Disclaimer: Information contained in the report addresses environmental conditions only and is not the official South Florida Water Management District operations recommendation or decision.

MEMORANDUM

- **TO:** John Mitnik, Chief, Operations, Engineering and Construction Bureau Paul Linton, Chief, Operations Section
- **FROM:** SFWMD Staff Environmental Advisory Team

DATE: August 29, 2017

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

Below average rains through Thursday before a temporary increase on Friday. High pressure between low pressure systems will dominate our weather for the next few days. Look for afternoon activity to focus over the Upper Kissimmee today, interior south tomorrow, and west on Thursday as steering winds change from southwesterly to light to southeasterly as the high builds in. Moisture increases on Friday with a corresponding increase in showers/storms then.

<u>Kissimmee</u>

Tuesday morning stages and departures from schedule were 56.5 feet (at schedule) in East Lake Toho, 53.5 feet (at schedule) in Lake Toho, and 52.0 feet (1.0 feet above schedule) in Kissimmee Cypress Hatchineha; S65A headwater stage was 46.5 feet. Tuesday morning discharges were 1,013 cfs at S65, 1,476 cfs at S65A, and 2,375 cfs at S65E. Dissolved oxygen concentration in the Kissimmee River averaged 2.0 milligrams per liter (mg/L) for the week. Kissimmee River mean floodplain depth on Sunday was 1.24 feet.

Lake Okeechobee

Lake stage is 13.51 feet NGVD having increased by 0.12 feet over the past week and 0.79 feet over the past month. Conditions appear less favorable for algal blooms in the northeastern and eastern portions of the Lake compared to earlier in the month, though the western shoreline along the Indian Prairie marsh still shows high potential for blooms based on NOAA's cyanobacteria monitoring product derived from OLCI sensor satellite data. Snail kites continue to nest late on the Lake in the same area of Moonshine Bay as last year, where managers have been actively removing dense vegetation since 2015. Nearly ³/₄ of the remaining nest activity in the state this season is in Moonshine Bay.

Estuaries

Total discharge to the St. Lucie estuary averaged 893 cfs over the past week with 0 cfs (0%) coming from Lake Okeechobee. Salinities at the three monitoring stations were slightly higher compared to the week before. Water was stratified with higher salinities near the bottom compared to the surface. The seven-day average salinity at the US1 Bridge is in the good range for adult oysters (conditions improved over the last week). Chlorophyll a concentration levels at LOBO stations (maintained by FAU) remain low (on average <7 μ g/L). Low oxygen levels (<3 mg/L) were recorded at HR1 monitoring station. Cyanobacteria bloom potential

status is unknown this week, due to a heave cloud coverage on NOAA satellite maps. No other types of algal blooms were reported for the estuary this week.

Total inflow to Caloosahatchee estuary averaged 4,656 cfs over the past week with 0 cfs coming from the Lake. The 30-day moving average surface salinity is 0.3 at Val I-75 and Ft. Myers. Salinity at Val I-75 is forecast to be 0.3 in two weeks with no flow through S-79. Salinity conditions between Val I-75 and Ft. Myers are good for tape grass. Salinity conditions are in the good range for adult oysters at Sanibel and Shell Point and in the poor range at Cape Coral (conditions deteriorated since last week). Chlorophyll a measurements by the Sanibel-Captiva Conservation Foundation did not show high chlorophyll a concentration levels neat Ft. Myers over the last week. Low oxygen levels (<3 mg/L) were recorded at Ft. Myers. Cyanobacteria bloom potential status is unknown this week, due to a heavy cloud coverage on NOAA maps. *Karenia brevis* (red tide dinoflagellate) was not observed in samples collected along the Lee County coast.

Stormwater Treatment Areas

Over the past week, the STAs/FEBs did not receive Lake releases. The total amount of Lake releases sent to the STAs/FEBs in WY2018 (since May 1, 2017) is approximately 19,600 acrefeet. Most STA cells are at or above target depths. Operational restrictions are in place for vegetation rehabilitation in STA-1E and STA-2. The nest of an Endangered Species Act protected species has been observed in STA-5/6. Due to basin runoff, it is recommended that no Lake releases be sent to the STAs/FEBs this week.

Everglades

Stages increased at all the gauges monitored for this report and depth modeling indicates all areas of the Everglades increased in stage over the last week except for portions of WCA-1 and Southern WCA-2A. Keeping depths below 2.5 feet at gauge 65 is important to moderate the stress to tree islands caused by flooding when durations last longer than 60-90 days. The depth on Sunday at that location was 3.24 feet, and has exceeded 2.5 feet for 71 days.

As of this weekend, salinities are decreasing across the bay with the largest weekly change in salinities occurring in the western nearshore area, which fell 4.9 psu. Salinities currently range from 22 psu in the US Highway 1 area to 43 psu in the western nearshore area. Current salinities are 1 to 15 psu above average with the western nearshore still furthest from average.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 1.23 inches of rainfall in the past week and the Lower Basin received 1.35 inches (SFWMD Daily Rainfall Report 8/28/2017).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in Table1.

Table 1. Departures from KCOL flood regulation (F) or temporary schedules (T, A, or S) (feet NGVD). Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date:	8/29/2017												
					Schedule*	Regulation (R) or Target (S or T) Stage (feet)	Daily Departure (feet)						
Water Body	Disch Structure/Site w ave	Discharge (cfs), week's average**	Stage Monitoring Site***	Lake Stage (feet)			8/27/17	8/20/17	8/13/17	8/6/17	7/30/17	7/23/17	7/16/17
Lakes Hart and Mary Jane	S62	103	LKMJ	60.1	R	60.0	0.1	0.1	0.0	0.0	0.1	-0.1	0.0
Lakes Myrtle, Preston, and Joel	S57	2	S57	61.1	R	61.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Alligator Chain	S60	36	ALLI	63.2	R	63.2	0.0	0.0	0.0	0.0	-0.1	0.0	-0.5
Lake Gentry	S63	110	LKGT	60.9	R	61.0	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.4
East Lake Toho	S59	354	TOHOE	56.6	R	56.5	0.1	0.0	0.0	0.0	-0.1	0.1	-0.4
Lake Toho	S61	598	TOHOW, S61	53.5	R	53.5	0.0	0.0	0.0	0.1	-0.1	0.1	-0.1
Lakes Kissimmee, Cypress, and Hatchineha	S65	1152	KUB011, LKIS5B	52.0	R	51.0	1.0	0.9	0.8	0.7	0.2	-0.3	-1.1

* T = temporary schedule, R = USACE flood control schedule, S = temporary snail kite schedule, A = projected ascension line, N/A= not applicable or data not available.

** Seven-day average of weighted daily means through Sunday midnight.

*** Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported. DATA ARE PROVISIONAL

Lower Kissimmee Basin

Discharges and stages at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 12. Kissimmee River floodplain stages at selected stations are shown in Figure 13.

Table 2. Mean weekly discharge at S-65x structures, and mean weekly Phase I area river channel dissolved oxygen and floodplain mean water depth. Discharge and stage data are provisional real-time data from SFWMD OASyS DualTrend; reported values are averages through midnight of the Sunday prior to the report date unless otherwise specified.

Report Date:	8/29/2017											
N di settati s	1	Sunday's 1-	Sunday's 1- Weekly Average**									
IVIETTIC	Location	day average	8/27/17	8/20/17	8/13/17	8/6/17	7/30/17	7/23/17	7/16/17	7/9/17	7/2/17	6/25/17
Discharge (cfs)	S-65	1068	1152	958	1181	665	616	342	160	392	407	455
Discharge (cfs)	S-65A	1481	1448	1213	1298	1274	927	638	575	393	564	1291
Discharge (cfs)	S-65D****	2140	2032	2255	2154	2234	1180	1236	838	875	1715	1426
Discharge (cfs)	S-65E****	2125	2085	2276	2195	2319	1293	1321	886	915	1698	1462
DO concentration (mg/L)***	Phase I river channel	2.4	2.0	2.8	2.0	2.2	2.3	1.8	3.0	2.9	0.7	0.5
Mean depth (feet)*	Phase I floodplain	1.24	1.17	1.08	1.09	1.00	0.63	0.68	0.46	0.37	1.00	0.90

* 1-day spatial average from South Florida Water Depth Assessment Tool (SFWDAT).

** Seven-day average of weighted daily means through Sunday midnight.

*** DO is the average for manual sondes at PC62 and PC33; telemetry sondes have been taken offline.

**** S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S65E discharge combines S65E and S65EX1.

DATA ARE PROVISIONAL; N/A indicates that data were not available.

Water Management Recommendations

Kissimmee Bas	in Adaptive Recommendations and Operational Actions			
Date	Recommendation	Purpose	Outcome	Source
8/29/2017	No new recommendations.		N/A	
8/22/2017	No new recommendations.		N/A	
8/15/2017	No new recommendations.		N/A	
8/4/2017	Increase S65A discharge by 150 cfs to about 1400 cfs.	Reduce rate of stage rise in KCH.		SFWMD Water Mgt, KB Ops
8/1/2017	No new recommendations.		N/A	
7/25/2017	Hold current discharge at S65A, adjusting S65 discharge to maintain current flow to the Kissimmee River.	Maintain current S65A discharge.		SFWMD Water Mgt, KB Ops
7/23/2017	Increase S65A discharge slowly using Figure 8a toward the seasonal target of 1400 cfs. Hold at 1400 cfs while stage in KCH remains above 50 feet (+/- 0.2 foot).	Reduce current rapid rate of stage rise in KCH; provide Kissimmee River floodplain inundation if conditions stay wet.	Implemented	KB Ops
7/16/2017	Reduce S65A flow to ~600-650 cfs. As Pool A runoff diminishes keep S65A around 650 +/- 50 cfs by increasing flow from S65.	Maintain moderate discharge to the Kissimmee River from S65A while maintaining S65A headwater within its operating range using flow from S65.	Implemented	SFWMD Water Mgt, KB Ops
7/6/2017	Hold 450 cfs at S65A due to reduced forecast.	Reduced-rainfall forecast led to decision to hold 450 cfs at S65A rather than continuing to ramp up.	Implemented	KB Ops
7/5/2017	Increase S65A flow by 150 cfs today to 450 cfs and by another 150 cfs tomorrow.	Control stage in KCH and Pool A in anticipation of forecast significant rainfall; begin discharge rampup in anticipation of forecast rainfall.	Implemented	KB Ops
6/28/2017	Reduce S65A discharge by a maximum of 150 cfs per day until 300 cfs is reached.	Allow KCH stage to rise before transitioning to 2017 Wet Season discharge plan; facilitate DO recovery in the Kissimmee River by reducing depth in the river channel.	Implemented	КВ Орз
6/26/2017	Hold 800 cfs at S65A until further notice.	Maintain reduced discharge to allow stages in KRR project area to decline to facilitate DO recovery.	Implemented	KB Ops
6/22/2017	Reduce discharge by 150 cfs each day on Thursday 6/22, Friday 6/23, Saturday 6/24, and Sunday 6/25. After the Sunday reduction hold at approximately 800 cfs through Monday when new DO data should be available to help guide next steps.	Attempt to allow Kissimmee River dissolved oxygen concentration to rise.	Implemented	KB Ops
6/20/2017	Maintain 1400 cfs at S65A as KCH stage continues to rise. Supplement declining S65A basin runoff by increasing discharge at S65 as needed.	Transition from current operations to 2017 Wet Season discharge plan.	Implemented	KB Ops, SFWMD Water Management
6/15/2017	Attempt to slow the rates of stage rise in Lakes Toho and East Toho by increasing discharge from S59 into Toho and S61 into KCH.	Slow rates of rise in Lakes Toho and East Toho.	Implemented	KB Ops, SFWMD Water Management
6/15/2017	Increase discharge from S65A as necessary using the discharge rates of change table in Figure 8a.	Lower stage in Pool A following rainfall directly over the S65A Basin.	Implemented	SFWMD Water Management, KB Ops
6/13/2017	No new recommendations.			
6/6/2017	No new recommendations.			
5/30/2017	No new recommendations.			
5/22/2017	No new recommendations.			
5/15/2017	Reduce discharge at S65/S65A by 40-50 cfs	Reduce rate of stage decline in KCH while maintaining discharge to the Kissimmee River.	Implemented	KB Ops
5/9/2017	No new recommendations.			
5/3/2017	Reduce discharge at S65/S65A by 50 cfs	Reduce rate of stage decline in KCH		SFWMD Water Management/KB Ops



KCOL Hydrographs (through Sunday midnight)





Figure 2.













Figure 6.



Limits on R S65/S65A I	ate of Discharge Change at During Dry Season 2016-2017
Discharge	Rate of Change Limits for S65/S65A (revised 11/16/16).
Q (cfs)	Maximum rate of increase or decrease (cfs/day)
300-650	75
650-1700	150
1700-3000	300
>3000	1000

Figure 8. Limits on rate of discharge change at S65/S65A for the 2016-2017 Dry Season.



Figure 9. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years or in Wet Season 2015.



Figure 10. Mean daily Dissolved Oxygen, discharge, temperature and rainfall in the Phase I river channel.



Figure 11. Phase I river channel dissolved oxygen and water temperature (measured at 15 minute intervals) and Pool BC daily rainfall.



Figure 12. Phase I area floodplain water depths for this week, one month ago, and two months ago. Note that the WDAT color-coding has been modified to accommodate greater water depths; these maps are not directly comparable to Kissimmee Basin WDAT maps published prior to Jan. 16, 2012.





Insert. Water depth at selected northern Kissimmee River floodplain sites on (A) the PC5's transect and (B) the PC4's transect, with S65A discharge.

Kissimmee River Hydrographs



Figure 13. Discharge at S65, stages at five monitoring stations in the Phase I area of the Kissimmee River floodplain, and headwater stage at S65-C since January 1, 2015. The most recent data (~2 weeks) are provisional real-time data from SFWMD DualTrend; previous data are from SFWMD DB-HYDRO (validated). Dashed lines are ground elevations.



Figure 14. The Kissimmee Basin

LAKE OKEECHOBEE

Total

6648

2.7

According to the USACE web site, Lake Okeechobee stage is at 13.51 feet NGVD for the period ending at midnight on August 28, 2017. This value is based on the use of four interior Lake stations (L001, L005, L006 and LZ40) and four perimeter stations (S308, S352, S4 and S133). Lake stage increased by 0.12 feet over the past week and is 0.79 feet higher than it was a month ago and 1.20 feet lower than it was a year ago (Figure 1). The Lake is currently in the Base Flow sub-band (Figure 2). According to RAINDAR, 1.02 inches of rain fell directly over the Lake during the week Aug 22 - Aug 28 (Figure 3). Most of the northeastern watershed had similar amounts of rainfall, but areas to the south, north, and west were wetter, generally receiving about 1.5 - 3.0 inches.

Average daily inflows and outflows for the last week are detailed below, as well as the approximate change in Lake stage from each major structure's total weekly flows (midnight August 22, 2017 to midnight August 28, 2017).

INFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)	OUTFLOWS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)
S65E & S65EX1	2099	0.9	S77	0	0.0
S71 & 72	242	0.1	S308	-319	-0.1
S84 & 84X	815	0.3	S351	0	0.0
Fisheating Creek	415	0.2	\$352	0	0.0
S154	52	0.0	6062	0	0.0
S191	144	0.1	5354	0	0.0
S133 P	0	0.0	L8	-98	0.0
S127 P	0	0.0	ET	1957	0.8
S129 P	13	0.0	Total	1539	0.7
S131 P	3	0.0			
S135 P	47	0.0			
S2 P	6	0.0			
S3 P	0	0.0			
S4 P	0	0.0			
C5	0	0.0			
Rainfall	2811	1.0			

Average daily outflows for the Lake have been negative since the beginning of June with the exception of one week in mid-August; a total of -418 average daily cfs flowed back into the Lake through outflow structures, with -319 cfs through S308 and -98 cfs from the L8 canal through Culvert 10A. There were no discharges through S77 or the S350 structures. The corrected evapotranspiration value based on the L006 weather platform solar radiation data was 0.71 inches for the week.

Late-August satellite imagery indicates that the bloom potential may have declined somewhat, specifically in the northeastern and eastern shorelines, based on NOAA's cyanobacteria monitoring product derived from the OLCI satellite sensor. A portion of the west/northwest shoreline along the Indian Prairie Marsh continues the pattern seen through most of July and August, with high potential for blooms (Figure 4).

Water Management Recommendations

The Lake is 13.51 feet NGVD having increased 0.12 feet over the past week due to rainfall and inflows mainly from the Kissimmee River basin. The submerged and emergent vegetation communities recovering in the nearshore region after high water levels in February and October of 2016 are still vulnerable to rapid ascension rates that may limit new growth.

Activities that maintain a moderate ascension rate in Lake Okeechobee will remain ecologically beneficial at this time and would be protective of the Lake's emergent wetland and submerged aquatic flora and its associated fauna.



Figure 1



Figure 2



SFWMD PROVISIONAL RAINDAR 7-DAY BASIN RAINFALL ESTIMATES FROM: 0515 EST, 08/22/2017 THROUGH: 0515 EST, 08/29/2017

Figure 3

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lake Okeechobee Algal Bloom Potential



Figure 4

LAKE ISTOKPOGA

Lake Istokpoga stage is 38.52 feet NGVD as of midnight August 28, 2017 and is currently 0.05 feet above its regulation schedule of 38.47 feet NGVD (Figure 5). Average daily flows into the Lake from Josephine Creek over the past week were up slightly to 173 cfs from 151 cfs, but no data have been reported for Arbuckle Creek since July 4. Average daily discharge from S68 and S68X this past week decreased slightly to 925 cfs, from the previous week's flow of 1,030 cfs. According to RAINDAR, 3.35 inches of rain fell in the Lake Istokpoga basin from August 22 - August 28.



Figure 5

ESTUARIES

St. Lucie Estuary

Over the past week, provisional flows averaged about 0 cfs at S-80, 291 cfs flowing into Lake Okeechobee, 156 cfs at S-49 on C-24, 132 cfs at S-97 on C-23, and 148 cfs from Ten Mile Creek at the Gordy Road Structure. Average inflow from tidal basin tributaries is estimated to be 457 cfs (Figures 1 and 2). Total inflow averaged about 893 cfs last week and 1,448 cfs over last month.

Over the past week, salinity increased throughout the estuary, although the increase was minimal (Table 1, Figures 3 and 4). The seven-day moving average salinity of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 12.4. Salinity conditions in the middle estuary are in the good range for the adult eastern oysters.

Table 1. Seven-day average salinity at three monitoring stations in the St. Lucie Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for adult eastern oysters (*Crassostrea virginica*) in the middle estuary.

Sampling Site	Surface	Bottom	Envelope
HR1 (N. Fork)	4.6 (3.9)	10.4 (8.3)	NA ¹
US1 Bridge	10.9 (9.0)	13.9 (11.6)	10.0-26.0
A1A Bridge	20.5 (18.5)	25.8 (24.9)	NA ¹

¹Envelope not applicable

Continuous monitoring of water quality is conducted at HR1 in the North Fork. Weekly dissolved oxygen data are summarized in Table 2.

Table 2. Weekly dissolved oxygen conditions at HR1 in the North Fork of the St. Lucie Estuary.

Location	Depth	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
HR1	surface	5.06	1.62	7.76
HR1	bottom	1.59	0.95	5.09

Continuous monitoring of water quality is conducted at five Land/Ocean Biogeochemical Observatory (LOBO) stations located in the St. Lucie Estuary and maintained by Florida Atlantic University/Harbor Branch Oceanographic Institute (FAU-HBOI). Data are summarized in Table 3 and station location map is shown in Figure 5.

Table 3. Weekly ranges of Instrument Depth, Chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at five FAU-HBOI LOBO stations located in the St. Lucie Estuary.

Location	Depth (m)	Chlorophyll <i>a</i> (µg/l)	Average DO (mg/l)	Minimum DO (mg/l)	Maximum DO (mg/l)
SF2	2.53	4.92 - 8.17	3.71	0.47	9.34
SF	1.49	4.53 - 6.57	5.06	3.99	6.15
NF	2.01	3.98 - 5.99	4.78	2.94	6.98
ME	1.77	3.31 - 6.16	5.11	4.19	6.76
IRL-SLE	3.45	1.04 - 5.39	5.53	4.85	7.36

NOAA satellite imagery was unavailable this week in the St. Lucie estuary due to cloud coverage.

Caloosahatchee Estuary

During the past week, provisional flows averaged approximately 0 cfs at S-77, 238 cfs at S-78, and 2,123 cfs at S-79. Average inflow from tidal basin tributaries is estimated to be 2,533 cfs (Figures 6 & 7). Total inflow averaged 4,656 cfs last week and 3,710 cfs over last month.

Over the past week in the estuary, surface salinity increased to Cape Coral Bridge and decreased downstream (Table 4, Figures 8 and 9). The seven-day average salinity values are within the poor range for adult oysters at Cape Coral, and within the good range at Shell Point and Sanibel (Figure 10). The 30-day moving average surface salinity is 0.3 at Val I-75 and 0.3 at Ft. Myers. Salinity at Val I-75 is forecast to be 0.3 in two weeks with no flow through S-79 (Figure 11). Salinity conditions between Val I-75 and Ft. Myers are good for tape grass.

Table 4. Seven-day average salinity at six monitoring stations in the Caloosahatchee Estuary. Current average is in bold face type, previous average in parentheses. The envelope reflects the preferred salinity range for tape grass (*Vallisneria americana*) at Val I-75 and for adult eastern oysters (*Crassostrea virginica*) elsewhere.

Sampling Site	Surface	Bottom	Envelope
S-79 (Franklin Lock)	0.3 (0.2)	0.3 (0.2)	NA ¹
*Val 175	0.3 (0.2)	0.3 (0.3)	0.0-5.0 ²
Ft. Myers Yacht Basin	0.4 (0.3)	0.5 (0.3)	NA
Cape Coral	4.3 (3.5)	5.3 (4.6)	10.0-30.0
Shell Point	13.5 (14.6)	13.8 (15.5)	10.0-30.0
Sanibel	23.0 (24.9)	26.8 (25.9)	10.0-30.0

¹Envelope not applicable and ²Envelope is based on a 30-day average.
*Val I75 is temporarily unavailable (salinity values are estimated using models developed for this site).

Monitoring data collected by the River, Estuary and Coastal Observing Network of Sanibel-Captiva Conservation Foundation using continuous sensors are summarized in Table 5 as concentration ranges of chlorophyll *a* and dissolved oxygen at Beautiful Island, Ft. Myers, and Shell Point in the Caloosahatchee Estuary.

Table 5. Weekly ranges of Chlorophyll *a* (a measure of algal biomass) and dissolved oxygen concentrations at three monitoring stations maintained by the Sanibel-Captiva Conservation Foundation.

	RECON Monitoring Stations					
	Beautiful Island	Ft. Myers	Shell Point			
Chlorophyll <i>a</i> (µg/l)	Down for maintenance	4.14 – 7.93	2.42 – 12.81 A spike to 44.16 on 8/22/17			
Dissolved Oxygen (mg/l)	Down for maintenance	1.73 – 4.28	No Data			

NOAA satellite imagery was unavailable this week in the Caloosahatchee estuary due to cloud coverage.

The Florida Fish and Wildlife Research Institute reported on August 25, 2017, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in samples collected from Lee County.

Water Management Recommendations

Lake stage is in the Base flow sub-band of 2008 LORS. The 2008 LORS recommends up to 450 cfs at S-79 and 200 cfs at S-80 and no releases from the Lake at S-77. Given the current estuarine conditions, there are no ecological benefits associated with freshwater releases from Lake Okeechobee.

Figure 1. Basins, water control structures, and salinity monitoring for the St. Lucie Estuary.

Figure 2. Estimated surface freshwater inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basins into the St. Lucie Estuary.

Figure 3. Seven-day mean salinity of the water column at the U.S. Highway 1 Bridge.

Figure 4. Daily mean salinity at the A1A, US1 and estimated HR1 stations.

Figure 5. Location of FAU-HBOI LOBO water quality stations in the St. Lucie Estuary.

Figure 6. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.

Figure 7. Freshwater inflows from Lake Okeechobee, runoff from the C-43 basin, and tributaries in the tidal basin into the Caloosahatchee River Estuary.

Figure 8. Daily mean flows at S-79 and salinity at upper estuary monitoring stations (A) and 30-day moving average salinity at Ft. Myers (B).

Figure 9. Daily mean flows at S-79 and salinity at lower estuary stations.

Figure 10. Seven-day mean salinity at Cape Coral Bridge, Shell Point and Sanibel Bridge monitoring stations.

EVERGLADES

Above average rainfall fell across the Everglades and well above average in Everglades National Park (ENP) last week. WCA-2A and 3A are above regulation and WCA-1 is just below.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.70	+0.08
WCA-2A	2.47	+0.06
WCA-2B	3.38	+0.11
WCA-3A	3.00	+0.18
WCA-3B	3.22	+0.19
ENP	5.22	+0.25

Regulation Schedules: WCA-1 three-gauge average is 0.09 feet below Zone A, and stage difference between the marsh and the canal is 0.15 feet. WCA-2A marsh stage at gauge GA2A17 is currently 1.72 feet above zone A. Marsh stage is 0.22 above canal stage at S11B. WCA-3A three-gauge average stage is 1.06 feet above zone A, and 0.65 feet higher than canal stage. WCA-3A at gauge 62 (Northwest corner) is 0.14 feet below schedule.

Blue – wetlands Green – canals

Water Depths and Changes: This week's range of water depths at monitored gauges other than in WCA-2B ranged from a low of 1.33 feet (WCA-1) to 3.26 feet (WCA-3A gauge 65). The WDAT tool for spatial interpolation of depth indicates a range from a low of 0.5 feet in extreme Northeastern WCA-3A to a high of 4.5 feet along the L-67A canal in Eastern WCA-3A.

Over the last week individual gauge changes ranged from +0.01 feet (WCA-1) to +0.29 feet (Northeast Shark River Slough 2). Pan evaporation was estimated to be 1.47 inches.

Taylor Slough stages: Between 1.6 and 5 inches of rain fell over Taylor Slough and Florida Bay last week. Water levels increased +0.15 to +0.49 feet this past week. All areas are -1 inch below (Southwest Taylor Slough) to 6 inches above (Northern Taylor Slough) the historic average for this time of year.

Florida Bay salinity: As of this weekend, salinities are decreasing across the bay with the largest weekly change of -4.9 psu occurring in the western nearshore area. Salinities currently range from 22 psu in the US Highway 1 area to 43 psu in the western nearshore area. Compared to historic averages, current salinities are 1 to 15 psu above average with the western nearshore still furthest from average.

Florida Bay MFL: Mangrove zone daily average salinity is still at 3 psu. The 30-day moving average changed +0.10 to end the week at 5.9 psu. The cumulative weekly flow from the five creeks identified by the stars on the map was approximately -1,100 acre-feet. Positive flows had returned over the weekend, but was not enough to overcome the negative total from earlier in the week. The 365-day moving sum of flow from the five creeks identified by stars on the map decreased about 5,000 acre-feet to 215,604 acre-feet (still below the long-term average of 257,628 acre-feet). Creek flow is provisional data from the US Geological Survey and is highly variable.

Water Management Recommendations

The rate of stage change should be moderated as possible in all the WCAs, as apple snail production can be negatively affected by rapid changes in water depth. Limiting ascensions to 0.25 feet per week will help to avoid drowning of apple snail egg clusters.

Water depths above 2.5 feet at gauge 65 are indicative that tree islands are flooded and under stress. Depths exceeded that mark on June 18, meaning as of Sunday the tree islands have been flooded for 71 days.

More specific recommendations appear in the summary table below. The red text represents new or modified information or recommendations.

Everglades Ecological Recommendations, August 22nd, 2017 (red is new)							
Area	Current Condition	Cause(s)	Recommendation	Reasons			
WCA-1	Stages increased from +0.01' to +0.13'	Rainfall, ET, management	Moderate ascension rates as possible. Maintaining water levels a minimum of 0.1 ft above WRS until early July is also recommended.	Achieve high water targets (17.5 ft) to protect habitat and facilitate invasive plant treatments.			
WCA-2A	Stages increased +0.06'	Rainfall, ET, management	Moderate ascension rates as possible. Limit to + 25 feet per week.	Protect habitat, wildlife and support apple snail reproduction.			
WCA-2B	Stages increased +0.11'	Rainfall, ET, management	Moderate ascension rates as possible.	Protect habitat, wildlife and support apple snail reproduction.			
WCA-3A NE	Stages increased +0.20'	Rainfall, ET, management					
WCA-3A NW	Stages increased +0.20'	Rainfall, ET, management	Moderate ascension rates as possible.	Protect habitat, wildlife and support apple snail reproduction.			
Central WCA-3A S	Stages increased +0.15'	Rainfall, ET, management	Moderate accension rates as nossible	Water depths above 2.5 feet at gauge 65 are indicative that tree islands are flooded and under stress. Depths exceeded that mark on 18 June			
Southern WCA-3A S	Stages increased +0.17'	Rainfall, ET, management		meaning the tree islands have been flooded for 71 days.			
WCA-3B	Stages increased from +0.16' to +0.21'	Rainfall, ET, management	Moderate ascension rates as possible	Protect habitat, wildlife and support apple snail reproduction.			
ENP-SRS	Stages increased +0.29'	ET, rainfall, topography, management	Make discharges to the Park according to the 2012 WCP rainfall plan.	Keep peat wet to promote native habitat and maintain wetland plant and animal communities. Protect habitat and wildlife, including apple snail reproduction.			
Taylor Slough	Stage changes ranged +0.15' to +0.49'	Rain, ET, inflows	Move water southward as possible	When available provide freshwater buffer for ecosystems and slow recession rates.			
FB- Salinity	Salinity changes ranged -4.9 to +2.7 psu.	Rain, ET, inflows, wind	Move water southward as possible	When available, provide freshwater to produce low salinity wet season conditions.			