Adaptive Protocols for Lake Okeechobee Operations

Ecological Retrospective

November, 2013 –May, 2014 and Near Future Expectations

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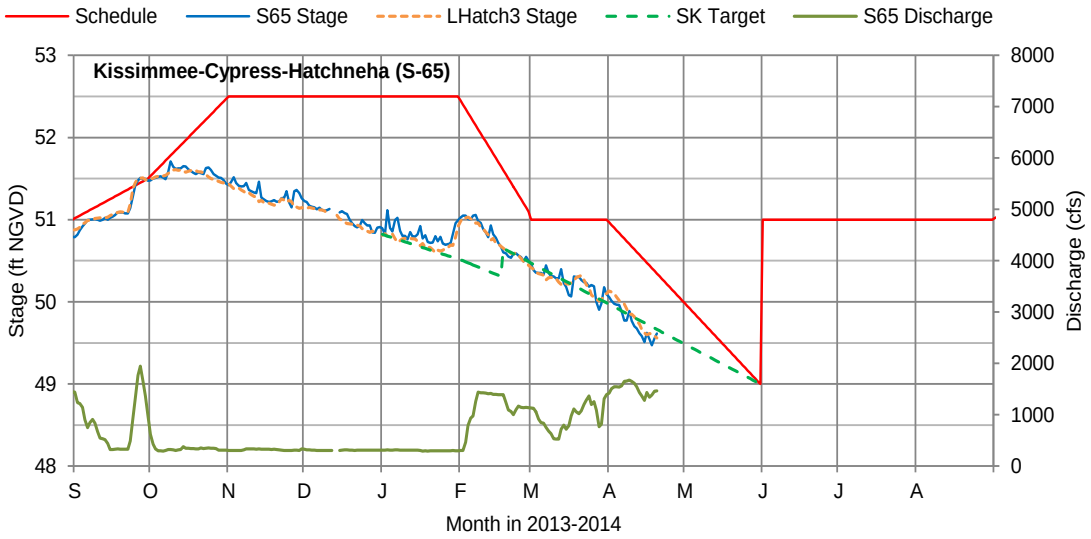
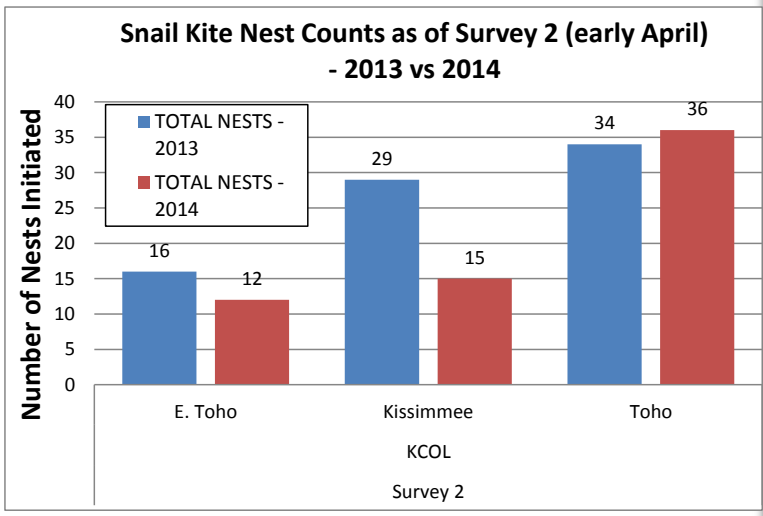
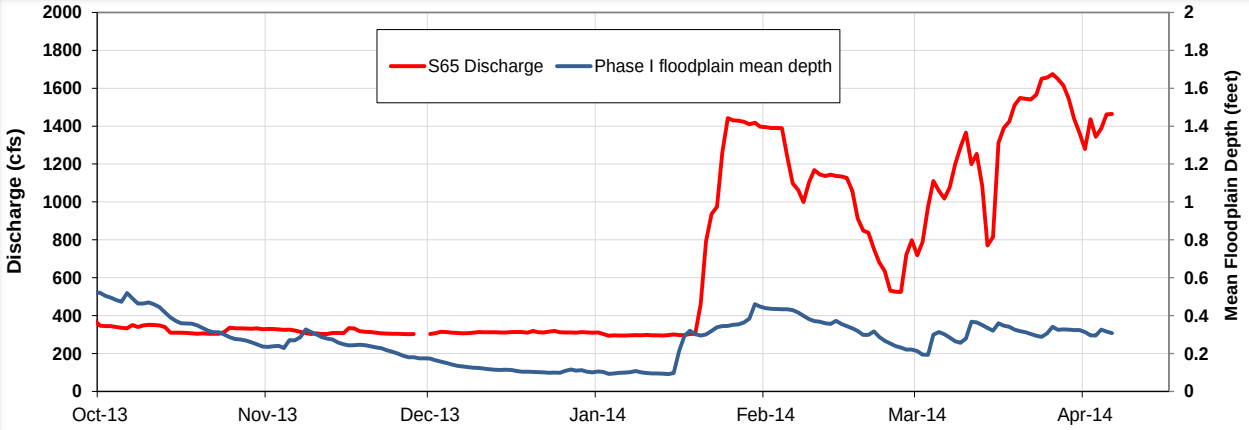
Previous Six Months S-65 and Lake Kissimmee



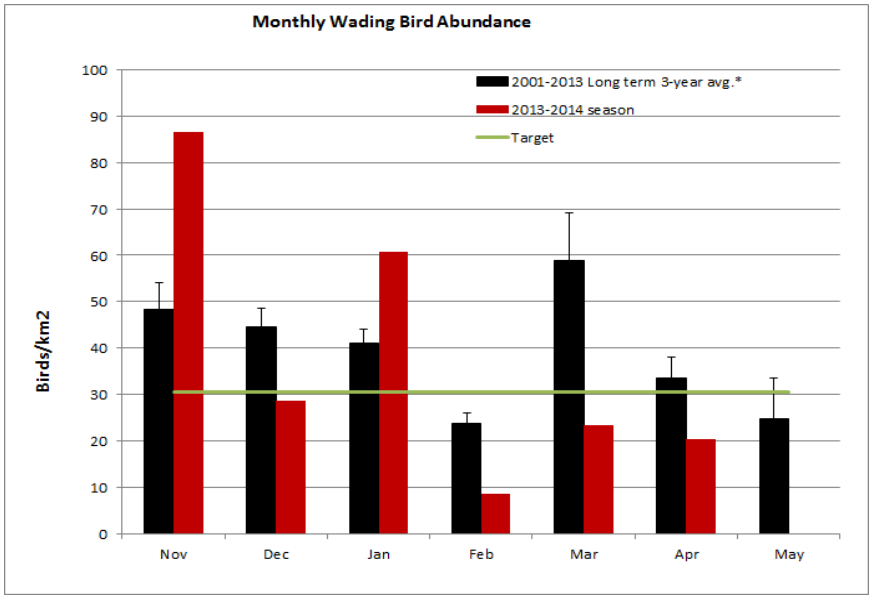


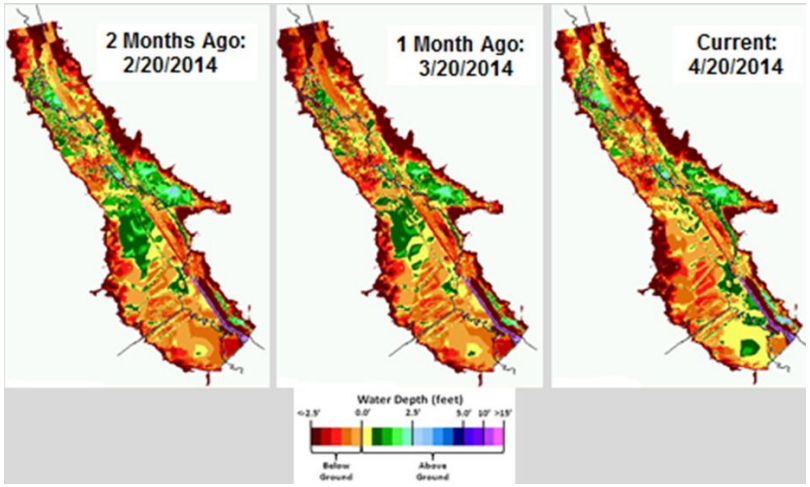
- Higher than average dry season rain meant that more discharge than expected from S-65 was needed to maintain lake stage recessions for snail kite nesting in the lakes (dashed green line)
- A stage reversal in February resulted in raising the planned recession line
- Compared to last year, snail kite nesting is getting off to a slow start this season, perhaps due to a cold winter

Previous Six Months Kissimmee River Floodplain

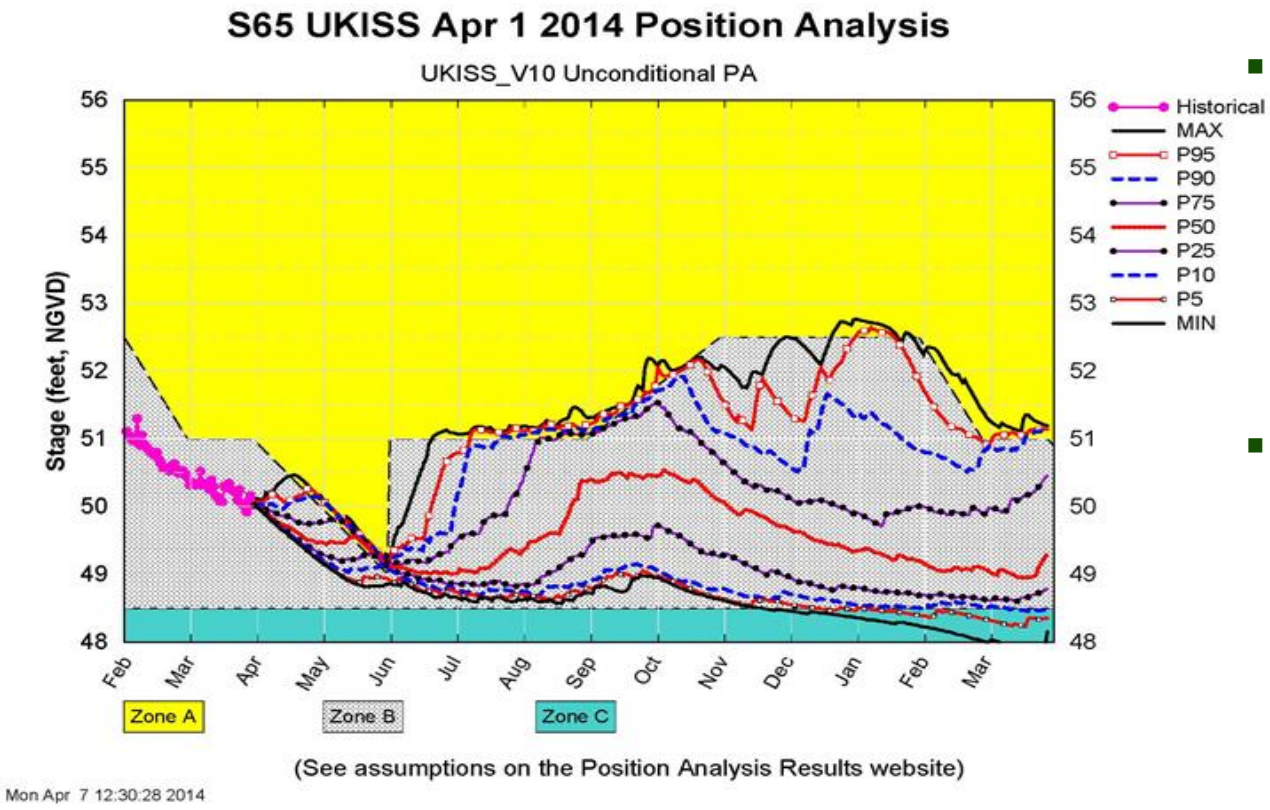


- Discharge from S-65 continues at about 1400 cfs.
- Small portions of the Kissimmee River floodplain downstream have been inundated since late January
- Wading bird densities on the floodplain l have been below monthly long term averages (black bars on graph) since February, likely due to the stage reversal in mid-January



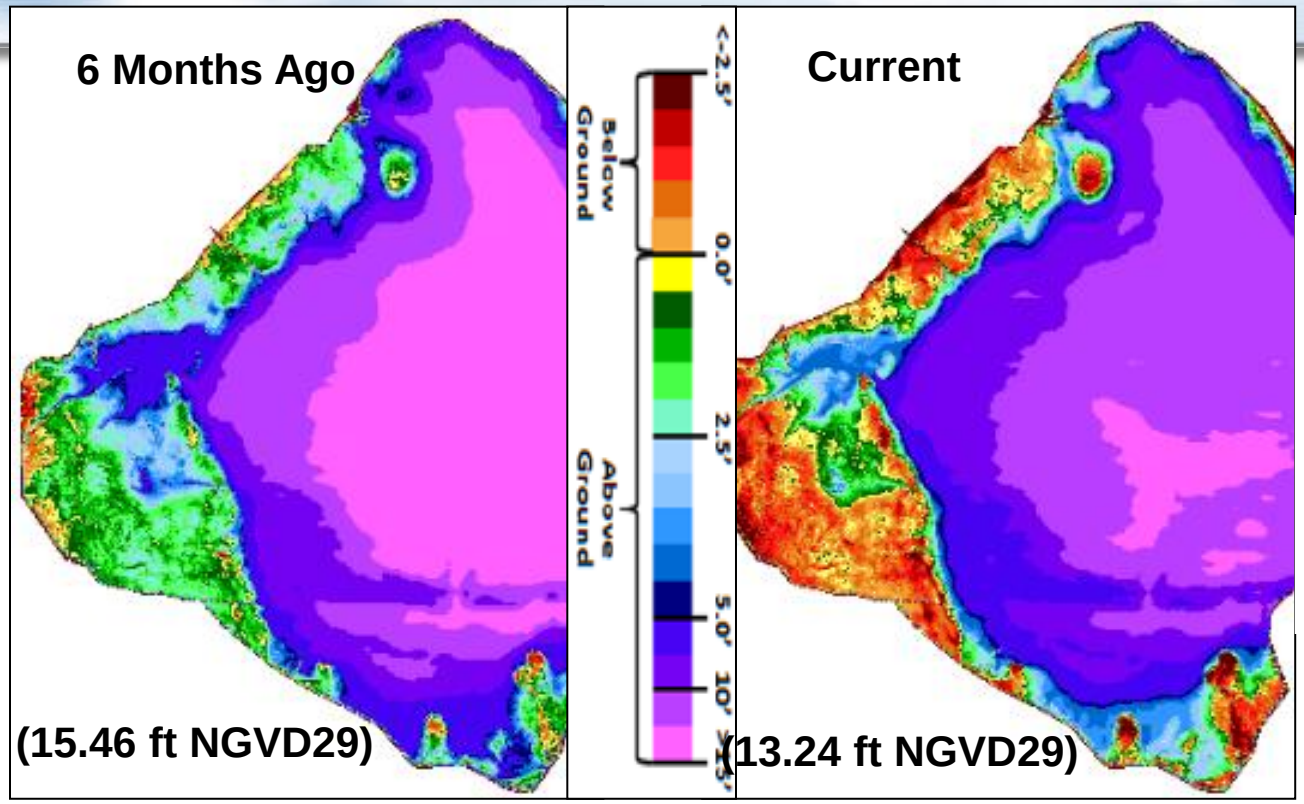


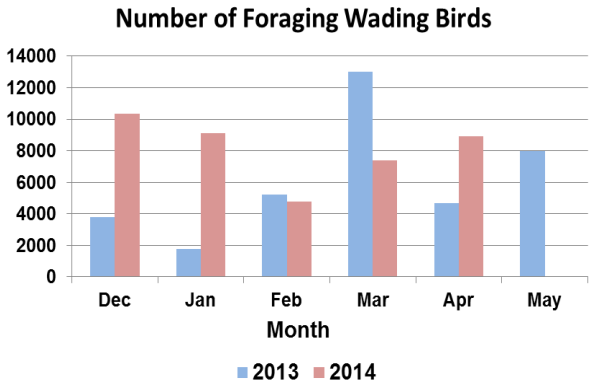
Expected Conditions – Next Six Months
Kissimmee Chain of Lakes & Kissimmee River

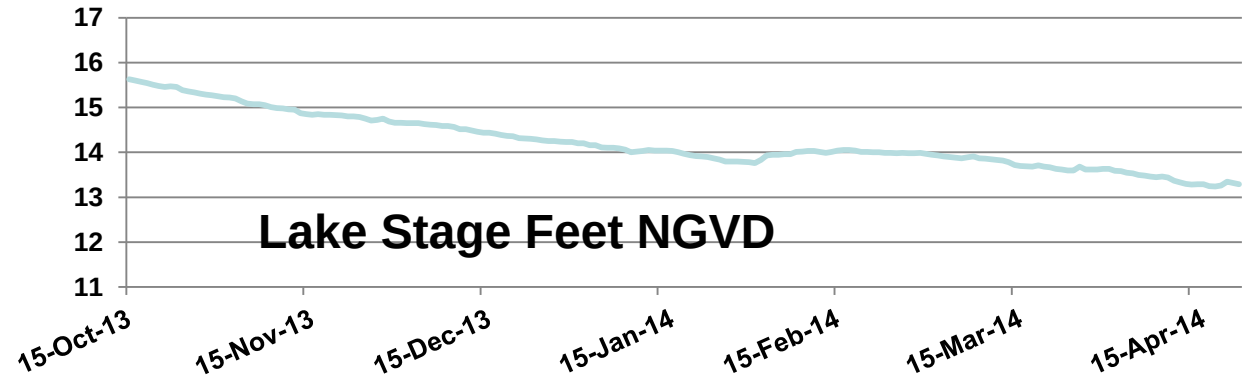


- April Position Analysis indicates only a small chance (5 to 10%) that flow to the Kissimmee River might not be sustainable through the wet season
- Flow in the Kissimmee River downstream depends on discharge from S-65. Maintaining continuous flow is a fundamental target of the Kissimmee River Restoration Project

Previous Six Months – Lake Okeechobee

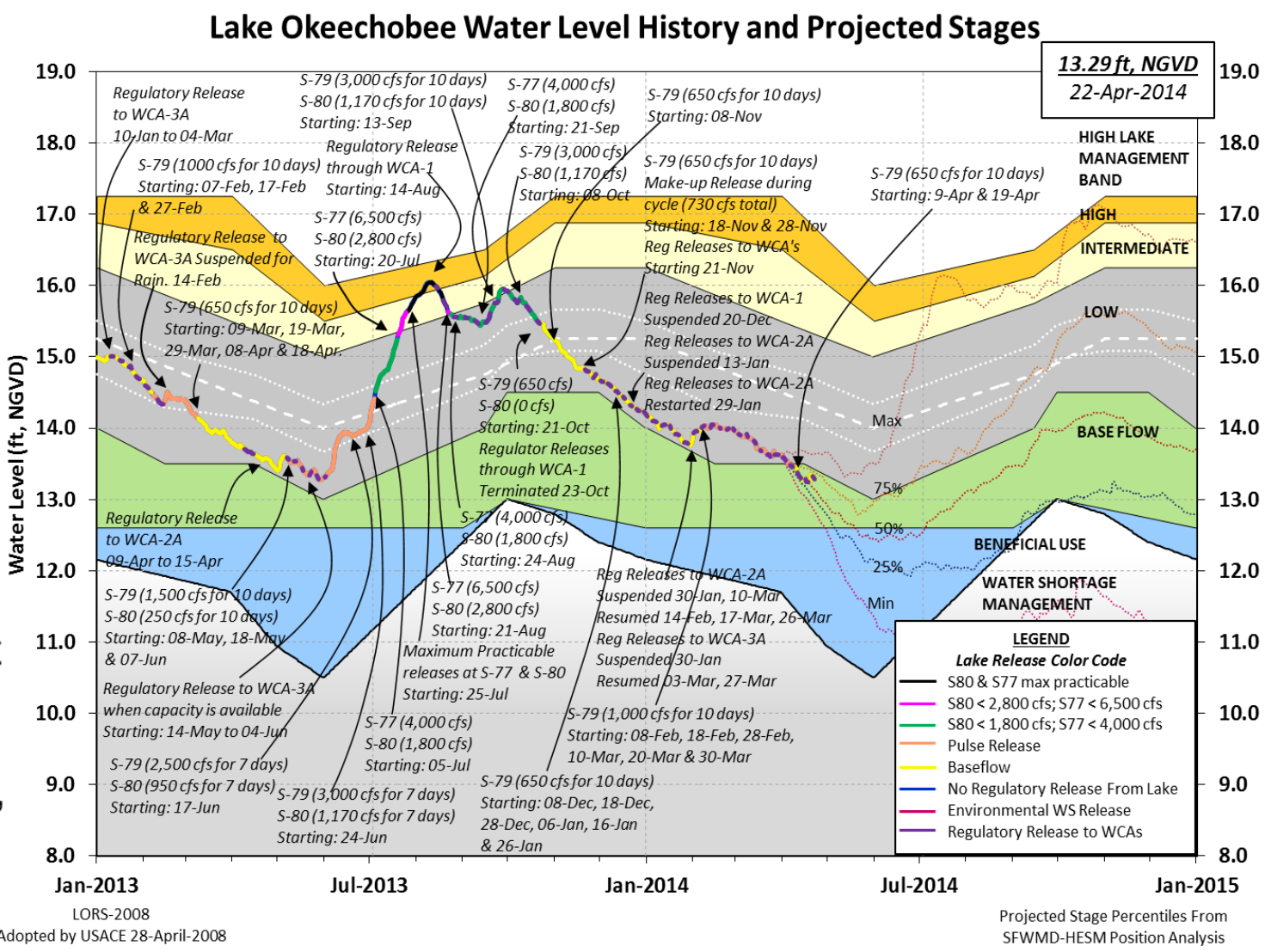






Lake Okeechobee – Next Six Months

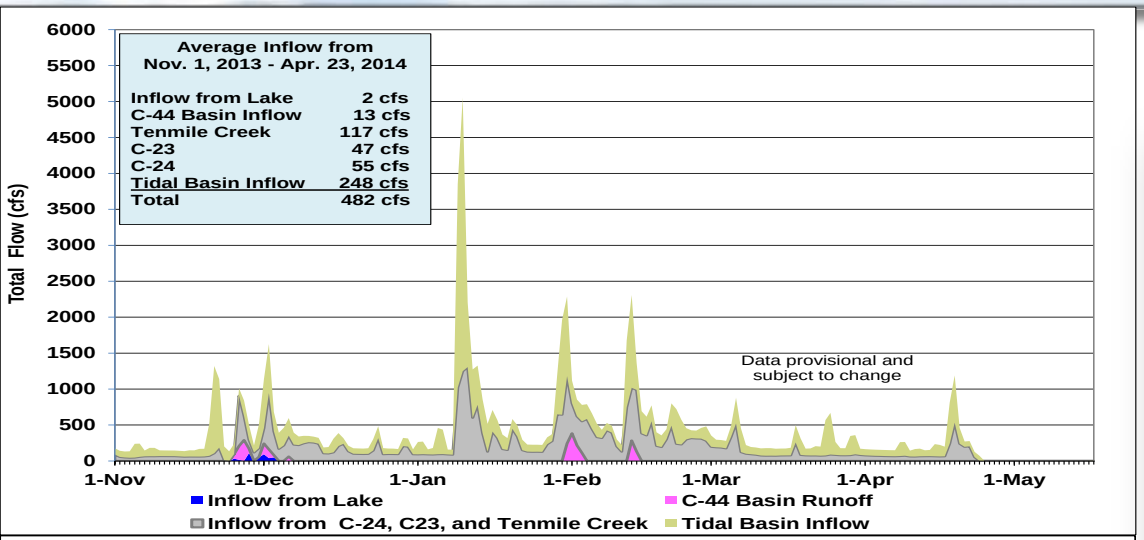
- Water levels for next 6 months highly dependent on severity of the dry season and date of onset of the rainy season.
- Currently Lake is trending below the minimum probability line suggesting that if current conditions persist the Lake will remain within, or fall slightly below, the preferred stage envelope

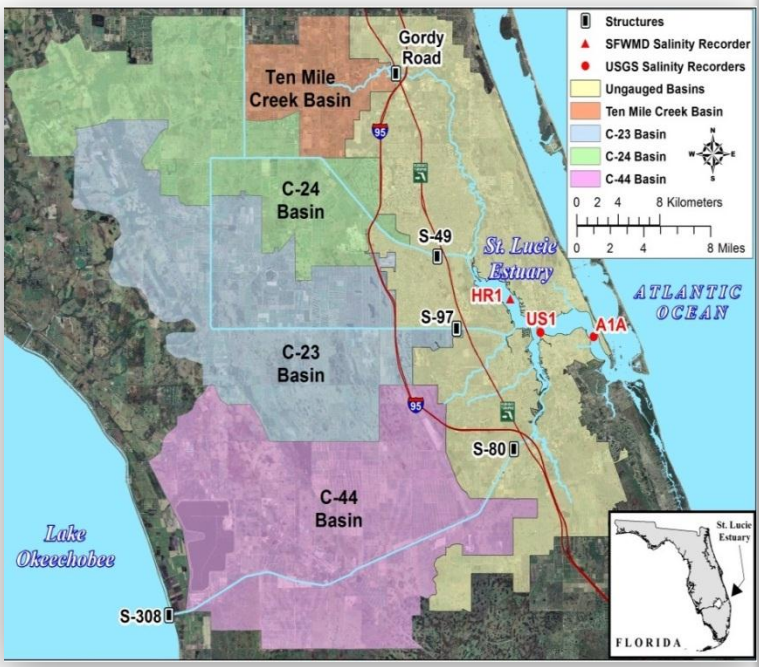


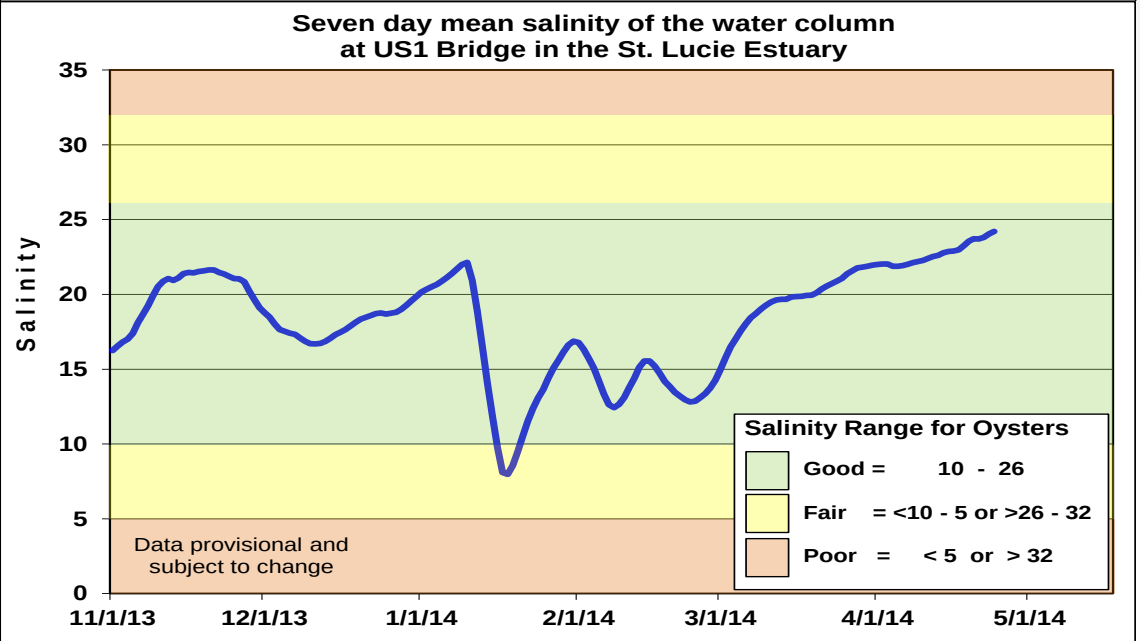
LORS-2008
Adopted by USACE 28-April-2008

Projected Stage Percentiles From SFWMD-HESM Position Analysis

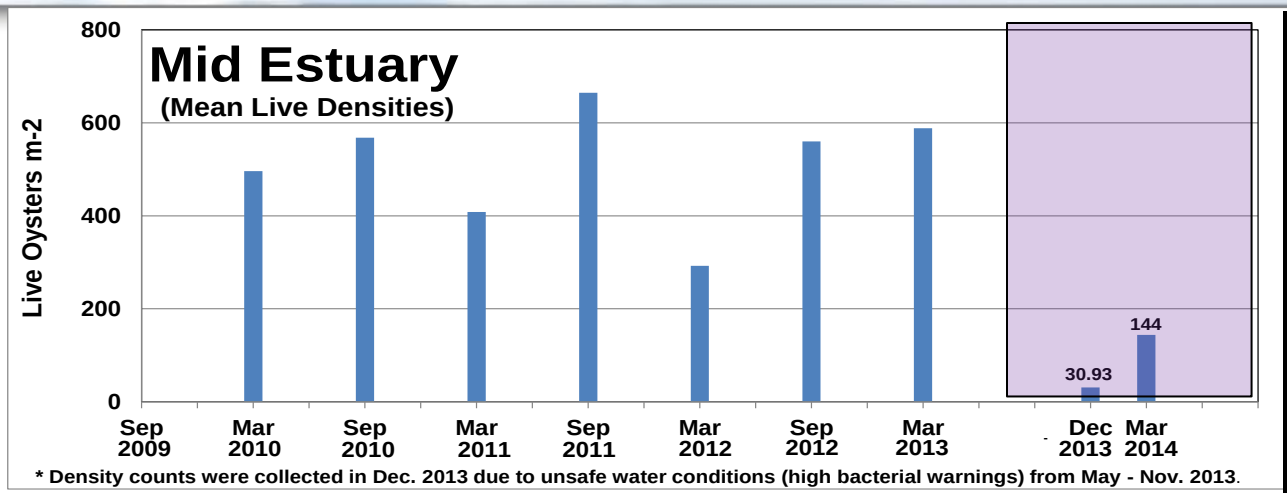
St. Lucie Estuary- Freshwater Inflow and Salinity Conditions

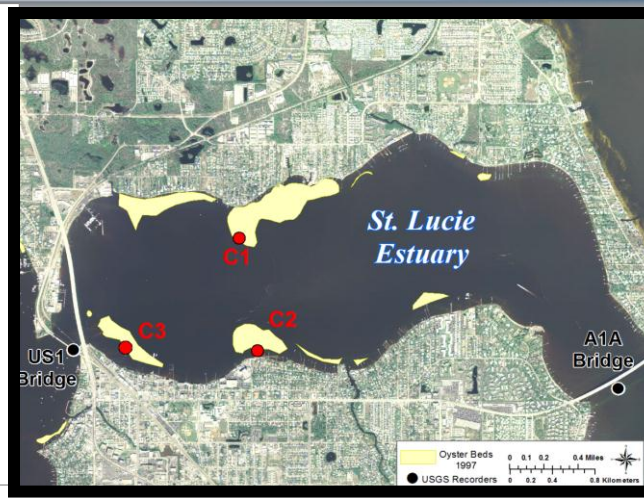


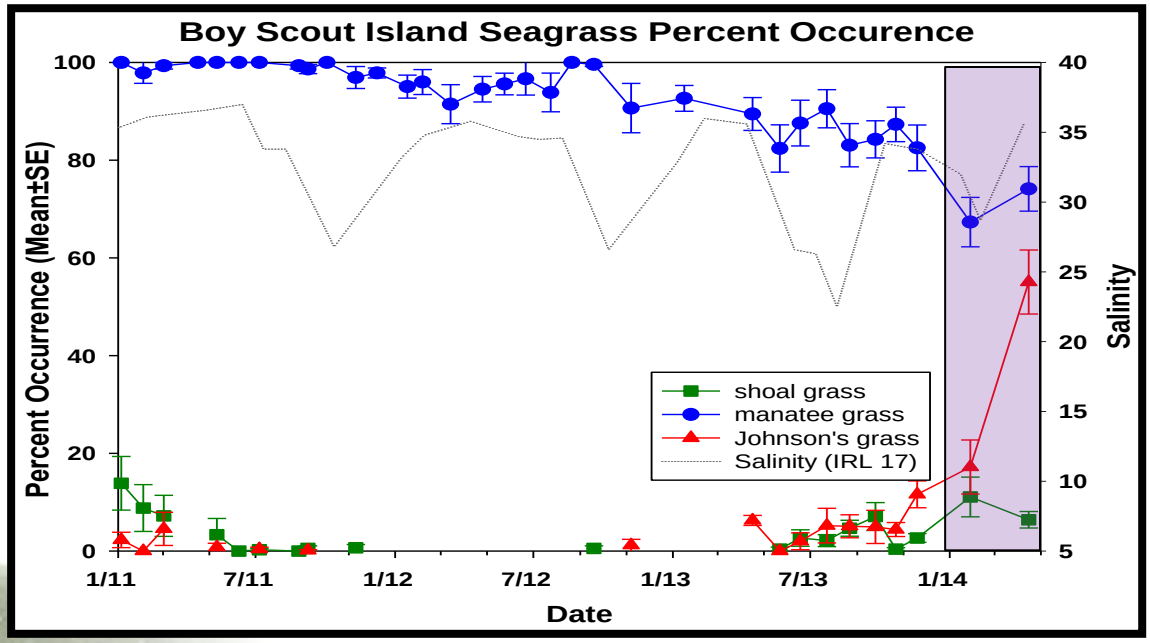




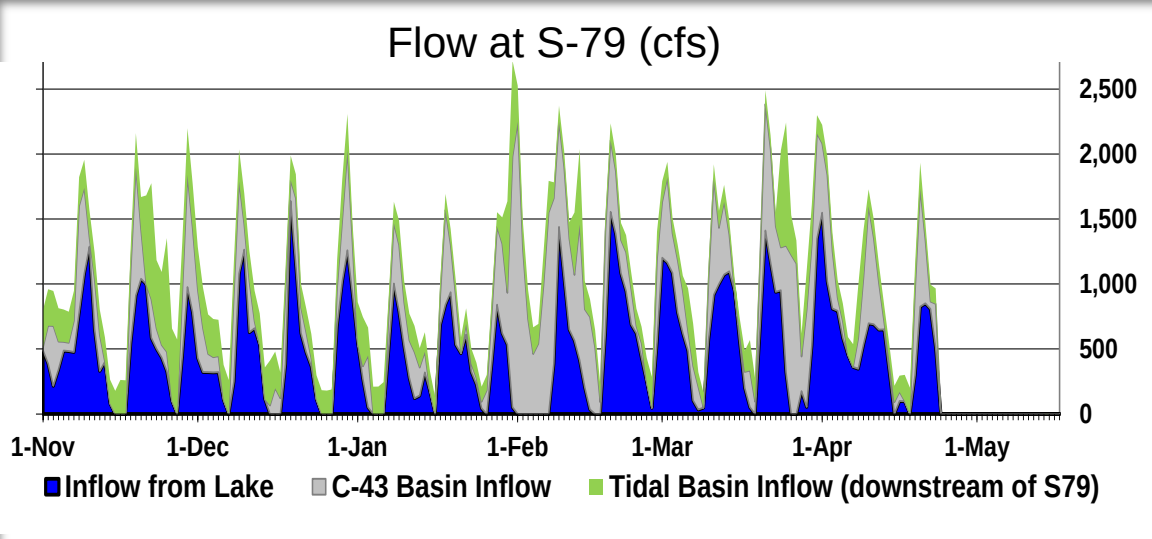
St. Lucie Estuary – Oyster and Seagrass Recovery

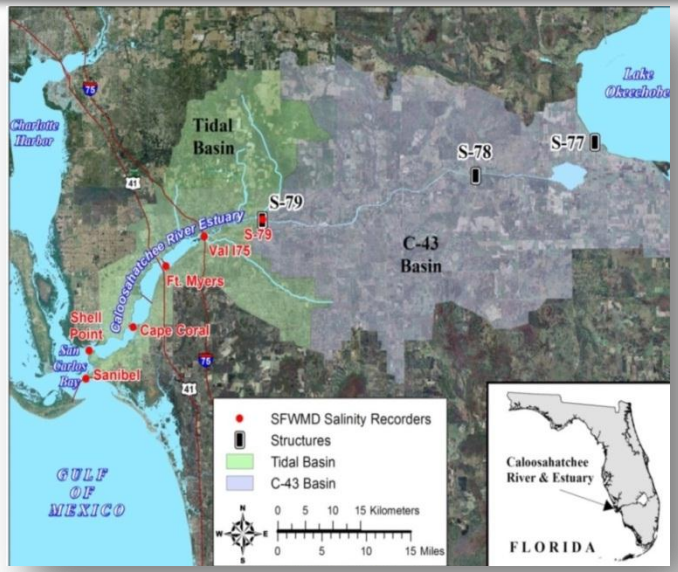


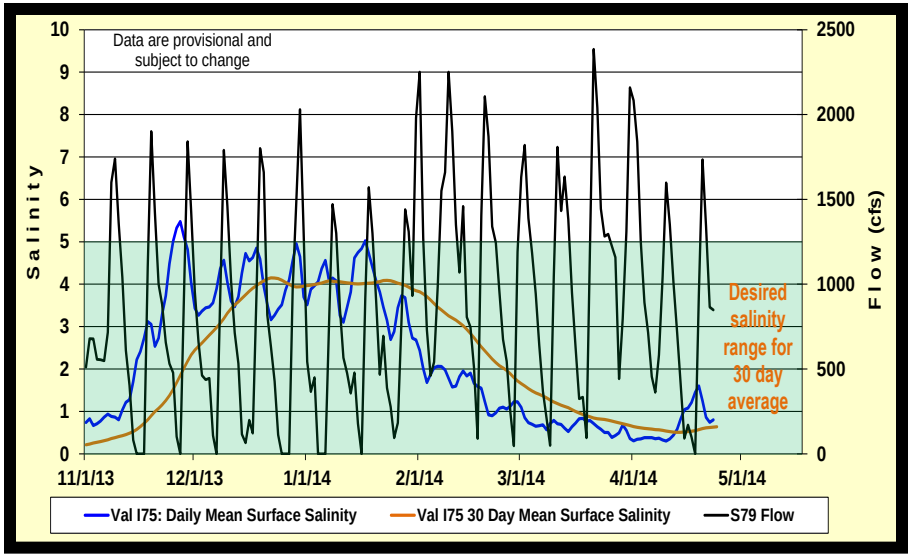


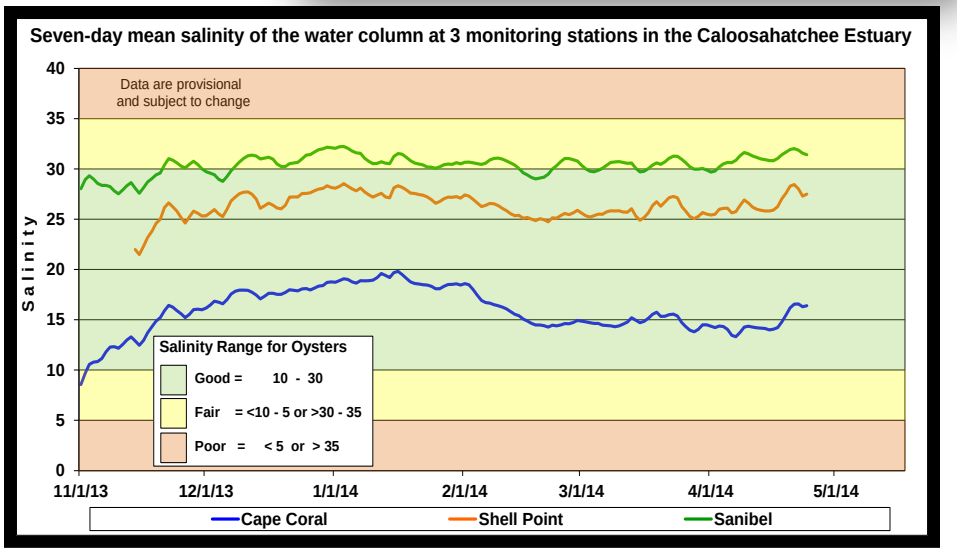


Caloosahatchee Estuary – Freshwater Inflow and Salinity Condition



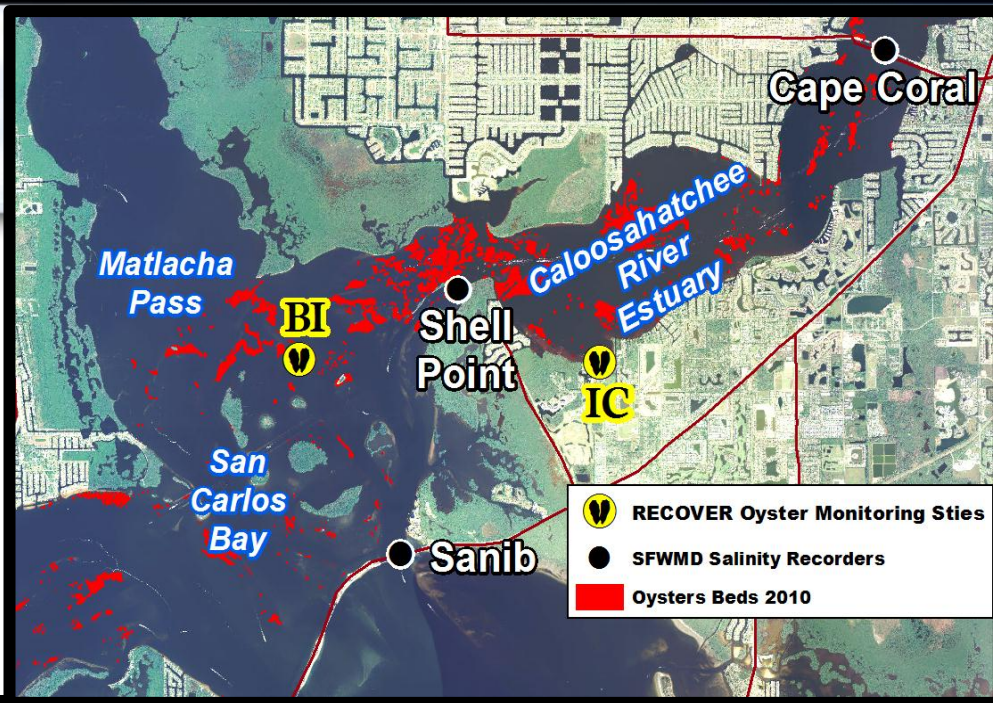


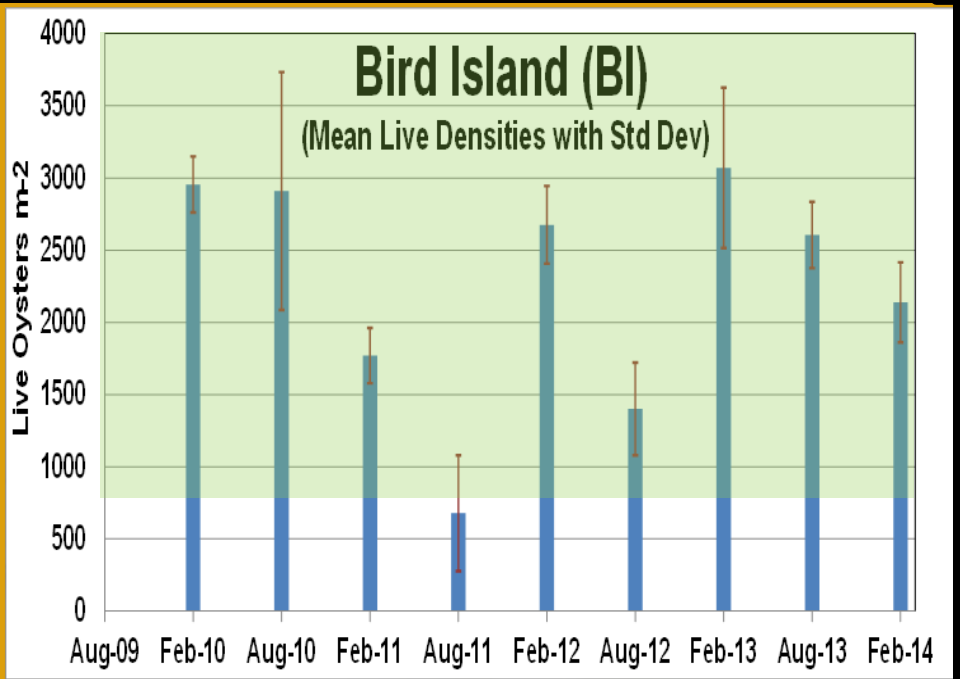


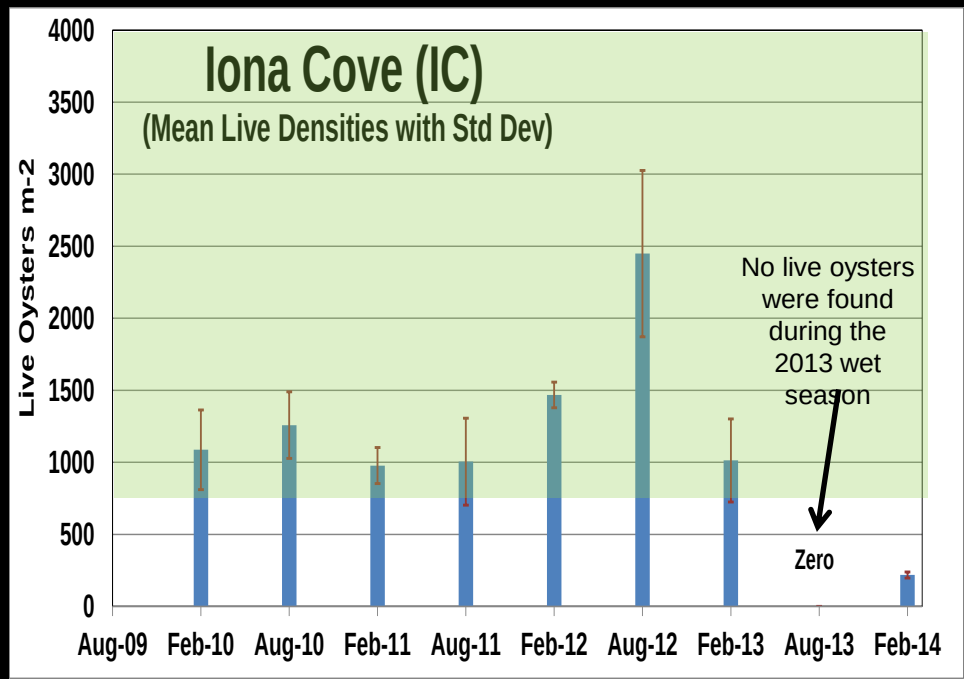


Caloosahatchee Estuary – Oyster Recovery

- Oyster monitoring data collected in the dry season of 2014 indicated recovery from the last wet season and new recruitment in the upstream monitoring station (IC)

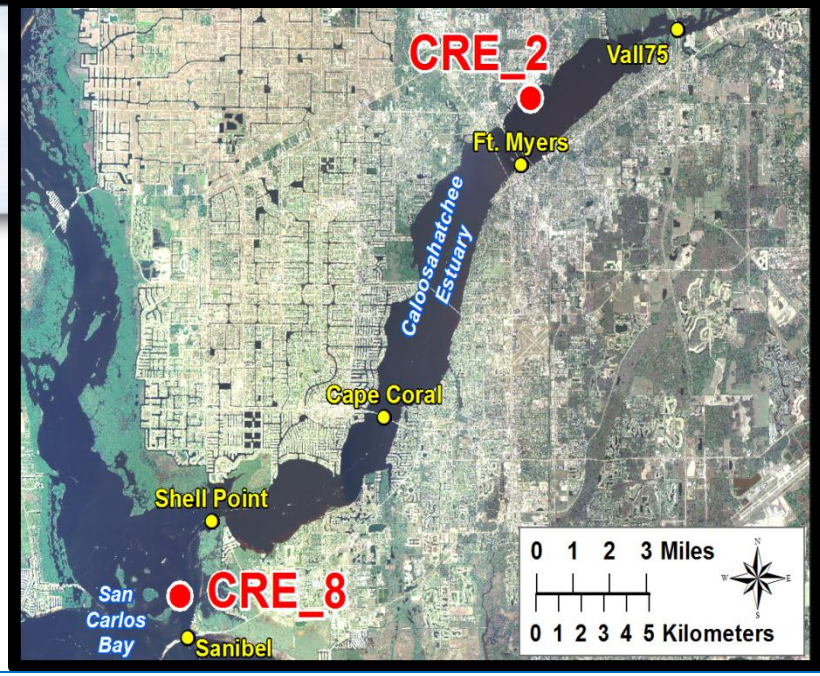




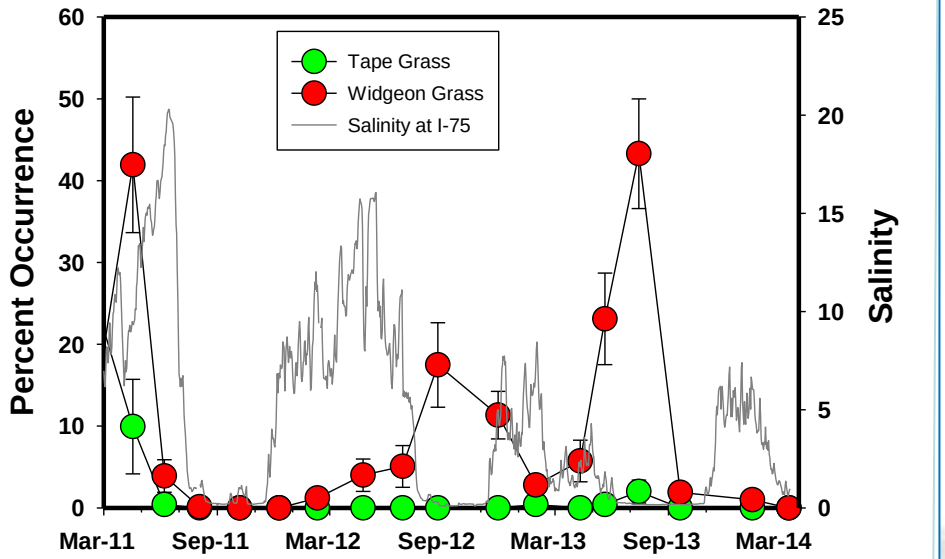


Caloosahatchee Estuary – SAV Recovery

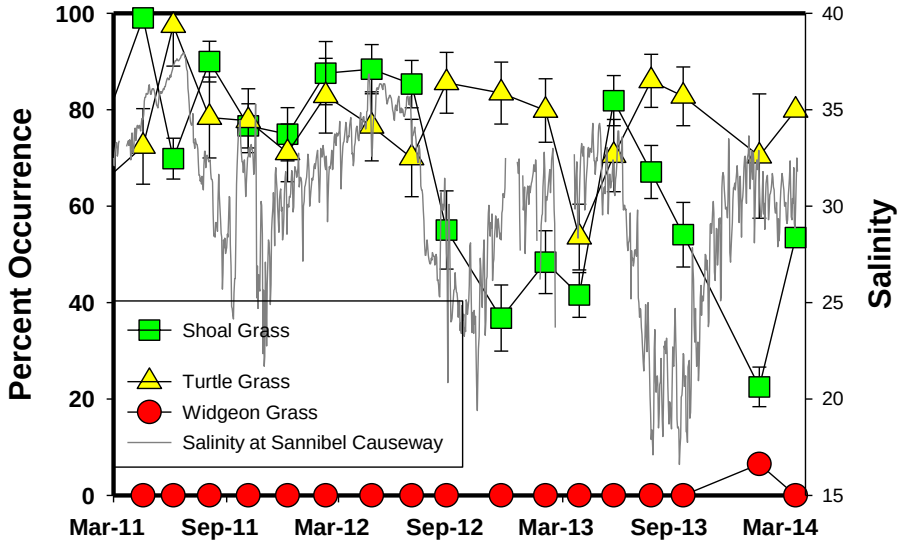
- Tape grass has been absent after slight recovery last summer
- Turtle grass remained stable while shoal grass showed recovery from last summer's drop



CRE_2
Submersed Aquatic Vegetation Percent Occurrence (Mean +/- SE)



CRE_8
Submersed Aquatic Vegetation Percent Occurrence (Mean +/- SE)



Expectations for the St. Lucie and Caloosahatchee Estuaries

- In both estuaries, salinity will rise, and oysters and seagrasses will continue to recover through the end of the dry season.
- Whether this recovery is sustained through the summer will depend on the severity of the wet season.
- In the Caloosahatchee Estuary, salinity conditions for tapegrass should continue to be favorable; yet other factors such as light and grazing may be limiting.

Previous 6 months – Everglades STAs

- Most STA water depths were maintained at or near target except as follows:
  - Stages fell below target in STA-5/6 due to dry season effects
  - Stages and flows were restricted in various cells for vegetation rehabilitation and plantings
  - STA-1E Eastern Flow-way and STA-2 Flow-way 5 remained offline for construction activities
- From November 1, 2013 through April 23, 2014, approximately 103,000 acre-feet of Lake Okeechobee Regulatory Releases were treated by the STAs
  - District currently lacks infrastructure to convey Lake Okeechobee releases to STA-5/6 designated inflow structures

Previous 6 months – Everglades STAs

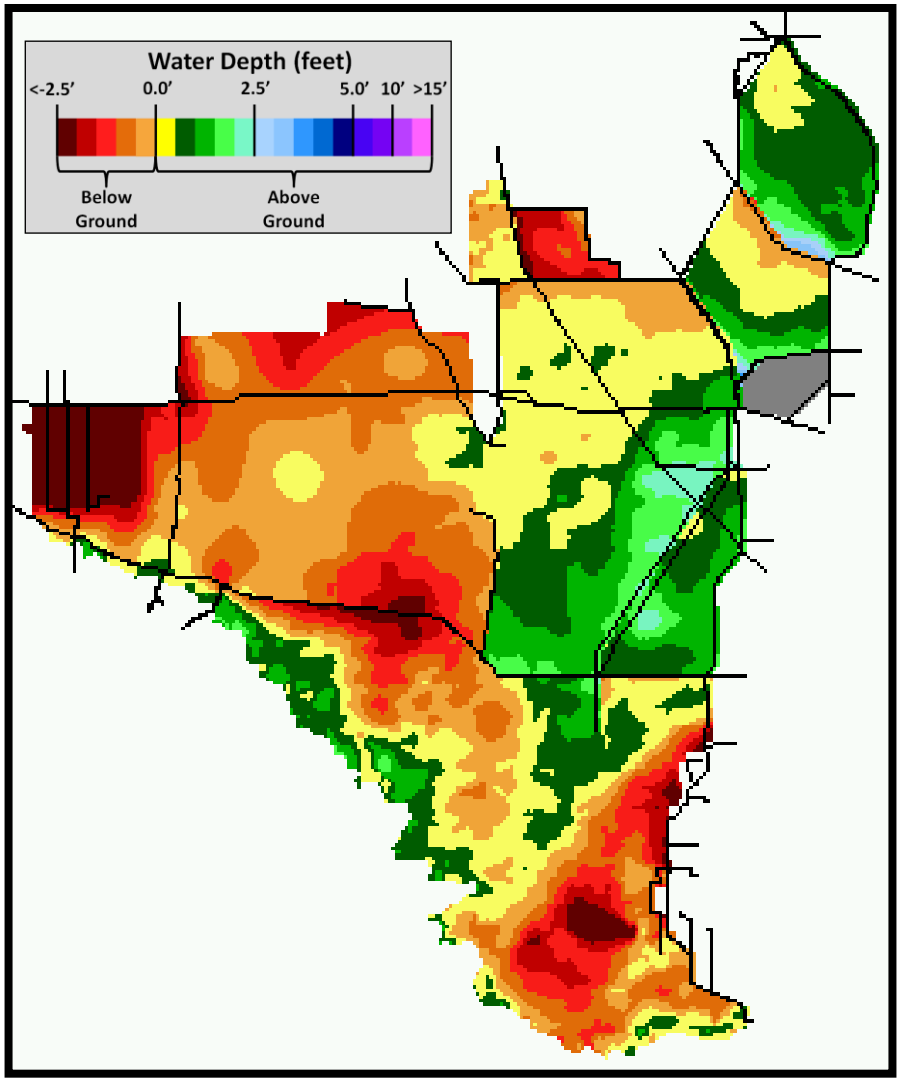
Snail Kite. Photo by Brian Garrett.

- Bird nesting surveys began in February 2014
- Snail kite nests in STA-1E and STA-5/6
- STA target water stages adjusted and access to areas restricted to protect nests

Next 6 Months - Everglades STAs

- Initiate vegetation establishment in STA-1E Eastern flow-way and STA-2 Cell 8 upon completion of construction activities
- Request supplemental water delivery to the STAs as needed to maintain hydration
- Continue bird nesting surveys throughout the summer
  - Operational decisions will consider nesting on a case by case basis

Previous Six Months – WCA's



Dry Season:

- Water levels in the WCAs have been generally above ground, keeping the peat well hydrated.
- The timing and duration of February rainfall and internal discharge events caused major reversals in areas critical for wading bird foraging and nesting. Therefore, this year was poor for many wading birds in spite of a good prey base.

Previous Six Months – Everglades National Park/Florida Bay

Dry Season:

- Water levels in ENP wetlands were generally 2-4 inches above average.
- Salinities in the near-shore areas of Florida Bay remained low, favoring seagrasses and fish production. The MFL site salinity has remained very low (< 5 psu)
- Poor recession rates in Taylor Slough resulted in poor nesting conditions for Roseate Spoonbills.

Expectations – WCAs

Wet Season:

- Water levels are anticipated to be normal to above normal with a normal precipitation outlook.
- Wading bird prey bases are expected to remain good in advance of next year's dry season.

Expectations– Everglades National Park/Florida Bay

Wet Season:

- Water levels in Everglades wetlands are expected to be above normal, good for aquatic species.
- Salinities in near-shore Florida Bay are expected to remain low to average this wet season, supporting bay vegetation and wildlife.
- So far conditions are favorable for the Cape Sable Seaside Sparrows, with very early nesting observed. The previous two wet years resulted in poor nesting conditions, increasing risk to species survival.