

BISCAYNE BAY AND SOUTHEASTERN EVERGLADES ECOSYSTEM RESTORATION (BBSEER):

Florida's Coral Reef Coordination Team Meeting
November 29, 2023

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Robert Kirby, Biologist
Jacksonville District



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of Engineers





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Overview



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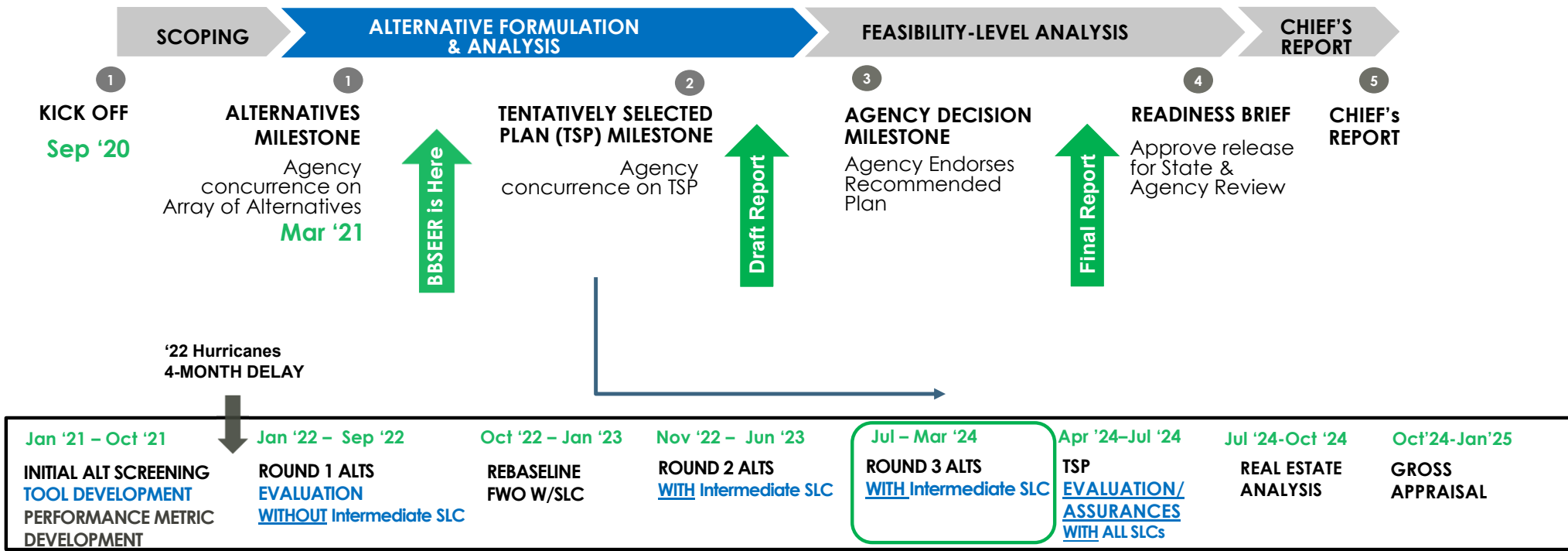
- Schedule
- Existing Conditions and Future without Project
- Project Objectives
- Alternatives Development
- Habitat Units
- Water Quality
- Next Steps, Discussion, Questions, Involvement



BBSEER SCHEDULE



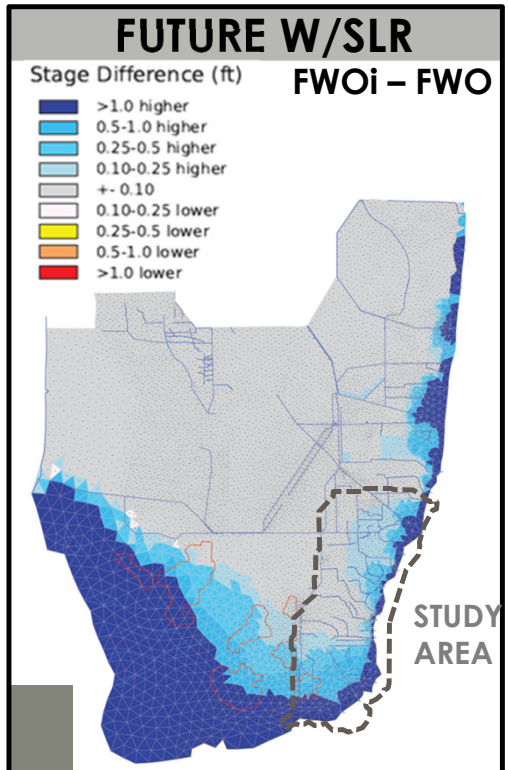
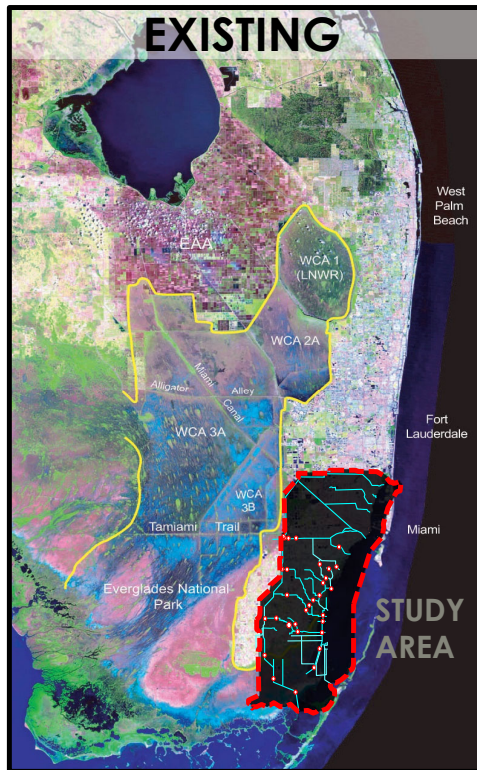
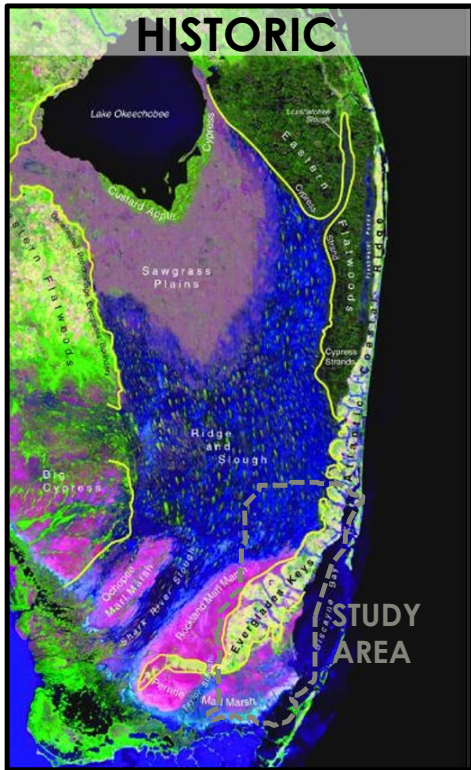
SMART PLANNING PROCESS





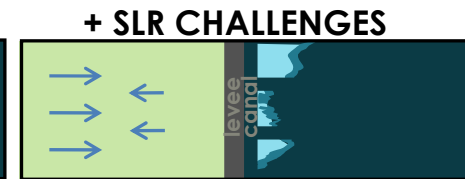
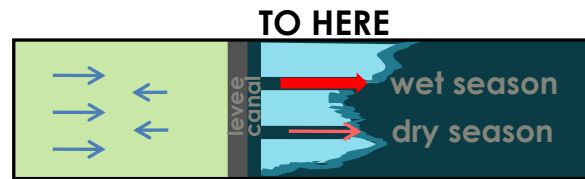
CONDITIONS

HISTORIC, EXISTING, FUTURE WITHOUT PROJECT



MODIFIED FLOWS

- Freshwater Wetlands
- Coastal Wetlands
- Nearshore





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EXISTING CONDITIONS: HABITAT AT RISK DESCRIPTIONS AND OPTIMAL SURFACE SALINITIES (PSU)

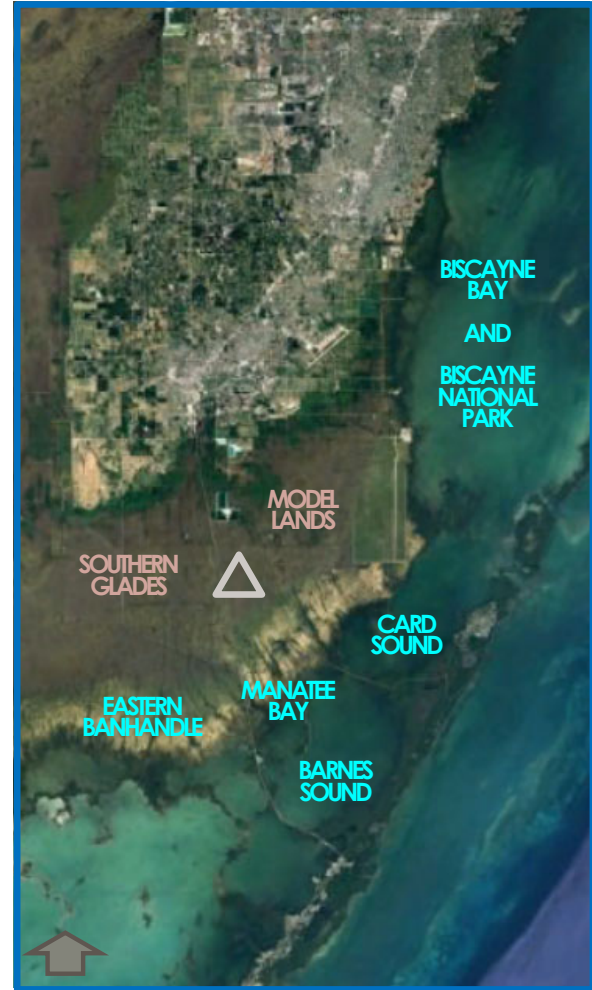


0 PSU

5-15 PSU

5-18 PSU

TERRESTRIAL Freshwater Wetlands	INTERTIDAL Coastal Wetlands	SUB-TIDAL Waterward of Low Tide Line
<ul style="list-style-type: none"> - Sawgrass - - Muhly Grass - <p style="text-align: center;">UPLAND</p>	<ul style="list-style-type: none"> - Mangrove - (Red, Black, White) <p style="text-align: center;">NEARSHORE (WATERWARD TO DEPTH OF 10 METERS)</p>	<ul style="list-style-type: none"> - Seagrasses - (Shoal, Turtle, Widgeon)
<p>INSET MAP Southern Glades and Model Lands (includes the "triangle")</p>	<p>INSET MAP Biscayne Bay, Biscayne National Park, Manatee Bay, Card Sound, Barnes Sound, Eastern Panhandle</p>	





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PROJECT OBJECTIVES

1) RESTORE SALINITY REGIMES, MINIMIZE UNNATURAL CANAL RELEASES:

Improve quantity, timing, and distribution of freshwater to estuarine and nearshore subtidal areas, including mangrove and seagrass areas (500-meter zone).

2) FRESHWATER WETLAND WATER DEPTH, PONDING DURATION AND FLOW TIMING:

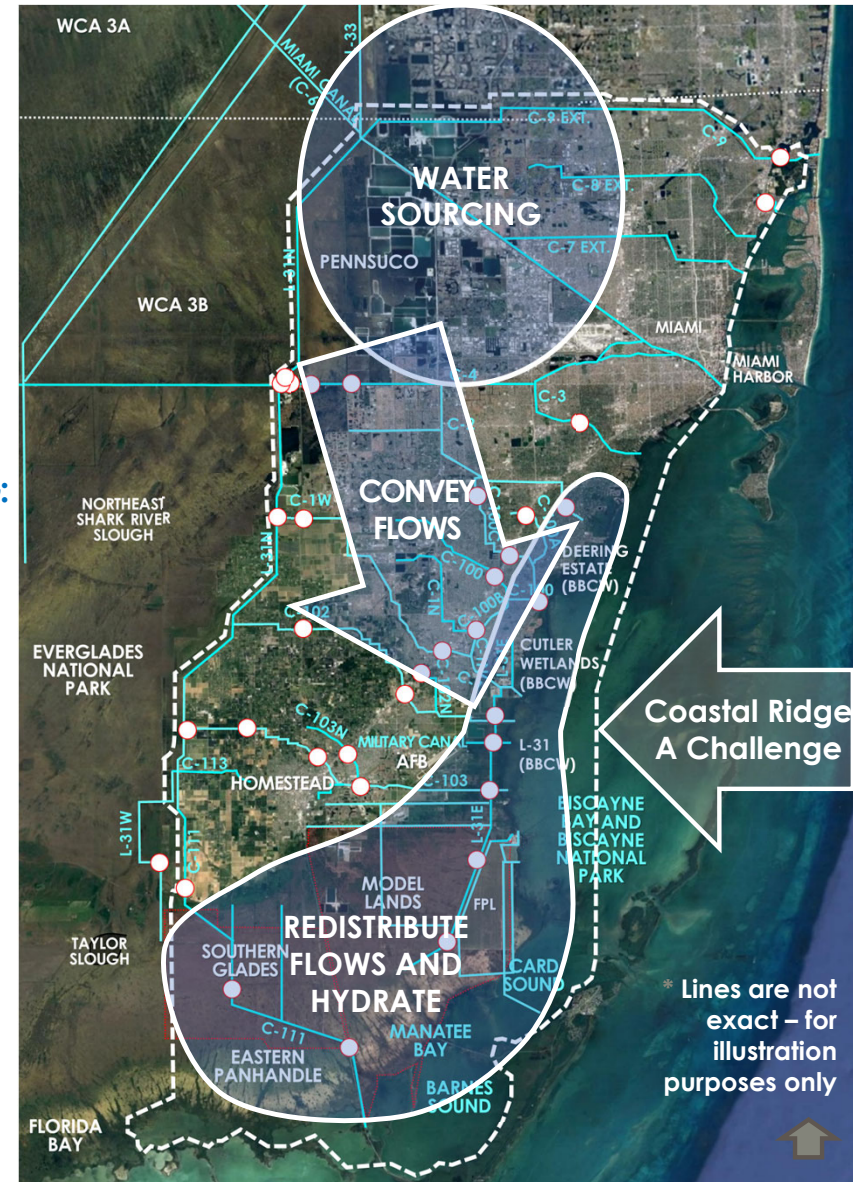
Restore freshwater depths, hydroperiods, and flows, for dry and wet seasons in terrestrial wetlands.

3) RESTORE NATURAL ECOLOGICAL AND HYDROLOGICAL CONNECTIVITY:

Restore connectivity and habitat gradients in areas compartmentalized by federal and state canal systems in Southern Everglades, Model Lands, Biscayne Bay Coastal Wetlands.

4) SEA LEVEL CHANGE RESILIENCY:

Increase and restore ecological resilience in coastal habitats in southeastern Miami-Dade County.





ALTERNATIVES DEVELOPMENT

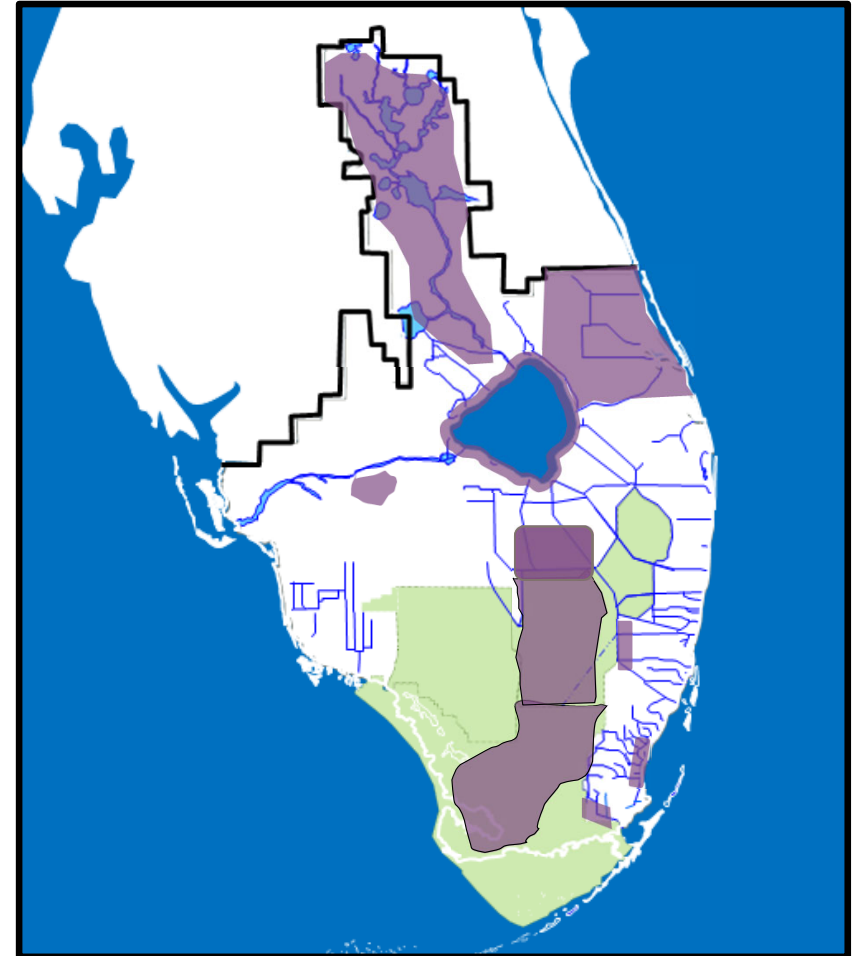
For Information



KEY SYSTEM CHANGES FROM ECB22 TO FWO/FWOI

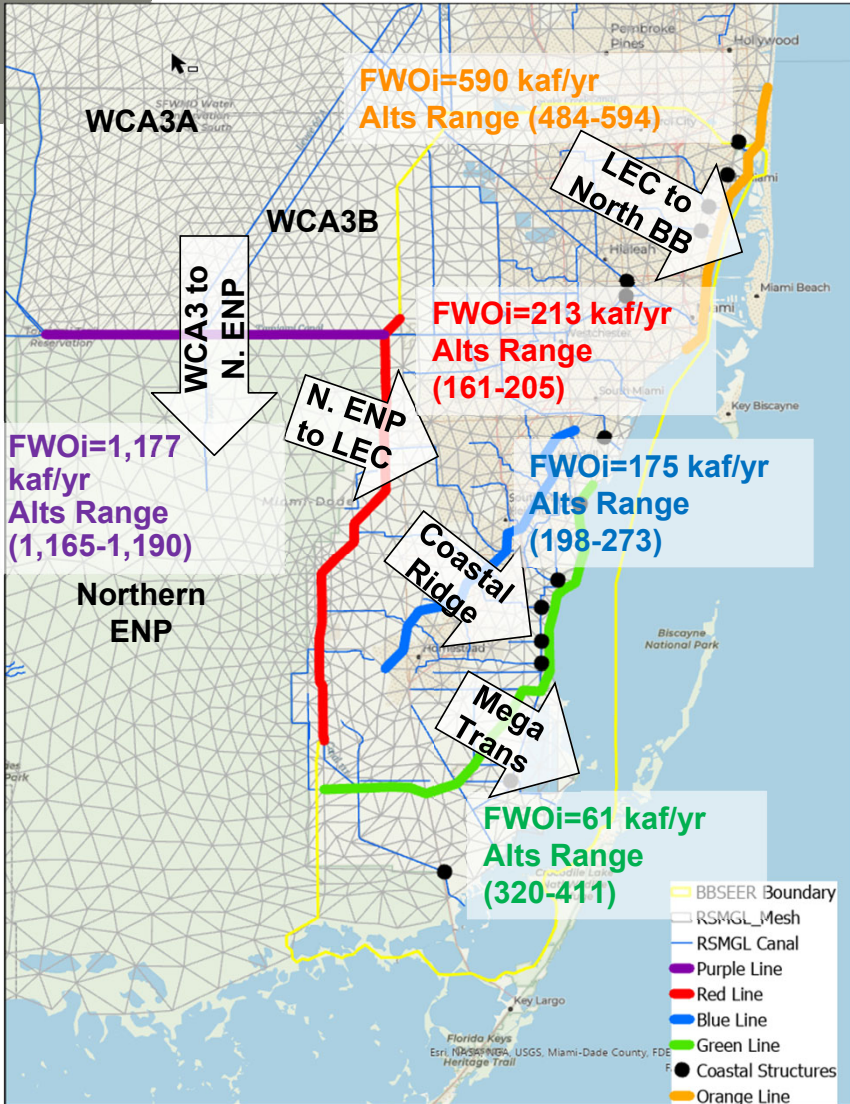


- Kissimmee Headwaters Revitalization
- Lake Okeechobee Regulation Schedule
- Indian River Lagoon-South
- C-43 Reservoir
- Everglades Agricultural Area Reservoir and A2 STA
- Central Everglades Project Features in the Greater Everglades
- Other 1st and 2nd Generation CERP and Foundation Projects
- C111 Spreader Canal W Phase 1
- BBCW Phase 1





HOW MUCH WATER AND WHERE?



“Purple Line” WCA3 to Northern ENP

Baselines show increases of flows into Northern ENP and Round 2 alternatives do not significantly alter flows from WCA3 to ENP relative to FWOi, all are within $\pm 1\%$.

“Red Line” Northern ENP to Lower East Coast Area (LEC)

Net Flows from Northern ENP to LEC increase progressively from ECB22 → FWO → FWOi. Round 2 Alts reduce net flows from Northern ENP to LEC relative to FWOi.

“Blue Line” Coastal Ridge (CRBB)

Annual average and Dry Season regional deliveries improve for all Alts across the CRBB transect and conveyance system.

“Green Line” BBSEER Mega Transect

All Round 2 Alts improve seasonal timing and Dry Season carryover of flows relative to baselines. All Round 2 Alts help reduce SLC effects and promote resilience to SLC.

“Orange Line” North Bay

North Bay sees improved flow reduction for Round 2 Alts with NW storage measures.

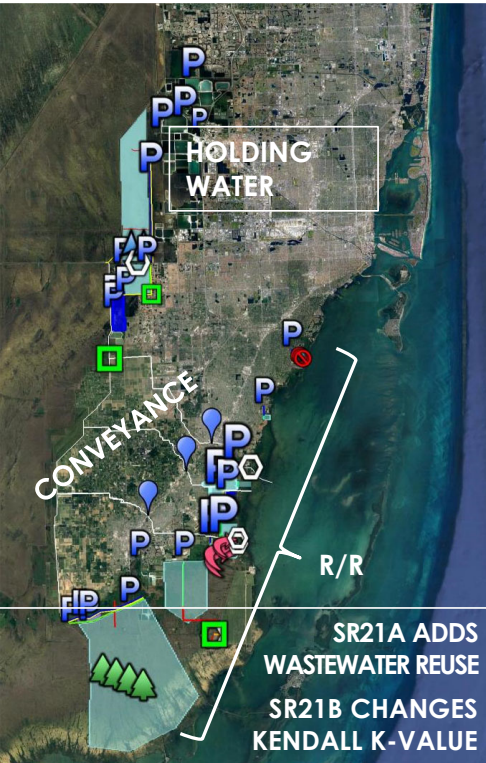
“Coastal Structures”

BBSEER Coastal Wetlands measure have multiple benefits; honor intent of Ag Drawdown operations, reduce total volume released to tide, limit excess flows (>235cfs), and redistributing flows for rehydrating wetlands.

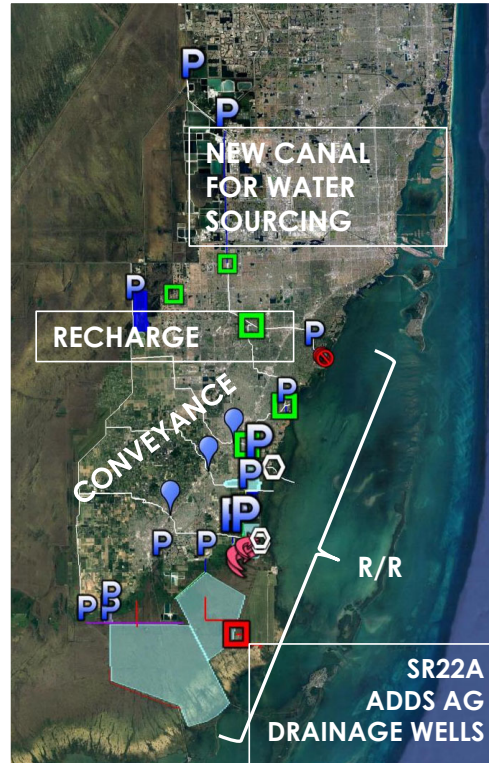


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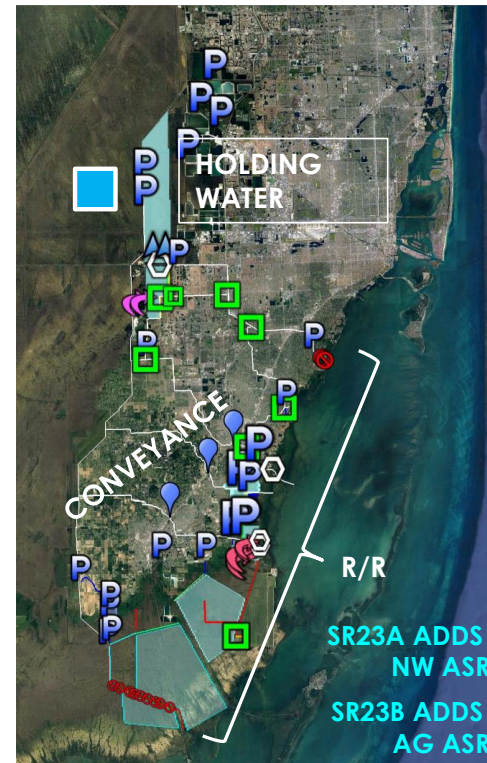
ALTERNATIVES



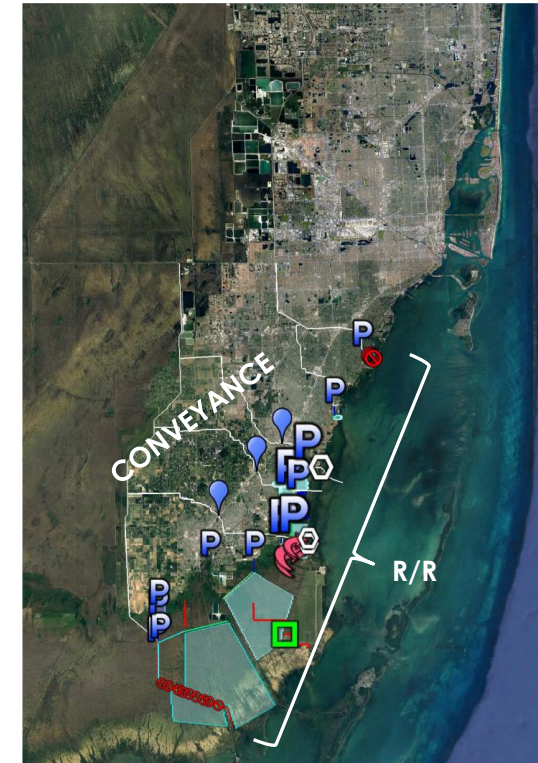
ALTERNATIVE 21



ALTERNATIVE 22



ALTERNATIVE 23



ALTERNATIVE 24

PRIMARY MEASURES/THEMES

HOLDING WATER: NORTHWESTERN WETLANDS AND STORAGE

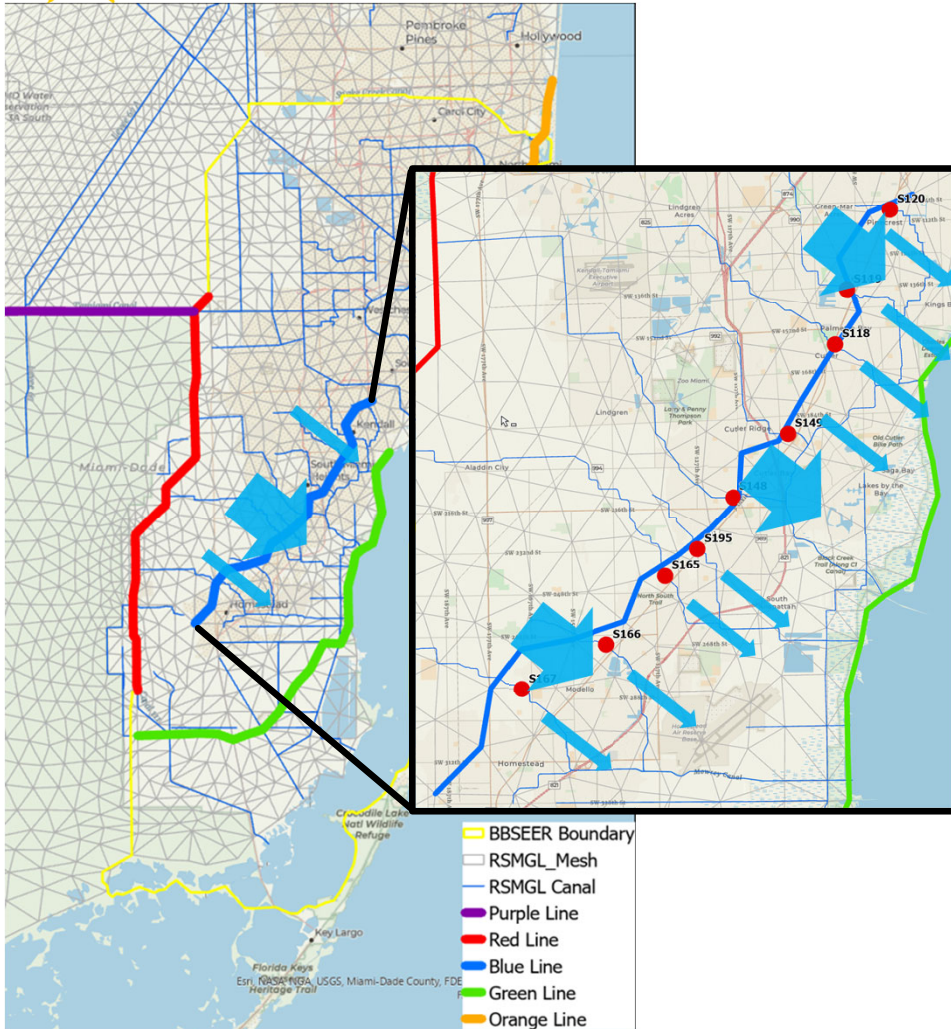
NEW CANAL FOR WATER SOURCING

CONVEYANCE CANALS (EXISTING) + OPERATIONAL CHANGES

REDISTRIBUTION AND REHYDRATION (INCLUDING PUMPS)



★ ROUND 2 ALTERNATIVES HYDROLOGY



“Blue Line” CRBB

- Groundwater Across Coastal Ridge
- Conveyance/Structure Flow

Total Flow = CRBB Groundwater + Structure Flow

Average Dry Season

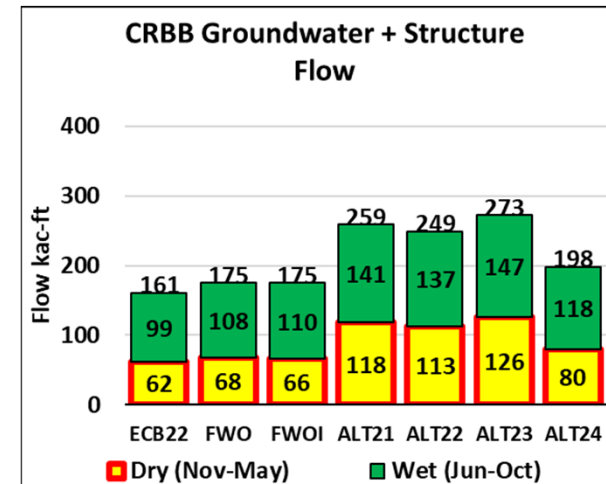
FWOi = 66 kacft/yr (+1.6ft SLC)

FWO = 68 kacft/yr

ECB22 = 62 kacft/yr

Round 2 Alts range 80 – 126 kacft/yr (+1.6ft SLC), which is a range of **+21% to +91%**, respectively, relative to FWOi.

- Dry Season regional deliveries are improved for all Round 2 Alts
- Alt 24 with no NW measures shows the least improvement



ROUND 3 – PATH TO A TSP

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What key features and themes do we want in our Tentatively Selected Plan?

- Water Sourcing from the Northwest Area.
- Optimize water volumes across the Coastal Ridge.
- Maximum conveyance flexibility.
- Store and rehydrate the largest extent of BBSEER target footprint.

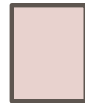
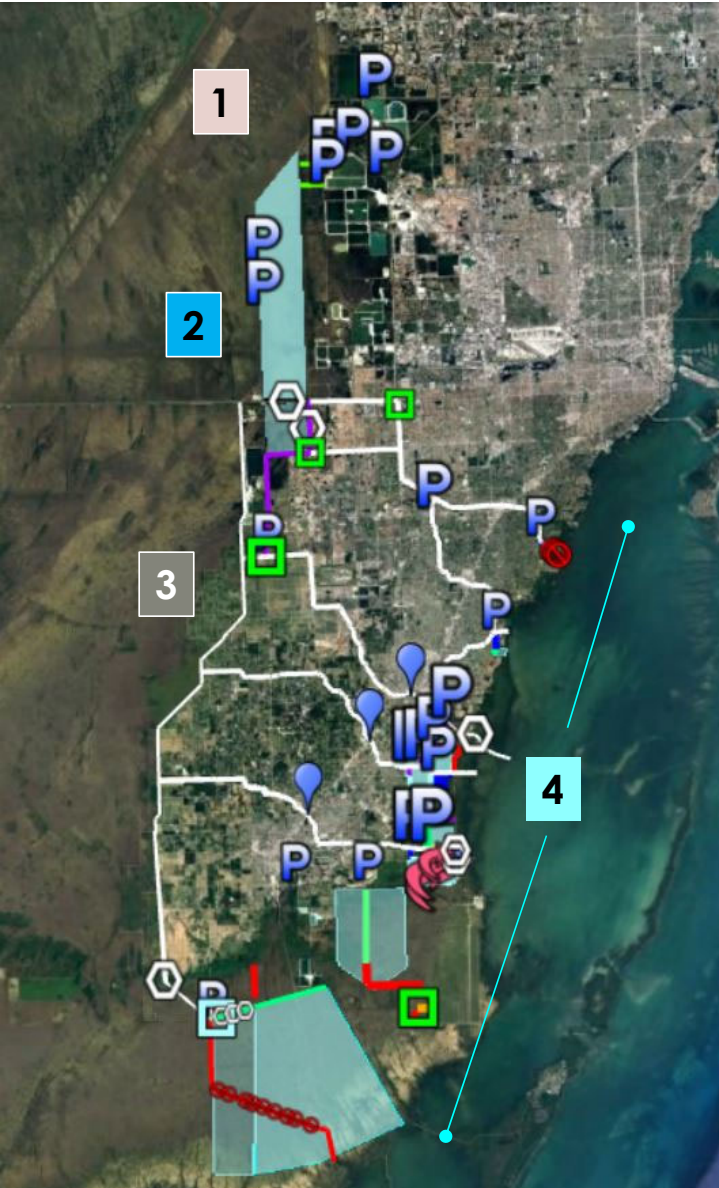


Round 3 Alternatives developed to compare the best performers for benefits.



ALTERNATIVE 31

PRIMARY FEATURES



1) WATER SOURCING



2) HOLDING WATER: NORTHWESTERN WETLANDS AND STORAGE



3) CONVEYANCE (EXISTING CANALS)
AND OPERATIONAL CHANGES IN CONVEYANCE CANALS



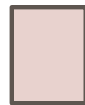
4) REDISTRIBUTION AND HYDRATION (INCLUDING USE OF PUMPS)

FEATURES	YB	31	32
POTENTIAL WATER SOURCING FROM BCWPA, C-9, C-6, AND C-4	✓	✓	✓
HOLDING WATER: NORTHWESTERN WETLANDS FLOW-THROUGH	✓	✓	
CONVEYANCE AND OPERATIONAL CHANGES	✓	✓	✓
HYDRATION AND REDISTRIBUTION	✓	✓	✓



ALTERNATIVE 32

PRIMARY FEATURES



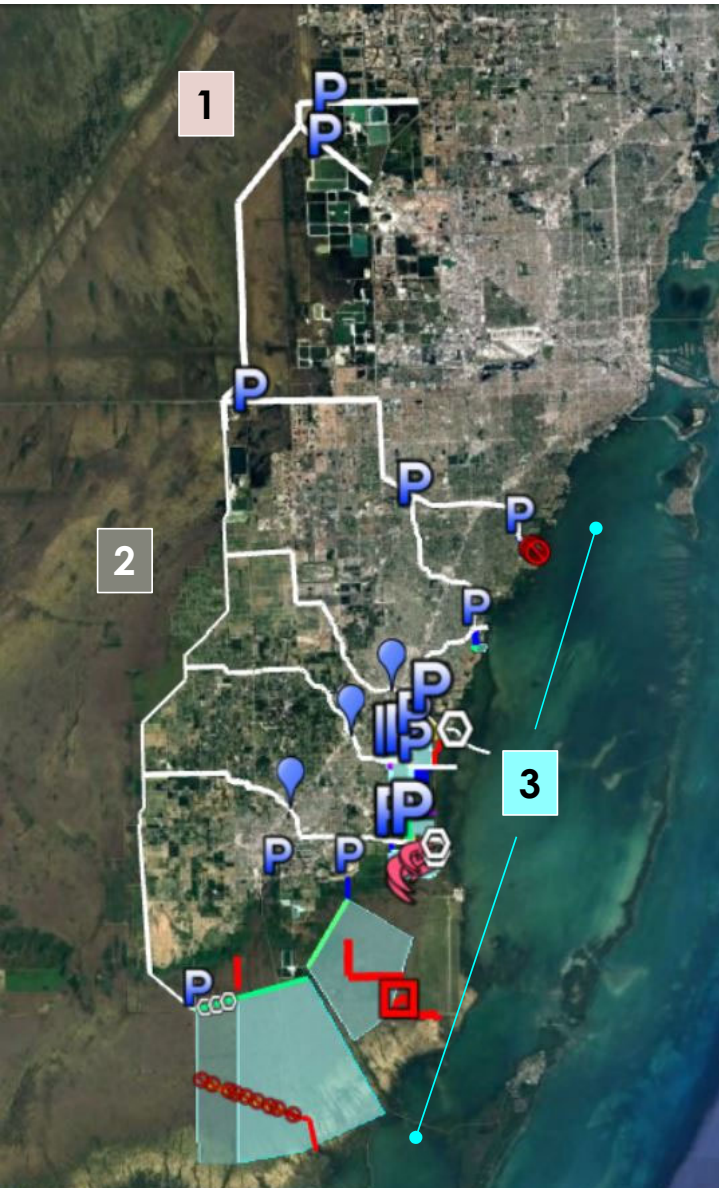
1) WATER SOURCING



2) CONVEYANCE (EXISTING CANALS)
AND OPERATIONAL CHANGES IN CONVEYANCE CANALS



3) REDISTRIBUTION AND HYDRATION (INCLUDING USE OF PUMPS)



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HOLDING WATER: NORTHWESTERN WETLANDS FLOW-THROUGH	✓	✓	
CONVEYANCE AND OPERATIONAL CHANGES	✓	✓	✓
HYDRATION AND REDISTRIBUTION	✓	✓	✓



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ROUND 3: NORTHWEST



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Major Differences:

- ALT31 uses the Lake Belt and Pennsuco as flow-through.
- ALT31 adds a lined connection from C-4 Canal to C-1W Canal.
- ALT31 uses Bird Drive Basin footprint as an outfall for peak flows that would otherwise go tide.

Answering the Questions:

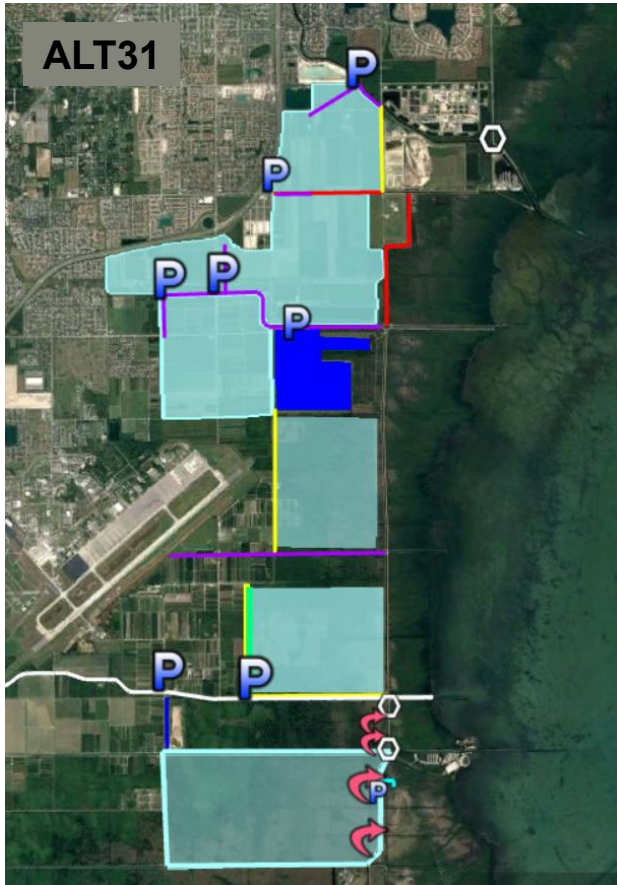
- Does use of Lake Belt and Pennsuco provide additional volumes and dry season carryover?
- Does an additional canal provide more capacity to the south, or is the downstream still capacity limited?
- How often would Bird Drive be utilized as an outfall?





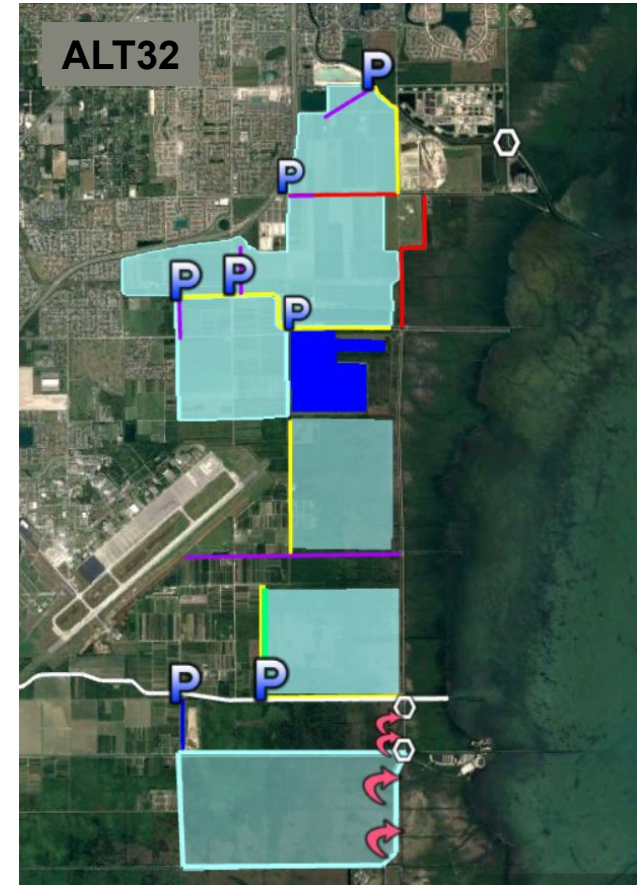
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ROUND 3: COASTAL WETLANDS



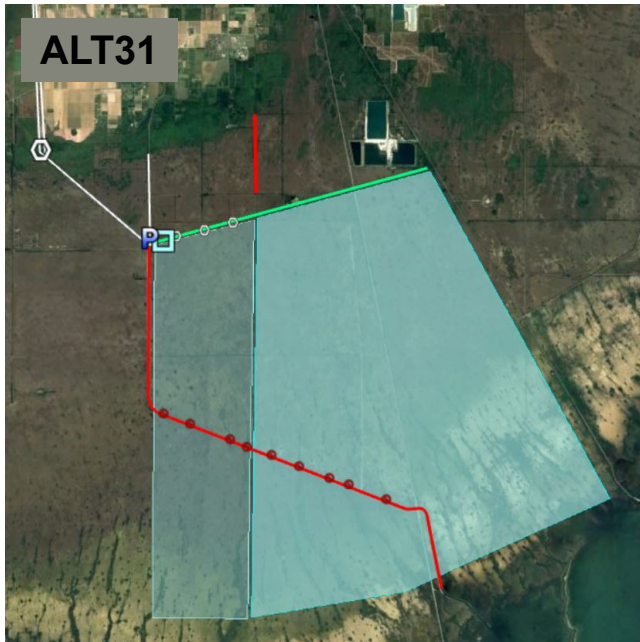
- Major Differences:**
- ALT31 uses curtain walls as seepage management adjacent to WPA footprints where ALT32 lines portions of the C-1 and C-102 Canals as seepage management.
 - ALT31 explores use of a pump and micro-tunnel in the Florida City Canal wetlands to move water from west to east.

- Answering the Questions:**
- Which seepage management option reduces the recirculated pumping from canal to WPA most efficiently.
 - What is the most efficient way to get water across L-31E corridor?



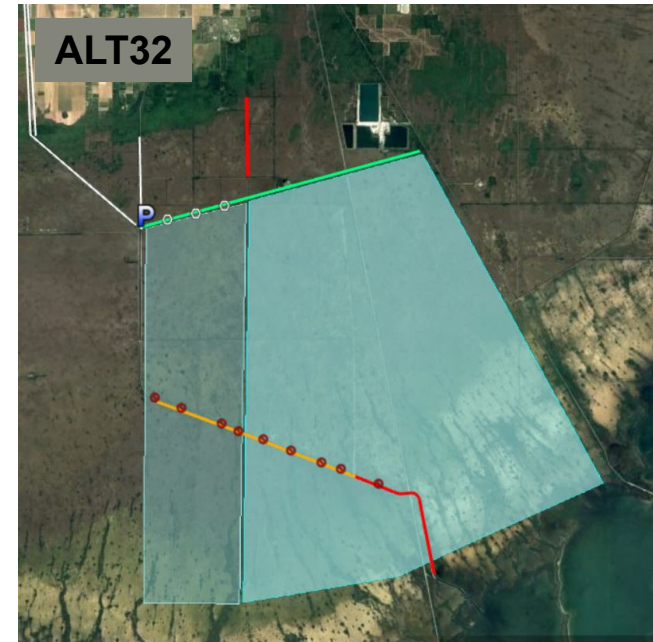


ROUND 3: SOUTHERN GLADES



- Major Differences:**
- ALT31 fully backfills the C-111 Canal while providing additional flood protection infrastructure.
 - Both alternatives add lateral adjustable weirs in the eastern spreader to control flow to Cape Sable Seaside Sparrow critical habitat.

- Answering the Questions:**
- Can the BBSEER project fully backfill the C-111 canal while providing for upstream flood protection?
 - What is the best option to optimize BBSEER objectives while protecting critical habitat?





ROUND 3: MODEL LANDS



- Major Differences:**
- ALT31 has a north-south spreader while ALT32 has an angled spreader.
 - ALT32 fully backfills the S-20 getaway canal and removes the S-20 while ALT31 shallows the S-20 getaway canal.

- Answering the Questions:**
- Which spreader canal alignment provides the best benefits to the freshwater marsh, coastal wetlands, and nearshore?
 - What is the additional benefit to the landscape with a full S-20 canal backfill?





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ADDITIONAL CONSIDERATIONS



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Round 3 Sensitivity Runs:

- Include Wastewater Reuse options with both Round 3 Alternatives.
- Possibly include Coastal ASR option in one Round 3 Alternative.

Additional Engineer/Design Details:

- Still need revisions and discussion.

Operations:

- Still need refined for Round 3 based on information gained in Round 2.

Implementation Plan:

- To be completed on the TSP.



BBSEER HABITAT UNITS





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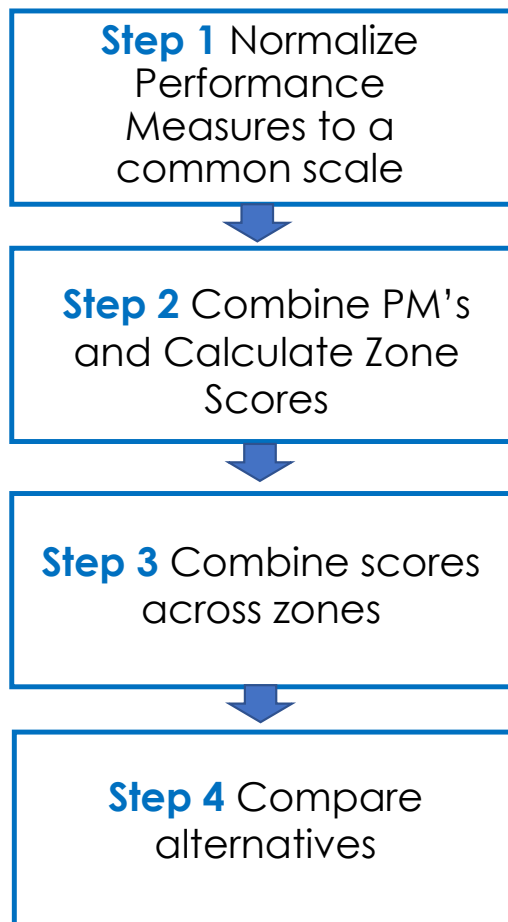
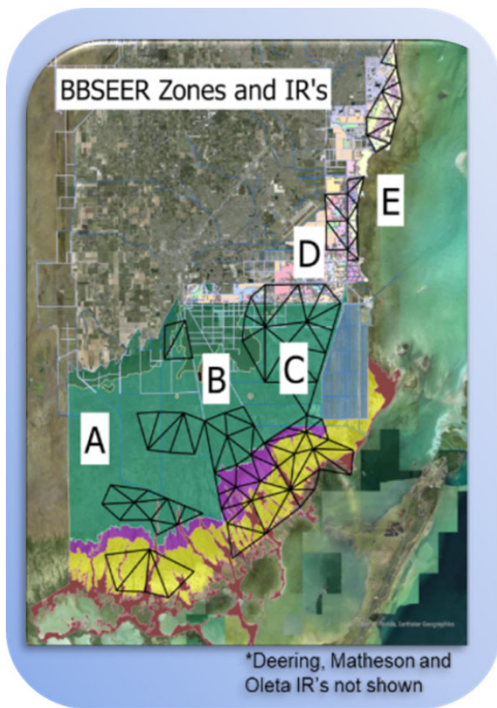
BBSEER HABITAT UNITS



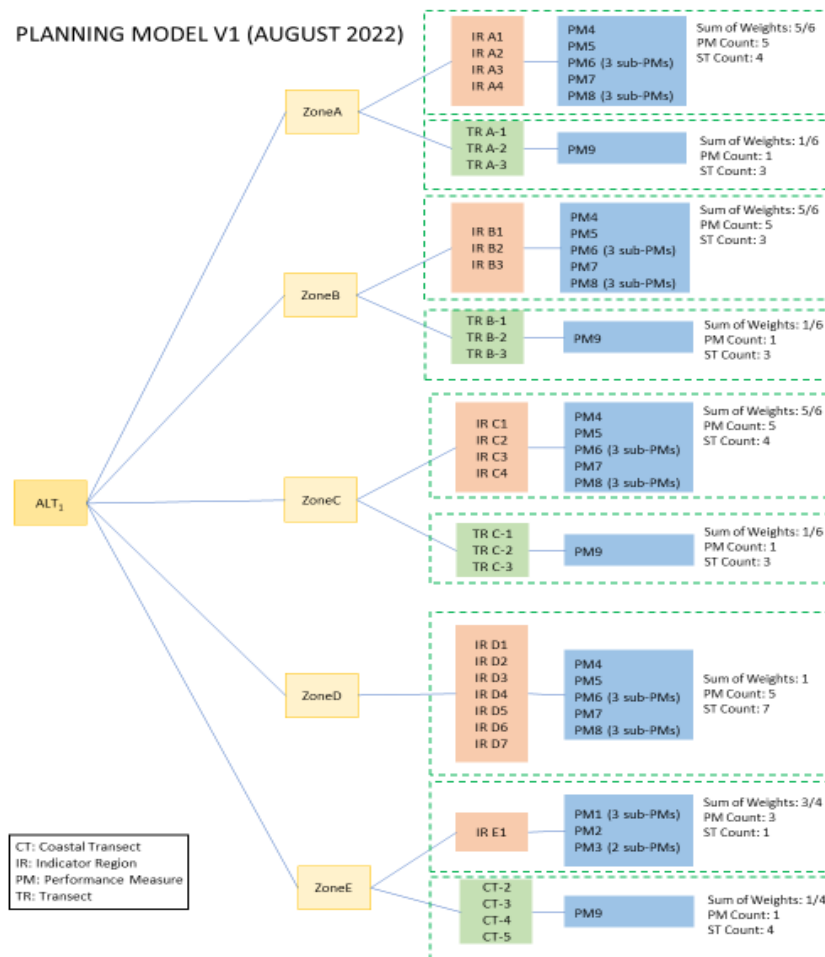
- **Habitat Units are used in Corps' studies to quantify environmental benefits versus the future condition in which no project were implemented (FWO).**
- **The Corps needs a bottom-line number that reflects ecosystem benefits by alternative and to describe environmental benefits for each CERP project as a whole.**
- **Habitat Units (ecological benefit across landscape) are needed to make comparisons of the cost effectiveness of alternatives.**
- **Corps' Planning Projects often use Habitat Suitability Indices or hydrologic surrogates (depth, hydroperiod, salinity) to quantify the project's ecological lift for the HU calculation.**
- **Indexed scores from the PM's that were just presented are the building block of the HU number.**



BBSEER HABITAT UNIT CALCULATION METHODOLOGY



PLANNING MODEL V1 (AUGUST 2022)





PERFORMANCE MEASURES, HABITAT UNITS AND PLANNING



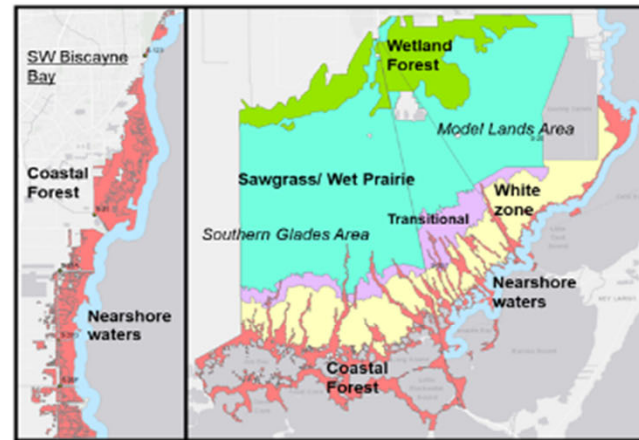
Develop Project Ecological Performance Measures with Targets



Identify Hydrologic Model Alternatives



Calculate % Target Achieved, as described in the Performance Measures, per given area. Success towards an ideal. Score Alternatives on their ability to get to 1, the ideal. Calculate Habitat Units (Quality X acres).



Evaluate Additional Environmental Effects and System wide Analysis



- Environmental Effects
- Water Supply
- Flood Protection
- Real Estate
- Economics

Savings Clause



Habitat Units – One Piece of the Puzzle



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BBSEER WATER QUALITY

From August 14, 2023 PDT Meeting



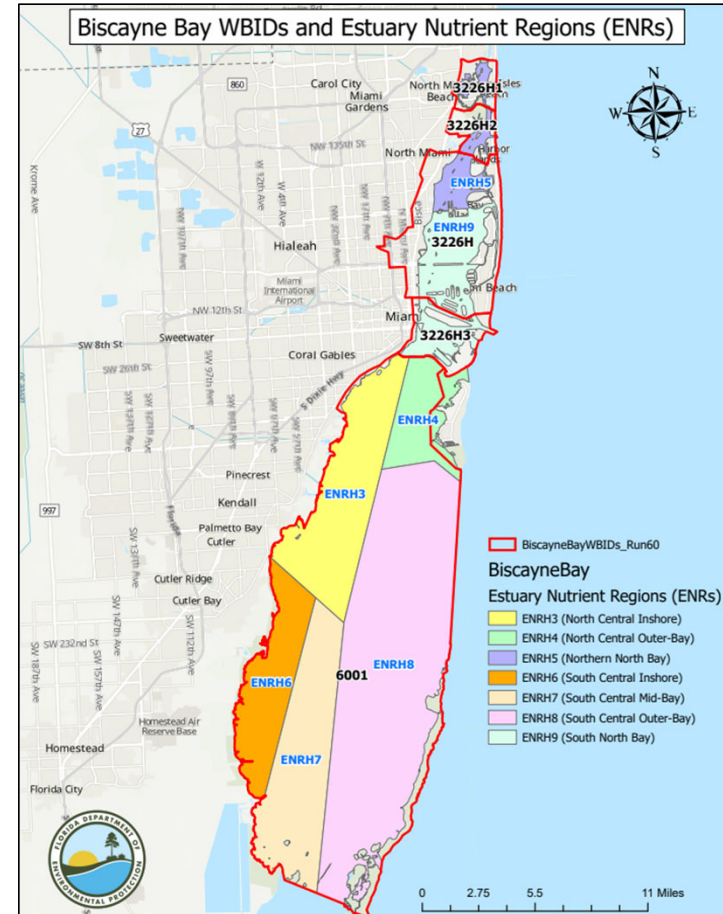


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NNC VS. OFW CRITERIA



- Biscayne Bay waters are classified as Class III waters by their designated use (62-302.400 F.A.C.).
- Numeric Nutrient Criteria (NNC) were developed as site-specific numeric interpretations of the narrative nutrient criteria, to protect the designated use of a water body (e.g., Class III: fish consumption; recreation, propagation and maintenance of healthy, well-balanced population of fish and wildlife)
- In addition to its surface water classification, Biscayne Bay water is an Outstanding Florida Water (OFW) (62-302.700 F.A.C.). This designation adds a layer of protection to prevent lowering of the existing water quality and to preserve the exceptional ecological and recreational significance of the waterbody.
- OFW rules are applied through permitting actions. Permitted activities in an OFW are not allowed to degrade water quality in the OFW (beyond natural variability) from the existing background levels for the year of OFW designation or the year prior to permit application, whichever is better water quality.





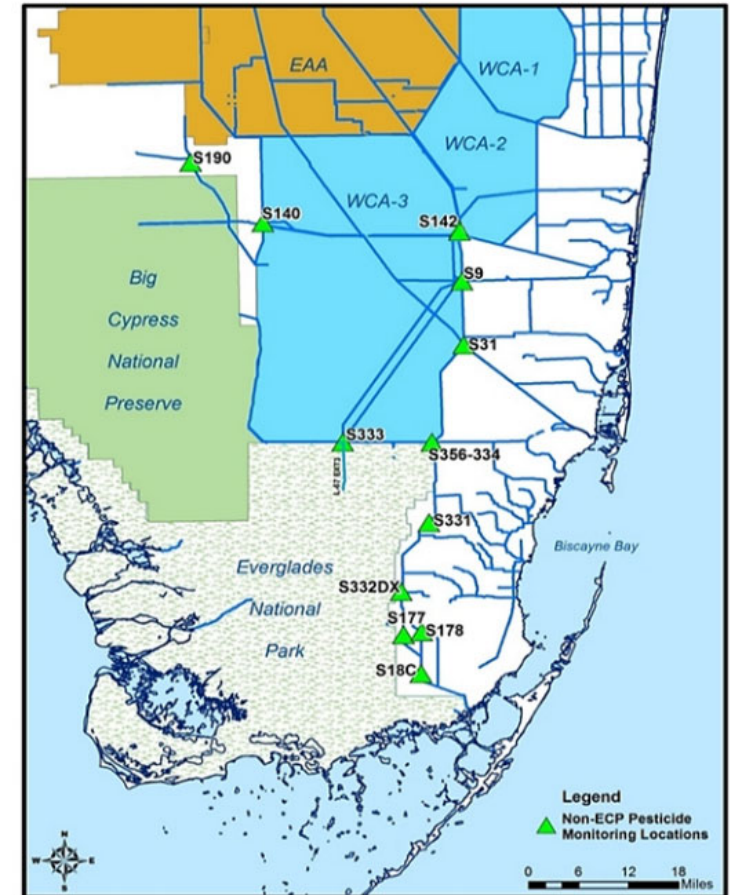
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SFWMD PEST MONITORING PROGRAM



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- 12 Non-ECP stations, including S-178 located at terminus of Loveland Slough
- Quarterly surface water & semiannual sediment samples analyzed for more than 70 pesticides
- S-178 surface water: no exceedances of Chapter 62-302, F.A.C., Class III criteria in WY22
- S-178 sediment: no exceedances of Probable Effects Concentration (PEC) in WY22
- PEST data reported annually in SFER: [v3_app3-2.pdf \(sfwmd.gov\)](#)

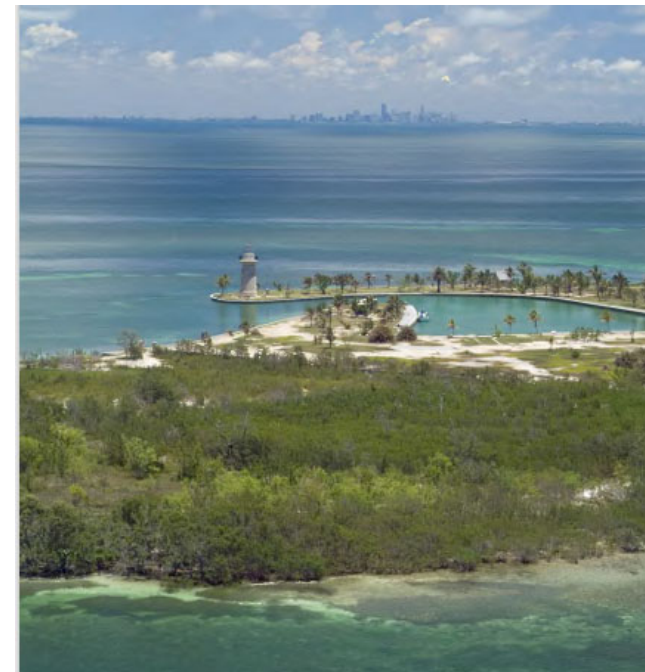




RECAP AND NEXT STEPS



- **December 20, 2023: PDT Meeting**
 - **Round 3 Initial Regional Simulation Model Results**
- **Round 3 Evaluation**
- **Subteams will reengage January to March 2024**
 - **Hydrology and Hydraulic Modeling/Climate Change,**
 - **Ecology**
 - **Water Quality**
 - **Water Supply/Flood Protection**
 - **Engineering - NEW**
 - **Adaptive Management and Monitoring - NEW**





DISCUSSION, QUESTIONS, INVOLVEMENT

Website: <https://www.saj.usace.army.mil/BBSEER/>

Email: bbseercomments@usace.army.mil

Thank you!