MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling Nat Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson PhD- Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: February 8, 2011

This report provides a scientific assessment of the conditions in the Caloosahatchee as of this date and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report also includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 12.47 Beneficial Use Sub band Previous week: 12.48
Lake Level equal to Dec 28, 2010
Water shortage management band = 11.96

Salinity Ft Myers: 11 -14 ppt/psu **surface** data USGS sonde @ Marker 52
12-16 ppt/psu **mid depth** data SCCF RECON sensor @ Marker 52
Unhealthy for tapegrass growth & reproduction
Previous week: surface 12 -14 ppt/psu
mid depth 12- 17 ppt/psu

MFL Status: Violation MFL Target at Ft Myers = 10 ppt/psu 30 day moving average
Above 10 ppt/psu (30 day moving average) since 11/21/10 = 79 days

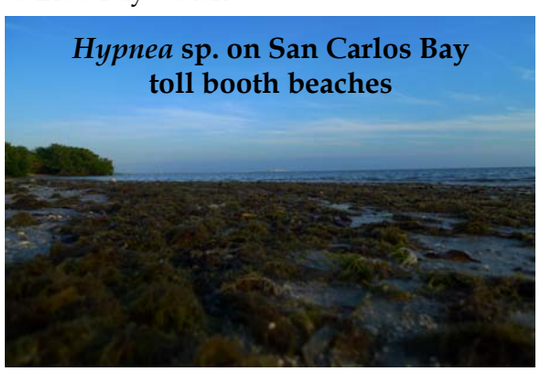
Olga Water Treatment Plant Chloride: 85 ppm Previous week: 98 ppm

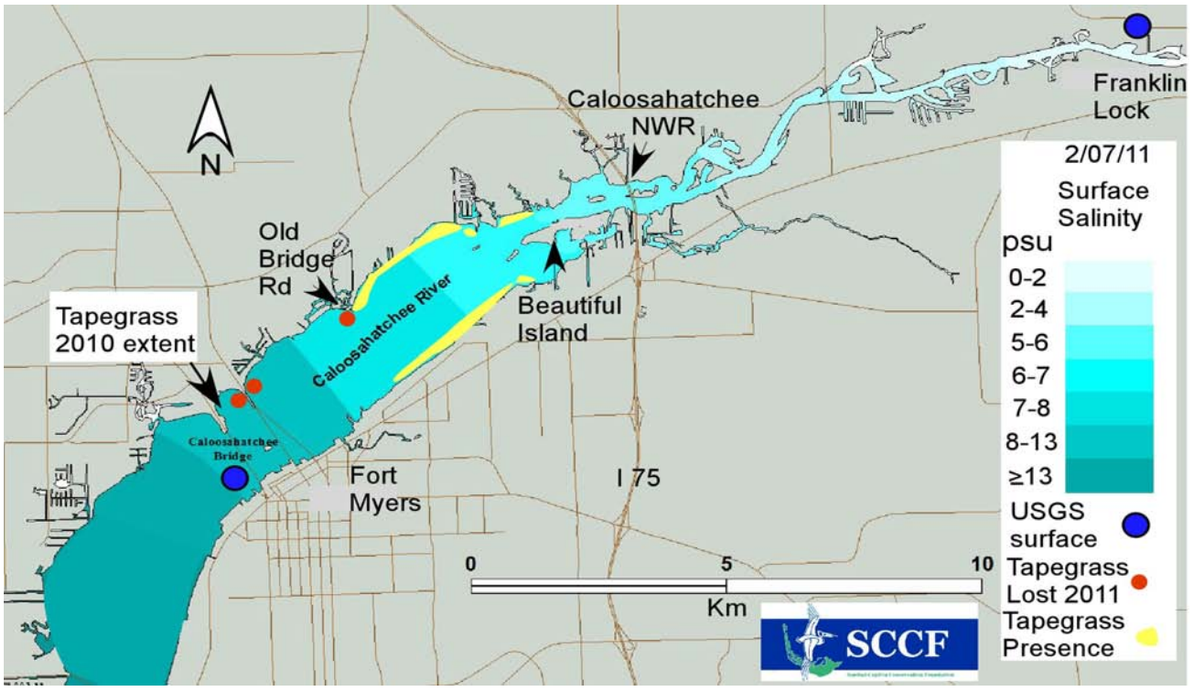
Salinity Shell Point: 27 - 32.5 ppt/psu RECON sensor
Previous week: 26-32 ppt/psu

Flow: Published schedule @S79: 300 cfs
Actual Flow: S77 = 135 cfs Feb 1-7, 2011 Previous week: 0 cfs
S79= 296 cfs Feb 1-7, 2011 Previous week: 661 cfs

Begin Date & Time	Day of the Week	Day of Pulse Release	S-79 Q(cfs)	S79 Actual (cfs)	S77 Release (cfs)
2/04/2011, 0700	Fri	1	900	669	180
2/05/2011, 0700	Sat	2	500	616	260
2/06/2011, 0700	Sun	3	300	371	276
2/07/2011, 0700	Mon	4	200	231	232
2/08/2011, 0700	Tue	5	200		
2/09/2011, 0700	Wed	6	0		
2/10/2011, 0700	Thu	7	0		

Algal Bloom status: Filamentous green algae observed at Franklin Locks. *Hypnea spp* on San Carlos Bay beach.





Upper Estuary Condition: Tapegrass and rhizomes no longer present at Old Bridge Road. Sampling at Beautiful island reveal abundant Wedge clams *(Rangia cuneata*) and Carolina marsh clams *(Polymesoda caroliniana*) *Rangia* is commonly used as a salinity indicator. Previous abundance of these clams downstream at Old Bridge Road is no longer observed.

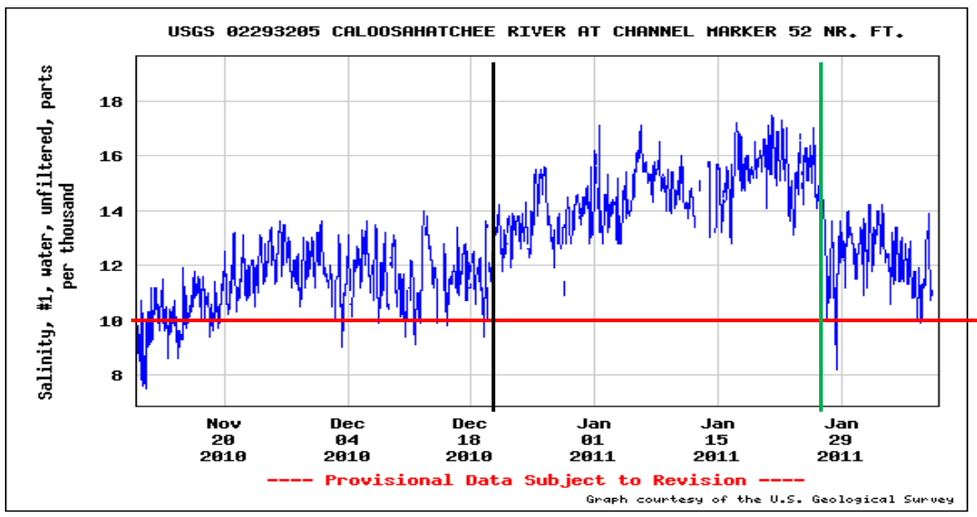
Lower Estuary Condition: Fair. Scattered macroalgae in San Carlos Bay and along the Sanibel Causeway. Water quality indicators at J.N. "Ding" Darling NWR have stabilized over the past two weeks.

Request: Thank you for the pulse releases. These releases, following the significant rainfall the preceding week, had the effect of extending the scope and duration of lower salinities in the upper estuary. We ask that minimal base flow releases continue with 300 cfs pulse release.

Rationale: Increasing salinity in the Caloosahatchee has caused the loss of 2010 tapegrass cover that extended west of the Caloosahatchee bridge at US 41. Last week's release on top of the rain reduced salinities that were creeping higher and moving eastward toward the lock. The clear benefit of these releases is in preventing additional loss of remaining tapegrass and clam habitat. Lake O levels remain stable, currently at the same level as it was December 28, 2010 and the short term forecast for rain later in the week magnifies the benefit of these releases. A continuing low level base flow release is needed to help maintain a salinity wedge below Franklin Locks and prevent stagnation of the pooled basins.

Detail

Releases the past week, augmented by the rainfall helped drop salinity significantly to early December levels, to the right of the green line**.**



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Deb Drumm, Susan Gray

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson PhD- Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: March 2, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 12.16 Beneficial Use Sub band Previous week: 12.28
Water shortage management band = 11.86

Rainfall: **Additional flow into lake from 3/1/11 rain event = 3,705 cfs**

Salinity Ft Myers: 11- 15.75 ppt/psu **surface** data USGS sonde @ Marker 52
14 – 18 ppt/psu **mid depth** data SCCF RECON sensor @ Marker 52
Previous week: surface 10 - 14.5 ppt/psu
mid depth 14.75-18 ppt/psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers = 10 ppt/psu 30 day moving average = 12.12 psu
Above 10 ppt/psu (30 day moving average) since 11/21/10 = 100 days

Olga Water Treatment Plant Chloride: 80 ppm Previous week: 79 ppm

Salinity Shell Point: 25 - 34 ppt/psu RECON sensor Previous week: 25 - 33 ppt/psu

Recommendation: Releases have maintained flow in the western pool and a salinity gradient in the upper estuary with minimal impact on the Lake. We request minimal base flow releases continue with a minimum 300 cfs pulse release to maintain suitable salinities for the tapegrass and fishery reproduction period in March. To help achieve minimal base flows of 300 cfs we ask the Corps to consider tapping water from the east and west pools of the upper Caloosahatchee in combination with water from the lake.

Benefits from Releases: Releases to the Caloosahatchee are needed to provide water for two objectives:

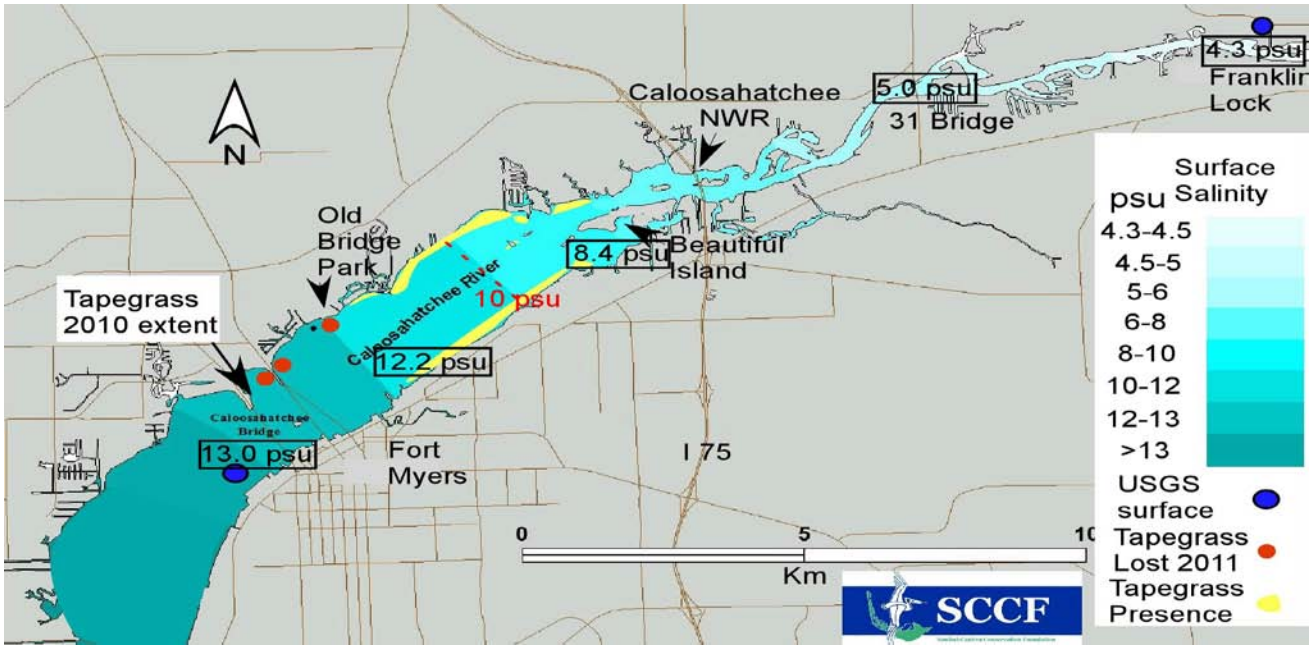
1. To keep a salinity mixing zone in the areas where there is tapegrass a habitat that commercially important species depend upon.

2. To provide flow to keep the Franklin-Ortona pool from stagnating and producing toxic bluegreen algal blooms that cause the Olga Water Treatment Plant to be shut down and has posted as unsafe for fishing and swimming by the Health Dept.

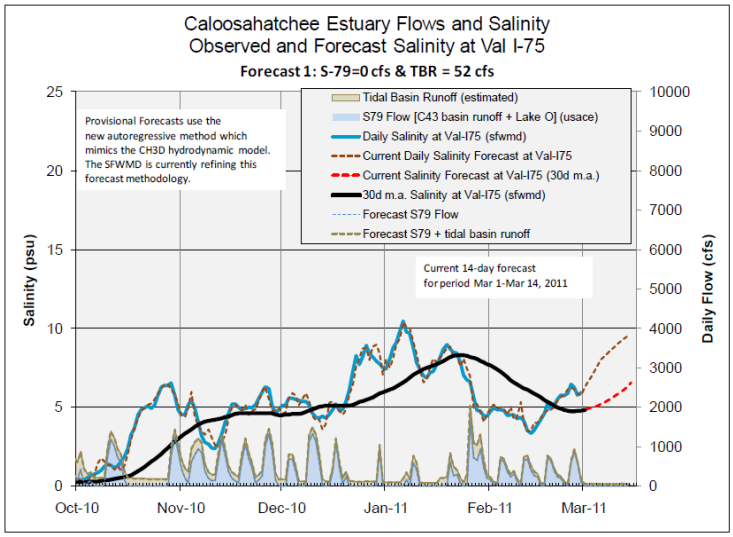
Recent base flow releases have resulted in maintaining salinity in the critical reach of the river, although salinities are slowly increasing upstream indicating that 300 is not sufficient to hold salinities in the absence of any rainfall. Maintaining a salinity wedge at the current location is needed to provide conditions suitable for the upcoming reproductive period for bay anchovy, silver perch, redfish, snook, crabs, shrimp and tapegrass. **A continuing low level base flow release is needed to help maintain this mixing zone near Beautiful Island downstream of S79 and prevent algal blooms above S79**. **We suggest the Corps consider providing base flows by drawing water from a combination of the Lake, east and west pools. The 8-9 ft head at S78 holds a significant volume of water that can be tapped as an additional source of water that will also provide flow through the west basin to limit stagnation.**

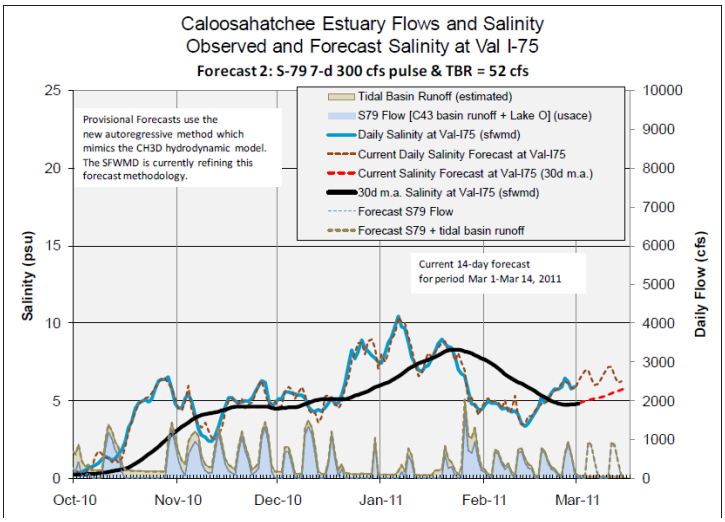
Flow: Published schedule @S79: 300 cfs *** From ACOE Website Daily Reports**

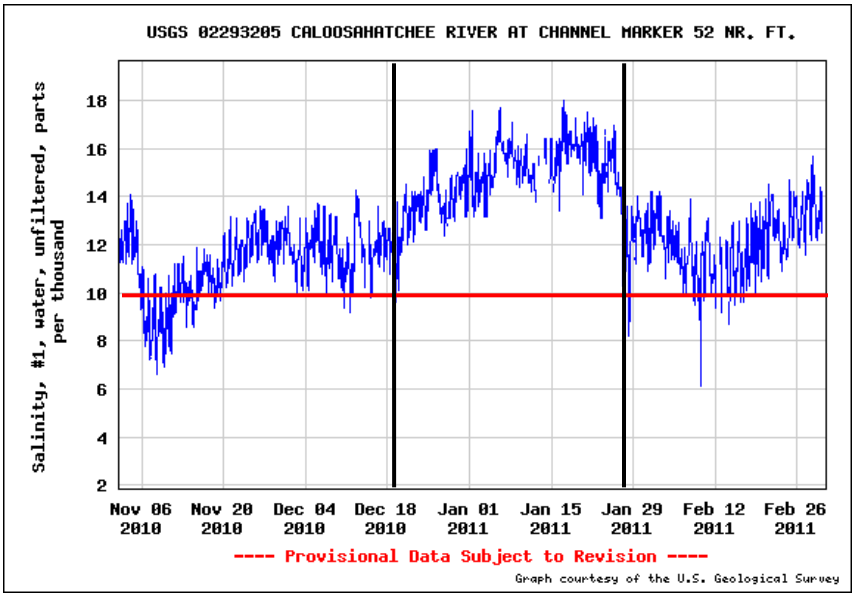
Begin Date & Time	Day of the Week	Day of Pulse Release	S-79 Q(cfs)	S79 Flow * (cfs)	S77 Release * (cfs)
2/25/2011, 0700	Fri	1	900	593	622
2/26/2011, 0700	Sat	2	800	877	962
2/27/2011, 0700	Sun	3	400	548	867
2/28/2011, 0700	Mon	4	0	101	409
3/01/2011, 0700	Tue	5	0		
3/02/2011, 0700	Wed	6	0		
3/03/2011, 0700	Thu	7	0		



Detail: Salinity this week trending higher with sampled salinities indicated in boxes in the graphic above, in a similar pattern to when releases were stopped on December 15, 2010. **Samples on 2/27 recorded salinity of 8.4 at Beautiful Island and 4.3 psu/ppt at the Franklin Lock.** Releases have helped drop salinity significantly and need to be continued**.** SFWMD projections show minimum 300 cfs are needed to keep salinity from rising sharply and additional water would be needed to drop salinity levels at I75. **At a minimum 300 cfs is needed to prevent salinity from rising significantly.**







Upper Estuary Condition: At 31 Bridge Sunday,2/27 chlorophyll a was 11.8 ug/l (elevated) caused by blooms of chain forming diatoms, *Skeletonema* and C*haetoceros*, several types of flagellates including *Gymnodinium* and the ciliate *Mesodinium*.

Lower Estuary Condition: Fair. Several varieties of attached algae on turtle grass in the San Carlos Bay.

Algal bloom status: *Cladophora* algae expanding at S79,Franklin Locks. Algae bloom remains around SR 31, along the north side of the river. Algae reported at Yacht Club Colony just west of Beautiful Island on the north shore.

Yacht Club Colony - February 28,2011

S79 WP Franklin Locks - February 27, 2011

MEMORANDUM

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Subject: Caloosahatchee & Estuary Condition Report

Date: March 8, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 11.97 Beneficial Use Sub band Previous week: 12.16
Water shortage management band = 11.82

Rainfall: None.

Salinity Ft Myers: **11.75 – 17. 5** ppt/psu **surface** data USGS sonde @ Marker 52
13 - 19 ppt/psu **mid depth** data SCCF RECON sensor @ Marker 52
Previous week: surface 11- 15.75 ppt/psu
mid depth 14 – 18 ppt/psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers = 10 ppt/psu 30 day moving average = 12.57 psu
Above 10 ppt/psu (30 day moving average) since 11/21/10 = 107 days

Olga Water Treatment Plant Chloride: 87 ppm Previous week: 80 ppm

Salinity Shell Point: 27 - 34 ppt/psu RECON sensor Previous week: 25 - 34 ppt/psu

Recommendation: Releases have maintained flow through the western/Franklin pool reducing the potential for stagnation and phytoplankton blooms and maintaining a salinity gradient in the upper estuary with minimal impact on the Lake. We request pulse releases continue with a minimum of 300 cfs to maintain low salinity zone (LSZ) habitat that is critical for estuarine-resident and estuarine-dependent fisheries reproduction currently underway.

Benefits from Releases: Releases to the Caloosahatchee are needed to provide water for two primary objectives:

1. To maintain a salinity gradient downstream of the S-79 water control structure to **maintain LSZ** (0.5–6 psu) habitat for larval fishes, which is critical during spring and summer peak reproductive periods.

2. To **reduce stagnation** in the Franklin pool which often results in bluegreen algal blooms that cause the Olga Water Treatment Plant to be shut down. In the past, blue-green algae blooms have resulted in the area being posted as unsafe for fishing and swimming by the Lee County Health Dept.

Maintain LSZ: Recent pulse releases have helped maintain LSZ habitat in upper estuary, which is critical for reproduction and survival of economically important fishery species including bay anchovy, drum, silver perch, redfish, snook, crabs, shrimp and tapegrass. Ichthyoplankton (eggs and larvae of fishes) are sensitive to changes in freshwater inflow and often depend on LSZ habitat during their early-life stages (preflexion and flexion larval stages), therefore, maintaining a gradient downstream of S-79 is critical for their growth and survival. In the Caloosahatchee, LSZ habitat changes as a function of flow. Habitat for larval fishes is compressed as flows are reduced due to changes in river geomorphology and placement of the S-79 structure. During low-flow periods the LSZ is truncated by S-79 compressing habitat volume and extent, increasing overlap between ichthyoplankton and gelatinous predators resulting in more

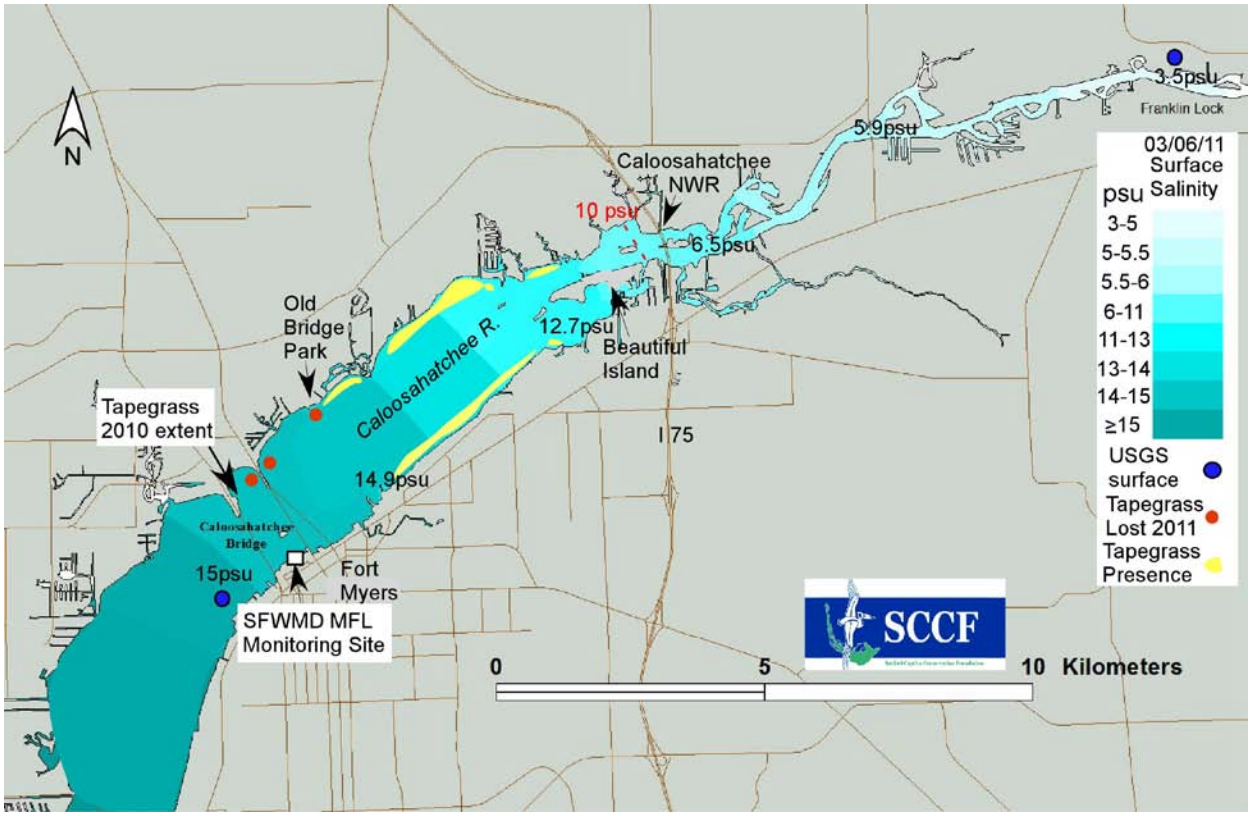
competition for prey resources and/or direct predation on larval fishes. Because some estuarine species, such as anchovies, grow relatively quickly and only spend a short period of time (i.e., days or weeks) in the pre-flexion and flexion stages, maintaining the LSZ downstream of S-79 is critical to ensure their growth and survival to postlarval stages where they can more effectively modulate their position in the water column and avoid predation.

Protected Species: Rising and sustained high salinity from current levels creates adverse conditions for Federally Endangered species including juvenile smalltooth sawfish and Florida manatee. Loss of tapegrass in current aggregation areas within the estuary requires manatees to travel further to find fresh water for drinking and submerged aquatic vegetation for food which causes greater vulnerability to boat collisions.

Reduce Stagnation: Current pulses have provided flow that has effectively reduced stratification in the Franklin pool and helped mitigate potential blue-green algae blooms near the Olga WTP.

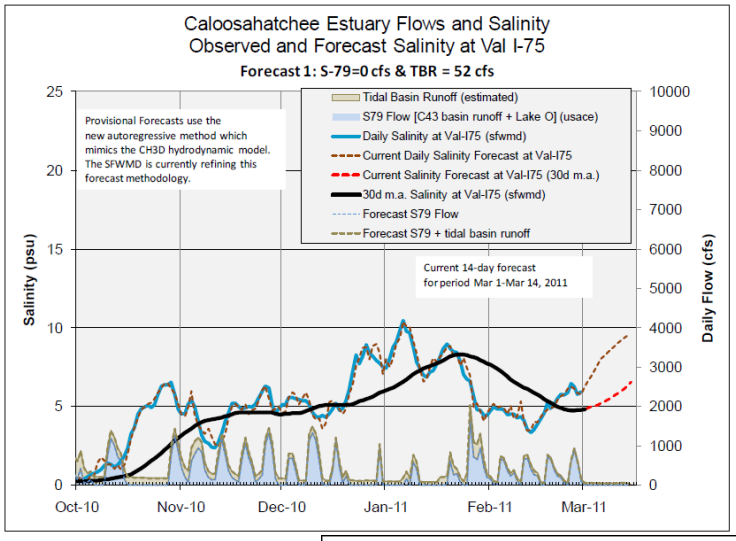
Flow: Published schedule @S79: 300 cfs *** From ACOE Website Daily Reports**

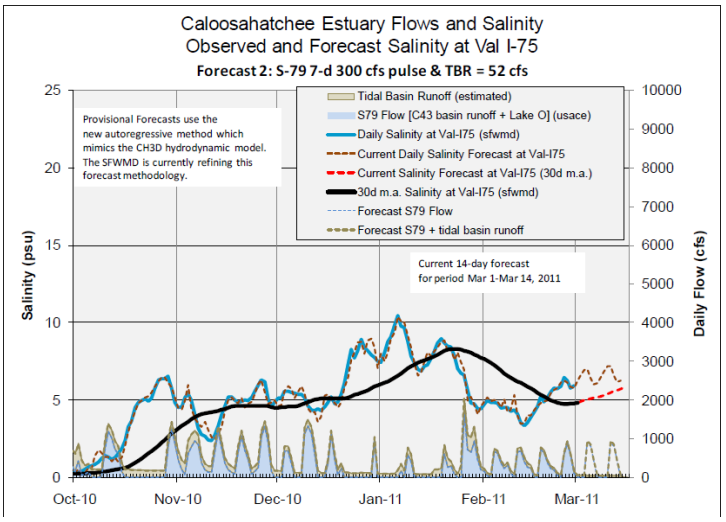
Begin Date & Time	Day of the Week	Day of Pulse Release	S-79 Q (cfs)	S79 Flow * (cfs)	S78 Flow * (cfs)	S77 Flow * (cfs)
3/04/2011, 1300	Fri	1	900	378	320	278
3/05/2011, 1300	Sat	2	800	828	616	938
3/06/2011, 1300	Sun	3	400	571	453	860
3/07/2011, 1300	Mon	4	0	162	95	240
3/08/2011, 1300	Tue	5	0			
3/09/2011, 1300	Wed	6	0			
3/10/2011, 1300	Thu	7	0			

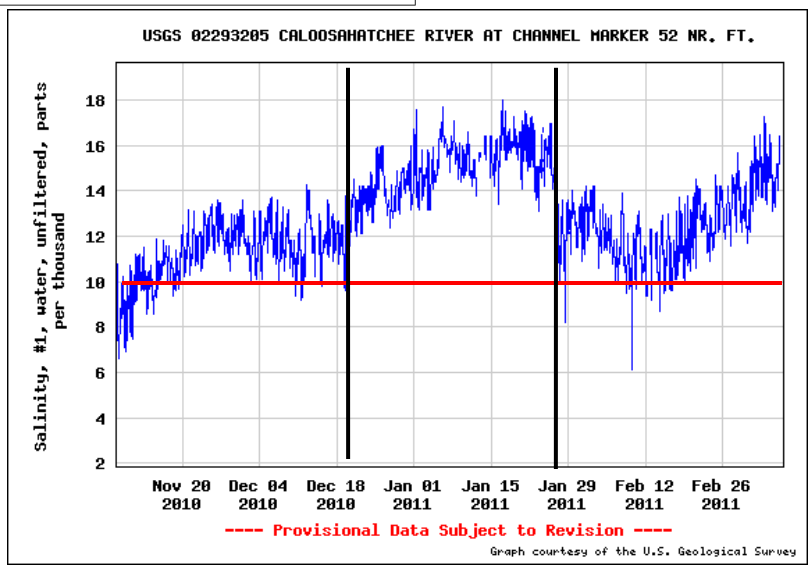


Detail: Salinity this week is significantly higher with samples on 3/6/11 indicating the **10 psu profile has moved 4 km upstream to the I75 bridge since last week.** Salinity at Beautiful Island is 12.7 psu, 5.9 psu at SR 31 and 3.5 psu at the Franklin Lock. Sampled salinities are indicated in boxes in the graphic above. As conditions have become drier, SFWMD salinity projections, below, are not tracking actual measured conditions as well as previous projections did. The

projections show minimum 300 cfs are needed to keep salinity from rising sharply relative to 5 psu at I75. Measured salinity this week is already 10 psu at I75 and the 5 psu profile is over 5 km upstream. Additional water would be needed to drop salinity levels at I75.







Upper Estuary Condition: Salinities are reaching mid January (no release) levels at Ft Myers and increasing upstream. Expanding blooms of filamentous green algae and *Cladophora* observed from SR 31 to S79.

Lower Estuary Condition: FGCU data indicates current salinities in the lower estuary are at the high end for oysters. Recent juvenile oyster survival data from open and closed bags, indicates most of the oysters in open bags did not survive due to predation, which increases with salinity. The preferred salinity range for oysters in the lower Caloosahatchee in the dry season is 20-30 psu.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Carol Wehle, Ken Ammon, Deb Drumm, Susan Gray
DEP Secretary Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. - Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: April 5, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 11.61' **Beneficial Use Sub band** Previous week: 11.52'
Water shortage management band = 11.60'

Rainfall: WP Franklin 1.81", Ortona 0.21", Moore Haven 0.20"

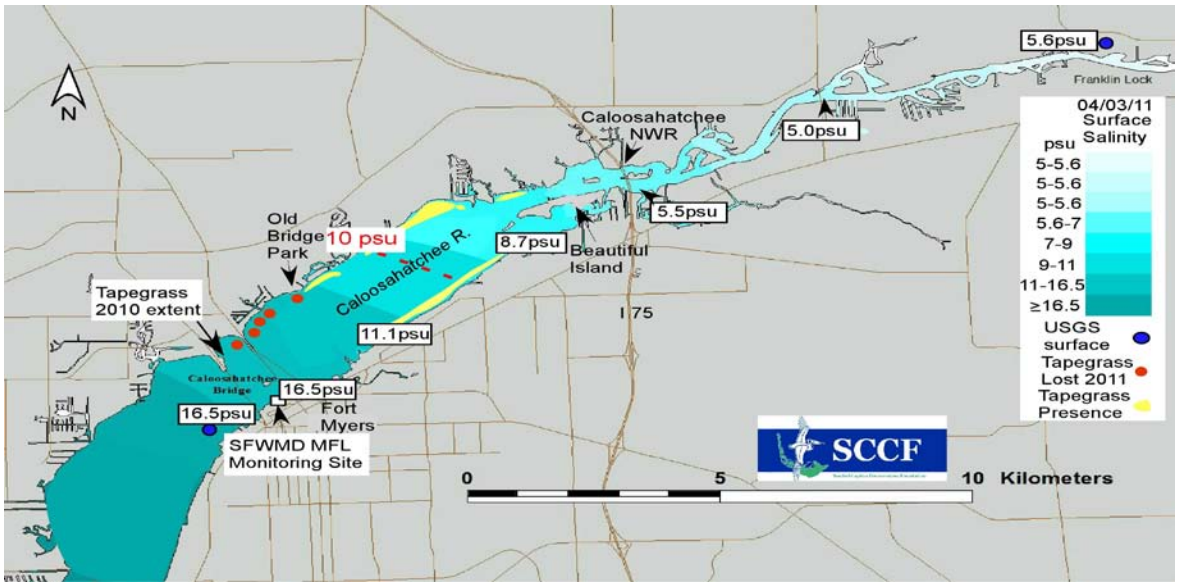
Salinity Ft. Myers: **14.0 - 17.5** ppt/psu **surface** data USGS Marker 52 Previous wk: **15.6 – 19.3** psu
15.0 - 19.0 ppt/psu **mid depth** data SCCF RECON Marker 52 **16.0 - 19.7** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 15.81 psu surface (**Violation**) 18.31 psu bottom
Above10 ppt/psu (30-day) since 11/21/10 = **135 days**

Olga Water Treatment Plant Chloride: 96 ppm Previous week: 105 ppm

Salinity Shell Point: 26.0 – 34.0 ppt/psu RECON sensor Previous week: 26.7 – 34.0 ppt/psu

Recommendation: Minimal base flows of freshwater are needed to retain low salinity habitat in the upper estuary, downstream of the WP Franklin Lock. In the past week rain in the basin supplied an average 684 cfs which pushed the 10 psu line downstream ±10 kilometers, demonstrating the magnitude of water needed to reduce salinities in the dry season. We request pulse releases of 300 cfs be resumed to extend the benefit from recent rain and slow the rate of salinity rise throughout the system.



Flow: * From ACOE Website Daily Reports ** Flow entirely from Rainfall

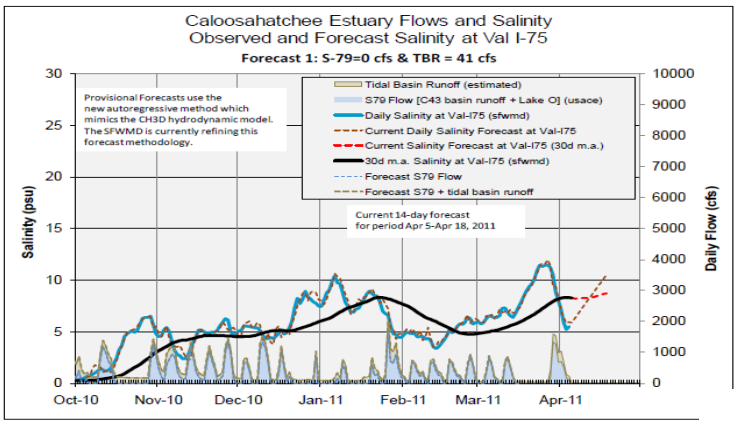
Date & Time	Day	S-79 Q (cfs)	S79 Flow * (cfs)	S78 Flow * (cfs)	S77 Flow * (cfs)
3/29/2011, 2400	Tue	0	1329	NR	0
3/30/2011, 2400	Wed	0	1267	496	0
3/31/2011, 2400	Thu	0	680	227	0
4/1/2011, 2400	Fri	0	708	279	0
4/2/2011, 2400	Sat	0	526	208	0
4/3/2011, 2400	Sun	0	165	0	0
4/4/2011, 2400	Mon	0	118	0	0

Rain in the past week supplied a total of 4,793 cfs, an average of 684 cfs, with all water coming from the basin. There has been no flow from Lake O since March 6. The rain pressed the 10 psu salinity zone downstream approximately ± 10 kilometers. This kept the high salinity zone from compressing against the S79 structure. Prior to this rain the lack of flow caused the salinity in the upper estuary to rise precipitously moving the salinity zone to within 6 kilometers of S79. Resuming minimal base flow releases will help moderate the rate of rise and geographic extent of the salinity zone from compressing remaining freshwater habitat that currently spawning species depend upon.

Upper Estuary Condition: Rain provided relief from rising salinity compressing the low salinity zone against the S79 structure. Blooms of the green algae *Cladophera* remain along the shorelines at the S79 structure.

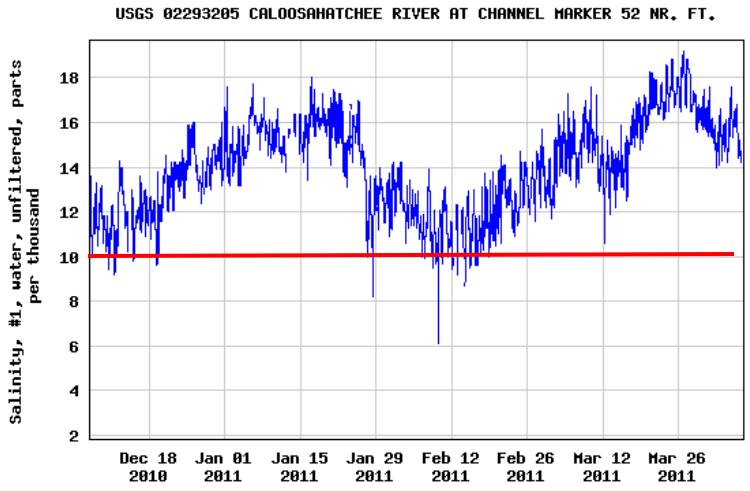
Lower Estuary Condition: Scattered macro algae is present at Bunche Beach and the Iona area at the mouth of the river causing high odor conditions. Current salinities in the lower estuary are above the desired range for oyster productivity, growth, larval recruitment and spawning. The dry season salinity range should be maintained below 25 psu. Mean *Perkinsus marinus* infection prevalence (85.38%) and intensity (1.48) remain high due to high salinities in the estuary. Reproduction and recruitment of oysters is in process. Predation of juvenile oysters remains very high. Freshwater inflow moderates salinities resulting in lower disease prevalence and intensity and higher juvenile oyster survival.

Provisional Val I-75 Salinity Forecast for April 5– Apr 18, 2011 - Created on April 5, 2011



The SFWMD forecast model graph for April 5 – April 18, 2011, at left, reflects the steep rate of salinity increase (brown dotted line) resulting from lack of freshwater flow through S79.

The USGS salinity graph, below, reflects current salinity levels that mirror those from January when flows were cut off. The affect of recent rains that provided an average of 684 cfs over the past week show the significant beneficial effect of freshwater flows.



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Tommy Stroud, Ken Ammon, Deb Drumm, Susan Gray, DEP Herschel Vinyard, Melissa Meeker

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Subject: Caloosahatchee & Estuary Condition Report

Date: May 3, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level**:** **10.89'** - Water Shortage Management Band Previous wk: 11.10' Beneficial Use Subband Water shortage management band **= 10.92'**

Weekly Rainfall: WP Franklin 0.21", Ortona 0.64", Moore Haven 1.28"

Salinity Ft. Myers: **17 – 21** psu **surface** data SCCF sonde Ft Myers Yacht Basin Previous week **15 – 19.5**

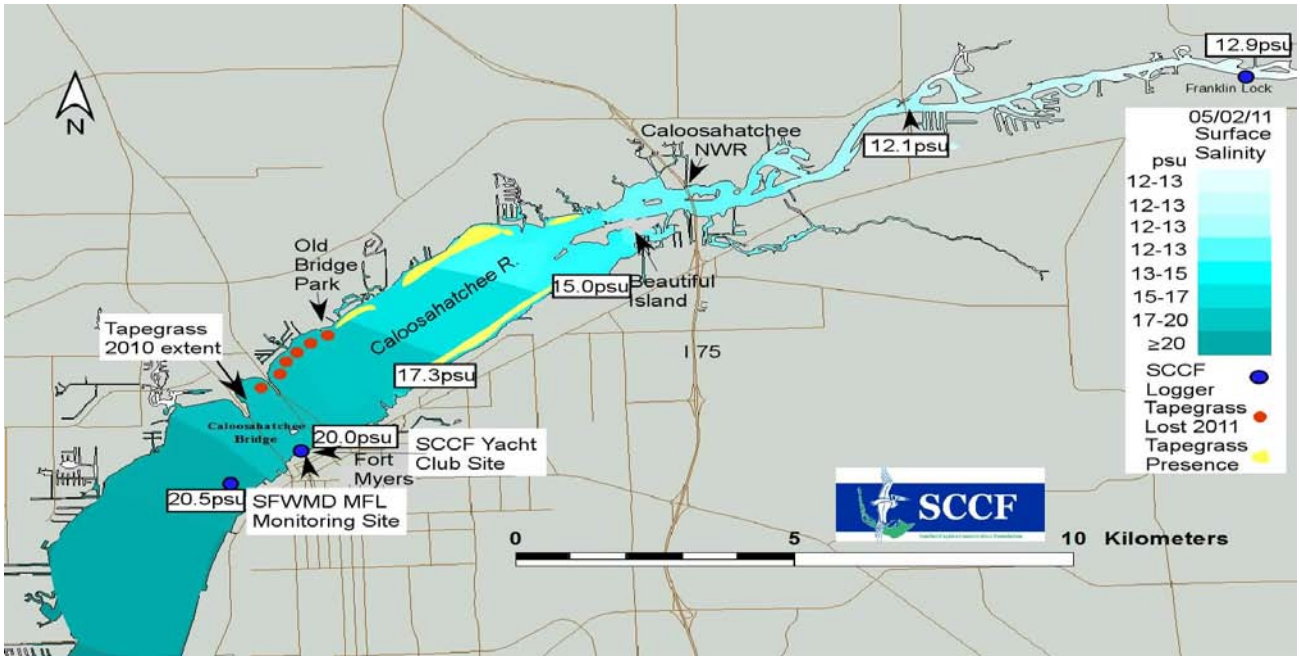
18 - 23.7 psu **mid depth** data SCCF RECON Marker 52 Previous week **17.5- 24** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 ppt/psu (30-day) since 11/21/10 = **163 days**
MFL Violation 1 day at 20 psu
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 16.8 psu surface (**Violation**)

Olga Water Treatment Plant Chloride: 162 ppm Previous week: 122 ppm

Salinity Shell Point: 29.5 – 34.5 psu RECON sensor Previous week: 29.7 – 35.0 psu

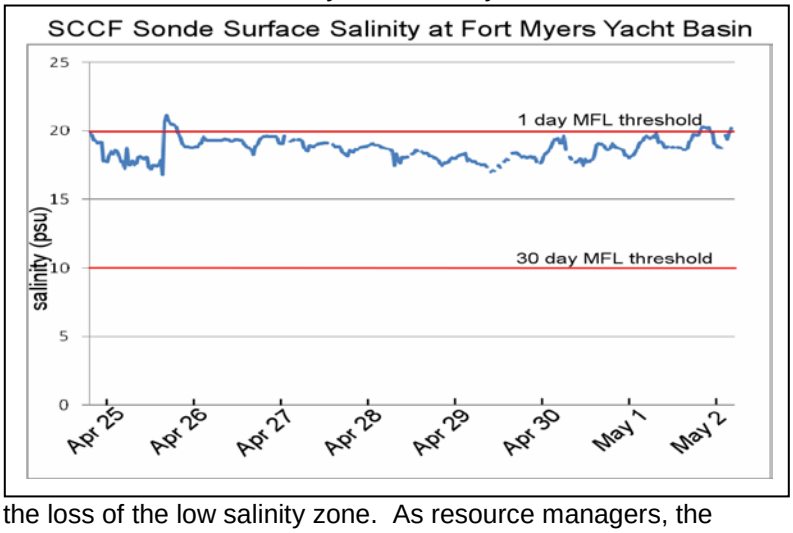
Recommendation: Salinity in the estuary and at the S79 structure continues to rise with no freshwater flow from the Lake. We request pulse releases of 300 cfs be resumed to restore low salinity zone habitat and improve water quality conditions within the estuary for spawning fish, crabs, shrimp and shellfish.



Flow: *** From ACOE Website Daily Reports**

Date	Day	S-79 Q (cfs)	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
4/26/2011	Tue	0	0	156	313
4/27/2011	Wed	0	0	149	-76
4/28/2011	Thu	0	0	149	-220
4/29/2011	Fri	0	0	148	164
4/30/2011	Sat	0	0	151	88
5/1/2011	Sun	0	0	149	-220
5/2/2011	Mon	0	0	40	-64

The estuary has not received any flow from the Lake over the past 9 weeks, since flow was cut off on March 6th. However, water has been continuously discharged from the lake for agricultural water supply the past 25 days. Very little, widely scattered rainfall fell in the basin the past week. Extremely dry conditions absorbed rainfall resulting in no net runoff. Chlorides above S79 rose 40 ppm in the past week. Salinities continued to rise in the estuary in the past week and at the S79 structure, eliminating the low salinity zone entirely.



Salinity at Fort Myers has reached the one day MFL threshold of 20 psu. Salinites continue to rise at Beautiful Island/ I-75 with salinity at 15.0 psu downstream of the Orange River inflow. Salinity at SR 31 is 12.1 psu and 12.9 psu at the S79 structure. Without flow, salinities above 20 psu are expected at the S-79 structure resulting in the total loss of both the oligohaline and mesohaline zones.

Releases between now and the end of the dry season would require just one inch of water off the lake and would protect some freshwater habitat at this critical spawning period. Recovery of freshwater habitat takes multiple years to recover once lost. This actual loss can be abated by resuming freshwater flows. The system is no longer functioning as an estuary without freshwater flows and the loss of the low salinity zone. As resource managers, the failure to protect the estuary as a natural system is a violation of the public trust and our agencies' missions.

Upstream of S79/Franklin Pool Condition: Deteriorating. Above the S79 Lock chlorophyll is elevated measuring 14ug/l. Phytoplankton samples indicate predominantly green filamentous algae, some dinoflagellates including *Prorocentrum*, and clumps of *Microcystis*.

Upper Estuary Condition: Very Poor. Complete loss of low salinity zone habitat for larval finfish and shellfish currently spawning. Extensive dinoflaggelate bloom in the estuary, Note brown discoloration on photo taken Monday May 2,2011.


Caloosahatchee diatom bloom 5/2/11 Looking West to Ft Myers/Cape Coral. *Photo: Don Doggett*

Lower Estuary Condition: Poor: Elevated Chlorophyll 17 ug/l measured at Tarpon Point Pier with dense phytoplankton bloom extending upstream to S 79.

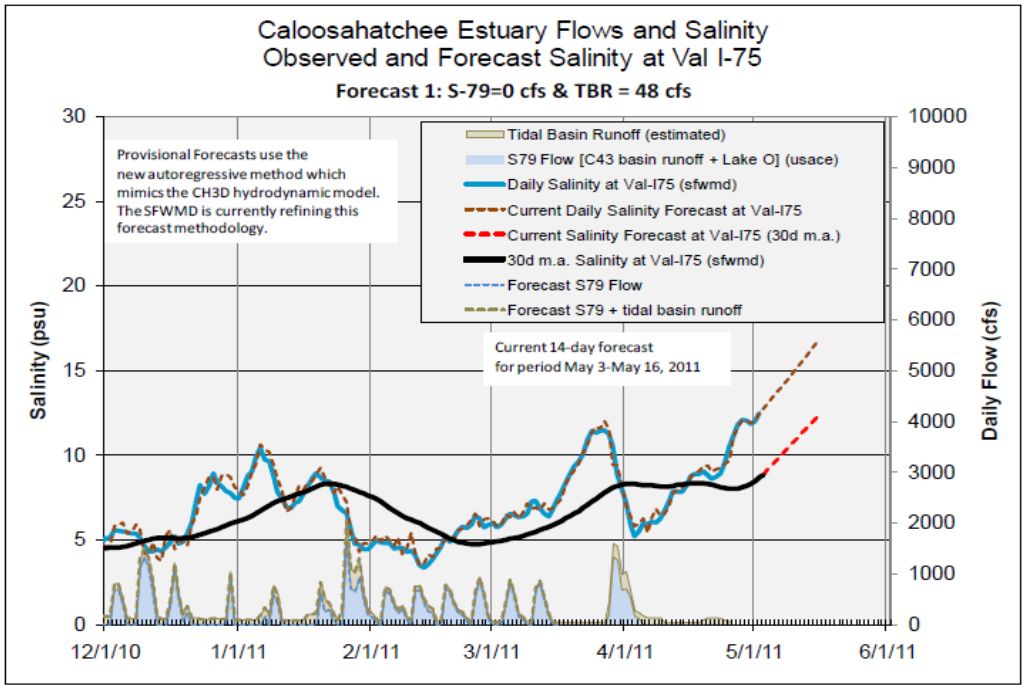
Oysters: Salinities of 30-35 remain well above the desired range for eastern oyster productivity, growth, larval recruitment and spawning. The desired dry season salinity range is below 25 psu. Disease prevalence is between 60 – 100%; Parasite intensity between 0.8 – 1.3; **Survival of juvenile oysters in open cages is poor** given predation as a result of high salinities. Freshwater releases are needed to moderate salinities, lower disease prevalence and intensity and improve oyster survival.

Wading birds: Rookery islands in the river and in Matlacha Pass are currently active with various stages of incubating birds, chicks and fledglings. The success of these rookeries is dependent on easily accessible food sources provided by the shellfish and bait fish species of the area. Loss of these important food chain links can have significant negative impacts on the reproductive potential of the local wading bird population.

Manatee Report: A dead manatee was found on Sanibel May 2nd. It was a young animal estimated to be 200 lbs. Initial assessment from FWC staff was the death was most likely caused by latent effects of cold-stress. Young animals are more susceptible to cold stress impacts, which can be exacerbated by prolonged foraging periods outside of warm water refugia during winter. Loss of tapegrass beds directly impacts foraging distances of manatees found in the Caloosahatchee River. FWC will perform a necropsy to confirm cause of death.

SFWMD Salinity Forecast:

Provisional Val I-75 Salinity Forecast for May 3 – May 16, 2011 - Created on May 3, 2011



The original objective of the SFWMD forecast model was to provide salinity predictions under varying flow volumes to achieve 5 psu or less at I-75. This was to help understand the consequences of alternative release volumes to inform the decision making process. This projection for May 2-16, 2011, projects only the conditions without flow. We request additional graphs be produced to reflect the impact of 300 cfs release. This information is critical to understanding the relationships between flow and salinity.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: June 6, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: **Immediate action requested.** The Caloosahatchee and Lake Okeechobee are in crisis. Toxic algal blooms in the Caloosahatchee have caused the Lee County Health Department to post warnings against swimming, drinking and fish consumption. Low water levels in the lake have caused the loss of snail kite nests and submerged aquatic vegetation. Despite these life threatening conditions the SFWMD continues to install and operate forward pumps to deliver an additional 1" of water out of the lake per week to permitted users. **We request the Corps and the SFWMD immediately stop the installation and use of the forward pumps and re-evaluate their operations to prevent further degradation of the natural systems of the Okeechobee Waterway.**

Lake Okeechobee Level**: 9.86'** (Water Shortage Management Band) Previous wk: **10.14'** (Water Shortage)

Weekly Rainfall: WP Franklin 0", Ortona 0", Moore Haven 0"

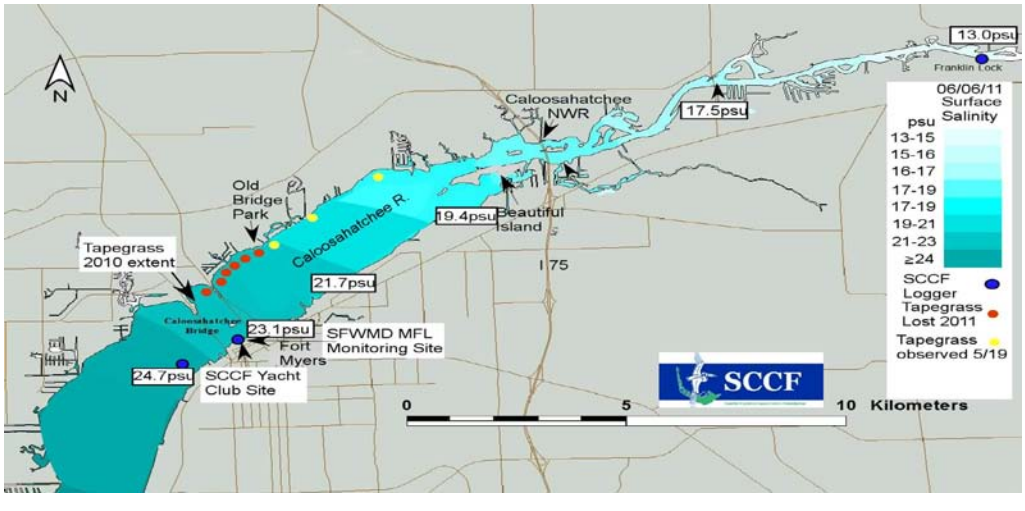
Salinity Ft. Myers: **21 – 23** psu **surface** data (SCCF sonde Ft Myers Yacht Basin) Previous wk: 20– 22 psu

22-26.2 psu **mid depth** (SCCF RECON Marker 52) Previous week: **21 – 24.7** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day) since 11/21/10 = **198 days**
Above 20 psu (1 day) since 5/9/11 = **28 days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average > 19.3 psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **High Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: 32 – 36 psu (SCCF RECON sensor) Previous week: 31.7 – 36 psu



Flow: *** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
5/31/11	Tue	0	100	312
6/1/11	Wed	0	98	284
6/2/11	Thu	0	99	508
6/3/11	Fri	0	NR	140
6/4/11	Sat	0	100	128
6/5/11	Sun	0	100	-1
6/6/11	Mon	0	98	172

The estuary has not received any freshwater inflow from the Lake for the past 13 weeks, since flow was cut off on March 6th. However, water has been continuously discharged from the Lake for agricultural water supply at levels significantly above lake inflows.

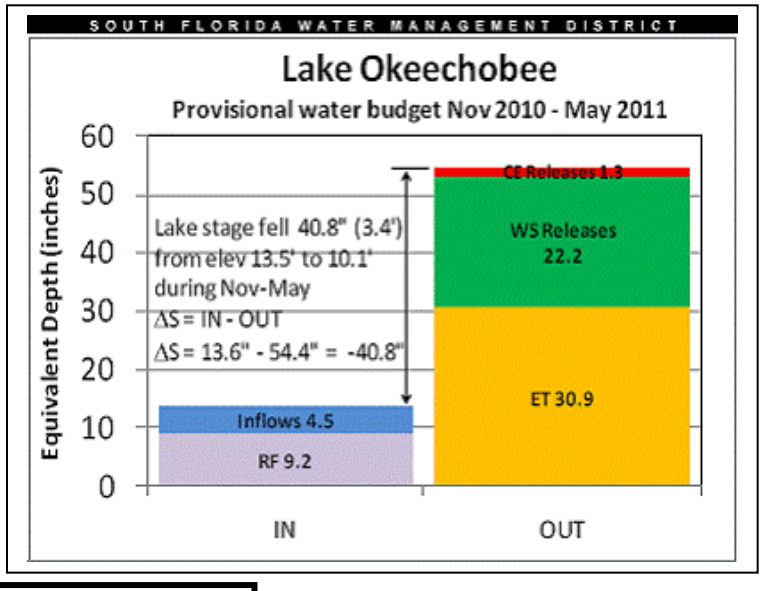
This past week **water was discharged out of the lake at a rate 46 times the inflow into the lake.**

Inflow = 78 cfs; Outflow = 3653* cfs

(* No Report from S84, S71 & C5)

Salinities increased over the past week to 19.4 psu at Beautiful Island/ I-75 and 17.5 psu at SR 31 and 13 psu west of the S79 structure. Salinity at Fort Myers continues to exceed the1-day MFL threshold of 20 psu with readings greater than 21 psu. Chlorophyll measurements were elevated throughout the river and estuary.

As shown in the SFWMD chart at right, water deliveries out of Lake O from November 2010 - May 2011 provided nearly **two feet** of water to permitted users (green bar) while the Caloosahatchee received only **one inch** (red bar) resulting in habitat losses and water quality degradation from lack of water**.** This condition, which occurs each drought, could have been avoided with discharges amounting to just one inch per month of water off Lake Okeechobee. **An additional 5 inches over the six month period could have avoided this condition**



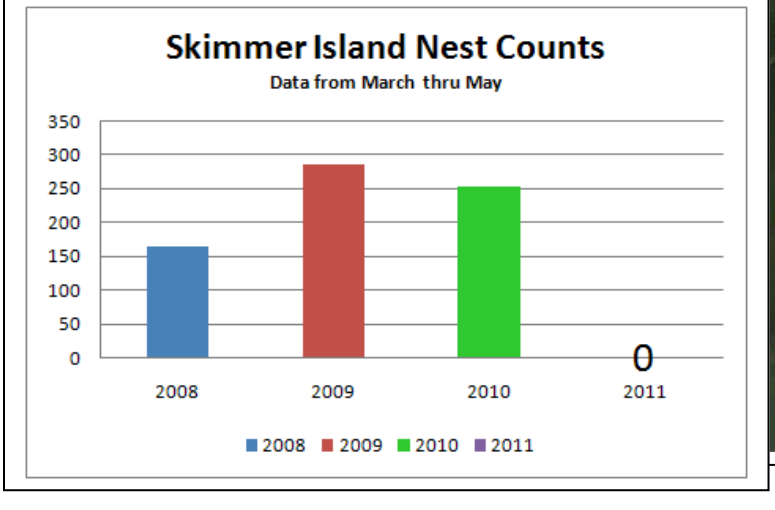
Upstream of S-79/Franklin Pool Condition: Grave. Posted Health Alert. Miles of toxic blue-green algae species *Anabaena circinalis*, and *Aphanizomenon* sp. are blooming causing the Health Dept to post warnings to avoid contact with the river and fish from the river. The odor is overwhelming.

Upper Estuary Condition: Very Poor. Chlorophyll levels ranged from 10 µg/l at Franklin Lock to 13.2 µg/l east of Fort Myers due to a dinoflagellate bloom of *Ceratium hircus,* pictured below . High salinities all the way to the Franklin Lock have persisted for over 3 months resulting in a complete loss of low salinity zone habitat critical during spring/summer when species of finfish and shellfish are spawning.

Lower Estuary Condition: Poor.

Seagrass: High epiphytic growth on seagrass throughout the lower estuary. Conditions for grasses are also impacted by dinoflagellate blooms, impacting the health and productivity.

Nesting Birds: J.N. "Ding" Darling biologists completed the May rookery islands survey and observed no colonial nesting birds on Skimmer Island within the Matlacha Pass National Wildlife Refuge. In each of the three previous years there were over 200 nests observed in, see Table below. Even more unusual was the absence of colonial birds using the island for resting/roosting. This is another indication that conditions adjacent to the island may not be supportive of seasonal colonial bird use this spring. Refuge personnel will survey again in mid-June. The island is approximately 1 mile west of the Caloosahatchee River in San Carlos Bay



Oysters: Extremely high salinities, up to 36 psu, remain detrimental to oyster productivity, growth, larval recruitment and spawning. Disease prevalence and predation are high.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 5 July, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Harmful algal blooms distributed through the freshwater portion of the Caloosahatchee continue to necessitate Health Department warnings against swimming and fish consumption in Lee, Hendry and Glades Counties. The estuary continues to experience blooms of phytoplankton and widespread hypoxic conditions. At this time, as long as rain provides flows of 450 – 1500 cfs to the estuary through S79 no additional flow from the lake is requested. However, if flows from basin runoff fall below 450 cfs we request that the water from S78 -currently being back flowed into the lake- be allowed to flow west into the estuary.

Lake Okeechobee Level**: 9. 83'** (Water Shortage Management Band) Previous wk: **9.68'** (Water Shortage)

Weekly Rainfall: Rain volumes not available

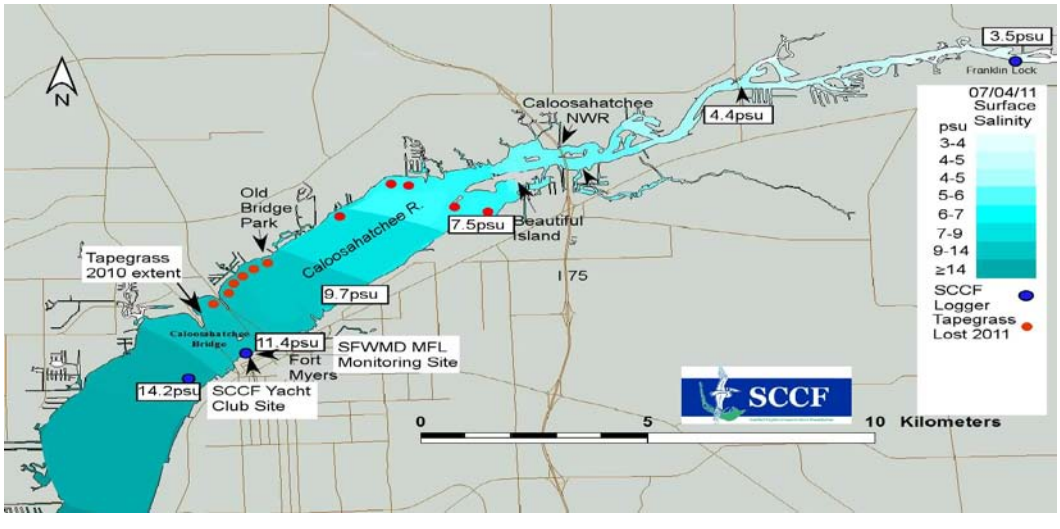
Salinity Ft. Myers: **11 – 19.7** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev wk: **15 – 24** psu

17 – 25 psu (SCCF RECON Marker 52) Previous week: **22.5 – 24.5** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day) since 11/21/10 = **226 days**
Above 20 psu (1 day) from 5/9 to 6/27/11 = **49 consecutive days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average **21.8** psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **90 ppm – Shutdown since 5/5/11 due to high TDS/Chloride levels**

Salinity Shell Point: **26.5 – 36.5 psu** (SCCF RECON sensor) Previous week: **31.9 – 36.8** psu



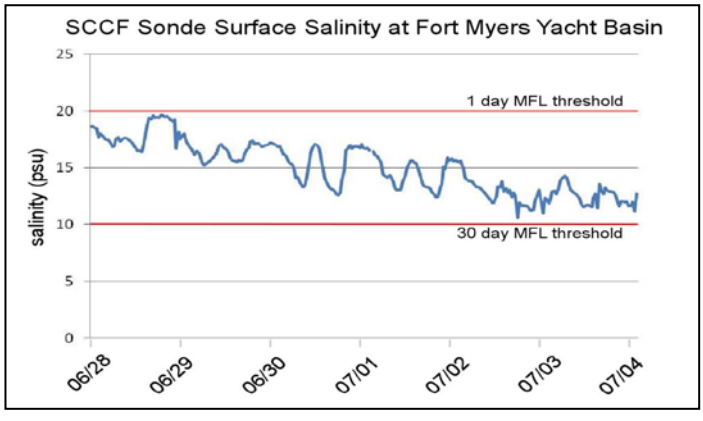
Flow: *** From ACOE Website Daily Reports**

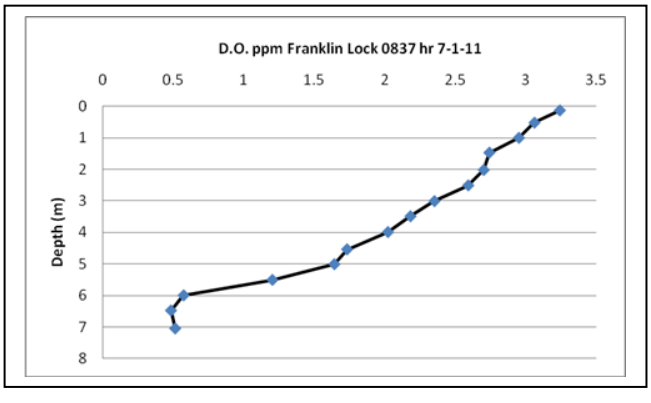
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/28/11	Tue	1719	NR	NR
6/29/11	Wed	1730	0	-1372
6/30/11	Thu	NR	NR	NR
7/1/11	Fri	1459	NR	NR
7/2/11	Sat	1422	NR	NR
7/3/11	Sun	1149	NR	NR
7/4/11	Mon	1620	NR	NR

Rains over the past week have provided flow to the Caloosahatchee, although volumes were not available due to lack of reporting from ACOE stations in the Caloosahatchee since June 30. Back-flowing from the Caloosahatchee basin into Lake Okeechobee that began June 19th - before the rains started- continued this week.

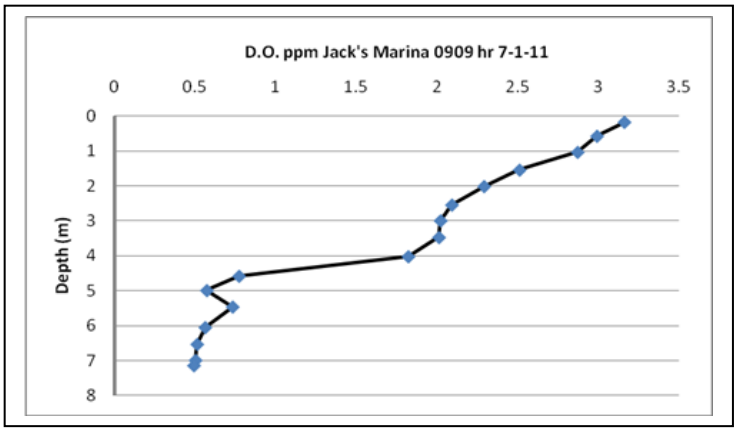
Rainfall within the basin the past week reduced salinities downstream of S-79 from 10.2 psu to 3.5 psu. Salinities at the Fort Myers Yacht Basin decreased to 11.4 psu and continue to exceed the MFL criteria for the 30-day moving average of 10 psu.

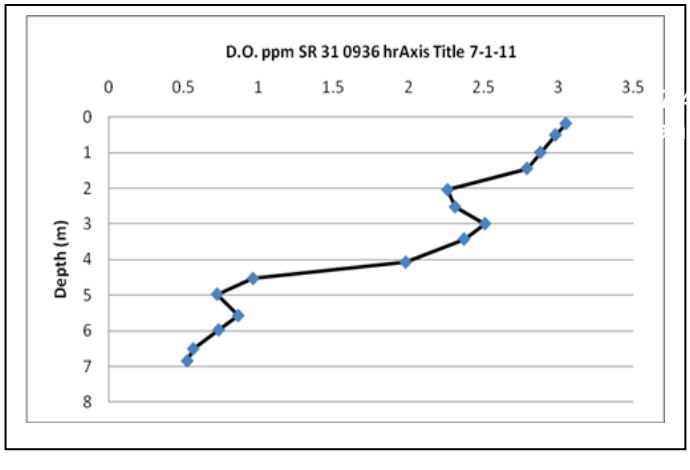
The relatively long period of no flows at S-79 has resulted in stratification and hypoxia within the upper estuary. Base flow releases during the dry season would have prevented stratification and blue green algae blooms, which are now contributing to hypoxia downstream of S-79.





Water quality data collected by the Lee County Hyacinth Control District on July 1st indicate that waters downstream of the lock are highly stratified with Dissolved oxygen (DO) levels hypoxic at the bottom and surface DO declined to half of what it was the week before. These hypoxic conditions continue downstream for miles with DO concentrations <0.50 mg/l.





Conditions: High chlorophyll from harmful algal blooms of cyanobacteria persist in the river from Alva to the SR 31 Bridge.

Upstream of S-79/Franklin Pool Condition: Very Poor: High chlorophyll from harmful algal blooms of cyanobacteria persist in the river from Alva to the Franklin Lock.

Department of Health warnings remain in place for Lee, Hendry and Glades Counties. Recent rains have dissipated the intensity of the blooms in some locations. Chlorophyll levels in Alva increased . However, the rain is washing the impacts downstream.

Upper Estuary Condition: Very Poor. Phytoplankton blooms persist in the estuary. Impacts from these blooms and from cyanobacteria being washed downstream with the rains has increased biological oxygen demand resulting in hypoxia in bottom waters downstream of S-79 to Fort Myers.

Lower Estuary Condition: Poor. Salinities in the lower estuary remain well above the preferred range for Eastern oysters (*Crassostrea virginica*), with salinities at Shell Point exceeding 30 psu despite the rain. Seagrasses throughout the lower estuary are impacted by high epiphytic loads, which negatively affect their health and productivity.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 2 August, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: The Corps reported (2 August 2011, Periodic Scientist Call) that S79 has been closed to maintain pool stages upstream; however this effectively cuts off flows to the Caloosahatchee estuary when they are needed to meet the MFL salinity targets in Fort Myers. Water continues to be back flowed from the eastern (Ortona) basin of the Caloosahatchee into Lake O to augment lake levels. We recommend that the Caloosahatchee basin water be used to provide flows to the estuary to meet its needs first before being back flowed into the Lake to avoid negatively impacting the estuary's recovery.

Lake Okeechobee Level: 10.24' (Water Shortage Management Band) Previous wk: **10.24'** (Water Shortage)
Weekly Rainfall: WP Franklin 0.00", Ortona 0.03", Moore Haven 0.80 "

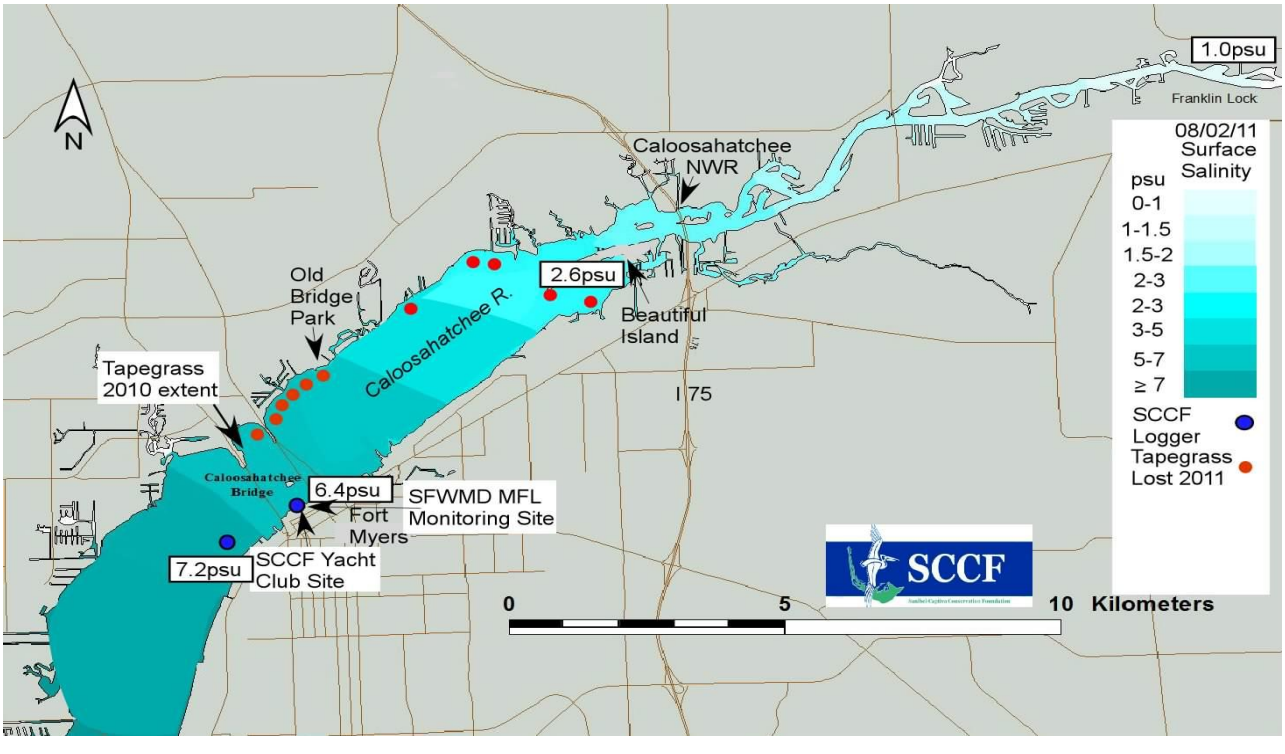
Salinity Ft. Myers: **2.6 – 7.6 psu** surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **3 - 6** psu

5 - 13 psu (SCCF RECON Marker 52) Previous week: **5.5 - 10.5** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = **7.2 < 10** psu at surface **In compliance**

Salinity Shell Point: **19.5 – 34 psu (**SCCF RECON sensor) Previous week: **17- 33 psu**

Olga Water Treatment Plant Chloride: 68 ppm – Expected to reopen August 8, 2011 Shutdown =9 weeks



Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
7/26/11	Tue	837	0	-708
727/11	Wed	486	0	-480
7/28/11	Thu	514	0	-716
7/29/11	Fri	441	0	-684
7/30/11	Sat	202	0	NR
7/31/11	Sun	401	0	NR
8/1/11	Mon	447	0	NR
Average Flow		475	Backflow	Backflow

Rainfall in the watershed over the past week provided an average flow of 475 cfs to the Caloosahatchee Estuary. Salinities at Fort Myers ranged between 2.6 and 7.6 psu. The surface salinities recorded near Iona during the past week were between 11 - 23 psu. Salinities in the lower estuary remain above the preferred range for oysters.

The Corps reported that S79 is currently closed to maintain pool stages upstream of the lock. This effectively cuts off flows to the estuary during a time when it is not receiving basin runoff as a result of dry conditions. Water continues to be back flowed from the eastern (Ortona) basin of the Caloosahatchee into Lake Okeechobee to augment lake levels. We request that basin water be used to meet the estuary's needs first to avoid further impacting the estuary's recovery.

The Lee County Health Department continues to leave the Caloosahatchee Caution Advisory in place for residents and visitors. The lack of flow supports suitable conditions for algal growth in the upper estuary. Bottom water hypoxia was present from S79 to the SR 31 Bridge. Estuary waters were generally hypoxic below 2 meters, but water at 1.6 meters was also hypoxic at one site.

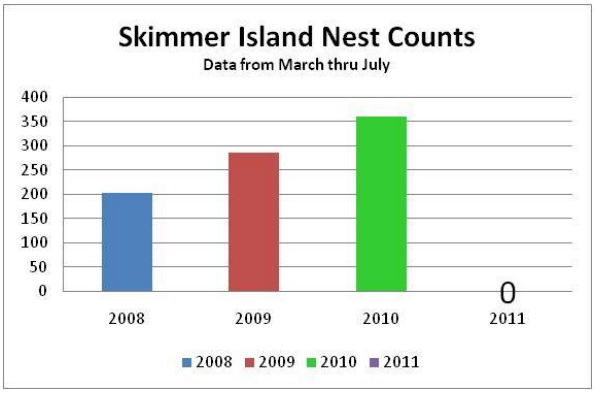
Caloosahatchee Stations	Chlorophyll (µg/l) 8/2/2011
Port LaBelle	10.3
Alva	-
Franklin East	-
Franklin West	7.4
SR 31 Bridge	-
Royal Palm Park	5.8
Tarpon Point	-
Ft Myers	21.4
Iona Peprtree Pnt	8.8

Oyster Status: The disease prevalence in oysters is still high (38-100%). With salinities trending down, oysters should start recovering from the effects of hyper-saline conditions. The condition index at present is 3.09 – 4.66, considered to be good. Early indications of recruitment are slightly below average. Data from July and August will provide a more accurate assessment of the annual recruitment.

Upstream of S79/Franklin Pool Conditions: Poor. Chlorophyll remains high upstream of the lock. With S79 closed there is little flow and no opportunity to circulate or flush the system with freshwater.

Upper Estuary Condition: Poor.
Chlorophyll levels remain high. Hypoxic conditions in the deeper portions of the river continue to slow recovery throughout the system.

Lower Estuary Condition: Fair. Salinities in the lower estuary are dropping, but hypoxia continues to be problem. Ding Darling Refuge staff completed the July rookery survey of Skimmer Island (approx 1 mile from the mouth of the river). No birds were seen nesting, although ibis were seen incubating on other islands in Matlacha Pass and Pine Island Sound.



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Terrie Bates, Susan Gray, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Date: 9 August, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Local rainfall within the Caloosahatchee watershed over the past week provided flows averaging 982 cfs to the estuary. At this time no action is requested; however, if flows at S-79 drop below the preferred range to meet the salinity targets for tapegrass in the upper estuary and oysters in the lower estuary additional flow may be needed to support recovery.

Lake Okeechobee Level: 10.28' (Water Shortage Management Band) Previous wk: **10.24'** (Water Shortage)

Weekly Rainfall: WP Franklin 2.48", Ortona 2.2", Moore Haven 2.4"

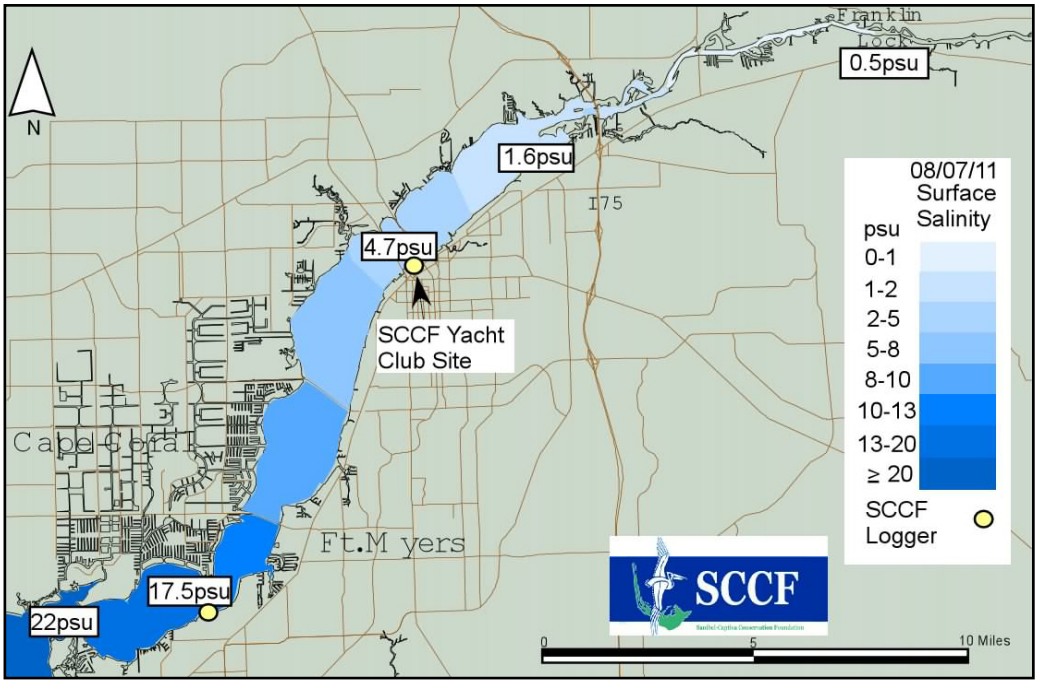
Salinity Ft. Myers: **2.5–7.6** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **2.6–7.6** psu

6–11 psu (SCCF RECON Marker 52) Previous week: **5–13** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = **6.5** psu **< 10** psu at surface **In compliance**

Salinity Shell Point: **21–33 psu (**SCCF RECON sensor) Previous week: **19.5–34 psu**

Olga Water Treatment Plant Chloride: 63 ppm – Expected to reopen August 15, 2011 Shutdown =10 weeks



Flow: * From ACOE Website Daily Reports

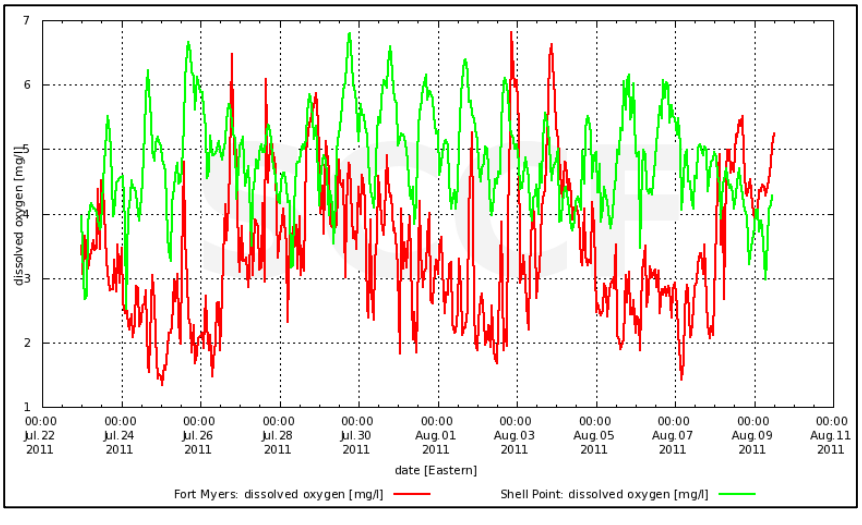
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
8/2/11	Tue	540	0	-298
8/3/11	Wed	1086	0	-278
8/4/11	Thu	1589	0	-278
8/5/11	Fri	1062	0	-230
8/6/11	Sat	805	0	-212
8/7/11	Sun	907	0	-70
8/8/11	Mon	883	0	0
Average Flow		982	0	Backflow

Flows averaging 982 cfs over the past week have been adequate to meet salinity targets within the upper estuary. Salinities at Fort Myers ranged between 2.5–7.6 psu.

Salinities within the lower estuary remain above the preferred range for oysters. Salinities at Shell Point ranged between 21–33 psu, suggesting slightly higher flows may be needed to reduce salinities to the optimal range for oysters.

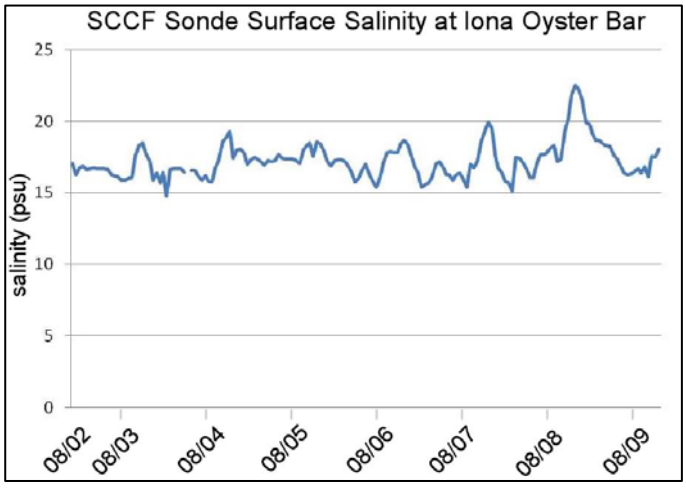
Upstream of S79/Franklin Pool Conditions: Poor.
Chlorophyll concentrations remain relatively high upstream of the lock, with chlorophyll concentrations at LaBelle of 12.5 µg/l. While no phytoplankton blooms have been reported by local scientists, the Lee County Health Department continues to leave the Caloosahatchee Caution Advisory in place for residents and visitors.

Caloosahatchee Stations	Chlorophyll (µg/l) 8/7/2011
LaBelle Bridge	12.5
Alva	-
Franklin East	-
Franklin West	7.8
SR 31 Bridge	-
Royal Palm Park	5.6
Tarpon Point	-
Ft Myers	-
Iona Peppertree Pnt	2.9



Upper Estuary Condition: Poor.
Conditions within the upper estuary over the past week were similar to those reported last week. Dissolved oxygen (DO) concentrations in Fort Myers remain relatively low, with the SCCF RECON sensor reporting DO concentrations of 1.5–4 µg/l between August 5th and August 8th. Recent rainfall appears to have increased DO concentrations in the upper estuary; however, DO in the lower estuary is trending downward.

Lower Estuary Condition: Fair.
Salinities in the lower estuary are approaching the preferred range for oysters. FGCU scientists report disease prevalence in oysters is still high (38-100%). The condition index is currently 3.09–4.66 and is considered to be good. Early indications of recruitment are slightly below average. As we enter the peak spawning period for oysters, which in the Caloosahatchee occurs between July and September, it is critical that we maintain optimal salinities in the range of 12–25 psu within the lower estuary.



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 4 October, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: The Caloosahatchee estuary received flows averaging 594 cfs over the past week from the Caloosahatchee watershed west of Ortona. East of Ortona, water continues to be back flowed into Lake Okeechobee. Despite this additional flow the lake remains in the Water Shortage Management band. Below average rainfall forecast for the remainder of the "wet season" raises concerns for managing resources through the coming dry season. **We request the COE and SFWMD provide details of the operational plan and adaptive strategies for managing limited water and minimizing negative impacts to publicly owned resources on the next call, scheduled for 11 October.**

Lake Okeechobee Level: 11.11' (Water Shortage Management Band) Previous wk: **11.10'** (Water Shortage)

Weekly Rainfall: WP Franklin 0.04 ", Ortona 0.03 ", Moore Haven 0.03"

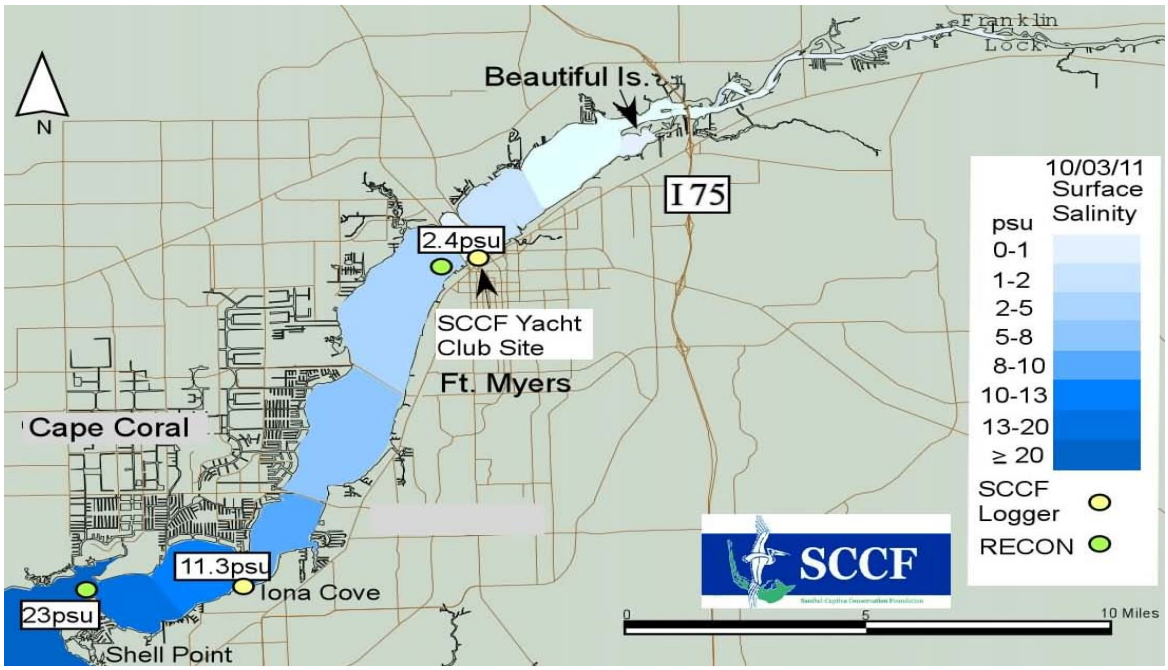
Salinity Ft. Myers: **2.4** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **2.9** psu

3 – 7 psu (SCCF RECON Marker 52) Previous week: **4 - 11** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = < **3.0** psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **15 – 33 psu** **(**SCCF RECON sensor) Previous week: **13.7 – 33** psu

Olga Water Treatment Plant Chloride: 52 ppm



Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
9/27/11	Tue	1353	0	-616
9/28/11	Wed	1236	0	-552
9/29/11	Thu	912	0	-480
9/30/11	Fri	450	0	-420
10/1/11	Sat	629	0	-272
10/2/11	Sun	498	30	-248
10/3/11	Mon	192	0	-224
Average Flow		594		**Backflow**

Estuary flows through S79 dropped to an average of 594 cfs over the past week. Salinities at Fort Myers remained below the 10 psu MFL line. Salinity at Iona Cove ranged from 8.3 – 17.4 psu, and at Shell Point ranged between 15 – 33 psu.

Caloosahatchee flows are coming entirely from the watershed west of Ortona, with no contribution from Lake Okeechobee. Due to dry conditions, Caloosahatchee basin water east of Ortona (S78) continues to be back flowed into Lake Okeechobee to augment lake levels. Despite this effort, lake levels remain in the Water Shortage Management Band, four feet below average. Forecasts for below average rainfall indicate water levels will remain critically low as we enter the dry season. We request the COE and SFWMD use the monitoring data collected during the 2010-2011 dry season to determine the effectiveness and impact of water management decisions and provide details of the operational plan and adaptive management strategies to minimize negative effects of limited water supplies for the 2011-2012 dry season.

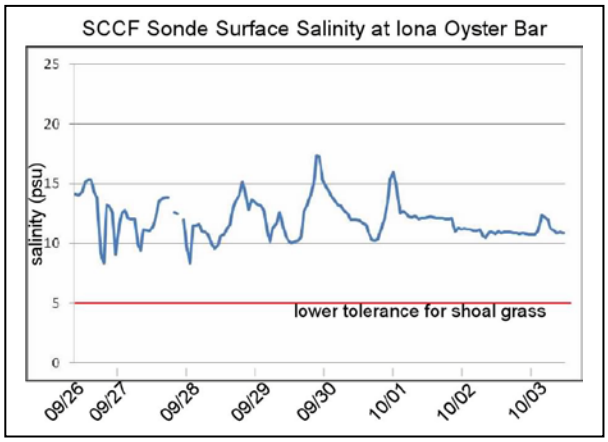
Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported, although CDOM values of 193 qsu in the river are relatively high and likely affecting light availability for submerged aquatic vegetation within the river.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qsu)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	2.5	193	1	0.47
Iona	1.1	146	2.2	0.6
San Carlos Bay	0.6	64	3	1.09

***CE**- Caloosahatchee Estuary **SCB**-San Carlos Bay*
*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.



Lower Estuary Condition: Fair.
Salinities near Iona are in the preferred range for shoal grass and oysters.

Oysters:
The Condition Index is low, perhaps due to spawning season, ranging between 1.82 – 2.83. The preferred range is > 2.

Disease (Dermo) prevalence is high ranging between 46 – 67%

Disease Intensity is good at levels ranging between 0.41 – 1.09. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

Recruitment is slightly low at 1 – 15.39 Living Density: Data collection on-going.

Survival in open bags is 0% due to predation due to lack of flow during dry months earlier in the year. Closed bags survival was poor ranging from 3 - 33%.

Red Tide: On September 29th, FWC's Fish and Wildlife Research Institute identified "very low" concentrations of *Karenia brevis* in northern Lee County waters near Cayo Costa Island.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 1 November, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: W**e request the South Florida Water Management District retain the current Phase III water restrictions throughout the District to retain water in Lake Okeechobee**.

Lake Okeechobee Level: 13.55' (**Beneficial Use Band**) Last wk: **12.93'** Last year 13.47'

Weekly Rainfall: WP Franklin 2.72", Ortona 2.65", Moore Haven 3.07"

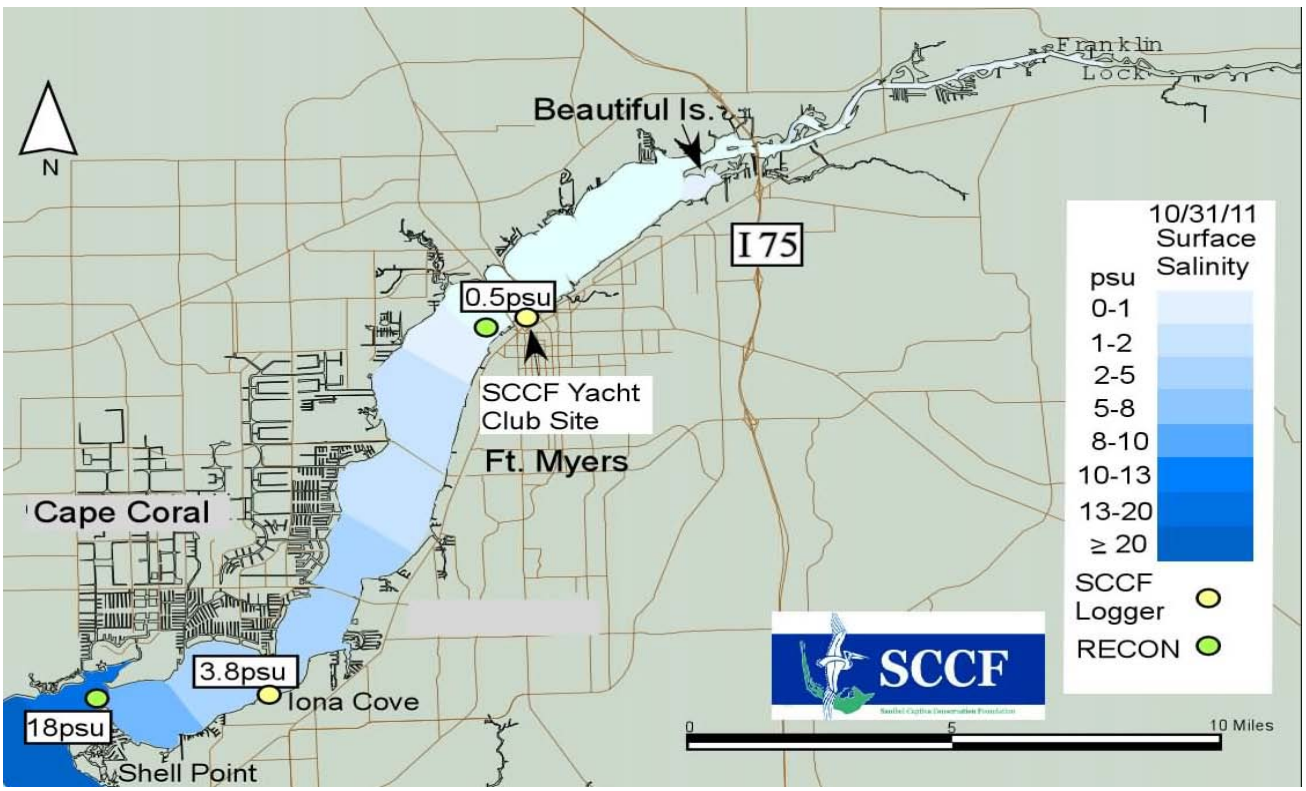
Salinity Ft. Myers: **0.3 – 2.3** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.3 - 6.5** psu

0.2 – 4.6 psu (SCCF RECON Marker 52) previous week: **0.3 – 8.9** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = **3.1** psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **5 – 31 psu** **(**SCCF RECON sensor) previous week: **6.5 – 32** psu

Olga Water Treatment Plant Chloride: 40 mg/L



*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
10/25/11	Tue	**1873**	**175**	**0**
10/26/11	Wed	**1284**	**177**	**0**
10/27/11	Thu	**1450**	**176**	**0**
10/28/11	Fri	**1136**	**234**	**0**
10/29/11	Sat	**4712**	**1067**	**0**
10/30/11	Sun	**6467**	**2459**	**0**
10/31/11	Mon	**4784**	**2163**	**0**
Average Flow		**3100**	**921**	**0**

Flow: Flows to the Caloosahatchee estuary remain very high as a result of late season rainfall this past week. Flows are entirely from the watershed with no contribution from Lake Okeechobee. Water levels in Lake Okeechobee continue to rise from rainfall throughout the watershed.

Rainfall increased estuary flows through S79 to an average of 3,100 cfs the past week with 921 cfs from the Ortona basin. Salinities at Fort Myers dropped to 0 - 5 psu in the past week. Salinity at Iona Cove ranged from 3 – 17 psu, and at Shell Point ranged between 5 – 31 psu.

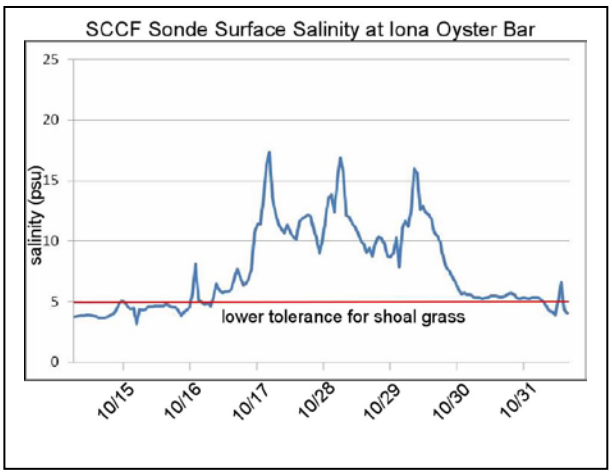
Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported. However high CDOM values of208 qse in Ft Myers and 167 qse in Iona and limited light penetration values of 0.40 m at Ft Myers and 0.97 m at Shell Point are limiting light availability for submerged aquatic vegetation within the river.

***CE**- Caloosahatchee Estuary*
***SCB**-San Carlos Bay*
*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	2.1	208	3.6	0.40
Iona	1.8	167	3.3	0.53
San Carlos Bay	0.7	73.4	4.5	0.97



Lower Estuary Condition: Fair.
Salinities near Iona have ranged widely from 3 to 17 psu as a result of high rainfall within the basin. High CDOM and turbidity are limiting light penetration to less than half of the minimum depth (1 m) needed to sustain submerged aquatic vegetation (SAV) health.

Red Tide:
The *Karenia brevis* bloom, first reported five weeks ago, is still located offshore Sanibel Island. Within the last week, low concentrations of *K. brevis* in were detected in Pine Island Sound (8,000/L) and San Carlos Bay (12,000/L). Very high concentrations (870,000/L) were measured 5 miles west of Sanibel.

Extremely high “King” tides over the weekend were not enough to lower very high CDOM or raise salinity in San Carlos Bay. These conditions are expected to inhibit growth and expansion of the *Karenia* bloom.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
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Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 1 November, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: W**e request the South Florida Water Management District retain the current Phase III water restrictions throughout the District to retain water in Lake Okeechobee**.

Lake Okeechobee Level: 13.55' (**Base Flow Band**) Last wk: **12.93'** Last year 13.47'

Weekly Rainfall: WP Franklin 2.72", Ortona 2.65", Moore Haven 3.07"

Salinity Ft. Myers: **0.3 – 2.3** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.3 - 6.5** psu

0.2 – 4.6 psu (SCCF RECON Marker 52) previous week: **0.3 – 8.9** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = **3.1** psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **5 – 31 psu** **(**SCCF RECON sensor) previous week: **6.5 – 32** psu

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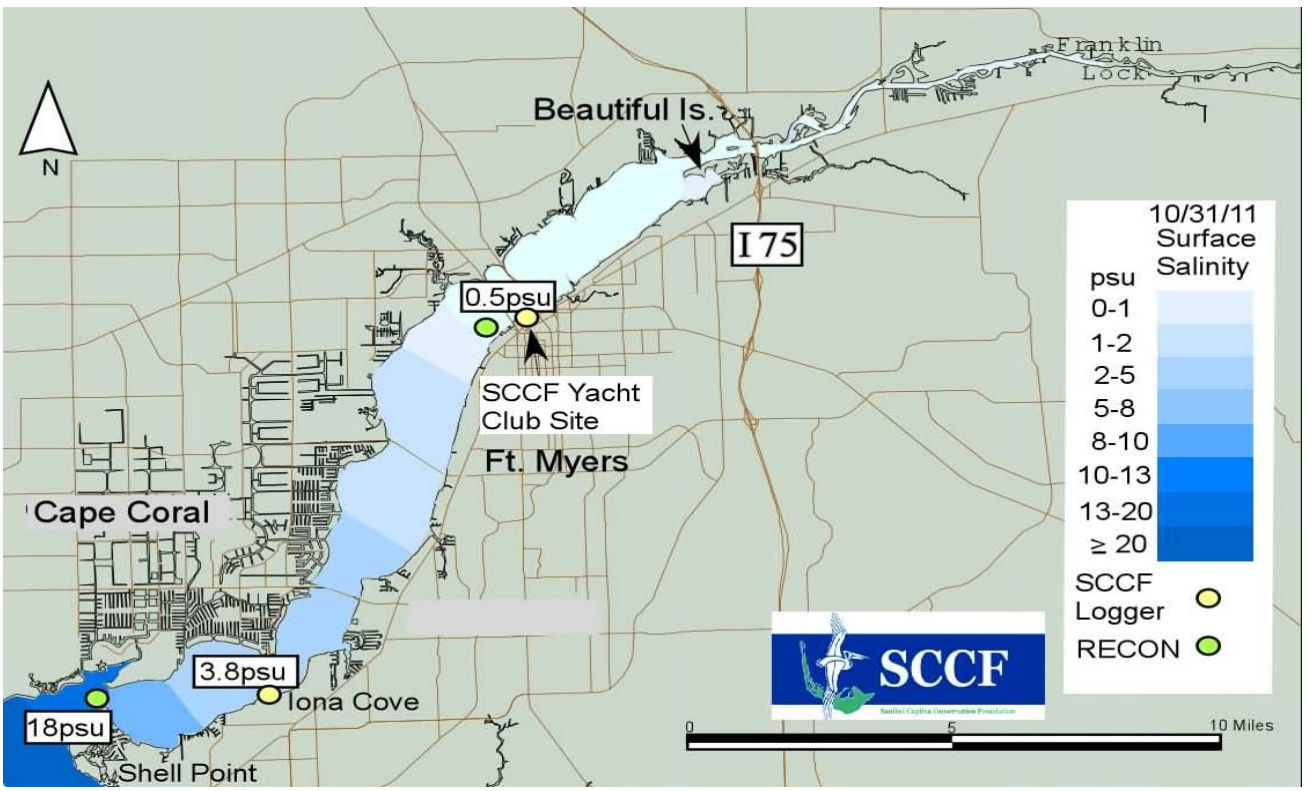

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Average Flow		**3100**	**921**	**0**

Flow: Flows to the Caloosahatchee estuary remain very high as a result of late season rainfall this past week. Flows are entirely from the watershed with no contribution from Lake Okeechobee. Water levels in Lake Okeechobee continue to rise from rainfall throughout the watershed.

Rainfall increased estuary flows through S79 to an average of 3,100 cfs the past week with 921 cfs from the Ortona basin. Salinities at Fort Myers dropped to 0 - 5 psu in the past week. Salinity at Iona Cove ranged from 3 – 17 psu, and at Shell Point ranged between 5 – 31 psu.

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported. However high CDOM values of208 qse in Ft Myers and 167 qse in Iona and limited light penetration values of 0.40 m at Ft Myers and 0.97 m at Shell Point are limiting light availability for submerged aquatic vegetation within the river.

***CE**- Caloosahatchee Estuary*
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The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

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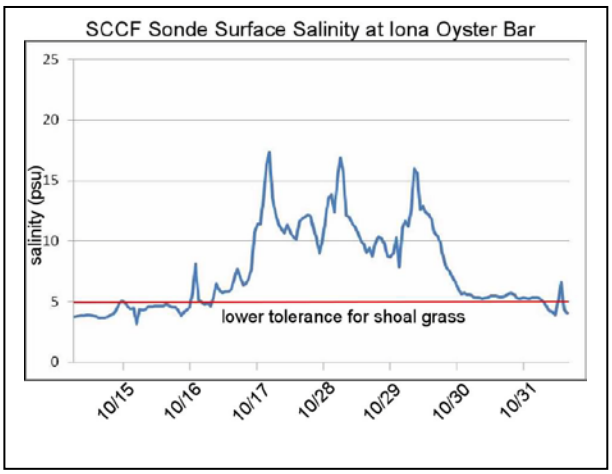

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Extremely high “King” tides over the weekend were not enough to lower very high CDOM or raise salinity in San Carlos Bay. These conditions are expected to inhibit growth and expansion of the *Karenia* bloom.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling Nat Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson PhD- Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee River & Estuary Condition Report

Date: January 11, 2011

This report provides a scientific assessment of the conditions in the Caloosahatchee as of this date and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report also includes a recommendation on lake releases to the Caloosahatchee to best meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Salinity Ft Myers: 14-16 ppt/psu Data from USGS surface sonde
Unhealthy for tapegrass growth & reproduction

MFL Status: Violation MFL Target at Ft Myers = 10 ppt/psu

Salinity Shell Point: 27 - 32 ppt/psu Data from RECON sensor

Flow: S77 =0
S79= 167 cfs (7 day average). Due entirely to heavy rain on Jan 6th.

Harmful Algal Bloom status: Bluegreen algal bloom observed in LaBelle on Monday, Jan 3, 2011.

Effects: Odor & reduced visibility

Upper Estuary tapegrass Condition: Very limited presence, being overrun by more salinity tolerant epiphytic algae

Lower Estuary Condition: Fair/Stable

Request: Provide flows to sustain a salinity of 10 ppt/psu around Beautiful Island where fledgling tape grass is struggling. A water release would also help prevent stratification and reduce progression of the bluegreen algal bloom. We understand the water shortage conditions that exist and ask that a release be made to keep conditions from further deteriorating in the river/estuary.

Detail

Salinity: Conditions at the surface in Ft Myers are range between 14-16 ppt/psu during the past 24 hour period. The 7 day surface salinities ranged from 14 to 17 ppt/psu. The minimum flow and level (MFL) at this location in Ft Myers is 10 ppt/psu.

This level was established and incorporated in the MFL rule after extensive sampling and modeling by the SFWMD because it represents the salinity tolerance of the freshwater tapegrass, *Vallisneria americana,* the sole submerged aquatic vegetation habitat in the upper estuary. Above 10 ppt/psu the plants become stressed and die back. One month above this level and the grass blades disappear and the energy of the plant retreats into the root system.

Impact: Loss of tapegrass means loss of nursery habitat critical to species in the Caloosahatchee including the endangered manatee, snook, redfish, shrimp and crab larvae, stone and blue crabs to name a few.

The federally endangered manatee depends on tapegrass in the upper estuary where they congregate in the warmer winter waters with their young. Loss of tapegrass around the Orange River and Beautiful Island causes manatees to travel downstream more than 20 miles away from their warm water refuge to find food.

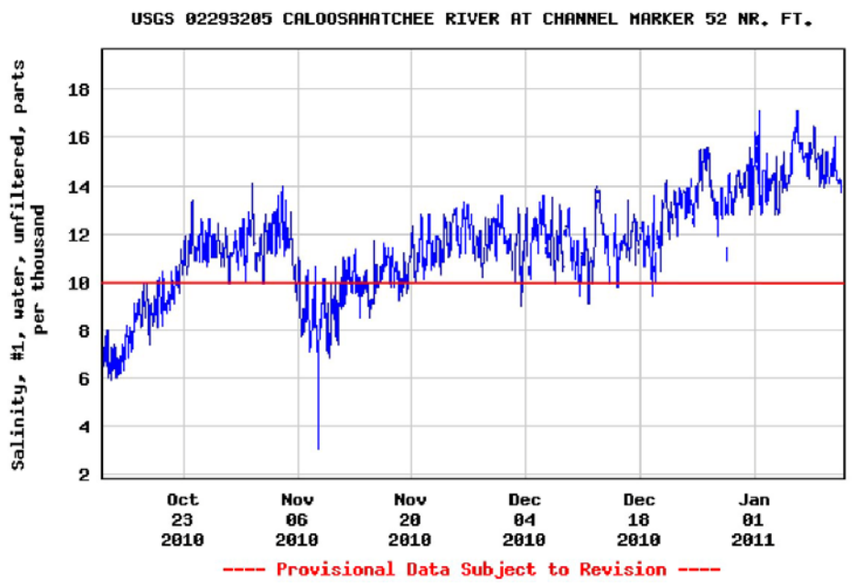
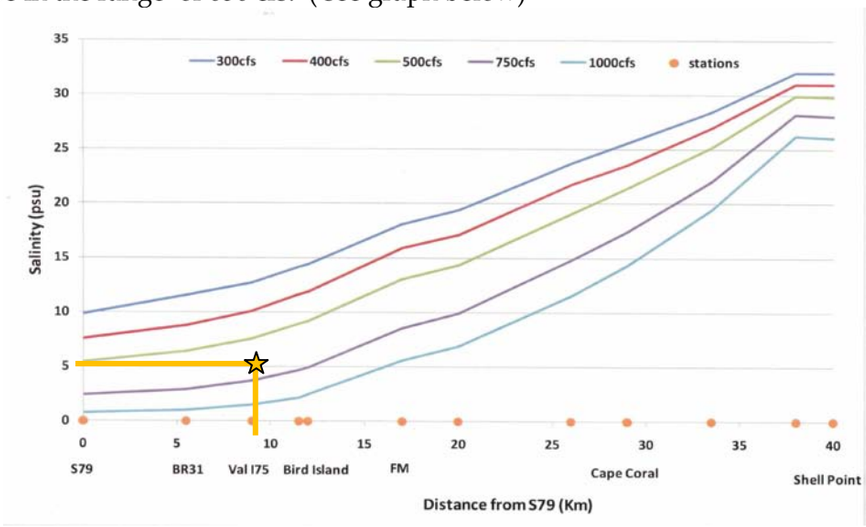


Figure 1: USGS graph of surface salinity conditions at Ft Myers from October 23, 2010 - January 11, 2011. Target salinity is 10 ppt/psu, (red line).

Rainfall: Heavy rainfall on January 6th had the effect of dropping the salinities from a high of above 17ppt/psu to the current range. Otherwise conditions have been dry and salinities are continuing to rise .

Flows: SFWMD research by Chamberlin & Doering reports optimum flows to maintain a healthy estuarine system = 450-800 cfs depending on conditions and time of year. To achieve 5 psu at I-75 flows needed to be in the range of 650 cfs. (see graph below)



Upper estuary tapegrass conditions: There are no *Vallisneria* shoots left at the Caloosahatchee Bridge though there may still be rhizomes (roots). Based on the flow analysis done by District scientists above

Ecological Importance of grass habitat: Seagrass are important both economically and ecologically, providing critical habitat and major structural elements in fresh, estuarine and coastal aquatic ecosystems. (e.g., Odum et al. 1982, Virnstein et al. 1983, Dennison et al. 1993, Sheridan 1992, 1997, Valiela et al. 2001).

These ecosystems provide significant ecosystem services (e.g., Costanza et al. 1997, Daily 1997, Peterson and Lubchenco 1997), including **stabilizing sediments and inhibiting their re-suspension, sequestering atmospheric carbon and export carbon to other systems, improving water transparency, trapping and cycling nutrients, and protecting shorelines through wave energy reduction** (e.g., Beck et al. 2001, 2003, Ellison and Farnsworth 2001, Valiela et al. 2001). **They also provide feeding, breeding, and nursery habitat and refuges to numerous invertebrates, migratory birds, reptiles, marine mammals and many other important fish populations during some stage of their life cycle** (e.g., Sheridan 1992, 1997, Halliday 1995, Beck et al. 2001, 2003, Orth et al. 2006, Duarte et al. 2008).

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 8 November, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: W**e request the South Florida Water Management District retain the current Phase III water restrictions throughout the District to retain water in Lake Okeechobee**. Current demand is minimal and holding water in the lake will allow more flexibility to manage water later in the dry season. With the long range forecast prediction for below average rainfall, higher lake levels could provide buffer capacity for the potential of year on year droughts. In addition, conservation of water resources is the most cost effective and equitable water management tool.

Lake Okeechobee Level: 13.76' (**Base Flow Band**) Last wk: **13.55'** Last year 13.28'

Weekly Rainfall: WP Franklin 0 ", Ortona 0.01", Moore Haven 0.06"

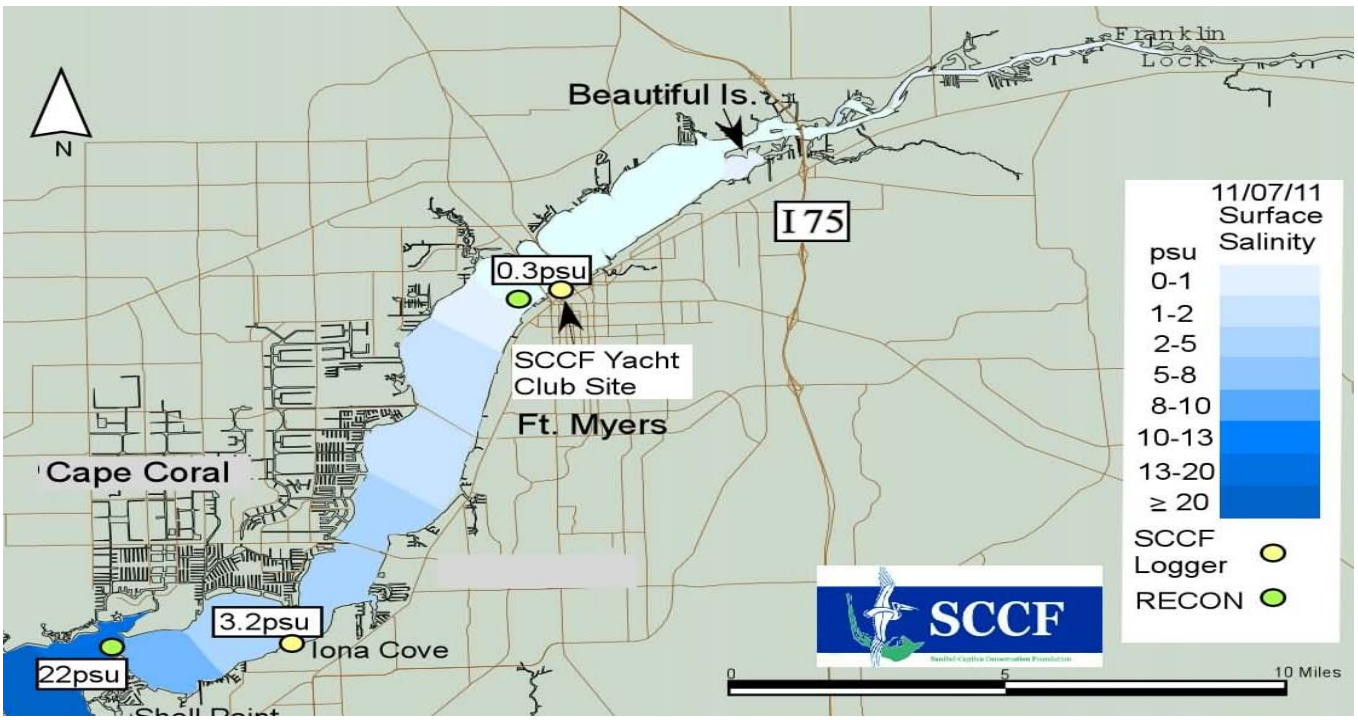
Salinity Ft. Myers: **0.25 – 0.35** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.3 – 2.3** psu

0 psu (SCCF RECON Marker 52) previous week: **0.2 – 4.6** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = 2.9**3.1** psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **5 – 30 psu** **(**SCCF RECON sensor) previous week: **5 – 31** psu

Olga Water Treatment Plant Chloride: 44 mg/L



*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
11/1/11	Tue	NR	1489	0
11/2/11	Wed	4026	1528	0
11/3/11	Thu	2852	628	0
11/4/11	Fri	2792	648	0
11/5/11	Sat	2473	656	0
11/6/11	Sun	2031	483	0
11/7/11	Mon	1380	326	0
Average Flow		2592	822	0

Flow:
Flows to the Caloosahatchee estuary remain extremely high, averaging 2,592 cfs, despite the lack of rain this past week. Flows are entirely from the watershed with an average of 822 cfs from the Ortona basin and no contribution from Lake Okeechobee.

The high flows at this time of year highlight the critical need for distributed storage within the watershed to retain water that will be needed later in the dry season, instead of flushing it to tide.

Water levels in Lake Okeechobee continue to rise from rainfall throughout the watershed. Lake levels are 0.48 ft above last year's level at this time.

The unseasonable high flows out the Caloosahatchee resulted in salinities of 0 psu at Fort Myers the past week. Salinity in the lower estuary was little changed. Shell Point ranged between 5 – 30 psu.

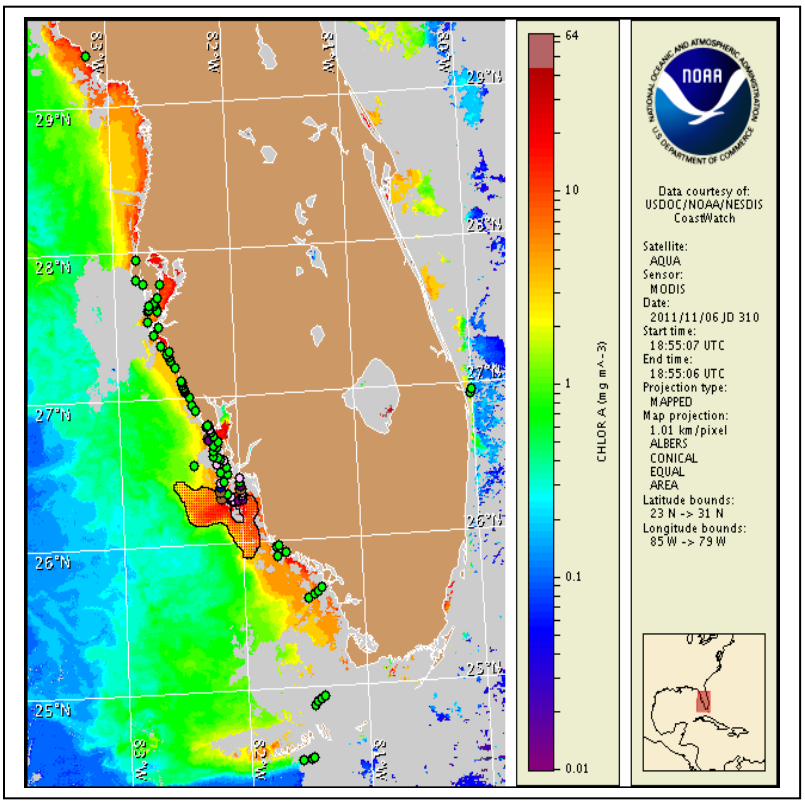
Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported. However high CDOM values of 233 qse in Ft Myers and 185 qse in Iona and limited light penetration values of 0.40 m at Ft Myers and 1.01 m at the Sanibel Causeway are limiting light availability for submerged aquatic vegetation within the river.

__CE__- Caloosahatchee Estuary
__SCB__-San Carlos Bay
Definition of 25% Iz: __I__ = irradiance and __z__ = depth.

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	2.0	233	2.0	0.40
Iona	1.3	185	3.3	0.49
San Carlos Bay	0.2	69.4	3.3	1.01



Lower Estuary Condition: Fair.
Salinities at Shell Point have ranged widely from 5 to 30 psu as a result of high surface water runoff within the Caloosahatchee watershed. High CDOM and turbidity are limiting light penetration to less than half of the minimum depth (1 m) needed to sustain submerged aquatic vegetation (SAV) health.

Red Tide:
The *Karenia brevis* bloom, first reported six weeks ago, has dissipated offshore Sanibel Island. Within the last week, no *K. brevis* were detected in Pine Island Sound or San Carlos Bay.

A bloom of *Peridinium quinquecorne* measuring 250,000 cells/L was found at Tarpon Bay Road Beach on 3 November.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling Nat Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson PhD- Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee River & Estuary Condition Report

Date: January 18, 2011

This report provides a scientific assessment of the conditions in the Caloosahatchee as of this date and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report also includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 12.41 Beneficial Use Sub band

Salinity Ft Myers: 15-17 ppt/psu Data from USGS surface sonde
Unhealthy for tapegrass growth & reproduction
Last week's status 14-16 ppt/psu

MFL Status: Violation MFL Target at Ft Myers = 10 ppt/psu

Olga Water Treatment Plant Chloride: 96 ppm. Last week: 81 ppm

Salinity Shell Point: 22 - 32 ppt/psu Data from RECON sensor

Flow: S77 =0 cfs Jan 11-17, 2011
S79= 0 cfs Jan 11-17, 2011

Harmful Algal Bloom status: Minimal drift algae on Sanibel

Effects:

Upper Estuary Tapegrass Condition: Poor. Very limited presence, tapegrass disappearing as salinities increase upstream.

Lower Estuary Condition: Fair/Stable

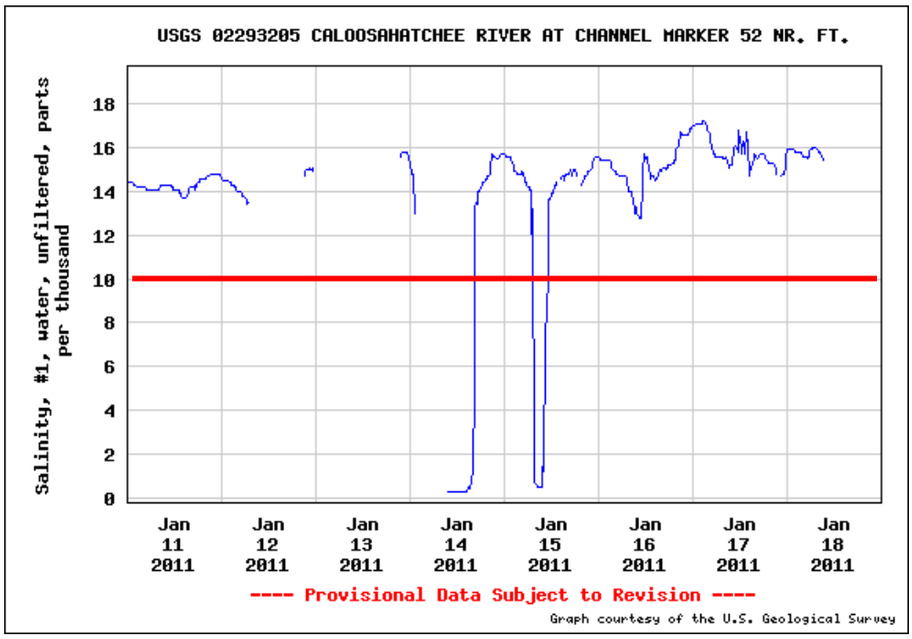
Request: Provide flows to sustain a salinity of 10 ppt/psu around Beautiful Island to keep a salinity gradient downstream of S79 where tape grass is being lost. A water release would also help protect grass roots keeping them alive to enable them to respond when conditions improve. If salinities rise too high they will impact the viability of these roots. We understand the water shortage projection concerns however lake levels have been holding steady and release to the estuary represents minimal water – inches off the lake - compared to all other users.

Rationale: A release of water now could take advantage of rainfall on Monday, Jan 17 to provide a pulse to lower salinities in the estuary and provide much needed relief from continually increasing negative impacts. A release this week coupled with the basin flow from the rain event could magnify a small pulse from the lake to increase benefits to the estuary.

Although the salinities will return to higher levels in the long-term, the few days of freshwater would give a much needed re-charge to the system. Current conditions provide us a unique opportunity to learn how the entire system and estuary respond with minimal releases to the Caloosahatchee. We ask that you not waste this opportunity to learn more and provide a release to keep conditions from further deteriorating in the river/estuary while building our understanding of how the system responds with minimal releases.

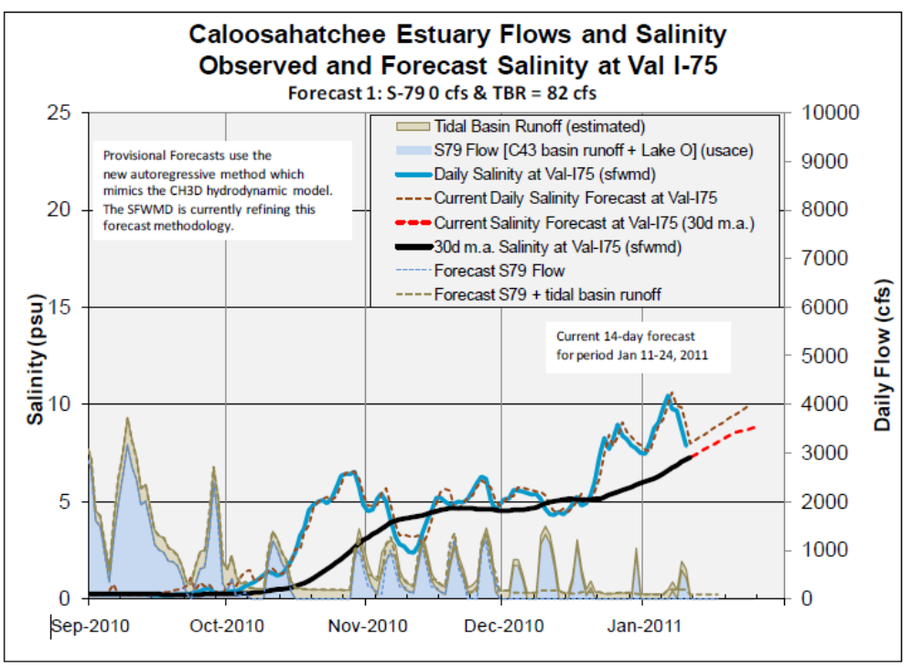
Detail

Salinity: Conditions at the surface in Ft Myers are range between 15-17 ppt/psu during the past week an increase over last week's values. The minimum flow and level (MFL) at this location in Ft Myers is 10 ppt/psu, (red line).



SFWMDs two week forecast model projects increasing salinities with no releases from S79 and minimal tidal basin runoff of 82 cfs. The estimates on tidal contribution are questionable and discussions with the SFWMD staff have revealed this value is not based on measurements and is affected by limits of the modeling. Consequently we question the reliability of this tidal basin value.

The current daily salinity shows values reaching 10 psu/psu at I75. 10 ppt/psu is the salinity tolerance of the freshwater tapegrass, *Vallisneria americana,* the sole submerged aquatic vegetation habitat in the upper estuary.



Impact: Increasing salinities, over 10 ppt/psu upriver will result in the increased loss of tapegrass and loss of nursery habitat critical to species in the Caloosahatchee including the endangered manatee, snook, redfish, shrimp and crab larvae, stone and blue crabs.

Flows: SFWMD research by Chamberlin & Doering reports optimum flows to maintain a healthy estuarine system = 450-800 cfs depending on conditions and time of year.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling Nat Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson PhD- Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: January 25, 2011

This report provides a scientific assessment of the conditions in the Caloosahatchee as of this date and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report also includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 12.40 Beneficial Use Sub band

Salinity Ft Myers: 15-16 ppt/psu Data from USGS surface sonde
Unhealthy for tapegrass growth & reproduction
Last week's status 15-17 ppt/psu

MFL Status: Violation MFL Target at Ft Myers = 10 ppt/psu

Olga Water Treatment Plant Chloride: 103 ppm. Last week: 96 ppm

Salinity Shell Point: 25-32 ppt/psu Data from RECON sensor
Last week: 22 – 32 ppt/psu

Flow: S77 =0 cfs Jan 18-24, 2011
S79= 177 cfs Jan 18-24, 2011

Harmful Algal Bloom status: No Harmful algal bloom species present. No drift algae on area beaches; however, moderate amounts of drift algae present in Pine Island Sound and San Carlos Bay.

Upper Estuary Tapegrass Condition: Poor. Very limited presence, tapegrass disappearing as salinities increase upstream.

Lower Estuary Condition: Fair. Increased biomass of epiphytic algae and macroalgae in seagrass beds in San Carlos Bay and Pine Island Sound.

Request: Provide a pulse release of 450-650 cfs to the Caloosahatchee.

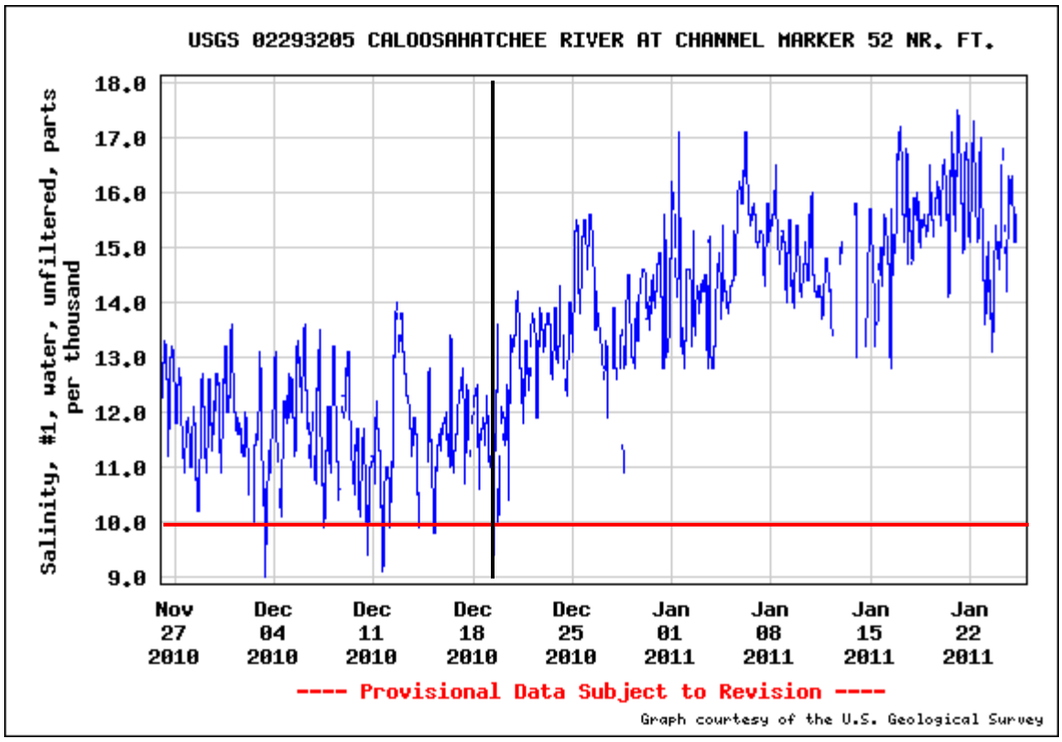
Rationale: A release of water now could take advantage of rainfall predicted for central and southern Florida over the next 36 hours. Rainfall last week did have a small impact on salinity levels throughout the system. The Upper Estuary could benefit significantly if the predicted rainfall was coupled with a pulse release of 450-650 cfs. Tapegrass would get a much needed recharge from the freshwater pulse, and the salinity gradient below Franklin Locks would allow a refugia to exist for seed stock. The 8-10 day outlook predicts above normal precipitation for north of the Lake, with 50/50 prediction above or below normal for south of the Lake. There may be no better time to expend minimal water flows to provide much needed relief to the Estuary.

Although salinities may return to higher levels in the long-term, a pulse of freshwater along with local rainfall would effectively reduce salinities downstream of S-79. This would maintain a salinity gradient that is critical for protecting the low-salinity zone (LSZ) nursery habitat for winter and spring spawning fishes. If salinity is allowed to increase upstream of the I-75 Bridge, the S-79 water control structure will effectively truncate the LSZ. The increased competition for prey resources between gelatinous predators and ichthyoplankton and/or increased direct predation on the eggs and larvae of fishes will substantially affect the ability of the system to recover. This would translate

into direct impacts on local fisheries. We urge the Corps to exercise its authority and take this opportunity to create a positive impact to the Estuary.

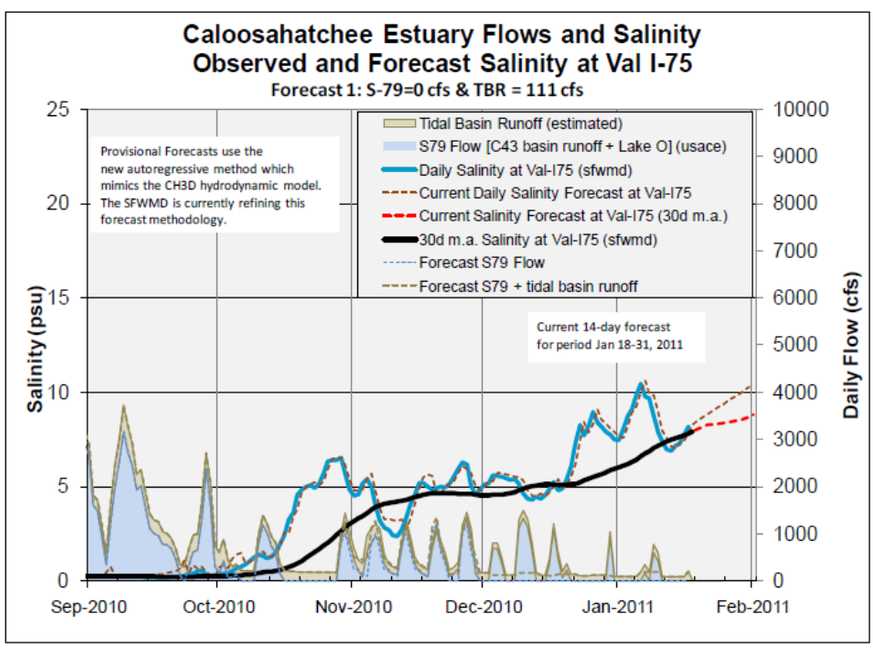
Detail

Salinity: Conditions at the surface in Ft Myers ranged between 13-17 ppt/psu during the past week. Rain and flow from the Ortona pool provided minimal flows over 4 days in the middle of the last week that averaged over the week equates to 177 cfs. The minimum flow and level (MFL) at this location in Ft Myers is 10 ppt/psu, (red line). Salinities have not been within that range since November 20, 2010. **Since releases were stopped on December 15, 2010 note the steady increase in salinity, to the right of the black line. Previous releases -left of the black line- kept salinities from rising.**



SFWMDs two week forecast model projects increasing salinities with no releases from S79 and minimal tidal basin runoff of 111 cfs. The estimates on tidal contribution are questionable and discussions with the SFWMD staff have revealed this value is not based on measurements and is affected by limits of the modeling. Consequently we question the reliability of this tidal basin value.

The current daily salinity shows values reaching 10 psu/psu at I-75. 10 ppt/psu is the salinity tolerance of the freshwater tapegrass, *Vallisneria americana,* the sole submerged aquatic vegetation habitat in the upper estuary.



Impact: Increasing salinities, over 10 ppt/psu upriver will result in the increased loss of tapegrass and loss of nursery habitat critical to species in the Caloosahatchee including the endangered manatee, snook, redfish, shrimp and crab larvae, stone and blue crabs.

Flows: SFWMD research by Chamberlin & Doering reports optimum flows to maintain a healthy estuarine system = 450-800 cfs depending on conditions and time of year.
conditions and time of year.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 6 December, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 13.75' (**Base Flow Band**) Last wk: 13.84' Last year 12.84'

Lake Okeechobee Inflow: 1,023 cfs **Lake Okeechobee Outflow:** 195 cfs

Weekly Rainfall: WP Franklin 0.01 ", Ortona 0.01 ", Moore Haven 0 "

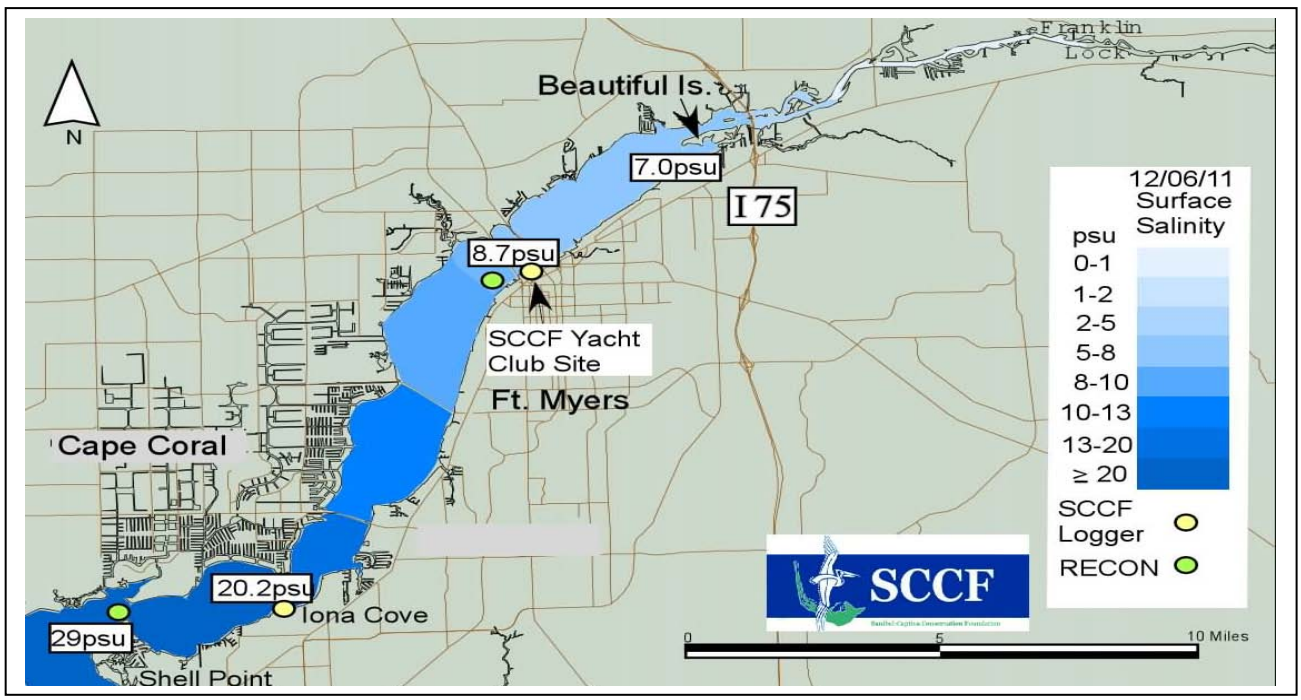
Salinity Ft. Myers: **6.4 – 11.4** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: 5 - 9.7 psu

9 - 17 psu (SCCF RECON Marker 52) previous week: **2 – 16** psu

MFL Status: **Daily salinity at Fort Myers ≤ 10 psu**
30-day moving average = 4.86 psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **20 -33 psu** (SCCF RECON sensor) previous week: **18 – 33** psu

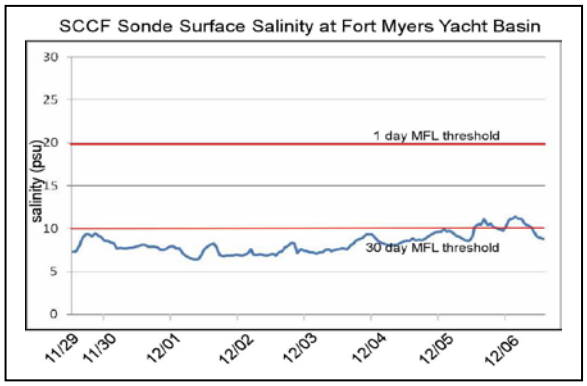
Olga Water Treatment Plant Chloride: 54 mg/L



Flow: The normal pattern of rising salinity in the Caloosahatchee estuary shifted this year from early October to early December due to late season October rainfall. An average of 122 cfs of lake water was supplied to the eastern basin through S77. During the past week there was only one day of flow to the estuary at S79 averaging 9 cfs for the week. As a result salinities continue to increase in the estuary with surface salinities trending **above 10** psu at Ft Myers and mid-depth salinities reaching **17** psu at high tide. In the past week the 30 day moving average jumped from 2.6 to 4.8 psu. Shell Point salinities are above the preferred range for oysters at 20–33 psu.

*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
11/29/11	Tue	0	0	0
11/03/11	Wed	0	0	136
12/1/11	Thu	0	0	180
12/2/11	Fri	0	0	76
12/3/11	Sat	0	0	372
12/4/11	Sun	0	0	96
12/5/11	Mon	66	0	0
Average Flow		9	0	122



Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Conditions: Fair.
CDOM remains relatively high at Fort Myers with values of 165 qse. In Iona, CDOM is 120 qse. Higher values contribute to limited light penetration and light availability for submerged aquatic vegetation within the river.

Lower Estuary Condition: Fair.
Salinities at Shell Point continue to increase to levels outside the preferred range for oysters. CDOM and turbidity continue to limit light penetration to less than the minimum depth 2.2 meters needed to sustain submerged aquatic vegetation (SAV) health in San Carlos Bay.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	1.55	165	1.7	0.54
Iona	1.1	120	1.9	0.69
San Carlos Bay	0.2	47	2.6	1.3

Target light penetration:

***CE**- Caloosahatchee Estuary = 1 meter*
***SCB**-San Carlos Bay = 2.2 meters*

*Definition of 25% Iz: **I** = irradiance and **z** = depth*

Red Tide:
The *Karenia brevis* bloom that started 9/26/11 currently extends alongshore and offshore of Sanibel Island in Lee County through Collier County and into San Carlos Bay and Pine Island Sound. High to medium concentrations of *K. brevis* have been reported along and offshore Lee County from Sanibel Island south to Lovers Key State Park with medium and high concentrations of *K. brevis* in southern Pine Island Sound and San Carlos Bay. SCCF Marine Lab scientists counted over 30 million cells/L at the Sanibel Boat ramp, 70 million cells/L at the Tarpon Bay boat ramp and 508 thousand cells/L at Kitchell Key west of the causeway. The picture at right shows red tide at the Tarpon Bay boat ramp on 12/06/11.

Six juvenile Kemp's Ridley sea turtles were found dead on the eastern shores of Sanibel near Lighthouse Point. Necropsy results are not available yet, but it is believed the deaths are related to the red tide event.

One of six dead Kemp's Ridley sea turtles found on Sanibel.

Oysters:
The Condition Index is good ranging from 1.99 – 3.83. The preferred range is >2.

Disease Prevalence (Dermo) is not good with 100% at all stations.
Disease Intensity is low to moderate ranging from 1.13 – 1.43.
The scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

Spat recruitment is very good for this time of year ranging from 1.33 – 8.53.

This week the Lee County Health Dept issued an advisory against harvesting and eating shellfish from local waters due to poisoning from red tide toxins.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson PhD- Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: February 15, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 12.36 Beneficial Use Sub band Previous week: 12.47
Water shortage management band = 11.93

Salinity Ft Myers: 9.75 -13 ppt/psu **surface** data USGS sonde @ Marker 52
10-18 ppt/psu **mid depth** data SCCF RECON sensor @ Marker 52
Due to extended high salinities no tapegrass present at Fort Myers
Previous week: surface 11 -14 ppt/psu
mid depth 12- 16 ppt/psu

MFL Status: Violation MFL Target at Ft Myers = 10 ppt/psu 30 day moving average
Above 10 ppt/psu (30 day moving average) since 11/21/10 = 86 days

Olga Water Treatment Plant Chloride: 84 ppm Previous week: 85 ppm

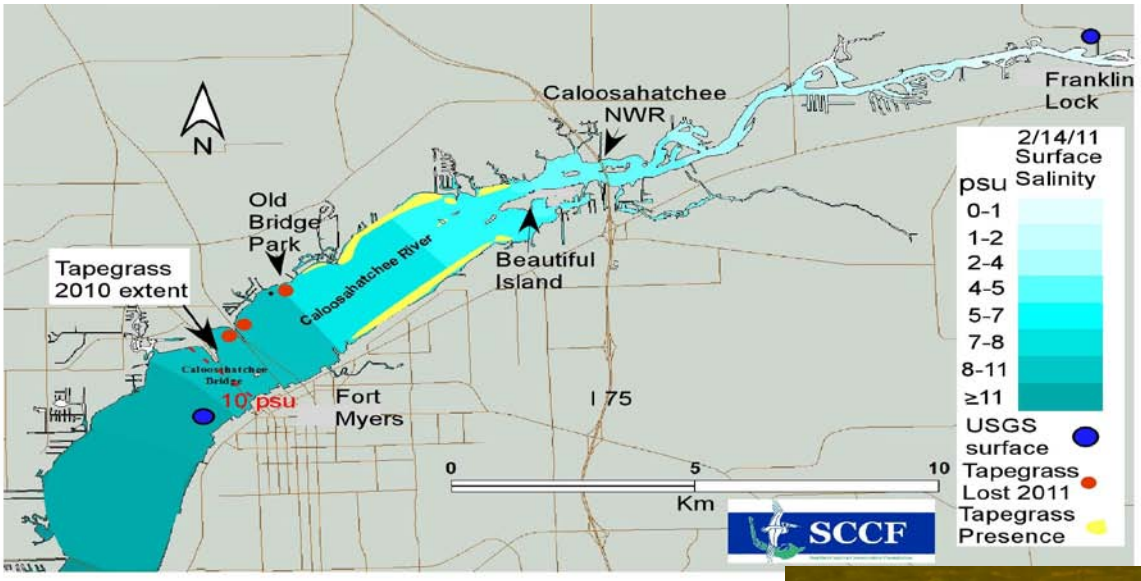
Salinity Shell Point: 22 - 32 ppt/psu RECON sensor Previous week: 27-32.5 ppt/psu

Recommendation: Releases have extended lower salinities in the upper estuary to Ft Myers with minimal impact on the Lake. We request minimal base flow releases continue with 300 cfs pulse release to establish suitable salinities for upcoming tapegrass and fishery reproduction period in March.

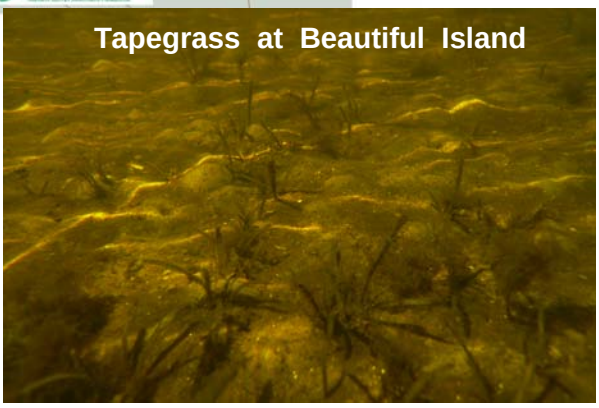
Rationale: In drought years of 2007-2009 lack of flow to the Caloosahatchee resulted in salinities of 20 psu/ppt at S79 wiping out tapegrass habitat west of the lock. This habitat is critical to a number of species that are economically important in Lee County for commercial and recreational fisheries. Releases have resulted in much improved salinities in the estuary creating beneficial conditions for the upcoming reproductive period for bay anchovy, silver perch, redfish, snook, crabs, shrimp and tapegrass. A continuing low level base flow release is needed to help maintain a salinity wedge below S79 and prevent stagnation of the pooled basins.

Flow: Published schedule @S79: 300 cfs * From ACOE Website Daily Reports

Begin Date & Time	Day of the Week	Day of Pulse Release	S-79 Q(cfs)	S79 Flow * (cfs)	S77 Release * (cfs)
2/11/2011, 0700	Fri	1	900	656	346
2/12/2011, 0700	Sat	2	500	678	328
2/13/2011, 0700	Sun	3	300	412	252
2/14/2011, 0700	Mon	4	200	268	247
2/15/2011, 0700	Tue	5	200	232	NR
2/16/2011, 0700	Wed	6	0		
2/17/2011, 0700	Thu	7	0		



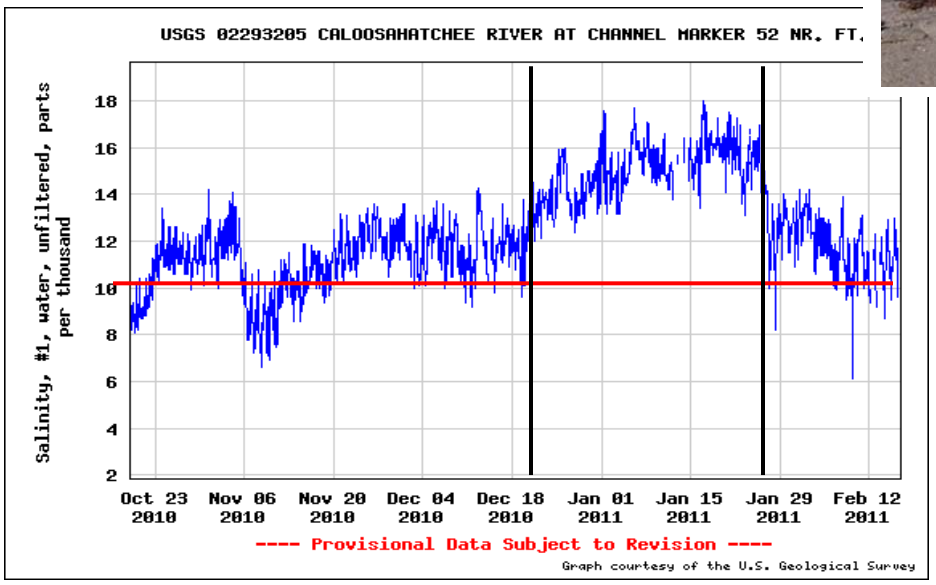
Upper Estuary Condition: Limited tapegrass coverage at Beautiful Is.



Lower Estuary Condition: Fair. Several varieties of algae in flats. Red drift algae washing ashore on Ft Myers Beach.

Algal bloom status: Filamentous green algae still present at Franklin Locks. Clumps of algae drifting on the San Carlos Bay flats including *Hypnea, Agardhiella, Gracilaria, Chondria and Dasya*. Red drift algae present on Fort Myers Beach (photo)**.**

Detail: Releases helped drop salinity significantly to sustainable late November levels**.**



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson PhD- Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: February 22, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 12.28 Beneficial Use Sub band Previous week: 12.36
Water shortage management band = 11.89

Salinity Ft Myers: 10 - 14.5 ppt/psu **surface** data USGS sonde @ Marker 52
14.75-18 ppt/psu **mid depth** data SCCF RECON sensor @ Marker 52
Due to extended high salinities no tapegrass present at Fort Myers
Previous week: surface 9.75 -13 ppt/psu
mid depth 10-18 ppt/psu

MFL Status: Violation MFL Target at Ft Myers = 10 ppt/psu 30 day moving average =12.29
Above 10 ppt/psu (30 day moving average) since 11/21/10 = 93 days

Olga Water Treatment Plant Chloride: 79 ppm Previous week: 84 ppm

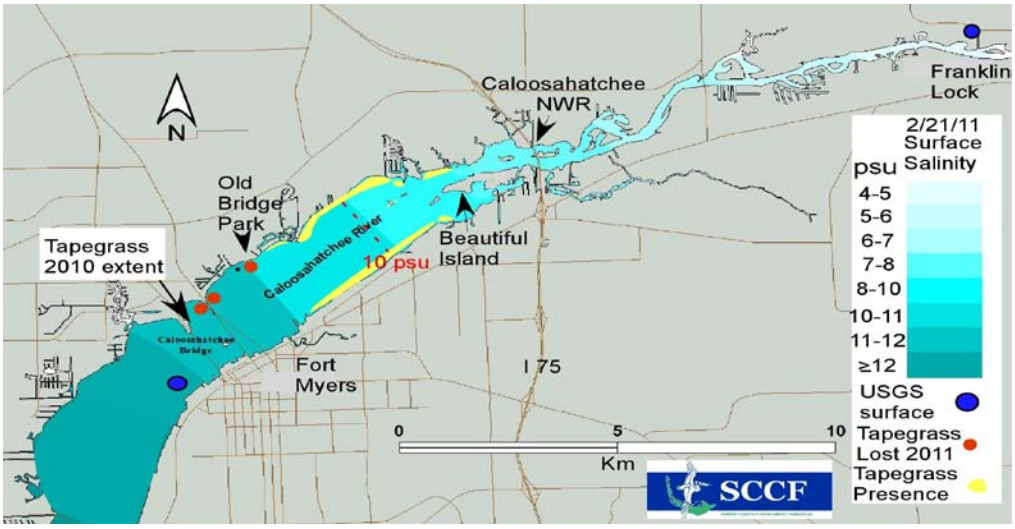
Salinity Shell Point: 25 - 33 ppt/psu RECON sensor Previous week: 22 - 32 ppt/psu

Recommendation: Releases have maintained flow in the western pool and a salinity gradient in the upper estuary with minimal impact on the Lake. We request minimal base flow releases continue with a minimum 300 cfs pulse release to maintain suitable salinities for upcoming tapegrass and fishery reproduction period in March.

Rationale: Recent releases have resulted in improved salinities in the estuary and provides a base flow in the upper basin to prevent stagnation. At a minimum maintaining a salinity wedge at the current location is needed to provide conditions suitable for the upcoming reproductive period for bay anchovy, silver perch, redfish, snook, crabs, shrimp and tapegrass. **A continuing low level base flow release is needed to help maintain this mixing zone near Beautiful Island downstream of S79 and prevent algal blooms above S79**.

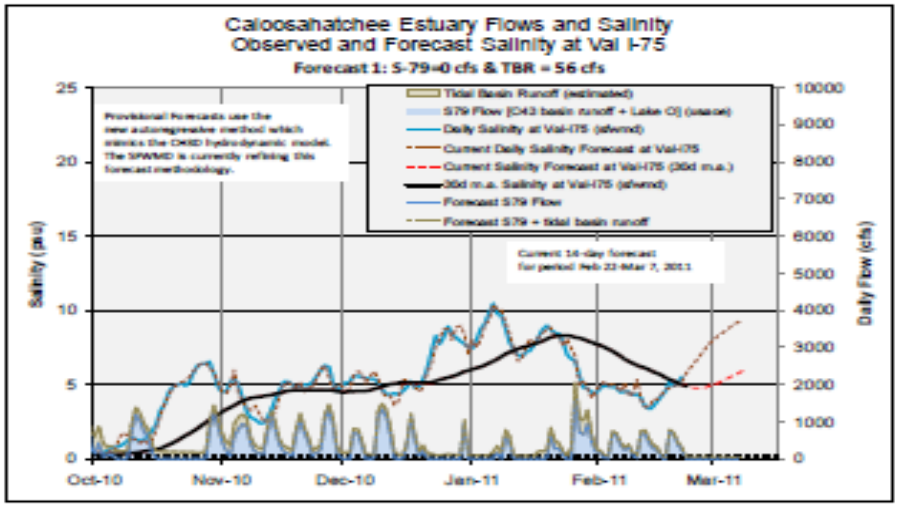
Flow: Published schedule @S79: 300 cfs *** From ACOE Website Daily Reports**

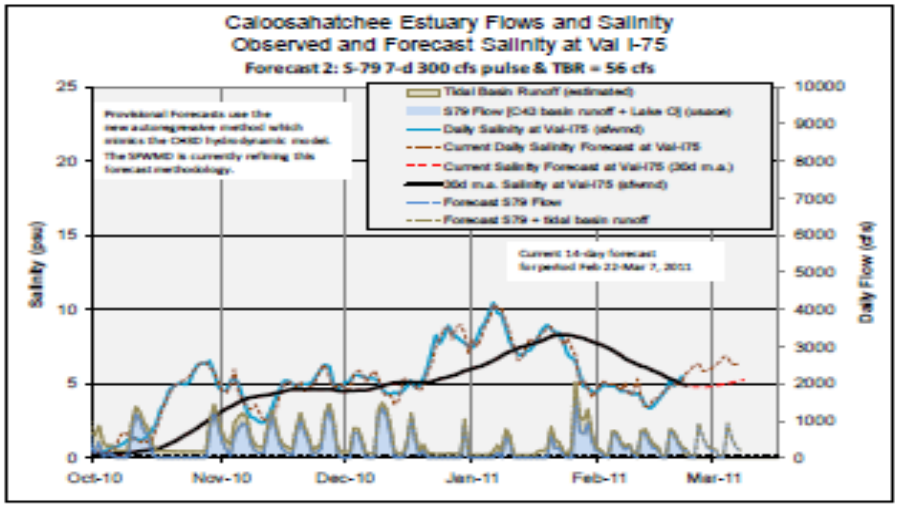
Begin Date & Time	Day of the Week	Day of Pulse Release	S-79 Q(cfs)	S79 Flow * (cfs)	S77 Release * (cfs)
2/18/2011, 0700	Fri	1	900	716	321
2/19/2011, 0700	Sat	2	500	637	746
2/20/2011, 0700	Sun	3	300	384	519
2/21/2011, 0700	Mon	4	200	229	348
2/22/2011, 0700	Tue	5	200		
2/23/2011, 0700	Wed	6	0		
2/24/2011, 0700	Thu	7	0		

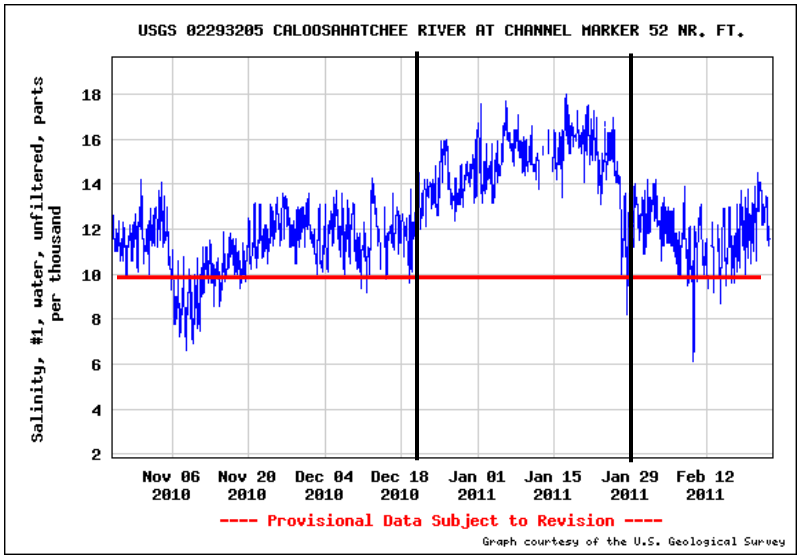


Detail: Salinity this week trending higher. **Sample on 2/20 recorded 4.7 psu/ppt at the Franklin Lock.** Releases have helped drop salinity significantly and need to be continued**.** SFWMD projections show minimum 300 cfs maintaining salinity levels close to 5 psu at I75 while no flow results in significant rise in salinity. **At a minimum 300 cfs is needed to prevent salinity from rising significantly.**

Provisional Val I-75 salinity Forecast for Feb 22 – Mar 7, 2011 - Created on February 22, 2011







Limited tapegrass near Beautiful Island

Upper Estuary Condition: Limited tapegrass coverage at Beautiful Island. Inside and outside of enclosures no difference in grass conditions.

Lower Estuary Condition: Fair. Several varieties of attached algae on turtle grass in the San Carlos Bay.

Algal bloom status: *Cladophora* algae still present at S79, Franklin Locks. New algae bloom reported around SR 31, along the north side of the river.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Deb Drumm, Susan Gray

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. - Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: March 15, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee and how these conditions affect the health, productivity and function of the Caloosahatchee and estuary. This report includes comments on lake releases to the Caloosahatchee to meet the needs of a healthy ecosystem.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 11.87' (Beneficial Use Sub-band) Previous week: 11.97'
Water shortage management band = 11.79'

Rainfall: 3/8/11–3/15/11 Basin rainfall estimate – Lake Okeechobee and vicinity: ~1.00" District-wide: 0.65"

Salinity Ft. Myers: **13.5 – 16** ppt/psu **surface** data USGS sonde @ Marker 52
14 – 20 ppt/psu **mid depth** data SCCF RECON sensor @ Marker 52

Previous week: surface: 11.75 – 17.5 ppt/psu
mid depth: 13 – 19 ppt/psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 13.40 psu (**Violation**)
Above10 ppt/psu (30-day moving average) since 11/21/10 = 114 days

Olga Water Treatment Plant Chloride: 81 ppm Previous week: 87 ppm

Salinity Shell Point: 26 – 34 ppt/psu RECON sensor Previous week: 27 – 34 ppt/psu

Recommendation: Releases have maintained flow through the western/Franklin pool reducing the potential for stagnation and phytoplankton blooms and maintaining a salinity gradient in the upper estuary with minimal impact on the Lake. We request pulse releases continue with a minimum of 300 cfs to maintain low salinity zone (LSZ) habitat that is critical for estuarine-resident and estuarine-dependent fisheries reproduction currently underway.

Benefits from Releases: Releases to the Caloosahatchee are needed to provide water for two primary objectives:

1. To maintain a salinity gradient downstream of the S-79 water control structure to **maintain LSZ** (0.5 – 6 psu) habitat for larval fishes, which is critical during spring and summer peak reproductive periods.

2. To **reduce stagnation** in the Franklin pool, which can stimulate blue-green algae blooms and require the Olga Water Treatment Plant to be shut down. In the past, blue-green algae blooms have resulted in the area being posted as unsafe for fishing and swimming by the Lee County Health Dept.

Maintain LSZ: Recent pulse releases have continued to help maintain LSZ habitat in upper estuary. The spawning season for some shellfish and economically important fish species is just beginning and emphasizes the need to maintain crucial water flows to the estuary. The reproductive success of these species is dependent upon an ecologically healthy LSZ. Ichthyoplankton (eggs and larvae of fishes) are sensitive to changes in freshwater inflow and often depend on LSZ habitat during their early-life stages (preflexion and flexion larval stages), therefore, maintaining a gradient downstream of

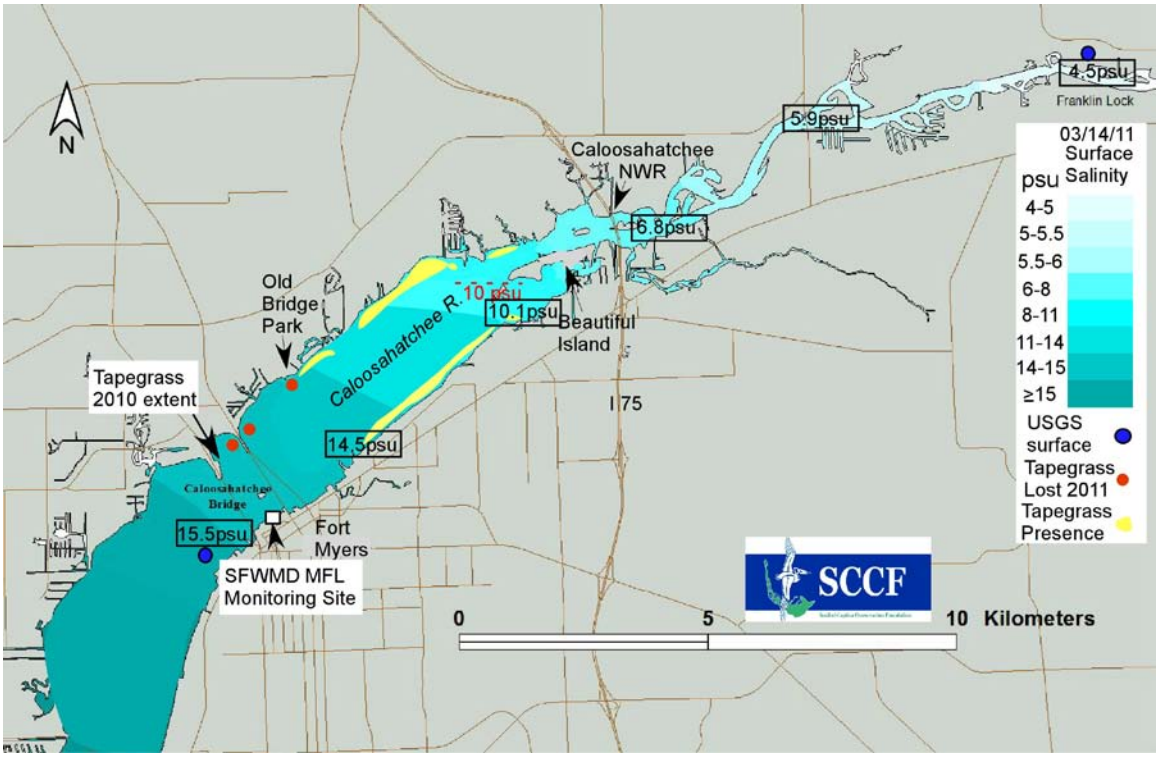
S-79 is critical for their growth and survival. In the Caloosahatchee, LSZ habitat changes as a function of flow. Habitat for larval fishes is compressed as flows are reduced due to changes in river geomorphology and placement of the S-79 structure. During low-flow periods the LSZ is truncated by S-79 compressing habitat volume and extent, increasing overlap between ichthyoplankton and gelatinous predators resulting in more competition for prey resources and/or direct predation on larval fishes. Because some estuarine species, such as anchovies, grow relatively quickly and only spend a short period of time (i.e., days or weeks) in the pre-flexion and flexion stages, maintaining the LSZ downstream of S-79 is critical to ensure their growth and survival to post larval stages where they can more effectively modulate their position in the water column and avoid predation.

Protected Species: Loss of tapegrass and compression of the LSZ due to lack of flow creates adverse conditions for Federally Endangered species including the Florida manatee and juvenile smalltooth sawfish. Tapegrass is critical to manatees upriver to support large concentrations during their annual seasonal aggregation within the estuary. A juvenile smalltooth sawfish (approx 4 ft) was observed just below the river mouth on March 16. One of the action items listed in the Smalltooth Sawfish Recovery Plan is "***to minimize the disruption of historic/natural freshwater flow regimes including timing, quality and quantity***".

Reduce Stagnation: Current pulses have provided flow that has effectively reduced stratification in the Franklin pool. In past drought years, when flow has been cut off, March is when stagnation and blue-green algae blooms begin to appear in the Franklin pool near the Olga WTP. So far no blooms are present.

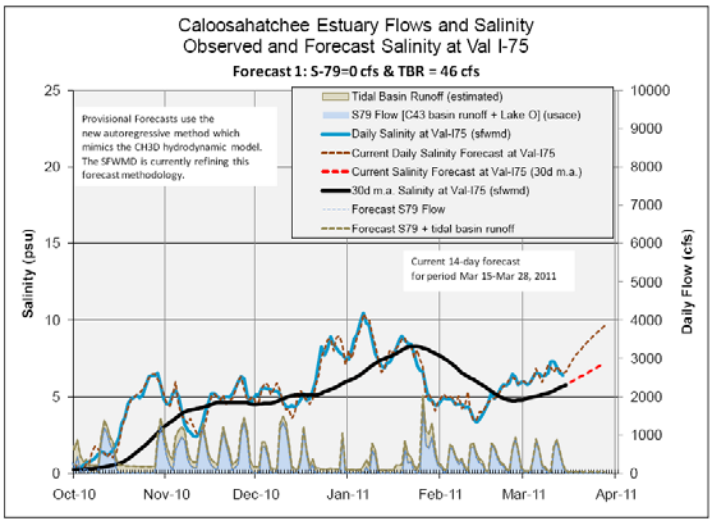
Flow: Published schedule @S79: 300 cfs *** From ACOE Website Daily Reports**

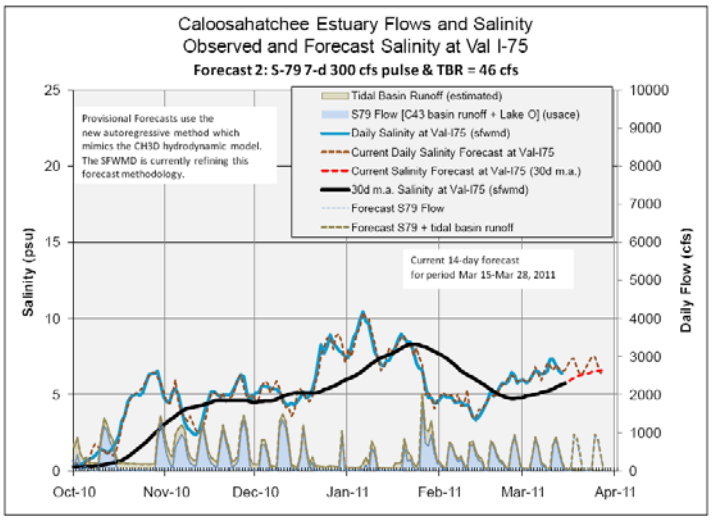
Begin Date & Time	Day of the Week	Day of Pulse Release	S-79 Q (cfs)	S79 Flow * (cfs)	S78 Flow * (cfs)	S77 Flow * (cfs)
3/11/2011, 0700	Fri	1	900	672	266	88
3/12/2011, 0700	Sat	2	800	817	415	308
3/13/2011, 0700	Sun	3	400	496	375	436
3/14/2011, 0700	Mon	4	0	141	95	136
3/15/2011, 0700	Tue	5	0	0	0	96
3/16/2011, 0700	Wed	6	0			
3/17/2011, 0700	Thu	7	0			

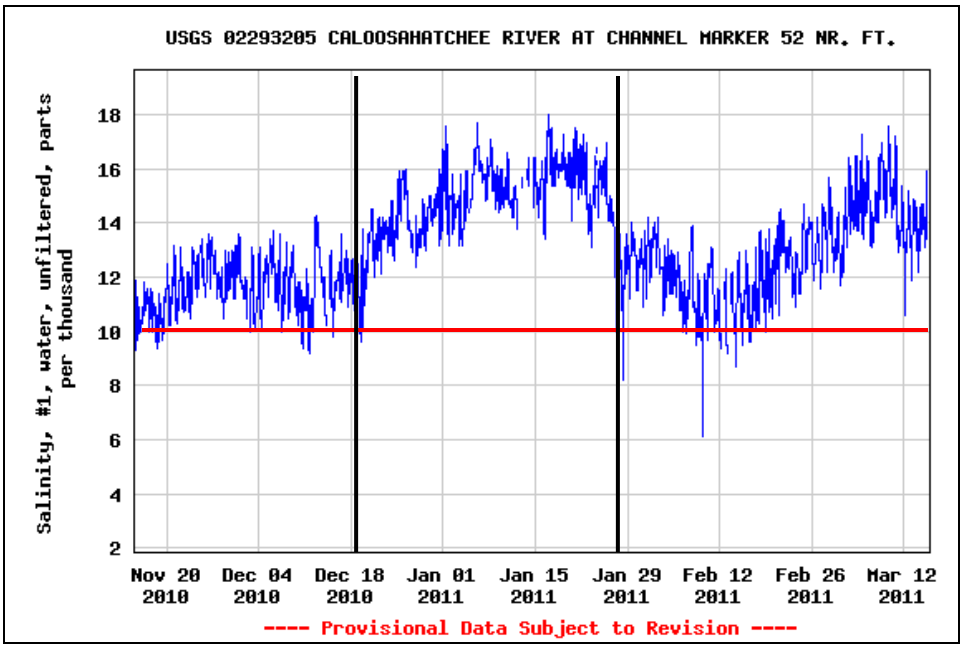


Detail: Pulse flows have helped to keep salinity from moving upstream. Salinity near Beautiful Island decreased from last week with readings of 10.1 psu at Beautiful Island, 6.8 psu at Orange River and 4.5 psu at the Franklin Lock. Sampled salinities are indicated in boxes in the graphic above. Although the target is to keep salinity at or below 5 at I75 and it is above that now, releases are helping to prevent salinity creep and maintain a low salinity zone.

The SFWMD model projections show minimum flows of 300 cfs are not enough to keep salinity at or below 5 at I75 but keep salinity from rising sharply.







Upper Estuary Condition: Tapegrass is still present from a few hundred yards east of the Caloosahatchee Bridge to Beautiful Island, though densities are decreasing, even in exclosures. The salinities just northwest of Beautiful Island have been averaging below 9 psu for the last month. Preferred target salinity range at Beautiful Island is 5 psu.

Lower Estuary Condition: Current salinities in the lower estuary are high for oyster spawning which begins March- April in the lower Caloosahatchee. To maximize productivity and growth and decrease predation and disease in the dry season target salinity is 25 psu. Without freshwater flows salinities would increase resulting in an even greater impact on spawn.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Col Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Carol Wehle, Ken Ammon, Deb Drumm, Susan Gray
DEP Secretary Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz- J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. - Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: March 22, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee river and estuary and how these conditions affect the health, productivity and function of the estuary.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 11.64' Water Shortage Management Band Previous week: 11.87'
Water shortage management band = 11.75'

Rainfall: None

Salinity Ft. Myers: **12.5 – 18.25** ppt/psu **surface** data USGS sonde @ Marker 52
17 – 21.5 ppt/psu **mid depth** data SCCF RECON sensor @ Marker 52

Previous week: surface: 13.5 – 16 ppt/psu
mid depth: 14 – 20 ppt/psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 14.47 psu (**Violation**)
Above10 ppt/psu (30-day moving average) since 11/21/10 = 121 days

Olga Water Treatment Plant Chloride: 89 ppm Previous week: 81 ppm

Salinity Shell Point: 26 – 33.75 ppt/psu RECON sensor Previous week: 26 – 34 ppt/psu

Recommendation: Pulse releases authorized by the Corps through March 14, provided major benefits to the estuary with minimal impact on Lake Okeechobee water levels. Minimal base flows of freshwater helped maintain and protect a salinity gradient in the upper estuary, downstream of the WP Franklin Lock and reduced the potential for stagnation and phytoplankton blooms in the Franklin pool. We request that these minimal pulse releases of 300 cfs be resumed to sustain a low salinity zone (LSZ) that is critical habitat for estuarine-resident and estuarine-dependent fisheries currently spawning.

Benefits from Releases: Releases to the Caloosahatchee are needed during the dry season and droughts to provide water for two primary objectives:

1. To maintain a salinity gradient downstream of the S-79 water control structure to **maintain a LSZ** (0.5 – 6 psu) habitat for larval fishes, which is critical during spring and summer peak reproductive periods.

2. To **reduce stagnation** in the Franklin pool, which can stimulate blue-green algae blooms that cause the Olga Water Treatment Plant to be shut down. In the past, blue-green algae blooms have resulted in the area being posted as unsafe for fishing and swimming by the Lee County Health Dept.

Maintain LSZ: Recent pulse releases have continued to help maintain the LSZ habitat in the upper estuary. The spawning season for some shellfish and economically important fish species is just beginning and emphasizes the need to maintain crucial water flows to the estuary. The reproductive success of these species is dependent upon an

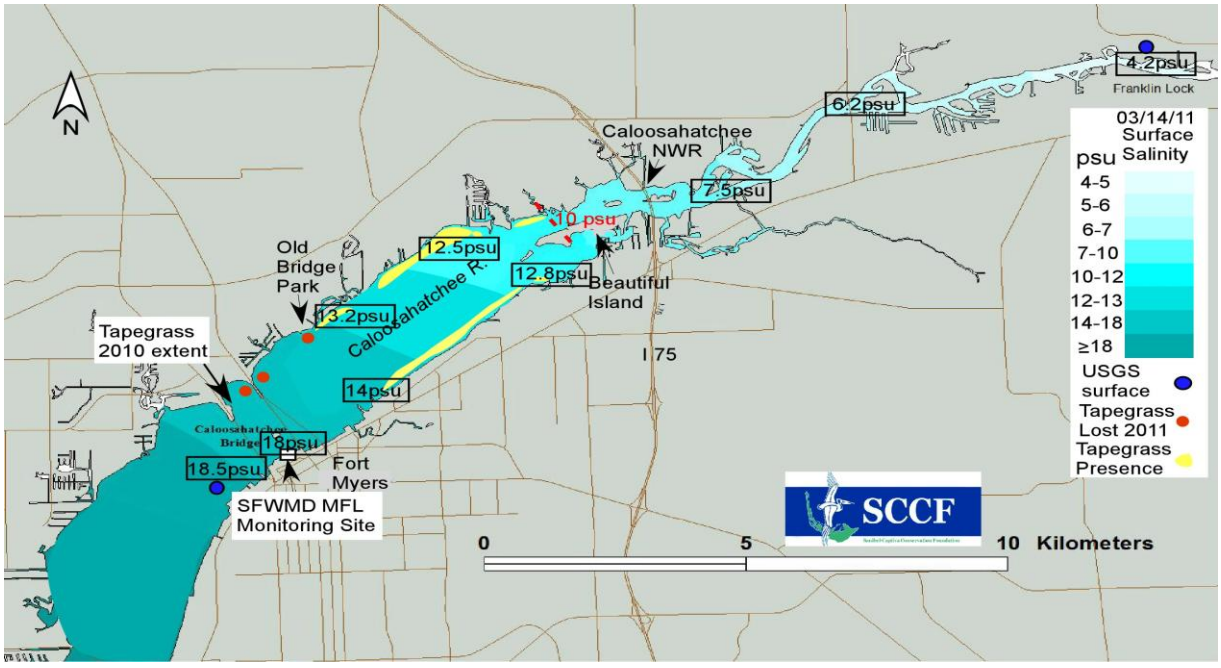
ecologically healthy LSZ. Ichthyoplankton (eggs and larvae of fishes) are sensitive to changes in freshwater inflow and often depend on LSZ habitat during their early-life stages (preflexion and flexion larval stages), therefore, maintaining a gradient downstream of S-79 is critical for their growth and survival. In the Caloosahatchee, flow from S79 is required during dry seasons and drought to maintain LSZ habitat in the estuary downstream of the lock. Habitat for larval fishes is compressed up against the lock as flows are reduced or cut off due to changes in river geomorphology and truncation of the estuary by the placement of the S-79 structure. Loss of the LSZ downstream of S-79 artificially compresses ichthyoplankton and gelatinous predators against the structure resulting in more competition for prey resources and/or direct predation on larval fishes. Because some estuarine species, such as anchovies, grow relatively quickly and only spend a short period of time (i.e., days or weeks) in the pre-flexion and flexion stages, maintaining the LSZ downstream of S-79 is critical to ensure their growth and survival to post larval stages where they can more effectively modulate their position in the water column and avoid predation.

Protected Species: Loss of tapegrass and compression of the LSZ due to lack of flow creates adverse conditions for Federally Endangered species including the Florida manatee and juvenile smalltooth sawfish. Tapegrass is critical to manatees upriver to support large concentrations during their annual seasonal aggregation within the estuary. Protecting the viability of the tapegrass beds during drought periods can minimize cold-induced stress documented in this manatee population the last 2 winters, especially the sub-adult animals. A juvenile smalltooth sawfish (approx 4 ft) was observed just below the river mouth on March 16. One of the action items listed in the Smalltooth Sawfish Recovery Plan is "***to minimize the disruption of historic/natural freshwater flow regimes including timing, quality and quantity"***.

Reduce Stagnation: Pulses have provided flow that has effectively reduced stratification in the Franklin pool. In past drought years- when flow has been cut off, stagnation and blue-green algae blooms appeared in the dry season at the Franklin pool near the Olga WTP. No blooms have been documented so far this season.

Flow: Published schedule @S79: 0 cfs *** From ACOE Website Daily Reports**

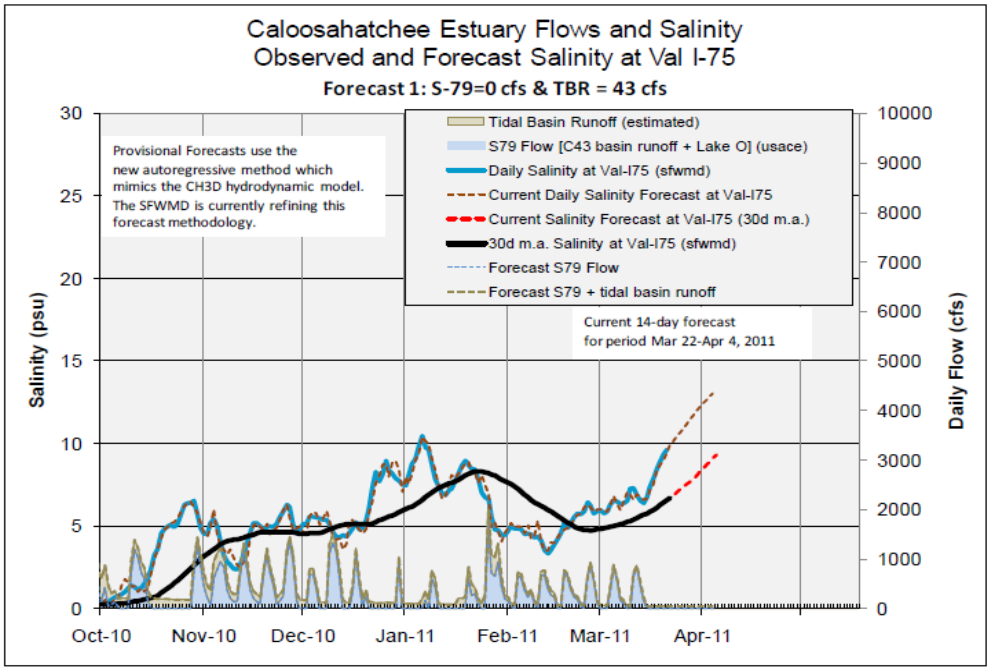
Begin Date & Time	Day of the Week	Day of Pulse Release	S-79 Q (cfs)	S79 Flow * (cfs)	S78 Flow * (cfs)	S77 Flow * (cfs)
3/15/2011, 0700	Tue	5	0	0	0	**96**
3/16/2011, 0700	Wed	6	0	0	0	**208**
3/17/2011, 0700	Thu	7	0	0	0	**250**
3/18/2011, 0700	Tue	-	0	**0**	**233**	**426**
3/19/2011, 0700	Wed	-	0	**0**	**189**	**548**
3/20/2011, 0700	Thu	-	0	**0**	**148**	**520**
3/21/2011, 0700	Thu	-	0	**0**	**44**	**230**

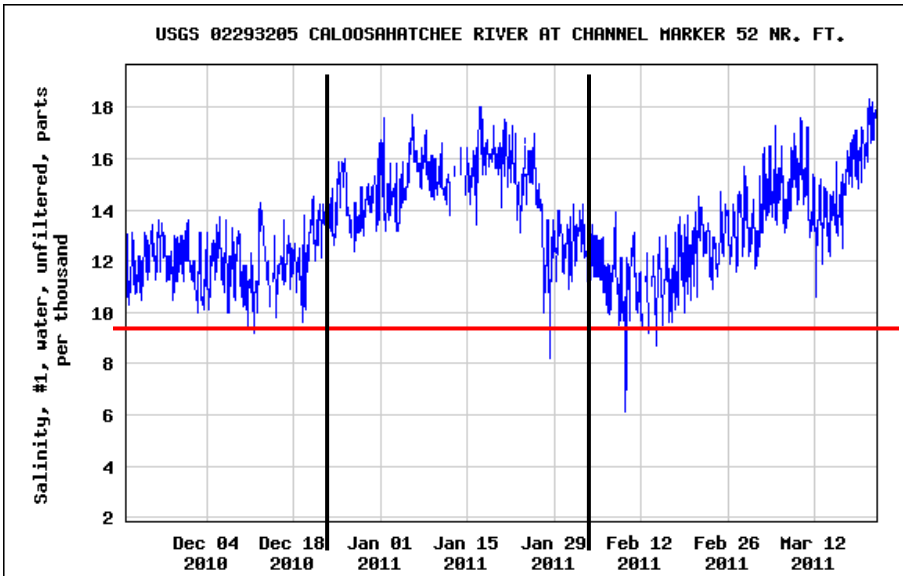


Detail: The decision to cut off flow to the estuary has resulted in the salinity gradient moving upstream, further reducing the LSZ habitat volume. Salinity near Beautiful Island has increased this past week from 10.1 to 12.8 psu at Beautiful Island, 7.5 psu at Orange River and 4.2 psu at the Franklin Lock. Sampled salinities are indicated in boxes in the graphic above. Although, the Caloosahatchee MFL is 10 psu at Ft Myers (SFWMD MFL Monitoring Site) salinity has exceeded the MFL since October, 2010. The SFWMD has established an alternate target of 5 psu at the I75 bridge. While salinities have exceeded that target since February 22 releases have helped to prevent salinity creep. In past years lack of flow has compressed high salinities of 20-22 psu up against the S79 structure. This has resulted in the complete loss of LSZ habitat, high chlorides at the Water Treatment Plant and blue green algae blooms in the basin.

The SFWMD model projections for March 22 – April 4 reflect the sharply rising salinities being experienced (surpassing 10 psu at I75) since flows have been cut off. Past experience when flows are cut off demonstrated that it takes much more water to reduce salinities once they are high than it would take to prevent such high salinities. The USGS graph shows salinities exceeding the previously high salinities in December when flow was initially cut off.

Provisional Val I-75 Salinity Forecast for Mar 22 – Apr 4, 2011 - Created on March 22, 2011





Upper Estuary Condition: Tapegrass beds have receeded upstream 8/10 of a mile from the Caloosahatchee Bridge with densities decreasing, even in exclosures. The salinities northwest of Beautiful Island have risen from below 9 psu to over 12 psu this past week, while salinities at Old Bridge Road are exceeding 14 psu. The preferred target salinity range at Beautiful Island is 5 psu.

Lower Estuary Condition: Current salinities in the lower estuary are high for oyster spawning which begins March- April in the lower Caloosahatchee. To maximize productivity and growth and decrease predation and disease in the dry season salinities should be maintained around 25 psu. Without freshwater inflow salinities will increase resulting in greater impacts on oyster larvae.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Carol Wehle, Ken Ammon, Deb Drumm, Susan Gray
DEP Secretary Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans- City of Sanibel
Keith Kibbey- Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. - Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: March 29, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee river and estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 11.52' Water Shortage Management Band Previous week: 11.64'
Water shortage management band = 11.72'

Rainfall: WP Franklin 1.34", Ortona 1.37", Moore Haven 1.04"

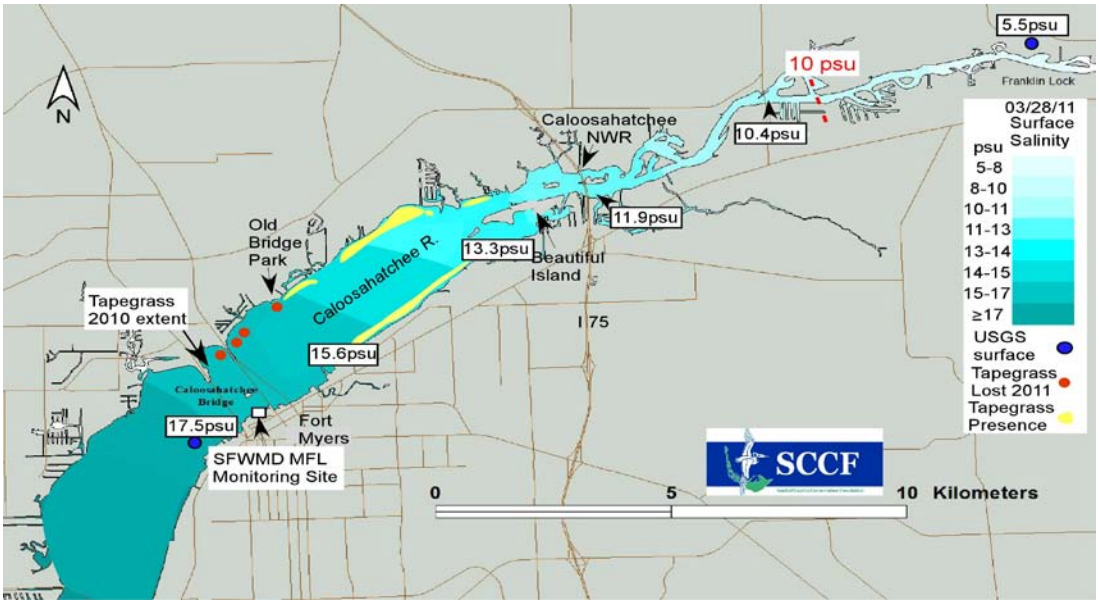
Salinity Ft. Myers: **15.6 – 19.3** ppt/psu **surface** data USGS Marker 52 Previous wk: **12.5 – 18.3** psu
16.0 - 19.7 ppt/psu **mid depth** data SCCF RECON Marker 52 **17.0 – 21.5** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 15.43 psu (**Violation**)
Above10 ppt/psu (30-day) since 11/21/10 = **128 days**

Olga Water Treatment Plant Chloride: 105 ppm Previous week: 89 ppm

Salinity Shell Point: 26.7 – 34.0 ppt/psu RECON sensor Previous week: 26 – 33.7 ppt/psu

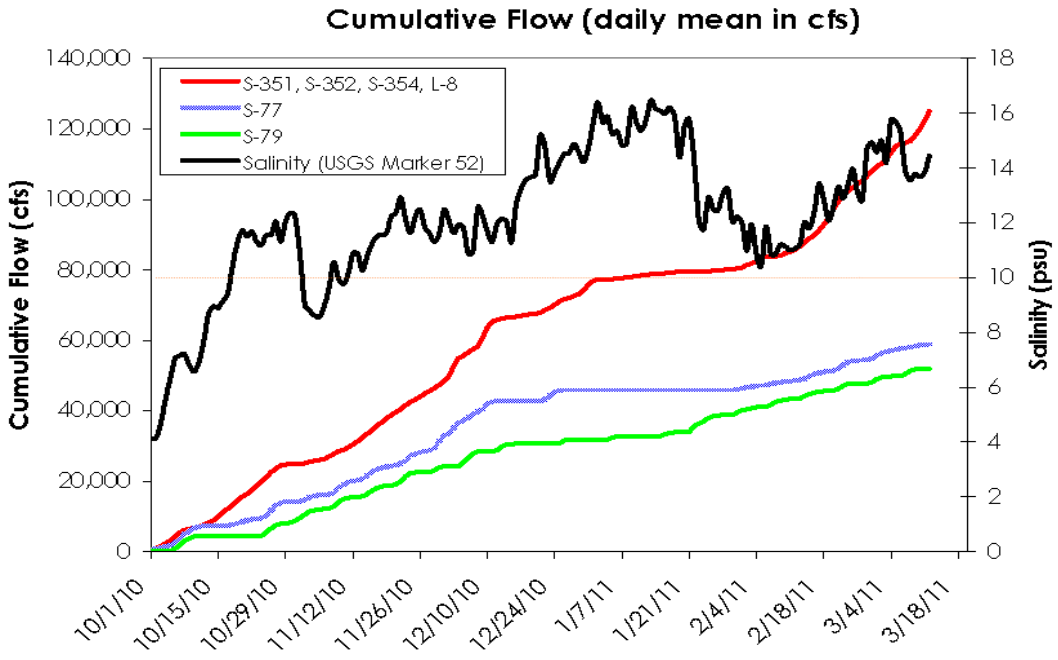
Recommendation: Minimal base flows of freshwater are needed to retain low salinity habitat in the eastern most reach of the estuary, downstream of the WP Franklin Lock. In the past week the 10 psu line moved 7.5 kilometers upstream, further reducing low salinity habitat. We request pulse releases of 300 cfs be resumed to sustain low salinity habitat critical for currently spawning commercial and recreational fisheries and oysters.



Flow: * From ACOE Website Daily Reports ** Flow entirely from Rainfall

Date & Time	Day	S-79 Q (cfs)	S79 Flow * (cfs)	S78 Flow * (cfs)	S77 Flow * (cfs)
3/22/2011, 0700	Tue	0	0	0	**260**
3/23/2011, 0700	Wed	0	0	0	**401**
3/24/2011, 0700	Thu	0	0	146	**465**
3/25/2011, 0700	Fri	0	**0**	**146**	**617**
3/26/2011, 0700	Sat	0	**0**	**108**	**616**
3/27/2011, 0700	Sun	0	**0**	**0**	**116**
3/28/2011, 0700	Mon	0	**204****	**NR**	**0**

There have been no pulse releases or flow into the estuary at S79 for the past two weeks. On 3/28 rain provided the first flow since 3/15. Lack of flow has caused the salinity in the upper estuary to rise precipitously. In the past week alone the 10 psu zone advanced 7.5 kilometer upriver. Given this rate of rise, another week without flow could result in salinities moving the remaining 6 kilometers to the S79 structure. Lack of flow has also resulted in a 16 ppm jump in chlorides at the Olga Water Treatment plant in the past week rising from 89 to 105 ppm. Due to the rising chloride levels the Franklin lock schedule will be reduced to three days per week. The reduction and elimination of freshwater habitat downstream of the lock will have a devastating impact on the spawning currently underway for commercial and recreational species that use the Caloosahatchee estuary.



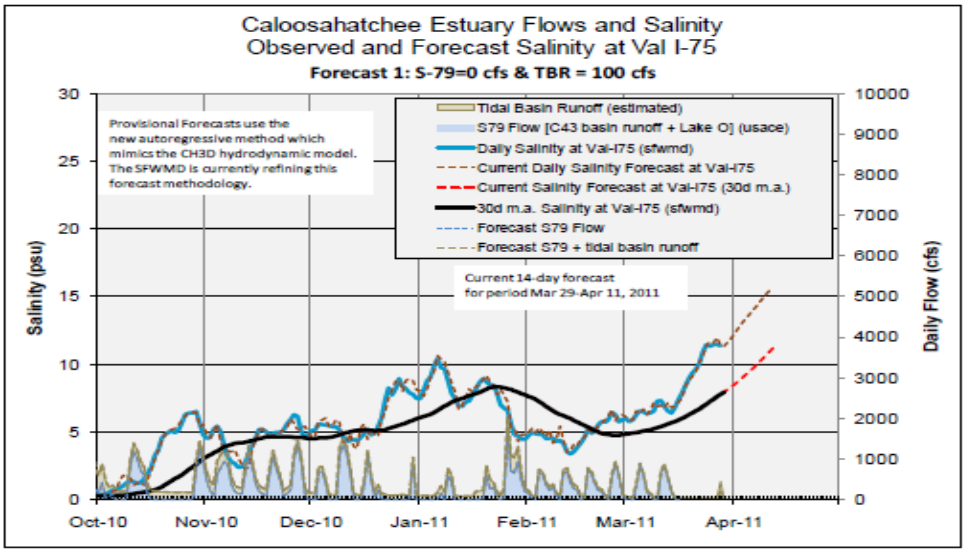
The above graph shows cumulative flows (colored lines) from October, 2010 – March 16, 2011 relative to salinity at Ft Myers (black line) and the Caloosahatchee MFL=10 psu (orange horizontal line). Note the precipitous rise in salinity beginning in October when flows into the Caloosahatchee (blue and green lines) are flat. Within the first two weeks the Caloosahatchee has exceeded its MFL target. Significant pulse releases beginning October 29 that front loaded high flows helped to drop salinity into the target MFL zone. Pulse releases helped keep salinity around 12 psu until releases were stopped completely on Dec 15th. At that point salinities once again rose precipitously to levels above 16 psu. January rainfall events provided freshwater flow to the estuary that slowed the increase in salinity levels. In February the COE restarted releases at the lower level of 300 cfs. These releases, coupled with additional rainfall events, were instrumental in retaining the low salinity habitats the fisheries resources depend on.

Upper Estuary Condition: Lack of flow has caused the salinity to move 7.5 kilometers upstream since last week. The spawning season is currently underway for some shellfish and economically important fish species that depend on a low salinity zone in the Caloosahatchee. Loss of low salinity habitat downstream of S-79 artificially eliminates the critical

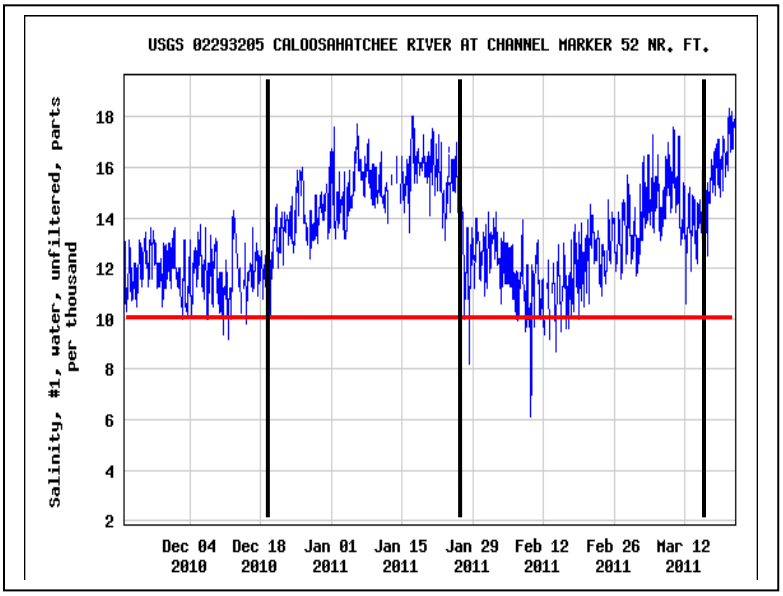
habitat compressing larval fishes and predators against the structure Some estuarine species, such as anchovies, grow relatively quickly and need only a short period of time (i.e., days or weeks) in the low salinity zone, therefore, maintaining the low salinity zone downstream of S-79 is critical to ensure their growth and survival to post larval stages where they can more effectively modulate their position in the water column and avoid predation.

Lower Estuary Condition: Current salinities in the lower estuary are high for oyster spawning which is underway in the lower Caloosahatchee. To maximize productivity and growth and decrease predation and disease in the dry season salinities should be maintained around 25 psu. Without freshwater inflow salinities will increase resulting in greater impacts on oyster larvae.

Provisional Val I-75 Salinity Forecast for Mar 29 – Apr 11, 2011 - Created on March 29, 2011



The above SFWMD forecast model graph for March 29 – April 11, 2011 show the dramatic increase in salinity resulting from lack of flow. Unfortunately they did not produce one showing the effect a 300 cfs pulse release would have on salinities. The below USGS graph does show the measured effect of releases on salinity. When water was cut off Dec 15 salinity rose until releases resumed in February. A drenching storm the last week of January accounted for the precipitous drop on January 29th. Lack of flow the last two weeks has resulted in escalating salinities.



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Carol Wehle, Ken Ammon, Deb Drumm, Susan Gray DEP Secretary Herschel Vinyard

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Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: April 12, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level**: 11.56'**- **Beneficial Use Sub band** Previous week:11.61' **Beneficial Use Sub band**
Water shortage management band **= 11.43'**

Weekly Rainfall: WP Franklin 0.59", Ortona 0.42", Moore Haven 0.00"

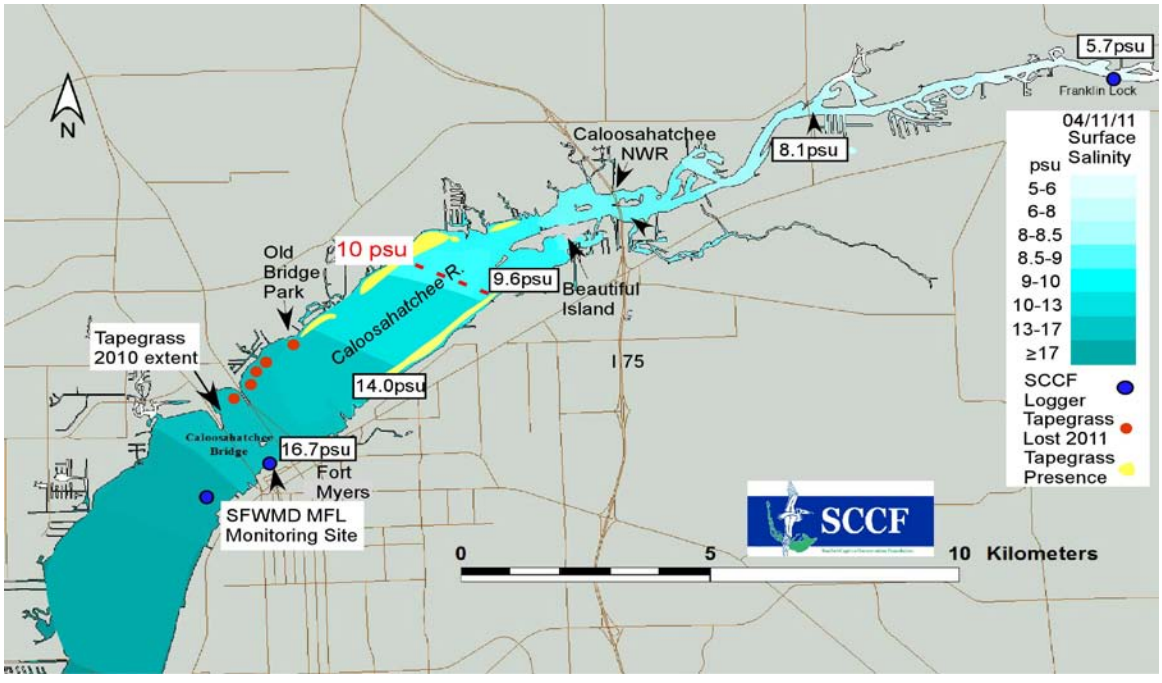
Salinity Ft. Myers: **16.0 -18.0** ppt/psu **mid depth** data SCCF RECON Marker 52 **14.0 – 17.5** psu
USGS Marker 52 no longer operating

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 15.81 psu surface (**Violation**) 18.31 psu bottom
Above10 ppt/psu (30-day) since 11/21/10 = **142 days**

Olga Water Treatment Plant Chloride: 102 ppm Previous week: 96 ppm

Salinity Shell Point: 30.0 – 34.0 ppt/psu RECON sensor Previous week: 26.0 – 34.0 ppt/psu

Recommendation: Minimal base flows of freshwater are needed to retain low salinity habitat in the upper estuary, downstream of the WP Franklin Lock. The 10 psu line moved 1.5 kilometers upstream in the past week, which underscores the importance of retaining a baseflow in the system to reduce salinities during the dry season. We request pulse releases of 300 cfs be resumed to extend the benefit from recent rain and slow the rate of salinity rise throughout the system.



Flow: *** From ACOE Website Daily Reports**

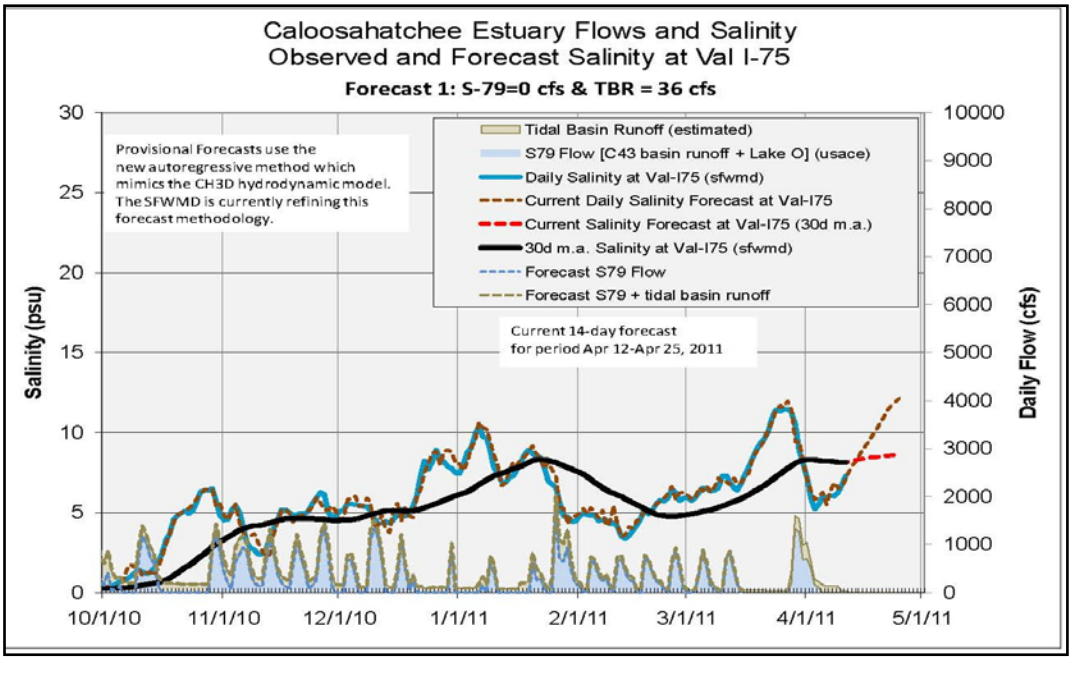
Date & Time	Day	S-79 Q (cfs)	S79 Flow * (cfs)	S78 Flow * (cfs)	S77 Flow * (cfs)
4/5/2011, 2400	Tue	0	0	0	0
4/6/2011, 2400	Wed	0	0	0	0
4/7/2011, 2400	Thu	0	0	0	0
4/8/2011, 2400	Fri	0	0	0	64
4/9/2011, 2400	Sat	0	0	0	146
4/10/2011, 2400	Sun	0	0	0	26
4/11/2011, 2400	Mon	0	0	0	160

There has been no flow from Lake O since March 6th. Last week's rainfall prevented the salinity wedge from moving upstream and further compressing the low salinity zone (LSZ) against the S-79 structure. Rapid increases in salinity in the upper estuary and loss of the LSZ habit could impact fisheries and shellfish species as they reach peak spawning season. Resuming minimal base flow releases will help moderate salinities and minimize compression and loss of LSZ habitat. Loss of freshwater tapegrass habitat takes years to recover once lost impacting all species.

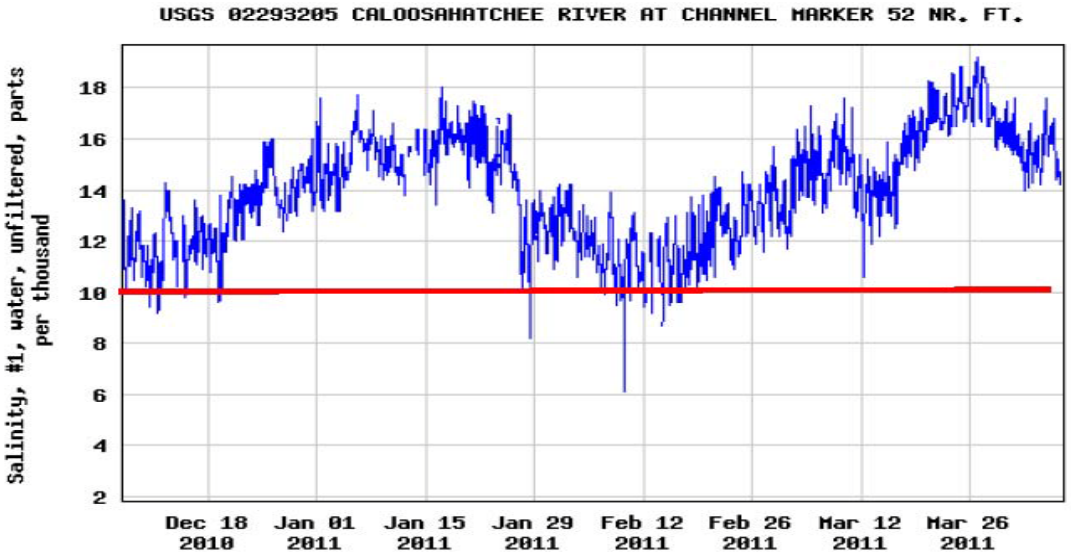
Upper Estuary Condition: Poor, due to increased salinity and loss of low salinity zone habitat for larval finfish and shellfish. Without flow phytoplankton blooms are common within the eastern pools and upper estuary as water temperatures and residence times increase.

Lower Estuary Condition: A diatom bloom was documented along the beaches of Sanibel over the past week (Lee County/FWRI). FWRI is working to identify the diatoms to species, but it appears to be Pseudo-nitzschia. Some species in this genus can produce a toxin called domoic acid. When cells lyse, it produces a chocolate milk looking fringe to appear along the shoreline.

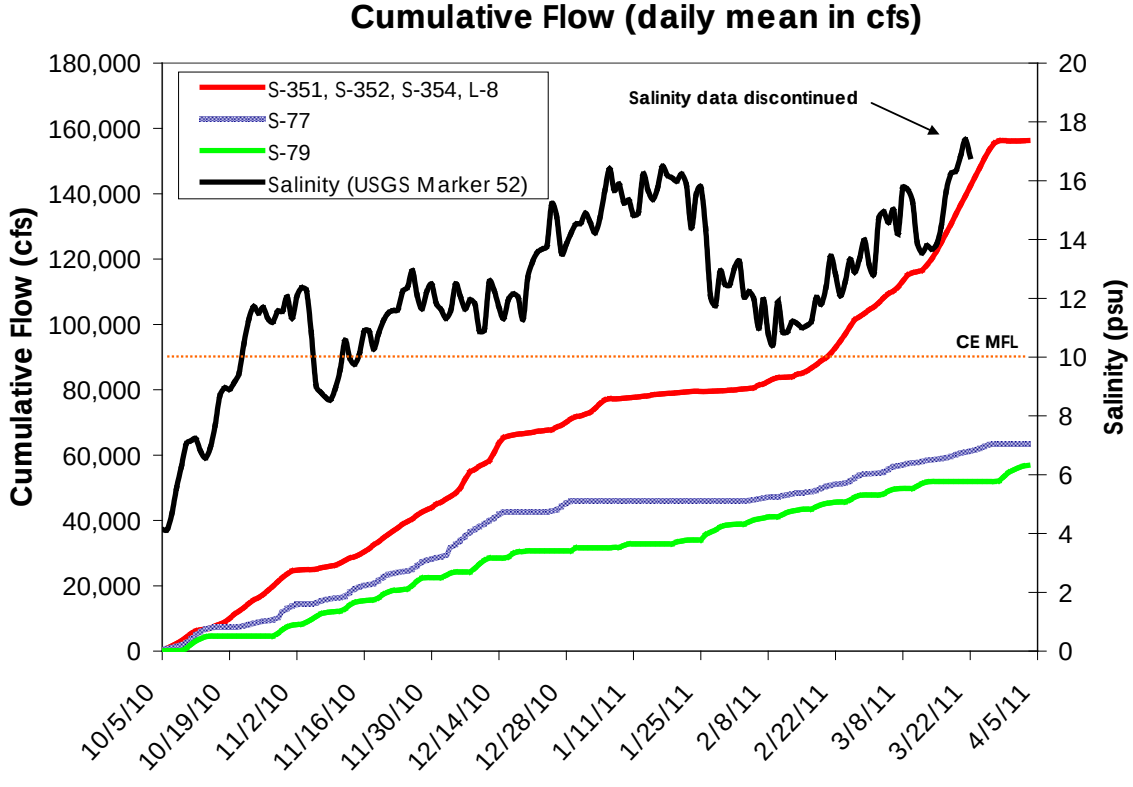
Current salinities in the lower estuary are above the desired range for Eastern oyster productivity, growth, larval recruitment and spawning. The dry season salinity range should be maintained below 25 psu. Mean *Perkinsus marinus* infection prevalence (85.38%) and intensity (1.48) remain high due to high salinities in the estuary. Reproduction and recruitment of oysters is in process. Predation of juvenile oysters remains very high. A freshwater release will moderate salinities resulting in lower disease prevalence and intensity and higher juvenile oyster survival.



The SFWMD forecast model graph for April 12–25, 2011, above, reflects the steep rate of salinity increase (brown dotted line) resulting from lack of freshwater flow through S79.



The USGS salinity graph, above, reflects salinity levels that mirror those from January when flows were cut off. The effect of recent rains that provided an average of 684 cfs two weeks ago shows the significant beneficial effect of freshwater flows. The USGS data for the previous week is not shown, as data collection was discontinued on March 31st. Future charts will show SCCF data from the Fort Myers Yacht Basin.



The above graph shows cumulative flows (colored lines) from October 5, 2010 through April 3, 2011 relative to surface salinity recorded at USGS Marker 52 in Ft Myers (black line). The Caloosahatchee MFL (10 psu) is depicted by the orange horizontal dotted line. Note the precipitous rise in salinity beginning in October when flows to the Caloosahatchee (blue and green lines) were flat. Within the first two weeks of October the Caloosahatchee exceeded its MFL target. Pulse releases in late October helped drop salinity briefly into the target MFL zone. Continuous pulse releases helped keep salinity around 12 psu until releases were stopped completely on Dec 15th. At that point salinities once again rose precipitously to levels above 16 psu. January rainfall events provided freshwater flow to the estuary that slowed the increase in salinity levels. In February the COE resumed releases at the lower level of 300 cfs. These releases, coupled with additional rainfall events, were instrumental in retaining the low salinity habitats the fisheries resources depend on. Early March releases were again completely cut off endangering the remaining freshwater habitat. March - May are crucial times when flows are needed to support reproduction of economically and ecologically critical species.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Carol Wehle, Ken Ammon, Deb Drumm, Susan Gray, DEP Herschel Vinyard, Melissa Meeker

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: April 19, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level**: 11.31'** - **Beneficial Use Sub band** Previous week:11.56' Beneficial Use Sub band
Water shortage management band **= 11.25'**

Weekly Rainfall: None

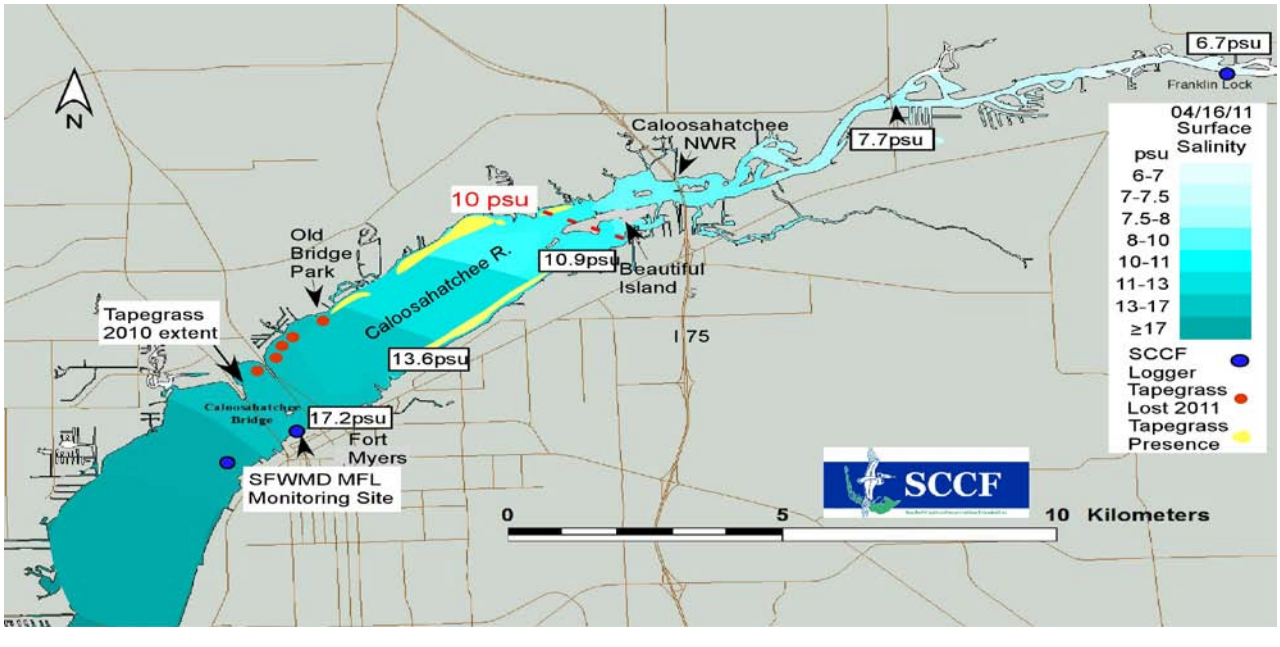
Salinity Ft. Myers: **14 - 18** psu **surface** data SCCF sonde Ft Myers Yacht Basin
17- 20 psu **mid depth** data SCCF RECON Marker 52 Previous week **16.0 -18.0** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 16.0 psu surface (**Violation**)
Above10 ppt/psu (30-day) since 11/21/10 = **149 days**

Olga Water Treatment Plant Chloride: 116 ppm Previous week: 102 ppm

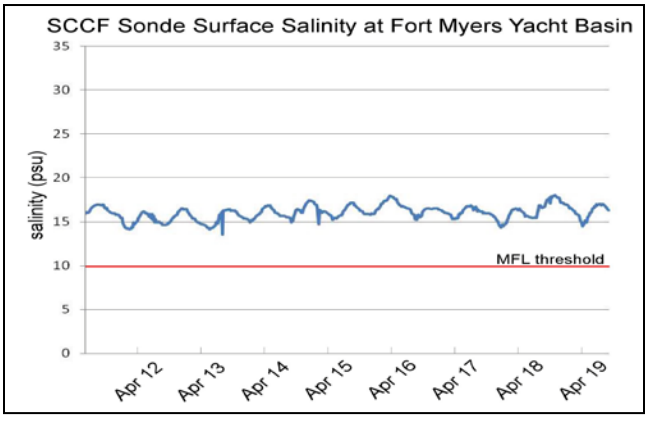
Salinity Shell Point: 29 – 34.5 psu RECON sensor Previous week: 30.0 – 34.0 psu

Recommendation: Minimal base flows of freshwater are needed to retain low salinity habitat in the upper estuary, downstream of the WP Franklin Lock. The 10 psu line moved over one kilometer upstream in the past week, due to lack of freshwater inflow. We request pulse releases of 300 cfs be resumed to slow the rate of salinity rise throughout the system.



Flow: *** From ACOE Website Daily Reports**

Date	Day	S-79 Q (cfs)	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
4/12/2011	Tue	0	0	0	308
4/13/2011	Wed	0	0	0	336
4/14/2011	Thu	0	0	245	470
4/15/2011	Fri	0	0	247	666
4/16/2011	Sat	0	0	147	448
4/17/2011	Sun	0	0	148	486
4/18/2011	Mon	0	0	149	480

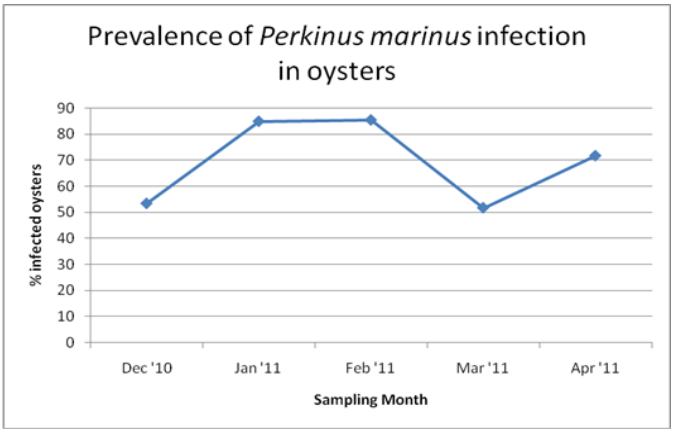


The estuary has received no flow from Lake O over the past 7 weeks, since March 6th. Water has been continuously discharged from the lake during the past 11 days for agricultural water supply. There has been no rainfall in the basin the past week. Salinities continue to rise in the estuary. The low salinity zone (LSZ) moved upstream approximately one kilometer to Beautiful Island/ I-75 where salinities measure 10.9 psu downstream of the Orange River inflow. Salinity at SR 31 is 7.7 psu and 6.7 psu at the S79 structure. The river topography narrows considerably above Beautiful Island/I-75 increasing the rate of LSZ loss. With no additional releases from the lake, loss of the entire LSZ is probable, as in prior drought years. This pattern has resulted in the total loss of LSZ habitat with salinities of 20 psu at the S-79 structure. Rapid increases in salinity in the upper estuary and loss of the LSZ habitat will impact fisheries and shellfish species during peak spawning season. Resuming minimal releases will help moderate salinities and minimize compression and loss of LSZ habitat. Recovery of freshwater tapegrass habitat will take years resulting in impacts to numerous species.

Upper Estuary Condition: Poor, due to increased salinity and loss of low salinity zone habitat for larval finfish and shellfish.

Lower Estuary Condition: ***Blooms***: Diatoms continue to bloom in Lee County waters along the beaches and in Pine Island Sound at Matlacha Pass. Identified as predominantly *Pseudonitzschia* , pennate mix and *Leptocylindrus minimu.*

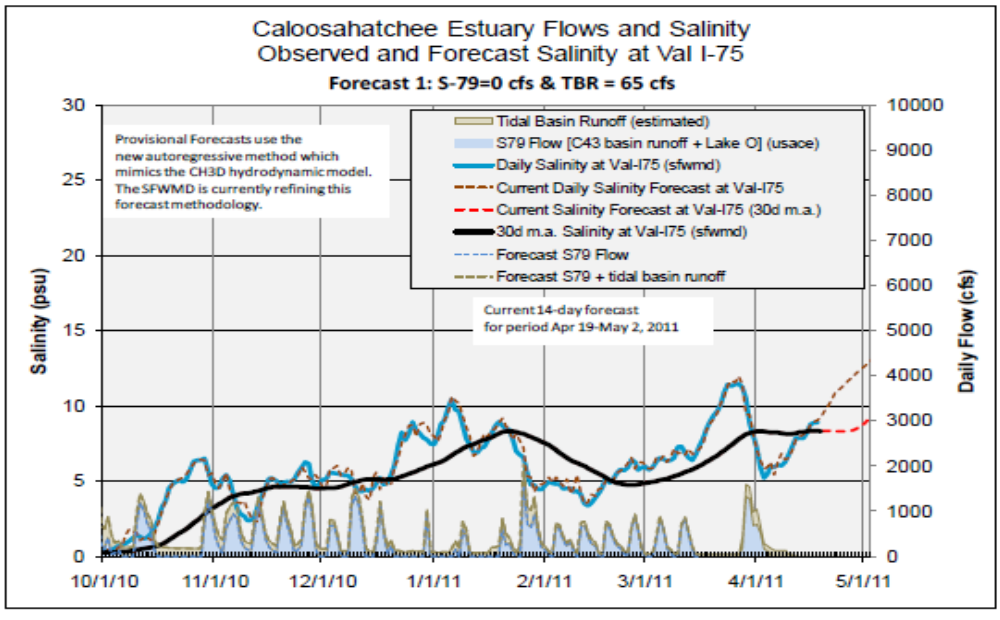
Oysters: Current salinities in the lower estuary continue above the desired range for eastern oyster productivity, growth, larval recruitment and spawning. The desired dry season salinity range is below 25 psu. Disease prevalence is between 60 – 100%; Parasite intensity between 0.8 – 1.3; **Survival of juvenile oysters in open cages is poor** given predation as a result of high salinities. Freshwater releases would moderate salinities resulting in lower disease prevalence and intensity and higher juvenile oyster survival.



Wading birds: Rookery islands in the river and in Matlacha Pass are currently active with various stages of incubating birds, chicks and fledglings. The success of these rookeries is dependent on easily accessible food sources provided by the shellfish and bait fish species of the area. Loss of these important food chain links can have significant negative impacts on the reproductive potential of the local wading bird population.

Night heron nest with chicks, Lower Bird Island, Matlacha Pass National Wildlife Refuge

Provisional Val I-75 Salinity Forecast for Apr 19 – May 2, 2011 - Created on April 19, 2011



The objective of the SFWMD forecast model was to graph predictions under varying flow conditions with the objective being to achieve 5 psu or less at I-75. This projection for April 19–May 2, 2011, above, only evaluates the conditions without flow. In comparison to samples recorded locally it under predicts the salinity increase with salinities just west of I-75 already at 10.9 psu.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Tommy Stroud, Ken Ammon, Deb Drumm, Susan Gray, DEP Herschel Vinyard, Melissa Meeker

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: April 26, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level**:** **11.10'** - **Beneficial Use Sub band** Previous week:11.31' Beneficial Use Sub band
Water shortage management band **= 11.08'**

Weekly Rainfall: WP Franklin 0.61", Ortona 0.11", Moore Haven 0.07"

Salinity Ft. Myers: **15 – 19.5** psu **surface** data SCCF sonde Ft Myers Yacht Basin **14 - 18**

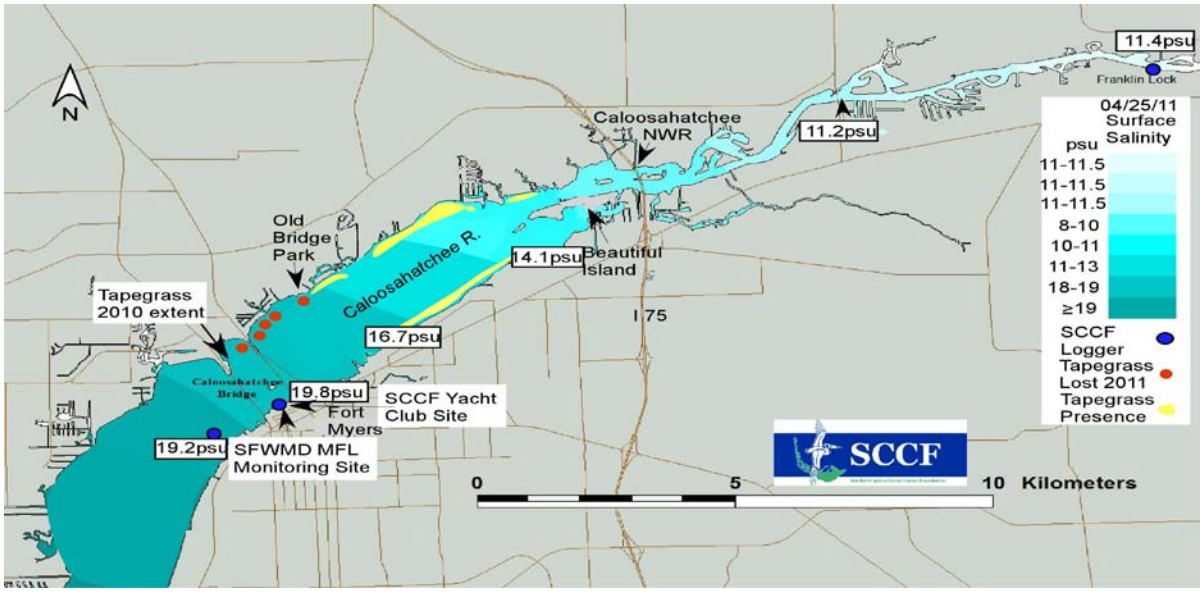
17.5- 24 psu **mid depth** data SCCF RECON Marker 52 Previous week **17- 20** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 16.5 psu surface (**Violation**)
Above10 ppt/psu (30-day) since 11/21/10 = **156 days**

Olga Water Treatment Plant Chloride: 122 ppm Previous week: 116 ppm

Salinity Shell Point: 29.7 – 35.0 psu RECON sensor Previous week: 29 – 34.5 psu

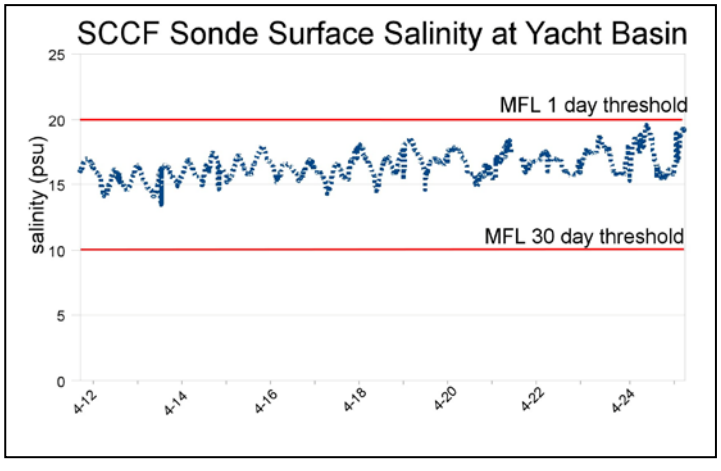
Recommendation: The low salinity zone in the Caloosahatchee was lost this past week. Lack of freshwater flow moved the salinity zone over 12 kilometers upstream compressing higher salinities against the S79 structure. We request pulse releases of 300 cfs be resumed to restore some low salinity zone habitat within the estuary for spawning fish, crabs, shrimp and shellfish.



Flow: *** From ACOE Website Daily Reports**

Date	Day	S-79 Q (cfs)	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
4/19/2011	Tue	0	0	20	500
4/20/2011	Wed	0	0	149	556
4/21/2011	Thu	0	0	148	470
4/22/2011	Fri	0	0	146	666
4/23/2011	Sat	0	0	36	448
4/24/2011	Sun	0	0	0	486
4/25/2011	Mon	0	0	0	480

The estuary has received no flow from Lake O over the past 8 weeks, since March 6th. However, water has been continuously discharged from the lake during the past 18 days for agricultural water supply. There has been very sparse and widely scattered rainfall in the basin the past week. Extremely dry conditions absorbed what fell resulting in little to no runoff. As forecast in last week's report salinities rose precipitously in the estuary in the past week moving upstream 12 km to the S79 structure, eliminating the low salinity zone.

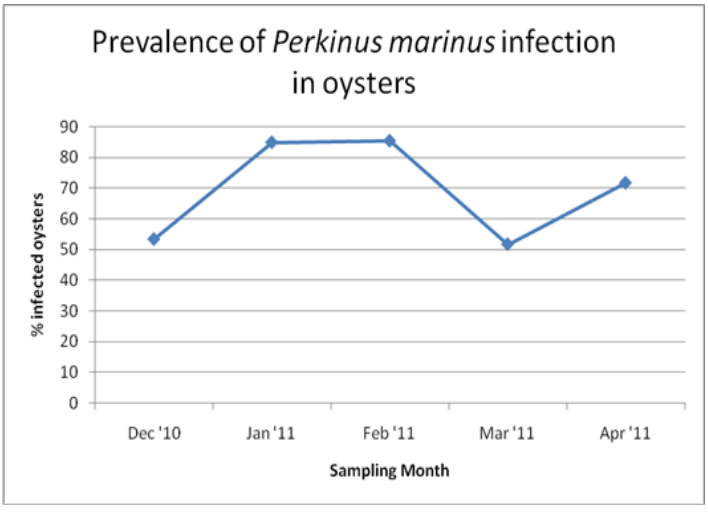


Salinity at Fort Myers is 19.5, at Beautiful Island/ I-75 salinities measure 14.1 psu downstream of the Orange River inflow. Salinity at SR 31 is 11.2 psu and 11.4 psu at the S79 structure. Without flow, salinities above 20 psu are expected at the S-79 structure resulting in the loss of both the oligohaline and mesohaline zones.

Releases between now and the end of the dry season would take just one inch of water off the lake and would protect some freshwater habitat at this critical spawning period. Recovery of freshwater habitat takes multiple years to recover once lost. This actual loss can be abated by resuming freshwater flows. Currently water supply to permitted users from the lake is twice the volume of water coming into the lake. These users are not using all their allocation yet natural systems are cut off 100% and experiencing actual loss and harm from lack of water supply.

Upper Estuary Condition: Very Poor. Complete loss of low salinity zone habitat for larval finfish and shellfish currently spawning.

Lower Estuary Condition: Poor: Dense phytoplankton bloom upstream of Ft Myers- Old Bridge and Beautiful Island (25-30 ug/l)Diatoms continue to bloom in Lee County waters along the beaches and in Pine Island Sound at Matlacha Pass. Identified as pennate diatoms.



Oysters: Salinities of 30-35 remain well above the desired range for eastern oyster productivity, growth, larval recruitment and spawning. The desired dry season salinity range is below 25 psu. Disease prevalence is between 60 – 100%; Parasite intensity between 0.8 – 1.3; **Survival of juvenile oysters in open cages is poor** given predation as a result of high salinities. Freshwater releases are needed to moderate salinities, lower disease prevalence and intensity and improve oyster survival.

Wading birds: Rookery islands in the river and in Matlacha Pass are currently active with various stages of incubating birds, chicks and fledglings. The success of these rookeries is dependent on easily accessible food sources provided by the shellfish and bait fish species of the area. Loss of these important food chain links can have significant negative impacts on the reproductive potential of the local wading bird population.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Tommy Stroud, Ken Ammon, Deb Drumm, Susan Gray, DEP Herschel Vinyard, Melissa Meeker

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: May 10, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary
Lake Okeechobee Level**:** **10.69'** - Water Shortage Management Band Previous wk: **10.89'** Water Shortage
Water shortage management band **= 10.82'**

Weekly Rainfall: WP Franklin 0.63", Ortona 0.68", Moore Haven 1.33"

Salinity Ft. Myers: **17 – 21** psu **surface** data SCCF sonde Ft Myers Yacht Basin Previous week 17 – **21** psu

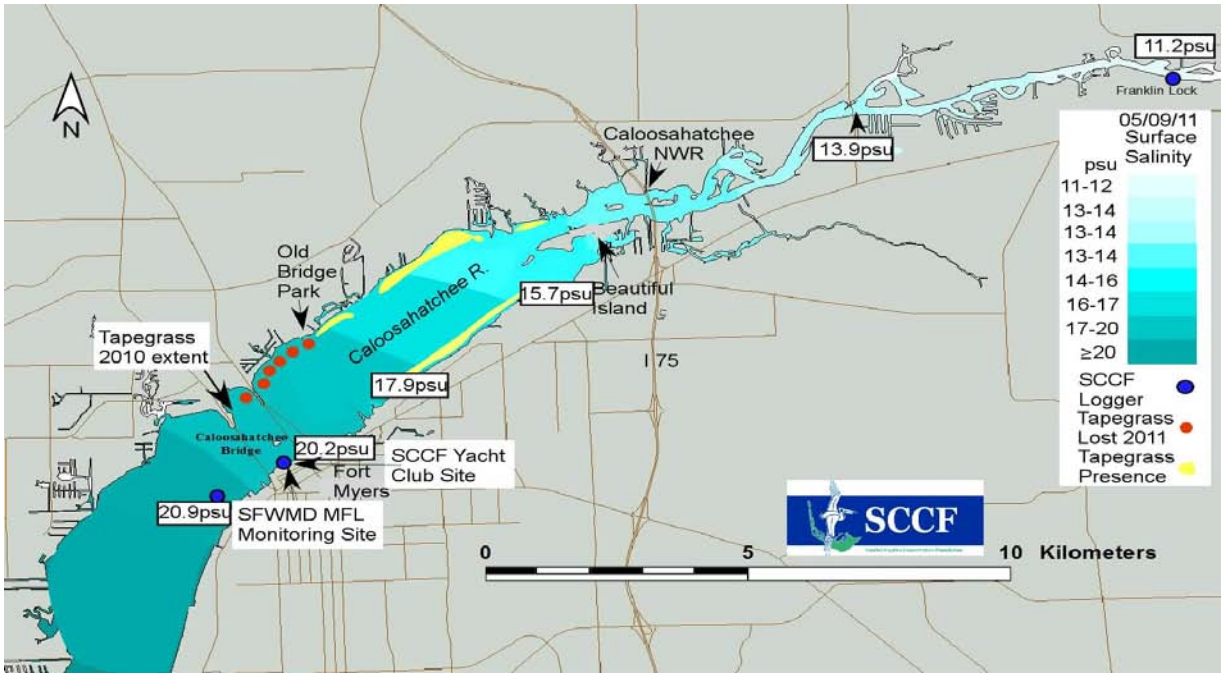
19- 25 psu **mid depth** data SCCF RECON Marker 52 Previous week 18 - 23.7 psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 ppt/psu (30-day) since 11/21/10 = **170 days**
MFL Violation 1 day at 20 psu
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 17.2 psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **202 ppm** **High Chloride Shut Down Plant 5/5/11** Previous week: 162 ppm

Salinity Shell Point: **31.5 – 35.5** psu RECON sensor Previous week: 29.7 – 35.0 psu

Recommendation: Salinity in the Caloosahatchee estuary continues to rise with no freshwater inflow from Lake O. We request pulse releases be resumed to restore the low salinity zone to improve water quality and habitat conditions within the estuary for spawning fish, crabs, shrimp and shellfish and to reduce salinity and stagnation upstream of S79 where the high salinity has caused the closure of the Olga Water Treatment Plant.

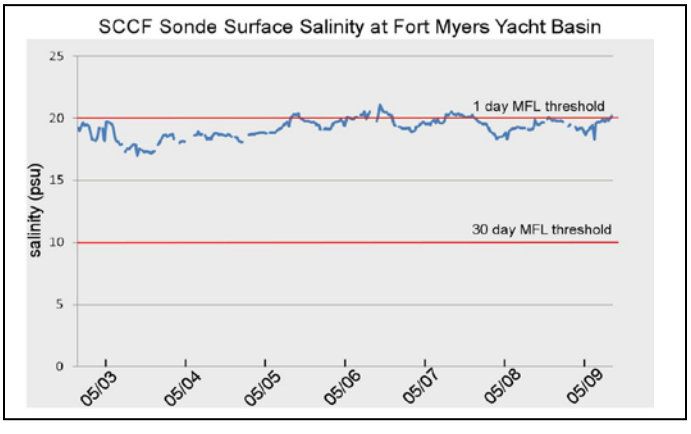


Flow: *** From ACOE Website Daily Reports**

Date	Day	S-79 Q (cfs)	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
5/3/2011	Tue	0	0	11	11
5/4/2011	Wed	0	0	0	580
5/52011	Thu	0	0	0	576
5/6/2011	Fri	0	0	0	80
5/7/2011	Sat	0	0	0	-76
5/8/2011	Sun	0	0	0	-276
5/9/2011	Mon	0	0	0	44

The estuary has not received any flow from the Lake over the past 10 weeks, since flow was cut off on March 6th. However, water has been continuously discharged from the lake for agricultural water supply the past 32 days. Extremely dry conditions absorbed widely scattered rainfall the past week resulting in no net runoff. Chlorides above S79 rose an additional 40 ppm in the past week to a high of 202 ppm resulting in the closure of the Olga Water Treatment plant.

Salinity at Fort Myers has reached the one day MFL threshold of 20 psu. Salinites continue to rise at Beautiful Island/ I-75 with salinity at 15.7 psu downstream of the Orange River inflow. Salinity at SR 31 is 13.9 psu and 11.2 psu at the S79 structure. Without flow, salinities above 20 psu are expected at the S-79 structure resulting in the loss of the mesohaline zone in addition to the oligohaline zone.



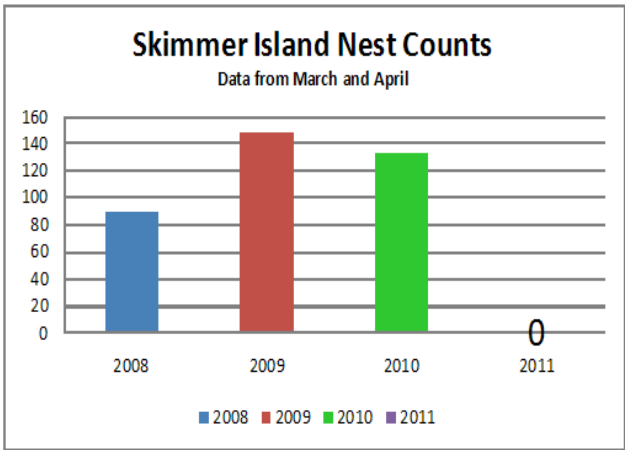
The negative effects of the extended high salinity in the estuary is not only destroying resources currently but also eliminates small gains the system has made last year and will impact resource recovery in the future.

The system is no longer functioning as an estuary without freshwater flows resulting in the complete loss of the low salinity zone. As resource managers, the failure to protect the estuary as a natural system is a violation of the public trust and our agencies' missions.

Upstream of S79/Franklin Pool Condition: Deteriorating. Above the S79 Lock chlorophyll measures 8.5ug/l. Blooms of Anabaena algae are reported in Hickey Creek, area canals and in the vicinity of the Alva Bridge.

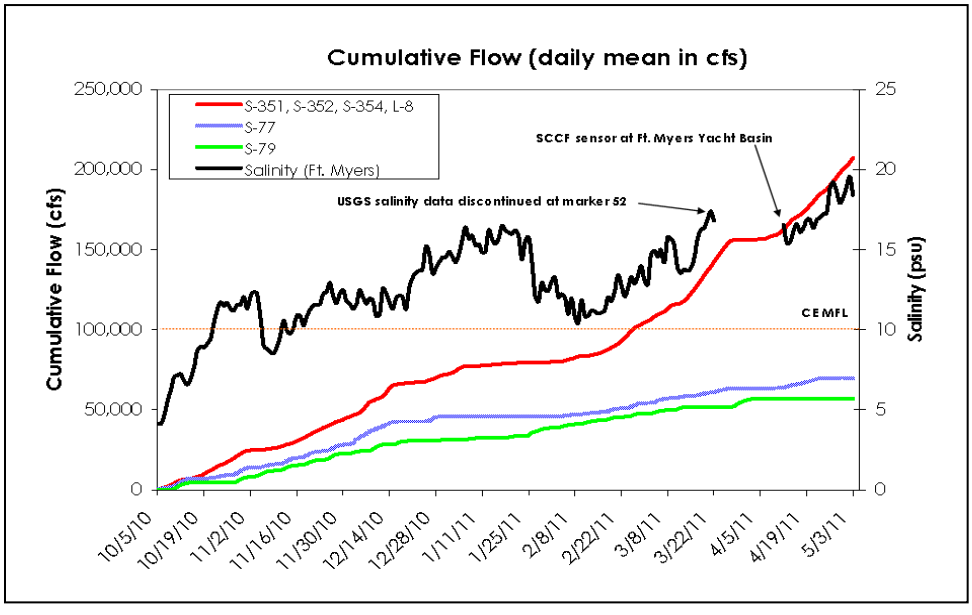
Upper Estuary Condition: Very Poor. Complete loss of low salinity zone habitat for spring/summer spawning finfish and shellfish.

Lower Estuary Condition: Poor: Elevated chlorophyll = 15.3 ug/l measured at Tarpon Point Pier with blooms dominated by diatoms plus din flagellates.



Nesting: Rookery island nest surveys over the past 4 years show a dramatic decrease in confirmed nests in 2011. Skimmer Island (one of several rookery islands making up Matlacha Pass National Wildlife Refuge) is located less than a mile downstream of the mouth of the Caloosahatchee. The concern is the decrease in nesting could be related to a drop in prey availability due to high salinity levels.

Oysters: **Survival of juvenile oysters in open cages is poor**. Salinities of 31.5 - 35.5 psu result in unhealthy conditions for oysters and expose larval stages to increased predation. The desired dry season salinity range for Eastern oyster productivity, growth, larval recruitment and spawning is < 25 psu. In May more recruitment is occurring but high salinities are resulting in greater predation. Disease prevalence remains very high between 60 – 100% with parasite intensity between 0.8 – 1.3.

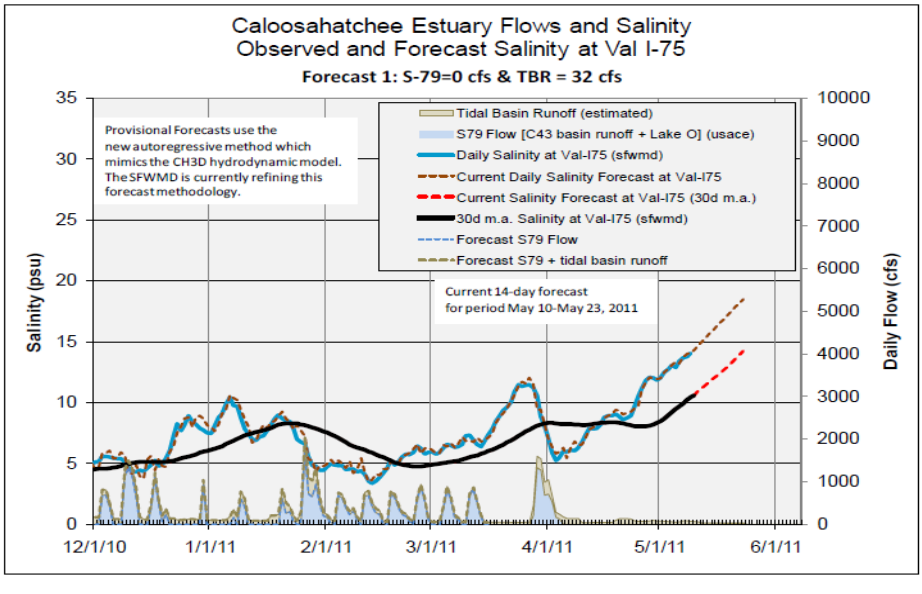


The above graph shows cumulative flow out of Lake O (colored lines) relative to surface salinity recorded at Ft Myers (black line). The Caloosahatchee MFL (10 psu) is depicted by the orange horizontal dotted line. Annually, beginning in October, there is a precipitous rise in salinity when flows to the Caloosahatchee (blue and green lines) are reduced. This year the Caloosahatchee exceeded its MFL target the second week of October. Pulse releases in late October helped drop salinity into the target MFL zone. Continued pulse releases helped keep salinity around 12 psu until releases were stopped completely on Dec 15th. Salinities once again rose precipitously to above 16 psu. January rainfall events provided freshwater flow to the estuary that slowed the increase in salinity levels. In February the COE resumed releases at the lower level of 300 cfs. These releases, coupled with additional rainfall events, were instrumental in retaining the low salinity habitats that fishery resources depend on. Releases were cut off again in early March resulting in the total loss of low salinity zone in the estuary during the fourth week in April. Despite significant detrimental impacts to the ecosystem of the lake and estuary from low water and lack of flow, water is being discharged for permitted users at a rate of 2.5 times the inflow.

SFWMD Salinity Forecast:

The SFWMD forecast projection for May 10-23, 2011, reflects the precipitous increase in salinity in the Caloosahatchee estuary resulting from lack of flow.

Provisional Val I-75 Salinity Forecast for May 10 – May 23, 2011 - Created on May 10, 2011



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Luis Alejandro, Steve Sullivan, SFWMD Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard, Melissa Meeker

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
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Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: May 17, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level**: 10.59'** (Water Shortage Management Band) Previous wk: **10.69'** (Water Shortage)
Top of the Water Shortage Management Band = **10.73'**

Weekly Rainfall: WP Franklin 1.76", Ortona 0.47", Moore Haven 0.88"

Salinity Ft. Myers: **20 – 21** psu **surface** data (SCCF sonde at Ft Myers Yacht Basin) Previous week: 17 – 21 psu

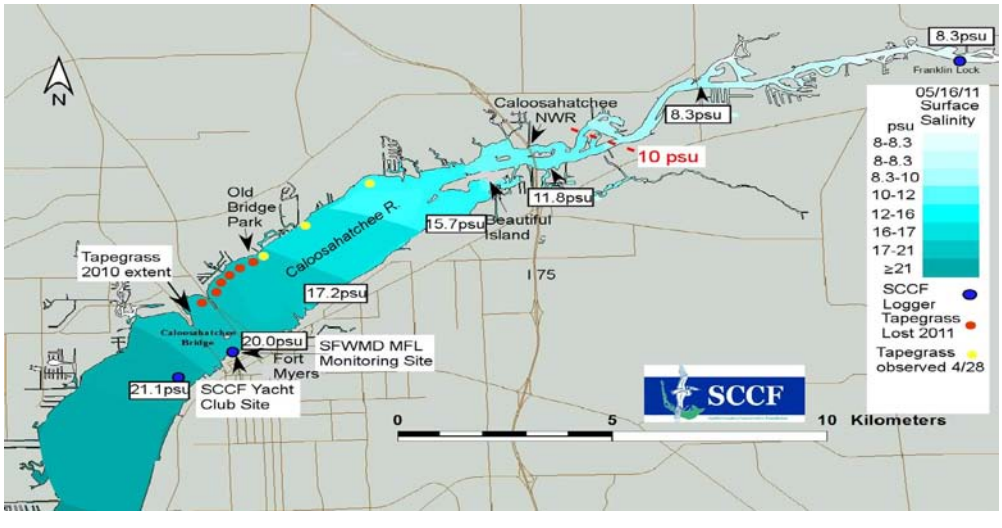
20.5 – 24 psu **mid depth** (SCCF RECON Marker 52) Previous week: 19-25 psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 ppt/psu (30-day) since 11/21/10 = **177 days**
MFL Violation 1 day at 20 psu
MFL Target at Ft Myers is ≤10 ppt/psu 30-day moving average
Current 30-day moving average = 18.4 psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **222 ppm High Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: 32 – 35 psu (SCCF RECON sensor) Previous week: 31.5 – 35.5 psu

Recommendation: Salinity in the Caloosahatchee estuary continues to rise with no freshwater inflow from the Lake. We request pulse releases be resumed to restore low salinity zone habitat to improve conditions within the estuary for spawning fish, crabs, shrimp and shellfish and to reduce salinity and stagnation upstream of S-79. High salinity conditions east of S-79 resulted in the closure of the Olga Water Treatment Plant on 5/5/11.

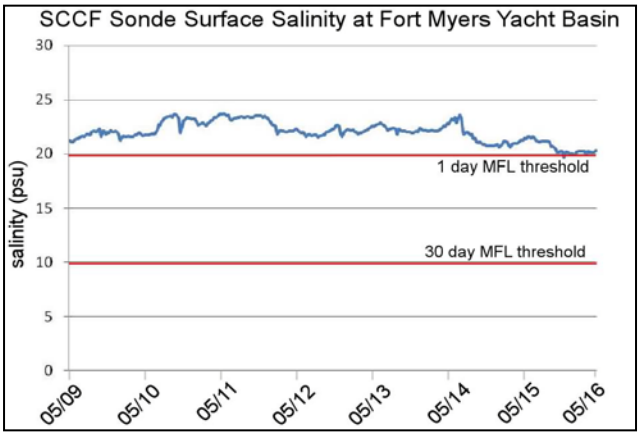


Flow: * From ACOE Website Daily Reports

Date	Day	S-79 Q (cfs)	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
5/10/11	Tue	0	0	0	136
5/11/11	Wed	0	0	73	60
5/12/11	Thu	0	0	270	636
5/13/11	Fri	0	0	313	576
5//14/11	Sat	NR	NR	74	144
5//15/11	Sun	NR	NR	0	-324
5/16/11	Mon	NR	NR	0	-120

The estuary has not received any freshwater inflow from the Lake during the past 11 weeks, since flow was cut off on March 6th; however, water has been continuously discharged from the Lake for agricultural water supply over the past 39 days.

Recent rainfall within the basin reduced salinities approximately 3 psu immediately downstream of the S-79 structure; however, salinities still exceed low-salinity zone criteria (0.5 – 5 psu). Salinities have decreased slightly at Beautiful Island/ I-75, with salinities of 11.8 psu recorded at the confluence of the Orange River. Salinity at SR 31 and just downstream of the S79 structure is 8.3 psu. Salinity at Fort Myers continues to exceed the1-day MFL threshold of 20 psu.



It is estimated that releases between now and the end of the dry season would require less than one inch of water off the lake. This would provide critical low salinity zone habitat for spring and summer spawning larval fish and shellfish and protect what is left of freshwater SAV that are ecologically and economically important to SW Florida. Recovery of freshwater habitat takes multiple years to recover once lost.

Upstream of S-79/Franklin Pool Condition: Deteriorating. Blooms of blue-green algae (*Anabaena circinalis*, *Microcystis* sp. and *Aphanizomenon* sp.) have been reported east of the S-79 water control structure with chlorophyll a readings of up to 22 µg/l.

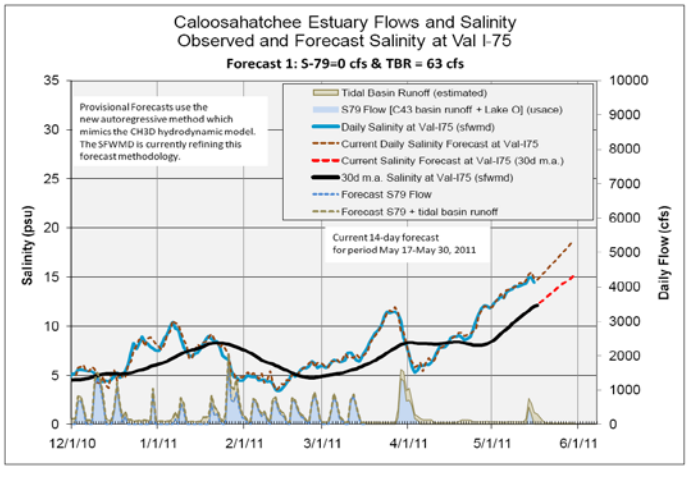
Upper Estuary Condition: Very Poor. Complete loss of low salinity zone habitat for spring/summer spawning finfish and shellfish. A dinoflagellate bloom (100,000 cells/l *Akashiwo sanguinea*) has been reported west of the S-79 structure. Slightly elevated chlorophyll a = 10 ug/l measured at Fort Myers A blue-green alga bloom of *Microcystis* sp., sampled by DEP and identified by FWRI was reported in Daughtry Creek, a tributary of the Caloosahatchee located on the north side of the river between US 41 and I75.

Lower Estuary Condition: Poor. Oyster survival and recruitment is being impacted by high salinities. FGCU biologists report that survival of juvenile oysters in open cages is poor. Salinities of 32 – 35 psu result in unhealthy conditions for oysters and expose larval stages to increased predation. Desired dry season salinity ranges for Eastern oyster productivity, growth, larval recruitment and spawning is less than 25 psu. In May, more recruitment is occurring but high salinities are resulting in greater predation. Disease prevalence remains very high between 60 – 100%, with parasite intensity between 0.8 – 1.3.

SFWMD Salinity Forecast:

The SFWMD forecast projection for May 17 – May 30, 2011, reflects the precipitous increase in salinity in the Caloosahatchee estuary resulting from lack of flow.

Provisional Val I-75 Salinity Forecast for May 17 – May 30, 2011 - Created on May 17, 2011



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard, Melissa Meeker

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: May 24, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level**: 10.38'** (Water Shortage Management Band) Previous wk: **10.59'** (Water Shortage)

Weekly Rainfall: WP Franklin 0.2", Ortona 0", Moore Haven 0"

Salinity Ft. Myers: **20 – 22** psu **surface** data (SCCF sonde Ft Myers Yacht Basin) Previous wk: 20– 21 psu

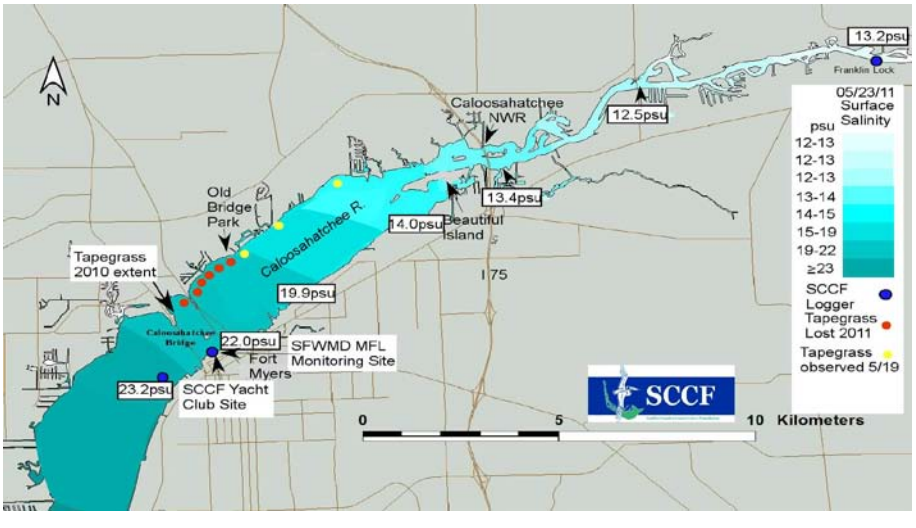
20 – 24 psu **mid depth** (SCCF RECON Marker 52) Previous week: 20.5 - 24 psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day) since 11/21/10 = **184 days**
Above 20 psu (1 day) since 5/9/11 = **14 days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average > 18.4 psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **207 ppm High Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: 31.7 – 35 psu (SCCF RECON sensor) Previous week: 32 – 35 psu

Recommendation: Salinity in the Caloosahatchee estuary remains at unhealthy levels and elevated chlorophyll throughout the estuary. Lack of flow continues to rise with no freshwater inflow from the Lake. We request pulse releases be resumed to restore low salinity zone habitat to improve conditions within the estuary for spawning fish, crabs, shrimp and shellfish and to reduce salinity and stagnation upstream of S-79. High salinity and algae east of S-79 caused the Olga Water Treatment Plant closure on 5/5/11. It remains offline.



Flow: * From ACOE Website Daily Reports

Date	Day	S-79 Q (cfs)	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow Below* (cfs)
5/17/11	Tue	0	0	0	125
5/18/11	Wed	0	0	0	1450
5/19/11	Thu	0	0	0	1208
5/20/11	Fri	0	0	0	1381
5//21/11	Sat	NR	0	0	907
5//22/11	Sun	NR	0	0	747
5/23/11	Mon	NR	0	NR	1003

The estuary has not received any freshwater inflow from the Lake during the past 12 weeks, since flow was cut off on March 6th; however, water has been continuously discharged from the Lake for agricultural water supply over the past 7 weeks. This past week 5.5 times the water flowing into the lake was discharged out of the lake.

Salinities rose this past week to 14.0 psu at Beautiful Island/ I-75, downstream of the Orange River inflow, 12.5 psu at SR 31 and 13.2 psu downstream of the S79 structure. Salinity at Fort Myers continues to exceed the1-day MFL threshold of 20 psu with readings of 22 psu.

Chlorophyll measurements were elevated throughout the river increasing over last week with 10 µg/l at Cape Coral, 54 µg/l at the Tarpon Point Pier, 20 µg/l ug/l at Marker 52 off Ft Myers, 30 µg/l at Beautiful Island and 15 µg/l near I75.

Releases between now and the end of the dry season would require less than one inch of water off the lake. This would provide critical low salinity zone habitat for spring and summer spawning larval fish and shellfish and protect what is left of freshwater SAV that are ecologically and economically important to SW Florida. Recovery of freshwater habitat takes multiple years to recover once lost.

Upstream of S-79/Franklin Pool Condition: Deteriorating. Chlorophyll levels ranged from 8.1 µg/l at Alva to 10.2 µg/l at the lock. Blooms of blue-green algae include *Anabaena circinalis*, *Microcystis* sp. and *Aphanizomenon* sp.

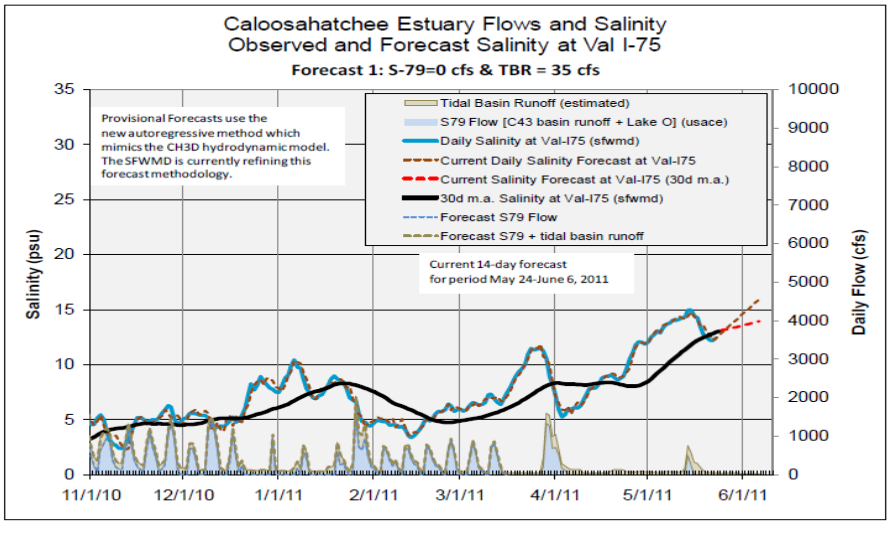
Upper Estuary Condition: Very Poor. Chlorophyll levels ranged from 13.1 µg/l at Franklin Lock to 54.4 µg/l just east of Fort Myers due to a bloom of *Ceratium furca* which decreased in intensity towards the Cape Coral Bridge. Complete loss of low salinity zone habitat for spring/summer spawning finfish and shellfish.

Lower Estuary Condition: Poor. Epiphyte loads on sea grasses around Sanibel are moderate to high. Turbidity is high in patches but water clarity is high overall Oyster survival and recruitment is being impacted by high salinities. FGCU biologists report the condition index is low with disease levels between 60 and 100%. Survival of juvenile oysters in open cages is poor. Salinities of 32 – 35 psu result in unhealthy conditions for oysters and expose larval stages to increased predation. Desired dry season salinity ranges for Eastern oyster productivity, growth, larval recruitment and spawning is less than 25 psu. In May, more recruitment is occurring but high salinities are resulting in greater predation.

SFWMD Salinity Forecast:

The SFWMD forecast projection for May 24 – June 6, 2011, reflects the continued increase in salinity in the Caloosahatchee estuary resulting from lack of flow.

Provisional Val I-75 Salinity Forecast for May 24 – June 6, 2011 - Created on May 24, 2011



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: May 31, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level**: 10.14'** (Water Shortage Management Band) Previous wk: **10.38'** (Water Shortage)

Weekly Rainfall: WP Franklin 0.35", Ortona 0.43", Moore Haven 0.01"

Salinity Ft. Myers: **20 – 22** psu **surface** data (SCCF sonde Ft Myers Yacht Basin) Previous wk: 20– 22 psu

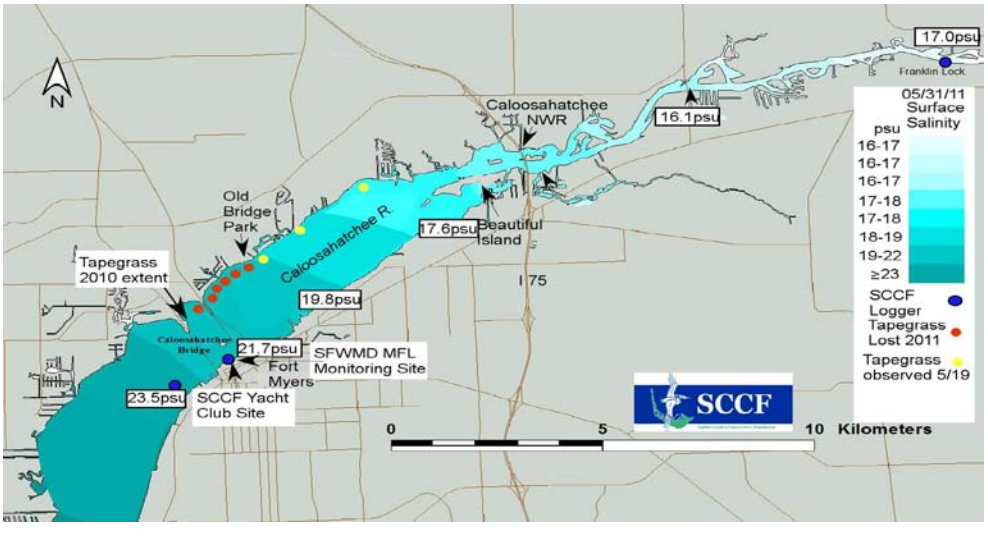
21 – 24.7 psu **mid depth** (SCCF RECON Marker 52) Previous week: 20 - 24 psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day) since 11/21/10 = **191 days**
Above 20 psu (1 day) since 5/9/11 = **21 days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average > 18.4 psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **200 ppm High Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: 31.7 – 36 psu (SCCF RECON sensor) Previous week: 31.7 – 35 psu

Recommendation: Salinity in the Caloosahatchee estuary has risen to the highest levels this season with 17 psu at the S79 structure. Since mid April lack of flow has resulted in the total loss of low salinity zone downstream of S79, closure of the Olga Water Treatment Plant and navigation impacts due to restricted lockage. Chlorophyll levels are elevated throughout the estuary. Lack of flow has caused stagnation in the Franklin pool resulting in toxic blue green algae blooms recording 32.5 µg/l. **We request pulse releases be resumed to restore low salinity zone habitat to improve conditions within the estuary for spawning fish, crabs, shrimp and shellfish and to reduce salinity and stagnation upstream of S-79.**



Flow: *** From ACOE Website Daily Reports**

Date	Day	S-79 Q (cfs)	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
5/24/11	Tue	0	0	0	332
5/25/11	Wed	0	0	68	300
5/26/11	Thu	0	0	86	144
5/27/11	Fri	0	0	86	16
5//28/11	Sat	NR	0	86	104
5//29/11	Sun	NR	0	95	216
5/30/11	Mon	NR	0	101	204

The estuary has not received any freshwater inflow from the Lake for the past 13 weeks, since flow was cut off on March 6th. However, water has been continuously discharged from the Lake for agricultural water supply at levels significantly above lake inflows.

This past week **water was discharged out of the lake at a rate 6 times the inflow into the lake.**
Inflow = 359 cfs; Outflow = 2159* cfs
(* No Report from C5 & S308)

Salinities increased over the past week to 17.6 psu at Beautiful Island/ I-75 and 17 psu west of the S79 structure. Salinity at Fort Myers continues to exceed the1-day MFL threshold of 20 psu with readings greater than 21 psu. Chlorophyll measurements were elevated throughout the river and estuary ranging from 7.4 to 32.5 µg/l.

Releases between now and the end of the dry season would require less than one inch of water off the lake. This would provide critical low salinity zone habitat for spring and summer spawning larval fish and shellfish and protect what is left of freshwater SAV that are ecologically and economically important to SW Florida. Recovery of freshwater habitat takes multiple years to recover once lost.

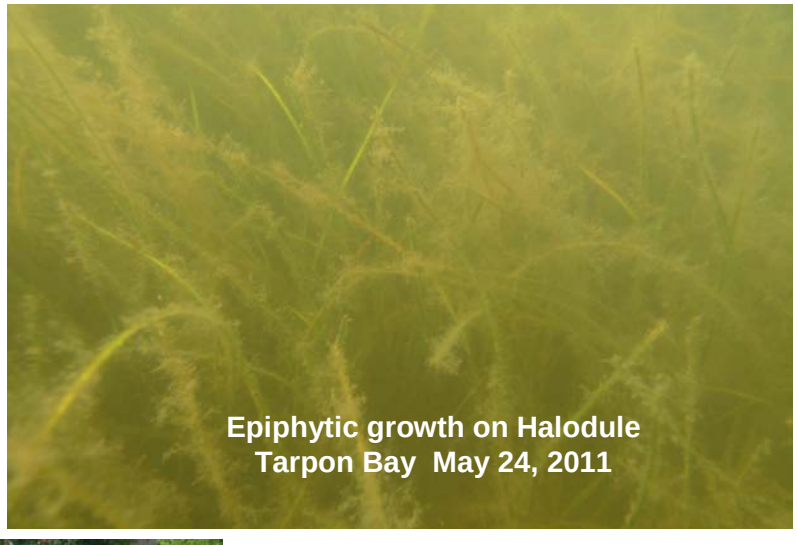
Upstream of S-79/Franklin Pool Condition: Very Poor. Chlorophyll levels ranged from 10.8 µg/l at Alva to 32.5 µg/l at the lock. The blue-green algae species *Anabaena circinalis*, and *Aphanizomenon* sp. were the dominant species of algae blooming at the lock.

May 15, 2011 Upstream of S79 Note Manatee

Same View May 30,2011 Note Algae

Caloosahatchee Chlorophyll (µg/l)	
Port LaBelle	10.8
Alva	7.8
Franklin East	32.5
Franklin West	9.9
SR 31 Bridge	7.4
Royal Palm Park	19.7
Tarpon Point	15.1
Ft Myers	9.5

Upper Estuary Condition: Very Poor. Chlorophyll levels ranged from 10.1 µg/l at Franklin Lock to 20.0 µg/l just east of Fort Myers due to a bloom of *Neoceratium hircus*. Complete loss of low salinity zone habitat for spring/summer spawning finfish and shellfish.



Epiphytic growth on Halodule
Tarpon Bay May 24, 2011

Lower Estuary Condition: Poor.

Seagrass: High epiphytic growth on seagrass throughout the lower estuary. Conditions for grasses are also impacted by dinoflagellate blooms, impacting the health and productivity.

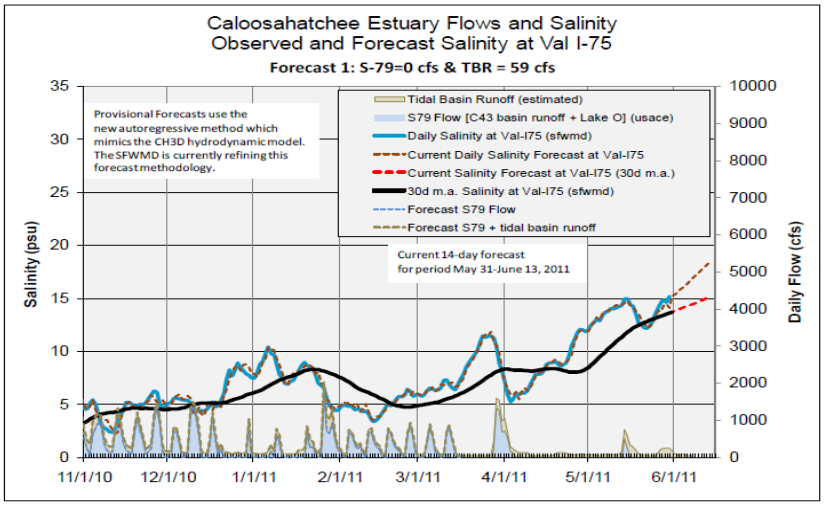
Caloosahatchee dinoflagellate bloom, Tarpon Point Pier
May 27, 2011

Oysters: Extremely high salinities, up to 36 psu, remain detrimental to oyster productivity, growth, larval recruitment and spawning.

SFWMD Salinity Forecast: The SFWMD forecast projection for May 31 – June 13, 20 reflects the continued increase in salinity in the Caloosahatchee estuary resulting from lack of flow.

Note that salinity is 1.5 times the high salinity target established at I-75 as a salinity management benchmark in the Adaptive Protocol process.

Provisional Val I-75 Salinity Forecast for May 31 – June 13, 2011 - Created on May 31, 2011



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: June 14, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: **Immediate action requested.** The Caloosahatchee and Lake Okeechobee are in crisis. Toxic algal blooms in the Caloosahatchee have caused the expansion of Health Departments from Lee County into Hendry and Glades Counties warning against swimming, drinking and fish consumption. Low water levels in the lake have caused the loss of snail kite nests and submerged aquatic vegetation. Despite these serious ecological impacts the SFWMD continues to install and operate forward pumps to deliver an additional 1" of water out of the lake per week to permitted users. **We request the Corps and the SFWMD immediately stop the installation and use of the forward pumps and re-evaluate their operations to prevent further degradation of the natural systems of the Okeechobee Waterway.**

Lake Okeechobee Level**: 9. 69'** (Water Shortage Management Band) Previous wk: **9.86'** (Water Shortage)

Weekly Rainfall: WP Franklin 0.28", Ortona 0.09", Moore Haven 2.01"

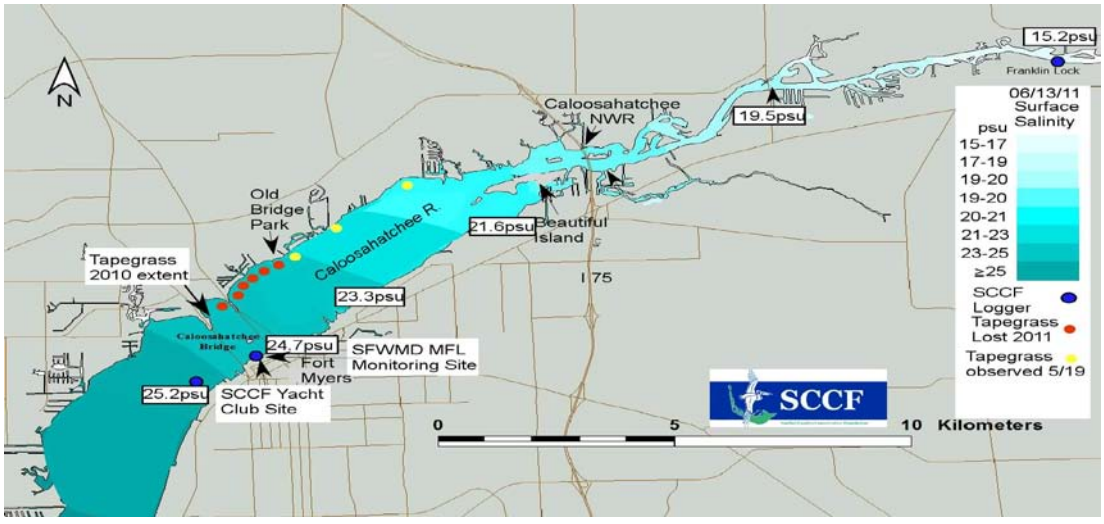
Salinity Ft. Myers: **23 - 24.7** psu **surface** data (SCCF sonde Ft Myers Yacht Basin) Previous wk: 21-23 psu

24 - 26.7 psu **mid depth** (SCCF RECON Marker 52) Previous week: **22 – 26.2** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day) since 11/21/10 = **205 days**
Above 20 psu (1 day) since 5/9/11 = **35 days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average **> 20.6** psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **232 ppm - High TDS/Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: **33.2 – 36.7 psu** (SCCF RECON sensor) Previous week: **32 – 36** psu



Flow: *** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/7/11	Tue	0	97	688
6/8/11	Wed	0	98	564
6/9/11	Thu	0	149	80
6/10/11	Fri	0	163	0
6/11/11	Sat	0	70	0
6/12/11	Sun	0	0	0
6/13/11	Mon	0	60	8

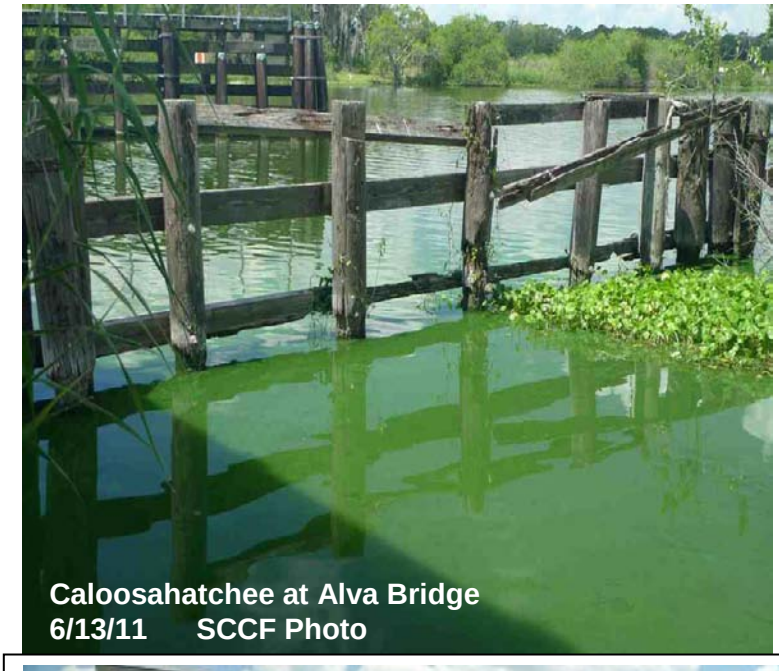
The estuary has not received any freshwater inflow from the Lake for the past 3 1/2 months, since flow was cut off on March 6th. However, water has been continuously discharged from the Lake for agricultural water supply at levels significantly above lake inflows.

This past week **water was discharged out of the lake at a rate over 15 times the inflow into the lake.**
Inflow = 77 cfs; Outflow = 1196* cfs
(* No Report from S354 & C5)

Salinities increased over the past week to 21.6 psu at Beautiful Island/ I-75 bridge, 19.5 psu at SR 31 and 15.2 psu west of the S79 structure. Salinity at Fort Myers continues to exceed the1-day MFL threshold of 20 psu with readings greater than 23 psu.

Chlorophyll levels were elevated throughout the river and estuary ranging from 40.7µg/l at Franklin Lock to 3.2 µg/l at Fort Myers. Primary organisms are cyanobacteria *Anabaena circinalis,* diatoms *Ceratium hircus* and *Chaetoceros sp.*

Upstream of S-79/Franklin Pool Condition: Grave. Posted Health Alert expanded to Hendry & Glades Counties.



Caloosahatchee at Alva Bridge
6/13/11 SCCF Photo

Miles of toxic blue-green algae species *Anabaena circinalis*, and *Microcystis sp.* are blooming upstream of S79, creating noxious odors that cause eye and respiratory irritation.

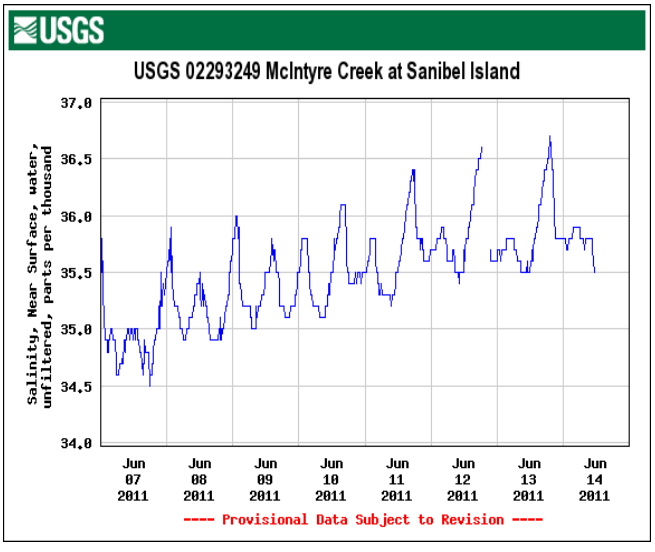
Hendry and Glades County Health Departments have expanded the public health warnings along the river into those counties to warn against contact with water and fishing.

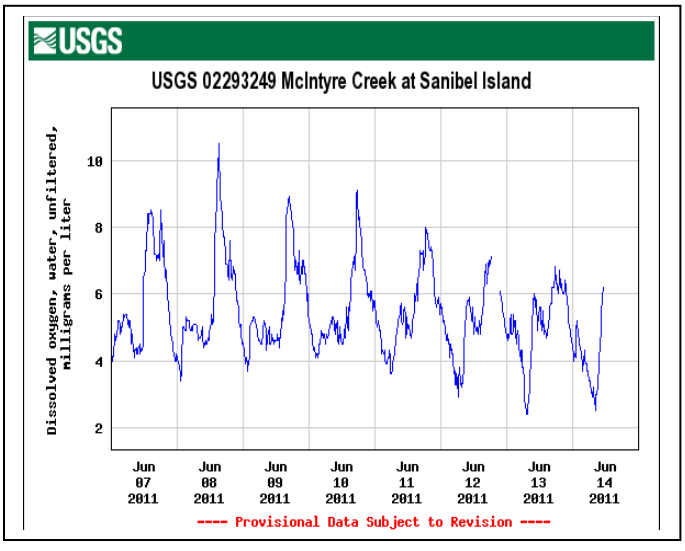
Public Health Warning at Franklin Lock (S79) Park Boat Ramp

Upper Estuary Condition: Very Poor. Dead jacks, mullet and sand bream found floating west of Franklin. Salinity increasd this week to 15 psu. High salinities all the way to the Franklin Lock have persisted for over 3 ½ months resulting in a complete loss of low salinity zone habitat critical during spring/summer when species of finfish and shellfish are spawning.

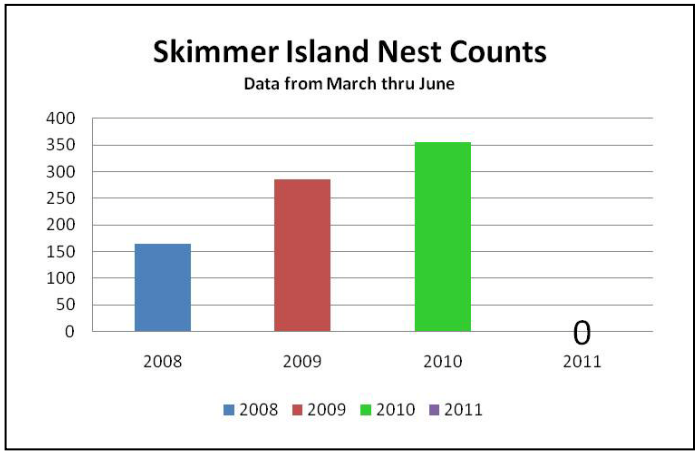
Dinoflagellate blooms of *Ceratium hircus and Chaetoceros sp..*extend from the Franklin Lock west to Fort Myers. Blooms compound impacts to Ruppia impeding light penetration and cause anoxic/ low oxygen conditions.

Lower Estuary Condition: Poor.
At McIntyre Creek on Sanibel Island lack of flow is causing salinities to trend up, USGS graph on left and decreasing dissolved oxygen, USGS graph on right. Near bottom salinities are extremely high reaching 37.7 psu.





Nesting Birds: J.N. "Ding" Darling biologists completed the June rookery islands survey and observed no colonial nesting birds on Skimmer Island within the Matlacha Pass National Wildlife Refuge. In each of the three previous years there were over 200 nests observed, see Table below. Other rookery islands in the vicinity are being used similarly to previous annual nesting efforts. This is another indication that conditions adjacent to the island may not be supportive of seasonal colonial bird use this spring. The island is approximately 1 mile west of the Caloosahatchee River confluence in San Carlos Bay.



Seagrass: High epiphytic growth on seagrass throughout the lower estuary. Conditions for grasses are also impacted by dinoflagellate blooms, impacting the health and productivity of the grass beds.

Oysters: Extremely high salinities, rising above 36 psu, remain detrimental to oyster productivity, growth, larval recruitment and spawning. Disease prevalence and predation are high.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 21 June 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Immediate action requested. The Caloosahatchee and Lake Okeechobee are in crisis. Harmful algal blooms in the Caloosahatchee resulted in the Health Department posting warnings against swimming, drinking and fish consumption in the river through Lee, Hendry and Glades Counties. The complete loss of the low salinity zone downstream of S-79 is resulting in high mortality rates of freshwater clams and high salinities in the lower estuary are negatively impacting oysters and seagrasses. Low water levels in the lake have resulted in the loss of snail kite nests and submerged aquatic vegetation. Despite these serious ecological impacts, the SFWMD continues to operate forward pumps to deliver additional water out of the lake to permitted users. **We request the Corps and the SFWMD stop the use of the forward pumps and re-evaluate their operations to prevent further degradation of the natural systems of the Okeechobee Waterway.**

Lake Okeechobee Level**: 9. 60'** (Water Shortage Management Band) Previous wk: **9.69'** (Water Shortage)

Weekly Rainfall: WP Franklin 1.15", Ortona 4.83", Moore Haven 1.32"

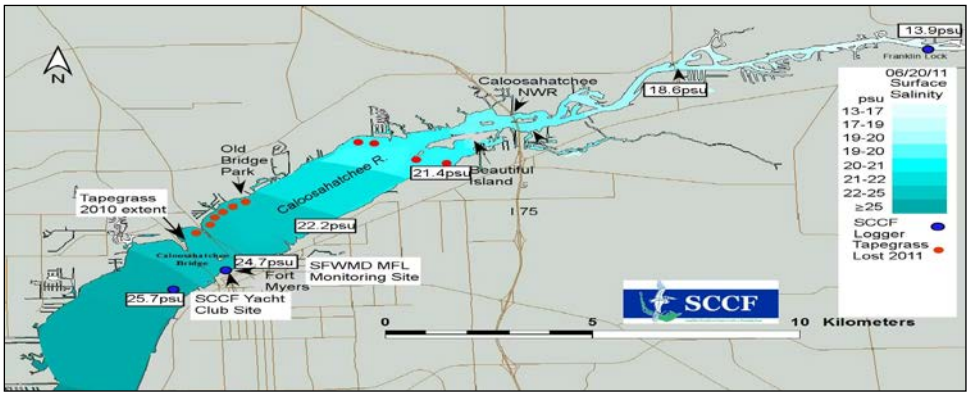
Salinity Ft. Myers: **24.2 - 26.8** psu surface data (SCCF sonde Ft Myers Yacht Basin) Previous wk: **23 - 24.7** psu

24.5 – 26.6 psu **mid depth** (SCCF RECON Marker 52) Previous week: **24 – 26.7** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above 10 psu (30-day) since 11/21/10 = **212 days**
Above 20 psu (1 day) since 5/9/11 = **42 days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average **21.9** psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **246 ppm - High TDS/Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: **34.5 – 36.5 psu** (SCCF RECON sensor) Previous week: **33 – 36.5** psu



Flow: *** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/14/11	Tue	2	79	318
6/15/11	Wed	1	2	564
6/16/11	Thu	3	206	492
6/17/11	Fri	1	272	452
6/18/11	Sat	4	156	238
6/19/11	Sun	3	13	-135
6/20/11	Mon	34	6	-413

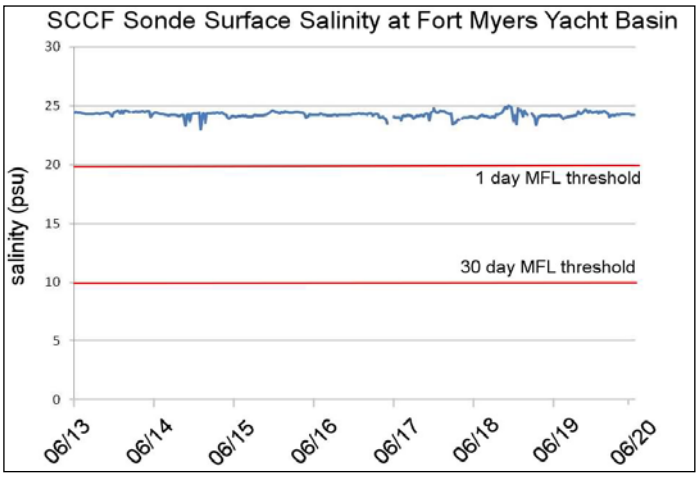
The estuary has not received any freshwater inflow from the Lake in over 3 1/2 months, since flow was cut off on March 6th. However, water has been continuously discharged from the Lake for agricultural water supply at flow volumes significantly above lake inflows.

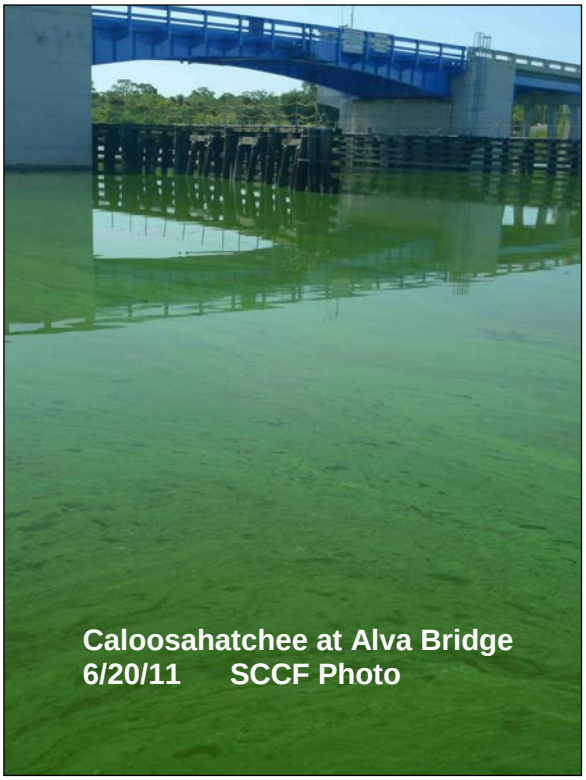
The lack of freshwater has resulted in the complete loss of the low salinity zone downstream of S-79. On June 20th, salinities recorded at Beautiful Island/ I-75 bridge were 21.4 psu, at SR 31 they were18.6 psu, and just west of the S79 structure they were 13.9 psu.

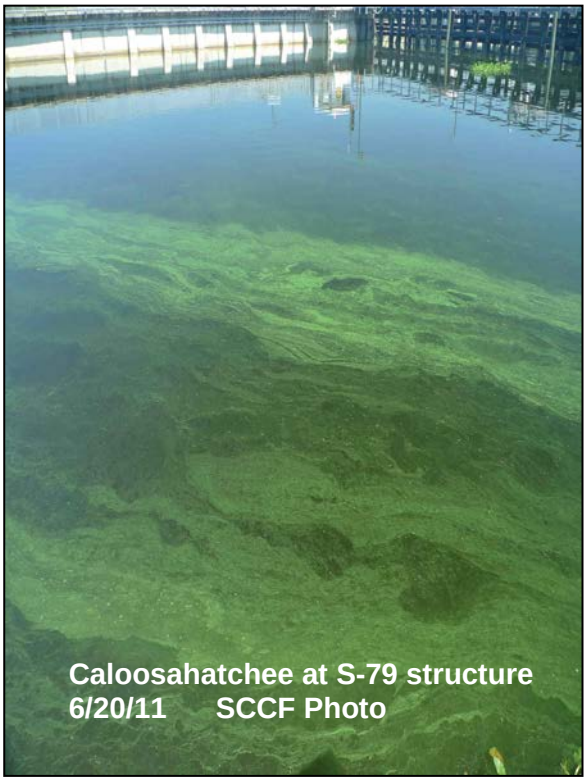
Salinity at Fort Myers continues to exceed the 30-day moving average MFL criteria of 10 psu and the 1-day MFL threshold of 20 psu, with salinity exceeding 23 psu.

Chlorophyll levels have been elevated throughout the river and estuary ranging from 13.7µg/l at Franklin Lock to 40.7µg/l at Fort Myers.

Due to stagnant conditions blue-green algae blooms persist throughout the river from Alva to Fort Myers. Species have shifted from *Anabaena spp.* to *Microcystis spp.* at Alva (320,000 colonies/liter) and *Ceratium* spp. were replaced by diatoms at the SR 31 bridge.



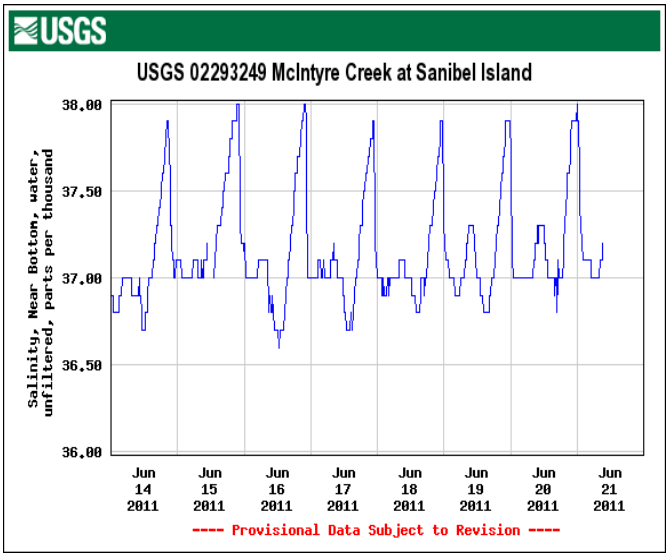


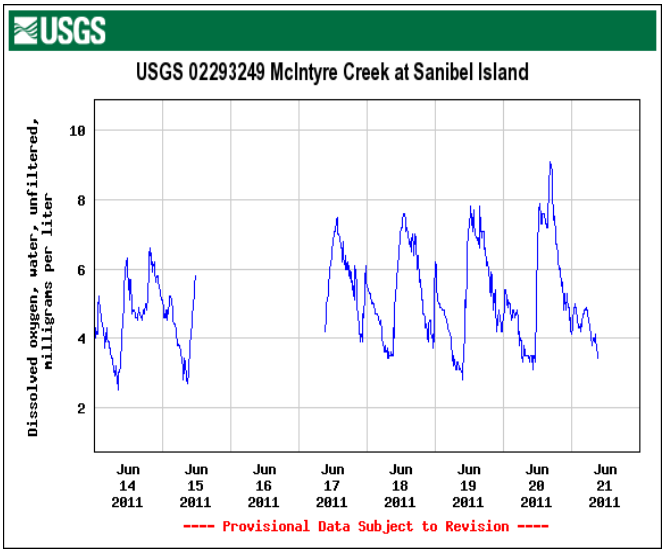


Upper Estuary Condition: Very Poor. High salinities in the estuary from S-79 to Shell Point have persisted for more than 3 ½ months resulting in the complete loss of low salinity zone habitat, which is critical for spring/summer spawning finfish and shellfish. The lack of flow has also resulted in stagnation within the Franklin pool and the upper estuary. SCCF biologist have also reported high mortality rates of *Rangia cuneata* clams near Beautiful Island, which is likely related to salinity stress.

Lower Estuary Condition: Poor. Salinities in the lower estuary remain above the preferred range for Eastern oysters (*Crassostrea virginica*), with salinities at Shell Point exceeding 36 psu. Seagrasses throughout the lower estuary are being impacted by high epiphytic loads and dinoflagellate blooms, which are negatively affecting their health and productivity.

At McIntyre Creek, leading into J.N. "Ding" Darling NWR on Sanibel Island, salinities continue to trend upwards due to the lack of freshwater flow from the estuary (USGS graph on left) and dissolved oxygen levels are dangerously low (USGS graph on right). Near bottom salinities are extremely high reaching 38 psu, nearing the level at which mangrove trees begin to show negative effects. The USGS data can be found here.





MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 21 June 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Immediate action requested. The Caloosahatchee and Lake Okeechobee are in crisis. Harmful algal blooms in the Caloosahatchee resulted in the Health Department posting warnings against swimming, drinking and fish consumption in the river through Lee, Hendry and Glades Counties. The complete loss of the low salinity zone downstream of S-79 is resulting in high mortality rates of freshwater clams and high salinities in the lower estuary are negatively impacting oysters and seagrasses. Low water levels in the lake have resulted in the loss of snail kite nests and submerged aquatic vegetation. Despite these serious ecological impacts, the SFWMD continues to operate forward pumps to deliver additional water out of the lake to permitted users. **We request the Corps and the SFWMD stop the use of the forward pumps and re-evaluate their operations to prevent further degradation of the natural systems of the Okeechobee Waterway.**

Lake Okeechobee Level**: 9. 60'** (Water Shortage Management Band) Previous wk: **9.69'** (Water Shortage)

Weekly Rainfall: WP Franklin 1.15", Ortona 4.83", Moore Haven 1.32"

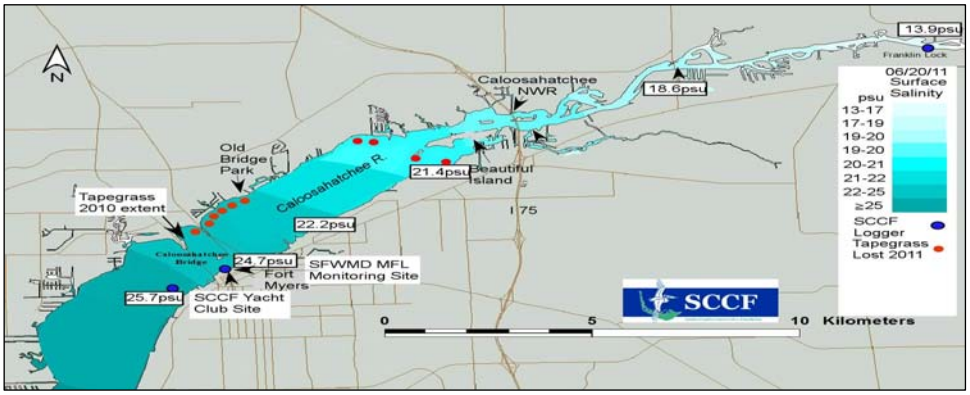
Salinity Ft. Myers: **24.2 - 26.8** psu surface data (SCCF sonde Ft Myers Yacht Basin) Previous wk: **23 - 24.7** psu

24.5 – 26.6 psu **mid depth** (SCCF RECON Marker 52) Previous week: **24 – 26.7** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above 10 psu (30-day) since 11/21/10 = **212 days**
Above 20 psu (1 day) since 5/9/11 = **42 days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average **21.9** psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **246 ppm - High TDS/Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: **34.5 – 36.5 psu** (SCCF RECON sensor) Previous week: **33 – 36.5** psu



Flow: *** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/14/11	Tue	2	79	318
6/15/11	Wed	1	2	564
6/16/11	Thu	3	206	492
6/17/11	Fri	1	272	452
6/18/11	Sat	4	156	238
6/19/11	Sun	3	13	-135
6/20/11	Mon	34	6	-413

The estuary has not received any freshwater inflow from the Lake in over 3 1/2 months, since flow was cut off on March 6th. However, water has been continuously discharged from the Lake for agricultural water supply at flow volumes significantly above lake inflows.

The lack of freshwater has resulted in the complete loss of the low salinity zone downstream of S-79. On June 20th, salinities recorded at Beautiful Island/ I-75 bridge were 21.4 psu, at SR 31 they were18.6 psu, and just west of the S79 structure they were 13.9 psu.

Salinity at Fort Myers continues to exceed the 30-day moving average MFL criteria of 10 psu and the 1-day MFL threshold of 20 psu, with salinity exceeding 23 psu.

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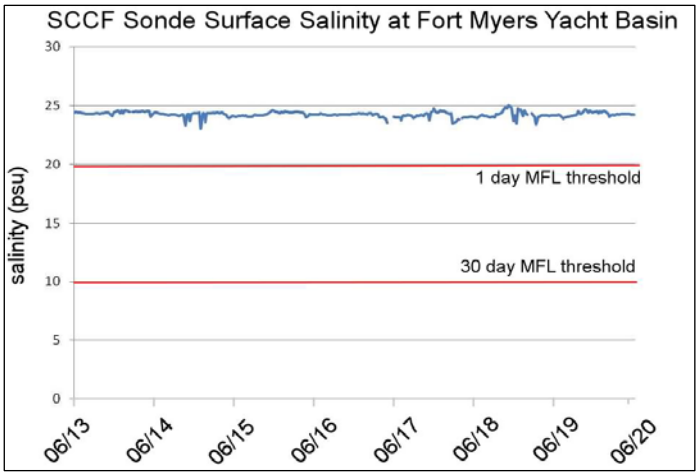
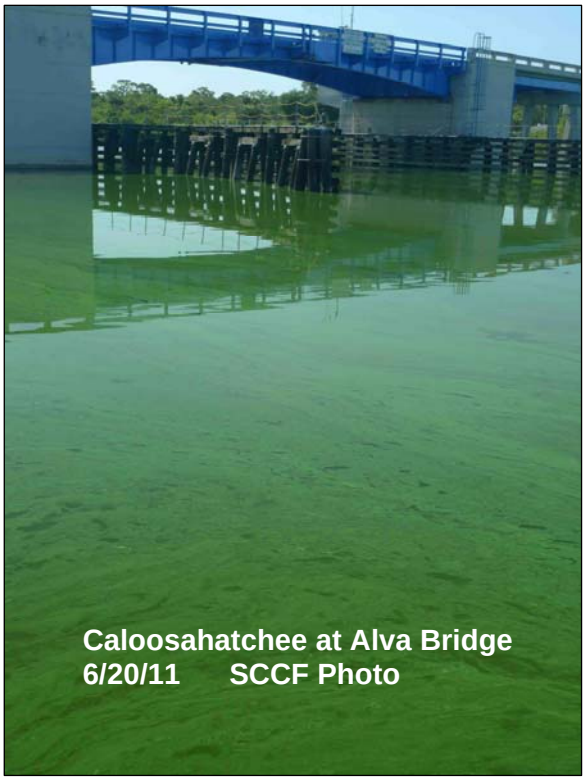
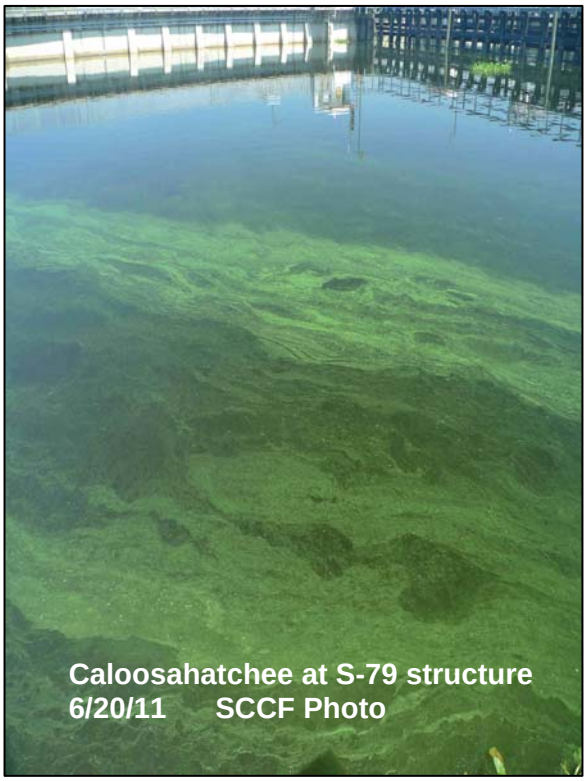
Due to stagnant conditions blue-green algae blooms persist throughout the river from Alva to Fort Myers. Species have shifted from *Anabaena spp.* to *Microcystis spp.* at Alva (320,000 colonies/liter) and *Ceratium* spp. were replaced by diatoms at the SR 31 bridge.



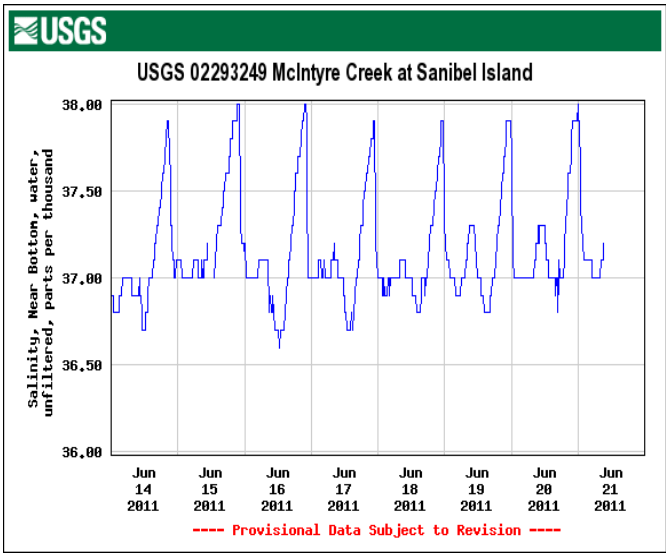


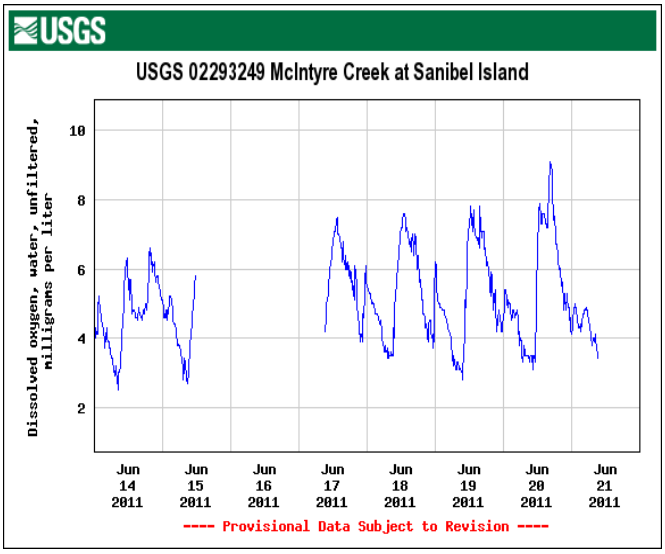


Upper Estuary Condition: Very Poor. High salinities in the estuary from S-79 to Shell Point have persisted for more than 3 ½ months resulting in the complete loss of low salinity zone habitat, which is critical for spring/summer spawning finfish and shellfish. The lack of flow has also resulted in stagnation within the Franklin pool and the upper estuary. SCCF biologist have also reported high mortality rates of *Rangia cuneata* clams near Beautiful Island, which is likely related to salinity stress.

Lower Estuary Condition: Poor. Salinities in the lower estuary remain above the preferred range for Eastern oysters (*Crassostrea virginica*), with salinities at Shell Point exceeding 36 psu. Seagrasses throughout the lower estuary are being impacted by high epiphytic loads and dinoflagellate blooms, which are negatively affecting their health and productivity.

At McIntyre Creek, leading into J.N. “Ding” Darling NWR on Sanibel Island, salinities continue to trend upwards due to the lack of freshwater flow from the estuary (USGS graph on left) and dissolved oxygen levels are dangerously low (USGS graph on right). Near bottom salinities are extremely high reaching 38 psu, nearing the level at which mangrove trees begin to show negative effects. The USGS data can be found here.





MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Ken Ammon, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 28 June 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: **Immediate action requested.** The Caloosahatchee and Lake Okeechobee remain in crisis. Harmful algal blooms in the Caloosahatchee continue to necessitate Health Department warnings against swimming and fish consumption in Lee, Hendry and Glades Counties. High salinities throughout the river continue to negatively impact habitat for larval finfish and shellfish, freshwater clams and tapegrass within the upper estuary, and oysters and seagrasses in the lower estuary. Low water levels in the Lake continue to negatively impact snail kite habitat and foraging and submerged aquatic vegetation. Despite these serious ecological impacts, the SFWMD continues to operate forward pumps to deliver additional water out of the lake to permitted users. **We request that the Corps and the SFWMD discontinue the use of forward pumps to prevent further degradation of the natural systems of the Okeechobee Waterway.**

Lake Okeechobee Level**: 9. 68'** (Water Shortage Management Band) Previous wk: **9.60'** (Water Shortage)

Weekly Rainfall: WP Franklin 2.01", Ortona 0.26", Moore Haven 0.07"

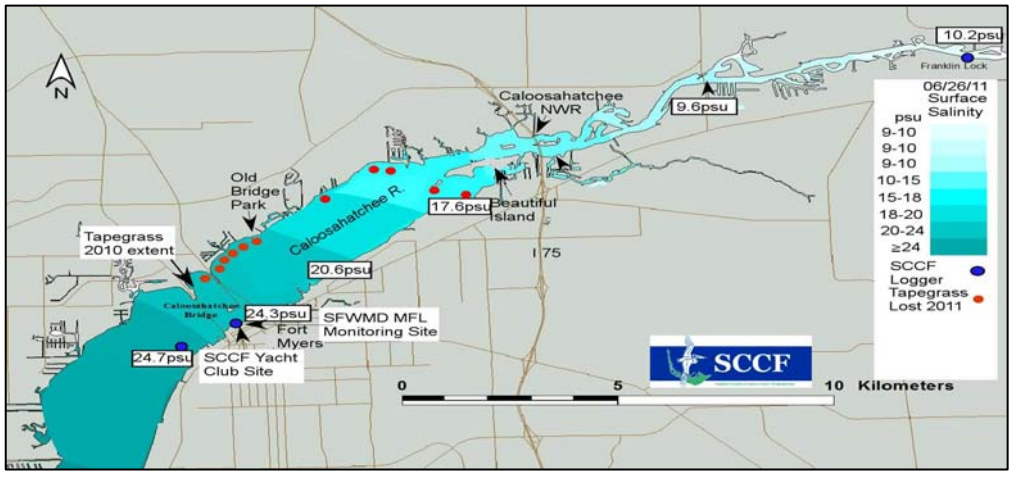
Salinity Ft. Myers: **22.5 - 26.5** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev wk: **24.2 - 26.8** psu

22.5 – 24.5 (SCCF RECON Marker 52) Previous week: **24.5 – 26.6** psu

MFL Status: **Violation 4th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day) since 11/21/10 = **219 days**
Above 20 psu (1 day) since 5/9/11 = **49 days**
MFL Violation 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average **23.3** psu surface (**Violation**)

Olga Water Treatment Plant Chloride: **152 ppm - High TDS/Chloride levels shut down plant on 5/5/11**

Salinity Shell Point: **31.9 – 36.8 psu** (SCCF RECON sensor) Previous week: **34.5 – 36.5** psu



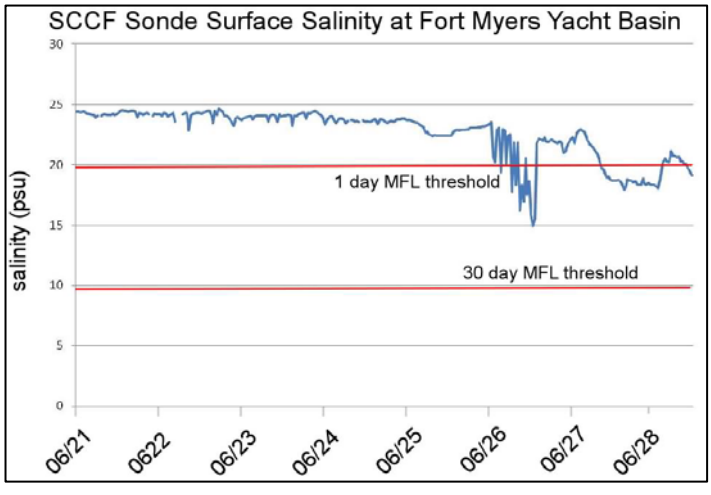
Flow: *** From ACOE Website Daily Reports**

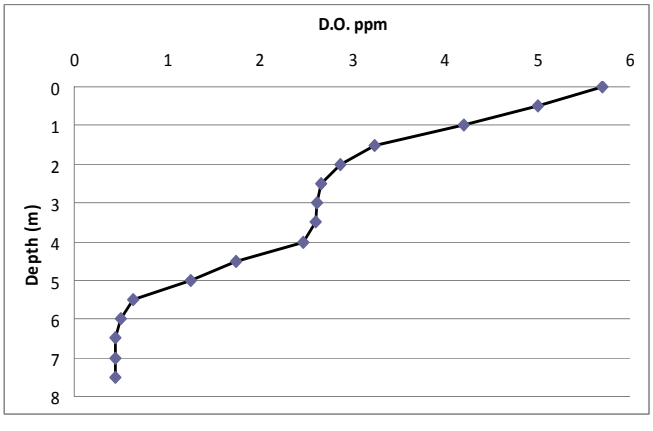
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/21/11	Tue	2	0	-270
6/22/11	Wed	2	8	-1
6/23/11	Thu	685	6	-183
6/24/11	Fri	1097	11	-267
6/25/11	Sat	-NR	-NR	-NR
6/26/11	Sun	738	14	-NR
6/27/11	Mon	3206	2	-1976

The estuary has not received any freshwater from the Lake since March 6th. Back-flowing from the Caloosahatchee basin into Lake Okeechobee has been occurring since June 19th. This action has removed water from the Caloosahatchee basin that would otherwise be available to help meet the minimum flow and level (MFL) for the estuary. The lack of flow through the S-78 structure has also contributed to stagnation within the western pool between S-78 and S-79 resulting in extensive blue-green algae blooms from Alva to Fort Myers.

Recent rainfall within the basin during the past week reduced salinities downstream of S-79 from 13.9 psu to 10.2 psu. Salinities at the Fort Myers Yacht Basin decreased slightly, but remain >20 psu and continue to exceed the MFL criteria for both the 30-day moving average of 10 psu and the 1-day threshold of 20 psu.

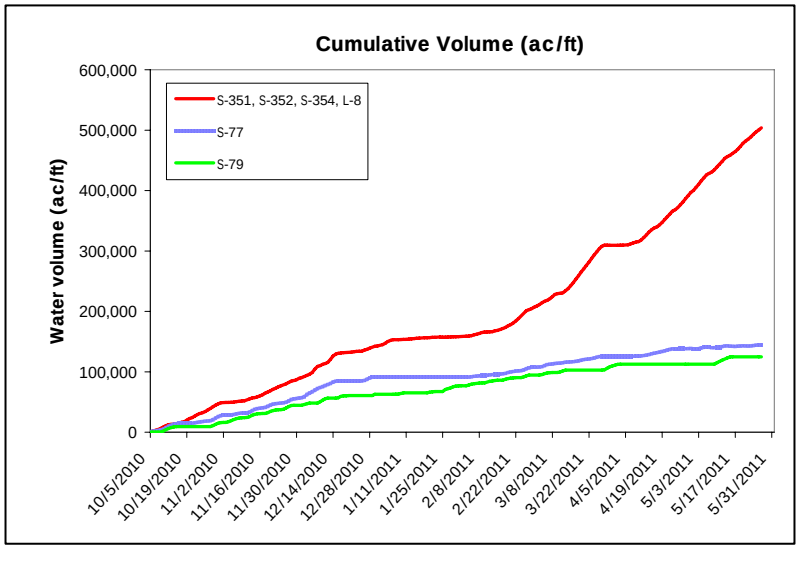
The relatively long period with no flows at S-79 has led to stratification and hypoxia within the upper estuary. Base flow releases during the dry season would have prevented both the stratification and the blue green-algae blooms, which are now contributing to hypoxia downstream of S-79.





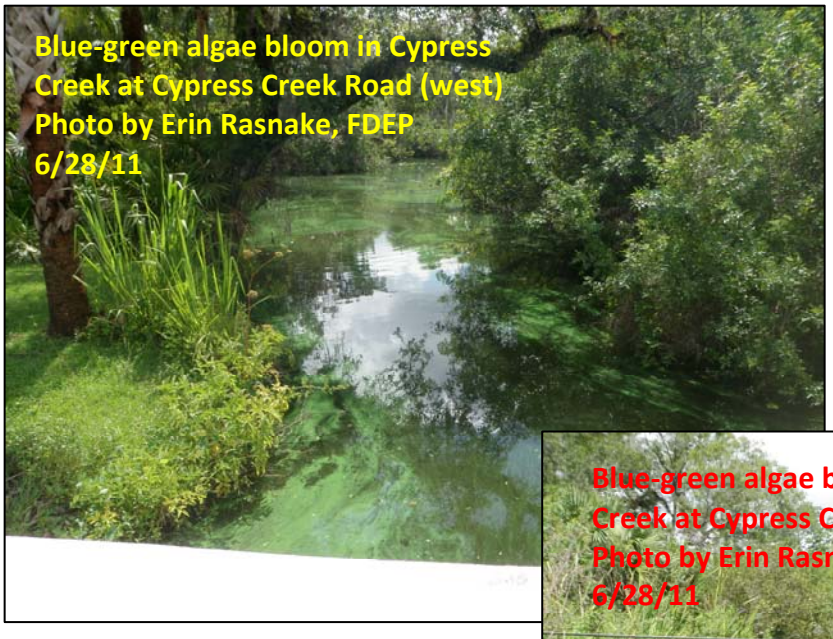
Water quality data collected by the Lee County Hyacinth Control District on June 28th indicate that waters just downstream of the lock are highly stratified and that bottom waters are hypoxic. Dissolved oxygen (DO) values recorded approximately 300 yards west of S-79 had surface DO concentrations of 5.7 mg/l, while bottom DO values were <0.50 mg/l.

Cumulative flow from Lake Okeechobee to the Everglades Agricultural Area from October through May was five times greater than flows to the estuary. The graph to the right shows the disproportionate distribution of water supplied to permitted users within the EAA versus the Caloosahatchee. More than 300k ac/ft of water was supplied to the EAA between March and June, while flows to the estuary were completely cut off. The only flows that the estuary received during that period were from small amounts of basin runoff.



Upper Estuary Condition: Very Poor. High salinities in the estuary from S-79 to Shell Point have persisted for more than 3 ½ months resulting in a complete loss of low salinity zone habitat, which is critical for spring/summer spawning finfish and shellfish. The lack of flow also resulted in stagnation within the Franklin pool and the upper estuary resulting in harmful algal blooms from Alva to Fort Myers. Recent rains helped dissipate the blooms; however, stratification and increased biological oxygen demand resulted in hypoxia in bottom waters just downstream of S-79. Blue-green algae blooms remain in the oxbows and the tributaries to the Caloosahatchee (see pictures below).

Lower Estuary Condition: Poor. Salinities in the lower estuary remain above the preferred range for Eastern oysters (*Crassostrea virginica*), with salinities at Shell Point exceeding 30 psu. Seagrasses throughout the lower estuary are being impacted by high epiphytic loads, which are negatively affecting their health and productivity.



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Deb Drum, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 12 July, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Rain has begun to dissipate algal blooms; however, high chlorophyll levels remain distributed through the Caloosahatchee. Health Department warnings against swimming and fish consumption in Lee, Hendry and Glades Counties remain in effect. The estuary continues to experience phytoplankton blooms and widespread hypoxia. This past week, S79 received average weekly flows of 1,114 cfs. As long as rain continues to provide flows of 450 – 1,500 cfs to the estuary through S79 no additional flow from the lake is requested. However, if flows from basin runoff fall below 450 cfs we request that Caloosahatchee basin water from S78 -currently being back flowed into the lake- be allowed to flow west into the estuary.

Lake Okeechobee Level: 9. 96' (Water Shortage Management Band) Previous wk: **9. 83'** (Water Shortage)

Lake Okeechobee Inflows/Outflows: 1491 cfs / 1085 cfs

Weekly Rainfall: WP Franklin 2.10", Ortona 6.14", Moore Haven 2.72"

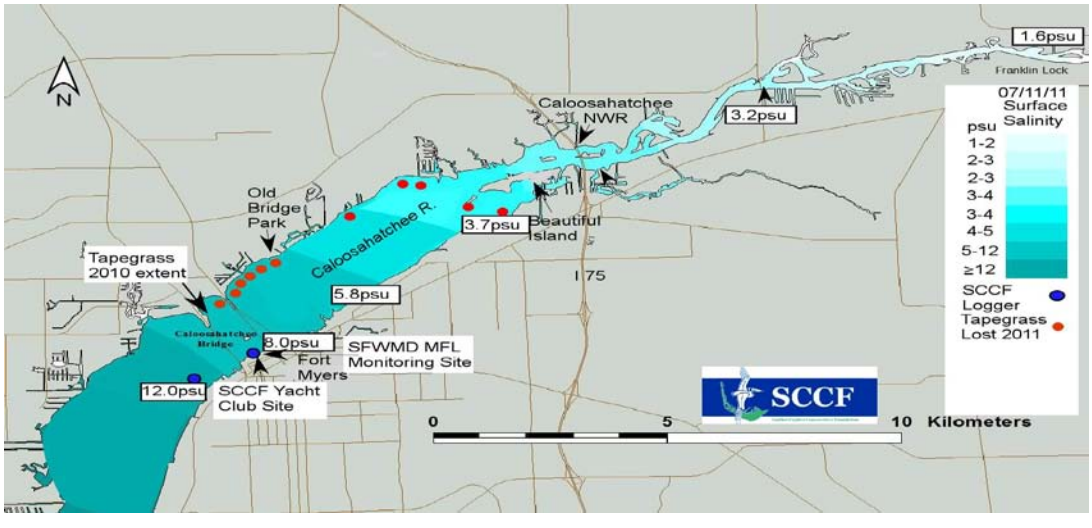
Salinity Ft. Myers: **8.0 – 12** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **11 – 19.7** psu

12 – 18 psu (SCCF RECON Marker 52) Previous week: **18 - 25** psu

MFL Status: **Violation 5th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day average) from 11/21/10 - 7/9/11 = **231days**
MFL Violation = 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average = **18.75** psu at surface = **Violation**

Olga Water Treatment Plant Chloride: 86 ppm – Shutdown since 5/5/11 due to high TDS/Chloride levels

Salinity Shell Point: **22 – 35 psu** (SCCF RECON sensor) Previous week: **26.5 – 36.5 psu**



Flow: *** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
7/5/11	Tue	1181	0	- 812
7/6/11	Wed	986	0	- 848
7/7/11	Thu	911	0	- 1052
7/8/11	Fri	1105	0	- 1170
7/9/11	Sat	988	0	- 992
7/10/11	Sun	762	0	- 880
7/11/11	Mon	1866	0	- 936
Weekly Ave Flow		1114	Backflow	Backflow

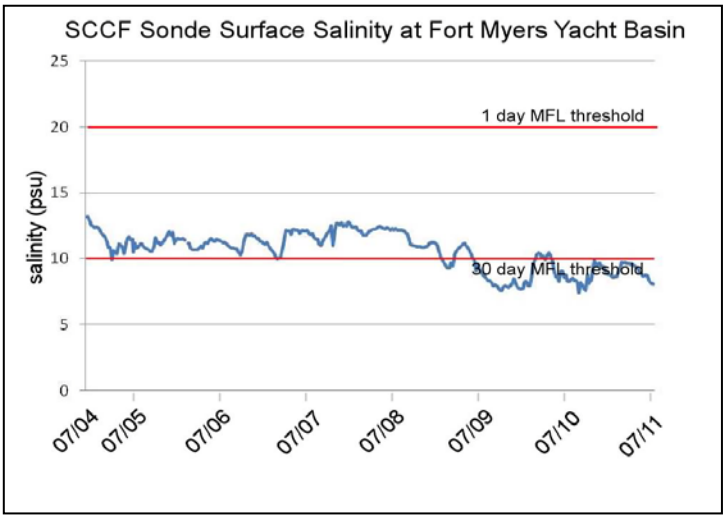
Rains over the past week provided the Caloosahatchee weekly average flows of 1,114 cfs, reducing salinities downstream of S-79 **to the MFL level at Fort Myers for the first time in the past 8 months**, since November 21, 2010. Salinities dropped from 3.5 to 1.6 psu downstream of S79 and fell slightly at Shell Point although they remain above the preferred range for oysters.

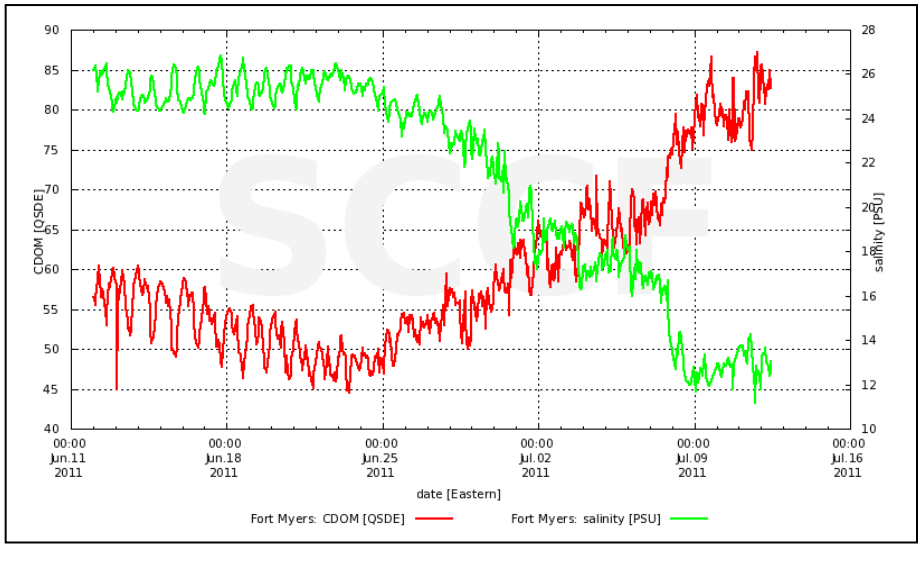
Water continues to be back flowed from the Caloosahatchee eastern (Ortona) basin into lake Okeechobee to augment lake levels. The redirection of Caloosahatchee basin water is acceptable as long as the Caloosahatchee estuary receives enough basin runoff to meet its MFL and ecological targets in the lower estuary.

Decaying algae in addition to high flows of freshwater following the extended period of no flow at S79 has caused high oxygen demand and stratification of the water column resulting in undesirable hypoxic conditions throughout the Caloosahatchee.

Achieving beneficial salinity levels is critical for the reestablishment of freshwater tapegrass habitat in the upper estuary. While flows have increased and salinity is reduced to an appropriate range for tapegrass, water color, from colored dissolved organic matter (CDOM), has increased as shown on the SCCF RECON graph from the Fort Myers sensor, below.

Higher levels of CDOM, particulates and nutrients washing into the river from the watershed reduces light availability which in turn impacts and inhibits reestablishment and regrowth of tapegrass.





Caloosahatchee Stations	Chlorophyll (µg/l) 7/11/2011
Port LaBelle	
Alva	
Franklin East	34.9
Franklin West	19
SR 31 Bridge	16.2
Royal Palm Park	26.1
Tarpon Point	19.1
Ft Myers	23.2
Iona Peppertree Pt	10.6

Upstream of S-79/Franklin Pool Condition: Very Poor.
Department of Health warnings remain in place for Lee, Hendry and Glades Counties. High chlorophyll remains upstream of the lock with flagellates and cyano filaments responsible for high chlorophyll levels at the lock. Rains have dissipated the intensity and visibility of the blooms.

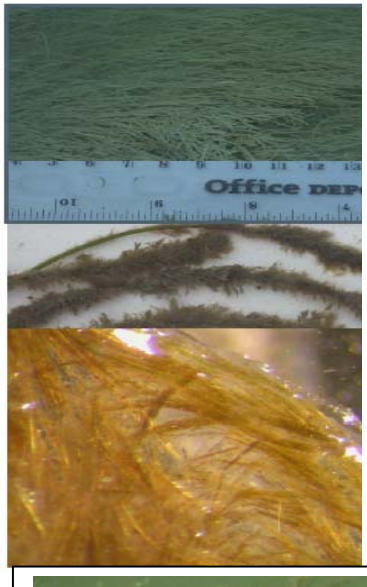
Upper Estuary Condition: Very Poor.
Phytoplankton blooms persist in the estuary. Water samples did not have colonies of *Microcystis* or *Anabaena circinalis,* but did have cyanobacteria filaments between Franklin Lock and Tarpon Point Pier. Detrital clumps which may have formerly been cyanobacteria colonies and have degraded pigments were also present down to Tarpon Pt. Pier. The major live plankton are flagellates. At Fort Myers there were two large dinoflagellate species including *Ceratium hircus*.

Impacts from these blooms and from cyanobacteria being washed downstream with the rains has increased biological oxygen demand resulting in hypoxia in bottom waters downstream of S-79 to Fort Myers.

Lower Estuary Condition: Poor. Salinities in the lower estuary are dropping but remain above the preferred range for Eastern oysters (*Crassostrea virginica*), with salinities at Shell Point still exceeding 25 psu despite the rain.

***Oysters*:** FGCU sampling for June reports disease prevalence of Perkinsus on the high end of 38 – 100%
Intensity 0.31 – 1.21 (low – medium)
Spat recruitment: 1.86 – 5.72 spat / shell
Spat Survival: - Open bags: 1 – 14% (poor survival)
- Closed bags: 10 – 52% (Good survival)

***Seagrasses*:** throughout the lower estuary are impacted by high epiphytic loads, which negatively affect their health and productivity. Seagrasses in Tarpon Bay on Sanibel this week are being overgrown by epiphytic cyanobacteria- pictured below.



Epiphytic cyanobacteria observed this week on seagrass in Tarpon Bay on Sanibel

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Terrie Bates, Susan Gray, DEP Herschel Vinyard

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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 19 July, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Rainfall in the basin is supplying flows to the Caloosahatchee estuary and dispersing algal blooms, however, high chlorophyll levels and anoxic conditions continue to affect water quality in the Caloosahatchee and estuary. Health Department warnings against swimming and fish consumption in Lee, Hendry and Glades Counties remain in effect. This week Lake Okeechobee violated its MFL with levels below 11 feet for 80 days. COE graphical projections indicate that at the current rate of rainfall and supply, the lake will remain in the water shortage band through August. Given these conditions we request Phase III water restrictions remain in effect throughout the South Florida Water Management District to enable the recovery of Lake Okeechobee.

Lake Okeechobee Level: 10.15' (Water Shortage Management Band) Previous wk: **9. 96'** (Water Shortage)

Weekly Rainfall: WP Franklin 0.57", Ortona 3.01", Moore Haven 1.18"

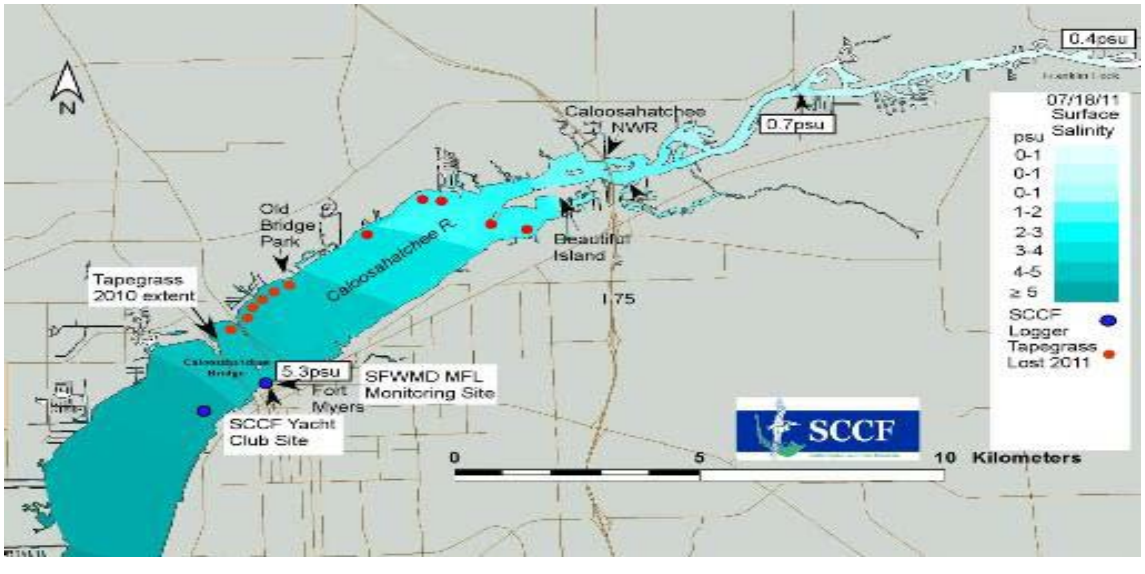
Salinity Ft. Myers: **4 – 9.7 psu** surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **8 – 12** psu

7 – 14 psu (SCCF RECON Marker 52) Previous week: **12- 18** psu

MFL Status: **Violation 5th Consecutive Year of MFL Exceedence = Serious Harm**
Above10 psu (30-day average) from 11/21/10 - 7/9/11 = **231days**
MFL Violation = 30 day moving average above 10 psu or 1 day at 20 psu
Current 30-day moving average = **14.9** psu at surface = **Violation**

Olga Water Treatment Plant Chloride: 78 ppm – Shutdown since 5/5/11 due to high TDS/Chloride levels

Salinity Shell Point: **19 - 34.7 psu** (SCCF RECON sensor) Previous week: **22 – 35 psu**

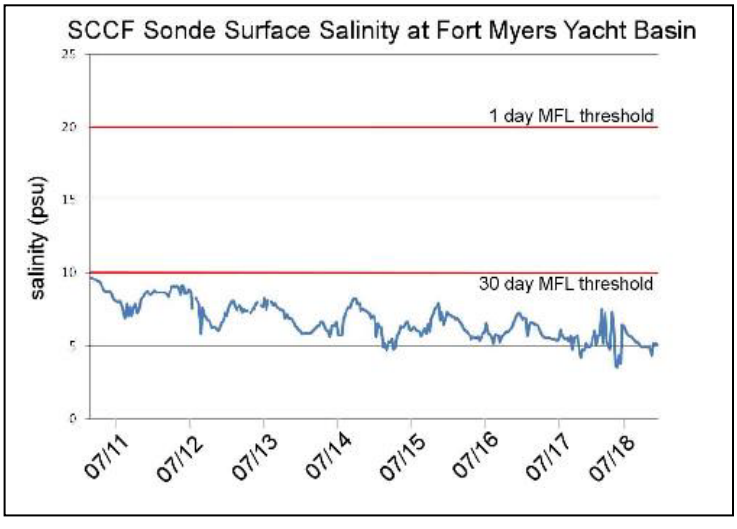


Flow: *** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
7/12/11	Tue	1637	0	-1132
713/11	Wed	1328	NR	-1120
7/14/11	Thu	1024	NR	-644
7/15/11	Fri	1064	0	-476
7/16/11	Sat	1830	84	-888
7/17/11	Sun	1292	0	-1256
7/18/11	Mon	2101	0	-1156
Average Flow		1468	Backflow	Backflow - 953

Rainfall in the watershed provided a weekly average flow of 1,468 cfs to the Caloosahatchee estuary and reduced salinities at Fort Myers to 5.3 psu. Salinities fell slightly at Shell Point although they remain above the preferred range for oysters.

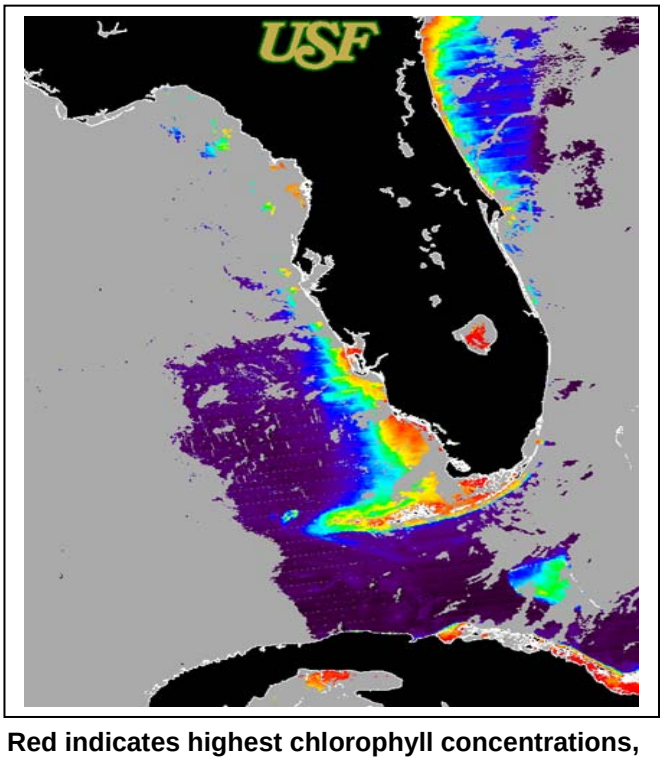
Water continues to be back flowed from the eastern (Ortona) basin of the Caloosahatchee into Lake Okeechobee to augment lake levels. This redirection of Caloosahatchee basin water is acceptable as long as the Caloosahatchee estuary receives enough basin runoff to meet its MFL and ecological targets in the lower estuary.



Algae, including cyanobacteria and dinoflaggelates, continue to impact water quality causing elevated chlorophyll levels and anoxia. A number of dead crabs were observed on the western side of S79.

The chlorophyll impairment level for estuaries is 11 ug/l based on annual average.

Caloosahatchee Stations	Chlorophyll (µg/l) 7/11/2011
Port LaBelle	11.5
Alva	19.25
Franklin East	3.3
Franklin West	15.9
SR 31 Bridge	16.8
Royal Palm Park	-
Tarpon Point	-
Ft Myers	21
Iona Peppertree Pt	4.2



Red indicates highest chlorophyll concentrations, yellow indicates intermediate levels and blue indicates low levels.

A “black water” bloom appeared over the past week in the Gulf of Mexico and along the coast of Southwest Florida extending from Collier County into Florida Bay. FWRI has identified over a million cells per liter of *Takayama tuberculata* in samples from two beaches during the past week. The bloom caused anoxic conditions resulting in dead fish, sharks, lobsters & crabs washing ashore on area beaches.

This is at least the third year in a row that this genus of algae has been blooming in Collier Co. Last year, there was also a bloom of a different species of *Takayama acrotricha* which extended from Collier up to Lee County beaches. A third species *T. tasmanica* has been blooming in Sanibel canals on the east end of the island with over 15 million cells per liter. *Takayama* is a gymnodinoid very similar to *Karenia*. *T. tuberculata* hasn't been noted to produce toxins but large blooms can cause hypoxia which can kill benthic organisms and fish.

Upstream of S-79/Franklin Pool Condition: Very Poor.
Department of Health warnings remain in place for Lee, Hendry and Glades Counties. Chlorophyll remains high upstream of the lock in Alva with flagellates and cells of cyanobacteria responsible for high chlorophyll levels Conditions continue to improve slightly as basin runoff moves through the system.

Upper Estuary Condition: Very Poor.
Phytoplankton blooms persist in the estuary. Water conditions continue to be anoxic from biological oxygen demand resulting from nutrient loads washing downstream and stratification from increased freshwater flow. Dead crabs were found on the west side of the Franklin Lock. Hypoxic conditions in bottom waters are widespread at Fort Myers from west to east of the Caloosahatchee Bridge.

Lower Estuary Condition: Fair. Salinities in the lower estuary are dropping but remain above the preferred range for Eastern oysters (*Crassostrea virginica*), with salinities at Shell Point still exceeding 25 psu despite the rain.

***Seagrass*:** Throughout the lower estuary seagrass are impacted by high epiphytic loads, which negatively affect their health and productivity.

Dead blue crabs at S79
July 18, 2011 Photo by SCCF

Algae East of Franklin Lock (S79)
July 18, 2011 Photo by SCCF

West side of Franklin Lock (S79)
July 18, 2011 Photo by SCCF

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 26 July, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 10.24' (Water Shortage Management Band) Previous wk: **10.15'** (Water Shortage)

Weekly Rainfall: WP Franklin 0.74", Ortona 0.07", Moore Haven 0.63 "

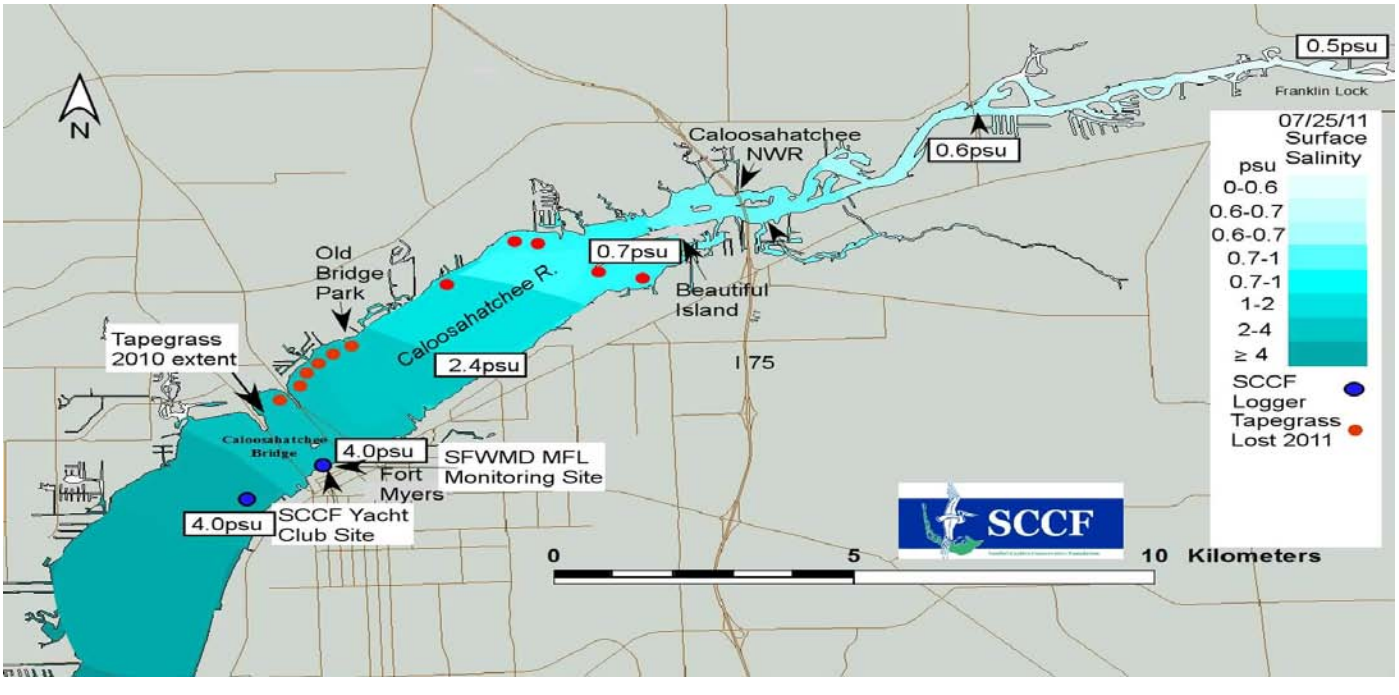
Salinity Ft. Myers: **3 - 6 psu** surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **8 – 12** psu

5.5 - 10.5 psu (SCCF RECON Marker 52) Previous week: **7 – 14** psu

MFL Status: Daily salinity at Fort Myers < 10 psu **In compliance**
30-day moving average = **10.4** **> 10** psu at surface = **Violation**

Salinity Shell Point: **17 – 33 psu (**SCCF RECON sensor) Previous week: **19 - 34.7 psu**

Olga Water Treatment Plant Chloride: 70 ppm – Expected to reopen August 8, 2011 Shutdown =9 weeks



Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
7/19/11	Tue	1925	0	-1188
720/11	Wed	1462	0	-1132
7/21/11	Thu	715	0	-992
7/22/11	Fri	1130	0	-632
7/23/11	Sat	514	0	-868
7/24/11	Sun	1063	0	-852
7/25/11	Mon	441	0	-680
Average Flow		1036	Backflow	Backflow - 906

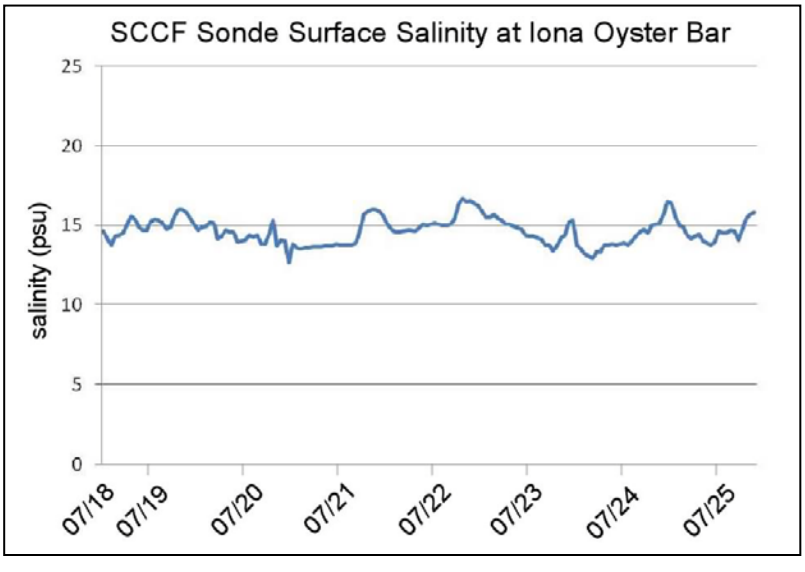
Rainfall in the watershed provided a weekly average flow of 1,036 cfs to the Caloosahatchee estuary and reduced salinities at Fort Myers to 4 psu. A sonde has been deployed to measure salinities in the oyster beds of the lower estuary. The surface salinity in Iona is in the range of 14 - 16 psu.

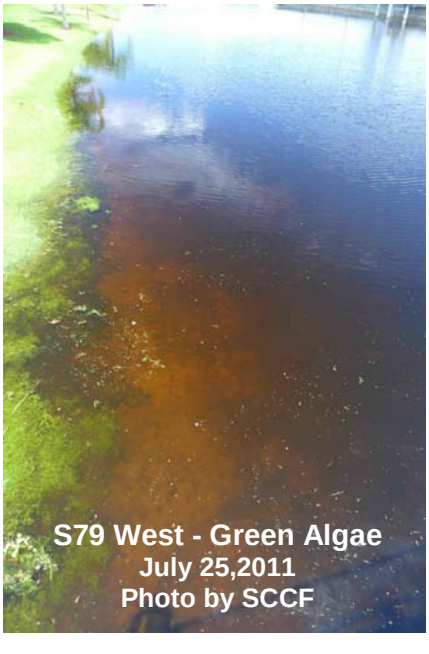
Water continues to be back flowed from the eastern (Ortona) basin of the Caloosahatchee into Lake Okeechobee to augment lake levels. This should not negatively impact the estuary recovery as long as the Caloosahatchee estuary receives enough basin runoff to meet its MFL and ecological targets in the lower estuary.

The Lee County Health Department has replaced water warnings with a caution. Bottom waters were hypoxic on July 23 from the railway trestle to shell Point (17 miles). Estuary waters were generally hypoxic below 2 meters, but water at 1.6 meters was also hypoxic at one site.

11 ug/l is the chlorophyll impairment level for estuaries based on annual average

Caloosahatchee Stations	Chlorophyll (µg/l) 7/11/2011
Port LaBelle	-
Alva	-
Franklin East	46.5
Franklin West	8.2
SR 31 Bridge	9.9
Royal Palm Park	11.5
Tarpon Point	6.0
Ft Myers	4.5
Iona Peprtree Pnt	5.3





Upstream of S79/Franklin Pool Conditions: Poor.
Chlorophyll remains high upstream of the lock. Health Department warnings have been replaced with a caution on water use.

Upper Estuary Condition: Poor.
Water conditions continue to be anoxic from biological oxygen demand resulting from nutrient loads in the water column and stratification from increased freshwater flow. Hypoxic conditions in bottom waters are widespread . extending at least from the railway trestle to Shell Point (17 miles).

Lower Estuary Condition: Fair. Salinities in the lower estuary are dropping but anoxic conditions were documented as a continuing problem. A sonde deployed in the oyster beds of the lower estuary (Iona) report surface salinities of 14 - 16 psu (graph above).

Mats of filamentous green algae along the shoreline west of S79.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 16 August, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Local rainfall within the Caloosahatchee watershed over the past week provided flows averaging 1,774 cfs to the estuary. At this time no action is requested; however, if flows at S-79 drop below the preferred range to meet the salinity targets for tapegrass in the upper estuary and oysters in the lower estuary additional flow may be needed to support estuary recovery.

Lake Okeechobee Level: 10.34' (Water Shortage Management Band) Previous wk: **10.28'** (Water Shortage)

Weekly Rainfall: WP Franklin 3.53", Ortona 2.23", Moore Haven 3.4"

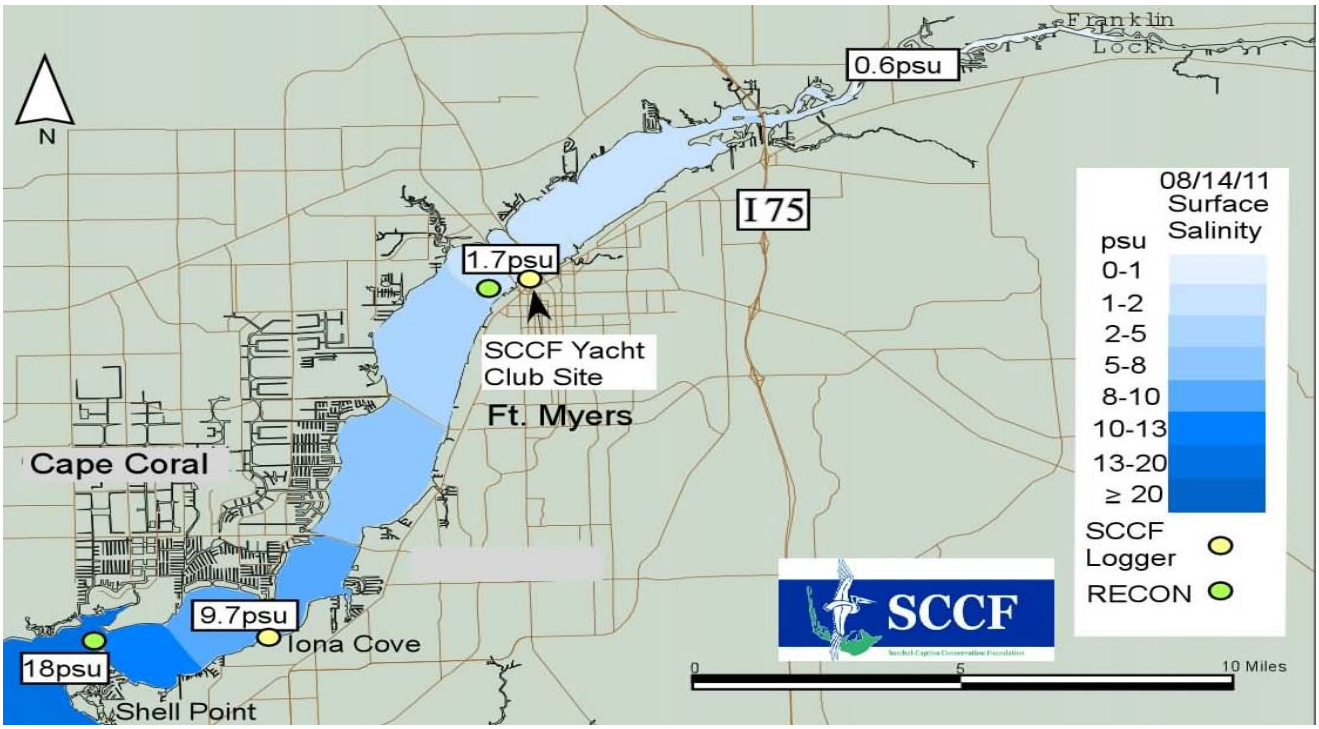
Salinity Ft. Myers: 1.7-7.6 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **2.5–7.6** psu

2 – 8.2 psu (SCCF RECON Marker 52) Previous week: 6**–11** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = **5.9** psu **< 10** psu at surface **In compliance**

Salinity Shell Point: 15 – 32.5 psu (SCCF RECON sensor) Previous week: 15 **– 31 psu**

Olga Water Treatment Plant Chloride: 57 ppm – Expected to reopen later this week, Shutdown =11 weeks



Flow: * From ACOE Website Daily Reports

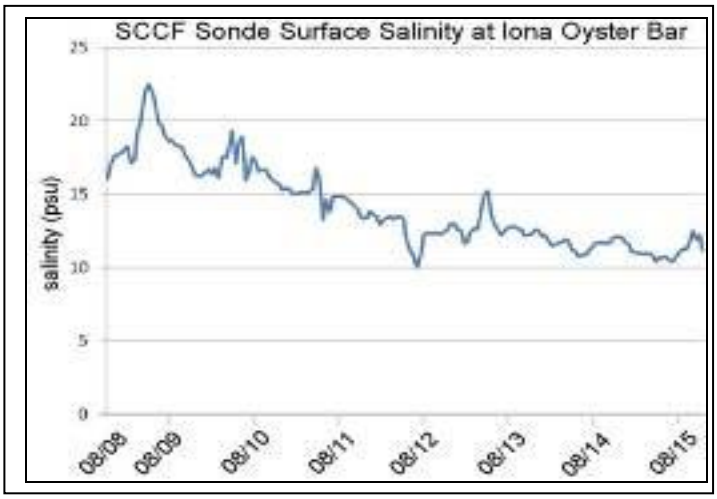
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
8/9/11	Tue	1548	0	-194
8/10/11	Wed	1708	0	-724
8/11/11	Thu	1811	0	-496
8/12/11	Fri	1621	0	-278
8/13/11	Sat	1745	0	-350
8/14/11	Sun	1938	0	-392
8/15/11	Mon	2053	0	-384
Average Flow		1,774	0	Backflow

Flows averaging 1,774 cfs over the past week have been adequate to meet salinity targets within the upper estuary. Salinities at Fort Myers ranged between 1.7–7.6 psu.

Salinities at Shell Point in the lower estuary remain above the preferred range for oysters, ranging between 15–32.5 psu. Salinities upstream at Iona Cove ranged from 10 -23 psu providing a suitable environment for oyster production and survival.

Upstream of S79/Franklin Pool Conditions: Improving.
While no phytoplankton blooms have been reported by local scientists, the Lee County Health Department continues to leave the Caloosahatchee Caution Advisory in place for residents and visitors.

Caloosahatchee Stations	Chlorophyll (µg/l)
SR 31 Bridge	4.7
Ft Myers	4.6
Iona Peppertree Pnt	2.8



Upper Estuary Condition: Improving.
Conditions continue to improve in the upper estuary over the past week. Dissolved oxygen (DO) concentrations in Fort Myers remain relatively low, dipping below 3 µg/l between Aug 9 and Aug 15. This seems to be a downward trend last week. DO concentrations remain low in the lower estuary as well. Chlorophyll levels are dropping.

Lower Estuary Condition: Improving.
Salinities in the lower estuary are in the preferred range for oysters in Iona but remain too high at Shell Point. FGCU scientists report disease prevalence in oysters remains high between 38-100%.

As we enter the peak spawning period for oysters, which in the Caloosahatchee occurs between July and September, it is critical that we maintain optimal salinities in the range of 12–25 psu within the lower estuary including Iona Cove and Shell Point.

On August 4th, a flagellate bloom was documented at Bowmans Beach off Sanibel. This was a different species than the one that bloomed the week before at Tarpon Bay Rd Beach. Both species were classified as raphidophytes that have been found to produce brevetoxin and other toxins. The Bowmans bloom was *Chatonella subsalsa*.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Stroud, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 23 August, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Local rainfall within the Caloosahatchee watershed over the past week provided flows averaging 2,469 cfs to the estuary. At this time no action is requested; however, if flows at S-79 drop below the preferred range to meet the salinity targets for tapegrass in the upper estuary and oysters in the lower estuary additional flow may be needed to support estuary recovery.

Lake Okeechobee Level: 10.56' (Water Shortage Management Band) Previous wk: **10.34'** (Water Shortage)

Weekly Rainfall: WP Franklin 1.20", Ortona 3.20", Moore Haven 2.31" .

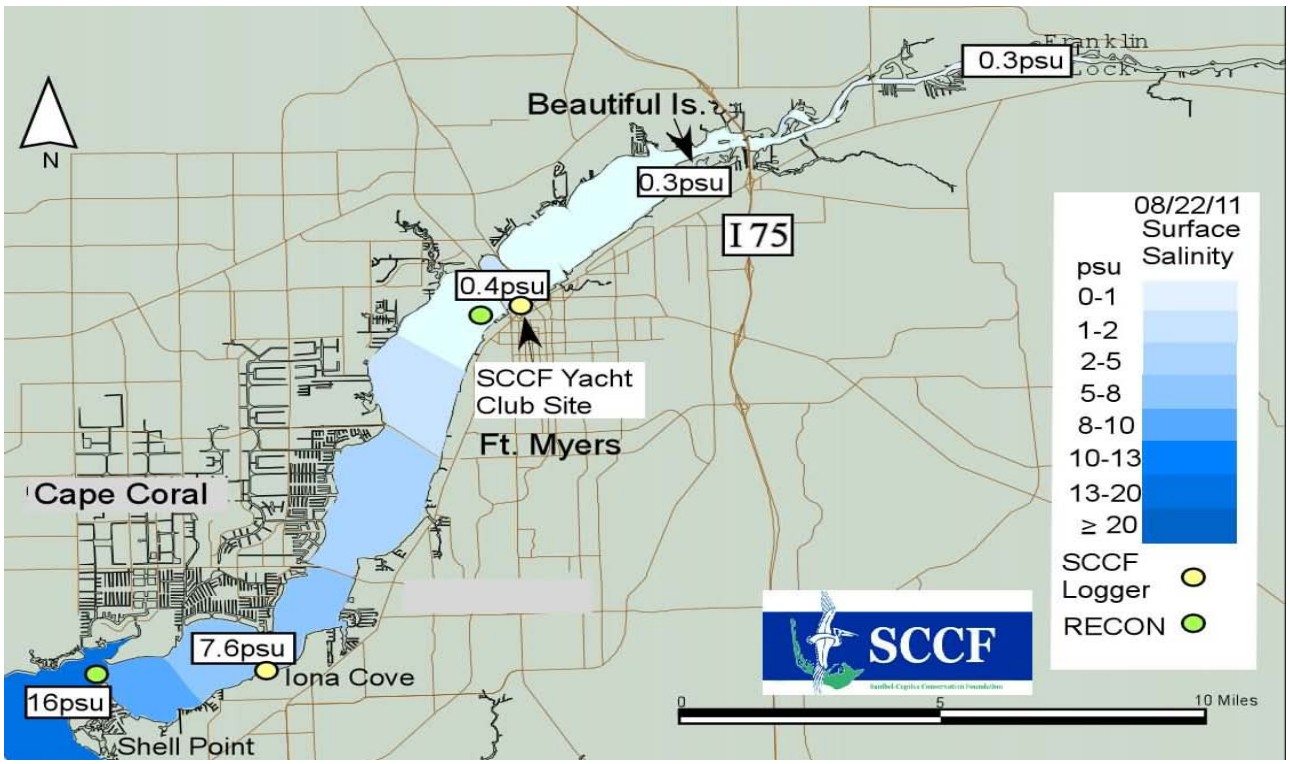
Salinity Ft. Myers: **0.4 – 2 psu** surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **1.7-7.6** psu

0.5 – 5 psu (SCCF RECON Marker 52) Previous week: **2 – 8.2** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = **4.1** psu **< 10** psu at surface **In compliance**

Salinity Shell Point: 12 – 32 psu (SCCF RECON sensor) Previous week: **15 – 32.5** psu

Olga Water Treatment Plant Chloride: 50 ppm – Plant remains offline for maintenance



Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
8/16/11	Tue	1982	0	-384
8/17/11	Wed	1979	0	-380
8/18/11	Thu	2209	0	-422
8/19/11	Fri	2989	0	-576
8/20/11	Sat	2945	0	-888
8/21/11	Sun	2534	0	-1052
8/22/11	Mon	2647	0	-1108
Average Flow		2,469	0	Backflow

The estuary received an average flow of 2,469 cfs over the past week through S79. Salinities at Fort Myers ranged between 0.5 - 5 psu in the middle estuary.

Despite these relatively high flows, at the upper range of desirable volumes in normal years, salinities at Shell Point in the lower estuary remain slightly above the preferred range for oysters, ranging between 12–32 psu. Current conditions do not indicate harmful effects from this higher flow at this time, perhaps because of the preceding extremely dry conditions this year.

Caloosahatchee basin water continues to be back flowed from the eastern (Ortona) basin of the Caloosahatchee into Lake Okeechobee to augment lake levels. This should not negatively impact the estuary recovery as long as the Caloosahatchee estuary receives enough basin runoff to support conditions for ecological recovery in the lower estuary.

Upstream of S79/Franklin Pool Conditions: Fair.
While no phytoplankton blooms have been reported, Chlorophyll levels remain elevated.

The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair
No phytoplankton blooms have been reported, although chlorophyll levels are higher than in recent weeks. Low dissolved oxygen (DO) concentrations in Fort Myers the last few days have resulted in hypoxic conditions with levels below3 µg/l.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (QSDE)	Turbidity (NTU)
Franklin Lock east	14.9	215.7	2.1
Franklin Lock west	10.9	224.9	2.4
Royal Palm Park	10.0	218.7	4.2
Ft Myers	7.72	198.3	1.1
Iona Peppertree Pt	26.2	149	3.1

Lower Estuary Condition: Fair.
Salinities in Iona are in the preferred range for oysters, 12–25 psu, but remain high at Shell Point. Lee County sampling of coastal waters reports low levels of dinoflagellate, diatoms and cyanobacteria.

Water samples from Iona reported elevated levels of chlorophyll, 26.2 ug/l, which is significantly higher than samples in recent weeks and well above the 11ug/l impairment level for estuaries.

Oysters:
This is the peak spawning period for Caloosahatchee oysters.

The condition index is very good ranging between 3.09 – 4.66. Preferred range > 2.

The Living Density is good at 829 – 1771 / sq. m.

Disease prevalence remains high ranging between 38 – 100%.

Disease intensity is good at levels of 0.31–1.21.
(scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

Data is not currently available for spat recruitment.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 13 September, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Local rainfall within the Caloosahatchee watershed over the past week provided high flows averaging 3,036 cfs to the estuary. However Lake Okeechobee water levels continue to languish at critically low levels. Persistent, very dry conditions in the lake and projections indicate that the lake will remain in the Water Shortage band as we enter the dry season. **We request conservation initiatives and Phase III water restrictions be enforced throughout the South Florida Water Management District to enable the recovery of Lake Okeechobee water levels.**

Lake Okeechobee Level: 10.9' (Water Shortage Management Band) Previous wk: **10.77'** (Water Shortage)

Weekly Rainfall: WP Franklin 2.85", Ortona 2.27", Moore Haven 2.43" .

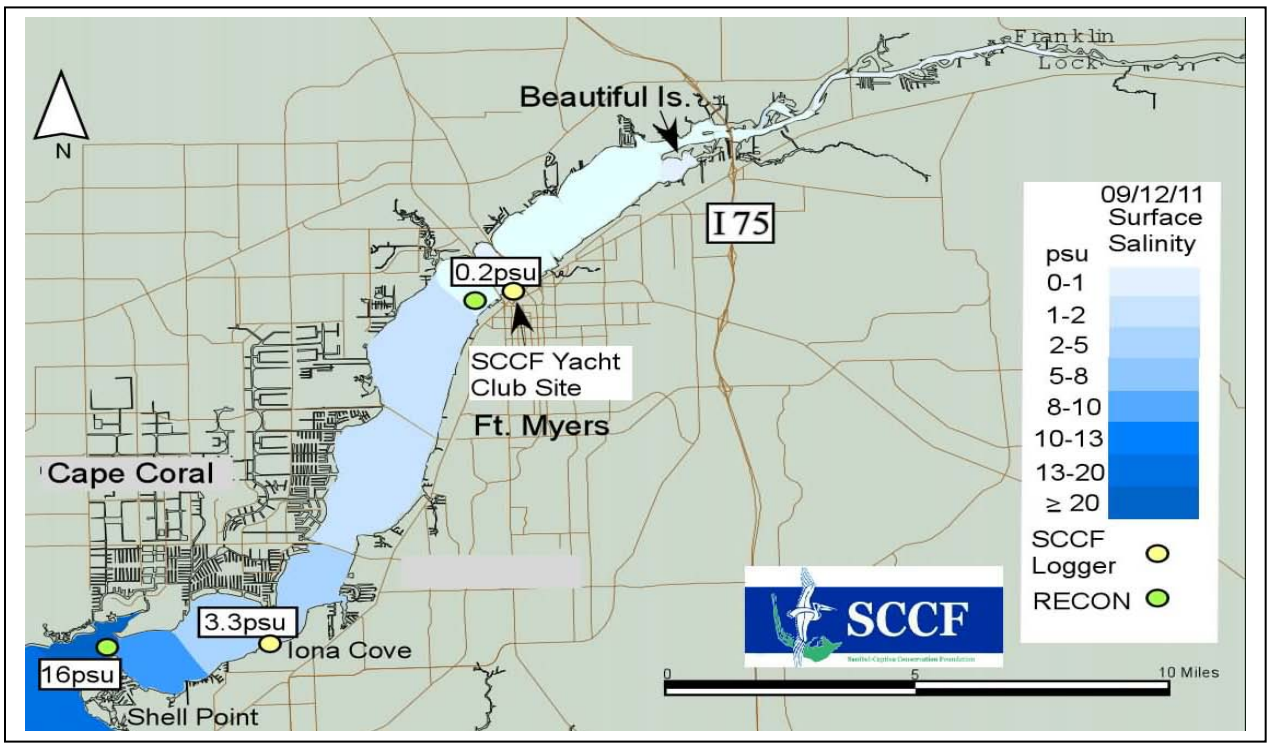
Salinity Ft. Myers: **0.2– 0.8 psu** surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.3 – 0.7** psu

1.0 psu (SCCF RECON Marker 52) Previous week: **1.0 – 4.0** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = < **3.0** psu **<** 10 psu at surface **In compliance**

Salinity Shell Point: **7 – 33 psu** **(**SCCF RECON sensor) Previous week: **12 – 33** psu

Olga Water Treatment Plant Chloride: 46 ppm



Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
9/6/11	Tue	2721	0	-214
9/7/11	Wed	4771	0	-382
9/8/11	Thu	3922	0	-436
9/9/11	Fri	2772	0	-624
9/10/11	Sat	3237	0	-772
9/11/11	Sun	2329	0	-700
9/12/11	Mon	1497	0	-748
Average Flow		3036		Backflow

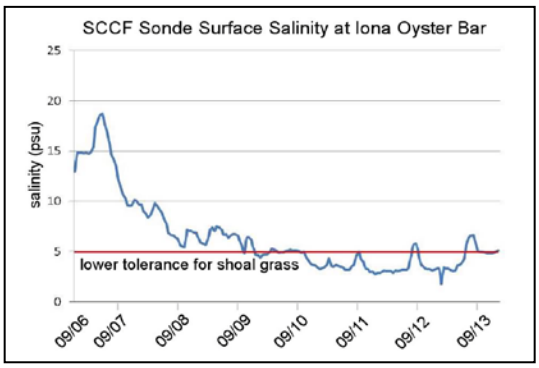
The estuary received high flows averaging 3,036 cfs over the past week through S79. Salinities at Fort Myers were below 1 psu in the middle estuary, 2.6 – 18.7 psu at Iona Cove and 7 – 33 psu at Shell Point.

Caloosahatchee flows are entirely from watershed rainfall runoff, with no contribution from Lake Okeechobee. Due to dry conditions Caloosahatchee basin water from the Ortona basin (S78) continues to be back flowed east into Lake Okeechobee to augment lake levels. Despite this effort lake levels remain critically low for this time of year. Projections indicate that without a tropical event or change in the weather, the lake will remain in the water shortage band as we enter the dry season, posing significant impacts to the south Florida water supply for all users. We recommend conservation initiatives and Phase III water restrictions be enforced throughout the South Florida Water Management District to enable the recovery of Lake Okeechobee water levels.

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
Surveys reveal no tapegrass survived the high salinities in the upper estuary this past dry season. SCCF biologists have started to plant tapegrass in the upper estuary to provide cover and forage for fish, shellfish and manatees that depend on grass habitats. A small population of *Polymesoda* clams were found alive near Beautiful Island that did survive the salinity spike. No phytoplankton blooms have been reported although CDOM values of 199 are very high, negatively affecting light penetration for tapegrass.

Lower Estuary Condition: Fair.
A diatom bloom of *Skeletonema spp* is present off the causeway in the lower estuary, pictured below. High flows have dropped salinities at Iona to levels below the tolerance for shoal grass.



Seagrass: Water color is dark in the lower estuary. Measurements of light penetration have been added in the table below to record the depth at which 25% of light is reaching to support seagrass growth. The target light penetration for healthy seagrass in San Carlos Bay is 2.2 meters. Due to the high CDOM seagrass at Iona only had sufficient light at 37 cm or less, and 65 cm or less in San Carlos Bay. As a result of poor light penetration, seagrass shoots in Iona are in very poor shape- missing most of the leaves and roots near the deep edges.

Caloosahatchee Stations	**Chlorophyll (µg/l)**	**CDOM** (QSDE)	**Turbidity** (NTU)	**25% Iz Light** (Meters)
Fort Myers	2.79	199	0.9	0.41
Iona	2.94	186	7.2	0.37
Kitchel Key	1.14	77	7.9	0.65

High Color and Algal blooms off the Sanibel Causeway

Diatom bloom on right Skeletonema spp

September 11, 2011 Photo SCCF

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 20 September, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Local rainfall within the Caloosahatchee watershed over the past week provided flows averaging 1,127 cfs to the estuary. However, Lake Okeechobee water levels continue to languish at critically low levels. Persistent, very dry conditions and projections for the Lake Okeechobee Service Area indicate that the lake will remain in Water Shortage as we enter the dry season. **We support the South Florida Water Management District Modified Phase III water restrictions and ask that every conservation initiative be enforced throughout the sixteen counties of the District to enable the recovery of Lake Okeechobee water levels.**

Lake Okeechobee Level: 10.93' (Water Shortage Management Band) Previous wk: **10.9'** (Water Shortage)

Weekly Rainfall: WP Franklin 0.1 ", Ortona 0.0 ", Moore Haven 0.15" .

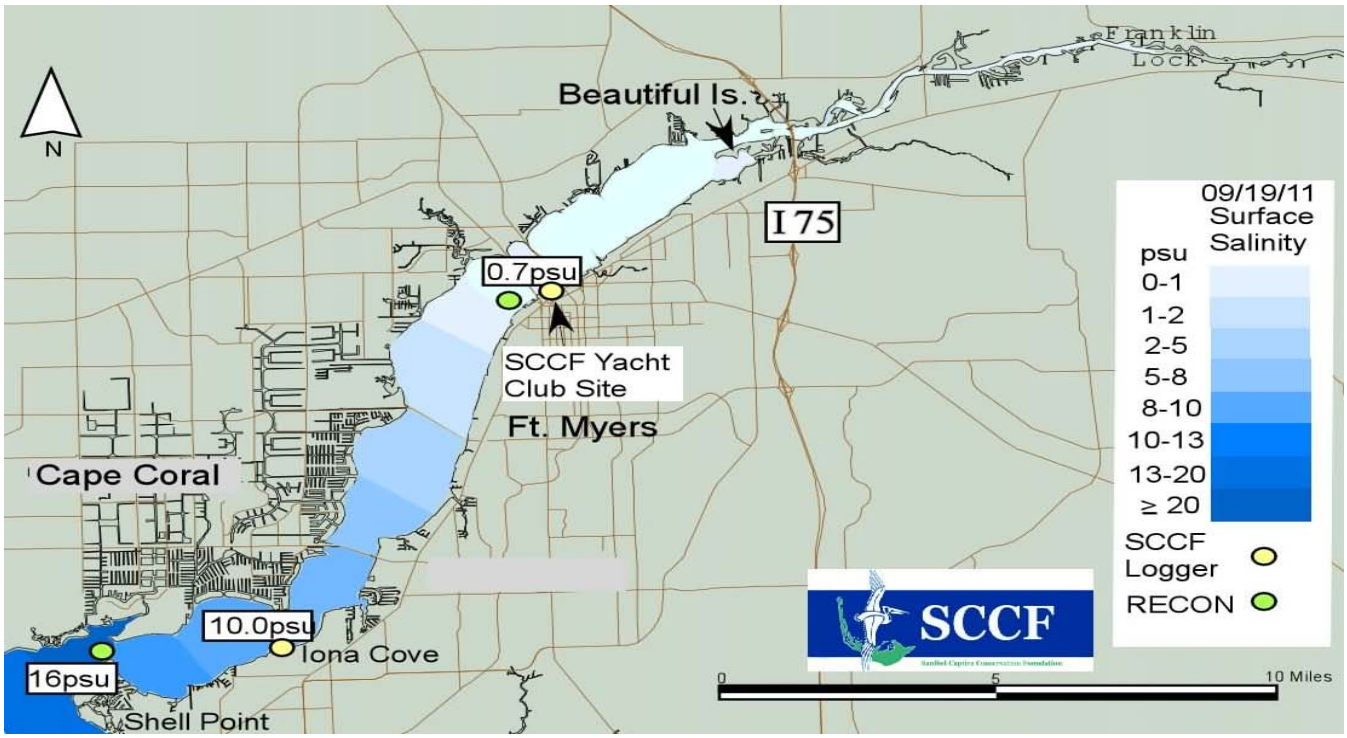
Salinity Ft. Myers: 0.7 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.2– 0.8** psu

0 – 5.2 psu (SCCF RECON Marker 52) Previous week: **1.0** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = < **3.0** psu **<** 10 psu at surface **In compliance**

Salinity Shell Point: **10 – 32 psu** **(**SCCF RECON sensor) Previous week: **7 – 33** psu

Olga Water Treatment Plant Chloride: 44 ppm



Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
9/13/11	Tue	1854	0	-716
9/14/11	Wed	1369	0	-644
9/15/11	Thu	1094	0	-602
9/16/11	Fri	1092	0	-296
9/17/11	Sat	922	0	0
9/18/11	Sun	867	0	0
9/19/11	Mon	694	0	0
Average Flow		1127		Backflow

Negligible rainfall reduced estuary flows through S79 to an average of 1,127 cfs over the past week. Salinities increased at all stations. Salinity in the middle estuary at Fort Myers measured <1 psu, at Iona Cove 3.1 – 11.8 psu, and at Shell Point 7 – 33 psu.

Caloosahatchee flows are coming entirely from watershed rainfall runoff, with no contribution from Lake Okeechobee. Due to dry conditions, Caloosahatchee basin water from the Ortona basin (S78) continues to be back flowed east into Lake Okeechobee to augment lake levels. Despite this effort lake levels remain critically low for this time of year. Projections indicate that without a tropical event or change in weather patterns, the lake will remain in the water shortage band as we enter the dry season, posing significant impacts to the south Florida water supply for all users. We recommend conservation initiatives and Phase III water restrictions be enforced throughout the South Florida Water Management District to enable the recovery of Lake Okeechobee water levels.

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
Surveys reveal no tapegrass survived the high salinities in the upper estuary this past dry season. SCCF marine lab scientists are planting tape grass in cages for future monitoring throughout the upcoming dry season. No phytoplankton blooms have been reported although CDOM values of 195 qsu in the river are very high and likely affecting light availability for grasses.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qsu)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	2.2	195	0.9	0.47
Iona	2.4	164	4.9	0.54
San Carlos Bay	3.8	82	3.4	0.9

***CE**- Caloosahatchee Estuary* ***SCB**-San Carlos Bay*
*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

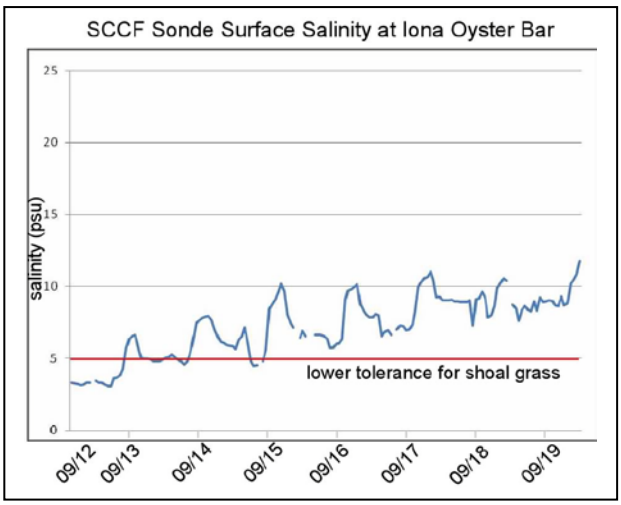
The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa, where values range widely each day.

Transplanted tapegrass in the upper Caloosahatchee estuary. Note high CDOM (orange color).

Lower Estuary Condition: Fair.
Flows have moderated elevating salinities at Iona back into the preferred range for shoal grass.

High CDOM in the estuary is limiting light availability for grasses. Light penetration measurements (Is) are reported to document the depth limit for 25% light penetration.

The target light penetration for healthy seagrass in the lower Caloosahatchee is 2.2 meters. Due to the high CDOM seagrass at Iona only had sufficient light at 0.54 m or less, and 0.9 m or less in San Carlos Bay. As a result of poor light penetration, seagrass shoots in Iona are in very poor shape- missing most of the leaves and roots near the deep edges.



MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 27 September, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: The Caloosahatchee estuary received flows averaging 852 cfs over the past week from the Caloosahatchee watershed west of Ortona. East of Ortona water continues to be back flowed into Lake Okeechobee. Despite this additional flow the lake remains in the Water Shortage Management band. Below average rainfall forecast for the remainder of the "wet season" raises concerns for managing resources through the coming dry season. **We request the COE and SFWMD provide details of the operational plan and adaptive strategies for managing limited water and minimizing negative impacts to publicly owned resources on the next call scheduled for 11 October.**

Lake Okeechobee Level: 11.10' (Water Shortage Management Band) Previous wk: **10.93'** (Water Shortage)

Weekly Rainfall: WP Franklin 2.60 ", Ortona 0.91 ", Moore Haven 1.61" .

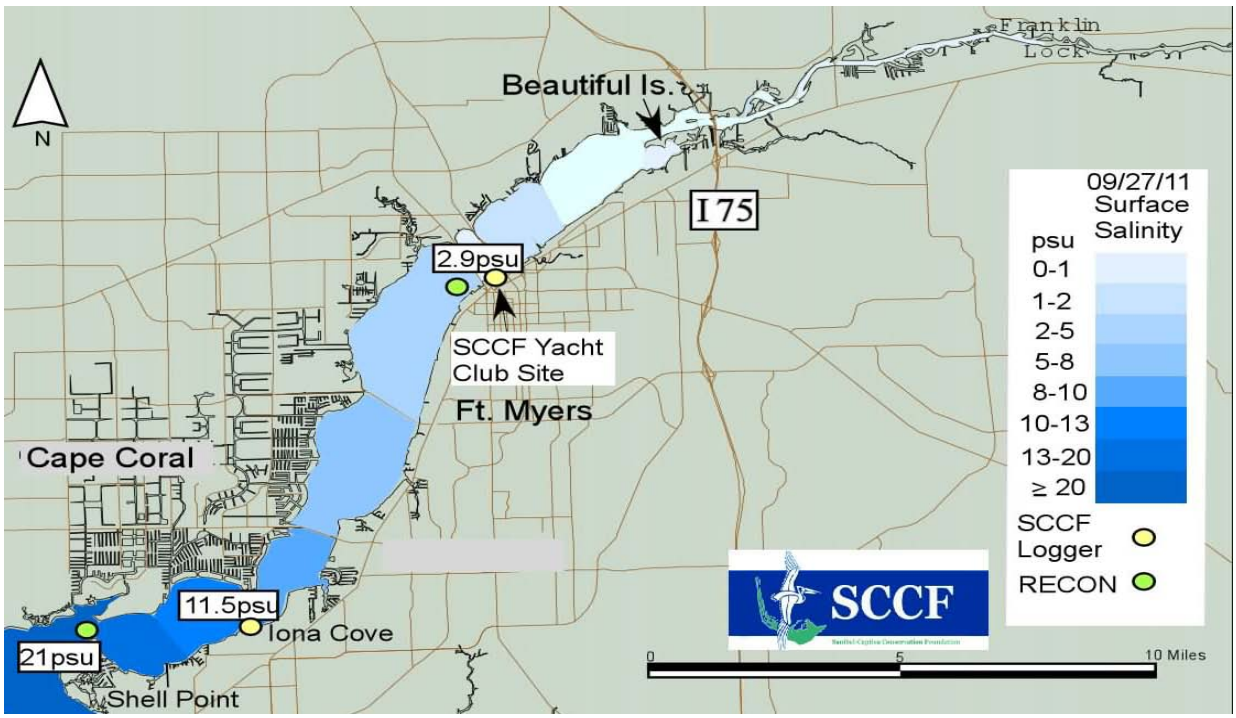
Salinity Ft. Myers: **2.9** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.7** psu

4 – 11 psu (SCCF RECON Marker 52) Previous week: **0 - 5.2** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu **In compliance**
30-day moving average = < **3.0** psu **<** 10 psu at surface **In compliance**

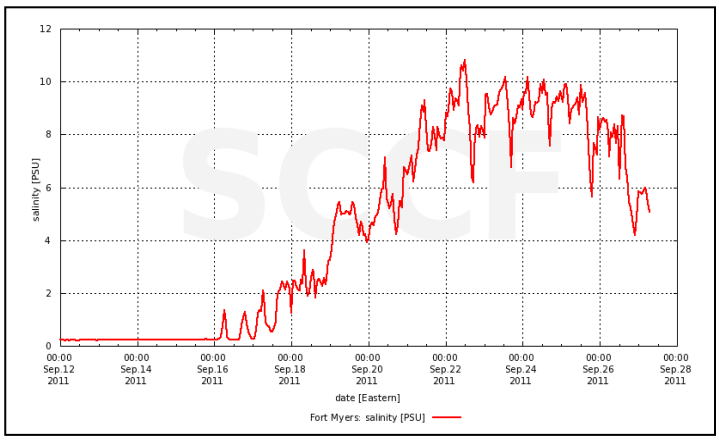
Salinity Shell Point: **13.7 – 33 psu** **(**SCCF RECON sensor) Previous week: **10 – 32** psu

Olga Water Treatment Plant Chloride: 45 ppm



Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
9/20/11	Tue	494	0	0
9/21/11	Wed	506	0	-100
9/22/11	Thu	580	0	-238
9/23/11	Fri	711	0	-274
9/24/11	Sat	810	0	-248
9/25/11	Sun	1038	0	-250
9/26/11	Mon	1825	0	-584
Average Flow		852		Backflow

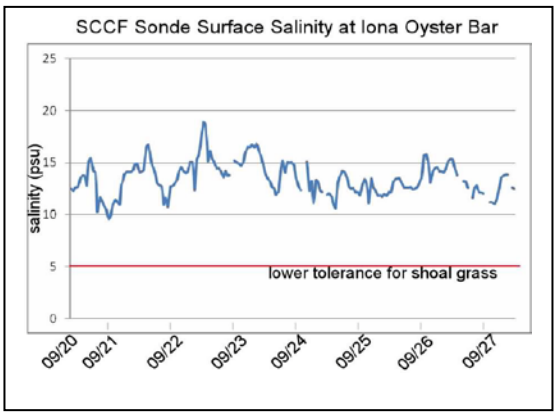


Estuary flows through S79 dropped to an average of 852 cfs over the past week. Salinities increased at all stations with a dramatic increase at Fort Myers where salinity exceeded the MFL level of 10 psu on a tidal cycle on Sept 23rd for the first time since August 6, 2011. Salinity at Iona Cove ranged from 9.5 – 18.9 psu, and at Shell Point 7 – 33 psu.

Caloosahatchee flows are coming entirely from watershed west of Ortona, with no contribution from Lake Okeechobee. Due to dry conditions, Caloosahatchee basin water east of Ortona (S78) continues to be back flowed into Lake Okeechobee to augment lake levels. Despite this effort lake levels remain in the Water Shortage Management Band, four feet below average. Forecasts for below average rainfall indicate water levels will remain critically low as we enter the dry season. We request the COE and SFWMD use the monitoring data collected during the 2010-2011 dry season to determine the impact of water management decisions and provide details of the operational plan and adaptive management strategies to minimize negative effects of limited water supplies for the 2011-2012 dry season.

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported although CDOM values of 204 qsu in the river are very high and likely affecting light availability for submerged aquatic vegetation in the river.



Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qsu)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	1.1	204	1.2	0.45
Iona	1.2	141	3.2	0.61
San Carlos Bay	1.8	58	4.9	1.31

***CE**- Caloosahatchee Estuary **SCB**-San Carlos Bay*
*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Lower Estuary Condition: Fair.
The Lee County Health Department posted an advisory at the Cape Coral Yacht Club Beach in the Caloosahatchee due to enterococcus bacteria levels that exceed EPA criteria for public health.

Salinities in Iona are in the preferred range for shoal grass and oysters.

High CDOM in the estuary is limiting light availability for grasses. Light penetration measurements (Is) are reported to document the depth limit for 25% light penetration. The target light penetration for healthy seagrass in the lower Caloosahatchee is 2.2 meters. Due to the high CDOM seagrass at Iona only had sufficient light at 0.61 m or less, and 1.3 m or less in San Carlos Bay. As a result of poor light penetration, seagrass shoots in Iona are in very poor shape- missing most of the leaves and roots near the deep edges.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 11 October, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: The Caloosahatchee estuary received flows averaging 656 cfs over the past week from the Caloosahatchee watershed west of Ortona. A significant multi-day tropical rain event this past weekend is expected to raise lake levels in the coming week. As of this report, the lake remains in the Water Shortage Management Band. We request the COE and SFWMD evaluate the water management actions and subsequent impacts from the last dry season to implement adaptive management strategies to minimize negative effects to publicly owned natural resources.

Lake Okeechobee Level: 11.24' (Water Shortage Management Band) Previous wk: **11.11'** (Water Shortage)

Weekly Rainfall: WP Franklin 2.96 ", Ortona 0.81 ", Moore Haven 1.20"

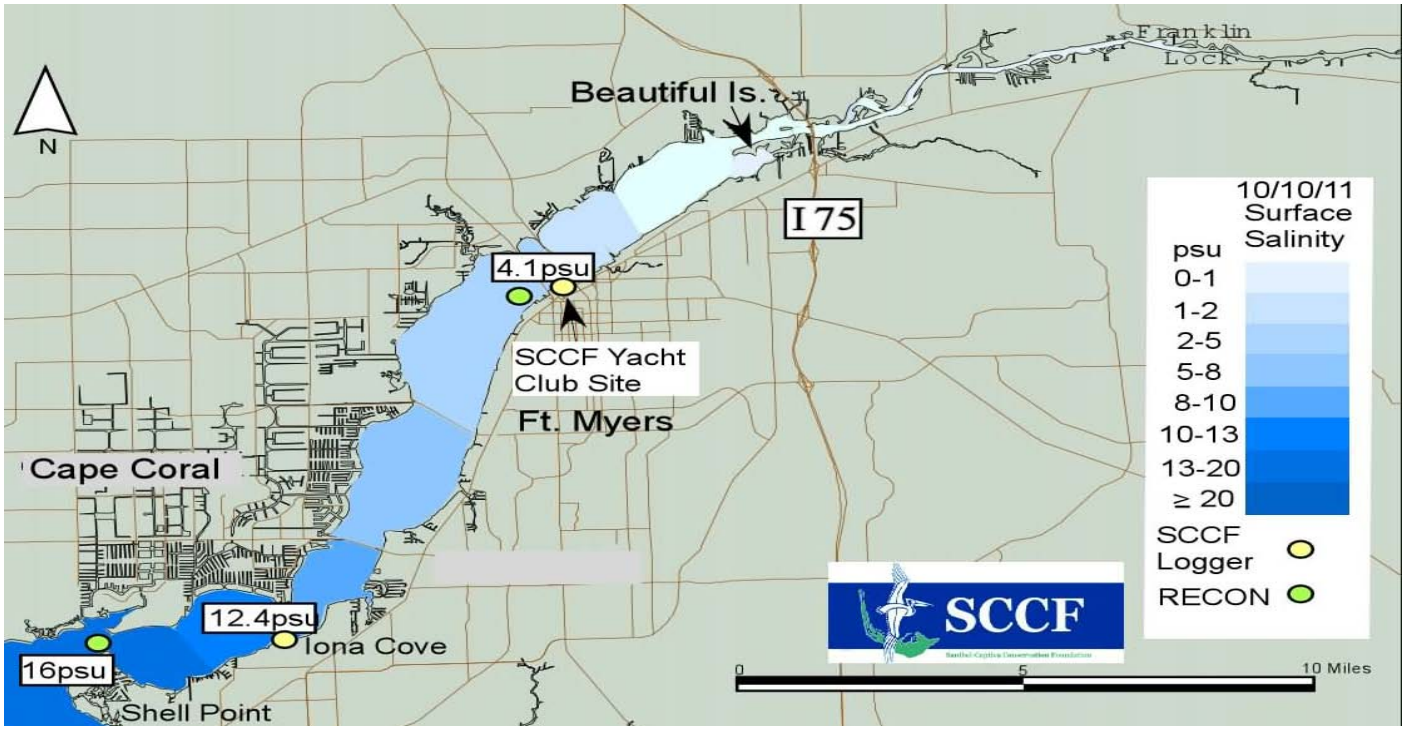
Salinity Ft. Myers: **1.9 - 8.0** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **2.4** psu

4 – 11 psu (SCCF RECON Marker 52) previous week: **3 - 7** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = < **3.0** psu Target ≤ 10 psu at surface **in compliance**

Salinity Shell Point: **15 - 33psu** **(**SCCF RECON sensor) previous week: **15 – 33** psu

Olga Water Treatment Plant Chloride: 54 mg/l



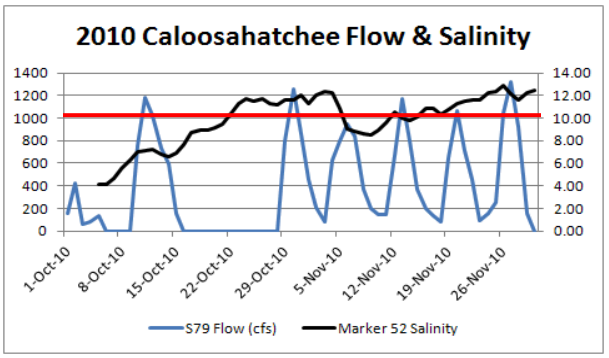
Flow: * From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
10/4/11	Tue	275	0	-168
10/5/11	Wed	72	0	-80
10/6/11	Thu	272	0	-128
10/7/11	Fri	232	0	0
10/8/11	Sat	398	0	0
10/9/11	Sun	1537	0	-244
10/10/11	Mon	1803	0	-512
Average Flow		656		Backflow

Estuary flows through S79 dropped to an average of 656 cfs over the past week. Salinities at Fort Myers ranged from 1.8 – 8.0 in the past week. Salinity at Iona Cove ranged from 10.8 – 16.7 psu, and at Shell Point remained between 15 – 33 psu.

Caloosahatchee flows are coming entirely from the watershed west of Ortona, with no contribution from Lake Okeechobee. Caloosahatchee basin water east of Ortona (S78) continues to be back flowed into Lake Okeechobee to augment lake levels. A multi-day tropical rain event produced large volumes in the Kissimmee valley and north of the lake that are expected to raise the lake stage over the next week.

As of this report, lake levels remain in the Water Shortage Management Band. The graph at right shows flow and salinity From Oct-Nov 2010 and how lack of flow in October raised salinity above the 10 psu MFL level as early as mid October.



Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported, although CDOM values of 199 qse in the river are relatively high and likely affecting light availability for submerged aquatic vegetation within the river.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	2.0	199	1.4	0.47
Iona	1.4	135	2.4	0.63
San Carlos Bay	0.9	49.2	8.3	1.16

***CE**- Caloosahatchee Estuary*
***SCB**-San Carlos Bay*
*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Lower Estuary Condition: Fair.
Salinities near Iona are in the preferred range for shoal grass although salinities at Shell Point remain higher than the preferred range for oysters.

Red Tide:
The *Karenia brevis* bloom first reported two weeks ago in southwest Florida, currently extends approximately 2 to 12 miles offshore of Charlotte and Lee counties from Gasparilla Pass south to Captiva, with the densest concentrations reported offshore of Cayo Costa. Analysis of water samples also confirmed the presence of *K. brevis* ranging from very low to medium concentrations in Pine Island Sound (Lee County). Widespread fish kills have been reported offshore in association with this bloom. Cell counts 8 miles off Sanibel recorded 61,000cells/liter. On Wednesday causeways samples measured 4000cells/l and Tarpon Bay Rd Bch had 333.

Oysters:
The Condition Index is average, ranging between 2.62 – 3.78. The preferred range is > 2.

Disease (Dermo) prevalence is **not good** ranging between very high levels of 67 - 93% Disease Intensity is not good at moderately high levels ranging between 2 - 3.07. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy). Dermo prevalence and intensity are probably high due to the very dry, high salinity conditions.
Recruitment is good at 3 – 60.33

Survival in open bags is 0% due to predation due to lack of flow during dry months earlier in the year. Low DO may have contributed to these numbers. Closed bags survival was poor ranging from 2 - 37%.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 18 October, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 12.10' (Water Shortage Management Band) Previous wk: **11.24'** (Water Shortage)

Weekly Rainfall: WP Franklin 1.05", Ortona 0.60", Moore Haven 0.77"

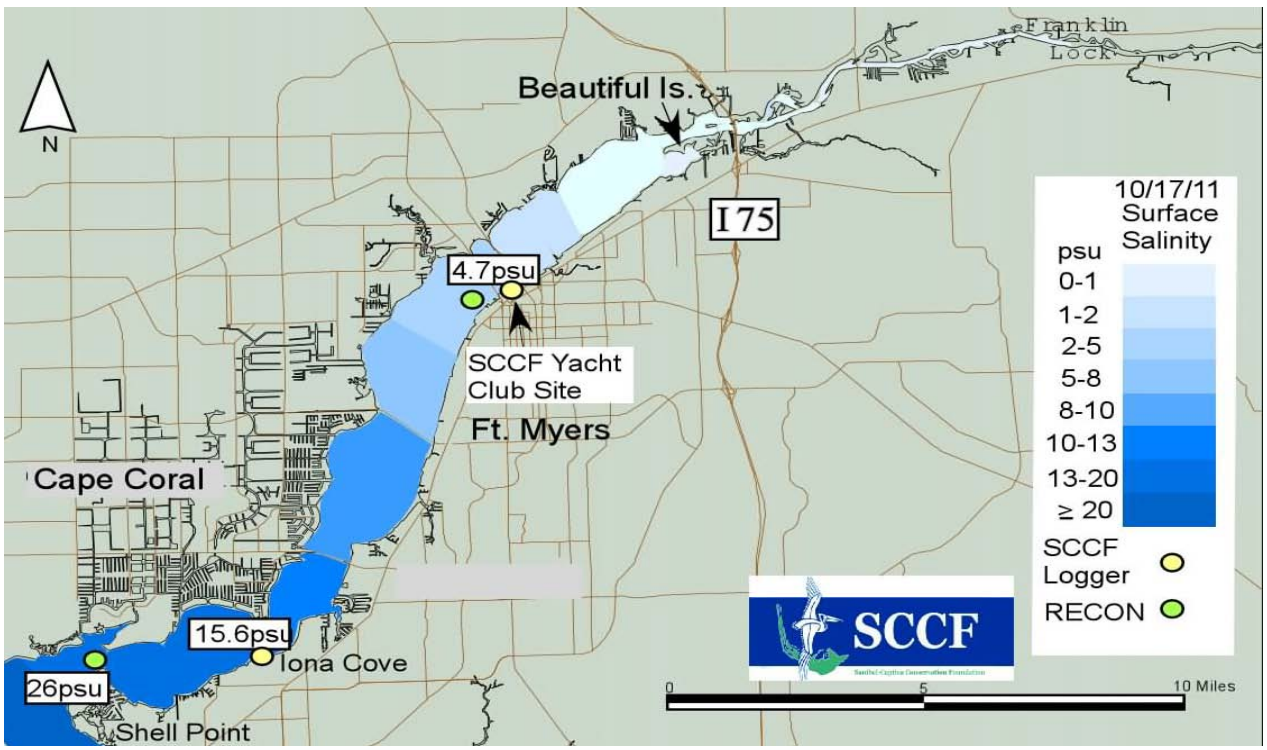
Salinity Ft. Myers: **2.4 - 6.8** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **1.9 - 8.0** psu

4.5 – 9.5 psu (SCCF RECON Marker 52) previous week: **4 – 11**psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = **4.1** psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **17 – 33 psu** **(**SCCF RECON sensor) previous week: **15 – 33** psu

Olga Water Treatment Plant Chloride: 57 mg/l



Flow:
Two late season tropical events brought significant rainfall to the entire greater Everglades watershed over the past two weeks. Water levels in Lake Okeechobee are rising and expected to continue rising for the next few weeks. As a result of inflows from the north, the back flowing of Caloosahatchee basin water into Lake O was stopped this week for the first time since 19 June. Rainfall increased estuary flows through S79 to an average of 1,051 cfs the past week. Salinities at Fort Myers ranged from 2.4 – 6.8 in the past week. Salinity at Iona Cove ranged from 11.5 - 19.6 psu, and at Shell Point ranged between 17 – 33 psu.

*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
10/11/11	Tue	678	0	-300
10/12/11	Wed	1059	0	-112
10/13/11	Thu	830	39	NR
10/14/11	Fri	1046	151	NR
10/15/11	Sat	1169	318	0
10/16/11	Sun	1251	271	0
10/17/11	Mon	1324	271	0
Average Flow		1051	150	

Caloosahatchee flows are still coming entirely from the watershed with no contribution from Lake Okeechobee although water from Ortona (S78) has begun to flow west for the first time since early July.

As of this report, lake levels remain in the Water Shortage Management Band. The top of the band is 12.89 ft

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported, although CDOM values of 190 qse in Ft Myers and 173 in Iona and limited light penetration, 0.48 m at Ft Myers and 1.07 m at Shell Point are negatively affecting submerged aquatic vegetation within the river.

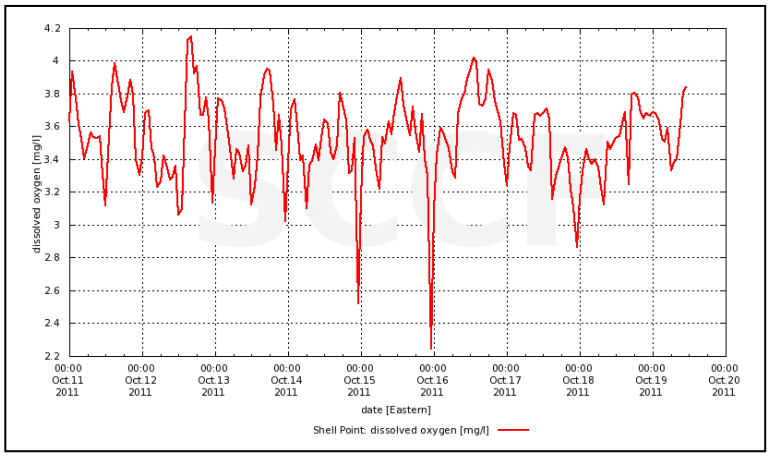
Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	1.87	190	1.6	0.48
Iona	1.25	173	3.4	0.52
San Carlos Bay	0.86	41	11	1.07

__CE__- Caloosahatchee Estuary
__SCB__-San Carlos Bay
Definition of 25% Iz: __I__ = irradiance and __z__ = depth.

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Lower Estuary Condition: Fair.
Salinities near Iona are in the preferred range for shoal grass although salinities at Shell Point remain higher than the preferred range for oysters. High CDOM and turbidity are limiting light penetration to less than half of the minimum depth needed to sustain submerged aquatic vegetation (SAV) health and are suspected as a cause of low dissolved oxygen (DO) values measured as Shell Point.

Low DO recorded at SCCF Shell Point RECON Sensor



Red Tide:
The *Karenia brevis* bloom first reported three weeks ago currently extends from southern Sarasota County south to Lee County. The densest concentrations of *K. brevis* have been reported off Charlotte County. Water samples confirmed the presence of *K. brevis* in Pine Island Sound in Lee County.

Stone Crab:
The stone crab season has commenced in the Caloosahatchee estuary and coastal waters off Lee County. Commercial fisherman report very low harvest numbers so far this year.

Oysters:
The Condition Index is average, ranging between 2.62 – 3.78. The preferred range is > 2.

Disease (Dermo) prevalence is **not good** ranging between very high levels of 67 - 93%
Disease Intensity is not good at moderately high levels ranging between 2 - 3.07. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).
Dermo prevalence and intensity are probably high due to the very dry, high salinity conditions.
Recruitment is good at 3 – 60.33

Survival in open bags is 0% due to predation due to lack of flow during dry months earlier in the year. Low DO may have contributed to these numbers. Closed bags survival was poor ranging from 2 - 37%.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

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James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 25 October, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: In light of the 3 month weather outlook, forecasting La Nina and below average rainfall, the current Lake Okeechobee level (0.7ft lower than last year and 1.25 ft lower than 2009), and the expectation that water demand will be the same as past years, **we request the South Florida Water Management District retain the current Phase III water restrictions throughout the District to retain water in Lake Okeechobee**.

Lake Okeechobee Level: 12.93' (**Beneficial Use Band**) Previous wk: **12.10'** (Water Shortage)

Weekly Rainfall: WP Franklin 3.20", Ortona 2.05", Moore Haven 1.66"

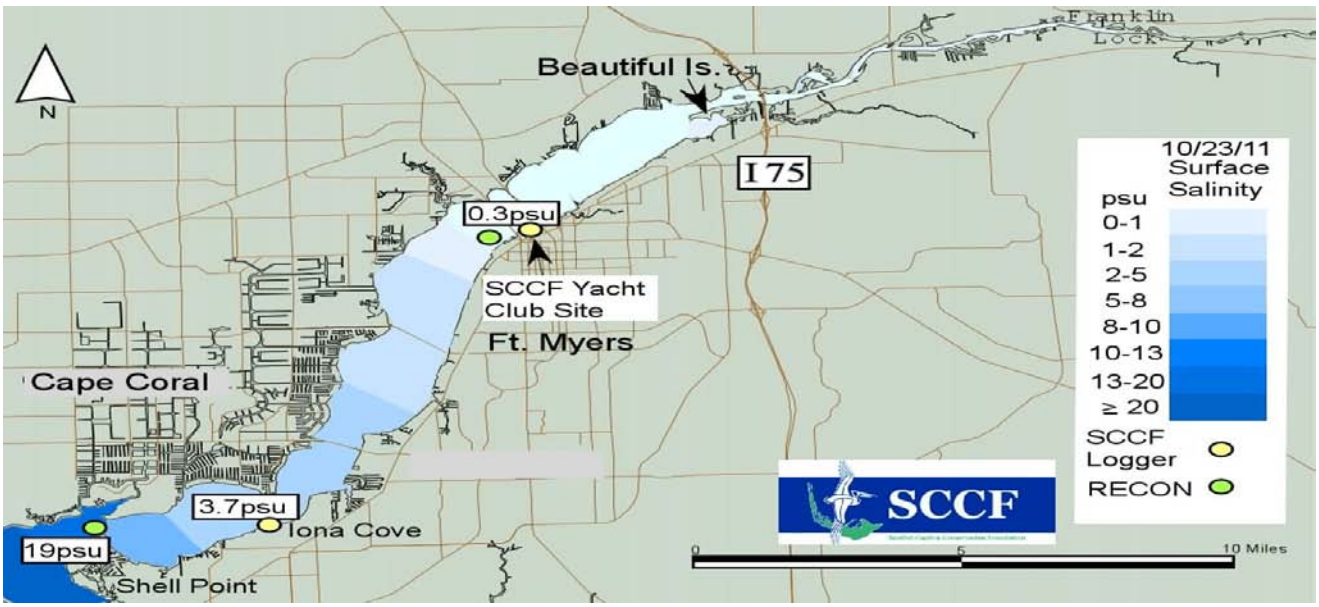
Salinity Ft. Myers: **0.3 - 6.5** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **2.4 - 6.8** psu

0.3 – 8.9 psu (SCCF RECON Marker 52) previous week: **4.5 – 9.5** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = **3.8** psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **6.5 – 32 psu** **(**SCCF RECON sensor) previous week: **17 – 33** psu

Olga Water Treatment Plant Chloride: 39 mg/l



Flow:
Flows to the Caloosahatchee estuary increased three-fold from last week's rain event, with significant salinity reductions from Ft Myers to Shell Point beginning on October 19. Water levels in Lake Okeechobee are rising and expected to continue rising for the next week. Rainfall increased estuary flows through S79 to an average of 3,489 cfs the past week. Salinities at Fort Myers dropped to 0.3 - 6.5 in the past week. Salinity at Iona Cove ranged from 3 - 25 psu, and at Shell Point ranged between 6.5 – 32 psu.

*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
10/18/11	Tue	2997	806	0
10/19/11	Wed	3547	930	0
10/20/11	Thu	5258	752	0
10/21/11	Fri	4245	890	0
10/22/11	Sat	3408	548	0
10/23/11	Sun	2999	293	0
10/24/11	Mon	1968	176	0
Average Flow		3489	628	0

Caloosahatchee flows are entirely from the watershed with no contribution from Lake Okeechobee. Water flows from Ortona (S78) averaged 3,489 the past week.

As of today lake levels have reached the Beneficial Use Band for the first time since 18 March 2011. The top of the Water Shortage band for this date is 12.85 ft.

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

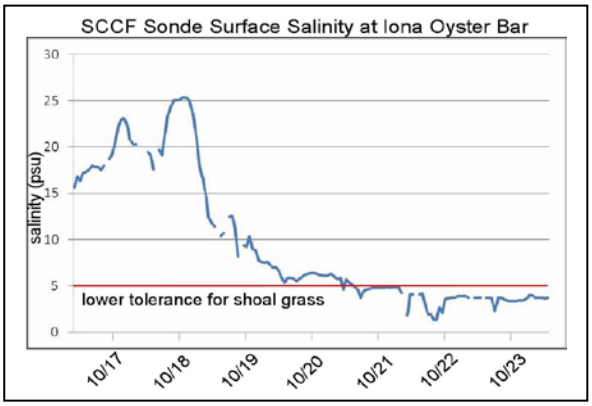
Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported. However CDOM values of 195 qse in Ft Myers and 175 qse in Iona and limited light penetration values of 0.42 m at Ft Myers and 0.94 m at Shell Point are limiting light availability for submerged aquatic vegetation within the river.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	2.9	195	4.0	0.42
Iona	2.3	175	4.3	0.51
San Carlos Bay	0.9	77.5	6.5	0.94

***CE**- Caloosahatchee Estuary*
***SCB**-San Carlos Bay*
*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Photo of water with CDOM of 200 qse at Tarpon Point Peir in the Caloosahatchee east of Fort Myers,



Lower Estuary Condition: Fair.
Salinities near Iona have ranged widely from 3 to 25 psu as a result of high rainfall within the basin. High CDOM and turbidity are limiting light penetration to less than half of the minimum depth needed to sustain submerged aquatic vegetation (SAV) health.

Red Tide:
The *Karenia brevis* bloom, first reported four weeks ago, is currently located offshore Sanibel Island measuring approximately 25 miles long and up to 10 miles wide. Analysis of water samples confirmed the presence of *K. brevis* in Pine Island Sound and Charlotte Harbor and low concentrations at Port Boca Grande.

Oysters:
The Condition Index is good ranging between 2.91 – 3.15. The preferred range is > 2.
Disease (Dermo) prevalence is not good ranging between 57 – 100%, probably due to high salinities in September.
Dermo Intensity is low to moderate ranging from 1.00 – 1.47 (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

Recruitment is good measuring 1 – 27 spat / shell.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 15 November, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 13.81' (**Base Flow Band**) Last wk: **13.76'** Last year 13.25'

Weekly Rainfall: WP Franklin 0 ", Ortona 0", Moore Haven 0.10"

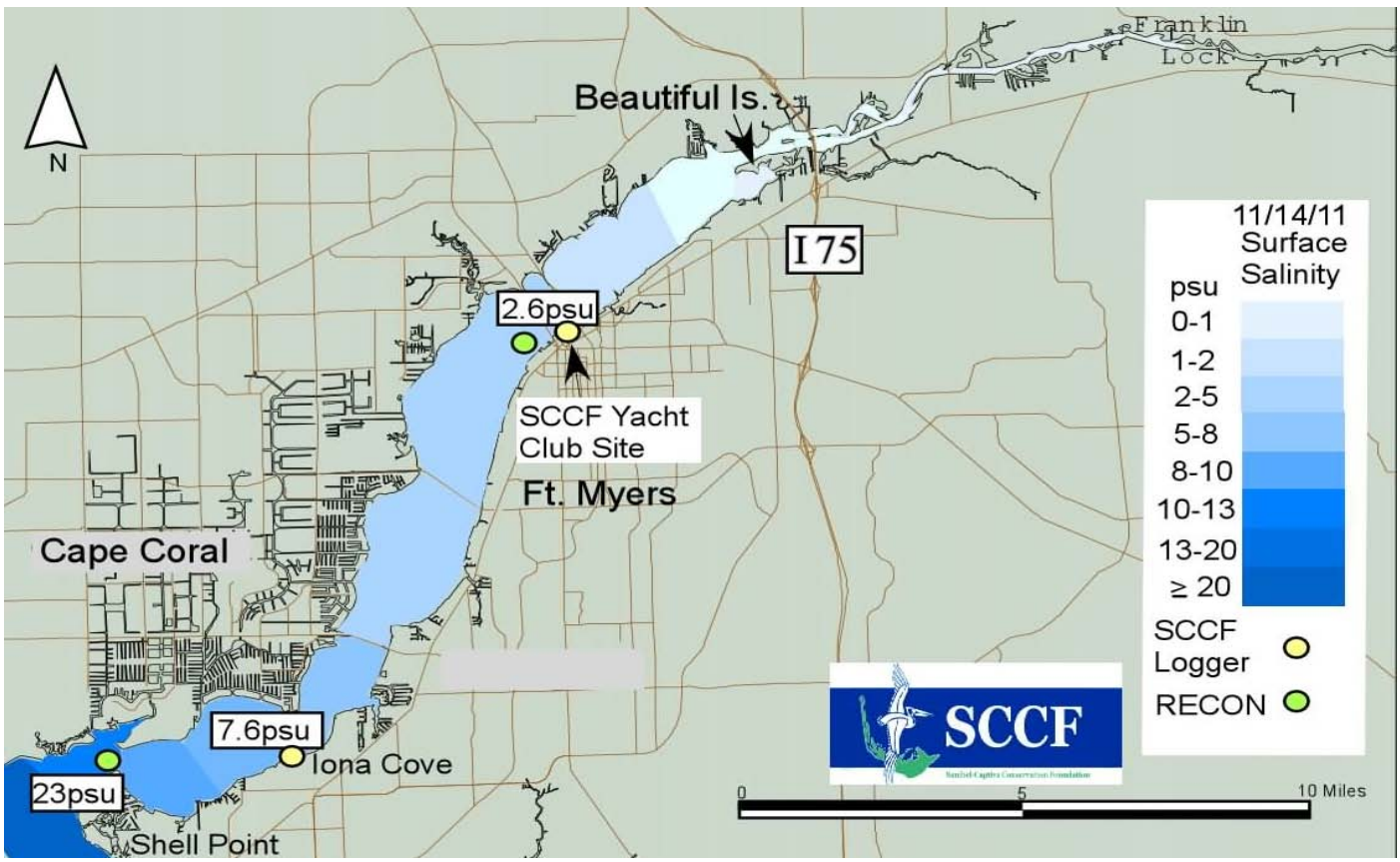
Salinity Ft. Myers: **0.25 – 0.33** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.25 –0.35** psu

0 – 10 psu (SCCF RECON Marker 52) previous week: **0** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = 1.2 psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **11 – 31 psu** **(**SCCF RECON sensor) previous week: **5 – 30** psu

Olga Water Treatment Plant Chloride: 50 mg/L



*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
11/8/11	Tue	1603	284	0
11/9/11	Wed	1050	130	0
11/10/11	Thu	640	0	0
11/11/11	Fri	848	0	0
11/12/11	Sat	996	111	0
11/13/11	Sun	985	150	0
11/14/11	Mon	816	83	0
Average Flow		991	108	0

Flow:
Flows to the Caloosahatchee estuary through S79 this past week averaged 991 cfs. Flows are entirely from the watershed with an average of 108 cfs from the Ortona basin and no contribution from Lake Okeechobee.

Salinities increased throughout the river measuring up to 10 psu at mid depths on a tidal cycle at Fort Myers, 3.9 - 21.5 psu at Iona and 11-31 psu at Shell Point.

Water levels in Lake Okeechobee continued to rise slightly over the past week measuring 0.56 ft above last year's level at this time.

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

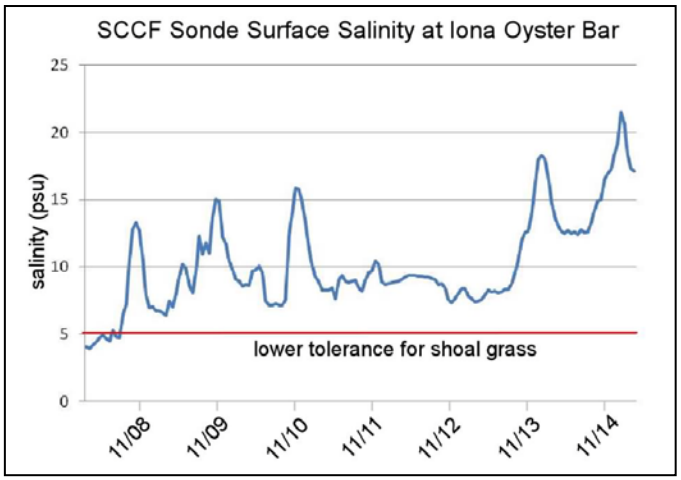
Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported. CDOM remains high at Fort Myers with values of 205 qse. In Iona CDOM has dropped to 74 qse but remains high contributing to limited light penetration and light availability for submerged aquatic vegetation within the river.

__CE__- Caloosahatchee Estuary
__SCB__-San Carlos Bay
Definition of 25% Iz: __I__ = irradiance and __z__ = depth.

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	1.5	205	5.7	0.45
Iona	1.0	74	8.3	0.94
San Carlos Bay	0.5	74	1.8	0.97

Lower Estuary Condition: Fair.
Salinities at Shell Point have increased as a result of lower freshwater inflows, ranging from 11 to 31 psu. High CDOM and turbidity continue to limit light penetration to less than half of the minimum depth (1 m) needed to sustain submerged aquatic vegetation (SAV) health.



Red Tide:
While elevated chlorophyll levels are still present offshore of Sanibel, only background levels of <1000 cells/L *Karenia brevis* have been found near Sanibel in the last week. Nearshore samples along Sanibel and Ft. Myers beaches and near Redfish Pass indicate elevated concentrations of diatoms including *Skeletonema* and *Pseudo-nitzchia* spp.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 22 November, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Lake Okeechobee Level: 13.85' (**Base Flow Band**) Last wk: **13.81'** Last year 1313'

Weekly Rainfall: WP Franklin 0.2", Ortona 1.03", Moore Haven 0.31"

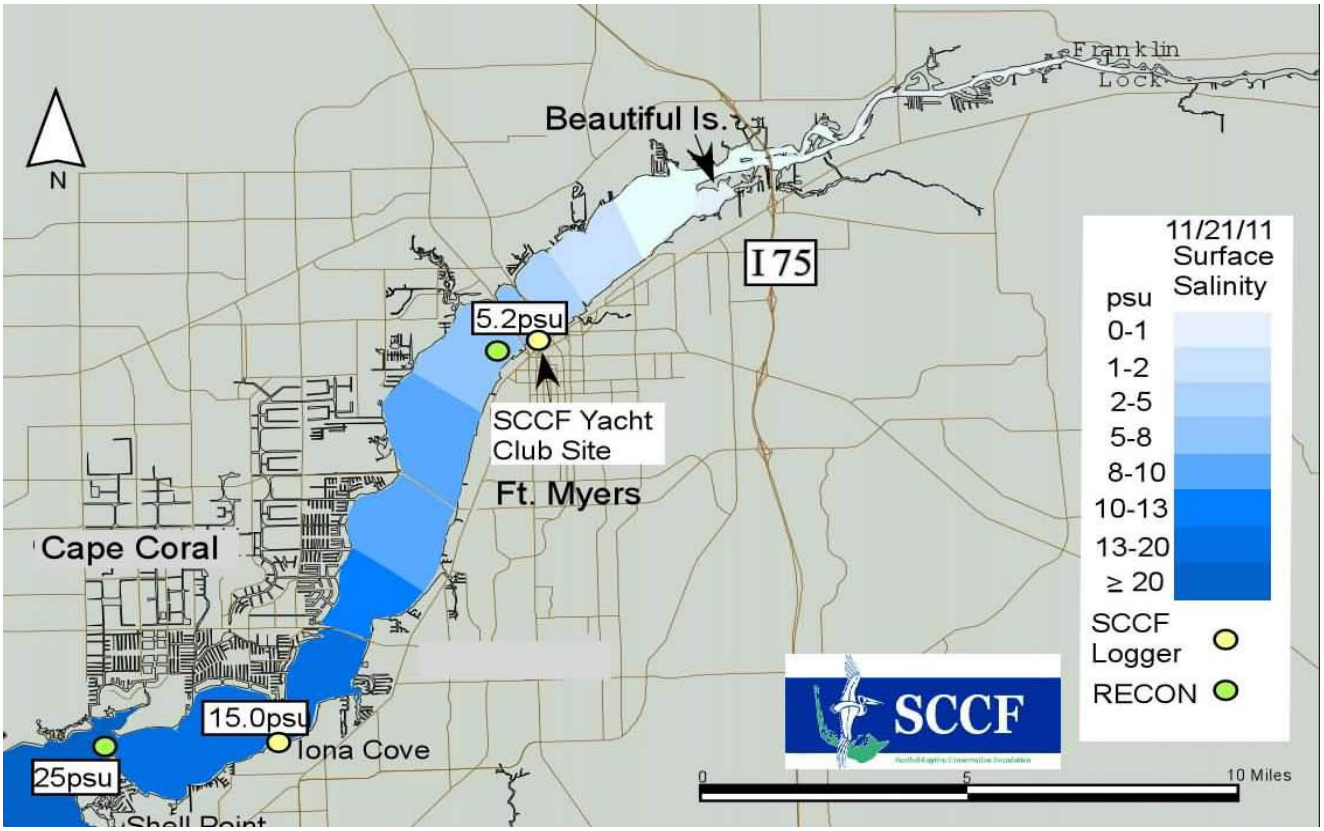
Salinity Ft. Myers: **2.1 - 7.8** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **0.25 –0.33** psu

3.5 – 12 psu (SCCF RECON Marker 52) previous week: **0 -10** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu
30-day moving average = 2.3 psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **13.5 – 34 psu** **(**SCCF RECON sensor) previous week: **11 – 31** psu

Olga Water Treatment Plant Chloride: 50 mg/L



Flow:
Flows to the Caloosahatchee estuary through S79 this past week averaged 257 cfs. Flows are entirely from the watershed with no flow from the Ortona basin and no contribution from Lake Okeechobee. Salinities increased throughout the river measuring up to **12 psu** at mid depths on a tidal cycle at Fort Myers, 11 – 22.1 psu at Iona and 13.5- 34 psu at Shell Point.

*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
11/15/11	Tue	0	0	0
11/16/11	Wed	278	0	132
11/17/11	Thu	488	0	NR
11/18/11	Fri	270	0	NR
11/19/11	Sat	253	0	NR
11/20/11	Sun	362	0	NR
11/21/11	Mon	150	0	NR
Average Flow		257	0	

Water levels in Lake Okeechobee rose 0.04 ft over last week and measuring 0.72 ft above last year's level at this time.

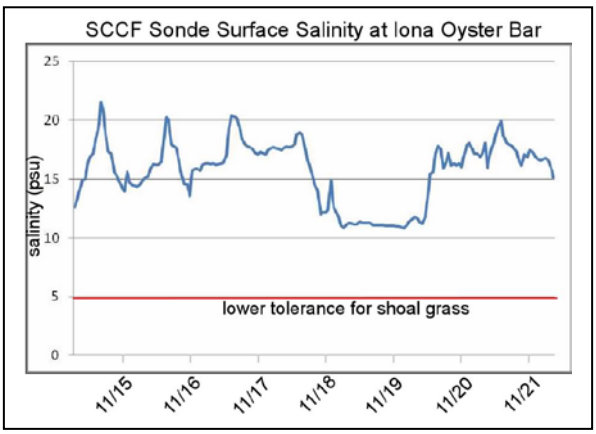
Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Condition: Fair.
No phytoplankton blooms have been reported. CDOM remains high at Fort Myers with values of 197 qse. In Iona CDOM is much higher at 143 qse contributing to limited light penetration and light availability for submerged aquatic vegetation within the river.

***CE**- Caloosahatchee Estuary*
***SCB**-San Carlos Bay*
*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	1.2	197	2.8	0.46
Iona	1.2	143	2.8	0.6
San Carlos Bay	0.15	44	4.6	1.34



Lower Estuary Condition: Fair.
Salinities at Shell Point have increased slowly as a result of lower freshwater inflows, ranging from 11 to 31 psu. This falls mostly within the preferred range for oysters. CDOM and turbidity continue to limit light penetration to less than the minimum depth (2.2 m) needed to sustain submerged aquatic vegetation (SAV) health.

Oysters:
The Condition Index is good, ranging between 1.99 – 3.83. The preferred range is > 2.

Disease (Dermo) prevalence is not good with 100%, all stations reporting. Disease Intensity is low ranging between 0.42 – 1.01 (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

Recruitment is good for this time of year ranging from at 1.33 – 8.53

Red Tide:
The *Karenia brevis* bloom that started 9/26 currently extends alongshore and offshore of Sanibel Island (southern Lee County) and northern Collier County.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, Kim Taplin, Anthony Rodino, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 29 November, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Salinity within the estuary continues to rise with no rainfall within the basin or releases from Lake Okeechobee. Without freshwater inflow it is expected that daily salinity will exceed 10 psu at Ft. Myers within the next couple of weeks. We request, at a minimum, flows from the Ortona basin to maintain salinity below 10 psu to help with recovery of the tapegrass beds in the upper estuary near Fort Myers.

Lake Okeechobee Level: 13.84' (**Base Flow Band**) Last wk: **13.85'** Last year 12.99'

Weekly Rainfall: WP Franklin 0.11", Ortona NR", Moore Haven 0.04"

Salinity Ft. Myers: 5 - 9.7 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **2.1 - 7.8** psu

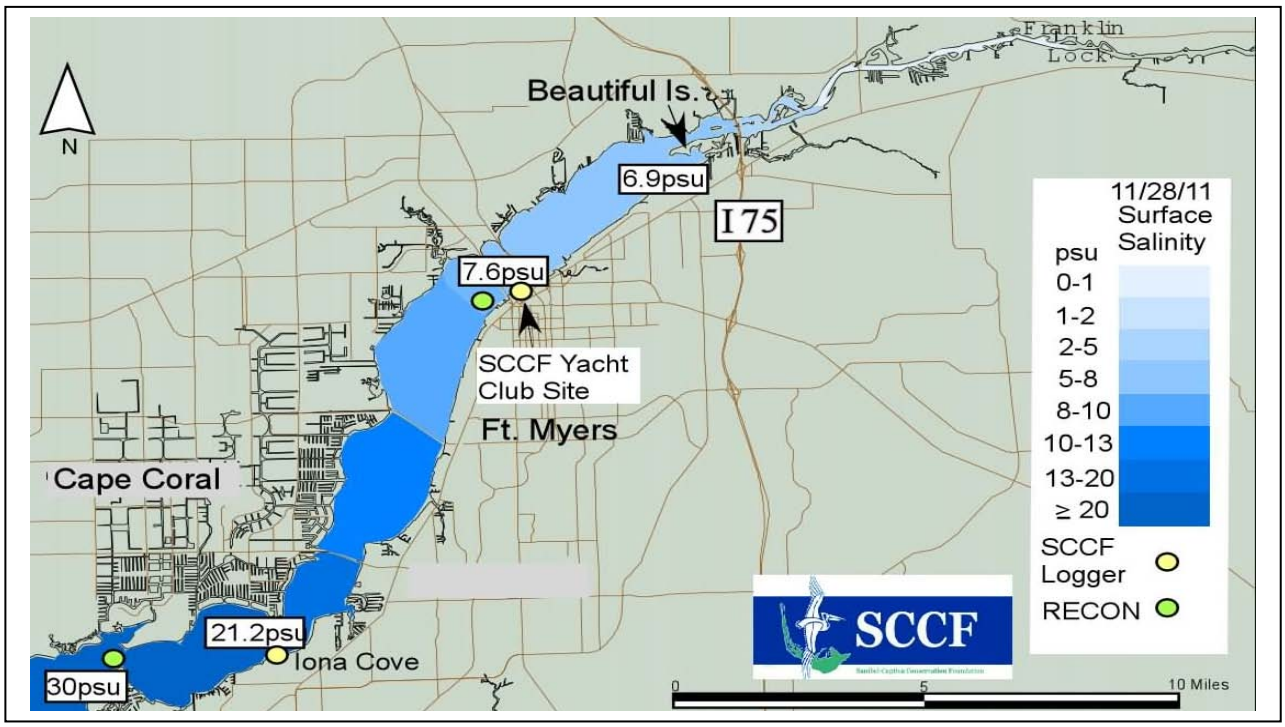
2 – 16 psu (SCCF RECON Marker 52) previous week: **3.5 – 12** psu

MFL Status: Daily salinity at Fort Myers ≤ 10 psu

30-day moving average = 2.6 psu Target ≤ 10 psu at surface **In compliance**

Salinity Shell Point: **18 – 33 psu** (SCCF RECON sensor) previous week: **13.5 – 34** psu

Olga Water Treatment Plant Chloride: 54 mg/L



*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
11/22/11	Tue	105	0	NR
11/23/11	Wed	257	0	NR
11/24/11	Thu	NR	54	NR
11/25/11	Fri	348	77	NR
11/26/11	Sat	313	0	NR
11/27/11	Sun	168	0	NR
11/28/11	Mon	111	NR	NR
Average Flow		186*		

Flow: Flows to the Caloosahatchee estuary through S79 over the past week averaged approximately 186 cfs. Freshwater inflow came entirely from the watershed. Gates at S77 were closed. Salinities increased throughout the entire estuary over the past week, with mid-depth salinities in Fort Myers reaching **16** psu at high tide; and 18–33 psu at Shell Point.

Water levels in Lake Okeechobee dropped approximately 0.01 ft over the past week.

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Conditions: Fair.
No phytoplankton blooms have been reported. CDOM remains relatively high at Fort Myers with values of 177 qse. In Iona, CDOM is 96 qse. Higher values may be contributing to limited light penetration and light availability for submerged aquatic vegetation within the river.

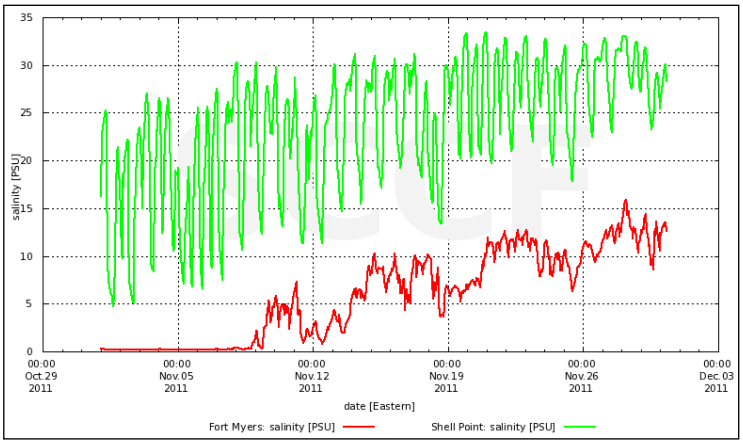
***CE**- Caloosahatchee Estuary*

***SCB**-San Carlos Bay*

*Definition of 25% Iz: **I** = irradiance and **z** = depth.*

The target depths for the Caloosahatchee and San Carlos Bay are 1m and 2.2m. The SCB site is at Punta Rassa.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Fort Myers	1.5	177	2.8	0.51
Iona	4.8	96	5.9	0.81
San Carlos Bay	1.3	17	5.0	1.95



Lower Estuary Condition: Fair.
Salinities at Shell Point increased relatively rapidly over the past week as a result of lower freshwater inflows, ranging from 18 to 33 psu. This is towards the top of the preferred range for oysters. CDOM and turbidity continue to limit light penetration to less than the minimum depth (2.2 m) needed to sustain submerged aquatic vegetation (SAV) health in San Carlos Bay.

Red Tide:
The *Karenia brevis* bloom that started 9/26/11 currently extends alongshore and offshore of Sanibel Island (southern Lee County) and northern Collier County. *K. brevis* cell counts of 2 million cells per liter have been reported at Lighthouse Beach Park on Sanibel Island and dead fish have been reported throughout Estero Bay.

The picture at right shows dead mullet in Estero Bay, likely related to the recent red tide bloom extending from southern Lee County to northern Collier County.

MEMORANDUM

To: Army Corps of Engineers Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 13 December, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: Surface salinity levels have risen to above 10 at Ft Myers and are 5.4 psu at S79. We request the District design a pulse release to provide flows to lower the surface salinity level to below the harm threshold of 10 at the Ft Myers Yacht Basin. Flows targeting 8 psu are needed to accommodate newly established tapegrass plants that, unlike mature plants, are not able to withstand elevated salinities. A release designed to keep the salinity below 10 psu adds capacity and resiliency to the estuary for the drier winter months to come.

Lake Okeechobee Level: 13.78' (**Base Flow Band**) Last wk: 13.75'

Lake Okeechobee Inflow: 1, 207 cfs **Lake Okeechobee Outflow:** -72 cfs

Weekly Rainfall: WP Franklin 0.41 ", Ortona 0.11 ", Moore Haven .48 "

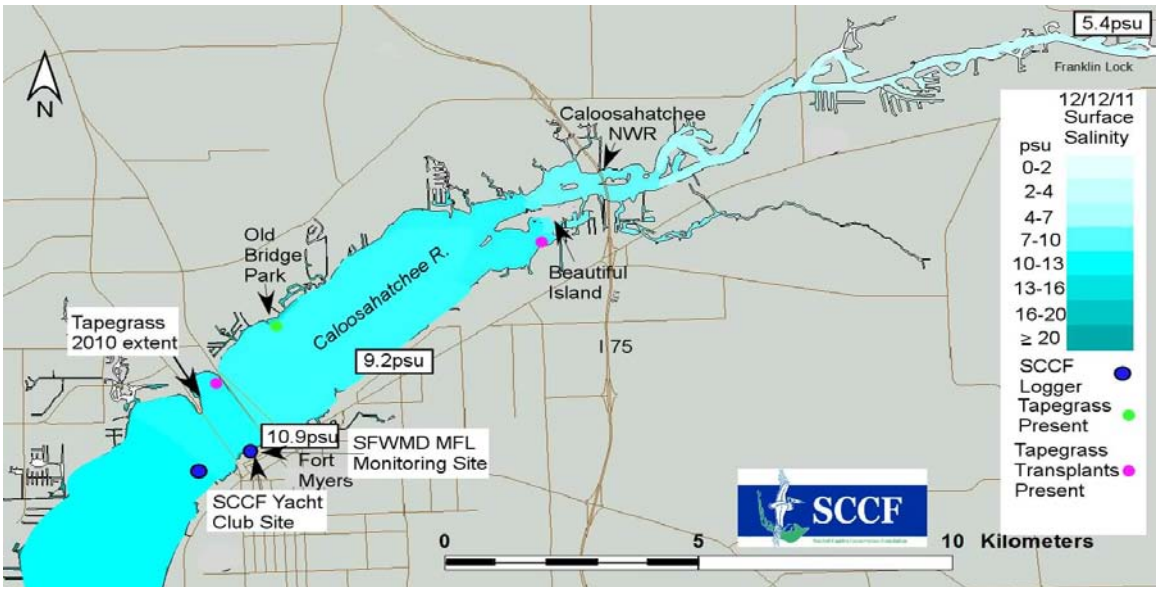
Salinity Ft. Myers: **8.4 - 12.6** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: **6.4 – 11.4** psu

10 - 17 psu (SCCF RECON Marker 52) previous week: 9 – 17 psu

MFL Status:
Daily salinity at Fort Myers ≥ 10 psu
7 day moving average = 10.5 psu
14 day moving average= 9.3 psu Target ≤ 10 psu at surface
30 day moving average = 6.8 psu

Salinity Shell Point: **20 - 32.5 psu** (SCCF RECON sensor) Last week: **20 – 33** psu

Olga Water Treatment Plant Chloride: 63 mg/L Last week 54 mg/L



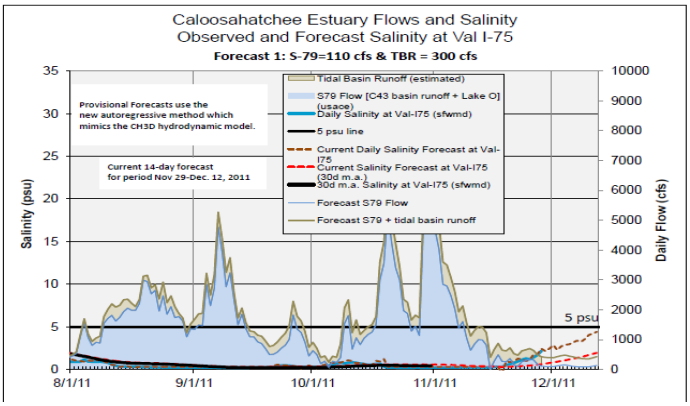
Flow: Salinity in the Caloosahatchee estuary is rising steadily with 5.4 psu measured at S79 and chlorides above the lock at the Olga Water Treatment Plant 9 psu higher than last week due to lack of flow. Over the past week flow to the estuary at S79 averaged only 73 cfs. As a result, salinities continue to increase in the estuary with surface salinities at Ft Myers reaching 12.6 psu and mid-depth salinities reaching **17** psu at high tide. In the past week the 30 day moving average moved from 4.8 to 6.8 psu while the seven day moving average is 10.5 psu above the threshold where impact to tapegrass occurs according to Caloosahatchee research by Chamberlin & Doering.

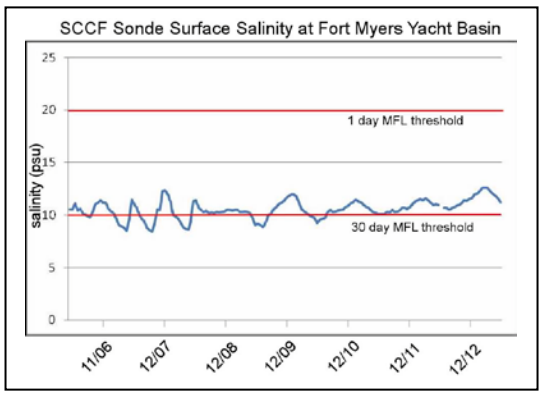
*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
12/6/11	Tue	138	0	0
12/7/11	Wed	0	0	184
12/8/11	Thu	0	0	368
12/9/11	Fri	0	0	220
12/10/11	Sat	39	0	0
12/11/11	Sun	130	0	0
12/12/11	Mon	209	113	0
Average Flow		73	16	110

Comparing SFWMDs salinity projection to measured conditions for both current salinity and the 30 day moving average salinity, the SFWMD two week projection graph, below left, from November 29 significantly under estimates salinities.

In the Adaptive Protocol process the District suggested that salinity of 5 psu at I-75 would be comparable to 10 psu at Ft Myers. However, due to the geomorphology of the river, we find salinities rising more quickly in Ft Myers than in the narrower river at I-75 where a small volume of water can show a reduction in salinity that is not equivalent at Ft Myers where the tapegrass is struggling to get established after being killed by salinity last spring.





Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Conditions: Fair.
CDOM remains relatively high at Fort Myers with values of 139 qse, double the target value of < 70 qse. The high CDOM values contribute to limited light penetration and light availability for submerged aquatic vegetation in the river.

Lower Estuary Condition: Fair.
Salinities at Shell Point continue to increase to levels outside the preferred range for oysters. CDOM and turbidity continue to limit light penetration to less than the minimum depth 2.2 meters needed to sustain submerged aquatic vegetation (SAV) health in San Carlos Bay. The Lee County Health Dept continues an advisory against harvesting and eating shellfish from local waters due to poisoning from red tide toxins.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
S79 west side	1.6	186	1.1	0.51
Tarpon Pt. Pier	1.4	154	2.5	0.57
Fort Myers	1.4	139	1.4	0.62

Target light penetration:

***CE**- Caloosahatchee Estuary = 1 meter*
***SCB**-San Carlos Bay = 2.2 meters*

*Definition of 25% Iz: **I** = irradiance*
***z** = depth*

Red Tide:
The *Karenia brevis* bloom that started 9/26/11 currently extends alongshore and offshore of Sanibel Island and into San Carlos Bay and Pine Island Sound in Lee County. High to medium concentrations of *K. brevis* have been reported along and offshore Lee County from Sanibel Island south to Lovers Key State Park with medium and high concentrations of *K. brevis* in southern Pine Island Sound and San Carlos Bay. SCCF Marine Lab scientists counted over 50 million cells/L nearshore in Tarpon Bay, and over 1 million cells/L away from shore.
The Lee County Health Dept. continues an advisory against harvesting and eating shellfish from local waters due to poisoning from red tide toxins.

MEMORANDUM

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, Steve Sullivan, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants
Paul Tritaik & Tara Wertz - J.N. "Ding" Darling National Wildlife Refuges Complex
James Evans-City of Sanibel
Keith Kibbey-Lee County Environmental Lab
Rae Ann Wessel & Rick Bartleson Ph.D. -Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 20 December, 2011

This report provides a scientific assessment of the current conditions in the Caloosahatchee River and Estuary and how these conditions affect the health, productivity and function of the system.

Caloosahatchee Condition Summary

Recommendation: The pulse release initiated on 12/16 contributed to average flows of 585 cfs the past week and dropped the surface salinity levels from 14 to 11.7 psu. We request releases continue over the next two weeks to provide flow to moderate surface salinity levels to below the harm threshold of 10 psu at the Ft Myers Yacht Basin. Flows targeting 8 psu are needed to accommodate newly established tapegrass plants that are emerging in the upper estuary and unable to tolerate elevated salinities.

Lake Okeechobee Level: 13.76' (**Base Flow Band**) Last wk: 13.78'

Lake Okeechobee Inflow: 681 cfs **Lake Okeechobee Outflow:** 630 cfs

Weekly Rainfall: WP Franklin 0.0", Ortona 0.02", Moore Haven 0.07"

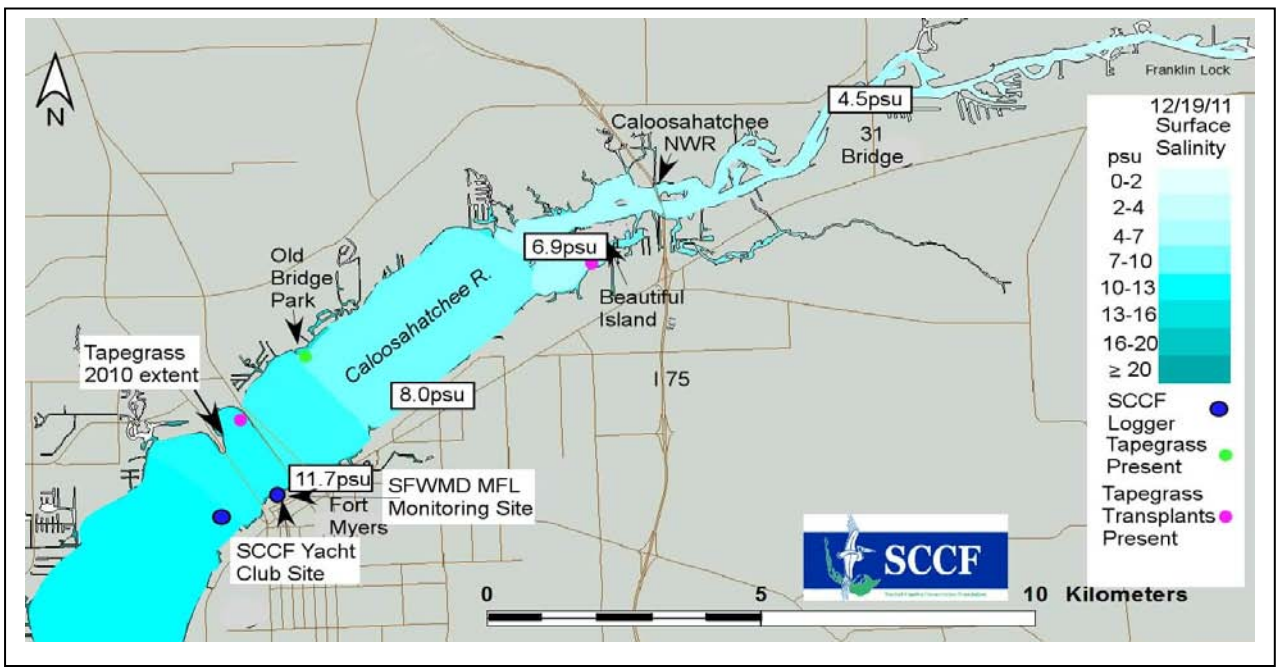
Salinity Ft. Myers: **10.7- 14.5** psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: 8.4 – 12.6 psu

12 - 18 psu (SCCF RECON Marker 52) previous week: 10 – 17 psu

MFL Status: **Target Daily salinity at Fort Myers ≤ 10 psu**
7 day moving average = 12.0 psu
14 day moving average= 11.1 psu Target ≤ 10 psu at surface
30 day moving average = 8.9 psu

Salinity Shell Point: **22 - 32.5 psu** (SCCF RECON sensor) Last week: **20 – 32.5** psu

Olga Water Treatment Plant Chloride: 67 mg/L Last week 63 mg/L



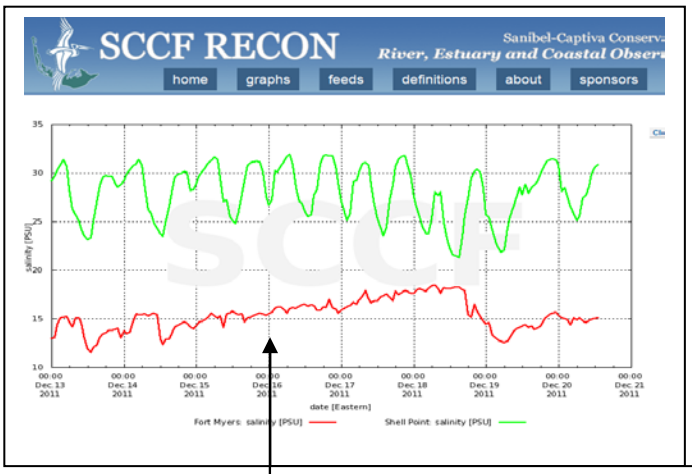
Flow: Salinity in the Caloosahatchee estuary dropped slightly with the pulse release last week, although chlorides above the lock at the Olga Water Treatment Plant continue to rise. Surface salinities at SR31 Bridge measured 4.5 psu, 6.9 psu at Beautiful Island, 8.0 psu at the Tarpon Point Pier and 11.76 psu at Ft. Myers while mid-depth salinities reached **18** psu at high tide. In the past week the 30 day moving average moved from 6.8 to 8.9 psu while the seven day moving average is **12** psu, above the threshold for sprouting and transplanted tapegrass. The RECON and SCCF sonde graphs below show the affect of the releases, initiated on 12/16, on salinity. The surface salinity began to decrease immediately while it took almost 3 days for the reduction to show up at mid depths.

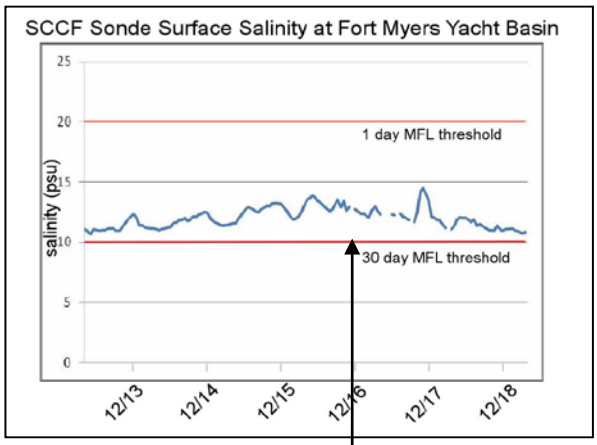
*** From ACOE Website Daily Reports**

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
12/13/11	Tue	221	110	0
12/14/11	Wed	59	0	0
12/15/11	Thu	0	0	0
12/16/11	Fri	853	473	140
12/17/11	Sat	1394	1008	1368
12/18/11	Sun	1034	683	984
12/19/11	Mon	534	416	628
Average Flow		585	384	445

Upstream of S79/Franklin Conditions: Fair.
The Lee County Health Department continues the Caloosahatchee Caution Advisory for residents and visitors.

Upper Estuary Conditions: Fair.
CDOM remains relatively high at Fort Myers with values of 153 qse, double the target of < 70 qse. The high CDOM values contribute to limited light penetration and light availability for submerged aquatic vegetation in the river.





Black arrows indicate the date releases began.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
31 Bridge	1.4	198	1.8	0.46
Beautiful Is.	1.3	185	3.3	0.49
Ft. Myers	1.2	153	2.4	0.57

Target light penetration:

***CE**- Caloosahatchee Estuary = 1 meter*
***SCB**-San Carlos Bay = 2.2 meters*

*Definition of 25% Iz: **I** = irradiance*
***z** = depth*

Lower Estuary Condition: Fair.
Salinities at Shell Point remain outside the preferred range for oysters. Red Tide continues to bloom along and offshore Sanibel and Lee County. The Lee County Health Dept continues an advisory against harvesting and eating shellfish from local waters due to poisoning from red tide toxins.

Red Tide:
A harmful algal bloom of *Karenia brevis* that started 9/26/11 persists in the southern Pine Island Sound/San Carlos Bay region of Lee County. Saturday SCCF Lab scientists counted 1.5 million/L at the causeway islands, 1.7 million/L at the Sanibel Boat Ramp and 2.5 million/L at the Tarpon Bay dock.

The Lee County Health Dept. advisory against harvesting and eating shellfish from local waters due to poisoning from red tide toxins remains in effect.