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: 8 January, 2013

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

Monday 1/7/13 was the last day of a ten day pulse release with an average target flow of 650 cfs at S79. Flows through S79 averaged 961 cfs over the past seven days. Since 12/12/12, releases have provided sufficient flow to maintain an ecologically appropriate salinity profile for the Caloosahatchee estuary. A Red Tide Advisory and shell fishing ban remain in effect in Lee County waterways.

USACE Action: A second ten day pulse release begins today, 1/8/2013, with an average target flow of 650 cfs at S79 with no flow for the first 4 days of the pulse.

Lake Okeechobee Level:	15.01 ft. (Low Sub-	Last wk: 14.90 ft.						
Lake Okeechobee Inflow:	1,193 cfs	Lake Okeechobee Outflow:	NR cfs					
Weekly Rainfall:	WP Franklin 0.16",	Ortona 0.05",	Moore Haven 0.89"					
Salinity Ft. Myers:	5.9 – 9.4 psu surface	5.9 – 9.4 psu surface data (Fort Myers Yacht Basin)						
	8 - 16 psu (SCCF RE	Previous wk: 7 - 16 psu						
MFL Status:	Daily salinity at Fort	Daily salinity at Fort Myers < 10 psu 30 day moving						
Salinity Beautiful Island:	1.8 – 4.0 psu (SCCF I	Previous wk: 1.8 – 3.9 psu						
Salinity Shell Point:	20 - 32 psu (SCCF	20 - 32 psu (SCCE RECON sensor)						



Flow: Flows to the Caloosahatchee estuary through S79 averaged 961 cfs over the past week. SCCFs surface salinity sensor at the Ft Myers Yacht Basin indicates that hourly and 30 day moving average salinities remained below the MFL threshold of 10 psu at Ft Myers.

* Fror	* From ACOE Website Daily Reports						
Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)			
1/1/13	Tue	0	0	206			
1/2/13	Wed	914	539	734			
1/3/13	Thu	1775	1435	1353			
1/4/13	Fri	1605	1300	1740			
1/5/13	Sat	1127	836	1087			
1/6/13	Sun	776	465	632			
1/7/13	Mon	533	396	216			
Average	Flow	961	710	852			



Upstream of S79/Franklin Conditions:

SCCF measured chlorophyll upstream of S79 of 12 ug/L over the past week caused predominantly by dinoflagellates at 333,000 cells/L. On 1/8/13, chlorides were 66 mg/L and apparent color was 114 CU at the Olga Water Treatment plant. The plant is offline for maintenance.

Upper Estuary Conditions:

SCCFs Ft Myers Yacht Basin sensor recorded surface salinity stabilizing last week at 5.9-9.4 psu, while the mid depth salinities at the Ft Myers RECON site increased slightly. Chlorophyll spikes over 20 ug/L (a moderate dinoflagellate bloom) recorded by the Beautiful Island RECON on 01/01/13 have returned to low levels.

Manatee Watch: Park Rangers at Manatee Park on the Orange River report up to 200 manatees in the discharge canal and Orange River, with a mating herd spotted at the north end of the discharge canal by the discharge pipes and also at the confluence with the Orange River.

Lower Estuary Condition:

Red Tide: Concentrations of *Karenia* spp. were very high, over 14 million cells/L, on the east end of Sanibel at three locations from Pine Island Sound to the Gulf on 01/04/13. Concentrations dropped at these sites over the weekend but increased in Tarpon Bay to medium levels. Dead fish have been reported in Tarpon Bay, the east end canal system, and at the Sanibel boat ramp. The main fish species noted on the beach over the weekend was mullet.

Oysters: Both disease intensity and prevalence of Dermo are high. Mean intensity ranged between 1.80 - 2.07 and prevalence was between 93 - 100%. This is likely due to the higher salinities in the estuary. Freshwater releases should help reduce salinities, and decrease the intensity and prevalence of Dermo.

Spat recruitment is between 0.05 – 1.08 spat/shell. Reproduction typically ends



by October / November and oysters conserve energy during the cooler months accumulating glycogen and lipid reserves for reproduction in the spring. FGCU will be deploying juveniles sometime this month or early next month to study predation and growth. (Data provided by Dr. Aswani Voleti, FGCU)

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	
Stations	(µg/L)	(qse)	(NTU)	(meters)	
Target 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
S79 West	5.5	221	1.3	0.72	
31 Bridge	4.8	221	2.5	0.72	Definition of 25% Iz: $I = irradiance$ $z = depth$
Colonial Bridge	6.5	142	1.4	0.99	

Wildlife Impacts: Nine new cases of wildlife poisoning by red tide brevetoxin were received at CROW, the rehabilitation hospital on Sanibel, including 4 Double Crested Cormorants, 2 Laughing Gulls, 1 Royal Tern, 1 White Pelican and 1 Kemp's ridley sea turtle. (Dr. Heather Barron, Hospital Director, CROW)

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: 15 January, 2013

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

Monday 1/14/13 was the seventh day of a ten day pulse release. Since 1/7/13 salinities in the upper estuary have been increasing and this past week crossed above the 10 psu MFL at Ft Myers and above 5 psu at Beautiful Island. Over the past seven days flows through S79 decreased compared to last week averaging 819 cfs, with four days of no releases from Lake Okeechobee. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: The current ten day pulse release, that ends on 1/17/13, targeted average flows of 650 cfs at S79.

Recommendation: Operation of the system between 12/12/12 and 1/7/13 suggests flows averaging 930 cfs through S79, and occasional basin run-off, were sufficient to maintain an appropriate ecological salinity regime for the estuary. We request the Corps design a pulse release averaging 1000 cfs to maintain salinity levels below 10 psu at Ft Myers which will support established and emerging tape grass.

Lake Okeechobee Level:	14.97 ft. (Low Sub-Ba	Last wk: 15.01 ft.	
Lake Okeechobee Inflow:	227 cfs	2088 cfs	
Weekly Rainfall:	WP Franklin 0.38",	Ortona 0.01",	Moore Haven 0.0"
Salinity Ft. Myers:	7.8 – 11.2 psu surface o	Previous wk: 5.9 – 9.4 psu	
	11 - 16 psu (SCCF REC	Previous wk: 8 - 16 psu	
MFL Status:	Daily salinity at Fort M	average = 8.4 psu	
Salinity Beautiful Island:	2.0 – 7.7 psu (SCCF R	Previous wk: 1.8 – 4.0 psu	
Salinity Shell Point:	20 - 33 psu (SCCF RI	ECON sensor)	Previous week: 20 - 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 819 cfs over the past week. SCCFs surface salinity sensor at the Ft Myers Yacht Basin indicates rising salinities have exceeded the MFL threshold of 10 psu at Ft Myers.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
1/8/13	Tue	129	97	0
1/9/13	Wed	376	231	0
1/10/13	Thu	547	327	0
1/11/13	Fri	351	288	0
1/12/13	Sat	1192	755	750
1/13/13	Sun	1624	1196	1059
1/14/13	Mon	1515	1272	1253
Average Flow		819	595	437

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

On 1/13/13 SCCF measured 6.5 µg/L chlorophyll upstream of S79. On 1/15/13, chlorides measured 62 mg/L and apparent color was 110 CU at the Olga Water Treatment plant. The plant remains offline for maintenance.

Upper Estuary Conditions:

Salinities at the Ft Myers and Beautiful Island RECON sensors and surface salinities at the Ft Myers Yacht basin increased slightly over the past week, exceeding the MFL at Ft Myers. Chlorophyll spikes were recorded by the Beautiful Island RECON. A diatom bloom of *Skeletonema* was sampled on 1/13/13 measuring 2.3 million filaments/L. On 1/15/13, 1.3 million cells/L of dinoflagellates were found at Beautiful Island.

Manatee Watch: Park Rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River but with recent warmer weather some have begun to disperse the past week. On 1/13/13, a manatee was rescued from the Orange River with suspected red tide poisoning.

Lower Estuary Condition:

Red Tide: Medium concentrations of *Karenia* spp. were recorded by FDACS/FWC throughout Pine Island Sound on 1/14/13 and by SCCF on 1/15/13. Concentrations of *Karenia* spp. along the east side of Sanibel decreased from the previous week, though high concentrations of *K. brevis* were found offshore of Captiva. Respiratory irritation (possibly brevetoxins) and dead fish were reported around Redfish Pass, Buck Key and Fort Myers Beach with mullet being the main species found, along with catfish and pinfish. Mullet roe fishermen may have contributed to the large numbers of dead mullet observed on Captiva, but the sex ratio of the mullet was not determined.

Caloosahatchee Stations	Chlorophyll (ug/L)	CDOM (gse)	Turbidity (NTU)	25% Iz Light (meters)	
Target Values	< 11	CE <70	CE < 18	CE = 1 m	Target light penetration: CE - Caloosahatchee Estuary =1 m
•		SCB <11	SCB < 5	SCB = 2.2m	SCP Son Corlos Pour - 2.2 motors
S79 West	5.3	201	1.1	0.80	3CB-3dH Callos Day = 2.2 Hielers
31 Bridge	4.7	194	1.0	0.83	Definition of 25% Iz: $I = irradiance$ $z = depth$
Colonial Bridge	6.0	150	1.7	0.95	

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Subject: Caloosahatchee & Estuary Condition Report

Date: 29 January, 2013

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 for a second consecutive week with no rain recorded in the basin. Sunday 1/27/13 was the last day of a 10 day pulse release. With the start of a new 10 day pulse release, flows on 1/28/13 were reduced to 117 cfs, and salinity in the upper estuary rose rapidly above 10 psu at Ft Myers, where it had been stabilized the previous week. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10 day pulse release averaging 650 cfs at S79 started on 1/28/13.

Recommendation: We request the Corps design a pulse release averaging 1,000 cfs to lower rising salinity levels to below 10 psu at Ft Myers to support emerging tape grass and prevent harmful effects to the estuary resources.

Lake Okeechobee Level:	14.69 ft. (Low Sub-B	Last wk: 14.86 ft.	
Lake Okeechobee Inflow:	456 cfs	NR cfs	
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.0",	Moore Haven 0.0"
Salinity Ft. Myers:	8.6 - 12.6 psu surface o	data (Fort Myers Yacht Basin)	Previous wk: 8.6 – 11.3 psu
	10 - 18 psu (SCCF REC	CON Marker 52)	Previous wk: 10 - 18 psu
MFL Status:	Daily salinity at Fort M	/lyers <u><</u> 10 psu 30 day moving a	average = 9.1 psu
Salinity Beautiful Island:	3.5 - 6.0 psu (SCCF RE	Previous wk: 3.5 – 6.0 psu	
Salinity Shell Point:	20 - 32 psu (SCCF R	ECON 14 th -17th)	Previous week: 23 - 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,027 cfs over the past seven days and 722 cfs for the 10 day pulse. SCCFs surface salinity sensor at the Ft Myers Yacht Basin indicates salinities rising above 10 psu since 1/8/13 and reaching 12.6 psu on 1/28/13 in response to reduced flow.

Date	Day	S79 Flow* (cfs)	S78 Flow* (cfs)	S77 Flow * (cfs)
1/22/13	Tue	920	573	628
1/23/13	Wed	2058	1317	1427
1/24/13	Thu	1655	733	1011
1/25/13	Fri	1071	756	546
1/26/13	Sat	833	602	513
1/27/13	Sun	538	324	424
1/28/13	Mon	117	99	218
Average Flow		1027	629	681

* From ACOE Website Daily Reports



Upstream of S79/Franklin Conditions:

On 1/29/13, chlorides measured 66 mg/L and apparent color was 106 CU at the Olga Water Treatment plant. The plant remains offline for maintenance.

Upper Estuary Conditions:

Salinities at the Ft Myers and Beautiful Island RECON sensors and surface salinities at the Ft Myers Yacht basin were similar to the previous week, exceeding the MFL at Ft Myers on 1/28/13 when flows dropped to 117 cfs. Chlorophyll spikes continue at the Beautiful Island RECON site where *Akashiwo sanguinea* (266,000 cells/L) and Skeletonema sp. were noted on 1/27/13.



Lower Estuary Condition:

Red Tide: High and medium concentrations of *Karenia brevis* were recorded by FDACS/FWC during the week in Pine Island Sound from northeast of Captiva to Blind Pass. *Karenia* spp. concentrations were high in Tarpon Bay until 1/28/13, when they dropped to medium. Dead fish and respiratory irritation were reported along Pine Island Sound and along the bay from Lighthouse Beach, Sanibel Boat Ramp, Tarpon Bay and Wulfert Point. Medium concentrations (240,000 *Karenia spp./L*) were found at Tarpon Beach on 01/28/13. Fort Myers Beach also reported scattered occurrences of dead fish along island beaches.

Oysters: Perkinsus marinus intensity is slightly high (1.8 – 2.07, mean 1.93); Disease prevalence is high 93 – 100% (Mean 96%), due to high salinities. December 2012 recruitment is between 0.06 and 2.56. This is the resting phase for oysters. In February oysters will be deployed for growth and survival research. (Data provided by Dr. Aswani Voleti, FGCU)

Wildlife impacts: Three double crested cormorants were treated for brevetoxicosis the past week at CROW, the rehabilitation hospital on Sanibel. (Dr. Heather Barron, Hospital Director, CROW)



Beautiful Island salinity/flow graph. Salinity based on RECON data with flows through S79. The salinity rise at BI can be caused by higher tides, water column mixing, decreased flow or any combination of these factors.

Manatee Watch: Lee County Park Rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River with up to 100 manatees present over the past week.



One of two Kemps Ridley sea turtle juveniles washed up on Sanibel the past two weeks. Suspect brevetoxin poisoning. Photo SCCF

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	
Stations	(µg/L)	(qse)	(NTU)	(meters)	
Target 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
S79 West	6.3	190	1.5	0.82	
31 Bridge	6.1	185	2.1	0.82	Deminition of 25% iz: $I = irradiance$ $Z = depth$
Colonial Bridge	5.3	129	1.8	1.04	

The SFWMD Val I75 graph below predicts the salinity level at I-75 Bridge will continue to rise within the next 2 weeks assuming a 650 cfs pulse release from S-79. The daily level will meet or exceed 5 psu, while the 30 day moving average will increase to just below 5 psu.



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Subject: Caloosahatchee & Estuary Condition Report

Date: 5 February, 2013

Salinity Shell Point:

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

Monday, 2/4/13, was the eighth day of the current 10 day pulse release. Salinity at Ft Myers rose above 10 psu, to 12 - 13.5 psu for four days this past week, in response to four days of little or no flow at the beginning of the pulse. The 30 day moving average at Ft Myers also exceeded 10 psu, establishing the 6th consecutive year of MFL exceedence. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10 day pulse release averaging 650 cfs at S79 started on 1/28/13.

Recommendation: We request that the Corps design a pulse release averaging 1,000 cfs to lower rising salinity levels to below 10 psu at Ft Myers to support emerging tape grass and prevent additional harm to the estuary resources.

Lake Okeechobee Level:	14.53 ft. (Low Sub-B	14.53 ft. (Low Sub-Band)					
Lake Okeechobee Inflow:	35 cfs	2,920 cfs					
Weekly Rainfall:	WP Franklin 0.02",	Ortona 0.08",	Moore Haven 0.06"				
Salinity Ft. Myers:	9.7 - 13.5 psu surface	data (Fort Myers Yacht Basin)	Previous wk: 8.6 - 12.6 psu				
	11- 16 psu (SCCF RE	CON Marker 52)	Previous wk: 10 - 18 psu				
MEL Clature	MEL Violetion oth Co.	Continue Verse Continue Horm					

MFL Status:MFL Violation 6" Consecutive Year = Serious Harm
Daily salinity at Fort Myers < 10 psu</th>30 day moving average = 10.1 psu

Salinity Beautiful Island:3.9 - 8.5 psu (SCCF RECON Marker 18)

22 - 33 psu (SCCF RECON 14th-17th)

Previous wk: 3.5 – 6.0 psu Previous week: 20 - 32 psu



SCCF Sonde Surface Salinity at Fort Myers Yacht Basin

Flow: Flows to the Caloosahatchee estuary through S79 averaged 784 cfs over the past seven days including three days of no flow. SCCFs surface salinity sensor at the Ft Myers Yacht Basin indicates that during the days with no flow salinities rose and stabilized around 13 psu. Subsequent flows reduced salinity to 10-11 psu.

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* From ACOE Website Daily Reports

Upstream of S79/Franklin Conditions:

On 1/29/13, chlorides measured 62 mg/L and apparent color was 123 CU at the Olga Water Treatment plant. The plant remains offline for maintenance. Water column chlorophyll a was elevated (18.3 ug/L) due mainly to flagellates. Phycocyanin levels were slightly elevated.

Upper Estuary Conditions:

Chlorophyll spikes continued at the Beautiful Island RECON site where flagellates and single celled cyanobacteria were the dominant groups on 2/4/13.

Manatee Watch: Lee County Park Rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River with up to 300 manatees and at least one juvenile present over the past week. According to FWRI there were 20 manatee mortalities in Lee County during the month of January. Red tide is the suspected causal factor.

Lower Estuary Condition:

Red Tide: Karenia brevis numbers recorded by FWC this past week in Pine Island Sound were low to medium. Karenia spp. concentrations in Tarpon Bay dropped to < 300,000 cells/L. Decomposing dead fish were present in Tarpon Bay this past week.

Caloosahatchee	Chlorophyll	CDOM (gso)		25% Iz Light	
Stations	(µg/Ľ)	(436)		(meters)	
Target 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
S79 West	6.0	223	1.6	0.73	
31 Bridge	6.2	205	1.5	0.78	Definition of 25% iz: $I = irradiance$ $Z = depth$
Colonial Bridge	6.3	131	1.9	1.02	

Wildlife Impacts: Seventeen new cases of brevetoxin poisoning have been admitted to CROW, the rehabilitation hospital on Sanibel over the past two weeks. Fourteen double crested cormorants, 1 ring billed gull, 1 sandwich tern and 1 black scoter.

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: February 5 -11, 2013

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

Caloosahatchee Condition Summary

Monday 2/11/13 was the fifth day of the current 10 day pulse release. Higher flows from the current release are having the desired result providing a downward salinity trend at Ft Myers. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10 day pulse release averaging 1000 cfs at S79 started on 2/7/13. The pulse includes 2 days of no flow at the end of the schedule.

Recommendation: We request that the Corps continue the current management operations with a pulse release averaging 1,000 cfs to further reduce and maintain salinity levels below 10 psu at Ft Myers. This will support emerging tape grass and prevent additional harm to the estuary resources.

Lake Okeechobee Level:	14.35 ft. (Low Sub-E	Last wk: 14.53 ft.				
Lake Okeechobee Inflow:	300 cfs	Lake Okeechobee Outflow:	3,281 cfs			
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.0",	Moore Haven 0.0"			
Salinity Ft. Myers:	8.3- 12.8 psu surface	Previous wk: 9.7 - 13.5 psu				
	11 -17 psu (SCCF RE	Previous wk: 11- 16 psu				
MFL Status:	MFL Violation 6 th Co Daily salinity at Fort	MFL Violation 6 th Consecutive Year = Serious Harm Daily salinity at Fort Myers < 10 psu 30 day moving				
Salinity Beautiful Island:	2.3 - <mark>6.0</mark> psu (SCCF F	Previous wk: 3.9 - 8.5 psu				
Salinity Shell Point:	22 - 32 psu (SCCF	RECON 14 th -17th)	Previous wk: 22 - 33 psu			



Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,297 cfs over the past seven days and 682 cfs over the ten day pulse release that ended on 2/6/13. Increased flows in the current pulse have been effective in reducing salinity at Ft Myers to the 10 psu range. The 30 day moving average remains above 10 psu.

ACOE January 28, 2013 Pulse Release						
Date	Day	S79 Flow*	S78 Flow*	S77 Flow *		
		(CIS)	(CIS)	(CTS)		
1/28/13	1	117	99	218		
1/29/13	2	0	0	288		
1/30/13	3	0	0	364		
1/31/13	4	0	265	484		
2/1/13	5	976	680	708		
2/2/13	6	1978	1369	1281		
2/3/13	7	1534	1267	1733		
2/4/13	8	1002	788	1039		
2/5/13	9	709	635	810		
2/613	10	512	445	795		
10 Day	Ave	682	554	772		

SCCF Sonde Surface Salinity at Fort Myers Yacht Basin



Upstream of S79/Franklin Conditions:

On 2/12/13, chlorides measured 68 mg/L and apparent color was 80 CU at the Olga Water Treatment plant. The plant remains offline for maintenance.

Upper Estuary Conditions:

Chlorophyll spikes from phytoplankton continued at the Beautiful Island RECON site ranging from a baseline of 6 ug/l to as high as 22 ug/l. Increased flow reduced maximum salinities from 8.5 psu to 6.0 psu.



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	5.6	222	1.4	0.74
31 Bridge	5.7	216	1.9	0.74
Colonial Bridge	5.3	120	3.7	0.99

 Target light penetration: CE- Caloosahatchee Estuary =1 m

 SCB-San Carlos Bay = 2.2 meters

 Definition of 25% lz:

 I = irradiance

 z = depth

Manatee Watch: Lee County Park Rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River with up to 200 manatees present over the past week. The Florida Fish & Wildlife Commission (FWC) removed a manatee carcass from the Orange River on 2/7/13.

Lower Estuary Condition:

Red Tide: Medium to high concentrations of *Karenia brevis* were reported by FWC this past week in the Gulf near Sanibel. *Karenia* spp. concentrations in Tarpon Bay dropped to < 200,000 cells/L. Between Friday 2/8/13 and Monday 2/11/13 dead fish were reported on Sanibel beaches. Ft Myers Beach reported dead fish, approximately 1,000 fish, scattered on the south end and more concentrated mid-island. Fish were primarily mullet, catfish and stingrays as well as other species. Respiratory effects were also reported from Bonita Beach to the north end of Ft Myers beach.

Oysters: Disease prevalence of Perkinsus *marinus* (Dermo) ranged from 77%-100%. Disease intensity is slightly high with a range of 1.56-2.33; the average intensity was 2.01. FGCU researchers have initiated a study to examine how various salinities impact juvenile growth and survival including predation pressure. (Data provided by Dr. Aswani Voleti, FGCU)

Wildlife Impacts: Six new cases of brevetoxin poisoning were admitted to CROW, the rehabilitation hospital on Sanibel over the past seven days. One Kemp's Ridley sea turtle, 1 Green Sea Turtle and 4 Double Crested Cormorants. (Dr. Heather Barron, Hospital Director, CROW)

From ACOE Website Daily Reports

Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
2/5/13	Tue	709	635	810
2/613*	Wed	512	445	795
2/7/13**	Thu	1326	1220	1233
2/8/13	Fri	2044	1674	2029
2/9/13	Sat	1838	1657	2003
2/10/13	Sun	1493	1191	1656
2/11/13	Mon	1160	1100	1410
7 day Av	7 day Avg Flow		1128	1419

*Last day of Pulse **First Day of Pulse

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

Reporting Period: February 12 -18, 2013

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

Caloosahatchee Condition Summary

Rain associated with a cold front delivered 2-3 inches of rain in the watershed and raised Lake Okeechobee levels over the past week. Monday 2/18/13 was the second day of the current 10 day pulse release. Higher flows from recent releases have reduced salinities at Fort Myers and Beautiful Island and reduced the 30 day moving average to below 10 psu. The Shell Point RECON is offline. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10 day pulse release averaging 1000 cfs at S79 started on 2/17/13. The pulse includes 2 days of no flow at the end of the schedule.

Recommendation: We request that the Corps continue the current management operations with a pulse release averaging 1,000 cfs to help with Lake Okeechobee recession and further reduce and maintain salinity levels below 10 psu at Fort Myers and 5 psu at Beautiful Island. Current salinity levels are ecologically supportive of emerging tape grass and will prevent additional harm to estuary resources. Flows above 1,500 cfs are not beneficial and should be avoided. We request the Corps consider diverting excess flows onto the C43 reservoir site if the need to lower lake levels requires higher volume releases.

Lake Okeechobee Level:	14.42 ft. (Low Sub-Ba	Last wk: 14.35 ft.	
Lake Okeechobee Inflow:	483 cfs	Lake Okeechobee Outflow:	1,109 cfs
Weekly Rainfall:	WP Franklin 2.17",	Ortona 2.33",	Moore Haven 3.06"
Salinity Fort Myers:	3.3 - 9.3 psu surface da	Previous wk: 8.3-12.8 psu	
	5.1- 13 psu (SCCF REC	Previous wk: 11 -17 psu	
MFL Status:	Daily salinity at Fort M	average = 9.7 psu	
Salinity Beautiful Island:	1.1 - 3.5 psu (SCCF RE	Previous wk: 2.3 - 6.0 psu	
Salinity Shell Point:	Offline (SCCF RECO	N)	Previous wk: 22 - 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 averaged 1,172 cfs over the past seven days. The last ten day pulse release that ended on 2/16/13 provided 1,294 cfs. Increased flows have been effective in reducing salinity at Ft Myers and have lowered the 30 day moving average to below 10 psu.

ACOE February 7, 2013 Pulse Release						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
2/7/13	1	1326	1220	1233		
2/8/13	2	2044	1674	2029		
2/9/13	3	1838	1657	2003		
2/10/13	4	1493	1191	1656		
2/11/13	5	1160	1100	1410		
2/12/13	6	936	936	1546		
2/13/13	7	628	495	910		
2/14/13	8	1239	682	284		
2/15/13	9	1072	1192	0		
2/16/13	10	1213	774	0		
10 Day	Ave	1294	1092	1107		



Upstream of S79/Franklin Conditions:

On 2/19/13, chlorides measured 62 mg/L and apparent color was 100 CU at the Olga Water Treatment plant. The plant remains offline for maintenance.

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 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	SCB -San Carlos Bay = 2.2 meters
S79 West	4.5	179	1.9	0.85	Definition of 25% Iz: z where I is 25% of surface I.
31 Bridge	5.3	191	1.1	0.83	I = irradiance, z = depth
Colonial Bridge	15.0	171	5.3	0.73	

Upper Estuary Conditions:

Increased flows reduced maximum salinities by 1.1 psu. Chlorophyll spikes from phytoplankton at Beautiful Island were not detected this week. Chlorophyll spikes up to 25 µg/L were detected at the Fort Myers RECON as salinities there dropped. *Skeletonema* was the dominant phytoplankton genus at Colonial Bridge.

Manatee Watch: Lee County Park Rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River with increased numbers congregating as the cold front lowered temperatures over the weekend.

Lower Estuary Condition:

Red Tide: Karenia spp. cell counts were low to zero in Pine Island Sound on 2/14/13. The beaches on the east and west ends of Sanibel had low or no *Karenia* spp. counts but Tarpon Beach had 353,000 cells/L and the Tarpon Bay count had 1 million cells/L on 2/19/13.

On Fort Myers Beach, thousands of dead fish, sharks and rays washed up last week along the entire length of the island

7 Day Flows from ACOE Daily Reports						
Date	Day	S79 Flow	S78 Flow	S77 Flow		
		(cfs)	(cfs)	(cfs)		
2/12/13	Tue	936	936	1546		
2/13/13	Wed	628	495	910		
2/14/13	Thu	1239	682	284		
2/15/13	Fri	1072	1192	0		
2/16/13*	Sat	1213	774	0		
2/17/13**	Sun	1220	965	645		
2/18/13	Mon	1897	1265	912		
7 day Av	7 day Avg Flow 1172 901 613					
*Las	st day of	Pulse **	First Day of	Pulse		

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

Reporting Period: February 19 - 25, 2013

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

Caloosahatchee Condition Summary

Dry conditions in the watershed and releases from Lake Okeechobee helped to lower Lake Okeechobee water levels slightly over the past week. Monday 2/25/13 was the ninth day of the current 10-day pulse release. Flows this past week further reduced salinities at Fort Myers and Beautiful Island. The Shell Point RECON came back online on 2/27/13. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 1000 cfs at S79 will begin on 2/27/13. The pulse includes 2 days of no flow at the end of the schedule.

Recommendation: We request that the Corps continue the current management operations with a 10 day pulse release averaging 1,000 cfs at S79 to maintain salinity levels below 10 psu at Fort Myers and 5 psu at Beautiful Island and help with the Lake Okeechobee recession. Current salinity levels are ecologically supportive of emerging tape grass and will prevent additional harm to the estuary resources. However, average flows greater than 1,000 cfs would not be beneficial to current estuarine conditions.

Lake Okeechobee Level:	14.40 ft. (Low Sub-B	Last wk: 14.42 ft.			
Lake Okeechobee Inflow:	403 cfs	Lake Okeechobee Outflow:	366 cfs		
Weekly Rainfall:	WP Franklin 0",	Ortona 0", Moore	Haven 0"		
Salinity Fort Myers:	3.8- 6.9 psu surface da	3.8- 6.9 psu surface data (Fort Myers Yacht Basin)			
	6.7 - 15 psu (SCCF RE	Previous wk: 5.1-13 psu			
MFL Status:	Daily salinity at Fort N	average = 8.8 psu			
Salinity Beautiful Island:	0.6 – 1.6 psu (SCCF R	ECON Marker 18)	Previous wk: 1.1 - 3.5 psu		
Salinity Shell Point:	Offline (SCCF RECO	Previous wk: Offline			



Flow: Flows to the Caloosahatchee estuary through S79 during the past seven days averaged 969 cfs. The ten day pulse release which ends on 2/26/13, provided an average 994 cfs. Pulse releases have been effective in reducing salinity at Fort Myers and the 30-day moving average to below 10 psu.

ACOE February 17, 2013 Pulse Release						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
2/17/13	1	1220	965	645		
2/18/13	2	1897	1265	912		
2/19/13	3	1859	976	493		
2/20/13	4	1537	1124	446		
2/21/13	5	1262	1054	630		
2/22/13	6	918	741	402		
2/23/13	7	682	485	294		
2/24/13	8	425	218	291		
2/25/13	9	104	140	87		
2/26/13	10	0	0	0		
10 Day	Ave	994	696	420		



Upstream of S79/Franklin Conditions:

On 2/26/13, chlorides measured 61 mg/L and apparent color was 169 CU at the Olga Water Treatment plant. The plant remains offline for maintenance.

Caloosabatchee	Chlorophyll	CDOM	Turbidity	25% lz Light	
Stations	(uall)	(asp)	(NTU)	(meters)	Target light penetration: CE- Caloosabatchee Estuany –1 m
otations	(µg/⊏)	(430)	(110)	(incleis)	
Target Values	< 11	CE <70	CE < 18	CE = 1 m	SCB-San Carlos Bay - 2.2 meters
		SCB <11	SCB < 5	SCB = 2.2m	
S79 West	4.5	179	1.9	0.85	Definition of 25% Iz: z where I is 25% of surface I.
31 Bridge	5.3	191	1.1	0.83	I = irradiance, z = depth
Colonial Bridge	15.0	171	5.3	0.73	

Upper Estuary Conditions:

Freshwater flows kept salinities low and chlorophyll levels decreased at Fort Myers.

Manatee Watch: Lee County Park Rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River and reported a number of recoveries of dead manatees the past week. FWC reports 65 manatee deaths in Lee, Charlotte and Sarasota Counties related to red tide from 1/9/13 – 2/20/13, details available at: http://myfwc.com/media/2477220/2013PreliminaryRedTide.pdf

Thirty dead manatees have been recovered in the Orange River and 19 in the Caloosahatchee over the 42 days reported. Water testing by SCCFs marine lab indicates no red tide present upstream in the Caloosahatchee at this time. However, manatees must travel downstream to feed on seagrass beds at the mouth of the river and beyond due to minimal tape grass available for forage upriver in their wintering grounds.

Manatees contract brevetoxicosis from filter feeders they ingest that are attached to seagrass blades. The filter feeders, including bryozoans, ciliates and tunicates concentrate the toxins. While the filter feeders are not affected by the toxins they are harmful to mammals.

Lower Estuary Condition:

Red Tide: Karenia spp. cell counts were medium to high in Pine Island Sound from 2/20/13- 2/25/13. The beaches from east to west ends of Sanibel had no to low concentrations of *Karenia* spp. The Sanibel boat ramp had 500,000 cells/L. Dead fish and respiratory irritation were reported on other Lee County beaches. On Sanibel dead fish included sand trout, silver perch, catfish, sole, croaker, scaled sardines, redfish, triggerfish, gag grouper, spadefish, king snake eels, anchovies, southern puffer, spiny box fish and one invasive exotic lionfish.

On Fort Myers Beach, thousands of dead fish washed up on the beach including small catfish (hardhead and sails), sand trout, eels, batfish, toadfish, and at least one Spanish mackerel. Respiratory irritation levels were high and clean up has been intensified for human health. Spring break has increased beach visitors.



Dead fish- mid Estero Island 2/25/13. Photo-Keith Laakkonen- Town of Fort Myers Beach

Wildlife Impacts: On North Captiva beach over the past four days a dead baby manatee washed up, and a pygmy sperm whale stranded twice and eventually died on Cayo Costa's Beach. On Fort Myers Beach two dead ring bill gulls were found on 2/25/13. CROW the rehabilitation clinic on Sanibel reports eight new cases of brevetox poisoning to 1 Double Crested Cormorant, 2 Great Blue Herons, 1 Brown Pelican, 3 Black Scoters and 1 Sandwich Tern.



7 Day Flows from ACOE Daily Reports						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
2/19/13	Tue	1859	976	493		
2/20/13	Wed	1537	1124	446		
2/21/13	Thu	1262	1054	630		
2/22/13	Fri	918	741	402		
2/23/13	Sat	682	485	294		
2/24/13	Sun	425	218	291		
2/25/13	2/25/13 Mon		140	87		
7 day Avg Flow 969 676 377						
*La:	st day of	Pulse **	First Day of	Pulse		

Dead fish on Sanibel's Tarpon Beach on 2/25/13 included trout, silver perch, catfish, sole, croaker and scaled sardines. 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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: February 26 - March 4, 2013

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

Caloosahatchee Condition Summary

Releases from Lake Okeechobee to the Caloosahatchee helped to lower Lake Okeechobee water levels over the past week. Monday 3/4/13 was the sixth day of the current 10-day pulse release. Flows this past week reduced salinities slightly at Fort Myers and Beautiful Island. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 1000 cfs at S79 began on 2/27/13. The pulse includes 2 days of no flow at the end of the schedule.

Recommendation: We request that the Corps continue the current management operations with a 10 day pulse release averaging 1,000 cfs at S79 to maintain salinity levels below 10 psu at Fort Myers and 5 psu at Beautiful Island and to help with the Lake Okeechobee recession. Current salinity levels are ecologically supportive of emerging tape grass and will prevent additional harm to the estuary resources.

Lake Okeechobee Level:	14.22 ft. (Low Sub-	Last wk: 14.40 ft.				
Lake Okeechobee Inflow:	192 cfs	Lake Okeechobee Outflow:	1911 cfs			
Weekly Rainfall:	WP Franklin 0.13",	Ortona 0.12",	Moore Haven 0.27"			
Salinity Fort Myers:	3.6 - 6.8 psu surface of	Previous wk: 3.8- 6.9 psu				
	5.1 – 14 psu (SCCF F	5.1 – 14 psu (SCCF RECON Marker 52)				
MFL Status:	Daily salinity at Fort	Daily salinity at Fort Myers < 10 psu 30 day moving				
Salinity Beautiful Island:	0.6 - 1.4 psu (SCCF F	RECON Marker 18)	Previous wk: 0.6 – 1.6 psu			
Salinity Shell Point:	18 - 32 psu (SCCF	18 - 32 psu (SCCF RECON)				



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Flow: Flows to the Caloosahatchee estuary through S79 during the past seven days averaged 1,300 cfs. Monday, 3/4/13 was the sixth day of the current release. The consecutive 10-day, 1000 cfs pulse releases have been effective in keeping the salinity at Fort Myers and the 30-day moving average below 10 psu.

AC	ACOE February 17, 2013 Pulse Release					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
2/27/13	1	1244	954	332		
2/28/13	2	2186	1898	1584		
3/1/13	3	1988	1771	2018		
3/2/13	4	1548	1578	1944		
3/3/13	5	1197	1211	1043		
3/4/13	6	937	860	1316		
3/5/13	7					
3/6/13	8					
3/7/13	9					
3/8/13	10					
10 Day	Ave					



Upstream of S79/Franklin Conditions:

On 3/5/13, chlorides measured 68 mg/L and apparent color was 78 CU at the Olga Water Treatment plant. The plant remains offline for maintenance.

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	7.8	207	1.4	0.77		
31 Bridge	6.3	199	1.0	0.80		
Colonial Bridge	6.9	175	1.7	0.85		
Target light penetration: CE- Caloosahatchee Estuary =1 m SCB-San Carlos Bay = 2.2 meters						

Definition of 25% lz: **z where I is 25% of surface I. I** = irradiance, **z**= depth

Upper Estuary Conditions:

Freshwater flows kept salinities around 5 psu at Fort Myers.



Orange River Manatee recovery and rescue on 3/5/13 Photo by Red Rubino

Manatee Watch: An aerial survey of manatees in Lee County was conducted on 3/5/13. Flights covered the Caloosahatchee between the Franklin Locks and the US 41 bridge, the Orange River (including Manatee Park/FPL discharge canal), the "Pit"- located off the Ten-Mile Canal in Estero Bay, Matlacha Isles, and the north Cape Coral canal system. A total of 649 manatees were counted with 61%, (396) located in the Orange River.

FWC staff reports 155 manatee deaths in this region so far this year as of 3/6/13. Not all are confirmed red tide however red tide is suspected.

Lower Estuary Condition:

Red Tide: Karenia spp. cell counts decreased to zero in southern Pine Island Sound from 2/27/13 - 3/04/13. On Lee County beaches numerous dead goliath grouper have washed up and on Sanibel three dead manatees washed up over the past week.

On Fort Myers Beach reports of respiratory of irritation and dead fish have steadily decreased since February 25th with no current red tide impacts along the beach.

Wildlife Impacts: CROW, the rehabilitation clinic on Sanibel, reported four new cases of brevetoxin poisoning to 1 Kemp's Ridley Sea Turtle, 1 Sanderling, 1 Double Crested Cormorant and 1 Black Scoter. (CROW Clinic)

7 Day Flows from ACOE Daily Reports					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
2/26/13	Tue	0	0	0	
2/27/13	Wed	1244	954	332	
2/28/13	Thu	2186	1838	1584	
3/1/13	Fri	1988	1771	2018	
3/2/13	Sat	1548	1578	1271	
3/3/13	Sun	1197	1211	1043	
3/4/13	Mon	937	860	1316	
7 day Avg Flow 1300 1173 1080					
*Las	st day of	Pulse **	First Day of	Pulse	

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: March 5 - March 11, 2013

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

Caloosahatchee Condition Summary

Evapotranspiration (ET) and releases from Lake Okeechobee to the Caloosahatchee helped to lower Lake Okeechobee water levels over the past week. Salinities increased slightly at Fort Myers and Beautiful Island. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 3/9/13. The pulse includes 4 days of no flow at the end of the schedule.

Recommendation: With reduced flows averaging 650 cfs at S79 we request that the Corps adjust the pulse release to a 7 day schedule to better enable managing salinity levels below 10 psu at Fort Myers and 5 psu at Beautiful Island. Current salinity levels are ecologically supportive of emerging tape grass and with sufficient water we hope to recover tape grass habitat this year and prevent additional harm to the estuary resources.

Lake Okeechobee Level:	14.08 ft. (Low Sub-	Last wk: 14.22 ft .	
Lake Okeechobee Inflow:	220 cfs	Lake Okeechobee Outflow	: 2618 cfs
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.0",	Moore Haven 0.05"
Salinity Fort Myers:	4.1 - 9.6 psu surface	Previous wk: 3.6 - 6.8 psu	
	5.1 - 14 psu (SCCF R	Previous wk: 5.1 – 14 psu	
MFL Status:	Daily salinity at Fort	a Myers <u><</u> 10 psu 30 day movir	ng average = 6.2 psu
Salinity Beautiful Island:	0.6 - 1.8 psu (SCCF I	RECON Marker 18) Prev	vious wk: 0.6 - 1.4 psu
Salinity Shell Point:	18 - 32 psu (SCCF	RECON) Prev	vious wk: 18 - 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 during the past seven days averaged 737 cfs. The ten-day pulse which ended on, 3/8/13 provided an average 1,027 cfs. Flows have supplied sufficient volumes since 2/9/13 to keep salinities in the preferred range for tape grass in the upper estuary.

ACOE February 17, 2013 Pulse Release					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
2/27/13	1	1244	954	332	
2/28/13	2	2186	1898	1584	
3/1/13	3	1988	1771	2018	
3/2/13	4	1548	1578	1944	
3/3/13	5	1197	1211	1043	
3/4/13	6	937	860	1316	
3/5/13	7	748	396	720	
3/6/13	8	342	173	279	
3/7/13	9	86	73	105	
3/8/13	10	0	0	67	
10 Day	Ave	1027	891	940	



Upstream of S79/Franklin Conditions:

On 3/12/13, chlorides measured 70 mg/L and apparent color was 125 CU at the Olga Water Treatment plant. The plant is back online.

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	7.6	221	2.4	0.71		
31 Bridge	8.5	215	1.3	0.75		
Colonial Bridge	5.0	126	1.2	0.84		
Target light penetration: CE - Caloosahatchee Estuary =1 m SCB -San Carlos Bay = 2.2 meters						
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth						



Upper Estuary Conditions:

Salinities increased slightly at Fort Myers and Beautiful Island.

Tape grass is present in low densities (15 shoots m⁻², photo) near Beautiful Island and is still absent at a site near Old Bridge Road. Chlorophyll increased at Beautiful Island due to filamentous diatoms.

Manatee Watch: Lee County park rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River with up to 100 individuals the past week. A number of recoveries were reported as well.

Lower Estuary Condition:

Red Tide: SCCF samples collected around Sanibel from 3/07/13 - 3/11/13

contained no *Karenia brevis*. A sample from Tarpon Bay had 200,000 cells/*L* of the dinoflagellate, *Akashiwo sanguinea*.

On Lee County beaches, conditions have continued to improve over the past week with no new reports of dead fish washing ashore or respiratory impacts experienced by beachgoers.

Wildlife Impacts: CROW, the rehabilitation clinic on Sanibel, reported two new cases of brevetoxin poisoning to double crested cormorants.



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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: March 12 - March 18, 2013

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

Caloosahatchee Condition Summary

Salinities increased slightly at Fort Myers, Beautiful Island and Shell Point. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 3/19/13. The pulse includes 3 days of no flow at the end of the schedule.

Recommendation: With reduced flows averaging 650 cfs at S79 we anticipate salinities will continue to rise throughout the estuary. Although LORS 2008 only allows 650 cfs allotted to the estuary with current conditions, data show 800 - 1000 is needed to maintain salinities below 10 psu at Ft Myers. We request that the Corps use all available management flexibility to keep the salinity levels below 10 psu and the estuary conditions supportive of native flora and fauna.

Lake Okeechobee Level:	13.94 ft. (Low Sub-I	Last wk: 14. 08 ft.	
Lake Okeechobee Inflow:	68 cfs	Lake Okeechobee Outflow:	1762 cfs
Weekly Rainfall:	WP Franklin 0.29",	Ortona 0.29",	Moore Haven 0.56"
Salinity Fort Myers:	4.6 - 9.3 psu surface of	data (Fort Myers Yacht Basin)	Previous wk: 4.1 - 9.6 psu
	6.9 – 14 psu (SCCF R	Previous wk: 5.1 - 14 psu	
MFL Status:	Daily salinity at Fort	Myers < 10 psu 30 day moving	g average = 5.9 psu
Salinity Beautiful Island:	1.0 - 3.2 psu (SCCF F	RECON Marker 18) Previ	ous wk: 0.6 - 1.8 psu
Salinity Shell Point:	19 - 33 psu (SCCF I	RECON) Previ	ous wk: 18 - 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 during the past seven days averaged 377 cfs. The ten-day pulse which ended on, 3/18/13 provided an average 663 cfs. With lower flows, salinities are rising but remain in the preferred range for tape grass in the upper estuary.

ACOE February 17, 2013 Pulse Release					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
3/9/13	1	958	630	721	
3/10/13	2	1708	1408	1468	
3/11/13	3	1320	1129	1456	
3/12/13	4	948	957	1220	
3/13/13	5	944	742	1224	
3/14/13	6	603	685	944	
3/15/13	7	150	234	432	
3/16/13	8	0	0	186	
3/17/13	9	0	96	184	
3/18/13	10	0	147	188	
10 Day	Ave	663	602	802	



Upstream of S79/Franklin Conditions:

On 3/19/13, chlorides measured 75 mg/L and apparent color was 76 CU at the Olga Water Treatment plant.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	
Stations	(µg/Ĺ) ໌	(qse)	(NTU)	(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	
S79 West	9.4	221	0.8	0.74	Definition of 25% Iz: z where I is 25% of surface I.
31 Bridge	21.0	220	3.1	0.65	I = irradiance, z = depth
Colonial Bridge	4.8	121	0.7	1.13	

Upper Estuary Conditions:

Salinities increased slightly at Fort Myers and Beautiful Island. Chlorophyll spikes continued at Beautiful Island and the SR 31 Bridge due predominantly to fine filamentous phytoplankton and euglenoids, along with ciliates and dinoflagellates.

Manatee Watch: Lee County park rangers at Manatee Park on the Orange River report manatees continue to congregate at the FPL discharge canal and Orange River with up to 80 individuals the past week. Two recoveries were reported at the park the past week.

Lower Estuary Condition:

Red Tide: SCCF found no Karenia brevis present in samples from Wulfert Point, Fulgur Beach and the Sanibel Boat Ramp.

FWC reports a bloom of Karenia brevis persists in the Pine Island Sound system in very low to medium concentrations.

Oysters: Oysters in the lower Caloosahatchee had a range of disease prevalence (Dermo) from 87%-100% with an average disease intensity of 1.38 the past month. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

At this time spat settlement is occurring at most of the sampled downstream locations.

Wildlife Impacts: CROW, the rehabilitation clinic on Sanibel, reported 11 new cases of brevetoxin poisoning to wildlife including: 7 Double-Crested Cormorants, 1 Common Loon, 2 Royal Terns and 1 Brown Pelican.

7 Day Flows from ACOE Daily Reports						
Date	Day	S79 Flow	S78 Flow	S77 Flow		
		(cfs)	(cfs)	(cfs)		
3/12/13	Tue	948	957	1220		
3/13/13	Wed	944	742	1224		
3/14/13	Thu	603	685	944		
3/15/13	Fri	150	234	432		
3/16/13	Sat	0	0	186		
3/17/13	Sun	0	96	184		
3/18/13*	Mon	0	147	188		
7 day Avg Flow 377 408 625						
*Las	st day of	Pulse **	First Day of	Pulse		

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Dan Delisi, 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

Reporting Period: March 19 - March 25, 2013

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

Caloosahatchee Condition Summary

Rainfall the past week increased Lake Okeechobee's water level and helped to augment flows to the Caloosahatchee that held salinities at Fort Myers and Beautiful Island in a range sustainable for tape grass. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 3/19/13. The pulse includes 3 days of no flow at the end of the schedule.

Recommendation: Given the desire to increase the rate of recession in Lake Okeechobee for the benefit of lake ecology and in anticipation that 650 cfs pulse releases will not be sufficient to maintain the current salinity profile in the Caloosahatchee, we ask the Corps to increase flow to the Caloosahatchee estuary, up to 1000 cfs, to maintain current conditions and provide additional benefits to the Lake.

Lake Okeechobee Level:	13.97 ft. (Low Sub-	Last wk: 13.94 ft.		
Lake Okeechobee Inflow:	475 cfs	Lake Okeechobee Outflow:	215 cfs	
Weekly Rainfall:	WP Franklin 1.72",	Ortona 0.82",	Moore Haven 0.65"	
Salinity Fort Myers:	5.1 - 8.7 psu surface of	5.1 - 8.7 psu surface data (Fort Myers Yacht Basin)		
	7.1 - 15 psu (SCCF R	ECON Marker 52)	Previous wk: 6.9 – 14 psu	
MFL Status:	Daily salinity at Fort	Myers <u><</u> 10 psu 30 day moving	average = 6.3 psu	
Salinity Beautiful Island:	1.2 - 3.2 psu (SCCF R	ECON Marker 18)	Previous wk: 1.0 - 3.2 psu	
Salinity Shell Point:	21 - 33 psu (SCCF	RECON)	Previous wk: 19 - 33 psu	



Flow: Flows to the Caloosahatchee estuary through S79 during the past seven days of the ten day pulse, averaged 980 cfs. The ten-day pulse began on 3/19/13. Rainfall helped to augment flows, holding salinities between 5-9 psu at Ft Myers, in the preferred range for tape grass in the upper estuary.

ACOE March 19, 2013 Pulse Release					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(015)	(015)	(015)	
3/19/13	1	771	388	184	
3/20/13	2	1562	966	228	
3/21/13	3	1539	1456	991	
3/22/13	4	1219	1079	1198	
3/23/13	5	852	446	378	
3/24/13	6	504	236	114	
3/25/13	7	414	149	0	
3/26/13	8				
3/27/13	9				
3/28/13	10				
10 Day	Ave				



Upstream of S79/Franklin Conditions:

On 3/26/13, chlorides measured 74 mg/L and apparent color was 59 CU at the Olga Water Treatment plant.

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	11.1	178	1.6	0.83
31 Bridge	25.6	183	1.6	0.75
Colonial Bridge	5.5	147	4.4	0.86

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

Upper Estuary Conditions:

Salinities remained in the same ranges at Fort Myers and Beautiful Island. Chlorophyll spikes continued at Beautiful Island and the SR 31 Bridge. Colonial green algae, *Eudorina* sp. and *Pandorina* sp. were mixed with cryptomonads, euglenoids, and dinoflagellates at the SR31 Bridge.

On 3/25/13 SCCF Marine Lab scientists transplanted tape grass shoots at Old Bridge Park on the north side of the Caloosahatchee east of the 41 bridges.

Manatee Watch: Lee County park rangers at Manatee Park on the Orange River report manatees continue to congregate in the warm water refuge of the FPL discharge canal and Orange River east of I-75.



Transplanted tape grass at Old Bridge Par 3/25/13 Photo SCCF

Lower Estuary Condition: Salinity conditions continue to support oysters during low tide periods (21 psu) but are above the preferred range during high tide periods (33 psu). The preferred range is 12 - 25 psu.

Red Tide: No *Karenia* cells were detected in Sanibel samples collected by SCCF Marine Lab staff from 3/22- 3/26/13. Red tide conditions continue to dissipate in and around Pine Island Sound and Sanibel, although the bloom persists at low concentration levels. Negative effects are still being documented on birds and fish in localized areas.

Wildlife Impacts: CROW, the rehabilitation clinic on Sanibel, reported 10 new cases of brevetoxin poisoning to wildlife including: 6 Double-crested Cormorants, 3 Royal Terns and 1 Brown Pelican.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Dan Delisi, 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

Reporting Period: March 26 - April 1, 2013

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

Caloosahatchee Condition Summary

Flows to the Caloosahatchee held salinities at Fort Myers and Beautiful Island in a range sustainable for tape grass. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 3/29/13. The pulse includes 3 days of no flow at the end of the schedule.

Recommendation: We request the Corps provide flows to maintain salinities in the Fort Myers and Beautiful Island regions of the Caloosahatchee estuary that are supportive of tape grass. Documented conditions have shown that flows of 800 – 1000 cfs are typically needed to provide the target salinity conditions in the dry season.

Lake Okeechobee Level:	13.78 ft. (Low Sub-B	Last wk: 13.97 ft.	
Lake Okeechobee Inflow:	262 cfs	Lake Okeechobee Outflow:	1,807 cfs
Weekly Rainfall:	WP Franklin 0.0",	Ortona 0.0",	Moore Haven 0.0"
Salinity Fort Myers:	3.7 -8.0 psu surface da	ata (Fort Myers Yacht Basin)	Previous wk: 5.1 - 8.7 psu
	5.1 – 12 psu (SCCF R	ECON Marker 52)	Previous wk: 7.1 - 15 psu
MFL Status:	Daily salinity at Fort I	Myers <u><</u> 10 psu 30 day moving	average = 6.3 psu
Salinity Beautiful Island:	1.0 - 2.1 psu (SCCF R	ECON Marker 18)	Previous wk: 1.2 - 3.2 psu
Salinity Shell Point:	19 - 32 psu (SCCF R	RECON)	Previous wk: 21 – 33 psu



Flow: Flows to the Caloosahatchee estuary through S79 during the past seven days averaged 700 cfs. The ten-day pulse, that ended on 3/28/13, provided an average flow of 698 cfs through S79. Salinities at Fort Myers ranged between 3.7 - 8.0 psu, in the preferred range for tape grass in the upper estuary.

ACOE March 19, 2013 Pulse Release					
Date	Day	S78 Flow (cfs)	S77 Flow (cfs)		
3/19/13	1	771	388	184	
3/20/13	2	1562	966	228	
3/21/13	3	1539	1456	991	
3/22/13	4	1219	1079	1198	
3/23/13	5	852	446	378	
3/24/13	6	504	236	114	
3/25/13	7	414	149	0	
3/26/13	8	122	100	0	
3/27/13	9	0	0	0	
3/28/13	10	0	0	102	
10 Day	Ave	698	482	229	



Upstream of S79/Franklin Conditions: On 4/2/13, chlorides measured 68 mg/L and apparent color was 68 CU at the Olga Water Treatment plant.

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	9.6	170	1.3	0.87
31 Bridge	11.5	172	1.8	0.84
Colonial Bridge	4.8	122	2.8	1.02



Upper Estuary Conditions: Salinities remained in the same ranges at Fort Myers and Beautiful Island. Chlorophyll spikes continued at Beautiful Island but receded in magnitude.

During this week's Periodic Scientists call, there was a question regarding the 30 day moving average salinity at Ft Myers as reported by SCCF, 6.3 psu, compared to the SFWMD value of 2.9 psu.

We have reviewed the data from our sensors that are regularly serviced and calibrated and find our reported values to be accurate.

In response to questions from the Corps regarding differences in readings by SCCF and SFWMD sensors/ sample sites, an assessment was conducted on 2/13/13 by Dr Richard Bartleson, SCCF Marine Lab. The analysis, included at the end of this report, shows high correlations between the sample sites and values.



Manatee Watch: Lee County park rangers at Manatee Park on the Orange River report that manatees continue to congregate in the warm water refuge of the FPL discharge canal and Orange River east of I-75; however with warmer weather they are dispersing. FWC reports record manatee mortalities from 1/1 - 3/22/13 with 192 deaths reported as red tide linked or suspected. In Lee County alone there have been 188 deaths, 101 of those red tide related or suspected. These statistics highlight the larger impact of lost tape grass habitat in the upper estuary where the manatees congregate in winter. After seven years of high salinities in the upper estuary there is no productive tape grass for manatees to feed on, necessitating their travel 25 miles downstream to feed on seagrass beds in the lower estuary where they have consumed red tide. Had tape grass been present in the upper estuary, the number of manatee deaths from red tide exposure could have been significantly reduced.

Lower Estuary Condition: Salinity conditions continue to support oysters during low tide periods but are above the preferred range during high tide periods (32 psu). The preferred range is 12 - 25 psu.

Red Tide: Karenia brevis persists in the Pine Island Sound system in Lee County in background to low concentrations.

Wildlife Impacts: CROW, the rehabilitation clinic on Sanibel, received 9 brevetoxicosis cases this past week including: 4 Cormorants, 2 Great Blue Herons, 1 Black Scoter, 1 Royal Tern and 1 Herring Gull.

Upper Caloosahatchee Estuary Salinity Data Comparison: SCCF Marine Lab and SFWMD Data

Rick Bartleson, Ph.D.

2/13/2013

The majority of the tape grass in the River was recently distributed between Fort Myers and Beautiful Island. Yacht basin surface salinities are the basis for the State Caloosahatchee MFL. South Florida Water Management District data from the yacht basin and I75 are compared to SCCF yacht basin and Beautiful Island RECON sensors.



SCCF Yacht Basin sonde is solar powered YSI/Campbell datalogger located in yacht basin next to an opening to the river. Salinity differences between the two "surface" sondes are likely due to the SCCF sonde being slightly further downstream and at a slightly different depth than the SFWMD sonde. The SFWMD DBHYDRO data used here is preliminary. A regression of the 30 day moving averages of the data sets from the two sondes from May 2012 to February 2013 yielded the equation: SFWMD YB Surface 30 day moving average salinity= $0.12 + 0.99 \times SCCF$ 30 dma YB salinity. R^2 = 0.97. The slope is not significantly different than 1 (95% CI =0.97-1.01) and the intercept is not significantly different than zero (95% CI = -0.02 to 0.27).



SCCF Beautiful Island RECON is located east of the railway trestle. Salinity differences between it and SFWMD I75 Surface is likely due to the SCCF sonde being downstream. The SFWMD data shown here is preliminary. Beautiful Isl. salinity= $0.34+0.99 \times 175$ Surf. $R^2=0.96$

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: April 2 - April 8, 2013

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

Caloosahatchee Condition Summary

Flows to the Caloosahatchee plus additional rainfall held salinities at Fort Myers and Beautiful Island in a range sustainable for tape grass, although salinity at Fort Myers increased slightly. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 4/8/13. The pulse includes 3 days of no flow at the end of the schedule.

Recommendation: We request the Corps provide flows to maintain salinities_in the Fort Myers and Beautiful Island regions of the Caloosahatchee estuary that are supportive of tape grass. Documented conditions have shown that flows between 800 and 1000 cfs are typically needed to provide the target salinity conditions in the dry season.

Lake Okeechobee Level:	13.71 ft. (Low Sub-Ba	Last wk: 13.78 ft	
Lake Okeechobee Inflow:	NR cfs	Lake Okeechobee Outflow:	617 cfs
Weekly Rainfall:	WP Franklin 0.97"	Ortona 1.04"	Moore Haven 0.49"
Salinity Fort Myers:	4.8 -9.0 psu surface (SC	CCF Ft. Myers Yacht Basin)	Previous wk: 3.7 - 8.0 psu
	5.7-15 psu (SCCF RE	CON Marker 52)	Previous wk: 5.1 - 12 psu
MFL Status:	Daily salinity at Fort My	ers <u><</u> 10 psu 30 day MA (SC	CF) = 6.6 psu (+ 0.3 psu)
Salinity Beautiful Island:	0.8 - 2.0 psu (SCCF RE	CON Marker 18)	Previous wk: 1.0 - 2.1 psu
Salinity Shell Point:	21-33 psu (SCCF RE	ECON)	Previous wk: 19 - 32 psu



Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged 486 cfs. The ten-day pulse release, ending on 4/7/13, provided an average flow of 735 cfs through S79. Salinities from Fort Myers eastward were in the preferred range (0-10 psu) for tape grass.

ACOE March 29, 2013 Pulse Release					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
3/29/13	1	798	487	673	
3/30/13	2	1655	1363	1403	
3/31/13	3	1481	1299	1582	
4/1/13	4	846	662	975	
4/2/13	5	796	457	714	
4/3/13	6	501	463	928	
4/4/13	7	315	322	877	
4/5/13	8	885	174	346	
4/6/13	9	74	52	0	
4/7/13	10	0	0	0	
10 Day	Ave	735	528	750	



Upstream of S79/Franklin Conditions: On 4/9/13, chlorides measured 75 mg/L and apparent color was 71 CU at the Olga Water Treatment plant. Water column chlorophyll was slightly elevated (17.7 µg/L) at S79 mainly from chlorophytes.

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	7.1	165	1.9	0.88
31 Bridge	11.6	151	1.2	0.92
Colonial Bridge	5.9	108	1.7	1.14

 Target light penetration: CE- Caloosahatchee Estuary =1 m

 SCB-San Carlos Bay = 2.2 meters

 Definition of 25% Iz:
 z where I is 25% of surface I.

 I = irradiance, z= depth

Upper Estuary Conditions: Salinities rose slightly at Fort Myers and remained nearly stable at Beautiful Island. Chlorophyll spikes continued at Beautiful Island and picked up at Fort Myers (to 25µg/L). Dense growths of *Polysiphonia subtilissima* were seen on hard substrates near Fort Myers.

Manatee Watch: With increasing water temperatures, Lee County park rangers at Manatee Park on the Orange River report few manatees at the FPL discharge canal and Orange River east of I-75. As of 4/3/13, manatee deaths confirmed or suspected to be caused by red tide in southwest Florida continue to rise, with FWC reporting 241in total and 213 in Lee County alone.

Lower Estuary Condition: Salinity conditions continue to support oysters during low tide periods (21 psu) but are above the preferred range during high tide periods (33 psu). The preferred range is 12 - 25 psu. Extensive macroalgae cover was present in patches in Pine Island Sound and in the river near Shell Point (*Sargassum filipendula* and *Rosenvigea intricata*). Both of these brown algal species have been drifting ashore at Punta Rassa and the Sanibel boat ramp.

Red Tide: Patchy red tide was present in the Pine Island Sound system in Lee County and in the Gulf near Sanibel in background to medium concentrations.

Wildlife Impacts: CROW, the wildlife rehabilitation clinic on Sanibel, received only 2 brevetoxicosis cases this week; a double crested cormorant and a ring-billed gull.



Patches of Spyridia filamentosa seen overgrowing shoal

7 Day Flows from ACOE Daily Reports					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
4/2/13	Tue	796	457	714	
4/3/13	Wed	501	463	928	
4/4/13	Thu	315	322	877	
4/5/13	Fri	885	174	346	
4/6/13	Sat	74	52	0	
4/7/13*	Sun	0	0	0	
4/8/13**	Mon	834	270	210	
7 day Avg Flow 486 248 439					
*Last day of Pulse **First Day of Pulse					

Photographs of Manatee Rescue Efforts in Lee County, courtesy of Manatee Guides

After years of high salinities in the upper estuary during the dry season, the lack of healthy tape grass in the upper Caloosahatchee forces manatees to move down river to feed, and for this year, has caused hundreds to be unnecessarily exposed to red tide.



Photo 1. Saving "Manlee" - Male - Rescued 2/19/2013



Photo 3. Saving "Eel" - Female - Rescued 3/4/2013



Photo 2. Saving "Three-P-O" - Male - Rescued 2/21/2013



Photo 4. Saving "Flee" - Female - Rescued 3/6/2013

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: April 9 – April 15, 2013

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

Caloosahatchee Condition Summary

Flows to the Caloosahatchee plus additional rainfall held salinities at Fort Myers and Beautiful Island in a range sustainable for tape grass, although salinity at Fort Myers continues to increase slightly. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 4/8/13. The pulse includes 3 days of no flow at the end of the schedule.

Recommendation: We request the Corps provide flows to maintain salinities in the Fort Myers and Beautiful Island regions of the Caloosahatchee estuary that are supportive of tape grass. Documented conditions have shown that flows between 800 and 1000 cfs are typically needed to provide the target salinity conditions in the dry season.

Lake Okeechobee Level:	13.62 ft. (Low Sub-Ba	13.62 ft. (Low Sub-Band)		
Lake Okeechobee Inflow:	321 cfs	Lake Okeechobee Outflow:	1031 cfs	
Weekly Rainfall:	WP Franklin 0.04"	Ortona 0.93"	Moore Haven 1.49"	
Salinity Fort Myers:	5.3 - 9.6 psu surface (S	SCCF Ft. Myers Yacht Basin)	Previous wk: 4.8 - 9.0 psu	
	7.0 - 14 psu (SCCF RE	ECON Marker 52)	Previous wk: 5.7 - 15 psu	
MFL Status:	Daily salinity at Fort M	yers <u><</u> 10 psu 30 day MA (SC	CCF) = 6.8 psu (+ 0.2 psu)	
Salinity Beautiful Island:	1.0 - 2.2 psu (SCCF R	ECON Marker 18)	Previous wk: 0.8 - 2.0 psu	
Salinity Shell Point:	22- 33 psu (SCCF R	ECON)	Previous wk: 21 - 33 psu	



ACOE April 9, 2013 Pulse Release							
Date	Day	S79 Flow S78 Flow S77 Flow (cfs) (cfs) (cfs)					
4/9/13	1	1936	952	692			
4/10/13	2	1486	1097	1548			
4/11/13	3	1000	765	1328			
4/12/13	4	774	469	744			
4/13/13	5	567	417	497			
4/14/13	6	347	200	205			
4/15/13	7	96	148	54			
7 Day	Avg	887	578	724			
4/16/13	8						
4/17/13	9						
4/18/13	10						

Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged 887 cfs. Salinities from Fort Myers eastward were in the preferred range (0-10 psu) for tape grass.



SCCF Sonde Surface Salinity at Fort Myers Yacht Basin

Upstream of S79/Franklin Conditions: On 4/16/13, chlorides measured 72 mg/L and apparent color was 71 CU at the Olga Water Treatment plant.

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	9.7	171	1.4	0.86
31 Bridge	16.1	158	1.8	0.85
Colonial Bridge	6.9	123	2.7	1.01

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

Upper Estuary Conditions: Salinities rose slightly at Fort Myers and Beautiful Island. Chlorophyll spikes continued at Beautiful Island and at Fort Myers (to 25 μ g/L). Elevated chlorophylls (>10 μ g/L) were detected at Fort Myers, Royal Palm Park (Beautiful Island) and the SR 31 Bridge. At Fort Myers, the dinoflagellate, *Akashiwo sanguinea*, was present at 280,000 cells/L. Water temperature in the FPL discharge canal was 98°F on 4/14/13.

Lower Estuary Condition: Salinity conditions continue to support oysters during low tide periods (22 psu) but are above the preferred range (12-25 psu) during high tide periods (33 psu). Scientists at FGCU report that *Perkinsus* prevalence ranged from 80%-93%, with an average of 84% for the estuary. *Perkinsus* intensity ranged from 0.87-1.33 with an average of 1.09. The recruitment of oyster spat ranged from 0-0.58 (upstream to downstream) with 0.28 spat per she



Patches of *Sargassum* and variety of rhodophyte species seen on hard substrate in the Caloosahatchee River (04/14/13).

ranged from 0-0.58 (upstream to downstream) with 0.28 spat per shell average.

Extensive macroalgae cover was present on hard substrate in the lower Caloosahatchee near Shell Point (*Sargassum sp., Agardhiella* sp., *Chondria* sp., *and* other rhodophytes as well as a filamentous green, *Chaetomorpha* sp.).

Red Tide: Patchy red tide was present in the Pine Island Sound system in Lee County, but most SCCF sites on Sanibel reported no *Karenia brevis*. Respiratory irritation or other impacts due to red tide were not reported on Fort Myers Beach.

Wildlife Impacts: CROW, the wildlife rehabilitation clinic on Sanibel, received 7 brevetoxicosis cases this week: 5 double-crested cormorants; 1 laughing gull; and 1 great blue heron.

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

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - 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

Reporting Period: April 16 - April 22, 2013

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

Caloosahatchee Condition Summary

Flows to the Caloosahatchee plus additional rainfall held salinities at Fort Myers and Beautiful Island in a range sustainable for tape grass, although salinity at Fort Myers continues to increase slightly. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 4/18/13. The pulse includes 3 days of no flow at the end of the schedule.

Recommendation: We request the Corps provide average flows of 1000 cfs, as measured at S79, to maintain salinities in the Fort Myers and Beautiful Island regions of the Caloosahatchee estuary that are supportive of tape grass. Increasing flows at this time will also facilitate the recession of Lake Okeechobee.

Lake Okeechobee Level:	13.59 ft. (Low Sub-B	Last wk: 13.62 ft	
Lake Okeechobee Inflow:	852 cfs	Lake Okeechobee Outflow:	301 cfs
Weekly Rainfall:	WP Franklin 1.14"	Ortona 3.67"	Moore Haven 0.89"
Salinity Fort Myers:	5.5 – 10.2 psu surface	e (SCCF Ft. Myers Yacht Basin)	Previous wk: 5.3 - 9.6 psu
	7.0 - 16 psu (SCCF R	ECON Marker 52)	Previous wk: 7.0 - 14 psu
MFL Status:	Daily salinity at Fort M	yers <u><</u> 10 psu 30 day MA (SC	CCF) = 6.5 psu
Salinity Beautiful Island:	1.5 - 2.5 psu (SCCF R	ECON Marker 18) Previo	us wk: 1.0 - 2.2 psu
Salinity Shell Point:	20 - 34 psu (SCCF F	RECON) Previo	us wk: 22- 33 psu



Page 2 of 2

Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged 1029 cfs. The ten day pulse that ended on 4/18/13 averaged 778 cfs. Salinities from Fort Myers eastward were in the preferred range (0-10 psu) for tape grass.

ACOE April 9, 2013 Pulse Release						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
4/9/13	1	1936	952	692		
4/10/13	2	1486	1097	1548		
4/11/13	3	1000	765	1328		
4/12/13	4	774	469	744		
4/13/13	5	567	417	497		
4/14/13	6	347	200	205		
4/15/13	7	96	100	54		
4/16/13	8	421	163	0		
4/17/13	9	270	158	0		
4/18/13	10	884	711	515		
10 Day	Avg	778	503	558		



Upstream of S79/Franklin Conditions: On 4/23/13, chlorides measured 68 mg/L and apparent color was 73 CU at the Olga Water Treatment plant.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	
Stations	(µg/Ĺ)	(qse)	(NTU)	(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 metars
-		SCB <11	SCB < 5	SCB = 2.2m	SCD-San Ganos Day = 2.2 meters
S79 West	8.5	166	2.0	0.87	Definition of 25% lz: z where I is 25% of surface I.
31 Bridge	9.2	162	2.6	0.86	I = irradiance, Z = depth
Colonial Bridge	8.0	115	3.1	1.02	

Upper Estuary Conditions: Salinities rose slightly at Fort Myers and Beautiful Island. Chlorophyll spikes continued at Fort Myers (to 35 µg/L)where the dinoflagellate, *Akashiwo sanguinea,* was present at 283,000 cells/L, and many nanoflagellates were present. Short hypoxic events were recorded from 4/19/13 to 4/21/13 at Fort Myers RECON. Water temperature in the FPL discharge canal was 92°F on 4/21/13.

Lower Estuary Condition: Salinity conditions continue to support oysters during low tide periods (20 psu) but are above the preferred range (12-25 psu) during high tide periods (34 psu).

Red Tide: Patchy red tide was present in the Pine Island Sound system in Lee County, but most SCCF sites on Sanibel reported no *Karenia brevis*. Respiratory irritation was reported on Sanibel on 4/20/13.

Wildlife Impacts: CROW, the wildlife rehabilitation clinic on Sanibel, received 5 new brevetoxicosis cases this week: 1 Double-crested Cormorant, 1 Royal Tern, 1 Kemp's Ridley Sea Turtle, 1 Common Loon and 1 Osprey.



Polysiphonia drift accumulation at the Caloosahatchee Bridge on April 21, 2013. Photo SCCF

ACOE Daily Reports					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cts)	(cts)	(cfs)	
4/16/13	Tues	421	163	0	
4/17/13	Wed	270	158	0	
4/18/13	Thrs	884	711	515	
4/19/13	Fri	1583	1113	1121	
4/20/13	Sat	1423	1238	1492	
4/21/13	Sun	1429	749	642	
4/22/13	Mon	1152	454	72	
7 Day	Avg	1029	655	548	

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

From: Periodic Scientists Conference Call Participants Paul Tritaik & Joyce Palmer - 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

Reporting Period: April 23 – April 29, 2013

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

Caloosahatchee Condition Summary

High spring tides contributed to higher salinities at Fort Myers and Beautiful Island with the upper limit at Fort Myers rising above 10 psu for the second consecutive week. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 4/28/13. The pulse includes 3 days of no flow at the end of the schedule.

Lake Okeechobee Level:	13.41 ft. (Low Sub-B	Last wk: 13.59 ft	
Lake Okeechobee Inflow:	320 cfs	Lake Okeechobee Outflow:	1957 cfs
Weekly Rainfall:	WP Franklin 0"	Ortona 0.25"	Moore Haven 1.00"
Salinity Fort Myers:	6.6 - 10.6 psu surface	(SCCF Ft. Myers Yacht Basin)	Previous wk: 5.5 – 10.2 psu
	9.2- 14 psu (SCCF REC	CON Marker 52)	Previous wk: 7.0 - 16 psu
MFL Status:	Daily salinity at Fort M	yers <u><</u> 10 psu 30 day MA (SCCF)) = 7.4 psu
Salinity Beautiful Island:	1.7 - 5.1 psu (SCCF RE	ECON Marker 18)	Previous wk: 1.5 - 2.5 psu
Salinity Shell Point:	21 - 34 psu (SCCF R	ECON)	Previous wk: 20 – 34 psu



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Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged 675 cfs. The ten day pulse that ended on 4/28/13 averaged 886 cfs. Salinities from Fort Myers eastward were in the preferred range (0-10 psu) for tape grass.

ACOE April 19, 2013 Pulse Release					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
4/19/13	1	1583	1113	1121	
4/20/13	2	1423	1238	1492	
4/21/13	3	1429	749	642	
4/22/13	4	1152	454	72	
4/23/13	5	1565	593	0	
4/24/13	6	633	314	0	
4/25/13	7	108	NR	0	
4/26/13	8	206	NR	38	
4/27/13	9	98	NR	182	
4/28/13	10	670	NR	244	
10 Day	Avg	886		379	



Upstream of S79/Franklin Conditions: On 4/30/13, chlorides measured 68 mg/L and apparent color was 64 CU at the Olga Water Treatment plant. For the second week, large numbers of bay anchovies were present on the east side of S79. Driven by salinity, bay anchovies and other estuarine fish and plankton moving upstream pass through the lock with east bound vessels. Once on the east side of the lock they become trapped upstream by the structure, unable to return downstream. The bay anchovy's lower salinity tolerance is 1 psu and the water on the east side of S79 is 0.3 psu.

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 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	SCB -San Carlos Bay = 2.2 meters
S79 West	7.1	156	2.9	0.88	Definition of 25% lz: z where I is 25% of surface I.
31 Bridge	8.4	156	1.8	0.91	I = irradiance, z = depth
Colonial Bridge	4.8	101	6.3	0.97	

Upper Estuary Conditions: Salinities rose at Fort Myers Yacht Basin and Beautiful Island. Part of the salinity increase at Fort Myers and Beautiful Island was due to spring tides associated with the recent full moon. The tide at Fort Myers on Saturday was 0.5 feet higher than the previous week, and 0.2 feet higher than the MHHW.

Chlorophyll spikes decreased in magnitude at Fort Myers (to 12 µg/L). Water temperature in the FPL discharge canal reached a high of 96°F and averaged 91°F, 11°F warmer than Shell Point.

Lower Estuary Condition: Salinity conditions continue to support oysters during low tide periods (21 psu) but are above the preferred range (12-25 psu) during high tide periods (34 psu).

Sea turtles: On Sunday April 28, 2013 the first loggerhead sea turtle nest of the season was laid in Southwest Florida on Captiva Island.

Red Tide: Red tide was present at low concentrations in parts of Pine Island Sound in Lee County.

Wildlife Impacts: CROW, the wildlife rehabilitation clinic on Sanibel, received 3 new brevetoxicosis cases this week: 1 Royal Tern and 2 Double-crested Cormorants.

ACOE Daily Reports						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
4/23/13	Tues	1565	593	0		
4/24/13	Wed	633	314	0		
4/25/13	Thrs	108	NR	0		
4/26/13	Fri	206	NR	38		
4/27/13	Sat	98	NR	182		
4/28/13	Sun	670	NR	244		
4/29/13	Mon	1451	NR	1104		
7 Day	Avg	675		224		

SCCF Sonde Surface Salinity at Fort Myers Yacht Basin
To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Melissa Meeker, Dan Delisi, 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

Reporting Period: April 30 - May 6, 2013

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

Caloosahatchee Condition Summary

Rain and higher flows the past week lowered salinities slightly at Fort Myers and Beautiful Island. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release averaging 650 cfs at S79 began on 4/28/13. The pulse included 3 days of no flow at the end of the schedule.

Recommendation: We request the Corps provide average flows of 1000 cfs but not to exceed 1,500 as measured at S79, to maintain salinities in the Fort Myers and Beautiful Island range of the Caloosahatchee estuary to support emerging tape grass habitat and facilitate the desired gradual water level recession in Lake Okeechobee.

Lake Okeechobee Level:	13.58 ft. (Low Sub-B	13.58 ft. (Low Sub-Band)		
Lake Okeechobee Inflow:	879 cfs	Lake Okeechobee Outflow:	341 cfs	
Weekly Rainfall:	WP Franklin 2.34"	Ortona 0.79"	Moore Haven 1.26"	
Salinity Fort Myers:	5.2- 10.0 psu surface (5.2-10.0 psu surface (SCCF Ft. Myers Yacht Basin)		
	7.2 – 18 psu (SCCF RE	CON Marker 52)	Previous wk: 9.2-14 psu	
MFL Status:	Daily salinity at Fort M	Daily salinity at Fort Myers < 10 psu 30 day MA (SCCF)		
Salinity Beautiful Island:	1.5 - 4.5 psu (SCCF RE	Previous wk: 1.7 - 5.1 psu		
Salinity Shell Point:	19 – 34 psu (SCCF R	Previous wk: 21 - 34 psu		



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Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged 1,392 cfs. As of the ninth day of the ten day pulse that ends on 5/7/13, flows averaged 1,318 cfs. Salinities in the upper estuary remain in the preferred range (0-10 psu) for tape grass.

	ACOE April 29, 2013 Pulse Release				
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(CIS)	(015)	(CIS)	
4/28/13	1	670	NR	244	
4/29/13	2	1451	NR	1104	
4/30/13	3	1715	NR	1156	
5/1/13	4	1198	NR	322	
5/2/13	5	2202	1208	46	
5/3/13	6	2046	1154	0	
5/4/13	7	1037	688	0	
5/5/13	8	797	490	0	
5/6/13	9	751	494	0	
5/7/13	10				
10 Day	Avg				



SCCF Sonde Surface Salinity at Fort Myers Yacht Basin

Upstream of S79/Franklin Conditions: On 5/7/13, chlorides measured 70 mg/L and apparent color was 74 CU at the Olga Water Treatment plant. Phytoplankton chlorophyll was elevated (24.5 μ g/L) near the lock due mainly to fine, short, diatom filaments. The level of the cyanobacteria pigment, phycocyanin, was minimal.

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	16.6	170	2.2	0.81
31 Bridge	24	166	1.6	0.80
Colonial Bridge	8.8	124	5.1	0.90

Upper Estuary Conditions: Salinities dropped at Fort Myers Yacht Basin and Beautiful Island. Hypoxic conditions (to 2 mg/L) were present in the lower layer of the water column at Fort Myers. The chlorophyll level at the SR 31 Bridge was significantly elevated ($24 \mu g/L$) on 05/05/13.

Lower Estuary Condition: Salinity conditions continue to support oysters during low tide periods (19 psu) but are above the preferred range (12-25 psu) during high tide periods (34 psu). Attached macroalgae (Acanthophora, Spyridia, Hincksia, Hypnea, and Dasya) was abundant in dense seagrass beds at most sites sampled in Sanibel's waters.

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





Accumulations of drift *Acanthophora* (60 cm tall) were found in the JNDDNWR. Attached macroalgae (*Acanthophora*, *Spyridia*, *Hincksia*, *Hypnea*, and *Dasya*) was abundant in dense seagrass beds at most sites sampled in Sanibel's waters. 5/5/13 Photo SCCF *Red Tide:* Red tide was present at low concentrations in parts of Pine Island Sound in Lee County.

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
4/30/13	Tues	1715	NR	1156
5/1/13	Wed	1198	NR	322
5/2/13	Thrs	2202	1208	46
5/3/13	Fri	2046	1154	0
5/4/13	Sat	1037	688	0
5/5/13	Sun	797	490	0
5/6/13	Mon	751	494	0
7 Day	Avg	1392	576	217

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: May 7 - May 13, 2013

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

Caloosahatchee Condition Summary

Salinities decreased slightly at Fort Myers and Beautiful Island. In the lower estuary dense macroalgae blooms are impacting seagrass beds. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release to the Caloosahatchee averaging 1500 cfs at S79 began on 5/8/13.

Recommendation: We request the Corps and SFWMD engage all storage options for reducing flows to the estuaries including holding more water in the Kissimmee chain of lakes that are currently below schedule, hydrating the Kissimmee flood plain and maximizing storage in all FRESP projects. In addition we request that excess Caloosahatchee flows be diverted to saturate the C43 West Basin Reservoir site to alleviate high flows and excess nutrient loading to the estuary. We recommend average flows not exceed 1000 cfs as measured at S79.

Lake Okeechobee Level:	13.55 ft. (Low Sub-Band)		Last wk: 13. 58 ft
Lake Okeechobee Inflow:	1,343 cfs	Lake Okeechobee Out	flow: 1,310 cfs
Weekly Rainfall:	WP Franklin 0"	Ortona 0.78"	Moore Haven 1.2"
Salinity Fort Myers:	4.5- 9.2 psu surface (SCCF	Ft. Myers Yacht Basin)	Previous wk: 5.2-10.0 psu
	(offline) psu (SCCF RECON	Marker 52)	Previous wk: 7.2 – 18 psu
MFL Status:	Daily salinity at Fort Myers	≤ 10 psu 30 day MA (SCCF)	= 7.4 psu
Salinity Beautiful Island:	1.0 - 2.2 psu (SCCF RECON	Marker 18)	Previous wk: 1.5 - 4.5 psu
Salinity Shell Point:	20 - 34 psu (SCCF RECOM	J)	Previous wk: 19 – 34 psu



Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged 834 cfs. Salinities in the upper estuary remain in the preferred range (0-10 psu) for tape grass.

ACOE May 8, 2013 Pulse Release				
Date	Day	S79 Flow	S78 Flow	S77 Flow
		(cfs)	(cfs)	(cfs)
5/8/13	1	297	48	208
5/9/13	2	600	371	580
5/10/13	3	738	703	1156
5/11/13	4	970	812	1472
5/12/13	5	1332	920	936
5/13/13	6	1682	1179	912
5/14/13	7			
5/15/13	8			
5/16/13	9			
5/17/13	10			
10 Day	Avg			



Upstream of S79/Franklin Conditions: On 5/14/13, chlorides measured 70 mg/L and apparent color was 88 CU at the Olga Water Treatment plant.

Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	
Stations	(µg/L)	(qse)	(NTU)	(meters)	Target light penetration: CE - Caloosabatchee Estuary -1 m
Target Values	< 11	CE <70	CE < 18	CE = 1 m	ranget light periodiation. OE Galoosanatorice Estadiy = 1 m
		SCB <11	SCB < 5	SCB = 2.2m	SCB -San Carlos Bay = 2.2 meters
S79 West	13.2	190	2.2	0.77	Definition of 25% Iz: z where I is 25% of surface I.
31 Bridge	9.7	182	2.0	0.81	<i>I</i> = <i>irradiance</i> , <i>z</i> = depth
Colonial Bridge	5.5	110	3.2	1.06	

Upper Estuary Conditions: Salinities dropped at Fort Myers Yacht Basin and Beautiful Island. Hypoxic conditions were not present in the lower layer of the water column at Fort Myers on 5/10/13. The chlorophyll level at the S79 West was slightly elevated (13.2 µg/L) on 05/12/13 with filamentous cyanobacteria dominant.

With salinities of 0.4 psu at S79 on 5/12/13 we were surprised to see a group of dolphins feeding on the west side of the lock. Most likely, the dolphin were feeding on schools of fish pushed upstream by extremely high tides.

Lower Estuary Condition: Salinity conditions remain relatively stable.

Oysters: Disease prevalence of *Perkinsus* (Dermo) ranged from 61-93% with an average of 75%. Disease intensity ranged from 0.77-1.07 with an average intensity of 0.87.

Red Tide: Red tide was present in low concentrations at a majority of FDACS red tide shellfish sampling sites in Pine Island Sound.

Wildlife Impacts: The wildlife rehabilitation hospital on Sanibel, CROW received 1 new brevetoxin patient this week, a loggerhead sea turtle from Bonita Beach.

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
5/7/13	Tues	224	160	0
5/8/13	Wed	297	48	208
5/9/13	Thrs	600	371	580
5/10/13	Fri	738	703	1156
5/11/13	Sat	970	812	1472
5/12/13	Sun	1332	920	936
5/13/13	Mon	1682	1179	912
7 Day	Avg	834	599	752

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: May 14 - May 20, 2013

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

Caloosahatchee Condition Summary

Salinities decreased slightly at Fort Myers and Beautiful Island. In the lower estuary dense macroalgae blooms are impacting seagrass beds. A Red Tide Advisory and shell fishing ban remain in effect in Lee County.

USACE Action: A 10-day pulse release to the Caloosahatchee averaging 1500 cfs at S79 began on 5/18/13.

Recommendation: We request the Corps and SFWMD engage all storage options for reducing and nutrient loading to the estuaries, including diverting water to saturate the C43 West Basin Reservoir site. We recommend average flows of 1000 cfs, but not to exceed 1500 cfs, as measured at S79.

Lake Okeechobee Level:	13.34 ft. (Low Sub-Ba	Last wk: 13.55 ft	
Lake Okeechobee Inflow:	941 cfs	Lake Okeechobee Outflow:	2,060 cfs
Weekly Rainfall:	WP Franklin 0.72"	Ortona 0.08"	Moore Haven 0"
Salinity Fort Myers:	3.5 - 6.2 psu surface (S	Previous wk: 4.5- 9.2 psu	
	8.0 - 13 psu (SCCF REC	CON Marker 52)	Previous wk: (offline)
MFL Status:	Daily salinity at Fort My	= 6.7 psu	
Salinity Beautiful Island:	0.6 - 1.4 psu (SCCF REC	Previous wk: 1.0 - 2.2 psu	
Salinity Shell Point:	17 - 33 psu (SCCF RE	CON)	Previous wk: 20 - 34 psu



Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged **1,594** cfs. The ten day pulse that ended on 5/17/13 averaged **1,472** cfs. Salinities in the upper estuary remain in the preferred range (0-10 psu) for tape grass.

	ACOE May 8, 2013 Pulse Release				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
5/8/13	1	297	48	208	
5/9/13	2	600	371	580	
5/10/13	3	738	703	1156	
5/11/13	4	970	812	1472	
5/12/13	5	1332	920	936	
5/13/13	6	1682	1179	912	
5/14/13	7	2031	1507	1560	
5/15/13	8	2238	1760	2180	
5/16/13	9	2542	1977	2558	
5/17/13	10	2294	2030	2590	
10 Day	Avg	1472	1130	1415	



Upstream of S79/Franklin Conditions: On 5/21/13, chlorides measured 68 mg/L and apparent color was 80 CU at the Olga Water Treatment plant. Chlorophyll at S79 was slightly elevated (to $11.2 \mu g/L$) but the cyanobacteria content was low.

Chlorophyll	CDOM	Turbidity	25% Iz Light		
(µg/L)	(qse)	(NTU)	(meters)		
< 11	CE <70	CE < 18	CE = 1 m		
	SCB <11	SCB < 5	SCB = 2.2m		
17.1	220	4.2	0.64		
8.7	199	2.6	0.76		
5.8	122	1.5	1.08		
Target light penetration: CE - Caloosahatchee Estuary =1 m					
SCB-San Carlos Bay = 2.2 meters					
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth					
	Chlorophyll (μg/L) < 11 17.1 8.7 5.8 ation: CE- Caloos SCB-San ε: z where I is 2 I = ii	Chlorophyll (μg/L) CDOM (qse) < 11	Chlorophyll CDOM Turbidity $(\mu g/L)$ (qse) (NTU) < 11		

Upper Estuary Conditions: Salinities rose slightly at Fort Myers Yacht Basin. Dissolved oxygen levels in the lower layer of the water column at Fort Myers were as low as 3.1 mg/L on 5/19/13 and 5/20/13. The phycocyanin and chlorophyll levels west of S79 were slightly elevated on 05/20/13 with filamentous cyanobacteria present near S79 and Fort Myers.

RECON graph at right shows chlorophyll spikes above 20 μ g/L occurred at Fort Myers from 5/15/13 to 5/20/13.

Lower Estuary Condition: The salinity range increased with salinities dropping to 17 psu on the outgoing tide. Since 5/16/13, marcoalgae has begun to wash up on Fort Myers Beach with every tidal cycle.

Red Tide: Last week, concentrations of red tide in Pine Island Sound ranged from not present (FWC and SCCF) to background (FWC). Recent sampling in coastal waters off Lee County indicated the presence of five other *Karenia* species, not *K.brevis*, whose presence has previously preceded blooms of *K. brevis* (FWC). This observation, in addition to the explosion of macroalgae in the lower estuary, raises a concern about the nutrient enrichment from high lake discharges. *Data courtesy of Alina Corcoran, FWC*.

Wildlife Impacts: CROW, the wildlife rehabilitation hospital on Sanibel, received 2 new brevetoxin patients this week; a Kemp's Ridley Sea Turtle and a Double-crested Cormorant.







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

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - 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

Reporting Period: May 21 - May 27, 2013

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

Caloosahatchee Condition Summary

Salinities remained in a low range supportive of tape grass and *Rangia* at Fort Myers and Beautiful Island. The Florida Department of Health in Lee County reported that red tide was "officially gone from Lee County waters as of Friday, May 17, 2013, when FDACS announced the full re-opening of Pine Island Sound." However, a number of other algae blooms have been reported in the Caloosahatchee, estuary, and Gulf waters.

USACE Action: A 10-day pulse release to the Caloosahatchee averaging 1500 cfs at S79 ended on 5/27/13; a subsequent 10-day pulse averaging 1500 cfs at S79 was initiated on 5/28/13.

Lake Okeechobee Level:	13.29 ft. (Low Sub-B	Last wk: 13.34 ft		
Lake Okeechobee Inflow:	720 cfs	Lake Okeechobee Outflow:	2,595 cfs	
Weekly Rainfall:	WP Franklin 0.25"	Ortona 2.08"	Moore Haven 1.39"	
Salinity Fort Myers:	3.9 -7.2 psu surface (\$	3.9 -7.2 psu surface (SCCF Ft. Myers Yacht Basin)		
	4.6 -12 psu (SCCF RE	CON Marker 52)	Previous wk: 8.0 - 13	
MFL Status:	Daily salinity at Fort M	Daily salinity at Fort Myers \leq 10 psu 30 day MA (SCCF)		
Salinity Beautiful Island:	0.4 – 1.6 psu (SCCF R	ECON Marker 18)	Previous wk: 0.6 - 1.4 psu	
Salinity Shell Point:	18 - 33 psu (SCCF R	ECON)	Previous wk: 17 - 33 psu	



Page 2 of 2

Flow: Flows to the Caloosahatchee estuary through S79 over the past seven days averaged **2,090** cfs. The ten day pulse that ended on 5/27/13 averaged **1,668** cfs. Salinities in the upper estuary remain in the preferred range for tape grass.

	ACOE May 18, 2013 Pulse Release				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
5/18/13	1	811	719	1032	
5/19/13	2	450	271	720	
5/20/13	3	794	324	882	
5/21/13	4	1114	794	856	
5/22/13	5	1798	553	620	
5/23/13	6	1898	926	286	
5/24/13	7	2184	1446	878	
5/25/13	8	2480	1722	1402	
5/26/13	9	2722	1948	1790	
5/27/13	10	2437	1942	1996	
10 Day	Avg	1668	1064	1046	



Upstream of S79/Franklin Conditions: On 5/28/13, chlorides measured 75 mg/L and apparent color was 63 CU at the Olga Water Treatment plant. A persistent algal bloom was noted at the Plant intake all week. Algae were also observed at the Alva Bridge, photos at right. Chlorophyll at S79 was slightly elevated to 10.0 µg/L, dominated by thin cyanobacteria filaments and small flagellates.

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	13.2	142	3.5	0.87	
31 Bridge	12.2	150	3.1	0.86	
Colonial Bridge	9.2	118	4.0	0.96	
Target light penetra	Target light penetration: CE - Caloosahatchee Estuary =1 m				
SCB-San Carlos Bay = 2.2 meters					
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth					



Algae at the Alva Bridge & Oxbow 5/28/13. Photo: A. Buff

Upper Estuary Conditions: Salinities remained low at Fort Myers Yacht Basin. Dissolved oxygen levels in the lower layer of the water column at Fort Myers increased from 3 mg/L to above 4 mg/L. Chlorophyll levels at the Ft. Myers RECON decreased from 35 µg/L to 5-10 µg/L, while levels upstream at the 31 Bridge increased with cyanobacteria filaments dominating.

Lower Estuary Condition: A low level bloom of diatoms and cyanobacteria (10 µg chl *a*/L) was detected in San Carlos Bay and on the beaches of Sanibel from 5/24-5/29. *Chaetoceros* sp. and *Rhizosolenia* sp. were the dominant diatoms. Patches of cyanobacteria *Lyngbya majuscula* was present on the sediment surface in the JN Ding Darling NWR. Drift algae was observed on beaches of Sanibel and Fort Myers Beach.

Wildlife Impacts: CROW, the wildlife rehabilitation hospital on Sanibel, reported no new brevetoxin patients this week.



ACOE Daily Reports							
Date	Day	Day S79 Flow S78 Flow S77 F					
		(cfs)	(cfs)	(cfs)			
5/21/13	Tues	1114	794	856			
5/22/13	Wed	1798	553	620			
5/23/13	Thrs	1898	926	286			
5/24/13	Fri	2184	1446	878			
5/25/13	Sat	2480	1722	1402			
5/26/13	Sun	2722	1948	1790			
5/27/13	Mon	2437	1942	1996			
7 Day	Avg	2090	1333	1118			

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: May 28 – June 3, 2013

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

Caloosahatchee Condition Summary

Cyanobacteria algae blooms have been occurring over the past week from LaBelle to the mid Caloosahatchee Estuary. Macro algae are washing up on the beaches of Fort Myers Beach and Sanibel Island.

USACE Action: A 10-day pulse release to the Caloosahatchee averaging 1500 cfs at S79 started on 5/28/13.

Recommendation: We request the Corps and SFWMD engage all storage options for reducing flows to the estuaries including maximizing storage in the Kissimmee lakes (currently below schedule) and in all FRESP projects. In addition, we request that excess Caloosahatchee flows be diverted to the C43 West Basin Reservoir test cells and saturation of the site to alleviate high flows and excess nutrient loading to the estuary. We recommend average flows of 1500 cfs as measured at S79.

Lake Okeechobee Level:	13.39 ft. (Low Sub-Ba	Last wk: 13.29 ft	
Lake Okeechobee Inflow:	972 cfs	Lake Okeechobee Outflow:	365 cfs
Weekly Rainfall:	WP Franklin NR	Ortona 2.41"	Moore Haven 1.19"
Salinity Fort Myers:	4.0 -8.1 psu surface (SC	Previous wk: 3.9 -7.2 psu	
	4.6 – 13 psu (SCCF REC	CON Marker 52)	Previous wk: 4.6 -12
MFL Status:	Daily salinity at Fort My	ers <u><</u> 10 psu 30 day MA (SCCF) = 5.7 psu
Salinity Beautiful Island:	0.4 -1.4 psu (SCCF REC	ON Marker 18)	Previous wk: 0.4 – 1.6 psu
Salinity Shell Point:	18 – 34 psu (SCCF RE	ECON)	Previous wk: 18 - 33 psu



Flow: Flows to the Caloosahatchee Estuary through S79 over the past seven days averaged **1,586** cfs. Salinities in the upper estuary remain in the preferred range for tape grass.

	ACOE May 28, 2013 Pulse Release				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
5/28/13	1	1569	1039	1440	
5/29/13	2	795	476	824	
5/30/13	3	1023	645	0	
5/31/13	4	1394	1174	388	
6/1/13	5	1500	1463	1388	
6/2/13	6	2626	1152	876	
6/3/13	7	2200	1188	446	
6/4/13	8				
6/6/13	9				
6/7/13	10				
10 Day	Avg				



Upstream of S79/Franklin Conditions: On 6/4/13, chlorides measured 75 mg/L and apparent color was 81 CU at the Olga Water Treatment Plant. A persistent algal bloom was noted at the Plant intake all week. Chlorophyll at S79 was slightly elevated (14.7 μ g/L) and dominated by thin cyanobacteria filaments including potentially toxic *Cylindrospermopsis* sp., *Anabaena* sp. and *Aphanizomenon* sp. Visible cyanobacteria blooms were also present at LaBelle (18.2 μ g/L) and Alva (9.0 μ g/L). An algae bloom at the LaBelle Boat Ramp was photographed on 6/2/13.

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	12.5	152	4.1	0.82
31 Bridge	13.6	152	4.0	0.82
Colonial Bridge	4.8	106	3.7	1.06
Target light penetra	tion: CE- Caloos	ahatchee Es	tuary =1 m	
SCB-San Carlos Bay = 2.2 meters				
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth				



Upper Estuary Conditions: Salinities remained low at the Fort Myers Yacht Basin. Chlorophyll levels at the 31 Bridge and S79 were elevated by a mixture of cyanobacteria including *Cylindrospermopsis* sp., *Anabaena* sp. and *Aphanizomenon* sp.

Lower Estuary Condition: Clumps of Lyngbya majuscula were present on seagrasses in Pine Island Sound near Tarpon Bay.

Wildlife Impacts: CROW, the wildlife rehabilitation hospital on Sanibel, reported one new brevetoxin patient this week; a double crested cormorant.

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
5/28/13	Tues	1569	1039	1440
5/29/13	Wed	795	476	824
5/30/13	Thrs	1023	645	0
5/31/13	Fri	1394	1174	388
6/1/13	Sat	1500	1463	1388
6/2/13	Sun	2626	1152	876
6/3/13	Mon	2200	1188	446
7 Day	Avg	1586	1019	766

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Dan Delisi, 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

Reporting Period: June 4 – June 10, 2013

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

Caloosahatchee Condition Summary

Cyanobacteria blooms continue from LaBelle to the coast causing the Olga Water Treatment Plant to be shut down. *Trichodesmium* and macroalgae blooms of *Lyngbya majuscule* are present in San Carolos Bay.

USACE Action: A 10-day pulse release to the Caloosahatchee averaging 1500 cfs at S79 ended on 6/6/13; a subsequent 10-day pulse averaging 1500 cfs at S79 was initiated on 6/7/13.

Recommendation: We request the Corps and SFWMD engage all storage options for reducing flows to the estuaries including maximizing storage in all Distributed Water Management (DWM) projects. In addition, we request that excess Caloosahatchee flows be diverted to the C43 West Basin Reservoir site to alleviate the excessive high flows and nutrient loading that is contributing to cyanobacterial blooms. We recommend a 10-day pulse release with average flows of 1500 cfs measured at S79. At no point should the 30-day moving average exceed 2800 cfs at S79.

Lake Okeechobee Level:	13.87 ft. (Low Sub-Band)		Last wk: 13.39 ft
Lake Okeechobee Inflow:	8,687 cfs	Lake Okeechobee Ou	tflow: -650 cfs
Weekly Rainfall:	WP Franklin 1.69"	Ortona 4.16"	Moore Haven 2.41"
Salinity Fort Myers:	0.5 - 4.7 psu surface (SCCF F	t. Myers Yacht Basin)	Previous wk: 4.0 -8.1 psu
	0.5 - 7.5 psu (SCCF RECON M	arker 52)	Previous wk: 4.6 – 13 psu
MFL Status:	Daily salinity at Fort Myers \leq '	10 psu 30 day MA (SCCF) = 4.8 psu
Salinity Beautiful Island:	0.3 - 0.9 psu (SCCF RECON M	arker 18)	Previous wk: 0.4 -1.4 psu
Salinity Shell Point:	12 - 34 psu (SCCF RECON)		Previous wk: 18 – 34 psu



Flow: Flows to the Caloosahatchee Estuary through S79 over the past seven days averaged **3,964** cfs. The 10-day pulse that ended on 6/6/13 averaged **2,154** cfs.

	ACOE May 28, 2013 Pulse Release				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
5/28/13	1	1569	1039	1440	
5/29/13	2	795	476	824	
5/30/13	3	1023	645	0	
5/31/13	4	1394	1174	388	
6/1/13	5	1500	1463	1388	
6/2/13	6	2626	1152	876	
6/3/13	7	2200	1188	446	
6/4/13	8	2500	1471	556	
6/5/13	9	2798	1635	428	
6/6/13	10	4969	1614	64	
10 Day	Avg	2154	1185	641	



Upstream of S79/Franklin Conditions: On 6/11/13, chlorides measured 60 mg/L and apparent color was 75 CU at the Olga Water Treatment Plant. A continuing cyanobacteria bloom caused the Olga WT plant to shut down on 6/5/13 the plant remains offline due to algae as of 6/11/13. Chlorophyll at S79 was slightly elevated (14.4 µg/L) and dominated by thin cyanobacteria filaments including potentially toxic *Cylindrospermopsis* sp., *Anabaena* sp., *Microcystis* sp., and *Aphanizomenon* sp. Chlorophyll levels were also slightly elevated at LaBelle (9.5µg/L) and Alva (9.8µg/L).

Caloosahatchee	Chlorophyll	CDOM (rea)		25% Iz Light	
Target Values	(µg/∟) < 11	(qse) CE <70	CE < 18	CE = 1 m	
		SCB <11	SCB < 5	SCB = 2.2m	
Ft Myers	15.1	152	2.2	0.87	
lona	11.2	119	1.9	1.03	
San Carlos Bay	6.7	38	2.5	1.64	
Target light penetra	Target light penetration: CE - Caloosahatchee Estuary =1 m				
SCB-San Carlos Bay = 2.2 meters					
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth					



Upper Estuary Conditions: Salinities at Fort Myers dropped to less than 1 psu. Chlorophyll levels at S79 were elevated by a mixture of cyanobacteria including potentially toxic *Aphanizomenon*. Chlorophyll levels were elevated at Fort Myers, and Colonial Bridge where cyanobacteria filaments were present. Elevated chlorophyll at Iona was due to *Skeletonema* sp.

Lower Estuary Condition: The marine cyanobacteria *Trichodesmium* sp. accumulated at the Sanibel Boat Ramp and in the surf zone on Tarpon Bay Beach on 6/10/13. *Trichodesmium* is able to fix nitrogen and may then supply macronutrients N, P and Fe to *Karenia brevis*, potentially fueling red tide bloom formation. Another cyanobacteria, *Lyngbya majuscule* was observed in Tarpon Bay on 6/10/13.





ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
6/4/13	Tues	2500	1471	556
6/5/13	Wed	2798	1635	428
6/6/13	Thrs	4969	1614	64
6/7/13	Fri	5895	2878	0
6/8/13	Sat	3940	2495	0
6/9/13	Sun	4560	2226	0
6/10/13	Mon	3087	1571	0
7 Day	Avg	3964	1984	149

Wildlife Impacts: CROW, the wildlife rehabilitation hospital on Sanibel, reported one new patient a sandwich tern with brevetoxicosis.

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: June 11 – June 17, 2013

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

Caloosahatchee Condition Summary

High flows continue to reduce salinity throughout the estuary. Salinities at the lona oyster beds in the lower estuary are below the preferred range for oysters. Patches of *Trichodesmium* were sampled in San Carlos Bay and along Sanibel beaches.

USACE Action: A 10-day pulse release to the Caloosahatchee averaging 1500 cfs at S79 ended on 6/16/13. A 7 day pulse of 2500 cfs at S79 began on 6/17/13.

Recommendation: We request the Corps and SFWMD engage all storage options for reducing flows to the estuaries including maximizing storage in all Distributed Water Management (DWM) projects. In addition, we request that excess Caloosahatchee flows be diverted to the C43 West Basin Reservoir site to alleviate the excessive high flows and nutrient loading that is contributing to cyanobacterial blooms. Pulse releases should be designed so as to not exceed the 2800 cfs (30-day moving average) harm threshold at S79.

Lake Okeechobee Level:	13.91 ft. (Low Sub-Band)		Last wk: 13.87 ft
Lake Okeechobee Inflow:	1,927 cfs	Lake Okeechobee Out	tflow: 1,153 cfs
Weekly Rainfall:	WP Franklin 0.32"	Ortona 0.28"	Moore Haven 0"
Salinity Fort Myers:	0.3 -0.5 psu surface (SCCF Ft.	. Myers Yacht Basin)	Previous wk: 0.5 - 4.7 psu
	0.3- 2.2 psu (SCCF RECON Ma	arker 52)	Previous wk: 0.5 - 7.5 psu
MFL Status:	Daily salinity at Fort Myers < 1	10 psu 30 day MA (SCCF)) = 3.7 psu
Salinity Beautiful Island:	0.3 - 0.3 psu (SCCF RECON M	arker 18)	Previous wk: 0.3 - 0.9 psu
Salinity Shell Point:	10 – 32 psu (SCCF RECON)		Previous wk: 12 - 34 psu



Flow: Flows to the Caloosahatchee Estuary through S79 averaged above the harm threshold. Over the past seven days flows averaged **2,485** cfs. The 10-day pulse that ended on 6/16/13 averaged **3,207** cfs with flows as high as 5,895 cfs.

ACOE June 7, 2013 Pulse Release					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
6/7/13	1	5895	2878	0	
6/8/13	2	3940	2495	0	
6/9/13	3	4560	2226	0	
6/10/13	4	3087	1571	0	
6/11/13	5	2183	1084	0	
6/12/13	6	2429	944	0	
6/13/13	7	3086	721	0	
6/14/13	8	2191	682	128	
6/15/13	9	2410	1004	514	
6/16/13	10	2294	1102	610	
10 Day	Avg	3207	1470	125	



Upstream of S79/Franklin Conditions: On 6/18/13, chlorides measured 62 mg/L and apparent color was 95 CU with no visible algae at the Olga Water Treatment Plant. The Olga WT plant remains offline.

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	13.5	186	2.2	0.78	
lona	10.7	129	3.3	0.94	
San Carlos Bay	n Carlos Bay 6.7		2.6	<u>1.66</u>	
Target light penetration: CE - Caloosahatchee Estuary =1 m					
SCB -San Carlos Bay = 2.2 meters					
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth					



Upper Estuary Conditions: Salinities at Fort Myers remained below 1 psu. Chlorophyll levels were elevated at Fort Myers, and Colonial Bridge where flagellates, diatoms, chlorophytes and cyanobacteria were present.

Lower Estuary Condition:

Patches of *Trichodesmium* were observed along the beaches of Sanibel during the week up to 6/17/13.

Oysters: Salinities in the oyster beds at Iona dropped below the preferred range for oysters, see graph above. Salinities at Shell point are dropping but on average remain within the preferred range (14 -28 psu). Scientists at FGCU report that *Perkinsus* prevalence is high ranging from 84.6-100% with an average of 94.8%. *Perkinsus* intensity is low ranging from 1.07-1.67 with an average of 1.41. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).



ACOE Daily Reports Date S79 Flow S78 Flow S77 Flow Day (cfs) (cfs) (cfs) 6/11/13 Tues 2183 1084 0 6/12/13 Wed 2429 944 0 6/13/13 Thrs 3086 721 0 6/14/13 128 Fri 2191 682 6/15/13 Sat 2410 1004 514 6/16/13 Sun 2294 1102 610 6/17/13 Mon 2805 1155 966 956 7 Day 2485 316 Avg

Cyanobacteria *Trichodesmium* (aka sea sawdust) in San Carlos Bay on 6/18/13. Photo SCCF

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: June 18 - June 24, 2013

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

Caloosahatchee Condition Summary

High flows continue to reduce salinity throughout the estuary. Average flow at S79 for the last 30 days (5/26/13-6/24/13) was 3,042 cfs, well above the 2,800 cfs harm threshold. With sustained flows above 2,800 cfs, we expect that low salinities will cause mortality of marine organisms in the lower estuary and harm to seagrasses. Salinities at the lona oyster reef in the lower estuary have already fallen below the preferred range for oysters.

USACE Action: A 7-day pulse of 2,500 cfs at S79 ended on 6/23/13; a 7-day pulse of 3,000 cfs at S79 began on 6/24/13.

Recommendation: Pulse releases should be designed to immediately reduce the 30-day moving average flow at S79 below the 2,800 cfs harm threshold. We request the Corps and SFWMD engage all storage options for reducing flows to the estuaries including maximizing storage in all Distributed Water Management (DWM) projects. In addition, we request that excess Caloosahatchee flows be diverted to the C43 West Basin Reservoir site to alleviate the excessive high flows and nutrient loading. Pulse releases should be designed so as to not exceed the 2,800 cfs (30-day moving average) harm threshold at S79.

Lake Okeechobee Level:	13.95 ft. (Low Sub-Band)	Last wk: 13.91 ft	
Lake Okeechobee Inflow:	3,504 cfs	Lake Okeechobee Ou	itflow: 1,391 cfs
Weekly Rainfall:	WP Franklin 1.26"	Ortona 4.30"	Moore Haven 2.05"
Salinity Fort Myers:	0.3 - 0.3 psu surface (SCCF	Ft. Myers Yacht Basin)	Previous wk: 0.3 -0.5 psu
	0.3 - 0.4 psu (SCCF RECON	Marker 52)	Previous wk: 0.3- 2.2 psu
Salinity Beautiful Island:	0.3 - 0.3 psu (SCCF RECON	Marker 18)	Previous wk: 0.3 - 0.3 psu
Salinity Shell Point:	10 – 31 psu (SCCF RECON	۷)	Previous wk: 10 – 32 psu



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Flow: Flows to the Caloosahatchee Estuary through S79 have averaged above the 2,800 cfs harm threshold over the past 30 days. For the past 7 days, flows have averaged 4,198 cfs, with all daily flows above 2,800 cfs, and 4 days of flow above 4,500 cfs.

	ACOE JI	7000 -				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	6000 -	
6/17/13	1	2805	1155	966	(s) 5000 -	
6/18/13	2	3213	1950	2082	ອັ 4000 +	
6/19/13	3	4563	2258	892	s 3000	
6/20/13	4	4711	2582	276	S Soor	^
6/21/13	5	5202	2741	669	<u>é</u> 2000 –	
6/22/13	6	4526	2303	500	1000 -	
6/23/13	7	4370	2380	789	0 -	/
7 Day	Avg	4198	2195	882	3-M	ay 13-May



Upstream of S79/Franklin Conditions: On 6/25/13, chlorides measured 52 mg/L and apparent color was 157 CU with no visible algae at the Olga Water Treatment Plant. The Olga WT plant remains offline.

Upper Estuary Conditions: Salinities at Fort Myers remained below 1 psu. Chlorophyll levels were slightly elevated at Fort Myers and the Colonial Bridge.

Lower Estuary Condition: A stranding event of red drift algae is continuing on the north end of Fort Myers Beach from Lynn Hall Park to Bowditch Point Park and water color in that area is becoming darker.

Caloosal	natchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	t
Stati	ons	(µg/L)	(qse)	(NTU)	(meters)	
Target	Values	< 11	CE <70	CE < 18	CE = 1 m	
			SCB <11	SCB < 5	SCB = 2.2m	۱
Ft My	/ers	12.9	205	3.6	0.70	
lor	a	9.8	195	3.0	0.75	
San Carlos Bay		6.6	91	4.2	1.10	
Target light penetration: CE - Caloosahatchee Estuary =1 m					uary =1 m	
SCB -San Carlos Bay = 2.2 meters					.2 meters	
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth						

Conditions at McIntyre Creek at the J.N. "Ding" Darling National Wildlife Refuge are starting to show effects of flows at S-79. Salinity has decreased from approximately 30 psu on June 18 to approximately 26 psu on June 25. CDOM has shown a corresponding increase during the same period.



Oysters: Salinities dropped below the preferred range for oysters at Iona. Scientists at FGCU report that larval recruitment ranged from 0.47-5.67 spat/shell from upstream to downstream with an average of 2.13 for the estuary. Lower recruitment compared to last month may be due to larval flushing from the system due to high rainfall and runoff.









Nitrogen fixing filamentous cyanobacteria, *Lyngbya majuscula* was noted floating on the surface and on seagrasses in San Carlos Bay on 06/20/13. Photo SCCF



at lona on 6/20/13 as salinities were decreasing to the lower end of their tolerance range. Photo SCCF

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

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - 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

Reporting Period: June 25 - July 1, 2013

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

Caloosahatchee Condition Summary

Across the watershed, above normal rainfall resulted in high flows that continued to reduce salinity throughout the estuary. **Average flow at S79 for the last 30 days (6/2/13-7/1/13) was 3,660 cfs, well above the 2,800 cfs harm threshold.** For the past three days, significant flows to the estuary were delivered entirely from the watershed with no contribution from Lake Okeechobee, with flows reaching 6961 cfs on 7/1/13. With sustained flows above 2,800 cfs, we expect that low salinities will cause mortality of marine organisms in the lower estuary and harm to seagrasses. Salinities at the lona oyster reefs in the lower estuary remain below the preferred range for oysters.

USACE Action: A 7-day pulse of 3,000 cfs at S79 began on 6/24/13. However, in order to bring the start of Lake releases into a better alignment with the planning process and meetings such as the Periodic Scientists Call, the current pulse release scheduled to end on 7/1/13 was extended to 7/4/13, with 4 days of constant flow of 3000 cfs at S79.

Recommendation: With continued high flows from the watershed expected, we request that the Corps minimize releases to the Caloosahatchee from S77 until basin runoff has returned to more typical levels. We continue to urge the SFWMD to engage all storage options for reducing flows to the estuaries including maximizing storage in all Distributed Water Management (DWM) projects and the C43 West Basin Reservoir site.

Lake Okeechobee Level:	14.23 ft. (Low Sub-Band)		Last wk: 13.95 ft
Lake Okeechobee Inflow:	11,255 cfs	Lake Okeechobee Ou	tflow: 264 cfs
Weekly Rainfall:	WP Franklin 2.35"	Ortona 2.44"	Moore Haven 4.19"
Salinity Fort Myers:	0.2 - 0.2 psu surface (SCCF F	Ft. Myers Yacht Basin)	Previous wk: 0.3 -0.3 psu
	0.2 - 0.3 psu (SCCF RECON N	Marker 52)	Previous wk: 0.3-0.4 psu
Salinity Beautiful Island:	0.2 - 0.3 psu (SCCF RECON N	Marker 18)	Previous wk: 0.3 - 0.3 psu

Salinity Shell Point:



Previous wk: 10 - 31 psu



Flow: The 30-day moving average flow to the Caloosahatchee Estuary through S79 has been above the 2,800 cfs harm threshold for the past 11 days. For the last 7 days, flow averaged 4279 cfs, with flows of 6961 cfs on 7/1/13. For the last three days, significant flows to the estuary were delivered entirely from the watershed with no contribution from Lake Okeechobee.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
6/25/13	Tues	3526	1811	538	
6/26/13	Wed	4216	2971	1522	
6/27/13	Thurs	4465	3174	2084	
6/28/13	Fri	4906	2036	912	
6/29/13	Sat	3254	1122	0	
6/30/13	Sun	2626	789	0	
7/1/13	Mon	6961	1764	0	
7 Day	Avg	4279	1952	722	

Upstream of S79/Franklin Conditions: On 7/2/13, chlorides measured 54 mg/L. Apparent color increased significantly over the last week from 157 Color Units (CU) to 219 CU. No visible algae was observed at the Olga Water Treatment Plant during the last week. The Olga WT plant remains offline.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Turbidity and chlorophyll levels were slightly elevated at the Colonial Bridge with a combination of cyanobacteria, diatoms and flagellates.

Lower Estuary Condition:

Chlorophyll level was elevated at Iona. Small amounts of macroalgae including *Acanthophora, Gracilaria and Hypnea*, were washing ashore along the causeway.

Oysters: Salinities remained below the preferred range for oysters at lona, but were within the preferred range near Shell Point.

McIntyre Creek: After falling from 30 to 26 psu, salinities at McIntyre Creek increased over the past week; however, salinity remains below 30 psu, the optimum range for *Thalassia* (Zieman, 1975). If salinity stays below 30 psu for long perids of time, local seagrass beds will be negatively impacted. Correlation analyses comparing CDOM and salinity at continuously recording stations to flows at S79 show strong correlations between CDOM and salinity with S79 flow rates at increasing lag times downstream (Thompson *et al*, 2012). The lag time at McIntyre Creek is approximately 11 days.

ACOE June 24, 2013 Pulse Release					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
6/24/13	1	3273	2049	1014	
6/25/13	2	3526	1811	538	
6/26/13	3	4216	2971	1522	
6/27/13	4	4465	3174	2084	
6/28/13	5	4906	2036	912	
6/29/13	6	3254	1122	0	
6/30/13	7	2626	789	0	
7/1/13	8	6961	1764	0	
7/2/13	9				
7/3/13	10				
7/4/13	11				
11 Day	Avg				



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	9.6	225	3.3	0.68
Colonial Bridge	14.8	205	10.3	0.58
Iona	13.3	172	3.5	0.78
San Carlos Bay	4.4	56	3.8	1.38

Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z= depth





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To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Ernie Barnett, Dan Delisi, 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

Reporting Period: July 2 - July 8, 2013

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

Caloosahatchee Condition Summary

Above normal rainfall has resulted in excessively high flows, up to 10,696 cfs, at S79 that continued to reduce salinity throughout the estuary. Average flow at S79 for the last 30 days (6/9/13-7/8/13) was 5,121 cfs, well above the 4,500 cfs harm threshold. Sustained flows above 2,800 cfs have caused mortality of marine organisms and seagrass habitat in the lower estuary and San Carlos Bay. Salinities at the lona oyster reefs in the lower estuary have plummeted to the mortality range for oysters and shoal grass.

USACE Action: A 14-day pulse release averaging 4000 cfs, measured at S-77, began on 7/5/13.

Recommendation: With continued high flows from the watershed expected, we request that the SFWMD to engage all storage options for reducing flows to the estuaries including maximizing storage in all Distributed Water Management (DWM) projects and the C43 West Basin Reservoir site.

Lake Okeechobee Level:14.75 ft. (Low Sub-Band)			Last wk: 14.23 ft
Lake Okeechobee Inflow:	10,163 cfs	Lake Okeechobee O	utflow: NR cfs
Weekly Rainfall:	WP Franklin 1.62"	Ortona 3.43"	Moore Haven 1.90"
Salinity Fort Myers:	0.2 - 0.3 psu surface (SCCF	Ft. Myers Yacht Basin)	Previous wk: 0.2 - 0.2 psu
	0.2 - 0.3 psu (SCCF RECON	Marker 52)	Previous wk: 0.2 - 0.3 psu
Salinity Beautiful Island:	0.2 - 0.3 psu (SCCF RECON	Marker 18)	Previous wk: 0.2 - 0.3 psu
Salinity Shell Point:	1.1 - 27 psu (SCCF RECON)		Previous wk: offline



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Caloosahatchee Estuary

Flow: The 11 day pulse release that ended on 7/4/13 delivered an average 5,665 cfs with flows as high as 9,900 cfs. The past seven days flows averaged 9,825 cfs with daily flows as high as 10,696 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 5,121 cfs; above the 4,500 cfs harm threshold for the past four days and above the 2,800 cfs harm threshold for the past 18 days.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
7/2/13	Tues	9394	2207	0	
7/3/13	Wed	9798	2230	0	
7/4/13	Thurs	9900	2959	0	
7/5/13	Fri	9151	3683	1680	
7/6/13	Sat	10696	5830	3228	
7/7/13	Sun	10477	6282	4037	
7/8/13	Mon	9363	5884	4030	
7 Day	Avg	9825	4153		



Upstream of S79/Franklin Conditions: On 7/9/13, chlorides measured 42 mg/L. Apparent color increased significantly over the last week from 219 Color Units (CU) to 301 CU. No visible algae was observed at the Olga Water Treatment Plant during the last week. The Olga WT plant remains offline.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Turbidity and chlorophyll levels were slightly elevated at the Colonial Bridge with a combination of cyanobacteria, diatoms and flagellates.

Lower Estuary Condition:

A phytoplankton bloom consisting mainly of a mixture of chain forming and pennate diatoms was present at Iona on 07/08/13. Genera present included *Skeletonema*, *Navicula*, *Thalassiosira*, *Pseudo-nitzchia*, *Asterionella*, *Bacillaria*, and *Leptocylindricus*. Patches of red drift algae were present on the north end of Fort Myers Beach.

Salinities at lona entered the lethal range for shoal grass.

Salinities dropped by 10 psu at the Tarpon Bay RECON site and also dropped at the Gulf of Mexico RECON site. Salinities in San Carlos Bay are below the optimal range for turtle grass, a stenohaline species. Light attenuation levels increased sharply in San Carlos Bay and in the near shore Gulf of Mexico. The 25% light depth at Tarpon Bay RECON on 07/09/13 was 0.67m (from measured Kdpar). Light levels of <25% of surface values at depths between 0.65 and 2 meters will result in reduced seagrass production.



Seagrass washed up on the Sanibel boat ramp beach 7/9/13. Photo SCCF

McIntyre Creek: Bottom salinities at McIntyre Creek have dropped significantly over the past week fluctuating between 18 and 22 psu. The dominant seagrass species *Thalassia testudinum*, is not known to persist locally in areas where salinity stays below 20 psu for extended periods (Greenawalt-Boswell et al. 2006). If extreme flows at S-79 continue, seagrasses within the refuge and surrounding area may be reduced. As of Saturday, 7/ 6/13, floating seagrass blades have been seen in the vicinity of the McIntyre Creek sensor and have been accumulating on the shoreline within the refuge and islands along the Sanibel causeway. CDOM has tripled since 7/1/13, indicating high nutrient loading and low light conditions.



Oysters: Salinities at Iona entered the lethal range for oysters while average salinities at Shell Point and seaward remained above the lethal range. If the salinity at Iona remains <1 psu for 2 more weeks there could be a complete oyster mortality at this location.



Ecological Targets: SFWMD Presentation by Bob Chamberlain Research & WQ Monitoring Plan Working Team *Summary of Salinity, Inflow, and Supporting Water Quality Targets in the Caloosahatchee Estuary* January 23, 2008 Presentation to Northern Everglades Caloosahatchee Watershed

Important Discharge Levels for the Caloosahatchee Estuary at S-79

- 1. < 450 cfs: high salinity in upper estuary causes mortality of tape grass habitat.
- >2800 cfs: low salinity causes mortality of marine organisms in the seaward portion of the estuary.
- >4500 cfs: low salinity in San Carlos Bay causes mortality of seagrasses.
- >6500 cfs: low salinity plume enter Gulf of Mexico adverse impacts on SAV and WQ in Pine Island Sound

Flow Based Hydrologic Performance Measure (Targets)

Preferred Alternative, with:

- Fewest number of times mean monthly flows from S-79 exceed the above important discharge levels (1-3).
- Lowest frequency of exceedence (Important Discharge Levels 1-3) for just 1 month, as well as the frequency of 2, 3, 4,..consecutive months.

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	6.8	235	1.7	0.70
Colonial Bridge	8.0	229	3.3	0.68
lona	30.1	221	4.7	0.60
San Carlos Bay	8.3	180	9.1	0.65

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

SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: z where l is 25% of surface l. l = irradiance, z= depth



ACOE June 24, 2013 Pulse Release				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
6/24/13	1	3273	2049	1014
6/25/13	2	3526	1811	538
6/26/13	3	4216	2971	1522
6/27/13	4	4465	3174	2084
6/28/13	5	4906	2036	912
6/29/13	6	3254	1122	0
6/30/13	7	2626	789	0
7/1/13	8	6961	1764	0
7/2/13	9	9394	2207	0
7/3/13	10	9798	2230	0
7/4/13	11	9900	2959	0
11 Day	Avg	5665	2101	551

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Ernie Barnett, Dan Delisi, 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

Reporting Period: July 9 – July 15, 2013

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

Caloosahatchee Condition Summary

July rainfall 172% above normal has resulted in excessively high flows, up to 10,328 cfs, the past week at S79 that continued to reduce salinity in the lower estuary. Average flow at S79 for the last 30 days (6/17/13-7/16/13) was 6,814 cfs, well above the 4,500 cfs harm threshold. Sustained flows above 2,800 cfs have caused mortality of marine organisms and seagrass habitat in the lower estuary. Salinities at the lona oyster reefs in the lower estuary have remained in the mortality range for oysters and shoal grass for the past ten days.

USACE Action: A 14-day pulse release averaging 4000 cfs, measured at S-77, began on 7/5/13.

Recommendation: With continued high flows from watershed runoff expected, we request that the SFWMD utilize all storage options for reducing flows to the estuaries including maximizing storage in the Kissimmee Chain of Lakes and all Distributed Water Management (DWM) projects and the C43 West Basin Reservoir site.

Lake Okeechobee Level: 15.01 ft. (Low Sub-Band)			Last wk: 14.75 ft
Lake Okeechobee Inflow:	14,961 cfs	Lake Okeechobee Out	flow: 4,090 cfs
Weekly Rainfall:	WP Franklin 2.00"	Ortona 1.55"	Moore Haven 3.80"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. My	ers Yacht Basin)	Previous wk: 0.2 - 0.3 psu
	0.2 psu (SCCF RECON Marker	52)	Previous wk: 0.2 - 0.3 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marker	18)	Previous wk: 0.2 - 0.3 psu
Salinity Shell Point:	0.8 - 27 psu (SCCF RECON)		Previous wk: 1.1 – 27 psu



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Flow: The past seven days flows averaged **9,097** cfs with daily flows as high as **10,328 cfs**. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is **6,814 cfs**; **above the 4,500 cfs harm threshold for the past 11 days and above the 2,800 cfs harm threshold for the past 25 days.**

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
7/9/13	Tues	8820	5769	4070
7/10/13	Wed	8522	5694	4178
7/11/13	Thurs	8902	5683	4152
7/12/13	Fri	8664	5510	NR
7/13/13	Sat	8852	5820	NR
7/14/13	Sun	10328	6174	NR
7/15/13	Mon	9594	6292	NR
7 Day	Avg	9097	5848	



Upstream of S79/Franklin Conditions: On 7/16/13, chlorides measured 48 mg/L and apparent color was 288 CU. Sparse algae was observed at the Olga Water Treatment Plant during the last week. The Olga WT plant came online 7/16/13.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. A hypoxic event (DO<3mg/L) was recorded by RECON sensors at Beautiful Island and Fort Myers. The hypoxic zone extended from Alva to Fort Myers. The water was mixed top to bottom from Labelle to Beautiful Island RECON, so the water was hypoxic from the bottom to the surface.

Lower Estuary Condition:

Seagrass: Salinities at Iona remained in the lethal range for shoal grass. Salinities rose slightly at the Tarpon Bay RECON site and stabilized at the Gulf of Mexico RECON site.

Seagrass leaves were forming wrack lines along the Sanibel causeway beaches on 7/15/13.

Scattered strandings of red drift algae continued along the north end of Fort Myers Beach and the water color along the beach was stained and dark.

MacIntyre Creek: Bottom salinities at MacIntyre Creek have fluctuated between 16 and 24 psu over the past week.

If extreme flows at S-79 continue, seagrasses within the refuge and surrounding area may be reduced.

CDOM has increased to a high value of over 3,500 RFU, indicating high nutrient loading and low light conditions.

Oysters: FGCU researchers report that disease prevalence of Dermo, *Perkinsus* ranged from 66.6 - 80%, averaging 73.3%. Disease intensity is low ranging from 0.93 - 2.2 with an estuary average of 1.49. Recruitment sampling from the first week of July ranged from 2.17-45.17 with an average of 19.87spat/shell

Salinities at Iona remained in the lethal range for oysters while average salinities at Shell Point and seaward remained above the lethal range. If the salinity at Iona remains <1 psu for 1 more week there could be a complete oyster mortality at this location.



	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
ſ	Ft Myers	7.5	246	1.2	0.68
1	Colonial Bridge	7.8	248	2.3	0.66
ſ	lona	10.9	250	2.9	0.64
	San Carlos Bay	5.7	84	2.7	1.23

Target light penetration: CE - Caloosahatchee Estuary =1 m
SCB -San Carlos Bay = 2.2 meters
Definition of 25% Iz: z where I is 25% of surface I.
I = Irradiance, Z = depth

Sanibel Causeway



Current conditions at San Carlos Bay and the Sanibel Causeway, Photo July 10, 2013 by SCCF



Normal conditions in San Carlos Bay at the Sanibel Causeway. Photo April 8, 2010 by Rusty Farst

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: July 16 - July 22, 2013

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

Caloosahatchee Condition Summary

Very high flows, up to 12,540 cfs at S79 have moved the freshwater plume entirely out of the estuaries to the Gulf side of the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (6/23/13-7/22/13) was 8,124 cfs, well above the 4,500 cfs harm threshold. Sustained high flows over one month have caused mortality of marine organisms and seagrass habitat in the lower estuary.

USACE Action: Beginning on 7/20/13 the Corps increased discharges to 6,500 cfs measured at S-77. These releases will continue until conditions significantly change.

Recommendation: With continued high flows from watershed runoff expected, we request that the SFWMD and Corps utilize all storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee and Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	15.53 ft. (Low Sub-Band	15.53 ft. (Low Sub-Band)		
Lake Okeechobee Inflow:	15,935 cfs	Lake Okeechobee	Outflow: 6,608 cfs	
Weekly Rainfall:	WP Franklin 1.26"	Ortona 4.94"	Moore Haven 4.18"	
Salinity Fort Myers:	0.2 psu surface (SCCF Ft.	Myers Yacht Basin)	Previous wk: 0.2 psu	
	0.2 psu (SCCF RECON Ma	arker 52)	Previous wk: 0.2 psu	
Salinity Beautiful Island:	0.2 psu (SCCF RECON Ma	rker 18)	Previous wk: 0.2 psu	
Salinity Shell Point:	0.8 – 30 psu (SCCF RECO	N)	Previous wk: 0.8 - 27 psu	



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Flow: The past seven days flows averaged 10,522 cfs with daily flows as high as 12,540 cfs. The 14 day pulse that ended on 7/18/13 averaged 9,445 cfs at S79. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 8,124 cfs; above the 4,500 cfs harm threshold for the past 18 days and above the 2,800 cfs harm threshold for the past 32 days.

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
7/16/13	Tues	9348	6286	NR
7/17/13	Wed	9626	6500	NR
7/18/13	Thurs	9884	6476	4590
7/19/13	Fri	11408	6991	4474
7/20/13	Sat	12540	8238	5563
7/21/13	Sun	11232	8258	6004
7/22/13	Mon	9616	8026	5824
7 Day	Avg	10522	7253	



Upstream of S79/Franklin Conditions: On 7/23/13, chlorides at the Olga Water Treatment Plant measured 44 mg/L. Apparent color was 211 Color Units (CU).

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. A hypoxic event (DO<3mg/L) was recorded by RECON sensors at Beautiful Island starting on 7/21/13.

Lower Estuary Condition:

Salinities at Iona remained in the lethal range for shoal grass. Water column chlorophyll and DO spikes occurred at Tarpon Bay and Redfish Pass RECON sites. In Tarpon Bay, filamentous and pennate diatoms were the dominant phytoplankton groups. DO at the Shell Point RECON site was dropping to 3.0 mg/L at high tide, indicating the possibility of hypoxic conditions in the deeper waters of San Carlos Bay. Beaches along Fort Myers Beach continued to experience patchy strandings of red drift algae. Dead sea grass has also been observed along the beach. Water color is highly stained and dark along the beach as the river plume stretches along the island and into Matanzas Pass.

MacIntyre Creek: Bottom salinities at MacIntyre Creek have fluctuated between 16 and 21 psu over the past week. If extreme flows at S-79 continue, seagrass densities within the Refuge and surrounding area will be reduced or eliminated.

CDOM has increased to a high value of over 3,000 RFUB. High levels of CDOM indicate low light conditions and can be associated with high nutrient loading. Chlorophyll concentrations increased to a value of over 4,000 RFUB.



lethal range. High oyster mortality at Iona is expected.



Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/L)	(qse)	(NTU)	(meters)
Target Values	a 11	CE <70	CE < 18	CE = 1 m
Talyet values	< 11	SCB <11	SCB < 5	SCB = 2.2m
Ft Myers	6.7	248	1.5	0.68
Colonial Bridge	7.0	243	1.4	0.69
lona	11.4	220	1.8	0.71
San Carlos Bay	7.9	199	6.2	0.67
_				

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

SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z= depth



NR



Photos of Caloosahatchee River plume in the coastal waters and the Gulf of Mexico

http://www.sccf.org/files/content/docs/Aerial%20photos%20of%20Caloosahatchee%20Plume%20July%202013_lo go.pdf



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

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - 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

Reporting Period: July 23– July 29, 2013

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

Caloosahatchee Condition Summary

Very high flows, up to 10,292 cfs at S79, have moved the freshwater plume entirely out of the estuaries to the Gulf side of the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days was 9,422 cfs, over three times the 2,800 cfs harm threshold. High flows sustained over 43 consecutive days have caused mortality of marine organisms and loss of seagrass habitat in the lower estuary.

USACE Action: On 7/20/13, the Corps increased discharges from S77 to 6,500 cfs. Beginning on 7/25/13, the Corps increased discharges further, deciding to utilize maximum discharge capacities of Lake Okeechobee outlet structures to the St. Lucie and Caloosahatchee estuaries. These releases will continue until lake levels fall into the operational low sub-band.

Recommendation: With continued high flows from watershed runoff occurring and projected, we request that the SFWMD and Corps utilize any and all emergency storage options for reducing flows to the estuaries including storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	15.78 ft. (Intermediat	Last wk: 15.53 ft	
Lake Okeechobee Inflow:	16,220 cfs	Lake Okeechobee Outflow:	11,290 cfs
Weekly Rainfall:	WP Franklin 2.53"	Ortona 2.11"	Moore Haven 1.15"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. Myers Yacht Basin)		Previous wk: 0.2 psu
	0.2 psu (SCCF RECON	Marker 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON	Marker 18)	Previous wk: 0.2 psu
Salinity Shell Point:	0.5 - 26 psu (SCCF REG	CON)	Previous wk: 0.8 - 30 psu



Flow: The past seven days flows averaged 9,563 cfs with daily flows as high as 10,292 cfs at S79. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 9,244 cfs; above the harm threshold of 2,800 cfs for the past 39 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 29 consecutive days.

	ACOE Daily Reports				
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
7/23/13	Tues	10292	7896	4888	
7/24/13	Wed	9632	6570	5280	
7/25/13	Thurs	9384	6244	5482	
7/26/13	Fri	9210	6502	5676	
7/27/13	Sat	8717	6518	5921	
7/28/13	Sun	9670	6398	6020	
7/29/13	Mon	10040	6817	5995	
7 Day	Avg	9563	6706	5608	



Upstream of S79/Franklin Conditions: On 7/30/13, chlorides measured 47 mg/L. Apparent color was 252 Color Units (CU).

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Hypoxic conditions (DO<3mg/L) have been recorded at the Beautiful Island RECON site for the last week.

Lower Estuary Condition:

Seagrass: Salinities at lona remained in the lethal range for shoal grass. A diatom bloom occurred in mid Pine Island Sound during the week, with raw chlorophyll levels of 48 μ g/L. Water color along Fort Myers Beach was very dark with tannins and CDOM. Dead seagrass continued to wash up on the beach. Staff has also received complaints from the public of slime and odor from intertidal sand. The surf zone at the Sanibel Beaches is a muddy color which may be from marine snow from the diatom bloom. Diatoms also produce oil that can create an oily surface film and fishy smell. An increase in coquina clam (*Donax variabilis*) mortality has been observed on the Gulf beaches of Sanibel Island.

MacIntyre Creek: Bottom salinities at MacIntyre Creek have fluctuated between 15 and 23 psu over the past week. If extreme flows at S-79 continue, seagrass densities within the refuge and surrounding area will be reduced. CDOM has increased to a high value of over 3,000 RFU indicating low light conditions and can be associated with high nutrient loading. Maximum daily turbidity has increased to 25 FNU, with a corresponding increase in maximum daily temperature to 34 degrees Celsius, and a decrease in daily maximum dissolved oxygen to 7 mg/L. These conditions can result in decreased photosynthesis and decreased marine life survival and reproduction.

Oysters: Salinities at Iona remained in the lethal range for oysters. A quick survey found many gaping oysters near the low tide line. Average salinities at Shell Point and seaward remained above the lethal range.



Salinity Contour Plot 7/26/13, SCCF.

Aqua Satellite Image of Caloosahatchee discharge 7/26/13, 2:23 pm incoming high tide. Plume visible offshore approximately 14 miles. Freshwater out Boca Grande Pass.





Wrack line of seagrass washed up on Sanibel near the causeway, 7/11/13. Photo SCCF



Caloosahatchee River discharge plume southwest of Lovers Key, south of Fort Myers Beach on 7/25/13. Photo Local Boater



Wrack line of seagrass and highly colored water along the Sanibel Causewav beach. 7/28/13. Photo SCCF

Freshwater plume, Sanibel Lighthouse Beach, 07/28/13. Photo SCCF



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Ernie Barnett, Dan Delisi, 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

Reporting Period: July 30 - August 5, 2013

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

Caloosahatchee Condition Summary

Very high flows at S79 continue to extend the freshwater plume entirely out of the estuary to the Gulf side of the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (7/7/13-8/5/13) was 9,777 cfs, three and one half times the 2,800 cfs harm threshold. High flows sustained over the last 50 consecutive days have caused mortality of marine organisms and seagrass habitat in the lower estuary.

USACE Action: Beginning on 7/25/13, the USACE decision was to utilize maximum discharge capacities of Lake Okeechobee outlet structures to the St. Lucie and Caloosahatchee estuaries. These releases will continue until lake levels fall into operational low sub-band.

Recommendation: With continued high flows from watershed runoff expected, we request that the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	15.94 ft. (HIGH Sub-Band)	Last wk: 15.78 f	ft	
Lake Okeechobee Inflow:	12,400 cfs	Lake Okeechobee (Dutflow: NR cfs	
Weekly Rainfall:	WP Franklin 1.55"	Ortona 0.96"	Moore Haven 5.00"	
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. My	ers Yacht Basin)	Previous wk: 0.2 psu	
	0.2 psu (SCCF RECON Market	r 52)	Previous wk: 0.2 psu	
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marker	18)	Previous wk: 0.2 psu	
Salinity Shell Point:	0.3 – 26 psu (SCCF RECON)		Previous wk: 0.5 - 26 p	osu



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Flow: The past seven day's flows averaged **9,883** cfs with daily flows as high as **10,493** cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is **9,777** cfs; above the **2,800** cfs harm threshold for the past 50 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 36 consecutive days. With support from the J.N. "Ding" Darling NWR, the Sanibel-Captiva Conservation Foundation Marine Laboratory and the U.S. Geological Survey have monitored salinity and other water quality parameters at the mouth of Tarpon Bay and McIntyre Creek adjacent to the Refuge and two stations in Pine Island Sound since 2009. Data show a strong correlation between flows at S-79 and salinity at Tarpon Bay and McIntyre Creek particularly when flows are greater than 1000 cfs (r = -0.781 and -0.744 respectively) with a lag time of 5 days. When flows are greater than 2500 cfs, the lag time is only 4 days cfs (r = -0.700 and -0.634 respectively). Weaker relationships were also noted in Pine Island Sound near Blind Pass and Redfish Pass.

To access the report: <u>http://sccf.org/content/268/J.N.%22Ding%22-Darling-National-Wildlife-Refuge-Landscape-Scale-Evaluation-of-Water-Qaulity-and-Aquatic-Habitats.aspx</u>

	ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
7/30/13	Tues	9940	7506	NR	
7/31/13	Wed	10080	7646	NR	
8/1/13	Thurs	9976	7602	NR	
8/2/13	Fri	8115	7536	NR	
8/3/13	Sat	10283	7538	NR	
8/4/13	Sun	10297	7538	NR	
8/5/13	Mon	10493	7538	NR	
7 Day	Avg	9883	7557	NR]



Upstream of S79/Franklin Conditions: On 8/6/13, chlorides measured 49 mg/L. Apparent color was 286 Color Units (CU). Video of flow at S78 Ortona Lock: <u>http://youtu.be/xvZsTlx6ppY</u>

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Hypoxic conditions (DO<3mg/L) have been recorded at the Beautiful Island RECON site for the last week with a 1.9 mg/L reading recorded on 08/05/13. This low oxygen level is likely representative of the entire water column near the channel.

Lower Estuary Condition:

Salinities at Iona remained in the lethal range for shoal grass. A diatom bloom continued in mid Pine Island Sound during the week, with peak raw chlorophyll levels of 23 μ g/L at Redfish Pass RECON. Chlorophyll was also elevated (26 μ g/L) in Iona at Peppertree Pt. Marina, where a mixture of cyanobacteria, flagellates, diatoms and green algae (including *Pandorina* sp.) were present. Hypoxic events (DO<3 mg/L) have been recorded at the Shell Point, Tarpon Bay, Redfish Pass and Gulf of Mexico RECON sites during the last week with a the lowest reading of 2.0 mg/L recorded at the Gulf of Mexico RECON on 8/05/13.

The freshwater plume extends into Pine Island Sound at least 16 miles from Shell Point and likely a similar distance into the Gulf of Mexico. Densities of stenohaline, benthic invertebrate species in Pine Island Sound, San Carlos Bay and the nearshore Gulf are likely lower than normal which could affect the balance of the ecosystem. Lower invertebrate grazer densities could result in higher macroalgae biomass. Lower seagrass biomass can result in more nutrients being available to algae. Beach conditions along Fort Myers Beach continue to be poor with highly colored water and dead seagrass washing up. Staff continued to receive complaints from the public regarding water conditions.

McIntyre Creek in DDNWR: Flows at S79 have been > 2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu since mid-June to just under 15 psu over the past week. CDOM has responded similarly with an inverse relationship to flows.

CDOM has increased from 500 RFUB to a high value of over 3,500 RFUB the week of 7/15/13. Values this week have fluctuated between 2,500 and 3,000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.



Scallops: The annual Sea Grant/ SCCF Scallop Survey on 7/27/13 found only 24 scallops in contrast to the three previous years of the survey when between 300 and 1000 scallops were found. The reduced scallop densities in the survey area were likely a result of a persistent red tide event from December 2012 through February 2013 and a weaker red tide between 2011 and 2012. The low densities make it uncertain that the Pine Island stock of bay scallops can successfully survive a major red tide event at densities high enough to replenish the local population. Pine Island Sound scallop fisheries have been closed since 1994 in an effort to revive the once overfished species, which are sensitive to water quality changes.

Oysters: Salinities at Iona remained in the lethal range for oysters. Average salinities at Shell Point and seaward remained above the lethal range.









Salinity contour map showing freshwater plume extending north into Pine Island Sound 7/30/13. Map SCCF

		1	1	
Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light
Stations	(µg/Ĺ)	(qse)	(NTU)	(meters)
Target Values	< 11	CE <70	CE < 18	CE = 1 m
		SCB <11	SCB < 5	SCB = 2.2m
Ft Myers	6.8	273	2.6	0.61
Colonial Bridge	12.8	262	3.2	0.60
lona	26.6	257	5.3	0.55
San Carlos Bay	10.1	221	10.0	0.57

Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: z where l is 25% of surface l. l = irradiance, z= depth

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 6 - 12, 2013

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

Caloosahatchee Condition Summary

Very high flows at S79 continue to push the freshwater plume beyond the Caloosahatchee estuary into Pine Island Sound and the Gulf side of the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (7/14/13-8/12/13) was 10,025 cfs, more than three times the 2,800 cfs harm threshold. High flows sustained over the last 53 consecutive days have caused 100% mortality of oysters upstream of Shell Point.

USACE Action: Beginning on 7/25/13, the USACE decision was to utilize maximum discharge capacities of Lake Okeechobee outlet structures to the St. Lucie and Caloosahatchee estuaries. These releases will continue until lake levels fall into operational Low sub-band.

Recommendation: With continued high flows from watershed runoff expected, we request that the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	16.01 ft. (HIGH Sub-Band)		Last wk: 15.94 ft	
Lake Okeechobee Inflow:	9,443 cfs	Lake Okeechobee	Outflow: 12,865 cfs	
Weekly Rainfall:	WP Franklin 1.58"	Ortona 2.90"	Moore Haven 0.13"	
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. Myers Yacht Basin)		Previous wk: 0.2 psu	
	0.2 psu (SCCF RECON Marker	52)	Previous wk: 0.2 psu	
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marker	· 18)	Previous wk: 0.2 psu	
Salinity Shell Point:	0.3 – 26 psu (SCCF RECON)		Previous wk: 0.3 – 26 psu	



Page 2 of 3

Flow: The past seven day's flows averaged 10,149 cfs with daily flows as high as 10,798 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 10,025 cfs; exceeding the 2,800 cfs harm threshold for the past 53 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 43 consecutive days.



Upstream of S79/Franklin Conditions: On 8/13/13, chlorides measured 48 mg/L. Apparent color was 185 Color Units (CU).

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Hypoxic conditions (DO<3mg/L) have been recorded at the Beautiful Island RECON site for the last week with a 1.7 mg/L reading recorded on 08/06/13. The low oxygen level is likely representative of the entire water column near the channel because of the mixing associated with high flows.

Lower Estuary Condition:

Salinities at Iona remained in the lethal range for shoal grass. Underwater light levels in a large area extending from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Less than 3% of surface irradiance is available at a depth of 2 m at the Causeway San Carlos Bay site. CDOM is the major cause of light attenuation near the river, and extending out into San Carlos Bay and Pine Island Sound. Phytoplankton blooms are contributing to light attenuation in some areas where CDOM levels are lower and where the water column is not well mixed.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been >2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu since mid June to just over 16 psu over the past week. Inversely, CDOM has increased with higher flows over the same time period..

CDOM has increased from 500 RFUB to a high value of over 3,500 RFUB the week of 7/15/13. Values this week have fluctuated between 2,500 and over 3,000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

A patchy phytoplankton bloom resulting in surface accumulation and turbidity has been noted in Tarpon Bay. Some of the seagrass blades in Tarpon Bay have macroalgae growing on them, further limiting light for photosynthesis.

Oysters: Salinities at lona remained in the lethal range for oysters. In the Caloosahatchee from 7/1/13 to 8/8/13, FGCU researchers report 100% mortality at locations upstream of Shell Point. Downstream of Shell Point 35% mortality was reported at Bird Island and 12% mortality at Kitchel Key. The downstream oysters may get enough tidal flushing at high tide to survive. July – September is prime recruitment for oysters in the Caloosahatchee making these ongoing releases devastating to a year class of oysters in the Caloosahatchee.



Phytoplankton bloom in Tarpon Bay 08/11/13. Photo SCCF


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 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB =2.2m	SCB -San Carlos Bay = 2.2 meters
Ft Myers	6.8	284	2.2	0.60	Definition of 25% lz: z where l is 25% of surface l.
Iona	16.4	264	4.6	0.57	I = irradiance, z = depth
San Carlos Bay	7.2	154	6.7	0.77	
Tarpon Bay	4.8	133	2.5	1.0	



Current conditions

Normal conditions

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 6 - 12, 2013

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

Caloosahatchee Condition Summary

Very high flows at S79 continue to push the freshwater plume beyond the Caloosahatchee estuary into Pine Island Sound and the Gulf side of the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (7/14/13-8/12/13) was 10,025 cfs, more than three times the 2,800 cfs harm threshold. High flows sustained over the last 53 consecutive days have caused 100% mortality of oysters upstream of Shell Point.

USACE Action: Beginning on 7/25/13, the USACE decision was to utilize maximum discharge capacities of Lake Okeechobee outlet structures to the St. Lucie and Caloosahatchee estuaries. These releases will continue until lake levels fall into operational Low sub-band.

Recommendation: With continued high flows from watershed runoff expected, we request that the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

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Lake Okeechobee Inflow:	9,443 cfs	Lake Okeechobee	Outflow: 12,865 cfs		
Weekly Rainfall:	WP Franklin 1.58"	Ortona 2.90"	Moore Haven 0.13"		
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. My	ers Yacht Basin)	Previous wk: 0.2 psu		
	0.2 psu (SCCF RECON Marker	52)	Previous wk: 0.2 psu		
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marker	· 18)	Previous wk: 0.2 psu		
Salinity Shell Point:	0.3 – 26 psu (SCCF RECON)		Previous wk: 0.3 – 26 psu		



Page 2 of 3

Shoal grass mortality rang

Flow: The past seven day's flows averaged 10,149 cfs with daily flows as high as 10,798 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 10,025 cfs; exceeding the 2,800 cfs harm threshold for the past 53 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 43 consecutive days.

		ACOE Daily R	leports		30 -	Sur	ace Sali	nity at lo	na Oyst	er Reefs
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	25 -	Oyster Prefe	erred Rang	je		
8/613	Tues	8389	6228	NR	-					
8/7/13	Wed	10798	7783	5780	nsd -					
8/8/13	Thurs	10540	8170	5825	, A15					
8/9/13	Fri	10648	8270	5871	alin					
8/10/13	Sat	10704	8225	6002	10					
8/11/13	Sun	10268	8363	6123	5	Or set an Marsta	lite - Damas			
8/12/13	Mon	9696	8389	6235		Oyster Morta	ility Range			Shoal g
7 Day	Avg	10,149	7918		0 -	1 3	20		2	~
					OT	oTh	on	OTTO	07/3	08/0

Upstream of S79/Franklin Conditions: On 8/13/13, chlorides measured 48 mg/L. Apparent color was 185 Color Units (CU).

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Hypoxic conditions (DO<3mg/L) have been recorded at the Beautiful Island RECON site for the last week with a 1.7 mg/L reading recorded on 08/06/13. The low oxygen level is likely representative of the entire water column near the channel because of the mixing associated with high flows.

Lower Estuary Condition:

Salinities at Iona remained in the lethal range for shoal grass. Underwater light levels in a large area extending from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Less than 3% of surface irradiance is available at a depth of 2 m at the Causeway San Carlos Bay site. CDOM is the major cause of light attenuation near the river, and extending out into San Carlos Bay and Pine Island Sound. Phytoplankton blooms are contributing to light attenuation in some areas where CDOM levels are lower and where the water column is not well mixed.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been >2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu since mid June to just over 16 psu over the past week. Inversely, CDOM has increased with higher flows over the same time period.

CDOM has increased from 500 RFUB to a high value of over 3,500 RFUB the week of 7/15/13. Values this week have fluctuated between 2,500 and over 3,000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

A patchy phytoplankton bloom resulting in surface accumulation and turbidity has been noted in Tarpon Bay. Some of the seagrass blades in Tarpon Bay have macroalgae growing on them, further limiting light for photosynthesis.

Oysters: Salinities at lona remained in the lethal range for oysters. In the Caloosahatchee from 7/1/13 to 8/8/13, FGCU researchers report 100% mortality at locations upstream of Shell Point. Downstream of Shell Point 35% mortality was reported at Bird Island and 12% mortality at Kitchel Key. The downstream oysters may get enough tidal flushing at high tide to survive. July - September is prime recruitment for oysters in the Caloosahatchee making these ongoing releases devastating to a year class of oysters in the Caloosahatchee.



Phytoplankton bloom in Tarpon Bay 08/11/13. Photo SCCF



Caloosahatchee	Chlorophyll	CDOM	Turbidity	25% Iz Light	
Stations	(µg/L)	(qse)	(NTU)	(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
Et Maria		308<11	368 < 3	SCB =2.2m	Definition of 25% Iz: z whore Lis 25% of surface L
Ft Myers	6.8	284	2.2	0.60	
lona	16.4	264	4.6	0.57	I = Irradiance, Z = deptn
San Carlos Bay	7.2	154	6.7	0.77	
Tarpon Bay	4.8	133	2.5	1.0	



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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 13 - 19, 2013

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

Caloosahatchee Condition Summary

Very high flows at S79 continue to push the freshwater plume beyond the Caloosahatchee estuary into the Gulf beyond the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (7/21/13-8/19/13) was 9,803 cfs, over three times the 2,800 cfs harm threshold. High flows sustained over the last 60 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point.

USACE Action: Beginning on 7/25/13, the USACE decision was to utilize maximum discharge capacities of Lake Okeechobee outlet structures to the St. Lucie and Caloosahatchee estuaries. These releases will continue until lake levels fall into operational Low sub-band.

Recommendation: With continued high flows expected, we request that the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	15.74 ft. (Intermediate	Last wk: 16.01 ft	
Lake Okeechobee Inflow:	4,640 cfs	Lake Okeecho	bbee Outflow: 12,360 cfs
Weekly Rainfall:	WP Franklin 3.05"	Ortona 1.03"	Moore Haven 1.15"
Salinity Fort Myers:	0.2 psu surface (SCCF F	Previous wk: 0.2 psu	
	0.2 psu (SCCF RECON Ma	arker 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Ma	Previous wk: 0.2 psu	
Salinity Shell Point:	0.3 – 26 psu (SCCF RECC	Previous wk: 0.3 – 26 psu	



Page 2 of 3

Flow: The past seven day's flows averaged 9,452 cfs with daily flows as high as 9,997 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 9,803 cfs; above the 2,800 cfs harm threshold for the past 60 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 50 consecutive days.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
8/1313	Tues	8994	8281	6234	
8/14/13	Wed	9997	8092	6362	
8/15/13	Thurs	9718	8318	6507	
8/16/13	Fri	9588	8289	6705	
8/17/13	Sat	9673	NR	6663	
8/18/13	Sun	8990	NR	7151	
8/19/13	Mon	9204	NR	6880	
7 Day	Avg	9452		6643	



Upstream of S79/Franklin Conditions: On 8/20/13, chlorides measured 50 mg/L. Apparent color was 187 Color Units (CU).

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen (DO) at the Beautiful Island RECON was less than 3 mg/L (hypoxic) for four entire days, from 8/13/13 to 8/17/13, with a low of 2.1 mg/L on 8/16/13. DO also fell below 3 mg/L (hypoxic) at the Fort Myers RECON on 8/15/13.

Lower Estuary Condition:

Salinities at Iona remained in the lethal range for shoal grass. Underwater light levels in a large area extending from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. At Iona, only dead, hollow shoal grass blades, roots and rhizomes were found on 08/14/13. Less than 3% of surface irradiance is available at a depth of 2 m at the Causeway San Carlos Bay site. CDOM is the major cause of light attenuation near the river, and extending out into San Carlos Bay and Pine Island Sound. Chlorophyll spikes are still being recorded at the Redfish Pass RECON.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been > 2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu since mid June to just under 15 psu the week of July 29. Values have fluctuated between 18 to 19 psu. Inversely, CDOM has increased with higher flows over the same time period.

CDOM has increased from 500 RFUB to a high value of over 3,500 RFUB the week of 7/15/13. Values this week have fluctuated between over 3,000 to 2,000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

Oysters: Salinities at Iona remained in the lethal range for oysters.

Due to the amount of freshwater there are currently no live oysters available for collection at the Shell Point location on the reef FGCU researchers use for their monthly collection. Therefore, *Perkinsus marinus* infection data is only for locations downstream of Shell Point (Bird Island, Kitchel Key). *P. marinus* intensity is very low ranging from 0.73-0.80, with the prevalence ranging from 73-80%.

The average spat recruitment for the upstream locations ranged from 0.06-0.14, whereas the average downstream recruitment ranges from 34.92-91.17 spat/shell. Kitchel Key and Bird Island juvenile oysters encountered little mortality, possibly due to flood tide bringing higher salinity waters.

July – September is peak recruitment period for oysters in the Caloosahatchee making these ongoing releases devastating to oyste spat at the upstream locations.

Oyster response data is provided by Dr. Aswani Volety and colleagues at Florida Gulf Coast University.



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	5.9	261	2.8	0.63
lona	12.9	278	4.0	0.57
San Carlos Bay	9.7	83	9.1	0.9
Tarpon Bay	13.2	115	6.0	0.88

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





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

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: August 20 - 26, 2013

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

Caloosahatchee Condition Summary

Very high flows at S79 continue to push the freshwater plume beyond the Caloosahatchee estuary into the Gulf beyond the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (7/28/13-8/26/13) was 10,193 cfs, over three times the 2,800 cfs harm threshold. High flows sustained over the last 67 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point.

USACE Action: On 8/21/13, the USACE reduced discharges at S77 to 6500 cfs. On 8/24/13, with the Lake elevation returning to the low sub-band, the USACE further reduced discharges at S77 to 4,000 cfs.

Recommendation: With continued high flows expected, we request that the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	15.56 ft. (Low Sub-Band)	Last wk: 15.74 ft	
Lake Okeechobee Inflow:	4128 cfs	Lake Okeechob	ee Outflow: 6785 cfs
Weekly Rainfall:	WP Franklin 2.74"	Ortona 1.14"	Moore Haven 0.05"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. N	lyers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON Mark	er 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Mark	er 18)	Previous wk: 0.2 psu
Salinity Shell Point:	0.3 - 24 psu (SCCF RECON)		Previous wk: 0.3 – 26 psu



Flow: Over the last 7 days, flows at S79 averaged 11,400 cfs, with daily flow as high as 14,212 cfs. Caloosahatchee estuary flows at S79 have increased to their highest level of the season. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 10,193 cfs; above the 2,800 cfs harm threshold for the past 67 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 57 consecutive days.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
8/2013	Tues	10802	8016	6387	
8/21/13	Wed	11287	7992	6649	
8/22/13	Thurs	11624	7356	6391	
8/23/13	Fri	14212	6488	5727	
8/24/13	Sat	10550	5038	4560	
8/25/13	Sun	11004	4931	4252	
8/26/13	Mon	10324	5057	4304	
7 Day	Avg	11400	6411	5467	



Upstream of S79/Franklin Conditions: On 8/27/13, chlorides

measured 40 mg/L. Apparent color nearly doubled, rising from 187 to 344 Color Units (CU).

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen (DO) at the Beautiful Island RECON has been in the hypoxic range (<3mg /L), but has been rising above 3 mg/L during high tides.

Lower Estuary Condition:

Salinities at lona remained in the harmful range for shoal grass. Underwater light levels in a large area extending out from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Shoal grass was present at Iona on

8/27/13 after 2 months of salinities below 3.5 psu. Less

I = irradiance, z = depththan 2% of surface irradiance was available at a depth of 1 meter at that site. Less than 0.5% of surface irradiance is

available at a depth of 2 m at two long term seagrass monitoring sites in San Carlos Bay near the river mouth (measured Kd_{PAR}< -2.67). Salinities at these seagrass sites were 5.9 and 8 psu on 8/26/13. Chlorophyll spikes above 10 µg/L were recorded at the Redfish Pass RECON. Water column chlorophyll was elevated at Iona where cyanobacteria and flagellates were present.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been > 2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu since mid-June to just under 15 psu the week of July 29 and have fluctuated between 15 to 19 psu during August with a reading of 15 psu on August 27. Inversely, CDOM has increased with higher flows over the same time period.

CDOM has increased from 500 RFUB to a high value of over 3,500 RFUB the week of 7/15/13. Values this past week have fluctuated between over 3,000 to 2,000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

Oysters: Salinities at lona remained in the lethal range for oysters. Due to the amount of freshwater, there were no live oysters available for collection at FGCU's Shell Point reef location during their most recent monthly sampling. However, on 08/27/13, SCCF found live oysters downstream, southeast of Shell Point, in Iona Cove. July through September is peak recruitment period for oysters in the Caloosahatchee, making these ongoing releases potentially devastating to oyster spat at upstream locations.

les					
Caloosah Statio	atchee ons	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target \	/alues	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Ft My	ers	5.9	240	2.5	0.67
lon	а	17.5	226	5.0	0.62
San Carl	os Bay	6.8	216	4.4	0.68
Tarpon	Bay	8.5	134	4.1	0.90
_					
Target light penetration: CE - Caloosahatchee Estuary =1 m					
SCB -San Carlos Bay = 2.2 meters					2 meters
Definition of 25% Iz: z where I is 25% of surface I.					

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 27 – September 2, 2013

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

Caloosahatchee Condition Summary

Very high flows at S79 continue to push the freshwater plume beyond the Caloosahatchee estuary into the Gulf beyond the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (8/4/13-9/2/13) was 9,808 cfs, over three times the 2,800 cfs harm threshold. High flows sustained over the last 74 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point.

USACE Action: On 8/24/13, with the Lake elevation in the low sub-band, the USACE in accordance with the LORS 2008 guidance reduced discharges to a maximum of 4,000 cfs at S77.

Recommendation: With continued high flows expected, we request that the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	15.55 ft. (Low Sub-Band)	Last wk: 15.56 ft	
Lake Okeechobee Inflow:	5813 cfs	Lake Okeechobe	e Outflow: 5797 cfs
Weekly Rainfall:	WP Franklin 4.29"	Ortona Error	Moore Haven 1.62"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. M	yers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON Marke	er 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marke	er 18)	Previous wk: 0.2 psu
Salinity Shell Point:	0.3 - 26 psu (SCCF RECON)		Previous wk: 0.3 – 24 psu



Flow: Over the last 7 days, flows at S79 averaged 9,220 cfs, with daily flow as high as 9,808 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 10,075 cfs; above the 2,800 cfs harm threshold for the past 74 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 64 consecutive days.

ACOE Daily Reports								
Date	Date Day S79 Flow S78 Flow S77 Flow							
		(Cts)	(Cts)	(Cts)				
8/27/13	Tues	9684	4661	4332				
8/28/13	Wed	9808	4918	4252				
8/29/13	Thurs	9499	5051	4216				
8/30/13	Fri	9203	5163	4196				
8/31/13	Sat	8566	5115	4228				
9/1/13	Sun	8016	5084	4228				
9/2/13	Mon	9766	NR	4144				
7 Day	Avg	9220	4999	4228				



Upstream of S79/Franklin Conditions: On 9/2/13, chlorides measured 40 mg/L. Apparent color decreased to 222 color units (CU).

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen (DO) at the Beautiful Island RECON has been just above the hypoxic range (<3mg /L).

Lower Estuary Condition:

Salinities at Iona remained in the harmful range for shoal grass. Underwater light levels in a large area extending out from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Chlorophyll spikes above 10 µg/L were recorded at the Redfish Pass RECON. Water column chlorophyll was elevated at Iona. Cyanobacteria, including *Microcystis* sp., were seen

Cyanobacteria, including *Microcystis* sp., were seen near Punta Rassa and west of the Causeway near

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)	
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	
Ft Myers	7.9	252	3.2	0.64	
lona	21.7	221	7.6	0.58	
San Carlos Bay	3.7	75	9.1	0.97	
Tarpon Bay	12.4	107	3.7	1.00	
Target light penetration: CE- Caloosahatchee Estuary =1 m SCB-San Carlos Bay = 2.2 meters Definition of 25% Iz: z where I is 25% of surface I. I = irradiance, z= depth					

Sanibel. Flagellates were dominant at Iona, and a *Ceratium furca* bloom (300,000 cells/L) was present in Tarpon Bay. Very dense epiphytic algal growth was present on some seagrass blades near Woodring's Point in San Carlos Bay. The amount of fresh seagrass wrack has been decreasing around the Causeway Islands. Benthic and epiphytic algae accumulation and production were noted in San Carlos Bay and Pine Island Sound.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been > 2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu in mid-June to just under 14 psu on 8/28/13. Bottom salinity has increased and is currently fluctuating between 18 and 22 psu since the 7-day average flows at S79 were reduced by approximately 2000 cfs. CDOM has decreased slightly with reduced flows over the same time period.

CDOM has increased from 500 RFUB to a high value of over 3,500 RFUB the week of 7/15/13. Values this past week have fluctuated from 1,500 to 2,500 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

Oysters: Salinities at lona remained in the lethal range for oysters. July through September is peak recruitment period for oysters in the Caloosahatchee, making these ongoing releases potentially devastating to oyster spat at upstream locations.



Cyanobacteria bloom in the Caloosahatchee, 9/2/13. Photo Lee County Natural Resources



Dense epiphytic algal growth on turtle grass blades near Woodring's Point (08/31/13). Photo SCCF



Decomposing seagrass blades along Causeway and fewer green shoots (09/02/13). Photo SCCF



Benthic algal mats are doing well as shown by gas bubbles (Picnic Island 08/26/13). Fragments of algal mats were abundant on the water surface in some locations in Pine Island Sound. Photo SCCF



Gas bubbles from benthic algal production near Picnic Island (08/26/13). Photo SCCF

USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan To: Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: September 3 - 9, 2013

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

Caloosahatchee Condition Summary

Very high flows at S79 continue to push the freshwater plume beyond the Caloosahatchee estuary into the Gulf beyond the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (8/11/13 - 9/9/13) was 9,687 cfs, over three times the 2,800 cfs harm threshold. High flows sustained over the last 74 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point.

USACE Action: On 8/24/13, with the Lake elevation in the low sub-band, the USACE in accordance with the LORS 2008 guidance reduced discharges to a maximum of 4,000 cfs at S77.

Recommendation: With the lake water elevation in the low sub-band and the tributary hydrologic conditions "wet", we request that the Corps follow the LORS 2008 guidance and reduce discharges to a maximum of 3000 cfs at S79. We continue to request the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level:	15.49 ft. (Low Sub-Band)		Last wk: 15.55 ft	
Lake Okeechobee Inflow:	4,996 cfs	Lake Okeechobee (Dutflow: 5,669 cfs	
Weekly Rainfall:	WP Franklin 1.63"	Ortona 1.89"	Moore Haven 0.39"	
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. Mye	rs Yacht Basin)	Previous wk: 0.2 psu	
	0.2 psu (SCCF RECON Marker	52)	Previous wk: 0.2 psu	
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marker	18)	Previous wk: 0.2 psu	
Salinity Shell Point:	1.0 – 25 psu (SCCF RECON)		Previous wk: 0.3 – 26 psu	



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Flow: Over the last 7 days, flows at S79 averaged 8,606 cfs, with daily flow as high as 9,516 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 9,687 cfs; above the 2,800 cfs harm threshold for the past 74 consecutive days. Daily flows at S79 have exceeded 6,500 cfs for the past 64 consecutive days.

ACOE Daily Reports								
Date	Date Day S79 Flow S78 Flow S77 Flow							
		(cfs)	(cfs)	(cfs)				
9/3/13	Tues	9516	5469	4008				
9/4/13	Wed	8920	5624	4116				
9/5/13	Thurs	8316	5532	4252				
9/6/13	Fri	8230	5271	4112				
9/7/13	Sat	7519	5024	3980				
9/8/13	Sun	8793	5010	3868				
9/9/13	Mon	8953	5101	3916				
7 Day	Avg	8606	5290	4036				



Upstream of S79/Franklin Conditions: On 9/10/13, chlorides measured 50 mg/L. Apparent color decreased to 175 CU.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen (DO) at the Beautiful Island RECON has been averaging in the hypoxic range (<3mg /L) since 9/3/13.

Lower Estuary Condition:

Salinities at Iona remained in the harmful range for shoal grass. Underwater light levels in a large area extending out from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Chlorophyll spikes above 10 µg/L were recorded at the Redfish Pass RECON indicating a phytoplankton bloom. Flagellates were again the dominant phytoplankton group at Iona where water column chlorophyll was elevated on 9/9/13. Stained and turbid water continued along Fort Myers Beach. Patches of green filamentous algae have been observed at some locations on the beach.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been > 2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu in mid-June to just under 14 psu on 8/28/13. Bottom salinity is currently fluctuating between 16 and 18 psu.

CDOM has increased from 500 RFUB in mid-June to a high value of over 3,500 RFUB the week of 7/15/13. Values this past week have fluctuated around 2,500 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.



Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)	
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	
Ft Myers	8.5	272	3.6	0.59	
lona	29.7	213	8.5	0.56	
San Carlos Bay	6.3	171	8.7	0.68	
Tarpon Bay	9.6	0.77			
Target light penetration: CE- Caloosahatchee Estuary =1 m SCB-San Carlos Bay = 2.2 meters Definition of 25% Iz: z where I is 25% of surface I. I = irradiance, z= depth					

Oysters: Salinities at lona remained in the lethal range for oysters. July through September is peak recruitment period for oysters in the Caloosahatchee, making these ongoing releases potentially devastating to oyster spat at upstream locations.





Enteromorpha at Crescent Beach Park on Ft Myers Beach 9/11/13. Photos Town of Fort Myers Beach



Foam caused by excess Dissolved Organic Matter (DOM) at causeway island A in San Carlos Bay 9/9/13. Photos SCCF



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: September 10 - 16, 2013

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

Caloosahatchee Condition Summary

High flows at S79 and high rainfall in the watershed continue to deliver harmful volumes of water into the estuary pushing the freshwater plume beyond the Caloosahatchee estuary into the Gulf beyond the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (8/18/13-9/16/13) was 8,809 cfs, over three times the 2,800 cfs harm threshold. High flows sustained over the last 88 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point.

USACE Action: On 9/13/13, following LORS 2008 guidance, the USACE initiated a 10 day pulse release reducing discharges to the Caloosahatchee to a maximum of 3,000 cfs, measured downstream at S79.

Recommendation: With the lake elevation in the low sub-band and the tributary hydrologic conditions "wet", we request that the Corps follow the LORS 2008 guidance and reduce discharges to a maximum of 3000 cfs at S79. We continue to request the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA.

Lake Okeechobee Level: 15.50 ft. (Low Sub-Band)			Last wk: 15.49 ft
Lake Okeechobee Inflow:	5,585 cfs	Lake Okeechobee	Outflow: 1,840 cfs
Weekly Rainfall:	WP Franklin 3.41"	Ortona 0.66"	Moore Haven 0.83"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. My	ers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON Marke	r 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marke	r 18)	Previous wk: 0.2 psu
Salinity Shell Point:	0.7- 27 psu (SCCF RECON)		Previous wk: 1.0 – 25 psu



Page 2 of 2

Flow: Over the last 7 days, flows at S79 averaged 5,925 cfs, with daily flow as high as 7,862 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 8,809 cfs; above the 2,800 cfs harm threshold for the past 88 consecutive days. Daily flows fell below 6,500 cfs at S79 after exceeding 6,500 cfs for 74 consecutive days.

ACOE Daily Reports									
Date	Date Day S79 Flow S78 Flow S77 Flow								
		(cfs)	(cfs)	(cfs)					
9/10/13	Tues	7862	5255	4000					
9/11/13	Wed	6990	4702	3972					
9/12/13	Thurs	6788	3983	3428					
9/13/13	Fri	4694	2278	1800					
9/14/13	Sat	5225	2249	1444					
9/15/13	Sun	5356	2441	1496					
9/16/13	Mon	4565	1961	1364					
7 Day	Avg	5925	3267	2500					



Upstream of S79/Franklin Conditions: On 9/17/13, chlorides measured 47 mg/L. Apparent color decreased to 177 CU. Algae visible at the intake in the mornings disperses during the day.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen (DO) at the Beautiful Island RECON has been averaging just above the hypoxic range (<3mg /L).

Lower Estuary Condition: Salinities at Iona remained in the harmful range for shoal grass. Underwater light levels in a large area extending out from Shell Point are too low to sustain seagrass production at maximum depths of occurrence.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been > 2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu in mid-June to just under 14 psu on 8/28/13. Bottom salinity is currently fluctuating between 18 and 20 psu.

CDOM has increased from 500 RFUB in mid-June to a high value of over 3,500 RFUB the week of 7/15/13. Values this past week have fluctuated around 2,300 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.





Oysters: Salinities at lona remained in the lethal range for oysters. July through September is peak recruitment period for oysters in the Caloosahatchee, making these ongoing releases potentially devastating to oyster spat at upstream locations.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)	Target light penetration: CE - Caloosahatchee Estuary =1 m
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	SCB -San Carlos Bay = 2.2 meters
Ft Myers	4.5	256	3.2	0.64	Definition of 25% Iz: z where I is 25% of surface I.
lona	12.4	260	5.0	0.59	<i>I</i> = irradiance, <i>z</i> = depth
San Carlos Bay	3.2	114	4.4	1.0	
Tarpon Bay	6.5	110	3.3	1.05	

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: September 17 - 23, 2013

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

Caloosahatchee Condition Summary

On 9/21/13,real-time flows in the Caloosahatchee reached 21,000 cfs at S79, 8,750 cfs at S78 and 7,100 cfs at S77. High flows into the estuary continue to deliver harmful volumes of water and lowering salinities in the Aquatic Preserves of Matacha Pass and Pine Island Sound and into the Gulf of Mexico, beyond the barrier islands of Sanibel and Fort Myers Beach. Average flow at S79 for the last 30 days (8/25 - 9/23/13) was 7,792 cfs. High flows sustained over the last 95 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point and impacted turtle grass beds in the Aquatic Preserves.

USACE Action: On 9/21/13, the USACE ended the 10 day pulse release after 8 days and increased discharges to the Caloosahatchee to an average of 4,000 cfs at S-77.

Recommendation: We continue to request the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA. Available storage capacity of an additional 80,000 acre-feet in the Kissimmee basin may not be meaningful in terms of Lake Okeechobee levels but can ultimately reduce flows to the estuaries and prevent peak flows of 21000 cfs at S-79.

Lake Okeechobee Level:	15.78 ft. (Low Sub-Band)	15.78 ft. (Low Sub-Band)	
Lake Okeechobee Inflow:	6,672 cfs	Lake Okeechobee	Outflow: 5,330 cfs
Weekly Rainfall:	WP Franklin 6.48"	Ortona 1.68"	Moore Haven 1.85"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. M	yers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON Marke	er 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marke	er 18)	Previous wk: 0.2 psu
Salinity Shell Point:	3.5- 27 psu (SCCF RECON)		Previous wk: 0.7-27 psu



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Caloosahatchee Estuary

Flow: Over the last 7 days, flows at S79 averaged 6,595 cfs, with real-time flows as high as 21,000 cfs at S79, 8,750 cfs at S78 and 7,100 at S77 as reported on the COE graphical plots. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 7,792 cfs; above the 2,800 cfs harm threshold for the past 95 consecutive days. Daily flows have exceeded 6,500 cfs at S79 for 77 of the last 85 days.

ACOE Daily Reports							
Date Day S79 Flow S78 Flow S77 Flow							
0/17/12	Tues						
9/17/13	Tues	0239	1161	312			
9/18/13	Wed	5099	1348	0			
9/19/13	Thurs	5918	965	0			
9/20/13	Fri	4310	648	0			
9/21/13	Sat	8085	3786	2796			
9/22/13	Sun	8628	4841	4276			
9/23/13	Mon	7890	4491	4112			
7 Day	Avg	6595	2462	1642			



Upstream of S79/Franklin Conditions: On 9/24/13, chlorides measured 43 mg/L. Apparent color decreased to 169 CU.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen (DO) at the Beautiful Island RECON decreased into the hypoxic range (<3mg /L) on 9/22/13.

Lower Estuary Condition: Salinities at Iona remained in the harmful range for shoal grass. Underwater light levels in a large area extending out from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Water column chlorophyll levels were elevated at Colonial Bridge and Iona due mainly to flagellates. High tannins and CDOM have returned to the beaches and the plume from the Caloosahatchee extends along the length of Fort Myers Beach making beach water conditions poor.

Seagrass: Salinities in Matlacha Pass Aquatic Preserve have measured in the harmful range for turtle grass (5-7 psu), since S79 flows of 10,000 cfs began in July. Data thru 8/31/13 (DEP Charlotte Harbor Aquatic Preserve program).

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Flows at S79 have been > 2800 cfs since 6/6/13. Bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu in mid-June to just under 14 psu on 8/28/13. Bottom salinity is currently fluctuating between 20 and 23 psu.

CDOM has increased from 500 RFUB in mid-June to a high value of over 3,500 RFUB the week of 7/15/13. Values this past week have fluctuated around 2,000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

Oysters: Salinities at lona remained in the lethal range for oysters. July through September is peak recruitment period for oysters in the Caloosahatchee, making these ongoing releases potentially devastating to oyster spat at upstream locations.

AC	ACOE September13, 2013 Pulse Release					
Date	Day	S79 Actual	S79 Pulse	S77 Flow		
		(cfs)	(cfs) Design (cfs)			
9/13/13	1	4694	3000	1528		
9/14/13	2	5225	5500	1444		
9/15/13	3	5356	5500	1496		
9/16/13	4	4565	5000	1364		
9/17/13	5	6239	4000	312		
9/18/13	6	5099	3000	0		
9/19/13	7	5918	2000	0		
9/20/13**	8	4310	1000	0		
9/21/13	9	8085	500	2796		
9/22/13	10	8628	500	4276		
10 Day	Avg	5811	3000	1321		
** Pulse F	Ended A	fter 8 Days				

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Ft Myers	8.5	262	3.2	0.62
lona	15.0	273	4.5	0.65
San Carlos Bay	4.0	83	6.0	1.07
Tarpon Bay	7.5	96	4.7	1.04

 Target light penetration: CE- Caloosahatchee Estuary =1 m

 SCB-San Carlos Bay = 2.2 meters

Definition of 25% Iz: **z where I is 25% of surface I**. **I** = irradiance, **z**= depth



USGS Salinity Map dated 8 /1/13, shows low salinity through the estuaries and Matlacha Pass and Pine Island Sound Aquatic Preserves.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex unable to participate due to the Government shutdown James Evans & Holly Milbrandt - 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

Reporting Period: September 24 - 30, 2013

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

Caloosahatchee Condition Summary

On 9/26/13, real-time flows in the Caloosahatchee reached 20,000 cfs at S79. High flows into the estuary continue to deliver harmful volumes of water and lower salinities beyond the barrier islands of Sanibel and Fort Myers Beach, into the Gulf of Mexico, impacting the Aquatic Preserves of Matacha Pass and Pine Island Sound. Average flow at S79 for the last 30 days (9/1 - 9/30/13) was 7,962 cfs. High flows sustained over the last 102 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point and impacted turtle grass beds in the Aquatic Preserves.

USACE Action: On 9/21/13, the USACE increased discharges to the Caloosahatchee to an average of 4,000 cfs at S-77.

Recommendation: We continue to request the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA. Although not likely to reduce daily flow volume, an additional 80,000 acre-feet of available storage capacity in the Kissimmee basin <u>can</u> change the timing and duration of flows. Since estuary discharges are based in part upon the Lake band, holding water in the Kissimmee Basin, even just a few inches, would allow the Lake to retreat to a lower band sooner which would trigger lower release volumes. If the lake rises, the additional storage capacity may delay expansion into a higher volume release band.

Lake Okeechobee Level:	15.91 ft. (Intermediate Sub-Band)		Last wk: 15.78 ft
Lake Okeechobee Inflow:	5416 cfs	Lake Okeecho	bee Outflow: 5,639 cfs
Weekly Rainfall:	WP Franklin 0.99"	Ortona 0.33"	Moore Haven 0.85"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft	. Myers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON Ma	arker 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Ma	arker 18)	Previous wk: 0.2 psu
Salinity Shell Point:	0.3- 28 psu (SCCF RECO	N)	Previous wk: 3.5-27 psu

Beautiful Is. 急 0.2psu 09/29/13 Surface 175 Salinity DSU 0.2psu 0-1 1-2 2-5 Ft. Myers 5-8 Yacht Basin 8-10 Ft. Myers 10-13 0.2psu Colonial Bridge Cape Coral 13-20 ≥ 20 SCCE 0 Logger RECON O SCCF 0.4psu Diona 10 Miles Shell Point

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Caloosahatchee Estuary

Flow: Over the last 7 days, flows at S79 averaged 10,456 cfs, with real-time flows again exceeding <u>20,000 cfs at S79</u>, <u>according to COE graphical plots</u>. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 7,962 cfs; above the 2,800 cfs harm threshold for the past 102 consecutive days. Daily flows have exceeded 6,500 cfs at S79 for 84 of the last 92 days.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
9/24/13	Tues	11,688	5178	4004	
9/25/13	Wed	12,362	5460	4076	
9/26/13	Thurs	12,570	5010	4172	
9/27/13	Fri	9682	4957	4112	
9/28/13	Sat	9616	5232	4120	
9/29/13	Sun	8987	5254	4260	
9/30/13	Mon	8285	4943	4304	
7 Day	Avg	10,456	5148	4150	



Upstream of S79/Franklin Conditions: On 9/30/13, chlorides measured 43 mg/L. Apparent color increased to 198 CU.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen (DO) at the Beautiful Island RECON averaged just above the hypoxic range (<3mg /L).

Lower Estuary Condition: Salinities at Iona remained in the harmful range for shoal grass. Underwater light levels in a large area extending out from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Water column chlorophyll levels were elevated at Iona due to flagellates and diatoms. Salinities at Shell Point dropped to near zero on outgoing tides and the salinity at the causeway was 11.4 on 9/29/13.

Seagrass: On 9/29/13, salinities at Matlacha Pass were in the harmful range for seagrasses (2.8-6.6 psu). Water column chlorophyll was elevated (20.1 µg) and the 25% light depth was 0.56 m.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: With flows at S79 greater than 2800 cfs since 6/6/13, bottom salinities at McIntyre Creek have steadily declined from approximately 35 psu in mid-June to just under 14 psu on 8/28/13. Bottom salinities at McIntyre Creek dropped during the week and ranged between 15 and 24 psu.

CDOM has increased from 500 RFUB in mid-June to a high value of over 3,500 RFUB the week of 7/15/13. Recent values have fluctuated around 2,000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

Oysters: Salinities at lona remained in the lethal range for oysters. July through September is peak recruitment period for oysters in the Caloosahatchee, making these ongoing releases potentially devastating to oyster spat at upstream locations.



Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Ft Myers	7.1	264	3.7	0.61
lona	27.5	246	7.2	0.53
San Carlos Bay	9.8	225	7.5	0.6
Tarpon Bay	12.5	130	9.6	0.74

Target light penetration: **CE**- Caloosahatchee Estuary =1 m **SCB**-San Carlos Bay = 2.2 meters

Definition of 25% lz: **z where I is 25% of surface I. I** = irradiance, **z**= depth

Seagrass washed up on the Sanibel Causeway 9/28/13. Photo SCCF

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: October 1 - 7, 2013

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

Caloosahatchee Condition Summary

High flows into the estuary continue to deliver harmful volumes of water and lower salinities beyond the barrier islands of Sanibel and Fort Myers Beach, into the Gulf of Mexico, impacting the Aquatic Preserves of Matlacha Pass and Pine Island Sound. Average flow at S79 for the last 30 days (9/8 - 10/7/13) was 7,648 cfs. High flows sustained over the last 109 consecutive days have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point and impacted turtle grass beds in the Charlotte Harbor Aquatic Preserves.

USACE Action: Since 9/21/13, target discharges to the Caloosahatchee have been 4000 cfs at S77. On 10/8/13, the USACE will decrease discharges to the Caloosahatchee to an average of 3,000 cfs measured at S-79.

Recommendation: We continue to request the SFWMD and Corps utilize all emergency storage options for reducing flows to the estuaries including initiating emergency storage on all available lands in the Kissimmee, Caloosahatchee watersheds and the EAA. With drier conditions emerging storage in the Kissimmee headwaters of the system are critical to dry season water supply and reducing water discharges to the estuaries.

Lake Okeechobee Level:	15.79 ft. (Low Sub-Band)	Last wk: 15.91 ft
Lake Okeechobee Inflow:	3,291 cfs Lake Okeechob	ee Outflow: 6,360 cfs
Weekly Rainfall:	WP Franklin 1.04" Ortona 0.46"	Moore Haven 1.62"
Salinity Fort Myers:	0.2 psu surface (SCCF Ft. Myers Yacht Basin)	Previous wk: 0.2 psu
	0.2 psu (SCCF RECON Marker 52)	Previous wk: 0.2 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marker 18)	Previous wk: 0.2 psu
Salinity Shell Point:	offline (SCCF RECON)	Previous wk: 0.3 - 28 psu



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Flow: Over the last 7 days, flows at S79 averaged 7,264 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 7,648 cfs; above the 2,800 cfs harm threshold for the past 109 consecutive days. Daily flows have exceeded 6,500 cfs at S79 for 91 of the last 99 days.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
10/1/13	Tues	8240	4856	4316	
10/2/13	Wed	7448	4798	4356	
10/3/13	Thurs	7143	4555	4384	
10/4/13	Fri	7447	4466	4356	
10/5/13	Sat	7191	4341	4368	
10/6/13	Sun	6799	4249	4260	
10/7/13	Mon	6583	4213	4172	
7 Day	Avg	7264	4496	4316	



Upstream of S79/Franklin Conditions: On 10/8/13, chlorides measured 48 mg/L. Apparent color increased to 185 CU. A surface film of cyanobacteria was present next to shore on 10/5/13.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu. Dissolved oxygen readings at Beautiful Island and Fort Myers RECONs indicate low primary productivity.

Lower Estuary Condition: Salinities at Iona remained in the harmful range for shoal grass. Underwater light levels in a large area extending out from Shell Point are too low to sustain seagrass production at maximum depths of occurrence. Water column chlorophyll levels were elevated at Iona on 10/6/13. MODIS Aqua imagery (10/6/13) shows elevated chlorophyll levels along the coast of southwest Florida. The plume from the Caloosahatchee River continues to extend along the entire length of Fort Myers Beach leading to stained and turbid water conditions. Sanibel beaches are accumulating large deposits of red drift algae along with two species of *Gracilaria* and *Agardhiella* sp.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: With flows at S79 greater than 2800 cfs since 6/6/13, bottom salinities at McIntyre Creek steadily declined from approximately 35 psu in mid-June to just under 14 psu on 8/28/13. Over the past week, bottom salinities at McIntyre Creek increased, ranging from 17 to 23 psu.

CDOM increased from 500 RFUB in mid-June to a high value of over 3,500 RFUB the week of 7/15/13. Values have decreased over the past week, falling from 2200 RFUB to 2000 RFUB. If extreme flows at S79 continue, seagrass densities within the Refuge and surrounding area will be significantly reduced due to the low salinity and low light conditions.

Oysters: Salinities at lona remained in the lethal range for oysters.





Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)	_
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	
Ft Myers	7.1	275	3.1	0.60	11
lona	28.6	254	4.3	0.56	11
San Carlos Bay	6.1	102	9.4	0.84	
Tarpon Bay	5.3	89	10.2	0.87	

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



Current conditions of Very dark, turbid waters on Fort Myers Beach from the Caloosahatchee plume. Picture taken at Lynn Hall Park 10/8/13.

Contrast with normal water conditions at Fort Myers Beach without discharges. Not current conditions. Photos: Town of Fort Myers Beach



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: October 8 - 14, 2013

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

Caloosahatchee Condition Summary

High flows into the estuary continue to deliver harmful volumes of water and lower salinities despite virtually no rainfall in the watershed. Average flow at S79 for the last 30 days (9/15 - 10/14/13) was 6,757 cfs, above 2800 cfs for 116 consecutive days, since 6/21/13. High flows have caused 100% mortality of intertidal juvenile oysters at two sites upstream of Shell Point and impacted turtle grass beds in the Charlotte Harbor Aquatic Preserves.

USACE Action: On 10/8/13, the USACE targeted flow to the Caloosahatchee of 3,000 cfs measured at S-79.

Recommendation: With the onset of the dry season and significantly reduced inflows to the lake we request the SFWMD and Corps reduce flows to the estuaries and hold/maintain lake levels throughout the system including the Kissimmee chain of lakes to preserve dry season water supplies and flows.

Lake Okeechobee Level:	15.65 ft. (Low Sub-Band)		Last wk: 15.79 ft	
Lake Okeechobee Inflow:	1,176 cfs	Lake Okeecho	bee Outflow: 3,553 cfs	
Weekly Rainfall:	WP Franklin 0.02"	Ortona 0.0"	Moore Haven 0.0"	
Salinity Fort Myers:	0.2 - 0.3 psu surface (SCCF	Ft. Myers Yacht Basin)	Previous wk: 0.2 psu	
	0.2 - 0.6 psu (SCCF RECON	Marker 52)	Previous wk: 0.2 psu	
Salinity Beautiful Island:	0.2 psu (SCCF RECON Mark	er 18)	Previous wk: 0.2 psu	
Salinity Shell Point:	2.1 - 27 psu (SCCF RECON)	Previous wk: offline	



Page 2 of 2

Flow: Over the last 7 days, flows at S79 averaged 3,227 cfs with virtually no rainfall in the watershed. The 30-day moving average flow to the Caloosahatchee Estuary at S79 is 6,757 cfs; above the 2,800 cfs harm threshold for the past 115 days.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
10/8/13	Tues	4614	2688	2136	
10/9/13	Wed	3107	1517	898	
10/10/13	Thurs	2712	1366	777	
10/11/13	Fri	2977	1651	1016	
10/12/13	Sat	3060	1729	1320	
10/13/13	Sun	3068	1841	1351	
10/14/13	Mon	3052	1888	1362	
7 Day	Avg	3227	1811	1265	



Upstream of S79/Franklin Conditions: On 10/15/13, chlorides measured 49 mg/L. Apparent color increased to 169 CU.

Upper Estuary Conditions: Salinities at Fort Myers remain below 1 psu but have started rising with lower flows.

Lower Estuary Condition: Salinities are rising out of the harmful range for oysters and shoal grass at Iona. CDOM Colored dissolved organic matter is the main factor affecting water column light attenuation in the estuary. Light attenuation coefficients are too high for seagrasses in deeper waters.

Based on monthly Lee County TSS sampling and S79 flows, the solids loading from S79 for July-September was 10,645 metric tons.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: With flows at S79 greater than 2800 cfs since 6/6/13, bottom salinities at McIntyre Creek steadily declined from approximately 35 psu in mid-June to just under 14 psu on 8/28/13. Over the past week, bottom salinities at McIntyre Creek ranged from 18 to 23 psu.

Oysters: Salinities at Iona moved out of the harmful ranges for oysters for the first time in 105 days, since 6/29/13. The October sampling in the Caloosahatchee Estuary reveals no living adult oysters upstream at Iona Cove or Peppertree Pointe.

At downstream sites, Bird Island and Kitchel Key, the average *Perkinsus* prevalence was 73.33 and Perkinsus intensity ranged from 0.73-0.88, averaging 0.77. Recruitment data are not yet available. (scale 0 = no infection, 1 = low, 3 = medium, 5 = heavy).

FGCUs annual juvenile growth study reports an average of 23% live oysters In closed bags and 0% living in the open bags with no living juveniles (in any bag type) at either of the 2 upstream sites.

The wet season predation study on juvenile oysters recorded an average of 12% alive in closed bags and an average of 4% in open bags with no living juveniles (in any bag type) at our most upstream site. (Data FGCU)

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)			
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m			
Ft Myers	8.8	264	3.0	0.62			
lona	11.4	225	4.2	0.65			
San Carlos Bay	San Carlos Bay 6.2		8.1	0.88			
Target light penetration: CE - Caloosahatchee Estuary =1 m							
SCB-San Carlos Bay = 2.2 meters							

Definition of 25% lz: **z where I is 25% of surface I. I** = irradiance, **z**= depth



100% of oysters dead in the Caloosahatcheeat lona, 10/14/13.Photo SCCF

Very fine silt fouled the RECON unit at Fort Myers 10/9/13. Photo SCCF



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: October 15 - 21, 2013

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

Caloosahatchee Condition Summary

Flows into the estuary have finally dropped below the 2,800 cfs high flow target at S-79, with flows of 1,430 cfs at S-79 on 10/21. Flows for the past week averaged 2,701 cfs (*excluding 10/18 missing data). Average flow at S-79 for the past 30 days (9/22 - 10/21/13) was 6,185 cfs, above 2,800 cfs for 122 consecutive days since 6/21/13.

USACE Action: On 10/21/13, the USACE reduced flow to the Caloosahatchee to 650 cfs measured at S-79. Releases from the Lake at S-77 will depend on local runoff. Flow from the Lake will be used to supplement local runoff if less than 650 cfs. When local runoff exceeds 650 cfs no releases will be made from the Lake.

Recommendation: With the onset of the dry season, we request that the Corps gradually cut back flows to the Caloosahatchee from 3,000 cfs to 650 cfs over a two to three week period to allow organisms within the estuary to acclimate to changing salinities following three and half months of high rainfall and regulatory releases from Lake Okeechobee. Flows should be stepped down using regulatory releases from the Lake over a two week period, with target flows the first week of 1,500 cfs, and 1,000 cfs the second week. After the third week, flows should transition to 650 cfs. If basin rainfall provides adequate flows then Lake water will not be needed during this transition period. This will ensure that the ecological resources within the Caloosahatchee have an opportunity to acclimate to dry season flows following extremely high wet season flows.

Lake Okeechobee Level:	15.46 ft . (Low Sub-Band) Last wk: 15.65 ft		
Lake Okeechobee Inflow:	1,174 cfs	Lake Okeecho	bee Outflow: 2,988 cfs
Weekly Rainfall:	WP Franklin 0.02"	Ortona 0.0"	Moore Haven 0.0"
Salinity Fort Myers:	0.2 - 0.3 psu surface (SCCF	CF Ft. Myers Yacht Basin) Previous wk: 0.2 - 0.3	
	0.2 - 1.4 psu (SCCF RECON	Marker 52)	Previous wk: 0.2 - 0.6 psu
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marke	er 18)	Previous wk: 0.2 psu

Salinity Shell Point:

7.6 - 31 psu (SCCF RECON)

Previous wk: 2.1 - 27 psu



Flow: Over the past 7 days (*excluding 10/18), flows at S-79 averaged 2,701 cfs. The 30-day moving average flow to the Caloosahatchee Estuary at S-79 is **6,185 cfs**; **above the 2,800 cfs harm threshold for the past 122 days.**

ACOE Daily Reports						
Date	Day S-79 Flow S-78 Flow S-77 Flo					
		(cfs)	(cfs)	(cfs)		
10/15/13	Tues	3004	1888	2228		
10/16/13	Wed	3008	1942	2324		
10/17/13	Thurs	3004	1934	2298		
10/18/13	Fri	NR	1850	2137		
10/19/13	Sat	2836	1769	1889		
10/20/13	Sun	2924	1760	1893		
10/21/13	Mon	1430	NR	1235		
7 Day	Avg	2701*	NA	2001		



Upstream of S-79/Franklin Conditions: On 10/22/13,

chlorides measured 50 mg/L. Apparent color increased to 177 CU.

Upper Estuary Conditions: Salinities at Fort Myers Yacht Basin remain below 1 psu, but have started rising.

Lower Estuary Condition: Salinities at Iona increased into the tolerance range for oysters and shoal grass. CDOM levels decreased, which increased light availability for seagrasses and benthic algae. The reduction in flows has resulted in the return of clear water in the surf zone of Fort Myers Beach and Sanibel. However, red and brown drift algae has been observed in the surf zone and on the sandy beach along Sanibel the northern end of Fort Myers Beach.

McIntyre Creek and Impoundments along Wildlife Drive in J.N. "Ding" Darling NWR: Over the past week, bottom salinities at McIntyre Creek increased from 20 to 26 psu and CDOM has decreased to approximately 1400 to 1700 RFUB. The reduction in flows has resulted in clearer water within the refuge. However, green algae is evident on exposed mudflats in the impoundments along Wildlife Drive. The bloom may be due to increased nutrient loading associated with the extreme releases at S-79.

Oysters: Salinities at lona were within the range of tolerance for shoal grass and oysters.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Ft Myers	7.8	231	3.0	0.68
lona	8.4	188	6.5	0.69
San Carlos Bay	4.3	71	8.0	1.03
Tarpon Bay	4.6	89	5.2	1.13

Target light penetration: **CE**- Caloosahatchee Estuary =1 m **SCB**-San Carlos Bay = 2.2 meters Definition of 25% lz: **z where l is 25% of surface l.**

 $I = irradiance, \mathbf{z} = depth$



Red drift algae at West Gulf Beach Access 1, Sanibel 10/17/13



Red drift algae at Tarpon Bay Beach access, Sanibel 10/16/13



Photo of algae (*Ulva* sp.) growing on rocks in the intertidal zone at Bunche Beach, 10/19/13

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: October 22 - 28, 2013

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

Caloosahatchee Condition Summary

Following four consecutive months of damaging flows averaging 7440 cfs, flows were abruptly cut back from 2,924 cfs to 762 cfs in a two day period. With reduced flows and dry conditions, salinities are beginning to rise in the mid estuary and water color is improving in the lower estuary.

USACE Action: On 10/21/13, the USACE reduced Caloosahatchee flow targets to 650 cfs, measured at S-79. Releases from the Lake will be used to supplement local runoff only when local runoff is less than 650 cfs.

Recommendation: With Lake Okeechobee's water elevation at 15.27 feet on 10/29/13, 0.60 feet below the level at this time last year, and outflows significantly higher than inflows, we request the SFWMD and Corps conserve water within the Kissimmee Chain of Lakes and Lake Okeechobee to preserve dry season water supplies and flows.

Lake Okeechobee Level:	15.29 ft. (Low Sub-Band)		Last wk: 15.46 ft	
Lake Okeechobee Inflow:	641 cfs	Lake Okeechobee	e Outflow: 2,144 cfs	
Weekly Rainfall:	WP Franklin 0.07"	Ortona 0.0"	Moore Haven 0.0"	
Salinity Fort Myers:	0.2 - 1.1 psu surface (SCCF Ft. Myers Yacht Bas		Previous wk: 0.2 - 0.3 psu	
	0.3 - 5.1 psu (SCCF RECON I	Marker 52)	Previous wk: 0.2 – 1.4 psu	
Salinity Beautiful Island:	0.2 psu (SCCF RECON Marke	r 18)	Previous wk: 0.2 psu	
Salinity Shell Point:	8.7 – 31 psu (SCCF RECON)		Previous wk: 7.6 -31 psu	



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Flow: Over the last 7 days, flows at S79 averaged **756 cfs dropping below four digit flows for the first time in four** months (122 days). The 30-day moving average (9/29/13-1028/13) flow to the Caloosahatchee Estuary at S79 is **3,869 cfs**; above the **2,800 cfs harm threshold for the past 130 consecutive days**.

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
10/22/13	Tues	762	324	188	
10/23/13	Wed	852	269	0	
10/24/13	Thurs	957	200	140	
10/25/13	Fri	612	326	456	
10/26/13	Sat	588	326	164	
10/27/13	Sun	715	317	296	
10/28/13	Mon	810	259	456	
7 Day	Avg	756	288	242	



Upstream of S79/Franklin Conditions: On 10/29/13, chlorides measured 50 mg/L. Apparent color increased to 168 CU.

Upper Estuary Conditions: Surface salinity rose above 1 psu at Fort Myers Yacht Basin. Mid-depth salinity rose above 5 psu at the Fort Myers RECON. Water column chlorophyll was elevated at Colonial Bridge due to flagellates. The water column light attenuation coefficient remains high due to CDOM.

Lower Estuary Condition: Macroalgae continued drifting onto Sanibel beaches. Macroalgal genera included: *Solieria*, *Agardhiella*, *Halymenia*, *Gracilaria*, *Laurencia*, *Botryocladia* and *Codium*.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Over the past week, bottom salinities at McIntyre Creek have fluctuated between 22 and 28 psu and CDOM has fluctuated between 1200 to 1800 RFUB. The reduction in flows at S-79 has resulted in clearer water within the refuge. However, filamentous green algae is evident on exposed mudflats in the impoundments along Wildlife Drive. The bloom may be due to increased nutrient loading associated with the extreme releases at S-79.



Green filamentous algae in "Ding" Darling NWR impoundments, 10/25/13. Photo USFWS

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
31 Bridge	6.6	264	2.2	0.63
Beautiful Is.	6.5	253	1.9	0.66
Fort Myers	8.5	229	2.2	0.70
Colonial Br.	12.2	222	1.9	0.70

Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: **z where I is 25% of surface I. I** = irradiance, **z**= depth



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, 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

Reporting Period: October 29 – November 5, 2013

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

Caloosahatchee Condition Summary

Reduced flows and dry conditions are causing, salinities to rise quickly in the mid and upper estuary. Flows at S79 averaged 657 cfs at S79 over the past week.

USACE Action: On 10/28/13, the USACE following LORS 2008 guidance, continued target flows of 650 cfs to the Caloosahatchee measured at S-79. However, due to changes in the conditions and forecasts, the LORS 2008 guidance established flows of up to 450 cfs at S79 and up to 200 cfs at S-80, but were modified as allowed to provide 650 cfs to S79 and no flows to S80.

Recommendation: With Lake Okeechobee elevation at 15.09 feet on 11/05/13, 0.60 feet below the level at this time last year, and outflows significantly higher than inflows, we request the SFWMD and Corps conserve water within the Kissimmee Chain of Lakes and Lake Okeechobee to preserve dry season water supplies and flows. We also request that the Corps consult with the SFWMD and implement a pulse release schedule that is beneficial to the river and estuary.

Lake Okeechobee Level:	15.09 ft. (Low Sub-Ban	Last wk: 15.29 ft	
Lake Okeechobee Inflow:	506 cfs Lake Okeechobee Outflow: 2		2,688 cfs
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.0"	Moore Haven 0.10"
Salinity Fort Myers:	1.8-6.1 psu surface (SCCF Ft. Myers Yacht Basin)		Previous wk: 0.2 - 1.1 psu
	4.6 - 9.9 psu (SCCF RECON Marker 52)		Previous wk: 0.3 - 5.1 psu
Salinity Beautiful Island:	0.2 -1.9 psu (SCCF RECO	Previous wk: 0.2 psu	
Salinity Shell Point:	13 – 31 psu (SCCF RECC	Previous wk: 8.7 – 31 psu	



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Flow: Over the last 7 days, flows at S79 averaged 657 cfs. The 30-day moving average (10/6/13-11/4/13) flow to the Caloosahatchee Estuary at S79 is 2,141 cfs. The 30 day moving average fell below 2800 cfs on 11/2/13. Flows exceeded the 2800 cfs harm threshold for 134 consecutive days from 6/21/13 - 11/2/13.

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
10/29/13	Tues	725	223	444
10/30/13	Wed	625	452	452
10/31/13	Thurs	600	493	624
11/1/13	Fri	560	491	944
11/2/13	Sat	742	387	220
1/3/13	Sun	752	409	440
11/4/13	Mon	600	502	342
7 Day	Avg	657	422	495



Upstream of S79/Franklin Conditions: On 11/5/13, chlorides measured 54 mg/L. Apparent color decreased to 127 CU.

Upper Estuary Conditions: The past week surface salinity rose above 5 psu at Fort Myers Yacht Basin. Mid-depth salinity rose to almost 10 psu at the Fort Myers RECON. Water column chlorophyll was again elevated at Colonial Bridge and began to rise at Fort Myers RECON. The water column light attenuation coefficient remains high due to CDOM.

Lower Estuary Condition: Fort Myers Beach water conditions have greatly improved due to the reduction of Caloosahatchee flows.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Over the past week, bottom salinities at McIntyre Creek have fluctuated between 22 and 28 psu and CDOM has fluctuated between 1200 to 1800 RFUB. The reduction in flows at S-79 has resulted in clearer water within the refuge. However, filamentous green algae is evident on exposed mudflats in the impoundments along Wildlife Drive.

Oysters: Oyster spat recruitment at sample sites in the Caloosahatchee estuary ranged from an average spat per shell of 0.03 at upstream sites where 100% mortality occurred this season to 71.97 at downstream sites. Spat recruitment over all estuary sample sites averaged 33.33 spat per shell.

Red Tide: FWCC reports the red tide organism Karenia brevis along and offshore southwest Florida from Sarasota to northern Lee County at concentrations that range from not present to medium. In northern Lee county waters Karenia brevis was found in low concentrations in Pine Island Sound near Redfish and Captiva Passes (FDACS samples).

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
31 Bridge	8.5	258	3.5	0.62
Beautiful Is.	5.8	246	5.9	0.61
Fort Myers	6.7	234	4.0	0.66
Colonial Br.	20.3	210	6.0	0.62

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

SCB-San Carlos Bay = 2.2 meters

Definition of 25% lz: **z where I is 25% of surface I. I** = irradiance, **z**= depth

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: November 5 - 11, 2013

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

Caloosahatchee Condition Summary

Increased flows from the 10 day pulse release moderated the rapid rise in salinities in the mid and upper Caloosahatchee estuary. Flows at S79 increased to an average of 1,137 cfs at S79 over the past week.

USACE Action: On Friday, 11/8/13 the USACE initiated a 10 day pulse release to the Caloosahatchee averaging 650 cfs measured at S-79. The pulse includes four days of zero flow at the end of the schedule.

Recommendation: We request that the Corps and the SFWMD continue to implement a pulse release schedule that provides flows to the river and estuary to manage salinity and the rate of rise. With dry conditions and rising salinities we are concerned that four consecutive days of no flow will cause a rapid rise in salinity.

Lake Okeechobee Level:	14.96 ft. (Low Sub-Band	Last wk: 15.09 ft		
Lake Okeechobee Inflow:	355 cfs	Lake Okeechobee Outflow:	2,075 cfs	
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.0"	Moore Haven 0.07"	
Salinity Fort Myers:	3.4 - 7.6 psu SCCF Ft. My	3.4 - 7.6 psu SCCF Ft. Myers Yacht Basin surface		
	4.1 – 15 psu (SCCF RECO	Previous wk: 4.6 - 9.9 psu		
Salinity Beautiful Island:	0.7 - 1.8 psu (SCCF RECO	Previous wk: 0.2 -1.9 psu		
Salinity Shell Point:	15 - 31 psu (SCCF RECON	Previous wk: 13 – 31 psu		



Flow: Over the last 7 days, flows at S79 increased over half of last week, averaging 1,137 cfs.

A	COE N	ovembei	^r 8, 2013 Pu	lse Release		SCCE Sonde Surface Salinity at Eart Myers Vacht Basin
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	25 1 day harm threshold
11/08/2013	1	1300	1668	779	1438	
11/09/2013	2	1900	1781	1079	1309	a 15
11/10/2013	3	1300	1422	1288	1366	ity (
11/11/2013	4	900	1124	653	1162	10 30 day harm threshold
11/12/2013	5	700				h . MM
11/13/2013	6	400				5 salinity
11/14/2013	7	0				30D MA - ANY TY
11/15/2013	8	0				0
11/16/2013	9	0				0111, 001, 180, 020, 190, 110, 110,
11/17/2013	10	0				
10 day Av						

Upstream of S79/Franklin Conditions: On 11/12/13, chlorides measured 50 mg/L. Apparent color increased to 148 CU.

Upper Estuary Conditions: The past week surface salinity continued to rise at Fort Myers Yacht Basin. Mid-depth salinity rose to 15 psu at the Fort Myers RECON. The water column light attenuation coefficient remains high due to CDOM.

Lower Estuary Condition: Red drift algae was observed in low to medium densities along Fort Myers Beach on Friday, 11/8/13. Dense accumulations of red drift macroalgae (Acanthophora) were sampled in Tarpon Bay.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR: Over the past week, bottom salinities at McIntyre Creek have fluctuated between 22 and 28 psu and CDOM has fluctuated between 1200 to 1800 RFUB. The reduction in flows at S-79 has resulted in clearer water within the refuge. However, filamentous green algae is evident on exposed mudflats in the impoundments along Wildlife Drive.

Red Tide: FWCC reports the red tide organism, Karenia brevis was detected in water samples collected this week ranging from background to medium concentrations at several locations in and alongshore of southern Sarasota County south to Charlotte County and in the northern Pine Island Sound in Lee County. Karenia brevis was not found in SCCF samples from Sanibel beaches, San Carlos Bay and southern Pine Island Sound.

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
11/5/13	Tues	600	488	615
11/6/13	Wed	599	484	726
11/7/13	Thurs	769	477	874
11/8/13	Fri	1668	779	1438
11/9/13	Sat	1781	1079	1309
11/10/13	Sun	1422	1288	1366
11/11/13	Mon	1124	653	1162
7 Day	Avg	1137	749	1070

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)	
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	
31 Bridge	7.1	242	2.1	0.67	
Beautiful Is.	4.5	228	2.4	0.71	
Fort Myers	5.8	201	3.2	0.75	
Colonial Br.	6.4	156	2.9	0.88	
Target light p	Target light penetration: CE - Caloosahatchee Estuary =1 m				
SCB -San Carlos Bay = 2.2 meters					
Definition of 25% lz: z where I is 25% of surface I. I = irradiance, z = depth					



Terns on Nerita Beach, Sanibel on Sunday 11/10/13. Photo SCCF

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: November 12 - 18, 2013

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

Caloosahatchee Condition Summary

Pulse flows at S79 the past week decreased from an average of 1,137 cfs to 332 cfs resulting in a rapid 6 psu increase in salinity at Fort Myers, elevating surface salinity to above 10 psu. Fort Myers RECON records salinities hovering around and extending above 16 psu. Reduced to no flows coupled with spring tides compounded the rapid change.

USACE Action: On Monday, 11/18/13 the USACE initiated a 10 day pulse release to the Caloosahatchee averaging 730 cfs measured at S-79 using make-up release water. The pulse includes two days of zero flow at the end of the schedule.

Recommendation: We request that the Corps and the SFWMD continue to use make up releases as needed to provide flows for prevention of a continuing MFL violation from consecutive years of rule exceedence. This action may enable the estuary to begin recovery from this summer's extensive freshwater flow impacts and the consecutive years of MFL Rule exceedences and violations that constitute Significant or Serious Harm.

Florida F.A.C. Chapter 40E-21 defines **Significant Harm** as the temporary loss of water resource functions, which result from a change in surface or ground water hydrology that takes more than two years to recover, but which is considered less severe than serious harm. **Serious Harm** is defined as long-term, irreversible, or permanent impacts.

Lake Okeechobee Level:	14.84 ft. (Low Sub-Band)	Last wk: 14.96 ft
Lake Okeechobee Inflow:	1,552 cfs	Lake Okeechobee O	utflow: 1,981 cfs
Weekly Rainfall:	WP Franklin 0.46"	Ortona 0.13"	Moore Haven 0.08"
Salinity Fort Myers:	4.9 - 11.6 psu SCCF Ft. Myers Yacht Basin		Previous wk: 3.4 - 7.6 psu
	5.2 - 17 psu (SCCF RECO	N Marker 52)	Previous wk 4.1 – 15 psu
Salinity Beautiful Island:	0.9 - 5.2 psu (SCCF RECC	DN Marker 18)	Previous wk: 0.7 - 1.8 psu
Salinity Shell Point:	14 – 33 psu (SCCF RECC	DN)	Previous wk: 15 - 31 psu


Page **2** of **2**

Flow: Over the last 7 days, flows at S79 decreased from an average of 1,137 cfs to 332 cfs. The surface salinity graph from Fort Myers, below, reflects the systems rapid 6 psu rise in salinity in response to three days of no flow during a spring tide. The MFL is expected to exceed the harm threshold if low to no flows are provided.

ACOE November 8, 2013 Pulse Release						
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
11/08/13	1	1300	1668	779	1438	
11/09/13	2	1900	1781	1079	1309	
11/10/13	3	1300	1422	1288	1366	
11/11/13	4	900	1124	653	1162	
11/12/13	5	700	674	331	600	
11/13/13	6	400	453	432	569	
11/14/13	7	0	102	473	708	
11/15/13	8	0	0	137	551	
11/16/13	9	0	0	0	78	
11/17/13	10	0	0	0	0	
Average		650	722	517	778	



Upstream of S79/Franklin Conditions: On 11/19/13, chlorides measured 56 mg/L and apparent color was 144 CU.

Upper Estuary Conditions: The past week surface salinity continued to rise at Fort Myers Yacht Basin with the 30 day moving average reaching 4.3 psu. Mid-depth salinity rose to 17 psu at the Fort Myers RECON. Water column light attenuation remains high for submersed plants at depth.

Lower Estuary Condition: Dense accumulations of red drift macroalgae (*Acanthophora*) were found in several areas in Tarpon Bay on 11/12/13. Sanibel beaches had little or no drift algae during the week.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR:

Over the past week, bottom salinities at McIntyre Creek have fluctuated between 22 and 28 psu and CDOM has fluctuated between 1200 to 1800 RFUB. The reduction in flows at S-79 has resulted in clearer water within

the refuge. However, filamentous green algae is evident on exposed mudflats in the impoundments along Wildlife Drive.

Manatees: Over the past 10 days manatees have begun their annual seasonal congregation at the FPL warm water discharge canal at the Orange River. On 11/17/13 Lee County Manatee Park volunteers counted 12 manatees in the canal.

Oysters: November sampling by FGCU revealed Perkinsus prevalence ranged from 46.66-93.33, with an estuary average of 70. The Perkinsus intensity ranged from 0.87-1.07, with an estuary average of 0.97. There are no live adult oysters for sampling at upstream sites.

Red Tide: *Karenia brevis* was not found in SCCF samples from Sanibel beaches, San Carlos Bay and southern Pine Island Sound, but low concentrations were reported by FWCC at Redfish Pass and medium concentrations east of Captiva on 11/12/13.

ACOE Daily Reports						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
11/12/13	Tues	674	331	600		
11/13/13	Wed	453	432	569		
11/14/13	Thurs	102	473	708		
11/15/13	Fri	0	137	551		
11/16/13	Sat	0	0	78		
11/17/13	Sun	0	0	0		
11/18/13	Mon	1096	546	557		
7 Day	Avg	332	274	437		

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m		
31 Bridge	4.5	237	1.4	0.71		
Beautiful Is.	5.8	187	1.1	0.84		
Fort Myers	6.7	172	1.0	0.89		
Colonial Br.	nial Br. 6.8		1.0	0.93		
Target light penetration: CE- Caloosahatchee Estuary =1 m SCB-San Carlos Bay = 2.2 meters						
Definition of 25% Iz: z where I is 25% of surface I. I = irradiance, z = depth						



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants

Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: November 19 - 25, 2013

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

Caloosahatchee Condition Summary

Flows over the past week averaged 1,045 cfs at S-79 and 910 cfs at S-77. Surface salinity at Fort Myers exceeded 10 psu from 11/17/13 through 11/23/13 following three days of 0 cfs flows at the end of the previous pulse release

USACE Action: On Monday, 11/18/13 the USACE initiated a 10 day pulse release to the Caloosahatchee averaging 730 cfs measured at S-79 using make-up release water. The pulse includes two days of zero flow at the end of the schedule.

Recommendation: We request that the Corps and the SFWMD continue to use make up releases as needed to provide flows for prevention of a continuing MFL violation from consecutive years of rule exceedence. This action may enable the estuary to begin recovery from this summer's extensive freshwater flow impacts and the consecutive years of MFL Rule exceedences and violations that constitute Significant or Serious Harm.

Lake Okeechobee Level:	14.72 ft. (Low Sub-Band)	Last wk: 14.84 ft
Lake Okeechobee Inflow:	1,715 cfs	Lake Okeechobee O	outflow: 2,956 cfs
Weekly Rainfall:	WP Franklin 0.88"	Ortona 0.13"	Moore Haven 0.0"
Salinity Fort Myers:	7.9 - 12.2 psu SCCF Ft. N	Ayers Yacht Basin	Previous wk: 4.9 - 11.6 psu
MFL Status:	6.5 psu Daily salinity at I	day moving average	
	9.5 - 16 psu (SCCF RECO	N Marker 52)	Previous wk 5.2 - 17 psu
Salinity Beautiful Island:	2.5- 5.5 psu (SCCF RECO	N Marker 18)	Previous wk: 0.9 - 5.2 psu
Salinity Shell Point:	18 - 32 DSU (SCCE RECON	J)	Previous wk: 14 – 33 psu



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Flow: Over the last 7 days, flows at S79 increased from an average last week of 332 cfs to 1045 cfs. The surface salinity at Fort Myers has ranged to above 10 psu for the past two weeks.

ACOE November 18, 2013 Pulse Release					
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
11/18/13	1	1300	1096	546	557
11/19/13	2	1900	1916	913	1023
11/20/13	3	1300	1521	1077	1041
11/21/13	4	900	1103	1000	1191
11/22/13	5	700	949	586	1100
11/23/13	6	400	732	502	892
11/24/13	7	400	576	435	700
11/25/13	8	400	520	330	428
11/26/13	9	0			
11/27/13	10	0			
10 day Av		730			



Upstream of S79/Franklin Conditions: NR

Upper Estuary Conditions: The past week surface salinity continued to rise at Fort Myers Yacht Basin with the 30 day moving average reaching 6.5 (SCCF sonde). Salinity at Franklin Lock rose to 3.3 psu, eliminating much of the oligohaline habitat volume. Though CDOM levels continue to drop, the water column light attenuation coefficient remains high for submersed plants at depth in the mid and upper Estuary.

Lower Estuary Condition: Slight accumulations of drift macroalgae (including *Solieria, Agardhiella, Ulva, Codium, Botryocladia, Halymenia* and *Dictyota*) were found along the beach at Access #1 on 11/25/13. *Ulva* was growing on intertidal hard surfaces at Blind Pass.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR:

Over the past week, bottom salinities at McIntyre Creek have fluctuated between 22 and 28 psu and CDOM has fluctuated between 1200 to 1800 RFUB. The reduction in flows at S-79 has resulted in clearer water within the refuge. However, filamentous green algae (including *Ulva* and *Rhizoclonium*) was evident on exposed mudflats in the impoundments along Wildlife Drive.

Red Tide: Low concentrations of *Karenia brevis* were found in SCCF samples from Tarpon Beach (11/22/13, 11/25/13, 11/26/13) and Beach Access #1 (11/23/13, 11/25/13). Dead fish were found at Access #1 (11/23/13) and Tarpon Beach (11/25/13, 11/26/13). 318,000 cells/L of *Karenia* spp. were present along the Sanibel Causeway (11/26/13). Dense patches of red tide were found in the Gulf near Sanibel last week (FWCC). Link to FWCC/FWRI Red Tide Map

Wildlife Impacts: Over the past week, CROW, the wildlife rehabilitation hospital on Sanibel, reports treating 1 green sea turtle, 2 double crested cormorants and 1 herring gull with probable brevetoxicosis from red tide.

Manatees: Lee County park rangers report a manatee suffering from pneumonia was successfully rescued from the Orange River last week.

ACOE Daily Reports						
Date	Day	Day S79 Flow S78 I (cfs) (cf		S77 Flow (cfs)		
11/19/13	Tues	1916	913	1023		
11/20/13	Wed	1521	1077	1041		
11/21/13	Thurs	1103	1000	1191		
11/22/13	Fri	949	586	1100		
11/23/13	Sat	732	502	892		
11/24/13	Sun	576	435	700		
11/25/13	Mon	520	330	428		
7 Day	Avg	1045	691	910		

Caloosahatchee Stations	hatchee Chlorophyll ions (µg/L)		CDOM Turbidity (qse) (NTU)			
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m		
31 Bridge	4.3	198	1.6	0.80		
Beautiful Is.	6.9	178	1.5	0.85		
Fort Myers	8.0	173	2.3	0.84		
Colonial Br.	4.1	154	3.8	0.87		
Target light penetration: CE - Caloosahatchee Estuary =1 m						
SCB -San Carlos Bay = 2.2 meters						
Definition of 25% lz: z where I is 25% of surface I.						

I = irradiance, z = depth



Light drift algae accumulation at Beach Access #1, Sanibel, 11/25/13. Photo SCCF



Ulva covering rocks at Blind Pass 11/25/13. Photo SCCF

Ulva on seawall at Blind Pass Beach 11/25/13 Photo SCCF

Dead Mackeral at Tarpon Beach 11/25/13. Dead catfish and mullet were noted 11/23/13 at Access #1. Photo SCCF



Dead fish on Tarpon Bay Beach, Sanibel on 11/26/13. Photo City of Sanibel



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: November 26 - December 2, 2013

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

Caloosahatchee Condition Summary

Flows over the 10-day pulse release averaged 853 cfs at S-79 and 602 cfs at S-77. The 30-day moving average of surface salinity at Ft. Myers was 8.0 psu and continues trending upward. Red tide offshore of Sanibel and Fort Myers Beach resulted in a large number of dead fish and numerous sharks washing up on local beaches between 11/27 and 12/1/13.

USACE Action: On Monday, 11/18/13 the USACE initiated a 10 day pulse release to the Caloosahatchee averaging 730 cfs measured at S-79 using make-up release water. The pulse includes two days of zero flow at the end of the schedule.

Recommendation: We request that the Corps and the SFWMD continue to use make up releases as needed to provide flows for prevention of a continuing MFL violation from consecutive years of rule exceedence. This action may enable the estuary to begin recovery from this summer's extensive freshwater flow impacts and the consecutive years of MFL Rule exceedences and violations that have resulted in the loss of upper estuary tape grass.

Lake Okeechobee Level:	14.65 ft. (Low Sub-Band	Last wk: 14.72 ft	
Lake Okeechobee Inflow:	430 cfs	Lake Okeechobee O	utflow: 1,698 cfs
Weekly Rainfall:	WP Franklin 0.36"	Ortona 0.27"	Moore Haven 0.25"
Salinity Fort Myers:	8.8 - 12.3 psu SCCF Ft. M	lyers Yacht Basin	Previous wk: 7.9 - 12.2 psu
MFL Status:	8.0 psu 30 day moving av	erage at Fort Myers	MFL target <u><</u> 10 psu
	8.4 - 14 psu (SCCF RECO	N Marker 52)	Previous wk 9.5 - 16 psu
Salinity Beautiful Island:	3.2 - 7.3 psu (SCCF RECO	N Marker 18)	Previous wk: 2.5 - 5.5 psu
Salinity Shell Point:	18 – 34 psu (SCCF RECO)	N)	Previous wk: 18 - 32 psu



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Flow: Flows at S79 over the last 7 days and 10 day pulse release averaged 853 cfs. On 11/27/13 a south wind appears to have compounded effects of 0 flow resulting in a rise of surface salinity at Fort Myers to above 12 psu. Subsequent days flows and a change in the wind direction reduced salinity to below 10 psu. The surface salinity at Fort Myers has ranged above 10 psu for the past three weeks.

A		lovembe	r 18, 2013 P	ulse Releas	e	
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	25 20 1 day harm threshold
11/18/13	1	1300	1096	546	557	
11/19/13	2	1900	1916	913	1023	ິ ກິງ 15
11/20/13	3	1300	1521	1077	1041	
11/21/13	4	900	1103	1000	1191	i au au au an
11/22/13	5	700	949	586	1100	S shawing in the
11/23/13	6	400	732	502	892	5 salinity
11/24/13	7	400	576	435	700	30D MA
11/25/13	8	400	520	330	428	
11/26/13	9	0	126	111	168	102/ 102/ 102/ 102/ 102/ 102/
11/27/13	10	0	0	0	0	11/1 1/116 1/16 1/21
10 day Av		730	853	550	602	

Upstream of S79/Franklin Conditions: On 12/3/13, chlorides measured 58 mg/L and apparent color was 104 CU.

Upper Estuary Conditions: The 30 day moving average surface salinity continued to rise at Fort Myers Yacht Basin (SCCF sonde) to 8.0 psu. Though CDOM levels continue to drop, the water column light attenuation coefficient remains high for submersed plants at depth in the mid and upper Estuary.

Lower Estuary Condition: Slight accumulations of drift macroalgae (including *Eucheuma*, *Solieria*, *Agardhiella*, and *Halymenia*) were found along the beach at Tarpon Bay on 12/01/13. Epiphytic algae, mainly diatoms were covering shoal grass shoots along the Causeway on 12/2/13 and on middle portions of Fort Myers Beach on 12/3/13. Abundant diatoms indicate high dissolved silica levels which favor diatoms over dinoflagellates and other phytoplankton groups. The water column light attenuation coefficient remains high for seagrasses at depth in the lower Estuary.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR:

Over the past week, bottom salinities at McIntyre Creek have fluctuated between 28 and 30 psu and CDOM has fluctuated between 1200 to 1800 RFUB. The reduction in flows at S-79 has resulted in clearer water within the refuge. However, filamentous green algae (including *Ulva* and *Rhizoclonium*) is persistent on exposed mudflats in the impoundments along Wildlife Drive.

Red Tide: No Karenia brevis cells were found in SCCF samples from the Sanibel shoreline or in Pine Island Sound from 11/29 -12/4/13. Sites included the Sanibel Causeway, Lighthouse Beach, East Gulf, Tarpon Beach, West Gulf, Tradewinds, Blind Pass, Redfish Pass and Tarpon Bay. However, accumulations of dead fish were found on Fort Myers and Sanibel beaches and in the surf zone from 11/27/13 – 12/1/13. Sanibel removed over 800 dead fish on Lighthouse Beach on 11/30/13 with more coming ashore over the following days. Over 500 catfish, 8 hammerhead sharks over 3 feet and more than 20 hammerhead sharks < 2 feet were found dead along Fort Myers Beach on 11/29 -11/30/13. These fish are presumed to have been killed by recent blooms of Red Tide along the beach.

Wildlife Impacts: Over the past week, CROW, the wildlife rehabilitation hospital on Sanibel, reports 10 new brevetoxicosis cases, including double crested cormorants, gulls, and terns.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
31 Bridge	4.5	192	1.1	0.83
Beautiful Is.	4.3	183	1.6	0.85
Fort Myers	4.3	165	2.2	0.89
Colonial Br.	5.1	144	2.3	0.95

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



To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: December 3 - 9, 2013

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

Caloosahatchee Condition Summary

Flows over the 10-day pulse release that began on 11/28/13 averaged 739 cfs at S-79. The 30-day moving average of surface salinity at Ft. Myers was 9.4 psu and continues trending upward.

USACE Action: On Thursday, 11/28/13 the USACE initiated a 10 day pulse release to the Caloosahatchee averaging 730 cfs measured at S-79 using make-up release water. The pulse included two days of zero flow at the end of the schedule. Beginning 12/8/13 a new 10 day pulse was initiated with reduced flows averaging 650 cfs and four days of no flow.

Recommendation: With salinities rising, reduced flows and four days of no flow are expected to trigger an MFL exceedence and violation within the next week. We request that make up releases be continued to provide flows to support the fledgling recovery of tape grass in the upper estuary. Pulse releases should be designed to minimize the number of zero flow days. Seven day pulse schedules should be considered if it minimizes the number of zero flow days between pulse schedules.

Lake Okeechobee Level:	14.57 ft. (Low Sub-Band))	Last wk: 14.65 ft
Lake Okeechobee Inflow:	230 cfs	Lake Okeechobee Ou	utflow: 4,655 cfs
Weekly Rainfall:	WP Franklin 0.01"	Ortona 0.0"	Moore Haven 0.0"
Salinity Fort Myers:	8.0- 12.6 psu SCCF Ft. My	yers Yacht Basin	Previous wk: 8.8 - 12.3 psu
MFL Status:	9.4 psu 30 day moving ave	erage at Fort Myers	MFL target <u><</u> 10 psu
	12-17 psu (SCCF RECON	Marker 52)	Previous wk 9.5 - 16 psu
Salinity Beautiful Island:	3.2 - 5.9 psu (SCCF RECO	N Marker 18)	Previous wk: 3.2 - 7.3 psu

Salinity Shell Point:

22 - 32 psu (SCCF RECON)

Previous wk: 18 - 34 psu



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A	ACOE November 28, 2013 Pulse Release				S(25	CCF Sonde Surface Salinity at Fort Myers Yacht Basin	
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	20	1 day harm threshold
11/28/13	1	1300	888	448	444	(ns	
11/29/13	2	1900	1824	977	1122	<u>ä</u> ¹⁵	
11/30/13	3	1300	1478	783	1054	lity	30 day harm threshold
12/1/13	4	900	973	431	598		
12/2/13	5	700	684	323	435	ŝ	Mark Walt
12/3/13	6	400	491	322	443	5	- white
12/4/13	7	400	465	320	445		salinity —
12/5/13	8	400	473	322	449	0	30D MA
12/6/13	9	0	117	254	451	0	
12/7/13	10	0	0	165	445		N-6 N-6 N-6 V-6 V-6 V-6 V-6 V-6 V-6 V-6 V-6 V-6 V
10 day Ay		730	739	434	588]	1 1 2 2

Flow: Flows at S79 over the last 10 day pulse release averaged 739 cfs. The past 7 days flows at S79 averaged 624 cfs.

Upstream of S79/Franklin Conditions: On 12/10/13, chlorides measured 58 mg/L and apparent color was 75 CU.

Upper Estuary Conditions: The 30 day moving average surface salinity continued to rise at Fort Myers Yacht Basin (SCCF sonde) to 9.4 psu. Though CDOM levels have dropped enough to allow enough light for diatoms (*Skeletonema*) and other phytoplankton, there is still insufficient light for submersed plants at depth in the upper Estuary.

Lower Estuary Condition: Epiphytic algae were covering shoal grass shoots around Sanibel12/6-12/9/13. Dominant epiphytes included *Polysiphonia* at the Toll booth flats and *Hincksia* at the boat ramp. The water column light attenuation coefficient remains high for seagrasses at depth in the lower Estuary. Red and brown macroalage continue to strand along Fort Myers Beach creating light to moderate wrack lines.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR:

Over the past week, bottom salinities at McIntyre Creek have steadily increased from 29 to 32. The reduction in flows at S-79 has resulted in clearer water within the refuge. However, filamentous green algae (including *Ulva* and *Rhizoclonium*) was evident on exposed mudflats in the impoundments along Wildlife Drive. .Large amounts of drift algae are present within the seagrass beds and on sand flats within Pine Island Sound.

Note: The USGS gages at McIntyre Creek were removed from operation December 10, 2013. The SCCF Marine Laboratory will place a RECON station at the same location that will be operational next week.

Red Tide: No *Karenia brevis* cells were found in SCCF samples from the Sanibel shoreline or in Pine Island Sound from 12/2-12/9/13.

Oysters: December sampling showed the *Perkinsus* disease prevalence ranged from 64.2-86.6% with an estuary average of 75.4%. Disease intensity ranged from 0.64-0.93 with an average of 0.79. Spat recruitment ranged from 0.11-3.53 spat/shell from upstream to downstream with an average of 0.79 spat/shell. (Data from FGCU)

Wildlife Impacts: Over the past week, CROW, the wildlife rehabilitation hospital on Sanibel, reported 26 new brevetoxicosis cases, including 24 double crested cormorants and 2 brown pelicans.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)	Target light penetration: CE - Caloosahatchee Estuary =1 m
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m	SCB -San Carlos Bay = 2.2 meters
31 Bridge	4.6	187	1.1	0.85	Definition of 25% Iz: z where I is 25% of surface I.
Beautiful Is.	6.0	167	1.2	0.92	I = Irradiance, Z = deptn
Fort Myers	9.0	141	1.3	0.98	
Colonial Br.	12.1	121	1.6	1.03	



Page 3 or 3										
	ACOE Daily Reports									
Date	Day S79 Flow S78 Flow S77 Flow (cfs) (cfs)									
12/3/13	Tues	491	322	443						
12/4/13	Wed	465	320	445						
12/5/13	Thurs	473	322	449						
12/6/13	Fri	117	254	451						
12/7/13	Sat	0	165	445						
12/8/13	Sun	978	249	433						
12/9/13	Mon	1846	1081	1143						
7 Day	Avg	624	387	544						





Shoal grass covered with filamentous epiphytic algae at the Sanibel toll booth flats in San Carlos Bay 12/8/13. Photo SCCF

Caloosahatchee tape grass 12/10/13. **Photo SCCF**



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To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: December 10 - 16, 2013

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

Caloosahatchee Condition Summary: Flows over the past 7 days averaged 625 cfs at S-79. The 30-day moving average of surface salinity at Fort Myers is 9.9 psu and rising. Despite projections indicating a low chance of water shortage this year, beneficial make up releases to the Caloosahatchee have been withheld resulting in salinities trending too high for tape grass recovery and oyster health. Following four months of damaging high flows this past summer, the Caloosahatchee estuary is being harmed by lack of freshwater flow despite little to no threat of water shortage. This inequity must be addressed through short-term adaptive management or policy changes.

USACE Action: On Sunday, 12/8/13 a 10 day pulse was initiated which eliminated "make up release" water and reduced average flows from 730 cfs to 650 cfs, with four days of no flow.

Recommendation: Reduced flows and dry conditions have resulted in salinities continuing to rise and will trigger an MFL exceedence and violation if additional flow is not provided. We request that make up releases be utilized to provide flows to support healthy conditions in the Caloosahatchee for tape grass and oyster health.

Lake Okeechobee Level:	14.42 ft. (Low Sub-Band)	Last wk: 14.57 ft
Lake Okeechobee Inflow:	330 cfs	Lake Okeechobee O	utflow: 2,917 cfs
Weekly Rainfall:	WP Franklin 0.13"	Ortona 0.0"	Moore Haven 0.10"
Salinity Fort Myers:	8.5- 12.7 psu SCCF Ft. M	yers Yacht Basin	Previous wk: 8.0- 12.6 psu
MFL Status:	9.9 psu 30 day moving av	erage at Fort Myers	MFL target <pre> < 10 psu</pre>
	9.4 - 16 psu (SCCF RECO	N Marker 52)	Previous wk 12- 17 psu
Salinity Beautiful Island:	3.5 – 6.1 psu (SCCF RECC	DN Marker 18)	Previous wk: 3.2 - 5.9 psu
Salinity Shell Point:	19 – 33 psu (SCCF RECOM	N)	Previous wk: 22 – 32 psu



Flow: Flows at S79 over the last 7 days averaged 625 cfs. Salinities continue to rise with the surface salinity at Fort Myers reaching 12.7 and the 30 day moving average at 9.9 psu.

ACOE December 8, 2013 Pulse Release								
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)			
12/8/13	1	1300	978	249	433			
12/9/13	2	1900	1846	769	1143			
12/10/13	3	1300	1528	1265	1848			
12/11/13	4	900	1096	629	860			
12/12/13	5	700	772	670	660			
12/13/13	6	400	573	722	1041			
12/14/13	7	0	123	190	578			
12/15/13	8	0	70	0	0			
12/16/13	9	0	214	0	0			
12/17/13	10	0						
10 day Av		650						



Upstream of S79/Franklin Conditions: On 12/17/13, chlorides measured 66 mg/L and apparent color was 96 CU.

Upper Estuary Conditions: Water clarity continued to improve. Turbidities have been low in the last month and CDOM levels have dropped. Tape grass is still present at the locations it occurred at the beginning of the wet season.

Lower Estuary Condition: Epiphytic algae were covering sea grass leaves at sites in San Carlos Bay 12/11-12/16/13. Epiphytes included *Laurencia, Polysiphonia, Cladophora* and chain forming diatoms. The water column light attenuation coefficient remains high for seagrasses at depth in the lower Estuary. Moderate to heavy wracks of red, green, and brown drift algae continues to strand along Fort Myers Beach. Dark gray silt was also observed washing onto the Fort Myers Beach at Lynn Hall Park.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR:

The USGS gages at McIntyre Creek were removed from operation December 10, 2013. The SCCF Marine Laboratory will place a RECON station at the same location on 12/18/13.

Wildlife Impacts: Over the past week, CROW, the wildlife rehabilitation hospital on Sanibel, reports 15 new brevetoxicosis cases, including 9 double crested cormorants, 2 common loons, 2 ring-billed gulls, 1 sandwich tern and 1 brown pelican.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
31 Bridge	4.6	163	1.1	0.95
Fort Myers	6.2	135	1.1	1.04
Colonial Br.	6.4	131	1.3	1.04
Tarpon Bay	5.8	51	10.2	1.01

Target light penetration: **CE**- Caloosahatchee Estuary =1 m **SCB**-San Carlos Bay = 2.2 meters Definition of 05% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of any factor of 100% (In a subset of 100%) of 100\% (In a subset of 100\%) of 100\% (In a subset of 100\%)

Definition of 25% lz: **z where l is 25% of surface l. I** = irradiance, **z**= depth

ACOE Daily Reports								
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)				
12/10/13	Tues	1528	1265	1848				
12/11/13	Wed	1096	629	860				
12/12/13	Thurs	772	670	660				
12/13/13	Fri	573	722	1041				
12/14/13	Sat	123	190	578				
12/15/13	Sun	70	0	0				
12/16/13	Mon	214	0	0				
7 Day	Avg	625	496	712				









Turtle grass in Tarpon Bay epiphytized by Laurencia, Cladophora and Polysiphonia (bottom to top) 12/16/13. Photo SCCF



Polysiphonia subtilissima growing on hard surfaces near Old Bridge Road 12/16/13. Photo SCCF



Epiphytic macroalgae on seagrass in San Carlos Bay near the river mouth 12/11/13. Photo SCCF

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

From: Periodic Scientists Conference Call Participants Paul Tritaik & Joyce Palmer - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex James Evans & Holly Milbrandt - 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

Reporting Period: December 17 - 23, 2013

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

Caloosahatchee Condition Summary: Flows over the past 7 days averaged 847 cfs at S-79. The 30-day moving average of surface salinity at Fort Myers is 10 psu and trending upward. Despite projections indicating a low chance of water shortage this year, beneficial make up releases to the Caloosahatchee have been discontinued resulting in salinities trending too high for tape grass recovery and oyster health. Following four months of damaging high flows this past summer, the Caloosahatchee Estuary is being harmed by lack of freshwater flow despite little to no threat of water shortage. This inequity must be addressed through short-term adaptive management and/or policy changes.

USACE Action: On Sunday, 12/8/13 a 10-day pulse was initiated which eliminated "make up release" water and reduced average flows from 730 cfs to 650 cfs, with four days of no flow.

Recommendation: We request that make up releases be utilized to provide the flows necessary to meet ecologically-based salinity targets supportive of tape grass and oysters in the Caloosahatchee Estuary.

Lake Okeechobee Level:	14.29 ft. (Low Sub-Band)		Last w	k: 14.42 ft
Lake Okeechobee Inflow:	316 cfs	Lake Okeechob	ee Outflow:	2,964 cfs
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.0"	Moore	Haven 0.0"
Salinity Fort Myers:	8.1- 12 psu SCCF Ft. Mye	ers Yacht Basin	Previous wk: 8	. 5- 13 psu
MFL Status:	10 psu 30 day moving ave	rage at Fort Mye	rs MFL ta	arget <mark><</mark> 10 psu
	10-16 psu (SCCF RECON N	Marker 52)	Previous wk:	9.4 - 16 psu
Salinity Beautiful Island:	3.0 - 5.7 psu (SCCF RECO	N Marker 18)	Previous wk:	3.5 – <mark>6.1</mark> psu
Salinity Shell Point:	21 – 32 psu (SCCF RECOM	I) F	Previous wk: '	19 – 33 psu

Flow: Flows at S79 over the last 7 days averaged 847 cfs. Salinities continue to rise with the surface salinity at Fort Myers reaching 12 psu and the 30 day moving average reaching 10 psu.

ACOE December 8, 2013 Pulse Release							CCF	Sonde S	Surfac
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	25 20			
12/8/13	1	1300	978	249	433	-			
12/9/13	2	1900	1846	769	1143	NSO 15	-		
12/10/13	3	1300	1528	1265	1848	y (I	30 da	ay harm t	hresho
12/11/13	4	900	1096	629	860		-	my	
12/12/13	5	700	772	670	660	Sa		V	MA
12/13/13	6	400	573	722	1041	5	-		
12/14/13	7	0	123	190	578				
12/15/13	8	0	70	0	0	0		10	
12/16/13	9	0	214	0	0	U	- 10	ov -	- Jec
12/17/13	10	0	132	0	0		23-N	28-N	3-D
10 day Av		650	734	449	656				



Upstream of S79/Franklin Conditions: On 12/23/13, chlorides measured 66 mg/L and apparent color was 77 CU.

Upper Estuary Conditions: Tape grass was still present (12/16/13) at the locations it occurred at the beginning of the wet season.

Lower Estuary Condition: No data collected due to the holidays.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR:

On 12/18/13 the SCCF Marine Laboratory placed a RECON station in McIntyre Creek where the USGS monitor was removed. Data will be available on the RECON website soon.

Wildlife Impacts: Over the past week, CROW, the wildlife rehabilitation hospital on Sanibel, reported 6 new brevetoxicosis cases, including 3 double crested cormorants, 1 common loon, 1 laughing gull and 1 brown pelican.

ACOE Daily Reports								
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)				
12/17/13	Tues	132	0	0				
12/18/13	Wed	986	390	384				
12/19/13	Thurs	1855	1640	1819				
12/20/13	Fri	1722	1145	2007				
12/21/13	Sat	889	622	1022				
12/22/13	Sun	687	476	816				
12/23/13	Mon	463	366	396				
7 Day	Avg	847	662	920				

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, John Kilpatrick, SFWMD Blake Guillory, Ernie Barnett, Dan Delisi, Tommy Strowd, Terrie Bates, Susan Gray, Peter Doering, DEP Herschel Vinyard

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: December 24 - 30, 2013

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

Caloosahatchee Condition Summary: Flows over the past 7 days averaged 681 cfs at S79. The 30-day moving average of surface salinity at the Fort Myers Yacht Basin is **10.1 psu** and trending upward. Despite projections indicating a low chance of water shortage this year, beneficial make up releases to the Caloosahatchee have been withheld resulting in salinities trending too high for tape grass and oyster recovery.

USACE Action: On Sunday, 12/8/13 a series of three 10-day pulses was initiated, which eliminated "make up release" water and reduced average flows from 730 cfs to 650 cfs, with two days of no flow at the end of each 10-day pulse. This series of pulse releases will continue through 1/16/14.

Recommendation: We request that make up releases be utilized to provide flows to support healthy conditions in the Caloosahatchee for tape grass and oyster health.

Lake Okeechobee Level:	14.20 ft. (Low Sub-Band)		Last wk: 14. 29 ft		
Lake Okeechobee Inflow:	296 cfs	Lake	Okeechobee Outflow:	3,677 cfs	
Weekly Rainfall:	WP Franklin 0.14"	Ortona 0.15"	Moore Haven 0.0"		
Salinity Fort Myers:	7.1-14 psu SCCF Ft. Myers Yacht Basin Previous wk: 8.1 - 12				
MFL Status:	10.1 psu 30 day moving ave	erage Fort Myers (SC	CF sonde) MFL target	<u><</u> 10 psu	
	8.6 - 18 psu (SCCF RECON	Marker 52)	Previous wk 10 - 16 psu		
Salinity Beautiful Island:	3.2 - 5.8 psu (SCCF RECON	Marker 18)	Previous wk 3.0 - 5.7 p	osu	
Salinity Shell Point:	20 – 33 psu (SCCF RECON)		Previous wk: 21 – 32	psu	



Flow: Flows at S79 over the last 7 days averaged 681 cfs and over the 10 day pulse averaged 672 cfs. The 30 day moving average at Fort Myers is 10.1 psu.

A)ecembe	r 18, 2013 P	ulse Releas	e	SC	CF Sonde Surface Salinity at Fort Myers Yacht Basir
Date	Day	Pulse	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	20 -	1 day harm threshold
12/18/13	1	1200	986	390	384	Ê	
12/19/13	2	1600	1855	1640	1819	Sc 15	
12/20/13	3	1200	1722	1145	2007	ty (30 day harm threshold
12/21/13	4	800	889	622	1022	<u> </u>	A MANAMANA IN ANALAS ANY
12/22/13	5	600	687	476	816	sa	Walt and the manual
12/23/13	6	400	463	366	396	5	
12/24/13	7	400	123	323	200	5	salinity —
12/25/13	8	300	0	106	102		30D MA
12/26/13	9	0	0	0	0	0 -	
12/27/13	10	0	0	0	148	0.140	hoe goe hoe goe poe shoe goe
10 day Av		650	672	506	689	2	Y Y V V

Upstream of S79/Franklin Conditions: On 12/31/13, chlorides measured 64 mg/L and apparent color was 61 CU.

Upper Estuary Conditions: Near Old Bridge Park, where tape grass was present on 12/16/13, the salinities have been occasionally exceeding 10 psu.

Lower Estuary Condition: Drift macroalgae (dominated by *Acanthophora*) was present in some seagrass beds in Tarpon Bay on 12/30/13. Macroalgae and seagrass blades covered with epiphytic algae were in the surf zone and wrack line along the causeway on 12/31/13. Macroalgae was abundant throughout the seagrass beds of San Carlos Bay and Pine Island Sound near Sanibel. Salinity in the lower estuary has been relatively stable over the past several weeks and is suitable for seagrass but near the upper threshold for oysters.

McIntyre Creek and Tarpon Bay in J.N. "Ding" Darling NWR:

The SCCF Marine Laboratory installed a RECON station at the USGS platform on 12/18/13 and the raw data will be available on the RECON website soon.

Red Tide: FWC reports no red tide, Karenia brevis, in samples from 12/20/13.

Wildlife Impacts: Over the past week, CROW, the wildlife rehabilitation hospital on Sanibel, reported 8 new brevetoxicosis cases, including 3 double-crested cormorants, 1 pelican, 1 loon and 1 royal tern. Toxins accumulated in the food web during the November red tide event could explain the continuing wildlife illnesses.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
31 Bridge	5.9	179	1.1	0.87
Colonial Br.	3.7	101	2.7	1.15
Tarpon Bay	9.8	39	7.2	1.2

Target light penetration: **CE**- Caloosahatchee Estuary =1 m **SCB**-San Carlos Bay = 2.2 meters

Definition of 25% lz: **z** where l is 25% of surface l. I = irradiance, z = depth

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
12/24/13	Tues	123	323	200
12/25/13	Wed	0	106	102
12/26/13	Thurs	0	0	0
12/27/13	Fri	0	0	148
12/28/13	Sat	1020	678	688
12/29/13	Sun	1554	1123	1020
12/30/13	Mon	2076	1272	1260
7 Day	Avg	681	500	488





Light drift algae accumulation at Beach Access #1, Sanibel, 11/25/13. Photo SCCF



Ulva covering rocks at Blind Pass 11/25/13. Photo SCCF

Ulva on seawall at Blind Pass Beach 11/25/13 Photo SCCF





Dead fish on Tarpon Bay Beach, Sanibel on 11/26/13. Photo City of Sanibel

