Myakka River Watershed Initiative

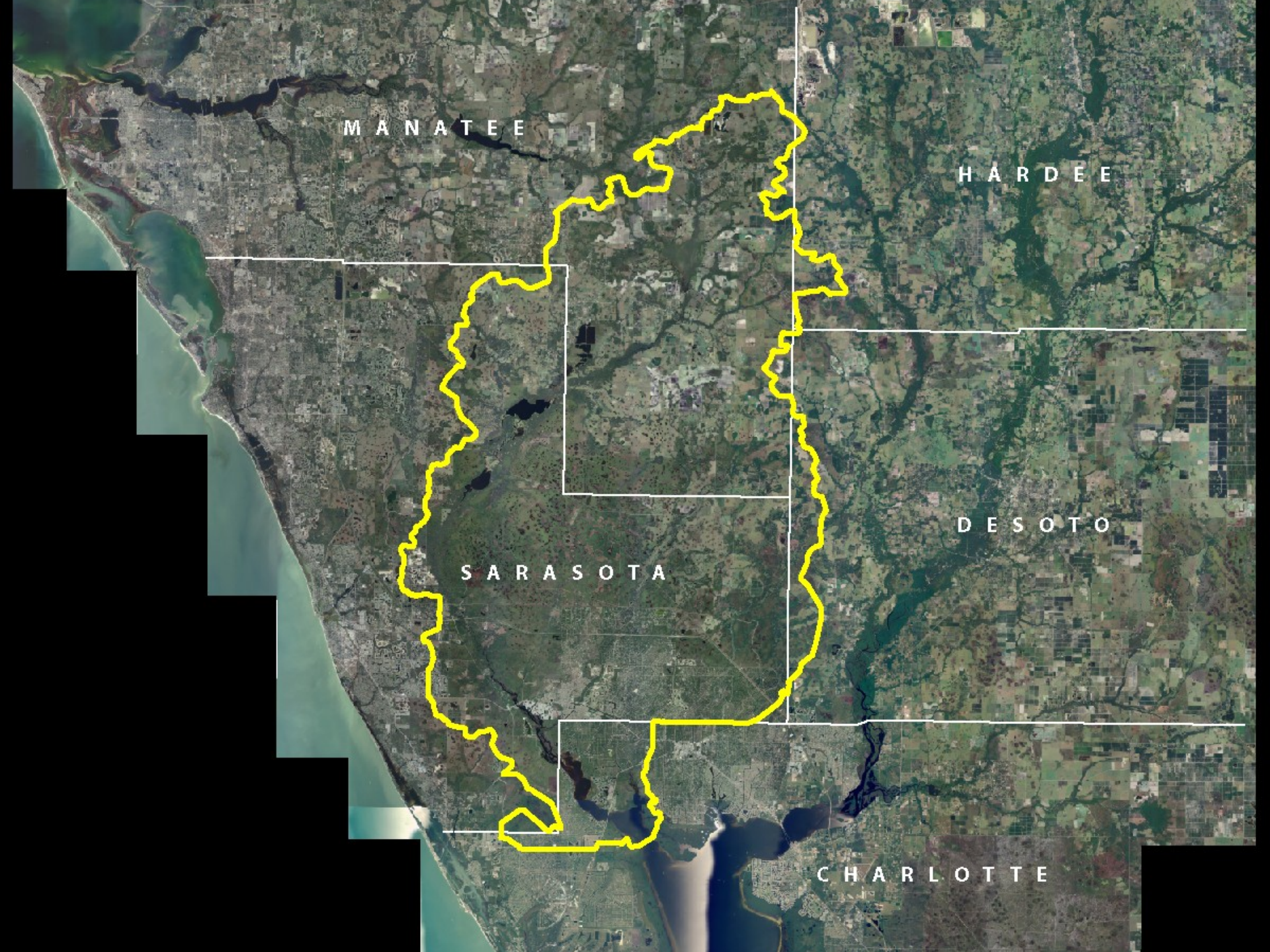
SINGHOFEN & ASSOCIATES INCORPORATED

INTERFLOW ENGINEERING LLC

January 22, 2010

Myakka River Watershed Initiative Status

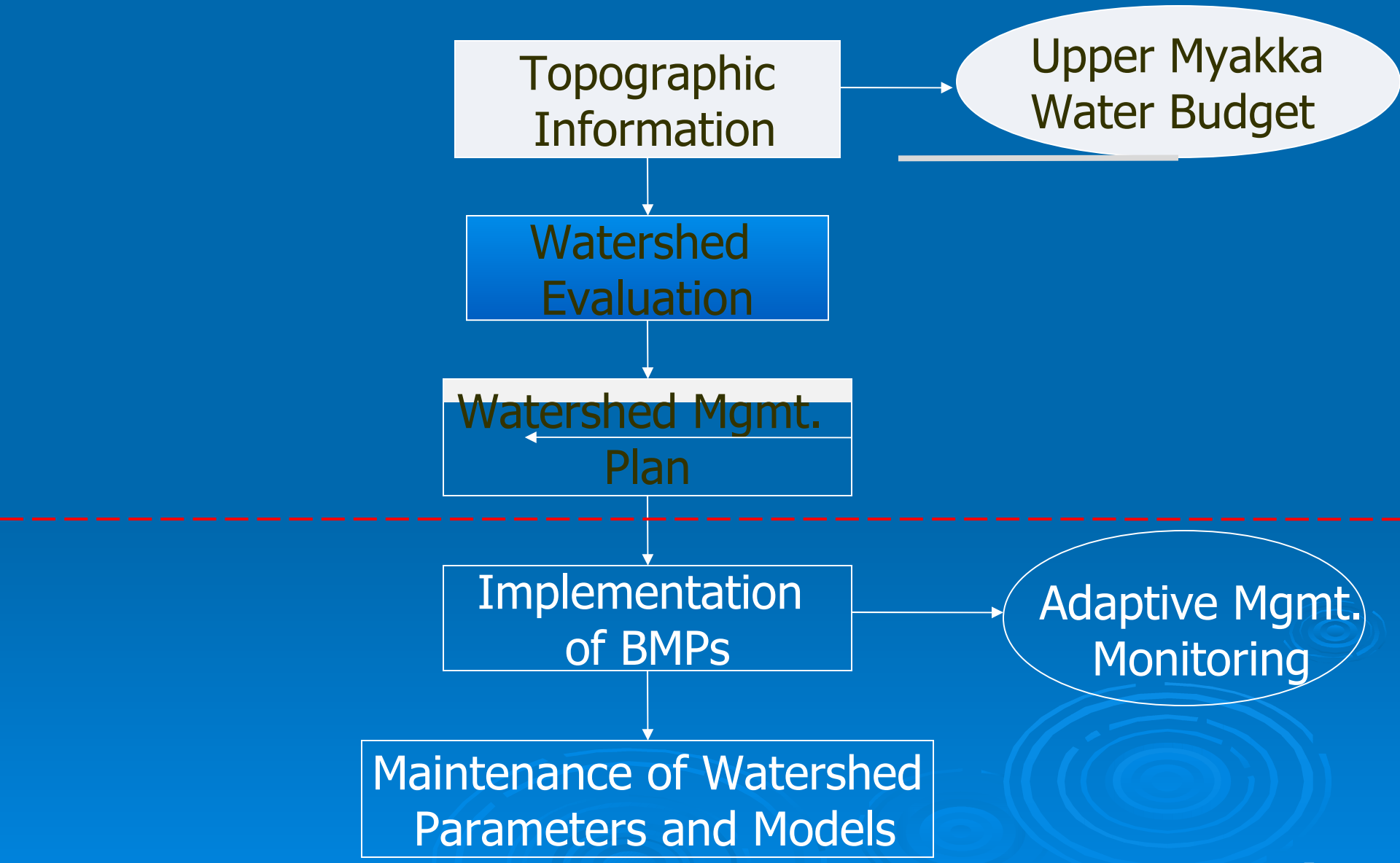
- MRWI Overview
- Watershed Evaluation Work Orders
- Tatum Sawgrass Evaluation
- Flatford Swamp Hydrologic Restoration
- Future tasks


MANATEE
HARDEE
SARASOTA
DESOTO
CHARLOTTE

Project Objectives

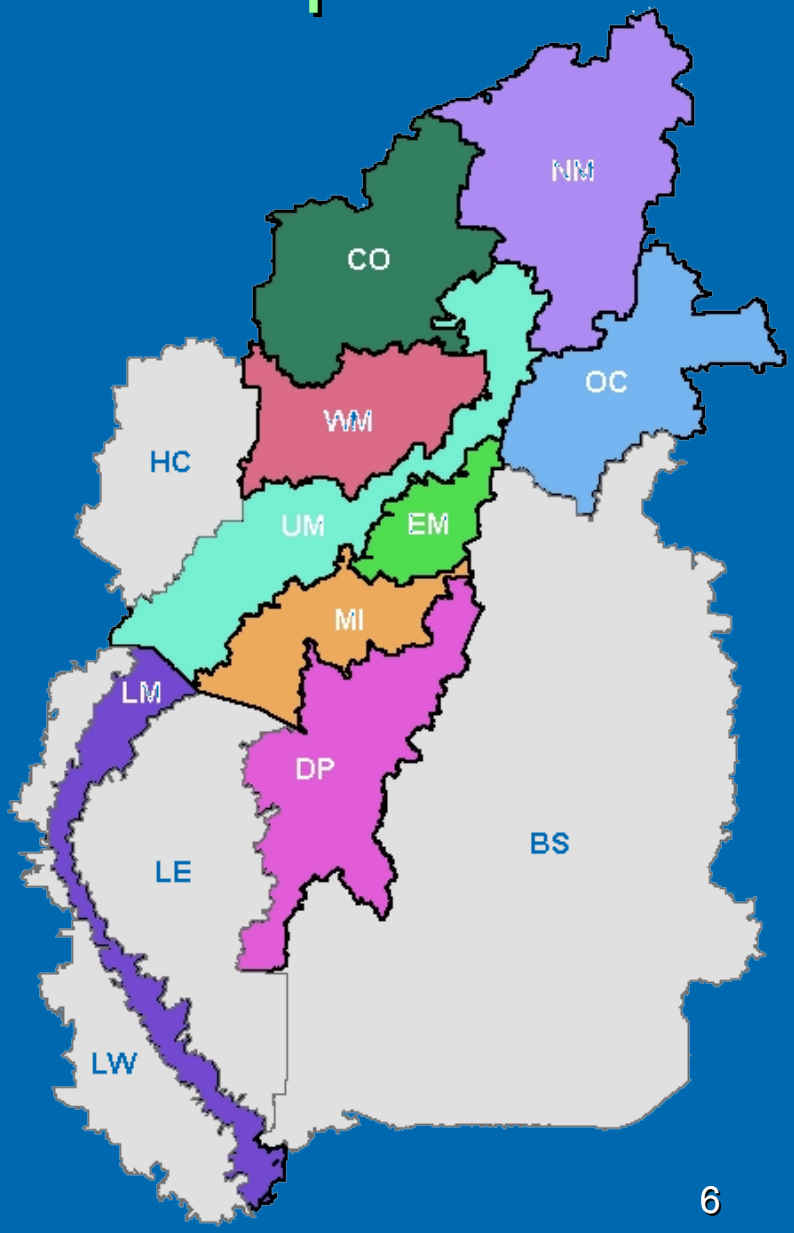
- Evaluate and illustrate the effects of past activities in the watershed (e.g. land use conversions and alterations)
- Develop and evaluate structural and non-structural best management practices (BMPs) in order to:
  - Restore natural systems
  - Address water supply issues
  - Address water quality issues
  - Provide flood protection
- Develop the framework suitable for future FEMA Flood Insurance Rate Map (FIRM) updates.

Myakka River Watershed Initiative



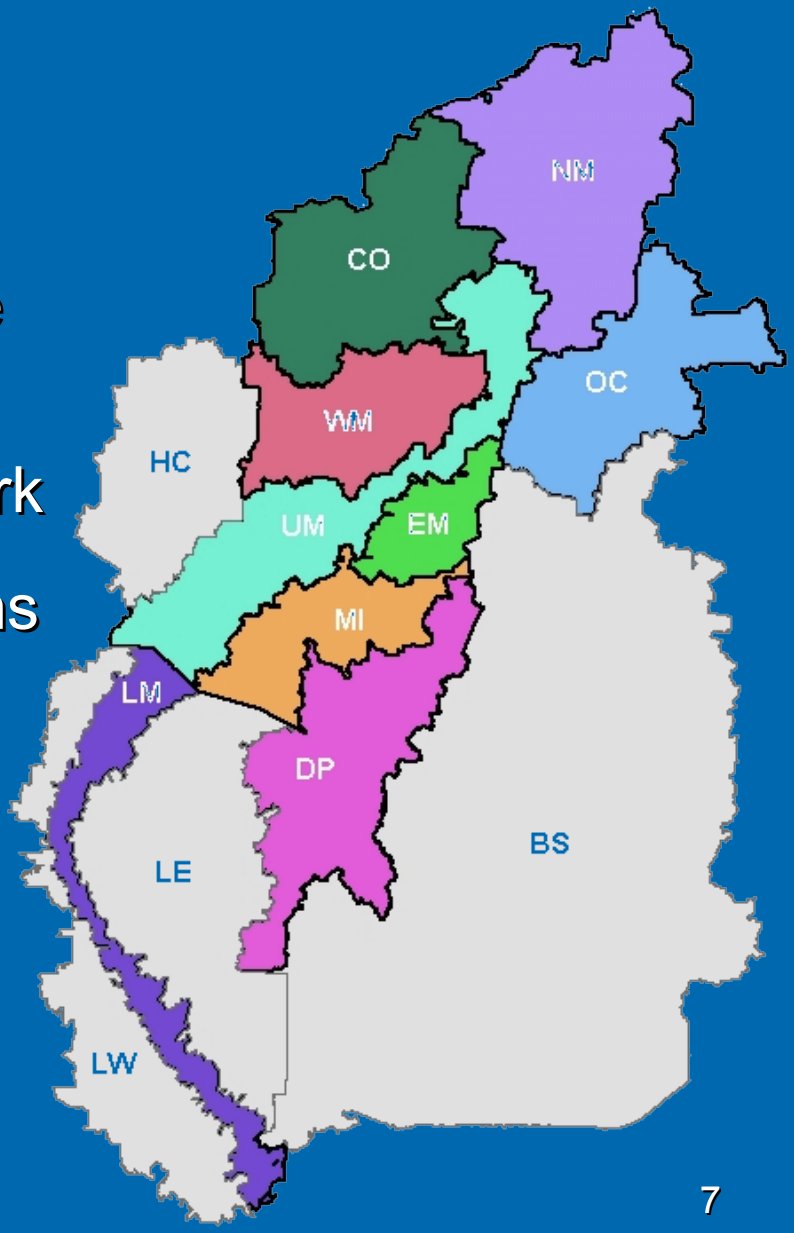
Stormwater Model Development

- Focus on main stem and Upper Myakka
- Existing watershed models
- Objectives:
  - Evaluate conceptual improvements (e.g. Blackburn Canal, Tatum dikes)
  - Flatford restoration design permitting
  - Tool for future FEMA mapping
  - Tool for future permit reviews



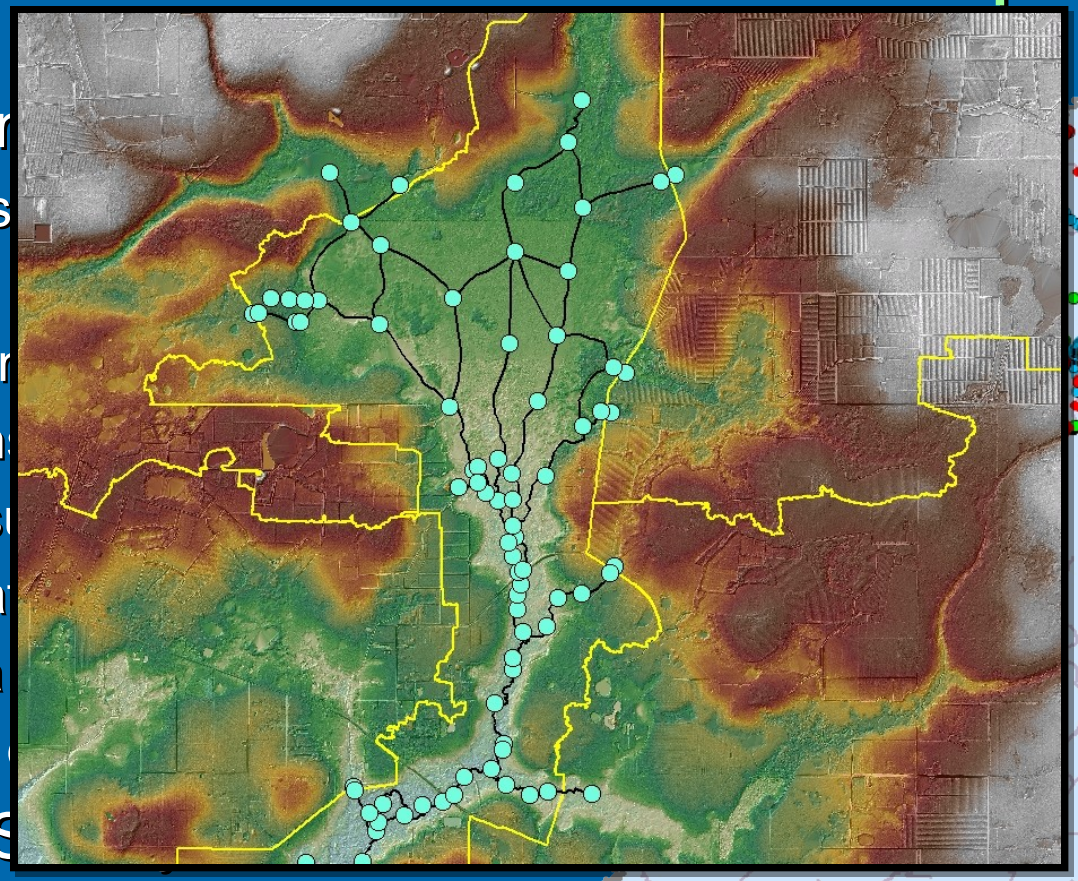
Watershed Evaluation

- Collection and review of available information
- Development of the model network
- Delineation of drainage sub-basins
- Field reconnaissance
- Identification of survey needs
- Populate model features

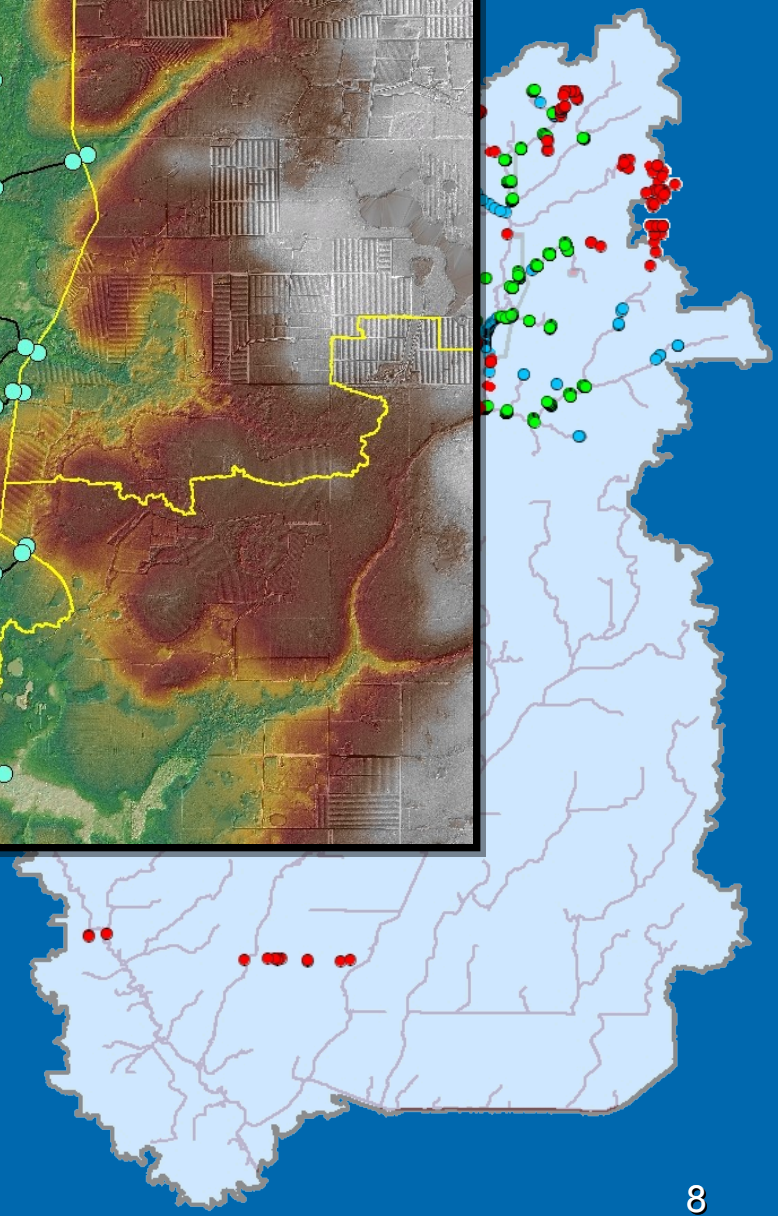


Data Review and Model Development

Available Inform
- Literature s
- SWFWMD
- Manatee ar
- FDOT plan
- Available s
- Historic wa
- Gage Data
- Reference

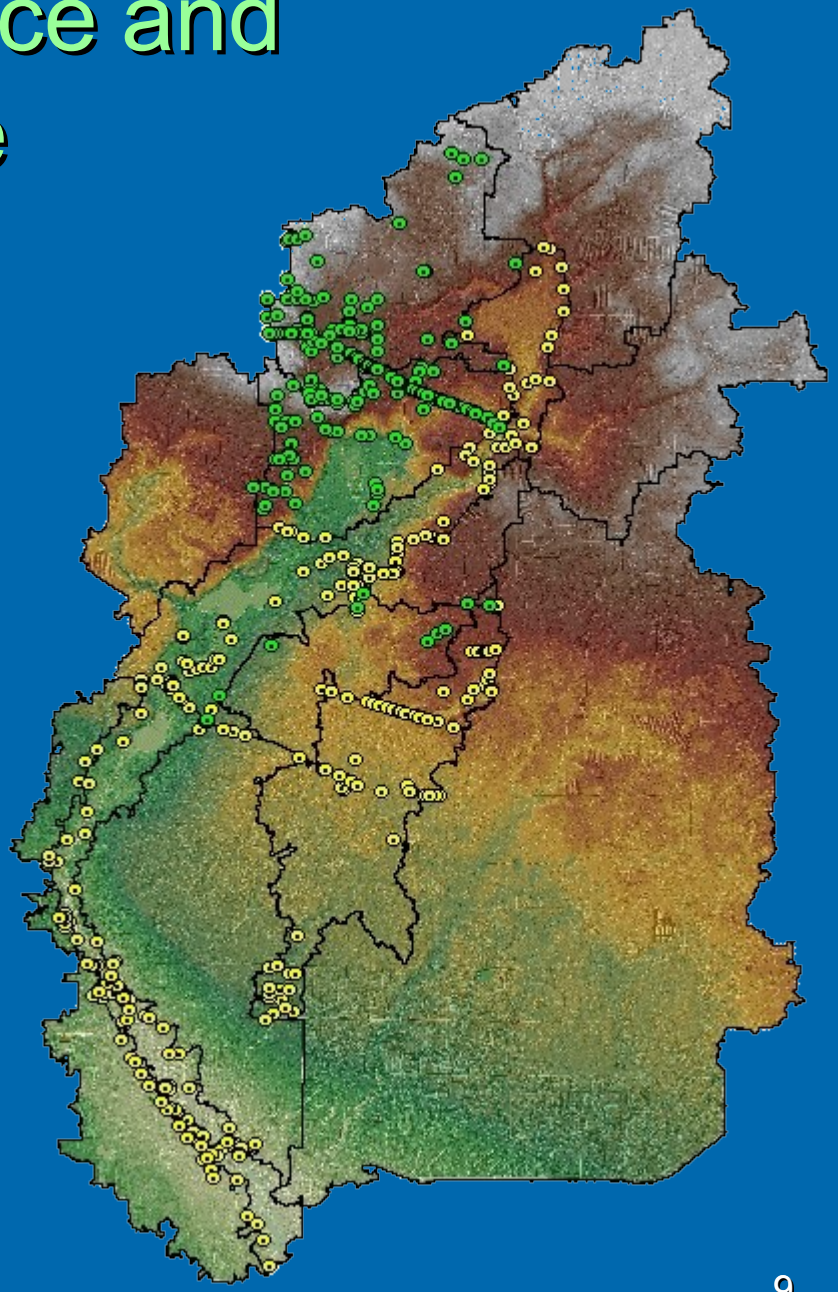


- Conducted S
- Model Network Development
  - GWIS data structure
- Delineate Sub-basins
  - ArcHydro / terrain data



Field Reconnaissance and WE Schedule

- ~ 600 initial locations w/i six sub-watersheds.
- Currently in progress
  - Confirm location of structure
  - Photograph
  - Document conditions
  - Verify data
  - Measure/describe features
- WE Schedule
  - Sub-watersheds - Staggered Schedule
  - 7/1/2010 to 9/1/2010

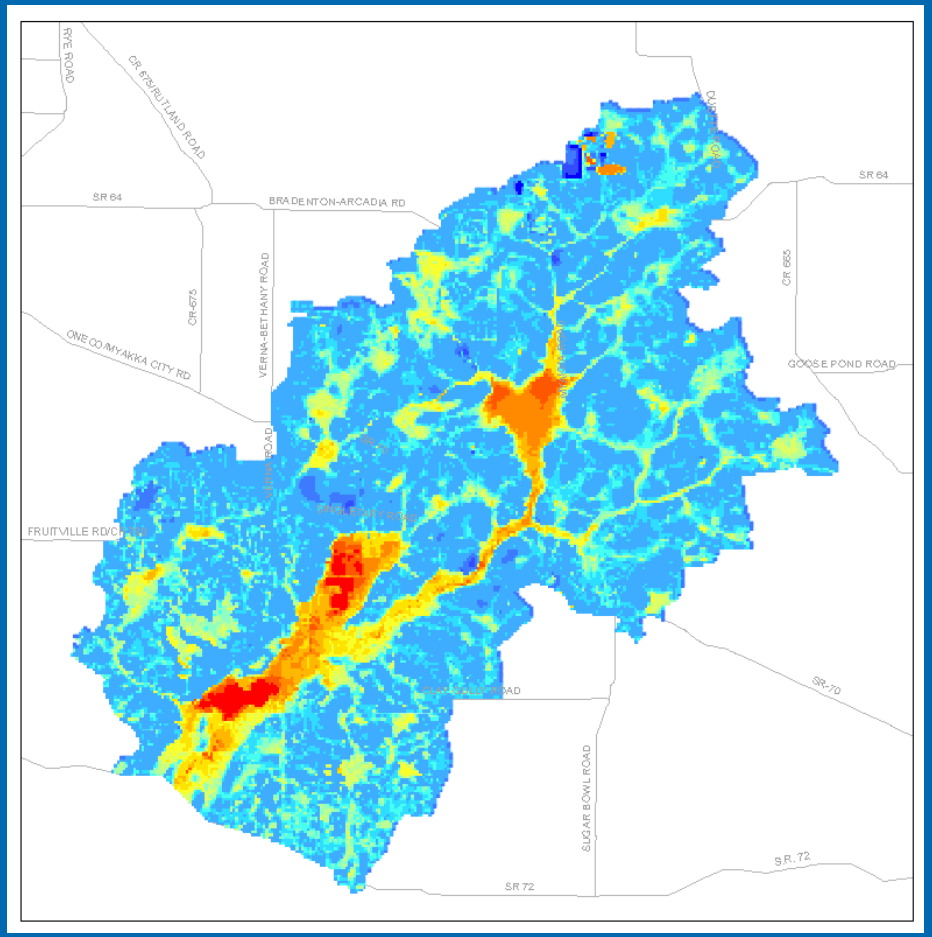


Water Budget Modeling

- Modeling objectives
- Land Use Scenarios:
  - Existing Conditions
  - Historical Conditions
  - Future Conditions
- Tatum Sawgrass Evaluation
- Flatford Swamp water diversion / extraction alternatives

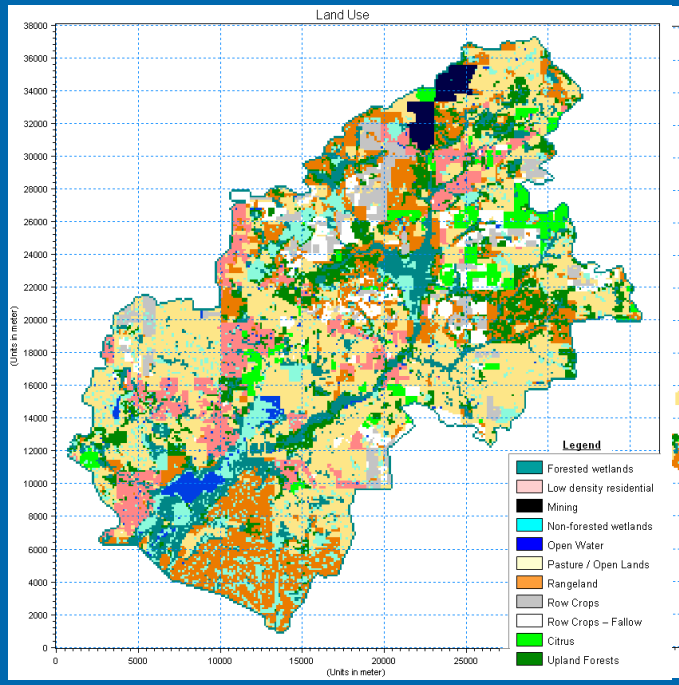
Modeling Objectives

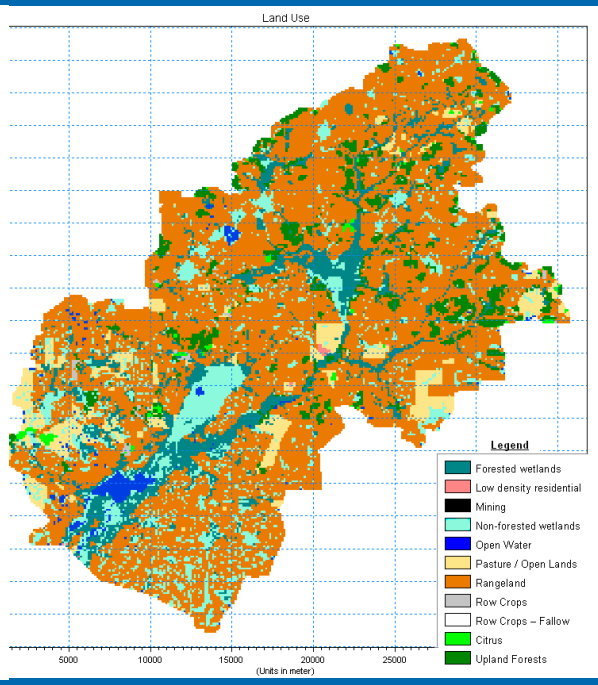
- Estimate the excess flows in the Upper Myakka River,
- Investigate linkages between land use/ land practices and excess flows,
- Develop time-series of flow rates for pollutant load modeling purposes,
- Simulate hydroperiods of the Flatford Swamp under historic, existing, and proposed conditions, and
- Evaluate alternative management scenarios for restoring the natural hydrology of the Upper Myakka River Watershed.

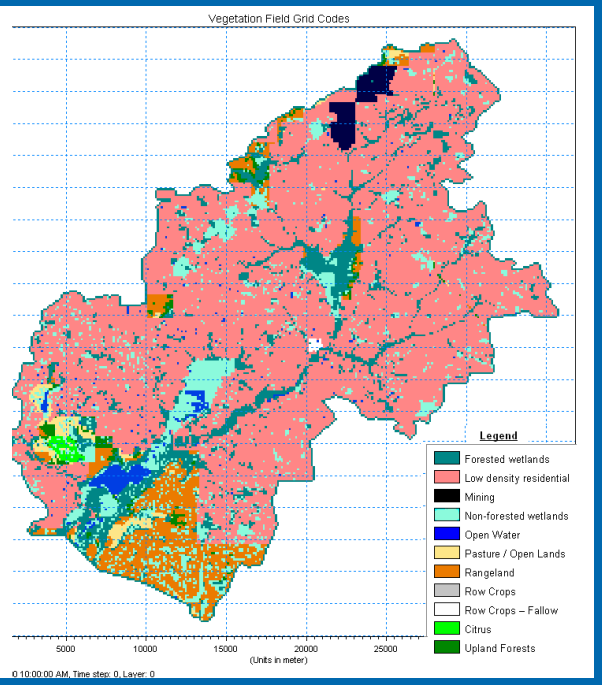


Land Use Scenarios

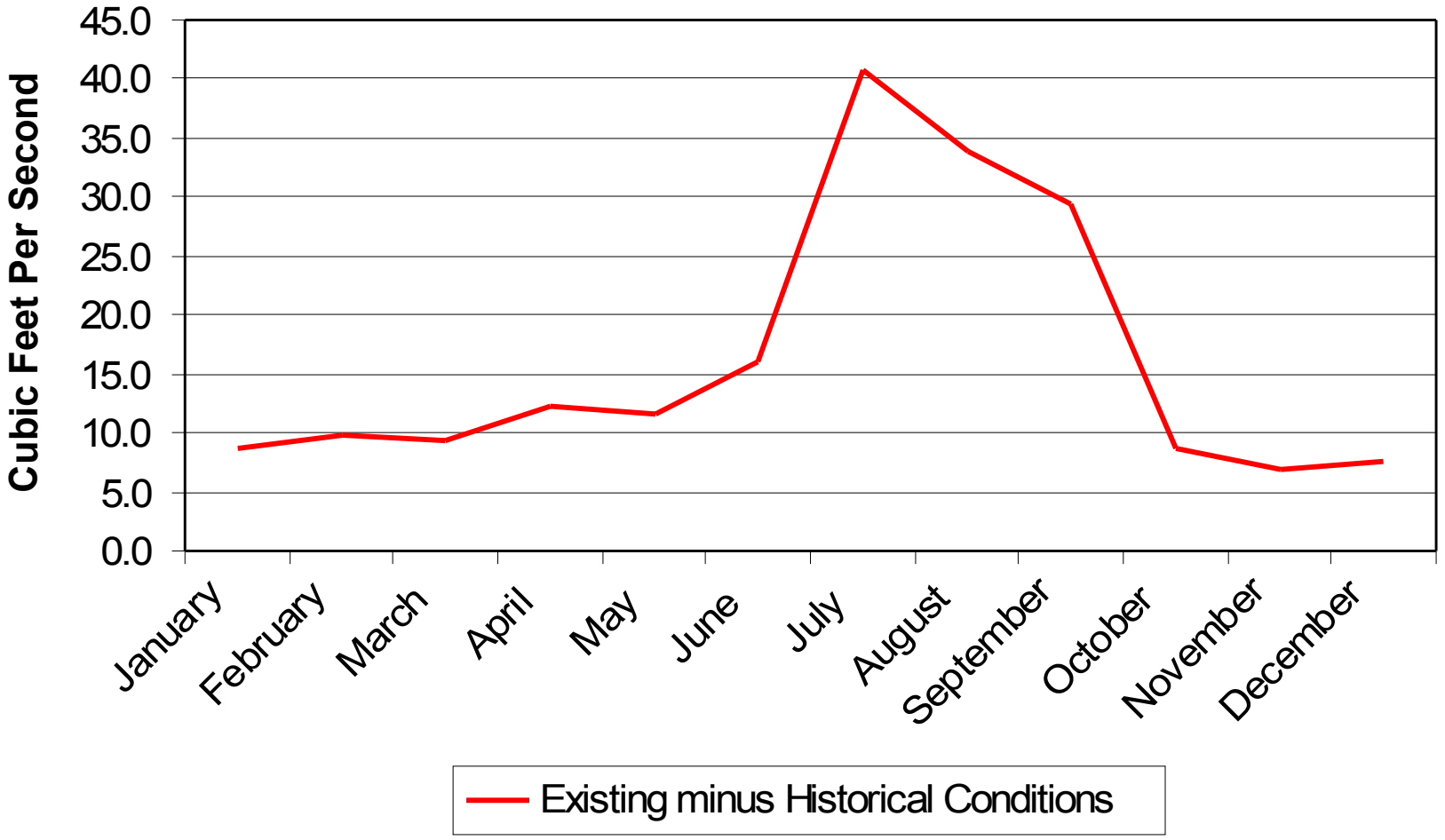
- Existing Conditions (1994-2006)
- Historical Land Use (early 1950's)
- Future Land Use (2025)





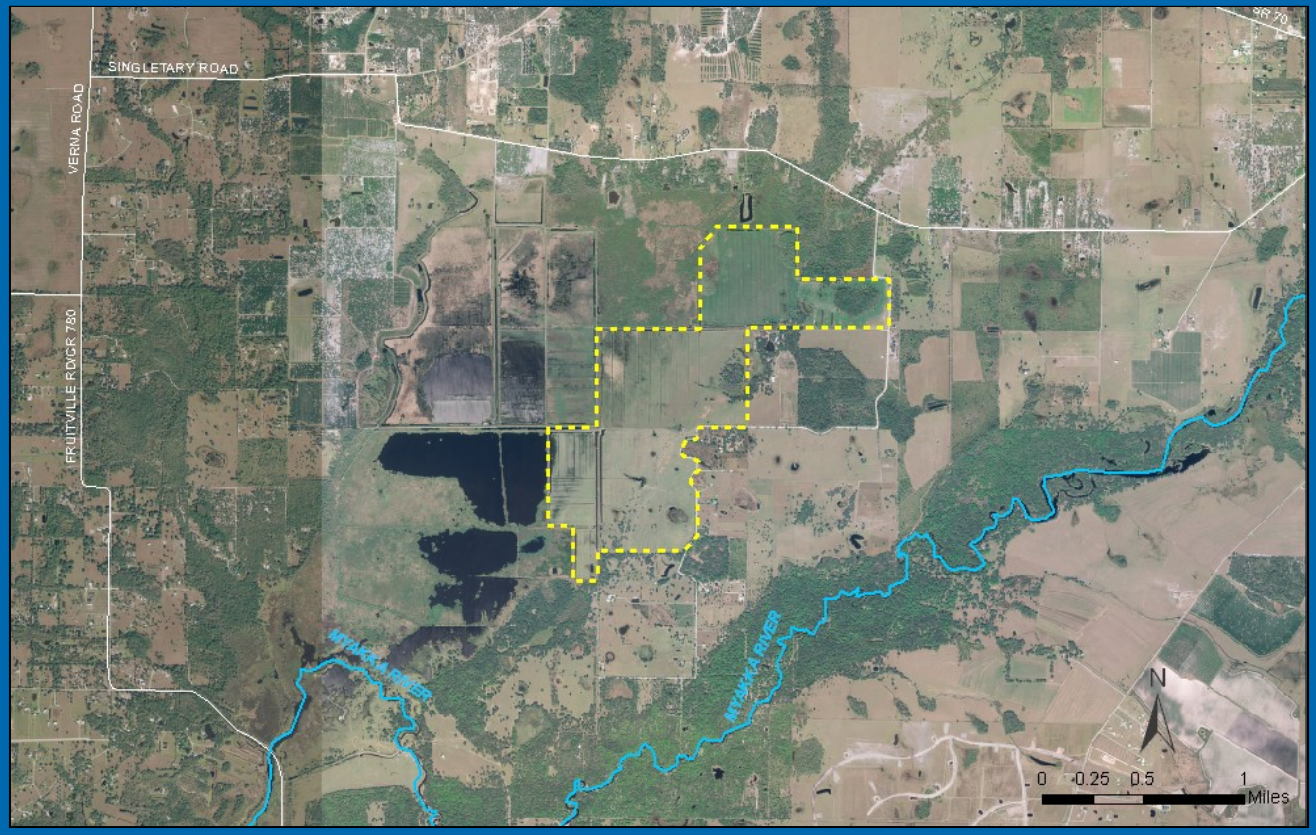


Median Day-of-Year Excess Flows, Sum of Flatford Swamp Tributaries

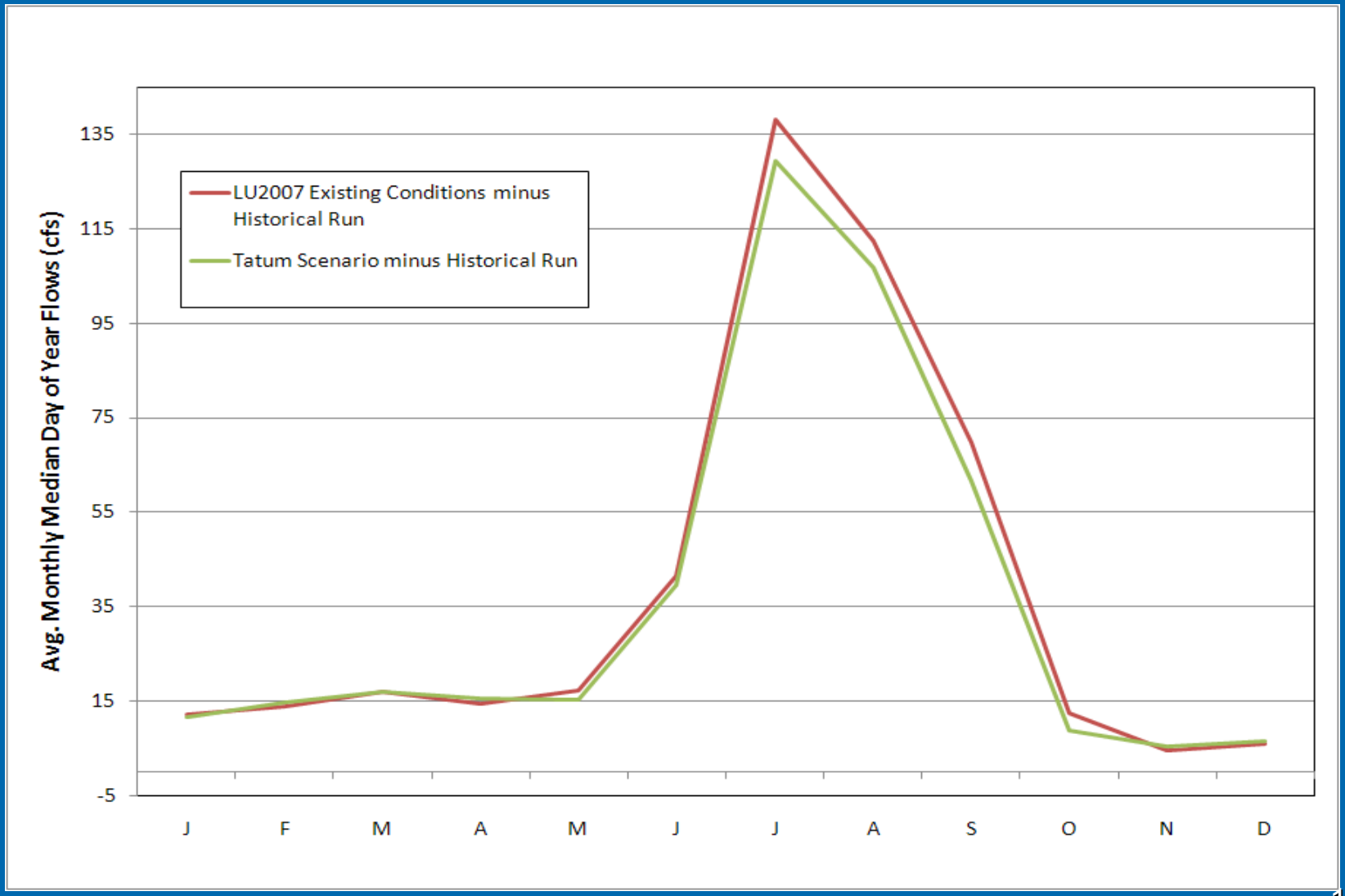


Tatum Sawgrass Evaluation: Task Objective

- Evaluate the potential hydrologic restoration of a portion of Tatum Sawgrass



Monthly Differences in Median Day-of-Year Flows, Myakka River near Sarasota

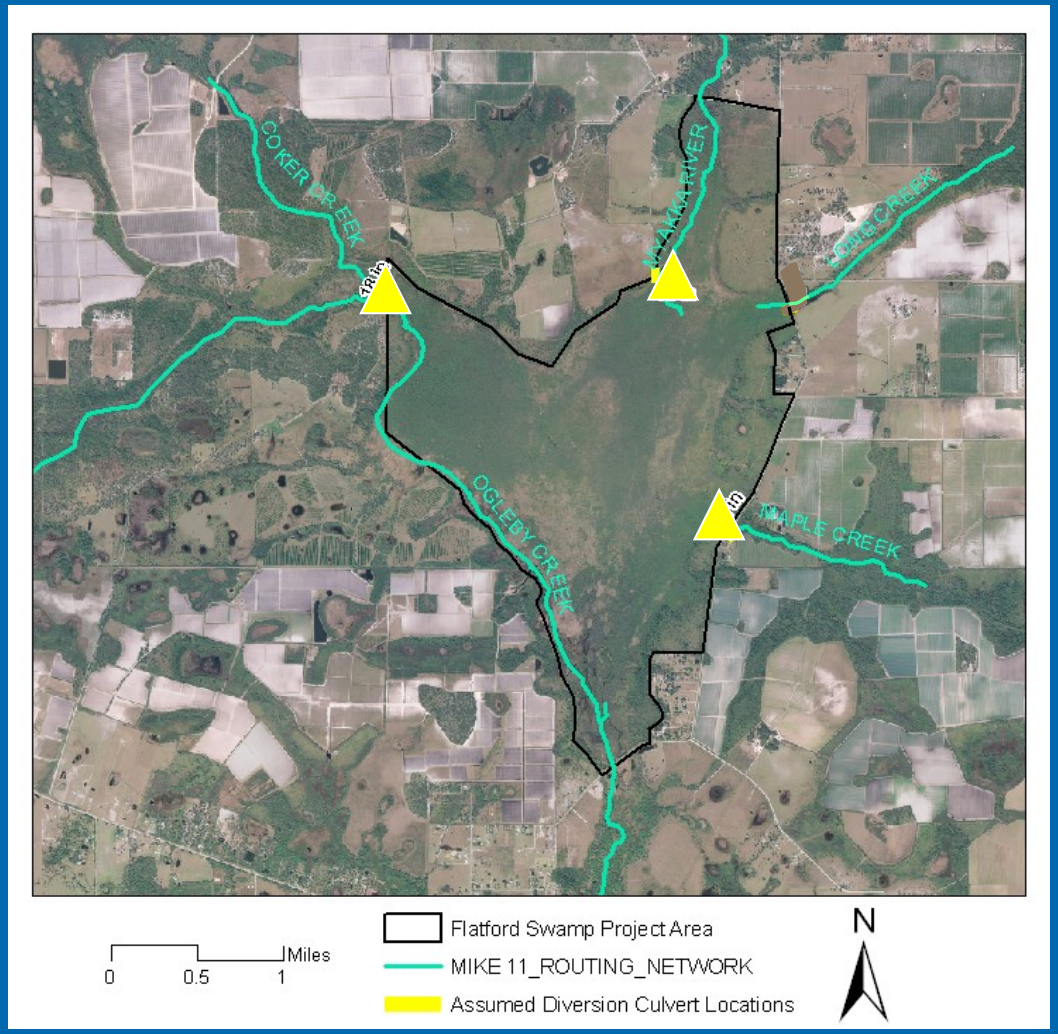


Flatford Swamp Diversion / Extraction Scenarios

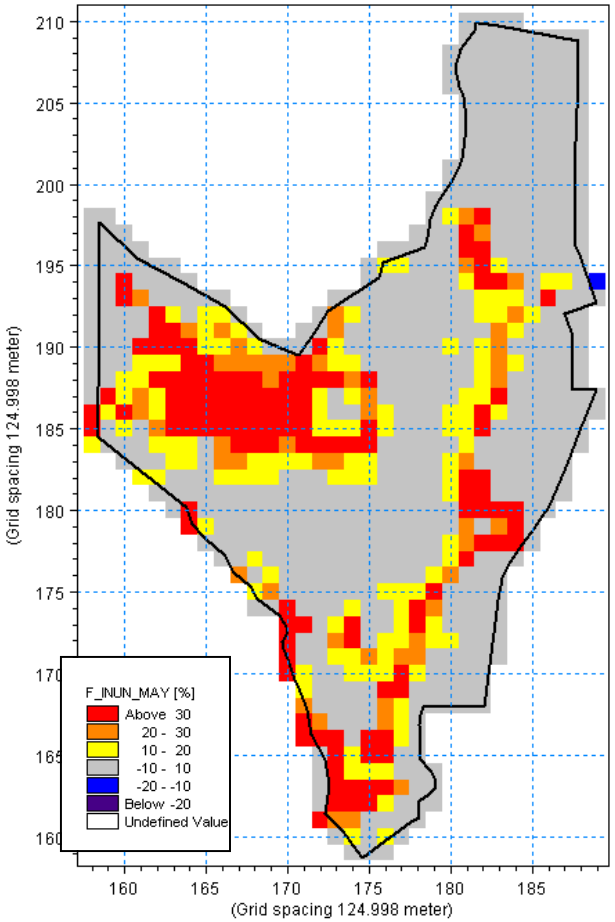
- FARMS Projects, effective but not complete solution
- Removal of sediment at strategic locations may be part of the solution
- Need “workhorse” to remove excess water

Diversion of Water at Three Tributary Inflows to Flatford Swamp

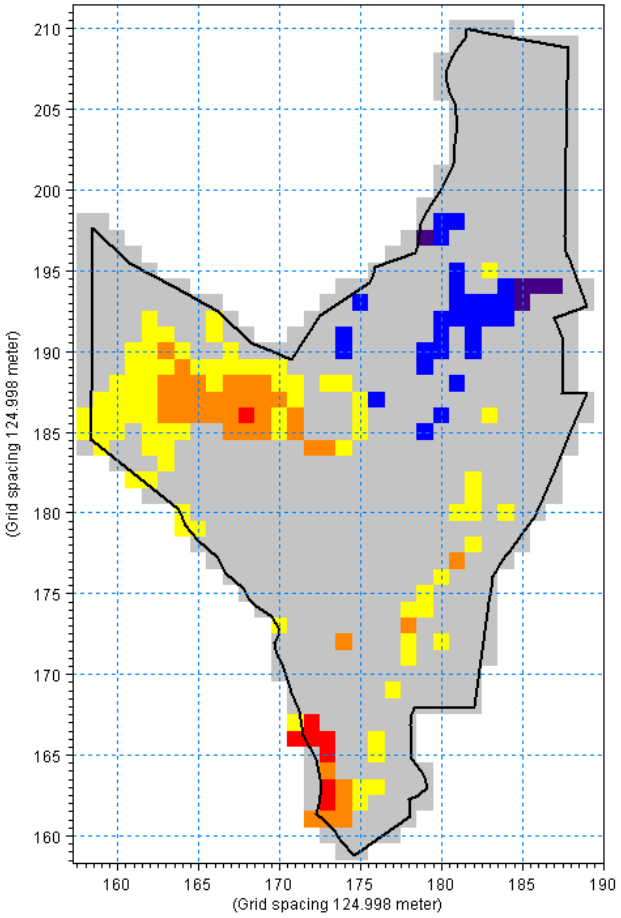
- Diversion of water just downstream of the confluence of three inflow points
- Diversion rates controlled by operable gates and upstream heads



Month of May Frequency of Inundation Difference Map Comparison

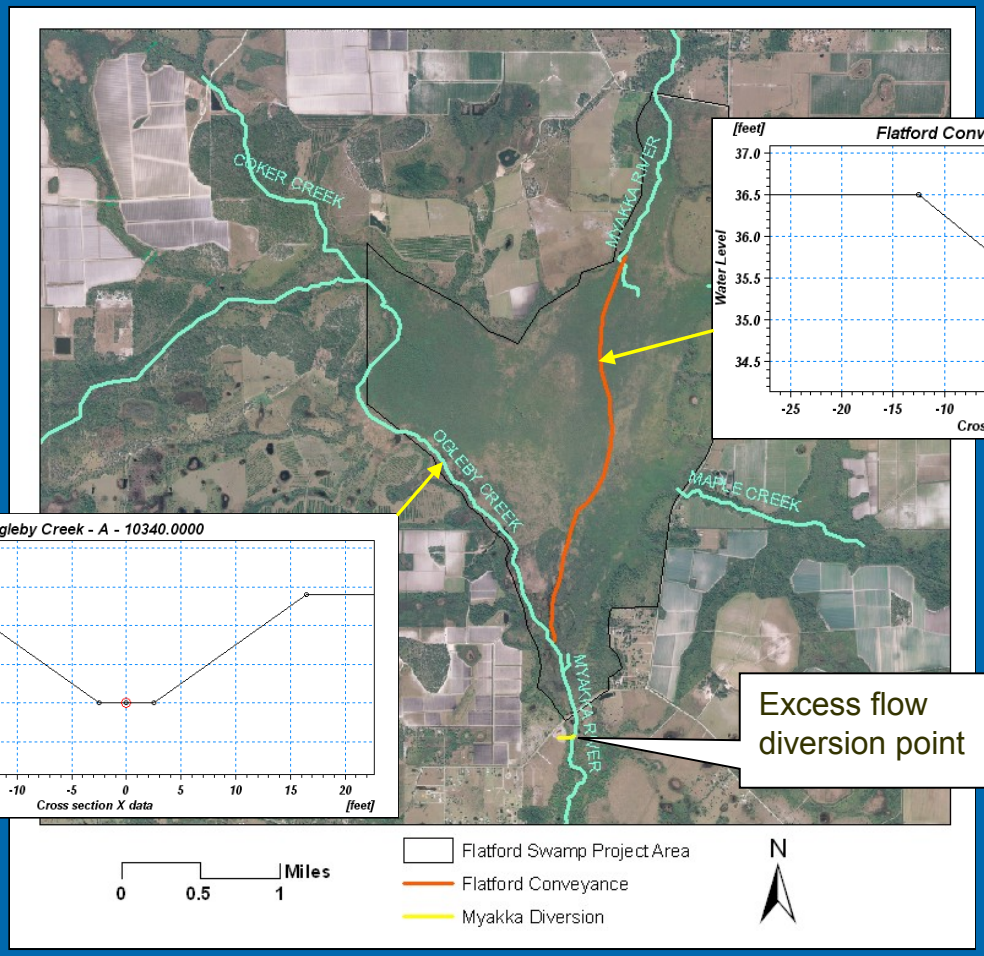


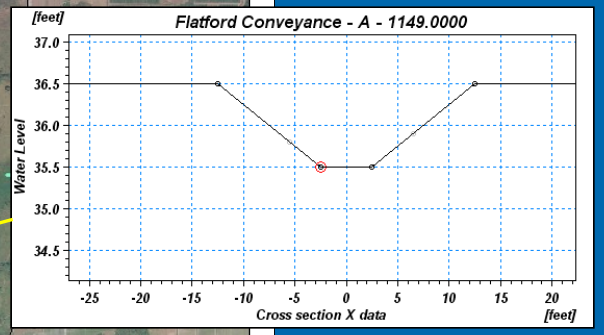
Existing minus Historical

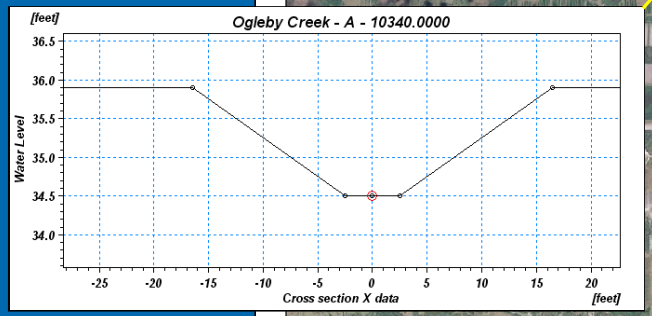


Scenario 3 minus Historical

Improving Conveyance through Flatford Swamp

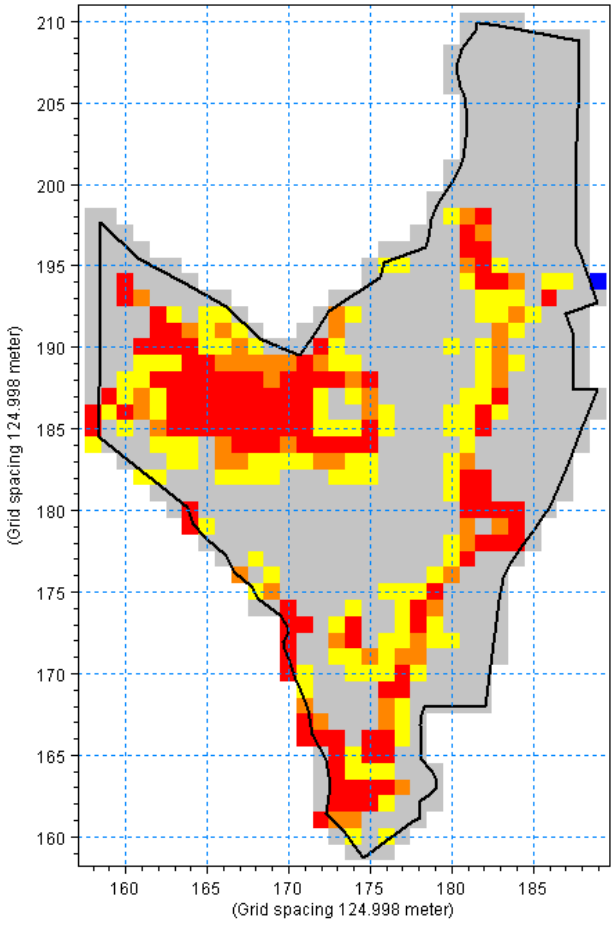




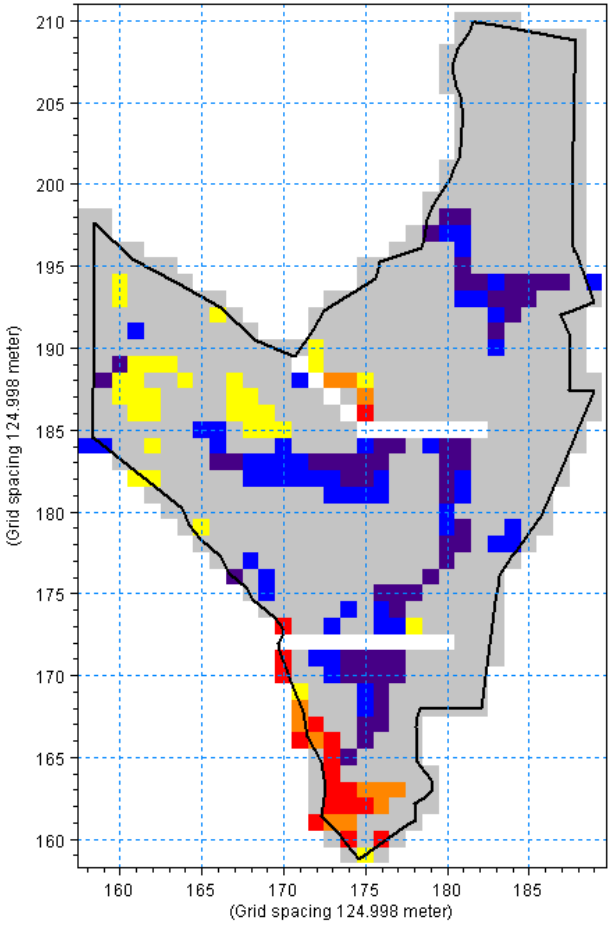


- Excavated channels through east and west sections of swamp
- Typical section, 5’ bottom width, 10:1 side slopes, approx. one to two ft deep.
- Diversion downstream of swamp

Month of May Frequency of Inundation Difference Map Comparison



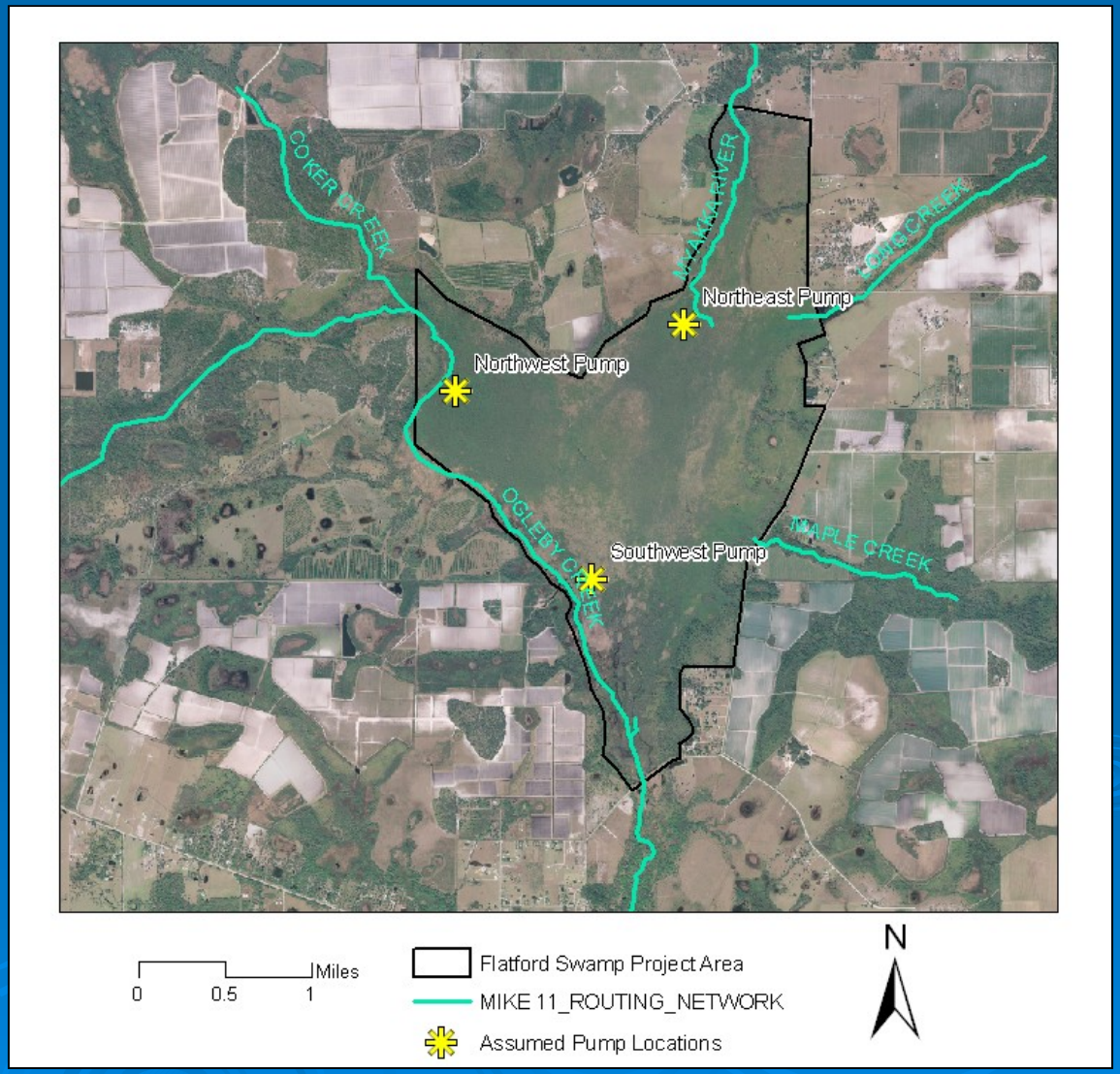
Existing minus Historical



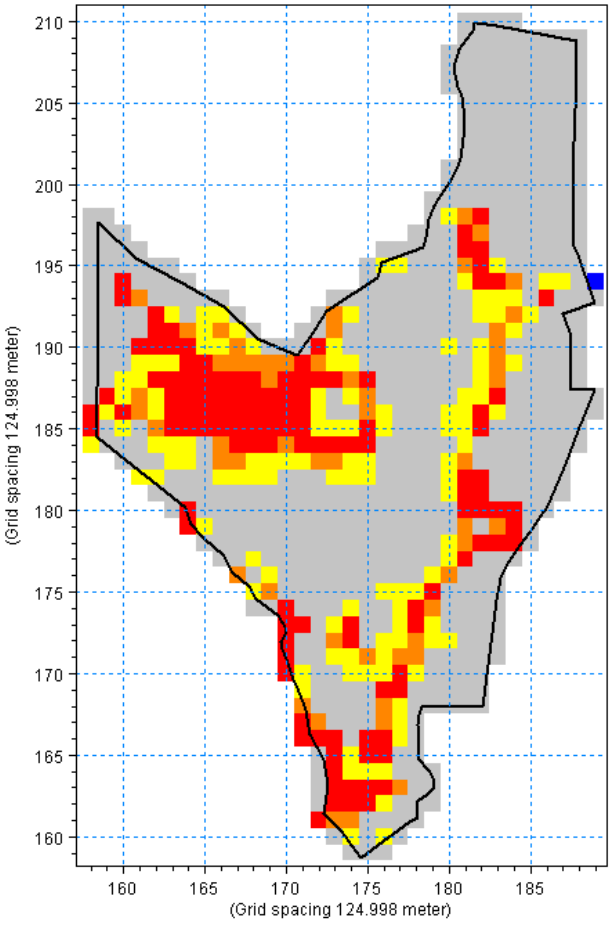
Scenario 5 minus Historical

Pumping from Points within the Swamp

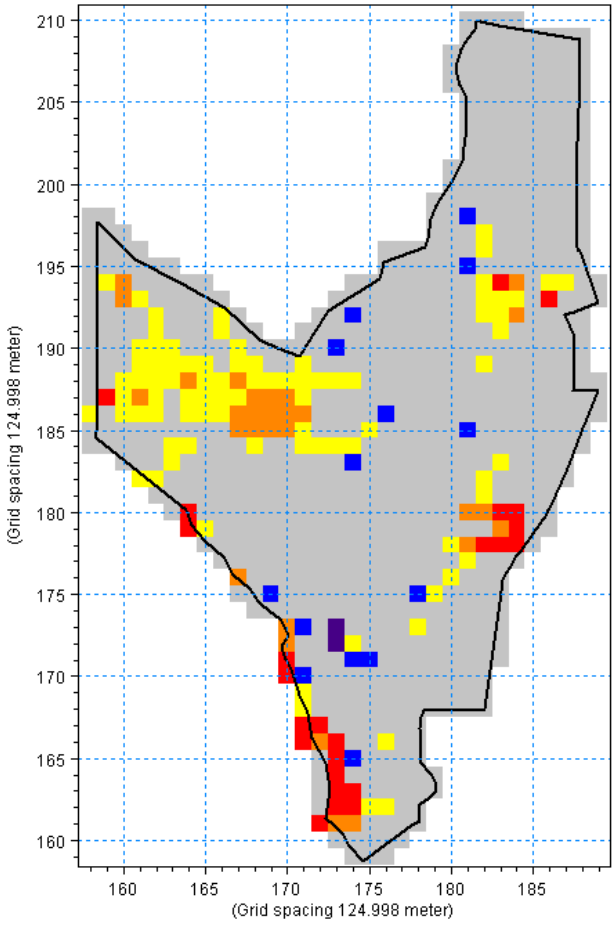
- Three pump stations removing water directly from interior of swamp
- Intake points would be reached by directionally drilling from pump stations in nearby upland areas at the edge of the swamp.



Month of May Frequency of Inundation Difference Map Comparison



Existing minus Historical



Scenario 6 minus Historical

Uses For the Available Excess Water

- MFL Recovery Strategy - Manatee River
  - d/s of Lake Manatee dam
  - Potable water replacement
- Direct Aquifer Injection (local area – near MIA)
- Use by Nearby Mines – Groundwater offset

Future Tasks

- For 2010,
  - Finish watershed evaluation
  - Complete development of alternatives for Flatford Swamp
  - Continue discussions with potential end users for excess water
  - Move to preliminary design activities for withdrawal scenarios
  - Start Watershed Management Plan (end of year)