

LAKE OKEECHOBEE SYSTEM OPERATING MANUAL (LOSOM)

STATUS UPDATE

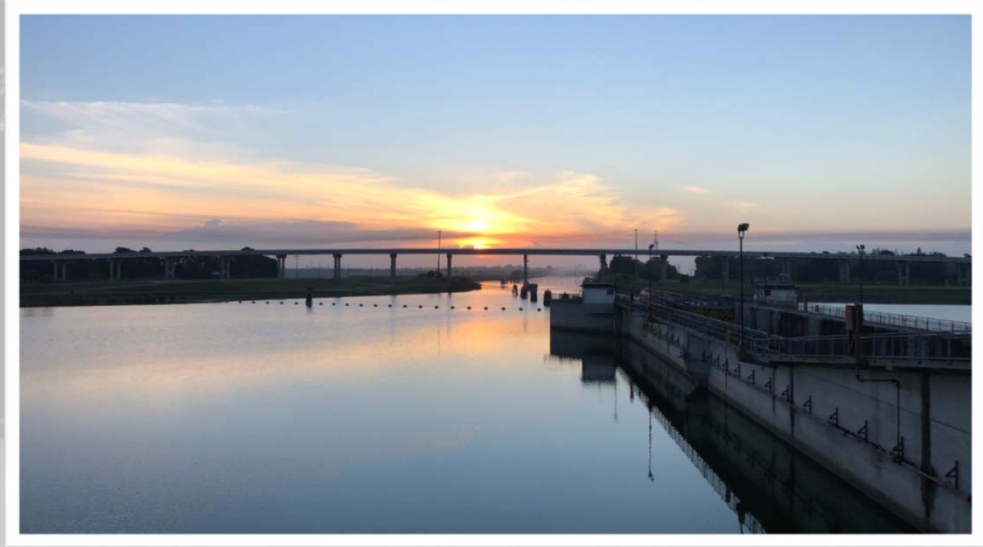
SOUTH FLORIDA ECOSYSTEM RESTORATION JOINT WG/SCG MEETING

May 19, 2021
Web Meeting

U.S. Army Corps of Engineers
Jacksonville District



US Army Corps
of Engineers®





LOSOM GOALS AND OBJECTIVES

STUDY GOAL

Incorporate flexibility in Lake Okeechobee operations while balancing congressionally authorized project purposes.

STUDY OBJECTIVES

There are four study objectives, each with their own sub-objectives:

Objective 1:

Manage risk to public health and safety, life and property

1A: Dam safety

1B: Algal bloom risk in Lake Okeechobee

1C: Algal bloom risk in northern estuaries

Objective 2:

Continue to meet authorized purposes for navigation, recreation, and flood control

2A: Navigation

2B: Recreation

2C: Flood control

Objective 3:

Improve water supply performance

3A: Lake Okeechobee Service Area

3B: Seminole Tribe of Florida

3C: Lower East Coast Service Area

Objective 4:

Enhance ecology in Lake Okeechobee, northern estuaries and across the south Florida ecosystem.

4A: Lake Okeechobee

4B: Caloosahatchee Estuary

4C: St. Lucie Estuary

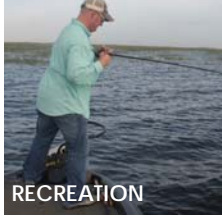
4D: South Florida



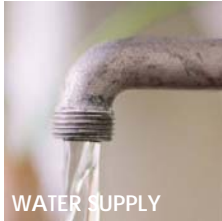
FLOOD CONTROL



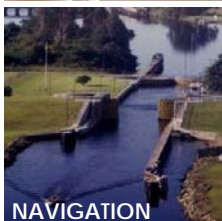
FISH AND WILDLIFE



RECREATION



WATER SUPPLY

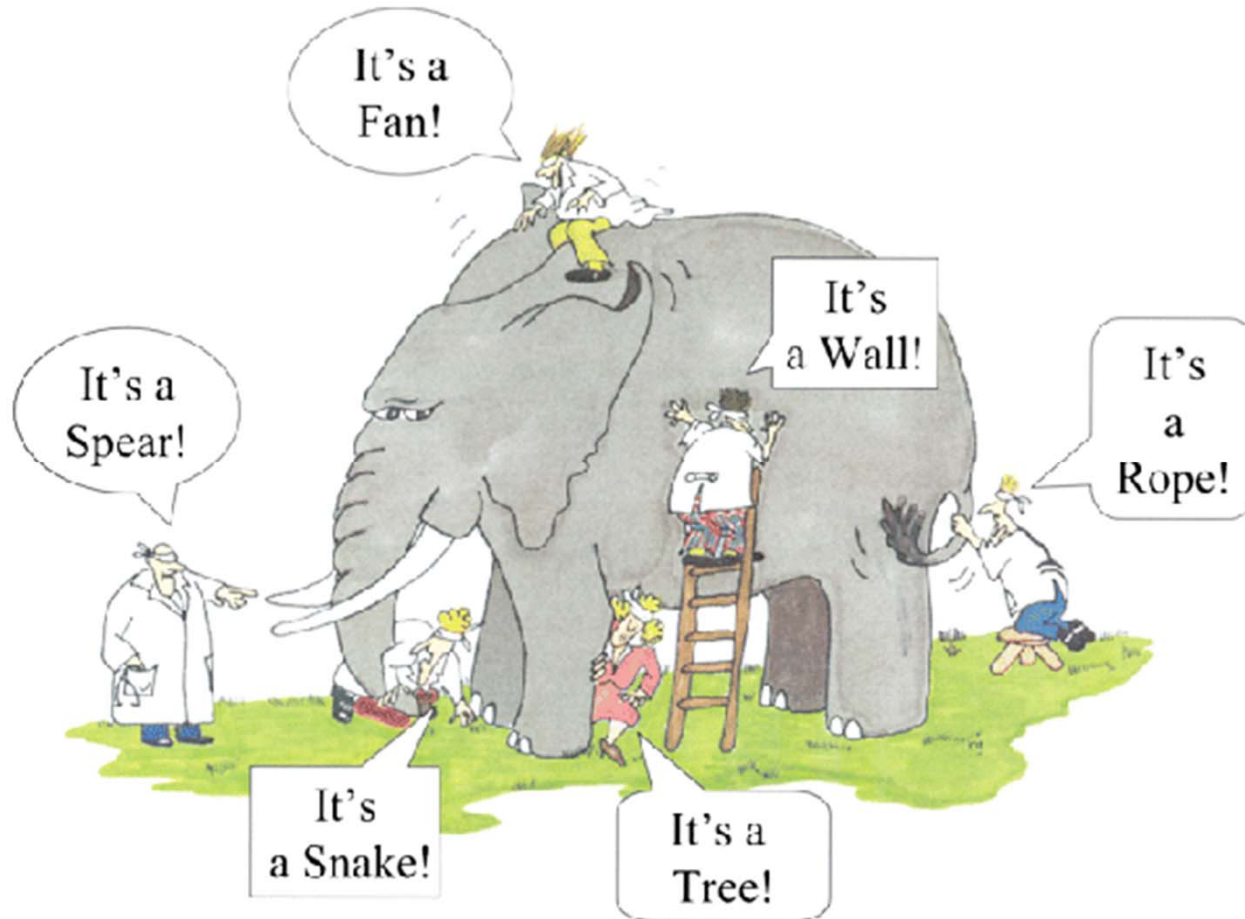


NAVIGATION



BALANCE

WHAT HAVE WE LEARNED DURING LOSOM





OVERVIEW

PLAN FORMULATION PROCESS



Preferred Alternative mid-July

ACTIVITIES

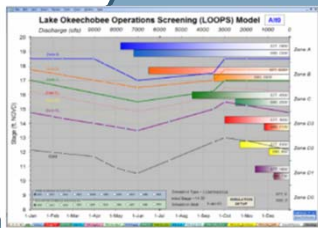
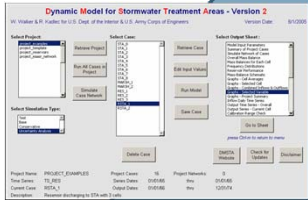
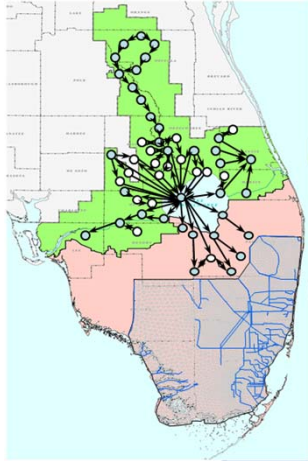
<ul style="list-style-type: none"> Develop conceptual lake schedules to maximize the performance of individual objectives Simulate ~120k variations of conceptual schedules using a subset of sensitive and representative criteria to guide the analysis Apply dam safety, WQBEL test, and Pareto-sorting (27K schedules remain) <p>RSM-BN</p>	<ul style="list-style-type: none"> Identify ranges of performances and relationships between performance measures Evaluation to understand how each plan operates to achieve benefits Recommend representative plans that prioritize performance for each sub objective for Iteration 1 <p>RSM-BN</p>	<ul style="list-style-type: none"> Iteration 1 schedules prioritize performance of a single objective Larger suite of performance metrics used for more detailed analysis of benefits, and effects Information gathering step to inform iteration 2 <p>January 26 – May 7</p> <p>RSM-BN & RSM-GL</p>	<ul style="list-style-type: none"> Lake schedules in this iteration will be balanced for project objectives Recombine/modify components of Iteration 1 alternatives and re-evaluate 27K schedules to create balanced alternatives Evaluate balanced alternatives to ID preferred lake schedule alternative <p>May 10 – July 23</p> <p>RSM-BN & RSM-GL</p>	<ul style="list-style-type: none"> Optimize lake schedule Modify to increase schedule robustness and flexibility for incremental implementation <p>July 26 – September 24</p> <p>RSM-BN & RSM-GL</p>
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MODELS USED IN ANALYSES:
 RSM-BN = Regional Simulation Model – BASINS
 RSM-GL = Regional Simulation Model – Glades LECSA

FEWER SCHEDULES / MORE DETAILED ANALYSIS



LOSOM MODELING PROCESS OVERVIEW



**Iteration 3
Preferred Alternative**

- **Goal:** Refine and optimize preferred alternative to ensure compatibility with future actions and develop operating criteria.

**Iteration 2
Balanced Alternatives**

- **Goal:** Develop alternatives that represent different perspectives on balance and evaluate using full suite of models to define long term outcomes.

**Iteration 1
Single Objective Plans**

- **Goal:** Evaluate single objective plans using full suite of models to identify desired performance.

Conceptual Plan Analysis

- **Goal:** Use Pareto analysis to identify top performing conceptual schedule for each LOSOM objective. Develop conceptual schedules and simulate using RSMBN to generate thousands of simulations.

Sensitivity Analysis

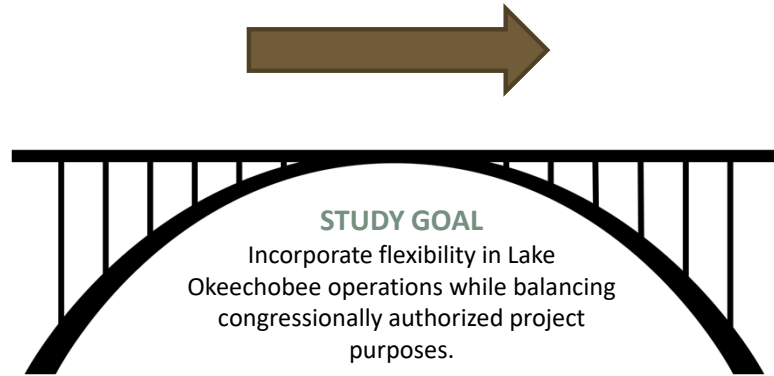
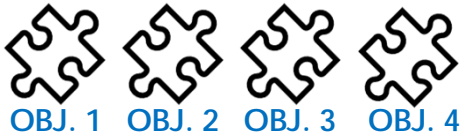
- **Goal:** Use simplified models and data processing techniques to analyze a broad range of options and to identify ideas that warrant further in-depth analysis.



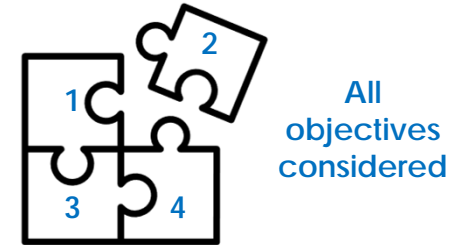
BRIDGE BETWEEN ITERATION 1 AND ITERATION 2



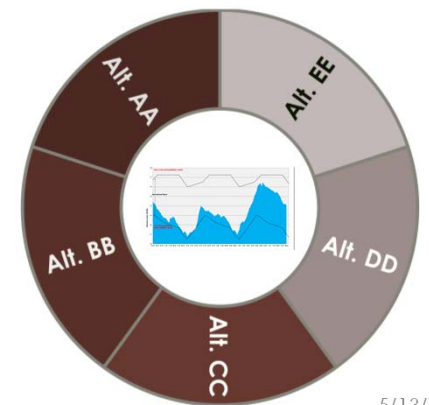
ITERATION 1
SINGLE OBJECTIVE SCHEDULES



ITERATION 2
BALANCED ARRAY OF LAKE SCHEDULES



Balanced Alternative Lake Schedules





DIVERSITY OF BALANCED PLANS (FINAL ARRAY)



Alternative AA



Explores upper and lower lake stages to increase interim storage in lake to:

- Reduce lake releases to St. Lucie Estuary
- Enhance Everglades ecology by sending more water south with dry season focus
- Improve water supply
- Increase low and optimal flows to Caloosahatchee Estuary

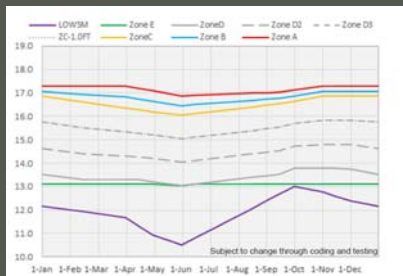
Alternative BB



Improves water supply performance to pre-LORS08 as a priority objective and:

- Reduce algal bloom risk
- Increase low and optimal flows to Caloosahatchee Estuary
- Reduce lake releases to St. Lucie Estuary
- Enhancing Everglades ecology by providing more freshwater south.

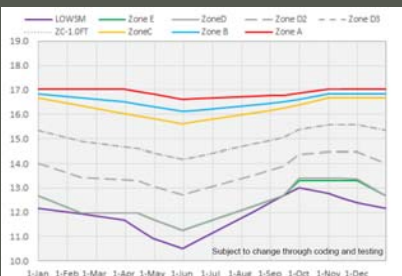
Alternative CC



Explores higher lake stages to increase interim storage in lake to:

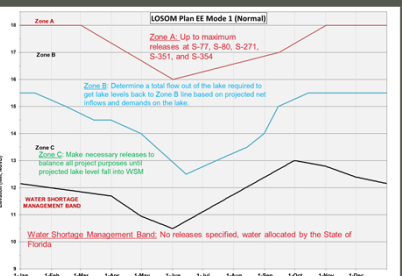
- Increase low and optimal flows and reduce extreme high flows to Caloosahatchee Estuary
- Reduce lake releases to St. Lucie Estuary
- Enhance Everglades ecology by providing more freshwater south
- Improve water supply performance

Alternative DD



Honors the perspective on balance that each of the LOSOM objectives should be incrementally improved over LORS08 performance

Alternative EE



Incorporates memory and flexibility by asking key questions at key times (Feb, May, Nov) define operational mode:

- Mode 1-Normal
- Mode 2- Conservation
- Mode 3-Wet
- Mode 4-Recovery

*Lake zones subject to change based on IMC testing broad ranges of parameter values to maximize performance



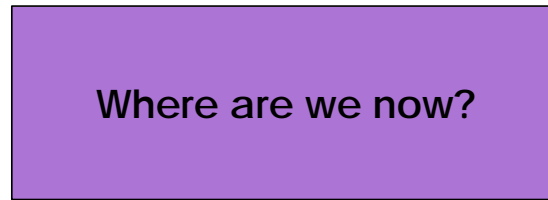
BALANCED ALTERNATIVE EE



MEMORY



Incorporate memory into a schedule where we ask the *right questions* at the *right time* (call it a decision point)



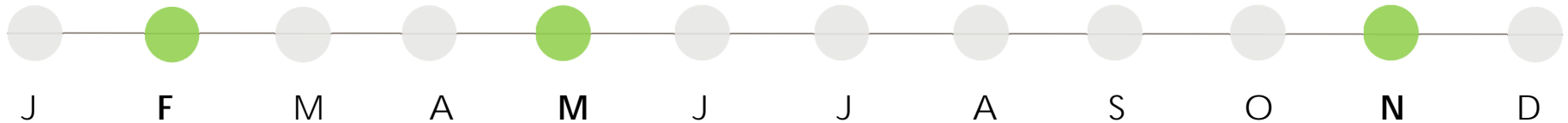
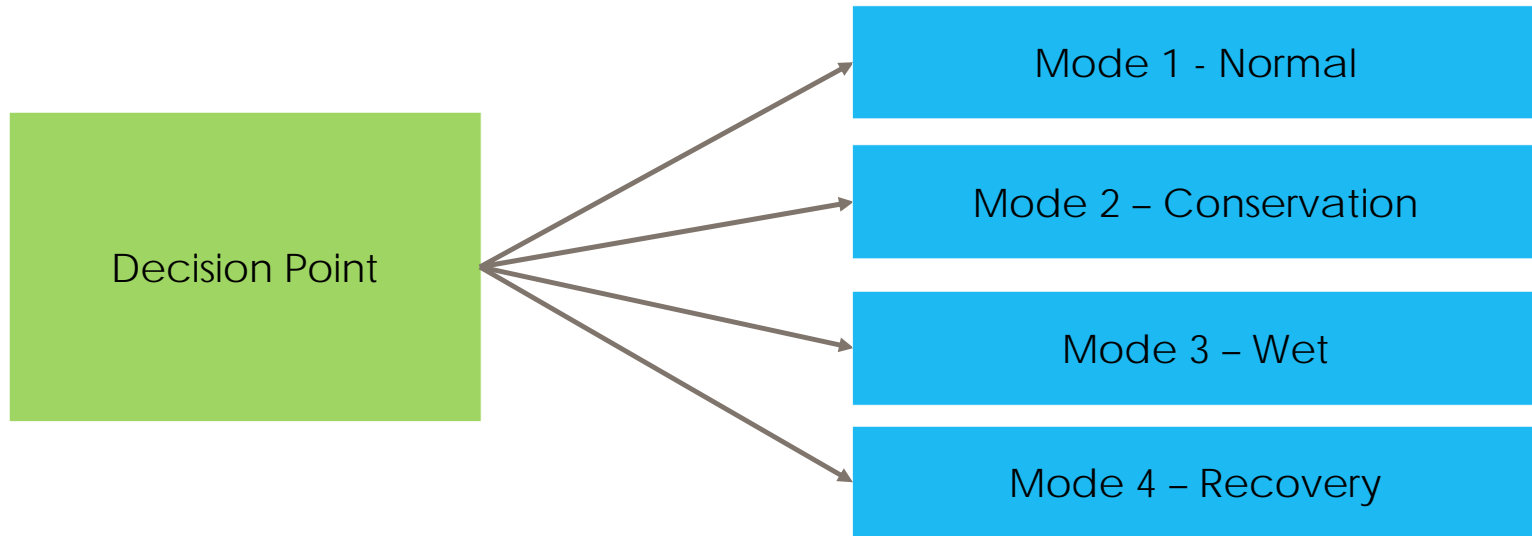
FLEXIBILITY



Incorporate flexibility into a schedule means primarily defining operations (modes) based on the outcome of key questions in addition to other tools



KEY QUESTIONS AT KEY TIMES DEFINE YOUR OPERATIONAL MODE





LOSOM ITERATION 2 MODELING PROCESS



Use Balanced Alternatives AA – EE as a framework



Provide guidance to modeling team on goals for performance improvements and identify guardrails for performance of other objectives



Collaborate with Interagency Modeling Center on coding of the framework of each alternative and testing for performance



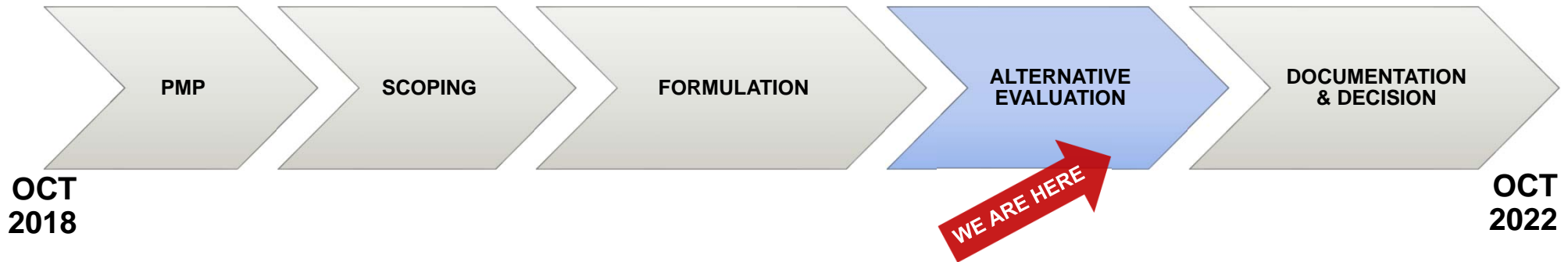
Present Iteration 2 model results to PDT and explain process used to code and test Balanced Alternatives AA-EE



Evaluate Iteration 2 Balanced Alternatives with PDT



LOSOM SCHEDULE AND NEXT STEPS



SCHEDULE LOOK AHEAD

MILESTONE	DATE
Scoping Meetings (complete)	February - March 2019
Plan Formulation & Performance Evaluation Finalized	June 2020
Evaluation of Alternative Lake Schedules	July 2020 – September 2021
Draft NEPA Document Release	January 2022
Final NEPA Document Release	July 2022
Record of Decision (ROD)	October 2022

