First Increment of the G-3273 and S-356 Pump Station Field Test for Operation of the Modified Water Deliveries Project: Ecological Monitoring Update

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First Quarterly Project Delivery Team Meeting
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Ecological Monitoring Goals and Objectives

Overarching goal

Assess restoration successes and problems, contributing to adaptive management process

Short-term Objectives (for 1st and 2nd Increments, but pertain to future projects and ops)

1. Quantify and assess effects of tests on:
   - Nutrient inputs, legacy accumulations, transport into un-impacted marsh
   - Ecosystem restoration indicators, including
     - hydropatterns
     - periphyton
     - soil condition (accretion)
     - plant community structure and biomass
     - prey base (fish and invertebrates)
     - wading birds and alligators
   - Threatened and endangered species
   - Invasive exotic species
   - Downstream salinity (with S-197 operations)

2. Improve "baseline" documentation and understanding for long-term assessment

3. Provide ecological information supporting water control plan development and implementation

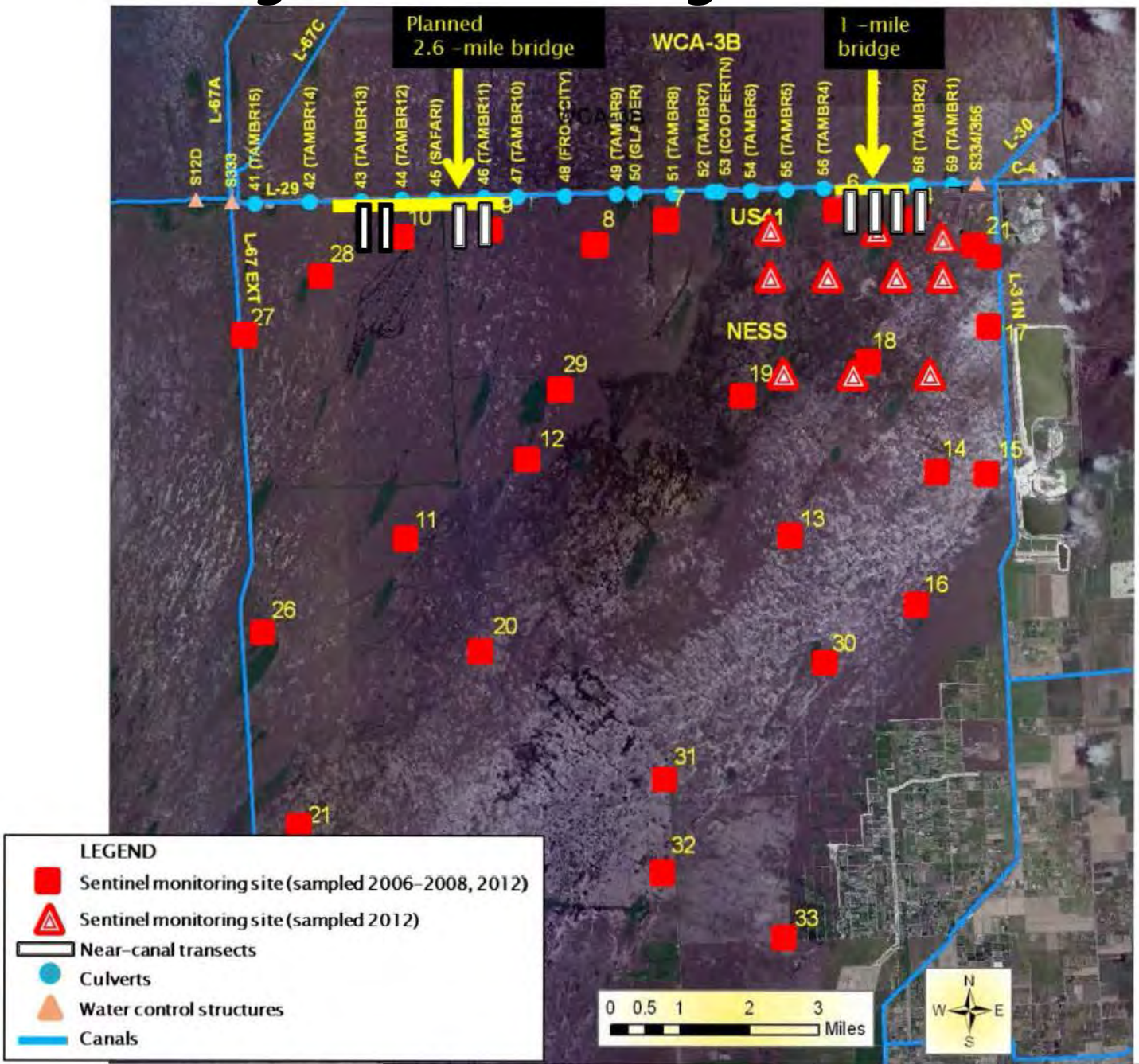
Monitoring Design

- Near-canal transects to quantify changes in areas with sharp environmental gradients (notably to track legacy phosphorus);
- Broad-scale sentinel sites (fixed stations) distributed across the marsh sufficient to assess changes in ecological zones and identify management influences;
- Broad-scale, fine resolution mapping vegetation via remote sensing.

Monitoring Strategy

- Maximize use of established ecological indicators
- Maximize use of existing stations with data collection history
- Priority on rapid response metrics and rapid reporting for test period assessment
- Include critical, slower response metrics (plant habitat, soils) to assess long-term change with MWD-TTNS-CEPP implementation

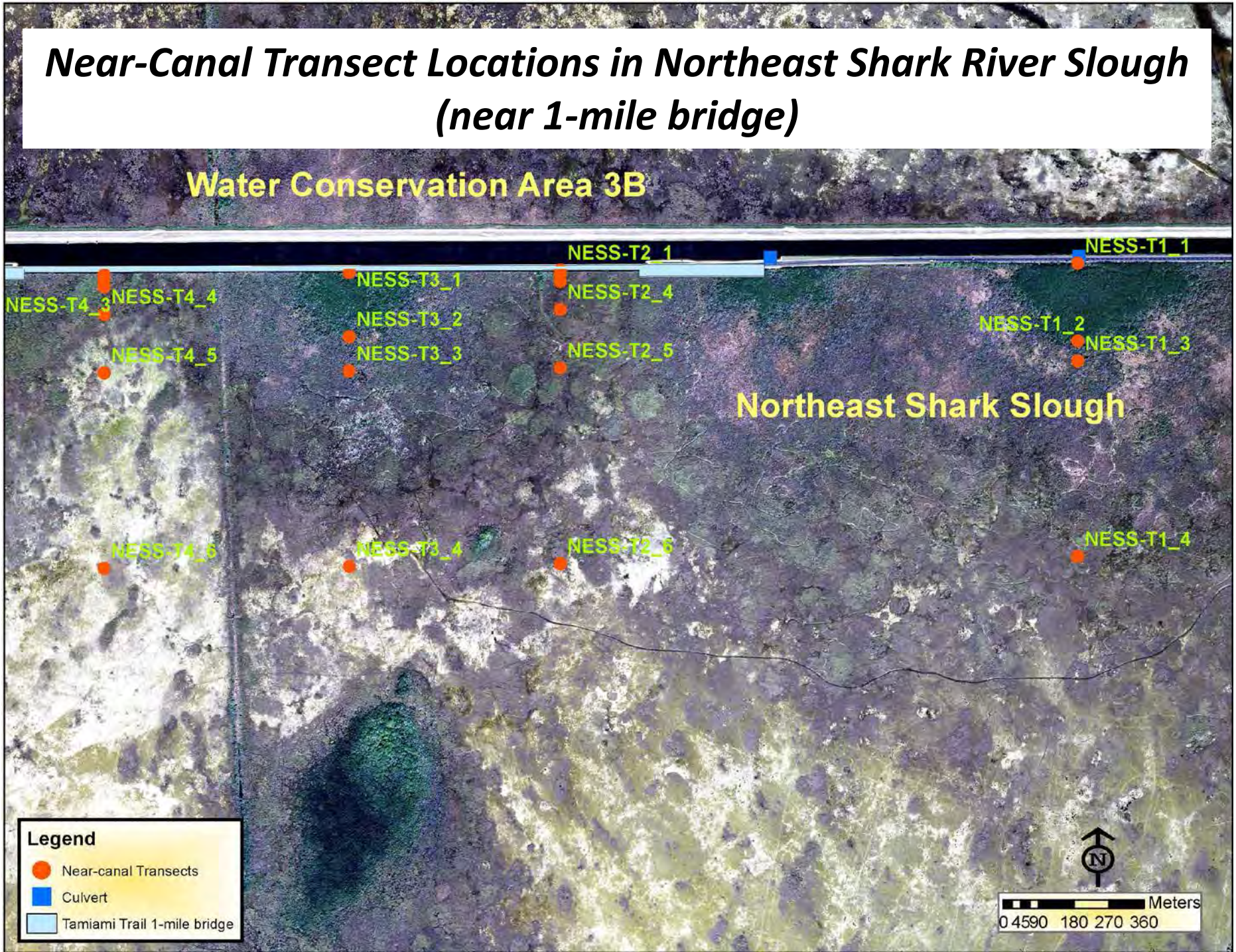
Ecological Monitoring Site Locations



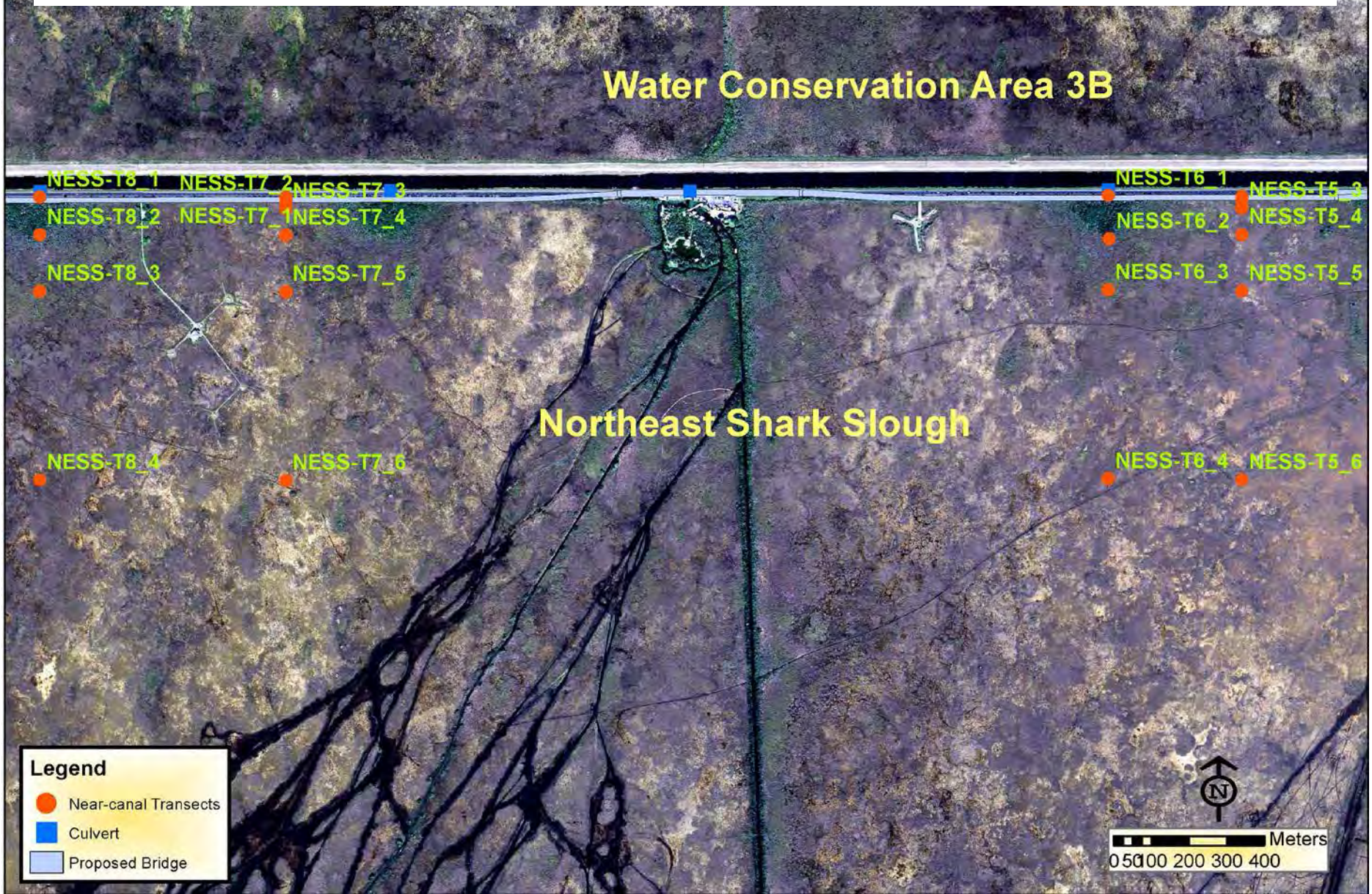
Progress

- Execution of 5 year ENP cooperative agreement with SFWMD, supporting water quality analysis, near-canal ecological assessment (flow and vegetation, hydrologic modeling support; S. Scully, SFWMD lead)
- Execution of 5 year ENP task agreement with FIU for downstream ecological monitoring, assessment, reporting (L. Scinto, FIU lead)
- ENP permits issued to SFWMD and FIU for field sampling planned in above agreements
- Dye tracer studies of flow from L-29 into NESRS conducted in Oct and Nov at 3 sites to establish the direction of near-canal sampling transects . Result: established north-south orientation for all transects.
- Completed “wet season” sampling of NESRS sites (near canal transects and sentinel sites) by FIU cooperators (Nov 16 – Dec 16)

Near-Canal Transect Locations in Northeast Shark River Slough (near 1-mile bridge)



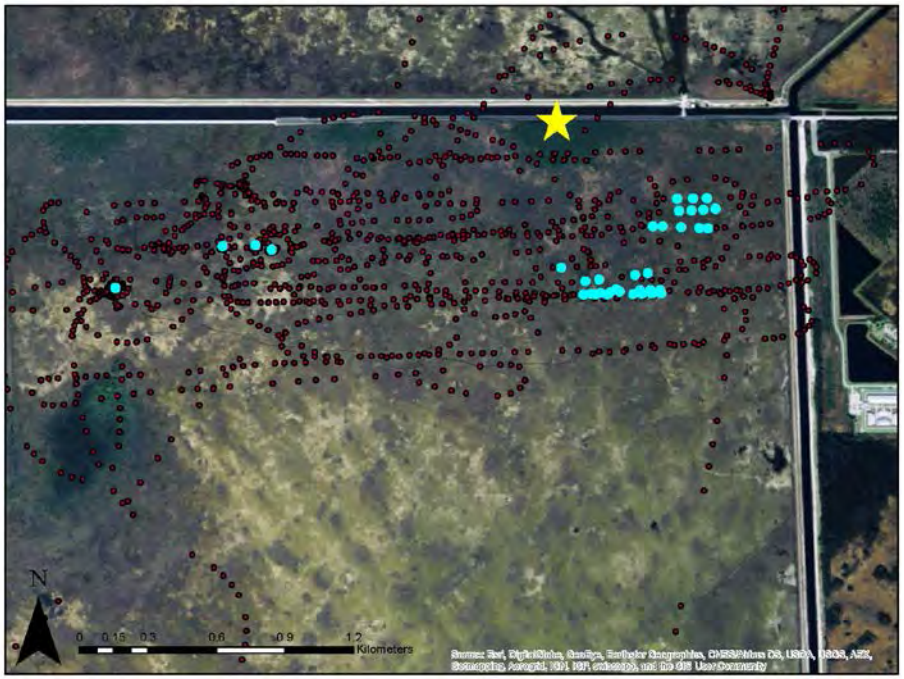
Near-Canal Transect Locations in Northeast Shark River Slough (near future 2.6-mile bridge)

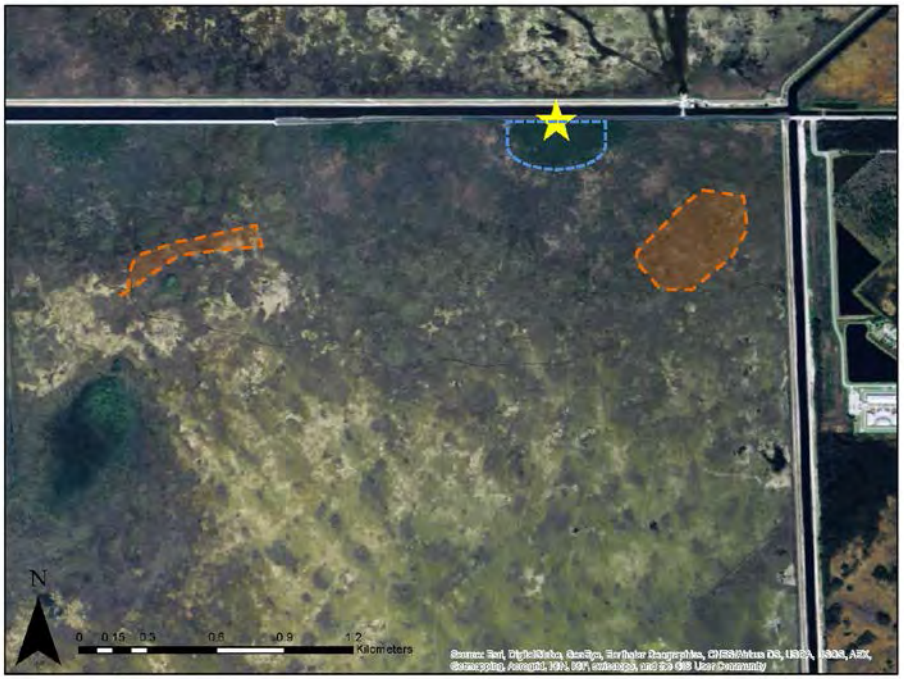


SFWMD Fluorescein Dye Test at Tamiami Canal Culvert (October 2015)

From: C. Zweig and J. Redwine

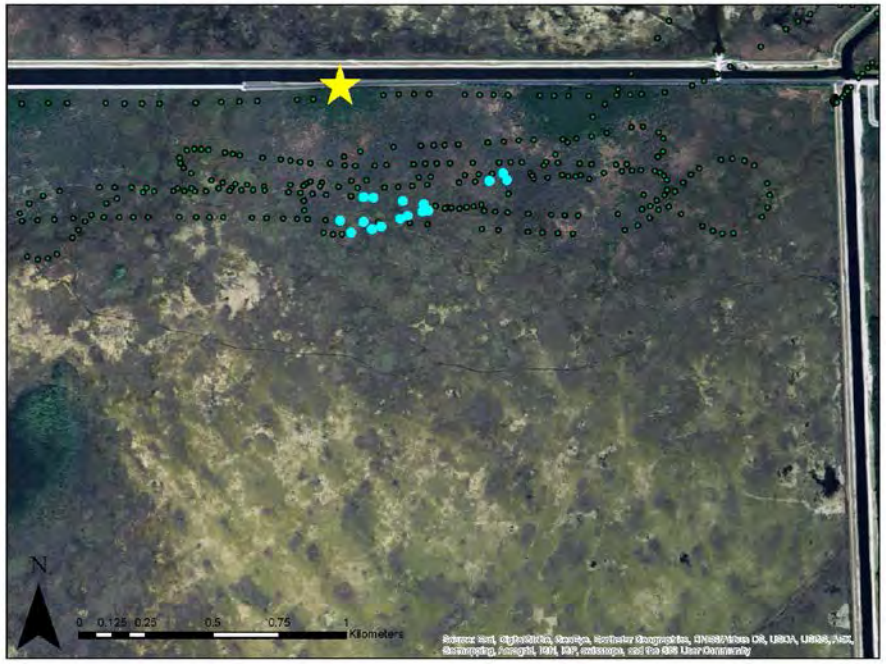
SFWMD Fluorescein Dye Test at Tamiami Canal Culvert (October 9, 2015)

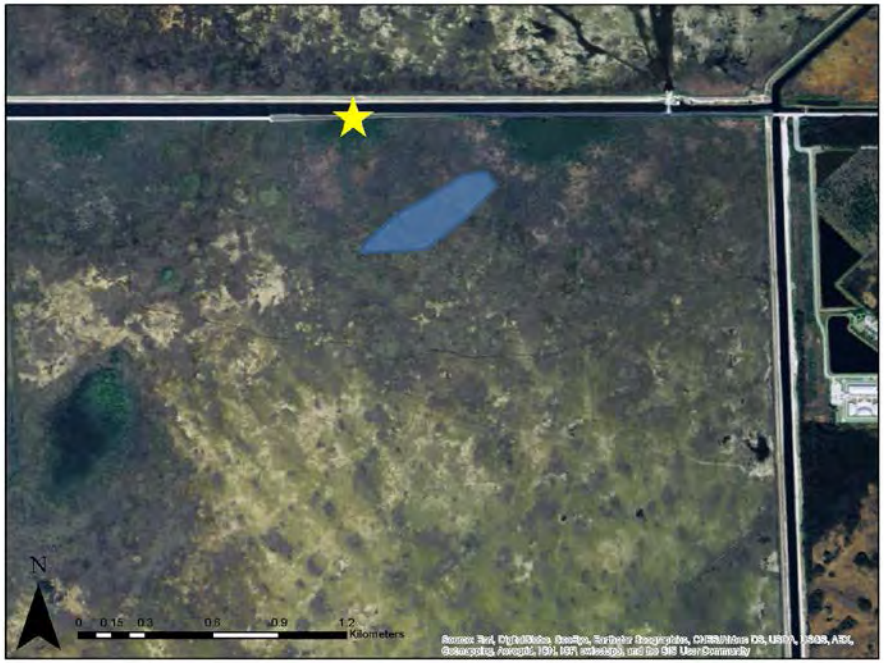




Star: dye release location
Red dots: aerial photo position
Blue dots: photos with dye observed

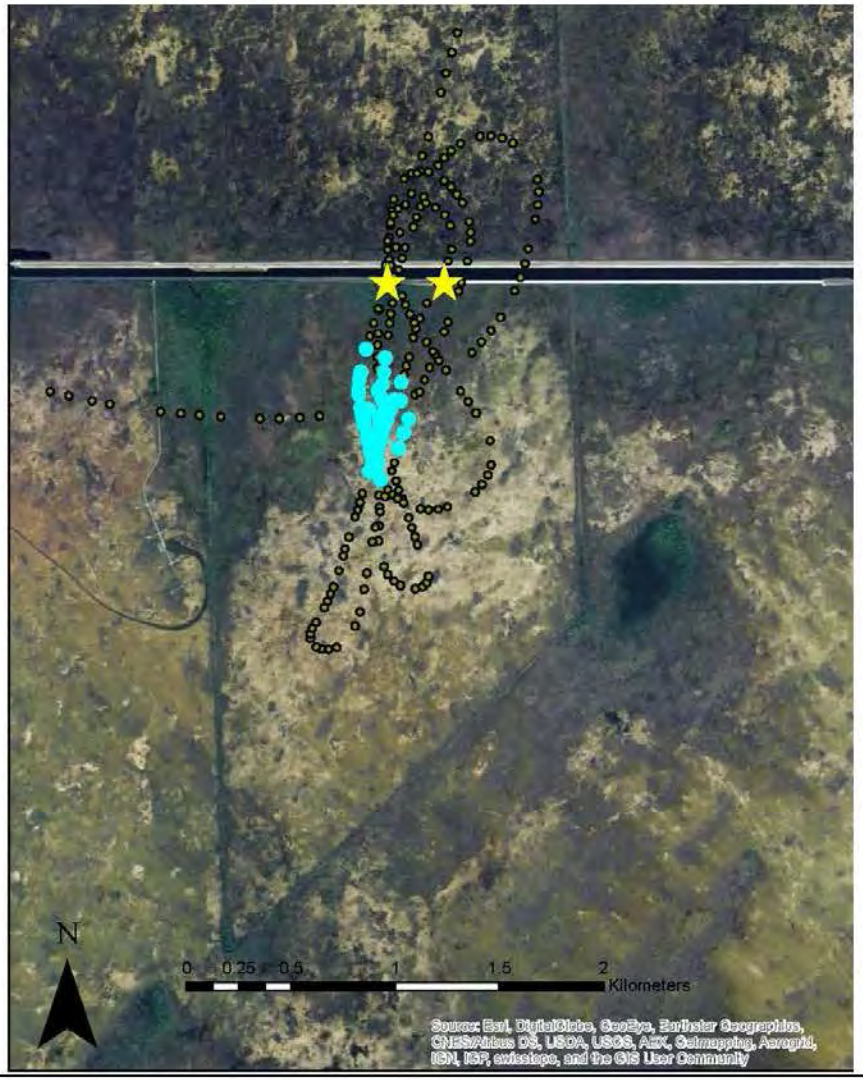
SFWMD Fluorescein Dye Test at Tamiami Canal Culvert (October 15, 2015)

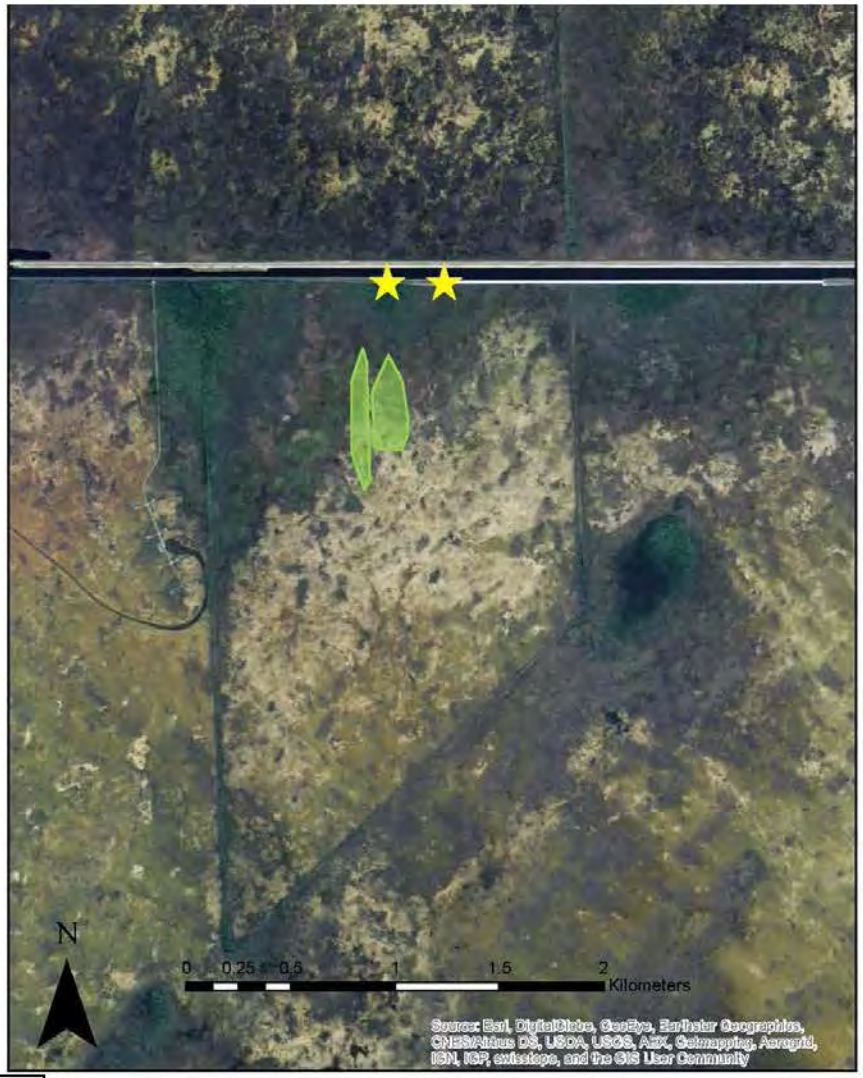




Star: dye release location
Red dots: aerial photo position
Blue dots: photos with dye observed

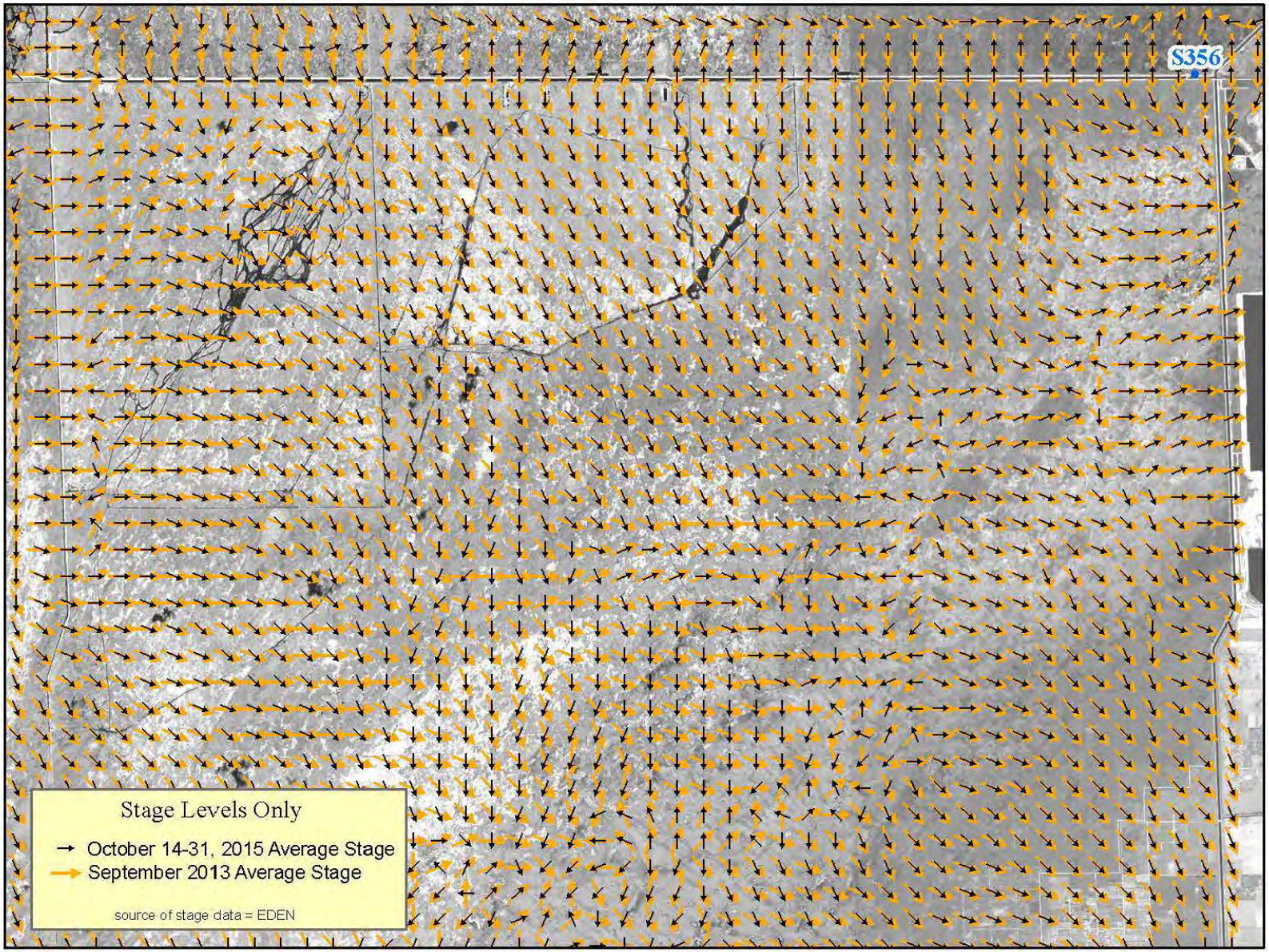
SFWMD Fluorescein Dye Test at Tamiami Canal Culvert (western edge of 1-mile bridge; November 13, 2015)





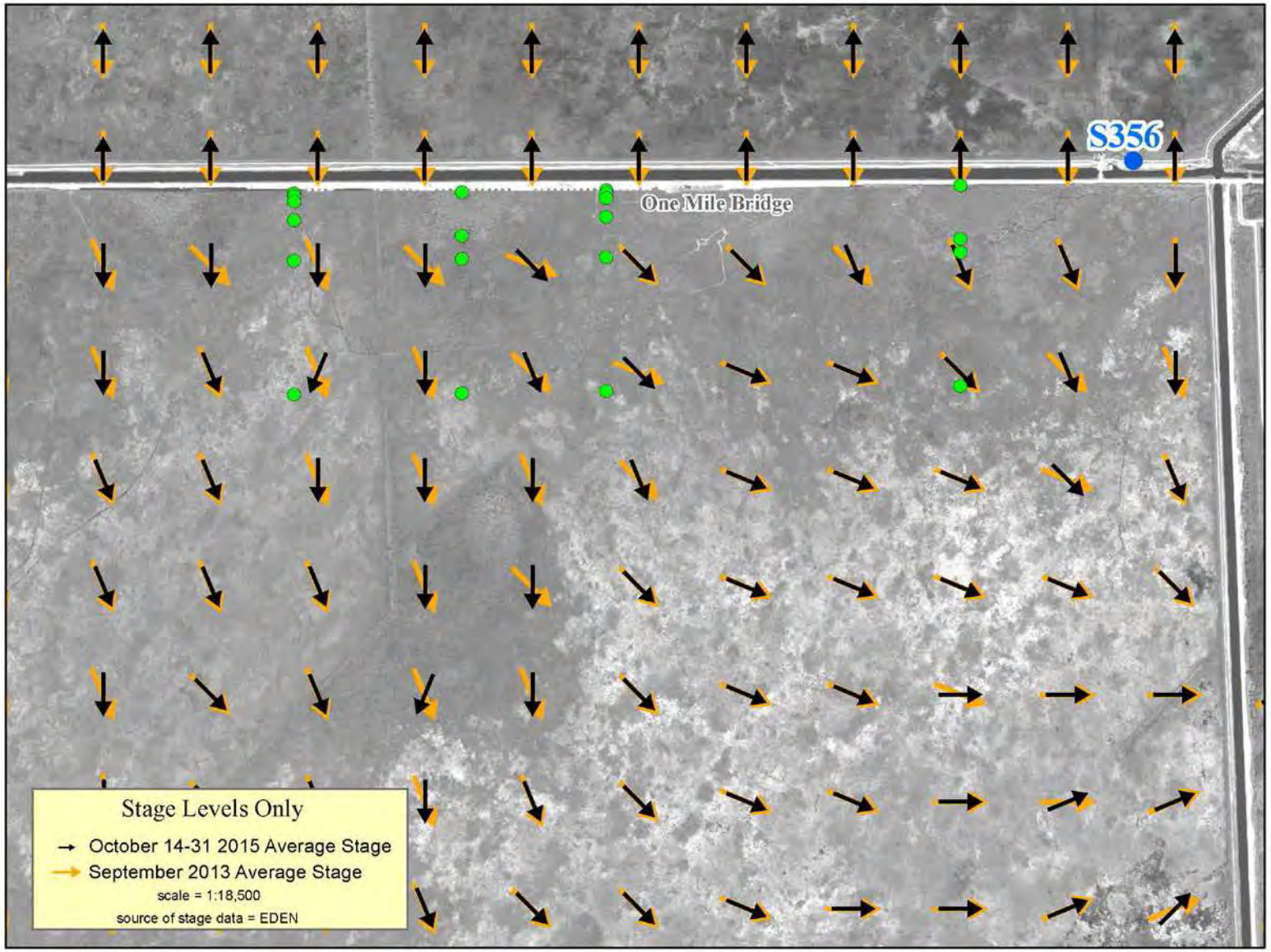
Stars: two dye release locations
Yellow dots: aerial photo position
Blue dots: photos with dye observed

Initial Flow Direction During S-356 Pump Test Compared to High Water Month, Estimated from EDEN



From: Troy Mullins

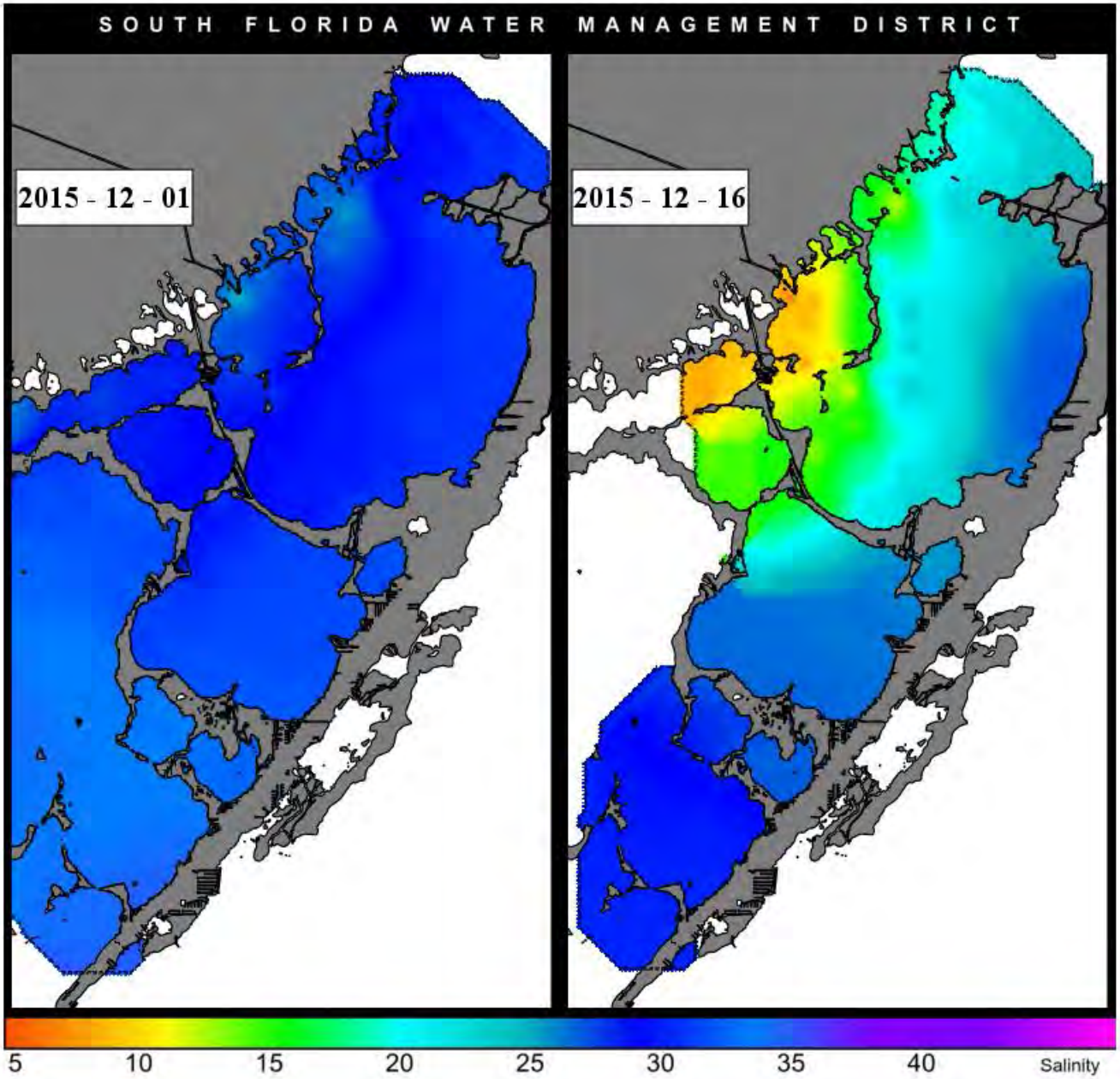
Initial Flow Direction During S-356 Pump Test Compared to High Water Month, Estimated from EDEN



From: Troy Mullins

Salinity Mapping of Manatee Bay/Barnes Sound Before and During S-197 Release

Salinity Distribution before and after December Rainfall event



From: C. Madden, S. Kelly, J. Stachelek (SFWMD)

Datasonde Deployment Locations in Manatee Bay

From S. Kelly, SFWMD