



**Collier County**<sup>™</sup>  
**POLLUTION CONTROL**  
LIVE GREEN. SAVE BLUE.

# COLLIER COUNTY WATER QUALITY MONITORING

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**PRESENTATION TO BIG CYPRESS BASIN BOARD**

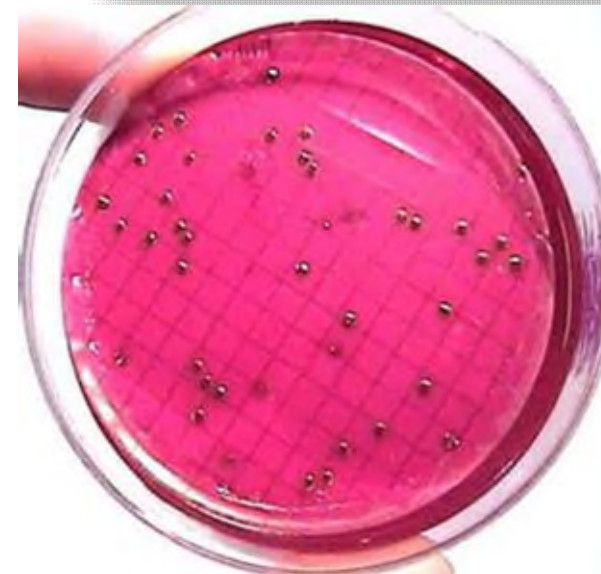
**Rhonda J. Watkins**

**April 22, 2021**

**Presenter: Rhonda Watkins**

# Pollution Control

- In-house laboratory
  - National Environmental Laboratory Accreditation Conference certified for over 75 drinking water and environmental water analytes.
- National Environmental Field Activities Program certified sampling program
  - 1<sup>st</sup> government agency in Florida to receive certification
  - Follow Florida Department of Environmental Protection (FDEP) Standard Operating Procedures
- Over 20 years of sampling and analysis
- Sample and analyze for internal and external clients





# Partnership with Big Cypress Basin

- Since 1998
- Surface and groundwater
  - Trend monitoring
  - Impaired waters assessment
  - Source tracking

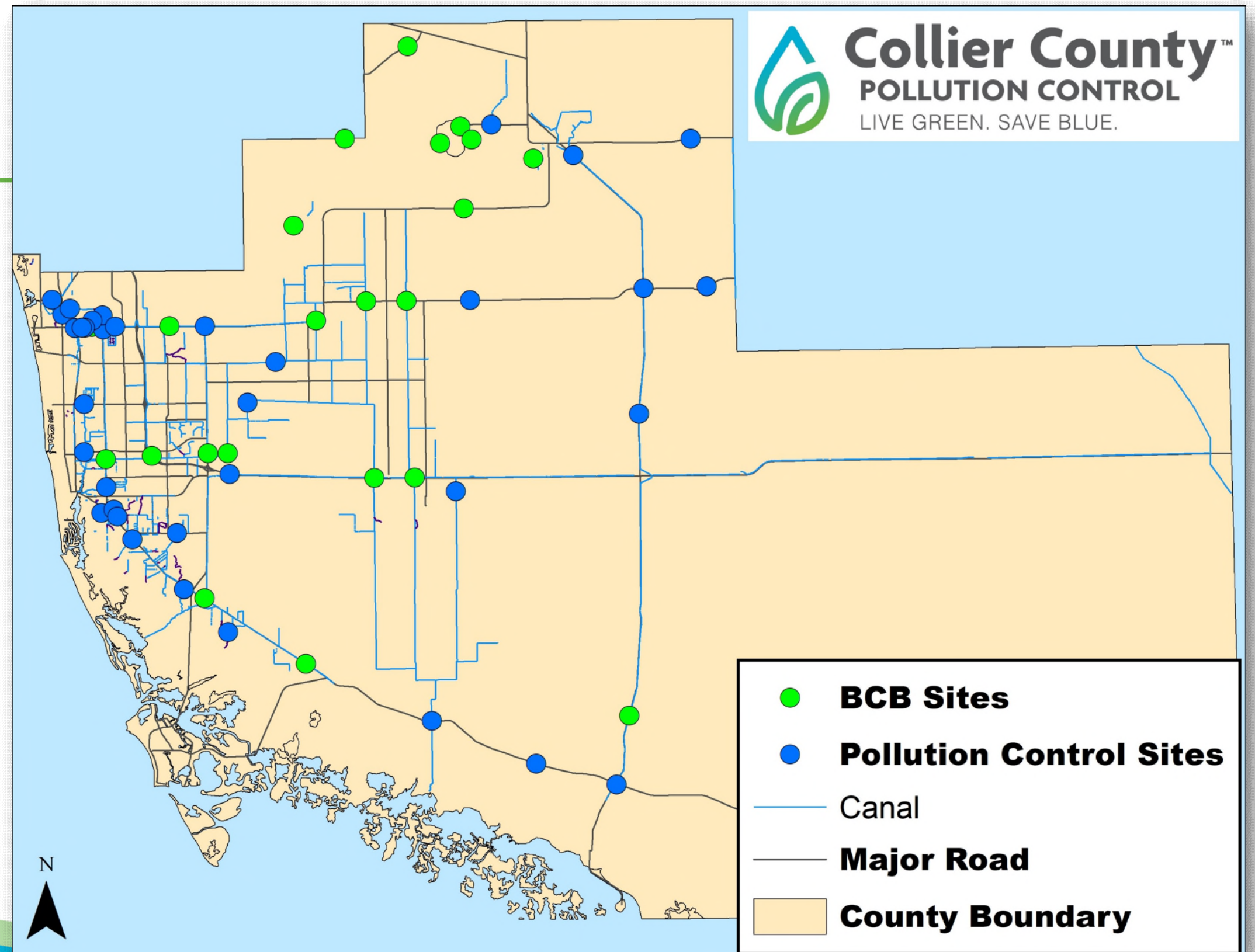


*Henderson Creek Weir #1 Site BC22*



# Surface Water Monitoring

- Trend Network
  - 54 sites
    - 17 BCB sites
  - Monthly
  - 1998-present
- Lake Trafford Watershed
  - 5 Sites
  - Monthly
  - 1996-present





# Surface Water Parameters

## Trend Monitoring

|                            |                        |
|----------------------------|------------------------|
| Dissolved Oxygen           | Total Organic Carbon   |
| Temperature                | Total phosphorus       |
| pH                         | Total suspended solids |
| Specific Conductance       | Turbidity              |
| Salinity                   | Arsenic                |
| Secchi depth               | Cadmium                |
| Ammonia                    | Calcium                |
| Biochemical Oxygen Demand  | Chloride               |
| Chlorophyll-a              | Chromium               |
| Color                      | Copper                 |
| E. Coli or Enterococcus    | Hardness               |
| Nitrate (NO <sub>3</sub> ) | Iron                   |
| Nitrite (NO <sub>2</sub> ) | Lead                   |
| Orthophosphate             | Magnesium              |
| Phaeophytin                | Sulfate                |
| Total Kjeldahl Nitrogen    | Zinc                   |

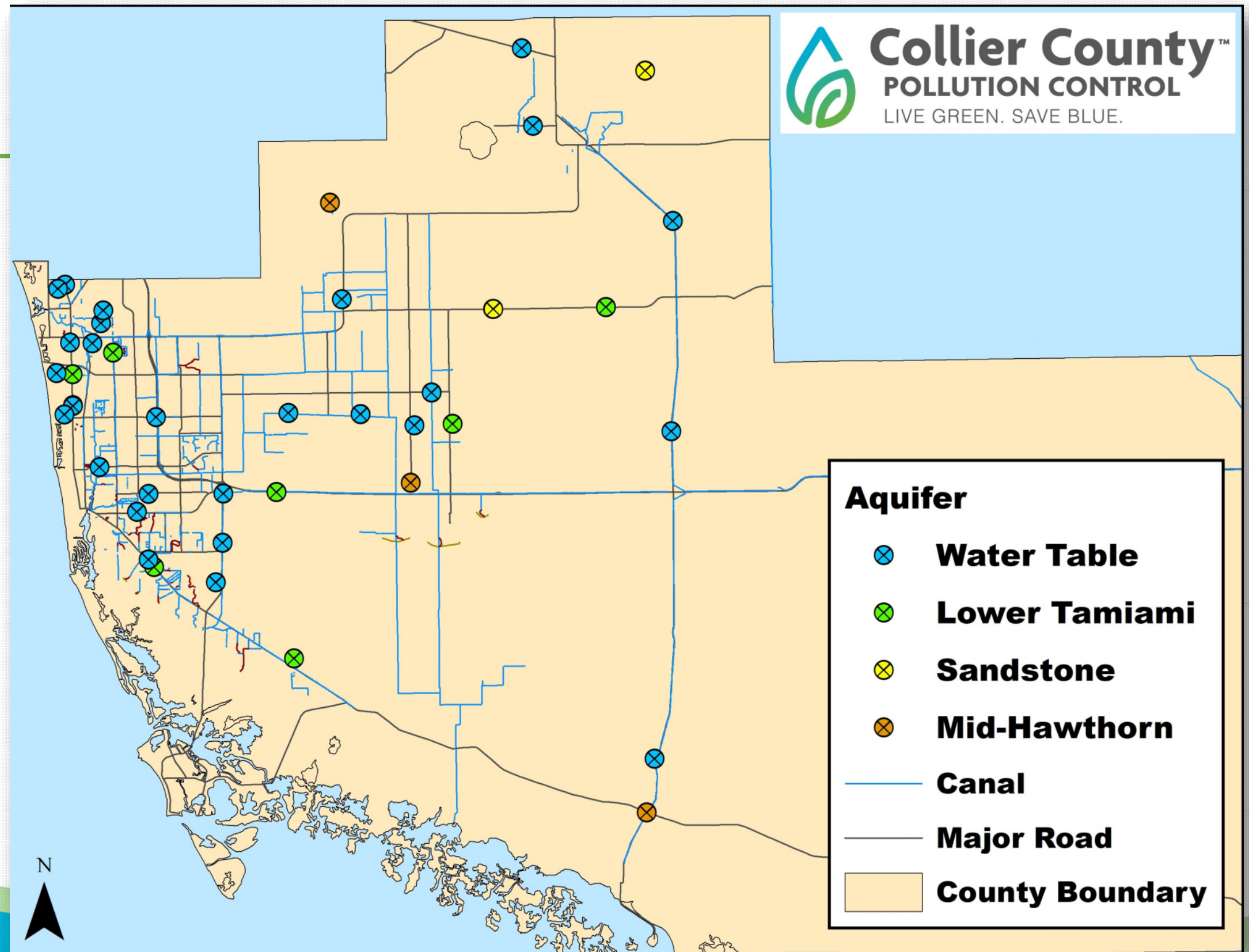
## Lake Trafford Monitoring

|                            |
|----------------------------|
| Dissolved oxygen           |
| Temperature                |
| pH                         |
| Specific conductivity      |
| Alkalinity                 |
| Ammonia                    |
| Biochemical Oxygen Demand  |
| Chlorophyll-a              |
| Color                      |
| Nitrate (NO <sub>3</sub> ) |
| Nitrite (NO <sub>2</sub> ) |
| Ortho-phosphate            |
| Phaeophytin                |
| Silica                     |
| Total Kjeldahl Nitrogen    |
| Total phosphorus           |
| Total Organic Carbon       |
| Total suspended solids     |
| Turbidity                  |



# Groundwater Monitoring

- Trend Network
  - 50 Sites
  - Sampled Wet/Dry Season
  - 2006-present





# FY20 Sampling Year Challenges

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- COVID-19
- Field team assignments
- Lab shut down
- Work remotely
- Sucralose analysis
- No hurricanes!

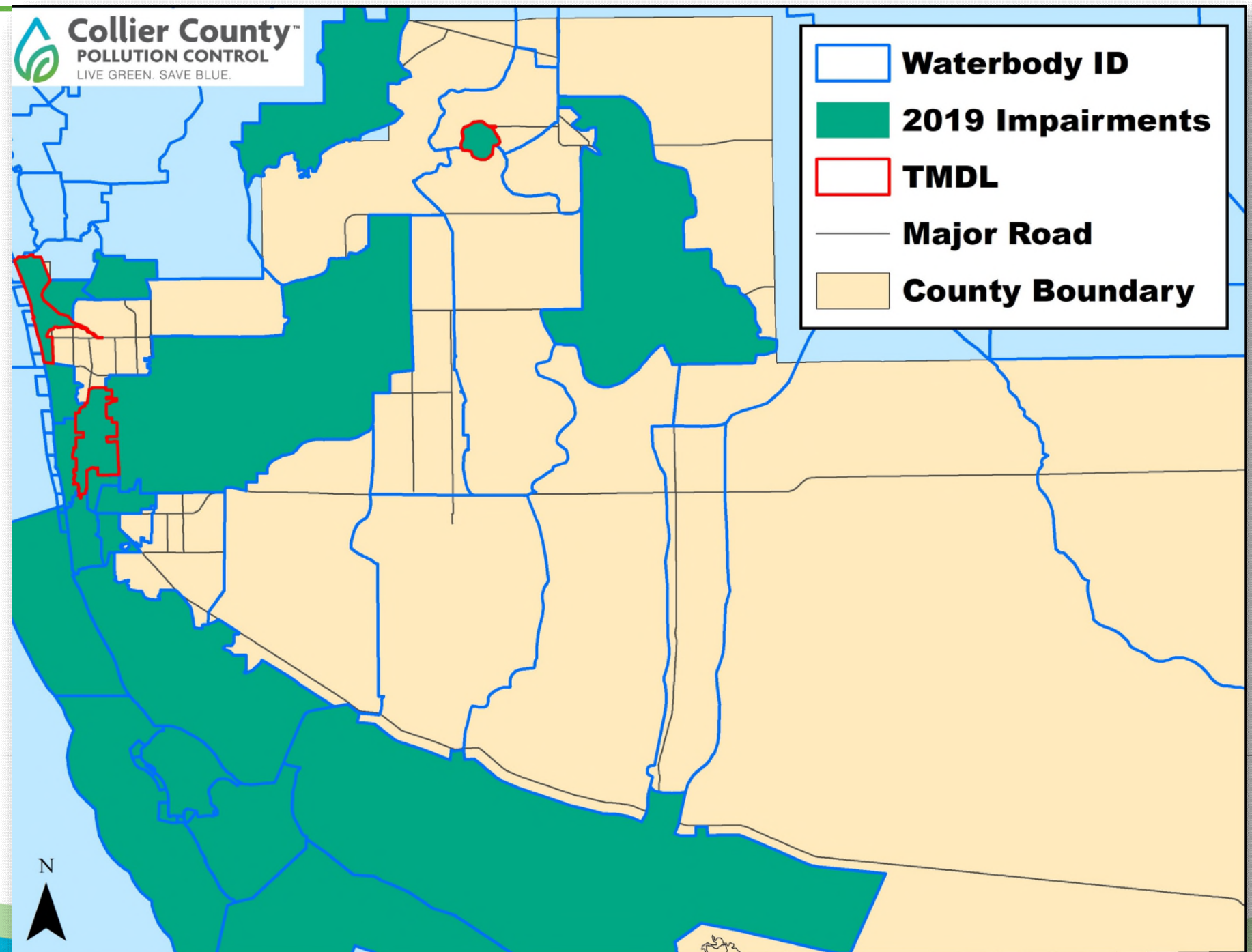
**ONLY MISSED 1  
SAMPLE AND  
ANALYSIS**





# Current Impairments—FDEP

- **2019 Impairments—not meeting designated use**
  - 21 Waterbodies
  - 48 Impairments
    - Copper
    - Dissolved oxygen
    - Bacteria
    - Iron
    - Nitrogen
    - Phosphorus
    - Chlorophyll
- **Completed Every 5 years**
  - Maybe every 2 years





# Assessment of Water Quality Standards

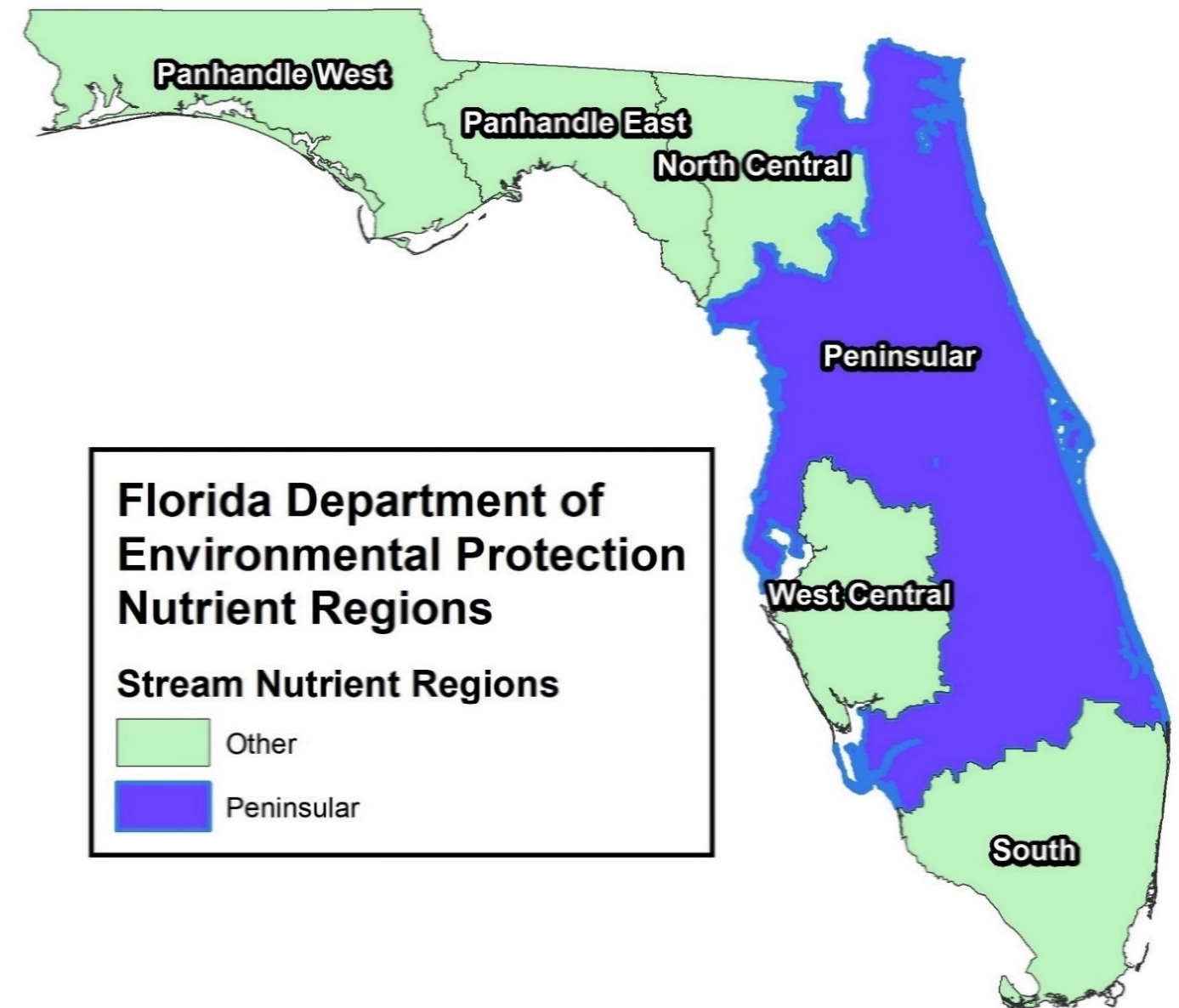
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- Florida Administrative Code 62-302
  - Some based on complex equations using other parameters
  - Annual geometric means
  - Not to exceed once in 3 years
  - Based on all the stations in a basin
  - Numeric Nutrient (nitrogen and phosphorus) Standards
    - Lake Trafford
    - Gordon River (Total Maximum Daily Load)
    - All the estuaries
    - **None** for freshwater canals in Collier



# Assessment of Water Quality Standards

- In the absence nutrient standards in canals
  - Peninsular Nutrient Standards for Streams
    - Total Nitrogen 1.54 mg/L
    - Total Phosphorus 0.12 mg/L
  - Chlorophyll-a 20ug/L
- Screening tools, not true “exceedances”



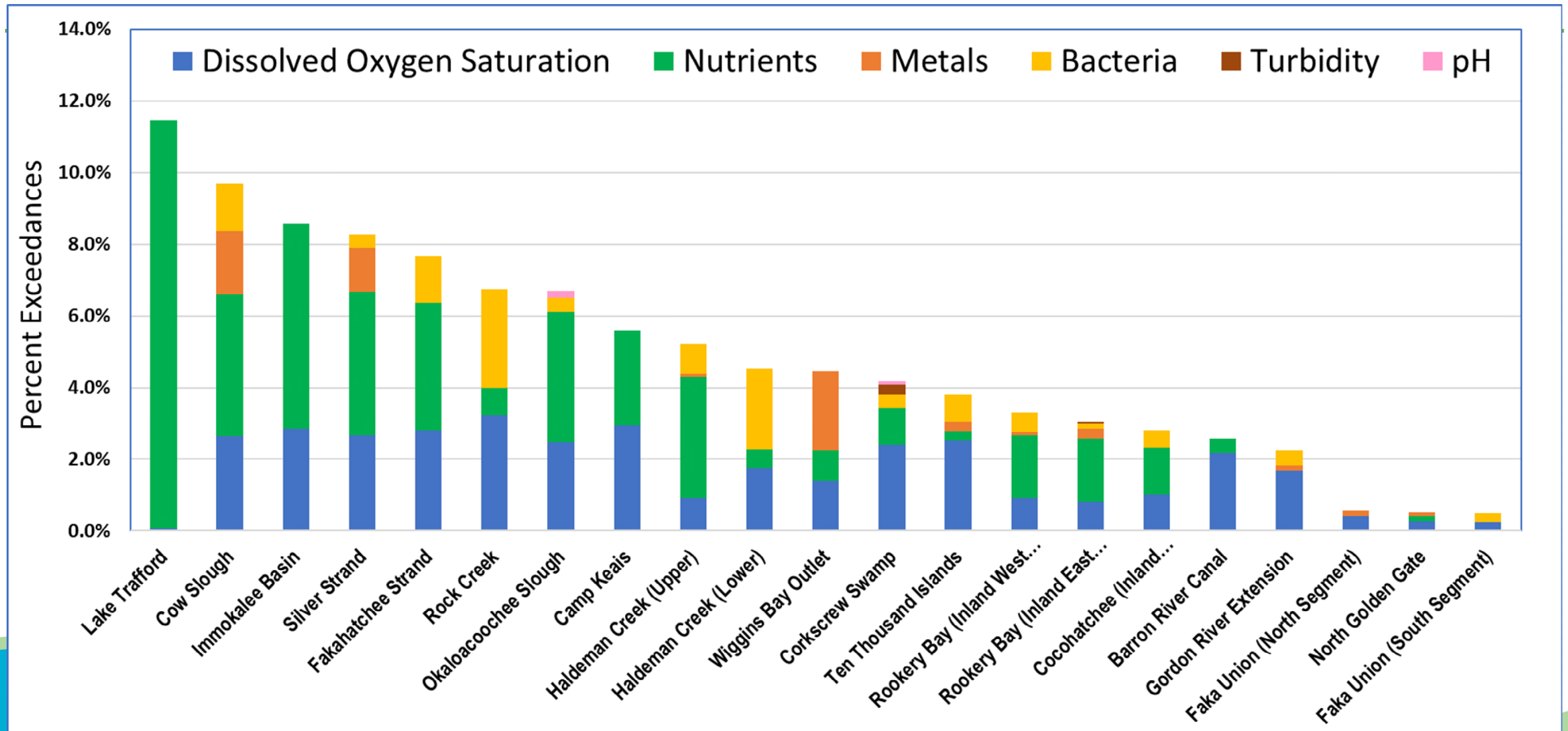


# FY20 Assessment

| Parameter                   | # of Exceedances |     | % of Samples that Exceeded |
|-----------------------------|------------------|-----|----------------------------|
|                             | Season           |     |                            |
|                             | Dry              | Wet |                            |
| Dissolved Oxygen Saturation | 129              | 120 | 34.5%                      |
| Chlorophyll-a               | 91               | 44  | 18.7%                      |
| Phosphorus- Total           | 77               | 58  | 18.7%                      |
| Total Nitrogen              | 71               | 47  | 16.3%                      |
| Escherichia coli (MPN)      | 41               | 17  | 8.0%                       |
| Iron                        | 19               | 15  | 4.7%                       |
| Enterococci (MPN)           | 13               | 10  | 3.2%                       |
| Turbidity                   | 2                | 2   | 0.6%                       |
| Copper                      | 1                | 1   | 0.3%                       |
| pH                          | 1                | 1   | 0.3%                       |

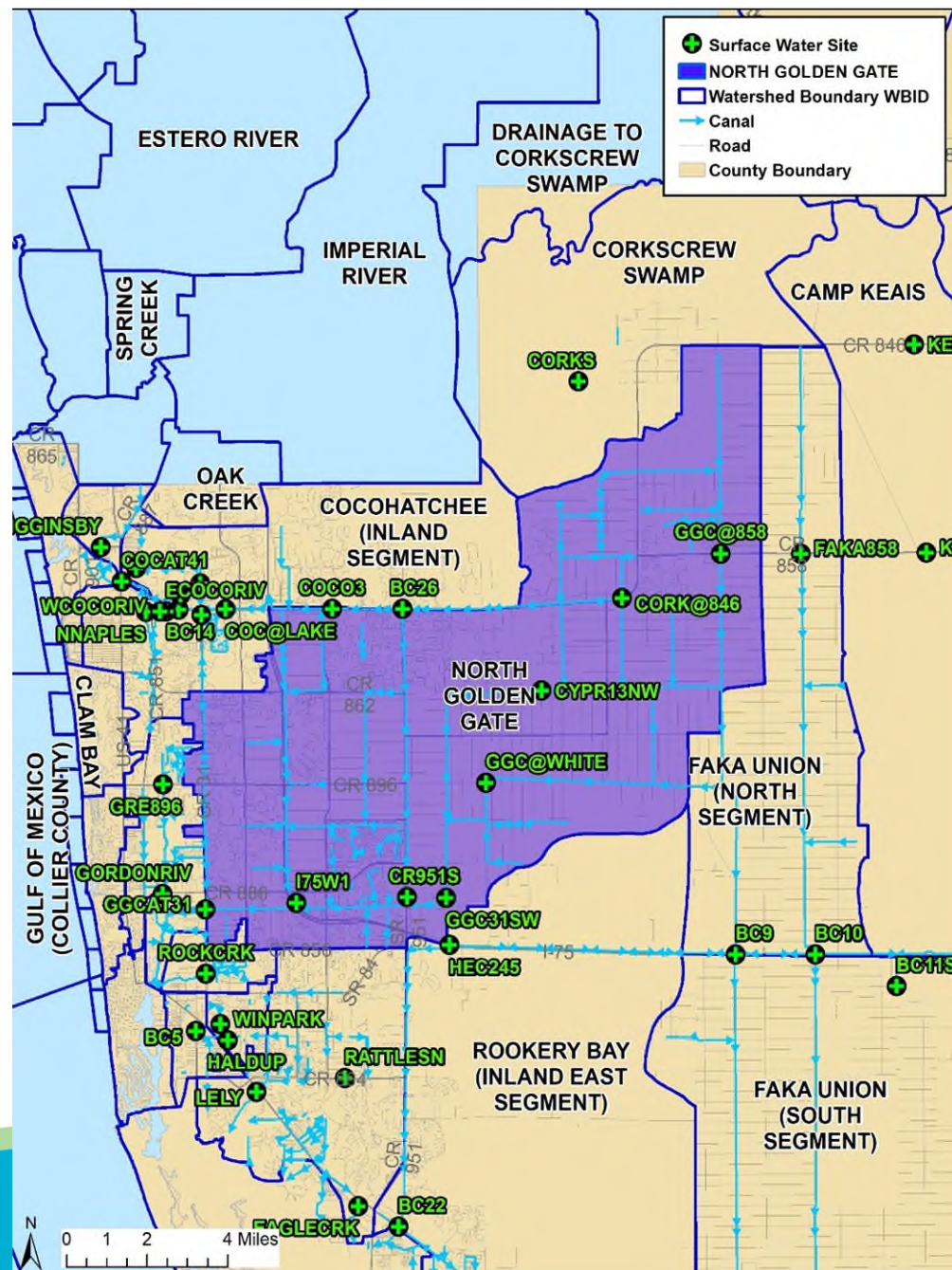
- Dissolved oxygen most exceeded
- Remember...
  - No nutrient standards for canals!
- Seasonal Variation
  - Chlorophyll
  - E. Coli
  - Nutrients

# FY20 Assessment by Waterbody





# FY20 Annual Surface Water Report



## NORTH GOLDEN GATE

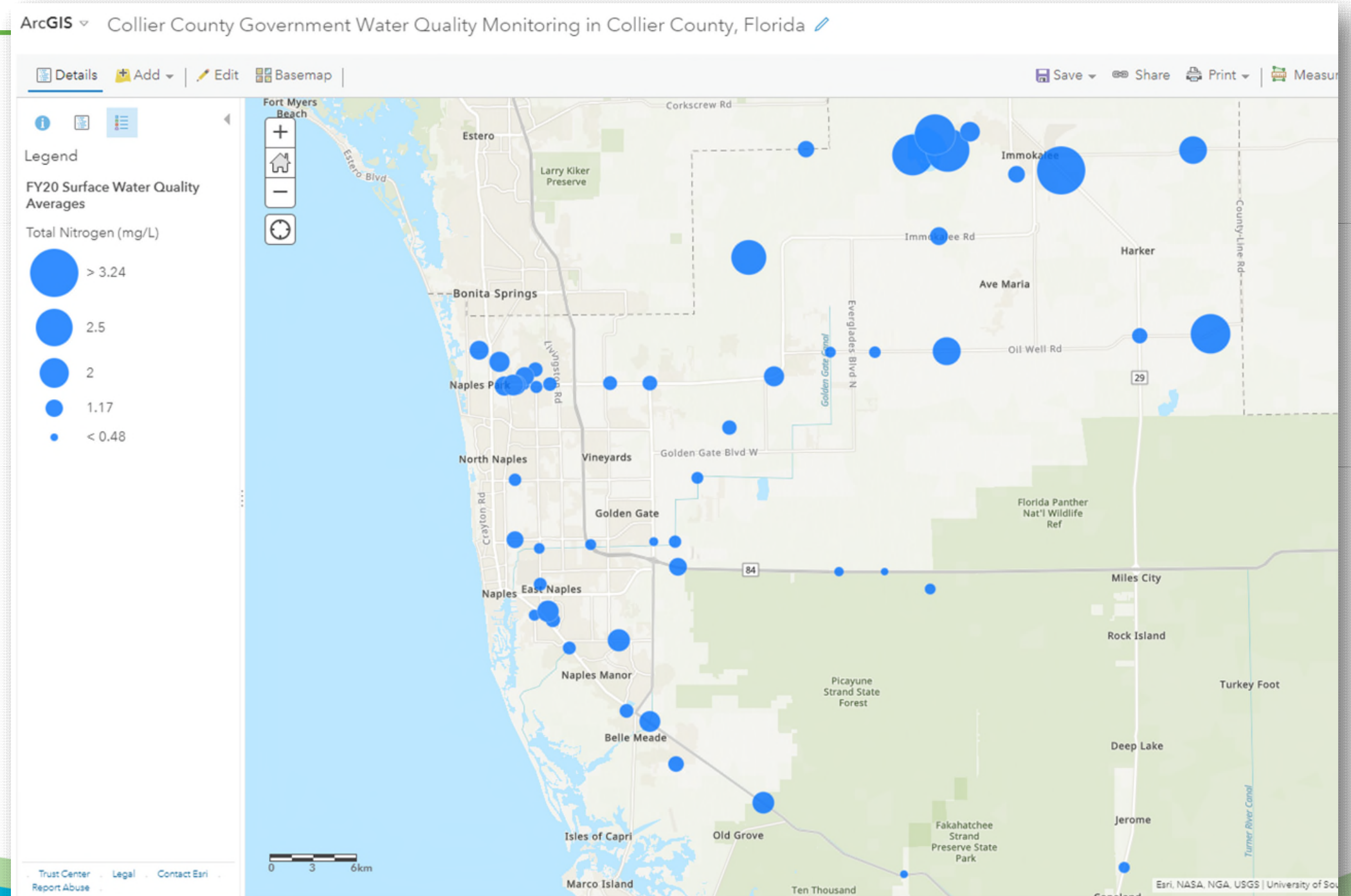
- Size: 72,785 acres
- Classification: Class III Fresh
- Drainage:
  - Receives from: Corkscrew Swamp, Cocohatchee (Inland Segment), Faka Union (North Segment)
  - Drains to: Cocohatchee (Inland Segment), Naples Bay (Coastal Segment), Faka Union (North Segment), Rookery Bay (Inland East Segment)
- Major Land Use(s):
  - Urban and Built Up 60%
    - Residential Low Density 60%
    - Residential Medium Density 15%
    - Residential High Density 7%
    - Recreational 7%
    - Institutional 3%
    - Commercial and Services 3%
    - Extractive 2.5
    - Open Land 2%
    - Industrial 0.7%
  - Wetlands 21%
- FDEP Impairments 2019: Dissolved Oxygen
- Water Quality Trends:
  - Short-term Improving: Iron, Total Nitrogen
  - Short-term Degrading: Copper
  - Long-term Improving: Nitrate-nitrite, Total Phosphorus
  - Long-term Degrading: Salinity
- Total# of FY20 Exceedances: [17](#)
- Summary Statistics: [Appendix C](#)

| WBID/STATION/PARAMETER      | # of Exceedances | Total # of Samples | % Exceeds   |
|-----------------------------|------------------|--------------------|-------------|
| <b>North Golden Gate</b>    | <b>17</b>        | <b>3262</b>        | <b>0.5%</b> |
| <b>CORK@846</b>             | <b>6</b>         | <b>393</b>         | 1.5%        |
| Chlorophyll a- corrected    | 2                | 12                 | 16.7%       |
| Dissolved Oxygen Saturation | 2                | 12                 | 16.7%       |
| Total Nitrogen              | 2                | 12                 | 16.7%       |
| <b>CR951S</b>               | <b>1</b>         | <b>394</b>         | 0.3%        |
| Dissolved Oxygen Saturation | 1                | 12                 | 8.3%        |
| <b>CYPR13NW</b>             | <b>1</b>         | <b>413</b>         | 0.2%        |
| Dissolved Oxygen Saturation | 1                | 12                 | 8.3%        |
| <b>GGC@WHITE</b>            | <b>0</b>         | <b>423</b>         | 0.0%        |
| <b>GGC@858</b>              | <b>5</b>         | <b>435</b>         | 1.1%        |
| Dissolved Oxygen Saturation | 2                | 19                 | 10.5%       |
| Iron                        | 3                | 12                 | 25.0%       |
| <b>GGC31SW</b>              | <b>3</b>         | <b>382</b>         | 0.8%        |
| Dissolved Oxygen Saturation | 2                | 12                 | 16.7%       |
| Iron                        | 1                | 12                 | 8.3%        |
| <b>GGCAT31</b>              | <b>1</b>         | <b>428</b>         | 0.2%        |
| Dissolved Oxygen Saturation | 1                | 18                 | 5.6%        |



# Collier County Water Quality Monitoring Interactive Map

- Public website
- FY20 Water Quality Station Averages
- All Monitoring Sites
  - Surface/Groundwater
  - Current/Historical
- Current Impairments
- All monitoring data is publicly available
  - Florida Department of Environmental Protection's Watershed Information Network (WIN)





# Coming Up

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- Surface water trend report—2021
  - Done every 5 years
- Sediment Report—2021
  - Delayed due to COVID shutdowns
  - Done every 5 years
- Isotopes in Lake Trafford FY22





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# Questions?

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**Live Green. Save Blue.**

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**[www.LiveGreenSaveBlue.com](http://www.LiveGreenSaveBlue.com)**