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, Assistant Executive Director, Executive Office Staff

FROM: SFWMD Staff Environmental Advisory Team

DATE: July 15, 2020

SUBJECT: Weekly Environmental Conditions for Systems Operations

Summary

Weather Conditions and Forecast

A mid- to upper-level trough of low pressure located offshore the east coast of the United States (U.S.) this morning will gradually lift northward and weaken today while shifting eastward. In the wake of the trough, large-scale upper-level convergence/subsidence extends from offshore the southeast U.S. coast, where it is most intense, to the Florida peninsula, a pattern that favors below normal total rainfall over the District. Despite the unfavorable pattern at upper levels, relatively good available moisture (especially north of Lake Okeechobee where moisture is much greater than it was 24 hours ago) and sufficient instability should mean that total rainfall would increase some over that observed yesterday. Westerly to west-southwesterly steering winds favor afternoon rains to be focused over the interior and the east (displaced away from the southwest coast) and could be most concentrated over or near the Kissimmee Valley, where the most ideal conditions for rain exist. The second most likely area where rains could concentrate would be over or near the southeastern metropolitan areas from the middle afternoon until late in the day. Rains should diminish around sunset or not long afterwards, followed by quiet conditions overnight. A remnant cyclonic circulation associated with an old thunderstorm complex over the southeastern U.S. this morning is forecast to drift westward along or near the northeastern and northcentral Gulf of Mexico coast on Wednesday. The indirect influence of this feature, along with an increase of moisture over Florida and a cooling aloft that should result in greater instability, is predicted to result in a good or widespread coverage of rain and a substantial increase of total rainfall to above normal levels. The large increase of rain will coincide with a transition of the weather pattern to an easterly wind regime, which will favor the most concentrated rains on Wednesday over the interior but more likely the western part of the District, where a large region of a 0.5 inches or more areal average rainfall is possible. Total rainfall should decrease on Thursday, possibly to about half of Wednesday's predicted rainfall, but with a significant increase of rains possible overnight Thursday into Friday. The overnight rains will be associated with the leading edge of a tropical wave that is forecast to move through the Bahamas on Thursday and cross Florida on Friday and Saturday before emerging into the Gulf of Mexico. The tropical wave, accompanied by copious moisture and good instability, should greatly enhance total rainfall on Friday and Saturday, providing what is likely to be a widespread coverage of rainfall across the District. Although the rains could subside some by early next week, a continued moist, easterly wind flow and good instability suggest that total rainfall would continue to be close to or above the daily climatological average, making for a rather extended period of enhanced rains during a time when climatologically lower rainfall is expected. For the week ending next Tuesday morning, the latest model output indicates a median total rainfall near but above the weekly long-term average. Today's quantitative precipitation forecast (QPF) has been adjusted higher, however, toward the wetter solutions (75th percentile) due to a significant dry bias in the guidance over land areas relative to the ocean during easterly wave passages.

Kissimmee

Tuesday morning stages were 55.4 feet NGVD (1.1 feet below schedule) in East Lake Toho, 53.7 feet NGVD (0.2 feet above schedule) in Toho, and 51.7 feet NGVD (0.7 feet above schedule) in Kissimmee-Cypress-Hatchineha; headwater stages were 46.1 feet NGVD at S-65A and 26.0 feet NGVD at S-65D. Tuesday morning discharges were 1,641 cfs at S-65, 2,295 cfs at S-65A, 1,993 cfs at S-65D and 1,720 cfs at S-65E. Dissolved oxygen concentration in the Kissimmee River averaged 1.6 mg/L for the week through Sunday. Kissimmee River mean floodplain depth on Sunday was 1.36 feet. Recommendations: Manage S-65/S-65A discharge to slow the stage rise in Lakes Kissimmee Cypress-Hatchineha while considering the effects on dissolved oxygen in the Kissimmee River. 2020 Wet Season Recommendations for Kissimmee Basin: Continue to use the IS-14-50 discharge plan through the 2020 Wet Season. The discharge rate of change limits for S-65/S-65A may be adjusted for individual events after consultation with Kissimmee River Restoration Evaluation Program staff. To the extent possible, attempt to control the ascension rate in East Lake Toho to be less than 1 feet per 30 days during the June 1- August 15 window. To the extent possible, attempt to control the ascension rate in Lakes Toho and Kissimmee-Cypress-Hatchineha to be less than 0.5 feet per 14 days during the June 1-August 15 window.

Lake Okeechobee

Lake Okeechobee stage was 12.53 feet NGVD on July 13, 2020, 0.21 feet higher than the previous week and 0.33 feet higher than the previous month. The Lake is now just 0.07 feet below the Base Flow sub-band. Lake stage moved back into the ecological envelope (which varies seasonally from 12.0 – 15.0 feet NGVD +/- 0.5 feet) on June 2, 2020, after being up to 1.5 feet below since October 15, 2019. While ascension rates were high in early June, the rate of rise has been slow over the past few weeks, providing submerged plant communities an opportunity to catch up with rising stages. The potential for cyanobacteria bloom risk over the past week was similar to the prior week, with some increase in central lake bloom density but decreases along the western and northeastern shorelines.

Estuaries

Total inflow to the St. Lucie Estuary averaged 1,447 cfs over the past week with no flow coming from Lake Okeechobee. The seven-day average salinities decreased in the estuary over the past week. Salinity at the US1 Bridge is in the good range for adult eastern oysters. Total inflow to the Caloosahatchee Estuary averaged 1,048 cfs over the past week with 219 cfs (estimated) coming from the Lake. The seven-day average salinity decreased slightly in the estuary over the past week. Salinities are in the good range (0-10) for tape grass at Val I-75 and Ft. Myers. Salinities are in the good range (10-30) for adult eastern oysters at Cape Coral and Shell Point and in the fair range at Sanibel. Lake stage is in the Beneficial Use sub-band of 2008 LORS. Tributary hydrological conditions are wet. The SFWMD's Lake Okeechobee Adaptive Protocol's Release Guidance suggests no S-77 release to the Caloosahatchee Estuary.

Stormwater Treatment Areas

Over the past week, 1,000 ac-feet of Lake Okeechobee water was delivered to the FEBs/STAs. The total amount of Lake releases sent to the FEBs/STAs in WY2021 (since May 1, 2020) is approximately 11,100 ac-feet. The total amount of inflows to the STAs in WY2021 is approximately 335,000 ac-feet. Most STA cells are at or near target stage, except EAV cells in STA-3/4. STA-1E Western Flow-way is offline for the Restoration Strategies project to fill and grade Cells 5 and 7. Operational restrictions are in place in STA-1W Northern Flow-way related to STA-1W Expansion #1 startup activities, in STA-1E Central Flow-way, STA-2 Flow-way 3, STA-2 Flow-way 4, STA-3/4 Eastern, Central, and Western Flow-ways for vegetation management activities, and in STA-5/6 Flow-ways 2 and 3 following the Restoration Strategies project to grade non-effective treatment areas. This week, there is no capacity for Lake releases in the STAs.

Everglades

All the WCAs are above regulation but depths have generally stabilized and followed the rising trend of the schedules over the past week. WCA-2A's descent has slowed, the one WCA that declined in stage last week. Ascension rates impact apple snail reproduction and the current ecologically preferred rate in the Everglades is 0.05–0.15 feet per week, with a maximum of 0.25 feet per week or 0.5 feet per two weeks. Most of the Everglades fell within the recommended ascension rates over the past week. Florida Bay and Taylor Slough received nearly double the rain over the week prior, and stages increased offsetting last week's decrease. Continued upstream stage increases could start the 2 to 3-week countdown to freshwater delivery into the Bay. Florida Bay average salinities decreased, but changes at the shoreline were mixed. Salinity in the mangrove zone decreased and flows from the creeks were mostly positive last week.

Supporting Information

KISSIMMEE BASIN

Kissimmee Basin Rainfall

The Upper Kissimmee Basin received 3.04 inches of rainfall in the past week and the Lower Basin received 1.89 inches (SFWMD Daily Rainfall Report 7/13/2020).

Upper Kissimmee Basin

Stages and departures in the Kissimmee Chain of Lakes (KCOL) are shown in **Table 1**. KCOL stage hydrographs with respective regulation schedules and rainfall are shown in Figures 1-3.

Table 1. Average discharge (cfs) for the preceding seven days, one-day stage (feet NGVD), and departures from KCOL flood regulation (R) or temporary schedules (T, A, or S). Provisional, real-time data are from SFWMD. Report Date: 7/14/2020

		7-day		Scheo			le Daily Departure (feet)						
Water Body	Structure	Average Discharge (cfs) ¹	Stage Monitoring Site ²	Lake Stage (feet)	Schedule Type ³	Stage (feet)	7/12/20	7/5/20	6/28/20	6/21/20	6/14/20	6/7/20	5/31/20
Lakes Hart and Mary Jane	S-62	247	LKMJ	60.2	R	60.0	0.2	0.2	0.0	0.2	0.1	-0.2	0.1
Lakes Myrtle, Preston, and Joel	S-57	33	S-57	61.1	R	61.0	0.1	-0.2	-0.1	-0.2	-0.2	-0.4	0.0
Alligator Chain	S-60	0	ALLI	63.0	R	63.2	-0.2	-0.6	-0.5	-0.4	-0.5	-0.9	0.1
Lake Gentry	S-63	38	LKGT	61.1	R	61.0	0.1	-0.2	-0.2	-0.3	-0.6	-1.0	0.2
East Lake Toho	S-59	408	TOHOE	55.3	R	56.5	-1.2	-1.5	-1.4	-2.2	-2.7	-3.1	-2.0
Lake Toho	S-61	1,198	TOHOW, S-61	53.7	R	53.5	0.2	0.1	0.0	0.0	-0.1	-0.8	0.3
Lakes Kissimmee, Cypress, and Hatchineha	S-65	1,779	KUB011, LKIS5B	51.7	R	51.0	0.7	0.4	0.5	0.2	-0.1	-0.6	0.8

¹Seven-day average of weighted daily means through midnight.

² Names of in-lake monitoring sites and structures used to determine lake stage; if more than one site is listed, an average is reported.

³A = projected ascension line, R = USACE regulation schedule, S = temporary recession target line, T = temporary schedule, N/A= not applicable or data not available. DATA ARE PROVISIONAL

Lower Kissimmee Basin

Discharges at Lower Basin structures are shown in Table 2. SFWDAT depth maps for the Phase I restoration area are shown in Figure 4. Mean daily dissolved oxygen concentrations, discharge, temperature, and rainfall are shown in Figure 5. The 2019-2020 Discharge Plan for S-65/S-65A, the interim regulation schedule for S-65, and a map of the Kissimmee Basin are shown respectively in Figures 6-8.

Table 2. One-day and seven-day averages of discharge at S-65x structures, of dissolved oxygen concentration in the Phase I area river channel, and water depth in the Phase I area floodplain. Data are provisional real-time data from SFWMD.

Report Date.	11 14/ 2020										
Matria	Location	1-Day Average Average for the Preceeding 7-Days ¹									
Wetric	Location	7/12/2020	7/12/20	7/5/20	6/28/20	6/21/20	6/14/20	6/7/20	5/31/20	5/24/20	5/17/20
Discharge (cfs)	S-65	1,384	1,779	1,527	873	581	80	427	695	496	353
Discharge (cfs)	S-65A ²	2,276	2,174	1,559	1,127	864	854	884	788	438	313
Discharge (cfs)	S-65D ²	1,840	1,602	1,314	1,453	1,641	1,988	1,485	903	325	441
Headwater Stage (feet NGVD)	S-65D ²	25.78	25.81	25.76	25.72	25.74	25.72	25.78	25.76	25.84	25.61
Discharge (cfs)	S-65E ²	1,693	1,574	1,240	1,402	1,549	1,868	1,552	926	312	411
Discharge (cfs)	S-67	0	0	0	0	0	0	0	0	0	0
DO (mg/L) ³	Phases I & II/III river channel	0.7	1.6	2.9	2.0	1.2	0.7	4.0	6.0	7.6	7.7
Mean depth (feet) ⁴	Phase I floodplain	1.36	1.12	0.73	0.71	0.78	0.90	0.56	0.28	0.08	0.07

¹Seven-day average of weighted daily means through Sunday midnight.

*S-65A discharge combines S-65A with auxiliary structures; S-65D discharge combines discharge at S-65D, S-65DX1, and S-65DX2; S-65D stage averages stage at S-65D and S-65DX1; S-65E discharge combines S-65E and S-65EX1.

³DO is the average for sondes at KRBN, PC62, PC33, PD62R, and PD42R.

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

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

KCOL Hydrographs (through Sunday midnight)



Figure 1.







Figure 3.







Figure 5. Mean daily dissolved oxygen, discharge, temperature and rainfall in the Phases I/II/III river channel.



Figure 6. The 2019-2020 Discharge Plan for S-65/S-65A.



Figure 7. Interim operations schedule for S-65. The discharge schedule shown to the right has not been used in recent years.



Figure 8. The Kissimmee Basin.

LAKE OKEECHOBEE

Lake Okeechobee stage is 12.53 feet NGVD, 0.33 feet higher than a month ago and 1.10 feet higher than one year ago (Figure 1). The Lake has been back within the preferred ecological envelope since June 2, 2020 (Figure 2). Lake stage moved into the Beneficial Use sub-band on March 4, 2020 and is now just 0.07 feet below the Base Flow sub-band (Figure 3). Lake stage reached a low of 10.99 feet NGVD on May 17, rose rapidly for a month, and then rose more slowly over the past week. According to RAINDAR, 2.1 inches of rain fell directly over the Lake during the past week (Figure 4), with highly variable rainfall across the watershed. The district-wide average was 1.6 inches.

The average daily inflows (minus rainfall) increased from 1,973 cfs to 3,621 cfs, while the outflows (minus evapotranspiration) decreased from 1,165 cfs to 373 cfs. Most of the inflows came from the Kissimmee River (1,640 cfs through S-65E & S-65EX1), while 930 cfs came from the C-41A canal (through S-84 & S-84X), 353 cfs from Fisheating Creek, and 237 cfs from S-71 and S-72. 329 cfs also came from the C-44 canal through S-308, which is predominantly an outflow from the Lake unless stages are relatively low. The only outflows were 285 cfs to the Caloosahatchee (S-77) and around 88 cfs released south through the S-350 structures. Total lake inflows and outflows for the past week are detailed in Table 1, as well as the approximate change in lake stage from each major structure's total flows over the period. Figure 5 shows the combined average daily cfs for inflows and outflows for the Lake over the past eight weeks. These data are provisional and are subject to change.

Water quality sampling occurs twice-monthly at approximately 30 stations from May – October as part of expanded monitoring efforts to track and study Harmful Algal Blooms on the Lake. The most recent sampling occurred on July 7 and 8 (Figure 6). Chlorophyll *a* results are still pending but microcystin toxin values were reported. Three of thirty sites (10%) had toxin levels above the EPA recreational waters recommendation of 8 μ g/L; NES191 at 8.8 μ g/L, CLV10A at 14.0 μ g/L, and a high of 17.0 μ g/L at L004 in the east/center of the lake. Eight more sites had microcystin detected (detection limit of 0.25 μ g/L or greater), ranging from 0.3 – 7.5 μ g/L.

NOAA's cyanobacteria monitoring product, which is derived from EUMETSAT's Sentinel 3 OLCI sensor data, provides near-daily estimates of cyanobacteria bloom potential on the Lake. Weekly composites are also available, which represent an approximate maximum weekly coverage based on combining several daily images, giving a better estimate of conditions due to variable cloud cover and weather patterns. The most recent composite (July 5 - 11, 2020) suggests similar cyanobacteria bloom risk potential compared to the prior week (June 28 – July 4, 2020), with some increase in central lake bloom density but decreases along the western and northeastern shorelines (Figure 7).

Water Management Summary

Lake Okeechobee stage was 12.53 feet NGVD on July 13, 2020, 0.21 feet higher than the previous week and 0.33 feet higher than the previous month. The Lake is now just 0.07 feet below the Base Flow sub-band. Lake stage moved back into the ecological envelope (which varies seasonally from 12.0 – 15.0 feet NGVD +/- 0.5 feet) on June 2, 2020, after being up to 1.5 feet below since October 15, 2019. While ascension rates were high in early June, the rate of rise has been slow over the past few weeks, providing submerged plant communities an opportunity to catch up with rising stages. The potential for cyanobacteria bloom risk over the past week was similar to the prior week, with some increase in central lake bloom density but decreases along the western and northeastern shorelines.

Table 1. Average daily inflows and outflows and the approximate depth equivalents on Lake Okeechobee for various structures.

INFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)	OUTFLOWS	Previous week Avg Daily CFS	Avg Daily Flow cfs	Equivalent Depth Week Total (in)	
S-65E & S-65EX1	1262	1640	0.8	S-77	665	285	0.1	
S-71 & S-72	87	237	0.1	S-308	-147	-329	-0.2	
S-84 & S-84X	137	930	0.4	S-351	130	0	0.0	
Fishesting Creek	201	252	0.2	S-352	252	88	0.0	
Fisheating Creek	384	303	0.2	S-354	233	0	0.0	
S-154	6	0	0.0	L-8 Outflow	32			
S-191	0	0	0.0	ET	2288	2200	1.0	
S-133 P	0	0	0.0	Total	3453	2245	1.0	
S-127 P	0	9	0.0	L				
S-129 P	0	9	0.0					
S-131 P	20	33	0.0					
S-135 P	0	12	0.0	Provisional Data				
S-2 P	0	0	0.0					
S-3 P	0	0	0.0					
S-4 P	77	0	0.0					
L-8 Backflow		69	0.0					

Rainfall

Total

2980

4953

4648

7939

2.1

3.6



Figure 1. Water depth estimates on Lake Okeechobee based on the South Florida Water Depth Assessment Tool.



Lake Okeechobee Stage vs Updated Ecological Envelope

Figure 2. Select annual stage hydrographs for Lake Okeechobee in comparison to the updated Ecological Envelope.



Lake Okeechobee Water Level History and Projected Stages

Figure 3. Recent Lake Okeechobee stage and releases, with projected stages based on a dynamic position analysis.



Figure 4. 7-Day rainfall estimates by RAINDAR.



Figure 5. Major inflows (orange) and outflows (blue) of Lake Okeechobee, including the S-350 structures designated as South (green). The L-8 Canal flows through Culvert 10A are included as outflows when positive, and as inflows when backflowing into the Lake. All inflows and outflows are shown as positive and negative, respectively, for visual purposes. Outflows through the S-77 and S-308 structures are shown based on their downstream gauges to account for lock openings for navigation.



Figure 6. Provisional results from the expanded monitoring sampling trips on July 7-8, 2020.



Figure 7. Potential for cyanobacterial blooms on Lake Okeechobee in late-June and early July 2020, based on NOAA's harmful algal bloom monitoring system. Images represent an approximate maximum coverage based on a composite of available weekly images. Gray color indicates cloud cover.

ESTUARIES

St. Lucie Estuary:

Last week total inflow to the St. Lucie Estuary averaged approximately 1,447 cfs (Figures 1 and 2) and last month inflow averaged about 1,098 cfs. Last week's provisional averaged inflows from the tidal basin and the structures are shown in Table 1.

Location	Flow (cfs)
Tidal Basin Inflow	744
S-80	0
S-308	-350
S-49 on C-24	242
S-97 on C-23	215
Gordy Rd. structure on Ten Mile Creek	246

Table 1. Weekl	y average inflows	(data are	provisional).

Over the past week, salinity decreased throughout the estuary (Table 2, Figures 3 and 4). The sevenday moving average of the water column (an average of the surface and bottom salinity) at the US1 Bridge is 13.8. Salinity conditions in the middle estuary are estimated to be within the good range for adult eastern oysters (Figure 3).

Table 2. Seven-day average salinity at three monitoring sites 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 (North Fork)	6.9 (7.1)	10.4 (12.4)	NA ¹
US1 Bridge	12.4 (13.5)	15.0 (16.4)	10.0-26.0
A1A Bridge	19.9 (22.8)	24.1 (26.8)	NA ¹

¹Envelope not applicable

Caloosahatchee Estuary:

Last week total inflow to the Caloosahatchee Estuary averaged approximately 1,048 cfs (Figures 5 and 6) and last month inflow averaged about 1,411 cfs. Last week's provisional averaged inflows from the structures and the tidal basin are shown in Table 3.

Location	Flow (cfs)
S-77	285
S-78	265
S-79	808
Tidal Basin Inflow	240

Table 3. Weekly average inflows (data is pro	/isional).
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Over the past week in the estuary, salinity remained about the same to Cape Coral and decreased downstream (Table 4, Figures 7 & 8). The seven-day average salinity values are within the good range for adult eastern oysters at Cape Coral and at Shell Point and in the fair range at Sanibel (Figure 9). The seven-day average surface salinities (Table 4) are in the good range (0-10) for tape grass at Val I-75 and at Ft. Myers.

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

Sampling Sito	Surfaco	Bottom	Envolopo
Sampling Site	Suilace	Бошот	Ellvelope
S-79 (Franklin Lock)	0.3 (0.3)	0.3 (0.3)	NA ¹
Val I75	0.5 (0.7)	0.5 (0.8)	0.0-5.0 ²
Ft. Myers Yacht Basin	5.0 (5.4)	6.3 (6.2)	NA
Cape Coral	13.5 (13.4)	15.3 (14.8)	10.0-30.0
Shell Point	25.8 (26.6)	26.5 (27.3)	10.0-30.0
Sanibel	29.5 (30.1)	31.0 (31.6)	10.0-30.0

¹Envelope not applicable, ²Envelope is based on a 2-week forecast 30-day average.

Forecast of surface salinity (Table 5 and Figure 10) at Val I-75 for the next two weeks using the autoregression model (Qiu and Wan, 2013) coupled with a linear reservoir model for the tidal basin predicts daily salinity ranging from 1.3 to 3.9 at the end of the two week period for pulse release at S-79 ranging from 0 to 800 cfs and estimated Tidal Basin inflows of 330 cfs. The 30-day moving average surface salinity at Val I-75 is forecast to be between 0.7 and 1.4 (Table 5). The current salinity conditions at Val I-75 are within the envelope of salinity 0.0-5.0 for this site (Table 4).

Scenario	Q79	TB runoff	Daily	30 day
	(cfs)	(cfs)	salinity	Mean
A	0	330	3.9	1.4
В	300	330	3.2	1.3
С	450	330	2.5	1.0
D	650	330	1.7	0.8
E	800	330	1.3	0.7

Table 5. Predicted salinity at Val I-75 at the end of forecast period

Red tide

The Florida Fish and Wildlife Research Institute reported on July 10, 2020, that *Karenia brevis*, the Florida red tide dinoflagellate, was not observed in samples collected from Lee, St. Lucie, Martin, or Palm Beach counties (no samples were analyzed this week from Broward or Miami-Dade counties).

Water Management Recommendations

Lake stage is in the Beneficial Use Flow sub-band. Tributary conditions are wet. The South Florida Water Management District's Lake Okeechobee Adaptive Protocol's Release Guidance suggests no releases to the Caloosahatchee Estuary.



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



Figure 2. Total daily inflows from Lake Okeechobee and runoff from the C-44, C-23, C-24, Ten Mile Creek, and tidal basin into the St. Lucie Estuary.



Figure 3. Seven-day mean salinity of the water column at the US1 Bridge.



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



Figure 5. Basins, water control structures, and salinity monitoring for the Caloosahatchee Estuary.



Figure 6. Total daily inflows from Lake Okeechobee, runoff from the C-43 basin





Figure 7. Daily mean flows at S-79 and salinity at upper estuary monitoring stations.

Figure 8. Daily mean flows at S-79 and salinity at lower estuary stations.





EVERGLADES

Near average rainfall was recorded across the Everglades last week, with ENP receiving the most. At the gauges monitored for this report, stages rose on average 0.07 feet last week with a maximum increase of 0.22 feet in ENP. Evaporation was estimated at 1.65 inches last week lower than the week prior.

Everglades Region	Rainfall (Inches)	Stage Change (feet)
WCA-1	1.81	+0.10
WCA-2A	0.86	-0.21
WCA-2B	1.35	+0.11
WCA-3A	1.67	+0.03
WCA-3B	1.43	+0.12
ENP	1.85	+0.22



Regulation Schedules: WCA-1: Stage at the 1-8C Gauge is now trending along the rising Zone A1 regulation line, currently 0.32 feet above. WCA-2A: Stage at Gauge 2-17 continued its fall towards the regulation line last week but leveled slightly, now 0.68 feet above the rising Zone A regulation line. WCA-3A: The Three Gauge Average continues to parallel the Increment 1.2-line, currently 0.07 feet above that rising action line. WCA-3A: Stage at gauge 62 (Northwest corner) steadied last week, remaining unchanged at 0.43 feet below the rising Upper Schedule.



Water Depths: The WDAT tool for spatial interpolation of depth monthly snapshots indicate depths in WCA-3A North are at 1.0 feet or higher across that sub-basin. Depths in WCA-3A South are building, in excess of 3.5 feet along the upper reaches of the L-67 canal. WCA-2A depths are fairly constant across that basin. Depths in WCA-1 are lowest in the northeast and deeper along the southern perimeter. Hydrologic connectivity has returned to Shark River Slough but looks to be diminishing in Taylor Slough and Lostman's Slough within Everglades National Park (ENP). Comparing WDAT water levels from present, over the last month stages rose across most of WCA-3A, most significantly along the L-67 canal downstream of the S-11s. Northwestern WCA-3A is slightly lower in stage. WCA-2A is significantly drier, most dramatically in the north. Stage differences in WCA-1 are mixed with wetter conditions in the southeast and northwest. Looking back one year the stage difference patterns are very similar and more significant in WCA-3A and WCA-1. The WDAT model indicates mixed but mostly wetter conditions in the western basins and western ENP compared to a month ago but not a year ago.

SFWDAT Water Depth Monthly Snapshots





Tree island inundation: 371 Tree Islands of known elevation within WCA-3A, -3B, and Everglades National Park's Shark Slough. Current rough estimates using WDAT (7/12/20), 22% or 83 of the tree islands are currently inundated, up from 18% the week prior. Initial islands inundated beginning 5/24/20, longest duration of continuous inundation is 46 days at 3A_17_4. Maximum water depth relative to the tree island head is currently 1.30 feet, minimum is -3.7 feet, average is -0.7 feet. Last week's maximum was 1.18 feet, average was -0.8 feet.

Taylor Slough Water Levels: A little more than double the previous week's rain fell over Taylor Slough and Florida Bay this past week at 0.61 inches, and stages increased an average of 0.17 feet (equal to last week's decrease). The largest increase was 0.34 feet in northern Taylor Slough. Stages are 2 inches higher than historical average with the northern areas being a little more than 4 inches higher than average.









Florida Bay Salinities: Average salinity in Florida Bay decreased 0.3 psu with the eastern shoreline area's decrease balancing out the small increases at the rest of the shoreline. If upstream stages keep rising, the 2 to 3-week countdown to getting freshwater to Florida Bay could begin.

Florida Bay MFL: Salinity at the TR station in the mangrove zone (tracked for the Florida Bay MFL) decreased from 23 psu to end the week at 15 psu while still decreasing. The 30-day moving average decreased 0.8 psu to end at 16.3 psu. Weekly flow from the 5 creeks identified by yellow stars on the map totaled +3,550 acre-feet with positive flows persisting through Thursday before alternating positive and negative over the weekend. The 365-day moving sum of flow from the five creeks (tracked as part of the Florida Bay MFL criteria) decreased 3,000 acre-feet this week to end at 237,098 acre-feet which is close to the median (249,091 acre-feet). Creek flows are provisional USGS data.

Water Management Recommendations

When water is discharged to tide its potential to benefit the ecology of the Everglades is lost. Conserving water in the WCAs and sending it southward has ecological benefit.

WCA-2A stages have fluctuated the most throughout the onset of the wet season. The ecology of that basin would be best served by moderating any change in depths over the next few weeks and gradually returning to scheduled stage.

Peak stages in northern WCA-3A provide improved conditions to support next season's wading bird nesting success at the Alley North colony by providing conditions for an increase in prey base as well as providing surface water that can protect nests from terrestrial predators during the nesting season.

Flows towards Taylor Slough and Florida Bay freshen salinity conditions within the nearshore areas of Florida Bay and decrease the currently stressful conditions for seagrasses and fauna as the nearshore/off shore gradient returns but more freshwater is needed to continue to decrease salinities in both the nearshore and across the bay towards more ecologically preferred conditions.

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

	SFWMD Ever	glades Ecological Recommendations	s, July 14th, 2020 (red is new)
Area	Weekly change	Recommendation	Reasons
WCA-1	Stage increased by 0.10'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks and conserving water in this basin has ecological benefit.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
WCA-2A	Stage decreased by 0.21'	Moderating the recession rate has ecological benefit.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
WCA-2B	Stage increased by 0.11'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
WCA-3A NE	Stage decreased by 0.05'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks. Conserving water in this region has ecological benefit.	Protect upstream/downstream habitat and wildlife. Apple snail
WCA-3A NW	Stage remained unchanged	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	reproduction is hindered by rapidly increasing stage.
Central WCA-3A S	Stage increased by 0.06'	Moderating the ascension rate to less than 0.25 feet per	Protect upstream/downstream habitat and wildlife. Apple snail
Southern WCA-3A S	Stage increased by 0.12'	week or 0.50 feet per two weeks.	reproduction is hindered by rapidly increasing stage.
WCA-3B	Stage increased by 0.12'	Moderating the ascension rate to less than 0.25 feet per week or 0.50 feet per two weeks.	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
ENP-SRS	Stage increased by 0.22'	Make discharges to the Park according to the 2012 WCP rainfall plan	Protect upstream/downstream habitat and wildlife. Apple snail reproduction is hindered by rapidly increasing stage.
Taylor Slough	Stage changes ranged from +0.02' to +0.34'	Move water southward as possible	When available, provide freshwater buffer for downstream conditions.
FB- Salinity	Salinity changes ranged -6.9 to +2.2 psu	Move water southward as possible	When available, provide freshwater to maintain low salinity buffer and promote water movement.