

APPENDIX A
OPERATIONAL STRATEGY
WITH HYDROLOGIC DATA AND ANALYSES
June 2018

Operational Strategy

The U.S. Army Corps of Engineers, Jacksonville District (Corps) is seeking a Planned Temporary Deviation from the Water Conservation Area (WCA) 2A Regulation Schedule in the 2012 Water Control Plan to provide relief from high water stages for WCA-3A until 30 April 2019 by reducing total inflows from WCA 2A into WCA-3A. The intent of the deviation is to reduce flows into WCA-3A through the S-11 structures. The Corps will coordinate with the South Florida Water Management District (SFWMD) to manage WCA-2A stages by maximizing releases out of WCA-2A to the east as practicable for the duration of the deviation while in the Transition Zone (Figure 1). The capacity to accomplish releases east is reduced when there is local rainfall over the east coast canal system. This deviation would remain in effect until WCA-3A falls below Zone A, at which point a recovery period would be initiated to reduce the WCA-2A stage to the pre-deviation regulation schedule (normal operations). The deviation, including the recovery period, shall not extend past 30 April 2019 under this request. The recovery period will include a steady reduction in stage until it reaches the current regulation schedule. The rate of reduction will be coordinated with partner agencies through the avenues currently in place. All release guidance will remain unchanged, aside from the higher stage triggers. The proposed schedule can be seen in Figure 1. The current regulation schedule and its zones is shown in black while the proposed schedule and zones are shown in red. The Corps retains operational flexibility to increase flows out of WCA-2A while in the Transition Zone and Zone A.

- Deviation Zone A - In Zone A of the regulation schedule, releases are made up maximum capacity at S 11; maximum capacity at S-144, S-145, and S-146; and maximum practicable at S-143 and S-38 when requested by the Corps. This zone is the same as the current Zone A of the regulation schedule.
- Transition Zone - In this zone releases maximum capacity at S-144, S-145, and S 146; and maximum practicable at S-143 and S-38 when requested by the Corps of Engineers.

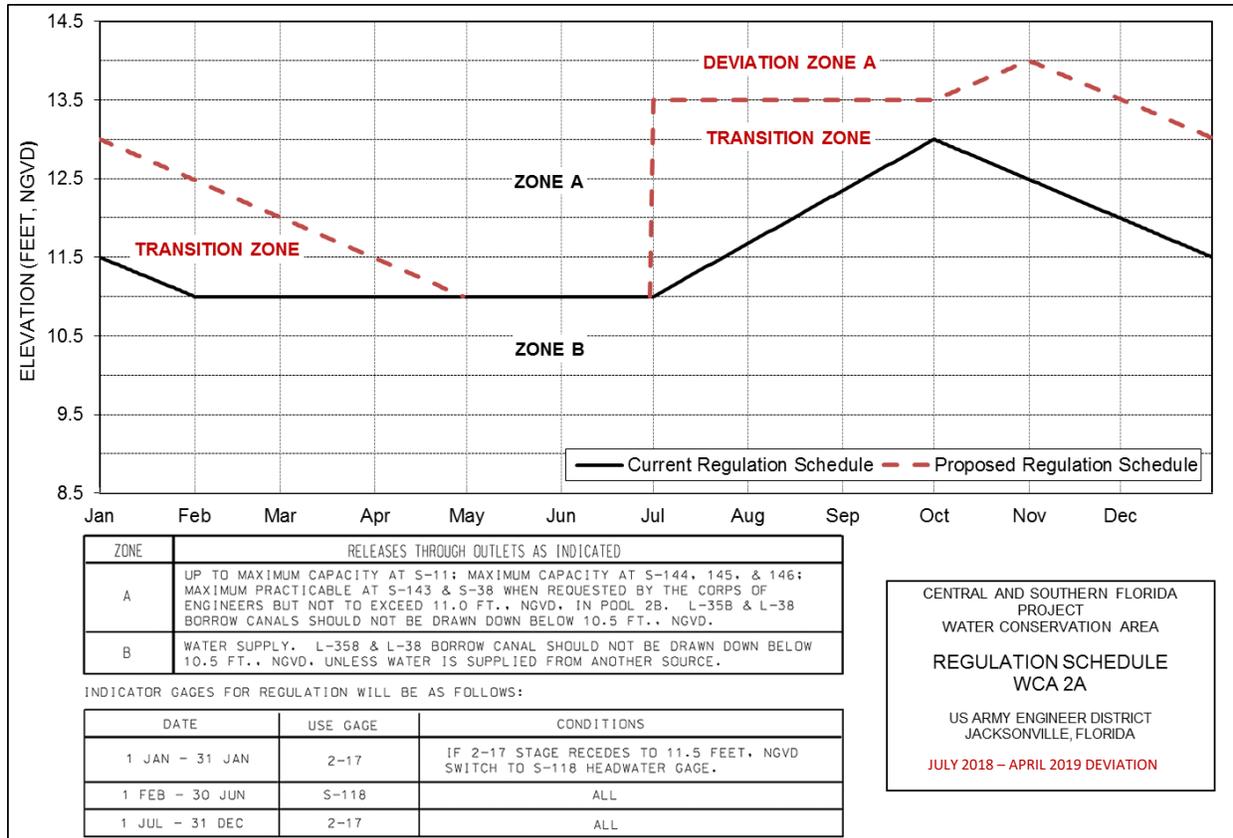


Figure 1: Proposed WCA-2A Regulation Schedule during the Planned Temporary Deviation

The hydrologic data and analysis includes additional background information, data analysis, and a summary regarding other water management activities managed by the State of Florida which were considered in the system wide analysis to lower the water levels in the WCAs.

Hydrologic Data and Analysis

A series of mid-May storms have caused conditions to change very rapidly from very dry conditions to very wet in south Florida, with the Lake Okeechobee, the WCAs, the eastern coast of Florida accumulating most of the rainfall. Table 1 and Figure 2 illustrate the widespread period-of-record rainfall for the month of May for southern Florida, with the area as a whole receiving 301% of average rainfall.

Table 1: Precipitation Data (02 May 2018 to 01 June 2018)

Area	Precipitation	% of Average
Lake Okeechobee	10.69 inches	344% (average 3.11 inches)
WCA-1 & WCA-2	16.87 inches	397% (average 4.25 inches)
WCA-3	12.33 inches	285% (average 4.32 inches)

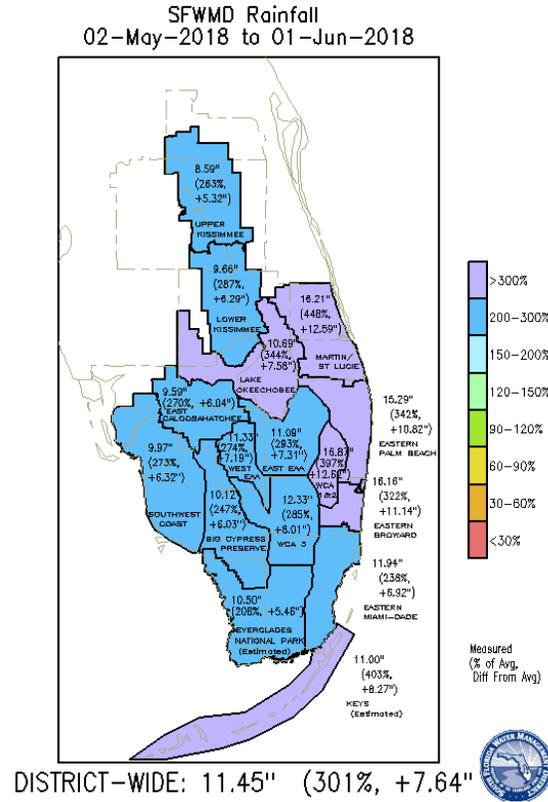


Figure 2: SFWMD Rainfall Map (02 May 2018 to 01 June 2018)

This record area-wide rainfall for the month of May has caused water levels in the three WCAs to rise above their maximum regulation schedules, as shown in Table 2. In addition, Lake Okeechobee and the Everglades Agricultural Area (EAA), which sends excess water south into the WCAs when capacity is available, has also received a significant amount of rainfall, further exacerbating the sharp rate of rise in the WCAs in May and June 2018. Table 2 shows the stage, and excess volume of water contained in these areas. There are currently 908,725 acre-feet above regulation schedule in the WCAs.

Table 2: WCA Stages Compared to Regulation Schedule (15 June 2018)

Area	Current Stage (ft. NGVD)	Regulation Schedule (ft. NGVD)	Departure from Regulation Schedule (ft.)	Volume above Schedule (ac-ft)
WCA-1	15.96	15.75	0.21	31,450
WCA-2	12.57	11.00	1.57	165,800
WCA-3	10.84	9.40	1.44	711,475

TOTAL: 908,725 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. All WCAs are above schedule (as seen in Figures 3-5) limiting the operational flexibility in the system. WCA-3A is the last storage area in the Central and Southern Florida (C&SF) Project and has an extremely limited outlet capacity. Exacerbating the high water levels in WCA-3A are the flows out of WCA-2A through the S-11s, which on 15 June 2018 were flowing 4,100 cubic feet per second (cfs) from WCA-2A into WCA-3A.

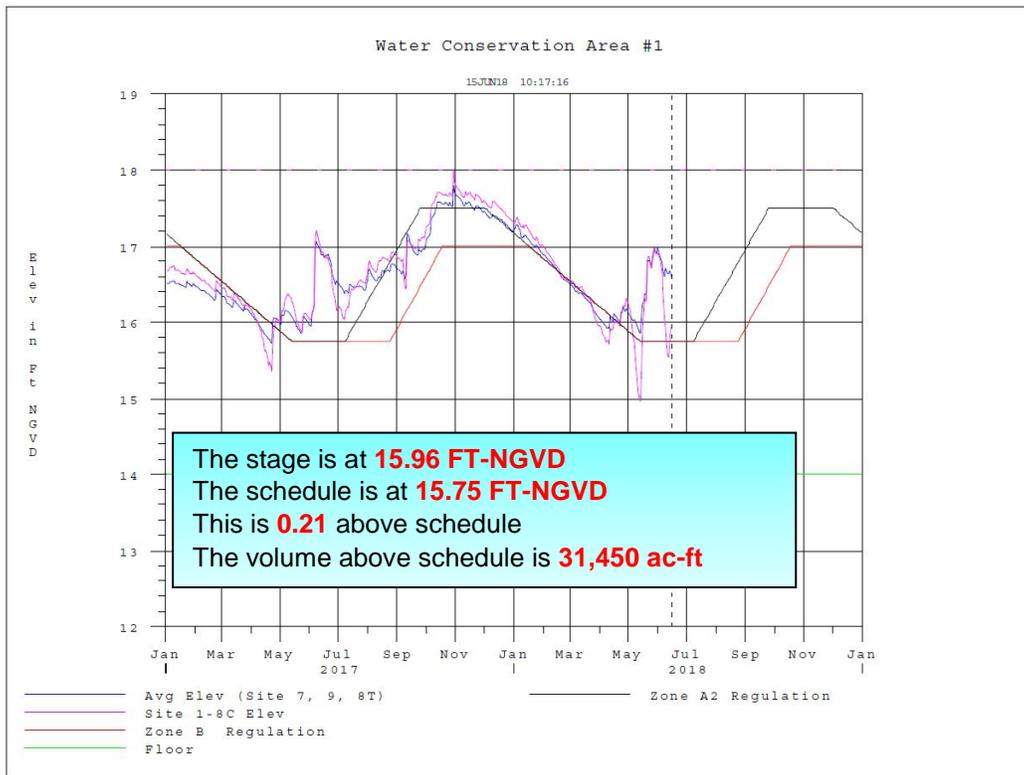


Figure 3: WCA-1 Stage Hydrographs and Regulation Schedule

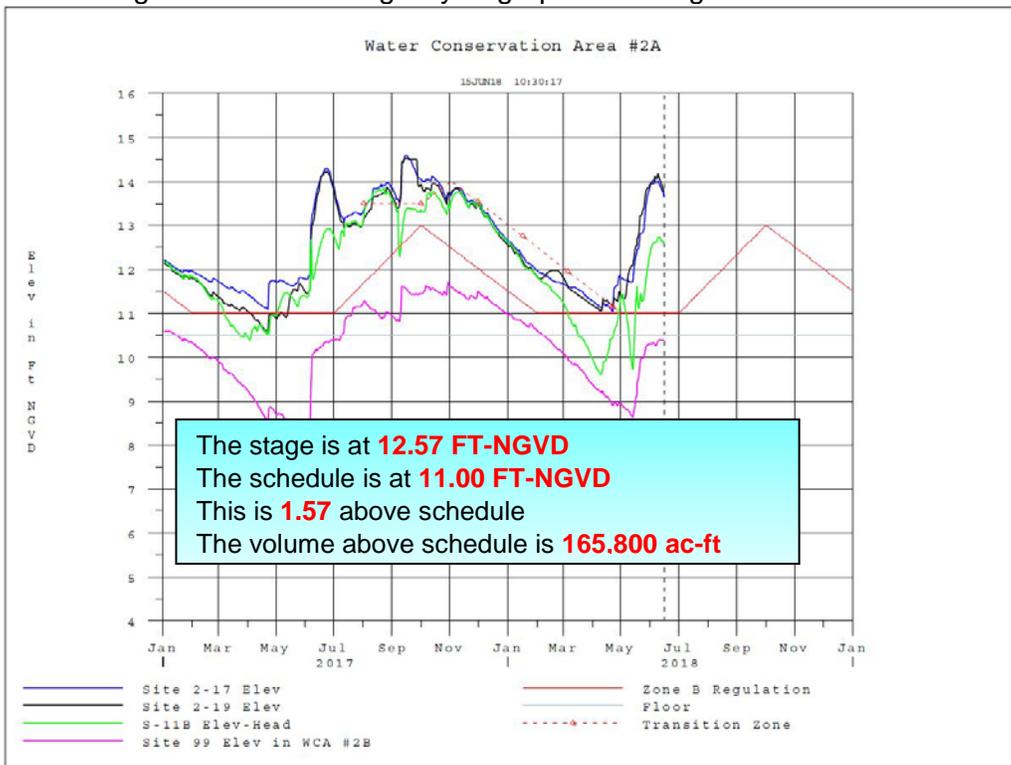


Figure 4: WCA-2A Stage Hydrographs and Regulation Schedule

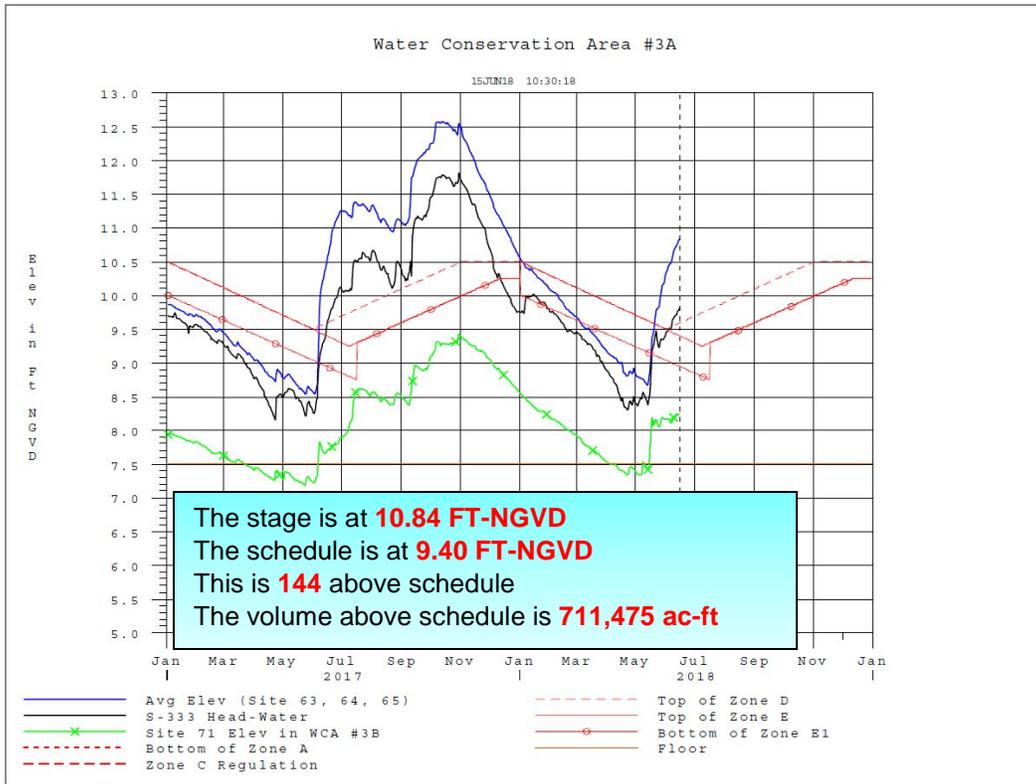


Figure 5: WCA-3A Stage Hydrographs and Regulation Schedule

SFWMD conducted positional analysis to forecast future water levels in the WCAs. The SFWMD analysis can be seen in Figure 6. These analysis indicate that there is a 50% chance water levels in 3A will likely not recede below Zone A until January at the earliest (P50).

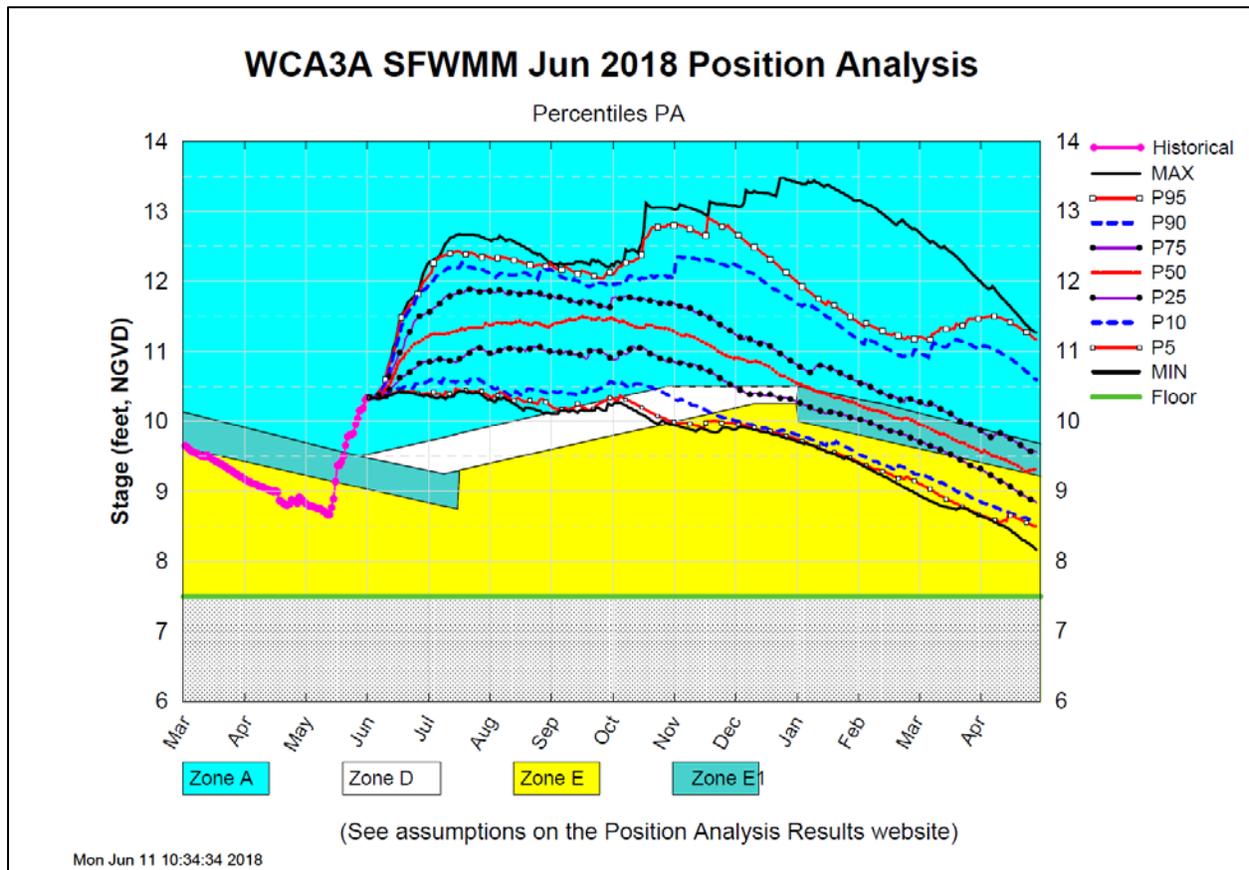


Figure 6: WCA-3A SFWMM June 2018 Dynamic Position Analysis

The Corps is maximizing available flows out of WCA-3A, subject to existing constraint prescribed under the MWD Increment 1.1 and 1.2 field test, and coordinating with the U.S. Fish and Wildlife Service (USFWS) on options to open structures prior to the July 15 2016 Everglades Restoration Transition Plan (ERTP) Biological Opinion closure dates for the S-343A, S-343B, S-344, S-12A and S-12B structures. These additional actions, if implemented, can further help to reduce the stage in WCA-3A. The Corps, in coordination with the SFWMD, proposes to hold additional water in WCA-2A to reduce inflows into WCA-3A and further alleviate high water conditions. WCA-2A has sufficient capacity to hold more than the current regulation schedule (the regulation schedule prior to 1988 allowed for these higher water levels) and the Corps is proposing to utilize this capacity to help alleviate conditions in WCA-3A. The proposed schedule can be seen in Figure 1. Release guidance out of WCA-2A for Zone A and Zone B will remain unchanged, but the action lines (the zone lines) will be raised such that releases will be required at a higher stage. The proposed action is to utilize capacity in WCA-2A to reduce inflows into WCA-3A by increasing the regulation schedule in WCA-2A until 30 April 2019.

The Corps has performed an analysis on reducing flows out of WCA-2A into WCA-3A which would store an additional 152,064 acre-feet in WCA-2A. This water would have otherwise flowed through the S-11s into WCA-3A. This volume of water amounts to approximately 0.31 feet of stage in WCA-3A (Table 4).

Table 4: Benefits of Planned Temporary Deviation

1.44	Total stage gained in feet in WCA-2A from implementation date to 31 December 2018
152,064	Total acre-feet over WCA-2A
0.31	Total stage in feet equivalent in WCA-3A

If the rate of rise in WCA-3A 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 2018 wet season and 2018 hurricane season also present an increased risk to the system due to reduced flood storage within the WCAs with each already above the top of the respective schedules.

Another water management action that will help alleviate the high water in WCA-3A is to raise the stage (maximum operating canal level) of the L-29 canal. The current Modified Water Deliveries Increment 2 operational plan includes the ability to raise the L-29 maximum operating limit from 7.5 feet National Geodetic Vertical Datum (NGVD) to 8.5 feet, NGVD once the Canal-111 South Dade (C-111 SD) Project construction features are completed. Completion of the C-111 SD Northern Detention Area (NDA) is scheduled for July 1, 2018 which will allow a transition for the L-29 maximum operating limit from the existing limit of 7.5 feet NGVD up to 8.0 feet NGVD. Completion of the C-111 SD Southern Detention Area (SDA) is scheduled for September 30, 2018 which will allow a transition for the L-29 maximum operating limit from 8.3 feet NGVD to 8.5 feet NGVD. 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.