

Lake Okeechobee Operations and Adaptive Protocols

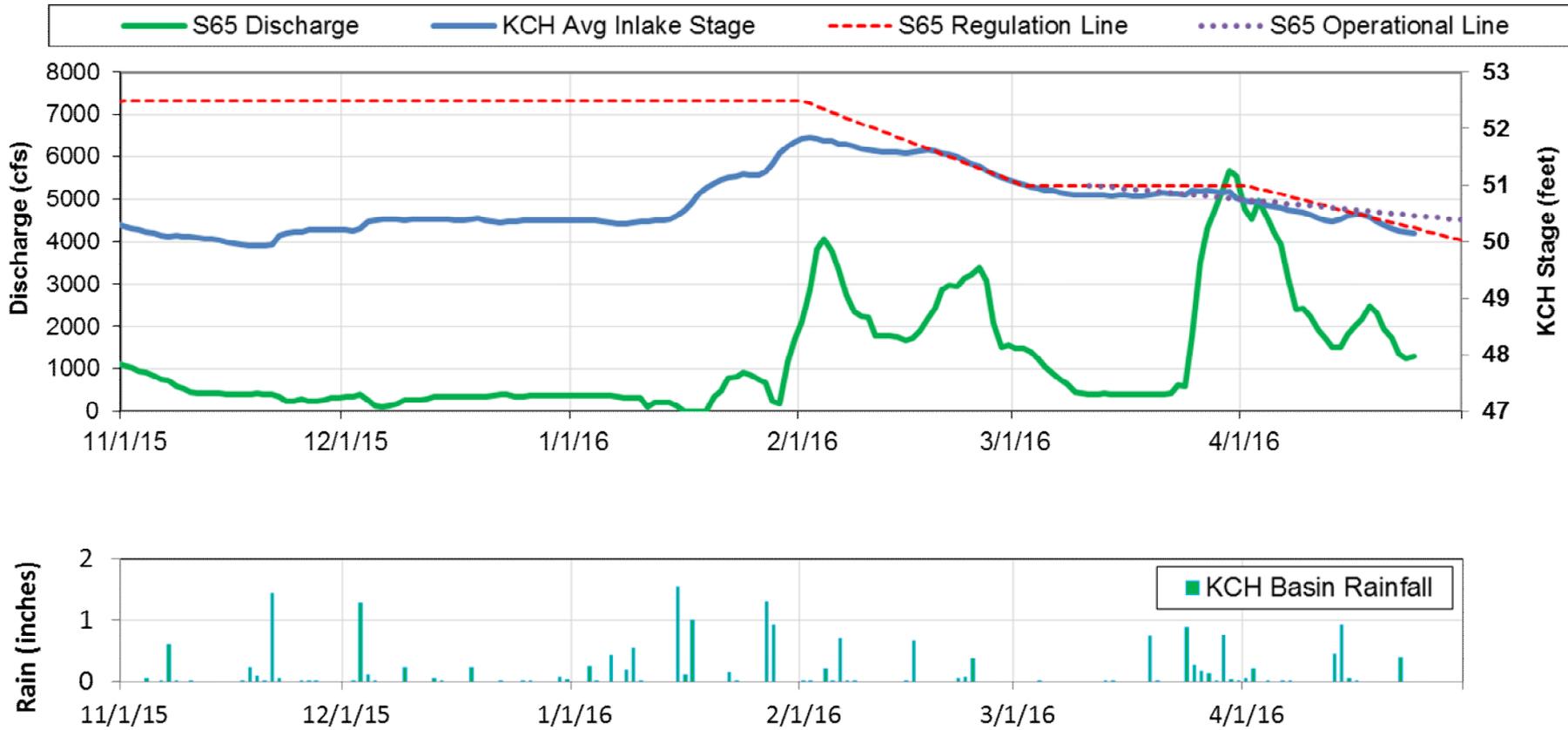
Semi-annual Update
November 2015 – May 2016

Susan Gray, Ph.D.

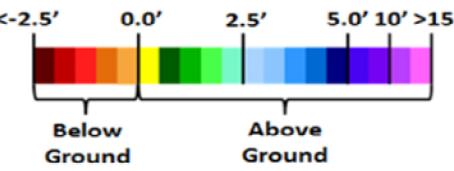
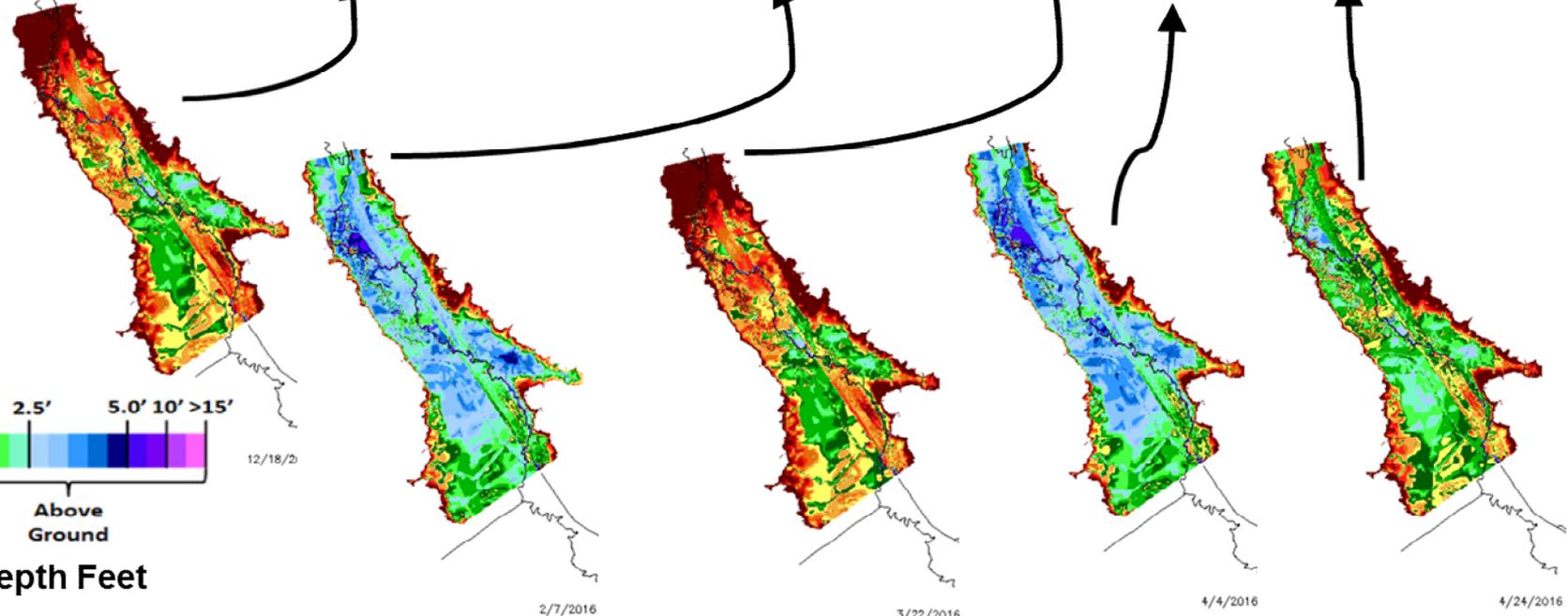
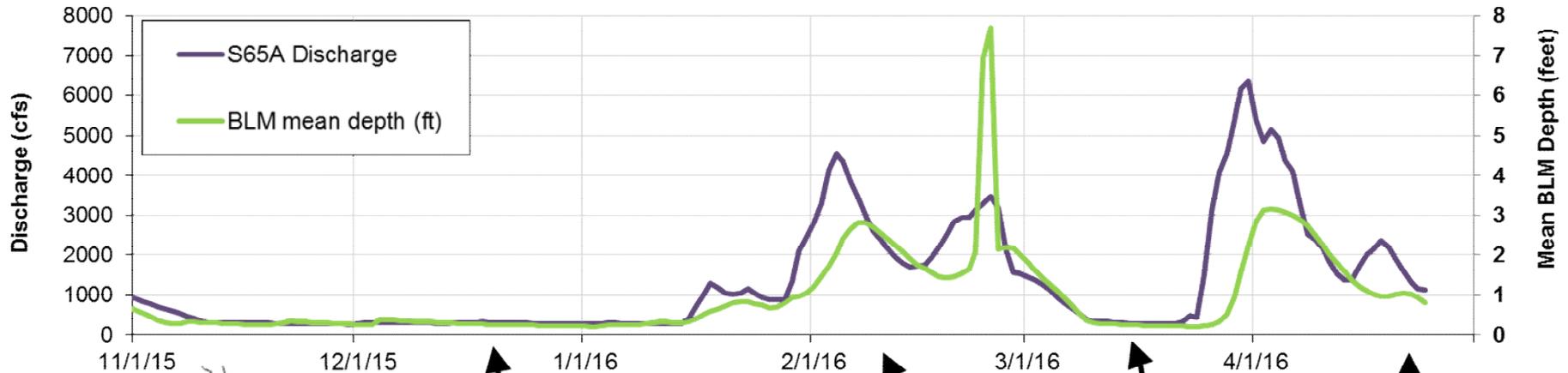
Bureau Chief

Applied Sciences Bureau

Previous Six Months Kissimmee-Cypress-Hatchineha



Previous Six Months S65A and Kissimmee River Floodplain



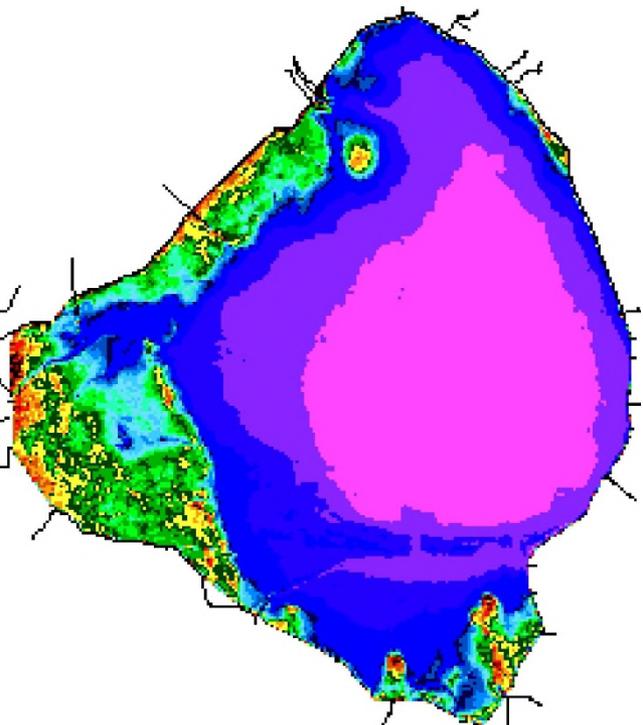
12/18/15 2/7/2016 2/22/2016 4/4/2016 4/24/2016

Expected Conditions - Next Six Months S65 and Kissimmee River

- S65, the outlet structure from Lake Kissimmee, is anticipated to have a stage on June 1 that will likely be above the regulation schedule low of 49 feet
- Stage and discharge at S65 are highly dependent on rainfall, which is currently expected to be about average in the first months of wet season
- S65 headwater stage will be allowed to rise slowly (if possible) to summer pool
- Discharge will be managed for flood control and to provide discharge to the Kissimmee River Restoration Project

Previous Six Months – Lake Okeechobee Stage

6 months ago

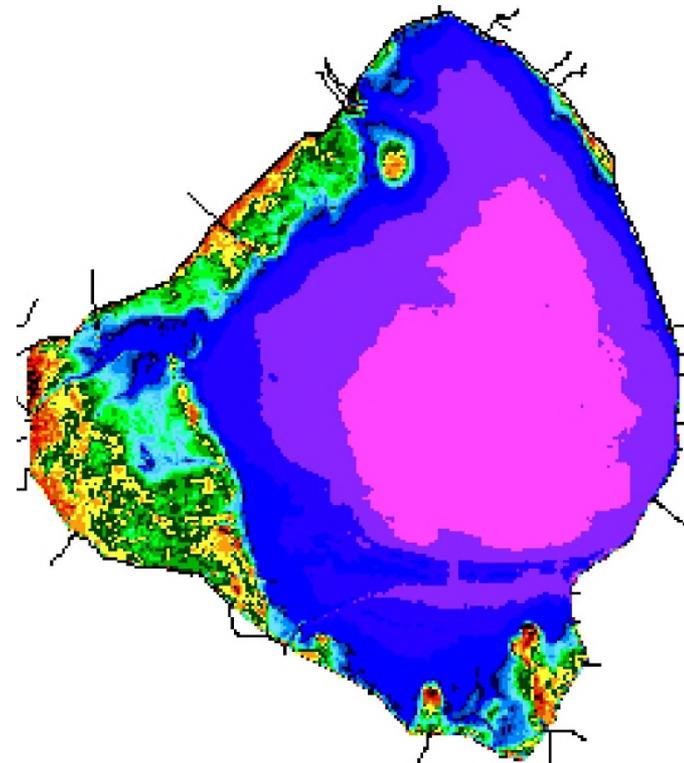


(14.57 ft NGVD29)

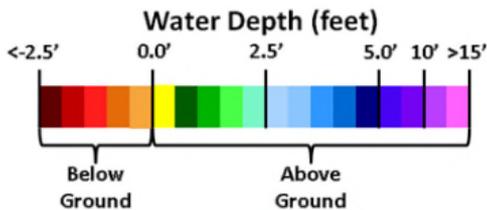
Lake Stage Feet NGVD



current

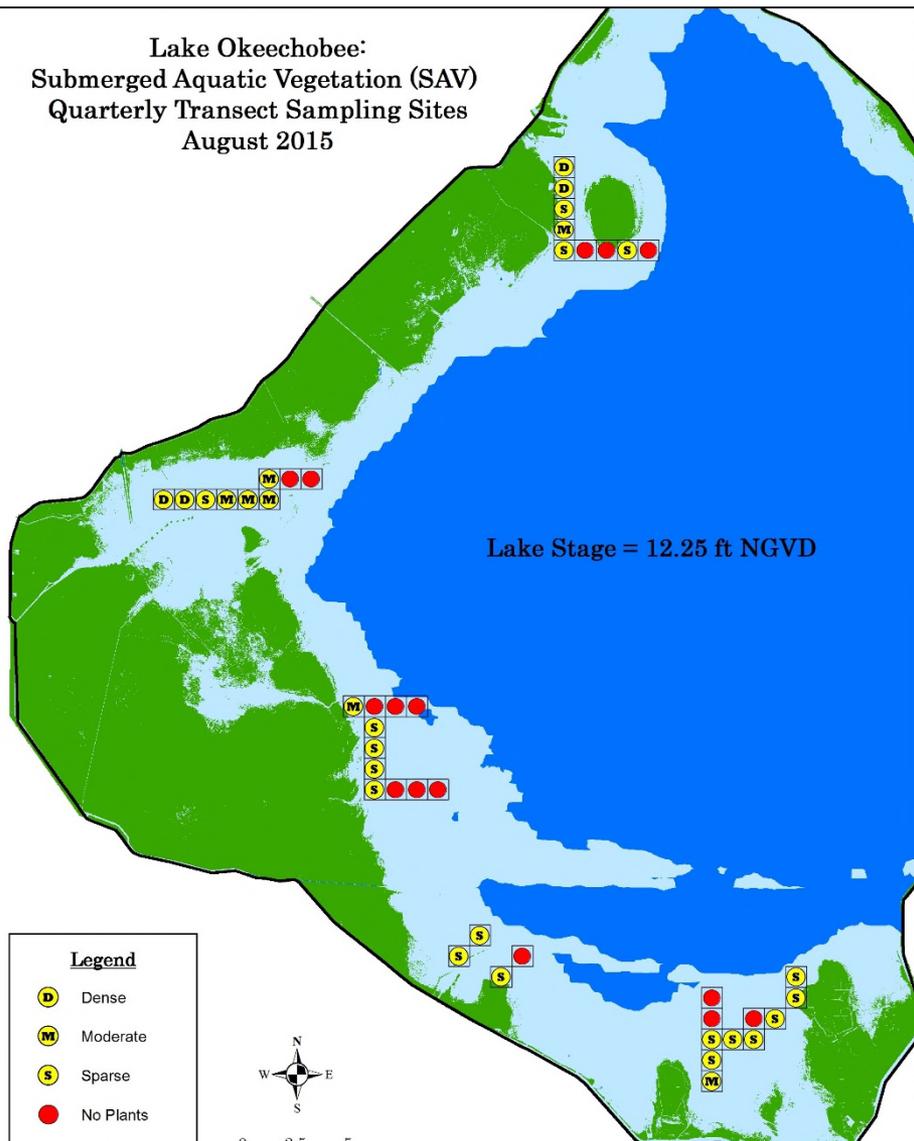


(14.12 ft NGVD29)

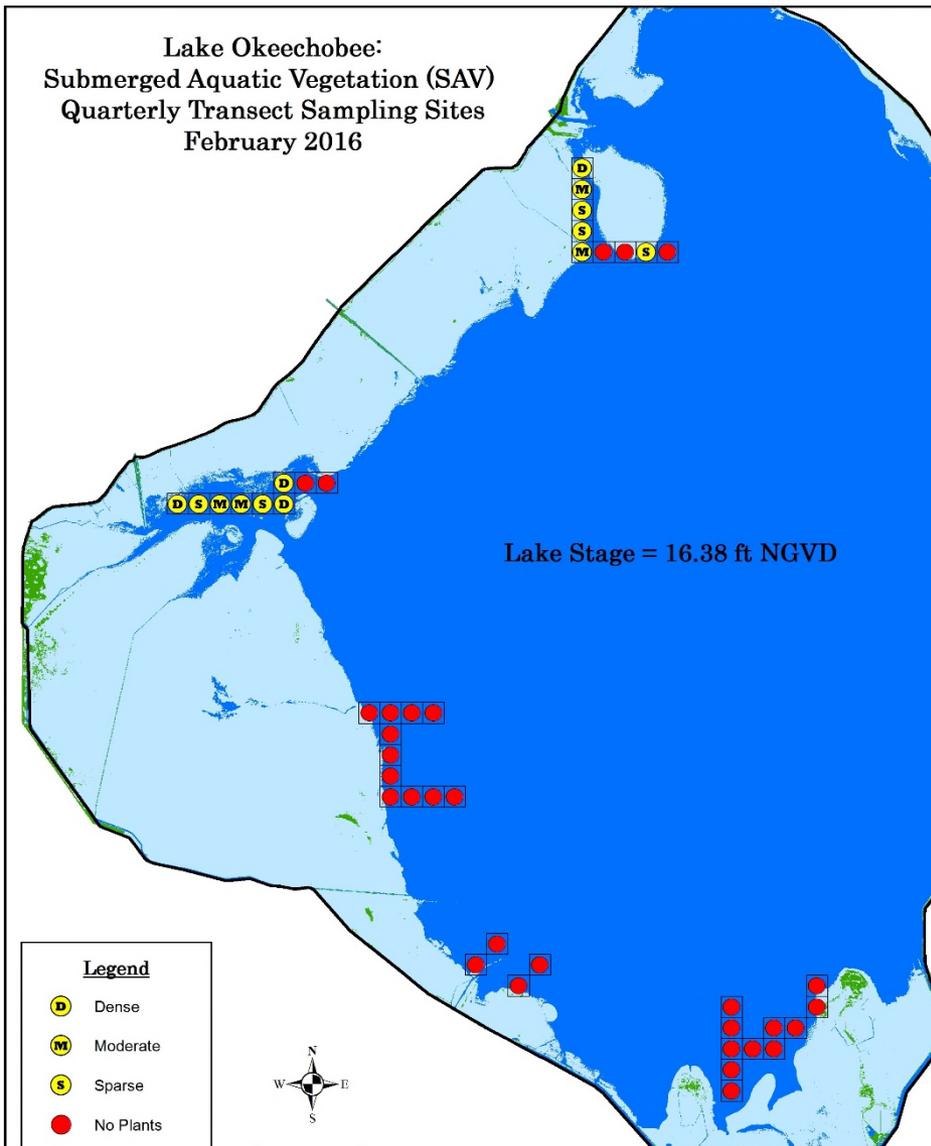


Lake Okeechobee Submerged Aquatic Vegetation

Lake Okeechobee:
Submerged Aquatic Vegetation (SAV)
Quarterly Transect Sampling Sites
August 2015

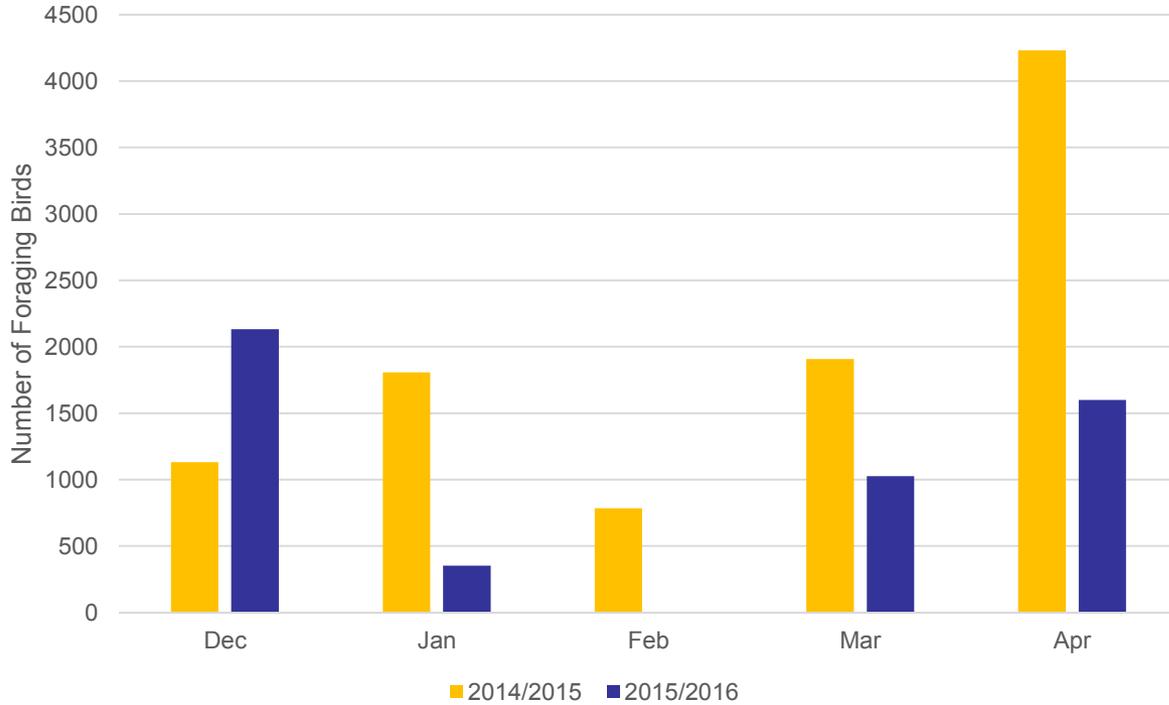


Lake Okeechobee:
Submerged Aquatic Vegetation (SAV)
Quarterly Transect Sampling Sites
February 2016



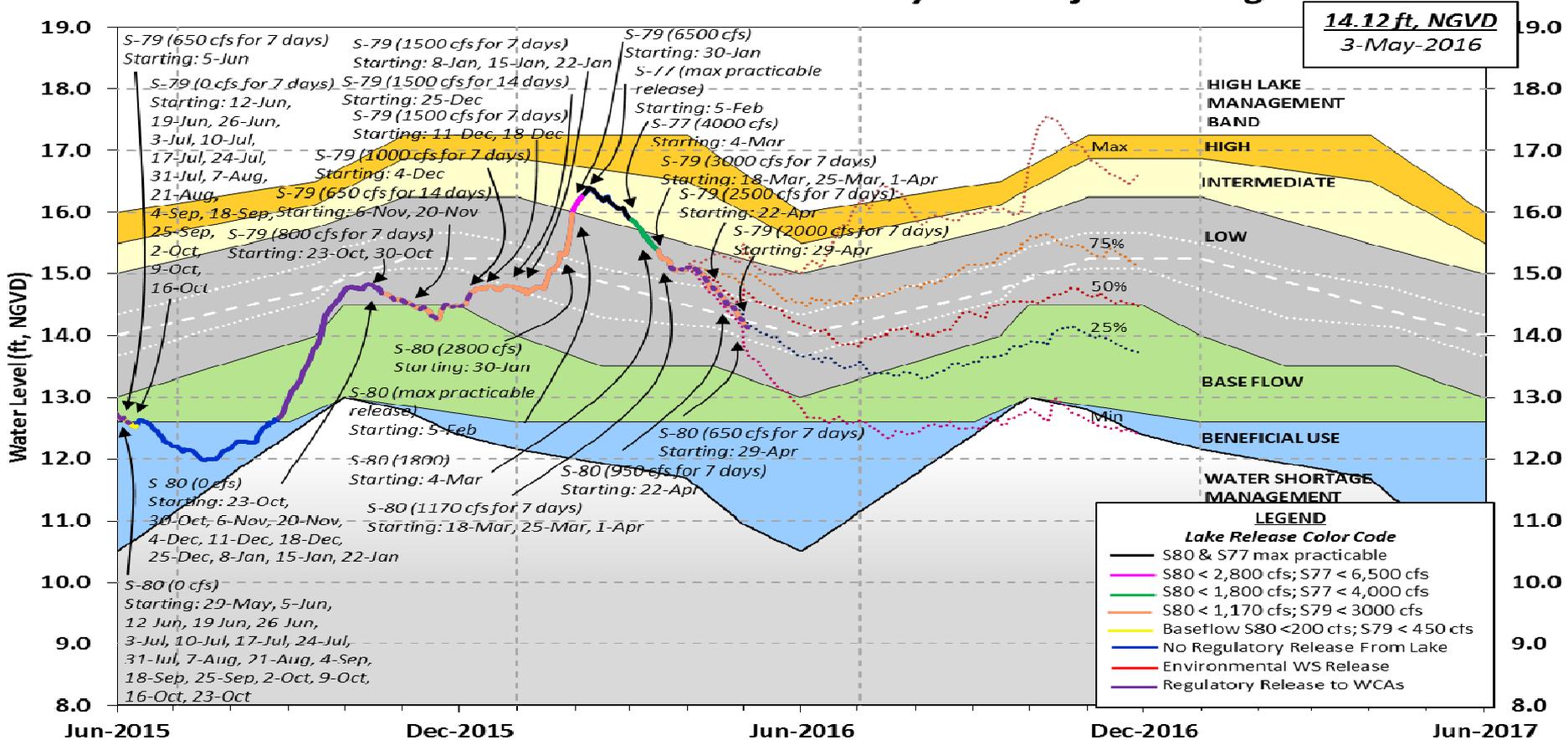
Lake Okeechobee Wading Bird Foraging

Lake Okeechobee Wading Bird Flights



Lake Okeechobee – Next 6 Months

Lake Okeechobee Water Level History and Projected Stages



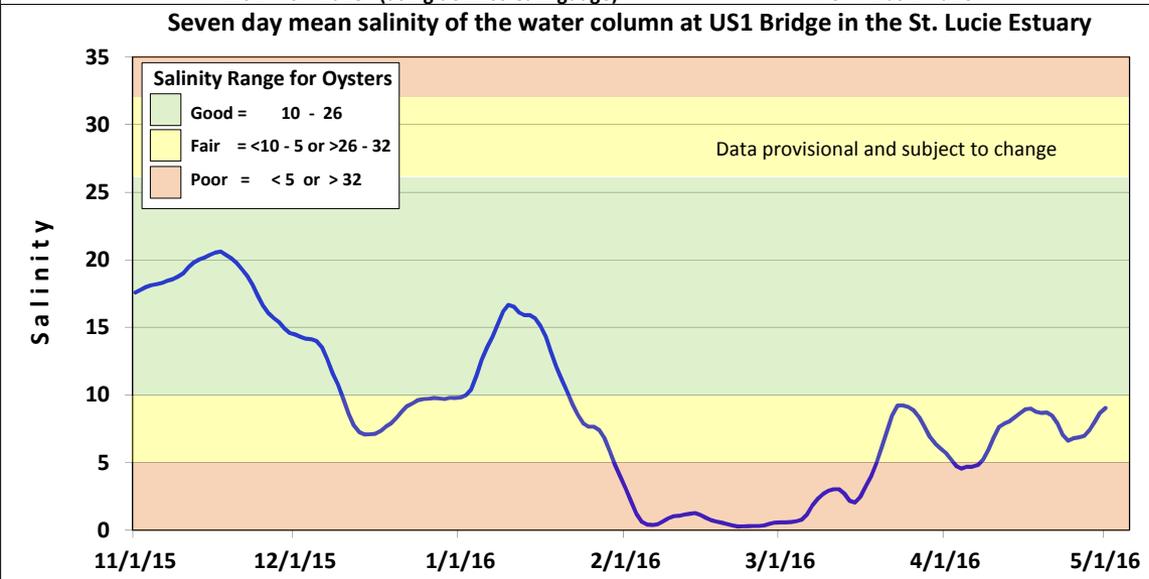
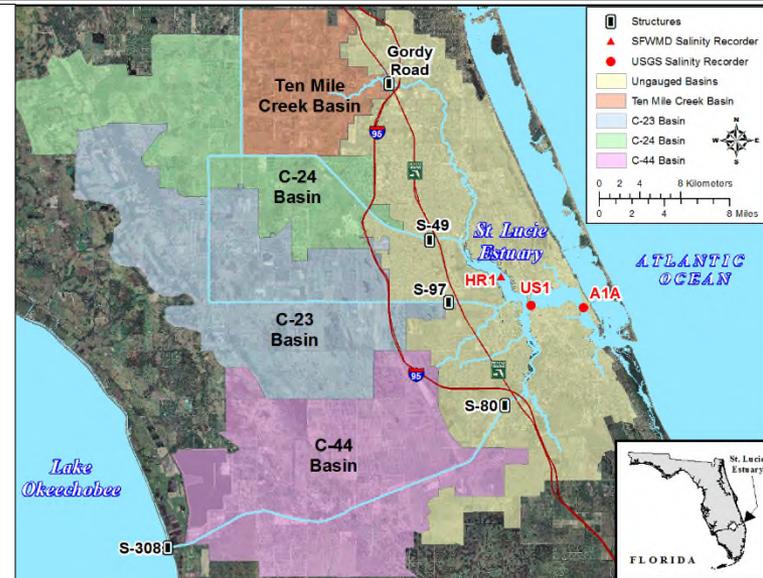
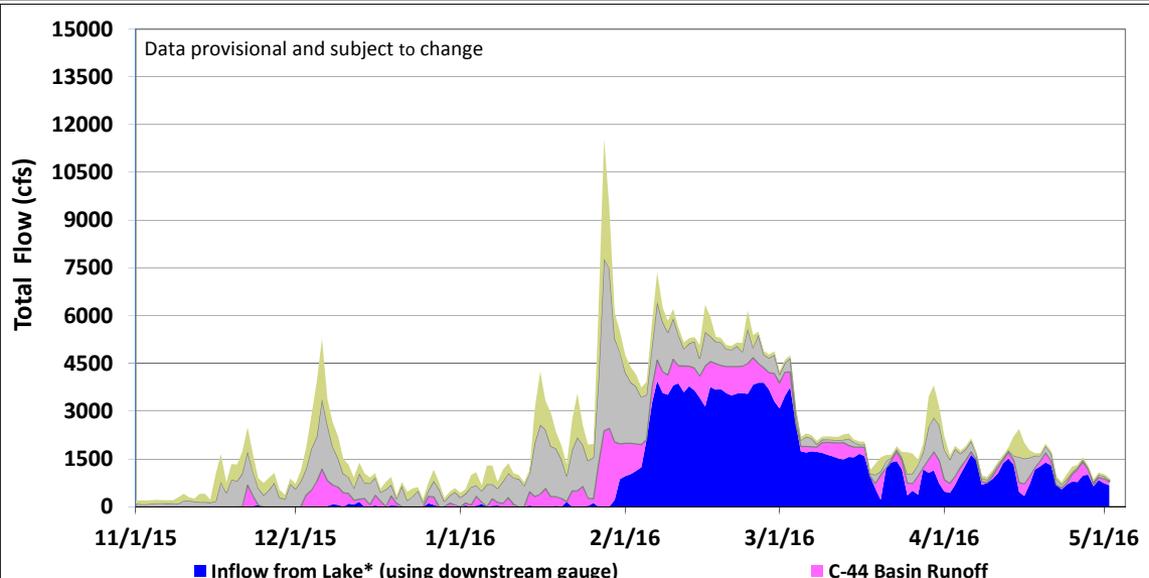
LORS-2008

Adopted by USACE 28-April-2008

Projected Stage Percentiles From SFWMID-HESM Position Analysis

- Water levels for the next six months are highly dependent on the remainder of the dry season, water management actions, the date of onset of the wet season, and

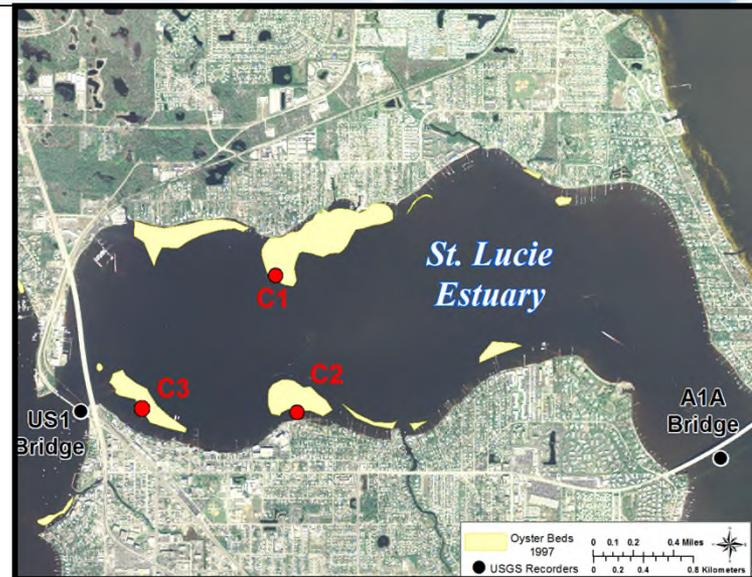
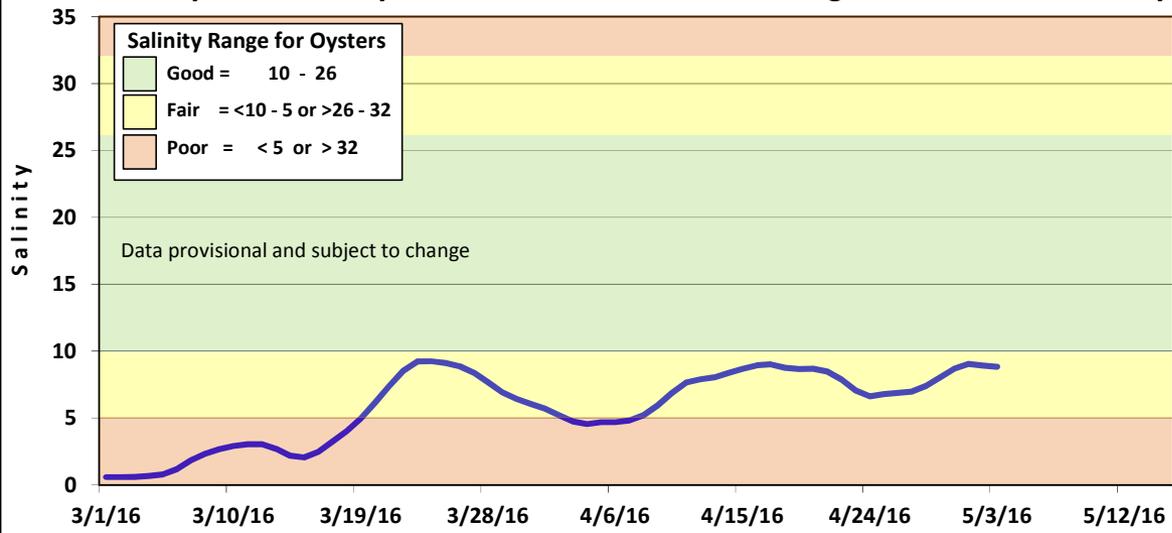
St. Lucie Estuary- Freshwater Inflow and Salinity Conditions



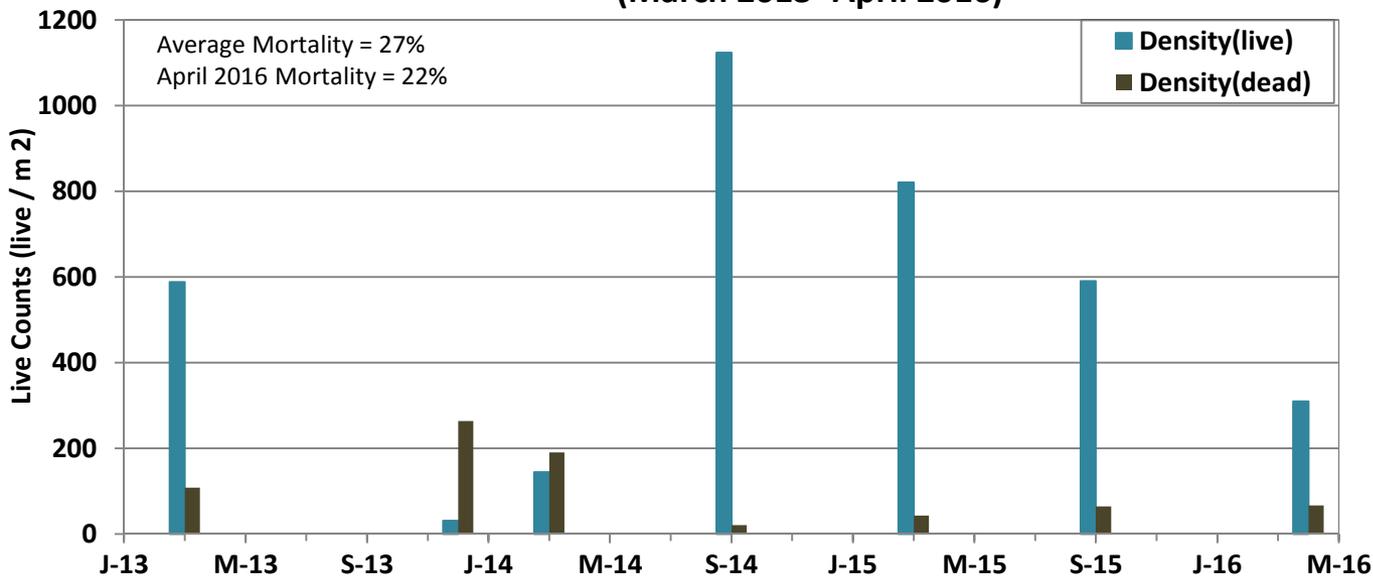
- Since late January, the strong El Nino influence has resulted in sustained lake releases into the estuary under LORS guidance.
- Salinity conditions were mostly “poor” or “fair” for adult oysters at US1.

St. Lucie Estuary - Oysters

Seven day mean salinity of the water column at US1 Bridge in the St. Lucie Estuary

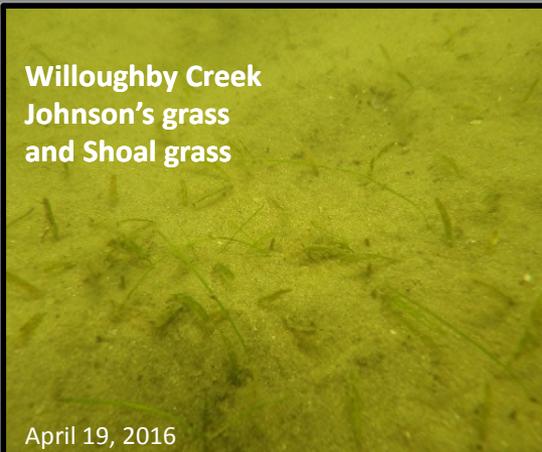


Spring & Fall Live/Dead Oyster Counts - SL Mid Estuary Stations (March 2013- April 2016)

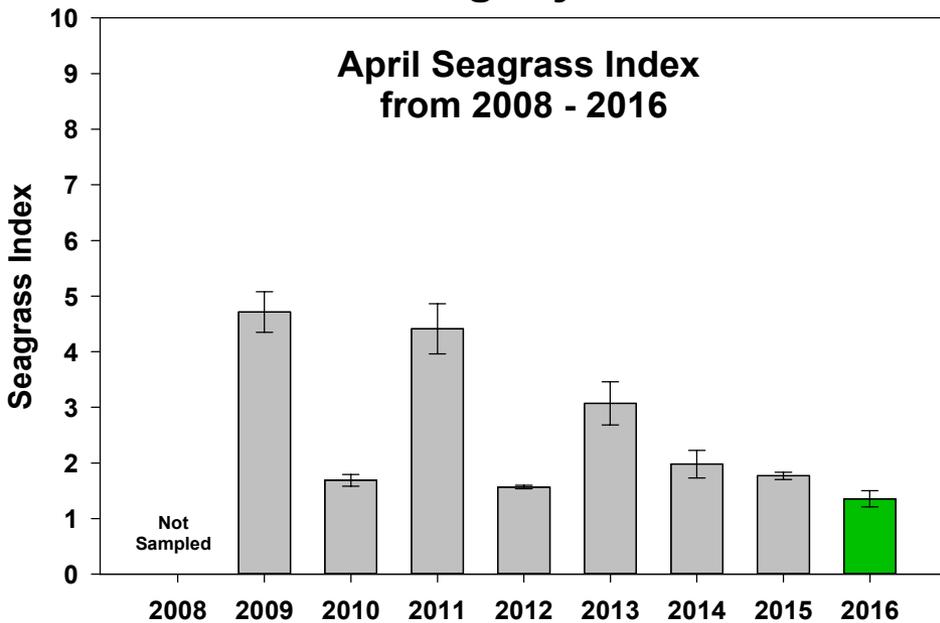


Live Oysters

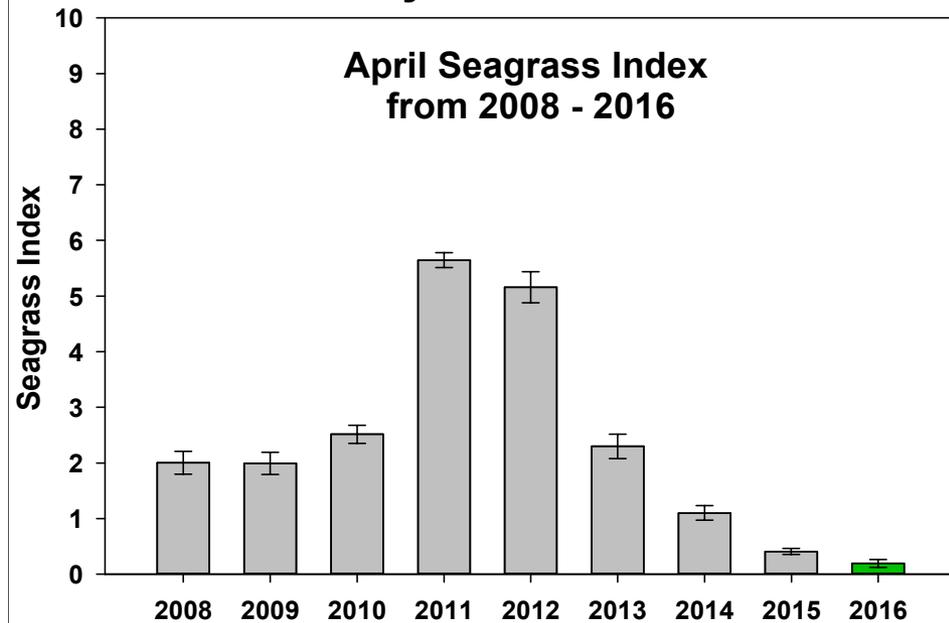
St. Lucie Estuary Seagrass



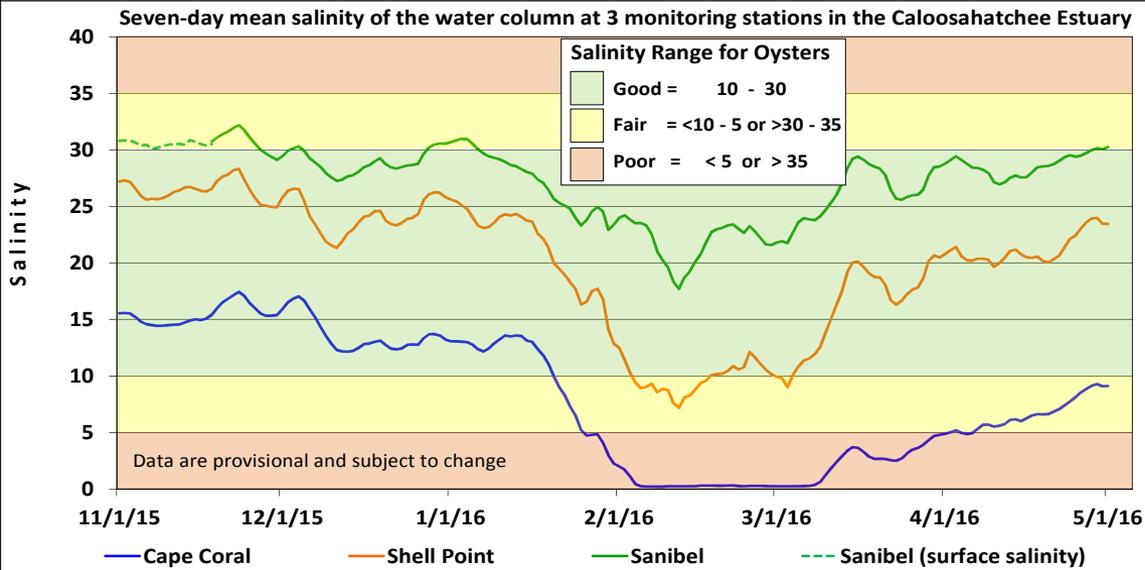
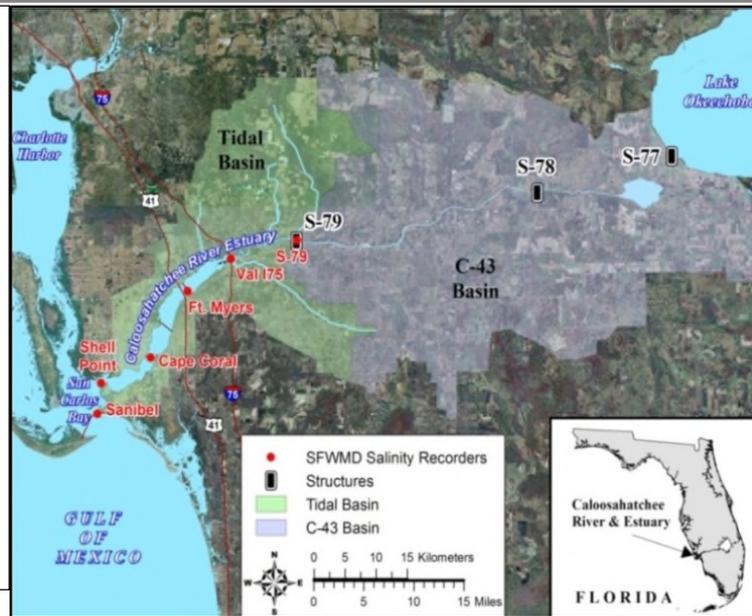
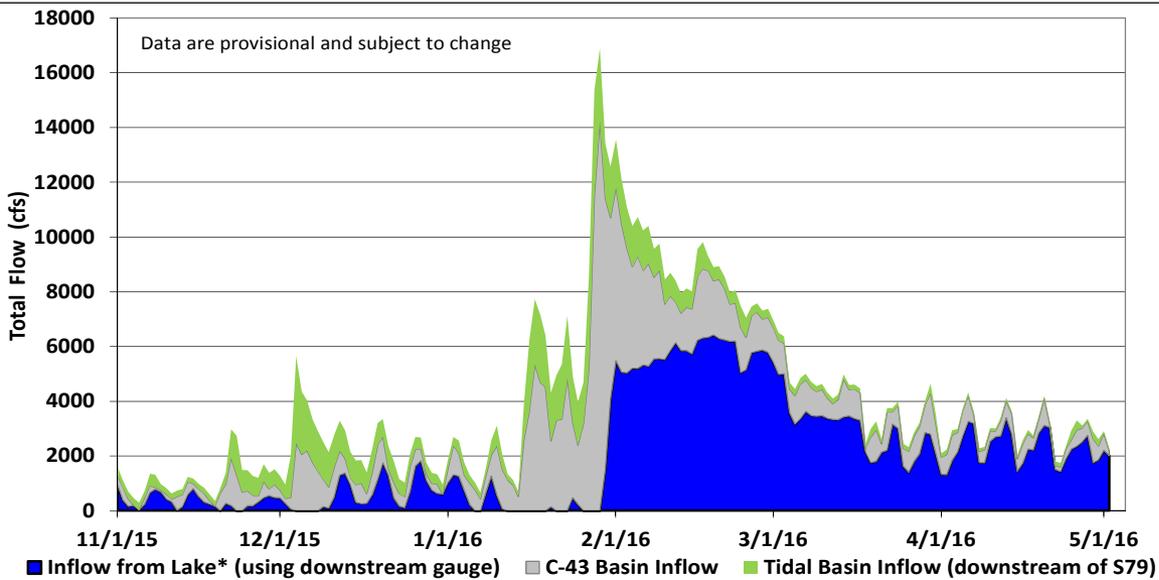
Willoughby Creek



Boy Scout Island

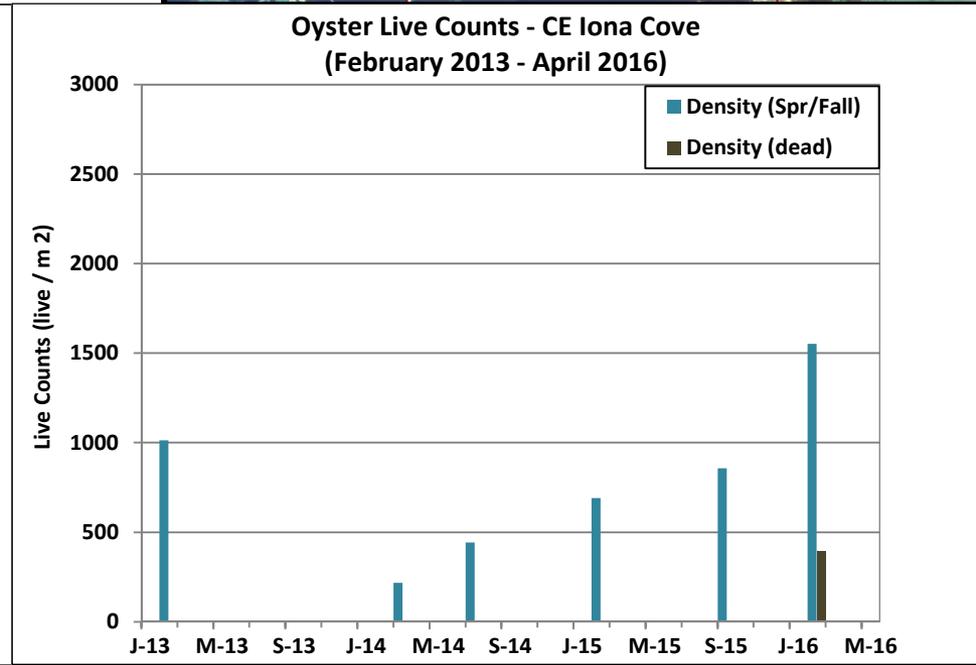
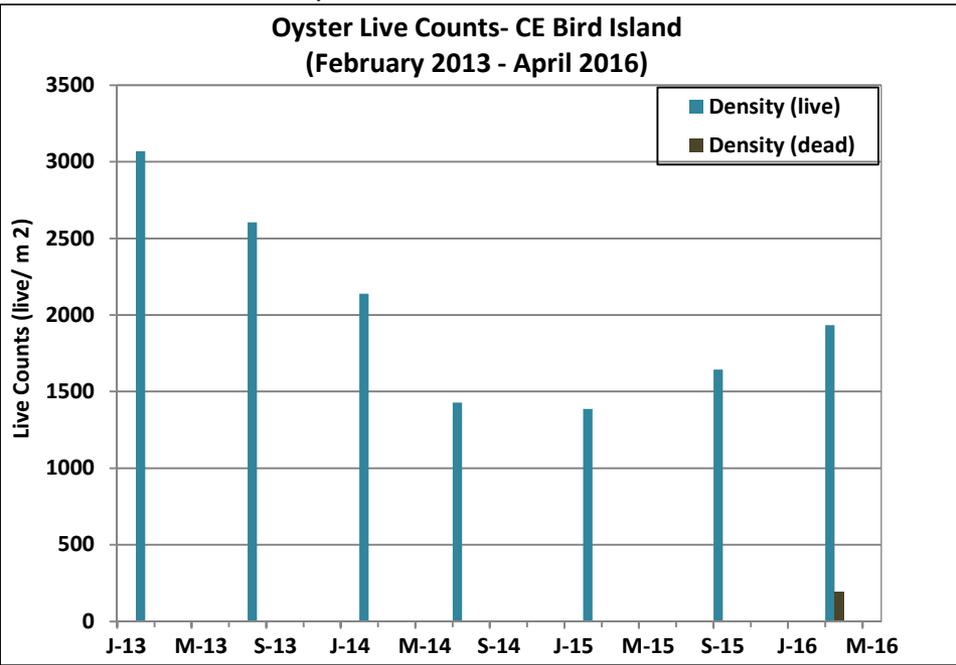
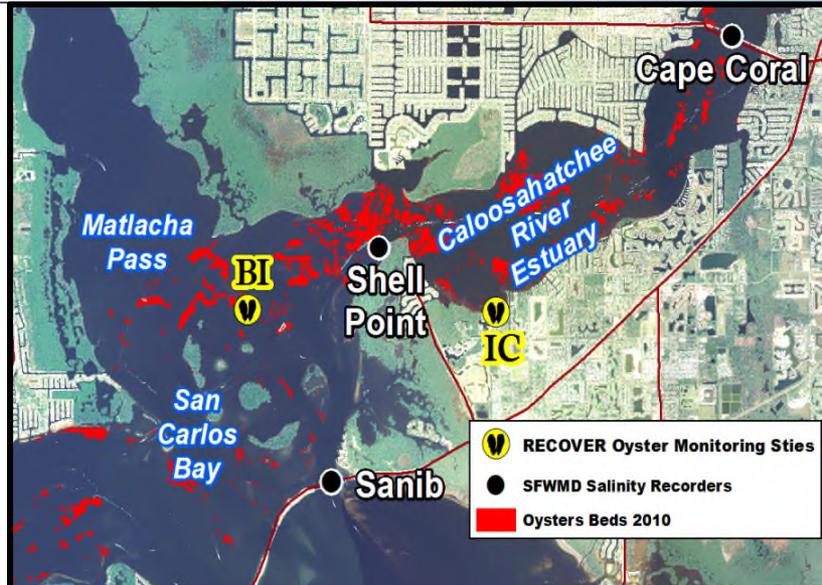
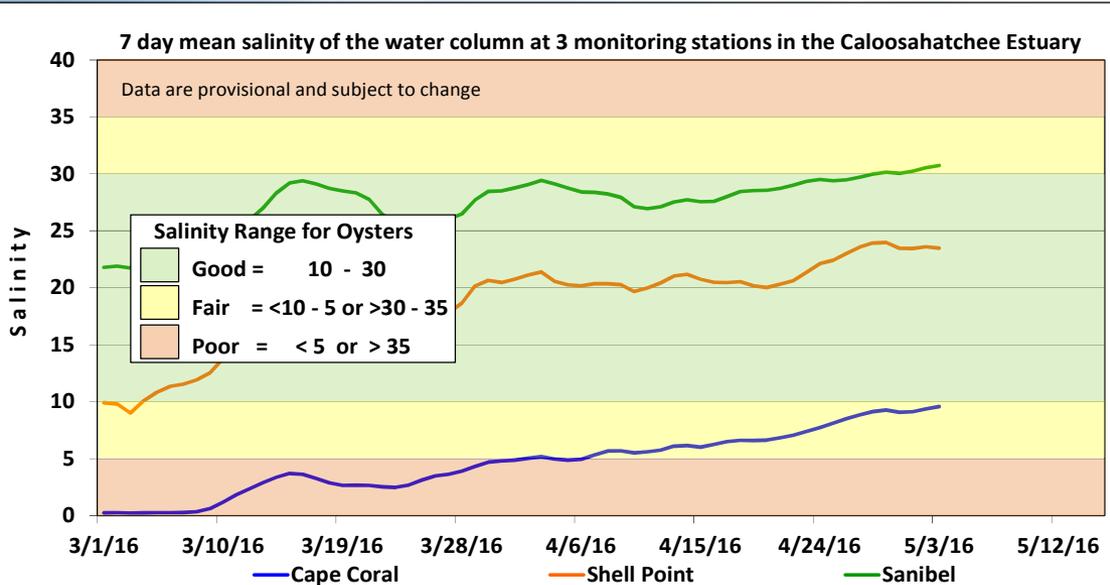


Caloosahatchee Estuary – Freshwater Inflow and Salinity Condition



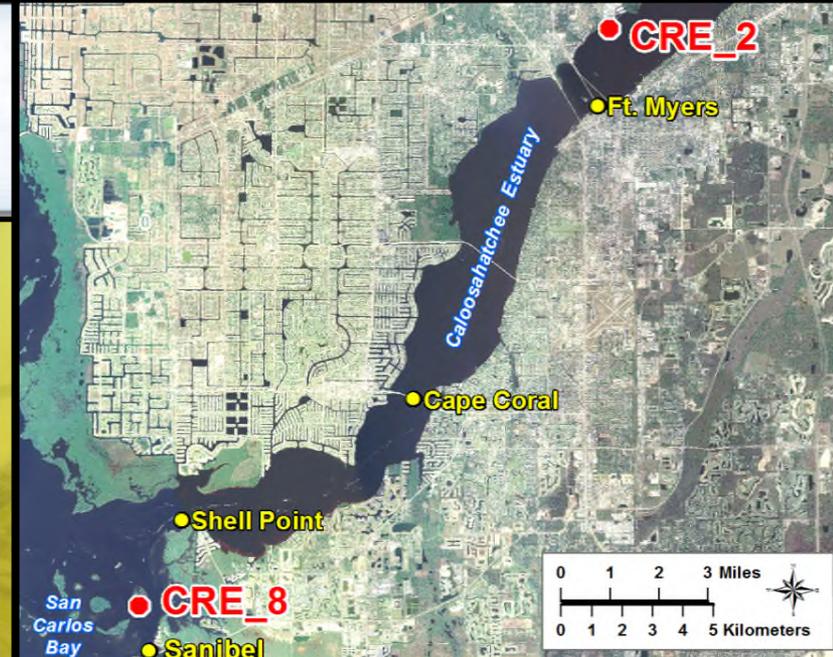
- Strong El Nino influence has resulted in sustained lake releases into the estuary under LORS guidance.
- Salinity conditions were mostly “good” for adult oysters downstream of Shell Point

Caloosahatchee Estuary - Oysters

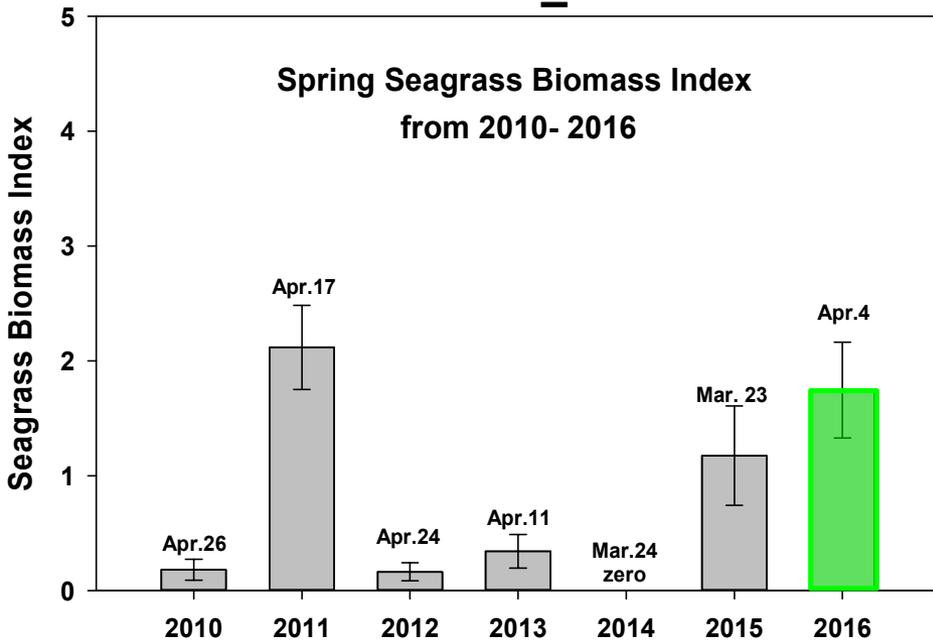


Caloosahatchee Estuary

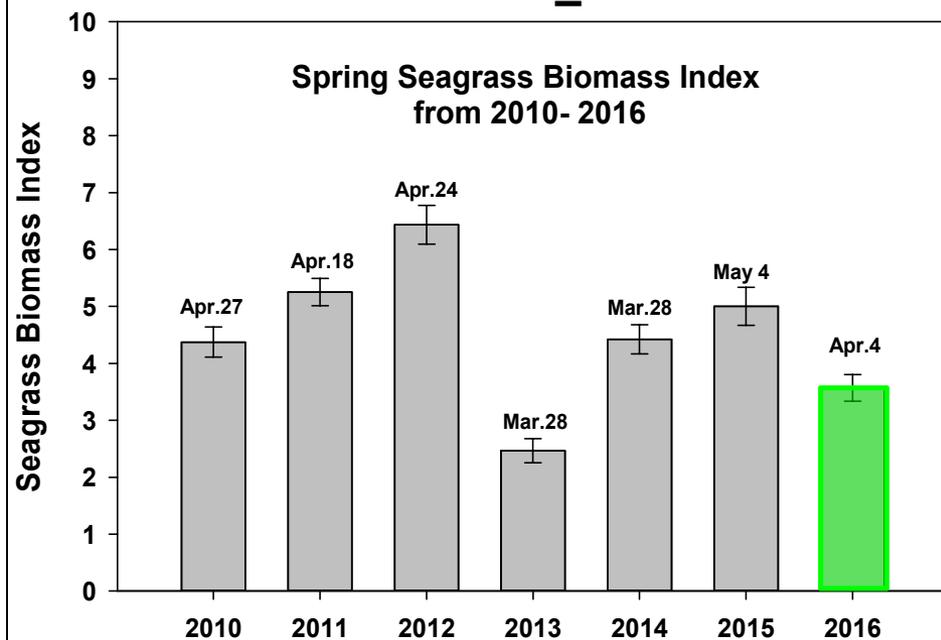
– Submerged Aquatic Vegetation



CRE_2



CRE_8

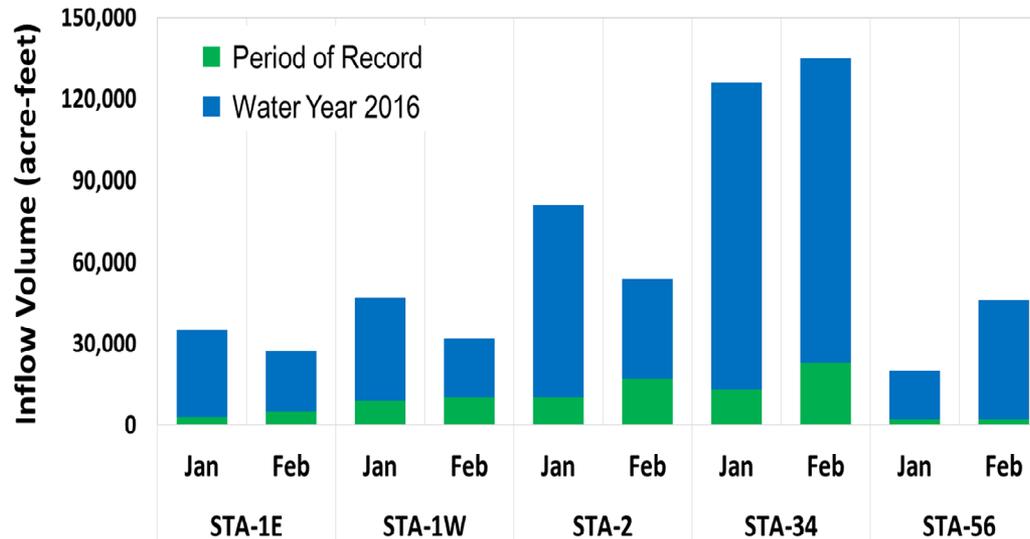


Expectations for the St. Lucie and Caloosahatchee Estuaries

- Both estuaries are currently experiencing reduced freshwater input in association with the weakening of El-Nino and reduced rainfall.
- However, freshwater inflow will likely increase with the onset of the wet season in late May.
- Salinities should decrease in response to the expected increase in inflow. Oysters and seagrasses might be affected if salinities are beyond their preferred ranges.
- In the Caloosahatchee Estuary, salinity conditions for tape grass are expected to be good; yet other factors such as light could be limiting.

Previous 6 months – Everglades STAs

Inflow Volumes (January – February)



Includes provisional data which is subject to change

- STA inflow volumes have been well above normal dry season flows due to very high rainfall and runoff in January and February
- From November 1, 2015, through April 30, 2016, approximately 88,000 acre-feet of Lake Okeechobee regulatory releases treated in STAs
- A-1 FEB has been reducing peak flows & TP concentrations to STA-3/4 & STA-2

Next 6 Months - Everglades STAs

- **Designed to treat basin runoff; secondarily Lake O regulatory releases as conditions allow**
- **Vegetation rehabilitation activities underway in several treatment cells will require temporary flow or stage restrictions**
- **STA-1W Expansion #1 construction continuing**
- **L-8 FEB complete construction and initiate operations**
- **Continue to use A-1 FEB to reduce peak flows to STAs**
- **May request supplemental water delivery to the STAs if needed to avoid dryout prior to onset of wet season**

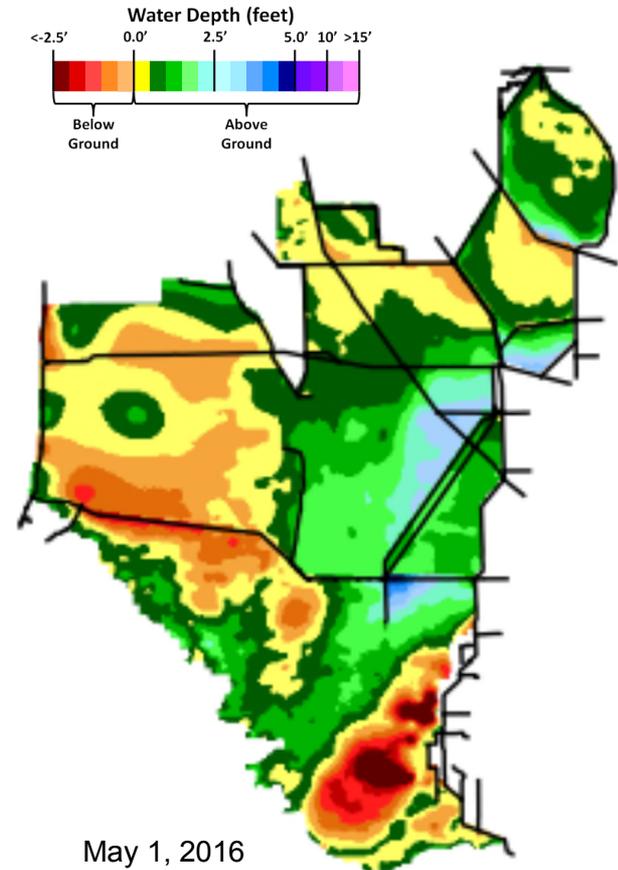
Previous Six Months – WCA's

“Dry” Season:



White ibis

- This dry season was one of the wettest on record. Conditions were too wet, too deep, and too variable for wading birds to forage or nest. Only white ibises are nesting in any significant number in the Everglades.
- In far southern WCA-3A, tree islands were inundated for 20 weeks over 2.5 feet depths.



Previous Six Months – Everglades National Park and Florida Bay

- The very wet El Niño conditions produced very high water levels in Shark River Slough and Taylor Slough, producing above average inflow into Florida Bay
- Inflows reduced salinities in Florida Bay from highs of 70 psu to 20-35 psu, levels that are lower than average and more like those desired for restoration
- The extensive seagrass die-off in 2015 has not produced significant algal blooms and waters are clear. Its long-term consequences are uncertain



Expectations – WCAs

Wet Season:

- More normal conditions in the Pacific Ocean are expected to produce a typical wet season.
- Because stages only recently have fallen, the ecosystems of the Everglades may experience some after-effects of high water stress.
- It is unclear what the long term effect of this year's very poor breeding success in the Everglades will mean to wading birds and endangered species in the region.



Expectations– Everglades National Park/Florida Bay

- ENP wetlands are likely to remain well hydrated through the summer assuming a normal wet season
- Salinities in Florida Bay are likely to remain below average to average
- Seagrass die-off in 2015 was extensive and vegetation is unlikely to recover soon. Cascading effects are possible as temperatures rise this summer and fall
- Creek flows into Florida Bay are likely to be average to above average from elevated water levels in Taylor Slough

