

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns - Town of Fort Myers Beach
Connie Jarvis & Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **December 19, 2017 - January 1, 2018**

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 past two weeks freshwater flows from Lake Okeechobee and the watershed decreased to an average of **3,044 cfs** (12/19 - 25/17) and **2,066 cfs** (12/26/17 - 1/1/18) at S-79. Light remains limited throughout the river and estuary from dark, freshwater discharge that extends to Lighthouse Beach on Sanibel. **Red tide has been persistent the past two weeks causing fish kills along coastal beaches and is the suspected cause of one manatee death in Matlacha Pass.**

USACE Action: On 12/29/17 the Army Corps continued the transition to reduce flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **1,500 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: In order to continue to reduce Lake Okeechobee water levels and acclimate the estuary to lower dry season flows we encourage the Corps to modify the discharge schedule to the Caloosahatchee estuary with a target of **1,000 cfs measured at S-79** over the next week.

Lake Okeechobee Level: **15.48 ft. (Low Sub-Band)**

Last week: **15.71 ft**

Lake Okeechobee Inflow: **1,124 cfs**

Lake Okeechobee Outflow: **1,525 cfs**

Weekly Rainfall: WP Franklin **0.13"**

Ortona **0.17"**

Moore Haven **0.07"**

Salinity Beautiful Island: **ND** (SCCF RECON Marker 18)

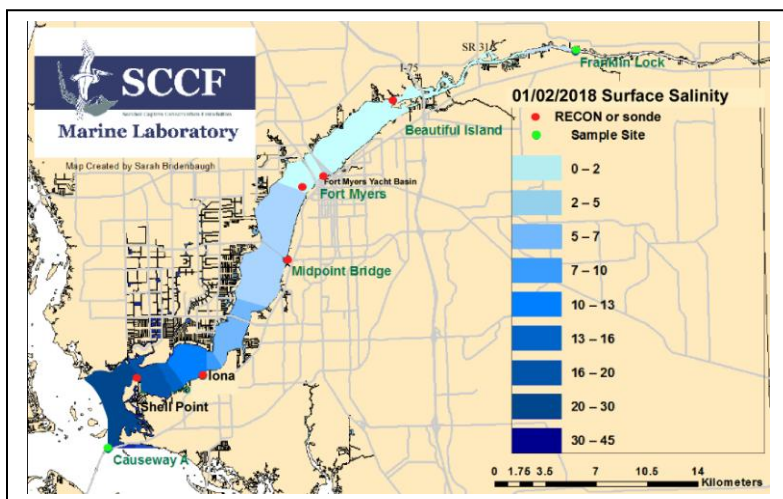
Previous wk **ND**

Salinity Fort Myers: **ND** (SCCF RECON)

Previous wk **ND**

Salinity Shell Point: **9.1 – 29 psu** (SCCF RECON)

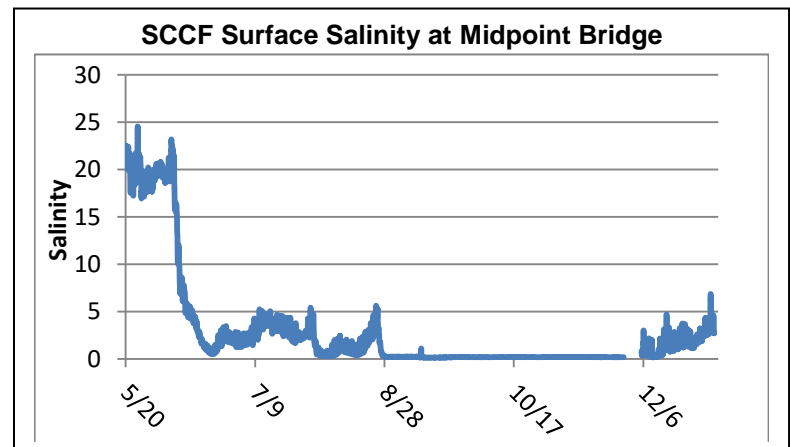
Previous wk **6.1 - 30 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	ND	<10 psu	In Range
Shell Point	9.1 – 29	25 - 32 psu	Low
Light (25% lz depth meters)			
Fort Myers	0.66	1 meter	Low
Shell Point	1.20	2.2 meters	Low
Causeway	1.60	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **2,066 cfs**. Over the past 14 days **84,594 AF** of water was discharged from Lake O, **67% to S-77** and **23% to S-308**. Over **6,635* AF (8%)** of water from Lake O was discharged south to the EAA (*no report for S-351). **100 AF** was discharged through L8 and **1,488 AF (1.8%)** through S310.

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
12/19/2017	2862	1806	2004
12/20/2017	2180	1632	1744
12/21/2017	1613	1319	1446
12/22/2017	3273	NR	2468
12/23/2017	4222	2876	3288
12/24/2017	3834	2902	3050
12/25/2017	3323	2280	2492
7 day Avg	3044	2136	2356
12/26/2017	2698	2052	2348
12/27/2017	2304	1920	2141
12/28/2017	1792	1200	1697
12/29/2017	2093	1698	1482
12/30/2017	2242	1202	1615
12/31/2017	1880	1392	1400
1/1/2018	1454	1180	1171
7 day Avg	2066	1521	1693



Upper Estuary Conditions: On 1/2/18 The Olga Water Treatment plant reported chlorides **56 mg/l**, apparent color **148 CU** and turbidity **3.95 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 2200 GPM. Salinities in the upper estuary were in the suitable range for tape grass.

Lower Estuary Conditions: The average weekly salinity was within the optimal range for oysters at Shell Point (**20 psu**).

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	4.1 – 9.6	12.7 – 60.7	3.8 – 8.4
Tarpon Bay	22.8 – 29.6	5.5 – 7.6	15.9 – 29.0	3.6 – 10.0

Red Tide: Over the past two weeks the Florida Fish and Wildlife Conservation Commission reported the Florida red tide organism, *Karenia brevis*, in background to high concentrations in local coastal waters of Lee and Charlotte counties. A SCCF water sample from Bowman's Beach on 12/30/17 had 210,000 *Karenia* cells/L. Fish kills were reported on Cayo Costa and Sanibel beaches.

Wildlife Impacts: Over the past two weeks, CROW the wildlife hospital on Sanibel treated **16 patients with red tide symptoms: 15 Double Crested Cormorants and 1 White Pelican**. A dead manatee was found in Matlacha Pass at MM 59; suspected cause of mortality, red tide.

Manatees: Lee County park staff reported over **69 manatees** in the warm water of the Orange River and FPL canal the past week. Water temperatures ranged from **69 - 82° F**. **Two manatee deaths washed up on Sanibel beaches the past 2 weeks, cause of deaths unknown.**

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	4.1	257	4.7	0.66
Shell Point	6.1	99	3.5	1.20
Causeway	4.4	43	5.5	1.60

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **January 2 - 8, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed decreased to an average of **1,024 cfs** at S-79. Water clarity throughout San Carlos Bay and along Sanibel and Fort Myers beaches continues to improve as a result of the reduced freshwater flows. **Red tide continues to cause fish kills along coastal beaches.**

USACE Action: On 1/5/18 the Army Corps continued the transition to reduce flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: In order to continue to reduce Lake Okeechobee water levels and provide healthy salinity conditions throughout the estuary we encourage the Corps to provide pulse releases to the Caloosahatchee of **800 - 1,000 cfs measured at S-79** over the next week. In addition to supporting estuary salinity this will help lower lake levels to prevent high lake levels at the beginning of the wet season.

Lake Okeechobee Level: **15.35 ft. (Low Sub-Band)**

Last week: **15.48 ft**

Lake Okeechobee Inflow: **913 cfs**

Lake Okeechobee Outflow: **497 cfs**

Weekly Rainfall: WP Franklin **0.17"** Ortona **0"**

Moore Haven **0.38"**

Salinity Beautiful Island: **ND** (SCCF RECON Marker 18)

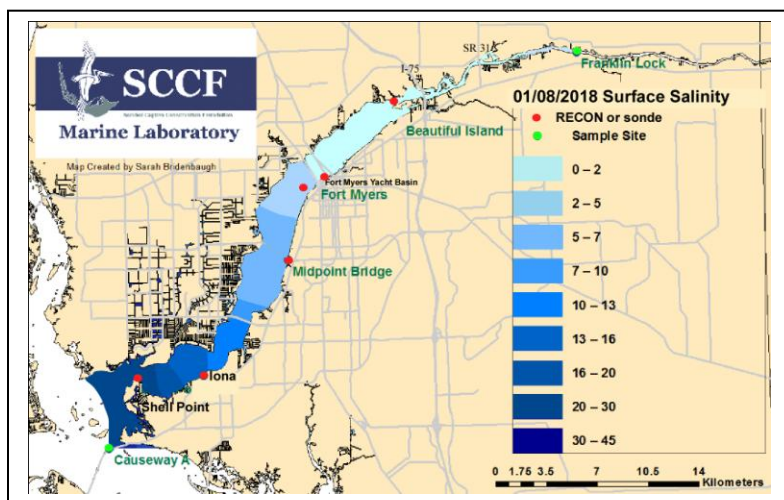
Previous wk **ND**

Salinity Fort Myers: **ND** (SCCF RECON)

Previous wk **ND**

Salinity Shell Point: **8.7 - 30 psu** (SCCF RECON)

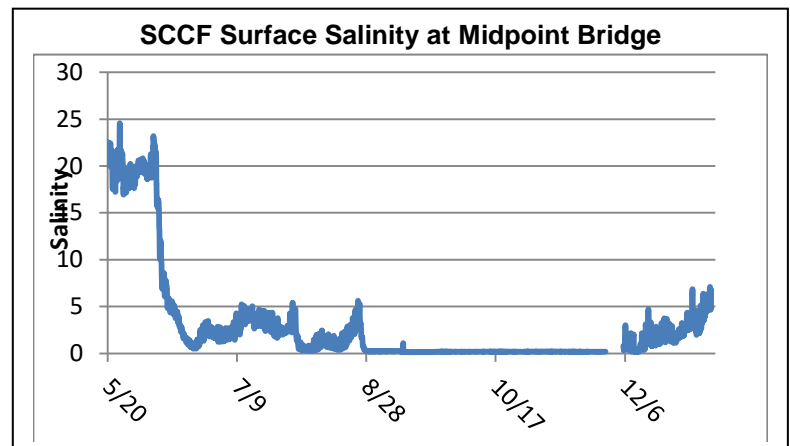
Previous wk **9.1 - 29 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	ND	<10 psu	In Range
Shell Point	8.7 - 30	25 - 32 psu	Low
Light (25% Iz depth meters)			
Fort Myers	0.48	1 meter	Low
Shell Point	1.16	2.2 meters	Low
Causeway	1.59	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **1,024 cfs**. Over the past 14 days **47,324 AF** of water was discharged from Lake O, **77% to S-77** and **9% to S-308**. **Over 5,420* AF (11.5%) of water from Lake O was discharged south to the EAA (*no report for S-351)**. **99 AF** was discharged through L8 and **1,387 AF (3%)** through S310.

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
1/2/2018	1324	991	766
1/3/2018	879	961	937
1/4/2018	554	433	762
1/5/2018	1101	845	702
1/6/2018	1528	1127	922
1/7/2018	1083	671	928
1/8/2018	698	294	220
7 day Avg	1024	760	748



Upper Estuary Conditions: On 1/9/18 The Olga Water Treatment plant reported chlorides **60 mg/l**, apparent color **71 CU** and turbidity **5.22 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 2200 GPM.

Salinities in the upper estuary were in the suitable range for tape grass.

Lower Estuary Conditions: The average weekly salinity was within the optimal range for oysters at Shell Point (**22 psu**).

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	5.0 - 7.5	9.0 – 62.8	2.5 – 9.0
Tarpon Bay	22.8 – 30.9	6.5 – 8.9	14.8 – 29.0	2.9 – 10.1

Beach Conditions: Water clarity is increasing along coastal beaches with lower flows. Accumulations of drift algae washed up on the northern and southern end of Fort Myers Beach along with sponges likely dislodged by high winds and wave action from recent storms. A green algae, **Ulva**, has been accumulating on the Sanibel causeway islands.

Red Tide: On 1/5/18 the Florida Fish and Wildlife Conservation Commission reported the Florida red tide organism, **Karenia brevis**, persists from Sarasota to Lee counties in Southwest Florida with low to medium concentrations in Charlotte and Lee Counties. Numerous fish kills and respiratory irritation were also reported. SCCF found no *Karenia* in water samples from mid Sanibel beaches.

Wildlife Impacts: Over the past two weeks, CROW the wildlife hospital on Sanibel treated **4 new patients with red tide symptoms: 2 Double Crested Cormorants, 1 White Pelican and 1 Ring Billed Gull**.

Manatees: Lee County park staff reported over **100 manatees** in the warm water of the Orange River and FPL canal the past week. A cold front dropped water temperatures from **58.3 - 78° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	7.3	315	7.2	0.48
Shell Point	7.5	104	3.4	1.16
Causeway	5.8	55	2.8	1.59

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

SCB-San Carlos Bay = 2.2 meters

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

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Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **January 9 - 15, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed decreased by over half to an average of **607 cfs** at S-79. Water clarity throughout San Carlos Bay and along Sanibel and Fort Myers beaches continues to improve as a result of the reduced freshwater flows. **Red tide continues along coastal beaches.**

USACE Action: On 1/12/18 the Army Corps continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To continue to reduce Lake Okeechobee water levels and provide healthy salinity conditions throughout the estuary we encourage the Corps to provide pulse releases to the Caloosahatchee of **800 - 1,000 cfs measured at S-79** over the next week. This will help lower lake levels to prevent high lake levels at the beginning of the wet season.

Lake Okeechobee Level: 15.39 ft. (Low Sub-Band)

Last week: 15.35 ft

Lake Okeechobee Inflow: 1,048 cfs

Lake Okeechobee Outflow: 732 cfs

Weekly Rainfall: WP Franklin 0.1" Ortona 0.15" Moore Haven 0.25"

Salinity Beautiful Island: ND (SCCF RECON Marker 18)

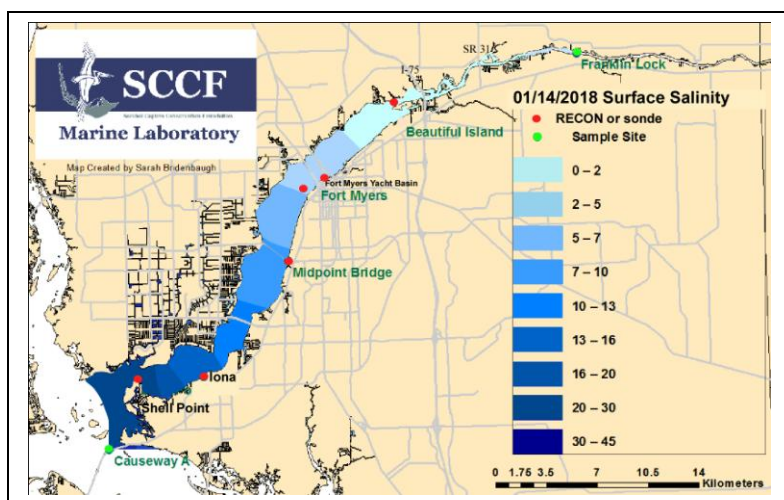
Previous wk ND

Salinity Fort Myers: ND (SCCF RECON)

Previous wk ND

Salinity Shell Point: 13 – 31 psu (SCCF RECON)

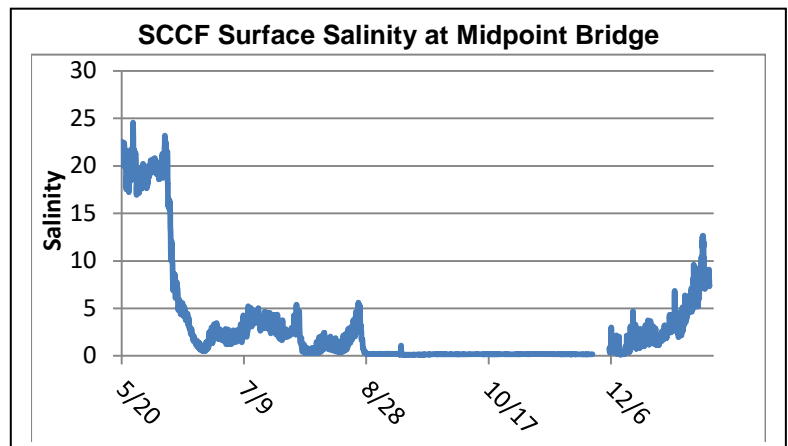
Previous wk 8.7 - 30 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	ND	<10 psu	In Range
Shell Point	13 – 31	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.62	1 meter	Low
Shell Point	1.04	2.2 meters	Low
Causeway	1.36	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **607 cfs**. Over the past 14 days **22,865 AF** of water was discharged from Lake O, **69% to S-77** and **3% to S-308**. **Over 20%* of water from Lake O was discharged south to the EAA (*no report for S-351).** Approximately 3% was discharged through each the L8 and S-310.

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
1/9/2018	329	147	0
1/10/2018	147	146	0
1/11/2018	26	0	0
1/12/2018	732	158	314
1/13/2018	1374	457	281
1/14/2018	1028	502	250
1/15/2018	614	491	702
7 day Avg	607	272	221



Upper Estuary Conditions: On 1/11/18 the Lee County Environmental Lab detected *Aphanizomenon*, *Microcystis* and *Dolichospermum* cyanobacteria upstream of the Franklin Lock in east Fort Myers. On 1/16/18 the Olga Water Treatment plant reported chlorides of **58 mg/l**, apparent color **148 CU** and turbidity **4.67 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 2200 GPM. Salinities in the upper estuary were in the suitable range for tape grass (**3.8 psu** weekly average).

Lower Estuary Conditions: The average weekly salinity was within the optimal range for oysters at Shell Point (**23 psu**).

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	4.9 - 12.0	17.4 – 27.2	2.9– 7.4
Tarpon Bay	25.2 – 32.9	6.4 – 8.7	7.5 – 23.8	2.3 – 7.7

Beach Conditions: Water clarity is increasing along coastal beaches with lower flows and higher salinities.

Red Tide: On 1/12/18 the Florida Fish and Wildlife Conservation Commission reports the Florida red tide organism, *Karenia brevis*, persists from Sarasota to Lee counties in Southwest Florida with medium concentrations in Charlotte County and very low to high concentrations in Lee. SCCF monitoring found medium concentrations at Wulfert Point and the Redfish Pass RECON site on 1/11/18.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **4 new patients with red tide symptoms: 2 Lesser Scaups and 2 Double Crested Cormorants**. One dead sea turtle was also recovered on Sanibel.

Manatees: Lee County park staff reported up to **100 manatees** in the warm water discharge of the Orange River and FPL canal the past week when water temperatures warmed to **67 - 80° F** from the week before.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	7.2	256	7.5	0.62
Shell Point	7.0	131	2.4	1.04
Causeway	5.7	82	2.4	1.36

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

SCB-San Carlos Bay = 2.2 meters

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

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Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **January 16 - 23, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed increased to an average of **647 cfs** at S-79. Water clarity throughout San Carlos Bay and along Sanibel and Fort Myers beaches continues to improve as a result of the reduced freshwater flows. **Red tide continues along coastal beaches.**

USACE Action: On 1/12/18 the Army Corps continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To continue to reduce Lake Okeechobee water levels and provide healthy salinity conditions throughout the estuary we encourage the Corps to provide pulse releases to the Caloosahatchee of **800 - 1,000 cfs measured at S-79** over the next week. This will help lower lake levels to prevent high lake levels at the beginning of the wet season.

Lake Okeechobee Level: 15.31 ft. (Low Sub-Band)

Last week: 15.39 ft.

Lake Okeechobee Inflow: 679 cfs

Lake Okeechobee Outflow: 1,643 cfs

Weekly Rainfall: WP Franklin 0.1" Ortona 0.0"

Moore Haven 0.0"

Salinity Beautiful Island: ND (SCCF RECON Marker 18)

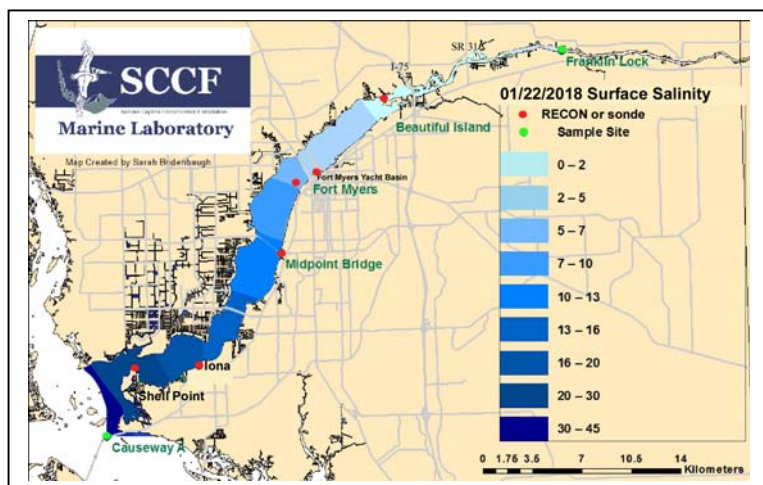
Previous wk. ND

Salinity Fort Myers: ND (SCCF RECON)

Previous wk. ND

Salinity Shell Point: 14 – 31 psu (SCCF RECON)

Previous wk. 13 – 31 psu

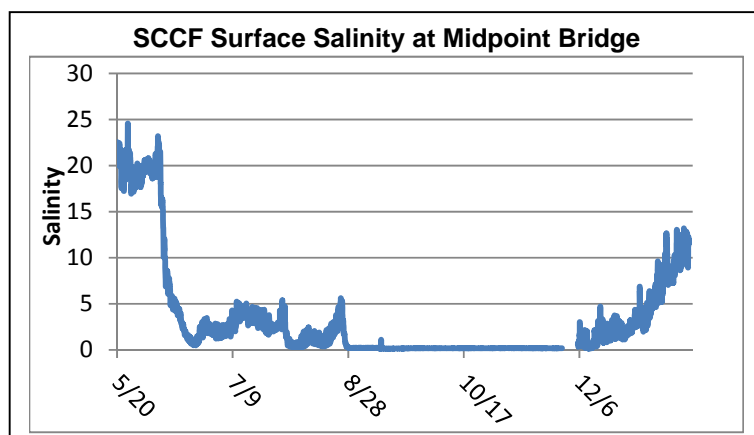


Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	ND	<10 psu	In Range
Shell Point	14 – 31	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.70	1 meter	Low
Shell Point	1.10	2.2 meters	Low
Causeway	1.79	2.2 meters	Low

*ND – No Data

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **647 cfs**. Over the past 14 days **29,819 AF** of water was discharged from Lake O, **36% to S-77** and **4% to S-308**. **Around 46% of water from Lake O was discharged south to the EAA. Approximately 13% was discharged through L8 and 2% was discharged through S-310.**

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
1/16/2018	410	270	550
1/17/2018	192	0	34
1/18/2018	45	0	51
1/19/2018	779	490	590
1/20/2018	1388	1158	1478
1/21/2018	1070	713	789
1/22/2018	646	300	347
7 day Avg	647	419	548



Upper Estuary Conditions: On 1/23/18 the Olga Water Treatment plant reported chlorides of **58 mg/l**, apparent color **141 CU** and turbidity **4.17 NTU**. No visible algae were reported at the plant intake the past week. The plant is online running at 2200 GPM.

Lower Estuary Conditions: The average weekly salinity was within the optimal range for oysters at Shell Point (**25 psu**). Diatoms (*Skeletonema* and *Thalassiosira*) were the dominant phytoplankton in a Shell Point sample on 1/19/18.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	-----	-----	-----
Tarpon Bay	27.5 – 32.0	6.2 – 8.0	10.2 – 20.3	1.9 – 7.2

Beach Conditions: Water clarity is increasing along coastal beaches with lower flows and higher salinities.

Red Tide: On 1/18/18 the Florida Fish and Wildlife Conservation Commission reports the Florida red tide organism, *Karenia brevis*, persists in Charlotte, Lee and Monroe counties in Southwest Florida with medium concentrations in Charlotte County and very low to low concentrations in Lee. SCCF monitoring found low concentrations of *Karenia* at Dinkin's Bayou on 1/18/18.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **3 new patients with red tide symptoms: 2 Royal Terns and 1 Brown pelican**. A green turtle was stranded on Captiva with no obvious wounds or abnormalities.

Manatees: Lee County park staff reported up to **100 manatees** in the warm water discharge of the Orange River and FPL canal the past week when water temperatures were **64 - 78° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	5.5	238	3.1	0.70
Shell Point	6.1	120	2.8	1.10
Causeway	1.5	50.5	1.9	1.79

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

SCB-San Carlos Bay = 2.2 meters

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

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **January 23 - 29, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed averaged **664 cfs** at S-79. Water clarity throughout San Carlos Bay and along Sanibel and Fort Myers beaches continues to improve as a result of the reduced freshwater flows. **Red tide continues along coastal beaches.**

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To offset rapidly rising salinities in the Caloosahatchee we request the Corps provide pulse releases to the Caloosahatchee to maintain salinities below the ecological harm threshold of **10 psu**. Past operations have shown that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: 15.29 ft. (Low Sub-Band)

Last week: 15.31 ft

Lake Okeechobee Inflow: 1,329 cfs

Lake Okeechobee Outflow: 1,208 cfs

Weekly Rainfall: WP Franklin 0.38"

Ortona 0.19"

Moore Haven 0.75"

Salinity Beautiful Island: ND (SCCF RECON Marker 18)

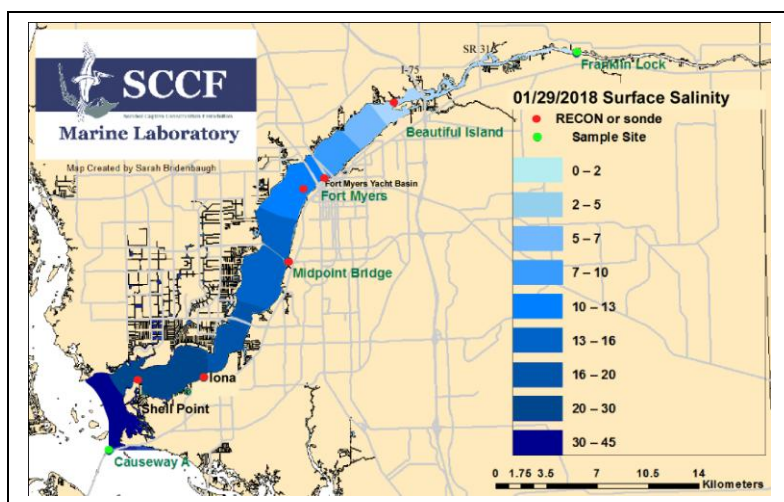
Previous wk ND

Salinity Fort Myers: ND (SCCF RECON)

Previous wk ND

Salinity Shell Point: 17 – 33 psu (SCCF RECON)

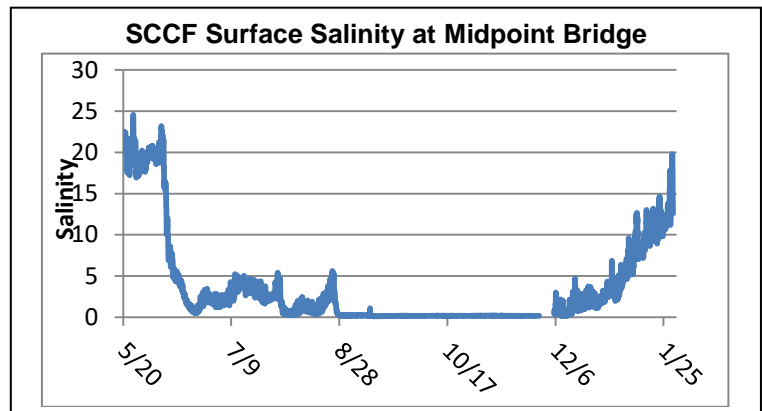
Previous wk 14 – 31 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	ND	<10 psu	In Range
Shell Point	17 – 33	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.76	1 meter	Low
Shell Point	1.59	2.2 meters	Low
Causeway	1.89	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **664 cfs**. Over the past 14 days **29,931** AF** of water was discharged from Lake O, **43% to S-77** and **2% to S-308**. **Over 38%* of water from Lake O was discharged south to the EAA (*no report for S-351). Approximately 15%** was discharged to the L8 and 2% was discharged through S-310. (** data missing)**

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
1/23/2018	452	300	363
1/24/2018	156	301	112
1/25/2018	59	2	0
1/26/2018	960	805	30
1/27/2018	1393	1400	392
1/28/2018	1061	837	310
1/29/2018	566	330	-8
7 day Avg	664	568	171



Upstream of S-79/Franklin Conditions: On 1/23/18 the Olga Water Treatment plant reported chlorides of **56 mg/l**, apparent color **152 CU** and turbidity **5.36 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 2200 GPM.

Upper Estuary Conditions: The average weekly salinity at the Fort Myers Yacht Basin was **8.0 psu**, in the suitable range for tape grass.

Lower Estuary Conditions: The average weekly salinity was **28 psu**, within the optimal range for oysters at Shell Point.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	4.9 - 9.5	9.6 - 21	2.3 - 6.1
Tarpon Bay	25.7 - 33.6	5.9 - 7.5	6.26 - 22.6	2.0 - 21.0

Beach Conditions: A green algae *Ulva* is present across local beaches in Sanibel, Fort Myers and Fort Myers Beach and colonizing hard structures in the lower estuary.

Red Tide: On 1/26/18 the Florida Fish and Wildlife Conservation Commission reported the Florida red tide organism, *Karenia brevis*, persists in Charlotte and Lee Counties in Southwest Florida in low concentrations. SCCF monitoring found medium concentrations near Pumpkin Key, and low to none near 11 other Pine Island sites on 1/24/18.

Wildlife Impacts: The past week **one dead green sea turtle was reported on Captiva with prop scars**.

Manatees: Lee County park staff reported over **80 manatees** in the warm water discharge of the Orange River and FPL canal the past week when water temperatures ranged from **65 - 78° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	5.7	214	2.6	0.76
Shell Point	4.1	50.4	4.2	1.59
Causeway	1.9	24.3	5.5	1.89

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **January 30 - February 5, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed averaged **705 cfs** at S-79. Salinities in the estuary are rising rapidly . **Red tide continues along coastal beaches.**

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To offset rapidly rising salinities in the Caloosahatchee we request the Corps provide pulse releases to the Caloosahatchee to maintain salinities below the ecological harm threshold of 10 psu. Past operations have shown that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: 15.23 ft. (Low Sub-Band)

Last week: 15.29 ft

Lake Okeechobee Inflow: 1,438 cfs

Lake Okeechobee Outflow: 1,471 cfs

Weekly Rainfall: WP Franklin 1.45"

Ortona 1.0"

Moore Haven 0.46"

Salinity Beautiful Island: ND (SCCF RECON Marker 18)

Previous wk ND

Salinity Fort Myers: 7.9 – 18 (SCCF RECON)

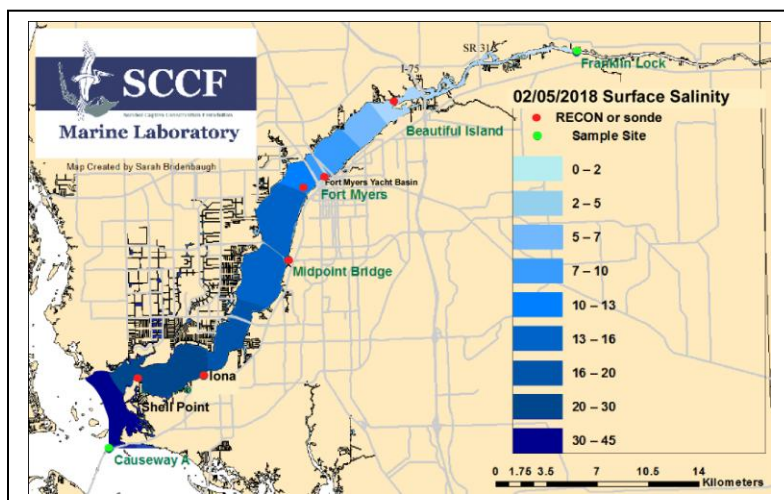
Previous wk ND

30 day moving average: 5.7 psu

Previous week: 4.1 psu

Salinity Shell Point: 20 – 33 psu (SCCF RECON)

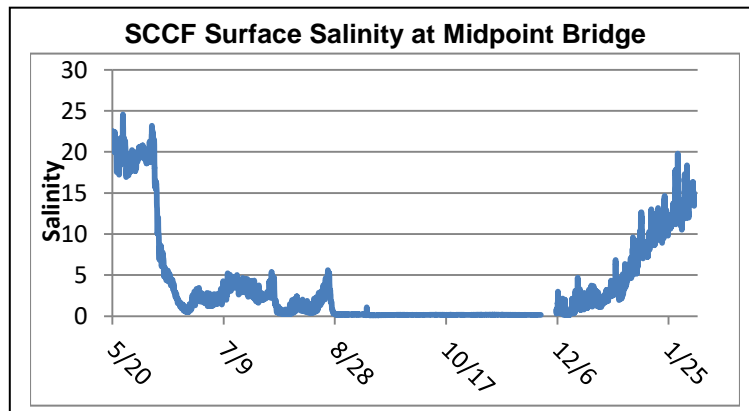
Previous wk 17 – 33 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	7.9 – 18	<10 psu	In Range
Shell Point	20 – 33	25 - 32 psu	In Range
Light (25% I _z depth meters)			
Fort Myers	0.91	1 meter	Low
Shell Point	1.54	2.2 meters	Low
Causeway	2.05	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **705 cfs**. Over the past 14 days **30,759** AF** of water was discharged from Lake O, **50% to S-77**. **Over 34%* of water from Lake O was discharged south to the EAA (*no report for S-351)**. **Approximately 14%** was discharged to the L8 and 2% was discharged through S-310. (** data missing)**

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
1/30/2018	518	326	336
1/31/2018	252	230	229
2/1/2018	39	63	226
2/2/2018	1055	790	1006
2/3/2018	1548	1022	1516
2/4/2018	880	970	996
2/5/2018	644	425	219
7 day Avg	705	547	647



Upstream of S-79/Franklin Conditions: On 2/6/18 the Olga Water Treatment plant reported chlorides of **57 mg/l**, apparent color **136CU** and turbidity **4.98 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 2200 GPM.

Upper Estuary Conditions: Salinities at the Fort Myers Yacht Basin were **8.9 psu**, weekly average, in the suitable range for tape grass.

Lower Estuary Conditions: The average weekly salinity was **28 psu**, within the optimal range for oysters at Shell Point.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	3.9 – 8.6	12.5 – 32.0	2.7 – 6.7
Tarpon Bay	29.2 – 33.2	5.8 – 7.4	7.1 – 43.3	2.3 – 7.4

Beach Conditions: A green algae *Ulva* is present across local beaches of Sanibel, Fort Myers and Fort Myers Beach and colonized hard structures in the lower estuary .

Red Tide: On 2/2/18 the Florida Fish and Wildlife Conservation Commission reports the Florida red tide organism, *Karenia brevis*, was detected in Pinellas, Sarasota, Charlotte, Lee, and Monroe counties in Southwest Florida.. SCCF found no *Karenia* spp. in samples from around Sanibel.

Wildlife Impacts: The past two weeks, CROW the wildlife hospital on Sanibel treated **4 patients with red tide symptoms: 2 Brown Pelicans and 2 Double Crested Cormorants**.

Manatees: Lee County park staff reported over **70 manatees** in the warm water discharge of the Orange River and FPL canal the past week when water temperatures ranged from **68 - 76° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	12.1	187	4.1	0.91
Shell Point	4.1	62.4	2.5	1.54
Causeway	1.9	30.8	2.2	2.05

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

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **February 6 - 12, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed averaged **692 cfs** at S-79. Salinities in the estuary are rising. Red tide continues along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To offset rising salinities in the Caloosahatchee we request the Corps provide pulse releases to the Caloosahatchee to maintain salinities below the ecological harm threshold of 10 psu. Past operations have shown that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: 15.18 ft. (Low Sub-Band)

Last week: 15.23 ft

Lake Okeechobee Inflow: 1,249 cfs

Lake Okeechobee Outflow: 2,521 cfs

Weekly Rainfall: WP Franklin 0.02" Ortona 0"

Moore Haven 0"

Salinity Beautiful Island: ND (SCCF RECON Marker 18)

Previous week ND

Salinity Fort Myers: 12 – 18 (SCCF RECON)

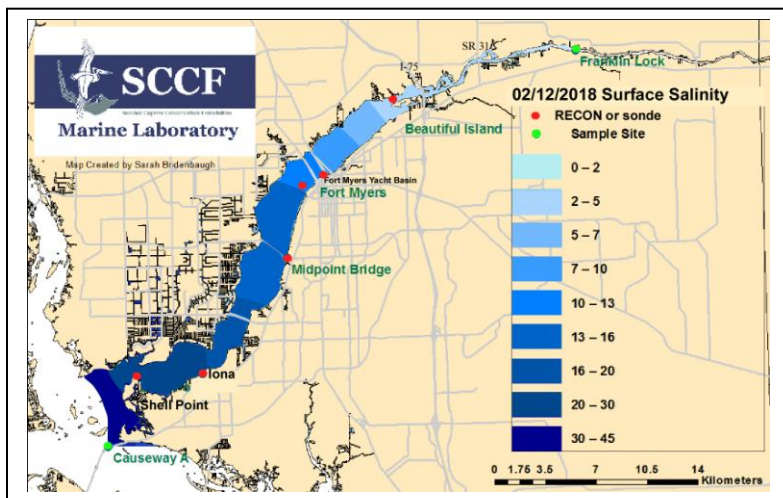
Previous week 7.9 – 18

30 day moving average: 7.4 psu

Previous week: 5.7 psu

Salinity Shell Point: ND (SCCF RECON)

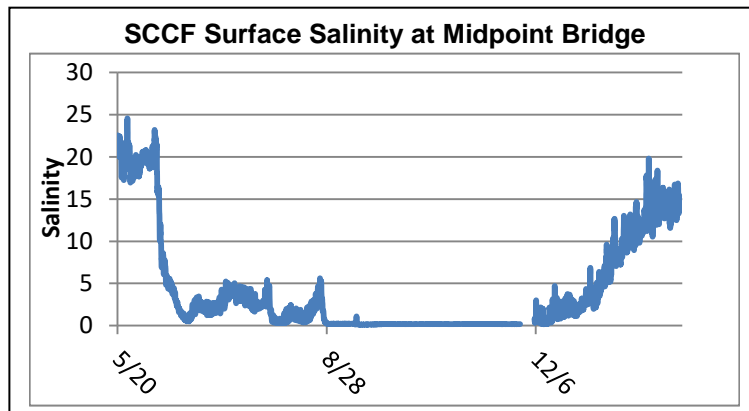
Previous week 20 – 33 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	12 – 18	<10 psu	In Range
Shell Point	ND	25 - 32 psu	-
Light (25% I _z depth meters)			
Fort Myers	0.72	1 meter	Low
Shell Point	1.54	2.2 meters	Low
Causeway	1.96	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **692 cfs**. Over the past 14 days **32,563** AF** of water was discharged from Lake O, **53.5% to S-77**. **Over 30%* of water from Lake O was discharged south to the EAA (*no report for S-351)**. **Approximately 15%** was discharged to the L8 and 1.5% was discharged through S-310. (** data missing)**

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
2/6/2018	491	153	0
2/7/2018	191	152	0
2/8/2018	27	1	0
2/9/2018	970	694	297
2/10/2018	1266	1033	535
2/11/2018	1208	893	795
2/12/2018	NR	346	442
7 day Avg	692	467	238



Upstream of S-79/Franklin Conditions: On 2/13/18 the Olga Water Treatment plant reported chlorides of **55 mg/l**, apparent color **138 CU** and turbidity **5.47 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 1800 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **9.5 psu**, in the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was in the appropriate range for seagrass and oysters up to 2/7/18 when the sensor malfunctioned.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	1.5 – 7.4	8.0 – 17.5	1.9 – 5.2
Tarpon Bay	31.4 – 32.9	-----	-----	-----

Beach Conditions: Water clarity has improved, see photos. A green algae *Ulva* is present across local sandbars and hard surfaces around the beaches of Sanibel, Fort Myers and Fort Myers Beach in the lower estuary.

Red Tide: On 2/9/18 the Florida Fish and Wildlife Conservation Commission reports the Florida red tide organism, *Karenia brevis*, was detected in and offshore Hillsborough, Sarasota, Charlotte, Lee, Collier and Monroe Counties in Southwest Florida.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **3 new patients with red tide symptoms: 2 Double Crested Cormorants and 1 Herring Gull**.

Manatees: Lee County park staff reported over **10 manatees** in the warm water discharge of the Orange River and FPL canal the past week when water temperatures ranged from **72 - 82° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	26	195	3.4	0.72
Shell Point	4.5	60.2	3.2	1.54
Causeway	2.4	32.1	3.0	1.96

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

SCB-San Carlos Bay = 2.2 meters

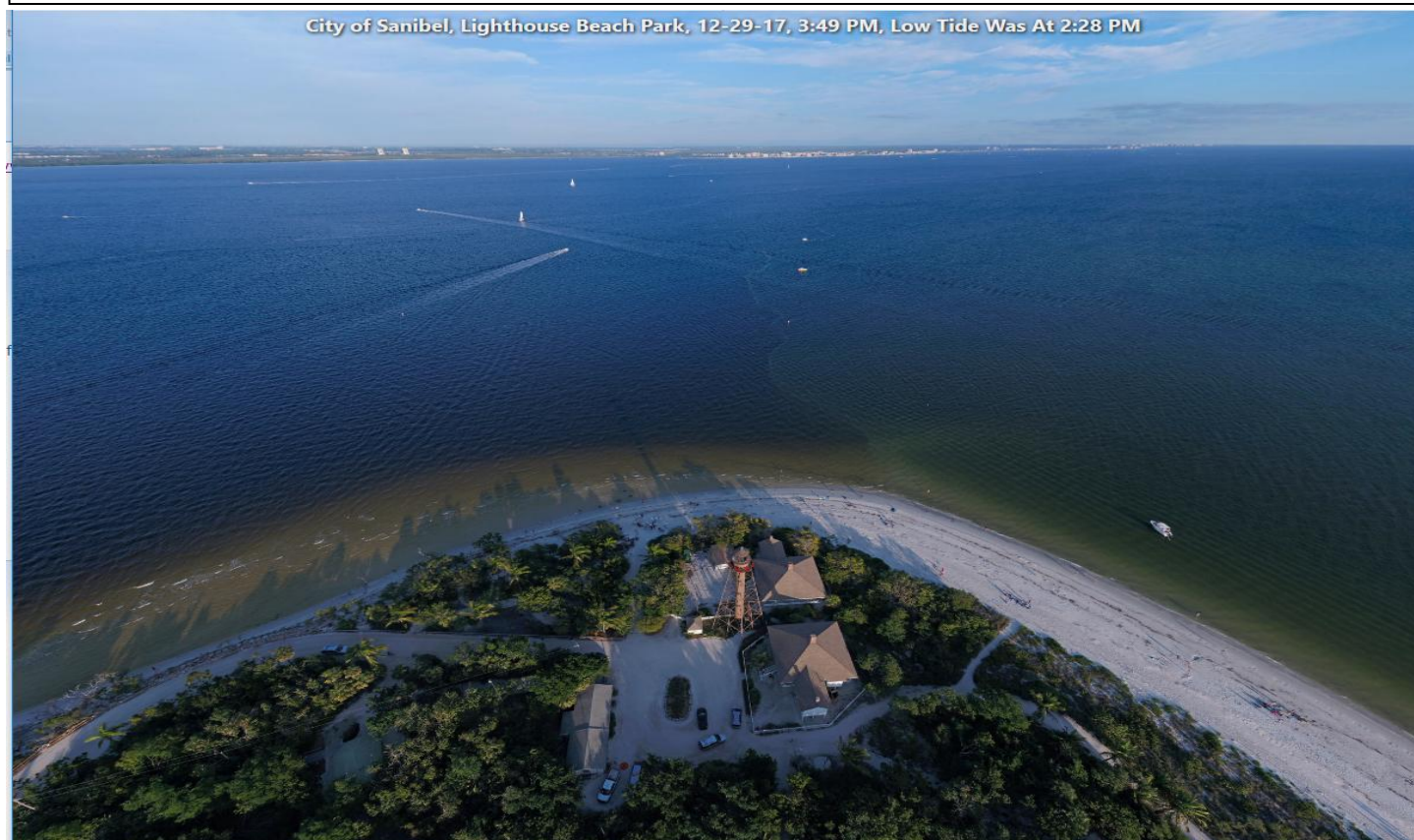
Definition of 25% I_z: **z** where **I** is 25% of surface **I**.
I = irradiance, z= depth

City Of Sanibel, Lighthouse Beach Park, 2-11-18, 1:15 PM, Low Tide Is At 3:26 PM



**Water clarity improving with lower freshwater inflows at Sanibel Lighthouse Beach Park on 2/11/18 (above)
from conditions on 1/6/18 (below)**

City of Sanibel, Lighthouse Beach Park, 12-29-17, 3:49 PM, Low Tide Was At 2:28 PM



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns - Town of Fort Myers Beach
Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **February 13 - 19, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed averaged **622 cfs** at S-79. Salinities in the estuary at Fort Myers are rising. Red tide was detected in background to low levels along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To offset rising salinities in the Caloosahatchee we request the Corps provide pulse releases to the Caloosahatchee to maintain salinities below the ecological harm threshold of 10 psu. Past operations have shown that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: 15.04 ft. (Low Sub-Band)

Last week: 15.18 ft

Lake Okeechobee Inflow: 1,198 cfs

Lake Okeechobee Outflow: 3,074 cfs

Weekly Rainfall: WP Franklin 0.0" Ortona 0"

Moore Haven 0"

Salinity Beautiful Island: ND (SCCF RECON Marker 18)

Previous week ND

Salinity Fort Myers: 11 – 16 psu (SCCF RECON)

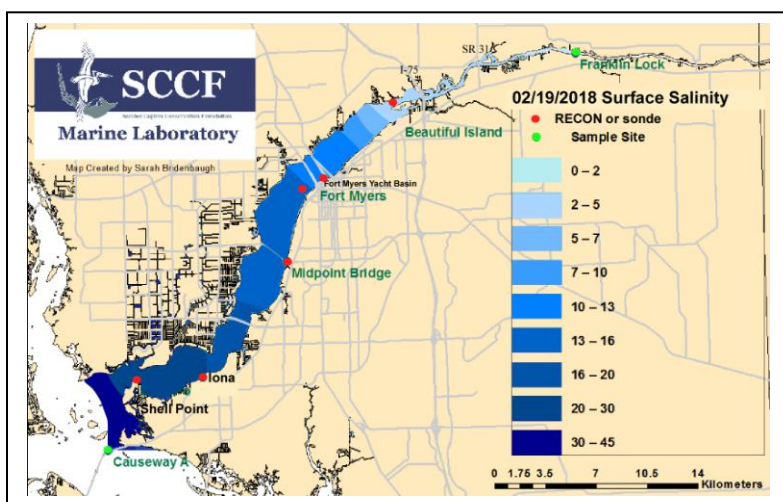
Previous week 12 – 18 psu

Yacht Basin 30 day moving average: 8.9 psu

Previous week: 7.4 psu

Salinity Shell Point: ND (SCCF RECON)

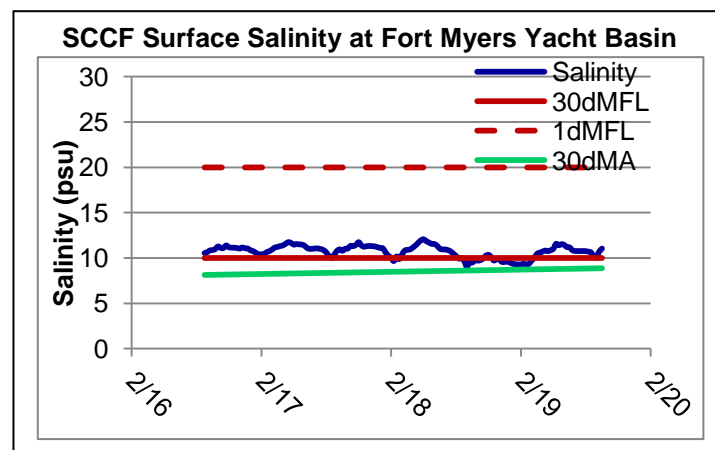
Previous week ND psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	-
Fort Myers	11 – 16	<10 psu	In Range
Shell Point	ND	25 - 32 psu	-
Light (25% I _z depth meters)			
Fort Myers	0.86	1 meter	Low
Shell Point	1.70	2.2 meters	Low
Causeway	2.15	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **622 psu**. Over the past 14 days **76,422 AF** of water was discharged from Lake O, **29% to S-77**. **Over 63% of water from Lake O was discharged south to the EAA. Approximately 8%* was discharged to the L8 and a net flow of <1% was discharged through S-310. (* data missing)**

Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
2/13/2018	193	244	563
2/14/2018	152	654	627
2/15/2018	71	187	352
2/16/2018	820	470	690
2/17/2018	1384	1108	1533
2/18/2018	1050	692	1244
2/19/2018	686	526	847
7 day Avg	622	554	837



Upstream of S-79/Franklin Conditions: On 2/19/18 Lee County Environmental Lab detected cyanobacteria including *Microcystis*, *Aphanizomenon* and *Dolichospermum*. On 2/20/18 the Olga Water Treatment plant reported chlorides of **58 mg/l**, apparent color **118 CU** and turbidity **3.32 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 1800 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **9.8 psu**, in the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. ***Skeletonema* and dinoflagellates contributed to elevated water column chlorophyll readings.**

Lower Estuary Conditions: The average salinity at Shell Point, **29 psu**, was **above the optimal range for oysters since 2/17/18.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	1.5 – 5.6	9.0 – 16.0	2.1 – 8.6

Red Tide: On 2/16/18 the Florida Fish and Wildlife Conservation Commission reports the Florida red tide organism, *Karenia brevis*, was observed in Pinellas, Lee, Collier and Monroe Counties with background to low concentrations in and offshore Lee County.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **8 new patients with red tide symptoms, all Double Crested Cormorants.**

Manatees: Lee County park staff reported only **one manatee** in the warm water discharge of the Orange River and FPL canal the past week when water temperatures ranged from **78 - 88.5° F.**

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	12	161	4.0	0.86
Shell Point	4.8	48.0	2.6	1.70
Causeway	1.5	24.4	2.8	2.15

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

SCB- San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
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Rae Burns - Town of Fort Myers Beach
Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **February 20 - 26, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed averaged **631 cfs** at S-79. **Salinities in the estuary at Fort Myers exceeded the 30 day moving average of 10 psu at Fort Myers.** Red tide persists off the coast causing fish kills and impacting birds along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To offset the MFL exceedence in the Caloosahatchee we request the Corps provide additional water through pulse releases to the Caloosahatchee to maintain salinities below the ecological harm threshold of **10 psu**. Past operations have shown that flows of **800 - 1,000 cfs** measured at **S-79** are needed to achieve this.

Lake Okeechobee Level: **14.92 ft. (Low Sub-Band)**

Last week: **15.04 ft**

Lake Okeechobee Inflow: **805 cfs**

Lake Okeechobee Outflow: **3,080 cfs**

Weekly Rainfall: WP Franklin **0.13"**

Ortona **0.05"**

Moore Haven **0"**

Salinity Beautiful Island: **3.4 - 6.3 (SCCF RECON Marker 18)**

Previous week **ND**

Salinity Fort Myers: **12 - 18 psu (SCCF RECON)**

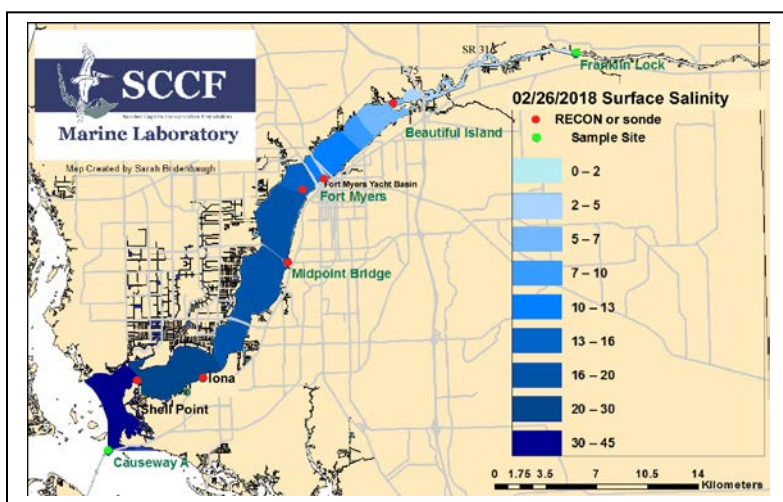
Previous week **11 - 16 psu**

Yacht Basin 30 day moving average: **10.1 psu**

Previous week: **8.9 psu**

Salinity Shell Point: **24 - 34 psu (SCCF RECON)**

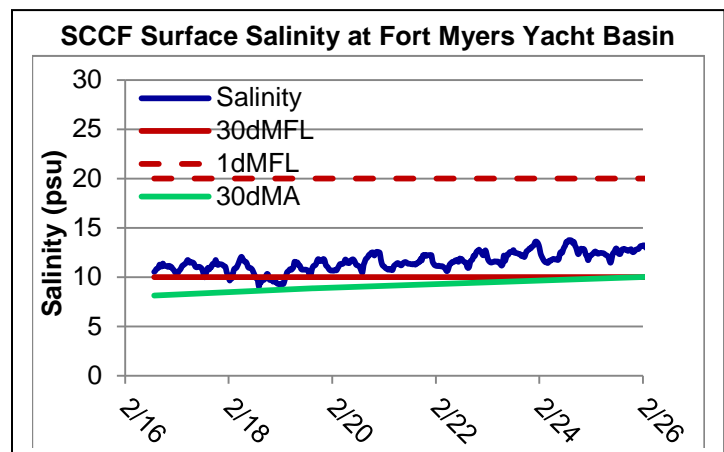
Previous week **ND psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	3.4 - 6.3	< 5 psu	-
Fort Myers	12 - 18	<10 psu	In Range
Shell Point	24 - 34	25 - 32 psu	In Range
Light (25% Iz depth meters)			
Fort Myers	1.01	1 meter	In Range
Shell Point	1.67	2.2 meters	Low
Causeway	1.80	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **631 cfs**. Over the past 14 days **90,396* AF** of water was discharged from Lake O, **29% to S-77**, **3.3% to S-308**, **60% of water from Lake O was discharged south to the EAA**. **Approximately 6.6% was discharged to the L8 and 1%* was discharged through S-310.** (* data missing)

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
2/20/2018	496	360	583
2/21/2018	220	56	506
2/22/2018	38	0	340
2/23/2018	684	902	873
2/24/2018	1310	1244	1552
2/25/2018	995	300	1057
2/26/2018	672	302	581
7 day Avg	631	452	785



Upstream of S-79/Franklin Conditions: On 2/27/18 the Olga Water Treatment plant reported chlorides of **60 mg/l**, apparent color **107 CU** and turbidity **3.22 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 1800 GPM.

Upper Estuary Conditions: **The 30 day moving average salinity at the Fort Myers Yacht Basin went over 10 psu and the weekly average salinity was 12 psu.** These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **30 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	2.0 – 8.8	5.8 – 13.6	2.2 – 10.7

Red Tide: On 2/23/18 the Florida Fish and Wildlife Conservation Commission reports a patchy bloom of the Florida red tide organism, ***Karenia brevis*** persists in southwest Florida at very low to medium concentrations offshore Lee County and medium concentrations offshore Monroe County. SCCF sampling found medium to high concentrations of ***Karenia*** along the beaches of Sanibel and no or low concentrations in Pine Island Sound. **Wide spread fish kills and respiratory irritation have been reported the past week.**

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **10 new patients with red tide symptoms**, all Double Crested Cormorants.

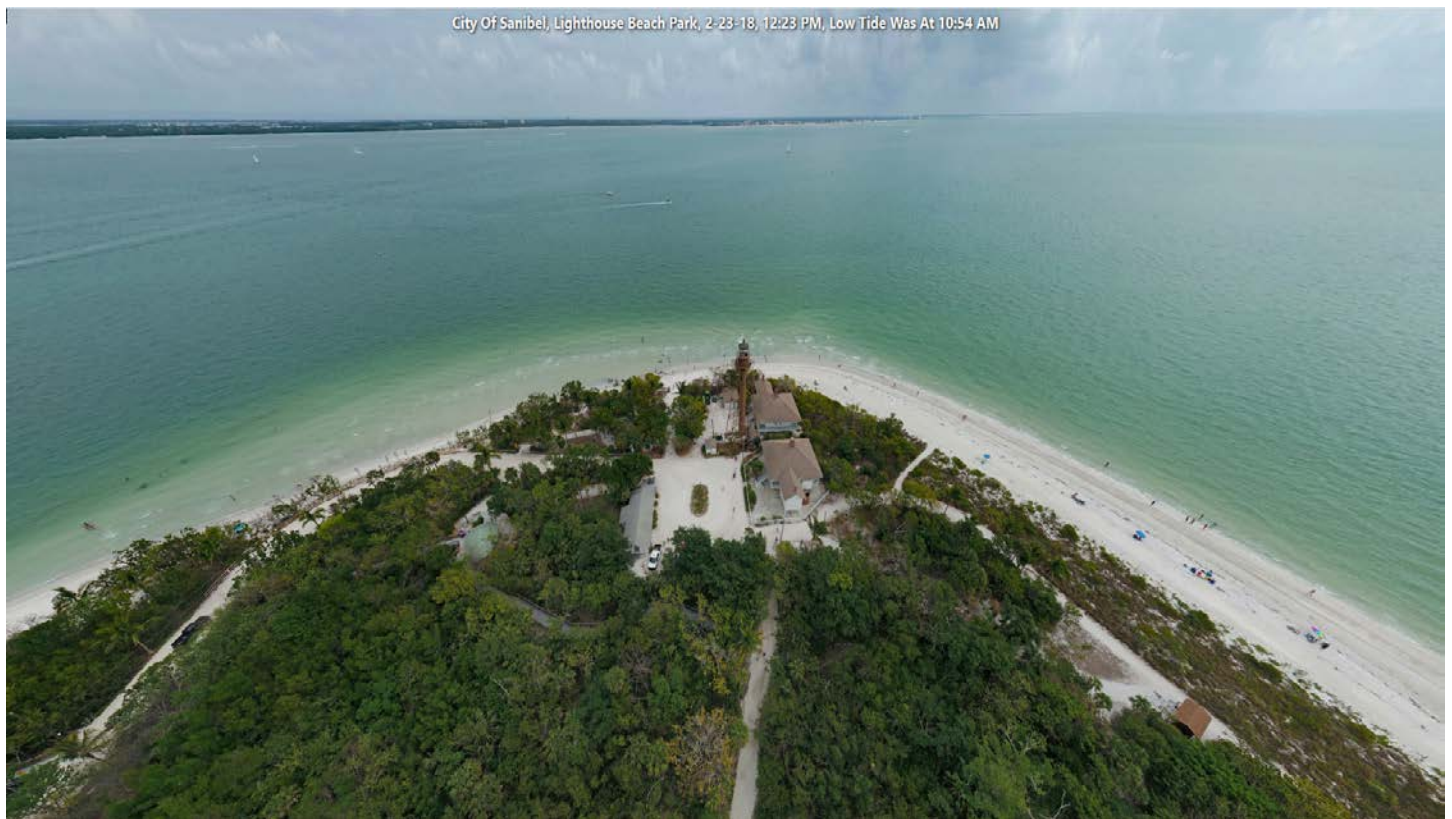
Manatees: Lee County park staff reported only **no manatees** in the warm water discharge of the Orange River and FPL canal the past week when unseasonably warm water temperatures ranged from **80 - 88° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	16	118	3.6	1.01
Shell Point	4.4	50.2	2.8	1.67
Causeway	2.5	44.1	2.7	1.80

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

SCB-San Carlos Bay = 2.2 meters

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



Clear water at Sanibel Lighthouse Beach on 2/23/18. Photo City of Sanibel.



Numerous large red drum, over 30", and dead mullet in coastal waters on 2/26/18. Photo Lee County

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **February 27 - March 5, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed averaged **708 cfs** at S-79. **Salinities in the estuary at Fort Myers exceeded the 30 day moving average of 10 psu at Fort Myers for 7 days.** Red tide caused fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To reduce harmful salinities throughout the Caloosahatchee estuary we request the Corps provide additional water through pulse releases to maintain salinities below the ecological harm threshold of 10 psu. Past operations have shown that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: **14.66 ft. (Low Sub-Band)**

Last week: **14.92 ft**

Lake Okeechobee Inflow: **523 cfs**

Lake Okeechobee Outflow: **3,706 cfs**

Weekly Rainfall: WP Franklin **0"** Ortona **0"**

Moore Haven **0"**

Salinity Beautiful Island: **3.8 - 7.8 psu** (SCCF RECON Marker 18)

Previous week **3.4 - 6.3 psu**

Salinity Fort Myers: **11 – 18 psu** (SCCF RECON)

Previous week **12 – 18 psu**

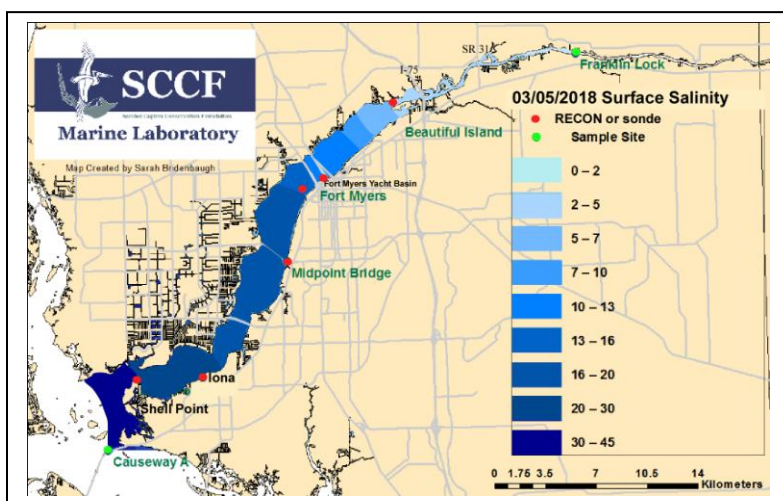
Yacht Basin 30 day moving average: **10.7 psu**

Previous week: **10.1 psu**

MFL Status: Exceedance = 7 days

Salinity Shell Point: **24 – 35 psu** (SCCF RECON)

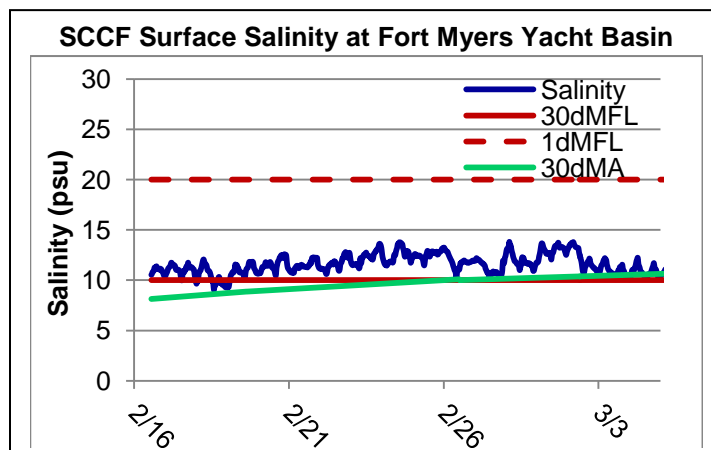
Previous week **24 - 34 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	3.8 - 7.8	< 5 psu	High
Fort Myers	11 – 18	<10 psu	In Range
Shell Point	24 - 35	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	1.17	1 meter	In Range
Shell Point	1.61	2.2 meters	Low
Causeway	2.00	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **708 cfs**. Over the past 14 days **94,616* AF** of water was discharged from Lake O, **29% to S-77**, **5% to S-308**, **57% of water from Lake O was discharged south to the EAA**. **Approximately 8% was discharged to the L8 and 1%* was discharged through S-310.** (* data missing)

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
2/27/2018	499	290	880
2/28/2018	203	194	810
3/1/2018	28	0	456
3/2/2018	808	1086	1151
3/3/2018	1562	1088	1484
3/4/2018	1155	1100	1467
3/5/2018	698	425	1066
7 day Avg	708	218	1045



Upstream of S-79/Franklin Conditions: On 3/6/18 the Olga Water Treatment plant reported chlorides of **59 mg/l**, apparent color **117 CU** and turbidity **2.97 NTU**. No visible algae was reported at the plant intake the past week. The plant is online running at 1800 GPM.

Upper Estuary Conditions: **The 30 day moving average salinity at the Fort Myers Yacht Basin was 10.7 psu and the weekly average salinity was 12 psu.** These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **30 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
Wulfert Flats	31.3 - 35.0	2.8 - 9.4	-----	-----
Wildlife Drive	34.7 - 36.5	0.7 - 11.7	-----	-----
McIntyre Creek	-----	0.2 - 7.4	7.0 - 13.5	2.4 - 11.5

Red Tide: On 3/21/8 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* was present in southwest Florida from Pinellas to Collier Counties with background to medium concentrations along Lee County. Numerous fish kills and respiratory irritation were reported for Lee and Collier counties the past week. Lee County reports include Big Carlos Pass, Big Hickory Island, Bonita Beach, Captiva Island, Carlos Point, Cayo Costa, Estero Island, Fort Myers Beach, Little Hickory Island, Lovers Key State Park, Pine Island Sound, San Carlos Bay, Sanibel, and offshore of St. James City. SCCF sampling found low to medium concentrations of *Karenia* at Tarpon Beach, Sanibel and low to high concentrations in Tarpon Bay with counts up to 15 million cells/liter.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **20 new patients with red tide symptoms**, **8 Double Crested Cormorants**, **8 Sanderlings**, **2 Ring-billed Gulls**, **1 Ruddy Turnstone** and **1 Osprey**.

Manatees: Lee County park staff reported only **one manatee** in the warm water discharge of the Orange River and FPL canal the past week when unseasonably warm water temperatures ranged from **81 - 90° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	13	86.4	4.7	1.17
Shell Point	5.0	52.8	3.2	1.61
Causeway	2.7	32.0	2.5	2.00

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

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
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James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns - Town of Fort Myers Beach
Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **March 6 - 12, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed decreased to an average of **661 cfs** at S-79. **Salinities in the estuary at Fort Myers have exceeded the 30 day moving average of 10 psu at Fort Myers for 14 days.** Red tide caused fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: We request the Corps provide additional water through pulse releases to reduce harmful salinities in the Caloosahatchee estuary to 10 psu to maintain salinities below the ecological harm threshold. Past operations have shown that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: **14.50 ft. (Low Sub-Band)**

Last week: **14.66 ft**

Lake Okeechobee Inflow: **455 cfs**

Lake Okeechobee Outflow: **2,778 cfs**

Weekly Rainfall: WP Franklin **0.27"**

Ortona **0.25"**

Moore Haven **0.38"**

Salinity Beautiful Island: **3.3 - 6.1 psu** (SCCF RECON Marker 18)

Previous week **3.8 - 7.8 psu**

Salinity Fort Myers: **11 - 20 psu** (SCCF RECON)

Previous week **11 - 18 psu**

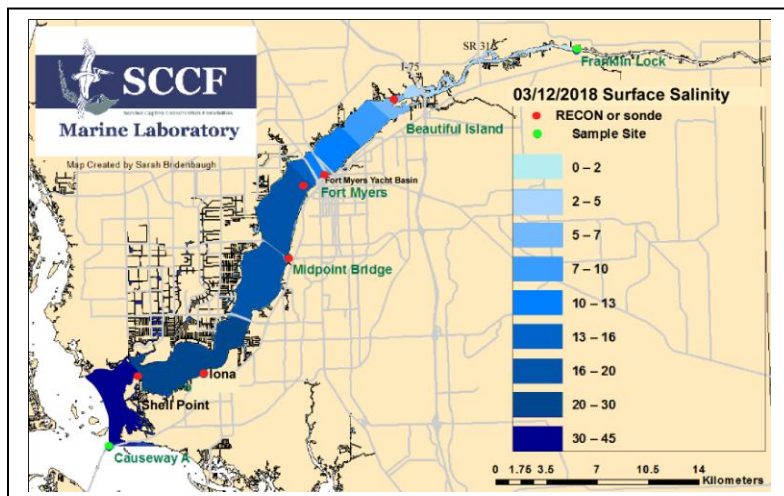
Yacht Basin 30 day moving average: **11.1 psu**

Previous week: **10.7 psu**

MFL Status: Exceedance = 14 days

Salinity Shell Point: **25 - 35 psu** (SCCF RECON)

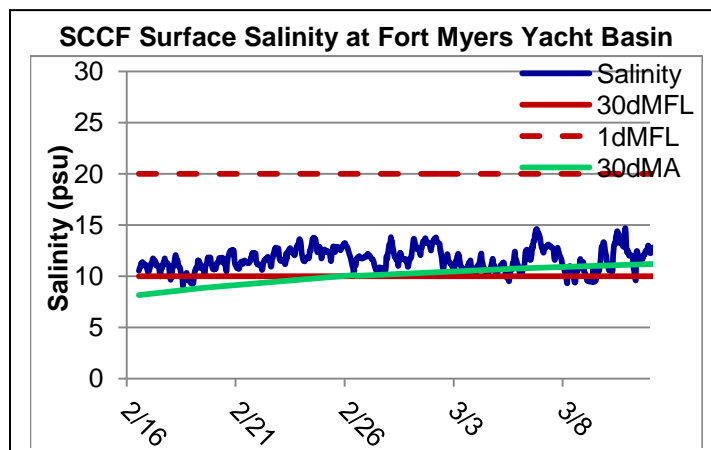
Previous week **24 - 35 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	3.3 - 6.1	< 5 psu	High
Fort Myers	11 - 20	<10 psu	High
Shell Point	25 - 35	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	1.13	1 meter	In Range
Shell Point	1.71	2.2 meters	Low
Causeway	1.91	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **661 cfs**. Over the past 14 days **94,108 AF** of water was discharged from Lake O, **24% to S-77**, **4% to S-308**, **62.5% of water from Lake O was discharged south to the EAA**. **Approximately 8% was discharged to the L8 and 1.5% was discharged through S-310.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
3/6/2018	384	149	682
3/7/2018	159	151	518
3/8/2018	40	150	428
3/9/2018	764	1313	1278
3/10/2018	1699	832	695
3/11/2018	1034	442	451
3/12/2018	547	234	300
7 day Avg	661	467	622



Upstream of S-79/Franklin Conditions: On 3/13/18 the Olga Water Treatment plant reported chlorides of **60 mg/l**, apparent color **101 CU** and turbidity **3.13 NTU**. No visible algae was reported at the plant intake the past week. The plant is off line running for maintenance.

Upper Estuary Conditions: **The 30 day moving average salinity at the Fort Myers Yacht Basin was 11.1 psu and the weekly average salinity was 12 psu.** These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **31 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
Wulfert Flats	34.2 - 35.2	5.0 - 9.1	-----	-----
Wildlife Drive	34.7 - 36.7	1.7 - 10.8	-----	-----
McIntyre Creek	-----	-----	7.7 - 17.8	3.3 - 6.2

Red Tide: On 3/9/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* was present in Pinellas, Manatee, Sarasota, Charlotte, Lee and Collier Counties with background to medium concentrations along Lee County. Numerous fish kills and respiratory irritation were reported for Lee and Collier counties the past week. **SCCF sampling found low to medium concentrations of *Karenia* at Tarpon Beach, Sanibel and low to high concentrations in Tarpon Bay, and medium concentrations inside the Causeway Islands.**

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **23 new patients with red tide symptoms**, **21 Double Crested Cormorants**, **1 Black Skimmer**, **1 Lesser Scaup**. SCCF reports **3 adult male loggerhead sea turtle strandings**, **2** on Sanibel and **1** on Captiva Island. **Suspected red tide related.** A sub adult manatee was found dead in San Carlos Bay. FWC will provide a necropsy to determine cause of death.

Manatees: Lee County park staff reported up to **20 manatees** in the warm water discharge of the Orange River and FPL canal the past week. Water temperatures ranged from **68 - 74° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	12	93.6	4.9	1.13
Shell Point	4.4	50.4	2.2	1.71
Causeway	4.3	32.0	2.1	1.91

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

SCB- San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
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Rae Burns - Town of Fort Myers Beach
Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **March 13 - 19, 2018**

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 past week freshwater flows from Lake Okeechobee and the watershed decreased to an average of **612cfs** at S-79 causing **salinities in the estuary at Fort Myers to continue to exceed the 30 day moving average of 10 psu at Fort Myers for a total of 21 days**. Red tide caused fish kills, sickened birds and sea turtles and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: To reduce harmful salinities throughout the Caloosahatchee estuary we request the Corps provide additional water through pulse releases to maintain salinities below the ecological harm threshold of 10 psu. Past operations have shown that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: **14.26 ft. (Low Sub-Band)**

Last week: **14.50 ft**

Lake Okeechobee Inflow: **426 cfs**

Lake Okeechobee Outflow: **3,209 cfs**

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

Salinity Beautiful Island: **4.0 - 6.7 psu** (SCCF RECON Marker 18)

Previous week **3.3 - 6.1 psu**

Salinity Fort Myers: **13 - 20 psu** (SCCF RECON)

Previous week **11 - 20 psu**

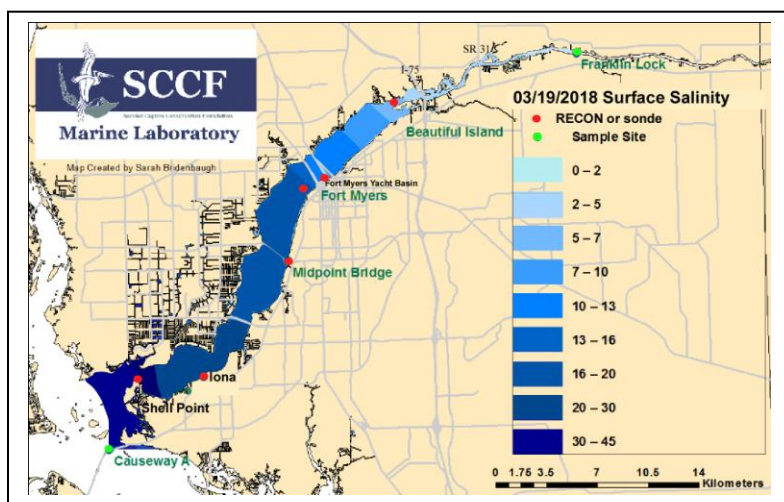
Yacht Basin 30 day moving average: **11.7 psu**

Previous week: **11.1 psu**

MFL Status: Exceedance = 21 days

Salinity Shell Point: **24- 34 psu** (SCCF RECON)

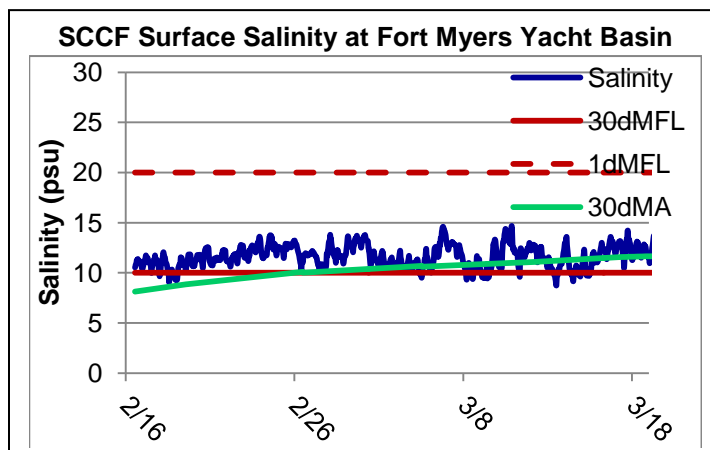
Previous week **25 - 35 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/ Low
Beautiful Is	4.0 - 6.7	< 5 psu	High
Fort Myers	13 - 20	<10 psu	High
Shell Point	24- 34	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	1.19	1 meter	In Range
Shell Point	1.72	2.2 meters	Low
Causeway	2.26	2.2 meters	In Range

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **612 cfs**. Over the past 14 days **89,508 AF** of water was discharged from Lake O, **25% to S-77**, **2.4% to S-308**, **70% of water from Lake O was discharged south to the EAA**. **Approximately 1% was discharged to the L8 and 1.5% was discharged through S-310.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
3/13/2018	443	146	306
3/14/2018	146	43	309
3/15/2018	19	0	174
3/16/2018	802	750	613
3/17/2018	1299	918	808
3/18/2018	962	589	550
3/19/2018	610	420	356
7 day Avg	612	409	445



Upstream of S-79/Franklin Conditions: On 3/20/18 the Olga Water Treatment plant reported chlorides of **62 mg/l**, apparent color **107 CU** and turbidity **3.47 NTU**. No visible algae was reported at the plant intake the past week. The plant is off line for maintenance.

Upper Estuary Conditions: **The 30 day moving average salinity at the Fort Myers Yacht Basin was 11.7 psu and the weekly average salinity was 12 psu.** These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll is elevated at Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **31 psu**, was above the optimal range for oysters. The phytoplankton community at the Causeway was dominated by *Thalassiosira* sp. (37,500 cells/L) and *Alexandrium* sp. (25,000 cells/L).

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
Wulfert Flats	31.9 – 35.6	4.6 – 9.3	-----	-----
Wildlife Drive	35.6 – 36.5	1.5 – 10.6	-----	-----
McIntyre Creek	-----	1.9 – 8.8	7.1 – 27.1	1.9 – 5.3

Beach Conditions: Moderate amounts of drift algae and dead fish are along shore and washing up on Sanibel beaches. Algae species include: *Gracilaria*, *Agardhiella*, *Solieria*, *Halymenia*, *Hypnea*, *Polysiphonia*, *Dasya Dictyota*, *Ulva*. Hundreds of dead fish including large black drum and mullet are being cleared from island beaches.

Red Tide: On 3/16/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* was present in Sarasota, Charlotte, Lee and Collier and Monroe Counties with **background to medium concentrations along Lee County**. Numerous fish kills and respiratory irritation were reported the past week. **SCCF sampling found low concentrations of *Karenia* at Tarpon Bay, Estero Bay and the Causeway Islands.**

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **24 new patients with red tide symptoms; 21 Double Crested Cormorants, 1 Black Skimmer, 1 Royal Tern and 1 Brown Pelican.**

SCCF reports 5 sea turtle strandings; 1 dead Kemp's Ridley, 2 dead green turtles and 2 loggerheads 1 live and 1 dead. CROW is analyzing tissue and blood for species of red tide.

A dolphin in distress was reported to FWC near lighthouse beach on 3/19/18.

Manatees: Lee County park staff reported up to **280 manatees** in the warm water discharge of the Orange River and FPL canal the past week as a cool front moved through the area dropping temperatures to **66 - 74° F**.

Caloosahatchee Stations	Chlorophyll ($\mu\text{g/L}$)	fDOM (qse)	Turbidity (NTU)	25% I_0 depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	9.5	91.2	4.9	1.19
Shell Point	4.4	48.0	2.2	1.72
Causeway	4.3	18.6	2.1	2.26

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

SCB-San Carlos Bay = 2.2 meters

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



Moderate amounts of drift algae and dead fish along Sanibel beaches from Lighthouse Beach to Blind Pass 3/19/18.
 Photos City of Sanibel



Algae along Tarpon Beach on Sanibel on 3/20/18. Accumulations of drift algae along Summerlin Road include species of *Gracilaria*, *Agardhiella*, *Solieria*, *Halymenia*, *Hypnea*, *Polysiphonia*, *Dasya*, *Dictyota*, *Ulva* that produce a sewage smell. Photo SCCF

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **March 20 - 26, 2018**

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 estuary **needs additional freshwater**. For 28 consecutive days the salinity has exceeded the MFL creating borderline conditions: **salinities too high for oysters in the lower estuary and too high for tapegrass in the upper estuary**. Red tide continues to cause fish kills, sicken birds and sea turtles and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: We request the Corps provide additional water through pulse releases to reduce harmful salinities throughout the Caloosahatchee estuary and maintain salinities below the ecological harm threshold of **10 psu at Ft Myers**. Past operations show that flows of **800 - 1,000 cfs measured at S-79** are needed to achieve this.

Lake Okeechobee Level: **14.02 ft. (Low Sub-Band)**

Last week: **14.26 ft**

Lake Okeechobee Inflow: **449 cfs**

Lake Okeechobee Outflow: **4,603 cfs**

Weekly Rainfall: WP Franklin **0.05"** Ortona **0"** Moore Haven **0.10"**

Salinity Beautiful Island: **2.7 - 7.0 psu** (SCCF RECON Marker 18)

Previous week **4.0 - 6.7 psu**

Salinity Fort Myers: **12 - 17 psu** (SCCF RECON)

Previous week **13 - 20 psu**

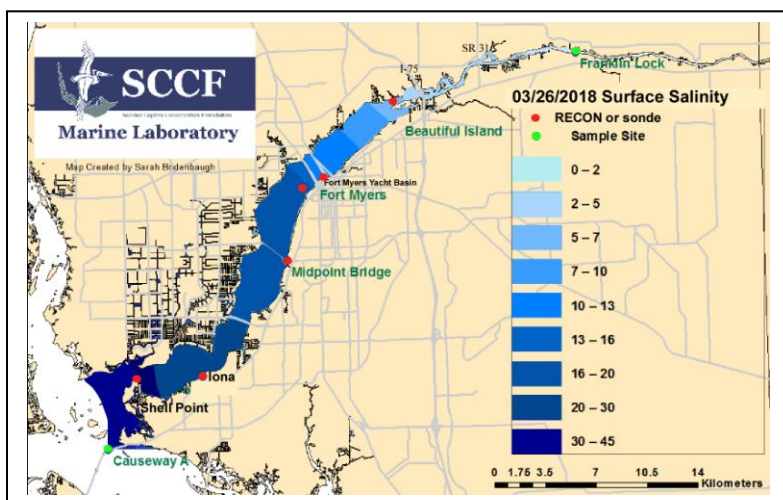
Yacht Basin 30 day moving average: **11.6 psu**

Previous week: **11.7 psu**

MFL Status: Exceedance = 28 days

Salinity Shell Point: **24- 34 psu** (SCCF RECON)

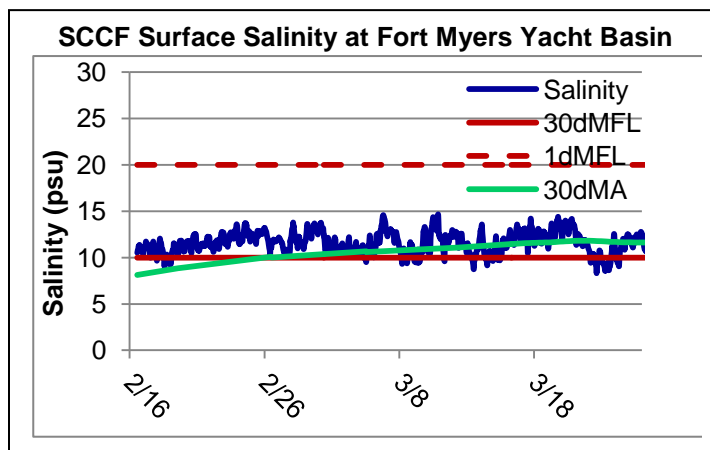
Previous week **24- 34 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	2.7 - 7.0	< 5 psu	High
Fort Myers	12 - 17	<10 psu	High
Shell Point	24- 34	25 - 32 psu	High
Light (25% Iz depth meters)			
Fort Myers	0.92	1 meter	In Range
Shell Point	1.62	2.2 meters	Low
Causeway	2.24	2.2 meters	In Range

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **662 cfs**. Over the past 14 days **112,763 AF** of water was discharged from Lake O, **24.4% to S-77**, **<1% to S-308**, **66% of water from Lake O was discharged south to the EAA**. **Approximately 7.1% was discharged to the L8 and 1.4% was discharged through S-310.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
3/20/2018	355	2	247
3/21/2018	180	57	179
3/22/2018	43	321	273
3/23/2018	864	1051	654
3/24/2018	1156	1180	805
3/25/2018	1302	857	586
3/26/2018	733	436	477
7 day Avg	662	558	460



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 3/26/18 reported the presence of *Aphanizomenon* and *Microcystis cyanobacteria*. On 3/27/18 the Olga Water Treatment plant reported chlorides of **60 mg/l**, apparent color **104 CU** and turbidity **3.26 NTU**. No visible algae was reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The 30 day moving average salinity at the Fort Myers Yacht Basin was **11.5 psu** and the weekly average salinity was **12 psu**. These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll is elevated at Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **30 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR: Dissolved oxygen fell below **3 mg/L** every day during the past week.

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	0.3 – 10.0	6.0 – 44.5	1.9 – 4.5

Beach Conditions: Accumulations of red drift algae washing up on Gulf beaches along Sanibel. **Phytoplankton at Sanibel Beach Access #7 was dominated by *Skeletonema costatum* and *Thalassionema nitzschiodes*. *Skeletonema costatum* was also abundant at Rue Belle Mer beach, where *Prorocentrum* was present.**

Red Tide: On 3/23/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* was present in Charlotte, Lee, Collier and Monroe Counties with **very low to high concentrations in samples collected from or offshore of Lee County.**

Numerous fish kills and respiratory irritation were reported the past week. SCCF found no *Karenia* in samples from south and southwest Sanibel beaches or Tarpon Bay on 3/22/18.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **20 new patients with red tide symptoms**; **16 Double Crested Cormorants**, **1 Laughing Gull**, **1 Sanderling**, **1 Tern** and **1 Brown Pelican**.

A dead manatee was brought to the Punta Rassa dock.

Manatees: Lee County park staff reported up to **25 manatees** in the warm water discharge of the Orange River and FPL canal the past week as a cool front moved through the area dropping temperatures to **71 - 86° F**.

Caloosahatchee Stations	Chlorophyll ($\mu\text{g/L}$)	fDOM (qse)	Turbidity (NTU)	25% I_0 depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	7.5	138	2.4	0.92
Shell Point	4.1	60.0	1.8	1.62
Causeway	1.6	23.9	2.0	2.24

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

SCB-San Carlos Bay = 2.2 meters

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

I = irradiance, z = depth



Red drift algae along Sanibel's Gulf beaches, 3/27/18.
Photos City of Sanibel



Roll of drift algae along the eastern shore of McCardle Island in Matlacha Pass 3/24/18. Photo Lee County

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns - Town of Fort Myers Beach
Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **March 27 - April 2, 2018**

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 estuary **needs additional freshwater**. The past **35 consecutive days salinity has exceeded the MFL resulting in harmful high salinities for oysters in the lower estuary and tape grass in the upper estuary**. Weekly average inflow to the estuary at S-79 was **686 cfs**. Red tide continues to impact birds, sea turtles and cause fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: Additional water discharges from the Lake would benefit both Lake Okeechobee marsh recovery and provide needed additional water to assist habitat recovery and reduce harmful salinities throughout the Caloosahatchee estuary. There is sufficient water in the lake to achieve this and meet consumptive uses.

Lake Okeechobee Level: **13.81 ft. (Low Sub-Band)**

Last week: **14.02 ft**

Lake Okeechobee Inflow: **303 cfs**

Lake Okeechobee Outflow: **4,847 cfs**

Weekly Rainfall: WP Franklin **0.13"** Ortona **0"** Moore Haven **0"**

Salinity Beautiful Island: **2.7 - 9.5 psu** (SCCF RECON Marker 18)

Previous week **2.7 - 7.0 psu**

Salinity Fort Myers: **14 - 20 psu** (SCCF RECON)

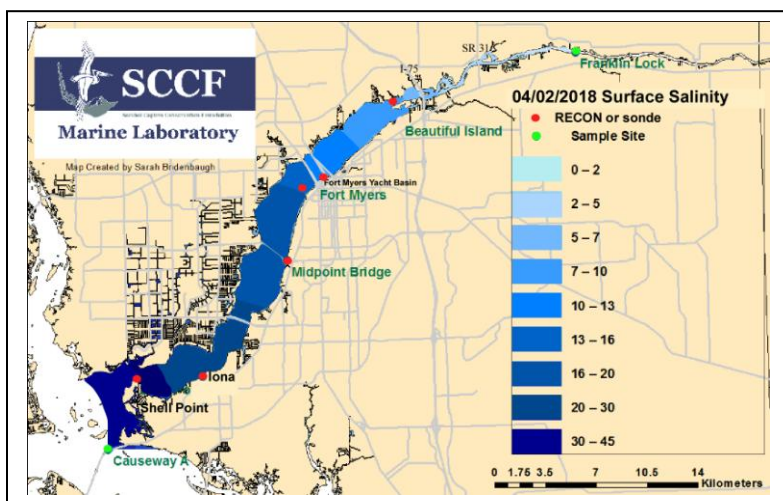
Previous week **12 - 17 psu**

MFL Status: Exceedance = **35 days** 30 day moving average: **12.0 psu**

Previous week: **11.6 psu**

Salinity Shell Point: **25 - 35 psu** (SCCF RECON)

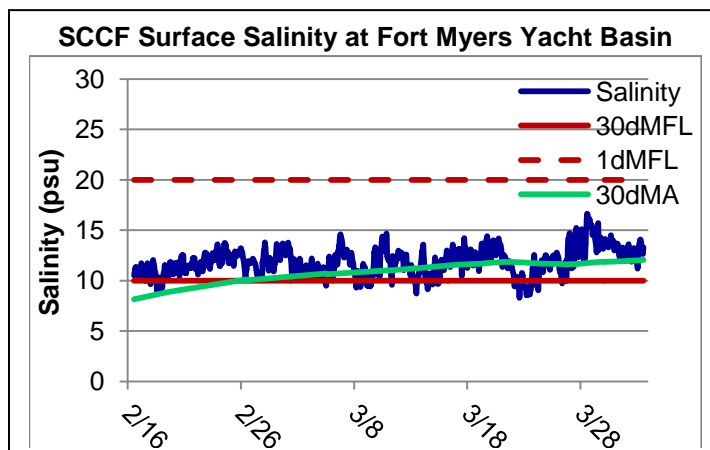
Previous week **24 - 34 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	2.7 - 9.5	< 5 psu	High
Fort Myers	14 - 20	<10 psu	High
Shell Point	25 - 35	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	0.78	1 meter	Low
Shell Point	1.81	2.2 meters	Low
Causeway	2.52	2.2 meters	In Range

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **686 cfs**. Over the past 14 days **143,258 AF** of water was discharged from Lake O, **19.7% to S-77**, **3.3% to S-308**, **70% of water from Lake O was discharged south to the EAA**. **Approximately 5.6% was discharged to the L8 and 1% was discharged through S-310.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
3/27/2018	515	302	410
3/28/2018	194	298	586
3/29/2018	29	297	947
3/30/2018	860	1519	1500
3/31/2018	1464	1332	1699
4/1/2018	1109	1018	1504
4/2/2018	631	599	1272
7 day Avg	686	766	1131



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 4/2/18 reported the presence of *Microcystis* and *Aphanizomenon* cyanobacteria. On 4/3/18 the Olga Water Treatment plant reported chlorides of **60 mg/l**, apparent color **85 CU** and turbidity **3.68 NTU**. No visible algae was reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The 30 day moving average salinity at the Fort Myers Yacht Basin was **12.0 psu** and the weekly average salinity was **13 psu**. These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **32 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR: Dissolved oxygen fell below 3 mg/L six days the past week.

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
Wulfert Flats	33.7 – 35.8	4.13 – 7.9	-----	-----
Wildlife Drive	35.8 – 37.6	0.7 – 9.9	-----	-----
McIntyre Creek	-----	0.5 – 8.6	6.7 – 13.8	1.9 – 4.5

Beach Conditions: Accumulations of red drift algae washing up on Gulf beaches along Sanibel.

Red Tide: On 3/30/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Sarasota, Charlotte, Lee and Collier Counties with **background to medium concentrations in samples collected from or offshore of Lee County**. Numerous fish kills and respiratory irritation were reported the past week.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **22 new patients with red tide symptoms**; **19 Double Crested Cormorants**, **1 Common Loon**, **1 Anhinga** and **1 Kemp's Ridley Sea Turtle**.

Manatees: In the last week of Manatee season, Lee County park staff reported up to **7 manatees** in the warm water discharge of the Orange River and FPL canal the past week. Temperatures ranged from **76 - 84° F**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	9.5	155	4.8	0.78
Shell Point	4.2	43.2	2.2	1.81
Causeway	1.3	11.2	2.3	2.52

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

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **April 3 - 9, 2018**

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 estuary **needs additional freshwater**. The past **42 consecutive days salinity has exceeded the MFL ecological criteria of 10 psu resulting in harmful high salinities for tape grass in the upper estuary and oysters in the lower estuary**. Weekly average inflow to the estuary at S-79 was **683 cfs**. Red tide continues to impact birds, sea turtles and cause fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: Additional water discharges from the Lake would benefit both Lake Okeechobee marsh recovery and provide needed additional water to lower salinity and support habitat recovery throughout the Caloosahatchee estuary. There is sufficient water in the lake to achieve this and meet consumptive uses.

Lake Okeechobee Level: **13.57 ft. (Low Sub-Band)**

Last week: **13.81 ft**

Lake Okeechobee Inflow: **295 cfs**

Lake Okeechobee Outflow: **3,454 cfs**

Weekly Rainfall: WP Franklin **NR"** Ortona **0"** Moore Haven **0.26"**

Salinity Beautiful Island: **4.8 - 7.9 psu** (SCCF RECON Marker 18)

Previous week **2.7 - 9.5 psu**

Salinity Fort Myers: **14 - 19 psu** (SCCF RECON)

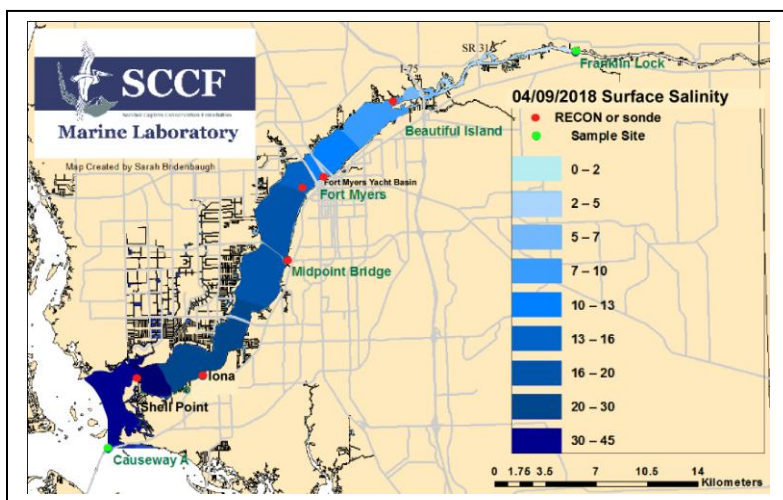
Previous week **14 - 20 psu**

MFL Status: Exceedance = 42 days 30 day moving average: **12.4 psu**

Previous week: **12.0 psu**

Salinity Shell Point: **25 - 35 psu** (SCCF RECON)

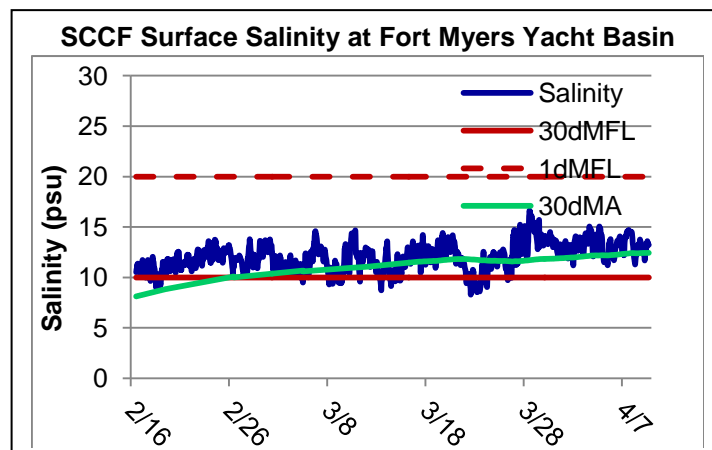
Previous week **25 - 35 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	4.8 - 7.9	< 5 psu	High
Fort Myers	14 - 19	<10 psu	High
Shell Point	25 - 35	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	0.84	1 meter	Low
Shell Point	1.97	2.2 meters	Low
Causeway	2.58	2.2 meters	In Range

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **683 cfs**. Over the past 14 days **127,765 AF** of water was discharged from Lake O, **25% to S-77, 5.4% to S-308, 62% of water from Lake O was discharged south to the EAA**. **Approximately 6% was discharged to the L8 and 1.2% was discharged through S-310.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
4/3/2018	343	502	1093
4/4/2018	167	250	610
4/5/2018	44	147	476
4/6/2018	935	1564	1504
4/7/2018	1336	1139	1823
4/8/2018	1322	710	1320
4/9/2018	636	NR	804
7 day Avg	683	719	1090



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 4/9/18 reported the presence of cyanobacteria at 2 sample sites; *Microcystis* and *Aphanizomenon* at the Alva boat ramp and *Microcystis* upstream of the Lock. On 4/10/18 the Olga Water Treatment plant reported chlorides of **60 mg/l**, apparent color **99 CU** and turbidity **3.73 NTU**. No visible algae was reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: **The 30 day moving average salinity at the Fort Myers Yacht Basin was 12.4 psu and the weekly average salinity was 13 psu.** These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **32 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
Wulfert Flats	33.8 – 35.8	4.1 – 7.7	-----	-----
Wildlife Drive	36.2 – 38.7	0.2 – 9.8	-----	-----
McIntyre Creek	-----	3.1 – 10.9	6.5 – 13.3	1.7 – 5.8

Beach Conditions: Hundreds of dead fish were reported in Estero Bay and catfish washed up along Fort Myers Beach, suspected culprit, red tide.

Red Tide: On 4/6/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Pinellas, Charlotte, Lee, Collier and Monroe Counties with **background to medium concentrations in samples collected from or offshore of Lee County**. Numerous fish kills and respiratory irritation were reported the past week.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **10 new patients with red tide symptoms; all Double Crested Cormorants**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	16	152	6.0	0.84
Shell Point	4.4	35.9	1.4	1.97
Causeway	3.2	7.9	2.0	2.58

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

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **April 10 - 16, 2018**

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 estuary **needs additional freshwater**. The past **49 consecutive days salinity has exceeded the MFL resulting in harmful high salinities for oysters in the lower estuary and tape grass in the upper estuary**. Weekly average inflow to the estuary at S-79 was **705 cfs**. **Red tide continues to impact birds, sea turtles and cause fish kills and respiratory irritation along coastal beaches**.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: Additional water discharges from the Lake would benefit both Lake Okeechobee marsh recovery and provide needed additional water to assist habitat recovery and reduce harmful salinities throughout the Caloosahatchee estuary. There is sufficient water in the lake to achieve this and meet consumptive uses.

Lake Okeechobee Level: **13.41 ft. (Low Sub-Band)**

Last week: **13.57 ft**

Lake Okeechobee Inflow: **390 cfs**

Lake Okeechobee Outflow: **NR cfs**

Weekly Rainfall: WP Franklin **0.79"** Ortona **1.28"** Moore Haven **0.61"**

Salinity Beautiful Island: **4.0 - 7.2 psu** (SCCF RECON Marker 18)

Previous week **4.8 - 7.9 psu**

Salinity Fort Myers: **12 - 18 psu** (SCCF RECON)

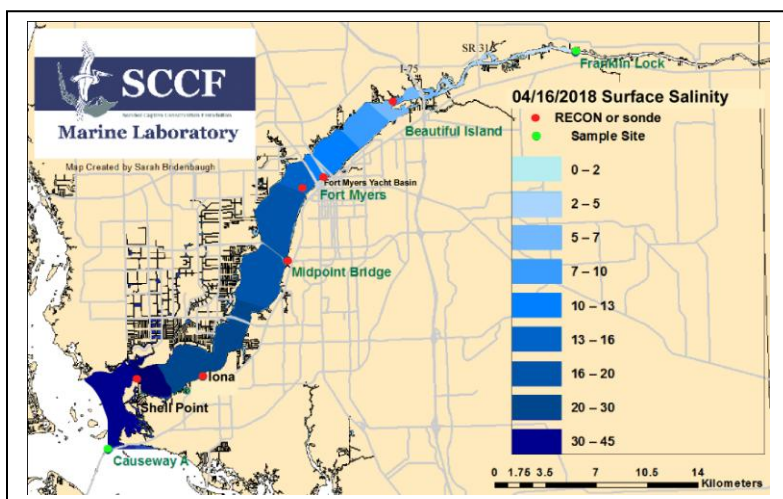
Previous week **14 - 19 psu**

MFL Status: Exceedance = 49 days 30 day moving average: **12.7 psu**

Previous week: **12.4 psu**

Salinity Shell Point: **24 - 36 psu** (SCCF RECON)

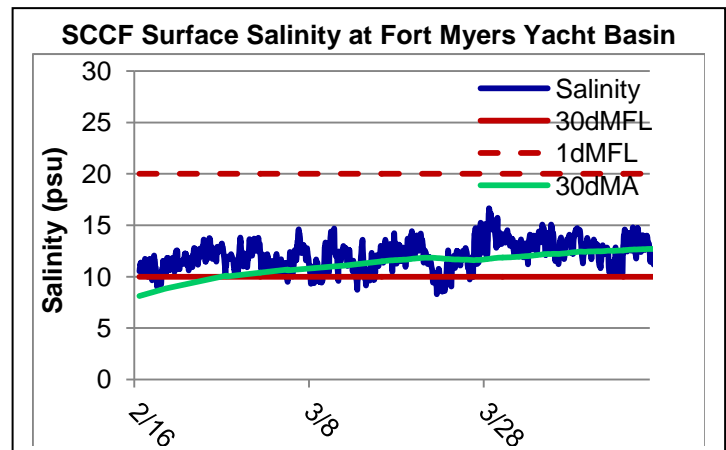
Previous week **25 - 35 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	4.0 - 7.2	< 5 psu	High
Fort Myers	12 - 18	<10 psu	High
Shell Point	24 - 36	25 - 32 psu	High
Light (25% Iz depth meters)			
Fort Myers	0.79	1 meter	Low
Shell Point	1.81	2.2 meters	Low
Causeway	1.78	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **705 cfs**. Over the past 14 days **95,268* AF** of water was discharged from Lake O, **29%*** to S-77, **7%*** to S-308, **54% of water from Lake O was discharged south to the EAA**. **Approximately 7% was discharged to the L8 and 2% was discharged through S-310.** (*Flow Data Missing)

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
4/10/2018	340	294	1107
4/11/2018	74	297	754
4/12/2018	0	106	219
4/13/2018	1045	1015	1120
4/14/2018	1526	1092	1595
4/15/2018	1104	890	1047
4/16/2018	848	485	NR
7 day Avg	705	597	974



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 4/16/18 reported the presence of *Microcystis* cyanobacteria at 2 sample sites; the Alva boat ramp and upstream of S-79. On 4/17/18 the Olga Water Treatment plant reported chlorides of **59 mg/l**, apparent color **97 CU** and turbidity **4.23 NTU**. No visible algae was reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The 30 day moving average salinity at the Fort Myers Yacht Basin was **12.7 psu** and the weekly average salinity was **13 psu**. These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Fort Myers and Beautiful Island RECON sites.

Lower Estuary Conditions: The average salinity at Shell Point, **32 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	34.8 – 36.0	1.8 – 11.9	6.2 – 15.0	1.5 – 10.5

Beach Conditions: Dead fish washed up along Sanibel and Fort Myers Beaches, suspected culprits, red tide.

Red Tide: On 4/13/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Sarasota, Charlotte, Lee, Collier and Monroe Counties with **very low to medium concentrations in samples collected from or offshore of Lee County**. Numerous fish kills and respiratory irritation were reported the past week. SCCF samples collected at the Sanibel boat ramp on 4/15/18 contained **418,000 cells/L** of *Karenia*.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel treated **7 new patients with red tide symptoms; 6 Double Crested Cormorants and 1 Sanderling**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	24	148	6.0	0.79
Shell Point	5.8	33.6	3.6	1.81
Causeway	6.4	3.7	9.8	1.78

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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 Harry Phillips – City of Cape Coral
 Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **April 17 - 23, 2018**

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 estuary **needs additional freshwater**. The past **55 consecutive days salinity has exceeded the MFL resulting in harmful high salinities for oysters in the lower estuary and tape grass in the upper estuary**. Weekly average inflow to the estuary at S-79 was **780 cfs**. Red tide continues to impact birds, sea turtles and cause fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: Additional water discharges from the Lake would benefit both Lake Okeechobee marsh recovery and provide needed additional water to assist habitat recovery and reduce harmful salinities throughout the Caloosahatchee estuary. There is sufficient water in the lake to achieve this and meet consumptive uses.

Lake Okeechobee Level: **13.24 ft. (Base Sub-Band)**

Last week: **13.41 ft**

Lake Okeechobee Inflow: **854 cfs**

Lake Okeechobee Outflow: **1210 cfs**

Weekly Rainfall: WP Franklin **1.53"** Ortona **1.80"**

Moore Haven **0.45"**

Salinity Beautiful Island: **4.8 - 8.5 psu** (SCCF RECON Marker 18)

Previous week **4.0 - 7.2 psu**

Salinity Fort Myers: **11 - 19 psu** (SCCF RECON)

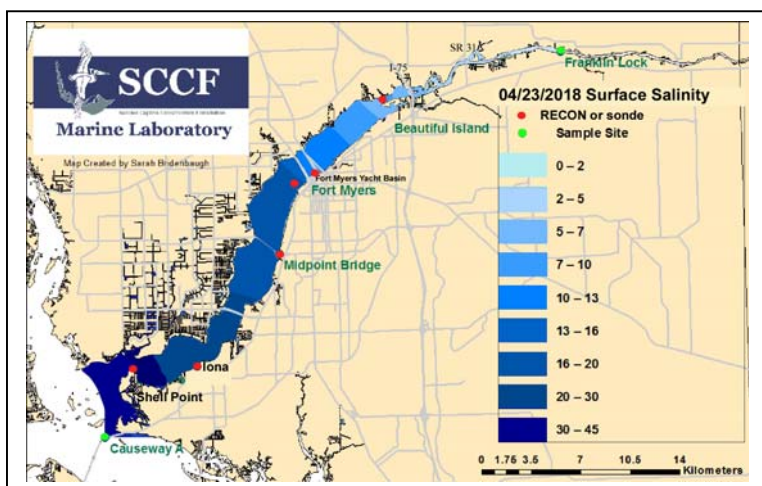
Previous week **12 - 18 psu**

MFL Status: Exceedance = 55 days 30 day moving average: 12.6 psu

Previous week: **12.7 psu**

Salinity Shell Point: **25 - 35 psu** (SCCF RECON)

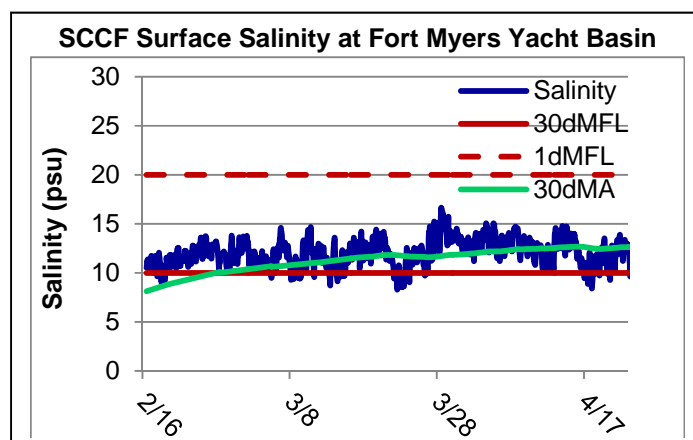
Previous week **24 - 36 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	4.8 - 8.5	< 5 psu	High
Fort Myers	11 - 19	<10 psu	High
Shell Point	25- 35	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	0.86	1 meter	Low
Shell Point	1.89	2.2 meters	Low
Causeway	2.59	2.2 meters	-

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged 780 cfs. Over the past 14 days **63,314 AF** of water was discharged from Lake O, **44% to S-77**, **4% to S-308**, **41% of water from Lake O was discharged south to the EAA**. **Approximately 8% was discharged to the L8 and 3% was discharged through S-310.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
4/17/2018	407	293	182
4/18/2018	280	289	855
4/19/2018	90	292	1127
4/20/2018	1020	1192	1272
4/21/2018	1410	883	2274
4/22/2018	1242	1097	1855
4/23/2018	1010	NR	574
7 day Avg	780	578	1163



Upstream of S-79/Franklin Conditions: The beach at the Franklin Lock Park was closed due to high *Enterococcus* bacteria levels. On 4/24/18 the Olga Water Treatment plant reported chlorides of **62 mg/l**, apparent color **92 CU** and turbidity **2.37 NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The 30 day moving average salinity at the Fort Myers Yacht Basin was **12.6 psu** and the weekly average salinity was **11 psu**. These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Fort Myers and Beautiful Island RECON sites.

Lower Estuary Conditions: The average salinity at Shell Point, **31 psu**, was above the optimal range for oysters. Water quality tests done on April 19, 2018 at the Yacht Club Beach, Cape Coral did not meet the safety criteria for *Enterococcus* bacteria recommended by the Florida Department of Health.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	34.6 – 36.1	3.5 – 12.9	8.2 – 14.9	1.6 – 11.0
Wulfert Flats	33.5 – 36.4	2.7 – 9.0	-----	-----
Wildlife Drive	36.5 – 38.5	0.6 – 11.0	-----	1.2 – 9.6

Beach Conditions: Dead fish washed up along Sanibel and Fort Myers Beaches, suspected cause, red tide.

Red Tide: On 4/20/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Charlotte, Lee and Collier Counties with **low to medium concentrations in samples collected from or offshore of Lee and Collier Counties**. Numerous fish kills and respiratory irritation were reported the past week. Seven out of thirteen SCCF samples collected in Pine Island Sound on 4/19/18 contained **low to medium** concentrations of *Karenia*. A sample from where a fish kill was occurring in Estero Bay on 4/20/18 contained 556,000 *Karenia* cells/L.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated **20 new patients with red tide symptoms**; **17 double crested cormorants**, **1 royal tern**, **1 brown pelican** and **1 sanderling**. Kelly Sloan, Sea Turtle Coordinator for SCCF, reported one juvenile green sea turtle dead near the lighthouse, with no obvious cause of death and one adult male loggerhead hit by boat. Both sea turtles were found on Sanibel Island.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	12	136	3.6	0.86
Shell Point	4.5	38.4	2.0	1.89
Causeway	1.6	12.1	2.3	2.59

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **April 24 - 30, 2018**

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: Average flows of **839 cfs** the past week reduced salinity at Fort Myers for the first time **demonstrating the level of freshwater flow needed to manage salinities below the harm threshold of 10 psu**. Dry conditions and lack of rainfall makes the Caloosahatchee estuary **dependant on freshwater flows from Lake Okeechobee**. **The past 62 consecutive days the 30 day moving average salinity has exceeded the MFL resulting in harmful high salinities for oysters in the lower estuary and tape grass in the upper estuary**. Red tide continues to impact birds, sea turtles and cause fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: Continue to provide increased water discharges from the Lake to benefit recovery of both the Lake Okeechobee marsh and assist habitat recovery and reduce harmful salinities throughout the Caloosahatchee estuary. There is sufficient water in the lake to achieve this and meet consumptive uses.

Lake Okeechobee Level: 13.16 ft. (Base Flow Sub-Band)

Last week: 13.24 ft

Lake Okeechobee Inflow: 303 cfs

Lake Okeechobee Outflow: 1817 cfs

Weekly Rainfall: WP Franklin 0.35" Ortona 0"

Moore Haven 0.32"

Salinity Beautiful Island: 2.6 - 4.8 psu (SCCF RECON Marker 18)

Previous week 4.8 - 8.5 psu

Salinity Fort Myers: 11 - 17 psu (SCCF RECON)

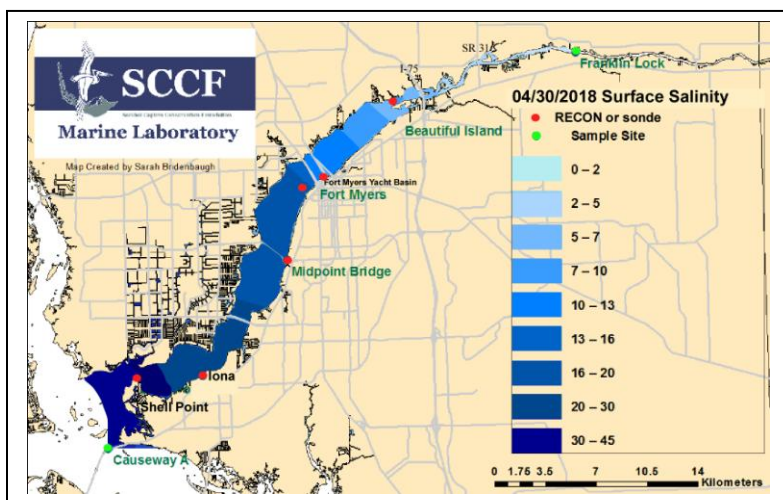
Previous week 11 - 19 psu

MFL Status: Exceedance = 62 days 30 day moving average: 11.9 psu

Previous week: 12.7 psu

Salinity Shell Point: 24 - 35 psu (SCCF RECON)

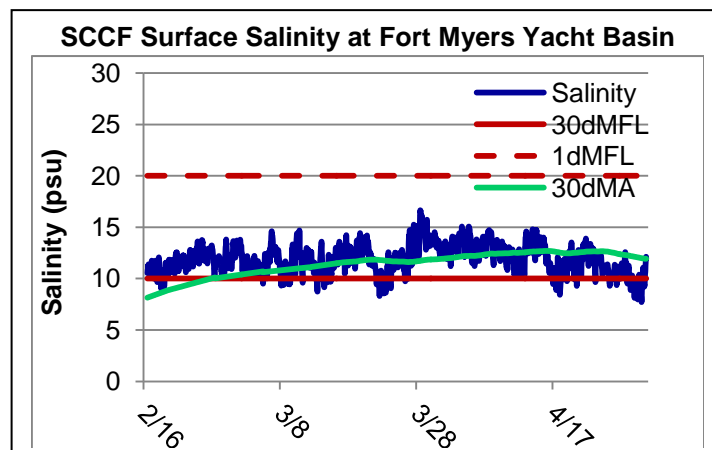
Previous week 25 - 35 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	2.6 - 4.8	< 5 psu	In Range
Fort Myers	11 - 17	<10 psu	High
Shell Point	24 - 35	25 - 32 psu	High
Light (25% Iz depth meters)			
Fort Myers	0.91	1 meter	Low
Shell Point	1.65	2.2 meters	Low
Causeway	2.05	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **839 cfs**. Over the past 14 days **61,095 AF** of water was discharged from Lake O, **47% to S-77**, **10% to S-308**, **40% of water from Lake O was discharged south to the EAA**. A net outflow of **2.3%** was discharged to the **L8** and a net less than **1%** was discharged through S-310.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
4/24/2018	788	NR	23
4/25/2018	707	300	0
4/26/2018	148	301	0
4/27/2018	950	820	1504
4/28/2018	1410	1162	1786
4/29/2018	1122	1157	1368
4/30/2018	748	1189	874
7 day Avg	839	822	794



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 4/30/18 reported accumulation of 4 cyanobacteria species on the upstream side of S-79: *Microcystis*, *Dolichospermum*, *Aphanizomenon* and *Planktothrix*. On 5/1/18 the Olga Water Treatment plant reported chlorides of **59 mg/l**, apparent color **86 CU** and turbidity **3.85 NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The 30 day moving average salinity at the Fort Myers Yacht Basin was **12.6 psu** and the weekly average salinity was **10.3 psu**. These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Fort Myers and Beautiful Island RECON sites.

Lower Estuary Conditions: The average salinity at Shell Point, **31 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	33.7 – 36.2	Probe failed	8.2 – 16.2	1.28 - 3.86
Wulfert Flats	33.7 – 36.7	2.2 – 10.0	-----	4.2 – 39.2
Wildlife Drive	36.5 – 38.7	0.5 – 12.3	-----	1.3 – 14.4

Beach Conditions: The past week eleven species of macroalgae were reported in the wrack line and in the swash zone for a large area of Sanibel beaches, from Lighthouse to Knapps Point.

Red Tide: On 4/27/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Charlotte, Lee, Collier and Monroe Counties with **background to high concentrations along or offshore Lee County**. Numerous fish kills and respiratory irritation were reported the past week. **SCCF samples collected at the Causeway and Tarpon Bay on 4/27/18 contained high and medium concentrations of *Karenia* respectively. A sample from where a fish kill was occurring in Estero Bay on 4/29/18 contained high concentrations of *Karenia*.**

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated **6 new patients with red tide symptoms**; 4 Double Crested Cormorants, 1 Loggerhead sea turtle and 1 Sanderling.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	12	136	4.9	0.91
Shell Point	4.1	57.6	1.8	1.65
Causeway	2.3	28.3	2.8	2.05

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

SCB-San Carlos Bay = 2.2 meters

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



Macroalgae on Sanibel beaches and in the swash zone on 4/26/18 and 4/29/18. Photos City of Sanibel.



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **May 1 - 7, 2018**

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: Average flows of **905 cfs** the past week reduced salinity at Fort Myers demonstrating the level of freshwater flow needed to manage salinities below the harm threshold of **10 psu**. Dry conditions and lack of rainfall makes the Caloosahatchee estuary **dependant on freshwater flows from Lake Okeechobee**. The past **69 consecutive days** the **30 day moving average salinity has exceeded the MFL resulting in harmful high salinities for oysters in the lower estuary and tape grass in the upper estuary**. Red tide continues to impact birds, sea turtles and cause fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: Continue to provide adequate water discharges from the Lake to benefit recovery of both the Lake Okeechobee marsh and assist habitat recovery and reduce harmful salinities throughout the Caloosahatchee estuary. There is sufficient water in the lake to achieve this and meet consumptive uses.

Lake Okeechobee Level: **12.96 ft. (Base Flow Sub-Band)**

Last week: **13.16 ft**

Lake Okeechobee Inflow: **444 cfs**

Lake Okeechobee Outflow: **698 cfs**

Weekly Rainfall: WP Franklin **0.09"**

Ortona **0.48"**

Moore Haven **0.72"**

Salinity Beautiful Island: **2.2 - 4.2 psu** (SCCF RECON Marker 18)

Previous week **2.6 - 4.8 psu**

Salinity Fort Myers: **11 - 19 psu** (SCCF RECON)

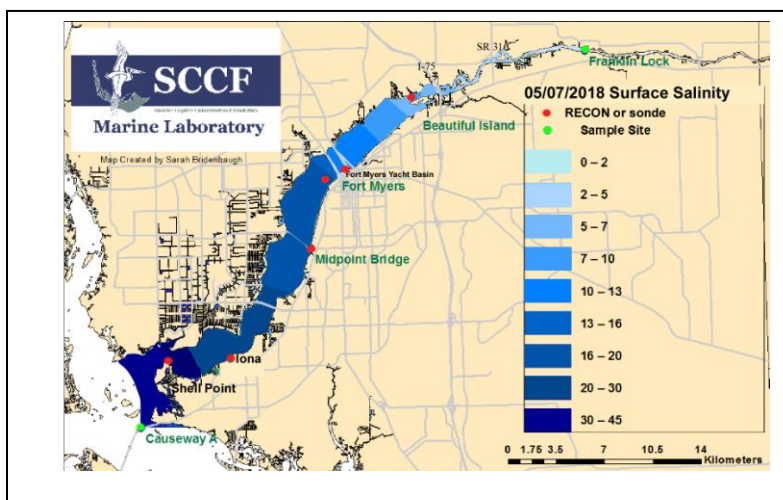
Previous week **11 - 17 psu**

MFL Status: Exceedance = 69 days 30 day moving average: **11.3 psu**

Previous week: **11.9 psu**

Salinity Shell Point: **23 - 35 psu** (SCCF RECON)

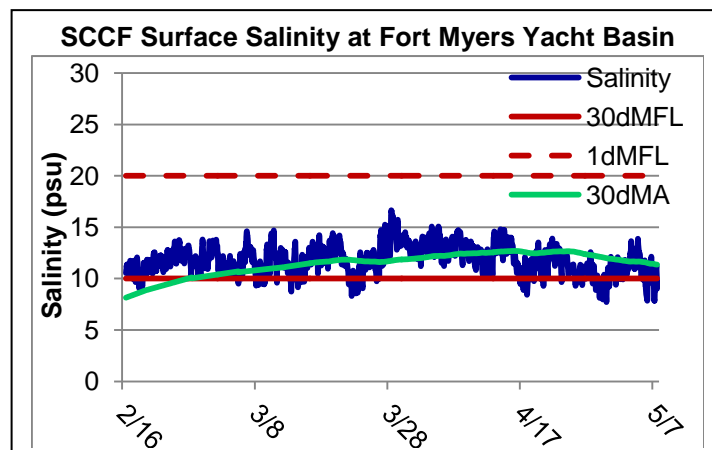
Previous week **24 - 35 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	2.2 - 4.2	< 5 psu	In Range
Fort Myers	11 - 19	<10 psu	High
Shell Point	23 - 35	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	0.94	1 meter	Low
Shell Point	1.69	2.2 meters	Low
Causeway	2.33	2.2 meters	In Range

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **905 cfs**. Over the past 14 days **58,740 AF** of water was discharged from Lake O, **54% to S-77**, **12% to S-308**, **31% of water from Lake O was discharged south to the EAA**. A net outflow of **1.7%** was discharged to the **L8** and a net **1.4%** was discharged through S-310.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
5/1/2018	890	1217	581
5/2/2018	661	1247	741
5/3/2018	101	1189	766
5/4/2018	1150	1233	626
5/5/2018	1681	1372	663
5/6/2018	1158	1370	582
5/7/2018	695	817	328
7 day Avg	905	1206	612



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 5/7/18 reported accumulation of 4 cyanobacteria species on the upstream side of S-79: *Microcystis*, *Dolichospermum*, *Aphanizomenon* and *Planktothrix*. On 5/8/18 the Olga Water Treatment plant reported chlorides of **58 mg/l**, apparent color **92 CU** and turbidity **4.21 NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The 30 day moving average salinity at the Fort Myers Yacht Basin was **11.3 psu** and the weekly average salinity was **11 psu**. These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Beautiful Island with *Skeletonema* and estuarine cyanobacteria the dominant taxa.

Lower Estuary Conditions: The average salinity at Shell Point, **31 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	32.8 – 35.8	4.1 – 13.4	10.4 – 16.3	1.3 – 202.5
Wulfert Flats	29.6 – 36.9	2.9 – 7.7	-----	4.8 – 55.8
Wildlife Drive	36.3 – 39.4	0.4 – 12.3	-----	0.9 – 8.7

Beach Conditions: The past week macroalgae was reported in the wrack line and in the swash zone along beaches on Sanibel and Fort Myers Beaches.

Red Tide: On 5/4/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Charlotte, Lee and Collier Counties with **background to high concentrations along or offshore Lee and Collier Counties**. Numerous fish kills and respiratory irritation were reported the past week. A water sample SCCF collected at the Causeway on 5/7/18 contained medium concentrations of *Karenia*.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated **8 new patients with red tide symptoms**; **3 Double Crested Cormorants**, **2 Brown pelicans**, **1 Ruddy Turnstone**, **1 Herring Gull** and **1 Sanderling**. SCCF reported a dead sub adult Loggerhead sea turtle stranded near Sanibel's Lighthouse Beach and a juvenile green sea turtle was taken to CROW for treatment.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.8	148	3.1	0.94
Shell Point	3.8	55.2	1.7	1.69
Causeway	4.0	14.2	2.3	2.33

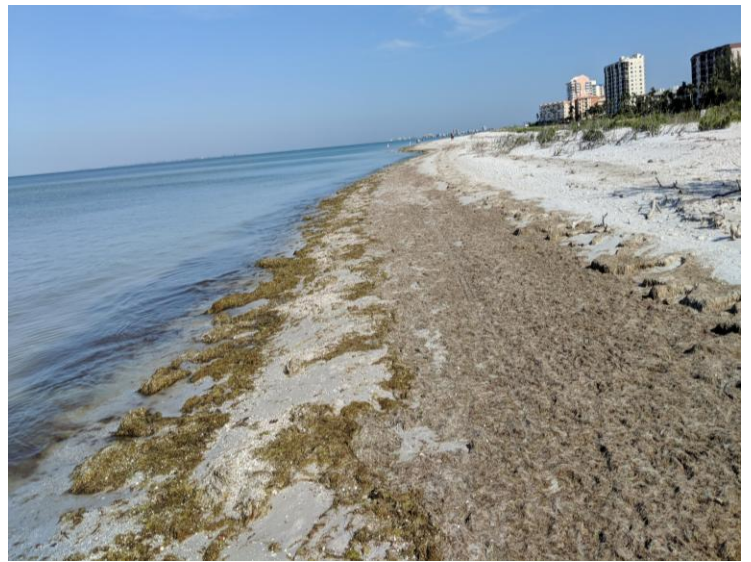
Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

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



Drift algae in the swash zone and washing up along Sanibel's West Gulf Beaches, 5/6/2018.
Photo City of Sanibel



Macroalgae in the swash zone and washing up along Fort Myers Beaches Critical Wildlife Area, 5/2/18.
Photos Town of Fort Myers Beach

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **May 8 - 14, 2018**

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: Average flows of 948 cfs the past week reduced salinity at Fort Myers demonstrating the level of freshwater flow needed to manage salinities below the harm threshold of 10 psu. Dry conditions and lack of rainfall makes the Caloosahatchee estuary **dependent on freshwater flows from Lake Okeechobee. The past 76 consecutive days the 30 day moving average salinity has exceeded the MFL resulting in harmful high salinities for oysters in the lower estuary and tape grass in the upper estuary.** Red tide continues to impact birds, sea turtles and cause fish kills and respiratory irritation along coastal beaches.

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: Continue to provide adequate water discharges from the Lake to benefit recovery of both the Lake Okeechobee marsh and assist habitat recovery and reduce harmful salinities throughout the Caloosahatchee estuary. There is sufficient water in the lake to achieve this and meet consumptive uses.

Lake Okeechobee Level: 13.04 ft. (Base Flow Sub-Band)

Last week: 12.96 ft.

Lake Okeechobee Inflow: 2,377 cfs

Lake Okeechobee Outflow: 138 cfs

Weekly Rainfall: WP Franklin 1.53" Ortona 2.70"

Moore Haven 1.80"

Salinity Beautiful Island: 3.0-6.9 psu (SCCF RECON Marker 18)

Previous week 2.2 - 4.2 psu

Salinity Fort Myers: 13-18 psu (SCCF RECON)

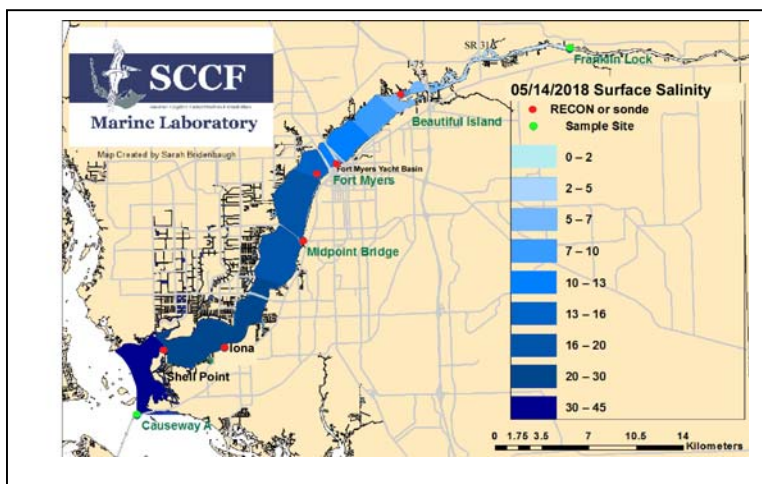
Previous week 11 - 19 psu

MFL Status: Exceedance = 76 days 30 day moving average: 11.2 psu

Previous week: 11.3 psu

Salinity Shell Point: 23-35 psu (SCCF RECON)

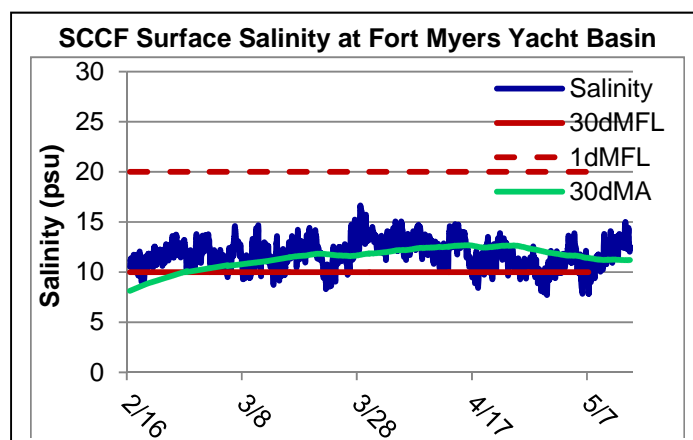
Previous week 23 - 35 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	3.0-6.9	< 5 psu	In Range
Fort Myers	13-18	<10 psu	High
Shell Point	23-35	25 - 32 psu	High
Light (25% Iz depth meters)			
Fort Myers	0.97	1 meter	Low
Shell Point	1.62	2.2 meters	Low
Causeway	2.10	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **948 cfs**. Over the past 14 days **34,136 AF** of water was discharged from Lake O, **39% to S-77**, **7% to S-308**, **43% of water from Lake O was discharged south to the EAA**. A net outflow of **7%** was discharged to the **L8** and a net **4%** was discharged through S-310.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
5/8/2018	407	351	227
5/9/2018	207	352	211
5/10/2018	42	349	234
5/11/2018	1125	980	452
5/12/2018	1505	1231	554
5/13/2018	1561	919	482
5/14/2018	1792	936	387
7 day Avg	948	731	364



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 5/14/18 reported accumulation of 2 cyanobacteria species on the upstream side of S-79: *Microcystis* and *Dolichospermum*. On 5/15/18 the Olga Water Treatment plant reported chlorides of **61 mg/l**, apparent color **82 CU** and turbidity **3.78 NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The 30 day moving average salinity at the Fort Myers Yacht Basin was **11.2 psu** and the weekly average salinity was **12 psu**. These salinities are above the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **30 psu**, was above the optimal range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	34.0 – 36.4	5.1 – 10.9	9.6 – 16.2	1.5 – 6.8
Wulfert Flats	24.0 – 37.4	3.0 – 8.9	-----	7.2 – 46.0
Wildlife Drive	35.5 – 39.2	0.7 – 10.7	-----	0.8 – 12.0

Beach Conditions: The past week macroalgae was reported until 5/11/18 along beaches on Sanibel. Macroalgae strandings were reported along some Fort Myers Beach beaches.

Red Tide: On 5/11/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Charlotte, Lee and Collier Counties with background to medium concentrations in 17 samples collected from or offshore of Lee County. A water sample SCCF collected at SCCF's Gulf RECON on 5/10/18 contained medium concentrations of *Karenia*.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, admitted one green sea turtle over the weekend. The turtle was euthanized due to internal & external fibropaps. SCCF reported one dead Kemp's Ridley on Sanibel beach.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	7.8	139	3.8	0.97
Shell Point	3.4	60.0	2.0	1.62
Causeway	1.8	28.6	2.4	2.10

Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
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 Rae Burns – Town of Fort Myers Beach
 Harry Phillips – City of Cape Coral
 Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **May 15 - 21, 2018**

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: Average flows of 3,053 cfs during the past week reduced salinity at the Fort Myers Yacht Basin below the 10 psu harm threshold. While recent rainfall has reduced salinities throughout the estuary, **the 30-day moving average salinity at the Fort Myers Yacht Basin has exceeded the MFL for the past 83 consecutive days. Red tide continues to affect birds and sea turtles along the coast.**

USACE Action: Since 1/12/18 the Army Corps has continued flows from Lake Okeechobee through pulse releases with an average target flow for the Caloosahatchee Estuary of **650 cfs** at S-79 and no releases to the St Lucie at S-80.

Recommendation: In order to maintain a manageable level for Lake Okeechobee we ask that flows be released at S77. However, we request that the average flow stay below 2,800 cfs at S79, due to the abundant rainfall.

Lake Okeechobee Level: 13.57 ft. (Low Flow Sub-Band)

Last week: 13.04 ft.

Lake Okeechobee Inflow: 6,202 cfs

Lake Okeechobee Outflow: 0 cfs

Weekly Rainfall: WP Franklin 2.45" Ortona 4.04"

Moore Haven *3.77"

Salinity Beautiful Island: 0.7-7.7psu (SCCF RECON Marker 18)

Previous week 3.0-6.9 psu

Salinity Fort Myers: 9.5-17 psu (SCCF RECON)

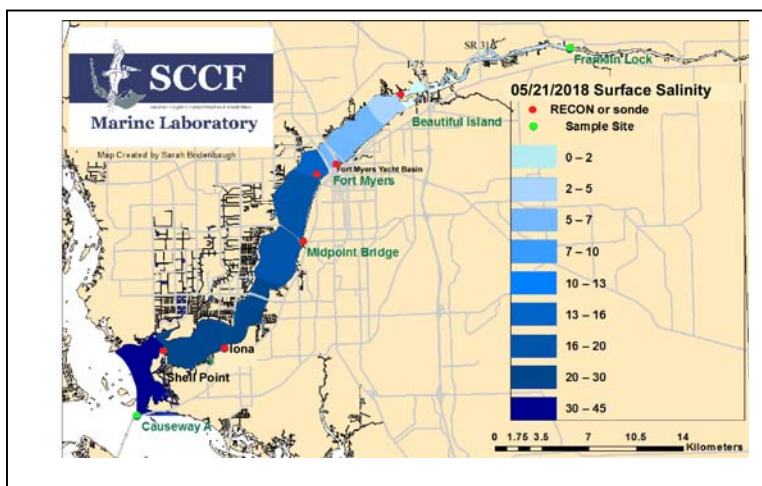
Previous week 13-18 psu

MFL Status: Exceedance = 83 days 30 day moving average: 10.7 psu

Previous week: 11.3 psu

Salinity Shell Point: 20-35 psu (SCCF RECON)

Previous week 23 - 35 psu

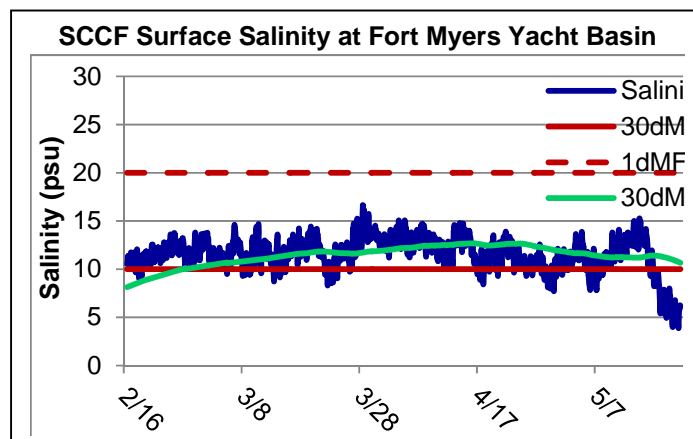


(*One or more days not reported)

Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.7-7.7	< 5 psu	High
Fort Myers	9.5-17	<10 psu	High
Shell Point	20-35	25 - 32 psu	High
Light (25% I _z depth meters)			
Fort Myers	0.87	1 meter	Low
Shell Point	1.58	2.2 meters	Low
Causeway	2.39	2.2 meters	In Range

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **3,053 cfs**. Over the past 14 days **14,616 AF** of water was discharged from Lake O, **59% to S-77**, **4% to S-308**, **37% of water from Lake O was discharged south to the EAA**. Back flow of **9,278 AF** occurred at **L8**, and back flow of **1,871 AF** occurred at S-310.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
5/15/2018	3577	2233	0
5/16/2018	3337	1405	0
5/17/2018	3143	1739	0
5/18/2018	2613	1846	0
5/19/2018	3048	1715	263
5/20/2018	2377	1486	0
5/21/2018	3276	1976	0
7 day Avg	3053	1771	38



Upstream of S-79/Franklin Conditions: Sampling by Lee County Environmental Lab on 5/22/18 reported accumulation of 3 cyanobacteria species on the upstream side of S-79: *Microcystis*, *Dolichospermum* and *Planktothrix*. On 5/22/18 the Olga Water Treatment plant reported chlorides of **57 mg/l**, apparent color 91 **CU** and turbidity 4.05 **NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity (8.7) is in the suitable range for tape grass, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **30 psu**, was above the optimal range for oysters, but the daily average dropped into the suitable range on 5/21/18.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	33.9 – 35.4	5.0 – 12.8	7.4 – 17.1	1.6 – 56.7
Wulfert Flats	34.1 – 35.4	3.6 – 7.0	-----	8.8 – 20.2
Wildlife Drive	34.6 – 36.6	0.8 – 13.6	-----	0.8 – 6.2

Beach Conditions: No major drift algae were reported along Sanibel beaches.

Red Tide: On 5/18/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Charlotte, Lee and Collier Counties with background to medium concentrations in 8 samples collected from Lee County. A water sample SCCF collected at Tarpon Beach on 5/17/18 contained medium concentrations of *Karenia*.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated 9 new patients with red tide symptoms; 3 double crested cormorants, 2 brown pelicans, 2 white ibis, 1 laughing gull, and 1 sanderling. **SCCF reported one stranding on 5/20/18. The stranded adult female loggerhead was brought to CROW and euthanized due to trauma.**

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (gse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	15	161	2.5	0.87
Shell Point	3.8	63.6	1.9	1.58
Causeway	2.2	8.3	3.6	2.39

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
 Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
 James Evans & Holly Milbrandt - City of Sanibel
 Keith Kibbey & Lesli Haynes - Lee County
 Rae Burns – Town of Fort Myers Beach
 Harry Phillips – City of Cape Coral
 Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **May 22 - 28, 2018**

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: Average flow at S79 was 3,307 cfs during the past week. The 30-day moving average salinity at the Fort Myers Yacht Basin had exceeded the MFL for 89 days, but is now below 10 psu.

USACE Action: No releases were made from Lake Okeechobee due to significant rainfall throughout the region.

Recommendation: With the lake rising to within 1-foot of the intermediate sub-band at the start of hurricane season, we understand the need to move water out of the lake. However, with watershed flows already exceeding 3000 cfs at S-79, we urge the Corps to equitably discharge water in all directions to limit harm to the estuaries.

Lake Okeechobee Level: 14.02 ft. (Low Flow Sub-Band)

Last week: 13.57 ft.

Lake Okeechobee Inflow: 6,995 cfs

Lake Okeechobee Outflow: 0 cfs

Weekly Rainfall: WP Franklin 1.86" Ortona 2.00"

Moore Haven NR

Salinity Beautiful Island: 0.6-3.1 psu (SCCF RECON Marker 18)

Previous week 0.7-7.7 psu

Salinity Fort Myers: 5.0-14 psu (SCCF RECON)

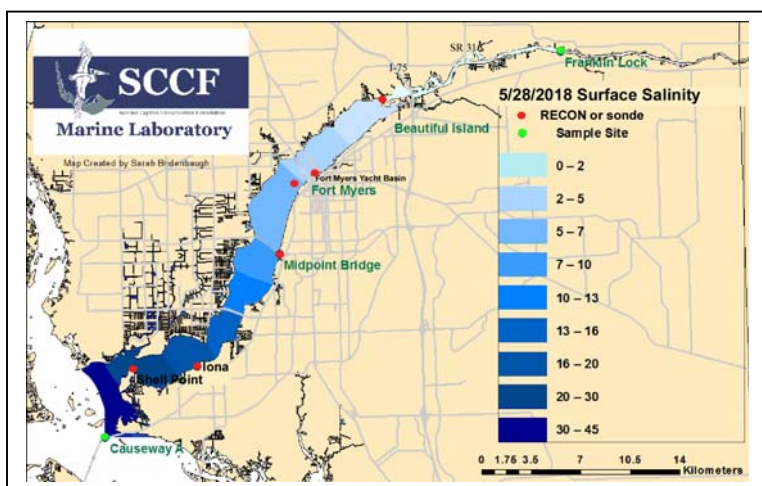
Previous week 9.5-17 psu

MFL Status: In compliance: 30 day moving average: 9.3 psu

Previous week: 10.7 psu

Salinity Shell Point: 16-34 psu (SCCF RECON)

Previous week 20-35 psu

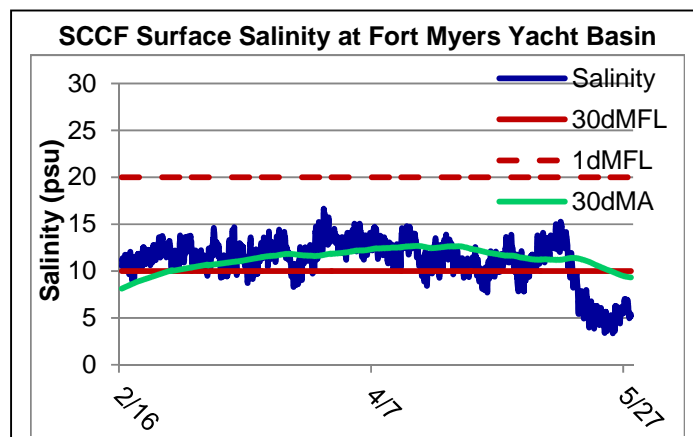


(*NR - not reported)

Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.6-3.1	< 5 psu	In Range
Fort Myers	5.0-14	<10 psu	In Range
Shell Point	16-34	25 - 32 psu	In Range
Light (25% lz depth meters)			
Fort Myers	0.77	1 meter	Low
Shell Point	1.31	2.2 meters	Low
Causeway	1.81	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **3,307 cfs**. Over the past 14 days **0 AF** of water were discharged from Lake O. There was 6,701 AF of discharge below **S-77** and **0 AF of water discharged south to the EAA**. Back flow of **26,056 AF** occurred at **L8**, Back flow of **450 AF** occurred at **S-308** and back flow of **4,301 AF** occurred at S-310.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
5/15/2018	3636	2243	0
5/16/2018	2854	1623	0
5/17/2018	2096	1260	0
5/18/2018	2865	1513	0
5/19/2018	2960	1437	0
5/20/2018	3338	1504	0
5/21/2018	3303	1632	0
7 day Avg	3307	1602	0



Upstream of S-79/Franklin Conditions: On 5/29/18 the Olga Water Treatment plant reported chlorides of **72 mg/l**, apparent color 97 **CU** and turbidity 4.05 **NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at Fort Myers Yacht Basin (5.2) is in the **suitable range for tape grass**, which is growing between the Caloosahatchee Bridge and Beautiful Island. The lower layer of the water column at Fort Myers RECON went hypoxic on 5 days this week. Water column chlorophyll was elevated at Fort Myers and Beautiful Island RECON stations.

Lower Estuary Conditions: The average salinity at Shell Point, **27 psu**, was in the **suitable range for oysters**.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	30.7 – 35.0	4.5 – 13.3	5.3 – 17.3	1.4 – 24.9
Wulfert Flats	29.3 – 34.9	3.1 – 9.0	-----	5.2 – 32.2
Wildlife Drive	29.8 – 36.0	0.7 – 10.0	-----	0.5 – 4.5

Beach Conditions: No major drift algae were strandings were reported along Sanibel beaches.

Red Tide: On 5/25/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, **Karenia brevis** persists in Charlotte, Lee and Collier Counties **with background to medium concentrations** in 19 samples collected from Lee County.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated **7 new patients with red tide symptoms**; **6 double crested cormorants** and **1 sandwich tern**. SCCF reported **one stranding on 5/24**, an adult female loggerhead with no obvious wounds or injuries.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	10	187	5.2	0.77
Shell Point	2.6	48.0	6.0	1.31
Causeway	4.3	5.2	11.4	1.81

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

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **May 29 - June 4, 2018**

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

Caloosahatchee Condition Summary: Following 89 days of MFL exceedance from flows below the low flow harm threshold, **discharge has switched to exceeding the high flow harm threshold. The weekly average flow at S79 was 5,555 cfs, with flows nearly 3 times the high flow harm threshold for two of the past 5 days.**

USACE Action: On 6/1/18 the U.S. Army Corps of Engineers initiated discharges of **4,000 cfs** to the Caloosahatchee measured at **S-77** and 1,800 cfs to the St Lucie measured at S-80.

Recommendation: We request that the Army Corps discontinue flows from Lake O to the Caloosahatchee until flows at S-79 drop below 3,000 cfs. We request water managers maximize use of all available storage and provide updates on emergency storage use and options. We urge the Corps and SFWMD to redirect stormwater from Clewiston's S-310 and the L8 that are back flowing into Lake Okeechobee at levels that exceed the total lake discharge the past 14 days.

Lake Okeechobee Level: 14.22 ft. (Low Flow Sub-Band)

Last week: 14.02 ft.

Lake Okeechobee Inflow: 5,456cfs

Lake Okeechobee Outflow: 4,442 cfs

Weekly Rainfall: WP Franklin 0.58" Ortona 1.18"

Moore Haven 3.46"

Salinity Beautiful Island: 0.3 - 1.1 psu (SCCF RECON Marker 18)

Previous week 0.6 - 3.1 psu

Salinity Fort Myers: 0.3 - 6.5 psu (SCCF RECON)

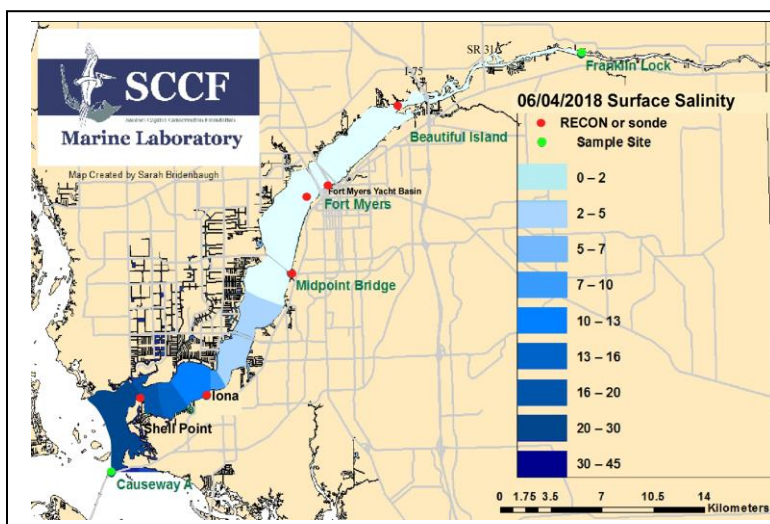
Previous week 5.0 - 14 psu

MFL Status: In compliance: 30 day moving average: 7.1 psu

Previous week: 9.3 psu

Salinity Shell Point: 6.0 - 34 psu (SCCF RECON)

Previous week 16 - 34 psu

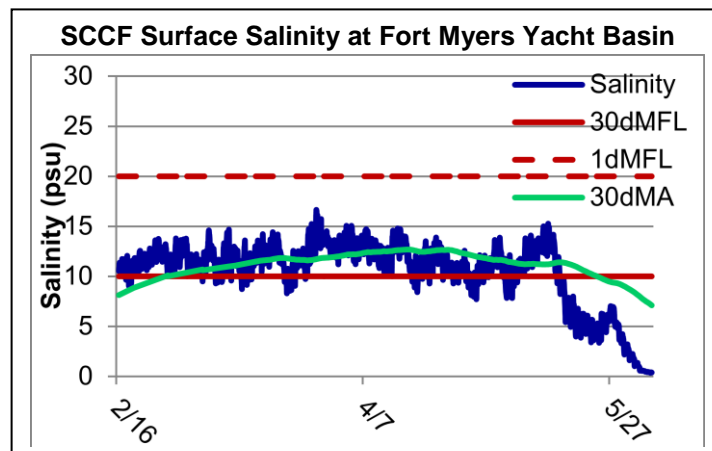


Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.3 - 1.1	< 5 psu	In Range
Fort Myers	0.3 - 6.5	<10 psu	In Range
Shell Point	6.0 - 34	25 - 32 psu	Low
Light (25% Iz depth meters)			
Fort Myers	0.46	1 meter	Low
Shell Point	0.45	2.2 meters	Low
Causeway	1.05	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **5,555 cfs**. Over the past 14 days **36,147 AF** of water was discharged from Lake O; 78% through **S-77** and 22% through **S-80**. **Zero water was discharged south to the EAA. The past 14 days the L8 backflowed 31,314 AF and stormwater from Clewiston discharged 4,289 AF into Lake Okeechobee.**

The combined back flows from the L8 and S-310 were 2,456 AF higher than the total outflows to the estuary the past 14 days.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
5/29/2018	2907	1533	0
5/30/2018	2064	832	0
5/31/2018	3227	1024	0
6/1/2018	6188	4150	1526
6/2/2018	8284	6099	3848
6/3/2018	8260	6036	3940
6/4/2018	7958	5786	3996
7 day Avg	5555	3637	1901



Upstream of S-79/Franklin Conditions: On 6/5/18 the Olga Water Treatment plant reported chlorides of **64 mg/l**, apparent color **203 CU** and turbidity **3.96 NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at Fort Myers Yacht Basin was **1.8 psu**, in the suitable range for **tape grass**, which is growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated at Fort Myers and Beautiful Island RECON stations.

Lower Estuary Conditions: The average salinity at Shell Point, **21 psu**, was in the suitable range for oysters.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	27.2 – 34.7	4.6 – 13.5	5.2 – 15.6	1.3 – 13.7
Wulfert Flats	31.4 – 35.0	3.8 – 8.5	-----	6.6 – 40.1
Wildlife Drive	26.5 – 34.2	0.3 – 9.1	-----	0.8 – 10.9

Red Tide: On 6/1/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, **Karenia brevis** persists in Hillsborough, Manatee, Sarasota, Charlotte and Lee Counties **with background to very low concentrations** in Lee County samples. No *Karenia* cells were found in SCCF samples from San Carlos Bay or Tarpon Beach.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated **10 new patients with red tide symptoms**; **7 Double Crested Cormorants**, **2 Brown Pelicans** and **1 Loggerhead sea turtle**.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	30	367	3.2	0.46
Shell Point	12	141	3.2	0.45
Causeway	4.5	133	2.6	1.05

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

SCB-San Carlos Bay = 2.2 meters

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



Sanibel Lighthouse Beach Park, 5/31/18 two hours before high tide. Photo City of Sanibel
<https://s3.amazonaws.com/cityofsanibel/LH5-31-18/index.html>



Sanibel Lighthouse Beach Park, 6/3/18 one hour before high tide.
Photo City of Sanibel with San Cap Aerial <https://s3.amazonaws.com/cityofsanibel/LH6-3-18/index.html>

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **June 5 - 11, 2018**

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 weekly average flow at S79 was **7,283 cfs**, with flows over two and a half times the high flow harm threshold. **Hundreds of small, estuarine clams were found dead, floating near Peppertree Point Marina on 6/7/18 where the salinity was less than 1 psu. Small clumps of freshwater cyanobacteria, including *Microcystis*, were visible beneath the water surface from Beautiful Island to Iona Cove.**

USACE Action: On 6/1/18 the U.S. Army Corps of Engineers initiated discharges of **4,000 cfs** to the Caloosahatchee measured at S-77 and 1,800 cfs to the St Lucie measured at S-80.

Recommendation: This early in the wet season we request that the Army Corps reduce flows from Lake O to the Caloosahatchee until flows at S-79 drop below 3,000 cfs. We urge the Corps and SFWMD to redirect stormwater from the L8 and Clewiston's Industrial Canal, S-310, that are back flowing volumes of water into Lake Okeechobee that could reduce or eliminate estuary discharges. We request water managers maximize use of all available storage and provide updates on emergency storage use and options.

Lake Okeechobee Level: 14.15 ft. (Low Flow Sub-Band)

Last week: 14.22 ft.

Lake Okeechobee Inflow: 4,468 cfs

Lake Okeechobee Outflow: 5,238 cfs

Weekly Rainfall: WP Franklin 1.62" Ortona 4.24"

Moore Haven 1.23"

Salinity Beautiful Island: 0.2 - 0.3 psu (SCCF RECON Marker 18)

Previous week 0.3 - 1.1 psu

Salinity Fort Myers: 0.2 - 0.3 psu (SCCF RECON)

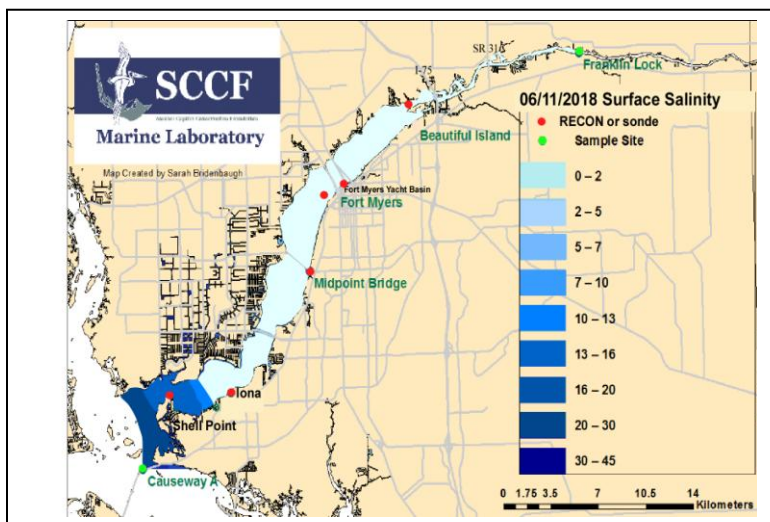
Previous week 0.3 - 6.5 psu

MFL Status: In compliance: 30 day moving average: 4.2 psu

Previous week: 7.1 psu

Salinity Shell Point: **2.1 – 29 psu** (SCCF RECON)

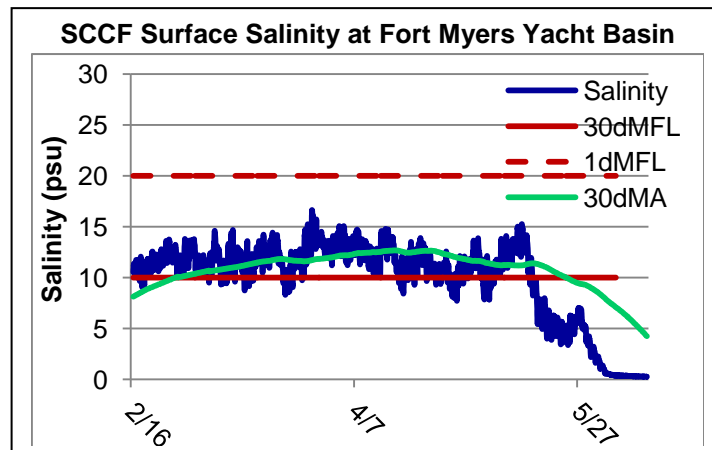
Previous week **6.0 - 34 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.3	< 5 psu	In Range
Fort Myers	0.2 - 0.3	<10 psu	In Range
Shell Point	2.1 – 29	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.43	1 meter	Low
Shell Point	0.87	2.2 meters	Low
Causeway	0.96	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the past seven days averaged **7,283 cfs**, **56% of flow originated from Lake Okeechobee**. Over the past 14 days **110,700 AF** of water was discharged from Lake O to the Caloosahatchee; **76% at S-77 and St Lucie 24% at S-80**. **Zero water was discharged south to the EAA**. A total of **24,562 AF of stormwater back flowed into Lake Okeechobee**, **22% of the discharge volume**; **-21,274 AF** from the L8 and **-3,288 AF** from Clewiston's Industrial Canal.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
6/5/2018	6640	4942	3512
6/6/2018	7020	5409	4152
6/7/2018	7725	5174	3980
6/8/2018	7979	5188	4100
6/9/2018	7484	5205	4208
6/10/2018	6904	5201	4232
6/11/2018	7230	4980	4288
7 day Avg	7283	5157	4067



Upstream of S-79/Franklin Conditions: Cyanobacteria, including *Dolichospermum* and *Planktothrix* was present at the Alva Boat Ramp in samples taken 6/11/18 by the Lee County Environmental Lab. On 6/12/18 the Olga Water Treatment plant reported chlorides of **56 mg/l**, apparent color **236 CU** and turbidity **6.23 NTU**. No visible algae reported at the plant intake the past week. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at Fort Myers Yacht Basin was **0.3 psu**, in the suitable range for tape grass, growing between the Caloosahatchee Bridge and Beautiful Island. Water column chlorophyll was elevated from Beautiful Island to Shell Point, with freshwater phytoplankton dominant. **Small clumps of freshwater cyanobacteria, including *Microcystis*, were visible beneath the surface from Beautiful Island to Iona Cove.**

Lower Estuary Conditions: The average salinity at Shell Point, **16 psu**, was in the suitable range for oysters. Chlorophyll was spiking at the Shell Point RECON on the outgoing tide. Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway. **Hundreds of small, estuarine, dwarf surf clams (*Mulinia lateralis*) were floating, dead near Peppertree Point Marina 6/7/18 where the salinity was less than 1 psu.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	23.9 – 34.1	3.7 – 13.1	6.9 – 26.8	1.5 – 5.6
Wulfert Flats	26.1 – 34.8	3.3 – 9.2	-----	7.5 – 59.4
Wildlife Drive	30.4 – 35.5	0.4 – 10.4	-----	1.7 – 20.1

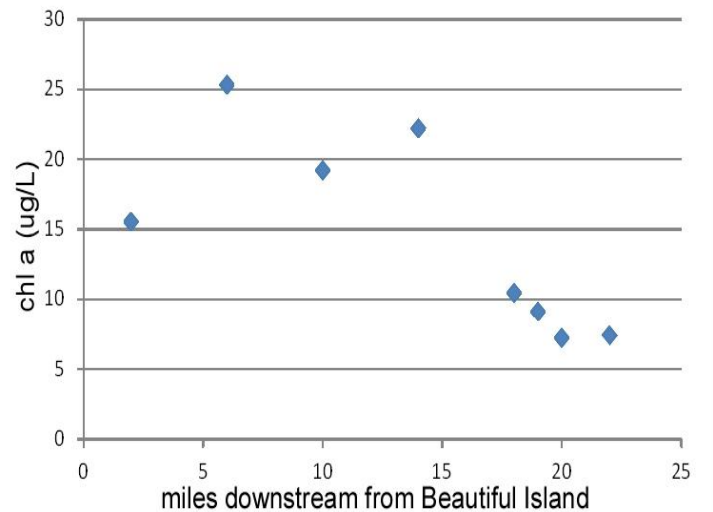
Red Tide: On 6/8/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Manatee, Sarasota, Charlotte, Lee and Collier Counties with background to medium concentrations in Lee County samples. **High concentrations of *Karenia* were found in Blind Pass (SCCF) on 6/8/18** after reports of dozens of smooth dogfish were reported washing up at Bowman's and Captiva Beaches.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated **11 new patients with red tide symptoms**; **5 Double Crested Cormorants**, **4 Brown Pelicans** and **2 Loggerhead sea turtles**. **Seven dead sea turtles washed up on Sanibel and Captiva beaches.**

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	25	399	5.9	0.43
Shell Point	14	162	2.8	0.87
Causeway	7.6	148	2.6	0.96

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

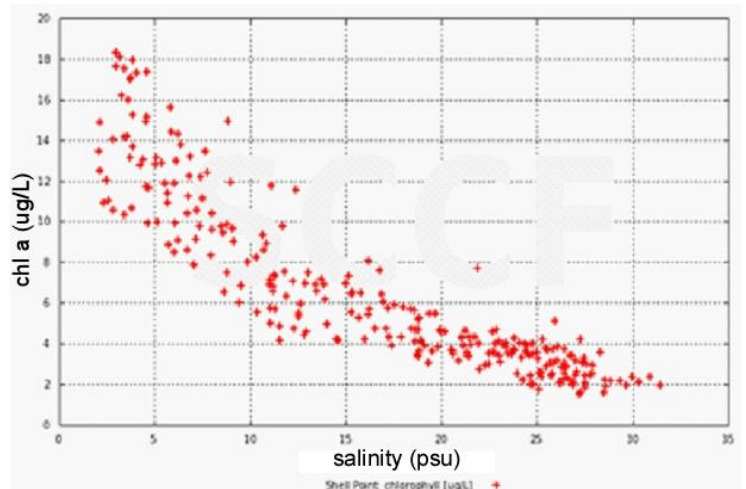
Large patches of the cyanobacteria *Trichodesmium* were seen 6 - 10 miles off Captiva on 6/11/18. Photo Lee County



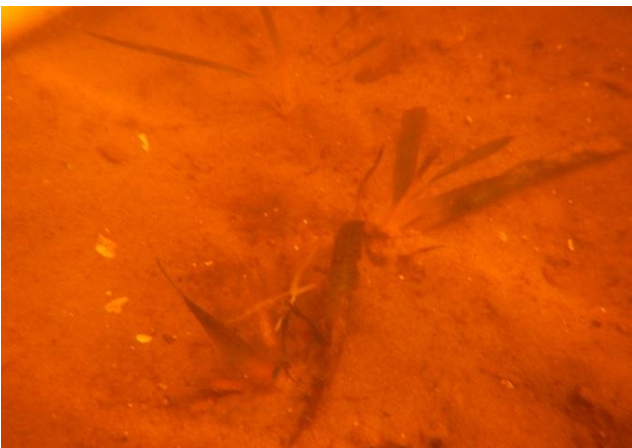
Water column chlorophyll concentrations from upstream to downstream in the Caloosahatchee, 6/10-11/18, showing higher concentrations in the fresher water. Graph SCCF



Least tern chicks and nest on Bowman's Beach, Sanibel, 6/11/18. Photo SCCF



Chlorophyll vs. salinity at Shell Point RECON from 6/1-11/18, showing the high concentrations in out flowing fresher water. Photo SCCF



A January tape grass transplant in shallow water near Palm Point surviving low light, grazing and burial. CDOM absorbs the short blue light wavelengths, leaving red light at depth. Photo taken 6/10/18. SCCF.



Single Snowy Plover chick, 3 weeks old, on Sanibel, 6/11/18 survived STS Alberto. Photo SCCF

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **June 12 - 18, 2018**

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 weekly average flow at S79 was **6,852 cfs**, with flows two and a half times the high flow harm threshold. **Freshwater cyanobacteria was found on the surface and in the water column at four stations in the Caloosahatchee.** Samples sent to DEP.

USACE Action: On 6/1/18 the U.S. Army Corps of Engineers initiated discharges of **4,000 cfs** to the Caloosahatchee measured at S-77 and 1,800 cfs to the St Lucie measured at S-80.

Recommendation: With Lake O water levels more than one foot below the Intermediate sub band and the LORS Part D Guidance recommendation **up to 3,000 cfs** at S-79, we request the Army **Corps reduce flows from Lake Okeechobee to the Caloosahatchee until flows at S-79 drop below 3,000 cfs.** We request water managers maximize use of all available storage and provide updates on emergency storage use and options.

Lake Okeechobee Level: 14.07 ft. (Low Flow Sub-Band)

Last week: 14.15 ft.

Lake Okeechobee Inflow: 5,915 cfs

Lake Okeechobee Outflow: 6,096 cfs

Weekly Rainfall: WP Franklin 2.24" Ortona 1.77"

Moore Haven 1.11"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

Previous week 0.2 - 0.3 psu

Salinity Fort Myers: 0.2 - 0.3 psu (SCCF RECON)

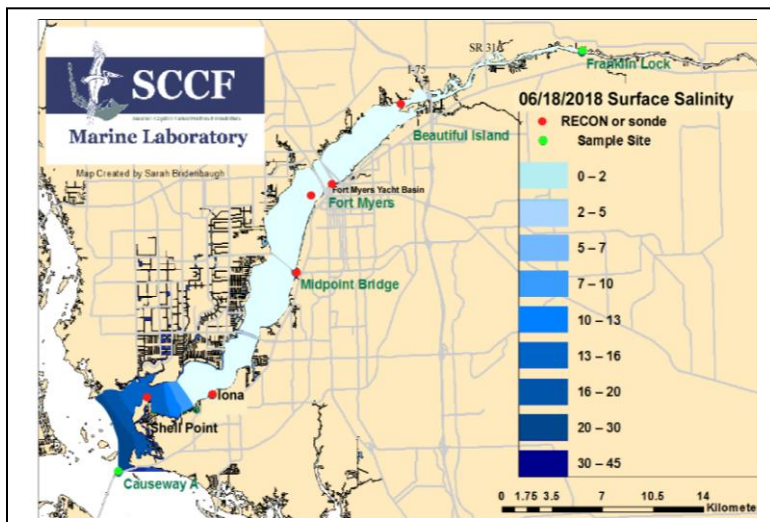
Previous week 0.2 - 0.3 psu

MFL Status: In compliance: 30 day moving average: 2.0 psu

Previous week: 4.2 psu

Salinity Shell Point: 3.4 – 28 psu (SCCF RECON)

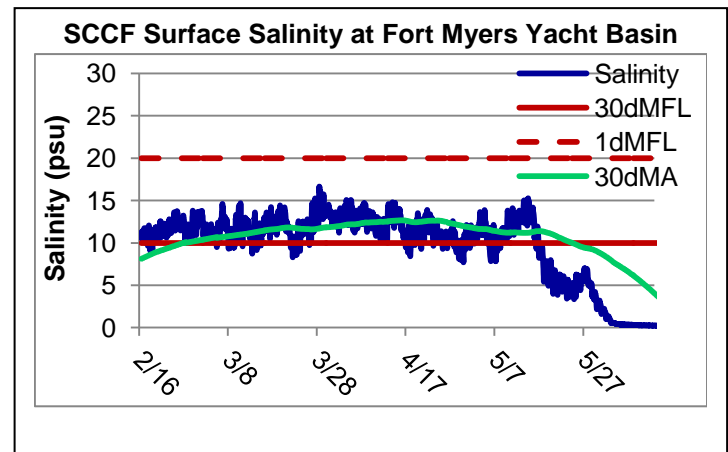
Previous week 2.1 – 29 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.3	<10 psu	In Range
Shell Point	3.4 – 28	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.46	1 meter	Low
Shell Point	0.91	2.2 meters	Low
Causeway	1.06	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **6,852 cfs**, **60% of flow originated from Lake Okeechobee**. Over the past 14 days **147,954 AF** of water was discharged from Lake Okeechobee to the Caloosahatchee; **72% at S-77 and 26% to the St Lucie at S-80**. Only **2% (3,415 AF)** was discharged south thru S-354. A total of **9,159 AF of stormwater back flowed into Lake Okeechobee = 6.2% of the discharge volume**; **-7,920 AF** from the L8 and a net **-1,239 AF** from Clewiston's Industrial Canal.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
6/12/2018	7260	4910	4232
6/13/2018	6871	4914	4164
6/14/2018	6705	4874	4196
6/15/2018	6456	4637	4208
6/16/2018	6635	4602	4052
6/17/2018	6990	4826	3976
6/18/2018	7046	5024	4076
7 day Avg	6852	4827	4129



Upstream of S-79/Franklin Conditions: Cyanobacteria were found at 4 stations in the Caloosahatchee on 6/11/18 by the Lee County Environmental Lab. *Dolichospermum* at both the Alva Boat Ramp and downstream of Franklin Lock, *Dolichospermum* + *Aphanizomenon* upstream of the Franklin Lock, and *Dolichospermum* + *Microcystis* at the Davis Boat Ramp. Samples were submitted to DEP for analysis. On 6/19/18 the Olga Water Treatment plant reported chlorides of **50 mg/l**, apparent color **271 CU** and turbidity **7.04 NTU**. Algae visible at the plant intake on 6/18/18. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at Fort Myers Yacht Basin was **0.3 psu**, in the suitable range for tape grass, growing between the Caloosahatchee Bridge and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **15 psu**, was in the suitable range for oysters, but below optimal for seagrass. Chlorophyll and turbidity were spiking at the Shell Point RECON on the outgoing tide. Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	21.6 – 26.9	2.9 – 13.1	20.7 – 30.6	2.5 – 6.0
Tarpon Bay	20.7 – 29.6	4.7 – 8.4	20.5 – 41.7	2.6 – 6.4

Red Tide: On 6/15/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Pinellas, Manatee, Sarasota, Charlotte, Lee and Collier Counties with background to medium concentrations in Lee County samples.

Wildlife Impacts: The past week, CROW, the wildlife hospital on Sanibel, treated **2 new patients with red tide symptoms** both Double Crested Cormorants. SCCF reported five dead loggerhead sea turtle strandings on Sanibel and Captiva beaches the past week.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	11	386	5.3	0.46
Shell Point	10	152	3.8	0.91
Causeway	3.5	135	2.2	1.06

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

SCB-San Carlos Bay = 2.2 meters

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

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **June 19 - 25, 2018**

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 weekly average flow at S79 was **4,695 cfs**, one and a half times the high flow harm threshold. **Extensive cyanobacteria was documented from Moore Haven to Fort Myers Shores, 5 miles downstream of the Franklin Lock. Beach is closed at the Franklin Lock park. Red tide persists along the coast.**

USACE Action: On 6/22/18 the U.S. Army Corps of Engineers initiated discharges of **3,000 cfs** to the Caloosahatchee measured at **S-79** and **1,170 cfs** to the St Lucie measured at **S-80**.

Recommendation: To balance salinity levels in the estuary and manage the extensive cyanobacteria bloom over 48 miles of the Caloosahatchee we request the Army Corps follow the LORS Part D Guidance recommendation of **up to 3,000 cfs at S-79 delivered in a pulse release**. We request SFWMD maximize the DWM available storage in the watershed including the 65% at BOMA and 63% at Nicodemus Slough while harmful flows are discharging to the estuary.

Lake Okeechobee Level: 14.10 ft. (Low Flow Sub-Band)

Last week: 14.07 ft.

Lake Okeechobee Inflow: 7,289 cfs

Lake Okeechobee Outflow: 1,579 cfs

Weekly Rainfall: WP Franklin **1.42"** Ortona **0.34"**

Moore Haven **1.08"**

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

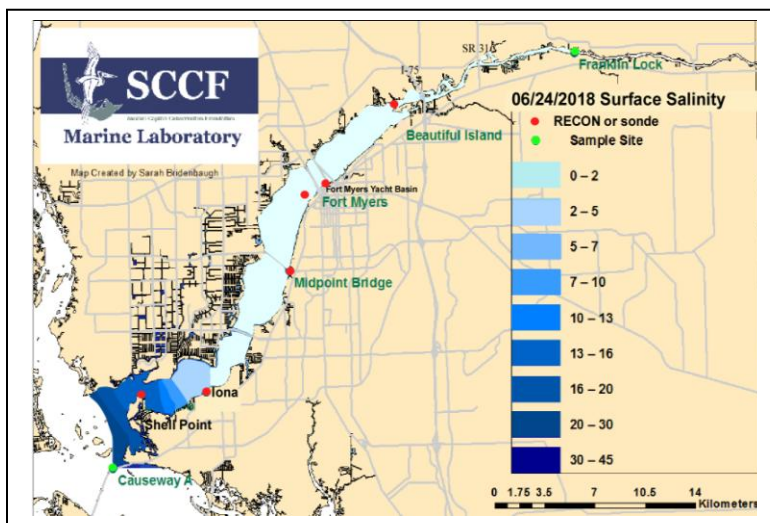
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.3 psu

Salinity Shell Point: 3.2 – 29 psu (SCCF RECON)

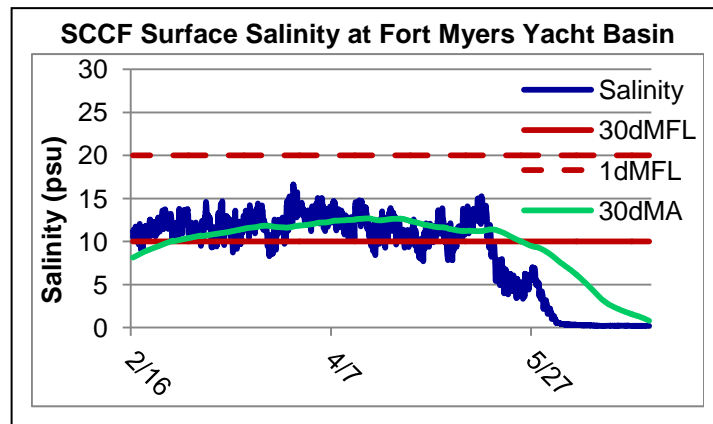
Previous week 3.4 – 28 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	3.2 – 29	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.58	1 meter	Low
Shell Point	0.97	2.2 meters	Low
Causeway	1.28	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **4,695 cfs**; **60% of flow originated from Lake Okeechobee**. Over the past 14 days **150,192 AF** of water was discharged from Lake Okeechobee to the Caloosahatchee; **64% at S-77 and 22% to the St Lucie at S-80**. **14% was discharged south to the EAA**. A net **-2,358 AF of stormwater back flowed into Lake Okeechobee = 1.6% of the discharge volume**; **-1,541 AF** from the L8 and a net **-817 AF** from Clewiston's Industrial Canal.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
6/19/2018	6436	4978	4184
6/20/2018	6036	4566	4276
6/21/2018	5724	4274	4164
6/22/2018	4386	2936	3260
6/23/2018	3836	2106	2129
6/24/2018	3470	1738	836
6/25/2018	2978	2028	815
7 day Avg	4695	3232	2809



Upstream of S-79/Franklin Conditions:

An extensive cyanobacteria bloom was documented by air 6/22/18 extending from Moore Haven to S-79. On 6/25/18 Lee County environmental lab documented blooms of *Microcystis* at the Alva Boat Ramp, Franklin Locks upstream and downstream.

On 6/26/18 the Olga Water Treatment plant reported chlorides of **50 mg/l**, apparent color **270 CU** and turbidity **4.67 NTU**.

Significant algae visible at the plant intake.

The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at Fort Myers Yacht Basin was **0.3 psu**, in the suitable range for **tape grass**, growing between the Caloosahatchee US 41 Bridges and Beautiful Island. *Microcystis* was present west of the SR 31 Bridge and at the Davis Boat Ramp 5 miles downstream of S-79 in Fort Myers Shores.

Additional Photos on Page 3



Caloosahatchee cyanobacteria algae bloom in Hendry County on 6/22/18. Photo J. Cassani

Lower Estuary Conditions: The average salinity at Shell Point, **16 psu**, was in the suitable range for oysters, but below optimal for seagrass. Chlorophyll and turbidity were spiking at the Shell Point RECON on the outgoing tide. Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway. Hypoxia extends up and downstream from Shell Point.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	21.8 – 26.5	1.2 – 9.1	17.9 – 28.2	2.8 – 6.6
Tarpon Bay	20.7 – 31.5	4.3 – 9.0	15.5 – 39.6	1.4 – 6.2

Red Tide: On 6/22/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Pinellas, Manatee, Sarasota, Charlotte, Lee and Collier Counties with background to medium concentrations in Lee County samples.

Wildlife Impacts: The past week, SCCF reported three dead loggerhead sea turtle strandings on Sanibel and Captiva beaches.

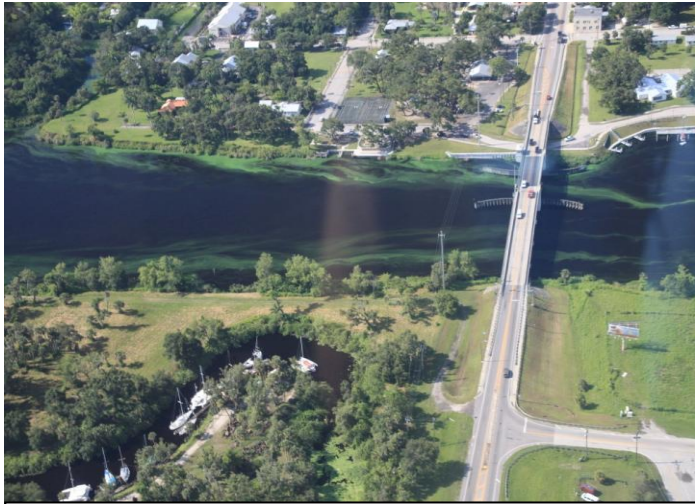
Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	9.6	288	6.1	0.58
Shell Point	6.3	141	4.2	0.97
Causeway	3.9	100	1.5	1.28

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

SCB-San Carlos Bay = 2.2 meters

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

Cyanobacteria, blue-green algae, blooms in the Caloosahatchee from Alva to LaBelle, 6/22/18. Photos J. Cassani



← Numerous reports of public swimming, fishing and recreation in blooms. No warning signage at boat ramps, beaches or public access areas.

Photos J. Cassani



Cyanobacteria bloom in Alva backyard on Goode Avenue on 6/24/18. Homeowner reports over 400 ft of river covered in algae. Photo R. Gause



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **June 26 - July 2, 2018**

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 weekly average flow at S79 was **3,654 cfs**, one and a third times the high flow harm threshold. **Extensive cyanobacteria was documented from Moore Haven to the Cape Coral Bridge, 22 miles downstream of the Franklin Lock. Beach is closed at the Franklin Lock park. Red tide persists along the coast.**

USACE Action: On 6/29/18 the U.S. Army Corps of Engineers initiated a 14 day pulse release of **3,000 cfs** to the Caloosahatchee measured at **S-79**. The St Lucie will receive **no releases for 9 days** and an average of **585 cfs** over the 14 day pulse measured at **S-80**.

Recommendation: Lake discharges contaminated with a cyanobacteria bloom have increased the extent and intensity of the bloom on the Caloosahatchee to 65 miles over the 75 mile river and estuary, causing beach closures and public health warnings. We request the Corps not exceed average flows of **3,000 cfs** and strictly follow the published 14 day pulse release schedule. We urge the Corps and SFWMD to prioritize newly available storage in the L29 for increased **lake flows** and maximize all available storage in the watershed including DWM to reduce harmful flows to the estuary.

Lake Okeechobee Level: 14.28 ft. (Low Flow Sub-Band)

Last week: 14.10 ft.

Lake Okeechobee Inflow: 5,529 cfs

Lake Okeechobee Outflow: 656 cfs

Weekly Rainfall: WP Franklin 1.60" Ortona 3.79"

Moore Haven 2.31"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

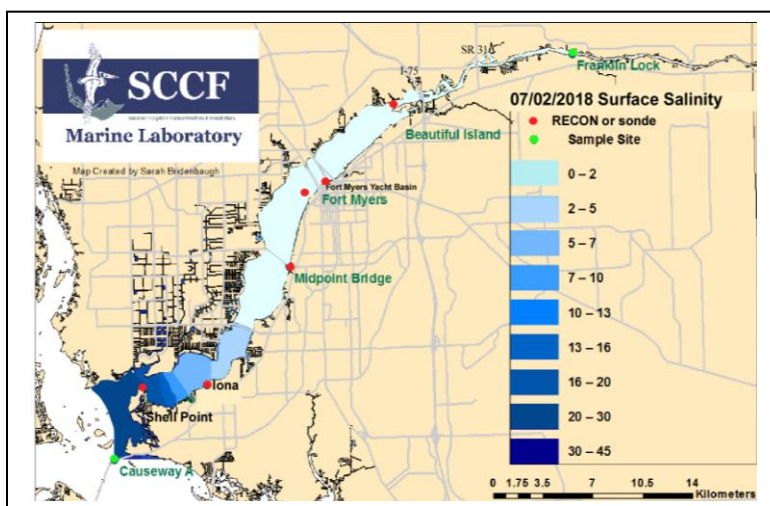
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 7.5 – 30 psu (SCCF RECON)

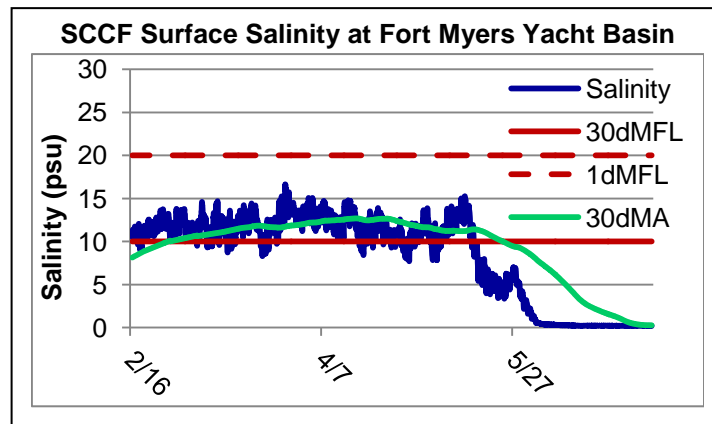
Previous week 3.2 – 29 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	7.5 – 30	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.55	1 meter	Low
Shell Point	1.27	2.2 meters	Low
Causeway	1.62	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,654 cfs**; **16% of flow originated from Lake Okeechobee**. Over the past 7 days* **22,326 AF** of water was discharged from Lake Okeechobee to the Caloosahatchee; **33% at S-77 and 56% to the St Lucie at S-80**. **11% was discharged south thru S-352 only**. A net **-1,277 AF of stormwater back flowed into Lake Okeechobee = 5.7% of Lake discharge volume**; **-11 AF** from the L8 and **99% -1,266 AF** from Clewiston's Industrial Canal. (*reporting 7 vs previous 14 days)

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
6/26/2018	3412	1872	1504
6/27/2018	3276	1611	1108
6/28/2018	3574	1622	544
6/29/2018	3759	1690	1
6/30/2018	4318	1773	0
7/1/2018	3950	1658	370
7/2/2018	3288	1533	558
7 day Avg	3654	1680	584



Upstream of S-79/Franklin Conditions:

An extensive cyanobacteria bloom extends from Moore Haven to the Fort Myers Yacht basin in downtown Ft Myers. On 6/26/18 Calusa Waterkeeper samples processed by Green Water Labs confirmed very high microcystin toxin levels of 172-1900 ug/l east of S-79. These levels were as high as 190 times the EPA recreational exposure threshold of 10 um microcystins/L.

The lower layer of the water column at both Alva and Ft. Denaud bridges was hypoxic midday on 6/27/18 with an extensive *Microcystis* bloom at each bridge.

On 7/3/18 the Olga Water Treatment plant reported chlorides of **47 mg/l**, apparent color **269 CU** and turbidity **6.72 NTU**.

Significant algae visible at the plant intake.

The plant remains off line for maintenance.

Cyanobacteria bloom in Hancock Creek, a tributary to the Caloosahatchee in North Ft Myers on 7/2/18.

Photo Lee County



Upper Estuary Conditions: The weekly average salinity at Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Dissolved oxygen levels dropped into the hypoxic range the last 6 days at Beautiful Island. Microcystis was present west of the SR 31 Bridge and at the Davis Boat Ramp 5 miles downstream of S-79 in Fort Myers Shores.**

Lower Estuary Conditions: Dissolved oxygen at Shell Point dipped into the hypoxic range below 3 mg/L daily. The average salinity at Shell Point was **20 psu**, in the suitable range for oysters. Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	22.8 – 26.6	0.6 - 8.6	17.1 - 24.7	2.7 – 6.1
Tarpon Bay	23.8 - 31.6	4.2 – 8.8	15.5 – 32.7	1.6 – 5.5

Beach Conditions: Accumulations of *Moorea* and *Hypnea* algae washing up on Sanibel and Fort Myers Beaches.

Red Tide: On 6/29/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Sarasota, Charlotte, Lee and Collier Counties with background to high concentrations in Lee County samples. Fish kills and respiratory irritation were also reported at northern Lee County beaches. SCCF sampling found medium to high concentrations of *Karenia* at Blind Pass and 2 Captiva Beaches on 7/3/18.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel reported 5 new patients with red tide symptoms; 2 Kemps Ridley, 1 Green and 1 Loggerhead sea turtle and 1 Double Crested Cormorant. SCCF reported 2 dead loggerheads stranded on Sanibel the past week. 1 dead manatee was found along wildlife drive.

Caloosahatchee Stations	Chlorophyll ($\mu\text{g/L}$)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.7	325	4.8	0.55
Shell Point	4.9	96	2.3	1.27
Causeway	3.5	61	1.9	1.62

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

Caloosahatchee cyanobacteria bloom in Olga on 7/1/18. Toxin levels confirmed nearly 190% of EPA recreational exposure recommendations. Photos C. Brown



Cyano bloom 6/29/18 at Oasis boat ramp downtown Ft Myers. Photo Lee County



Cyano bloom in Alva 7/2/18 Photos M. Buff



Extensive cyano bloom at Cape Coral Eco Park north of Mid Point Bridge 7/2/18 Photo Cape Coral



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **July 3 - 9, 2018**

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 weekly average flow at S79 was **4,683 cfs**, over one and a half times the high flow harm threshold. **Extensive cyanobacteria was documented from Moore Haven to Pine Island Sound and the beaches of Sanibel. Beach is closed at the Franklin Lock park and Cape Coral Yacht Club. Red tide persists along the coast. Governor issued an Emergency Order due to algae.**

USACE Action: On 6/29/18 the U.S. Army Corps of Engineers initiated a 14 day pulse release of **3,000 cfs** to the Caloosahatchee **measured at S-79**. The St Lucie will receive **no releases for 9 days and an average of 585 cfs** over the 14 day pulse measured at **S-80**.

Recommendation: Lake discharges containing cyanobacteria have resulted in a bloom that covers the entire length of the 75 mile river and estuary, causing beach closures and public health warnings. Additional flow will further contaminate the river with toxic algae and exacerbate the stratification/hypoxic conditions. **We request the Corps and SFWMD use operational flexibility under the Governors Emergency Order to consider the use of forward pumps to move water onto the 488,000 acres of crop lands south of the lake. This acreage will allow water to be spread out and expedite ET. We request NO flows thru S-77 until flows at S-79 fall below 3,000 cfs.**

Lake Okeechobee Level: **14.46 ft. (Low Flow Sub-Band)**

Last week: **14.28 ft.**

Lake Okeechobee Inflow: **4,594 cfs**

Lake Okeechobee Outflow: **143 cfs**

Weekly Rainfall: WP Franklin **2.14"**

Ortona **2.12"**

Moore Haven **1.35"**

Salinity Beautiful Island: **0.2 - 0.2 psu (SCCF RECON Marker 18)**

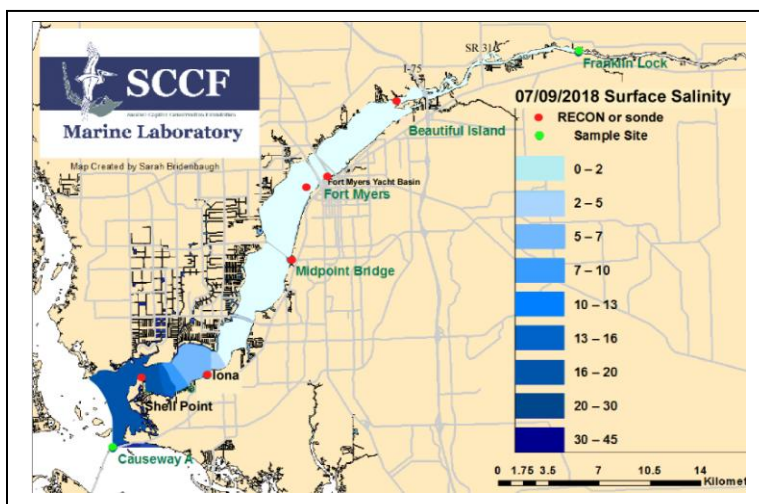
Previous week **0.2 - 0.2 psu**

Salinity Fort Myers: **0.2 - 0.2 psu (SCCF RECON)**

Previous week **0.2 - 0.2 psu**

Salinity Shell Point: **4.4 – 28 psu (SCCF RECON)**

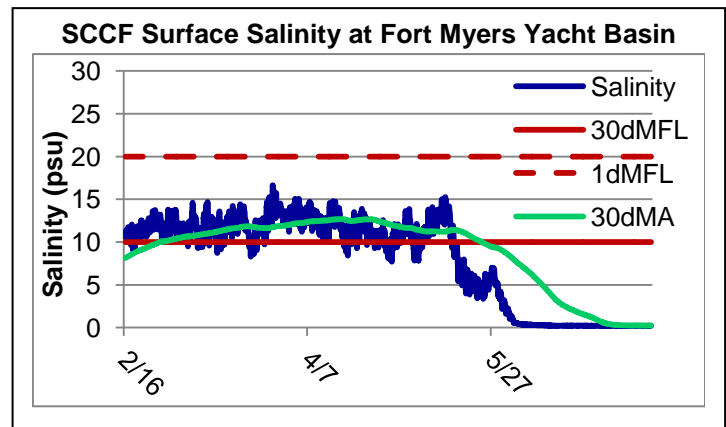
Previous week **7.5 – 30 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	4.4 – 28	25 - 32 psu	Low
Light (25% Iz depth meters)			
Fort Myers	0.53	1 meter	Low
Shell Point	1.17	2.2 meters	Low
Causeway	1.19	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **4,683 cfs**; **4% of flow originated from Lake Okeechobee**. Over the past 7 days 5,864 AF of water was discharged from Lake Okeechobee to the Caloosahatchee; **46% at S-77 and 0% to the St Lucie at S-80**. **54% was discharged south only thru S-354**. A net **-1,798 AF of stormwater back flowed into Lake Okeechobee = 31% of Lake discharge volume**; **12%/-213 AF from the L8 and 88% -1,585 AF from Clewiston's Industrial Canal**.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
7/3/2018	3360	1546	565
7/4/2018	3250	1530	596
7/5/2018	4988	1279	187
7/6/2018	5593	1194	0
7/7/2018	5159	1386	0
7/8/2018	6080	1555	0
7/9/2018	4348	1440	0
7 day Avg	4683	1419	193



Upstream of S-79/Franklin Conditions:

An extensive cyanobacteria bloom extends from Moore Haven to the Franklin Lock. On 7/10/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* at the Alva Boat Ramp and upstream of the Franklin Locks. Samples were sent to FDEP for identification and toxin analysis.

On 7/10/18 the Olga Water Treatment plant reported chlorides of **51 mg/l**, apparent color **295 CU** and turbidity **3.47 NTU**. **Significant algae visible at the plant intake.** The plant remains off line for maintenance.

Upper Estuary Conditions: On 7/10/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* at Franklin Locks downstream, the Davis Boat ramp, North Shore Park and the Midpoint Bridge.

The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Dissolved oxygen levels dropped into the hypoxic range daily at Beautiful Island.**

Lower Estuary Conditions: **Dissolved oxygen at Shell Point was in the hypoxic range for 2 days. *Microcystis* was present in the water along the causeway, along the north shore of Sanibel and at the south end of Tarpon Bay.**

The average salinity at Shell Point was **18 psu**, in the suitable range for oysters. **Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway.**

Cape Coral: Over the last week the City of Cape Coral has received numerous citizen calls and emails related to the cyanobacteria algae blooms along the river and in the City's canals. On 7/9/18 City staff reported that patches of cyanobacteria blooms had intruded at least 1 mile into the canals system, reaching Bimini Basin. See map, page 3.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	21.4 – 26.1	1.0 – 16.3	20.9 – 34.4	2.9 – 5.9
Tarpon Bay	19.3 – 27.4	4.2 – 8.6	23.6 – 37.6	2.0 – 7.1

Red Tide: On 7/6/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Sarasota, Charlotte, Lee and Collier Counties **with background to high concentrations** in Lee County samples. **Fish kills and respiratory irritation were also reported at northern Lee County beaches.**

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel reported **3 new patients with red tide symptoms; 2 Brown Pelicans and 1 Kemps Ridley. SCCF recovered one dead female loggerhead on Captiva.** Numerous manatees have been reported severely impacted.

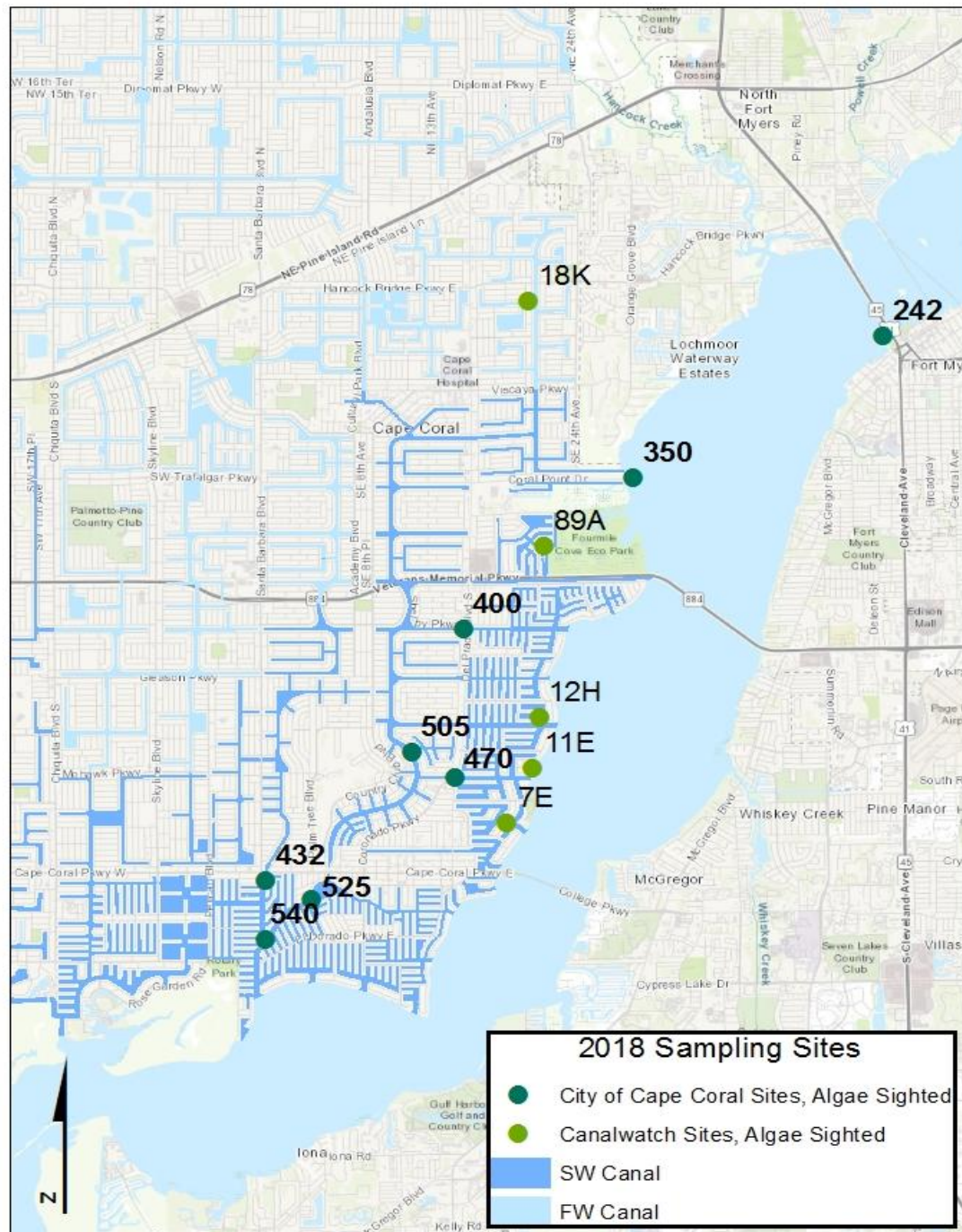
Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	9.0	338	3.2	0.53
Shell Point	5.3	110	2.5	1.17
Causeway	4.5	98	1.5	1.19

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

Cyanobacteria Sighting in the City of Cape Coral Canal



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **July 10 - 16, 2018**

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

Caloosahatchee Condition Summary: On 7/17/18 the City of Sanibel flew the Caloosahatchee documenting an extensive cyanobacteria bloom from Lake O over the entire 75 mile river to Pine Island Sound and the Sanibel causeway. Weekly average flow at S79 was 5,179 cfs, over 1.75 times the high flow harm threshold. Red tide persists along the coast.

USACE Action: On 7/13/18 the U.S. Army Corps of Engineers initiated a 14 day pulse release of 3,000 cfs to the Caloosahatchee measured at S-77. The St Lucie will receive an average of 1,800 cfs over the 14 day pulse with 3 days of no releases measured at S-80.

Recommendation: We thank the Corps for incorporating our request to modify the pulse delivery. While no flows at S-77 would provide the most benefit to the Caloosahatchee due to significant watershed flows, we request the Corps and SFWMD use operational flexibility to reduce flows to 3,000 cfs or less at S-79. We urge the agencies to consider moving water onto the 484,000 acres of crop lands south of the lake. This acreage will allow water to be spread out to saturate soils over acreage larger than Lake O and expedite evaporation and evapotranspiration.

Lake Okeechobee Level: 14.44 ft. (Low Flow Sub-Band)

Last week: 14.46 ft.

Lake Okeechobee Inflow: 4,955 cfs

Lake Okeechobee Outflow: 7,433 cfs

Weekly Rainfall: WP Franklin 2.10"

Ortona 3.31"

Moore Haven 0.25"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

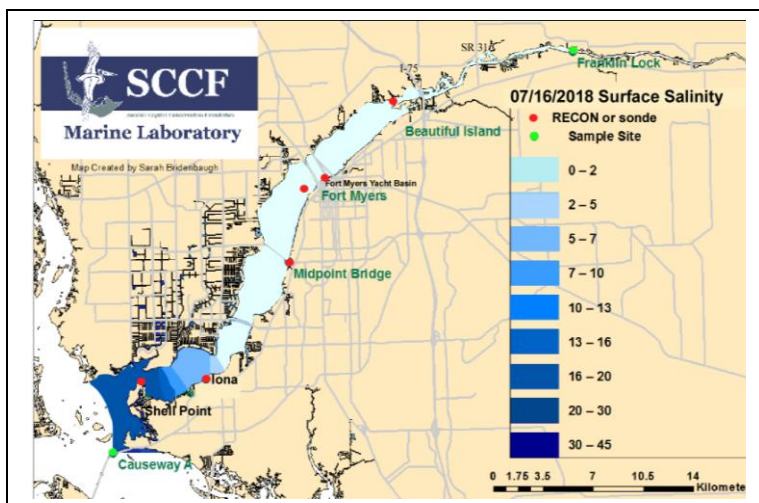
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 4.8 – 29 psu (SCCF RECON)

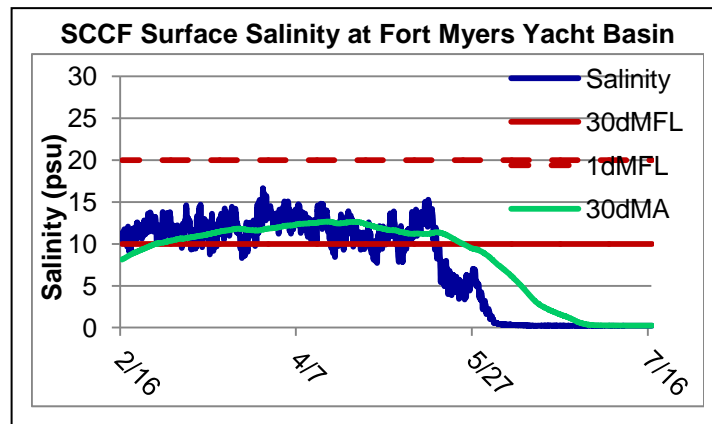
Previous week 4.4 – 28 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	4.8 – 29	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.46	1 meter	Low
Shell Point	1.21	2.2 meters	Low
Causeway	1.13	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **5,179 cfs**; **31% of flow originated from Lake Okeechobee**. Over the past 7 days **53,906 AF** of water was discharged from Lake Okeechobee: **55% to the Caloosahatchee at S-77**, **22% to the St Lucie at S-80**. **22% was discharged south to the EAA**. A net **-82 AF of stormwater back flowed into Lake Okeechobee = 0.15% of Lake discharge volume**; **-82 AF** from Clewiston's Industrial Canal S-310.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
7/10/2018	3912	1198	0
7/11/2018	2648	839	0
7/12/2018	1987	149	0
7/13/2018	5923	3356	2781
7/14/2018	7030	5173	4259
7/15/2018	7892	NR	4232
7/16/2018	6858	NR	3742
7 day Avg	5179	-	1600



Upstream of S-79/Franklin Conditions:

An extensive cyanobacteria bloom extends from Moore Haven to the Franklin Lock. On 7/17/18 the Lee County Environmental Lab documented significant blooms of *Microcystis*, *Dolichospermum* and *Planktothrix* at the Alva Boat Ramp and *Microcystis* upstream of the Franklin Locks. Samples were sent to FDEP for identification and toxin analysis.

On 7/17/18 the Olga Water Treatment plant reported chlorides of **40 mg/l**, apparent color **306 CU** and turbidity **3.65 NTU**. **Significant algae visible at the plant intake**. The plant remains off line for maintenance.

Upper Estuary Conditions: On 7/17/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* at the Davis Boat ramp, North Shore Park and the Midpoint Bridge Park and presence downstream of the Franklin Lock. The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Dissolved oxygen levels averaged in the hypoxic range at Beautiful Island**.

Lower Estuary Conditions: Dissolved oxygen at Shell Point dropped down to the hypoxic range twice during the week. *Microcystis* was present in the water along the causeway, and in a canal on the north side of Sanibel. The average salinity at Shell Point was **17 psu**, in the suitable range for oysters, but below optimal for seagrasses. **Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway**.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	21.8 – 30.0	3.3 – 11.0	20.9 – 34.4	3.0 – 7.3
Tarpon Bay	21.7 – 24.3	4.1 – 7.6	19.6 – 36.1	1.8 – 9.5

Fort Myers Beach: Fort Myers Beach canals report *Microcystis* cyanobacteria in canals along Primo Drive, Tropical Shores Way, Delmar Ave and Ohio Ave on the northern half of the island.

Red Tide: On 7/13/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Manatee, Sarasota, Charlotte, Lee and Collier Counties **with background to high concentrations in Lee County samples**. Fish kills and respiratory irritation were also reported at northern Lee County beaches. An SCCF sample from Blind Pass on 7/11/18 had a medium concentration of *Karenia* spp.

Wildlife Impacts: The past week, CROW the wildlife hospital on Sanibel reported **3 new patients with red tide symptoms**; **1 Common Tern**, **1 Laughing Gull** and **1 Muscovy Duck**. SCCF recovered two loggerhead seaturtles; **1 each on Sanibel and Captiva**. Ducks were reported dead in Cape Coral Canals one sent to FWRI for necropsy.

Caloosahatchee Stations	Chlorophyll ($\mu\text{g/L}$)	fDOM (qse)	Turbidity (NTU)	25% I_0 depth (meters)
Target Values	< 11	CE < 70 SCB < 11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	10	413	2.1	0.46
Shell Point	5.0	115	2.4	1.21
Causeway	14.5	82	3.1	1.13

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

SCB-San Carlos Bay = 2.2 meters

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

City of Sanibel photos of algae on the Caloosahatchee from Lake O to the coast on 7/17/18. Algae discharged into the Caloosahatchee from Lake O through the Moore Haven Lock S-77, in canals boat basins and along the river. Photos City of Sanibel



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **July 17 - 23, 2018**

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: **An extensive cyanobacteria bloom persists within Lake Okeechobee and throughout the Caloosahatchee.** The weekly average flow at S79 was 4,455 cfs, one and a half times the high flow harm threshold. **Red tide persists along the coast causing a mass mortality of endangered sea turtles.**

USACE Action: On 7/13/18, the U.S. Army Corps of Engineers initiated a 14 day pulse release of **3,000 cfs** to the Caloosahatchee **measured at S-77**. The St Lucie will receive **an average of 1,800 cfs** over the 14 day pulse with 3 days of no releases **measured at S-80**.

Recommendation: We support the Corps intent to follow the LORS 2008 guidance and reduce flows to the Caloosahatchee to 3,000 cfs at S-79. We request the Corps and SFWMD use operational flexibility to increase water levels to saturate soils on agricultural lands within the EAA via dispersed water management storage as an emergency measure to address ongoing harmful estuary releases and high lake stages. This acreage will expedite evaporation and evapotranspiration.

Lake Okeechobee Level: 14.35 ft. (Low Flow Sub-Band)

Last week: 14.44 ft.

Lake Okeechobee Inflow: 4,255 cfs

Lake Okeechobee Outflow: 6,266 cfs

Weekly Rainfall: WP Franklin 0.20"

Ortona 0.64"

Moore Haven 0.44"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

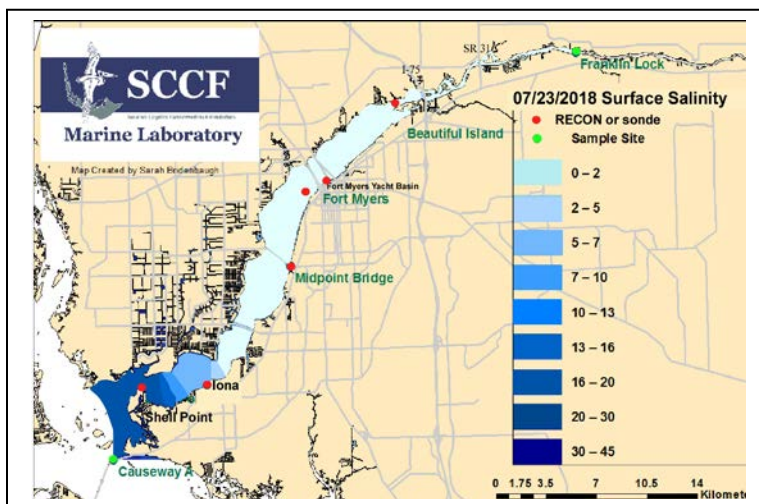
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 2.8 - 27 psu (SCCF RECON)

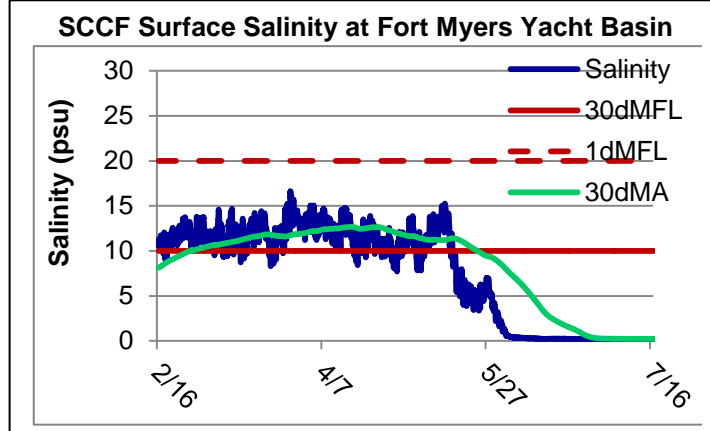
Previous week 4.8 – 29 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	2.8 - 27	25 - 32 psu	Low
Light (25% Iz depth meters)			
Fort Myers	0.46	1 meter	Low
Shell Point	1.03	2.2 meters	Low
Causeway	1.16	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **4,455 cfs**; **67% of flow originated from Lake Okeechobee**. Over the past 7 days, **94,070 AF** of water was discharged from Lake Okeechobee: **49% to the Caloosahatchee at S-77**, **32% to the St Lucie at S-80**, **18% discharged south to the EAA** and less than 1% through S-310. **-39 AF of stormwater back flowed into Lake Okeechobee from the L8.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
7/17/2018	5310	3507	3407
7/18/2018	5171	3422	3374
7/19/2018	4562	2994	3428
7/20/2018	4169	2919	3295
7/21/2018	3850	2922	3240
7/22/2018	4006	2740	3215
7/23/2018	4115	2749	964
7 day Avg	4455	3036	2997



Upstream of S-79/Franklin Conditions: On 7/24/18, the Lee County Environmental Lab documented significant blooms of *Microcystis* and *Dolichospermum* at the Alva Boat Ramp and *Microcystis*, *Dolichospermum* and *Planktothrix* upstream of the Franklin Locks. Samples were sent to FDEP for identification and toxin analysis. On 7/24/18, the Olga Water Treatment plant reported chlorides of 40 mg/l, apparent color 156 CU and turbidity 6.75 NTU. Light algae is visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: On 7/24/18, the Lee County Environmental Lab documented significant blooms of *Microcystis* at Franklin Locks downstream, North Shore Park and the Midpoint Bridge. *Microcystis* was also observed at the Davis Boat ramp.

The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **The daily average dissolved oxygen level at Beautiful Island was in the hypoxic range for 3 days.**

Lower Estuary Conditions: The average salinity at Shell Point was **16 psu**, in the suitable range for oysters, but **below optimal for seagrasses**. **Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	23.3 – 28.4	3.3 – 14.0	19.7 – 32.3	2.9 – 8.7
Tarpon Bay	23.1 – 30.6	3.6 – 8.2	18.7 – 34.1	2.6 – 7.7
Wildlife Drive	22.1 – 26.9	0.48 – 12.0	-----	2.6 – 12.5
Wulfert Flats	23.8 – 30.0	3.66 – 9.8	-----	4.8 – 29.9

Red Tide: On 7/20/18, the Florida Fish and Wildlife Conservation Commission reported that the Florida red tide organism, *Karenia brevis* persists in Sarasota, Charlotte, Lee and Collier Counties with background to high concentrations in Lee County samples. Fish kills and respiratory irritation were also reported at Lee County beaches. SCCF samples from Blind Pass and South Seas on 7/19/18 and Tarpon Bay Beach on 7/23/18 had medium concentrations of *Karenia*.

Wildlife Impacts: The past week, SCCF recovered **19 dead sea turtles**, **10 loggerheads**, **9 critically endangered Kemps Ridley's**, and **2 live loggerheads** were taken to CROW for treatment. A deceased 26-foot adult, male endangered whale shark washed up on a Sanibel Beach. FWC performed a necropsy and will report results when available.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.1	388	5.4	0.46
Shell Point	6.0	127	6.2	1.03
Causeway	3.6	116	4.0	1.16

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB-San Carlos Bay = 2.2 meters

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

Wrack line dominated by parchment worm tubes at Sanibel's Lighthouse Beach Park on 7/24/18. Photo: City of Sanibel



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **July 24 - 30, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persists within Lake Okeechobee and in the Caloosahatchee. The weekly average flow at S79 was 3,061 above the high flow harm threshold. Red tide persists along the coast causing a mass mortality of marine life and endangered sea turtles. Due to the unprecedented volume of dead sea life the City of Sanibel and Town of FM Beach are cleaning beaches.**

USACE Action: On 7/27/18 the U.S. Army Corps of Engineers initiated a 7 day pulse release of **3,000 cfs** to the Caloosahatchee measured at **S-79**. The St Lucie will receive **an average of 1,170 cfs** with two days of no releases measured at **S-80**.

Recommendation: We support the Corps recommendation to flow 3,000 cfs to the Caloosahatchee measured at S-79 to accommodate significant watershed inflows. We request the Corps and SFWMD use operational flexibility to increase water levels to saturate soils on agricultural lands within the EAA via dispersed water management storage as an emergency measure to address ongoing harmful estuary releases and high lake stages. This acreage will expedite evaporation and evapotranspiration.

Lake Okeechobee Level: 14.36 ft. (Low Flow Sub-Band)

Last week: 14.35 ft.

Lake Okeechobee Inflow: 6,357 cfs

Lake Okeechobee Outflow: 2,046 cfs

Weekly Rainfall: WP Franklin **3.72"** Ortona **4.99"**

Moore Haven **1.48"**

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

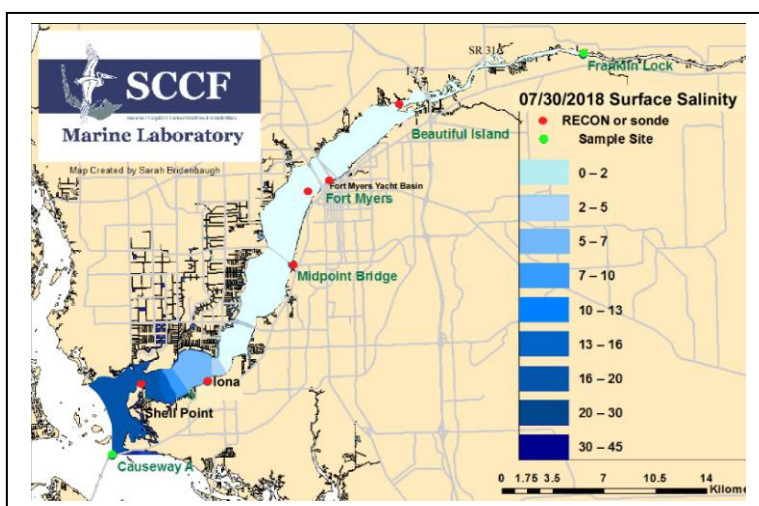
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 3.5 – 28 psu (SCCF RECON)

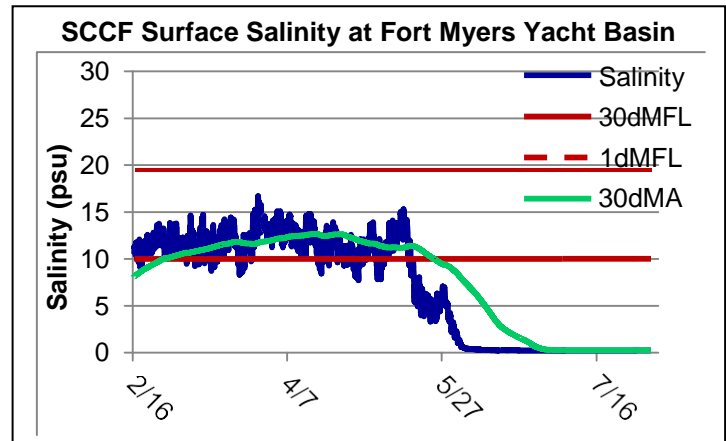
Previous week 2.8 - 27 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	3.5 – 28	25 - 32 psu	Low
Light (25% Iz depth meters)			
Fort Myers	0.52	1 meter	Low
Shell Point	1.10	2.2 meters	Low
Causeway	0.96	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,061 cfs**; **37% of flow originated from Lake Okeechobee**. Over the past 7 days **31,934 AF** of water was discharged from Lake Okeechobee: **58% to the Caloosahatchee at S-77**, **17% to the St Lucie at S-80**, **25% was discharged south to the EAA**. **A net -757 AF of stormwater back flowed into Lake Okeechobee from Clewiston's Industrial Canal S-310**. A net 20 AF was discharged through the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
7/24/2018	4614	2777	3087
7/25/2018	3349	2054	2365
7/26/2018	2095	NR	468
7/27/2018	2902	NR	1294
7/28/2018	3347	1771	1595
7/29/2018	3878	1611	524
7/30/2018	5021	1544	0
7 day Avg	3601	-	1333



Upstream of S-79/Franklin Conditions: On 7/31/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* and *Dolichospermum* at the Alva Boat Ramp and *Microcystis*, upstream of the Franklin Locks. Samples were sent to FDEP for identification and toxin analysis.

On 7/24/18 the Olga Water Treatment plant reported chlorides of 42 mg/l, apparent color 300 CU and turbidity 5.80 NTU. Light algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: On 7/31/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* at the Midpoint Bridge. *Microcystis* was also observed at the Franklin Locks downstream, North Shore Park and Davis Boat ramp.

The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **The daily average dissolved oxygen level at Beautiful Island was in the hypoxic range for 3 days**. *Microcystis* clumps were observed at Beautiful Island, Fort Myers and Twin Palm drive on 7/26/18.

Lower Estuary Conditions: The average salinity at Shell Point was **18 psu**, in the suitable range for oysters, but **below optimal for seagrasses**. **Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway**. *Microcystis* clumps were observed at Punta Rassa and in Tarpon Bay on 7/30/18.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	23.8 – 28.4	2.9 – 11.9	19.6 – 31.2	4.9 – 26.9
Tarpon Bay	21.4 – 31.9	4.3 – 8.2	15.1 – 38.0	2.7 – 63.7
Wildlife Drive	23.9 – 29.4	0.40 – 7.6	-----	1.9 – 15.1
Wulfert Flats	24.6 – 30.4	3.0 – 9.4	-----	11.7 – 66.4

Red Tide: On 7/27/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Sarasota, Charlotte, Lee and Collier Counties with background to high concentrations in Lee County samples. Fish kills and respiratory irritation were reported at Lee County beaches. **An SCCF sample on 7/27/18 from the gulf side of Sanibel had 20 million cells/L while samples along the causeway on 7/30/18 averaged 14 million cells/L of *Karenia* spp.** Dark parcels of water were observed from the air near Bowman's Beach and near Sundial Resort Friday.

Wildlife Impacts: The past week, **25 dead sea turtles were removed from area beaches**. **SCCF recovered 15 dead sea turtles on Sanibel**; 9 adult Kemp's ridleys, 2 juvenile Kemp's ridleys, and 4 adult loggerheads. **Fort Myers Beach removed 10 dead seaturtles: 7 Kemps ridleys, 2 green and 1 loggerhead**. CROW, the wildlife hospital on Sanibel treated 10 new patients with red tide symptoms; 3 Kemp's ridley sea turtles, 3 double crested cormorants, 2 loggerhead sea turtles, 1 brown pelican and 1 northern gannet.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.4	338	5.6	0.52
Shell Point	13	108	2.5	1.10
Causeway	47	82.7	2.4	0.96

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

SCB-San Carlos Bay = 2.2 meters

Definition of 25% I_z: **z** where I is 25% of surface I.

I = irradiance, z = depth

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Gulf beaches, Islands
Ongoing, Non-Comprehensive List

Dolphin	Pig fish	Hardhead catfish
Manatees	Threadfin herring	Sting rays
Whale shark	Blenny	Pale spotted eels
Kemps ridley sea turtle	Gobbie	Seahorses
Loggerhead sea turtle	Catfish	Grunt
Green sea turtle	Mullet	Spanish mackerel
Smalltooth Sawfish	Sheepshead	Pufferfish
Striped burr fish	Jack fish	Stone crab
Goliath grouper	Parchment worms	Blue crab
Tarpon	Horseshoe crabs	Permit
Snook	Coquina	Double crested
Black drum	Scaled sardine	cormorant
Cowfish	Mangrove snapper	Brown pelican
Spotted eels	Crevalle jack	Laughing gull
American eels	Menhaden	Common tern
Angel fish	Tripletail	Moscovy duck
Batfish	Kingfish	Mallard ducks
Grouper	Pompano	Yellow snake eel
Sting rays	Red drum/ Redfish	Lookdown fish
Flounder	Spotted sea trout	Toadfish
Sea trout	Gafftopsail catfish	Grunt
Pinfish		



Cyano bacteria pervasive in Cape Coral Canal system and at the Yacht Club Marina on the Caloosahatchee pictured above. Three dead manatees awaiting collection from FWC at the boat ramp 7/31/18. Photos City of Cape Coral/SCCF



Dead fish, drift algae and marine life along Fort Myers Beach, 7/30/18. Photo: Town of Fort Myers Beach

**Dense raft of drift Algae along Fort Myers Beach, 7/26/18
Photo: Town of Fort Myers Beach**

Drift algae, dead goliath grouper and eels along Fort Myers Beach 7/30/18. Photo: Town of Fort Myers Beach



Fish kills along Sanibel Causeway and Lighthouse Beach 7/29/18. Photo Ben Depp



Large numbers of dead fish in the Refuge, Tarpon Bay, and McIntyre Creek including: mullet, redfish, pinfish, sheephead, seatrout, grouper, stingrays in the refuge, Photos: DDNWR



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D. - Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **July 31 - August 6, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee and in the Caloosahatchee.** The weekly average flow at S79 was **3,613 cfs**, above the high flow harm threshold. **Red tide persists along the coast causing a mass mortality of marine life and endangered sea turtles.** Due to the unprecedented volume of dead sea life the City of Sanibel and Lee County are cleaning beaches of dead marine organisms.

USACE Action: On 7/27/18 the U.S. Army Corps of Engineers initiated a 7 day pulse release of **3,000 cfs** to the Caloosahatchee measured at **S-79**. The St Lucie will receive **an average of 1,170 cfs** with two days of no releases measured at **S-80**.

Recommendation: We support the Corps recommendation to flow 3,000 cfs to the Caloosahatchee measured at **S-79** to accommodate significant watershed inflows. We request the Corps and SFWMD use operational flexibility to increase water levels to saturate soils on agricultural lands within the EAA via dispersed water management storage as an emergency measure to address ongoing harmful estuary releases and high lake stages. This acreage will expedite evaporation and evapotranspiration.

Lake Okeechobee Level: 14.39 ft. (Low Flow Sub-Band)

Last week: 14.36 ft.

Lake Okeechobee Inflow: 6,477 cfs

Lake Okeechobee Outflow: 2,591 cfs

Weekly Rainfall: WP Franklin 1.77" Ortona 0.8

Moore Haven 1.00"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

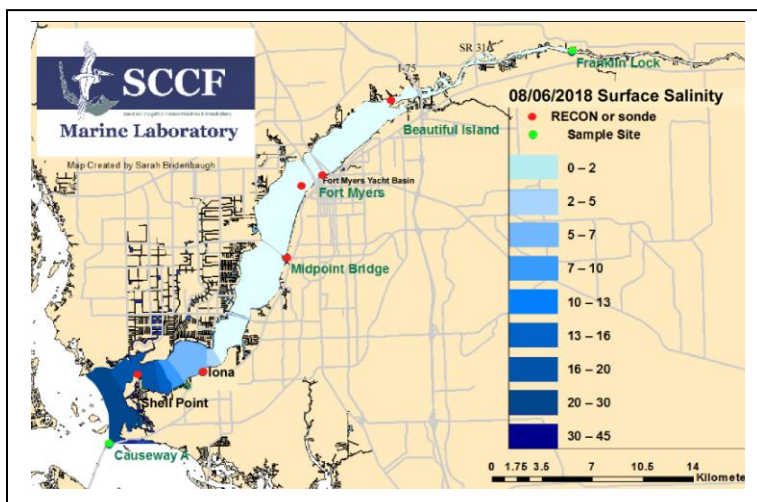
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 6.2 - 29 psu (SCCF RECON)

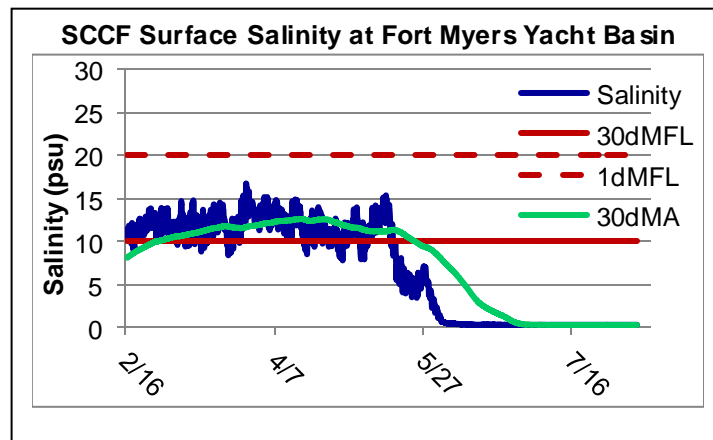
Previous week 3.5 - 28 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	6.2 - 29	25 - 32 psu	Low
Light (25% Iz depth meters)			
Fort Myers	0.53	1 meter	Low
Shell Point	1.12	2.2 meters	Low
Causeway	1.20	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,613 cfs**; **10% of flow originated from Lake Okeechobee**. Over the past 7 days 39,366 AF of water was discharged from Lake Okeechobee: 13% to the Caloosahatchee at S-77, 39% to the St Lucie at S-80, 48% was discharged south to the EAA(zero thru S-352). **A net -371 AF of stormwater back flowed into Lake Okeechobee from Clewiston's Industrial Canal S-310**. A net 23 AF was discharged through the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
7/31/2018	4703	1580	0
8/1/2018	4381	1546	0
8/2/2018	3950	1529	194
8/3/2018	3236	1189	595
8/4/2018	3216	1040	588
8/5/2018	3039	1044	593
8/6/2018	2769	1034	617
7 day Avg	3613	1280	370



Cyanobacteria bloom: On 8/7/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* at the Alva Boat Ramp, upstream of the Franklin Locks, Davis Boat Ramp, North Shore Park, Midpoint Bridge Park. *Microcystis* was also observed at the Franklin Locks downstream. SCCF recorded *Microcystis* clumps along the northern side of Sanibel from Blind Pass to the Causeway on 8/6/18.

Upstream of S-79/Franklin Conditions: On 8/7/18 the Olga Water Treatment plant reported chlorides of 41 mg/l, apparent color 191 CU and turbidity 4.65 NTU. Light algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was 0.2 psu, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was 18 psu, in the suitable range for oysters, but below optimal for seagrasses. Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	24.5 – 32.8	2.9 – 12.4	24.0 – 31.3	10.2 – 57.2
Tarpon Bay	20.8 – 30.5	4.3 – 9.5	18.3 – 34.8	4.1 – 72.0
Wildlife Drive	24.8 – 27.5	0.31 – 11.9	-----	3.2 – 30.1
Wulfert Flats	24.4 – 26.2	2.8 – 12.1	-----	29.7 – ND

Red Tide: On 8/3/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Pinellas, Manatee, Sarasota, Charlotte, Lee and Collier Counties with background to high concentrations in Lee County samples. Massive die off of fish and marine organisms were reported across Lee County beaches. SCCF samples in the Gulf within a mile from shore taken 8/2/18 and 8/5/18, had high concentrations of *Karenia* (> 1 million cells/L). Some samples closer to shore had very high concentrations (> 10 million cells/L), possibly concentrated by currents. Chlorophyll was elevated at SCCF's Gulf, Shell Point, Tarpon Bay and McIntyre Creek RECON sensors with levels as high as 75 ug/L at the Gulf sensor where the *Karenia* concentration was high on 8/5/18. There were 10 million *Karenia* cells/L on the bay side of the Causeway on 8/6/18.

Wildlife Impacts: The past week, 25 dead sea turtles were removed from area beaches. SCCF recovered 21 Kemp's ridley and 4 loggerheads. CROW, the wildlife hospital on Sanibel treated 4 new patients with red tide symptoms; 1 Kemp's ridley sea turtle, 2 brown pelicans and 1 double crested cormorant.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.4	330	5.5	0.53
Shell Point	13	108	2.0	1.12
Causeway	26	71	2.2	1.2

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

SCB-San Carlos Bay = 2.2 meters

Definition of 25% I_z: **z** where **I** is 25% of surface **I**.

I = irradiance, **z**= depth

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Gulf beaches, Islands Ongoing list not comprehensive Endangered/Threatened/Listed Species		
American eels	Loggerhead sea turtle	Stone crab
Angel fish	Lookdown fish	Striped burr fish
Atlantic needlefish	Mackerel	Threadfin herring
Atlantic Spadefish	Manatees	Tarpon
Batfish	Mallard ducks	Toadfish
Black drum	Mangrove snapper	Tripletail
Blenny	Menhaden	Whale shark
Blue crabs	Minnows	Whiting
Bottlenose Dolphin	Moray Eel	Yellow snake eel
Brown pelican	Muscovy duck	
Bull shark	Mullet sp.	
Catfish sp.	Pale spotted eels	
Cobia	Parchment worms	
Common tern	Permit	
Coquina	Pig fish	
Cowfish	Pinfish	
Crevalle jack	Florida Pompano	
Double crested cormorant	Red drum/ Redfish	
Flounder	Red Snapper	
Gafftopsail catfish	Remora	
Goby	Reticulate moray	
Goliath grouper	Sand Trout	
Green sea turtle	Scaled sardine	
Grey triggerfish	Seahorses	
Grouper sp.	Sheepshead	
Grunt sp.	Smalltooth Sawfish	
Hardhead catfish	Snook	
Horse shoe crabs	Southern Puffer	
Jack fish sp.	Southern Stargazer	
Kemps ridley sea turtle	Spanish mackerel	
Kingfish	Spotted eels	
Lane snapper	Spotted seatrout	
Laughing gull	Sting rays sp.	



**Cyanobacteria in Caloosahatchee 8/7/18.
Photo City of Cape Coral**



**Cyanobacteria in Cape Coral Canals 8/7/18.
Photo City of Cape Coral**



**Dead Tarpon in Tarpon Bay in Ding Darling National Wildlife
Refuge 8/7/18. Photo DDNWR**



MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **August 7 - 13, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, Caloosahatchee and estuary.** The weekly average flow at S79 was **3,014 cfs**, above the high flow harm threshold. **Red tide persists along the coast causing mortality of a wide variety of marine life and endangered sea turtles.** Due to the unprecedented volume of dead sea life the City of Sanibel and Lee County are paying contractors to clean beaches of dead marine organisms. Significant economic impacts are reported by area businesses.

USACE Action: On 7/27/18 the U.S. Army Corps of Engineers initiated a 7 day pulse release of **3,000 cfs** to the Caloosahatchee measured at **S-79**. The St Lucie will receive an average of **1,170 cfs** with two days of no releases measured at **S-80**.

Recommendation: We understand the need to increase flows out of the lake and request the Corps keep flows below **4,000 cfs** and maintain the measurement point at **S-79** to accommodate significant watershed inflows. We request the Corps and SFWMD use operational flexibility to increase water levels in canals south of the lake as an emergency measure to address ongoing harmful estuary releases and high lake stages.

Lake Okeechobee Level: 14.55 ft. (Low Flow Sub-Band)

Last week: 14.39 ft.

Lake Okeechobee Inflow: 6,527 cfs

Lake Okeechobee Outflow: 3,381 cfs

Weekly Rainfall: WP Franklin 2.50" Ortona 3.44"

Moore Haven 1.55"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

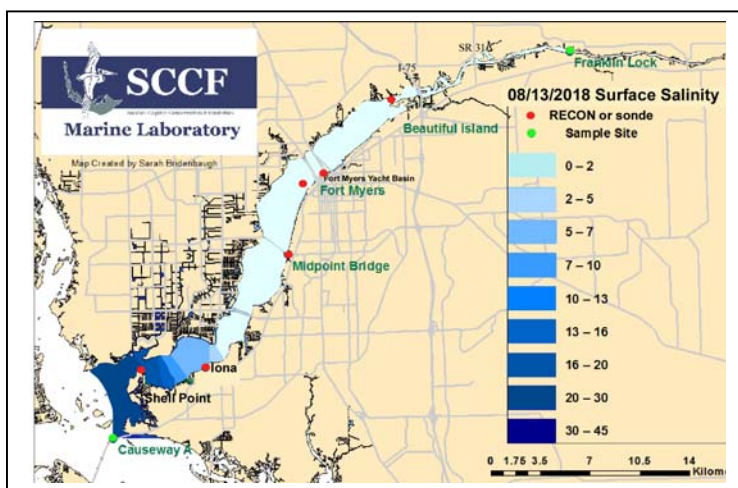
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 6.9 – 31 psu (SCCF RECON)

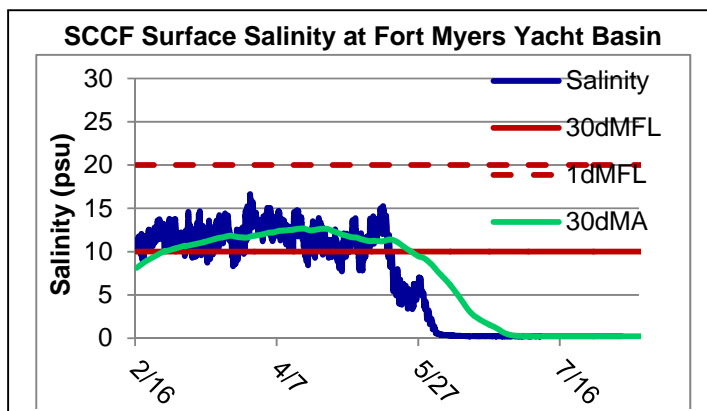
Previous week 6.2 - 29 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	6.9 – 31	25 - 32 psu	Low
Light (25% lz depth meters)			
Fort Myers	0.52	1 meter	Low
Shell Point	1.20	2.2 meters	Low
Causeway	1.32	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,014 cfs**; **53% of flow originated from Lake Okeechobee**. Over the past 7 days **62,440 AF** of water was discharged from Lake Okeechobee: **36% to the Caloosahatchee at S-77**, **23% to the St Lucie at S-80**, **41% was discharged south to the EAA**. A net 272 AF was discharged through Clewiston's Industrial Canal S-310. **A net -93 AF of storm water back flowed into Lake Okeechobee from the L8.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
8/7/2018	2444	1028	1718
8/8/2018	2519	1555	1902
8/9/2018	3282	1778	1978
8/10/2018	3056	1775	1567
8/11/2018	3143	1747	1398
8/12/2018	3221	1620	1422
8/13/2018	3436	1591	1292
7 day Avg	3014	1585	1611



Cyanobacteria bloom: On 8/14/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* at the **Alva Boat Ramp, upstream and downstream of the Franklin Locks, Davis Boat Ramp, North Shore Park and Midpoint Bridge Park**. SCCF recorded *Microcystis* clumps persisting along the **northern side of Sanibel** the past week.

Upstream of S-79/Franklin Conditions: On 8/14/18 the Olga Water Treatment plant reported chlorides of **51 mg/l**, apparent color **220 CU** and turbidity **3.16 NTU**. Light algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **20 psu**, in the suitable range for oysters. **Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway.** *Microcystis* clumps were present along the north side of Sanibel during the week.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	24.4 – 31.4	2.0 – 10.8	25.0 – 31.1	3.9 – 27.8
Tarpon Bay	22.5 – 29.9	3.2 – 8.1	18.5 – 32.6	5.7 – 58.0
Wildlife Drive	-----	-----	-----	-----
Wulfert Flats	-----	-----	-----	-----

Red Tide: On 8/10/18 the Florida Fish and Wildlife Conservation Commission reports that the Florida red tide organism, *Karenia brevis* persists in Pinellas, Manatee, Sarasota, Charlotte, Lee and Collier Counties **with background to high concentrations in Lee County samples**. Widespread variety of dead marine life continues to wash up on **Lee County beaches**, see Page 3. **Samples from SCCF's Gulf, Shell Point, Tarpon Bay and McIntyre Creek RECON stations on 8/8/18, had high and medium concentrations of *Karenia* with levels as high as 5.9 million cells/L at the McIntyre Creek station.**

Wildlife Impacts: The past week, **20 dead sea turtles were removed from Sanibel and Captiva beaches**. SCCF recovered **4 Kemp's ridley and 16 loggerheads**. CROW, the wildlife hospital on Sanibel treated 4 new patients with red tide symptoms; 1 ruddy turnstone, 1 semipalmated plover, 1 sanderling and 1 double crested cormorant.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.4	345	3.8	0.52
Shell Point	6.0	108	1.6	1.20
Causeway	4.4	96	1.1	1.32

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB-San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands		
<i>Ongoing list not comprehensive Endangered/Threatened Species</i>		
American eels	Laughing gull	Sting rays sp
Angel fish	Loggerhead sea turtle	Stone crab
Atlantic needlefish	Lookdown fish	Striped burr fish
Atlantic Spadefish	Mackerel	Threadfin herring
Batfish	Manatees	Tarpon
Black drum	Mallard ducks	Toadfish
Black tip shark	Mangrove snapper	Tripletail
Blenny	Menhaden	Whale shark
Blue crabs	Minnows	Whiting
Bottlenose Dolphin	Moray Eel	Yellow snake eel
Brown pelican	Muscovy duck	Ornate Diamondback Terrapin
Bull shark	Mullet sp.	
Catfish sp.	Pale spotted eels	
Cobia	Parchment worms	
Common tern	Permit	
Coquina	Pig fish	
Cowfish	Pinfish	
Crevalle jack	Florida Pompano	
Double crested cormorant	Red drum/ Redfish	
Flounder	Red Snapper	
Gafftopsail catfish	Remora	
Goby	Reticulate moray	
Goliath grouper	Sand Trout	
Green sea turtle	Scaled sardine	
Grey triggerfish	Seahorses	
Grouper sp.	Sheepshead	
Grunt sp.	Smalltooth Sawfish	
Hardhead catfish	Snook	
Horseshoe crabs	Southern Puffer	
Jack fish sp.	Southern Stargazer	
Kemps ridley sea turtle	Spanish mackerel	
Kingfish	Spotted eels	
Lane snapper	Spotted seatrout	



Cyanobacteria in Harbor view Canal, North Fort Myers 8/14/18

Photo Lee County



North Shore Park 8/13/18

Photo Lee County

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
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Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **August 14 - 20, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, Caloosahatchee and estuary.** The weekly average flow at S79 was **3,460 cfs**, above the high flow harm threshold. **Red tide persists along the coast causing mortality of a wide variety of marine life and endangered sea turtles.** Due to the unprecedented volume of dead sea life the City of Sanibel and Lee County are paying contractors to clean beaches of dead marine organisms. Significant economic impacts are reported by area businesses.

USACE Action: On 7/27/18 the U.S. Army Corps of Engineers initiated a 7 day pulse release of **3,000 cfs** to the Caloosahatchee measured at **S-79**. The St Lucie will receive an average of **1,170 cfs** with two days of no releases measured at **S-80**.

Recommendation: We request the Corps keep flows at or below **3,000 cfs** and maintain the measurement point at **S-79** to accommodate significant watershed inflows. We request the Corps and SFWMD use operational flexibility to increase water levels in canals south of the lake and use all emergency storage measures to address ongoing harmful estuary releases.

Lake Okeechobee Level: 14.59 ft. (Low Flow Sub-Band)

Last week: 14.55 ft.

Lake Okeechobee Inflow: 5,196 cfs

Lake Okeechobee Outflow: 3,422 cfs

Weekly Rainfall: WP Franklin 1.41" Ortona 0.96"

Moore Haven 1.05"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

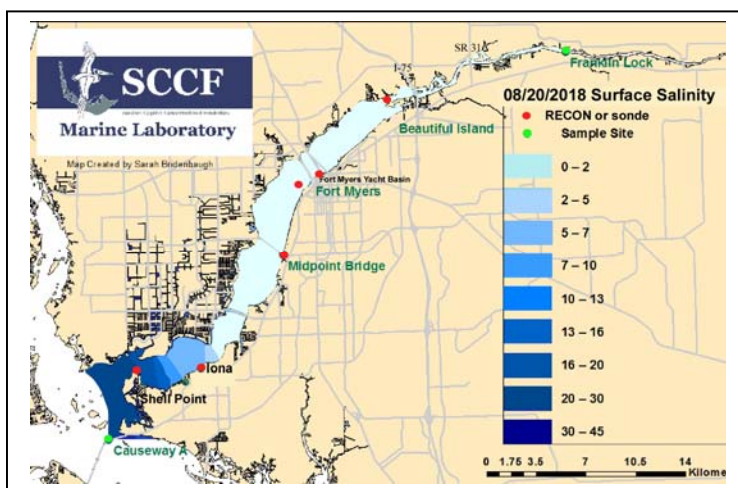
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 7.8 – 29 psu (SCCF RECON)

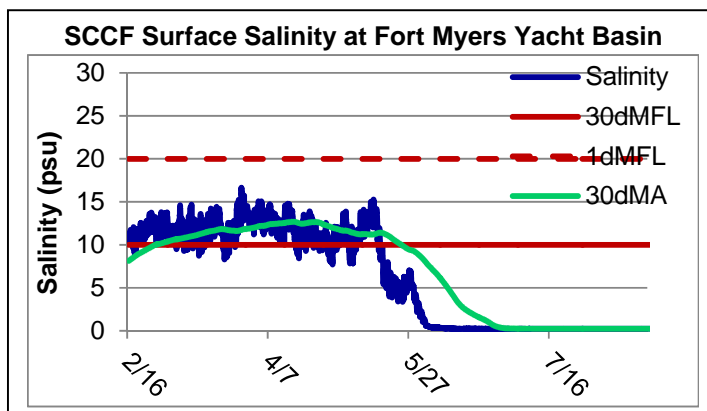
Previous week 6.9 - 31 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	7.8 – 29	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.52	1 meter	Low
Shell Point	1.33	2.2 meters	Low
Causeway	1.29	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,460 cfs**; **24% of flow originated from Lake Okeechobee**. Over the past 7 days **41,537 AF** of water was discharged from Lake Okeechobee: **28% to the Caloosahatchee at S-77**, **32% to the St Lucie at S-80**, **41% was discharged south to the EAA**. **A net 237 AF was discharged through Clewiston's Industrial Canal S-310**. **A net -188AF of storm water back flowed into Lake Okeechobee from the L8.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
8/14/2018	4040	1621	336
8/15/2018	3230	1592	752
8/16/2018	3350	1602	994
8/17/2018	3610	1598	901
8/18/2018	3357	1621	901
8/19/2018	3292	1609	901
8/20/2018	3338	1602	1090
7 day Avg	3460	1606	839



Cyanobacteria bloom: On 8/21/18 the Lee County Environmental Lab documented **Microcystis** and **Dolichospermum** to be **abundant upstream of the Franklin Lock**. **Davis Boat Ramp, North Shore Park and Midpoint Bridge Park also were reported as having abundant Microcystis**. **Microcystis** was reported to be **present with only some algae visible** at the Alva Boat Ramp and downstream of S-79.

Upstream of S-79/Franklin Conditions: On 8/14/18 the Olga Water Treatment plant reported chlorides of **45 mg/l**, apparent color **198 CU** and turbidity **2.38 NTU**. Slight algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **20 psu**, in the suitable range for oysters. **Light levels are too low for submersed plants growing at depth in the Caloosahatchee and around the Causeway**. **Microcystis** clumps were present along the north side of Sanibel during the week.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	23.7 – 27.0	2.0 – 10.7	22.8 – 29.2	3.4 – 57.2
Tarpon Bay	22.2 – 29.7	2.8 – 7.7	18.1 – 29.5	3.2 – 23.0
Wildlife Drive	25.5 – 27.3	0.31 – 12.6	-----	1.6 – 8.6
Wulfert Flats	22.9 – 26.6	1.6 – 7.5	-----	11.4 – 78.6

Red Tide: On 8/17/18 the Florida Fish and Wildlife Conservation Commission reports that a bloom of the Florida red tide organism, **Karenia brevis** persists along **130 miles of coastline with High counts, > 1 million cells/liter**, from Manatee to Collier Counties. **Widespread variety of dead marine life continues to wash up on Lee County beaches**, see Page 3. **Samples from SCCF's Gulf, Tarpon Bay and McIntyre Creek RECON stations on 8/19/18 had high or medium concentrations of Karenia**. Three Lee County samples from offshore also had medium to high *Karenia* concentrations (2.7 million cells/L 10 miles out).

Wildlife Impacts: The past week SCCF recovered **12 dead sea turtles from Sanibel beaches**, **4 Kemp's ridley juveniles and 10 loggerhead adults**. CROW, the wildlife hospital on Sanibel treated 11 new patients with red tide symptoms; 2 loggerhead and 2 green sea turtles, 1 ruddy turnstone, 1 royal tern, 1 little blue heron, 1 sanderling, 1 anhinga and 2 double crested cormorant.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (gse)	Turbidity (NTU)	25% I ₀ depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.6	350	3.3	0.52
Shell Point	6.0	91.2	1.1	1.33
Causeway	4.4	82	1.3	1.29

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

SCB-San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Sanibel ONLY has removed 309 tons of dead marine life

*Ongoing list not comprehensive **Endangered/Threatened Species***

American eels	Loggerhead sea turtle	Stone crab
Angel fish	Lookdown fish	Striped burr fish
Atlantic needlefish	Mackerel	Threadfin herring
Atlantic Spadefish	Manatees	Tarpon
Batfish	Mallard ducks	Toadfish
Black drum	Mangrove snapper	Tripletail
Black tip shark	Menhaden	Whale shark
Blenny	Minnows	Whiting
Blue crabs	Moray Eel	Yellow snake eel
Bottlenose Dolphin	Muscovy duck	
Brown pelican	Mullet sp.	
Bull shark	Ornate Diamondback Terrapin	
Catfish sp.	Pale spotted eels	
Cobia	Parchment worms	
Common tern	Permit	
Coquina	Pig fish	
Cowfish	Pinfish	
Crevalle jack	Florida Pompano	
Double crested cormorant	Red drum/ Redfish	
Flounder	Red Snapper	
Gafftopsail catfish	Remora	
Goby	Reticulate moray	
Goliath grouper	Sand Trout	
Green sea turtle	Scaled sardine	
Grey triggerfish	Seahorses	
Grouper sp.	Sheepshead	
Grunt sp.	Smalltooth Sawfish	
Hardhead catfish	Snook	
Horseshoe crabs	Southern Puffer	
Jack fish sp.	Southern Stargazer	
Kemps ridley sea turtle	Spanish mackerel	
Kingfish	Spotted eels	
Lane snapper	Spotted seatrout	
Laughing gull	Sting rays sp	

MEMORANDUM

To: USACE Colonel Jason A. Kirk, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **August 21 - 27, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, Caloosahatchee and estuary.** The weekly average flow at S79 increased to **4,294 cfs**, one and a half times the high flow harm threshold. **Red tide persists along the coast causing mortality of a wide variety of marine life and endangered sea turtles. Dead manatees were recovered in the Ding Darling Refuge and a Sanibel canal.** A third non toxic bloom of *Oscillatoria* was detected fueled by nutrients from dead fish. Businesses continue to be significantly impacted by water quality issues associated with blue green algae and red tide.

USACE Action: On 8/24/18 the U.S. Army Corps of Engineers initiated a 14-day average of **2,000 cfs** from Moore Haven Lock & Dam (**S-77**) and **1,500 cfs** pulse from St. Lucie Lock & Dam (**S-80**) with no flows on Saturdays and Sundays.

Recommendation: We request the Corps keep flows at or below **3,000 cfs at S-79** to accommodate significant watershed inflows and significant damage already occurring in the estuary. We request the Corps and SFWMD use operational flexibility to maximize water levels in canals south of the lake and use all emergency storage measures to address ongoing harmful estuary releases and high lake stages.

Lake Okeechobee Level: 14.54 ft. (Low Flow Sub-Band)

Last week: 14.59 ft.

Lake Okeechobee Inflow: 4,432 cfs

Lake Okeechobee Outflow: 4,648 cfs

Weekly Rainfall: WP Franklin 2.50" Ortona 0.39"

Moore Haven 2.20"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

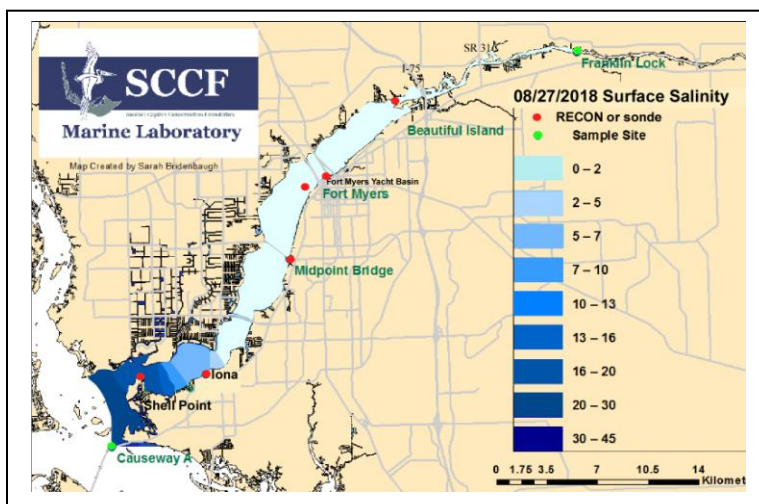
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 6.2 – 29 psu (SCCF RECON)

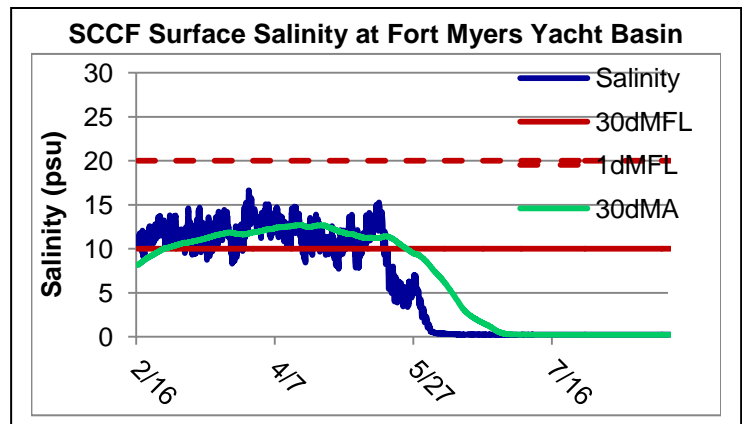
Previous week 7.8 - 29 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	6.2 – 29	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.50	1 meter	Low
Shell Point	0.82	2.2 meters	Low
Causeway	0.83	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **4,294 cfs**; **36% of flow originated from Lake Okeechobee**. Over the past 7 days 57,933 AF of water was discharged from Lake Okeechobee: **34% to the Caloosahatchee at S-77**, **25% to the St Lucie at S-80**, **41% was discharged south to the EAA**. A **net -370 AF** was discharged through Clewiston's Industrial Canal S-310. A net 21 AF of water was discharged from the lake through the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
8/21/2018	3357	1613	1146
8/22/2018	3376	1609	960
8/23/2018	3279	1567	879
8/24/2018	4821	2492	1729
8/25/2018	4782	2971	2032
8/26/2018	5112	3149	2070
8/27/2018	5332	3388	2043
7 day Avg	4294	2398	1551



Cyanobacteria bloom: On 8/28/18 the Lee County Environmental Lab documented significant blooms of *Microcystis* at the **Davis Boat Ramp, North Shore Park and Midpoint Bridge Park** and algal presence at the **Alva Boat Ramp, upstream and downstream of the Franklin Locks**. SCCF recorded *Microcystis* clumps persisting along the **northern side of Sanibel** the past week. A non toxic bloom of *Oscillatoria* was detected fueled by nutrients from dead fish.

Upstream of S-79/Franklin Conditions: On 8/28/18 the Olga Water Treatment plant reported chlorides of **48 mg/l**, apparent color **192 CU** and turbidity **3.08 NTU**. Slight algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Hypoxia was recorded at Beautiful Island during the week.**

Lower Estuary Conditions: The average salinity at Shell Point was **19 psu**, in the suitable range for oysters. **Hypoxia was recorded at Shell Point**. **Light levels are too low for submersed plants growing at depth in the river and around the Causeway**. *Microcystis* clumps were present along the north side of Sanibel during the week.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	ChlorophyllI (µg/L)
McIntyre Creek	22.9 – 26.5	1.6 – 9.2	24.4 - 29.2	5.1 – 21.3
Tarpon Bay	20.1 – 28.5	2.8 – 6.2	18.9 – 31.9	3.2 – 35.7
Wildlife Drive	19.6 – 27.4	0.3 – 9.9	-----	1.8 – 11.3
Wulfert Flats	23.9 – 27.0	2.6 – 8.2	-----	13.0 – 48.0

Red Tide: On 8/24/18 the Florida Fish and Wildlife Conservation Commission reported a bloom of the Florida red tide organism, *Karenia brevis* persists along 145 miles of coastline with High counts, > 1 million cells/litre, from Manatee to Collier Counties. Dead marine life continues to wash up on Lee County beaches. Sanibel alone had 408 tons of dead marine life removed from the island at a cost of \$1.1 million so far. **SCCF's samples from Gulf, San Carlos Bay and Pine Island Sound had high to medium concentrations of *Karenia***. Locations more than 1 km from shore had more than 10 million *Karenia* cells/L. The lower level of the water column was anoxic at multiple locations offshore of Sanibel on 8/27/18.

Wildlife Impacts: The past week SCCF recovered **14 dead sea turtles from Sanibel beaches**. **6 Kemp's ridley, 5 greens and 3 loggerheads**. **Massive numbers of fish, crustaceans and shellfish collecting on beaches.**

CROW, the wildlife hospital on Sanibel treated 11 new patients with red tide symptoms; 1 kemp's ridley and 1 green sea turtle, 2 ruddy turnstones, 2 anhingas, 2 double crested cormorants, 1 black bellied plover, 1 semipalmated plover and, 1 mottled duck.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	5.4	370	3.8	0.50
Shell Point	8.0	193	1.7	0.82
Causeway	34	145	1.6	0.83

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Sanibel ONLY has removed 309 tons of dead marine life

Ongoing list not comprehensive *Endangered/Threatened Species*

American eels	Kemps ridley sea turtle	Sheepshead
Angel fish	Kingfish	Smalltooth Sawfish
Atlantic needlefish	Lane snapper	Snook
Atlantic Spadefish	Laughing gull	Starfish
Batfish	Loggerhead sea turtle	Southern Puffer
Black drum	Lookdown fish	Southern Stargazer
Black tip shark	Mackerel	Spanish mackerel
Blenny	Manatees	Spiny lobster
Blue crabs	Mallard ducks	Spotted eels
Bottlenose Dolphin	Mangrove snapper	Spotted seatrout
Brown pelican	Menhaden	Sting rays sp
Bull shark	Minnows	Stone crab
Calico crab	Moray Eel	Striped burr fish
Catfish sp.	Muscovy duck	Threadfin herring
Cobia	Mullet sp.	Tarpon
Common tern	Ornate Diamondback Terrapin	Toadfish
Coquina	Pale spotted eels	Tripletail
Cowfish	Parchment worms	Whale shark
Crevalle jack	Permit	Whiting
Double crested cormorant	Pig fish	Yellow snake eel
Flounder	Pinfish	
Gafftopsail catfish	Florida Pompano	
Goby	Red drum/ Redfish	
Goliath grouper	Red Snapper	
Green sea turtle	Remora	
Grey triggerfish	Reticulate moray	
Grouper sp.	Sand Trout	
Grunt sp.	Scaled sardine	
Hardhead catfish	Scaly tail mantis shrimp	
Horseshoe crabs	Seahorses	
Jack fish sp.	Shame- faced crab	

Dead manatee in a Sanibel canal, 8/28/18.
Photo City of Sanibel



Dead manatee in the Refuge 8/28/18. One of three recovered
from Sanibel Island the past week. Photo DDNWR

Daily turtle patrol 8/28/18 recorded massive
numbers of fish, crustaceans and shellfish,
spiny lobster and scaly tail mantis shrimp and
many crabs twitching on the sand and a birds
struggling from toxins. Photo SCCF



Shame-faced and Calico crabs escaping the red tide water in droves to die in the sun, 8/28/18. Photos SCCF



MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **August 28 - September 3, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, Caloosahatchee and estuary. The weekly average flow at S79 increased to 5,212 cfs, 1.86 times the high flow harm threshold. Red tide persists along the coast causing mortality of a wide variety of marine life and endangered sea turtles. Two dead manatees were recovered in the Ding Darling Refuge.**

USACE Action: On 8/24/18 the U.S. Army Corps of Engineers initiated a 14-day average of **2,000 cfs** from Moore Haven Lock & Dam (**S-77**) and **1,500 cfs** pulse from St. Lucie Lock & Dam (**S-80**) with no flows on Saturdays and Sundays.

Recommendation: We request the Corps keep flows at or below **3,000 cfs at S-79** to accommodate significant watershed inflows and significant damage already occurring in the estuary. We request the Corps and SFWMD use operational flexibility to maximize water levels in canals south of the lake and use all emergency storage measures to address ongoing harmful estuary releases and high lake stages.

Lake Okeechobee Level: 14.61 ft. (Low Flow Sub-Band)

Last week: 14.54 ft.

Lake Okeechobee Inflow: 5,750 cfs

Lake Okeechobee Outflow: 3,557 cfs

Weekly Rainfall: WP Franklin 1.79" Ortona 0.94"

Moore Haven 0.53"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

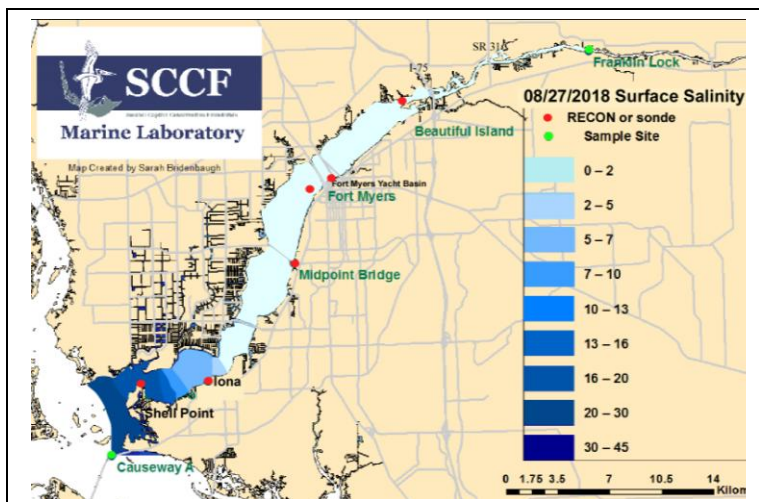
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 4.5 – 29 psu (SCCF RECON)

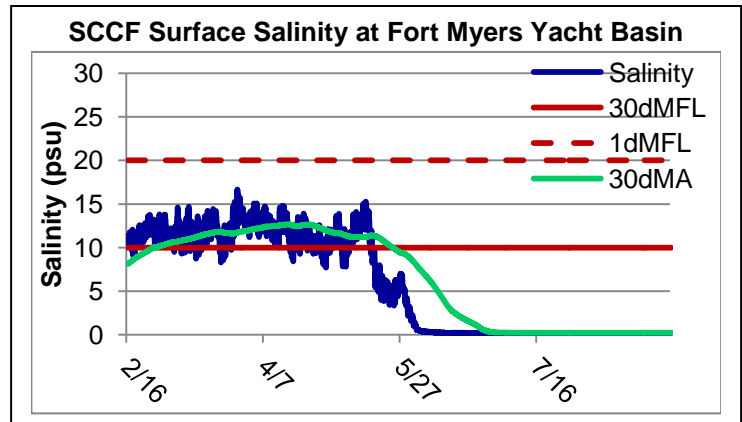
Previous week 6.2 - 29 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	4.5 – 29	25 - 32 psu	Low
Light (25% Iz depth meters)			
Fort Myers	0.49	1 meter	Low
Shell Point	0.93	2.2 meters	Low
Causeway	0.98	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **5,212 cfs**; **43% of flow originated from Lake Okeechobee**. Over the past 7 days **62,333 AF** of water was discharged from Lake Okeechobee: **50% to the Caloosahatchee at S-77**, **28% to the St Lucie at S-80**, **22% was discharged south to the EAA**. **-1,554 AF was backflowed into the lake** from Clewiston's Industrial Canal at S-310. **A net -112 AF was backflowed into the lake** from the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
8/28/2018	5481	3358	2100
8/29/2018	5527	3319	2142
8/30/2018	5799	3291	2196
8/31/2018	5338	3162	2253
9/1/2018	4992	2721	2322
9/2/2018	4073	2564	2304
9/3/2018	5275	2576	2325
7 day Avg	5212	2999	2235



Cyanobacteria bloom: On 9/4/18 the Lee County Environmental Lab documented various combinations of *Dolichospermum*, *Microcystis*, *Planktothrix* and *Aphanizomenon* at sample sites with significant blooms at the Alva Boat Ramp and Midpoint Bridge Park. Algal presence upstream and downstream of the Franklin Locks, Davis Boat Ramp and North Shore park was also observed.

Upstream of S-79/Franklin Conditions: On 9/4/18 the Olga Water Treatment plant reported chlorides of **50 mg/l**, apparent color **174 CU** and turbidity **4.05 NTU**. Slight algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Hypoxia was recorded at Beautiful Island on 8/28/18 before dissolved oxygen concentrations rose.**

Lower Estuary Conditions: The average salinity at Shell Point was **17 psu**, in the suitable range for oysters. **Hypoxia was recorded at Shell Point where the average dissolved oxygen concentration on 9/2/18 was 2.6 mg L⁻¹. Light levels are too low for submersed plants growing at depth in the river and around the Causeway. Microcystis clumps were present along the north side of Sanibel during the week.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	21.6 – 25.0	1.4 – 7.2	26.1 - 31.2	2.0 – 63.3
Tarpon Bay	20.1 – 32.3	2.8 – 6.2	9.9 – 30.9	3.5 – 50.3
Wildlife Drive	19.6 – 23.9	0.4 – 14.4	-----	1.9 – 18.2
Wulfert Flats	20.7 – 24.3	3.2 – 8.6	-----	17.9 – 96.6

Coastal Conditions: The lower level of the water column was anoxic at multiple locations offshore of Sanibel, while the **surface layer was hypoxic** near shore on 8/30/18. **Anoxic water samples were spread over 25 square miles offshore of Sanibel.** East winds have caused upwelling of bottom waters and offshore movement of the surface layer.

Red Tide: On 8/31/18 the Florida Fish and Wildlife Conservation Commission reported a bloom of the Florida red tide organism, *Karenia brevis* persists along 145 miles of coastline with High counts, **> 1 million cells/litre**, from Manatee to Collier Counties. The amount of dead marine life fell off the last week. On Captiva 48 tons of dead marine life has been removed with a total 2,100 tons Countywide. SCCF's samples from the Gulf averaged 4 million *Karenia* cells/L from 8/28-8/31, while beaches had higher concentrations. *Karenia* concentrations in 10 samples collected by Grace Mann in San Carlos Bay and the lower Caloosahatchee on 8/30/18 also averaged over 4 million cells per liter.

Wildlife Impacts: The past week SCCF recovered **2 dead immature green sea turtles from Sanibel beaches**. CROW, the wildlife hospital on Sanibel treated 9 new patients with red tide symptoms; 4 ruddy turnstones, 3 anhingas, 1 royal tern and, 1 sanderling. **2 dead manatees were recovered from the Refuge in Tarpon Bay.**

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	5.7	375	4.0	0.49
Shell Point	5.5	162	2.2	0.93
Causeway	12	140	1.9	0.98

Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

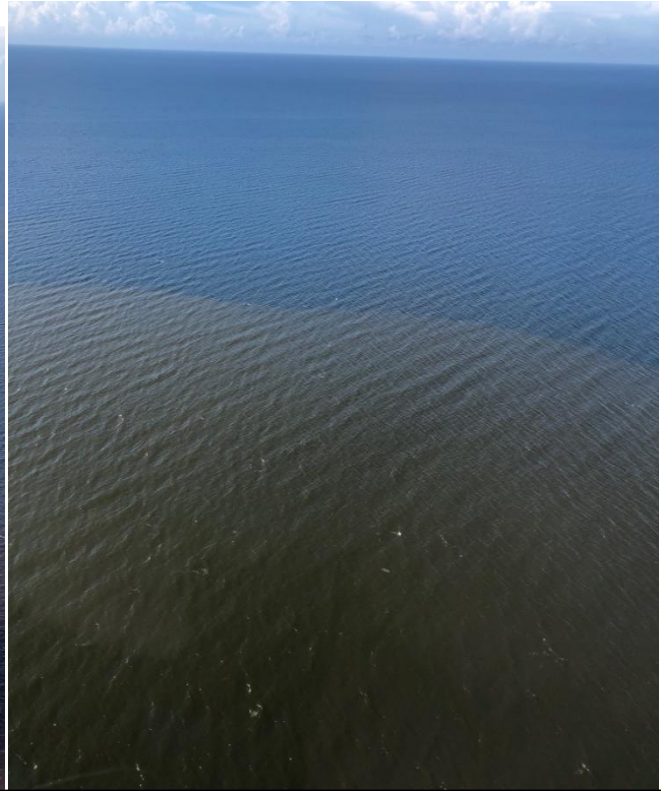
Definition of 25% Iz: z where I is 25% of surface I.
I = irradiance, z= depth

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,100 tons of dead marine life Sanibel 408 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

American eels	Kemps ridley sea turtle	Smalltooth Sawfish
Angel fish	Kingfish	Snook
Atlantic needlefish	Lane snapper	Starfish
Atlantic Spadefish	Laughing gull	Southern Puffer
Battfish	Loggerhead sea turtle	Southern Stargazer
Black drum	Lookdown fish	Spanish mackerel
Black tip shark	Mackerel	Spotted eels
Blenny	Manatees	Spotted seatrout
Blue crabs	Mallard ducks	Sting rays sp
Bottlenose Dolphin	Mangrove snapper	Stone crab
Brown pelican	Menhaden	Striped burr fish
Bull shark	Minnows	Threadfin herring
Calico crab	Moray Eel	Tarpon
Catfish sp.	Muscovy duck	Toadfish
Cobia	Mullet sp.	Tripletail
Common tern	Ornate Diamondback Terrapin	Whale shark
Coquina	Pale spotted eels	Whiting
Cowfish	Parchment worms	Yellow snake eel
Creville jack	Permit	
Double crested cormorant	Pig fish	
Flounder	Pinfish	
Gafftopsail catfish	Florida Pompano	
Goby	Red drum/ Redfish	
Goliath grouper	Red Snapper	
Green sea turtle	Remora	
Grey triggerfish	Reticulate moray	
Grouper sp.	Sand Trout	
Grunt sp.	Scaled sardine	
Hardhead catfish	Seahorses	
Horseshoe crabs	Shame- faced crab	
Jack fish sp.	Sheepshead	



Red tide line offshore Sanibel Causeway on an outgoing tide. Red tide line just south of Blind Pass. Photos from Lee County flight on 8/29/18

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **September 4 - 10, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, the Caloosahatchee and estuary.** The weekly average flow at S79 decreased to **3,275 cfs**, (17 weeks = 119 days) over the high flow harm threshold. **Red tide persists along the coast. Sea turtles continue to be heavily impacted.** The Sanibel-Captiva Chamber of Commerce reported this week that the combined economic impact for Sanibel and Captiva for July and August is \$19.1 million in lost revenue, with a decrease in business of 41.2% compared to 2017. The data was collected from 2,757 survey participants.

USACE Action: On 9/7/18 the U.S. Army Corps of Engineers reduced discharges from Lake Okeechobee to a constant **3,000 cfs** at WP Franklin Lock & Dam (**S-79**) and a 7 day pulse averaging **1,170 cfs** from the St. Lucie Lock & Dam (**S-80**) with no flows on Saturdays and Sundays.

Recommendation: We request the Corps keep flows at or below **3,000 cfs at S-79** to accommodate significant watershed inflows and significant damage already occurring in the estuary. We request the Corps and SFWMD use operational flexibility to maximize water levels in canals south of the lake and use all emergency storage measures to address ongoing harmful estuary releases and high lake stages.

Lake Okeechobee Level: 14.71 ft. (Low Flow Sub-Band)

Last week: 14.61 ft.

Lake Okeechobee Inflow: 5,972 cfs

Lake Okeechobee Outflow: 1,829 cfs

Weekly Rainfall: WP Franklin 0.38"

Ortona 1.16"

Moore Haven 2.05"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

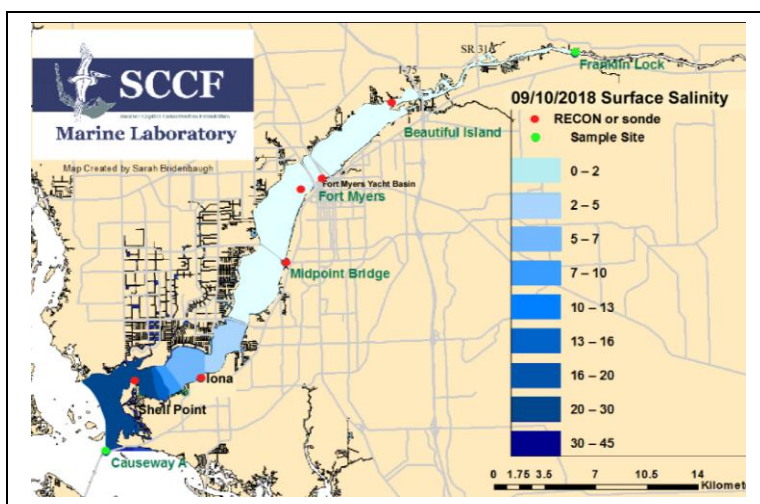
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.2 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 5.9 – 33 psu (SCCF RECON)

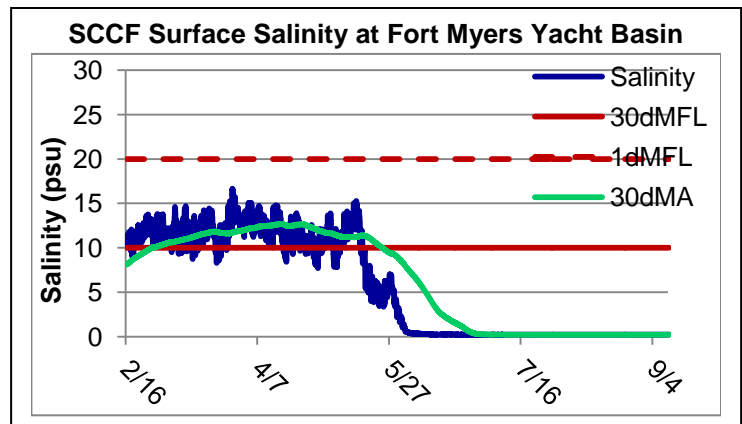
Previous week 4.5 - 29 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	5.9 – 33	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.49	1 meter	Low
Shell Point	0.98	2.2 meters	Low
Causeway	1.32	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,275 cfs**; **47% of flow originated from Lake Okeechobee**. Over the past 7 days **48,440 AF** of water was discharged from Lake Okeechobee: **45% to the Caloosahatchee at S-77**, **34% to the St Lucie at S-80**, **21% was discharged south to the EAA with no flow through S-352**. **A net - 324 AF was backflowed into the lake** from Clewiston's Industrial Canal at S-310. **A net - 907 AF was backflowed into the lake** from the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
9/4/2018	4618	2604	2268
9/5/2018	4072	2450	2304
9/6/2018	3263	2244	2259
9/17/2018	2928	1946	2104
9/8/2018	2698	1654	1784
9/9/2018	2674	1267	9
9/10/2018	2671	1033	148
7 day Avg	3275	1885	1554



Cyanobacteria bloom: On 9/11/18 the Lee County Environmental Lab documented decreased distribution of cyano blooms with a significant bloom of *Dolichospermum* and *Microcystis* upstream of the Franklin Locks and algal presence at Midpoint Bridge Park.

Upstream of S-79/Franklin Conditions: On 9/11/18 the Olga Water Treatment plant reported chlorides of **50 mg/l**, apparent color **196CU** and turbidity **3.5 NTU**. Slight algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **22 psu**, in the suitable range for oysters. **Hypoxia** was recorded at Shell Point on three days with readings as low as **1.9 mg L⁻¹**. **Light levels are too low for submersed plants growing at depth in the river and around the Causeway.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	21.3 – 27.5	1.0 – 9.1	18.2 – 29.5	3.5 – 31.4
Tarpon Bay	21.6 – 32.3	4.0 – 7.3	9.8 – 25.8	2.0 – 16.5
Wildlife Drive	16.5 – 22.8	0.4 – 10.3	-----	1.6 – 12.6
Wulfert Flats	18.7 – 26.5	2.9 – 9.2	-----	6.1 – 54.2

Coastal Conditions: East winds have caused upwelling of bottom waters and offshore movement of the surface layer near Sanibel which has restored oxygen to the lower layer. **The lower level of the water column was hypoxic at 2 of 20 locations offshore of Sanibel, 9/7/18.** The Lee County Dept of Health issued a Health Advisory on 9/7/18 for high bacteria counts on the Sanibel Causeway beaches. The advisory was lifted on 9/11/18.

Red Tide: On 9/7/18 the Florida Fish and Wildlife Conservation Commission reported a bloom of the Florida red tide organism, *Karenia brevis* persists along **120 miles of coastline with high concentrations, over 1 million cells/liter, from Sarasota to Collier Counties with the bloom extending offshore 10 miles or more.** SCCF's samples from the Gulf averaged less than 1 million *Karenia* cells/L on 9/7/18.

Wildlife Impacts: The past week SCCF recovered **6 dead loggerhead sea turtles, 5 adults and one subadult including one huge male, from Sanibel and Captiva beaches.** CROW, the wildlife hospital on Sanibel treated **17 new patients** with red tide symptoms; 5 ruddy turnstones, 5 double crested cormorants 3 sanderling, 1 great blue heron, 1 plover, 1 white ibis, 1 sandwich tern. A dead manatee washed up on the southern end of Fort Myers Beach.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	9.3	370	4.2	0.49
Shell Point	5.6	151	1.5	0.98
Causeway	3.8	97.5	0.9	1.32

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,100 tons of dead marine life. Sanibel = 408 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

American eels	Kemps ridley sea turtle	Snook
Angel fish	Kingfish	Starfish
Atlantic needlefish	Lane snapper	Southern Puffer
Atlantic Spadefish	Laughing gull	Southern Stargazer
Batfish	Loggerhead sea turtle	Spanish mackerel
Black drum	Lookdown fish	Spotted eels
Black tip shark	Mackerel	Spotted seatrout
Blenny	Manatees	Sting rays sp
Blue crabs	Mallard ducks	Stone crab
Bottlenose Dolphin	Mangrove snapper	Striped burr fish
Brown pelican	Menhaden	Threadfin herring
Bull shark	Minnows	Tarpon
Calico crab	Moray Eel	Toadfish
Catfish sp.	Muscovy duck	Tripletail
Cobia	Mullet sp.	Whale shark
Common tern	Ornate Diamondback Terrapin	Whiting
Coquina	Pale spotted eels	Yellow snake eel
Cowfish	Parchment worms	
Crevale jack	Permit	
Double crested cormorant	Pig fish	
Flounder	Pinfish	
Gafftopsail catfish	Florida Pompano	
Goby	Red drum/ Redfish	
Goliath grouper	Red Snapper	
Green sea turtle	Remora	
Grey triggerfish	Reticulate moray	
Grouper sp.	Sand Trout	
Grunt sp.	Scaled sardine	
Hardhead catfish	Seahorses	
Horseshoe crabs	Shame- faced crab	
Jack fish sp.	Sheepshead	



Seagrass washing up along Sanibel's Bailey Beach Park, 9/11/18.

Photos City of Sanibel

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **September 11 - 17, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, the Caloosahatchee and estuary. The weekly average flow at S79 decreased to 3,015 cfs, (18 weeks = 126 days) over the high flow harm threshold. Red tide persists along the coast. Sea turtles continue to be heavily impacted. Cape Coral's Yacht Club Beach remains closed.**

USACE Action: On 9/7/18 the U.S. Army Corps of Engineers reduced discharges from Lake Okeechobee to a constant **3,000 cfs** at WP Franklin Lock & Dam (**S-79**) and a 7 day pulse averaging **1,170 cfs** from the St. Lucie Lock & Dam (**S-80**) with no flows on Saturdays and Sundays.

Recommendation: We request the Corps keep flows at or below **3,000 cfs at S-79** to accommodate significant watershed inflows and significant damage already occurring in the estuary. We request the Corps and SFWMD use operational flexibility to maximize water levels in canals south of the lake and use all emergency storage measures to address ongoing harmful estuary releases and high lake stages.

Lake Okeechobee Level: 14.78 ft. (Low Flow Sub-Band)

Last week: 14.71 ft.

Lake Okeechobee Inflow: 3,306 cfs

Lake Okeechobee Outflow: 1,693 cfs

Weekly Rainfall: WP Franklin 2.45" Ortona 0.50"

Moore Haven 0.40"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

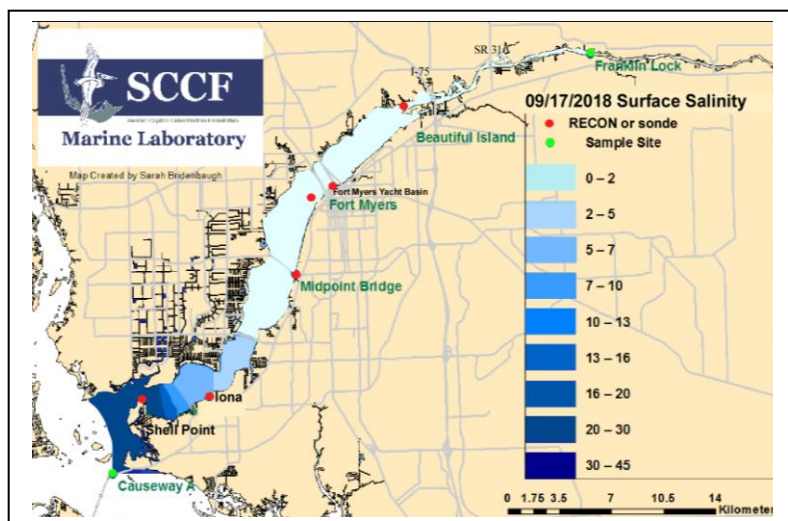
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.4 psu (SCCF RECON)

Previous week 0.2 - 0.2 psu

Salinity Shell Point: 7.4 – 28 psu (SCCF RECON)

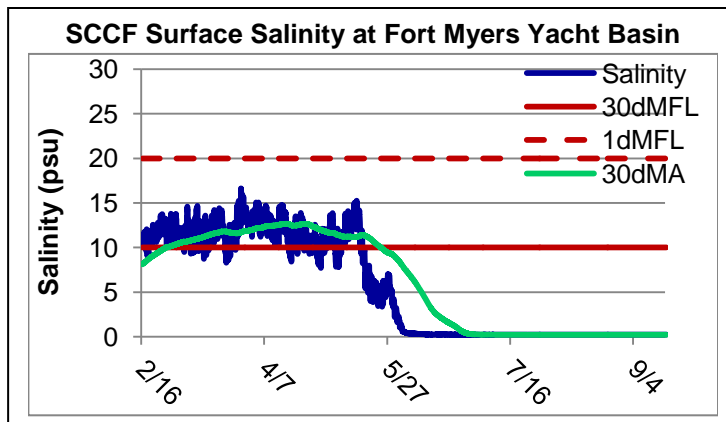
Previous week 5.9 - 33 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.2	<10 psu	In Range
Shell Point	7.4 – 28	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.51	1 meter	Low
Shell Point	0.76	2.2 meters	Low
Causeway	0.93	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,015 cfs**; **18% of flow originated from Lake Okeechobee**. Over the past 7 days **26,591 AF** of water was discharged from Lake Okeechobee: **28% to the Caloosahatchee at S-77**, **49% to the St Lucie at S-80**, **22% was discharged south to the EAA**. **A net - 1,480 AF was backflowed into the lake from Clewiston's Industrial Canal at S-310**. A net 23 AF was backflowed into the lake from the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
9/11/2018	2888	1039	214
9/12/2018	2776	1032	455
9/13/2018	2703	1030	999
9/14/2018	3365	734	923
9/15/2018	3503	923	226
9/16/2018	2838	859	334
9/17/2018	3030	745	590
7 day Avg	3015	909	534



Cyanobacteria bloom: On 9/18/18 the Lee County Environmental Lab documented abundant cyano blooms of *Microcystis* at Midpoint Bridge Park. *Microcystis* was present at the Alva boat ramp, upstream of the Franklin locks, Davis boat ramp and North Shore Park. Samples were collected for FDEP at Alva Boat ramp, North Shore Park, and Four Mile Cove.

Upstream of S-79/Franklin Conditions: On 9/18/18 the Olga Water Treatment plant reported chlorides of **40 mg/l**, apparent color **163 CU** and turbidity **2.96 NTU**. Slight algae visible at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **19 psu**, in the suitable range for oysters. **Hypoxia** was recorded at Shell Point on three days with readings as low as **1.5 mg L⁻¹**. **Light levels are too low for submersed plants growing at depth in the river and around the Causeway**. Hypoxia was recorded at Captiva and Redfish Passes on 9/14/18.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	25.6 – 27.9	1.0 – 6.4	17.2 – 28.5	2.6 – 23.4
Tarpon Bay	24.6 – 29.8	2.3 – 6.5	12.1 – 19.3	2.9 – 16.5
Wildlife Drive	11.7 – 26.2	0.3 – 10.0	-----	1.4 – 13.2
Wulfert Flats	9.51 – 28.2	1.8 – 8.8	-----	5.2 – 73.8

Red Tide: On 9/14/18 the Florida Fish and Wildlife Conservation Commission reported a bloom of the Florida red tide organism, *Karenia brevis*, persists in Southwest Florida along ~130 miles of coastline, from northern Pinellas to Lee counties, and extends offshore (10 miles or more). A patchy bloom of *K. brevis* was also observed in Northwest Florida for the first time this past week. Background to high concentrations were measured in or offshore of Lee County, **SCCF's samples from the Sanibel beaches ranged as high as 200 million *Karenia* cells/L on 9/14/18**. A large number of dead snook and mullet were reported around Blind Pass over the weekend.

Wildlife Impacts: The past week SCCF recovered **26 dead sea turtles from Sanibel beaches; 23 loggerheads, 2 kemp's ridley and 1 unknown due to decomposition**. CROW, the wildlife hospital on Sanibel treated **25 new patients** with red tide symptoms; 1 loggerhead sea turtle, 7 double crested cormorants 5 sanderling, 3 ruddy turnstones, 2 osprey, 2 short-billed dowitchers, 1 northern gannet, 1 snowy plover, 1 white ibis, 1 sandwich tern and 1 brown pelican.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	9.9	360	2.5	0.51
Shell Point	7.5	220	1.2	0.76
Causeway	9.6	156	2.2	0.93

Target light penetration: CE- Caloosahatchee Estuary =1 m

SCB-San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,100 tons of dead marine life. Sanibel = 425 tons

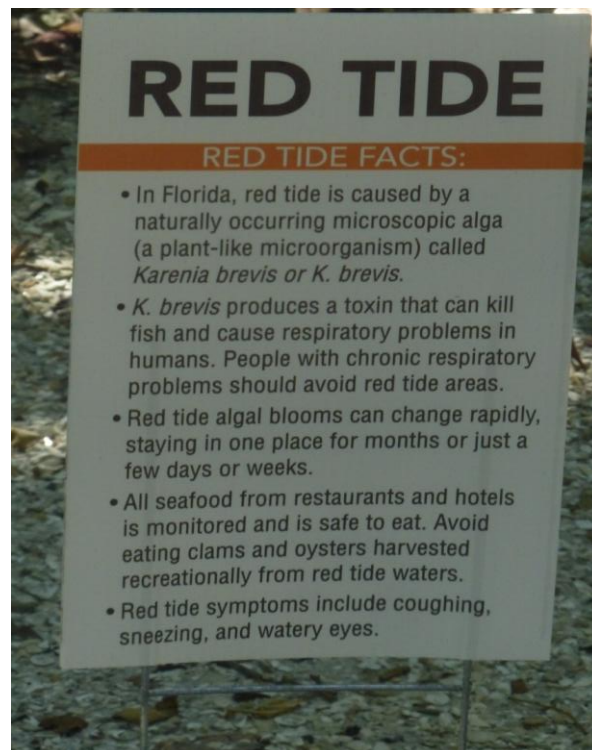
Ongoing list not comprehensive *Endangered/Threatened Species*

American eels	Kemps ridley sea turtle	Seahorses
Angel fish	Kingfish	Shame- faced crab
Atlantic needlefish	Lane snapper	Snook
Atlantic spadefish	Laughing gull	Snowy plover
Batfish	Loggerhead sea turtle	Starfish
Black drum	Lookdown fish	Southern puffer
Black tip shark	Mackerel	Southern stargazer
Blenny	Manatees	Spanish mackerel
Blue crabs	Mallard ducks	Spotted eels
Bottlenose dolphin	Mangrove snapper	Spotted seatrout
Brown pelican	Mantis shrimp	Sting rays sp
Bull shark	Menhaden	Stone crab
Calico crab	Minnows	Striped burr fish
Catfish sp.	Moray Eel	Threadfin herring
Cobia	Muscovy duck	Tarpon
Common tern	Mullet sp.	Toadfish
Coquina	Ornate diamondback terrapin	Tripletail
Cowfish	Pale spotted eels	Whale shark
Creville jack	Parchment worms	Whiting
Double crested cormorant	Permit	Yellow snake eel
Flounder	Pig fish	
Gafftopsail catfish	Pinfish	
Goby	Florida Pompano	
Goliath grouper	Red drum/ Redfish	
Green sea turtle	Red snapper	
Grey triggerfish	Remora	
Grouper sp.	Reticulate moray	
Grunt sp.	Sand dollar	
Hardhead catfish	Sand Trout	
Horseshoe crabs	Scaled sardine	
Jack fish sp.	Sheepshead	



Sanibel's Tarpon Beach 9/14/18, red tide counts were 200 million cells/ litre. SCCF staff reported lysing red tide cells made the water near the shoreline like aloe vera gel that sticks to the skin and makes it shine. The staff member got some of the water in his eye. It was reported to FWC who advised we call poison control. Poison control said it's up to DOH to provide warnings. Lee County DOH said they only monitor beaches for enterococcus bacteria. Photos SCCF

Signage does not adequately inform public. Sign on left indicates "NO WATER QUALITY ADVISORY AT THIS TIME". Red tide fact sign does not advise keeping out of the water or concerns for children and pets.



MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **September 18 - 24, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, the Caloosahatchee and estuary. The weekly average flow at S79 decreased to 3,095 cfs, (19 weeks = 133 days) over the high flow harm threshold. Red tide persists along the coast. Sea turtles continue to be heavily impacted by red tide.**

USACE Action: On 9/13/18 the U.S. Army Corps of Engineers maintained discharges from Lake Okeechobee, **and the Caloosahatchee River and estuary. Weekly** to a constant **3,000 cfs** at WP Franklin Lock & Dam (**S-79**) and a 7 day pulse averaging **1,170 cfs** from the St. Lucie Lock & Dam (**S-80**) with no flows on Saturdays and Sundays.

Recommendation: We request the Corps keep flows at or below **3,000 cfs at S-79** to accommodate significant watershed inflows and significant damage already occurring in the estuary. We request the Corps and SFWMD use operational flexibility to maximize water levels in canals south of the lake and use all emergency storage measures to address ongoing harmful estuary releases and high lake stages. **We urge the Corps and District to continue to move as much water south even as we transition into the dry season to reduce the potential for high-volume discharges associated with strengthening el niño conditions this winter and spring.**

Lake Okeechobee Level: 14.69 ft. (Low Flow Sub-Band)

Last week: 14.78 ft.

Lake Okeechobee Inflow: 3,121 cfs

Lake Okeechobee Outflow: 3,597 cfs

Weekly Rainfall: WP Franklin 1.33" Ortona 0.39"

Moore Haven 0.06"

Salinity Beautiful Island: 0.2 - 0.2 psu (SCCF RECON Marker 18)

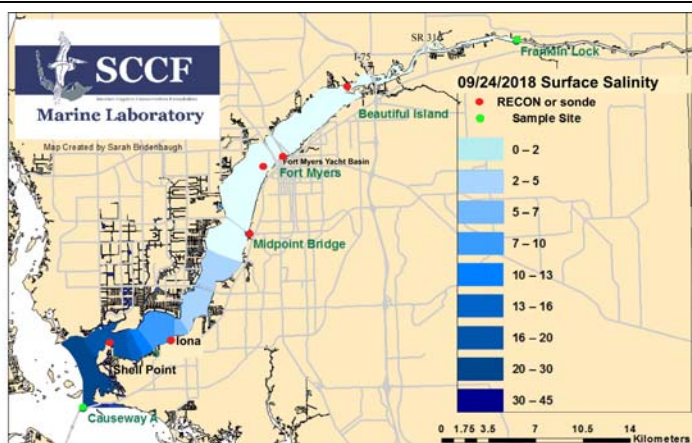
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 - 0.6 psu (SCCF RECON)

Previous week 0.2 - 0.4 psu

Salinity Shell Point: 7.5 – 28 psu (SCCF RECON)

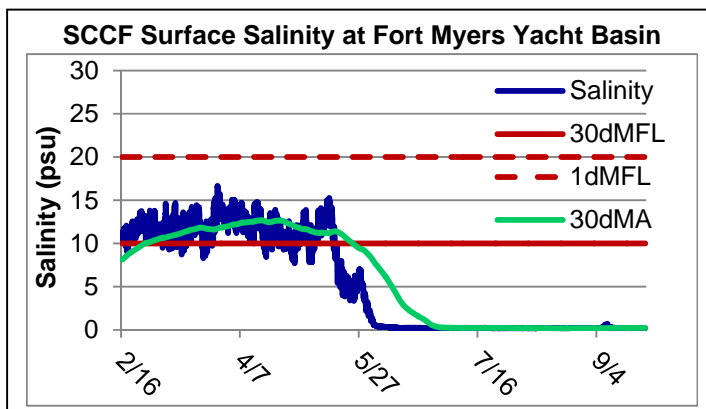
Previous week 7.4 – 28 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.6	<10 psu	In Range
Shell Point	7.5 – 28	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.50	1 meter	Low
Shell Point	0.86	2.2 meters	Low
Causeway	1.10	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **3,095 cfs**. Over the past **7 days 48,207 AF** of water was discharged from Lake Okeechobee: **39% to the Caloosahatchee at S-77, 34% to the St Lucie at S-80, 26% was discharged south to the EAA, 1% was discharged to S-310. A net 1 AF was backflowed into the lake from the L8.**

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
9/18/2018	2971	751	190
9/19/2018	2695	741	212
9/20/2018	2516	1337	1742
9/21/2018	3480	1585	2235
9/22/2018	3590	1604	2187
9/23/2018	3420	1622	2019
9/24/2018	2992	1609	1947
7 day Avg	3,095	1,321	1,505



Cyanobacteria bloom: On 9/24/18 the Lee County Environmental Lab documented sparse cyano blooms of *Microcystis* at Franklin locks upstream. *Microcystis* was not present at the Alva boat ramp, downstream of the Franklin locks, Davis boat ramp, Midpoint Bridge Park and North Shore Park.

Upstream of S-79/Franklin Conditions: On 9/25/18 the Olga Water Treatment plant reported chlorides of **50 mg/l**, apparent color **157 CU** and turbidity **2.03 NTU**. No visible algae at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **18 psu**, in the suitable range for oysters. **Hypoxia was recorded at Shell Point on six days with readings as low as 1.6 mg L⁻¹. Light levels are too low for submersed plants growing at depth in the river and around the Causeway.** Hypoxia was recorded in the surface layer at 2:00 PM on an outgoing tide at Blind Pass on 9/20/18. Large amounts of seagrass continue to wash up on Sanibel's bayside beaches (see photos included).

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	25.2 – 59.3	1.4 – 7.8	16.6 – 21.4	2.3 – 6.3
Tarpon Bay	21.5 – 26.9	1.5 – 6.3	15.3 – 23.1	2.2 – 13.6
Wildlife Drive	20.7 – 26.2	0.3 – 9.4	-----	1.4 – 14.9
Wulfert Flats	17.4 – 27.2	1.9 – 7.3	-----	6.2 – 66.5

Red Tide: On 9/21/18 the Florida Fish and Wildlife Conservation Commission reported a bloom of the Florida red tide organism, *Karenia brevis*, persists in Southwest Florida along ~135 miles of coastline, from northern Pinellas to northern Collier counties, and extends offshore (10 miles or more). Background to high concentrations was measured in or offshore of Lee County. SCCF's samples from the Sanibel beaches ranged to over 20 million *Karenia* cells/L on 9/19/18, but were lower (medium to >1 million/L) on 9/23 and 9/24/18.

Wildlife Impacts: The past week SCCF recovered 14 **Dead Sea turtles from Sanibel beaches; 5 loggerheads, 7 kemp's ridley, 1 Green and 1 unknown due to decomposition.** CROW, the wildlife hospital on Sanibel treated **23 new patients** with red tide symptoms; 1 American Avocet, 2 DCCOs, 1 Great Egret, 1 Green Sea Turtle, 2 Kemp's Ridley Sea Turtles, 1 Muscovy, 1 Northern Gannet, 1 Osprey, 2 Red Knots, 2 Ruddy Turnstones, 6 Sanderlings, 1 Semipalmated Plover and 2 Snowy Egrets.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.6	362	3.1	0.50
Shell Point	5.3	185	1.6	0.86
Causeway	1.6	128	2.6	1.10

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,100 tons of dead marine life. Sanibel = 425 tons

*Ongoing list not comprehensive **Endangered/Threatened Species***

American eels	Kemps ridley sea turtle	Seahorses
Angel fish	Kingfish	Shame- faced crab
Atlantic needlefish	Lane snapper	Snook
Atlantic spadefish	Laughing gull	Snowy plover
Batfish	Loggerhead sea turtle	Starfish
Black drum	Lookdown fish	Southern puffer
Black tip shark	Mackerel	Southern stargazer
Blenny	Manatees	Spanish mackerel
Blue crabs	Mallard ducks	Spotted eels
Bottlenose dolphin	Mangrove snapper	Spotted seatrout
Brown pelican	Mantis shrimp	Sting rays sp
Bull shark	Menhaden	Stone crab
Calico crab	Minnows	Striped burr fish
Catfish sp.	Moray Eel	Threadfin herring
Cobia	Muscovy duck	Tarpon
Common tern	Mullet sp.	Toadfish
Coquina	Ornate diamondback terrapin	Tripletail
Cowfish	Pale spotted eels	Whale shark
Crevalle jack	Parchment worms	Whiting
Double crested cormorant	Permit	Yellow snake eel
Flounder	Pig fish	
Gafftopsail catfish	Pinfish	
Goby	Florida Pompano	
Goliath grouper	Red drum/ Redfish	
Green sea turtle	Red snapper	
Grey triggerfish	Remora	
Grouper sp.	Reticulate moray	
Grunts sp.	Sand dollar	
Hardhead catfish	Sand Trout	
Horseshoe crabs	Scaled sardine	
Jack fish sp.	Sheepshead	



MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **September 25 - October 1, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee, the Caloosahatchee and estuary. The weekly average flow at S79 decreased to 2,970 cfs, (20 weeks = 140 days) over the high flow harm threshold. Red tide persists along the coast. Sea turtles continue to be heavily impacted by red tide.**

USACE Action: On 9/13/18 the U.S. Army Corps of Engineers maintained discharges from Lake Okeechobee at a constant **3,000 cfs** at WP Franklin Lock & Dam (**S-79**) and a 7 day pulse averaging **1,170 cfs** from the St. Lucie Lock & Dam (**S-80**) with no flows on Saturdays and Sundays.

Recommendation: We request the Corps reduce flows to the Caloosahatchee **to below the 2,800 cfs harm threshold at S-79**, as we transition to the dry season, to reduce significant damage in the estuary. We request the Corps and SFWMD use operational flexibility to maximize water levels in canals south of the lake and **continue to move water south. We encourage transitioning flows down slowly to 800 - 1,000 cfs into the dry season to accommodate strengthening el niño conditions this winter and spring.**

Lake Okeechobee Level: **14.50 ft. (Low Flow Sub-Band)**

Last week: **14.69 ft.**

Lake Okeechobee Inflow: **2,212 cfs**

Lake Okeechobee Outflow: **5,504 cfs**

Weekly Rainfall: WP Franklin **0.80"** Ortona **0.72"**

Moore Haven **0.20"**

Salinity Beautiful Island: **0.2 - 0.2 psu** (SCCF RECON Marker 18)

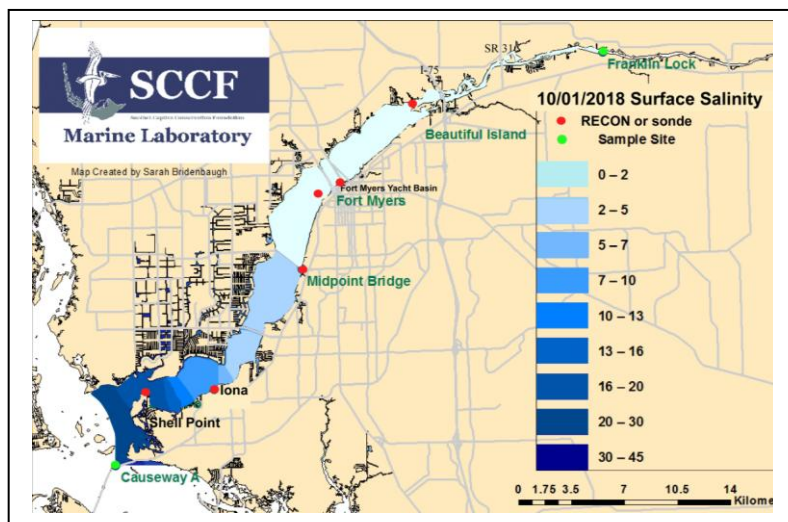
Previous week **0.2 - 0.2 psu**

Salinity Fort Myers: **0.2 - 0.3 psu** (SCCF RECON)

Previous week **0.2 - 0.6 psu**

Salinity Shell Point: **7.6 – 28 psu** (SCCF RECON)

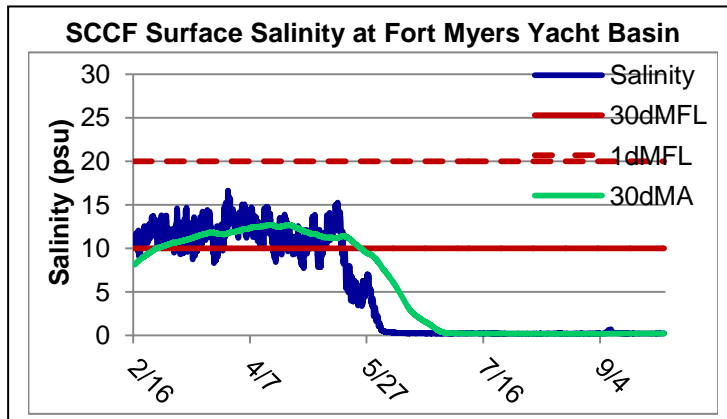
Previous week **7.5 – 28 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 0.6	<10 psu	In Range
Shell Point	7.6 – 28	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.54	1 meter	Low
Shell Point	1.15	2.2 meters	Low
Causeway	1.66	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **2,970 cfs** with **66%** from Lake Okeechobee discharges. Over the past **7 days** **64,256 AF** of water was discharged from Lake Okeechobee: **42%** to the Caloosahatchee at **S-77**, **23%** to the St Lucie at **S-80**, **34%** was discharged south to the **EAA**, **386 AF** was discharged to **S-310**. A net **12 AF** was discharged through the **L8**.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
9/25/2018	2924	1603	2202
9/26/2018	2956	1605	2151
9/27/2018	3253	1259	1414
9/28/2018	2529	1735	1404
9/29/2018	3214	1761	2220
9/30/2018	2981	1686	2160
10/1/2018	2936	1896	2142
7 day Avg	2970	1649	1956



Cyanobacteria bloom: On 10/2/18 the Lee County Environmental Lab documented sparse cyano presence of *Dolichospermum* at the Alva boat ramp and *Dolichospermum*, *Aphanizomenon* and *Microcystis* upstream of the Franklin locks upstream.

Upstream of S-79/Franklin Conditions: On 10/2/18 the Olga Water Treatment plant reported chlorides of **45 mg/l**, apparent color **227 CU** and turbidity **4.28 NTU**. No visible algae at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **0.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **The average dissolved oxygen was below 4 mg/L at Beautiful Island.**

Lower Estuary Conditions: The average salinity at Shell Point was **19 psu**, in the suitable range for oysters. **Hypoxia was recorded at Shell Point with readings as low as 2.2 mg L⁻¹. Light levels are too low for submersed plants growing at depth in the river and around the Causeway.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	1.2 – 9.3	17.4 – 21.3	2.2 – 6.8
Tarpon Bay	22.1 – 27.7	3.5 – 6.1	13.9 – 20.5	3.1 – 19.7

Red Tide: On 9/28/18 the Florida Fish and Wildlife Conservation Commission reported a bloom of the Florida red tide organism, *Karenia brevis*, persists in Southwest Florida along ~130 miles of coastline, from northern Pinellas to southern Lee counties extending offshore 10 miles or more. **High concentrations were measured in or offshore Lee County the past week.** SCCF's samples from offshore of Sanibel ranged to **over 47 million *Karenia* cells/L on 9/26/18**, though on average, concentrations around Sanibel were lower offshore and on the southeastern beaches which had medium concentrations. The surf zone at Bowman's beach was brownish-red from high concentrations of 46 million cells/L of *Peridinium* on 9/27/18. **Black water was reported near Boca Grande Pass. With anoxic water upwelling near shore, sulfate reducers producing hydrogen sulfide can result in iron sulfide precipitates.**

Wildlife Impacts: The past week SCCF recovered **12 dead sea turtles; 11 Kemp's ridley from Sanibel beaches and 1 loggerhead on Captiva.** CROW, the wildlife hospital on Sanibel treated **17 new patients** with red tide symptoms; 6 double crested cormorants, 3 ruddy turnstones, 2 red knots, 1 american oystercatcher, 1 laughing gull, 1 spotted sandpiper, 1 tri-colored heron, 1 osprey and 1 muscovy duck.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	6.5	334	2.7	0.54
Shell Point	4.2	121	1.4	1.15
Causeway	2.9	55	2.6	1.66

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

*Ongoing list not comprehensive **Endangered/Threatened Species***

American eels	Kemps ridley sea turtle	Seahorses
Angel fish	Kingfish	Shame- faced crab
Atlantic needlefish	Lane snapper	Snook
Atlantic spadefish	Laughing gull	Snowy plover
Batfish	Loggerhead sea turtle	Starfish
Black drum	Lookdown fish	Southern puffer
Black tip shark	Mackerel	Southern stargazer
Blenny	Manatees	Spanish mackerel
Blue crabs	Mallard ducks	Spotted eels
Bottlenose dolphin	Mangrove snapper	Spotted seatrout
Brown pelican	Mantis shrimp	Sting rays sp
Bull shark	Menhaden	Stone crab
Calico crab	Minnows	Striped burr fish
Catfish sp.	Moray Eel	Threadfin herring
Cobia	Muscovy duck	Tarpon
Common tern	Mullet sp.	Toadfish
Coquina	Ornate diamondback terrapin	Tripletail
Cowfish	Pale spotted eels	Whale shark
Crevalle jack	Parchment worms	Whiting
Double crested cormorant	Permit	Yellow snake eel
Flounder	Pig fish	
Gafftopsail catfish	Pinfish	
Goby	Florida Pompano	
Goliath grouper	Red drum/ Redfish	
Green sea turtle	Red snapper	
Grey triggerfish	Remora	
Grouper sp.	Reticulate moray	
Grunt sp.	Sand dollar	
Hardhead catfish	Sand Trout	
Horseshoe crabs	Scaled sardine	
Jack fish sp.	Sheepshead	

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **October 2 - 8, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee.** The weekly average flow to the Caloosahatchee at S79 decreased to 2,626 cfs. YTD Harmful flows totaled 20.5 weeks = 143 days over the high flow harm threshold. **Red tide persists along the coast. A dead zone has been identified in the Gulf that encompasses over 600 square kilometres. The geographic limits have not yet been located.**

USACE Action: On 10/5/18 the U.S. Army Corps of Engineers initiated a three week pulse release reducing average weekly flows from Lake Okeechobee beginning with 2,000 cfs dropping to 1,500 cfs then 1,000 cfs at S-79, the WP Franklin Lock & Dam. No Lake releases will be directed to the St. Lucie Lock & Dam at S-80.

Recommendation: We support the Corps step down releases to the Caloosahatchee at **S-79** to acclimate the estuary as we transition to the dry season. **We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season for lake and estuary health. To achieve this we support dry season flows to the Caloosahatchee be maintained between 800 - 1,000 cfs to accommodate forecast el niño conditions this winter and spring.**

Lake Okeechobee Level: 14.22 ft. (Low Flow Sub-Band)

Last week: 14.50 ft.

Lake Okeechobee Inflow: 1,691 cfs

Lake Okeechobee Outflow: 4,335 cfs

Weekly Rainfall: WP Franklin 0.29" Ortona 0.13"

Moore Haven 0.13"

Salinity Beautiful Island: 0.1 - 0.2 psu (SCCF RECON Marker 18)

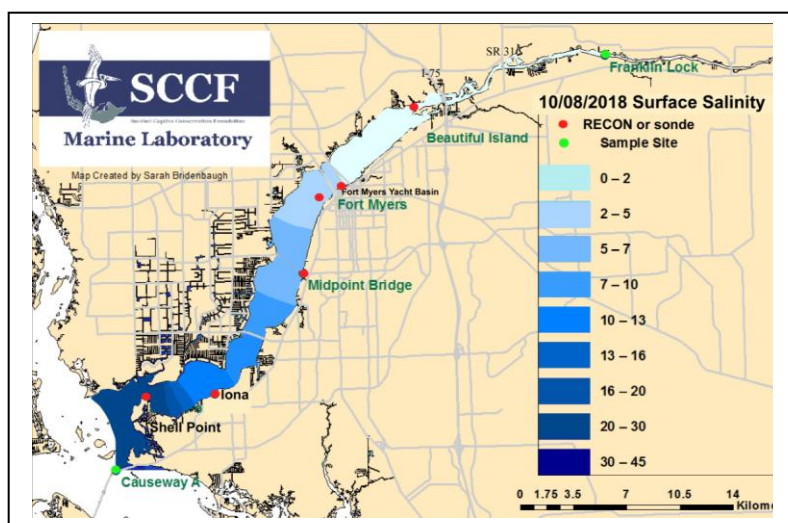
Previous week 0.2 - 0.2 psu

Salinity Fort Myers: 0.2 – 6.9 psu (SCCF RECON)

Previous week 0.2 - 0.3 psu

Salinity Shell Point: 8.5 – 31 psu (SCCF RECON)

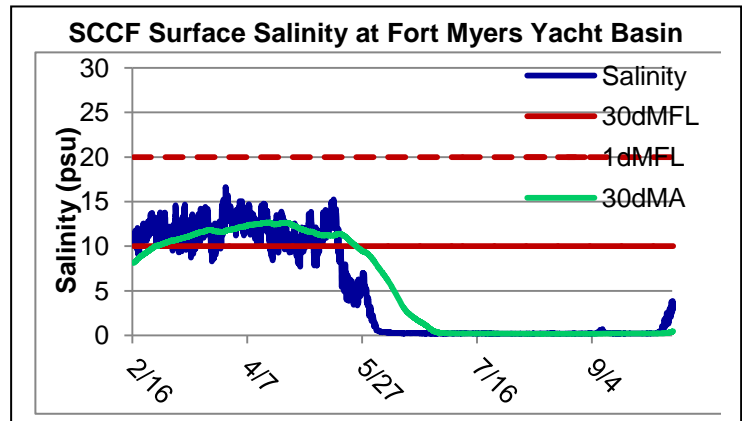
Previous week 7.6 – 28 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.1 - 0.2	< 5 psu	In Range
Fort Myers	0.2 - 6.9	<10 psu	In Range
Shell Point	8.5 – 31	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.70	1 meter	Low
Shell Point	1.24	2.2 meters	Low
Causeway	1.51	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **2,626 cfs**. Over the past 7 days **70,751 AF** of water was discharged from Lake Okeechobee: **46% to the Caloosahatchee at S-77**, **14% to the St Lucie at S-80**, **40% was discharged south to the EAA**, **639 AF** was discharged to S-310. A net 2 AF was discharged through the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
10/2/2018	2920	2075	2391
10/3/2018	2876	2066	2555
10/4/2018	2930	2066	2572
10/5/2018	2466	2007	2598
10/6/2018	2657	1681	2544
10/7/2018	2736	1702	2096
10/8/2018	1795	1302	1571
7 day Avg	2626	1843	2332



Cyanobacteria bloom: On 10/9/18 the Lee County Environmental Lab found no cyanobacteria blooms at sample locations.

Upstream of S-79/Franklin Conditions: On 10/9/18 the Olga Water Treatment plant reported chlorides of **44 mg/l**, apparent color **161 CU** and turbidity **3.8 NTU**. No visible algae at the plant intake. The plant remains off line for maintenance.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **1.5 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **22 psu**, in the suitable range for oysters and seagrasses. Hypoxia was recorded daily at Shell Point from 9/28 to 10/04. **Light levels were too low for submersed plants growing at depth in the river and around the Causeway.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	-----	-----	-----
Tarpon Bay	22.1 – 33.0	3.8 – 6.3	10.0 – 24.7	1.1 – 6.4
Wildlife Drive	24.0 – 26.2	0.5 – 14.8	-----	1.1 – 7.9
Wulfert Flats	18.5 – 25.6	3.6 – 8.7	-----	3.7 – 64.4

Red Tide: On 10/5/18 the Florida Fish and Wildlife Conservation Commission reported a bloom of the Florida red tide organism, *Karenia brevis*, persists in Southwest Florida along ~145 miles of coastline, from northern Pinellas to northern Collier counties extending offshore 10 miles or more. High concentrations of >1,000,000 *K. brevis* cells per liter occurred in Southwest Florida and on Florida's East Coast this week, in or offshore of Pinellas, Manatee, Sarasota, Lee, and Palm Beach counties. A patchy bloom was also recorded in northwest Florida. SCCF found *Karenia* in samples on 10/8 when a low concentration was present at Tarpon Beach. The water was dark at the Captiva beaches where anoxic upwelled water was present from 10/2 to 10/8.

Wildlife Impacts: The past week CROW, the wildlife hospital on Sanibel treated **8 new patients with red tide symptoms**; **3 double crested cormorants**, **2 anhingas**, **1 osprey**, **1 red knot** and **1 royal tern**. No sea turtle standings were reported.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.6	240	2.3	0.70
Shell Point	3.6	107	1.5	1.24
Causeway	2.8	74	1.6	1.51

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

*Ongoing list not comprehensive **Endangered/Threatened Species***

American eels	Jack fish sp.	Sand Trout
American oystercatcher	Kemps ridley sea turtle	Scaled sardine
Angel fish	Kingfish	Sheepshead
Atlantic needlefish	Lane snapper	Seahorses
Atlantic spadefish	Laughing gull	Shame- faced crab
Batfish	Loggerhead sea turtle	Snook
Black drum	Lookdown fish	Snowy plover
Black tip shark	Mackerel	Starfish
Blenny	Manatees	Southern puffer
Blue crabs	Mallard ducks	Southern stargazer
Bottlenose dolphin	Mangrove snapper	Spanish mackerel
Brown pelican	Mantis shrimp	Spotted eels
Bull shark	Menhaden	Spotted seatrout
Calico crab	Minnows	Sting rays sp
Catfish sp.	Moray Eel	Stone crab
Cobia	Muscovy duck	Striped burr fish
Common tern	Mullet sp.	Threadfin herring
Coquina	Ornate diamondback terrapin	Tarpon
Cowfish	Osprey	Toadfish
Crevalle jack	Pale spotted eels	Tri-colored Heron
Double crested cormorant	Parchment worms	Tripletail
Flounder	Permit	Whale shark
Gafftopsail catfish	Pig fish	Whiting
Goby	Pinfish	Yellow snake eel
Goliath grouper	Florida Pompano	
Green sea turtle	Red drum/ Redfish	
Grey triggerfish	Red knot	
Grouper sp.	Red snapper	
Grunt sp.	Remora	
Hardhead catfish	Reticulate moray	
Horseshoe crabs	Sand dollar	



**Black water and light colored foam in the Miramar Canal, Cape Coral Yacht Club area on 10/9/18.
Photo by Sharon Basil**

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **October 9 - 15, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria blooms persist within Lake Okeechobee and algae is present in the Caloosahatchee upstream and at Shell Point. The weekly average flow to the Caloosahatchee at S79 decreased to 1,793 cfs. Low levels of red tide persist along the Lee County coastline.**

USACE Action: On 10/5/18 the U.S. Army Corps of Engineers initiated a three week pulse release reducing average weekly flows from Lake Okeechobee beginning with **2,000 cfs** dropping to **1,500 cfs** then **1,000 cfs** at S-79, the WP Franklin Lock & Dam. No Lake releases will be directed to the St. Lucie Lock & Dam at S-80.

Recommendation: We support the Corps step down releases to the Caloosahatchee at **S-79** to acclimate the estuary as we transition to the dry season. **We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season for lake and estuary health. To achieve this we support dry season flows to the Caloosahatchee be maintained between 800 - 1,000 cfs to accommodate forecast el niño conditions this winter and spring.**

Lake Okeechobee Level: **14.19 ft. (Low Flow Sub-Band)**

Last week: **14.22 ft.**

Lake Okeechobee Inflow: **1,619 cfs**

Lake Okeechobee Outflow: **4,096 cfs**

Weekly Rainfall: WP Franklin **0.26"** Ortona **1.92"**

Moore Haven **0.82"**

Salinity Beautiful Island: **0.2 - 0.4 psu** (SCCF RECON Marker 18)

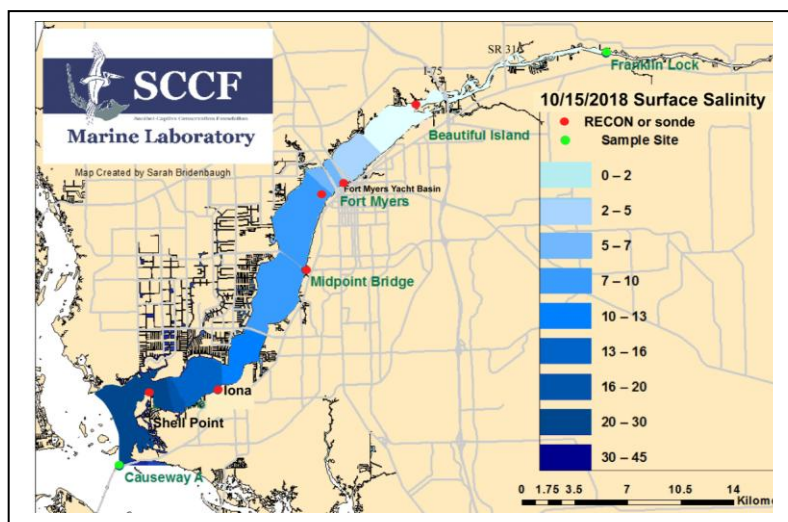
Previous week **0.2 - 0.2 psu**

Salinity Fort Myers: **2.0 - 8.9 psu** (SCCF RECON)

Previous week **0.2 - 6.9 psu**

Salinity Shell Point: **13 - 33 psu** (SCCF RECON)

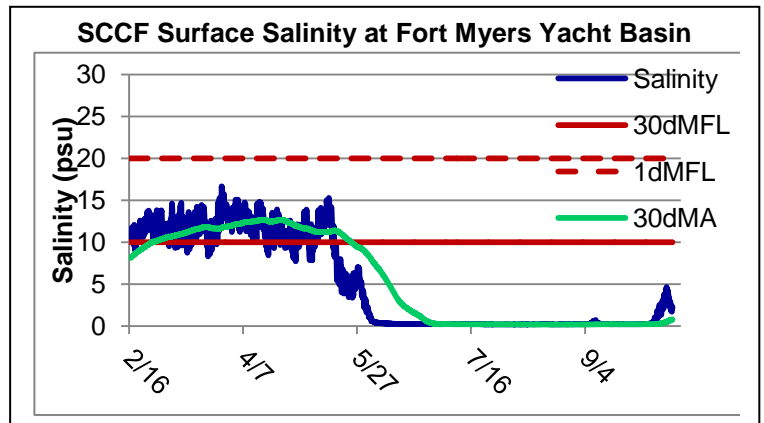
Previous week **8.5 – 31 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 0.4	< 5 psu	In Range
Fort Myers	2.0 - 8.9	<10 psu	In Range
Shell Point	13 - 33	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.63	1 meter	Low
Shell Point	1.30	2.2 meters	Low
Causeway	1.47	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **1,793 cfs**. **EAA discharges were unavailable**. Over the past 7 days **15,387 AF** of water was discharged from Lake Okeechobee to the Caloosahatchee at S-77, **16 AF** to the St Lucie at S-80, **97 AF** was discharged to S-310 and a net **277 AF** was discharged through the L8.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
10/9/2018	1414	1191	1358
10/10/2018	2214	600	670
10/11/2018	806	662	708
10/12/2018	1910	1085	1126
10/13/2018	2327	1195	1116
10/14/2018	1954	1361	1124
10/15/2018	1923	1408	1622
7 day Avg	1793	1072	1103



Cyanobacteria bloom: On 10/16/18 the Lee County Environmental Lab found **cyanobacteria presence including *Dolichospermum*, *Microcystis* and *Aphanizomenon*** at the **Alva Boat Ramp**, ***Microcystis*** and ***Dolichospermum***, upstream of the Franklin locks and ***Dolichospermum*, *Microcystis*** and ***Aphanizomenon*** downstream of the locks.

Upstream of S-79/Franklin Conditions: On 10/16/18 the Olga Water Treatment plant reported chlorides of **46 mg/l**, apparent color **109 CU** and turbidity **3.0 NTU**. No visible algae at the plant intake. The plant is **online** at 1,400 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **2.6 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **23 psu**, in the suitable range for oysters and seagrasses. Hypoxia was recorded at Shell Point on 10/13 and 10/14. **Light levels were too low for submersed plants growing at depth in the river and around the Causeway.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	-----	-----	-----	-----
Tarpon Bay	27.3 - 34.6	3.8 – 7.3	7.4 – 20.3	1.1 – 5.4

Beach Conditions: Fort Myers Beach received a massive deposit of drift algae along coastal beaches over the week end.

Red Tide: On 10/12/18 the Florida Fish and Wildlife Conservation Commission **reported the Florida red tide organism, *Karenia brevis*, persists in Southwest Florida from Pinellas to Monroe counties** with background concentrations in Lee, and Collier counties. A bloom was also recorded in northwest Florida and in the Atlantic from Miami-Dade to Martin counties. Low concentrations of *Karenia* were found along the eastern beaches of Sanibel on 10/15 by SCCF and Sanibel Sea School.

Wildlife Impacts: The past week **CROW**, the wildlife hospital on Sanibel treated **14 new patients with red tide symptoms; 8 double crested cormorants, 1 anhinga, 1 sanderling, 1 osprey, 1 great blue heron, 1 laughing gull and 1 loggerhead sea turtle.**

A massive deposit of drift algae on Fort Myers Beach on 10/13/18. Photo Town of Fort Myers Beach



Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	7.9	276	1.7	0.63
Shell Point	6.6	88.5	2.3	1.30
Causeway	9.5	62.2	2.6	1.47

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

Ongoing list not comprehensive *Endangered/Threatened Species*

American eels	Horseshoe crabs	Sand dollar
American oystercatcher	Jack fish sp.	Sanderling
Angel fish	Kemps ridley sea turtle	Sand Trout
Anhinga	Kingfish	Scaled sardine
Atlantic needlefish	Lane snapper	Sheepshead
Atlantic spadefish	Laughing gull	Seahorses
Batfish	Loggerhead sea turtle	Shame- faced crab
Black drum	Lookdown fish	Snook
Black tip shark	Mackerel	Snowy plover
Blenny	Manatees	Starfish
Blue crabs	Mallard ducks	Southern puffer
Bottlenose dolphin	Mangrove snapper	Southern stargazer
Brown pelican	Mantis shrimp	Spanish mackerel
Bull shark	Menhaden	Spotted eels
Calico crab	Minnows	Spotted seatrout
Catfish sp.	Moray Eel	Sting rays sp
Cobia	Muscovy duck	Stone crab
Common tern	Mullet sp.	Striped burr fish
Coquina	Ornate diamondback terrapin	Threadfin herring
Cowfish	Osprey	Tarpon
Crevalle jack	Pale spotted eels	Toadfish
Double crested cormorant	Parchment worms	Tri-colored Heron
Flounder	Permit	Tripletail
Gafftopsail catfish	Pig fish	Whale shark
Goby	Pinfish	Whiting
Goliath grouper	Florida Pompano	Yellow snake eel
Green sea turtle	Red drum/ Redfish	
Grey triggerfish	Red knot	
Grouper sp.	Red snapper	
Grunt sp.	Remora	
Hardhead catfish	Reticulate moray	

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **October 16 - 22, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee and at sample sites along the upstream Caloosahatchee.** The beach at the Cape Coral Yacht Club has reopened. The weekly average flow to the Caloosahatchee at S79 decreased to **1,343 cfs**. Red tide along the Lee County coastline has reduced to low levels.

USACE Action: On 10/5/18 the U.S. Army Corps of Engineers initiated a three week pulse release reducing average weekly flows from Lake Okeechobee beginning with **2,000 cfs** dropping to **1,500 cfs** then **1,000 cfs** at S-79, the WP Franklin Lock & Dam. No Lake releases will be directed to the St. Lucie Lock & Dam at S-80.

Recommendation: We support the Corps step down releases to the Caloosahatchee at **S-79** to acclimate the estuary as we transition to the dry season. **We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season for lake and estuary health. To achieve this we support dry season flows to the Caloosahatchee be maintained between 800 - 1,000 cfs to accommodate the El Niño conditions forecasted for this winter and spring.**

Lake Okeechobee Level: **13.98 ft. (Base Flow Sub-Band)**

Last week: **14.19 ft.**

Lake Okeechobee Inflow: **1,519 cfs**

Lake Okeechobee Outflow: **5,062 cfs**

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

Salinity Beautiful Island: **0.2 - 2.4 psu** (SCCF RECON Marker 18)

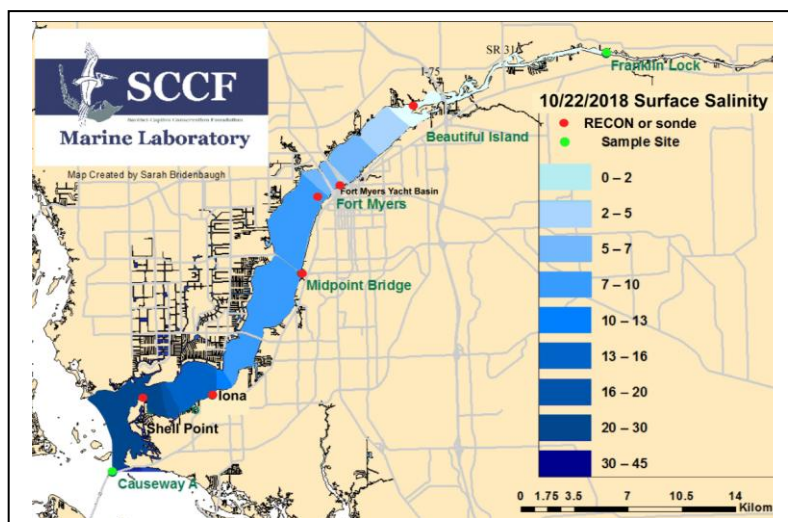
Previous week **0.2 - 0.4 psu**

Salinity Fort Myers: **7.3 – 13 psu** (SCCF RECON)

Previous week **2.0 - 8.9 psu**

Salinity Shell Point: **13 – 33 psu** (SCCF RECON)

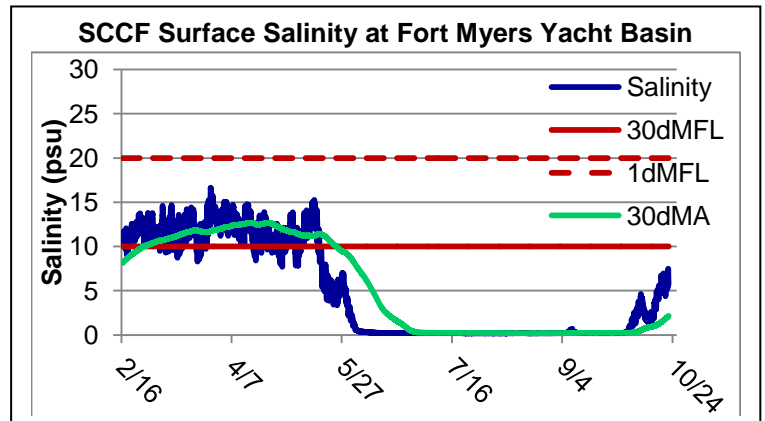
Previous week **13 - 33 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.2 - 2.4	< 5 psu	In Range
Fort Myers	7.3 - 13	<10 psu	In Range
Shell Point	13 – 33	25 - 32 psu	Low
Light (25% I _z depth meters)			
Fort Myers	0.55	1 meter	Low
Shell Point	1.26	2.2 meters	Low
Causeway	1.52	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **1,343 cfs**. Over the past 7 days **61,629 AF** of water was discharged from Lake Okeechobee; **34%** to the Caloosahatchee at **S-77**, **1.5%** to the St Lucie at **S-80**, **61%** was discharged south to the **EAA**, **3.2%** was discharged through the **L8** and **263* AF** was discharged to **S-310**. (* Missing flow data)

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
10/16/2018	1649	960	1425
10/17/2018	1193	857	785
10/18/2018	682	511	1198
10/19/2018	1354	823	956
10/20/2018	1639	1518	2172
10/21/2018	1626	1450	2318
10/22/2018	1261	775	1259
7 day Avg	1343	985	1445



Cyanobacteria bloom: On 10/23/18 the Lee County Environmental Lab found a **cyanobacteria bloom of *Microcystis* and *Dolichospermum*** upstream of the Franklin locks and presence of ***Microcystis* and *Dolichospermum*** at the Alva Boat Ramp, downstream of the locks and at the Davis Boat ramp.

Upstream of S-79/Franklin Conditions: On 10/16/18 the Olga Water Treatment plant reported chlorides of **50 mg/l**, apparent color **115 CU** and turbidity **3.1 NTU**. No visible algae at the plant intake. The plant is online at 1,400 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **5.1 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Water column chlorophyll** spiked up to over **20 ug/L** at the Ft. Myers RECON.

Lower Estuary Conditions: The average salinity at Shell Point was **25 psu**, in the suitable range for oysters and seagrasses. **Light levels were too low for submersed plants growing at depth in the river and around the Causeway.**

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	29.3 – 30.5	2.9 – 8.6	10.6 – 14.7	1.7 – 4.0
Tarpon Bay	27.3 – 32.6	4.2 – 7.7	10.6 – 20.3	1.7 – 7.6
Wildlife Drive	30.3 – 31.7	0.4 – 15.3	-----	1.1 – 8.8
Wulfert Flats	24.7 – 30.6	4.0 – 9.4	-----	3.4 – 33.9

Beach Conditions: Reduced amounts of drift algae continues to wash up on Ft Myers beach with dead horseshoe crabs.

Wildlife recovery in coastal waters and beaches around Sanibel has been observed the past week with the reduction in red tide. A dramatic increase in sightings of wildlife including bait fish, jack, snook, tarpon, sheepshead, dolphins, manatees, pelicans, terns, gulls, osprey and bald eagles.

Red Tide: On 10/19/18 the Florida Fish and Wildlife Conservation Commission **reported the Florida red tide organism, *Karenia brevis*, increased in Pinellas and Sarasota counties, reported** very low concentrations in Lee, and Collier counties. A bloom lingers in northwest Florida and continues along the Atlantic east coast of Florida. **Access to a new FWC daily red tide sample map can be accessed: <http://myfwc.com/redtidestatus>**

No red tide was found in SCCF samples from the Gulf, beaches or the estuary.

Wildlife Impacts: The past week **SCCF recovered 3 dead sea turtles: 2 loggerheads from Sanibel and 1 juvenile Kemp's ridley**. CROW, the wildlife hospital on Sanibel treated **5 new patients with red tide symptoms; 3 double crested cormorants, 1 ruddy turnstone, 1 laughing gull.**

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	26	278	6.2	0.55
Shell Point	3.5	103	1.7	1.26
Causeway	2.2	75.1	1.3	1.52

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

*Ongoing list not comprehensive **Endangered/Threatened Species***

American eels	Grunt sp.	Red snapper
American oystercatcher	Hardhead catfish	Remora
Anchovies	Horseshoe crabs	Reticulate moray
Angel fish	Jack fish sp.	Sand dollar
Anhinga	Kemps ridley sea turtle	Sanderling
Atlantic needlefish	Kingfish	Sand Trout
Atlantic spadefish	Lane snapper	Scaled sardine
Batfish	Laughing gull	Sheepshead
Black drum	Loggerhead sea turtle	Seahorses
Black tip shark	Lookdown fish	Shame- faced crab
Blenny	Mackerel	Snook
Blue crabs	Manatees	Snowy plover
Bottlenose dolphin	Mallard ducks	Starfish
Brown pelican	Mangrove snapper	Southern puffer
Bull shark	Mantis shrimp	Southern stargazer
Calico crab	Menhaden	Spanish mackerel
Catfish sp.	Minnows	Spotted eels
Cobia	Moray Eel	Spotted seatrout
Common tern	Muscovy duck	Sting rays sp
Coquina	Mullet sp.	Stone crab
Cowfish	Ornate diamondback terrapin	Striped burr fish
Crevalle jack	Osprey	Threadfin herring
Double crested cormorant	Pale spotted eels	Tarpon
Flounder	Parchment worms	Toadfish
Gafftopsail catfish	Permit	Tri-colored Heron
Goby	Pig fish	Tripletail
Goliath grouper	Pinfish	Whale shark
Green sea turtle	Florida Pompano	Whiting
Grey triggerfish	Red drum/ Redfish	Yellow snake eel
Grouper sp.	Red knot	

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns - Town of Fort Myers Beach
Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **October 23 - 29, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee and at sample sites along the upstream Caloosahatchee.** The weekly average flow to the Caloosahatchee at S79 decreased to **1,008 cfs**. Red tide persists in background to medium concentrations along the Lee County coastline.

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7 day average pulse release of **1,000 cfs** measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: We appreciate the Corps step down releases to the Caloosahatchee at S-79 and recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 cfs in preparation for El Niño conditions forecasted for this winter and spring. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season for lake and estuary health.

Lake Okeechobee Level: 13.72 ft. (Base Flow Sub-Band)

Last week: 13.98 ft.

Lake Okeechobee Inflow: 311 cfs

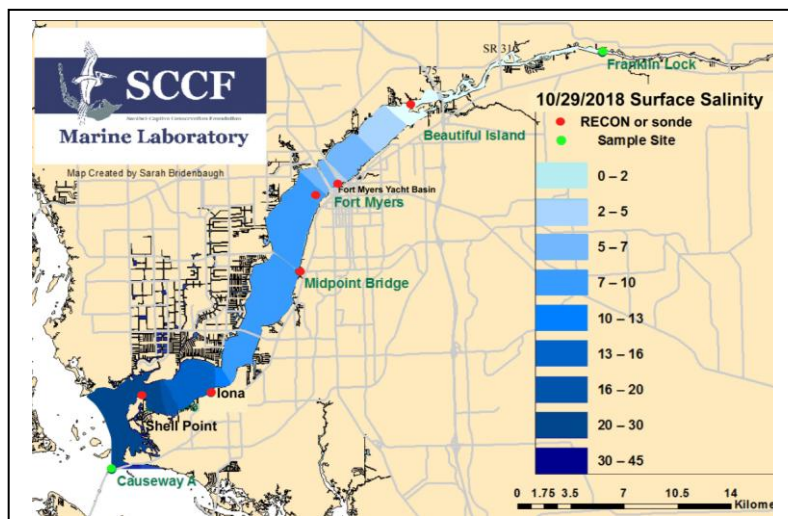
Lake Okeechobee Outflow: 5,533 cfs

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

Salinity Beautiful Island: 1.2 – 3.7 psu (SCCF RECON Marker 18) **Previous week** 0.2 - 2.4 psu

Salinity Fort Myers: 5.6- 12 psu (SCCF RECON) **Previous week** 7.3 – 13 psu

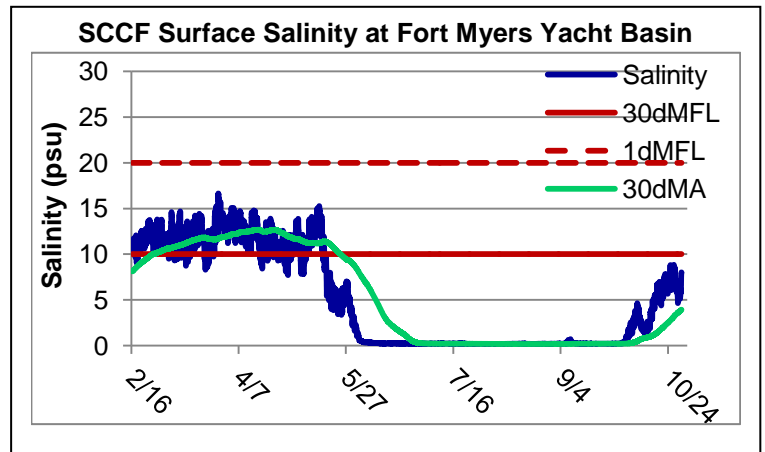
Salinity Shell Point: 16 – 32 psu (SCCF RECON) **Previous week** 13 - 33 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	1.2 – 3.7	< 5 psu	In Range
Fort Myers	5.6- 12	<10 psu	In Range
Shell Point	16 – 32	25 - 32 psu	In Range
Light (25% I _z depth meters)			
Fort Myers	0.60	1 meter	Low
Shell Point	1.25	2.2 meters	Low
Causeway	1.54	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **1,008 cfs**. Over the past 7 days **67,719 AF** of water was discharged from Lake Okeechobee; **25%** to the Caloosahatchee at **S-77**, **1 %** to the St Lucie at **S-80**, **68%** was discharged south to the **EAA**, **5%** was discharged through the **L8** and **533* AF** was discharged to **S-310**. (* Missing flow data)

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
10/23/2018	845	642	1090
10/24/2018	485	404	1104
10/25/2018	118	91	334
10/26/2018	889	745	1510
10/27/2018	1624	975	1669
10/28/2018	1696	906	975
10/29/2018	1399	892	1557
7 day Avg	1008	665	1177



Cyanobacteria bloom: On 10/30/18 the Lee County Environmental Lab found a cyanobacteria bloom of *Microcystis*, *Dolichospermum* and *Planktothrix* upstream of the Franklin locks and presence of *Microcystis Dolichospermum* and *Planktothrix* downstream of the locks and at the Davis Boat ramp.

Upstream of S-79/Franklin Conditions: On 10/16/18 the Olga Water Treatment plant reported chlorides of **50 mg/l**, apparent color **106 CU** and turbidity **2.59 NTU**. No visible algae at the plant intake. The plant is online at 1,400 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **6.8 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Water column chlorophyll** spiked over **40 ug/L** at the Ft. Myers RECON during a *Skeletonema* bloom.

Lower Estuary Conditions: The average salinity at Shell Point was **25 psu**, in the suitable range for oysters and seagrasses. **Dense clumps of macroalgae** were covering the bottom in much of Tarpon Bay 10/29/18.

J.N. "Ding" Darling NWR:

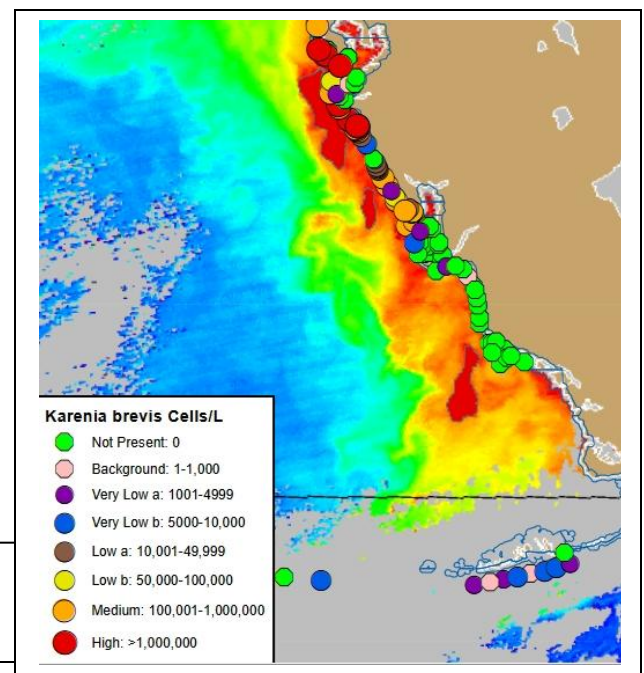
Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	28.0 – 31.0	2.4 – 9.3	11.8 – 16.2	1.9 – 5.0
Tarpon Bay	28.2 – 32.7	3.6 – 7.2	9.7 – 19.4	1.7 – 6.7
Wildlife Drive	29.8 – 32.5	0.9 – 8.8	-----	0.4 – 15.4
Wulfert Flats	25.7 – 31.8	3.4 – 66.3	-----	3.9 – 9.4

Red Tide: On 10/26/18 the Florida Fish and Wildlife Conservation Commission reported the Florida red tide organism, *Karenia brevis*, persists on Florida's Southwest, Northwest, and East coasts. Concentrations increased from Pinellas through Lee counties. A FWC daily red tide sample map can be accessed: <http://myfwc.com/redtidestatus>. Sanibel Sea School found low and medium levels of *Karenia* on east Sanibel beaches during the week.

Wildlife Impacts:

CROW, the wildlife hospital on Sanibel treated **6 new patients with red tide symptoms; 4 double crested cormorants, 1 mottled duck and 1 laughing gull.**

Suspected *Karenia* patches offshore are shown as red polygons outlined in black in image from 10/29/18 NOAA HAB report.



Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	17	272	3.6	0.60
Shell Point	4.8	97.7	1.7	1.25
Causeway	3.1	69.2	1.3	1.54

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB- San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

American eels	Grunt sp.	Red snapper
American oystercatcher	Hardhead catfish	Remora
Anchovies	Horseshoe crabs	Reticulate moray
Angel fish	Jack fish sp.	Sand dollar
Anhinga	Kemps ridley sea turtle	Sanderling
Atlantic needlefish	Kingfish	Sand Trout
Atlantic spadefish	Lane snapper	Scaled sardine
Batfish	Laughing gull	Sheepshead
Black drum	Loggerhead sea turtle	Seahorses
Black tip shark	Lookdown fish	Shame- faced crab
Blenny	Mackerel	Snook
Blue crabs	Manatees	Snowy plover
Bottlenose dolphin	Mallard ducks	Starfish
Brown pelican	Mangrove snapper	Southern puffer
Bull shark	Mantis shrimp	Southern stargazer
Calico crab	Menhaden	Spanish mackerel
Catfish sp.	Minnows	Spotted eels
Cobia	Moray Eel	Spotted seatrout
Common tern	Muscovy duck	Sting rays sp
Coquina	Mullet sp.	Stone crab
Cowfish	Ornate diamondback terrapin	Striped burr fish
Crevalle jack	Osprey	Threadfin herring
Double crested cormorant	Pale spotted eels	Tarpon
Flounder	Parchment worms	Toadfish
Gafftopsail catfish	Permit	Tri-colored Heron
Goby	Pig fish	Tripletail
Goliath grouper	Pinfish	Whale shark
Green sea turtle	Florida Pompano	Whiting
Grey triggerfish	Red drum/ Redfish	Yellow snake eel
Grouper sp.	Red knot	

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **October 30 - November 5, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee has increased in Hendry County and is present at Lee County sample sites along the upstream Caloosahatchee.** Salinities in the estuary are rising quickly. The weekly average flow to the Caloosahatchee at S79 decreased to **990 cfs**. Red tide persists along the Lee County coastline and northern counties.

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7 day average pulse release of **1,000 cfs** measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: We appreciate the Corps step down releases to the Caloosahatchee at S-79. With rapidly rising salinities at Fort Myers we recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 cfs to prevent salinities above 10 psu at the Fort Myers Yacht Basin. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season for lake and estuary health.

Lake Okeechobee Level: 13.64 ft. (Base Flow Sub-Band)

Last week: 13.72 ft.

Lake Okeechobee Inflow: 408 cfs

Lake Okeechobee Outflow: 1,638 cfs

Weekly Rainfall: WP Franklin 0.39" Ortona 0.14"

Moore Haven 0.80"

Salinity Beautiful Island: 0.9 - 3.4 psu (SCCF RECON Marker 18)

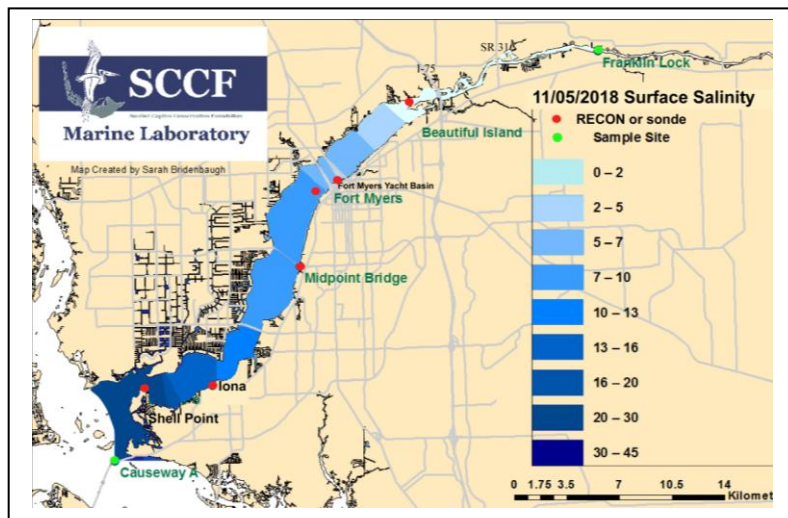
Previous week 1.2 – 3.7 psu

Salinity Fort Myers: 6.6 - 15 psu (SCCF RECON)

Previous week 5.6- 12 psu

Salinity Shell Point: 18 - 32 psu (SCCF RECON)

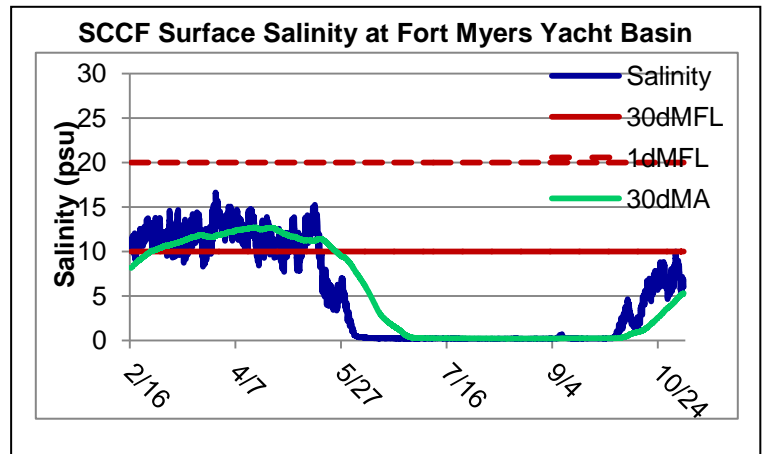
Previous week 16 – 32 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	0.9 – 3.4	< 5 psu	In Range
Fort Myers	6.6 - 15	<10 psu	In Range
Shell Point	18 – 32	25 - 32 psu	In Range
Light (25% Iz depth meters)			
Fort Myers	0.63	1 meter	Low
Shell Point	1.30	2.2 meters	Low
Causeway	1.61	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **990 cfs**. Over the past 7 days **42,904 AF** of water was discharged from Lake Okeechobee; **34.5%** to the Caloosahatchee at **S-77**, **0.5 %** to the St Lucie at **S-80**, **60%** was discharged south to the **EAA**, a **net 3%** was discharged through the **L8** and **2%** was discharged to **S-310**.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
10/30/2018	925	596	1551
10/31/2018	368	248	813
11/1/2018	44	227	509
11/2/2018	1148	662	1043
11/3/2018	1878	1082	1341
11/4/2018	1526	1364	1163
11/5/2018	1041	1028	1040
7 day Avg	990	658	1066



Cyanobacteria bloom: On 11/5/18 the Lee County Environmental Lab found **cyanobacteria presence of *Dolichospermum* and *Microcystis* at the Alva Boat Ramp and upstream of the Franklin locks**. Other sample sites were clear.

Upstream of S-79/Franklin Conditions: On 10/16/18 the Olga Water Treatment plant reported chlorides of **52 mg/l**, apparent color **85 CU** and turbidity **2.33 NTU**. No visible algae at the plant intake. The plant is online at 2,000 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **7.2 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island. **Water column chlorophyll spiked over 20 ug/L at the Beautiful Island RECON during a *Skeletonema* bloom.**

Lower Estuary Conditions: The average salinity at Shell Point was **26 psu**, in the suitable range for oysters and seagrasses.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	28.0 – 31.7	2.2 – 9.2	8.3 – 32.5	1.5 – 6.1
Tarpon Bay	27.9 – 33.9	4.4 – 7.6	8.0 – 18.2	1.5 – 6.3
Wildlife Drive	30.5 – 32.7	0.7 – 13.2	-----	1.0 – 8.2
Wulfert Flats	21.5 – 31.6	3.5 – 9.9	-----	10.1 – 69.3

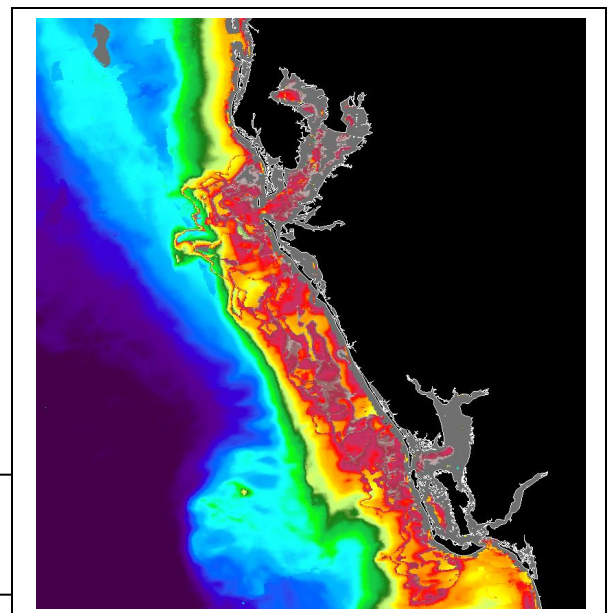
Red Tide: On 11/2/18 the Florida Fish and Wildlife Conservation Commission reported the Florida red tide organism, ***Karenia brevis***, persists on Florida's Southwest, Northwest, and East coasts. Background to medium concentrations were recorded off Lee County.

FWC daily red tide sample map can be accessed:

<http://myfwc.com/redtidestatus>.

Wildlife Impacts: CROW, the wildlife hospital on Sanibel treated **14 new patients with red tide symptoms; 11 double crested cormorants, 1 anhinga, 1 brown pelican and 1 royal tern.**

High concentrations of surface chlorophyll across 30 km of the shelf are shown in red on this 7 day composite NOAA Modis image on 11/4/18.



Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	11	267	3.0	0.63
Shell Point	3.8	92.6	2.5	1.30
Causeway	3.2	62.6	1.7	1.61

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB- San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

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Black drum	Loggerhead sea turtle	Sheepshead
Black tip shark	Lookdown fish	Seahorses
Blenny	Mackerel	Shame- faced crab
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Common tern	Muscovy duck	Spotted seatrout
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Cowfish	Ornate diamondback terrapin	Stone crab
Crevalle jack	Osprey	Striped burr fish
Double crested cormorant	Pale spotted eels	Threadfin herring
Flounder	Parchment worms	Tarpon
Gafftopsail catfish	Permit	Toadfish
Goby	Pig fish	Tri-colored Heron
Goliath grouper	Pinfish	Tripletail
Green sea turtle	Florida Pompano	Whale shark
Grey triggerfish	Red drum/ Redfish	Whiting
Grouper sp.	Red knot	Yellow snake eel

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **November 6 - 12, 2018**

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: **A Cyanobacteria bloom persists in Lake Okeechobee and has increased in Hendry County and is present at Lee County sample sites along the Caloosahatchee upstream of S-79.** Salinities in the estuary are rising quickly. The weekly average flow to the Caloosahatchee at S-79 increased to **1,022 cfs**. Red tide persists along the Lee County coastline and northern counties.

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7 day average pulse release of **1,000 cfs** measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: With increasing salinities at Fort Myers we recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 cfs to prevent salinities above 10 psu at the Fort Myers Yacht Basin. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season to improve the ecology of the lake and protect the estuaries from harmful high-flow discharges associated with the impending el niño.

Lake Okeechobee Level: 13.50 ft. (Base Flow Sub-Band) **Last week:** 13.64 ft.

Lake Okeechobee Inflow: 282 cfs

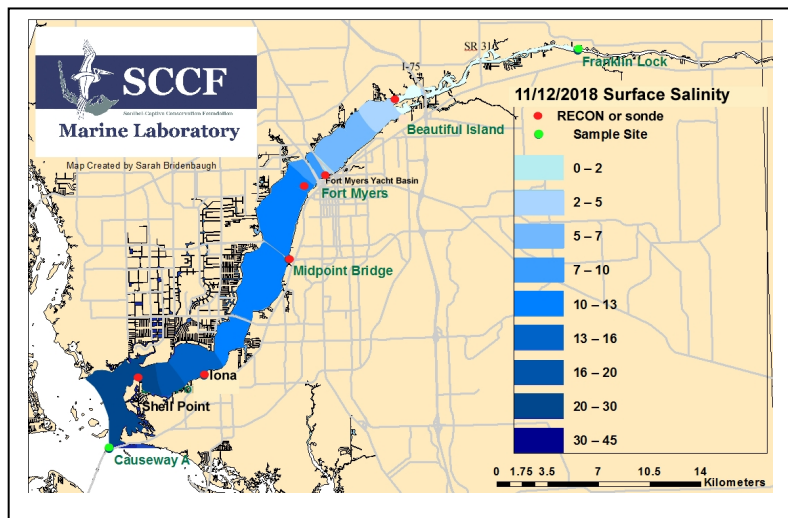
Lake Okeechobee Outflow: 2,718 cfs

Weekly Rainfall: WP Franklin 0.03" Ortona 0" Moore Haven 0.20"

Salinity Beautiful Island: ND (SCCF RECON Marker 18) **Previous week** 0.9 - 3.4 psu

Salinity Fort Myers: 8.8 - 14 psu (SCCF RECON) **Previous week** 6.6 - 15 psu

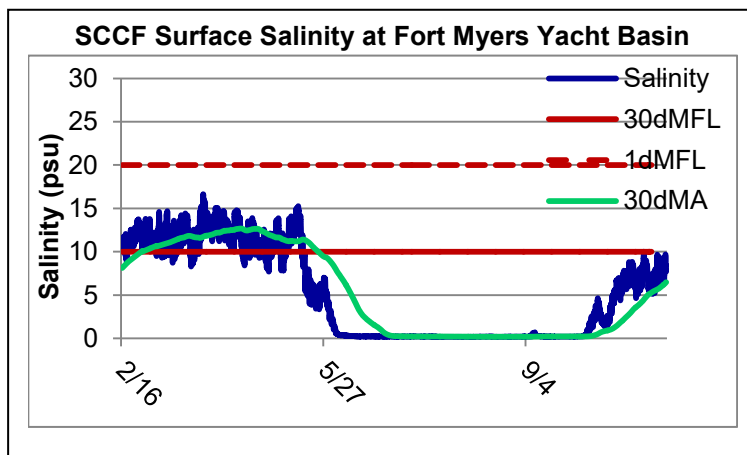
Salinity Shell Point: 19 - 33 psu (SCCF RECON) **Previous week** 18 - 32 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	In Range
Fort Myers	8.8 - 14	<10 psu	In Range
Shell Point	19 - 33	25 - 32 psu	In Range
Light (25% I _z depth meters)			
Fort Myers	0.70	1 meter	Low
Shell Point	1.42	2.2 meters	Low
Causeway	1.68	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **1,022 cfs**. Over the past 7 days **38,381 AF** of water was discharged from Lake Okeechobee; **38%** to the Caloosahatchee at **S-77**, **1%** to the St Lucie at **S-80**, **53%** was discharged south to the **EAA**, a **net 6%** was discharged through the **L8** and **2%** was discharged to **S-310**.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
11/6/2018	814	685	767
11/7/2018	513	380	644
11/8/2018	88	96	595
11/9/2018	1253	756	666
11/10/2018	1888	1465	1670
11/11/2018	1698	1371	1840
11/12/2018	899	640	1072
7 day Avg	1022	770	1036



Cyanobacteria bloom: On 11/13/18 the Lee County Environmental Lab found **cyanobacteria presence of *Dolichospermum*, *Microcystis* and *Planktothrix* at the Alva Boat Ramp**, upstream and downstream of the Franklin locks. Other sample sites were clear.

Upstream of S-79/Franklin Conditions: On 11/13/18 the Olga Water Treatment plant reported chlorides of **54 mg/l**, apparent color **83 CU** and turbidity **3.4 NTU**. No visible algae at the plant intake. The plant is online at 2,000 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **7.4 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **27 psu**, in the suitable range for oysters and seagrasses. Dissolved oxygen at Shell Point dropped into the hypoxic range during three days of the last week.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	30.7 – 31.8	2.0 – 8.9	9.5 – 32.5	1.5 – 4.5
Tarpon Bay	30.1 – 33.7	3.8 – 7.4	6.8 – 14.8	1.7 – 4.0

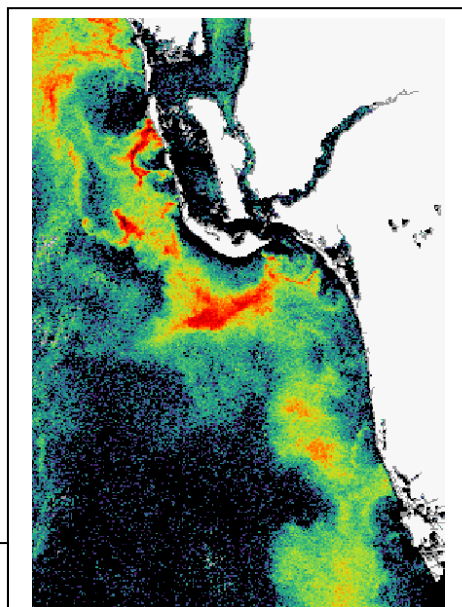
Red Tide: On 11/9/18 the Florida Fish and Wildlife Conservation Commission reported the **Florida red tide organism, *Karenia brevis***, persists on Florida's Southwest and Northwest coasts. High concentrations, >1,000,000 cells/liter were recorded from Pinellas to Lee Counties.

FWC daily red tide sample map can be accessed:

<http://myfwc.com/redtidestatus>. SCCF found medium concentrations of *Karenia* at Tarpon Beach on 11/13. Sanibel Sea School found medium concentrations of *Karenia* on eastern Sanibel beaches on 11/09, and low concentrations on 11/13.

Wildlife Impacts: **CROW**, the wildlife hospital on Sanibel treated **6 new patients with red tide symptoms; 2 double crested cormorants (1 died), 1 pie-billed grebe, 1 royal tern (Died), 1 laughing gull and 1 sandwich tern.**

Satellite image of chlorophyll from weekend (NOAA)



Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.0	239	2.4	0.70
Shell Point	3.2	82.3	1.7	1.42
Causeway	2.2	57.5	1.9	1.68

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB- San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

American eels	Grunt sp.	Red snapper
American oystercatcher	Hardhead catfish	Remora
Anchovies	Horseshoe crabs	Reticulate moray
Angel fish	Jack fish sp.	Royal tern
Anhinga	Kemps ridley sea turtle	Sand dollar
Atlantic needlefish	Kingfish	Sanderling
Atlantic spadefish	Lane snapper	Sand Trout
Batfish	Laughing gull	Scaled sardine
Black drum	Loggerhead sea turtle	Sheepshead
Black tip shark	Lookdown fish	Seahorses
Blenny	Mackerel	Shame- faced crab
Blue crabs	Manatees	Snook
Bottlenose dolphin	Mallard ducks	Snowy plover
Brown pelican	Mangrove snapper	Starfish
Bull shark	Mantis shrimp	Southern puffer
Calico crab	Menhaden	Southern stargazer
Catfish sp.	Minnows	Spanish mackerel
Cobia	Moray Eel	Spotted eels
Common tern	Muscovy duck	Spotted seatrout
Coquina	Mullet sp.	Sting rays sp
Cowfish	Ornate diamondback terrapin	Stone crab
Crevalle jack	Osprey	Striped burr fish
Double crested cormorant	Pale spotted eels	Threadfin herring
Flounder	Parchment worms	Tarpon
Gafftopsail catfish	Permit	Toadfish
Goby	Pig fish	Tri-colored Heron
Goliath grouper	Pinfish	Tripletail
Green sea turtle	Florida Pompano	Whale shark
Grey triggerfish	Red drum/ Redfish	Whiting
Grouper sp.	Red knot	Yellow snake eel

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex
James Evans & Holly Milbrandt - City of Sanibel
Keith Kibbey & Lesli Haynes - Lee County
Rae Burns – Town of Fort Myers Beach
Harry Phillips – City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **November 13 - 19, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee is present in Hendry County and at Lee County sample sites along the upstream Caloosahatchee and estuary.** The weekly average flow to the Caloosahatchee at S79 decreased to approximately **900 cfs*** (flow calculated). Red tide persists along the Lee County coastline and northern counties.

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7 day average pulse release of **1,000 cfs** measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: With increasing salinities at Fort Myers, we recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 CFS to prevent salinities above 10 PSU at the Fort Myers Yacht Basin. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season to improve the ecology of the lake and protect the estuaries from harmful high-flow discharges associated with the impending el Niño.

Lake Okeechobee Level: 13.34 ft. (Base Flow Sub-Band)

Last week: 13.50 ft.

Lake Okeechobee Inflow: 392 cfs

Lake Okeechobee Outflow: 2,848 cfs

Weekly Rainfall: WP Franklin **2.76"** Ortona **0.50"**

Moore Haven **0.25"**

Salinity Beautiful Island: **ND psu** (SCCF RECON Marker 18)

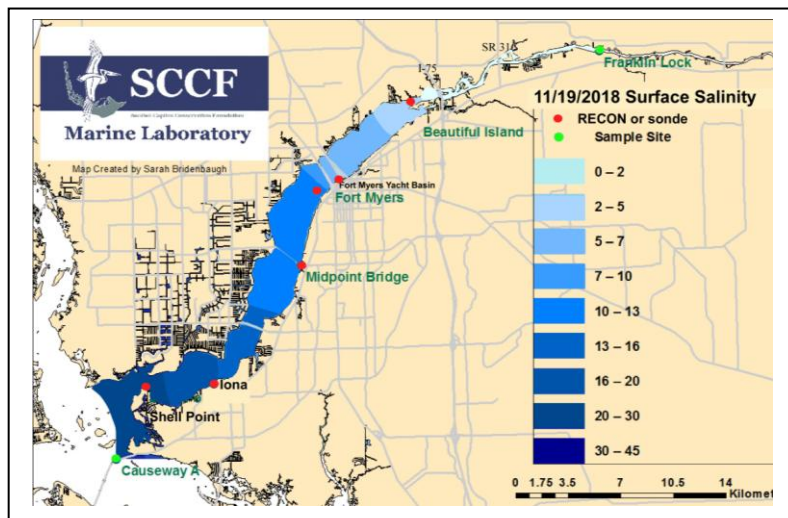
Previous week **ND psu**

Salinity Fort Myers: **8.7 - 17 psu** (SCCF RECON)

Previous week **8.8 - 14 psu**

Salinity Shell Point: **18 – 32 psu** (SCCF RECON)

Previous week **19 – 33 psu**

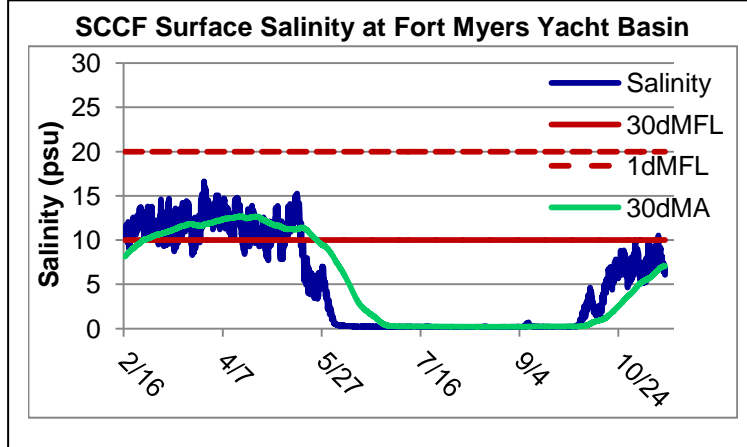


Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	In Range
Fort Myers	8.7 - 17	<10 psu	In Range
Shell Point	18 – 32	25 - 32 psu	In Range
Light (25% Iz depth meters)			
Fort Myers	0.70	1 meter	Low
Shell Point	1.33	2.2 meters	Low
Causeway	1.63	2.2 meters	Low

Flow & Water Quality: Flows to the Caloosahatchee Estuary at S-79 during the **past seven days** averaged **900 cfs** *. Over the past 7 days **31,210 AF** of water was discharged from Lake Okeechobee; **43%** to the Caloosahatchee at **S-77**, - **111AF** from the St Lucie at **S-80**, **49%** was discharged south to the **EAA**, **8%** was discharged through the **L8** and a **net 132 AF** was discharged to **S-310**.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
11/13/2018	678	439	668
11/14/2018	507	443	739
11/15/2018	228	240	330
11/16/2018	599 *	594	552
11/17/2018	1675 *	1513	1648
11/18/2018	1564	1172	1653
11/19/2018	1049	745	1108
7 day Avg	900 *	735	957

* calculated flow



Cyanobacteria bloom: On 11/21/18 the Lee County Environmental Lab found **cyanobacteria bloom** of *Dolichospermum*, *Microcystis* and *Planktothrix* at the Davis Boat ramp and presence of the same three species upstream and downstream of the Franklin locks.

Upstream of S-79/Franklin Conditions: On 11/20/18 the Olga Water Treatment plant reported chlorides of **52 mg/l**, apparent color **97 CU** and turbidity **2.98 NTU**. Trace of algae visible at the plant intake. The plant is online at 2,000 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **7.8 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **26 psu**, in the suitable range for oysters and seagrasses. **Hypoxia was recorded at Shell Point on 5 days during the week**. Drift algae was present on Sanibel between Lighthouse Beach and Tarpon Bay Beach on 11/18/18.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	30.7 – 32.5	2.9 – 9.6	8.3 – 11.4	1.5 – 6.1
Tarpon Bay	29.5 – 33.7	3.8 – 7.7	6.9 – 13.3	1.6 – 3.3

Beach Conditions: Dead blue crabs washed up on Sanibel from Lighthouse beach to Fulgur Street and at Newton Park on Fort Myers Beach the past week. **Two dead dolphin were recovered from Sanibel beaches**. Drift algae was reported accumulating along Sanibel beaches.

Red Tide: On 11/16/18 the Florida Fish and Wildlife Conservation Commission reported blooms of the Florida red tide organism, *Karenia brevis*, persists on Florida's Southwest and Northwest coasts. High concentrations, >1,000,000 cells/liter were recorded from Pinellas to Lee Counties. SCCF reported high concentrations of *Karenia* were found at Sanibel's Lighthouse (SSS) and Tarpon Beaches () on 11/14/18, but no *Karenia* was found at Tarpon beach on 11/16 or 11/19 (SCCF) *Peridinium* concentrations were elevated on 11/19 at Tarpon Beach.

Wildlife Impacts: CROW, the wildlife hospital on Sanibel treated **10 new patients with red tide symptoms; 5 double crested cormorants, 3 laughing gulls, 1 brown pelican and 1 sandwich tern**. SCCF recovered two dead loggerheads on Sanibel the past week.



Algae and dead crabs washed up on Fort Myers Beach. Town of Fort Myers Beach

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.6	237	2.7	0.70
Shell Point	3.9	92.6	1.5	1.33
Causeway	2.8	61.2	1.9	1.63

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB- San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

*Ongoing list not comprehensive **Endangered/Threatened Species***

American eels	Grunt sp.	Red snapper
American oystercatcher	Hardhead catfish	Remora
Anchovies	Horseshoe crabs	Reticulate moray
Angel fish	Jack fish sp.	Royal tern
Anhinga	Kemps ridley sea turtle	Sand dollar
Atlantic needlefish	Kingfish	Sanderling
Atlantic spadefish	Lane snapper	Sand Trout
Batfish	Laughing gull	Scaled sardine
Black drum	Loggerhead sea turtle	Sheepshead
Black tip shark	Lookdown fish	Seahorses
Blenny	Mackerel	Shame- faced crab
Blue crabs	Manatees	Snook
Bottlenose dolphin	Mallard ducks	Snowy plover
Brown pelican	Mangrove snapper	Starfish
Bull shark	Mantis shrimp	Southern puffer
Calico crab	Menhaden	Southern stargazer
Catfish sp.	Minnows	Spanish mackerel
Cobia	Moray Eel	Spotted eels
Common tern	Muscovy duck	Spotted seatrout
Coquina	Mullet sp.	Sting rays sp
Cowfish	Ornate diamondback terrapin	Stone crab
Crevalle jack	Osprey	Striped burr fish
Double crested cormorant	Pale spotted eels	Threadfin herring
Flounder	Parchment worms	Tarpon
Gafftopsail catfish	Permit	Toadfish
Goby	Pig fish	Tri-colored Heron
Goliath grouper	Pinfish	Tripletail
Green sea turtle	Florida Pompano	Whale shark
Grey triggerfish	Red drum/ Redfish	Whiting
Grouper sp.	Red knot	Yellow snake eel

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants
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Keith Kibbey & Lesli Haynes - Lee County
Rae Burns - Town of Fort Myers Beach
Harry Phillips - City of Cape Coral
Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **November 20 - 26, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee and at Lee County sample sites along the Caloosahatchee and estuary.** The weekly average flow to the Caloosahatchee at S79 increased to **1,150 cfs**. **Red tide persists along the SW coastline; 36 dead dolphins washed onto Lee and Collier counties beaches the past week and hundreds of dead mullet were reported at Cayo Costa State Park beach.**

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7 day average pulse release of **1,000 cfs** measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: We recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 CFS to prevent salinities above 10 PSU at the Fort Myers Yacht Basin. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season to improve the ecology of the lake and protect the estuaries from harmful high-flow discharges associated with the impending el Niño.

Lake Okeechobee Level: 13.22 ft. (Base Flow Sub-Band)

Last week: 13.34 ft.

Lake Okeechobee Inflow: 354 cfs

Lake Okeechobee Outflow: 2,642 cfs

Weekly Rainfall: WP Franklin **0.05"** Ortona **0.62"** Moore Haven **0"**

Salinity Beautiful Island: ND (SCCF RECON Marker 18)

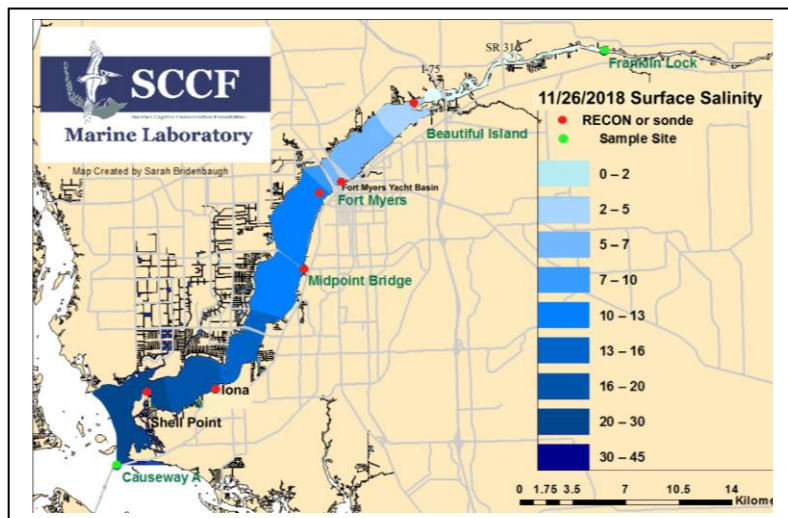
Previous week ND

Salinity Fort Myers: 9.0 – 15 psu (SCCF RECON)

Previous week 8.7 - 17 psu

Salinity Shell Point: 20 – 33 psu (SCCF RECON)

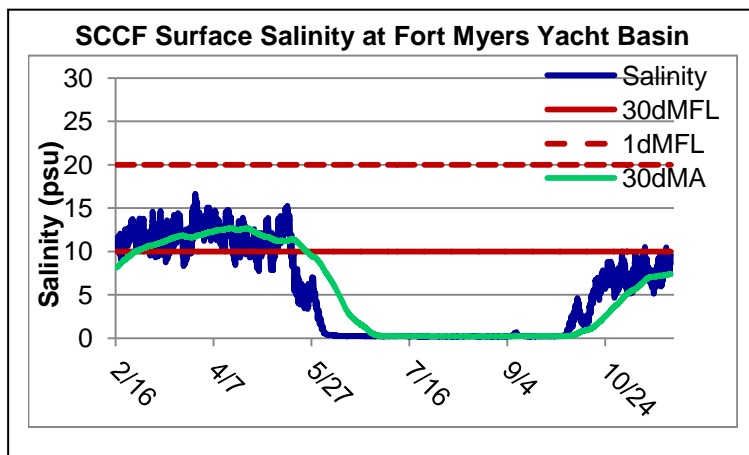
Previous week 18 – 32 psu



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	In Range
Fort Myers	9.0 - 15	<10 psu	In Range
Shell Point	20 - 33	25 - 32 psu	In Range
Light (25% Iz depth meters)			
Fort Myers	0.71	1 meter	Low
Shell Point	1.62	2.2 meters	Low
Causeway	1.93	2.2 meters	Low

Lake Okeechobee Flows: Over the past 7 days **33,835 AF** of water was discharged from Lake Okeechobee; **38%** to the Caloosahatchee at **S-77**, **53%** was discharged south to the **EAA**, **8%** was discharged through the **L8**, **1%** was discharged through **S-310** and **- 11 AF** back flowed from the St Lucie at **S-308**.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
11/20/2018	819	429	687
11/21/2018	566	299	305
11/22/2018	234	126	206
11/23/2018	2123	715	956
11/24/2018	1666	1482	1797
11/25/2018	1683	989	1490
11/26/2018	957	752	839
7 day Avg	1150	685	897



Cyanobacteria bloom: On 11/26/18 the Lee County Environmental Lab found **cyanobacteria blooms** of *Dolichospermum*, *Microcystis* and *Planktothrix* at both the Alva and Davis Boat ramps.

Upstream of S-79/Franklin Conditions: On 11/27/18 the Olga Water Treatment plant reported chlorides of **54 mg/l**, apparent color **102 CU** and turbidity **3.27 NTU**. Trace of algae visible at the plant intake. Plant is online at 2,000 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **8.0 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **28 psu**, in the suitable range for oysters and seagrasses. **Hypoxia** was recorded at **Shell Point** on 11/26/18.

J.N. "Ding" Darling NWR:

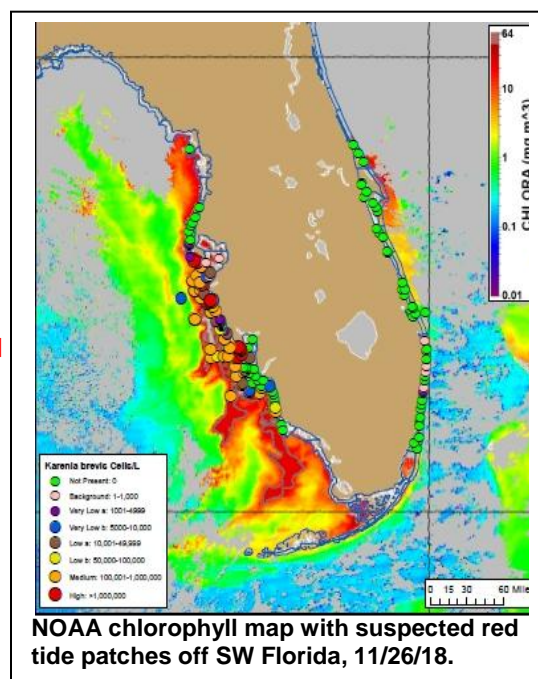
Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	30.6 – 32.5	2.4 – 7.7	7.9 – 11.4	1.6 – 3.2
Tarpon Bay	30.7 – 33.2	4.3 – 7.6	8.0 – 12.9	1.7 – 60.7

Beach Conditions: Hundreds of dead mullet were reported washed up on Cayo Costa State Park beach. Drift algae accumulating in deep drifts along Fort Myers Beach.

Red Tide: On 11/21/18 the Florida Fish and Wildlife Conservation Commission reported persistent blooms of the Florida red tide organism, *Karenia brevis*, along Florida's Southwest and Northwest coasts. High concentrations, >1,000,000 cells/liter, were recorded from Pinellas to Lee Counties.

Wildlife Impacts: The past week 36 dead dolphins stranded on Lee and Collier County beaches. SCCF recovered two dead loggerheads; 1 on Sanibel and 1 on Captiva. Fort Myers Beach recovered a dead kemp's ridley sea turtle. CROW, the wildlife hospital on Sanibel treated 24 new patients with red tide symptoms; 7 laughing gulls, 6 double crested cormorants, 5 royal terns, 3 brown pelicans, 1 anhinga, 1 black bellied plover and 1 lesser scaup.

Shellfish Harvesting: Closed on 11/20/18: #6222 Pine Island Sound Section 2 (Matlacha Pass) Shellfish Harvest Area, due to red tide.



Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.4	231	2.5	0.71
Shell Point	3.2	61.7	1.8	1.62
Causeway	2.5	42.9	1.2	1.93

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB- San Carlos Bay = 2.2 meters

Definition of 25% I_z: z where I is 25% of surface I.
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Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

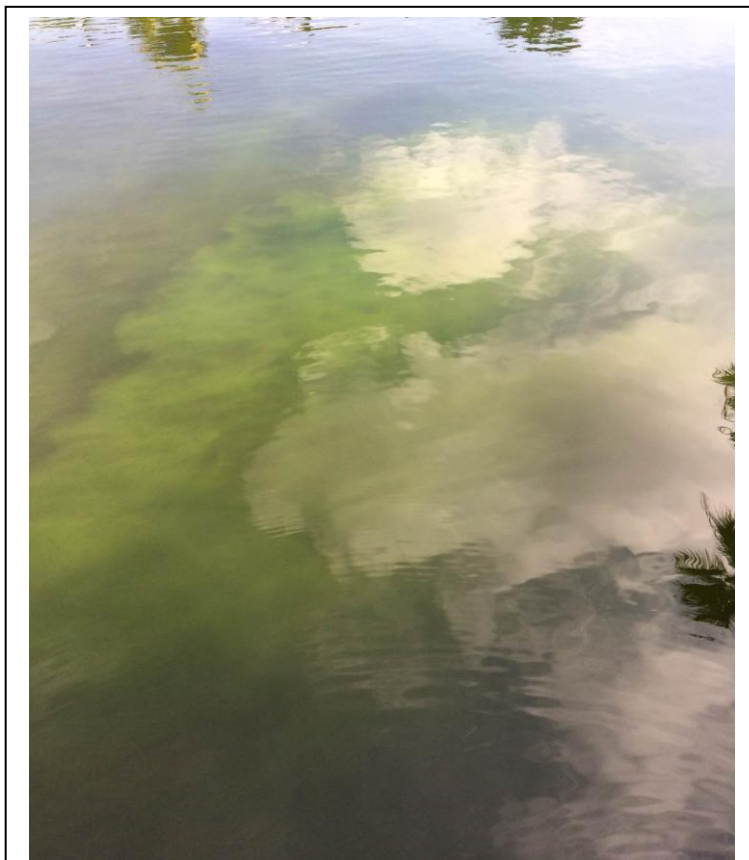
Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

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Black drum	Loggerhead sea turtle	Sheepshead
Black tip shark	Lookdown fish	Seahorses
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Bottlenose dolphin	Mallard ducks	Snowy plover
Brown pelican	Mangrove snapper	Starfish
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Calico crab	Menhaden	Southern stargazer
Catfish sp.	Minnows	Spanish mackerel
Cobia	Moray Eel	Spotted eels
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Flounder	Parchment worms	Tarpon
Gafftopsail catfish	Permit	Toadfish
Goby	Pig fish	Tri-colored Heron
Goliath grouper	Pinfish	Tripletail
Green sea turtle	Florida Pompano	Whale shark
Grey triggerfish	Red drum/ Redfish	Whiting
Grouper sp.	Red knot	Yellow snake eel



**Drift algae along Fort Myers Beach on 11/27/18.
Photo town of Fort Myers Beach**



**Possible blue green algae occurrence in Cape Coral
Marlboro Canal on 11/27/18. Photo City of Cape Coral**

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

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Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **November 27 - December 3, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee and at Lee County sample sites along the Caloosahatchee and estuary.** The weekly average flow to the Caloosahatchee at S79 decreased to **919 cfs**. **Red tide persists along the SW coastline causing fish kills and respiratory irritation on area beaches.**

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7-day average pulse release of 1,000 cfs measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: With salinities stabilizing at Fort Myers, we recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 CFS to prevent salinities above 10 PSU at the Fort Myers Yacht Basin. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season to improve the ecology of the lake and protect the estuaries from harmful high-flow discharges associated with the impending el Niño.

Lake Okeechobee Level: 13.02 ft. (Base Flow Sub-Band) Last week: 13.22 ft.

Lake Okeechobee Inflow: 280 cfs

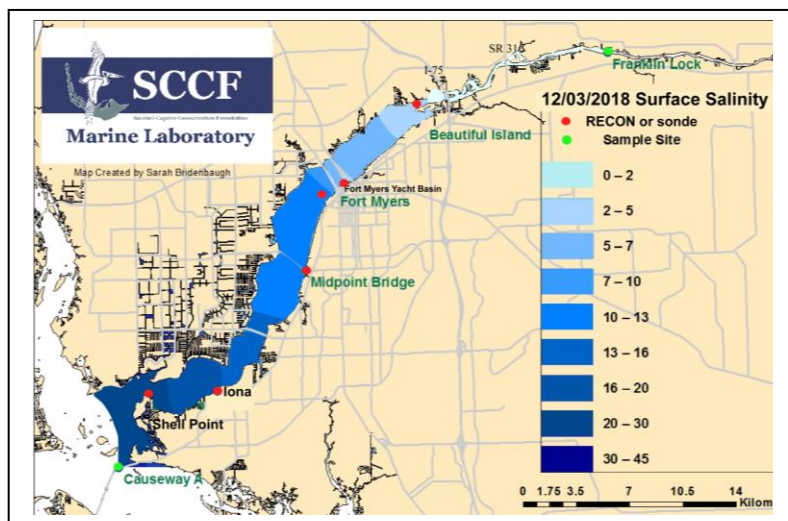
Lake Okeechobee Outflow: 3,156 cfs

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

Salinity Beautiful Island: ND (SCCF RECON Marker 18) **Previous week ND**

Salinity Fort Myers: 6.5 – 15 psu (SCCF RECON) **Previous week 9.0 – 15 psu**

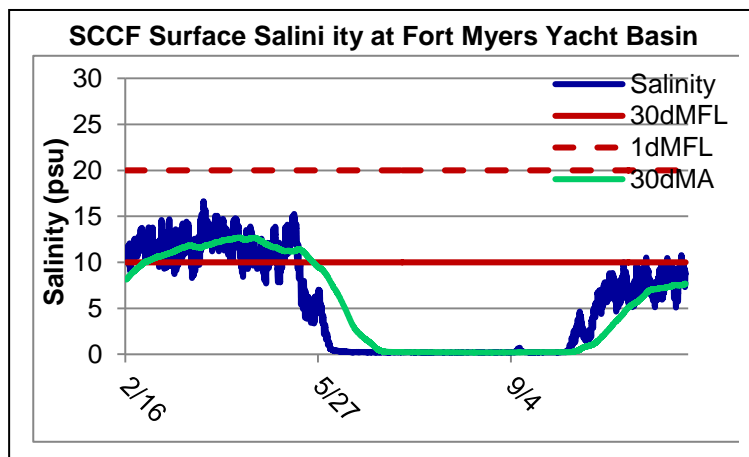
Salinity Shell Point: 19 – 33 psu (SCCF RECON) **Previous week 20 – 33 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	ND	< 5 psu	In Range
Fort Myers	6.5 - 15	<10 psu	In Range
Shell Point	19 – 33	25 - 32 psu	In Range
Light (25% Iz depth meters)			
Fort Myers	0.69	1 meter	Low
Shell Point	1.59	2.2 meters	Low
Causeway	2.00	2.2 meters	Low

Flow & Water Quality: Over the past 7 days **45,155 AF** of water was discharged from Lake Okeechobee; **37%** to the Caloosahatchee at **S-77**, - **554 AF** from the St Lucie at **S-80**, **55%** was discharged south to the **EAA**, **6%** was discharged through the **L8** and **2%** was discharged through **S-310**.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
11/27/2018	768	737	976
11/28/2018	538	733	1120
11/29/2018	110	236	880
11/30/2018	1106	717	849
12/1/2018	1478	1019	1522
12/2/2018	1333	1036	1554
12/3/2018	1201	988	1485
7 day Avg	919	781	1198



Cyanobacteria bloom: On 12/3/18 the Lee County Environmental Lab found **cyanobacteria blooms of *Microcystis*, *Dolichospermum* and *Planktothrix*** at the Alva Boat ramp and ***Microcystis*** presence at the Davis Boat Ramp. Sample sent to DEP.

Upstream of S-79/Franklin Conditions: On 11/27/18 the Olga Water Treatment plant reported chlorides of **55 mg/l**, apparent color **92 CU** and turbidity **2.87 NTU**. Trace of algae visible at the plant intake. Plant is online at 2,000 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **8.1 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **29 psu**, in the suitable range for oysters and seagrasses. **Hypoxia was recorded at Shell Point twice during the week.**

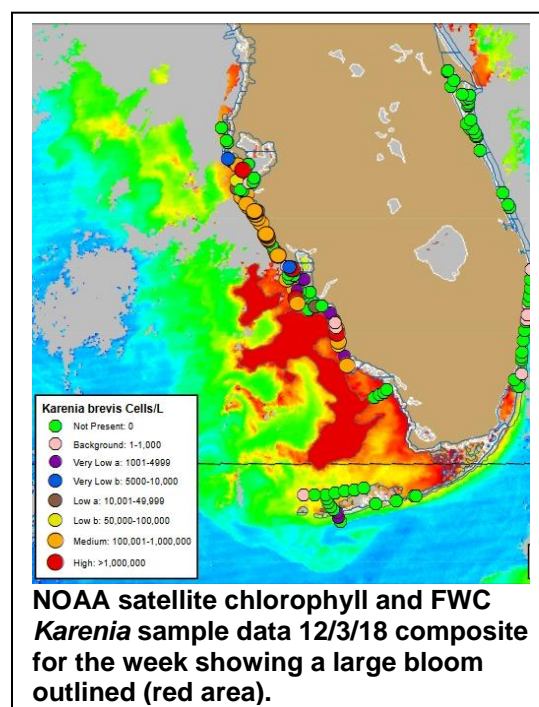
J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	31.2 – 33.5	3.8 – 10.2	5.6 – 14.7	1.6 – 3.4
Tarpon Bay	29.6 – 34.1	4.4 – 7.8	7.8 – 33.9	1.7 – 4.9

Red Tide: On 11/30/18 the Florida Fish and Wildlife Conservation Commission reported **patchy blooms of the Florida red tide organism, *Karenia brevis***, on Florida's Southwest coast. High concentrations, **>1,000,000 cells/liter** were recorded in Pinellas, Sarasota, Charlotte and Lee counties and medium concentrations in Manatee and Collier counties. Sanibel Sea School and SCCF found low and medium concentrations at Sanibel's Lighthouse, Donax, Bowman's and Tarpon Beaches. A NOAA satellite image shows a large area of *Karenia* offshore of Southwest Florida.

Wildlife Impacts: The past week SCCF recovered 1 dead loggerhead on Captiva. CROW, the wildlife hospital on Sanibel treated 25 new patients with red tide symptoms; 6 double crested cormorants, 6 laughing gulls, 6 royal terns, 2 brown pelicans, 2 black scoters, 1 white pelican, 1 osprey and 1 lesser scaup. Twelve died.

Shellfish Harvesting: Closed on 11/20/18: #6222 Pine Island Sound Section 2 (Matlacha Pass) Shellfish Harvest Area, due to red tide.



Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	15.1	225	3.3	0.69
Shell Point	3.2	66.5	1.4	1.59
Causeway	3.2	36.1	1.5	2.00

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands

Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

American eels	Grunt sp.	Red snapper
American oystercatcher	Hardhead catfish	Remora
Anchovies	Horseshoe crabs	Reticulate moray
Angel fish	Jack fish sp.	Royal tern
Anhinga	Kemps ridley sea turtle	Sand dollar
Atlantic needlefish	Kingfish	Sanderling
Atlantic spadefish	Lane snapper	Sand Trout
Batfish	Laughing gull	Scaled sardine
Black drum	Lesser scaup	Sheepshead
Black scoter	Loggerhead sea turtle	Seahorses
Black tip shark	Lookdown fish	Shame- faced crab
Blenny	Mackerel	Snook
Blue crabs	Manatees	Snowy plover
Bottlenose dolphin	Mallard ducks	Starfish
Brown pelican	Mangrove snapper	Southern puffer
Bull shark	Mantis shrimp	Southern stargazer
Calico crab	Menhaden	Spanish mackerel
Catfish sp.	Minnows	Spotted eels
Cobia	Moray Eel	Spotted seatrout
Common tern	Muscovy duck	Sting rays sp
Coquina	Mullet sp.	Stone crab
Cowfish	Ornate diamondback terrapin	Striped burr fish
Crevalle jack	Osprey	Threadfin herring
Double crested cormorant	Pale spotted eels	Tarpon
Flounder	Parchment worms	Toadfish
Gafftopsail catfish	Permit	Tri-colored Heron
Goby	Pig fish	Tripletail
Goliath grouper	Pinfish	Whale shark
Green sea turtle	Florida Pompano	Whiting
Grey triggerfish	Red drum/ Redfish	Yellow snake eel
Grouper sp.	Red knot	

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

Paul Tritaik - J.N. "Ding" Darling National Wildlife Refuge (NWR) Complex

James Evans & Holly Milbrandt - City of Sanibel

Keith Kibbey & Lesli Haynes - Lee County

Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **December 4 - 10, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee and at Lee County sample sites along the Caloosahatchee and estuary.** The weekly average flow to the Caloosahatchee at S79 increased to 1,114 cfs. Red tide persists along the SW coastline.

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7 day average pulse release of **1,000 cfs** measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: With salinities stabilizing at Fort Myers, we recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 CFS to prevent salinities above 10 PSU at the Fort Myers Yacht Basin. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season to improve the ecology of the lake and protect the estuaries from harmful high-flow discharges associated with the impending el Niño.

Lake Okeechobee Level: 12.87 ft. (Base Flow Sub-Band)

Last week: 13.02 ft.

Lake Okeechobee Inflow: 280 cfs

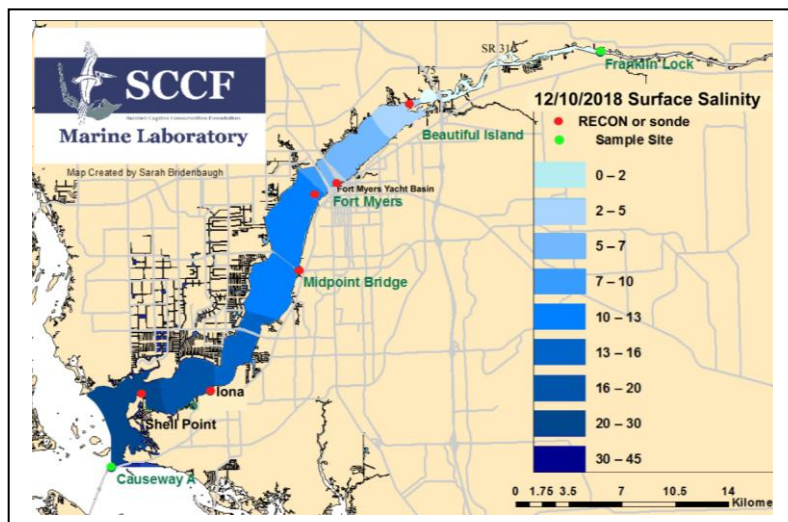
Lake Okeechobee Outflow: 2,856 cfs

Weekly Rainfall: WP Franklin **0.27"** Ortona **0.15"** Moore Haven **0.15"**

Salinity Beautiful Island: ND (SCCF RECON Marker 18) **Previous week ND**

Salinity Fort Myers: 9.5 - 16 psu (SCCF RECON) **Previous week 6.5 – 15 psu**

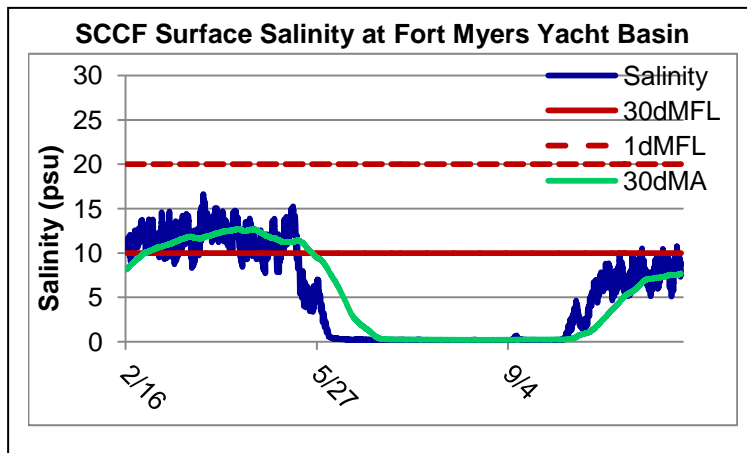
Salinity Shell Point: 18 – 33 psu (SCCF RECON) **Previous week 19 – 33 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/ Low
Beautiful Is	ND	< 5 psu	In Range
Fort Myers	9.5 - 16	<10 psu	In Range
Shell Point	18 – 33	25 - 32 psu	In Range
Light (25% I _z depth meters)			
Fort Myers	0.73	1 meter	Low
Shell Point	1.51	2.2 meters	Low
Causeway	2.06	2.2 meters	Low

Flow & Water Quality: Over the past 7 days **37,434 AF** of water was discharged from Lake Okeechobee; **43%** to the Caloosahatchee at **S-77, -820 AF** from the St Lucie at **S-80, 48%*** was discharged south to the **EAA, 7%** was discharged through the **L8** and **2%** was discharged through **S-310**. (*missing data at S-352)

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
12/4/2018	987	769	969
12/5/2018	722	583	558
12/6/2018	182	178	436
12/7/2018	1393	596	715
12/8/2018	2001	1027	1799
12/9/2018	1381	1019	1567
12/10/2018	1129	1011	1220
7 day Avg	1114	740	1038



Cyanobacteria bloom: On 12/11/18 the Lee County Environmental Lab found **cyanobacteria blooms of *Microcystis*, *Dolichospermum* and *Planktothrix*** upstream of the Franklin Lock and at the Davis Boat ramp and presence downstream of the Lock. Samples of the bloom were sent to FDEP.

Upstream of S-79/Franklin Conditions: On 12/11/18 the Olga Water Treatment plant reported chlorides of **54 mg/l**, apparent color **96 CU** and turbidity **2.96 NTU**. Trace of algae visible at the plant intake. Plant is online at 2,000 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **6.8 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point was **28 psu**, in the suitable range for oysters and seagrasses.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	30.9 – 33.6	3.2 – 9.0	5.8 – 10.6	1.6 – 3.7
Tarpon Bay	30.7 – 33.7	4.8 – 7.9	8.4 – 21.2	2.0 – 6.8
Wulfert Flats	16.9 – 34.5	4.6 – 9.6	-----	-----
Wildlife Drive	32.5 – 34.6	1.8 – 13.5	-----	0.5 – 3.1

Red Tide: On 12/7/18 the Florida Fish and Wildlife Conservation Commission **reported blooms of the Florida red tide organism, *Karenia brevis*, on Florida's Southwest coast. High concentrations, were recorded in Collier County with medium concentrations in Pinellas, Manatee, Sarasota and Lee Counties. Fish kills and respiratory issues were reported in these counties.**

Wildlife Impacts: CROW, the wildlife hospital on Sanibel treated **14 new patients with red tide symptoms; 1 double crested cormorants, 3 laughing gulls, 4 royal terns, 2 brown pelicans, 1 black scoters, 1 white pelican, 1 sandwich tern and 1 ring billed gull. Six died.** Beaches scattered with dead crabs and fish.

Shellfish Harvesting: **Closed** on 11/20/18: #6222 Pine Island Sound Section 2 (Matlacha Pass) Shellfish Harvest Area, due to red tide.



Sanderling feeding on red tide killed crab at Lighthouse Beach 12/10/18. Photo SCCF

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.7	221	2.8	0.73
Shell Point	2.9	74.9	1.3	1.51
Causeway	2.2	33.8	1.6	2.06

Target light penetration: CE- Caloosahatchee Estuary = 1 m

SCB- San Carlos Bay = 2.2 meters

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands
Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

American eels	Hardhead catfish	Reticulate moray
American oystercatcher	Horseshoe crabs	Royal tern
Anchovies	Jack fish sp.	Ruddy turnstone
Angel fish	Kemps ridley sea turtle	Sand dollar
Anhinga	Kingfish	Sanderling
Atlantic needlefish	Lane snapper	Sand Trout
Atlantic spadefish	Laughing gull	Sandwich tern
Batfish	Lesser scaup	Scaled sardine
Black drum	Loggerhead sea turtle	Sheepshead
Black scoter	Lookdown fish	Seahorses
Black tip shark	Mackerel	Shame- faced crab
Blenny	Manatees	Snook
Blue crabs	Mallard ducks	Snowy plover
Bottlenose dolphin	Mangrove snapper	Starfish
Brown pelican	Mantis shrimp	Southern puffer
Bull shark	Menhaden	Southern stargazer
Calico crab	Minnows	Spanish mackerel
Catfish sp.	Moray Eel	Spotted eels
Cobia	Muscovy duck	Spotted seatrout
Common tern	Mullet sp.	Sting rays sp
Coquina	Ornate diamondback terrapin	Stone crab
Cowfish	Osprey	Striped burr fish
Crevalle jack	Pale spotted eels	Threadfin herring
Double crested cormorant	Parchment worms	Tarpon
Flounder	Permit	Toadfish
Gafftopsail catfish	Pig fish	Tri-colored Heron
Goby	Pinfish	Tripletail
Goliath grouper	Florida Pompano	Whale shark
Green sea turtle	Red drum/ Redfish	Whiting
Grey triggerfish	Red knot	Yellow snake eel
Grouper sp.	Red snapper	
Grunt sp.	Remora	

MEMORANDUM

To: USACE Colonel Andrew D. Kelly, LTC Jennifer A. Reynolds, Richard McMillen, Kim Taplin, SFWMD Governing Board, Executive Director Ernie Marks, Terrie Bates, Susan Gray, DEP Secretary Noah Valenstein

From: Periodic Scientists Conference Call Participants

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James Evans & Holly Milbrandt - City of Sanibel

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Rae Burns – Town of Fort Myers Beach

Harry Phillips – City of Cape Coral

Rae Ann Wessel & Rick Bartleson, Ph.D.-Sanibel Captiva Conservation Foundation

Subject: Caloosahatchee & Estuary Condition Report

Reporting Period: **December 11 - 17, 2018**

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

Caloosahatchee Condition Summary: **Cyanobacteria persists in Lake Okeechobee and at Lee County sample sites along the Caloosahatchee and estuary.** The weekly average flow to the Caloosahatchee at S79 decreased to **973 cfs**. **Red tide persists along the SW Florida coastline.**

USACE Action: On 10/26/18 the U.S. Army Corps of Engineers initiated a 7 day average pulse release of **1,000 cfs** measured at S-79, the WP Franklin Lock & Dam. No Lake releases are directed to the St. Lucie Lock & Dam at S-80.

Recommendation: With salinities stabilizing at Fort Myers, we recommend dry season flows to the Caloosahatchee be maintained between 800 - 1,000 CFS to prevent salinities above 10 PSU at the Fort Myers Yacht Basin. We encourage the Corps and SFWMD to allow the lake to drop lower than average by the start of the next rainy season to improve the ecology of the lake and protect the estuaries from harmful high-flow discharges associated with the impending el Niño.

Lake Okeechobee Level: 12.75 ft. (Base Flow Sub-Band)

Last week: 12.87 ft.

Lake Okeechobee Inflow: 262 cfs

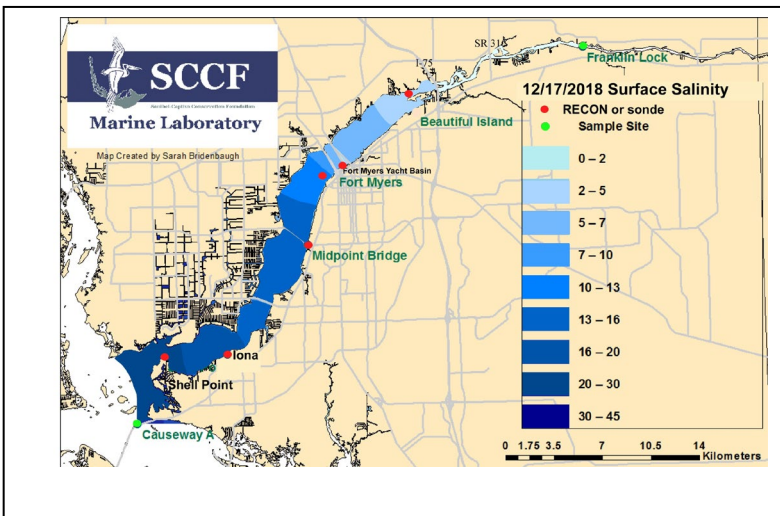
Lake Okeechobee Outflow: 3,055 cfs

Weekly Rainfall: WP Franklin **0.41"** Ortona **0.35"** Moore Haven **0.31"**

Salinity Beautiful Island: **1.6-3.5 psu** (SCCF RECON Marker 18) **Previous week ND**

Salinity Fort Myers: **8.5 – 16 psu** (SCCF RECON) **Previous week 9.5 – 16 psu**

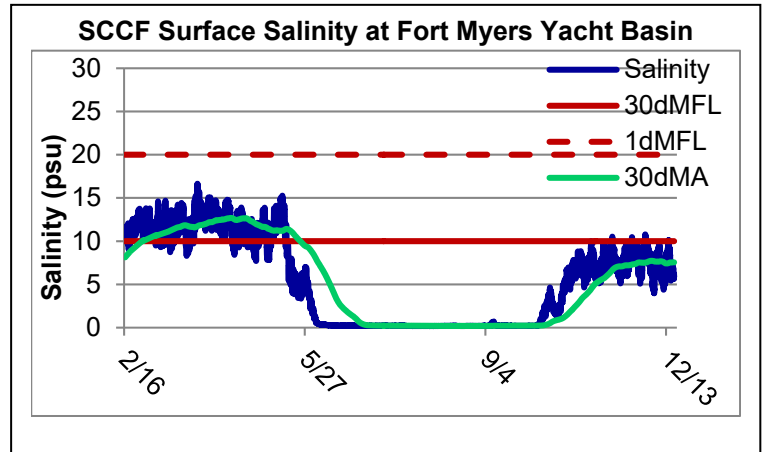
Salinity Shell Point: **18 – 33 psu** (SCCF RECON) **Previous week 18 – 33 psu**



Salinity (psu)			
	Current Value	Sustainable Range	High/Low
Beautiful Is	1.6 - 3.5	< 5 psu	In Range
Fort Myers	8.5 – 16	<10 psu	In Range
Shell Point	18 – 33	25 - 32 psu	In Range
Light (25% Iz depth meters)			
Fort Myers	0.83	1 meter	Low
Shell Point	1.57	2.2 meters	Low
Causeway	1.90	2.2 meters	Low

Flow & Water Quality: Over the past 7 days **62,718 AF** of water was discharged from Lake Okeechobee; **46%** to the Caloosahatchee at **S-77**, **1%** to the St Lucie at **S-80**, **43%** was discharged south to the **EAA**, **8%** was discharged through the **L8** and **2%** was discharged through **S-310**. *Flows at S-352 not reported.

ACOE Daily Reports			
Date	S79 Flow (cfs)	S78 Flow (cfs)	S77 Flow (cfs)
12/11/2018	832	419	1222
12/12/2018	393	150	459
12/13/2018	81	149	135
12/14/2018	1160	711	804
12/15/2018	1754	1036	1236
12/16/2018	1348	1040	1190
12/17/2018	1244	1030	1182
7 day Avg	973	648	890



Cyanobacteria bloom: On 12/18/18 the Lee County Environmental Lab found **cyanobacteria blooms of *Microcystis*, *Dolichospermum* and *Planktothrix*** upstream of the Franklin Lock and at the Davis Boat ramp and presence at the Alva Boat Ramp. Samples of the bloom were sent to FDEP.

Upstream of S-79/Franklin Conditions: On 12/18/18 the Olga Water Treatment plant reported chlorides of **57 mg/l**, apparent color **82 CU** and turbidity **2.75 NTU**. Trace of algae visible at the plant intake. Plant is online at 2,000 GPM.

Upper Estuary Conditions: The weekly average salinity at the Fort Myers Yacht Basin was **7.6 psu**, in the suitable range for tape grass growing between the Caloosahatchee US 41 Bridges and Beautiful Island.

Lower Estuary Conditions: The average salinity at Shell Point, **26 psu**, was in the suitable range for oysters and seagrasses.

J.N. "Ding" Darling NWR:

Monitor Site	Salinity (psu)	Diss O ₂ (mg/L)	FDOM (qsde)	Chlorophyll (µg/L)
McIntyre Creek	31.4 – 32.5	3.8 – 10.0	6.5 – 10.1	1.8 – 4.4
Tarpon Bay	30.0 – 34.0	5.5 – 7.8	8.9 – 15.5	1.8 – 9.0

Red Tide: On 12/14/18 the Florida Fish and Wildlife Conservation Commission **reported blooms of the Florida red tide organism, *Karenia brevis***, on Florida's Southwest coast from Pinellas to Collier counties. Background to low concentrations were recorded from Sarasota through Collier County. Fish kills and respiratory issues were reported in these counties. Sanibel Sea School and SCCF found no *Karenia* in beach samples.

Wildlife Impacts: CROW, the wildlife hospital on Sanibel treated **15 new patients with red tide symptoms; 2 double crested cormorants, 2 laughing gulls, 7 royal terns, 2 brown pelicans, 1 sandwich tern and 1 Foster's tern. Eight died.**

Manatees: Lee County Park staff report up to 33 manatees in the warm water of the Orange River and FPL cooling canal the past week. River water temperatures ranged from 71 to 78° F.

Shellfish Harvesting: Opened on 12/19/18: #6222 Pine Island Sound Section 2 (Matlacha Pass) Shellfish Harvest Area.



Sick Royal Tern brought to CROW on 12/15/18. Photo by SCCF.

Caloosahatchee Stations	Chlorophyll (µg/L)	fDOM (qse)	Turbidity (NTU)	25% lo depth (meters)
Target Values	< 11	CE <70 SCB <11	CE < 18 SCB < 5	CE = 1 m SCB = 2.2m
Fort Myers	8.0	180.5	3.6	0.83
Shell Point	3.3	67.1	1.5	1.57
Causeway	1.1	45.8	1.5	1.90

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

Dead wildlife: Caloosahatchee, estuary, canals, back bays, Sanibel, Fort Myers beaches & Islands
Lee County has removed 2,200 tons of dead marine life. Sanibel = 425 tons

Ongoing list not comprehensive **Endangered/Threatened Species**

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Atlantic spadefish	Laughing gull	Sandwich tern
Batfish	Lesser scaup	Scaled sardine
Black drum	Loggerhead sea turtle	Sheepshead
Black scoter	Lookdown fish	Seahorses
Black tip shark	Mackerel	Shame- faced crab
Blenny	Manatees	Snook
Blue crabs	Mallard ducks	Snowy plover
Bottlenose dolphin	Mangrove snapper	Starfish
Brown pelican	Mantis shrimp	Southern puffer
Bull shark	Menhaden	Southern stargazer
Calico crab	Minnows	Spanish mackerel
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Cobia	Muscovy duck	Spotted seatrout
Common tern	Mullet sp.	Sting rays sp
Coquina	Ornate diamondback terrapin	Stone crab
Cowfish	Osprey	Striped burr fish
Crevalle jack	Pale spotted eels	Threadfin herring
Double crested cormorant	Parchment worms	Tarpon
Flounder	Permit	Toadfish
Gafftopsail catfish	Pig fish	Tri-colored Heron
Goby	Pinfish	Tripletail
Goliath grouper	Florida Pompano	Whale shark
Green sea turtle	Red drum/ Redfish	Whiting
Grey triggerfish	Red knot	Yellow snake eel
Grouper sp.	Red snapper	
Grunt sp.	Remora	