



COLLIER COUNTY & BIG CYPRESS BASIN

WATER CONDITIONS OVERVIEW

WATER MANAGEMENT IN GOLDEN GATE ESTATES

May 21, 2024

Brad J Jackson, P.E., CFM
Principal Engineer
Big Cypress Basin/SFWMD

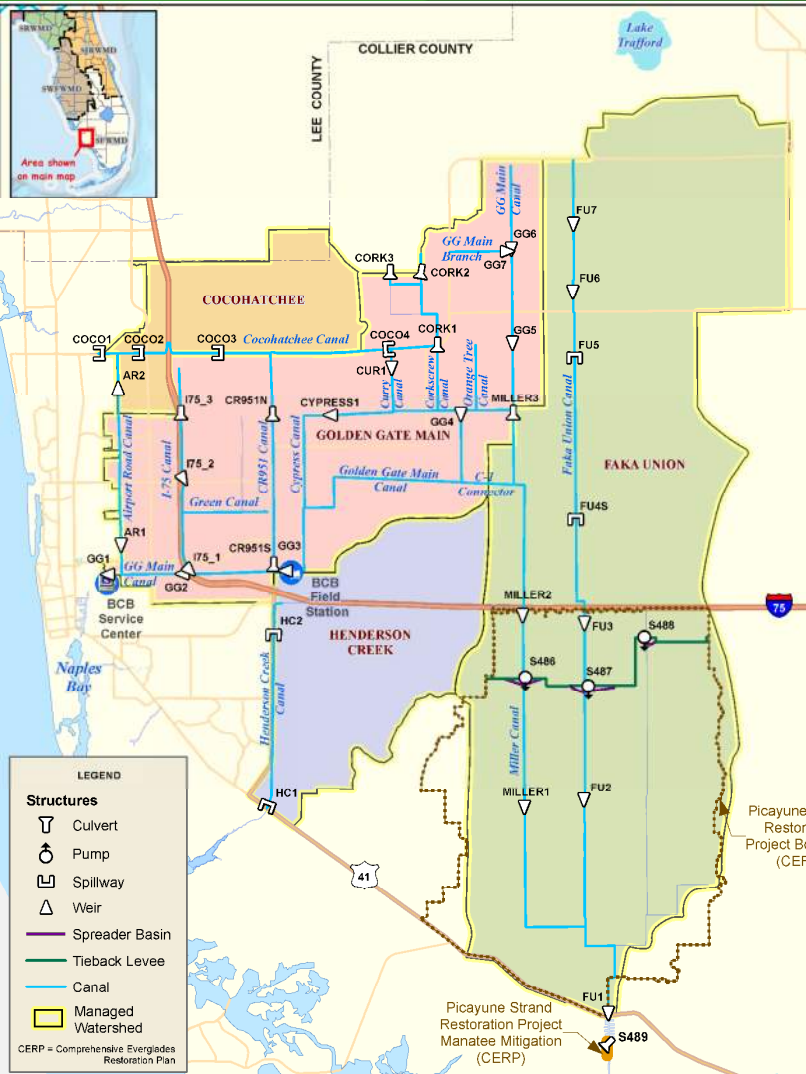
Marshal Miller
Road Maintenance Division Director
Collier County

Tonight's General Topics

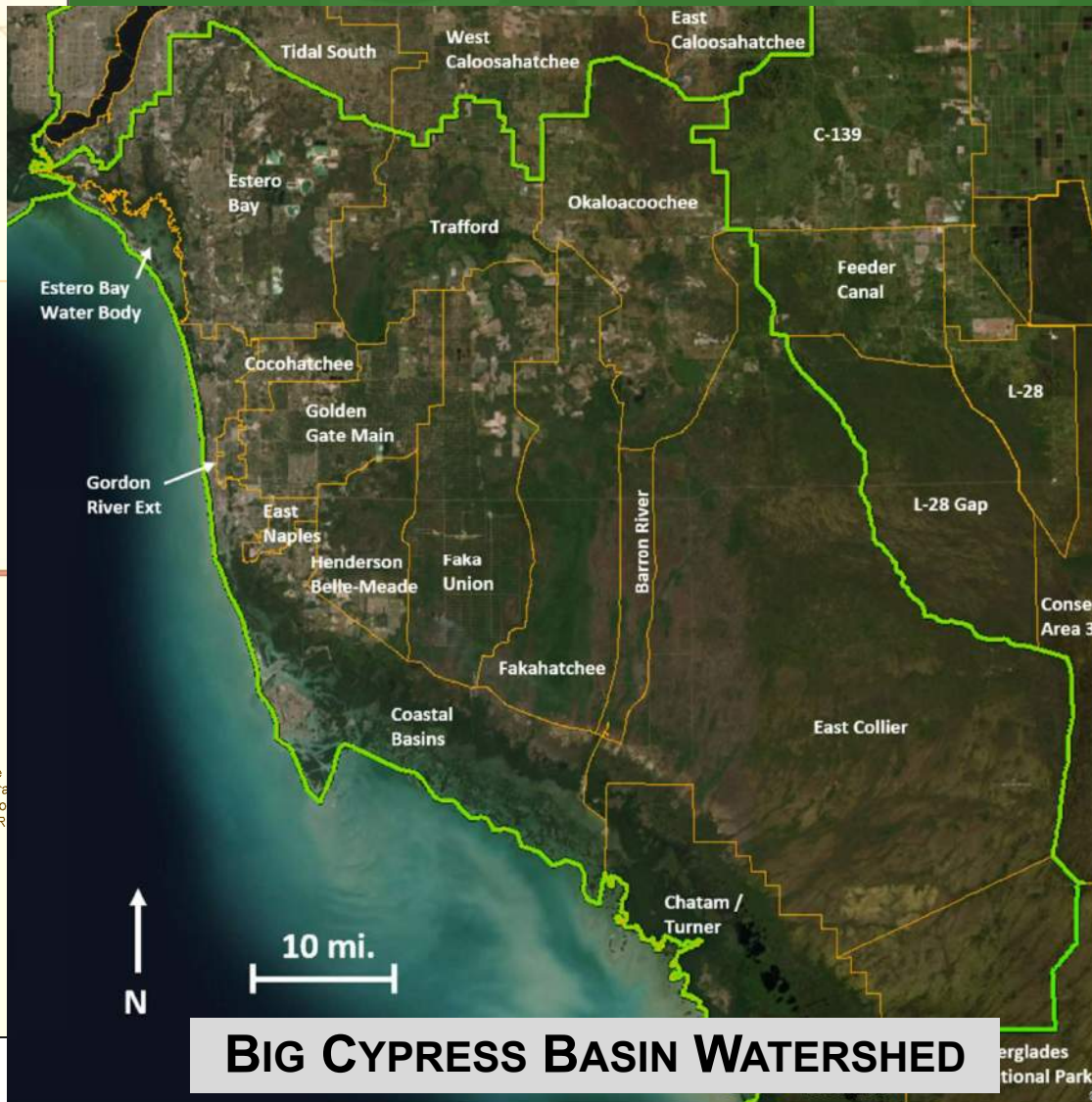
- Hydrologic & Big Cypress Basin Overview
- Canal Ownership and Maintenance
- System and System Operational Roles and Responsibilities
- Primary Canal System Constraints
- BCB Capital Improvement Plans
- Collier County Stormwater and Swale Maintenance
- Collier County Pollution Control
- Who to Contact with Concerns



Big Cypress Basin Watershed



MANAGED WATERSHEDS



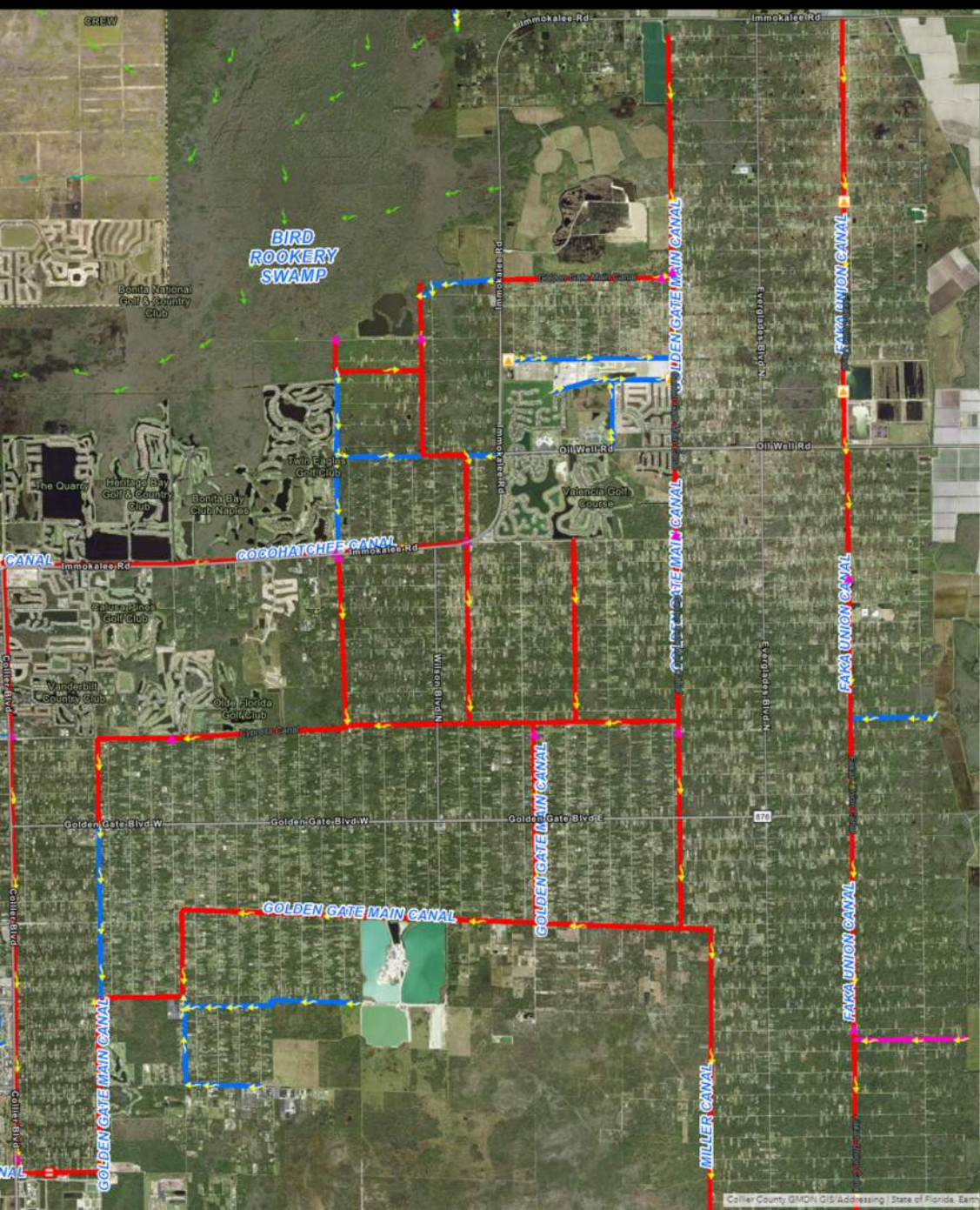
BIG CYPRESS BASIN WATERSHED

- Hydraulically isolated from rest of south Florida
- Solely dependent on direct rainfall on the Basin
- 5 watersheds directly managed by BCB primary canal system



Collier County

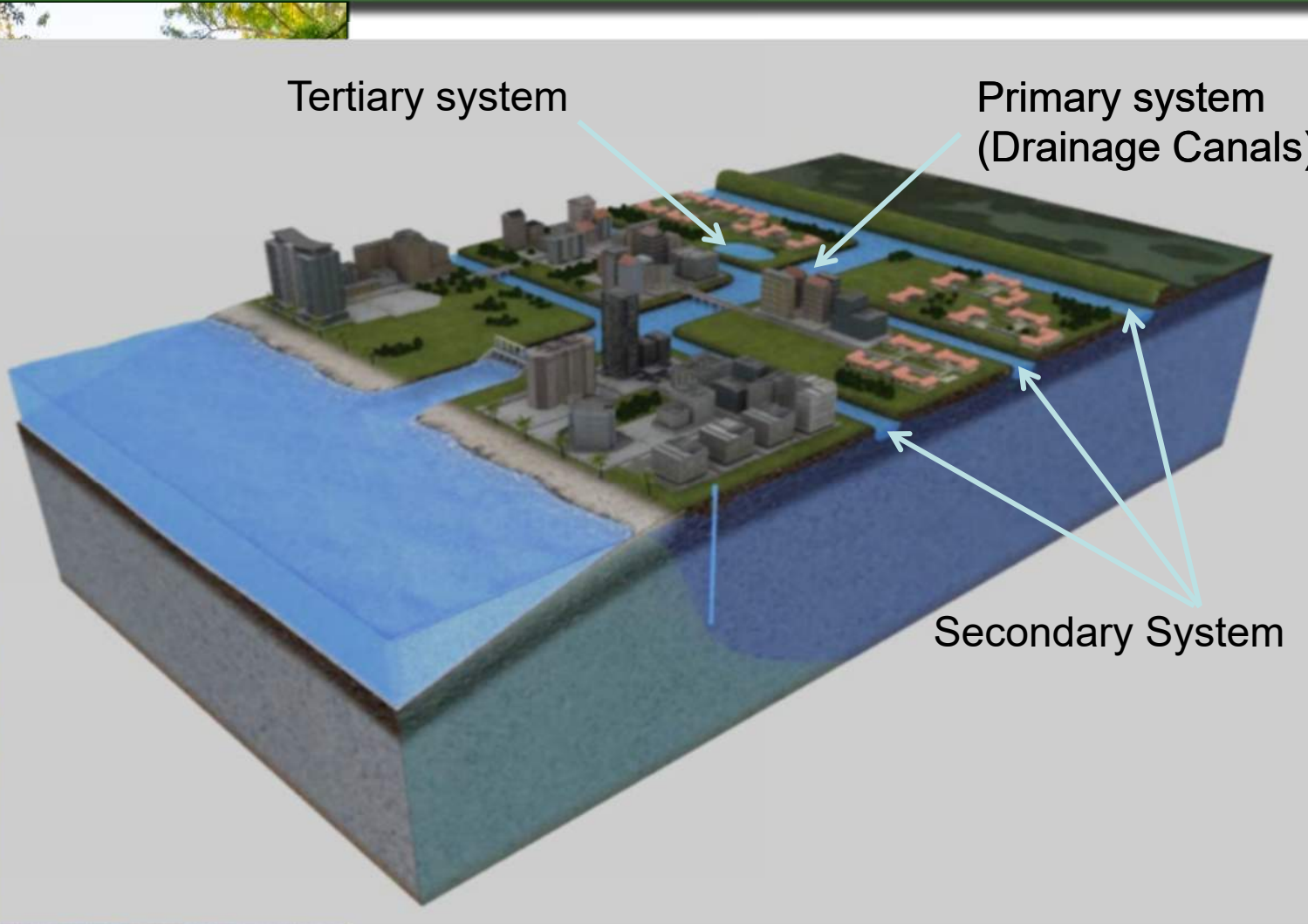
Ownership of the Canals



- Ownership
 - Collier County (Primary & Secondary Canals)
- Operations & Maintenance
 - Big Cypress Basin (Primary Canals)
 - Collier County (Secondary Canals)
 - Collier County (Roadside Water Management Areas)



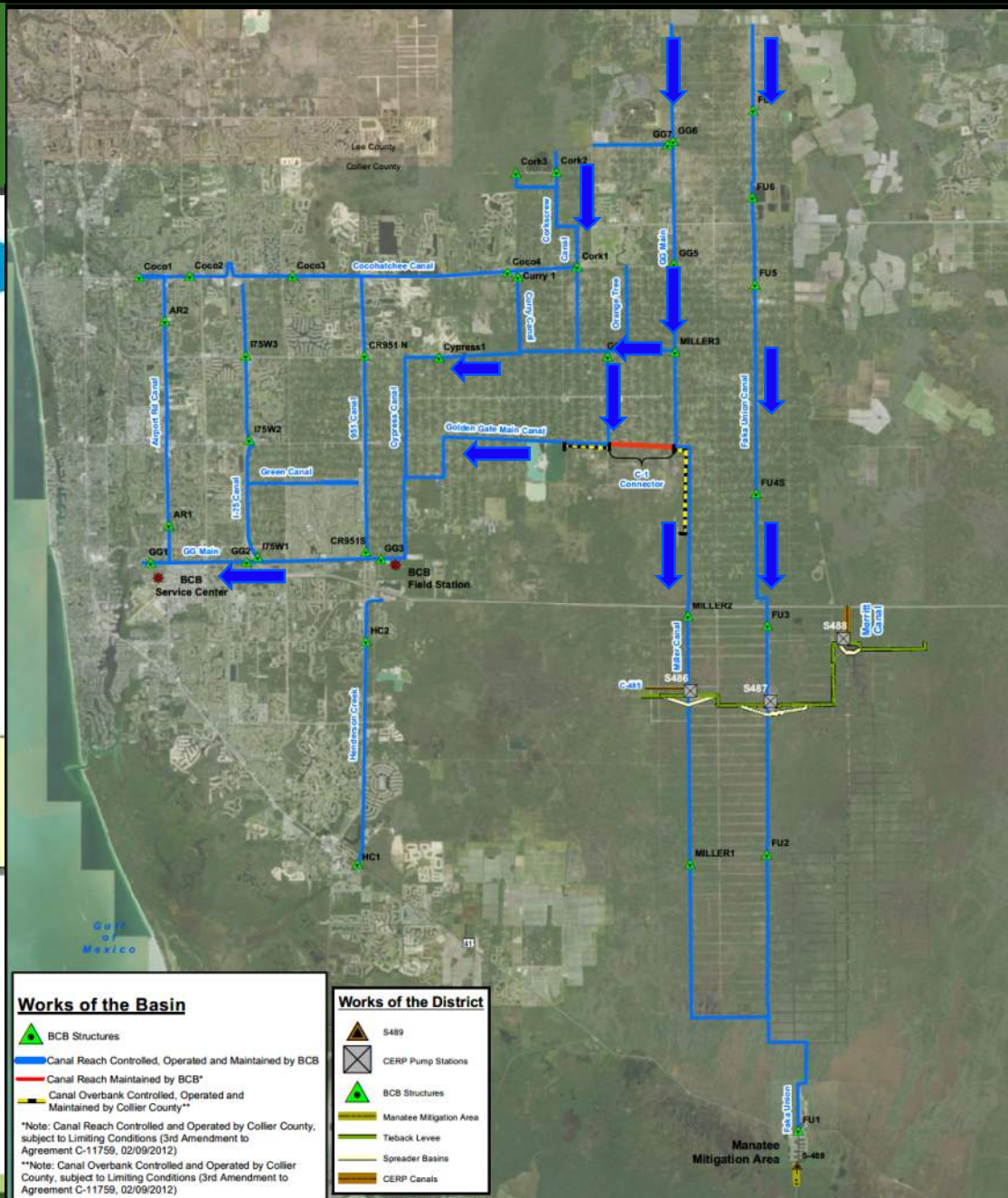
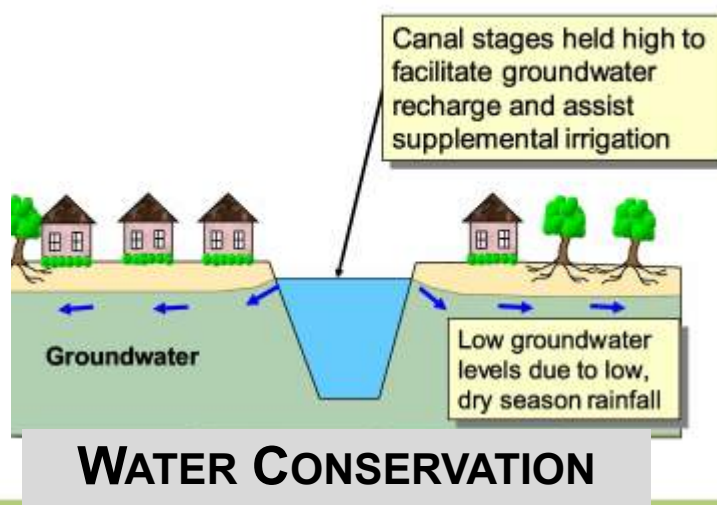
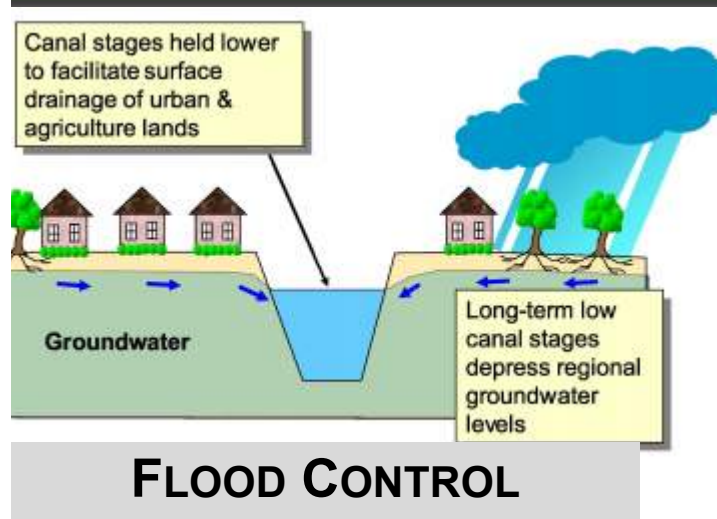
South Florida's Tiered Flood Control



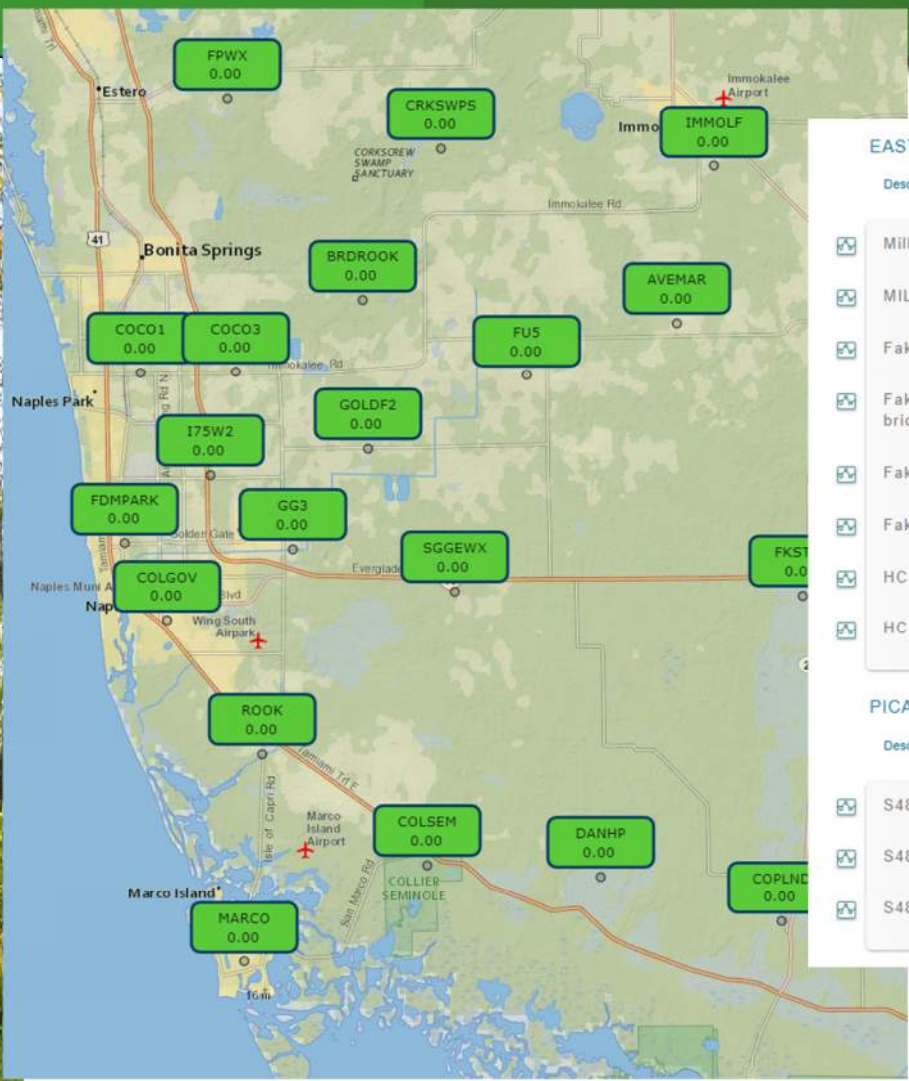
- Tertiary – Neighborhood & Private Drainage Systems
- Secondary – Collier County Canals
- Primary – Big Cypress Basin
- Shared Responsibility – All tiers must function to support optimum flood control

Primary & Secondary Canal Water Operations

- Slow moving cascading gravity canal system requires 24-hour, 365-day monitoring and active management
- Water management is not only a wet season mission
- Water conservation operations is equally or more important as flood control operations
 - **Groundwater recharge**
 - **Water supply**
 - **Wildfire risk reduction**
- Canals and water control structures actively manage water levels of surface water and the surficial aquifer



BCB Rainfall & Monitoring



EASTERN SYSTEM

Description	Site	Flow CFS	Upstream WATER LEVEL (ft NAVD88)	Downstream
Miller @ I-75	MLR175		5.11	
MILLER #3	MILLER3	0	8.12	5.20
Faka Union Canal Weir #1	FU1	85	0.91	-0.29
Faka Union Canal @ I-75 bridge	FAK175		5.28	
Faka Union Canal Weir #4	FU4S	0	6.96	4.00
Faka Union Canal Weir #5	FU5	0	12.39	6.98
HC Weir #1	HC1	0	2.25	
HC Weir #2	HC2	0	4.95	4.83

PICAYUNE STRAND PUMP STATIONS

Description	Site	Flow CFS	Upstream WATER LEVEL (ft NAVD88)	Downstream
S488	S488	0	7.14	12.07
S487	S487	0	5.38	11.79
S486	S486	0	4.15	4.58

Big Cypress Basin

All water level data are reported in feet NAVD88

- Rainfall last 24 hours
- Rainfall 24hr (7am-7am)
- Rainfall Last 7 Days
- Operational Status Report

REAL TIME DATA

- Current Values
- > 2 Hours
- ** Sum of multiple flow stations at the Site

PROVISIONAL
Updated on May 20, 2024 10:29:38 AM

View Water Quality Data

COCO SYSTEM

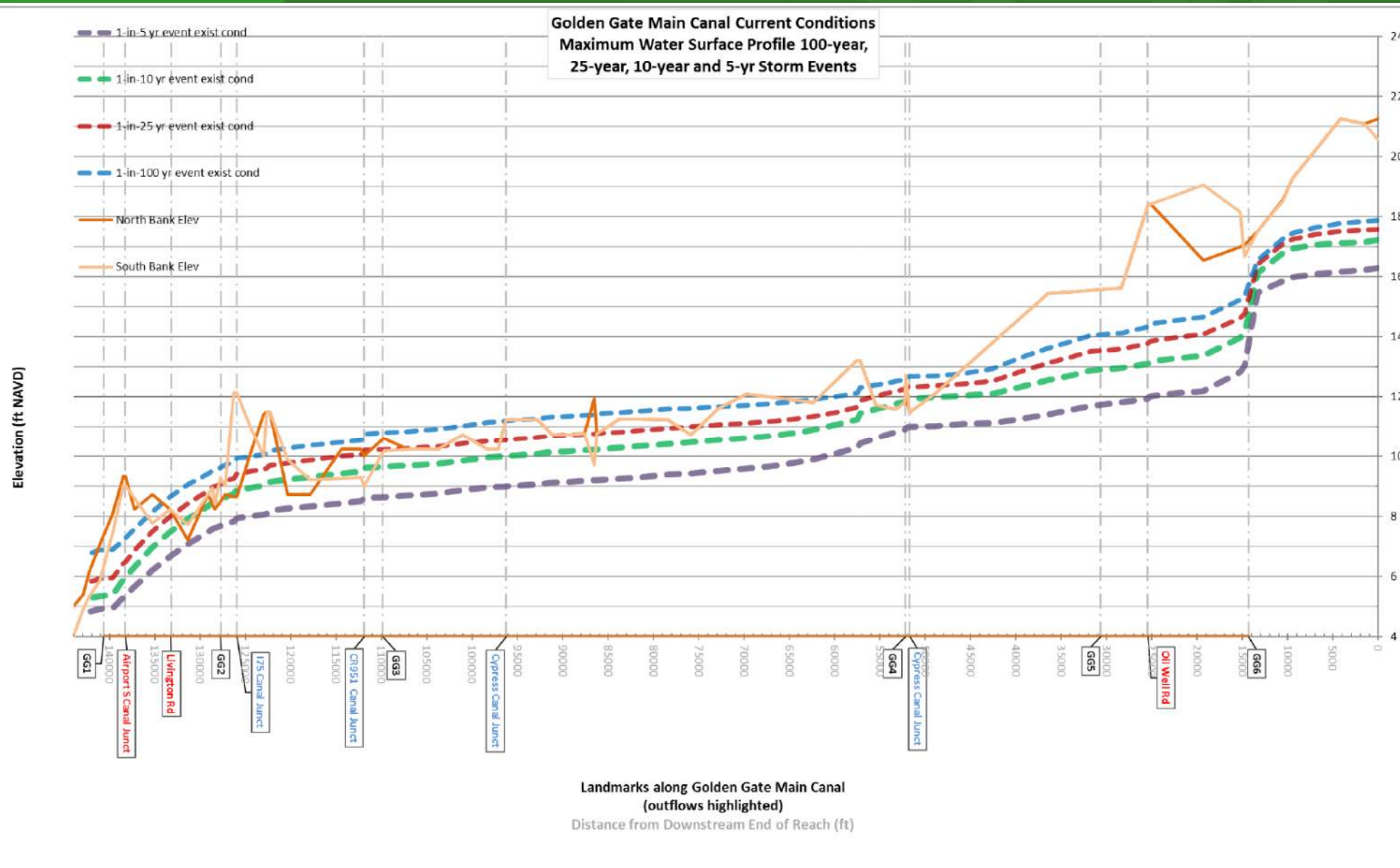
Description	Site	Flow CFS	Upstream WATER LEVEL (ft NAVD88)	Downstream	Offset (ft NGVD29)
Cocohatchee Weir #1	COCO1	0	4.80	0.76	1.24
Cocohatchee Weir #2	COCO2	0	8.12	4.71	1.24
Cocohatchee Weir #3	COCO3	0	8.65	8.14	1.26
Cocohatchee Weir #4	COCO4	0**	8.78	8.83	1.30

GOLDEN GATE SYSTEM

Description	Site	Flow CFS	Upstream WATER LEVEL (ft NAVD88)	Downstream	Offset (ft NGVD29)
Golden Gate Canal Weir #1	GG1	0	2.05	0.92	1.27
Golden Gate Canal Weir #2	GG2	0	4.42	1.98	1.29
Golden Gate Canal Weir #3	GG3	0	5.90	4.42	1.31
Golden Gate Canal (GG4)	GG4	0**	8.15	5.95	1.32
Cypress 1	GOLD4A		8.08		1.30
Golden Gate Canal Weir #5	GOLDW5	0	9.27	7.99	1.32
Golden Gate Canal Weir #6	GG6		14.08		1.31
Golden Gate Canal Weir #7	GG7		12.22		1.31
Golden Gate Canal Structures 6 and 7 Shared Tailwater	GG67T		9.43		1.31
Corkscrew Weir #2	CORK2	0	9.73	8.81	1.30
Corkscrew Weir #3	CORK3		12.04		1.29
Curry Canal Structure #1	CUR1	0	8.84	8.09	1.30

<https://apps.sfwmd.gov/rainfall-report/#/maptwentyfourhour>

Limitations of BCB Drainage System



- Limited flood control level of service provided from developer inherited system
- Approximately 5-to-10-year design storm level of service
- Some localized areas have 25-year level; mostly limited by canal size
- Canals surrounded by development and infrastructure

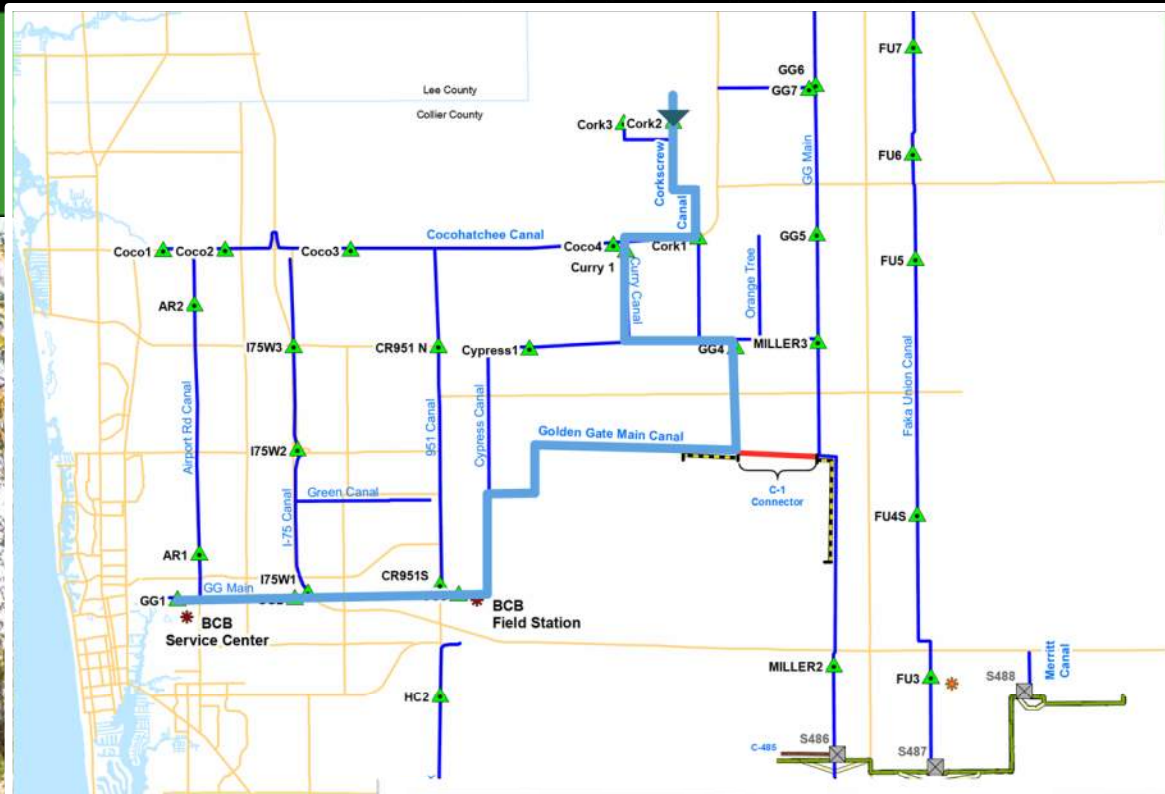
Challenges of BCB Drainage System

Storm Photos from Nov 2011



Improvement/Operations Plans

- Primary Canal System Improvements
 - Focus on improving system operations & response time
 - Remote operations & monitoring
 - Upgrade/replace water control structures
 - Improve timing of pre-storm, storm, & post-storm operations
 - Increase dry season water levels
 - Promote additional groundwater recharge (water supply & wildfire risk reduction)
 - Maintain & improve canal flowway efficiency
 - Mechanical vegetation removal
 - Shoaling/debris removal

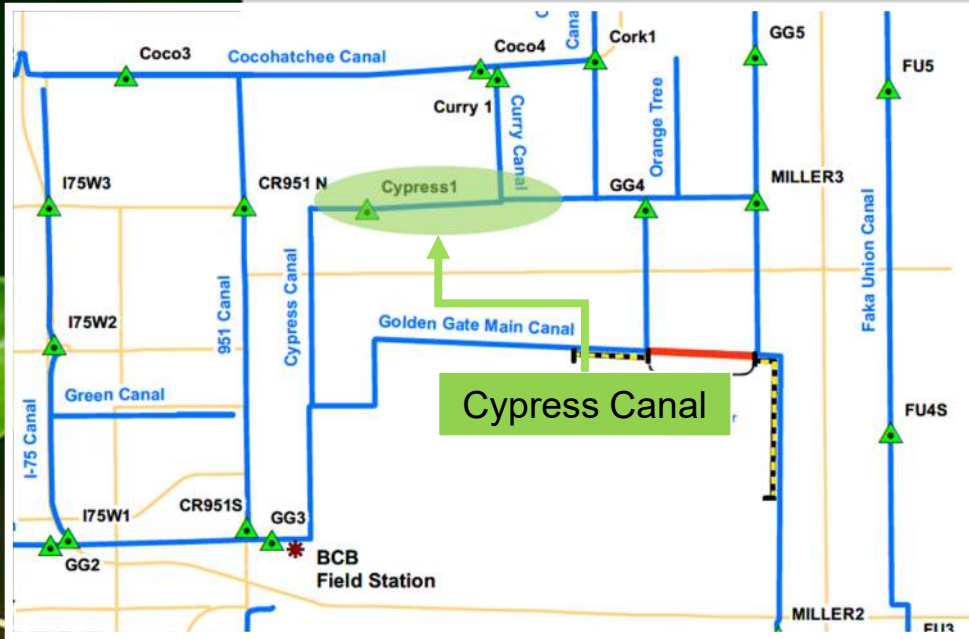


Works of the Basin

- ▲ BCB_Structures
- ✶ To be taken out of service 2021
- BCB_Canals
- Canal Reach Maintained by BCB*
- Canal Overbank Controlled, Operated and Maintained by Collier County**

*Note: Canal Reach Controlled and Operated by Collier County subject to Limiting Conditions (3rd Amendment to Agreement C-11759, 02/09/2012)
**Note: Canal Overbank Controlled and Operated by Collier County, subject to Limiting Conditions (3rd Amendment to Agreement C-11759, 02/09/2012)

Cypress Canal Flood Control Improvements

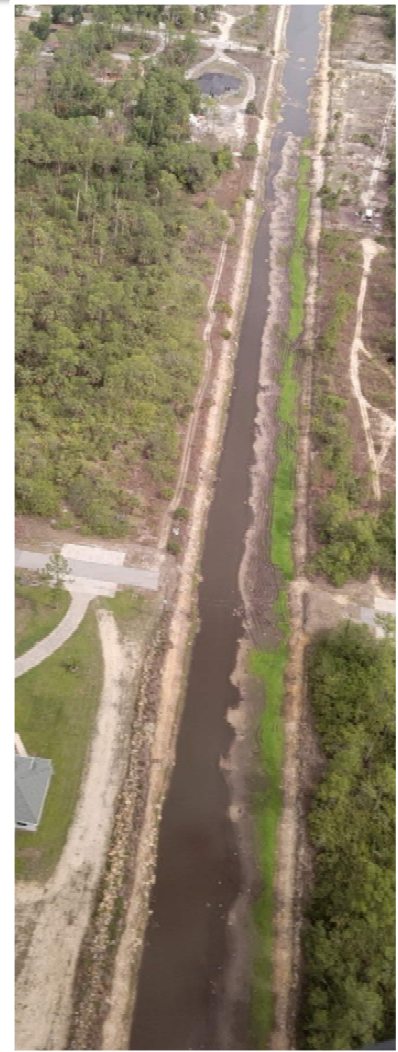


New Cypress Water Control Structure

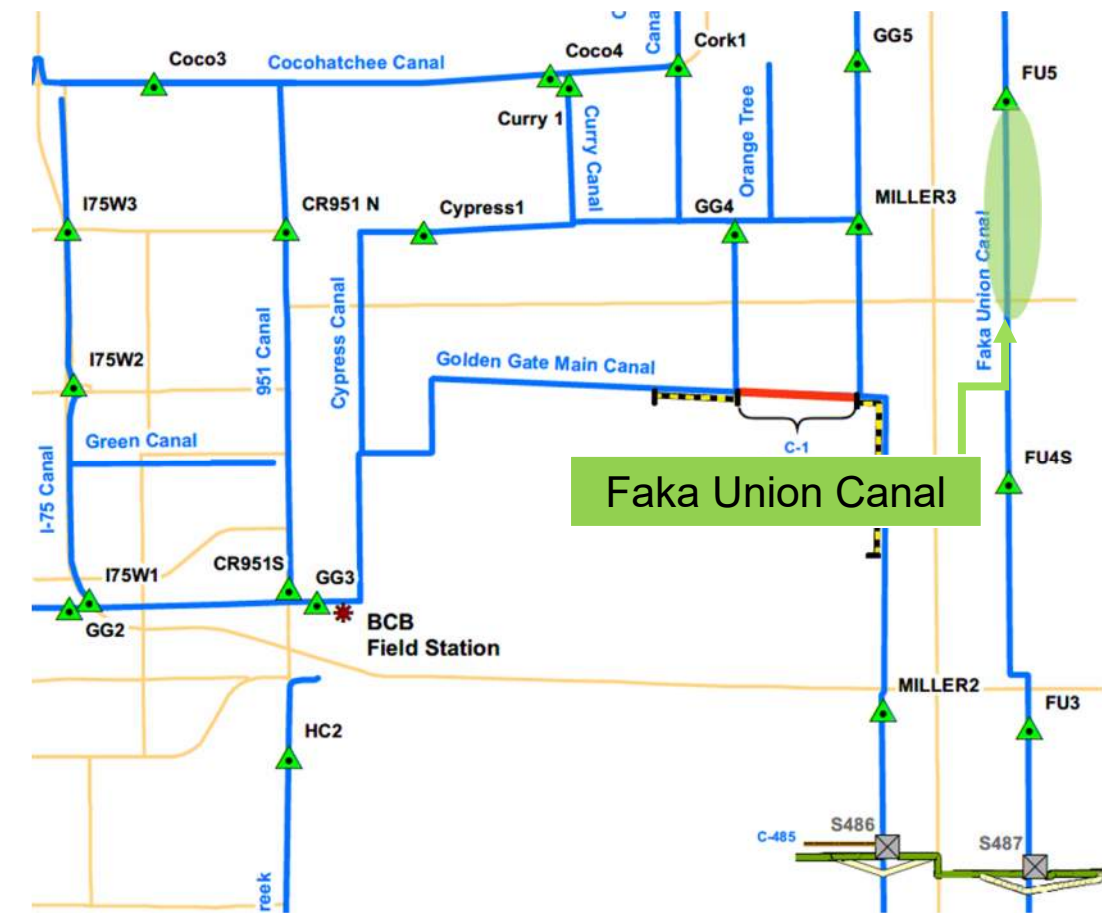
- 2022 - Completed new Cypress Canal water control structure (~\$5,000,00 SFWMD)
- 2024 – Completed cypress canal widening at Curry Canal (~\$500,000 SFWMD)
- 2025 – Expected completion of ~2.0 miles of improved Cypress Canal (Part of Vanderbilt Beach Rd Ext Project – Collier County)

Canal Flood Control Improvements

- Main objective - improve flood control
 - Faka Union Canal
 - Remove 1.5 miles of shoaling
- FY2024 – 2025 – Design
- FY2025 - 2027 – Construction Faka Union
- Planned \$3,500,000 Capital Investment

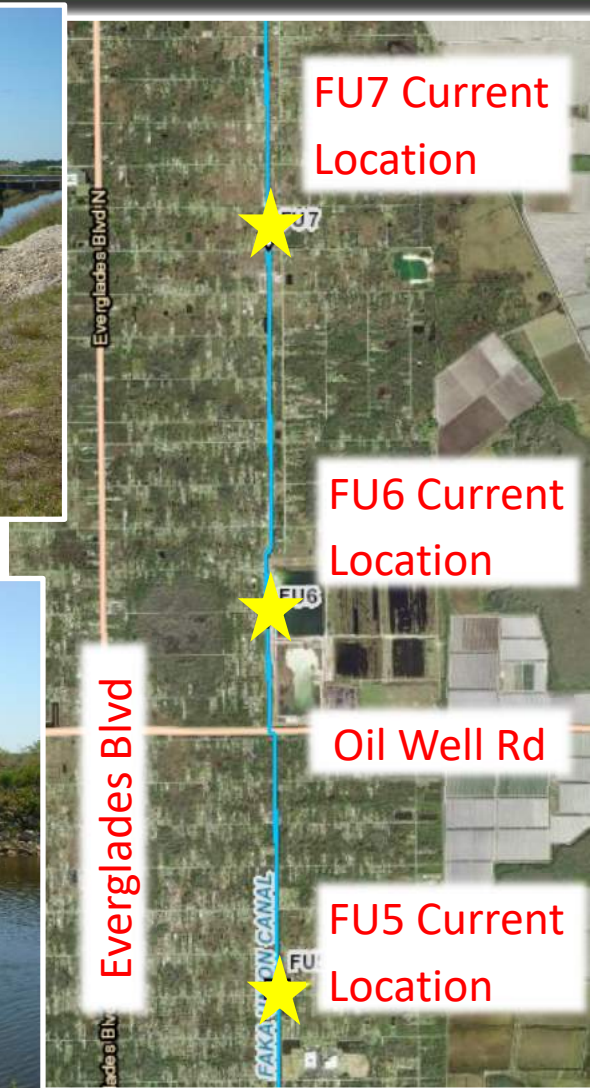


Shoaling Faka Union

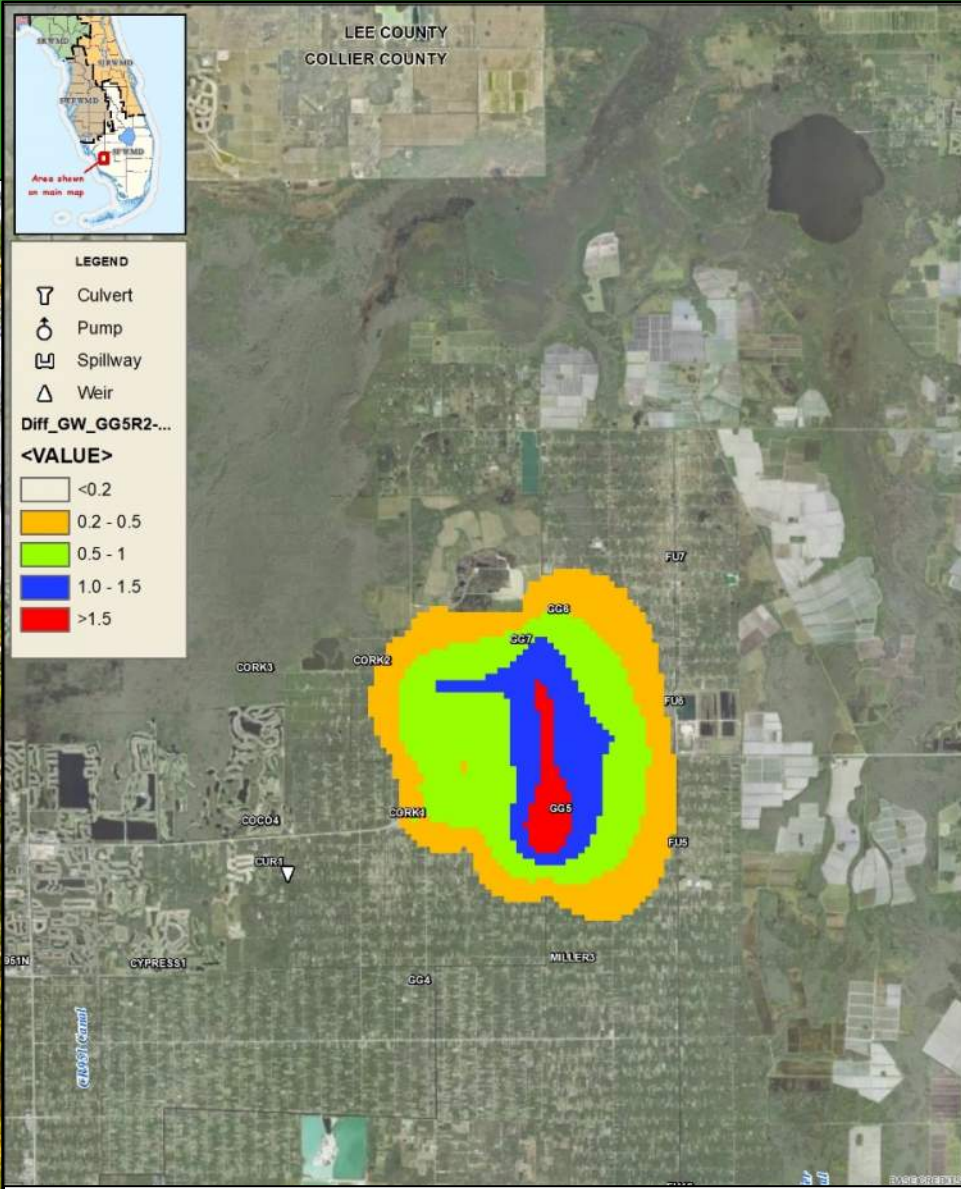


Upper Faka Union Improvements

- Goals
 - Increase flood protection level of service
 - Increase hydroperiod & depth for wetlands
 - Increase aquifer recharge
 - Reduce over drainage & protect water supply
- H&H study and design 2024 - 2026
- Construction (tentative) 2026 - 2028 (FU5 & FU6)
- Construction (tentative) 2032 - 2033 (FU7)
- Planned \$7,000,000 Capital Investment (FU5 & FU6)



Golden Gate #5 Replacement



GG5 Replacement Dry Season Groundwater Improvement

- GG5 Replacement H&H Study & Siting Analysis
 - Optimized location for replacement structure
 - Rapid growth & development in region
- Existing structure
 - Over drains groundwater
 - Manual operations & limited pre-storm draw-down capability
- H&H Goals & Constraints
 - Improve flood control level of service
 - Increase surface & surficial aquifer water levels when hydrologically appropriate
 - Reduce over-drainage & discharges to Naples Bay
 - Improve canal system response
- FY2024-25 – Right of Way Acquisition (\$650,000)
- Planned \$8,000,000 Capital Investment

Collier County Improvement/Operations Plans for Underground Infrastructure



- **Program Description:**
 - Sweepers provide proactive maintenance to our stormwater systems by removing debris and pollutants from roadways before they enter our drains.
 - This is a primary maintenance type for the Municipal Separate Storm Sewer System permit (MS4 Permit) that is designed to reduce the amount of sediment and other pollutants entering our system.
 - The other method of maintenance is done in our Vac-trucks for local system cleaning. They clean our county on a five-year TRS system ensuring that culvert pipes and underground systems in front of homes and some commercial areas are cleaned out and ready to take on stormwater.



Collier County Improvement/Operations Plans Canals and Ditches



- **Program Description:**
- Teams utilizes Mechanical Harvesting methods to reduce the use of selective treatment applications in certain areas.
- Adding in Debris booms assists our harvesting program heavy equipment easy and direct access.
- Herbicide treatments are used in conjunction with the Harvesting program to get the best result possible.
- By implementing a comprehensive approach to weed control in our stormwater systems we can effectively manage vegetation. This will reduce maintenance costs, enhance water quality, and protect the long-term functionality of their drainage capacity.

Clean, View, & Repair Program

➤ Program Description:

- Utilizes a mixture vac-trucks, camera equipment, and construction crews. This program focuses on Arterial roadways where the systems are more impacted by debris and systems are updated less often.
- Underground Systems are cleaned thoroughly, removing all debris, capped off and dewatered for viewing.
- Camera viewing serves two purposes. It helps identify issues in under ground infrastructures current state and also keeps a historical log of our assets if needed after major events to assist in capturing state or federal funding.
- Based on the viewing, plans can be developed ahead of major failures throughout the county while also spreading out the schedule of these repairs to help balance the budget.



Clean, View, & Repair Program



Collapsed Pipe



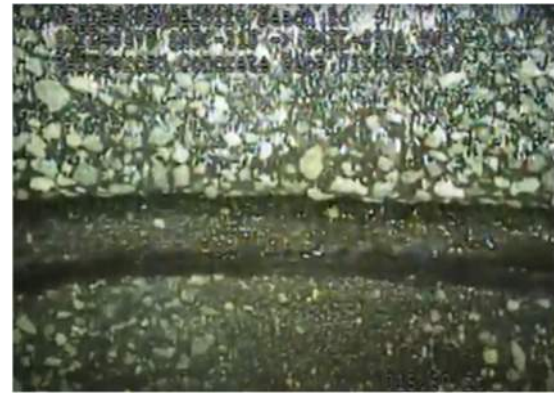
Warped/Collapsed Pipe



Water Infiltration



Water Infiltration



Joint Separation



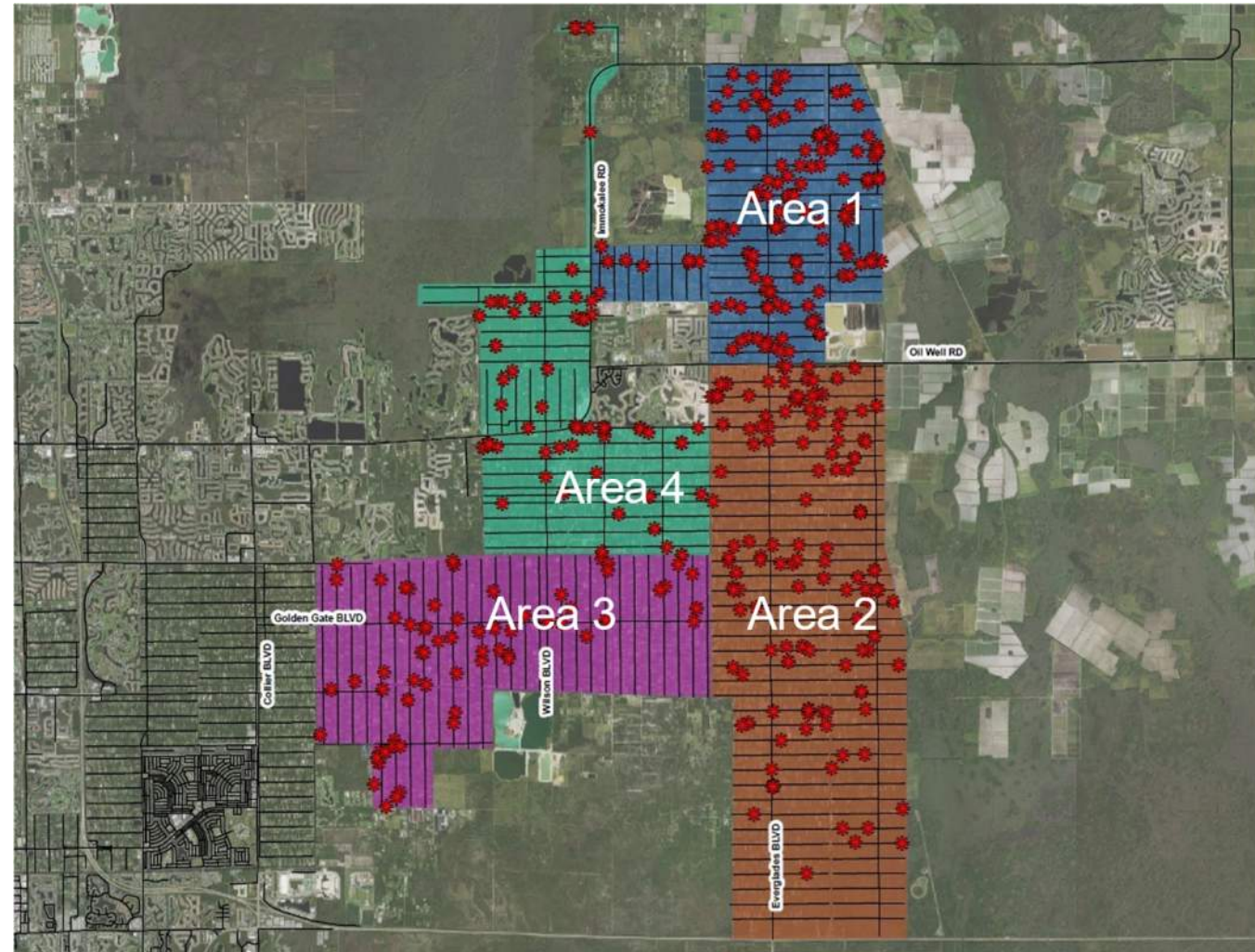
Joint Separation/Signs of Pipe Sinking



Estates Swale Maintenance and Restoration Program



- Four (4) work areas based on historical requests
- Eight (8) months of dedicated, proactive swale maintenance
- Four (4) months of rainy season, crews will also be available county-wide for flooding concerns, as needed



Swale Program Composition



Field Supervisor II

Execute long range plan and plan weekly progress for program



Crew Leader I

Leads employees in the field, Monitors on site progress



Gen Maint Specialist II (4)

Control traffic within limits of work zone and manual labor.



Heavy Equip Operator
Excavator

Utilize equipment, Excavators, boom mowers



Equip Operator I (2)

Utilize hand equipment, skid steer, dump trucks



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Leads employees in the field, Monitors on site progress



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Utilize equipment, Excavators, boom mowers



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Utilize hand equipment, skid steer, dump trucks



Proactive Swale Program Impact

Increase from 3-5 swale miles per year to an estimated **50 swale miles** per year

Reduce program cycle from 100+ years to an estimated **13 years**

Decrease number of crisis-based service requests and **increase level of service** through proactive measures

Strategic Plan Objectives

- ✓ Support and enhance our commitment to robust public safety services
- ✓ Develop integrated and sustainable plans to protect and manage water resources
- ✓ Prepare for the impacts of natural disasters on our critical infrastructure and natural resources
- ✓ Optimize the useful life of all public infrastructure and resources through proper planning and preventative maintenance



What Can You Do to Help the Stormwater System

- **Select the proper plants, mulch & irrigation to minimize weed growth and runoff pollution.**
- **Swales are best for Stormwater functionality, creating more open channels will benefit everyone in the area.**
- **Keep roadside swales free and clear of debris. Do not blow grass clippings in the swale.**
- **Report Illegal dumping, removing debris ahead of storms is critical.**
- **If you see something, say something. You are the best eyes on the system.**





Who to Contact

Canals: Big Cypress Basin Field Station

Phone: 239-348-7530

Email: awolf@sfwmd.gov

<https://www.sfwmd.gov/contact>

Roads, Ditches, Swales: Collier County Road, Bridge, and Stormwater Maintenance

Phone: 239-252-8924

Email: roadmaintenance@colliercountyfl.gov

Dial 311



Collier County[™]
POLLUTION CONTROL
LIVE GREEN. SAVE BLUE.

East of 951 Advisory Committee

May 21, 2024

Chad Ward, P.G., Pollution Control Manager

Why Sucralose

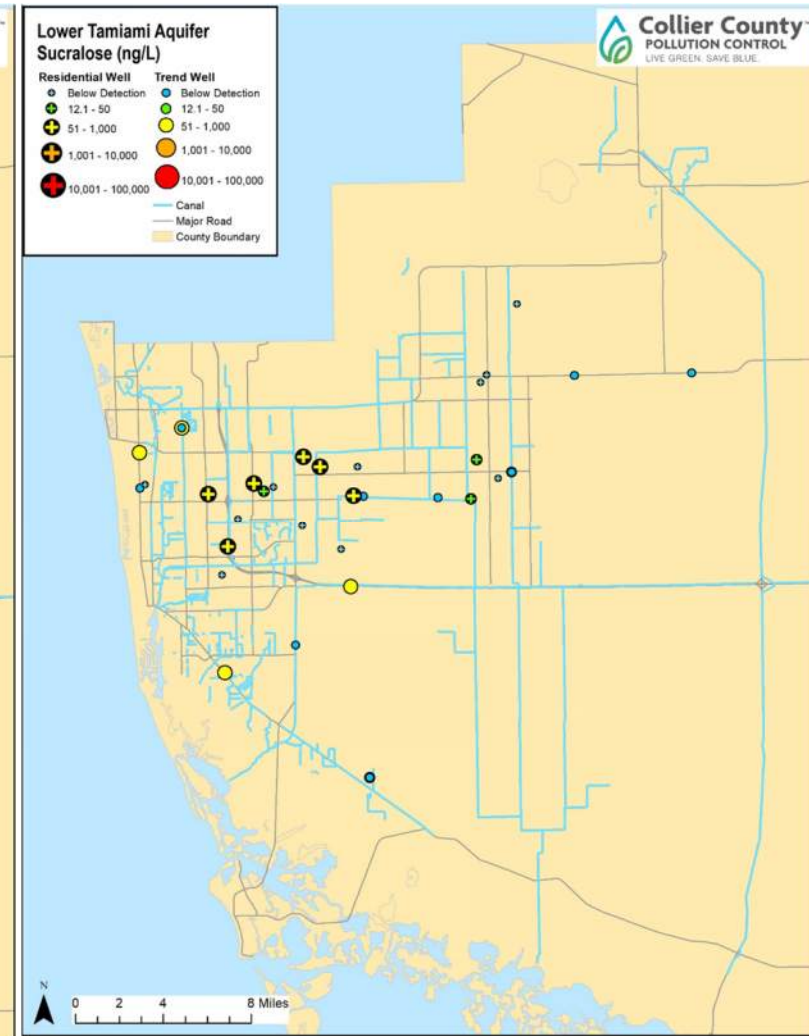
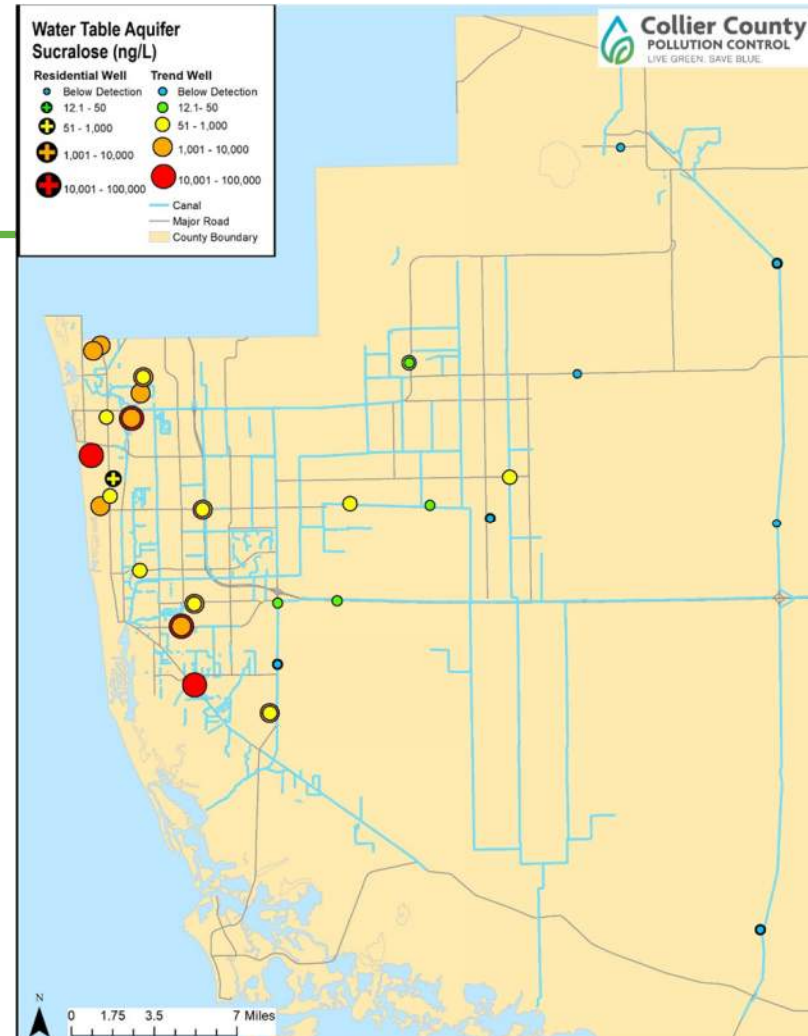
- Fecal Indicator Bacteria:
 - Can continue to grow in the environment
 - Can be human or animal
- Sucralose:
 - Not metabolized by the body
 - Not removed by conventional wastewater treatment process



Sucralose Sampling

Groundwater

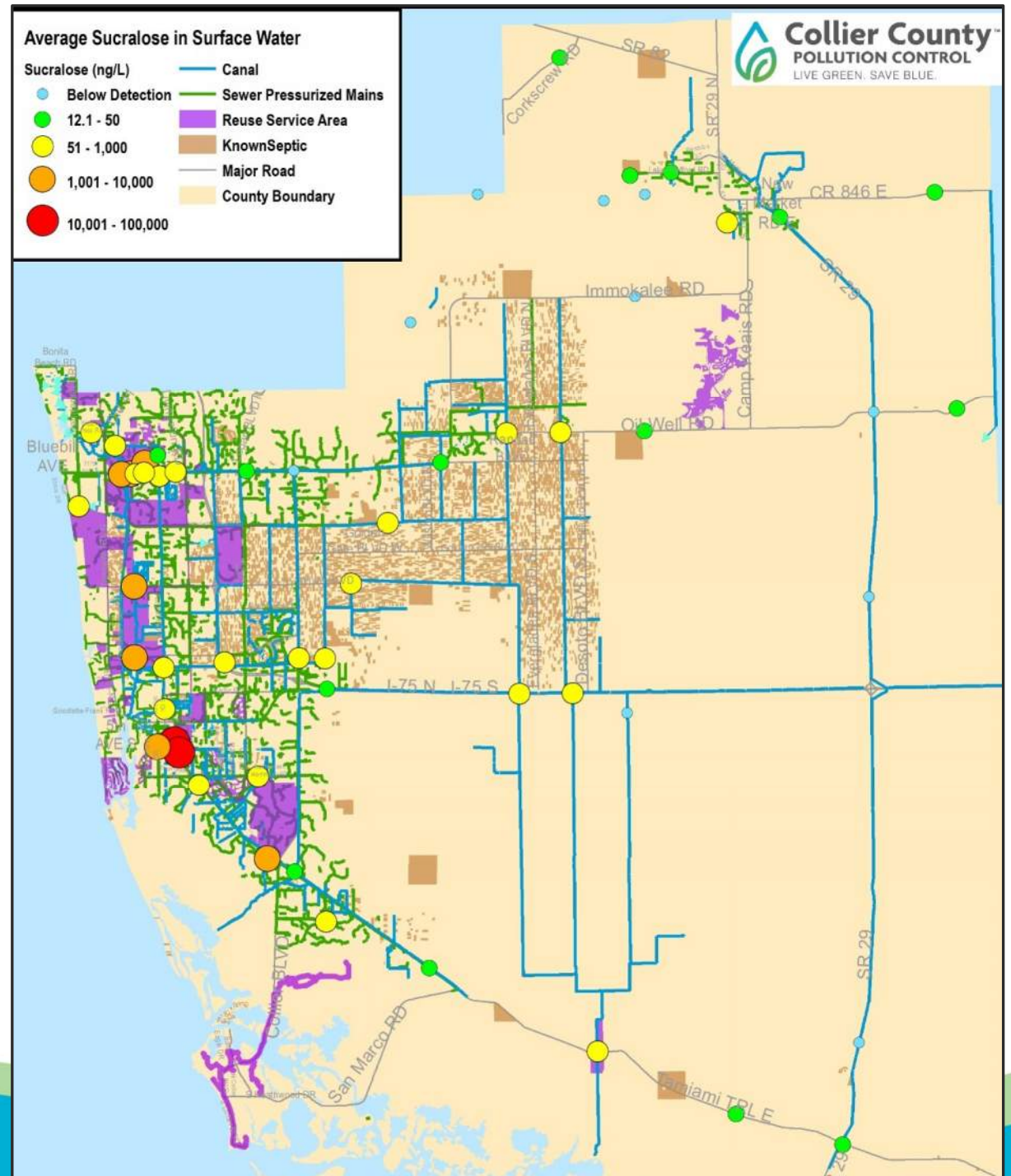
- 51 monitoring wells in 4 aquifers
 - Collected wet-season dry-season 2017
- 24 Residential potable drinking water wells
 - Collected wet-season 2017



Sucralose Sampling

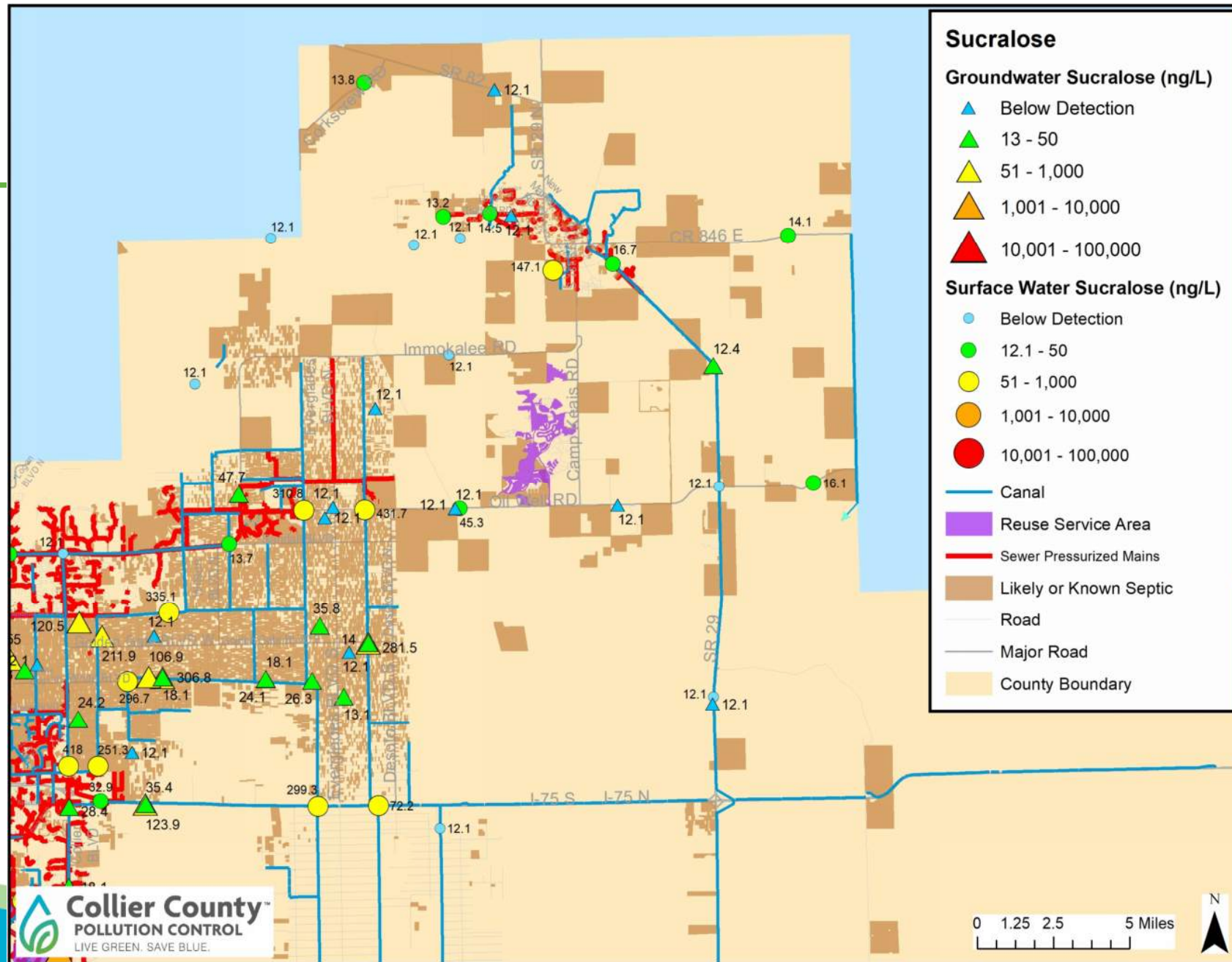
Surface Water

- 57 sampling sites
 - Collected Quarterly
 - 2019 - 2021



Sucralose Results

- Groundwater
 - Water Table Aquifer
 - Lower Tamiami Aquifer
- Surface Water



Working Together to Improve Water Quality

What Are We Doing

- Continue monitoring
- Conduct source tracking
- Promptly repair/replace any compromised infrastructure

What Can You Do

- Maintain / repair / or replace your septic system
 - Think at the sink
 - Don't strain your drain
 - Shield your field



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POLLUTION CONTROL
LIVE GREEN. SAVE BLUE.

Thank You!

Live Green. Save Blue. Report Pollution.