Cooperative Management Initiative for St. Joseph Bay, Northwest Florida

July 16, 2020

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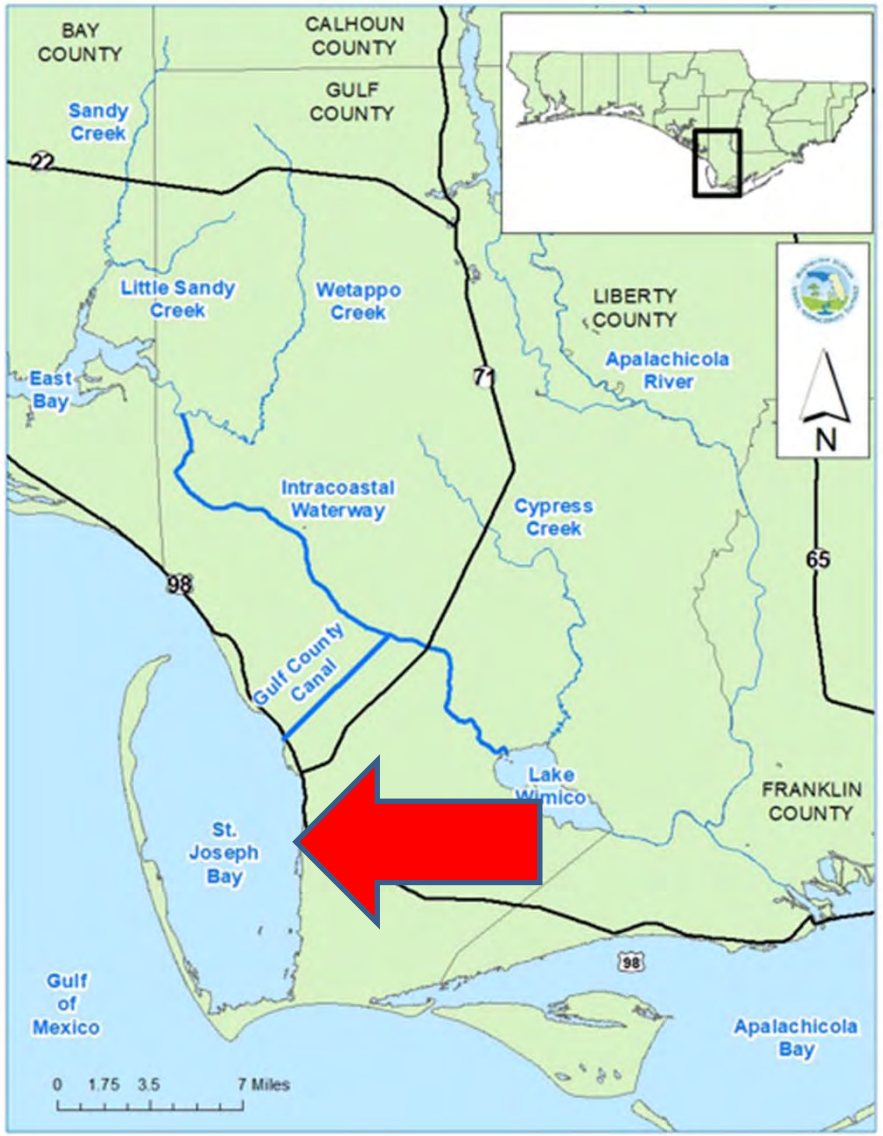
Program Manager, Minimum Flows and Levels

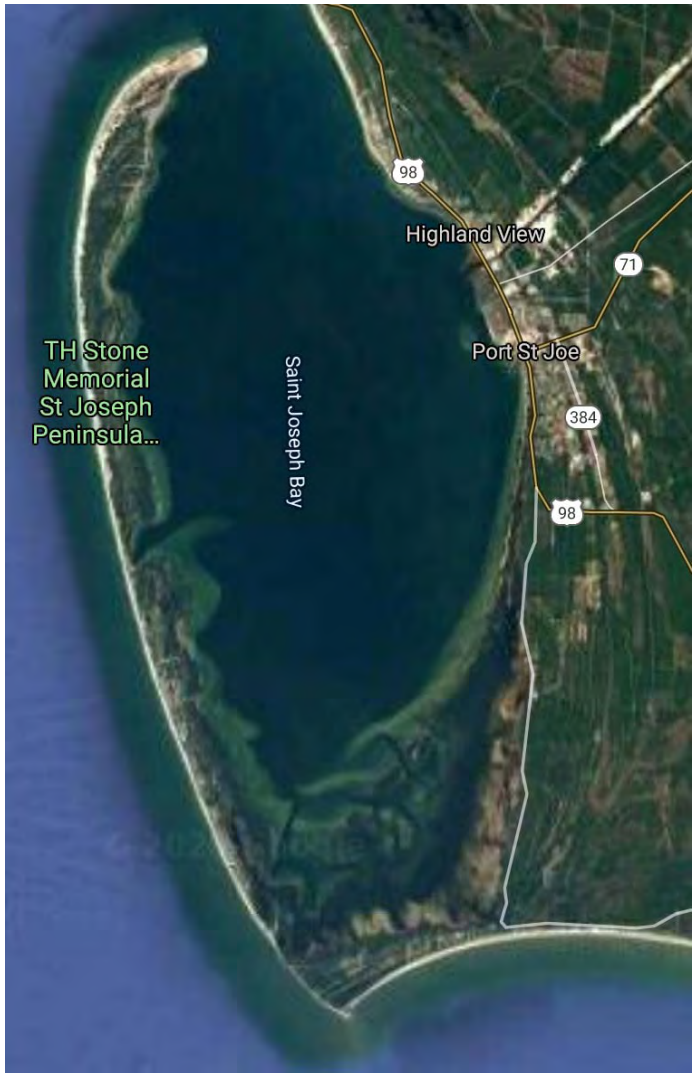
St. Joseph Bay

- Approximately 42,502 acres
- Bordered by:
  - St. Joseph Bay Peninsula
  - Cape San Blas
  - mainland Florida
- Mouth of bay = 1.7 miles
- City of Port St. Joe



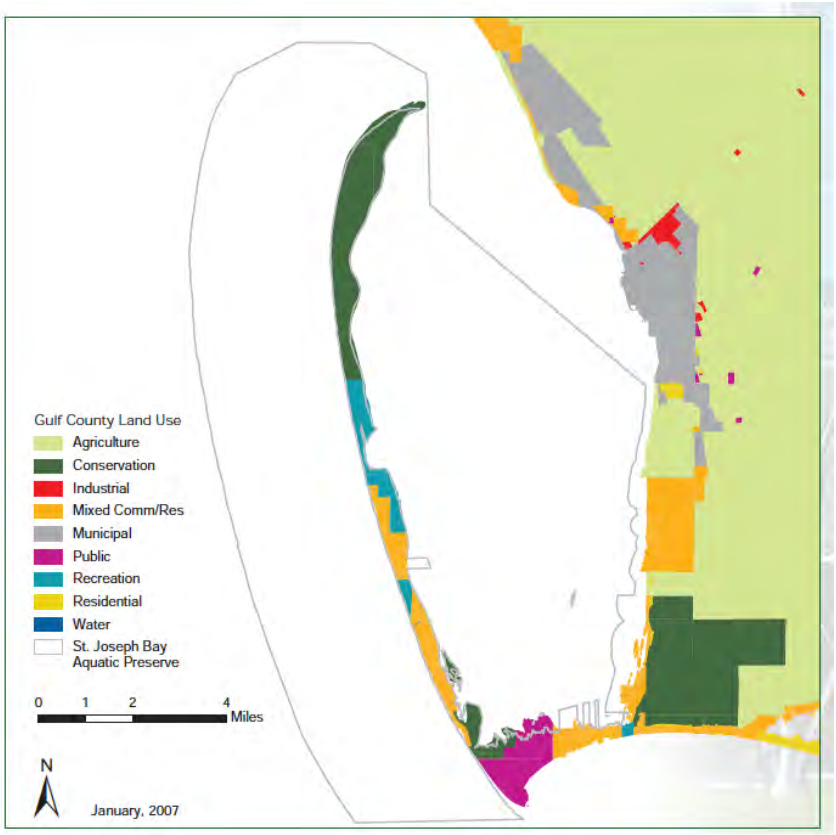
St. Joseph Bay

- Average depth = 21 ft (6.4 m)
- Bay is relatively saline
  - Few natural surface water inputs
    - Many small tidal creeks
  - Gulf County Canal
- Popular destination for scalloping, fishing, etc.
- St. Joseph Bay Aquatic Preserve created in 1969
- T.H. Stone Memorial Park



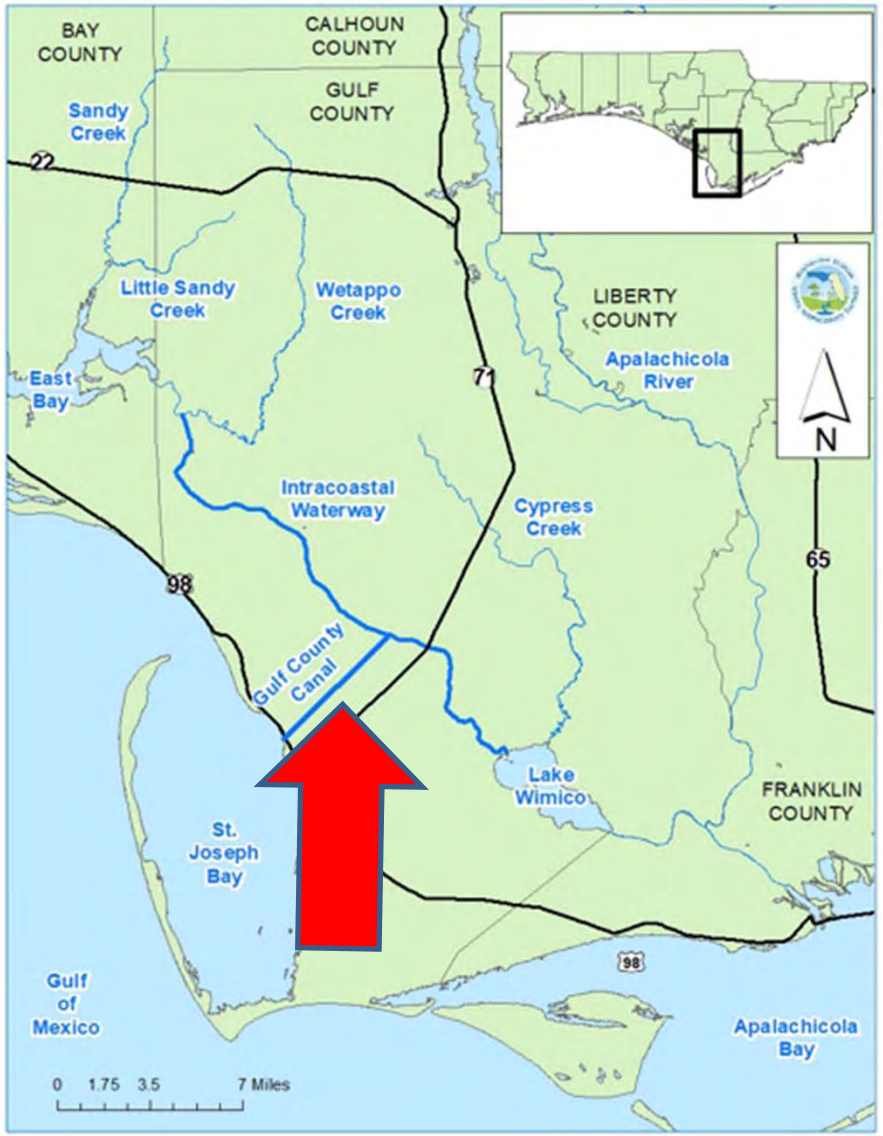
St. Joseph Bay Concerns

- Areas of Concern
  - Sea Grass Density and Coverage
  - Coastal Development and Land Use Changes
  - Water Quality
- DEP Impaired Water Bodies
  - Nutrients, Fecal coliform, bacteria
- Relatively Limited Development
  - Port St. Joe, Cape San Blas, St. Joe Peninsula
  - Numerous Septic Tanks, Largely Unverified
- Limited Natural Surface Water Inputs
- Gulf County Canal
  - Largest Waterway Connected to St. Joseph Bay



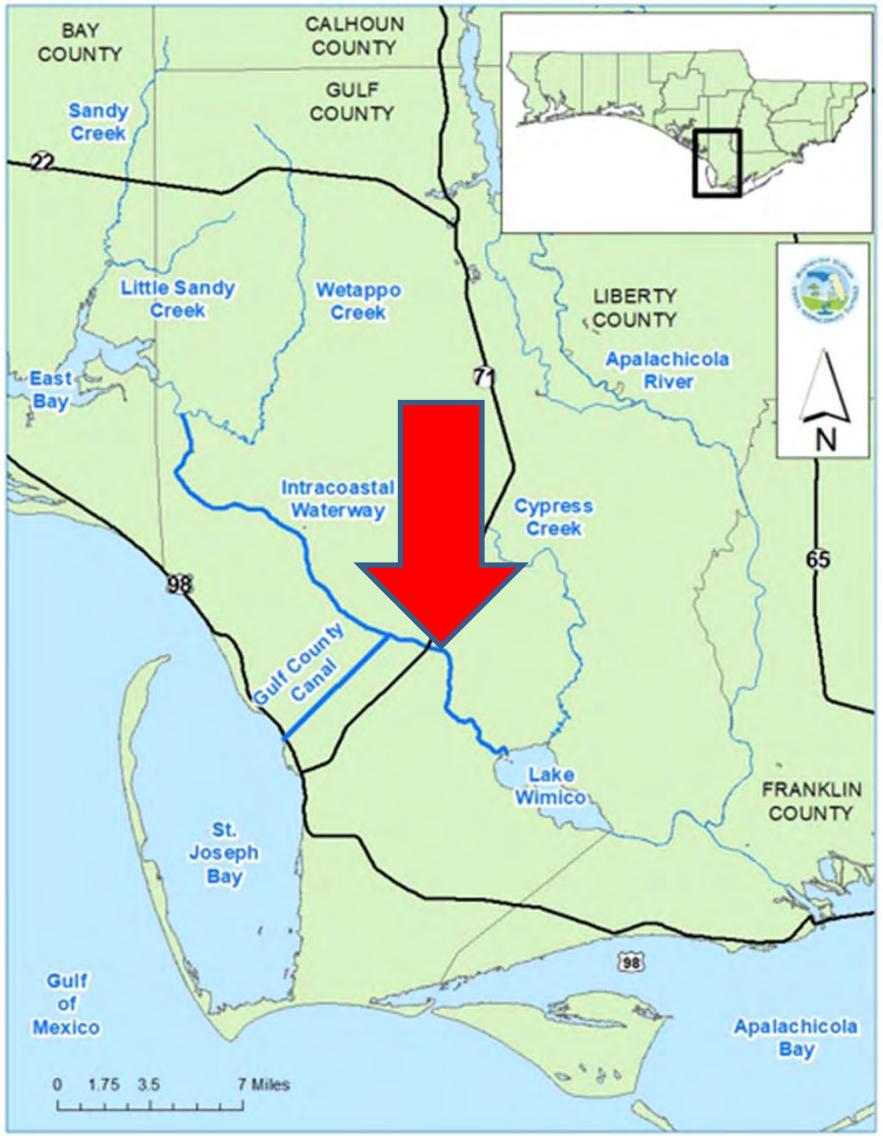
Gulf County Canal

- Finished in 1938
- Approved low water depth of between 6 and 8.9 ft
- Width
- Approximately 5.5 miles in length
- Connects Intracoastal Waterway to St. Joseph Bay



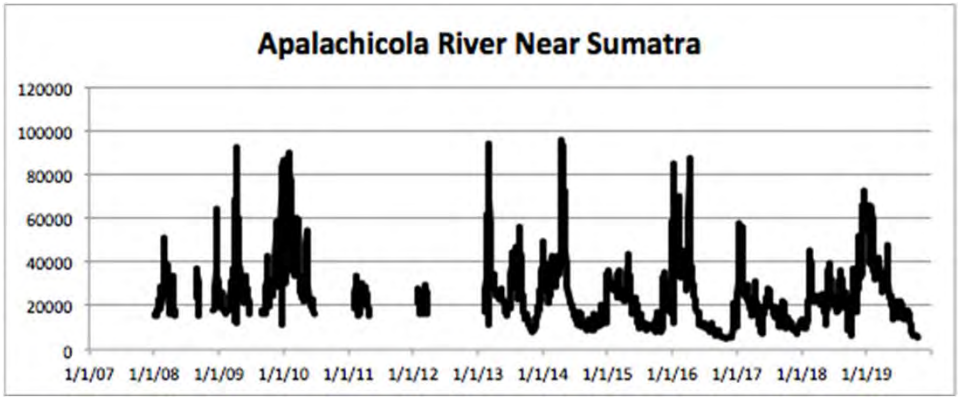
Intracoastal Waterway

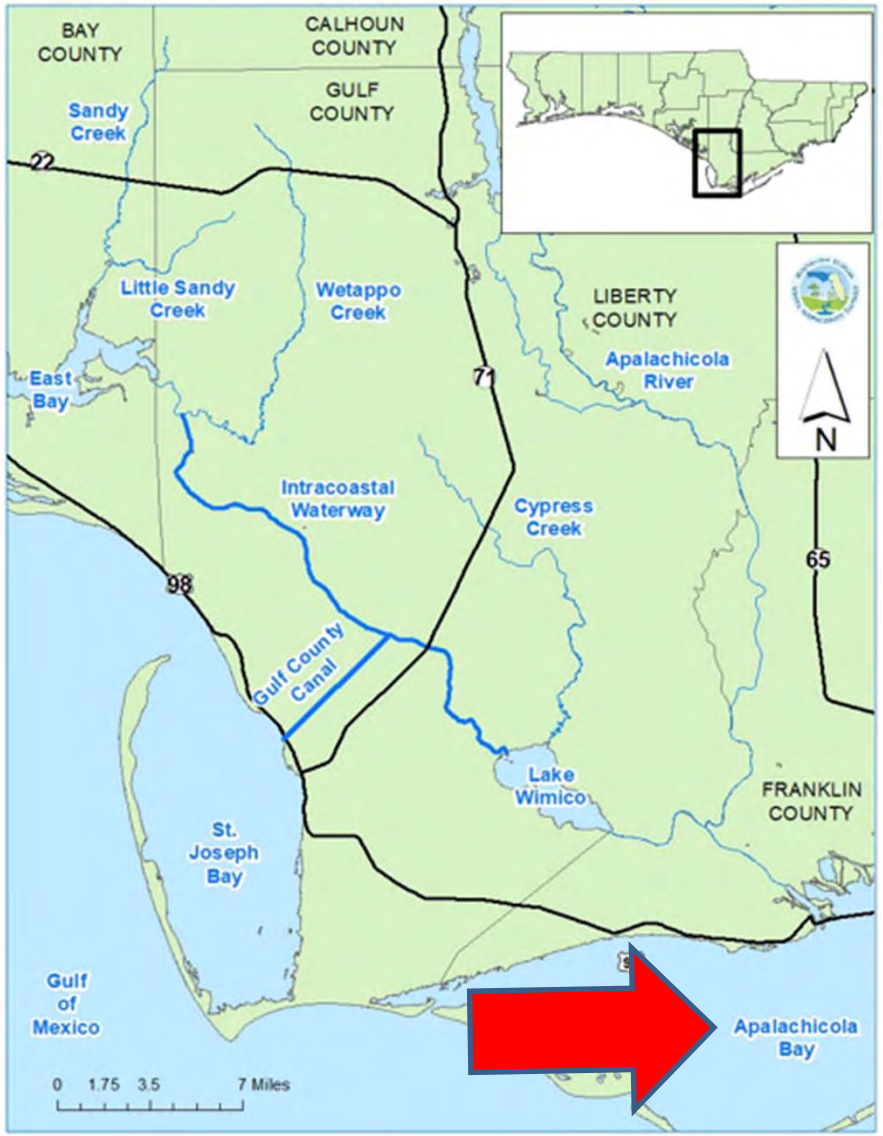
- Finished in early 1940s
- Navigable inland waterway for barges and shipping
- Approved depth of 12 ft
- 150 ft wide
- 14.3 Miles East Bay to GCC
- 7.5 Miles GCC to Lake Wimico
- 5 Miles through Lake Wimico
- 5 Miles Lake Wimico to Apalachicola River, aka Jackson River
- 6 Miles Apalachicola River to Apalachicola Bay
- Connects St. Andrew Bay, Lake Wimico, and Apalachicola Bay
- Connects to Gulf County Canal



Apalachicola River and Bay

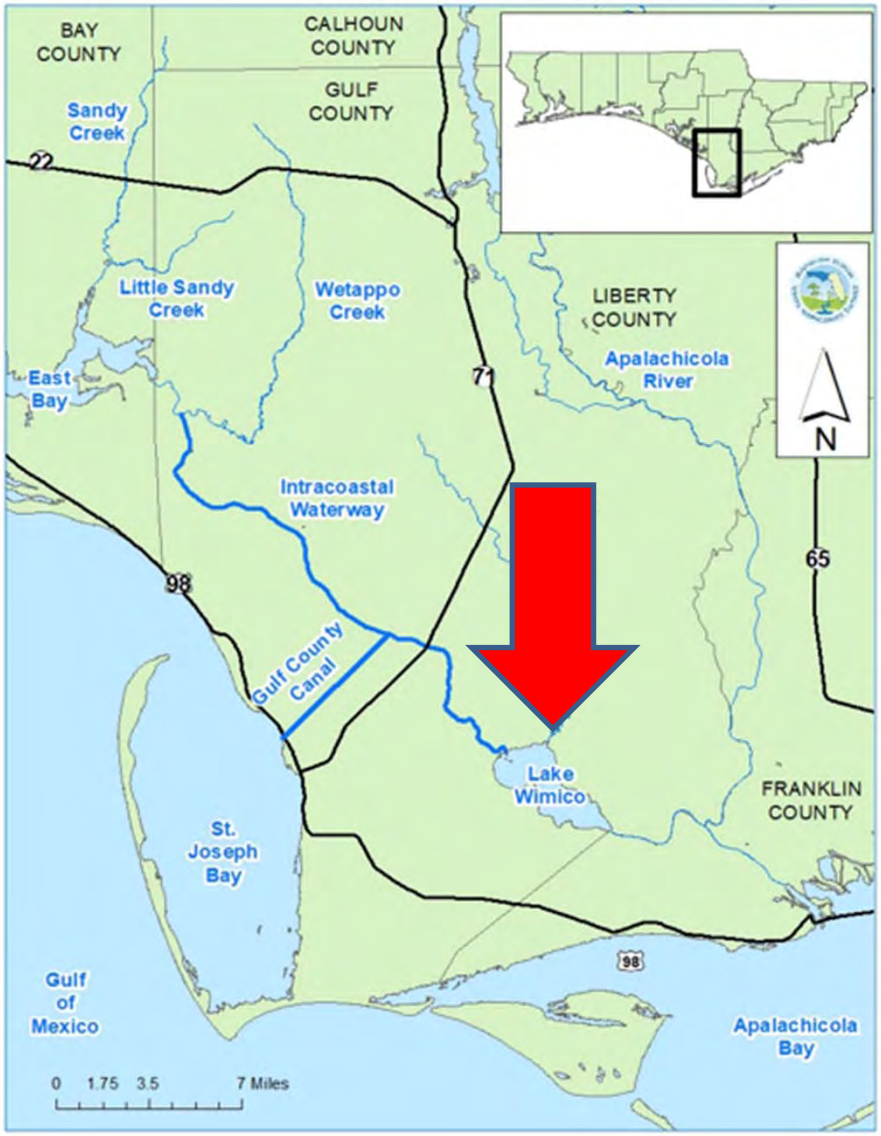
- Long History and Abundant Data
- Received a lot of Attention
- Highly Variable Flows
- Declining Flows through Time
- Unconfirmed Reports of Flows entering St. Joseph Bay
- Tidal Influence
- Stratified Flows





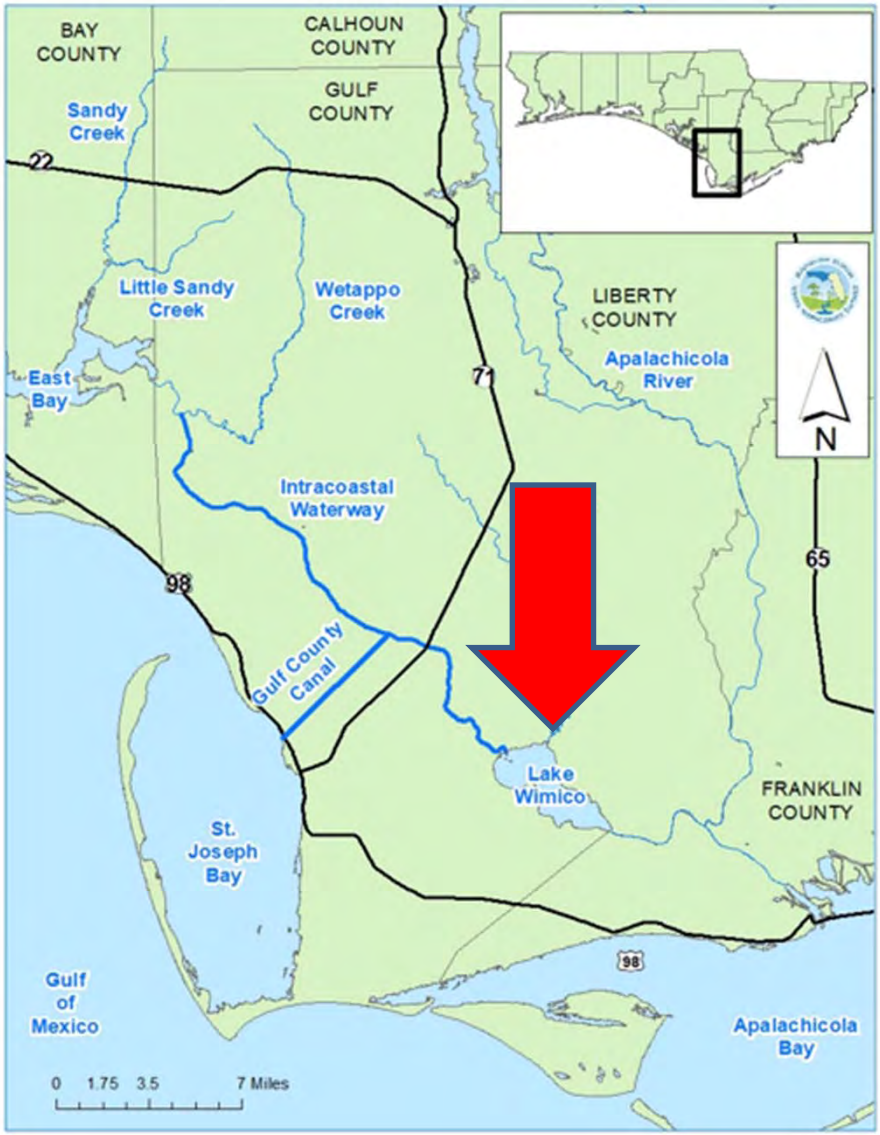
Lake Wimico

- 5 Miles in length
- Width ranges from 2.2 to <1 mile
- 14 Miles of shoreline
- Approximately 4,136 acres of open water, more with floodplain
- Bisected by Intracoastal Waterway



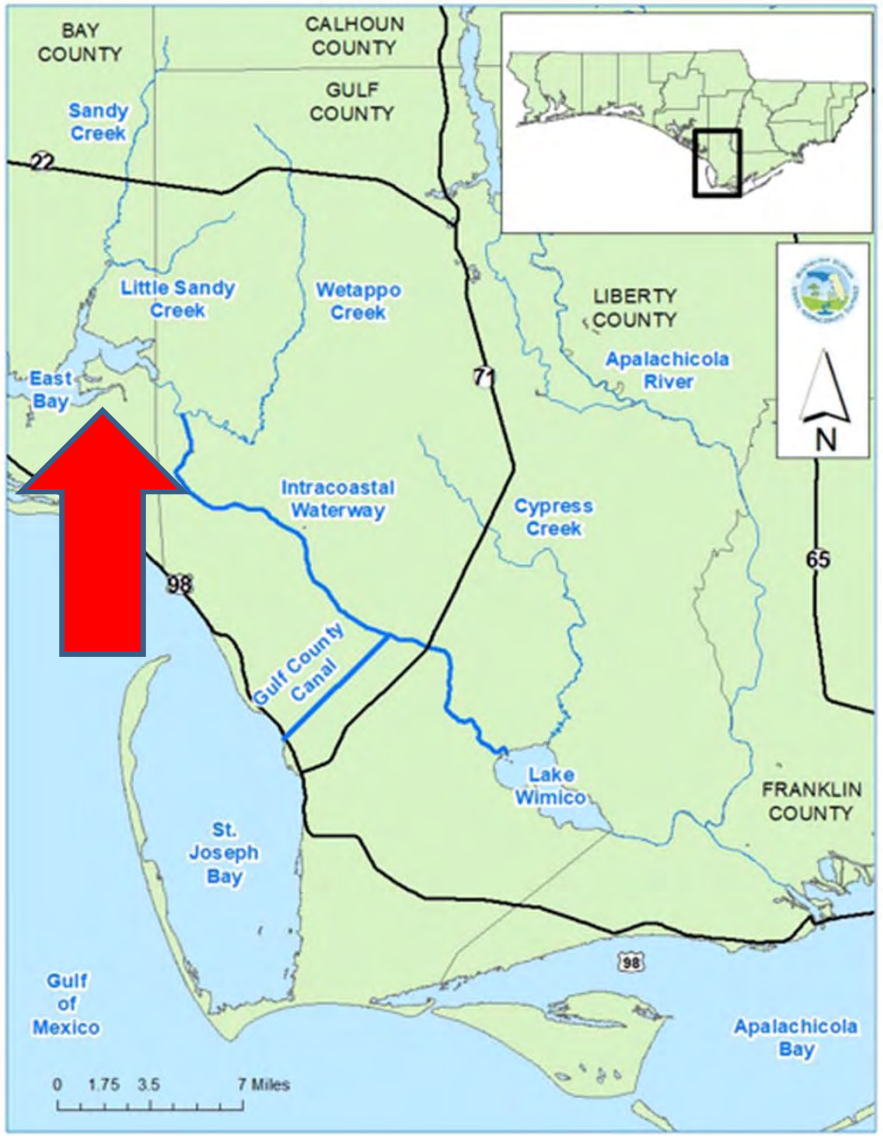
Lake Wimico Concerns

- Unverified Changes
  - Increased Salinity in Lake
  - Freshwater flows from Apalachicola River into St. Joseph Bay



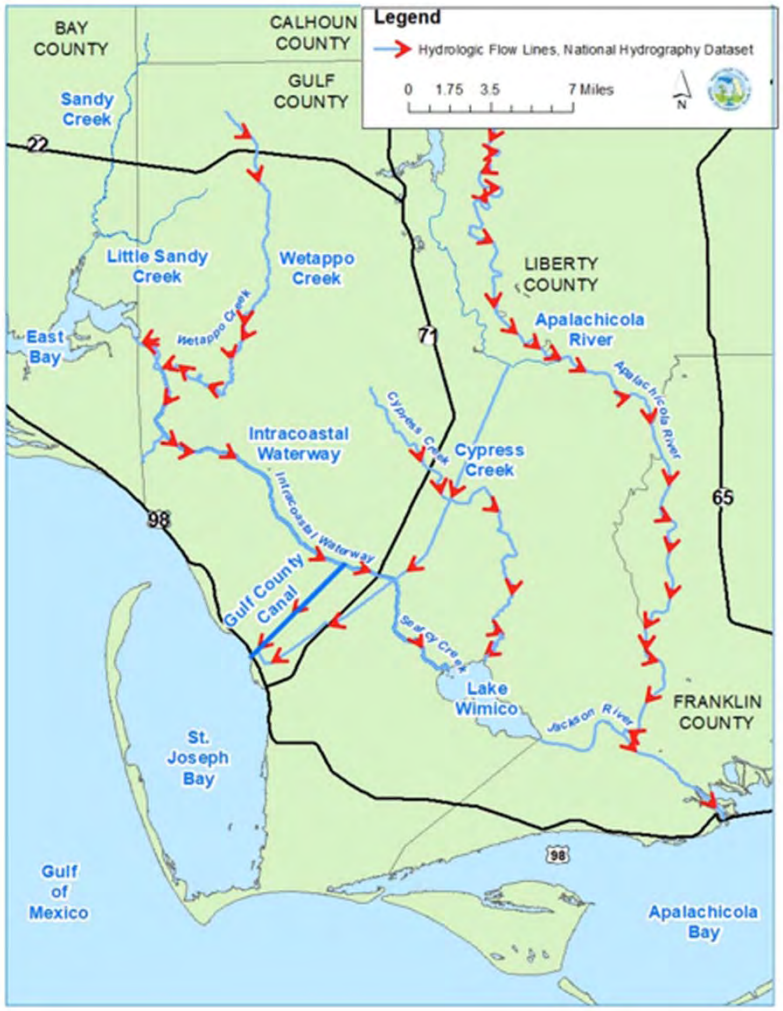
East Bay

- Connects Intracoastal Waterway and St. Andrew Bay
- Hurricane Michael
- Sandy Creek, Little Sandy Creek, Wetappo Creek
- Impaired water bodies
  - Sandy Creek – fecal coliform, bacteria in shellfish
  - Little Sandy Creek - DO
- Recent land-use changes
  - Hurricane Michael



Tri-Bay Hydrologic Connectivity

- Flows between watersheds probable, but seasonality and volume of cross boundary flows largely undescribed
- Multiple models and reports, no measured flows
- Creates problems for assessing water-quality trends and sources in some areas
  - i.e. St. Joseph Bay



St. Joseph Bay Water Quality Initiative

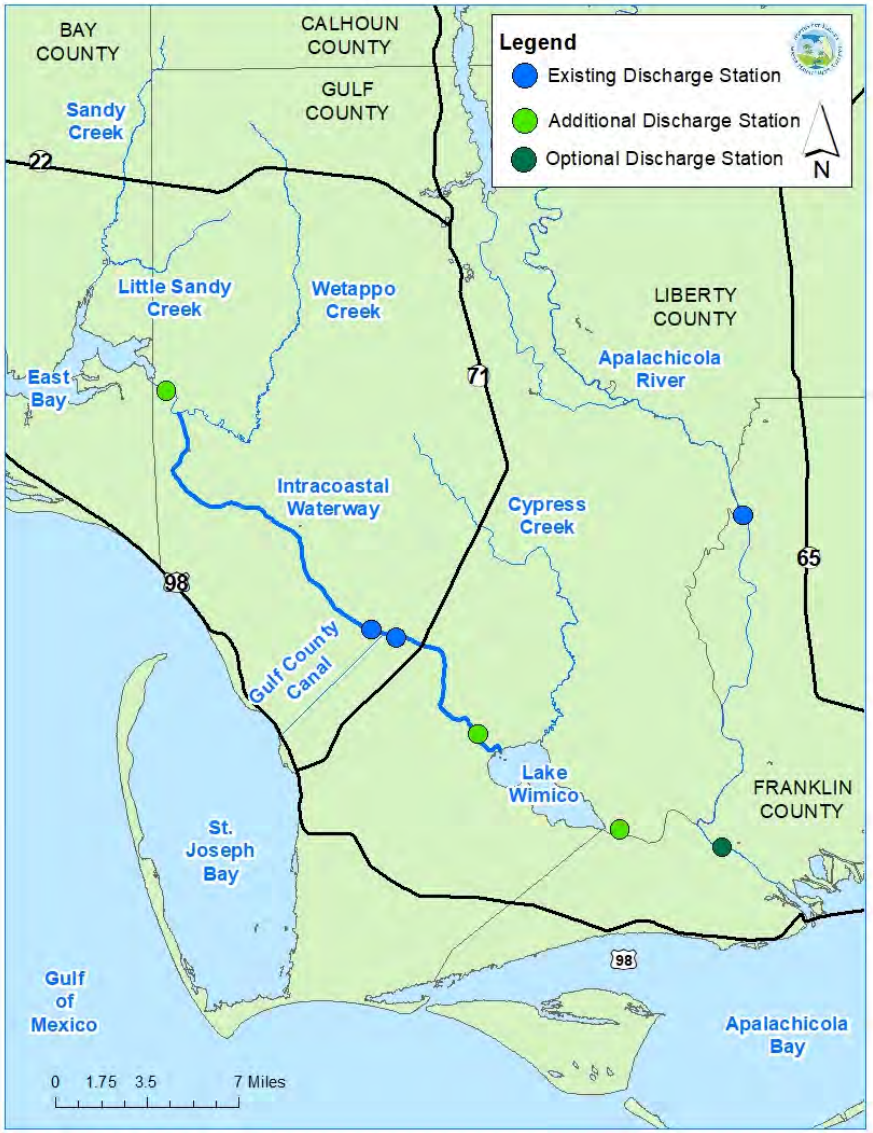
- Multiagency effort involving DEP, FWC, FDACS, SJB Aquatic Preserve, NWFWMD, non-profits, etc.
- Promote data sharing and collaboration among agencies in order to
  - Identify data gaps
  - Provide additional expertise
  - Expand our areas of interest
- Quarterly meetings with all groups presenting

Major Data Gaps

- St. Joseph Bay
  - What are the flows and seasonality of freshwater entering SJB?
  - What is the relative contribution of smaller stormwater discharges vs. the Gulf County Canal?
- East Bay
  - What is the current water quality of East Bay tributaries?
  - How has land use quantitatively changed?
  - How does water flow through the Intracoastal Waterway in relation to East Bay and St. Joseph Bay?
- Lake Wimico
  - How much water flows through Lake Wimico?
  - What are the current salinity patterns in Lake Wimico?

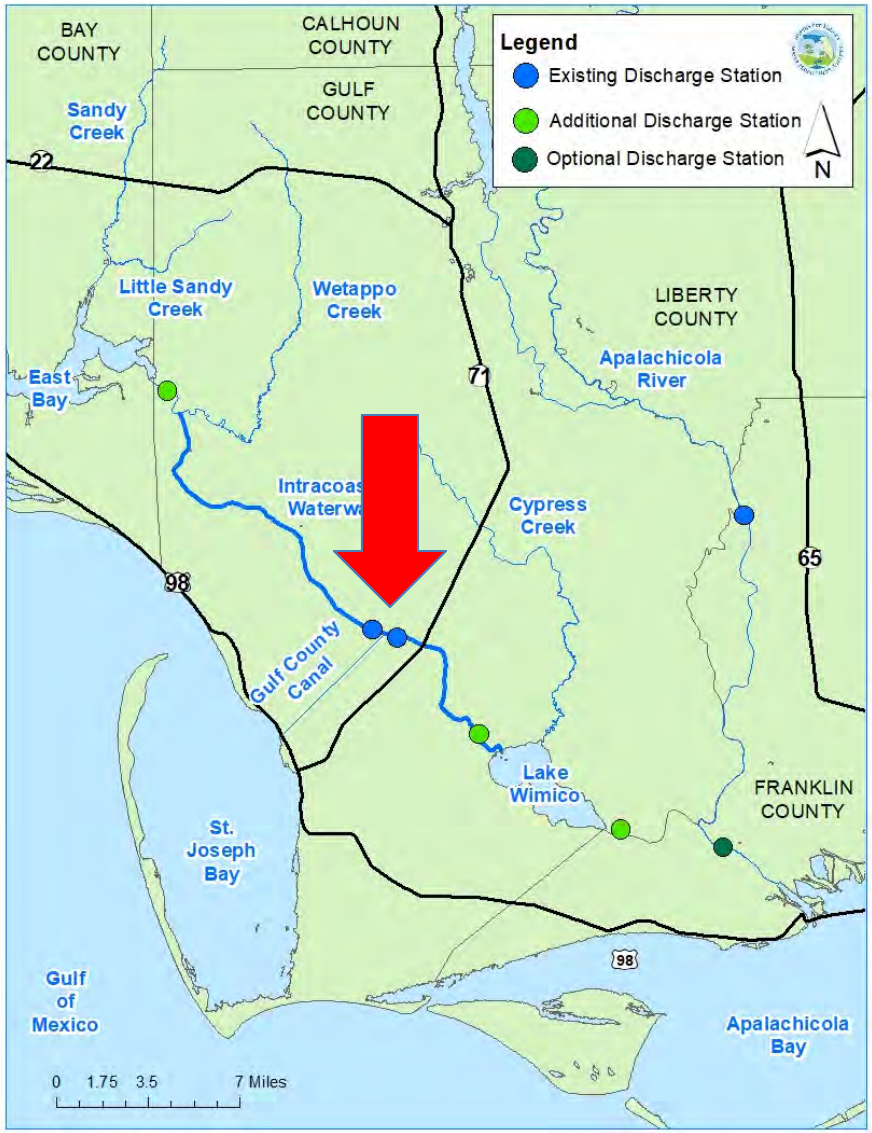
Discharge Monitoring

- Little information available concerning flows among Apalachicola River, St. Joseph Bay, and East Bay
- Previous reports suggest a net flow from East Bay to the southeast
- Extensive discharge data collection efforts
- Numerous challenges to collecting discharge
- Multiple methodologies being used
  - Continuous discharge stations
  - Tidal cycle ADCP measurements throughout the year



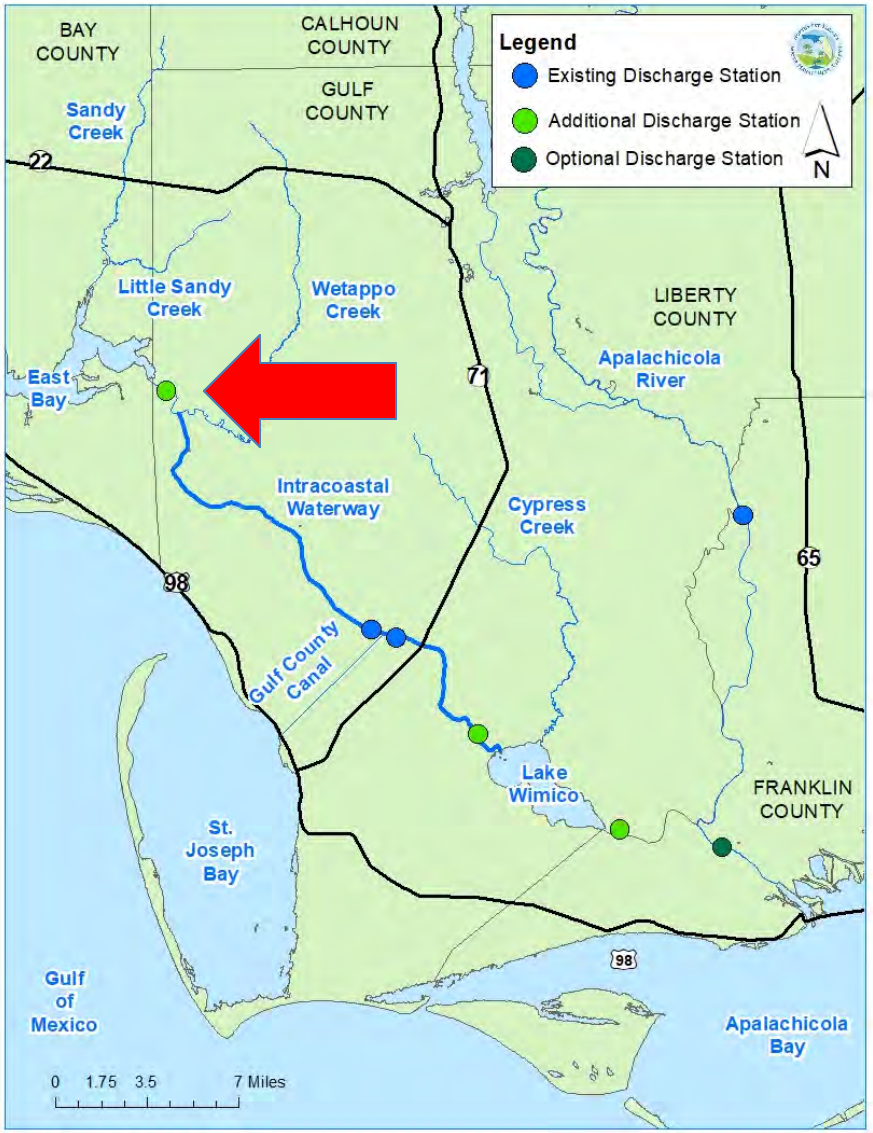
Gulf County Canal Discharge Monitoring

- Continuous Monitoring
  - Contracting with USGS
  - Two stations
  - Mass balance approach
  - Awaiting COE permits for station construction
  - Tidally filtered discharge data
- Tidal cycle ADCP profiles near mouth of Bay



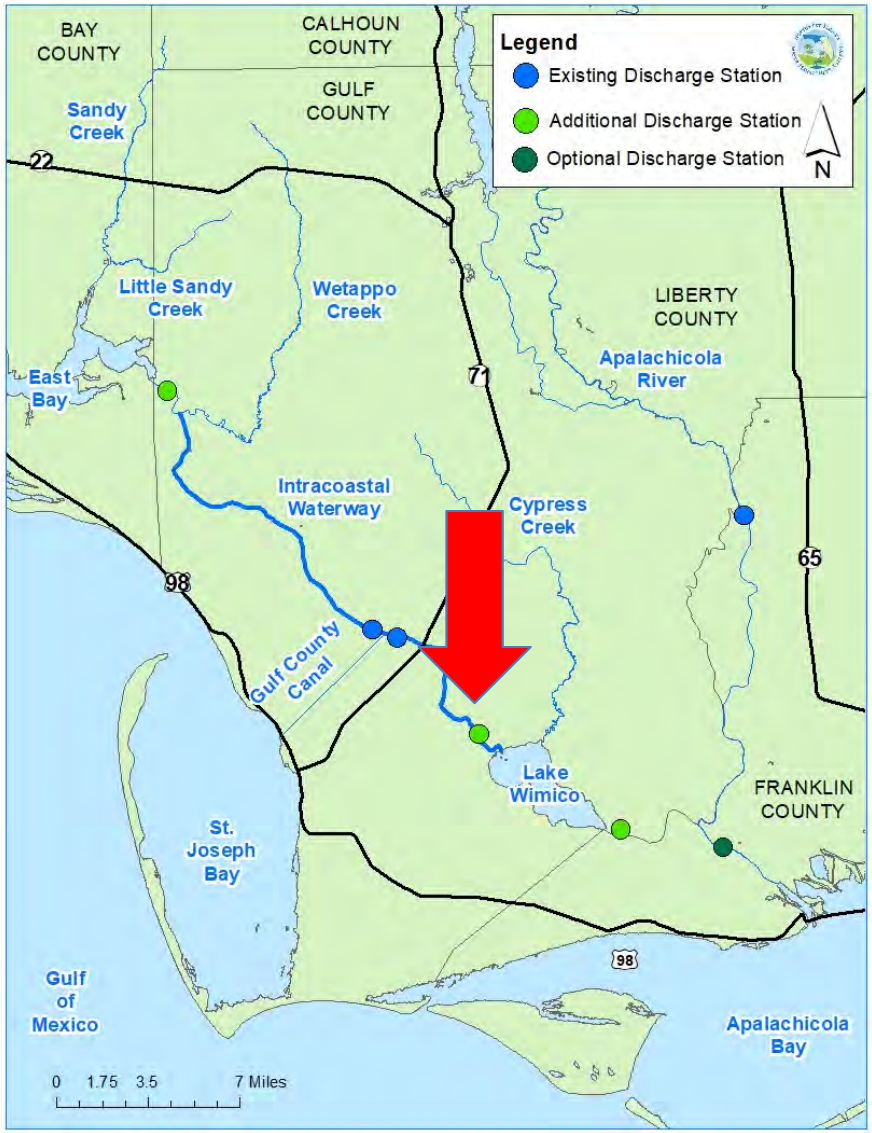
Intracoastal Waterway Discharge Monitoring

- Difficult location to sample
  - Flows tidally influenced
  - Can be highly stratified
- Not suitable for index velocity monitoring station
- Series of full tidal cycle ADCP discharge measurements
  - Net daily discharge
  - Across different boundary and environmental conditions



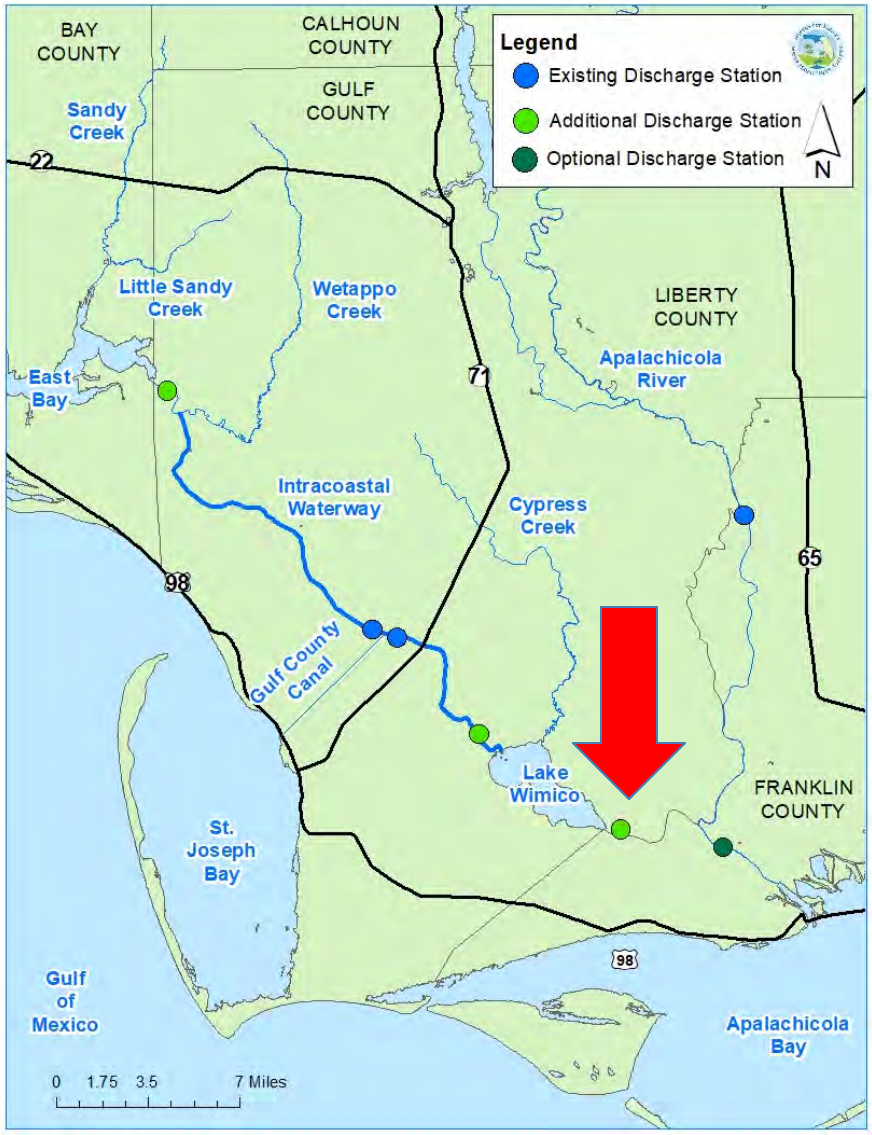
Lake Wimico Discharge Monitoring

- Two locations on either side of the lake
- NW Side of the lake
  - Tidal cycle ADCP profiles near mouth of Bay
  - Poor access
  - Abundant debris
  - Poor site for continuous station



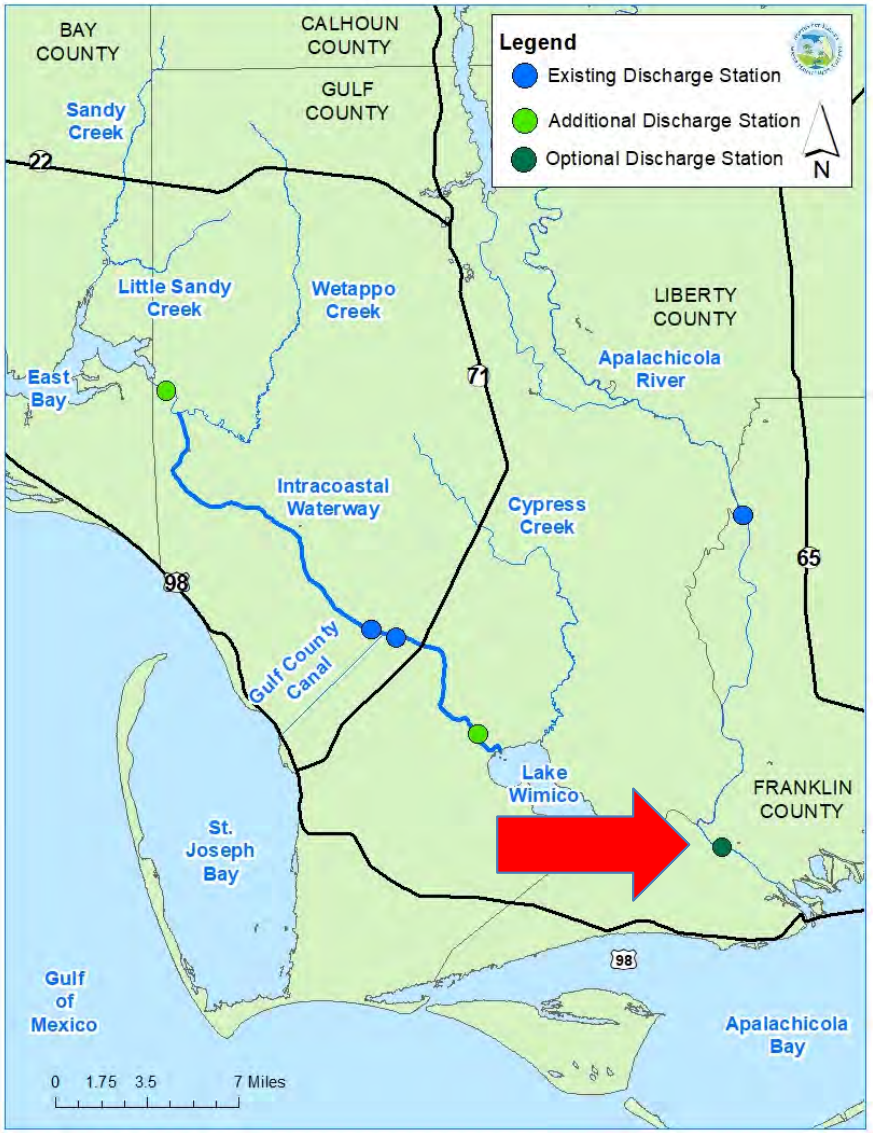
Lake Wimico Discharge Monitoring

- SE Side of the Lake
  - Jackson River
  - Flows between the Apalachicola River/Bay and Lake Wimico
  - Contracting with USGS
  - Index velocity
  - Station on Box R WMA



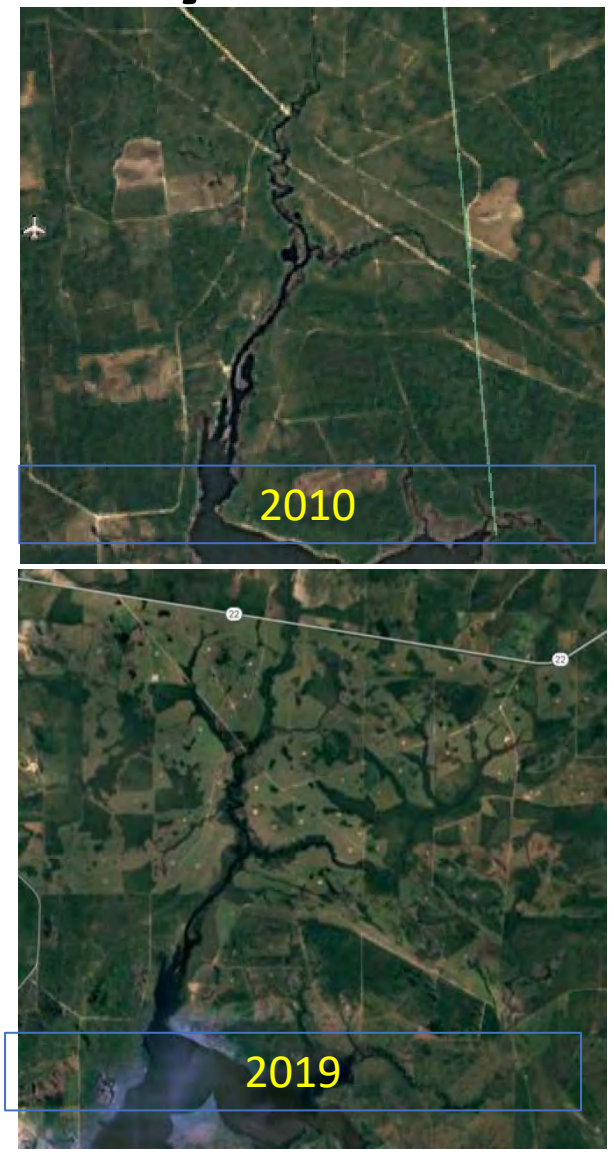
Apalachicola River Discharge Monitoring

- Tidal cycle ADCP profiles between Apalachicola Bay and the Jackson River/Apalachicola River confluence
- Compare data with Apalachicola River near Sumatra and Jackson River discharge station
- More accurate distribution of Apalachicola River flows
  - Distributaries, Apalachicola River, Lake Wimico



East Bay Water Quality

- Many land-use changes in recent years
  - Pine silviculture, etc. to cattle production
  - Hurricane Michael
- How are changes in use affecting water quality?
- Reports of sediment laden water flowing into St. Joseph Bay after periods of high rainfall
- Are changes in water quality contributing to St. Joseph Bay water-quality trends?
- Three systems
  - Sandy Creek
  - Little Sandy Creek
  - Wetappo Creek



Sandy Creek/Little Sandy Creek

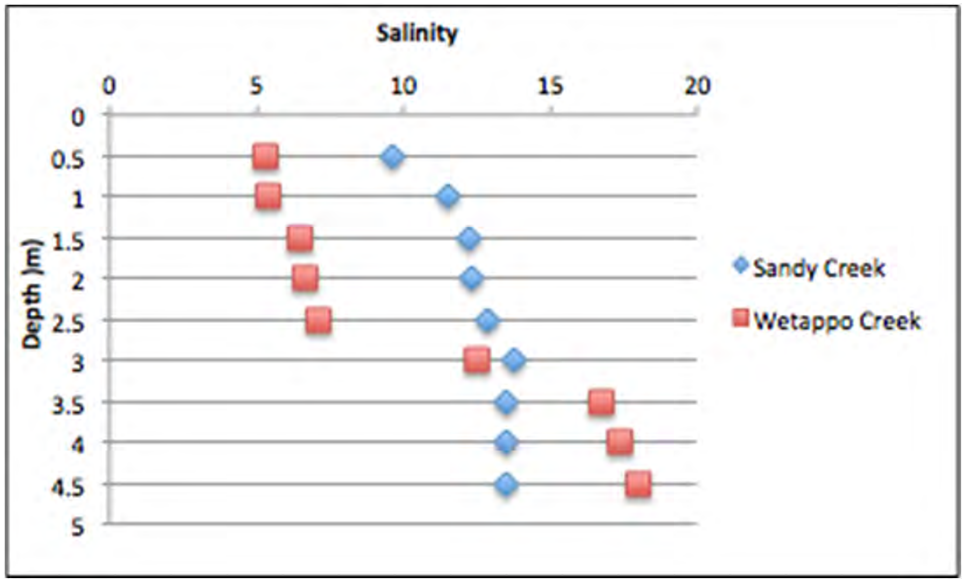
East Bay Water Quality

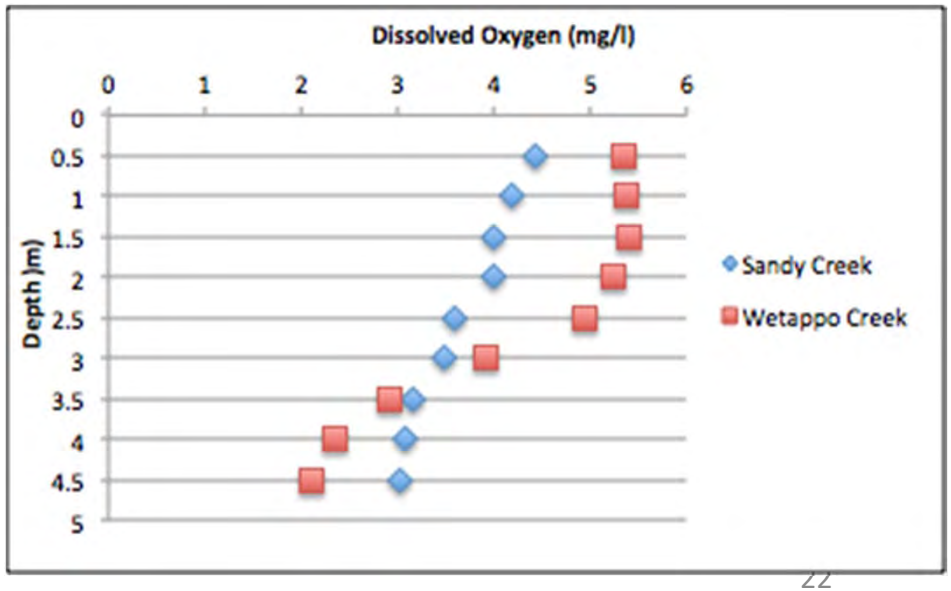
- Multiple parameters
  - Nutrients
  - Bacteria
  - Water clarity/color
- Monthly intervals
  - Grab samples
    - Laboratory analyzed
    - DOH – certified laboratory
  - Vertical profile – salinity, specific conductivity, temperature, Dissolved Oxygen, pH
- Combine with discharge data
  - When/how much flows are potentially Flowing into SJB

To Be Analyzed by the DEP Lab.	
Alkalinity - Total	Ortho-Phosphate
Ammonia	Sulfate
Bromide	TKN – Total Kieldahl N
Chloride	Total Organic Carbon
Chlorophyll-a Suite	Total Phosphorus
Color (true)	Total Dissolved Solids
Flouride	Total Suspended Solids
Nitrate-Nitrite N	Turbidity
E. coli	
To Be Collected Using a Calibrated YSI, etc.	
Dissolved Oxygen	Specific Conductivity
pH	Temperature
Salinity	Depth

East Bay Water Quality
Preliminary Results 5/27/2020

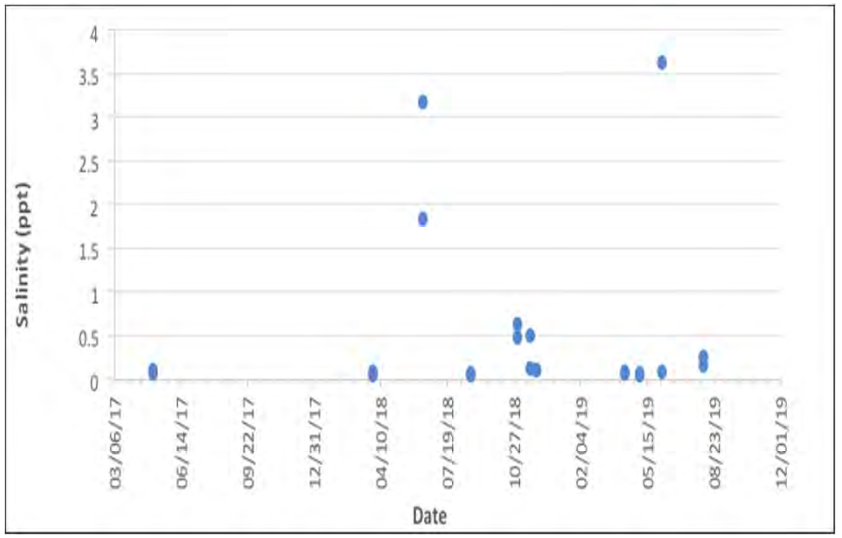
- Vertical salinity and DO stratification in Wetappo Creek
- Sandy Creek more mixed
- Nutrient results not yet available

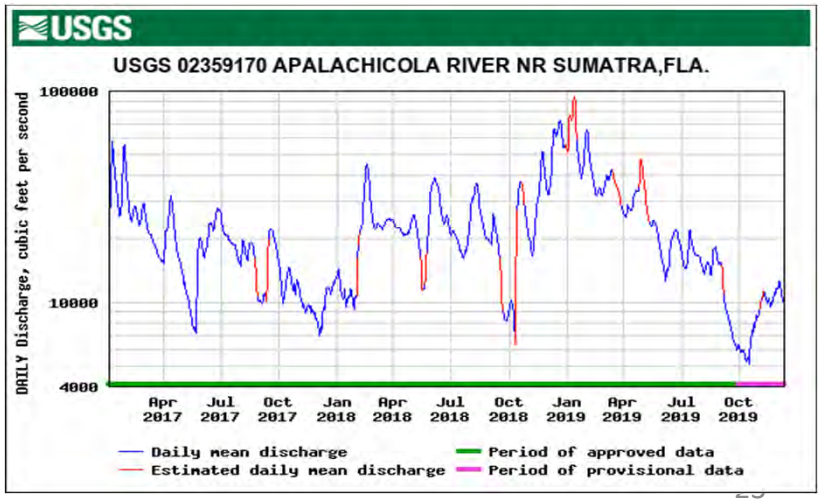




Lake Wimico Water Quality

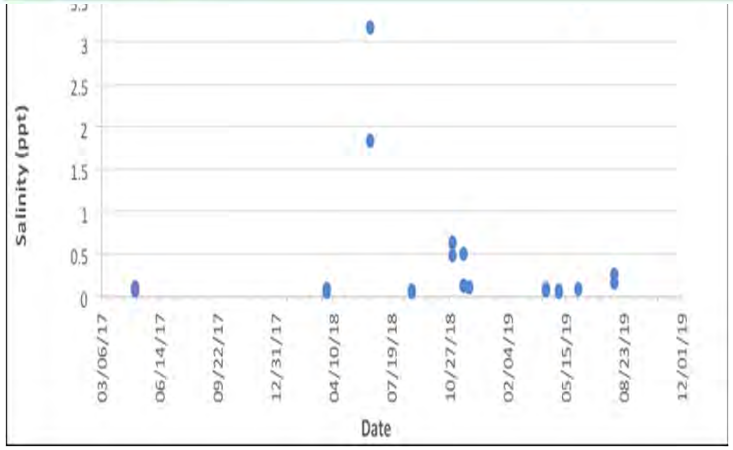
- Resident and stakeholder concerns of increased salinity in Lake Wimico
- Reporting more estuarine fish species
- Supports freshwater and estuarine fishery species
- Little scientific data available
  - Salinity is somewhat variable
- Historical data unavailable
- How do Apalachicola River flows and coastal sea levels affect lake salinity?





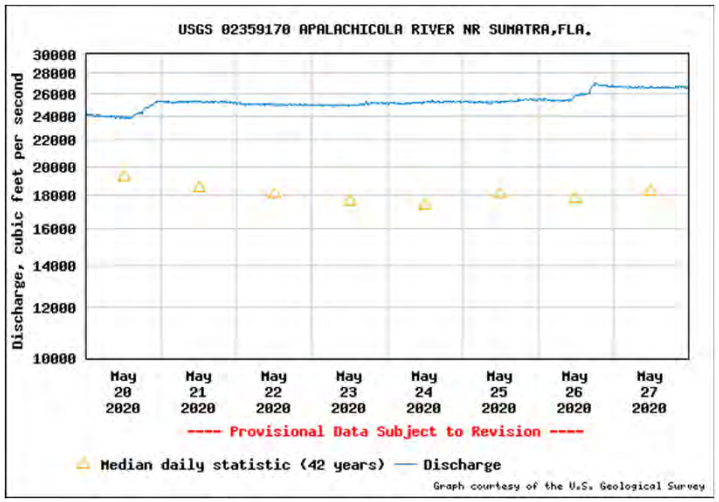
Lake Wimico Water Quality Monitoring Plan

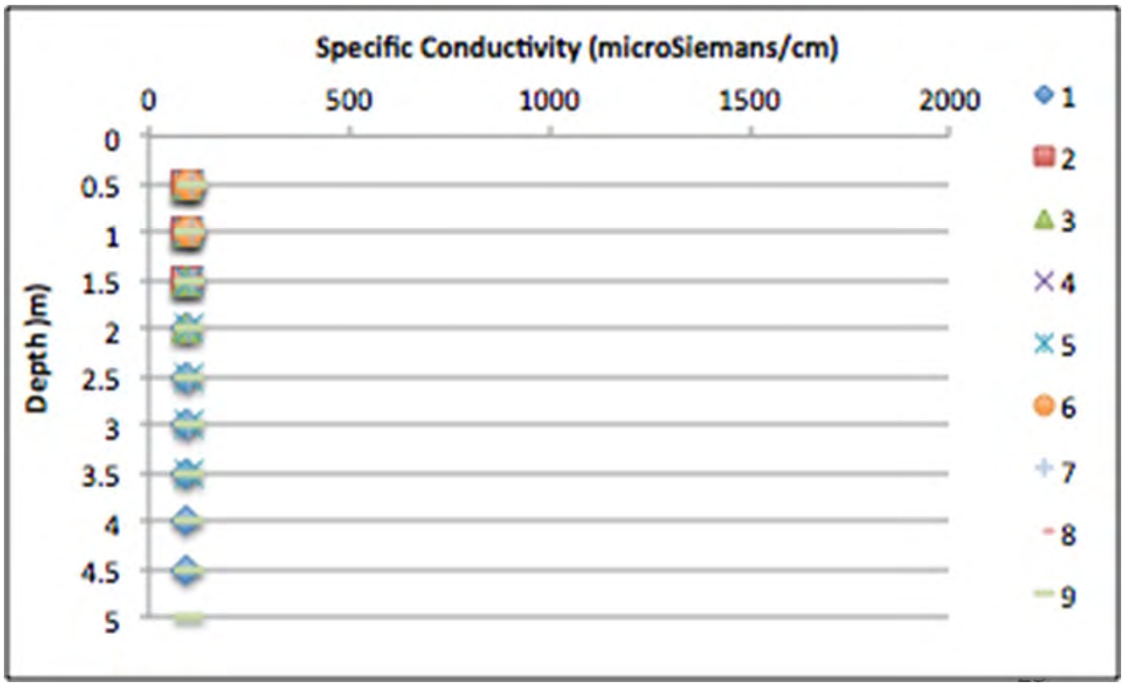
- Vertical salinity profiles
  - Minimum monthly intervals
  - Nine locations
  - 0.5m depth intervals
  - Salinity, specific conductivity, temperature, dissolved oxygen, pH
- Different boundary conditions
  - Apalachicola River
  - Offshore sea level



Lake Wimico Water Quality Preliminary Results May 22, 2020

- No vertical or horizontal stratification in specific conductivity (avg.=99µS/cm, 0 ppt)
- Apalachicola River near Sumatra – 25,000 cfs (61% Flow Percentile)





Port St. Joe
Stormwater Improvement Project

- Reduce pollutant loading into the bay from stormwater runoff and nonpoint source pollution
- Construction of one or more retrofit treatment ponds near Sixteenth Street with an additional downstream outfall weir

SJB WQ Initiative Project Goals

- Collect and analyze discharge and water quality data through June 2021
- What conclusions can be drawn from the data and how do they relate to observations and efforts in St. Joseph Bay?
  - Including all members of the SJB Water Quality Initiative
- Identify target areas for additional research, restoration, etc.

Acknowledgements

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Thank You!

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