

# MWD/C-111 South Dade Increment 1 Field Test: Alternatives and Evaluation

for

# National Environmental Policy Act (NEPA) Assessment



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# Presentation Overview

- Increment 1 Schedule
- Eco Sub Team Update
- WQ Surface/Ground Water Sub Team Update
- H&H/Operations Sub Team Update
  - ▶ Operational Strategy Hybrid
  - ▶ Hydrologic Effects Evaluation
- Alternatives Evaluation
- Cultural Resources
- PDT Discussion
- Pump Test, S-357N, S-355s Update
- Public Comment
- Next Steps



# Increment 1- Schedule

Finalize draft EA	02 Jan
DQC Begin	05 Jan
Submit Test Authorization (NLT)	23 Jan
Public/Agency/State/SAD Review	04 Feb
Initiate Test	27 Apr



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# Eco Sub Team Update



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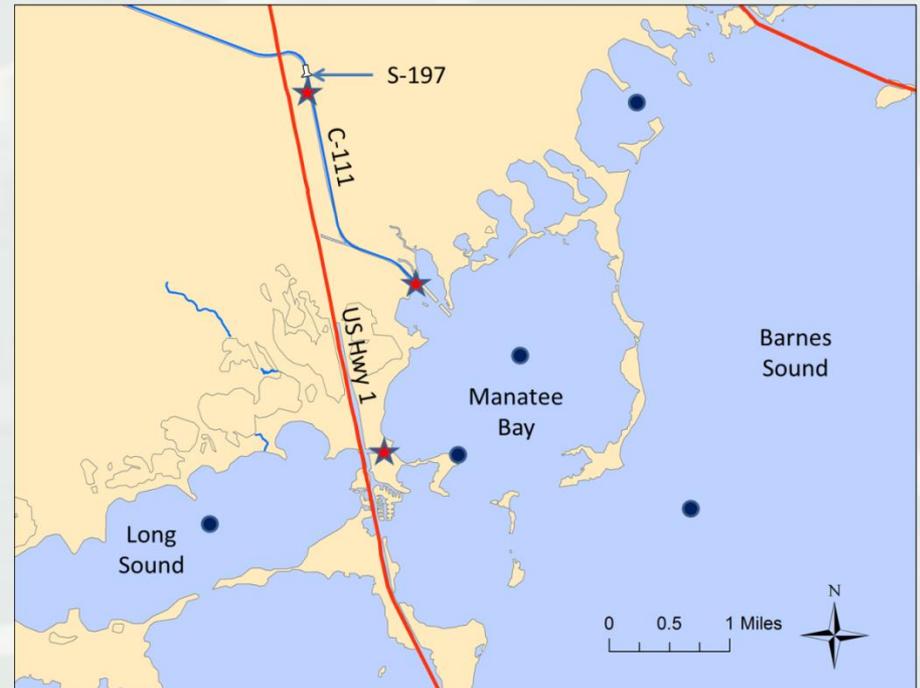
# Eco Sub Team Update

- Propose field test species monitoring to measure potential hydrologic impacts within CSSS subpopulations and wood stork colonies located adjacent to Tamiami Trail and within NESRS.
- USACE and SFWMD will continue existing hydrologic and species monitoring plans to ensure that the Incidental Take as defined within the FWS 2009 BO for C-111 Western Spreader Canal Project and 2010 BO for E RTP is not exceeded.
- E RTP Periodic Scientists Calls will continue to be conducted throughout the G-3273 Constraint Relaxation and S-356/S-357N Field Test to ensure wildlife recommendations are considered during the water management decision process.
- Corps will monitor existing salinity gages to measure potential hydrologic impacts associated with operational criteria included within the field test for S-197 (S-18C HW). SFWMD proposes installation of additional gages.
- Eco Sub Team has not defined constraints/triggers to be incorporated into the operational strategy.



# COASTAL SALINITY MONITORING

- SFWMD proposes additional salinity monitoring stations.
- Event-driven, flow-through spatial salinity mapping unit called the Dataflow, built and maintained by the SFWMD, would be used to track the resulting freshwater plume during releases from S-197.



Existing Stations - Dark Blue Circles  
New Stations – Red Stars



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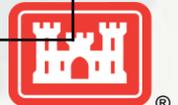
# WQ Surface/Ground Water Sub Team Update



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# Water Quality Monitoring Roles/Responsibilities

Activities	Number of New Stations / Annual Sampling Events*	Station Registration in DBHYDRO	Field Collection & Lab Reporting	WQ Lab Analysis & Lab Reporting	Analysis and Reporting of Collected Data
1. Ongoing Surface Water Quality Compliance Monitoring			SFWMD	SFWMD	SFWMD**
2. Increment 1 Specific Surface Water Quality Monitoring	10 / 520	SFWMD	SFWMD	SFWMD	USACE, ENP
3. Ongoing NESRS Water Quality Monitoring			ENP	SFWMD	USACE, ENP
4. Increment 1 Specific NESRS Water Quality Monitoring	1 / 52	SFWMD	ENP	SFWMD	USACE, ENP
5. Ongoing ADVN Monitoring of Flow in L29 and L31N		SFWMD	USGS	N/A	USACE, ENP
6. Ongoing Groundwater Stage Monitoring			USACE, SFWMD, ENP, MDLPA	N/A	USACE, ENP
7. Increment 1 Specific Groundwater Stage and Flow Direction Monitoring		SFWMD	USACE	N/A	USACE, ENP
8. Increment 1 Specific Groundwater Quality Monitoring	26 / 368	SFWMD	USACE	SFWMD	USACE, ENP
9. C-111 Spreader Canal Monitoring / Reporting per PIR & Corps Regulatory Permit					SFWMD



# Roles/Responsibilities for South of S-331 (Annex 1 monitoring)

Activities	Installation of New Monitoring Locations	Station Registration in DBHYDRO	Field Collection & Lab Reporting	Well Installation	Analysis and Reporting of Collected Data
1. Ongoing Surface Water Quality Compliance Monitoring and Reporting per 1991 Settlement Agreement and other regulatory requirements			SFWMD		SFWMD
2. Ongoing C-111 Spreader Canal Monitoring per PIR and Corps permit.			SFWMD		SFWMD
3. Increment 1 Specific Groundwater Stage Monitoring	USACE	SFWMD	USGS	USACE	USACE, ENP



# H&H/Operations Sub Team Update



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# Operational Strategy Hybrid



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WCA-3A

WCA-3B

S12D

S333

S355A

S355B

S334

S336

S335

SW 8th St

41

S-333

S-356

WCA-3A FLOW

L-31N  
SEEPAGE

Krome Ave

94

N Kendall Dr

997

G211

S338

G-3273

© 2010 Google

© 2009

Google

S-177 S-178

S-18C

**C-111 FLOW**



S-197

1

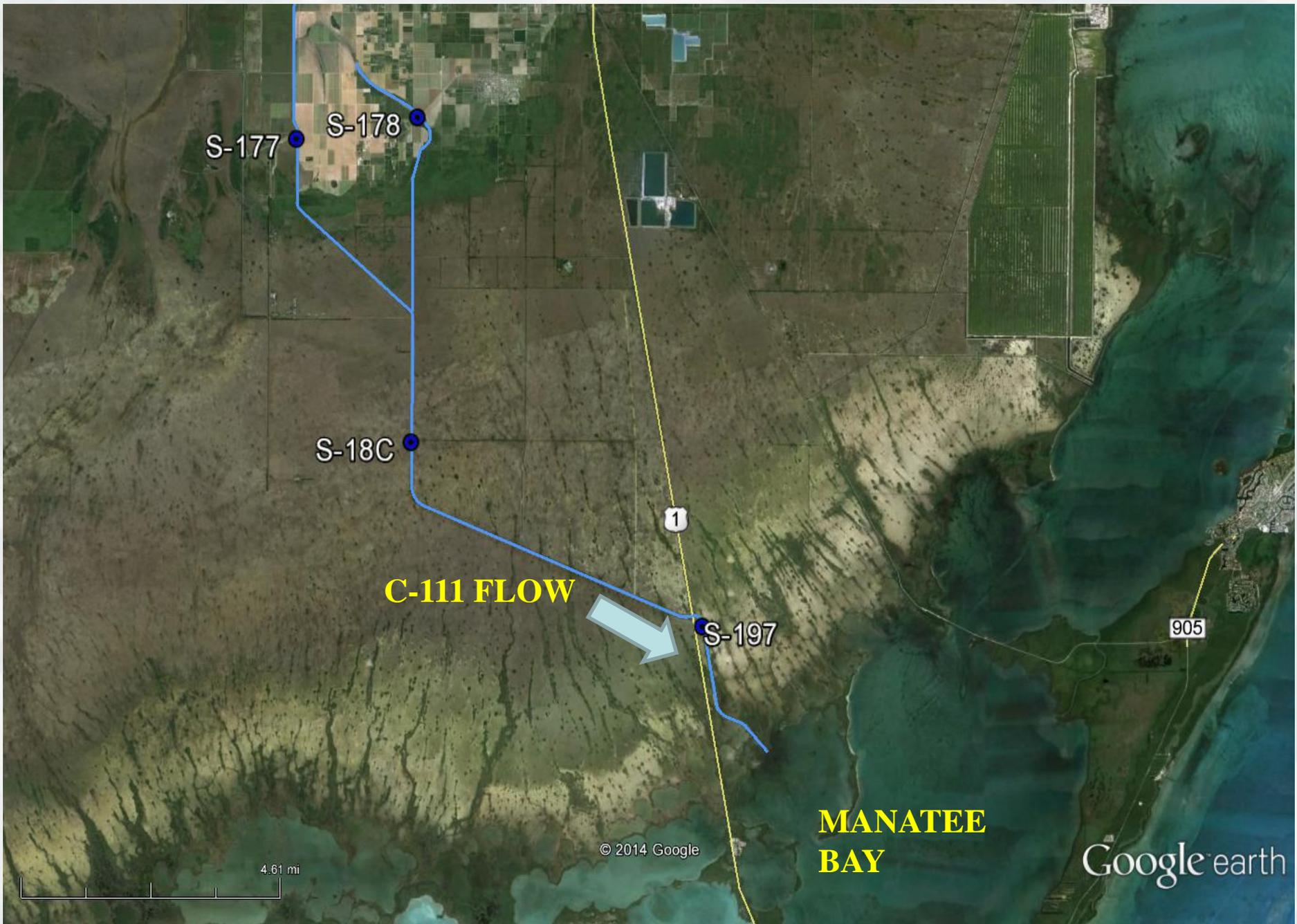
905

**MANATEE  
BAY**

4.61 mi

© 2014 Google

Google earth



# Overview

- Management of WCA-3A
- L-31N Canal Seepage Management
- New Seepage Management
- Water Management Operating Criteria



# Management of WCA-3A

Includes existing:

- Rainfall Plan
- L-29 Canal constraint of 7.5 ft., NGVD
- Column 2 during S-12s CSSS Closure Period
- Water supply

New:

- S-333 flows no longer have a constraint at G-3273
- WCA-3A water level Action Line sets priority of S-333, S-356 flows to NESRS
- S-332B,C,D available capacity determines maximum S-334 release during Column 2 (S-332s < 1125 cfs, S-334: 250 cfs) (S-332s < 1000 cfs, S-334: 400 cfs)
- Column 2 S-334 use outside Closure Period limited to 15 July through 14 August when Rainfall Plan water has not been successfully removed from WCA-3A through 14 July



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# L-31N Canal Seepage Management

Includes Existing:

L-29 Canal constraint of 7.5 ft., NGVD

L-31N Canal range of 5.5 to 5.8 ft., NGVD

New:

S-356 flows to NESRS with no G-3273 constraint

S-356 flows of 250 cfs guaranteed until WCA-3A water level rises to Action Line



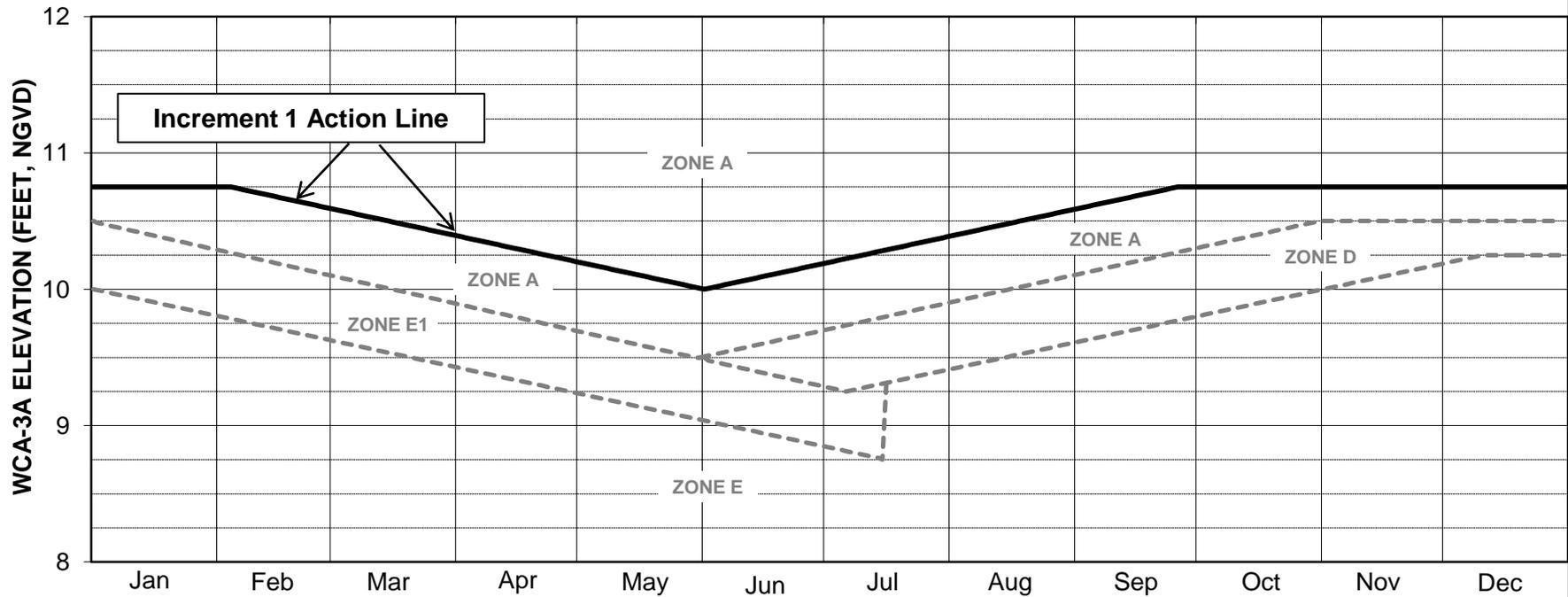
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# New Seepage Management

- C-111 Column 2 operational criteria when G-3273 above 6.8 ft., NGVD and WCA-3A is above Action Line
- *Added S-178 TW as S-197 opening trigger when WCA-3A above Action Line (C-111 Column 2 operational criteria) and S-18C gates are full open. Established incremental increase in S-197 discharges to 500 cfs (Level 1 flows may occur earlier but lower flows 500 vs 800 cfs ,S-197 opening triggers at S-177 and S-18C remain)*
- S-357N testing protocol to establish S-357N operating criteria, iterative approach consisting of 4 to 5 weeks of gate changes in wet season, gate changes intended to measurably stress the system



**DRAFT**



**NOTES:**

WCA-3A Elevation is the average of Sites 63, 64, and 65.

Increment 1 Action Line is not part of the 2012 WCA-3A Interim Regulation Schedule.

For ease of reference, Increment 1 Action Line is shown with the 2012 WCA-3A Interim Regulation Schedule Zones.

Increment 1 Action Line to be referenced as indicated in the G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy.

CENTRAL AND SOUTHERN FLORIDA PROJECT

**G-3273 Constraint Relaxation/S-356  
Field Test and S-357N  
Operational Strategy**

**Increment 1 Action Line**

DATED: August 2014  
US ARMY ENGINEER DISTRICT  
JACKSONVILLE, FLORIDA



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## **Year-round when stage at G-3273 is below 6.8 and WCA-3A stage is below the Increment 1 Action Line**

- S-333 has priority; S-356 use is secondary to S-333 but S-356 can and should be used subject to L-29 constraint
  - ▶ S-333 will be used to release up to the full rate prescribed by Rainfall Plan into NESRS subject only to the L-29 constraint.
  - ▶ S-356 will be used to control the stage in L-31N between 5.5 and 5.8 ft., NGVD to the extent there is capacity in L-29 without reducing the ability to release the full allocation through S-333.
  - ▶ Excess flow from L-30 through S-335 may be diverted into NESRS using S-356 if desired by the agencies.



## **Year-round when stage at G-3273 is above 6.8 and the WCA-3A stage is below the Increment 1 Action Line**

- ▶ S-333 will be used to release up to the full Rainfall Plan into NESRS subject to the L-29 constraint and an assured minimum available capacity of 250 cfs through S-356.
- ▶ S-356 will be used to control the stage in L-31N between 5.5 and 5.8 feet NGVD with an assured minimum available capacity of 250 cfs through S-356 (S-356 limited priority over S-333), subject only to the L-29 constraint.



# When WCA-3A is above the Increment 1 Action Line from 1 November through 14 July (CSSS Closure Period)

- S-333 has priority
  - ▶ S-356 is not operated.
  - ▶ S-333 makes maximum releases to NESRS subject to L-29 constraint.
  - ▶ When L-29 constraint is reached or exceeded and;
    - S-12C and S-12D are full open, and
    - the discharge to tide from all of the WCAs are maximized to the extent that downstream condition allow, and
    - the SDCS has available capacity (combined pumping rate at S-332B,C,D is less than 1125/1000 cfs maintaining stage in the lower half of the range).



# When WCA-3A is above the Increment 1 Action Line from 1 November through 14 July (CSSS Closure Period) - continued

- S-334 may be utilized up to a maximum flow rate of 250/400 cfs (1125/1000 cfs at S-332 B,C,D) to maintain the L-29 canal stage at or below 7.5 ft., NGVD.
  - ▶ C-111 structures (S-332B,C,D, S-176, S-177, S-18C, S-194, and S-196) will be operated according to the 2012 WCP Column 2 criteria and S-338 operated consistent with the 2012 WCP.
  - ▶ When the S-18C gate is fully open, *S-197 will be opened incrementally based upon S-178 TW:*

<b>S-178 TW (feet, NGVD)</b>	<i>2.5 to 2.6</i>	<i>2.61 to 2.7</i>	<i>2.71 to 2.9</i>	<i>Greater than 2.9</i>
<b>S-197 Discharge (cfs)</b>	<i>50 to 100</i>	<i>100 to 150</i>	<i>150 to 200</i>	<i>500</i>

- ▶ When S-18C TW falls below 2.4 for 24 hours, S-197 will be reduce as necessary to bring S-18C HW above 2.4 feet in 24 hours.



# When WCA-3A is above the Increment 1 Action Line from 15 July through 31 October

- S-333 has priority with no use of S-334.
  - ▶ S-333 makes maximum releases to NESRS subject only to L-29 constraint
  - ▶ S-356 is not operated and S-334 remains closed.
  - ▶ C-111 structures (S-332B,C,D, S-176, S-177, S-18C, S-194, and S-196) are operated according to the 2012 WCP Column 2 criteria and S-338 operated consistent with the 2012 WCP.
  - ▶ When the S-18C gate is fully open, *S-197 will be opened incrementally based upon S-178 TW:*

<b>S-178 TW (feet, NGVD)</b>	2.5 to 2.6	2.61 to 2.7	2.71 to 2.9	Greater than 2.9
<b>S-197 Discharge (cfs)</b>	50 to 100	100 to 150	150 to 200	500

- ▶ When S-18C TW falls below 2.4 for 24 hours, S-197 will be reduce as necessary to bring S-18C HW above 2.4 feet in 24 hours.



# Potential Hydrologic Effects from proposed changes to S-197 operational criteria

Increment 1 PDT meeting  
09 December 2014



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# Data Analysis Assumptions

- Period of analysis limited to operations period of CERP C-111 Spreader Canal Project (July 2012-June 2014) – no hydrologic modeling
- Used ERTP historical stages for WCA-3A 3-gauge average and S-18C gate openings from SFWMD DBHYDRO to estimate periods of new S-197 discharges
- Historical discharges from S-197 assumed unchanged for Alternative E
- Historical discharges from S-197 updated for Alternative G, per operational criteria
- Empirical relationships between S-18C HW/TW stages (gates fully open) and S-197 discharges during 2002-2014 were used to adjust historical S-18C HW stages/S-178 TW stages in response to new proposed S-197 discharges
  - ▶ In lieu of solely relying on historical S-18C/S-178 TW stages to estimate the duration and magnitude of new potential S-197 discharges (basis for October 2014 PDT analysis)



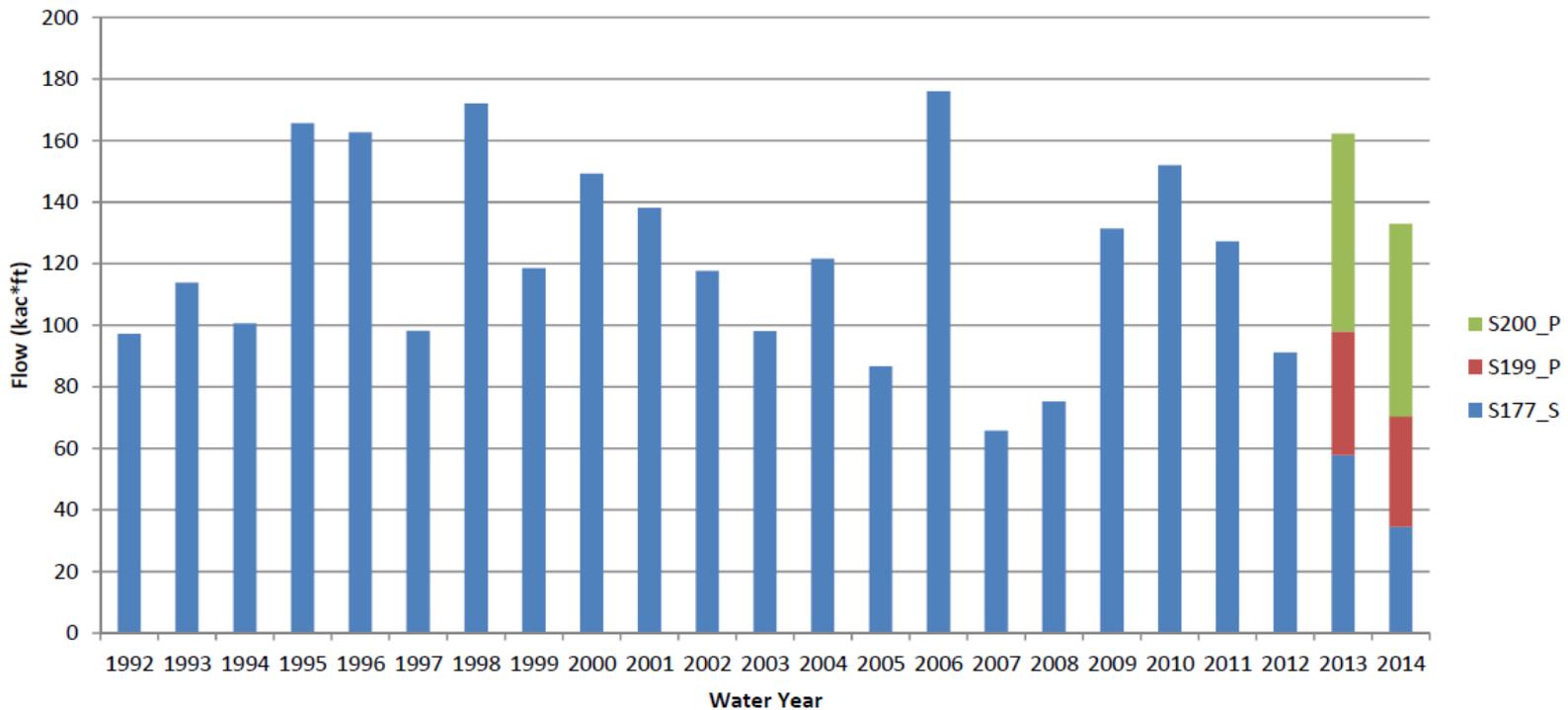
# Data Analysis Assumptions

- Potential effects not accounted for:
  - ▶ Climatological/hydrologic conditions not observed during analysis period
  - ▶ WCA-3A changes from ERTTP Regulation Schedule during July – Sept. 2012 (ERTTP Oct. 2012)
  - ▶ WCA-3A stage changes which would result from Increment 1 operations, with increased flows to NESRS and revised criteria for regulatory releases to the SDCCS via S-334 (ERTTP Column 2)
  - ▶ Effects from S-18C gate opening when S-18C HW > 2.25 when WCA-3A stage is above the Action Level during S-12A closure period (included in all action alternatives)
  - ▶ Potential additional or prolonged S-197 gate openings if operated below prescribed flow rates
  - ▶ Water management operations to minimize open/close cycles at S-197



# CERP C-111 Spreader Canal Operational Changes

Figure 1. C-111 Flow Distribution



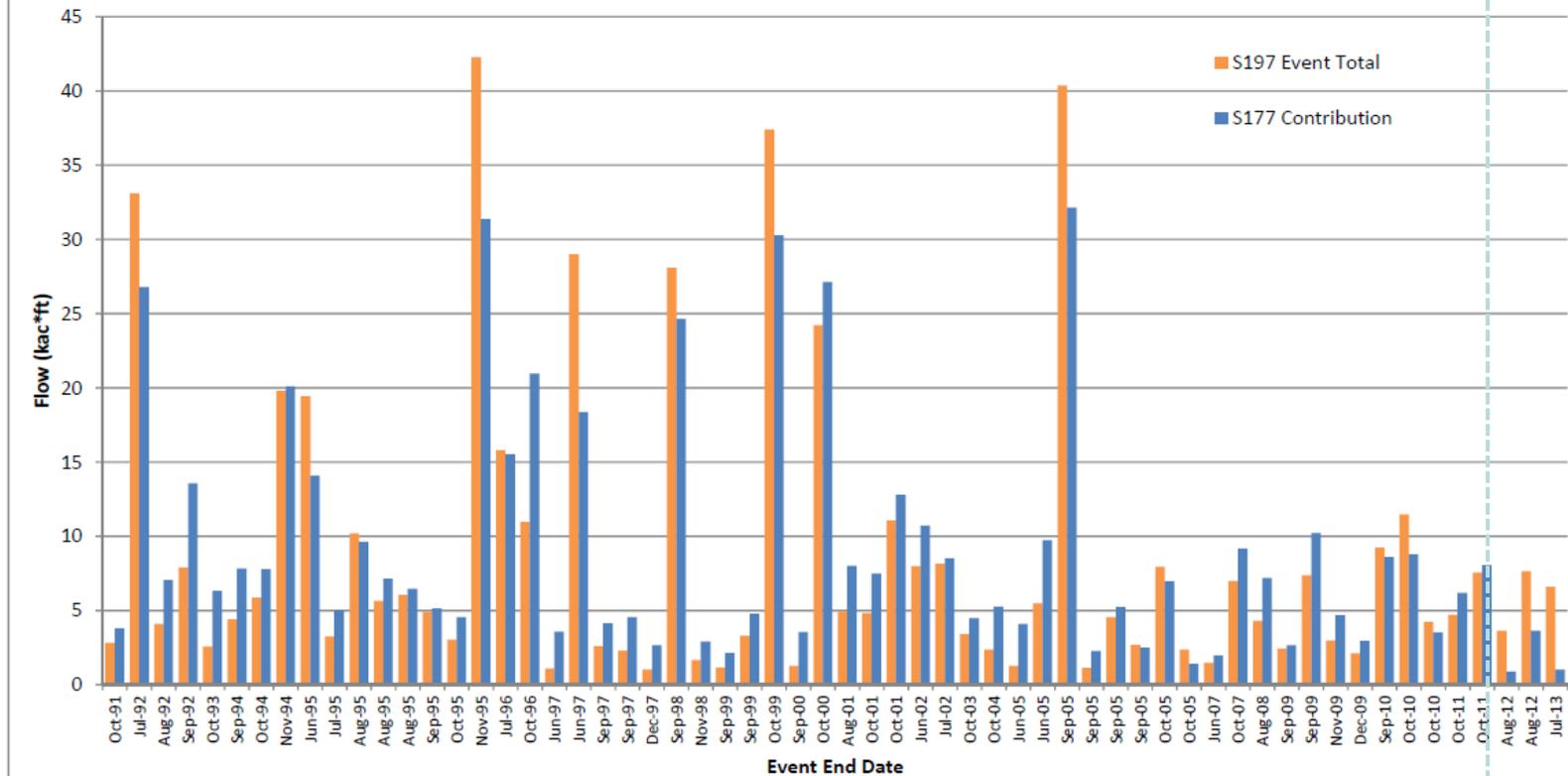
Source: T. MacVicar (29OCT2014 Ops/H&H sub-team)



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# CERP C-111 Spreader Canal Operational Changes

Figure 2. Historic S197 Flow Events



Source: T. MacVicar (29OCT2014 Ops/H&H sub-team)



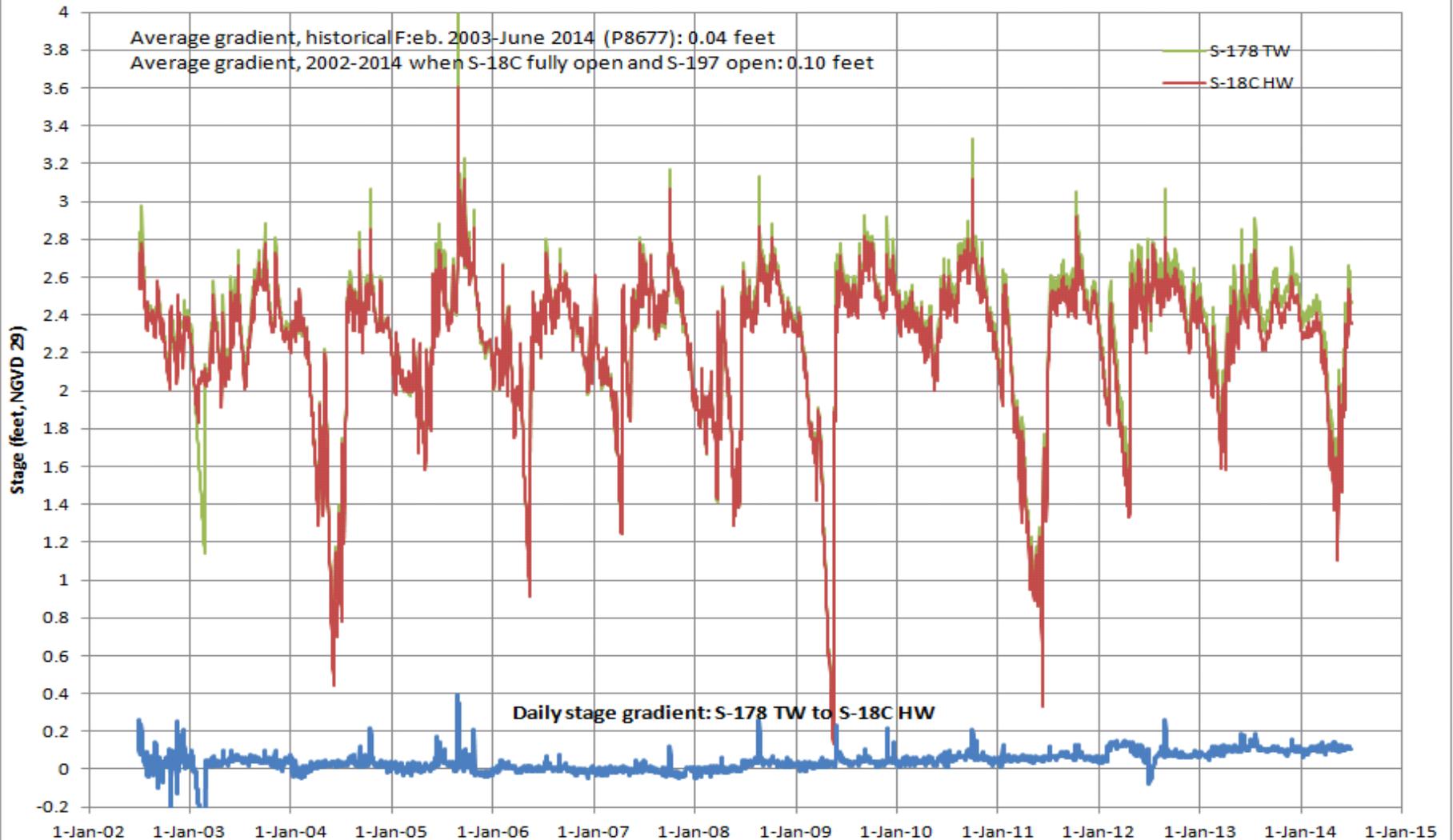
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# ERTP WCP: S-18C and S-197

Structure/ Operational Component	Column 1: No WCA-3A Regulatory Releases to SDCS or SRS	Column 2: WCA-3A Releases to SDCS	WCA-3A Ecological Intent (defined at bottom of Table)
	Close 4.8 feet, NGVD	Open 4.9 feet, NGVD Close 4.5 feet, NGVD	
S-176	Open 5.0 feet, NGVD Close 4.75 feet, NGVD	Open 4.9 feet, NGVD Close 4.7 feet, NGVD	
S-177	Open 4.2 feet, NGVD (see S-197 open) Close 3.6 feet, NGVD		
S-18C	Open 2.6 feet, NGVD Close 2.3 feet, NGVD	Open 2.25 feet, NGVD Close 2.0 feet, NGVD	
S-197	<p>If S-177 headwater is greater than 4.1 feet, NGVD or S-18C headwater is greater than 2.8 feet, NGVD, open 3 culverts.</p> <p>If S-177 headwater is greater than 4.2 feet, NGVD for 24 hours or S-18C headwater is greater than 3.1 feet, NGVD; open 4 more culverts for a total of 7 culverts open.</p> <p>If S-177 headwater is greater than 4.3 feet, NGVD or S-18C headwater is greater than 3.3 feet, NGVD, then open 6 more culverts for a total of 13 culverts open.</p> <p>Close gates when all the following conditions are met:</p> <ol style="list-style-type: none"> <li>1. S-176 headwater is less than 5.2 feet, NGVD and S-177 headwater is less than 4.2 feet, NGVD.</li> <li>2. Storm has moved away from the basin</li> <li>3. After Conditions 1 and 2 are met, keep the number of S-197 culverts open necessary only to match residual flow through S-176. All culverts should be closed if S-177 headwater is less than 4.1 feet, NGVD after all conditions are satisfied.</li> </ol>		



# IOP/ERTP Hydrographs: C-111 Canal at S-178TW and S-18C HW



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# Alternative E



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# Alternative E: S-197 Criteria

- Maintain IOP/ERTP Gate Open Criteria for S-197:
  - ▶ Level 1: S-177 HW > 4.1 feet NGVD or S-18C HW > 2.8 (~800 cfs)
  - ▶ Level 2: S-177 HW > 4.2 feet NGVD or S-18C HW > 3.1 (~1600 cfs)
  - ▶ Level 3: S-177 HW > 4.3 feet NGVD or S-18C HW > 3.3 (~2400 cfs)
- Additionally, if the following conditions are met:
  - ▶ WCA-3A stage > Action Line (IOP Zone A)\*;
  - ▶ S-18C Fully Open (Bottom of gates > S-18C HW);
  - ▶ S-18C HW > 2.4 feet NGVD (Column 2 S-18C HW criteria: 2.25/2.0);

Then, S-197 may be operated up to 200 cfs  
(200 cfs used for effects assessment)

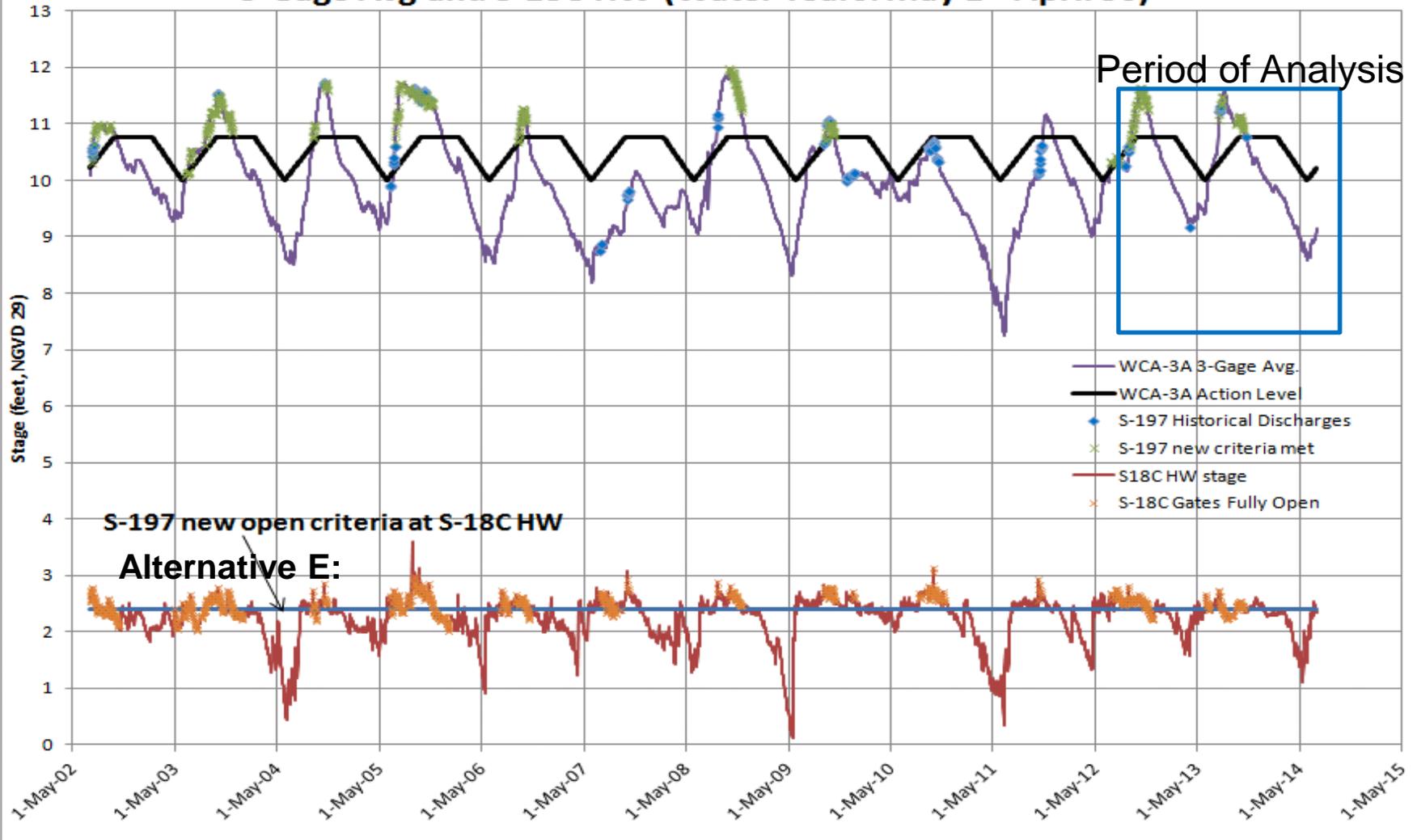


\*Column 2 Operational Criteria used for SDCS (S-356 off)

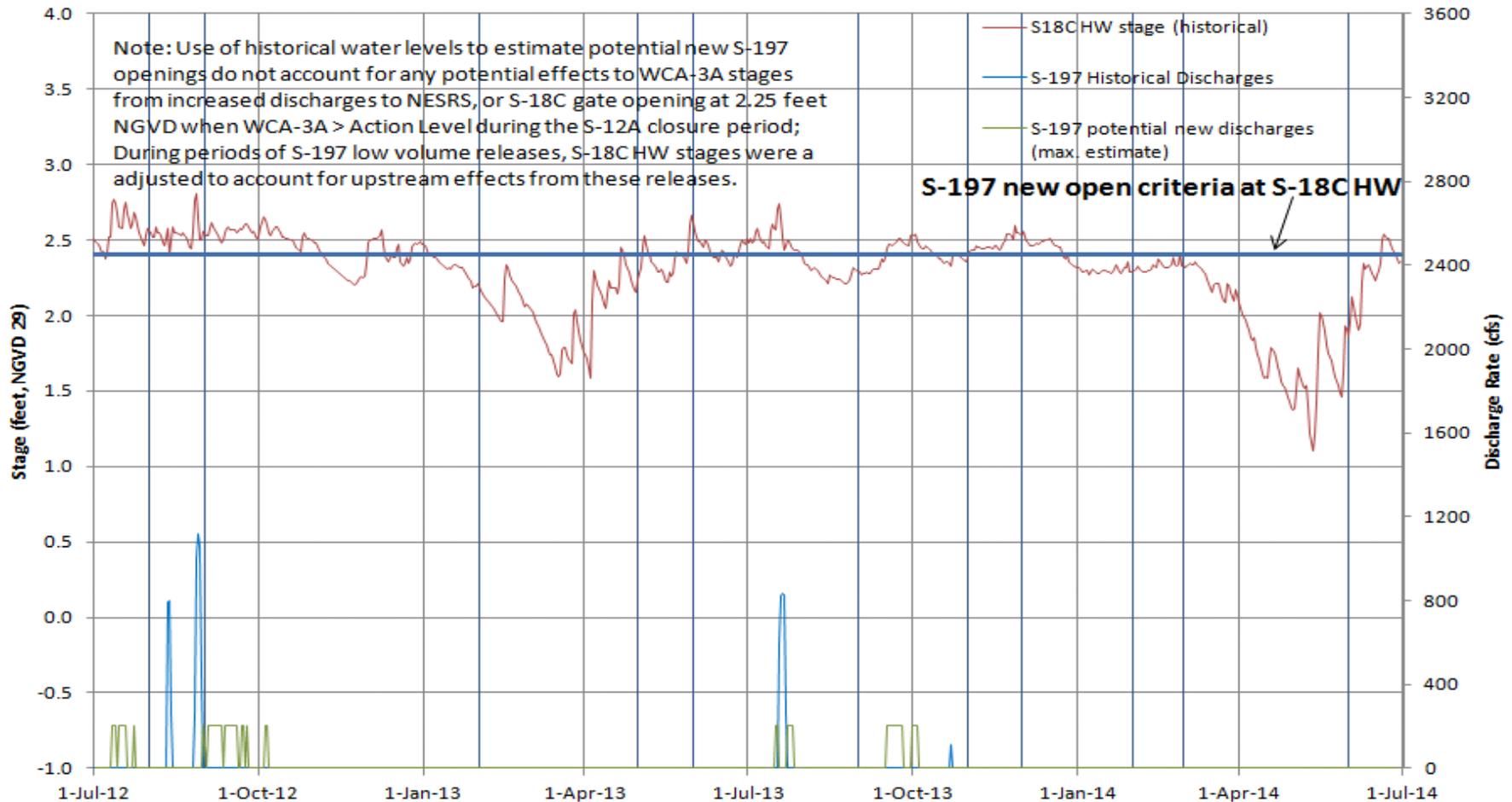


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# IOP/ERTP Hydrographs: New S-197 Open Criteria based on WCA-3A 3-Gage Avg and S-18C HW (Water Years: May 1 - April 30)

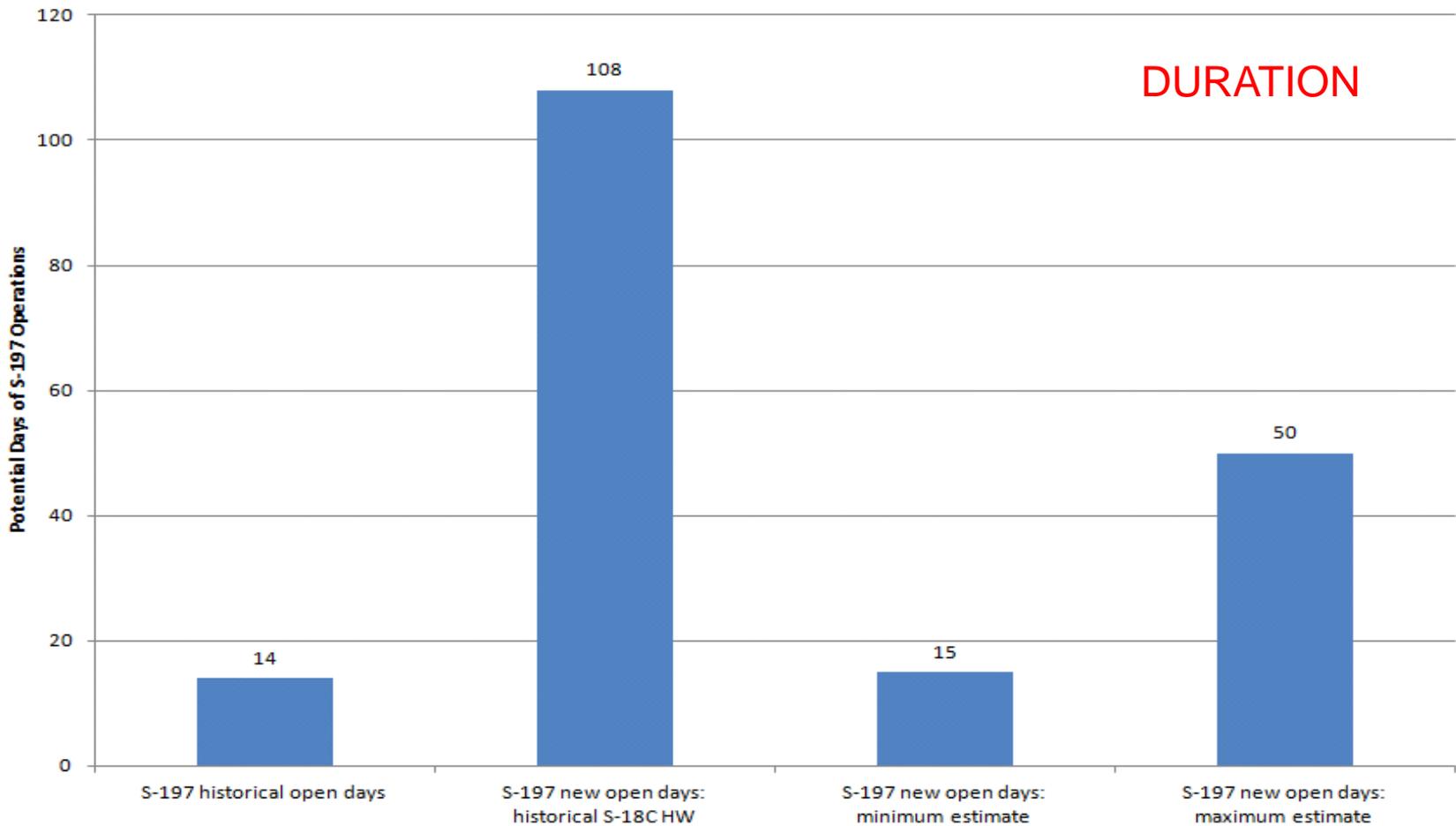


## IOP/ERTP Hydrographs, Alternative E: Potential New S-197 Discharges based on WCA-3A3-Gage Avg and S-18C HW (July 2012- June 2014)

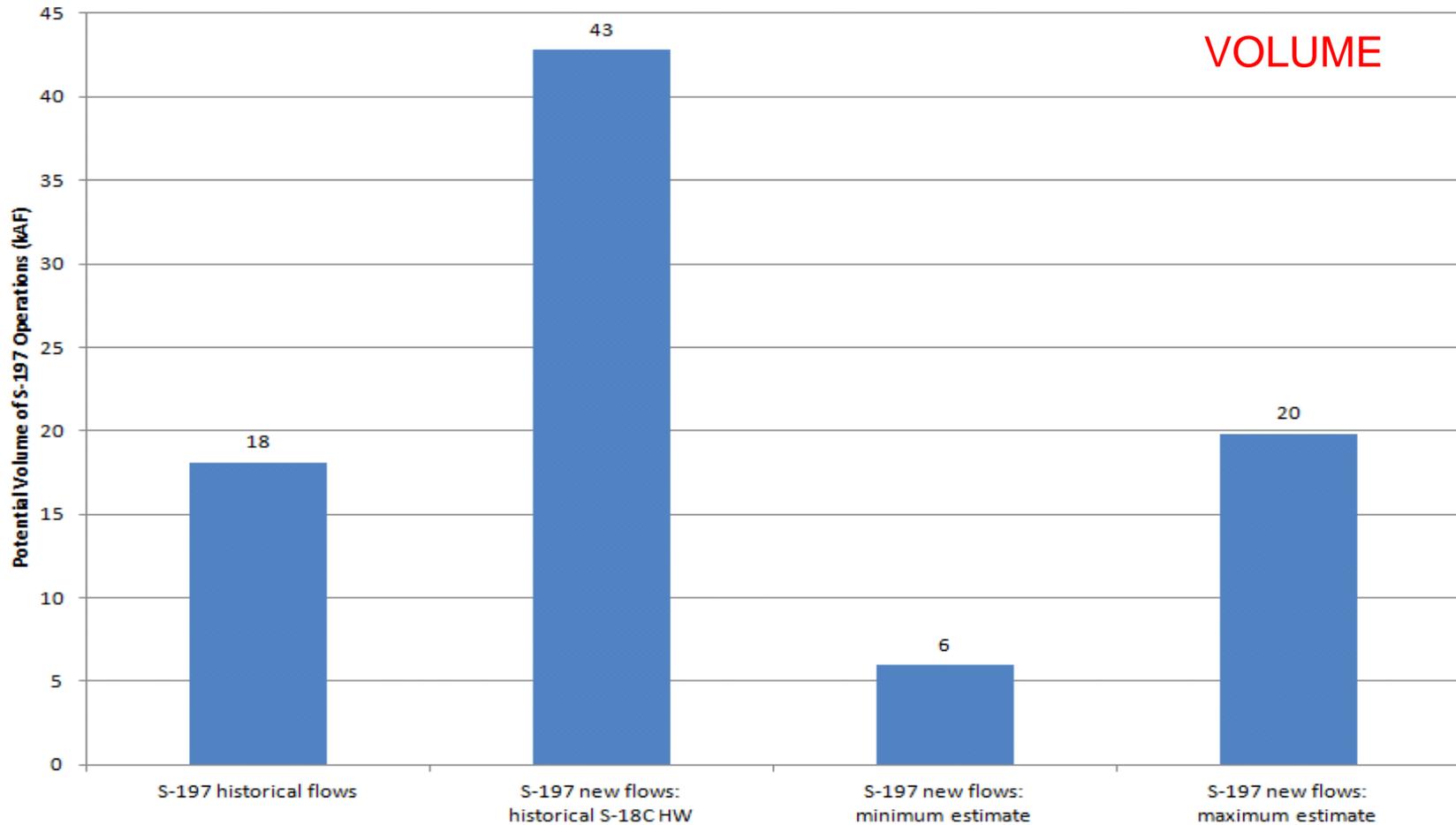


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### July 2012-June 2014: Potential Additional Days of S-197 Operations with Revised S-18C Headwater Criteria for S-197 Gate Opening when WCA-3A stages > Action Level (Alternative E)

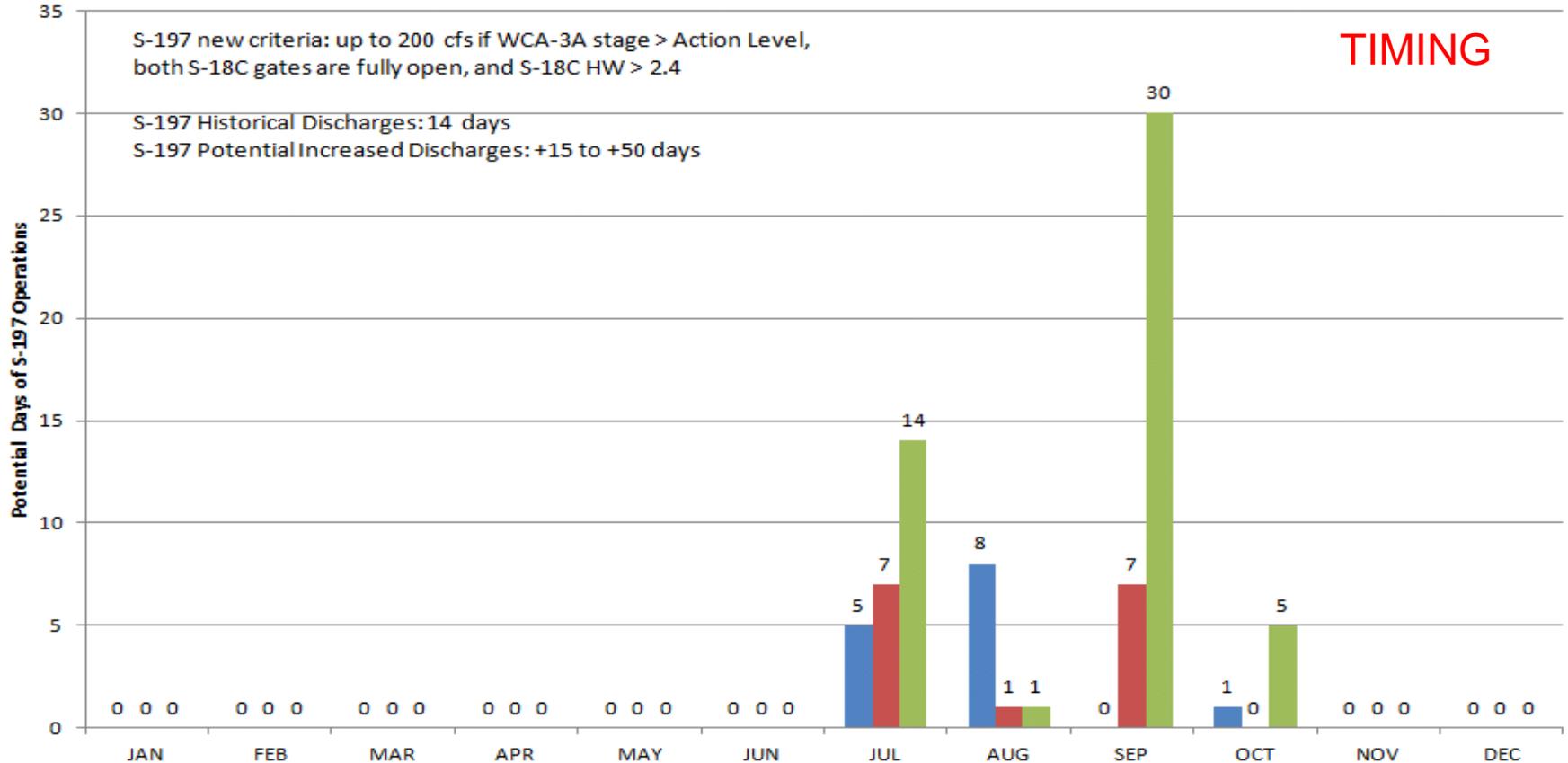


### July 2012-June 2014: Potential Additional Days of S-197 Operations with Revised S-18C Headwater Criteria for S-197 Gate Opening when WCA-3A stages > Action Level (Alternative E)



## July 2012-June 2014: Potential Additional Days of S-197 Operations with Revised S-18C Headwater Criteria for S-197 Gate Opening when WCA-3A stages > Action Level (Alternative E)

- Historical S-197 Discharges (No Action/Alternative F)
- S-197 Potentially Increased with new criteria (min. new open days)
- S-197 Potentially Increased with new criteria (max. new open days)



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# Alternative G



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# Alternative G: S-197 Criteria

- Maintain IOP/ERTP Gate Open Criteria for S-197
  - ▶ S-177 HW > 4.1 feet NGVD (Level 1, Level 2, and Level 3)
  - ▶ S-18C HW > 3.1 (Level 2 and Level 3 only)
- Revised IOP/ERTP Gate Open Criteria for S-197
  - ▶ S-18C HW Level 1 criteria (stage > 2.8) revised, per below
- If the following conditions are met:
  - ▶ WCA-3A stage > Action Line (IOP Zone A)\*;
  - ▶ S-18C Fully Open (Bottom of gates > S-18C HW);
  - ▶ S-178 TW > 2.5 feet NGVD (Column 2 S-18C HW criteria: 2.25/2.0);

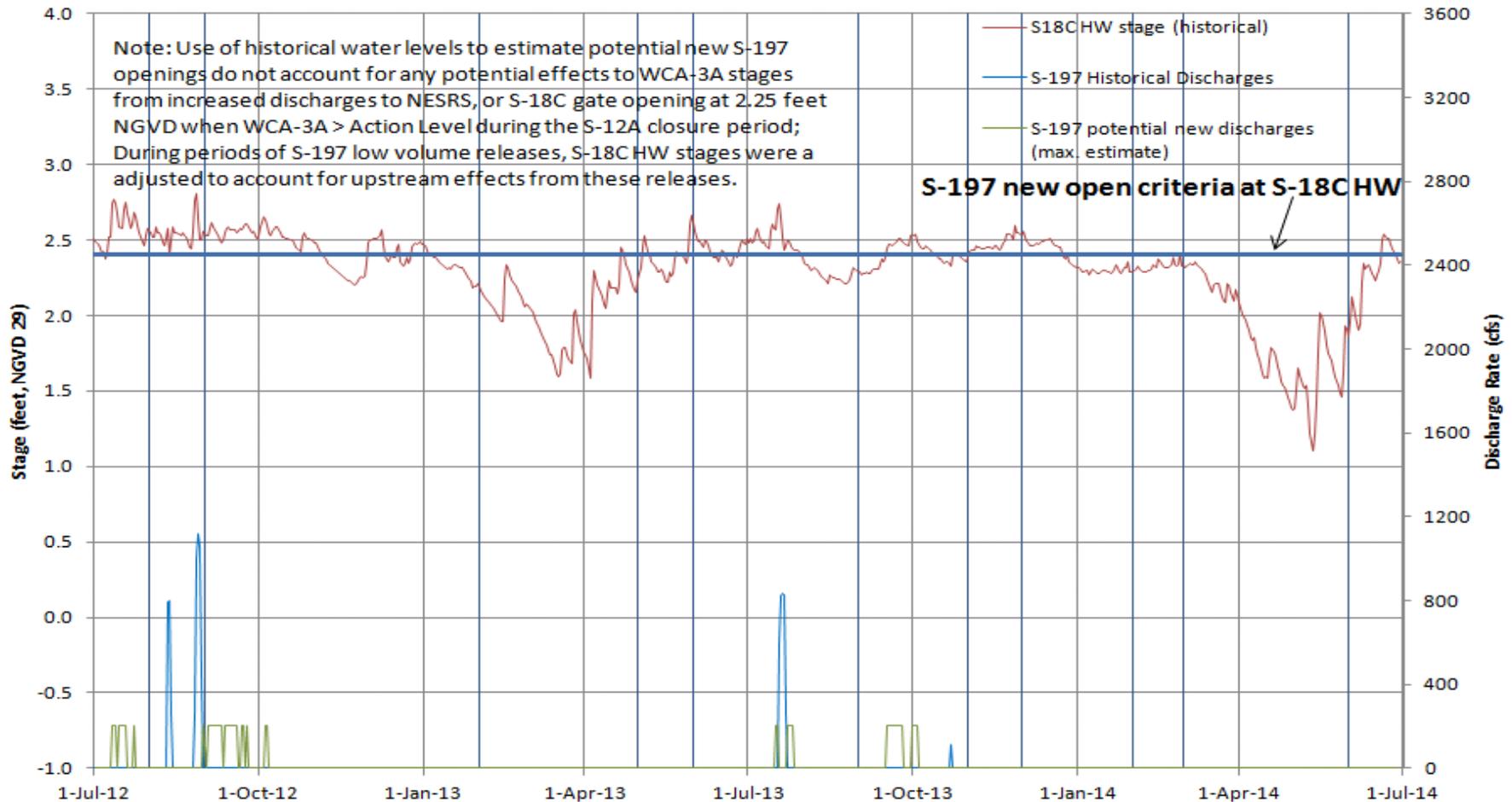
Then, S-197 may be operated with target flows:

- S-178 TW 2.5-2.6: S-197 up to 100 cfs (corresponds to S-18C HW stage ~2.4);
- S-178 TW 2.61-2.7: S-197 up to 150 cfs;
- S-178 TW 2.71-2.9: S-197 up to 200 cfs (corresponds to S-18C HW stage ~2.6);
- S-178 TW >2.9: S-197 up to 500 cfs (IOP/ERTP Level 1 S-197 opening up to ~800 cfs)

\*Column 2 Operational Criteria used for SDCS (S-356 off)



## IOP/ERTP Hydrographs, Alternative E: Potential New S-197 Discharges based on WCA-3A3-Gage Avg and S-18C HW (July 2012- June 2014)



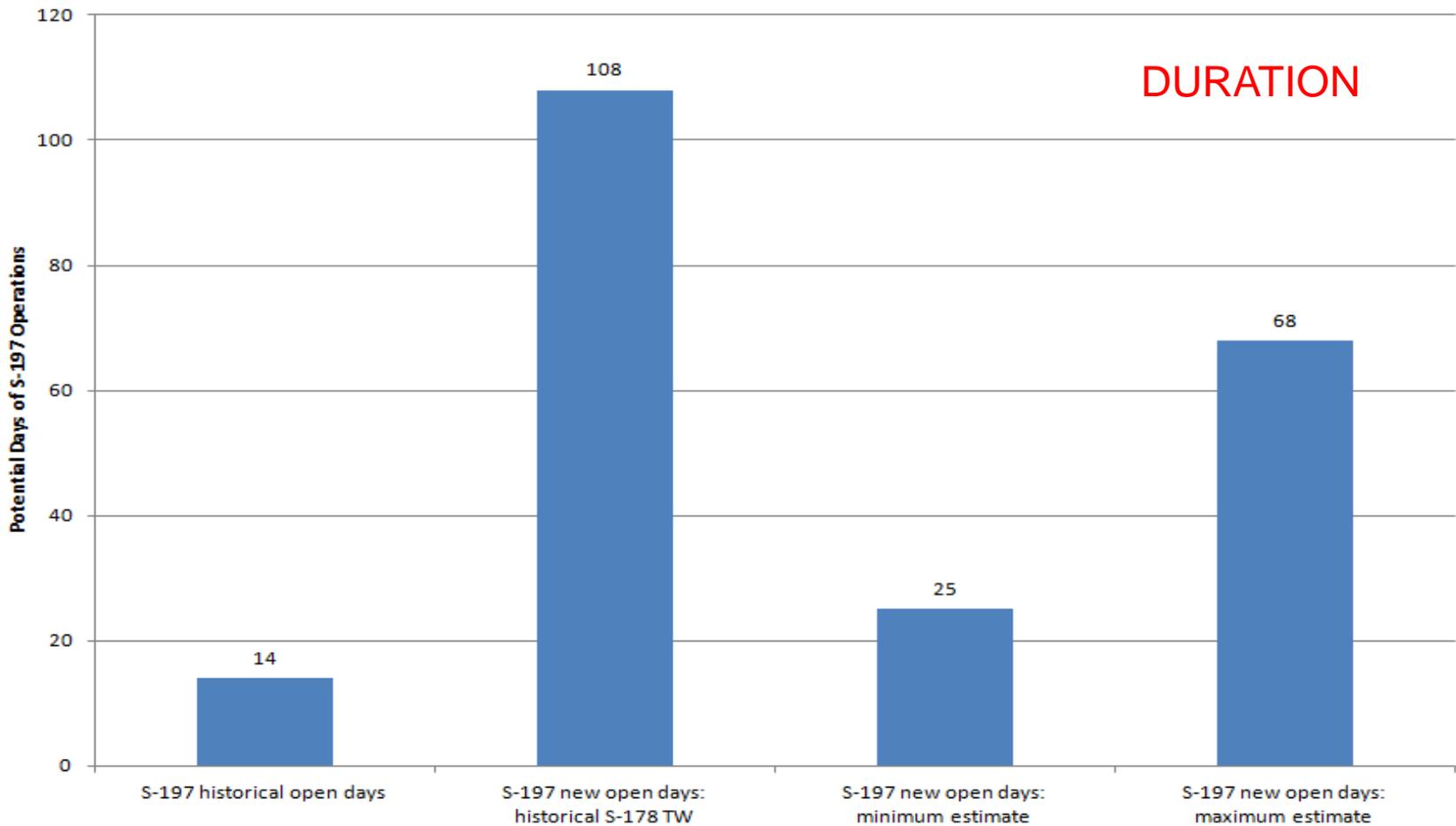
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# IOP/ERTP Hydrographs, Alternative G: Potential New S-197 Discharges based on WCA-3A3-Gage Avg and S-178 TW HW (July 2012- June 2014)

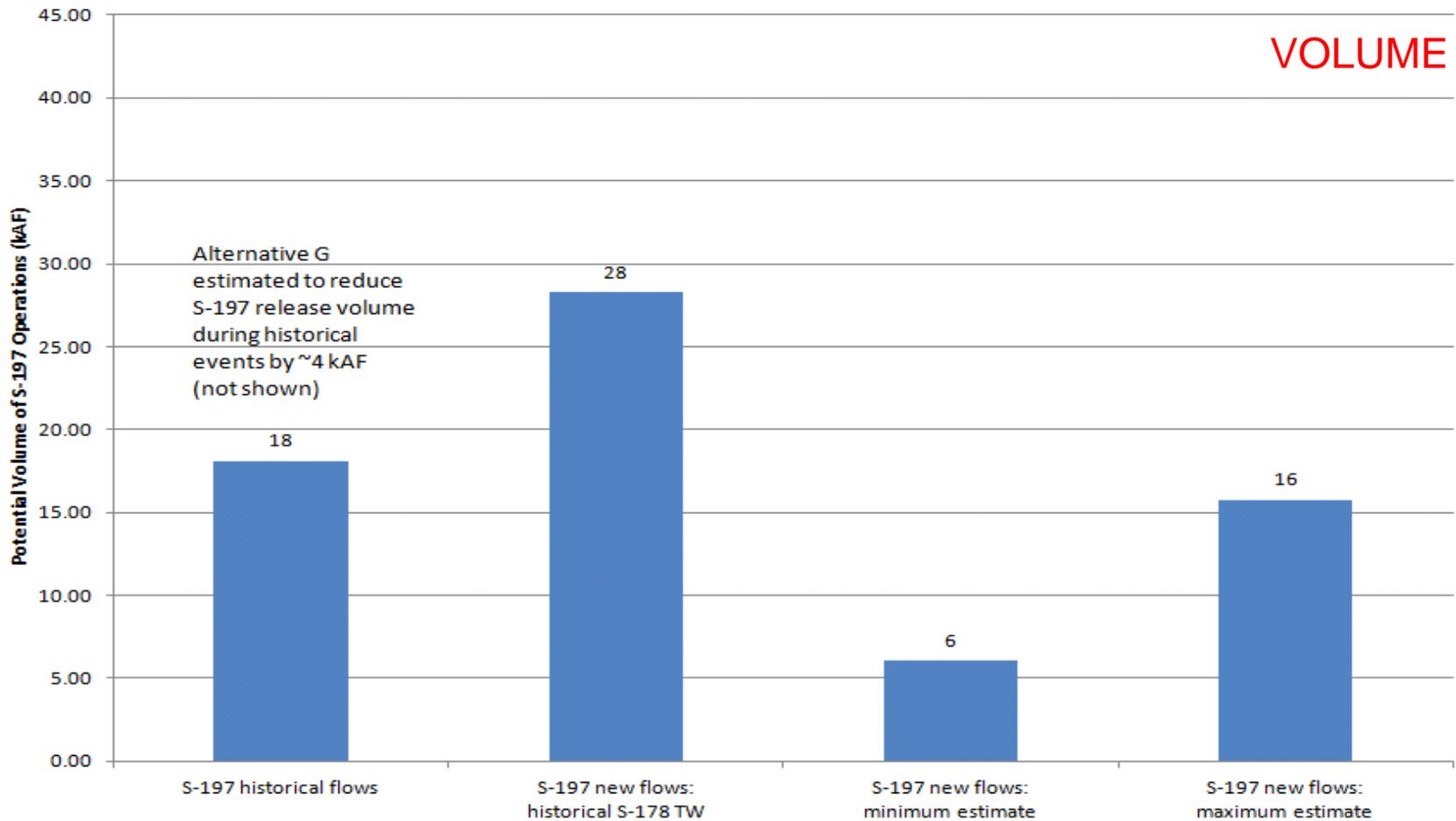


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### July 2012-June 2014: Potential Additional Days of S-197 Operations with Revised S-178 Tailwater Criteria for S-197 Gate Opening when WCA-3A stages > Action Level (Alternative G)

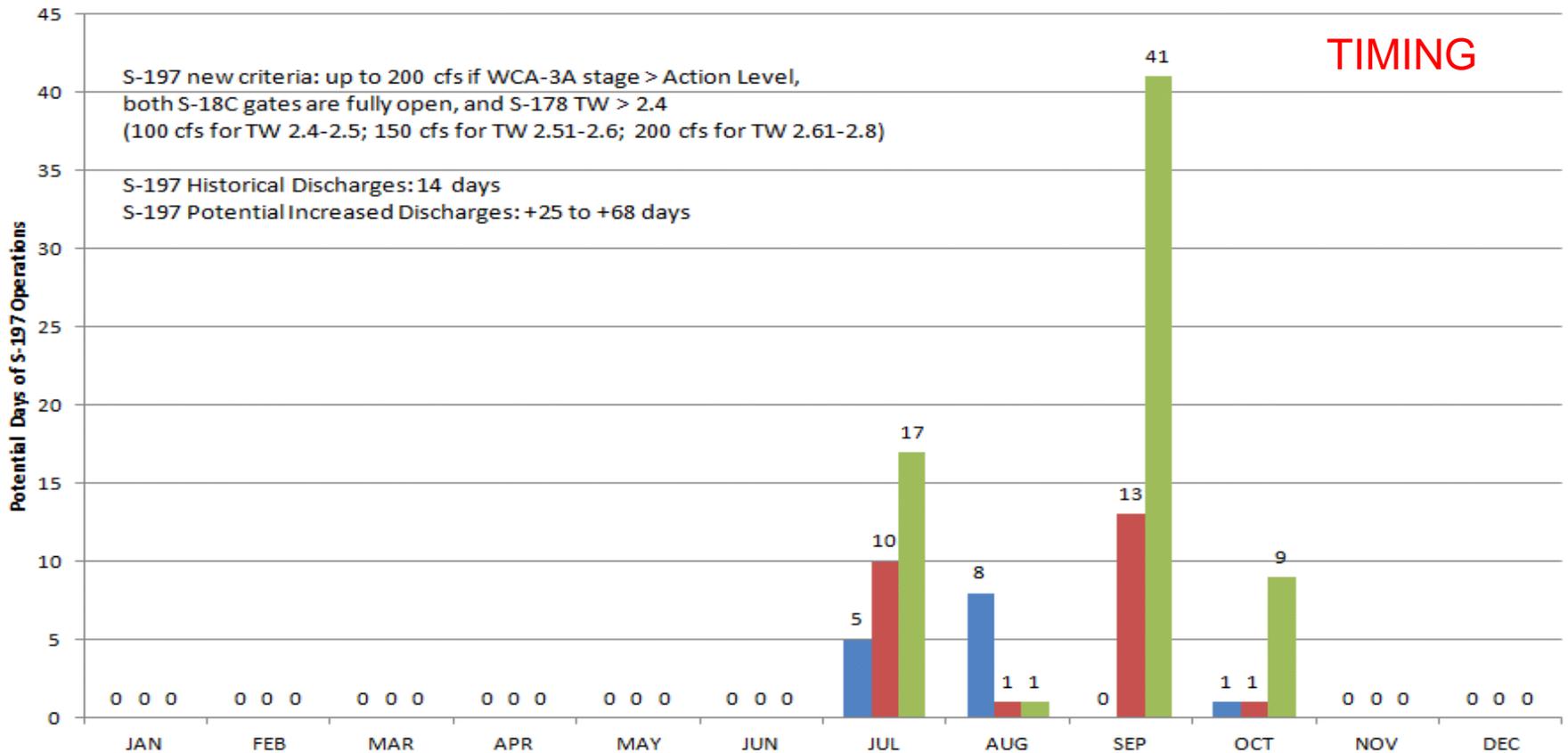


# July 2012-June 2014: Potential Additional Days of S-197 Operations with Revised S-178 Tailwater Criteria for S-197 Gate Opening when WCA-3A stages > Action Level (Alternative G)



## July 2012-June 2014: Potential Additional Days of S-197 Operations with Revised S-178 Tailwater Criteria for S-197 Gate Opening when WCA-3A stages > Action Level (Alternative G)

- Historical S-197 Discharges(No Action/Alternative F)
- S-197 Potentially Increased with new criteria (min. new open days)
- S-197 Potentially Increased with new criteria (max. new open days)



TIMING



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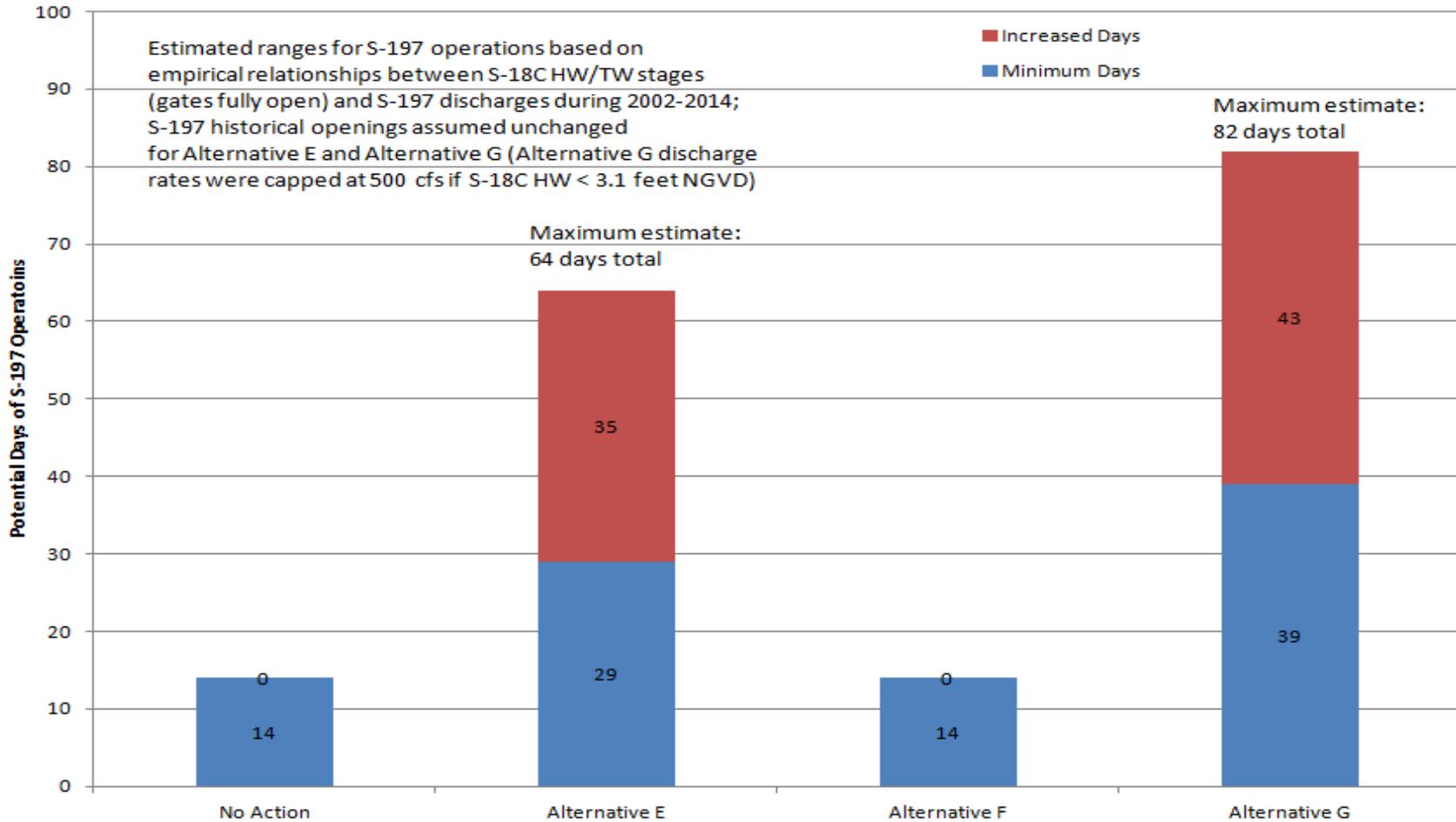
# Comparison of Effects for Action Alternatives E/F/G



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# Potential Additional Days of S-197 Operations for Increment 1 Alternatives: July 2012-June 2014

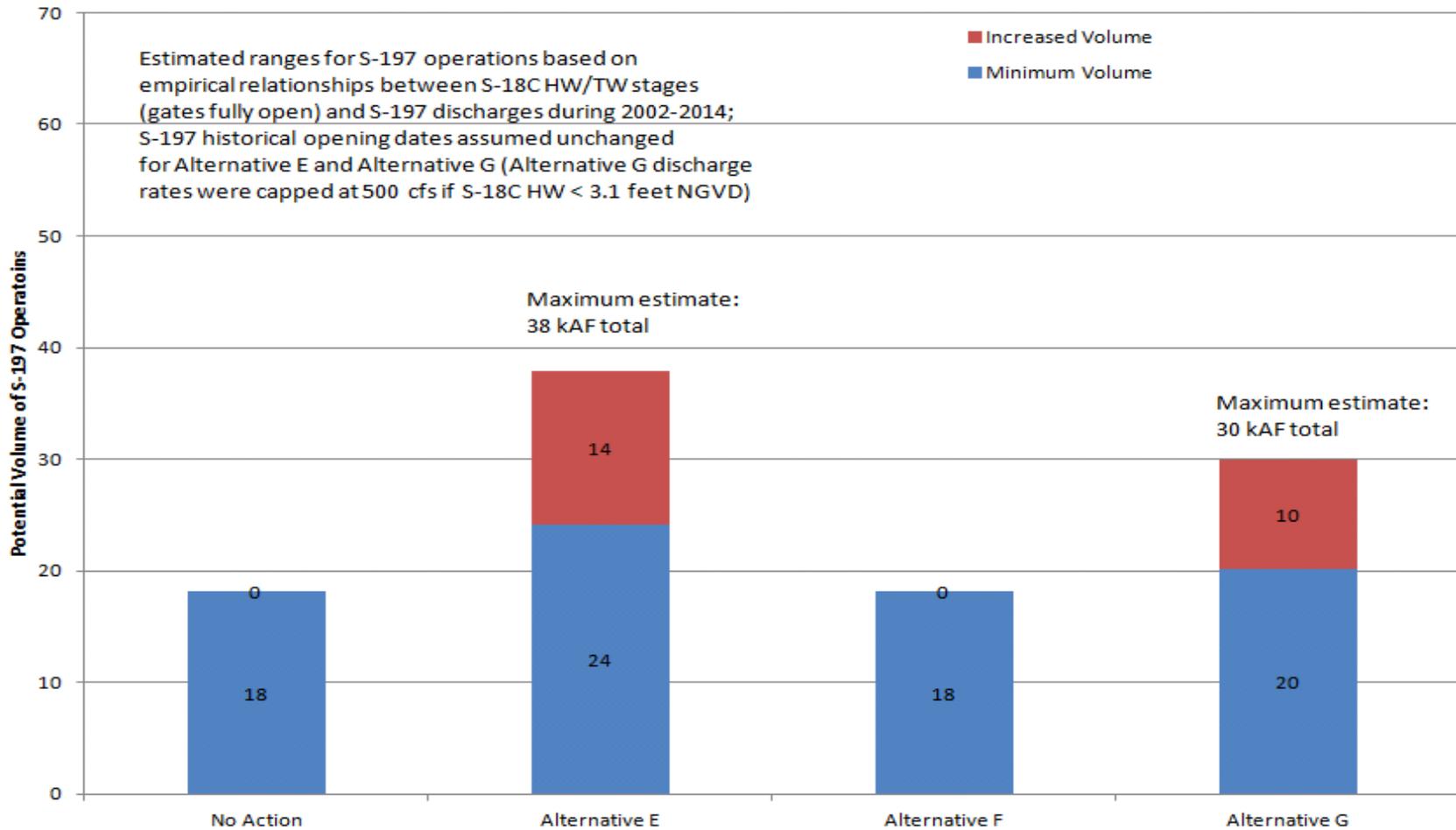
**DURATION**



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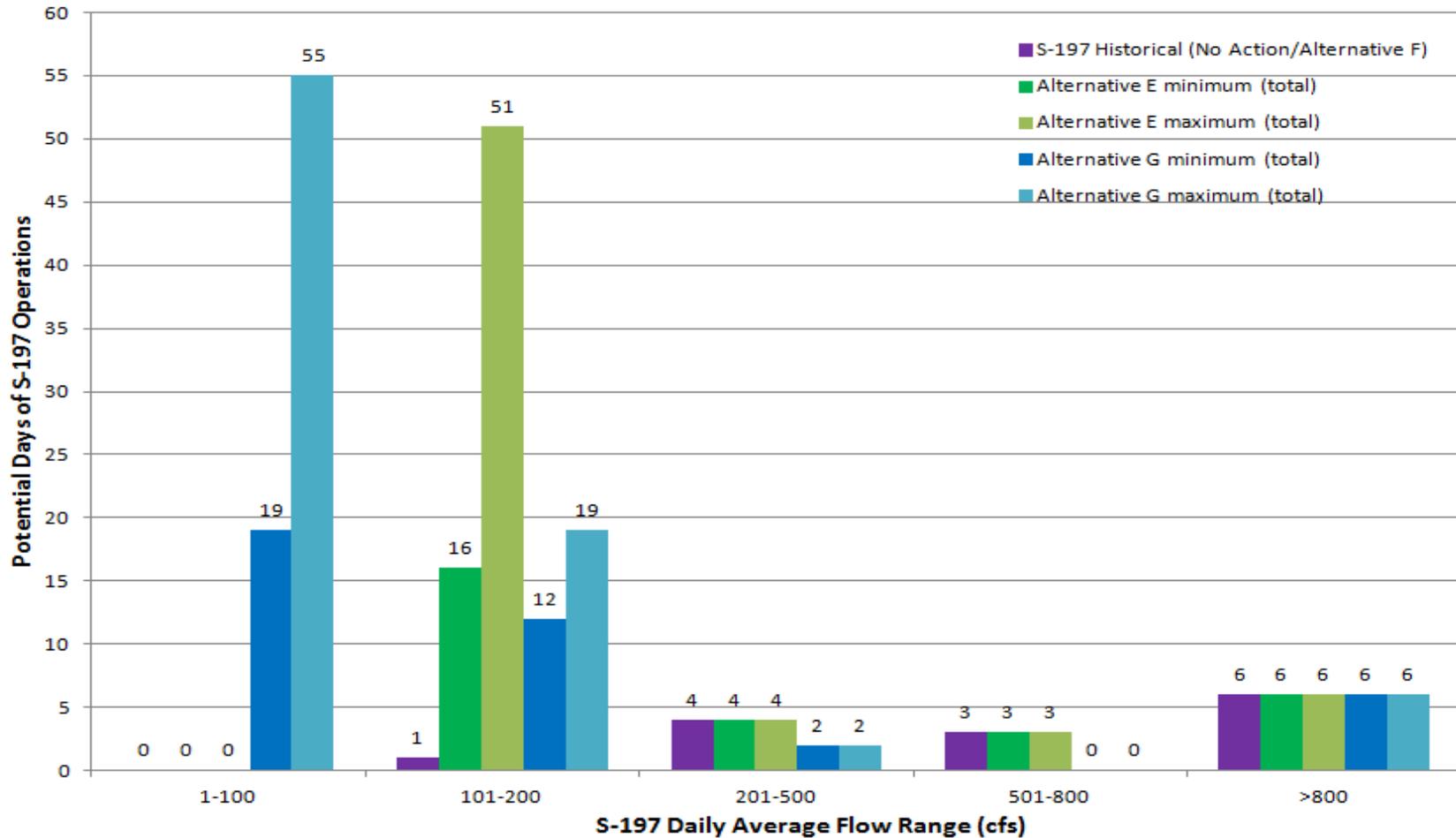
# Potential Additional Discharges from S-197 Operations for Increment 1 Alternatives: July 2012-June 2014

VOLUME



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## Potential Additional Days of S-197 Operations for Increment 1 Alternatives: July 2012-June 2014



# Hydrologic Effects of Action Alternatives E/F/G

- Period of analysis limited to CERP C-111 Spreader Canal operational period by SFWMD (July 2012-June 2014)
- Compared to the No Action Alternative, **Alternative F** is not anticipated to change the frequency and duration of S-197 discharges or increase flood control releases from S-18C



# Hydrologic Effects of Action Alternatives E/F/G

- Compared to No Action Alternative, given the hydrological conditions experienced during IOP/ERTP, **Alternative E** is anticipated to:
  - ▶ Increase the frequency and duration of S-197 discharges to Manatee Bay/Barnes Sound from 14 days to a range of 29-64 days (timing unchanged)
  - ▶ Increase the total volume of S-197 discharges by between 33-111% (18 kAF to a range between 24-38 kAF)
  - ▶ Increase flood control releases from S-18C and S-197 to mitigate for potential increased risk to flood protection for South Dade areas, which may be conditionally effected by operation of S-332D and/or the C-111 South Dade South Detention Area during the Increment 1 field test



# Hydrologic Effects of Action Alternatives E/F/G

- Compared to No Action Alternative, given the hydrological conditions experienced during IOP/ERTP, **Alternative G** is anticipated to:
  - ▶ Increase the frequency and duration of S-197 discharges to Manatee Bay/Barnes Sound from 14 days to a range of 39-82 days (timing unchanged; durations are slightly higher than Alternative E since releases start at a lower discharge rate of 100 cfs)
  - ▶ Increase the total volume of S-197 discharges by between 11-67% (18 kAF to a range between 20-30 kAF)
  - ▶ Reduce the frequency and duration of S-197 discharges from 200-800 cfs (Level 1 S-197 gate opening range)
  - ▶ Increase flood control releases from S-18C and S-197 to mitigate for potential increased risk to flood protection for South Dade areas which may be conditionally affected by operation of S-332D and/or the C-111 South Dade South Detention Area during the Increment 1 field test

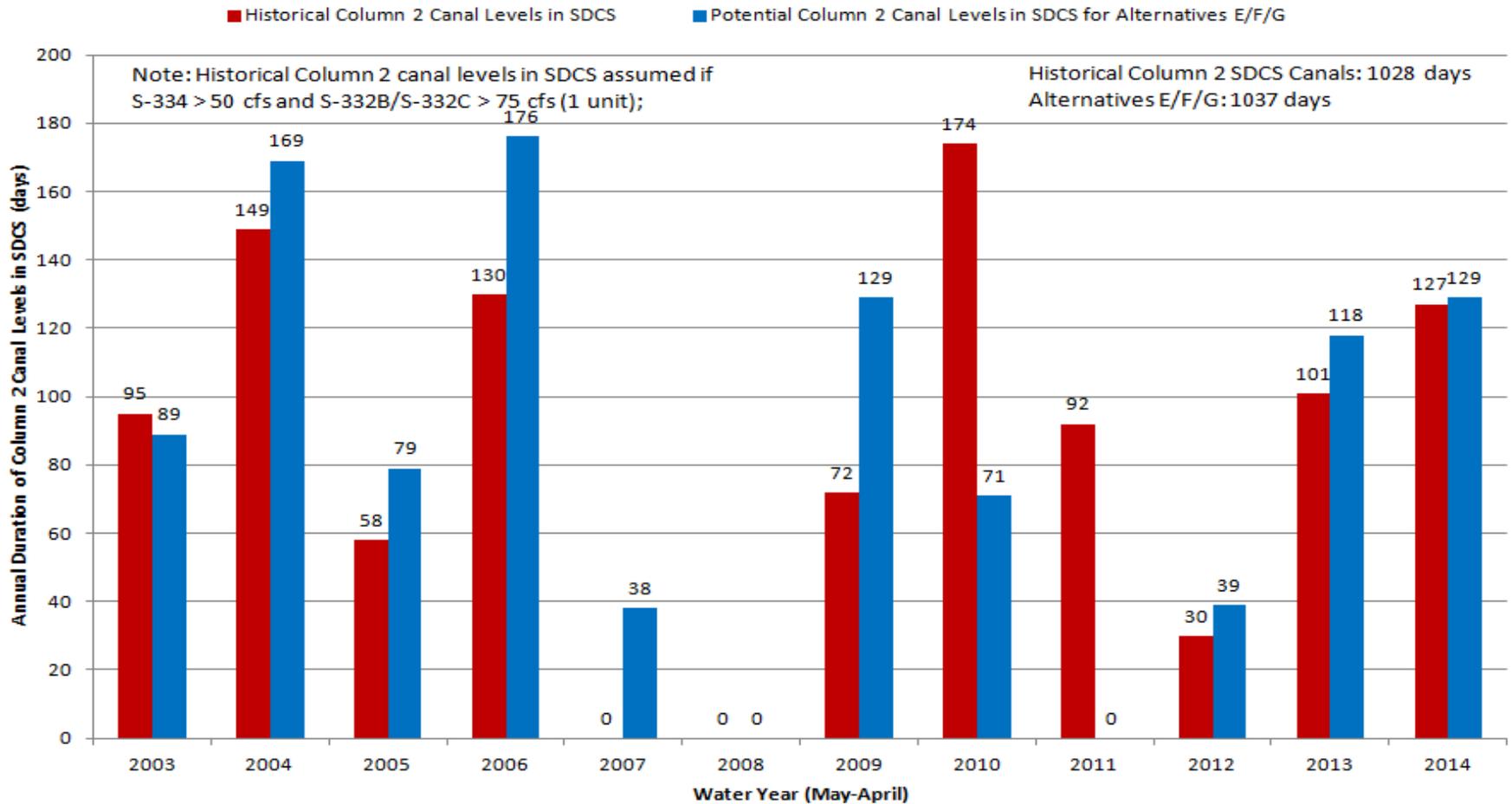


# SDCS Column 2 Operational Criteria



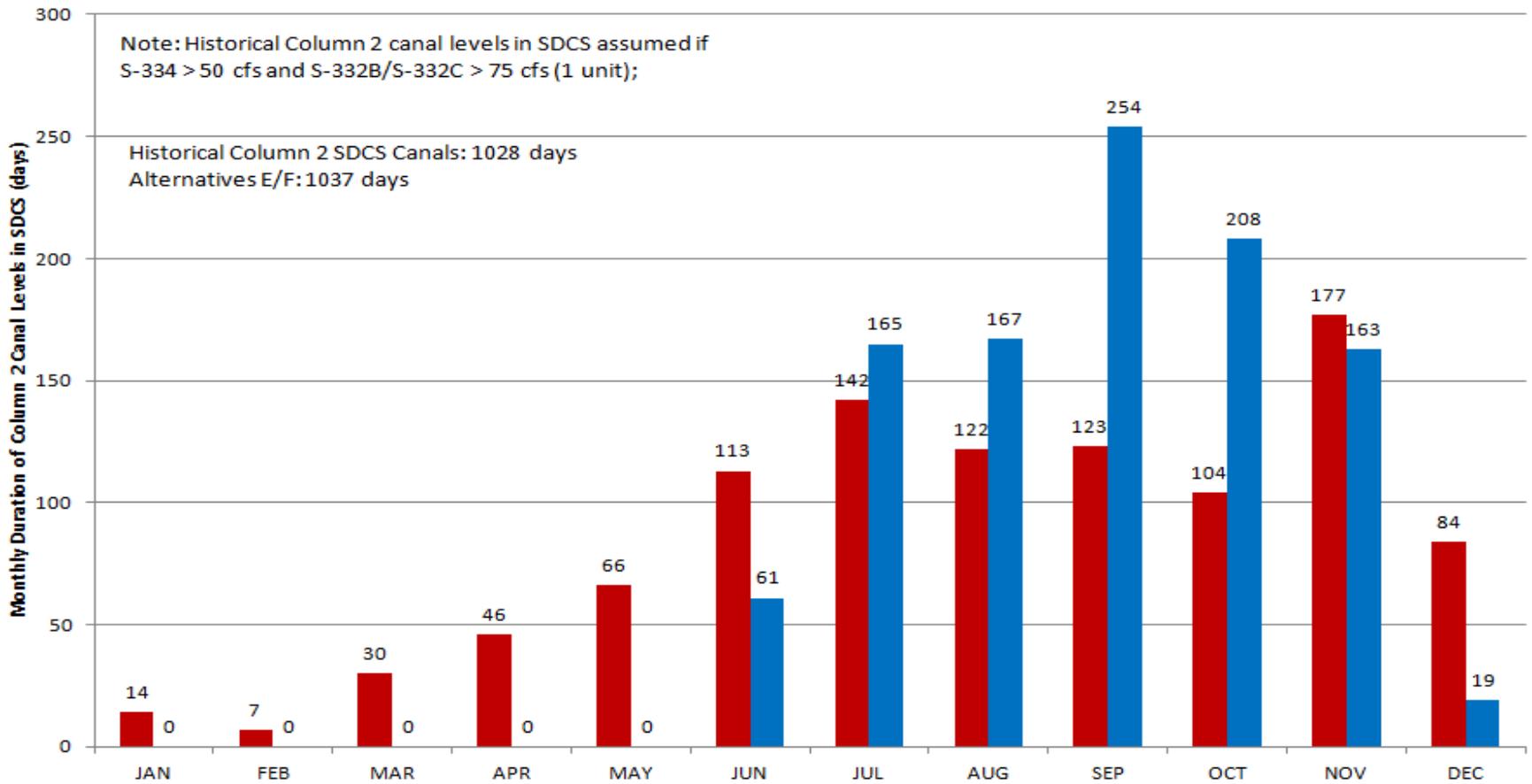
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## G-3273 Relaxation: Duration of Alternative E/F/G Potential S-334 Column 2 Canal Levels in SDCS, compared to Historical Column 2 Operations (POR July 2002- June 2014)



## G-3273 Relaxation: Duration and Timing of Alternative E/F/G Potential S-334 Column 2 Canal Levels in SDCS, compared to Historical Column 2 Operations (POR July 2002- June 2014)

■ Historical Column 2 Canal Levels in SDCS     
 ■ Potential Column 2 Canal Levels in SDCS for Alternatives E/F/G

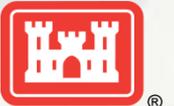


# Questions & Discussion



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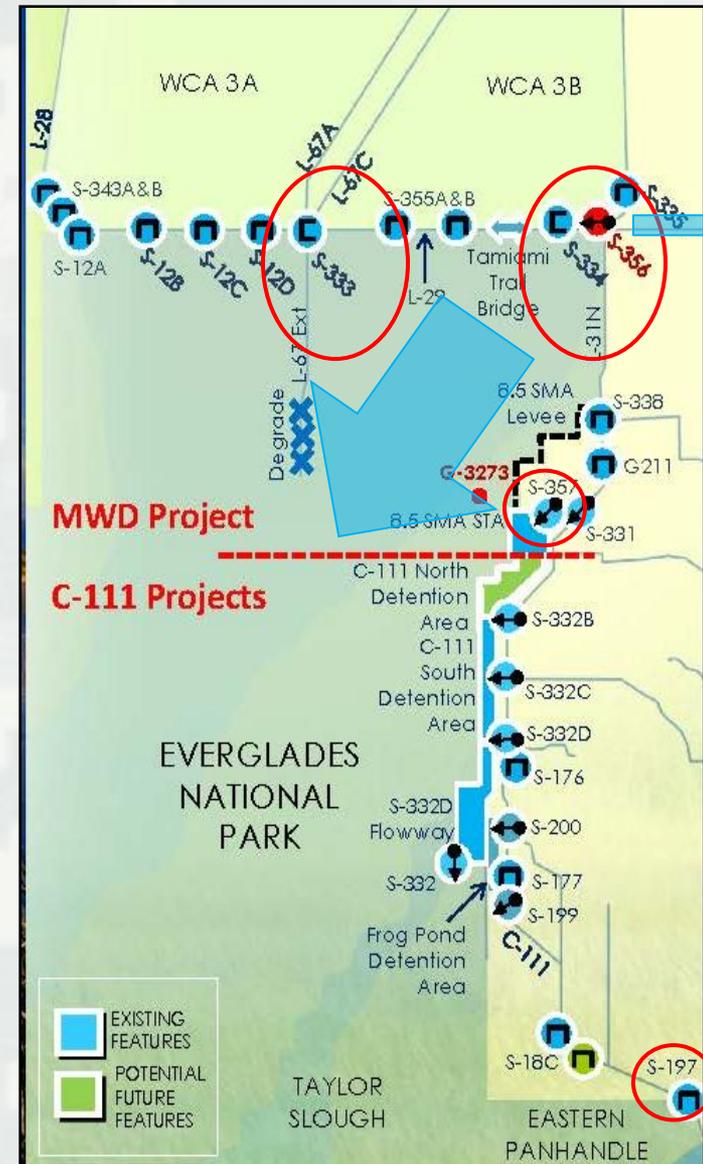
# Alternatives Evaluation



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# Alternatives for NEPA Assessment

- Overarching project need is to increase the availability of S-333 to increase water deliveries from WCA 3A to ENP through NESRS.
- Reduce the number of times S-333 discharges are limited by the existing G-3273 stage constraint of 6.8 feet NGVD.
- Reliance on S-334 to lower stages in WCA 3A is expected to decrease due to the increased availability of discharge to NESRS (ERTP Column 2).
- Alternatives differ based on:
  - ▶ Degree of relaxation of G-3273 stage constraint
  - ▶ Use of Column 2 Operations
  - ▶ Inclusion of operational changes to C-111 Canal structures S-197 (S-18C HW or S-178 TW)



# Objectives of Increment 1 Field Test

- A. Improve hydrological conditions in NESRS through the relaxation of the G-3273 stage criteria to increase water deliveries from WCA 3A to NESRS, while maintaining other C&SF Project authorized purposes.
- B. Use the S-356 pump station to return seepage to NESRS and manage seepage from NESRS to the L-31N Canal resulting from the relaxation of the G-3273 stage constraint on S-333, in conjunction with increased flows through the S-333 spillway to NESRS via the L-29 Canal.
- C. Improve hydrological conditions in NESRS by maximizing the flexibility and efficiency of the existing infrastructure, including use of seepage management (e.g., S-356) to complement inflows to NESRS from WCA 3A.
- D. Gather and analyze infrastructure performance, ecologic, hydrologic and water quality data sufficient to support Increment 2, resulting in the following:
  - i. Data gathering sufficient to support water quality certification
  - ii. Refined operational criteria for the MWD and C-111 South Dade Projects
  - iii. Updates to the 2012 Water Control Plan



# Constraints of Increment 1 Field Test

- A. L-29 Canal maximum operating limit of 7.5 ft NGVD, pending future acquisition of real estate interests along Tamiami Trail and additional NEPA evaluation
- B. Maintain the authorized purposes of the C&SF Project and subsequent modifications to include:
  - I. MWD Project
  - II. C-111 South Dade Project
  - III. CERP
- C. No reduction in current flood protection
- D. Maintain the current multi-species objectives of the 2012 Water Control Plan and comply with the requirements of the current biological opinions from the USFWS to include ERTP and CERP C-111 Spreader Canal Western Project



# Alternatives for NEPA Assessment

- A) No Action
- B) Incremental Relaxation of G-3273 Constraint
- C) Relaxation of G-3273 Constraint up to 7.5 feet NGVD
- D) Relaxation of G-3273 Constraint and Removal of Column 2 Operations at S-334
- E) Relaxation of G-3273 Constraint and Operational Criteria Changes at S-197 (Trigger S-18C HW)
- F) Relaxation of G-3273 Constraint Without Operational Criteria Changes at S-197
- G) Relaxation of G-3273 Constraint and Operational Changes at S-197 (Trigger S-178 TW)



# Common Components: Action Alternatives

- The field test will maintain the ERTP operating limit constraint of 7.5 feet NGVD in L-29 Canal, while relaxing the G-3273 constraint for S-333, and utilizing S-356 for management of seepage to the L-31N Canal.
- During the field test, the combined flows to NESRS through S-333 and S-356 will be more than what would have otherwise been discharged through S-333 under current operations.
- It is expected that under typical conditions, the combined flows through S-173 and S-331 to the C-111 Basin will be less than what would have been discharged through these features currently.
- Field test operations may result in increased seepage to the L-31N Canal south of the S-331 pump station, prior to construction and operation of the C-111 south Dade Project North Detention Area.
- No changes to water supply operations are proposed.



# Common Components: Action Alternatives

- S-355A and S-355B may be utilized to discharge to the L-29 as indicated under current operations and other future associated permit requirements, if available for use.
- The 2012 Water Conservation Areas, Everglades National Park, ENP-South Dade Conveyance System (WCAs, ENP, ENP-SDCS) Water Control Plan does not contain water management operating criteria for the planned spillway S-357N. All Action Alternatives include a testing protocol for S-357N.
- Field test duration will be a minimum of one year. If weather conditions do not provide sufficient data for a conclusive field test or other conditions warrant, the field test may be extended up to one year for a maximum of two years.
- The Corps does not plan to impose operational constraints for water quality that could restrict or otherwise limit inflows to NESRS.
- Approval of operational strategy and completion of NEPA documentation anticipated April 2015. Initiation dependent on weather conditions.



# Alternatives for NEPA Assessment

ALTERNATIVE	G-3273 STAGE CONSTRAINT	C&SF OPS CHANGES	COLUMN 2 OPERATIONS
A	NO	NO	Column 2 Operations to manage WCA 3A during S-12 seasonal closures and high water as conducted under IOP/ERTP
B	Calendar Based Restrictions	S-333, S-334, S-356, S-357N	Same as A
C	Relaxed up to 7.5 Feet NGVD No Calendar Based Restrictions	Same as B	Column 2 Operations to manage WCA 3A during S-12 Seasonal Closure Period
D	Same as C	Same as B	No Column 2 Operations at S-334
E	Same as C	S-333, S-334, S-356, S-357N, S-197	Limited Column 2 Operations during S-12 Seasonal Closure Period and conditional extension to August 15 <sup>th</sup>
F	Same as C	Same as B	Same as E
G	Same as C	Same as E*	Same as E

Magnitude of Change Column 2 Operations

\* Alternative G differs from Alternative E based on the trigger location used to define opening criteria for S-197 discharges and reduces IOP/ERTP Level 1 S-197 opening from 800 to 500 cfs.



CONCEPTUAL ALTERNATIVES



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# Issues and Basis for Choice: Alternatives B, C, D

- Alternatives were evaluated based on achievement of field test objectives and constraints and potential environmental effects.
- Currently, the delivery of water to NESRS by S-333 must be reduced or discontinued when the stage at G-3273 exceeds 6.8 feet NGVD, except under Column 2 Operations (S-334 must match S-333).
- Relaxation of G-3273 to the L-29 stage limit of 7.5 feet NGVD and operation of S-356 will increase water deliveries to NESRS.
- Reliance on S-334 to lower stages in WCA 3A is expected to decrease due to the increased availability of discharge to NESRS.
- Alternatives which did not maximize hydrologic improvements to NESRS while modifying Column 2 Operations to maintain regulatory releases from WCA 3A were eliminated from detailed evaluation (Alternatives B and D).



# Issues and Basis for Choice: Alternatives B, C, D

- Alternative C was identified as a potentially viable alternative pending further refinement to the operational criteria.
- Continued coordination and modifications to the operational criteria with members of the hydrology and hydraulics sub team and project delivery team led to the revision of Alternative C into Alternative E and Alternative F with and without S-197.
- October 15, 2014 PDT – USACE recommended development of hybrid from Alternatives E and F to better balance C&SF Project purposes
- The No Action Alternative, Alternative E, Alternative F, and Alternative G will be carried through the environmental effects analysis.



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ALTERNATIVE	MEETS FIELD TEST OBJECTIVES	MEETS FIELD TEST CONSTRAINTS				ENVIRONMENTAL EFFECTS				REDUCTION IN FLOWS TO SDGS FROM WCA 3A
		L-29 Canal maximum operating limit of 7.5 feet, NGVD ...	Maintain the authorized purposes of the C&SF Project and subsequent modifications (MWD/C-111SD/CERP*)	Meets current flood protection	Maintain the current multi-species objectives of the 2012 Water Control Plan and comply with the requirements of current biological opinions...	WCA 3A	ENP	EASTERN FLORIDA BAY	MANATEE BAY AND BARNES SOUND	
A	<b>NO</b>	YES	YES	YES	YES	0	0	0	0	0
B	YES	YES	YES	UNCERTAIN	YES	0	+	0	0	+
C	YES	YES	YES	UNCERTAIN	YES	0	++	0	0	++
D	YES	YES	YES	UNCERTAIN	YES	-	++	0	0	+++
E	YES	YES	UNCERTAIN	YES	YES	0	++	--	--	++
F	YES	YES	YES	UNCERTAIN	YES	0	++	0	0	++
G	YES	YES	UNCERTAIN	YES	YES	0	++	-	-	++

- NEGATIVE + POSITIVE 0 NEUTRAL (NO CHANGE FROM EXISTING CONDITIONS)

NOTE: CHART REQUIRES INTERPRETATION. ADDITIONAL JUSTIFICATION TO BE PROVIDED WITHIN THE EA. POTENTIAL ENVIRONMENTAL EFFECTS EXPECTED TO BE TEMPORARY.

CONCEPTUAL  
ALTERNATIVES



\*CERP, C-111 SC Construction/Monitoring and Assessment Ongoing



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# Evaluation of Alternatives E, F, and G

- Compared to No Action Alternative, given the hydrological conditions experienced during IOP/ERTP, Alternatives E/F/G are anticipated to:
  - ▶ Increase number of days with WCA-3A unconstrained discharges to NESRS by up to 1176 days (up to 64% increase)
  - ▶ Increase the frequency and duration of L-29 Canal stages approaching the maximum operating limit of 7.5 feet NGVD (IOP/ERTP stage > 7.3 ~29%)
  - ▶ Reduce the total duration of WCA-3A regulatory releases to the SDCS by an estimated 832 days (81% reduction; frequency reduced from 23.5% to 4.5% of period of analysis), while also reducing seepage losses caused by lowered Column 2 canal operating levels (used if S-356 is closed)
  - ▶ Reduce the volume of WCA-3A regulatory releases to the SDCS by an estimated 85% (735 kAF under IOP/ERTP to 112 kAF)
  - ▶ Increase flood control releases from S-331 for 8.5 SMA mitigation and increase seepage to L-31N south of S-331, prior to completion of C-111 South Dade North Detention Area
    - Additional volume to L-31N Canal is expected to be primarily managed with the C-111 South Detention Area using S-332 B, S-332C, and S-332D, given the significant reduction in WCA-3A regulatory releases to the SDCS



# Evaluation of Alternatives E, F, and G

- Compared to No Action Alternative, given the hydrological conditions experienced during IOP/ERTP, Alternative E is anticipated to:
  - ▶ Increase the frequency and duration of S-197 discharges to Manatee Bay/Barnes Sound from 14 days to a range of 29-64 days (timing unchanged)
  - ▶ Increase the total volume of S-197 discharges by between 33-111% (18kAF to a range between 24-38 kAF)
  - ▶ Increase flood control releases from S-18C and S-197 to mitigate for potential increased risk to flood protection for South Dade areas, which may be conditionally affected by operation of S-332D and/or the C-111 South Dade South Detention Area during the increment 1 field test
- Compared to No Action Alternative, Alternative F is not anticipated to change the frequency and duration of S-197 discharges or increase flood control releases from S-18C.



# Evaluation of Alternatives E, F, and G

- Compared to No Action Alternative, given the hydrological conditions experienced during IOP/ERTP, Alternative G is anticipated to:
  - ▶ Increase the frequency and duration of S-197 discharges to Manatee Bay/Barnes Sound from 14 days to a range of 39-82 days (timing unchanged; durations are slightly higher than Alternative E since releases start at a lower discharge rate of 100 cfs)
  - ▶ Increase the total volume of S-197 discharges by between 11-67% (18kAF to a range between 20-30 kAF)
  - ▶ Reduce the frequency and duration of S-197 discharges from 200-800 cfs (initial S-197 gate opening range)
  - ▶ Increase flood control releases from S-18C and S-197 to mitigate for potential increased risk to flood protection for South Dade areas, which may be conditionally affected by operation of S-332D and/or the C-111 South Dade South Detention Area during the increment 1 field test



# Next Steps

- Consider PDT comments and concerns
- Complete Environmental Assessment



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# Cultural Resources



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# Cultural Resources

- Consultation Ongoing
- Corps' Determination: No Adverse Effects
  - ▶ Test is of limited duration
  - ▶ Predicted frequency of S-333 releases
  - ▶ Stage increase at G-3273
- ERTTP Programmatic Agreement conditions and stipulations do not apply to deviations

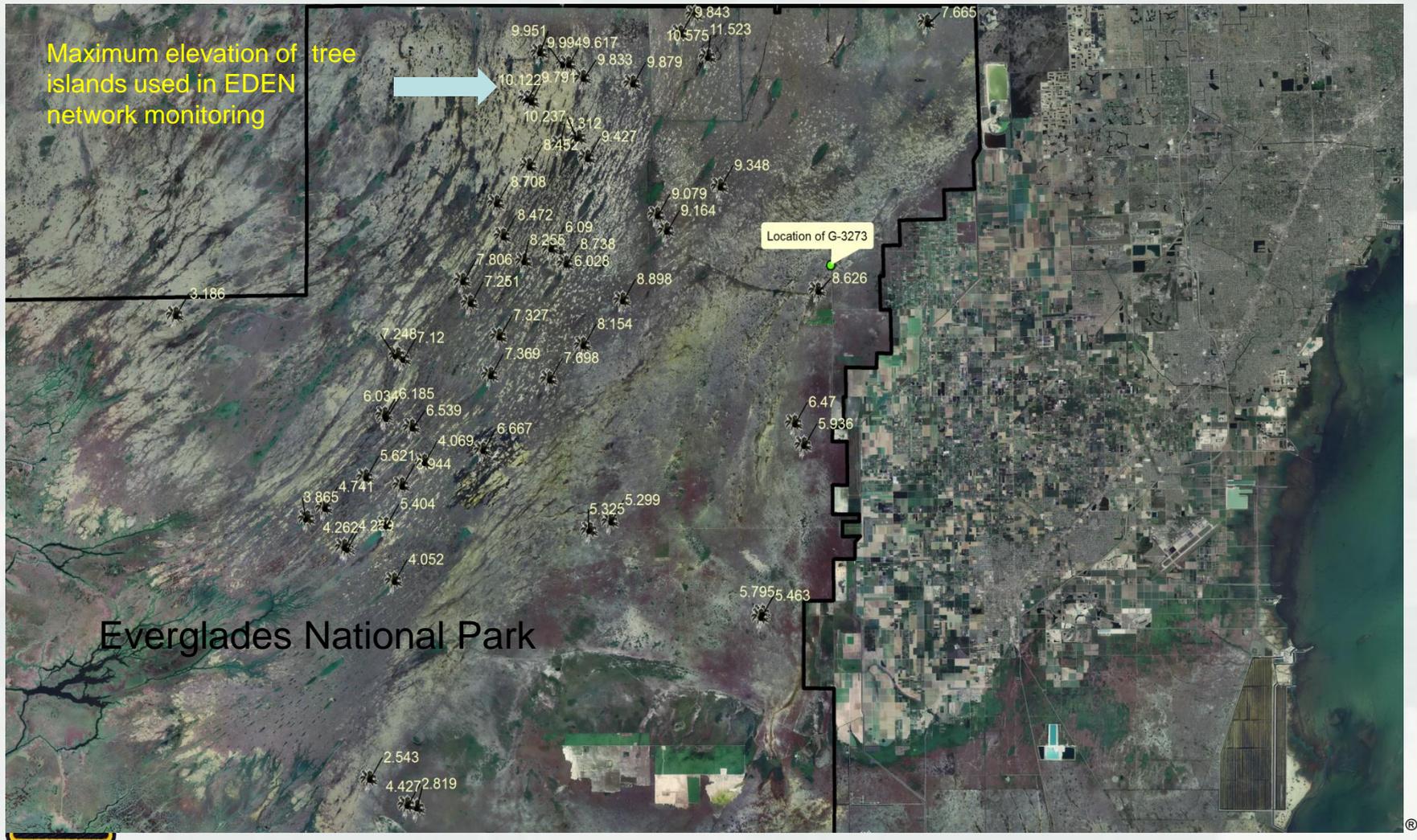


# Cultural Resources Analysis

- 58 ENP Tree Islands
  - ▶ 35 known to contain archaeological sites
- Four periods of rain driven high water periods were examined. Each indicated period mimicked water levels that may be expected during the G-3273 relaxation.
  - ▶ 6-1 thru 6-24, 2012 G-3273 average 6.84 ft (IOP)
  - ▶ 9-19 thru 10-3 2012 G-3273 average 7.14 ft (IOP)
  - ▶ 7-3 thru 7-8, 2013 G-3273 average 6.93 ft (ERTP)
  - ▶ 9-19 thru 9-24, 2013 average 7.35 ft (ERTP)
- Four periods of analysis allows for better examination and to account for variables within environmental conditions



# Cultural Resources Analysis



example of GIS tool utilized.

# Cultural Resources Considerations

- Test is designed to be short term (1-2 years), no adverse effects on cultural resources are anticipated as interaction with the increased water elevations are extremely negligible of the duration of the test.
- Modeling of 4 periods indicates that tree islands with archaeological sites typically occur on islands of higher elevation.
- Monitoring of water elevations established within the ERTP Programmatic Agreement utilizing established EDEN Network will continue to be used for monitoring of cultural resources.



# Cultural Resources Considerations

- Monitoring designed to continue to track water elevations located within 35 archaeological sites.
  - ▶ While inundation is not anticipated, should this occur then an evaluation of the causes will be conducted to facilitate any needed changes to the operations parameters of the test and ensure no impacts would have resulted from the operational portion of the test.
- Natural rain driven inundation of the sites does occur and is anticipated to occur during the test and as such will not be considered an impact related to this test.



# PDT Discussion



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# Other Updates



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# S-356 Pump Test Update

- REC, CatEx and Test Authorization Complete



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# 8.5 SMA: S-357N Schedule

BCOE Certification	27 Jan
Contract Advertised	06 Feb
Contract Awarded	06 Apr
Construction Physically Complete	30 Jan



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# S-355s Update

- RAI responses with signed cover letter submitted to FDEP on 18 Nov
- Expect response within 30 days (RAI or acceptance)



# *Public Comment*



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# Next Steps

## Closing Comments



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# Increment 1- Schedule

Finalize draft EA	02 Jan
DQC Begin	05 Jan
Submit Test Authorization (NLT)	23 Jan
Public/Agency/State/SAD Review	04 Feb
Initiate Test	27 Apr

