To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Connie Jarvis – City of Cape Coral 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: January 6 - 12, 2015

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: The Caloosahatchee has been receiving average flows of 1400 – 1500 for the past seven weeks. Average flows of **1,419 cfs** over the past week have dropped average salinity to below **5 psu** at Fort Myers. Salinity is suitable for tape grass in the upper estuary and oysters in the lower estuary.

USACE Action: On 1/9/15 the USACE continued a 7-day pulse release schedule with average flows of 1,500 cfs to the Caloosahatchee at S79 and no releases to the St Lucie.

Recommendation: Due to decreasing salinities throughout the estuary, we recommend flows to the Caloosahatchee not exceed **1,500 cfs.** This is necessary to not exceed established ecological targets for the estuary, including light and TMDL targets. The above-optimal flows will help lower lake levels to reduce the potential for high-volume wet season releases. We request the agencies maximize storage in all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level:	א: 15.03 ft. (Low Sub-Band)		Last week: 15.18 ft.
Lake Okeechobee Inflow:	2,080 cfs		Lake Okeechobee Outflow: 3,437 cfs
Weekly Rainfall:	WP Franklin 0.26"	Ortona 0.0"	Moore Haven 0.53"
Salinity Fort Myers:	3.5 – 11 psu (SCCF R	ECON Marker 52)) Previous wk 6.5 – 12 psu
Salinity Beautiful Island:	0.5 – 1.4 psu (SCCF F	RECON Marker 18	3) Previous wk 0.6 – 1.5 psu
Salinity Shell Point:	15 – 32 psu (SCCF RI	ECON)	Previous wk: 17 – 32 psu



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 1/815 averaged 1,434 cfs and over the past 7 days flows averaged 1,419 cfs with 68% of inflow from Lake O. Over the past 14 days, approximately 36% of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77.

ACOE January 2, 2015 Pulse Release							
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
1/2/2015	1	2000	1500	878	1032		
1/3/2015	2	2400	2025	1529	1430		
1/4/2015	3	2100	2098	1970	1628		
1/5/2015	4	1400	1590	1455	1338		
1/6/2015	5	1200	1198	1000	1176		
1/7/2015	6	900	963	916	1136		
1/8/2015	7	500	663	522	638		
7 day avg		1500	1434	1181	1197		



Upstream of S79/Franklin Conditions: On 1/13/15 at the Olga Water Treatment plant, chlorides measured 54 mg/L, apparent color was 123 CU and turbidity measured 1.06 NTU.

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligohaline zone extends to Fort Myers.

Lower Estuary Condition: The salinity at Iona (16 psu on 01/11/15) and Shell Point (23 psu weekly average), were in the optimal range for oysters.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 29.5 to 32 psu over the last week and CDOM ranged from 17 to 30 qse. Salinity at Tarpon Bay ranged from 29 to 32 psu and CDOM ranged from to 22 to 34 qse. Salinity at both locations was just below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Caloosahatchee	Chlorophyll	CDOM	Turbidity	lity 25% lo		ACOE Daily Reports				
Stations	(µg/Ĺ)	(qse)	(NTU)	(meter	rs)	Date	Day	S79 Flow	S78 Flow	S77 Flow
Terret Malues		CE <70	CE < 18	CE = 1	1 m			(cfs)	(cfs)	(cfs)
larget values	< 11	SCB <11	SCB < 5	SCB = 2.2m		1/6/2015	Tues	1198	1000	1176
Ft. Myers	5.0	181.8	4.0	0.78	8	1/7/2015	Wed	963	916	1136
Colonial Br.	5.5	139	3.0	0.94		1/8/2015	Thur	663	522	638
Causeway	2.6	45	3.5	1.53	3	1/9/2015	Fri	1546	942	844
Target light p	enetration: CE-	Caloosahat	chee Estuary	r=1 m		1/10/2015	Sat	2335	1718	1494
	SCB-San	Carlos Bay =	2.2 meters			1/11/2015	Sun	2166	1928	1928
Definition of 25% Iz: z where I is 25% of surface I.				1/12/2015	Mon	1728	1230	1524		
						7 Day	Avg	1419	1179	1106

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: January 13 - 19, 2015

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: The oligohaline zone extends to Fort Myers. Over the past three weeks flows to the estuary at S79 averaged **1,431 cfs**, maintaining an average salinity of **5 psu** at Fort Myers and suitable salinity conditions for tape grass in the upper estuary and oysters in the lower estuary.

USACE Action: On 1/16/15 the USACE continued a 7-day pulse release maintaining average flows of 1,500 cfs to the Caloosahatchee at S79 and adding average flows of 300 cfs to the St Lucie at S80.

Recommendation: We recommend flows to the Caloosahatchee not exceed **1,500 cfs.** This is necessary to not exceed established ecological targets for the estuary, including light and TMDL targets. These above-optimal flows will help lower lake levels to reduce the potential for high-volume wet season releases. We request the agencies maximize storage in all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level:	14.94 ft. (Low Sub-Band)		Last week: 15.03 ft .		
Lake Okeechobee Inflow:	1,758 cfs		Lake Okeechobee Outflow: 4,229 cfs		
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.0"	Moore Haven 0.22"		
Salinity Fort Myers:	8.0 – 13 psu (SCCF I	RECON Marker 52	2) Previous wk 3.5 – 11 psu		
Salinity Beautiful Island:	0.5 – 2.6 psu (SCCF	RECON Marker 18	8) Previous wk 0.5 – 1.4 psu		
Salinity Shell Point:	11 – 31 psu (SCCF R	RECON)	Previous wk: 15 – 32 psu		



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 1/15/15 averaged **1,525 cfs** and over the past 7 days flows averaged **1,431 cfs.** Over the past 14 days, approximately **31%** of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77.

ACOE January 2, 2015 Pulse Release							
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
1/9/2015	1	2000	1546	942	844		
1/10/2015	2	2400	2335	1718	1494		
1/11/2015	3	2100	2166	1928	1928		
1/12/2015	4	1400	1728	1230	1524		
1/13/2015	5	1200	1282	722	642		
1/14/2015	6	900	1002	615	216		
1/15/2015	7	500	615	399	282		
7 day avg		1500	1525	1079	990		



Upstream of S79/Franklin Conditions: On 1/20/15 at the Olga Water Treatment plant, chlorides measured 66 mg/L, apparent color was 113 CU and turbidity measured 1.15 NTU

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligohaline zone extends to Fort Myers.

Lower Estuary Condition: The salinity at Iona (14 psu on 01/18/15) and Shell Point (23 psu weekly average), were in the optimal range for oysters.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 28 to 30 psu over the last week and CDOM ranged from 22.5 to 27.5 qse. Salinity at Tarpon Bay ranged from 27.5 to 31.5 psu and CDOM ranged from to 22 to 37 qse. Salinity at both locations was just below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Oysters: January sampling by FGCU reported disease prevalence of *Perkinsus marinus* ranged from 40 - 73.33%. Disease intensity ranged from ranged from 0.40 - 1.00. (scale 0 = no infection, 1 = low, 3 = medium, 5 = high) Larval recruitment in the Caloosahatchee ranged from 0.00 - 0.11 spat/shell.

Wildlife Impacts: Although FWRI reported no red tide in samples throughout Florida the past five weeks, CROW, the wildlife rehabilitation clinic on Sanibel, has received and is treating **31 new cases of birds suffering from brevetoxicosis** since 1/6/15; 18 double crested cormorants, 12 black scoters and 1 common loon.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% dept (mete	lo th ers)			
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = SCB =	1 m 2.2m			
Ft. Myers	8.8	198	1.8	0.7	8			
Colonial Br.	5.5	177	2.1	0.84				
Causeway	4.2	59	4.2	1.3	2			
Target light p	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								

ACOE Daily Reports							
Date	Day	S79 Flow	S78 Flow	S77 Flow			
		(cfs)	(cfs)	(cfs)			
1/13/2015	Tues	1282	722	642			
1/14/2015	Wed	1002	615	216			
1/15/2015	Thur	615	399	282			
1/16/2015	Fri	1510	927	956			
1/17/2015	Sat	2081	1498	1608			
1/18/2015	Sun	1999	1424	1450			
1/19/2015	Mon	1530	1088	1129			
7 Day	Avg	1431	953	898			

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: January 20 - 26, 2015

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: The oligonaline zone extends to the Fort Myers Yacht Basin. Over the past week flows to the estuary at S79 averaged 1,465 cfs.

USACE Action: On 1/16/15 and 1/23/15 the USACE continued 7-day pulse releases maintaining average flows of 1,500 cfs to the Caloosahatchee at S79 and average flows of 300 cfs to the St Lucie at S80.

Recommendation: With the need to lower water levels in Lake Okeechobee we recommend flows to the Caloosahatchee not exceed **1,700 cfs** in order to maintain suitable salinities in the mid estuary. These above-optimal flows will help lower lake levels to reduce the potential for high-volume wet season releases but deliver higher nutrient and CDOM loading that limits light for tapegrass recovery. We request the SFWMD use all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level:	14.84 ft. (Low Sub-Band)		Last week: 14.94 ft .		
Lake Okeechobee Inflow:	3,778 cfs	L	ake Okeechobee Outflow:	4,600 cfs	
Weekly Rainfall:	WP Franklin 0.15"	Ortona 0.14"	Moore Haven 0.21"		
Salinity Fort Myers:	6.2 – 12 psu (SCCF R	ECON Marker 52)	Previous wk	8.0 – 13 psu	
Salinity Beautiful Island:	1.4 – 3.2 psu (SCCF F	RECON Marker 18)	Previous wk	0.5 – 2.6 psu	
Salinity Shell Point:	17 – 33 psu (SCCF RE	ECON)	Previous wk:	11 – 31 psu	



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 1/22/15 averaged 1,409 cfs and over the past 7 days flows averaged 1,465 cfs. Over the past 14 days, approximately 26% of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77.

AC	OE Jan	nuary 16, 2	2015 Puls	e Release	ļ	SCCF Sonde Surface Salinity at Fort Myers Yacht Basin
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	20 1 day harm threshold Salinity 30D MA
1/16/2015	1	2000	1510	927	956	D S 15
1/17/2015	2	2400	2081	1498	1608	(ity (
1/18/2015	3	2100	1999	1424	1450	E 10 30 day harm threshold
1/19/2015	4	1400	1530	1088	1129	where the second
1/20/2015	5	1200	1152	953	1272	5 With whith which have and white the
1/21/2015	6	900	951	620	1022	Verte
1/22/2015	7	500	641	382	710	11 th 11 th 11 th 11 th 11 th
7 day avg		1500	1409	984	1163	2212 ONON ONON ONON ONN ONN

Upstream of S79/Franklin Conditions: On 1/27/15 at the Olga Water Treatment plant, chlorides measured 60 mg/L, apparent color was **116 CU** and turbidity measured **1.02 NTU**.

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligohaline zone extends to Fort Myers.

Lower Estuary Condition: The salinity at Iona (16 psu on 01/26/15) and Shell Point (24 psu weekly average), were in the optimal range for oysters.

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 29 to 32 psu over the last week and CDOM ranged from 16 to 30.5 gse. Salinity at Tarpon Bay ranged from 29 to 33.5 psu and CDOM ranged from to 14 to 33 qse. Salinity at both locations was just below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: Although FWRI reported no red tide in samples throughout Florida since early December, CROW, the wildlife rehabilitation clinic on Sanibel continues to receive new brevetoxicosis patients with 4 the past week including 1 gannet, 2 double crested cormorants and a brown pelican.

Manatees: Lee County Park staff report up to 50 manatees congregating the past week at Manatee Park on the Orange River and FPL discharge canal.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% dep (mete	lo oth ers)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2r			
Ft. Myers	5.8	192	5.3	0.72			
Colonial Br.	6.0	162	3.3	0.85			
Causeway	iseway 7.4 40.5 4.5 1		1.4	0			
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

	ACOE Daily Reports							
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)				
1/20/2015	Tues	1152	953	1272				
1/21/2015	Wed	951	620	1022				
1/22/2015	Thur	641	382	710				
1/23/2015	Fri	1414	1146	874				
1/24/2015	Sat	2188	1475	1234				
1/25/2015	Sun	2290	1601	1332				
1/26/2015	Mon	1624	1410	1290				
7 Day	Avg	1465	1083	1105				

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: January 27 - February 2, 2015

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: The oligonaline zone extends to the Fort Myers Yacht Basin where salinities are just below 5 psu. Over the past week flows to the estuary at S79 averaged **1,523 cfs.**

USACE Action: On 1/23/15 and 1/30/15 the USACE continued 7-day pulse releases maintaining average flows of **1,500 cfs** to the Caloosahatchee at S79 and average flows of **300 cfs** to the St Lucie at S80.

Recommendation: With the need to lower water levels in Lake Okeechobee we recommend flows to the Caloosahatchee not exceed **1,700 cfs** in order to maintain suitable salinities in the mid estuary. These above-optimal flows will help lower lake levels to reduce the potential for high-volume wet season releases but deliver higher nutrient and CDOM loading that limits light for tapegrass recovery. We request the SFWMD use all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level:	Evel: 14.66 ft. (Low Sub-Band)		Last week: 14.84 ft.		
Lake Okeechobee Inflow:	3,431 cfs	L	ake Okeechobee Outflow:	4,953 cfs	
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.0"	Moore Haven 0.05"		
Salinity Fort Myers:	4.0 – 12 psu (SCCF F	RECON Marker 52)	Previous wk	6.2 – 12 psu	
Salinity Beautiful Island:	0.5 – 1.9 psu (SCCF	RECON Marker 18)	Previous wk	1.4 – 3.2 psu	
Salinity Shell Point:	16 – 32 psu (SCCF R	ECON)	Previous wk:	17 – 33 psu	



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 1/29/15 averaged 1,507 cfs and over the past 7 days flows averaged 1,523 cfs. Over the past 14 days, approximately 27% of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77 and 9% were delivered to the St Lucie.

AC	OE Jan	uary 23, 2	2015 Puls	e Release	!	SCCF Sonde Surface Salinity at Fort Myers Yacht Basir
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	20 1 day harm threshold Salinity 30D MA
1/23/2015	1	2000	1414	1146	874	2 S 4 15
1/24/2015	2	2400	2188	1475	1234	tt (
1/25/2015	3	2100	2290	1601	1332	G 10 30 day harm threshold
1/26/2015	4	1400	1624	1410	1290	w https://www.
1/27/2015	5	1200	1359	921	1016	5 my man in mound of the calor
1/28/2015	6	900	1025	766	884	- Volue
1/29/2015	7	500	648	754	1241	
7 day avg		1500	1507	1153	2553	0102, 0108, 0113, 0118, 0113, 0113,

Upstream of S79/Franklin Conditions: On 2/3/15 at the Olga Water Treatment plant, chlorides measured 60 mg/L, apparent color was 114 CU and turbidity measured 1.09 NTU.

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligohaline zone extends to Fort Myers.

Lower Estuary Condition: The salinity at Iona (17 psu on 02/01/15) and Shell Point (24 psu weekly average), were within the optimal range for oysters. Sanibel reports light amounts of red drift algae on area beaches and SCCF identified scattered clumps of Agardhiella on the bay side of the causeway on Sunday.

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 30 to 33.5 psu over the last week (ending at 31 psu) and CDOM ranged from 14 to 27 qse (ending at 22 qse). Salinity at Tarpon Bay ranged from 30 to 33.5 psu (ending at 31.5 psu) and CDOM ranged from to 13 to 32 gse (ending at 22 gse). Salinity at both locations was at or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: Although FWRI reported no red tide in samples throughout Florida since early December, CROW, the wildlife rehabilitation clinic on Sanibel, received 5 new brevetoxicosis patients the past week including: 1 brown pelican and 4 double crested cormorants.

Manatees: Lee County Park staff report up to 100 manatees and a mating herd congregating at Manatee Park on the Orange River and FPL discharge canal over the past week.

Ca	loosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% dep (mete	lo th ers)
Та	rget Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = SCB =	1 m 2.2m
Ft. Myers		4.1	195	1.4	0.82	
С	olonial Br.	3.5	153	1.7	0.9	5
(Causeway 2.6 38.1 2.2 1.7					6
	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

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
1/27/2015	Tues	1359	921	1016	
1/28/2015	Wed	1025	766	884	
1/29/2015	Thur	648	754	1241	
1/30/2015	Fri	1837	1471	1835	
1/31/2015	Sat	2432	1824	2078	
2/1/2015	Sun	2063	1741	1963	
2/2/2015	Mon	1299	1105	1281	
7 Day	Avg	1523	1226	1471	

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: February 3 - 9, 2015

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 throughout the watershed and three days of higher flows from S77 have caused salinities to continue trending down to below **4 psu**. Over the past week flows to the estuary at S79 averaged **1,539** cfs. Nicodemus slough DWM project has been pumping water from the lake rim canal to reduce lake inflows since 1/30/15.

USACE Action: On 1/30/15 and 2/6/15 the USACE continued 7-day pulse releases maintaining average flows of **1,500 cfs** to the Caloosahatchee at S79 and average flows of **300 cfs** to the St Lucie at S80.

Recommendation: With the need to lower water levels in Lake Okeechobee we recommend flows to the Caloosahatchee not exceed **1,700 cfs** in order to maintain suitable salinities in the mid estuary. These above-optimal flows will help lower lake levels to reduce the potential for high-volume wet season releases but deliver higher nutrient and CDOM loading that limits light for tapegrass recovery. We request the SFWMD use all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level: 14.74 ft. (Low Sub-Band)		Last week: 14.66 ft.	
Lake Okeechobee Inflow:	3,565 cfs		Lake Okeechobee Outflow: 2,842 cfs
Weekly Rainfall:	WP Franklin 1.51"	Ortona 1.29"	Moore Haven 1.98"
Salinity Fort Myers:	3.0 – 11 psu (SCCF RE	CON Marker 52)) Previous wk 4.0 – 12 psu
Salinity Beautiful Island:	0.4 – 1.4 psu (SCCF RE	ECON Marker 18	3) Previous wk 0.5 – 1.9 psu
Salinity Shell Point:	15 – 32 psu (SCCF REG	CON)	Previous wk: 16 – 32 psu



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 2/5/15 averaged **1,501 cfs** and over the past 7 days flows averaged **1,539 cfs.** Over the past 14 days, approximately **40%** of total Lake Okeechobee outflows were delivered to the northern estuaries; **31%** to the Caloosahatchee at S77 and **9%** to the St Lucie.

ACOE January 30, 2015 Pulse Release					
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
1/30/2015	1	2000	1837	1471	1835
1/31/2015	2	2400	2432	1824	2078
2/1/2015	3	2100	2063	1741	1963
2/2/2015	4	1400	1299	1105	1281
2/3/2015	5	1200	1213	869	860
2/4/2015	6	900	1004	931	1294
2/5/2015	7	500	659	690	628
7 day avg		1500	1501	1233	1420



Upstream of S79/Franklin Conditions: On 2/10/15 at the Olga Water Treatment plant, chlorides measured 60 mg/L, apparent color was 88 CU and turbidity measured 1.65 NTU.

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligohaline zone extends to Fort Myers.

Lower Estuary Condition: The salinity at Iona (16 psu on 02/07/15) and Shell Point (23 psu weekly average), were within the optimal range for oysters. Sanibel reports light amounts of red drift algae at low tide on some beaches.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 29 to 31.5 psu over the last week (ending at 29.5 psu) and CDOM ranged from 20 to 33 qse (ending at 25 qse). Salinity at Tarpon Bay ranged from 28.5 to 33.5 psu (ending at 30 psu) and CDOM ranged from to 13 to 44 qse (ending at 27 qse). Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: Although FWRI reported no red tide in samples throughout Florida since early December, CROW, the wildlife rehabilitation clinic on Sanibel, received **7 new brevetoxicosis patients the past week** including: 4 double crested cormorants, 2 brown pelicans and 1 royal tern.

Manatees: Lee County Park staff reported up to **80 manatees** congregating at Manatee Park on the Orange River and FPL discharge canal over the past week.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% dep (mete	lo th ers)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = SCB =	1 m 2.2m
Ft. Myers	6.1	168	3.7	0.8	2
Colonial Br.	4.9	135	2.3	0.9	9
Causeway	3.9	62	5.1	1.2	4
Target light penetration: CE - Caloosahatchee Estuary =1 m					
SCB -San Carlos Bay = 2.2 meters					
Definition of 25% <i>Iz:</i> z where I is 25% of surface I. I = irradiance, z = depth					

ACOE Daily Reports					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
2/3/2015	Tues	1213	869	860	
2/4/2015	Wed	1004	931	1294	
2/5/2015	Thur	659	690	628	
2/6/2015	Fri	1982	1483	996	
2/7/2015	Sat	2380	1938	1586	
2/8/2015	Sun	2100	1723	1680	
2/9/2015	Mon	1433	1270	1152	
7 Day	Avg	1539	1272	1171	

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Connie Jarvis – City of Cape Coral 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 10 - 16, 2015

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: No rain the past week in the watershed however, increased Lake O discharges continue to reduce salinity at Fort Myers Yacht Basin to **below 3 psu**. Over the past week flows to the estuary at S79 averaged **1,477 cfs.** According to the SFWMD approximately 2,000 acre feet of water was pumped from Lake O onto Nicodemus Slough during the first week of February and just under 4,000 acre feet was pumped in January.

USACE Action: On 2/13/15 the USACE increased the 7-day pulse releases from Lake Okeechobee to average flows of **1,700 cfs** to the Caloosahatchee at S79 and **500 cfs** to the St Lucie at S80.

Recommendation: With the need to lower water levels in Lake Okeechobee we recommend flows to the Caloosahatchee not exceed **1,700 cfs** in order to maintain suitable salinities in the mid estuary. These above-optimal flows will help lower lake levels to reduce the potential for high-volume wet season releases but deliver higher nutrient and CDOM loading that limits light for tapegrass recovery. We request the SFWMD use all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level:	14.77 ft. (Low Sub-Band)		Last week: 14.74 ft.		
Lake Okeechobee Inflow:	6,320 cfs	Lake Oke	echobee Outflow: 4,404 cfs		
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.0"	Moore Haven 0.0"		
Salinity Fort Myers:	6.3 – 10.3 psu (SCCF REC	ON Marker 52)	Previous wk 3.0 – 11 psu		
Salinity Beautiful Island:	0.4 – 0.9 psu (SCCF RECC	N Marker 18)	Previous wk 0.4 – 1.4 psu		
Salinity Shell Point:	15 – 31 psu (SCCF RECOM	۷)	Previous wk: 15 – 32 psu		



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 2/12/15 averaged **1,523 cfs** and over the past 7 days flows averaged **1,477 cfs.** Over the past 14 days, approximately **46%** of total Lake Okeechobee outflows were delivered to the northern estuaries; **33%** to the Caloosahatchee at S77 and **13%** to the St Lucie.

ACOE January 30, 2015 Pulse Release					
		Pulse	S79	S78	S77
Date	Day	Target	Flow	Flow	Flow
			(cfs)	(cfs)	(cfs)
2/6/2015	1	2000	1982	1483	996
2/7/2015	2	2400	2380	1938	1586
2/8/2015	3	2100	2100	1723	1680
2/9/2015	4	1400	1433	1270	1152
2/10/2015	5	1200	1203	854	572
2/11/2015	6	900	977	774	408
2/12/2015	7	500	590	757	548
7 day avg		1500	1523	1257	991
2/13/2015	1	2200	1579	1365	1548
2/14/2015	2	2600	2301	1739	1888
2/15/2015	3	2300	2156	1639	1696
2/16/2015	4	1600	1534	1116	1140
2/17/2015	5	1400			
2/18/2015	6	1100			
2/19/2015	7	700			
7 day avg		1700			



Upstream of S79/Franklin Conditions: On 2/17/15 at the Olga Water Treatment plant, chlorides measured 60 mg/L, apparent color was 98 CU and turbidity measured 1.54 NTU.

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligonaline zone extends to Fort Myers.

Lower Estuary Condition: The salinity at Iona (16 psu on 02/16/15) and Shell Point (24 psu weekly average), were within the optimal range for oysters.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 29.5 to 33.5 psu over the last week and CDOM ranged from 11 to 27 qse. Salinity at Tarpon Bay ranged from 29.5 to 34 psu and CDOM ranged from to 10 to 30 qse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: Although FWRI reports no red tide in samples throughout Florida since early December, CROW, the wildlife rehabilitation clinic on Sanibel, continues to receive wildlife affected by brevetoxicosis including 3 new patients the past week: 1 brown pelican, 1 white pelican and 1 anninga.

Manatees: Lee County Park staff reported up to **165 manatees** congregating at Manatee Park on the Orange River and FPL discharge canal over the past week.

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	9.2	166	2.1	0.86	
lona	4.3	107	3.4	1.07	
Causeway 2.7		64.5	3.1	1.39	
Target light penetration: CE- Caloosahatchee Estuary =1 mSCB-San Carlos Bay = 2.2 meters					

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

ACOE Daily Reports					
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
2/10/2015	Tues	1203	854	572	
2/11/2015	Wed	977	774	408	
2/12/2015	Thur	590	757	548	
2/13/2015	Fri	1579	1365	1548	
2/14/2015	Sat	2301	1739	1888	
2/15/2015	Sun	2156	1639	1696	
2/16/2015	Mon	1534	1116	1140	
7 Day	Avg	1477	1177	1114	

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: February 17 - 23, 2015

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 Lake Okeechobee discharges continue to reduce salinity at the Fort Myers Yacht Basin averaging **3 psu the past week**. Flows to the estuary at S79 over the past week averaged **1,828 cfs.**

USACE Action: On 2/13/15 the USACE increased the 7-day pulse releases from Lake Okeechobee to average flows of 1,700 cfs to the Caloosahatchee at S79 and 500 cfs to the St Lucie at S80. Beginning on 2/20/15 the 7 day pulse decision eliminated flow to the St Lucie at S80 and held flows to the Caloosahatchee at 1,700 cfs at S79.

Recommendation: With the need to lower water levels in Lake Okeechobee we recommend flows to the Caloosahatchee not exceed **1,700 cfs** in order to maintain suitable salinities in the mid estuary. These above-optimal flows will help lower lake levels to reduce the potential for high-volume wet season releases but deliver higher nutrient and CDOM loading that limits light for tapegrass recovery. We request the SFWMD use all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level:	14.68 ft. (Low Sub-Band)		Last week: 14.77 ft.		
Lake Okeechobee Inflow:	4,213 cfs	Lake Okee	chobee Outflow: 4,161 cfs		
Weekly Rainfall:	WP Franklin 0.01"	Ortona 0.08"	Moore Haven 0.02"		
Salinity Fort Myers:	2.5 – 9.5 psu (SCCF RECON	Narker 52)	Previous wk 6.3 – 10.3 psu		
Salinity Beautiful Island:	0.2- 1.1 psu (SCCF RECON	Marker 18)	Previous wk 0.4 – 0.9 psu		
Salinity Shell Point:	15 – 32 psu (SCCF RECON)		Previous wk: 15 – 31 psu		



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Caloosahatchee Estuary

Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 2/19/15 averaged 1,671 cfs and over the past 7 days flows averaged 1,828 cfs. The past week 71% of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately 45% of total Lake Okeechobee outflows were delivered to the west and east; 34% to the Caloosahatchee at S77 and 11% to the St Lucie at S308.

ACC	DE Feb	ruary 13, 2	2015 Puls	e Release	;	25 SCCF Sonde Surface Salinity at Fort Myers Yacht Basin
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	20 <u>1 day harm threshold</u> Salinity 30D MA
2/13/2015	1	2200	1579	1365	1548	<u>ä</u> 15
2/14/2015	2	2600	2301	1739	1888	
2/15/2015	3	2300	2156	1639	1696	S 10
2/16/2015	4	1600	1534	1116	1140	5 Jun 1 Ma ala 1 m
2/17/2015	5	1400	1136	992	1060	and the manual was
2/18/2015	6	1100	1795	1401	1756	0
2/19/2015	7	700	1200	1395	2140	12412 (12912 20312 00812 212312 212912
7 day avg		1700	1671	1378	1604	0x 0x 0r 0r 0r 0r

Upstream of S79/Franklin Conditions: On 2/24/15 at the Olga Water Treatment plant, chlorides measured 63 mg/L, apparent color was 60 CU and turbidity measured 1.12 NTU.

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligohaline zone extends west of downtown Fort Myers. A dinoflagellate bloom contributed to elevated chlorophyll level (13 μ g/L) at the Colonial Bridge.

Lower Estuary Condition: The salinity at Iona (15 psu on 02/23/15) and Shell Point (24 psu weekly average), were within the optimal range for oysters.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 32 to 34 psu over the last week and CDOM ranged from 11 to 26 qse. Salinity at Tarpon Bay ranged from 32 to 34 psu and CDOM ranged from to 10 to 27 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: FWRI reports no red tide in samples throughout Florida since early December, however, CROW, the wildlife rehab clinic on Sanibel, continues to receive wildlife affected by brevetoxicosis including 3 new patients the past week: 1 brown pelican, 1 northern gannet, and 1 cormorant.

Manatees: Lee County Park staff reported up to **150 manatees** congregating at Manatee Park on the Orange River and FPL discharge canal over the past week. An aerial survey to count manatees at power plants was conducted on Sunday, February 15, 2015.

Counts reveal highest number at the FPL plant on the Orange River/ Caloosahatchee with 523 individuals, Cape Canaveral, 473 individuals and Riviera with 105 individuals. Survey counts are generally considered minimal estimates.

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	10.5	173	5.4	0.74			
Colonial Br	13.2	134	3.7	0.89			
Causeway	2.9	41.5	2.9	1.59			
Terret light and testing OF Only and hat the Fathering Arm							

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



ACOE Daily Reports						
Date	Day	S79 Flow	S78 Flow	S77 Flow		
		(cfs)	(cfs)	(cfs)		
2/17/2015	Tues	1136	992	1060		
2/18/2015	Wed	1795	1401	1756		
2/19/2015	Thur	1200	1395	2140		
2/20/2015	Fri	1942	1607	2253		
2/21/2015	Sat	2625	1290	1967		
2/22/2015	Sun	2314	1607	1792		
2/23/2015	Mon	1783	1523	1610		
7 Day	Avg	1828	1402	1797		



Recent University of South Florida satellite image showing dark plume of water emerging from the Caloosahatchee moving south toward Fort Myers Beach

http://cyclops.marine.usf.edu/modis/level3/husf/tampabay/2015/050/250m/pass/final/MODIS.2015050.162419.ta mpabay.rgb.png



Photo of Nicodemus Slough water storage on 2/11/15. Photos by James Evans

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: February 24 - March 2, 2015

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 Lake Okeechobee discharges continue to reduce salinity at the Fort Myers Yacht Basin to an average of 2.5 psu for the past week. Flows to the estuary at S79 the past week averaged 1,867 cfs.

USACE Action: On 2/27/15 the USACE increased the 7-day pulse releases from Lake Okeechobee to average flows of **2,000 cfs** to the Caloosahatchee at S79 and **730 cfs** to the St Lucie at S80.

Recommendation: We request the SFWMD and USACE engage all emergency and dispersed storage projects and find additional outlets for excess water other than the estuaries.

Lake Okeechobee Level:	14.70 ft. (Low Sub-Ba	nd)	Last week: 14.68 ft .		
Lake Okeechobee Inflow:	5,848 cfs		Lake Okeechobee Outflow: 2,847 cfs		
Weekly Rainfall:	WP Franklin 1.10"	Ortona 0.08"	Moore Haven 0.06"		
Salinity Fort Myers:	3.9 - 11 psu (SCCF R	ECON Marker 52)	Previous wk 2.5 - 9.5 psu		
Salinity Beautiful Island:	0.2 - 0.5 psu (SCCF R	ECON Marker 18) Previous wk 0.2 - 1.1 psu		
Salinity Shell Point:	14 – 32 psu (SCCF R	ECON)	Previous wk: 15 – 32 psu		



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Caloosahatchee Estuary

Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 2/26/15 averaged **1,720 cfs** and over the past 7 days flows averaged **1,867 cfs**. The past week **70%** of Caloosahatchee flows were from Lake Okeechobee. Over the past 14 days, approximately **46%** of total Lake Okeechobee outflows were delivered to the west and east; **39%** to the Caloosahatchee at S77 and **7%** to the St Lucie at S308.

ACO	DE Feb	ruary 20, ź	2015 Puls	e Release	•	SCCF Sonde Surface Salinity at Fort Myers Yacht Basin
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	20 1 day harm threshold Salinity 30D MA
2/20/2015	1	2200	1942	1607	2253	
2/21/2015	2	2600	2625	1290	1967	30 day harm threshold
2/22/2015	3	2300	2314	1607	1792	ů lo
2/23/2015	4	1600	1783	1523	1610	5 Ma Ala Angela Martin
2/24/2015	5	1400	1346	1492	1642	a she was a way was a second
2/25/2015	6	1100	1200	1159	1398	
2/26/2015	7	700	836	694	706	181112 2105112 2110112 2115112 2120112 2125112
7 day avg		1700	1720	1338	1624	or or or or or or

Upstream of S79/Franklin Conditions: On 3/3/15 at the Olga Water Treatment plant, chlorides measured **58 mg/L**, apparent color was **89 CU** and turbidity measured **2.03 NTU**. The plant is on line at 1600 GPM

Upper Estuary Conditions: Surface salinities at the Fort Myers Yacht Basin are in the suitable range for tape grass. The oligohaline zone extends west of downtown Fort Myers. Drift red algae continued washing ashore along the north bank.

Lower Estuary Condition: The salinity was below optimal at Iona (13 psu on 03/02/15) and optimal at Shell Point (22 psu weekly average). High nutrient loading has fed algae that is washing up along beaches at the mouth of the Caloosahatchee.

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 29 to 33 psu over the last week and CDOM ranged from 12 to 25 qse. Salinity at Tarpon Bay ranged from 29 to 34 psu and CDOM ranged from to 10 to 30 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Oysters: February sampling by FGCU reported disease prevalence of *Perkinsus marinus* ranged from 73.33 - 80%. Disease intensity ranged from 0.73 - 0.80 (scale 0 = no infection, 1 = low, 3 = medium, 5 = high). Larval recruitment ranged from 0.0 - 0.64 spat per shell. Large oysters were present in the intertidal area at Iona on 3/02/15.

Wildlife Impacts: CROW, the wildlife rehab clinic on Sanibel, received **3 new patients affected by brevetoxicosis** the past week including: 2 double crested cormorants and 1 brown pelican.

Manatees: Lee County Park staff reported up to **35 manatees** congregating at Manatee Park on the Orange River and FPL discharge canal over the past week.

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	3.7	159	2.1	0.91
Colonial Br	5.4	130	2.4	1.01
Causeway	3.7	75.3	2.7	1.32



Attached green algae and drift red algae along the bank at the mouth of the Caloosahatchee 3/3/15. Photo SCCF

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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ACOE Daily Reports							
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)			
2/24/2015	Tues	1346	1492	1642			
2/25/2015	Wed	1200	1159	1398			
2/26/2015	Thur	836	694	706			
2/27/2015	Fri	2173	1747	1594			
2/28/2015	Sat	2616	2380	2248			
3/1/2015	Sun	2496	1966	1924			
3/2/2015	Mon	2408	1814	2064			
7 Day	Avg	1867	1607	1653			



Manatees with young congregating in the Orange River by Manatee Park, March 2015



Decomposing red drift algae, Polysiphonia spp. along the north shore of the Caloosahatchee near Old Bridge Park, upstream of downtown Fort Myers on 3/01/15. Photo SCCF



Benthic algae mats of *Enteromorpha* and *Cladophora* in the Refuge impoundment 02/25/15. Photo SCCF

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: March 3 - 9, 2015

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 Lake Okeechobee discharges continue to reduce salinity at the Fort Myers Yacht Basin averaging **3.5 psu the past week**. Flows to the estuary at S79 over the past week averaged **2,332 cfs.**

USACE Action: On 3/6/15 the USACE increased the 7-day pulse releases from Lake Okeechobee to average flows of **2,500 cfs** to the Caloosahatchee at S79 and **950 cfs** to the St Lucie at S80.

Recommendation: We request the SFWMD and USACE use all emergency and dispersed storage projects and find other outlets for excess water.

Lake Okeechobee Level:	14.68 ft. (Low Sub-Ba	and)	Last week: 14.70 ft .		
Lake Okeechobee Inflow:	6,700 cfs	L	_ake Okeechobee Outflow:	5,963 cfs	
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.01"	Moore Haven 0.18"		
Salinity Beautiful Island:	0.3 - 1.1 psu (SCCF I	RECON Marker 18)	Previous wk 0.2 - 0.5	psu	
Salinity Fort Myers:	1.9 - 10 psu (SCCF F	ECON Marker 52)	Previous wk 3.9 - 11 p	osu	
Salinity Shell Point:	14 - 31 psu (SCCF R	ECON)	Previous wk: 14 – 32 p	su	



Caloosahatchee Estuary

Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 3/5/15 averaged **1,977 cfs** and over the past 7 days flows averaged **2,332 cfs**. The past week **72%** of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately **59%** of total Lake Okeechobee outflows were delivered to the west and east; **44%** to the Caloosahatchee at S77 and **15%** to the St Lucie at S308.

ACOE February 20, 2015 Pulse Release						
Date	Dav	Pulse Target	S79 Flow	S78 Flow	S77 Flow	
	5	J	(cfs)	(cfs)	(cfs)	
2/27/2015	1	2200	2173	1747	1594	
2/28/2015	2	2600	2616	2380	2248	
3/1/2015	3	2300	2496	1966	1924	
3/2/2015	4	1600	2408	1814	2064	
3/3/2015	5	1400	1780	1334	1976	
3/4/2015	6	1100	1360	1105	1420	
3/5/2015	7	700	1008	807	1510	
7 day avg		1700	1977	1593	1819	

ACOE March 6, 2015 Pulse Release							
3/6/2015		3000	2425	1863	1670		
3/7/2015		3800	3773	2822	2584		
3/8/2015		3300	3398	3214	2749		
3/9/2015		2400	2580	2417	2410		
3/10/2015		2200					
3/11/2015		1800					
3/12/2015		1000					
7 Day		2500					



Upstream of S79/Franklin Conditions: On 3/10/15 at the Olga Water Treatment plant, chlorides measured 58 mg/L, apparent color was 109 CU and turbidity measured 3.11 NTU. The plant is on line at 1600 GPM

Upper Estuary Conditions: Surface salinities down to the Colonial Bridge are in the suitable range for tape grass. The oligohaline zone extends west of downtown Fort Myers.

Lower Estuary Condition: The salinity was below optimal for oysters at lona (11 psu on 03/08/15), where large, live oysters are present, and optimal at Shell Point (24 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 29 to 31.5 psu over the last week and CDOM ranged from 14 to 37 qse. Salinity at Tarpon Bay ranged from 29 to 33 psu and CDOM ranged from to 11 to 28 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Extensive mats of *Enteromorpha* and *Cladophora* algae have persisted within the refuge since 2/24/15.

Wildlife Impacts: Although FWC sampling reported no Red Tide throughout Florida on 3/6/15, CROW, the wildlife rehab clinic on Sanibel, received **1 new patient affected by brevetoxicosis** the past week: 1 double crested cormorant.

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	4.4	168	2.2	0.88
Colonial Br	4.5	131	2.5	1.00
Causeway	3.2	41.6	2.2	1.70

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

ACOE Daily Reports								
Date	Date Day S79 Flow S78 Flow S77 Flow							
		(cfs)	(cfs)	(cfs)				
3/3/2015	Tues	1780	1334	1976				
3/4/2015	Wed	1360	1105	1420				
3/5/2015	Thur	1008	807	1510				
3/6/2015	Fri	2425	1863	1670				
3/7/2015	Sat	3773	2822	2584				
3/8/2015	Sun	3398	3214	2753				
3/9/2015	Mon	2580	2417	2400				
7 Day	Avg	2332	1937	2044				

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Connie Jarvis – City of Cape Coral 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 10 - 16, 2015

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 Lake Okeechobee discharges have extended the oligohaline zone further downstream to near the Midpoint Bridge. Flows to the estuary at S79 over the past week averaged **2,546 cfs.**

USACE Action: On 3/13/15 the USACE maintained the 7-day pulse releases from Lake Okeechobee to average flows of **2,500 cfs** to the Caloosahatchee at S79 and **950 cfs** to the St Lucie at S80.

Recommendation: We support continuing with the current pulse release of 2,500 cfs at S-79 in light of current lake levels, but with spawning season underway for a number of our economically important fish species we do not support flows exceeding a 30-day moving average of 2,800 cfs. We request that additional water be held north in the Kissimmee Basin to reduce impacts to the estuaries during spawning period from mid-march through May.

Lake Okeechobee Level:	14.53 ft. (Low Sub-Ba	ind)	Last week: 14.68 ft .		
Lake Okeechobee Inflow:	2,390 cfs		Lake Okeechobee Outflow: 6	5,205 cfs	
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.14"	Moore Haven 0.02"		
Salinity Beautiful Island:	0.2 - 0.3 psu (SCCF F	RECON Marker 18)	Previous wk 0.3 - 1.1 p	su	
Salinity Fort Myers:	1.9 - 9.3 psu (SCCF F	RECON Marker 52)	Previous wk 1.9 - 10 ps	su	
Salinity Shell Point:	16 - 32 psu (SCCF RI	ECON)	Previous wk: 14 - 31 ps	u	



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 3/12/15 averaged 2,527 cfs and over the past 7 days flows averaged 2,546 cfs. The past week 73% of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately 58% of total Lake Okeechobee outflows were delivered to the west and east coasts; 41% to the Caloosahatchee at S77 and 17% to the St Lucie at S308.

ACOE March 6, 2015 Pulse Release						
	Pulse S79 S78					
Date	Day	Target	Flow	Flow	Flow	
		_	(cfs)	(cfs)	(cfs)	
3/6/2015	1	3000	2425	1863	1670	
3/7/2015	2	3800	3773	2822	2584	
3/8/2015	3	3300	3398	3214	2753	
3/9/2015	4	2400	2580	2417	2400	
3/10/2015	5	2200	2240	1800	2276	
3/11/2015	6	1800	1955	1692	2047	
3/12/2015	7	1000	1319	1204	1688	
7 day avg		2500	2527	2144	2202	

Caloosahatchee Estuary

ACOE March 13, 2015 Pulse Release					
3/13/2015	1	3000	2484	1741	1908
3/14/2015	2	3800	3371	2466	2604
3/15/2015	3	3300	3660	2830	2938
3/16/2015	4	2400	2796	2368	2702
3/17/2015	5	2200			
3/18/2015	6	1800			
3/19/2015	7	1000			
7 Day		2500			



Salinity at Fort Myers RECON approaches wet season levels

Upstream of S79/Franklin Conditions: On 3/17/15 at the Olga Water Treatment plant, chlorides measured **62 mg/L**, apparent color was **60 CU** and turbidity measured **2.35 NTU.** The plant is on line at 1600 GPM.

Upper Estuary Conditions: Surface salinities down to the Colonial Bridge are in the suitable range for tape grass but are in the lethal range for oysters. On 3/14/15 the oligohaline zone extended to the Colonial

(Midpoint) Bridge. Chlorophyll and phycoerythrin were elevated at Fort Myers.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (11 psu on 03/15/15), where large, live oysters are present, and in the optimal range at Shell Point (24 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 29 to 33.5 psu over the last week and CDOM ranged from 7 to 24 qse. Salinity at Tarpon Bay ranged from 29 to 34.5 psu and CDOM ranged from to 7 to 24 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Extensive mats of *Enteromorpha* and *Cladophora* algae have persisted within the refuge since before 2/24/15.

Wildlife Impacts: Although FWC sampling reported no Red Tide throughout Florida on 3/13/15, CROW, the wildlife rehab clinic on Sanibel, received **7 new patients affected by brevetoxicosis** the past week: 5 double crested cormorants and 2 brown pelicans.

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	15.2	152	3.6	0.83
Colonial Br	2.7	131	2.9	1.00
Causeway	1.9	53	2.7	1.54

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

ACOE Daily Reports							
Date	Day S79 Flow S78 Flow S77 Flow						
		(cfs)	(cfs)	(cfs)			
3/10/2015	Tues	2240	1800	2276			
3/11/2015	Wed	1955	1692	2047			
3/12/2015	Thur	1319	1204	1688			
3/13/2015	Fri	2484	1741	1908			
3/14/2015	Sat	3371	2466	2604			
3/15/2015	Sun	3660	2830	2938			
3/16/2015	Mon	2796	2368	2702			
7 Day	Avg	2546	2014	2309			

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Connie Jarvis – City of Cape Coral 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 17 - 23, 2015

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 Lake Okeechobee discharges have extended the oligohaline zone further downstream past the Midpoint Bridge. Flows to the estuary at S79 over the past week averaged **2,421 cfs.**

USACE Action: On 3/20/15 the USACE maintained the 7-day pulse releases from Lake Okeechobee to average flows of **2,500 cfs** to the Caloosahatchee at S79 and reduced flows to 730 **cfs** to the St Lucie at S80.

Recommendation: We support continuing with the current pulse release of 2,500 cfs at S-79 in light of current lake levels, but with spawning season underway for a number of our economically important fish species we do not support flows exceeding a 30-day moving average of 2,800 cfs. We request that additional water be held north in the Kissimmee Basin to reduce impacts to the estuaries during spawning period from mid-march through May.

Lake Okeechobee Level:	14.27 ft. (Low Sub-Ba	ind)	Last week: 14.53 ft .		
Lake Okeechobee Inflow:	1,595 cfs		Lake Okeechobee Outflow: 6,065 cfs		
Weekly Rainfall:	WP Franklin 0.71"	Ortona 0.11"	Moore Haven 0.04"		
Salinity Beautiful Island:	0.2 – 0.3 psu (SCCF I	RECON Marker 18) Previous wk 0.2 - 0.3 psu		
Salinity Fort Myers:	0.9 – 9.3 psu (SCCF I	RECON Marker 52) Previous wk 1.9 - 9.3 psu		
Salinity Shell Point:	16 – 32 psu (SCCF R	ECON)	Previous wk: 16 - 32 psu		



Flow & Water Quality: Flows into the Caloosahatchee Estuary at S79 during the pulse release ending on 3/19/15 averaged **2,458 cfs** and over the past 7 days flows averaged **2,421 cfs**. The past week **79%** of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately **52%** of total Lake Okeechobee outflows were delivered to the west and east coasts; **38%** to the Caloosahatchee at S77 and **14%** to the St Lucie at S308.

ACOE March 13, 2015 Pulse Release					
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
3/13/2015	1	3000	2484	1741	1908
3/14/2015	2	3800	3371	2466	2604
3/15/2015	3	3300	3660	2830	2938
3/16/2015	4	2400	2796	2368	2702
3/17/2015	5	2200	2154	1683	2340
3/18/2015	6	1800	1720	1573	2132
3/19/2015	7	1000	1023	1098	1556
7 day avg		2500	2458	1965	2311

ACOE March 20, 2015 Pulse Release						
3/20/2015	1	3000	2288	1899	2090	
3/21/2015	2	3800	3408	2969	3056	
3/22/2015	3	3300	3249	3081	2842	
3/23/2015	4	2400	3110	2090	2408	
3/24/2015	5	2200				
3/25/2015	6	1800				
3/26/2015	7	1000				
7 Day		2500				



Upstream of S79/Franklin Conditions: On 3/24/15 at the Olga Water Treatment plant, chlorides measured **62 mg/L**, apparent color was **118 CU** and turbidity measured **3.44 NTU.** The plant is on line at 1600 GPM.

Upper Estuary Conditions: On 3/22/15 the oligohaline zone extended downstream of the Colonial (Midpoint) Bridge. Surface salinities down to the Colonial Bridge are in the suitable range for tape grass but are **in the lethal range for oysters.**

Lower Estuary Condition: The salinity was below the optimal range for oysters at lona (10 psu weekly average on 3/22/15, where large, live oysters are present, and was in the optimal range at Shell Point (24 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 31 to 33 psu over the last week and CDOM ranged from 13 to 21 qse. Salinity at Tarpon Bay ranged from 30 to 34 psu and CDOM ranged from to 9 to 22 qse. Salinity at both locations was in the low end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Extensive mats of *Enteromorpha* and *Cladophora* algae persist within the refuge since before 2/24/15.

Wildlife Impacts: CROW, the wildlife rehab clinic on Sanibel, received **7 new patients affected by brevetoxicosis** the past week: 5 double crested cormorants, 1 brown pelican and. 1 laughing gull. FWC reports red tide in background concentrations the past week alongshore Charlotte County.

Oysters: March sampling by FGCU reported disease prevalence of *Perkinsus marinus* ranged from **38.46 - 66.66%**. Disease intensity ranged from **0.38 - 0.67** (scale 0 = no infection, 1 = low, 3 = medium, 5 = high). Larval recruitment ranged from **0.00-0.03 spat per shell**.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m		
Colonial Br	2.6	154	1.8	0.96		
lona	7.4	127	1.6	1.03		
Causeway	Causeway 4.9 27 4.0 1.63					
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters						

25% lz:	where z is 25% of surface I .	I = irradiance, z = depth
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ACOE Daily Reports								
Date	DateDayS79 FlowS78 FlowS77 Flow							
		(cfs)	(cfs)	(cfs)				
3/17/2015	Tues	2154	1683	2340				
3/18/2015	Wed	1720	1573	2132				
3/19/2015	Thur	1023	1098	1556				
3/20/2015	Fri	2288	1899	2090				
3/21/2015	Sat	3408	2969	3056				
3/22/2015	Sun	3249	3081	2842				
3/23/2015	Mon	3110	2090	2408				
7 Day	Avg	2421	2056	2346				

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: March 24 - 30, 2015

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: Unseasonably high Lake Okeechobee discharges and basin runoff have reduced salinity at the SCCF Fort Myers RECON to zero psu and pushed the freshwater zone further downstream past the Midpoint Bridge. Salinity is below the optimal range for oysters in Iona. Flows to the estuary at S79 over the past week averaged **2,546 cfs.**

USACE Action: On 3/27/15 the USACE maintained the 7-day pulse releases from Lake Okeechobee to average flows of **2,500 cfs** to the Caloosahatchee at S79 and reduced flows to **500 cfs** to the St Lucie at S80.

Recommendation: We recommend reducing the current pulse releases from 2,500 to 2,000 cfs at S-79 to improve salinity conditions within the estuary. These reduced flows will help improve conditions for oysters, seagrass and spawning fish and shellfish, with peak spawning occurring from mid-march through May. We encourage water managers to hold water north of the Lake and send water south where possible to minimize impacts to the estuaries.

Lake Okeechobee Level:	14.04 ft. (Low Sub-Band)		Last week: 14.27 ft.
Lake Okeechobee Inflow:	1,461 cfs		Lake Okeechobee Outflow: 4,485 cfs
Weekly Rainfall:	WP Franklin 0.81"	Ortona 1.22"	Moore Haven 0.70"
Salinity Beautiful Island:	0.2 - 0.2 psu (SCCF R	ECON Marker 18	3) Previous wk 0.2 - 0.3 psu
Salinity Fort Myers:	0.3 – 5.7 psu (SCCF F	RECON Marker 5	2) Previous wk 0.9 – 9.3 psu
Salinity Shell Point:	8 – 32 psu (SCCF RE	CON)	Previous wk: 16 - 32 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 3/26/15 averaged **2,546 cfs** and over the past 7 days flows averaged **2,615 cfs**. The past week **64%** of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately **57%** of total Lake Okeechobee outflows were delivered to the west and east coasts; **43%** to the Caloosahatchee at S77 and **14%** to the St Lucie at S308.

ACOE March 13, 2015 Pulse Release					
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
3/20/2015	1	3000	2288	1899	2090
3/21/2015	2	3800	3408	2969	3056
3/22/2015	3	3300	3249	3081	2842
3/23/2015	4	2400	3110	2090	2408
3/24/2015	5	2200	2514	1727	2252
3/25/2015	6	1800	2036	1427	1864
3/26/2015	7	1000	1221	877	1368
7 day avg		2500	2546	2010	2268

ACOE March 20, 2015 Pulse Release						
3/27/2015	1	3000	2437	1937	1828	
3/28/2015	2	3800	3924	2625	2656	
3/29/2015	3	3300	3571	2954	2785	
3/30/2015	4	2400	2606	2030	2336	
3/31/2015	5	2200				
4/1/2015	6	1800				
4/2/2015	7	1000				
7 Day		2500				



Upstream of S79/Franklin Conditions: On 3/24/15 at the Olga Water Treatment plant, chlorides measured **66 mg/L**, apparent color was **118 CU** and turbidity measured **3.96 NTU.** The plant is on line at 1600 GPM.

Upper Estuary Conditions: On 3/29/15 the oligohaline zone extended well downstream of the Midpoint Bridge where the salinity was 0.9 psu. Oligohaline salinities are in the suitable range for tape grass but are **in the lethal range for oysters upstream**.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (11 psu weekly average on 3/29/15), where large, live oysters are present, and was in the optimal range at Shell Point (**20 psu** weekly average). Chlorophyll was elevated at the causeway with flagellates dominant. Diatom bloom patches were present in the Gulf from Fort Myers Beach to Bonita Beach.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 29.5 to 32 psu over the last week and CDOM ranged from 13 to 25 qse. Salinity at Tarpon Bay ranged from 26.5 to 33.5 psu and CDOM ranged from to 9 to 31 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Extensive mats of *Enteromorpha* and *Cladophora* algae have persisted within the refuge since before 2/24/15.

Red Tide: On 3/27/15 FWC reported *Karenia brevis*, the Florida red tide organism, in background concentrations in one sample collected alongshore of Charlotte County. **No red tide has been reported in Lee County waters.**

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m		
Colonial Br	6.4	154	4.1	0.86		
lona	2.3	146	1.9	0.98		
Causeway	8.6	97.4	1.2	1.21		
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters						
25% Iz: where a	z is 25% of sur	face I. I =	irradiance, z	: = depth		

ACOE Daily Reports					
Date	Date Day S79 Flow S78 Flow S (cfs) (cfs)				
3/24/2015	Tues	2514	1727	2252	
3/25/2015	Wed	2036	1427	1864	
3/26/2015	Thur	1221	877	1368	
3/27/2015	Fri	2437	1937	1828	
3/28/2015	Sat	3924	2625	2656	
3/29/2015	Sun	3571	2954	2785	
3/30/2015	Mon	2606	2030	2336	
7 Day	Avg	2615	1939	2155	



MODIS AQUA image 3/24/15 showing phytoplankton bloom along the coast and extending out into the Gulf southwest of the Caloosahatchee Estuary.

Short, epiphyte covered *Ruppia maritima* shoots near Beautiful Island 3/18/15. Squares are 10x10cm.





Large, live oysters on structures at Iona 3/29/15.

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: March 31 – April 6, 2015

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: Unseasonably high Lake Okeechobee discharges have reduced salinity at the SCCF Fort Myers RECON to below 4 psu and pushed the oligohaline zone downstream of the Midpoint Bridge. Salinity is below the optimal range for oysters in Iona. Flows to the estuary at S79 over the past week averaged **2,200 cfs.**

USACE Action: On 4/3/15 the USACE reduced the 7-day pulse releases from Lake Okeechobee to average flows of **2,000 cfs** to the Caloosahatchee at S79 and **eliminated flows** to the St Lucie at S80.

Recommendation: We recommend reducing average flows from 2,000 cfs to 1,800 cfs at S-79 to help improve salinity conditions throughout the estuary for oysters, seagrass and spawning fish and shellfish, with peak spawning occurring from mid-March through May. We encourage water managers to hold water north of the Lake and send water south where possible to minimize impacts to the estuaries.

Lake Okeechobee Level:	13.84 ft. (Low Sub-Band)		Last week: 14.04 ft.
Lake Okeechobee Inflow:	1,261 cfs	Lake C	Okeechobee Outflow: 4,463 cfs
Weekly Rainfall:	WP Franklin 0.0"	Ortona 0.0"	Moore Haven 0.0"
Salinity Beautiful Island:	0.2 - 0.2 psu (SCCF RE	CON Marker 18)	Previous wk 0.2 - 0.2 psu
Salinity Fort Myers:	0.3 – 3.9 psu (SCCF RE	CON Marker 52)	Previous wk 0.3 – 5.7 psu
Salinity Shell Point:	8.5 – 32 psu (SCCF REG	CON)	Previous wk: 8 – 32 psu



Caloosahatchee Estuary

Page 2 of 3

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 4/2/15 averaged 2,536 cfs and over the past 7 days flows averaged 2,200 cfs. Over the past 14 days, approximately 58% of total Lake Okeechobee outflows were delivered to the west and east coasts; 48% to the Caloosahatchee at S77 and 10% to the St Lucie at S308.

ACOE March 27, 2015 Pulse Release					
		Pulse	S79	S78	S77
Date	Day	Target	Flow	Flow	Flow
			(cfs)	(cfs)	(cfs)
3/27/2015	1	3000	2437	1937	1828
3/28/2015	2	3800	3924	2625	2656
3/29/2015	3	3300	3571	2954	2785
3/30/2015	4	2400	2606	2030	2336
3/31/2015	5	2200	2039	1437	1794
4/1/2015	6	1800	1810	1421	1772
4/2/2015	7	1000	1370	1121	1816
7 day avg		2500	2536	1932	2141
A	COE A	pril 3, 201	5 Pulse F	Release	

A	ACOE April 5, 2015 Puise Release					
4/3/2015	1	2500	2056	1593	2020	
4/4/2015	2	3100	2997	2352	2707	
4/5/2015	3	2600	2959	2306	2842	
4/6/2015	4	1900	2169	1870	2305	
4/7/2015	5	1700				
4/8/2015	6	1400				
4/9/2015	7	800				
7 Day		2000				



Upstream of S79/Franklin Conditions: On 4/7/15 at the Olga Water Treatment plant, chlorides measured 64 mg/L, apparent color was 92 CU and turbidity measured 3.81 NTU. The plant is on line at 1600 GPM.

Upper Estuary Conditions: On 4/5/15 the oligohaline zone extended downstream of the Midpoint Bridge where the salinity was 3.3. Oligohaline salinities are in the suitable range for tape grass but are in the lethal range for oysters. Macroalgae covered over 90% of the bottom near shore between Old Bridge Park and Beautiful Island (4/2/15)

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (9.5 psu weekly average on 4/25/15), where large, live oysters are present, and was in the optimal range at Shell Point (22 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 29.5 to 32 psu over the last week and CDOM ranged from 14 to 21.5 qse. Salinity at Tarpon Bay ranged from 28.5 to 31 psu and CDOM ranged from to 17.5 to 27.5 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Extensive mats of *Enteromorpha* and *Cladophora* algae have persisted within the refuge since before 2/24/15.

Red Tide: On 4/3/15 FFWC reported background concentrations of *Karenia brevis*, the Florida red tide organism, in one sample collected alongshore of Charlotte County. No red tide has been reported in Lee County waters.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m
Colonial Br	3.9	103	1.8	1.19
lona	5.4	69.5	2.4	1.37
Courseway	4.2	20 6	30	1 62
Causeway	4.Z	JO.O	3.0	1.02
Target light pend	etration: CE – SCB	Caloosahat – San Carlo	chee estuar os Bay = 2.	y = 1 meter 2 meters

ACOE Daily Reports						
Date	Day	S78 Flow	S77 Flow			
		(cfs)	(cfs)	(cfs)		
3/31/2015	Tues	2039	1437	1794		
4/1/2015	Wed	1810	1421	1772		
4/2/2015	Thur	1370	1121	1816		
4/3/2015	Fri	2056	1593	2020		
4/4/2015	Sat	2997	2352	2707		
4/5/2015	Sun	2959	2306	2842		
4/6/2015	Mon	2169	1870	2305		
7 Day	Avg	2200	1729	2179		



Epiphytic macroalgae (*Spirogyra* sp.) on tape grass in fresh water near Beautiful Island 4/2/15. Photo SCCF





Macroalgae in the J.N. "Ding" Darling NWR western impoundment 4/2/15. Photo DDNWR

Benthic macroalgae mats in the J.N. "Ding" Darling NWR western mpoundment 4/2/15. Photo DDNWR

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Connie Jarvis – City of Cape Coral 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 7 - 13, 2015

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: The reduction in Lake Okeechobee discharges from 2000 - 1800 cfs slightly increased salinity at the SCCF Fort Myers RECON to just under **5 psu**. Salinity is below the optimal range for oysters in Iona. Flows to the estuary at S79 over the past week averaged **1,861 cfs.**

USACE Action: On 4/10/15 the USACE reduced the 7-day pulse releases from Lake Okeechobee to average flows of **1,800 cfs** to the Caloosahatchee at S79 and **continued zero flows** to the St Lucie at S80.

Recommendation: We recommend reducing average flows from 1,800 cfs to 1,500 cfs at S-79 to help improve salinity conditions throughout the estuary for oysters, seagrass and spawning fish and shellfish, with peak spawning occurring from mid-March through May. We encourage water managers to hold water north of the Lake and send water south where possible to minimize impacts to the estuaries.

Lake Okeechobee Level:	13.68 ft. (Low Sub-Band)		Last week: 13.84 ft.		
Lake Okeechobee Inflow:	1,977 cfs	Lake O	keechobee Outflow:	3,274 cfs	
Weekly Rainfall:	WP Franklin 2.01"	Ortona 3.62"	Moore Haven 1.45"		
Salinity Beautiful Island:	0.2 - 0.2 psu (SCCF REC	CON Marker 18)	Previous wk 0.2 - 0.2	psu	
Salinity Fort Myers:	0.4 – 4.9 psu (SCCF RE	CON Marker 52)	Previous wk 0.3 - 3.9	psu	
Salinity Shell Point:	14 – 32 psu (SCCF REC	ON)	Previous wk: 8.5 – 32 p	osu	



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 4/9/15 averaged **2,014 cfs** and over the past 7 days flows averaged **1,861 cfs**. The past week **73%** of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately **50%** of total Lake Okeechobee outflows were delivered to the west and east coasts; **46%** to the Caloosahatchee at S77 and **4%** to the St Lucie at S308.

ACOE April 3, 2015 Pulse Release						
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
4/3/2015	1	3000	2056	1593	2020	
4/4/2015	2	3800	2997	2352	2707	
4/5/2015	3	3300	2959	2306	2842	
4/6/2015	4	2400	2169	1870	2305	
4/7/2015	5	2200	1701	1281	2221	
4/8/2015	6	1800	1264	1163	1565	
4/9/2015	7	1000	953	1002	1404	
7 day avg		2500	2014	1652	2152	

ACOE April 10, 2015 Pulse Release						
4/10/2015	1	2300	1983	1702	2019	
4/11/2015	2	2800	2814	2098	2376	
4/12/2015	3	2400	2510	1763	2016	
4/13/2015	4	1700	1807	1378	1440	
4/14/2015	5	1500				
4/15/2015	6	1200				
4/16/2015	7	700				
7 Day		1800				

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (12 psu weekly average) where large, live oysters were present 4/13/15, and was in the optimal range at Shell Point (23 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. *"Ding"* Darling NWR: Salinity at McIntyre Creek ranged from 30.2 to 31 psu over the last week and CDOM ranged from 14.5 to 17.5 qse. Salinity at Tarpon Bay ranged from 30.3 to 32 psu and CDOM ranged from to 15 to 21 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Extensive mats of *Enteromorpha* and *Cladophora* algae have persisted within the refuge since before 2/24/15.

Wildlife: The past week CROW, the wildlife rehab clinic on Sanibel, received **5 double crested cormorants affected by brevetoxicosis.** On 4/10/15 FFWC reported no *Karenia brevis*, throughout Florida.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m		
Colonial Br	1.6	134	1.7	1.05		
lona	4.8	122	0.7	1.13		
Causeway	0.7	23.5	3.1	1.89		
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters						
25% Iz : where z is 25% of surface I . I = irradiance, z = depth						



Upstream of S79/Franklin Conditions: On 4/14/15 at the Olga Water Treatment plant, chlorides measured 64 mg/L, apparent color was 102 CU and turbidity measured 2.05 NTU. The plant is on line at 1600 GPM.

Upper Estuary Conditions: On 4/12/15 the oligohaline zone extended almost to the Midpoint Bridge where the salinity was 5.6 psu. Oligohaline salinities are in the suitable range for tape grass but are in the lethal range for oysters.



Drift Polysiphonia (red algae, though it looks green) along the beach on the north side of the Caloosahatchee Bridge 4/14/15. Photo SCCF

ACOE Daily Reports						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
4/7/2015	Tues	1701	1281	2221		
4/8/2015	Wed	1264	1163	1565		
4/9/2015	Thur	953	1002	1404		
4/10/2015	Fri	1983	1702	2019		
4/11/2015	Sat	2814	2098	2376		
4/12/2015	Sun	2510	1763	2016		
4/13/2015	Mon	1807	1378	1440		
7 Day	Avg	1861	1483	1863		

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: April 14 - 20, 2015

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: Despite reductions in Lake Okeechobee discharges from 1800 - 1500 cfs rain in the watershed increased flow to the estuary at S79 over the past week to an average of **2,270 cfs**. Salinities at the SCCF Fort Myers RECON remained less than **5 psu**.

USACE Action: On 4/17/15 the USACE reduced the 7-day pulse releases from Lake Okeechobee to average flows of **1,500 cfs** to the Caloosahatchee at S79 and **continued zero flows** to the St Lucie at S80.

Recommendation: We recommend maintaining average flows of 1,500 cfs at S-79 to help improve salinity conditions throughout the estuary for oysters, seagrass and spawning fish and shellfish, with peak spawning occurring from mid-March through May. We encourage water managers to hold water north of the Lake and send water south where possible to minimize impacts to the estuaries.

Lake Okeechobee Level:	13.68 ft. (Low Sub-Band)		Last week: 13.68 ft.
Lake Okeechobee Inflow:	3,515 cfs	Lake	Okeechobee Outflow: 1,239 cfs
Weekly Rainfall:	WP Franklin 0.10"	Ortona 4.31"	Moore Haven 1.55"
Salinity Beautiful Island:	0.2 - 0.2 psu (SCCF REC	CON Marker 18)	Previous wk 0.2 - 0.2 psu
Salinity Fort Myers:	0.4 – 4.7 psu (SCCF RE	CON Marker 52)	Previous wk 0.4 – 4.9 psu
Salinity Shell Point:	14 – 33 psu (SCCF REC	ON)	Previous wk: 14 – 32 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 4/16/15 averaged **1,937 cfs** and over the past 7 days flows increased to an average of **2,270 cfs**. The past week **16%** of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately **37%** of total Lake Okeechobee outflows were delivered to the west and east coasts; **35%** to the Caloosahatchee at S77 and **2%** to the St Lucie at S308.

ACOE April 10, 2015 Pulse Release						
		Pulse	S79	S78	S77	
Date	Day	Target	Flow	Flow	Flow	
			(cfs)	(cfs)	(cfs)	
4/10/2015	1	2300	1983	1702	2019	
4/11/2015	2	2800	2814	2098	2376	
4/12/2015	3	2400	2510	1763	2016	
4/13/2015	4	1700	1807	1378	1440	
4/14/2015	5	1500	2042	821	890	
4/15/2015	6	1200	1278	698	746	
4/16/2015	7	700	1128	706	610	
7 day avg		1800	1937	1309	1442	

ACOE April 17, 2015 Pulse Release						
4/17/2015	1	1600	3346	1965	141	
4/18/2015	2	2200	2786	2445	0	
4/19/2015	3	1900	2668	2637	0	
4/20/2015	4	1400	2642	1901	356	
4/21/2015	5	1200				
4/22/2015	6	1100				
4/23/2015	7	1100				
7 Day		1500				

Lower Estuary Condition: The salinity was within the optimal range for oysters at Iona (15 psu) where large, live oysters were present 4/19/15, and was in the optimal range at Shell Point (26 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 30.5 to 33.3 psu over the last week and CDOM ranged from 9.5 to 19.5 qse. Salinity at Tarpon Bay ranged from 31.2 to 34.3 psu and CDOM ranged from to 7.5 to 19.5 qse. Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Extensive mats of *Enteromorpha* and *Cladophora* algae have persisted within the refuge since before 2/24/15.

Oysters: April sampling by FGCU reported disease prevalence of *Perkinsus marinus* ranged from **85.71% - 93.33%**. Disease intensity was **0.93** for all sites. (scale 0 = no infection, 1 = low, 3 = medium, 5 = high).

Larval recruitment ranged from	n 0.00 - 8.56 spat per shell .
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Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m
Colonial Br	4.6	129	4.2	0.94
lona	9.5	94.9	2.0	1.17
Causeway	2.9	20.8	4.5	1.68

Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters

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



Upstream of S79/Franklin Conditions: On 4/21/15 at the Olga Water Treatment plant, chlorides measured 64 mg/L, apparent color was 98 CU and turbidity measured 1.96 NTU. The plant is on line at 1600 GPM.

Upper Estuary Conditions: On 4/19/15 the oligohaline zone extended almost to the Midpoint Bridge where the salinity was **6.4 psu**. Oligohaline salinities are in the suitable range for tape grass but are in the lethal range for oysters.

Red Drift algae stranding along ¼ mile of Fort Myers Beach on 4/21/15.

> Photo Keith Laakkonen



ACOE Daily Reports						
Date	Day	Day S79 Flow S78 Flow S77				
		(cfs)	(cfs)	(cfs)		
4/14/2015	Tues	2042	821	890		
4/15/2015	Wed	1278	698	746		
4/16/2015	Thur	1128	706	610		
4/17/2015	Fri	3346	1965	141		
4/18/2015	Sat	2786	2445	0		
4/19/2015	Sun	2668	2637	0		
4/20/2015	Mon	2642	1901	356		
7 Day	Avg	2270	1596	391		

To: USACE Colonel Alan M. Dodd, Lt. Colonel Thomas Greco, Richard McMillen, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

From: Periodic Scientists Conference Call Participants

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: April 21 - 27, 2015

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 distributed over and north of Lake Okeechobee increased lake levels during the past week. An algae bloom in the Lake resulted in discontinuing discharges to the St Lucie estuary. Caloosahatchee discharges at S79 during the past week averaged **1,961 cfs**.

USACE Action: On 4/24/15 the USACE increased the 7-day pulse release flow from Lake Okeechobee to an average of **1,800 cfs** to the Caloosahatchee at S79 and **continued to hold back flows** to the St Lucie at S80 **due to an algae bloom** at **S80**.

Recommendation: We recommend average flows of 1,800 - 2,000 cfs at S-79 to help with increasing Lake levels. Higher flows will not improve salinity conditions throughout the estuary for oysters, seagrass and spawning fish and shellfish as peak spawning occurs from mid-March through May. We encourage water managers to hold water north of the Lake and send water south where possible to minimize impacts to the estuaries.

Lake Okeechobee Level:	13.76 ft. (Low Sub-Band)		Last week: 13.68 ft.	
Lake Okeechobee Inflow:	4,990 cfs	Lake	Okeechobee Outflow:	1,802 cfs
Weekly Rainfall:	WP Franklin 0.06"	Ortona 0.79"	Moore Haven 0.92"	
Salinity Beautiful Island:	0.2 - 0.2 psu (SCCF REC	CON Marker 18)	Previous wk 0.2 - 0.2	psu
Salinity Fort Myers:	0.4 – 7.3 psu (SCCF RE	CON Marker 52)	Previous wk 0.4 – 4.7	′ psu
Salinity Shell Point:	13 – 33 psu (SCCF REC	ON)	Previous wk: 14 – 33	psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 4/23/15 increased to an average of 2,383 cfs and over the past 7 days flows averaged 1,961 cfs. The past week 38% of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately 34% of total Lake Okeechobee outflows were delivered to the west and east coasts; 33% to the Caloosahatchee at S77 and 1% to the St Lucie at S308.

ACOE April 17, 2015 Pulse Release						
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
4/17/2015	1	1600	3346	1965	141	
4/18/2015	2	2200	2786	2445	0	
4/19/2015	3	1900	2668	2637	0	
4/20/2015	4	1400	2642	1901	356	
4/21/2015	5	1200	2605	1832	898	
4/22/2015	6	1100	1594	1084	461	
4/23/2015	7	1100	1040	698	216	
7 day avg		1500	2383	1794	296	
A	ACOE April 24, 2015 Pulse Release					
4/24/2015	1	2300	1864	1515	1013	

4/24/2015	1	2300	1864	1515	1013	
4/25/2015	2	2800	2486	1864	1219	
4/26/2015	3	2400	2280	1544	1025	
4/27/2015	4	1700	1858	1258	832	
4/28/2015	5	1500				
4/29/2015	6	1200				
4/30/2015	7	700				
7 Day		1800				



Upstream of S79/Franklin Conditions: On 4/28/15 at the Olga Water Treatment plant, chlorides measured 64 mg/L, apparent color was 122 CU and turbidity measured 1.54 NTU. The plant is on line at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: The salinity was below the optimal range for oysters at the Cape Coral Bridge (9.3 psu) 4/26/15, and was in the optimal range at Shell Point (24 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 31.2 to 33.3 psu over the last week and CDOM ranged from 9.5 to 18 qse. Salinity at Tarpon Bay ranged from 30.7 to 34.3 psu and CDOM ranged from to 7.5 to 19.5 qse.

Salinity at both locations was in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Some mats of *Enteromorpha* and *Cladophora* algae have persisted within the refuge since before 2/24/15.

ACOE Daily Reports				
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
4/21/2015	Tues	2605	1832	898
4/22/2015	Wed	1594	1084	461
4/23/2015	Thur	1040	698	216
4/24/2015	Fri	1864	1515	1013
4/25/2015	Sat	2486	1864	1219
4/26/2015	Sun	2280	1544	1025
4/27/2015	Mon	1858	1258	832
7 Day	Avg	1961	1399	809
To: USACE Colonel Alan M. Dodd, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

From: Periodic Scientists Conference Call Participants

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: April 28 - May 4, 2015

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: Caloosahatchee discharges at S79 during the past week increased to an average of 2,121 cfs.

USACE Action: On 5/1/15 the USACE increased the 7-day pulse release flow from Lake Okeechobee to an average of **2,000 cfs** to the Caloosahatchee at S79. On 5/4/15 discharges to the St Lucie will increase to an average of **900 cfs** at S80.

Recommendation: We recommend average flows not to exceed 2,200 cfs at S-79 to help mitigate the increasing Lake level. This is despite the fact that that we are in peak spawning season for a number of ecologically and economically important fish and shellfish species and that it will result in sub-optimal salinity conditions for oysters and seagrasses throughout the lower estuary. We encourage water managers to hold water north of the Lake and send water south where possible and to utilize all dispersed and emergency storage options available to minimize impacts to the estuaries.

Lake Okeechobee Level:	13.74 ft. (Low Sub-Band)		Last week: 13.76 ft.	
Lake Okeechobee Inflow:	4,084 cfs	Lake Okeech	obee Outflow: 3,770 cfs	
Weekly Rainfall:	WP Franklin 0.73"	Ortona 0.60"	Moore Haven 1.02"	
Salinity Beautiful Island:	0.2 - 0.3 psu (SCCF RE	CON Marker 18)	Previous wk 0.2 - 0.2 psu	
Salinity Fort Myers:	0.4 – 5.5 psu (SCCF RE	ECON Marker 52)	Previous wk 0.4 – 7.3 psu	
Salinity Shell Point:	13 – 32 psu (SCCF RE	CON)	Previous wk: 13 – 33 psu	



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 4/30/15 decreased to an average of **1,881 cfs** and over the past 7 days flows increased to an average of **2,121 cfs**. The past week **62%** of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately **60%** of total Lake Okeechobee outflows were delivered to the west and east coasts; **58%** to the Caloosahatchee at S77 and **2%** to the St Lucie at S308.

	ACOF Annil 24 2045 Dules Delesso						
A	COE A	pril 24, 20	15 Pulse	Release			
		Pulse	S79	S78	S77		
Date	Day	Target	Flow	Flow	Flow		
	_	Ū	(cfs)	(cfs)	(cfs)		
4/24/2015	1	2300	1864	1515	1013		
4/25/2015	2	2800	2486	1864	1219		
4/26/2015	3	2400	2280	1544	1025		
4/27/2015	4	1700	1858	1258	832		
4/28/2015	5	1500	1594	1445	989		
4/29/2015	6	1200	1300	1117	787		
4/30/2015	7	700	1789	768	591		
7 day avg		1800	1881	1358	922		
	ACOF N	May 1, 201	5 Pulse R	lease			
5/1/2015	1	2500	2109	1411	1256		
5/2/2015	2	3100	3042	2333	2318		
5/3/2015	3	2600	2793	2417	2444		

4

5

6

7

5/4/2015

5/5/2015

5/6/2015

5/7/2015

7 Day

1900

1700

1400

800

2000

2226

1761



Upstream of S79/Franklin Conditions: On 5/5/15 at the Olga Water Treatment plant, chlorides measured **80** mg/L, apparent color was **98 CU** and turbidity measured **2.45 NTU.** The plant is on line at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (7.9 psu) 5/3/15, and was in the optimal range at Shell Point (22 psu weekly average).

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McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 29.7 to 33.0 psu over the last week and CDOM ranged from 12.0 to 21.0 qse. Salinity at Tarpon Bay ranged from 28.7 to 32.7 psu and CDOM ranged from to 12.9 to 22.2 qse.

Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Some mats of *Enteromorpha* and *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m		
Colonial Br	4.1	125	6.4	0.88		
lona	3.2	115	1.6	1.14		
Causeway	8.0	25.2	17.5	0.83		
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters						

ACOE Daily Reports						
Date	Day	S79 Flow	S78 Flow	S77 Flow		
		(cfs)	(cfs)	(cfs)		
4/28/2015	Tues	1594	1445	989		
4/29/2015	Wed	1300	1117	787		
4/30/2015	Thur	1789	768	591		
5/1/2015	Fri	2109	1411	1256		
5/2/2015	Sat	3042	2333	2318		
5/3/2015	Sun	2793	2417	2444		
5/4/2015	Mon	2226	1761	1905		
7 Day	Avg	2121	1607	1470		

To: USACE Colonel Alan M. Dodd, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral 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 5 - 11, 2015

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: Caloosahatchee discharges at S79 during the past week averaged 1,914 cfs.

USACE Action: On 5/8/15 the USACE continued the 7-day pulse release from Lake Okeechobee to an average flow of **2,000 cfs** to the Caloosahatchee at S79 and **900 cfs** to the St Lucie at S80.

Recommendation: We recommend average flows of 2,200 cfs at S-79 to help mitigate the increasing Lake level. This is despite the fact that that we are in peak spawning season for a number of ecologically and economically important fish and shellfish species. While additional flow will compound sub-optimal salinity conditions for oysters and seagrasses throughout the lower estuary we hope taking flow now will prevent much higher, more harmful flows later. We encourage water managers to hold water north of the Lake and send water south where possible and to utilize all dispersed and emergency storage options available to minimize impacts to the estuaries.

Lake Okeechobee Level:	13.56 ft. (Low Sub-Band	1)	Last week: 13.74 ft.
Lake Okeechobee Inflow:	1,758 cfs	Lake Okeech	obee Outflow: 4,931 cfs
Weekly Rainfall:	WP Franklin 0.73"	Ortona 2.85"	Moore Haven 0.0"
Salinity Beautiful Island:	0.3 – 0.4 psu (SCCF RE	CON Marker 18)	Previous wk 0.2 - 0.3 psu
Salinity Fort Myers:	0.5 – 8.7 psu (SCCF RE	CON Marker 52)	Previous wk 0.4 – 5.5 psu
Salinity Shell Point:	14 – 31 psu (SCCF REC	CON)	Previous wk: 13 – 32 psu



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Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 5/7/15 increased to an average of **2,043 cfs** and over the past 7 days flows decreased to an average of **1,914 cfs.** The past week **75%** of Caloosahatchee flows were from Lake O. Over the past 14 days, approximately **59%** of total Lake Okeechobee outflows were delivered to the west and east coasts; **49%** to the Caloosahatchee at S77 and **10%** to the St Lucie at S308.

ACOE May 1, 2015 Pulse Release						
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
5/1/2015	1	2500	2109	1411	1256	
5/2/2015	2	3100	3042	2333	2318	
5/3/2015	3	2600	2793	2417	2444	
5/4/2015	4	1900	2226	1761	1905	
5/5/2015	5	1700	1696	1303	1670	
5/6/2015	6	1400	1406	1263	2020	
5/7/2015	7	800	1032	888	1528	
7 day avg		2000	2043	1625	1877	

ACOE May 8, 2015 Pulse Release						
5/8/2015	1	2500	1871	1694	1916	
5/9/2015	2	3100	2735	2123	2682	
5/10/2015	3	2600	2566	2189	2538	
5/11/2015	4	1900	2095	1581	1944	
5/12/2015	5	1700				
5/13/2015	6	1400				
5/14/2015	7	800				
7 Day		2000				



Upstream of S79/Franklin Conditions: On 5/12/15 at the Olga Water Treatment plant, chlorides measured 68 mg/L, apparent color was 98 CU and turbidity measured 1.95 NTU. A slight tinge of visible algae was observed 5/11/15 at the intake. The plant is on line at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Chlorophyll and phycocyanin levels were spiking at Ft. Myers and elevated at the Beautiful Island RECON. Hypoxia was detected at Ft Myers RECON on 5/11/15. Flagellates and cyanobacteria were the main components of the phytoplankton at 31 Bridge where chlorophyll phycocyanin were elevated at the surface 5/10/15. A faint, green surface slick was visible at both the 31 Bridge and Ft Myers.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (10.0 psu) 5/10/15, and was in the optimal range at Shell Point (23 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 28.5 to 32.3 psu over the last week and CDOM ranged from 14.0 to 20.0 qse. Salinity at Tarpon Bay ranged from 28.0 to 31.6 psu and CDOM ranged from to 14.2 to 26.2 qse.

Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Some mats of *Enteromorpha* and *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)				
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m				
Ft. Myers	5.8	192	1.1	0.83				
lona	2.1	126	0.9	1.13				
Causeway	1.1	36.9	2.4	1.79				
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters								
25% Iz where:	25% Iz: where z is 25% of surface I I – irradiance z – depth							

ACOE Daily Reports						
Date	Day	S79 Flow	S78 Flow	S77 Flow		
		(cts)	(cts)	(cts)		
5/5/2015	Tues	1696	1303	1670		
5/6/2015	Wed	1406	1263	2020		
5/7/2015	Thur	1032	888	1528		
5/8/2015	Fri	1871	1694	1916		
5/9/2015	Sat	2735	2123	2682		
5/10/2015	Sun	2566	2189	2538		
5/11/2015	Mon	2095	1581	1944		
7 Day	Avg	1914	1577	2042		

To: USACE Colonel Alan M. Dodd, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: May 12 - 19, 2015

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: Caloosahatchee discharges at S79 during the past week averaged 1,882 cfs.

USACE Action: On 5/15/15 the USACE continued the 7-day pulse release from Lake Okeechobee to an average flow of **2,000 cfs** to the Caloosahatchee at S79 and **700 cfs** to the St Lucie at S80.

Recommendation: : In light of decreasing lake levels and dryer weather forecasted, we recommend reducing discharges to the Caloosahatchee to a 7 day pulse release with average flows ranging 1,500-1,800 cfs at S-79 to improve salinity and spawning conditions in the estuary.

Lake Okeechobee Level:	13.27 ft. (Low Sub-Band)		Last week: 13.56 ft.	
Lake Okeechobee Inflow:	607 cfs	Lake Okeech	nobee Outflow: 5,229 cfs	
Weekly Rainfall:	WP Franklin 0.11"	Ortona 0.04"	Moore Haven 0.22"	
Salinity Beautiful Island:	0.2 – 0.5 psu (SCCF R	ECON Marker 18)	Previous wk 0.3 - 0.4 psu	
Salinity Fort Myers:	4.0 – 6.9 psu (SCCF R	ECON Marker 52)	Previous wk 0.5 – 8.7 psu	
Salinity Shell Point:	14 – 32 psu (SCCF RE	CON)	Previous wk: 14 – 31 psu	



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 5/14/15 decreased to an average of **1,905 cfs** and over the past 7 days flows decreased to an average of **1,882 cfs**. The past week **94%** of Caloosahatchee flows were from Lake Okeechobee.

ACOE May 8, 2015 Pulse Release					
		Pulse	S79	S78	S77
Date	Day	Target	Flow	Flow	Flow
			(cfs)	(cfs)	(cfs)
5/8/2015	1	2500	1871	1694	1916
5/9/2015	2	3100	2735	2123	2682
5/10/2015	3	2600	2566	2189	2538
5/11/2015	4	1900	2095	1581	1944
5/12/2015	5	1700	1740	1316	1248
5/13/2015	6	1400	1353	1299	1144
5/14/2015	7	800	978	864	943
7 day avg		2000	1905	1581	1774
A		lay 15, 20 ⁻	15 Pulse F	Release	
5/15/2015	1	2500	2307	1698	1740
5/16/2015	2	3100	2909	2332	2528
5/17/2015	3	2600	2531	2056	2408
5/18/2015	4	1900	1931	1471	1876
5/19/2015	5	1700	1472	1286	1791
5/20/2015	6	1400	1428	1226	1832
5/21/2015	7	800			
7 Dav		2000			



Upstream of S79/Franklin Conditions: On 5/19/15 at the Olga Water Treatment plant, chlorides measured 66 mg/L, apparent color was 98 CU and turbidity measured 1.23 NTU. The plant is on line at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. Hypoxia was detected at Ft Myers RECON from 5/11-5/14/15 and the dissolved oxygen level is still depressed.

Lower Estuary Condition: The salinity was in the optimal range for oysters at Iona (14 psu) 5/17/15, and at Shell Point (24 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 28.8 to 30.5 psu over the last week and CDOM ranged from 13.0 to 20.0 qse. Salinity at Tarpon Bay ranged from 28.2 to 32.7 psu and CDOM ranged from to 10.5 to 22.2 qse.

Salinity at both locations were below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Some mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.



Caloosahatchee tape grass 5/14/15 doing well in patches upstream of Edison Bridge.



Widgeongrass at the Caloosahatchee Bridge 5/14/15.



Cladophora in the western impoundment at the Refuge, 5/19/2015.

Blue-Green Algae Franklin Locks 5/14/2015, LCDOH

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)	
T	4.4	CE <70	CE < 18	CE = 1 m	5/
larget values	< 11	SCB <11 SCB < 5	SCB = 2.2 m	5/*	
Colonial Br	2.4	138	1.2	1.05	5/*
lona	3.6	115	1.0	1.17	5/
Causeway	3.7	14.7	3.2	1.93	5/
Torget light per	atration: CE	Coloopohot	abaa aatuar	u - 1 motor	5/
raiget light pen	SCB	– San Carl	$rac{1}{2}$ s Bay = 2	2 meters	5/*
	002	Can Can	50 Day - 1 .		5/*
25% Iz: where a	z is 25% of sur	face I. I =	irradiance, z	z = depth	

ACOE Daily Reports						
Date	Day	S79 Flow	S78 Flow	S77 Flow		
		(cfs)	(cfs)	(cfs)		
5/12/2015	Tues	1740	1316	1248		
5/13/2015	Wed	1353	1299	1144		
5/14/2015	Thur	978	864	943		
5/15/2015	Fri	1871	1694	1916		
5/16/2015	Sat	2735	2123	2682		
5/17/2015	Sun	2566	2189	2538		
5/18/2015	Mon	1931	1471	1876		
7 Day	Avg	1882	1565	1764		

To: USACE Colonel Alan M. Dodd, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: May 19 - 26, 2015

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: Caloosahatchee discharges at S79 during the past week averaged 1,882 cfs.

USACE Action: On 5/22/15 the USACE started a 7-day pulse release from Lake Okeechobee to an average flow of **1,400 cfs** to the Caloosahatchee at S79 and **200 cfs** to the St Lucie at S80.

Recommendation: In light of decreasing lake levels and dryer weather forecasted, we recommend reducing discharges to the Caloosahatchee to a 7 day pulse release with average flows ranging 1,200-1,400 cfs at S-79 to improve salinity and spawning conditions in the estuary.

Lake Okeechobee Level:	12.99 ft. (Low Sub-Band	1)	Last week: 13.27 ft.
Lake Okeechobee Inflow:	674 cfs	Lake Okeeche	obee Outflow: 3,653 cfs
Weekly Rainfall:	WP Franklin 0.14"	Ortona 0.04"	Moore Haven 0.84"
Salinity Beautiful Island:	0.2 – 0.5 psu (SCCF RE	CON Marker 18)	Previous wk 02 – 0.5 psu
Salinity Fort Myers:	2.9 – 7.2 psu (SCCF RE	CON Marker 52)	Previous wk 4.0 – 6.9 psu
Salinity Shell Point:	14 – 32 psu (SCCF REC	ON)	Previous wk: 14 – 32 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 5/21/15 increased to an average of **1,943 cfs** and over the past 7 days flows decreased to an average of **1,753 cfs**. The past week **94%** of Caloosahatchee flows were from Lake Okeechobee.

ACOE May 15, 2015 Pulse Release						
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
5/15/2015	1	2500	2307	1698	1740	
5/16/2015	2	3100	2909	2332	2528	
5/17/2015	3	2600	2531	2056	2408	
5/18/2015	4	1900	1931	1471	1876	
5/19/2015	5	1700	1472	1286	1791	
5/20/2015	6	1400	1428	1226	1832	
5/21/2015	7	800	1020	839	1465	
7 day avg		2000	1943	1558	1949	

ACOE May 22, 2015 Pulse Release						
5/222015	1	1900	1859	1282	1861	
5/23/2015	2	2300	2967	1725	2036	
5/24/2015	3	2000	2250	1231	1068	
5/25/2015	4	1300	1274	990	1068	
5/26/2015	5	1100				
5/27/2015	6	800				
5/28/2015	7	400				
7 Day		1400				

Upstream of S79/Franklin Conditions: On 5/19/15 at the Olga Water Treatment plant, chlorides measured 72 mg/L, apparent color was 98 CU and turbidity measured 1.23 NTU. The plant is on line at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. Dissolved oxygen at the Ft Myers RECON was depressed.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Cape Coral Bridge (7.5 psu) 5/25/15, and in the optimal range at Shell Point (23 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 28.2 to 30.8 psu over the last week and CDOM ranged from 13.0 to 20.0 qse. Salinity at Tarpon Bay ranged from 28.0 to 32.5 psu and CDOM ranged from to 10.0 to 24.5 qse.

Salinity at both locations were **below or in the lower end of the preferred range for shoal grass and turtle grass** (30 to 40 psu). Some mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.



Blue-Green Algae Lee County Utilities Olga Drinking Water Plant intake 5/27/2015, Lee County Natural Resources



ACOE Daily Reports					
Date	Day	Day S79 Flow S78 Flow (cfs) (cfs)		S77 Flow (cfs)	
5/19/2015	Tues	1472	1286	1791	
5/20/2015	Wed	1428	1226	1832	
5/21/2015	Thur	1020	839	1465	
5/22/2015	Fri	1859	1282	1861	
5/23/2015	Sat	2967	1725	2036	
5/24/2015	Sun	2250	1231	1482	
5/25/2015	Mon	1274	990	1068	
7 Day	Avg	1753	1226	1648	

Blue-Green Algae Franklin Locks 5/27/2015, Lee County Natural Resources

To: USACE Colonel Alan M. Dodd, LTC Jennifer A.Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: May 26 - June 1, 2015

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: Caloosahatchee discharges at S79 during the past week decreased to almost half of previous weeks averaging 901 cfs. A potentially toxic algal bloom at the Franklin Lock caused Lee County to shut down the Olga Water Treatment plant and the Department of Health to issue a Health Notice to avoid contact with Caloosahatchee water due to the potentially toxic blooms.

USACE Action: On 5/29/15 the USACE initiated a 7-day pulse release from Lake Okeechobee with average flows of **750 cfs** to the Caloosahatchee at S79 (650 cfs from S-77 and 100 cfs from Nicodemus Slough) and **0 flow** to the St Lucie at S80.

Recommendation: In light of decreasing lake levels and a cyanobacteria bloom in the river we recommend discharges to the Caloosahatchee averaging 1,000 cfs at S-79 in a 7 day pulse release to maintain flow and moderate salinities as we enter the wet season.

Lake Okeechobee Level:	12.66 ft. (Base Flow Sub-Band)		Last week: 12.99 ft.	
Lake Okeechobee Inflow:	292 cfs	Lake Okeecho	bee Outflow: 3,882 cfs	
Weekly Rainfall:	WP Franklin 1.41"	Ortona 1.45"	Moore Haven 0.0"	
Salinity Beautiful Island:	0.3 – 1.3 psu (SCCF RE	CON Marker 18)	Previous wk 0.2 – 0.5 psu	
Salinity Fort Myers:	4.8 – 10 psu (SCCF REC	CON Marker 52)	Previous wk 2.9 – 7.2 psu	
Salinity Shell Point:	16 – 34 psu (SCCF REC	ON)	Previous wk: 14 – 32 psu	



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Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 5/28/15 decreased to an average of **1,547 cfs** and over the past 7 days flows decreased to an average of **901 cfs**. The past week **65%** of Caloosahatchee flows were from Lake Okeechobee. Over the past 14 days approximately **36%** of total Lake O outflows were delivered to the west and east coasts: **32%** to the Caloosahatchee at S77 and **4%** to the St Lucie at S308.

ACOE May 22, 2015 Pulse Release						
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
5/222015	1	1900	1859	1282	1861	
5/23/2015	2	2300	2967	1725	2036	
5/24/2015	3	2000	2250	1231	1068	
5/25/2015	4	1300	1274	990	1068	
5/26/2015	5	1100	1027	763	1225	
5/27/2015	6	800	798	696	1299	
5/28/2015	7	400	660	696	1263	
7 Day		1400	1547	926	1402	

A	ACOE May 29, 2015 Pulse Release					
5/29/2015	1	750	769	694	1207	
5/30/2015	2	1200	1128	891	1413	
5/31/2015	3	1000	1025	868	1228	
6/1/2015	4	900	900	690	1079	
6/2/2015	5	700				
6/3/2015	6	500				
6/4/2015	7	200				
7 day avg		750				



Upstream of S79/Franklin Conditions: On 6/2/15 at the Olga Water Treatment plant, chlorides measured **72 mg/L**, apparent color was **98 CU** and turbidity spiked to **4.96 NTU.** The plant has been shutdown since 5/27/15 due to a bloom of potentially toxic cyanobacteria.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. Dissolved oxygen at the Ft Myers RECON dipped below 3 mg/L several times during the week. The Beautiful Island RECON recorded chlorophyll spiked during the week.

Lower Estuary Condition: The salinity was in the optimal range for oysters at Iona (16 psu) on 6/02/15, and in the optimal range at Shell Point (26 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 28.9 to 31.2 psu over the last week and CDOM ranged from 11.6 to 18.4 qse. Salinity at Tarpon Bay ranged from 29.6 to 34.8 psu and CDOM ranged from to 7.0 to 21.0 qse.

Salinity at both locations were **below or in the lower end of the preferred range for shoal grass and turtle grass** (30 to 40 psu). Mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Oysters: May sampling in the Caloosahatchee by FGCU reported disease prevalence of *Perkinsus marinus* ranged from **73.33 - 93.33%.**

Disease intensity of *Perkinsus marinus* ranged from 0.73 - 0.93 (scale 0 = no infection, 1 = low, 3 = medium, 5 = high). Larval recruitment ranged from 4.11 - 8.83 spat/shell.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)	
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m	
Ft. Myers	8.9	152	3.6	0.86	
Colonial Br	2.8	138	1.2	1.04	
lona	7.0	100	2.6	1.13	
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters					
25% Iz : where z is 25% of surface I. I = irradiance, $z = depth$					

ACOE Daily Reports						
Date	Day	S78 Flow (cfs)	S77 Flow (cfs)			
5/26/2015	Tues	1027	763	1225		
5/27/2015	Wed	798	696	1299		
5/28/2015	Thur	660	696	1263		
5/29/2015	Fri	769	694	1207		
5/30/2015	Sat	1128	891	1413		
5/31/2015	Sun	1025	868	1228		
6/1/2015	Mon	900	690	1079		
7 Day	Avg	901	756	1244		



Dense growth of Chara and other benthic macroalgae between Caloosahatchee and Edison Bridges on 5/29/15. Hydrilla was also present. Photo SCCF



Cyanobacteria accumulation along the bank of the Caloosahatchee above the W. P. Franklin Lock on 5/30/15. Photo SCCF



Florida Health Mission: To protect, promote & improve the health of all people in Florida through integrated state, county, & community efforts.

> Rick Scott Governor

John H. Armstrong, MD, FACS Surgeon General & Secretary

Florida Department of Health Lee County

> Main Office 3920 Michigan Avenue Fort Myers, FL 33916 www.leechd.com

www.floridahealth.gov TWITTER: HealthyFLA FACEBOOK: FLDepartmentofHealth YOUTUBE: fldoh FOR IMMEDIATE RELEASE May 28, 2015 Contact: Diane Holm, PIO (239) 332-9561 (850) 519-5728 (cell) Diane.Holm@FLHealth.gov

Florida Department of Health in Lee County 2015:027

HEALTH NOTICE Harmful algal blooms may be present

Lee County, FL— The Florida Department of Health in Lee County is recommending that the public be cautious before exposing themselves, pets or livestock to the brackish and fresh water of the Caloosahatchee River and its tributaries due to sporadic but potentially harmful algal blooms.

It is recommended not to fish, participate in recreational activities or drink the water if:

- The water appears greenish or off color
- The water smells different
- · Dead or distressed animal and aquatic life are present.

Algae may grow in lakes, canals and rivers of the county for the foreseeable future. There are a large number of these fresh water bodies, making it impractical to track the algae conditions in all areas. An advisory will be issued if toxic blooms are identified in public areas.

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To: USACE Colonel Alan M. Dodd, LTC Jennifer A.Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral 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 2 - 8, 2015

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: Caloosahatchee discharges at S79 during the past week increased slightly to an average 1,127 cfs. A cyanobacteria bloom extended from Fort Myers to Beautiful Island. The Olga Water Treatment plant and beach at the WP Franklin Lock & Dam remain closed due to a potentially toxic cyanobacteria bloom.

USACE Action: On 6/5/15 the USACE initiated a 7-day pulse release from Lake Okeechobee with average flows of **650 cfs** to the Caloosahatchee at S79 and **0 flow** to the St Lucie at S80.

Recommendation: In light of decreasing lake levels and a cyanobacteria bloom in the river we recommend discharges to the Caloosahatchee averaging **650 - 800 cfs at S-79** in a 7 day pulse release to maintain flow and moderate salinities as we enter the wet season.

Lake Okeechobee Level:	12.54 ft. (Beneficial U	2.54 ft. (Beneficial Use Sub-Band)		
Lake Okeechobee Inflow:	374 cfs	Lake Okeed	hobee Outflow: 3,647 cfs	
Weekly Rainfall:	WP Franklin 2.78"	Ortona 0.55"	Moore Haven 0.32"	
Salinity Beautiful Island:	0.3 – 2.2 psu (SCCF F	RECON Marker 18)	Previous wk 0.3 – 1.3 psu	
Salinity Fort Myers:	5.5 – 14 psu (SCCF R	ECON Marker 52)	Previous wk 4.8 – 10 psu	
Salinity Shell Point:	19 – 33 psu (SCCF RI	ECON)	Previous wk: 16 – 34 psu	



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Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 6/4/15 **decreased 46%** to an average of **998 cfs** and over the past 7 days flows increased to an average of **1,127 cfs.** This past week **47%** of Caloosahatchee flows were from Lake Okeechobee. Over the past 14 days approximately **31%** of total Lake O outflows were delivered to the west and east coasts: **30%** to the Caloosahatchee at S77 and **1%** to the St Lucie at S308.

ACOE May 29, 2015 Pulse Release					
		Pulse	S79	S78	S77
Date	Day	Target	Flow	Flow	Flow
			(cfs)	(cfs)	(cfs)
5/29/2015	1	750	769	694	1207
5/30/2015	2	1200	1128	891	1413
5/31/2015	3	1000	1025	868	1228
6/1/2015	4	900	900	690	1079
6/2/2015	5	700	887	688	1180
6/3/2015	6	500	1108	692	930
6/4/2015	7	200	1173	688	830
7 day avg		750	998	744	981

ACOE June 5, 2015 Pulse Release						
Date	Day	Pulse Target	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)	
6/5/2015	1	650	1095	682	1225	
6/6/2015	2	1100	1076	690	1035	
6/7/2015	3	900	1124	694	1006	
6/8/2015	4	800	1428	718	886	
6/9/2015	5	600				
6/10/2015	6	400				
6/11/2015	7	100				
7 Day avg		650				



Upstream of S79/Franklin Conditions: On 6/9/15 at the Olga Water Treatment plant, chlorides measured 58 mg/L, apparent color was 115 CU and turbidity measured 3.95 NTU. The plant has been shutdown since 5/27/15 due to a bloom of potentially toxic cyanobacteria.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. Dissolved oxygen at the Ft Myers RECON dipped below 2 mg/L this week. Chlorophyll at the Beautiful Island RECON spiked during the week. A blue green algae bloom extends from Fort Myers to Beautiful Island.

Lower Estuary Condition: The salinity was in the optimal range for oysters at Iona (14 psu) on 6/8/15, and in the optimal range at Shell Point (26 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 29.1 to 31.3 psu over the last week and CDOM ranged from 11.0 to 20.4 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L six times during the week. Salinity at Tarpon Bay ranged from 30.6 to 34.8 psu and CDOM ranged from to 7.0 to 19.6 qse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Wildlife: A federally endangered smalltooth sawfish was captured on video visiting Tarpon Bay, Sanibel on 6/5/14. http://marinelab.sccf.org/sawfishvideo/ The Caloosahatchee estuary is designated critical habitat for the fish.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)	
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m	
Ft. Myers	4.6	148	0.8	1.00	
Colonial Br	2.7	130	2.0	1.04	
lona	3.2	111	2.5	1.11	
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters					
25% Iz : where z is 25% of surface I . $I = irradiance$, z = depth					

ACOE Daily Reports					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
6/2/2015	Tues	887	688	1180	
6/3/2015	Wed	1108	692	930	
6/4/2015	Thur	1173	688	830	
6/5/2015	Fri	1095	682	1225	
6/6/2015	Sat	1076	690	1035	
6/7/2015	Sun	1124	694	1006	
6/8/2015	Mon	1428	718	886	
7 Day	Avg	1127	693	1433	

To: USACE Colonel Alan M. Dodd, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: June 9 - 15, 2015

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 rainfall in the watershed provided increased average flows of 2,113 cfs at S-79 the past week even with four days of no flow from Lake Okeechobee. The Olga Water Treatment plant and beach at the WP Franklin Lock & Dam remain closed due to a potentially toxic cyanobacteria bloom.

USACE Action: On 6/12/15 the USACE stopped water releases from Lake Okeechobee to the Caloosahatchee at S-77.

Recommendation: Rainfall within the watershed may provide sufficient flows without additional water from Lake Okeechobee. If supplemental flows are needed, we recommend flows averaging **650 - 800 cfs** at S-79.

Lake Okeechobee Level:	12.60 ft. (Beneficial Use Sub-Band)		Last week: 12.54 ft.	
Lake Okeechobee Inflow:	1,144 cfs	Lake Okeech	nobee Outflow:	1,082 cfs
Weekly Rainfall:	WP Franklin 2.01"	Ortona 7.14"	Moore Haven	1.97"
Salinity Beautiful Island:	0.4 – 1.8 psu (SCCF R	ECON Marker 18)	Previous wk	0.3 – 2.2 psu
Salinity Fort Myers:	4.0 – 10.6 psu (SCCF F	RECON Marker 52)	Previous wk	5.5 – 14 psu
Salinity Shell Point:	17 – 33 psu (SCCF RE	CON)	Previous wk:	19 – 33 psu



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Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the pulse release ending on 6/11/15 **increased** to an average of **1,492 cfs** and over the past 7 days flows increased to an average of **2,113 cfs**. The past week **7%** of Caloosahatchee flows were from Lake Okeechobee. Over the past 14 days approximately **28%** of total Lake O outflows were delivered to the Caloosahatchee at S77 and **0%** to the St Lucie at S308.

ACOE June 5, 2015 Pulse Release					
Date	Day	Pulse Target	S79 Flow	S78 Flow	S77 Flow
	1	650	(CIS)	(CIS)	(CIS)
6/5/2015	I	650	1095	002	1223
6/6/2015	2	1100	1076	690	1035
6/7/2015	3	900	1124	694	1006
6/8/2015	4	800	1428	718	886
6/9/2015	5	600	1051	690	891
6/10/2015	6	400	1518	690	590
6/11/2015	7	100	3155	1250	96
7 day avg		650	1492	773	818



Chlorophyll at Beautiful Island RECON (red) and Fort Myers (green).

Upstream of S79/Franklin Conditions: On 6/16/15 at the Olga

Water Treatment plant, chlorides measured **68 mg/L**, apparent color was **85 CU** and turbidity measured **1.71 NTU**. Moderate algae was present at the plant intake over the past week. The plant has been shut down since 5/27/15 due to a bloom of potentially toxic cyanobacteria.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. **Dissolved oxygen at the Ft Myers RECON dipped to 2 mg/L this week** but it has increased with higher flows.

Lower Estuary Condition: The salinity was near the optimal range for oysters at Iona (**13 psu**) on 6/15/15, and in the optimal range at Shell Point (**25 psu** weekly average). Red drift algae *Solieria filiformis* began washing up on Fort Myers Beach on 6/14/15. The SCCF Marine Lab has conducted studies on growth and nitrogen uptake on common red algae including *Solieria filiformis*. The results indicate that *Solieria* is a very opportunistic species that grows well after it has been fragmented (Table 1) and has the ability to uptake high concentrations of nitrate (Fig. 1) relative to other species.

Table 1. Change in biomass (g DW day-1) over a 52 day laboratory growth experiment with high nitrate vs. low nitrate treatments on fragmented specimens.

Algae	Average chan	ge in biomass	Standard Dev		
Species	High	Low	High	Low	
Agardhiella subulata	1.50	-0.20	0.54	0.53	
Gracilaria tikvahiae	2.12	0.88	1.41	0.42	
Solieria filiformis	4.25	2.84	1.13	0.66	

Figure 1. Comparison of nitrate uptake rates in two common red algae stranded on southwest Florida beaches.





McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 27.7 to 31.3 psu over the last week and CDOM ranged from 10.0 to 18.3 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L three times during the week. Chlorophyll at McIntyre Creek ranged from 2.6 to 12.0 µg/L. Salinity at Tarpon Bay ranged from 30.0 to 33.5 psu and CDOM ranged from to 9.6 to 19.2 qse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)	
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m	
Ft. Myers	10.4	148	2.6	0.90	
Colonial Br	3.2	131	1.6	1.06	
lona	3.3	116	2.8	1.07	
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters					
25% Iz : where z is 25% of surface I . I = irradiance, $z = depth$					

ACOE Daily Reports					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
6/9/2015	Tues	1051	690	891	
6/10/2015	Wed	1518	690	590	
6/11/2015	Thur	3155	1250	96	
6/12/2015	Fri	2860	1462	0	
6/13/2015	Sat	3111	1692	0	
6/14/2015	Sun	2041	1154	0	
6/15/2015	Mon	1057	263	0	
7 Day	Avg	2113	1029	225	





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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: June 16 - 22, 2015

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: Low Lake Okeechobee levels and limited rainfall resulted in decreased average flows to the Caloosahatchee of **556 cfs** at S79 the past week. Low lake levels also prompted the USACE to initiate restricted lockages at S79 and S80 beginning on 6/22/15. **The Olga Water Treatment plant remains offline due to a potentially toxic cyanobacteria bloom.**

USACE Action: On 6/19/15 the USACE continued no water releases from Lake Okeechobee to the Caloosahatchee at S77.

Recommendation: We recommend flows averaging **650 cfs** at S79 to maintain appropriate salinities within the estuary and to mitigate the formation of cyanobacteria blooms associated with stagnant conditions.

Lake Okeechobee Level:	12.42 ft. (Beneficial Use Sub-Band)		Jse Sub-Band)	Last week: 12	2.60 ft.
Lake Okeechobee Inflow:	674 cfs		Lake Okeecho	bee Outflow:	2,994 cfs
Weekly Rainfall:	WP Franklin	1.37"	Ortona 0.13"	Moore Haven	0.0"
Salinity Beautiful Island:	0.4 – 1.2 psu	(SCCF RE	CON Marker 18)	Previous wk	0.4 – 1.8 psu
Salinity Fort Myers:	2.9 – 6.2 psu	(SCCF Yad	cht Basin)	Previous wk	ND
	4.4 – 11 psu (SCCF REC	CON Marker 52)	Previous wk	4.0 – 11 psu
Salinity Shell Point:	18 - 33 psu (S	SCCF REC	ON)	Previous wk:	17 – 33 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past 7 days decreased to an average of **556 cfs.** During the past week no water was discharged from Lake Okeechobee for the first three days. The last four days flow was delivered from the lake for Ortona basin water supply with no flows discharged from S78. Over the past 14 days approximately **13%** of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77 and **0%** to the St Lucie at S308.



Upstream of S79/Franklin Conditions: On 6/23/15 at the Olga Water Treatment plant, chlorides measured **68 mg/L**, apparent color was **93 CU** and turbidity measured **1.46 NTU.** Moderate algae was present at the plant intake over the past week. The plant has been shut down since 5/27/15 due to a bloom of potentially toxic cyanobacteria.



Upper Estuary Conditions: Salinities in the upper estuary

are in the suitable range for tape grass. Dissolved oxygen at the Ft Myers RECON dipped to 2 mg/L and hypoxia occurred each day between 6/18/15 and 6/23/15. Cyanobacteria clumps were observed in the surface layer near Beautiful Island 6/22/15.

Lower Estuary Condition: The salinity was in the optimal range for oysters at Iona (15 psu on 6/23/15) and at Shell Point (25 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 30.6 - 31.6 psu over the last week and CDOM ranged from 10 - 16 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L twice during the week and chlorophyll spiked above 11 μ g/L three times, ranging from 3 - 18 μ g/L. Salinity at Tarpon Bay ranged from 30 - 33.5 psu and CDOM ranged from to 9 - 17 qse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Oysters: June sampling in the Caloosahatchee by FGCU reported disease prevalence of *Perkinsus marinus* from **86.66** - **100** %. Disease intensity of *Perkinsus marinus* ranged from **1.00** - **1.47**. Scale 0 = no infection, 1 = low, 3 = medium, 5 = high. Average larval recruitment ranged from **0.83** - **23.31** spat per shell.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m
Ft. Myers	8.6	137	3.7	0.91
lona	1.9	105	1.8	1.20
Causeway A	0.98	23.8	1.9	2.08
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters				
25% Iz : where z is 25% of surface I . I = irradiance, z = depth				

ACOE Daily Reports					
Date	Day	S79 Flow	S78 Flow	S77 Flow	
		(cfs)	(cfs)	(cfs)	
6/16/2015	Tues	926	485	0	
6/17/2015	Wed	1196	634	0	
6/18/2015	Thur	600	127	0	
6/19/2015	Fri	270	0	83	
6/20/2015	Sat	278	0	153	
6/21/2015	Sun	290	0	146	
6/22/2015	Mon	333	0	143	
7 Day	Avg	556	178	75	

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: June 23 - 29, 2015

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: Despite low Lake Okeechobee levels, rainfall provided a slight increase of average flows to the Caloosahatchee of **858 cfs** at S79 the past week. Low lake levels continue the restricted lockages at S79 and S80. **The Olga Water Treatment plant remains offline since 5/27/15 due to a potentially toxic cyanobacteria bloom.**

USACE Action: On 6/24/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend flows averaging **650 cfs** at S79 to maintain appropriate salinities within the estuary and to mitigate the formation of cyanobacteria blooms associated with stagnant conditions.

Lake Okeechobee Level:	12.20 ft. (Beneficial	Use Sub-Band)	Last week: 12. 42 ft.	
Lake Okeechobee Inflow:	619 cfs	Lake Okeech	obee Outflow:	3,009 cfs
Weekly Rainfall:	WP Franklin 1.79 "	Ortona 2.92 "	Moore Haven	1.18"
Salinity Beautiful Island:	0.7 – 1.3 psu (SCCF R	ECON Marker 18)	Previous wk	0.4 – 1.2 psu
Salinity Fort Myers:	3.5 – 6.1 psu (SCCF Y	acht Basin Surface)	Previous wk	2.9 – 6.2 psu
Salinity Shell Point:	18 – 32 psu (SCCF RE	ECON)	Previous wk:	18 - 33 psu



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Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days increased to an average of 858 cfs. During the past week, three days of lake discharge were provided for Ortona basin water supply. The first two days no discharge was made from S78, one day of lake discharge did provide flow out of S78. The last 4 days of the week no water was discharged from Lake Okeechobee at S77. Over the past 14 days approximately 5% of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77 and 0% to the St Lucie at S308.

Upstream of S79/Franklin Conditions: On 6/30/15 at the Olga Water Treatment plant, chlorides measured 70 mg/L, apparent color was 124 CU and turbidity measured 2.21 NTU. Light visible algae was present at the plant intake over the past week. The plant has been shut down since 5/27/15 due to a bloom of potentially toxic cyanobacteria.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. Dissolved oxygen at the Ft Myers RECON dipped to 1.5 mg/L and hypoxia occurred each day between 6/23/15 and 6/28/15.

Lower Estuary Condition: The salinity was in the optimal Range for oysters at Iona (15 psu on 6/29/15) and at Shell Point (25 psu weekly average).

McIntvre Creek & Tarpon Bay in J.N. "Ding" Darling NWR:

Salinity at McIntyre Creek ranged from 30.3 – 32.3 psu over the last week and CDOM ranged from 10.5 – 15.5 ase. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L three times during the last week ranging from 2 – 8 mg/L. Chlorophyll spiked above 11 µg/L five of the last seven days, ranging from 3 – 32 µg/L. Salinity at Tarpon Bay ranged from 29.9 – 32.3 psu and CDOM ranged from to 13.3 - 18 gse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of Cladophora algae continue to persist within the west impoundment of the Refuge.

Red Tide: On 6/26/15 FWC reported Karenia brevis, the Florida red tide organism, was detected in background concentrations last week in one sample collected alongshore of Lee County in southwest Florida. Additional samples collected throughout Florida did not contain red tide.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)	ACOE Daily Reports				
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
lona	2.4	72	1.4	1.47	6/23/2015	Tues	126	0	207
Causeway A	1.3	22.8	1.9	2.09	6/24/2015	Wed	536	0	203
Tarpon Bay	12	30.3	3.7	1.51	6/25/2015	Thur	1157	131	84
Target light pene	etration: CE -	Caloosaha	tchee estuar	v = 1 meter	6/26/2015	Fri	1212	291	0
· · · · · · · · · · · · · · · · · · ·	SCB	– San Carlo	s Bay = 2.2	meters	6/27/2015	Sat	1300	289	0
					6/28/2015	Sun	1261	292	0
		6/29/2015	Mon	415	147	0			
					7 Day	Avg	858	164	70



http://marinelab.sccf.org/research/fm salinity/

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: June 30 – July 6, 2015

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: Despite over 6 inches of rain upstream of S79, limited flow through S78 the past week decreased average flows to the Caloosahatchee estuary at S79 to **407 cfs**, less than half the previous weeks flow. Low lake levels continue to necessitate restricted lockages at S79 and S80. The Olga Water Treatment plant remains offline since 5/27/15 due to a potentially toxic cyanobacteria bloom. Algal blooms in the river and oxbows upstream of S79 persist since first occurring in late May.

USACE Action: On 7/2/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend flows at S79 sufficient to maintain appropriate ecologically based salinity targets within the estuary.

Lake Okeechobee Level:	12.15 ft. (Beneficial	Last week: 12.20 ft.	
Lake Okeechobee Inflow:	2,016 cfs	Lake Okeecho	obee Outflow: 1,722 cfs
Weekly Rainfall:	WP Franklin 1.19"	Ortona 3.18"	Moore Haven 2.12"
Salinity Beautiful Island:	0.7 – 1.2 psu (SCCF R	ECON Marker 18)	Previous wk: 0.7 – 1.3 psu
Salinity Fort Myers:	2.8 – 6.3 psu (SCCF Y	acht Basin Surface)	Previous wk: 3.5 – 6.1 psu
Salinity Shell Point:	18 – 33 psu (SCCF RE	CON)	Previous wk: 18 – 32 psu



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Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days decreased by more than half of last week's flows to an average of **407 cfs.** During the past week, water was discharged from Lake Okeechobee to S77 to maintain optimum canal levels in the Ortona basin for water supply. Only one day of flow was discharged out of S78. Over the past 14 days approximately **4%** of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77 and **0%** to the St Lucie at S308.



Upstream of S79/Franklin Conditions: On 7/7/15 at the Olga Water Treatment plant, chlorides measured **70 mg/L**, apparent color was **88 CU** and turbidity measured **2.05 NTU**. Noticeable algae in intake for the last week. The plant has been shut down since 5/27/15 due to a bloom of potentially toxic cyanobacteria. Blooms have been reported along the river and in the oxbows since late May.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: The salinity was in the optimal range for oysters at Iona (**15 psu** on 7/6/15) and at Shell Point (**26 psu** weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 30.3 – 32.1 psu over the last week and CDOM ranged from 9.5 – 17.5 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L three times during the last week ranging from 2.5 – 8.5 mg/L. Chlorophyll spiked above 11 μg/L two of the last seven days, ranging from 3 – 14.5 μg/L. Salinity at Tarpon Bay ranged from 30 – 33.5 psu and CDOM ranged from to 8.5 – 18.5 qse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Red Tide: On 7/2/15 FWC reported no *Karenia brevis*, the Florida red tide organism, detected in samples last week.

	Chlorophyll	CDOM	Turbidity 25% Iz			A	COE Daily R	eports	
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	depth (meters)	Date	Day	S79 Flow	S78 Flow	S77 Flow
		CE <70	CE < 18	CE = 1 m			(Cts)	(Cts)	(Cts)
Target Values	< 11	SCB <11	SCB < 5	SCB < 5 SCB = 2.2 m	6/30/2015	Tues	136	0	27
Colonial Br	1.5	105	1.4	1.23	7/1/2015	Wed	296	0	21
lona	1.4	57.7	2.0	1.57	7/2/2015	Thur	214	0	0
Causeway A	1.2	28.2	2.7	1.87	7/3/2015	Fri	312	0	44
Target light pene	etration: CE -	Caloosaha	tchee estuar	y = 1 meter	7/4/2015	Sat	0	0	111
	SCB	 San Carlo 	os Bay = 2.2	meters	7/5/2015	Sun	56	0	124
25% Iz : where z is 25% of surface I. I = irradiance, $z = depth$			7/6/2015	Mon	1834	79	36		
		7 Day	Avg	407	11	52			
						1			

Page 3 of 3 Algae bloom in Caloosahatchee Oxbow in Alva persisting since late May. Photos by River Spotter M.Buff 7/3/2015 6/4/2015 5/30/2015 5/29/2015

To: USACE Colonel Alan M. Dodd, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: July 7 - 13, 2015

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: Despite no flow through S77 the first three days of the week and no flows through S78 the last four days of the week, flows to the Caloosahatchee through S79 more than doubled to **1,169 cfs**. Low lake levels continue to necessitate restricted lockages at S79 and S80. The Olga Water Treatment plant remains offline since 5/27/15 due to the persistence of a potentially toxic cyanobacteria bloom.

USACE Action: On 7/10/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend flows at S79 sufficient to maintain appropriate ecologically based salinity targets within the estuary.

Lake Okeechobee Level:	12.05 ft. (Beneficial	Use Sub-Band)	Last week: 12.15 ft.
Lake Okeechobee Inflow:	2,176 cfs	Lake Okeeche	obee Outflow: 2,305 cfs
Weekly Rainfall:	WP Franklin 0.14"	Ortona 0.05 "	Moore Haven 2.17"
Salinity Beautiful Island:	ND (SCCF RECON Ma	rker 18)	Previous wk: 0.7 – 1.2 psu
Salinity Fort Myers:	2.6 – 4.8 psu (SCCF Ya	acht Basin Surface)	Previous wk: 2.8 – 6.3 psu
Salinity Shell Point:	17 – 32 psu (SCCF RE	CON)	Previous wk: 18 – 33 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days more than doubled over last week's flows to an average of **1,169 cfs.** During the past week, water was not discharged from Lake Okeechobee to S77 for the first three days of the week. S78 did not discharge water to S79 for the last four days of the week. Over the past 14 days approximately **4%** of total Lake Okeechobee outflows were delivered to the Caloosahatchee at S77 and **0%** to the St Lucie at S308.



Upstream of S79/Franklin Conditions: On 7/14/15 at the Olga Water Treatment plant, chlorides measured **69 mg/L**, apparent color was **93 CU** and turbidity measured **0.84 NTU.** A slight tinge of algae was present in the plant intake over the past week. The plant has been shut down since 5/27/15 due to the persistence of a bloom of potentially toxic cyanobacteria.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. Dense benthic algae is present from Beautiful Island to North Fort Myers in the shallows along the north side of the river.

Lower Estuary Condition: The salinity was in the optimal range for oysters at Iona (**14 psu** on 7/13/15) and at Shell Point (**25 psu** weekly average).

Beach Conditions: Sanibel and Fort Myers Beach report extraordinary water clarity for July. The past week some sea Grass blades washed up along Sanibel beaches and minor accumulations of brown and green drift algae were observed near the Fort Myers Beach Pier.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 30.3 - 31.7 psu over the last week and CDOM ranged from 9.8 - 17.5 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L two times during the last week ranging from 2.8 - 8.3 mg/L. Chlorophyll spiked above 11μ g/L one of the last seven days, ranging from $3.5 - 12.3 \mu$ g/L. Salinity at Tarpon Bay ranged from 30.1 - 32.7 psu and CDOM ranged from to 9.6 - 17.4 qse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.

		1		25% 17		A	COE Daily Re	eports	
Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	depth (meters)	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	< 11	CE <70	CE < 18	CE < 18 CE = 1 m	7/7/2015	Tues	2438	146	0
		300 <11	368 < 3	3CB = 2.2 m	7/8/2015	Wed	2016	147	0
lona	1.1	101	0.9	1.29	7/0/2015	Thur	904	73	0
Causeway A	2.3	23.8	3.1	1.84	1/9/2013				400
Tarpon Bay	1.5	31.4	1.3	2.03	7/10/2015	Fri	1248	0	100
Target light pend	stration: CE		tchee estuar	v – 1 meter	7/11/2015	Sat	449	0	220
	SCB	– San Carlo	Bay = 2.2	meters	7/12/2015	Sun	828	0	56
25% Iz : where z is 25% of surface I . I = irradiance, $z = depth$			7/13/2015	Mon	299	0	88		
			= depth	7 Day	Avg	1169	52	66	



Unusually clear water along the Sanibel Causeway beaches for July. Photo: 7/14/15. Photo: J. Evans



Low rainfall and limited flows provide Fort Myers Beach some of the highest July water clarity in 7 years. Photo: 7/14/15 Photo: K. Laakkonen

Extraordinarily rare: an American Flamingo in Estero Bay on 7/14/15. Photo K. Laakkonen



To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: July 14 - 20, 2015

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: Caloosahatchee flow to the estuary at S79 averaged **1,233 cfs** the past week, providing a beneficial salinity range in the upper estuary. The majority of water originated from rainfall in the watershed.

USACE Action: On 7/17/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend flows at S79 sufficient to maintain appropriate ecologically based salinity targets within the estuary.

Lake Okeechobee Level:	11.99 ft. (Beneficia	I Use Sub-Band)	Last week: 12.05 ft.
Lake Okeechobee Inflow:	2,260 cfs	Lake Okeech	obee Outflow: 770 cfs
Weekly Rainfall:	WP Franklin 2.44"	Ortona 2.14"	Moore Haven 2.87"
Salinity Beautiful Island:	offline due to a lightn	ing strike	
Salinity Fort Myers:	1.8 – 5.6 psu (SCCF Y	'acht Basin Surface)	Previous wk: 2.6 – 4.8 psu
Salinity Shell Point:	17 – 32 psu (SCCF R	RECON)	Previous wk: 17 – 32 psu



Page 2 of 3

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days averaged of **1,233 cfs.** During the past week, water was not discharged from Lake Okeechobee to S77 the last 4 days of the week and S78 did not discharge water west the first four days of the week. Over the past 14 days approximately **96.4%** of total Lake Okeechobee outflows were delivered south for EAA water supply with the remainder, **3.6%** directed to the Caloosahatchee at S77.



Upstream of S79/Franklin Conditions: On 7/21/15 at the Olga Water Treatment plant, chlorides measured **70 mg/L**, apparent color was **100 CU** and turbidity measured **0.65 NTU**. No visible algae was present in the plant intake over the past week. The plant remains shut down since 5/27/15.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: The salinity was in the optimal range for oysters at Iona (14 psu on 7/19/15) and at Shell Point (24 psu weekly average). A diatom bloom (3 million cells/L) was present at the Causeway on 7/19/15.

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Salinity at McIntyre Creek ranged from 28 – 31.57 psu over the last week and CDOM ranged from 10 – 19 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L seven times during the last week ranging from 2 – 7.5 mg/L. Chlorophyll spiked above 11 µg/L three of the last seven days, ranging from 4 – 16 µg/L. Salinity at Tarpon Bay ranged from 29 – 33.5 psu and CDOM ranged from to 9 – 18 qse. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae continue to persist within the west impoundment of the Refuge.

Oysters: July sampling in the Caloosahatchee by FGCU reported disease prevalence of *Perkinsus marinus* ranged from **92.85 - 93.33**. Disease intensity of *P. marinus* ranged from **0.93 - 1.14**. Scale 0 = no infection, 1 = low, 3 = medium, 5 = high. Larval recruitment ranged from **1.41 - 14.36** spat per shell in the estuary.

		1				A	COE Daily Re	eports	
Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	a 11	CE <70	CE < 18	CE < 18 CE = 1 m	7/14/2015	Tues	381	0	216
Target values	× 11	SCB <11	SCB < 5	SCB < 5 SCB = 2.2 m		Wed	238	0	188
Colonial Br.	5.5	118	1.1	1.13	7/16/2015	Thur	761	0	52
lona	2.3	98.2	1.1	1.29	7/17/2015	Fri	1179	0	0
Causeway A	15.4	26.4	2.2	1.64	7/18/2015	Sat	1917	310	0
Target light pene	etration: CE –	Caloosaha	tchee estuar	y = 1 meter	7/19/2015	Sun	2329	160	0
SCB – San Canos Bay = 2.2 meters				meters	7/20/2015	Mon	1827	0	0
25% Iz : where z is 25% of surface I. I = irradiance, $z = depth$			7 Day	Avg	1233	67	65		





Clear water in the Caloosahatchee Oxbow on July 16, 2015 upriver of the Alva Bridge where cyanobacteria blooms persisted since May 27, 2015. Photo by River Spotter M. Buff



To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: July 21 - 27, 2015

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: Caloosahatchee flow to the estuary at S79 averaged **1,638 cfs** the past week. The majority of water originated from rainfall in the watershed west of S78.

USACE Action: On 7/24/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend flows at S79 support ecologically based salinity targets within the estuary.

Lake Okeechobee Level:	12.13 ft. (Beneficia	Last week: 11.99 ft.	
Lake Okeechobee Inflow:	1,881 cfs	Lake Okeech	obee Outflow: 197 cfs
Weekly Rainfall:	WP Franklin 4.51"	Ortona 4.12"	Moore Haven 2.50"
Salinity Fort Myers:	0.5 – 3.5 psu (SCCF)	(acht Basin Surface)	Previous wk: 1.8 – 5.6 psu
Salinity Shell Point:	16 – 31 psu (SCCF F	RECON)	Previous wk: 17 – 32 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days averaged of **1,638 cfs.** During the past week, water was not discharged from S78 to the west the first five days of the week. Over the past 14 days approximately **96%** of total Lake Okeechobee outflows were delivered south for EAA water supply with the remainder, **4%**, directed to the Caloosahatchee at S77.



Upstream of S79/Franklin Conditions: On 7/28/15 at the Olga Water Treatment plant, chlorides measured **66 mg/L**, apparent color was **91 CU** and turbidity measured **0.68 NTU**. No visible algae was present in the plant intake over the past week. The plant remains shut down for servicing.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (**10 psu** on 7/27/15) and within the optimal range at Shell Point (**24 psu** weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Salinity at McIntyre Creek ranged from 24 - 32.5 psu over the last week and CDOM ranged from 9.8 - 19.5 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L 12 times during the last week ranging from 2 - 7.5 mg/L. Chlorophyll spiked above 11 µg/L two of the last seven days, ranging from 2.8 - 11.5 µg/L. Salinity at Tarpon Bay ranged from 26.5 - 32.5 psu and CDOM ranged from to 13 - 27 qse. Chlorophyll spiked above 11 µg/L one of the last seven days, ranging from 3 - 14 µg/L. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae within the west impoundment of the Refuge are dissipating.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)	Date	Т
Target Values	< 11	CE <70 SCB	CE < 18 SCB < 5	CE = 1 m SCB = 2.2	7/21/2015	
Colonial Br.	2.9	160	1.8	0.93	7/22/2015	_
lona	2.1	118	1.5	1.14	7/23/2015	
Causeway A	1.4	30.3	3.6	1.71	7/24/2015	
Target light per	netration: CE -	Caloosaha	tchee estuary	v = 1 meter	7/25/2015	
	SCB	 San Carlo 	s Bay = 2.2 r	neters	7/26/2015	
25% Iz: where	z is 25% of sur	face I. I =	irradiance. z :	= depth	7/27/2015	
		••••			7 Dav	T

ACOE Daily Reports								
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)				
7/21/2015	Tues	1427	0	0				
7/22/2015	Wed	775	0	33				
7/23/2015	Thur	590	0	53				
7/24/2015	Fri	801	0	50				
7/25/2015	Sat	1358	0	15				
7/26/2015	Sun	2767	414	0				
7/27/2015	Mon	3752	582	0				
7 Day	Avg	1638	142	21				





Widgeon grass wrack-line near Midpoint Bridge 7/27/15. Photo SCCF



Beach erosion caused by the streaming low pressure system created a 5 foot escarpment at the Silver Key Clam Bayou beach on Sanibel on 7/26/15. Photo SCCF

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: July 28 - August 3, 2015

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: Caloosahatchee flow to the estuary at S79 increased to an average of **1,833 cfs** over the past week. The majority of water originated from rainfall in the watershed west of S77.

USACE Action: On 7/31/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend flows at S79 adequate to support ecologically based salinity targets within the estuary.

Lake Okeechobee Level:	12.28 ft. (Beneficia	Last week: 12.13 ft.	
Lake Okeechobee Inflow:	3,284 cfs	Lake Okeeche	obee Outflow: -162 cfs
Weekly Rainfall:	WP Franklin 0.73 "	Ortona 1.96 "	Moore Haven 0.56"
Salinity Fort Myers:	0.5 – 2.3 psu (SCCF)	Yacht Basin Surface)	Previous wk: 0.5 – 3.5 psu
Salinity Shell Point:	9.1 – 29 psu (SCCF I	RECON)	Previous wk: 16 – 31 psu


Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days averaged of **1,833 cfs.** No water was discharged from S77 the last five days of the week. Over the past 14 days approximately **95%** of total Lake Okeechobee outflows were delivered south for EAA water supply. A total of **5%** was directed to the Caloosahatchee at S77.

Upstream of S79/Franklin Conditions: On 8/4/15 at the Olga Water Treatment plant, chlorides measured 67 mg/L, apparent color was 111 CU and turbidity measured 1.02 NTU. A small amount of algae was visible from the plant over the past week. The plant remains shut down.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are too low for oysters upstream of the Midpoint Bridge. A phytoplankton bloom was present at the Midpoint Bridge on 8/2/15.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (**7.5 psu** on 8/2/15) and within the optimal range at Shell Point (**20 psu** weekly average).



McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week salinity at McIntyre Creek ranged from 26 - 30.5 psu and CDOM ranged from 10.5 - 24 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L 9 times during the last week ranging from 1.5 - 6.5 mg/L. Chlorophyll ranged from 3 – 11 μg/L. Salinity at Tarpon Bay ranged from 26 – 33.5 psu and CDOM ranged from to 12 – 31 qse. Chlorophyll spiked above 11 μg/L one of the last seven days, ranging from 3 – 11.5 μg/L.

Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae within the west impoundment of the Refuge are dissipating.

Calescale takes Chlorophyll C		CDOM	Turbidity	ty 25% Iz ACOE Daily Repor			ports		
Stations	(µg/L)	(qse)	(NTU)	(meters)	Date	Day	S79 Flow	S78 Flow	S77 Flow
		CE <70		CE = 1 m			(cts)	(cts)	(cts)
Target Values	< 11	SCB	CE < 18 SCB < 5	SCB = 2.2	7/28/2015	Tues	1801	529	57
		<11	000 < 0	m	7/20/2015	Wed	2268	231	35
Colonial Br.	15.4	157	4.5	0.78	1123/2013	T 1	4040	0.40	0
lona	10.1	143	2.3	0.93	7/30/2015	Inur	1842	243	U
Causeway A	6.3	26.0	3.7	1.65	7/31/2015	Fri	1886	504	0
Target light per	etration: CE -	Caloosahat	chee estuarv	= 1 meter	8/1/2015	Sat	1704	379	0
SCB – San Carlos Bay = 2.2 meters			8/2/2015	Sun	1784	292	0		
25% Iz : where z is 25% of surface I . I = irradiance, $z = depth$				8/3/2015	Mon	1549	295	0	
				7 Day	Avg	1833	353	13	

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 4 - 10, 2015

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: Caloosahatchee flow to the estuary at S79 decreased by 50% compared to last week to an average of **981 cfs**. **The lower estuary salinity was below the optimal range for oysters at lona.** The majority of water flowing through S79 originated from rainfall in the watershed west of S77.

USACE Action: On 8/7/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend flows at S79 adequate to support ecologically based salinity targets within the estuary.

Lake Okeechobee Level:	12.27 ft. (Benefi	cial Use Sub-Band)	Last week: 12. 28 ft.
Lake Okeechobee Inflow:	1,993 cfs	Lake Okeeche	obee Outflow: 425 cfs
Weekly Rainfall:	WP Franklin 1.01 "	' Ortona 1.32 "	Moore Haven 0.18"
Salinity Fort Myers:	0.3 – 0.5 psu (SCC	CF Yacht Basin Surface)	Previous wk: 0.5 – 2.3 psu
Salinity Shell Point:	9.3 – 29 psu (SCC	F RECON)	Previous wk: 9.1 – 29 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days were 50% less than last week's flow averaging 981 cfs. No water was discharged west from S78 three of the past seven days. Over the past 14 days approximately 78% of total Lake Okeechobee outflows were delivered south for EAA water supply. A total of 22% was directed to the Caloosahatchee at S77.



Upstream of S79/Franklin Conditions: On 8/11/15 at the Olga Water Treatment plant, chlorides measured **62 mg/L**, apparent color was **101 CU** and turbidity measured **0.94 NTU**. No algae was visible from the plant over the past week. The plant remains offline.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are too low for oysters upstream of the Midpoint Bridge. **Phytoplankton blooms were present at Fort Myers (cyanobacteria and flagellates) and at the Midpoint Bridge (cyanobacteria and Skeletonema sp) on 8/7/15.**

Since May, 2015 SCCF Marine Lab staff have planted over 3,000 shoots of tape grass on the north side of the upper estuary between Beautiful Island and Hancock Creek. Despite grazing, macroalgae overgrowth, and high CDOM levels transplants remain and are producing new shoots.

Lower Estuary Condition: The salinity was below the optimal range for oysters at Iona (8.5 psu on 8/7/15) and within the optimal range at Shell Point (22 psu weekly average). Large, live oysters were present at Iona.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week salinity at McIntyre Creek ranged from 25.7 - 28.5 psu and CDOM ranged from 13.2 – 17.4 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L 7 times during the last week ranging from 1 - 8 mg/L. Chlorophyll ranged from 2.3 – 6.2 µg/L. Salinity at Tarpon Bay ranged from 25.2 – 31 psu and CDOM ranged from to 14 – 37 qse. Chlorophyll ranged from 2.4 – 95 µg/L. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae within the west impoundment of the Refuge are dissipating. Large wracks of floating seagrasses have accumulated along the shoreline of the east impoundment.

Calaaaahatahaa	Chlorophyll	CDOM	Turbidity 25% Iz			A	ACOE Daily Reports		
Stations	(µg/L)	(qse)	(NTU)	(meters)	Date	Day	S79 Flow	S78 Flow	S77 Flow
				CE = 1 m			(cts)	(cts)	(cts)
Target Values	< 11	CE <70	CE < 18	SCB = 2.2	8/4/2015	Tues	1563	297	0
		000 <11	000 < 0	m	8/5/2015	Wed	1109	231	140
Ft. Myers	16.9	216	3.0	0.68		Thur	1040	12	1/9
Colonial Br.	15.1	190	4.5	0.71	8/6/2015	Thur	1040	43	140
Iona	7.2	49.0	1.6	1.61	8/7/2015	Fri	777	0	40
Target light per	Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters				8/8/2015	Sat	596	0	118
					8/9/2015	Sun	635	0	122
25% Iz : where z is 25% of surface I . I = irradiance, $z = depth$				8/10/2015	Mon	1152	180	32	
					7 Day	Avg	981	107	85

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 11 - 17, 2015

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: Caloosahatchee flow to the estuary at S79 was more than double compared to last week averaging **1,991 cfs. The lower estuary salinity remains below the optimal range for oysters at lona.** No water was discharged from the Lake to the Caloosahatchee, all flows originated from the watershed west of S77, the majority from the central watershed basin.

USACE Action: On 8/14/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We request the SFWMD engage all emergency and dispersed water storage capacity in the Caloosahatchee watershed to reduce the volumes and alter the timing of water deliveries specifically from the central watershed between S78 and S79.

Lake Okeechobee Level:	12.49 ft. (Beneficial Use Sub-Band)		Last week: 12. 27 ft.	
Lake Okeechobee Inflow:	5,367 cfs	Lake Okeecho	bbee Outflow: 23 cfs	
Weekly Rainfall:	WP Franklin 4.81"	Ortona 5.11"	Moore Haven 1.41"	
Salinity Fort Myers:	0.3 – 0.7 psu (SCCF Y	acht Basin Surface)	Previous wk: 0.3 – 0.5 psu	
Salinity Shell Point:	11 – 30 psu (SCCF R	ECON)	Previous wk: 9.3 – 29 psu	



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 over the past seven days more than doubled over the previous week averaging **1,991 cfs.** No water was discharged from Lake Okeechobee through S77. Over the past 14 days approximately **71%** of total Lake Okeechobee outflows were delivered south for EAA water supply. A total of **29%** was directed to the Caloosahatchee at S77.





Grazed and ungrazed tapegrass shoots at Old Bridge Rd north shore of the Caloosahatchee on 8/13/15. Photo SCCF

Upstream of S79/Franklin Conditions: On 8/18/15 at the Olga Water Treatment plant, chlorides measured **62 mg/L**, apparent color was **131 CU** and turbidity measured **0.65 NTU**. No algae was visible from the plant over the past week. The plant remains offline.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are **too low for** oysters upstream of the Midpoint Bridge. Water column chlorophyll was elevated at the Midpoint Bridge. *Skeletonema* sp. was the dominant phytoplankton identified on 8/13/15.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (8.3 psu on 8/16/15) and within the optimal range at Shell Point (21 psu weekly average). Large, live oysters were present at Iona.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week salinity at McIntyre Creek ranged from 25.7 - 28.1 psu and CDOM ranged from 13 - 17 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L 7 times ranging from 1.1 - 7.3 mg/L. Chlorophyll ranged from 2.2 - 4.2 µg/L. Salinity at Tarpon Bay ranged from 26.4 - 31.5 psu and CDOM ranged from to 12 - 36 qse. Chlorophyll ranged from 2.4 - 13.8 µg/L. Salinity at both locations was below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu). Mats of *Cladophora* algae within the west impoundment of the Refuge are dissipating. Large wracks of floating seagrasses have accumulated along the shoreline of the east impoundment.

Oysters: Caloosahatchee oyster sampling in August by FGCU reported disease prevalence of *Perkinsus marinus* ranged from **71.43 - 100**. Disease intensity of *P. marinus* ranged from **0.79 - 1.00**. Scale 0 = no infection, 1 = low, 3 = medium, 5 = high. Larval recruitment decreased from last month to a range of **0.17 - 4.61** spat per shell in the estuary.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m		
Ft. Myers	7.8	227	2.0	0.71		
Colonial Br.	10.0	178	3.0	0.79		
Causeway A	6.1	34	1.6	1.82		
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters						
25% Iz: where	z is 25% of sur	face I. I = ir	radiance. z =	depth		

ACOE Daily Reports						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
8/11/2015	Tues	587	201	0		
8/12/2015	Wed	802	144	0		
8/13/2015	Thur	654	145	0		
8/14/2015	Fri	665	146	0		
8/15/2015	Sat	1957	356	0		
8/16/2015	Sun	3671	807	0		
8/17/2015	Mon	5600	567	0		
7 Day	Avg	1,991	338	0		

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 18 - 24, 2015

This report provides a weekly 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 watershed run-off during the past week more than doubled Caloosahatchee flow to the estuary at S79 to an average of 4,022 cfs. The salinity is in the harmful range for oysters in the lower estuary at Iona. The majority of inflow originated from the central watershed basin west of S78.

USACE Action: On 8/21/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We request the SFWMD utilize all emergency and dispersed water storage capacity in the Caloosahatchee watershed to reduce the volumes and alter the timing of water deliveries, specifically from the central watershed between S78 and S79.

Lake Okeechobee Level:	12.63 ft. (Base Flow	vSub-Band)	Last week: 12.49 ft.		
Lake Okeechobee Inflow:	5,218 cfs	Lake Okeecho	obee Outflow: - 4 cfs		
Weekly Rainfall:	WP Franklin 0.94 "	Ortona 0.36 "	Moore Haven 0.63"		
Salinity Fort Myers:	0.2 - 0.4 psu (SCCF Ya	cht Basin Surface)	Previous wk: 0.3 – 0.7 psu		
Salinity Shell Point:	5.0 - 30 psu (SCCF RE	CON)	Previous wk: 11 – 30 psu		



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days more than doubled compared to the previous week to an average of 4,022 cfs dropping salinity to the harmful level for oysters in Iona. Over the past 14 days approximately 88% of total Lake Okeechobee outflows were delivered to the L8 basin and south for EAA water supply. A total of 12% was directed to the Caloosahatchee at S77.





Upstream of S79/Franklin Conditions: On 8/25/15 at the Olga Water Treatment plant, chlorides measured **56 mg/L**, apparent color was **159 CU** and turbidity measured **1.23 NTU.** No algae was visible from the plant over the past week. The plant remains offline for maintenance.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are too low for oysters upstream of Iona. Water column chlorophyll was elevated at Iona due to a *Skeletonema* sp. (dominant) diatom bloom on 8/23/15.

Lower Estuary Condition: Surface salinity has been in the harmful range for oysters at lona for 5 days, since 8/19/15. Oyster mortality is expected if the salinities remain this low for another week. Low salinity effects on oysters are worse at higher temperatures (Heilmayer et al. 2008). They stop feeding at 3 psu or higher depending on temperature (Loosanoff 1953), and young oysters died within 2 weeks at salinities of 2.5 (100%) and 5 psu (50%) (Chanley 1958). Water column chlorophyll was elevated at the Causeway due to a diatom bloom (*Skeletonema* sp. dominant) on 8/23/15. This is the first Shell Point bloom this year. Dissolved oxygen is trending down, but not hypoxic.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week salinity at McIntyre Creek ranged from 22.5 – 28 psu due to recent high flows. CDOM ranged from 13.5 - 23 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L 8 times, ranging from 2 – 8.5 mg/L. Chlorophyll ranged from 2.3– 6.3 µg/L. Salinity at Tarpon Bay ranged from 22 – 29.5 psu and CDOM ranged from to 21 - 39 qse. Chlorophyll ranged from 2.8 – 9 µg/L. Salinity at both locations was below the preferred range for shoal grass and turtle grass (30 to 40 psu). Large wracks of floating seagrasses have accumulated along the shoreline of the east impoundment.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m		
Ft. Myers	4.2	225	1.8	0.73		
Iona	26.0	211	2.9	0.66		
Causeway A	17.0	31.0	3.2	1.46		
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters						

ACOE Daily Reports						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
8/18/2015	Tues	3963	998	0		
8/19/2015	Wed	4014	1269	0		
8/20/2015	Thur	3455	397	160		
8/21/2015	Fri	5334	697	0		
8/22/2015	Sat	4577	358	0		
8/23/2015	Sun	3878	267	0		
8/24/2015	Mon	2932	148	0		
7 Day	Avg	4022	590	23		

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Dan Delisi, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: August 25 - 31, 2015

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 watershed run-off during the past week delivered an average of **2,902 cfs** to the estuary at S79. **The salinity is in the harmful range for oysters in the lower estuary at lona**.

USACE Action: On 8/28/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We request the SFWMD utilize all emergency and dispersed water storage capacity in the Caloosahatchee watershed to reduce the volumes and alter the timing of water deliveries, specifically from the central watershed between S78 and S79.

Lake Okeechobee Level:	13.02 ft. (Base Flow	v Sub-Band)	Last week: 12.63 ft.
Lake Okeechobee Inflow:	10,605 cfs	Lake Okeecho	bbee Outflow: - 19 cfs
Weekly Rainfall:	WP Franklin 3.20"	Ortona 2.34"	Moore Haven 4.07"
Salinity Fort Myers:	0.2 - 0.2 psu (SCCF Ya	acht Basin Surface)	Previous wk: 0.2 - 0.4 psu
Salinity Shell Point:	3.8 – 29 psu (SCCF R	ECON)	Previous wk: 5.0 - 30 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 2,902 cfs. Over the past 14 days approximately 68% of total Lake Okeechobee outflows were delivered to the L8 basin and 32% was directed to the Caloosahatchee at S77. No water was directed south for EAA water supply.



Upstream of S79/Franklin Conditions: On 9/1/15 at the Olga Water Treatment plant, chlorides measured **46 mg/L**, apparent color was **189 CU** and turbidity measured **0.86 NTU.** No algae was visible from the plant over the past week. The plant remains offline for maintenance.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are **too low for oysters upstream of the Cape Coral Bridge**.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (6.1 psu on 8/31/15, live oysters were present) and within the optimal range at Shell Point (17 psu weekly average). Water column chlorophyll was elevated at the Causeway (*Skeletonema* sp. dominant) on 8/31/15.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week salinity at McIntyre Creek ranged from 22.5 – 27.3 psu due to recent high flows. CDOM ranged from 18 – 26 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L 11 times ranging from 1.8 – 7 mg/L. Chlorophyll ranged from 3.5 – 8.8 µg/L. Salinity at Tarpon Bay ranged from 21.5 – 32 psu and CDOM ranged from to 15 - 45 qse. Chlorophyll ranged from 3.5 – 9.5 µg/L. Salinity at both locations was below the preferred range for shoal grass and turtle grass (30 to 40 psu). Large wracks of floating seagrasses have accumulated along the shoreline of the east impoundment.

Caloosahatchee Stations	Chlorophyll CDOM (µg/L) (qse)		Turbidity (NTU)	25% Iz depth (meters)		
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m		
Colonial Br	4.0	210	2.9	0.74		
lona	4.5	214	2.6	0.74		
Causeway A	A 10.7 90.9 2.8 1.1					
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters						
25% Iz: where z is 25% of surface $I = I$ = irradiance z = denth						

ACOE Daily Reports						
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
8/25/2015	Tues	864	0	0		
8/26/2015	Wed	2385	257	0		
8/27/2015	Thur	2610	447	0		
8/28/2015	Fri	3344	987	0		
8/29/2015	Sat	3615	1294	0		
8/30/2015	Sun	4053	1495	0		
8/31/2015	Mon	3440	1282	0		
7 Day	Avg	2902	823	0		

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: September 1 - 7, 2015

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 watershed run-off during the past week delivered an average of **2,945 cfs** to the estuary at S79.

USACE Action: On 9/4/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We request the SFWMD utilize all emergency and dispersed water storage capacity in the Caloosahatchee watershed to reduce the volumes and alter the timing of water deliveries, specifically from the central watershed between S78 and S79.

Lake Okeechobee Level:	13.40 ft. (Base Flow	/ Sub-Band)	Last week: 13.02 ft.
Lake Okeechobee Inflow:	13,052 cfs	Lake Okeed	chobee Outflow: 113 cfs
Weekly Rainfall:	WP Franklin 1.35"	Ortona 0.41 "	Moore Haven 1.38"
Salinity Fort Myers:	0.2 psu (SCCF Yacht B	asin Surface) Pre	vious wk: 0.2 - 0.2 psu
Salinity Shell Point:	6.1 – 28 psu (SCCF RE	CON) Pre	vious wk: 3.8 – 29 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 2,945 cfs. Over the past 14 days approximately 53% of total Lake Okeechobee outflows were delivered to the L8 basin, 44% was sent to S351 for EAA water supply and 3% the Caloosahatchee at S77.



Upstream of S79/Franklin Conditions: On 9/8/15 at the Olga Water Treatment plant, chlorides measured **54 mg/L**, apparent color was **189 CU** and turbidity measured **0.67 NTU**. No algae was visible from the plant over the past week. The plant remains offline for maintenance.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are **too low for oysters upstream of the Cape Coral Bridge**.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (5.7 psu on 9/6/15) and within the optimal range at Shell Point (17 psu weekly average). Water column chlorophyll was elevated at the Causeway on 9/6/15. Stratification and hypoxia were detected in shallow water (1.3 m) at Iona on 9/7/15. Hypoxia can cause mortality of benthic infauna.

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: Over the past week salinity at McIntyre Creek ranged from 23.1 – 27.5 psu due to recent high flows. CDOM ranged from 14.5 - 26 qse. Dissolved oxygen at McIntyre Creek dipped below 3 mg/L 3 times, ranging from 1.8 - 8.4 mg/L. Chlorophyll ranged from 3.7 - 12.2 µg/L. Salinity at Tarpon Bay ranged from 22.0 – 32.0 psu and CDOM ranged from to 15 - 37. qse. Chlorophyll ranged from 4.0 - 22.5 µg/L. Salinity at both locations was below the preferred range for shoal grass and turtle grass (30 to 40 psu). Large wracks of floating seagrasses have accumulated along the shoreline of the east impoundment and algal mats have washed up in the western end of the Refuge near Kesson Bayou.

Caloosahatchee Stations	Chlorophyll (µg/L)	CDOM (qse)	Turbidity (NTU)	25% Iz depth (meters)			
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2 m			
Colonial Br	5.6	195	2.0	0.79			
lona	3.9	204	2.5	0.76			
Causeway A	15.2	106	4.1	0.97			
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters							

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

	ACOE Daily Reports								
Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)					
9/1/2015	Tues	4310	1274	0					
9/2/2015	Wed	3694	1058	0					
9/3/2015	Thur	3024	852	0					
9/4/2015	Fri	2345	690	0					
9/5/2015	Sat	2525	640	0					
9/6/2015	Sun	2344	590	0					
9/7/2015	Mon	2371	319	0					
7 Day	Avg	2945	775	0					

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: September 8 - 14, 2015

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: Watershed run-off during the past week delivered an average of 2,152 cfs to the estuary at S79. There continue to be no discharges from Lake Okeechobee. In the lower estuary salinity is below the optimal range for oysters at Iona and light levels were too low for seagrasses at their lower depth of occurrence.

USACE Action: On 9/11/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We request the SFWMD utilize all emergency and dispersed water storage capacity in the Caloosahatchee watershed to reduce the volumes and alter the timing of water deliveries, specifically from the central watershed between S78 and S79.

Lake Okeechobee Level:	13.81 ft. (Base Flow	v Sub-Band)	Last week: 13.40 ft.
Lake Okeechobee Inflow:	12,636 cfs	Lake Okeech	obee Outflow: 165 cfs
Weekly Rainfall:	WP Franklin 4.26"	Ortona 2.40 "	Moore Haven 0.50"
Salinity Fort Myers:	0.2 - 0.2 psu (SCCF Y	acht Basin Surface)	Previous wk: 0.2 - 0.2 psu
Salinity Shell Point:	6.2 – 28 psu (SCCF RE	CON)	Previous wk: 6.1 – 28 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 2,152 cfs. Over the past 14 days approximately 80% of total Lake Okeechobee outflows were delivered to the L8 basin, 18% was sent to S351 for EAA water supply and 2% to the Caloosahatchee at S77.



Upstream of S79/Franklin Conditions: On 9/15/15 at the Olga Water Treatment plant, chlorides measured **56 mg/L**, apparent color was **122 CU** and turbidity measured **0.78 NTU.** No algae was visible at the plant intake over the past week. The plant remains offline for maintenance.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are **too low for oysters upstream of the Cape Coral Bridge**.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (4.8 psu on 9/14/15) and within the optimal range at Shell Point (19 psu weekly average). Water column chlorophyll was elevated at the Causeway on 9/14/15. Light levels were too low for seagrasses at their lower depth of occurrence.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 24 - 26 psu. CDOM readings ranged from 18 - 23.5 qse. Dissolved oxygen in McIntyre Creek dipped below 3 mg/L 5 times, ranging from 1.5 - 7.5 mg/L. Chlorophyll readings ranged from 3 - 5 ug/L. Salinity at Tarpon Bay ranged from 24 - 31 psu, and CDOM ranged from 17 - 35 qse. Dissolved oxygen ranged steady from 4 - 8 mg/L, and chlorophyll readings ranged from 3.5 - 10 ug/L. Salinity at both locations remains below the preferred range for shoal grass and turtle grass (30 to 40 psu).

Oysters: Caloosahatchee oyster sampling in September by FGCU, reported disease prevalence of *Perkinsus marinus* was **100%** for all sites. Disease intensity of *P. marinus* ranged from **1.07 to 1.33**. Scale 0 = no infection, 1 = low, 3 = medium, 5 = high. Larval recruitment ranged from **1.00 - 28.42** spat per shell in the estuary. Maximum recruitment values were from the stringers at Bird Island.

	Chlanamhadl	CDOM	M Turbidity 25% Iz			eports			
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	depth (meters)	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	
Target Values	c 11	CE <70	CE < 18	CE = 1 m SCB = 2 2	9/8/2015	Tues	2090	221	ľ
ranget valuee		SCB <11	SCB < 5	m	9/9/2015	Wed	2384	319	Ĩ
Colonial Br	6.3	240	2.8	0.67	9/10/2015	Thur	1614	320	
lona	6.6	225	2.0	0.72	9/11/2015	Fri	2177	315	ľ
Causeway A	10.4	123	3.4	0.96	9/12/2015	Sat	1788	322	ľ
Target light per	netration: CE -	Caloosahato	hee estuary	= 1 meter	9/13/2015	Sun	2498	320	
	000		, Day – 2.2 m		9/14/2015	Mon	2515	431	Ī
25% Iz: where	z is 25% of sur	face I. I = ir	radiance, z =	depth	7 Day	Avg	2152	321	Ī

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: September 15 - 21, 2015

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: The highest flows of the year 4,985 cfs, almost twice the harm threshold, were delivered the past week entirely from inland watershed run-off to the estuary at S79. There continue to be no discharges from Lake Okeechobee. In the lower estuary salinity was in the lethal range for oysters and shoal grass at lona where salinities have gone below 5 psu for a month. Light levels in the lower estuary are too low for seagrass below 1 meter. The MFL recovery target is 2.2 meters in San Carlos Bay.

USACE Action: On 9/18/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We request the SFWMD utilize all emergency and dispersed water storage capacity in the Caloosahatchee watershed to reduce the volumes and alter the timing of water deliveries, specifically from the central watershed between S78 and S79.

Lake Okeechobee Level:	14.41 ft. (Low Sub-I	Band) Last w	eek: 13.81 ft.
Lake Okeechobee Inflow:	12,544 cfs	Lake Okeecho	bbee Outflow: 150 cfs
Weekly Rainfall:	WP Franklin 0.93"	Ortona 1.87 "	Moore Haven 2.20"
Salinity Fort Myers:	0.2 - 0.2 psu (SCCF Ya	acht Basin Surface)	Previous wk: 0.2 - 0.2 psu
Salinity Shell Point:	3.2 – 28 psu (SCCF RE	CON)	Previous wk: 6.2 – 28 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 4,985 cfs. Over the past 14 days 98 % of total Lake Okeechobee outflows were delivered to the L8 basin, no water was sent south for EAA water supply and 2% was directed to the Caloosahatchee at S77.





Shoalgrass rafting in fresh water at Iona on 9/21/15. Photo SCCF Marine Lab

Upstream of S79/Franklin Conditions: On 9/22/15 at the Olga Water Treatment plant, chlorides measured **54 mg/L**, apparent color was **222 CU** and turbidity measured **1.88 NTU.** No algae was visible at the plant intake over the past week. The plant remains offline for maintenance.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are **too low for oysters upstream of Iona**.

Lower Estuary Condition: Salinity was in the lethal range for oysters and shoal grass at Iona (1.4 psu on 9/21/15) and within the optimal range for oysters at Shell Point (16 psu weekly average). Salinities at Iona have been going below 5 psu for a month. Light levels were too low for seagrass below 1 meter.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 21.4 – 26.7 psu. CDOM readings ranged from 18 - 27 qse. Dissolved oxygen in McIntyre Creek dipped below 3 mg/L 7 times, ranging from 1.9 – 9.0 mg/L. Chlorophyll readings ranged from 3 - 13 ug/L. Salinity at Tarpon Bay ranged from 21 – 26.5 psu, and CDOM ranged from 25 - 60 qse. Dissolved oxygen ranged steady from 3.0 – 10.7 mg/L, and chlorophyll readings ranged from 3 - 27 ug/L. Salinity at both locations remains below the preferred range for shoal grass and turtle grass (30 to 40 psu).

	Chlorophyll	CDOM	Turkidity	25% Iz donth			A	COE Daily Re	ports	
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)		Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	< 11	CE <70	CE < 18	CE = 1 m SCB = 2 2m	9	9/15/2015	Tues	3677	464	0
lana	0.4	300 < 11		0 70		9/16/2015	Wed	4157	321	0
Iona	8.1	190	2.3	0.79		9/17/2015	Thur	4586	720	0
Causeway A	6.5	157	3.5	0.86		0/11/2010		7000	0004	
Tarpon Bay	10.8	128	1.8	1.0		9/18/2015	Fri	7202	2264	0
Torget light per		Coloopohoto		1 motor	- !	9/19/2015	Sat	5796	2100	0
SCB – San Carlos Bay = 2.2 meters				9	9/20/2015	Sun	5368	1516	0	
					9	9/21/2015	Mon	4111	1046	0
25% IZ: where	z is 25% of sur	face I. $I = irr$	radiance, z =	depth		7 Day	Avg	4985	1204	0

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Blake Guillory, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: September 22 - 28, 2015

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: Watershed runoff delivered an average flow of **2,599 cfs**, to the estuary at S79 the past week entirely from inland watershed runoff. There continue to be no discharges from Lake Okeechobee. **Salinity was** below the optimal range for oysters at Iona. Light levels in the lower estuary are too low for seagrass below 1 meter.

USACE Action: On 9/25/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We request the SFWMD utilize all emergency and dispersed water storage capacity in the Caloosahatchee watershed to reduce the volumes and alter the timing of water deliveries, specifically from the central watershed between S78 and S79.

Lake Okeechobee Level:	14.67 ft. (Low Sub-	Last week: 14.41 ft.		
Lake Okeechobee Inflow:	8,628 cfs	Lake Okeeche	obee Outflow: 172 cfs	
Weekly Rainfall:	WP Franklin 1.95"	Ortona 0.62 "	Moore Haven 0.92"	
Salinity Fort Myers:	0.2 - 0.2 psu (SCCF Y	/acht Basin Surface)	Previous wk: 0.2 - 0.2 psu	
Salinity Shell Point:	2.9 – 29 psu (SCCF RE	ECON)	Previous wk: 3.2 – 28 psu	



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 2,599 cfs. Over the past 14 days 84 % of total Lake Okeechobee outflows were delivered to the L8 basin, 15% was sent south through S351 for EAA water supply and 1% was directed to the Caloosahatchee at S77.





Plume of highly colored Caloosahatchee discharge along the south west end of Fort Myers Beach 9/20/15. Photo John Petracco

Upstream of S79/Franklin Conditions: On 9/29/15 at the Olga Water Treatment plant, chlorides measured **47 mg/L**, apparent color was **229 CU** and turbidity measured **1.23 NTU**. No algae was visible at the plant intake over the past week. The plant is online operating at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are **too low for oysters upstream of the Cape Coral Bridge**.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (8.5 psu on 9/28/15) and within the optimal range for oysters at Shell Point (20 psu weekly average). Light levels were too low for seagrass below 1 meter.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 20.3 – 27.5 psu. CDOM readings ranged from 18 - 31 qse. Dissolved oxygen in McIntyre Creek dipped below 3 mg/L 8 times, ranging from 1.4 – 8.0 mg/L. Chlorophyll readings ranged from 3 - 13 ug/L. Salinity at Tarpon Bay ranged from 18 - 33 psu, and CDOM ranged from 14 - 60 qse. Dissolved oxygen ranged steady from 3.0 – 8.5 mg/L, and chlorophyll readings ranged from 3 - 18 ug/L. Salinity at both locations remains below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: This past week CROW, the Wildlife rehabilitation clinic on Sanibel, received **29 red tide patients** suffering from brevetoxicosis. The **7 laughing gulls** and **22 sanderlings** were mostly from Fort Myers Beach. On 9/25 FWC reported red tide in background to very low concentrations in several counties from Charlotte County north.

	Chlorophyll	CDOM	Turkidity	Turkidity 25% Indepth			Α	COE Daily Re	ports	
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)	I	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	< 11	CE <70	CE < 18	CE = 1 m SCB = 2 2m	9/2	2/2015	Tues	2868	526	0
Colonial Br	5.2	254	22	0.67	9/2	3/2015	Wed	3117	322	0
	5.5	234	2.2	0.07	9/2	4/2015	Thur	1806	320	NR
Iona	4.3	215	1.5	0.74	0/2	5/2015	Fri	2841	324	0
Causeway A	3.1	138	3.2	0.85	9/2	5/2015		2011		•
Torget light per	atration: CE	Calaaaabata		1 motor	9/2	6/2015	Sat	2238	549	0
Target light penetration: $CE - Caloosanatchee estuary = 1 meter SCB - San Carlos Bay = 2.2 meters$				9/2	7/2015	Sun	2933	850	0	
					9/2	8/2015	Mon	2390	812	0
25% IZ: where	25% Iz : where z is 25% of surface I . I = irradiance, $z = depth$				7	' Day	Avg	2599	529	0

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: September 29 - October 5, 2015

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: Watershed runoff delivered an average flow of 1,619 cfs, to the estuary at S79 the past week predominantly from inland watershed runoff. Salinity was below the optimal range for oysters at Iona. Light levels in the lower estuary are too low for seagrass below 1 meter.

USACE Action: On 10/2/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: We recommend no lake releases to the Caloosahatchee at this time. We urge the Corps to continue to raise lake levels to at least above 15 ft. as we enter the drier months. We support moving more water south to the WCAs. When watershed runoff drops we would support minimal supplemental releases to the Caloosahatchee from the Lake to provide 1,000 -1,200 cfs at S79. We request the SFWMD utilize all available emergency and dispersed water storage capacity throughout the system to reduce the volumes and alter the timing of water discharges to the estuaries.

Lake Okeechobee Level:	14.77 ft. (Low Sub-Ba	and) Last we	eek: 14.67 ft .
Lake Okeechobee Inflow:	5,845 cfs	Lake Okeecho	bee Outflow: 2,832 cfs
Weekly Rainfall:	WP Franklin 1.65"	Ortona 0.58 "	Moore Haven 0.52"
Salinity Fort Myers:	0.2 - 0.2psu (SCCF Yach	nt Basin Surface)	Previous wk: 0.2 - 0.2 psu
Salinity Shell Point:	6.9 – 29 psu (SCCF REC	CON)	Previous wk: 2.9 – 29 psu



Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 1,619 cfs. Over the past 14 days 64 % of total Lake Okeechobee outflows were sent south to the EAA for water supply and 36% were delivered to the L8 basin.



Upstream of S79/Franklin Conditions: On 10/6/15 at the Olga Water Treatment plant, chlorides measured **48 mg/L**, apparent color was **213 CU** and turbidity measured **0.53 NTU.** No algae was visible at the plant intake over the past week. The plant is online operating at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass but are **too low for oysters upstream of the Cape Coral Bridge**.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (6.0 psu on 10/05/15) and within the optimal range for oysters at Shell Point (19 psu weekly average). Light levels were too low for seagrass below 1 meter.

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 22 – 30.6 psu. CDOM readings ranged from 11 - 25 qse. Dissolved oxygen in McIntyre Creek dipped below 3 mg/L 5 times, ranging from 1.4 – 7.8 mg/L. Chlorophyll readings ranged from 3 – 15.8 ug/L. Salinity at Tarpon Bay ranged from 23.4 – 32.8 psu, and CDOM ranged from 14.5 – 37.5 qse. Dissolved oxygen ranged steady from 3.8 – 8.5 mg/L, and chlorophyll readings ranged from 3 – 15.8 ug/L. Salinity at Doth Iocations remains below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: This past week CROW, the Wildlife rehabilitation clinic on Sanibel, received **105 patients** suffering from brevetoxicosis. The **96 red knots**, **7 laughing gulls** and **2 sanderlings** were migrant shorebirds from Fort Myers Beach.

Red Tide: On 10/2/15 FWC reported red tide *Karenia brevis* in "... background to low concentrations in 32 samples collected in and alongshore of Manatee County south to northern Charlotte County. **One sample collected offshore of northern Lee County contained background concentrations of** *K. brevis.*"

	Chlorophyll	CDOM	Turkidity	2E0/ In dowth	1	ACOE Daily Reports			
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	< 11	CE <70	CE < 18	CE = 1 m SCB = 2 2m	9/29/2015	Tues	2402	765	0
lana	25	000 <11	300 4 3	0.72	9/30/2015	Wed	2169	450	0
Iona	3.0	235	1.4	0.72	10/1/2015	Thur	2189	258	0
Causeway A	7	59	2.3	1.44	10/1/2013	Г	4000	4.47	0
Sanibel	9.2	50	2.7	1.45	10/2/2015	Fri	1080	147	U
Torgot light non		Calaaabata	han naturati	1 meter	10/3/2015	Sat	1666	83	0
SCB – San Carlos Bay = 2.2 meters					10/4/2015	Sun	671	45	22
					10/5/2015	Mon	1161	57	0
25% IZ: where	z is 25% of sur	tace I. I = Ir	radiance, z =	depth	7 Day	Avg	1619	257	3

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: October 6 -12, 2015

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: Watershed runoff was less than half the previous week delivering average flows of 693 cfs to the estuary at S79, predominantly from inland watershed run-off. Salinity was below the optimal range for oysters at Iona.

USACE Action: On 10/9/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: With drier conditions and a significant decrease in freshwater from the watershed, we recommend flows of 650 to 800 cfs to the Caloosahatchee estuary at S79.

Lake Okeechobee Level:	14.83 ft. (Low Sub-	Band)	Last week: 14.77 ft.		
Lake Okeechobee Inflow:	4,956 cfs	Lake Okeech	nobee Outflow: 2,245 cfs		
Weekly Rainfall:	WP Franklin 0.20"	Ortona 0.55 "	Moore Haven 0.25"		
Salinity Fort Myers:	0.2 - 1.4 psu (SCCF Ya	acht Basin Surface)	Previous wk: 0.2 - 0.2 psu		
Salinity Shell Point:	9.5 - 31 psu (SCCF RE	ECON)	Previous wk: 6.9 - 29 psu		

SCCF	~		Salinit	y (psu)	
Marine Laboratory			Current Value	Sustainable Range	High/ Low
Map Created by Sarah Bridenbaugh		Beautiful Island	0.2	< 5psu	In range
Fort Myers 2-5		Fort Myers	0.2 -1.4	< 10 psu	In range
		Shell	<mark>9.5</mark> – 31	25 – 31 psu	Low
	╞	Point			
		Ligh	t (25% Iz	depth meters	5)
13-16		Colonial	0.68	1 meter	Low
16-20	-	Bridge			
20 - 30		lona	0.79	1 meter	Low
		Causeway	1.05	2.2 meters	Low
Causeway A 20 - 45					
Kilon	meter				

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 693 cfs. Over the past 14 days 88 % of total Lake Okeechobee outflows were sent south to the EAA for water supply and 12% were delivered to the L8 basin.



Upstream of S79/Franklin Conditions: On 10/13/15 at the Olga Water Treatment plant, chlorides measured **54 mg/L**, apparent color was **175 CU** and turbidity measured **0.76 NTU**. No algae was visible at the plant intake over the past week. The plant is online operating at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (8.8 psu on 10/12/15) and within the optimal range for oysters at Shell Point (22 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 27.3 – 30.7 psu. CDOM readings ranged from 11.5 - 20 qse. Dissolved oxygen in McIntyre Creek dipped below 3 mg/L 7 times, ranging from 1.7 – 6.7 mg/L. Chlorophyll readings ranged from 3 – 10 ug/L. Salinity at Tarpon Bay ranged from 26.5 – 30.5 psu. CDOM readings were not available for this past week. Dissolved oxygen ranged steady from 3.3 – 7.3 mg/L, and chlorophyll readings ranged from 3 – 10 ug/L. Salinity at both locations remains below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: This past week CROW, the Wildlife rehabilitation clinic on Sanibel, received **1 laughing gull** suffering from suspected brevetoxicosis.

Red Tide: On 10/9/15 FWC reported red tide *Karenia brevis* blooms along and offshore of Bay and Gulf counties in northwest Florida and background to low concentrations in 26 samples collected in, along, and offshore of Manatee, Sarasota, Charlotte, and Lee counties in southwest Florida.

	Chlorophyll	CDOM	Turbidity	25% Iz donth]	ACOE Daily Reports						
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)			
Target Values	< 11	CE <70	CE < 18	CE = 1 m SCB = 2 2m	10/6/2015	Tues	1060	175	0			
Colonial Dr	6.2	254	10	0.69	10/7/2015	Wed	724	119	0			
	0.3	204	1.0	0.00	10/8/2015	Thur	585	0	0			
Iona	4.9	203	1.5	0.79	10/0/2015	Fri	712	0	0			
Causeway A	2.9	114	3.6	1.05	10/3/2013	Sat	573	00	0			
Target light per	etration: CE -		hee estuary	- 1 meter	10/10/2015	Sat	575	33	V			
raiget light per	SCB	- San Carlos	Bay = 2.2 m	eters	10/11/2015	Sun	758	146	0			
050/ I=						Mon	439	44	32			
23% IZ: where	25% Iz : where z is 25% of surface I . I = irradiance, z = depth						693	83	5			

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: October 13 - 19, 2015

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: No rain, zero watershed runoff from S78 the past week and releases from Lake O available only for the Ortona pool water supply dropped flows to the estuary at S79 to an average of **147 cfs**.

USACE Action: On 10/16/15 the USACE continued the closure of the S77 structure except to maintain optimum canal levels in the Caloosahatchee for water supply and navigation.

Recommendation: With drier conditions and no freshwater from the watershed, we recommend a seven day pulse release to the Caloosahatchee to provide average flows of **800 - 1000 cfs** at S79 in order to gradually transition salinity changes in the estuary and avoid unnecessary abrupt and harmful flow/salinity extremes.

Lake Okeechobee Level:	14.69 ft. (Low Sub-B	-Band) Last week: 14. 83 ft.					
Lake Okeechobee Inflow:	3,289 cfs	Lake Okeecho	obee Outflow: 2,212 cfs				
Weekly Rainfall:	WP Franklin 0 "	Ortona 0.04 "	Moore Haven 0"				
Salinity Fort Myers:	1.0- 4.5 psu (SCCF Yach	I.0- 4.5 psu (SCCF Yacht Basin Surface)					
Salinity Shell Point:	12 – 31 psu (SCCF REC	ON)	Previous week: 9.5 - 31 psu				

SCCF	Franklin Lock		Salinit	y (psu)	
Marine Laboratory	ECON or sonde Sample Site		Current Value	Sustainable Range	High/ Low
Map Created by Sarah Bridenbaugh	0 - 2	Beautiful Island	ND	< 5psu	In Range
	2-5	Fort Myers	1.0 - 4.5	< 10 psu	In Range
Midpoint Bridge	7-10	Shell Point	12 – 31	25 – 31 psu	Low
	10 - 13	Ligh	it (25% Iz	depth meters	5)
elona Ashall Point	16 - 20	Iona	0.84	1 meter	Low
	20 - 30	Causeway	0.84	2.2 meters	Low
Causeway A Ma	30 - 45	Sanibel	0.99	2.2 meters	Low
0 1.75 3.5	7 10.5 14 Kilometers				

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 147 cfs, only 21% of the previous weeks flow. Over the past 14 days 83% of total Lake Okeechobee outflows were sent south to the EAA for water supply, 12% was delivered to the L8 basin, 3% was directed to the Caloosahatchee and 1.6% to the St Lucie.



Upstream of S79/Franklin Conditions: On 10/20/15 at the Olga Water Treatment plant, chlorides measured **58 mg/L**, apparent color was **161 CU** and turbidity measured **0.93 NTU.** No algae was visible at the plant intake over the past week. The plant is online operating at 1600 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (14 psu on 10/18/15) and within the optimal range for oysters at Shell Point (23 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 27 – 28.8 psu. CDOM readings ranged from 15.5 – 22.3 qse. Dissolved oxygen in McIntyre Creek dipped below 3 mg/L 5 times, ranging from 1.8 – 8.2 mg/L. Chlorophyll readings ranged from 2.8 – 8 ug/L. Salinity at Tarpon Bay ranged from 27 – 32 psu. CDOM readings ranged from 20 to 52 qse. Dissolved oxygen ranged from 3.75 – 7.5 mg/L, and chlorophyll readings ranged from 3 – 11 ug/L. Salinity at both locations remains below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Wildlife Impacts: The past week CROW, the Wildlife rehabilitation clinic on Sanibel, received **1 double crested cormorant** with suspected brevetoxicosis.

Red Tide: On 10/17/15 FWC reported red tide, *K. brevis* in background to high concentrations alongshore Bay and Gulf counties; background to medium concentrations alongshore Pinellas, Manatee and Sarasota counties; background to very low concentrations along, and offshore Charlotte County and very low concentrations in one sample off Lee County.

	Chlorophyll	CDOM	Turbidity	25% Iz dont	h	ACOE Daily Reports							
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)		Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)			
Target Values	< 11	CE <70	CE < 18 SCB < 5	CE = 1 m	n	10/13/2015	Tues	267	0	31			
long	2.2	169	4.2	000 = 2.211		10/14/2015	Wed	212	0	0			
Iona	3.2	100	4.2	0.64		10/15/2015	Thur	133	0	159			
Causeway A	5.1	80.9	12.9	0.84		10/10/2010	Eri	190	0	225			
San Carlos		CO O	40 E	0.00		10/16/2015	ГП	100	U	235			
Bay	4.1	02.2	10.5	0.99		10/17/2015	Sat	36	0	232			
Target light per	etration: CE -	Caloosahato	hee estuary :	= 1 meter		10/18/2015	Sun	0	0	230			
SCB – San Carlos Bay = 2.2 meters						10/19/2015	Mon	207	0	113			
25% Iz: where z is 25% of surface $I = I$ – irradiance z – denth						7 Day	Avg	147	0	142			
23 /012. Where Z is 25 /0 or suitable I . I = indulatice, Z = ueptit													

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: October 20 - 26, 2015

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: With no rain over the past week, Lake Okeechobee regulatory releases were crucial in providing freshwater flow to the estuary following last week's lowest flow of the year. Releases provided average flows of 690 cfs which helped slow the rapid rise in salinity at Fort Myers the past two weeks.

USACE Action: On 10/23/15 the USACE initiated a 7-day pulse release from Lake Okeechobee to provide average flows of **800 cfs** to the Caloosahatchee estuary at S79.

Recommendation: With dry conditions resulting from no rainfall and no freshwater from the watershed, we recommend a seven day pulse release to the Caloosahatchee to provide average flows of **800 - 1000 cfs** at S79.

Lake Okeechobee Level:	14.59 ft. (Low Sub	o-Band)	Last week: 14.69 ft.				
Lake Okeechobee Inflow:	2,673 cfs	Lake Okeed	chobee Outflow: 3,670 cfs				
Weekly Rainfall:	WP Franklin 0 "	Ortona 0.04 "	Moore Haven 0"				
Salinity Fort Myers:	4.0 - 9.4 psu (SCCF Ya	acht Basin Surface)	Previous week: 1.0- 4.5 psu				
Salinity Shell Point:	14 – 32 psu (SCCF RE	ECON)	Previous week: 12 – 31 psu				



Salinity (psu)									
Current Sustainable High/ Value Range Low									
Beautiful Island	ND	< 5psu	In Range						
Fort Myers	4.0 - 9.4	< 10 psu	In Range						
Shell Point	14 - 32	25 – 31 psu	Low						

Light (25% Iz depth meters)

1.05	.05 ^{1 meter}	
		Range
1.41	2.2 meters	Low
1.72	2.2 meters	Low
	1.05 1.41 1.72	1.05 1 meter 1.41 2.2 meters 1.72 2.2 meters

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 690 cfs. Over the past 14 days 72% of total Lake Okeechobee outflows were sent south to the EAA for water supply, 9% was delivered to the L8 basin, 16.5% was directed to the Caloosahatchee and 2.5% to the St Lucie.



Upstream of S79/Franklin Conditions: On 10/27/15 at the Olga Water Treatment plant, chlorides measured **60 mg/L**, apparent color was **174 CU** and turbidity measured **1.16 NTU**. No algae was visible at the plant intake over the past week. The plant is online operating at 2400 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (20 psu on 10/26/15) and at Shell Point (26 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 26 – 32.5 psu. CDOM readings ranged from 11 – 24 qse. Dissolved oxygen in McIntyre Creek did not go below 3 mg/L for the first time in months, although values ranged from 3 – 9 mg/L. Chlorophyll readings ranged from 2.5 – 7 ug/L. Salinity at Tarpon Bay ranged from 26 – 34.5 psu. CDOM readings ranged from 11 to 41 qse. Dissolved oxygen ranged from 4.75 – 8.75 mg/L, and chlorophyll readings ranged from 2.75 - 8 ug/L. Salinity at both locations remains below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Oysters: Caloosahatchee oyster sampling in October by FGCU reported disease prevalence of *Perkinsus marinus* ranged from **73.33% to 100%.** Disease intensity of *P. marinus* ranged from **0.73 to 1.20**. Scale 0 = no infection, 1 = low, 3 = medium, 5 = high. Larval recruitment ranged from **0.1 - 31.92** spat per shell.

Red Tide: Karenia brevis has been detected in background to low concentrations in samples collected along and offshore of Lee County.

		0001	Tankidia						
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	< 11	CE <70	CE < 18	CE = 1 m SCB = 2 2m	10/20/2015	Tues	82	0	443
lona	27	144	00	1 05	10/21/2015	Wed	0	0	600
	1.4	81.2	1.5	1.05	10/22/2015	Thur	0	49	395
San Carlos	1.4	01.2	1.0 1.41	10/23/2015	Fri	1038	811	1162	
Bay	1.4	39.3	2.8	1.72	10/24/2015	Sat	1768	909	1486
Target light per	etration: CE -	- Caloosahato	hee estuary :	= 1 meter	10/25/2015	Sun	1133	779	1241
	SCB	 San Carlos 	Bay = 2.2 m	eters	10/26/2015	Mon	810	597	868
25% Iz: where z is 25% of surface $I = I$ = irradiance z = depth					7 Day	Avg	690	449	885
207012. WHETE	2 13 23 /0 01 301			doptil					

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: October 27 - November 2, 2015

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 continued the past week raising salinities throughout the estuary making Lake Okeechobee regulatory releases crucial in providing freshwater flow to the estuary for salinity management. Releases provided average flows of **852 cfs** which helped stabilize salinities at Fort Myers below 10 psu.

USACE Action: On 10/30/15 the USACE initiated a 7-day pulse release from Lake Okeechobee to provide average flows of **800 cfs** to the Caloosahatchee estuary at S79.

Recommendation: With continuing dry conditions providing no freshwater from the watershed, we recommend a seven day pulse release to the Caloosahatchee to provide average flows of **800 - 1000 cfs** at S79.

Lake Okeechobee Level:	14.54 ft. (Lov	w Sub-Band)	Sand) Last week: 14.59 ft.				
Lake Okeechobee Inflow:	2,696 cfs		Lake Okeecho	bee Outflow:	3,591 cfs		
Weekly Rainfall:	WP Franklin 1	. 19 " Orto	na 0.16"	Moore Haven	0.05"		
Salinity Fort Myers:	6.4 – 9.7 psu (SC	CF Yacht Basin	Previous week	:: 4.0 - 9.4 psu			
Salinity Shell Point:	20 – 33 psu (SC	CF RECON)		Previous week	:: 14 – 32 psu		

Franklin Lock	-		Salinit	y (psu)	
Marine Laboratory	l		Current Value	Sustainable Range	High/ Low
Map Created by Sarah Bridenbaugh		Beautiful Island	ND	< 5 psu	-
2-5 5-7		Fort Mvers	6.4 – 9.7	< 10 psu	In Range
Midpoint Bridge 7-10		Shell Point	20 – 33	25 – 31 psu	In Range
10-13 13-16 16-20		Lię	ght (25% Iz	depth meters)	
Shell Point 20 – 30		Iona	1.11	1 meter	In Range
30-45		Causeway	1.70	2.2 meters	Low
Causeway A	rs	San Carlos Bay	1.96	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 852 cfs. Over the past 14 days 64% of total Lake Okeechobee outflows were sent south to the EAA for water supply, 6% was delivered to the L8 basin, 27% was directed to the Caloosahatchee and 3% to the St Lucie.



Upstream of S79/Franklin Conditions: On 10/27/15 at the Olga Water Treatment plant, chlorides measured **57 mg/L**, apparent color was **179 CU** and turbidity measured **0.63 NTU.** No algae was visible at the plant intake over the past week. The plant is online operating at 2400 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (21 psu on 11/2/15) and at Shell Point (27 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 28 – 33.3 psu. CDOM readings ranged from 8 – 21 qse. Dissolved oxygen in McIntyre Creek dropped below 3 mg/L one time, values ranged from 2 – 7.8 mg/L. Chlorophyll readings ranged from 1.8 – 7 ug/L. Salinity at Tarpon Bay ranged from 29 – 34.5 psu. CDOM readings ranged from 12 to 35 qse. Dissolved oxygen ranged from 3.75 – 7 mg/L, and chlorophyll readings ranged from 2.5 – 9.5 ug/L. Salinity at both locations remains below or in the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Red Tide: The past week FWC reported blooms of *Karenia brevis*, in, along and offshore Santa Rosa, Okaloosa, Walton, Bay, and Gulf counties in Northwest Florida and in, along and offshore Pinellas, Manatee, Sarasota, Charlotte, and Lee counties in Southwest Florida. *K. brevis* was detected in background to low concentrations in and alongshore Manatee, Charlotte, and Lee counties and background concentrations were detected in one sample alongshore Collier County. SCCF found medium levels (230k cells/L) of *Karenia spp.* at Donax Beach on Sanibel on 11/3/15 and low levels, ranging from 16,000 to 45,000 cells/L, at three Sanibel Beach sites and on the inside of the Causeway on 11/2/15.

	Chlorophyll	CDOM	Turbidity	25% Iz dopth	7	ACOE Daily Reports						
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)		Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)		
Target Values	< 11	CE <70	CE < 18	CE = 1 m	, 10	10/27/2015	Tues	550	267	584		
lono	2.4	120	000 < 0	1 11	•	10/28/2015	Wed	415	49	340		
	2.4	129	0.0	1.11	[10/29/2015	Thur	90	0	243		
Causeway A	4.5	27.0	3.5	1.70		10/20/2015	Fri	994	588	790		
San Carlos	25	9 10	2.0	1.06		10/30/2015			500	150		
Bay	2.5	0.10	3.9	1.90		10/31/2015	Sat	1560	993	1624		
Target light per	etration: CE -	Caloosahato	hee estuary	= 1 meter		11/1/2015	Sun	1424	946	1604		
SCB – San Carlos Bay = 2.2 meters						11/2/2015	Mon	933	390	992		
25% Iz : where z is 25% of surface I . \mathbf{I} = irradiance, \mathbf{z} = depth						7 Day	Avg	852	462	882		

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: November 3 - 9, 2015

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 continued the past week. Reduced regulatory releases averaging **559 cfs** raised salinities in the upper estuary to 10 psu reflecting the need for Lake Okeechobee regulatory releases to the estuary during dry conditions for salinity management and the health of the upper estuary.

USACE Action: On 11/6/15 the USACE initiated a 7-day pulse release from Lake Okeechobee to provide average flows of **650 cfs** to the Caloosahatchee estuary at S79.

Recommendation: With continuing dry conditions providing no freshwater from the watershed, we recommend a seven day pulse release to the Caloosahatchee to provide average flows of **800 - 1000 cfs** at S79.

Lake Okeechobee Level:	14.43 ft. (Bene	ficial Use Sub-Ba	ind) Las	t week: 14.5	4 ft.
Lake Okeechobee Inflow:	1,623 cfs	Lak	e Okeechobee	Outflow: 3	,094 cfs
Weekly Rainfall:	WP Franklin 0.8	3" Ortona	0.92 " Mod	ore Haven	0.0"
Salinity Fort Myers:	5.2 – 10 psu (SCCF	Yacht Basin Surfa	ace) Pre	vious week:	6.4 – 9.7 psu
Salinity Shell Point:	19 – 33 psu (SCCF	RECON)	Pre	vious week:	20 – 33 psu

SUCF 11/	09/2015 Surface Salinity
Marine Laboratory	RECON or sonde
Map Created by Sarah Bridenbaugh	0-2
Fort Myers	2-5
	5-7
Midpoint Bridge	7-10
	13 - 16
Plona	16 - 20
A Company Sector	20 - 30
Chilseway & Wa	30 – 45
0 1.75	3.5 7 10.5 14 Kilometers

Salinity (psu)						
Current Sustainable High/ Value Range Low						
Beautiful Island	ND	< 5 psu	-			
Fort Myers	5.2 – 10	< 10 psu	In Range			
Shell Point	19 – 33	25 – 31 psu	In Range			

Light (25% Iz depth meters)

Iona	1 12	1 meter	In
			Range
Causeway	1.28	2.2 meters	Low
San Carlos Bay	1.62	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged **559 cfs.** Over the past 14 days **65%** of total Lake Okeechobee outflows were sent south to the EAA for water supply, **6%** was delivered to the L8 basin, **29%** was directed to the Caloosahatchee.



Upstream of S79/Franklin Conditions: On 11/10/15 at the Olga Water Treatment plant, chlorides measured **69 mg/L**, apparent color was **120 CU** and turbidity measured **0.86 NTU.** No algae was visible at the plant intake over the past week. The plant is online operating at 2400 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass. A phytoplankton bloom was present at the Fort Myers RECON site starting on 11/5/15.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (**20 psu** on 11/9/15) and at Shell Point (**28 psu** weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 30.9 – 32.7 psu. CDOM readings ranged from 9 – 14.2 qse. Dissolved oxygen in McIntyre Creek dropped below 3 mg/L five times and values ranged from 2.2 – 8.7 mg/L. Chlorophyll readings ranged from 1.6 – 7.2 ug/L. Salinity at Tarpon Bay ranged from 30.5 – 34.5 psu. CDOM readings ranged from 7.5 to 21 qse. Dissolved oxygen ranged from 4.4 – 7.5 mg/L, and chlorophyll readings ranged from 2.5 – 8.1 ug/L. Salinity at both locations was within the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Red Tide: The past week FWC reported patchy blooms of the Florida red tide organism along Okaloosa, Walton, Bay, and Gulf counties in Northwest Florida and along Pinellas, Manatee, Sarasota, and Lee counties in Southwest Florida. Three samples collected in and alongshore Lee County recorded background to low concentrations. SCCF found very low levels of *Karenia spp.* from Bowman's Beach to Lighthouse Beach during the past week.

Wildlife Impacts: The past week CROW, the Wildlife rehabilitation clinic on Sanibel, received **3 birds** with suspected brevetoxicosis; 2 cormorants and 1 laughing gull.

	Chlorophyll	CDOM	Turkidity	2E% In domth	ACOE Daily Reports				
Caloosahatchee Stations	(µg/L)	(qse)	(NTU)	(meters)	Date	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2 2m	11/3/2015	Tues	474	150	666
lana	2.4	120	0.00	1 4 2	11/4/2015	Wed	214	270	918
Iona	2.1	129	0.0	1.12	11/5/2015	Thur	37	145	767
Causeway A	2.0	50.8	6.0	1.28	11/0/2010	Eri	166	224	790
San Carlos	0.7	40.0	5.0	4.00	11/6/2015	ГП	400	224	700
Bay	2.7	12.8	5.9	1.62	11//7/2015	Sat	962	652	1138
Target light per	etration: CE -	Caloosahato	hee estuary :	= 1 meter	11/8/2015	Sun	943	788	1148
	SCB	 San Carlos 	Bay = 2.2 m	eters	11/9/2015	Mon	820	683	1130
25% Iz: where	z is 25% of sur	face I. I = ir	radiance, z =	depth	7 Day	Avg	559	416	935
25% Iz: where	25% Iz : where z is 25% of surface I . I = irradiance, z = depth				7 Day	Avg	559	416	935

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: November 10 - 16, 2015

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 continued the past week. Regulatory releases averaging **757 cfs** did not stem the rise in salinities in the upper and lower estuary. Salinities at Fort Myers rose to a daily maximum of 11 psu indicating additional freshwater is needed to meet estuarine salinity targets. The Minimum Flow & Level exceedence is 10 psu over a 30 day moving average. Rising salinities reflect the need for Lake Okeechobee regulatory releases to the estuary during dry conditions for estuary health.

USACE Action: On 11/13/15 the USACE continued a 7-day pulse release from Lake Okeechobee to provide average flows of **650 cfs** to the Caloosahatchee estuary at S79.

Recommendation: With continuing dry conditions providing no freshwater from the watershed, and a very wet forecast for coming months we request the Caloosahatchee not be harmed by reducing lake regulatory releases and recommend a seven day pulse release to the Caloosahatchee to provide average flows of **800 - 1000 cfs** at S79 to reduce rising salinities.

Lake Okeechobee Level:	14.31 ft. (B	ase Flow	Sub-Band)		Last week: 14.43 ft.
Lake Okeechobee Inflow	780 cfs		Lake	Okeec	hobee Outflow: 2,551 cfs
Weekly Rainfall:	WP Franklin	0.21"	Ortona 0	.17"	Moore Haven 0.38"
Salinity Fort Myers:	7.1 – 11 psu (S	CCF Yach	nt Basin Surfa	ce)	Previous week: 5.2 – 10 psu
Salinity Shell Point:	20 – 34 psu (S	CCF REC	ON)		Previous week: 19 – 33 psu

SCCF	Franklin Lock
Marine Laboratory Beautiful Island	RECON or sonde Sample Site
Map Created by Sarah Bridenbaugh	0-2
	5-7
Midpoint Bridge	7 - 10
	13 – 16
Shell Point	20 – 30
Causeway A	30 – 45 1.75 3.5 7 10.5 14 Kilometers

Salinity (psu)					
	Current Value	Sustainable Range	High/ Low		
Beautiful Island	ND	< 5 psu	-		
Fort Myers	7.1 – 11	< 10 psu	In Range		
Shell Point	20 – 34	25 – 31 psu	In Range		
	•		. <u> </u>		

Light (25% Iz depth meters)

Iona	1.02	1 meter	In Range
Causeway	1.53	2.2 meters	Low
San Carlos Bay	1.74	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged **757 cfs.** Over the past 14 days **65%** of total Lake Okeechobee outflows were sent south to the EAA for water supply, **7%** was delivered to the L8 basin, **28%** was directed to the Caloosahatchee.



Upstream of S79/Franklin Conditions: On 11/17/15 at the Olga Water Treatment plant, chlorides measured **62 mg/L**, apparent color was **168 CU** and turbidity measured **0.89 NTU.** No algae was visible at the plant intake over the past week. The plant is online operating at 2000 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (20 psu on 11/16/15) and at Shell Point (28 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "*Ding*" Darling NWR: Over the past week, salinity at McIntyre Creek ranged between 30.8 – 32.7 psu. CDOM readings ranged from 9 – 16.5 qse. Dissolved oxygen in McIntyre Creek dropped below 3 mg/L five times and values ranged from 1.8 – 9.4 mg/L. Chlorophyll readings ranged from 1.9 – 7.0 ug/L. Salinity at Tarpon Bay ranged from 32.9 – 34.1 psu. CDOM readings ranged from 11.5 to 18.2 qse. Dissolved oxygen ranged from 4.5 – 6.1 mg/L, and chlorophyll readings ranged from 3.1 – 6.4 ug/L. Salinity at both locations was within the lower end of the preferred range for shoal grass and turtle grass (30 to 40 psu).

Red Tide: The past week FWC reported blooms of the Florida red tide organism in Northwest Florida and Pinellas, Manatee, Sarasota, Charlotte, and Lee counties in Southwest Florida. SCCF sampling showed medium concentrations of *Karenia* spp. along the causeway on 11/16/15 and along Sanibel beaches on 11/17/15 with concentrations up to 570,000 cells per liter at Lighthouse Beach.

Wildlife Impacts: The past week CROW, the Wildlife rehabilitation clinic on Sanibel, received **5 birds** with suspected brevetoxicosis; 3 double crested cormorants, 1 white pelican and 1 loon.

Oysters: November sampling by FGCU in the Caloosahatchee, reported disease prevalence of *Perkinsus marinus* for all oysters sampled ranged from 86.67% to 100%. Disease intensity of *P. marinus* increased this month, ranging from 0.87 to 1.53. Larval recruitment ranged from 1.92-6.5 spat per shell.

Chlorophyll CDOM Turbidity 25% Iz d				ACOE Daily Reports						
Caloosahatchee Stations	chlorophyll (μg/L)	(qse)	(NTU)	25% Iz deptr (meters)	Dat	e	Day	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
Target Values	< 11	CE <70	CE < 18	CE = 1 m	11/10/2	2015	Tues	667	429	1022
-		2CB <11	2CB < 2	500 = 2.2m	11/11/2	2015	Wed	466	323	362
lona	2.1	135	1.7	1.02	11/12/2	2015	Thur	544	208	12
Causeway A	2.0	59.3	2	1.53	11/12/2	2013	E.	C4.F	140	220
San Carlos						2015	Fri	619	140	330
Bay	2.7	36.4	2.3	1.74	11/14/2	2015	Sat	1105	587	817
Target light per	etration: CF -	Caloosahato	hee estuary :	= 1 meter	11/15/2	2015	Sun	1067	805	1075
ranget light per	SCB	- San Carlos	Bay = 2.2 m	eters	11/16/2	2015	Mon	834	514	795
25% Iz: whore	z is 25% of sur	faco II – in	radianco z –	donth	7 Da	ıy	Avg	757	430	631
ZJ /0 IZ. WHERE			$autance, \mathbf{Z} =$	ueptii	L					

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: November 17 - 23, 2015

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 in the basin augmented freshwater flow to the estuary at S79 to a weekly average of **916 cfs**. The Dept of Health issued an advisory for the beach at North Shore Park in the Caloosahatchee. During the past week, a red tide bloom off the coast of Sanibel resulted in several fish kills and several cases of brevetoxicosis in birds along Sanibel's beaches.

USACE Action: On 11/20/15 the USACE began a 14-day pulse release from Lake Okeechobee to provide average flows of **650 cfs** to the Caloosahatchee estuary at S79 and zero flow to the St. Lucie at S80.

Recommendation: With very wet conditions forecast for coming months associated with a strong El Niño, we request average flows of **800 - 1000 cfs** at S79 to reduce rising salinities within the estuary.

Lake Okeechobee Level:	14.51 ft. (Base F	low Sub-Band)	Sub-Band) Last week: 14.3		
Lake Okeechobee Inflow:	6005 cfs	Lake	e Okeechobee Outflow:	210 cfs	
Weekly Rainfall:	WP Franklin 1.81'	Ortona 1	1.14" Moore Haven	1.26"	
Salinity Fort Myers:	7.1 – 12 psu (SCCF)	'acht Basin Surfa	ce) Previous wee	k: 7.1 – 11 psu	
Salinity Shell Point:	18 – 33 psu (SCCF F	RECON)	Previous wee	k: 20 – 34 psu	



Salinity (psu)						
	Current Value	Sustainable Range	High/ Low			
Beautiful Island	ND	< 5 psu	-			
Fort Myers	7.1 – 12	< 10 psu	In Range			
Shell Point	18 – 33	25 – 31 psu	In Range			
Light (25% Iz depth meters)						
lona	0.97	1 meter	In Range			
Causeway	1.66	2.2 meters	Low			
San Carlos	2.07	2.2 meters	In			

Range

Bay

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged **916 cfs.** Over the past 14 days **59%** of total Lake Okeechobee outflows were sent south to the EAA for water supply, **12%** was delivered to the L8 basin, **29%** was directed to the Caloosahatchee.



Date	Day	S-79 (cfs) Pulse	S-79 (cfs) Actual
11/20/2015	1	650	663
11/21/2015	2	1100	1035
11/22/2015	3	900	1983
11/23/2015	4	800	1469
11/24/2015	5	600	729
11/25/2015	6	400	
11/26/2015	7	100	
11/27/2015	8	650	
11/28/2015	9	1100	
11/29/2015	10	900	
11/30/2015	11	800	
12/01/2015	12	600	
12/02/2015	13	400	
12/03/2015	14	100	

Upstream of S79/Franklin Conditions: On 11/24/15 at the Olga

Water Treatment plant, chlorides measured **54 mg/L**, apparent color was **228 CU** and turbidity measured **1.12 NTU**. No algae was visible at the plant intake over the past week. The plant is online operating at 2000 GPM.

Upper Estuary Conditions: The Lee County Dept of Health closed North Shore Park beach in North Ft Myers due to enterococcus bacteria levels that exceed safe levels. Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (**17 psu** on 11/23/15) and at Shell Point (**27 psu** weekly average).

McIntyre Creek & Tarpon Bay in J.N. *"Ding"* Darling NWR: RECON values McIntyre Creek Salinity: 30 – 32.8 psu; CDOM: 12– 32 qse; Dissolved oxygen: 2.9 – 9.4 mg/L, <3 mg/L 1 time. Tarpon Bay salinity: No data

Salinities within the lower end of the preferred range for shoal and turtle grass.

Red Tide: The past week FWC reported blooms of the Florida red tide organism *Karenia brevis* along six Northwest Florida counties and Pinellas, Manatee, Sarasota, Charlotte, Lee, and northern Collier counties in Southwest Florida. SCCF sampling found *Karenia* spp. concentrations decreased along Sanibel beaches but concentrations in Tarpon Bay increased to medium levels.

Wildlife Impacts: The past week CROW, the Wildlife rehabilitation clinic on Sanibel, treated **18 new cases of red tide poisoning**; 17 double crested cormorants and 1 white pelican.

Calaasahatahaa	Chlorophyll CDO	CDOM	CDOM Turbidity	NTU) 25% Iz depth (meters)	h	ACOE Daily Reports					
Stations	(µg/L)	(qse)	(NTU)			Date	Day	S79 Flow	S78 Flow	S77 Flow	
		CE ~70	CE < 18 $CE = 1 m$				(cfs)	(cfs)	(cfs)		
Target Values	Farget Values < 11	SCB = 2.2n	n	11/17/2015	Tues	669	315	688			
lona	2.1	148	1.8	0.97		11/18/2015	Wed	406	38	764	
Causeway A	2.0	12.2	5.6	1.66		11/19/2015	Thur	187	176	174	
San Carlos	27	10.6	3.0	2.07		11/20/2015	Fri	663	203	0	
Bay	2.1	10.0	5.0			11/21/2015	Sat	1035	368	267	
Target light penetration:CE – Caloosahatchee estuary = 1 meterSCB – San Carlos Bay = 2.2 meters					11/22/2015	Sun	1983	543	179		
					11/23/2015	Mon	1469	540	0		
25% Iz : where z is 25% of surface I . I = irradiance, z = depth			depth		7 Day	Avg	916	312	296		

Red tide fish kill off Sanibel
Photo City of Sanibel11/19/15Image: City of Sanibel11/19/15

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: November 24 - 30, 2015

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: Regulatory releases from Lake Okeechobee provided weekly average flows of **808 cfs** to the estuary at S79 that held salinities stable at Fort Myers. Dry conditions and no rainfall in the basin makes these flows critical to maintaining salinity balance in the upper estuary.

USACE Action: On 11/20/15 the USACE began a 14-day pulse release from Lake Okeechobee to provide average flows of **650 cfs** to the Caloosahatchee estuary at S79 and zero flow to the St. Lucie at S80.

Recommendation: With very wet conditions forecast for coming months associated with a strong El Niño, we request average flows of **800 - 1000 cfs** at S79 to reduce rising salinities within the estuary.

Lake Okeechobee Level:	14.48 ft. (Base Flo	w Sub-Band)	Last week: 14.51 ft .		
Lake Okeechobee Inflow:	2,441 cfs	Lake Okeech	nobee Outflow: 742 cfs		
Weekly Rainfall:	WP Franklin 0 "	Ortona 0.04 "	Moore Haven 0"		
Salinity Fort Myers:	7.1 – 12 psu (SCCF Ya	acht Basin Surface)	Previous week: 7.1 – 12 psu		
Salinity Shell Point:	16 – 32 psu (SCCF RE	ECON)	Previous week: 18 – 33 psu		

Franklin Lock		Salinit	y (psu)	
SCCF Linde Open Constraints Linde Open Constraints RECON or sonde		Current Value	Sustainable Range	High/ Low
Marine Laboratory Beautiful Island Sample Site	Beautiful Island	ND	< 5 psu	-
Fort Myers 2-5	Fort Myers	7.1 – 12	< 10 psu	In Range
5-7	Shell Point	16 – 32	25 – 31 psu	In Range
10-13 13-16	Ligi	nt (25% Iz	depth meters)	
Ashell Point 20 – 30	lona	1.1	1 meter	In Range
30-45	Causeway	1.66	2.2 meters	Low
Causeway A	San Carlos Bay	1.91	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged 808 cfs. Over the past 14 days 15% of total Lake Okeechobee outflows were sent south to the EAA for water supply, 31% was delivered to the L8 basin, 54% was directed to the Caloosahatchee.



Date	Day	S-79 (cfs) Pulse	S-79 (cfs) Actual
11/20/2015	1	650	663
11/21/2015	2	1100	1035
11/22/2015	3	900	1983
11/23/2015	4	800	1469
11/24/2015	5	600	729
11/25/2015	6	400	757
11/26/2015	7	100	607
11/27/2015	8	650	570
11/28/2015	9	1100	1134
11/29/2015	10	900	846
11/30/2015	11	800	1010
12/01/2015	12	600	
12/02/2015	13	400	
12/03/2015	14	100	

Upstream of S79/Franklin Conditions: On 12/1/15 at the Olga

Water Treatment plant, chlorides measured **50 mg/L**, apparent color was **223 CU** and turbidity measured **1.12 NTU**. No algae was visible at the plant intake over the past week. The plant is online operating at 2000 GPM.

Upper Estuary Conditions: The Lee County Dept of Health lifted the bacteria advisory at North Shore Park along the Caloosahatchee. Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (20 psu on 11/30/15) and at Shell Point (27 psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: RECON values

McIntyre Creek Salinity: 28.75 – 31.5 psu; CDOM: 21– 32 qse; Dissolved oxygen: 4.5 – 10 mg/L Tarpon Bay: data not available

Salinities within the lower end of the preferred range for shoal and turtle grass. Floating algal mats have developed in the west impoundment of the refuge.

Red Tide: The past week FWC reported blooms of the Florida red tide organism *Karenia brevis* along two Northwest Florida counties and Pinellas, Manatee, Sarasota, Charlotte, Lee, and northern Collier counties in Southwest Florida. Samples collected in, along and offshore of Lee County had background to low concentrations.

Wildlife Impacts: The past week CROW, the Wildlife rehabilitation clinic on Sanibel, treated **42 new cases of red tide poisoning**; all juvenile double crested cormorants.

Calasashatahaa	Chlorophyll	CDOM	Turbidity	25% Iz depth	h ACOE Daily Reports				
Stations	(µg/L)	(qse)	(NTU)	(meters)	Date	Day	S79 Flow	S78 Flow	S77 Flow
		CE <70	70 CE < 18 CE = 1 m			(cts)	(cts)	(Cts)	
Target Values	< 11	SCB <11	SCB < 5	< 5 SCB = 2.2m	11/24/2015	Tues	729	388	0
lona	2.7	131	1.8	1.1	11/25/2015	Wed	757	216	172
Causeway A	2.0	59.6	2.0	1.66	11/26/2015	Thur	607	176	324
San Carlos	27	20.4	1 2	1.91	11/27/2015	Fri	570	383	320
Bay	2.1	30.1	1.3		11/28/2015	Sat	1134	469	533
Target light penetration: CE – Caloosahatchee estuary = 1 meter SCB – San Carlos Bay = 2.2 meters			= 1 meter	11/29/2015	Sun	846	548	613	
			eters	11/30/2015	Mon	1010	473	540	
25% Iz : where z is 25% of surface I . I = irradiance, $z = depth$			depth	7 Day	Avg	808	379	357	

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: December 1 - 7, 2015

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 throughout the region raised Lake Okeechobee water levels and provided significant flows averaging **1536 cfs** to the estuary at S79 predominantly from the watershed. No flow was directed to the Caloosahatchee from Lake O the past four days due to high watershed runoff. Salinities dropped below the optimum range for oysters in Iona.

USACE Action: On 12/4/15 the USACE began a 7-day pulse release from Lake Okeechobee to provide average flows of **1,000 cfs** to the Caloosahatchee estuary at S79 and zero flow to the St. Lucie at S80.

Recommendation: With very wet conditions forecast for coming months associated with a strong El Niño, we request average flows of **800 - 1000 cfs** at S79 to maintain suitable salinities within the estuary.

Lake Okeechobee Level: 14.72 ft. (Low Sub-B			Band) Last week: 14.48 ft.			
Lake Okeechobee Inflow: 5,668 cfs			Lake Okeechobee Outflow: 158 cfs			
Weekly Rainfall:	WP Franklin	2.77"	Ortona	2.41"	Moore Haven	2.60"
Salinity Fort Myers:	5.2 – 11 psu (SC	CCF Yacht B	asin Sur	face)	Previous week	: 7.1 – 12 psu
Salinity Shell Point:	15 - 31 psu (SC	CF RECON)		Previous week	: 16 – 32 psu



Salinity (psu)							
	Current Value	Sustainable Range	High/ Low				
Beautiful Island	ND	< 5 psu	-				
Fort Myers	5.2 – 11	< 10 psu	In Range				
Shell Point	15 - 31	25 – 31 psu	In Range				

Light (25% Iz depth meters)

lona	0.86	1 meter	Low
Causeway	1.23	2.2 meters	Low
San Carlos Bay	1.50	2.2 meters	Low
Caloosahatchee Estuary

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged **1536 cfs.** Over the past 14 days **no water** from Lake Okeechobee was directed south to the EAA for water supply, **37%** was delivered to the L8 basin, **57%** was directed to the Caloosahatchee and **6%** went to the St Lucie at S308.



Upstream of S79/Franklin Conditions: On 12/8/15 at the Olga Water Treatment plant, chlorides measured **54 mg/L**, apparent color was **148 CU** and turbidity measured **1.16 NTU**. No algae was visible at the plant intake over the past week. The plant is online operating at 2000 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was below the optimal range for oysters at Iona (**10 psu** on 12/07/15) but was optimal for oysters at Shell Point (**23 psu** weekly average).

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: RECON values

McIntyre Creek Salinity: 24.3 - 30.0 psu; CDOM: 23-32 qse; Dissolved oxygen: 3.2 - 10.5 mg/L

Tarpon Bay: data not available

Salinities within the lower end of the preferred range for shoal and turtle grass. Floating algal mats have developed in the west impoundment of the refuge.

Red Tide: The past week FWC reported blooms of the Florida red tide organism *Karenia brevis* persisting in northwest and southwest Florida with background to very low concentrations in, along, and offshore Lee County. SCCF has not found *Karenia* in recent samples around Sanibel and the Causeway.

Wildlife Impacts: The past week CROW, the Wildlife rehabilitation clinic on Sanibel, treated **11 new cases of red tide poisoning**; all double crested cormorants.

Calaasahatahaa	Chlorophyll	CDOM	Turbidity	25% Iz depth (meters)	۱	ACOE Daily Reports				
Stations	(µg/L)	(qse)	(NTU)		Date	Day	S79 Flow	S78 Flow	S77 Flow	
	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m			(cfs)	(cfs)	(cfs)	
Target Values					12/1/2015	Tues	801	466	774	
Iona	3.4	171	2.4	0.86		12/2/2015	Wed	480	261	422
Causeway A	2.2	96.1	2.2	1.23		12/3/2015	Thur	513	121	56
San Carlos	157	70.2	1 5	1.5 1.50		12/4/2015	Fri	2618	745	0
Bay	1.5.7	70.5	1.5			12/5/2015	Sat	2175	1195	0
Target light penetration: CE – Caloosahatchee estuary = 1 meter				= 1 meter		12/6/2015	Sun	2311	930	0
SCB – San Carlos Bay = 2.2 meters				eters		12/7/2015	Mon	1855	792	0
25% Iz : where z is 25% of surface I . I = irradiance, $z = depth$				depth		7 Day	Avg	1536	644	178

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Executive Director Peter Antonacci, Terrie Bates, Jeff Kivett, Susan Gray, Peter Doering, DEP Secretary Jon Steverson

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 Natural Resources Connie Jarvis – City of Cape Coral Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: December 8 - 14, 2015

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: No rain recorded throughout the region the past week. Lake and watershed flows averaged **1560 cfs** to the estuary at S79.

USACE Action: On 12/11/15 the USACE began a 7-day pulse release from Lake Okeechobee to provide average flows of **1,500 cfs** to the Caloosahatchee estuary at S79 and zero flow to the St. Lucie at S80.

Recommendation: With very wet conditions forecast for the coming months associated with a strong El Niño, we request average flows of **1000 -1500 cfs** at S79 to maintain salinities within the estuary.

Lake Okeechobee Level:	14.78 ft. (Low Sub-B	and) Last	Last week: 14.72 ft .			
Lake Okeechobee Inflow	: 2,758 cfs	Lake Okeech	obee Outflow: 1,171 cfs			
Weekly Rainfall:	WP Franklin 0 "	Ortona 0 "	Moore Haven 0"			
Salinity Fort Myers:	3.9 – 8.3 psu (SCCF Yach	nt Basin Surface)	Previous week: 5.2 – 11 psu			
Salinity Shell Point:	16 – 31 psu (SCCF RECC	DN)	Previous week: 15 - 31 psu			

	12/14/2015 Surface Salinity
Marine Laboratory	RECON or sonde Sample Site
Map Created by Sarah Bridenbaugh	0-2
	5-7
Midpoint Bridge	7 - 10
	13 - 16
Bhell Point	16 – 20 20 – 30
Causeway A	30 - 45

Sainity (psu)								
	Current Value	Sustainable Range	High/ Low					
Beautiful Island	ND	< 5 psu	-					
Fort	3.9 – 8.3	< 10 psu	In					
Myers			Range					
Shell	16 - 31	25 – 31 psu	In					
Point			Range					

12.14

Light (25% Iz depth meters)

lona	1.08	1 meter	In Range
Causeway	2.00	2.2 meters	Low
San Carlos Bay	2.21	2.2 meters	In Range
		1	

Caloosahatchee Estuary

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S79 during the past seven days averaged **1560 cfs.** Over the past 14 days **no water** from Lake Okeechobee was directed south to the EAA for water supply, **29%** was delivered to the L8 basin, **67%** was directed to the Caloosahatchee and **4**% went to the St Lucie at S308.



ACOE December 4, 2015 Pulse Release								
Date	Day	S-79 (cfs) Pulse Target	S-79 (cfs) Actual					
12/4/2015	1	1400	2618					
12/5/2015	2	1600	2175					
12/6/2015	3	1300	2311					
12/7/2015	4	1000	1855					
12/8/2015	5	800	1491					
12/9/2015	6	600	1212					
12/10/2015	7	300	922					
7 day avg		1000	1798					

Upstream of S79/Franklin Conditions: On 12/15/15 at the Olga Water Treatment plant, chlorides measured **55 mg/L**, apparent color was **158 CU** and turbidity measured **0.67 NTU**. No algae was visible at the plant intake over the past week. The plant is online operating at 2000 GPM.

Upper Estuary Conditions: Salinities in the upper estuary are in the suitable range for tape grass.

Lower Estuary Condition: Salinity was in the optimal range for oysters at Iona (**17** psu on 12/14/15) and at Shell Point (**25** psu weekly average).

McIntyre Creek & Tarpon Bay in J.N. "Ding" Darling NWR: RECON values

McIntyre Creek Salinity: 25.3 – 28.7 psu; CDOM: 23– 33 qse; Dissolved oxygen: 4.3 – 10. mg/L Tarpon Bay: data not available

Salinities within the lower end of the preferred range for shoal and turtle grass. Floating algal mats have developed in the west impoundment of the refuge.

Red Tide: The past week FWC reported blooms of the Florida red tide organism *Karenia brevis* persisting in northwest and southwest Florida with low to medium concentrations off Cayo Costa. SCCF has not found *Karenia* in recent samples around the east side of Sanibel or San Carlos Bay.

Wildlife Impacts: The past week CROW, the Wildlife rehabilitation clinic on Sanibel, treated **20 new cases of red tide poisoning**; **14** double crested cormorants,**2** gulls, **1** pelican, **1** sanderling and **1** northern gannet.

Calaasahatahaa	Chlorophyll	CDOM	Turbidity	25% Iz depth (meters)	ACOE Daily Reports				
Stations	(µg/L)	(qse)	(NTU)		Date	Day	S79 Flow	S78 Flow	S77 Flow
		CE <70	CE < 18	CE - 1m			(Cts)	(Cts)	(cts)
Target Values < 11 CE < 70 CE < 78 CE = 71 SCB < 11	SCB = 2.2m	12/8/2015	Tues	1491	456	0			
Iona	1.7	135	0.8	1.08	12/9/2015	Wed	1212	197	146
Causeway A	0.0	31.7	1.7	2.00	12/10/2015	Thur	922	149	88
San Carlos	0.0	20.9	0.7	2.24	12/11/2015	Fri	1676	653	502
Bay	0.0	30.0	0.7	2.21	12/12/2015	Sat	2304	1293	1406
Target light penetration: CE – Caloosahatchee estuary = 1 meter				= 1 meter	12/13/2015	Sun	2028	1461	1370
SCB – San Carlos Bay = 2.2 meters				eters	12/14/2015	Mon	1286	935	974
25% Iz : where z is 25% of surface I . I = irradiance, z = depth			depth	7 Day	Avg	1560	735	641	