States Environmental Protection Agency	To fund activities related to protection of water quality. Examples may include construction of wastewater treatment plants, control of runoff, estuary improvement projects, wet weather flow control for sewers and storm sewers, alternative wastewater treatment technologies, and preparation of landfills and riparian buffers, among other types of projects.	States, territories and possessions of the U.S., including the District of Columbia. These entities may use allotments under Title II of the Clean Water Act as grants for the construction of municipal wastewater facilities. Indian tribes are eligible to receive capitalization grants	The purpose of this program is to enable States to create State Revolving Funds (SRFs) through a program of capitalization grants to States which will provide a long term source of State financing for construction of wastewater treatment facilities and implementation of other water quality management activities.	Formula grants	Contact Agency	Contact Agency	20%	Contact Agency	<a href="http://www.epa.gov/owow/">http://www.epa.gov/owow/</a>	United States Environmental Protection Agency, 401 "M" Street, SW, Washington, DC 20460	This is a mitigation funding source for disasters which involve the damage or destruction of water and wastewater treatment plants	
Capitalization Grants for Drinking Water State Revolving Funds	None	United States Environmental Protection Agency	To create Drinking Water State Revolving Funds (DWSRFs) through a program which provides capitalization grants to States in order to establish a long-term source of State financing for the costs of infrastructure needed to achieve or maintain compliance with Safe Drinking Water Act (SDWA) requirements, and to protect public health. The State may also use the Federal funds to establish new programs that emphasize the prevention of contamination problems through water source protection and enhanced water systems management procedures.	The States and Puerto Rico are eligible to receive capitalization grants. The District of Columbia, U.S. Territories, and Indian tribes are eligible to receive direct grants from the program. The funds are to be used by the States to provide loans and other financial assistance to water supply utilities that are publicly and privately owned, or which operate non-profit drinking water systems for small communities.	Capitalization grants are available to each State for the purpose of establishing a Drinking Water State Revolving Fund (DWSRF) for providing assistance for construction of potable water systems at the local level	Formula grants	Contact Agency	Contact Agency	20%	Contact Agency	<a href="http://www.epa.gov/owow/">http://www.epa.gov/owow/</a>	Office of Ground Water and Drinking Water, United States Environmental Protection Agency, 401 "M" Street, SW, Washington, DC 20460; State Contact: (850) 487-1762	This is a mitigation funding source for potential failure of small potable water treatment plants	
Chemical Emergency Preparedness and Prevention Technical Assistance Grant Program	None	United States Environmental Protection Agency	To provide financial assistance to States and Indian Tribes for chemical emergency planning, chemical accident prevention, and community right-to-know programs which are established to prevent or eliminate unreasonable risk to the health and environment of communities within the State.	The States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, the Northern Mariana Islands, and Federally Recognized Indian Tribes. Beneficiaries include States, Local Emergency Planning Committees, and local emergency responders. (Note: In Florida, the Local Emergency Planning Committees (LEPCs) are staffed by the Regional Planning Councils.	Projects which address extremely hazardous substances or high profile chemicals and/or high risk areas are especially of interest. The grant money may not supplant State or Tribal funds already being spent. Because these awards are being made under the Toxic Substances Control Act (TSCA) authorities, all grant proposals must be related to activities involving chemicals subject to regulation under the TSCA.	Project grants	\$ 1,000,000.00	Contact Agency	25%	Contact Agency	<a href="http://www.epa.gov/swercepp">http://www.epa.gov/swercepp</a>	401 "M" Street, SW, Suite 5104, Washington, DC 20460, (202) 260-6657	This is the primary federal funding source for most State and local hazardous material programs. As such, it is an excellent mitigation funding source for chemical emergency incidents.	
Clean Water Act Section 319 Grants/Nonpoint Source Implementation Grants	319 Program	United States Environmental Protection Agency	Formula funds are awarded to states (state agencies) to implement certain non-point source programs pursuant to Section 319(h) of the Clean Water Act, including wetland restoration.	Applicants can include: States, the District of Columbia, American Samoa, Guam, Northern Marianas, Puerto Rico, Pacific Trust Territories, Virgin Islands, and Indian Tribes. Beneficiaries can include: State and local governments, interstate and intrastate agencies, public and private nonprofit organizations and institutions	Requires maintenance of effort; proceeds of State grants may be used for financial assistance to individual persons in the case of demonstration projects only; a limit on administrative costs; annual reporting requirements; and EPA determinations of adequate State progress before additional funding.	Formula grants	\$100,000,000 in 1997	Contact Agency	Federal participation is limited to 60%, and an EPA approved State non-point source management program is required.	Contact Agency	<a href="http://www.epa.gov/owow/">http://www.epa.gov/owow/</a>	Nonpoint Source Control Branch, Assessment and Watershed Protection Division, Office of Wetlands, Oceans and Watersheds, United States Environmental Protection Agency, 401 "M" Street, SW, Washington, DC 20460	This is a good program for local governments; however, funding is through the Florida Department of Environmental Protection through a competitive grant process; thus the usefulness of this program to smaller local governments may be limited	

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Coastal Zone Management Program	CZM	United States Department of Commerce/National Oceanic and Atmospheric Administration	Funds for planning and implementing sustainable management of coastal zones. Section 306 Grants are for programs at the state level and for coastal hazard mitigation strategies, including the development of local hazard mitigation plans, outreach and education activities, monitoring programs, and projects to enhance program management. Section 308 Grants, The Coastal Zone Management Fund, provides emergency grants to address a wide range of unforeseen or disaster-related circumstances. Section 309 Grants are competitive funds designed to enhance state programs, including planning and land regulation activities, enhancing natural features, and preventative measures.	State, tribal, and local entities	Through FDEP, the State has an annual funding program which allows coastal zone program monies to be passed on to local governments. In order to be funded, the project must be consistent with the State's approved Coastal Zone Management Program. The consistency review process is coordinated by the Florida Department of Community Affairs's Coastal Zone Management Office.	Grants and cooperative agreements	Contact Agency	Contact Agency	Contact Agency	Contact Agency	<a href="http://www.noaa.gov">http://www.noaa.gov</a>	Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 1305 East-West Highway, Silver Spring, MD 20910, (301) 713-3102	The State's Coastal Program consists of the majority of the State statutes concerning environmental regulations, as well as portions of Chapters 163 and 180, <u>Florida Statutes</u> , dealing with the local comprehensive planning requirements. In that sense, the program is a mitigation funding source for hurricane and coastal storm disasters, and for inappropriate planning and zoning decisions which might contribute to potential future disasters.	
Community Assistance Program – State Support Services Element	CAP	United States Department of Homeland Security/Federal Emergency Management Agency	To ensure that communities participating in the National Flood Insurance Program (NFIP) are achieving flood loss reduction measures consistent with program direction. The program is intended to identify, prevent, and resolve floodplain management issues in participating communities before they require compliance action by FEMA.	The direct beneficiary of the CAP-SSSE is the individual State receiving financial assistance. In addition, participating NFIP communities and local governments which receive floodplain management and flood loss reduction assistance provided by the State are also (indirect) beneficiaries as a consequence of the services they receive.	The CAP-SSSE is a product-oriented program directly related to the flood loss reduction objectives of the NFIP.	Cooperative agreement	\$5,000,000 in 1997	Contact Agency	75% federal maximum and 25% minimum State cost sharing basis	Contact Agency	<a href="http://www.fema.gov/mit/">http://www.fema.gov/mit/</a>	Program Implementation Division, Mitigation Directorate, Federal Emergency Management Agency, 500 “C” Street, SW, Room 430, Washington DC, 20472, (202) 646-3121	This program does not provide any form of direct mitigation funding to local governments. However, the program is a source of funding for State Programs and, thus, indirectly impacts local governments.	
Community Development Block Grant Program	CDBG	United States Department of Housing and Urban Development THROUGH Collier County Financial Administration and Housing Department	Annually allocated to Collier County to develop viable urban communities through decent housing, a suitable living environment, and by expanding economic activities, principally for low- and moderate-income persons.	Non profit organizations (501(c)3 and governmental organizations	Contact Collier County Financial Administration and Housing Department for details and current priorities outlined in annual plan	Grants	varies from year to year	Contact Agency	none, although applicant commitment gives project higher ranking	Contact Agency	<a href="http://www.hud.gov">http://www.hud.gov</a>	Local Contact - Collier County Financial Administration and Housing Department - 403-2330; Federal Contact - Office of Community Planning and Development, United States Department of Housing and Urban Development, 451 7 <sup>th</sup> Street, SW, Washington, DC 20410, (202) 708-3587	Funds call also fund long-term needs, such as acquisition, rehabilitation, or reconstruction of damaged properties and facilities and redevelopment of disaster-affected areas. Funds may also be used for emergency response activities, such as debris clearance and demolition, and extraordinary increases in the level of necessary public services.	
Community Disaster Loans	None	United States Department of Homeland Security/Federal Emergency Management Agency	To provide loans to any local government that has suffered substantial loss of tax and other revenues, and which is in a geographic area in which the President designates a major disaster exists. The funds can only be used to maintain existing functions of a municipal operating character and the local government must demonstrate a need for financial assistance.	Applicants must be in a designated major disaster area and must demonstrate that they meet the specific conditions of FEMA Disaster Assistance Regulations 44 CFR, Part 206, Subpart K, Community Disaster Loans. To be eligible the applicant must demonstrate: 1) a substantial loss of tax and other revenues, as a result of a major disaster; and 2) a need for financial assistance to perform its governmental functions. Any local government within a designated disaster area is a potential beneficiary.	Loans are made only to local governments or other political subdivisions of the State, and are based on need, not to exceed 25 percent of the annual operating budget of the local government for the fiscal year in which the disaster occurs. The funds cannot be used to meet the non-federal share of any Federal program, finance capital improvements, or repair or restore public facilities	Direct loans	Contact Agency	Contact Agency	25%	Contact Agency	<a href="http://www.fema.gov/r-n-r/">http://www.fema.gov/r-n-r/</a>	Response and Recovery Directorate, Federal Emergency Management Agency, 500 “C” Street, SW, Washington, DC 20472, (202) 646-4066	This is an excellent mitigation program for the purpose of enabling local governments to temporarily (occasionally, permanently) recoup their disaster period operating expenses.	
Comprehensive Improvement Assistance Program for Public and Indian Housing	CIAP	United States Department of Housing and Urban Development	To provide capital funds to improve the physical condition and to upgrade the management and operation of existing Public and Indian Housing projects to assure that they continue to be available to serve low-income families.	Public Housing Agencies (PHAs) and Indian Housing Authorities (IHAs) operating PHA/IHA-owned low-income housing projects under an existing Annual Contributions Contract (ACC) with fewer than 250 units. The residents of the housing projects are the program's ultimate beneficiaries.	Comprehensive Improvement Assistance Program (CIAP) funding may be used to fund capital improvements, as well as major repairs, management improvements, and planning costs.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.hud.gov/pri/rodesc/pihindx.html">http://www.hud.gov/pri/rodesc/pihindx.html</a>	Office of Public and Indian Housing, U.S. Department of Housing and Urban Development, 451 7 <sup>th</sup> Street, SW, Washington, DC 20410, (202) 708-0950	This is a good funding source for local housing agencies which are contemplating modernizing and upgrading their existing public housing projects. The program also covers the establishment of new public housing projects. This is disaster mitigation in the sense that sub-standard housing is less likely to withstand a disaster than is “up-to-code” housing.	

Collier County Local Mitigation Strategy  
Funding Sources

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Disaster Mitigation Planning and Technical Assistance	None	United States Department of Commerce/Economic Development Administration	Primarily for economic development initiatives, but also for hazard mitigation when the focus is on creating disaster resistant jobs and workplaces; monies are applicable because projects related to developing infrastructure are also making the community more disaster resistant.	Primarily for economic development initiatives, but also for hazard mitigation when the focus is on creating disaster resistant jobs and workplaces; monies are applicable because projects related to developing infrastructure are also making the community more disaster resistant.	Contact Agency	Grants	Contact Agency	Contact Agency	Contact Agency	Contact Agency	<a href="http://www.doc.gov/eda/grants">http://www.doc.gov/eda/grants</a>	United States Department of Commerce, 1244 Speer Boulevard, Suite 670 Denver, CO 80204-3591 (303) 844-4715.	Primarily for economic development initiatives, but also for hazard mitigation when the focus is on creating disaster resistant jobs and workplaces; monies are applicable because projects related to developing infrastructure are also making the community more disaster resistant.	
Disaster Relief Program	DRI/Disaster Recovery Initiative	United States Department of Housing and Urban Development	Provides flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas. When disasters occur, Congress may appropriate additional funding for the CDBG and HOME programs as DRI grants to rebuild the affected areas and bring crucial seed money to start the recovery process. Since it can fund a broader range of recovery activities than most other programs, DRI helps communities and neighborhoods that otherwise might not recover due to limited resources. DRI supplements disaster programs of the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers.	States and local governments in places that have been designated by the President of the United States as disaster areas	Examples of funded activities include: (1) buying damaged properties in a flood plain and relocating them to safer areas; (2) relocation payments for people and businesses displaced by the disaster; (3) debris removal; (4) rehabilitation of homes and buildings damaged by the disaster; (5) buying, constructing, or rehabilitating public facilities such as water and sewer systems, streets, neighborhood centers, and government buildings; (6) code enforcement; (7) home ownership activities such as down payment assistance, interest rate subsidies and loan guarantees; (8) public services (generally limited to no more than 25 percent of the grant); (9) energy conservation activities; (10) helping businesses create jobs; and (11) planning and administration costs (limited to no more than 20 percent of the grant)	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.hud.gov">http://www.hud.gov</a>	Office of Community Planning and Development, United States Department of Housing and Urban Development, 451 7 <sup>th</sup> Street, SW, Washington, DC 20410, (202) 708-3587 Extension 4538	The funds from this program are distributed to the State, to be disbursed to local governments within declared disaster areas. This program is part of the "package" of funding sources which the federal government makes available to States which have suffered from disasters.	
Disposal of Federal Surplus Real Property	None	United States General Services Administration	To dispose of surplus federal property through lease, use permits, sale, exchange or donation.	State and local governments are eligible to apply for surplus real property for the purpose of constructing parks, recreational facilities, correctional institutions, historical monuments, public airports, health facilities, educational institutions, facilities to serve homeless persons, replacement housing, and general public purposes.	Surplus real and related personal property may be conveyed to eligible entities for use as public parks or recreation areas, and public health or educational uses at discounts of up to 100%. Property to be utilized for public airports, wildlife conservation, correctional facilities, replacement housing, and historic monuments, may be provided to eligible agencies at no cost. Otherwise, property planned to be utilized for general public uses can be provided, without restrictions, at a negotiated cost of fair market value or greater.	Varies depending on type of acquisition	N/A	N/A	None	N/A	Not provided	Office of Property Disposal, General Services Administration, Public Building Service, Washington, DC 20405 (202) 501-0084	Excellent way for a local agency to replace equipment which was damaged or lost as a result of its use in disaster response activities. Response/relief agencies can find replacement equipment and supplies within the Federal inventory.	
Emergency Bank Protection	None	United States Department of Defense/United States Army/United States Army Corps of Engineers	To provide protection for highways, highway bridges, essential public works, churches, hospitals, schools, and other nonprofit public services which are endangered by flood-caused erosion.	States, political subdivisions of States or other responsible local agencies which have been established under State law with full authority and ability to undertake necessary legal and financial responsibilities	The Corps of Engineers designs and constructs the project. Each project selected must be feasible from an engineering standpoint, complete within itself and economically justifiable.	Specialized services, Contact Agency	\$12,500,000 spent nationwide in 1996	Non-federal interests are responsible for all project costs in excess of the Federal limit of \$500,000	Anything above \$500,000 project costs	Contact Agency	<a href="http://www.usace.army.mil/">http://www.usace.army.mil/</a>	U.S. Army Corps of Engineers, United States Army, United States Department of Defense, USACE, Attention: CECW-PM DoD, Washington, DC 20314-1000, (202) 272-0169	Any local government which is aware of a local critical facility which has recently been endangered by erosion of a stream bank or flowway could be an eligible local sponsor for this type of federal aid. While most of these projects are related to erosion of highways or bridge embankments, the Corps has also conducted erosion control projects for schools, hospitals, wastewater treatment plants, and other types of public facilities.	

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Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Emergency Community Water Assistance Grants	None	United States Department of Agriculture	Available to rural communities when disaster strikes. Congress may appropriate funds for the program after a flood, earthquake, or other disaster if Federal assistance is warranted.	Applicants must demonstrate that a significant decline in quantity or quality of water occurred within two years of the date the application was filed with RUS. Public bodies and nonprofit corporations serving rural areas, including cities or towns whose population does not exceed 10,000 people may be eligible.	Extend, repair, or perform significant maintenance on existing water systems; construct new water lines, wells or other sources of water, reservoirs, and treatment plants; replace equipment; and pay costs associated with connection or tap fees. (2) Pay related expenses such as legal and engineering fees and environmental impact analyses, or acquire rights associated with developing sources of, treating, storing, or distributing water. (3) Achieve compliance with the requirements of the Federal Water Pollution Control Act (33 U.S.C. 1 et seq.) or with the Safe Drinking Water Act when noncompliance is directly related to a recent decline in quality of potable water.	Grants	\$21,700,000 (FY 03)	\$ 500,000.00	None	Contact Agency	<a href="http://www.usda.gov/rus/water/docs/wwfact.pdf">http://www.usda.gov/rus/water/docs/wwfact.pdf</a>	Assistant Administrator, Water and Environmental Programs, USDA – RUS, Washington, D.C. 20250, Telephone: (202) 720-9583	Construction of new or improved facilities that are up to current standards, wind strengths, etc. is mitigation.	
Emergency Management Assistance for State and Local Governments	State and Local Assistance (SLA)	United States Department of Homeland Security/Federal Emergency Management Agency	To encourage the development of comprehensive disaster preparedness and assistance plans, programs, capabilities, and organizations by the States and by local governments.	Applications are accepted only from States; local governments and Indian Tribes are eligible to participate as sub-grantees under their States' applications.	SLA funds may be used for necessary and essential State and local emergency management personnel and administrative expenses including salaries and benefits of emergency management personnel, essential official travel and other administrative expenses.	Formula grants	Varies from year to year	Contact Agency	Vaires	Contact Agency	<a href="http://www.fema.gov/pre/about.htm">http://www.fema.gov/pre/about.htm</a>	State and Local Preparedness Division, Preparedness, Training and Exercises Directorate, Federal Emergency Management Agency, 500 "C" Street, SW, Washington, DC 20472, (202) 646-3492	This program covers a wide variety of activities; both at the State and local levels. Local agencies should maintain communications with their appropriate State contacts, in order to determine what kinds of activities will be eligible to receive funding during the fiscal year	
Emergency Management Preparedness and Assistance Trust Fund - General	EMPA	Florida Department of Community Affairs	To implement projects that will further state and local emergency management objectives	State or regional agencies, local governments, and private non-profit organizations	Eligible applicants may submit multiple applications, however, no single application shall seek or receive an award in excess of \$300,000. All eligible applicants, with the exception of counties and state agencies shall be limited to no more than three (3) application submissions in an application cycle.	Grants	Contact Agency	\$300,000 max.	Points awarded depending on match provided	To submit to County EM Department for review- January; to DEM - February	<a href="http://www.floridadisaster.org/cps/grants.htm#CompetitiveGrant">http://www.floridadisaster.org/cps/grants.htm#CompetitiveGrant</a>	Department of Community Affairs, Division of Emergency Management, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100, Paula Churchwell, (850) 413-9942, paula.churchwell@dca.state.fl.us	Projects that do any of the following mitigation: 1) promote public education on disaster preparedness and recovery relief efforts of statewide private sector organizations, including public-private business partnership efforts, or 3) improve the training and operations capabilities of agencies assigned lead or support responsibilities in the State Comprehensive Emergency Management Plan.	
Emergency Management Preparedness and Assistance Trust Fund - Municipalities	EMPA	Florida Department of Community Affairs	To implement projects that will further state and local emergency management objectives	Municipalities that are legally constituted	Municipalities must have an authorized, established, and maintained emergency management program, and have signed the current Statewide Mutual Aid Agreement (SMAA) and supplied all required information and documentation such that the SMAA agreement is ready to be signed by the Division as of the date of the application deadline.	Grants	Contact Agency	\$ 50,000.00	Points awarded depending on match provided	To submit to County EM Department for review- January; to DEM - February	<a href="http://www.floridadisaster.org/cps/grants.htm#CompetitiveGrant">http://www.floridadisaster.org/cps/grants.htm#CompetitiveGrant</a>	Department of Community Affairs, Division of Emergency Management, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100, Paula Churchwell, (850) 413-9942, paula.churchwell@dca.state.fl.us	Projects that do any of the following mitigation: 1) promote public education on disaster preparedness and recovery issues, 2) enhance coordination of relief efforts of statewide private sector organizations, including public-private business partnership efforts, or 3) improve the training and operations capabilities of agencies assigned lead or support responsibilities in the State Comprehensive Emergency Management Plan.	

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Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Emergency Relief Program	None	United States Department of Transportation/Federal Highway Administration	To assist State Transportation agencies in planning for and developing an integrated, interconnected transportation system based upon the National Highway System (including the interstate system). The program will also assist state agencies in making transportation improvements to all public roads (excepting designated "minor collectors"). The program will also assist in repairs to federal-aid roads after disasters. The program objectives are to foster safe highway design, replace or rehabilitate deficient or obsolete bridges, and to provide for certain special purposes.	State transportation agencies, or local road/bridge agencies receiving federal funds.	Federal-aid highway funds are generally apportioned by statutory formulas to the States and restricted to roads open to the public and not functionally classified as local or rural minor collectors. Exceptions to this include planning and research activities, bridge and safety improvements which may be done on any public road. Projects in Collier County must be based on transportation planning process carried out by the Metropolitan Planning Organization (MPO) in cooperation with the State and transit operators, and be included in metropolitan plans and programs. These projects must also be included in the approved statewide transportation improvement program (STIP)	Formula Grants and Project Grants		Contact Agency	None	Contact Agency	<a href="http://www.fhwa.dot.gov/">http://www.fhwa.dot.gov/</a>	Director, Office of Engineering, Federal Highway Administration, United States Department of Transportation, 400 Seventh Street, SW, Washington, DC 20590, (202) 366-4853,	In order to use this program for mitigation purposes, it would probably be necessary for the local transportation agency to establish some type of partnership with the Florida Department of Transportation (FDOT). Furthermore, the particular project might have to be scheduled on FDOT's five-year work program for the region. Thus, it could take several years for the project to be selected, scheduled, funded and then actually completed.	
Emergency Watershed Protection Program	EWP	United States Department of Agriculture/Natural Resources Conservation Service	Undertake emergency measures, including the purchase of flood plain easements, for runoff retardation and soil erosion prevention to safeguard lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed. It is not necessary for a national emergency to be declared for an area to be eligible for assistance. Program objective is to assist sponsors and individuals in implementing emergency measures to relieve imminent hazards to life and property created by a natural disaster. Activities include providing financial and technical assistance to remove debris from streams, protect destabilized streambanks, establish cover on critically eroding lands, repairing conservation practices, and the purchase of flood plain easements. The program is designed for installation of recovery measures.	Public and private landowners are eligible for assistance but must be represented by a project sponsor. The project sponsor must be a public agency of state, county, or city government, or a special district.	All EWP work must reduce threats to life and property. Furthermore, it must be economically and environmentally defensible and sound from an engineering standpoint. EWP work must yield benefits to more than one person. All work must represent the least expensive alternative.	Individual assistance	Varies depending on project	Varies depending on project	25%	Contact Agency	<a href="http://www.nrcs.usda.gov/programs/ewp/">http://www.nrcs.usda.gov/programs/ewp/</a>	NRCS Naples Service Center, 14700 Immokalee Road, Naples, Florida 34120-1468, (239) 455-4100, (239) 455-2693 fax	Emergency work includes establishing quick vegetative cover on denuded land, sloping steep land, and eroding banks; opening dangerously restricted channels; repairing diversions and levees; and other emergency work; purchase of rural and agricultural floodplain easements designed to retire land from frequent flooding to preclude federal disaster payments, retire land to allow levee setbacks, or limit the use of the land.	
Environmental Justice Grants to Small Community Groups	None	United States Environmental Protection Agency	To provide financial assistance to community-based organizations and Tribal governments for the support of projects to design, demonstrate or disseminate practices, methods or techniques related to environmental justice.	Eligible applicants include: community-based grassroots organizations, other incorporated nonprofit organizations and federally recognized Tribal Governments. Eligible beneficiaries can include: the general public, community groups, public nonprofit institutions/organizations, and federally recognized Tribal governments.	Projects may include: 1. design, demonstration, or dissemination of environmental justice curricula, including development of educational tools and materials; 2. design and demonstration of field methods, practices, and techniques, including assessment of environmental and ecological conditions and analysis of environmental and public health problems; 3. identification, assessment or improvement of a specific local environmental justice issue or a specific environmental problem; and, 4. provision of environmental justice training or related education for teachers, faculty, or related personnel in a specific geographic area or region.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://es.epa.gov/oeca/oej/">http://es.epa.gov/oeca/oej/</a>	Office of Environmental Justice, United States Environmental Protection Agency, 401 "M" Street, SW, Suite 2201A, Washington, DC 20460, (202) 564-2515	The program is geared toward helping local communities educate the public about potential environmental hazards, and to alleviating such hazards when they are identified (particularly with regard to lower income areas within a local jurisdiction). Communities or groups looking for funding to clean up hazardous waste sites in residential areas, remove or reduce sources of water and air pollution, and/or seeking to halt environmental health problems should investigate this program	

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Fannie Mae Pilot Loan Program	None	United States Department of Homeland Security/Federal Emergency Management Agency/Florida Department of Community Affairs	FEMA and DCA jointly sponsor this program. It makes consumer installment loans available to Florida homeowners to make specific disaster prevention home improvements.	All single-family homeowners in Florida.	Homeowners may borrow up to \$15,000 and take up to 10 years to repay the loan.	Loans	N/A	\$ 15,000.00	N/A	N/A	<a href="http://www.fema.gov/fima/">http://www.fema.gov/fima/</a>	3003 Chamblee-Tucker Rd., Atlanta, Georgia 30341 (770) 220-5200	When Florida homeowners make improvements to their homes to protect the structure from disasters, they are potentially mitigating certain disaster related problems and reduce insurance claims and costs.	
First Responder Anti-Terrorism Assistance	None	United States Department of Homeland Security/Federal Emergency Management Agency	To enhance the capabilities of first responders in managing the consequences of terrorist acts.	All fire and emergency first response agencies and law enforcement personnel who have operational and/or incident management responsibilities	Training is provided through State fire training programs. The program is targeted to first responders, as being the individuals who will first come into contact with and have to manage terrorist acts and their consequences.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.fema.gov/">http://www.fema.gov/</a>	U.S. Fire Administration, Fire Academy, Federal Emergency Management Agency, 16825 South Seton Avenue, Emmitsburg, MD 21727, (301) 447-1158	These funds are provided to the State Fire College (in Florida), and aren't really available to local agencies. However, first response agencies who either come into contact with terrorist acts, or who expect to do so, would do well to contact the State Fire College or FEMA and explore the possibility of making this training available to their employees	
Fisheries Development, Utilization Research and Development	None	United States Department of Commerce/National Oceanic and Atmospheric Administration	These related programs are administered by the National Marine Fisheries Service (NMF). The stated purpose of these programs is: "To increase greatly the Nation's wealth and quality of life through sustainable fisheries that support fishing industry jobs, safe and wholesome seafood, and recreational opportunities."	Any United States citizen, any group of commercial interests, federal, state or local governments, or groups thereof	Proposals must be consistent with the annual funding priorities of the applicable NMF or Regional Fisheries Council offices. Applicants should demonstrate an awareness of the fisheries resources of their region, as well as the issues or problems associated with local fisheries. Issues and problems to be addressed in the project should be supported by industry experience.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.nmfs.gov/sfweb/sfhome.html">http://www.nmfs.gov/sfweb/sfhome.html</a>	Office of Sustainable Fisheries Division, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 1315 East-West Highway, Silver Spring, MD 20910, (301) 713-2358	Any entity meeting the eligibility requirements, and interested in fisheries enhancement could apply. Presumably, if a disaster had damaged a fisheries resource, or an economic disaster was likely, due to a fisheries collapse, program funds could be used for restoration purposes.	
Flood Insurance	FIP	United States Department of Homeland Security/Federal Emergency Management Agency/National Flood Insurance Program	To enable persons to purchase insurance against physical damage to or loss of buildings and/or contents therein caused by floods, mudslide (i.e., mud flow), or flood-related erosion, thereby reducing Federal disaster assistance payments, and to promote wise floodplain management practices in the Nation's flood-prone and mud flow-prone areas.	Flood insurance can be made available in any community (a State or political subdivision thereof with authority to adopt and enforce floodplain management measures for the areas within its jurisdiction) that submits a properly completed application to FEMA including copies of enacted floodplain management measures consistent with the National Flood Insurance Program regulations.	Under the Emergency Program of the National Flood Insurance Program (NFIP), property owners may buy flood insurance at a chargeable premium rate that is generally lower than a normal actuarial rate.	Insurance	N/A	Maximum amounts of such coverage available under the Emergency Program of the NFIP are: \$35,000 for a single-family home, \$100,000 for all other residential structures, plus \$10,000 per dwelling unit for any contents; for non-residential structures, an aggregate liability for any single structure of \$100,000 and for contents, \$100,000 per unit.	None	N/A	<a href="http://www.fema.gov/nfip/">http://www.fema.gov/nfip/</a>	National Flood Insurance Program, Federal Emergency Management Agency, 500 "C" Street, SW, Room 430, Washington DC, 20472 (202) 646-2781	This is the quintessential hazard mitigation program in the United States. So important is this program that it essentially drives all federal flood, storm and hurricane related disaster response programs. One of the best mitigation activities a local government could undertake would be to encourage increased resident purchase of flood insurance.	
Flood Mitigation Assistance Program	FMA	United States Department of Homeland Security/Federal Emergency Management Agency	To fund cost-effective measures by States and communities that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other insurable structures. Planning grants assist state agencies and local governments in developing or updating flood mitigation plans that assess risk and propose possible mitigation actions. Project grants assist state agencies and local governments in implementing flood mitigation projects that will reduce risk of flood damage to repetitive loss properties identified in a flood mitigation plan.	State agencies, local governments participating in the National Flood Insurance Program (NFIP), and qualified local organizations.	Planning Grants may be used to assist States and communities in developing and updating flood mitigation plans. Technical Assistance Grants may be used to provide States with funding that will allow them to provide technical assistance to communities that are completing applications for Flood Mitigation Assistance (FMA) planning or project grants, or in the process of implementing FMA-funded mitigation projects. The only applicants eligible for Technical Assistance Grants are the State agencies or departments responsible for administering FMA. Project Grants may be used to assist States and communities in implementing flood mitigation projects to reduce the risk of flood damage to insurable structures	Project grants and formula grants	\$20 million	Individual planning grants will not exceed \$150,000 to any State agency applicant, or exceed \$50,000 to any community applicant. The total planning grant made in any Fiscal Year to any State, including all communities located in the State, will not exceed \$300,000. Project Grants: \$100,000 - base amount per State, with remaining funds distributed based on the number of flood insurance policies and repetitively damaged structures.	25%	Contact Agency	<a href="http://www.fema.gov/mit/">http://www.fema.gov/mit/</a>	Mitigation Directorate, Federal Emergency Management Agency, 500 "C" Street, SW, Washington, DC 20472 (202) 646-4621	This is a very good mitigation program for communities which are members of the NFIP and actively maintain their ratings status under the program. The primary requirement of the grant program is that the community must have or propose to develop a mitigation plan to guide proposed activities. Regional staff notes that the approved, finalized Local Mitigation Strategy may meet the criteria for such planning	

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Flood Plain Management Services	None	United States Department of Defense/United States Army/United States Army Corps of Engineers	Section 206 of the 1960 Flood Control Act provides USACE services in planning and technical services without charge for studies, including hurricane evacuation studies, comprehensive flood plain management studies, flood damage reduction studies, urbanization impact studies, stormwater management studies, and inventories of flood-prone structures.	State, tribal, and local governments	None provided	Services	N/A	N/A	N/A	N/A	<a href="http://www.saj.usace.army.mil/">http://www.saj.usace.army.mil/</a>	Jacksonville Corps Of Engineers, 904-232-2568 or 1-800-291-9405	Planning, designing and constructing for flood control is a form of mitigation	
Florida Communities Trust/Florida Forever Program	FCT	Florida Department of Community Affairs/Florida Communities Trust	To facilitate the purchase of lands, for conservation and/or recreation purposes, by local governments	Local governments and non-profit environmental organizations that are tax exempt under section 501(c)(3) of the United States Internal Revenue Code are eligible to apply for funding.	Land acquisition proposals in which the local government proposes to use matching funds are viewed more favorably than outright grants. However, both types of financing can be approved.	Purchases, purchase agreements	\$66 million	\$6.6 million	Counties with populations greater than 75,000 and municipalities with populations greater than 10,000 are required to provide a minimum match of 25% of the total project cost. Small counties and cities that are under the above thresholds, and eligible nonprofit environmental organizations, may apply for a 100% grant award.	May each year, date varies	<a href="http://www.dca.state.fl.us/fct/">http://www.dca.state.fl.us/fct/</a> or <a href="http://www.state.fl.us/comaff/MORE_AB7/progindx/dfct.html">http://www.state.fl.us/comaff/MORE_AB7/progindx/dfct.html</a>	2555 Shumard Oaks Blvd., Tallahassee, FL 32399-922-2207 (850) fctinfo@dca.state.fl.us	Because of its emphasis on preservation, conservation and environmental protection, this program is often overlooked as a potential funding source for disaster mitigation. However, a partially settled area, wherein the local government has recorded periodic reoccurring flood damage, is an excellent subject for purchase with funds from this program; particularly if other (environmental) benefits can also be demonstrated.	
Florida Recreation Development Assistance Program	FRDAP	Department of Environmental Protection/Division of Recreation and Parks	Provides grants for acquisition or development of land for public outdoor recreation use or to construct or renovate recreational trails.	Municipal and county governments or other legally constituted entities with the legal responsibility to provide public outdoor recreation.	Applicants may submit up to two applications during the submission period	Grants	Contact Agency	\$ 200,000.00	The match requirements depend on the total project cost: 1) \$50,000 or less requires a 0% match, 2) \$50,001 - 150,000, requires a 25% match, and 3) over \$150,000, requires a 50% match. Matching funds may be in the form of cash, the value of undeveloped land owned by the applicant (subject to conditions), or in-kind services.	October each year	<a href="http://www.dep.state.fl.us/parks/bdrs">www.dep.state.fl.us/parks/bdrs</a>	Bureau of Design and Recreation Services, 3900 Commonwealth Boulevard, Mail Station #585, Tallahassee, Florida 32399-3000, Phone: 850/488-7896, Fax: 850/488-3665, mahogany.r.simmons@dep.state.fl.us	Acquisition of land or improvement of acquired land may be mitigation.	
Florida Warning and Information Network	None	Florida Department of Community Affairs	This is a state-sponsored program to harden existing facilities against disasters events. The program contains some new elements and may be applicable to needs identified by participating municipalities.	Contact Agency	None provided	Contact Agency	\$4.66 million	Contact Agency	Contact Agency	Contact Agency	<a href="http://www.floridadisaster.org/hwaw/appendix/fwin.htm">http://www.floridadisaster.org/hwaw/appendix/fwin.htm</a>	Chuck Hagan, Florida Division of Emergency Management 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100 850.413.9900 charles.hagan@dca.state.fl.us	Hardening facilities against hazards is a form of mitigation	
Food Distribution	Food Donation Program	United States Department of Agriculture	To improve the diets of school-age and pre-school children, the elderly, needy persons in charitable institutions, and other individuals requiring food assistance. To increase the market for domestically produced foods which have been acquired under surplus removal or price support programs.	State, territorial and federal agencies involved in food distribution programs, or other entities who receive and distribute donated food, school systems and child-feeding programs, charitable institutions to the extent that they serve needy persons, emergency feeding operations, elderly nutrition programs, elderly nutrition programs for American Indians on reservations, and households participating in The Emergency Food Assistance Program, are eligible to participate, but must do so through the relevant State or Federal agency.	USDA makes food available to state agencies for distribution to qualified outlets. These outlets include, but may not be limited to, emergency feeding organizations, soup kitchens, food banks, child/adult day care facilities, certain charitable institutions, elderly nutrition programs, non-profit summer camps, and Summer Food Service Programs for children. Individuals receiving food are not charged. Donated foods may not be sold, exchanged or disposed of by the distributing agencies, without specific prior approval by the USDA.	Sale, exchange or donation of food/food supplies.	N/A	N/A	N/A	N/A	<a href="http://www.usda.gov">http://www.usda.gov</a>	Food Distribution Division, Food and Consumer Service, United States Department of Agriculture, Park Office Center, Room 502, 3101 Park Center Drive, Alexandria, VA 22302, (703) 305-2680	In order to use this program for mitigation purposes, a local agency would need to establish an emergency food distribution service meeting all applicable state and federal requirements. In order to justify its existence, the service would also have to operate in a non-disaster capacity. It is likely that most local governments are aware of local programs which provide meals, canned goods, etcetera, to needy individuals. A good mitigation strategy might be to work with one or more of these agencies (already certified under the USDA program) to establish mechanisms for quickly putting disaster mass feeding operations in place.	

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Forest Lands	None	Florida Department of Agriculture and Consumer Services/Division of Forestry	To preserve Florida forests	The State of Florida receives annual Florida Forever funding for the acquisition of forested lands	The program operates primarily through the purchase of land from "willing sellers". However, land acquired through other land acquisition programs may also be added to the State Forest System.	Purchases, purchase agreements, donations, condemnation, purchase of development rights, conservation easements, etc.	Contact Agency	Contact Agency	Contact Agency	Contact Agency	<a href="http://www.fl-dof.com/">http://www.fl-dof.com/</a>	Division of Forestry, Florida Department of Agriculture and Consumer Services, 3125 Conner Boulevard, Tallahassee, FL 32399-1650, (850) 488-4274	Acquisition of lands, especially along the coast or rivers is mitigation because it removes the potential for development. Acquisition and subsequent appropriate management of interior forested lands is mitigation .	
Greenways and Trails Land Acquisition Program	Florida Forever	Office of Greenways and Trails/Department of Environmental Protection	To preserve natural environments and to establish a State Trail System. The Florida Recreational Trails Program was created in 1979, and in 1987 the Florida Rails-to-Trails Program was created to acquire abandoned railroad rights of way and additions to the Florida National Scenic Trail for recreational purposes. This program was added to the Preservation 2000 program in 1990. In 1996, the Florida State Legislature created the Florida Greenways and Trails Acquisition Program. The components of the original Recreational Trails program are still included in the new program, but now the Department of Environmental Protection can purchase greenways in addition to purchasing abandoned railroad rights-of-way and additions to the Florida National Scenic Trail.	Federal, state, or local government; non-profit organizations; and individual citizens of Florida. For a project to qualify for the Greenways and Trails Acquisition Program, it must meet the following criteria: (1) have documentation of a willing seller; (2) have documentation of a willing manager; and, (3) meet the definition of a greenway or trail	A Certificate of Eligibility is necessary to prove that the applicant's proposed project meets the following criteria: project meets statutory definition of greenway or trail, the project is located within or adjacent to an opportunity segment on the Recreational Prioritization Maps, at least 80% of project has a willing seller(s), project has a willing manager	Land acquisition	\$4.5 million	Depends on land costs	Variable	August each year	<a href="http://www.dep.state.fl.us/gwt/acq/">http://www.dep.state.fl.us/gwt/acq/</a>	Cindy Radford, Office of Greenways & Trails, Department of Environmental Protection, 3900 Commonwealth Blvd., MS 795, Tallahassee, Florida 32399-3000, cynthia.radford@dep.state.fl.us 850-245-2052	Because of its emphasis on preservation, conservation and environmental protection, this program is often overlooked as a potential funding source for disaster mitigation. Also, these funds are not directly available to local governments, unless, of course, the local agency is the land. However, in Florida, lands which are environmentally endangered, such as wetlands, coastal areas and riverine areas, are often also lands subject to flooding, tidal surge, frequent fires and other natural hazards. Removal of these properties from the threat of development is thus a form of disaster mitigation.	
Hazard Mitigation Grant Program - Section 404	HMGP - Post Disaster Hazard Mitigation Program	United States Department of Homeland Security/Federal Emergency Management Agency and Florida Department of Community Affairs/Division of Emergency Management	To prevent future losses of lives and property due to disasters. The program seeks to aid emergency management agencies in implementing State and local hazard mitigation plans, to enable mitigation measures to begin in the immediate aftermath of a disaster, and to provide funding to enable agencies to implement previously identified mitigation measures.	State and local governments, private/non-profit organizations, Indian	Eligible applicants make application through their State emergency management agency following a Presidential disaster declaration. Eligible projects include, but may not be limited to, elevating, relocating, acquiring, or demolishing structures so as to prevent or reduce future losses. Following a disaster declaration, the State will advertise that HMGP funding is available to fund mitigation projects in the State. Those interested in applying to the HMGP should contact their local government to begin the application process. Local governments should contact their State Hazard Mitigation Officer.	Grants	The amount of funding available for the HMGP under a particular disaster declaration is limited. The program may provide a State with up to 7.5 percent of the total disaster grants awarded by FEMA. States that meet higher mitigation planning criteria may qualify for 20 percent under the Disaster Mitigation Act of 2000.	Varies depending on amount of overall funding allocated post disaster	FEMA can fund up to 75% of the eligible costs of each project. The State or grantee must provide a 25% match, which can be fashioned from a combination of cash and in-kind sources. Funding from other Federal sources cannot be used for the 25% share with one exception	Applications for mitigation projects are encouraged as soon as possible after the disaster occurs so that opportunities to do mitigation are not lost during reconstruction. The State will set a deadline for application submittal. You should contact your State Hazard Mitigation Officer for specific application dates.	<a href="http://www.fema.gov/mit">http://www.fema.gov/mit</a> or <a href="http://www.floridadisaster.org">http://www.floridadisaster.org</a>	Mitigation Directorate, Federal Emergency Management Agency, 500 "C" Street, SW, Emmitsburg, MD 20472 (202) 646-4621 or Eric Poole, Florida Division of Emergency Management 2555 Shumard Oak Blvd. Tallahassee, Florida 32399-2100 (850) 413-9947 <a href="http://www.floridadisaster.org">http://www.floridadisaster.org</a>	This is one of the better mitigation funding sources. From examining the various projects referenced on the DCA website, it appears that these funds could be utilized for a large variety of mitigation projects.	
Hazard Mitigation Technical Assistance Program	HMTAP	United States Department of Homeland Security/Federal Emergency Management Agency	To provide technical support to state/local communities, FEMA Regional and Headquarters Mitigation staff in support of mitigation initiatives; technical support necessary to mitigate against potential loss of lives and minimize the amount of damage as a result of a natural disaster	Available for use by all FEMA Regional and Headquarters Mitigation staff.	Provides assistance to FEMA staff, designed to provide architectural, engineering, and other mitigation related technical assistance in support of post disaster mitigation initiatives; examples are environmental assessments, benefit cost analysis, engineering/architectural feasibility studies, remote sensing and GIS, post disaster floodplain analysis and training	Technical assistance	N/A	N/A	N/A	N/A	<a href="http://www.fema.gov/fima/">http://www.fema.gov/fima/</a>	Federal Emergency Management Agency, Suite 900, 2323 Grand Blvd., Kansas City, MO 64108, (816) 283-7061, or 3003 Chamblee-Tucker Rd., Atlanta, Georgia 30341,	Support of mitigation initiatives; technical support necessary to mitigate against potential loss of lives and minimize the amount of damage as a result of a natural disaster	

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Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Hazardous Materials Training Program	None	United States Department of Homeland Security/Federal Emergency Management Agency	To make funding available to provide training in support of State, local, and Tribal governments and university-sponsored programs designed to improve emergency planning, preparedness, mitigation, response, and recovery capabilities. These programs must provide special emphasis on emergencies associated with hazardous chemicals.	These funds are available to State and tribal governments and U.S. territories. The funds benefit State governments, local governments, tribes, and U.S. territories.	These funds are authorized to provide education and training programs for Federal, State, local, and tribal personnel with special emphasis on hazardous chemicals and related chemical emergencies. These funds are intended for the delivery of training courses only. The assistance is normally available for one year. The assistance is awarded to the State in a lump sum. The State may then pass the funds through to other agencies (in Florida, the Local Emergency Planning Committees).	Grants	Contact Agency	Contact Agency	20%	Contact Agency	<a href="http://www.fema.gov/em/ishome.htm">http://www.fema.gov/em/ishome.htm</a>	Emergency Management Institute, Federal Emergency Management Agency, 16825 South Seton Avenue, Emmitsburg, MD 21727, (301) 447-1142	Training is a form of preparation.	
Hazardous Waste Worker Health and Safety	Superfund Worker Training Program	United States Department of Health and Human Services	To provide cooperative agreements and project grant support for the development and administration of model worker health and safety training programs, consisting of both classroom and practical health and safety training of workers and supervisors, for activities related to hazardous materials, hazardous waste generation, treatment, storage, disposal, removal, containment, transportation, or emergency response. To assist organizations in the development of institutional competency to provide appropriate training and education to hazardous waste workers	Eligible applicants include: public or private nonprofit entities providing worker health and safety education and training	Cooperative agreements and project grants administered under this program are intended to support the direct costs of a project, in accordance with an approved budget, plus indirect costs at a pre-established rate. Both the award and use of funds are subject to applicable provisions of basic statutory authorities, appropriations acts, pertinent regulations, and operating policies of the National Institute of Environmental Health Sciences (NIEHS), the National Institutes of Health (NIH), and the Department of Health and Human Services (DHHS).	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.nih.gov/">http://www.nih.gov/</a>	Office of Extramural Outreach and Information, National Institute of Environmental Health Sciences, National Institutes of Health, Public Health Service, U.S. Department of Health and Human Services, 6701 Rockledge Drive, MSC 7910, Bethesda, MD 20892-7910, (301) 435-0714	This is a good training program for local governments to utilize. Education is a form of mitigation, in that individuals responsible for implementing and overseeing hazardous waste cleanups would be better trained to do so, and thus would be more likely to be successful.	
Home Investment Partnerships Program	HOME	United States Department of Housing and Urban Development	To expand the supply of decent, affordable housing, with particular emphasis on rental housing, for low-income and very low-income citizens.	States, cities, urban counties, and consortia (of contiguous units of general local governments with a binding agreement)	This program provides loans for rehabilitation of existing units, conversion of non-residential uses to residential uses; acquisition and rehabilitation of existing units, and new construction; all for the purpose of increasing the availability of affordable housing units.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.hud.gov">http://www.hud.gov</a>	Community Planning and Development, United States Department of Housing and Urban Development, 451 7 <sup>th</sup> Street, SW, Washington, DC 20410, (202) 708-3587	A mitigation strategy utilizing these funds would require the local government to have, or to partner with, a local housing agency. Under such circumstances, the program could be a good source of mitigation funds for replacement of sub-standard units (more likely to succumb to a disaster) with safe, decent, affordable housing.	
Hurricane Program	None	United States Department of Homeland Security/Federal Emergency Management Agency	To significantly reduce the loss of life, property, economic disruption, and disaster assistance costs resulting from hurricanes.	States	Provides state and local assistance; property protection; hazard identification and evacuation studies; post-storm analysis; training and exercises; and public awareness and education campaigns, and materials to support State and local activities.	Grants	Contact Agency	Contact Agency	25%	Contact Agency	<a href="http://www.fema.gov">http://www.fema.gov</a>	Mitigation Directorate, Federal Emergency Management Agency, 500 "C" Street, SW, Washington, DC 20472, (202) 646-3685	The program primarily provides information, public awareness materials, and technical assistance to local and State governments (for use by their own programs). This is a good public outreach mitigation program.	
Impact Aid Disaster Assistance Program	None	United States Department of Education	To assist with the increased costs to schools, and the decreased revenues to school districts, which can result from the effects of a disaster.	Local educational agencies that provide free public elementary or secondary education may apply for these funds.	Applications must be submitted within 90 days of the publication of the applicable disaster declaration notice in the Federal Register. However, applicant eligibility and the funding awarded will be based upon "before and after" (the disaster) data, which may not be available for a year, or longer time period.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.ed.gov/offices/OESE/">http://www.ed.gov/offices/OESE/</a>	Office of Elementary and Secondary Education, U.S. Department of Education, 600 Independence Avenue, SW, Portals Building, Room 4200, Washington, DC 20202-6244, (202) 260-3858	These funds could be used by individual public schools, or school districts, to aid in post-disaster recovery and mitigation. However, the long time lag between application and receipt of the grant (if awarded) is somewhat of a deterrent.	

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Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Interagency Hazardous Materials Public Sector Training and Planning Grants	Hazardous Materials Emergency Preparedness Grants.	United States Department of Transportation	To increase State, local, territorial and Native American tribal abilities to safely and efficiently handle hazardous materials accidents and incidents; to enhance implementation of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA); and to encourage a comprehensive approach to emergency planning and training by incorporating response to transportation standards.	States, U. S. Territories and Federally recognized Native American Tribes may apply for either or both planning and training grants	This grant program is intended to be used to increase the emphasis on transportation in ongoing training efforts and to improve the capability of communities to plan for and respond to the full range of potential risks posed by accidents and incidents involving hazardous materials. The grants have two principal uses: (1) to assist States, Territories and Native American Tribes in developing, improving and implementing emergency response plans under EPCRA (including the determination of flow patterns of hazardous materials within a State, between States and Native American lands); and determining the need for regional hazardous materials response teams. (2) to stimulate support for training of Public Sector employees to respond to accidents and incidents involving hazardous materials.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.rspa.dot.gov/">http://www.rspa.dot.gov/</a>	Research and Special Programs Administration, U.S. Department of Transportation, 400 7 <sup>th</sup> Street, SW, DHM-64 Washington, DC 20590 (202) 366-0001	The LEPC training programs are an excellent mitigation tool for local emergency response agencies. Communities which have not taken advantage of these programs should consider doing so.	
National Fire Academy Educational Program	None	United States Fire Administration	The National Fire Academy (part of the U.S. Fire Administration, which is part of FEMA) offers various courses on disaster and emergency related topics for fire department personnel, or others with fire prevention responsibility. The purpose of this program is to provide travel stipends to students attending Academy courses.	Potential applicants include any student who is a member of a fire department or has significant responsibility for fire prevention and control and has been accepted into an eligible course at the National Fire Academy. The program reimburses the local agency or personal travel expense for attending training programs.	Presently, the program covers reimbursement for the cost of a 21-day pre-purchase, non-refundable ticket for round-trip transportation by common carrier, or privately owned vehicle mileage reimbursement not to exceed the cost of the airline ticket, for the resident program courses at the National Fire Academy in Emmitsburg, Maryland, and also a limited stipend for selected regional delivery courses throughout the nation. For Resident Program courses, students are required to pay the cost of meals which is \$15.76 (includes tax) daily (subject to change each October 1). For Regional Delivery courses, a limited stipend of up to \$100 for a one-week course and up to \$200 for a two-week course is provided to help offset the students' transportation and lodging costs. Reimbursements are not made to Federal employees attending on behalf of their employer, private industry employees, or foreign students.	Direct payments	N/A	N/A	None	Contact Agency	<a href="http://www.usfa.fema.gov/index.htm">http://www.usfa.fema.gov/index.htm</a>	Educational and Technology Services Branch, National Emergency Training Center, U.S. Fire Administration, 16825 South Seton Avenue, Emmitsburg, MD 21727 (301) 447-1000	This is an excellent mitigation program, particularly with regard to fire suppression and control issues. The reimbursement program is open to all fire and rescue or related agencies. Training of personnel to enable them to better respond to an emergency is a form of mitigation.	
National Historical Publications and Records Grants	None	National Historical Publications and Records Commission/National Archives and Records Administration	To undertake a wide range of activities related to the preservation, publication and use of documentary sources relating to United States history.	State and local governments, territorial governments, Indian tribes, educational and/or non-profit institutions, universities, colleges, libraries, historical societies, museums, university presses, archives, individuals, etc.	Funds may be used for projects having the purpose of: advancing the state of the art (of preservation); to promote cooperative efforts by institutions and organizations; to improve the knowledge, performance and professional skills of those individuals who work with historic records; for the preservation, arrangement and description of historical records; and for the publication (in book, microfiche or electronic versions) of historical records.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.nara.gov/gils/gils.html">http://www.nara.gov/gils/gils.html</a>	National Historical Publications and Records Commission, National Archives and Records Administration, National Archives Building, Washington, DC 20408, (202) 501-5610	These funds could be used by local agencies in the creation of County/Municipal records preservation or restoration strategies. Preservation of documents to reduce the amount of paperwork is a form of mitigation.	

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Oil Spill Liability Trust Fund	None	United States Department of Transportation	To encourage greater State participation in response to actual or threatened discharges of oil. The program is funded through fines paid to the U.S. Coast Guard by entities liable for clean up costs for oil/fuel spills.	The Governor of any State may apply for financial assistance under this program.	Funds are to be used for immediate clean up action costs that are directly related to a specific incident. Removal costs must generally be incurred at the spill site or in support of spill site clean up activities (e.g., salary costs for State officials actually engaged in the removal actions, transportation costs for transporting persons and materials to the spill site, costs of equipment usage and items consumed during clean up, contract costs, and administrative costs for preparing reports and documenting actions which occurred at the spill site). Removal actions must be consistent with the National Contingency Plan (40 CFR 300) and must be approved by the cognizant Coast Guard or Environmental Protection Agency (EPA) Federal On-Scene Coordinator (FOSC). Remedial actions and restorations are not eligible for reimbursement.	Grants and cooperative agreements	Contact Agency	Funding is limited to \$250,000 per incident.	Contact Agency	Contact Agency	<a href="http://www.uscg.mil/">http://www.uscg.mil/</a>	Director's Office, National Pollution Funds Center, United States Coast Guard, United States Department of Transportation, 4200 Wilson Boulevard, Suite 1000, Arlington, VA 22203-1804, (703) 235-4756	This program represents the primary funding source for U.S. Coast Guard activities involved in responding to fuel or oil spills; particularly in navigable waterways. This type of funding is generally available when a large-scale disaster has created actual or potential fuel spill incidents.	
Partners for Fish and Wildlife	None	United States Department of the Interior/United States Fish and Wildlife Service	The US Fish and Wildlife Service provides financial and technical assistance to private landowners, businesses, and local governments interested in restoring wetlands and riparian habitats on their land.	Private landowners, Native American Organizations, local governments, educational institutions and organizations are eligible for financial and technical assistance from the Partners Program.	Assistance provided to private landowners and Native American Tribes. Program goal is to achieve a 50 percent cost share on projects with matching funds and in-kind contributions provided by the landowners and other partners.	Direct Payments for Specified Use	FY 05 est \$32,000,000	\$200 to \$25,000. The average cost per project is \$5,400	This program has no statutory formula. The Program goal is to obtain a 50 percent match of Federal monies by partnering with landowners, local community groups and other local and national conservation organizations.	Contact Agency	<a href="http://www.partners.fws.gov">http://www.partners.fws.gov</a>	Chief, Branch of Habitat Restoration, U.S. Fish and Wildlife Service, Department of the Interior, 4401 N. Fairfax Drive, Room 400, Arlington, VA 22203. Telephone: (703) 358-2201. Use the same number for FTS. Fax number is (703) 358-2232.	Typical wetland restoration and enhancement techniques involve restoring the natural hydrology of a site through the blocking of surface ditches, breaking sub-surface drain tiles, building shallow berms to trap water, filling in concentration pits, removing eroded sediment which fills in basins, installing grass buffers, or installing fences along wetlands or stream corridors that prevent cattle grazing within the stream or wetland.	
Physical Disaster Loans	None	Small Business Administration	To provide loans to victims of physical disasters to cover uninsured losses.	Individuals, business concerns, charitable and nonprofit organizations. Agricultural enterprises are ineligible. Applicants must have suffered physical property loss s a result of a disaster which occurred in an area declared as eligible for assistance by the President or The Small Business Administration. Applicants must demonstrate an ability to repay the loan.	Loans are made to homeowners, renters, businesses of all sizes and nonprofit organizations to repair and/or replace damaged and/or destroyed real property and/or personal property to its pre-disaster conditions. Loans to homeowners/tenants are made for periods of up to 30 years.	Direct Loans; Guaranteed/Insured Loans	Contact Agency	There is a funding limit of \$200,000 for repair/replacement of real property and a limit of \$40,000 for repair/replacement of personal property. The loan limit may be increased by 20 percent to provide protective measures from damages caused by physical disasters. The interest rate for homeowners/tenants who have credit available elsewhere is determined by a formula based on the cost of money to the U.S. Government, but not to exceed 8 percent. The interest rate for homeowners/tenants who do not have credit available elsewhere is one-half of the formula rate, but not to exceed 4 percent. Loans to business may not exceed \$1,500,000.	Contact Agency	Contact Agency	<a href="http://www.sba.gov/disaster/">http://www.sba.gov/disaster/</a> or <a href="http://www.sba.gov/disaster_recov/loaninfo/dloanassit.html">http://www.sba.gov/disaster_recov/loaninfo/dloanassit.html</a>	Office of Disaster Assistance, Small Business Administration, 409 3 <sup>rd</sup> Street, SW, Washington, DC 20416, (202) 205-6734	This is the standard SBA disaster loan which becomes available after an area has suffered from a Presidentially-declared disaster. The purpose is to implement mitigation measures to protect business property from damage by future disasters. Examples might be retaining walls, sea walls, grading and contouring land, elevating flood-prone structures, relocating utilities, and retrofitting structures against high winds, earthquakes, floods, wildfires, or other disasters.	

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Planning Assistance to States	Section 22 Program	United States Department of Defense/United States Army/United States Army Corps of Engineers	Section 22 of the Water Resources Development Act (WRDA) of 1974 allows the USACE to assist state, tribal, and local governments in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources with up to 50% federal match. Technical and planning assistance may include wetlands evaluation studies, flood damage reduction studies, flood plain management studies, and water quality/quantity studies.	State, regional, and local units of government should submit requests for assistance to the State Section Coordinator with a copy to the Corps.	The State or Tribal coordinator/official would verify that the request for assistance is in agreement with their comprehensive water plan and include it in their annual program budget request. The State's and Tribe's annual request for assistance is used to develop the Corps Section 22 Program for that year	Technical assistance	Contact Agency	\$ 300,000.00	50%	Contact Agency	<a href="http://www.saj.usace.army.mil/pd/pdpf.htm">http://www.saj.usace.army.mil/pd/pdpf.htm</a> or <a href="http://www.saj.usace.army.mil/pd/22.html">http://www.saj.usace.army.mil/pd/22.html</a>	Mr. Russ Rote, P.E., Chief, Flood Control and Flood Plain Management Section, U.S. Army Corps of Engineers, Attn: PD-PF, P.O. Box 4970, Jacksonville, FL 32232. Russ.L.Rote@saj02.usace.army.mil, 904-232-2232	Some neighborhood drainage systems are only designed to handle, or are capable of handling, a few inches of rainfall. The Corps can perform studies of these and other community flooding problems, perform environmental improvement studies involving water resources, act in concert with other governmental agencies to perform hurricane evacuation and damage studies, and perform studies of floods and flood plain issues. The Planning Assistance to States Program may help States in support of the Coastal Zone Management Act of the Floodplain Management Services Program when the primary purpose is to supplement basinwide or regional State planning for the coastal zone or floodplains.	
Pollution Control Bond Program	State Bond Loan Program	Florida Department of Environmental Protection	Construction of pollution control facilities, including those related to drinking water, wastewater, stormwater, solid waste, and air pollution.	Local governments; special districts are eligible as well as municipalities and county governments	Plans and specifications of proposed facilities are required. The loan interest rate is a pass through rate.	Loans that come from State of Florida full faith and credit revenue bonds. Bonds are sold on a competitive bid basis and reflect market conditions. The bonds are tax exempt. No interest subsidy.	\$300 million annually; source of the funds are bonds sold by the state	Loans less than \$10 million probably would be packaged with other loans. Loans in the million dollar range may not be practical. Projects involving numerous small contracts, work orders, purchase orders, etc. are not practical under this program.	Contact Agency	Contact Agency	<a href="http://www.dep.state.fl.us/water/wff/sbl/index.htm">http://www.dep.state.fl.us/water/wff/sbl/index.htm</a>	Don Berryhill, Chief, Water Facilities Funding Program, Florida Department of Environmental Protection, 2600 Blair Stone Road M.S. 3500 Tallahassee, Florida 32399, 850-245-8359	Ensuring structurally sound and properly engineered facilities is a form of mitigation.	
Pollution Prevention Grants Program	PPIS	United States Environmental Protection Agency	To support State and tribal level pollution prevention programs that address the reduction of pollutants across all environmental media: air, land, and water.	States, local governments, private universities, private non-profit entities, private businesses, and individuals are not eligible. Any State, interstate, and/or local agency/organization/university, Federally-Recognized Indian Tribes, public non-profit organization/institution, for-profit organization, private organization, and quasi-public nonprofit organization may serve as a funding beneficiary.	Source reduction is any practice that: (1) reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and, (2) reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.	Grants	Contact Agency	Contact Agency	50%	Contact Agency	<a href="http://www.epa.gov/oppptintr/">http://www.epa.gov/oppptintr/</a>	Pollution Prevention Division, Office of Pollution Prevention and Toxics, United States Environmental Protection Agency, 401 "M" Street, SW, Suite 7409, Washington, DC 20460 (202) 564-2515	Use of this program by a local government in Florida would probably require a partnership arrangement with the State and Federal governments and, perhaps, a contributing non-profit agency. However, the program might be able to provide assistance in resolving local pollution control problems.	
Pre-Disaster Mitigation Competitive Grant Program	PDM - Competitive	United States Department of Homeland Security/Federal Emergency Management Agency and Florida Department of Community Affairs/Division of Emergency Management	Provides funds to State, Tribal, and local governments for pre-disaster mitigation planning and projects primarily addressing natural hazards. Cost-Effective pre-disaster mitigation activities reduce risk to life and property from natural hazard events before a natural disaster strikes, thus reducing overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. Funds will be awarded on a competitive basis to successful.	State and territorial emergency management agencies; eligible sub-applicants include state agencies; Federally-recognized Indian Tribal governments; and local governments. Applicants can apply for PDM competitive grant funds directly to FEMA, while Sub-applicants must apply for funds through an eligible Applicant. Private non-profit organizations are not eligible to apply for PDM but may ask the appropriate local government to submit an application for the proposed activity on their behalf.	Not dependent upon a Presidential disaster declaration. Mitigation planning and mitigation projects are eligible activities, including information dissemination activities regarding cost-effective mitigation technologies related to the proposed mitigation planning activity or project. Associated Applicant and Sub-applicant management costs also are eligible.	Grants	\$132,650,000 in FY 2003	\$3,000,000	25%, for small impoverished communities, match is 10%	October each year	<a href="http://www.fema.gov/fima/pdm">http://www.fema.gov/fima/pdm</a>	Karen Magnino, Mitigation Division, FEMA, 500 C Street SW, Room 444, Washington, DC 20472 (202) 646-3807. Karen.Magnino@dhs.gov.	A PDM competitive grant will provide funds for the community to reduce the overall risk to populations and structures through mitigation projects and plans prior to a disaster occurring. Mitigation projects, acquisition or relocation of vulnerable properties, hazard retrofits, minor structural hazard control or protection projects, community outreach and education	

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Pre-Disaster Mitigation Program – Planning Grants	PDM - Planning	United States Department of Homeland Security/Federal Emergency Management Agency and Florida Department of Community Affairs/Division of Emergency Management	To provide technical assistance (risk assessments, project development) and to revise and update the Local Mitigation Strategy.	States, which, in turn, may provide sub-grants to local and Indian Tribal governments. Private non-profit organizations are not eligible sub-grantee applicants; however, local governments may sponsor an application on their behalf.	Not dependent upon a Presidential disaster declaration. All applicants must be participating in the National Flood Insurance Program if they have been identified through the NFIP as having a Special Flood Hazard Area (a Flood Hazard Boundary Map (FHBM) or Flood Insurance Rate Map (FIRM).	Grants	For FY 2003, FEMA provided a maximum of \$248,375 (Federal share) to each state, Collier County's share was \$20,000	\$ 20,000.00	25%	Deadline for state submittal to FEMA is in April, local government deadline to state would follow	<a href="http://www.fema.gov/fima/pdm.shtml">http://www.fema.gov/fima/pdm.shtml</a> or <a href="http://a257.g.akamaitech.net/7/257/2422/03mar20030800/edocket.access.gpo.gov/2003/03-4903.htm">http://a257.g.akamaitech.net/7/257/2422/03mar20030800/edocket.access.gpo.gov/2003/03-4903.htm</a>	FEMA Region IV, 3003 Chamblee, Tucker Road, Atlanta, GA 30341 or 500 C Street, SW., Room 401, Washington, DC 20472, (202) 646-3027 or E-mail: Margaret.Lawless@fema.gov.	Useful for updating mitigation strategies	
Public Assistance	PA/Section 406	United States Department of Homeland Security/Federal Emergency Management Agency	To allow state and local governments to respond to disasters, to recover from their impact and to mitigate impact from future disasters. While these grants are aimed at governments and organizations -- their final goal is to help a community and all its citizens recover from devastating natural disasters. The PA Program provides the basis for consistent training and credentialing of staff ( <b>people</b> ) who administer the program; more accessible and understandable guidance and <b>policy</b> for participating in the grant program; improved customer service through a more efficient grant delivery <b>process</b> , applicant-centered management, and better information exchange; and continuing <b>performance</b> evaluations and program improvements.	State and local governments and to certain private nonprofit organizations.	The Public Assistance Program provides supplemental Federal disaster grant assistance for the repair, replacement, or restoration of disaster damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. Grants can be used to clear debris; apply emergency protective measures to preserve life and property in response to the declared event; and repair or replace damaged structures, such as buildings, utilities, roads and bridges, water-control facilities, and recreational facilities.	Grants	Varies each year, and depends on cost of declared disasters and funding available	For small projects (under \$48,900 for FY00), the grant is based on an estimate of the cost of the work. For large projects (\$48,900 or more), the final grant is based on actual eligible costs. In large projects, the State will disburse progress payments, as required	The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The State determines how the non-Federal share (up to 25%) is split with the applicants	The project completion deadlines are set from the date that the major disaster or emergency is declared. Emergency Work: 6 months, Permanent Work: 18 months	<a href="http://www.fema.gov/rrr/pa/">http://www.fema.gov/rrr/pa/</a>	Region IV, Federal Emergency Management Agency, 3003 Chamblee-Tucker Rd. Atlanta, Georgia 30341 (770) 220-5200	Repair of facilities, cleaning up of debris, etc. is mitigation and improving the facilities to a standard that makes them even more secure and damage resistant is even better mitigation.	
Public Works & Infrastructure Development Grants	EDA	United States Department of Commerce/Economic Development Administration	To support the construction or rehabilitation of essential public infrastructure and development facilities necessary to generate private sector jobs and investment, including investments that support technology-led development, redevelopment of brownfield sites, and eco-industrial development.	Universities, state and local governments, Indian Tribes and non-profit organizations in cooperation with governmental organization.	Project proposals must be located within an economically distressed EDA designated area and be in conformance with an Overall Economic Development Program (OEDP) for the eligible area. Projects must also contribute to long-term economic development of the area by creating or retaining permanent jobs and raising income levels. Examples of projects include 1) Infrastructure for industrial park development; 2) port development and expansion; 3) infrastructure necessary for economic development (e.g. water/sewer facilities); 4) renovation and recycling of old industrial buildings; 5) construction of vocational-technical facilities and skill centers; and 6) construction of incubator facilities.	Grants	\$ 204,000,000.00	Average of over \$1.24 million in FY 02	50%	None	<a href="http://a257.g.akamaitech.net/7/257/2422/14mar20010800/edocket.access.gpo.gov/2003/03-8612.htm">http://a257.g.akamaitech.net/7/257/2422/14mar20010800/edocket.access.gpo.gov/2003/03-8612.htm</a>	Margo Leydic-Boyd, 14th & Constitution Avenue, NW Washington, DC 20230, (202) 482-4085, mleydic-boyd@eda.doc.gov	Communities that have experienced economic distress, either as a result of a disaster, or as a result of local demographics and unrelated conditions, may find these funds useful to help establish facilities that are up to current codes and/or that are stronger in the face of natural or manmade disasters; may also be used to redevelop contaminated brownfield sites; economic distress may result from natural or other major disasters	

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Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Recreational Trails Program	RTP	United States Department of Transportation/Federal Highway Administration and Florida Department of Environmental Protection/Office of Greenways & Trails	Federally funded competitive grant program that provides financial assistance to agencies of city, county, state or federal governments, and organizations, approved by the State, or state and federally recognized Indian tribal governments, for the development of recreational trails, trailheads and trailside facilities.	Municipal or county governments, state or federal governmental agencies, recognized state and federal Indian tribal governments, and organizations approved by the State.	Projects must be either a Greenway: A linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, or over land along a railroad right-of-way converted to recreational use; a canal, a scenic road, or other route; any natural or landscaped course for pedestrian or bicycle passage; an open space connector linking parks, nature reserves, cultural features, or historic sites with each other and populated areas; or a local strip or linear park designated as a parkway or greenbelt. Or a Trail: Linear corridors and any adjacent support parcels on land or water providing public access for recreation or authorized alternative modes of transportation. The evaluation criteria include ecological, recreational, and acquisition components.	Grants	Contact Agency	Non-Motorized Projects = \$100,000, Mixed-Use Projects = \$100,000, Motorized Projects = \$250,000	80:20, 60:40, 50:50, more points are awarded depending on the match provided	January in 2004, deadline varies	<a href="http://www.dep.state.fl.us/gwt/grants/">http://www.dep.state.fl.us/gwt/grants/</a>	Alexandra Weiss, Office of Greenways & Trails, Department of Environmental Protection, 3900 Commonwealth Blvd., MS 795, Tallahassee, Florida 32399-3000, alexandra.weiss@dep.state.fl.us, (850) 245-2052	Because of its emphasis on preservation, conservation and environmental protection, this program is often overlooked as a potential funding source for disaster mitigation. Also, these funds are not directly available to local governments, unless, of course, the local agency is the land. However, in Florida, lands which are environmentally endangered, such as wetlands, coastal areas and riverine areas, are often also lands subject to flooding, tidal surge, frequent fires and other natural hazards. Removal of these properties from the threat of development is thus a form of disaster mitigation.	
Residential Construction Mitigation Program	RCMP	Florida Department of Community Affairs	Funds are used for programs to improve wind resistance of residences and mobile homes, including loans, subsidies, grants demonstration projects, and direct assistance; cooperative programs with local governments and the Federal Government; and other efforts to prevent or reduce losses or reduce the cost of rebuilding after a disaster.	Typically, grants have been provided to local governments on a noncompetitive basis for wind resistive house retrofit projects, while grantees/ contractors are sought for other desired projects through Notice of Funding Availability (NOFA) and Request for Proposals (RFP) processes.	\$2.8 million is designated for the Mobile Home Tie-Down Program. \$700,000 is designated for Hurricane Research to be conducted by Florida International University. Research tracks include: (a) eliminate state and local barriers to upgrading existing mobile homes and communities; (b) research and develop a recycling program of older mobile homes; and (c) support programs of research and development relating to hurricane loss reduction devices and techniques for site-built residences. \$3.5 million is to be used to improve the wind resistance of residences through loans, subsidies, grants, demonstration projects, direct assistance, and cooperative programs with local and federal governments.	Contact Agency	\$7 million	An annual budget is determined by the Secretary of the Department of Community Affairs, in consultation with the RCMP Advisory Council	Contact Agency	NOFAs are advertised in the Florida Administrative Weekly and all RFPs are issued via the www.myflorida.com web portal. NOFAs and RFPs can be issued at any time during the fiscal year.	<a href="http://www.floridadisaster.org/brm/rcmp/index.htm">http://www.floridadisaster.org/brm/rcmp/index.htm</a>	Ted Court, Financial Specialist, Florida Department of Community Affairs/Residential Construction Mitigation Program , 2555 Shumard Oak Blvd., Tallahassee, FL 32399-2100, Phone: (850) 410-1563, ted.court@dca.state.fl.us	Provides funding for hurricane retrofitting. A certified inspector using DCA's Wind Resistance Checklist may perform a structural inspection of the home. Information is assessed and a mitigation report is prepared that outlines the hurricane hazard risk, identifies retrofit options and packages, assesses costs and benefits, and provides retrofitting recommendations and estimated costs. If homeowners are recommended for the program, they are eligible for a forgivable loan to complete the retrofitting.	

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Revolving Fund Loan Program for Waste Water Treatment	Water Pollution Control SRF program	Florida Department of Environmental Protection	Provides funding to assist in the financing of publicly owned waster water and stormwater treatment collection, transmission, disposal, and reclamation, re-use facilities as well as infiltration/inflow correction. Project loans for up to 20 years at interest rates that are over 60% below market rate.	Local governments (municipalities, counties, authorities, special districts, and agencies thereof) are eligible for loans to control wastewater and stormwater pollution. Non-governmental parties (basically any entity that can repay a loan) are eligible for loans to control stormwater pollution related to agricultural operations.	The Clean Water Act State Revolving Fund (SRF) Program provides low interest loans for water pollution control activities and facilities. Water pollution control can be divided into point source (a permit for discharge in an urban area is generally involved) and non-point source (stormwater runoff from agricultural operations is generally involved). The Clean Water SRF Program is distinct from the Safe Drinking Water Act SRF that provides funding for drinking water activities and facilities. The Clean Water SRF Program began in 1989 and over a billion dollars in loans have been made by the Florida Department of Environmental Protection. The Program was recently expanded to make stormwater management, agricultural runoff, estuary protection, and nearly any type of water pollution control activity eligible for funding. The Program revolves in perpetuity using state and federal appropriations, loan repayments, investment earnings, and bond proceeds.	Low interest loans; loans are to be repaid over the useful life of the project (a maximum of 20 years). Preconstruction loans and loans for the costs associated with pollution control associated with agricultural runoff have shorter loan repayment periods (generally 10 years). The interest rate is below market.	Contact Agency	Contact Agency	Contact Agency	Contact Agency	<a href="http://www.dep.state.fl.us/water/wtf/cwsrf/index.htm">http://www.dep.state.fl.us/water/wtf/cwsrf/index.htm</a>	Submit a request for inclusion (RFI) on a priority list form. The RFI form provides basic project information such as project sponsor, description, practices (sometimes called "best management practices") associated with agricultural stormwater runoff from the Wastewater Manual or obtained by contacting (850) 2458358.	Projects eligible for SRF loans include wastewater management facilities, reclaimed wastewater reuse facilities, stormwater management facilities, widely accepted pollution control practices (sometimes called "best management practices") associated with agricultural stormwater runoff pollution control activities, and estuary protection activities and facilities.	
Rural Business Enterprise Grant Program	RBEG	United States Department of Agriculture	To facilitate the development of small and emerging private business, industry, and related employment opportunities in order to improve the economy in rural areas. There are two different grant programs.	State, county, city, township and municipal governments, government agencies, special districts, and tribal agencies which serve rural areas. The rural area in question cannot be within a municipal boundary of an incorporated local government having a population of 50,000 or more. Priority for the grants is given to areas with populations of 25,000 or less. The grantee can pass the money to a designated beneficiary business which will employ 50 or less new employees, has less than \$1,000,000.00 in projected gross revenue, and is utilizing, or proposing to utilize technological innovation and/or new product commercialization within the target rural area.	RBEG funds are utilized to establish revolving funds, provide operating capital, finance industrial site acquisition/construction/start-up, modernize buildings and equipment, construct access roads, construct parking areas, provide transportation to project sites, extend utility infrastructure, provide pollution control cost funding, provide technical assistance, pay permitting fees, and for refinancing. TDG funds can be used to establish television programs targeting agricultural and rural interests.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.usda.gov">http://www.usda.gov</a>	Rural Business-Cooperative Service, U.S. Department of Agriculture, South Agriculture Building, Room 6321, Washington, DC 20250-0700, (202) 690-4100	Utilized by local governments to assist in the rebuilding of businesses which had been previously damaged in a disaster, or which were particularly vulnerable to certain types of disasters.	
Rural Economic Development Loans and Grants	None	United States Department of Agriculture	To promote rural economic development and job creation projects, including funding for project feasibility studies, start-up costs, incubator projects, and other reasonable expenses for the purpose of fostering rural development.	Electric and telephone utilities that have current Rural Electric Administration or Rural Telephone Bank loans, or outstanding guarantees, and which are not delinquent on any Federal debt or which are not currently in bankruptcy proceedings.	Projects must promote rural economic development and job creation. The maximum loan or grant available is \$100,000.00, with a ten-year term at 0% interest rate.	Grants or Loans	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.usda.gov">http://www.usda.gov</a>	Rural Business-Cooperative Service, U.S. Department of Agriculture, South Agriculture Building, Room 6321, Washington, DC 20250-0700, (202) 690-4100	It appears that the funding applicant would have to be a designated Rural Electric Cooperative or a Rural Telephone Bank. This would be a potential source of funds for a rural utility that had received extensive damage from a large-scale disaster and needed money for repairs.	

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Rural Housing Site Loans and Self-Help Housing Land Development	Section 523 and Section 524 Site Loans	United States Department of Agriculture	To assist public or private non-profit organizations, who are interested in providing sites for housing, in acquiring and developing rural land areas, and subdividing land into appropriate building sites. The land so acquired is to be sold, on a "cost of development" basis, to families eligible for low income and very low income loans, housing cooperatives, and broadly based non-profit rural rental housing applicants.	Applicants must be private or public non-profit entities which provide developed sites to qualified borrowers, on a "cost of development" basis. The sites are to be located in open country and/or incorporated municipalities with 10,000 or less population, or recognized places with up to 25,000 in population, under certain conditions. Potential applicants located within areas of population between 10,000 and 25,000 should check with their local Rural Development program before making application. Sites developed with Section 524 loans must be utilized for low, or very low, income housing, and may be sold as such to families, non-profit organizations, public agencies, and eligible cooperatives. Section 523 sites must be for housing to be built by the "self-help" method.	Loans may be utilized for the purchase and development of adequate sites, including the placement of any necessary infrastructure, such as sewer/water facilities; payment of fees for engineering, legal services, and closing costs; landscaping; or construction of sidewalks, parking areas and driveways. Loans above \$200,000.00 must receive national office approval. Loan funds may not be used for the purpose of debt refinancing, payment of broker/negotiator/referral fees, meeting administrative expenses (except in limited circumstances). Loans are expected to be repaid in two years.	Loans	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.usda.gov">http://www.usda.gov</a>	Rural Housing Service, Single Family Housing Division, U.S. Department of Agriculture, Washington, DC 20250, (202) 720-1474	A local agency with housing construction authority, or a local non-profit agency specializing in housing provision, could utilize these funds to build up site elevations above projected flood levels, install sewer and water mains for future low income housing development, or, possibly, to elevate existing low income areas being reconstructed after a flood disaster.	
Rural Self-Help Housing Technical Assistance	Section 523 Technical Assistance	United States Department of Agriculture	This program is based upon requirements of the Federal Housing Act of 1949, as amended. The purpose of the program is to provide financial support for programs of technical and supervisory assistance that will aid very low and low-income individuals and their families in carrying out mutual self-help housing efforts in rural areas.	Applicants must be a State or political subdivision of a State, a public nonprofit corporation or a private nonprofit corporation. The targeted beneficiaries are very low and low-income rural families, usually in groups of 6 to 10 families.	Not-for-profit organizations may use technical assistance funds to hire the personnel to carry out a program of technical assistance for self-help housing in rural areas; to pay necessary and reasonable office and administrative expenses; to purchase or rent equipment such as power tools for use by families participating in self-help housing construction; and to pay fees for training self-help group members in construction techniques or for other professional services needed. Funds will not be used to hire personnel to perform any construction work, to buy real estate or building materials, or pay any debts, expenses or costs other than previously outlined for participating families in self-help projects.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.rurdev.usda.gov/agency/rhs/rhs.html">http://www.rurdev.usda.gov/agency/rhs/rhs.html</a>	Single Family Housing Programs, Rural Housing Service, U.S. Department of Agriculture, AgBox 0761 1400 Independence Avenue, SW, Washington, DC 20250, (202) 720-1474	This program is a good long-term funding source for a local low-income housing construction program. The program could be operated solely by the local government, or in partnership with another public (or private) entity. Getting low-income individuals into safer and stronger housing is important to mitigation against natural hazards.	
Rural Utilities Service Water and Waste Disposal Program	RUS	United States Department of Agriculture	Provides grants and loans to rural communities with fewer than 10,000 people for wastewater, drinking water, solid waste, and storm drainage projects.	Recipients must be public entities. These can include municipalities, counties, special purpose districts, Indian tribes, and corporations not operated for profit, including cooperatives. A new entity may be formed to provide the needed service if an appropriate one does not already exist.	Construct, repair, modify, expand, or otherwise improve water supply and distribution systems and waste collection and treatment systems, including storm drainage and solid waste disposal facilities. Certain other costs related to development of the facility may also be covered. (2) Acquire needed land, water sources, and water rights. (3) Pay costs such as legal and engineering fees when necessary to develop the facilities.	Grants and Loans	FY 2003: Direct Loans \$797,567,000, Guaranteed Loans \$ 75,000,000, Grants \$425,000,000	Contact Agency	Grants may be provided when necessary to reduce user costs to a reasonable level. They may cover a maximum of 75 percent of eligible facility development costs. Loan guarantees may be available for up to 90 percent of any eligible loss incurred by the lender. Lenders pay a 1 percent guarantee fee, which may be passed on to the loan recipient.	File requests any time of year at any rural development office in the county, district or state.	<a href="http://www.usda.gov/rus/water/">http://www.usda.gov/rus/water/</a>	Assistant Administrator, Water and Environmental Programs, USDA – RUS, Washington, D.C. 20250, Telephone: (202) 720-9583	Construction of new or improved facilities that are up to current standards, wind strengths, etc. is mitigation.	

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Section 108 Loan Guarantee Program	Section 108 Loans	United States Department of Housing and Urban Development	HUD offers CDBG recipients guaranteed loan funds to acquire real property, relocate homeowners and businesses, rehabilitate publicly owned real property (including infrastructure), housing rehabilitation, and economic development.	Metropolitan cities and urban counties (i.e. CDBG entitlement recipients)	Section 108 provides communities with a source of financing for economic development, housing rehabilitation, public facilities, and large-scale physical development projects.	Loans	Varies	Entitlement public entities. An entitlement public entity may apply for up to five times the public entity's latest approved CDBG entitlement amount, minus any outstanding Section 108 commitments and/or principal balances of Section 108 loans.	Contact Agency	Contact Agency	<a href="http://www.hud.gov/offices/cpd/communitydevelopment/programs/108/index.cfm">http://www.hud.gov/offices/cpd/communitydevelopment/programs/108/index.cfm</a>	U.S. Department of Housing and Urban Development, 451 7th Street S.W., Washington, DC 20410. Telephone: (202) 708-1112	Any of the following could be used for mitigation purposes: acquisition of real property, rehabilitation of publicly owned real property, housing rehabilitation eligible under CDBG, construction, reconstruction, or installation of public facilities (including street, sidewalk, and other site improvements), related relocation, clearance, and site improvements	
Small Business Development Center	SBDC	Small Business Administration	To provide management counseling, training, and technical assistance to the small business community through Small Business Development Centers (SBDCs).	The Small Business Administration (SBA) is authorized to make grants (including contracts and cooperative agreements) to any public or private institution of higher education, including but not limited to any land-grant college or university, any college or school of business, engineering, commerce, or agriculture, community college or junior college. SBA is also authorized to renew the funding of other entities currently funded as SBDCs providing SBA affirmatively determines that such applicants have their own budget and will primarily utilize institutions of higher education to provide the services to the small business community. Beneficiaries of these programs are current and potential small business persons.	Funds are restricted to the purpose of assisting small businesses.	Project Grants and Cooperative Agreements	Contact Agency	Contact Agency	Contact Agency	Contact Agency	<a href="http://www.sba.gov/SBDC/">http://www.sba.gov/SBDC/</a>	Office of Small Business Development Centers, Small Business Administration, 409 3 <sup>rd</sup> Street, SW, 4 <sup>th</sup> Floor, Washington, DC 20416 (202) 205-6766	A small business which had been damaged by a disaster would be eligible for participation in this program. In fact, it is part of the disaster aid package typically offered to communities by the federal government.	
Small Watershed Program (PL-566 Operations Phase)	None	United States Department of Agriculture	The objective of this program is to provide technical and financial assistance in carrying out works of improvement to protect, develop, and utilize the land and water resources in small watersheds.	Funding is available to any State agency, county or groups of counties, municipality, town or township, soil and water conservation district, flood prevention or flood control district, Indian tribe or tribal organization, or any other nonprofit agency with authority under State law to carry out, maintain, and operate watershed works of improvement may apply for assistance.	Resource Conservation and Development (RCD) loans for measures or projects needed to implement the RCD area plan to achieve objectives in an RCD area.	Loans and Advances	Contact Agency	Contact Agency	Program funds may pay for up to 100% of flood prevention costs and requires preparation of an approved watershed plan. Contact Agency for details.	Contact Agency	<a href="http://www.usda.gov/rus/water/regs/1781.doc">http://www.usda.gov/rus/water/regs/1781.doc</a>	NRCS Naples Service Center, 14700 Immokalee Road, Naples, Florida 34120-1468, (239) 455-4100, (239) 455-2693 fax	Protection of the watershed is a form of mitigation.	

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Snagging and Clearing for Flood Control	None	United States Department of Defense/United States Army/United States Army Corps of Engineers	To reduce the potential for flood damage through the removal of debris and vegetation from watercourses.	States, political subdivisions of States or other responsible local agencies which have been established under State law with full authority and ability to undertake necessary legal and financial responsibilities.	ACOE designs and performs the project. Each project selected must be feasible from an engineering standpoint, complete within itself, and economically justifiable. The non-federal sponsor must provide all lands, easements and rights-of-way; must provide all project costs in excess of the Federal limit of \$500,000; agree to maintain the project after completion; hold and save the United States free from damages; provide a contribution toward the costs of land enhancement or special benefits; and, agree to prevent future encroachment of vegetation or structures upon the stream bed or floodway. Local cost participation requirements and procedures for feasibility studies, cost sharing and determining the local share of project cost are similar to those for flood control projects specifically authorized by Congress under regular authorization procedures.	Provision of Specialized Services	Contact Agency	Contact Agency	Technically, no match is required. However, the local sponsor generally shares the cost of the project and, in some cases, performs all or part of the actual work.	Contact Agency	<a href="http://www.usace.army.mil/">http://www.usace.army.mil/</a>	U.S. Army Corps of Engineers, United States Army, United States Department of Defense, USACE, Attention: CECW-PM DoD, Washington, DC 20314-1000, (202) 272-0169	Any local government or public agency can serve as the local sponsor for this type of project. However, the feasibility study phase for these projects is often long and involved; including environmental impact studies, permitting and public comment. Also, the project is likely to involve a fair amount of local expenditure, in terms of time, expertise, equipment and personnel.	
Solid Waste Management Grants	None	United States Department of Agriculture	Objectives are 1) Reduce or eliminate pollution of water resources in rural areas, 2) Improve planning and management of solid waste sites in rural areas. Solid Waste Management Grants are made available from an amount which is usually stipulated by Congress when it appropriates funds for Water Programs Grants.	Private nonprofit organizations that have been granted tax exempt status by the IRS and public bodies, including local government-based multi-jurisdictional organizations, may be eligible for assistance. Applicants must have proven ability, background, experience, legal authority, and actual capacity to provide the proposed services.	Funds may be used to: (1) Evaluate landfill conditions to determine threats to water resources. (2) Provide technical assistance and/or training to help communities reduce the solid waste stream; enhance operator skills in operation and maintenance of active landfills, or assist operators of landfills which are closed, or will be closed soon, with the development and implementation of the plans for closing and future land use.	Grants	FY 2003 - \$3,500,000	Contact Agency	None	Preapplications must be filed between October 1 and December 31 of each fiscal year.	<a href="http://www.usda.gov/rus/water/docs/wwfact.pdf">http://www.usda.gov/rus/water/docs/wwfact.pdf</a>	Assistant Administrator, Water and Environmental Programs, USDA – RUS, Washington, D.C. 20250, Telephone: (202) 720-9583	Reducing the potential for pollution is a form of mitigation.	
Special Agricultural Research Grants	None	Sustainable Agriculture Network/National Agricultural Library	To carry out research in order to facilitate or expand promising breakthroughs in the areas of food and agricultural sciences, which are of importance to the nation, and to facilitate or expand on-going State-Federal food and agricultural research programs. The program includes two types of Grants: Special Research Grants; and, Rangeland Research Grants.	Entities eligible to apply for Special Research Grants include: State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations and individuals having a demonstrable capacity to conduct research to facilitate or expand promising breakthroughs in areas of the food and agricultural sciences which are of importance to the United States. Entities eligible to apply for Rangeland Research Grants include: Land-grant colleges, universities, State agricultural experiment stations, colleges, universities and Federal laboratories having a demonstrable capacity in rangeland research.	Areas of basic and applied research are generally limited to high priority problems of a regional or national scope. Areas recently awarded, on a competitive basis, are Special Research Grants for Water Quality, Integrated Pest Management and General Rangeland Research Grants.	Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="mailto:san@nal.usda.gov">san@nal.usda.gov</a>	Sustainable Agriculture Network, National Agricultural Library, Room 304, 10301 Baltimore Ave., Beltsville, MD 20705-2351 (301) 504-6425	This could be a good mitigation funding source for an agricultural business, State agricultural extension service, university or local environmental agency which is seeking to either conduct new agricultural research or to disseminate little-known knowledge which might be valuable to agricultural interests. Such information could be considered as mitigation for agricultural and/or economic disasters.	

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Special Disease Prevention and Health Promotion Services for the Aging	Title III, Part F Grants	United States Department of Health and Human Services	To assist State Agencies on Aging and Area Agencies on Aging to carry out programs with respect to disease prevention and health promotion for older individuals.	All States and U.S. Territories which have State agencies on aging designated by the State Governor are eligible to receive grants. Eligible program beneficiaries are individuals age 60 and older, especially older individuals with the greatest social needs and those with the greatest economic needs.	Funds are awarded to States to develop or strengthen preventive health service and health promotion systems through designated State Agencies on Aging and Area Agencies on Aging. A State plan covering 2, 3, or 4 years, with annual revisions as necessary, must be submitted to appropriate State agencies for approval. Funds are used to design and implement programs for periodic preventive health services to be provided at senior centers or alternative sites as appropriate. The preventive health services under this Program may not include services eligible for reimbursement under Medicare.	Formula Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.aoa.dhhs.gov/">http://www.aoa.dhhs.gov/</a>	Administration on Aging, U.S. Department of Health and Human Services, 330 Independence Avenue, SW, Washington, DC 20201 (202) 619-2618 or Atlanta Federal Center 61 Forsyth Street, SW - Suite 5M69 Atlanta, GA 30303-8909 Phone: 404-562-7600 Fax: 404-562-7598	This program is administered through the State's various Area Agencies on Aging, along with other programs for the aging. As such it is not truly a mitigation program. However, local governments should coordinate with Area Agencies on Aging in order to determine what services could be provided within an emergency setting.	
Special Economic Development and Adjustment Assistance Program	Sudden and Severe Economic Dislocation (SSED) and Long-Term Economic Deterioration (LTED)	United States Department of Commerce	To assist States and local areas in developing and/or implementing strategies designed to address structural economic adjustment problems resulting from sudden and severe economic dislocation such as plant closings, military base closures and defense contract cutbacks, as well as natural disasters (SSED), or from long-term economic deterioration in an area's economy (LTED).	States, cities, counties, other political subdivisions of a state, consortia of such entities, public/private non-profit organizations representing redevelopment areas designated under the Public Works and Economic Development Act of 1965; Economic Development Districts as established under Title IV of the Act; and Indian tribes	LTED eligibility factors are: (1) very high unemployment; (2) low per capita income; and, (3) chronic distress. The SSED eligibility factor is that economic dislocation must exceed certain standard job loss thresholds for the target area. Grants may be for the purpose of developing an economic adjustment strategy (Adjustment Strategy Grant), or to implement a previously developed strategy (Adjustment Implementation Grant). Implementation grants may also be made to fund construction of public facilities, new business development and financing (including revolving loan programs), technical assistance, job training, or any other activities aimed at addressing economic adjustment problems.	Project Grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.doc.gov/eda/">http://www.doc.gov/eda/</a>	Economic Adjustment Division, Economic Development Administration, U.S. Department of Commerce, Room H7327, Herbert C. Hoover Building, Washington, DC 20230, (202) 482-2659	This is an excellent program, which has awarded a large number of post-disaster redevelopment grants, covering a wide range of projects.	
Special Nutrition Programs for the Aging	Title III, Part C Grants	United States Department of Health and Human Services	To provide grants to States to support nutrition services including nutritious meals, nutrition education and other appropriate nutrition services for older Americans in order to maintain health, independence and quality of life. Meals may be served in a congregate setting or delivered to the home.	All States and Territories may apply. Beneficiaries for this program are older individuals aged 60 and over and their spouses, especially those older individuals with the greatest social need or those with the greatest economic need, and in certain cases, under age 60, if the individual is handicapped or disabled and resides with and accompanies an older individual.	Local projects must provide a hot or other appropriate meal which provides one-third of the "recommended dietary allowance" (RDA), at least once per day, five or more days per week, except in rural areas where a lesser frequency may be determined feasible, to eligible people aged 60 and over and their spouses.	Formula grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.aoa.dhhs.gov/">http://www.aoa.dhhs.gov/</a>	Administration on Aging, U.S. Department of Health and Human Services, 330 Independence Avenue, SW, Washington, DC 20201 (202) 619-2618	It is possible that a local agency, in partnership with the appropriate State agency, could use these funds to develop a mass feeding program for older residents in the event of a large-scale emergency. To be most effective, the funds would need to be applied for and received prior to the actual emergency event. Otherwise, and also through a State partnership, a local government could use the funds to establish an elderly nutrition program.	

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Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
State Disaster Preparedness Grants	None	United States Department of Homeland Security/Federal Emergency Management Agency	To assist States in developing and improving State and local plans, programs, and capabilities for disaster preparedness and prevention.	All States are eligible (including the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, the Republic of the Marshall Islands, the Commonwealth of the Northern Mariana Islands, and the Federated States of Micronesia. Requests must be in writing from the Governor or his authorized representative. All of the above-referenced entities are also beneficiaries of the program.	These "improvement grants" may apply to such preparedness programs and capabilities as: (1) planning for disaster response in general, for specific natural disaster contingencies in special locales, for local and area mutual emergency support under State sponsorship, for long-range recovery, and for disaster mitigation and hazard reduction; (2) revision, as necessary, of State legislation, implementing orders, regulations, and other authorities and assignments relevant to disaster preparedness and assistance; (3) disaster-related mutual aid compacts and agreements; (4) the conduct of vulnerability analyses not otherwise available but necessary for the development of State and local disaster preparedness plans and programs; (5) the design of disaster-related emergency systems; (6) training and exercises; (7) program reviews and post-disaster critiques; and (8) public information and education programs. Grant funds may not be used to procure or repair equipment, materials, or facilities except as required for grant administration.	Grants	Contact Agency	Contact Agency	50%	Contact Agency	<a href="http://www.fema.gov/pte/about.htm">http://www.fema.gov/pte/about.htm</a>	State and Local Preparedness Division, Preparedness, Training and Exercises Directorate, Federal Emergency Management Agency, 500 "C" Street, SW, Washington, DC 20472, (202) 646-3492	This program does not provide any form of direct mitigation funding to local governments. However, it benefits them indirectly, in that State disaster planning, training and advisory programs are funded, in part, from this program.	
State Identification Systems Grant Program	SIS	United States Department of Justice	This program provides Federal assistance to States to establish, develop, update, or upgrade: 1) computerized identification systems that are compatible and integrated with the database of the National Crime Information Center (NCIC) at the FBI; 2) the capability to analyze deoxyribonucleic acid (DNA) in a forensic laboratory in ways that are compatible with the Combined DNA Identification Systems (CODIS) of the FBI; and 3) automated fingerprint identification systems that are compatible and integrated with the Integrated Automation Fingerprint Identification System (IAFIS) of the FBI.	States, which can then identify subrecipients. State shall require that each person convicted of a sexual felony must provide, to appropriate State law enforcement officials, a sample of blood, saliva, or other specimen necessary to conduct a DNA analysis consistent with the standards established for DNA testing by the FBI Director.	In general, expenditures for this grant program may include equipment, supplies, training, contractor-provided services to address backlog or program implementation issues, State and local personnel expenses, and other expenses deemed reasonable and necessary for a qualifying project. The Federal share of funds may cover 100% of the total cost of the project described in the application. States may use grant funds in conjunction with local government agencies or other States in any combination. States receiving funding under the SIS grant program however, are not required to pass through funding to local agencies. Additionally, a State may enter into compacts with other States to implement the grant programs.	Formula grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.ojp.usdoj.gov/">http://www.ojp.usdoj.gov/</a>	Office of Justice Programs, U.S. Department of Justice, 810 7 <sup>th</sup> Street, NW, 6 <sup>th</sup> Floor, Washington, DC 20531, (202) 616-3214	Local law enforcement agencies should contact the Office of Justice Programs, or the Florida Department of Law Enforcement for information regarding this program. An improved identification system would serve as a mitigation tool for civil disturbances, crime and/or terrorism.	

**Collier County Local Mitigation Strategy  
Funding Sources**

Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
State Park Additions	None	Florida Department of Environmental Protection	To acquire endangered environmental, historical and/or archaeological lands for State Parks.	The Division of Recreation and Parks, Florida Department of Environmental Protection (FDEP), annually reserves funds for the purchase of lands to be added to existing State Parks and State Recreation Facilities. The ultimate sources for these funds include the State's Conservation and Recreation Lands Program, Preservation 2000, and other sources. The Division has authority to negotiate land purchase agreements with single or multiple parties.	The program operates primarily through the purchase of land from "willing sellers". However, land acquired through other acquisition programs may be added to the State Park System.	Purchases, purchase agreements, donations, condemnation, purchase of development rights, conservation easements, etc.	Contact Agency	Contact Agency	Contact Agency	Contact Agency	<a href="http://www.state.fl.us/parks/">http://www.state.fl.us/parks/</a>	Division of Recreation and Parks, Florida Department of Environmental Protection, Marjory Stoneman Douglas Building, Room 1009A, 3900 Commonwealth Boulevard, Tallahassee, FL 32399, (850) 488-6131	Because of its emphasis on preservation, conservation and environmental protection, this program is often overlooked as a potential funding source for disaster mitigation. Also, these funds are not directly available to local governments, unless, of course, the local agency is the land. However, in Florida, lands which are environmentally endangered, such as wetlands, coastal areas and riverine areas, are often also lands subject to flooding, tidal surge, frequent fires and other natural hazards. Removal of these properties from the threat of development is thus a form of disaster mitigation.	
Superfund Technical Assistance Grants for Citizen Groups at Priority Sites	TAG	United States Environmental Protection Agency	To provide resources under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, Section 117(e) to enable community groups to hire technical advisors to assist them in interpreting technical information concerning the assessment of potential hazards and the selection and design of appropriate remedies at sites eligible for cleanup under the Superfund program.	Any qualified group of individuals which may be affected by a release or threatened release at any Superfund facility. "Affected" individuals are those who can demonstrate direct effects from the site, such as actual or potential health effects or economic injury. The recipient group must incorporate to receive funds.	There are specific criteria regarding the activities for which these Federal funds may be used: (a) Federal funds may be used at sites listed or proposed for listing on the National Priorities List (NPL) where cleanup is underway for the purpose of obtaining technical assistance in interpreting information with regard to the nature of the hazard, performing the remedial investigation and feasibility study, record of decision, selection and construction of remedial action, operation and maintenance, or removal action.	Technical assistance and grants	Contact Agency	Contact Agency	Contact Agency	Contact Agency	<a href="http://es.epa.gov/oeca/osre/">http://es.epa.gov/oeca/osre/</a>	Office of Site Remediation Enforcement, Office of Enforcement and Compliance Assurance, United States Environmental Protection Agency, 401 "M" Street, SW, Suite 5204G, Washington, DC 20460, (202) 564-5110	A local government environmental agency could conceivably serve as the "consulting firm" for helping a community group perform the required site assessment. If the "consulting" position was one with which the local agency was not comfortable, the local agency could make interested citizens aware of this program and guide them through the application process; leaving the citizen group to hire its own consultant. In either case, this is a good mitigation funding source for contaminated site cleanup. This program will benefit groups of individuals affected by Superfund hazardous waste sites. This may include homeowners, land/property owners, as well as any other individuals in the general public who live near a site or are otherwise affected by it.	
Surplus Property Utilization	Federal Property Assistance Program	United States Department of Health and Human Services	To convey or lease all surplus Federal real properties which are needed and usable by eligible healthcare organizations and institutions.	States governments, their political subdivisions and instrumentalities, tax-supported public health institutions, and nonprofit institutions which (except for institutions which lease property to assist the homeless under Title V of Public Law 100-77) have been held exempt from taxation under Section 501 (c) (3) of the 1986 Internal Revenue Code. Beneficiaries can include anyone attending, working with or for, or served by the eligible applicants. Examples of potentially eligible programs are hospitals, public health clinics, water and sewer systems, institutions for the rehabilitation of the mentally or physically handicapped, health research institutions, homeless assistance facilities, and other institutions which operate basic health programs.	Real property must be used for eligible health purposes including research. It may consist of land, with or without buildings and other improvements, or buildings only. A discount of up to 100 percent, based on the proposed-use, is granted. This discount, applied against the fair value of the property, is earned by the approved use over a prescribed period of 30 years for land, with or without improvements, and a lesser time for leased facilities and improvements which are sold without land. Discount of less than 100 percent requires payment of the difference in cash at the time of conveyance. Property must be used for the purpose for which conveyed, and may not be sold, leased, mortgaged, or encumbered without consent of the Department.	Sale, Exchange, or Donation of Property and Goods.	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.psc.gov/">http://www.psc.gov/</a>	Program Support Center, Division of Property Management, U.S. Department of Health and Human Services, Parklawn Building, Room 5B-41, 5600 Fishers Lane, Rockville, MD 20857, (301) 443-2265	The main limitation of this program for local governments is that HHS property must be located within or reasonably close to the local jurisdiction in order for the program to be useful. Otherwise, this program represents an excellent way for local agencies to acquire (at little or no out-of-pocket expense) public facilities sites.	

Collier County Local Mitigation Strategy  
Funding Sources

Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Technical Assistance and Training Grants	None	United States Department of Agriculture	Identify and evaluate solutions to water and/or waste related problems of associations in rural areas. (2) Assist entities with preparation of applications for Water and Waste Disposal loans and grants. (3) Provide training to association personnel in order to improve the management, operation and maintenance of water and/or waste disposal facilities. (4) Pay expenses related to providing the technical assistance and/or training.	Private nonprofit organizations may receive grants. They must have tax exempt status granted by the Internal Revenue Service (IRS). Applicants must have the proven ability, background, experience, legal authority, and actual capacity to provide technical assistance and/or training to associations.	Technical Assistance and Training Grants are made available from at least one percent and not more than three percent of the funds appropriated for Water and Waste Disposal Grants.	Assistance and Grants	FY 2003 - \$18,213,835	Contact Agency	None	Preapplications must be filed between October 1 and December 31 of each fiscal year.	<a href="http://www.usda.gov/rus/water/docs/wwfact.pdf">http://www.usda.gov/rus/water/docs/wwfact.pdf</a>	Assistant Administrator, Water and Environmental Programs, USDA – RUS, Washington, D.C. 20250, Telephone: (202) 720-9583	Construction of new or improved facilities that are up to current standards, wind strengths, etc. is mitigation.	
Technology Opportunities Program	TOP	United States Department of Commerce/National Telecommunications and Information Administration	To demonstrate how digital networks support lifelong learning for all Americans, help public safety officials protect the public, assist in the delivery of health care and public health services, and foster communication, resource-sharing, and economic development within rural and urban communities.	State, local and tribal governments, health care providers, schools, libraries, police departments, and community-based non-profit organizations.	TOP projects are demonstrations of how digital network technologies can be used to extend and improve the delivery of valuable services and opportunities to all Americans. By serving as models that can be replicated in similar communities across the country, TOP projects extend their benefits far beyond the communities in which they take place, and provide economic and social benefits to the nation as a whole.	Grants	\$12.9 million	\$ 700,000.00	1:1	April each year	<a href="http://www.ntia.doc.gov/top/grants/grants.htm">http://www.ntia.doc.gov/top/grants/grants.htm</a>	Technology Opportunities Program, Office of Telecommunications and Information Applications, National Telecommunications and Information Administration, U.S. Department of Commerce, 1401 Constitution Avenue, NW, Room 4096, Washington, DC 20230, (202) 482-2048, top@ntia.doc.gov	A project help public safety officials protect the public could result in mitigation.	
Unemployment Compensation	None	United States Department of Labor	To administer a program of unemployment insurance for eligible workers through Federal and State cooperation; to administer payment of trade adjustment assistance; to administer disaster unemployment assistance; to provide unemployment compensation for Federal employees and military veterans.	Eligible agencies include all State unemployment insurance agencies, (including agencies in the District of Columbia, Puerto Rico and the Virgin Islands). Eligible beneficiaries are all workers whose wages are subject to State unemployment insurance laws, Federal civilian employees, and ex-employees of the military services. The program also provides trade readjustment allowances for workers who become unemployed as a result of product imports, and assistance to workers whose unemployment is caused by a Presidentially declared disaster (under the Robert T. Stafford Disaster Relief and Emergency Assistance Act). Workers are eligible if they are involuntarily unemployed, able to work, available for work, meet the eligibility and qualifying requirements of the State law, and are free from disqualifications. Individual State information and eligibility requirements are available from local employment offices.	The States have direct responsibility for establishing and operating their own unemployment insurance programs, while the Federal Government finances the cost of administration.	Formula Grants, Direct Payments with Unrestricted Use	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.doleta.gov/">http://www.doleta.gov/</a>	Employment and Training Administration, U.S. Department of Labor, 200 Constitution Avenue, NW, Suite 4203, Washington, DC 20210, (202) 219-5690	Of importance for mitigation purposes is the Disaster Unemployment Assistance Program, administered by the Department of Labor from funds allocated by FEMA. Unfortunately, this funding would only be available after a disaster, and could not be used by a local government to build up the employment base of a community before a disaster struck. However, the monies would conceivably be available after an economic disaster; such as a massive crop failure or the closure of a major employer.	

Collier County Local Mitigation Strategy  
Funding Sources

Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Volunteer Fire Assistance Grants	VFAG	Florida Division of Forestry/Florida Department of Agriculture and Consumer Services	To provide federal financial, technical, and other assistance to State Foresters to organize, train, and equip fire departments in rural areas and rural communities to prevent and suppress fires.	A single fire department serving a rural area or a rural community with a population of 10,000 or less, area fire departments (fire districts, townships, etc.) may serve an aggregate population of greater than 10,000 as long as the service area of the fire department includes a rural area or a rural community having a population of 10,000 or less, a single county or town with a population over 10,000 which is served by two or more fire districts operating entirely within the bounds of the county or town, a single community with a population greater than 10,000 and having a single fire department with one or more fire stations may qualify, or a single community fire department serving a population greater than 10,000 and not providing protection to a rural area or to a rural community is not eligible for VFA financial assistance.	A rural community is defined as having 10,000 or less population, or as defined below. This 10,000-population limit for participation in the VFA Program facilitates distribution of available VFA funds to the most needy fire departments. Preference will be given to VFA Grant applications for the purchase of wildland personal protective gear, communications equipment, water handling equipment, and training. The purchase of vehicles and high value equipment will not be funded due to the limited amount of funds available. Purchases made before the date of the VFA application are not eligible for reimbursement. Proof of Purchase forms and invoices must be dated after the date of the VFA application	Grants and technical assistance	Contact Agency	Contact Agency	50%	April each year	<a href="http://flame.fl-dof.com/resource/">http://flame.fl-dof.com/resource/</a>	Forest Protection Bureau, Division of Forestry, 3125 Conner Boulevard, Tallahassee, Fl 32399-1650, Telephone (850) 488-6111 or Caloosahatchee District Office Florida Division of Forestry 10941 Palm Beach Blvd. Ft. Myers, FL 33905 Telephone: 239/690-3500	Having properly trained and resourced firefighters is a form of mitigation.	
Volunteer Florida Disaster Mitigation Projects	None	United States Department of Homeland Security/Federal Emergency Management Agency and Florida Department of Community Affairs/Division of Emergency Management	To support community based projects to prevent a disaster or to minimize the impact of the disaster on people, property and the environment	Local non-profit/501(c)3	None provided	Grants	\$ 70,000.00	\$ 5,000.00	None	March	<a href="http://www.volunteerflorida.org">www.volunteerflorida.org</a>	Amy Bradbury, amy@volunteerflorida.org	Installation of smoke alarms, safe room demo, clean storm drains, perform stream restoration, conduct wildfire risk assessment, install storm shutters, remove threatening trees,	
Water Pollution Control	None	United States Environmental Protection Agency	To assist States (including territories, the District of Columbia, and qualified Indian tribes, and interstate agencies in establishing and maintaining adequate measures for prevention and control of surface and ground water pollution.	Potential applicants include State and interstate water pollution control agencies, as defined in the Federal Water Pollution Control Act, and Indian Tribes qualified under Section 519(e) of the Act. Agencies making application for funds must annually submit their pollution-control program to the appropriate EPA Regional Administrator for approval. Requirements of the program are based on Section 106 of the Act, and 40 CFR Parts 35 and 30. Eligible beneficiaries include State and interstate water pollution control agencies and Indian Tribes qualified under Section 518(e) of the Clean Water Act (CWA).	The program is intended to provide broad support for the prevention and abatement of surface and ground water pollution from point and nonpoint sources including water quality planning, monitoring, setting of water quality standards, assessments, permitting, pollution control studies, planning, surveillance and enforcement; advice and assistance to local agencies; training; and public information. Funds cannot be used for construction, operation, or maintenance of waste treatment plants, nor can they be used for costs financed by other Federal grants.	Formula grants	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.epa.gov/">http://www.epa.gov/</a>	United States Environmental Protection Agency, 401 "M" Street, SW, Washington, DC 20460 0003, (202) 260-2090	This is a good grant program for use in mitigating existing or potential water pollution control problems. However, the restriction against utilizing the program to correct problems regarding water/wastewater treatment plants may limit its usefulness to small local governments.	
Water Quality Cooperative Agreements	None	United States Environmental Protection Agency	To support creation of new and unique approaches to enhancing State capabilities in water quality.	State water pollution control agencies, interstate water resource agencies, local governments, Indian tribes, non-profit institutions, organizations and individuals.	Grants are for the purpose of aiding appropriate agencies in meeting water quality goals for stormwater treatment, combined sewer outflows, sludge disposal, and potable water treatment, and for enhancing State capabilities in these areas.	Loans	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.epa.gov/owm/">http://www.epa.gov/owm/</a>	Office of Wastewater Management, Environmental Protection Agency, SRF Branch, Municipal Support Division (4204), 401 M Street, SW, Washington, DC 20460, (202) 260-2268	Loan funds might be applicable for the purpose of restoring, or even upgrading, a treatment facility damaged by a natural disaster.	

Collier County Local Mitigation Strategy  
Funding Sources

Grant Program	Acronym/Nickname	Grantor Name	Purpose	Eligibility	Criteria/Use	Funding Mechanism	Overall Funding Available	Funding Amount	Match Requirements	Deadline	Website	Contact Info	Applicability to Mitigation	Applicable Collier Mitigation Projects
Watercourse Navigation Maintenance	Emergency Dredging Projects	United States Department of Defense/United States Army/United States Army Corps of Engineers	To restore channels for purposes of navigation and/or flood control.	States, political subdivisions of States or other responsible local agencies which have been established under State law with full authority and ability to undertake necessary legal and financial responsibilities.	Each project selected must be feasible from an engineering standpoint, complete within itself, and economically justifiable. Work pursuant to this program is undertaken as an emergency measure to clear or remove obstructions to navigation in navigable portions of rivers, harbors, and other waterways of the United States, or tributaries thereof, in order to provide existing traffic with immediate and significant benefit. The non-federal interest (the local sponsor) involved must provide all lands, easements and rights-of-way necessary for completion of the project and must bear the costs of necessary annual maintenance until and unless such time as the location may become a part of a specifically authorized annual or periodic project. Local cost participation requirements and procedures for determining the local share of project costs are similar to those for navigation or flood control projects specifically authorized by Congress under regular authorization procedures. Annual expenditures under this program are limited to \$1,000,000 per project.	Provision of Specialized Services	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.usace.army.mil/">http://www.usace.army.mil/</a>	U.S. Army Corps of Engineers, United States Army, United States Department of Defense, USACE, Attention: CECW-PM DoD, Washington, DC 20314-1000, (202) 272-0169	Any governmental entity with jurisdiction over a natural or artificial waterway is eligible to serve as a local sponsor for Corps of Engineers' activities performed under this program. Certain floodplain management activities, such as removal of debris, dredging of shoals or sediment dams, and flowway maintenance are eligible activities under this program	
Watershed Surveys and Planning	None	United States Department of Agriculture/Natural Resources Conservation Service	To provide planning assistance to Federal, State, and local agencies for the development of coordinated water resource (and related land resource) programs within watersheds or river basins. Funding priority is given to proposed studies which: (1) Contribute to achieving the National Conservation Program high priority objectives; (2) Have a high likelihood of implementation; (3) Can be implemented with little or no direct federal assistance; (4) Have the assistance of other State and/or local agencies in the Study; (5) Are of 2 to 4 years expected duration; and (6) Are considered low cost. Special priority is given to freshwater flooding problems, agricultural nonpoint source water quality improvements, wetland preservation, and drought management in rural/agricultural communities. Special emphasis has been given to communities desiring to develop floodplain regulations to meet requirements of the National Flood Insurance Program (NFIP), and State agencies involved in the development of a strategic water resource plan.	Applicants can include any local or State water resource agency, federal land and water resource agencies, counties, municipalities, towns, townships, soil and water conservation districts, flood prevention/control districts, Indian tribes, tribal organizations, non-profit organizations. Federal participation is a cooperative effort with the applicant. State and local agencies are expected to participate in the Studies and fund their own activities.	Technical assistance is provided in planning activities to help solve water, and related land, resource problems. Federal technical assistance can include, but is not limited to, engineering, economics, social sciences, agronomy, range management, forestry, biology, hydrology, archaeology, landscape architecture, waste management, and recreation.	Provision of Specialized Services; Advisory Services and Counseling.	Contact Agency	Contact Agency	None	Contact Agency	<a href="http://www.nrcs.usda.gov/">http://www.nrcs.usda.gov/</a>	Natural Resources Conservation Service, U.S. Department of Agriculture, Post Office Box 2890, Washington, DC 20013, (202) 720-4527	This is an excellent technical assistance program to aid local governments, and other governmental agencies in the development of floodplain regulations.	
Wind and Water Technical Assistance Program	WAWTAP	United States Department of Homeland Security/Federal Emergency Management Agency	To provide technical support to state/local communities, FEMA Regional and Headquarters Mitigation staff in support of mitigation initiatives; technical support necessary to mitigate against potential loss of lives and minimize the amount of damage as a result of a natural disaster	Provide assistance in support of hurricane and flood programs; designed to enhance the state/local communities' ability to become more resistant to hazards related to flooding and hurricanes	All states and US territories that participate in the Hurricane and/or Flood Programs	Technical assistance	N/A	N/A	N/A	N/A	<a href="http://www.fema.gov/fima/">http://www.fema.gov/fima/</a>	Federal Emergency Management Agency, Suite 900, 2323 Grand Blvd., Kansas City, MO 64108 (816) 283-7061, or 3003 Chamblee-Tucker Rd., Atlanta, Georgia 30341, (770) 220-5200	Provide assistance in support of hurricane and flood programs; designed to enhance the state/local communities' ability to become more resistant to hazards related to flooding and hurricanes	

## ANNEX E

### Prioritized Listing of Mitigation Action Items

Mitigation actions items, projects and/or initiatives of the LMS typically address existing buildings, infrastructure and/or environment. However, **new buildings** and/or **infrastructure** are addressed two ways: 1) the county has adopted and rigorously applies the Florida Building Code (which is a code based on Hurricane Andrew experiences) for all new construction; and, 2) the Emergency Management Department reviews all Developments of Regional Impact (DRI) and Planned Unit Developments (PUD) for mitigation initiatives that may offset their impacts to the community's emergency preparedness.

The mitigation action items contained on this listing get there via the following process:

1. Either the Local Mitigation Strategy Working Group (LMSWG) member makes a pitch to a "responsible agency" to apply for a grant to fund a mitigation initiative, or a "responsible agency" submits a Mitigation Initiative Evaluation Score Sheet (Annex I) to the LMSWG for consideration at a working group meeting. [NOTE: The Mitigation Initiative Evaluation Score Sheet (Annex H) is a tool used by the LMSWG to analyze the mitigation initiative. It forces the applicant to consider the project in light of the goals and objectives contained within the Local Mitigation Strategy (Section 3), and it provides an indication of the project's impact and/or value to the community. It also provides a very basic benefit-cost analysis (BCA) on the worksheet for the applicant to complete.]
2. The "responsible agency", henceforth the applicant, will make a presentation about the mitigation initiative to the LMSWG at either a regular or special meeting.
3. The LMSWG members have an opportunity to ask questions to the applicant regarding the initiative as well as challenge scores and/or comments on the Mitigation Initiative Evaluation Score Sheet (Annex H).
4. Once all issues are resolved and/or scores adjusted, the LMSWG members vote on the initiative. If the initiative passes with a simple majority vote, the Chair will complete the scoring process, according to the weighting factors contained in Section 4 (Procedures for Prioritizing Hazard Mitigation Initiatives) and place the new "action item" on the listing below in the location commensurate with the final weighted project score received.
5. **Special Circumstance:** Should an eligible entity have an opportunity to apply for a mitigation grant for an initiative not previously listed on the Prioritized Listing of Mitigation Action Items (Annex E) and not be able to apply for the grant because the next announced LMSWG meeting would preclude timely application, this procedure applies. The applicant will complete a project score sheet, Annex H, and submit it to the Emergency Management Department. Emergency Management will transmit the score sheet to the Chair. The Chair will electronically transmit the score sheet to the voting members of the LMSWG along with an explanation of the exigent circumstances. The LMSWG voting members have **two** business-days to vote on the initiative's acceptability to the Prioritized Listing of Mitigation Action Items. At the conclusion of the two business-days a majority vote, with at least three votes agreeing, determines the initiative's status. A transcript of this exception will be entered into the minutes at the next scheduled meeting.

6. **Special Rule for Initiatives which can't be quantified:** See Section 4, para. 4.1.4

It should be noted, either process only gets the project on the Collier County project priority listing. The applicant still must complete the appropriate project application, including the FEMA BCA, for appropriate grant.

7. **Floodplain Management Initiatives:** Annex I, Collier County Floodplain Plans, addresses the minimal initiatives National Floodplain Insurance Program, NFIP, participants must do to maintain compliance. CRS communities who have floodplain management plans list their activities above and beyond the basic NFIP requirements within their respective plans. Where CRS communities are not required and choose not to have a floodplain management plan, this section will serve as the main repository for their initiatives.

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## ANNEX E COLLIER COUNTY LOCAL MITIGATION ACTION ITEMS PRIORITY LISTING (Effective 21 Feb 2020)

**1. Hazard:** The hazard listed was the main hazard the responsible office considered when developing this initiative. However, that does not mean that the mitigation initiative only reduces the effects from only the disaster indicated. Projects which indicate “dangerous winds” as the hazard specifically will mitigate against the severe storm, tornado and tropical cyclone wind hazards. Likewise, flooding, coastal storms and tropical cyclone surge are all related in that mitigation projects which address flooding address these specific hazards.

**2. New or Existing Buildings or Infrastructure:** Does the project address reducing the effects of the hazard on new or existing buildings and/or infrastructure.

**3. Beneficiary:** Who benefits by the project? CW=Countywide (includes Collier County Public Schools)

**4. FUNDING: Grant Abbreviations:** (see also: <http://floridadisaster.org/mitigation/>)

- **FMAP** = Flood mitigation Assistance Program (offered annually)
- **RCMP** = Residential Construction Mitigation Program (offered annually)
- **PDM** = Pre-Disaster Mitigation (offered annually)
- **HMGP** = Hazard Mitigation Grant Program (offered after Presidential Disaster Declaration)
- **CDBG** = Community Development Block Grant

**5. Office Responsible:** CC=Collier County, PUD=Public Utilities Department, ATM=Alternative Transportation Modes, P & R=Parks & Recreation, PSD =Public Services Department, SFWMD/BCB=South Florida Water Management District/Big Cypress Basin, GMD=Growth Management Department, LCEC=Lee County Electric Cooperative, CCPS = Collier County Public Schools

**6. Timeframe (to be Implemented) - Status:** If grant monies and corresponding match monies available, timeframe is either less than (<) a year or more than (>) a year to implement project.

#	SCORE	Name/Location/JURISDICTION	Description & Goal(s) Achieved	Hazard Mitigated <sup>1</sup>	New or Existing Bldgs? <sup>2</sup>	Beneficiary <sup>3</sup>	Estimated Cost	Potential Funding Source <sup>4</sup>	Office Responsible <sup>5</sup>	Submitted /Updated	Timeframe - Status <sup>6</sup>
1	25437.5	Marco Island/Collier Co. Watermain Interconnect Mainsail Dr, Naples 34114 <b>MARCO ISL/COLLIER CO.</b>	This water supply interconnect between the City and County water systems will provide redundancy in a disaster situation for community water and fire suppression. Goal 3	All	Existing	Marco Isl & E. Naples	\$200.0K	HMGP/PDM	Marco Public Wks	2/20	>
2	4789.88	Naples Manor North Area Flood Mitigation <b>COLLIER COUNTY</b>	Complete Nap. Manor North Canal improvements by rechannelization of existing canal. Goal 1	Flood	Existing	E. Naples	\$600.0K	HMGP	Collier GMD Stormwater	2/20	>
3	4045.47	GNFD-Station 90 Hardening 175 Capri BLVD <b>Greater Naples Fire District</b>	Replace windows, pedestrian and facility bay doors to impact and wind resistant code, roof hardening. Goal 3	Dangerous Winds	Existing	Isles of Capri	\$96,600.0K	HMGP	Greater Naples Fire District	1/20	>
4	3559.68	GNFD-Station 23 Hardening 6055 Collier BLVD <b>Greater Naples Fire District</b>	Replace windows, pedestrian and facility bay doors to impact and wind resistant code, roof hardening. Goal 3	Dangerous Winds	Existing	E. Naples	\$96,600.0K	HMGP	Greater Naples Fire District	1/20	>
5	2642.7	Flood Mitigation of Madison Av Area in Immokalee. <b>COLLIER COUNTY</b>	Improvement of roadside ditches/swales, repair/upgrading of non-functioning driveway culverts, addition of cross-drainage structures, & construction of stormwater treatment facs. Goal 1	Flood	Existing	Immokalee	\$1.0M	HMGP	Collier GMD Stormwater	2/20	>
6	1816.34	Naples City Hall Wind Protection 735 8 <sup>th</sup> St. S. Naples 34102 <b>CITY OF NAPLES</b>	Wind retrofit non-structural exterior glass window and metal frame replacement with higher impact glass to meet code...Goal 3, objs 3.1,3.2,3.3	Dangerous Winds	Existing	Naples	\$776.0K	HMGP	City of Naples	2/20	<

7	1677.37	Upper Gordon River north of GG Pkwy to Pine Ridge Rd Dvmt <b>COLLIER COUNTY</b>	Includes improvements to the existing conveyance channel known as the Upper Gordon River. Goal 1	Flooding	Existing	N. Naples	\$2.0M	HMGP	Collier GMD Stormwater	2/20	>
8	1554.57	Naples Airport Hangar <b>Collier Mosquito Control District</b>	Purchase /install one generator at the hangar. Goal 1	All	Existing	CW	\$80.0K	HMGP	CMCD	2/20	<
9	1501.37	Immokalee-Eden Garden Bypass <b>COLLIER COUNTY</b>	Construct new ditch along northern boundary and Install 24" pipe under Boxwood Drive to tie into. Goal 1	Flooding	Existing	Immokalee	\$600,000	CDBG DR & MIT, HMGP	Collier GMD Stormwater	1/20	>
10	1444.62	Old Lely Area <b>COLLIER COUNTY</b>	Old Lely Backbone Stormwater Management System Improvements. Goal 1	Flooding	Existing	E. Naples	\$2.0M	HMGP	Collier GMD Stormwater	2/20	>
11	1413.75	West side of Goodlette Rd from GG Pkwy north to Pine Ridge Rd <b>COLLIER COUNTY</b>	Improving the capacity for flow of an existing ditch located on the west side of Goodlette Road. Goal 1	Flooding	Existing	N. Naples	\$1.0M	HMGP	Collier GMD Stormwater	2/20	>
12	1286.65	GNFD Sta 21, 11121 E. Tamiami Trail <b>Greater Naples Fire &amp; Rescue</b>	Purchase and install larger generator to increase coverage of emergency activities. Goal 3	All	Existing	E. Naples	\$110.0K	Wildfire HMGP	GNFR	2/20	<
13	956.87	Rock Rd./Cypress Canal Area Flood Mitigation <b>COLLIER COUNTY</b>	Elevating the roads, improvement of roadside ditches, addition of cross-drainage culverts, & Stormwater treatment outfalls. Goal 1	Flooding	Existing	GG Estates	\$1.2M	HMGP	Collier GMD Stormwater	2/20	>
14	877.5	Lake Trafford Slough <b>COLLIER COUNTY</b>	Lake Trafford Immokalee Slough Capacity Improvements. Goal 1	Flooding	Existing	Immokalee Area	\$1.0M	HMGP	Collier GMD Stormwater	2/20	>
15	859.89	Griffin Road Area <b>COLLIER COUNTY</b>	Griffin Road Area Stormwater Management Improvements. Goal 1	Flooding	Existing	E. Naples Area	\$1.5M	HMGP	Collier GMD Stormwater	2/20	>
16	828.33	Utilities Admin Bldg. 380 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 3	Dangerous Winds	Existing	Naples	\$150.0K	HMGP	City of Naples	2/20	<
17	778.64	Immokalee-North 3 <sup>rd</sup> Street Drainage <b>COLLIER COUNTY</b>	Roadside Swales. Installation of inlets on 3 <sup>rd</sup> Street, Construct storm drainpipe system to alleviate ponding and allow conveyance southward to storm drain system on West Main Street.	Flooding	Existing	Immokalee	\$600,000	CDBG DR & MIT, HMGP	Collier GMD Stormwater	1/20	>
18	756.05	Equipment Svs Facility & River Park Cmty Ctr 301 11 <sup>th</sup> Street North & 370 Riverside Cir, Naples <b>CITY OF NAPLES</b>	Purchase and install a generator at each facility. Goal 3.	All	Existing	Naples	\$180.0K	HMGP	City of Naples	2/20	<
19	682.916	Naples Fire Sta 2, 977 26 <sup>th</sup> Avenue North <b>CITY OF NAPLES</b>	Apparatus Bay renovation and facility hardening. Goal 1	All	Existing	Naples	\$450K	HMGP	City of Naples	3/18	<
20	552.46	Naples Park Area Flood Mitigation <b>COLLIER COUNTY</b>	Improvement to existing roadside swales, driveways, & installation of stormwater outfall treatment system. Goal 1	Flood	Existing	N. Naples	\$14.0M total, in 7 phases	HMGP	Collier GMD Stormwater	2/20	>
21	527.78	Auto Ranch Road Area Flood Mitigation <b>COLLIER COUNTY</b>	Improvement of roadside ditches, elevation of roads, addition of cross-drainage culverts, and stormwater treatment outfalls. Goal 1	Flood	Existing	E. Collier County	\$500K	HMGP	Collier GMD Stormwater	2/20	>
22	526.76	Pine Ridge Estates	Stormwater Management Improvements. Goal 1	Flooding	Existing	E. Collier	\$5.5M	HMGP	Collier GMD	2/20	>

		<b>COLLIER COUNTY</b>				County			Stormwater		
23	520.37	<i>Big Corkscrew Isl. Regional Park</i> <b>COLLIER COUNTY</b>	Generators for facilities, wind- hardening Goal 3.	All	New	CW	\$1,200.0K	HMGP	Collier PSD P&R	2/20	>
24	501.43	<i>Approx. 200' south of the Goodlette Rd/GG Pkwy intersection</i> <b>COLLIER COUNTY</b>	Construction of a new piped stormwater outfall conveying flow south from the existing ditch along the west side of Goodlette Rd., adjacent to the Naples High School. Goal 1	Flooding	Existing	Naples area	\$4.0M	HMGP	Collier GMD Stormwater	2/20	>
25	476.250	<i>Desoto Blvd Area, GGE</i> <b>COLLIER COUNTY</b>	Swale reconstruction. Goal 1	Flooding	Existing	Golden Gate Estates	\$2.6M	HMGP	Collier GMD Stormwater	2/20	>
26	428.62	<i>Lake Trafford Rd</i> <b>COLLIER COUNTY</b>	Lake Trafford Road Stormwater Management Improvements. Goal 1	Flooding	Existing	Immokalee Area	\$2.0M	HMGP	Collier GMD Stormwater	2/20	>
27	423.9	<i>Marco Island Public Works Office 415 Lily Ct, MI</i> <b>CITY OF MARCO ISLAND</b>	New pre-engineered metal building hardened beyond codes and standards, build two feet above BFS. Coal 3	Flood and Dangerous Winds	New	Marco Island	\$750.0K	HMGP	City of Marco Island	2/20	<
28	412.75	<i>Logan Blvd Area</i> <b>COLLIER COUNTY</b>	Stormwater Improvements. Goal 1	Flood	Existing	W. Golden Gate Estates	\$4.5M	HMGP	Collier GMD Stormwater	2/20	>
29	412.75	<i>Old Lely Utility Renewal</i> <b>COLLIER COUNTY</b>	Old Lely Utility Renewal Stormwater Management Improvements. Goal 1.	Flood	Existing	E. Naples Area	\$7.0M	HMGP	Collier GMD Stormwater	2/20	>
30	389.333	<i>Fire Sta. #51 751 Elkcam Cir. E.</i> <b>CITY OF MARCO ISLAND</b>	Purchase/install Windscreen for hurricane wind protection. Goal 1.1 & 3.3	Dangerous Winds	Existing	Marco Island	\$15.0K	Wildfire HMGP	City of Marco Island	2/20	<
31	360.08	<i>Caxambas USCGA Building 909 Collier Ct., MI</i> <b>COLLIER COUNTY</b>	Add a new hardened building. Goal 3	Damaging Winds	New	Marco Island	\$1,500.0K	HMGP	Collier PSD P&R	2/20	>
32	341.33	<i>Emergency Services Ctr 8075 Lely Cultural Pkwy</i> <b>COLLIER COUNTY</b>	Drill water well and install backup water system. Goal 1	All	Existing	CW	\$150.0k	HMGP	Collier Facilities Mgt	2/20	<
33	n/a	<i>Harden proposed Sports &amp; Entertainment Complex for PSN sheltering.</i> <b>COLLIER COUNTY</b>	Harden field-house facility of the proposed/new Sports & Entertainment Complex for PSN sheltering. Goal 1	All	New	CW	\$7.5M	HMGP/P DM	Collier Fac. Mgt	2/20	>
34	n/a	<i>US Hwy-41 Distribution Ochopee, Florida</i> <b>Lee County Electric Cooperative</b>	Move the electric lines to the Southside of US-41 for quicker access to repair	All	Existing	Ochopee & Everglades City	\$4.01M	HMGP	LCEC	2/20	>

### NON-“BRICK-AND-MORTAR” MITIGATION INITIATIVES

(SEE ALSO FLOODPLAIN MANAGEMENT PLAN PROGRESS REPORTS FROM THE CITIES – ANNEX J)

#	NAME	Description & Goal(s) Achieved	Hazard	New or Existing	Beneficiary	Est. Cost	Potential Funding Source	Office Respon.	Submitted /Updated	Timeframe - Status
48	<i>Annual Public Appeal/Outreach</i> <b>ALL JURISDICTIONS</b>	Annually, present the LMS to the public for comment and participation in the LMS process via the Flood Plain Management Committee outreach initiative. Goal 5	All Hazards	Both	CW	None	N/A	EM & Floodplain Mgrs.	2/20	Annually
49	<i>StormReady Community</i>	Maintain the County's certification as StormReady which	All Hazards	Both	CW	None	N/A	EM &	2/20	2020 due

	<i>Certification from the National Weather Service</i> <b>ALL JURISDICTIONS</b>	signifies that the community is better prepared to save lives from the onslaught of severe weather through advances planning, education and awareness. Goals 1 & 5						Municipalities		
<b>50</b>	<i>Firewise Community Designation &amp; Awareness Program</i> <b>ALL JURISDICTIONS</b>	Program that recognizes communities or neighborhoods that demonstrate the spirit, resolve and willingness to take responsibility as a partner in wildfire protection. Firewise Communities/USA is a way to help prevent and reduce losses to wildland/urban interface fire and foster community participation in applying Firewise principles. Goals 1, 5 & 6	Wildfire	Both	Municipalities & Immokalee, Golden Gate Estates, Ave Maria, N. Naples Communities	None	Residents, Div. of Forestry & HMGP	Fla. Forest Svs.	2/20	On-going

**DELETED & DEFERRED PROJECT/ACTION ITEM LISTING**

(This space is provided to show projects which were approved by the LMSWG to go forward, but lacked support, etc. later)

<i>NAME/Location</i>	<i>Description &amp; Goal(s) Achieved</i>	<i>Hazard</i>	<i>Beneficiary</i>	<i>Est.Cost</i>	<i>Potential Funding Source</i>	<i>Office Respon.</i>	<i>Why Deleted/Deferred?</i>
<i>Wind Retrofit residential properties</i> <b>REBUILD NW FLORIDA</b>	Wind retrofit residential properties. Goal 1	Dangerous Winds	CW	\$93M	HMGP	Retrofit NW Fla.	Couldn't find the project sponsor to validate project.
<i>Roberts Ranch Museum</i> 1215 Roberts Ave, Immok. <b>COLLIER COUNTY</b>	On all facilities at the museum, retrofit w/hurricane strapping, storm shutters, bury electrical utilities & wind-proof. Goal 3, Obj 3.2.& 3.3	Dangerous Winds	E. Collier County	\$92K	HMGP	Collier PSD Museums	Not considered a necessary project.
<i>Naples Depot Museum</i> 1051 5 <sup>th</sup> Ave S. <b>COLLIER COUNTY</b>	Install hurricane tie-down at loading dock and buy/install generator. Goal 3	Dangerous Winds	Naples	\$215K	HMGP	Collier PSD Museums	Not considered a necessary project.
<i>Museum @ Collier Govt Ctr</i> 3339 Tamiami Trl E. <b>COLLIER COUNTY</b>	Replace doors, add hurricane strapping, shutters and generator. Goal 3	Dangerous Winds	E. Naples	\$208K	HMGP	Collier PSD Museums	Not considered a necessary project.
<i>Headquarters Library</i> 2385 Orange Blossom Dr. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	N. Naples	\$200K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>Vanderbilt Beach Library</i> 788 Vanderbilt Bch Rd. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	N. Naples	\$100K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>Marco Island Library</i> 210 s. Heathwood Dr. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	Marco Island	\$150K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>South Regional Library</i> 8065 Lely Cultural Pkwy <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	E. Naples	\$150K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>Estates Branch Library</i> 1266 GG Blvd. W. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	G.G. Estates	\$150K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>E. Naples Library</i> 2385 Orange Blossom Dr. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	E. Naples	\$225K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>Golden Gate Library</i> 2432 Lucerne Rd. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	G.G Estates	\$175K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>Naples Regional Library</i> 650 Central Ave <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	All	Naples	\$150.K	HMGP	Collier PSD Library	Not an eligible generator project as a Critical Facility
<i>Gulf Coast High School, 7878 Shark Way</i> <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.1	All	CW	\$20.0K	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
<i>Sabal Palm ES,</i> 4095 18th Ave. NE <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.1	All	CW	\$20.0K	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
<i>Corkscrew Elementary School,</i> 1065 C.R. 858	Connect generator to lift station. Goal 1.1	All	CW	\$20.0K	HMGP/PDM	Collier Public	The grant process takes too long.

<b>COLLIER COUNTY SCHOOLS</b>						Schools	Superintendent wants work done now.
Mike Davis Elementary School, 3215 Magnolia Pond Drive <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.1	All	CW	\$20.0K	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
Lely Elementary School, 8125 Lely Cultural Pkwy <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.1	All	CW	\$20.0K	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
Oakridge Middle School, 14975 Collier Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.1	All	CW	\$35.0K	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
Palmetto Ridge High School, 1655 Victory Lane <b>COLLIER COUNTY SCHOOLS</b>	Connect Special Needs Shelter Electrical Load to Existing 1.8MW Generator. Goals 1 & 3	All	CW	\$400.0K	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
Calusa Park Elementary School, 4600 Santa Barbara Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	All	CW	\$35.0K	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
Gulf Coast High School, 7878 shark Way <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	All	CW	\$1.3M	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
Golden Gate High School, 2925 Titan Way <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	All	CW	\$1.3M	HMGP/PDM	Collier Public Schools	The grant process takes too long. Superintendent wants work done now.
Various Locations <b>COLLIER COUNTY</b>	Public Safety Radio System redundant fiber optic connectivity	County Wide	County Wide	\$750K	HMGP	County IT	Found it difficult to meet the HMGP criteria.
Radio Station, 110 South 2 <sup>nd</sup> Street, Immokalee <b>IMMOKALEE (PNP)</b>	Generator, residential and wind retrofit facility. Goal 1,2,3,4,5,6	All	Immokalee	\$88.0K	HMGP	Coalition of Immokalee Workers	Found another source for the money to complete the project
San Marco Rd from Collier Blvd. , easterly to Landmark St. <b>CITY OF MARCO ISLAND</b>	Improve drainage into large collector piping systems. Goal 1	Flood	Marco Island	\$750K	HMGP	City of Marco Island	Found another funding source.
City of Marco Island fuel inventory for self-sustainability <b>CITY OF MARCO ISLAND</b>	Acquire fuel truck for fuel transfer of diesel and gas and obtain generators for lift stations. Goal 3	All	Marco Island	\$175K	HMGP	City of Marco Island	Couldn't get HMGP funding for equipment.
Naples Airport Collier Mosquito Control District	Purchase two side by side surveillance all-wheel drive vehicles. Goal 1	Disease Control	County Wide	\$50.33K	HMGP	Collier Mosquito Control	Couldn't get HMGP funding for equipment.
1240 Blue Hill Creek, MI <b>CITY OF MARCO ISLAND</b>	Construct a residential safe room. Goal 1	Wind	Resident	\$30K	HMGP	City of Marco Island	City requested removal
Marine Based Fire/EMS Station <b>CITY OF MARCO ISLAND</b>	Elevate and reconstruct this facility that was struck by lightning and damaged by fire. Objs 1.1 & 1.2	Wind/flood	Marco Island Area	\$540.0K	HMGP	City of Marco Island	Began the project without HMGP funding
Retrofit SW Fla Homes through the county. <b>ALL JURISDICTIONS</b>	Retrofit single family homes to Cat-3 Hurricane wind threat. Goal 1	Dangerous winds	County Wide	\$20.0M	HMGP/PDM & RCMP	Retrofit SW Fla	Retrofit SW Florida dissolved.
Port. Gen.Wire Pass-thru & Anchorage <b>COLLIER COUNTY</b>	Install Portable Generator pad w/tie-down & building cutout to pass Gen. wires. Goal 1,Obj:1.1, 1.2 Goal 3, Obj 3.1	Dangerous winds	County Wide	\$100K	HMGP	Collier Dist. Schools	Schools decided to fund the project totally with its resources.
Wood Electric Pole Replacement <b>LEE COUNTY ELECTRIC</b>	Replace a portion of the wood poles in its Collier	Wind	Subscribers to LCEC	\$750K	HMGP	LCEC	FEMA didn't think replacing wood poles with concrete ones was mitigation.

<b>COOPERATIVE</b>	County electric system to concrete. Goal 1, objs. 1.1, 1.2, 1.2.1, Goal 2, objs. 2.2, 2.3, 2.4, and Goal 3, objs. 3.1, 3.2, 3.3						
Marco Substation Relay Vault Replacement & Elevation <b>LEE COUNTY ELECTRIC COOPERATIVE</b>	Replace the existing relay vault with a relay vault whose floor would be at a higher elevation, thereby minimizing the risk of flood damage to the relay. Goal 1, objs. 1.1, 1.2, 1.2.1, Goal 2, objs. 2.2, 2.3, 2.4, and Goal 3, objs. 3.1, 3.2, 3.3	Flood	Marco Island area served by LCEC	\$338K	HMGP	LCEC	Involved more staffing time than the project was worth. Too many FEMA obstacles.
Community Emergency Radio Network	Establish an emergency radio system throughout the community.	All	Vineyards Community	\$13K	HMGP/local	<i>Vineyards Amateur Radio Assn</i>	Purchased and established program via member resources.
NNFD #40 – Wind Protection	Install entry door and cupola protection and wind protection for 5 vehicle bay doors at No. Naples Fire District Station 40.	Dangerous Winds	County Wide	\$13K	HMGP/PDM	NN Fire District	Did not indicate interest when grant available and validate requirement on time. Given an opportunity to resubmit and nothing received.
NNFD #42 – Wind Protection	Install entry door and cupola and wind protection for 5 bay doors at No. Naples Fire District Station 42.	Dangerous Winds	County Wide	\$13K	HMGP/PDM	NN Fire District	Did not indicate interest when grant available and validate requirement on time. Given an opportunity to resubmit and nothing received.
NNFD #46 – Wind Protection	Install entry door protection and cupola and wind protection for 5 bay doors at No. Naples Fire Station 46.	Dangerous Winds	County Wide	\$13K	HMGP/PDM	NN Fire District	Did not indicate interest when grant available and validate requirement on time. Given an opportunity to resubmit and nothing received.
NNFD #44- Wind Protection	Install entry door and cupola protection and wind protection for 5 bay doors at North Naples Fire District Station 44	Dangerous Winds	County Wide	\$13K	HMGP/PDM	NN Fire District	Did not indicate interest when grant available and validate requirement on time. Given an opportunity to resubmit and nothing received.
Naples Recycling Center	Install pad, berm and electric for building being moved on site to store hazardous waste.	All	County Wide	\$80K	HMGP/PDM	CC Solid Waste Dept	Changed recycling center locations.
Big Corkscrew IFRD Sta. 10 Wind Retrofit	Replace four bay doors.	Dangerous Winds	County Wide	\$19.3K	HMGP/PDM	Big Corkscrew IFRD	Job completed using other funding mechanisms.
Big Corkscrew IFRD Sta. 11 Wind Retrofit	Strengthen siding and doors and roof.	Dangerous Winds	County Wide	\$60K	HMGP/PDM	Big Corkscrew IFRD	Job completed using other funding mechanisms.
Wind Retrofit Building H (DoH, EMS HQ, & Lab)	Install 10,800 sq.ft. wind protection to all bldg windows of Bldg. H.	Dangerous Winds	County Wide	\$800K	HMGP/PDM	CC Facilities Dept.	H. Wilma HMGP was to be used, but materials FEMA approved was not aesthetically suitable for the building.
3301 Tamiami Tr. E, Building F, Naples	Replace Generator	All	County Wide	\$408K	PDM	CC Facilities Dept.	County replaced generator with other funding mechanism.
Acquisition & development of Gordon River Water Quality Park	The project will combine wetlands, habitats, trails, boardwalks, fishing piers, educational facilities, extensive landscape and hardscape within a passive park setting that will intrigue & educate nature enthusiasts.	Flood	Adjacent community	\$19.2M	unknown	CC Trans. Services Division - Stormwater	Project had been acquired and 80% development completion.
Barefoot Beach Sea Oats Project	To plant a sea oat buffer 10 feet wide for approximately 9,210 LF to replace the dune system that has been damaged by many years of storms.	Coastal storms	Adjacent community	\$163.4K	FMAP/HMGP	CC Tourism	Pulled. Found out that FEMA and Fla. DEP would not fund because the beach is a Reserve, with no public access and not critically eroded.

### SUCCESS STORIES - Funded/Complete Projects

**NOTE: Annex 1, Appendix 4, Attachment 1** lists completed wildfire mitigation projects and the affected communities.

**OPR=Office of Primary Responsibility**

Title	Work Disc.	Amt Req/funded	Source	OPR
<i>Community Services Bldg., 270 Riverside Circle</i> <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 1	\$60K	H. Irma HMGP	Naples
<i>Estates Wildland Areas</i> <b>FLORIDA FOREST SERVICE</b>	Hazardous Fuel Reduction. Goal 1	\$566,677	HMGP (Wildfire Mitigation Project)	Florida Forest Service
<i>N. Collier Regional Park 15000 Livingston Rd.</i> <b>COLLIER COUNTY</b>	3 each, Generator and installation. Goal 3	\$398.0K	H. Irma HMGP	Collier PSD P&R
<i>IFAS Bldg. 14700 Immokalee Rd.</i> <b>COLLIER COUNTY</b>	Wind retrofit building and harden facility	\$300.0K	H. Irma HMGP	Collier University Extension
<i>20 Residential Structures in EGC</i> <b>EVERGLADES CITY</b>	Elevate 20 homes. Goal 1.	\$800.0K	H. Irma CDBG	Everglades City
<i>Freedom Park Bypass Ditch Improvements</i> <b>COLLIER COUNTY</b>	Stormwater system conveyance improvements. Goal 1	\$400.0K	H. Irma HMGP	Collier GMD Stormwater
<i>Five (5) Critical Facilities</i> <b>COLLIER COUNTY</b>	Install emergency generator improvements at 5 critical buildings. Goal 1	\$2.506M	H. Irma HMGP	Collier Fac. Mgt
<i>Northwest Corner of Freedom Park @ Goodlette Road – Pump Sta.</i> <b>COLLIER COUNTY</b>	Upgrading the existing stormwater pumping station located at the northwest corner of the Freedom Park Goal 1	\$800.0K	H. Irma HMGP	Collier GMD Stormwater
<i>Marco Island Police 50 Bald Eagle Dr.</i> <b>CITY OF MARCO ISLAND</b>	Install quick generator connection Goal 3	\$27,992	H. Irma HMGP	City of Marco Island
<i>Immokalee Sports Complex 505 Escambia St.</i> <b>COLLIER COUNTY</b>	2 each, Generator and installation. Goal 3	\$245.0K	H. Irma HMGP	Collier PSD P&R
<i>Three (3) Critical Facs.</i> <b>COLLIER COUNTY</b>	Procure and install wind protection. Goal 1	\$150K	H. Irma HMGP	Collier Fac. Mgt
<i>Marco Island City Hall 50 Bald Eagle Dr.</i> <b>CITY OF MARCO ISLAND</b>	Wind retrofit window & doors. Dry flood-proof the facility. Install generator. Goal 3	\$2,955.0K	H. Irma HMGP	City of Marco Island
<i>Lift Stations #18, 27,82,32,106,86 &amp; 61</i> <b>CITY OF NAPLES</b>	Purchase/Install Seven (7) Diesel-Driven Standby Pumps at lift stations. Goal 3	\$525.0K	H. Irma HMGP	City of Naples
<i>Solana Road East of Goodlette Road</i> <b>COLLIER COUNTY</b>	Reconstruct 400 feet of a county stormwater management conveyance	\$700.0K	H. Irma HMGP	Collier GMD Stormwater

	system. Goal 1			
<i>Intersection of San Marco Rd &amp; Heathwood Dr.</i> <b>CITY OF MARCO ISLAND</b>	Elevate existing roadway. Goal 1	\$1,136.0K	H. Irma HMGP	City of Marco Island
<i>Domestic Animal Services</i> <i>7610 Davis Blvd</i> <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	\$350.0K	H. Irma HMGP	Collier PSD DAS
<i>Wastewater Membrane</i> <i>807 E. Elkcam Cir. Marco Island</i> <b>CITY OF MARCO ISLAND</b>	Harden existing structure by constructing walls and overhead doors. Reinforce roof to withstand Category 5 Hurricane wind forces. Goal 3	\$1.5M	H. Irma HMGP	City of Marco Island
<i>Project for 15 Critical Facilities</i> <b>COLLIER COUNTY</b>	Install emergency generators pin & sleeve connectors at 15 critical bldg.. Goal 1	\$300K	H. Irma HMGP	Collier Facilities Mgt.
<i>Marco Island Lift Stas. &amp; RO Wells</i> <i>807 E. Elkcam Cir.</i> <b>CITY OF MARCO ISLAND</b>	Purchase and install 60 generators for lift stations and RO wells. Goal 3	\$3,320.0K	H. Irma HMGP	City of Marco Island
<i>Upper Gordon River just south of Golden Gate Parkway</i> <b>COLLIER COUNTY</b>	Replacement of the downstream-most existing water level and flow control structure in the Upper Gordon River. Goal 1	\$3.09M	H. Irma HMGP	Collier GMD Stormwater
<i>Source Water Facility</i> <i>7130 Collier Bl, Naples</i> <b>CITY OF MARCO ISLAND</b>	Purchase and install a generator for the Source Water Facility. Goal 1	\$2.0M	H. Irma HMGP	City of Marco Island
<i>Immokalee Library</i> <i>243417 N 1<sup>st</sup> St.</i> <b>COLLIER COUNTY</b>	Generator and installation, replace roof and windows Goal 3	\$275.0K	H. Irma HMGP	Collier PSD Library
<i>David Lawrence Center, Naples</i> <b>David Lawrence Center (PNP)</b>	Purchase & Install Generator to service bldgs. D & F. Goal 1	\$260.0K	H. Irma HMGP	David Lawrence Ctr
<i>22 Poles along SR-29 Canal</i> <b>LEE CTY. ELECTRIC COOP.</b>	Reinforce w/riprap 22 electric distribution poles along SR-29 canal. Goal 1	\$308K	H. Irma HMGP	LCEC
<i>North Collier Fire Stas. 43 &amp; 44</i> <b>N. Collier Fire Control &amp; Rescue District</b>	Replace generators at two stations. Goal 3	\$120.0K	H. Irma HMGP	NCFC&R
<i>MI Fire Sta. 50</i> <i>1280 San Marco Road</i> <b>CITY OF MARCO ISLAND</b>	Wind and water retrofit fire station. Goal 3	\$3.5M	H. Irma HMGP	City of Marco Island
<i>Naples Cmty Development Bldg.</i> <i>295 Riverside Cr.</i>	Roof replacement. Goal 3.3	\$412.0K	H. Irma HMGP	City of Naples

<b>CITY OF NAPLES</b>				
53 locations around the county <b>COLLIER COUNTY</b>	Procure and install 54 generators for lift stations. Goal 1	\$4,510,000	H. Irma HMGP	Collier PUD
Lift stations city wide <b>CITY OF NAPLES</b>	Add Transfer Switches to Lift Stas. in Naples. Obj 3.1	\$45K	H. Irma HMGP	City of Naples
America's Business Park Land Acquisition <b>COLLIER COUNTY</b>	Develop 83 acres for public access consistent w/conservation goals. Goal 1- 1.1, 1.2, 1.3, 1.7, 1.8 .Goal 2- 2.3, 2.4, Goal 5- 5.1, 5.2. , Goal 6- 6.1, 6.2, 6.4, 6.5	\$21.200M	Ad Valorum	Conservation Collier
CC Road Maintenance Facility Generator Pre-wiring <b>COLLIER COUNTY</b>	Install generator hook-up equipment Goal 1, 1.1, 1.2, 1.3 1.4 – Goal 3, 3.1,3.2,3.3	\$10K	General Revenue	CC Growth Mgt Dept
Naples Cmty Early Warning Outdoor WX Siren Sys. <b>CITY OF NAPLES</b>	Install early wx warning equipment thru-out city. Goal1/Obj 1.2	\$31K		City of Naples
Haldeman Creek Stormwater Improvements & Lock Louise Weir Reconstruction <b>COLLIER COUNTY</b>	Construct/reconstruct weir, install box culvert & ditch, etc.Goal 6	\$515.2K	HMGP (TS Fay)	CC Growth Mgt Dept
CC Landfill leachate 6-inch HDPE pipe Install. <b>COLLIER COUNTY</b>	Install 6 – inch pipe Obj 3.1	\$320K	HMGP (TS Fay)	CC Public Utilities
Repetitive Loss Property Acquisition on Marco Island <b>CITY OF MARCO ISLAND</b>	The City of Marco Island will acquire the property and demo the structure. The property will be designated as “Open Space” and landscaped utilizing Florida Friendly Landscaping. Goal 6	\$234K	FMAP	City of Marco Island
E. Naples Cmty Center Wind Retrofit <b>COLLIER COUNTY</b>	Install electrical shutters & pre-wire for generator. Oby 3.1 & 3.1	\$75K	TS Fay	CC Parks & Recreation Dept.
Immokalee High School – Wind Prot & Prewire (701 Immokalee Dr., Immokalee 34142) <b>COLLIER COUNTY</b>	Install emergency generator switching equipment.... Goal 1, Obj. 1.1, Goal 3 –Obj. 3..3	\$1.6M	TS Fay -DRI	CC School District
Wind Retrofit Immokalee & Golden Gate Cmty Centers <b>COLLIER COUNTY</b>	Wind retrofit with electrical shutters.Obj 3.12 & 3.3	\$125K	TS Fay	CC Parks & Recreation Dept.
CAT Facility Wind Retrofit <b>COLLIER COUNTY</b>	Install electric roll-down shutters Obj 3.1.& 3.3	\$200K	TS Fay	CC Alt. Transportation Modes
MI – WW Treatment Plant - Wind Protection	Install windscreen protection on two membrane Bio-Reactor	\$70,000	TS Fay	City of Marco Island

<b>CITY OF MARCO ISLAND</b>	skids. Goal 1 – Obj 1.1 & Goal 3, Obj 3.3			
<i>CC Landfill Scale House Hurricane Shutters</i> <b>COLLIER COUNTY</b>	Install wind protection. Obj 3.1.& 3.3	\$50.0K	TS Fay – HMGP	<i>CC Public Utilities Dept.</i>
<i>Shadowlawn Dr. &amp; Francis Av Drainage Improvement</i>	Construct/repair swales and culverts in project area. Goal 1: <b>Objective 1.2 and 1.2.1</b>	\$2.7M	TS Fay -DRI	<i>Bayshore/ Gateway Triangle CRA</i>
Collier County Emergency Services Complex – Wind Abatement (4600 Santa Barbara Bl., Naples 34116)	Improve hi-wind survivability by installing wind resistance improvements aimed at further protecting communications and the generator. Goal 3, Obj. 3.1 & Goal 2, Obj. 2.2	\$1.63M/\$1.63M	HMGP - Wilma	CC Emergency Management
112 10 <sup>th</sup> Av S., Naples 34102	Elevate Chirgwin Historical House above BFE	\$185K/\$222K	HMGP-Wilma	City of Naples
Lee Co. Electric Coop – Move Electric to Underground in MI	Move overhead elect. facs. to underground in Marco Island. (Obj 1.1, 1.2 and Goal 3)	\$5.9M/\$?	HMGP-Wilma Awaiting City of MI to let LCEC proceed	LCEC
N. Collier Regional Park 15000 Livingston Rd.	Wind protection for several facilities @ the park and pre-wire Gym for generator.	\$40K/\$19.9K	HMGP-Wilma	CC P&R
Marco Island EOC	Wind protection -MIFD/EOC	\$70K/\$38.975K	HMGP-Wilma	MIFRD
Isles of Capri DFD	Heliport retention wall.	\$59K/\$60K	HMGP-Wilma Need \$~\$10K	ICDFD
Road Maint. Admin. Fac. 4800 Davis Blvd, Naples 34101	Wind retrofit.	\$60K/\$30K	HMGP-Wilma	Trans. Svs Div
3301 Tamiami Tr. E, Buildings W, G, D, B & K, Naples	Wind protection for glass & doors.	\$244K/\$203.950K	HMGP-Wilma	CC Facilities
Naples FD #2	Wind Renovation	~\$150K	2002	Emerg Mgt & Nap FD
Everglades City Hall	Elevation Engineering	~\$7K	2002	CC Emergency Management
ENFS #20	Wind Screens	~\$10K	2002	CC Emergency Management
NNFS #45	Shutters/screens	~\$10K	2002	CC Emergency Management
GGFS #73	Shutters/screens	~\$10K	2002	CC Emergency Management
BCSFS #12	Shutters/screens	~\$10K	2002	CC Emergency Management
Immokalee FS #30	Shutters/screens	~\$10K	2002	CC Emergency Management
Ochopee FS #60	Shutters/screens	~\$10K	2002	CC Emergency Management
Isles of Capri FS 90	Shutters/screens	~\$10K	2002	CC Emergency Management
Marco Island FS 50	Wind Screens	~\$10K	2002	CC Emergency Management
Sheriff/EMS Hanger	Wind Screens	~\$10K	2002	CC Emergency

				Management
Golden Terrace Middle School	Roof Retrofit	~\$15K	2000	CC Emergency Management
Golden Gate Middle School	Roof Retrofit	~\$15K	2000	CC Emergency Management
Laurel Oak Elementary School	Roof Retrofit	~\$15K	2000	CC Emergency Management
Big Cypress Elementary School	Roof Retrofit	~\$15K	2000	CC Emergency Management
Barron Collier High School	Window Screens	~\$10K	2000	CC Emergency Management
Veterans Elementary School	Shutters/Roof Retrofit	~\$20K	1999/2000	CC Emergency Management
Village Oak Elementary School	Shutters	~\$15K	1999	CC Emergency Management
Gulf Coast High School	Wind Screens	~\$10K	1999	CC Emergency Management
Norris Center (City of Nap)	Window Film	~\$5K	1999	CC Emergency Management
Immokalee Middle School	Shutters	~\$10K	1998	CC Emergency Management
Oak Ridge Middle School	Shutters	~\$10K	1998	CC Emergency Management
Golden Gate Community Ctr	Window Film	~\$5K	1998	CC Emergency Management
Fleishman Park	Window Film	~\$5K	1997	CC Emergency Management
Barron Collier High School	Window Film	~\$5K	1997	CC Emergency Management

ANNEX F

Local Mitigation Strategy Working Group

Meeting Minutes

Because of the frequency of meetings and the volume of paperwork generated for the minutes the meeting minutes only samples of the meeting invitation, press release announcements and a year of meeting minutes are attached to this document. The historical archive for all minutes is maintained on-line on the Local Mitigation Strategy Working Group Web Page ([bit.ly/2Br1j3Z](https://bit.ly/2Br1j3Z)).

Should you need further assistance in this matter or wish to get on the e-mail meeting invitation distribution listing, please contact:

Emergency Management Department  
Collier County Emergency Management Dept.  
8075 Lely Cultural Pkwy., Suite 445  
Naples, FL 34113

Or,

E-mail: [EmergMan@CollierGov.net](mailto:EmergMan@CollierGov.net) and request to be added to the LMS email distribution list.

Attachments:

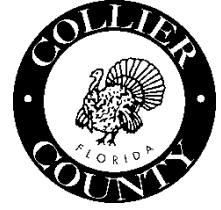
Attachment 1 – Sample Press Release for Public Meeting Announcements “in the Sunshine”

Attachment 2 – Sample e-mail invitation to specific entities regarding LMS matters

Attachment 3 – 2019 Summary Minutes

## Attachment 1 - Sample Press Release

# Collier County Government



Communication & Customer Relations Division  
3299 Tamiami Trail E., Suite 102  
Naples, Florida 34112-5746

[colliercountyfl.gov](http://colliercountyfl.gov)  
[twitter.com/CollierPIO](https://twitter.com/CollierPIO)  
[facebook.com/CollierGov](https://facebook.com/CollierGov)  
[youtube.com/CollierGov](https://youtube.com/CollierGov)

October 4, 2019

**Notice of Public Meeting**  
**Collier County Local Mitigation Strategy Working Group**  
**Collier County, Florida**

**Friday, October 18, 2019**  
**9:30 a.m.**

Notice is hereby given that the **Collier County Local Mitigation Strategy Working Group** will meet at **9:30 a.m., Friday, October 18**, at the Collier County South Regional Library, 8065 Lely Cultural Parkway, Naples, Florida 34113.

The meeting is open to the public. Residents are encouraged to attend and provide comments on the proposed changes for the 2020 Multi-Jurisdictional Local Mitigation Strategy (<http://bit.ly/2nU3zO9>). This document provides the framework to obtain funding from FEMA to make our communities more disaster resilient through mitigation projects that meet the communities' priorities.

About the public meeting:

Two or more members of the Board of County Commissioners may be present and participate at the meeting. The subject matter of this meeting may be an item for discussion and action at a future Board of County Commissioners meeting.

All interested parties are invited to attend, and to register to speak. All registered public speakers will be limited to three minutes unless permission for additional time is granted by the chairman.

Collier County Ordinance No. 2004-05 requires that all lobbyists shall, before engaging in any lobbying activities (including, but not limited to, addressing the Board of County Commissioners, an advisory board or quasi-judicial board), register with the Clerk to the Board at the Board Minutes and Records Department.

Anyone who requires an auxiliary aid or service for effective communication, or other reasonable accommodations to participate in this proceeding, should contact the Collier County Facilities Management Division, located at 3335 Tamiami Trail E., Suite 101, Naples, Florida 34112, or (239) 252-8380, as soon as possible, but no later than 48 hours before the scheduled event. Such reasonable accommodations will be provided at no cost to the individual.

For more information, call the Richard Zyvoloski at 239-252-3603.

###

## Attachment 2 - Sample Email Invitation

Below is a copy of an invitation/meeting announcement that goes out prior to each LMS Working Group Meeting and other LMS announcements such as notification of grant opportunities.

Special LMS Meeting - 18 June 2019 @ EOC, 0930hrs

R

zyvoloski\_r

Reply

Reply All

Forward

...

Tue 6/4/2019 3:39 PM

To

AMU\_HMO-Carol DiFlorio; Avni, Melinda; BelpedioJennifer; BurnettAlistair; CCSD-Marc Rouleau; Chief Eloy Ricardo (eRicardo@northcollierfire.com); Chief Kingman Schultz (kschuldt@gnfire.org); Chief-Michael Choate (mchoate@immfire.com); Chris Byrne; CollierMindy; CritchfieldHoward; Dorn, Tricia; +26 others

Cc

BCIRP; BishopMargaret; CarballoMiguel; CDR-Ben Davis; City of Naples Roof; CondominaAmanda; DAS; David Lawrence Ctr-Jim Warnken (jamesw@dlcmhc.com); EGC; EGC; GMD\_Stormwater; GNFD; GrantKimberley; Julia Perkins; Kathy Brock; Kevin Swisher; Libraries; ML\_FD; ML\_FDalt; MildenAnthony; +4 others

You forwarded this message on 6/5/2019 11:19 AM.

PressRelease\_Meeting\_18June19.pdf

156 KB

Open PDFs in Adobe Acrobat

Greetings Mitigators,

I have been asked to call a special LMS meeting to consider the increase of the City of Naples project costs for their Lift Station Project. We will also discuss the next projects up for funding, the commitment for match should the next projects be selected for the funding and, in light of this information the adjustments to the project priority listing. The meeting will be at the EOC at 0930hrs.

Respectfully,

Richard A. Zyvoloski Jr, FPEM, CFM  
Chair,  
Multi-Jurisdictional Local Mitigation Strategy Working Group



**REPORT Weather-related Damages & Blocked Roads:** <https://www.crisistrack.com/public/collierFL/citizenRequest.html>

Want to give feedback? Tell us how we're doing by clicking [here](#)!

## Attachment 3 CY 2019's LMS Working Group Meeting Summary Minutes

(a complete set of all working group meeting minutes can be found at the LMS Working Group home page at: **[bit.ly/2Br1j3Z](https://bit.ly/2Br1j3Z)**)

**Summary Minutes**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
 South Regional Library  
 8065 Lely Cultural Pkwy, Naples, FL 34113  
 Friday, January 18, 2019, 9:30 AM

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
Samantha Quinn, <b>Vice Chair</b>	Interested Citizen	X
William Lang	Collier C. Emergency Management	X
Melinda Avni	Florida Forest Service	E
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	X
Reg Buxton	Citizens Corps/North Naples Journal	X
Terry Smallwood/Dottie Joiner	Everglades City	X
Christa Carrera	City of Naples (Floodplain Mgr)	X
Evy Ybaceta	Collier C. Growth Management Dept.	-
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	X
James Price	Collier C. Public Utilities Dept., Water Dept.	-
Roosevelt Leonard/J.Malamphy	Collier C. Facilities Div.	-
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield/Caroline Cilek	Collier C. Growth Mgt. Dept.	E
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	X
Tricia Dorn	Lee County Electric Coop	-
Jeff Johnson	Retrofit SW Florida, Inc.	-
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	E
Lisa Oien	Collier Co. Community and Human Services	-
Jim von Rinteln	Interested Citizen	X
Chris Niforatos	Interested Citizen	-

Also attending: Mark Grazewski, Collier Mosquito Control District

**1. Approval of Oct. 19, 2018 Meeting Minutes:**

<http://www.colliergov.net/Index.aspx?page=1544>: The working group unanimously approved the minutes

**2. Membership**

The following members were removed from the active voting membership rolls due to their many absences. On 2 Nov 2018, the chair sent an email advising the following folks that they have been absent from three, or more meetings, and thereby have their voting privileges removed:

- Chris Niforatos
- Roosevelt Leonard
- Everildo Ybaceta
- James Price

**New Member:** Mark Grajewski, Collier County Mosquito Control District, was unanimously voted in as a voting member.

### 3. Project Validation & Project(s) for review

- Annual Project Validation – The Chair sent out a notice to all project sponsors and asked if the project(s) is/are still valid. Attachment 2 shows the results.
- New Projects for Review
  - i. Wind Retrofit a Marco Island Fire Station #51 with a wind screen (attachment 3). This project was accepted by the working group.
  - ii. Collier County Facilities - Install generator in Property Appraiser's Building – Deferred to the 11 February meeting.
  - iii. FFS - Fuel Reduction for Wildland-Urban Interface Fires – Deferred to the 11 February meeting.

### 4. New Business

- Project Priority Letter for the Wildfire HMGP Grant

Wind Retrofit a Marco Island Fire Station #51 with a wind screen	\$15K
City of Naples – two generators (Equipment Svs. & River Park Cmty. Ctr.)	\$175K
Mosquito Control District generator for hangar	\$80K
Greater Naples Fire District – Sta #21 generator	\$110K

- Hurricane Michael - Next potential HMGP opportunity. We'll be eligible to apply for Tier 3 monies for the HMGP opportunity.
- Review of Section 4 of the LMS and Initiative Scoring Criteria (Project Worksheet) Attachments 2 and 3. Changes were accepted with one exception for each. The working group asked the floodplain managers to appropriately fix the "Cost" section dealing with "flood" in both documents.
- 2020 LMS Update – The below items will be taken up at the 11 February meeting
  - i. Membership – change to local? (If local, we'll need a new Chair and Vice Chair.)
  - ii. Goals....

### 5. Next Meeting:

**February 11<sup>th</sup>** at 9:30am in the Emergency Operations Center will be a Special LMS Meeting and it's the last meeting before the Wildfire HMGP opportunity closes on the 25<sup>th</sup> of February. After that meeting, the next scheduled quarterly regular meeting, will be the third Friday of April (9:30am on the 19<sup>th</sup>) at the **South Regional Library**.

However, please be available for any call of a special meeting up to **February 11<sup>th</sup>**; after that, there's not enough time for the public notice of the meeting.

### **ATTACHMENTS**

1. October 19, 2018 Summary Minutes
2. Annual Project Validation
3. Wind Retrofit Marco Island Fire Station #51
4. Section 4 of the LMS (Procedures for Prioritizing Hazard Mitigation Initiatives)
5. Annex I - Initiative Scoring Criteria

**Attachment 1**  
**Summary Minutes**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
Collier County South Regional Library  
8065 Lely Cultural Pkwy, Naples, FL 34113  
Friday, October 19, 2018, 9:30 AM

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
Samantha Quinn, <b>Vice Chair</b>	Interested Citizen	X
William Lang	Collier C. Emergency Management	X
Melinda Avni	Florida Forest Service	E
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	X
Reg Buxton	Citizens Corps/North Naples Journal	E
Terry Smallwood/Dottie Joiner	Everglades City	E
Christa Carrera	City of Naples (Floodplain Mgr)	E
Evy Ybaceta	Collier C. Growth Management Dept.	-
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	E
James Price	Collier C. Public Utilities Dept., Water Dept.	-
Roosevelt Leonard/J.Malamphy	Collier C. Facilities Div.	-
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield/Caroline Cilek	Collier C. Growth Mgt. Dept.	-
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	X
Tricia Dorn	Lee County Electric Coop	E
Jeff Johnson	Retrofit SW Florida, Inc.	-
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	X
Lisa Oien	Collier Co. Community and Human Services	E
Jim von Rinteln	Interested Citizen	X
Chris Niforatos	Interested Citizen	-

Also attending: Margaret Bishop, Collier County PUD, Facilities Mgt.

- Approval of September 26, 2018 Meeting Minutes:**  
<http://www.colliergov.net/Index.aspx?page=1544> : The working group unanimously approved the minutes.
- Membership:** The Chair said that there have been three working group member absences from Regular Meetings by Mr. Evy Ybaceta, Mr. J. Price, Mr. Roosevelt Leonard and Mr. Chris Niforatos. Chair will contact them to advise them that they are removed from “voting member” status until they request a return to voting member status and recommit to attending regularly scheduled meeting.

3. **Project for review:** Ms. Bishop briefed the working group on the County's initiative to build a Sports and Entertainment Complex and harden the facility for a hurricane stronger than Category 5 so that it can be used as a Special Needs Community Saferoom. Because of Hurricane Michael, Ms. Bishop was unable to get guidance from the Florida of Emergency Management Division's Mitigation staff to help her develop the Benefit-Cost Analysis for the LMS Worksheet. The committee liked the project and allowed the project to be listed last on the LMS Project Priority listing until she can complete the BCA part of the Project Worksheet no later than 28 November 2018.

#### 4. **New Business**

- 2019 LMSWG Chair/Vice Chair nominations & elections. The LMSWG unanimously reelected the current chair and vice chair to another term.
- Pre-Disaster and Flood Mitigation Grants submission deadline to the State is 5pm, 28 November 2018.
- Hurricane Michael HMGP – The chair recommended that eligible agencies continue to develop HMGP projects and keep them on the shelves for any and all HMGP opportunities as they are offered. Expect the first notification of funding announcement to come out around February or March of 2019.
- The final Hurricane Irma HMGP 12-month lock-in amount for Collier County project costs were increased to \$32,890,170. This amount is enough to fund 26 of our projects fully and a partial amount of funding for the 27<sup>th</sup>.
- Local Mitigation Strategy Update – The State sent out notice last week reminding us that our LMS expires on 13 Apr 2020. To have the updated LMS up to FEMA for approval, the State wants our updated draft LMS to them for their review/approval sometime during November 2019. So, we've begun our LMS review/update starting with LMS Section 4 (Procedures for Prioritizing Hazard Mitigation Initiatives) and Annex I (Initiative Scoring Criteria). The following are the recommendations so far:
  - i. **Section 4** – Incorporate the corrections indicated in the draft attached to this meeting's agenda. In paragraph 4.1.2, after "...electronic submittal" add "in MS Word format". In paragraph 4.1.2.1, about mid-paragraph, after "...intentions to apply for that grant" continue the sentence to read: "via a letter certifying that they have the 25% project-match for each project going forward for FEMA funding." Add a paragraph telling grant project applicants that the projects listed on the project priority listing will be updated every two years by the applicant-agency or removed from the listing. Regarding the Prioritization Matrix, the working group wanted, the Risk section, item 1, Scoring Criteria #3 to read "3 – Medium: Benefits half, or more of all the municipalities and/or the unincorporated area. In item 2, in "Parameter", change it to read "Potential to protect human lives". In Section 2's "Points", change the "1-Low ..." value to "0" (nil). In the Cost section, item 5, in "Parameter", change it to read: "Repetitive FLOOD damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses of \$1,000 or more w/in 10 yrs.)", also, in the "Points" column, change the "1-Low" value to "N/A".

- ii. In **Annex I** – In the third paragraph in section “A”, after “...using the scoring matrix”, change the next sentence to read: “The list will then be briefed to the Collier County Citizen Corps.” Delete the remainder of the paragraph after this sentence is inserted then delete the sentence before section “B”. In section “B”

5. **Next Meeting:**

This Regular Quarterly Meeting adjourned at 1130AM. The next Regular meeting is 18 January 2019, 9:30AM at the South Regional Library.

(Summary Minutes attachments removed)

**Attachment 2**  
**2019 Annual Project Validation/Update**  
**LOCAL MITIGATION ACTION ITEMS**  
**PRIORITY LISTING**

#	SCORE	Name/Location/JURISDICTION	Description & Goal(s) Achieved	Beneficiary <sup>3</sup>	Est. Cost	Office Respon <sup>5</sup>
1	11808	Naples Regional Library 650 Central Ave <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	Naples	\$150.0K	Collier PSD Library
2	7843	Headquarters Library 2385 Orange Blossom Dr. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	N. Naples	\$200.0K	Collier PSD Library
3	7620	Vanderbilt Beach Library 788 Vanderbilt Bch Rd. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	N. Naples	\$100.0K	Collier PSD Library
4	7108.11	Gulf Coast High School, 7878 Shark Way <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.1	CW	\$20.0K	Collier Public Schools
5	6380.3	1240 Blue Hill Creek, MI <b>CITY OF MARCO ISLAND</b>	Construct a residential safe room. Goal 1	Resident	\$30,000	City of Marco Island
6	5833.3	Marco Island Library 210 s. Heathwood Dr. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	Marco Island	\$150.0K	Collier PSD Library
7	5800	South Regional Library 8065 Lely Cultural Pkwy <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	E. Naples	\$150.0K	Collier PSD Library
8	5715	Estates Branch Library 1266 GG Blvd. W. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	GG Estates	\$150.0K	Collier PSD Library
9	5445.68	Radio Station, 110 South 2 <sup>nd</sup> Street, Immokalee <b>IMMOKALEE (PNP)</b>	Generator, residential and wind retrofit facility. Goal 1,2,3,4,5,6	Immokalee	\$88.0K	Coalition of Immokalee Workers
10	5320	E. Naples Library 2385 Orange Blossom Dr. <b>COLLIER COUNTY</b>	Replace roof & Generator and installation. Goal 3	E. Naples	\$225.0K	Collier PSD Library
11	5216.07	Golden Gate Library 2432 Lucerne Rd. <b>COLLIER COUNTY</b>	Generator and installation. Goal 3	GG Estates	\$175.0K	Collier PSD Library
12	5125.62	Sabal Palm ES, 4095 18th Ave. NE <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
13	4789.88	Naples Manor North Area Flood Mitigation <b>COLLIER COUNTY</b>	Complete Nap. Manor North Canal improvements by rechannelization of existing canal. Goal 1	E. Naples	\$600.0K	Collier GMD Stormwater
14	3730.41	Corkscrew Elementary School, 1065 C.R. 858 <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
15	3447.21	Mike Davis Elementary School, 3215 Magnolia Pond Drive <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal	CW	\$20.0K	Collier Public Schools
16	2660.0	Big Cypress Golf & Country Club Estates-Stormwater <b>COLLIER COUNTY</b>	Stormwater Improvements - system needs to be reconstructed (upgraded). Goal 1	N. Naples	\$600.0K	Collier GMD Stormwater
17	2642.7	Flood Mitigation of Madison Av Area in Immokalee. <b>COLLIER COUNTY</b>	Improvement of roadside ditches/swales, repair/upgrading of non-functioning driveway culverts, addition of cross-drainage structures, & construction of stormwater treatment facs. Goal 1	Immokalee	\$1.0M	Collier GMD Stormwater
18	2621.86	Museum @ Collier Govt Ctr 3339 Tamiami Trl E. <b>COLLIER COUNTY</b>	Replace doors, add hurricane strapping, shutters and generator. Goal 3	E. Naples	\$208.0K	Collier PSD Museums

19	1816.34	Naples City Hall Wind Protection 735 8 <sup>th</sup> St. S., Naples 34102 <b>CITY OF NAPLES</b>	Wind retrofit non-structural exterior glass window and metal frame replacement with higher impact glass to meet code... Goal 3, objs 3.1, 3.2, 3.3	Naples	\$776.0K	City of Naples
20	1677.37	Upper Gordon River north of GG Pkwy to Pine Ridge Rd Dvmt <b>COLLIER COUNTY</b>	Includes improvements to the existing conveyance channel known as the Upper Gordon River. Goal 1	N. Naples	\$2.0M	Collier GMD Stormwater
21	1616.25	Naples Depot Museum 1051 5 <sup>th</sup> Ave S. <b>COLLIER COUNTY</b>	Install hurricane tie-down at loading dock and buy/install generator. Goal 3	Naples	\$215.0K	Collier PSD Museums
22	1478.61	Lely Elementary School, 8125 Lely Cultural Pkwy <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
23	1444.62	Old Lely Area <b>COLLIER COUNTY</b>	Old Lely Backbone Stormwater Management System Improvements. Goal 1	E. Naples	\$2.0M	Collier GMD Stormwater
24	1413.75	West side of Goodlette Rd from GG Pkwy north to Pine Ridge Rd <b>COLLIER COUNTY</b>	Improving the capacity for flow of an existing ditch located on the west side of Goodlette Road. Goal 1	N. Naples	\$1.0M	Collier GMD Stormwater
25	1286.65	GNFD Sta 21, 11121 E. Tamiami Trail <b>Greater Naples Fire &amp; Rescue</b>	Purchase and install larger generator to increase coverage of emergency activities. Goal 3	E. Naples	\$110.0K	GNFR
26	1198.02	Naples Airport <b>Collier Mosquito Control District</b>	Purchase /install two one generator(s), one in Admin Building and one at the hangar. Goal 1	CW	\$80K	CMCD
27	1127.53	Naples Airport <b>Collier Mosquito Control District</b>	Purchase two side by side surveillance all wheel drive vehicles. Goal 1	CW	\$50,334	CMCD
28	1112.0	Oakridge Middle School, 14975 Collier Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools
29	1066.66	Community Services Bldg, 270 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 1	Naples	\$60.0K	City of Naples
30	956.87	Rock Rd./Cypress Canal Area Flood Mitigation <b>COLLIER COUNTY</b>	Elevating the roads, improvement of roadside ditches, addition of cross-drainage culverts, & Stormwater treatment outfalls. Goal 1	GG Estates	\$1.2M	Collier GMD Stormwater
31	889.03	Palmetto Ridge High School, 1655 Victory Lane <b>COLLIER COUNTY SCHOOLS</b>	Connect Special Needs Shelter Electrical Load to Existing 1.8MW Generator. Goals 1 & 3	CW	\$400.0K	Collier Public Schools
32	859.94	Wind Retrofit residential properties <b>REBUILD NW FLORIDA</b>	Wind retrofit residential properties. Goal 1	CW	\$96.3M	Rebuild NW FL
33	877.5	Lake Trafford Slough <b>COLLIER COUNTY</b>	Lake Trafford Immokalee Slough Capacity Improvements. Goal 1	Immokalee Area	\$1.0M	Collier GMD Stormwater
34	859.89	Griffin Road Area <b>COLLIER COUNTY</b>	Griffin Road Area Stormwater Management Improvements. Goal 1	E. Naples Area	\$1.5M	Collier GMD Stormwater
35	828.33	Utilities Admin Bldg, 380 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 3	Naples	\$150.0K	City of Naples
36	795.04	Roberts Ranch Museum 1215 Roberts Ave, Immok. <b>COLLIER COUNTY</b>	On all facilities at the museum, retrofit w/hurricane strapping, storm shutters, bury electrical utilities & wind-proof. Goal 3, Obj 3.2.& 3.3	E. Collier County	\$91,850	Collier PSD Museums
37	777.65	Equipment Svs Facility & River Park Cmty Ctr 301 11 <sup>th</sup> Street North & 370 Riverside Cir, Naples <b>CITY OF NAPLES</b>	Purchase and install a generator at each facility. Goal 3.	Naples	\$175.0K	City of Naples
38	745.7	City of Marco Island fuel inventory for self sustainability <b>CITY OF MARCO ISLAND</b>	Acquire fuel truck for fuel transfer of diesel and gas and obtain generators for lift stations. Goal 3	Marco Island	\$175.0K	City of Marco Island
39	682.916	Naples Fire Sta 2, 977 26 <sup>th</sup> Avenue North <b>CITY OF NAPLES</b>	Apparatus Bay renovation and facility hardening. Goal 1	Naples	\$450K	Naples
40	630.46	Calusa Park Elementary School, 4600 Santa Barbara Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools
41	552.46	Naples Park Area Flood Mitigation <b>COLLIER COUNTY</b>	Improvement to existing roadside swales, driveways, & installation of stormwater outfall treatment system. Goal 1	N. Naples	\$14.0M total, in 7 phases	Collier GMD Stormwater

42	527.78	<i>Auto Ranch Road Area Flood Mitigation</i> <b>COLLIER COUNTY</b>	Improvement of roadside ditches, elevation of roads, addition of cross-drainage culverts, and stormwater treatment outfalls. Goal 1	E. Collier County	\$500K	Collier GMD Stormwater
43	526.76	<i>Pine Ridge Estates</i> <b>COLLIER COUNTY</b>	Stormwater Management Improvements. Goal 1	E. Collier County	\$5.5M	Collier GMD Stormwater
44	520.37	<i>Big Corkscrew Isl. Regional Park</i> <b>COLLIER COUNTY</b>	Generators for facilities, wind- hardening Goal 3.	CW	\$1,200.0K	Collier PSD P&R
45	501.43	<i>Approx. 200' south of the Goodlette Rd/GG Pkwy intersection</i> <b>COLLIER COUNTY</b>	Construction of a new piped stormwater outfall conveying flow south from the existing ditch along the west side of Goodlette Rd., adjacent to the Naples High School. Goal 1	Naples area	\$4.0M	Collier GMD Stormwater
46	476.250	<i>Desoto Blvd Area, GGE</i> <b>COLLIER COUNTY</b>	Swale reconstruction. Goal 1	Golden Gate Estates	\$2.6M	Collier GMD Stormwater
47	428.62	<i>Lake Trafford Rd</i> <b>COLLIER COUNTY</b>	Lake Trafford Road Stormwater Management Improvements. Goal 1	Immokalee Area	\$2.0M	Collier GMD Stormwater
48	423.9	<i>Marco Island Public Works Office</i> <i>415 Lily Ct, MI</i> <b>CITY OF MARCO ISLAND</b>	New pre-engineered metal building hardened beyond codes and standards, build two feet above BFS. Coal 3	Marco Island	\$750.0K	City of Marco Island
49	412.75	<i>Logan Blvd Area</i> <b>COLLIER COUNTY</b>	Stormwater Improvements. Goal 1	W. Golden Gate Estates	\$4.5M	Collier GMD Stormwater
50	412.75	<i>Old Lely Utility Renewal</i> <b>COLLIER COUNTY</b>	Old Lely Utility Renewal Stormwater Management Improvements. Goal 1.	E. Naples Area	\$7.0M	Collier GMD Stormwater
51	392.9	<i>Marco Island Academy</i> <i>2255 San Marco Rd, MI</i> <b>CITY OF MARCO ISLAND</b>	Construct hurricane hardened High School Gym and school building. Goal 3	Marco Island	\$8,100.0K	City of Marco Island
52	360.08	<i>Caxambas USCGA Building</i> <i>909 Collier Ct., MI</i> <b>COLLIER COUNTY</b>	Add a new hardened building. Goal 3	Marco Island	\$1,500.0K	Collier PSD P&R
53	350.82	<i>Gulf Coast High School,</i> <i>7878 shark Way</i> <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	CW	\$1.3M	Collier Public Schools
54	349.1	<i>Golden Gate High School,</i> <i>2925 Titan Way</i> <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	CW	\$1.3M	Collier Public Schools
55	341.33	<i>Emergency Services Ctr</i> <i>8075 Lely Cultural Pkwy</i> <b>COLLIER COUNTY</b>	Drill water well and install backup water system. Goal 1	CW	\$150.0k	Collier Facilities Mgt
56	273.33	<i>San Marco Rd from Collier Blvd., easterly to Landmark St.</i> <b>CITY OF MARCO ISLAND</b>	Improve drainage into large collector piping systems. Goal 1	Marco Island	\$750.0K	City of Marco Island
57	229.225	<i>Various Locations</i> <b>COLLIER COUNTY</b>	Public Safety Radio System redundant fiber optic connectivity	CW	\$200.0K	Collier IT
58	n/a	<i>Harden proposed Sports &amp; Entertainment Complex for PSN sheltering.</i> <b>COLLIER COUNTY</b>	Harden field-house facility of the proposed/new Sports & Entertainment Complex for PSN sheltering. Goal 1	CW	\$7.5M	Collier Fac. Mgt

## Attachment 3

## PART I

Project Title:		<b>Fire Station 51 Wind Retrofit</b>					
Project Location:		<b>751 Elkcarn Circle E., Marco Island, FL 34145</b>					
TYPE PROJECT ("X" appropriate box, or explain)							
Acquisition	Elevation	Relocation	Reconstruction	Essential Facility Retrofit	Non-Residential Retrofit	New Construction	Special Considerations or Impact Statement, if any: Fire Station 51 is a new facility constructed to "above-code" standards to withstand severe tropical cyclone events. Windscreen protection for apparatus bay doors has proven to be a low-cost highly effective protection measure preventing bay door damage and thus maintaining the ingress and egress capability of Fire Rescue apparatus during storm events.
				<b>X</b>			
What Goal or Objective does this address (See Sec. 3.0, LMS)?						1.1, 3.3	
What hazard(s) does this project or initiative correct/mitigate?						Tropical Cyclone	
Who (what community) benefits from this project or initiative?						City of Marco Island & Collier County	
Does this project or initiative address mitigation on <b>NEW</b> infrastructure or buildings?						Yes	
Does this project or initiative address mitigation on <b>EXISTING</b> infrastructure or buildings?						No	
Project or Initiative Description:				Acquisition & installation of wind screen protection for apparatus bay doors and elevator lobby.			
Applicant and Responsible Agency:				City of Marco Island			
Agency Contact Information							
NAME				E-Mail		PHONE	
Chris Byrne				cbyrne@cityofmarcoisland.com		239-389-5189	
Potential Funding Source(s) (See Annex J, LMS)						Estimated Cost	15,000.00

Suitability			Score	For LMS WG only
1	Appropriateness of the Measure	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth. <b>3- Medium:</b> Needed but doesn't tie to identified vulnerability. <b>1- Low:</b> Inconsistent with LMS goal or plans.	5	
2	Community Acceptance	<b>5- High:</b> Endorsed by most communities. <b>3- Medium:</b> Endorsed by most; may create burdens. <b>1- Low:</b> Not likely to be endorsed by the communities.	5	
3	Environmental Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	3	
4	Legislation	<b>5- High:</b> Consistent with the existing laws and regulations. <b>3- Medium:</b> New legislation or policy change. <b>1- Low:</b> Conflicts with existing laws and regulations.	5	
5	Consistent With Existing Plans and Priorities.	<b>5- High:</b> Consistent with existing plans. <b>3- Medium:</b> Somewhat consistent. <b>1- Low:</b> Conflicts with existing plans and policies.	5	

Risk			Score	For LMS WG only
1	Scope of Benefits	<b>5- High:</b> Benefits all municipalities and unincorporated area directly or indirectly <b>3- Medium:</b> Benefits more than half, but <b>not all of</b> not all of the municipalities and/or the unincorporated area. <b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.	3	
2	Potential to save human lives	<b>5- High:</b> More than 1,000 lives <b>3- Medium:</b> Up to 1,000 lives <b>1- Low:</b> No lifesaving potential.	3	
3	Importance of Benefits	<b>5- High:</b> Need for essential services. <b>3- Medium:</b> Need for other services. <b>1- Low:</b> No significant implications.	5	
4	Inconvenience of Problem Correction	<b>5- None:</b> Causes no problems. <b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e. traffic jams, loss of power, delays).	5	
5	Economic Loss (Effect of implementing the project on local economy)	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (minimal disruption). <b>1- Significant:</b> Economic loss (businesses closed, jobs affected).	5	
6	Number of People to Benefit	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000	3	

Cost			Score	For LMS WG only
1	Initial Cost	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million	5	
2	Maintenance /Operating Costs	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.	5	
3	Environmental Cost Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	3	
4	Financing Availability	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified	5	
5	Repetitive <u>FLOOD</u> damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>N/A:</b> Not a NFIP insured structure		

## PART II

### *Benefit Cost Analysis – QUICK WORKSHEET*

This worksheet to be filled out by the applicant, is designed for Local Mitigation Strategy Working Group use only. This gives the group a flavor for the potential benefits a particular project may yield. Here's your chance to quantitatively make the case for your project as COST EFFECTIVE. This BCA is not the same one as the FEMA BCA. The FEMA BCA requires a lot more detail, but this one will help you to further develop the "official FEMA BCA" should your project go forward as a FEMA grant request.

ESTIMATED COST OF THE PROJECT: 15,000.00

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DESCRIBE THE COSTS ASSOCIATED WITHOUT THIS MITIGATION PROJECT:

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Some possible costs are:

Real Property Losses:	16,000.00
Furnishing/Equipment Losses:	_____
Alternate facility costs:	_____
Contract/rental costs:	_____
Other associated costs (list):	_____
_____	_____
_____	_____
_____	_____
_____	_____

**Total Cost for Future Damages & Associated Expenses: 16,000.00**

(NOTE: This figure should be detailed above.)

Statement to support above costs/losses: Damage to real property consists of replacement of two

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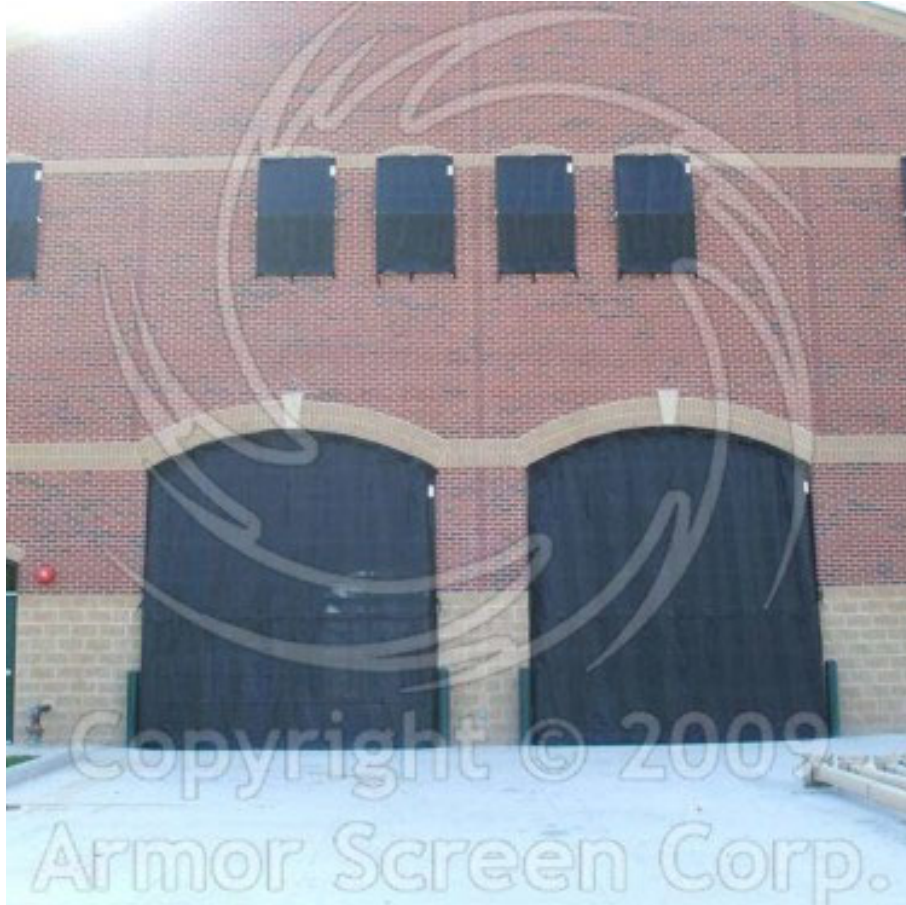
Aluminum framed glass apparatus bay doors.

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**DAMAGE & LOSS COSTS, divided by PROJECT COST = QUICK BCA RATIO**

DAMAGES ( 16,000.00 )	=	BCA	1.06
PROJECT \$ ( 15,000.00 )			

### Example of Windscreen Protection



## Attachment 4

### 4.0 Procedures for Prioritizing Hazard Mitigation Initiatives

#### 4.1 SCORING

4.1.1 Annex F contains a listing of those projects & action items identified by the participating jurisdictions in Collier County as necessary for the successful implementation of the hazard mitigation process. Initiative(s) submitted by a participating municipality will go on the prioritized project/initiative listing. However, its placement on the list in Annex F will depend on the score received on the “Mitigation Initiatives Evaluation Score Sheet in Annex I. Each participating jurisdiction/agency has submitted initiatives that are intended to mitigate the identified hazards as they may impact that jurisdiction/agency. Upon submittal, the individual initiative is scored using the criteria identified by the participants as being the most reflective of the mitigation needs of Collier County. Included in this listing are the three review criteria deemed by FEMA as important: Cost effectiveness (represented by the benefit-cost ratio), technical feasibility, and environmental soundness.

4.1.2 The submitting jurisdiction/agency scores each initiative and completes the “simplified benefit-cost analysis (BCA)” prior to electronic submittal to the Local Mitigation Strategy Working Group, via the Collier County Emergency Management Office. The simplified BCA will utilize reasonable costs for anticipated losses, and not just the total replacement cost of all facilities and equipment. Additionally, the submitting entity must make a presentation to the assembled Local Mitigation Strategy Working Group describing the mitigation project, its impact and support the presentation with graphics and/or mapping to give the group an idea of the project's location. The Local Mitigation Strategy Working Group reviews the initiative and the recommended scoring. Upon review, the initiative is then placed in the list of Collier County Local Mitigation Action Items/Initiatives.

4.1.2.1 **SPECIAL RULES FOR PRIORITIZING HAZARD MITIGATION GRANT PROGRAM (HMGP) PROJECTS:** Following each disaster in the State of Florida, FEMA makes hazard mitigation grant monies available via the HMGP program. The local LMSWG will establish a project priority listing for each HMGP opportunity. **PROCESS:** After each disaster the LMSWG Chair will notify each agency having a project on the project listing and determine their intent to apply for an HMGP grant. Upon receipt of the “Notification of Funds Availability (NOFA)”, the Chair will issue a letter to all those having a project in Annex F, Prioritized Listing of Mitigation Action Items, stating they have 30 days from the date of the NOFA to let the Chair of the LMS Working Group know of their intentions to apply for that grant. For those who do not intend to apply, no further action is necessary on their part. For those who intend to apply, each will be asked to make a presentation to the LMSWG and make their case as to why their project should be ranked as number one. Following the last presentation, the LMSWG will discuss and rank-order the projects going forward for the current grant opportunity. (NOTE: Approved project score sheets received after the “announced project prioritizing date” will be added to the bottom of the prioritized listing in the order received by the emergency management office.) The Chair will furnish each potential applicant a letter to submit along with their grant application package that shows that the project complies with the county’s mitigation strategy and where it ranks.

4.1.3 For purposes of this section, jurisdictions will conduct a preliminary BCA for each of the project prior to submittal to the working group. (Another BCA, using FEMA guidelines for federal grants is required for actual grant application submission\*.)

\* **NOTE:** A Benefit-Cost Analysis (BCA) is required for all mitigation projects;

however, a BCA is not required for planning activities and some acquisition projects. Florida Division of Emergency Management Mitigation staff will perform the FEMA BCA for all hazard mitigation projects. A BCA should be used as a tool to assist in project selection, as mitigation projects with higher benefit-cost ratios will be more competitive in the application evaluation process. Mitigation projects without a BCA or with a benefit-cost ratio less than 1.0 will not be considered for the for a FEMA hazard mitigation grant. PDM competitive grant program.

The Applicant is required to perform a BCA for all properties, including repetitive flood loss properties and substantially damaged properties. FEMA has developed a simplified, alternative methodology to conduct the BCA, which may be used in lieu of a traditional BCA, for certain properties insured under the NFIP and included in the Pilot NFIP Repetitive Loss Properties List. The guidance for using this alternative approach is available for Applicants and Sub-applicants on the FEMA website: [www.fema.gov/fima/pdm](http://www.fema.gov/fima/pdm).

Applicants and Sub-applicants are strongly encouraged to use FEMA's BCA software for their analyses. The software can be obtained free from FEMA by contacting the BCA hotline: 1-866-222-3580. Applicants may use programs or mechanisms other than the FEMA benefit-cost model to determine the benefit-cost ratio; however, the methodology used must be consistent with the FEMA benefit-cost model and must be approved in advance by FEMA. More information about the FEMA's BCA program and guidelines can be found at: <https://www.fema.gov/benefit-cost-analysis>.

The Applicant must provide verification with the application that FEMA has approved the other BCA software or methods. An e-mail or letter signed and dated by FEMA is considered appropriate verification. Questions, contact a State Mitigation Specialist @ 850.410.3286.

**4.1.4 RULE FOR INITIATIVES THAT CAN NOT BE SCORED, BUT ACHIEVES A GOAL OF THE LMS:** There have been times where some initiatives cannot be scored or quantified because their nature, e.g. road elevation to facilitate evacuations, conduct hurricane seminars in the community, etc. In these cases, if the applicants want the initiatives on the priority listing, they will automatically be placed at the end of the listing in the order received and approved. Should the project later be completely scored on the worksheet, the projects position may change on the priority chart.

**4.1.5 PROJECT & INITIATIVE VALIDATION:** In order to keep the priority listing "fresh", the Chair, LMSWG may contact the agencies responsible for projects or initiatives to determine their validity no later than April every two years. This was done in 2007 after a whole series of HMGP grant opportunities were offered and a significant number of agencies with the "highest priorities" on the listing did not take advantage of those opportunities. This resulted in initiatives further down the priority listing to not seek funding because "Tier 1" monies were to be used up.

## Local Mitigation Strategy Prioritization Matrix

Parameter	Weighting Factor	Percent	Points
<b>SUITABILITY SUBTOTAL</b>	<b>25%</b>	<b>100%</b>	<b>25</b>
<b>RISK REDUCTION SUBTOTAL</b>	<b>50%</b>	<b>100%</b>	<b>50</b>
<b>COST SUBTOTAL</b>	<b>25%</b>	<b>100%</b>	<b>25</b>
<b>TOTAL</b>	<b>100%</b>		<b>100</b>

Suitability = 25%					
Parameter		Weighting Factor	Scoring Criteria	Score	Points
1	Appropriateness of the Measure	40%	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth.	5	200
			<b>3- Medium:</b> Needed, but doesn't tie to identified vulnerability.	3	120
			<b>1- Low:</b> Inconsistent with LMS goal or plans.	1	40
2	Community Acceptance	15%	<b>5- High:</b> Endorsed by most communities.	5	75
			<b>3- Medium:</b> Endorsed by most; may create burdens.	3	45
			<b>1- Low:</b> Not likely to be endorsed by the communities.	1	15
3	Environmental Impact	15%	<b>5- Positive</b> effect on the environment.	5	75
			<b>3- No effect</b>	3	45
			<b>1- Adverse</b> effect on the environment.	1	15
4	Legislation	15%	<b>5- High:</b> Consistent with the existing laws and regulations.	5	75
			<b>3- Medium:</b> New legislation or policy change.	3	45
			<b>1- Low:</b> Conflicts with existing laws and regulations.	1	15
5	Consistent With Existing Plans and Priorities.	15%	<b>5- High:</b> Consistent with existing plans.	5	75
			<b>3- Medium:</b> Somewhat consistant.	3	45
			<b>1- Low:</b> Conflicts with existing plans and policies.	1	15
Parameter Subtotal		100%	Sum of the parameter scores; max = 500		500
Suitability Subtotal		(sum of parameter scores) / (maximum possible score)			100%
Risk = 50%					
Parameter		Weighting Factor	Scoring Criteria	Score	Points
1	Scope of Benefits	15%	<b>5- High:</b> Benefits all municipalities and unincorporated areas directly or indirectly	5	75
			<b>3- Medium:</b> Benefits more than half, but or more of not all the municipalities and/or the unincorporated area.	3	45
			<b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.	1	15
2	Potential to save protect human lives	35%	<b>5- High:</b> More than 1,000 lives	5	175
			<b>3- Medium:</b> Up to 1,000 lives	3	105
			<b>0- Low:</b> No lifesaving potential.	0	0 35
3	Importance of Benefits	15%	<b>5- High:</b> Need for essential services.	5	75
			<b>3- Medium:</b> Need for other services.	3	45
			<b>1- Low:</b> No significant implications.	1	15
4	Inconvenience of	10%	<b>5- None:</b> Causes no problems.	5	50

	Problem Correction		<b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e.traffic jams, loss of power, delays).	<b>3</b> <b>1</b>	30 10
5	Economic Effect or Loss (Effect of implementing the project on local economy)	10%	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (minimal disruption). <b>1- Significant:</b> Economic loss (businesses closed, jobs affected).	5 <b>3</b> <b>1</b>	50 30 10
6	Number of People to Benefit	15%	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000	5 <b>3</b> <b>1</b>	75 45 30
Parameter Subtotal		100%	Sum of the parameter scores; max = 500		
Risk Subtotal		(sum of parameter scores) / (maximum possible score)			
Cost = 25%					
Parameter		Weighting Factor	Scoring Criteria	Score	Points
1	Initial Cost	15%	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million	5 <b>3</b> <b>1</b>	75 45 15
2	Maintenance /Operating Costs	5%	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.	5 <b>3</b> <b>1</b>	25 15 5
3	Environmental Cost Impact	40%	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	5 <b>3</b> <b>1</b>	200 120 40
4	Financing Availability	10%	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified	5 <b>3</b> <b>1</b>	50 30 10
5	Repetitive FLOOD damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	30%	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>0 - Not an NFIP insured structure</b>	5 <b>3</b> <b>1</b> <b>0</b>	150 90 30 <b>0</b>
Parameter Subtotal		100%	Sum of the parameter scores; max = 500		
Cost Subtotal		(sum of parameter scores) / (maximum possible score)			
		100%			

**Benefit to Cost Ratio multiplied by the Final Score on the Project Score Sheet will provide the final score for the Project Priority Listing.**

**Attachment 5**

**D-R-A-F-T**

**ANNEX I**

**Initiative Scoring Criteria**

A. Mitigation Initiatives: Criteria for Scoring and Prioritizing

The prioritization of mitigation initiative process begins with the sponsor(s) of each initiative then goes to the Local Mitigation Strategy Working Group.

The first step consists of the sponsoring governments, agencies, and departments developing their initiatives and then scoring each project using the matrix developed by the LMS Working Groups.

The sponsor's prioritized initiatives are then presented to the LMS Working Group via the Collier County Emergency Management Division who will put the initiative on the LMS meeting agenda. The Working Group then reviews, discusses, revises and votes on each of the initiatives, assigning each a score and a ranking using the scoring matrix. The LMS Chair will brief the Collier County Citizen Corps about new mitigation projects and activities LMS Working Group since the Citizen Corps last meeting. ~~The list was then reviewed and revised by the.~~ Following further discussion, the decision was made that like initiatives should be scored alike and grouped. For this purpose, the scores derived from the matrix would be used as a guide to the grouping, and initiatives not grouped would retain their original scores derived from use of the matrix.

In grouping the initiatives, in addition to using the scores derived from the matrix as a guide, considerations such as useful life of the initiative, cost-effectiveness, funding capability, and time required to implement and complete the project were factored.

~~Upon the Citizen Corps approval of the revised Priority Listing, it will be updated in the Collier County Local Mitigation Strategy (Annex F).~~

- B. Special Grant Funding Opportunities & other exigent circumstances: Should an eligible entity have an opportunity to apply for a mitigation grant for a project not previously listed on the Project Priority Listing (Annex F) and not be able to apply for the grant because the next announced LMSWG meeting would preclude timely application, this procedure applies. The applicant will complete a project score sheet, below, and submit it to the Emergency Management Division. Emergency Management will transmit the score sheet to the LMS Chair. The LMS Chair will electronically transmit the score sheet to the voting members of the LMSWG along with an explanation of the exigent circumstances. The LMSWG voting members have **two** business-days to vote on the project acceptability to the project priority listing. At the conclusion of the two business-days a majority vote, with at least three votes agreeing, determines the initiative's status. A transcript of this exception will be entered into the minutes at the next scheduled meeting.

C. Mitigation Initiatives Scoring Matrix

The following table represents the scoring matrix used for the submission of initiatives for consideration for inclusion in the Collier County LMS. Submit the completed "Mitigation Initiative Evaluation Score Sheet" to Emergency Management Div. in MS Word format. (NOTE: See Section 4, para. 4.1.4 for situations which deal with initiatives that cannot be scored.)

### Mitigation Initiatives Evaluation Score Sheet

Instructions: Applicant completes this score sheet for EACH Project. Information required in each of the **SHADED AREAS**. Submit this score sheet in **MS Word format** to the Emergency Management Office electronically: [Richard.Zyvoloski@Colliercountyfl.gov](mailto:Richard.Zyvoloski@Colliercountyfl.gov). Questions, call: 252-3603

If a submitter does not agree with the final determination he or she shall have the right to meet with the scoring committee to present compelling information to change the score.

## PART I

Project Title:							
Project Location:							
<i>TYPE PROJECT ("X" appropriate box, or explain)</i>							
Acquisition	Elevation	Relocation	Reconstruction	Essential Facility Retrofit	Non-Residential Retrofit	New Construction	Special Considerations or Impact Statement, if any:
What Goal or Objective does this address (See Sec. 3.0, LMS)?							
What hazard(s) does this project or initiative correct/mitigate?							
Who (what community) benefits from this project or initiative?							
Does this project or initiative address mitigation on <b>NEW</b> infrastructure or buildings?							
Does this project or initiative address mitigation on <b>EXISTING</b> infrastructure or buildings?							
Project or Initiative Description:							
Applicant and Responsible Agency:							
<i>Agency Contact Information</i>							
NAME				E-Mail			PHONE
Potential Funding Source(s) (See Annex J, LMS)					Estimated Cost		

Suitability			Score	For LMS WG only
1	Appropriateness of the Measure	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth. <b>3- Medium:</b> Needed but isn't tied to an identified vulnerability. <b>1- Low:</b> Inconsistent with LMS goal or plans.		
2	Community Acceptance	<b>5- High:</b> Endorsed by most communities. <b>3- Medium:</b> Endorsed by most; may create burdens. <b>1- Low:</b> Not likely to be endorsed by the communities.		
3	Environmental Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.		
4	Legislation	<b>5- High:</b> Consistent with the existing laws and regulations. <b>3- Medium:</b> New legislation or policy change. <b>1- Low:</b> Conflicts with existing laws and regulations.		
5	Consistent with Existing Plans and Priorities.	<b>5- High:</b> Consistent with existing plans. <b>3- Medium:</b> Somewhat consistent. <b>1- Low:</b> Conflicts with existing plans and policies.		

Risk			Score	For LMS WG only
1	Scope of Benefits	<b>5- High:</b> Benefits all municipalities and unincorporated area directly or indirectly <b>3- Medium:</b> Benefits more than half, but <b>not all</b> the municipalities and/or the unincorporated areas. <b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.		
2	Potential to <b>save protect</b> human lives	<b>5- High:</b> More than 1,000 lives <b>3- Medium:</b> Up to 1,000 lives <b>0- Low:</b> No lifesaving potential.		
3	Importance of Benefits	<b>5- High:</b> Need for essential services. <b>3- Medium:</b> Need for other services. <b>1- Low:</b> No significant implications.		
4	Inconvenience of Problem Correction	<b>5- None:</b> Causes no problems. <b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e. traffic jams, loss of power, delays).		
5	Economic Loss (Effect of implementing the project on local economy)	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (some disruption). <b>1- Significant:</b> Economic loss (businesses closed, jobs affected).		
6	Number of People to directly Benefit	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000		

Cost			Score	For LMS WG only
1	Initial Cost	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million		
2	Maintenance /Operating Costs	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.		
3	Environmental Cost Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.		
4	Financing Availability	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified		
5	Repetitive <b>FLOOD</b> damages corrected (applies <b>ONLY</b> to NFIP-insured structure(s) w/two paid flood losses).	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>0- Not a NFIP insured structure</b>		

## PART II

### *Benefit Cost Analysis – QUICK WORKSHEET*

This worksheet to be filled out by the applicant, is designed only for the Local Mitigation Strategy Working Group use only. This gives the group a flavor for the potential benefits that the project may yield. Here's your chance to quantitatively make the case for your project as COST EFFECTIVE. This BCA is not the same one as the FEMA BCA. The FEMA BCA requires a lot more detail and supporting documentation, but this one will help you to further develop the "official FEMA BCA" should your project go forward as a FEMA grant request. (Please note the asterisked "\*" items below for the appropriate help.)

ESTIMATED COST OF THE MITIGATION PROJECT: **????**

---

DESCRIBE THE COSTS ASSOCIATED WITHOUT THIS MITIGATION PROJECT:

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Some possible costs are:

\* Real Property Losses based on hazard mitigated: \_\_\_\_\_

\*\* Furnishing/Equipment Losses: \_\_\_\_\_

\*\* Alternate facility costs: \_\_\_\_\_

\*\* Contract/rental costs: \_\_\_\_\_

\*\* Other associated costs (list): \_\_\_\_\_

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**Total Cost for Future Damages & Associated Expenses:** **\_\_\_\_\_** (NOTE: This figure should be detailed above.) **& Statement to support above costs/losses/ people directly are affected by this project, briefly explain:** **\_\_\_\_\_**

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**DAMAGE & LOSS COSTS, divided by PROJECT COST = QUICK BCA RATIO**

DAMAGE COSTS: ( **\_\_\_\_\_** )  
                   divided by \_\_\_\_\_ = BCA **\_\_\_\_\_**  
 MITIGATION PROJECT \$: ( **\_\_\_\_\_** )

**Summary Minutes**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
 South Regional Library  
 8065 Lely Cultural Pkwy, Naples, FL 34113  
 Friday, February 11, 2019, 9:30 AM

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
Samantha Quinn, <b>Vice Chair</b>	Interested Citizen	E
William Lang	Collier C. Emergency Management	X
Melinda Avni	Florida Forest Service	X
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	X
Reg Buxton	Citizens Corps/North Naples Journal	E
Terry Smallwood/Dottie Joiner	Everglades City	-
Christa Carrera	City of Naples (Floodplain Mgr)	X
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	X
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield/Caroline Cilek	Collier C. Growth Mgt. Dept.	-
R. Wiley/ Jerry Kurtz/L. Gosselin	Collier C. Stormwater Div.	E
Ilonka Washburn	Collier C. Parks & Recreation Div.	E
Tricia Dorn	Lee County Electric Coop	X
Jeff Johnson	Retrofit SW Florida, Inc.	-
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	E
Lisa Oien	Collier Co. Community and Human Services	X
Jim von Rinteln	Interested Citizen	X
Mark Grazewski	Collier Mosquito Control District	X

Also attending: Jorge Aguilera & Sal D'Angelo, North Collier Fire Rescue, Ashley Jones, The Salvation Army

**1. Approval of January 18, 2019 Meeting Minutes:**

<http://www.colliergov.net/Index.aspx?page=1544>: The working group unanimously approved the minutes

**2. Project Validation & Project(s) for review**

- Project Validation – Collier Public Schools requested to have all their projects removed from the project priority listing of the Local Mitigation Strategy. (This change is reflected in attachment 2 of the attached 18 January meeting minutes highlighted in **BLUE**)
- New Projects for Review
  - i. Collier County Facilities - Install generator in Property Appraiser's Building – This project was withdrawn from consideration.

- ii. FFS - Fuel Reduction for Wildland-Urban Interface Fire – The working group unanimously approved this project. It will be added to the Project Priority Letter as project #5 for the Wildfire Mitigation Grant for funding.

### 3. **New Business**

- Hurricane Michael HMGP grant opportunity: The Notification of Funds Availability (NOFA) for Hurricane Michael should soon be announced. We can apply for project funding; however, we'll only be eligible for Tier 3 monies, i.e., monies not spent by the disaster-declared counties.
- Projects for the Wildfire HMGP – Only five of Collier's projects will go forward for this grant funding opportunity. All applications need to be at the Florida Division of Emergency Management in Tallahassee by the close of business on 25 February.
- 2020 LMS Update – The below items will be taken up at the 11 February meeting
  - i. Membership – The LMS working group wants the Chair to draft language in Section 1 of the LMS to restrict voting-membership to County residents and non-county residents who have business dealings within the County.
  - ii. Goals - The LMS goals will be discussed at the next regular meeting.

### 4. **Next Meeting:**

The next scheduled quarterly regular meeting, will be the third Friday of April (9:30am on the 19<sup>th</sup>) at the **South Regional Library**.

## **ATTACHMENTS**

1. January 18, 2019 Meeting Minutes
2. Collier Wildfire Mitigation 2019 – Hazardous Fuel Reduction

**Attachment 1 to Feb 11<sup>th</sup> Minutes**

**Summary Minutes**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
 South Regional Library  
 8065 Lely Cultural Pkwy, Naples, FL 34113  
 Friday, January 18, 2019, 9:30 AM

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
Samantha Quinn, <b>Vice Chair</b>	Interested Citizen	X
William Lang	Collier C. Emergency Management	X
Melinda Avni	Florida Forest Service	E
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	X
Reg Buxton	Citizens Corps/North Naples Journal	X
Terry Smallwood/Dottie Joiner	Everglades City	X
Christa Carrera	City of Naples (Floodplain Mgr)	X
Evy Ybaceta	Collier C. Growth Management Dept.	-
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	X
James Price	Collier C. Public Utilities Dept., Water Dept.	-
Roosevelt Leonard/J.Malamphy	Collier C. Facilities Div.	-
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield/Caroline Cilek	Collier C. Growth Mgt. Dept.	E
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	X
Tricia Dorn	Lee County Electric Coop	-
Jeff Johnson	Retrofit SW Florida, Inc.	-
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	E
Lisa Oien	Collier Co. Community and Human Services	-
Jim von Rinteln	Interested Citizen	X
Chris Niforatos	Interested Citizen	-

Also attending: Mark Grazewski, Collier Mosquito Control District

**5. Approval of Oct. 19, 2018 Meeting Minutes:**

<http://www.colliergov.net/Index.aspx?page=1544>: The working group unanimously approved the minutes

**6. Membership**

The following members were removed from the active voting membership rolls due to their many absences. On 2 Nov 2018, the chair sent an email advising the following folks that they have been absent from three, or more meetings, and thereby have their voting privileges removed:

- Chris Niforatos
- Roosevelt Leonard
- Everildo Ybaceta
- James Price

**New Member:** Mark Grajewski, Collier County Mosquito Control District, was unanimously voted in as a voting member.

## 7. Project Validation & Project(s) for review

- Annual Project Validation – The Chair sent out a notice to all project sponsors and asked if the project(s) is/are still valid. Attachment 2 shows the results.
- New Projects for Review
  - i. Wind Retrofit a Marco Island Fire Station #51 with a wind screen (attachment 3). This project was accepted by the working group.
  - ii. Collier County Facilities - Install generator in Property Appraiser's Building – Deferred to the 11 February meeting.
  - iii. FFS - Fuel Reduction for Wildland-Urban Interface Fires – Deferred to the 11 February meeting.

## 8. New Business

- Project Priority Letter for the Wildfire HMGP Grant

Wind Retrofit a Marco Island Fire Station #51 with a wind screen	\$15K
City of Naples – two generators (Equipment Svs. & River Park Cmty. Ctr.)	\$175K
Mosquito Control District generator for hangar	\$80K
Greater Naples Fire District – Sta #21 generator	\$110K

- Hurricane Michael - Next potential HMGP opportunity. We'll be eligible to apply for Tier 3 monies for the HMGP opportunity.
- Review of Section 4 of the LMS and Initiative Scoring Criteria (Project Worksheet) Attachments 2 and 3. Changes were accepted with one exception for each. The working group asked the floodplain managers to appropriately fix the "Cost" section dealing with "flood" in both documents.
- 2020 LMS Update – The below items will be taken up at the 11 February meeting
  - i. Membership – change to local? (If local, we'll need a new Chair and Vice Chair.)
  - ii. Goals....

## 9. Next Meeting:

**February 11<sup>th</sup>** at 9:30am in the Emergency Operations Center will be a Special LMS Meeting and it's the last meeting before the Wildfire HMGP opportunity closes on the 25<sup>th</sup> of February. After that meeting, the next scheduled quarterly regular meeting, will

be the third Friday of April (9:30am on the 19<sup>th</sup>) at the **South Regional Library**. However, please be available for any call of a special meeting up to **February 11<sup>th</sup>**; after that, there's not enough time for the public notice of the meeting.

### **ATTACHMENTS**

6. ~~October 19, 2018 Summary Minutes~~ (**minutes removed, posted on the web - <http://bit.ly/2Br1j3Z>**)
7. Annual Project Validation
8. ~~Wind Retrofit Marco Island Fire Station #51~~ (**removed, posted on the web - <http://bit.ly/2Br1j3Z>**)
9. ~~Section 4 of the LMS (Procedures for Prioritizing Hazard Mitigation Initiatives)~~ (**removed, posted on the web - <http://bit.ly/2Br1j3Z>**)
10. ~~Annex I—Initiative Scoring Criteria~~ (**removed, posted on the web - <http://bit.ly/2Br1j3Z>**)

**Attachment 2**  
**2019 Annual Project Validation/Update**  
**LOCAL MITIGATION ACTION ITEMS**  
**PRIORITY LISTING**

#	SCORE	Name/Location/JURISDICTION	Description & Goal(s) Achieved	Beneficiary <sup>3</sup>	Est.Cost	Office Respon <sup>5</sup>
1	11808	Naples Regional Library 650 Central Ave COLLIER COUNTY	Generator and installation. Goal 3	Naples	\$150.0K	Collier PSD Library
2	7843	Headquarters Library 2385 Orange Blossom Dr. COLLIER COUNTY	Generator and installation. Goal 3	N. Naples	\$200.0K	Collier PSD Library
3	7620	Vanderbilt Beach Library 788 Vanderbilt Bch Rd. COLLIER COUNTY	Generator and installation. Goal 3	N. Naples	\$100.0K	Collier PSD Library
4	7108.11	Gulf Coast High School, 7878 Shark Way COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
5	6380.3	1240 Blue Hill Creek, MI CITY OF MARCO ISLAND	Construct a residential safe room. Goal 1	Resident	\$30,000	City of Marco Island
6	5833.3	Marco Island Library 210 s. Heathwood Dr. COLLIER COUNTY	Generator and installation. Goal 3	Marco Island	\$150.0K	Collier PSD Library
7	5800	South Regional Library 8065 Lely Cultural Pkwy COLLIER COUNTY	Generator and installation. Goal 3	E. Naples	\$150.0K	Collier PSD Library
8	5715	Estates Branch Library 1266 GG Blvd. W. COLLIER COUNTY	Generator and installation. Goal 3	GG Estates	\$150.0K	Collier PSD Library
9	5445.68	Radio Station, 110 South 2 <sup>nd</sup> Street, Immokalee IMMOKALEE (PNP)	Generator, residential and wind retrofit facility. Goal 1,2,3,4,5,6	Immokalee	\$88.0K	Coalition of Immokalee Workers
10	5320	E. Naples Library 2385 Orange Blossom Dr. COLLIER COUNTY	Replace roof & Generator and installation. Goal 3	E. Naples	\$225.0K	Collier PSD Library
11	5216.07	Golden Gate Library 2432 Lucerne Rd. COLLIER COUNTY	Generator and installation. Goal 3	GG Estates	\$175.0K	Collier PSD Library
12	5125.62	Sabal Palm ES, 4095 18th Ave. NE COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
13	4789.88	Naples Manor North Area Flood Mitigation COLLIER COUNTY	Complete Nap. Manor North Canal improvements by rechannelization of existing canal. Goal 1	E. Naples	\$600.0K	Collier GMD Stormwater
14	3730.41	Corkscrew Elementary School, 1065 C.R. 858 COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
15	3447.21	Mike Davis Elementary School, 3215 Magnolia Pond Drive COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
16	2660.0	Big Cypress Golf & Country Club Estates-Stormwater COLLIER COUNTY	Stormwater Improvements - system needs to be reconstructed (upgraded). Goal 1	N. Naples	\$600.0K	Collier GMD Stormwater
17	2642.7	Flood Mitigation of Madison Av Area in Immokalee. COLLIER COUNTY	Improvement of roadside ditches/swales, repair/upgrading of non-functioning driveway culverts, addition of cross-drainage structures, & construction of stormwater treatment facs. Goal 1	Immokalee	\$1.0M	Collier GMD Stormwater
18	2621.86	Museum @ Collier Govt Ctr 3339 Tamiami Trl E. COLLIER COUNTY	Replace doors, add hurricane strapping, shutters and generator. Goal 3	E. Naples	\$208.0K	Collier PSD Museums

19	1816.34	Naples City Hall Wind Protection 735 8 <sup>th</sup> St. S., Naples 34102 <b>CITY OF NAPLES</b>	Wind retrofit non-structural exterior glass window and metal frame replacement with higher impact glass to meet code...Goal 3, objs 3.1,3.2,3.3	Naples	\$776.0K	City of Naples
20	1677.37	Upper Gordon River north of GG Pkwy to Pine Ridge Rd Dvmt <b>COLLIER COUNTY</b>	Includes improvements to the existing conveyance channel known as the Upper Gordon River. Goal 1	N. Naples	\$2.0M	Collier GMD Stormwater
21	1616.25	Naples Depot Museum 1051 5 <sup>th</sup> Ave S. <b>COLLIER COUNTY</b>	Install hurricane tie-down at loading dock and buy/install generator. Goal 3	Naples	\$215.0K	Collier PSD Museums
22	1478.61	Lely Elementary School, 8125 Lely Cultural Pkwy <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$20.0K	Collier Public Schools
23	1444.62	Old Lely Area <b>COLLIER COUNTY</b>	Old Lely Backbone Stormwater Management System Improvements. Goal 1	E. Naples	\$2.0M	Collier GMD Stormwater
24	1413.75	West side of Goodlette Rd from GG Pkwy north to Pine Ridge Rd <b>COLLIER COUNTY</b>	Improving the capacity for flow of an existing ditch located on the west side of Goodlette Road. Goal 1	N. Naples	\$1.0M	Collier GMD Stormwater
25	1286.65	GNFD Sta 21, 11121 E. Tamiami Trail <b>Greater Naples Fire &amp; Rescue</b>	Purchase and install larger generator to increase coverage of emergency activities. Goal 3	E. Naples	\$110.0K	GNFR
26	1198.02	Naples Airport <b>Collier Mosquito Control District</b>	Purchase /install two one generator(s), one in Admin Building and one at the hangar. Goal 1	CW	\$80K	CMCD
27	1127.53	Naples Airport <b>Collier Mosquito Control District</b>	Purchase two side by side surveillance all-wheel drive vehicles. Goal 1	CW	\$50,334	CMCD
28	1112.0	Oakridge Middle School, 14975 Collier Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools
29	1066.66	Community Services Bldg, 270 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 1	Naples	\$60.0K	City of Naples
30	956.87	Rock Rd./Cypress Canal Area Flood Mitigation <b>COLLIER COUNTY</b>	Elevating the roads, improvement of roadside ditches, addition of cross-drainage culverts, & Stormwater treatment outfalls. Goal 1	GG Estates	\$1.2M	Collier GMD Stormwater
31	889.03	Palmetto Ridge High School, 1635 Victory Lane <b>COLLIER COUNTY SCHOOLS</b>	Connect Special Needs Shelter Electrical Load to Existing 1.8MW Generator. Goals 1 & 3	CW	\$400.0K	Collier Public Schools
32	859.94	Wind Retrofit residential properties <b>REBUILD NW FLORIDA</b>	Wind retrofit residential properties. Goal 1	CW	\$96.3M	Rebuild NW FL
33	877.5	Lake Trafford Slough <b>COLLIER COUNTY</b>	Lake Trafford Immokalee Slough Capacity Improvements. Goal 1	Immokalee Area	\$1.0M	Collier GMD Stormwater
34	859.89	Griffin Road Area <b>COLLIER COUNTY</b>	Griffin Road Area Stormwater Management Improvements. Goal 1	E. Naples Area	\$1.5M	Collier GMD Stormwater
35	828.33	Utilities Admin Bldg, 380 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 3	Naples	\$150.0K	City of Naples
36	795.04	Roberts Ranch Museum 1215 Roberts Ave, Immok. <b>COLLIER COUNTY</b>	On all facilities at the museum, retrofit w/hurricane strapping, storm shutters, bury electrical utilities & wind-proof. Goal 3, Obj 3.2.& 3.3	E. Collier County	\$91,850	Collier PSD Museums
37	777.65	Equipment Svs Facility & River Park Cmty Ctr 301 11 <sup>th</sup> Street North & 370 Riverside Cir, Naples <b>CITY OF NAPLES</b>	Purchase and install a generator at each facility. Goal 3.	Naples	\$175.0K	City of Naples
38	745.7	City of Marco Island fuel inventory for self sustainability <b>CITY OF MARCO ISLAND</b>	Acquire fuel truck for fuel transfer of diesel and gas and obtain generators for lift stations. Goal 3	Marco Island	\$175.0K	City of Marco Island
39	682.916	Naples Fire Sta 2, 977 26 <sup>th</sup> Avenue North <b>CITY OF NAPLES</b>	Apparatus Bay renovation and facility hardening. Goal 1	Naples	\$450K	Naples
40	630.46	Calusa Park Elementary School, 1600 Santa Barbara Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools
41	552.46	Naples Park Area Flood Mitigation <b>COLLIER COUNTY</b>	Improvement to existing roadside swales, driveways, & installation of stormwater outfall treatment system. Goal 1	N. Naples	\$14.0M total, in 7 phases	Collier GMD Stormwater

42	527.78	Auto Ranch Road Area Flood Mitigation <b>COLLIER COUNTY</b>	Improvement of roadside ditches, elevation of roads, addition of cross-drainage culverts, and stormwater treatment outfalls. Goal 1	E. Collier County	\$500K	Collier GMD Stormwater
43	526.76	Pine Ridge Estates <b>COLLIER COUNTY</b>	Stormwater Management Improvements. Goal 1	E. Collier County	\$5.5M	Collier GMD Stormwater
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45	501.43	Approx. 200' south of the Goodlette Rd/GG Pkwy intersection <b>COLLIER COUNTY</b>	Construction of a new piped stormwater outfall conveying flow south from the existing ditch along the west side of Goodlette Rd., adjacent to the Naples High School. Goal 1	Naples area	\$4.0M	Collier GMD Stormwater
46	476.250	Desoto Blvd Area, GGE <b>COLLIER COUNTY</b>	Swale reconstruction. Goal 1	Golden Gate Estates	\$2.6M	Collier GMD Stormwater
47	428.62	Lake Trafford Rd <b>COLLIER COUNTY</b>	Lake Trafford Road Stormwater Management Improvements. Goal 1	Immokalee Area	\$2.0M	Collier GMD Stormwater
48	423.9	Marco Island Public Works Office 415 Lily Ct, MI <b>CITY OF MARCO ISLAND</b>	New pre-engineered metal building hardened beyond codes and standards, build two feet above BFS. Coal 3	Marco Island	\$750.0K	City of Marco Island
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50	412.75	Old Lely Utility Renewal <b>COLLIER COUNTY</b>	Old Lely Utility Renewal Stormwater Management Improvements. Goal 1.	E. Naples Area	\$7.0M	Collier GMD Stormwater
51	392.9	Marco Island Academy 2255 San Marco Rd, MI <b>CITY OF MARCO ISLAND</b>	Construct hurricane hardened High School Gym and school building. Goal 3	Marco Island	\$8,100.0K	City of Marco Island
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53	350.82	Gulf Coast High School 7878 Shark Way <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	CW	\$1.3M	Collier Public Schools
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56	273.33	San Marco Rd from Collier Blvd., easterly to Landmark St. <b>CITY OF MARCO ISLAND</b>	Improve drainage into large collector piping systems. Goal 1	Marco Island	\$750.0K	City of Marco Island
57	229.225	Various Locations <b>COLLIER COUNTY</b>	Public Safety Radio System redundant fiber optic connectivity	CW	\$200.0K	Collier IT
58	n/a	Harden proposed Sports & Entertainment Complex for PSN sheltering. <b>COLLIER COUNTY</b>	Harden field-house facility of the proposed/new Sports & Entertainment Complex for PSN sheltering. Goal 1	CW	\$7.5M	Collier Fac. Mgt

Attachment 2 to Feb 11<sup>th</sup> Minutes

Project Title:		<b>Collier Wildfire Mitigation 2019 – Hazardous Fuel Reduction</b>					
Project Location:		<b>Collier County</b>					
TYPE PROJECT ("X" appropriate box, or explain)							
Acquisition	Elevation	Relocation	Reconstruction	Essential Facility Retrofit	Non-Residential Retrofit	New Construction	Special Considerations or Impact Statement, if any: Create defensible space corridors within the wildland urban interface throughout Collier county.
					<b>X</b>		
What Goal or Objective does this address (See Sec. 3.0, LMS)?						Goal 1, Objs 1.1 & 1.2	
What hazard(s) does this project or initiative correct/mitigate?						Mitigate wildfire	
Who (what community) benefits from this project or initiative?						Collier county residents	
Does this project or initiative address mitigation on <b>NEW</b> infrastructure or buildings?							Y
Does this project or initiative address mitigation on <b>EXISTING</b> infrastructure or buildings?							Y
Project or Initiative Description:		Hazardous fuel reduction in wildland urban interface to support wildfire response.					
Applicant and Responsible Agency:		<b>Florida Forest Service and Collier County</b>					
<b>Agency Contact Information</b>							
NAME				E-Mail		PHONE	
Fred Boehm				<a href="mailto:Fred.boehm@freshfromflorida.com">Fred.boehm@freshfromflorida.com</a>		954-347-8071	
Potential Funding Source(s) (See Annex J, LMS)		HMGP (FEMA through FDEM – 75%) Florida Forest Service and Collier – 25%		Estimated Cost		<b>\$755,569.32</b>	

Suitability			Score	For LMS WG only
1	Appropriateness of the Measure	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth. <b>3- Medium:</b> Needed but isn't tied to an identified vulnerability. <b>1- Low:</b> Inconsistent with LMS goal or plans.	5	
2	Community Acceptance	<b>5- High:</b> Endorsed by most communities. <b>3- Medium:</b> Endorsed by most; may create burdens. <b>1- Low:</b> Not likely to be endorsed by the communities.	3	
3	Environmental Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	5	
4	Legislation	<b>5- High:</b> Consistent with the existing laws and regulations. <b>3- Medium:</b> New legislation or policy change. <b>1- Low:</b> Conflicts with existing laws and regulations.	5	
5	Consistent with Existing Plans and Priorities.	<b>5- High:</b> Consistent with existing plans. <b>3- Medium:</b> Somewhat consistent. <b>1- Low:</b> Conflicts with existing plans and policies.	5	

Risk			Score	For LMS WG only
1	Scope of Benefits	<b>5- High:</b> Benefits all municipalities and unincorporated area directly or indirectly <b>3- Medium:</b> Benefits more than half, but <b>not all</b> the municipalities and/or the unincorporated areas. <b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.	3	
2	Potential to save human lives	<b>5- High:</b> More than 1,000 lives <b>3- Medium:</b> Up to 1,000 lives <b>1- Low:</b> No lifesaving potential.	5	
3	Importance of Benefits	<b>5- High:</b> Need for essential services. <b>3- Medium:</b> Need for other services. <b>1- Low:</b> No significant implications.	5	
4	Inconvenience of Problem Correction	<b>5- None:</b> Causes no problems. <b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e. traffic jams, loss of power, delays).	3	
5	Economic Loss (Effect of implementing the project on local economy)	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (some disruption). <b>1- Significant:</b> Economic loss (businesses closed, jobs affected).	5	
6	Number of People to directly Benefit	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000	3	

Cost			Score	For LMS WG only
1	Initial Cost	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million	3	
2	Maintenance /Operating Costs	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.	1	
3	Environmental Cost Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	3	
4	Financing Availability	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified	5	
5	Repetitive <u>FLOOD</u> damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>0- Not a NFIP insured structure</b>	0	

## Benefit Cost Analysis – QUICK WORKSHEET

This worksheet to be filled out by the applicant, is designed only for the Local Mitigation Strategy Working Group use only. This gives the group a flavor for the potential benefits that the project may yield. Here's your chance to quantitatively make the case for your project as COST EFFECTIVE. This BCA is not the same one as the FEMA BCA. The FEMA BCA

requires a lot more detail and supporting documentation, but this one will help you to further develop the “official FEMA BCA” should your project go forward as a FEMA grant request. (Please note the asterisked “\*” items below for the appropriate help.)

ESTIMATED COST OF THE MITIGATION PROJECT: \$755,569.32

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How many people directly are affected by this project? 15,000

DESCRIBE THE COSTS ASSOCIATED WITHOUT THIS MITIGATION PROJECT:

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Some possible costs are:

* Real Property Losses based on hazard mitigated:	1,300,000
** Furnishing/Equipment Losses:	430,000
** Alternate facility costs:	30,000
** Contract/rental costs:	
** Other associated costs (list):	

**Total Cost for Future Damages & Associated Expenses: 1,760,000** (NOTE:

This figure should be detailed above.)

Statement to support above costs/losses: Real Property and Alternate Facility loss based on 2017 wildfire in Collier county, 30<sup>th</sup> Avenue, Furnishing equipment loss based on real property content and alternate facility contents.

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Does not include wildfire suppression costs for out of area personnel, contract aviation resources, etc.

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**DAMAGE & LOSS COSTS, divided by PROJECT COST = QUICK BCA RATIO**

DAMAGE COSTS: ( 1,760,000 )  
 divided by = BCA 2.33  
 MITIGATION PROJECT \$: ( 755,569.32 )

**Summary Minutes**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
 South Regional Library  
 8065 Lely Cultural Pkwy, Naples, FL 34113  
 Friday, April 19, 2019, 9:30 AM

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
Samantha Quinn, <b>Vice Chair</b>	Interested Citizen	E
William Lang	Collier C. Emergency Management	X
Melinda Avni	Florida Forest Service	X
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	X
Reg Buxton	Citizens Corps/North Naples Journal	E
Terry Smallwood/Dottie Joiner	Everglades City	-
Christa Carrera	City of Naples (Floodplain Mgr)	X
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	X
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield/Caroline Cilek	Collier C. Growth Mgt. Dept.	-
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	E
Tricia Dorn/Bob Adkins	Lee County Electric Coop	X
Jeff Johnson	Retrofit SW Florida, Inc.	-
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	E
Lisa Oien	Collier Co. Community and Human Services	X
Jim von Rinteln	Interested Citizen	X
Mark Grazewski	Collier Mosquito Control District	-
Sal D'Angelo	North Collier Fire & Rescue District	X
Vacant	Greater Naples Fire Rescue District	-
Vacant	Immokalee Independent Fire District	-
Ashley Jones	The Salvation Army	X

Also attending: Thomas Gonzalez & Sean Allen, Florida Forest Service

1. **Approval of February 7, 2019 Meeting Minutes:** (removed – go to: <http://bit.ly/2Br1j3Z>)  
 The working group unanimously approved the minutes
2. **Membership:** Ms. Ashley Jones, The Salvation Army, was unanimously voted in as a new voting member.
3. **Project Validation & Project(s) for review**
  - Project Validation – Collier Public Schools requested to have all their projects removed from the project priority listing of the Local Mitigation Strategy. (This change is reflected

in attachment 2 of the attached 18 January meeting minutes highlighted in **BLUE**)

➤ New Projects for Review

- i. Collier County Facilities - Install generator in Property Appraiser's Building – This project was withdrawn from consideration.
- ii. FFS - Fuel Reduction for Wildland-Urban Interface Fire – The working group unanimously approved this project. It will be added to the Project Priority Letter as project #5 for the Wildfire Mitigation Grant for funding.

**4. New Business**

- Hurricane Michael HMGP grant opportunity: The Notification of Funds Availability (NOFA) for Hurricane Michael should soon be announced. We can apply for project funding; however, we'll only be eligible for Tier 3 monies, i.e., monies not spent by the disaster-declared counties.
- Projects for the Wildfire HMGP – Only five of Collier's projects will go forward for this grant funding opportunity. All applications need to be at the Florida Division of Emergency Management in Tallahassee by the close of business on 25 February.
- 2020 LMS Update – The below items will be taken up at the 11 February meeting
- i. Membership – The LMS working group wants the Chair to draft language in Section 1 of the LMS to restrict voting-membership to County residents and non-county residents who have business dealings within the County.
  - ii. Goals - The LMS goals will be discussed at the next regular meeting.

**5. Next Meeting:**

The next scheduled quarterly regular meeting, will be the third Friday of April (9:30am on the 19<sup>th</sup>) at the **South Regional Library**.

**ATTACHMENTS**

1. Annual Project Validation
2. Collier Wildfire Mitigation 2019 – Hazardous Fuel Reduction

Attachment 1 to Feb 11<sup>th</sup> Minutes

**2019 Annual Project Validation/Update**  
**LOCAL MITIGATION ACTION ITEMS**  
**PRIORITY LISTING**

#	SCORE	Name/Location/JURISDICTION	Description & Goal(s) Achieved	Beneficiary <sup>3</sup>	Est. Cost	Office Respon <sup>5</sup>
1	11808	Naples Regional Library 650 Central Ave COLLIER COUNTY	Generator and installation. Goal 3	Naples	\$150.0K	Collier PSD Library
2	7843	Headquarters Library 2385 Orange Blossom Dr. COLLIER COUNTY	Generator and installation. Goal 3	N. Naples	\$200.0K	Collier PSD Library
3	7620	Vanderbilt Beach Library 788 Vanderbilt Bch Rd. COLLIER COUNTY	Generator and installation. Goal 3	N. Naples	\$100.0K	Collier PSD Library
4	7108.11	Gulf Coast High School, 7878 Shark Way COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.1	CW	\$20.0K	Collier Public Schools
5	6380.3	1240 Blue Hill Creek, MI CITY OF MARCO ISLAND	Construct a residential safe room. Goal 1	Resident	\$30,000	City of Marco Island
6	5833.3	Marco Island Library 210 s. Heathwood Dr. COLLIER COUNTY	Generator and installation. Goal 3	Marco Island	\$150.0K	Collier PSD Library
7	5800	South Regional Library 8065 Lely Cultural Pkwy COLLIER COUNTY	Generator and installation. Goal 3	E. Naples	\$150.0K	Collier PSD Library
8	5715	Estates Branch Library 1266 GG Blvd. W. COLLIER COUNTY	Generator and installation. Goal 3	GG Estates	\$150.0K	Collier PSD Library
9	5445.68	Radio Station, 110 South 2 <sup>nd</sup> Street, Immokalee IMMOKALEE (PNP)	Generator, residential and wind retrofit facility. Goal 1,2,3,4,5,6	Immokalee	\$88.0K	Coalition of Immokalee Workers
10	5320	E. Naples Library 2385 Orange Blossom Dr. COLLIER COUNTY	Replace roof & Generator and installation. Goal 3	E. Naples	\$225.0K	Collier PSD Library
11	5216.07	Golden Gate Library 2432 Lucerne Rd. COLLIER COUNTY	Generator and installation. Goal 3	GG Estates	\$175.0K	Collier PSD Library
12	5125.62	Sabal Palm ES, 4095 18th Ave. NE COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
13	4789.88	Naples Manor North Area Flood Mitigation COLLIER COUNTY	Complete Nap. Manor North Canal improvements by rechannelization of existing canal. Goal 1	E. Naples	\$600.0K	Collier GMD Stormwater
14	3730.41	Corkscrew Elementary School, 1065 C.R. 858 COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
15	3447.21	Mike Davis Elementary School, 3215 Magnolia Pond Drive COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1	CW	\$20.0K	Collier Public Schools
16	2660.0	Big Cypress Golf & Country Club Estates-Stormwater COLLIER COUNTY	Stormwater Improvements - system needs to be reconstructed (upgraded). Goal 1	N. Naples	\$600.0K	Collier GMD Stormwater
17	2642.7	Flood Mitigation of Madison Av Area in Immokalee. COLLIER COUNTY	Improvement of roadside ditches/swales, repair/upgrading of non-functioning driveway culverts, addition of cross-drainage structures, & construction of stormwater treatment facs. Goal 1	Immokalee	\$1.0M	Collier GMD Stormwater

18	2621.86	Museum @ Collier Govt Ctr 3339 Tamiami Trl E. <b>COLLIER COUNTY</b>	Replace doors, add hurricane strapping, shutters and generator. Goal 3	E. Naples	\$208.0K	Collier PSD Museums
19	1816.34	Naples City Hall Wind Protection 735 8 <sup>th</sup> St. S., Naples 34102 <b>CITY OF NAPLES</b>	Wind retrofit non-structural exterior glass window and metal frame replacement with higher impact glass to meet code...Goal 3, objs 3.1,3.2,3.3	Naples	\$776.0K	City of Naples
20	1677.37	Upper Gordon River north of GG Pkwy to Pine Ridge Rd Dvmt <b>COLLIER COUNTY</b>	Includes improvements to the existing conveyance channel known as the Upper Gordon River. Goal 1	N. Naples	\$2.0M	Collier GMD Stormwater
21	1616.25	Naples Depot Museum 1051 5 <sup>th</sup> Ave S. <b>COLLIER COUNTY</b>	Install hurricane tie-down at loading dock and buy/install generator. Goal 3	Naples	\$215.0K	Collier PSD Museums
22	1478.61	Lely Elementary School, 8125 Lely Cultural Pkwy <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$20.0K	Collier Public Schools
23	1444.62	Old Lely Area <b>COLLIER COUNTY</b>	Old Lely Backbone Stormwater Management System Improvements. Goal 1	E. Naples	\$2.0M	Collier GMD Stormwater
24	1413.75	West side of Goodlette Rd from GG Pkwy north to Pine Ridge Rd <b>COLLIER COUNTY</b>	Improving the capacity for flow of an existing ditch located on the west side of Goodlette Road. Goal 1	N. Naples	\$1.0M	Collier GMD Stormwater
25	1286.65	GNFD Sta 21, 11121 E. Tamiami Trail <b>Greater Naples Fire &amp; Rescue</b>	Purchase and install larger generator to increase coverage of emergency activities. Goal 3	E. Naples	\$110.0K	GNFR
26	1198.02	Naples Airport <b>Collier Mosquito Control District</b>	Purchase /install two one generator(s), one in Admin Building and one at the hangar. Goal 1	CW	\$80K	CMCD
27	1127.53	Naples Airport <b>Collier Mosquito Control District</b>	Purchase two side by side surveillance all wheel drive vehicles. Goal 1	CW	\$50,334	CMCD
28	1112.0	Oakridge Middle School, 14975 Collier Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools
29	1066.66	Community Services Bldg, 270 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 1	Naples	\$60.0K	City of Naples
30	956.87	Rock Rd./Cypress Canal Area Flood Mitigation <b>COLLIER COUNTY</b>	Elevating the roads, improvement of roadside ditches, addition of cross-drainage culverts, & Stormwater treatment outfalls. Goal 1	GG Estates	\$1.2M	Collier GMD Stormwater
31	889.03	Palmetto Ridge High School, 1655 Victory Lane <b>COLLIER COUNTY SCHOOLS</b>	Connect Special Needs Shelter Electrical Load to Existing 1.8MW Generator. Goals 1 & 3	CW	\$400.0K	Collier Public Schools
32	859.94	Wind Retrofit residential properties <b>REBUILD NW FLORIDA</b>	Wind retrofit residential properties. Goal 1	CW	\$96.3M	Rebuild NW FL
33	877.5	Lake Trafford Slough <b>COLLIER COUNTY</b>	Lake Trafford Immokalee Slough Capacity Improvements. Goal 1	Immokalee Area	\$1.0M	Collier GMD Stormwater
34	859.89	Griffin Road Area <b>COLLIER COUNTY</b>	Griffin Road Area Stormwater Management Improvements. Goal 1	E. Naples Area	\$1.5M	Collier GMD Stormwater
35	828.33	Utilities Admin Bldg, 380 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 3	Naples	\$150.0K	City of Naples
36	795.04	Roberts Ranch Museum 1215 Roberts Ave, Immok. <b>COLLIER COUNTY</b>	On all facilities at the museum, retrofit w/hurricane strapping, storm shutters, bury electrical utilities & wind-proof. Goal 3, Obj 3.2.& 3.3	E. Collier County	\$91,850	Collier PSD Museums
37	777.65	Equipment Svs Facility & River Park Cmty Ctr 301 11 <sup>th</sup> Street North & 370 Riverside Cir, Naples <b>CITY OF NAPLES</b>	Purchase and install a generator at each facility. Goal 3.	Naples	\$175.0K	City of Naples
38	745.7	City of Marco Island fuel inventory for self sustainability <b>CITY OF MARCO ISLAND</b>	Acquire fuel truck for fuel transfer of diesel and gas and obtain generators for lift stations. Goal 3	Marco Island	\$175.0K	City of Marco Island
39	682.916	Naples Fire Sta 2, 977 26 <sup>th</sup> Avenue North <b>CITY OF NAPLES</b>	Apparatus Bay renovation and facility hardening. Goal 1	Naples	\$450K	Naples
40	630.46	Calusa Park Elementary School, 4600 Santa Barbara Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools

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54	349.4	Golden Gate High School, 2025 Titan Way <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	CW	\$1.3M	Collier Public Schools
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					<b>X</b>		
What Goal or Objective does this address (See Sec. 3.0, LMS)?						Goal 1, Objs 1.1 & 1.2	
What hazard(s) does this project or initiative correct/mitigate?						Mitigate wildfire	
Who (what community) benefits from this project or initiative?						Collier county residents	
Does this project or initiative address mitigation on <b>NEW</b> infrastructure or buildings?							Y
Does this project or initiative address mitigation on <b>EXISTING</b> infrastructure or buildings?							Y
Project or Initiative Description:		Hazardous fuel reduction in wildland urban interface to support wildfire response.					
Applicant and Responsible Agency:		<b>Florida Forest Service and Collier County</b>					
<b>Agency Contact Information</b>							
NAME				E-Mail		PHONE	
Fred Boehm				<a href="mailto:Fred.boehm@freshfromflorida.com">Fred.boehm@freshfromflorida.com</a>		954-347-8071	
Potential Funding Source(s) (See Annex J, LMS)		HMGP (FEMA through FDEM – 75%) Florida Forest Service and Collier – 25%		Estimated Cost		<b>\$755,569.32</b>	

Suitability			Score	For LMS WG only
1	Appropriateness of the Measure	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth. <b>3- Medium:</b> Needed but isn't tied to an identified vulnerability. <b>1- Low:</b> Inconsistent with LMS goal or plans.	5	
2	Community Acceptance	<b>5- High:</b> Endorsed by most communities. <b>3- Medium:</b> Endorsed by most; may create burdens. <b>1- Low:</b> Not likely to be endorsed by the communities.	3	
3	Environmental Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	5	
4	Legislation	<b>5- High:</b> Consistent with the existing laws and regulations. <b>3- Medium:</b> New legislation or policy change. <b>1- Low:</b> Conflicts with existing laws and regulations.	5	
5	Consistent with Existing Plans and Priorities.	<b>5- High:</b> Consistent with existing plans. <b>3- Medium:</b> Somewhat consistent. <b>1- Low:</b> Conflicts with existing plans and policies.	5	

Risk			Score	For LMS WG only
1	Scope of Benefits	<b>5- High:</b> Benefits all municipalities and unincorporated area directly or indirectly <b>3- Medium:</b> Benefits more than half, but <b>not all</b> the municipalities and/or the unincorporated areas. <b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.	3	
2	Potential to save human lives	<b>5- High:</b> More than 1,000 lives <b>3- Medium:</b> Up to 1,000 lives <b>1- Low:</b> No lifesaving potential.	5	
3	Importance of Benefits	<b>5- High:</b> Need for essential services. <b>3- Medium:</b> Need for other services. <b>1- Low:</b> No significant implications.	5	
4	Inconvenience of Problem Correction	<b>5- None:</b> Causes no problems. <b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e. traffic jams, loss of power, delays).	3	
5	Economic Loss (Effect of implementing the project on local economy)	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (some disruption). <b>1- Significant:</b> Economic loss (businesses closed, jobs affected).	5	
6	Number of People to directly Benefit	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000	3	

Cost			Score	For LMS WG only
1	Initial Cost	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million	3	
2	Maintenance /Operating Costs	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.	1	
3	Environmental Cost Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	3	
4	Financing Availability	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified	5	
5	Repetitive <u>FLOOD</u> damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>0- Not a NFIP insured structure</b>	0	

## Benefit Cost Analysis – QUICK WORKSHEET

This worksheet to be filled out by the applicant, is designed only for the Local Mitigation Strategy Working Group use only. This gives the group a flavor for the potential benefits that the project may yield. Here's your chance to quantitatively make the case for your project as COST EFFECTIVE. This BCA is not the same one as the FEMA BCA. The FEMA BCA

requires a lot more detail and supporting documentation, but this one will help you to further develop the “official FEMA BCA” should your project go forward as a FEMA grant request.

(Please note the asterisked “\*” items below for the appropriate help.)

**ESTIMATED COST OF THE MITIGATION PROJECT: \$755,569.32**

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How many people directly are affected by this project? **15,000**

**DESCRIBE THE COSTS ASSOCIATED WITHOUT THIS MITIGATION PROJECT:**

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Some possible costs are:

* Real Property Losses based on hazard mitigated:	1,300,000
** Furnishing/Equipment Losses:	430,000
** Alternate facility costs:	30,000
** Contract/rental costs:	
** Other associated costs (list):	

**Total Cost for Future Damages & Associated Expenses: 1,760,000** (NOTE: This figure should be detailed above.)

Statement to support above costs/losses: Real Property and Alternate Facility loss based on 2017 wildfire in Collier county, 30<sup>th</sup> Avenue, Furnishing equipment loss based on real property content and alternate facility contents.

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Does not include wildfire suppression costs for out of area personnel, contract aviation resources, etc.

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**DAMAGE & LOSS COSTS, divided by PROJECT COST = QUICK BCA RATIO**

DAMAGE COSTS: ( 1,760,000 )  
 divided by = BCA 2,33  
 MITIGATION PROJECT \$: ( 755,569.32 )

**Special Meeting**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
 Emergency Operations Center  
 8075 Lely Cultural Pkwy, Naples, FL 34113  
 18 June 2019

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
vacant, <b>Vice Chair</b>		-
William Lang	Collier C. Emergency Management	E
Melinda Avni	Florida Forest Service	X
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	E
Reg Buxton	Citizens Corps/North Naples Journal	X
Terry Smallwood/Dottie Joiner	Everglades City	-
Christa Carrera	City of Naples (Floodplain Mgr)	X
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	E
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield	Collier C. Growth Mgt. Dept.	-
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	X
Tricia Dorn/Bob Atkins	Lee County Electric Coop	E
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	-
Lisa Oien	Collier Co. Community and Human Services	E
Jim von Rinteln	Interested Citizen	E
Mark Grazewski	Collier Mosquito Control District	-
W. Martin/A. McLaughlin	Greater Naples Fire Rescue District	E
Sal D'Angelo	North Collier Fire Rescue District	X
vacant	Immokalee Independent Fire District	
Ashley Jones	The Salvation Army	E

Visitors: Thomas Gonzalez, Florida Forest Service, Felicia Kirby & Barry Williams, Collier Co. Parks and Recreation

1. Approval of 19 April Regular Meeting minutes. (attached) - approved
2. Project(s) for Review - none
3. Membership
  - a. **Samantha Quinn**, Vice Chair, resigned to take a new job. (see attached)
  - b. New Vice Chair – William Lang, Collier Alert & Warning Coordinator
  - c. Jurisdictional minimum requirements discussed:

- i. Document how each jurisdiction participated in the planning process.  
(NOTE: the best way is to show participation by the attendance roster in the meeting minutes)
  - ii. New and removed jurisdictions must be identified in the plan
- 4. Irma HMGP Project – Increase costs for:
  - a. Naples Lift-Station project
  - b. Parks & Recreation Generator Projects
- 5. Irma Projects & Priorities (see attached)
  - a. Increased monies
  - b. Reprioritize based on the increased monies.

Next regular meeting: **July 19**, 0930hrs, at the S. Regional Library

#### **ATTACHMENTS**

- 11. April 19 Summary Minutes
- 12. Vice Chair Resignation
- 13. Naples Lift Station Projects -Budget (sent separately)
- 14. Parks & Recreation Project Increased Costs
- 15. Current Irma Project Status

**Attachment 1**

**Summary Minutes**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
 South Regional Library  
 8065 Lely Cultural Pkwy, Naples, FL 34113  
 Friday, April 19, 2019, 9:30 AM

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
Samantha Quinn, <b>Vice Chair</b>	Interested Citizen	E
William Lang	Collier C. Emergency Management	X
Melinda Avni	Florida Forest Service	X
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	X
Reg Buxton	Citizens Corps/North Naples Journal	E
Terry Smallwood/Dottie Joiner	Everglades City	-
Christa Carrera	City of Naples (Floodplain Mgr)	X
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	X
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield/Caroline Cilek	Collier C. Growth Mgt. Dept.	-
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	E
Tricia Dorn/Bob Adkins	Lee County Electric Coop	X
Jeff Johnson	Retrofit SW Florida, Inc.	-
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	E
Lisa Oien	Collier Co. Community and Human Services	X
Jim von Rinteln	Interested Citizen	X
Mark Grazewski	Collier Mosquito Control District	-
Sal D'Angelo	North Collier Fire & Rescue District	X
Vacant	Greater Naples Fire Rescue District	-
Vacant	Immokalee Independent Fire District	-
Ashley Jones	The Salvation Army	X

Also attending: Thomas Gonzalez & Sean Allen, Florida Forest Service

**10. Approval of February 7, 2019 Meeting Minutes:** (removed – go to: <http://bit.ly/2Br1j3Z>)

The working group unanimously approved the minutes

**11. Membership:** Ms. Ashley Jones, The Salvation Army, was unanimously voted in as a new voting member.

**12. Project Validation & Project(s) for review**

- Project Validation – Collier Public Schools requested to have all their projects removed from the project priority listing of the Local Mitigation Strategy. (This change is reflected in attachment 2 of the attached 18 January meeting minutes highlighted in **BLUE**)
- New Projects for Review
  - i. Collier County Facilities - Install generator in Property Appraiser's Building – This project was withdrawn from consideration.
  - ii. FFS - Fuel Reduction for Wildland-Urban Interface Fire – The working group unanimously approved this project. It will be added to the Project Priority Letter as project #5 for the Wildfire Mitigation Grant for funding.

### 13. New Business

- Hurricane Michael HMGP grant opportunity: The Notification of Funds Availability (NOFA) for Hurricane Michael should soon be announced. We can apply for project funding; however, we'll only be eligible for Tier 3 monies, i.e., monies not spent by the disaster-declared counties.
- Projects for the Wildfire HMGP – Only five of Collier's projects will go forward for this grant funding opportunity. All applications need to be at the Florida Division of Emergency Management in Tallahassee by the close of business on 25 February.
- 2020 LMS Update – The below items will be taken up at the 11 February meeting
  - i. Membership – The LMS working group wants the Chair to draft language in Section 1 of the LMS to restrict voting-membership to County residents and non-county residents who have business dealings within the County.
  - ii. Goals - The LMS goals will be discussed at the next regular meeting.

### 14. Next Meeting:

The next scheduled quarterly regular meeting, will be the third Friday of July 19<sup>th</sup>, 9:30am ,at the **South Regional Library**.

### **ATTACHMENTS**

1. Annual Project Validation
2. Collier Wildfire Mitigation 2019 – Hazardous Fuel Reduction

Attachment 1 to April 19<sup>th</sup> Meeting

**2019 Annual Project Validation/Update**  
**LOCAL MITIGATION ACTION ITEMS**  
**PRIORITY LISTING**

#	SCORE	Name/Location/JURISDICTION	Description & Goal(s) Achieved	Beneficiary <sup>3</sup>	Est. Cost	Office Respon <sup>5</sup>
1	11808	Naples Regional Library 650 Central Ave COLLIER COUNTY	Generator and installation. Goal 3	Naples	\$150.0K	Collier PSD Library
2	7843	Headquarters Library 2385 Orange Blossom Dr. COLLIER COUNTY	Generator and installation. Goal 3	N. Naples	\$200.0K	Collier PSD Library
3	7620	Vanderbilt Beach Library 788 Vanderbilt Bch Rd. COLLIER COUNTY	Generator and installation. Goal 3	N. Naples	\$100.0K	Collier PSD Library
4	7108.11	Gulf Coast High School, 7878 Shark Way COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.1	CW	\$20.0K	Collier Public Schools
5	6380.3	1240 Blue Hill Creek, MI CITY OF MARCO ISLAND	Construct a residential safe room. Goal 1	Resident	\$30,000	City of Marco Island
6	5833.3	Marco Island Library 210 s. Heathwood Dr. COLLIER COUNTY	Generator and installation. Goal 3	Marco Island	\$150.0K	Collier PSD Library
7	5800	South Regional Library 8065 Lely Cultural Pkwy COLLIER COUNTY	Generator and installation. Goal 3	E. Naples	\$150.0K	Collier PSD Library
8	5715	Estates Branch Library 1266 GG Blvd. W. COLLIER COUNTY	Generator and installation. Goal 3	GG Estates	\$150.0K	Collier PSD Library
9	5445.68	Radio Station, 110 South 2 <sup>nd</sup> Street, Immokalee IMMOKALEE (PNP)	Generator, residential and wind retrofit facility. Goal 1,2,3,4,5,6	Immokalee	\$88.0K	Coalition of Immokalee Workers
10	5320	E. Naples Library 2385 Orange Blossom Dr. COLLIER COUNTY	Replace roof & Generator and installation. Goal 3	E. Naples	\$225.0K	Collier PSD Library
11	5216.07	Golden Gate Library 2432 Lucerne Rd. COLLIER COUNTY	Generator and installation. Goal 3	GG Estates	\$175.0K	Collier PSD Library
12	5125.62	Sabal Palm ES, 4095 18th Ave. NE COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
13	4789.88	Naples Manor North Area Flood Mitigation COLLIER COUNTY	Complete Nap. Manor North Canal improvements by rechannelization of existing canal. Goal 1	E. Naples	\$600.0K	Collier GMD Stormwater
14	3730.41	Corkscrew Elementary School, 1065 C.R. 858 COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1.	CW	\$20.0K	Collier Public Schools
15	3447.21	Mike Davis Elementary School, 3215 Magnolia Pond Drive COLLIER COUNTY SCHOOLS	Connect generator to lift station. Goal 1	CW	\$20.0K	Collier Public Schools
16	2660.0	Big Cypress Golf & Country Club Estates-Stormwater COLLIER COUNTY	Stormwater Improvements - system needs to be reconstructed (upgraded). Goal 1	N. Naples	\$600.0K	Collier GMD Stormwater
17	2642.7	Flood Mitigation of Madison Av Area in Immokalee. COLLIER COUNTY	Improvement of roadside ditches/swales, repair/upgrading of non-functioning driveway culverts, addition of cross-drainage structures, & construction of stormwater treatment facs. Goal 1	Immokalee	\$1.0M	Collier GMD Stormwater

18	2621.86	Museum @ Collier Govt Ctr 3339 Tamiami Trl E. <b>COLLIER COUNTY</b>	Replace doors, add hurricane strapping, shutters and generator. Goal 3	E. Naples	\$208.0K	Collier PSD Museums
19	1816.34	Naples City Hall Wind Protection 735 8 <sup>th</sup> St. S., Naples 34102 <b>CITY OF NAPLES</b>	Wind retrofit non-structural exterior glass window and metal frame replacement with higher impact glass to meet code...Goal 3, objs 3.1,3.2,3.3	Naples	\$776.0K	City of Naples
20	1677.37	Upper Gordon River north of GG Pkwy to Pine Ridge Rd Dvmt <b>COLLIER COUNTY</b>	Includes improvements to the existing conveyance channel known as the Upper Gordon River. Goal 1	N. Naples	\$2.0M	Collier GMD Stormwater
21	1616.25	Naples Depot Museum 1051 5 <sup>th</sup> Ave S. <b>COLLIER COUNTY</b>	Install hurricane tie-down at loading dock and buy/install generator. Goal 3	Naples	\$215.0K	Collier PSD Museums
22	1478.61	Lely Elementary School, 8125 Lely Cultural Pkwy <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$20.0K	Collier Public Schools
23	1444.62	Old Lely Area <b>COLLIER COUNTY</b>	Old Lely Backbone Stormwater Management System Improvements. Goal 1	E. Naples	\$2.0M	Collier GMD Stormwater
24	1413.75	West side of Goodlette Rd from GG Pkwy north to Pine Ridge Rd <b>COLLIER COUNTY</b>	Improving the capacity for flow of an existing ditch located on the west side of Goodlette Road. Goal 1	N. Naples	\$1.0M	Collier GMD Stormwater
25	1286.65	GNFD Sta 21, 11121 E. Tamiami Trail <b>Greater Naples Fire &amp; Rescue</b>	Purchase and install larger generator to increase coverage of emergency activities. Goal 3	E. Naples	\$110.0K	GNFR
26	1198.02	Naples Airport <b>Collier Mosquito Control District</b>	Purchase /install two one generator(s), one in Admin Building and one at the hangar. Goal 1	CW	\$80K	CMCD
27	1127.53	Naples Airport <b>Collier Mosquito Control District</b>	Purchase two side by side surveillance all wheel drive vehicles. Goal 1	CW	\$50,334	CMCD
28	1112.0	Oakridge Middle School, 14975 Collier Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools
29	1066.66	Community Services Bldg, 270 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 1	Naples	\$60.0K	City of Naples
30	956.87	Rock Rd./Cypress Canal Area Flood Mitigation <b>COLLIER COUNTY</b>	Elevating the roads, improvement of roadside ditches, addition of cross-drainage culverts, & Stormwater treatment outfalls. Goal 1	GG Estates	\$1.2M	Collier GMD Stormwater
31	889.03	Palmetto Ridge High School, 1655 Victory Lane <b>COLLIER COUNTY SCHOOLS</b>	Connect Special Needs Shelter Electrical Load to Existing 1.8MW Generator. Goals 1 & 3	CW	\$400.0K	Collier Public Schools
32	859.94	Wind Retrofit residential properties <b>REBUILD NW FLORIDA</b>	Wind retrofit residential properties. Goal 1	CW	\$96.3M	Rebuild NW FL
33	877.5	Lake Trafford Slough <b>COLLIER COUNTY</b>	Lake Trafford Immokalee Slough Capacity Improvements. Goal 1	Immokalee Area	\$1.0M	Collier GMD Stormwater
34	859.89	Griffin Road Area <b>COLLIER COUNTY</b>	Griffin Road Area Stormwater Management Improvements. Goal 1	E. Naples Area	\$1.5M	Collier GMD Stormwater
35	828.33	Utilities Admin Bldg, 380 Riverside Circle <b>CITY OF NAPLES</b>	The Purchase and Installation of Impact rated windows. Goal 3	Naples	\$150.0K	City of Naples
36	795.04	Roberts Ranch Museum 1215 Roberts Ave, Immok. <b>COLLIER COUNTY</b>	On all facilities at the museum, retrofit w/hurricane strapping, storm shutters, bury electrical utilities & wind-proof. Goal 3, Obj 3.2.& 3.3	E. Collier County	\$91,850	Collier PSD Museums
37	777.65	Equipment Svs Facility & River Park Cmty Ctr 301 11 <sup>th</sup> Street North & 370 Riverside Cir, Naples <b>CITY OF NAPLES</b>	Purchase and install a generator at each facility. Goal 3.	Naples	\$175.0K	City of Naples
38	745.7	City of Marco Island fuel inventory for self sustainability <b>CITY OF MARCO ISLAND</b>	Acquire fuel truck for fuel transfer of diesel and gas and obtain generators for lift stations. Goal 3	Marco Island	\$175.0K	City of Marco Island
39	682.916	Naples Fire Sta 2, 977 26 <sup>th</sup> Avenue North <b>CITY OF NAPLES</b>	Apparatus Bay renovation and facility hardening. Goal 1	Naples	\$450K	Naples
40	630.46	Calusa Park Elementary School, 4600 Santa Barbara Blvd <b>COLLIER COUNTY SCHOOLS</b>	Connect generator to lift station. Goal 1	CW	\$35.0K	Collier Public Schools

41	552.46	Naples Park Area Flood Mitigation <b>COLLIER COUNTY</b>	Improvement to existing roadside swales, driveways, & installation of stormwater outfall treatment system. Goal 1	N. Naples	\$14.0M total, in 7 phases	Collier GMD Stormwater
42	527.78	Auto Ranch Road Area Flood Mitigation <b>COLLIER COUNTY</b>	Improvement of roadside ditches, elevation of roads, addition of cross-drainage culverts, and stormwater treatment outfalls. Goal 1	E. Collier County	\$500K	Collier GMD Stormwater
43	526.76	Pine Ridge Estates <b>COLLIER COUNTY</b>	Stormwater Management Improvements. Goal 1	E. Collier County	\$5.5M	Collier GMD Stormwater
44	520.37	Big Corkscrew Isl. Regional Park <b>COLLIER COUNTY</b>	Generators for facilities, wind- hardening Goal 3.	CW	\$1,200.0K	Collier PSD P&R
45	501.43	Approx. 200' south of the Goodlette Rd/GG Pkwy intersection <b>COLLIER COUNTY</b>	Construction of a new piped stormwater outfall conveying flow south from the existing ditch along the west side of Goodlette Rd., adjacent to the Naples High School. Goal 1	Naples area	\$4.0M	Collier GMD Stormwater
46	476.250	Desoto Blvd Area, GGE <b>COLLIER COUNTY</b>	Swale reconstruction. Goal 1	Golden Gate Estates	\$2.6M	Collier GMD Stormwater
47	428.62	Lake Trafford Rd <b>COLLIER COUNTY</b>	Lake Trafford Road Stormwater Management Improvements. Goal 1	Immokalee Area	\$2.0M	Collier GMD Stormwater
48	423.9	Marco Island Public Works Office 415 Lily Ct, MI <b>CITY OF MARCO ISLAND</b>	New pre-engineered metal building hardened beyond codes and standards, build two feet above BFS. Goal 3	Marco Island	\$750.0K	City of Marco Island
49	412.75	Logan Blvd Area <b>COLLIER COUNTY</b>	Stormwater Improvements. Goal 1	W. Golden Gate Estates	\$4.5M	Collier GMD Stormwater
50	412.75	Old Lely Utility Renewal <b>COLLIER COUNTY</b>	Old Lely Utility Renewal Stormwater Management Improvements. Goal 1.	E. Naples Area	\$7.0M	Collier GMD Stormwater
51	392.9	Marco Island Academy 2255 San Marco Rd, MI <b>CITY OF MARCO ISLAND</b>	Construct hurricane hardened High School Gym and school building. Goal 3	Marco Island	\$8,100.0K	City of Marco Island
52	360.08	Caxambas USCGA Building 909 Collier Ct., MI <b>COLLIER COUNTY</b>	Add a new hardened building. Goal 3	Marco Island	\$1,500.0K	Collier PSD P&R
53	350.82	Gulf Coast High School, 7878 Shark Way <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	CW	\$1.3M	Collier Public Schools
54	349.4	Golden Gate High School, 2025 Titan Way <b>COLLIER COUNTY SCHOOLS</b>	Install 1.8MW Generator. Goals 1 & 3	CW	\$1.3M	Collier Public Schools
55	341.33	Emergency Services Ctr 8075 Lely Cultural Pkwy <b>COLLIER COUNTY</b>	Drill water well and install backup water system. Goal 1	CW	\$150.0k	Collier Facilities Mgt
56	273.33	San Marco Rd from Collier Blvd., easterly to Landmark St. <b>CITY OF MARCO ISLAND</b>	Improve drainage into large collector piping systems. Goal 1	Marco Island	\$750.0K	City of Marco Island
57	229.225	Various Locations <b>COLLIER COUNTY</b>	Public Safety Radio System redundant fiber optic connectivity	CW	\$200.0K	Collier IT
58	n/a	Harden proposed Sports & Entertainment Complex for PSN sheltering. <b>COLLIER COUNTY</b>	Harden field-house facility of the proposed/new Sports & Entertainment Complex for PSN sheltering. Goal 1	CW	\$7.5M	Collier Fac. Mgt

Attachment 2 to April 19<sup>th</sup> Meeting

Project Title:		<b>Collier Wildfire Mitigation 2019 – Hazardous Fuel Reduction</b>				
Project Location:		<b>Collier County</b>				
TYPE PROJECT ("X" appropriate box, or explain)						
Acquisition	Elevation	Relocation	Reconstruction	Essential Facility Retrofit	Non-Residential Retrofit	New Construction
					<b>X</b>	
Special Considerations or Impact Statement, if any: Create defensible space corridors within the wildland urban interface throughout Collier county.						
What Goal or Objective does this address (See Sec. 3.0, LMS)?						Goal 1, Objs 1.1 & 1.2
What hazard(s) does this project or initiative correct/mitigate?						Mitigate wildfire
Who (what community) benefits from this project or initiative?						Collier county residents
Does this project or initiative address mitigation on <b>NEW</b> infrastructure or buildings?						Y
Does this project or initiative address mitigation on <b>EXISTING</b> infrastructure or buildings?						Y
Project or Initiative Description:				Hazardous fuel reduction in wildland urban interface to support wildfire response.		
Applicant and Responsible Agency:				<b>Florida Forest Service and Collier County</b>		
<u>Agency Contact Information</u>						
NAME				E-Mail		PHONE
Fred Boehm				<a href="mailto:Fred.boehm@freshfromflorida.com">Fred.boehm@freshfromflorida.com</a>		954-347-8071
Potential Funding Source(s) (See Annex J, LMS)				HMGP (FEMA through FDEM – 75% Florida Forest Service and Collier – 25%)	Estimated Cost	<b>\$755,569.32</b>

Suitability			Score	For LMS WG only
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3	Environmental Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	5	
4	Legislation	<b>5- High:</b> Consistent with the existing laws and regulations. <b>3- Medium:</b> New legislation or policy change. <b>1- Low:</b> Conflicts with existing laws and regulations.	5	
5	Consistent with Existing Plans and Priorities.	<b>5- High:</b> Consistent with existing plans. <b>3- Medium:</b> Somewhat consistent. <b>1- Low:</b> Conflicts with existing plans and policies.	5	

Risk			Score	For LMS WG only
1	Scope of Benefits	<b>5- High:</b> Benefits all municipalities and unincorporated area directly or indirectly <b>3- Medium:</b> Benefits more than half, but <b>not all</b> the municipalities and/or the unincorporated areas. <b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.	3	
2	Potential to save human lives	<b>5- High:</b> More than 1,000 lives <b>3- Medium:</b> Up to 1,000 lives <b>1- Low:</b> No lifesaving potential.	5	
3	Importance of Benefits	<b>5- High:</b> Need for essential services. <b>3- Medium:</b> Need for other services. <b>1- Low:</b> No significant implications.	5	
4	Inconvenience of Problem Correction	<b>5- None:</b> Causes no problems. <b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e. traffic jams, loss of power, delays).	3	
5	Economic Loss (Effect of implementing the project on local economy)	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (some disruption). <b>1- Significant:</b> Economic loss (businesses closed, jobs affected).	5	
6	Number of People to directly Benefit	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000	3	

Cost			Score	For LMS WG only
1	Initial Cost	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million	3	
2	Maintenance /Operating Costs	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.	1	
3	Environmental Cost Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	3	
4	Financing Availability	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified	5	
5	Repetitive <u>FLOOD</u> damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>0- Not a NFIP insured structure</b>	0	

## Benefit Cost Analysis – QUICK WORKSHEET

This worksheet to be filled out by the applicant, is designed only for the Local Mitigation Strategy Working Group use only. This gives the group a flavor for the potential benefits that the project may yield. Here's your chance to quantitatively make the case for your project as COST EFFECTIVE. This BCA is not the same one as the FEMA BCA. The FEMA BCA

requires a lot more detail and supporting documentation, but this one will help you to further develop the “official FEMA BCA” should your project go forward as a FEMA grant request. (Please note the asterisked “\*” items below for the appropriate help.)

**ESTIMATED COST OF THE MITIGATION PROJECT: \$755,569.32**

---

How many people directly are affected by this project? **15,000**

**DESCRIBE THE COSTS ASSOCIATED WITHOUT THIS MITIGATION PROJECT:**

---

Some possible costs are:

* Real Property Losses based on hazard mitigated:	1,300,000
** Furnishing/Equipment Losses:	430,000
** Alternate facility costs:	30,000
** Contract/rental costs:	
** Other associated costs (list):	

**Total Cost for Future Damages & Associated Expenses: 1,760,000** (NOTE:

This figure should be detailed above.)

Statement to support above costs/losses: Real Property and Alternate Facility loss based on 2017 wildfire in Collier county, 30<sup>th</sup> Avenue, Furnishing equipment loss based on real property content and alternate facility contents.

---

Does not include wildfire suppression costs for out of area personnel, contract aviation resources, etc.

---

**DAMAGE & LOSS COSTS, divided by PROJECT COST = QUICK BCA RATIO**

DAMAGE COSTS: ( 1,760,000 )  
 divided by = BCA 2,33  
 MITIGATION PROJECT \$: ( 755,569.32 )

**Attachment 2**Vice Chair Resignation

On Jun 11, 2019, at 09:10, Samantha Quinn <[squinn@sanibelfire.com](mailto:squinn@sanibelfire.com)> wrote:

Good morning Rick,

I am writing to tell you that I am resigning from my position as Vice Chair for the Collier County Local Mitigation Strategies Working Group. I have recently accepted a position with Sanibel Fire and Rescue District. Unfortunately, the demands of work mean I no longer have the time to devote to the group. I hope you understand.

Serving on the Collier County LMS Working Group has been a great experience and I am happy to have had the opportunity to work with so many wonderful people. I apologize for any inconvenience that this may cause to you or the group.

Stay in touch!

*Samantha Quinn*

**Sanibel Fire Rescue District**

2351 Palm Ridge Road

Sanibel, Florida 33957

**Business** (239) 472-5525

**Fax** (239) 472-2422

**Email** [SQuinn@sanibelfire.com](mailto:SQuinn@sanibelfire.com)

<image001.jpg>

*Florida has very broad public records laws. Most written communications to or from local officials regarding District business are public records and are available to the public and media upon request. Your e-mail communications may, therefore be subject to public disclosure. Under Florida Law, e-mail addresses are public records. If you do not want your e-mail address released to a public records request, do not send electronic mail to this entity.*

**Attachment 3**

Naples Lift-Station Projects

Revised Budget file sent separately, attached to the Agenda Email.

**Attachment 4****Parks & Recreation Project Increased Costs**

Please take note why I added 30% on top of the estimated costs: \*\*The engineer did not do generator calculations or an electrical load analysis to determine the size of the generators needed or the electrical equipment modifications needed, the order of magnitude cost opinion for budget purposes for each park building are based on rough estimates.

Costs provided by Atkins is shown in yellow. The costs I reported in the grant application are shown in red.

**North Collier Regional Park**

- Exhibit Hall Building
  - ✓ Generator 2 – 600 Amp approximately a 500KW generator
  - ✓ Engineer's Estimate: \$400,000
  - ✓ Reported cost (added 30%): \$520,000
- Office Building
  - ✓ Generator 3 – 400 Amp approximately 300KW generator
  - ✓ Engineer's Estimate: \$300,000
  - ✓ Reported cost (added 30%): \$390,000
- Recreation Building
  - ✓ Generator 1 – Generator for 1600 Amp Chillers = approximately 1500KW generator
  - ✓ Engineer's Estimate: \$1M
  - ✓ Reported cost (added 30%): \$1,300,000

Difference between the two costs for NCRP: \$510,000

Two generators needed at Immokalee Regional park

**Immokalee Sports Complex**

- Generator 1 – 500 Amp = 400 KW
  - ✓ Engineer's Estimate: \$350,000
  - ✓ Reported cost (added 30%): \$450,000
- Generator 2 – 300 Amp = 200 KW
  - ✓ Engineer's Estimate: \$230,000
  - ✓ Reported cost (added 30%): \$300,000

Difference between the two costs for Immokalee: \$170,000

Respectfully,

Felicia Kirby  
Associate Project Manager

**Facilities Management Divison**  
**3335 Tamiami Trl E Ste 101, Naples, FL 34112**  
**Office: 239-252-5014 Cell: 239-269-0617**

**Summary Minutes**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
 S. Regional Library  
 8065 Lely Cultural Pkwy, Naples, FL 34113  
 19 July 2019

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
William Lang, <b>Vice Chair</b>	Collier C. Emergency Management	E
Melinda Avni/Tom Gonzalez	Florida Forest Service	X
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	X
Reg Buxton	Citizens Corps/North Naples Journal	E
Terry Smallwood/Dottie Joiner	Everglades City	-
Christa Carrera	City of Naples (Floodplain Mgr)	X
Alister Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	E
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	E
Tricia Dorn/Bob Atkins	Lee County Electric Coop	X
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	E
Lisa Oien	Collier Co. Community and Human Services	X
Jim von Rinteln	Interested Citizen	X
Mark Grazewski	Collier Mosquito Control District	X
W. Martin/A. McLaughlin	Greater Naples Fire Rescue District	-
Sal D'Angelo	North Collier Fire Rescue District	X
Rita Greenberg	Immokalee Independent Fire District	X
Ashley Jones	The Salvation Army	X

Visitors: Justin Martin, City of Marco Island, J. Bethecourt, S. Florida Water Mgmt. District, Tom Gonzalez, Fla. Forest Svs., Marty Mielke, Southwest Regional Director for CFO Jimmy Patronis.

6. The 18 June Special Meeting minutes were unanimously approved. (attachment 1)
7. Project(s) for Review – Marco Island/Collier Co. Watermain Interconnect project was unanimously approved. (attachment 2)
8. Grant Opportunities
  - a. Hurricane Michael – The NOFA still isn't out. Collier county would only be eligible for Tier 3 monies.
  - b. Hurricane Loss Mitigation Program is now open for project submission. (attachment 3)

9. **LMS Update** – Please review and send the chair a letter stating the results of your review for documentation purposes. Hopefully we will be contracting out our Consolidated Hazard and Vulnerability Analyses.
10. This meeting ended at about 9:40am. The next regular meeting is October 18, 09:30am, at the S. Regional Library

#### **ATTACHMENTS**

16. June 18 Summary Minutes
17. Project Worksheet
18. Hurricane Loss Mitigation Program

**Attachment 1**

**Special Meeting**  
**Collier County Local Mitigation Strategy (LMS) Working Group**  
**Emergency Operations Center**  
8075 Lely Cultural Pkwy, Naples, FL 34113  
18 June 2019

Name	Affiliation	X=Present E=Excused
Rick Zyvoloski, <b>Chair</b>	Collier C. Emergency Management	X
vacant, <b>Vice Chair</b>		-
William Lang	Collier C. Emergency Management	E
Melinda Avni	Florida Forest Service	X
Kelli Defedericis	City of Marco Island, Community Affairs	X
Chris Byrne	City of Marco Island	E
Reg Buxton	Citizens Corps/North Naples Journal	X
Terry Smallwood/Dottie Joiner	Everglades City	-
Christa Carrera	City of Naples (Floodplain Mgr)	X
Alistair Burnett, Nicole Jensen	Collier C. Public Util. Dept., Solid & Haz. Waste	E
Chris Mason	Collier C. Growth Mgt. Dept. (Floodplain Coord.)	X
Howard Critchfield	Collier C. Growth Mgt. Dept.	-
R.Wiley/ Jerry Kurtz/L.Gosselin	Collier C. Stormwater Div.	X
Ilonka Washburn	Collier C. Parks & Recreation Div.	X
Tricia Dorn/Bob Atkins	Lee County Electric Coop	E
Marc Rouleau/Marc MacDonald	Collier C. Public Schools	-
Lisa Oien	Collier Co. Community and Human Services	E
Jim von Rinteln	Interested Citizen	E
Mark Grazewski	Collier Mosquito Control District	-
W. Martin/A. McLaughlin	Greater Naples Fire Rescue District	E
Sal D'Angelo	North Collier Fire Rescue District	X
vacant	Immokalee Independent Fire District	
Ashley Jones	The Salvation Army	E

Visitors: Thomas Gonzalez, Florida Forest Service, Felicia Kirby & Barry Williams, Collier Co. Parks and Recreation

1. Approval of 19 April Regular Meeting minutes. (attached) – approved
2. Project(s) for Review - none
3. Membership
  - a. **Samantha Quinn**, Vice Chair, resigned to take a new job. (see attached)
  - b. New Vice Chair – William Lang, Collier Alert & Warning Coordinator

- c. Jurisdictional minimum requirements discussed:
  - i. Document how each jurisdiction participated in the planning process.  
(NOTE: the best way is to show participation by the attendance roster in the meeting minutes)
  - ii. New and removed jurisdictions must be identified in the plan
- 4. Irma HMGP Project – Increase costs for:
  - a. Naples Lift-Station project
  - b. Parks & Recreation Generator Projects
- 5. Irma Projects & Priorities (see attached)
  - a. Increased monies
  - b. Reprioritize based on the increased monies.

Next regular meeting: **July 19, 0930hrs**, at the S. Regional Library

#### **ATTACHMENTS**

- 1. April 19 Summary Minutes – removed, see 18 June Minutes
- 2. Vice Chair Resignation– removed, see 18 June Minutes
- 3. Naples Lift Station Projects -Budget (sent separately) - – removed, see 18 June Minutes
- 4. Parks & Recreation Project Increased Costs - – removed, see 18 June Minutes
- 5. Current Irma Project Status - – removed, see 18 June Minutes

## Attachment 2

## PART I

Project Title:		<b>City of Marco Island/Collier County Watermain Interconnect</b>					
Project Location:		<b>Mainsail Dr., Naples, FL 34114</b>					
TYPE PROJECT ("X" appropriate box, or explain)							
Acquisition	Elevation	Relocation	Reconstruction	Essential Facility Retrofit	Non-Residential Retrofit	New Construction	Special Considerations or Impact Statement, if any: <b>This project will provide an emergency interconnect between the City and County water systems for reliability in the aftermath of a disaster whereby one entity can rely on the other entity's water system in the event of a loss of the ability to distribute water. The loss of water distribution results in the inability to suppress fires and inability to provide the water needs of the community.</b>
			<b>X</b>				
What Goal or Objective does this address (See Sec. 3.0, LMS)?				Goal 1: Obj 1.1 and Goal 6: Obj 6.5			
What hazard(s) does this project or initiative correct/mitigate?				Water Supply system redundancy			
Who (what community) benefits from this project or initiative?				<b>City of Marco Island &amp; Collier County</b>			
Does this project or initiative address mitigation on <b>NEW</b> infrastructure or buildings?							Yes
Does this project or initiative address mitigation on <b>EXISTING</b> infrastructure or buildings?							Yes
Project or Initiative Description:		<b>Construct a watermain interconnection between the City and County water systems</b>					
Applicant and Responsible Agency:		<b>City of Marco Island/Collier County</b>					
<b>Agency Contact Information</b>							
NAME				E-Mail		PHONE	
<b>Justin Martin, P.E.</b>				<a href="mailto:jmartin@cityofmarcoisland.com">jmartin@cityofmarcoisland.com</a>		<b>239-961-8261</b>	
Potential Funding Source(s) (See Annex J, LMS)						Estimated Cost	<b>\$200,000</b>

Suitability			Score	For LMS WG only
1	Appropriateness of the Measure	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth. <b>3- Medium:</b> Needed but isn't tied to an identified vulnerability. <b>1- Low:</b> Inconsistent with LMS goal or plans.	<b>5</b>	
2	Community Acceptance	<b>5- High:</b> Endorsed by most communities. <b>3- Medium:</b> Endorsed by most; may create burdens. <b>1- Low:</b> Not likely to be endorsed by the communities.	<b>5</b>	
3	Environmental Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	<b>5</b>	
4	Legislation	<b>5- High:</b> Consistent with the existing laws and regulations. <b>3- Medium:</b> New legislation or policy change. <b>1- Low:</b> Conflicts with existing laws and regulations.	<b>5</b>	
5	Consistent with Existing Plans and Priorities.	<b>5- High:</b> Consistent with existing plans. <b>3- Medium:</b> Somewhat consistent. <b>1- Low:</b> Conflicts with existing plans and policies.	<b>5</b>	

Risk			Score	For LMS WG only
1	Scope of Benefits	<b>5- High:</b> Benefits all municipalities and unincorporated area directly or indirectly <b>3- Medium:</b> Benefits more than half, but <b>not all</b> the municipalities and/or the unincorporated areas. <b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.	5	
2	Potential to protect human lives	<b>5- High:</b> More than 1,000 lives <b>3- Medium:</b> Up to 1,000 lives <b>0- Low:</b> No lifesaving potential.	5	
3	Importance of Benefits	<b>5- High:</b> Need for essential services. <b>3- Medium:</b> Need for other services. <b>1- Low:</b> No significant implications.	5	
4	Inconvenience of Problem Correction	<b>5- None:</b> Causes no problems. <b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e. traffic jams, loss of power, delays).	5	
5	Economic Loss (Effect of implementing the project on local economy)	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (some disruption). <b>1- Significant:</b> Economic loss (businesses closed; jobs affected).	5	
6	Number of People to directly Benefit	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000	5	

Cost			Score	For LMS WG only
1	Initial Cost	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million	5	
2	Maintenance /Operating Costs	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.	5	
3	Environmental Cost Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.	5	
4	Financing Availability	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified	5	
5	Repetitive <u>FLOOD</u> damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	<b>5- High:</b> Resolves repetitive loss <b>3- Medium:</b> Repetitive loss mitigation possible, but not documented. <b>1- Low:</b> Little effect on repetitive loss. <b>0- Not a NFIP insured structure</b>	0	

*PART II***Benefit Cost Analysis – QUICK WORKSHEET**

This worksheet to be filled out by the applicant, is designed only for the Local Mitigation Strategy Working Group use only. This gives the group a flavor for the potential benefits that the project may yield. Here's your chance to quantitatively make the case for your project as COST EFFECTIVE. This BCA is not the same one as the FEMA BCA. The FEMA BCA requires a lot more detail and supporting documentation, but this one will help you to further develop the "official FEMA BCA" should your project go forward as a FEMA grant request. (Please note the asterisked "\*" items below for the appropriate help.)

**ESTIMATED COST OF THE MITIGATION PROJECT: \$200,000**

---

How many people directly are affected by this project? Approximately 25,000

**DESCRIBE THE COSTS ASSOCIATED WITHOUT THIS MITIGATION PROJECT:**

---

Some possible costs are:

* Real Property Losses based on hazard mitigated:	<u>&gt; \$10,000,000</u>
** Furnishing/Equipment Losses:	<u>&gt; \$1,000,000</u>
** Alternate facility costs:	_____
** Contract/rental costs:	_____
** Other associated costs (list):	_____
_____	_____
_____	_____
_____	_____

**Total Cost for Future Damages & Associated Expenses: >\$11,000,000** (NOTE: This figure should be detailed above.)

Statement to support above costs/losses:

---

**This project will provide an emergency interconnect between the City and County water systems for reliability in the aftermath of a disaster whereby one entity can rely on the other entity's water system in the event of a loss of the ability to distribute water. The loss of water distribution results in the inability to suppress fires and inability to provide the water needs of the community. Real property, furnishing, and equipment losses for a community of more than 16,000 residents resulting from fires, loss of business, and lack of sanitation can easily exceed \$10,000,000.**

---

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**DAMAGE & LOSS COSTS, divided by PROJECT COST = QUICK BCA RATIO**

$$\begin{array}{rcl} \text{DAMAGE COSTS:} & (\$11,000,000) & \\ \text{divided by} & & \\ \hline \text{MITIGATION PROJECT \$:} & (\$200,000) & \\ & & = \text{BCA } 55 \end{array}$$

## Attachment 3

### Hurricane Loss Mitigation Program

(<https://floridadisaster.org/dem/mitigation/hurricane-loss-mitigation-program/>)

The Florida's Division of Emergency Management created the Hurricane Loss Mitigation Program to act as a specialized, state-funded mitigation program aimed at minimizing damages caused by hurricanes. The program began as an active response to the devastation brought by Hurricane Andrew, specifically to the insurance Market in the State of Florida. With an annual budget of \$7 million, provided by the Florida Hurricane Catastrophe Trust Fund, the program is funding activities that promote property resiliency through retrofits made to residential, commercial, and mobile home properties, the promotion of public education and public information, and through hurricane research activities.

Up to \$3.4 million is to be used on improving community resiliency through the Hurricane Loss Mitigation Program Grant. Through partnering with local housing authorities and non-profit organizations, the Division has been able to promote wind and flood mitigation and provide hazard mitigation retrofitting to residential and commercial properties. Funded activities include retrofits, inspections, and construction or modification of building components designed to increase a structure's ability to withstand hurricane-force winds and flooding. The Retrofit Program utilizes the Florida Building Code as its standard for all retrofitting. The \$194,000 reimbursement grant may also be used for Local Mitigation Strategy projects.

Grant funds awarded under the HLMP qualify as state financial assistance under the Florida Single Audit Act. See Section 215.971, Florida Statutes. The Catalog of State Financial Assistance number (CSFA#) for HLMP is 31.066. Because the Legislature provides the Division with HLMP funds through the grants and aid appropriation category, eligible proposers under this RFP include governmental entities, nonprofit organizations, and qualified for-profit organizations; **individual homeowners are ineligible** to apply.

RFPs are advertised in the Florida Administrative Register and issued via the [www.myflorida.com](http://www.myflorida.com) web portal. Email [HLMP@em.myflorida.com](mailto:HLMP@em.myflorida.com) to request being added to announcements in funding opportunities.

Contracts and grants can begin at any time during the fiscal year, but must all be terminated by June 30 of the same fiscal year. The state fiscal year is July 1 through June 30.

### Grant Management Tools

Brianna Beynart  
Project Manager  
[Brianna.Beynart@em.myflorida.com](mailto:Brianna.Beynart@em.myflorida.com)  
850-815-4516

## ANNEX G

### Local Mitigation Strategy Working Group

#### Participating Membership

In December 2003 we “kicked off” the redevelopment of the Local Mitigation Strategy to the Collier County Local Mitigation Strategy. The public was invited via E-mail, newspaper advertisements, blast-fax announcements and the World Wide Web (<http://www.colliergov.net/Index.aspx?page=1544>). We invited the media, business, medical community, other governments and governmental agencies via the same means and direct invitation. At the “kick off” meeting, the County Manager set the tone of the initiative with a welcoming speech, the Florida Division of Emergency Management Mitigation specialist and the Collier County Emergency Management director explained the spirit and intent of the program and the need to do it right as well as maintain it. See Section 1 for membership information.

The listing below details those specifically invited and their choice of how they chose to participate as well as the current membership. As changes to the membership occur this annex is updated. On October 18, 2013, the LMS Working Group voted to change membership terminology from “Voting” to “Participating” and eliminating “the “Non-Voting” status all together.

Each Local Mitigation Strategy Working Group meeting is announced via a press release, through an email announcement and posted on the web. (See Annex G for sample documents)

#### ABBREVIATIONS:

Res = Interested resident

PNP = Private Non-Profit

CC = Unincorporated Collier County

EGC = City of Everglades

MI = City of Marco Island

Nap = City of Naples

CCPS = Collier County Public Schools

CDD = Community Development Dist.

Jurisdiction	Name	Position/title Agency	1. Participating	Invited
CC	Rick Zyvoloski, Chair	Coordinator Emergency Management Dept.	P	
CC	William Lang, Vice Chair	Warning Coordinator Bureau of Emergency Svs – EM	P	
Res	James von Rinteln	Interested Resident	P	
Res	Reg Buxton	Citizen Corps/Naples City Council	P	
Res	Jeff Johnson	Interested Resident	P	
PNP	Tricia Dorn	Key Account Executive Lee Co. Elec. Cooperative	P	
PNP	Ashley Jones	The Salvation Army	P	
CCPS	Marc Rouleau/ Marc MacDonald	Facilities Engineer Collier County Public Schools	P	
State	Melinda Avni/Thomas Gonzales	Florida Forest Service	P	
CC	Mark Grajewski	Collier Mosquito Control District	P	
CC	Christopher Mason	Floodplain Coordinator Growth Management Department	P	
CC	Robert Wiley/Jerry Kurtz, L.Gosselin	Principal Project Manager Stormwater Mgmt. Section	P	
CC	Nicole Jensen	Solid & Haz. Waste Mgmt. Div.	P	

CC	Ilonka Washburn	Manager – Park Operations Parks & Recreation Department	<b>P</b>	
Nap	Christa Carrera	Floodplain Manager City of Naples	<b>P</b>	
MI	Kelli Defedericis	Floodplain Mgr. City of Marco Isl., Cmty Affairs	<b>P</b>	
MI	Chris Byrne	Irma Incident Commander City of Marco Island	<b>P</b>	
EGC	Terry Smallwood/Dottie Smallwood	Building Official City of Everglades	<b>P</b>	
Fire Dist	W. Martin/A. McLaughlin	Greater Naples Fire Rescue Dist.	<b>P</b>	
Fire Dist	Sal D’Angelo	North Collier Fire & Rescue Dist.	<b>P</b>	
Fire Dist	Rita Greenberg	Immokalee Fire & Rescue Dist.	<b>P</b>	
CDD	Invited	Heritage Bay Community Development Dist.		X
Edu	Invited	Fla. Gulf Coast Univ.		X
Edu	Invited	Hodges University		X
Edu	Invited	Univ of Fla. (IFAS)		X
Business	Invited	Naples Chamber of Commerce		X
PNP	Invited	Conservancy of Naples		X
Hosp	Invited	Naples Cmty Hospital		X
State	Invited	Fla.Div. of Law Enforcement		X
State	Invited	SW Fla. Regional Plng Council		X
County	Invited	CC Planning Commission		X
County	Invited	CC Clerk of Courts		X
County	Invited	CC Library		X
County	Invited	CC Mgr’s Office		X
County	Invited	CC Solid Waste		X
County	Invited	CC Purchasing		X
County	Invited	CC Fleet		X
County	Invited	CC Transportation		X
County	Invited	CC Property Appraiser		X
County	Invited	CC Risk Mgt.		X
County	Invited	CC Human Resources		X
County	Invited	CC Recycling		X
County	Invited	CC Information Technology		X
County	Invited	CC Cmty & Customer Rel.		X
County	Invited	CC Univ. of FL Extension		X
County	Invited	Community Redevelopment Agency		X
Munic	Invited	Naples Airport		X
EMS	Invited	CC Emerg Med. Svs.		X
Fire	Invited	Marco Island FD		X
Sem. Tribe	Invited	Seminole Tribe of Florida		X
Lee Co	Invited	Emergency Management		X
Hendry Co	Invited	Emergency Management		X

## **ANNEX H**

### **Initiative Scoring Criteria**

A. Mitigation Initiatives: Criteria for Scoring and Prioritizing

The prioritization of mitigation initiative process begins with the sponsor(s) of each initiative then goes to the Local Mitigation Strategy Working Group.

The first step consists of the sponsoring governments, agencies, and departments developing their initiatives and then scoring each project using the matrix developed by the LMS Working Groups.

The sponsor's prioritized initiatives are then presented to the LMS Working Group via the Collier County Emergency Management Division who will put the initiative on the LMS meeting agenda. The Working Group then reviews, discusses, revises and votes on each of the initiatives, assigning each a score and a ranking using the scoring matrix. The LMS Chair will brief the Collier County Citizen Corps about new mitigation projects and activities LMS Working Group since the Citizen Corps last meeting.

In grouping the initiatives, in addition to using the scores derived from the matrix as a guide, considerations such as useful life of the initiative, cost-effectiveness, funding capability, and time required to implement and complete the project were factored.

- B. Special Grant Funding Opportunities & other exigent circumstances: Should an eligible entity have an opportunity to apply for a mitigation grant for a project not previously listed on the Project Priority Listing (Annex E) and not be able to apply for the grant because the next announced LMSWG meeting would preclude timely application, this procedure applies. The applicant will complete a project score sheet, below, and submit it to the Emergency Management Division. Emergency Management will transmit the score sheet to the LMS Chair. The LMS Chair will electronically transmit the score sheet to the voting members of the LMSWG along with an explanation of the exigent circumstances. The LMSWG voting members have **two** business-days to vote on the project acceptability to the project priority listing. At the conclusion of the two business-days a majority vote, with at least three votes agreeing, determines the initiative's status. A transcript of this exception will be entered in the minutes at the next scheduled meeting.

C. Mitigation Initiatives Scoring Matrix

The following table represents the scoring matrix used for the submission of initiatives for consideration for inclusion in the Collier County LMS. Submit the completed "Mitigation Initiative Evaluation Score Sheet" to Emergency Management Div. in MS Word format. (NOTE: See Section 4, para. 4.1.4 for situations which deal with initiatives that cannot be scored.)



### Mitigation Initiatives Evaluation Score Sheet

**Instructions:** Applicant completes this score sheet for EACH Project. Information required in each of the **SHADED AREAS**. Submit this score sheet in **MS Word format** to the Emergency Management Office electronically: [Richard.Zyvoloski@Colliercountyfl.gov](mailto:Richard.Zyvoloski@Colliercountyfl.gov). Questions, call: 252-3603

If a submitter does not agree with the final determination, he or she shall have the right to meet with the scoring committee to present compelling information to change the score.

## PART I

Project Title:									
Project Location:									
<i>TYPE PROJECT ("X" appropriate box, or explain)</i>									
Acquisition	Elevation	Relocation	Reconstruction	Essential Facility Retrofit	Non-Residential Retrofit	New Construction	Special Considerations or Impact Statement, if any:		
What Goal or Objective does this address (See Sec. 3.0, LMS)?									
What hazard(s) does this project or initiative correct/mitigate?									
Who (what community) benefits from this project or initiative?									
Does this project or initiative address mitigation on <b>NEW</b> infrastructure or buildings?									
Does this project or initiative address mitigation on <b>EXISTING</b> infrastructure or buildings?									
Project or Initiative Description:									
Applicant and Responsible Agency:									
<i>Agency Contact Information</i>									
NAME					E-Mail			PHONE	
Potential Funding Source(s) (See Annex J, LMS)							Estimated Cost		

Suitability			Score	For LMS WG only
1	Appropriateness of the Measure	<b>5- High:</b> Reduces vulnerability and is consistent with Local Mitigation goals and plans for future growth. <b>3- Medium:</b> Needed but isn't tied to an identified vulnerability. <b>1- Low:</b> Inconsistent with LMS goal or plans.		
2	Community Acceptance	<b>5- High:</b> Endorsed by most communities. <b>3- Medium:</b> Endorsed by most; may create burdens. <b>1- Low:</b> Not likely to be endorsed by the communities.		
3	Environmental Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.		
4	Legislation	<b>5- High:</b> Consistent with the existing laws and regulations. <b>3- Medium:</b> New legislation or policy change. <b>1- Low:</b> Conflicts with existing laws and regulations.		
5	Consistent with Existing Plans and Priorities.	<b>5- High:</b> Consistent with existing plans. <b>3- Medium:</b> Somewhat consistent. <b>1- Low:</b> Conflicts with existing plans and policies.		

Risk			Score	For LMS WG only
1	Scope of Benefits	<b>5- High:</b> Benefits all municipalities and unincorporated area directly or indirectly <b>3- Medium:</b> Benefits half or more, but <b>not all</b> the municipalities and/or the unincorporated areas. <b>1-Low:</b> Benefits less than half of the municipalities and/or the unincorporated area.		
2	Potential to protect human lives	<b>5- High:</b> More than 1,000 lives <b>3- Medium:</b> Up to 1,000 lives <b>0- Low:</b> No lifesaving potential.		
3	Importance of Benefits	<b>5- High:</b> Need for essential services. <b>3- Medium:</b> Need for other services. <b>1- Low:</b> No significant implications.		
4	Inconvenience of Problem Correction	<b>5- None:</b> Causes no problems. <b>3- Moderate:</b> Causes few problems. <b>1- Significant:</b> Causes much inconvenience (i.e. traffic jams, loss of power, delays).		
5	Economic Loss (Effect of implementing the project on local economy)	<b>5- Minimal:</b> Economic loss has little effect during the project. <b>3- Moderate:</b> Economic loss (minimal disruption). <b>1- Significant:</b> Economic loss (businesses closed; jobs affected).		
6	Number of People to directly Benefit	<b>5- High:</b> More than 20,000 <b>3- Medium:</b> 4,000 –20,000 <b>1- Lower:</b> Fewer than 4,000		

Cost			Score	For LMS WG only
1	Initial Cost	<b>5- Low:</b> \$0 to \$250,000 <b>3- Moderate:</b> \$251,000 to \$1 million <b>1- High:</b> More than \$1 million		
2	Maintenance /Operating Costs	<b>5- Lower costs:</b> Less than 5% per annum of the initial cost. <b>3- Moderate:</b> 5%-10% per annum of the initial cost. <b>1- High:</b> More than 10% per annum of the initial cost.		
3	Environmental Cost Impact	<b>5- Positive</b> effect on the environment. <b>3- No effect</b> <b>1- Adverse</b> effect on the environment.		
4	Financing Availability	<b>5- Good:</b> Readily available with grants and/or matching funds <b>3- Moderate:</b> Limited matching funds available <b>1- Poor:</b> No funding sources or matching funds identified		
5	Repetitive <u>FLOOD</u> damages corrected (applies ONLY to NFIP-insured structure(s) w/two paid flood losses).	<b>5- High:</b> Corrects repetitive loss/severe repetitive loss <b>3- Medium:</b> Possible repetitive loss mitigation, but not documented. <b>1- Low:</b> Improves NFIP flood insured. <b>0-</b> Not a NFIP insured structure.		

## PART II

### *Benefit Cost Analysis – QUICK WORKSHEET*

This worksheet to be filled out by the applicant, is designed only for the Local Mitigation Strategy Working Group use only. This gives the group a flavor for the potential benefits that the project may yield. Here's your chance to quantitatively make the case for your project as COST EFFECTIVE. This BCA is not the same one as the FEMA BCA. The FEMA BCA requires a lot more detail and supporting documentation, but this one will help you to further develop the "official FEMA BCA" should your project go forward as a FEMA grant request. (Please note the asterisked "\*" items below for the appropriate help.)

ESTIMATED PROJECT COST:

---

How many people directly are affected by this project?

ESTIMATED POTENTIAL DAMAGE AND LOSS COSTS:

---

Some possible costs are:

\* Real Property Losses based on hazard mitigated: \_\_\_\_\_

\*\* Furnishing/Equipment Losses: \_\_\_\_\_

\*\* Alternate facility costs: \_\_\_\_\_

\*\* Contract/rental costs: \_\_\_\_\_

\*\* Other associated costs (list): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Total Cost for Future Damages & Associated Expenses:**  (NOTE:

This figure should be detailed above.)

Statement to support above costs/losses:

---

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**DAMAGE & LOSS COSTS, divided by PROJECT COST = QUICK BCA RATIO**

DAMAGE COSTS: (  )

divided by

= BCA

MITIGATION PROJECT \$: (  )

## ANNEX I

### Collier County's Floodplain Plans

Unincorporated Collier County has a Floodplain Management Plan. The City of Marco Island and the City of Naples do not possess a Floodplain Management Plan, nor are they required to adopt one. The Floodplain Management Plan is a part of the Collier County multi-jurisdictional, multi-hazard mitigation plan which addresses the jurisdictional flooding hazards. They are written according to FEMA regulations and Section 511 and 512 of the CRS Coordinator's Manual.

All jurisdictions are active participants in the NFIP. To ensure continued compliance with the NFIP, each participating community will:

1. Continue to enforce their adopted Floodplain Management Ordinance requirements, which include regulating all new development and substantial improvements in Special Flood Hazard Areas (SFHA).
2. Continue to maintain all records pertaining to floodplain development, which shall be available for public inspection
3. Continue to notify the public when there are proposed changes to the floodplain ordinance or Flood Insurance Rate Maps.
4. Maintain the map and Letter of Map Change repositories.
5. Continue to promote Flood Insurance for all properties.
6. Continue their Community Rating System outreach programs.

#### **SUMMARY OF JURISDICTIONAL CRS PROGRAMS**

**Collier County:** Collier County's NFIP participation commitments meet or exceed the following minimum requirements as set for by the NFIP.

- Issuance or denial of floodplain development/building permits
- Inspection of all development to assure compliance with the local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of floodplain maps
- Aid residents in obtaining information on flood hazards, floodplain map data, flood insurance and proper construction measures

The County's Building Plan Review & Inspection Division (BPRID) is the agency responsible for the review and approval of all development order applications to the County. The application review process includes analysis for compliance with the County's Land Development Code, the County's Code of Laws and Ordinances (which includes the Floodplain Management Ordinance), the Florida Building Code, the South Florida Water Management District permitting rules (when applicable), the County's Growth Management Plan, and other related regulations for development compliance. The development and building permit approval processes consist of extensive reviews of the submitted applications to determine compliance before a recommendation for approval is given. Once a development project begins actual construction, there are periodic on-site inspections performed by trained inspection staff to ensure compliance before the construction can proceed toward completion. All documents submitted to the County become part of the project's public record file and are available for the public to review upon request. Copies can be ordered if requested. Once a project is completed, the file is closed and archived and is available for record retrieval. The BPRID is also active in the preparation and revision of Flood Insurance Rate Maps (FIRM) and maintains the record of all map revisions and changes received from FEMA. As a part of the services offered to the public, the BPRID provides FIRM information, flood insurance program information, flooding hazards, and proper construction methods within the special flood hazard area. The BPRID also oversees the County's participation in the Community Rating System (CRS) program. The County is currently designated as a CRS Class 5 rated community for its efforts to promote activities that make the community more resistant to flood damage.

Collier County is currently in the process of producing a new Digital Flood Insurance Rate Map (DFIRM) series through a CTP Partnership Agreement with the City of Naples, the South Florida Water Management District, and FEMA. On January 9, 2019 the County adopted a new Floodplain Management Ordinance that is compliant with the current State of Florida "Model" Flood Ordinance. The County has an active Floodplain Management Planning Committee to oversee the development and updating of the County's Floodplain Management Plan. As part of the CRS program the County provides flood hazard and flood insurance information to the public through a newsletter, mailings, and the internet.

**City of Naples:** The City of Naples's NFIP participation commitments meet or exceed the following minimum requirements as set for by the NFIP.

- Issuing or denying floodplain development/building permits
- Inspecting all development to assure compliance with the local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of floodplain maps
- Helping residents obtain information on flood hazards, floodplain map data, flood insurance and proper construction measures

The City of Naples Building Department is the agency responsible for the review and approval of all development order applications to the City of Naples. The application review process includes an analysis for compliance with the Land Development Code, the Code of Laws and Ordinances (which includes the Flood Damage Prevention Ordinance), the Florida Building Code, the South Florida Water Management District permitting rules (when applicable), the Growth Management Plan, and other related regulations for development approval compliance. Both the development permit and building permit approval processes consist of extensive reviews of the submitted applications to determine compliance before a recommendation for approval is given. Once a development begins actual construction, there are a number of

periodic on-site inspections performed by trained inspection staff to ensure compliance before the construction can proceed toward completion. All documents submitted to the City become part of the development's public record file and are available to the public's review upon request. Copies can be ordered if requested. Once a development is completed, the file is closed and archived, but still available for record retrieval. The Building Department is also active in the preparation and revision of floodplain maps and maintains the record of all map revisions and changes received from FEMA. As a part of the services offered to the public, the Floodplain Coordinator provides FEMA floodplain mapping information, flood insurance program information, flooding hazards, and proper construction methods within the special flood hazard area. The Floodplain Coordinator also oversees the City's participation in the Community Rating System (CRS) program, and which currently holds a Class 6 rating for its efforts to promote activities to make the community more resistant to flood damage.

The City of Naples is currently in the final efforts to produce a new Digital Flood Insurance Rate Map (DFIRM) through a CTP Partnership Agreement with Collier County, the South Florida Water Management District, and FEMA. As part of the CRS program the City provides flood hazard and flood insurance information to the public through a newsletter, mailings, and the internet.

**City of Marco Island:** The City of Marco Island's NFIP participation commitments meet or exceed the following minimum requirements as set for by the NFIP.

- Issuing or denying floodplain development/building permits
- Inspecting all development to assure compliance with the local ordinance
- Maintaining records of floodplain development
- Assisting in the preparation and revision of floodplain maps
- Helping residents obtain information on flood hazards, floodplain map data, flood insurance and proper construction measures

One of the Growth Management Department responsibilities is to promote sound and effective Floodplain Management within the City of Marco Island. We continue to promote public awareness of natural disasters and the benefits of participation in the National Flood Insurance Program. Our intent is to reduce flood losses in accordance with the City's Floodplain Ordinance and participate in the Federal Emergency Management Agency's Community Rating System (CRS) to lower insurance premiums for residents. Our staff works closely with residents, contractors, businesses, local, state, and federal agencies to facilitate cooperation and the exchange of information on floodplain management issues.

## **Appendix 1**

# **Collier County's Floodplain Management Plan**

Collier County's Floodplain Management Plan can be found on the internet at the following address:

<https://www.colliercountyfl.gov/home/showdocument?id=58898>

The FEMA CRS Coordinator's Manual can be found on the internet at the following address:

[https://www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300\\_2017\\_CRS\\_Coordinators\\_Manual\\_508.pdf](https://www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300_2017_CRS_Coordinators_Manual_508.pdf)