

APPENDIX A
OPERATIONAL CRITERIA
June 2018

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

The U.S. Army Corps of Engineers, Jacksonville District (Corps) is seeking a Planned Temporary Deviation from the 2012 Water Control Plan and the Modified Water Deliveries (MWD) to Everglades National Park Project Increment 2 (MWD Increment 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 details regarding other water management activities managed by the State of Florida which were considered in the system-wide analysis to reduce water stages in the WCAs.

Corps' Structure Deviation Summary

S-344 discharges are currently constrained at zero through July 15, 2018 due to the 2016 U.S. Fish & Wildlife Service (USFWS) Everglades Restoration Transition Plan (ERTP) Biological Opinion (BO) and the MWD Increment 2 Operational Strategy. The Planned Temporary Deviation will maximize releases at this structure to approximately 200 cubic feet per second (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 WCA 3A Regulation Schedule Zone A before July 15, 2018, these flows will be turned off. After July 15, 2018 2016 ERTP BO operational constraints will be lifted and normal operations under MWD Increment 2 will resume.

S-343A discharges are currently constrained at zero through July 15, 2018 due to the 2016 USFWS ERTP BO and the MWD Increment 2 Operational Strategy. The Planned Temporary Deviation will maximize releases at this structure to approximately 200 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 WCA 3A Regulation Schedule Zone A before July 15, 2018 these flows will be turned off. After July 15, 2018 operational constraints will be lifted and normal operations under MWD Increment 2 will resume.

S-343B discharges are currently constrained at zero through July 15, 2018 due to the 2016 USFWS ERTP BO and the MWD Increment 2 Operational Strategy. The Planned Temporary Deviation will maximize releases at this structure to approximately 200 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 WCA 3A Regulation Schedule Zone A before July 15, 2018 these flows will be turned off. After July 15, 2018 operational constraints will be lifted and normal operations under MWD Increment 2 will resume.

S-12A discharges are currently constrained at zero through July 15, 2018 due to the 2016 USFWS ERTP BO and the MWD Increment 2 Operational Strategy. The Planned Temporary Deviation will maximize releases at this structure (expected to initially discharge around 300 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 WCA 3A Regulation Schedule Zone A before July 15, 2018 these flows will be turned off. After July 15, 2018 operational constraints will be lifted and normal operations under MWD Increment 2 will resume.

S-12B discharges are currently constrained at zero through July 15, 2018 due to the 2016 USFWS ERTF BO and the MWD Increment 2 Operational Strategy. The Planned Temporary Deviation will maximize releases at this structure (expected to initially discharge around 300 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 WCA 3A Regulation Schedule Zone A before July 15, 2018, these flows will be turned off. After July 15, 2018 operational constraints will be lifted and normal operations under MWD Increment 2 will resume.

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 MWD Increment 2 Operational Strategy.
- Reevaluation of, extension to, or termination of any or all of the requested deviations, as needed.

ANNEX A
HYDROLOGIC DATA AND ANALYSES
June 2018

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

The U.S. Army Corps of Engineers, Jacksonville District (Corps) is seeking a planned temporary deviation from the 2012 Water Control Plan and the Modified Water Deliveries (MWD) Increment 1.1 and 1.2 and MWD Increment 2.0 Operational Strategies 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' Planned Temporary Deviation Operational Strategy.

A series of early wet season storms since May 13, 2018 have caused conditions to change very rapidly from very dry conditions to very wet in South Florida. **Table 1** and **Figure 1** illustrate the extraordinary quantity of precipitation experienced across the WCAs and the Everglades Agricultural Area (EAA), specifically. WCA-3 alone received 12.33 inches in precipitation in May, which is 285% of the average for this time of year. May 2018 was the wettest May on record within the South Florida Water Management District Service Area with 11.5 inches (previous record was 9.25 inches in 1895) of rainfall recorded.

TABLE 1: PRECIPITATION DATA (MAY 2, 2018 TO JUNE 1, 2018)

Area	Precipitation	% of Average
East EAA	11.09 inches	293% (average 3.78 inches)
WCA-1 & WCA-2	16.87 inches	397% (average 4.25 inches)
WCA-3	12.33 inches	285% (average 4.32 inches)

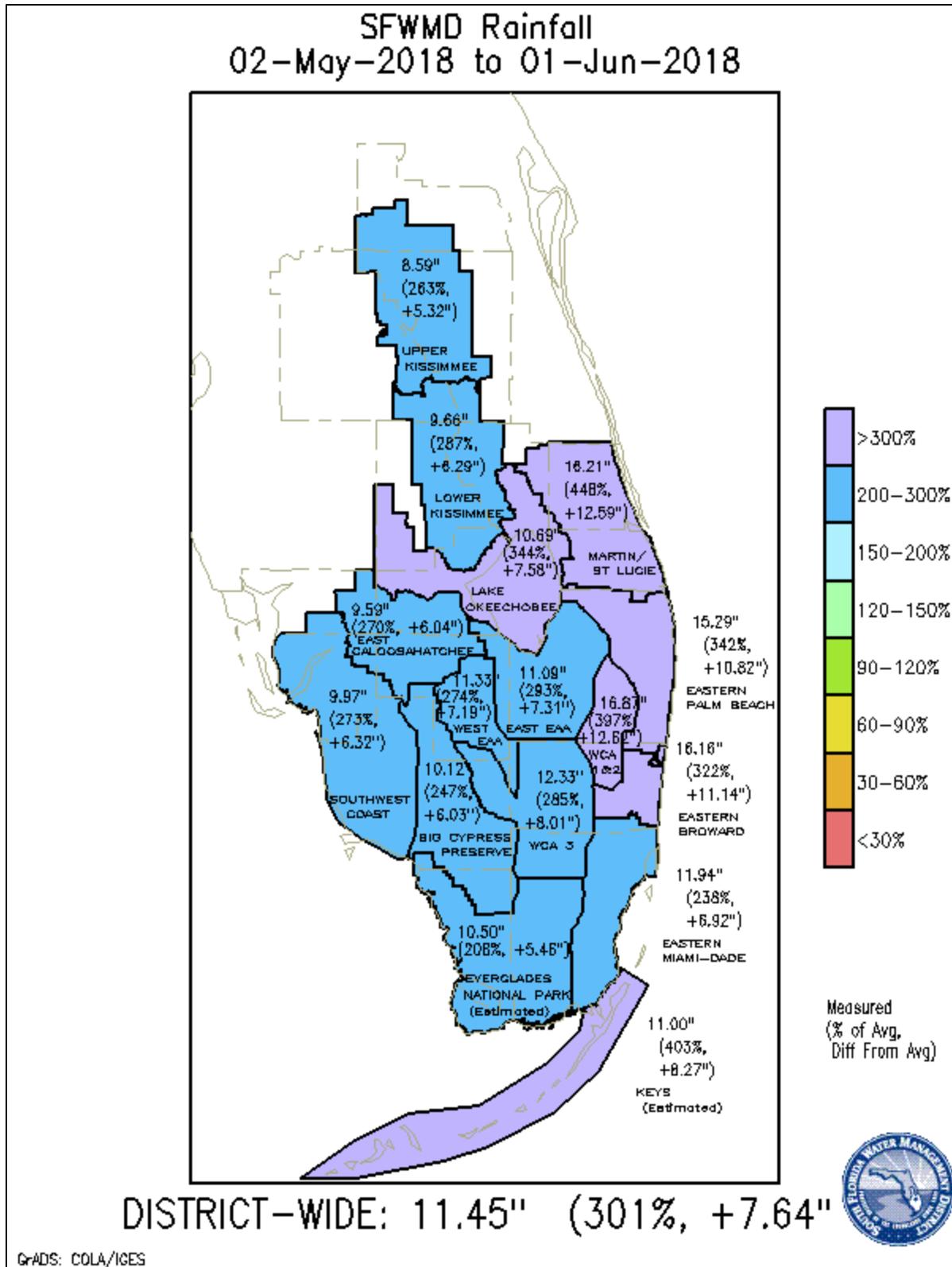


FIGURE 1: SFWMD RAINFALL MAP (MAY 2, 2018 TO JUNE 1, 2018)

This unprecedented area-wide rainfall for the month of May has caused water stages 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 2018. **Table 2** shows the stage, and excess volume of water contained in these areas. There are currently over 908,725 acre-feet of water above schedules in the WCAs.

TABLE 2: WCA STAGES COMPARED TO REGULATION SCHEDULE (JUNE 15, 2018)

Area	Current Stage (feet NGVD*)	Regulation Schedule (feet NGVD)	Departure from Regulation Schedule (feet)	Volume above Schedule (acre-feet)
WCA-1	15.96	15.75	0.21	31,450
WCA-2	15.57	11.00	1.57	165,800
WCA-3	10.84	9.40	1.44	711,475

TOTAL: 908,725 acre-feet

*NGVD: National Geodetic Vertical Datum of 1929

High stages within the WCAs are concerning and WCA 3A in particular because of ongoing construction, environmental constraints, and current system capacity limiting the volume of water that can be moved out of the system. All WCAs are above schedule (as seen in **Figures 2-4**) limiting the operational flexibility in the system. WCA 3A is the last downstream storage area in the Central and Southern Florida Project and it has extremely limited outlet capacity. The WCA 3A stage is currently above the maximum regulation schedule as shown in the stage hydrographs depicted below.

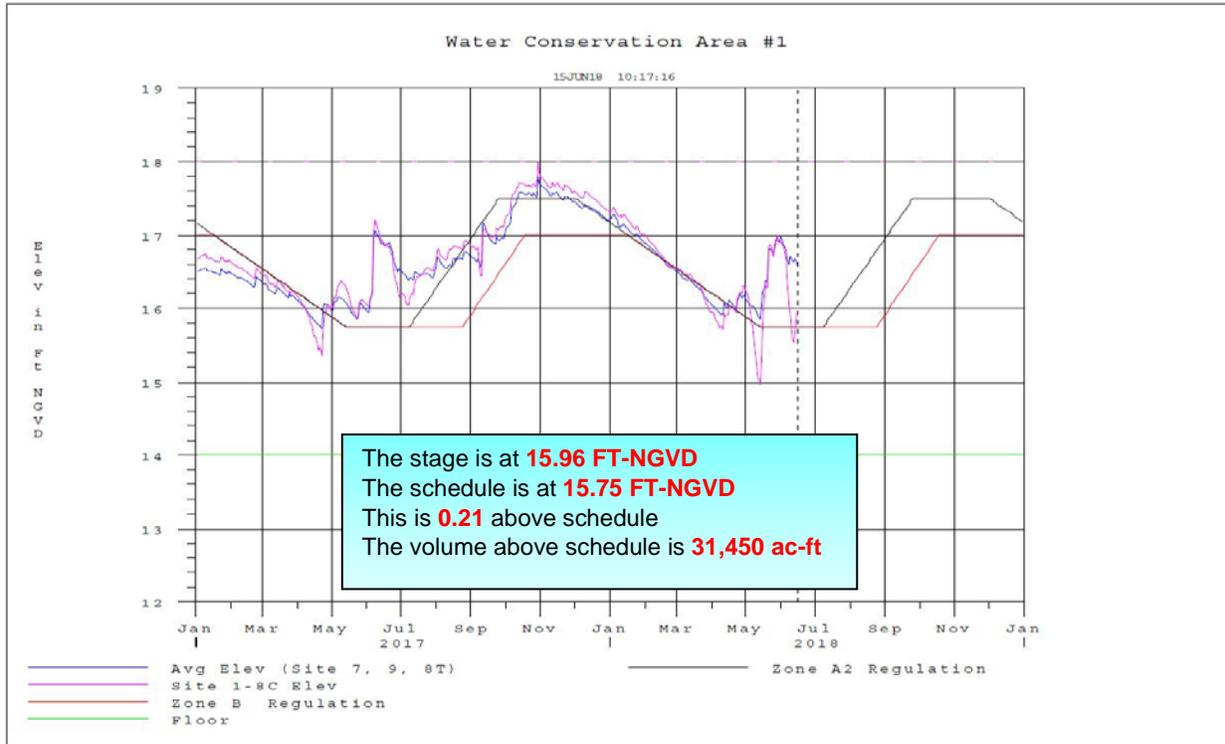


FIGURE 2: WCA-1 STAGE HYDROGRAPHS AND REGULATION SCHEDULE

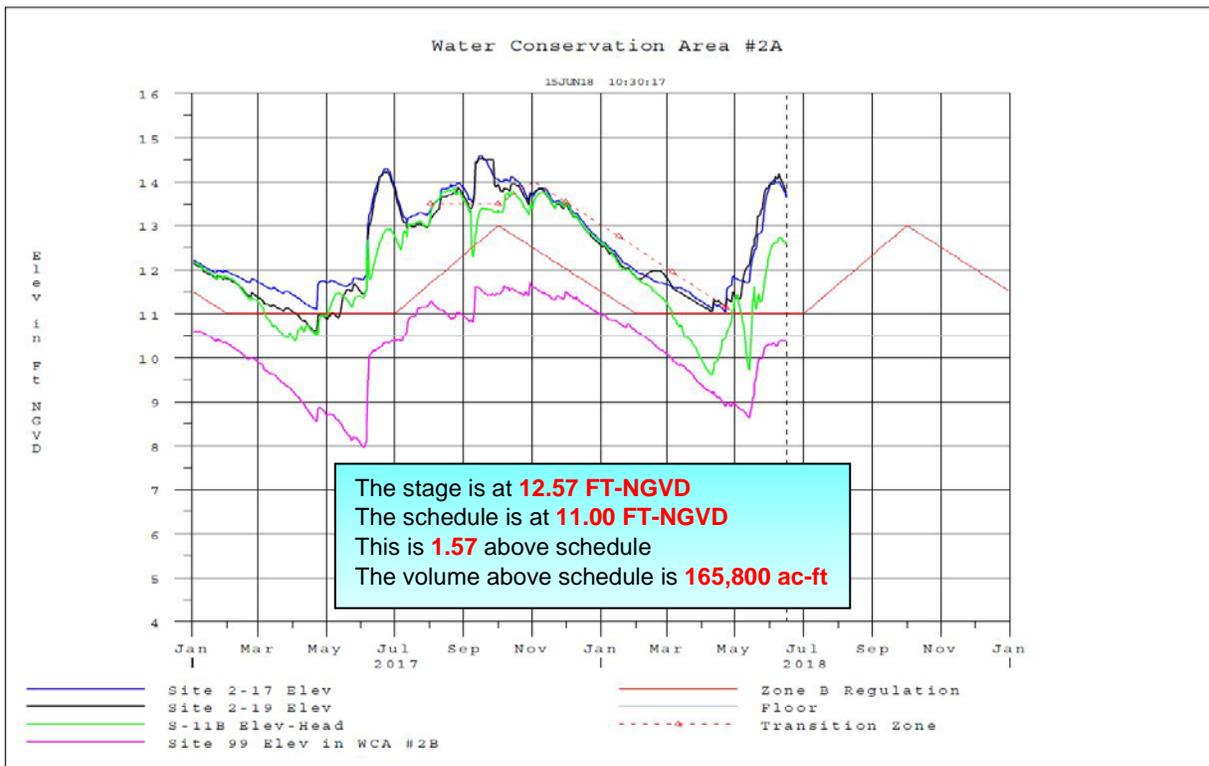


FIGURE 3: WCA-2A STAGE HYDROGRAPHS AND REGULATION SCHEDULE

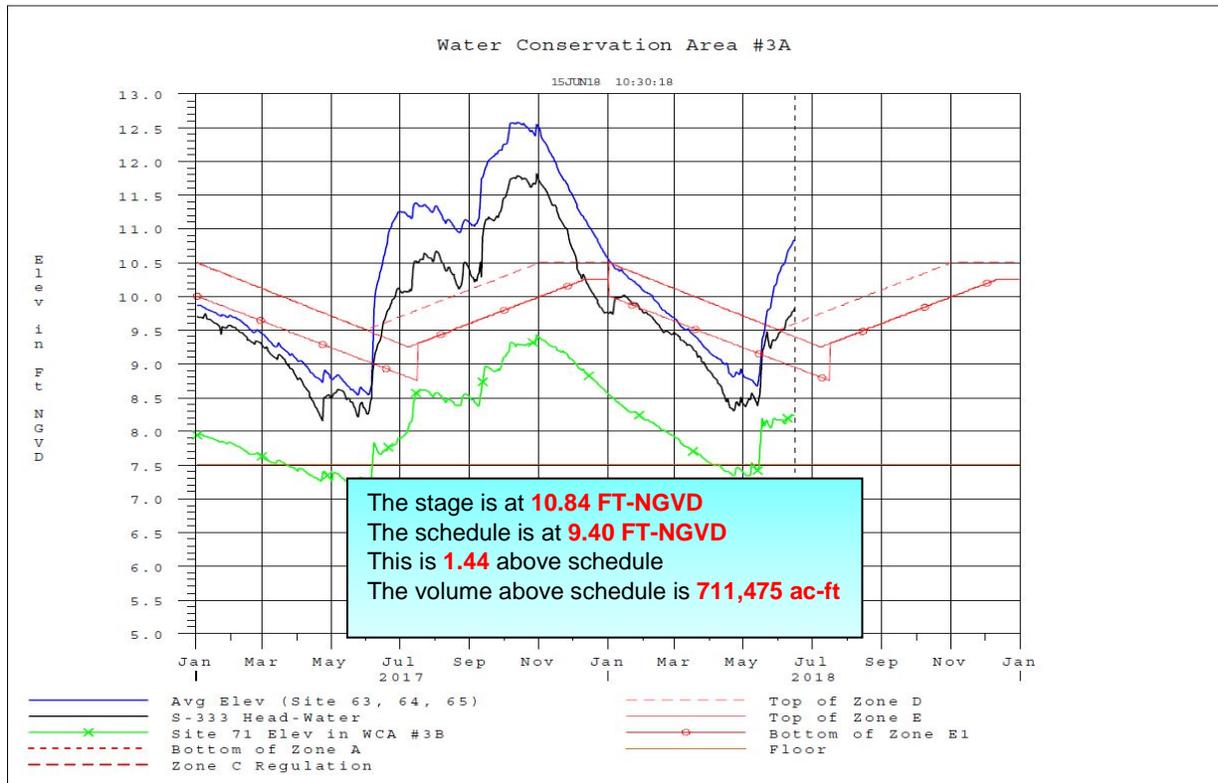


FIGURE 4: WCA-3A STAGE HYDROGRAPHS AND REGULATION SCHEDULE

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 0.27 feet per week. The S-12A and S-12B gated spillways, two of the five main outlet structures from WCA-3A, are currently closed through July 14 in accordance with the MWD 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).

Position analysis has been done by both South Florida Water Management District (SFWMD) to forecast future water levels in the WCAs. SFWMD analysis can be seen in **Figures 5 and 6**. These analysis indicate that there is a 50% chance water levels in WCA 3A will likely not recede below Zone A until January at the earliest (P50). The analysis of the NP-205 gage in Everglades National Park shows that water levels are and will most likely continue to be above ground at this site, indicating that additional flows are not likely to cause any additional inundation to CSSS nesting areas prior to July 15. At current release rates for S-12C, S-12D, and S-333 and assuming full releases from S-344, S-343A, S-343B, S-12A, and S-12B, it will take approximately six months to remove the excess water currently being held in all three WCAs.

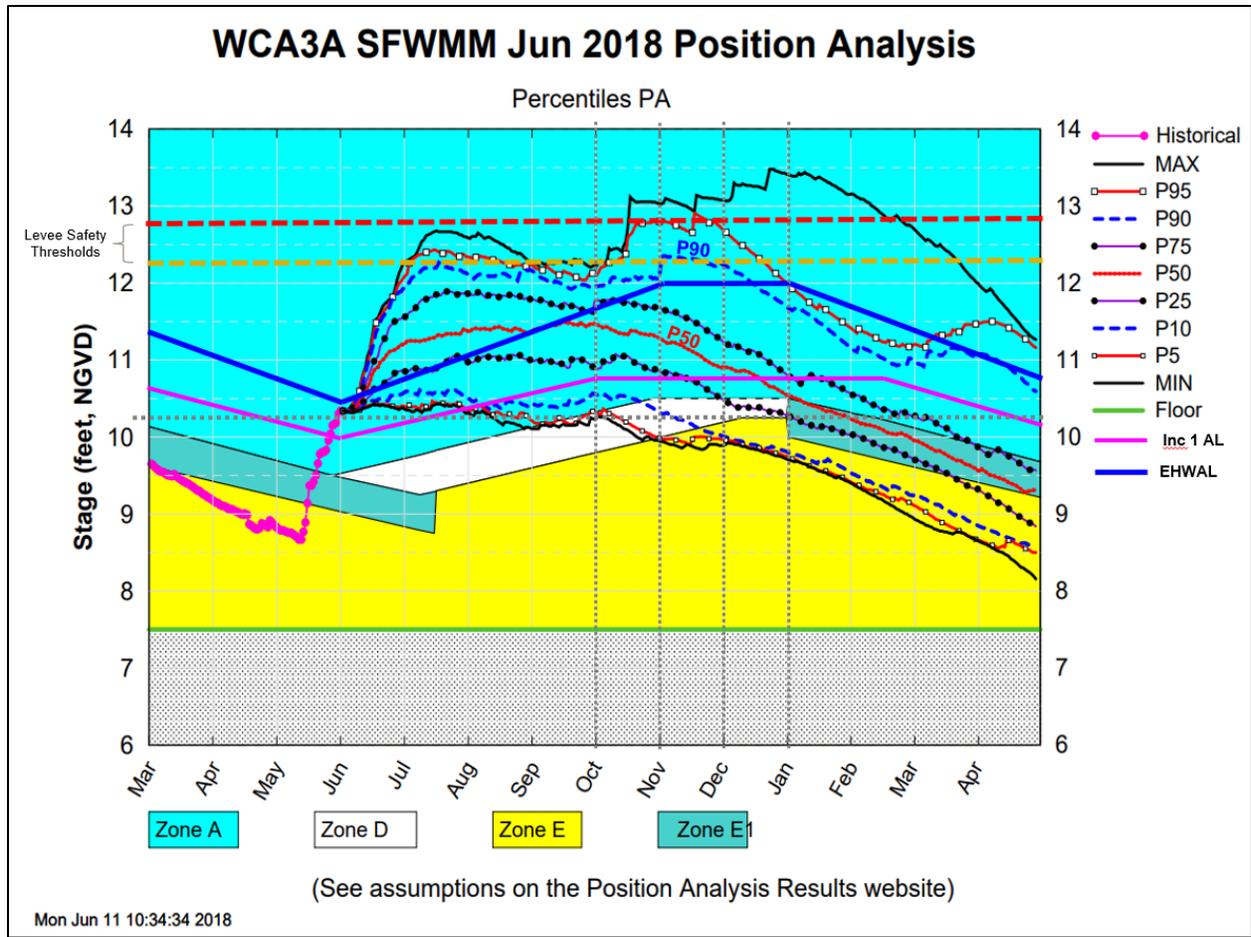


FIGURE 5: WCA-3A SFWMM JUNE 1, 2018 DYNAMIC POSITION ANALYSIS

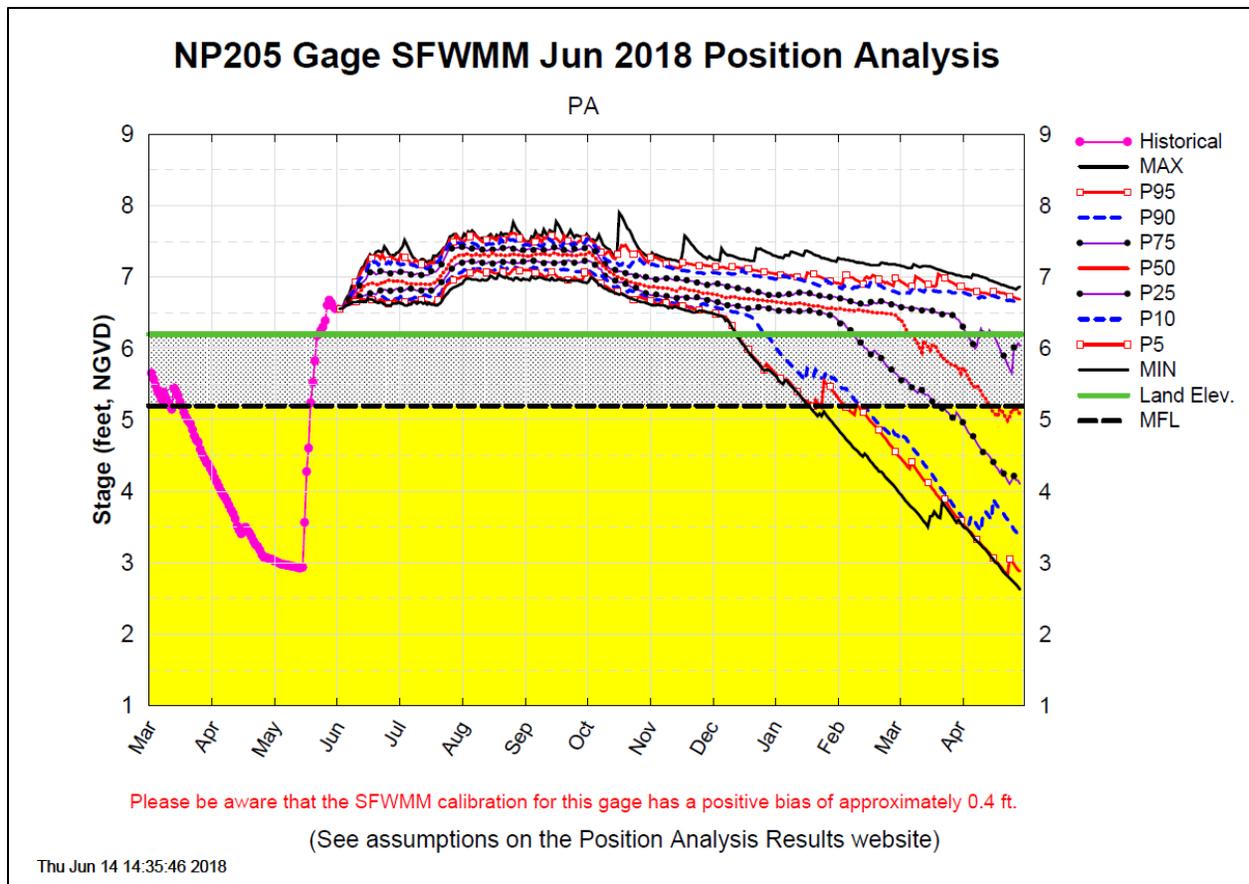


FIGURE 6: NP-205 GAGE SFWMM JUNE 1, 2018 DYNAMIC POSITION ANALYSIS

The Corps is currently releasing the maximum amount of water out of WCA 3A to help mitigate these high water stages under the current operating criteria available. Water continues to flow into WCA 3A due to WCA 2A being above regulation schedule as well. The S-11s are currently releasing an estimated 3,500 cubic feet per second (cfs) into WCA 3A as of June 15, 2018. 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 3,500 cfs and at this rate, it would take approximately 151 days (5 months) to move 933,800 acre-feet of water out of WCA 3A. The current and full discharge capacities of WCA 3A outlet structures are listed in **Table 3**.

TABLE 3: CURRENT AND FULL DISCHARGE CAPACITIES OF WCA 3A OUTLETS

Structure	Flow (cfs) as of June 15, 2018	Estimated flow (cfs) if no restrictions or on July 15, 2018
S-12A	0	300
S-12B	0	300
S-12C	590	590
S-12D	730	730
S-333/S-334	570*	570*
S-343A	0	200
S-343B	0	200
S-344	0	200
S-151	0	0
S-152	0	400
TOTAL	1,890	3,490

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

***S-151 will be offline for construction activities.*

If the rate of rise is not mitigated and the duration of high water conditions is reduced, there is a potential for increased 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 limited flood storage available with each of the WCAs already above the top of the respective schedules. Therefore, a Planned Temporary Deviation, if implemented, proposes the opening of the following structures on July 1, 2018, prior to their official opening date of July 15, 2018 to achieve high water relief in the WCA-3A.

- S-344
- S-343A
- S-343B
- S-12A
- S-12B

Opening the S-344, S-343A, S-343B, S12A, and S-12B structures before July 15, 2018 requires consultation with US Fish and Wildlife Service (USFWS) and would be a deviation from regular operating procedures outlined in the 2012 Water Control Plan, MWD Increment 1.1/1.2, MWD Increment 2 and the 2016 Everglades Restoration Transition Plan (ERTP) Biological Opinion (BO). This long-standing closure constraint until July 15 annually was re-affirmed in the 2016 ERTTP BO 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. Consultation with the Tribes and other stakeholder agencies are required and are occurring concurrent to the development of this Operational Strategy. Independent of this deviation request to further address WCA 3A high water conditions, the Corps is also seeking a

WCA 2A regulation schedule planned deviation to reduce inflows to WCA-3A via the S-11 structures.

Currently, the Corps has chosen not to pursue raising the level of L-29 above its current maximum operating limit stage of 7.5 feet NGVD until at earliest July 1, 2018 in order to prevent delayed completion and/or damages to the in-progress Canal-111 South Dade (C-111 SD) Contract 8 (initiated in 2015) and Contract 8A (initiated in 2016) construction projects. Maintaining the authorized flood mitigation for the 8.5 Square Mile Area (SMA) also requires holding L-29 at its current maximum operating limit prior to completion of the North Detention Area (NDA), which allows requisite operation of the 8.5 SMA S-357 pump station. The current projected completion date for the NDA of the C-111 SD Project is projected to be June 30, 2018. At that time, the MWD Increment 2 Operational Strategy and its transition plan have the ability to incrementally raise the L-29 Canal stage maximum operating limit from the existing limit of 7.5 feet, NGVD up to a maximum of 8.3 feet, NGVD on July 1, 2018 and up to a maximum of 8.5 feet, NGVD on October 1, 2018 when the Southern Detention Area (SDA) construction of the C-111 SD Project is completed. Note that 8.5 feet, NGVD is a maximum elevation, and the day-to-day operations will require a slightly lower canal elevation so that storage is available for forecasted rain. The L-29 Canal maximum operating limit is subject to downstream constraints which include requirements to operate L-29 Canal water control structures to ensure the stability and safety of the Tamiami Trail highway, in coordination with the Florida Department of Transportation, and requirements to maintain the Congressionally-authorized level of flood mitigation for the 8.5 SMA. 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 7.5 feet NGVD up to 8.5 feet NGVD under the planned MWD Increment 2. A map of the structures discussed above can be seen in **Figure 7**. The effects of the proposed actions on WCA 3A are summarized in **Table 4**.

TABLE 4. PROPOSED ACTIONS TO MODERATE THE RATE OF RISE OF WATER LEVELS IN WCA-3A

Description	Constraints	Effective Option (acre-feet per day)*	Effect on WCA-3A in feet (June 30 to 15 July)	Effect on WCA-3A in feet (June 30 to Dec 31)
Open S-344	2016 USFWS ERTTP BO requires closure Oct 1-July 14 for S-12A, S-343A/B and S-344 and Nov 1-July 14 for S-12B	up to 400	0.01	0.09
Open S-343A		up to 400	0.01	0.08
Open S-343B		up to 400	0.01	0.08
Open S-12A		up to 600	0.02	0.09

Open S-12B		up to 600	0.02	0.09
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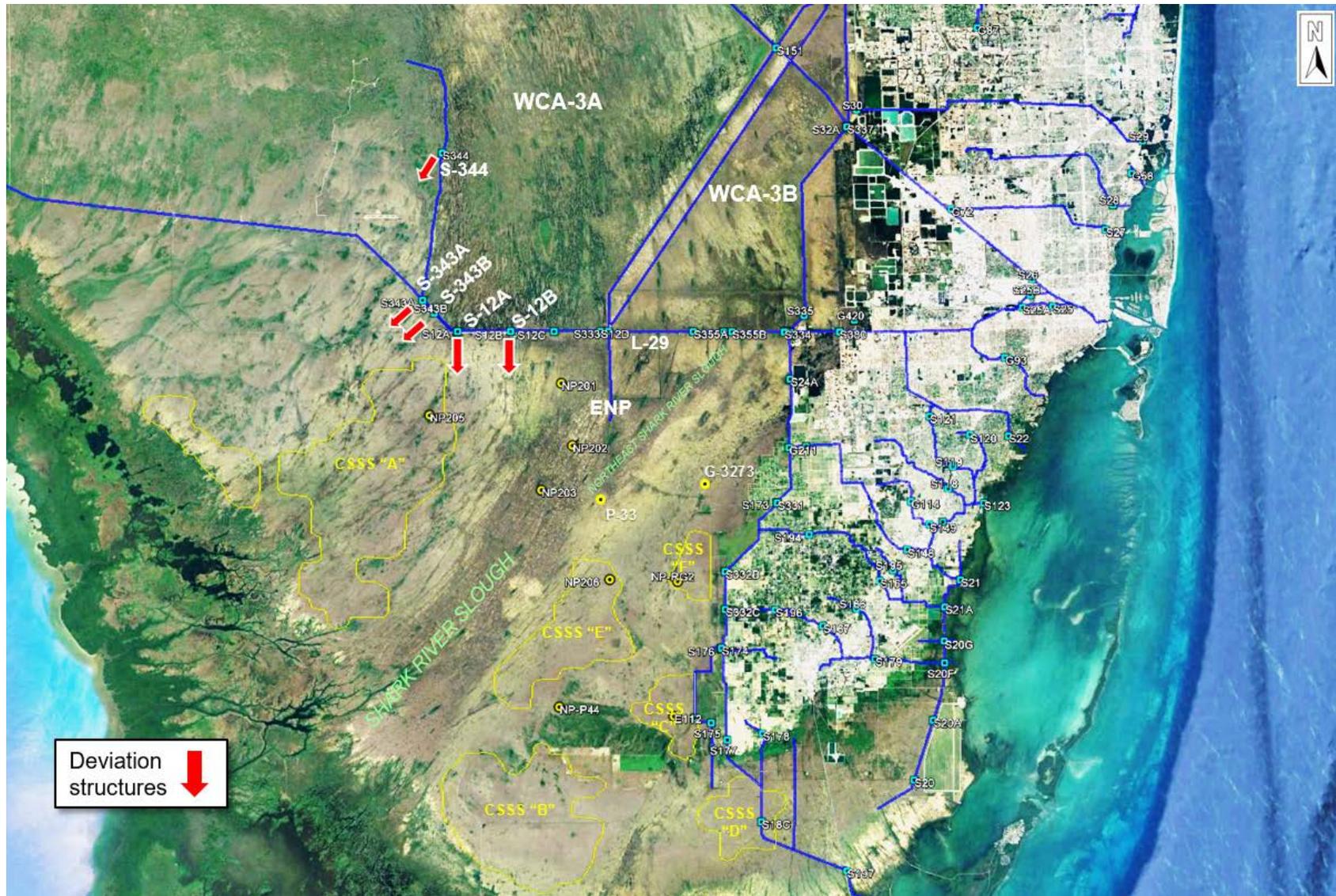


FIGURE 7: WCAS-ENP-SDCS SYSTEM AND STRUCTURE MAP