Project Ranking Procedure

- Calculate improvement based on Performance Measures
- Define Watershed Weighting Factors by Benefit Type
  - Watershed drainage area
  - Size of the receiving estuary
  - Land use distribution
- Normalize Benefit Type Scores
- Additional Weighting Based on Relative Importance
  - (Normalized Score of Water Discharges to Estuaries) * 2
  - (Pollutant Load and Watershed Hydrology) * 1

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Watershed Weighting Factors

- Weighting factors calculated per watershed by benefit-type
- Factors are calculated relative to the drainage area
  - Water Quantity: estuary area/drainage area
  - Water Quality: urban or agricultural area/drainage area
  - Natural Resources/Hydrology: existing inland wetland area/drainage area

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Watershed Weighting Factors

Watershed	Weighting Factor		
	Discharge to Estuary	Wetland Hydrology/Habitat	Water Quality
Golden Gate/Naples Bay	9.75	5.86	6.06
Rookery Bay	6.55	4.89	2.45
FU-FA-OK/Ten Thousand Islands	7.27	1.17	1.81
Cocohatchee-Corkscrew/Wiggins Pass	9.75	3.87	4.01

Discharge to Estuary Weighting Factor = 10 - (10 x (Receiving Estuary Area / Watershed Area))

Wetland Hydrology/Habitat Weighting Factor = 10 - (10 x (Non-Tidal Wetland Area / Watershed Area))

Water Quality Weighting Factor = 10 x (Urban + Agricultural Area / Watershed Area)

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Example Calculations

- North Belle Meade Spreader Swale
  - Discharge to Estuary Benefit:

    Golden Gate: Performance Measure Lift of 0.89

    Rookery Bay: Performance Measure Lift of 1.25
  - Wetland Hydrology/Habitat Benefit:

    Rookery Bay: Performance Measure Lift of

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Normalized Project Ranking

RECOMMENDED PROJECT	DISCHARGE TO ESTUARY BENEFIT		WATER QUALITY BENEFIT		WETLAND HYDROLOGY/HABITAT BENEFIT		Total Normalized Project Score
	Weighted Score	Normalized Score	Weighted Score	Normalized Score	Weighted Score	Normalized Score	
North Belle Meade/Southern Horsepen Strand Rehydration[(1)]	16.865	8.5976	1.0658	2.579	0.1751	2.537	22.310
North Golden Gate Estates Flowway Restoration Project[(1)]	0.0927	0.0472	4.1330	10.000	0.690264	10.000	20.094
Henderson Creek Diversion Pump Station (100 cfs)[(1)]	19.616	10.0000	0.0000	0.000	0.0000	0.000	20.000
South I-75 Canal Spreader Swale and Wetland Rehydration	0.0000	0.0000	0.4304	1.041	0.5062	7.334	8.375
Corkscrew Regional Ecosystem Watershed	0.0000	0.0000	0.0000	0.000	0.1214	1.758	1.758
Middle Okaloacoochee Slough Wetland Restoration	0.0000	0.0000	0.5033	1.218	0.0180	0.261	1.479
Henderson Creek Off-Line Storage Reservior	0.2351	0.1199	0.0581	0.141	0.0000	0.000	0.380
Lower Okaloacoochee Slough Wetland Restoration	0.0000	0.0000	0.1065	0.258	0.0028	0.040	0.298
Fakahatchee Wetland Restoration - Area 1	0.0000	0.0000	0.0751	0.182	0.0001	0.002	0.183
US HWY 41 Stormwater Treatment Area & Wetland Hydration	0.0000	0.0000	0.0143	0.035	0.0076	0.110	0.144
Fakahatchee Wetland Restoration - Area 2	0.0000	0.0000	0.0560	0.135	0.0001	0.001	0.137
Wolfe Road Wetland Treatment System	0.0000	0.0000	0.0462	0.112	0.0000	0.000	0.112
Upper Okaloacoochee Slough Wetland Restoration	0.0000	0.0000	0.0042	0.010	0.0005	0.007	0.017
Okaloacoochee Wetland Restoration - Area 2	0.0000	0.0000	0.0000	0.000	0.0003	0.004	0.004
Okaloacoochee Wetland Restoration - Area 3	0.0000	0.0000	0.0000	0.000	0.0003	0.004	0.004
Okaloacoochee Wetland Restoration - Area 1	0.0000	0.0000	0.0000	0.000	0.0002	0.003	0.003
Upper Golden Gate Estates Canal Weir Constuction	0.0006	0.0003	0.0000	0.000	0.0000	0.000	0.001
Orange Tree Canal Control Structure Installation	0.0005	0.0003	0.0000	0.000	0.0000	0.000	0.001

(1) Weighted score considers benefit to both watersheds

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Initial Project Ranking

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Conclusions

- Projects that divert water between watersheds will provide benefits that protect the estuaries
- Relatively inexpensive wetland restoration activities can provide significant hydrologic restoration benefits
- Non-structural and policy issues will have a significant role in managing water supply and quality in the future

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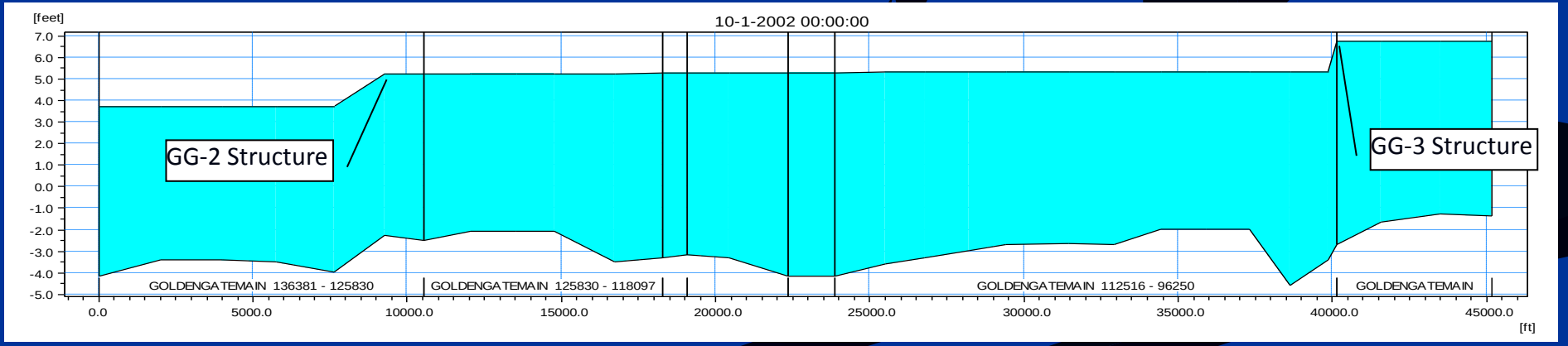
Structure Operations

- Two Primary Issues in Golden Gate Watershed
  - Reduce baseflow contributions
  - Direct water to other watersheds
- Currently wet season structure control elevations are below dry season control elevations



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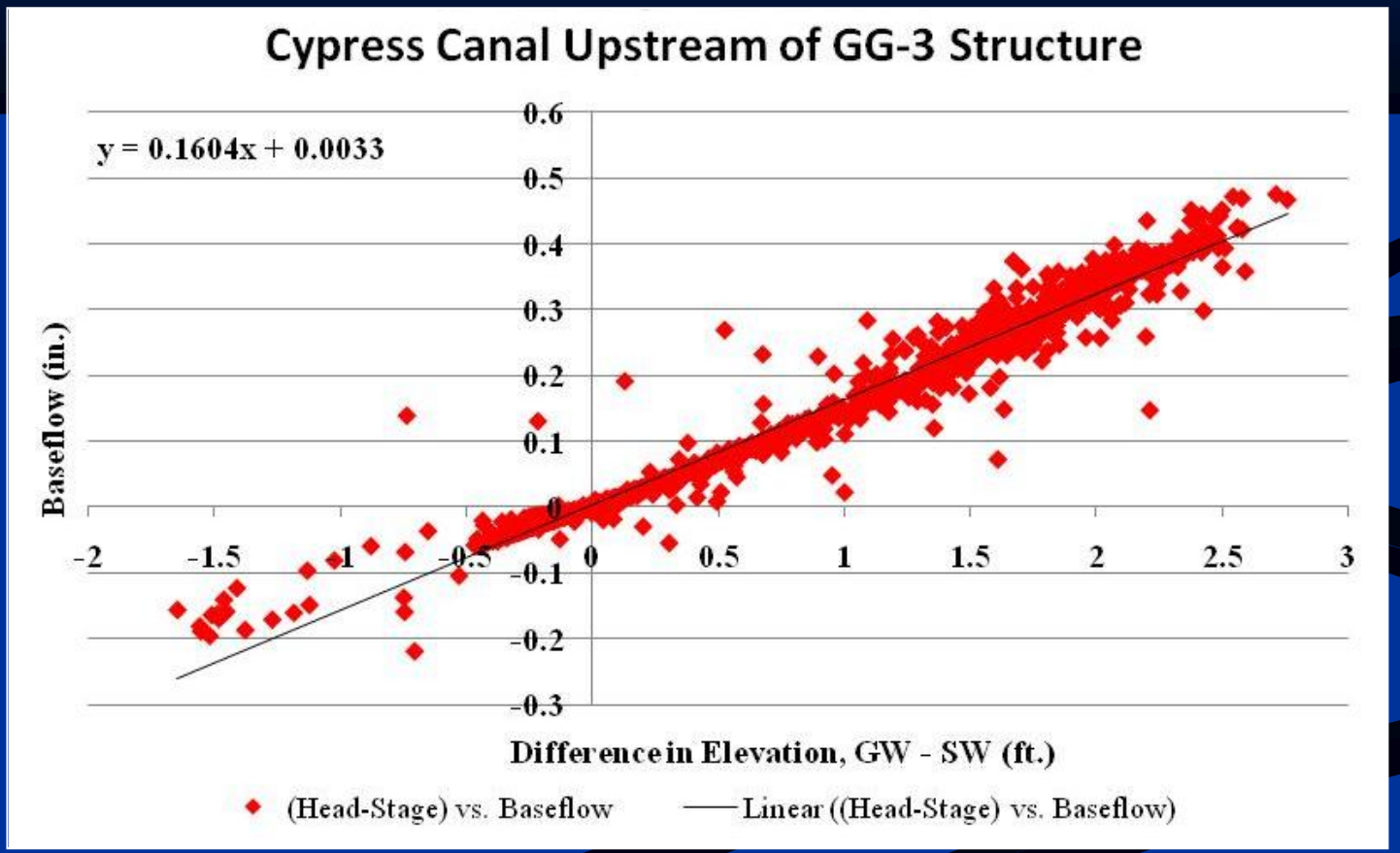
Water Control Structure Operations

- Difference between groundwater elevation and surface water elevation determines baseflow



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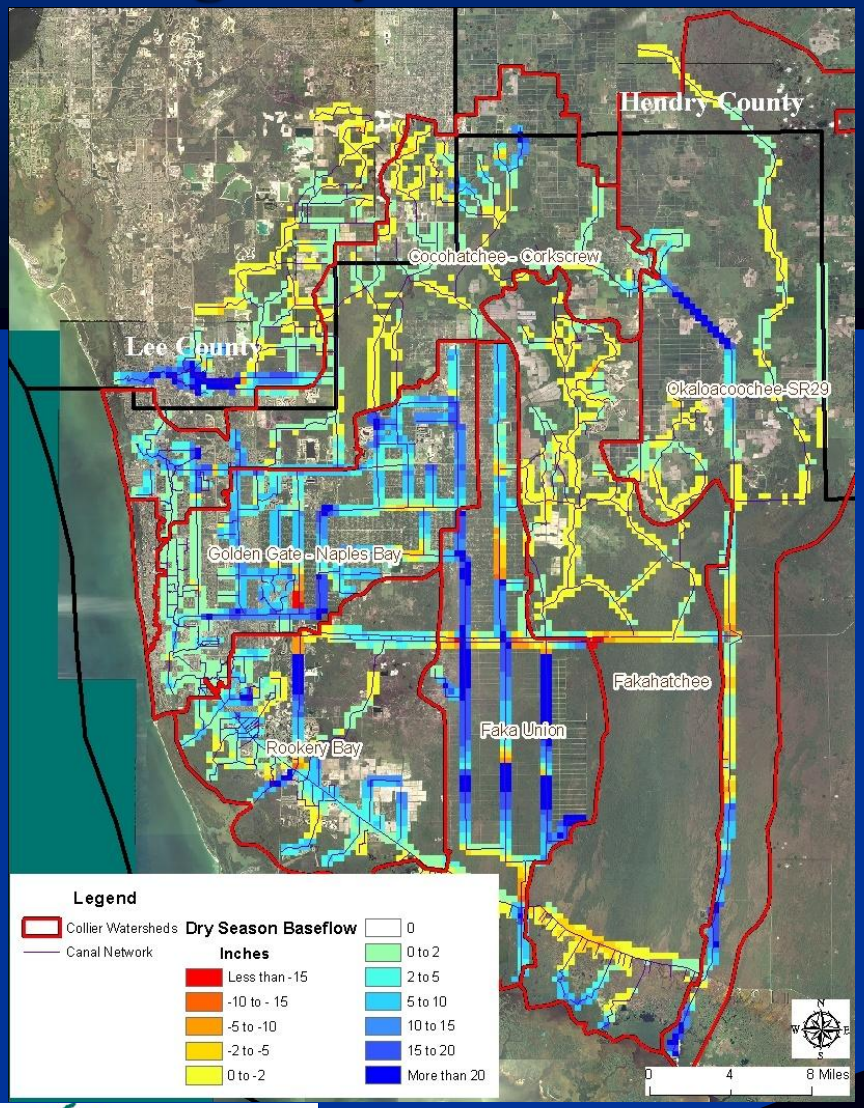
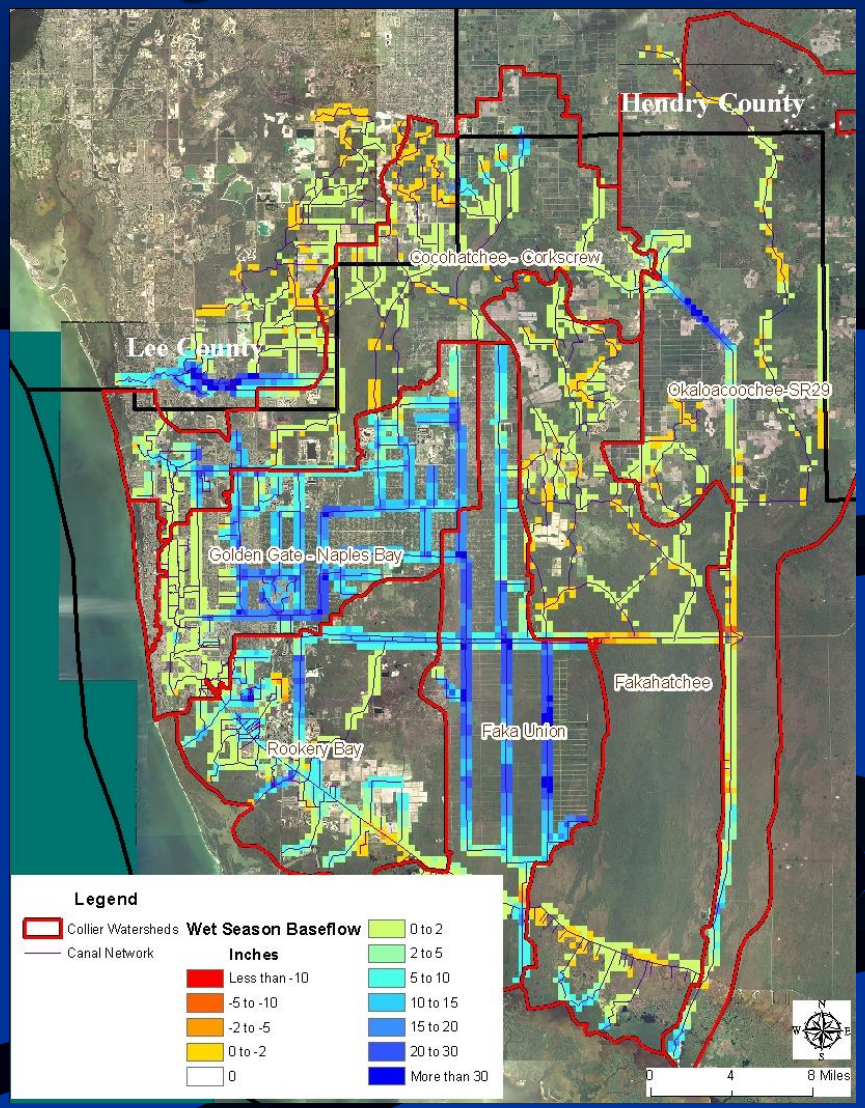
Water Control Structure Operations

Average Dry Season Baseflow



Average Wet Season Baseflow



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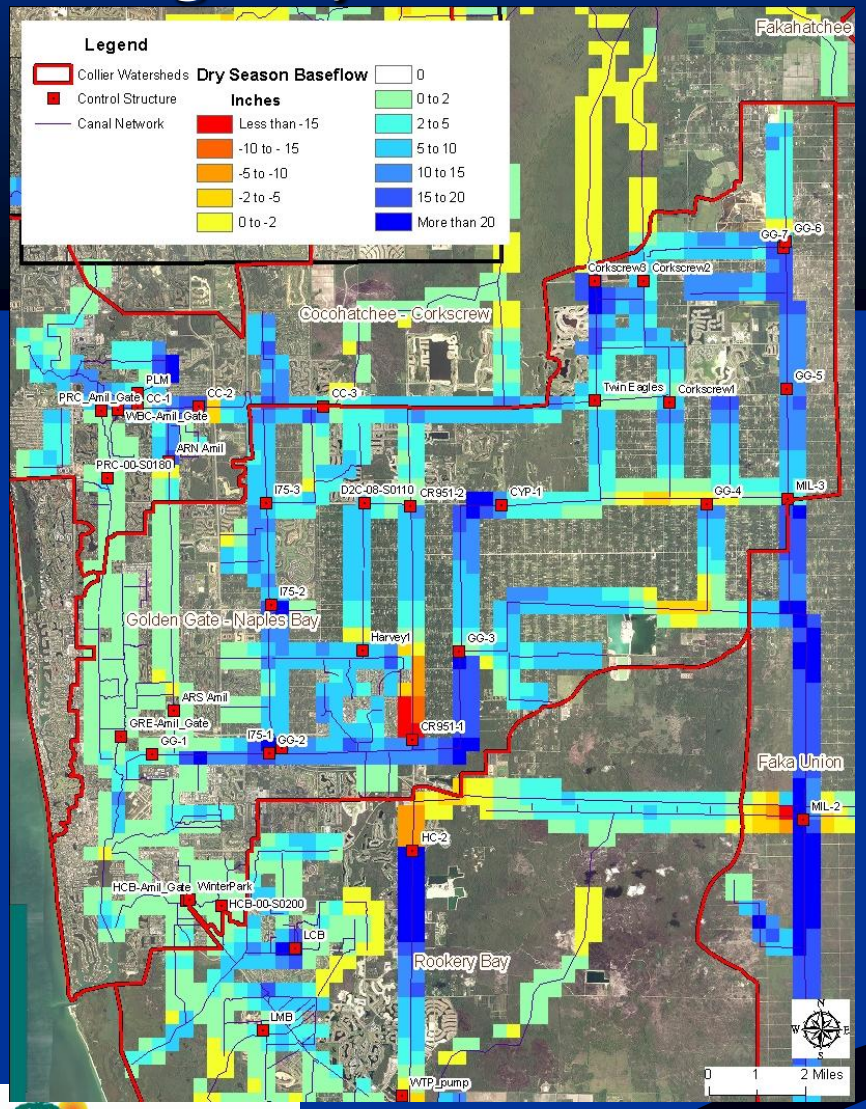
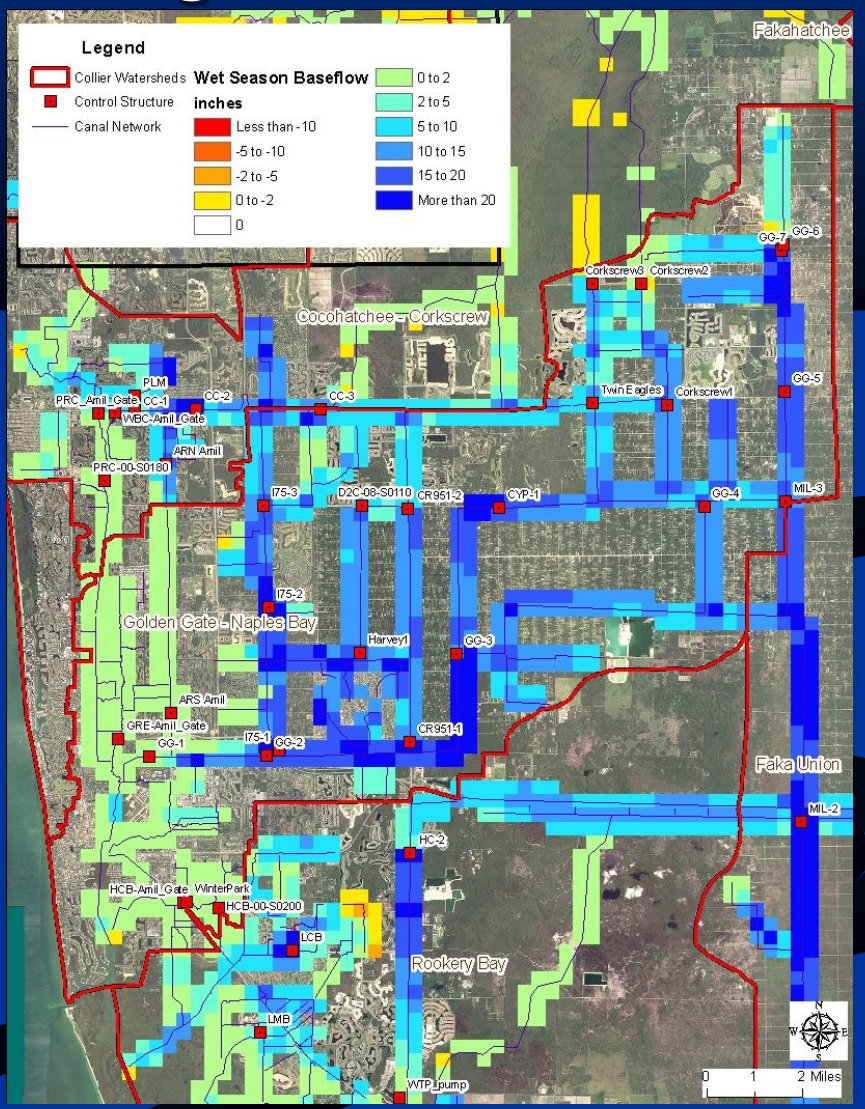
Water Control Structure Operations

Golden Gate Watershed

Average Dry Season Baseflow



Average Wet Season Baseflow



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Structure Operations in the Golden Gate Watershed

- Work with SFWMD to optimize structure operations so that canal stage more closely matches groundwater elevation
- More important in dry season than wet; but wet season can be adjusted to further reduce baseflow
- Coordinate with SFWMD to direct excess water to Faka Union watershed during rainy season (Miller 3 and C-1 Connector Canal)

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Regulatory Review and Recommendations

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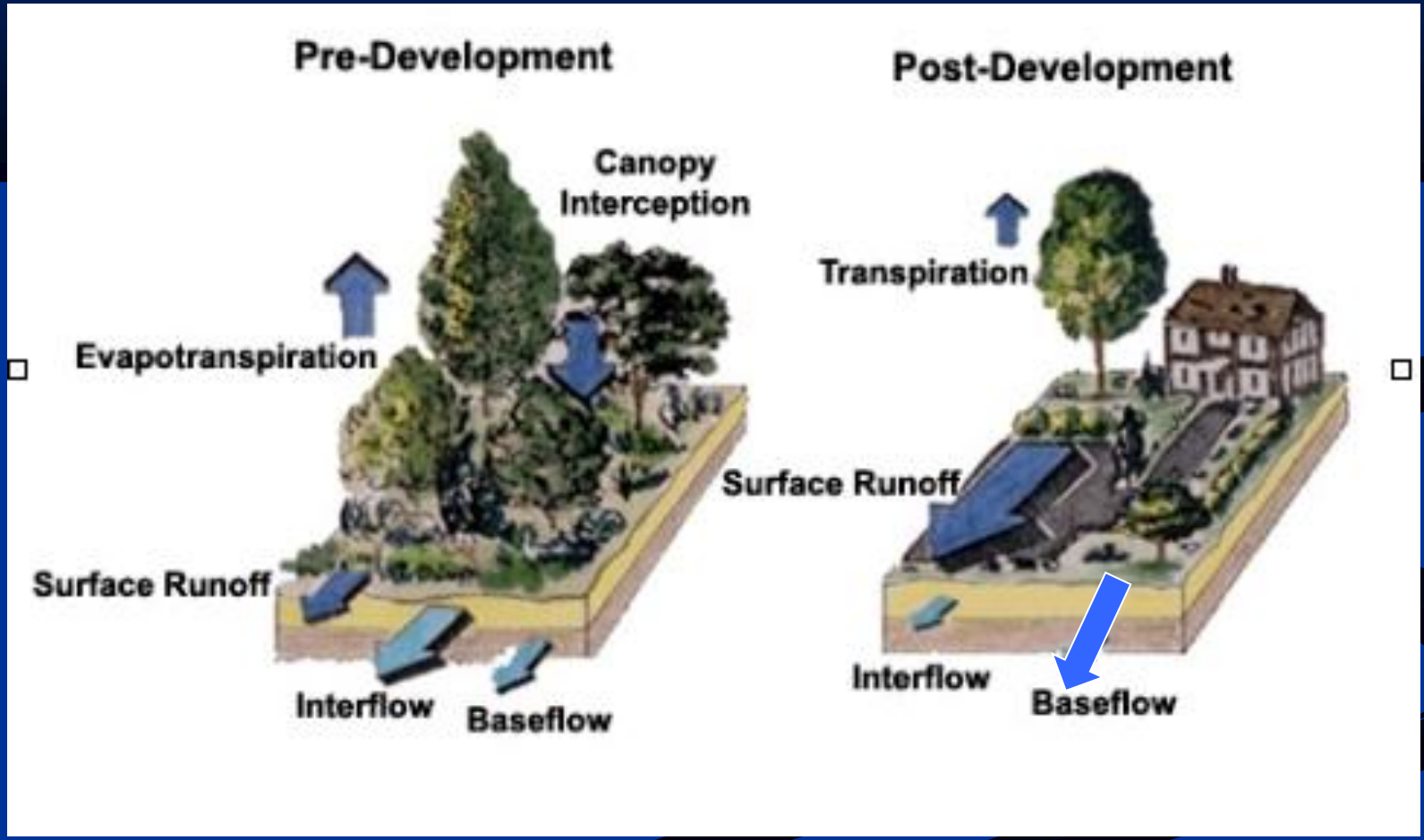
Current Stormwater Management Approach



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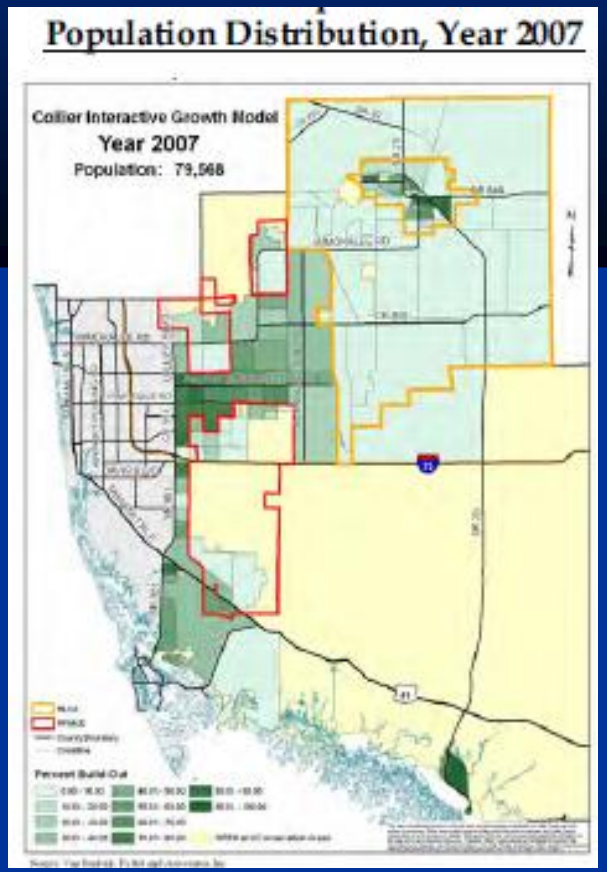
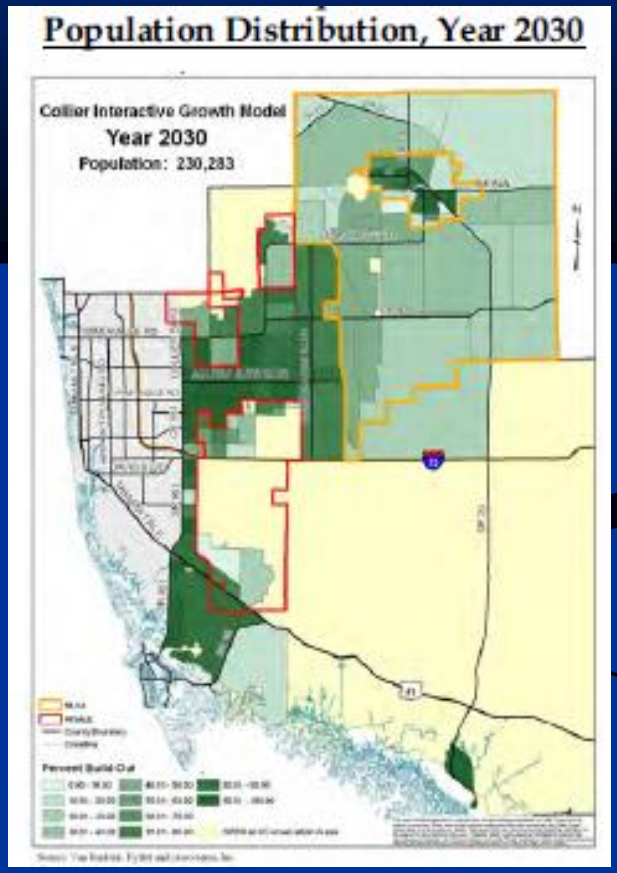
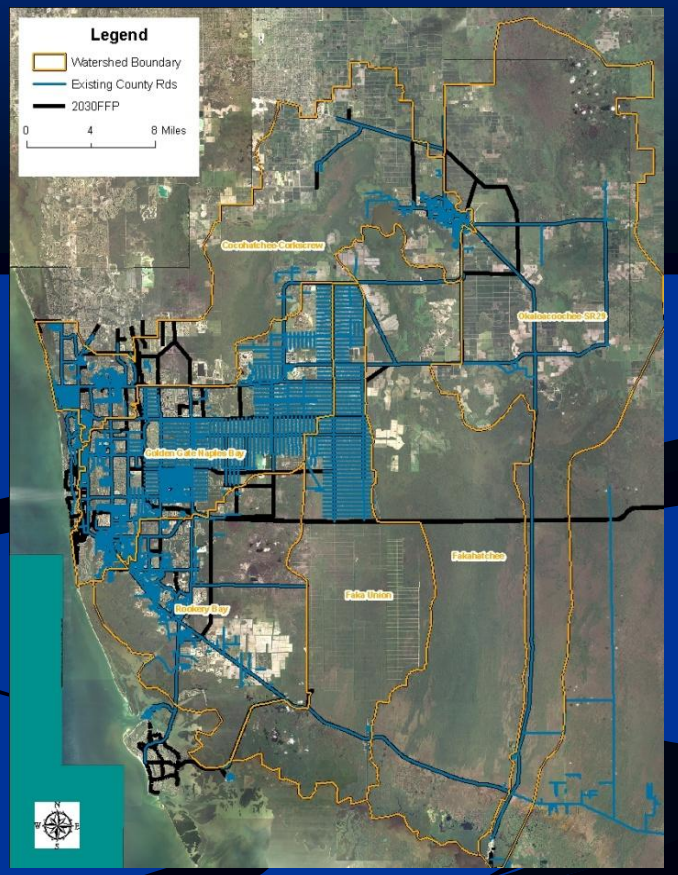
County Growth Projections







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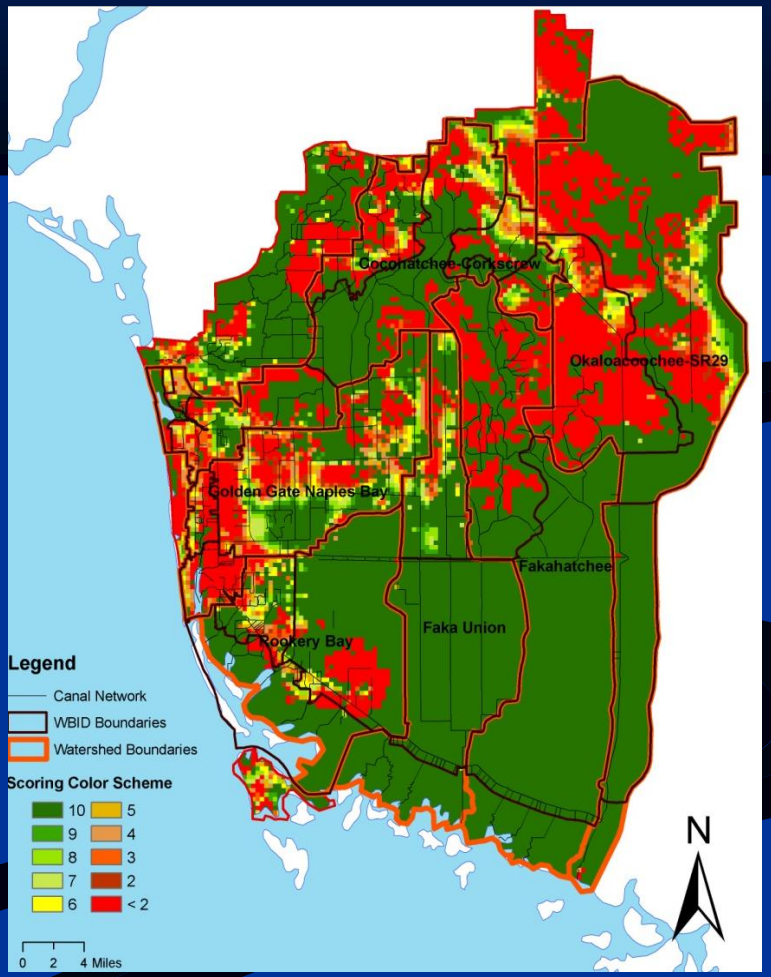
Water Quality and Pollution Load Issues

- Several impaired water bodies
- Numerous areas with no runoff pollution control
- GMP Conservation and Coastal Element requires no increase in pollution load from pre-development

Total Nitrogen Load



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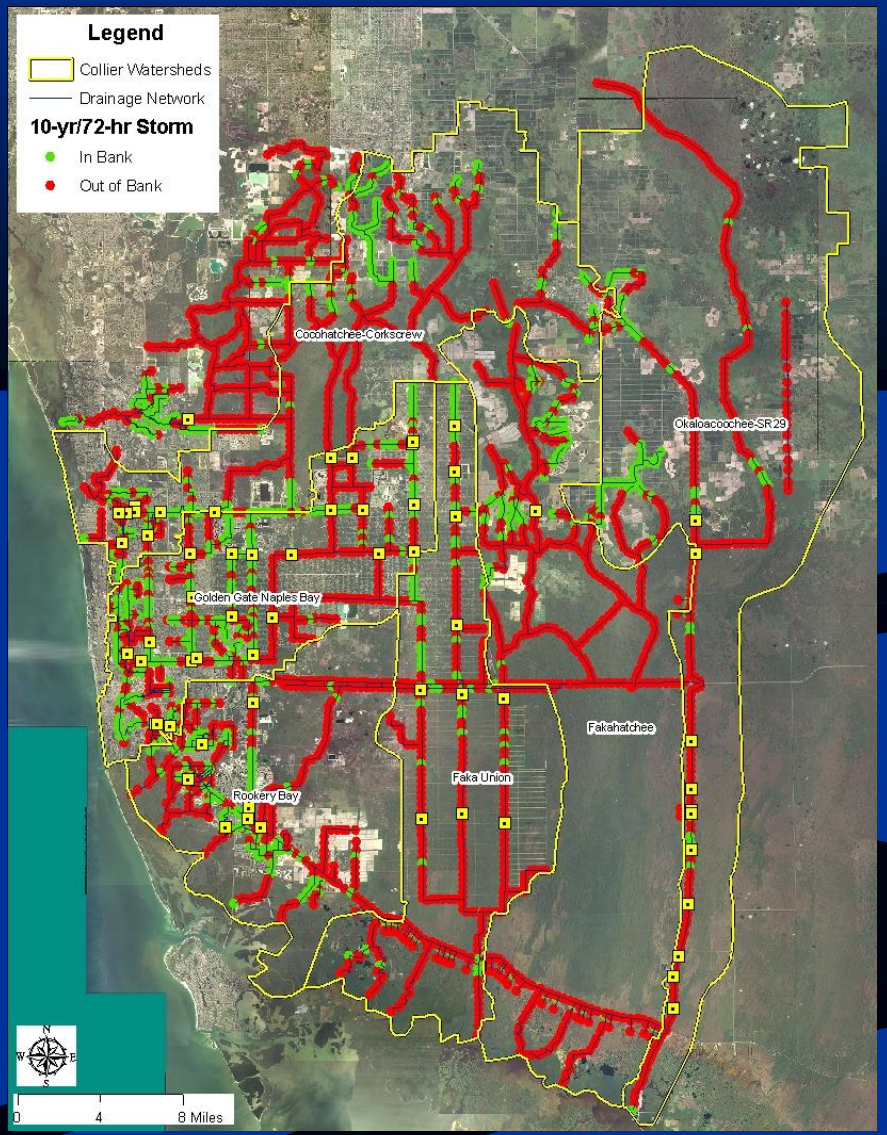
Current Canal Capacity

- Model results show limited conveyance capacity in numerous canal segments
- GMP Conservation and Coastal Element requires no increase in pollution load from pre-development



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Objective

- Help implement a Sustainable Stormwater Management Program
- The programs should aim to:
  - Promote more effective site planning to minimize anthropogenic impacts,
  - Promote preservation of the natural system
  - Help reduce development costs
  - Help reduce cost of future drainage system improvements

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Water Quality Regulations Promote Low Impact Development (LID)

- LID promotes management of stormwater by:
  - Encouraging management of stormwater at the site
  - Minimize the extent of directly connected impervious areas.
  - Minimize site disturbance
  - Maintain or restore a site's natural hydrology
  - Maximize the site's assimilative capacity

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Low Impact Development (LID)

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Water Quality Regulatory Issues

- Main Issue: How to provide water quality credits for development
- Not feasible under current State regulations. Feasible under proposed new stormwater rules.

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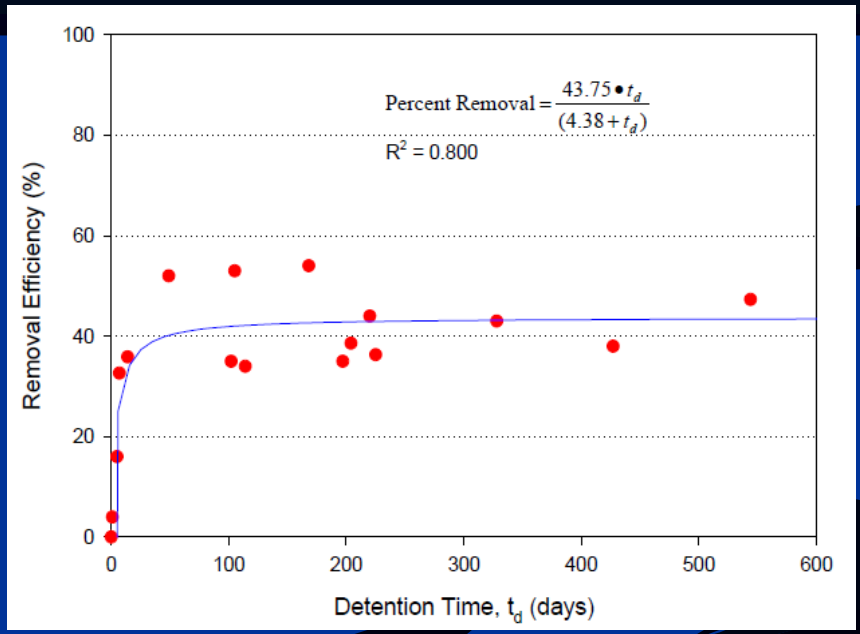
Water Quality Treatment Requirement Growth Management Plan

All new development and redevelopment projects shall meet 150% of the water quality volumetric requirementsof Section 5.2.1a of the Basis of Review for ERP applications (Ordinance 2008-10, 3.07.02 Interim Watershed Regulations)



Removal Efficiency of TN

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Recommendation

- Modify Land Development Code and Ordinance 2008-10 to require treatment by LID of 50% of runoff volume (i.e. provide retention of additional 0.5" of runoff over the drainage area)
- Provide incentives for further treatment

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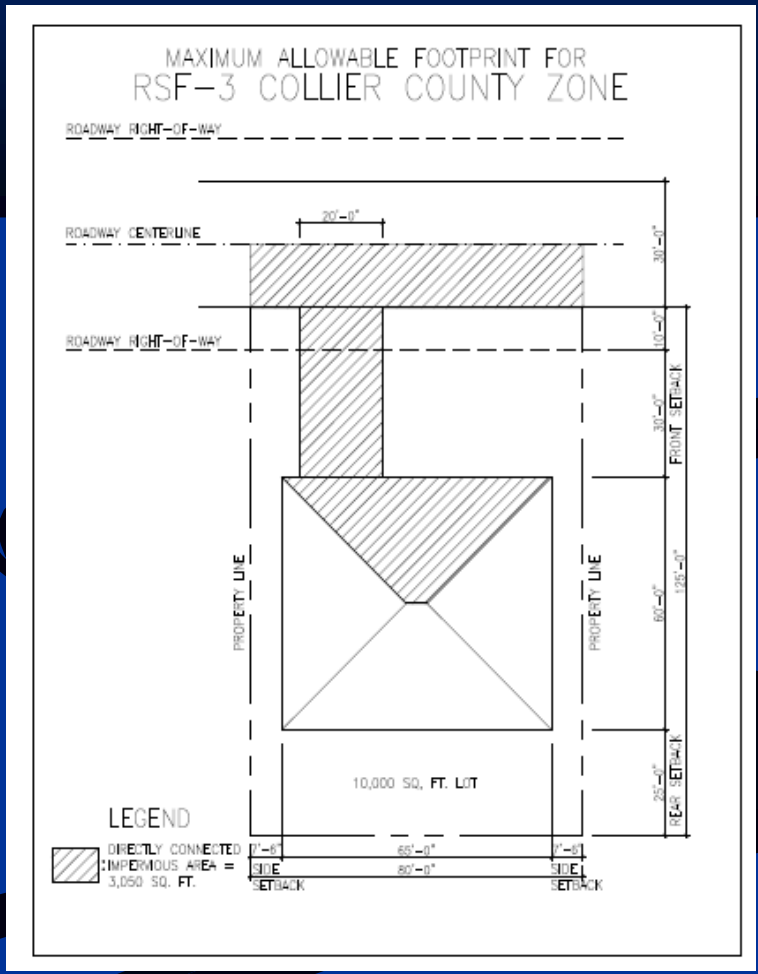
Directly Connected Impervious Area (DCIA) Current Conditions

Current Code Design Standards:

- Maximum impervious area in RSF-3 – RSF-6 areas is 43%
- Maximum DCIA in RSF-3 to RSF-6 areas ranges from 25% to 29%
- Road design using valley gutters



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Directly Connected Impervious Area (DCIA) Incentives

Recommendation

- Allow cluster development design standards if DCIA is reduced to 15% (LDC 4.02.04)
- Allow use of drainage swales on local streets

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Retrofit Opportunities

- Construction of large projects alone will not solve the problems of excess water to the estuaries
- Construction of large projects alone will not significantly reduce pollutant load

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LID Retrofit of Public Facilities

- Identify locations where retrofit is possible, i.e. parking lots in government buildings and schools

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Golden Gate High School
Potential Retrofits

- Utilize islands as infiltration basins
- Install pervious pavement in low traffic areas
- Install rain gardens to capture roof runoff

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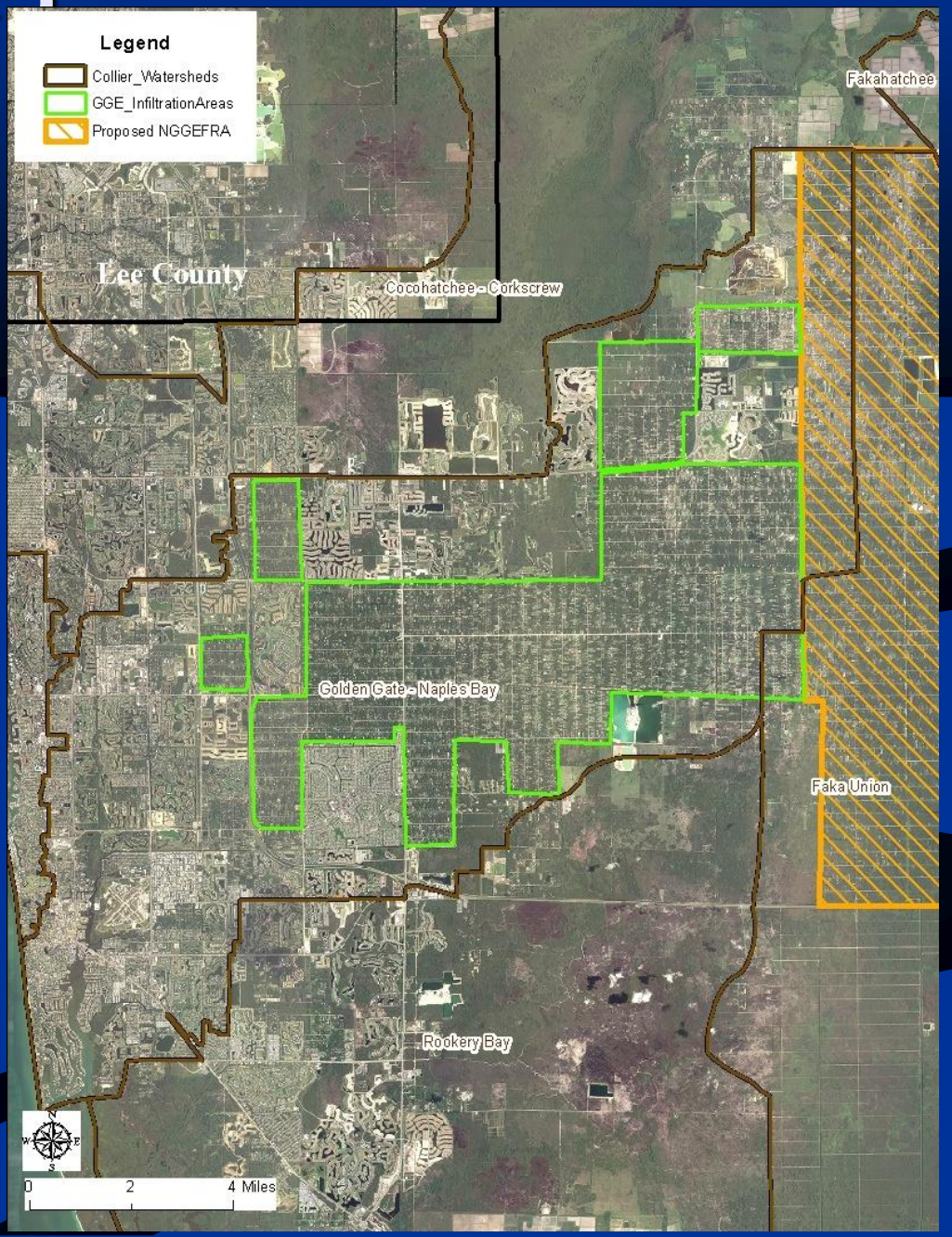
Retrofit Opportunities

- Golden Gate Estates Stormwater Management
  - Road side swales and canals comprise current stormwater management
  - More than 400 residential streets in GGE that dead end at a canal
  - Divert roadside swales to infiltration basins
  - Develop a program to purchase 5-acre lots on as many streets as possible



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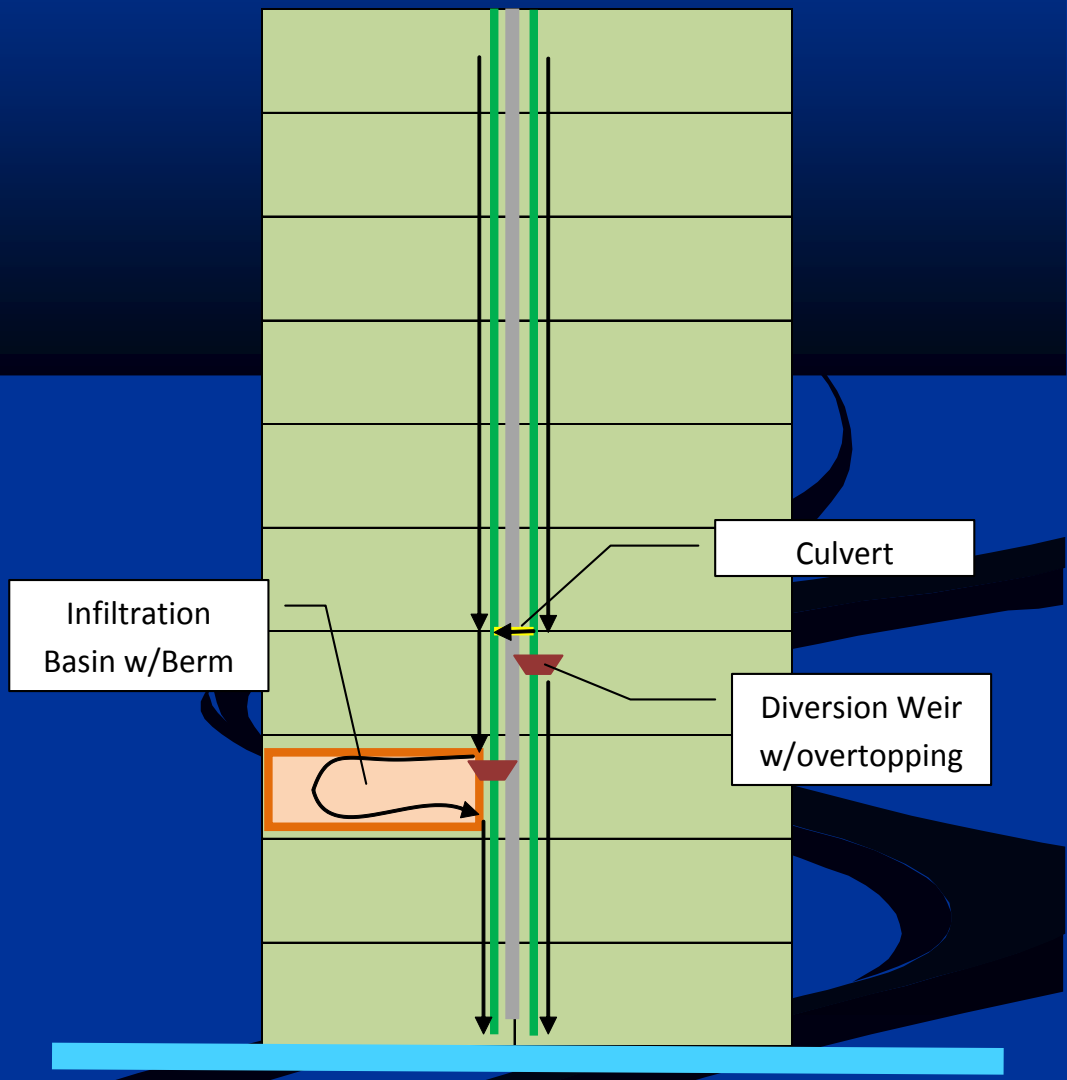
Retrofit Opportunities

- Golden Gate Estates Retrofits
  - Develop 4-acre infiltration basins
  - Typical Drainage Area is approximately 70 acres
  - Treats approximately 60% of total runoff



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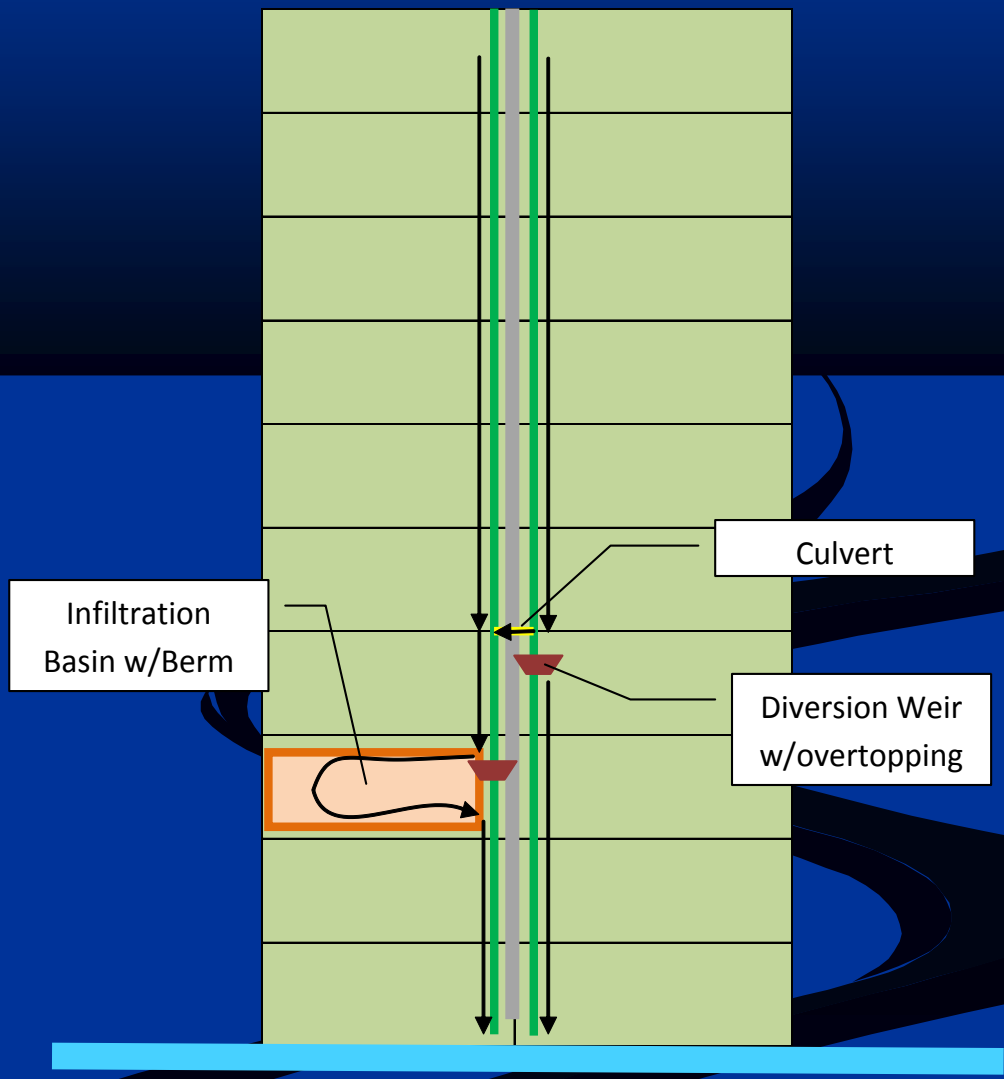
Retrofit Opportunities

- Benefits
  - Moves surface water runoff pollutant load score from 1 to 7
  - Could be used as a small neighborhood park/ educational facility
  - Will require periodic maintenance
  - Avoid Impacts to septic tank drain fields



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LID Redevelopment and Retrofits Private Property

- Ordinance 2008-80 creates the Stormwater Capital Improvement Fund – 0.15 mills of ad valorem tax revenues
- Provide incentives by changing the focus of the County's Stormwater Utility by creating a fee based on discharged volume of runoff
- Promote LID redesign through MSTUs

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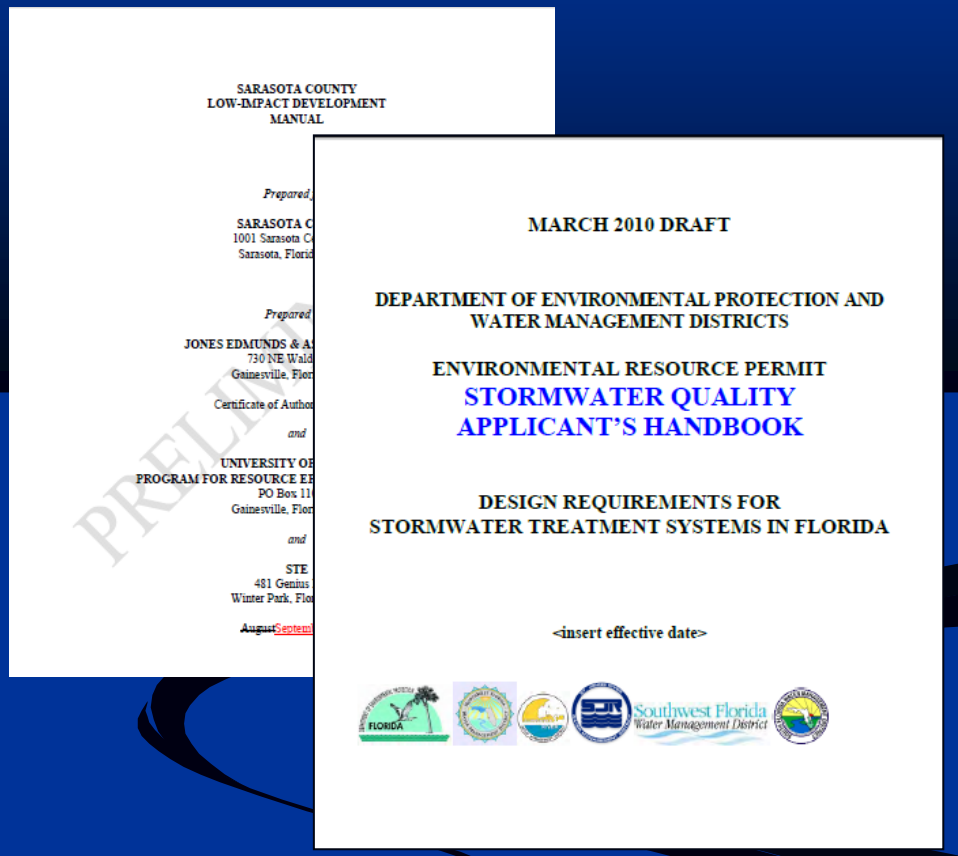
LID Design Standards

- Adopt standards in the Draft Proposed Stormwater Rule.
- Adopt by reference Sarasota County LID Manual



http://dep.state.fl.us/water/wetlands/erp/rules/stormwater/index.htm

http://www.scgov.net/EnvironmentalServices/Water/SurfaceWater/LowImpactDevelopment.asp

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Water Quantity and Flood Risk

- GMP Drainage Sub-Element Policy 1.2:
- "County drainage system capital facility planning shall be designed to implement procedures and projects in a manner to ensure adequate stormwater management facility capacity available at the time a development permit is issued"

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Water Quantity and Flood Risk

- Issue: Current regulations for large storms focus on control of peak discharge for the 25-year/72-hour design event.
- Recommendation 1:
  - Require volume control for the 25-year/24-hour design event (allow control of peak, volume and timing of stormwater discharges)

Percent of Site Needed to Control Additional Volume

DCIA for Developed Area*	% of Overall Site
50	14.07
40	12.1
30	9.87
25	8.89
20	7.9
15	6.66

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Water Quantity and Flood Risk

- Issue: Peak control at a site does not guarantee no downstream impacts
- Recommendation 2:
  - No increases in 100-year/72 hour flood elevations upstream or downstream

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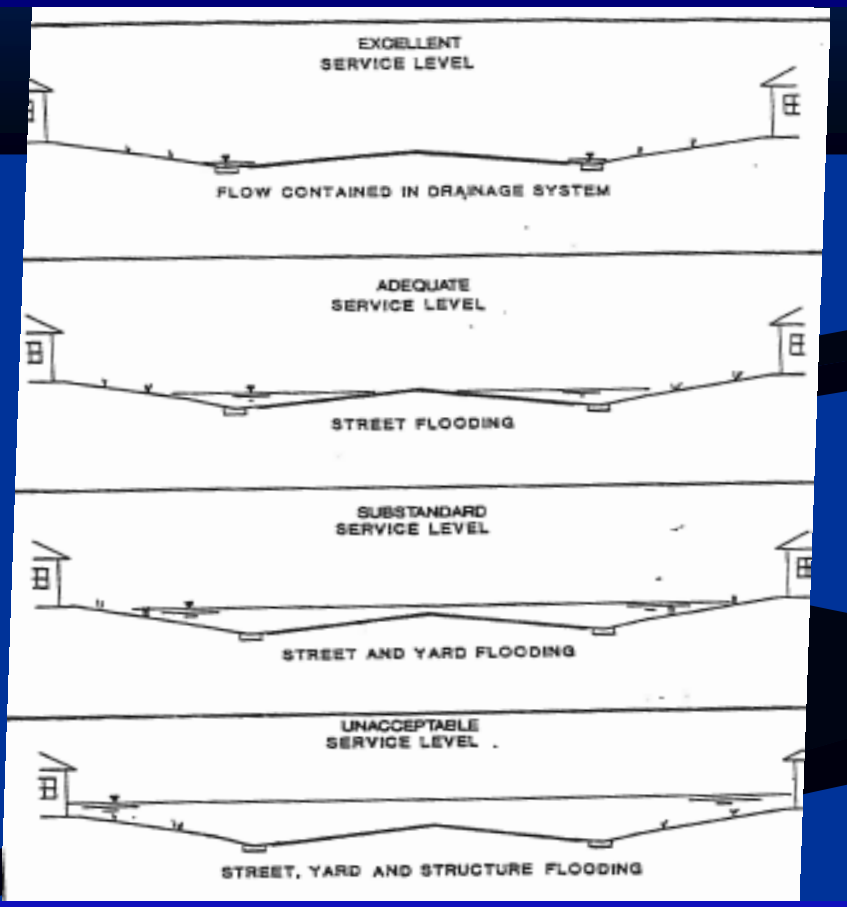
Water Quantity and Flood Risk

- Issue: Current flood protection levels of service (FPLOS) define conditions from Levels A–D
- Most County roads meet only Level D

Current FPLOS



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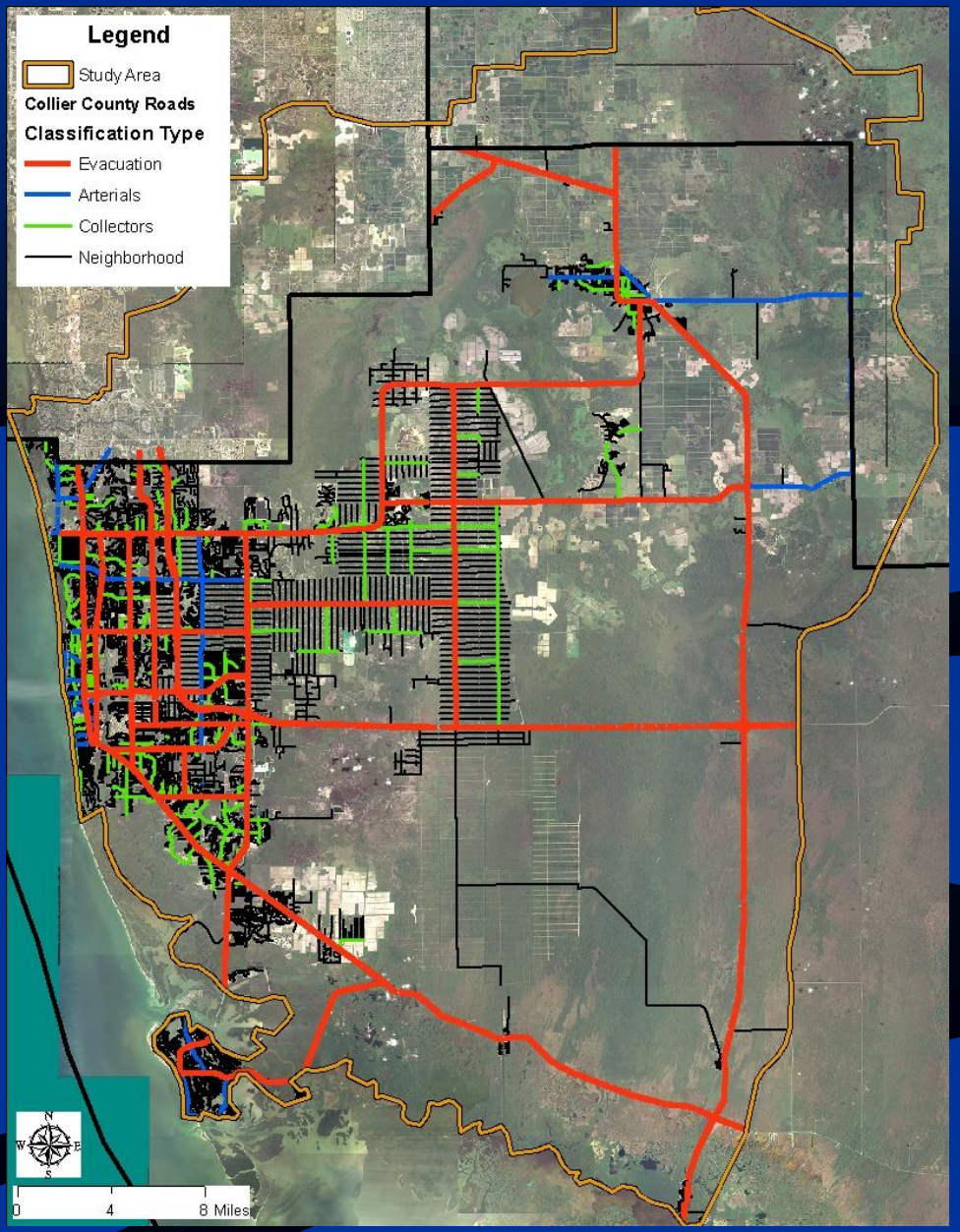
Water Quantity and Flood Risk

Proposed FPLOS

	Storm Return Period (years)		
Roadways	**10**	**25**	**100**
A. Evacuation Routes	None	None	None
B. Arterials	None	None	6 inches
C. Collectors	None	6 inches	9 inches
D. Neighborhood	6 inches	9 inches	12 inches
Open Space			
Flooding of open space is acceptable if it does not compromise public health and safety			



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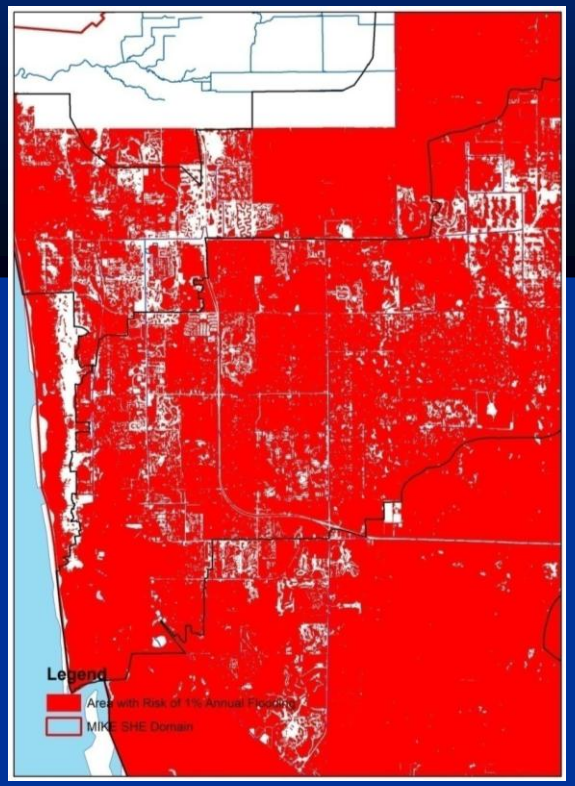
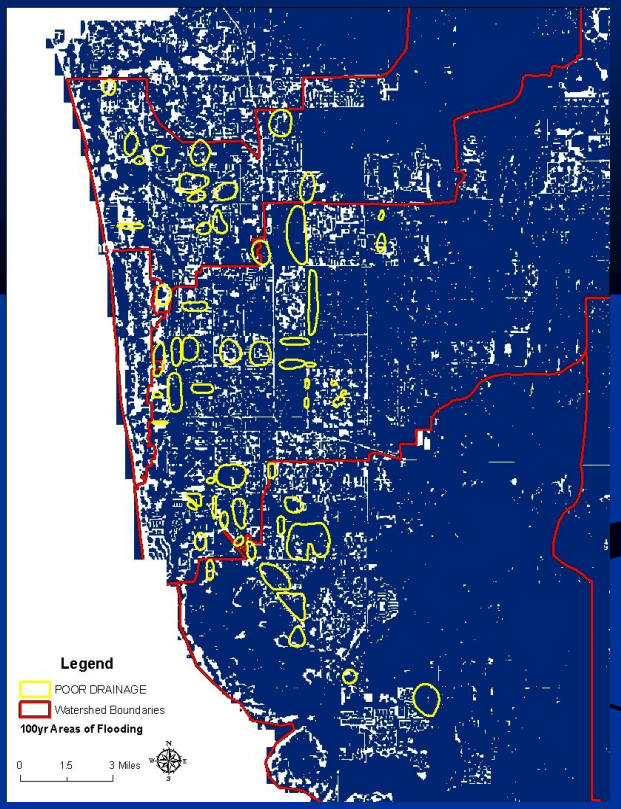
100-yr/72-hr Inundation Maps

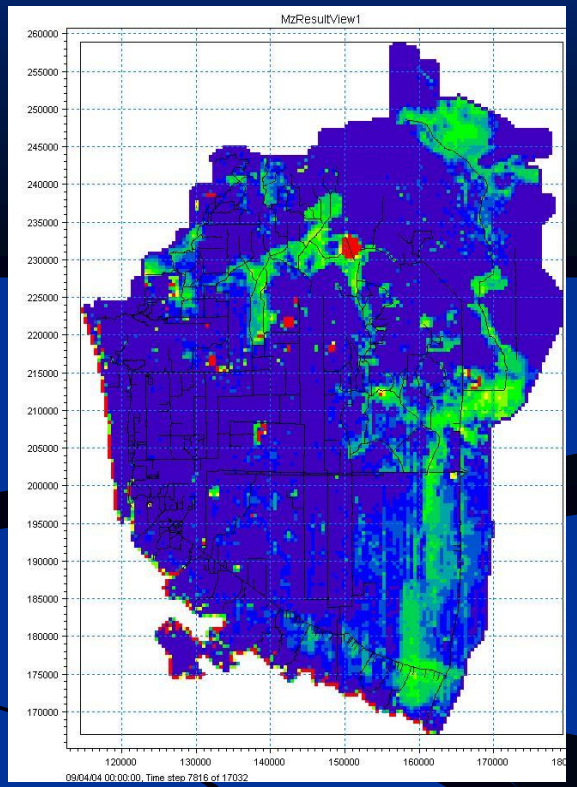
FEMA Map



MIKE SHE Map



Initial Conditions



September 4, 2004

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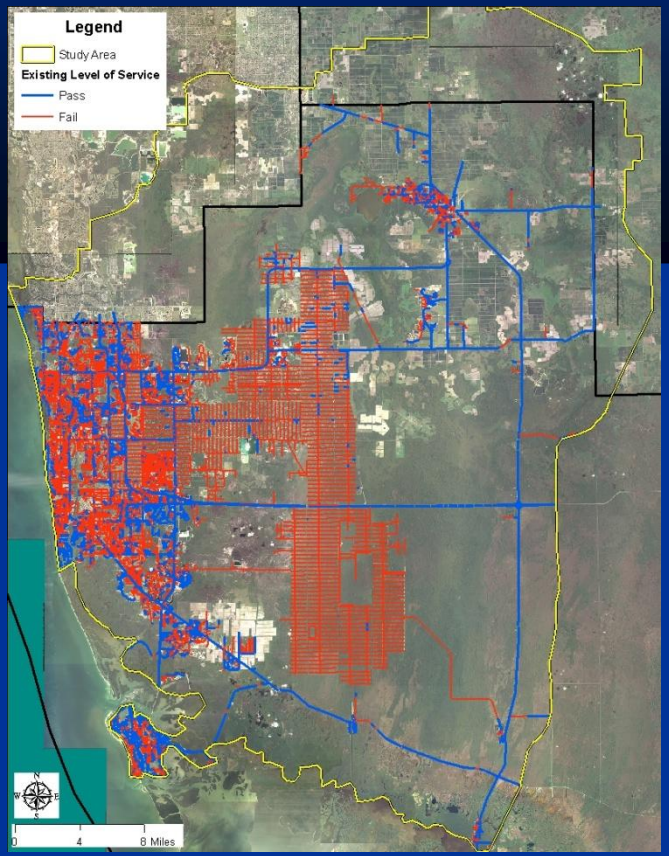
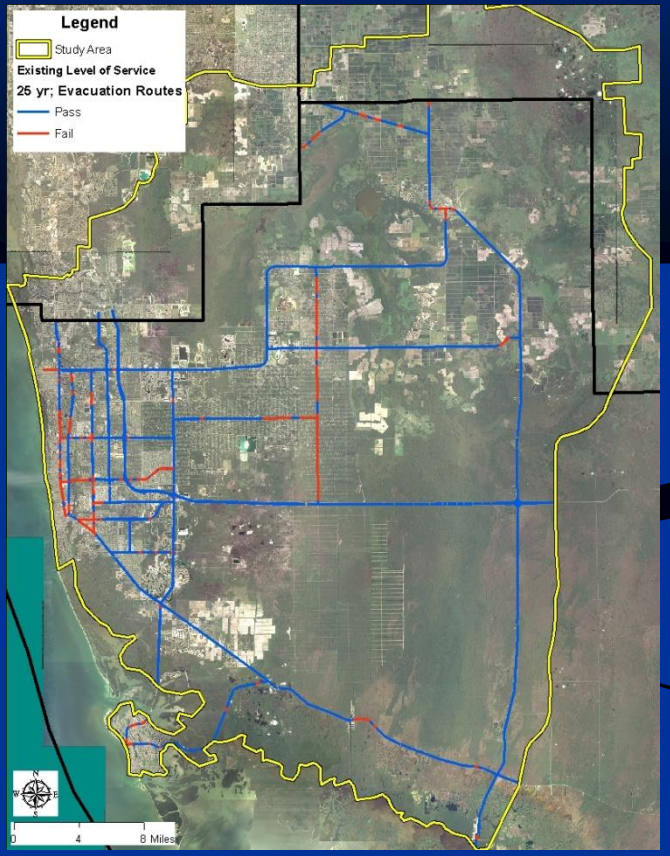
Existing Level of Service

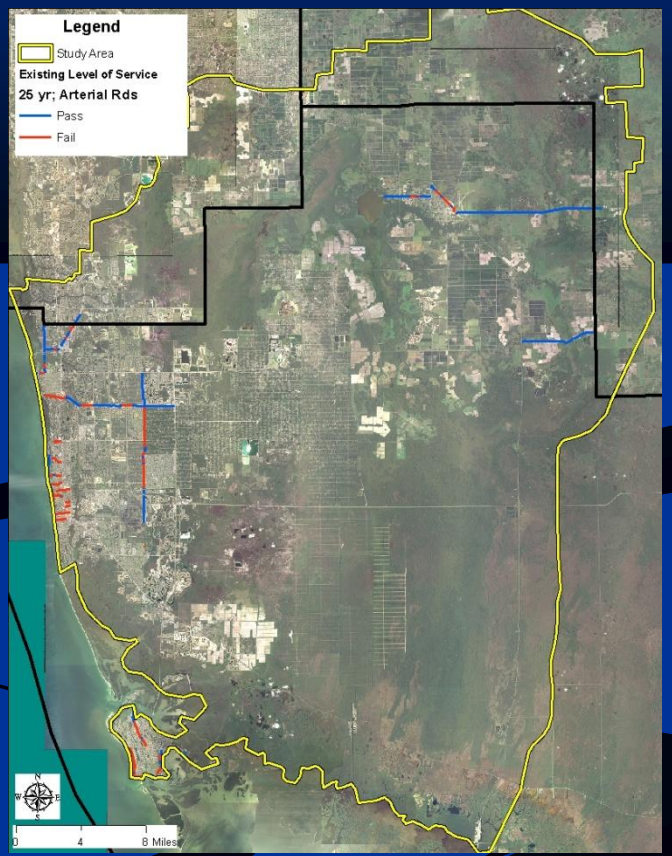
All Roads



Evacuation Routes



Arterial Roads



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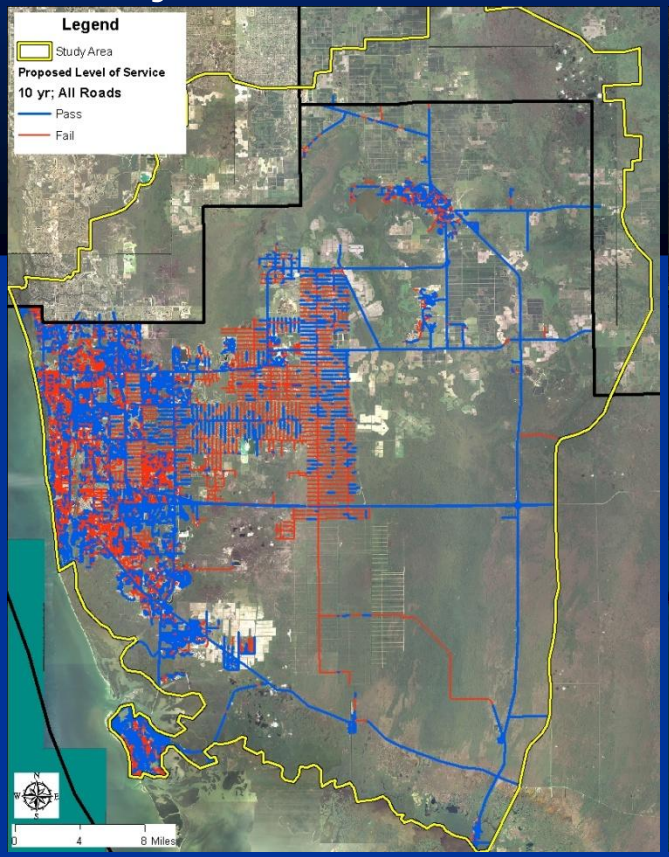
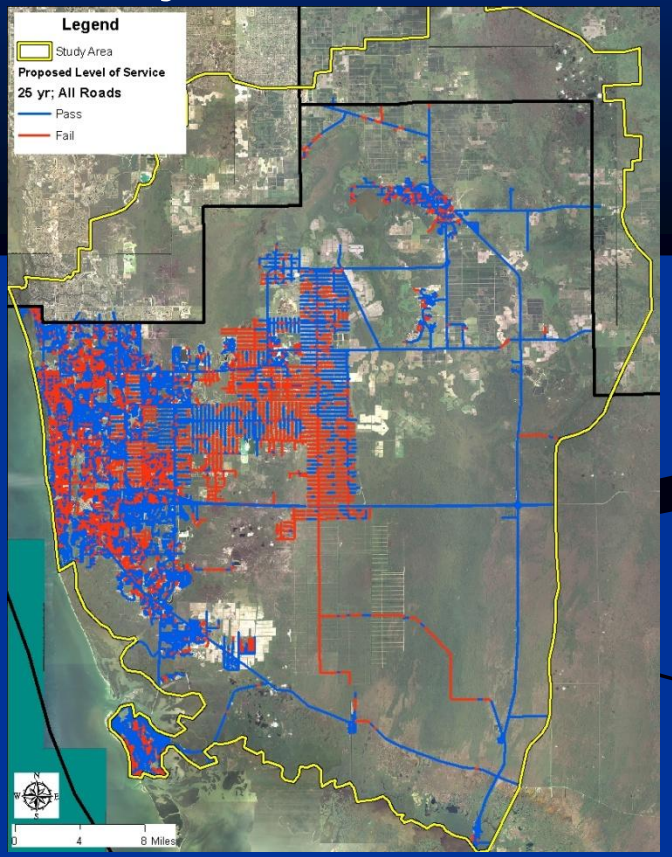
Proposed Level of Service

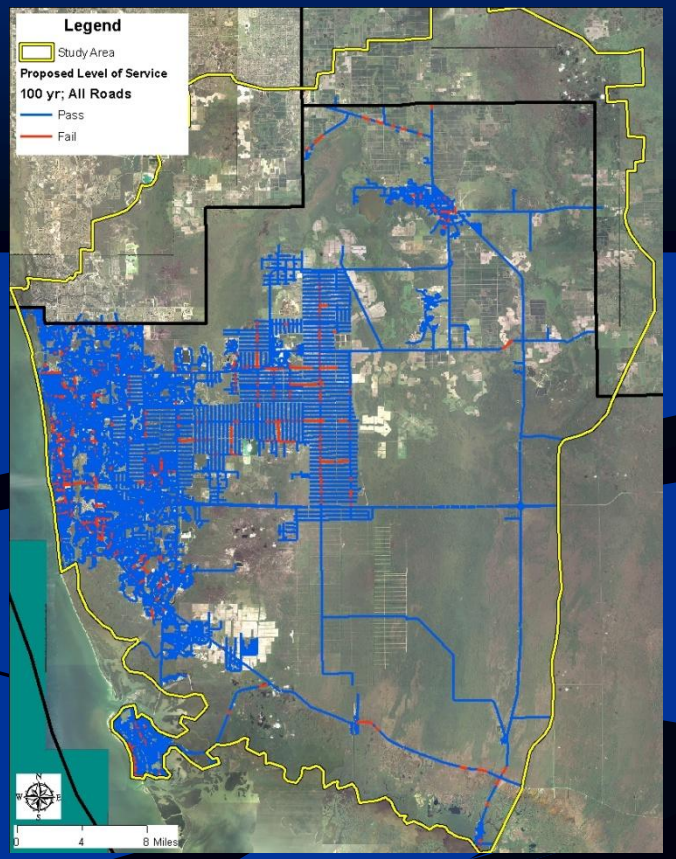
10-yr; 72-hr Storm



25-yr; 72-hr Storm



100-yr; 72-hr Storm



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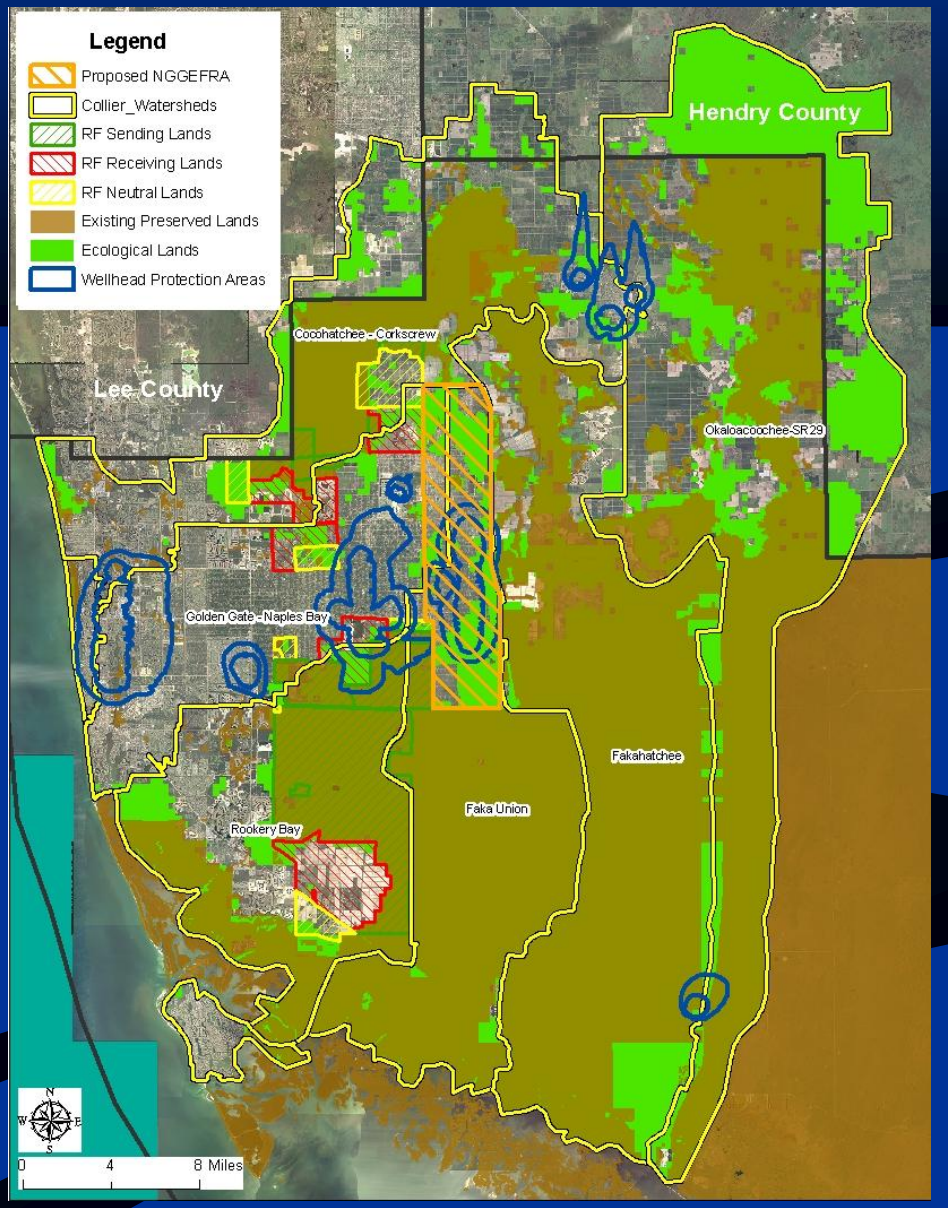
Recommended TDR Program for Golden Gate Estates

- Recommended Area includes valuable Ecological lands
- Wellhead protection area



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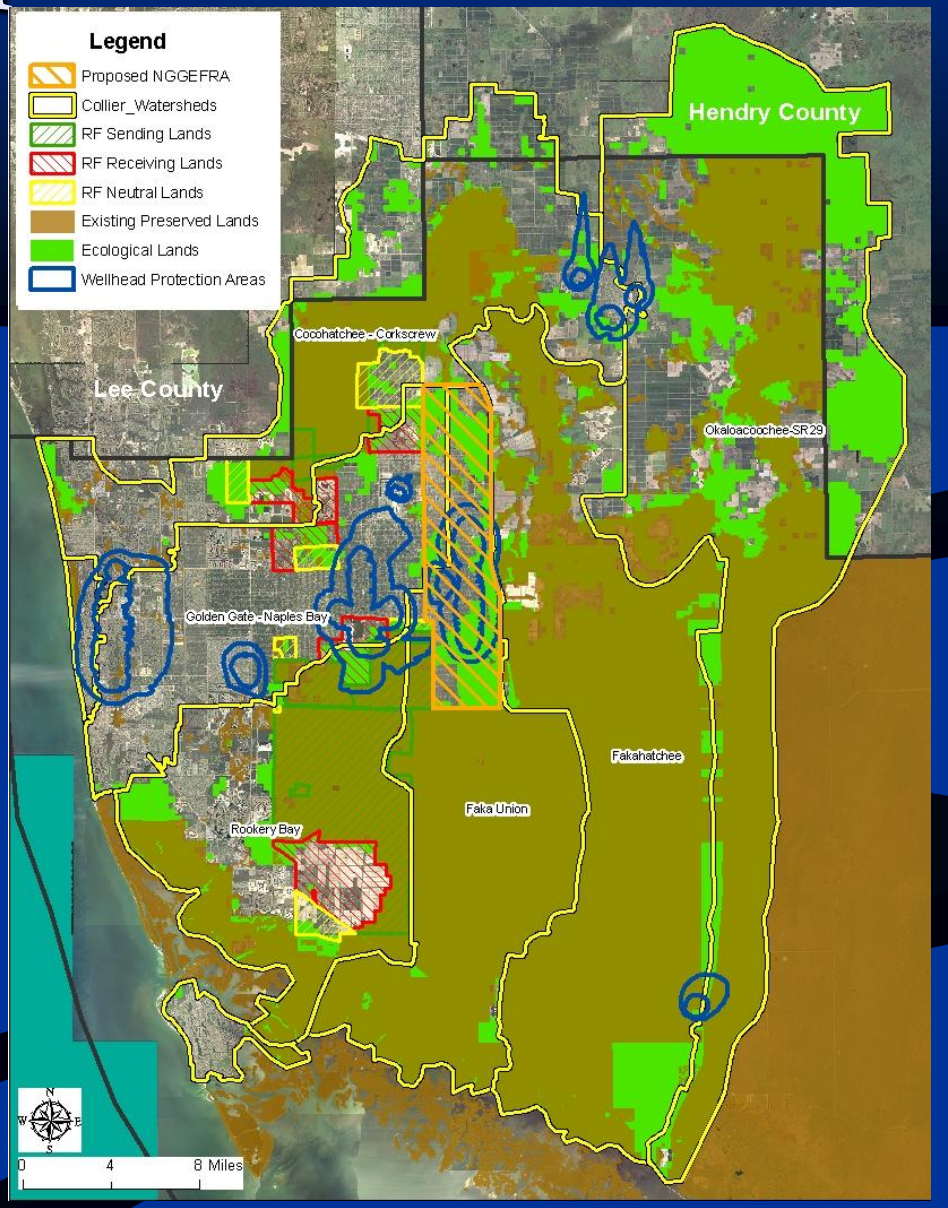
TDR Program for GGE Key Components

- Distinct from existing TDR programs that have been ineffective
- Goal is to provide sufficient market attraction
- Utilize existing receiving lands



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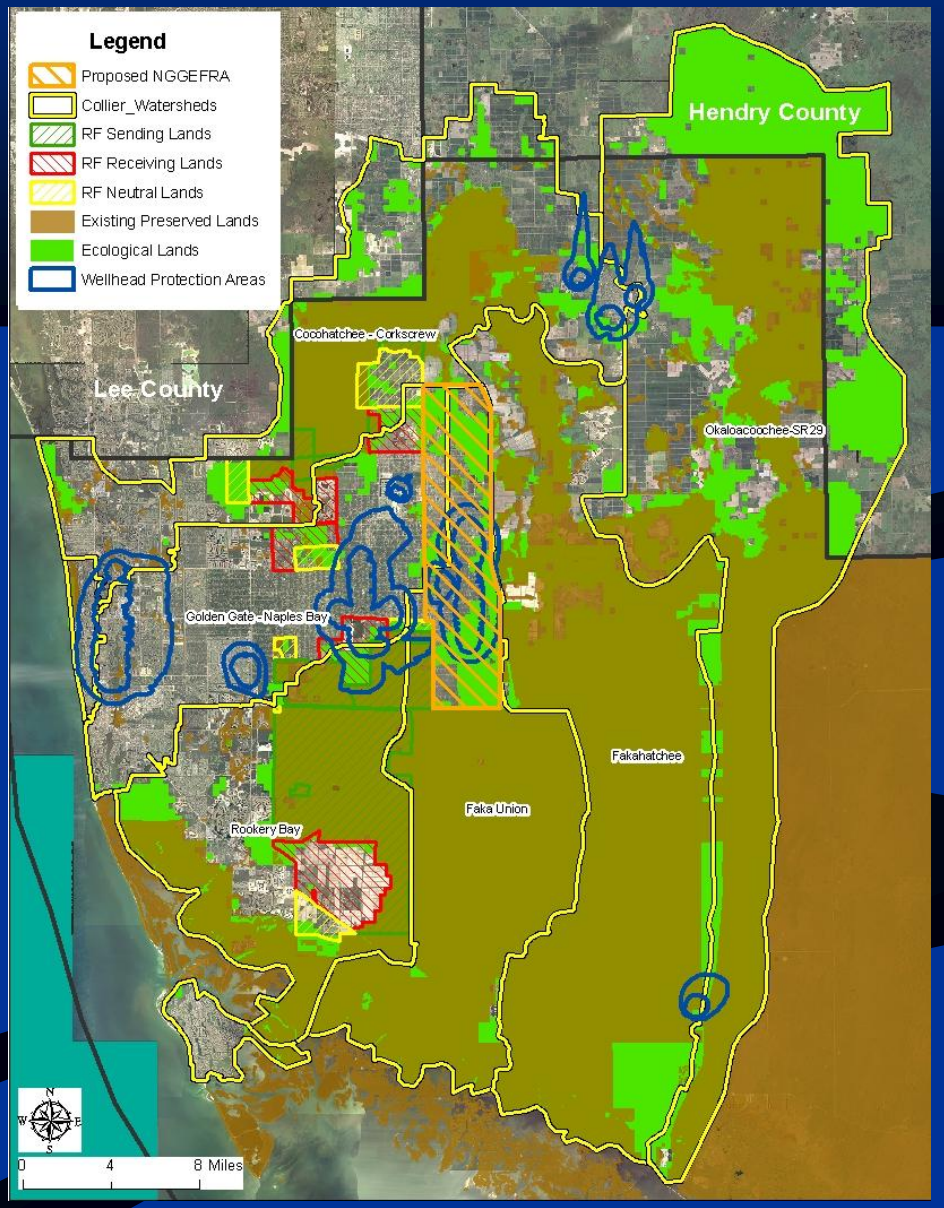
TDR Program for GGE Benefits

- Allow transfer for urban infill
- Program is voluntary – with incentives
- Use incentives to encourage aggregation of parcels
- Used for mitigation within the NGGE



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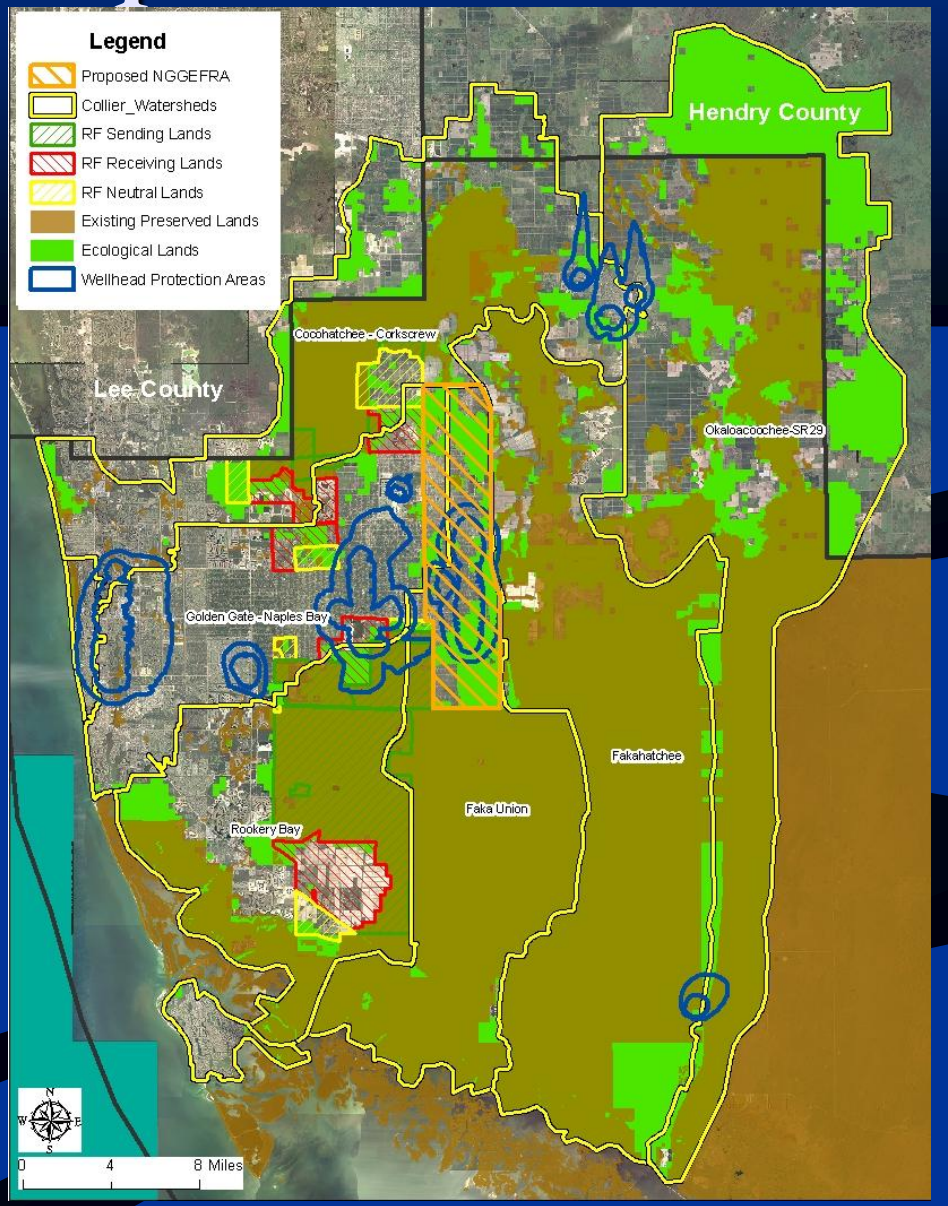
TDR Program for GGE Next Steps

- Establish 9 person Oversight Committee to develop specifics of the program
- Quantify the number of nonconforming and conforming parcels



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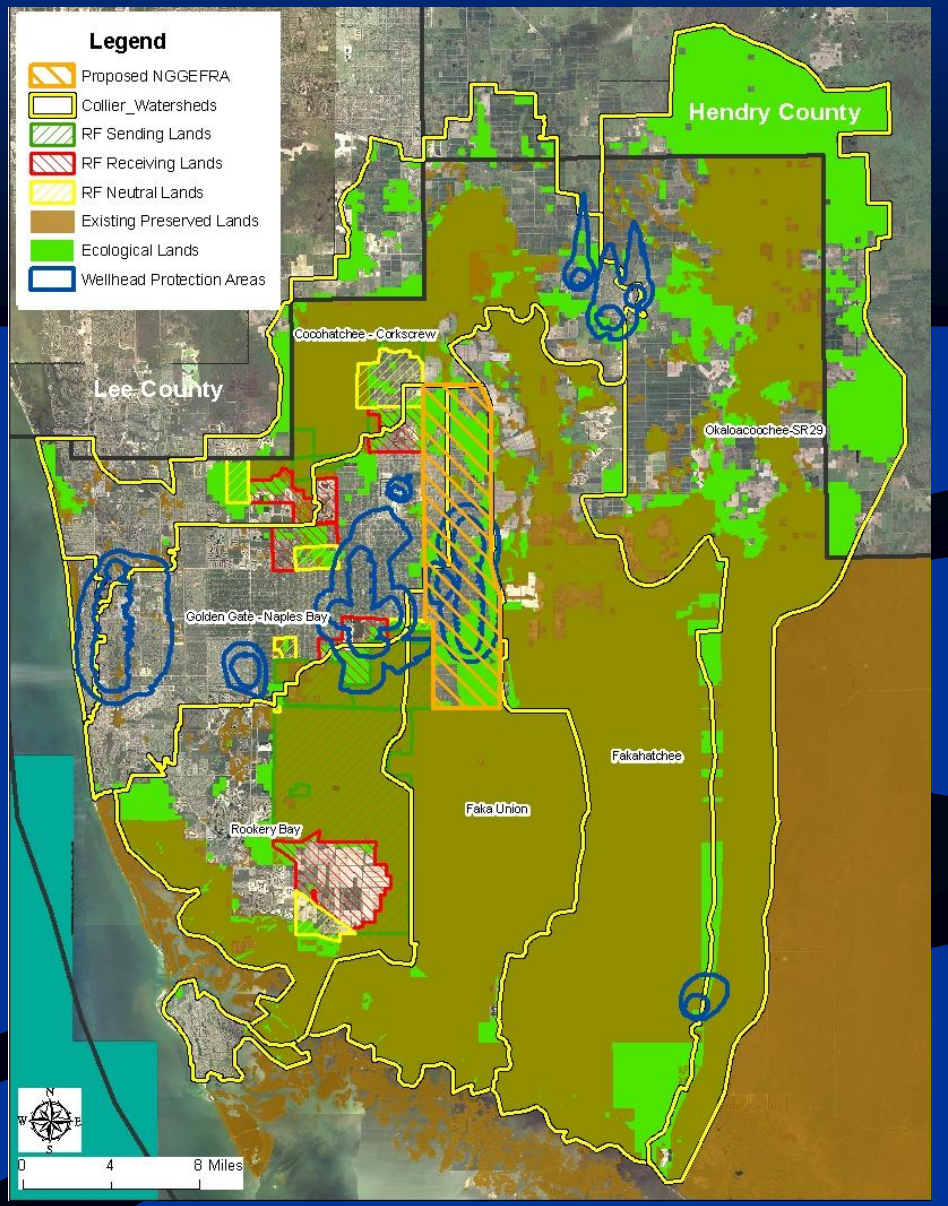
TDR Program for GGE
Key Issues to be Resolved

- Extent of the Protection Area
- Economics and Relationship to Existing TDR Program
- Receiving Lands
- Funding



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TDR Program for GGE Conceptual Timeline

Task	Day to Complete
Policy Discussion Regarding NGGEFRA before EAC, CCPC, and BCC	90
Creation of Oversight Committee and Committee Work Period	250
Preparation of final draft GMP amendments for public hearings before EAC, CCPC, BCC (Transmittal Hearings) and Transmittal Hearings	150
DCA Review and issuance of Objection Recommendation and Comment (ORC) Report (issued 60 days after completion determination)	70
County review of ORC and Adjustments to address Objections (and Recommendations and Comments) (Note: Rule requires the adoption to occur within 60 days after receipt of ORC, but typically this is not accomplished within 60 days (given process requiring hearings before the EAC, CCPC and BCC) and DCA has been tolerant providing the County is working to address issues. Assuming Objections are not substantial, the County will simultaneously begin preparing LDC amendments.	120
DCA issues Notice of Intent (NOI) to find Plan Amendments in Compliance (or not) - within 45 days of receipt of a complete adopted plan amendment	50
LDC Amendment Final Preparation and hearings (again, EAC, CCPC,BCC)	100
Total Estimated Time for Completion	**830**

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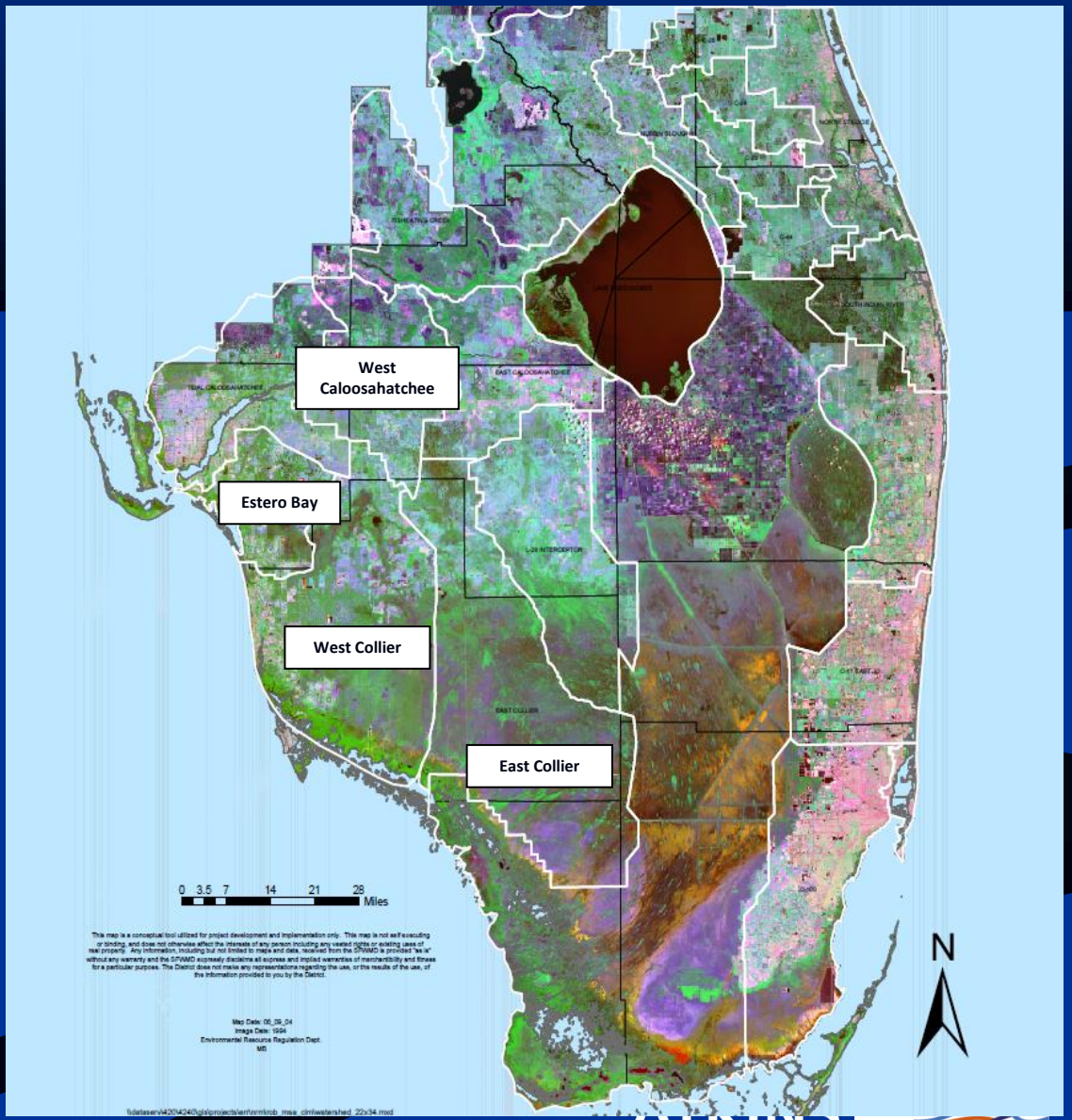
Mitigation Issues

- No regulatory mechanism to require mitigation within a functional watershed
- Economics determine where mitigation occurs



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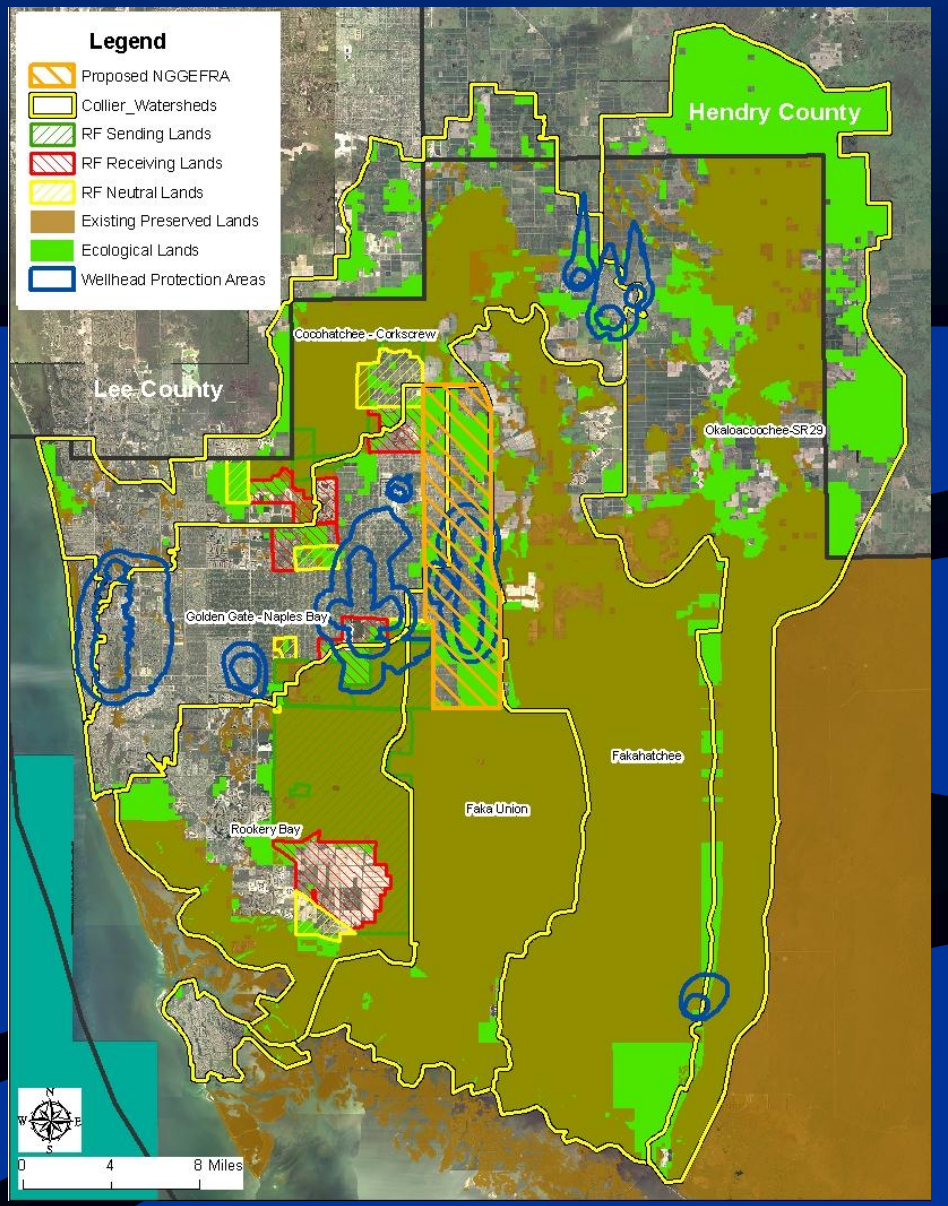
Recommendations to Establish Mitigation Area in NGGE

- Regional Offsite Mitigation Area located within proposed NGGE TDR area
- Phase I:
  - Permitted by FDEP for single family mitigation
  - Acquisition funded through TDR, grants, sale of credits, or direct County funding



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Recommendations to Establish Mitigation Area in NGGE

- Phase 2:
  - Permitted by SFWMD for public works projects
  - Funded by internal sale of credits (Collier County to Collier County)

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Factors that Favor Mitigation Within the NGGE

- Reduction in mitigation costs
- Serves wetland restoration and stormwater attenuation goals
- A regulatory precedent exists (Lee County)
- Pending statewide rules affect water quality criteria and allow credit-trading

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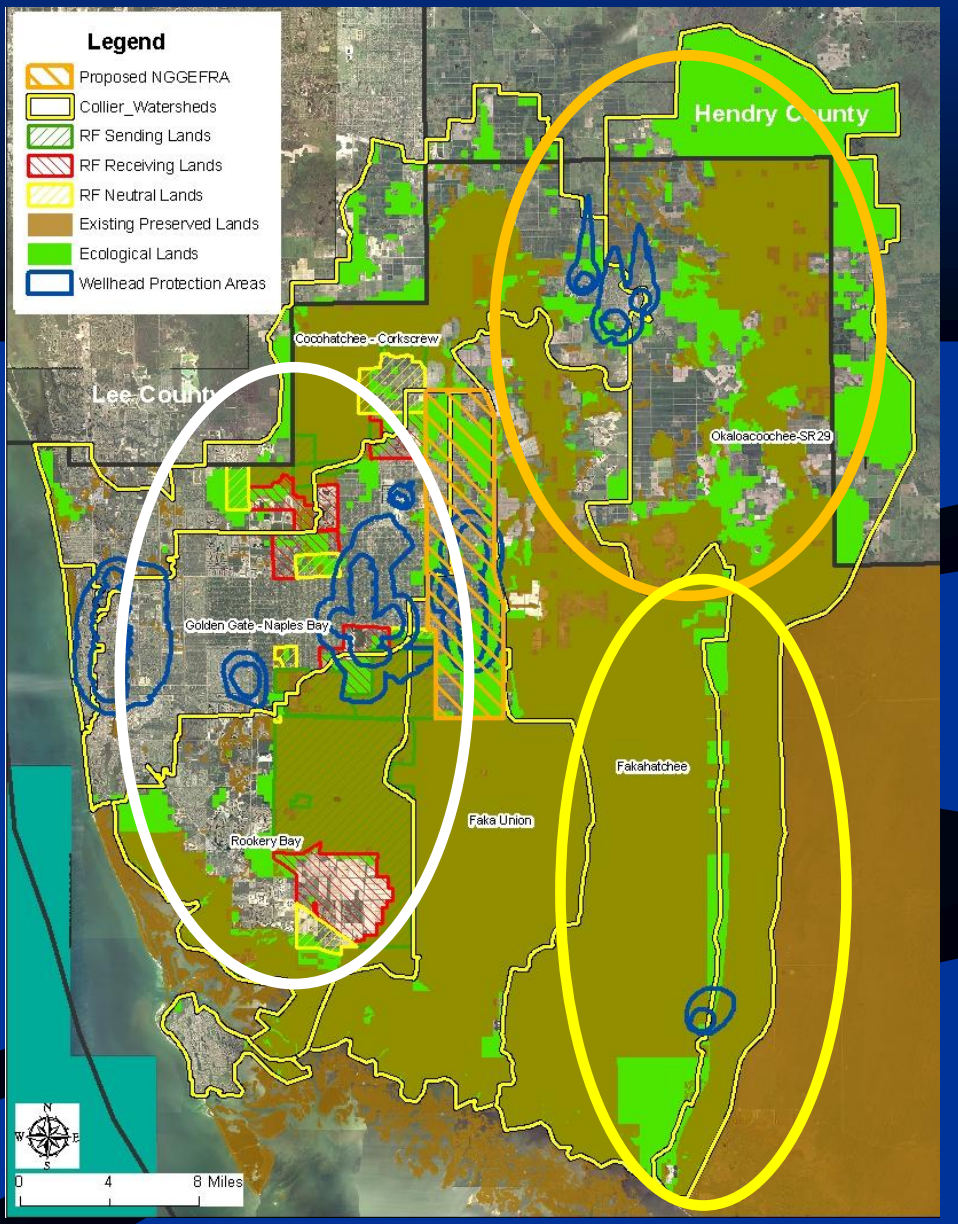
Recommended Additional Protection Areas

- Areas of localized restoration efforts
- Recyclable Water Containment agricultural areas
- Areas recommended for State acquisition



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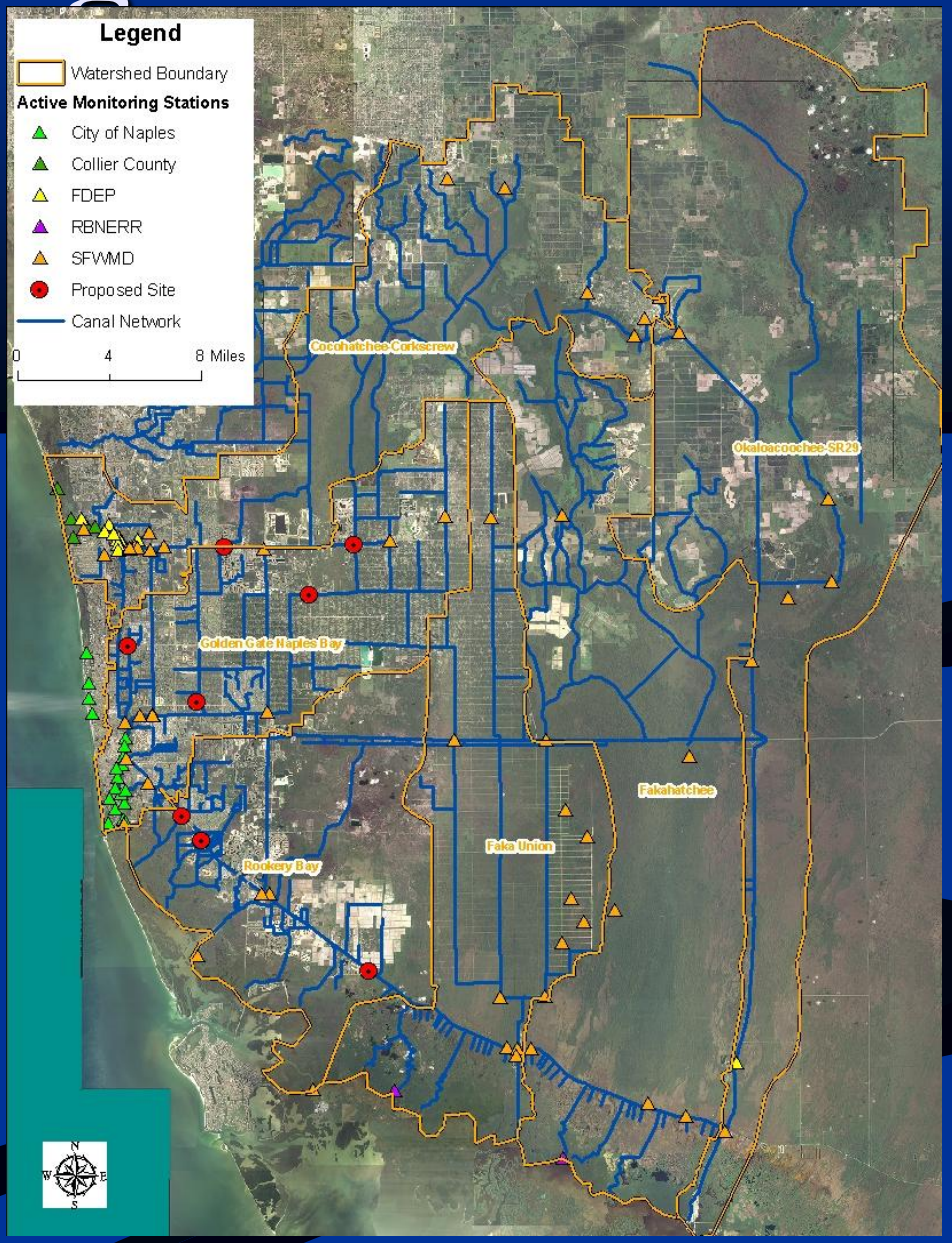
Monitoring Plan

- Surface Water Monitoring
  - Additional permanent monitoring stations
  - Wet weather monitoring program



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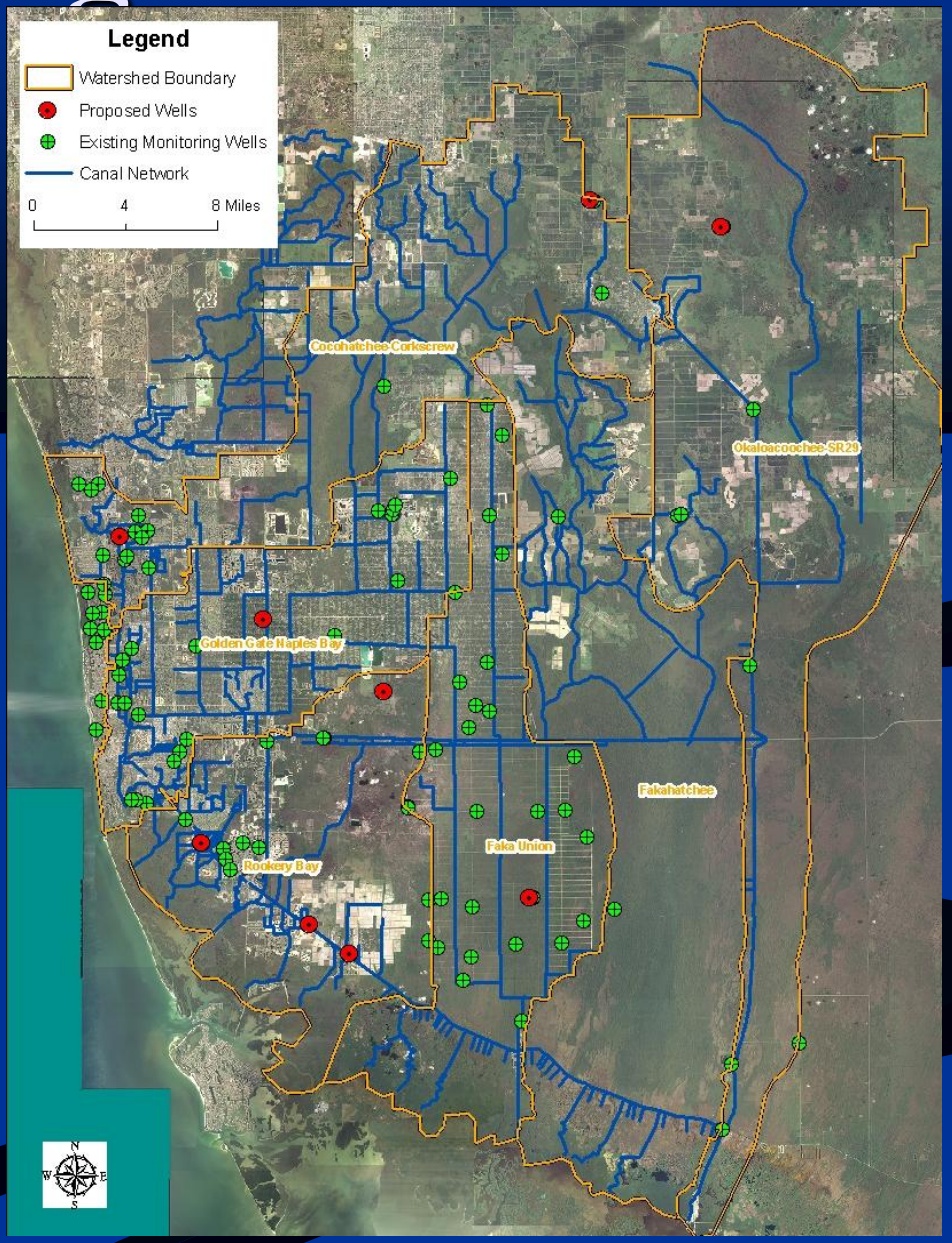
Monitoring Plan

- Groundwater Monitoring
  - Confirm extent of estimated pollutant concentrations
  - Coordinate with SFWMD for more regular sampling of wells in Picayune Strand and Okaloacoochee Slough
  - Report DO data



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Fertilizer Model Ordinance Requirements

- Training and Licensing
- Prohibited Period – Watches
- Application Rate – Label requirement
- Fertilizer Free Zone – Voluntary 10 feet
- Low Maintenance Area (buffers)
- Exemptions – Agriculture
- Application Practices – No fertilizer on impervious

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Provisions Considered

- Black Out Period – June 1 – Sept 30
- Reduction in N load to 4 lbs/1000 ft/yr
- 50 % Slow Release Nitrogen
- Mandatory 10 ft Buffer for Water Bodies

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FDEP - Watershed Restoration Bureau Chief

- Rainy Season Ban – Science incomplete
- Irrigation program to maintain slight Irrigation deficit
- Decompaction of urban landscape soils to decrease runoff
- Ensure citizens aware of saturated soil conditions
- 4 lb N per year – Less than minimum for Bermuda grass in S Fla

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Dept. Agriculture & Consumer Servc.

- Absent of scientific confirmation of need for more stringent standards recommend Model Ordinance
- Proposed restrictions jeopardize turf health and filtration capabilities

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U of Fl IFAS Chair of Environmental Horticulture Department

- Science supports fertilization during growth period (June – Sept) – minimal N loss
- UF-IFAS recommends 30% SRN at 1 lb per application until documentation supports higher
- Soluble N at proper rates have low leaching rates
- Proper irrigation important
- Keep plant debris off impervious

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Staff Recommendation

- Scientific support for Model Ordinance
- Lack of clear scientific support for more stringent fertilizer ordinance
- Model Ordinance and Public Education
- Include Collier buffer requirements
- Future evaluation of local conditions

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Education Program

- Education for residents – web and TV
- Ordinance requirements and guidance at retail
- Irrigation awareness
- Precipitation awareness
- Re-Use Nutrient awareness

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Wrap Up

- If you didn't sign in, please do so
  - Include your E-mail address and Phone Number
- Comments via E-Mail

  machatcher@colliergov.net
- Formal position papers
  - Please mail to Mac Hatcher

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