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: 3 January, 2012

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: Recent releases have helped to maintain salinity just above the harm threshold; however, salinities remain too high for reestablishment or support of emerging tapegrass. We request adaptive management strategies be used to design pulse releases to lower salinities below the harm threshold of 10 psu at Fort Myers to provide conditions sustainable for tapegrass recovery in the estuary.

Lake Okeechobee Level: 13. 65' (Base Flow Band) Last wk: 13.71' Lake Okeechobee Inflow: 768 cfs Lake Okeechobee Outflow: 626 cfs Weekly Rainfall: WP Franklin 0.23", Ortona 0.47", Moore Haven 0.54" Salinity Ft. Myers: 10.5- 14.1 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: 11 – 14psu 13 - 18 psu (SCCF RECON Marker 52) previous week: 14 - 18 psu **MFL Status:** Target Daily salinity at Fort Myers < 10 psu 7 day moving average = 12.0 psu 14 day moving average= 12.2 psu Target < 10 psu at surface 30 day moving average = 11.4 psu Violation previous week: 10.67

Salinity Shell Point: 21 – 33.5 psu (SCCF RECON sensor) Last week: 21.5 – 33 psu

Olga Water Treatment Plant Chloride: 63 mg/L

Last week 69 mg/L



Flow: A series of pulse releases averaging 450 cfs the past two weeks helped stem the rising salinity in the estuary and maintained salinity levels between 11-14 psu. For the past two weeks the salinity violated the 30 day MFL moving average, measuring 11.4 psu this week and 10.6 psu last week. In the past two weeks surface salinities at Beautiful Island/I75 were as high as 9.3 psu, well above the SFWMD forecast model prediction. This past week salinities moderated with the pulse release to 6.7 psu. Salinity of 4.2 psu was measured this week at the Franklin Lock (S79).

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *	
		(cfs)	(cfs)	(cfs)	
12/27/11	Tue	99	92	378	
12/28/11	Wed	0	0	73	
12/29/11	Thu	0	0	0	
12/30/11	Fri	754	387	498	
12/31/11	Sat	1246	634	885	
1/1/12	Sun	783	494	693	
1/2/12	Mon	423	239	558	
Average	Flow	472	263	440	

* From ACOE Website Daily Reports

SFWMD Forecast Model Prediction Graph



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

Upper Estuary Conditions: Fair – Poor. CDOM remains relatively high at Fort Myers with values of 153 qse, double the target of < 70 qse.

SCCF RECON Salinity at Shell Point and Ft Myers



Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/l)	(qse)	(NTU)	(meters)
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
31 Bridge	1.1	229	1.2	0.41
Beautiful Is.	1.7	183	17	0.48
Ft. Myers	1.5	155	2.4	0.56

Target light penetration:

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

Definition of 25% lz: I = irradiancez = depth

Lower Estuary Condition: Fair - Poor.

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 and intensified in the southern Pine Island Sound/San Carlos Bay region of Lee County. During the last week, SCCF Lab scientists counted 1-4 million cells/L at the causeway islands, 15 million/L at the Sanibel Boat Ramp and 1 -4.7 million cells/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.

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

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Subject: Caloosahatchee & Estuary Condition Report

Date: 7 February, 2012

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: Salinities increased throughout the estuary over the past week, with flows averaging 469 cfs at S79. Salinities over the past 2 months have exceeded the salinity envelope for tapegrass causing the last transplants to disappear from Beautiful Island. Flow volumes delivered in pulse releases have not provided enough water to meet ecological targets and keep salinity below the harm threshold of 10 psu at Fort Myers or 5 psu at the I75 monitoring station. We request that the Corps design a front loaded pulse release which increases Caloosahatchee flows to 650 cfs, providing 200 cfs available in the Water Control Plan allocated to, but not wanted by the St Lucie estuary.

Lake Okeechobee Level: 13.21' (Base Flow Band) Last wk: 13.28' Lake Okeechobee Inflow: 1820 cfs Lake Okeechobee Outflow: 789 cfs Ortona 0.83", Weekly Rainfall: WP Franklin 0.27", Moore Haven 0.49" Salinity Ft. Myers: 10.9 – 17.8 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev.wk: 12.9 – 15 psu 16 - 22.5 psu (SCCF RECON Marker 52) previous week: 13 - 18.5 psu MFL Status: MFL Violation = 30 day moving average > 10 psu = 44 days 7 day moving average = 14.7 psu previous week: 12.97 psu 14 day moving average= 14.4 psu previous week: 13.0 psu 30 day moving average = 13.9 psu previous week: 13.5 psu Salinity Shell Point: 25.5 – 34 psu (SCCF RECON sensor) Last week: 23 - 34 psu Olga Water Treatment Plant Chloride: 78 mg/L Last week 72 mg/L



Flow: Pulse releases averaged 469 cfs the past week. Surface salinity at Ft Myers increased to 17.8 psu, salinity at Beautiful Island/I75 increased 5 psu to 13.8 psu and the Franklin Lock (S79) salinity increased to 7 psu. The salinity at Ft Myers has exceeded the 30 day MFL moving average for the past 44 days. Elevated salinities in the upper estuary have caused the loss of all tapegrass in the critical area between the US 41 bridges and I75 where manatees congregate in the winter. Salinities in the lower estuary also exceeded the upper limit of the preferred salinity range for oysters during the past week.

					SCCF Sonde Surface Salinity at Fort Myers Yacht Basin
* Fror	n ACOE	Website Dai	ly Reports		1 day MFL threshold
Date	Day	S79 Flow*	S78 Flow*	S77 Flow *	20
		(cfs)	(cfs)	(cfs)	
1/31/12	Tue	681	538	723	
2/1/12	Wed	272	520	1012	30 day moving average
2/2/12	Thu	539	192	440	30 day MFL threshold
2/3/12	Fri	217	319	340	
2/4/12	Sat	609	315	464	5 salinity
2/5/12	Sun	168	322	668	30D MA salinity —
2/6/12	Mon	801	324	308	0
Average	Flow	469	361	607	0110° 01113 0111° 01123 0112° 02102 02101

Upstream of S79/Franklin Conditions: Fair.

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

Upper Estuary Conditions: Fair – Poor.

Increased salinity has caused the failure of both transplanted and volunteer tape grass between Beautiful Island/I75 and the 41 Bridges.

CDOM is high at all sampled sites in the upper estuary. Sampled sites S79 west, Beautiful Island and Fort Myers, registered values well above the expected values of a healthy functioning system.

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 (W)	1.3	175	1.2	0.51
Beautiful Island	1.5	130	1.9	0.65
Ft. Myers	2.0	123	2.1	0.68

Target light penetration:

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

Definition of 25% lz: I = irradiancez = depth

Lower Estuary Condition: Fair.

Salinities at Shell Point remain above the preferred range for oysters. Salinity increased more than 2 psu over the past week, ranging between 25 – 34 psu. The preferred range is 15-25 psu.

Red Tide:

The red tide organism, *Karenia brevis*, was not detected in water samples along and offshore Lee County and Sanibel and the bloom appears to have shifted south near the Florida Keys.

Since the red tide began on 9/26/11,130 birds from 19 different species have been treated at CROW, the Care and Rehabilitation of Wildlife clinic on Sanibel for brevetoxin poisoning. Treatment success was 90% prior to the past week when mortality rates increased to 47%. In addition, 9 endangered Kemps Ridley juvenile turtles were found dead of brevetoxin poisoning and 1 live juvenile is being treated. San Carlos Bay is a critical nursery area for these endangered sea turtles.

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: 6 March, 2012

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 augmented pulse releases to the estuary during the past week providing flows averaging 529 cfs at S79. Releases and rainfall within the basin have helped to keep salinities from rising but have not provided enough water to lower salinity below the harm threshold of 10 psu at Fort Myers or the 5 psu Adaptive Protocol target at the I75 monitoring station. As a result salinity levels are not supportive of aquatic resources in the middle to upper estuary. We request that the Corps and SFWMD continue to provide pulse releases to the Caloosahatchee to maintain a low salinity zone downstream of S79 throughout the dry season.

Lake Okeechobee Lev	vel: 12.87 (Base Flow	Band) La	ast wk: 13.00'	
Lake Okeechobee Infl	ow: 823 cfs	Lake Okee	chobee Outflow:	811 cfs
Weekly Rainfall:	WP Franklin 0.20",	Ortona 0.29"	, Moore Haven	0.27"
Salinity Ft. Myers:	10.3 -17.9 psu surface	e data (DEP so	onde Marker 52)	Prev.wk: 12.3 – 16.1 psu
	12 - 21 psu (SCCF RE	CON Marker	52)	previous week: 13.3 -18.8 psu
MFL Status:	MFL Violation = 30 da	ay moving ave	erage > 10 psu = 7 2	2 days
	7 day moving averag 14 day moving avera 30 day moving avera	le = 14. lge= 14. lge = 15.	2 psu 7 psu <mark>5</mark> psu	previous week: 13.9 psu previous week: 14.6 psu previous week: <mark>14.6</mark> psu
Salinity Shell Point:	23 - 35 psu (SCCF F	RECON senso	r) Last week: 25	.8 – 33.8 psu
Olga Water Treatment	t Plant Chloride: 88 mc	ŋ∕L	Last week 78	mg/L

Green dots added to map indicate tape grass identified by SFWMD



Flow: Rain this past Sunday augmented pulse releases this week providing average flows of 529 cfs at S79. The combination of longer pulse releases and rainfall within the basin have contributed in salinity trending down as compared with early February when release schedules were shorter. This past week, surface salinity monitoring data at Ft Myers is reported from the FDEP sonde on Marker 52 due to recording problems with the SCCF sonde. Ft Myers salinity ranged from 10.3 to 17.9 psu. Salinity decreased at the SR 31 bridge from 5.1 to 4.5 psu and at S79 from 6.5 to 3.5 psu. The salinity range in the lower estuary increased over the past week, 23 – 35 psu, and continues to exceed the upper limit of the preferred salinity range for oysters.

	-	-		-	
Date	Day	S79 Flow*	S78 Flow*	S77 Flow *	
		(cfs)	(cfs)	(cfs)	
2/28/12	Tue	1370	682	562	
2/29/12	Wed	1032	805	795	
3/1/12	Thu	649	399	773	
3/2/12	Fri	421	146	480	
3/3/12	Sat	203	39	302	
3/4/12	Sun	31	0	220	
3/5/12	Mon	0	0	0	
Average Flow		529	295	447	



* From ACOE Website Daily Reports

SCCF RECON weather station graph at Fort Myers showing affect of March 4th rainfall (green line) on salinity (red line).



SCCF has deployed a weather station at the Fort Myers RECON. The graph below reflects the impact of rain on salinity at Fort Myers on Sunday March 4.

Upstream of S79/Franklin Conditions: Good. No reports of algae blooms.

Upper Estuary Conditions: Fair.

Chlorophyll at Royal Palm Park was elevated with a phytoplankton bloom that includes dinoflagellates *Peridinium sp., Akashio sanguine* and *Polykrikos schwartzii* along with diatoms.

CDOM remains high at all sampled sites in the upper estuary.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/l)	(qse)	(NTU)	(meters)
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
S79 (W)	1.8	167	1.0	0.53
Beautiful Island	5.4	137	12.2	0.54
Ft. Myers	4.3	128	4.0	0.65

Target light penetration	n: CE - Caloosahato SCB -San Carlos	chee Estuary =1 m s Bay = 2.2 meters
Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$

Lower Estuary Condition: Fair.

No reports of red tide or algae blooms in the water or on the beaches of Sanibel or San Carlos Bay. Salinities at Shell Point ranged between 23 - 35 psu, above the preferred range of 15-25 psu for oysters.

Oysters:

The Condition Index is 2.28 - 3.8, good for this time of the year. The preferred range > 2. Disease prevalence of *Perkinsus marinus* (Dermo) remains very high ranging between 93 - 100%. The disease intensity is also moderate - high (1.5 - 3.1). (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

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Subject: Caloosahatchee & Estuary Condition Report

Date: 3 April, 2012

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: Flows of 0 cfs through S79 over the past eight days has resulted in salinities rising in the upper river and estuary. Chlorides at Olga increased from 115 to 142 mg/L in the past 7 days. A toxic blue green algae bloom has been identified from LaBelle to the S79 Lock and a lingering odor continues to be reported at Olga. Similar toxic cyanobacteria blooms have occurred in each of the past drought years when flow is cut off resulting in stagnation of the Franklin pool. We request that the Corps use the discretionary authority explicitly identified in the LORS08 Water Control Plan and flexibility provided in the Adaptive Protocols to resume freshwater releases to the Estuary for the purposes of 1) maintaining a low salinity zone downstream of S79 and 2) preventing stagnation in the Franklin pool, through the dry season.

Lake Okeechobee Lev	/el: 12.29' (Beneficia	al Use Sub-Band	l) Last wk: 12	.53'
Lake Okeechobee Infl	ow: 105 cfs	Lake Okeec	hobee Outflow:	2,520 cfs
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.0",	Moore Haven 0.1"	,
Salinity Ft. Myers:	14.7 -19.8 psu surfa	ce data (Fort Mye	ers Yacht Basin)	Previous wk: 15.0 -18.4 psu
	18 - 21.5 psu (SCCF	RECON Marker	52)	Previous wk 16.7 - 20.5 psu
MFL Status:	MFL Violation = 30	day moving aver	age > 10 psu = 10	0 days
	7 day moving avera 14 day moving ave 30 day moving ave	age = 17.6 rage= 16.9 rage = 15.9	psu psu psu	Previous week: 16.7 psu Previous week: 16.5 psu Previous week: 15.1 psu
Salinity Shell Point:	29.7 – 35.5 psu (S	CCF RECON ser	nsor)	Previous week: 29.5 – 35.7 psu

Olga Water Treatment Plant Chloride: 142 mg/L

Previous week: 115 mg/L



Flow: Flows of 0 cfs at S79 resulted in increased salinities throughout the estuary. No substantive basin rainfall was recorded compounding the negative impacts to the estuary by the Corp's decision to cut off releases at S79. The 2010-2011 dry season data indicates the estuary will suffer severe ecological impacts without freshwater flow.

Surface salinity at Ft. Myers increased from 15.5 to 16.8 psu. Salinities at Beautiful Island increased from 11.5 to 12.2 psu, at the SR 31 bridge salinities increased from 8.2 to 9.9 psu and at S79 from 5.1 to 6.2 psu. The salinity range in the lower estuary remained static over the past week, ranging from 29.7 - 35.5 psu, continuing to exceed the preferred salinity range for oysters.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
3/27/12	Tue	0	145	778
3/28/12	Wed	0	146	916
3/29/12	Thu	0	146	728
3/3012	Fri	0	1	512
3/31/12	Sat	0	0	488
4/1/12	Sun	0	0	496
4/2/12	Mon	0	0	480
Average	Flow	0	62	628
			•	•

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions: Deteriorating.

Chloride levels at the Olga Water Treatment plant increased from 115 to 142 mg/L in the last week. Though chlorophyll concentrations (in situ fluorescence) were not elevated, the cyanobacteria count was high at Labelle (8.5 million filaments/L) on April 2nd and a bloom of toxic cyanobacteria *Aphanizomenon sp.* was visible to the eye. Late evening samples of dissolved oxygen were slightly above saturation. If the algae bloom continues to intensify, hypoxic conditions are likely to develop as oxygen demand increases from decomposing algae.

Upper Estuary Conditions: Fair.

Polysiphonia macroalgae was observed coating shells and drifting on the bottom near Beautiful Island. Dissolved oxygen concentrations recorded by RECON sensor at Fort Myers decreased this week to as low as 4 mg/L. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)	Targat light papatratio	n: CE Calaasaha	toboo Estuany -1 m
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m	Target light penetratio	SCB-San Carlo	os Bay = 2.2 meters
S79 (W)	1.9	143	1.2	0.6	Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$
Beautiful Island	1.2	125	4.0	0.65			
Ft. Myers	1.7	102	1.6	0.72]		

Lower Estuary Condition: Fair.

Abundant red and brown macroalgae, *were* observed on the hard bottom substrate near Shell Point. Salinities at Shell Point ranged between 29.7–35.5 psu, above the preferred range of 15-25 psu for oysters.

Oysters

The Condition Index 2.1 - 3.9, is relatively low for this time of the year. The preferred range > 2. Disease prevalence of *Perkinsus marinus* (Dermo) remains very high ranging between 93 - 100%. The disease intensity is light/moderate 1 - 2.07. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy). Recruitment is very low 0.03 - 0.06. Recruitment should increase through April- May. Mortality in open bags is higher than in closed bags suggesting that predation is a factor.

Smalltooth Sawfish:

The smalltooth sawfish is listed as **Endangered** by the National Marine Fisheries Service (2003), its habitat in the Caloosahatchee is designated Critical Habitat (2009) and it is listed as **Critically Endangered** on the ICUN Red List. An objective of the recovery plan is to protect or restore habitats for juveniles that occur in estuarine and nearshore waters. March and April are the months that the smalltooth sawfish give birth.

Research by Simpfendorfer et al. (2011) indicates that pups and juveniles have very limited home ranges and show a preference for salinities between 18 and 24 psu. Compression of the 18-24 psu salinity zone could result in direct impacts to smalltooth sawfish critical habitat. While these young fish will move up the river as this salinity envelope moves, the habitat characteristics upriver may not provide the protection and forage availability the fish require to survive.

The preferred salinity envelope of 18-24 psu currently extends from Marker 52 at Ft. Myers to Whiskey Creek.

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

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Subject: Caloosahatchee & Estuary Condition Report

Date: 1 May, 2012

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

Seven days of flow, from rainfall and five days of pulse release provided an average 1216 cfs through S79 to the Caloosahatchee estuary to flush algae out of the Franklin pool that formed following 26 days of no flow. Current conditions show algae accumulations heaviest on the east side of S79 indicating that additional flow is needed to flush the system.

Recommendation: Continue to provide pulse releases of greater volume to the Caloosahatchee estuary to flush the algae out of the Franklin pool and prevent further blooms.



Flow: Basin rainfall and a 5 day pulse release initiated on 4/23/12, provided an average flow of 1,216 cfs which helped moderate surface salinities in the Caloosahatchee River and estuary and reduced chlorides at the Olga Water Treatment plant from 260 – 144 mg/L. Since the release ended on 4/27 salinity in the estuary downstream of S79 has begun increasing. The river continues to exceed the 30 day moving average of 10 psu, but the pulse has stopped the 1 day 20 psu exceedance.

Surface salinity at Ft. Myers decreased over past week from **20.1 to 15.5** psu. Salinity at Beautiful Island decreased from **17.7 to 15.6** psu and at the SR 31 Bridge salinities decreased from **12.4 to 7.2** psu. No flow through S79 the past three days has caused salinity to increased downstream of the structure from **6.5** to **10.6** psu. SCCFs Shell Point RECON sensor was offline for maintenance.

Date Day	S79 Flow* (cfs) 1990	S78 Flow* (cfs)	S77 Flow * (cfs)
	1990		
4/24/12 Tue		1055	1048
4/25/12 Wed	1962	1099	1152
4/26/12 Thu	1493	1022	1156
4/2712 Fri	408	448	948
4/28/12 Sat	0	0	188
4/29/12 Sun	0	0	56
4/30/12 Mon	0	0	0
Average Flow	836	517	649



Upstream of S79/Franklin Conditions: Poor.

Chloride levels at the Olga Water Treatment plant decreased from 260 to 144 mg/L in the last week. The plant has been shut down since April 7, 2012 due to Safe Drinking Water Act violation of a primary drinking water standard for TDS. Algae is reported at the plant. In situ sampling of chlorophyll fluorescence from LaBelle downstream to S79 east ranged from 11.0 at LaBelle, 9.7 at Alva to 14.5 at S79E. At S79E, where the higher concentration of algae was sampled, the majority of cells were fine cyanobacteria filaments including *Planktothrix* sp. with some *Anabaena spp.* (curly and straight types) and *Aphanizomenon sp.* These three genera include strains that are potential toxin producers.

Upper Estuary Conditions: Poor.

Chlorophyll levels increased dramatically over last week with levels at Ft Myers increasing from 2.2 to 13.0 ug/L. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

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 (W)	4.2	126	4.2	0.66
Beautiful Island	9.0	106	2.8	0.75
Ft. Myers	13.0	96	2.5	0.81

arget light penetration: CE - Caloosahatchee Estuary =1 m					
	SCB-San Carlos	Bay = 2.2 meters			
Definition of 25% lz:	I = irradiance	$\mathbf{z} = depth$			

Lower Estuary Condition: Poor.

The RECON sensor was down for maintenance however salinities remain well above the preferred range of 15-25 psu for oysters. April through May is the recruitment season for oysters in the Caloosahatchee.

L

Oysters

The Condition Index is good, ranging from 2.26-5.23. The preferred range is > 2. Disease prevalence of *Perkinsus marinus* (Dermo) remains very high ranging from 92% - 100%. The disease intensity is low/moderate 1.00-2.86. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy). Recruitment is average for this time of year 0.53-4.64. Recruitment should increase through April - May.

To: USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

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Subject: Caloosahatchee & Estuary Condition Report

Date: 8 May, 2012

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

Ten days of 0 cfs flow through S79 to the Caloosahatchee estuary is resulting in increased algae blooms upstream of the Franklin Lock and an increase in chlorides at the Olga Water Treatment Plant. Downstream of the lock salinities are increasing throughout the estuary. Sampling by SCCF revealed the highest accumulation of algae at the Alva Bridge and independent laboratory tests at Lee County's Water Treatment Plant recorded the presence of potentially toxic cyanobacteria. The GreenWater Laboratories report is included with this week's conditions report.

Recommendation: Resume proactive pulse releases to the Caloosahatchee estuary to flush the algae out of the Franklin pool and prevent further blooms. There is very low risk of water shortage for permitted users who have not been restricted at all this year. However, the river and estuary have been completely cut off from critical freshwater flows this spring for a total of 36 days so far.

Lake Okeechobee Lev	el: 11.57' (Beneficial	Use Sub-Band)	Last wk: 11	.68' Water Shortage 10.85'
Lake Okeechobee Inflo	ow: 198 cfs	Lake Okeeche	obee Outflow:	2,019 cfs
Weekly Rainfall:	WP Franklin 0.48",	Ortona 0.16",	Moore Haven 0.	.65"
Salinity Ft. Myers:	16.8 – 20 psu surface	data (Fort Myers	Yacht Basin)	Previous wk: 12 - 19.2 psu
	18.5 – 22 psu (SCCF	RECON Marker	52) Previou	us wk 18 –23 psu
MFL Status:	MFL Violation 5 th Cor 30 day moving 1 day ≥ 20 ps	p <mark>asecutive Year (</mark> g average > 10 p su = 11 days (i	of MFL Exceeder su = 135 days non consecutive)	nce in Serious Harm
	7 day moving averag	e = 18.6 p	su	Previous week: 16.6 psu
	14 day moving avera	ge= 17.7 p	su	Previous week: 18.6 psu
	30 day moving avera	ge = 18.5 p	su	Previous week: 18.4 psu
Salinity Shell Point:	31.7 – 36 psu (SCC	F RECON sense	or)	Previous week: offline psu
Olga Water Treatment	Plant Chloride: 150	mg/L OFF	LINE	Previous week: 144 mg/L
				n a 11.0psu



Flow: Ten days of 0 cfs flow through S79 to the Caloosahatchee estuary has caused an increase in algae blooms upstream of the Franklin Lock and an increase in chlorides from 144 – 150 mg/L, at the Olga Water Treatment Plant. The river continues to exceed the 30 day moving average of 10 psu and had a one day exceedence of the 20 psu threshold in the past week.

Surface salinity at Ft. Myers increased over the past week from 15.5 to 18.7 psu. Salinity at Beautiful Island increased from 15.6 to 16.3 psu, at the SR 31 Bridge salinities increased from 7.2 to 14.4 psu and downstream of the structure at S79 salinity increased from 10.6 to 11.0 psu. Surface salinities at Shell Point ranged from 31.7 – 36 psu and continue to exceed the preferred salinity range for oysters.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
5/1/12	Tue	0	0	0
5/2/12	Wed	0	0	436
5/3/12	Thu	0	0	644
5/4/12	Fri	0	0	781
5/5/12	Sat	0	0	691
5/6/12	Sun	0	0	395
5/7/12	Mon	0	0	382
Average	Flow	0	0	475

* From ACOE Website Daily Reports

Upstream of S79/Franklin Conditions: Poor.

Chloride levels at the Olga Water Treatment plant increased from 144 to 150 mg/L over the last week. The plant has been shut down since April 7, 2012 due to Safe Drinking Water Act violation of a primary drinking water standard for TDS.

A significant presence of potentially toxic (PTOX) algae is reported at the plant, most visible in the morning. In-situ chlorophyll concentrations east of S79 were 9.7 μ g/L at LaBelle, 9.7 - 13.1 μ g/L at Alva and 12.4 μ g/L at S79 east.

The highest phytoplankton concentrations were sampled at Alva, photo at right, with green clumps visible on and under the surface of the water. The dominant genus sampled was *Anabaena*, a potential toxin producer.

Upper Estuary Conditions: Poor.



SCCF Sonde Surface Salinity at Fort Myers Yacht Basin



Without flow, salinity levels continue to increase throughout the estuary. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

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 (W)	7.8	123	1.5	0.67
Beautiful Island	12.7	100	4.8	0.77
Ft. Myers	9.6	88	3.5	0.88

Target light penetration: CE- Caloosahatchee Estuary =1 mSCB-San Carlos Bay = 2.2 metersDefinition of 25% Iz:I = irradiancez = depth

Lower Estuary Condition: Poor.

A cyanobacteria bloom of *Trichodesmium erythraeum* measuring 3.5 million trichomes/L is present in the surf zone along Sanibel, Captiva and Ft. Myers Beaches.

Surface salinities at Shell Point ranged from 31.7 – 36 psu and continue to remain well above the preferred range of 15-25 psu for oysters. April through May is the recruitment season for oysters in the Caloosahatchee.



USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, To: 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: 5 June, 2012

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

Tapegrass

2010 extent

Rain augmented a 10 day pulse release to the Caloosahatchee estuary that ended on Friday, June 1. The flow lowered estuary salinity levels and may have helped decrease chlorophyll levels upstream of the Franklin Lock.

Recommendation: We request proactive water releases continue to provide flow that will help to 1) prevent further development of algal blooms and 2) allow time for the estuary to gradually acclimate and adapt to lower wet season salinities.

Lake Okeechobee Level: 11.69 ft. (Beneficial Use Sub-Band) Last wk: 11.71 ft. Water Shortage 10.56 ft Lake Okeechobee Inflow: 1039 cfs Lake Okeechobee Outflow: NR cfs Weekly Rainfall: WP Franklin 0.87", Ortona 0.67", Moore Haven 0.40" Salinity Ft. Myers: 13.2-16.4 psu surface data (Fort Myers Yacht Basin) Previous wk: 12.5 - 16.9 psu 14.6-18.5 psu (SCCF RECON Marker 52) Previous wk: 16 - 22 psu MFL Violation 5th Consecutive Year of MFL Exceedence in Serious Harm **MFL Status:** 30 day moving average > 10 psu = 163 days 1 day > 20 psu = 16 days (Total days since April 10, 2012) 7 day moving average = 14.7 psu Previous week: 14.9 psu 14 day moving average = 15.0 psu Previous week: 16.4 psu 30 day moving average = 17.0 psu Previous week: 17.6 psu Salinity Shell Point: 28-35.9 psu (SCCF RECON sensor) Previous week: 28-36 psu **Olga Water Treatment Plant Chloride** 112 mg/L OFFLINE Previous week: 98 mg/L 4.1psu 75. A 5.9psu 06/04/12 Surface Salinity Caloosahatchee 31 NWR psu 0-2 Bridge Tressel 2-4 4-7 7-10 10-13 Old 8.6psu

autiful

13.7psul SFWMD MFL

Monitoring Site

0

Fort

Myers

SCCF Ya Club Site Yacht 75

13-16 16-20

≥ 20

SCCE Logger Tapegrass Present

Tapegrass Transplants Present

Tapegrass Lost 2012

10 Kilometers

SCCF

Flow: The past week flows to the Caloosahatchee estuary through S79 averaged 248 cfs. Flow helped reduce chlorophyll levels upstream of the lock and lowered salinities downstream of the lock. Chloride levels at the Olga Water Treatment Plant increased. Chlorophyll levels increased dramatically at the downstream side of S79 but decreased in the upper and middle estuary. The river has exceeded its MFL of 10 psu for 163 days since December 27, 2011 and has exceeded the one day 20 psu threshold for 16 days since April 10, 2012.

Surface salinity at Ft. Myers decreased over the past week from 16.0 to 13.7 psu. Salinity at Beautiful Island decreased from 10.5 to 8.6 psu and at the SR 31 Bridge salinities decreased from 7.6 to 5.9 psu. Downstream of S79 salinity has decreased from 5.5 to 4.1 psu. SCCFs Shell Point RECON sensor recorded salinities of 28 – 36 psu which continue to exceed the preferred salinity range for oysters.



Upstream of S79/Franklin Conditions: Improving.

Chloride levels at the Olga Water Treatment plant increased from 98 to 112 mg/L in the last week. In-situ chlorophyll concentrations east of S79 decreased from 11.5 to 7.5 μ g/L. Floating cyanobacteria mats were present along the banks and epiphytic algae were covering submersed vegetation.

Upper Estuary Conditions: Improving.

Salinity decreased in the upper estuary but remains too high for tape grass survival and recovery.

Chlorophyll levels increased dramatically west of S79 from 12.5 to 21.8 µg/L over the last week. Chlorophyll at both Beautiful Island and Ft Myers decreased.

CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
S79 (W)	21.8	140	2.7	0.60
Beautiful Island	4.5	132	4.2	0.64
Ft. Myers	7.9	103	2.4	0.77

Target light penetration: CE- Caloosahatchee Estuary =1 m				
	SCB-San Carlos	s Bay = 2.2 meters		
Definition of 25% Iz:	I = irradiance	z = depth		

Lower Estuary Condition: Poor.

A *Trichodesmium* bloom was observed on Sanibel beaches from Tarpon Bay Road to Blind Pass late last week.

Red Tide:

On June 3, red/brown water near the Sanibel Causeway was sampled at Shell Point. Analysis by FWC found 80,000 cells/L of *Karenia brevis*.

Oysters:

The RECON sensor at Shell Point recorded salinities between 28 and 36 psu, well above the preferred range of 15-25 psu for oysters.



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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: 3 July, 2012

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

The departure of Tropical Storm Debby reduced storm surge allowing basin runoff to decrease salinities throughout the estuary.

Recommendation: We request the Corps resume proactive water releases to help gradually lower salinity downstream of S-79 to acclimate estuarine organisms to lower wet season salinities. This should also help in meeting the MFL salinity targets.

Lake Okeechobee Lev	el: 12.02 ft. (Bend	eficial Use Sub-Band)	Last wk: 11.93 ft.		
Lake Okeechobee Inflo	ow: 1690 cfs	Lake Okeechobee O	utflow: N/A cfs		
Weekly Rainfall:	WP Franklin 1.23",	Ortona 1.56", Moore	e Haven 0.74"		
Salinity Ft. Myers:	8.9 - 13.5 psu surfac	e data (Fort Myers Yacht	Basin) Previous wk: 13.	6 - 17.6 psu	
	13.5 – 20 psu (SCCI	F RECON Marker 52)	Previous wk: 16.	0 - 23.1 psu	
MFL Status:	MFL Violation 5 th Consecutive Year of MFL Exceedence in Serious Harm 30 day moving average > 10 psu = 191 days 1 day > 20 psu = 16 days (Total days since April 10, 2012)				
	7 day moving avera 14 day moving aver 30 day moving aver	ge = 11.8 psu a ge = 13.9 psu a ge = 13.8 psu	Previous week: 15.8 psu Previous week: 14.3 psu Previous week: 14.5 psu		
Salinity Shell Point:	26 -36 psu (SCCF	RECON sensor)	Previous week: 28.4 - 37	. 0 psu	
Olga Water Treatment	Plant Chloride 9	6 mg/L OFFLINE	Previous week: 110 mg/l	-	
X		1			



Flow: Flows to the Caloosahatchee estuary averaged 1104 cfs during the past week through S79. Rain from Tropical Storm Debby decreased salinity throughout the estuary following the storms departure. Chloride levels at the Olga Water Treatment plant decreased from 110 to 96 mg/L over the past week. The river has exceeded its MFL of 10 psu for 191 days since December 27, 2011 and has exceeded the one day 20 psu threshold for 16 days this year since the first exceedance on April 10, 2012.

Surface salinity at Ft. Myers decreased from 15.3 to 10.2 psu, compared to sampling the previous week. Salinity at Beautiful Island decreased from 14.9 to 5.3 psu and at the SR 31 Bridge salinities decreased from 7.7 to 3.2 psu. Downstream of S79 salinity has decreased from 9.9 to 3.6 psu. Salinity at Shell Point decreased ranging from 26 – 36 psu, which continues to exceed the preferred salinity range for oysters.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/26/12	Tue	1898	163	0
6/27/12	Wed	2908	253	0
6/28/12	Thu	1441	324	0
6/29/12	Fri	452	176	0
6/30/12	Sat	314	0	0
7/1/12	Sun	318	0	NR
7/2/12	Mon	402	0	NR
Average	Flow	1104	130	



* From ACOE Website Daily Reports

Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment plant decreased from 110 to 96 mg/L during the past week. In-situ chlorophyll concentrations east of S79 increased from 4.9 to 10.5 µg/L. Cyanobacteria including *Anabaena* and *Planktothrix* were mixed in with unidentified coccoid cells.

Upper Estuary Conditions:

Salinity levels have dropped reaching a low of 10 psu on tidal cycles however salinity continues to exceed levels suitable for tape grass survival and recovery.

In situ chlorophyll levels west of S79 ranged from 7.4 - 14.7 µg/L on 7/02. The dominant phytoplankton species at S79 West was an unidentified coccoid cell. CDOM remains high and light penetration limited at all sampled sites in the upper estuary. A swarm of copepods *Acartia tonsa*, observed and photographed at the Ft Myers Yacht Basin on July 2nd, photo at right.

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 (W)	14.7	185	2.6	0.49
Beautiful Island	9.9	162	4.4	0.54
Ft. Myers	7.4	122	1.8	0.68

Lower Estuary Condition:

Red Tide:

NOAA Gulf of Mexico HAB bulletin for July 2, 2012 reported no red tide in Lee County waters or offshore Sanibel last week.

SCCF observed Sargassum and red drift algae off the causeway in the lower estuary, San Carlos Bay and on Sanibel beaches that may have broken loose in TS Debby.

Smalltooth Sawfish:

A juvenile smalltooth sawfish measuring 38" has been observed in Tarpon Bay Sanibel on 5/29, 6/18 - 6/22 and on 6/25.

Video of the fish swimming in Tarpon Bay on June 22, 2012 taken by SCCF Marine Lab scientists:





Sargassum and red drift algae in the lower Caloosahatchee. July 2,2012 Photo NBC2

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - 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: 7 August, 2012

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

Flows from the watershed this past week held salinities static throughout the estuary.

Recommendation: We request that the Corps continue to provide flow to the Caloosahatchee to meet ecologically appropriate wet season estuary conditions and proactively manage lake levels to avoid flows above 2800 cfs.

Lake Okeechobee Lev	el: 12.12 ft. (Benefic	cial Use Sub-Band) Last where the second sec	<: 12.12 ft.
Lake Okeechobee Infle	ow: 1,117 cfs	Lake Okeechobee Outflow:	NR cfs
Weekly Rainfall:	WP Franklin 4.08",	Ortona 1.18", Moore Hav	ren 2.70"
Salinity Ft. Myers:	1.9 - 4.8 psu surface da	ata (Fort Myers Yacht Basin)	Previous wk: 1.6 - 3.8 psu
	3 - 10 psu (SCCF REC	ON Marker 52)	Previous wk: 3 – 9 psu
MFL Status:	Daily salinity at Fort M 7 day moving average = 14 day moving average 30 day moving average	lyers <u><</u> 10 psu In compliance = 3.3 psu = 3.0 psu = 5.2 psu	Previous week: 2.7 psu Previous week: 3.8 psu Previous week: 7.1 psu
Salinity Shell Point:	16 – 33 psu (SCCF R	ECON sensor)	Previous week: 16 – 32 psu

Olga Water Treatment Plant Chloride 70 mg/L OFFLINE



Previous week: 70 mg/L

Page 2 of 2

Caloosahatchee Estuary

Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,041 cfs during the past week. Surface salinity at Ft. Myers increased from **2.9 to 4.8** psu, compared to sampling the previous week. Salinity at Beautiful Island increased from **1.0 to 1.3** psu. In the lower estuary salinity at Iona decreased from **14.1 to 13.9** psu and at Shell Point salinity ranged from **16 – 33** psu. These salinity levels are average for this time of year.

TION ACOL WEDSILE Daily Reports						
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)		
7/31/12	Tue	779	100	NR		
8/1/12	Wed	426	82	NR		
8/2/12	Thu	1080	329	NR		
8/3/12	Fri	1638	631	NR		
8/4/12	Sat	1312	301	NR		
8/5/12	Sun	1088	NR	NR		
8/6/12	Mon	965	NR	NR		
Average	Flow	1041				

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

No algae reported at the Olga Water Treatment Plant intake. The plant remains offline for maintenance.

Upper Estuary Conditions:

In situ chlorophyll levels west of S79 ranged from 2.8 in San Carlos Bay to 7.5 μ g/L at the Beautiful Island on 8/06/12.

Ft. Myers RECON sensor detected hypoxic conditions from July 31 through Aug 6th. The water column was stratified and hypoxic conditions (DO<3.0mg/L) were detected in the lower layer of the water column (starting at 2-3 m deep) from at least I75 to the Ft Myers RECON over a 10.6 km section of the river.

	Hypoxic below	Min. DO
	(meters)	(mg/l)
175	2.8	1.29
Trestle	3.4	0.81
Beautiful Is.	2.3	0.9
Mkr 33	2.4	1.06
Mkr 39	2.7	1.73
City Ramp	1.6	1.1
Cal Brdg	1.5	1.83
Mkr 52	2.7	2.4

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light			
Stations	(µg/L)	(qse)	(NTU)	(meters)			
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m			
		SCB <11	SCB < 5	SCB =2.2m	Target light penetration	n: CF - Caloosaha	tchee Estuary =1 m
Ft. Myers	7.5	212	4.5	0.44	raiget ignt periodation		
lona	5.6	167	3.2	0.53		SCB-San Carlo	s Bay = 2.2 meters
San Carlos Bay	2.8	25	16.6	1.74	Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$

Lower Estuary Condition:

Salinities at Iona and Shell Point are averaging 14 and 24 psu which is within the preferred range (14-28 psu) for oysters. Dissolved oxygen levels were below 3 mg/l in Ding Darling and near shore in Pine Island Sound.

Small, nonmotile, coccoid cells were the dominant phytoplankton type sampled at all lower estuary sites. Small unidentified flagellates and *Myrionecta rubra* were also present.

Photo SCCF

Smalltooth Sawfish:

A juvenile smalltooth sawfish that has been frequenting Tarpon Bay on Sanibel was observed again on July 31 2012.

This fish has not yet been tagged by the Florida Wildlife Commission.

Clear sauerkraut bryozoans, *Zoobotryon verticillatum* mixed with *Sargassum* on Sanibel beaches.

August 4, 2012



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 2 October, 2012

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

Kissimmee basin inflow to Lake Okeechobee decreased 40% over last week's flow. The upper lakes are at or below regulation schedules. The river-plume frontal zone continues to extend past the Sanibel Lighthouse at Point Ybel. Salinities in the lower estuary have been too low to support oysters for the past five consecutive weeks and for ten days were in the mortality zone for shoal grass. A phytoplankton bloom persists in the lower estuary.

Recommendation: We request that the Corps and District explore and use all available storage capacity within the system with special emphasis on storage in the upper chain of lakes and Lake Kissimmee to maximize storage above regulation schedules. This would help minimize additional inflow to the lake and negative impacts to the estuary from excessive high flow discharges (>4500 cfs). To minimize salinity stress on oysters, salinities should be maintained above 7.5 psu in the lower estuary, while salinities above 4 psu are needed to prevent shoal grass mortality.

Lake Okeechobee Lev	el: 15.64 ft. (Low Sub-Band) Last wk	: 15.38 ft.
Lake Okeechobee Inflo	w: 7,434 cfs Lake Okeecho	bee Outflow: 2,114 cfs
Weekly Rainfall:	WP Franklin 0.13", Ortona 0.61", Moo	re Haven NR
Salinity Ft. Myers:	0.2 psu surface data (Fort Myers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON Marker 52)	Previous wk: 0.2 psu
MFL Status:	Daily salinity at Fort Myers < 10 psu In comp	bliance
	7 day moving average =0.2 psu14 day moving average =0.2 psu30 day moving average =0.3 psu	Previous week: 0.2 psu Previous week: 0.2 psu Previous week: 0.3 psu
Salinity Shell Point:	4 - 28 psu (SCCF RECON sensor)	Previous week: 4 - 29 psu

Olga Water Treatment Plant Chloride 50 mg/L

Previous week: 58 mg/L



Flow: Flows to the Caloosahatchee estuary through S79 averaged 3,817 cfs during the past week. Surface salinities at Ft. Myers and Beautiful Island measured 0.2 psu on 10/01. In the lower estuary, salinities at Iona increased to 6.8 psu. The salinity range at Shell Point ranged from 4 - 28 psu.

* From ACOE Website Daily Reports Date Day S79 Flow* S78 Flow* S77 Flow * (cfs) (cfs) (cfs) 9/25/12 Tue 4272 1896 1194 9/26/12 Wed 4068 1926 1254 9/27/12 3860 1926 1258 Thu 9/28/12 2198 1436 Fri 3517 2052 9/29/12 Sat 3554 1584 9/30/12 Sun 3592 1806 1572 1524 10/1/12 3856 1831 Mon Average Flow 1947 1403 3817



Red indicates flows exceeding ecological harm threshold >2,800 cfs

Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment Plant measure 58 mg/L. Apparent water color is 280 cu.

Upper Estuary Conditions:

Surveys on 10/1 report no tapegrass recovery at Old Bridge Park - the western edge of where *Vallisineria* was seen growing last year. Hypoxic conditions at Ft. Myers were not detected by SCCF's RECON sensor this past week.



Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)			
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m			
Ft. Myers	8.8	241	1.6	0.40			
lona	8.3	200	3.7	0.48			
San Carlos Bay	13.5	73	11.4	0.81			
Target light penetration: CE- Caloosahatchee Estuary =1 m SCB-San Carlos Bay = 2.2 meters							
Definition of 25% lz: $I = irradiance$ $z = depth$							

Lower Estuary Condition:

Salinities at Iona ranged between 2 and 8 psu over the past week, which is below the preferred range (14-28 psu) for oysters and too low to sustain shoal grass. Salinity levels have been in the mortality zone for shoal grass (below 4 psu) for ten days at Iona but have risen out of that zone the past few days. Increasing flows from S79 could exacerbate these negative effects. The average salinity at Shell Point was 16 psu, within the preferred range for oysters. Hypoxia was detected at the Shell Point RECON. Chlorophyll was slightly elevated at the Sanibel Causeway where diatoms including *Skeletonema* sp. and *Chaetoceros* sp. were dominant.

In the lower estuary, CDOM concentrations and turbidity were elevated, resulting in murky brown colored water. Within Pine Island Sound and at Shell Point, RECON sensors detected elevated chlorophyll levels. The resulting light attenuation is harmful for seagrasses at depth.

Red Tide:

Background concentrations of the harmful algae *Karenia brevis* has been identified onshore northern Lee County and in Pine Island Sound. In addition, low levels of *K. brevis* were found 19 miles west of North Captiva and rafts of dead fish were reported 5 miles south of Sanibel on Monday.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 9 October, 2012

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

Regional rainfall continues to raise the lake level, exacerbating high volume regulatory releases to the estuaries. Salinities in the lower estuary have been too low to support oysters for the past six consecutive weeks and for the past 17 days have remained in the mortality zone for shoal grass. High CDOM freshwater extends into the Gulf of Mexico, San Carlos Bay and Pine Island Sound.

Recommendation: We request that the Corps and District use their discretionary authority to adjust lake releases so that the estuaries can absorb the basin runoff in the short-term. To minimize salinity stress on oysters, salinities should be maintained above 7.5 psu in the lower estuary, while salinities above 4 psu are needed to prevent seagrass mortality.

Lake Okeechobee Lev	/el:	15.88	ft. (Low S	Sub-Bar	nd) L	.ast wk: 15.6 4	ft.	
Lake Okeechobee Infl	ow:	12,259	9 cfs		Lake Ok	eechobee Ou	utflow:	4,889 cfs
Weekly Rainfall:	WP Fra	anklin	1.07",	Ortona	1.06",	Moore Hav	ven 0.2	2"
Salinity Ft. Myers:	0.2 ps	su surfa	ace data (F	ort Myer	rs Yacht E	Basin) Previc	ous wk: (0.2 psu
	0.2 ps	su (SCC		I Marker	⁻ 52)	Previo	ous wk:	0.2 psu
MFL Status:	Daily s	salinity	at Fort My	yers <u><</u> 1	0 psu Ir	n compliance	•	
	7 day r 14 day 30 day	moving moving moving	average = g average : g average :	0.2 = 0.2 = 0.2	psu psu psu	Previc Previc Previc	ous weel ous weel ous weel	k: 0.2 psu k: 0.2 psu k: 0.3 psu
Salinity Shell Point:	3 – 30	psu	(SCCF RE	CON se	nsor)	Previo	ous weel	k: 4 - 28 psu

Olga Water Treatment Plant Chloride 52 mg/L

Previous week: 50 mg/L



Flow: Flows to the Caloosahatchee estuary through S79 averaged **6,464** cfs during the past week. Flows have exceeded the 6,500 cfs harm threshold for the past 3 days. Freshwater has displaced the estuary, extending past the Sanibel lighthouse and several miles along Fort Myers Beach and into the Gulf of Mexico. Surface salinities at Ft. Myers and Beautiful Island measured 0.2 psu on 10/07. In the lower estuary, salinities at Iona decreased from 6.8 to 1.2 psu. The salinity at Shell Point ranged from 3 - 30 psu.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
10/2/12	Tue	4616	1421	1508
10/3/12	Wed	4795	2236	1544
10/4/12	Thu	5144	3705	1906
10/5/12	Fri	6358	4894	3136
10/6/12	Sat	7833	3778	4098
10/7/12	Sun	8356	5261	4020
10/8/12	Mon	8152	3906	3990
Average	Flow	6464	3600	2886

* From ACOE Website Daily Reports

Red indicates flows exceeding ecological harm threshold >2,800 cfs

Upstream of S79/Franklin Conditions:

On October 9th chlorides were 52 mg/L and apparent color 284 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

Surveys on 10/1 report no tapegrass recovery at Old Bridge Park - the western edge of where Vallisineria was seen growing last year.



Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m		
Ft. Myers	8.8	246	1.1	0.39		
Iona	14.3	228	3.0	0.41		
San Carlos Bay	5.6	172	3.2	0.52		
Target light penetration: CE- Caloosahatchee Estuary =1 m SCB-San Carlos Bay = 2.2 meters						
Definition of 25% Iz: $I = irradiance$ $z = depth$						

Lower Estuary Condition:

Salinities at Iona dropped to a low of 1.2 psu over the past week, which is well below the preferred range (14-28 psu) for oysters and too low for sustaining shoal grass. Increasing flows from S79 are extending the duration of these low salinity impacts. The

average salinity at Shell Point was 14 psu, at the bottom of the preferred range for oysters. Hypoxia was detected at SCCFs Shell Point and Tarpon Bay RECON sensors. Chlorophyll was slightly elevated at Iona.

In the lower estuary, CDOM concentrations and turbidity were elevated, resulting in highly colored water. The resulting light attenuation is harmful for seagrasses at depth. FDACS samples taken on 10/8 and counted by FWC found 21,000 *Karenia* cells/L inshore of North Captiva, and a bloom of *Alexandrium* (which can produce haemotoxins) off Regla Island in southern Pine Island.

Red Tide:

Medium concentrations of red tide, *Karenia brevis* have been identified onshore northern Lee County and offshore of Sanibel and Captiva. Visitors and residents of Sanibel have been reporting low levels of respiratory distress in discrete locations around the J.N. "Ding" Darling NWR.

Oysters:

Sampling from the 1st week of September – 1st week of October reveals Dermo prevalence is between 0.86 – 1.6, still high for the salinity levels. Recruitment ranges from 1.64 – 15.11 with 15.11 recorded at Tarpon Bay, so some larvae have been flushed downstream.





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: 10 January, 2012

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: Weekly releases have been effective in keeping salinity from rising in the mid estuary but salinities remain too high for tapegrass reestablishment or support of emerging tapegrass. We request adaptive management strategies be used to provide a 650 cfs pulse release to reduce salinities below the harm threshold of 10 psu at Fort Myers to provide conditions suitable for tapegrass recovery in the estuary.

Lake Okeechobee Level: 13.52' (Base Flow Band) Last wk: 13.65' Lake Okeechobee Inflow: 464 cfs Lake Okeechobee Outflow: 491 cfs Weekly Rainfall: WP Franklin 0.0", Ortona 0.0", Moore Haven 0.0" 8.8 – 15.3 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: 10.5 – 14.1 psu Salinity Ft. Myers: NR psu (SCCF RECON Marker 52) previous week: 13 - 18 psu **MFL Status:** MFL Violation = 30 day moving average > 10 psu = 16 days 7 day moving average = 11.7 psu previous week: 12.0 psu 14 day moving average= 11.9 psu previous week: 12.2 psu 30 day moving average = 11.9 psu previous week: 11.4

Salinity Shell Point: 21 – 33.5 psu (SCCF RECON sensor)

Olga Water Treatment Plant Chloride: 68 mg/L

Last week 63 mg/L

Last week: 21 - 33.5 psu



Flow: Pulse releases averaging 450 cfs the past few weeks have helped stabilize the rising salinity in the estuary maintaining surface salinities between 8-14 psu the past week. The past three weeks the salinity at Ft Myers has exceeded the 30 day MFL moving average, measuring 11.9 psu this week up from 11.4 psu last week. Surface salinities increased upriver, with Beautiful Island/I75 salinities of 9.5 psu and the Franklin Lock (S79) of 4.9 psu. Tapegrass transplants at the Ft Myers Bridge are gone and one of two transplant plots are gone at Beautiful Island.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
1/3/12	Tue	114	184	843
1/4/12	Wed	0	299	1218
1/5/12	Thu	0	126	969
1/6/12	Fri	771	342	360
1/7/12	Sat	1160	595	783
1/8/12	Sun	758	481	771
1/9/12	Mon	400	198	459
Average	Flow	457	317	771

* From ACOE Website Daily Reports



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



Upper Estuary Conditions: Fair – Poor. Increased salinity has negatively impacted plots of transplanted tapegrass at Beautiful Island and transplants between Old Bridge Park and the 41 Bridges. A bloom of *Polysiphonia* is occurring between Old Bridge Park and the 41 Bridge.

Rangia clams were found dead along the black wrack line on shore between old Bridge Park and the US 41. The photo above shows dead *Rangia* in decomposing algae mats with white sulfur precipitate produced by sulfur bacteria. It is suspected that decomposing algae have caused anoxic conditions and high hydrogen sulfide levels which killed the clams.

CDOM is high at all three sites the 31 Bridge, Beautiful and Fort Myers with values well above the desirable target of < 70 qse.

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	1.3	214	1.1	0.44
Beautiful Is.	1.6	158	2.3	0.56
Ft. Myers	1.6	129	1.9	0.65

Target light penetration:

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

Definition of 25% Iz: I = irradiancez = 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 Department continues an advisory against harvesting and eating shellfish from local waters due to potential poisoning from red tide toxins.

Red Tide:

A harmful algal bloom of *Karenia brevis* that started 9/26/11 persists in area waters with very low to medium concentrations alongshore and offshore of Sanibel Island, very low concentrations were detected alongshore of southern Lee County south to Lovers Key State Park.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 6 November, 2012

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

Dry conditions continued the past week, reducing Lake Okeechobee inflows by more than 1,000 cfs. Regulatory releases to the Caloosahatchee also decreased from 2,698 to 2,340 cfs, however, total outflow from Lake O increased 50% over the previous week. Highly colored (CDOM) freshwater continues to extend into the Gulf of Mexico, San Carlos Bay and Pine Island Sound. A Red Tide Advisory has been issued by the Lee County Health Department and shell fishing is closed in Lee County waterways.

USACE Action: On 10/30/12, the Corps decided to continue regulatory releases up to 3,000 cfs at S-79.

Recommendation: We request that the Corps reduce flows at S79 to basin flows of 1,000 cfs. This will allow the estuary to slowly begin to acclimate to dry season conditions, to achieve appropriate salinities within the estuary and preserve water supplies in the system for the dry season. We continue to urge the COE and SFWMD to hold as much water as possible in the northern chain of lakes to help abate high Lake O levels, excessive flows to the estuaries and retain water in the system for the dry season.

Lake Okeechobee Lev	vel: 15.67	ft. (Low Sub-B	Band) L	Last wk: 15.87 ft		
Lake Okeechobee Infl	ow: 1,551	cfs	Lake Ok	eechobee Outf	low: 2,978	cfs
Weekly Rainfall:	WP Franklin	0.0", C	Ortona 0.0	",	Moore Haven	0.0"
Salinity Ft. Myers:	0.8 psu surfa	ce data (Fort My	yers Yacht I	Basin) I	Previous wk: 0	. 2 psu
	0.2 - 5.0 psu	(SCCF RECON	N Marker 52	2)	Previous wk: 0	. 2 psu
MFL Status:	Daily salinity	at Fort Myers <	<u><</u> 10 psu	30 day moving	average = 0	.2 psu

Salinity Shell Point:

8 - 33 psu (SCCF RECON sensor)

Previous week: 7 - 29 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 2,340 cfs the past week. While reduced freshwater flows have allowed salinities in the estuary to increase, lessening the stress on oysters and seagrass, the freshwater plume continues to extend beyond the Sanibel lighthouse, along the north end of Fort Myers Beach and into the Gulf of Mexico.

* From ACOE Website Daily Reports					
Date	Day	S79 Flow*	S78 Flow*	S77 Flow *	
		(cfs)	(cfs)	(cfs)	
10/30/12	Tue	2754	1895	2069	
10/31/12	Wed	2683	2313	2570	
11/1/12	Thu	3004	2159	2744	
11/2/12	Fri	2130	1636	2251	
11/3/12	Sat	1874	1622	2197	
11/4/12	Sun	1989	1629	1912	
11/5/12	Mon	1950	1612	1824	
Average	Flow	2340	1838	2223	



Red indicates flows exceeding ecological harm threshold >2,800 cfs

Upstream of S79/Franklin Conditions:

On 10/23/12, chlorides were 64 mg/L and apparent color was 122 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

Fort Myers RECON sensor recorded low phytoplankton levels and did not detect hypoxia this week.

Lower Estuary Condition:

Over the past week, salinity at Iona averaged 9.2 psu well below the preferred range (14-28 psu) for oysters. Reduced flows have improved the salinity for shoal grass. The average salinity at Shell Point remained 19 psu. However, the highly colored (CDOM) water of the freshwater discharge continues to extend past the Sanibel lighthouse into the Gulf of Mexico and along the northern portions of Fort Myers Beach. The resulting light attenuation is harmful for seagrasses at deeper depths.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)	Target light penetration: CE - Caloosahatchee Estuary =1 m
Target Values	< 11	CE <70	CE < 18	CE = 1 m	SCB -San Carlos Bay = 2.2 meters
-		SCB <11	SCB < 5	SCB =2.2m	Definition of 25% lz: $I = irradiance$ $z = depth$
Ft. Myers	2.5	234	2.8	0.40	
lona	3.6	181	3.3	0.48	
San Carlos Bay	2.5	84	1.9	0.89	

Red Tide:

Lee County issued a Red Tide Advisory due to the red tide. On Sanibel's Tarpon Bay Beach, SCCF Marine Lab reported medium concentrations, 200,000 cells/L, of *K. brevis* f on Wednesday and high concentrations, 150 million cells/L, on Monday (11/05/12). In Tarpon Bay, medium concentrations, 300,000 cells/L, were reported on Wednesday and high concentrations, 3.75 million cells/L, on Monday. Fish kills and highly discolored water were reported on Sanibel's mid-island beaches on Monday, 11/5/12 and along Wildlife Drive in the DDNWR.

An additional 7 birds, 6 double crested cormorants and 1 herring gull, have become ill with brevatoxicosis from red tide in the past week. The veterinarian at CROW (Care and Rehabilitation of Wildlife) on Sanibel reports these birds are more ill than the eighteen double crested cormorants they received last week.





Chlorophyll and DO spikes showing presence of phytoplankton bloom at Redfish Pass RECON.

Red tide advisory

FOR IMMEDIATE RELEASE 2012:037 2:00 p.m. Nov. 7, 2012 Contact: Diane Holm, PIO (239) 332-9561 (850) 519-5728 (cell) <u>Diane Holm@doh.state.fl.us</u>



Fort Myers, FL—The Lee County Health Department advises beach goers and boaters to be wary of spotty patches of red tide that can cause respiratory irritation in susceptible people.

Beach goers are advised to wear shoes when walking on the sand to avoid the possibility of a puncture wound from fish bones, especially catfish spines. Shell fishing is closed throughout Lee County waterways; however shell fish sold at restaurants and stores is safe to eat.

Staff from the health department, Lee County Parks and Recreation and Mote Marine Laboratories continues to monitor beaches for signs of red tide. Results show spotty patches of the toxin creating fish kills, discolored water and minor respiratory irritation mostly in open water, but occasionally coming ashore on local beaches.

Based on observations taken this morning, Bunche Beach near the Sanibel Causeway, and the Gulfside beach access at Algiers Lane, Tarpon Bay beach and Tarpon Bay at Ding Darling Preserve experienced a few days with various amounts of dead fish and odor. Some respiratory irritation was noted from the red tide bloom offshore.

Local officials say people can still enjoy the beaches, however, those with asthma or chronic respiratory impairments need to be aware of beach conditions where red tide impacts are reported. Those who experience symptoms should move to another beach without reports of red tide.

The Mote Marine Laboratory's Beach Conditions Report is updated at 10 a.m. and 3 p.m. daily. Reports can be viewed online at <u>www.mote.org/beaches</u>. Residents and visitors can also register to receive email reports about specific beaches. For telephone updates, call 941-BEACHES (232-2437).

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: 17 January, 2012

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: Recent releases over the past week have not been effective in keeping salinity from rising in the mid estuary. Salinities remain too high for tapegrass reestablishment or support of emerging tapegrass and the trend continues to be increasing over time. We request adaptive management strategies be used to provide a 650 cfs pulse release to reduce salinities below the harm threshold of 10 psu at Fort Myers to provide conditions suitable for tapegrass recovery in the estuary.

Lake Okeechobee Level: 13.43' (Base Flow Band) Last wk: 13.52' Lake Okeechobee Inflow: 409 cfs Lake Okeechobee Outflow: NR (missing S77 & S308 data) WP Franklin 0.0", Weekly Rainfall: Ortona 0.0", Moore Haven 0.0" 10.5–16 psu surface data (SCCF sonde Ft. Myers Yacht Basin) Prev. wk: 8.8–15.3 psu Salinity Ft. Myers: 12.5-19 psu (SCCF RECON Marker 52) Previous week: NR **MFL Status:** MFL Violation = 30 day moving average > 10 psu = 23 days previous week: 11.7 psu 7 day moving average = 13.61 psu 14 day moving average= 12.56 psu previous week: 11.9 psu 30 day moving average = 12.42 psu previous week: 11.9 psu Salinity Shell Point: 23-33 psu (SCCF RECON sensor) Last week: 21 - 33.5 psu

Olga Water Treatment Plant Chloride: 81 mg/L

Last week: 68 mg/L



Flow: Pulse releases averaging 450 cfs over the past week were not effective in reducing salinities in Ft. Myers below the 10 psu harm threshold. However, releases did help slow the rate of salinity rise in the estuary, maintaining surface salinities in Ft. Myers between 10.5–16 psu over the past week. Salinity in Ft Myers has exceeded the MFL 30-day moving average for more than 3 weeks, with salinity measuring 12.42 psu this week up from 11.9 psu last week. Surface salinities decreased slightly upriver, with Beautiful Island/I75 salinities at 7.2 psu and the Franklin Lock (S79) at 4.6 psu.

* From ACOE Website Daily Reports

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
4/40/40	-	(013)		
1/10/12	Iue	1	1	17
1/11/12	Wed	0	0	0
1/12/12	Thu	0	0	0
1/13/12	Fri	810	362	630
1/14/12	Sat	1447	985	1173
1/15/12	Sun	919	713	1182
1/16/12	Mon	425	250	610
Average Flow		515	330	516

Upper Estuary Conditions: Poor

Salinity remains above the MFL "harm" threshold of 10 psu in Ft. Myers. Increased salinities may be contributing to a loss of tapegrass between Old Bridge Park and Beautiful Island.



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
S-79 (W)	1.5	217	1.1	0.43
Beautiful Island	1.7	186	3.4	0.49
Ft. Myers	1.3	142	1.0	0.60

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



CDOM remains relatively high between S-79 and Ft. Myers, with values well above the desirable target of <70 qse.

Target light penetration:

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

Definition of 25% lz: I = irradiancez = depth

Lower Estuary Condition: Fair–Poor

Salinities at Shell Point remain outside the preferred range for oysters, and salinity at the lower end of the range increased 2 psu over the past week from 21–33.5 to 23–33 psu. The red tide bloom in San Carlos Bay and offshore of Sanibel and Lee County dissipated over the past week. The Lee County Health Department continues an advisory against harvesting and eating shellfish from local waters due to potential poisoning from red tide toxins.

Red Tide: A harmful algal bloom of *Karenia brevis* that has been persisting in southern Pine Island Sound/San Carlos Bay region of Lee County for the past few weeks may have finally died out. From January 13th to the 17th, SCCF Marine Lab scientists did not find any *K. brevis* present at the Sanibel boat ramp or Tarpon Bay.

Drift Algae: Small amounts of drift algae have been reported on Sanibel beaches as a result of the recent cold front.

USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, Steve Sullivan, SFWMD Melissa Meeker, To: 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: 24 January, 2012

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: Salinities rose at all stations this week despite average flows of 490 cfs at S79. Salinities in the upper estuary remain too high for tapegrass reestablishment or support of emerging tapegrass. As discussed on the call we ask that adaptive management strategies to be used to reduce salinities below the harm threshold of 10 psu at Fort Myers to provide conditions suitable for tapegrass recovery in the estuary.

Lake Okeechobee Level: 13.37' (Base Flow Band) Last wk: 13.43' Lake Okeechobee Inflow: 818 cfs Lake Okeechobee Outflow: 2008 cfs Weekly Rainfall: WP Franklin 0.0", Ortona 0.0", Moore Haven 0.0" Salinity Ft. Myers: 11.8 – 16.8 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev. wk: 10.5 – 16 psu 15.7 - 19 psu (SCCF RECON Marker 52) previous week: 12.5 - 19 psu **MFL Status:** MFL Violation = 30 day moving average > 10 psu = 30 days 7 day moving average = 13.9 psu previous week: 13.6psu 14 day moving average= 13.6 psu previous week: 12.5 psu 30 day moving average = 12.7 psu previous week: 12.4 Last week: 22 - 33 psu

Salinity Shell Point: 25.7 – 33.7 psu (SCCF RECON sensor)

Olga Water Treatment Plant Chloride: 72 mg/L

Last week 81 mg/L



Flow: Pulse releases averaging 490 – 515 cfs the past few weeks have not been effective in reducing salinity at Ft Myers below the 10 psu harm threshold. Salinities rose throughout the estuary the past week with surface salinity at Ft Myers ranging from 11.8 to 16.8 psu, salinity at Beautiful Island/I75 of 9.5 psu and the Franklin Lock (S79) salinity measuring 5.5 psu. The salinity at Ft Myers has exceeded the 30 day MFL moving average for the past 30 days establishing the 5th consecutive year of MFL exceedances. Salinities in the lower estuary also exceed the desirable salinity range for oysters.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
1/17/12	Tue	95	1	36
1/18/12	Wed	0	0	264
1/19/12	Thu	0	0	261
1/20/12	Fri	783	331	411
1/21/12	Sat	1231	736	870
1/22/12	Sun	872	510	771
1/23/12	Mon	453	317	555
Average Flow		490	270	452

* From ACOE Website Daily Reports

Polysiphonia growing where tapegrass transplants have been lost at Old Bridge Park



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



Upper Estuary Conditions: Fair – Poor.

Increased salinity has negatively impacted plots of transplanted tapegrass at Beautiful Island and transplants between Old Bridge Park and the 41 Bridges. A bloom of *Akashiwo* with a density of 340,000/L extends from Royal Palm Park to the RECON west of the Caloosahatchee Bridge and is densest at Tarpon Street Pier at 26.5 ug chl a/L. *Akashiwo* produces a soap-like protein which acts as a surfactant, which strips the natural waterproofing from bird feathers and can lead to hypothermia. *Synechococcus,* a smaller dinoflagellate is also present in the Ft. Myers. Synechococcus can produce microcystins and BMAAs.

CDOM is high at all three sites the S79 west, Beautiful Island and Fort Myers with values well above the desirable target of < 70 qse.

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 (W)	2.5	193	1.5	0.46
Beautiful Island	1.4	168	3.4	0.53
Ft. Myers	12.5	145	3.4	0.55

Target light penetration:

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

Definition of 25% lz: I = irradiancez = depth

Lower Estuary Condition: Fair.

Salinities ranges at Shell Point of 25.7 – 33.7 psu have increased to levels outside the sustainable range for oysters.

Red Tide is reported in very low concentrations at Lighthouse Beach on Sanibel and Lovers Key State Park in southern Lee County. Outside Tarpon Bay on Sanibel there are a lot of dead conchs and whelks, probably from the red tide.

The Lee County Health Department continues an advisory against harvesting and eating shellfish from local waters due to potential poisoning from red tide toxins.

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: 31 January, 2012

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: Salinities decreased slightly at all stations this week despite average flows of 308 cfs at S79. Salinities are increasing overall and in the upper estuary remain too high for tapegrass reestablishment or support of emerging tapegrass. Despite the new release schedule which alternates 900 cfs days with 0 flow days, the overall flow is not enough to meet the biological targets and keep salinity below the harm threshold of 10 psu at Fort Myers.

Lake Okeechobee Level: 13.28' (Base Flow Band) Last wk: 13.37' Lake Okeechobee Inflow: 893 cfs Lake Okeechobee Outflow: 2259 cfs WP Franklin 0.1", Ortona 0.02", Moore Haven 0.4" Weekly Rainfall: 12.9 – 15 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev.wk: 11.8–16.8 psu Salinity Ft. Myers: 13 – 18.5 psu (SCCF RECON Marker 52) previous week: 15.7 - 19 psu **MFL Status:** MFL Violation = 30 day moving average > 10 psu = 37 days 7 day moving average = 12.97 psu previous week: 13.9 psu 14 day moving average= 13.0 psu previous week: 13.6 psu 30 day moving average = 13.5 psu previous week: 12.7 psu Salinity Shell Point: 23 – 34 psu (SCCF RECON sensor) Last week: 25.7 - 33.7 psu

Olga Water Treatment Plant Chloride: 72 mg/L

Last week 72 mg/L



Flow: Pulse releases averaged only 308 cfs the past week. Surface salinity at Ft Myers increased from 12.9 to 15 psu, salinity at Beautiful Island/I75 was 8.1 psu and the Franklin Lock (S79) salinity dropped to 3.7 psu. The salinity at Ft Myers has exceeded the 30 day MFL moving average for the past 37 days establishing the 5th consecutive year of MFL exceedances. Salinities in the lower estuary also exceeded the preferred salinity range for oysters.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
1/24/12	Tue	98	317	561
1/25/12	Wed	Closed	147	513
1/26/12	Thu	0	0	296
1/27/12	Fri	649	602	639
1/28/12	Sat	374	278	954
1/29/12	Sun	723	509	390
1/30/12	Mon	318	478	1005
Average Flow		308	333	622

* From ACOE Website Daily Reports



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



Upper Estuary Conditions: Fair – Poor.

Increased salinity has negatively impacted both transplanted and volunteer tape grass at both Beautiful Island and between Old Bridge Park and the 41 Bridges. Decomposing *Polysiphonia* wracks near Beautiful Island are releasing the pigment phycoerythrin which is mixing with precipitated sulfur (a result of anoxia) causing the pastel pink water color shown in the photo above.

CDOM is high at all sampled sites in the upper estuary. Sampled sites S79 west, Beautiful Island and Fort Myers, registered values well above the expected values of a naturally functioning system.

Caloosahatchee Stations	Chlorophyll (µɑ/l)	CDOM (gse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
S79 (W)	1.7	210	1.7	0.44
Beautiful Island	1.8	176	2.0	0.51
Ft. Myers	0.3	150	2.2	0.55

Target light penetration:

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

Definition of 25% lz: I = irradiancez = depth

Lower Estuary Condition: Fair.

The lower salinity levels at Shell Point, 23 – 32 psu reduced slightly from last week but remain at levels outside the sustainable range for oysters.

The red tide organism, *Karenia brevis*, was not detected in water samples collected this week on the southwest coast of Florida alongshore of Pinellas, Hillsborough, Charlotte, Lee, Collier and Monroe counties. With medium to high concentrations of *K. brevis* present last week along Lee and Collier counties, it is possible that patches are still present in unsampled (offshore) areas. Latent effects could continue to negatively affect the estuarine and marine environments.

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: 14 February, 2012

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: Salinities decreased slightly throughout the estuary over the past week, with rainfall and flows averaging 550 cfs at S79. Salinities over the past 7 weeks have exceeded the salinity envelope for tapegrass causing the last transplants to disappear from Beautiful Island. Releases to date have not provided enough water to meet ecological targets and keep salinity below the harm threshold of 10 psu at Fort Myers or 5 psu at the I75 monitoring station. We request that the Corps design a front loaded pulse release which increases Caloosahatchee flows to achieve the MFL target at Fort Myers.

Lake Okeechobee Lev	vel: 13.13' (Base Flow	Band) Last	t wk: 13.21'	
Lake Okeechobee Inf	low: 861 cfs	Lake Okeech	obee Outflow:	1305 cfs
Weekly Rainfall:	WP Franklin 0.10",	Ortona 0.61",	Moore Haven	0.46"
Salinity Ft. Myers:	12.6 – 17.6 psu surface	e data (SCCF so	onde Ft Myers Y	′acht Basin) Prev.wk: <mark>10.9–17.8</mark> psu
	14 – 21 psu (SCCF RI	ECON Marker 5	2)	previous week: 16 - 22.5 psu
MFL Status:	MFL Violation = 30 da	ay moving avera	ge > 10 psu = 5	1 days
	7 day moving average 14 day moving average 30 day moving average	e = 15.3 p ge= 14.7 p ge = 14.3 p	osu osu osu	previous week: 14.7 psu previous week: 14.4psu previous week: <mark>13.9</mark> psu
Colinity Chall Daint	22 24 may (SCCE F			E 94 mar

Salinity Shell Point: 23 – 34 psu (SCCF RECON sensor) Last week: 25.5 – 34 psu

Olga Water Treatment Plant Chloride: 80 mg/L

Last week 78 mg/L



Flow: Rainfall augmented pulse releases this past week providing an average 550 cfs at S79. Surface salinity at Ft Myers dropped to 13.3 psu, salinity at Beautiful Island/I75 decreased 4 psu to 9.6 psu and the Franklin Lock (S79) salinity decreased to 5 psu although chlorides at the Olga water treatment plant increased. The salinity at Ft Myers has exceeded the 30 day MFL moving average for the past 51 days. Elevated salinities in the upper estuary have contributed to the loss of all tapegrass transplants in the critical area between the US 41 bridges and I75 where manatees are now congregating. Salinities in the lower estuary remained relatively stable over the past week but continue to exceed the upper limit of the preferred salinity range for oysters.

* From ACOE Website Daily Reports						
Date Day		S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)		
2/7/12	Tue	246	250	316		
2/8/12	Wed	758	208	312		
2/9/12	Thu	400	323	420		
2/10/12	Fri	76	422	640		
2/11/12	Sat	1018	799	608		
2/12/12	Sun	872	911	936		
2/13/12	Mon	486	457	1064		
Average	Average Flow 550 481 757					



Upstream of S79/Franklin Conditions: Fair.

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

Upper Estuary Conditions: Fair – Poor.

Increased salinity has contributed to the failure of transplanted tapegrass between Beautiful Island/I75 and the 41 Bridges. Extensive blooms of *Polysiphonia* in this area has further obscured light penetration and visibility.

CDOM is high at all sampled sites in the upper estuary. Sampled sites S79 west, Beautiful Island and Fort Myers, registered values well above the expected values of a healthy functioning system.

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 (W)	1.4	198	1.5	0.46
Beautiful Island	2.3	159	2.9	0.55
Ft. Myers	2.8	137	4.4	0.63

Target light penetration:

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

Definition of 25% lz: I = irradiancez = depth

Lower Estuary Condition: Fair.

Salinities at Shell Point ranged between 23 – 34 psu, above the preferred range of 15-25 psu for oysters.

Oysters:

New juvenile oysters were put out in January and their growth will be monitored over the next few months. Dermo prevalence and intensity are currently high. Dermo prevalence is 73 - 100% and intensity is 0.79 - 4.07. The Condition index is good ranging from 2 - 3.87.

There is no spat recruitment at this time as oysters are in resting phase due to low temperatures. Seasonal recruitment will begin in April.

Red Tide:

The red tide organism, *Karenia brevis,* was not detected in water samples along or offshore Lee County and Sanibel this week.
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: 21 February, 2012

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: Salinities remained relatively static throughout the estuary over the past week with flows to the estuary averaging 586 cfs at S79. Salinities over the past 8 weeks have exceeded the salinity tolerance for tapegrass. Surveys this week found no remaining transplanted or volunteer tapegrass in the upper estuary. Releases to date have not provided enough water to keep salinity below the harm threshold of 10 psu at Fort Myers or 5 psu at the I75 monitoring station. As a result salinity levels are not supportive of aquatic resources in the middle to upper estuary. We request that the Corps design pulse releases to increase Caloosahatchee flows to achieve the MFL target at Fort Myers.

Lake Okeechobee Level: 13.12' (Base Flow Band) Last wk: 13.13' Lake Okeechobee Inflow: 1017 cfs Lake Okeechobee Outflow: 1035 cfs Weekly Rainfall: WP Franklin 0.0", Ortona 0.0", Moore Haven 0.01" Salinity Ft. Myers: 12.5 – 17.3 psu surface data (SCCF sonde Ft Myers Yacht Basin) Prev.wk: 12.6–17.6 psu 13.4 -21.4 psu (SCCF RECON Marker 52) previous week: 14 - 21 psu MFL Status: MFL Violation = 30 day moving average > 10 psu = 58 days 7 day moving average = 15.5 psu previous week: 15.3 psu 14 day moving average= 15.3 psu previous week: 14.7 psu 30 day moving average = 14.8 psu previous week: 14.3 psu Salinity Shell Point: 23 – 33 psu (SCCF RECON sensor) Last week: 23 - 34 psu

Olga Water Treatment Plant Chloride: 72 mg/L

Last week 80 mg/L



Flow: The pulse release this past week provided an average flow of 586 cfs at S79. Surface salinity at Ft Myers remained relatively static at 14.4 psu, salinity at Beautiful Island/I75 measured 9.7 psu and the Franklin Lock (S79) salinity decreased to 3.6 psu. The salinity at Ft Myers has exceeded the 30 day MFL moving average for the past 58 days. Elevated salinities in the upper estuary have contributed to the loss of all tapegrass transplants in the critical area between the US 41 bridges and I75 where manatees are now congregating in warm water discharge on the Orange River. Salinities in the lower estuary remained relatively stable over the past week but continue to exceed the upper limit of the preferred salinity range for oysters.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
2/14/12	Tue	118	39	244
2/15/12	Wed	108	0	34
2/16/12	Thu	240	0	164
2/17/12	Fri	788	444	822
2/18/12	Sat	1358	825	1282
2/19/12	Sun	876	616	762
2/20/12	Mon	616	368	644
Average	Flow	586	327	564

* From ACOE Website Daily Reports



Upper Estuary Conditions: Fair – Poor.

Transects sampled this week revealed no remaining transplanted or volunteer tapegrass in the upper estuary. *Polysiphonia* continues to bloom extensively in and around Beautiful Island.

CDOM is high at all sampled sites in the upper estuary.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum values	< 11	SCB <11	SCB < 5	SCB =2.2m
S79 (W)	1.4	180	0.9	0.5
Beautiful Island	1.4	160	0.9	0.55
Ft. Myers	1.9	160	2.4	0.55

Target light penetration:

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

Definition of 25% lz: I = irradiancez = depth

Lower Estuary Condition: Fair.

No reports of red tide or algae blooms in the water or on the beaches of Sanibel or San Carlos Bay. Salinities at Shell Point ranged between 23 – 33 psu, above the preferred range of 15-25 psu for oysters.

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: 28 February, 2012

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: Salinities dropped slightly at Ft Myers and Beautiful Island but increased at the Franklin Lock and in the lower estuary over the past week. Rain events made up for reduced flows to the estuary averaging 229 cfs at S79. Salinities over the past 9 weeks have exceeded the salinity tolerance for tape grass. No transplanted or volunteer tape grass is left in the upper estuary. Releases to date have not provided enough water to keep salinity below the harm threshold of 10 psu at Fort Myers or the 5 psu Adaptive Protocols target at the I75 monitoring station. As a result salinity levels are not supportive of aquatic resources in the middle to upper estuary. We request that the Corps and SFWMD continue efforts to lower salinity levels in the Caloosahatchee through pulse releases designed to achieve the MFL target at Fort Myers.

Lake Okeechobee Lev	el: 13.00 (Base Flow	Band) Las	st wk: 13.12'	
Lake Okeechobee Infle	ow: 896 cfs	Lake Okeec	hobee Outflow:	845 cfs
Weekly Rainfall:	WP Franklin 1.37",	Ortona 2.23",	Moore Haven 0	0.41"
Salinity Ft. Myers:	12.3 – 16.1 psu surfac	e data (SCCF s	sonde Ft Myers Ya	acht Basin) Prev.wk: 12.5–17.3 psu
	13.3 -18.8 psu (SCCF	RECON Mark	er 52)	previous week: 13.4 -21.4 psu
MFL Status:	MFL Violation = 30 da	ay moving aver	age > 10 psu = 65	days
	7 day moving averag 14 day moving averag 30 day moving averag	e = 13.9 ge= 14.6 ge = 14.6	psu psu psu	previous week: 15.5 psu previous week: 15.3 psu previous week: <mark>14.8</mark> psu

Salinity Shell Point: 25.8 – 33.8 psu (SCCF RECON sensor)

Olga Water Treatment Plant Chloride: 78 mg/L

Last week: **23 – 33** psu

Last week 72 mg/L



Flow: The pulse release that started on February 17 provided an average flow of 229 cfs at S79, but was augmented by rain over the weekend and Monday February 27. This past week, surface salinity at Ft Myers dropped slightly from 14.4 to 13.9 psu, salinity at Beautiful Island/I75 decreased from 9.7 to 6.8 psu but salinity increased from 3.8 to 6.5 psu at the Franklin Lock (S79). The salinity at Ft Myers has exceeded the 30 day MFL moving average for the past 65 days. Elevated salinities in the upper estuary have contributed to the loss of all tape grass transplants in the critical area between the US 41 bridges and I75 where manatees are now congregating in warm water discharge on the Orange River. Salinity in the lower estuary increased over the past week and continues to exceed the upper limit of the preferred salinity range for oysters.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
2/21/12	Tue	435	363	640
2/22/12	Wed	362	464	656
2/23/12	Thu	99	197	784
2/24/12	Fri	0	0	374
2/25/12	Sat	0	0	206
2/26/12	Sun	0	0	312
2/27/12	Mon	707	358	340
Average	Flow	229	197	473

* From ACOE Website Daily Reports



Upper Estuary Conditions: Fair – Poor.

No reports of algae blooms.

Tape grass-*Valliseneria americana***:** In September and October 2011, SCCF Marine Lab researchers transplanted tape grass in the Caloosahatchee at two sites (Caloosahatchee Bridge and Royal Palm Park) where it was previously found growing. The tape grass transplants were grown at the SCCF lab and installed in two exclosures at each of the two sites. Approximately 10 transplants were placed in each exclosure for a total of approximately 40 plants. Transplants were 50–100 cm tall when planted. All four transplant plots were initially caged with exclosures of ½ inch mesh.

Transplants inside the exclosures were grazed to approximately 10 cm. The cages were subsequently removed from all plots. After initial grazing of the large shoots, rosettes increased in density at Caloosahatchee Bridge and Royal Palm Park. Though grazing of leaves continued, the combination of salinity at or above 10 psu and limited light penetration due to algae (*Polysiphonia, Ulva*, and diatoms) and CDOM contributed to the decline and eventual loss of all transplants and volunteer plants observed at Royal Palm Park and volunteer plants at Old Bridge Road. Current surveys along 100 m transects indicate no surviving transplants or volunteers at Caloosahatchee Bridge, Old Bridge Road, Tarpon Street Pier or Royal Palm Park. Tape grass studies have shown that under ideal light and temperature conditions tape grass can survive at 10 psu, but existing conditions in the River are not supportive of tape grass survival as shown in the table below.

CDOM remains high at all sampled sites in the upper estuary.

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 (W)	1.4	167	1.6	0.53
Beautiful Island	1.4	150	4.2	0.57
Ft. Myers	1.9	122	2.6	0.68
Target light µ	ght penetration: CE - Caloosahatchee Estuary = 1 meter SCB -San Carlos Bay = 2.2 meters			
Definition of	25% lz:	= irradiance	z = depth	



Transplanted tape grass at the Caloosahatchee Bridge Sept 14, 2011

Lower Estuary Condition: Fair.

No reports of red tide or algae blooms in the water or on the beaches of Sanibel or San Carlos Bay. Salinities rose at Shell Point ranging between 25.8 – 33.8 psu, above the preferred range of 15-25 psu for oysters.

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, 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: 13 March, 2012

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 augmented pulse releases to the estuary during the past week providing flows averaging 707 cfs at S79. Releases and rainfall within the basin have helped to keep salinities from rising but have not provided enough water to lower salinity below the harm threshold of 10 psu at Fort Myers or the 5 psu Adaptive Protocol target at the I75 monitoring station. As a result salinity levels are not supportive of aquatic resources in the upper estuary. We request that the Corps and SFWMD continue to provide pulse releases to the Caloosahatchee to maintain a low salinity zone downstream of S79 throughout the dry season.

Lake Okeechobee Lev	/el: 12.84 [°] (Base Flow	Band) Last	wk: 12.87	
Lake Okeechobee Infl	ow: 1081 cfs	Lake Okeecho	bee Outflow:	648 cfs
Weekly Rainfall:	WP Franklin 0.63",	Ortona 0.31",	Moore Haven 1	.21"
Salinity Ft. Myers:	10.7 - 16.8 psu surfac	e data (Fort Myer	s Yacht Basin)	Prev.wk: 10.3 – 17.5 psu
	14 – 20.7 psu (SCCF	RECON Marker 5	52)	previous week: 12 -21 psu
MFL Status:	MFL Violation = 30 da	ay moving averaç	ge > 10 psu = 79	days
	7 day moving averag 14 day moving avera 30 day moving avera	je =14.3 pige=14.5 pige =14.7 p	su su su	previous week: 14.2 psu previous week: 14.7 psu previous week: 15.5 psu
Salinity Shell Point:	27 – 34.5 psu (SCCF	FRECON sensor) Last we	eek: 23 – 35 psu
		4		4

Olga Water Treatment Plant Chloride: 82 mg/L

Last week 78 mg/L



Orange dots added to map indicate tape grass locations identified by SFWMD

Flow: Rain augmented pulse releases this past week providing average flows of 707 cfs at S79. During the past week, surface salinity at Ft Myers ranged from 10.7 - 16.8 psu. Salinities increased upstream at Beautiful Island from 6.7 - 12.9, at the SR 31 bridge from 4.5 to 4.9 psu and at S79 from 3.5 to 5.9 psu. The salinity range in the lower estuary also increased over the past week, ranging from 27 - 34.5 psu, continuing to exceed the upper limit of the preferred salinity range for oysters and exceeding the preferred salinity range for newborn and juvenile smalltooth sawfish. March and April are the pupping months for smalltooth sawfish in the Caloosahatchee.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
3/6/12	Tue	0	0	0
3/7/12	Wed	0	0	240
3/8/12	Thu	864	444	872
3/912	Fri	1376	972	1336
3/10/12	Sat	1253	1003	1344
3/11/12	Sun	850	645	956
3/12/12	Mon	609	429	644
Average	Flow	707	499	770

* From ACOE Website Daily Reports

Upstream of S79/Franklin Conditions: Good. No reports of algae blooms.

Upper Estuary Conditions: Fair.

The past week Fort Myers had a mixed dinoflagellate bloom of 1.05 million dinoflagellates/liter including *Peridinium sp. and Polykrikos schwartzii* and other species as well as pennate and centric diatoms. The bloom peaked on March 5 as shown on the SCCF RECON graph at right with chlorophyll concentrations of 18 μ g/l. Annual mean chlorophyll of 11 μ g/l indicates nutrient enrichment (FLDEP).

CDOM remains high at all sampled sites in the upper estuary.

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 (W)	1.1	156	1.5	0.56
Beautiful Island	2.0	133	2.8	0.64
Ft. Myers	3.8	108	2.0	0.74

SCCF Sonde Surface Salinity at Fort Myers Yacht Basin





Target light penetration: **CE**- Caloosahatchee Estuary =1 mSCB-San Carlos Bay = 2.2 metersDefinition of 25% Iz:I = irradiancez = depth

Lower Estuary Condition: Fair.

No reports of red tide or algae blooms in the water or on the beaches of Sanibel or San Carlos Bay. Salinities at Shell Point ranged between 27 - 34.5 psu, above the preferred range of 15 - 25 psu for oysters.

Smalltooth Sawfish:

The smalltooth sawfish is listed as **Endangered** by the National Marine Fisheries Service (2003), its habitat in the Caloosahatchee is designated Critical Habitat (2009) and it is listed as **Critically Endangered** on the ICUN Red List. An objective of the recovery plan is to protect or restore habitats for juveniles that occur in estuarine and nearshore waters.

Researchers studying smalltooth sawfish in the Caloosahatchee report that March and April are the months that smalltooth sawfish give birth or pup. Newborns have very limited home ranges and show a preference for salinities between 18 - 24 psu. They have been documented moving higher in the estuary to find preferred salinity conditions when flow patterns result in salinity changes. However, suitable habitat that they can use as a refuge from predation may be limited upriver.

A February 2011 study by Simpfendorfer et al. entitled *Environmental Influences on the Spatial Ecology of Juvenile Smalltooth Sawfish*, (PLoS One, Volume 6 Issue 2, e16918) concludes that the amount of flow from Lake Okeechobee via the Caloosahatchee and St Lucie rivers may have important implications for conservation measures.

USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, To: 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 March, 2012

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: Average flow of 184 cfs at S79, including no flow for four days the past week, resulted in salinity and chlorides rising dramatically downstream and upstream of S79. In addition a strong odor upstream of S79 is being reported to Lee County staff. In past years when the water was cut off in March salinities rose to >20 psu in the upper estuary, downstream of the lock and toxic cyanobacteria blooms resulted. We request that the Corps continue to provide pulse releases to the Caloosahatchee to maintain a low salinity zone downstream of S79 and prevent stagnation in the Franklin pool, through the dry season.

Lake Okeechobee Lev	vel: 12.74' (Base Flow	(Band) L	ast wk: 12.84	
Lake Okeechobee Infl	ow: 95 cfs	Lake Okee	chobee Outflow:	1766 cfs
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.0",	Moore Haven 0.0"	
Salinity Ft. Myers:	13.8 - 17.8 psu surfac	e data (Fort M	yers Yacht Basin)	Previous wk: 10.7 – 16.8 psu
	17 – 22 psu (SCCF R	ECON Marker	52)	Previous wk 14 – 20.7 psu
MFL Status:	MFL Violation = 30 d	lay moving ave	erage > 10 psu = 86	days
	7 day moving averag 14 day moving avera 30 day moving avera	ge = 15.0 age = 15.0 age = 14.0	6 psu) psu <mark>8</mark> psu	Previous week: 14.3 psu Previous week: 14.5 psu Previous week: 14.7 psu
Salinity Shell Point:	26 – 35 psu (SCCF	RECON senso	or)	Previous week: 27 – 34.5 psu
Olga Water Treatment	t Plant Chloride: 110 n	ng/L Strong C	dor Reported	Previous week: 82 ma/L



Orange dots added to map indicate tape grass identified by SFWMD

Flow: No flow for four of the past seven days of the pulse release resulted in an average flow of 184 cfs at S79. With very dry conditions, no rain and very limited flow, salinities increased throughout the system. Surface salinity at Ft Myers increased from 16.8 - 17.8 psu. Salinities at Beautiful Island increased from 12.9 to 15.3, at the SR 31 bridge from 4.9 to 11.5 psu and at S79 from 5.9 to 10.8 psu. The salinity range in the lower estuary remained static over the past week, ranging from 26 – 35 psu, continuing to exceed the upper limit of the preferred salinity range for oysters. March and April are the pupping months for smalltooth sawfish in the Caloosahatchee.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
3/13/12	Tue	274	136	344
3/14/12	Wed	48	0	150
3/15/12	Thu	0	0	156
3/1612	Fri	0	0	158
3/17/12	Sat	0	0	485
3/18/12	Sun	0	0	609
3/19/12	Mon	970	317	634
Average	Flow	184	64	362

* From ACOE Website Daily Reports



SCCF Sonde Surface Salinity at Fort Myers Yacht Basin

Upstream of S79/Franklin Conditions: Fair.

Chloride levels at the Olga Water Treatment plant increased dramatically from 82 to 110 mg/L in the last week and a strong odor is reported.

Upper Estuary Conditions: Fair.

Phytoplankton concentrations continued to decrease, but increasing light levels and salinities are resulting in a bloom of Polysiphonia subtilissima, a benthic macroalgae, pictured blooming at SR 31.

CDOM remains high at all sampled sites in the upper estuary.

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 (W)	1.4	167	2.0	0.53
Beautiful Island	0.5	110	4.9	0.70
Ft. Myers	1.5	121	2.0	0.68

Target light penetration: CE- Caloosahatchee Estuary =1 m **SCB**-San Carlos Bay = 2.2 meters Definition of 25% Iz: I = irradiance $\mathbf{z} = depth$

Lower Estuary Condition: Fair.

Mats of algae are reported covering the bottom in and around the beaches of San Carlos Bay, Sanibel and the causeway islands. Drift algae blooms in Pine Island Sound included Solieria filiformis, Hypnea musciformis, Sargassum filipendula Acanthophora spicifera and Gracilaria tikvahiae.

Salinities at Shell Point ranged between 26-35 psu, above the preferred range of 15-25 psu for oysters.

Smalltooth Sawfish:

The smalltooth sawfish is listed as **Endangered** by the National Marine Fisheries Service (2003), its habitat in the Caloosahatchee is designated Critical Habitat (2009) and it is listed as Critically Endangered on the ICUN Red List. An objective of the recovery plan is to protect or restore habitats for juveniles that occur in estuarine and nearshore waters.

00:00 Feb.11 2012 00:00 Mar 17 2012 date [Ea



Increased light and salinity at SR 31 promoting blooms of Polysiphonia subtilissima

Research by Simpfendorfer et al (2011) documented that smalltooth sawfish in the Caloosahatchee estuary give birth or pup in March and April. Newborns have very limited home ranges and show a preference for salinities between 18 and 24 psu.

This salinity envelope currently extends between Marker 52 at Ft Myers and the Cape Coral Bridge.

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, 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: 27 March, 2012

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: Average flow of 561 cfs at S79 the past seven days, reduced salinities in the upper and mid estuary over last week. Chlorides at Olga increased the past week and salinities at Shell Point are also higher. Algae and a lingering odor upstream of S79 are being reported at Olga. Pulse releases have been critical in maintaining a low salinity zone downstream of S79 and have kept the Franklin pool from stagnating. We request that the Corps use their discretionary authority within the Beneficial Use Sub-Band and continue to provide pulse releases to the Caloosahatchee to maintain a low salinity zone downstream of S79 and prevent stagnation in the Franklin pool, through the dry season.

Lake Okeechobee Le	vel: 12.53' (Beneficial	l Use Sub-Band)) Last wk: 12	.74'
Lake Okeechobee Inf	low: 121 cfs	Lake Okeech	obee Outflow:	2,326 cfs
Weekly Rainfall:	WP Franklin 0.12",	Ortona 0.0",	Moore Haven 0.0)"
Salinity Ft. Myers:	15.0 -18.4 psu surfac	e data (Fort Mye	rs Yacht Basin)	Previous wk: 13.8 - 17.8 psu
	16.7 - 20.5 psu (SCCF	F RECON Marke	r 52)	Previous wk 17 – 22 psu
MFL Status:	MFL Violation = 30 c	day moving avera	age > 10 psu <mark>= 93</mark>	days
	7 day moving avera 14 day moving aver 30 day moving aver	ge = 16.7 age= 16.5 age = 15.1	psu psu psu	Previous week: 15.6 psu Previous week: 15.0 psu Previous week: <mark>14.8</mark> psu
Salinity Shell Point:	29.5 – 35.7 psu (SC	CF RECON sen	sor)	Previous week: 26 – 35 psu

Olga Water Treatment Plant Chloride: 115 mg/L

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Previous week: 110 mg/L

Flow: Today is the last day of the 10 day pulse release initiated on 3/18/12. Over the past seven days flows at S79 averaged 561 cfs. With very dry conditions and very limited basin rainfall, it is clear that the pulse releases this past week helped to decrease salinities in the upper and middle Caloosahatchee estuary. (*Note the salinity response to flow the past week, in the graph below of SCCF sonde data from Ft. Myers*). Salinities in the mid to lower estuary are especially important in March and April when smalltooth sawfish are pupping in the Caloosahatchee estuary. The salinity preference for newborns and juveniles is 18-24 psu.

Surface salinity at Ft. Myers decreased from 17.8 to 15.5 psu. Salinities at Beautiful Island decreased from 15.3 to 11.5 psu, at the SR 31 bridge salinities decreased from 11.5 to 8.2 psu and at S79 from 10.8 to 5.1 psu. The salinity range in the lower estuary rose over the past week, ranging from 29.5 - 35.7 psu, continuing to exceed the upper limit of the preferred salinity range for oysters.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(CTS)	(CTS)	(CIS)
3/20/12	Tue	1423	1151	1548
3/21/12	Wed	1182	894	1702
3/22/12	Thu	702	784	1508
3/2312	Fri	415	435	1630
3/24/12	Sat	173	216	556
3/25/12	Sun	32	51	304
3/26/12	Mon	0	39	218
Average Flow		561	510	1066





Upstream of S79/Franklin Conditions: Fair.

Chloride levels at the Olga Water Treatment plant increased from 110 to 115 mg/L in the last week. Algae was present upstream of the lock on Friday and a lingering odor was detected.

Upper Estuary Conditions: Fair.

No Polysiphonia wracks were observed the past week.

CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

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 (W)	1.3	151	2.4	0.57
Beautiful Island	2.0	121	11.5	0.64
Ft. Myers	1.6	105	1.7	0.7

 Target light penetration: CE- Caloosahatchee Estuary =1 m

 SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: I = irradiance z = depth

Lower Estuary Condition: Fair.

Abundant drifting red macroalgae, *Dasya baillouviana*, was observed near lona.

Salinities at Shell Point ranged between 29.5–35.7 psu, above the preferred range of 15-25 psu for oysters.

Smalltooth Sawfish:

The smalltooth sawfish is listed as **Endangered** by the National Marine Fisheries Service (2003), its habitat in the Caloosahatchee is designated Critical Habitat (2009) and it is listed as **Critically Endangered** on the ICUN Red List. An objective of the recovery plan is to protect or restore habitats for juveniles that occur in estuarine and nearshore waters.

Research by Simpfendorfer et al. (2011) documented that smalltooth sawfish in the Caloosahatchee estuary give birth or pup in March and April. Pups and juveniles have very limited home ranges and show a preference for salinities between 18 and 24 psu. This salinity envelope currently extends between Marker 52 at Ft. Myers and Whiskey Creek.



Clump of *Sargassum* and *Dasya* drift algae in San Carlos Bay 3/27/2012.

SCCF Sonde Surface Salinity at Fort Myers Yacht Basin

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, 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: 10 April, 2012

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 Flows of 0 cfs through S79 over the past fifteen days has resulted in salinities rising in the upper river and estuary. Chlorides at Olga increased from 142 to 196 mg/L in the past 7 days, causing the Olga Water Treatment Plant to shut down to prevent a secondary drinking water standard violation for total dissolved solids. Potentially toxin cyanobacteria continue to bloom in the river from LaBelle to the S79 Lock and a lingering odor continues to be reported at Olga. The Lee County Health Department has issued a public health warning on the river. We request that the SFWMD work with the Corps to resume freshwater releases to the Estuary for the purposes of 1) maintaining a low salinity zone downstream of S79 and 2) preventing stagnation in the Franklin pool, through the dry season.

Lake Okeechobee Lev	el: 12.02' (Beneficial	Use Sub-Band) Last wk: 12	2.29'		
Lake Okeechobee Infle	ow: 77 cfs	Lake Okeech	nobee Outflow:	3,254 cfs		
Weekly Rainfall:	WP Franklin 0.10",	Ortona 0.0",	Moore Haven 0.	0"		
Salinity Ft. Myers:	16.5 -19.2 psu surface	e data (Fort Mye	rs Yacht Basin)	Previous wk: 14.7 -19.8 psu		
	18 - 21.5 psu (SCCF F	RECON Marker	52)	Previous wk 18 - 21.5 psu		
MFL Status:	MFL Violation = 30 day moving average > 10 psu = 107 days					
	7 day moving averag 14 day moving avera 30 day moving avera	je =17.9ige =17.4ige =16.7	psu psu psu	Previous week: 17.6 psu Previous week: 16.9 psu Previous week: 15.9 psu		
Salinity Shell Point:	29.8 – 35.7 psu (SC	CF RECON sen	sor)	Previous week: 29.7 – 35.5 psu		

Olga Water Treatment Plant Chloride: 196 mg/L

Previous week: 142 mg/L



Flow: Flows of 0 cfs at S79 resulted in rapidly increasing salinities throughout the estuary. Dry conditions are compounding the negative impacts to the estuary as a result of SFWMD and COE decisions to cut off releases. Past experience with similar conditions indicate that the estuary will suffer public health impacts and severe ecological impacts without freshwater flow.

Surface salinity at Ft. Myers increased from **16.8 to 18.5** psu. Salinities at Beautiful Island increased from **12.2 to 14.3** psu, at the SR 31 bridge salinities increased from **9.9 to 12.1** psu and at S79 from **6.2** to **10.0** psu. The salinity range in the lower estuary remained static over the past week, ranging from 29.8 – 35.7 psu, continuing to exceed the preferred salinity range for oysters.

* From ACOE Website Daily Reports							
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)			
4/3/12	Tue	0	57	496			
4/4/12	Wed	0	147	612			
4/5/12	Thu	0	147	672			
4/612	Fri	0	147	636			
4/7/12	Sat	0	150	808			
4/8/12	Sun	0	150	456			
4/9/12	Mon	0	146	336			
Average Flow		0	134	573			



Upstream of S79/Franklin Conditions: Deteriorating.

Chloride levels at the Olga Water Treatment plant increased from 142 to 196 mg/L in the last week. The plant has been shut down to prevent a secondary drinking water standard violation for total dissolved solids. Chlorophyll and cell counts are increasing west of Franklin Lock. The highest chlorophyll levels were at Labelle and Port Labelle (13 and 11.9 ug/l). Low levels of cyanobacteria were found at the Ortona Lock. Samples were taken at Franklin Lock, Alva, Labelle and Port Labelle on April 6nd that contained elevated levels of cyanobacteria including potentially toxic cyanobacteria including *Aphanizomenon sp.* A sample from Labelle on April 8th contained *Anabaena* and *Microcystis* as well as other cyanobacteria. At Olga the potentially toxic genus *Planktothrix* sp. was the dominant plankton (CyanoLabs). Afternoon samples of dissolved oxygen were at or above saturation at all sites except Franklin Lock, which may already have a hypoxia problem. If the algae bloom continues to intensify, hypoxic conditions are likely to develop over the stretch of the bloom as oxygen demand increases from decomposing algae.

Upper Estuary Conditions: Deteriorating.

Polysiphonia macroalgae was observed coating shells and drifting on the bottom near Beautiful Island. Dissolved oxygen concentrations recorded by RECON sensor at Fort Myers increased this week to as low as 4 mg/L. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)	Target light penetratio	n: CE- Caloosaha	tchee Estuany –1 m
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m	n m SCB-San Carlos Bay		
S79 (W)	1.9	138	1.8	0.62	Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$
Beautiful Island	7.1	125	0.2	0.65			
Ft. Myers	10.9	102	1.5	0.72			

Lower Estuary Condition: Fair.

Salinities at Shell Point ranged between 29.7–35.5 psu, well above the preferred range of 15-25 psu for oysters. April through May is the recruitment season for oysters in the Caloosahatchee.

Smalltooth Sawfish:

The smalltooth sawfish is listed as **Endangered** by the National Marine Fisheries Service (2003), its habitat in the Caloosahatchee is designated Critical Habitat (2009) and is listed as **Critically Endangered** on the ICUN Red List. An objective of the recovery plan is to protect or restore habitats for juveniles that occur in estuarine and nearshore waters. March and April are the months that the smalltooth sawfish give birth.

Research by Simpfendorfer et al. (2011) indicates that pups and juveniles have very limited home ranges and show a preference for salinities between 18 and 24 psu. Compression of the 18-24 psu salinity zone could result in direct impacts to smalltooth sawfish critical habitat. While these young fish will move up the river as this salinity envelope moves, the habitat characteristics upriver may not provide the protection and forage availability.

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, 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: 17 April, 2012

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 Flows of 0 cfs through S79 over the past 22 days have resulted in salinities rising throughout the river and estuary and crossing the 1 day MFL violation threshold of > 20 psu. Algae continues to bloom in the Franklin pool and downstream of the lock. We request that the SFWMD and Corps immediately implement freshwater releases to the estuary as directed by the SFWMD Governing Board for the purpose of improving conditions and preventing stagnation and further expansion of harmful algal blooms in the Franklin pool.

Lake Okeechobee Level: 11.75' (Beneficial Use Sub-Band) Last wk: 12.02' Water Shortage 11.62 ft Lake Okeechobee Inflow: 119 cfs Lake Okeechobee Outflow: 2,346 cfs Weekly Rainfall: WP Franklin 0.0", Ortona 0.08", Moore Haven 0.28" Salinity Ft. Myers: 17.8 -21.1 psu surface data (Fort Myers Yacht Basin) Previous wk: 16.5 -19.2 psu 19.8 - 24.5 psu (SCCF RECON Marker 52) Previous wk 18 - 21.5psu MFL Violation 5th Consecutive Year of MFL Exceedence in Serious Harm **MFL Status:** 30 day moving average > 10 psu = 114 days 1 day > 20 psu = 3 days 7 day moving average = 19.4 psu Previous week: 17.9 psu 14 day moving average= 18.7 psu Previous week: 17.4 psu 30 day moving average = 17.5 psu Previous week: 16.7 psu Salinity Shell Point: 30.5 -35.7 psu (SCCF RECON sensor) Previous week: 29.8 - 35.7 psu Olga Water Treatment Plant Chloride: 220 mg/L OFFLINE Previous week: 196 mg/L



Flow: Flows of 0 cfs at S79 resulted in rapidly increasing salinities throughout the estuary. The Caloosahatchee estuary has been in a Violation of its MFL with the 30 day moving average above 10 psu for 114 days and this week also crossed the 1 day 20 psu threshold for 3 days. Dry conditions are compounding the negative impacts to the estuary as a result of SFWMD and COE decisions to stop releases. Last week the Health Departments of Lee, Hendry and Glades Counties issued Public Health Advisories for the river warning against contact with discolored water.

Surface salinity at Ft. Myers increased from 18.5 to 19.7 psu. Salinities at Beautiful Island increased from 14.3 to 17.1 psu, at the SR 31 Bridge salinities increased from 12.1 to 12.3 psu and at S79 from 10.0 to 11.8 psu. The salinity range in the lower estuary increased to 30.5 - 35.7 psu, continuing to exceed the preferred salinity range for oysters.

* From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
4/10/12	Tue	0	144	764
4/11/12	Wed	0	146	856
4/12/12	Thu	0	148	772
4/1312	Fri	0	148	648
4/14/12	Sat	0	39	532
4/15/12	Sun	0	0	276
4/16/12	Mon	0	0	216
Average Flow		0	89	580



Upstream of S79/Franklin Conditions: Poor.

Chloride levels at the Olga Water Treatment plant increased from 196 – 220 mg/L in the last week. The plant has been shut down to prevent a secondary drinking water standard violation for total dissolved solids. Chlorophyll and cyanobacteria cell counts increased east of Franklin Lock (7.4 ug/L, 65 million filaments/L) and Labelle (10.4 ug/L) and were elevated at Ortona (16.5 ug/L) and in the Lake at Moore Haven (11.2 ug/L). The east pool was not sampled. If the algae bloom continues to intensify, hypoxic conditions are likely to develop during thermal stratification events over the stretch of the bloom as oxygen demand increases from decomposing algae.

Upper Estuary Conditions: Poor.

The heterotrophic dinoflagellate *Akashiwo sanguina* was abundant at Franklin Lock on 4/14 (340,000 cells/L) but chlorophyll concentrations were low. Benthic algae mats forming near shore included *Polysiphonia* and *Spirogyra*. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

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 (W)	0.1	132	2.3	0.65
Beautiful Island	1.3	103	4.4	0.77
Ft. Myers	2.2	89	3.4	0.86

Target light penetration: Caloosahatchee Estuary =1 m					
SCB-San Carlos Bay = 2.2 meters					
Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$			

Lower Estuary Condition: Deteriorating.

Salinities at Shell Point ranged between 30.5 – 35.7 psu, well above the preferred range of 15-25 psu for oysters. April through May is the recruitment season for oysters in the Caloosahatchee. Macroalgae including *Acanthophora, Spyridia, Chondria, Solieria, Champia, Hypnea* and *Gracilaria* were in the surf zone and making a wrack line on Bunche Beach in San Carlos Bay.

Smalltooth Sawfish:

The smalltooth sawfish is listed as **Endangered** by the National Marine Fisheries Service (2003), its habitat in the Caloosahatchee is designated Critical Habitat (2009) and is listed as **Critically Endangered** on the ICUN Red List. An objective of the recovery plan is to protect or restore habitats for juveniles that occur in estuarine and nearshore waters. March and April are the months that the smalltooth sawfish give birth.

Research by Simpfendorfer et al. (2011) indicates that pups and juveniles show a preference for salinities between 18 and 24 psu. This salinity envelope continues to move upstream from the lower estuary. While these young fish will move up the river as this salinity envelope moves, the habitat characteristics upriver may not provide protection from predators nor adequate forage availability.

To: USACE Colonel Pantano, Lt. Colonel Kinard, John Kilpatrick, 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: 24 April, 2012

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

Supplemental discharges from the Lake, along with recent rainfall within the basin, are expected to lower salinity downstream of S-79 and reduce stratification and stagnation within eastern and western pools.

Lake Okeechobee Le	vel: 11.83' (Beneficial Use S	Sub-Band) Last wk: 1	1.75' Water Shortage 11.12 ft
Lake Okeechobee Inf	low: 199 cfs Lak	e Okeechobee Outflow:	404 cfs
Weekly Rainfall:	WP Franklin 2.19", Ortor	a 2.10", Moore Haven 2	2.07"
Salinity Ft. Myers:	19.1 - 21.2 psu surface data	(Fort Myers Yacht Basin)	Previous wk: 17.8 -21.1 psu
	19.5 - 23 psu (SCCF RECC	DN Marker 52)	Previous wk 19.8 - 24.5 psu
MFL Status:	MFL Violation 5 th Consecu 30 day moving avera 1 day > 20 psu = 1	ence in Serious Harm	
	7 day moving average =	20.1 psu	Previous week: 19.4 psu
	14 day moving average=	19.5 psu	Previous week: 18.7 psu
	30 day moving average =	18.2 psu	Previous week: 17.5 psu
Salinity Shell Point:	30.5 – 36 psu (SCCF REC	ON sensor)	Previous week: 30.5 -35.7 psu

Olga Water Treatment Plant Chloride: 260 mg/L Limit 250 mg/l OFFLINE Previous week: 220 mg/L



Flow: Basin runoff from weekend rain provided freshwater flow to the estuary for the first time in 26 days. On Monday 4/23 a 3 day, 2,000 cfs pulse release was initiated to address algal blooms. High salinity resulting from inadequate flow has caused the Caloosahatchee estuary to be in violation of both MFL thresholds for the fifth consecutive year. The river has exceeded the 30 day moving average of 10 psu for 121 days and has exceeded the 1 day 20 psu threshold for the past 10 days.

Basin rainfall helped moderate the increase in surface salinity of the river compared with previous weeks. Surface salinity at Ft. Myers increased over the past week from **19.7 to 20.1** psu. Salinities at Beautiful Island increased from **17.1 to 17.7** psu and at the SR 31 Bridge salinities increased from **12.3 to 12.4** psu. Salinities at S79 decreased from **11.8** to **6.5** psu. The salinity range in the lower estuary increased to **30.5 - 36** psu and continues to exceed the preferred salinity range for oysters. The pulse initiated late on Monday is expected to have an additional beneficial effect in reducing salinities throughout the estuary.

* From ACOE Website Daily Reports

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
4/17/12	Tue	0	0	354
4/18/12	Wed	0	0	448
4/19/12	Thu	0	0	384
4/2012	Fri	0	109	356
4/21/12	Sat	375	148	150
4/22/12	Sun	728	276	0
4/23/12	Mon	1556	592	160
Average Flow		379	160	264



Upstream of S79/Franklin Conditions: Poor.

Chloride levels at the Olga Water Treatment plant increased from 220 to 260 mg/L in the last week crossing the secondary drinking water standard of 250 mg/L. The plant has been shut down since April 7, 2012 due to a Safe Drinking Water Act violation of the primary drinking water standard for TDS. Sunday, chlorophyll and cyanobacteria pigments (phycocyanin and phycoerythrin) were elevated at S79 due to thin (maximum 8µm width) cyanobacteria filaments. Basin run-off should have a short-term positive effect on preventing stagnation and algal blooms.

Upper Estuary Conditions: Poor.

Although recent rainfall helped to lower salinity levels, without additional freshwater input, the LSZ (low salinity zone will continue to be compressed against the S-79 lock. The LSZ is needed to maintain habitat volume for a variety of estuarine species and reduce predation from gelatinous predators. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

Caloosahatchee Stations	Chlorophyll (µg/l)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)	Target light penetratio	n: CE- Caloosaha	tchee Estuany –1 m
Maximum Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m	m SCB-San Carlos Bay		
S79 (W)	0.1	127	1.8	0.66	Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$
Beautiful Island	1.3	95	3.9	0.81			
Ft. Myers	2.2	67	1.5	1.03			

Lower Estuary Condition: Poor.

Salinities at Shell Point ranged between 30.5– 36 psu, well above the preferred range of 15-25 psu for oysters. April through May is the recruitment season for oysters in the Caloosahatchee. A number of shore birds from Bunche, Bowditch and Ft Myers Beaches are being treated for symptoms similar to brevetoxin poisoning, although FWC scientists are not reporting any presence of *K. brevis* in local water samples.

Smalltooth Sawfish:

The Caloosahatchee is designated critical habitat for the endangered smalltooth sawfish. March and April are the months that the smalltooth sawfish typically give birth. The pups and juveniles are documented to be very responsive to salinity changes seeking out salinities between 18 – 24 psu.



Lee County Algal Screening Report

Prepared: May 7, 2012 Prepared By: GreenWater Laboratories/Amanda Foss

Samples: Olga Raw (collected 5/3/2012)

Methods

Two mL of the samples Olga Raw collected May 3, 2012 was preserved with Lugol's iodine solution and allowed to settle. A non-preserved sample was also prepared. Preserved & non-preserved samples were observed at 200X and 400X using a Nikon Eclipse TS200 Inverted Microscope equipped with phase contrast optics.

<u>Results</u>

Olga Raw:

Microscopic observation revealed that the Olga Raw sample was dominated by the cyanobacterium *Pseudanabaena* sp. The second most dominant cyanobacterium was the potentially toxic (PTOX) *Anabaena/Aphanizomenon* sp. #1, followed by *Anabaena* sp., and a second *Anabaena/Aphanizomenon* sp. #2. Other cyanobacteria observed included *Merismopedia* sp. and *Aphanicapsa* sp. Akinetes of the *Anabaena/Aphanizomenon* spp. were not observed so identification to species level could not be conducted at this time.



Pseudanabaena sp. at 400x with phase contrast optics





aquatic analysis ... research ... consulting



Anabaena/Aphanizomenon sp. #1 at 400x with phase contrast optics



Anabaena sp. with phase contrast optics at 400x



Anabaena/Aphanizomenon sp. #2 at 400x with phase contrast optics

Olga Finish Water Plant is currently off-line and a finished sample was not provided.

Recommendations

Due to the significant presence of PTOX cyanobacteria, toxin testing is again recommended at this time. Testing for microcystins, PSTs (saxitoxins), cylindrospermopsin, and anatoxin-a are recommended based on the presence of both *Anabaena* and *Anabaena/Aphanizomenon* spp.

Submitted by:

Date:

Mark T. Aubel, Ph.D. 5/7/12



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To: USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, 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: 15 May, 2012

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

Seventeen days without flow through S79 to the Caloosahatchee estuary has contributed to cyanobacteria blooms accumulating along the shoreline of the river and oxbows upstream of the Franklin Lock, increased chlorides at the Olga Water Treatment Plant and rapidly increasing salinity in the estuary. Independent laboratory testing contracted by Lee County to GreenWater Laboratories report cyanobacteria accumulations and some toxin production. Their report is included with this week's Condition Report.

Recommendation: A 3-day pulse release was initiated Tuesday morning, 5/15/12. We request proactive water releases continue after the current pulse concludes to prevent development of algal blooms and further deterioration of the Franklin reach of the river.

Lake Okeechobee Lev	el: 11.56' (Beneficial	Use Sub-Band)	Last wk: 11.57'	Water Shortage 10.75 ft
Lake Okeechobee Infle	ow: 101 cfs	Lake Okeechobee	e Outflow: 36	
Weekly Rainfall:	WP Franklin 0.46",	Ortona 1.06" Mod	ore Haven 0.51"	
Salinity Ft. Myers:	18.3 - 20.6 psu surface	e data (Fort Myers Ya	acht Basin) Prev	vious wk: 16.8 - 20 psu
	19 -22.5 psu (SCCF	RECON Marker 52)	Pre	evious wk 18.5 –22 psu
MFL Status:	MFL Violation 5 th Cor 30 day moving 1 day > 20 ps	secutive Year of M average > 10 psu = au = 16 days (non-	FL Exceedence in 142 days -consecutive)	<u>n Serious Harm</u>
	7 day moving averag 14 day moving avera 30 day moving avera	e = 19.4 psu ge= 18.8 psu ge = 18.8 psu	Prev Prev Prev	vious week: 18.6 psu vious week: 17.7 psu vious week: 18.5 psu
Salinity Shell Point:	30.5 - 36 psu RECON	offline (SCCF RE	CON sensor) Pre	evious week: 31.7 – 36 psu
Olga Water Treatment	Plant Chloride 176 m	g/L OFFLINE	Prev	vious week: 150 mg/L
Tapegrass 2010 extent	Old Bridge Park Park 20.7psul Fort Monitoring S SCCF Yacht Club Site 0	Caloosahatchee Tresset 18.1psu 18.1psu 18.1psu 19.1 19.1 19.1 19.1 19.1 19.1 19.1 19.	14.5psu 31 Bridge	Prankin Lock O5/13/12 Surface psu Salinity 0-2 2-4 4-7 7-10 10-13 13-16 16-20 2 20 SCCF Logger Tapegrass Present Tapegrass Present Tapegrass Desent Tapegrass Lost 2012

Flow: Seventeen days of 0 cfs flow through S79 to the Caloosahatchee estuary has contributed to an increase in algae blooms upstream of the Franklin Lock and an increase in chlorides from 150 to 176 mg/L, at the Olga Water Treatment Plant. The river has exceeded its MFL of 10 psu for 142 days and has exceeded the one day 20 psu threshold for 16 days.

Surface salinity at Ft. Myers increased over past week from **18.7 to 20.7** psu. Salinity at Beautiful Island increased from **16.3 to 18.1** psu and at the SR 31 Bridge salinities increased from **14.4 to 14.5** psu. No flow through S79 the past 17 days has caused salinity to increase downstream of the structure from **11.0** to **13.9** psu. SCCFs Shell Point RECON sensor recorded salinities of 30.5 – 36 which continue to exceed the preferred salinity range for oysters.



Upstream of S79/Franklin Conditions: Poor.

Chloride levels at the Olga Water Treatment plant increased from 150 to 176 mg/L in the last week. The plant has been shut down since April 7, 2012 due to a Safe Drinking Water Act violation of a primary drinking water standard for TDS.

Algae is reported at the plant. In-situ chlorophyll concentrations east of S79 were 10.0 μ g/L at LaBelle, 11.7 μ g/L at Alva and 12.2 μ g/L at S79E. Though chlorophyll concentrations were similar to the previous week, no green clumps or green discoloroation were observed, and the amount of the circular form of Anabaena was much lower than the previous week. *Anabaena, Aphanizomenon* and *Planktothrix* were the dominant cyanophytes at these sites.

A toxin screen of cyanobacteria sampling from 5/3/12 by GreenWater Laboratories detected microcystin toxin at 0.16 ug/L. See attached reports.

Upper Estuary Conditions: Poor.

Salinity continues to increase in the upper estuary and remains too high for tape grass survival. Chlorophyll levels decreased slightly over the last week with levels at Ft Myers decreasing from 9.6 to 9.3 ug/L. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

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 (W)	4.8	118	1.1	0.68
Beautiful Island	7.7	100	3.4	0.78
Ft. Myers	9.3	86	2.9	0.90

Target light penetration:**CE**- Caloosahatchee Estuary =1 mSCB-San Carlos Bay = 2.2 metersDefinition of 25% Iz:I = irradiancez = depth

Lower Estuary Condition:

Late last week a *Trichodesmium erythraeum* bloom was identified along the shorelines of Sanibel, Captiva and Fort Myers Beach.

Oysters: Poor.

The RECON sensor at Shell Pt recorded salinities between 30.5 and 36, well above the preferred range of 15-25 psu for oysters. April through May is the recruitment season for oysters in the Caloosahatchee.

To: USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

Paul Tritaik, Tara Wertz & Jeremy Conrad- 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 May, 2012

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

A pulse release that began last Tuesday was augmented by rain which fell predominantly inland. The combination provided weekly average flows of 1073 cfs to the Caloosahatchee estuary through S79.

Recommendation: Conditions remain extremely dry in Lee County while upstream basins are receiving a significant amount of rain. We request proactive water releases continue to provide flow that will help prevent further development of algal blooms, deterioration of the river and estuary and allow time for the estuary to gradually acclimate and adapt to lower summer salinities.

Lake Okeechobee Level: 11.77' (Beneficial Use Sub-Band) Last wk: 11.56' Water Shortage 10.65 ft Lake Okeechobee Inflow: 420 cfs Lake Okeechobee Outflow: -190 cfs 1.15" WP Franklin 0.46", Weekly Rainfall: Ortona 2.73" Moore Haven 4.48" Salinity Ft. Myers: 12.1 -19.8 psu surface data (Fort Myers Yacht Basin) Previous wk: 18.3 - 20.6 psu 17.8 -22.5 psu (SCCF RECON Marker 52) Previous wk 19 -22.5 psu MFL Violation 5th Consecutive Year of MFL Exceedence in Serious Harm **MFL Status:** 30 day moving average > 10 psu = 149 days 1 day > 20 psu = 18 days (non-consecutive) 7 day moving average = 18.2 psu Previous week: 19.4 psu 14 day moving average= 18.8 psu Previous week: 18.8 psu 30 day moving average = 18.4 psu Previous week: 18.8 psu Salinity Shell Point: 29 - 36 psu RECON offline (SCCF RECON sensor) Previous week: 30.5 - 36 psu

Olga Water Treatment Plant Chloride 110 mg/L OFF

OFFLINE

Previous week: 176 mg/L



Flow: Average flows of 1073 cfs flow through S79 reduced salinities in the upper and middle estuary and reduced chloride levels at the Olga WTP from 176 to 110 mg/L. Cyanobacteria blooms persist upstream of the Franklin Lock. The estuary has exceeded its MFL of 10 psu for 149 days and has exceeded the one day 20 psu threshold for a cumulative total of 18 days this year.

Surface salinities decreased throughout the middle and upper estuary the past week in response to flow. Salinity at Ft. Myers decreased from 20.7 to 17.0 psu, at Beautiful Island it decreased from 18.1 to 11.5 psu, at the SR 31 Bridge salinities decreased from 14.5 to 6.3 psu and downstream of S79 salinity dropped from 13.9 to 6.9 psu. Salinity at Shell Point decreased slightly at the low end ranging from 29 – 36 psu which continue to exceed the preferred salinity range for oysters.

* From ACOE Website Daily Reports					
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)	
5/15/12	Tue	1416	908	618	
516/12	Wed	1968	1266	1040	
5/17/12	Thu	1971	1272	1052	
5/18/12	Fri	623	518	598	
5/19/12	Sat	45	76	18	
5/20/12	Sun	705	322	0	
5/21/12	Mon	785	559	0	
Average	Flow	1073	703	475	



Upstream of S79/Franklin Conditions: Poor.

Chloride levels at the Olga Water Treatment plant decreased from 176 to 110 mg/L in the last week. The plant remains offline, 51 days, due to a Safe Drinking Water Act violation of a primary drinking water standard for TDS. A heavy skim of algae on the plant intake has been observed in the mornings the last two days. Cyanobacteria are also present along the river shorelines and some oxbows.

In-situ chlorophyll concentrations east of S79 were 10.9 μ g/L at LaBelle,13.0 μ g/L at Alva and 15.2 μ g/L at S79E. Though chlorophyll concentrations were similar to the previous week, green clumps and green discoloration were observed at S79E and Alva. The majority of the phytoplankton were cyanophytes with *Planktothrix, Anabaena,* and *Aphanizomenon* present.

Cyanobacteria blooms along the south shore of the Caloosahatchee in Alva



May 18, 2012

Photos by SCCF River Spotter Mike Dove

Upper Estuary Conditions: Poor.

Salinity decreased in the upper estuary but remains too high for tape grass survival at Fort Myers. Chlorophyll concentrations were slightly elevated at S79W where cyanophytes were also dominant. CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
S79 (W)	16.4	133	1.6	0.64
Beautiful Island	7.6	113	2.2	0.72
Ft. Myers	13.0	94	2.1	0.83

Target light penetration: CE - Caloosahatchee Estuary =1 m				
SCB -San Carlos Bay = 2.2 meters				
Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$		

Lower Estuary Condition:

Friday, an accumulation of *Trichodesmium* was noted at the Sanibel Boat Ramp, on the east end of the Island. Another cyanobacteria, *Lyngbya majuscula* was abundant in seagrass wrack in western San Carlos Bay.

Oysters: Poor.

Disease prevalence of *Perkinsus marinus* (Dermo) remains very high ranging from 93% - 100%. The disease intensity is low/moderate 0.93-2.73 . (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy). The Condition Index is good, ranging from 2.77-5.03. The preferred range is > 2. Recruitment increased dramatically to 1.89-15.64. Recruitment should increase through May.

To: USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, 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: 29 May, 2012

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

Rain inland augmented a 10 day pulse release that started on Saturday, May 26 and provided continuous flow through S79 to the Caloosahatchee estuary this past week. The flow reduced chloride levels at the Olga Water Treatment Plant, lowered estuary salinity levels and may have helped decrease chlorophyll levels upstream of the Franklin Lock.

Recommendation: We request proactive water releases continue to provide flow that will help to 1) prevent further development of algal blooms and 2) allow time for the estuary to gradually acclimate and adapt to lower wet season salinities.

Lake Okeechobee Level: 11.71 ft. (Beneficial Use Sub-Band) Last wk: 11.77 ft. Water Shortage 10.54 ft

Lake Okeechobee Inflo	ow: 624 cfs	Lake Okeed	chobee Outflow:	17 cfs
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.77"	Moore Haven 0.1	7"
Salinity Ft. Myers:	12.5 – 16.9 psu sur	face data (Fort M	Iyers Yacht Basin)	Previous wk: 12.1- 19.8 psu
	16 - 22 psu (SCCF	RECON Marker	52)	Previous wk 17.8 -22.5 psu
MFL Status:	MFL Violation 5 th C 30 day mov 1 day > 20	Consecutive Yea ing average > 10 psu = 16 days	ar of MFL Exceede) psu = 156 days (Total days since	<mark>nce in Serious Harm</mark> April 10, 2012)
	7 day moving aver 14 day moving ave 30 day moving ave	age = 14.9 erage= 16.4 erage = 17.6	9 psu Previou 1 psu 5 psu	us week: 18.2 psu Previous week: 18.8 psu Previous week: <mark>18.4</mark> psu
Salinity Shell Point:	28-36 psu (SCCF	RECON sensor)	Previou	us week: 29 – 36 psu
Olga Water Treatment	Plant Chloride 98	mg/L OFFL	INE Previou	us week: 110 mg/L
Tapegrass 2010 extent	Old Bridge Park Park Bridge Park Bridge Park Bridge Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Park Bridge Bridge Park Bridge Park Bridge Park Bridge Bridge Park Bridge Brid Bridge Bridge Brid Brid	Caloo Tresset 10.5psu Beautif Island	7.6psu NVVR all Bridge	CCCF 10 Kilometers 5.5psu 05/28/12 05/28/12 0-2 2-4 4-7 7-10 10-13 13-16 16-20 ≥ 20 SCCF Logger Tapegrass Present Tapegrass Lost 2012 10 Kilometers

Flow: The past week flows to the Caloosahatchee estuary through S79 averaged 915 cfs. Flow helped reduce chlorophyll levels upstream of the lock and lowered salinities downstream of the lock. Chlorophyll levels increased in the middle and upper estuary. The river has exceeded its MFL of 10 psu for 156 days and has exceeded the one day 20 psu threshold for a total of 16 days since April 10, 2012.

Surface salinity at Ft. Myers decreased over the past week from **17.0** to **16.0** psu. Salinity at Beautiful Island decreased from **11.5** to **10.5** psu and at the SR 31 Bridge salinities increased from **6.3** to **7.6** psu. Downstream of S79 salinity has decreased from **6.9** to **5.5** psu. SCCFs Shell Point RECON sensor recorded salinities of 28 – 36 psu which continue to exceed the preferred salinity range for oysters.

Date	Day	S79 Flow* (cfs)	S78 Flow*	S77 Flow *
5/22/12	Tue	1282	1161	0
523/12	Wed	1700	1237	0
5/24/12	Thu	1282	759	0
5/25/12	Fri	246	204	0
5/26/12	Sat	340	324	0
5/27/12	Sun	764	753	284
5/28/12	Mon	796	689	620
Average	Flow	915	732	129

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions: Poor.

Chloride levels at the Olga Water Treatment plant decreased from 110 to 98 mg/L in the last week. Algae was reported accumulating at the plant intake canal but the plant remains offline.

In-situ chlorophyll concentrations east of S79 decreased at LaBelle from 10.9 to 8.0 μ g/L, decreased at Alva from 13.0 to 7.0 μ g/L and decreased at S79E from 15.2 to 11.5 μ g/L. Chlorophyll concentrations were slightly lower than the previous week, and no green clumps or green discoloration were observed. *Anabaena, Aphanizomenon* and *Planktothrix* were the dominant cyanophytes at these sites.

Upper Estuary Conditions: Poor.

Salinity decreased in the upper estuary but remains too high for tape grass recovery. Chlorophyll levels increased over the last week at Ft Myers from 13 to 16 ug/L and at Beautiful Island increased from 7.6 to 9.2 ug/L. Chlorophyll decreased on the west side of S79 from 16.4 to 12.5 ug/L CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

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 (W)	12.5	137	3.2	0.62
Beautiful Island	9.2	127	3.6	0.66
Ft. Myers	16.0	95	3.0	0.81

Target light penetration: CE- Caloosahatchee Estuary =1 m				
	SCB-San Carlos	Bay = 2.2 meters		
Definition of 25% Iz:	I = irradiance	z = depth		

Lower Estuary Condition:

No reports of algae.

A juvenile smalltooth sawfish was observed in Tarpon Bay, Sanibel, Tuesday morning, May 29, 2012.

Oysters: Poor.

The RECON sensor at Shell Pt recorded salinities between 28 and 36 psu, well above the preferred range of 15-25 psu for oysters. April through May is the recruitment season for oysters in the Caloosahatchee.



To: USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, 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: 12 June, 2012

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

Rain augmented a 10 day pulse release to the Caloosahatchee estuary that started on Tuesday, June 5. The flow lowered estuary salinity levels and may have helped decrease chlorophyll levels upstream of the Franklin Lock.

Recommendation: We request proactive water releases continue and be increased if possible to help gradually move salinity downstream to acclimate and adapt to lower wet season salinities.

Lake Okeechobee Lev	el:	11.82 ft. (B	eneficial	Use Sub-B	and) Last	wk: 11.69 ft.
Lake Okeechobee Inflo	ow:	661 cfs	Lal	e Okeecho	bee Outflow:	- 447 cfs
Weekly Rainfall:	WP F	ranklin 3.78	", Orto	na 4.47",	Moore Have	en 3.00"
Salinity Ft. Myers:	10.0	- 16.9 psu si	urface dat	a (Fort Mye	rs Yacht Basir	n) Previous wk: 13.2-16.4 psu
	14.6	- 20.6 psu (S	SCCF RE	CON Marke	r 52)	Previous wk: 14.6-18.5 psu
MFL Status:	FL Status:MFL Violation 5th Consecutive Year of MFL Exceedence in Serious Harm 30 day moving average > 10 psu = 170 days 1 day > 20 psu = 16 days (Total days since April 10, 2012)					<mark>dence in Serious Harm</mark> ce April 10, 2012)
	7 day 14 da 30 da	/ moving ave ay moving av ay moving av	erage = verage = verage =	14.4 ps 14.6 ps 16.0 ps	su su su	Previous week: 14.7 psu Previous week: 15.0 psu Previous week: 17.0 psu
Salinity Shell Point:	28-36	រ psu (SCC	F RECON	sensor)		Previous week: 28-35.9 psu
Olga Water Treatment	Plant	Chloride	88 mg/L	OFFLI	NE	Previous week: 112 mg/L



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Caloosahatchee Estuary

Flow: The past week flows to the Caloosahatchee estuary through S79 averaged 746 cfs. Flow helped reduce chlorophyll levels upstream of the lock and lowered salinities downstream of the lock. Chloride levels at the Olga Water Treatment Plant decreased. Chlorophyll levels increased dramatically at Beautiful Island from 4.5- 20.9 µg/L. Nutrients being flushed downstream and the nutrients released from decomposition of upstream algal blooms may have contributed to increased chlorophyll levels downstream over the past three weeks. The river has exceeded its MFL of 10 psu for 170 days since December 27, 2011 and has exceeded the one day 20 psu threshold for 16 days this year since the first exceedance on April 10, 2012.

Surface salinity at Ft. Myers decreased over the past week from 13.7 to 11.2 psu. Salinity at Beautiful Island increased from 8.6 to 8.9 psu and at the SR 31 Bridge salinities decreased from 5.9 to 2.4 psu. Downstream of S79 salinity has decreased from 4.1 to 2.9 psu. Salinity at Shell Point remained static at 28 – 36 psu which continues to exceed the preferred salinity range for oysters.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/5/12	Tue	258	242	506
6/6/12	Wed	724	469	880
6/7/12	Thu	653	473	720
6/8/12	Fri	662	423	572
6/9/12	Sat	1297	412	96
6/10/12	Sun	1006	463	0
6/11/12	Mon	625	150	0
Average Flow		746	376	396

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment plant decreased from 112 to 88 mg/L in the last week. In-situ chlorophyll concentrations east of S79 increased from 7.5 to 27.7 µg/L. Small coccoid and thin filamentous cyanobacteria, including *Planktothrix* sp., were the dominant phytoplankton groups.

Upper Estuary Conditions:

Salinity decreased in the upper estuary but remains too high for tape grass survival and recovery. Chlorophyll levels remained elevated west of S79 ranging from 8.1 - 20.9 µg/L over the last week. Chlorophyll concentrations at Beautiful Island and Ft Myers were high due to chain-forming diatoms.

CDOM remains high and light penetration remains very limited at all sampled sites in the upper estuary.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
S79 (W)	12.5	151	2.6	0.57
Beautiful Island	20.9	126	3.2	0.60
Ft. Myers	8.1	114	3.7	0.71

Target light penetration: **CE**- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

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

Lower Estuary Condition:

A *Trichodesmium* bloom was observed at the Sanibel boat ramp and on Sanibel beaches from Tarpon Bay Beach to Lighthouse Beach.

Red Tide:

The June, 11 NOAA HAB Bulletin reports patchy harmful algal blooms of *Karenia brevis* in San Carlos Bay.

A brown pelican, anhinga and glossy ibis are being treated at CROW for suspected red tide brevetoxicosis.

Smalltooth Sawfish:

A juvenile smalltooth sawfish was spotted in Tarpon Bay, Sanibel on June 6 despite high (35-36 psu) salinities.



To: USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Date: 19 June, 2012

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

Rain augmented a 10 day pulse release to the Caloosahatchee estuary that started on Friday, June 15. The additional flow helped lower salinity levels within the estuary.

Recommendation: We request proactive water releases continue, and increased if possible, to help gradually lower salinity downstream of S-79 to acclimate estuarine organisms to lower wet season salinities.

Lake Okeechobee Lev	el: 11.80 ft. (Beneficial Use	Sub-Band)	Last wk	: 11.82 ft.
Lake Okeechobee Infle	ow: 289 cfs	Lake O	keechobee	Outflow:	189 cfs
Weekly Rainfall:	WP Franklin 1.06	6", Ortona ().62", Mo	ore Haven 2	2.50"
Salinity Ft. Myers:	9.9 - 15.4 psu su	urface data (For	t Myers Yac	ht Basin)	Previous wk: 10.0 - 16.9 psu
	14.7 - 20.8 psu	(SCCF RECON	Marker 52)		Previous wk: 14.6 - 20.6 psu
MFL Status:	MFL Violation 5 th Consecutive Year of MFL Exceedence in Serious Harm 30 day moving average > 10 psu = 177 days 1 day > 20 psu = 16 days (Total days since April 10, 2012)				
	7 day moving av 14 day moving a 30 day moving a	verage = average = average =	13.1 psu 13.6 psu 14.5 psu		Previous week: 14.4 psu Previous week: 14.6 psu Previous week: 16.0 psu
Salinity Shell Point:	25.9 - 35.9 psu	(SCCF RECO	N sensor)		Previous week: 28-36 psu
Olga Water Treatment	Plant Chloride	85 mg/L	OFFLINE		Previous week: 88 mg/L



Flow: Flows to the Caloosahatchee estuary during the past week through S79 averaged 529 cfs. Flow helped to reduce salinities slightly downstream of the lock. Chloride levels at the Olga Water Treatment Plant also decreased slightly from 88 mg/L to 85 mg/L. The river has exceeded its MFL of 10 psu for 177 days since December 27, 2011 and has exceeded the one day 20 psu threshold for 16 days this year since the first exceedance on April 10, 2012.

Surface salinity at Ft. Myers (collected on June 17th) increased from **11.2** to **14.1** psu, compared to sampling the previous week. Salinity at Beautiful Island increased from **8.9** to **9.0** psu and at the SR 31 Bridge salinities increased from **2.4** to **6.3** psu. Downstream of S79 salinity has increased from **2.9** to **5.6** psu. Salinity at Shell Point decreased ranging from **25.9** - **35.9** psu, which continues to exceed the preferred salinity range for oysters. Higher salinities on June 17th in the mid and upper estuary may be an artifact of the timing of sampling and the tidal cycle at which samples were collected. Overall, salinity within the estuary appears to be trending downward.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/12/12	Tue	352	149	0
6/13/12	Wed	256	67	0
6/14/12	Thu	167	103	0
6/15/12	Fri	609	263	238
6/16/12	Sat	929	676	678
6/17/12	Sun	820	NR	653
6/18/12	Mon	571	NR	576
Average	Flow	529		306

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment plant decreased from 88 to 85 mg/L in the last week. In-situ chlorophyll concentrations east of S79 increased from 7.5 to 27.7 μ g/L with *Anabaena* sp. being the dominant phytoplankton.

Upper Estuary Conditions:

Salinity remains too high for tape grass survival and recovery.

Chlorophyll levels west of S79 ranged from 5.0 - 7.5 μ g/L on 6/17.

CDOM remains high and light penetration limited at all sampled sites in the upper estuary.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
S79 (W)	7.5	152	3.1	0.57
Beautiful Island	5.0	126	2.9	0.60
Ft. Myers	6.3	98	2.0	0.76

Target light penetration:CE- Caloosahatchee Estuary =1 mSCB-San Carlos Bay = 2.2 metersDefinition of 25% lz:I = irradiancez = depth

Lower Estuary Condition:

Red Tide:

Low concentrations of red tide were detected (on 6/12) a few miles south of Sanibel (FWC report). SCCF samples along the causeway and beach (6/18) did not contain any *Karenia* cells.

Oysters:

Disease prevalence of *Perkinsus marinus* (Dermo) remains high ranging from 53% - 100%. The disease intensity is low/moderate 0.53-1.87. (Scale: 0 = no infection, 1 = low, 3 = medium, 5 = heavy). The Condition Index is normal for this time of year, ranging from 2.37 - 4.2. The preferred range is > 2. Spat Recruitment is low for this time of year to 1.28-3.56. Recruitment should increase through May.

Surviving juvenile oysters in closed bags: 12 - 28% (May data; June sampling not yet completed) Surviving juvenile oysters in open bags: 2 - 6% (May data; June sampling not yet completed)

To: USACE Colonel Alfred Pantano, Lt. Colonel Thomas Greco, John Kilpatrick, 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: 26 June, 2012

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

Tropical Storm Debby's storm surge increased salinity throughout the estuary; however, the rainfall associated with the storm is expected to decrease salinity over the next week as basin runoff flows through the system.

Recommendation: We request the that the Corps continue proactive water releases to help gradually lower salinity downstream of S-79 to acclimate estuarine organisms to lower wet season salinities.

Lake Okeechobee Lev	el: 11.93 ft. (B	eneficial Use Sub	-Band) Last w	k: 11.80 ft.
Lake Okeechobee Infle	ow: 3467 cfs	Lake Okeed	chobee Outflow:	N/A cfs
Weekly Rainfall:	WP Franklin 2.16"	, Ortona 1.67",	Moore Haven 3	3.4"
Salinity Ft. Myers:	13.6 - 17.6 psu su	urface data (Fort M	yers Yacht Basin)	Previous wk: 9.9 - 15.4 psu
	16.0 - 23.1 psu (\$	SCCF RECON Ma	rker 52)	Previous wk: 14.7 - 20.8 psu
MFL Status:	MFL Violation 5 th 30 day mo 1 day > 2	Consecutive Yea oving average > 10 20 psu = 16 days	ar of MFL Exceede) psu = 184 days (Total days since	e <mark>nce in Serious Harm</mark> April 10, 2012)
	7 day moving ave 14 day moving av 30 day moving av	erage = 15.8 verage = 14.3 verage = 14.5	B psu B psu 5 psu	Previous week: 13.1 psu Previous week: 13.6 psu Previous week: 14.5 psu
Salinity Shell Point:	28.4 - 37.0 psu	(SCCF RECON se	nsor)	Previous week: 25.9-35.9 psu
Olga Water Treatment	Plant Chloride	110 mg/L OF	FLINE	Previous week: 85 mg/L
			A	9.9psu Professional Profession



Flow: Flows to the Caloosahatchee estuary averaged 578 CFS during the past week through S79. Tropical Storm Debby's storm surge increased salinity throughout the estuary. Chloride levels at the Olga Water Treatment plant increased from 85 to 110 mg/L over the past week. The river has exceeded its MFL of 10 psu for 184 days since December 27, 2011 and has exceeded the one day 20 psu threshold for 16 days this year since the first exceedance on April 10, 2012.

Surface salinity at Ft. Myers (collected on June 24th) increased from **14.1** to **15.3** psu, compared to sampling the previous week. Salinity at Beautiful Island increased from **9.0** to **14.9** psu and at the SR 31 Bridge salinities increased from **6.3** to **7.7** psu. Downstream of S79 salinity has increased from **5.6** to **9.9** psu. Salinity at Shell Point increased ranging from **28.5** - **37.0** psu, which continues to exceed the preferred salinity range for oysters. Higher salinities on June 24th throughout estuary are likely attributed to Tropical Storm Debby's storm surge.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
6/19/12	Tue	392	NR	620
6/20/12	Wed	423	NR	508
6/21/12	Thu	234	NR	NR
6/22/12	Fri	60	NR	NR
6/23/12	Sat	460	NR	NR
6/24/12	Sun	1292	NR	NR
6/25/12	Mon	1184	NR	NR
Average	Flow	578	N/A	N/A

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment plant increased from 85 to 110 mg/L during the past week. In-situ chlorophyll concentrations east of S79 decreased from 27.7 μ g/L to 4.9 μ g/L. Tropical Storm Debby's storm surge forced water backwards over the Franklin Locks (S79) spillway.

Upper Estuary Conditions:

Salinity continues to exceed levels suitable for tape grass survival and recovery. In situ chlorophyll levels west of S79 ranged from 7.9 - 12.3 μ g/L on 6/24 (previous week: 5.0 -7.5 μ g/L). Dominant phytoplankton species at Beautiful Island and 31 Bridge was the diatom *Skeletonema* sp. CDOM remains high and light penetration limited at all sampled sites in the upper estuary.

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 (W)	7.9	138	1.8	0.62
Beautiful Island	10.8	106	3.6	0.75
Ft. Myers	8.9	91	1.8	0.84

Target light penetration:CE- Caloosahatchee Estuary =1 mSCB-San Carlos Bay = 2.2 metersDefinition of 25% lz:I = irradiancez = depth

Lower Estuary Condition:

Red Tide:

Only background concentrations of red tide were detected (on 6/13-18, FWRI) in Lee County waters and offshore of Sanibel last week. SCCF samples along the causeway and beach (6/21-26) did not contain any *Karenia* cells.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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: 10 July, 2012

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

Rainfall during the past week combined with a 10 day pulse release that started on July 5th, to help decrease salinities in the estuary. Cyanobacteria blooms have reappeared upstream of S79 accumulating at the Olga Water Treatment Plant intake and at the Franklin Lock.

Recommendation: While pulse releases have helped reduce salinity levels to bring the estuary into a more ecologically balanced state, water has become stratified between Ft. Myers and S79 and hypoxic conditions are likely to result. We request that the Corps continue proactive water releases to help gradually lower salinity downstream of S-79 to acclimate estuarine organisms to lower wet season salinities.

Lake Okeechobee Lev	el: 12.00 ft. ((Beneficial Use Sub-	Band) Last wk	: 12.02 ft.
Lake Okeechobee Inflo	ow: 1073 cfs	Lake Okeec	hobee Outflow:	N/A cfs
Weekly Rainfall:	WP Franklin 1.7	71", Ortona 0.05",	Moore Haven 0	0.20"
Salinity Ft. Myers:	8.8-12.6 psu su	Irface data (Fort Myer	s Yacht Basin)	Previous wk: 8.9 - 13.5 psu
	13 – 24 psu (SC	CCF RECON Marker	52)	Previous wk: 13.5 – 20 psu
MFL Status:MFL Violation 6th Consecutive Year of MFL Exceedence in Serious Harm 30 day moving average > 10 psu = 198 days 1 day > 20 psu = 16 days (Total days since April 10, 2012)				
	7 day moving a 14 day moving 30 day moving	average = 13.1 psu average = 13.6 psu average = 14.5 psu	Previo Previo Previo	us week: 11.8 psu us week: 13.9 psu us week: 13.8 psu
Salinity Shell Point:	23.5 - 37 psu	(SCCF RECON sense	or) Previo	us week: 26 - 36 psu
Olga Water Treatment	Plant Chloride	92 mg/L OF	FLINE Previo	us week: 96 mg/L
			à	7. 0 3.0psu



Flow: Flows to the Caloosahatchee estuary averaged 681 cfs during the past week through S79. Basin runoff has decreased salinity throughout the estuary. For the first time since December 13, 2011 the salinity at Ft Myers has extended below 10 psu for several consecutive days the past week. Chloride levels at the Olga Water Treatment plant decreased from 96 to 92 mg/L over the past week. The river has exceeded its MFL of 10 psu for 198 days since December 27, 2011.

Surface salinity at Ft. Myers decreased from **10.2** to **9.2** psu, compared to sampling the previous week. Salinity at Beautiful Island increased from **5.3** to **6.3** psu and at the SR 31 Bridge salinities decreased from **3.2** to **3.1** psu. Downstream of S79 salinity has decreased from **3.6** to **3.0** psu. Salinity at Shell Point decreased at the lower end of the range to 23.5 psu and increased at the upper end of the range to 37 psu. These levels continue to exceed the preferred salinity range for oysters.

* From ACOE Website Daily Reports

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
7/3/12	Tue	906	0	NR
7/4/12	Wed	832	21	56
7/5/12	Thu	520	147	28
7/6/12	Fri	781	146	112
7/7/12	Sat	796	349	NR
7/8/12	Sun	547	330	NR
7/9/12	Mon	385	173	NR
Average	Flow	681	166	



Upstream of S79/Franklin Conditions:

In-situ chlorophyll concentrations east of S79 increased from 10.5 to 19.4 µg/L. Filamentous cyanobacteria, including *Planktothrix* sp., were sampled together with unidentified coccoid cells. An odor and some green surface accumulation was noted 07/08. One large dead fish was noted. The Olga Water Treatment Plant remains offline.

Upper Estuary Conditions:

For the first time since December 13, 2011 the salinity at Ft Myers has extended to and below 10 psu for several consecutive days.

In situ chlorophyll levels west of S79 ranged from $9.7 - 22.5 \mu g/L$ on 7/08. The dominant phytoplankton species was *Skeltonema* sp and small flagellates were abundant. Though RECON sensors and surface samples did not detect hypoxia, the water has become stratified and hypoxic conditions are likely between Ft. Myers and S79. CDOM remains high and light penetration is limited at all sampled sites. One small dead mullet was noted at the 31 Bridge.

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 (W)	10.2	181	1.6	0.50
Beautiful Island	9.7	152	4.7	0.57
Ft. Myers	22.6	125	1.9	0.67

Lower Estuary Condition:

Red Tide:

NOAA Gulf of Mexico HAB bulletin reports no red tide in Lee County waters or offshore Sanibel last week.

Oysters:

The RECON sensor at Shell Point reports salinities between 23.5-37 psu, well above the preferred range of 15 - 25 psu for oysters.





To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - 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: 17 July, 2012

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

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7.5psu SFWMD MFL Fort Monitoring Site

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Mye Yacht

SCCF Ya Club Site

Rainfall during the past week, combined with a 10 day pulse release that ended on July 14th, helped decrease salinities in the estuary. Cyanobacteria blooms are present in the river upstream of S79, at the Olga Water Treatment Plant and around Beautiful Island at the SR 31 Bridge. Resident complaints of algae were reported over the past week in these areas.

Recommendation: We request the Corps continue to design pulse releases that lower salinities gradually to acclimate the system to wet season water flows. Current salinity levels have reached thresholds suitable to support tape grass but salinities in the lower estuary remain above the harm threshold for oysters.

Lake Okeechobee Lev	el: 12.01 ft. (Benefi	cial Use Sub-Band)	Last wk: 12.00 ft.
Lake Okeechobee Infle	ow: 1988 cfs	Lake Okeechobee Out	flow: - 290 cfs
Weekly Rainfall:	WP Franklin 2.67",	Ortona 2.10", Moore	Haven 4.06"
Salinity Ft. Myers:	7.2 - 11.3 psu surface of	data (Fort Myers Yacht B	asin) Previous wk: 8.8 - 12.6 psu
	8 – 14.8 psu (SCCF RE	ECON Marker 52)	Previous wk: 13 – 24 psu
MFL Status:	MFL Violation 6 th Cons 30 day moving 1 day > 20 ps 7 day moving average 14 day moving average	secutive Year of MFL Ex average > 10 psu = 205 d u = 16 days (Total day = 8.9 psu e = 10.1 psu	<mark>xceedence in Serious Harm</mark> days s since April 10, 2012) Previous week: 13.1 psu Previous week: 13.6 psu
	30 day moving averag	e = 12.2 psu	Previous week: 14.5 psu
Salinity Shell Point:	19-34 psu (SCCF R	RECON sensor)	Previous week: 23.5 - 37 psu
Olga Water Treatment	Plant Chloride 82 n	ng/L OFFLINE	Previous week: 92 mg/L
Tapegrae 2010 ext	Old Bridge au Bridge au Park Park au State au St	extent of lower layer hypoxia Caloosahatchee Tressel 4.9psu 4.9psu Island 1175	1.8psu 31 Bridge 1.8psu 31 Bridge 0.2 2.4 4.7 7.10 10.13 13.16 16.20 a 20 SCCF Logger Tapegrass Present

Tapegrass Transplants <mark>e</mark> Present

Tapegrass Lost 2012

Hypoxia Present

10 km

SCCF

Flow: Flows to the Caloosahatchee estuary through S79 averaged 729 cfs during the past week. Salinity levels decreased throughout the estuary. Chloride levels at the Olga Water Treatment Plant decreased from 92 to 82 mg/L over the past week. The river is now in its **sixth consecutive year of MFL exceedences**, with 205 days above 10 psu since December 27, 2011.

Surface salinity at Ft. Myers decreased from **9.2 to 7.5** psu, compared to sampling the previous week. Salinity at Beautiful Island decreased from **6.3 to 4.9** psu and at the SR 31 Bridge salinities decreased from **3.1** to **1.8** psu. Downstream of S79 salinity decreased from **3.0** to **2.8** psu. Salinity at Shell Point decreased to a range of 19 - 34 psu. These levels continue to exceed the preferred salinity range for oysters.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
7/10/12	Tue	361	173	204
7/11/12	Wed	114	78	212
7/12/12	Thu	660	0	56
7/13/12	Fri	880	129	0
7/14/12	Sat	1142	327	0
7/15/12	Sun	695	324	0
7/16/12	Mon	1257	248	0
Average	Flow	729	182	67

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

In-situ chlorophyll concentrations east of S79 were 12.5 μ g/L at the Franklin Lock, 10.9 μ g/L at the Labelle Boat ramp and 14.4 μ g/L on the west side of the Alva bridge. Filamentous cyanobacteria dominated at the Franklin Lock, with *Anabaena sp. Aphanizomenon sp.* and *Planktothrix sp.* also present. The Olga Water Treatment Plant remains offline for maintenance.

Upper Estuary Conditions:

In situ chlorophyll levels west of S79 ranged from 6.0 - 9.9 µg/L on 7/16. A green surface accumulation was noted at the 31 Bridge, where cyanobacteria *Anabaena* spp. *Aphanizomenon* sp. were present along with *Skeletonema* sp. and small motile cells.

Though RECON sensors and surface samples did not detect hypoxia, the water column has become stratified from at least Jack's Marine (3 km west of S79) to Tarpon Street Pier (14 km of the river). On 7/12, the lower layer of the water column was hypoxic in the afternoon. Bottom readings were below 0.3 mg/L in several locations. DEP data from Telegraph Creek and upstream of the power plant in the Orange River showed hypoxic conditions present in the surface layer for the last month. CDOM remains high and light penetration is limited at all sampled sites.



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 (W)	6.0	188	1.6	0.47
Beautiful Island	7.8	191	1.5	0.49
Ft. Myers	9.9	135	2.3	0.63

Target light penetration: CE - Caloosahatchee Estuary =1 m			
SCB -San Carlos Bay = 2.2 meters			
Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$	

Lower Estuary Condition:

No reports of macroalgae besides *Sargassum* on area beaches and no red tide present in samples taken last week. Salinity levels continue to be above the preferred range for oysters, although levels are gradually decreasing with basin run-off and heavy rain throughout the past week. The RECON sensor at Shell Point reports salinities between 19 - 34 psu, down from 23.5 – 37 psu last week.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - 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: 24 July, 2012

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

Rainfall during the past week decreased salinities in the estuary to below 10 psu. Cyanobacteria blooms are present in the river upstream of S79, at the Olga Water Treatment Plant and around the SR 31 Bridge.

Recommendation: We request the Corps continue to design pulse releases that lower salinities gradually to acclimate the system to wet season water flows. Current salinity levels have reached thresholds suitable to support tape grass but salinities in the lower estuary remain above the harm threshold for oysters.

Lake Okeechobee Lev	vel: 12.10 ft. (Bei	neficial Use Sub	-Band) Last w	k: 12.01 ft.
Lake Okeechobee Infl	ow: 3,424 cfs	Lake Okeec	hobee Outflow:	NR cfs
Weekly Rainfall:	WP Franklin 0.44",	Ortona 2.08	", Moore Haver	า 1.4"
Salinity Ft. Myers:	3.8 - 6.9 psu surfac	e data (Fort Myer	s Yacht Basin)	Previous wk: 7.2 - 11.3 psu
	4.8 – 9 psu (SCCF	RECON Marker 5	52)	Previous wk: 8 – 14.8 psu
MFL Status:	MFL Violation 6th Consecutive Year of MFL Exceedence in Serious Harm30 day moving average > 10 psu = 211 days1 day > 20 psu = 16 days(Total days since April 10, 2012)			
	7 day moving average = 4.8 psu 14 day moving average = 7.2 psu 30 day moving average = 9.9 psu			Previous week: 8.9 psu Previous week: 10.1 psu Previous week: <mark>12.2</mark> psu
Salinity Shell Point:	16.5 – 32.5 psu (S	SCCF RECON se	nsor)	Previous week: 19 – 34 psu
Olga Water Treatment	Plant Chloride	75 mg/L OF	FLINE	Previous week: 82 mg/L
				n O.6psu


Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,466 cfs during the past week. Salinity levels decreased throughout the estuary. Chloride levels at the Olga Water Treatment Plant decreased from 82 to 75 mg/L over the past week. The river is now in its **sixth consecutive year of MFL exceedences**, with 211 days above 10 psu since December 27, 2011.

Surface salinity at Ft. Myers decreased from **7.5 to 4.3** psu, compared to sampling the previous week. Salinity at Beautiful Island decreased from **4.9 to 1.5** psu and at the SR 31 Bridge salinities decreased from **1.8** to **0.8** psu. Downstream of S79 salinity decreased from **2.8** to **0.6** psu. Salinity at Shell Point decreased to a range of 16.5 – 32.5 psu. These salinity levels are average for this time of year although the lower estuary salinities continue to exceed the preferred salinity range for oysters.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
7/17/12	Tue	1031	178	0
7/18/12	Wed	1869	693	0
7/19/12	Thu	2414	1132	0
7/20/12	Fri	1535	606	0
7/21/12	Sat	369	178	0
7/22/12	Sun	1141	212	0
7/23/12	Mon	1766		
Average	Flow	1446		



* From ACOE Website Daily Reports

Upstream of S79/Franklin Conditions:

In-situ chlorophyll concentration east of S79 was 10.6 µg/L at the Franklin Lock. Filamentous cyanobacteria dominated at the Franklin Lock, with *Anabaena* sp., *Planktolyngbya* sp. *and Planktothrix* sp. present. Algae has been observed at the Olga Water Treatment Plant intake in the afternoons. The plant remains offline for maintenance.

Upper Estuary Conditions:

In situ chlorophyll levels west of S79 ranged from 5.4 - 18.8 μ g/L on 7/22. Small green specs were noted at the 31 Bridge, where decomposing cyanobacteria were present.

Though RECON sensors and surface samples did not detect hypoxia, the water column has become stratified and hypoxic conditions are present in the lower layer of the water column. On 7/22, the lower layer of the water column was hypoxic in the afternoon at the two locations tested: Franklin Lock and 31 Bridge. CDOM remains high and light penetration is limited at all sampled sites.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Maximum Values	< 11	CE <70	CE < 18 SCB < 5	CE = 1 m SCB = 2 2m
S79 (W)	5.4	221	1.4	0.43
Beautiful Island	18.8	191	7.1	0.48
Ft. Myers	18.5	155	3.5	0.56

Farget light penetration: CE- Caloosahatchee Estuary =1 m			
	SCB-San Carlos	s Bay = 2.2 meters	
Definition of 25% Iz:	I = irradiance	z = depth	

Lower Estuary Condition:

Salinity in the lower estuary continues to be marginal for oysters ranging between 16.5 – 32.5 psu. Scattered *Sargassum* is present along Sanibel beaches at the wrack line and Red Drift algae, predominantly *Hypnea musciformis* and *Acanthophora spicifera* is washed up along Bunche Beach in San Carlos Bay.

Oysters:

Spat Recruitment is low for this time of year ranging from 1.28- 3.56. Survival of juvenile oysters in both open and closed bags is poor with 0% survival in open bags by April/May and less than 10% survival in closed bags.

Disease prevalence of *Perkinsus marinus* (Dermo) remains very high measuring 100%.

The disease intensity is high ranging from 1.4-1.67. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy). The Oyster Body Condition Index is normal for this time of year, ranging from 2.96 - 4.47, indicating some oysters have not yet spawned. The preferred range is > 2.

Higher salinities result in higher predation so they are suspected to have caused reduced fecundity and/or higher predation of spat. This condition was also observed in 2007.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - 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: 31 July, 2012

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

Flows from the watershed the past week decreased salinities throughout the estuary. Cyanobacteria blooms are present in the river upstream of S79 and decomposing remnants of blooms are present around the SR 31 Bridge.

Recommendation: We request the Corps continue to provide flows to meet ecologically appropriate wet season estuary conditions and proactively manage lake levels to avoid flows above 2800 cfs.

Lake Okeechobee Lev	ee Level: 12.12 ft. (Beneficial Use Sub-Band) Last wk: 12.10 ft.				
Lake Okeechobee Inflo	Okeechobee Inflow: 1,131 cfs Lake Okeechobee Outflow: NR				
Weekly Rainfall:	WP Franklin 0.25",	Ortona 0.64", N	loore Haven	1.56"	
Salinity Ft. Myers:	1.6 - 3.8 psu surface	data (Fort Myers Yach	nt Basin)	Previous wk: 3.8 - 6.9 psu	
	3 – 9 psu (SCCF REC	CON Marker 52)		Previous wk: 4.8 – 9 psu	
MFL Status:	MFL Violation 6 th Consecutive Year of MFL Exceedence in Serious Harm 30 day moving average > 10 psu = 211 days 1 day > 20 psu = 16 days (Total days since April 10, 2012)				
	7 day moving averag 14 day moving avera 30 day moving avera	ge = 2.7 psu age = 3.8 psu age = 7.1 psu		Previous week: 4.8 psu Previous week: 7.2 psu Previous week: 9.9 psu	
Salinity Shell Point:	16 - 32 psu (SCCF)	RECON sensor)	Previou	s week: 16.5 – 32.5 psu	
Olga Water Treatment	Plant Chloride 7	0 mg/L OFFLINE	E	Previous week: 75 mg/L	



Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,258 cfs during the past week. Salinity levels continue to decrease throughout the estuary. Chloride levels at the Olga Water Treatment Plant decreased from 75 to 70 mg/L over the past week.

Surface salinity at Ft. Myers decreased from **4.3 to 2.9** psu, compared to sampling the previous week. Salinity at Beautiful Island decreased from **1.5 to 1.0** psu. In the lower estuary salinity measured **14.1** psu on 7/30 and at Shell Point salinity ranged from **16 – 32** psu. These salinity levels are average for this time of year although the lower estuary salinities continue to exceed the upper preferred salinity range for oysters.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
7/24/12	Tue	1404	172	0
7/25/12	Wed	1168	270	0
7/26/12	Thu	1459	323	0
7/27/12	Fri	1176	324	0
7/28/12	Sat	1077	322	0
7/29/12	Sun	1630	318	0
7/30/12	Mon	897	275	0
Average	Flow	1258	286	0



* From ACOE Website Daily Reports

Upstream of S79/Franklin Conditions:

In-situ chlorophyll concentration east of S79 was 15.3 µg/L at the Franklin Lock. Filamentous cyanobacteria including *Anabaena* sp., *Planktolyngbya* sp. *and Planktothrix* sp. dominated at the Franklin Lock. No algae was reported at the Olga Water Treatment Plant intake. The plant remains offline for maintenance.

Upper Estuary Conditions:

In situ chlorophyll levels west of S79 ranged from 4.6 in San Carlos Bay to 12.1 µg/L at the SR31 Bridge on 7/30/12. Very small coccoid cells and decomposing cyanobacteria were present at Ft. Myers.

Ft. Myers RECON sensor detected hypoxic conditions from July 28 through the 31st. The water column was stratified and hypoxic conditions were detected in the lower layer of the water column. CDOM remains high and light penetration is limited at all sampled sites.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
Ft. Myers	11.3	166	6.3	0.54
lona	11.6	98	3.7	0.80
San Carlos Bav	4.6	25	15.2	1.76

Target light penetration: CE- Caloosahatchee Estuary =1 mSCB-San Carlos Bay = 2.2 metersDefinition of 25% Iz:I = irradiancez = depth

Lower Estuary Condition:

Salinity in the lower estuary continues to be marginal for oysters ranging between 16 – 32 psu. At Iona phytoplankton were observed including a ciliate *Myrionecta rubra*, a centric diatom *Coscinodiscus* sp. and a dinoflagellate *Peridinium* sp. Floating seagrass blades covered with the cyanobacteria *Lyngbya majuscula* were also present.

USGS sensors at McIntyre Creek within the J.N."Ding" Darling NWR show that water temperatures continued to increase (ave 32° C) as usual for mid-summer conditions, while oxygen levels are borderline hypoxic (4 psu) during low tide stages.

Smalltooth Sawfish:

A juvenile smalltooth sawfish has been observed in Tarpon Bay, Sanibel on July 3-6, 13,16-17, 21 and 25, 2012. This fish is not yet tagged.



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - 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: 14 August, 2012

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

Flows from the watershed over the past week held salinities stable within the upper estuary and reduced salinities slightly in the lower estuary.

Recommendation: We request that the Corps continue to monitor conditions within the Caloosahatchee and provide flows to meet ecological targets appropriate for wet season conditions and proactively manage lake levels to avoid flows above 2800 cfs.

Lake Okeechobee Lev	vel: 12.15 ft. (Benefic	cial Use Sub-Band) Last w	k: 12.12 ft.
Lake Okeechobee Infl	ow: 770 cfs	Lake Okeechobee Outflow:	NR cfs
Weekly Rainfall:	WP Franklin 1.55",	Ortona 0.55", Moore Ha	ven 0.25"
Salinity Ft. Myers:	2.1 - 4.3 psu surface da	ata (Fort Myers Yacht Basin)	Previous wk: 1.9 - 4.8 psu
	3.5 - 10 psu (SCCF RE	CON Marker 52)	Previous wk: 3 – 10 psu
MFL Status:	Daily salinity at Fort M	lyers <u><</u> 10 psu In complianc	e
	7 day moving average 14 day moving averag 30 day moving averag	e = 3.4 psu je = 3.2 psu je = 4.0 psu	Previous week: 3.3 psu Previous week: 3.0 psu Previous week: 5.2 psu
Salinity Shell Point:	16 - 30 psu (SCCF R	ECON sensor)	Previous week: 16 – 33 psu

Previous week: 70 mg/L

Olga Water Treatment Plant Chloride 74 mg/L OFFLINE



Flow: Flows to the Caloosahatchee estuary through S79 averaged 829 cfs during the past week. Surface salinity at Ft. Myers decreased from 4.8 to 2.8 psu, compared to sampling the previous week. Salinity at Beautiful Island decreased from 1.3 to 0.9 psu. In the lower estuary salinity at lona decreased from 13.9 to 12.3 psu and at Shell Point salinity ranged from 16 – 30 psu. These salinity levels are average for this time of year.



* From ACOE Website Daily Reports

Upstream of S79/Franklin Conditions:

No algae reported at the Olga Water Treatment Plant intake. The plant remains offline for maintenance.

Upper Estuary Conditions:

Watershed runoff is providing flows to meet the MFL at Fort Myers. In situ chlorophyll levels ranged from 9.2 at the Franklin Lock to 13.5 µg/L at Fort Myers on 8/13/12. Algae observed at Ft. Myers included Skeletonema sp. and small coccoid cells.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	
Stations	(µg/L)	(qse)	(NTU)	(meters)	
Maximum Values	< 11	CE <70	CE < 18	CE = 1 m	Target light penetration: CE - Caloosahatchee Estuary =1 m
		SCB <11	SCB < 5	SCB =2.2m	SCB -San Carlos Bay = 2.2 meters
Ft. Myers	13.5	190	4.8	0.48	Definition of 25% / Iz. I irrediance = depth
lona	4.8	150	3.1	0.58	$\mathbf{Z} = \mathbf{U} = \mathbf{U} + \mathbf{U} + \mathbf{U} = \mathbf{U} + \mathbf{U} + \mathbf{U} + \mathbf{U} = \mathbf{U} + $
San Carlos Bay	3.8	24	5.4	1.74	1

SCCFs Ft. Myers RECON sensor detected hypoxic conditions from August 8 through Aug 14th.



Lower Estuary Condition:

Salinities at Iona and Shell Point are averaging 12.3 and 23 psu which is within the preferred range (14-28 psu) for oysters. Dissolved oxygen levels in the lower layer of the water column at the Shell Point RECON station were hypoxic on the 12th. In the Refuge and into Pine Island Sound, dissolved oxygen levels continued to drop below 4 mg/l during low tides while water temperatures remained warm but normal for this time of year.

Drift algae, Sargassum sp. was reported washing up on Sanibel from Tarpon Bay Beach to Blind Pass but has now dissipated.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - 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 September, 2012

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

Heavy rainfall within the Caloosahatchee watershed related to Tropical Storm Isaac resulted in large volume discharges through the S-78 and S-79 structures. Rain and watershed runoff from the Kissimmee basin increased lake stages more than one foot over the previous week, raising the lake to the Low Sub-band. A significant phytoplankton bloom turned the lower estuary a golden/green color.

Recommendation: We request that the Corps use all available storage capacity in the system to minimize negative impacts to the estuary from excessive high flow discharges (>4500 cfs). To minimize salinity stress on oysters, salinities should be maintained above 7.5 psu in the lower estuary.

Lake Okeechobee Lev	el: 14.24 ft. (l	Low Sub-Band	l) Las	t wk: 13.12 ft.	
Lake Okeechobee Inflo	ow: 16,272 cfs	L	ake Okeed	chobee Outflow:	- 1,706 cfs
Weekly Rainfall:	WP Franklin 0.16	o", Ortona	0.23",	Moore Haven NR	
Salinity Ft. Myers:	0.2 - 0.3 psu surfa	ce data (Fort N	lyers Yacht	Basin) Previo	ous wk: 0.4 - 1.1 psu
	0.3 psu (SCCF RE	CON Marker 5	2)	Previous wk:	0.4 - 4.2 psu
MFL Status:	Daily salinity at F	ort Myers <u><</u> 10	psu In c	ompliance	
	7 day moving ave 14 day moving av 30 day moving av	rage = 0.24 p erage = 0.5 ps erage = 1.8 ps	su u u	Previous weel Previous weel Previous weel	c: 0.6 psu c: 1.4 psu c: 2.3 psu
Salinity Shell Point:	4 – 33 psu (SCC	F RECON sens	sor)	Previous weel	k: 4.9 – 33.5 psu
Olga Water Treatment	Plant Chloride	42 mg/L	OFFLIN	E Previous weel	k: 52 mg/L
	A			Story	Franklin Lock gross



Flow: Flows to the Caloosahatchee estuary through S79 averaged 5,757 cfs during the past week. Surface salinities at Ft. Myers and Beautiful Island decreased to 0.2 -0.3 psu in the last week. In the lower estuary, salinities at Iona and Shell Point decreased to 3.1 and 17 psu respectively.





Upstream of S79/Franklin Conditions:

The plant is coming back online today and should start pumping into the distribution within 24-48 hours.

Upper Estuary Conditions:

Hypoxic conditions were not detected by SCCF's Ft. Myers RECON sensor this week.

Lower Estuary Condition:

Salinities at Iona dropped below 5 psu for six days over the past week, which is below the preferred range (14-28 psu) for oysters. The average salinity at Shell Point was 17 psu, within the preferred range for oysters though the rapid swings in salinity and low salinity levels of 5 psu are stressful to seagrasses.

5 psu are stressful to seagrasses. In the lower estuary, a phytoplankton bloom of chain forming diatoms, flagellates and some dinoflagellates turned the water a murky golden green color. At Iona, *Skeletonema* sp. was dominant while at the causeway a variety of phytoplankton were present including, *Thalasiosira* sp, *Chaetoceros* sp., *Skeletonema* sp., and *Asterionella* sp.



Rapid swings in salinity and low salinity levels at Shell Point.

> 00:00 00:00 Sep.04 Sep.06 2012 2012

2012



SCCF RECON graph at Shell Point (red line) and Tarpon Bay (green line) reported a spike in chlorophyll reflecting a significant phytoplankton bloom in the lower estuary.



Aug. 23 Aug. 25 2012 2012

Shell Point: chlorophyll [ug/L]

date [Eastern]

2012

Tarpon Bay: chlorophyll [ug/L]

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Date: 11 September, 2012

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

Rain and watershed runoff from the Kissimmee basin increased lake stages more than a half foot over the previous week. A phytoplankton bloom persists in the lower estuary.

Recommendation: We request that the Corps use all available storage capacity within the system to minimize negative impacts to the estuary from excessive high flow discharges (>4500 cfs). To minimize salinity stress on oysters, salinities should be maintained above 7.5 psu in the lower estuary.

Lake Okeechobee Lev	el: 14.81 ft. (Low	Sub-Band) Last w	k: 14.24 ft.
Lake Okeechobee Infle	w: 11,869 cfs	Lake Okeecho	bee Outflow: - 480 cfs
Weekly Rainfall:	WP Franklin 3.74",	Ortona 2.95", Moo	ore Haven NR
Salinity Ft. Myers:	0.2 psu surface data (F	Fort Myers Yacht Basin)	Previous wk: 0.2 - 0.3 psu
	0.2 psu (SCCF RECO	N Marker 52)	Previous wk: 0.3 psu
MFL Status:	Daily salinity at Fort M	Myers <u><</u> 10 psu ∣ <mark>In com</mark>	pliance
	7 day moving average 14 day moving average 30 day moving average	e = 0.2 psu ge = 0.2 psu ge = 1.0 psu	Previous week: 0.2 psu Previous week: 0.5 psu Previous week: 1.8 psu
Salinity Shell Point:	7 - 29 psu (SCCF RE	CON sensor)	Previous week: 4 – 33 psu
Olgo Water Treatment	Diant Chiarida 40		Draviaua waaku 42 mg/l



Flow: Flows to the Caloosahatchee estuary through S79 averaged 3,981 cfs during the past week. Surface salinities at Ft. Myers and Beautiful Island measured 0.3 psu on Sunday. In the lower estuary, salinities at Iona increased from 3.1 to 5.3 psu. The salinity range at Shell Point increased at the lower end and decreased at the top end ranging from 7 - 29 psu.

* Fror	* From ACOE Website Daily Reports					
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)		
9/4/12	Tue	2530	582	0		
9/5//12	Wed	1860	526	0		
9/6/12	Thu	4483	1148	0		
9/7/12	Fri	5921	2195	0		
9/8/12	Sat	5118	1571	0		
9/9/12	Sun	4312	1264	0		
9/10/12	Mon	3644	860	0		
Average	Flow	3981	1163	0		



Red indicates flows exceeding ecological harm threshold (>2,800 cfs)

Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment Plant remain 42 mg/L.

Upper Estuary Conditions:

Hypoxic conditions at Ft. Myers were not detected by SCCF's RECON sensor this past week.

Lower Estuary Condition:

Salinities at Iona ranged between 3 and 9 psu over the past week, which is below the preferred range (14-28 psu) for oysters. The average salinity at Shell Point was 17 psu, within the preferred range for oysters. Hypoxia was detected at the Shell Point RECON.

In the lower estuary, a phytoplankton bloom of chain forming diatoms combined with high CDOM concentrations turned the water a golden brown color. At Iona and the Causeway *Skeletonema* sp. was the dominant phytoplankton.



Seaward edge of high CDOM water (95 qsu) and diatom bloom (24 ug/l) at Lighthouse Point, Sanibel. September 7, 2012 Photo SCCF



Shell Point DO dropping below 3 mg/l. The fresh water induced stratification, phytoplankton bloom, dark water, low salinities, rapid salinity drop and large salinity swings contribute to lower DO especially at depth.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)	
Target Values	< 11	CE <70	CE < 18	ČE = 1 m	
-		SCB <11	SCB < 5	SCB =2.2m	
Ft. Myers	9.7	220	2.3	0.42	
lona	36.7	204	6.7	0.44	
San Carlos Bay	7.9	105	7.5	0.74	
Terret light genetic terre OF Ocheverheiteter Feture der					

Target light penetration: **CE**- Caloosahatchee Estuary =1 m

	SCB-San Carlo	os Bay = 2.2 me	ters
Definition of 25% lz:	I = irradiance	$\mathbf{z} = depth$	

USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Tommy To: 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 18 September, 2012

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 Summarv

Rain and watershed runoff from the Kissimmee basin continue to increase Lake Okeechobee water levels. Runoff from the Caloosahatchee watershed is resulting in flows greater than 2,800 cfs at S-79 which has dropped salinities in the lower estuary to the range where deleterious impacts on marine organisms are expected. Flows greater than 4,500 cfs are expected to have significant negative impacts on marine organisms and seagrasses in San Carlos Bay. A phytoplankton bloom persists in San Carlos Bay and Pine Island Sound stretching from Redfish Pass to the Sanibel Causeway.

Recommendation: We request that the Corps use all available storage capacity within the system, including keeping lake stages higher in the Kissimmee Chain of Lakes and maximizing storage on publicly and privately owned lands under contract for water storage, to minimize negative impacts to the estuary from excessive high flow discharges (>4500 cfs). To minimize stress on oysters, salinities should be maintained above 7.5 psu in the lower estuary.

Lake Okeechobee Lev	vel: 15.	I1 ft. (Low	Sub-Ban	i d) La	ast wk: 14	.81 ft.	
Lake Okeechobee Inf	low: 8,37	3 cfs	L	.ake Oke	echobee	Outflow:	- 161 cfs
Weekly Rainfall:	WP Franklir	n 1.00",	Ortona	2.22",	Moore ⊦	laven NR	
Salinity Ft. Myers:	0.2 psu sur	face data (Fo	ort Myers	Yacht Ba	isin) Pre	vious wk: ().2 psu
	0.2 psu (SC	CF RECON	Marker 5	52)	Pre	vious wk:	0.2 psu
MFL Status:	Daily salini	ty at Fort My	yers <u><</u> 10	psu In	compliar	nce	
	7 day movi 14 day mov 30 day mov	ng average ving average ving average	= 0.2 p = 0.2 p = 0.4 p	isu isu isu	Pre Pre Pre	vious weel vious weel vious weel	<: 0.2 psu <: 0.2 psu <: 1.0 psu
Salinity Shell Point:	4 – 29 psu	(SCCF REC	CON sens	sor)	Pre	vious weel	k: 7 - 29 psu

Salinity Shell Point: (SCCF RECON sensor) 4 – 29 psu

Olga Water Treatment Plant Chloride 52 mg/L Previous week: 42 mg/L



Flow: Flows to the Caloosahatchee estuary through S79 averaged 3,518 cfs during the past week, exceeding the ecological harm threshold of 2800 cfs. Surface salinities at Ft. Myers measured 0.2 and 0.3 psu at Beautiful Island on 9/17. In the lower estuary, salinities at Iona increased from 5.3 to 6.3 psu. The salinity range at Shell Point decreased at the lower end of the range while the upper end remained static ranging from 4 - 29 psu.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *		
		(cfs)	(cfs)	(cfs)		
9/11/12	Tue	3625	726	0		
9/12//12	Wed	3586	1088	0		
9/13/12	Thu	3817	1246	0		
9/14/12	Fri	3441	1134	0		
9/15/12	Sat	3094	1032	0		
9/16/12	Sun	3121	1034	0		
9/17/12	Mon	3945	1102	0		
Average	Flow	3518	1051	0		
and the difference of the second difference of the second difference (the second second second second second se						





Red indicates flows exceeding ecological harm threshold (>2,800 cfs)

Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment Plant measure 52 mg/L.

Upper Estuary Conditions:

Hypoxic conditions at Ft. Myers were not detected by SCCF's RECON sensor this past week.

Lower Estuary Condition:

Salinities at Iona ranged between 3 and 10 psu over the past week, which is below the preferred range (14-28 psu) for oysters and too low for healthy shoal grass

. The average salinity at Shell Point was 19 psu, within the preferred range for oysters. Hypoxia was detected at the Shell Point RECON.

In the lower estuary, a phytoplankton bloom of chain forming diatoms combined with high CDOM concentrations to turn the water a golden brown color. At the Sanibel Causeway on 9/17, filamentous diatoms were the dominant phytoplankton present and the turbidity was high. The river-plume frontal zone is now extending past the Sanibel Lighthouse at Point Ybel and to the south along the north end of Fort Myers Beach.



High turbidity and CDOM and diatom blooms
color the water at the Sanibel Causeway.September 17, 2012Photo SCCF

Red Tide:

The harmful algae *Karenia brevis*, Florida Red Tide, has been identified at very low concentrations in Pine Island Sound in northern Lee County.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m
Ft. Myers	7.8	222	2.3	0.42
Iona	8.4	182	4.7	0.50
San Carlos Bay	17.2	59	22.8	1.12

Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: I = irradiance z = depth



Microscope image of plankton from Blind Pass 9/18. RECON sensors at Redfish Pass, Blind Pass, and Tarpon Bay show elevated chlorophyll levels. 1) *Skeletonema* sp. 2) *Chaetoceros* sp.

Photo SCCF Marine Lab

Oysters:

Samples early last week showed an increase in

spat recruitment densities over spat counts in August. Spat recruitment was recorded at 20-30 spat/shell. Disease prevalence of *Perkinsus marinus* (Dermo) remains high measuring 71 - 94%. The disease intensity is low ranging from 0.87 - 1.6. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

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Subject: Caloosahatchee & Estuary Condition Report

Date: 25 September, 2012

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

Kissimmee basin inflow to Lake Okeechobee increased by over half of last weeks flow. The river-plume frontal zone continues to extend past the Sanibel Lighthouse at Point Ybel. Salinities in the lower estuary have been too low to support oysters for the past four contiguous weeks and are creating stressed conditions for seagrass. A phytoplankton bloom persists in the lower estuary.

Recommendation: We request that the Corps use all available storage capacity within the system with special emphasis on storage in the upper chain of lakes and Lake Kissimmee to maximize storage above regulation schedules to minimize additional inflow to the lake and negative impacts to the estuary from excessive high flow discharges (>4500 cfs). To minimize salinity stress on oysters, salinities should be maintained above 7.5 psu in the lower estuary.

Lake Okeechobee Lev	rel: 15.38 ft. (Low 3	Sub-Band) Last wk	:: 15.11 ft.
Lake Okeechobee Infl	ow: 12,472 cfs	Lake Okeecho	bee Outflow: 1,088 cfs
Weekly Rainfall:	WP Franklin 1.97",	Ortona 0.73", Moc	ore Haven NR
Salinity Ft. Myers:	0.2 psu surface data (Fo	ort Myers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON	Marker 52)	Previous wk: 0.2 psu
MFL Status:	Daily salinity at Fort M	yers <u><</u> 10 psu In com	oliance
	7 day moving average = 14 day moving average 30 day moving average	 0.2 psu = 0.2 psu = 0.3 psu 	Previous week: 0.2 psu Previous week: 0.2 psu Previous week: 0.4 psu
Salinity Shell Point:	4 - 29 psu (SCCF REC	CON sensor)	Previous week: 4 - 29 psu
Olga Water Treatment	Plant Chloride	58 mg/L	Previous week: 52 mg/L



Flow: Flows to the Caloosahatchee estuary through S79 averaged **4,279** cfs during the past week. Surface salinities at Ft. Myers and Beautiful Island measured **0.2** psu on 9/24. In the lower estuary, salinities at Iona decreased to **2.1** psu. The salinity range at Shell Point ranged from **4 - 29** psu.

S79 Flow* Date Day S78 Flow* S77 Flow * (cfs) (cfs) (cfs) 9/18/12 Tue 3423 1102 0 9/19//12 Wed 3703 1507 398 9/20/12 Thu 4198 2150 666 9/21/12 4236 2399 1242 Fri 4528 9/22/12 Sat 2474 1356 9/23/12 Sun 5110 2058 964 9/24/12 4756 1984 984 Mon Average Flow 4279 1953 801

Red indicates flows exceeding ecological harm threshold >2,800 cfs

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

Chloride levels at the Olga Water Treatment Plant measure 58 mg/L. Water color is 200 cu (apparent).

Upper Estuary Conditions:

Hypoxic conditions at Ft. Myers were not detected by SCCF's RECON sensor this past week.

Lower Estuary Condition:

Salinities at Iona ranged between 2 and 10 psu over the past week, which is below the preferred range (14-28 psu) for oysters and too low for sustaining shoal grass. The average salinity at Shell Point was 17 psu, within the preferred range for oysters. Hypoxia was detected at the Shell Point RECON. Chlorophyll was slightly elevated at Iona where dinoflagellates and ciliates (*Myrionecta rubra*) were present.

In the lower estuary, CDOM concentrations are high, resulting in brown colored water. Within Pine Island Sound, diatoms and other phytoplankton are still elevating chlorophyll levels.

Red Tide:

Red Tide, *Karenia brevis* Karenia brevis was found in background concentrations in northern Lee County in the Gulf off Boca Grande and Pine Island Sound.



Caloosahatche	e Chlorophyll	CDOM	Turbidity	25% Iz Light			
Stations	(µg/L)	(qse)	(NTU)	(meters)			
Target Values	< 11	CE <70	CE < 18	CE = 1 m			
		SCB <11	SCB < 5	SCB =2.2m			
Ft. Myers	7.7	245	1.4	0.39			
lona	13.1	196	3.2	0.47			
San Carlos Bay	8.9	105	4.0	0.76			
Target ligi	Target light penetration: CE - Caloosahatchee Estuary =1 m						
	SCB-San Carlos Bay = 2.2 meters						

Definition of 25% lz:	I = irradiance	$\mathbf{z} = depth$
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To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 16 October, 2012

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

Drier conditions over the past week reduced inflow to Lake Okeechobee to half the volume of flow from the previous week. However regulatory releases to the Caloosahatchee increased to 7,007 cfs, the highest level of the season. Salinities in the lower estuary have been too low to support oysters for the past seven consecutive weeks and for the past three weeks have been dipping into the mortality zone for shoal grass. High CDOM freshwater extends into the Gulf of Mexico, San Carlos Bay and Pine Island Sound.

USACE Action: On 10/4/12, the Corps initiated regulatory releases of 4000 cfs from S-77.

Recommendation: With drier conditions prevailing we request that the Corps and District reduce lake releases by half to reduce the extreme flows at S79. We understand the limited available storage and forecasts are contributing factors but request flows at S79 be reduced to not exceed 3,000 cfs. To minimize salinity stress on oysters, salinities should be maintained above 7.5 psu in the lower estuary, while salinities above 4 psu are needed to prevent seagrass mortality.

Lake Okeechobee Lev	vel: 15.89	ft. (Low S	Sub-Band)	Last wk: 15.88 ft .	
Lake Okeechobee Inf	ow: 6,280	cfs	Lake (Okeechobee Outflow:	4,747 cfs
Weekly Rainfall:	WP Franklin	0.03",	Ortona	0.13", Moore	Haven NR
Salinity Ft. Myers:	0.2 psu surfa	ce data (F	ort Myers Yacl	ht Basin) Previo	ous wk: 0.2 psu
	0.2 psu (SCC	F RECON	l Marker 52)	Previo	ous wk: 0.2 psu
MFL Status:	Daily salinity	at Fort My	/ers <u><</u> 10 psu	30 day moving avera	age = 0.2 psu
Salinity Shell Point:	2 - 26 psu (S	SCCF REC	CON sensor)	Previo	ous week: 3 – 30 psu

Olga Water Treatment Plant Chloride 48 mg/L

Previous week: 52 mg/L



10/15

SCCF Sonde Surface Salinity at Iona Oyster Bar

Oyster Preferred Range

Isacc

08/2

0910

e?

Shoal grass

08/16

Flow: Flows to the Caloosahatchee estuary through S79 averaged 7,007 cfs during the past week. Flows have exceeded the 2,800 cfs harm threshold for the past 8 weeks (since 8/23) and the 6,500 cfs harm threshold for eight consecutive days. Freshwater has displaced the estuary, extending past the Sanibel lighthouse, along the Gulf side of Fort Myers Beach and into the Gulf of Mexico. Surface salinity at Ft. Myers was 0.2 psu on 10/15. In the lower estuary, salinity at Iona was as low as 0.2 psu. The salinity at Shell Point ranged from 2 - 26 psu.

30

25

20

0

salinity (psu)

* From ACOE Website Daily Reports					
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)	
10/9/12	Tue	8504	5465	4042	
10/10/12	Wed	8052	5357	4146	
10/11/12	Thu	7226	5123	4056	
10/12/12	Fri	7310	5053	4094	
10/13/12	Sat	6630	4766	4104	
10/14/12	Sun	6126	4701	4080	
10/15/12 Mon		5202		3616	
Average Flow		7007		4019	



Upstream of S79/Franklin Conditions:

On October 16th chlorides were 48 mg/L and apparent color 210 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

Fort Myers RECON sensor documented hypoxia on 10/09, but dissolved oxygen levels have been improving.

Lower Estuary Condition:

Salinities at Iona were as low as 0.2 psu over the past week, well below the preferred range (14-28 psu) for oysters and too low for sustaining shoal grass. Increasing flows from S79 are extending the duration of these low salinity impacts. Extreme salinity fluctuations of over 24 psu are occurring daily and some days twice a day, compounding impacts to shoal grass.

Shoal grass impacts are shown below in photos taken at Iona on 9/5/12 and on 10/13/12. During this 5 week period, discharges from S-79 increased from an average of 1,648 cfs in the six weeks before 8/28, to an average of 4,844 cfs the past six weeks. Shoot density is reduced by 67% and blade length/canopy is reduced by 55% between these two monitoring events.



Lower estuary shoal grass metrics (lona)

Metric	September	October	
Shoot Density (shoots m ⁻²)	876	293	
Canopy height (cm)	20	9	

Lower Estuary Condition continued:

Many non-motile, benthic species in the lower estuary, Pine Island Sound, San Carlos Bay, and the Gulf of Mexico are not tolerant of low salinities. Extended periods of extreme low salinities negatively affects the stability of these ecosystems.

Freshwater has displaced the estuary, extending past the Sanibel lighthouse and several miles along the majority of Fort Myers Beach and flowing from the Estero Bay Aquatic Preserve through Matanzas Pass and into the Gulf of Mexico. The average salinity at Shell Point was 13 psu, below the preferred range for oysters. Hypoxia was again detected at SCCFs Shell Point and Tarpon Bay RECON sensors. Chlorophyll was slightly elevated at Iona. In the lower estuary, CDOM concentrations and turbidity were elevated, resulting in highly colored water. The resulting light attenuation is harmful for seagrasses at depth.

Phytoplankton Bloom: At Tarpon Bay beach on 10/12, 1.8 million dinoflagellate cells/L were present including *Scrippsiella* sp.

Red Tide:

High concentrations of red tide, *Karenia brevis* have been identified offshore of Captiva. Lower concentrations were found offshore of Sanibel and in northern Pine Island Sound.



Salinity at the Causeway was 5.8 psu on 10/15. Low salinities and rapid swings of over 24 psu daily are harmful to seagrasses and other species.

Target light penetration: CE - Caloosahatchee Estuary =1 m			
SCB -San Carlos Bay = 2.2 meters			
Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$	



Plume of freshwater discharge out of Blind Pass on the gulf side of Sanibel, Lee County. October 12, 2012 Photo: Lee County Mosquito Control

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
Ft. Myers	7.7	246	2.0	0.39
lona	11.5	247	3.1	0.39
San Carlos Bay	8.2	185	7.7	0.50



High flows of 7,310 cfs at S79 (WP Franklin Lock) 10/12/2012 Photo: Kurt Harclerode, Lee County



High CDOM freshwater in Pine Island Sound behind Captiva Island, Redfish Pass. October 12, 2012 Photo: Kurt Harclerode, Lee County

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 23 October, 2012

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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

Dry conditions continued the past week, reducing Lake Okeechobee inflow and outflow by half of the previous week's volumes. Regulatory releases to the Caloosahatchee decreased from 7,007 to 4,034 cfs. For the past eight consecutive weeks salinities in the lower estuary have remained too low to support oysters. However, after three weeks with salinity in the mortality zone for shoal grass at lona, salinity increased this past week improving conditions for shoal grass. Highly colored (CDOM) freshwater continues to extend into the Gulf of Mexico, San Carlos Bay and Pine Island Sound.

USACE Action: On 10/17/12, the Corps recommended reducing regulatory releases to 3,000 cfs at S-79.

Recommendation: With drier conditions anticipated over the next two weeks, we request that the Corps and District continue to reduce regulatory discharges to the estuary. Last week the SFWMD began pumping 300 cfs/day from Townsend canal onto the West Basin Reservoir to reduce basin inflows. We ask that other sites described to the Governing Board by staff at their 10/11/12 meeting be utilized to further reduce harmful estuary flows including BOMA, fallow citrus lands and Babcock Ranch preserve lands. With the regulation schedule in the northern chain of lakes rising precipitously on November 1, we ask that additional water be maintained in these systems to help abate high lake levels and excessive flows to the estuaries. With these additional storage opportunities we request flows at S79 be further reduced to 1,500 cfs allowing the system to slowly begin to acclimate to dry season conditions and to restore appropriate salinities within the estuary.

Lake Okeechobee Lev	ei: 15.8	7 ft. (Low Su	o-Band)	Last wk: 15.89 ft.		
Lake Okeechobee Infl	ow: 3,648	5 cfs	Lake C	Okeechobee Outflow	w: 2,972	2 cfs
Weekly Rainfall:	WP Frankli	n 0.08",	Ortona	0.04", Mo	ore Haven	0"
Salinity Ft. Myers:	0.2 psu sur	face data (Fort	Myers Yach	nt Basin) Pro	evious wk:	0.2 psu
	0.2 psu (SC	CF RECON M	larker 52)	Pro	evious wk:	0.2 psu
MFL Status:	Daily salinit	y at Fort Myeı	rs <u><</u> 10 psu	30 day moving a	verage =	0.2 psu
Salinity Shell Point:	6 - 30 psu	(SCCF RECO	N sensor)	Pro	evious wee	k: 2 - 26 psu

Beautiful Is 10/21/12 Surface I75 Salinity psu 0.2psu a Jp? 0-1 1-2 2-5 SCCF Yacht 5-8 Club Site 8-10 Ft. Myers 10-13 13-20 Cape Coral ≥ 20 SCCF 0 Logger RECON O SCCF 3.9psu Olona Cove Tapegrass 🔿 Shell Point

Flow: Flows to the Caloosahatchee estuary through S79 averaged 4,034 cfs during the past week. Flows have exceeded the 2,800 cfs harm threshold for the past 9 weeks (since 8/23/12) including 8 days of flows exceeding the 6500 cfs harm threshold. Freshwater has displaced the Estuary, extending past the Sanibel lighthouse, along the north end of Fort Myers Beach and into the Gulf of Mexico.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
10/16/12	Tue	5483	2925	3984
10/17/12	Wed	5586	4033	3964
10/18/12	Thu	4152	2866	2478
10/19/12	Fri	3236	1500	1900
10/20/12	Sat	3122	2085	1866
10/21/12	Sun	3233	2749	2198
10/22/12	Mon	3426	2774	2345
Average	Flow	4034	2704	2676



* From ACOE Website Daily Reports

Red indicates flows exceeding ecological harm threshold >2,800 cfs

Upstream of S79/Franklin Conditions:

On 10/23/12, chlorides were 48 mg/L and apparent color was 221 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

Fort Myers RECON sensor did not detect hypoxia or phytoplankton blooms this week.

Lower Estuary Condition:

Over the past week, salinity at Iona was as low as 1.1 psu, well below the preferred range (14-28 psu) for oysters. The average salinity at Shell Point was 13 psu, also below the preferred range for oysters. Salinities have increased to levels suitable for shoal grass. However, the highly colored (CDOM) water of the freshwater discharge continues to extend past the Sanibel lighthouse into the Gulf of Mexico and along the northern portions of Fort Myers Beach. The resulting light attenuation is harmful for seagrasses at depth.

Many non-motile, benthic species in the lower estuary, Pine Island Sound, San Carlos Bay, and the Gulf of Mexico are not tolerant of low salinities. Extended periods of extreme low salinities negatively affects the stability of these ecosystems.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
-		SCB <11	SCB < 5	SCB =2.2m
Ft. Myers	4.1	237	2.0	0.4
lona	7.6	205	2.5	0.45
San Carlos Bay	5.6	118	1.7	0.69

Target light penetration: CE- Caloosahatchee Estuary =1 m			
SCB -San Carlos Bay = 2.2 meters			
Definition of 25% lz:	I = irradiance	z = depth	

Phytoplankton Blooms:

A bloom of *Alexandrium monilatum*, a potentially toxic dinoflagellate, was reported in Pine Island Sound and lower concentrations were found at Tarpon Bay Rd. Beach by SCCF. Another dinoflagellate, *Prorocentrum* sp. was found in elevated numbers (316K/L) in Tarpon Bay on 10/21/12 and lower numbers at the Sanibel causeway.

Red tide at Donax beach on 10/20/12.

Red Tide:

High concentrations of Florida red tide, *Karenia brevis* off Sanibel and Lee County caused a large fish kill that accumulated hundreds of dead fish on area beaches including grunts, bonnethead shark, striped mullet, gafftop sail catfish, and mangrove snapper. On Sanibel's beaches, concentrations of *K. brevis* ranged from low to high; the highest concentration of 20 million cells/L was measured at Algiers Beach by SCCF Marine Lab staff on 10/19/12.

One double crested cormorant has been admitted to CROW (Care and Rehabilitation of Wildlife) on Sanibel for neurologic problems possibly connected to the red tide and one sanderling is being treated for brevetoxicosis. FWRI and NOAA HAB reports show that red tide is still present offshore of Sanibel and in northern Pine Island Sound.



MODIS, Moderate Resolution Imaging Spectroradiometer, image showing the high CDOM freshwater plume/ extending out of the Caloosahatchee into the Gulf of Mexico, October 21, 2012.



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 30 October, 2012

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

Dry conditions continued the past week, reducing Lake Okeechobee inflow and outflow volumes over the previous week's. Regulatory releases to the Caloosahatchee decreased from 4,034 to 2,698 cfs. For the past nine consecutive weeks salinities in the lower estuary have remained too low to support oysters. Highly colored (CDOM) freshwater continues to extend into the Gulf of Mexico, San Carlos Bay and Pine Island Sound.

USACE Action: On 10/23/12, the Corps recommended continuing regulatory releases up to 3,000 cfs at S-79.

Recommendation: With the arrival of the dry season, we request that the Corps and District continue to reduce regulatory discharges to the estuary to 1,500 cfs to allow the estuary to slowly begin to acclimate to dry season conditions and to restore appropriate salinities within the estuary. We ask that agencies report the pumping volumes being discharged to alternative storage sites within the Caloosahatchee watershed. We continue to urge the COE and SFWMD to hold water in the northern chain of lakes to help abate high lake levels and excessive flows to the estuaries.

Lake Okeechobee Lev	vel: 15.87 ft. (Low Su	b-Band) Last wk: 1	5.87 ft.
Lake Okeechobee Infl	ow: 2,651 cfs	Lake Okeechobee	e Outflow: 1,969 cfs
Weekly Rainfall:	WP Franklin 0.03",	Ortona 0.2",	Moore Haven 0.89"
Salinity Ft. Myers:	0.2 psu surface data (For	t Myers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON M	/larker 52)	Previous wk: 0.2 psu
MFL Status:	Daily salinity at Fort Mye	rs <u><</u> 10 psu 30 day n	noving average = 0.2 psu
Salinity Shell Point:	7 - 29 psu (SCCF RECC	N sensor)	Previous week: 6 - 30 p



Flow: Flows to the Caloosahatchee estuary through S79 averaged 2,698 cfs during the past week falling below the 2,800 cfs harm threshold. Freshwater continues to extend beyond the Sanibel lighthouse, along the north end of Fort Myers Beach and into the Gulf of Mexico, displacing the estuary.

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Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
10/23/12	Tue	3194	2787	2483
10/24/12	Wed	3346	2819	2872
10/25/12	Thu	2567	2005	1623
10/26/12	Fri	1827	901	1104
10/27/12	Sat	2748	1907	1544
10/28/12	Sun	2498	1889	1866
10/29/12	Mon	2711	1920	1964
Average	Flow	2698	2032	1922





SCCF Sonde Surface Salinity at Iona Oyster Bar

Red indicates flows exceeding ecological harm threshold >2,800 cfs

Upstream of S79/Franklin Conditions:

On 10/23/12, chlorides were 54 mg/L and apparent color was 240 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

Fort Myers RECON sensor recorded low phytoplankton levels and did not detect hypoxia this week.

Lower Estuary Condition:

Over the past week, salinity at Iona was as low as 3.4 psu, well below the preferred range (14-28 psu) for oysters. Salinities have remained suitable for shoal grass. The average salinity at Shell Point was 19 psu which is suitable for oysters. However, the highly colored (CDOM) water of the freshwater discharge continues to extend past the Sanibel lighthouse into the Gulf of Mexico and along the northern portions of Fort Myers Beach. The resulting light attenuation is harmful for seagrasses at deeper depths.

Caloosahatchee Stations	Chlorophyll	CDOM (ase)	Turbidity (NTU)	25% Iz Light (meters)
0101.0.10	(1997-7	(900)	((1101010)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
Ft. Myers	7.4	223	5.4	0.42
lona	6.7	207	20.6	0.44
San Carlos Bay	10.1	80	7.0	0.90

Phytoplankton Blooms:

A bloom of diatoms was present in San Carlos Bay 10/27/12. The bloom included *Coscinodiscus* sp., *Rhizosolenia* spp., *Pseudo-nitzchia* sp., *Asterionella* sp., *Skeletonema* sp. and *Chaetoceros* sp.

Recent data from Shell Point and the Gulf of Mexico show NO₃⁺ spikes to 0.42 mg/L at Shell Pt and to 0.14 mg/L at the Gulf of Mexico and on an outgoing tide. The nitrate level at the Gulf RECON site is reaching 10 times the level required to saturate phytoplankton photosynthesis.

Red Tide:

FWRI and NOAA HAB reports *Karenia brevis* present along and offshore southern Pinellas to southern Collier counties.

Patchy high respiratory impacts are possible through Tuesday, with patchy moderate respiratory impacts possible Wednesday through Thursday. On Sanibel's Tarpon Bay Rd Beach, concentrations of *K. brevis* ranged from low concentrations of 83,000 cells/L on Friday down to 0 cells/L Saturday and Monday (10/29/12).

Eighteen double crested cormorants are being treated at CROW (Care and Rehabilitation of Wildlife) on Sanibel for brevetoxicosis from red tide.

Oysters:

Disease prevalence of Perkinsus marinus (Dermo) remains high ranging from 73%-100%. Disease intensity is low averaging 1.29 (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy). Spat recruitment averaged recruitment was 7.4 spat/shell.





To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 13 November, 2012

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 inflows have fallen sharply; however, outflows remain high raising the risk of over draining the system early in the dry season. Regulatory releases to the Caloosahatchee decreased from 2,340 to 1,099 cfs. Colored (CDOM) water from the Caloosahatchee continues to extend into the Gulf of Mexico, San Carlos Bay and Pine Island Sound. A Red Tide Advisory and shell fishing ban remain in effect in Lee County waterways. As a result the J.N. "Ding" Darling National Wildlife Refuge has canceled a November 17, 2012, youth fishing event planned at the Sanibel Causeway.

USACE Action: On 11/6/12, the Corps decided to reduce regulatory releases up to 1,000 cfs at S-79.

Recommendation: We request that the COE and SFWMD hold as much water as possible in the northern chain of lakes to retain water in the upper reaches of the system to prevent the need for excessive flows to the estuaries and to preserve water supply for the dry season. We request flows at S79 be reduced to 850 cfs.

Lake Okeechobee Lev	vel: 15.51 ft.	(Low Sub-Band)	Last wk: 15.67	ft.
Lake Okeechobee Infl	ow: 259 cfs	Lake Okeech	obee Outflow:	2,906 cfs
Weekly Rainfall:	WP Franklin (0.02", Ortona	0.0",	Moore Haven 0.0"
Salinity Ft. Myers:	0.6 - 3.0 psu su	urface data (Fort Myer	s Yacht Basin)	Previous wk: 0.8 psu
	1.1 - 7.0 psu (SCCF RECON Marke	r 52)	Previous wk: 0.2 – 5.0 psu
MFL Status:	Daily salinity at	Fort Myers <u><</u> 10 psu	30 day movir	ng average = 0.5 psu
Salinity Shell Point:	11 – 32 psu	(SCCF RECON sense	or)	Previous week: 8 – 33 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,099 cfs the past week. Reduced freshwater flows have allowed salinities in the estuary to increase, slowly acclimating the estuary to dry season conditions, reducing stress on oysters and seagrass.



* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

On 10/23/12, chlorides were 56 mg/L and apparent color was 206 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

Fort Myers RECON sensor recorded low phytoplankton levels and did not detect hypoxia this week.

Lower Estuary Condition:

A red tide warning issued by the Lee County Dept of Health last week, remains in effect for area beaches. A ban on shell fishing remains in effect for Pine Island Sound

Over the past week, average salinity at Iona increased to 10.4 psu, remaining below the preferred range (14-28 psu) for oysters. Reduced flows have improved the salinity for shoal grass. The average salinity at Shell Point increased to 22 psu. However, colored (CDOM) water of the freshwater discharge continues to extend to the Sanibel lighthouse and along the northern portions of Fort Myers Beach. The resulting light attenuation is harmful for seagrasses at deeper depths.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB =2.2m
Ft. Myers	2.3	207	2.3	0.45
lona	4.4	173	1.6	0.53
San Carlos Bay	8.9	69	5.8	1.01

Target light penetration: CE - Caloosahatchee Estuary =1 m			
	SCB-San Carlos	Bay = 2.2 meters	
Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$	

Red Tide:

High and medium concentrations of red tide, *Karenia brevis,* continue to be found in Tarpon Bay, Pine Island Sound, and along the Sanibel Causeway by FWRI and SCCF.

On Monday 2.75 million cells/L were found in Tarpon Bay, and 700,000 cells/L were found at the Sanibel Causeway where another dying, large goliath grouper was found Sunday.

USF MODIS image for Nov 8, showing 7 day chlorophyll concentrations depicted as cool colors for low and warmer colors for high concentrations (yellow and red). Note reds along outside edge of Caloosahatchee plume. Also note amount of yellow compared to Tampa Bay area. Autotrophic and mixotrophic estuarine phytoplankton species, including *Karenia*, are inhibited by high CDOM concentrations, but have optimal conditions on the edge of the freshwater plume where both nutrient concentrations and light levels are high.





Map of approximate locations where high concentrations of *Karenia* have been found around Sanibel and Captiva during the October-November 2012 bloom period. High nutrient loading rates help support intense blooms.



A 150 cm long goliath grouper struggling near Sanibel Causeway 11/11/12. Photo SCCF

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, 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 & Holly Downing - City of Sanibel Keith Kibbey - Lee County Environmental Lab Keith Laakkonen - Town of Fort Myers Beach Rae Ann Wessel & Rick Bartleson Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Date: 20 November, 2012

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

Regulatory releases to the Caloosahatchee decreased from an average of 1,099 to 815 cfs. This has raised salinities in the lower estuary to the preferred range for oysters. Manatees are actively migrating upriver to the warm water refuge at the FPL plant and slow speed zones went into effect on 11/15. A Red Tide Advisory and shell fishing ban remain in effect in Lee County waterways.

USACE Action: On 11/14/12, the Corps decided to reduce regulatory discharges to 650 cfs at S-79.

Recommendation: We request that the COE and SFWMD hold as much water as possible in the northern chain of lakes to retain water in the upper reaches of the system to preserve water supply for the dry season. We request flows at S79 be managed between 800 and 850 cfs to maintain appropriate salinities from the lower to the upper estuary.

Lake Okeechobee Lev	vel: 15.36 ft. (Lo	ow Sub-Band) Last wk:	15.51 ft.	
Lake Okeechobee Infl	ow: 296 cfs	Lake Okeechobee Outf	low: 2662 cfs	
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.0",	Moore Haven 0.0"	
Salinity Ft. Myers:	2.6 - 6.5 psu surface	e data (Fort Myers Yacht Ba	sin) Previous wk: 0.6 - 3.0 ps	u
	4.7 - 11.8 psu (SCC	F RECON Marker 52)	Previous wk: 1.1 - 7.0 p	su
MFL Status:	Daily salinity at Fo	rt Myers <u><</u> 10 psu 30 day	moving average = 1.6 psu	
Salinity Shell Point:	17 -32 psu (SCCF	RECON sensor)	Previous week: 11 – 32 p	osu

Beautiful Is 3psu 11/18/12 Surface 175 Salinity psu 5.7psu 0-1 0 1-2 2-5 SCCF Yacht 5-8 Club Site 8-10 Ft. Myers 10-13 13-20 Cape Coral ≥ 20 SCCF 0 Logger RECON O SCCF 13 7psi Tapegrass 🔘 lona Cove 10 Miles 25psu Shell Point

Flow: Flows to the Caloosahatchee estuary through S79 averaged 815 cfs the past week. Reduced freshwater flows have allowed salinities in the estuary to increase, changing the estuary to dry season conditions, reducing stress on oysters and seagrass.

* From ACOE Website Daily Reports				
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
11/13/12	Tue	1060	893	726
11/14/12	Wed	687	816	718
11/15/12	Thu	677	740	566
11/16/12	Fri	866	726	623
11/17/12	Sat	855	736	1149
11/18/12	Sun	889	749	1107
11/19/12	Mon	671	745	1105
Average	Flow	815	772	856



Upstream of S79/Franklin Conditions:

On 11/20/12, chlorides were 54 mg/L and apparent color was 180 CU at the Olga Water Treatment plant. Samples from the 11/5/12 water sampling at the plant revealed low levels of potentially toxic (PTOX) cyanobacteria including *Microcystis sp.* and *Anabaena* sp. as well as *Pseudanabaena* sp., *Merismopedia* sp., and *Aphanocapsa* sp. The dominant algae observed were dinoflagellates (Pyrrophyta) and green algae (Chlorophyta), followed by diatoms (Bacillariophyta) and euglenoids (Euglenophyta). The Green Water Laboratories report is included as a separate attachment on the email with this report.

Upper Estuary Conditions:

Manatee Watch: Since November 1st, Lee County Park Rangers at Manatee Park have reported manatees migrating and congregating upriver in the warm water refuge at the FPL plant on the Orange River. Seasonal slow speed zones for manatees went into effect on 11/15/12.

Lower Estuary Condition:

A red tide warning issued on 11/7/12 by the Lee County Dept of Health, remains in effect for area beaches. A ban on shell fishing remains in effect for Pine Island Sound.

Over the past week, average salinity at lona increased to 15.8 psu, which is within the preferred range (14-28 psu) for oysters. Reduced flows have also improved the salinity for shoal grass. The average salinity at Shell Point increased to 25 psu.

SCCF Marine Lab documented macroalgae on Sanibel beaches and in the J.N. "Ding" Darling National Wildlife Refuge impoundment. Macroalgae included *Ectocarpus sp.* along the Sanibel Causeway mixed with *Botryocladia, Gracilaria, Agardhiella, Hypnea* on Sanibel beaches. Photo at right shows *Acanthophora* (left), *Hypnea* (right) in a DDNW Refuge impoundment.

Red Tide:

High concentrations of *Karenia* spp., the Florida red tide organism, were found in Tarpon Bay, in a Refuge impoundment and in Pine Island Sound near shore on Captiva. Medium and low concentrations were found at open water sites in Pine Island Sound, San Carlos Bay and Sanibel beaches by SCCF and FWRI.

Macroalgae (*Acanthophora spicifera*), photo below, accumulating in Tarpon Bay on 11/16/12 where an anoxia event associated with high concentrations of *Karenia* killed dozens of King's crown conchs *Melogena corona*.



The latest NOAA HAB report MODIS image (for 11/9 to 11/15) shows elevated chlorophyll and suspected *K.brevis* bloom off of Lee County in areas shown by red polygon(s).





Wildlife Impacts:

CROW –Care and Rehabilitation of Wildlife, on Sanibel reports two sick sea turtles, numerous double crested cormorants and pelicans have been sampled and positively identified as sickened by brevetoxin. The past week 13 additional birds have been brought in for treatment.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
_		SCB <11	SCB < 5	SCB =2.2m
Ft. Myers	5.0	207	1.3	0.45
lona	4.8	162	1.4	0.56
San Carlos Bay	5.2	87	9.3	0.94

Target light penetration: CE - Caloosahatchee Estuary =1 m				
SCB-San Carlos Bay = 2.2 meters				
Definition of 25% lz:	I = irradiance	$\mathbf{z} = depth$		

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Subject: Caloosahatchee & Estuary Condition Report

Date: 27 November, 2012

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

Pulse releases to the Caloosahatchee initiated on 11/21/12 reduced flow from an average of 815 to 698 cfs at S79. Salinities are rising throughout the estuary. A Red Tide Advisory and shell fishing ban remain in effect in Lee County waterways.

USACE Action: On 11/21/12, the Corps initiated a 7 day pulse release with flows averaging 650 cfs at S-79 including 2 days with no releases.

Recommendation: We request the Corps use their regulatory authority and the flexibility explicitly stated in the Adaptive Protocols to design water releases needed to maintain appropriate salinities from the lower to the upper estuary. Monitoring data from the past 5 years indicate that flows \leq 650 cfs at S-79 are inadequate to prevent the loss of the low salinity zone during the dry season.

Lake Okeechobee Leve	l: 15.20 ft. (Lo	ow Sub-Band) Last wk: 15.	36 ft.
Lake Okeechobee Inflo	w: 738 cfs	Lake Okeechobee Outflow	: 1777 cfs
Weekly Rainfall:	WP Franklin 0.0"	, Ortona 0.0",	Moore Haven 0.0"
Salinity Ft. Myers:	4.1 -9.7 psu surface	e data (Fort Myers Yacht Basin)	Previous wk: 2.6 - 6.5 psu
	6.9 -14.7 psu (SCC	CF RECON Marker 52)	Previous wk: 4.7 - 11.8 psu
MFL Status:	Daily salinity at Fo	ort Myers <u><</u> 10 psu 30 day mov	ing average = 2.8 psu
Salinity Shell Point:	18 – 32 psu (SCO	CF RECON sensor)	Previous week: 17 -32 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 689 cfs the past week. SCCFs RECON sensor at Ft Myers and sonde at the Ft Myers Yacht Basin documented a rise in salinity as flows dropped below 1000 cfs, (see graph below right). As a result of lower flows and no rainfall for the past four weeks, surface salinity at Ft Myers is nearing the MFL threshold of 10 psu, (red line in graph).

* From ACOE Website Daily Reports					
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)	
11/20/12	Tue	423	467	1119	
11/21/12	Wed	929	420	1114	
11/22/12	Thu	1198	658	1107	
11/23/12	Fri	979	945	1220	
11/24/12	Sat	725	660	1057	
11/25/12	Sun	466	402	558	
11/26/12	Mon	104	98	144	
Average	Flow	689	521	902	



Upstream of S79/Franklin Conditions:

On 11/27/12, chlorides were 58 mg/L and apparent color was 171 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

Tape grass sampling has identified grass beginning to re-emerge in the upper estuary.

Flow data from USGS stations in the two major tributaries in the upper estuary, Telegraph Creek and Orange River, reveal that dry season (November – May) flows into the Caloosahatchee have averaged 28 cfs and 51 cfs respectively since 2007.

These combined tributary flows of 79 cfs are significantly lower than the assumed 265 cfs used in the SFWMD model projections for tidal basin inflows. The location of inflows is a critical metric



as inflows west of the US 41 bridges do not provide freshwater to the areas where tape grass beds seasonally occur.

Local freshwater inflow is an important source of water to the area around Beautiful Island where critical tape grass beds, *Vallisneria americana*, struggle to survive during the dry season when flows through S79 are limited. These tape grass beds are critical resources for endangered manatees that congregate in the Orange River over the winter months.

Manatee Watch: Lee County park rangers at Manatee Park on the Orange River have reported manatees congregating in the warm water refuge for approximately 4 weeks since water temperatures began dropping on October 20, 2012. Rangers report a number of mothers with calves estimating that calves account for approximately 15% of the population.

Lower Estuary Condition:

Red Tide: The latest NOAA HAB report MODIS image shows elevated chlorophyll and a suspected *K. brevis* bloom south of the Caloosahatchee in areas shown by red polygon(s). The red tide warning issued on 11/7/12 by the Lee County Dept of Health, remains in effect for area beaches. A ban on shell fishing remains in effect for Pine Island Sound.

Wildlife Impacts: Twenty six new cases of wildlife poisoned by brevetoxin have been admitted the past week to CROW, the wildlife rehabilitation center on Sanibel. Species include numerous double crested cormorants, brown pelicans and one Kemps Ridley sea turtle.

Oysters: Both disease intensity and prevalence of Dermo are high with disease prevalence at 93 - 100% and disease intensity ranging from 1.5 - 3.0.



Spat recruitment ranged from 0.44 spat/shell/month at Piney Point to 26.7 spat/shell/month at Kitchel Key, similar to last year. The lower numbers at Piney Point may be due to the recent extreme releases or may be a natural slowdown of reproduction this time of year, or both. All juvenile oysters died in late spring early summer possibly from high salinities. Spawning was affected by high salinities that prevailed until late August.

Macroalgae: (*Ulva* sp.), is accumulating on rocks along the Sanibel Causeway. Photo by SCCF on 11/26/12.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB = 2.2m
S79 West	5.4	234	1.1	0.40
Beautiful Is.	5.5	212	1.2	0.44
Ft. Myers	6.2	191	0.9	0.48
	•	- -	•	

Target light penetration: CE - Caloosahatchee Estuary =1 m					
SCB -San Carlos Bay = 2.2 meters					
Definition of 25% Iz:	I = irradiance	$\mathbf{z} = depth$			



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Subject: Caloosahatchee & Estuary Condition Report

Date: 4 December, 2012

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

Dry conditions remain throughout the area with no rain documented within the watershed. Pulse releases continue to supply freshwater flow through S79 to the Caloosahatchee estuary. The past week flows averaged 727 cfs at S79. Surface salinities at Ft Myers continue to rise reaching 10 psu on the upper end of the range. A Red Tide Advisory and shell fishing ban remain in effect in Lee County waterways.

USACE Action: On 11/28/12, the Corps re-initiated a 7 day pulse release with flows averaging 650 cfs at S-79 including two days with no releases.

Recommendation: We request the Corps use their regulatory authority and the flexibility explicitly stated in the Adaptive Protocols to design water releases needed to maintain appropriate salinities from the lower to the upper estuary. Monitoring data from the past 5 years show that flows \leq 650 cfs at S-79 are inadequate to prevent the loss of the low salinity zone during the dry season.

Lake Okeechobee Level:	15.09 ft. (Low Sub-Band) Last wk: 15.20 ft .	
Lake Okeechobee Inflow:	501 cfsLake Okeechobee Outflow:1616	cfs
Weekly Rainfall:	WP Franklin 0.0", Ortona 0.0",	Moore Haven 0.0"
Salinity Ft. Myers:	7.2 - 10.9 psu surface data (Fort Myers Yacht Basin)	Previous wk: 4.1 -9.7 psu
	9.1 - 14.7 psu (SCCF RECON Marker 52)	Previous wk: 6.9 -14.7 psu
MFL Status:	Daily salinity at Fort Myers < 10 psu 30 day moving	average = 4.8 psu
Salinity Beautiful Island:	2.5 - 4.8 psu (SCCF RECON Marker 18)	Deployed 11/27/12
Salinity Shell Point:	18 -32 psu (SCCF RECON sensor)	Previous week: 18 – 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 727 cfs the past week. SCCFs surface salinity sensor at the Ft Myers Yacht Basin reports the salinity at Ft Myers reached the MFL threshold of 10 psu during high tide periods. SCCF deployed a RECON sensor at Beautiful Island where tape grass, *Valliseneria americana*, is attempting to re-emerge. Data from this site will allow scientists to more accurately assess salinity responses in the immediate vicinity of tape grass beds to changes in water flows at S79.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
11/27/12	Tue	0	0	152
11/28/12	Wed	949	941	1092
11/29/12	Thu	1554	1422	1726
11/30/12	Fri	1126	1105	1341
12/1/12	Sat	723	685	1023
12/2/12	Sun	593	526	556
12/3/12	Mon	147	339	388
Average	Flow	727	716	896



Upstream of S79/Franklin Conditions:

On 12/4/12, chlorides were 58 mg/L and apparent color was 169 CU at the Olga Water Treatment plant.

Upper Estuary Conditions:

SCCFs RECON and Yacht Basin sensors recorded surface salinity rising above 10 psu during high tides.

Manatee Watch: Lee County park rangers at Manatee Park on the Orange River have reported manatees congregating in the warm water refuge. Rangers report approximately 12 – 30 individuals the past week.

Lower Estuary Condition:

Red Tide: Satellite chlorophyll image with possible K. brevis HAB areas shown by red polygon(s). Cell concentration sampling data from November 24 to 29 shown as red (high), orange (medium), yellow (low b), brown (low a), blue(very low b), purple (very low a), pink (present), and green (not present). Cell count data are provided by Florida FWC Fish and Wildlife Research Institute. A red tide advisory and shell fishing ban remain in effect for area beaches and Pine Island Sound.





Drift Algae:

Small amounts of macroalgae including *Acanthophora* and *Ulva* are present along the shoreline of San Carlos Bay. *Acanthophora spicifera* is one of the dominant inshore types of red drift macroalgae,

shown in the SCCF photo at right taken on 11/29/12.

Wildlife Impacts: Twenty nine new cases of wildlife poisoned by brevetoxin have been admitted the past week to CROW, the wildlife rehabilitation center on Sanibel. Species include laughing gulls, royal terns, double crested cormorants and brown pelicans.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
-		SCB <11	SCB < 5	SCB = 2.2m
S79 West	5.0	211	1.4	0.49
Beautiful Is.	5.4	187	1.5	0.56
Ft. Myers	6.0	192	1.5	0.61

Target light penetration: CE - Caloosahatchee Estuary =1 m					
SCB-San Carlos Bay = 2.2 meters					
Definition of 25% lz:	I = irradiance	z = depth			

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Subject: Caloosahatchee & Estuary Condition Report

Date: 11 December, 2012

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

Dry conditions remain throughout the area with average rainfall of 1.10" documented within the watershed over the past week. Pulse releases continue to supply freshwater flow through S79 to the Caloosahatchee estuary. The past week flows averaged 636 cfs at S79. Surface salinities at Ft. Myers continue to rise and are reaching 10 psu on the upper end of the range. A Red Tide Advisory and shell fishing ban remain in effect in Lee County waterways.

USACE Action: A new 10-day pulse release will begin 12/12/12 and end on 12/21/12, with an average flow of 650 cfs. The pulse is designed to address rapidly rising salinity in the upper estuary. A series of 10-day pulses are scheduled through 1/10/13, with average flows of 650 cfs. Each 10-day pulse release includes 4 days of no releases.

Recommendation: We request that the Corps use their regulatory authority and the flexibility explicitly stated in the Adaptive Protocols to design water releases needed to maintain appropriate salinities within the upper and lower estuary. Monitoring data from the past 5 years show that flows \leq 650 cfs at S-79 are inadequate to prevent the loss of the low salinity zone during the dry season.

Lake Okeechobee Level:	15.11 ft. (Low Sub-Ba	and) Last wk: 15. 09 ft.	
Lake Okeechobee Inflow:	3267 cfs	Lake Okeechobee Outflow:	N/A cfs
Weekly Rainfall:	WP Franklin 0.53",	Ortona 1.01", Moore	e Haven 1.77"
Salinity Ft. Myers:	8.2 - 12.9 psu surface of	data (Fort Myers Yacht Basin)	Previous wk: 7.2 - 10.9 psu
	12.8- 16.1 psu (SCCF	RECON Marker 52)	Previous wk: 9.1 - 14.7 psu
MFL Status:	Daily salinity at Fort M	Myers <u><</u> 10 psu 30 day moving a	average = 6.9 psu
Salinity Beautiful Island:	3.2 – 6.8 psu (SCCF F	RECON Marker 18)	Previous week: 2.5 - 4.8
Salinity Shell Point:	20 – 32 psu (SCCF F	RECON sensor)	Previous week: 18 – 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 636 cfs during the past week. SCCF's surface salinity sensor at the Ft Myers Yacht Basin reports salinity at Ft. Myers reached the MFL threshold of 10 psu during high tide periods. The data from the new Beautiful Island SCCF RECON sensor is now available on-line. Tape grass is only documented (as of 12/10) along a shallow depth range just west of this site.

Date	Day	S79 Flow*	S78 Flow*	S77 Flow *
		(cfs)	(cfs)	(cfs)
12/4/12	Tue	0	0	226
12/5/12	Wed	760	487	540
12/6/12	Thu	1157	1000	1228
12/7/12	Fri	903	623	904
12/8/12	Sat	787	585	684
12/9/12	Sun	671	565	487
12/10/12	Mon	175	180	96
Average	Flow	636	491	595

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

On 12/11/12, chlorides were 62 mg/L and apparent color was 113 CU at the Olga Water Treatment plant. The raw chlorophyll concentration at S79 E was 5.8 ug/L on 12/09.

Upper Estuary Conditions:

SCCFs RECON and Yacht Basin sensors recorded surface salinity rising above 10 psu and chlorophyll rising above 25 ug/L. The elevated chlorophyll concentrations at Ft. Myers were visible to the naked eye Monday morning due to high concentrations of filamentous diatoms (*Leptocylindrus danicus*). Bloom was expanding upstream to Beautiful Island Sunday and Monday (12/10).

Lower Estuary Condition:

Red Tide: SCCF samples, the NOAA report and FWC reports show either no or low concentrations of *Karenia brevis* around Sanibel and Lee County, though elevated chlorophyll concentrations are still present offshore of Lee County. This past week 10 birds were admitted to C.R.O.W. for suspected brevetoxicosis.

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Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz Light (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
S79 West	6.9	1 98	1.2	0.80
Beautiful Is.	8.7	185	1.0	0.83
Ft. Myers	32.0	179	1.9	0.73

Target light penetration: CE - Caloosahatchee Estuary =1 m						
	SCB -San Carlos Bay = 2.2 meters					
Definition of 25% lz:	I = irradiance	$\mathbf{z} = depth$				



Photo to left shows tape grass shoots near Beautiful Island 12/10/12.

Manatee Reports:

Manatees were present in the FPL canal and river from 12/3 through 12/9 and are visible from the viewing areas at Manatee Park. Both adults and calves have been reported in the area.

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Subject: Caloosahatchee & Estuary Condition Report

Date: 18 December, 2012

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

The past week flows averaged 1087 cfs at S79. A Red Tide Advisory and shell fishing ban remain in effect in Lee County waterways.

USACE Action: On 12/12/12, the Corps initiated a 10 day pulse release with flows averaging 650 cfs at S79 including four days with no releases.

Recommendation: We request the Corps and District design a 10 day pulse release averaging 1000 cfs at S79 to follow the current pulse release. Previous weeks flows averaging 684 cfs resulted in salinities rising above the 10 psu MFL at Ft Myers. The past weeks flow of 1085 cfs has lowered rising salinities to below the 10 psu MFL.

Lake Okeechobee Level:	15.18 ft. (Low Sub-E	Band) Last wk: 15.11 ft.	
Lake Okeechobee Inflow:	2,256 cfs	Lake Okeechobee Outflow:	545 cfs
Weekly Rainfall:	WP Franklin 0.43",	Ortona 0.17", Moor	e Haven 0.26"
Salinity Ft. Myers:	6.9 - 11.4 psu surface	data (Fort Myers Yacht Basin)	Previous wk: 8.2 - 12.9 psu
	8 - 16 psu (SCCF REC	CON Marker 52)	Previous wk: 13 - 16 psu
MFL Status:	Daily salinity at Fort	Myers <u><</u> 10 psu 30 day moving	average = 8.2 psu
Salinity Beautiful Island:	2.6 – 6.8 psu (SCCF I	RECON Marker 18)	Previous wk: 3.2 – 6.8 psu
Salinity Shell Point:	20 - 33 psu (SCCF F	RECON sensor)	Previous week: 20 – 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,085 cfs the past week. SCCFs surface salinity sensor at the Ft Myers Yacht Basin indicates that the higher flows during the middle of the week reduced salinity at Ft Myers below the MFL threshold of 10 psu.

* From ACOE Website Daily Reports						
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)		
12/11/12	Tue	712	239	0		
12/1212	Wed	1336	913	0		
12/13/12	Thu	1893	1093	836		
12/14/12	Fri	1385	1062	948		
12/15/12	Sat	987	867	796		
12/16/12	Sun	802	436	330		
12/17/12	Mon	484	322	222		
Average	Flow	1085	704	447		



Upstream of S79/Franklin Conditions:

On 12/18/12, chlorides were 62 mg/L and apparent color was 95 CU at the Olga Water Treatment plant. Chlorophyll at S79 east was 14.0 ug/L on 12/16/12.

Upper Estuary Conditions:

Comparing this week's higher flows through S79 (1085 cfs) to last week's (636 cfs), SCCFs RECON and Yacht Basin sensors recorded surface salinity rising with lower flows last week and dropping with higher flows this week. The RECON sensors at Ft Myers and Beautiful Island recorded elevated chlorophyll levels through 12/12/12.

Manatee Watch: Lee County park rangers at Manatee Park on the Orange River report manatees congregating in the warm water refuge of the canal and river.

Lower Estuary Condition:

Macroalgae:

Moderate amounts of macroalgae dominated by *Ulva* were growing attached to shells along the causeway and also washed up at Lighthouse Beach on 12/14/12. Larger amounts of drift algae, mainly red algae, washed ashore along Ft Myers Beach on 12/13-12/15/12. Dominant genera were *Agardhiella subulata*, *Gracilaria*, *Hypnea spinella*, *Dasya* and *Acanthophora spicifera*. Large clumps of *Agardhiella* and smaller clumps of *Acanthophora spicifera*, *Hincksia mitchelli*, *Lomentaria*, *Spyridia filamentosa* and a tube dwelling diatom *Nitzschia*, were found in seagrass meadows in San Carlos Bay.

Wildlife Impacts: Since 12/10/12, there have been 34 new cases of suspected Brevetoxicosis admitted to CROW, the wildlife rehabilitation center on Sanibel. All past "suspected brevetoxicosis" cases have been confirmed to be from red tide. Over 1/3 of all wildlife cases presented to



Oysters: Disease (Dermo) prevalence and Intensity are high with prevalence ranging from 93-100% and Intensity 1.8 - 2.07 (high, but normal for this time of the year).

Spat recruitment is normal at 0.06 – 2.58 spat/shell/month, as oysters enter a quiet period for reproduction between now through April/May. (Data provided by Dr. Aswani Voleti, FGCU)

Caloosahatchee Stations	Chlorophyll (ug/L)	CDOM (gse)	Turbidity (NTU)	25% Iz Light (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m		
S79 West	5.5	201	1.3	0.79		
Beautiful Is.	5.8	207	1.3	0.81		
Colonial Bridge	4.1	152	1.44	0.96		
Target light penetration: CE- Caloosahatchee Estuary =1 m SCB-San Carlos Bay = 2.2 meters						

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



Red drift algae at Bowditch Park Ft Myers Beach 12/15/12 Photo SCCF



Filamentous *Ulva* attached to shell along the Sanibel Causeway 12/14/12. Photo SCCF
Hincksia growing on seagrass in San Carlos Bay 12/17/12. Photo SCCF





Lee County Algal Screening Report

Prepared: November 19, 2012 Prepared By: GreenWater Laboratories/Amanda Foss

Samples: Olga Raw (collected 11/5/12) Olga Finish

Methods

Two mL of the Olga Raw & Finish samples collected November 5, 2012 were preserved with Lugol's iodine solution and allowed to settle. Non-preserved samples were also prepared. Both preserved & non-preserved aliquots were observed at 200X and 400X using a Nikon Eclipse TS200 Inverted Microscope equipped with phase contrast optics.

Results

Olga Raw:

Microscopic observation revealed that in the Olga Raw sample has increased in algal densities and diversity from previous the month collection. Although the sample was not dominated by potentially toxic (PTOX) cyanobacteria, the PTOX cyanobacteria *Microcystis* sp. and *Anabaena* sp. were observed. Other cyanobacteria included *Pseudanabaena* sp., *Merismopedia* sp., and *Aphanocapsa* sp. The dominant algae observed were dinoflagellates (Pyrrophyta) and green algae (Chlorophyta), followed by diatoms (Bacillariophyta) and euglenoids (Euglenophyta).

Olga Finish:

Algal cells were not observed in the finished water sample.



Microcystis sp. at 200x Olga Raw





Anabaena sp. at 400x Olga Raw

Recommendations

Although cell densities of PTOX cyanobacteria were not high, toxin analysis for microcystins is recommended at this time based on the observation of *Microcystis* colonies. *Anabaena* sp. densities were much lower than that of *Microcystis*, therefore anatoxin-a analysis is not currently recommended.

Submitted by:

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