APPENDIX A – PLANNED TEMPORARY DEVIATION OPERATIONAL STRATEGY

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Operational Criteria to Mitigate High Water Conditions in the Water Conservation Areas (WCAs)

The Corps of Engineers, Jacksonville District (the Corps) is seeking a Planned Temporary Deviation from the Water Control Plan and the Modified Water Deliveries (MWD) Increment 1.1 and 1.2 Operational Strategy in order to provide high water relief for the Water Conservation Areas (WCA) WCA-1, WCA-2A, and WCA-3A until the WCA-3A 3-station gage average falls below Zone A of the WCA-3A Regulation Schedule. A summary description and associated deviations for the structures the Corps will be responsible for is included below. Annex A to this Operational Strategy includes additional background information, data analysis, and brief details regarding other water management activities managed by the State which were considered in the system wide analysis to lower the water levels in the WCAs.

Corps' Structure Deviation Summary

S-344 discharges are currently constrained at zero through July 15th due to the 2016 USFWS Biological Opinion and the Increment 1.1 and 1.2 Operational Strategy. The deviation will maximize releases at this structure to approximately 135 cfs which will move water into L-28 from WCA-3 helping to alleviate prolonged high water levels in WCA-3A. In the event that WCA-3A falls below the regulation schedule Zone A before July 15th these flows will be shut off. After July 15th operational constraints will be lifted and normal operations under Increment 1.1 and 1.2 will resume.

S-343A discharges are currently constrained at zero through July 15th due to the 2016 USFWS Biological Opinion and the Increment 1.1 and 1.2 Operational Strategy. The deviation will maximize releases at this structure to approximately 195 cfs which will move water into L-28 from WCA-3A helping to alleviate prolonged high water levels in WCA-3A. In the event that WCA-3A falls below the regulation schedule Zone A before July 15th these flows will be shut off. After July 15th operational constraints will be lifted and normal operations under Increment 1.1 and 1.2 will resume.

S-343B discharges are currently constrained at zero through July 15th due to the 2016 USFWS Biological Opinion and the Increment 1.1 and 1.2 Operational Strategy. The deviation will maximize releases at this structure to approximately 195 cfs which will move water into L-28 from WCA-3A helping to alleviate prolonged high water levels in WCA-3A. In the event that WCA-3A falls below the regulation schedule Zone A before July 15th these flows will be shut off. After July 15th operational constraints will be lifted and normal operations under Increment 1.1 and 1.2 will resume.

S-12A discharges are currently constrained at zero through July 15th due to the 2016 USFWS Biological Opinion and the Increment 1.1 and 1.2 Operational Strategy. The deviation will maximize releases at this structure (expected to initially discharge around 200 cfs) which will move water into L-28 from WCA-3A helping to alleviate prolonged high water levels in WCA-3A. The S-12 structures are the main outlets from WCA-3A. In the event that WCA-3A falls below

the regulation schedule Zone A before July 15th these flows will be shut off. After July 15th operational constraints will be lifted and normal operations under Increment 1.1 and 1.2 will resume.

S-12B discharges are currently constrained at zero through July 15th due to the 2016 USFWS Biological Opinion and the Increment 1.1 and 1.2 Operational Strategy. The deviation will maximize releases at this structure (expected to initially discharge around 200 cfs) which will move water into L-28 from WCA-3A helping to alleviate prolonged high water levels in WCA-3A. The S-12 structures are main outlets from WCA-3A. In the event that WCA-3A falls below the regulation schedule Zone A before July 15th, these flows will be shut off. After July 15th operational constraints will be lifted and normal operations under Increment 1.1 and 1.2 will resume.

S-152 discharges are currently constrained by an FDEP permit which allows releases from WCA-3A into WCA-3B from November 1st through January 31st to meet the objectives of the Decompartmentalization Physical Model (DPM) Science Plan to the extent that the trigger stage (measured at Site 71 or SRS-1) of 8.5 feet NGVD allows. The operation of S-152 can be partially or fully open with the expectation that S-152 will initially be fully opened and then could be partially closed when the stage at Site 71 or SRS-1 approaches the trigger stage. Design flow for this structure is up to 800 cfs fully open, although historical DPM operations have only realized 300-400 cfs. If the trigger stage is exceeded for more than 24 hours, then all inflows shall be closed until the stage at Site 71 or SRS-1 declines to below the trigger stage for more than 24 hours. Due to cultural resource constraints, use of the S-152 structure requires coordinated use of temporary pumps by SFWMD at S-355A and S-355B structures to allow for releases from WCA-3B flows that have been added from WCA-3A by use of the S-152 structure.

S-332D discharges are currently constrained at 250 cfs through July 15th due to the 2016 USFWS Biological Opinion and the Increment 1.1 and 1.2 Operational Strategy. The deviation will increase discharges to 500 cfs which will move water from L-31N into the S-332D Detention Area to maintain the L-31N Canal's average daily stage within the ranges prescribed by the Increment 1.1 and 1.2 Operational Strategy: between 4.2 and 4.8 feet NGVD (through July 31st, near the end of the CSSS nesting window) or between 4.0 and 4.6 (August 1st through February 14th, 2018). S-332DX1 will be used to the maximum extent possible without impacting the current Contract 8A construction to mitigate for the requested deviation. S-332D operations will also consider potential impacts to the in-progress SFWMD construction of the S-332D Detention Area southern weir.

S-197 discharges are currently constrained to 400 cfs by the Increment 1.1 and 1.2 Operational Strategy, based on the prescribed S-18C headwater stage criteria. The deviation will increase discharges to maximum capacity (2400cfs). This increase is needed to handle up to 1250 cfs that will be discharged from WCA-3A to the SDCS using S-333/S-334 while retaining capacity to

manage local basin runoff. S-197 and the structures listed above are shown in Figure 15. WCA-3A discharges through the SDCS could continue beyond the date at which deficit due to S-12 closures has been met or past the cutoff date of 15 August 2017.

Operational Flexibility

To address uncertainties and present or future system conditions, the following actions may be taken for any duration throughout the effect of the temporary deviation:

- adjustment of gate openings, pump rates, and/or flows as needed to maximize and/or optimize conditions consistent with the purpose in addition to operational flexibility already prescribed in Increment 1.1 and 1.2 Operational Strategy; and
- reevaluation of, extension to, or termination of any or all of the requested deviations, as needed.

ANNEX A

HYDROLOGIC DATA AND ANALYSES

Version 27 June 2017

Extreme High Water Conditions in the Water Conservation Areas (WCAs)

The Corps of Engineers, Jacksonville District (the Corps) is seeking a planned temporary deviation from the Water Control Plan and the Modified Water Deliveries (MWD) Increment 1.1 and 1.2 Operational Strategy in order to provide high water relief for Water Conservation Areas (WCA) WCA-1, WCA-2A, and WCA-3A until the WCA-3A 3-station gage average falls below Zone A of the WCA-3A Regulation Schedule. This Annex provides a system wide analysis to accompany the Corps Operational Strategy. Focus remains on the Corps led efforts, however, reference is made to other activities led by other agencies to demonstrate all efforts are being maximized to reduce the high water levels in the WCAs.

A series of early wet season storms since June 5, 2017 have caused conditions to change very rapidly from very dry conditions to very wet in south Florida, with the WCAs along with the Everglades Agricultural Area (EAA) accumulating most of the rainfall. Table 1 and Figures 1 and 2 illustrate the extraordinary quantity of precipitation experienced across the WCAs and the EAA. WCA-3 alone received 17.57 inches in precipitation since June 1, which is 280% of the average for this time of year.

Table 1: Precipitation Data (02 June 2017 to 23 June 2017)

Area	Precipitation	% of Average
East EAA	14.33 inches	260% (average 5.51 inches)
WCA-1 & WCA-2	17.65 inches	320% (average 5.51 inches)
WCA-3	17.57 inches	280% (average 6.28 inches)

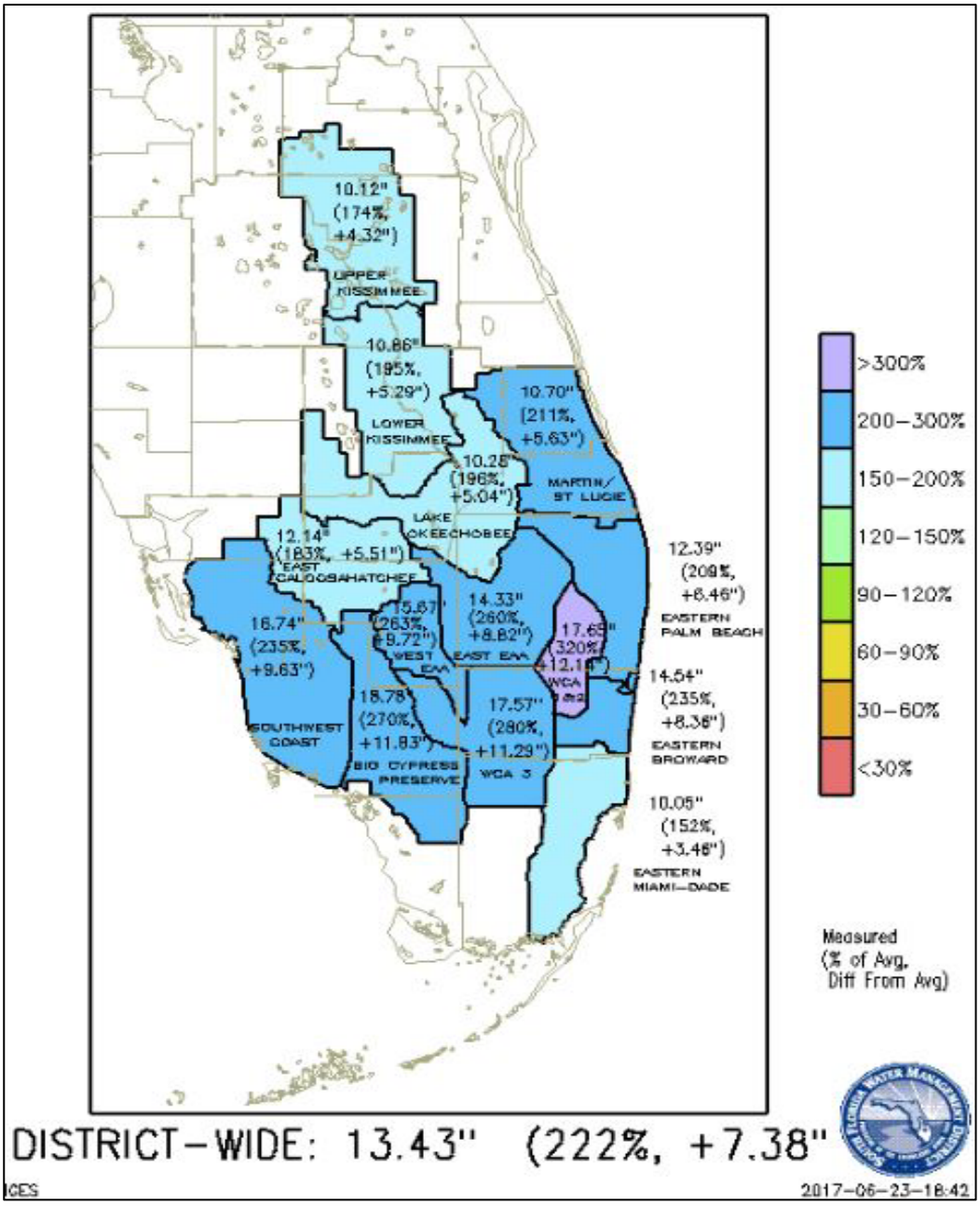

Figure 1: SFWMD Rainfall Map (02 June 2017 to 23 June 2017)

This unprecedented area-wide rainfall has caused water levels in the three WCAs to rise above their maximum regulation schedules, as shown in Table 2, In addition, the EAA, which sends excess water south into the WCAs, has also received a significant amount of rainfall, further exacerbating the sharp rate of rise in the WCAs in June 2017. Table 2 shows the stage, and excess volume of water contained in these areas. There are currently 1.195 million acre-feet from the WCAs through these structures.

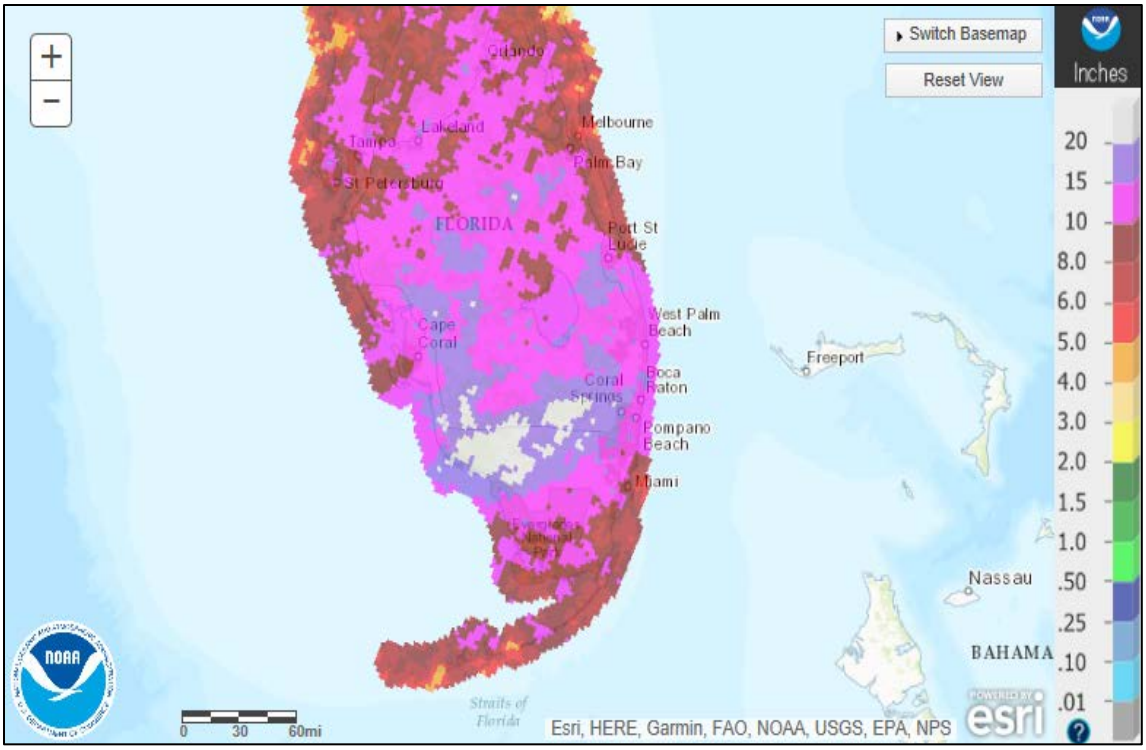

Figure 2: NOAA Rainfall Map Last 30-day from June 25, 2017

Table 2: WCA Stages Compared to Regulation Schedule (23 June 2017)

Area	Current Stage (ft. NGVD)	Regulation Schedule (ft. NGVD)	Departure from Regulation Schedule (ft.)	Volume above Schedule (ac-ft)
WCA-1	16.58	15.75	0.83	105,250
WCA-2	14.24	11.00	3.24	299,300
WCA-3	11.13	9.33	1.80 (1.4 ft. above Zone A)	790,000

TOTAL: 1,194,550 ac-ft

High levels in the WCAs are concerning and WCA-3A is particularly so because of ongoing construction, environmental constraints, and current system capacity limiting the volume of water that can be moved out of the system. WCA-3A is the last storage area in the Central and Southern Florida Project and it's extremely limited in outlet capacity. The WCA-3A stage is currently above both the maximum regulation schedule as shown in the stage hydrographs and stage exceedance curves depicted below.

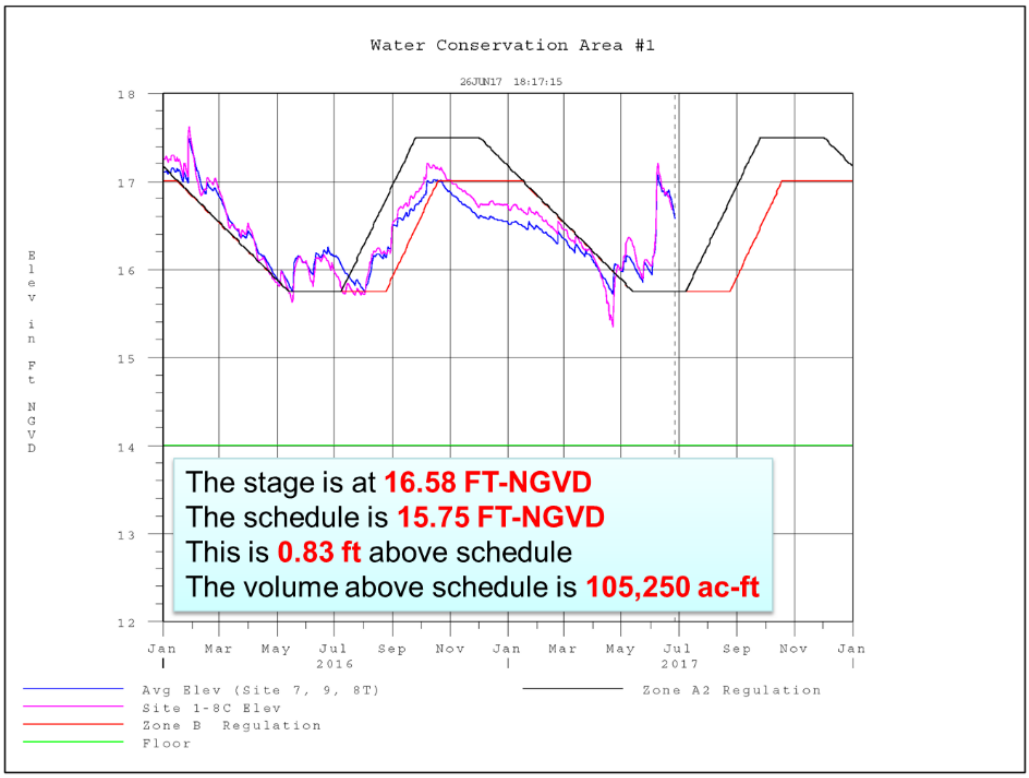

Figure 4: WCA-1 Stage Hydrographs and Regulation Schedule

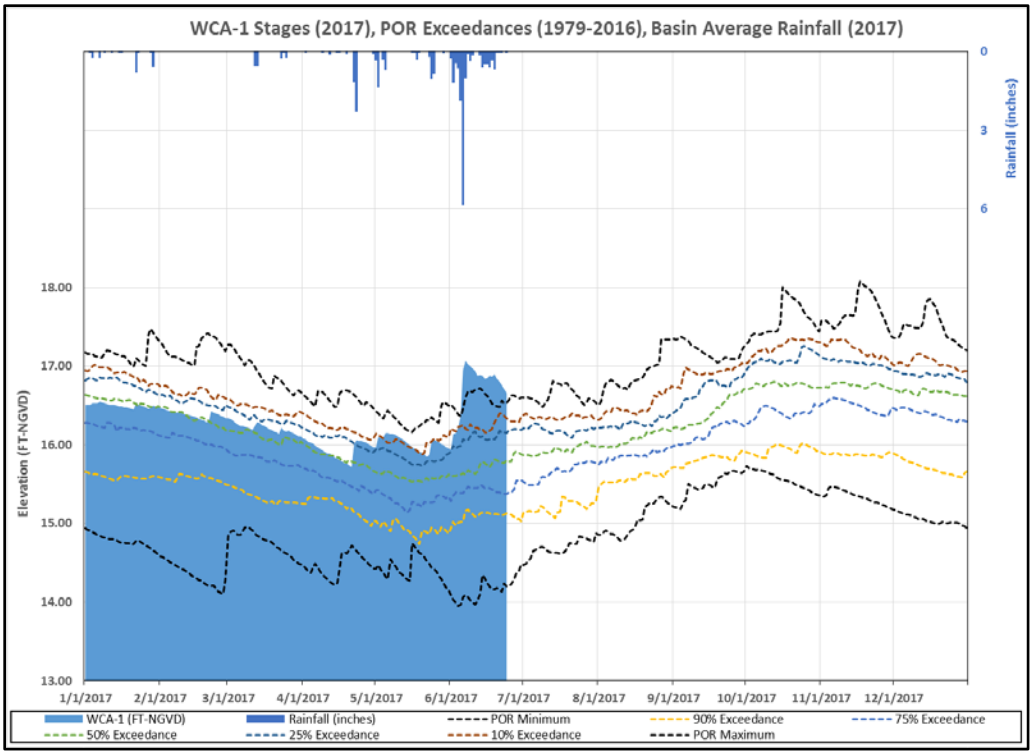

Figure 5: WCA-1 Stage Hydrograph and Exceedance Statistics

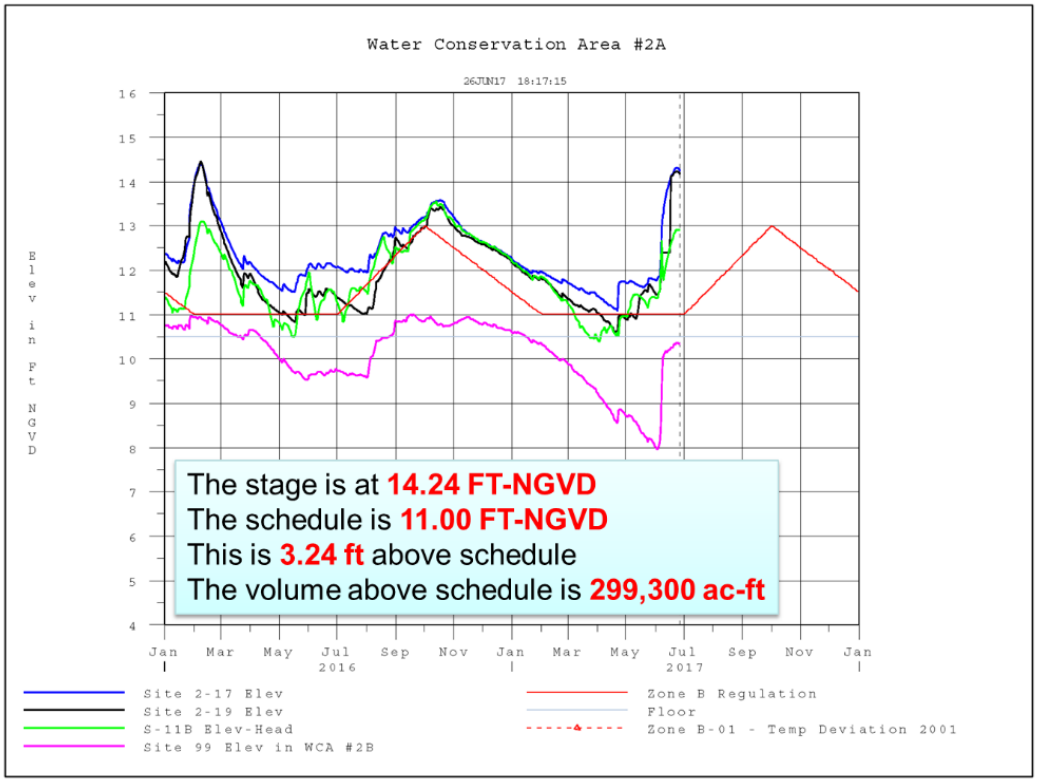

Figure 6: WCA-2A Stage Hydrographs and Regulation Schedule

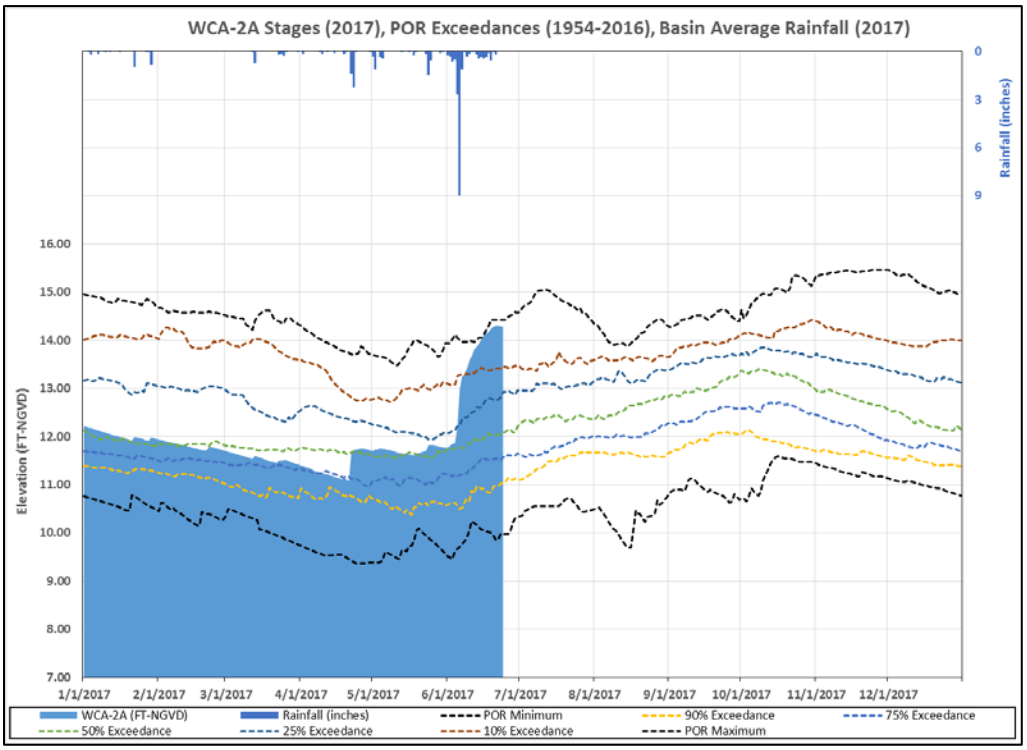

Figure 7: WCA-2A Stage Hydrograph and Exceedance Statistics

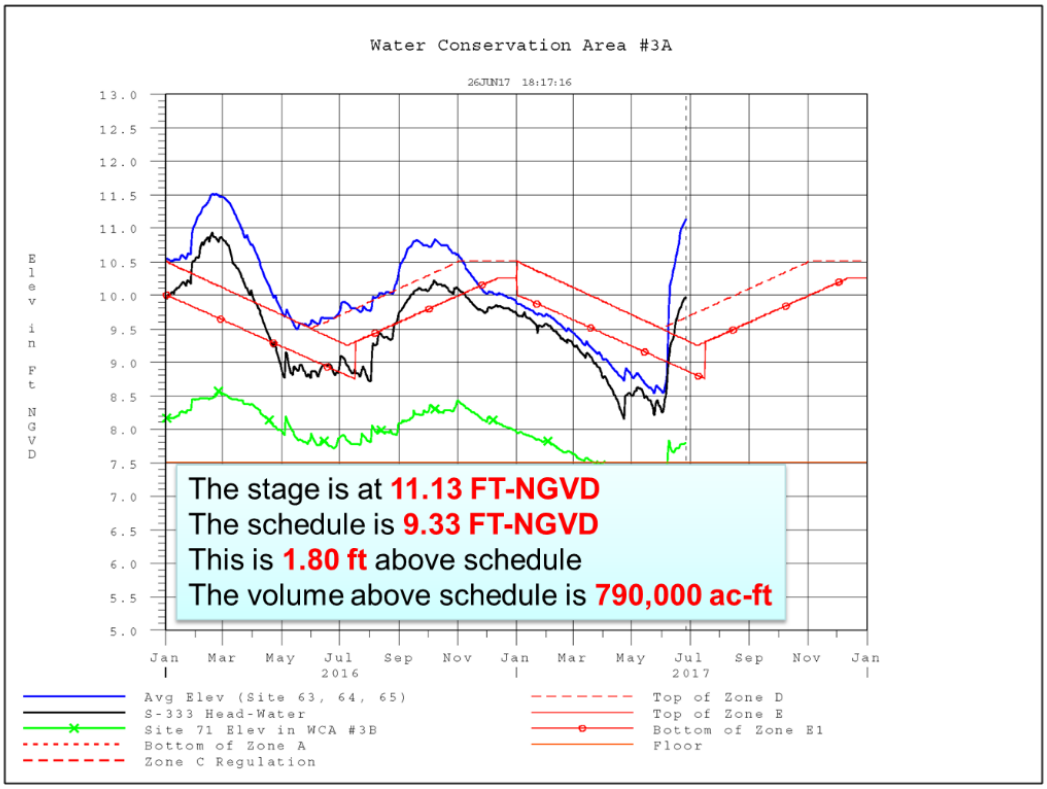

Figure 8: WCA-3A Stage Hydrographs and Regulation Schedule

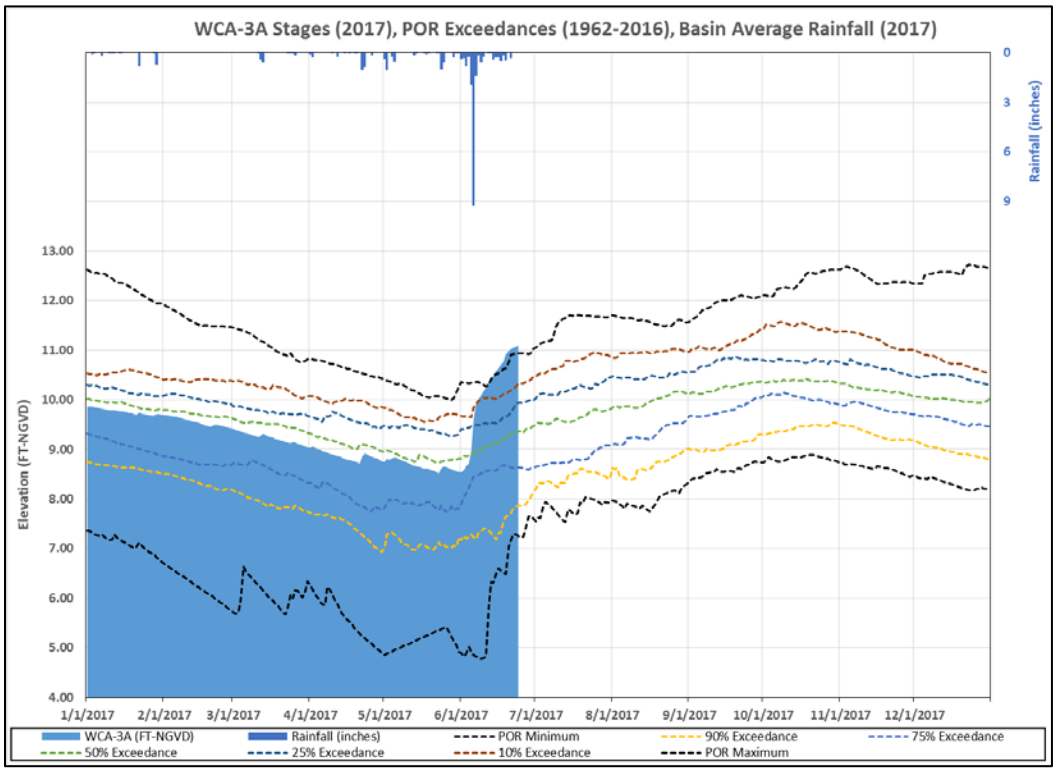

Figure 9: WCA-3A Stage Hydrograph and Exceedance Statistics

The extraordinary rainfall which has resulted in the amount of water shown above, has caused the WCA-3A 3-gage average stage to rise at a rate of approximately 0.5 feet per week. The S-12A and S-12B gated spillways, two of the five main outlet structures for WCA-3A, are currently closed through July 14 in accordance with the Increment 1.1 and 1.2 Operational Strategy to prevent additional surface water inflows towards Sub-population A of the endangered Cape Sable Seaside Sparrow (CSSS). However, if the recent ascension rate remains unchanged, the headwater levels at S-12A and S-12B are projected to result in water stages which overtop the gate elevation of 11.0 feet NGVD (gates in closed position) around July 9, 2017, as shown in Figure 10.

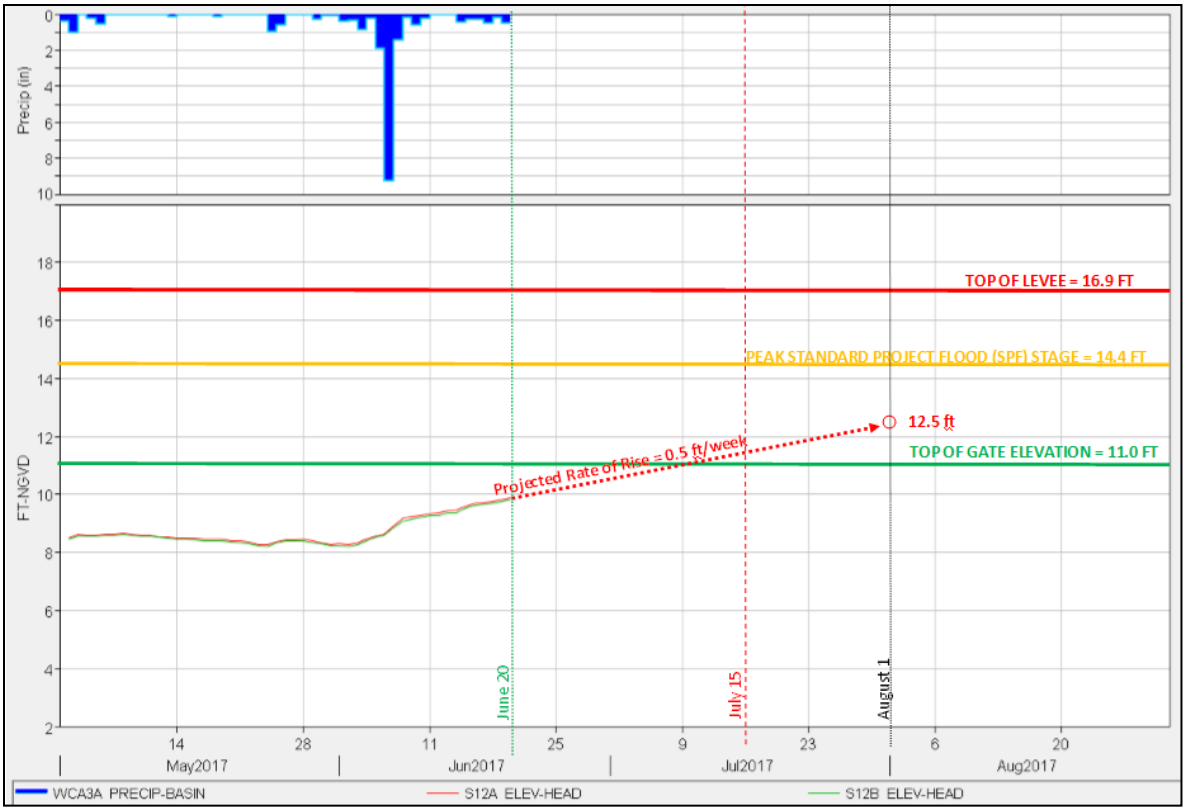

Figure 10: Headwater Elevations and Projections at S-12A and S-12B

Positional analysis has been done by both South Florida Water Management District (SFWMD) as well as the Corps to forecast future water levels in the WCAs. SFWMD analysis can be seen in Figures 11 and 12. These analysis indicate that the water levels in 3A will likely not recede below Zone A until October at the earliest. The analysis of the NP-205 gage in the ENP shows that water levels are and will be above ground at this site, indicating that additional flows are not likely to cause any additional inundation to CSSS nesting areas. The Corps has performed a positional analysis comparing a “do nothing” scenario and implementing the proposed actions. Figure 13 shows the first scenario and Figure 14 the second, both show that the water levels will take a significant amount of time to recede. At current release rates for S-12C and S-12D and assuming full releases from S-12A, S-12B, and S-333, it will take approximately six months to remove the excess water currently being held in all three WCAs.

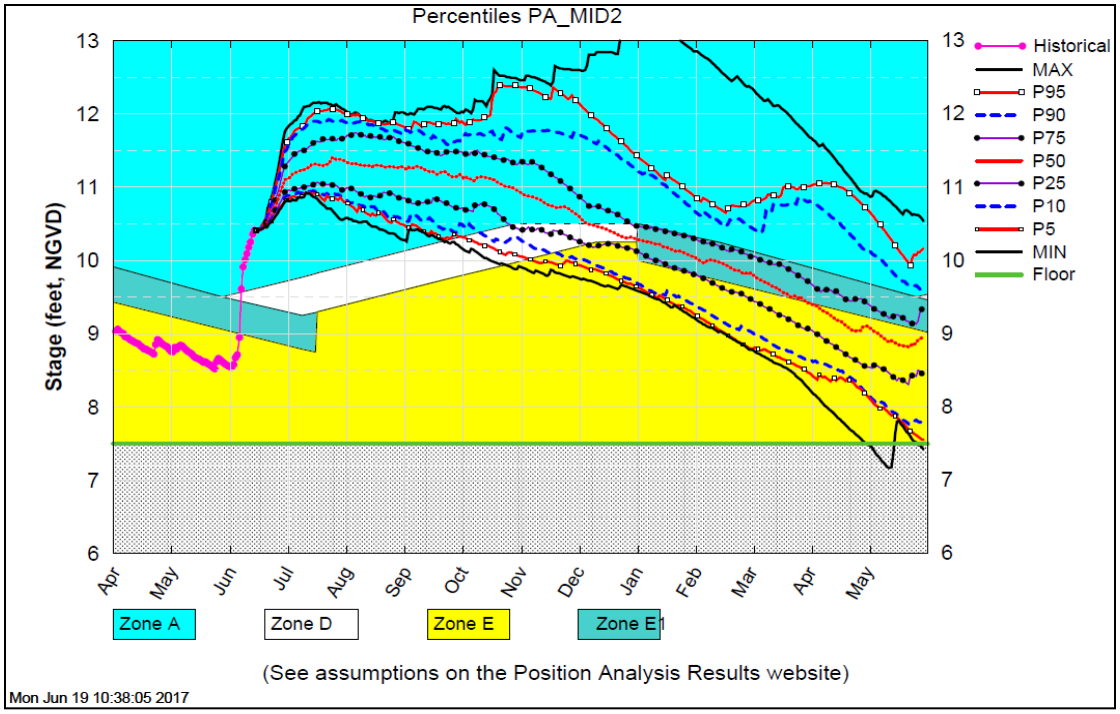

Figure 11: WCA-3A SFWMM 14 June 2017 Dynamic Position Analysis

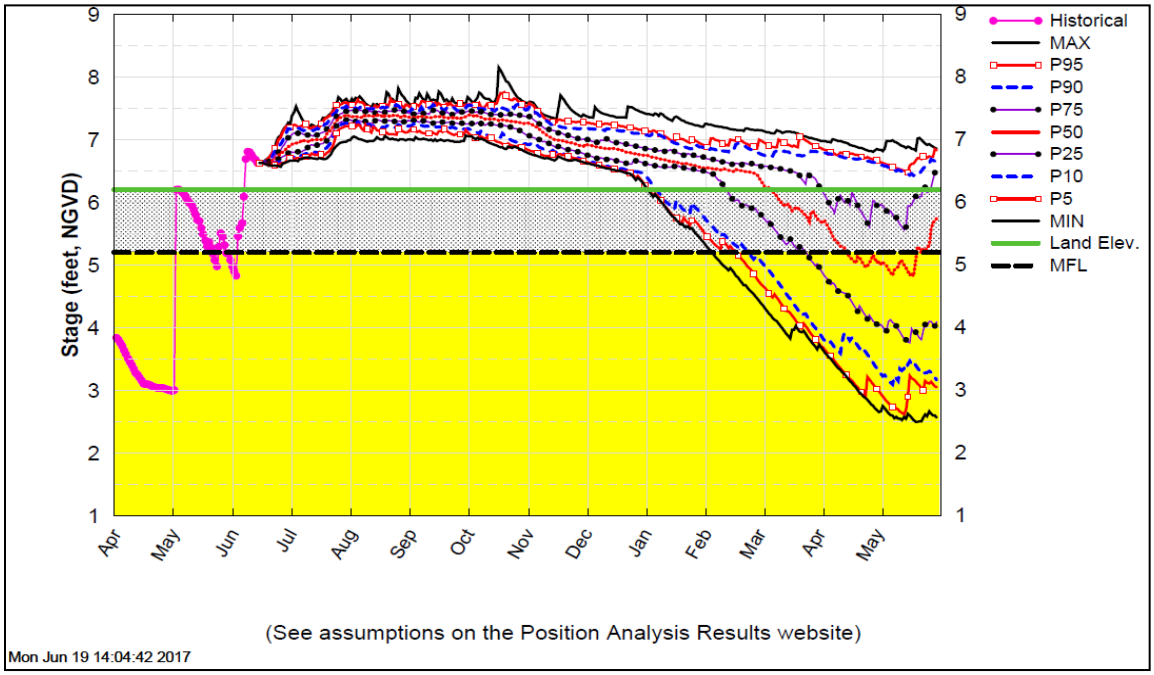

Figure 12: NP-205 Gage SFWMM 14 June 2017 Dynamic Position Analysis

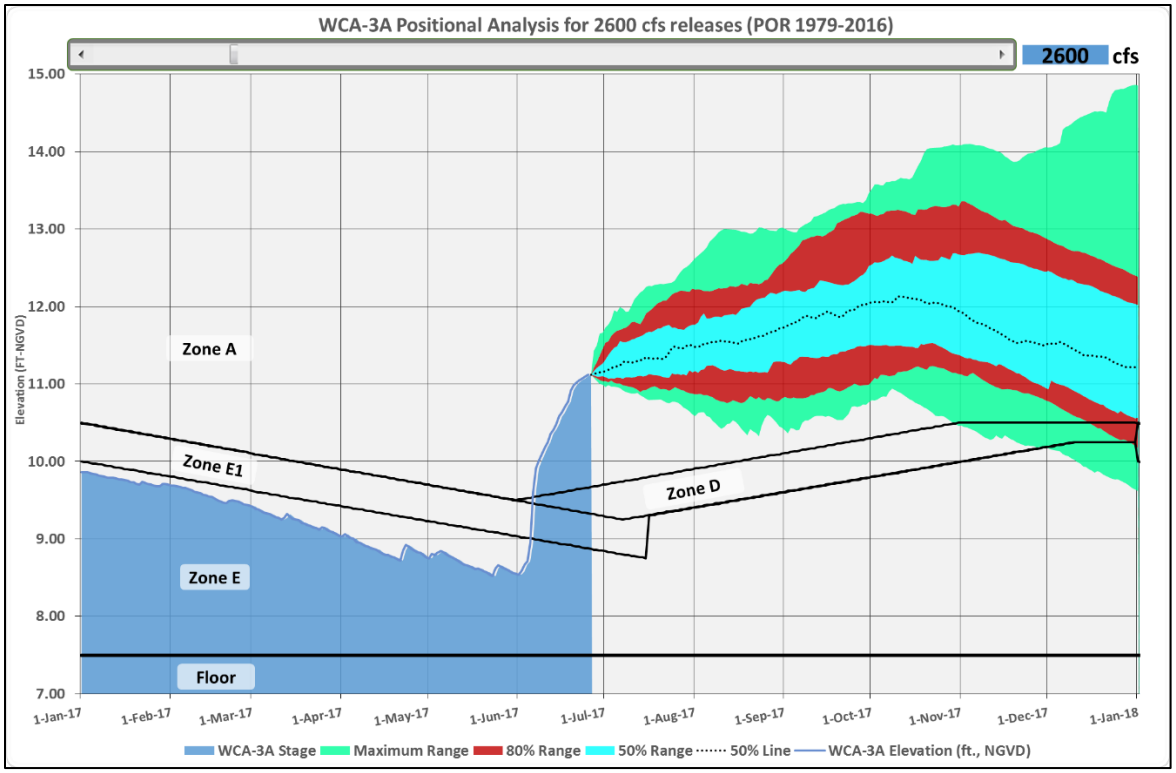

Figure 3: Positional Analysis of WCA-3A with current discharges at 2,600 cfs

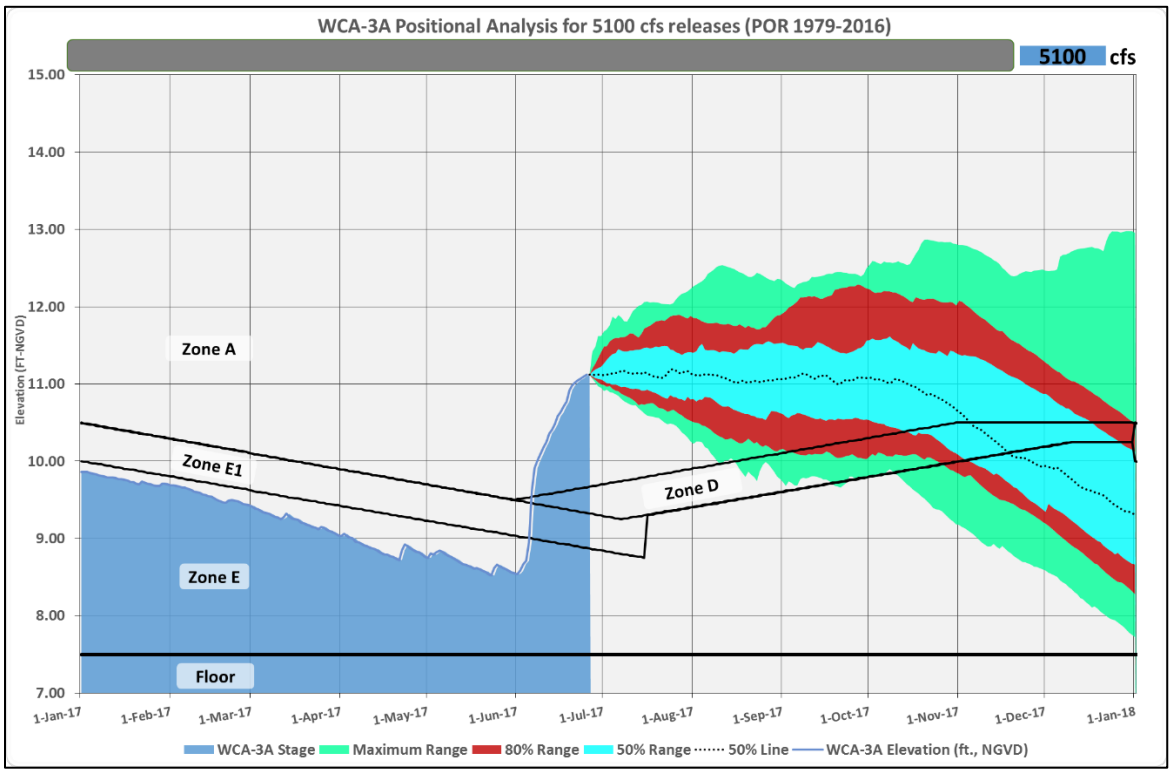

Figure 4: Positional Analysis of WCA-3A with full discharge capacity at 5,100 cfs

The Corps is currently releasing the maximum amount of water out of WCA-3A to help mitigate these high water levels. SFWMD is supporting this effort and making releases out of S-199, S-200 and G-737 as well as back pumping into Lake Okeechobee at S-2 and S-3. The back pumping is helping to reduce inflows into the WCAs significantly. In the event of rainfall in southern Florida, flow capacities are reduced. Water continues to flow into WCA-3A due to WCA-1 and 2 being above regulation schedule as well. The S-10s are currently released an estimated 300 cfs into WCA-2A. Much of the water that is released from WCA-2A is passing through the S-11 structures into WCA-3A. The S-11s are currently released an estimated 5,500-7,000 cfs into WCA-3A. There are additional structures and structure capacities available to release water from WCA-3A, but they are currently not utilized due to restrictions. Without these restrictions, the estimated combined flow rate from WCA-3A could reach approximately 5,100 cfs. At a rate of 2,600 cfs, it would take approximately 230 days to move 1,195,000 acre-feet of water. At 5,100 cfs, it would take 120 days. The current and full discharge capacities of WCA-3A outlet structures are listed in Table 4.

Table 4: Current and Full Discharge Capacities of WCA-3A Outlets

Structures	**Flow (cfs) as of 25 June 2017**	**Estimated flow (cfs) if no restrictions**
S-12A	0	221
S-12B	0	221
S-12C	773	773
S-12D	1,076	1,076
S-333/S-334	0 (S-333 is currently open, but may be closed depending on rainfall)	1,250*
S-343A	0	70
S-343B	0	170
S-344	0	160
S-151	663	663
S-152	0	525
TOTAL	**2,512**	**5,129**

**1,250 cfs is the maximum release with S-334 open.*

If the rate of rise is not mitigated to limit the duration of high water conditions, there is a potential for high water levels to pose more environmental risks, as well as, risks to public health, safety, welfare, and property in the South Florida region. The coming wet season and hurricane season also present an increased risk to the system due to reduced flood storage. As such, the Florida Department of Environmental Protection (FDEP) issued an Emergency Final Order on June 23, 2017 to take immediate action for the following proposed water management actions to achieve high water relief in the WCAs:

- (Corps lead) open S-344, S-343A, S-343B, S-12A, and S-12B prior to official opening date of July 15;

- (Corps lead) open S-152 to discharge water from WCA-3A to WCA-3B;
- (Corps lead) increase discharge at S-332D from 250cfs to 500 cfs to increase discharge from WCA-3A to the South Dade Conveyance System (SDCS) using S-333 and S-334, if needed;
- (Corps lead) increase the discharge at S-197 to maximum capacity from the current maximum release of 400 cfs to accommodate additional flows from WCA-3A to the SDCS using S-333 and S-334 while retaining capacity to manage local basin runoff;
- (SFWMD lead) install temporary pumps adjacent to S-355A, S-355B; and
- (SFWMD lead) execute operational changes for structures S-199, S-200, and G-737, all of which are owned and operated by the South Florida Water Management District (SFWMD).

Details discussed in this Annex primarily address the components for which the Corps has operational responsibility.

Opening the S-344, S-343A, S-343B, S12A, and S-12B structures before July 15 requires permission from the US Fish and Wildlife Service (USFWS) and would be a deviation from regular operating procedures outlined in the 2012 Water Control Plan and the current Increment 1.1 and 1.2 planned deviation. This closure constraint until July 15th was established in the 2016 USFWS Biological Opinion in order to protect Sub-population A of the endangered CSSS during its breeding season. The proposed action would allow more water to be released from WCA-3A to western Everglades National Park (ENP). Similarly, increasing the discharge limit at S-332D prior to July 15th would require USFWS to approve relaxation of the CSSS subpopulation C and D constraints. Permit actions are not required for opening the S-152 and increasing flows at S-197 following FDEP's issuance of the Emergency Final Order, however, consultation with the Tribes and other stakeholder agencies are required and are occurring concurrent to the development of this Operational Strategy.

Currently, the Corps is choosing not to pursue raising the level of L-29 above its current maximum operating limit stage of 7.5 ft, NGVD in order to prevent delayed completion and/or damages to the in-progress C-111 South Dade Contract 8 (initiated in 2015) and Contract 8A (initiated in 2016) construction projects and in order to maintain the authorized flood mitigation for the 8.5 Square Mile Area (SMA). The current Increment 1.1 and 1.2 deviation includes the ability to raise the L-29 Canal stage maximum operating limit from 7.5 up to 7.8 feet, NGVD, contingent upon the following conditions: (1) acquisition of required real estate interest and any associated improvements for the private ownership along Tamiami Trail including receipt of Tamiami Trail Bridge and roadway channel and flowage easements from the FDOT; (2) completion of the C-358 Canal (Richmond Drive Seepage Collection Canal) and installation of S-357N (C-358 control structure); and (3) completion of sufficient portions of Contracts 8 (construction of the C-111 NDA L-315 western levee and the L-357W Extension Levee between Richmond Drive and the 8.5 SMA Detention Cell) and completion of the Contract 8A berms inside the 8.5 SMA Detention Cell. Independent of this deviation request to address WCA-3A high water conditions, the Corps is actively coordinating with the construction contractors and other agencies to expedite the schedule raising the L-29 Canal maximum operating limit to 7.8 feet NGVD. Delayed completion of the in-progress C-111 South Dade Contract 8 and Contract 8A construction efforts may preclude completion of the North Detention Area (NDA). Operation of the NDA to receive 8.5 SMA flood mitigation discharges from the S-357 pump station is a

prerequisite for raising the L-29 Canal maximum operating limit from 7.8 feet NGVD up to 8.5 feet NGVD under the planned Increment 2 Field Test, and implementation of the Increment 2 Field Test by March 1st, 2018 is a requirement of the Reasonable and Prudent Alternative (RPA) identified in the 2016 USFWS Biological Opinion.

A map of the structures discussed above can be seen in Figure 15.

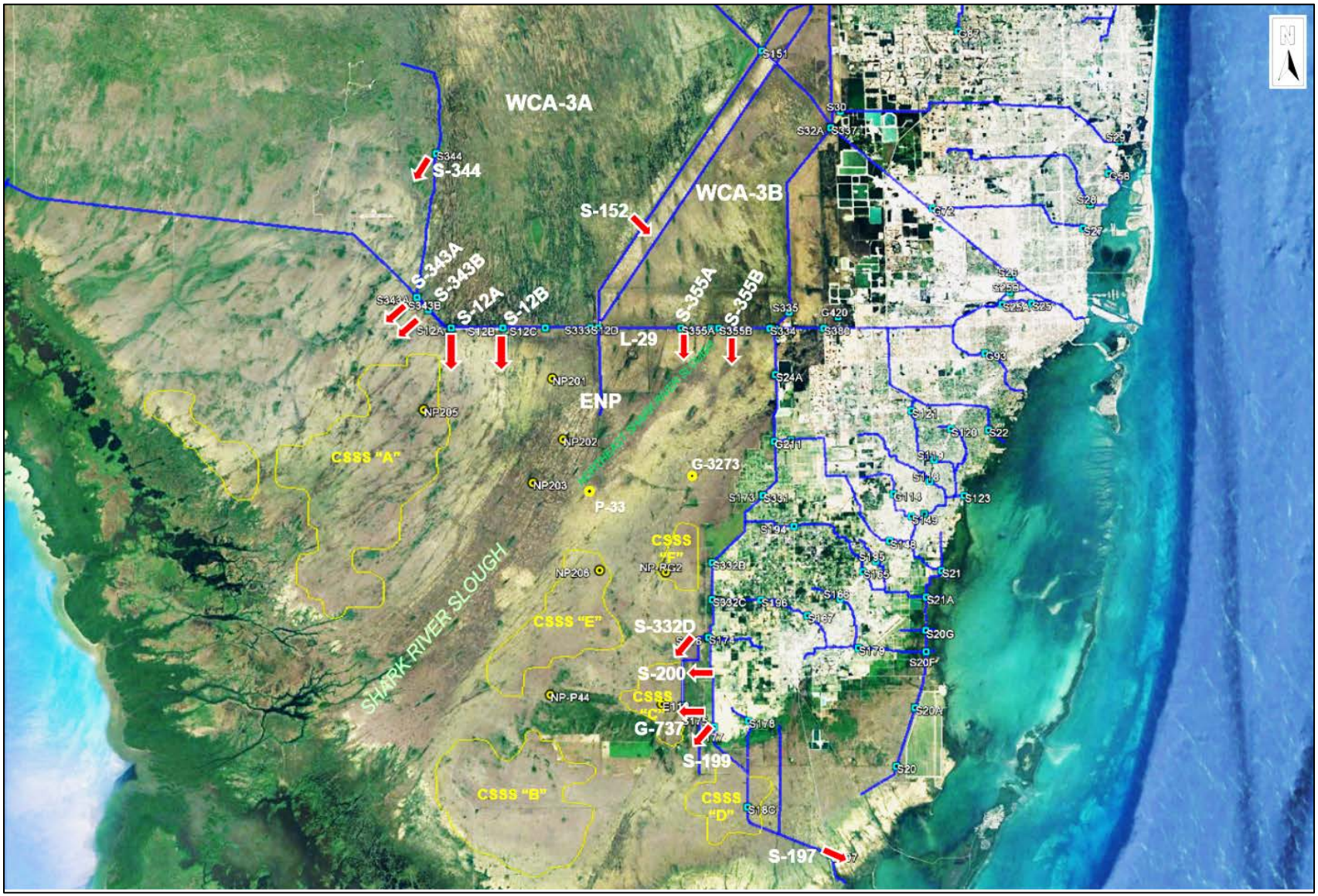

Figure 15: WCAs-ENP-SDCS System and Structure Map