Modified Water Deliveries G-3273 Relaxation and S-356 Field Test (Increment 1)

Summary of Comments on EA and Proposed FONSI

EA and FONSI

- The FONSI for the G-3273 Constraint Relaxation/S-356 Field Test and S-357N Operational Strategy was signed by Colonel Dodd on 27 May 2015.
- The FONSI and operational strategy support a request for SAD approval specific to water management operating criteria contained in the 2012 WCAs, ENP, and Enp-SDCS Water Control Plan.
- Transmittal to SAD occurred 28 May 2015. Approval 12 June 2015.
- Field test will initiate when hydrologic conditions allow for relaxation of G-3273 above 6.8 feet NGVD consistent with field test objectives.

Comments on EA

- A Notice of Availability and copy of the comment response matrix was sent 16 June 2015 to those who commented on the EA.

- EA and FONSI posted on the USACE Environmental Branch Website under Miami-Dade County and field test website.
  - http://www.saj.usace.army.mil/About/DivisionsOffices/Planning/EnvironmentalBranch/EnvironmentalDocuments.aspx#Dade
  - http://www.saj.usace.army.mil/Missions/Environmental/EcosystemRestoration/G3273andS356PumpStationFieldTest.aspx

Comments on EA

- References made to artificial high water tables currently being experienced in agricultural areas east of ENP as a result of current C&SF operations
- Lack of quantitative assessment to assess current allegations related to potential flooding in agricultural areas east of ENP
- Ability to maintain current flood protection
  - *Current water management operations are consistent with authorized purposes of C&SF. The Corps and the SFWMD will continue to look at flooding concerns within the C&SF project area. In addition it is the Corps understanding that the SFWMD is actively assessing recent flooding concerns identified by agencies and stakeholders within the South Dade area, for further coordination with the Corps and other interested stakeholders.*
- Concerns related to operations of field test without construction of the C-111 South Dade Project North Detention Area (Contract 8)

  Details on use of S-357N and S-331 provided within operational strategy

Comments on EA

- Column 2 Operations to alleviate high water conditions in WCA 3A outside of the CSSS closure period
  - *The Corps will operate in accordance with the approved Water Control Plan and NEPA.*
- Compatibility of Alternatives G (Preferred Alternative) with C-111 Spreader Canal Western Project (Incremental Increases S-18C). Step backward in restoration.
  - *Committed to Everglades restoration. Steps will be taken in the future to incorporate the C-111 Spreader Canal Western Project into the federally authorized C&SF Project . The SFWMD will continue to operate their expedited C-111 Spreader Canal Western Project.*
- Potential environmental effects in Taylor Slough, Florida Bay, and Manatee and Barnes Sound. Warrants preparation of EIS.
  - *Field test is limited to ~ 2 years duration with implementation of robust monitoring plan. Potential effects not determined to be significant to warrant EIS. Minimal and of short duration.*

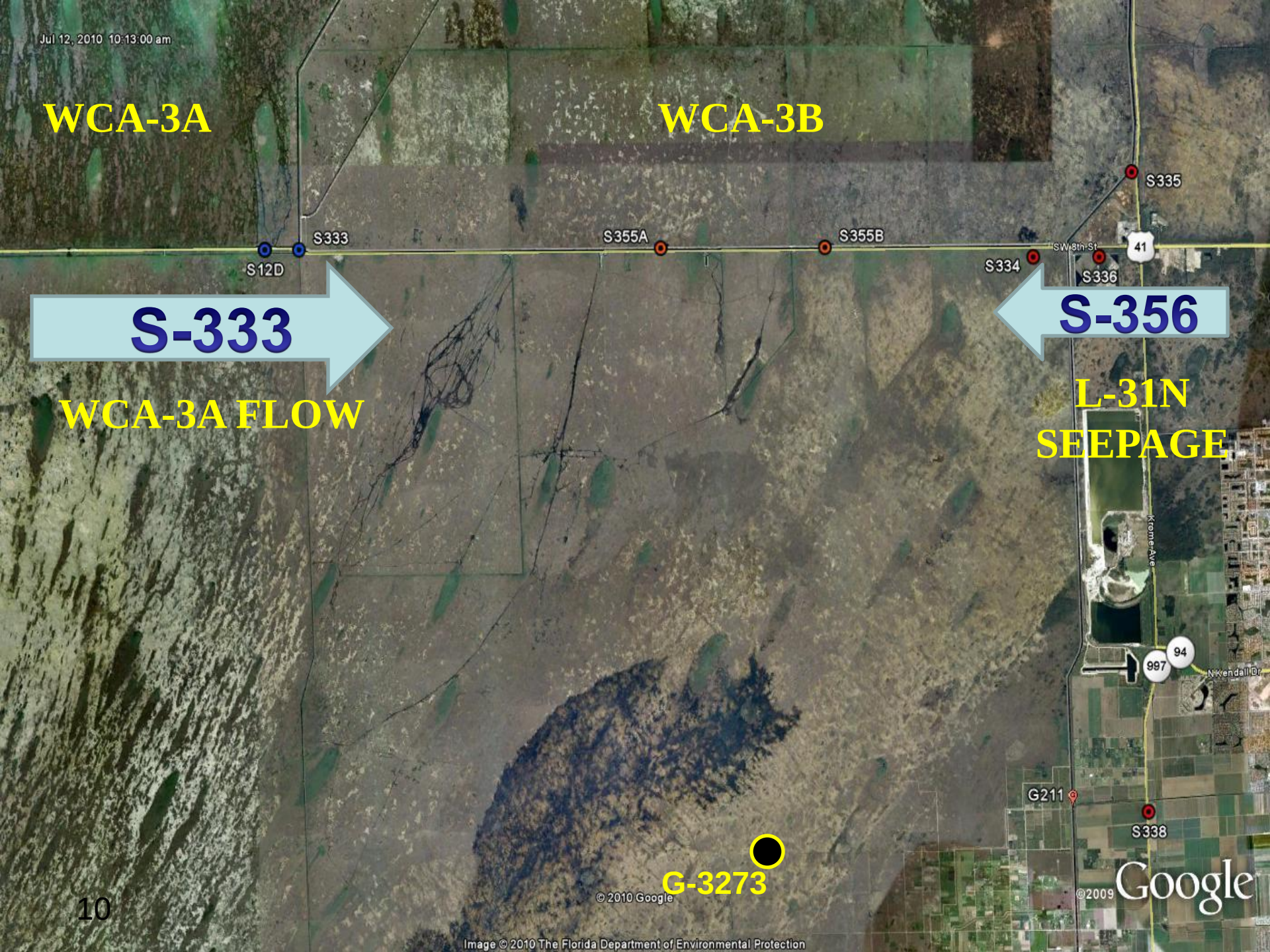
Comments on EA

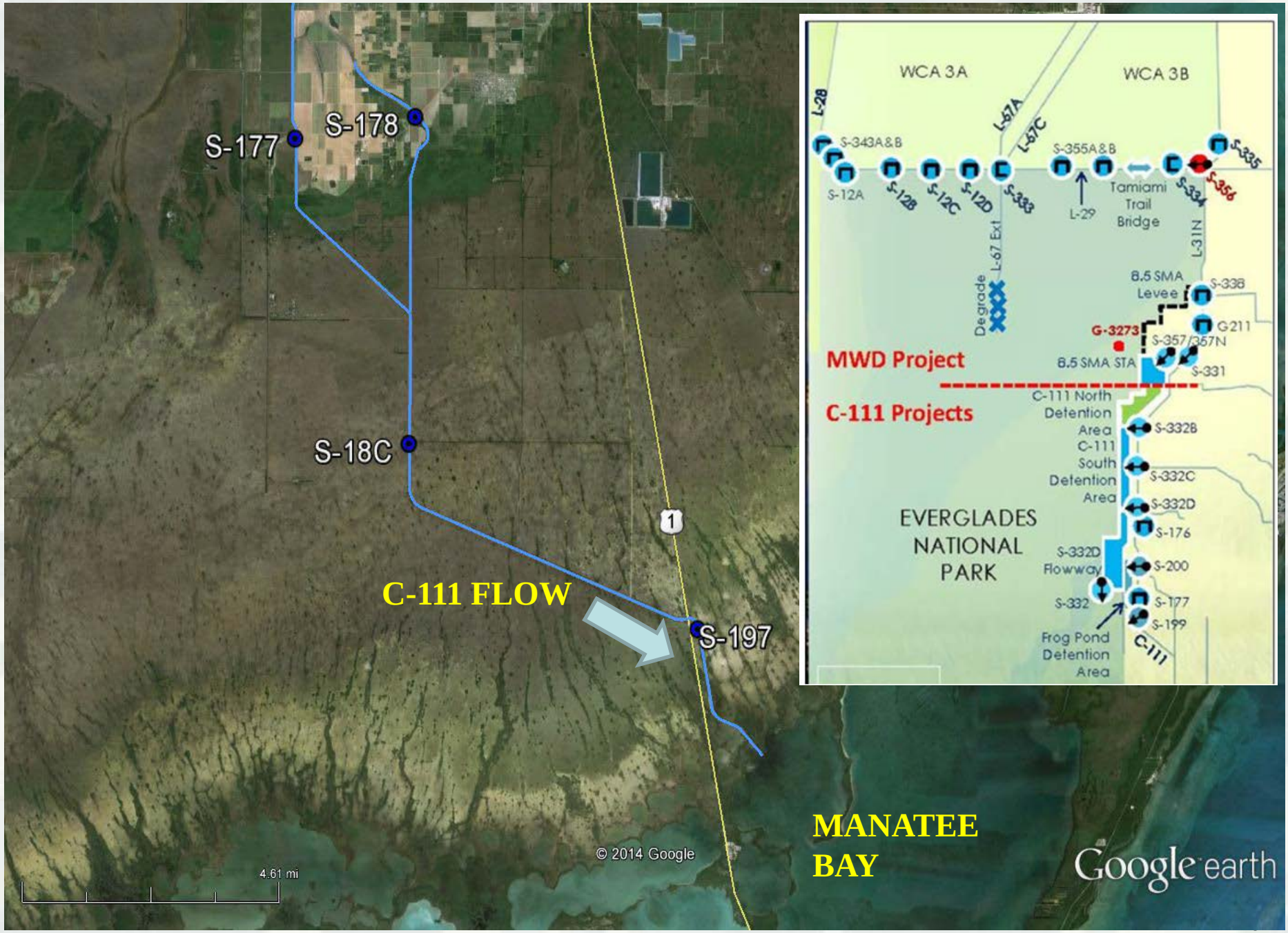
- Needed permit requirements/authorizations for structures S-357N and S-197
  - *Current permit authorizations/modifications will be obtained.*
- Monitoring roles and responsibilities
  - *Defined within Appendix C (Monitoring Plan). Cooperative agreement has been signed between the ENP and SFWMD.*

Operational Strategy and Sub-Team Analyses

Overview

- 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
- Real-time Operations Data Analysis
  - Further details added since December 2014 PDT and the February 2015 Draft EA


Jul 12, 2010 10:13:00 am
WCA-3A
WCA-3B
S335
S333
S355A
S355B
S12D
S334
SW 8th St
41
S336
S-333
S-356
WCA-3A FLOW
L-31N
SEEPAGE
Krome Ave
94
997
N Kendall Dr
G211
S338
G-3273
© 2010 Google
©2009 Google
Image © 2010 The Florida Department of Environmental Protection


S-177
S-178
S-18C
C-111 FLOW
S-197
MANATEE BAY
© 2014 Google
4.61 mi
Google earth
WCA 3A
WCA 3B
L-28
L-67A
L-67C
S-343A&B
S-355A&B
S-335
S-12A
S-12B
S-12C
S-12D
S-333
S-356
S-334
L-29
Tamiami Trail Bridge
L-31N
L-67 Ext
Degrade
8.5 SMA Levee
S-338
G-3273
G211
S-357/357N
MWD Project
8.5 SMA STA
S-331
C-111 Projects
C-111 North Detention Area
S-332B
C-111 South Detention Area
S-332C
S-332D
EVERGLADES NATIONAL PARK
S-176
S-332D Flowway
S-200
S-332
S-177
S-199
Frog Pond Detention Area
C-111

Management of WCA-3A

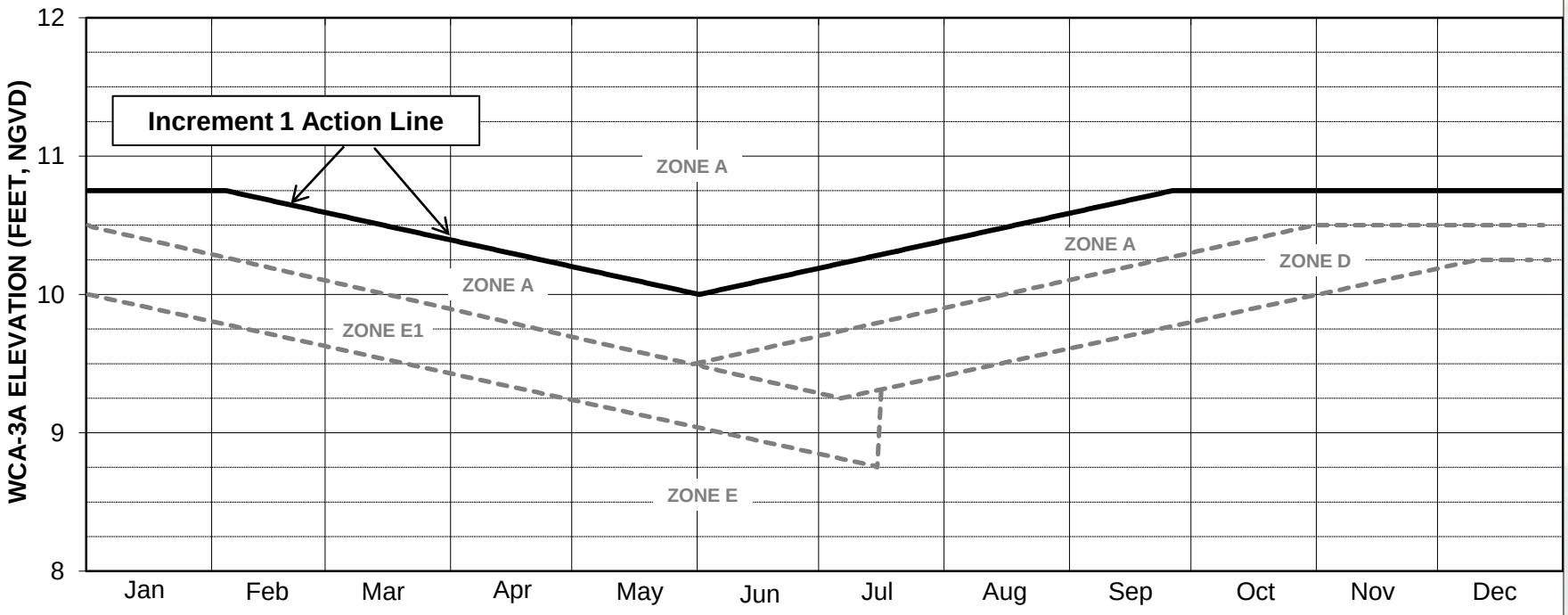
Increment 1 includes changes to operational constraints for WCA-3A releases to NESRS (via S-333) and WCA-3A releases to SDCS, including use of S-356 pump station, additional conditional operation of S-197, and revised Column 2 criteria

- ERTP 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)
- ERTP 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

Includes pre-existing operations from ERTP 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

Management of WCA-3A

New with MWD Increment 1:

- S-333 flows no longer have a constraint at G-3273 (6.8 ft., NGVD under ERTP)
- 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

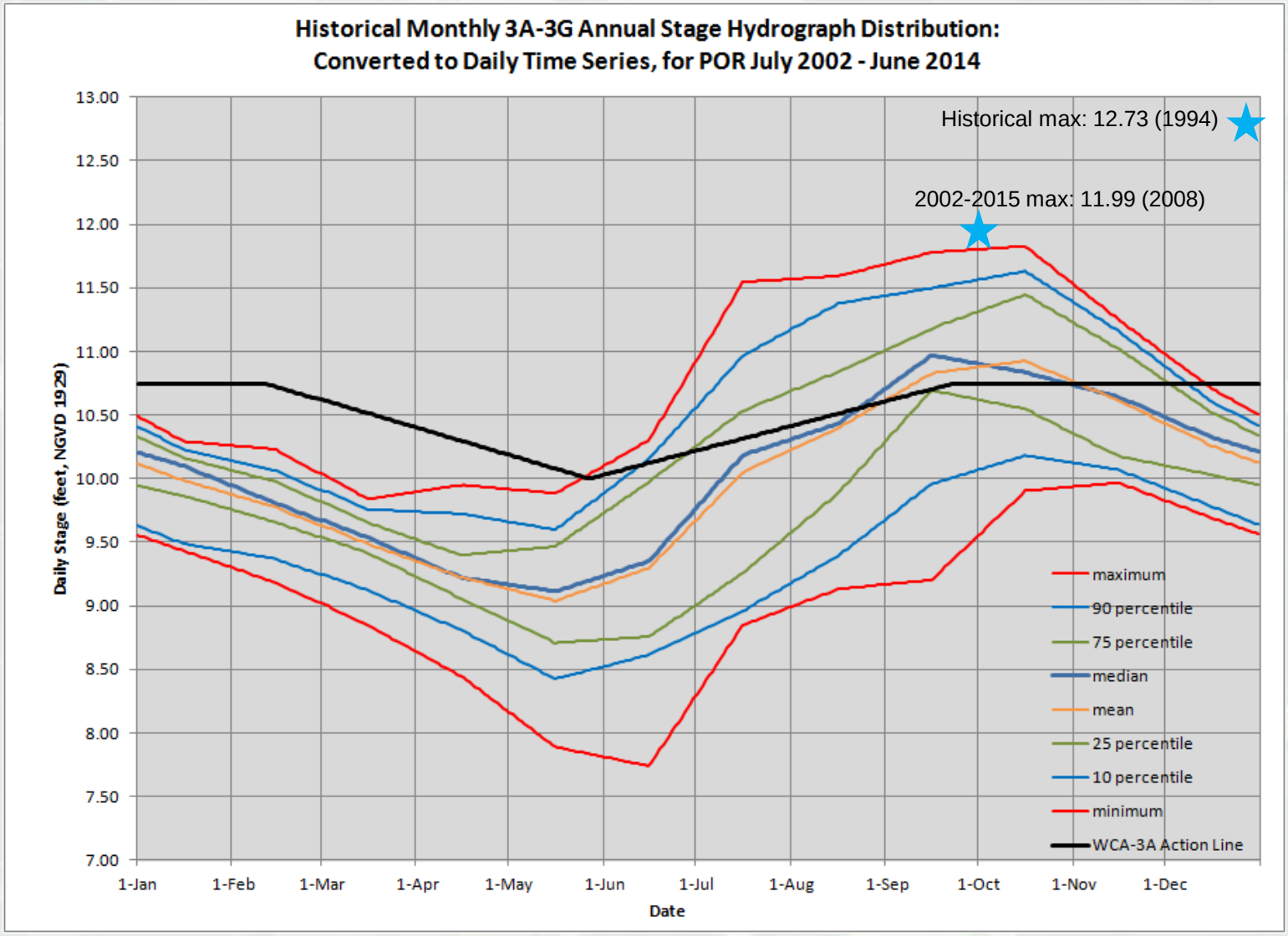
L-31N Canal Seepage Management

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)

New with MWD Increment 1:

- S-356 flows to NESRS with no 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 stages 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



New Seepage Management

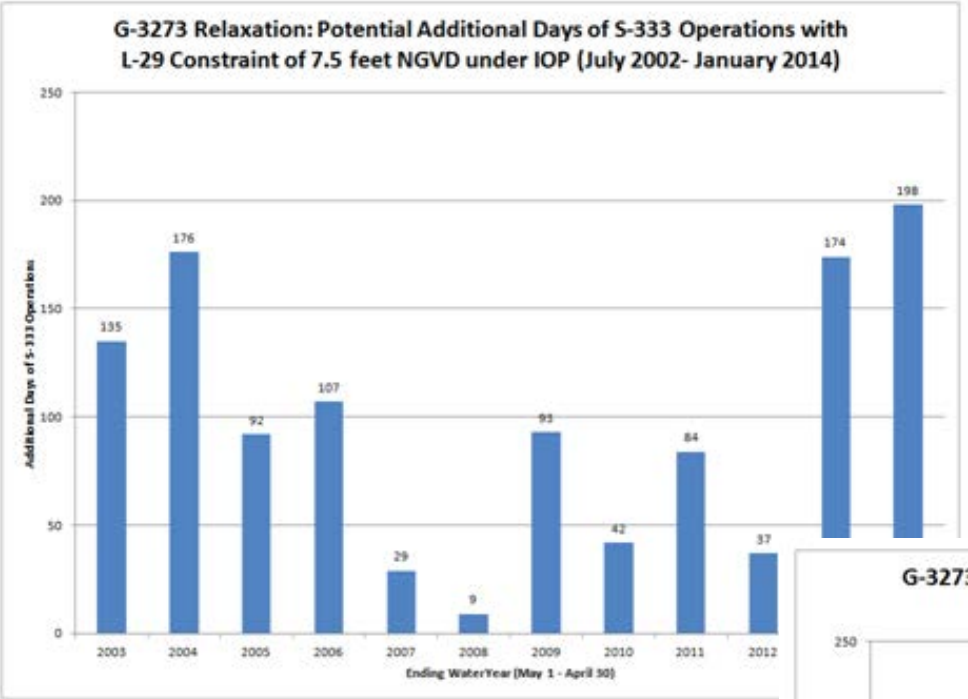
- C-111 Column 2 operational criteria when G-3273 above 6.8 ft., NGVD and WCA-3A is above Action Line for operations at S-332B/C/D, S-176, S-177, S-18C, S-194, and S-196
  - S-356 is not operated (to give priority to S-333), but increased seepage from NESRS
  - NOTE: C-111 Column 1 operational criteria 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 ERTP WCP (with continued use of SFWMD C-111 Spreader Canal S-199 and S-200 pump stations)

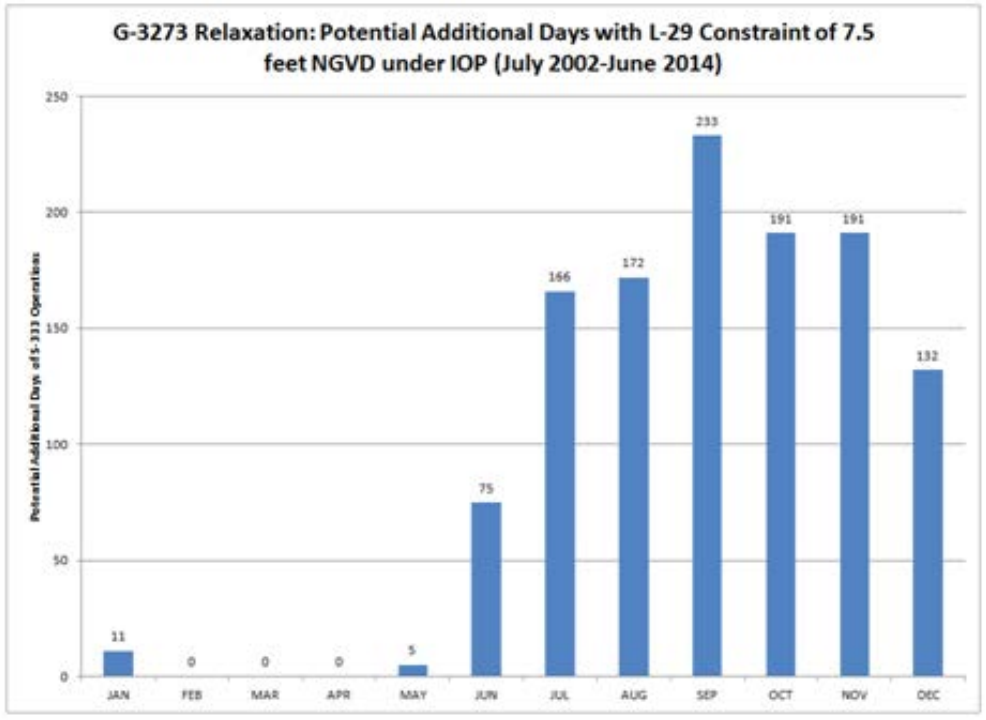
S-178 TW (feet, NGVD)	*2.5 to 2.6*	*2.61 to 2.7*	*2.71 to 2.9*	*Greater than 2.9*
S-197 Discharge (cfs)	*50 to 100*	*100 to 150*	*150 to 200*	*500*

New Seepage Management

- 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 April 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





Real-time Operations Data Analysis

- Analyses identified by the H&H/operations sub-team as needed to inform future water management actions within the Increment 1 test and future field test operations, intended to complement overall project monitoring plan
  - Analyses are listed within the Operational Strategy (Appx. A) and Monitoring Plan (Appx. C)
- Purpose to evaluate implementation of Increment 1 water management operations relative to its objective and constraints, including monitoring plan objectives (*refer to Final EA for complete objective/constraint text*):
  - EA OBJECTIVE A: Improve hydrological conditions in NESRS through the relaxation of the G-3273 stage criteria…, while maintaining other C&SF Project authorized purposes
  - EA OBJECTIVE B: Use the S-356 pump station to manage seepage from NESRS to the L-31N Canal resulting from the relaxation of the G-3273 stage constraint on S-333…
  - EA OBJECTIVE 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.
  - EA OBJECTIVE D: Gather and analyze infrastructure performance, ecologic, hydrologic and water quality data sufficient to support Increment 2, resulting in… refined operational criteria for the MWD and C-111 South Dade Projects

Real-time Operations Data Analysis

- Evaluate implementation of Increment 1 water management operations relative to its goals, objective and constraints, including monitoring plan objectives (continued from previous slide):
  - EA CONSTRAINT A: Maintain L-29 Canal maximum operating limit of 7.5 feet NGVD…
  - EA CONSTRAINT B: Maintain the authorized purposes of the C&SF Project and subsequent modifications to include: MWD Project; C-111 South Dade Project; and CERP
  - EA CONSTRAINT D: Maintain the current multi-species objectives of the 2012 Water Control Plan and comply with the requirements of the applicable current biological opinion from the USFWS, to include the ERTP and the CERP C-111 Spreader Canal Western Project
  - EA CONSTRAINT C: No reduction in current flood protection (corresponding specific monitoring plan objectives are further listed below)
    - (1) ensure existing levels of flood protection are maintained within the northern L-31N Basin (between S-335 and S-331);
    - (2) ensure existing levels of flood mitigation are maintained within protected portion of the 8.5 SMA;
    - (3) determine whether the Increment 1 operational changes contribute to flooding within the C-111 basin; and
    - (4) determine whether the Increment 1 operational changes at S-197 are necessary to ensure existing levels of flood protection are maintained within the C-111 Basin (south of S-176), including assessment of the trigger criteria used for S-197 gate openings.

Real-time Operations Data Analysis

- Analyses will account for average monthly historic rainfall as measured at available rainfall gages, compared to the average monthly rainfall observed at available rainfall gages (e.g. S-334, S-331, S-177, S-18C, etc.)
- Preliminary data, analysis, and interpretations will be principally discussed and analyzed by water managers at USACE, SFWMD, and ENP (weekly), including regular coordination with additional agency technical staff (monthly) and the interagency PDT (quarterly)
  - Real-time tracking for analysis items C through H (listed on upcoming slides);
  - Periodic analysis for analysis items A, B, I, and J, which require extended periods of data collection and analysis (listed on upcoming slides)
- Modifications to the methodologies for the analyses listed in Appendix C may be necessary due to data limitations or inconclusive results realized during implementation of Increment 1, and additional analyses are expected to be developed to support review of Increment 1 performance
  - Analysis placeholders were included in the Draft EA
  - Preliminary analysis methodologies are included in the Final EA
  - Operations and monitoring plan analyses may be leveraged to modify the operational strategy, if justified and within the NEPA scope (e.g. adaptive management)

Real-time Operations Data Analysis

Table 2

Hydro-meteorologic Monitoring Locations

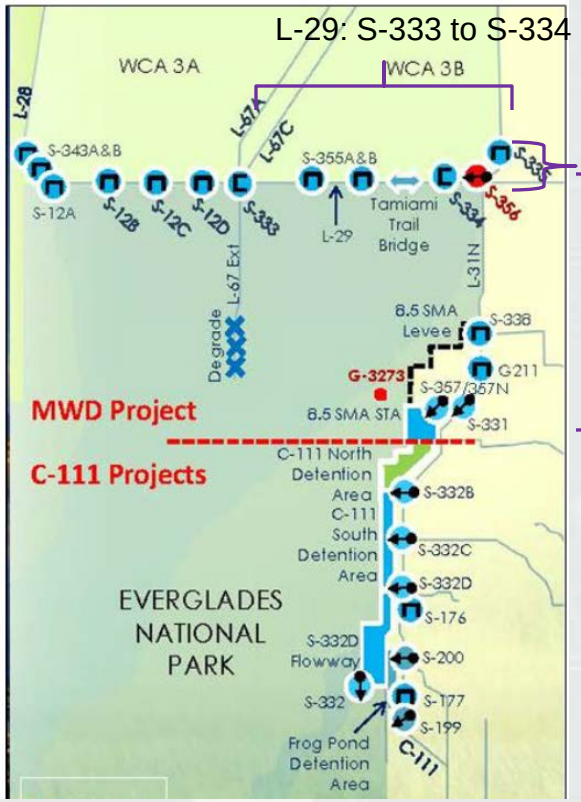
Location	Parameter(s)
S-333	HW, TW, Q
S-334	HW, TW, Q
S-336	HW, TW, Q
S-355A	HW, TW, Q
S-355B	HW, TW, Q
S-356	HW, TW, Q
G-3273	Stage
C-358	Stage
S-357N	HW, TW, Q
S-357	HW, TW, Q
G-211	HW, TW, Q
S-331	HW, TW, Q, Precipitation
S-338	HW, TW, Q
S-332B, S-332C, S-332D	HW, TW, Q
RG4, NTS18	Stage
S-332DX1	HW, TW, Q
G-3574	Stage
G-3576	Stage
G-3577	Stage
G-3578	Stage
G-3272	Stage
G-596	Stage
G-3626	Stage
G-3627	Stage
G-3628	Stage
LPG1, LPG2, LPG3, LPG5, LPG7, LPG8	Stage
LPG11, LPG12, LPG13, LPG14, LPG15	Stage
NE1	Stage
NE2	Stage
NE4	Stage
G-3557	Stage
G-3558	Stage
S-177	HW, TW
S-178	HW, TW, Q
S-18C	HW, TW, Q
S-197	Q
G-613	Stage
G-864A	Stage
G-3336	Stage
G-3338	Stage
G-3350	Stage
G-3355	Stage
G-3620	Stage
G-3901	Stage
G-789	Stage
ENP-TSB	Stage
S-199, S-200	HW, TW, Q

Notes: HW – Headwater stage; TW – Tailwater stage; Q – Discharge (cfs)

Note: Highlighted edits indicate prior oversights that were added for Final EA

Periodic Operations Data Analysis

- A-1. Develop an accurate water budget for the period of the Field Test from surface water and groundwater monitoring flow and water-quality data:
  - 1) L-31N between S-335 and G-211/S-331
  - 2) L-29 from S-334 to S-333
  - 3) L-31N canal between S-335 and S-356
- A-2. Identify the zone of influence of the S-356 pump station

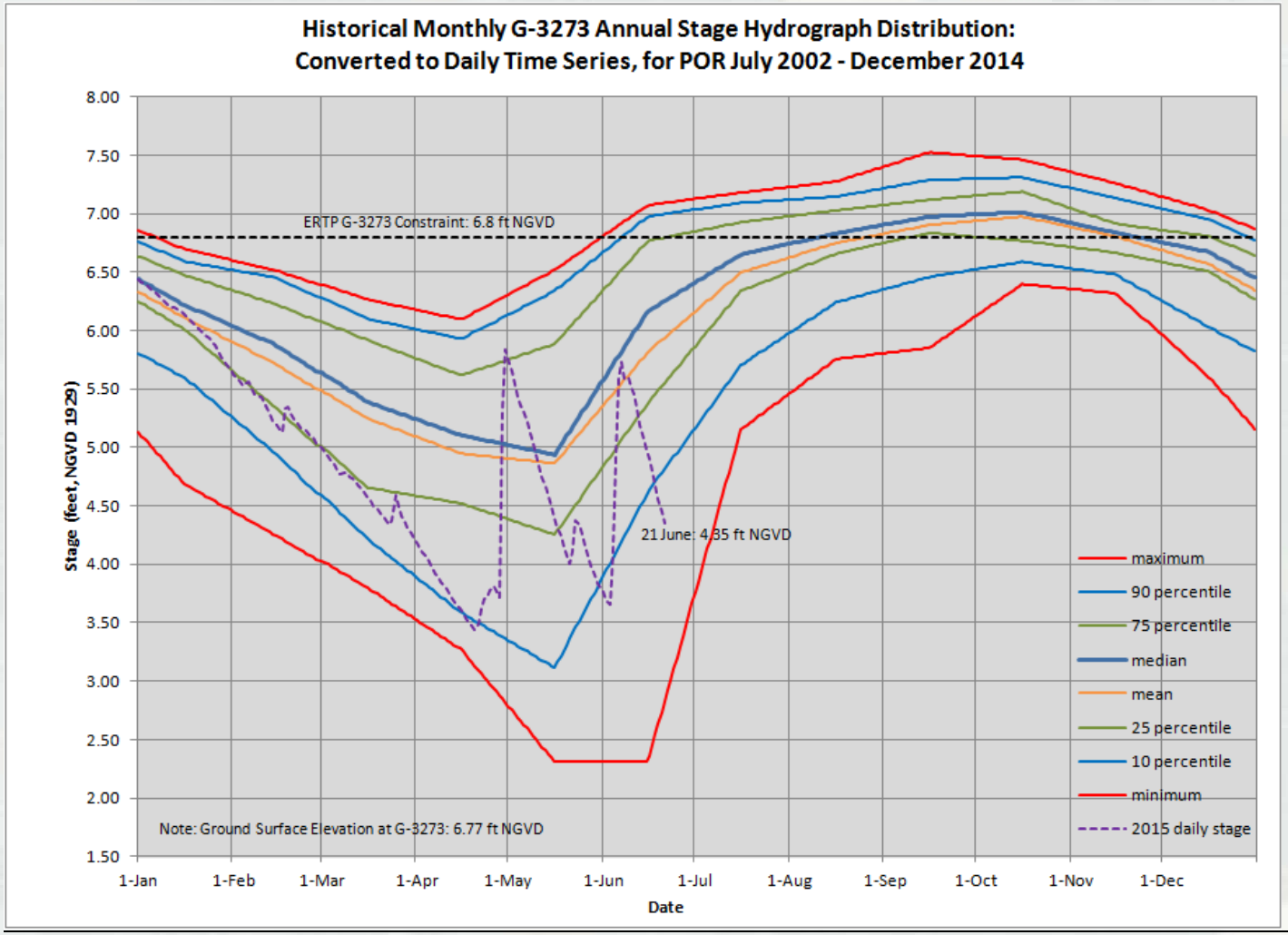


Periodic Operations Data Analysis

- B. Identify the area of influence for hydrologic effects resulting from increased water deliveries from WCA-3A to NESRS… Also assess hydrologic effects within the South Dade Basin from reduced deliveries from WCA-3A to the SDCS, and use of S-331 to provide 8.5 SMA flood mitigation.
  - Use pre-project base conditions at all regional surface water and groundwater gauges listed in Appendix C which include at least 5 years of record under IOP/ERTP (post July 2002)
    - Intra-annual stage frequency exceedence curves used for long-term hydrologic statistics
    - Monthly pre-project rainfall amounts at regional rainfall monitoring gauges
    - Estimate intra-annual frequency for 2002-2015 rainfall, based on 30-day moving average rainfall amounts
  - Real-time stage and rainfall data will be tabulated and plotted for comparison against the pre-project base conditions for stage and rainfall (available on USACE webpage)

Real-time Operations Data Analysis

Example: Intra-annual stage frequency exceedance curve at G-3273

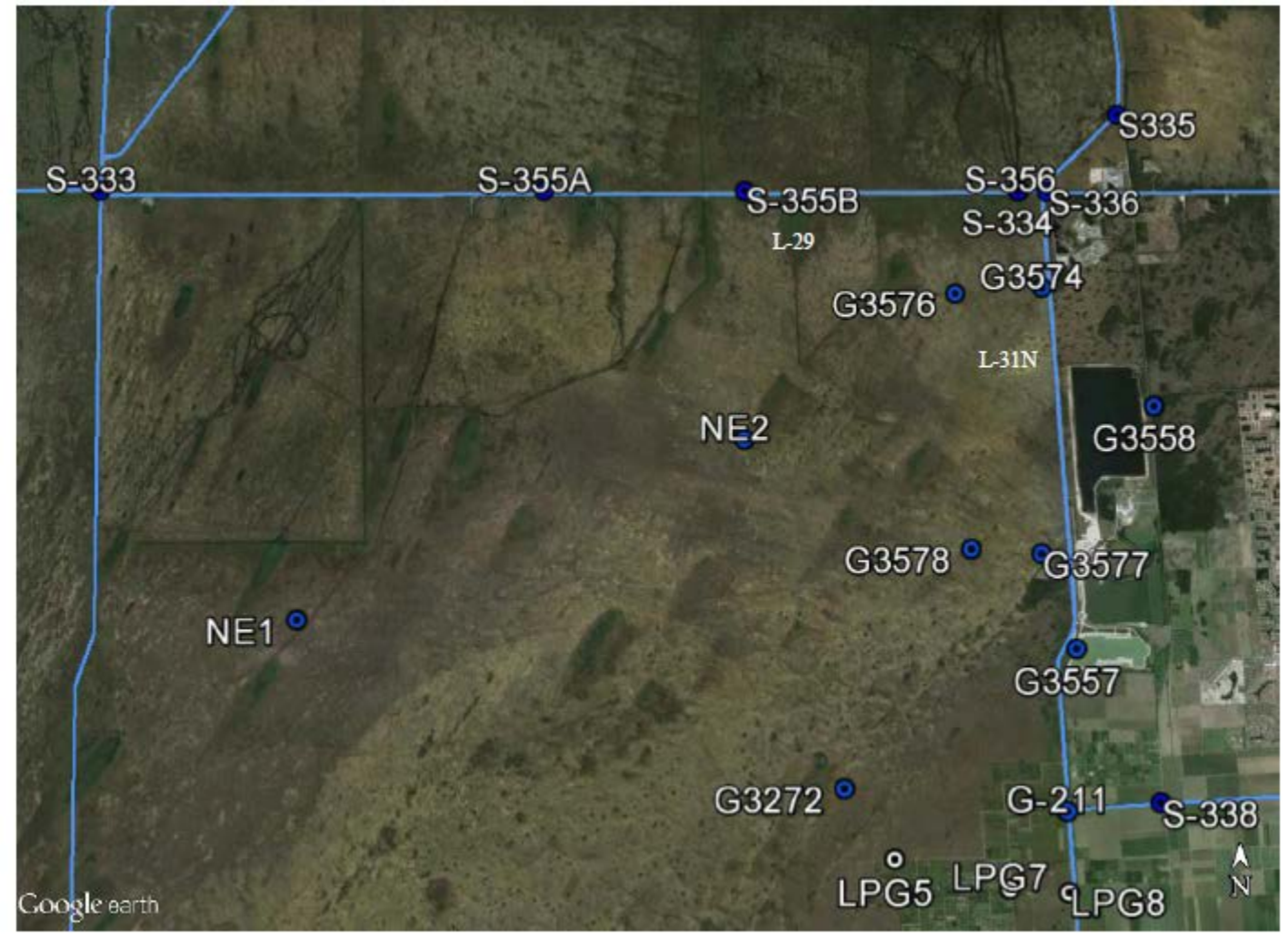


Real-time Operations Data Analysis

- C. Compare the volume of water sent to NESRS (S-333, S-355A, S-355B, S-356) during this Field Test (G-3273 above 6.8 feet) to the historical volume (G-3273 operationally maintained below the 2012 WCP constraint of 6.8 feet, except under Column 2 operations) of water that was sent to NESRS (S-333, S-355A, S-355B).
  - Monthly, seasonal, and annual totals
  - Comparison of real-time and historical intra-annual flow frequency exceedance curves

- D. Compare the volume of water sent from WCA-3A to the SDCS (S-334) during this Field Test (revised Column 2 and S-334 operational criteria) to the historical volume (Column 2 operations used if G-3273 above 6.8) of water that was sent to the SDCS (S-334).
  - Monthly, seasonal, and annual totals
  - Comparison of real-time and historical intra-annual flow frequency exceedance curves

Real-time Operations Data Analysis

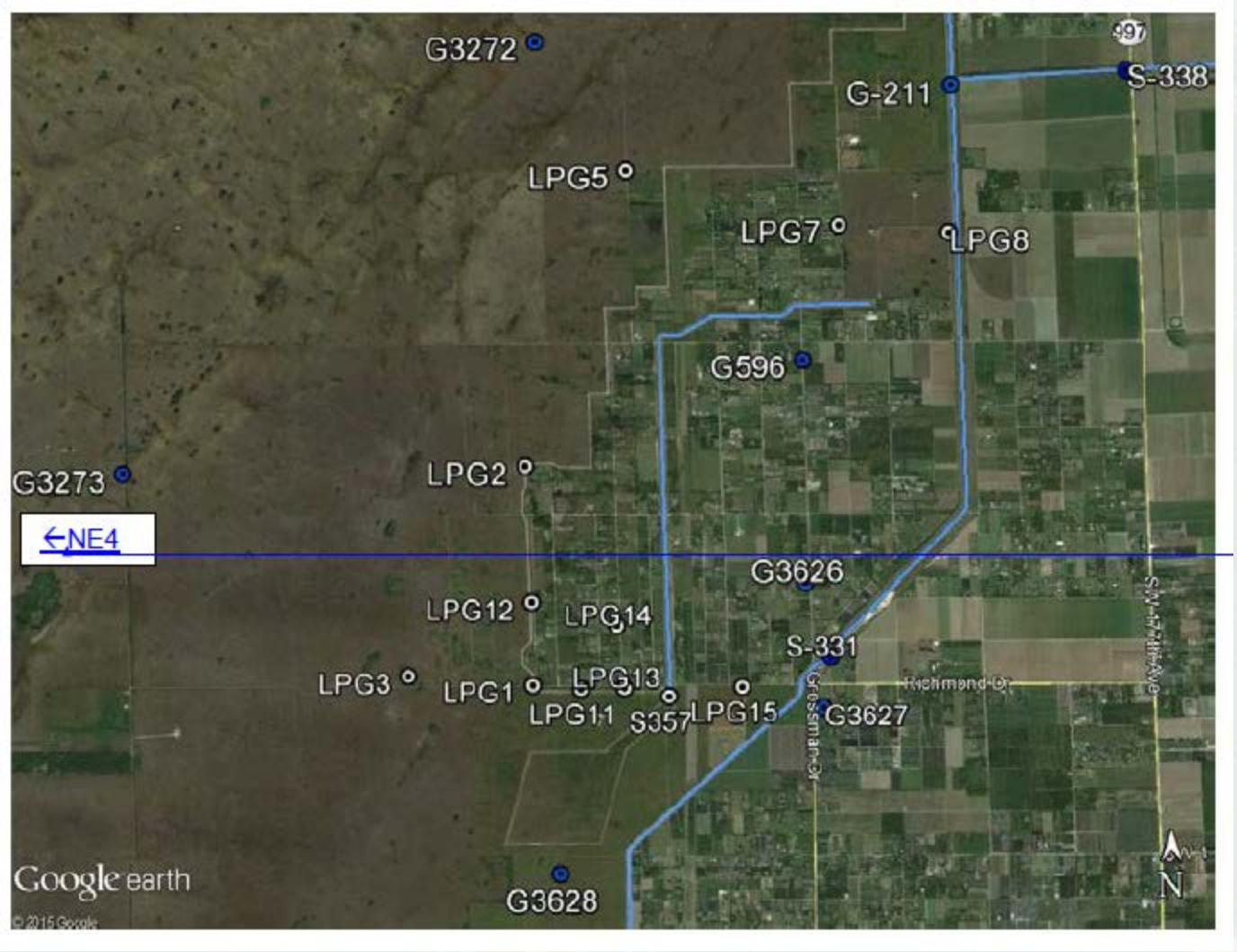


Real-time Operations Data Analysis

- E. Quantify the effect of S-356 operation on the L-29 Canal stage and describe conditions under which S-356 may limit the ability to discharge the WCA-3A Rainfall Plan target releases at S-333.
  - Develop relationship between S-356 discharges and L-29 Canal rise
  - Estimate the reduction in discharges from S-333 due to rise in tailwater stage in the L-29 Canal

- F. Compare the volume of water sent to the 8.5 SMA detention area (S-357) during this Field Test (G-3273 above 6.8 feet) to the historical volume (G-3273 operationally maintained below the 2012 WCP constraint of 6.8 feet, except under Column 2 operations) of water that was sent to the 8.5 SMA detention area.
  - Monthly, seasonal, and annual totals
  - Comparison of real-time and historical intra-annual flow frequency exceedance curves
  - Intra-annual stage exceedance frequency curves for C-357 stage, gradient between Angel's Well and LPG-1, and 8.5 SMA detention cell stage – with comparison to pre-project baseline
  - Find characteristics of data during current test, compared to pre-test conditions

Real-time Operations Data Analysis



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Real-time Operations Data Analysis

- G. Compare the volume of water sent to the L-31N/C-1W (S-331, S-338) during this Field Test (G-3273 above 6.8 feet) to the historical volume (G-3273 operationally maintained below the 2012 WCP constraint of 6.8 feet, except under Column 2 operations) of water that was sent to L-31N/C-1W (S-331, S-338).
  - Monthly, seasonal, and annual totals (include delineation of S-356 on/off operations)
  - Comparison of real-time and historical intra-annual flow frequency exceedance curves
  - Find characteristics of data during current test, compared to pre-test conditions

- H. The effect of the water management operating criteria, including S-357N and S-357, on water levels within the perimeter levee of the 8.5 SMA and the 8.5 SMA detention area will be assessed relative to G-3273 relaxation (G-3273 target stage from 6.8 feet up to 7.5 feet) prior to completion of the C-111 South Dade Project NDA.
  - Show groundwater/surface water contours and other flood mitigation metrics previously reported in USACE 2009 report on 8.5 SMA operational testing (Increment 1 has similar constraints)

Periodic Operations Data Analysis

- I. Quantify the effects of the S-178 TW trigger criteria for S-197 discharges on flood damage reduction performance within the C-111 South Dade Basin and describe observed ecological effects within the ENP Taylor Slough Basin, ENP Eastern Panhandle, and Manatee Bay/Barnes
  - Evaluate stage response using the rainfall frequency data and comparison with the corresponding stage level in the intra-annual stage frequency curves developed for the pre-project base conditions
  - Initial set of wells recommended to assess regional groundwater levels in the South Dade area was developed following coordination with the SFWMD: G-613, G-3350, TSB, G-864A, G-3620, G-3355, G-3901, G-789, G-3336, and G-3338
  - Monthly, seasonal, and annual discharge totals
  - Comparison of real-time and historical intra-annual flow frequency exceedance curves
  - Identify timing and frequency of S-178 trigger criteria during the Increment 1 field test
  - Assessment by water managers will be integrated with input from the ecological monitoring sub-team

Real-time Operations Data Analysis

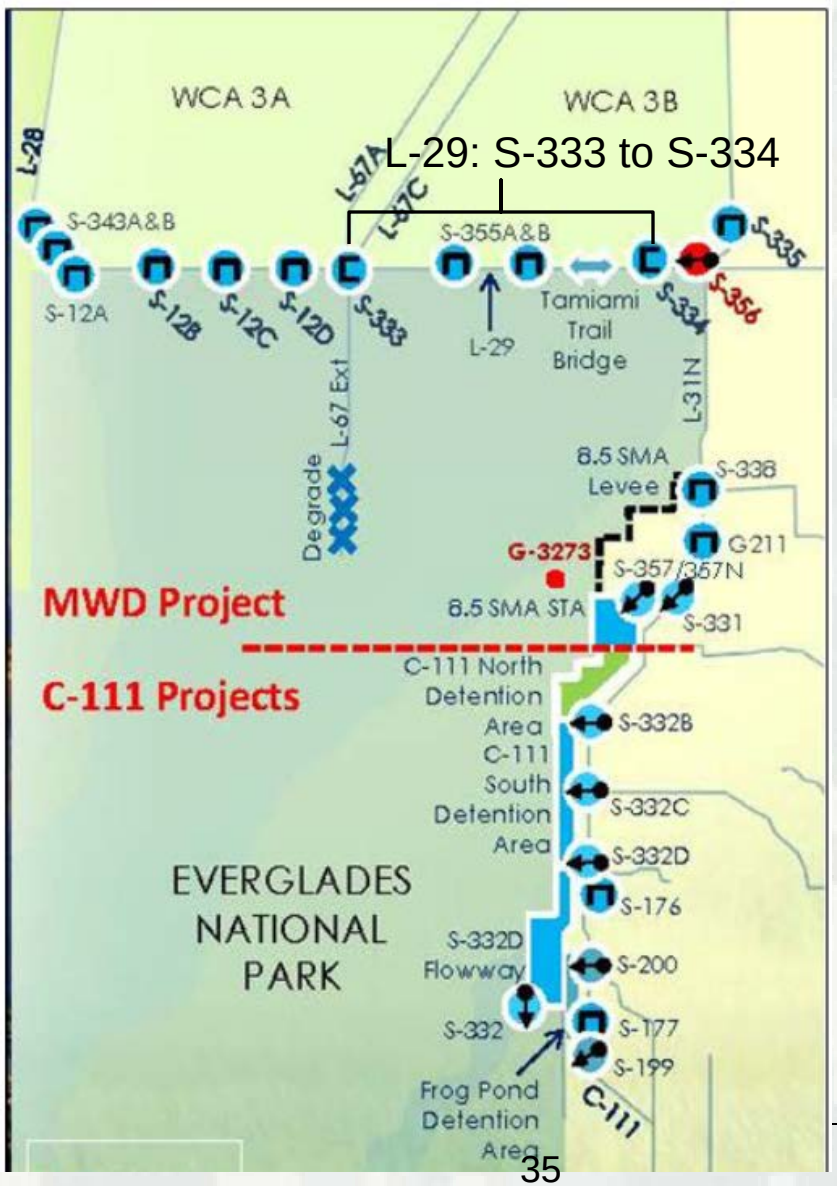
Periodic Operations Data Analysis

- J. Develop a water budget from surface water and groundwater monitoring flow (water quality data may also be used). The water budget will quantify contributions of surface and groundwater flow at important reaches surrounding the S-332B, S-332C, S-332D, S-199, and S-200 pump stations.
  - Limited hydraulic testing (up to 1 month) of the C-111 South Dade and C-111 Spreader Canal detention areas (limited to representative regional conditions, more steady pumping rates, and expanded monitoring of existing operations)
    - Anticipate hydraulic testing at start of dry season, when eastern ENP stages remain relatively high
  - It is expected that additional, expanded future testing will be required to definitively explore how effectively increased pumping can further separate the canal levels from the water levels along the eastern boundary of ENP during the testing
    - Year 2 of Increment 1, or Increment 2 – to be accompanied by appropriate NEPA analysis and documentation

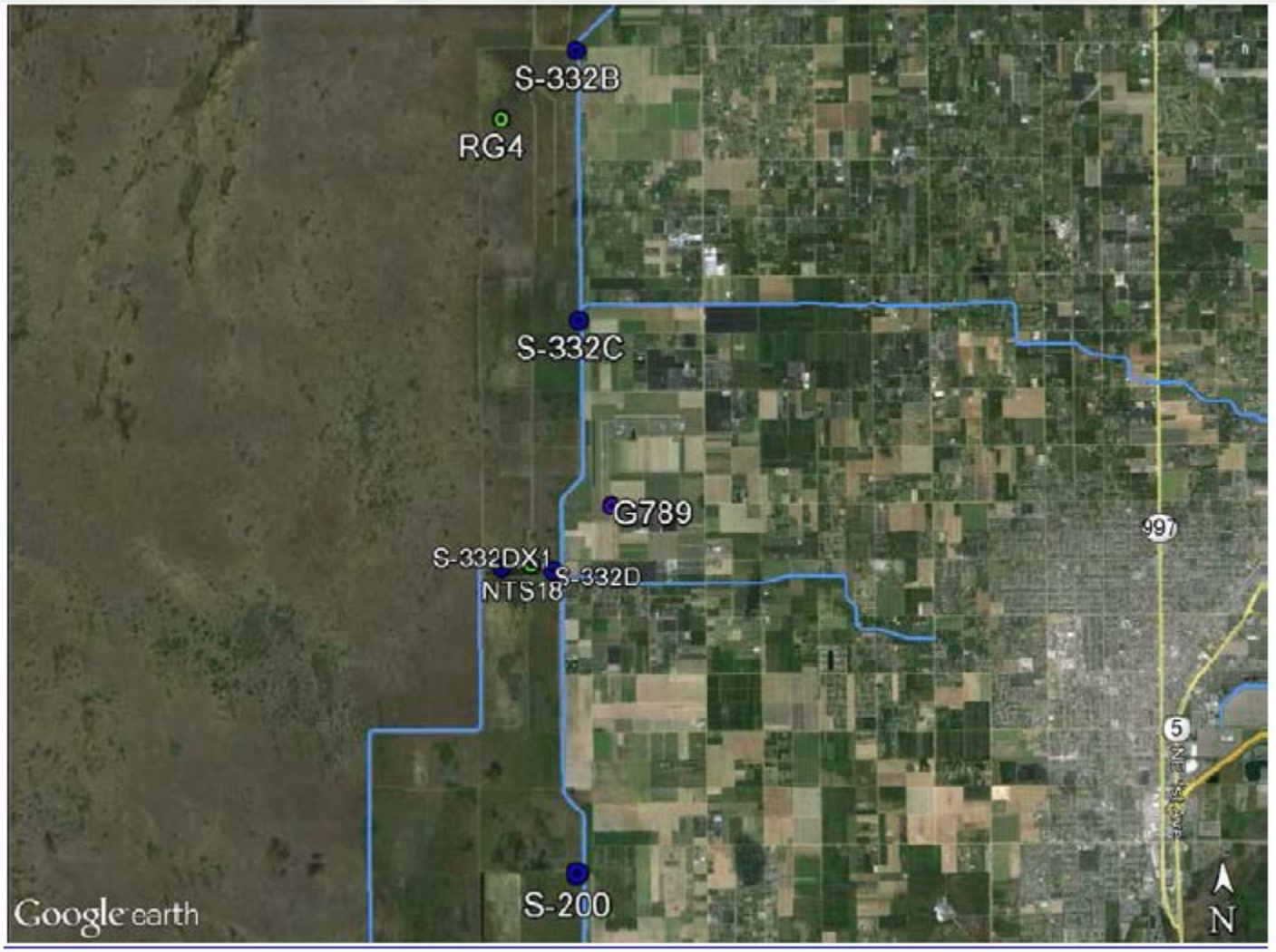
Water budget calculations will be developed at the following reaches:

- Along L-31N between S-331 and S-176
- Along the C-111 Canal from S-176 to S-177

Real-time Operations Data Analysis



Real-time Operations Data Analysis



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Monitoring

Ecological

Roles and Responsibilities

- **USACE:** Species monitoring to measure potential impacts within CSSS subpopulations and wood stork colonies near Tamiami Trail and in NESRS.

- **USACE/SFWMD:** Continue existing monitoring plans to ensure that Incidental Take (FWS 2009 BO for C-111 Western Spreader Canal Project and 2010 BO for ERTP) is not exceeded.

- **USACE:** ERTP Periodic Scientists Calls will continue to ensure wildlife recommendations are considered during the water management decision process.

Roles and Responsibilities

- **ENP:** Conduct additional monitoring of resources within NESRS as part of greater effort to assess restoration success as result of MWD (vegetation, water quality, fish and invertebrates.) Reporting under purview of ENP.

- **USACE:** Monitor existing salinity gages to measure potential impacts of S-197. Reporting under purview of USACE.

- **SFWMD:** Install additional gages under Cooperative Agreement with ENP. Reporting under purview of SFWMD.

- ***USACE:** FWS requested a comparison of flows through the S-12 structures during G-3273 consultation. Reporting under purview of USACE.

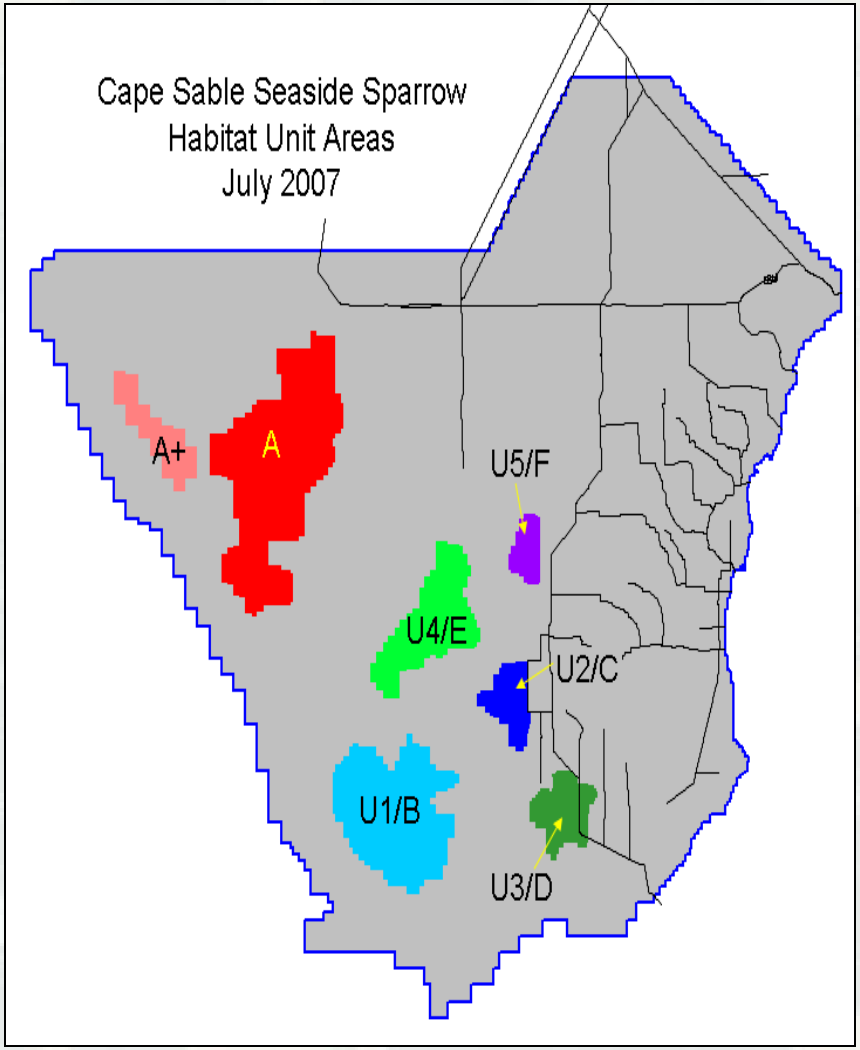
*** Revision to Draft EA.**

Cape Sable Seaside Sparrow: USACE

Monitor existing hydrological gages to measure potential hydrologic impacts within CSSS-subpopulations: post-field test

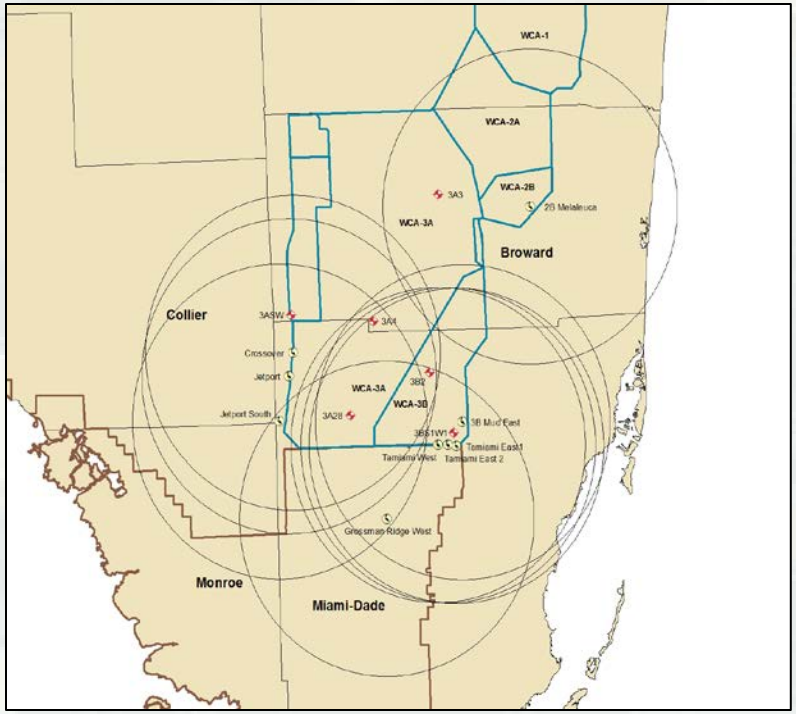
1. ***Dry nesting days at related gages within CSSS-E, CSSS-F, and CSSS-C between March 1 and July 15.***
2. ***Annual hydroperiod or number of days water is above ground surface during the water year.***

Sub-Population	Gages
E	NP-206, CR3, A13, NP62, NP44
F	RG1, RG2, RG3
C	E112, R3110, NTS10, NTS1, NTS18, NTS14



CSSS sub-populations (A-F) and designated Critical Habitat Units

Wood Stork: USACE

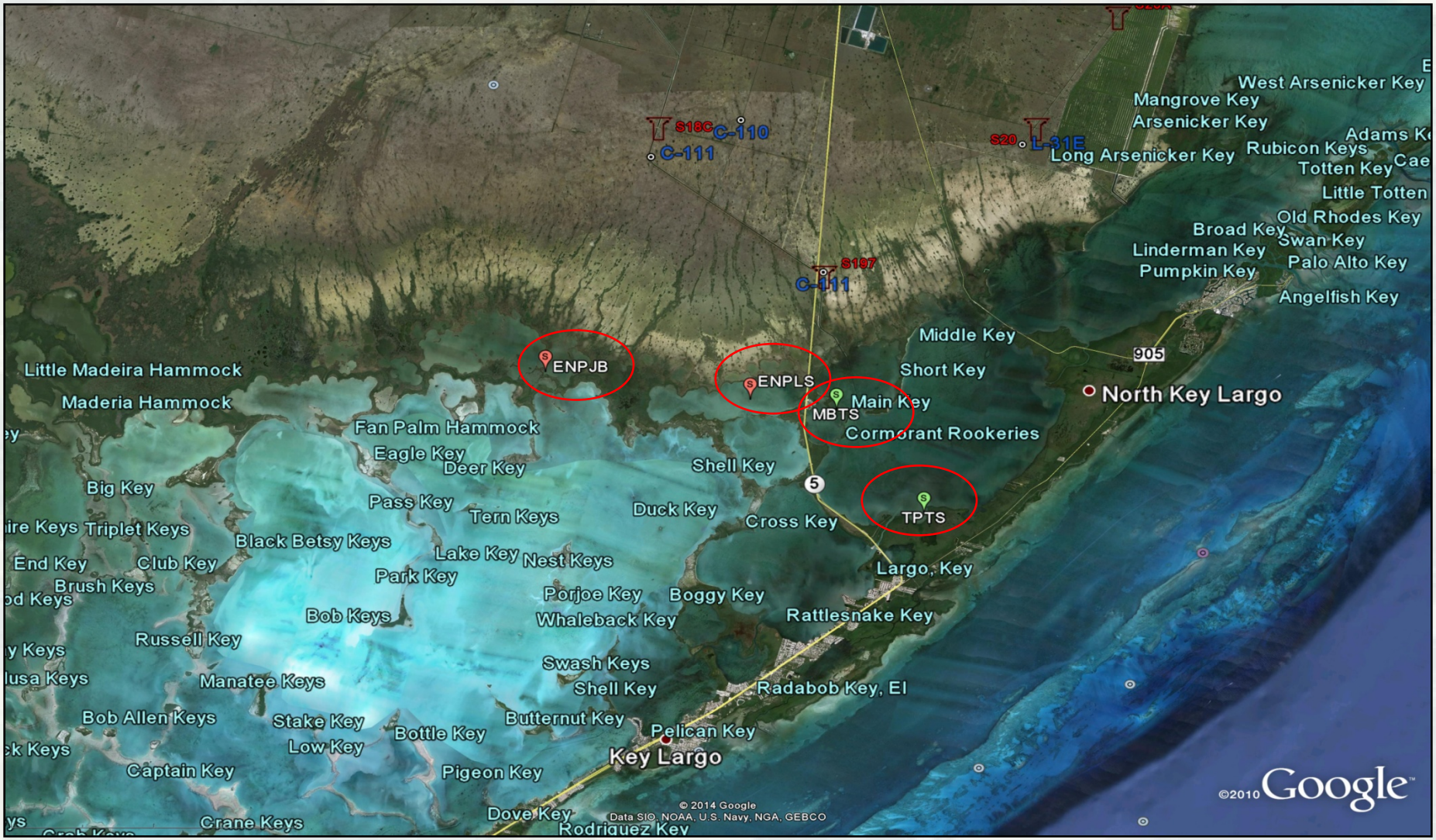


Monitor existing hydrological gages to measure foraging depths and recession rates within TT-West, TT-East, TT-East 2, and Grossman Ridge West

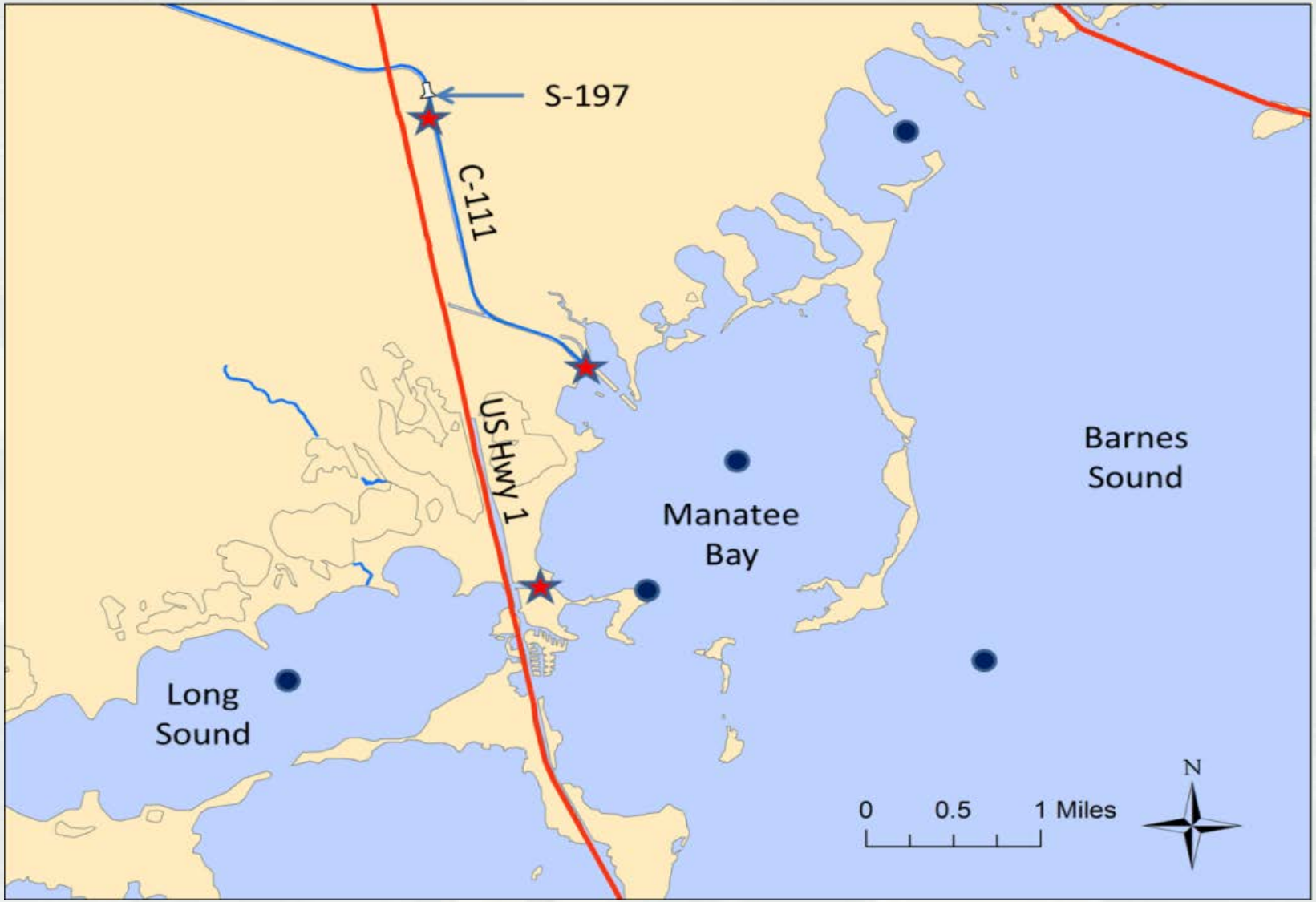
Water Depth (centimeters)
< -9 cm
-9 to 4 cm
5 to 25 cm
26 to 40 cm
> 40 cm

Recession Rate (feet per week)
< 0.17
> 0.07 but ≤ 0.17
Preferred 0.06-0.07
≥ -0.05 but < 0.06
< -0.05

1. ***Water depths (5-25 cm) within the Core Foraging Area (18.6 mile radius, CFA) of any active wood stork colony***
2. ***Recession rates (optimal range of 0.06 to 0.07 feet per week), from January 1 to June 1.***



Field Test Salinity Monitoring Stations
ENP Marine Monitoring Network
ENP JB, ENPLS, MBTS and TPTS

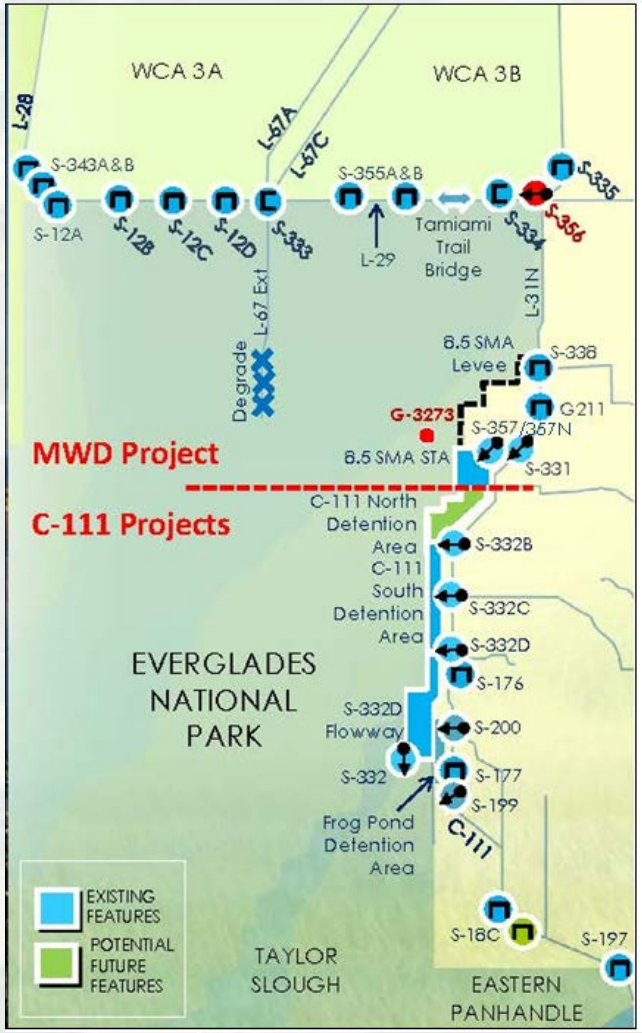


SFWMD Salinity Monitoring
Existing Stations - Dark Blue Circles
New Stations – Red Stars

Cultural Resources

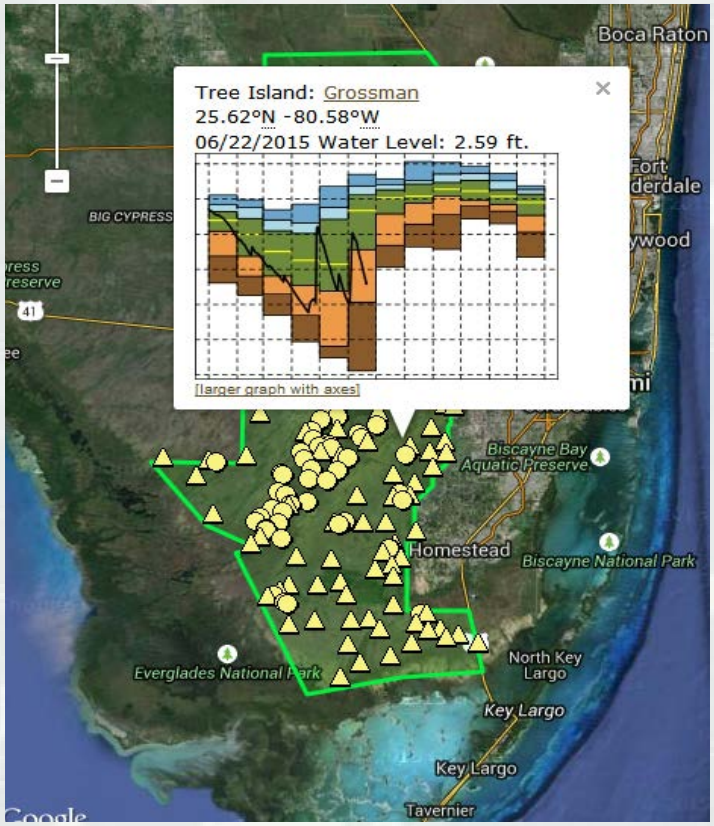
Cultural Resources

- Consultation Complete
- Corps' Determination: No Adverse Effects
- Monitoring Plan to study water elevation in relation to known cultural resources and ensure predictive results are accurate.



Cultural Resources

- Active monitoring will occur utilizing the Everglades Depth and Elevation Network (EDEN) to determine whether conditions significantly vary from those established within the EA.
  - http://sofia.usgs.gov/eden/water_level_percentiles_map.php



Cultural Resources

- 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.

Cultural Resources

- The monitoring efforts will allow a better understanding of potential effects of the additional water discharged into ENP and how the water spreads south throughout Northeast Shark River Slough (NESRS).
- They will provide a better understanding of the zone of influence of water across the cultural landscape.
- The monitoring efforts will provide valuable information to better understand effects of water on cultural resources for future planned field test increments and the completed Modified Water Deliveries (MWD) to ENP Project.

Surface Water
Water Quality

Hydrometeorological and Water Quality Monitoring Plan Objectives

- **Surface Water and Groundwater Flows and Levels**
  - Characterize surface water level responses to S-356 operation
  - Define the area of influence of S-356 during test
  - Define groundwater seepage direction
  - Show real-time levels and flows via web portal

- **Surface Water and Groundwater Quality**
  - Characterize surface water quality changes during S-356 operation
  - Characterize groundwater quality from locations north and south of Tamiami Trail to trace seepage flows

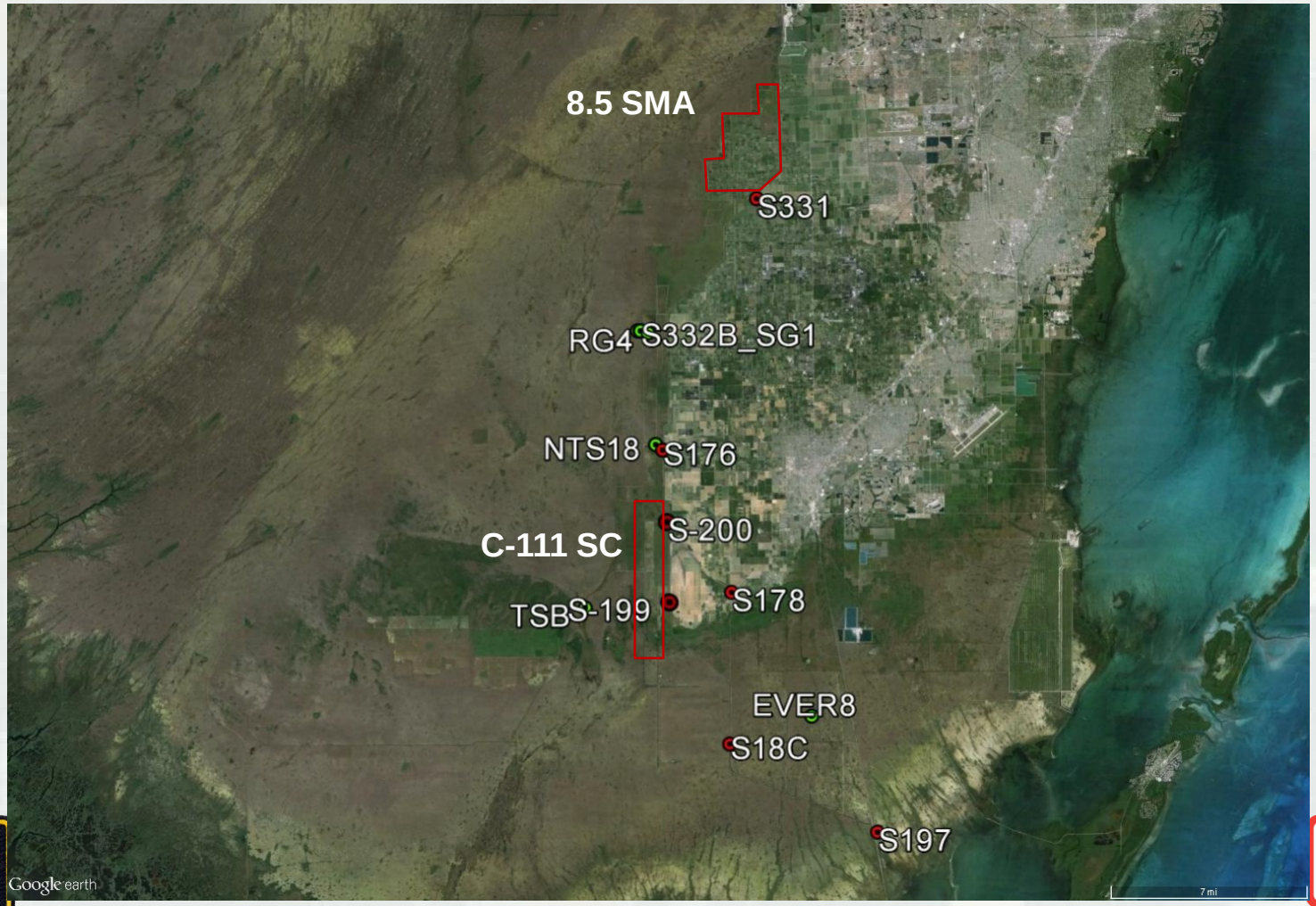
Surface Water Monitoring Plan

- Will use existing surface water monitoring instrumentation and locations, supplemented by new stations along Tamiami Trail
- Multi-agency effort – Resources provided by SFWMD, USACE, ENP, USGS
- Leverage on-going SFWMD monitoring for CERP C-111 South Dade projects to assess effects in project area, with additional analysis by USACE
- Real-time water level and flow data are available for viewing
- Interagency workshops scheduled quarterly to evaluate S-356 test performance and achievement of test goals and objectives

Changes to Surface Water Monitoring Plan Since Draft EA

- Additional surface stage monitoring gages added to include C-111 South Dade Project (Appendix C, Annex 1)
- Multi-agency and PDT coordination for C-111 South Dade and 8.5 SMA monitoring, analysis, and oversight (Operational Strategy and Appendix C)
- No changes to the surface water quality monitoring plan (Appendix C)

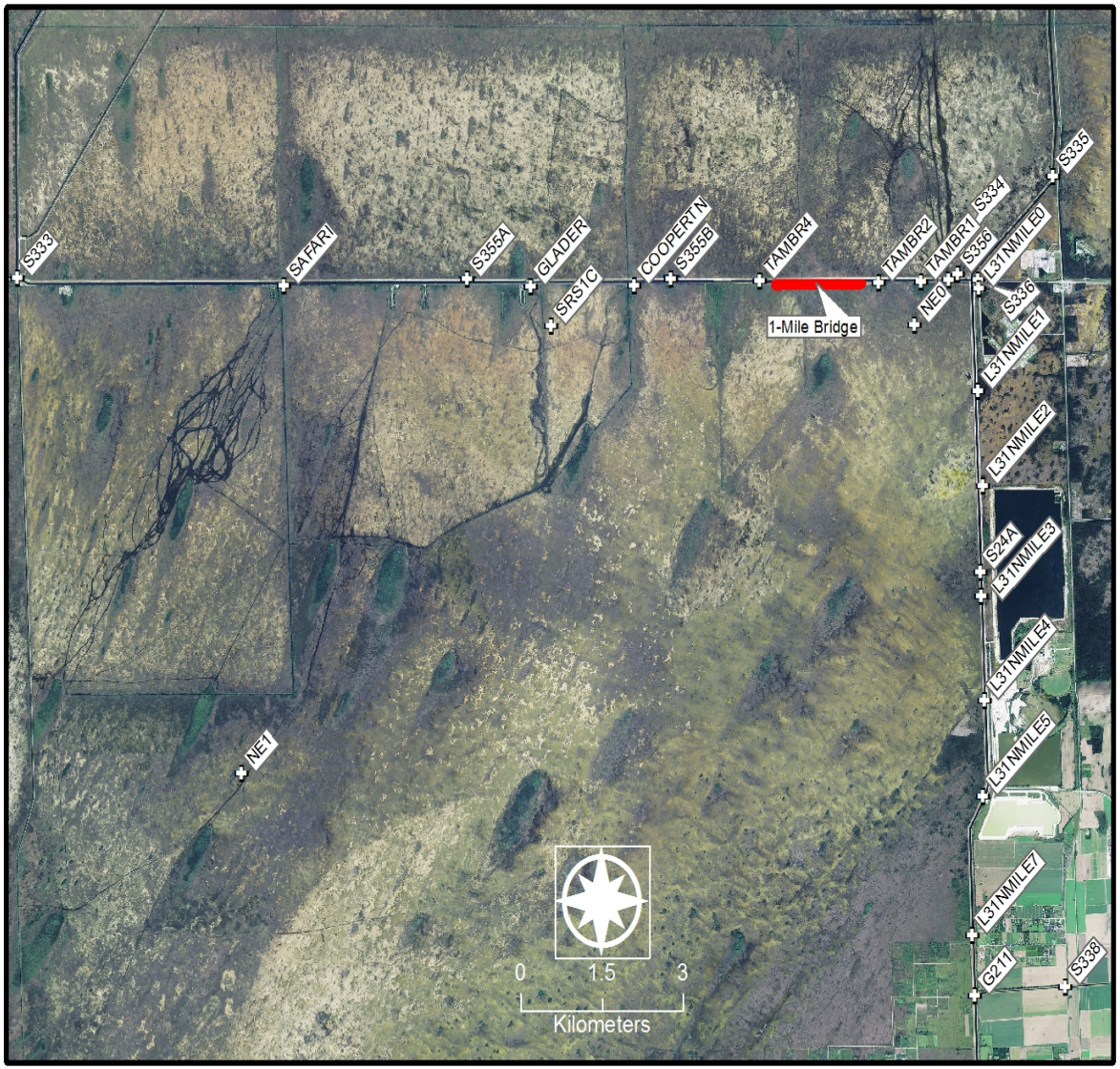
Surface Water Monitoring In C-111 Basin



Surface WQ Monitoring Plan

- Existing surface water monitoring stations are supplemented by additional stations along Tamiami Trail
- Multi-agency effort
- Provisional water quality data will be available for key structures on SFWMD database DBHydro
- No changes to the surface water quality monitoring plan presented in Jan 2015

S356 Pump Test Surface Water Quality Monitoring



SRS1B is west of L67-Extension

Surface Water Quality Data and Interpretations

- Testing operational guidance will not be adjusted to address potential water quality issues until after increment 1 testing/analysis is complete. An exception would involve any indication of overpumping potentially pulling GW from the eastern urban areas. Any indications of urban ground water being pulled into s356 intake (phosphorus signal or other indication) will required operations to be adjusted to prevent that situation.
- Opportunities to better manage water quality inflows into ENP that do not interfere with the G3273/S356 testing will be implemented if possible during the increment 1 testing.
- It is expected that the primary concern with wq inflows into ENP occur when G3273 stages are below 6.8ft/WCA dry season conditions. In general operational adjustments to address wq concerns for flows into ENP under those conditions is not expected to impact the G3273/S356 testing.

Ground Water

Groundwater Monitoring Plan

- Will use existing instrumented groundwater wellfields along L-31N and L-30, WCA-3B and east of the project area
- Multi-agency effort – Resources provided by SFWMD, USACE and Contractors, ENP, USGS
- Leverage on-going SFWMD monitoring for CERP C-111 South Dade projects to assess effects in project area, with additional analysis by USACE
- Real-time water level and flow data are available for viewing

  https://l30l31.dri.edu/

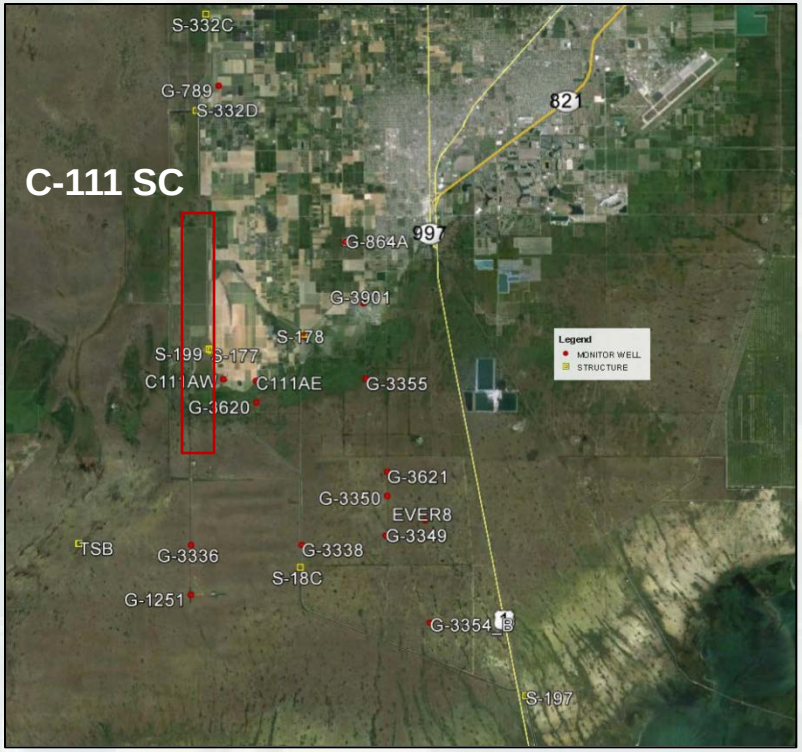
- Interagency workshops scheduled quarterly for data review

Changes to Groundwater Monitoring Plan Since Draft EA

- MDLPA wells along L-31N were deleted from groundwater quality sampling plan (Appendix C).
- Additional wells to monitor groundwater level added to include C-111 South Dade Project (Appendix C, Annex 1)
- Multi-agency and PDT coordination for C-111 South Dade and 8.5 SMA monitoring, analysis, and oversight (Operational Strategy and Appendix C)

Groundwater Monitoring in C-111 Basin

Northern C-111 Basin



Southern C-111 Basin

S-356 Pump Test
Increment 0

Increment 0 - Schedule

- Schedule
  - Monthly Test (Engines Only) 01 Jun
  - Initiate 21 Day Test 06 Jul
  - Prepare Draft Report 27 Jul
- Issues
  - No Water

G-3273 Relaxation
S-356 Field Test (Increment 1)

Increment 1

- Significant Actions
  - ▸ FONSI Signed 28 May
  - ▸ SAD Approved Deviation 12 Jun
- Schedule
  - ▸ Solicitation to Monitoring Contractor 15 Jun
  - ▸ Implement Test 03 Aug
- Path Forward
  - ▸ Award Monitoring Contract 01 Jul
  - ▸ Collect Baseline Groundwater Quality data
  - ▸ Permit S-357N

Modified Water Deliveries: Combined Operational Plan

Task	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
8.5 SMA	DESIGN, ADVERTISE AND AWARD								8.5 SMA CONSTRUCTION MODIFICATIONS																			
Tamiami Trail Modifications	TTM Construction Complete	TTM Transfer Complete							TTM Close Out																			
ERTP BO	ERTP BO - Expires January 1, 2016 / FWS Consultation Concluded for Increment 1																											
MWD Real Estate	Acquisition of Real Estate Interest of AAoF (USACE) / Flowage Easements for DOI properties												**Cure for Salem Communications, FPL, Cooper Town, Everglades Safari, Gator Park and Financial Radio Tower and complete NEPA document (DOI)**															
S-356 Pump Test				Develop Pump Test Criteria and 21-Day Test	Repairs: P&S, Contract, Begin Work			PUMP TEST																				
Increment 1: G-3273 and S-356		Coordinate Initiation of Test with Agencies and Tribe RE Analysis			G-3273, S356, S357N Test Development; associated NEPA				Perform 1st Increment - 1st Year Data Analysis and Periodic operational adjustments →			Test Eval Rpt	Perform 1st Increment - 2nd Year Data Analysis and periodic operational adjustments →			Test Eval Rpt	Interim Ops Criteria, Struct Trans, FDEP Permit											
C-111 SD Contract 8									Construction of Contract 8																			
C-111 SD Contract 9													Construction of Contract 9 (Estimate to complete)															
Increment 2: L-29 with G-3273 and S-356													Develop GOC, Operating Strategy, Monitoring Plan for 2nd Increment; associated NEPA.				Perform 2nd Increment - 1 year min. Data Analysis and periodic adjustments. RE Acquisitions must be complete. →			Test Eval Rpt	Interim Ops Criteria, Modified FDEP Permit						
MWD PCA AMENDMENT									HQ Guidance	Amend PCA, if necessary																		
Increment 3: Revise WCP		Coordinate Initiation of Operating Plan											Operating Plan Scope and Modeling Tool Development				** Operating Plan Development - incorporate 1st Increment test results and 2nd Increment development information.			Duration dependent on Scope 14 Months					**ROD, Revised WCP Vol 4**			

* ALL EASEMENTS MUST BE ACQUIRED PRIOR TO BEGINNING 2nd INCREMENT/ 2nd INCREMENT MAY CONTINUE UNTIL INTIATION OF OPERATING PLAN

** ONE YEAR OF 2nd INCREMENT TESTING NEEDED PRIOR TO INITIATION OF INCREMENT 3: REVISION OF WCA/ENP/SDCS WCP (Vol. 4)

G-3273 Relaxation
S-356 Field Test (Increment 1) Coordination

Water Management Section
Jacksonville District
U.S. Army Corps of Engineers

WCA-3A Water Management Operations

- USACE coordinating agencies:
  - South Florida Water Management District
  - Everglades National Park
  - US Fish and Wildlife Service
  - Miccosukee Tribe of Indians
  - Florida Fish and Wildlife Conservation Commission
  - Others

WCA-3 Periodic Scientists Call

- USACE WCA-3 Periodic Scientists Call:
  - Corps presents System Status
  - Provides an opportunity for Tribal, Federal, State and local agencies' representatives to exchange technical information and the Corps to collect input.
  - PDT members invited
    - Send E-mail to: Olice.E.Williams@usace.army.mil
  - Provides opportunity for public comment

Weekly Coordination

- Weekly (Corps and South Florida Water Management District Operations Call)
  - Everglades National Park technical staff participates as necessary
  - ▶ Weather (Recent and Forecasted)
  - ▶ System Status (water levels, discharges, etc.)
  - ▶ Increment 1 operational status and any potential issues

Monthly Coordination

- USACE/SFWMD/ENP Monthly Coordination calls to discuss:
  - Weather
  - System Status
  - Observed and Analyzed Data
  - Discuss any potential operational changes to Increment 1

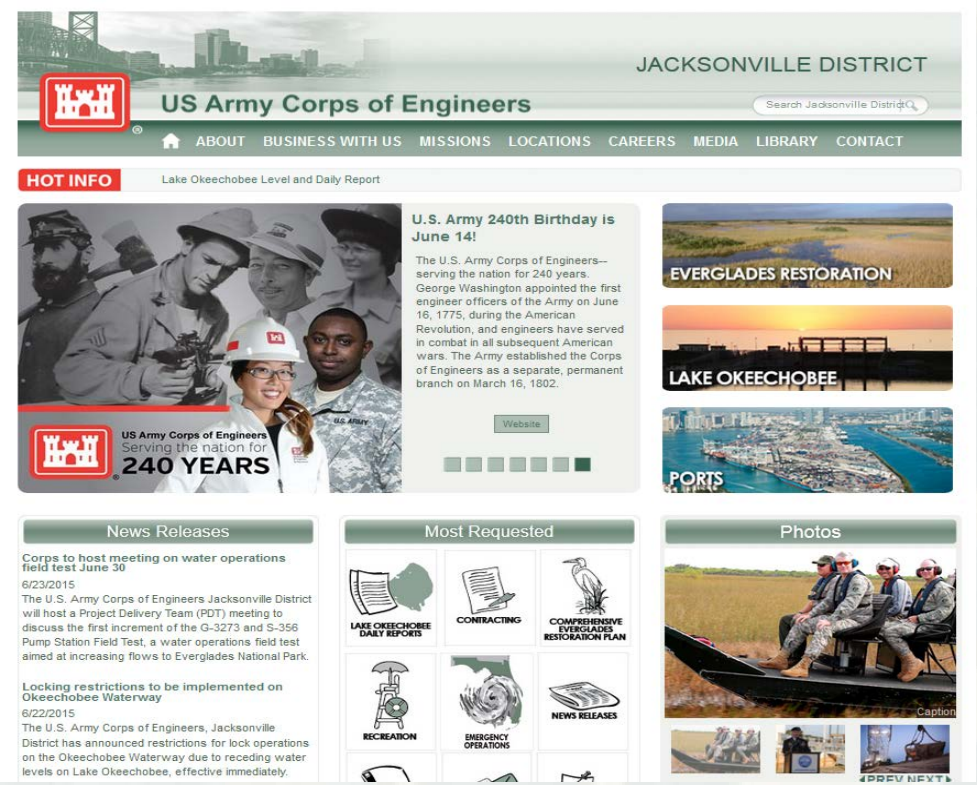
Quarterly Coordination

- Quarterly Multi-Agency PDT meeting to discuss:
  - Weather
  - System status
  - Observed and Analyzed Data
  - Collect Input
  - Discuss any potential operational changes to Increment 1

    (Changes will be documented including consideration of agency and/or stakeholder input)

USACE Web Page

- Jacksonville Districts Web Page
  - http://www.saj.usace.army.mil



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Questions and Comments:
Email:
dll-cesaj-mwd-ops@usace.army.mil

Lunch Break

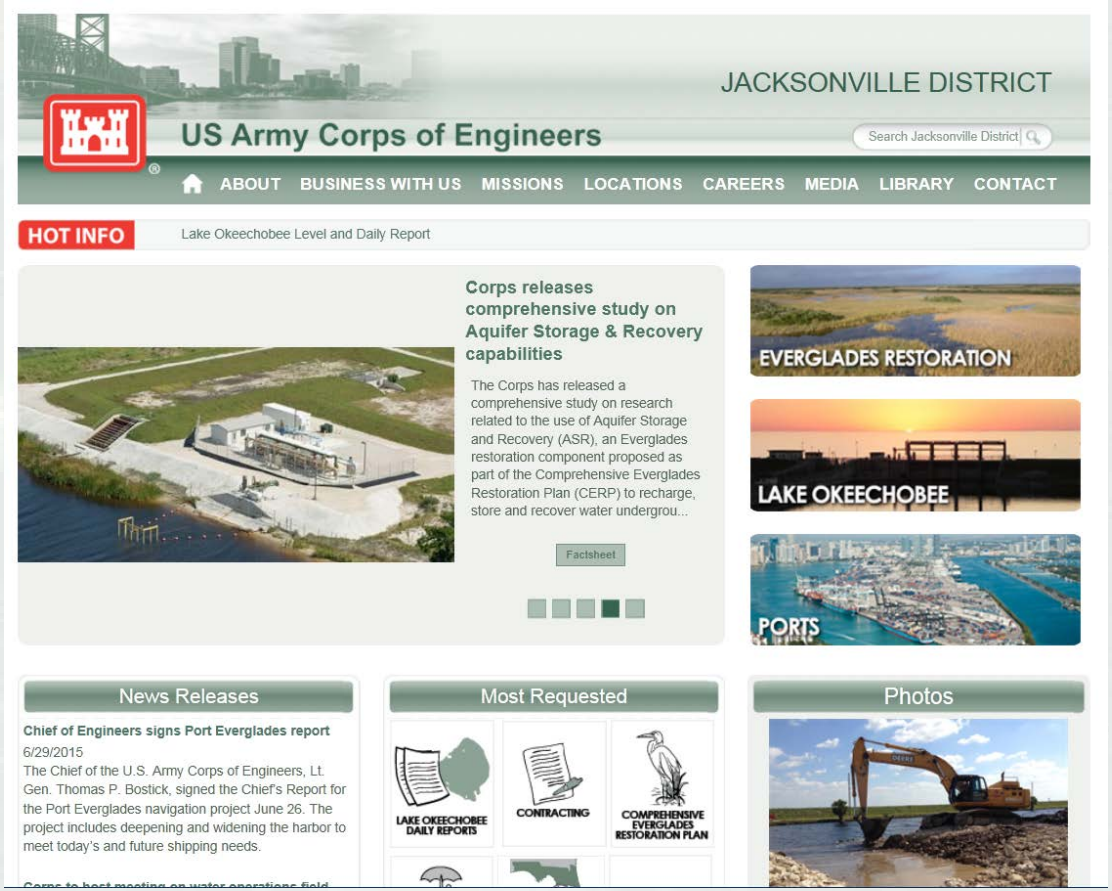
Public Comment

Website Presentation and Discussion

G-3273 Relaxation and S-356 Field Test (Increment 1) Web-Page Guide

Water Management Section
Jacksonville District
U.S. Army Corps of Engineers

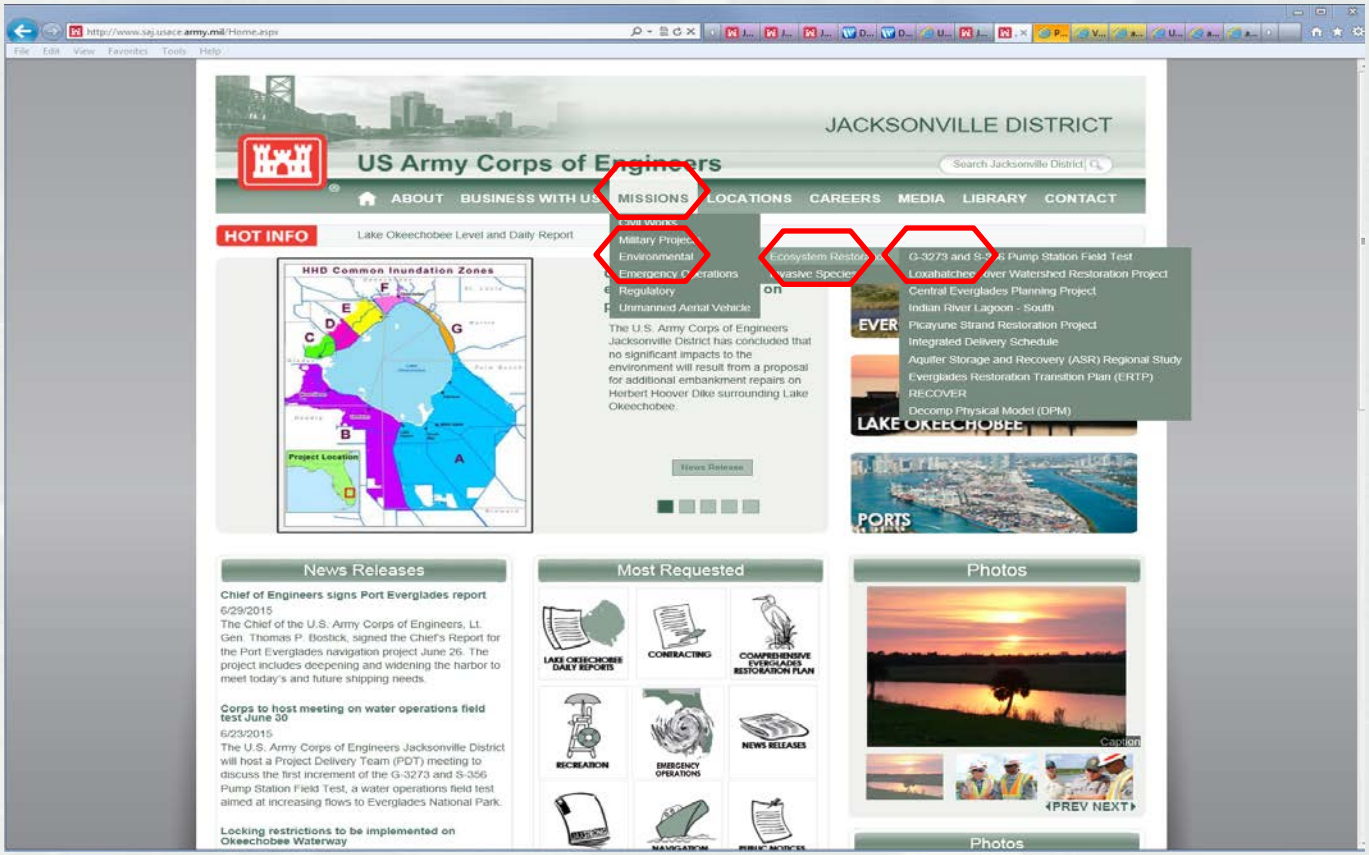
US Army Corps of Engineers Jacksonville District Home Page http://www.saj.usace.army.mil



Navigation to G-3273 and S356 Pump Station Field Test Web Page

Use http://bit.ly/MWD_FieldTest or From http://www.saj.usace.army.mil

SELECT: Mission → Environmental → Ecosystem Restoration → G-3273 and S356 Pump Station Field Test

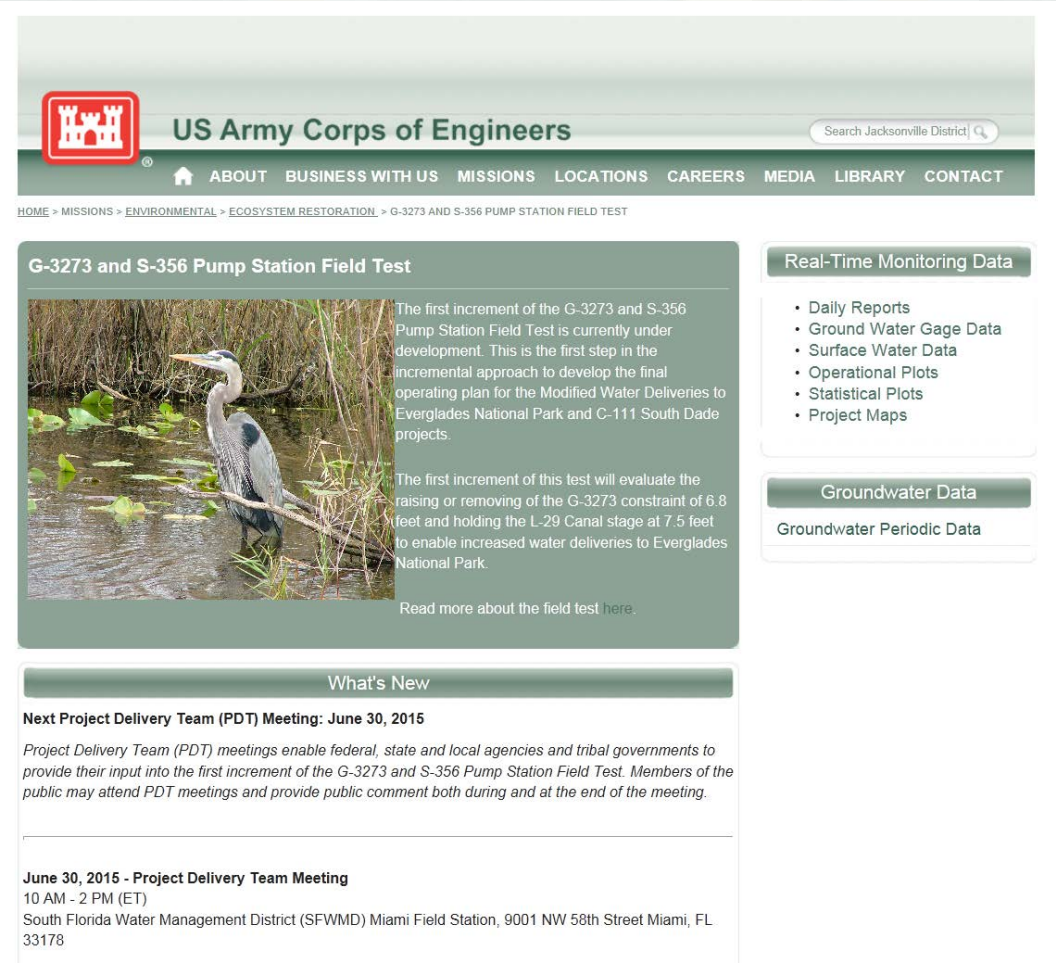


Questions and Comments:

Email:

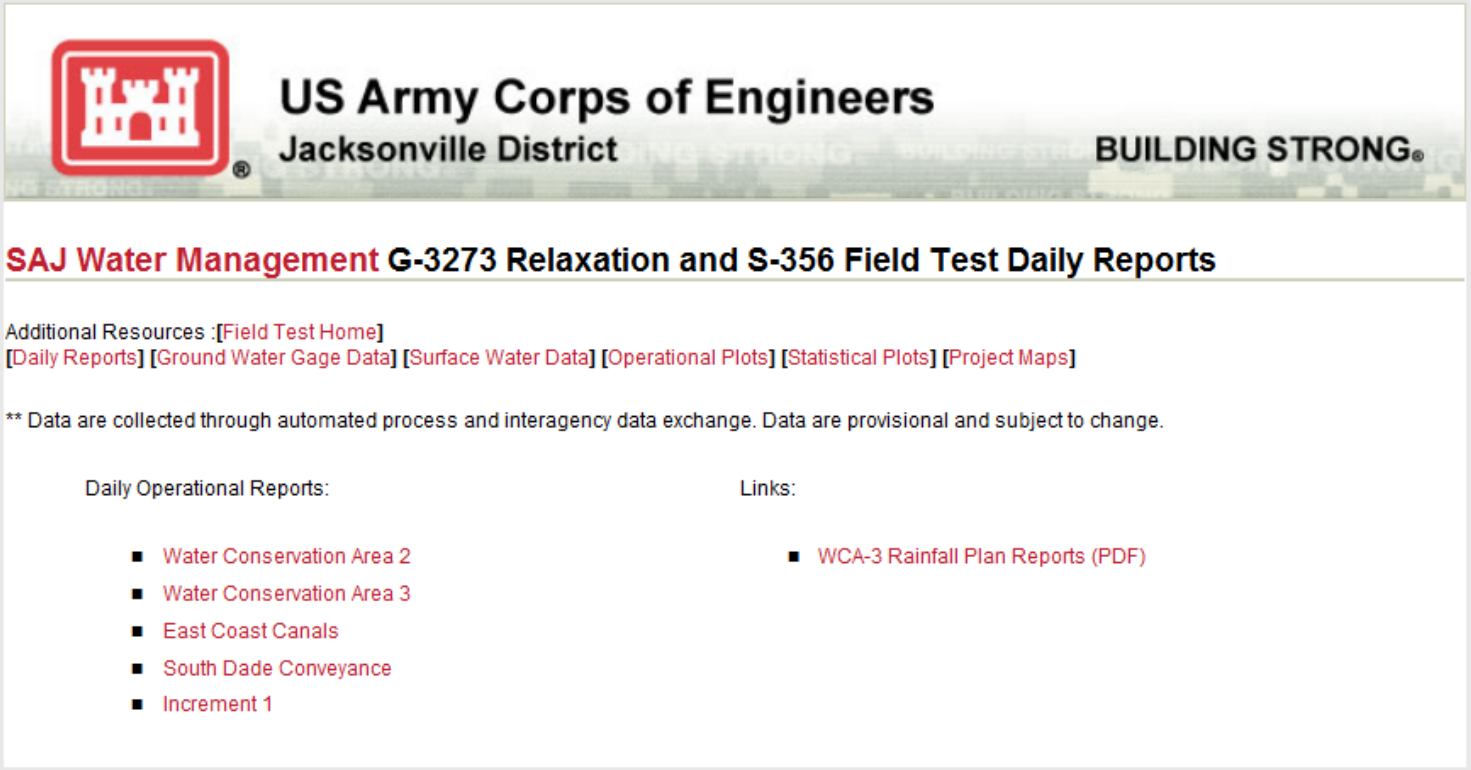
dll-cesaj-mwd-ops@usace.army.mil

US Army Corps of Engineers Jacksonville District G-3273 and S356 Pump Station Field Test



US Army Corps of Engineers Jacksonville District G-3273 and S356 Pump Station Field Test

•Daily Reports:



US Army Corps of Engineers
Jacksonville District
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SAJ Water Management G-3273 Relaxation and S-356 Field Test Daily Reports

Additional Resources :[Field Test Home]
[Daily Reports] [Ground Water Gage Data] [Surface Water Data] [Operational Plots] [Statistical Plots] [Project Maps]

** Data are collected through automated process and interagency data exchange. Data are provisional and subject to change.

Daily Operational Reports:

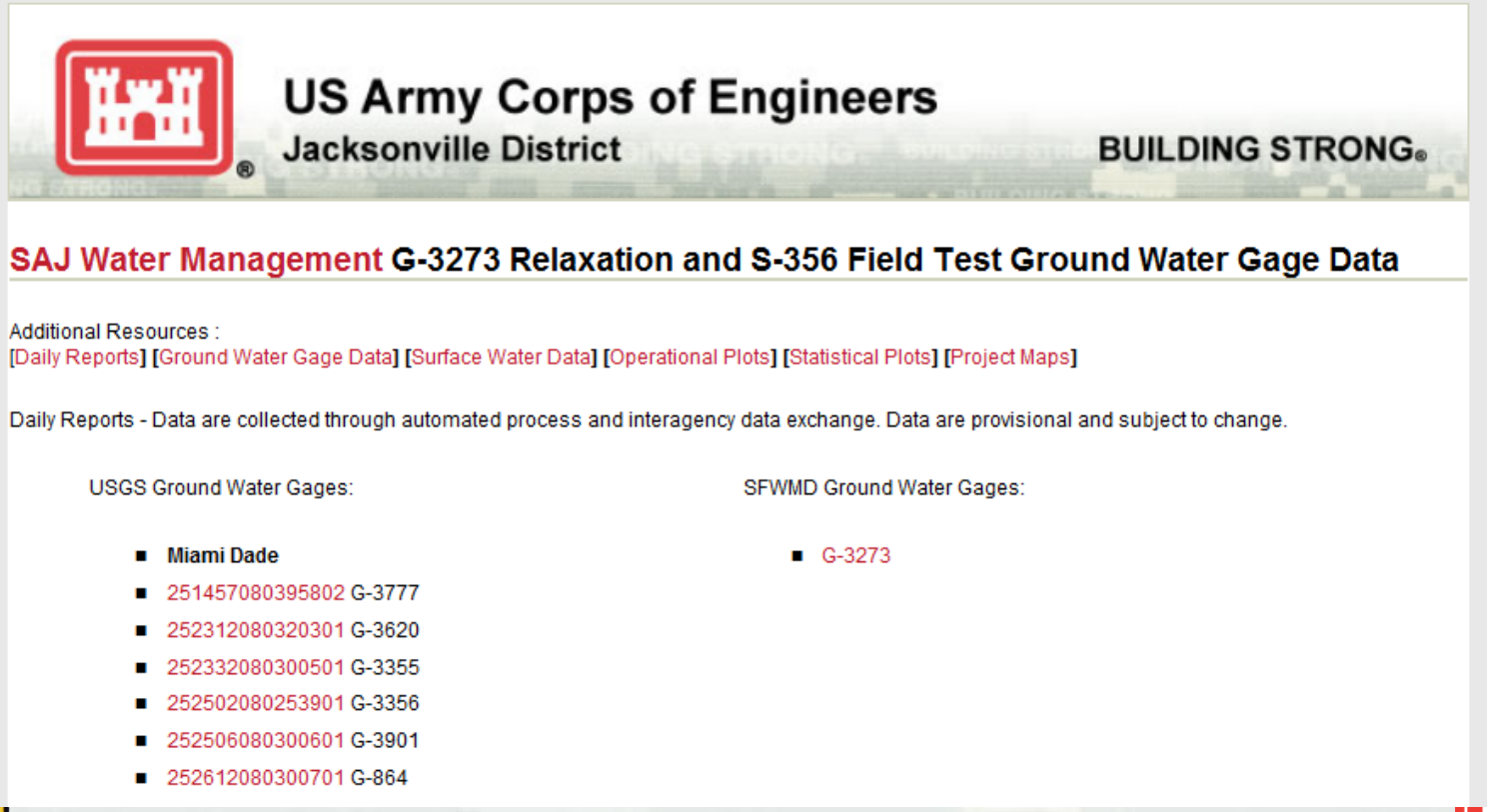
- Water Conservation Area 2
- Water Conservation Area 3
- East Coast Canals
- South Dade Conveyance
- Increment 1

Links:

- WCA-3 Rainfall Plan Reports (PDF)

US Army Corps of Engineers Jacksonville District G-3273 and S356 Pump Station Field Test

•Ground Water Gage Data:



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SAJ Water Management G-3273 Relaxation and S-356 Field Test Ground Water Gage Data

Additional Resources :
[Daily Reports] [Ground Water Gage Data] [Surface Water Data] [Operational Plots] [Statistical Plots] [Project Maps]

Daily Reports - Data are collected through automated process and interagency data exchange. Data are provisional and subject to change.

USGS Ground Water Gages:

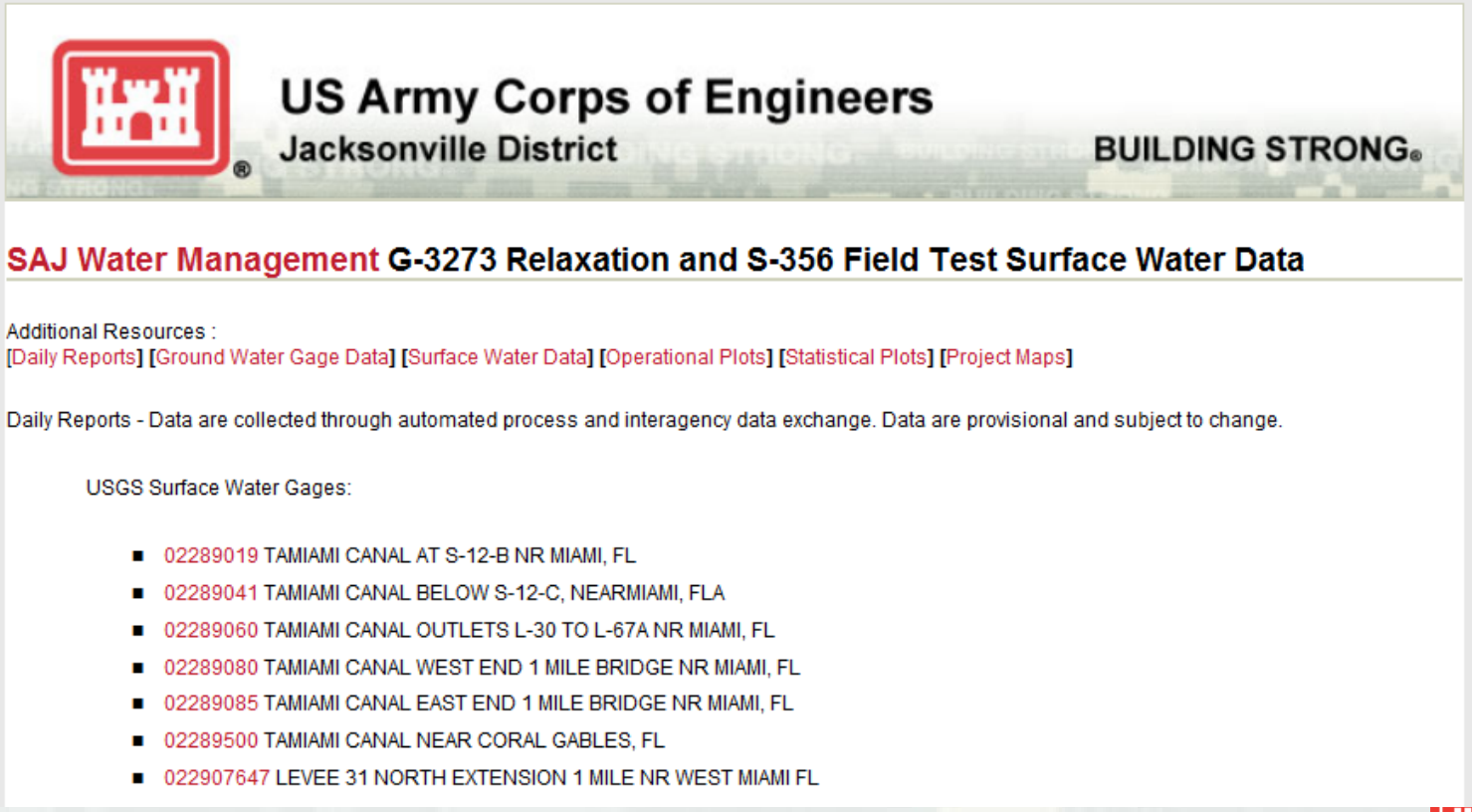
- **Miami Dade**
- 251457080395802 G-3777
- 252312080320301 G-3620
- 252332080300501 G-3355
- 252502080253901 G-3356
- 252506080300601 G-3901
- 252612080300701 G-864

SFWMD Ground Water Gages:

- G-3273

US Army Corps of Engineers Jacksonville District G-3273 and S356 Pump Station Field Test

- Surface Water Data:



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SAJ Water Management G-3273 Relaxation and S-356 Field Test Surface Water Data

Additional Resources :
[Daily Reports] [Ground Water Gage Data] [Surface Water Data] [Operational Plots] [Statistical Plots] [Project Maps]

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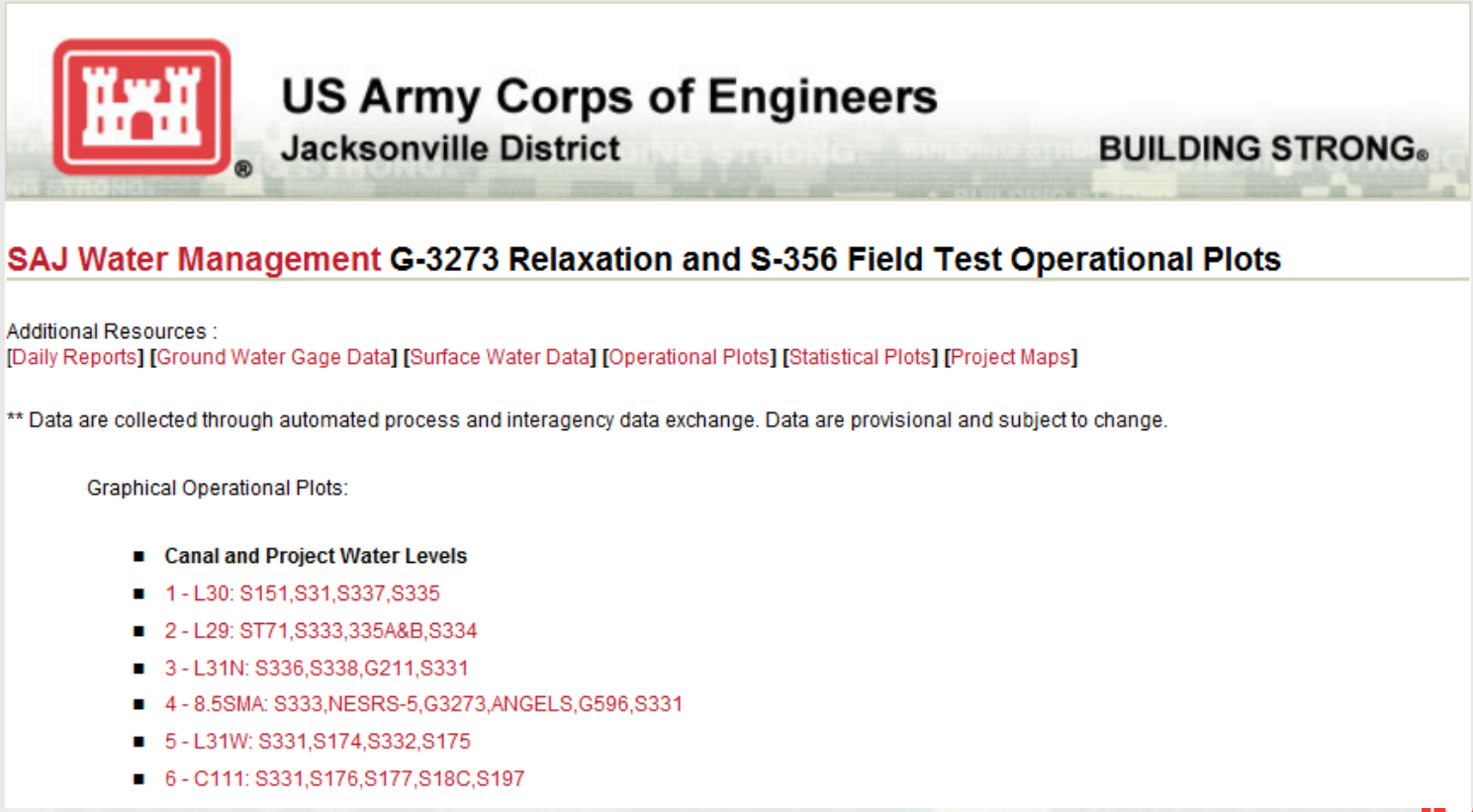
USGS Surface Water Gages:

- 02289019 TAMIAMI CANAL AT S-12-B NR MIAMI, FL
- 02289041 TAMIAMI CANAL BELOW S-12-C, NEARMIAMI, FLA
- 02289060 TAMIAMI CANAL OUTLETS L-30 TO L-67A NR MIAMI, FL
- 02289080 TAMIAMI CANAL WEST END 1 MILE BRIDGE NR MIAMI, FL
- 02289085 TAMIAMI CANAL EAST END 1 MILE BRIDGE NR MIAMI, FL
- 02289500 TAMIAMI CANAL NEAR CORAL GABLES, FL
- 022907647 LEVEE 31 NORTH EXTENSION 1 MILE NR WEST MIAMI FL

US Army Corps of Engineers Jacksonville District G-3273 and S356 Pump Station Field Test

•Operational Plots:



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SAJ Water Management G-3273 Relaxation and S-356 Field Test Operational Plots

Additional Resources :
[Daily Reports] [Ground Water Gage Data] [Surface Water Data] [Operational Plots] [Statistical Plots] [Project Maps]

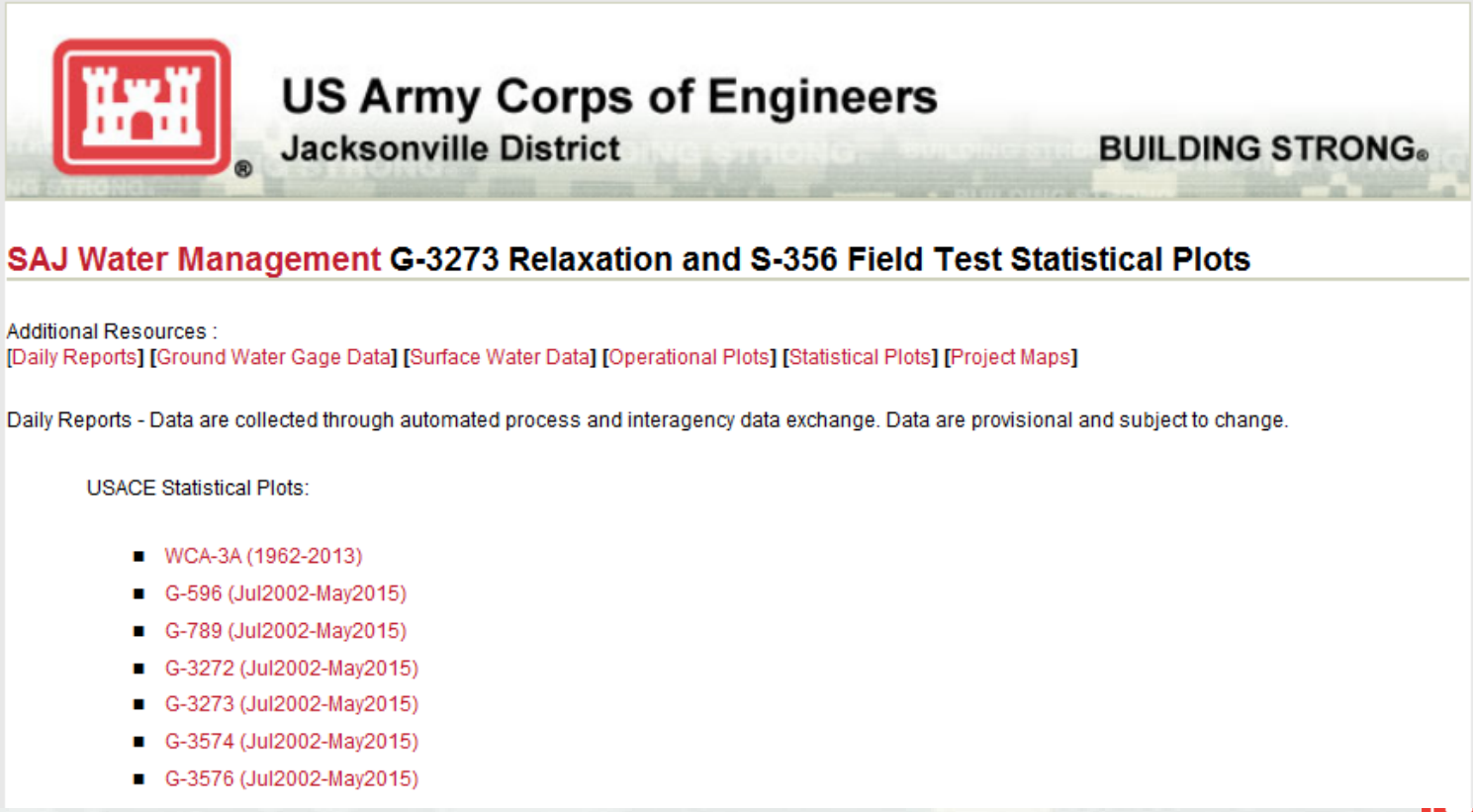
** Data are collected through automated process and interagency data exchange. Data are provisional and subject to change.

Graphical Operational Plots:

- **Canal and Project Water Levels**
- 1 - L30: S151,S31,S337,S335
- 2 - L29: ST71,S333,335A&B,S334
- 3 - L31N: S336,S338,G211,S331
- 4 - 8.5SMA: S333,NESRS-5,G3273,ANGELS,G596,S331
- 5 - L31W: S331,S174,S332,S175
- 6 - C111: S331,S176,S177,S18C,S197

US Army Corps of Engineers Jacksonville District G-3273 and S356 Pump Station Field Test

- Statistical Plots:



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SAJ Water Management G-3273 Relaxation and S-356 Field Test Statistical Plots

Additional Resources :
[Daily Reports] [Ground Water Gage Data] [Surface Water Data] [Operational Plots] [Statistical Plots] [Project Maps]

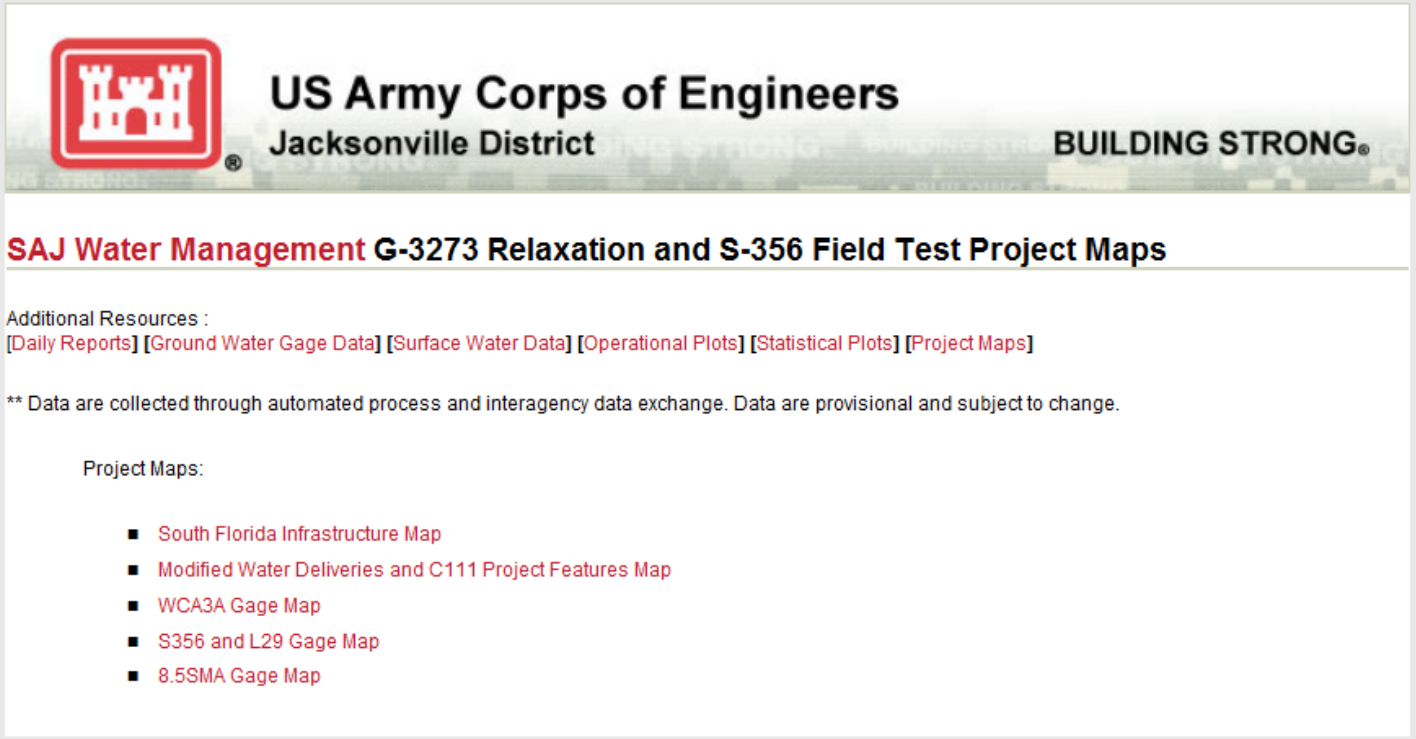
Daily Reports - Data are collected through automated process and interagency data exchange. Data are provisional and subject to change.

USACE Statistical Plots:

- WCA-3A (1962-2013)
- G-596 (Jul2002-May2015)
- G-789 (Jul2002-May2015)
- G-3272 (Jul2002-May2015)
- G-3273 (Jul2002-May2015)
- G-3574 (Jul2002-May2015)
- G-3576 (Jul2002-May2015)

US Army Corps of Engineers Jacksonville District G-3273 and S356 Pump Station Field Test

•Project Maps:



US Army Corps of Engineers
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SAJ Water Management G-3273 Relaxation and S-356 Field Test Project Maps

Additional Resources :
[Daily Reports] [Ground Water Gage Data] [Surface Water Data] [Operational Plots] [Statistical Plots] [Project Maps]

** Data are collected through automated process and interagency data exchange. Data are provisional and subject to change.

Project Maps:

- South Florida Infrastructure Map
- Modified Water Deliveries and C111 Project Features Map
- WCA3A Gage Map
- S356 and L29 Gage Map
- 8.5SMA Gage Map

Questions and Comments:

Email:

dll-cesaj-mwd-ops@usace.army.mil

Next Steps
Closing Comments