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Lake Okeechobee Operations and Adaptive Protocols

Semi-annual Update: Ecological Conditions

Water Resources Advisory Commission

December 1, 2016

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Chief
Applied Sciences Bureau

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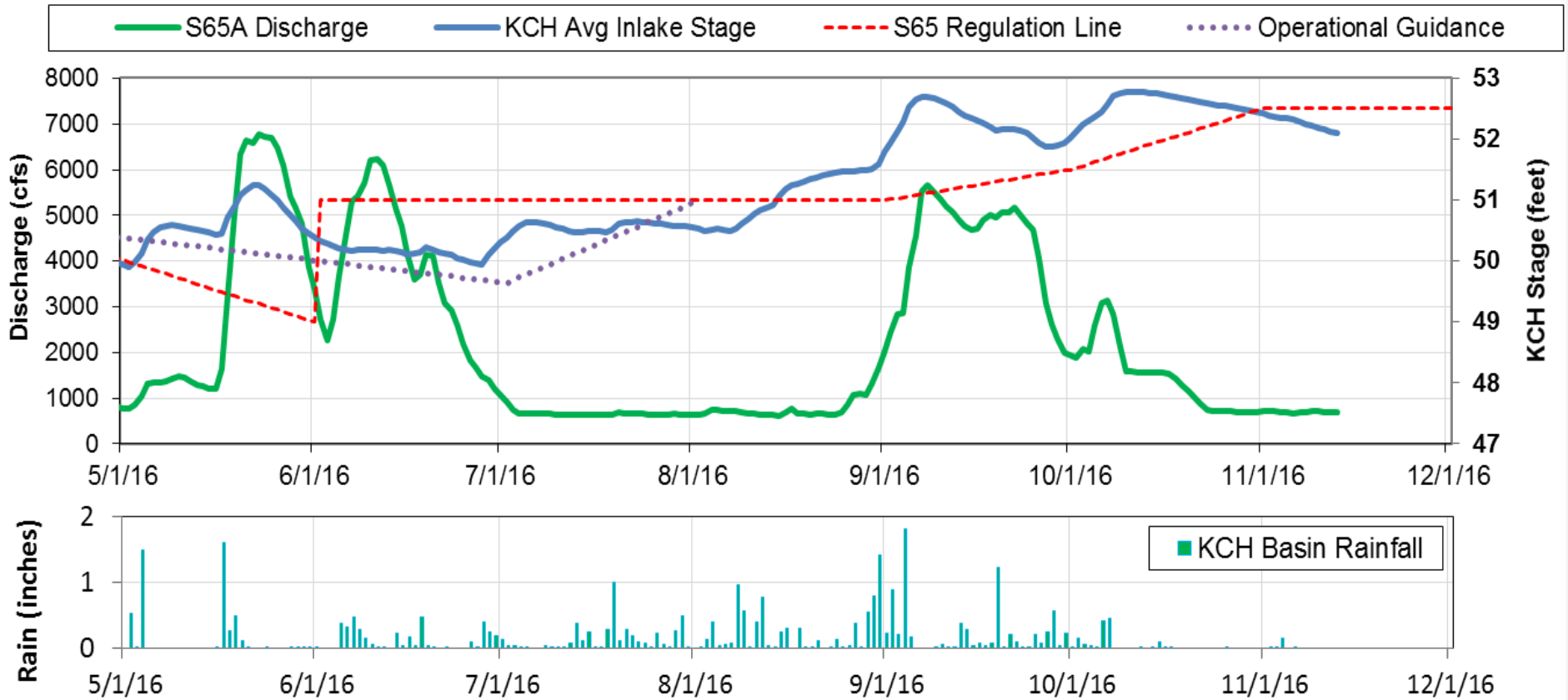
Previous Six Months Kissimmee-Cypress-Hatchineha



- To provide relief downstream under very wet conditions, the District operated above the S-65 regulation line in September - October

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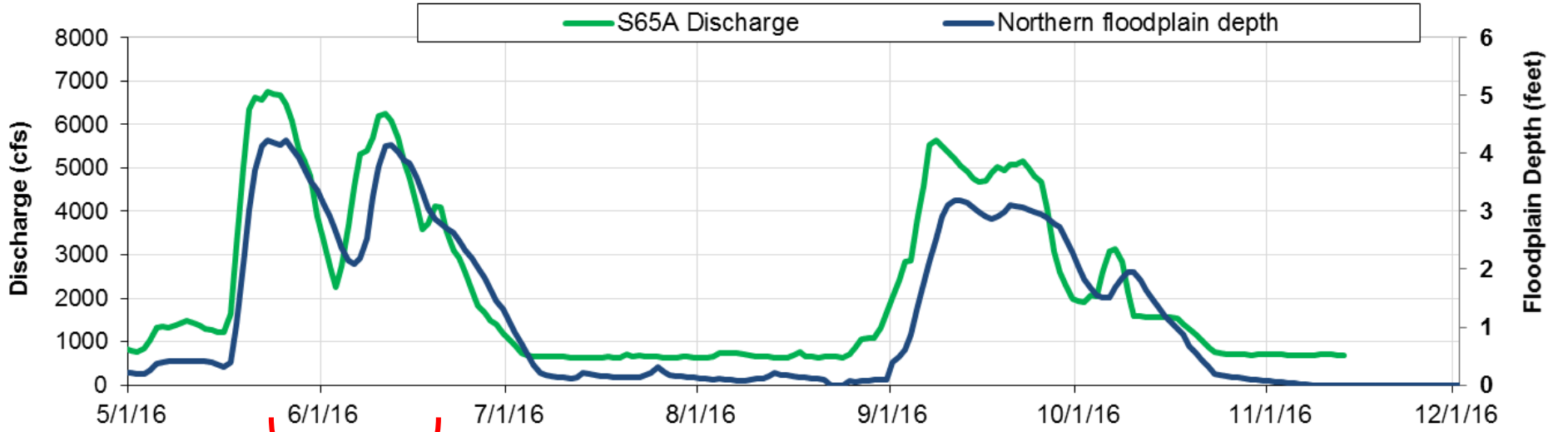
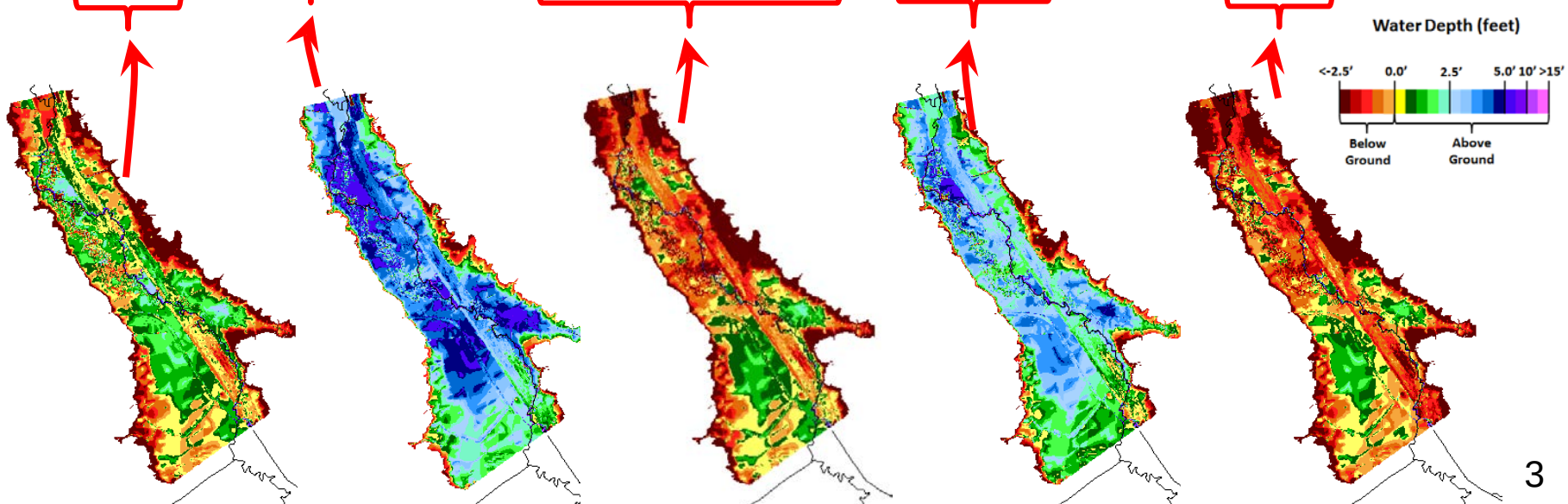
Previous Six Months
S65A and Kissimmee River Floodplain





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Expected Conditions - Next Six Months S65 and Kissimmee River

- Construction contracts for the Kissimmee River Restoration Project will dominate 2016-17 dry season operations
- S-65, S-65A, S-65C, and S-65D will be operated to facilitate construction through the dry season with consideration of environmental needs as possible
- La Nina conditions are present as of November; the current CPC outlook is for dry to very dry conditions through the first half of the dry season, with rainfall returning to normal in late dry season

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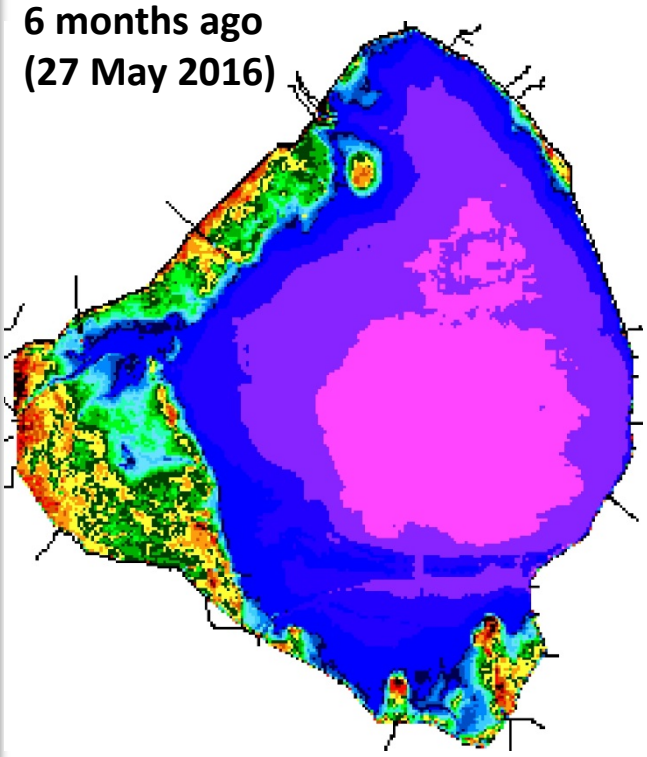
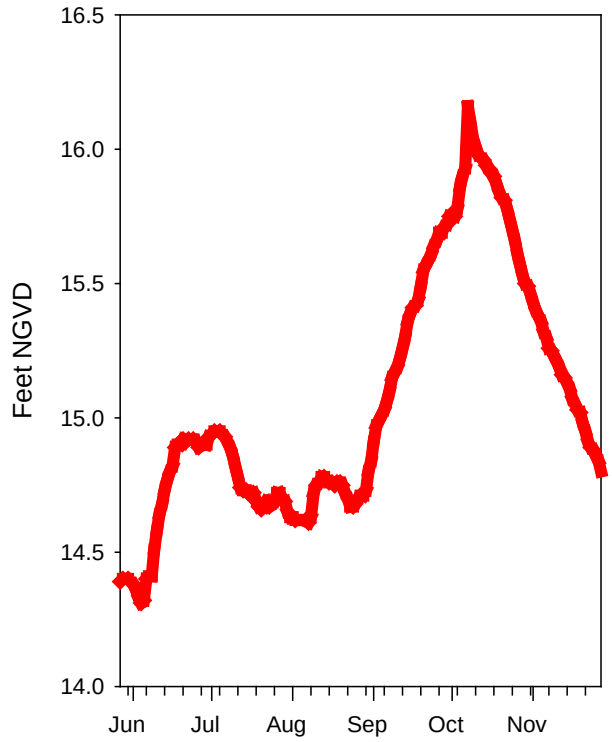
Previous Six Months – Lake Okeechobee Stage

6 months ago
(27 May 2016)

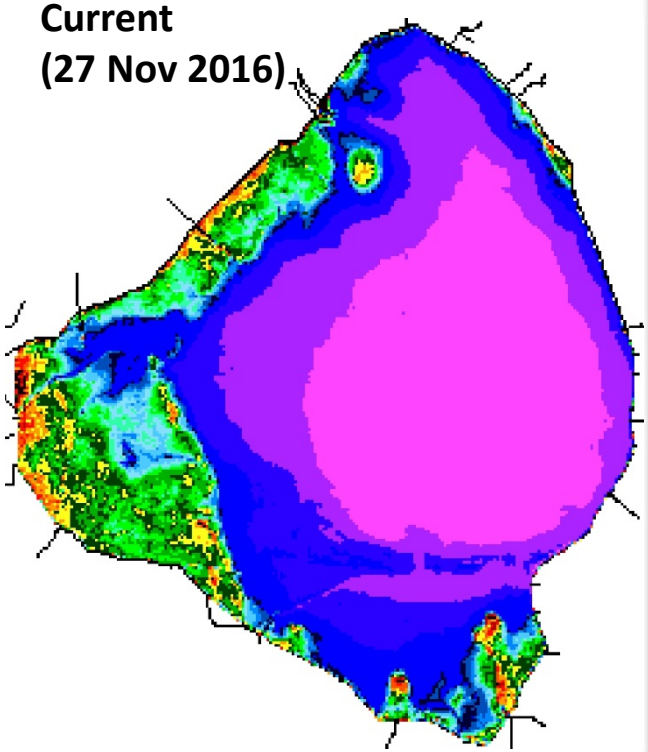


(14.39 ft NGVD29)

Lake Stage Feet NGVD

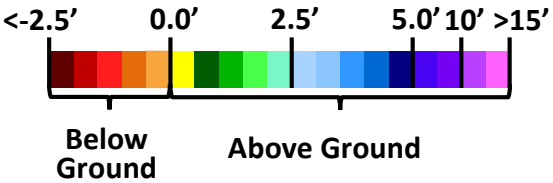


Current
(27 Nov 2016)



(14.80 ft NGVD29)

Water Depth (feet)



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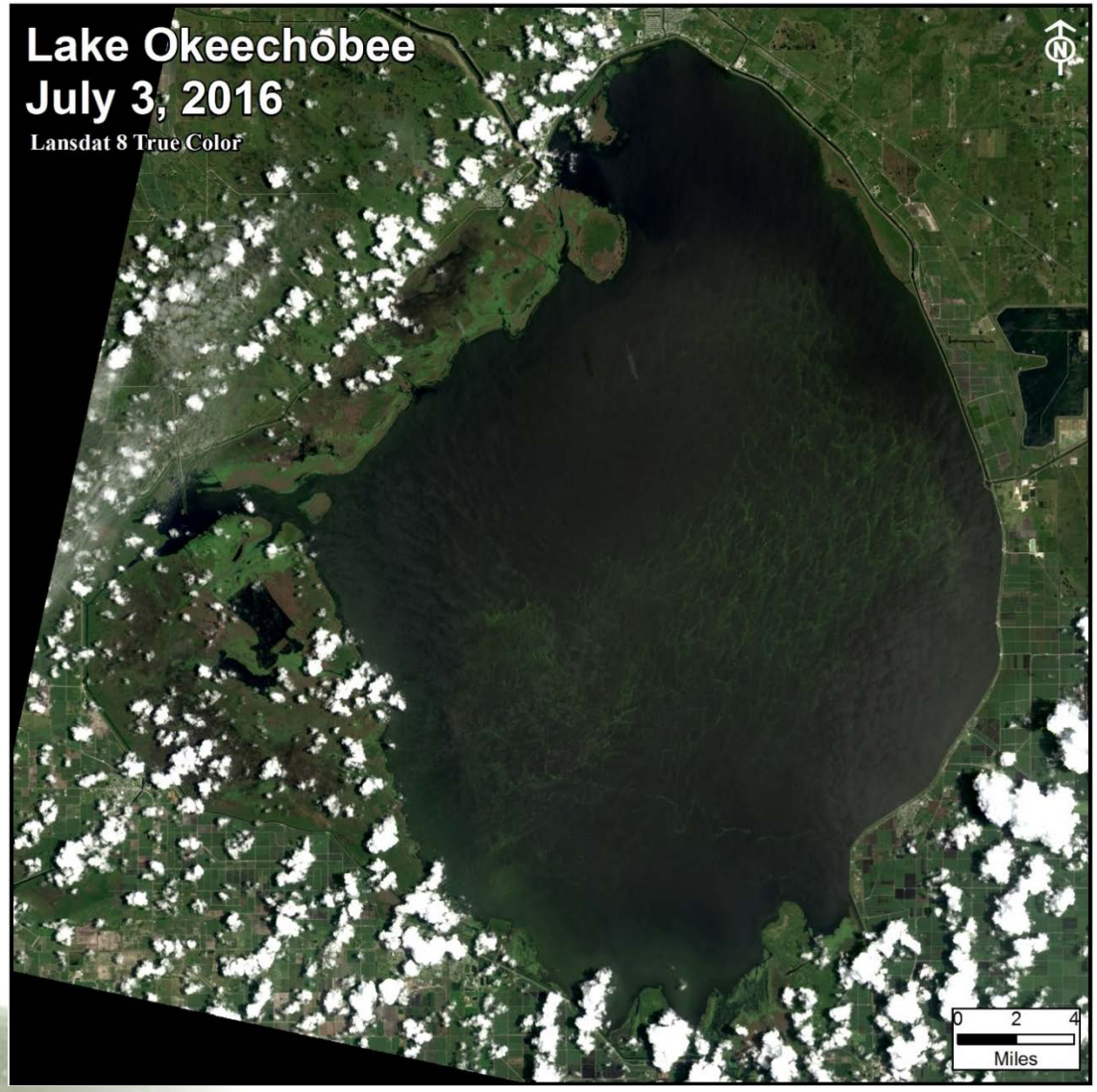
Lake Okeechobee
Algal Blooms

- Spring and summer 2016 were characterized by severe cyanobacterial blooms
- Blooms began in May and continued through September
- Blooms associated with high nutrient concentrations, warm temperatures and with spring lake stages of 14 feet NGVD or greater



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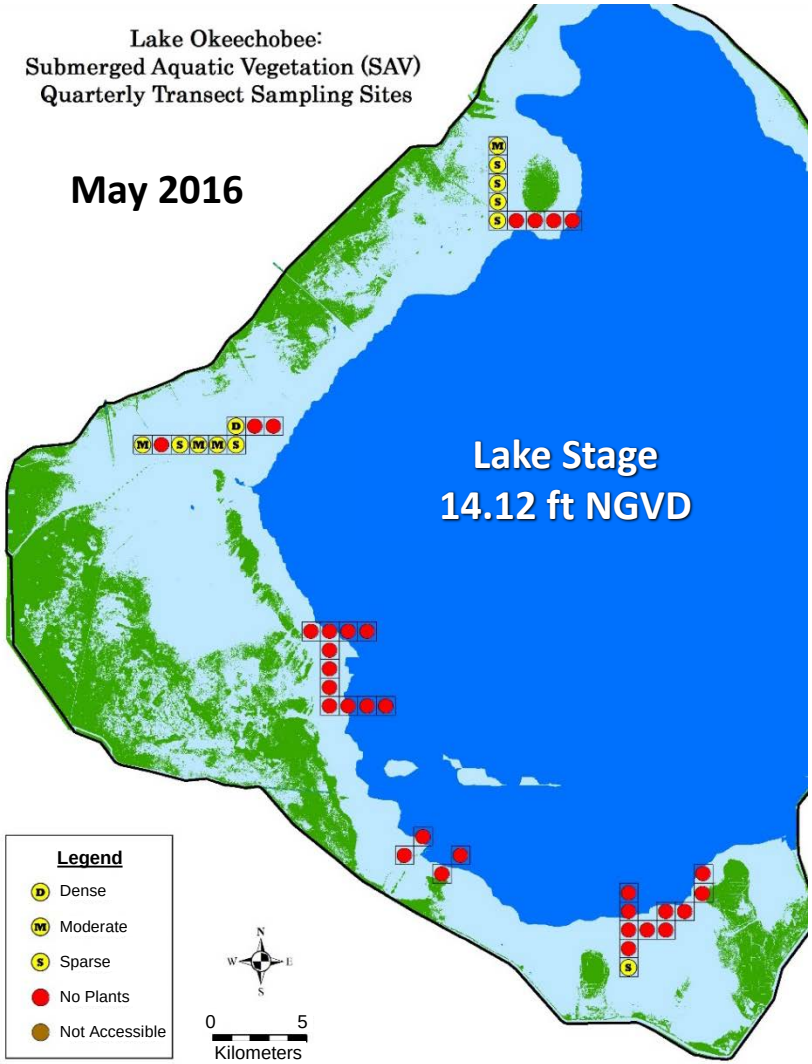
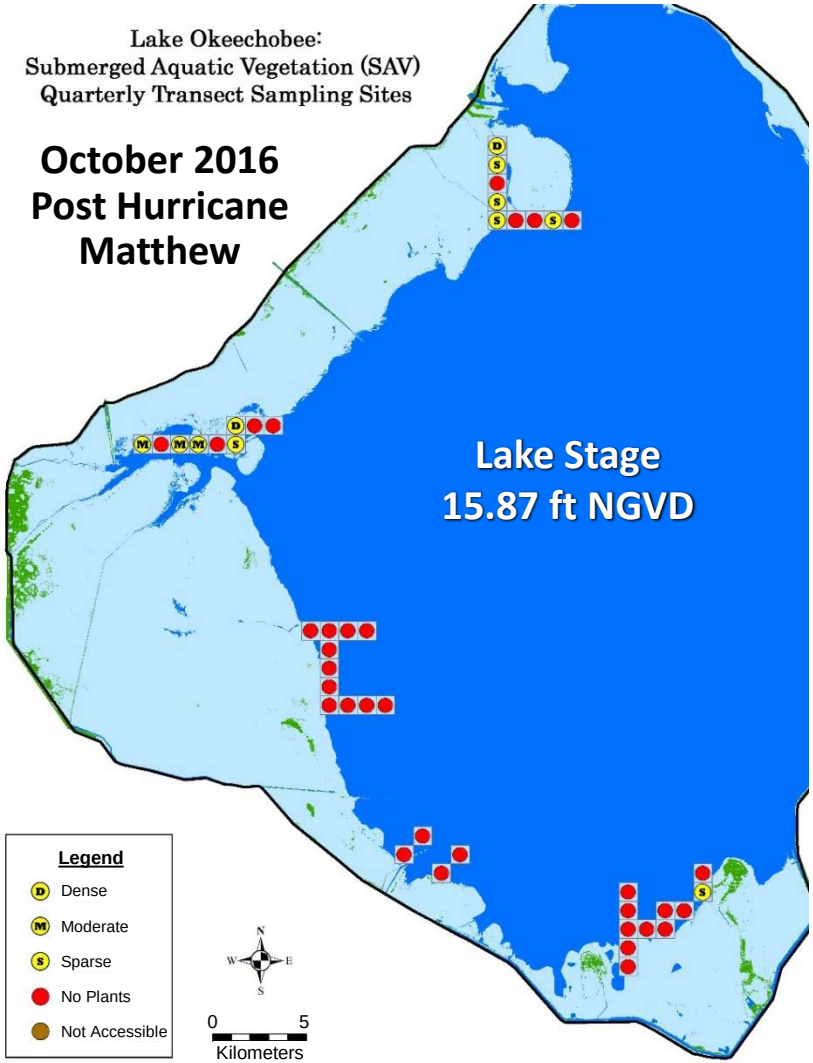
Lake Okeechobee Submerged Aquatic Vegetation





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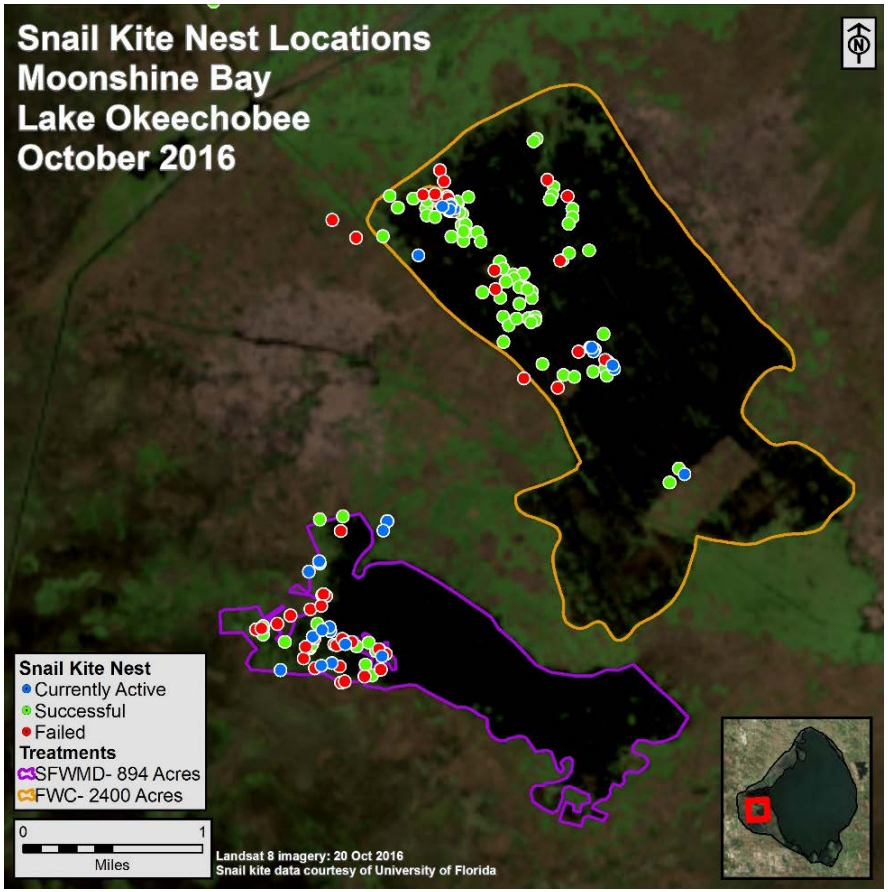
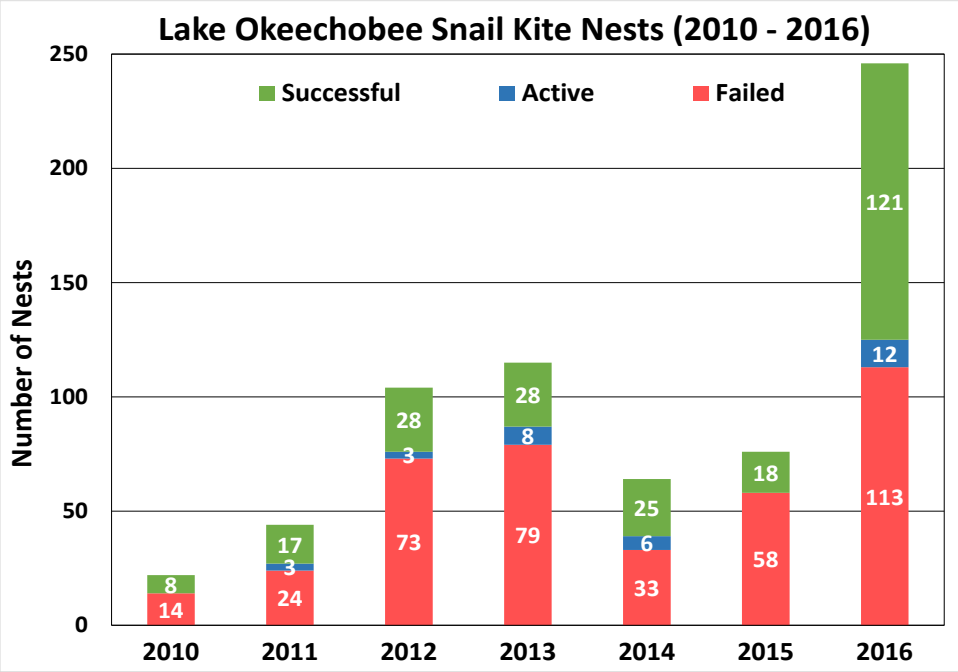
Lake Okeechobee Snail Kites



Mid-November Survey

- Total Nests: 246
- Successful: 121
- Still Active: 4
- Failed: 113 (8 unknown)



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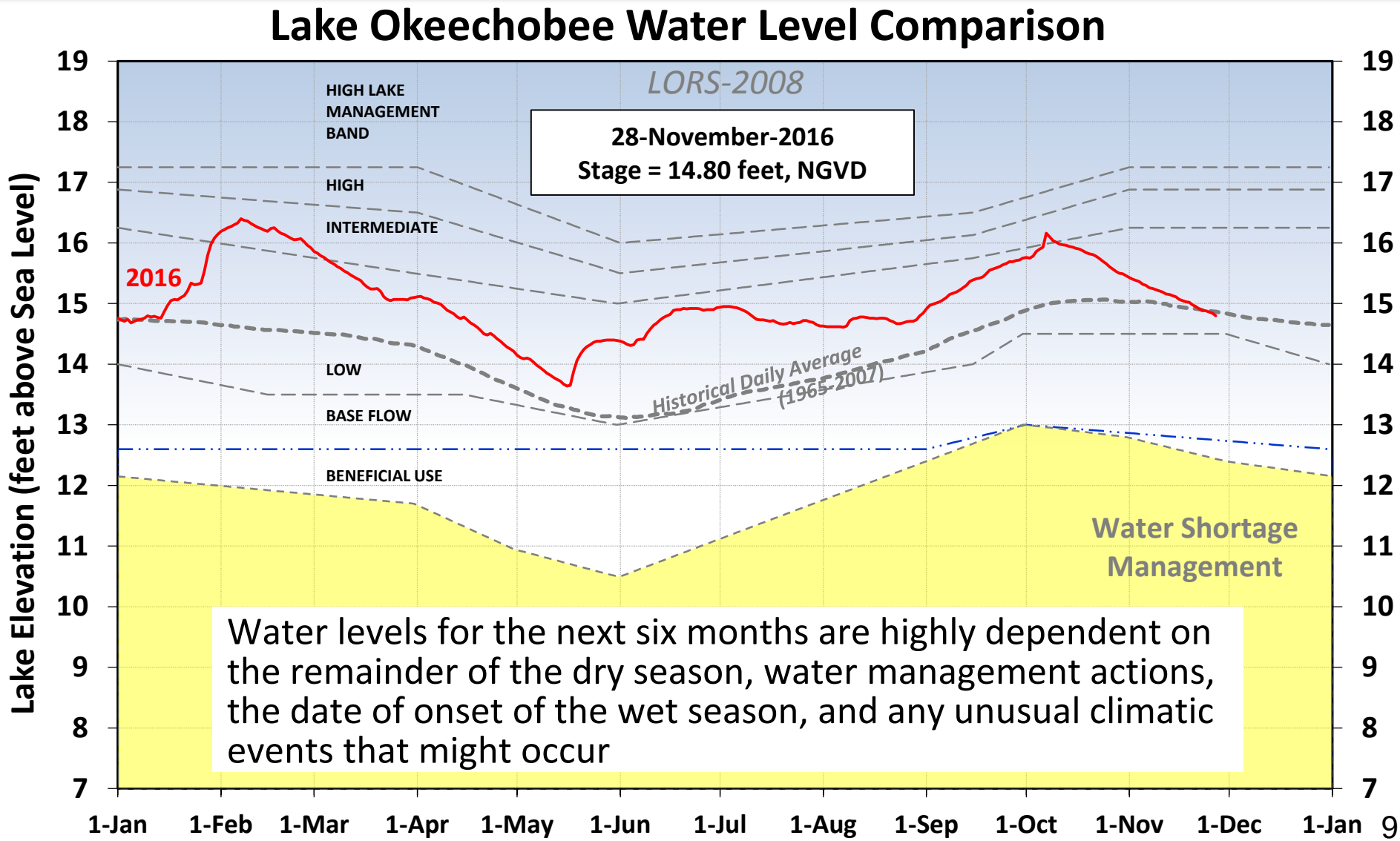
Lake Okeechobee – Next 6 Months



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 any unusual climatic events that might occur

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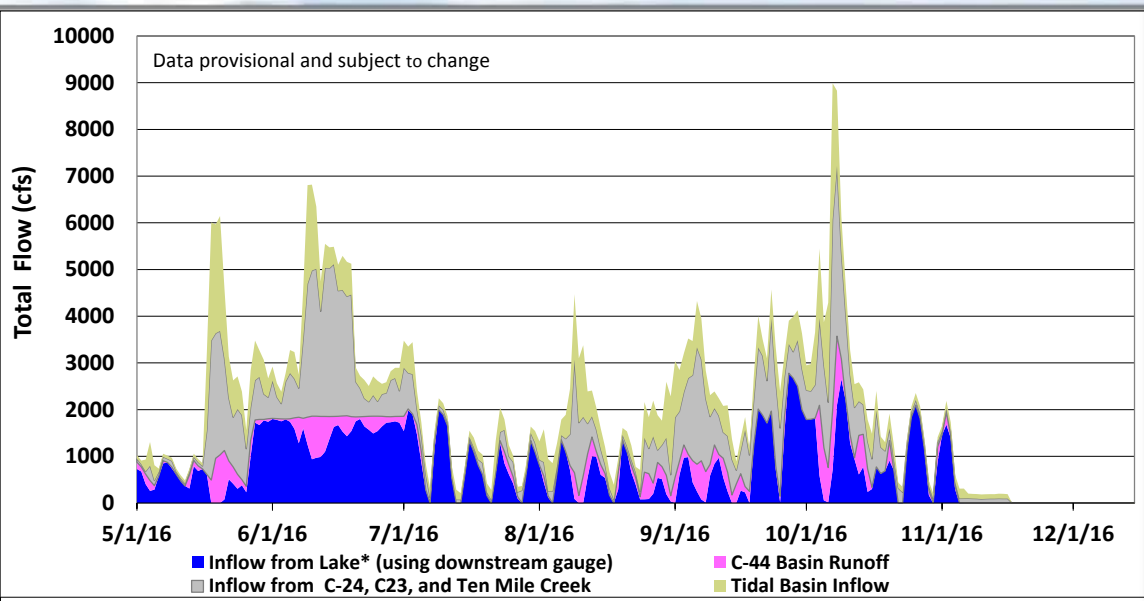
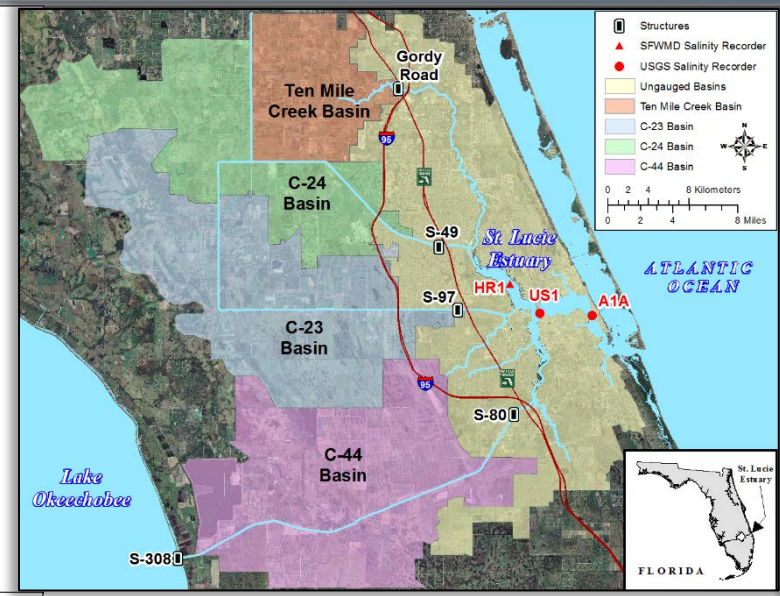
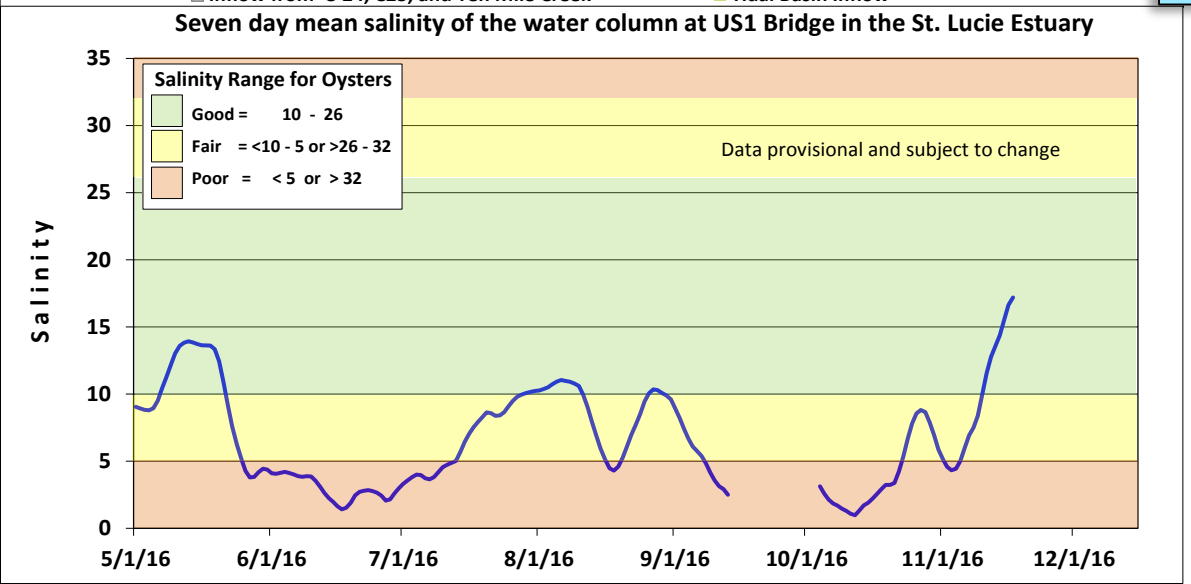
St. Lucie Estuary - Freshwater Inflow and Salinity Conditions







- The strong El Nino influence has resulted in sustained lake releases into the estuary under LORS guidance
- Salinity conditions since May were mostly “poor” or “fair” for adult oysters at US1

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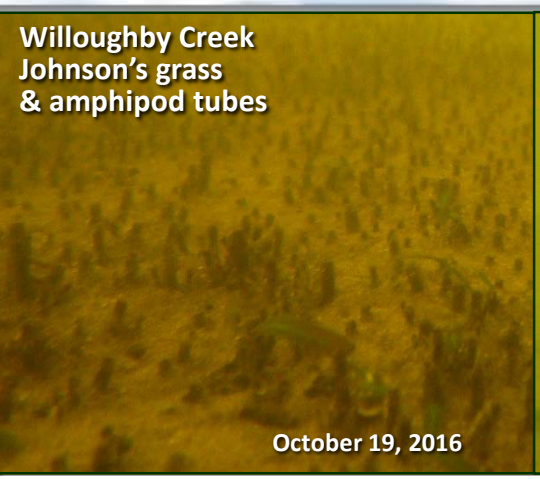
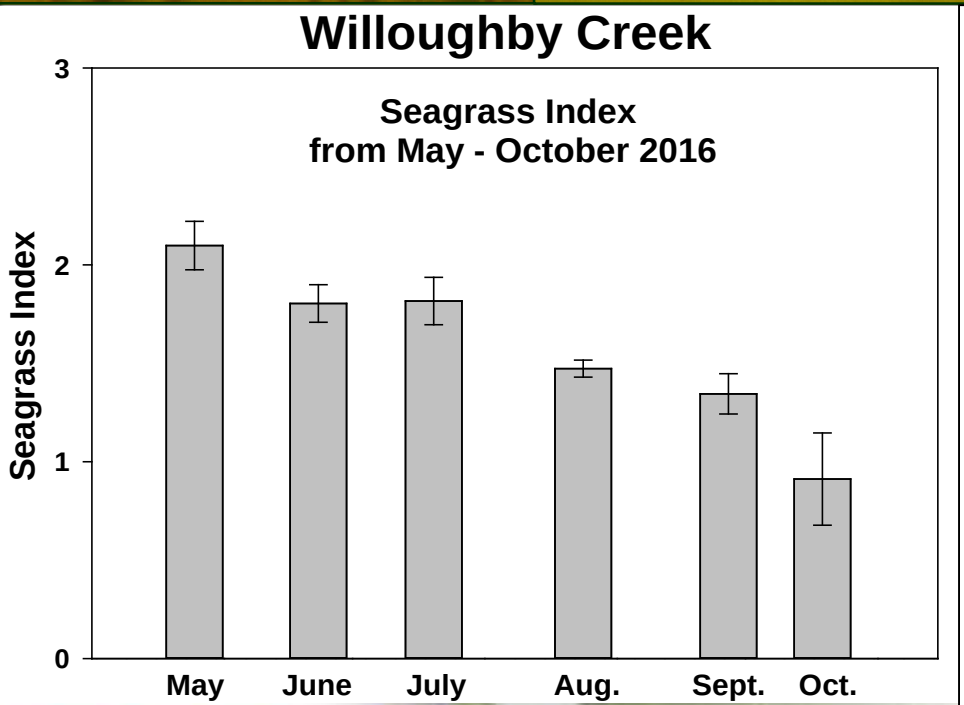
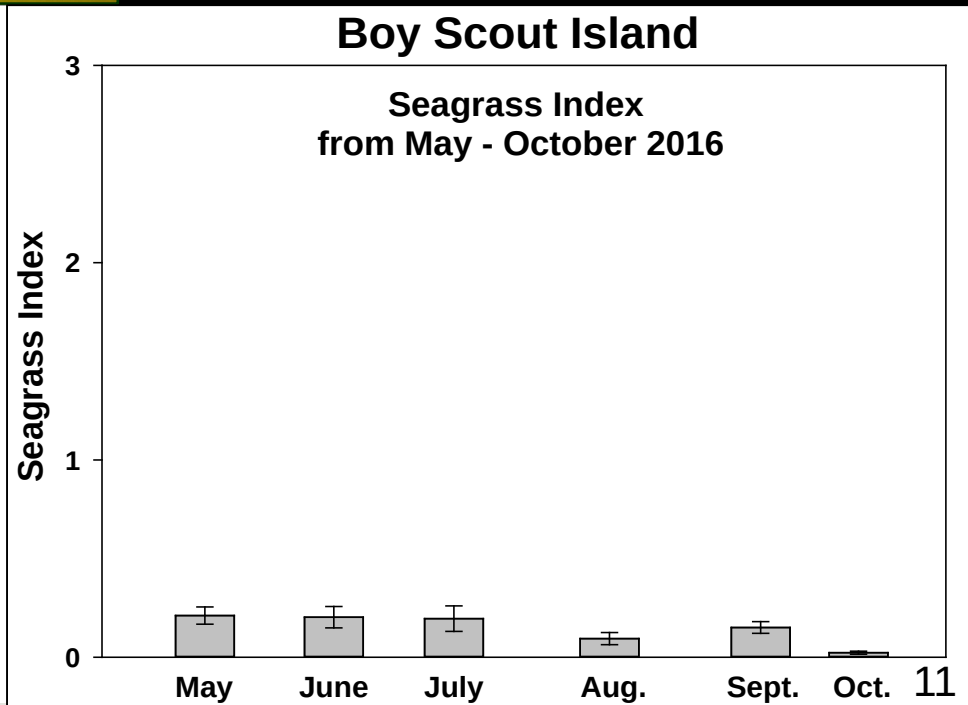
St. Lucie Estuary Seagrass







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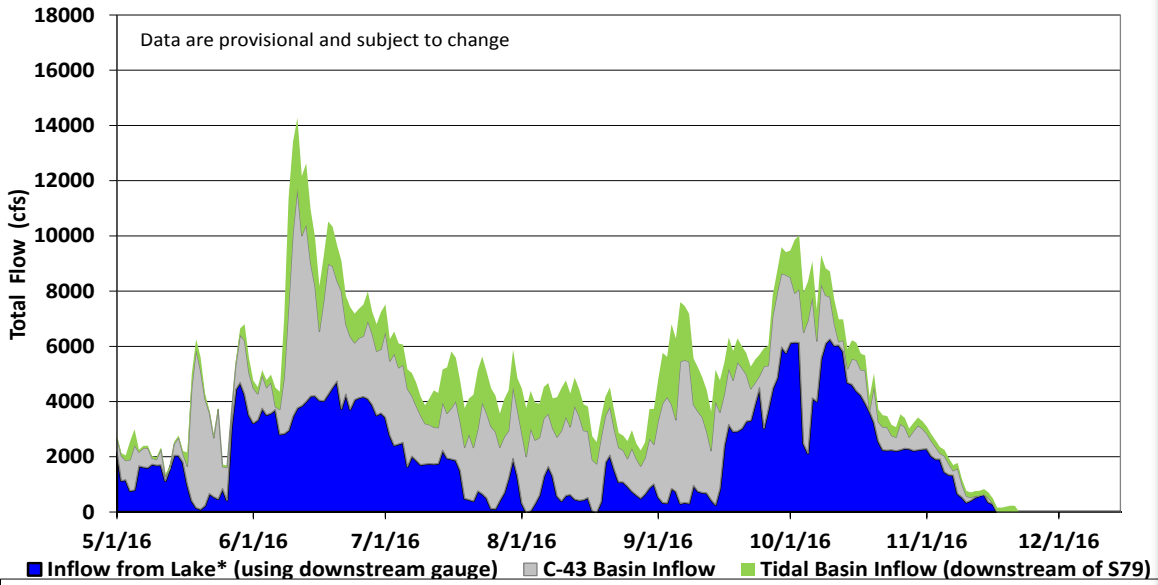
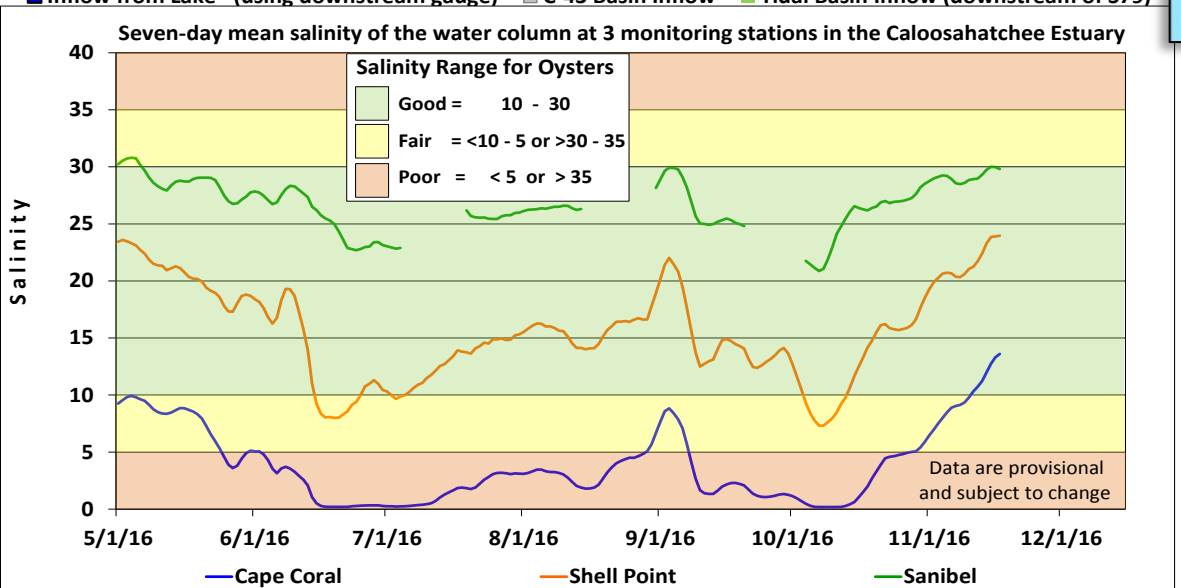
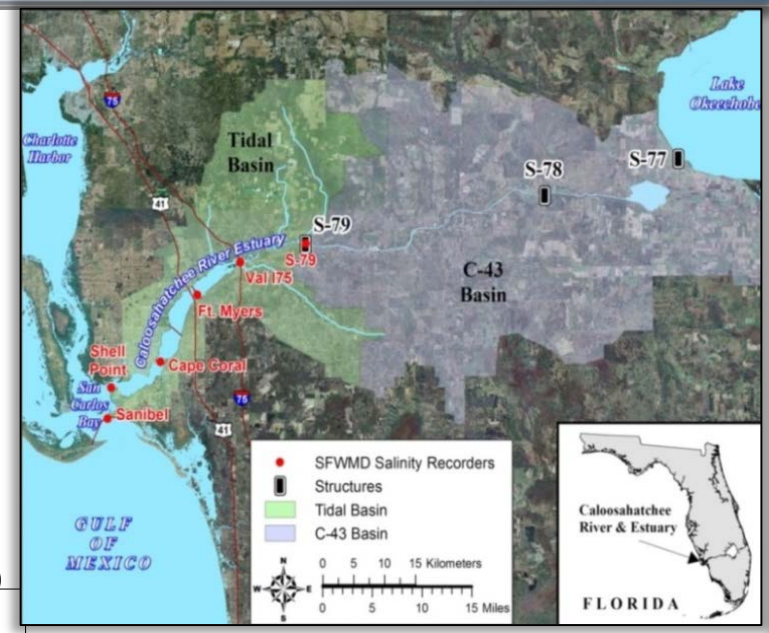
Caloosahatchee Estuary – Freshwater Inflow and Salinity Condition

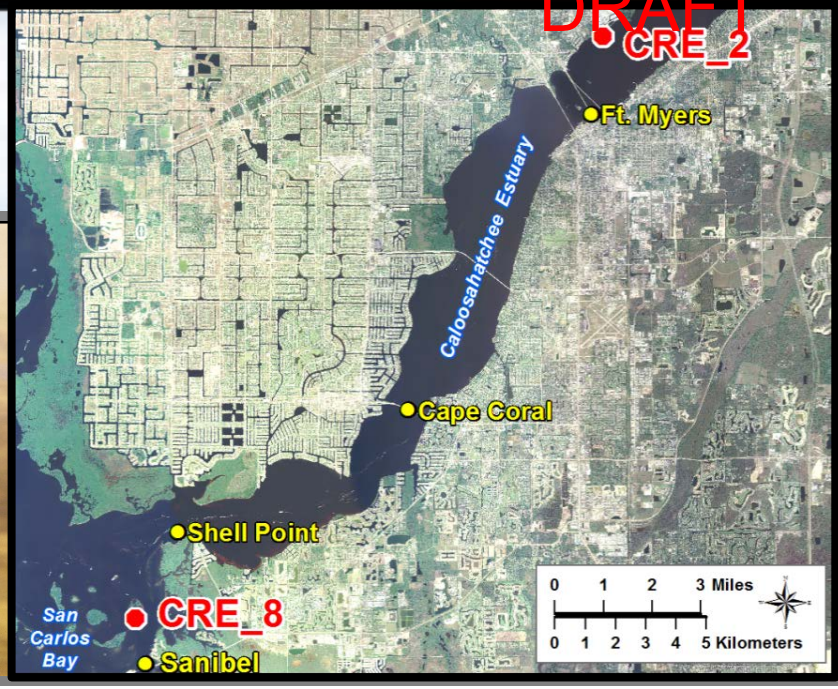


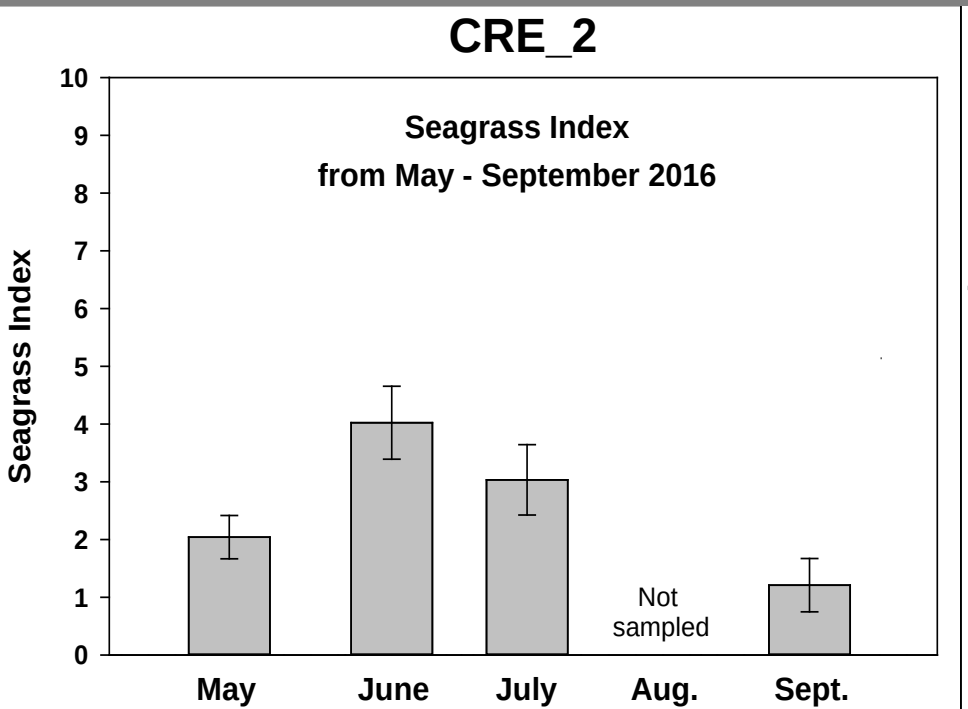


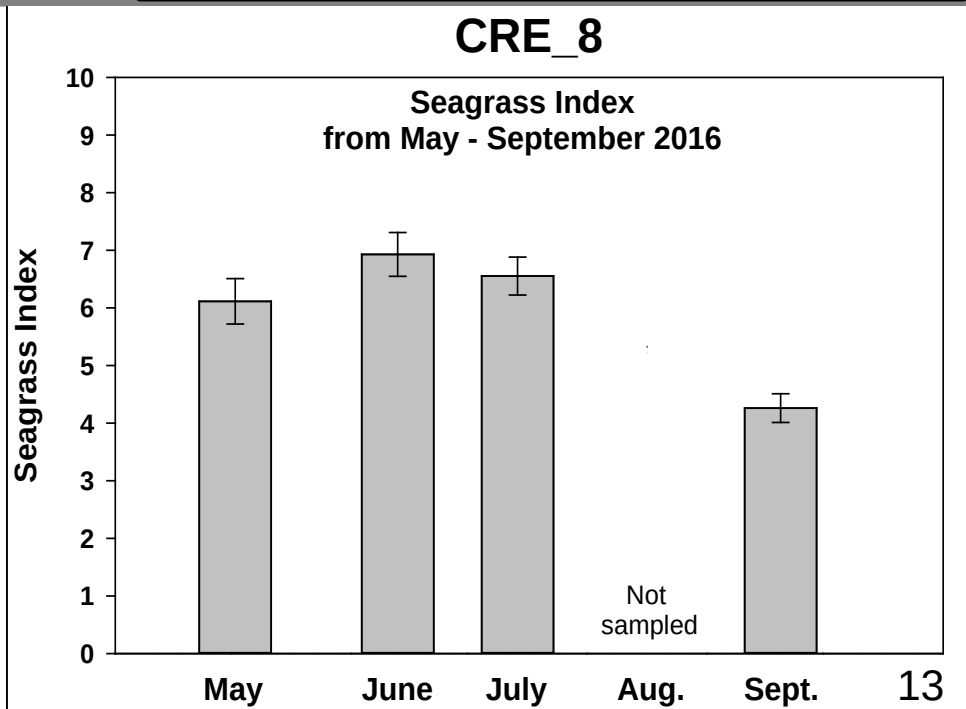


- Strong El Nino influence has resulted in sustained lake releases into the estuary under LORS guidance
- Salinity conditions were mostly "good" for adult oysters downstream of Shell Point

Caloosahatchee Estuary – Submerged Aquatic Vegetation







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Expectations for the St. Lucie and Caloosahatchee Estuaries

- Both estuaries are currently experiencing reduced freshwater input in association with the transition to La-Nina and reduced rainfall.
- Salinities should increase in response to the expected decrease in freshwater inflow. Oysters are expected to increase in density as salinities return to preferred ranges and spat recruitment has been good in both estuaries.
- In the Caloosahatchee Estuary, Vallisneria might be affected if salinities are beyond its preferred ranges.

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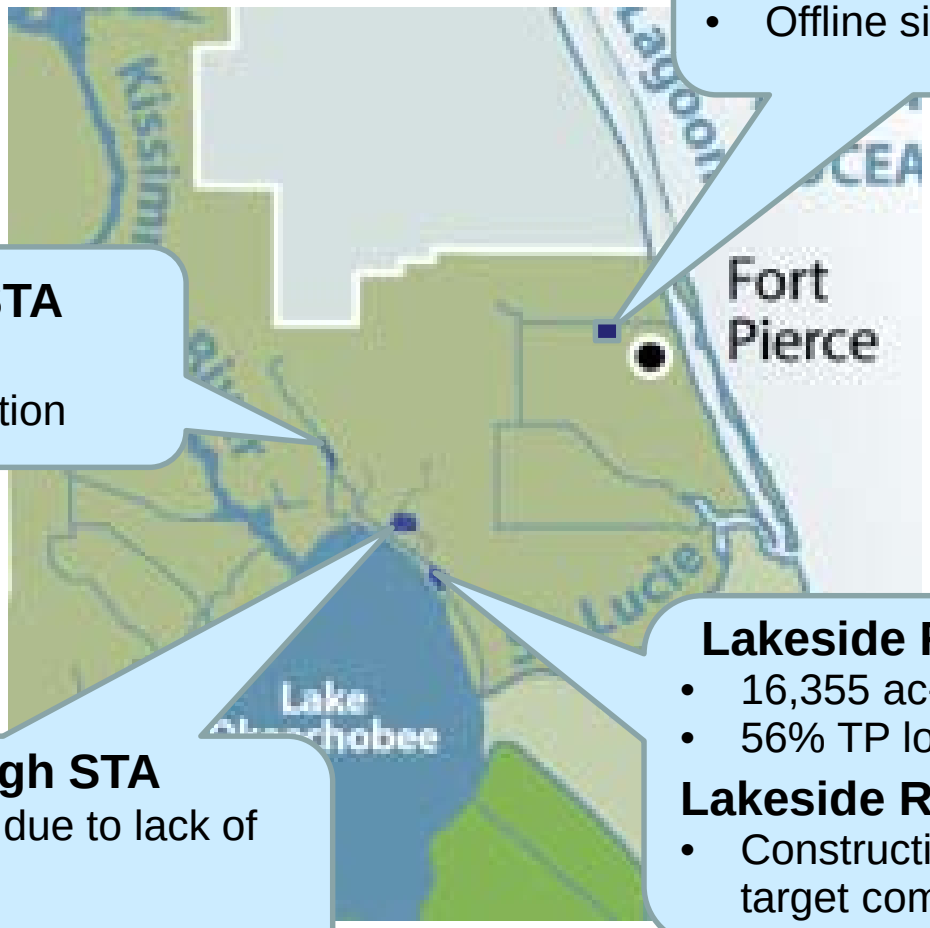
Northern STAs – Last 6 months

Ten Mile Creek STA
- 2,598 ac-ft inflow
- Offline since Oct 2016



Taylor Creek STA
- 3,748 ac-ft inflow
- 51% TP load reduction

Lakeside Ranch STA Phase I
- 16,355 ac-ft inflow
- 56% TP load reduction

Lakeside Ranch STA Phase II
- Construction began Jan 2016; target completion date: Jan 2018

Nubbin Slough STA
- Sporadic operation due to lack of flows
- 1,360 ac-ft inflows

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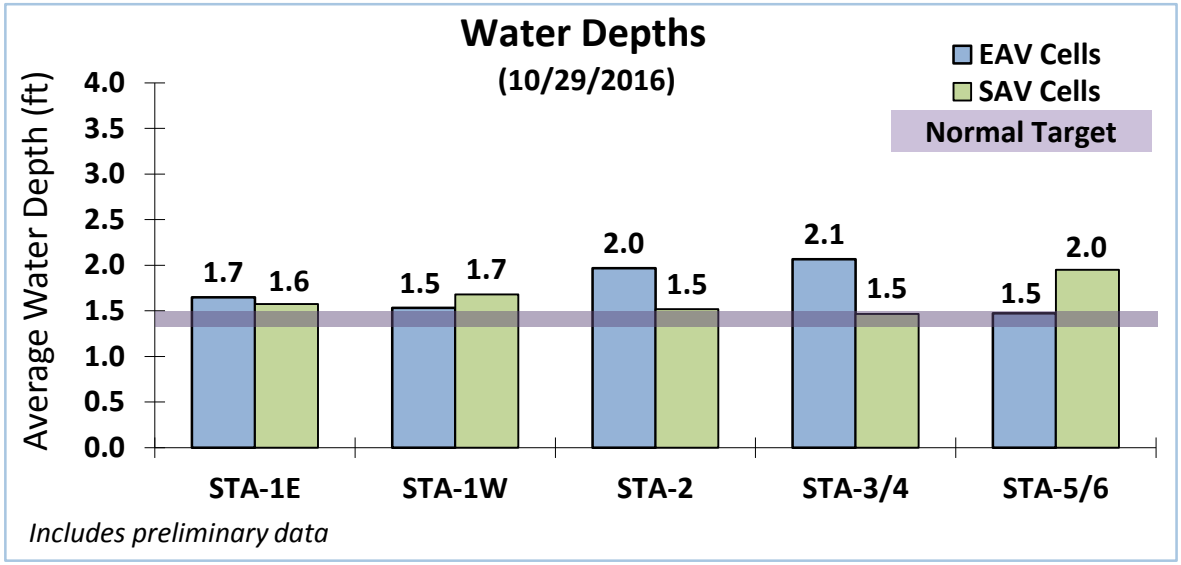
Everglades STAs - Previous 6 months

- STA water depths were above target during wet season due to basin runoff and Lake releases
- A-1 FEB received runoff & Lake releases which reduced peak flows and TP concentrations to STA-2 & STA-3/4



- Total inflows to STAs in WY2017 (since May 1, 2016) ~900,000 ac-ft
  - Includes ~100,000 ac-ft Lake releases

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Northern STAs – Next 6 months

STA	Plans for next 6 months
Taylor Creek	Normal operation
Lakeside Ranch Phase 1	Normal operation
Lakeside Ranch Phase 2	Construction
Nubbin Slough	Normal operation
Ten Mile Creek	Offline

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Everglades STAs - Next 6 Months

- Treat Lake Regulatory Releases as conditions allow
  - Basin runoff treated as first priority
  - Minimize impacts to STA vegetation health and treatment performance
  - Vegetation rehabilitation activities in select treatment cells will require temporary flow or stage restrictions
- STA-1W Expansion #1 construction continuing
- Continue to use A-1 FEB to reduce peak flows to STAs

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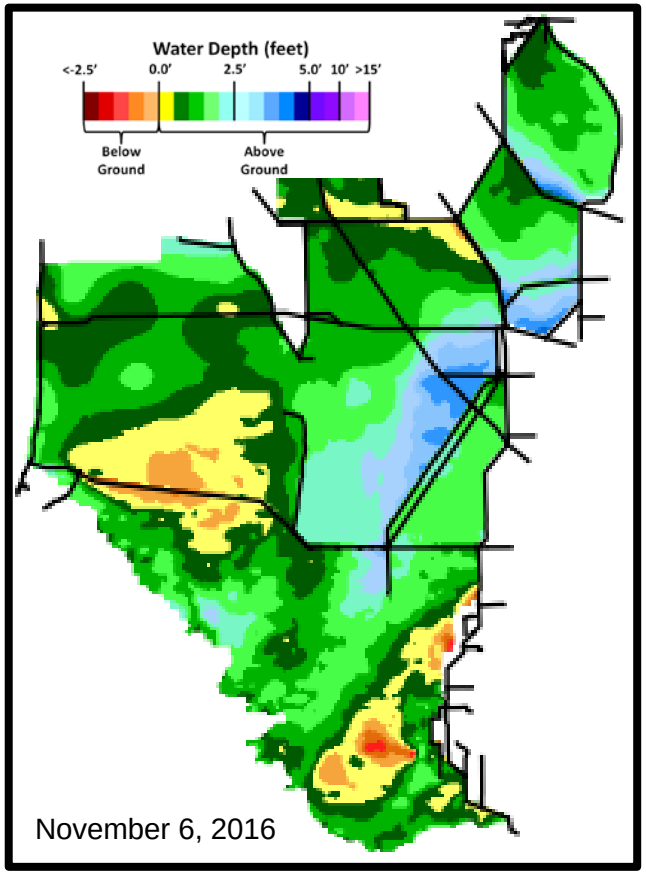
Previous Six Months – WCA's

Wet Season:

- A very wet dry season was followed by a typical wet season resulting in extended periods of deep water. Southern WCA-3A tree islands were inundated for a total of 31 weeks with potentially negative but uncertain impacts for trees.
- FWC closed the WCAs to the public once in winter and once in summer because of high water
- Wading bird nesting was limited this year because water levels were generally too deep for foraging



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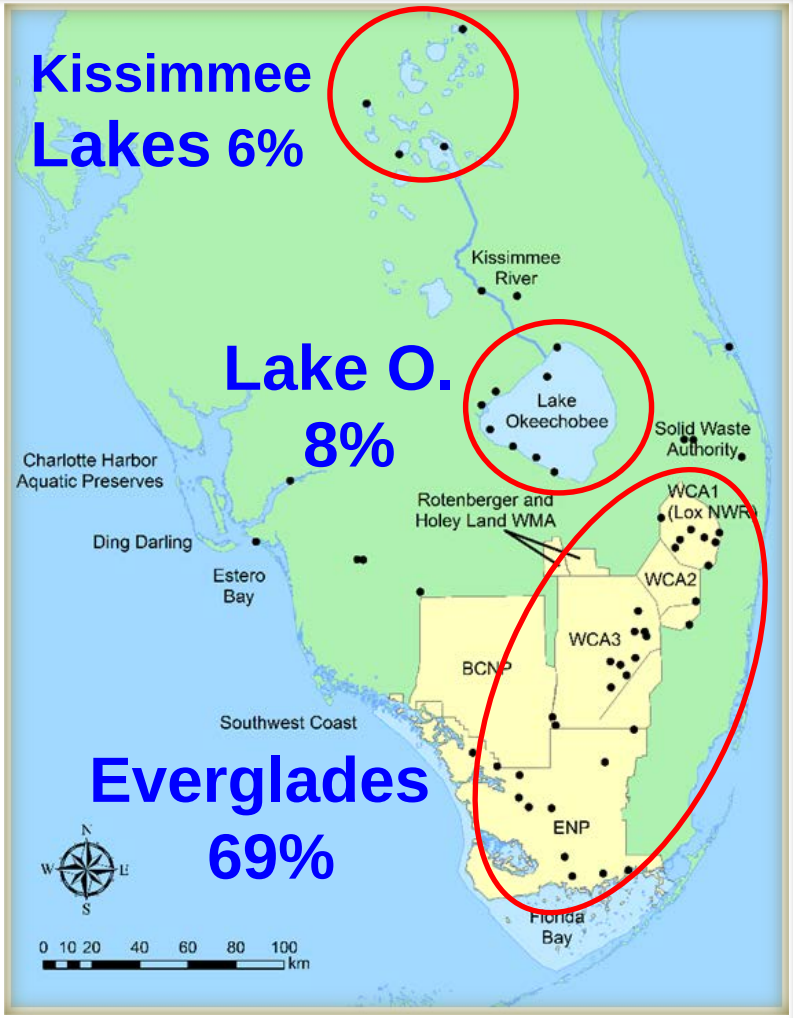
South Florida Wading Bird Report 2016

27,051 nests in South Florida in 2016

- Relatively poor nesting season
- 37% fewer nests than 10-yr average
- Second lowest count since 2000
- All species exhibited reduced nesting effort
- Most nesting (18,637 nests) occurred in the Everglades Protection Area



Distribution of nests in 2016

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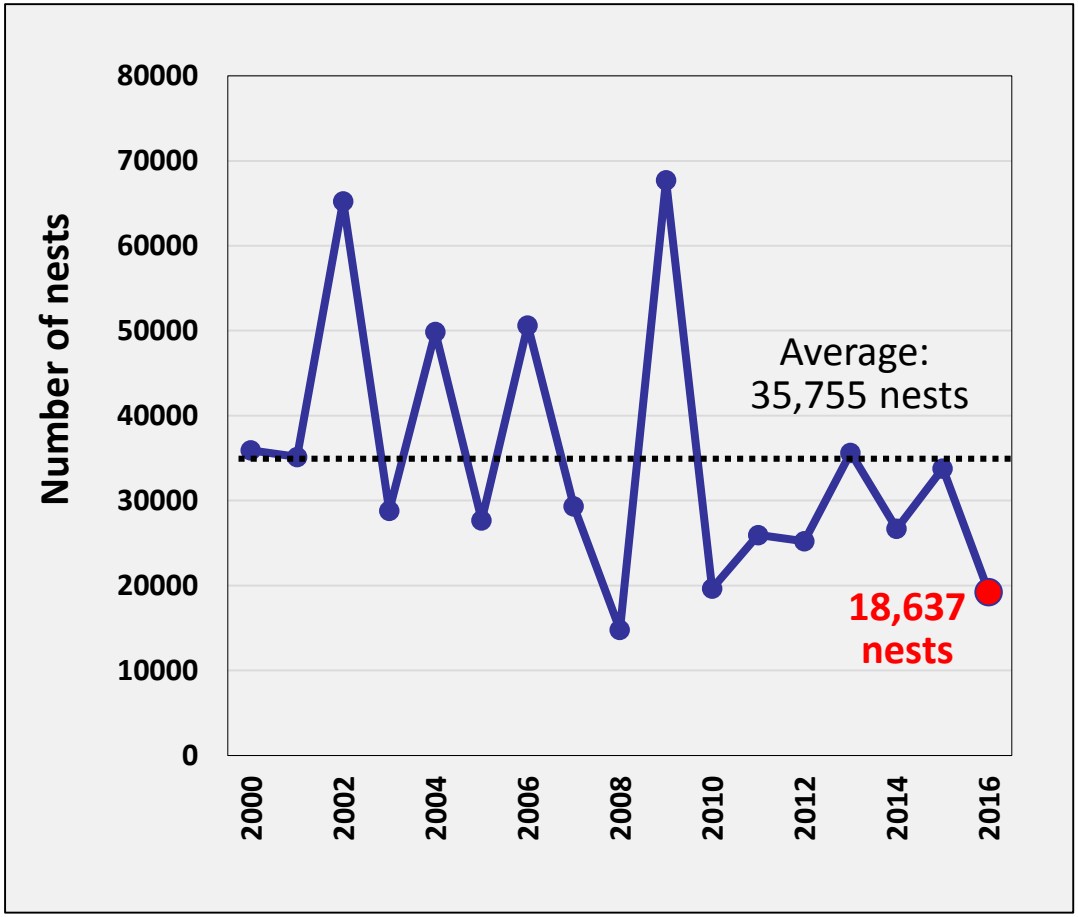
Nesting Effort in the Everglades

Annual Total Number of Nests for the CERP Indicator Species in the Everglades

White Ibis

Great Egret

Wood Stork



Snowy Egret

Tricolored Heron

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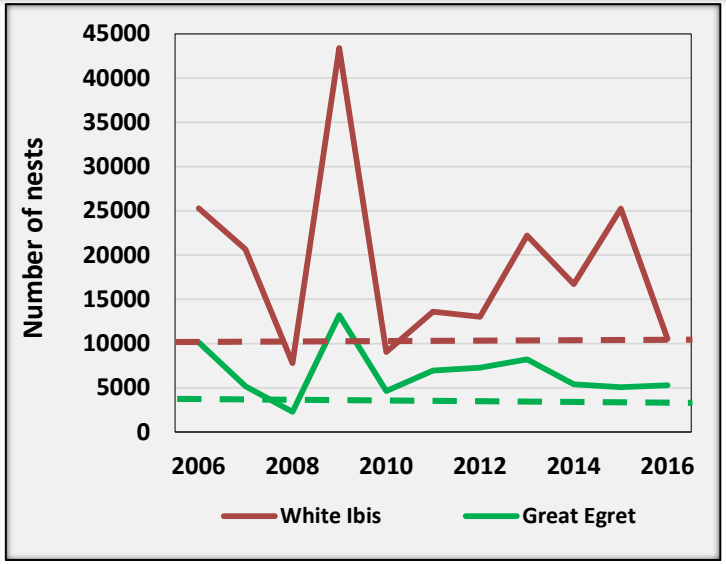
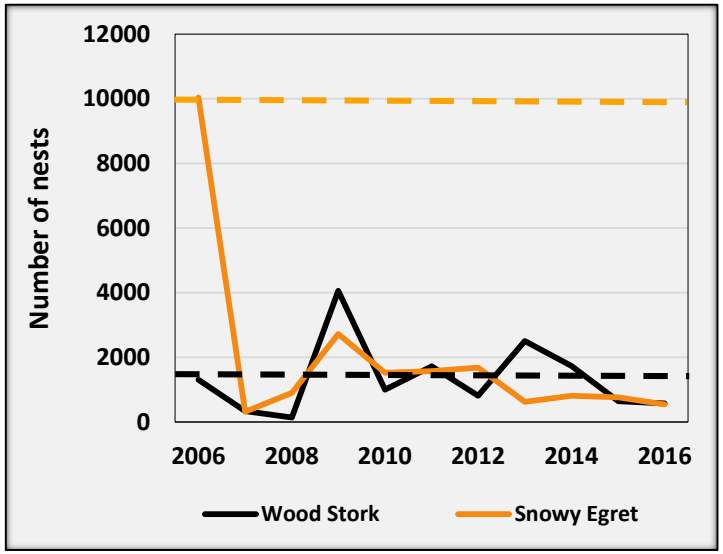
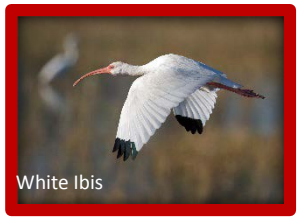
Individual Species Trends in the Everglades







	2016 v. 10-yr average	Long-term trend and CERP status
White Ibis	-47%	Stable, meeting target
Great Egret	-23%	Stable, meeting target
Wood Storks	-60%	Stable, meeting target
Snowy Egret	-74%	Declining, not meeting target

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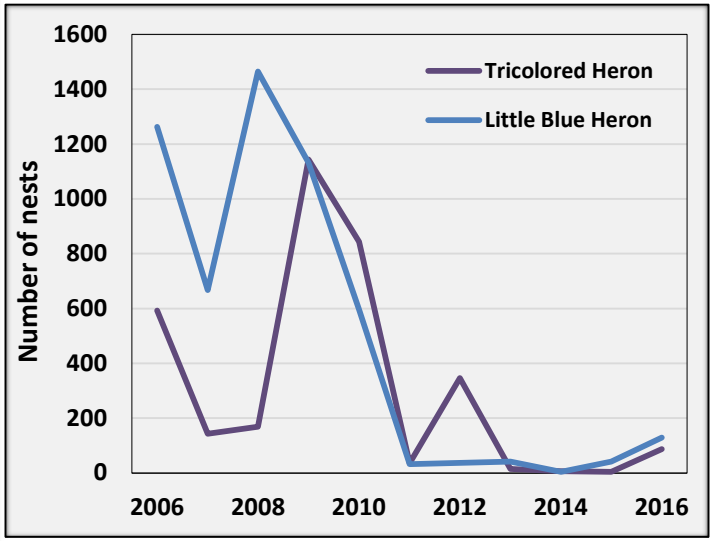
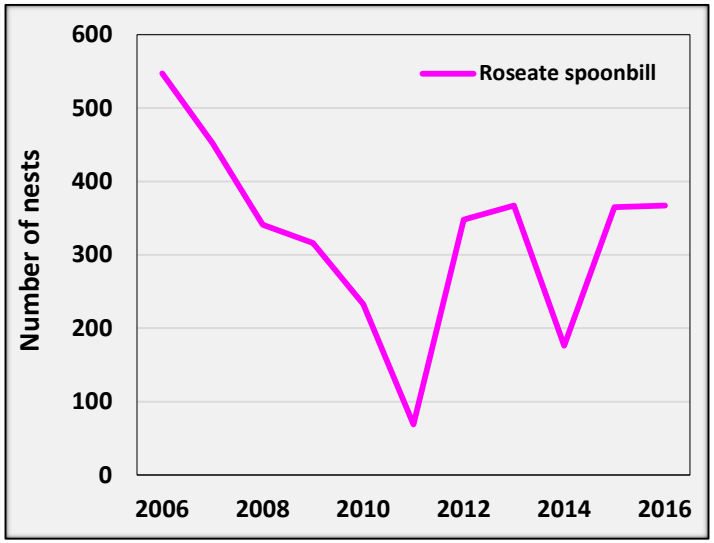
Nesting Effort Trends in the Everglades





	2016 v. 10-yr average	Long-term trend and CERP status
Tricolored Heron	-74% ↓	Declining, not meeting target (10,000 nests)
Little Blue Heron	-77% ↓	Declining
Roseate Spoonbills	8% ↑	Stable, not meeting target in Florida Bay (1258 nests)

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Previous Six Months – Everglades National Park and Florida Bay

Wet season:

- Stages in ENP wetlands remained above average throughout the summer
- Inflow into Florida Bay rose to levels 19% above average through the end of the wet season, and salinities remained about average through the wet season
- Salinities at the MFL site in Taylor Slough remained very low throughout the wet season and are still below 1 psu
- Roseate Spoonbill nesting was successful this year relative to recent years

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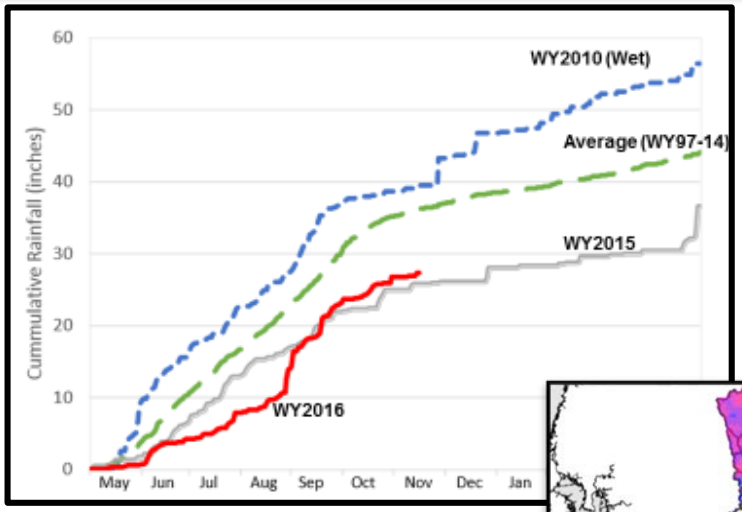
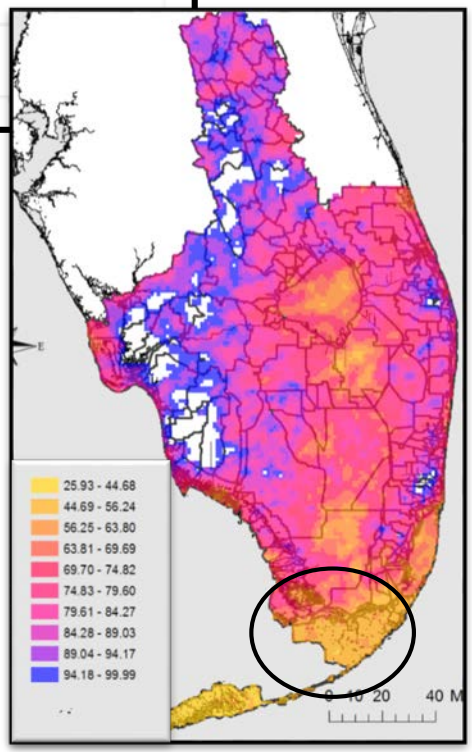
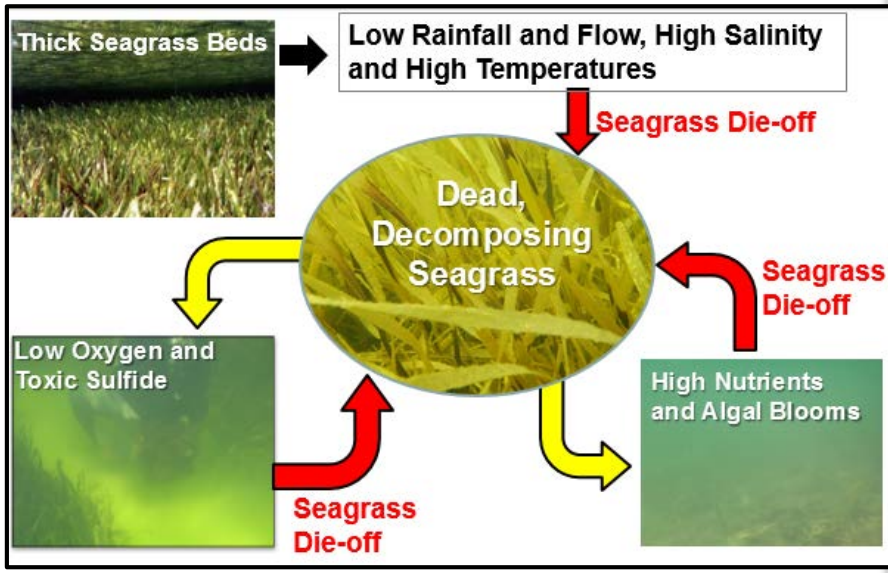
Central Florida Bay





May 2014- Oct 2015

18 consecutive months of well below average rainfall across southern Everglades and Florida Bay



'Cascading Effects' Loop

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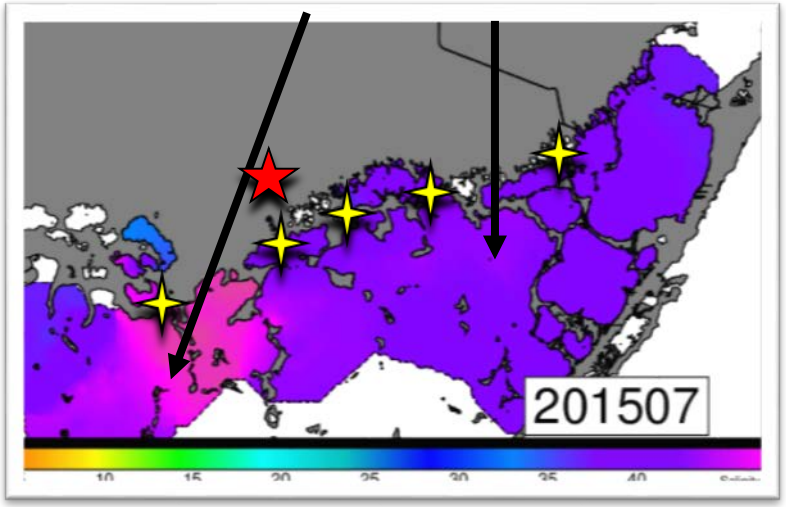
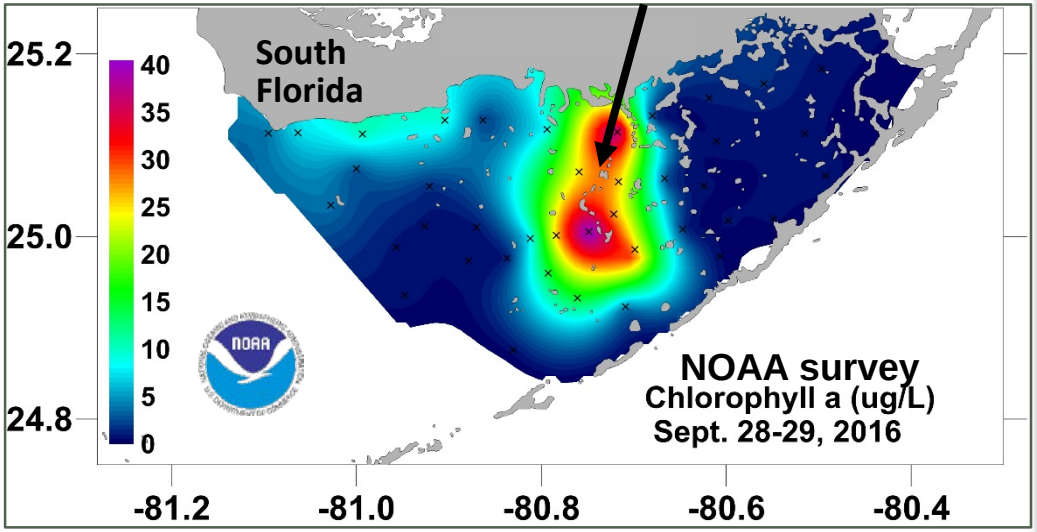
Central Florida Bay

Hypersalinity in Central & Northeastern Bay

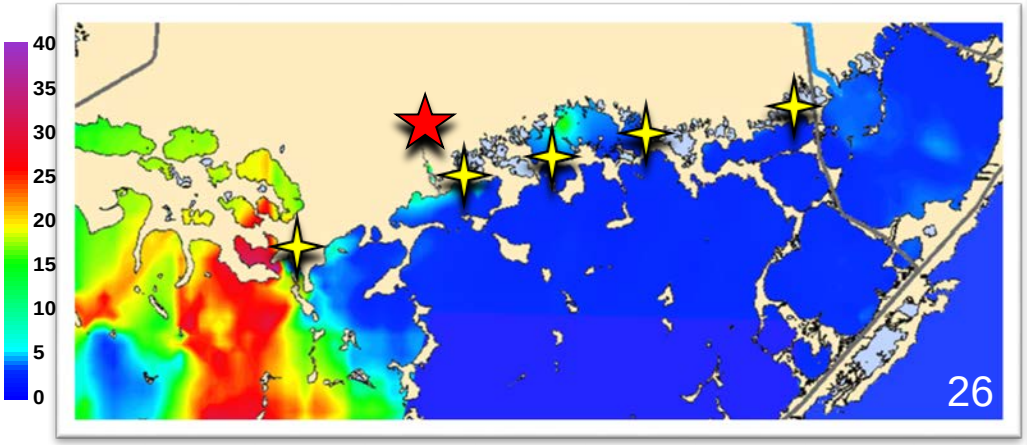


Algal Bloom in Central Bay (Chlorophyll a ug/l)



Seagrass Die-off in Central Bay

SFWMD survey Chlorophyll a (µg/L) Oct. 11-13, 2016



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Expectations – WCAs

Dry Season:

- Current climate outlook is for weak La Niña conditions with below average rainfall expected through February
- Wading bird nesting is expected to improve in the winter/spring of 2017 relative to this year
- Extended wet conditions are good for prey production, while the predicted upcoming dry conditions will concentrate prey and produce optimal foraging habitats

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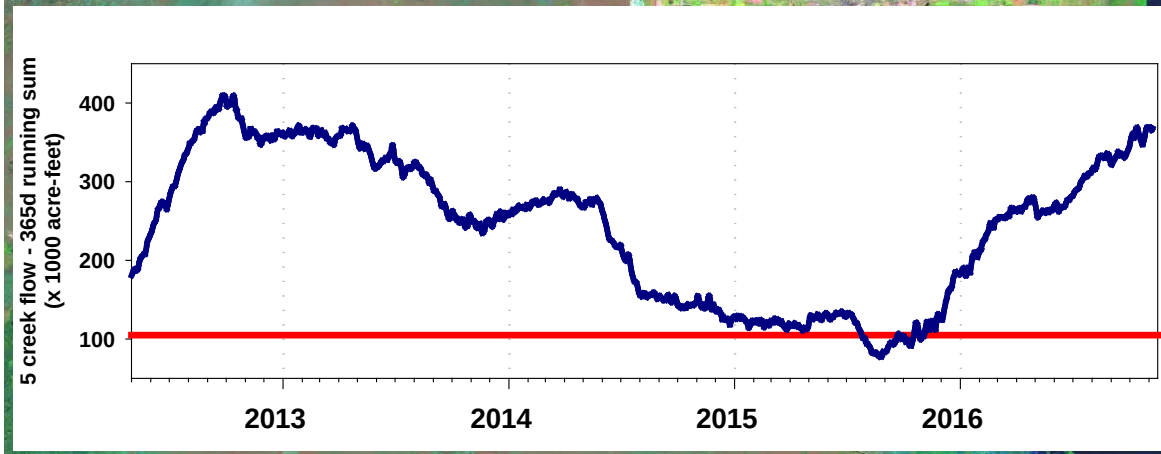
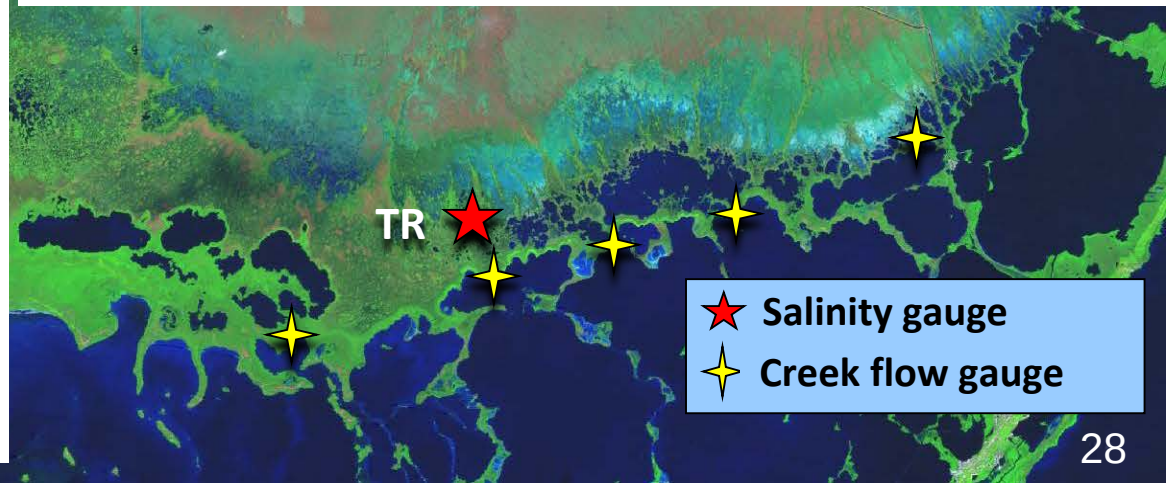
Expectations– Everglades National Park/Florida Bay

- A normal to dry winter should restore stages in the Park wetlands to levels typical of dry seasons and increase salinities to concentrations typical in Florida Bay
- Creek flows into Florida Bay are likely to decrease over the winter with dryer climatic conditions
- Normal dry conditions may support breeding of the endangered Cape Sable Seaside Sparrow, which suffered from very poor conditions last winter with high water
- Florida Bay algae bloom expected to persist





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Questions ?