SOUTH FLORIDA ECOSYSTEM RESTORATION PROGRAM UPDATE

Combined Operational Plan

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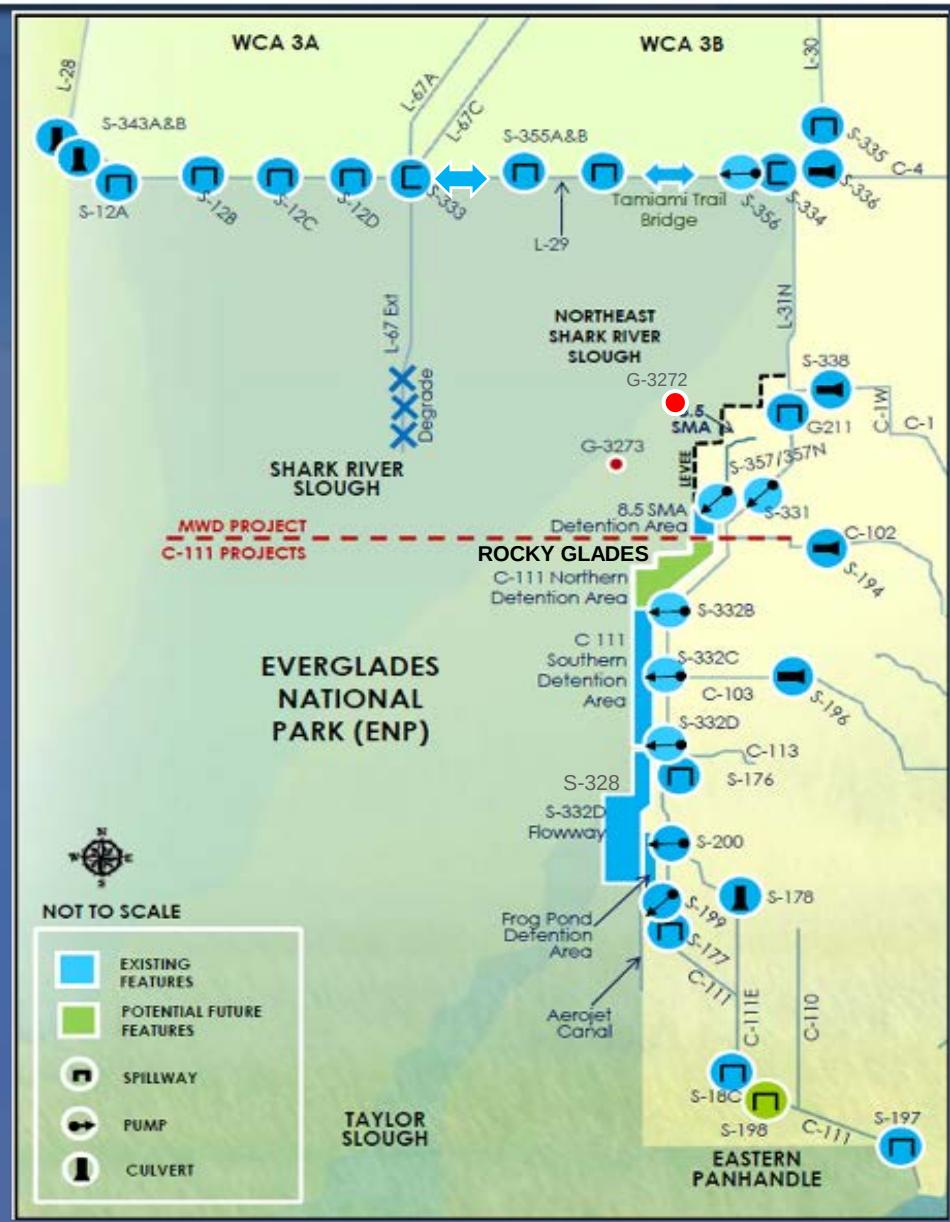
Combined Operational Plan (COP)

Presentation Outline

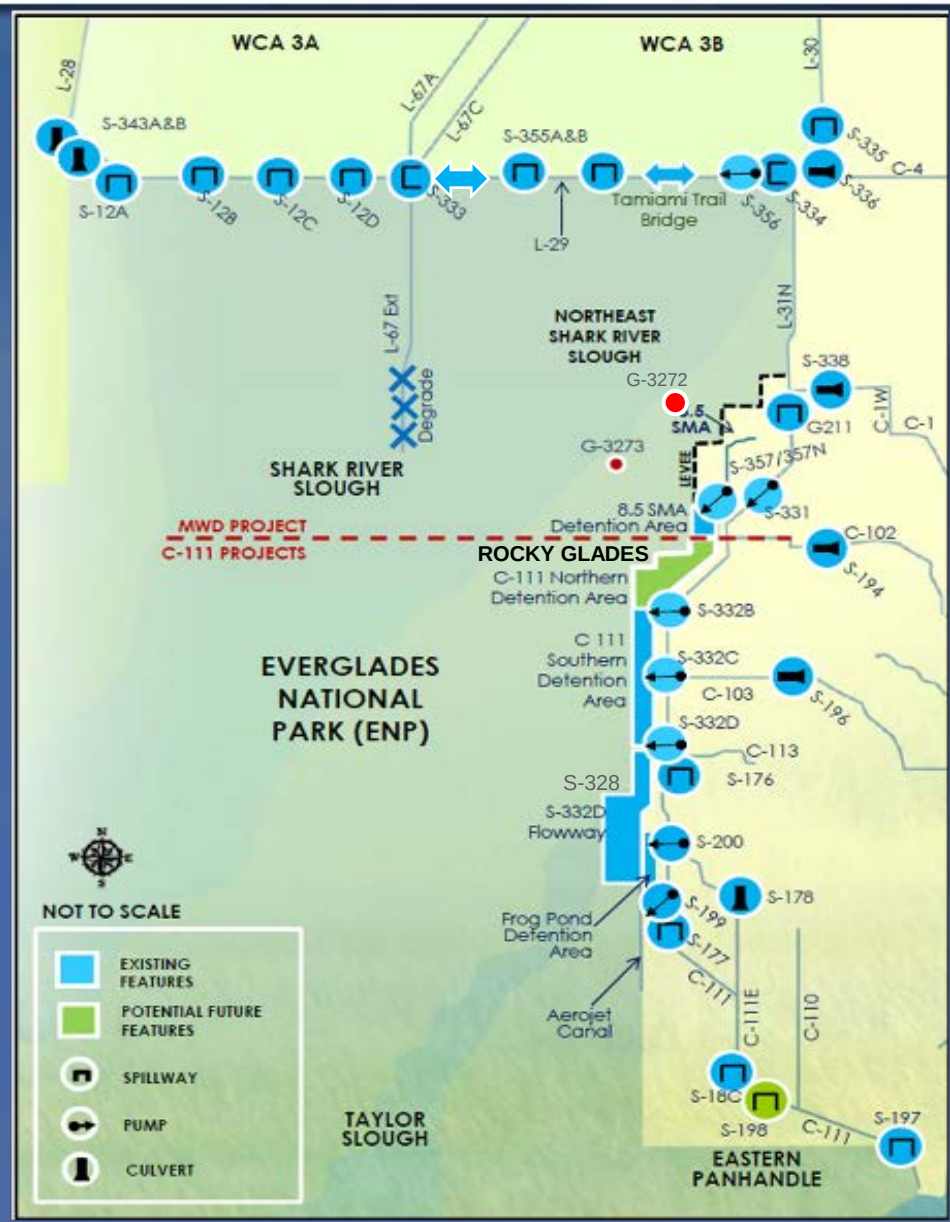
- Background
- Project Objectives, Scope, Constraints and Considerations
- Modeling Tool
- Round 1 - Array of Alternatives
- Round 1 - Alternatives performance trends
- Risks and uncertainties
- Project Schedule



Combined Operational Plan

- Development of the Combined Operational Plan (COP) is a USACE led effort to define water management operations in the southeast central portion of the surface water management system
  - WCA 3 outlet water control structures
  - Water control structures in the L-31N and C-111 Basins
  - Constructed components of the Modified Water Deliveries to Everglades National Park
  - Constructed components of the C111 South Dade Project
- Development of COP is an iterative process and is the latest in a series of water control plan updates conducted by the USACE
  - Interim Structural and Operating Plan (2000)
  - Interim Operating Plan (2002)
  - Everglades Restoration Transition Plan (2012)
  - Incremental Field Tests (2015, 2016, 2018)*

*Note – information and data gained from Incremental Field Test is being used in development of the Combined Operating Plan



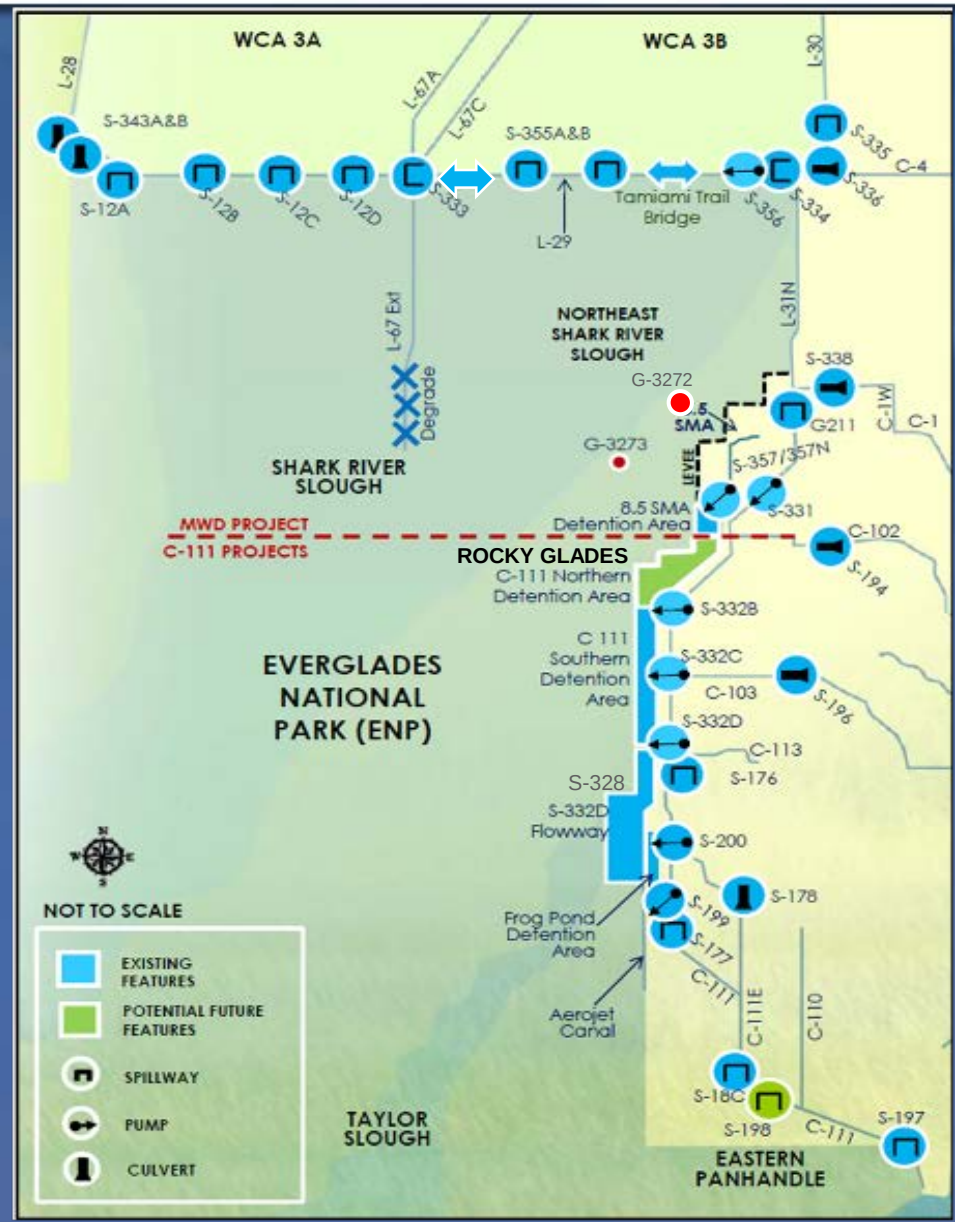
Combined Operating Plan - Project Objectives

- Improve water deliveries by changing the timing, location, and volume of water delivered to Everglades National Park - Shark River Slough
- Improve hydrologic conditions in the Taylor Slough, Rocky Glades, eastern Panhandle of Everglades National Park
- Protect ecological values associated with WCA 3A and Everglades National Park
- Minimize damaging freshwater flows to Manatee Bay and Barnes Sound through the S197 structure

Modified Water Deliveries

Modified Water Deliveries to Everglades National Park project will re-distribute existing water flow to the eastern portions of Everglades National Park

- Operational modifications to S-333 to redistribute water to the east
- Tamiami Trail Modifications provide bridges and road raising to allow for higher water levels in L-29 Canal and promote increased flow to Shark River Slough
- Pump Station S-356 maintains L-31N Canal and portions of the L-30 Canal stages and conveys water to Shark River Slough
- 8.5 Square Mile Area (Las Palmas)
  - Residential flood mitigation allows for increased surface water flow and groundwater stages in Everglades National Park



C-111 South Dade Project

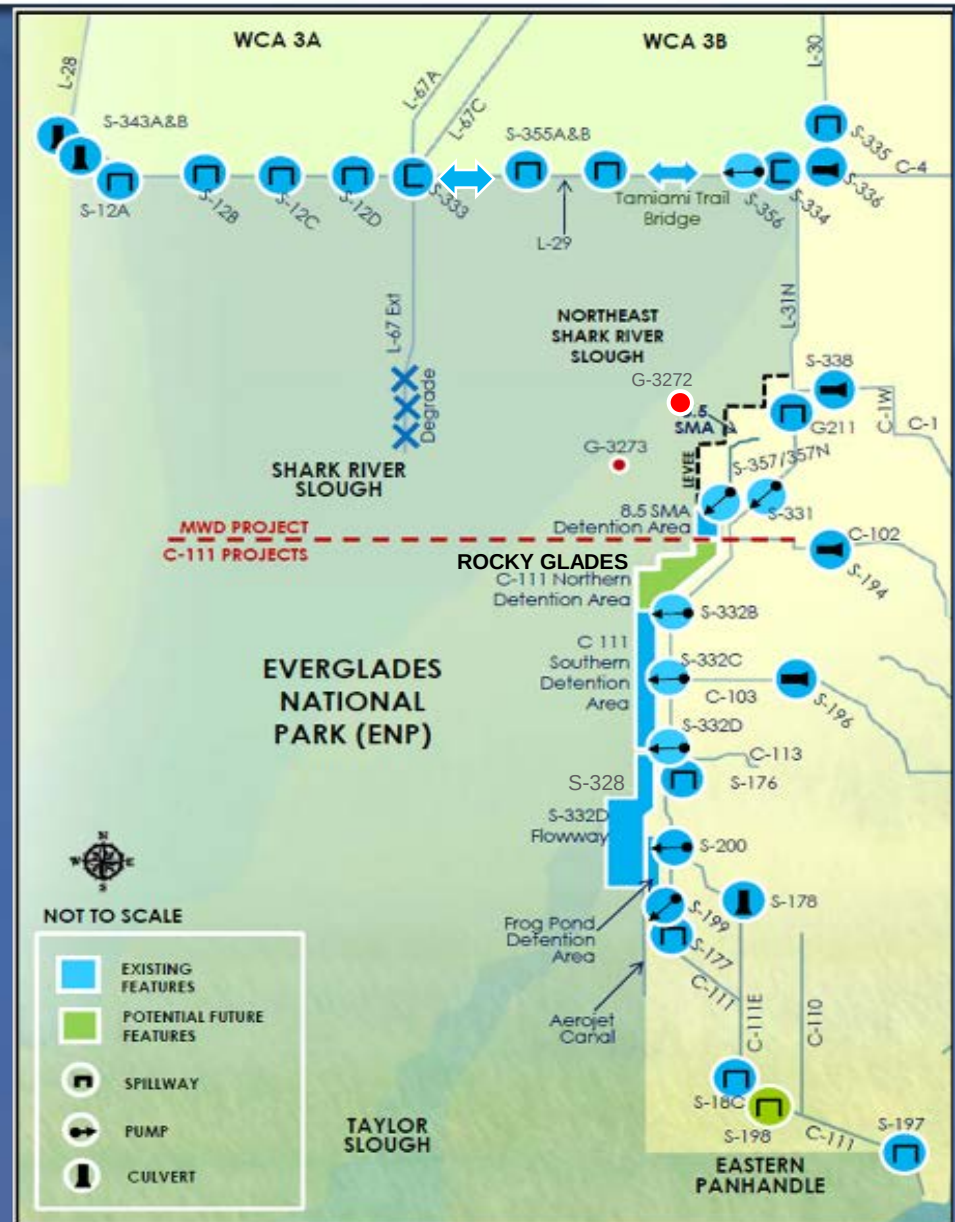
The C-111 South Dade Project works with Modified Water Deliveries to the north and the C-111 Spreader Canal to the south creating a hydraulic ridge

Project Features

- North Detention Area
- South Detention Area
- S-332D Floway
- Pump Stations S-332B, S-332C and S-332D

Project Benefits and Effects

- Improves hydrologic conditions in Taylor Slough, Rocky Glades and Eastern Panhandle of Everglades National Park
- Reduces seepage from natural area
- Returns seepage collected in L-31N Canal to the natural system
- Minimizes damaging discharges to Manatee Bay and Barnes Sound
- Provides flood protection to the human environment

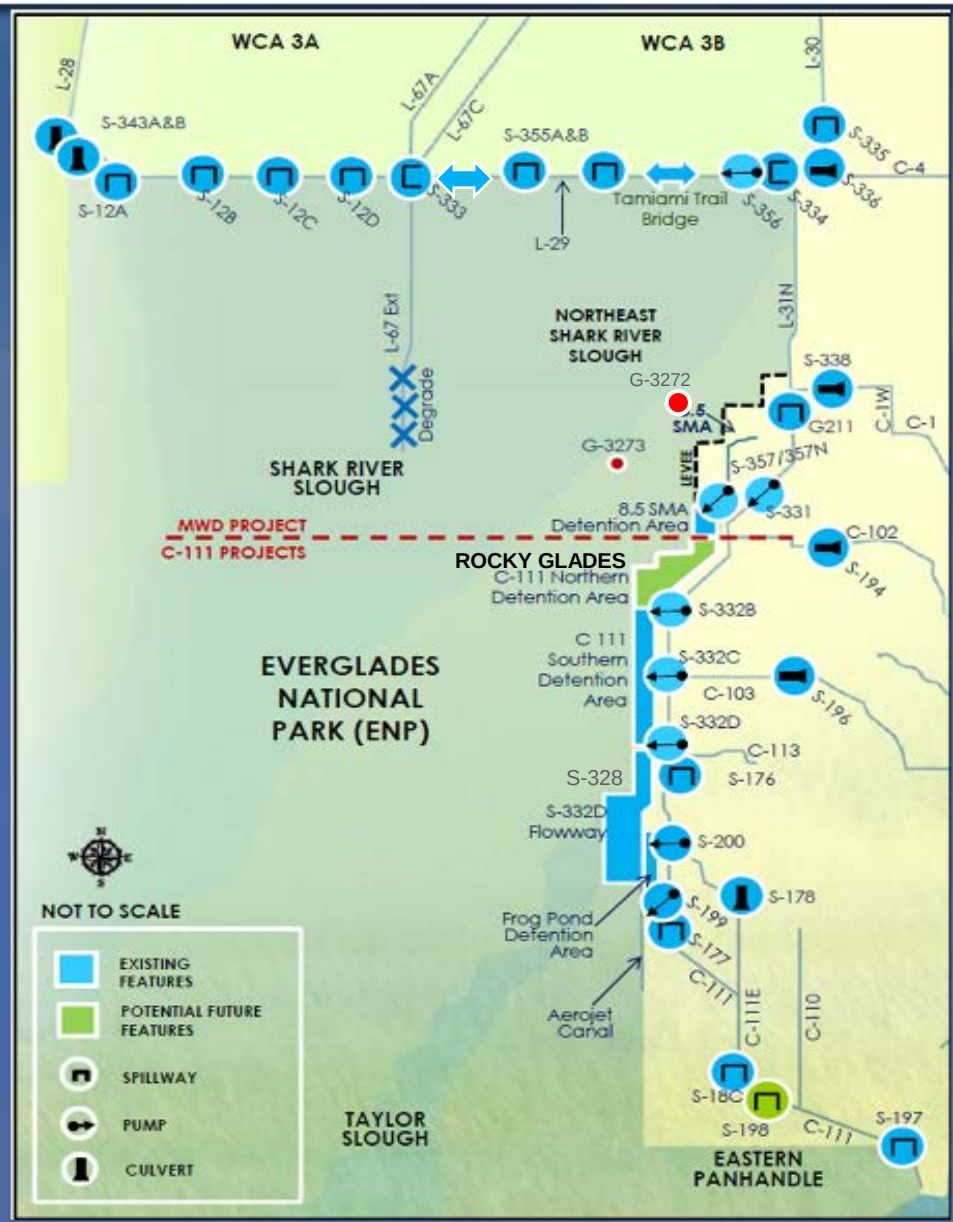


Combined Operating Plan - Project Scope

- Modify the Rainfall Plan to convey water from WCA 3A to Everglades National Park
- Raise the maximum operating limit in the L-29 canal to 8.5 feet NGVD
- Operate pump station S-356 to manage canal stages when water is sent to Shark River Slough
- Deliver water to Taylor Slough, including operating the S-328 consistent with the SFWMD Florida Bay Initiative
- Modify operation of the C&SF structures in the South Dade Conveyance System while maintaining flood protection (including S-197)

Combined Operating Plan - Project Constraints

- Central and Southern Florida (CS&F) Project
  - Water supply municipal, industrial, agriculture
  - Flood control
  - Salt water intrusion prevention
  - Water supply for Everglades National Park
  - Protection of fish and wildlife resources
- Authorized levels of flood mitigation and flood damage reduction for 8.5 Square Mile Area and C-111 South Dade
- Upper limit of the WCA-3A Regulation Schedule (Zone A)
- L-29 Canal maximum stage of 8.5 feet NGVD

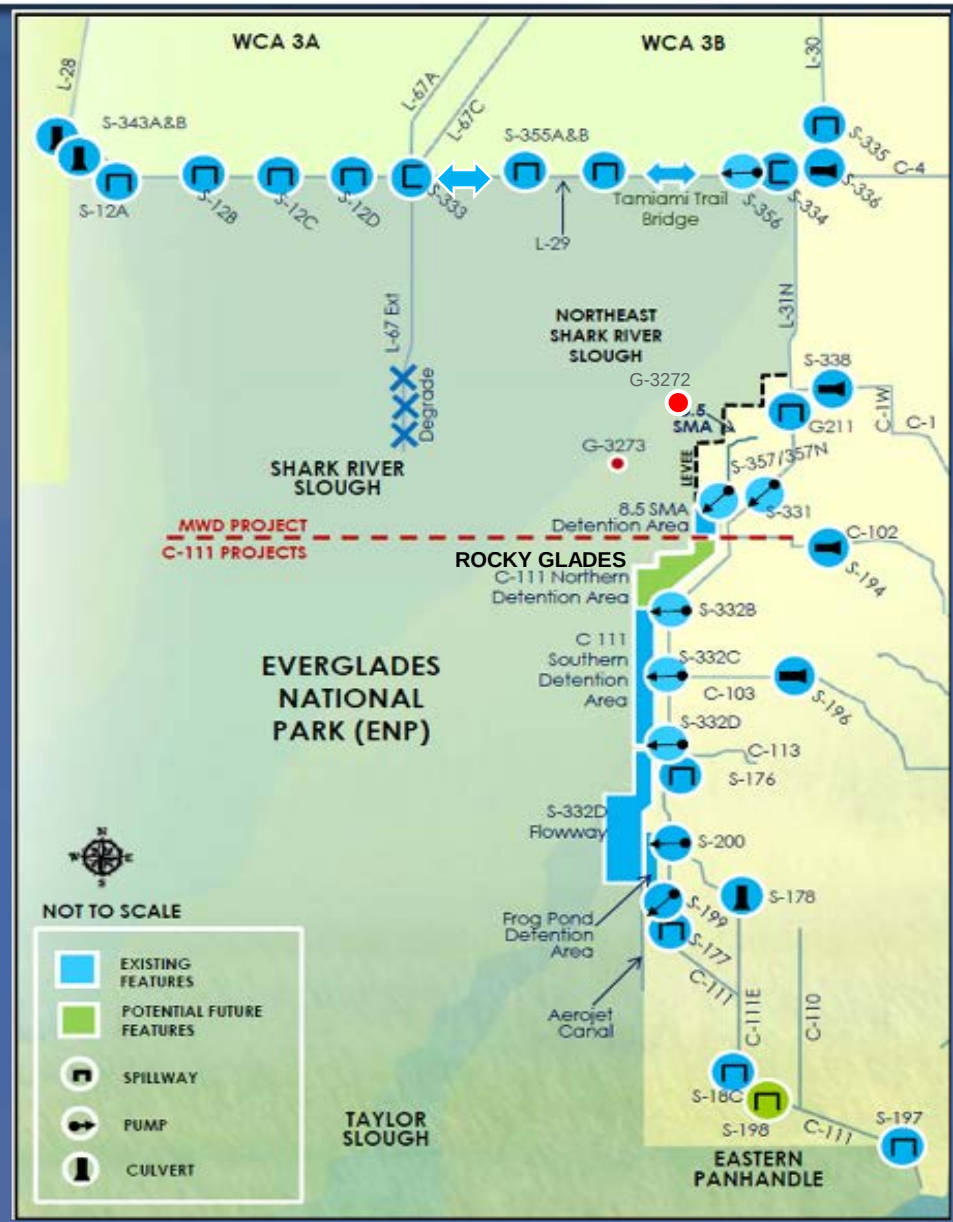


Combined Operating Plan - Considerations

- Water Quality Standards
  - Requirements and effects are considered
  - Uncertainty of how hydrologic improvements will effect compliance with Consent Decree Appendix A methodology
  - May impact ability to concur and fully implement water control plan

- Maintain multi-species objectives and comply with Biological Opinions from USFWS
  - 2016 Everglades Restoration Transition Plan
  - C-111 Spreader Canal Western Project

- Avoid or minimize adverse effects to cultural resources



Alternative Formulation and Evaluation

Modeling Tool - Regional Simulation Model Glades/Lower East Coast Service Area (RSM-GL)

Modeling Conditions

- Existing Conditions Base 2019
- Round 1 - Alternative K, Alternative L and Alternative N

Key Modeling assumptions for all Alternatives

- 2006 New Rainfall Formula to deliver water from WCA 3A to ENP
- L-29 Canal constraint of 8.5 feet NGVD

Key Modeling assumptions for Alternative K and Alternative N

- WCA 3A Regulation Schedule Changes
  - Limits drawdown at end of dry season in Zone E1 in WCA 3A
  - Includes Incremental Field Test Action Line and Extreme High Water Action Line to move WCA 3A water south through S-334

Other Information

- Experience and data gained from Incremental Field Tests, Emergency High Water Events, South Dade Study and Moving Water to Florida Bay Initiative are considered in the Alternatives

Combined Operating Plan - Alternative K

Increase water conveyed to Everglades National Park with downstream gauge constraint at G-3272 of 7.4 feet NGVD; incorporates seasonal and lower operations consistent with South Dade Study and Incremental Field Tests; S-197 utilized to maintain canal stages while supplying water to ENP Eastern Panhandle

- Revise bottom of WCA 3A regulation schedule and keep Increment 1 Action Line and Extreme High Water Action criteria for WCA 3A to move water south
- Constrain S-333 flows to L-29 Canal based on G-3272 gauge constraint of 7.4 feet NGVD in NESRS
- Raise S-331 operating range by 0.5 feet to 5.5 – 6.0 feet NGVD
- Seasonal operating ranges for S-332 pump stations from the South Dade Study
- Lower S-176 and S-177 operating ranges and allow for small downstream releases due to high rainfall
- S-199 and S-200 pump stations consistent with FDEP and USACE permits with current lower seasonal operating range
- Taylor Slough supplemental deliveries during October-February

- Utilize full range of S-197 operations

Combined Operating Plan - Alternative L

Increase water conveyed to Everglades National Park by eliminating use of S-334 Column 2 Operations, and provides S-356 with priority over S-333, retain majority of the ERTP 2012 operating ranges including fixed open and close criteria for structure operations

- No Increment 1 Action Line or Extreme High Water Action criteria for WCA 3A to move water south, no constraint on S-333 flows, no use of Column 2 Operations, and provide S-356 with priority over S-333
- S-331 operating range of 4.5 – 5.0 feet NGVD
- Taylor Slough Supplemental deliveries during October-February only
- S-200 and S-199 pump stations as per 2011 PIR with historic higher operating range
- Remaining pumps and structure criteria similar to current Water Control Plan (ERTP 2012) including S-197

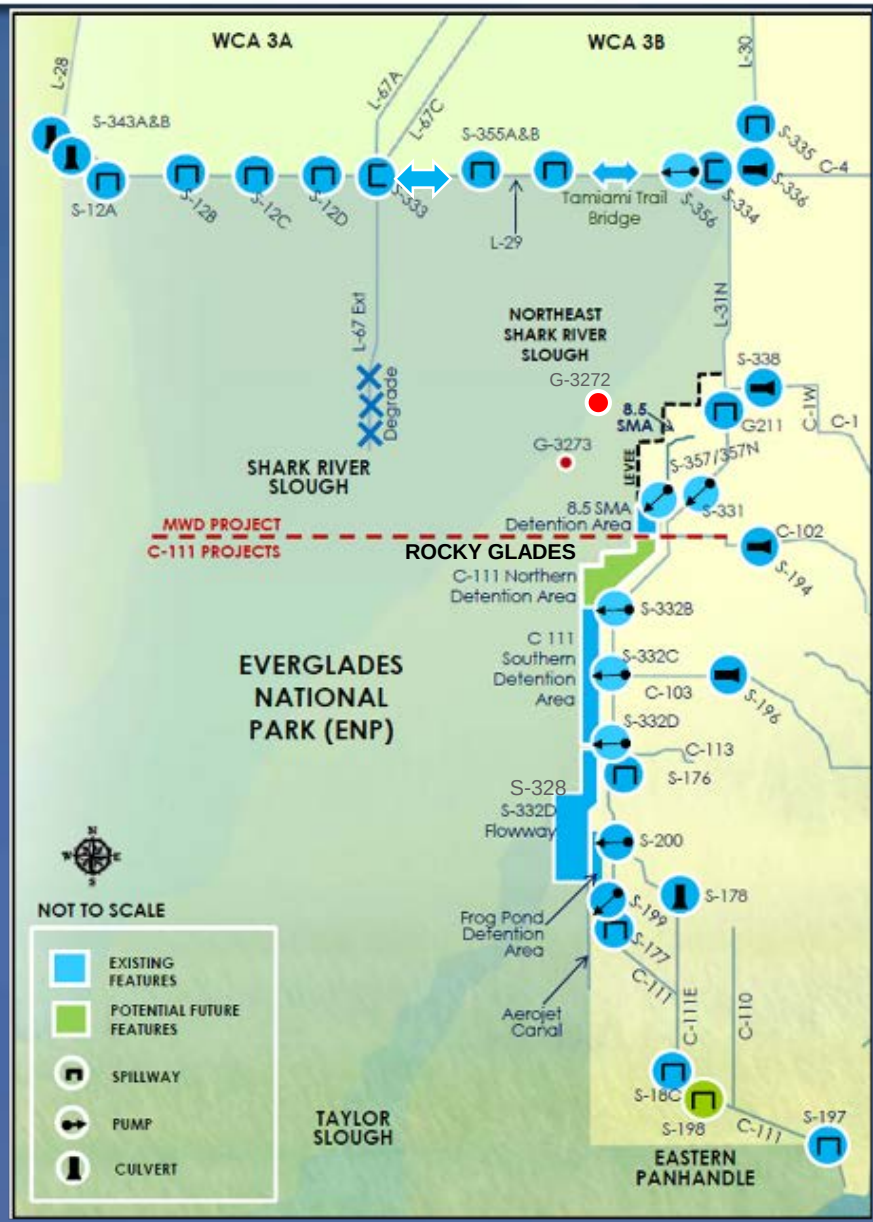
Combined Operating Plan - Alternative N

Increase water conveyed to Everglades National Park; partially incorporates the lower operations and high rainfall operations consistent with South Dade Study and Incremental Field Tests; S-197 flows limited to 400 cfs while water supplied to ENP Eastern Panhandle increased

- Revise WCA 3A bottom of regulation schedule (Zone E1) and keep Increment 1 Action Line and Extreme High Water Action criteria for WCA 3A to move water south
- Operational range for S-331 and S-357 as per Increment 2 Field Test (5.0 to 5.5 Feet NGVD)
- S-176 and S-177 Operating Range consistent with Water Control Plan (ERTP 2012), but allow lower range due to high rainfall
- S-199 and S-200 pump stations consistent with FDEP and USACE permits with current lower seasonal operating range
- Taylor Slough supplemental delivery limited to November - December as in the as Existing Conditions Baseline 2019
- S-197 criteria similar to current Water Control Plan (ERTP 2012) but limited to 400 cfs only

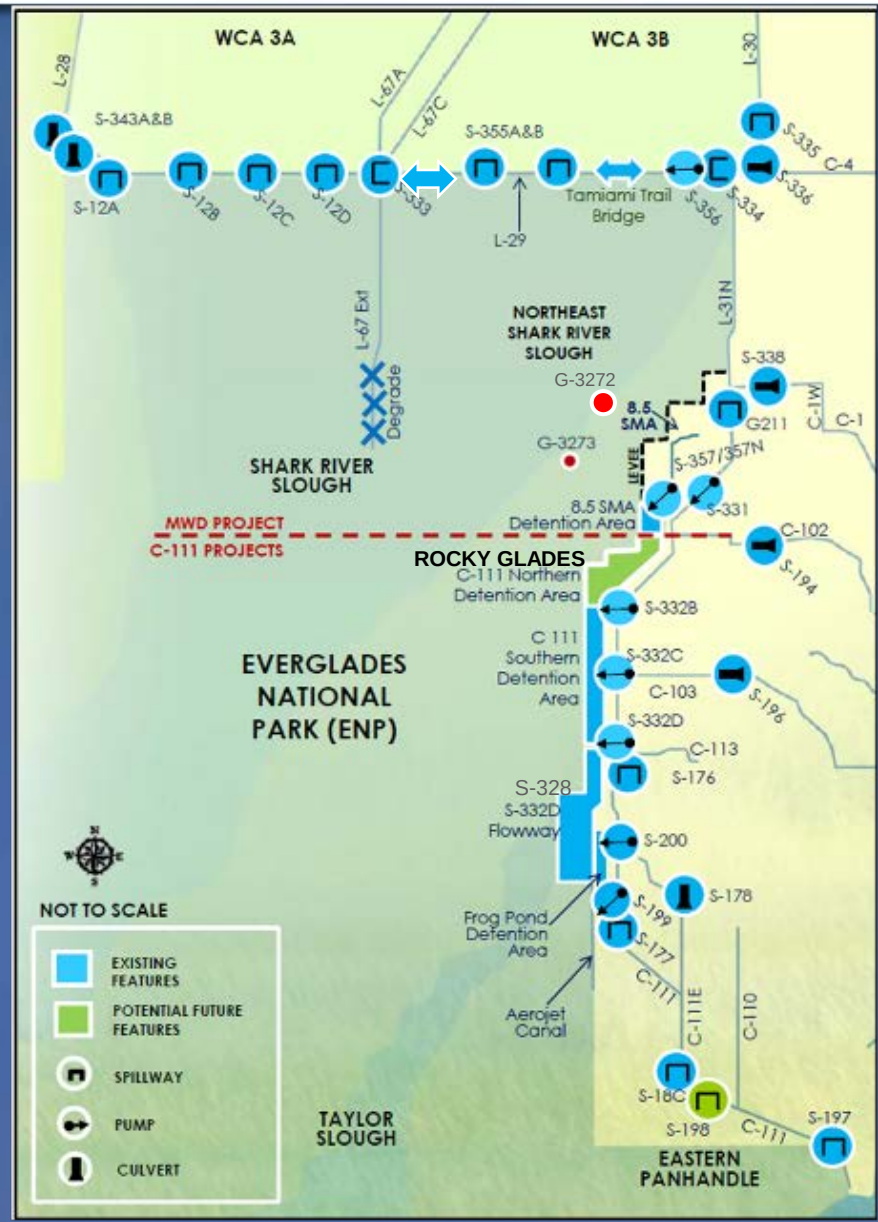
Flows to Everglades National Park

	Average Annual Flows (1,000 acre-feet) Everglades National Park			
	ECB19R	Alt K	Alt L	Alt N
Flows to ENP across Tamiami Trail	571	594	737	762
Percent Flow West and East of the L-67 Extension	40% 60%	45% 55%	25% 75%	21% 79%



Flows to Taylor Slough and Eastern Florida Bay

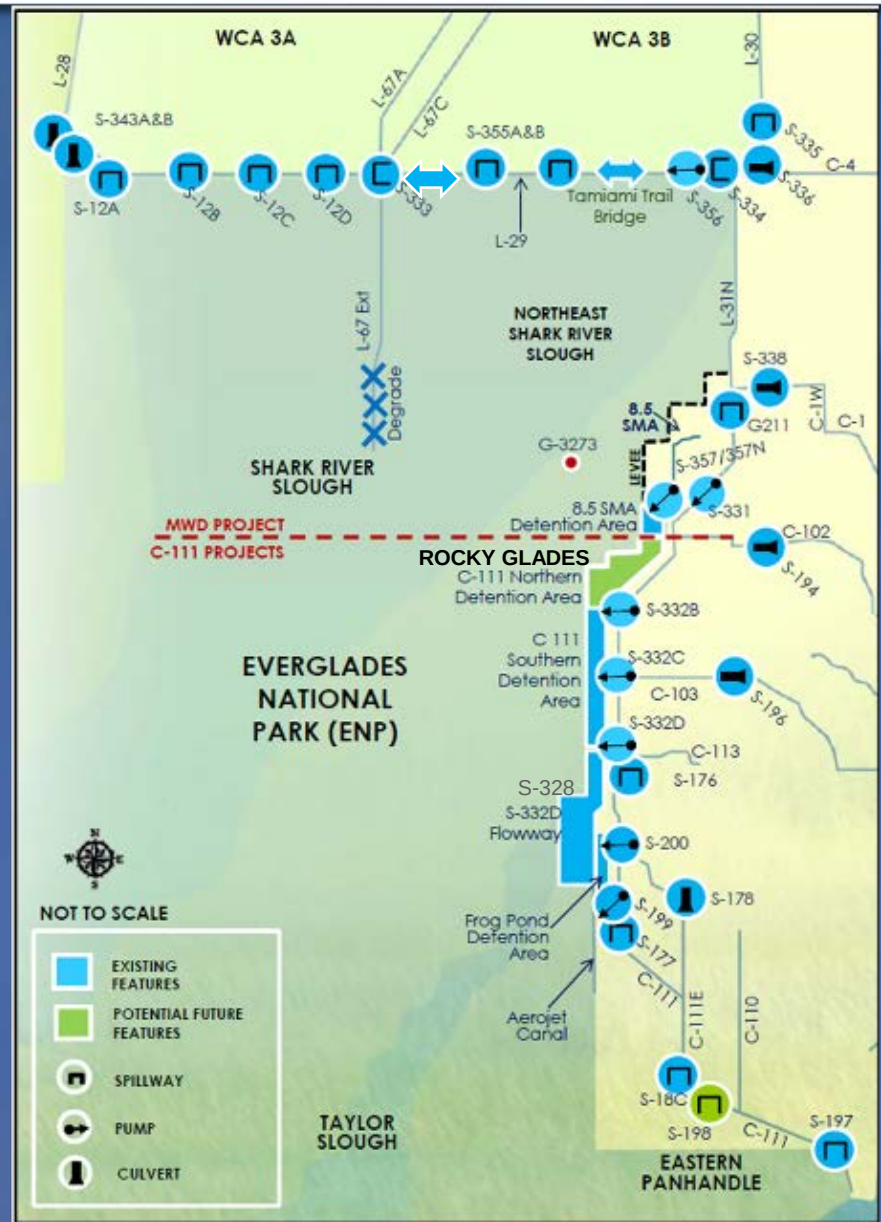
	Average Annual Flows (1,000 acre-feet) Taylor Slough Headwaters and Eastern Florida Bay			
	ECB19R	Alt K	Alt L	Alt N
Flows towards Taylor Slough Headwaters	21	10	17	20
Flows towards Eastern portion of Florida Bay	88	68	78	86



Flows to Eastern Panhandle, Manatee Bay and Barnes Sound

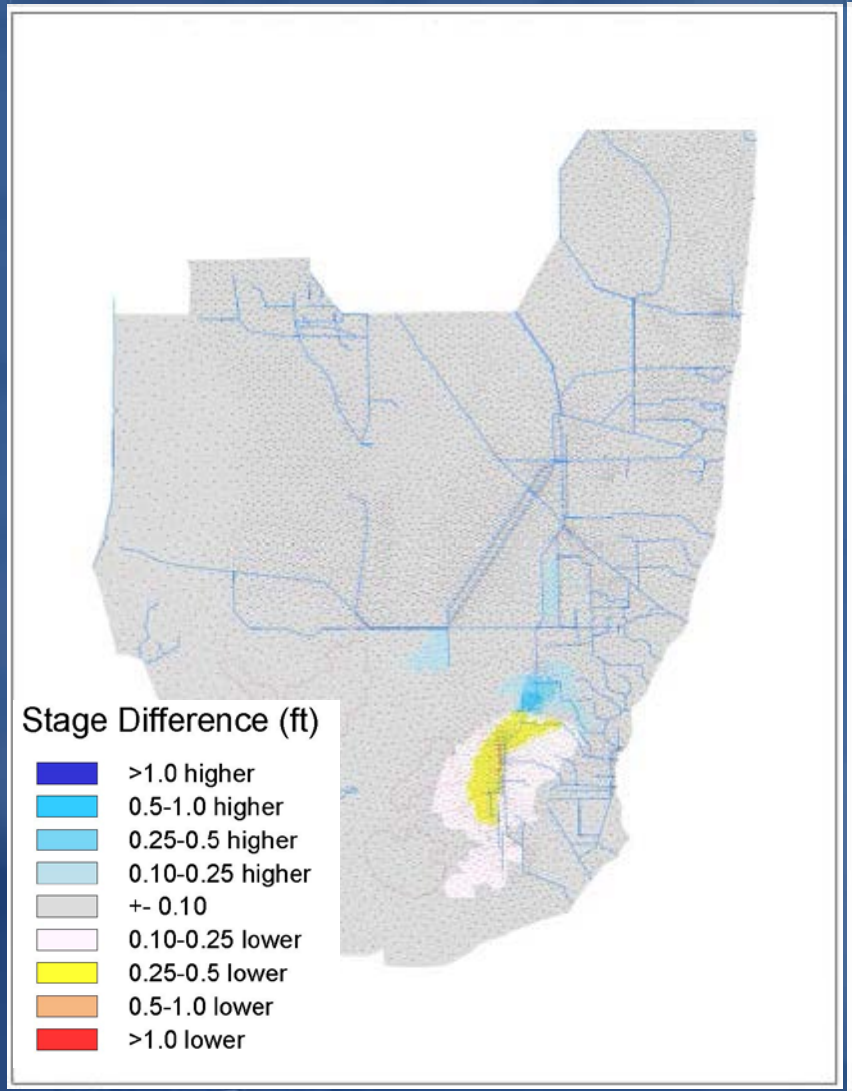
	Average Annual Flows (1,000 acre-feet) Eastern Panhandle, Manatee Bay and Barnes Sound			
	ECB19R	Alt K	Alt L	Alt N
Flows to Eastern Panhandle of ENP (over C-111 bank)	78	78	85	107
Flows to Manatee Bay and Barnes Sound via S-197*	61	28	11	8

* Less is better

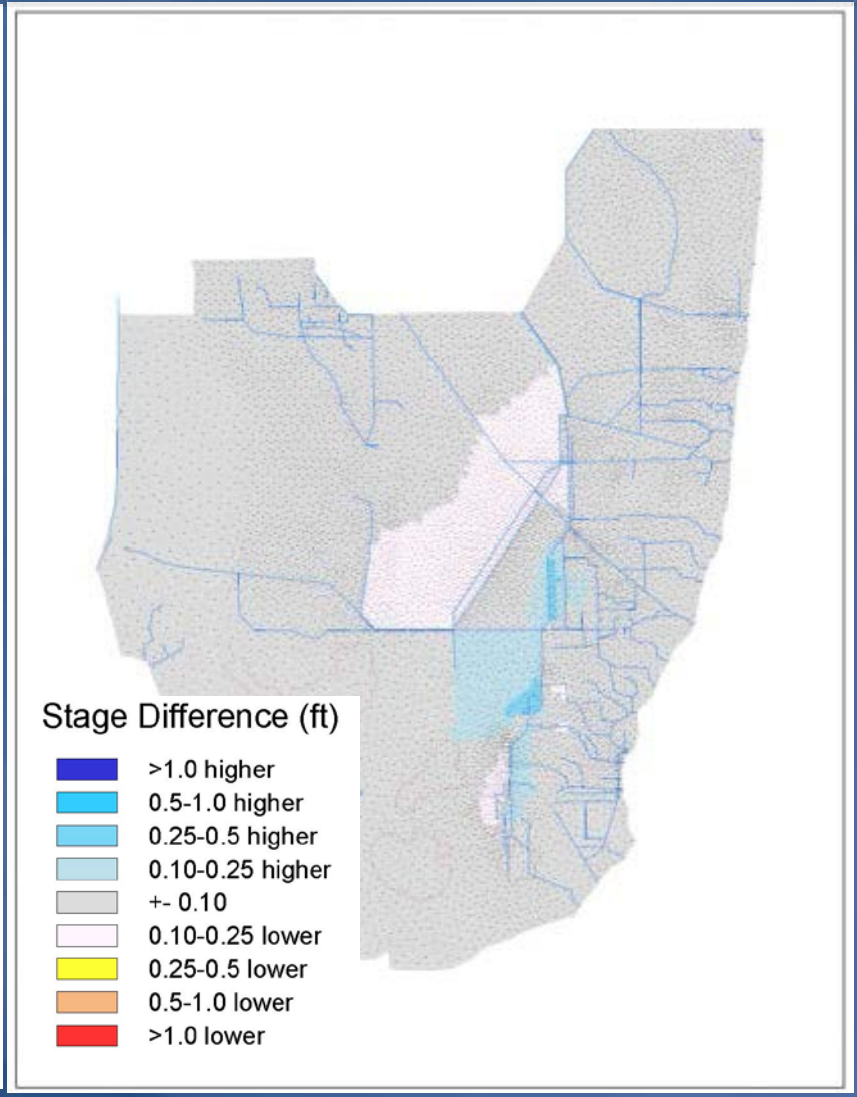


Average Annual Stage Difference Maps 1965 - 2005

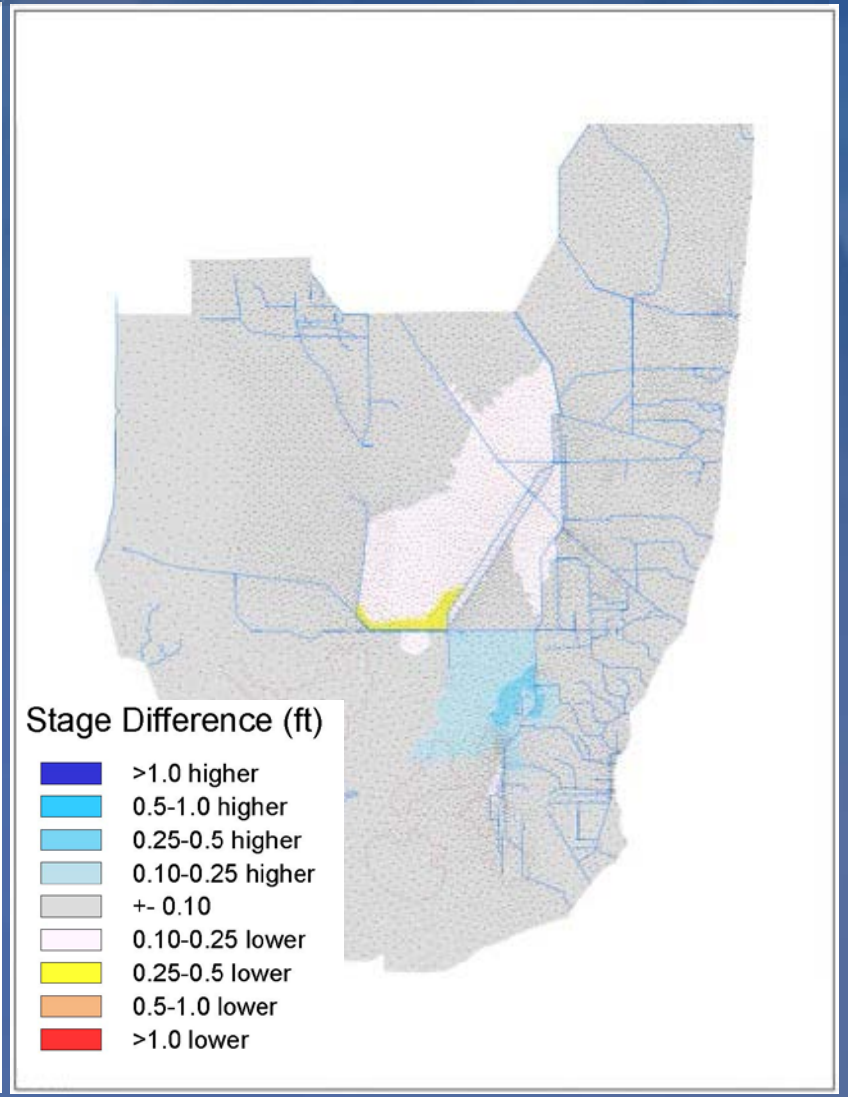
Alternative K



Alternative L

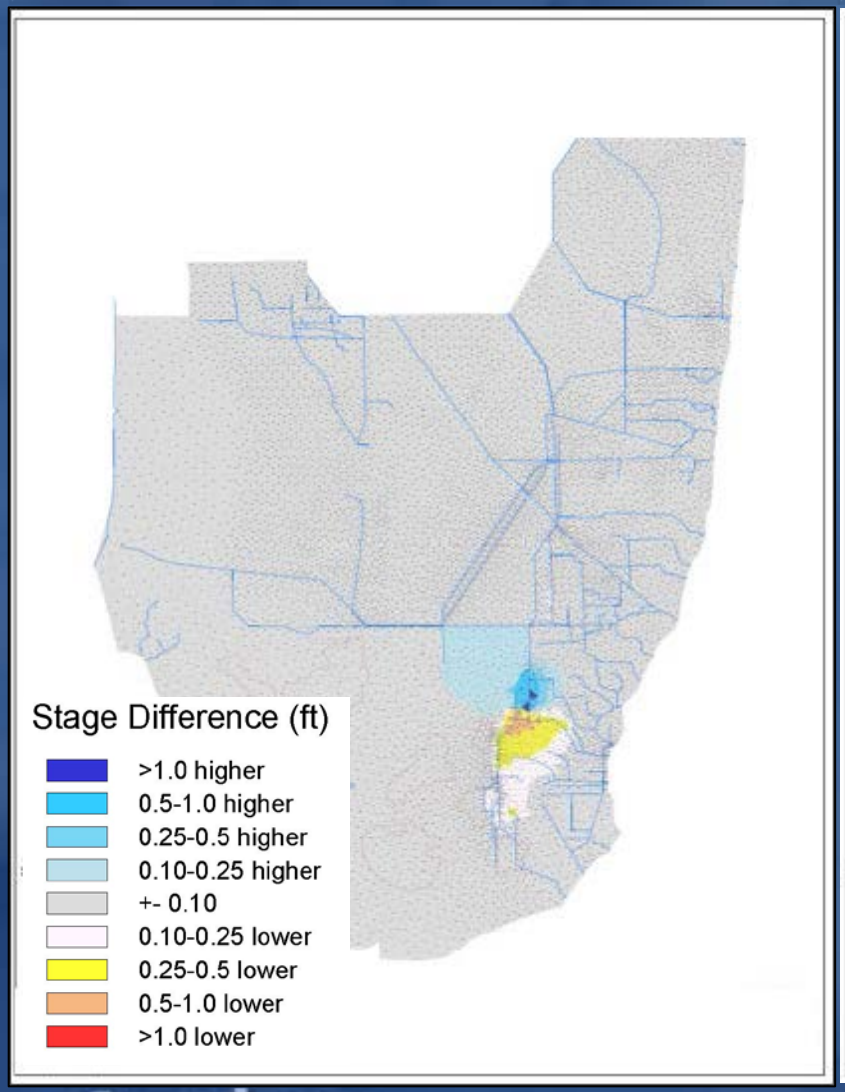


Alternative N

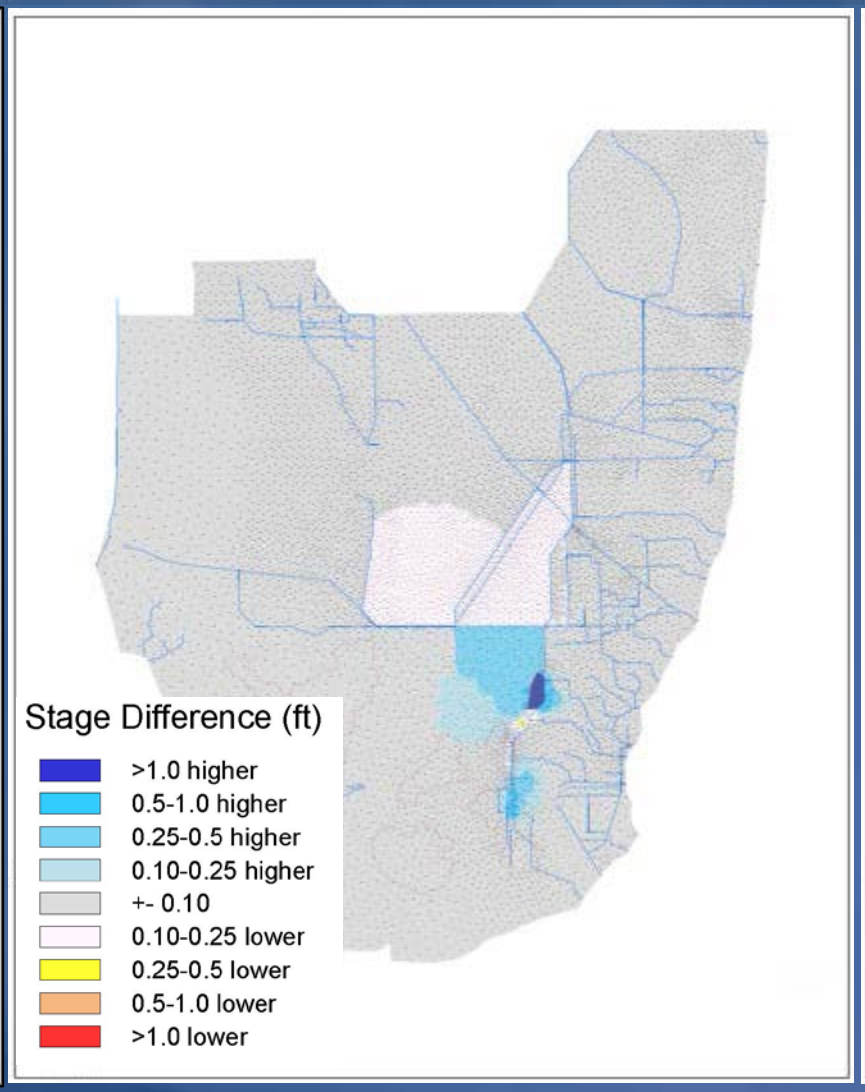


Average Stage Difference Maps October 1995

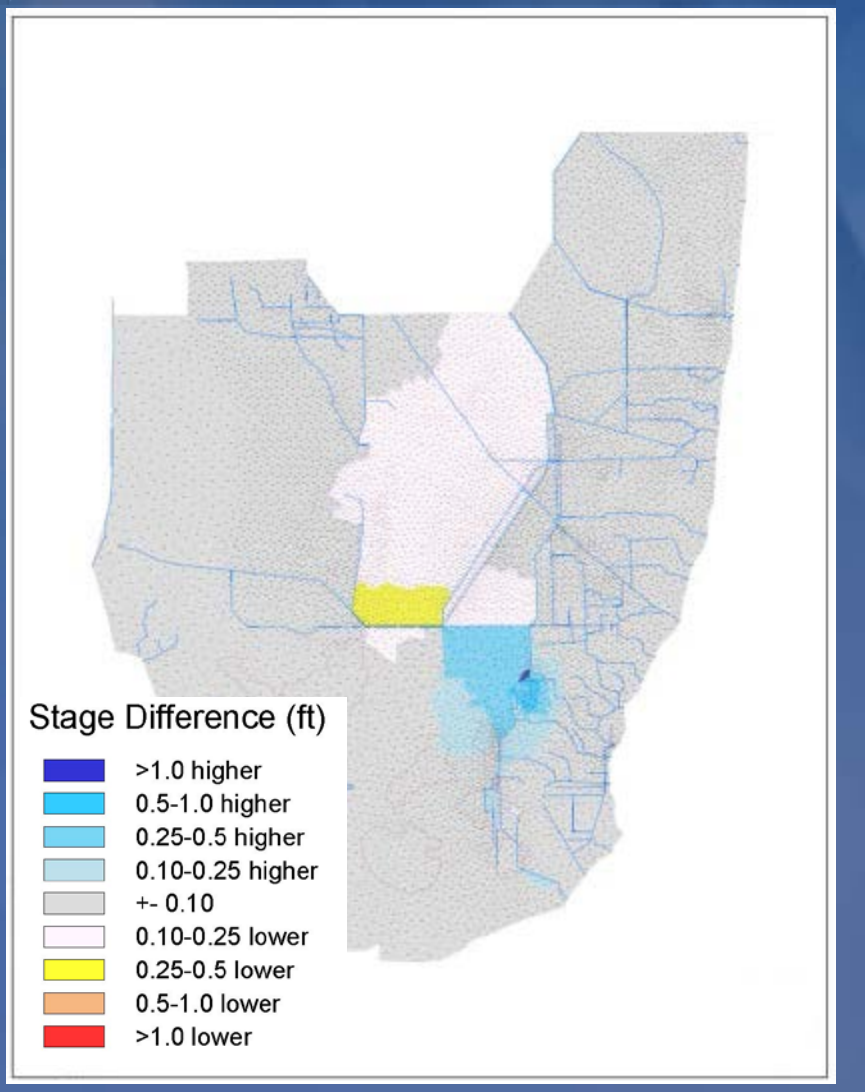
Alternative K



Alternative L

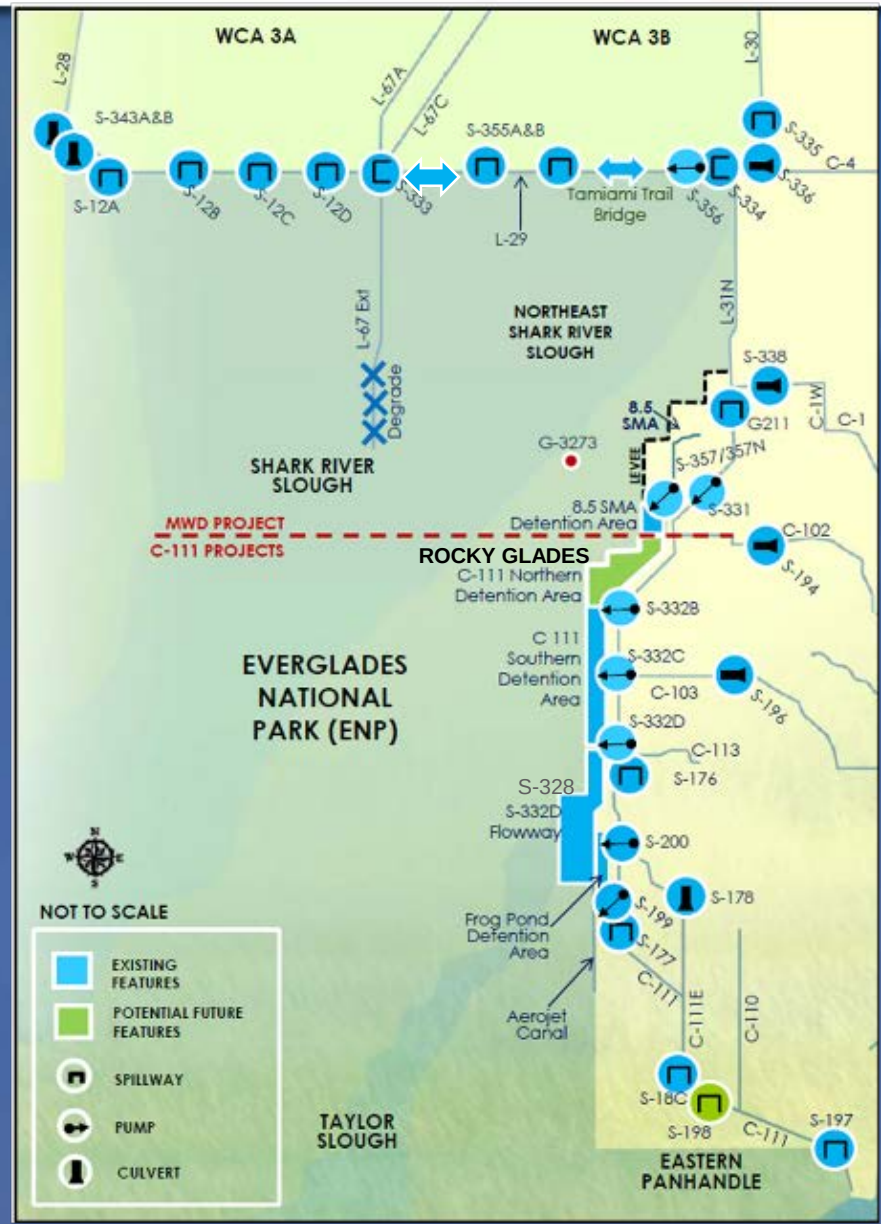


Alternative N



Water Supply

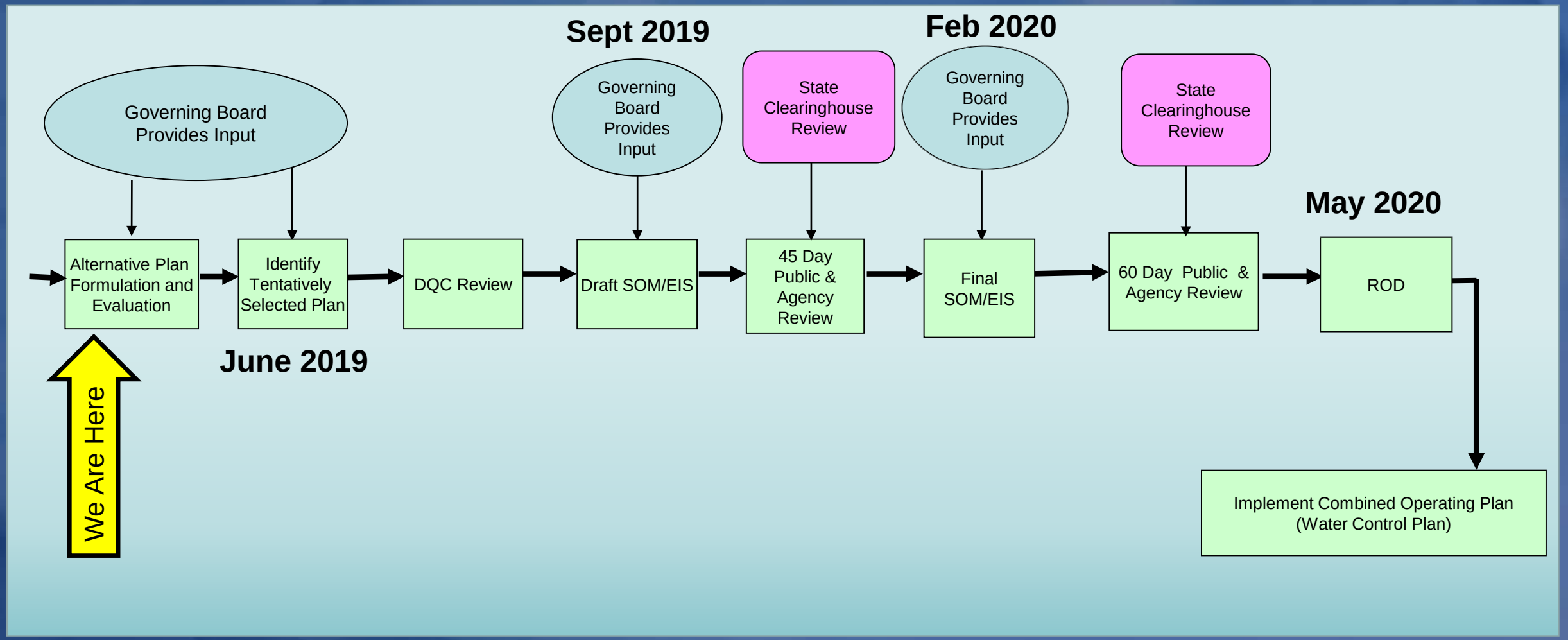
- When increasing water flows to Everglades National Park, WCA 3A stages decrease. There is a potential increased risk to water supplies for urban and agriculture users.
- The project team is aware of this potential and will be seeking a balance between water supply and the environment during the next round of alternatives.



Next Steps

Finalize evaluation of Round 1 Alternatives (Alt K, Alt L and Alt N)	Aug 2018
Identify Round 2 Alternatives	Aug 2018
Round 2 Modeling of Alternatives Complete	Oct 2018
Evaluation of Round 2 Alternatives Complete	Dec 2018
Identification and optimization of the Round 3 Alternative Complete	Feb 2019
Identify Preliminary Tentatively Selected Plan	Jun 2019
Release Draft Integrated System Operating Manual and Environmental Impact Statement for Public and Agency Review	Sep 2019
Release Final Integrated System Operating Manual and Environmental Impact Statement for Public and Agency Review	Feb 2020
USACE Record of Decision	May 2020

State Input and Decision Points During Federal Process



Project Risks and Uncertainties

Water Quality Compliance

Flood Protection

Water Supply

Water to Florida Bay

Combined Operational Plan

Discussion