

G-3273/S-356 Increment 1 Field Test Operational Strategy

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27 January 2016

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Overview



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- MWD Increment 1 field test is a two-year Planned Deviation to the 2012 WCA, ENP, and SDCS Water Control Plan (based on the Everglades Restoration Transition Plan, or ERTP EIS)
 - ▶ Management of WCA-3A
 - ▶ L-31N Canal Seepage Management
 - ▶ New Seepage Management
- Initiated 15 October 2015
 - ▶ Minimum duration of one year

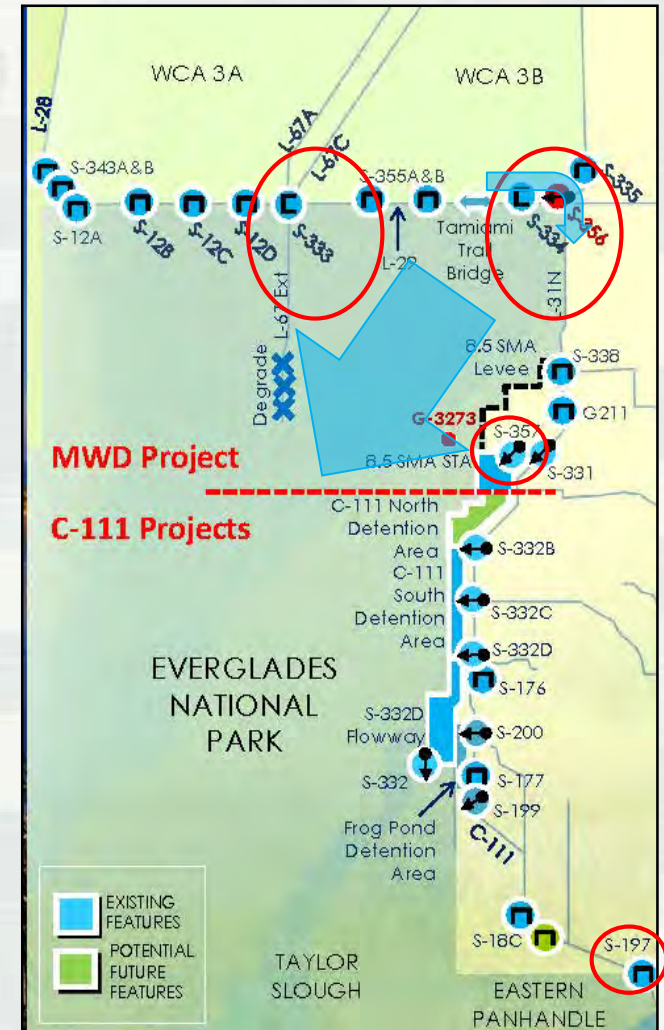


Increment 1 Field Test



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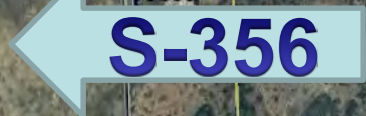
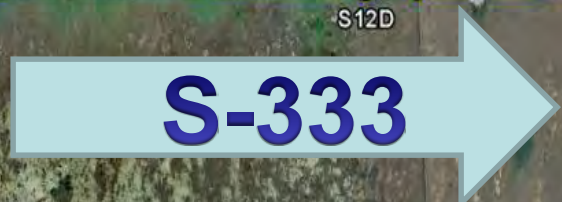
- Overarching project need is to increase the availability of S-333 to increase water deliveries from WCA 3A to ENP through NESRS
- Reduce the number of times S-333 discharges are limited by the prior G-3273 constraint of 6.8 feet NGVD
- Operate S-356 to manage seepage from NESRS to the L-31N Canal
- Gather and analyze infrastructure performance, ecologic, hydrologic and water quality data sufficient to update the 2012 WCP and support development of Increment 2, which would raise the L-29 Canal stage limit above 7.5 feet NGVD



WCA-3A

WCA-3B

L-29 Canal



WCA-3A FLOW

**L-31N
SEEPAGE**

S12D

S333

S355A

S355B

S334

S336

S335

SW 8th St

41

Krome Ave

94

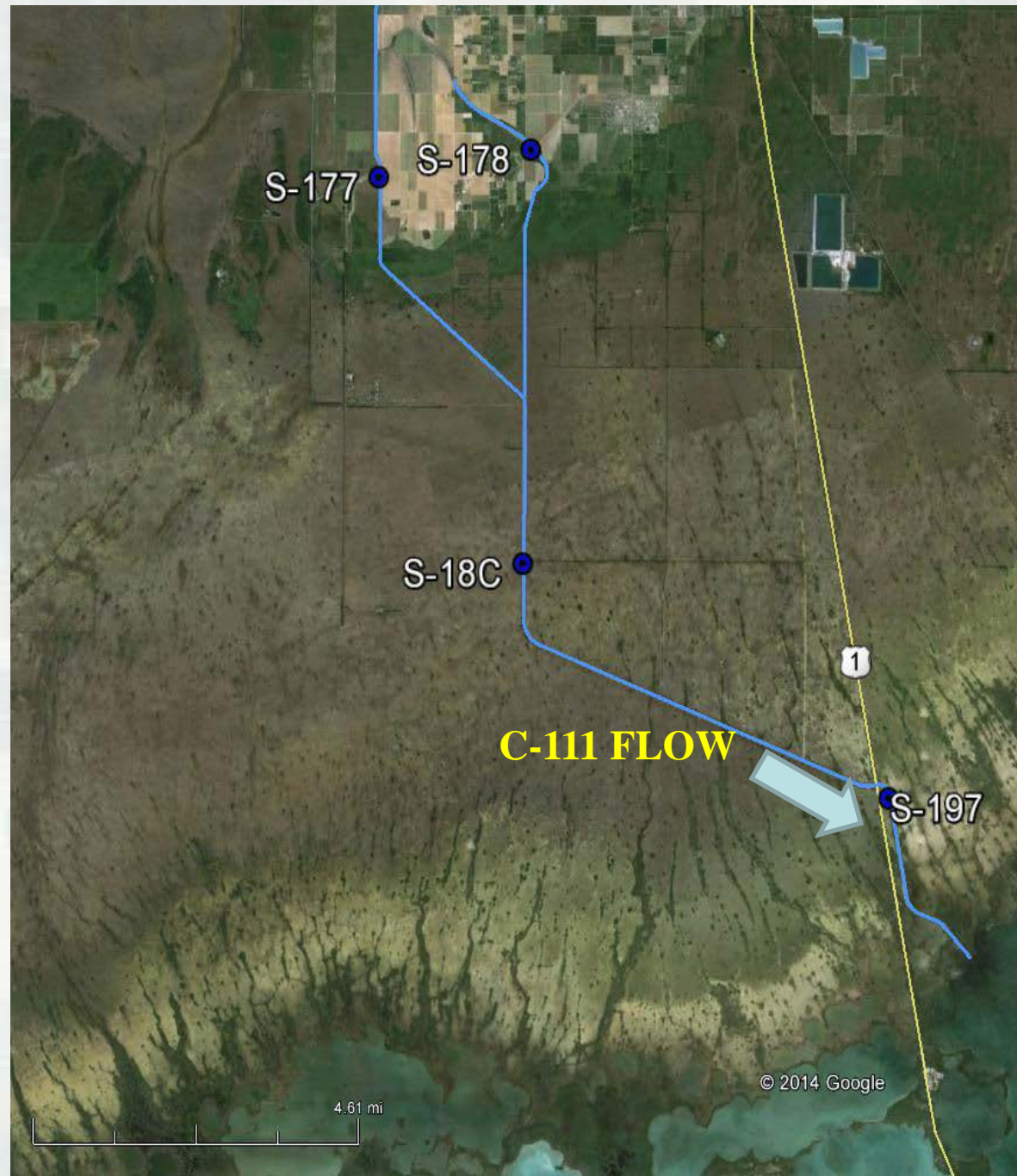
997

N Kendall Dr

G211

S338

G-3273



**MANATEE
BAY**

Google earth



Management of WCA-3A



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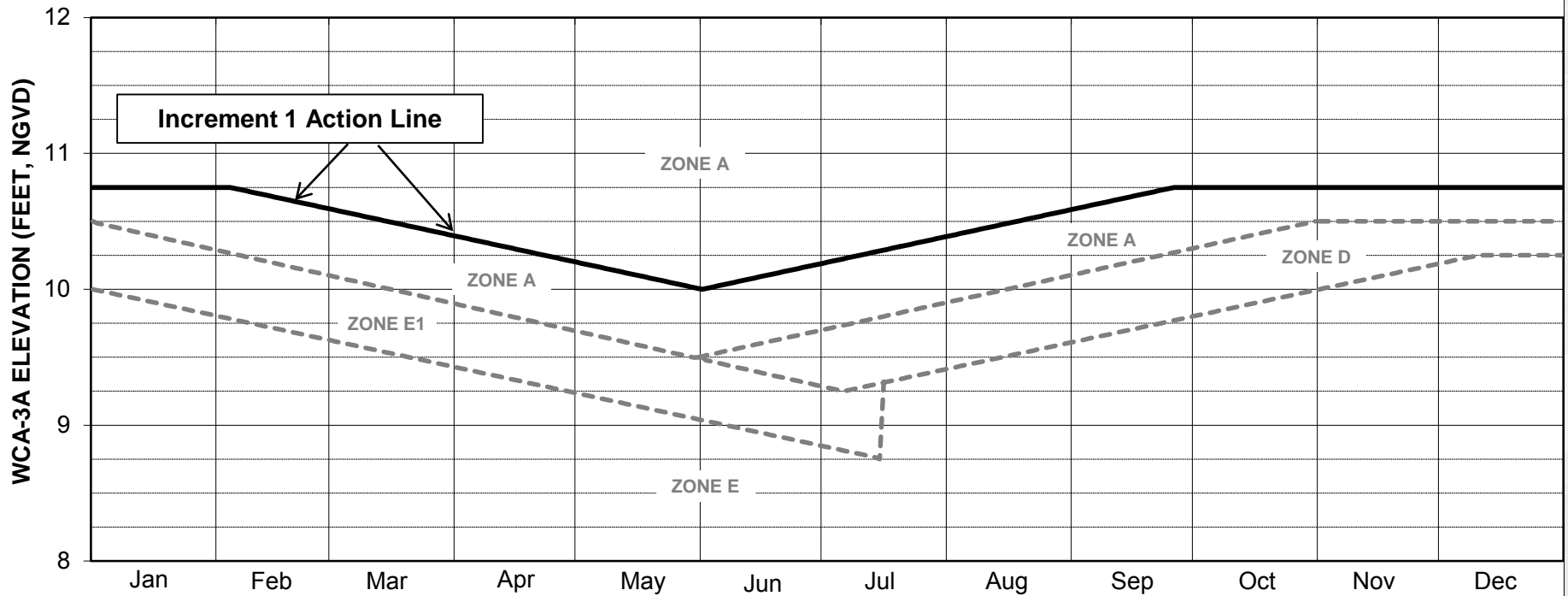
Increment 1 includes changes to operational constraints for WCA-3A releases to NESRS (via S-333) and WCA-3A releases to SDCS, including use of S-356 pump station, additional conditional operation of S-197, and revised Column 2 criteria

- ▶ ERTF Column 1: WCA-3A regulatory releases are met by normal operation of the WCA-3A regulatory outlets (S-12s, S-333, S-344, S-343s, and S-151)
- ▶ ERTF Column 2: WCA-3A regulatory releases are made via S-333 and S-334 to the L-31N Canal and the SDCS to address the reduction in WCA-3A releases due to the Cape Sable Seaside Sparrow (CSSS) S-12A and S-12B closure periods (01 Nov./01Jan. to 14 July)
 - Includes use of S-331, S-332B, S-332C, and S-332D pump stations
 - Includes lowering of SDCS Canal control stages to minimize potential flood impacts and provide gradients

Increment 1 includes pre-existing operations from ERTF Water Control Plan (WCP):

- WCA-3A Regulation Schedule and Rainfall Plan
- L-29 Canal maximum operating limit of 7.5 ft., NGVD
- WCA-3A Regulatory releases to the SDCS (Column 2 operations) during S-12s CSSS Closure Period (01 Nov.–14 July) – retain column 1/column 2 SDCS levels
- Water supply

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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Management of WCA-3A



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New with MWD Increment 1:

- S-333 flows no longer have a constraint at G-3273 (6.8 ft., NGVD under ERTTP)
- WCA-3A water level Action Line sets priority of S-333 & S-356 flows to NESRS

	WCA-3A > Action Line	WCA-3A < Action Line
G-3273 > 6.8 ft. NGVD	S-12A closure period: (3) S-12A non-closure period: (4)	(2)
G-3273 < 6.8 ft. NGVD	N/A (maximize S-333 up to L-29 max. operating limit)	(1)

(#) refer to specific sections of the Increment 1 Operational Strategy (Appendix A of EA)

- Column 2 operations (S-334, etc.) limited to periods when G-3273 stages is above 6.8 ft., NGVD, WCA-3A stages are above the Action Line, S-12C and S-12D are fully open from WCA-3A, and SDCS has available capacity
 - ▶ 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 S-12A Closure Period (01 Nov. to 14 July) limited to 15 July through 14 August when Rainfall Plan water has not been successfully removed from WCA-3A (due to S-12 closures) through 14 July, AND WCA-3A stages remain above the Action Line

L-31N Canal Seepage Management



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Increment 1 includes pre-existing operations from ERTP WCP:

- L-29 Canal maximum operating limit of 7.5 ft., NGVD
- L-31N Canal range of 5.5 to 5.8 ft., NGVD (S-338 Column 1)
- S-335 may be used to manage L-30 Canal stages if capacity is available within the L-31N Canal

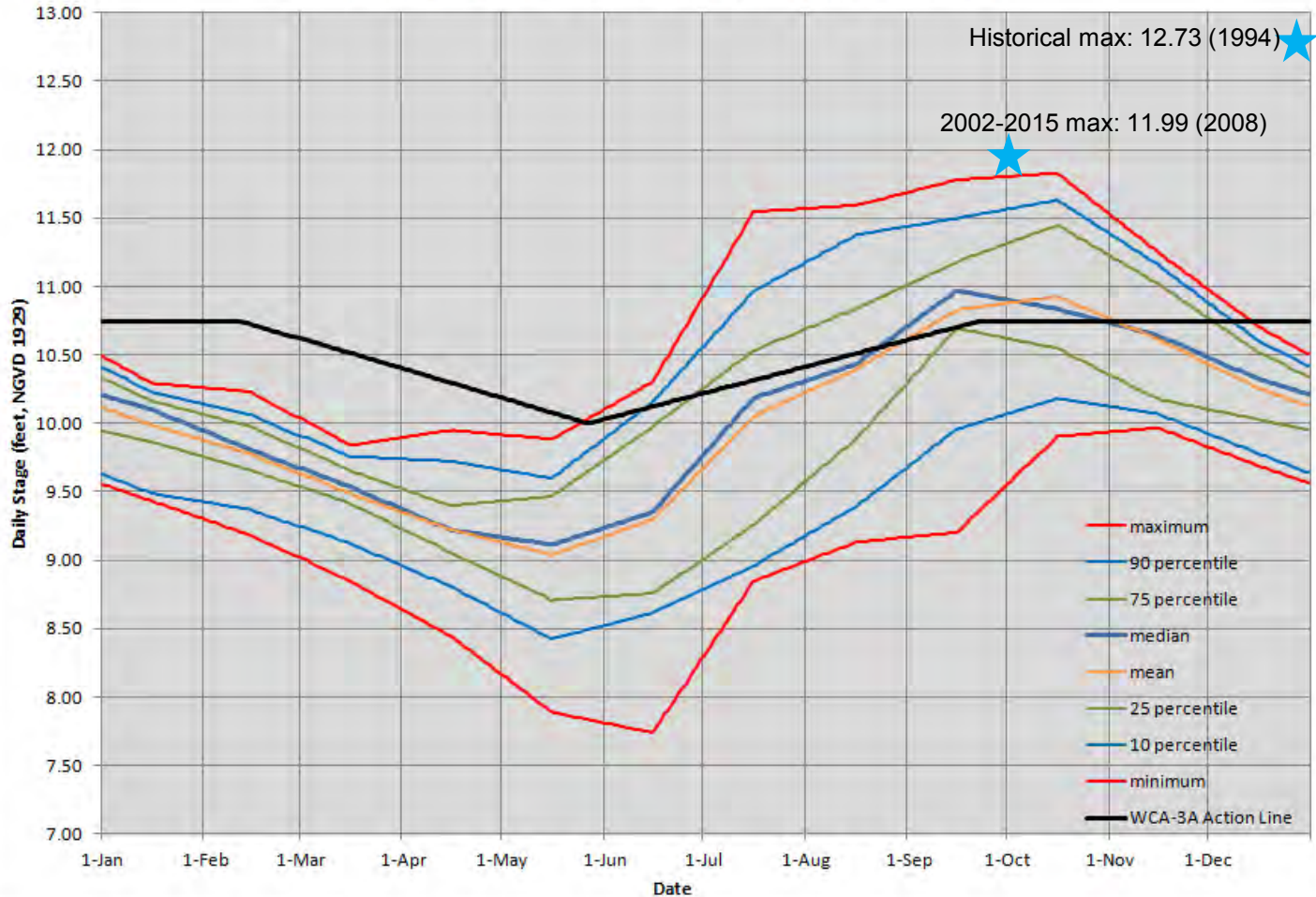
New with MWD Increment 1:

- S-356 flows to NESRS, with no restrictions based on G-3273 constraint
- S-356 flows of 250 cfs guaranteed if G-3273 stage is above 6.8 feet NGVD, until WCA-3A water level rises to Action Line
- S-356 is not operated when WCA-3A average stage is above Action Line
- Flexibility to keep S-338 and/or G-211 closed or reduce discharges if S-356 is able to maintain L-31N stages within target range
- No requirement for S-335 closure during S-356 operations



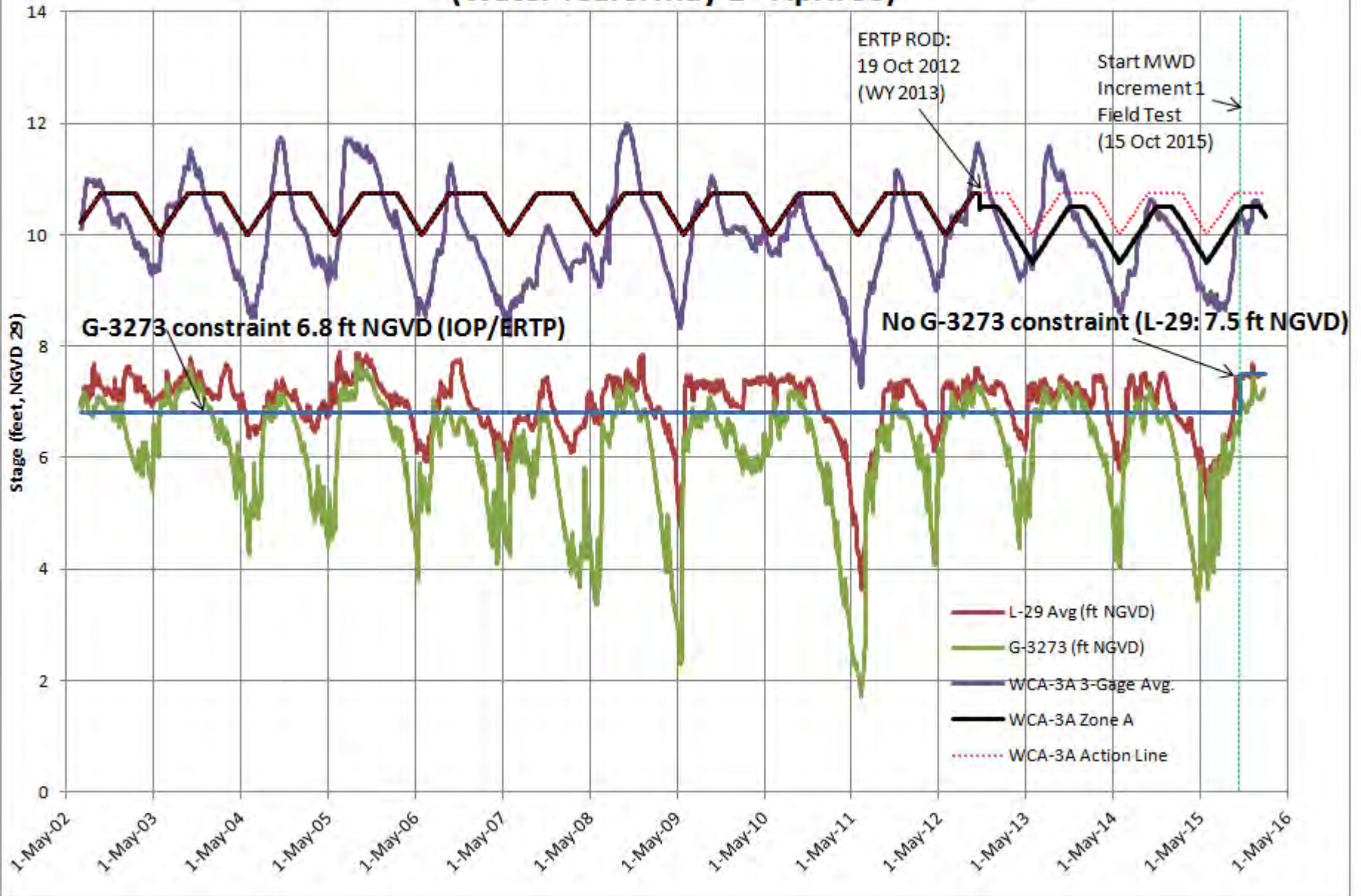
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**Historical Monthly 3A-3G Annual Stage Hydrograph Distribution:
Converted to Daily Time Series, for POR July 2002 - June 2014**



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IOP/ERTP Hydrographs: L-29 Borrow Canal, G-3273, WCA-3A 3-Gage Avg (Water Years: May 1 - April 30)





New Seepage Management



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- C-111 Column 2 operational criteria when G-3273 above 6.8 ft., NGVD and WCA-3A is above Action Line for operations at S-332B/C/D, S-176, S-177, S-18C, S-194, and S-196
 - ▶ S-356 is not operated (to give priority to S-333), but increased seepage from NESRS
 - ▶ NOTE: C-111 Column 1 operational criteria apply when WCA-3A is below Action Line for above-listed structures
- *Added S-178 TW as an additional S-197 opening trigger when WCA-3A above Action Line (S-356 not operated; C-111 Column 2 operational criteria), S-18C gates are full open, AND S-178 TW above 2.4 ft. NVGD. Established incremental increase in S-197 discharges to 500 cfs*
 - ▶ S-197 Level 1 flows may occur earlier but cap flows at 500 cfs vs 800 cfs
 - ▶ S-197 opening triggers at S-177 and S-18C remain per E RTP WCP (with continued use of SFWMD C-111 Spreader Canal S-199 and S-200 pump stations)

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



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ERTP WCP: S-18C and S-197



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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"> 1. S-176 headwater is less than 5.2 feet, NGVD and S-177 headwater is less than 4.2 feet, NGVD. 2. Storm has moved away from the basin 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. 		



New Seepage Management



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- S-357N testing protocol to establish S-357N operating criteria, iterative approach consisting of 4 to 5 weeks of gate changes in wet season (refer to Operational Strategy for further details)
 - ▶ Gate changes to test the hydrologic response of the system to minor adjustments in operations at S-357N (S-331 criteria same as ERTP WCP)
 - ▶ Increase S-357 normal operations limit to 2 pumps (250 cfs)
 - ▶ Anticipate construction completion by November 2016

- Limited hydraulic testing (up to 1 month) of the C-111 South Dade and C-111 Spreader Canal detention areas will be used to develop a water budget from surface water and groundwater monitoring data

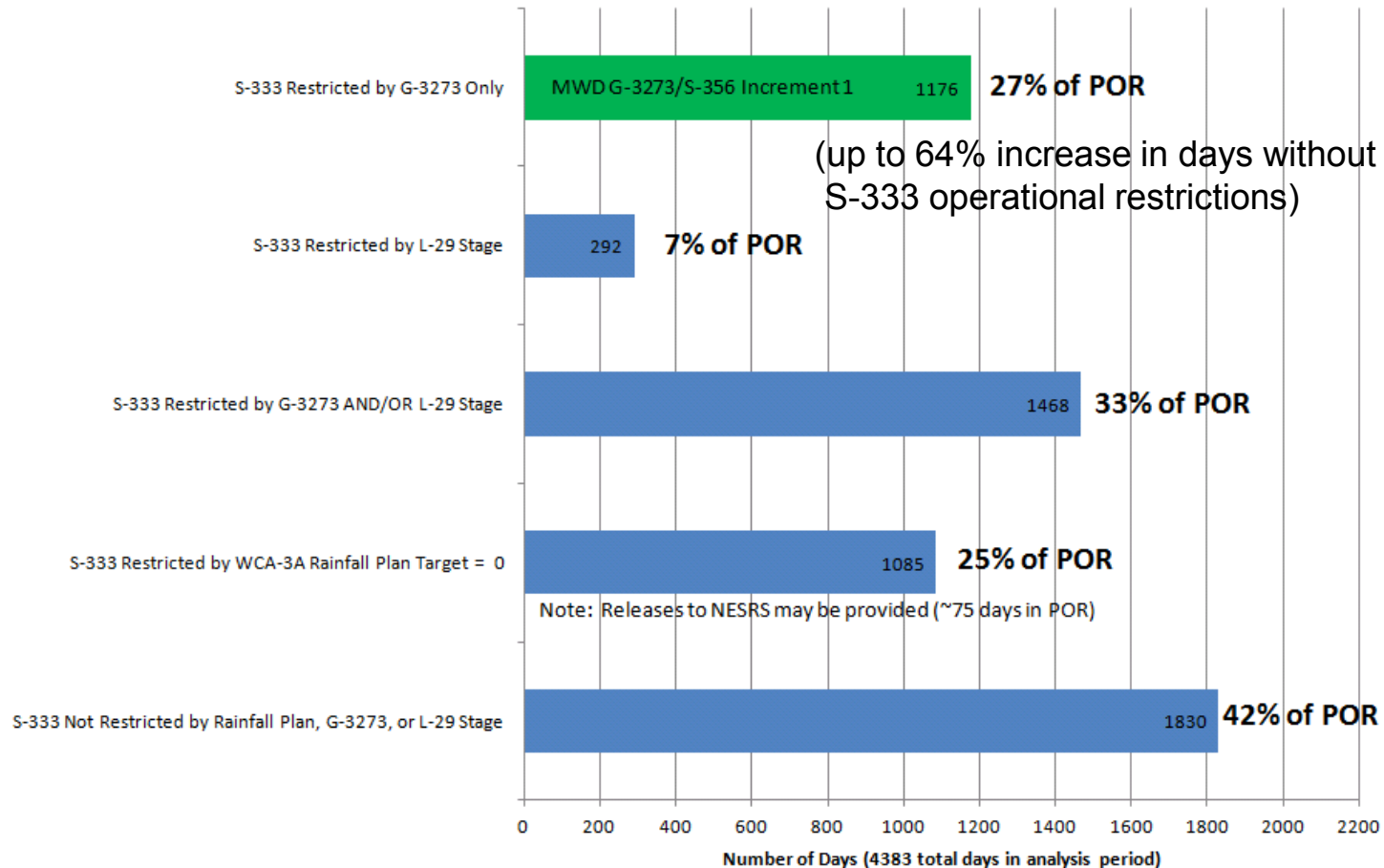


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Frequency of S-333 Operational Constraint Triggers under IOP/ERTP (July 2002-June 2014)



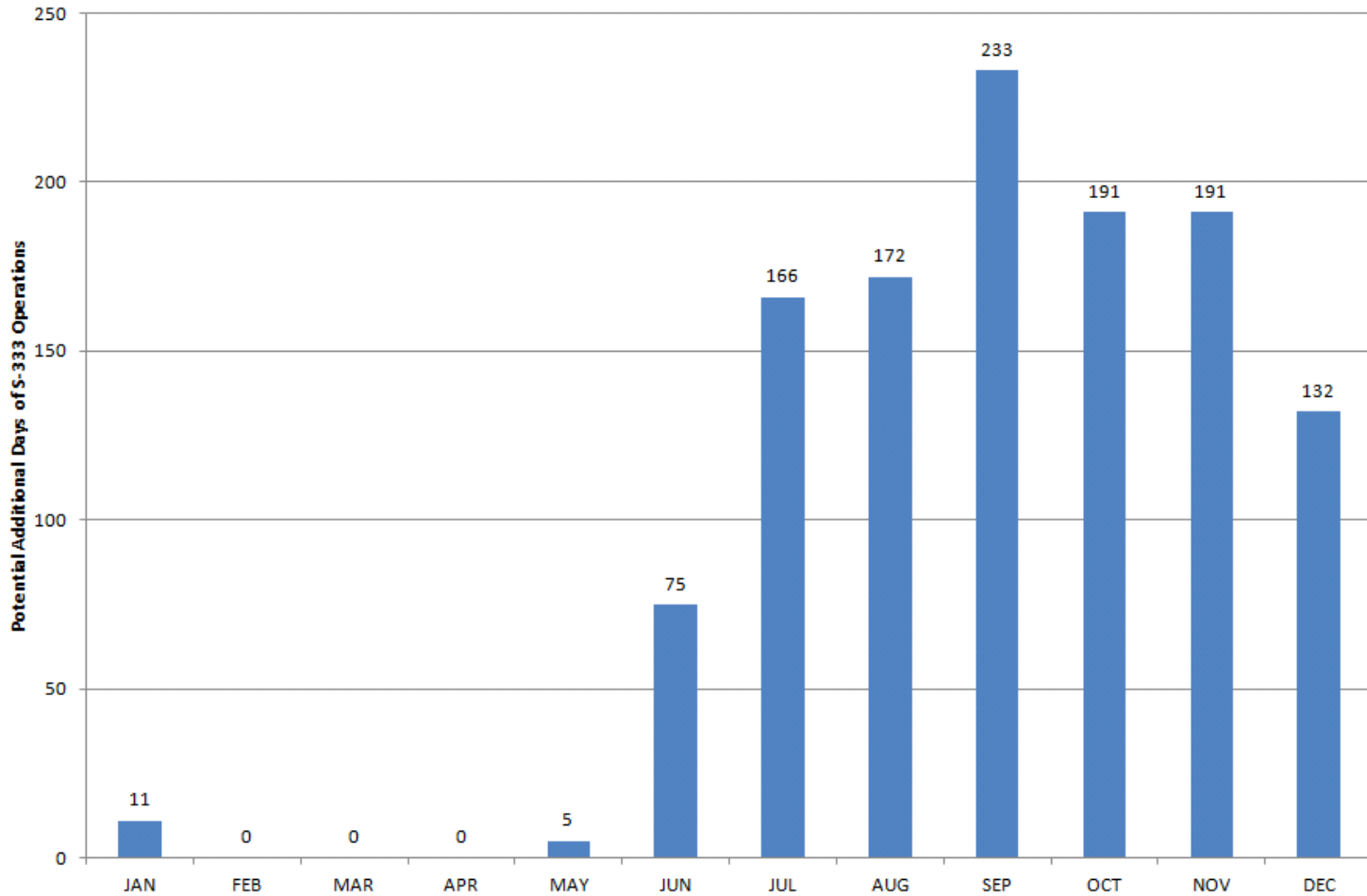


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G-3273 Relaxation: Potential Additional Days with L-29 Constraint of 7.5 feet NGVD under IOP (July 2002-June 2014)



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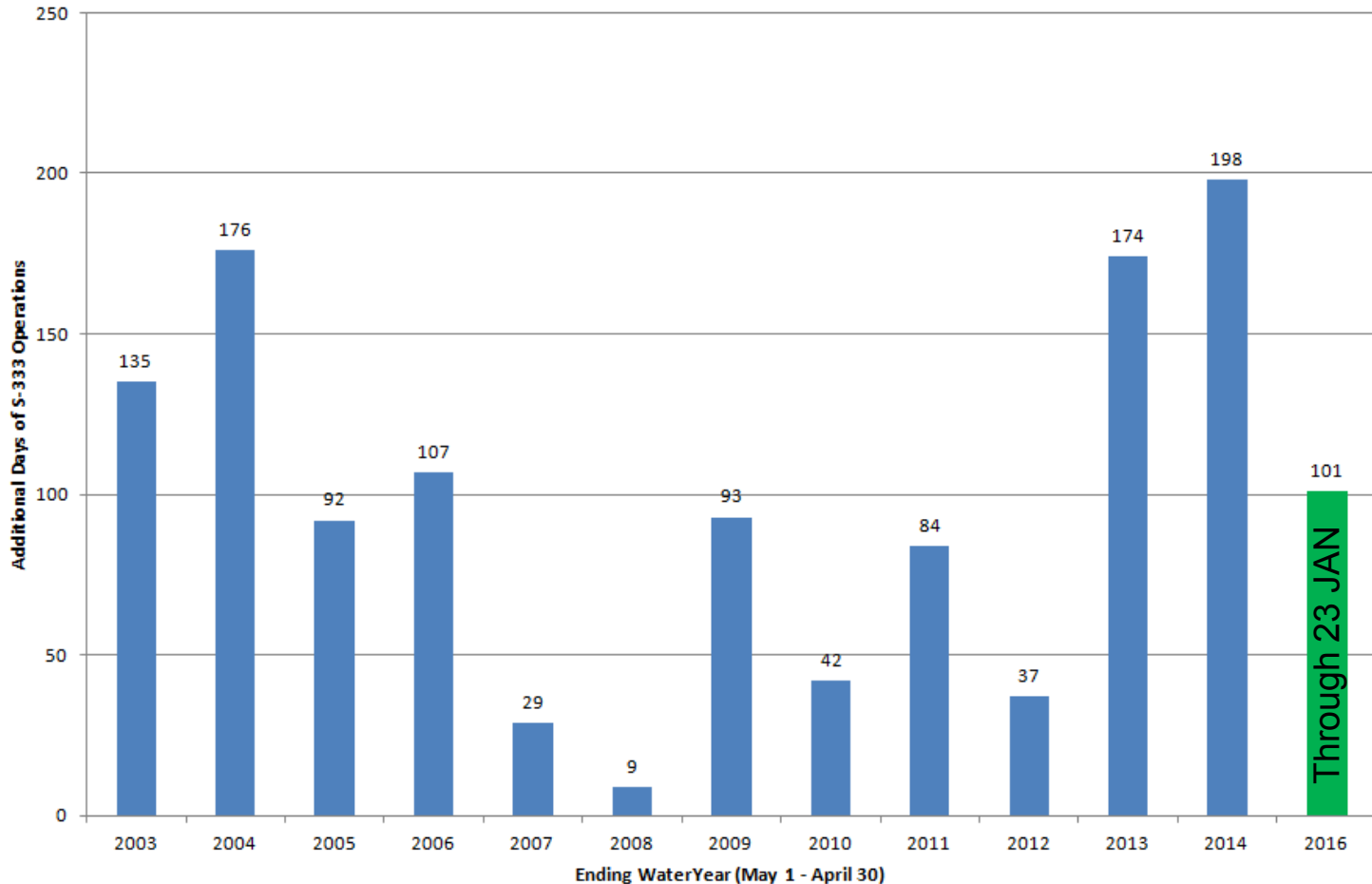


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G-3273 Relaxation: Potential Additional Days of S-333 Operations with L-29 Constraint of 7.5 feet NGVD: Predicted (2002-2014) vs. Observed



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Frequency of S-333 Operational Constraint Triggers under IOP/ERTP (July 2002-June 2014) versus Increment 1 (started 15 Oct 2015)

