SOUTH FLORIDA WATER MANAGEMENT DISTRICT

WELCOME

EAA STORAGE RESERVOIR

Public Peer-Review Session
Water Reservation Technical Document

May 29, 2020

Zoom Format for Public Engagement

- Please use the “Q & A” (Question and Answer) feature on the Zoom tool bar to submit questions throughout the Peer Review Session
- This Q & A feature is the only means for the public to engage with us during this Peer Review Session
- Questions from the public will be addressed during the "Public Comment (Q & A)" portions of the agenda
- Questions from the public will be read out loud and live answers will be provided for all to hear
- Please indicate who your question is directed to: Panel, SFWMD, or both

AGENDA

Morning

9:00 – 9:15 AM Introductions and Objectives

9:15 – 10:30 AM SFWMD Presentations

- Water Reservations Overview
- EAA Reservoir Background/Purpose
- Description of Hydrologic Benefits
- Description of Benefits to Fish and Wildlife
- Identification of Water to be Reserved

10:30 – 11:00 AM Summary of Peer-Review Panel Assessment of Draft Technical Document

11:00 – 11:45 AM Peer-Review Panel Discussion

11:45 AM – 12:30 PM Public Comment (Q & A)

12:30 – 1:00 PM Lunch Break

Afternoon

1:00 – 1:05 PM Format for Afternoon Session

1:05 – 2:00 PM Collaborative Peer-Review Panel Discussion

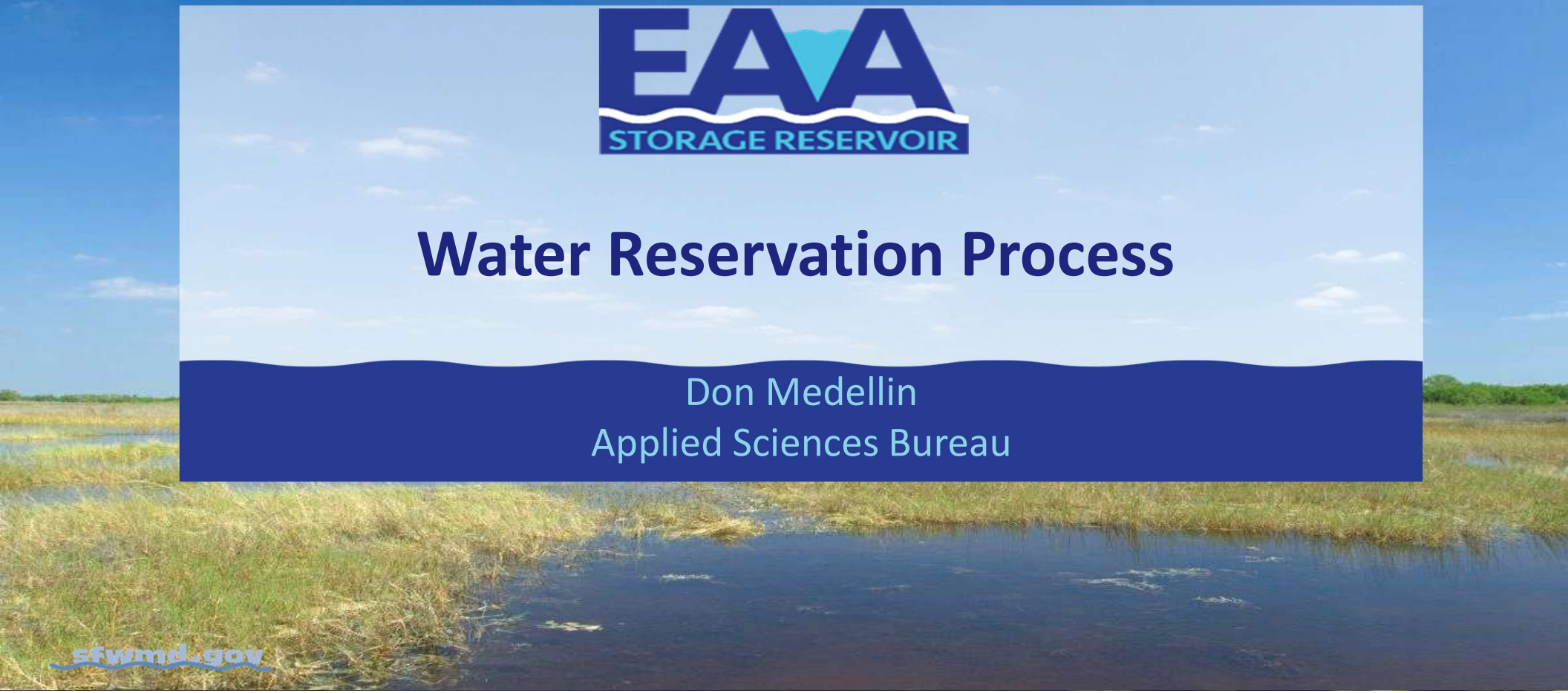
- Development of Final Peer-Review Report Outline and Writing Assignments
- Development of Outstanding Questions for SFWMD

2:00 – 3:00 PM Public Comment (Q & A)

3:00 – 3:15 PM Wrap Up and Next Steps

3:15 – Adjourn

Public Peer-Review Session for the EAA Reservoir Water Reservation
May 29, 2020



Water Reservation Process

Don Medellin
Applied Sciences Bureau

Water Reservations

Authority: Section 373.223(4), F.S.

Functions and Considerations

- Reserve water for the protection of fish and wildlife or public health and safety
- Prevent use of reserved water by consumptive users
- Required by WRDA 2000 for CERP projects
- May be used as part of an MFL recovery or prevention strategy

Osprey (*Pandion haliaetus)* with bass (*Micropterus* sp.) on Merritt's Mill Pond.
Source: http://nykography.weebly.com

Water Reservations Do Not…

- Prevent use of unreserved water or water already allocated
- Establish an operating regime
- Drought-proof the natural system
- Ensure wildlife proliferation
- Improve water quality

S-67 water control structure (replaced G-85 structure)
Source: SFWMD

Lake Okeechobee under drought conditions
Source: SFWMD

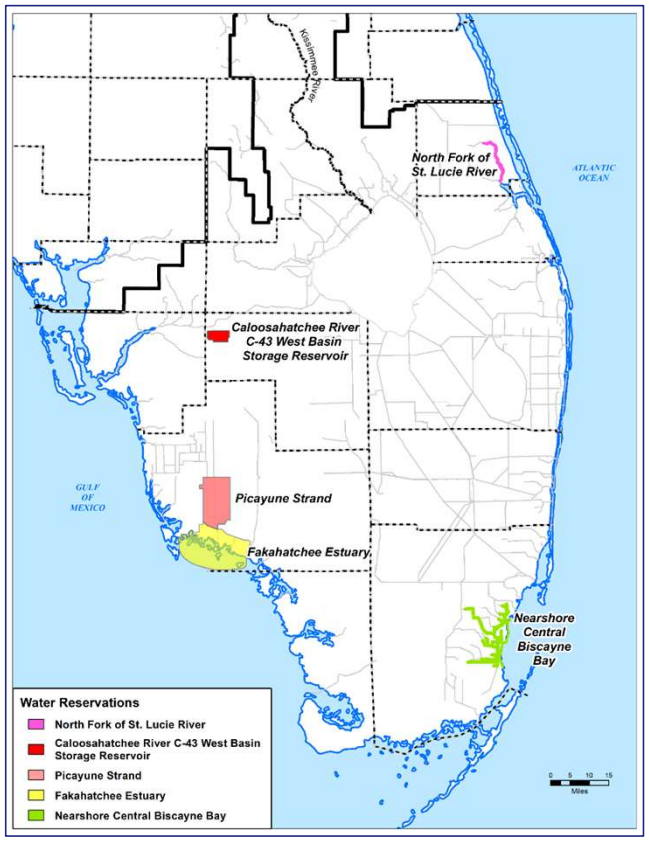
Birds in a stormwater treatment area
Source: SFWMD

Technical Aspects of Defining Water to be Reserved

- Identify the "reservation waterbody"
- Characterize the hydrology of the waterbody
- Identify water needed for key indicator species
- Identify linkages between hydrology and fish and wildlife
- Define the water needed for the protection of fish and wildlife

Florida Panther

Water Reservations Adopted in SFWMD



- Fakahatchee Estuary
- Picayune Strand
- North Fork of the St. Lucie River
- Nearshore Central Biscayne Bay
- Caloosahatchee River C-43 West Basin Storage Reservoir

Cover ~172,074 acres Districtwide

Presenter: Don Medellin

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EAA Reservoir Water Reservation

Chapter 40E-10, F.A.C.

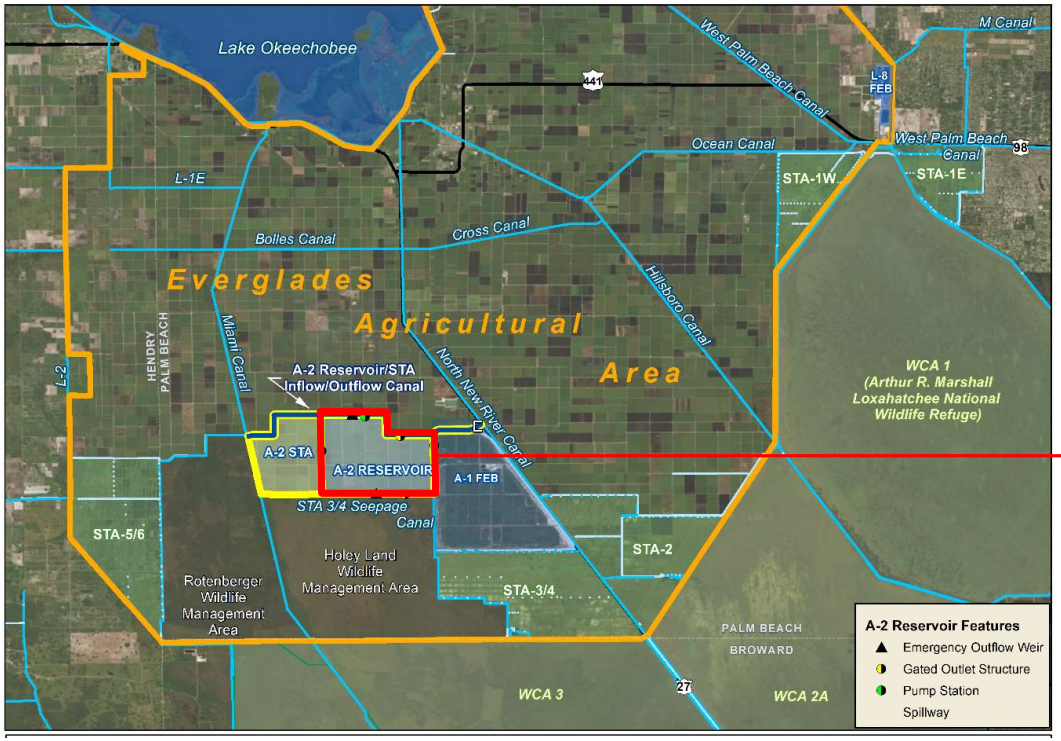
For the Protection of Fish and Wildlife

American alligator (*Alligator mississipiensis)*
Source: http://www.photodrom.com

Failed kite nest with apple snail shells
Source: SFWMD http://whqeps02p:8085/wildlife/#/
Slough crayfish (*Procambarus fallax*)
Source: USGS and https://eol.org/pages/14263/media

Wood stork (*Mycteria americana)*
Source: Brandon Kruse/The Palm Beach Post

EAA Reservoir Reservation Waterbody



➢ EAA Reservoir Features

- 10,500-acre footprint
- 240,000 acre-feet of static storage
- Normal full storage water depth 22.6 feet

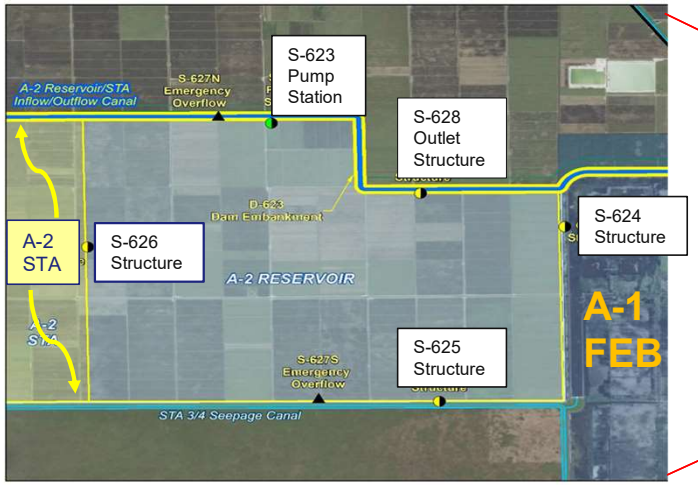
EAA Reservoir Reservation Waterbody

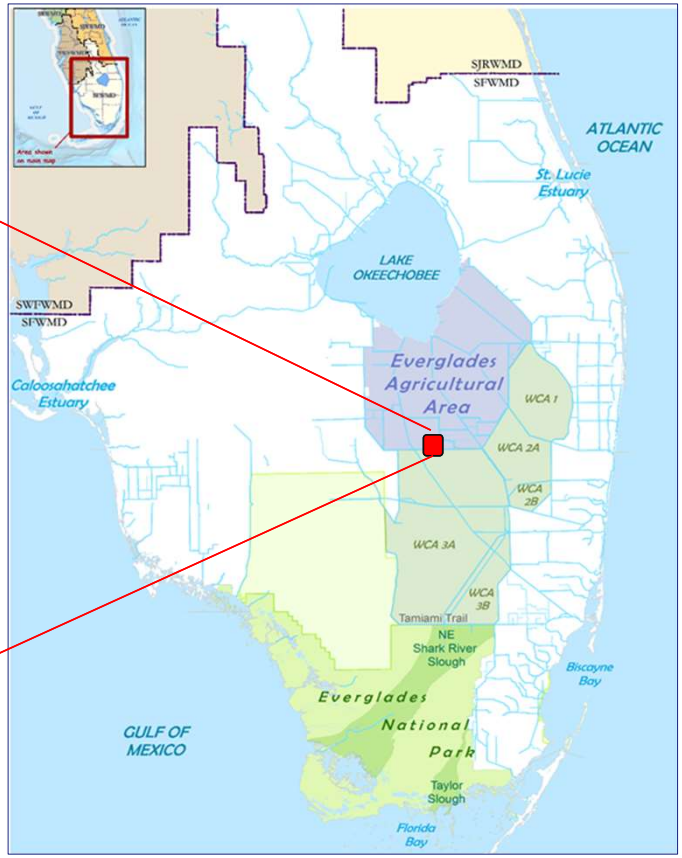
Presenter: Don Medellin

EAA STORAGE RESERVOIR

EAA Reservoir Water Reservation

- Protects water for fish and wildlife
- Will increase flows to northern WCA-3 and ENP
- Supports implementation of CERP





Presenter: Don Medellin

Questions from the Peer-Review Panel

Public Peer-Review Session for the EAA Reservoir Water Reservation
May 29, 2020

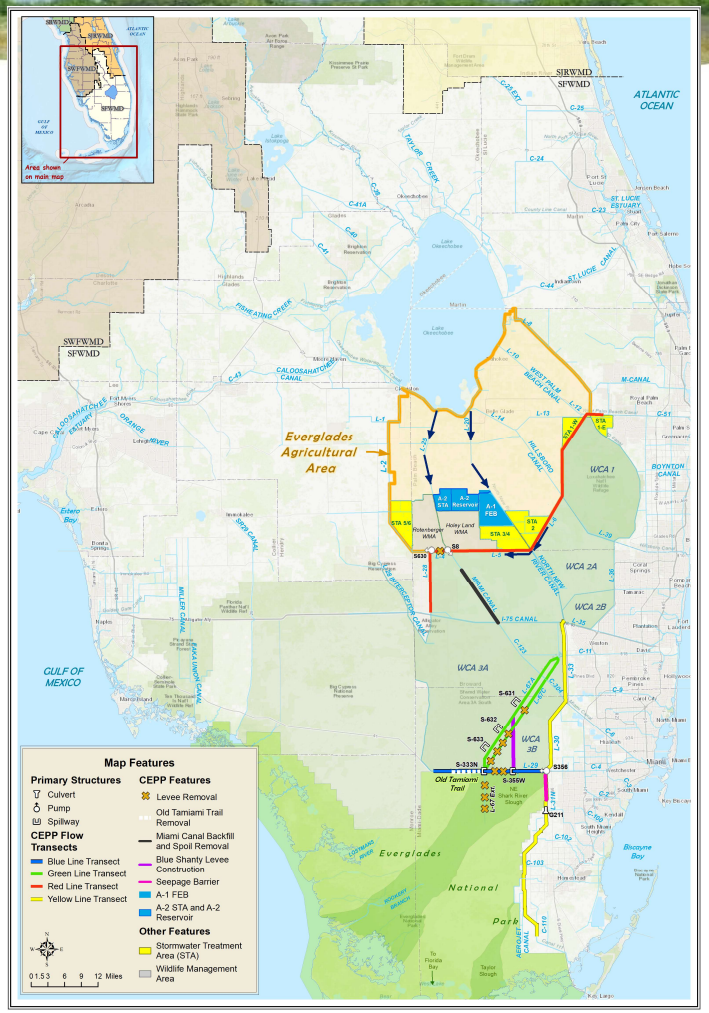
EAA STORAGE RESERVOIR

Background and Purpose

Leslye Waugh
Ecosystem Restoration Bureau

Project Purpose

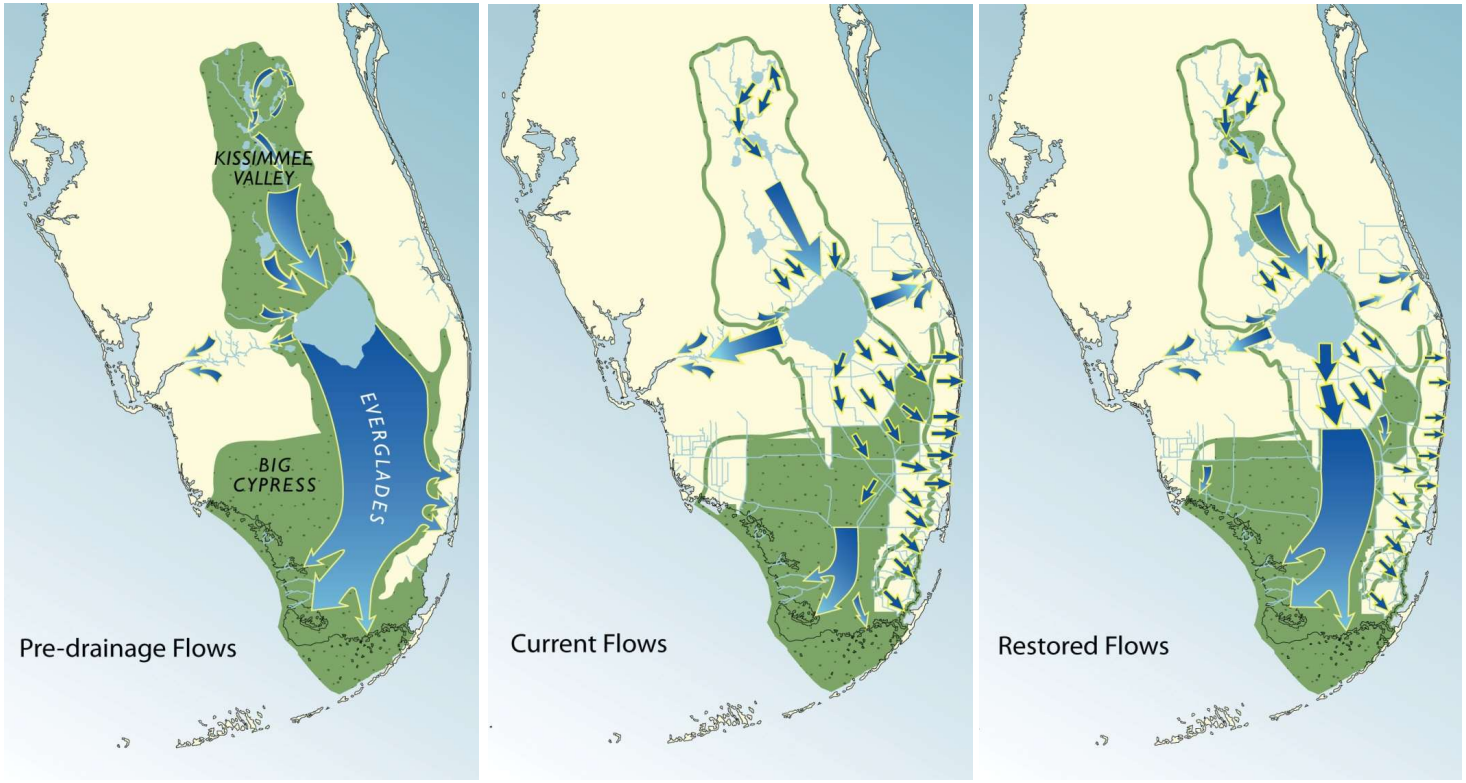
- Purpose of CEPP is to improve the quantity, quality, timing, and distribution of water flows from Lake Okeechobee to the Central Everglades, Everglades National Park, and Florida Bay while maintaining flood control and water supply for existing legal users
  - Decreases damaging discharges to the northern estuaries
  - Increases restoration flows to the Everglades
- The EAA Reservoir is the main storage feature of CEPP, which also includes additional treatment and conveyance features as described in the:
  - Project Implementation Report (2014)
  - Post Authorization Change Report (2018)



Presenter: Leslye Waugh

EAA STORAGE RESERVOIR

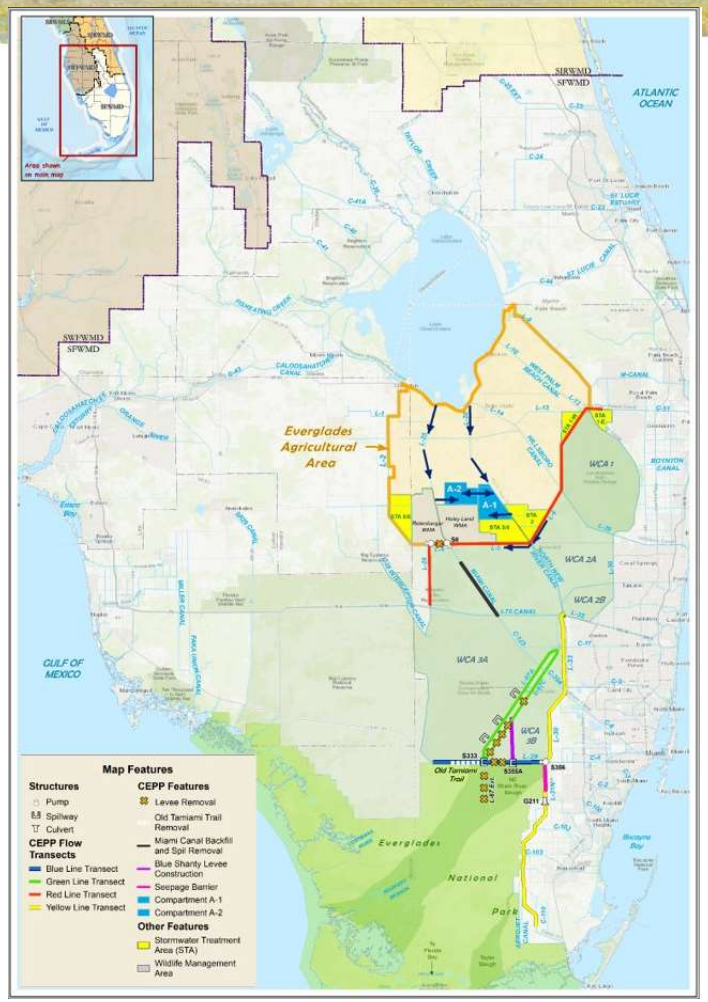
Comprehensive Everglades Restoration Plan (CERP)



- Authorized in the Water Resources Development Act of 2000
- Framework for the restoration of the natural system
- Consists of 68 project components and a variety of water management features
  - Storage
  - Treatment
  - Seepage management
  - Conveyance modifications
- CEPP and the EAA Reservoir Project include multiple components of CERP

Presenter: Leslye Waugh

EAA STORAGE RESERVOIR



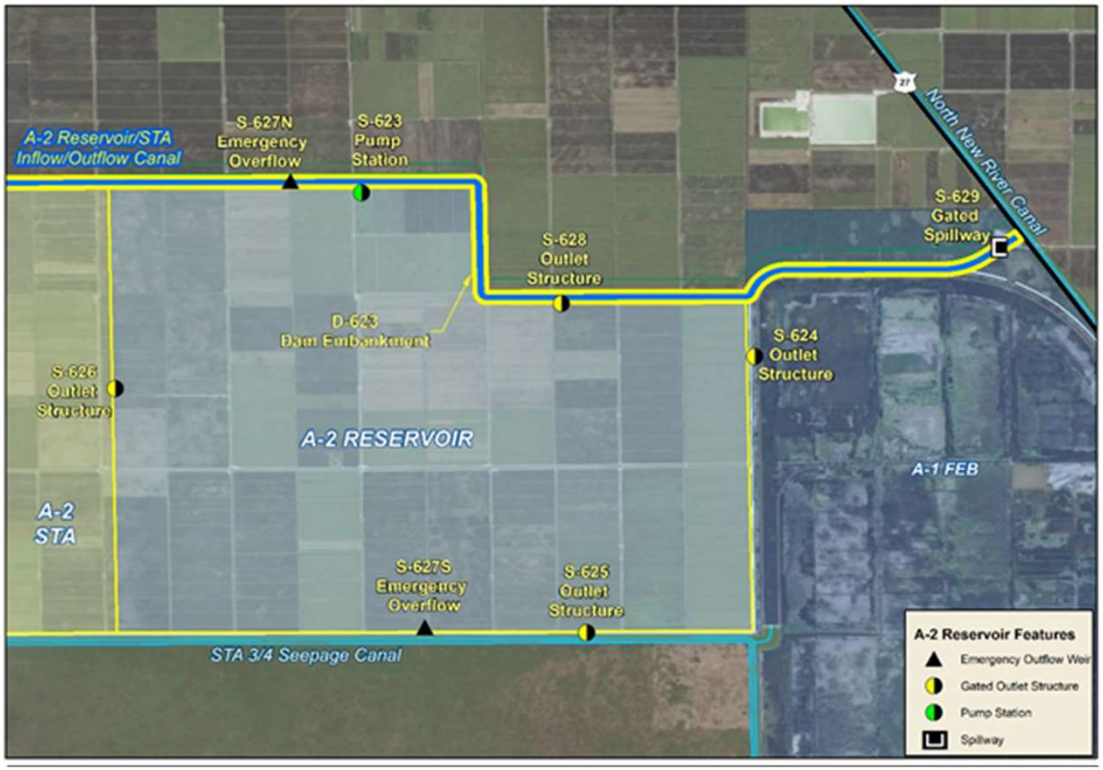
Central Everglades Planning Project

- Authorized in the WRDA 2016
- CEPP Recommended Plan ALT 4R2
  - •CEPP New Water
    - •A-1 & A-2 Flow Equalization Basin
    - •Seepage Barrier, L-31N Levee
  - •CEPP North
    - •L-6 Canal Flow Diversion
    - •L-5 Canal Conveyance Improvements
    - •S-8 Pump Station Complex Modifications
    - •L-4 Levee Degrade and Pump Station
    - •Miami Canal Backfill
  - •CEPP South
    - •S-333 Spillway Modification
    - •L-29 Canal Gated Spillway
    - •L-67A Conveyance Structures
    - •L-67C Levee Degrade & Gap
    - •Blue Shanty Levee, WCA-3B
    - •L-29 Levee Degrade
    - •L-67 Extension Levee Degrade and Canal Backfill
    - •Old Tamiami Trail Removal
    - •S-356 Pump Station Modifications
    - •Systemwide Operations Refinements

Presenter: Leslye Waugh

CEPP Post Authorization Change Report

- In 2017: Senate Bill 10 was signed into State law
  - Provided direction to SFWMD to expedite planning, design, and construction of the EAA storage reservoir
  - Conducted feasibility study to increase the storage and necessary treatment plus conveyance improvements
- In 2018: SFWMD completed the Post Authorization Change Report for CEPP
  - Modified the A-2 FEB to a deepwater reservoir and necessary stormwater treatment area
  - Authorized in WRDA 2018



Presenter: Leslye Waugh

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Optimized Best Performing Alternative

- Alternative C240A
  - Most cost-effective alternative
  - 240,000-acre-foot reservoir
    - 10,500 acres and ~23 feet deep
  - 6,500-acre stormwater treatment area
  - Multipurpose operations consistent with CERP
    - Environmental benefits and other water-related needs

Presenter: Leslye Waugh

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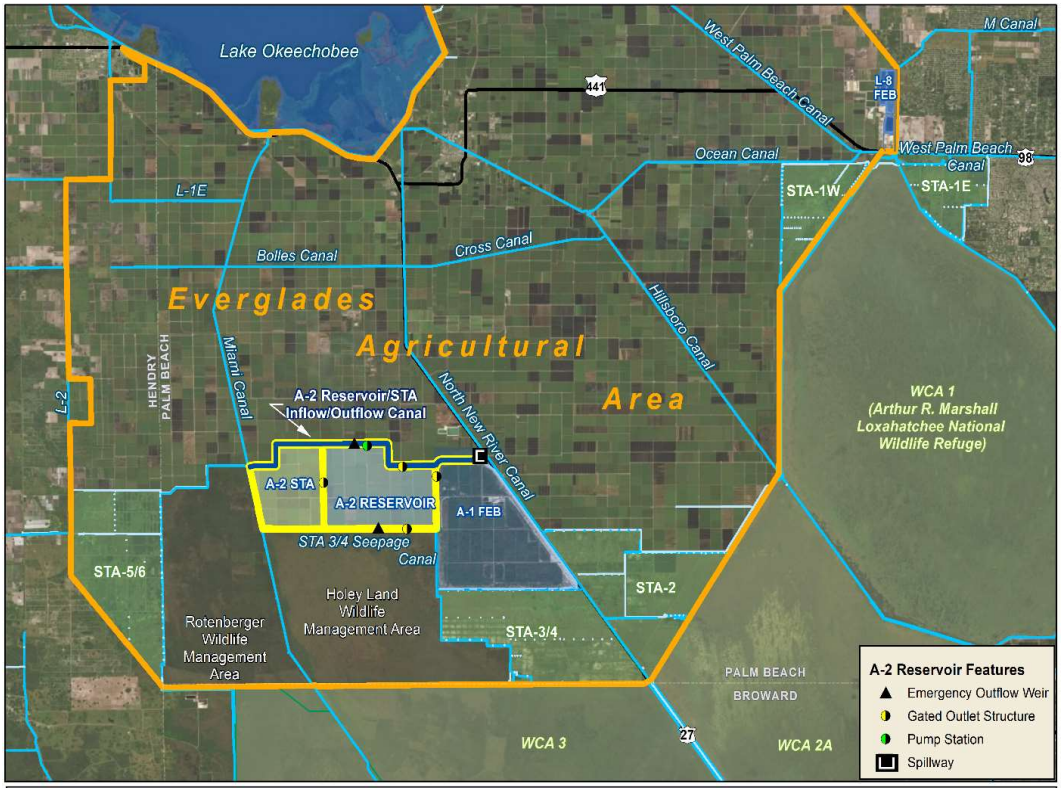
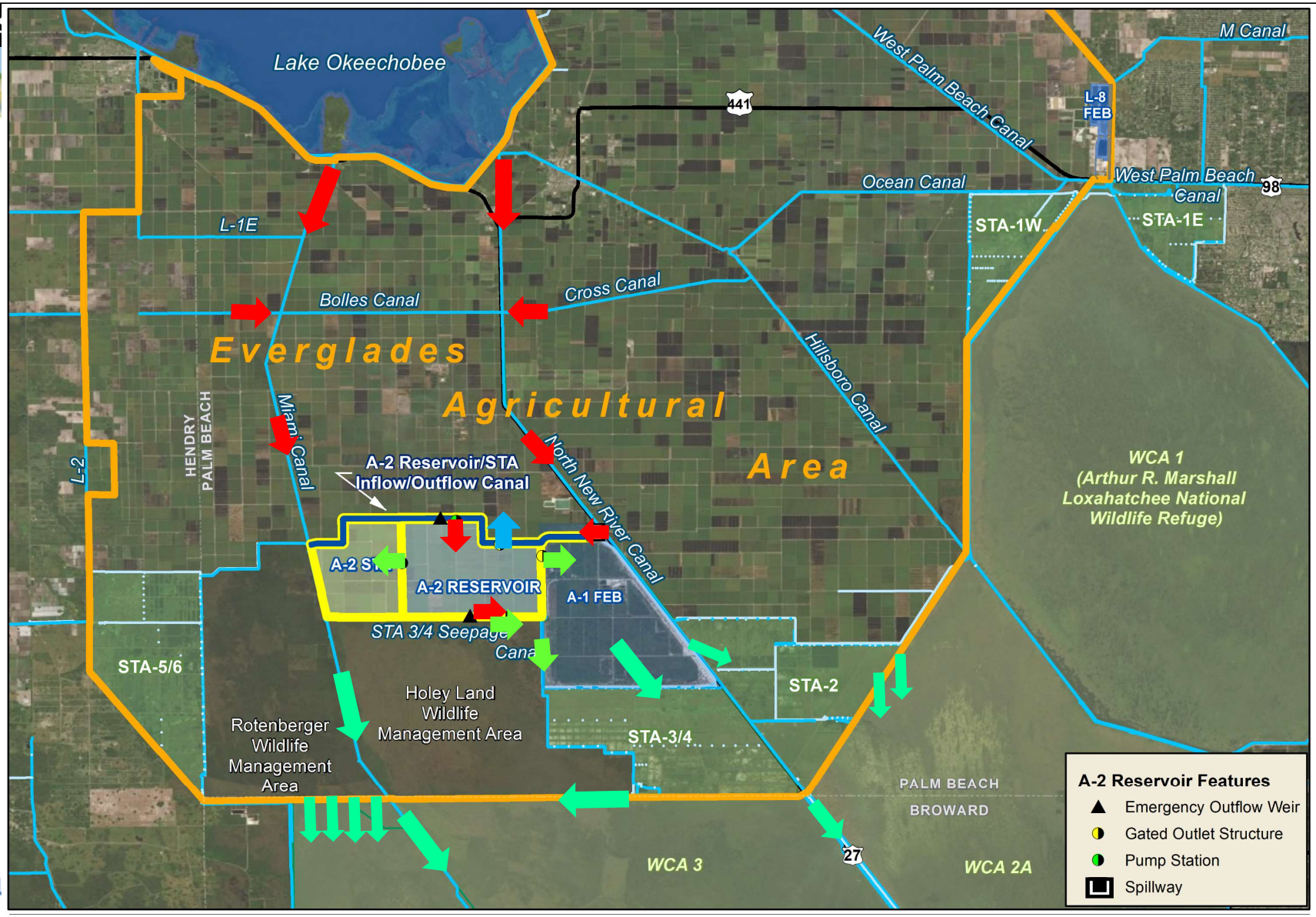
EAA Reservoir Flows

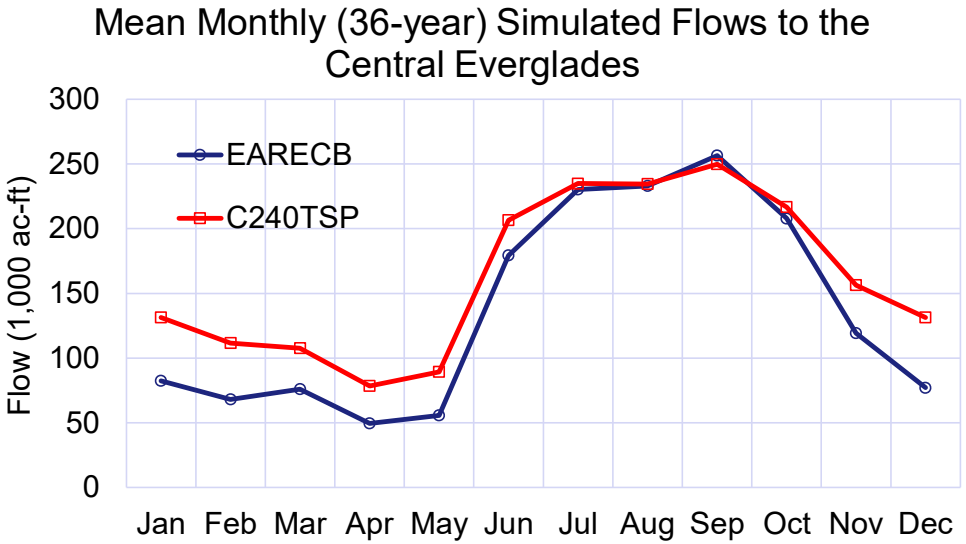
- Additional 240,000 ac-ft of effective storage
- On average annually, 825,000 ac-ft of water delivered from the EAA Reservoir
- Generally, flows attenuate during the wet season and carry over water into the dry season
- The additional water, above existing conditions, to the Central Everglades (WCA-3A) is 370,000 ac-ft on average annually



Presenter: Leslye Waugh


Lake Okeechobee
441
West Palm Beach Canal
M Canal
L-8 FEB
Ocean Canal
West Palm Beach Canal
98
STA-1W
STA-1E
L-1E
Bolles Canal
Cross Canal
Everglades
Agricultural
Area
Hillsboro Canal
HENDRY
PALM BEACH
L-2
Miami Canal
North New River Canal
A-2 Reservoir/STA
Inflow/Outflow Canal
WCA 1
(Arthur R. Marshall
Loxahatchee National
Wildlife Refuge)
A-2 S
A-2 RESERVOIR
A-1 FEB
STA 3/4 Seepage
Cana
STA-5/6
Holey Land
Wildlife
Management Area
STA-2
Rotenberger
Wildlife
Management
Area
STA-3/4
PALM BEACH
BROWARD
WCA 3
27
WCA 2A
A-2 Reservoir Features
Emergency Outflow Weir
Gated Outlet Structure
Pump Station
Spillway

Ecological Benefits to Central Everglades

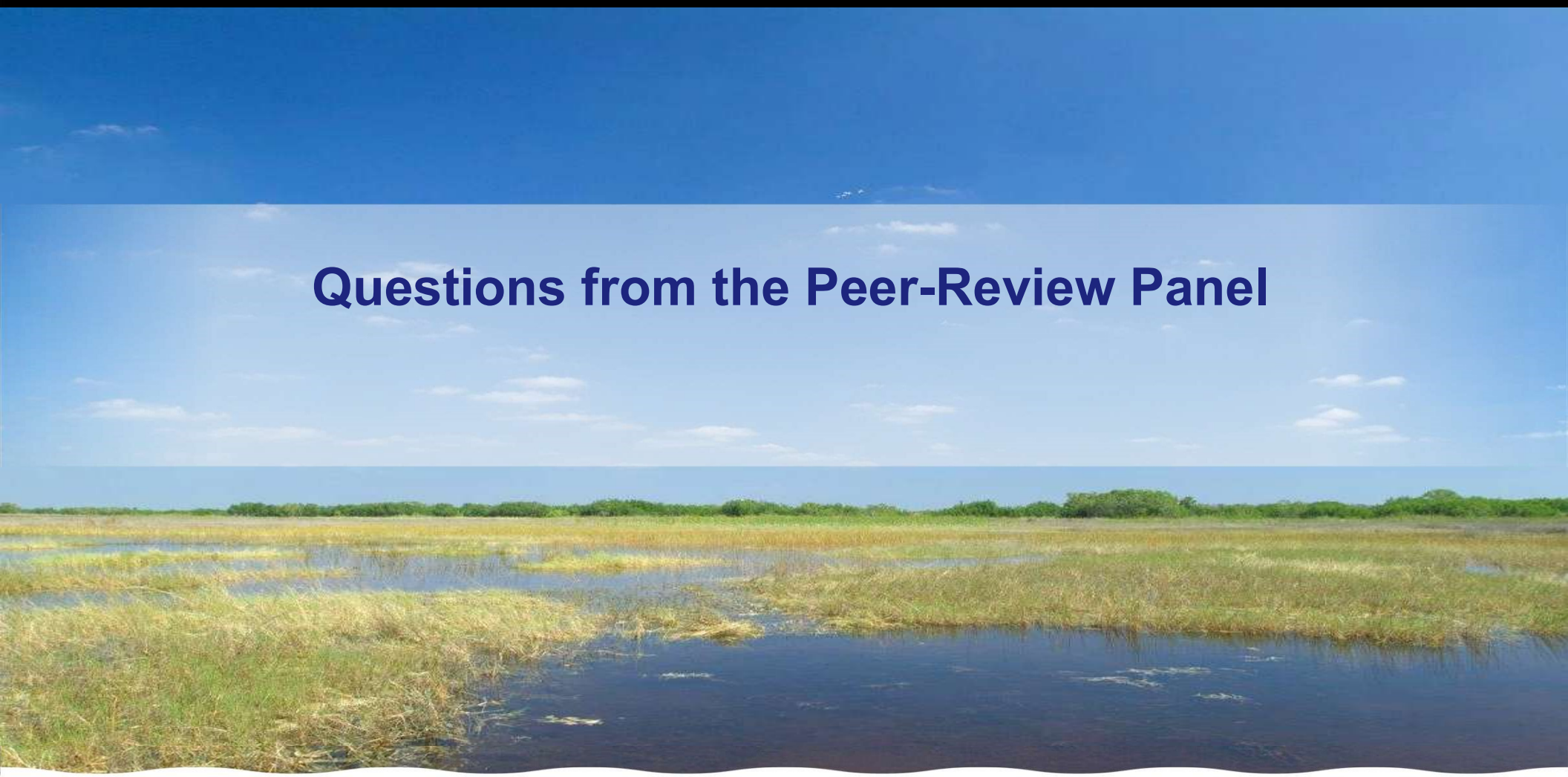


Timing of treated flows south into the Central Everglades with CEPP (C240TSP) compared to existing conditions (EARECB).

- Additional flow will have the following ecological benefits to the Central Everglades:
  - Improve and/or restore vegetative communities and habitat for fish and wildlife
  - Improve natural processes critical for development of peat soils and tree islands
  - Improve slough vegetation depths resulting in fewer dryouts
  - Provide longer durations hydroperiods
  - Additional overland flow to Northeast Shark River Slough will improve the timing, distribution, and continuity of sheetflow across the Everglades ridge and slough landscape

Presenter: Leslye Waugh

EAA STORAGE RESERVOIR



Questions from the Peer-Review Panel

Public Peer-Review Session for the EAA Reservoir Water Reservation
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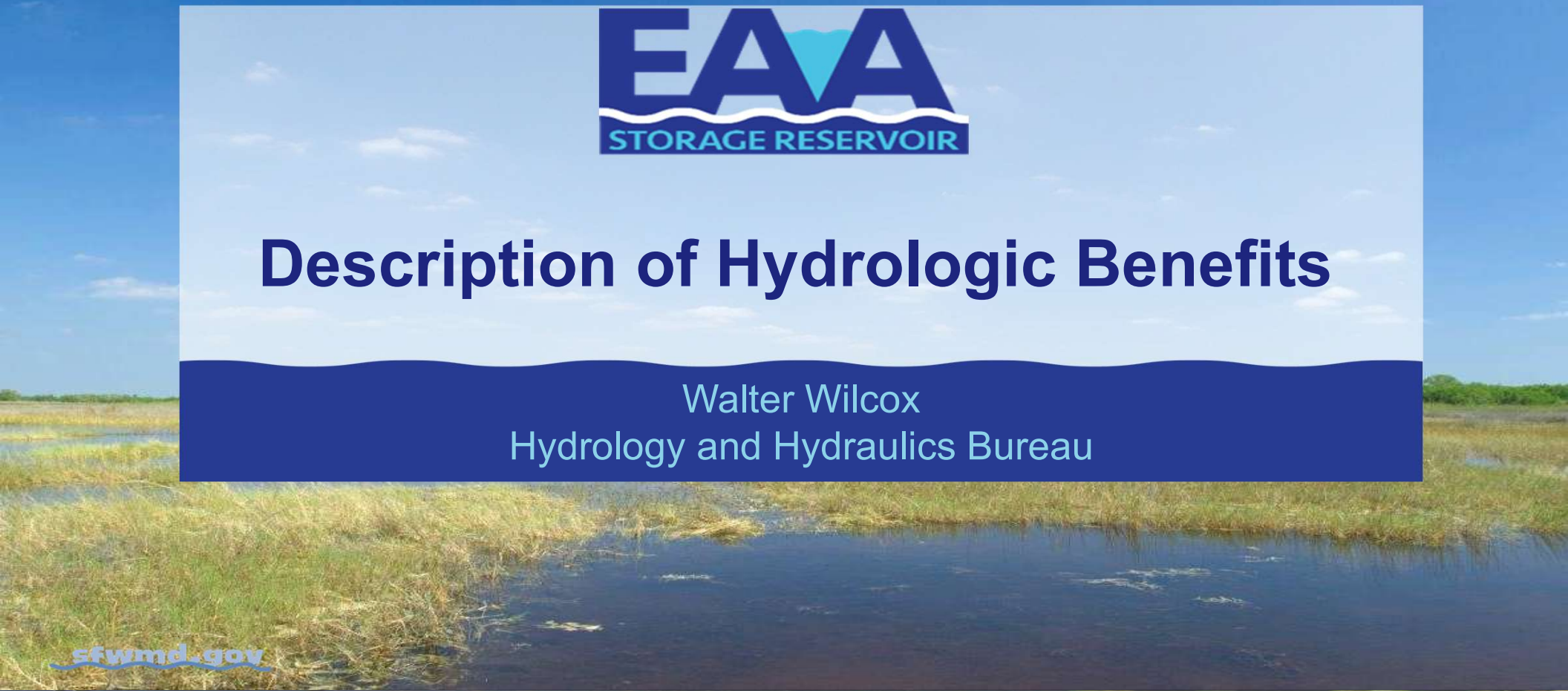


Description of Hydrologic Benefits

Walter Wilcox
Hydrology and Hydraulics Bureau

Overview of Modeling Tools

- A broad range of disciplines use "modeling" in the EAA Reservoir study
  - Hydrologic and benefit
  - Water quality
  - Ecologic
- Guiding principle for modeling during the EAA Reservoir planning effort in 2017:

  Maintain consistency with the tools used to authorize the Central Everglades Planning Project (CEPP) in 2014.
- Modeling tools used in the study have a high degree of acceptability and typically are:
  - Calibrated/validated based on historical observation
  - Independently peer reviewed
  - Approved for use by the United States Army Corps of Engineers (USACE)

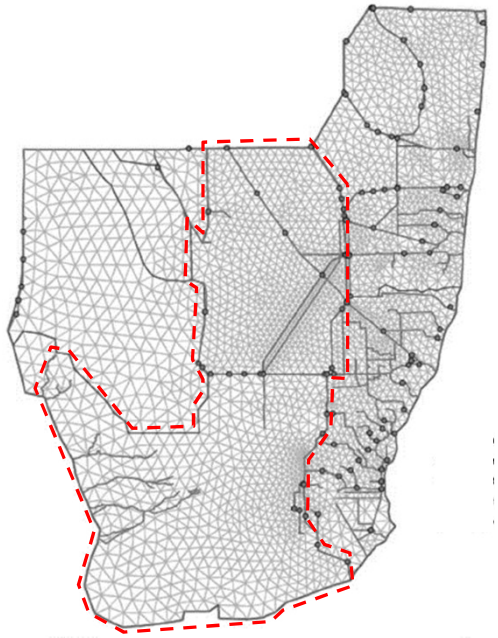
CEPP/EAA – Hydrologic Modeling

Regional Simulation Model (RSM)

- RSM is a regional hydrologic model designed to handle Florida's unique conditions
- RSM has been peer reviewed (twice) and is approved for use by the USACE (certified)
- Model outputs include:
  - Stages/head/ponding
  - Transects, flow vectors, structure flows
  - Water budgets

RSM-GL Model Calibration

	Average (ft)		Std. Deviation (ft)	
	Calib.	Valid.	Calib.	Valid.
Absolute Bias (ft)	**0.21**	0.26	**0.18**	0.29
RMSE (ft)	0.54	0.59	0.25	0.35



Mesh Information:
- Number of cells: 5,794
- Size: ~1 sq. mile

Model inputs:
- Rainfall
- Evapotranspiration
- Topography
- Land cover
- Peat thickness
- Aquifer elevation
- Structures

Period of Simulation:
- 1965 – 2005 climate

RSM-GL

Note: RSM-BN used to simulate Northern Everglades

Presenter: Walter Wilcox

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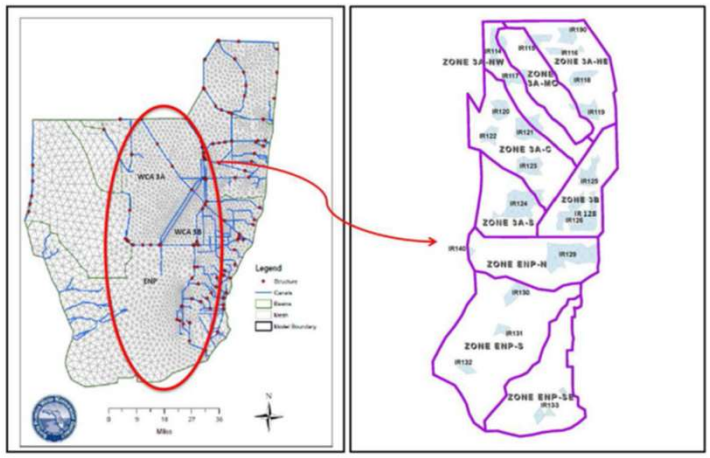
CEPP/EAA – Benefit Modeling

- Use project performance measures to quantify relative benefits (habitat units)
- CEPP methodology reviewed and approved by the USACE's National Ecosystem Planning Center of Expertise



Indicator Regions and Zones

Greater Everglades	**Hydrologic Surrogate for Soil Oxidation**	Measure of cumulative drought intensity to reduce exposure of peat to oxidation
	Inundation Pattern in Greater Everglades Wetlands	Measure of the number and duration of inundation events used to calculate the percent period of record of inundation
	Number and Duration of Dry Events in Shark River Slough	Measure of the number of times and mean duration in weeks that water drops below ground
	Sheet flow in the Everglades Ridge and Slough Landscape	Measure of the timing, distribution and continuity of sheet flow across the landscape
	Slough Vegetation Suitability	Measure to evaluate the hydrologic suitability for slough vegetation (hydroperiod, drydown, dry and wet season depths)

Habitat Units

USACE methodology for quantifying ecological benefits on the array of alternatives

Step 1:

- Raw performance measure sub-metrics are linearly re-scaled between 0 and 100

Step 2:

- Within each zone, performance measure metrics are combined for each project alternative to produce a net zone benefits score between 0 and 1

Step 3:

- The 0 to 1 benefits score for each zone is multiplied by the acreage of the zone to generate a Habitat Unit value for the zone
  - Northern Estuaries (2 zones)
  - Greater Everglades (9 zones)

Step 4:

- Habitat Unit Lift = Alternative – FWO Project Condition

Presenter: Walter Wilcox

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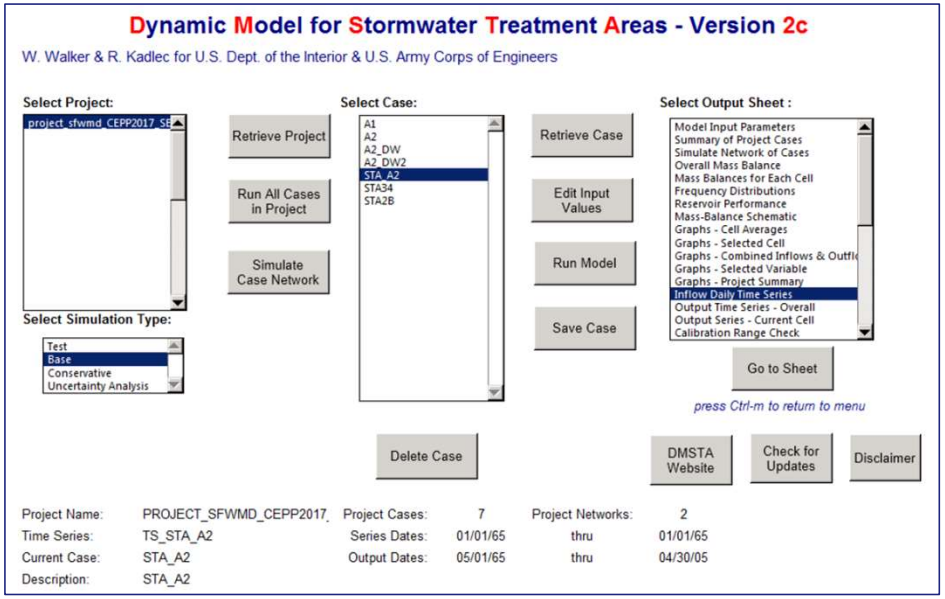
CEPP/EAA – Water Quality Modeling

- DMSTA was developed and calibrated to information specific to South Florida to predict phosphorus removal performance of Everglades STAs and storage reservoirs
- Developed for the U.S. Dept. of the Interior and USACE (Walker and Kadlec 2005)
- Extensively used in South Florida since 2001 to analyze STA design, operation, and management
  - Including Central Everglades and Restoration Strategies
- Reviewed and approved CEPP by the USACE's engineering model certification and Agency Technical Review processes

Dynamic Model for Stormwater Treatment Areas (DMSTA)



Walker and Kadlec, 2005. Dynamic Model for Stormwater Treatment Areas, prepared for the U.S. Department of the Interior and the U.S. Army Corps of Engineers. http://wwwalker.net/dmsta/

sfwmd.gov

Presenter: Walter Wilcox

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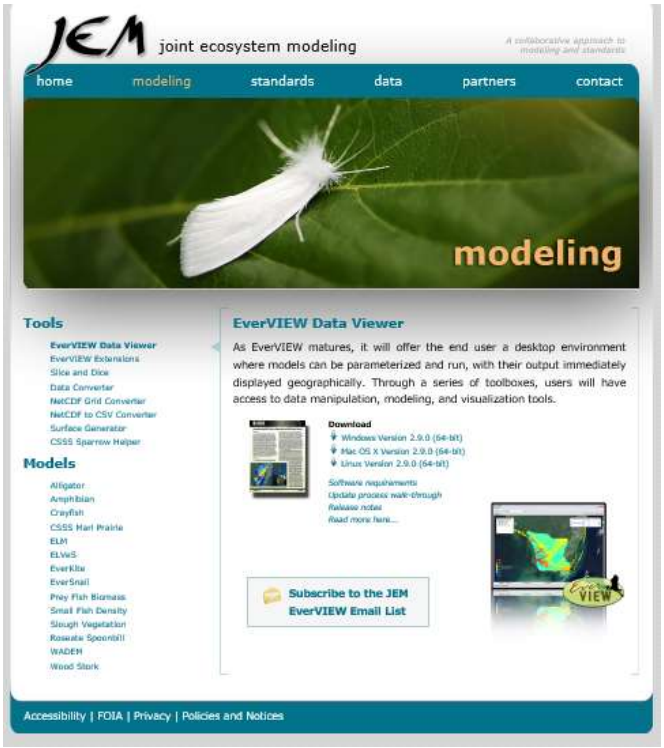
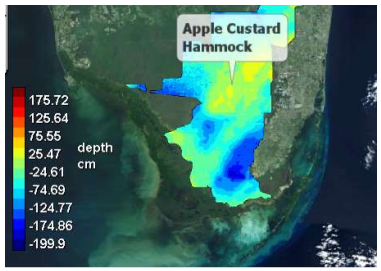
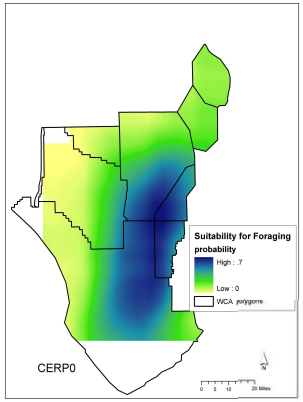
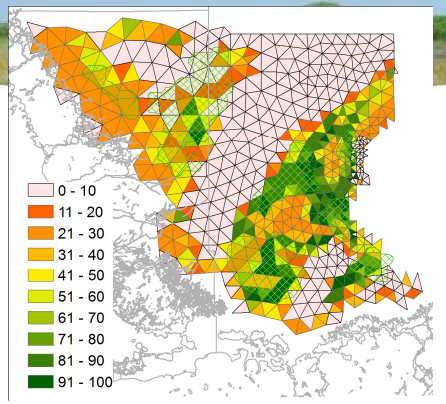
CEPP/EAA – Ecological Modeling

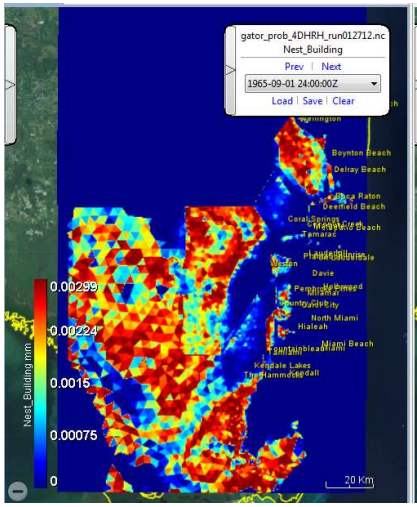
Joint Ecosystem Modeling – USGS & DOI

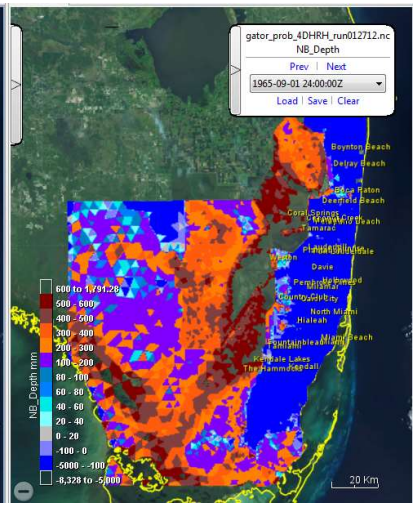


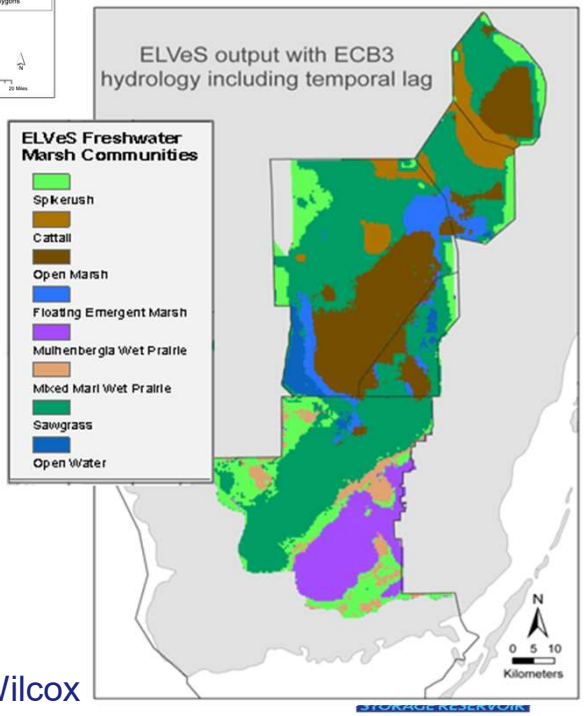








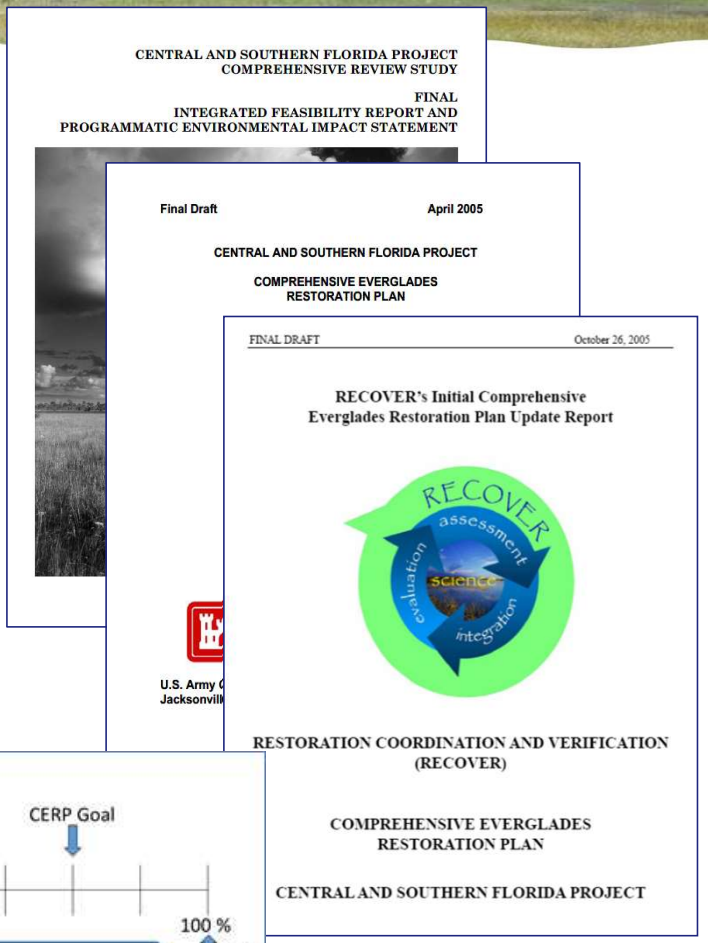


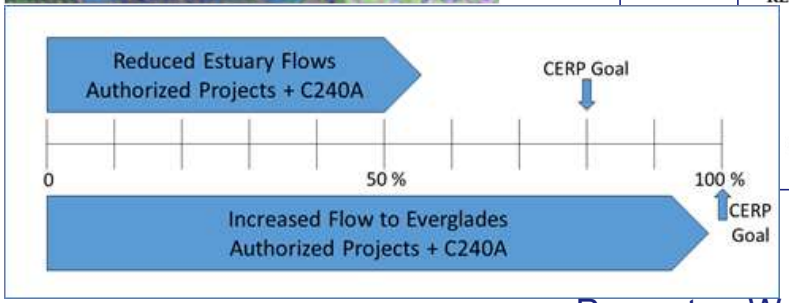


Presenter: Walter Wilcox

Informing the EAA Reservoir Study: Defining the CERP Goal

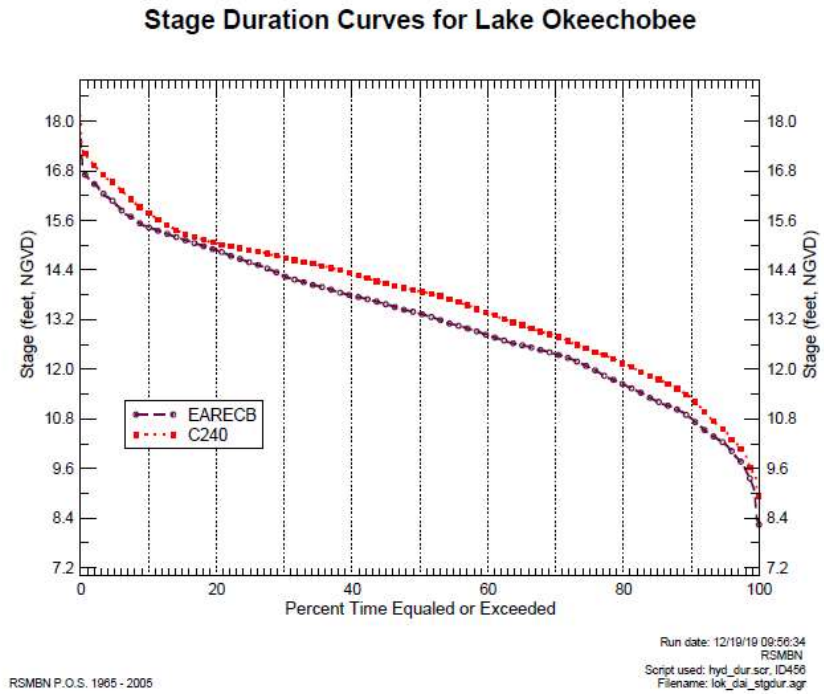
- Starting point was the original RESTUDY and other programmatic documents by RECOVER
- CERP defined a 360,000-ac-ft storage reservoir and no STA
  - Sent ~300,000 ac-ft avg. annually, above existing conditions, into the Central Everglades (across the "redline")
  - 1965-2000 Period of simulation
- EAA project identified a 240,000-ac-ft, storage reservoir with an STA
  - Sent ~300,000 ac-ft avg. annually, above existing conditions, for 1965-2000
  - Sent ~370,000 ac-ft avg. annually, above existing conditions, for 1965-2005

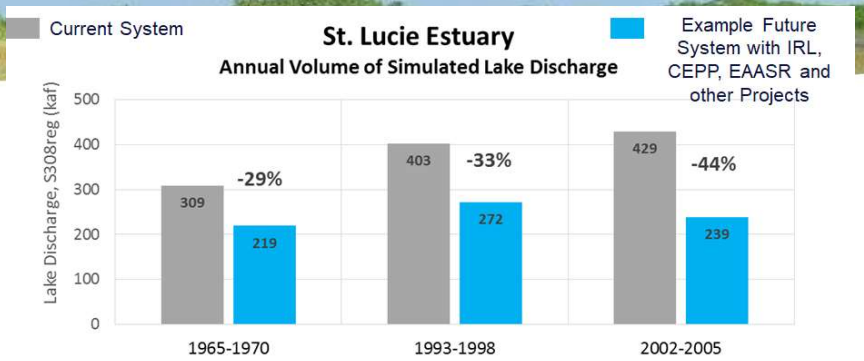




Presenter: Walter Wilcox

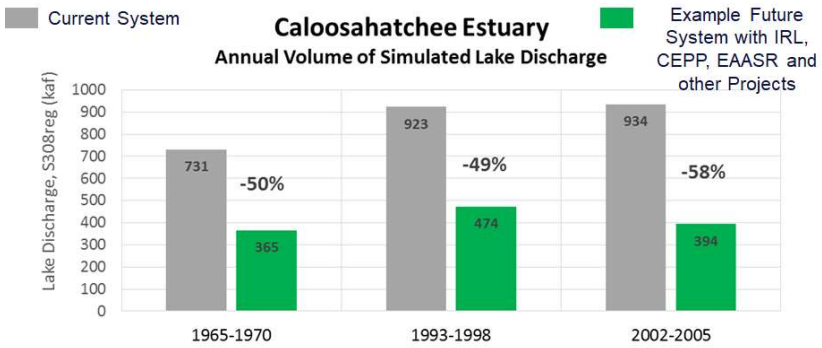
Improved Conditions in Lake Okeechobee and Northern Estuaries





Duration of the Lake-Caused High Discharge Events

Reduced from 10 to 5 months	Reduced from 8 to 4 months	Reduced from 6 to 2 months
Reduced from 4 to 3 years	Reduced from 5 to 2 years	Reduced from 2 to 2 years



Duration of the Lake-Caused High Discharge Events

Reduced from 11 to 7 months	Reduced from 14 to 4 months	Reduced from 8 to 4 months
Reduced from 5 to 3 years	Reduced from 4 to 3 years	Reduced from 3 to 3 years

Presenter: Walter Wilcox

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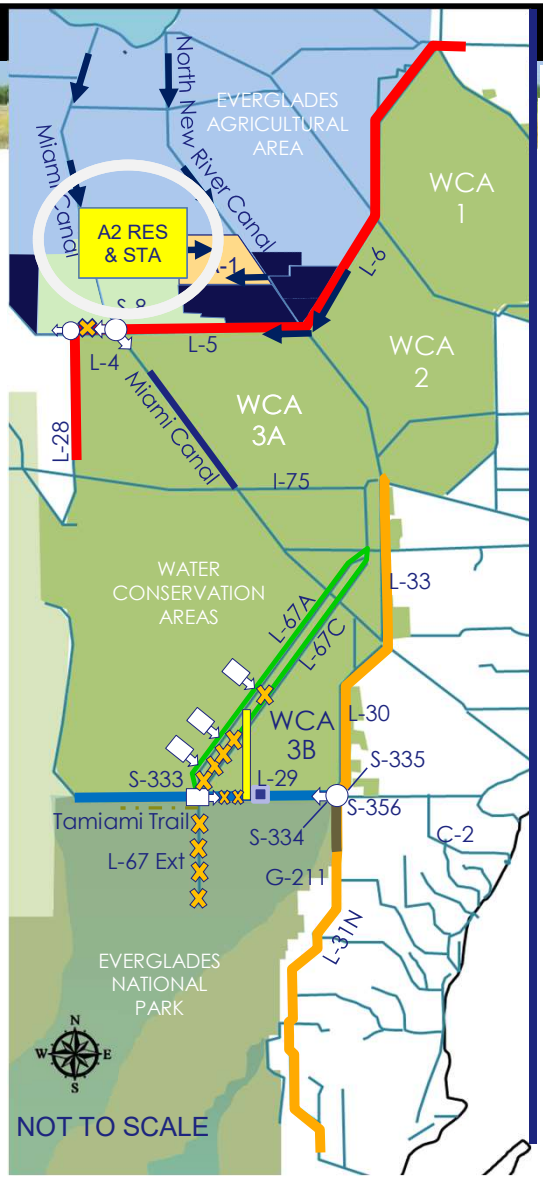
EAA Reservoir Project – Enhancing the Authorized Central Everglades Plan



STORAGE AND TREATMENT

- Construct EAR and STA and integrate with A-1 FEB / ECP operations
- Lake Okeechobee operation refinements within LORS

DISTRIBUTION/CONVEYANCE

- Diversion of L-6 flows, Infrastructure and L-5 canal improvements
- Remove western ~2.9 miles of L-4 levee (west of S-8 3,000 cfs capacity)
- Construct 360 cfs pump station at western terminus of L-4 levee removal
- Backfill Miami Canal and Spoil Mound Removal ~1.5 miles south of S-8 to I-75

DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 2,500 cfs
- Two 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A canal north and south of structures
- Construct ~8.5 mile levee in WCA 3B, connecting L-67A to L-29
- Remove ~8 miles of L-67C levee in Blue Shanty flowway (no canal back fill)
- One 500 cfs gated structure north of Blue Shanty levee and 6,000-ft gap in L-67C levee
- Remove ~4.3 miles of L-29 levee in Blue Shanty flowway, divide structure east of Blue Shanty levee at terminus of western bridge
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Remove entire 5.5 miles L-67 Extension levee, backfill L-67 Extension canal
- Remove ~6 mile Old Tamiami Trail road (from L-67 Ext to Tram Rd)

SEEPAGE MANAGEMENT

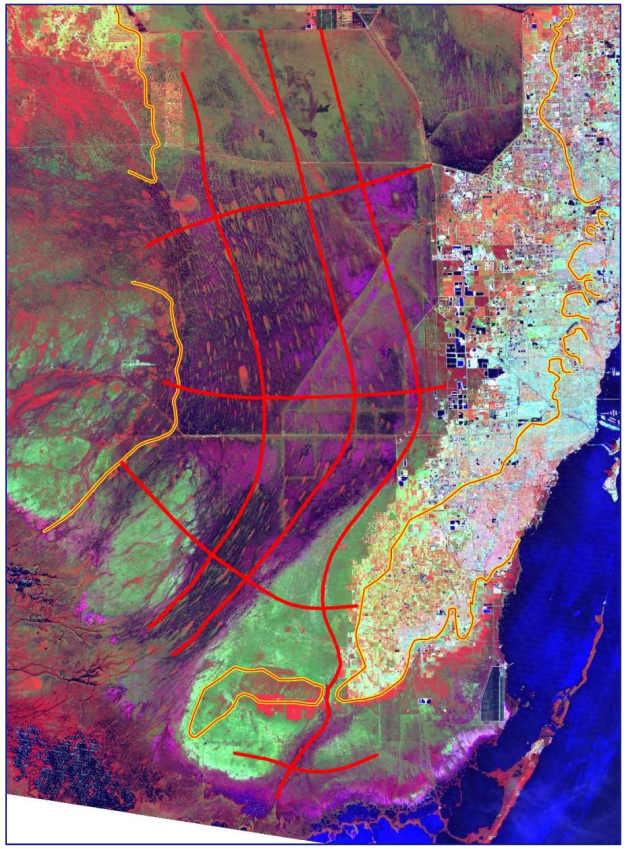
- Increase S-356 pump station to ~1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail (along L-31N)
- G-211 operational refinements; use coastal canals to convey seepage

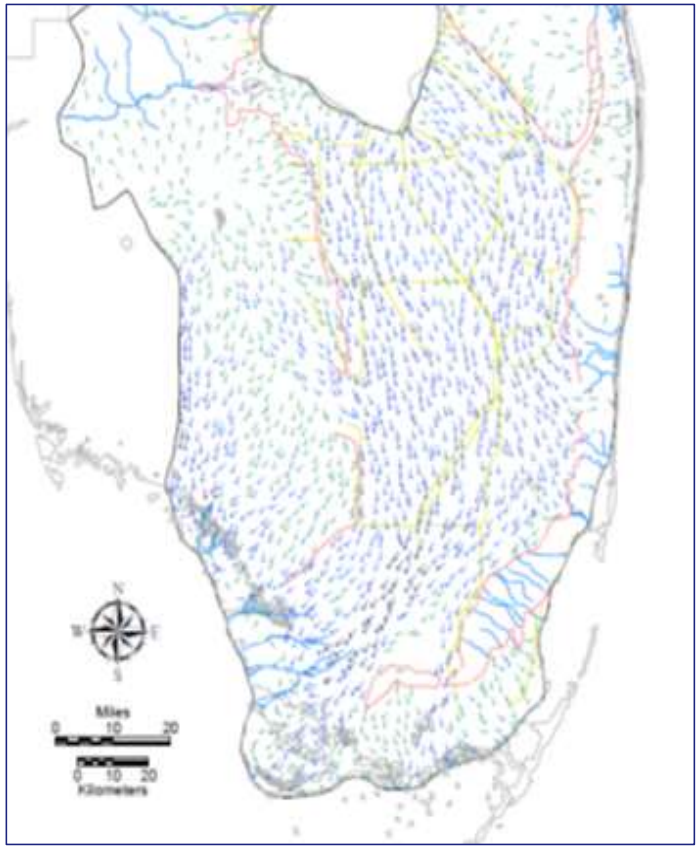
Note: System wide operational changes and adaptive management considerations will be included in project

FEB · STA · Pump · Old Tamiami Trail Removal · Backfill · Levee Removal · Gated Structure · Seepage Barrier · Divide · Levee

The Natural System Landscape

Landscape Directionality (Current System)

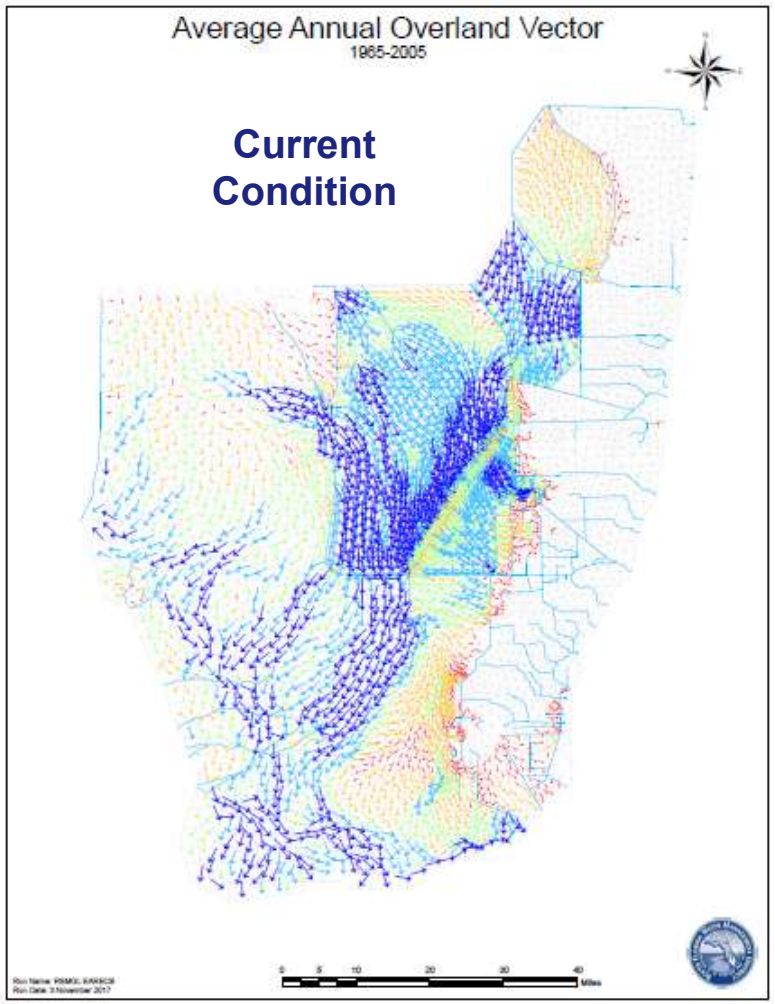




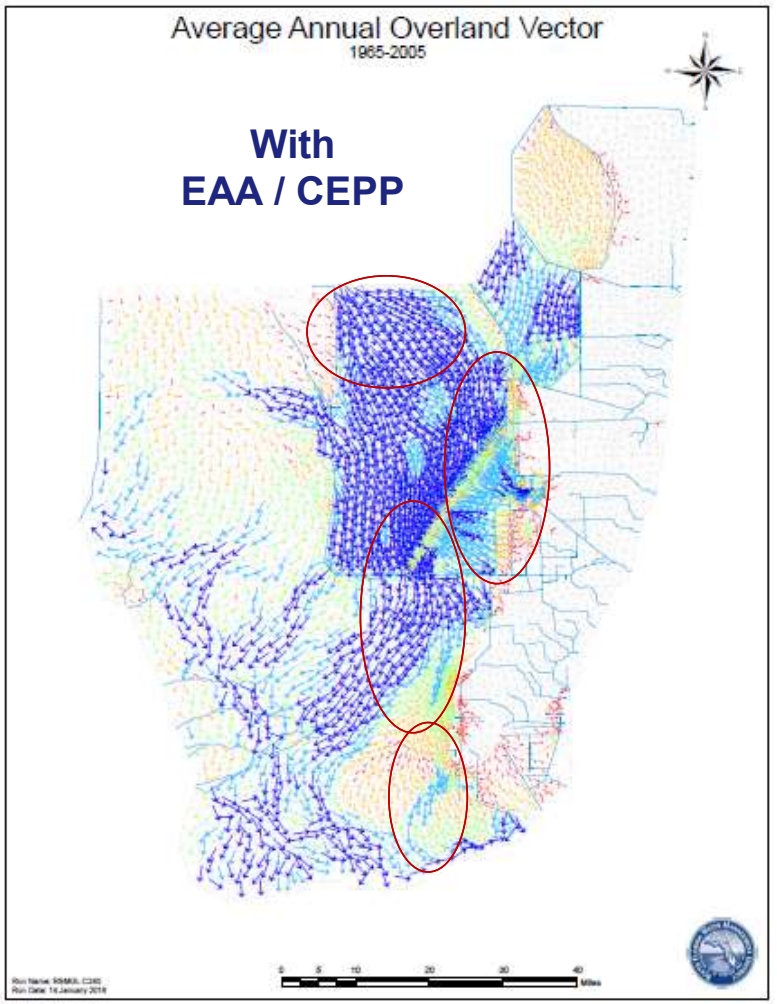
Overland Flow Directionality (Natural System Modeling)

Presenter: Walter Wilcox

EAA STORAGE RESERVOIR



Comparison:
Overland Flow
Vector Maps



Presenter: Walter Wilcox

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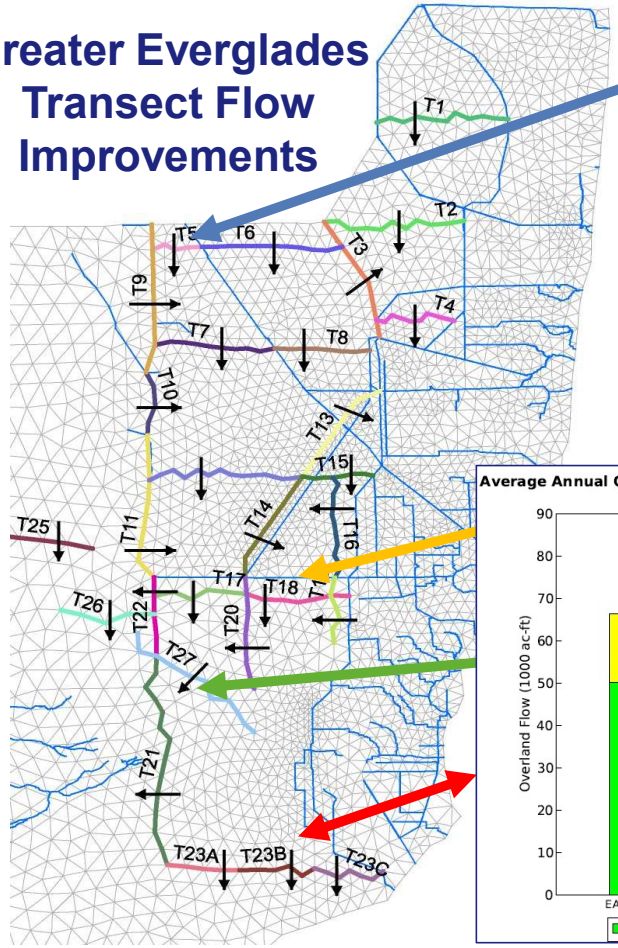
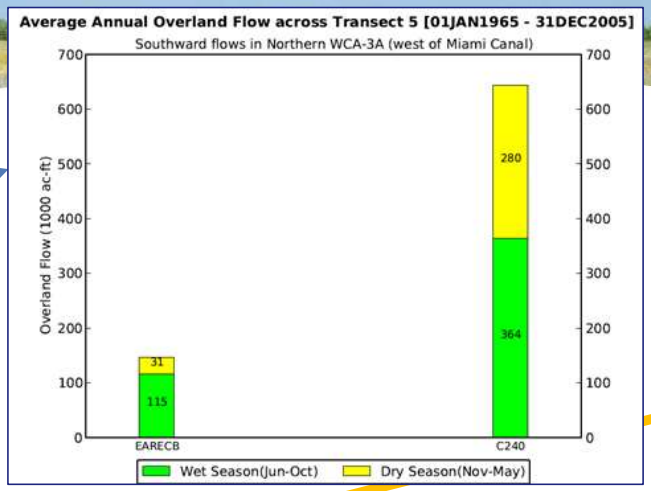
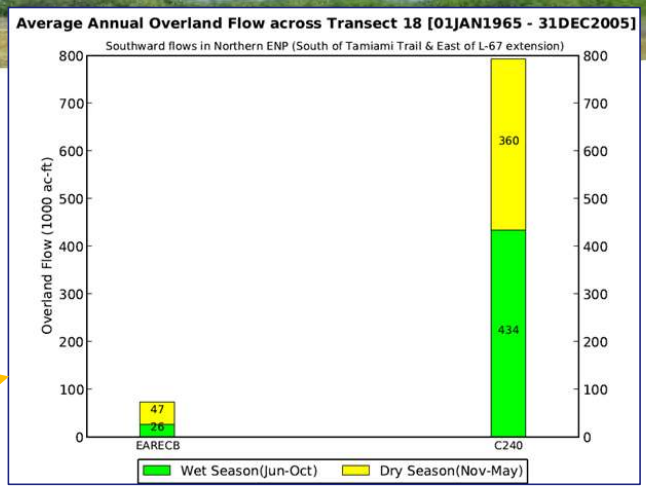
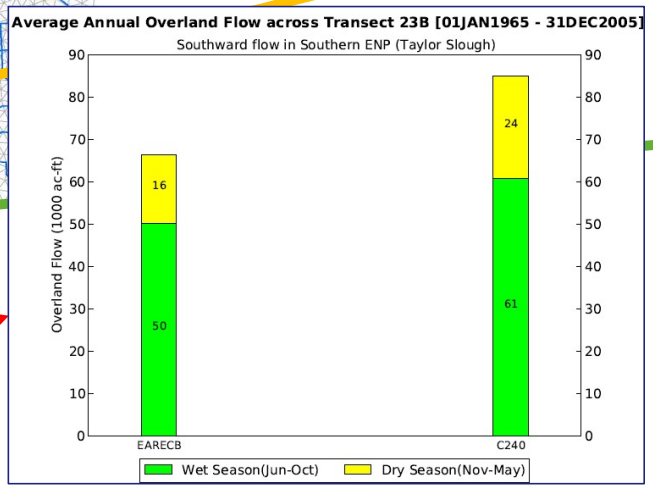
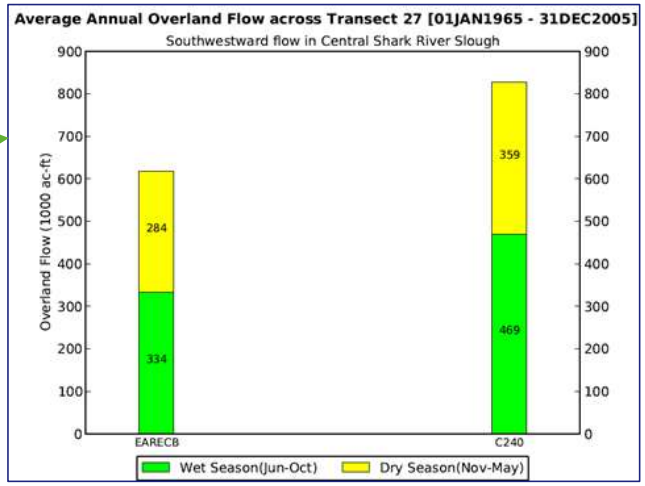
Greater Everglades Transect Flow Improvements











Presenter: Walter Wilcox

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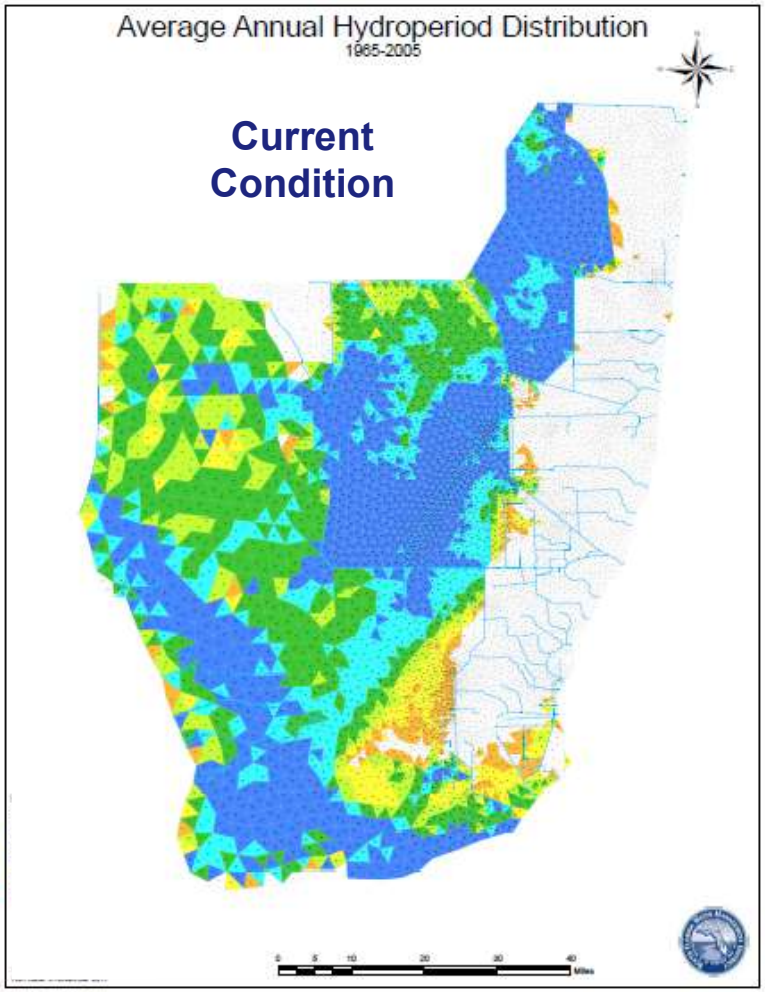
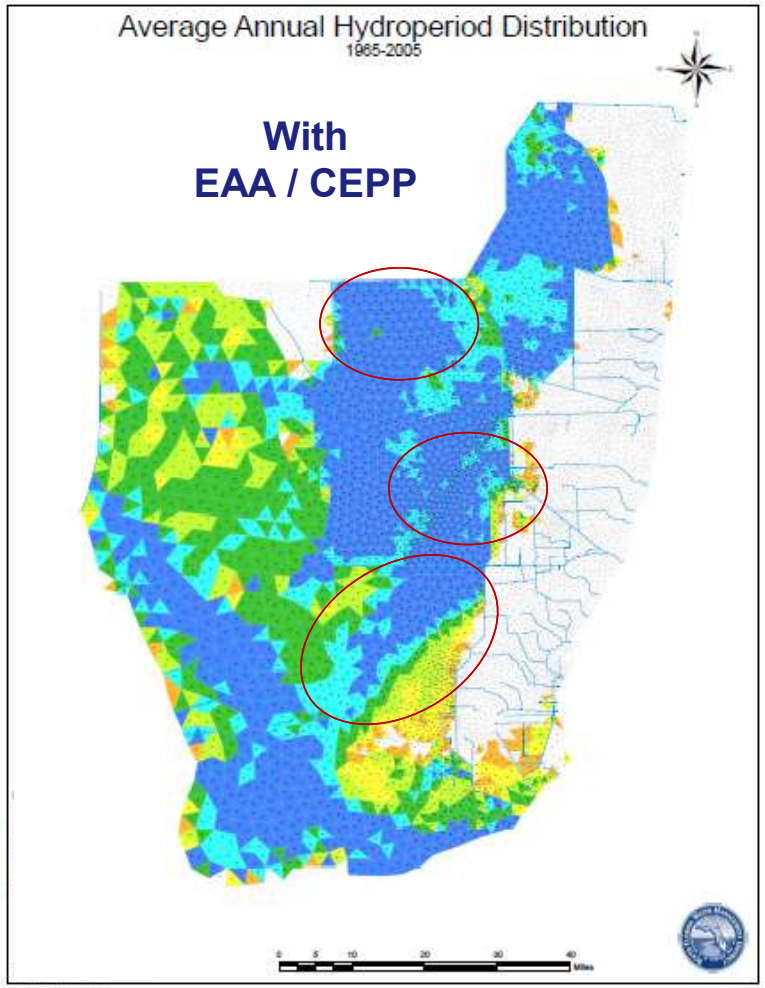


Comparison: Hydroperiod Maps



Hydroperiod Class
- 0 to 60 days
- 60 to 120 days
- 120 to 180 days
- 180 to 240 days
- 240 to 300 days
- 300 to 330 days
- 330 to 365 days

Presenter: Walter Wilcox

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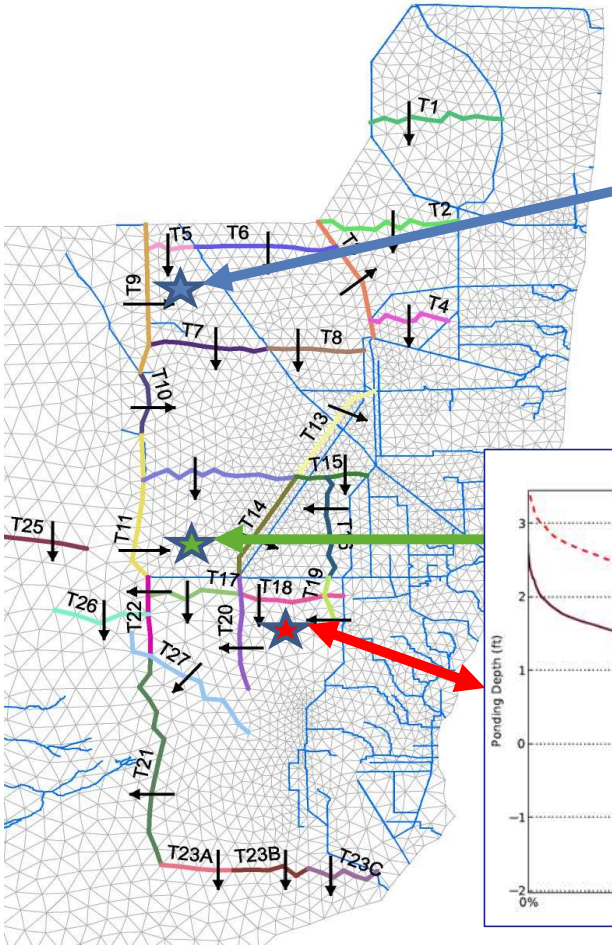
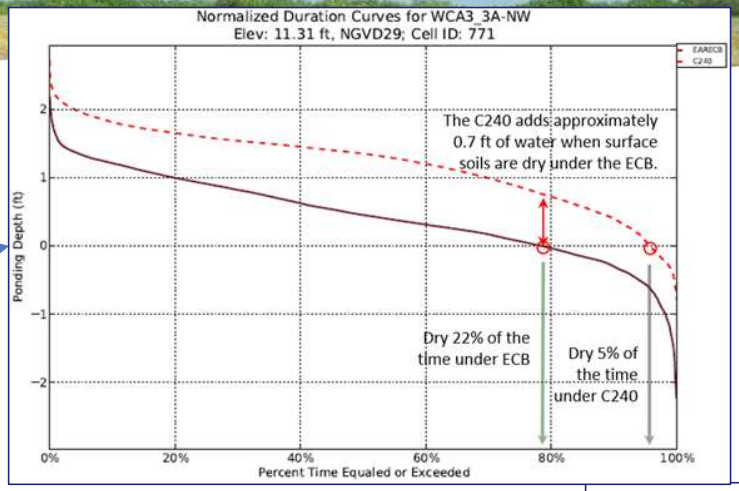
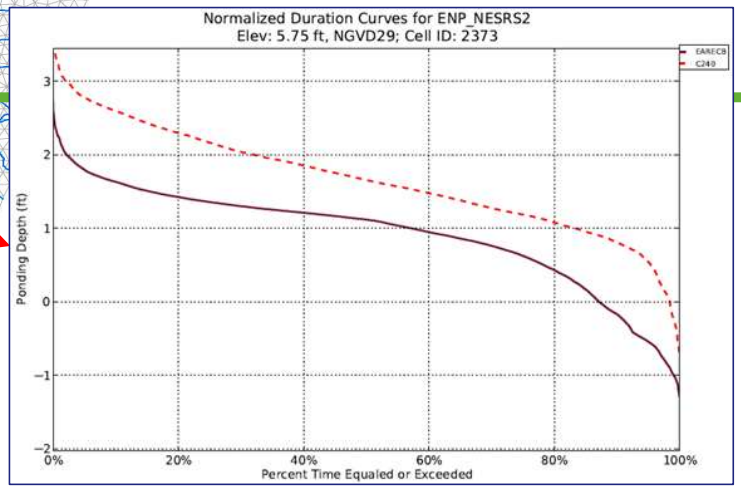
Greater Everglades Water Level Improvements







Presenter: Walter Wilcox

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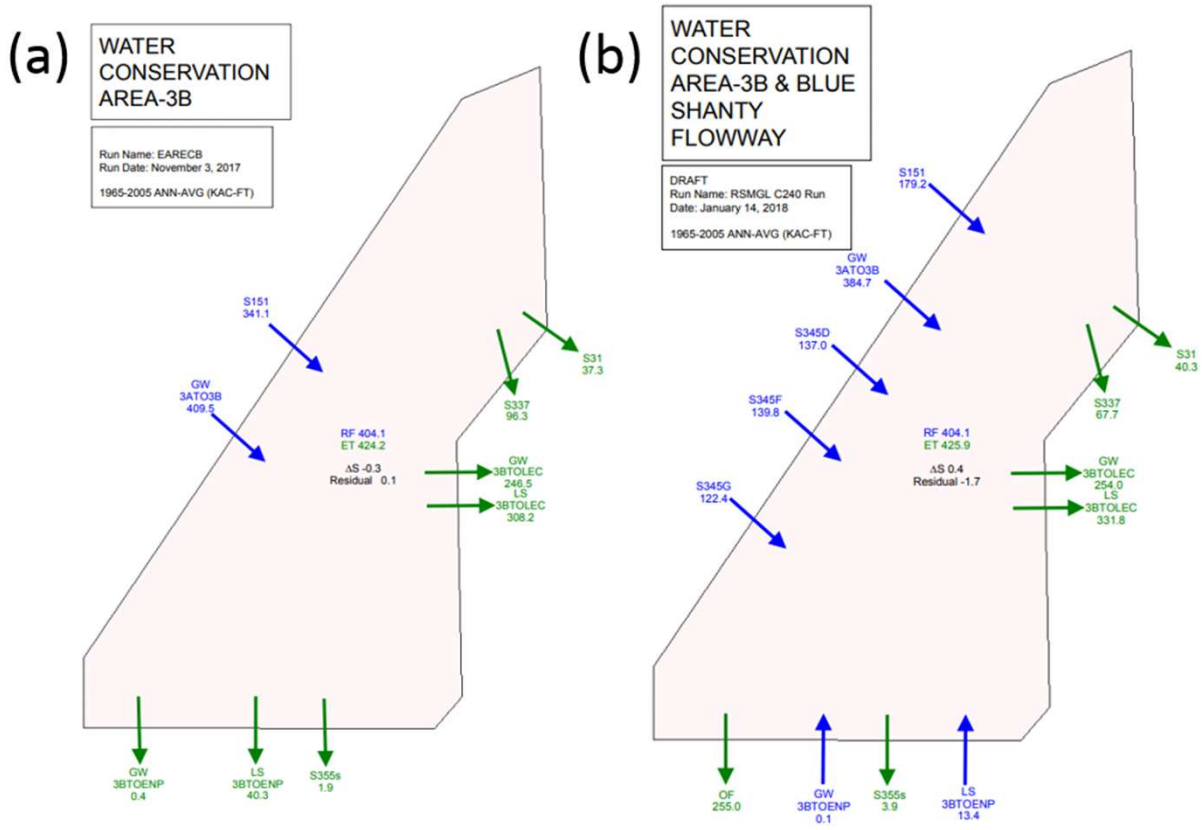
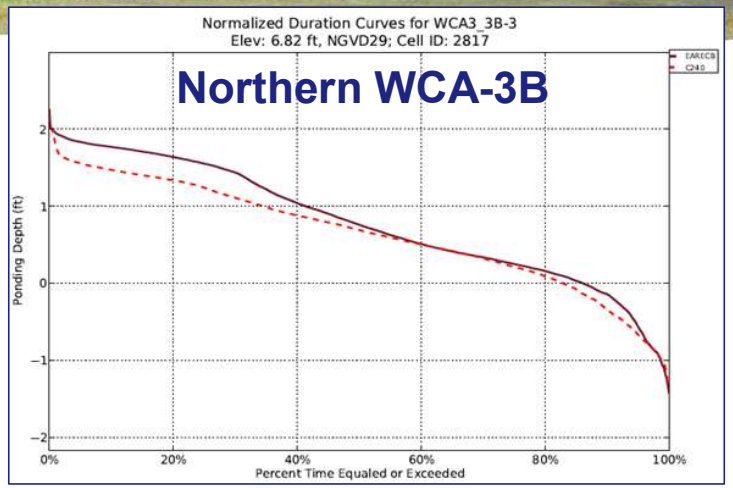
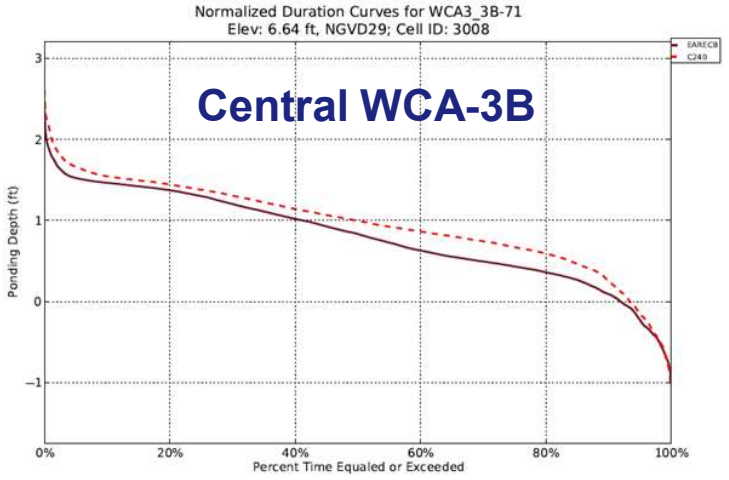
WCA-3B Water Budgets







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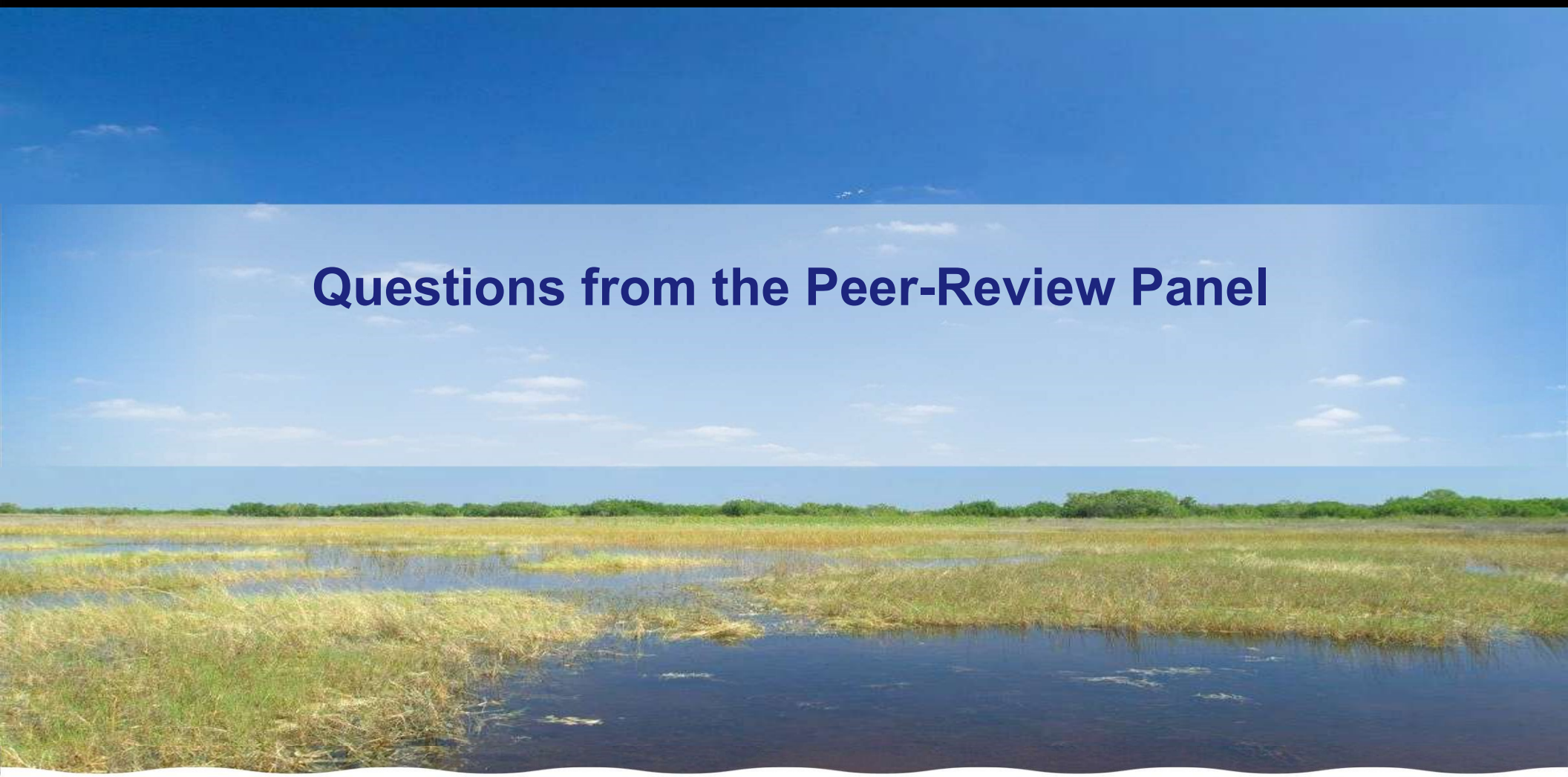


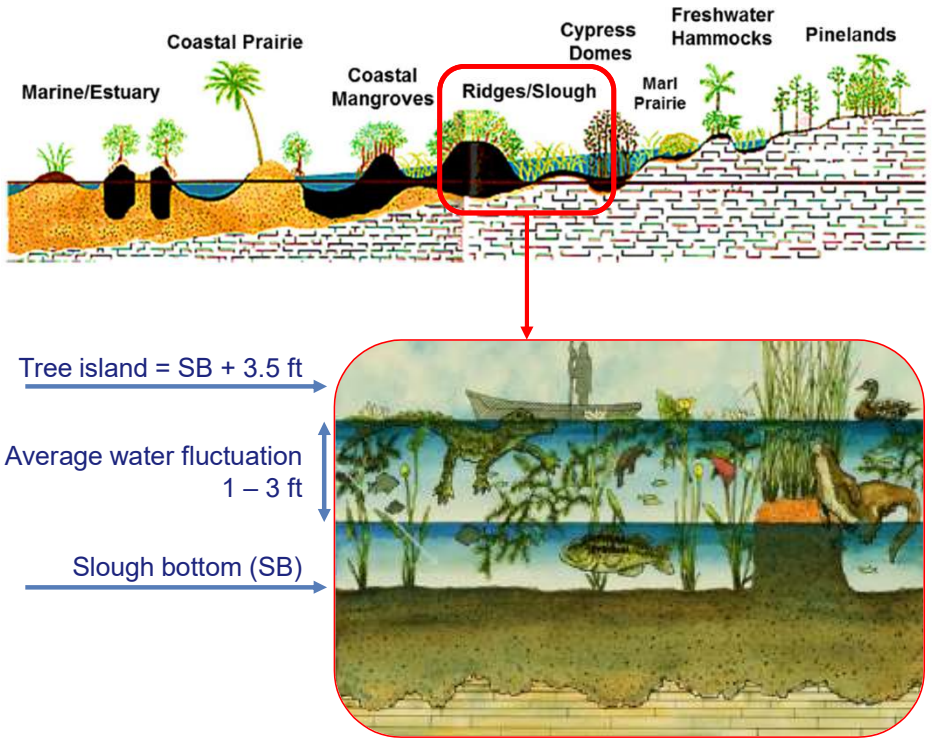
Questions from the Peer-Review Panel

Public Peer-Review Session for the EAA Reservoir Water Reservation
May 29, 2020

Description of Fish and Wildlife Benefits

Dong Yoon Lee
Applied Sciences Bureau

Predicted Changes in the Central Everglades



(From: Sklar, F.H., S. Newman, L. Cadavid, M.I. Cook, C. Coronado, C. Zweig, W. Wilcox, and M.C. Brown. 2019. The Subtropical Everglades, Florida, USA. In: Reference Module in Earth Systems and Environmental Sciences. Elsevier.)

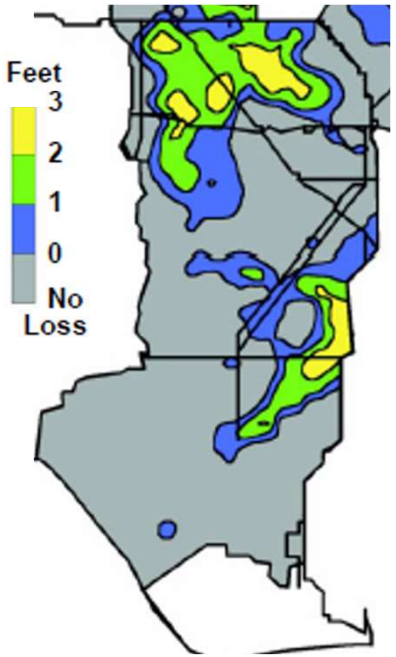
- **Restoration**
  - Depth
  - Duration
  - Timing
  - Quantity
- **Soil**
  - Oxidation
  - Transport
  - Accretion

- **Fish and Wildlife**
  - Abundance
  - Density
  - Habitat quality
- **Vegetation**
  - Growth
  - Control (exotic)
  - Composition
- **Landscape**
  - Microtopography
  - Tree island

Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

RSM Estimates of Hydropattern (1965-2005)



Loss of soil thickness between 1946 and 1996
(From: Sheidt et al. 2000)

	(Annual average, ft)		(Seasonal maximum, ft)		(Annual, day)	
Region	ECB depth	C240 depth	ECB max. depth	C240 max. depth	ECB hydroperiod	C240 hydroperiod
3A-NW						
3A-NE						
3A-E						
3A-Central						
3A-S						
3B-Central						
3B-S						
SRS						
SRS-E						
SRS-W						

Good quality habitat | An over-drained area | A high-water area | A rain-fed compartment

(Scheidt, D., J. Stober, R. Jones, and K. Thornton. 2000. South Florida ecosystem assessment: Everglades water management, soil loss, eutrophication and habitat. United States Environmental Protection Agency, Region 4, EPA 904-R-00-003. 48 pp.)

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EAA STORAGE RESERVOIR

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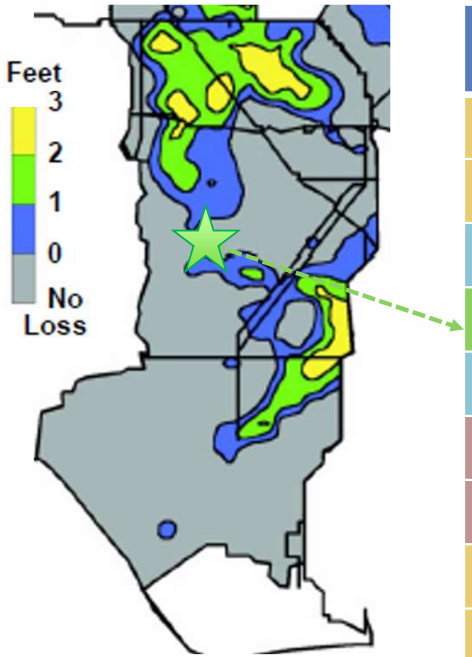

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3A-NW						
3A-NE						
3A-E						
3A-Central	1.3	1.5	4.6	4.3	337	338
3A-S						
3B-Central						
3B-S						
SRS						
SRS-E						
SRS-W						

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Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

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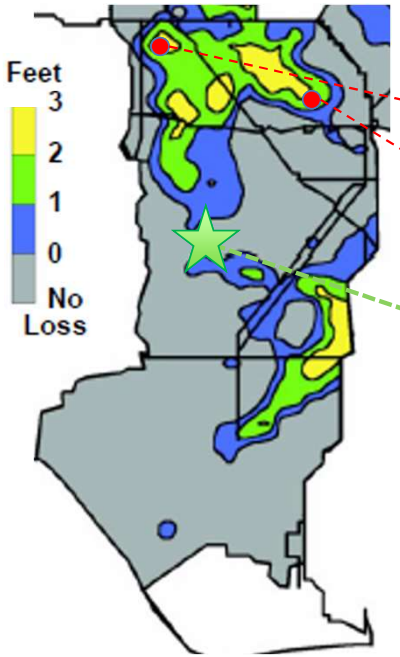

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3A-NE	0.8	1.2	4.4	4.2	284	324
3A-E						
3A-Central	1.3	1.5	4.6	4.3	337	338
3A-S						
3B-Central						
3B-S						
SRS						
SRS-E						
SRS-W						

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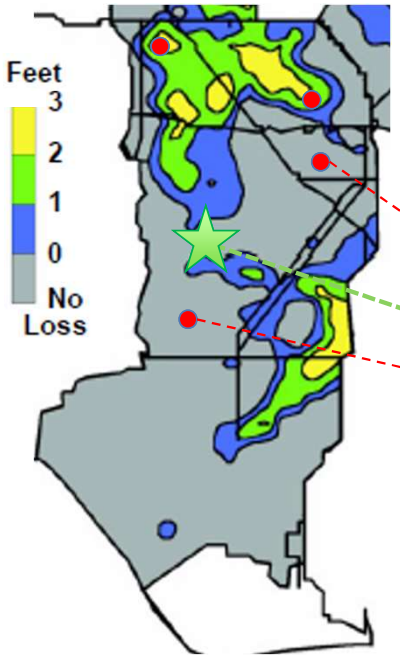

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3A-E	2.1	2.3	5.8	5.6	350	335
3A-Central	1.3	1.5	4.6	4.3	337	338
3A-S	1.8	1.9	5.1	4.7	350	346
3B-Central						
3B-S						
SRS						
SRS-E						
SRS-W						

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Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

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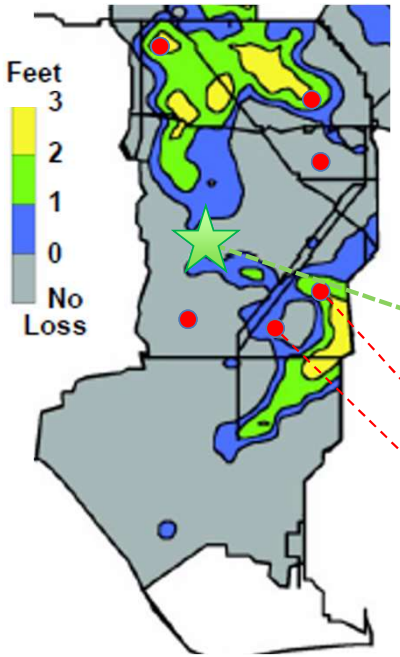

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3B-Central	1.1	1.1	2.8	2.9	335	335
3B-S	1.2	1.6	2.9	3.4	350	357
SRS						
SRS-E						
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EAA STORAGE RESERVOIR

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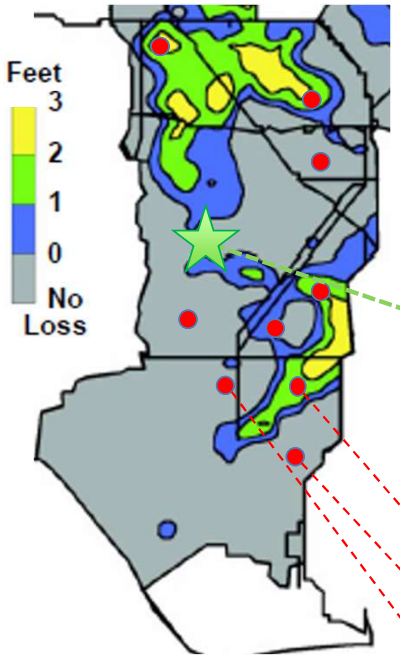

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SRS	0.9	1.5	3	3.8	302	350
SRS-E	-1.3	-0.6	1.0	1.6	73	110
SRS-W	0.4	0.5	3.1	2.7	306	270

Good quality habitat | An over-drained area | A high-water area | A rain-fed compartment

Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

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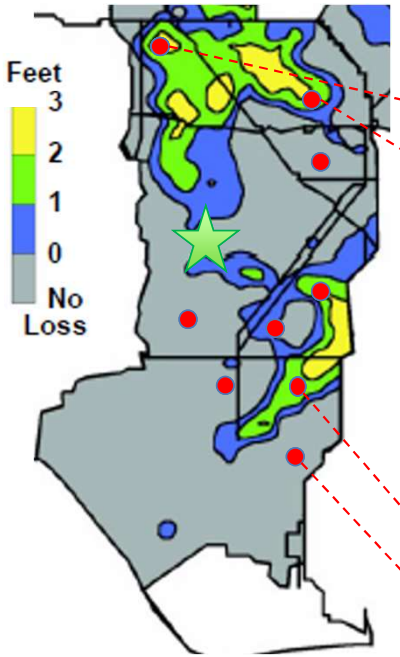

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EAA STORAGE RESERVOIR

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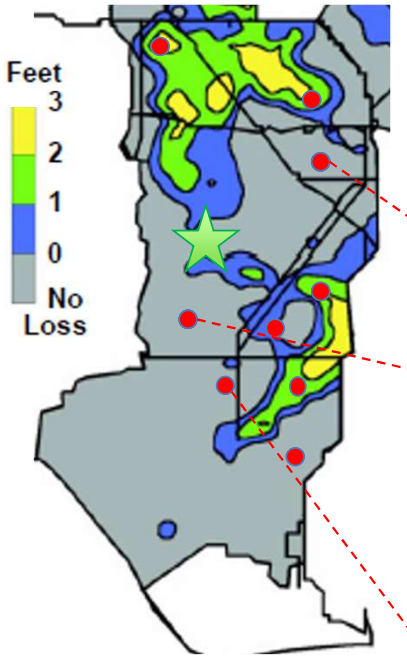

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Good quality habitat | An over-drained area | A high-water area | A rain-fed compartment

Presenter: Dong Yoon Lee

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Evaluation of Ecological Models

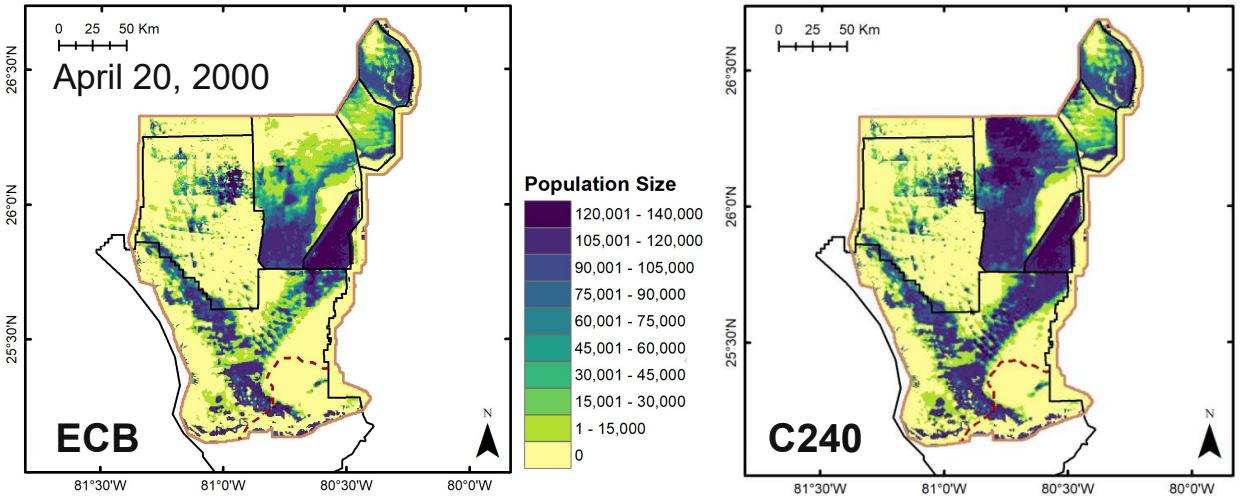
Taxa	Function	Model Input Variables
	Prey for snail kites	Water depth, temperature
	Major energy source	Days since dry
	Major energy source	(Not available)

Taxa	Function	Model Input Variables
	Marl prairie habitat conditions	Hydropattern, continuous dry days
	Ridge and slough habitat indicator	Water depth and its change, hydroperiod, days since dry
	Keystone species	Water depth and its change, hydroperiod, habitat

Apple Snail

Existing Condition Baseline

- Emergent, long-hydroperiod wetlands
- Adult (>20 mm)
- 400m-scale
- Model period: 1995 – 2005
- Average rainfall year: April 20, 2000



Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δdensity, %)

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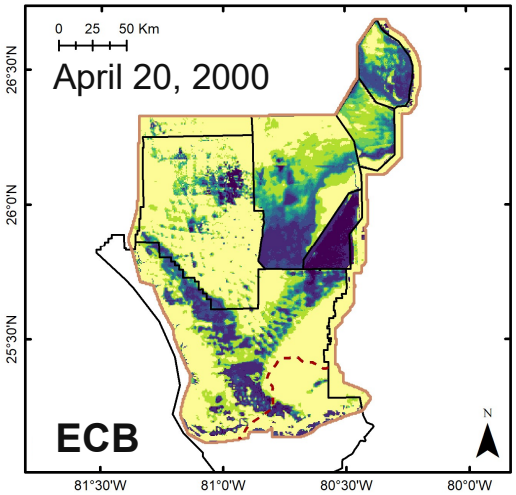
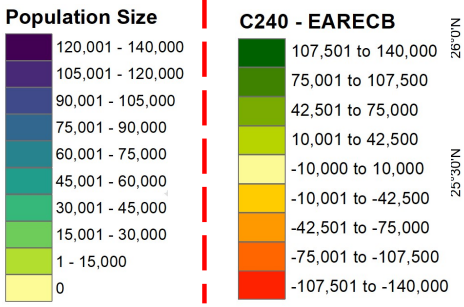
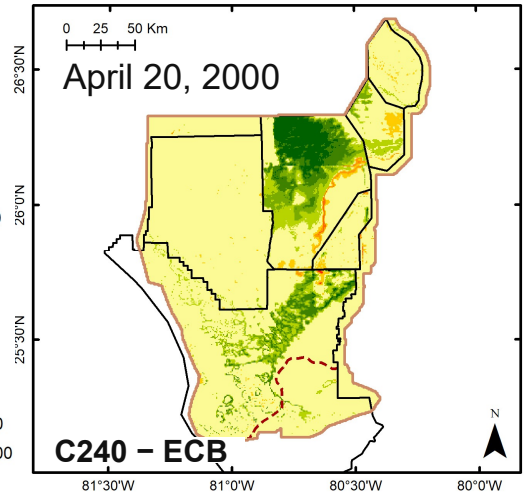


Lift of population density under C240 relative to the ECB





Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δdensity, %)
3A-E	3A-N, 3A-C, SRS	+318,000*	+19 to +126 (Avg: +41)

* Average of a representative dry (2004) and wet (1995) rainfall year.

Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

Apple Snail

Existing Condition Baseline

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- Adult (>20 mm)
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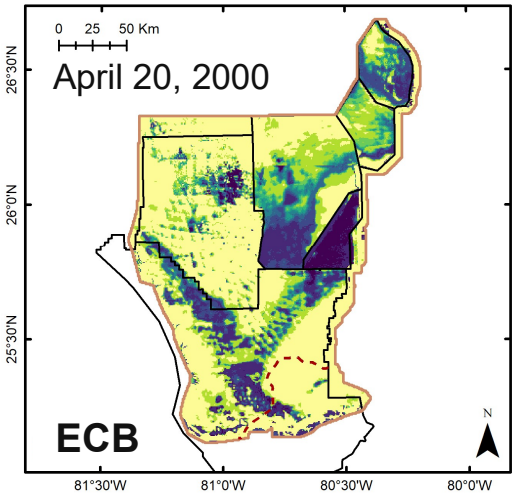
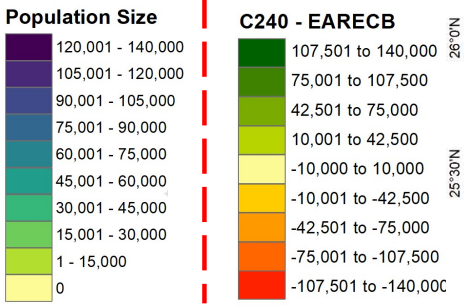
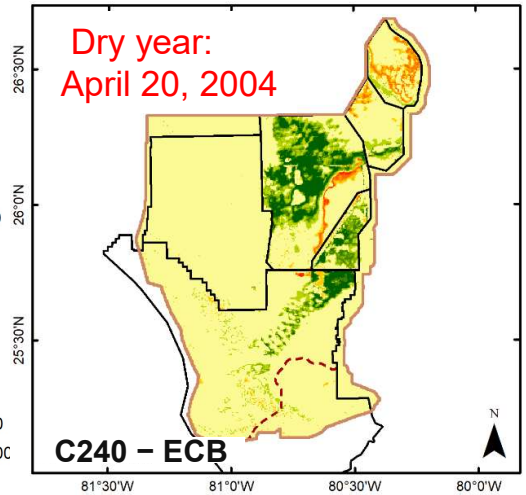
- Model period: 1995 – 2005
- Average rainfall year: April 20, 2000



Lift of population density under C240 relative to the ECB





Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δdensity, %)
3A-E	3A-N, 3A-C, SRS	+318,000*	+19 to +126 (Avg: +41)

* Average of a representative dry (2004) and wet (1995) rainfall year.

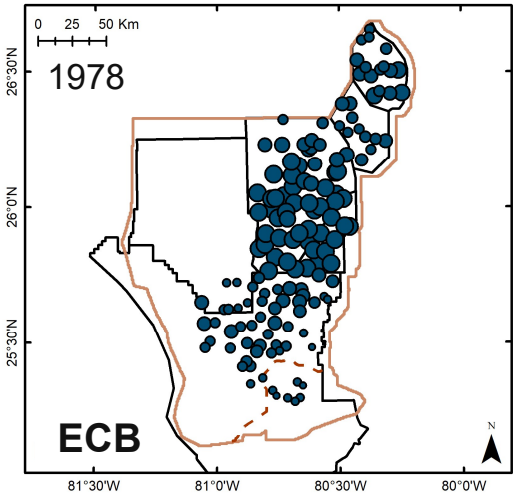
Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

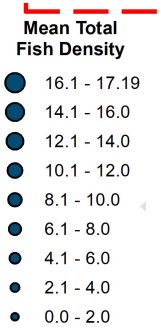
Small Fish

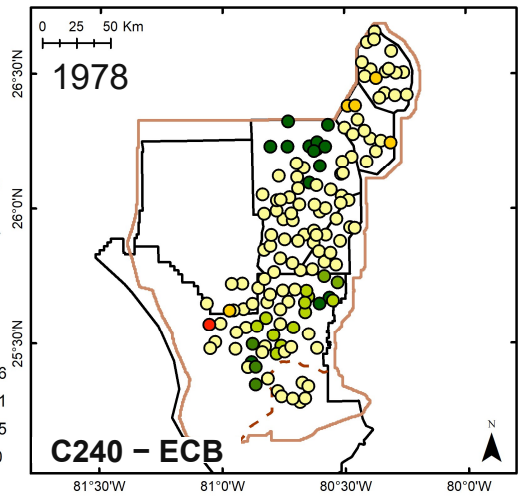
Existing Condition Baseline

- Sensitive to local hydrology and productivity
- Small fish (<8 cm)
- Primary sampling unit (count m^{-2})
- Model period: 1965 – 2005
- Average rainfall year: 1978



Lift of population density under C240 relative to the ECB





Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δdensity, %)
ENP-C	3A-N, NE-SRS, S-SRS, C-SRS	(Not available)	+27 to +361 (Avg: +129)

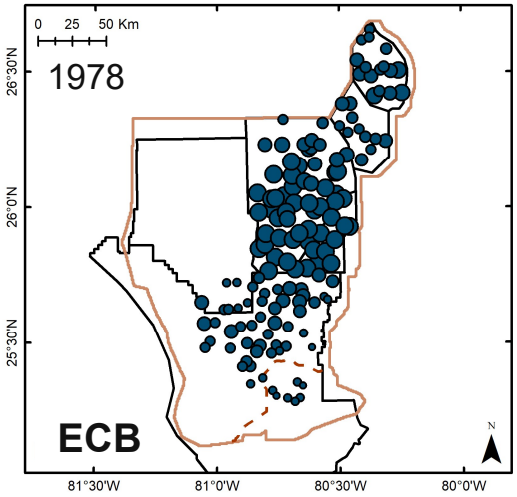
Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

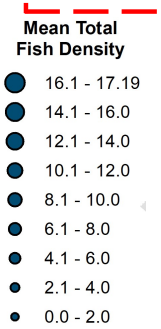
Small Fish

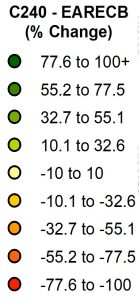
Existing Condition Baseline

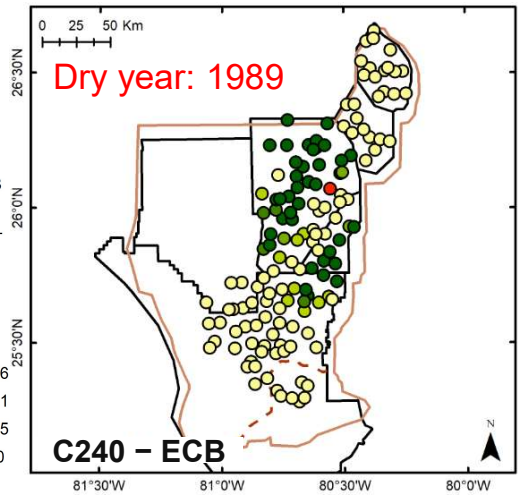
- Sensitive to local hydrology and productivity
- Small fish (<8 cm)
- Primary sampling unit (count m^{-2})
- Model period: 1965 – 2005
- Average rainfall year: 1978



Lift of population density under C240 relative to the ECB







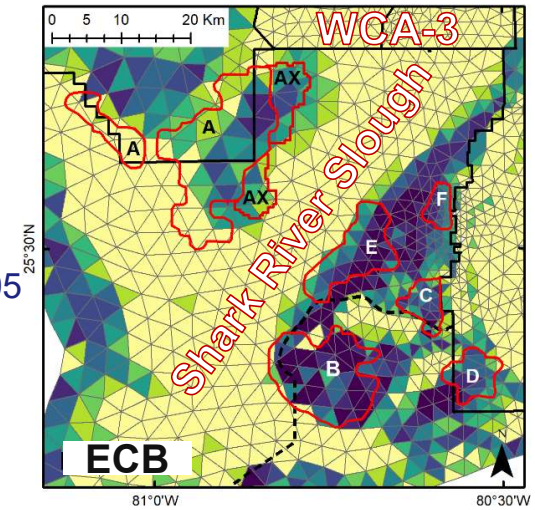
Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δdensity, %)
ENP-C	3A-N, NE-SRS, S-SRS, C-SRS	(Not available)	+27 to +361 (Avg: +129)

Cape Sable Seaside Sparrow (CSSS)

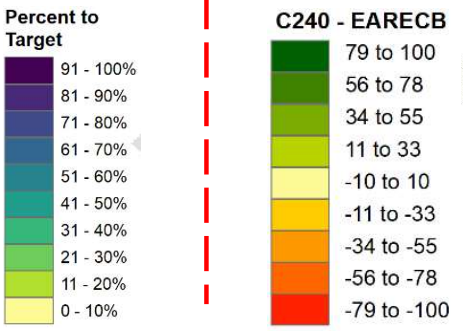
Existing Condition Baseline

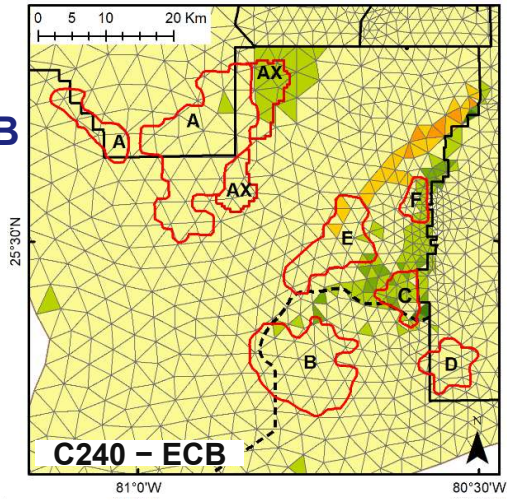
- Short-hydroperiod marl prairies
- Habitat Suitability Score
- Model period: 1965 – 2005

: Critical Habitat Areas (subpopulation)



Changes of CSSS habitat scores under C240 relative to the ECB





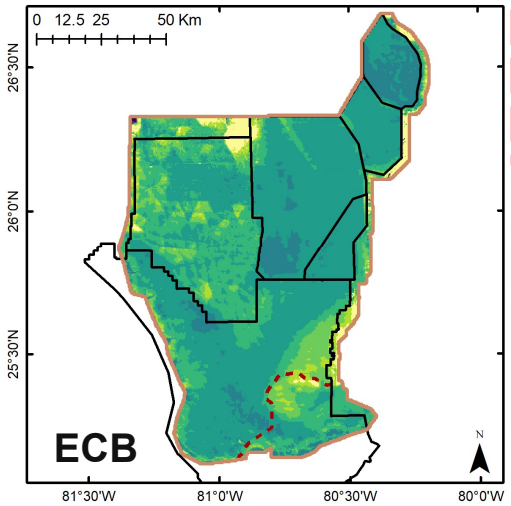
Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (%)
Shallow-edge of SRS	Other sides of SRS	-13,000*	(Not available)

* Within the CSSS Critical Habitat Areas.

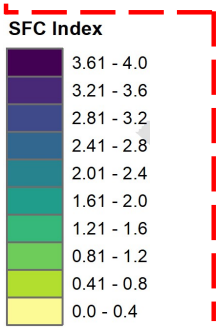
White Ibis

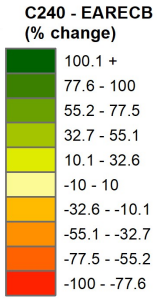
Existing Condition Baseline

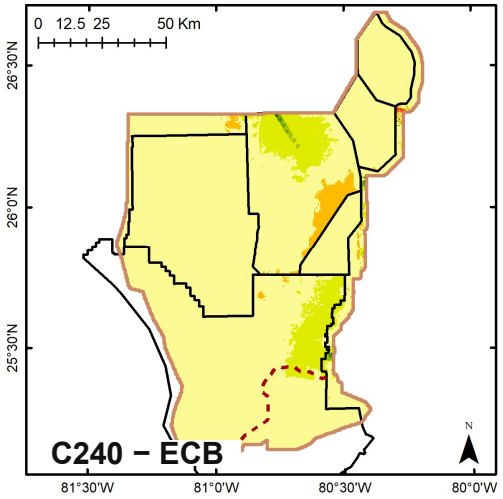
- Predicted frequency of bird occurrence
- The abundance of foraging habitat
- 400-m scale
- Mean of March and April
- Model period: 1975 – 2005



Lift of foraging abundance under C240 relative to the ECB







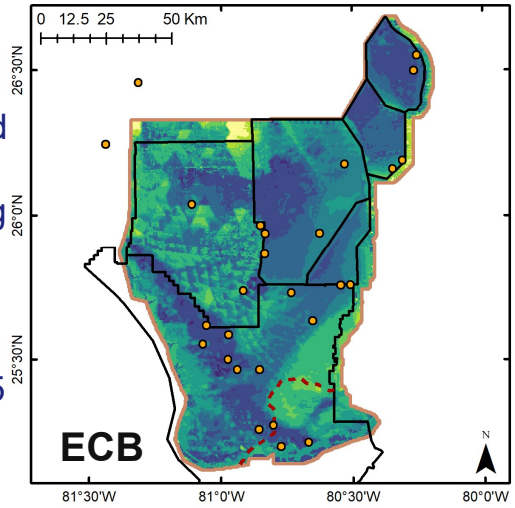
Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δindex, %)
3A-E	3A-N, Eastern marl prairies	+193,000*	–11 to +25 (Avg: +3.5)*

* The quality of foraging habitat (Foraging depth range of -4.9 ~ +32 cm).

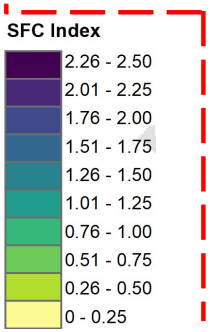
Wood Stork

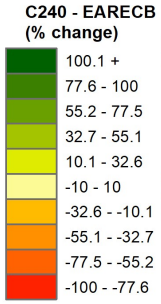
Existing Condition Baseline

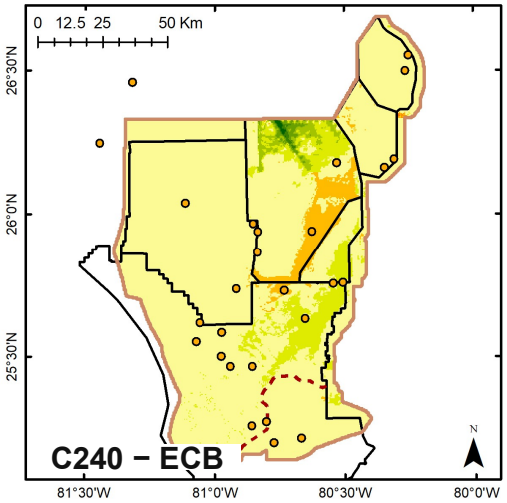
- Predicted frequency of bird occurrence
- The abundance of foraging habitat
- 400-m scale
- Mean of March and April
- Model period: 1975 – 2005
  - : Past and present colonies



Lift of foraging abundance under C240 relative to the ECB







Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δindex, %)
3A-E, 3A-S	3A-N, 3B-E, SRS, shallow wetlands	+161,000*	–17 to +13 (Avg: –2.1)*

- A product of Spatial (abundance) and Temporal (quality) Foraging Index (Foraging depth range of -8.7 ~ +45 cm).

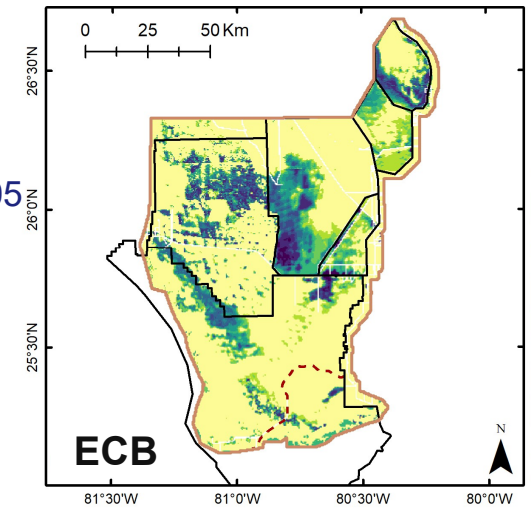
Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

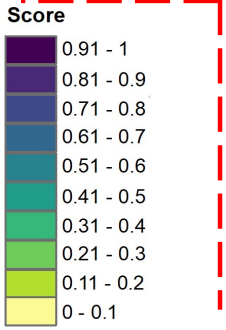
American Alligator

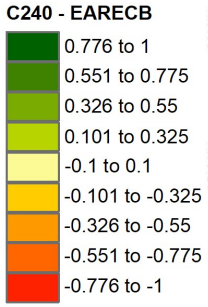
Existing Condition Baseline

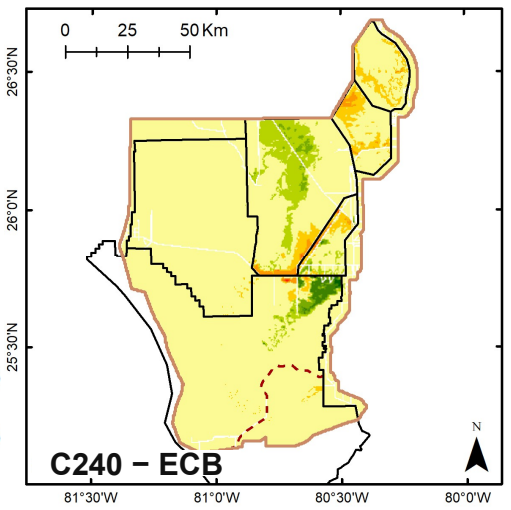
- Habitat Suitability Index
- Model period: 1966 – 2005



Lift of habitat scores under C240 relative to the ECB







Areas of Loss	Areas of Improvement	Areal Change (acres)	Annual Change (Δindex, %)
3A-SE, 3B-N	3A-N, 3A-C, 3B-S, SRS	+80,000*	–2 to +83 (Avg: +20)

* Average of a representative dry (1989), wet (1995), and average (1978) rainfall year.

Presenter: Dong Yoon Lee

EAA STORAGE RESERVOIR

Summary of Ecological Models

Taxa	Function	Potential Benefit of the A-2 Reservoir
	Prey for snail kites	↑
	Major energy source	↑
	Major energy source	↑

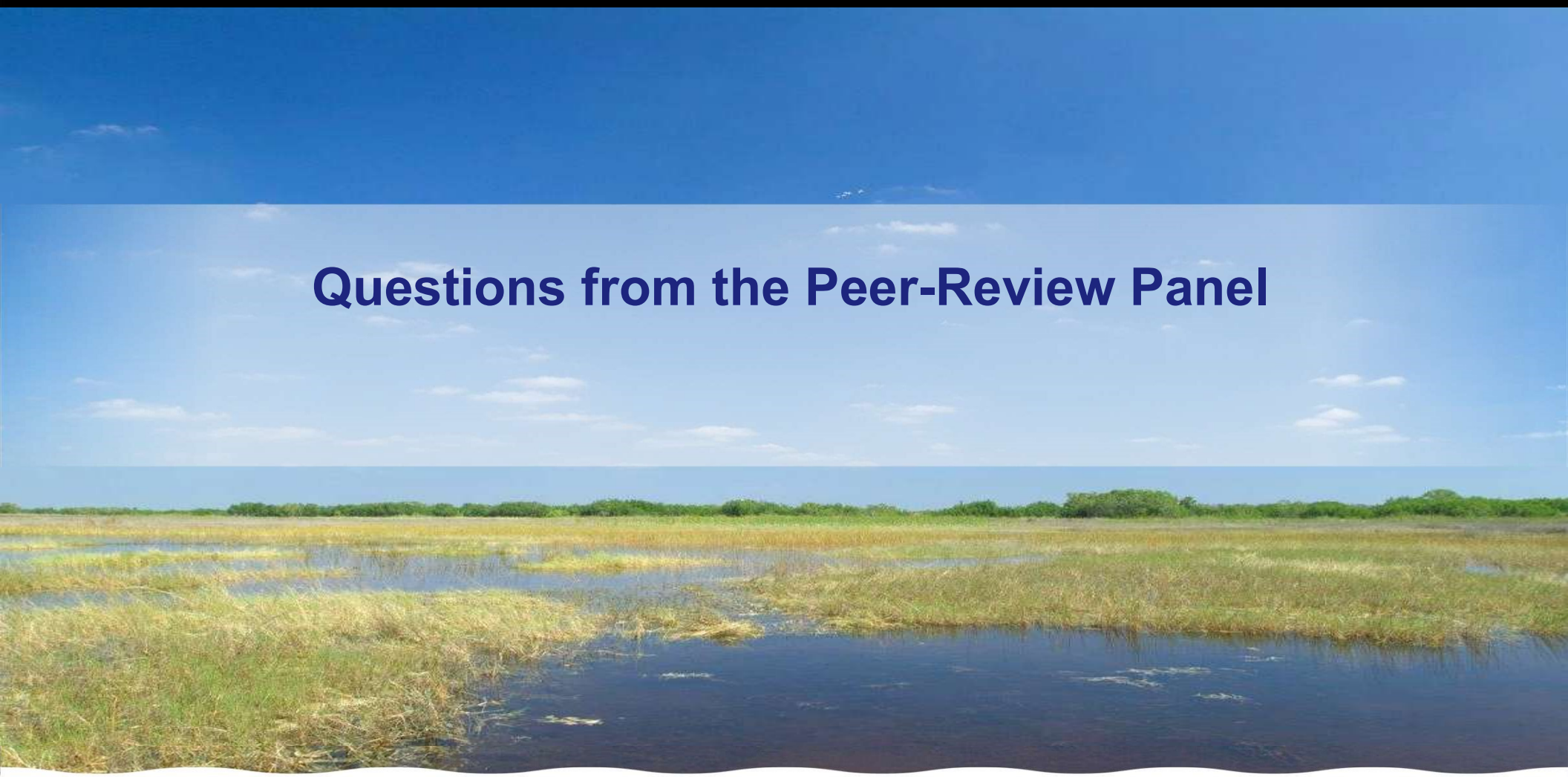
Taxa	Function	Potential Benefit of the A-2 Reservoir
	Marl prairie habitat conditions	⇔
	Ridge and slough habitat indicator	↑
	Keystone species	↑

⇔ No change

↑ Minor improvement

↑ Moderate improvement

↑ Major improvement



Questions from the Peer-Review Panel

Public Peer-Review Session for the EAA Reservoir Water Reservation
May 29, 2020

EAA STORAGE RESERVOIR

Identification of Water to be Reserved

Don Medellin
Applied Sciences Bureau

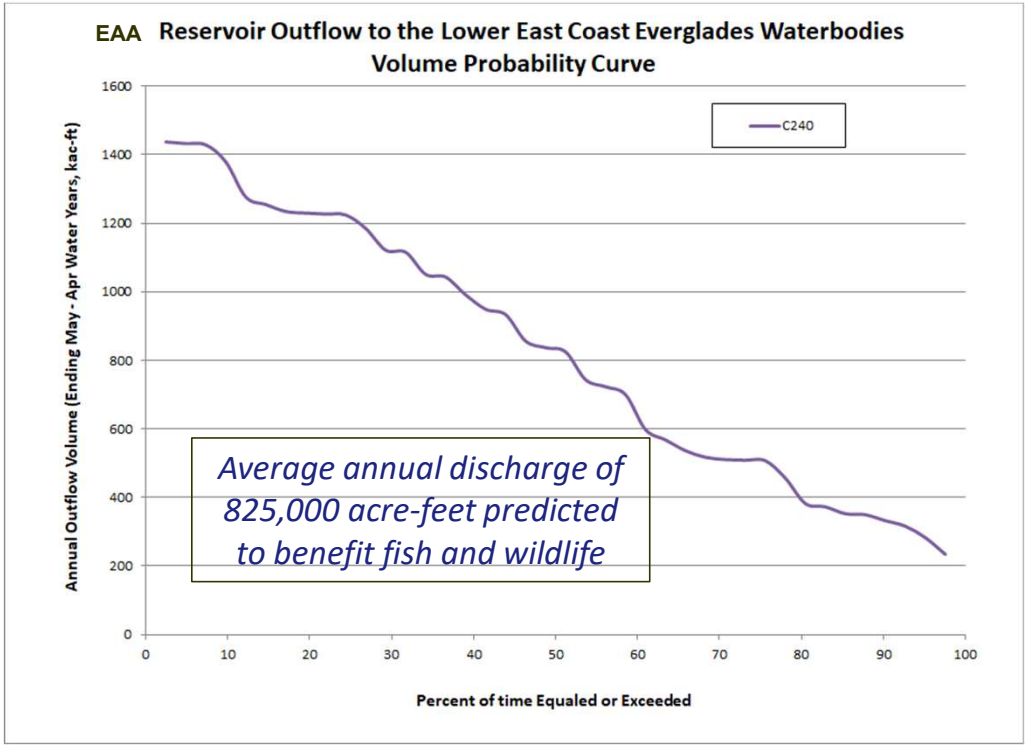
Water Identified by the Project

- Water stored within the EAA Reservoir and discharged through S-624, S-625, and S-626
- Water delivered to the Central Everglades
  - WCA-3A and WCA-3B
  - Everglades National Park
- Water required for the protection of fish and wildlife
- Legal protection of water is required to enter into a Project Partnership Agreement with the US Army Corps of Engineers for a 50/50 Cost share

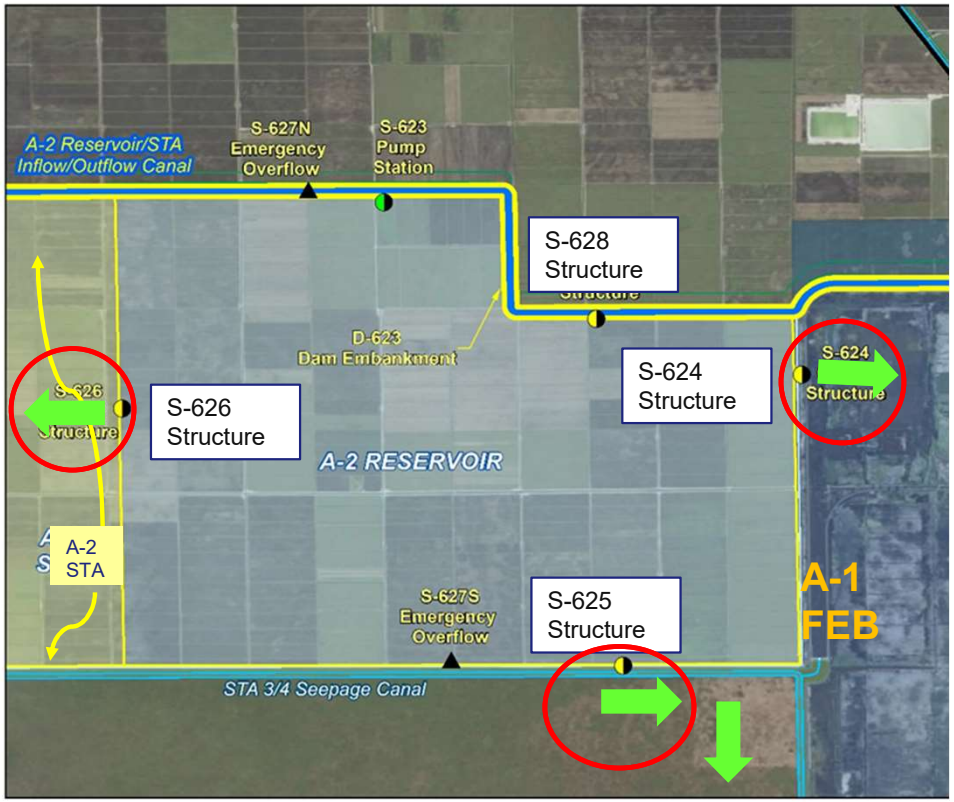
Presenter: Don Medellin

EAA STORAGE RESERVOIR

Volume of Water Reserved for Fish and Wildlife



Volume of water discharged from reservoir through structures S-624, S-625, and S-626



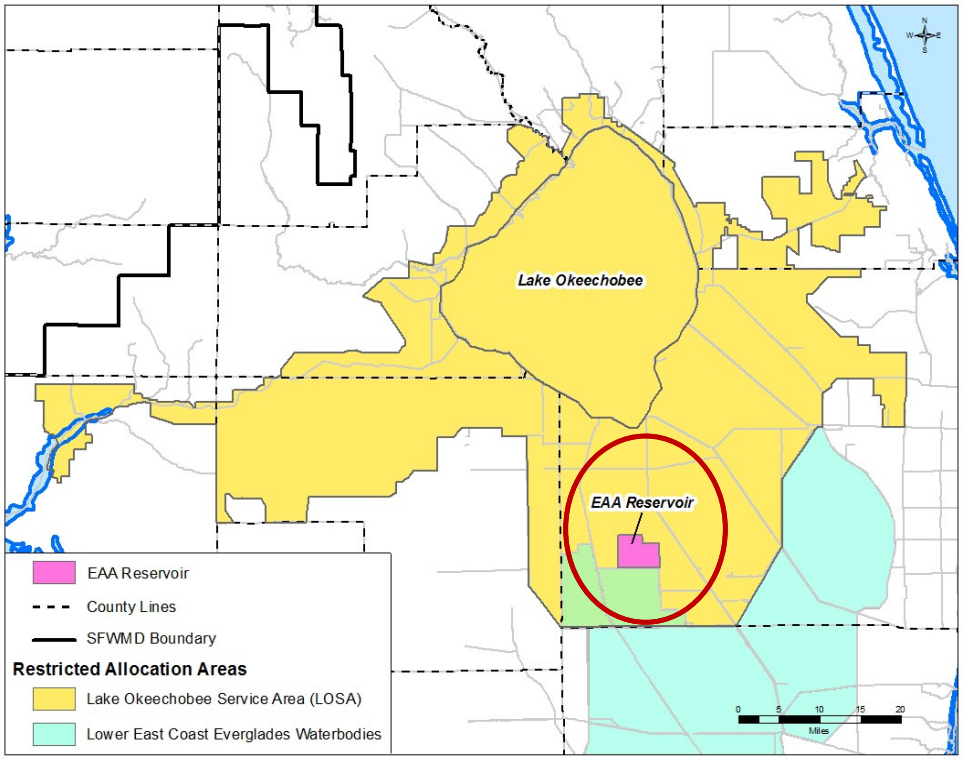
Presenter: Don Medellin

EAA STORAGE RESERVOIR

Protection of Project Waters

Upstream Watershed Evaluation

- Evaluated a small basin within Lake Okeechobee Service Area
- Existing legal users
  - Surface water withdrawals
  - No groundwater withdrawals
- Seven existing legal users draw water from the Miami and New North River canals
- No new allocations or increases in allocations due to the existing LOSA rule



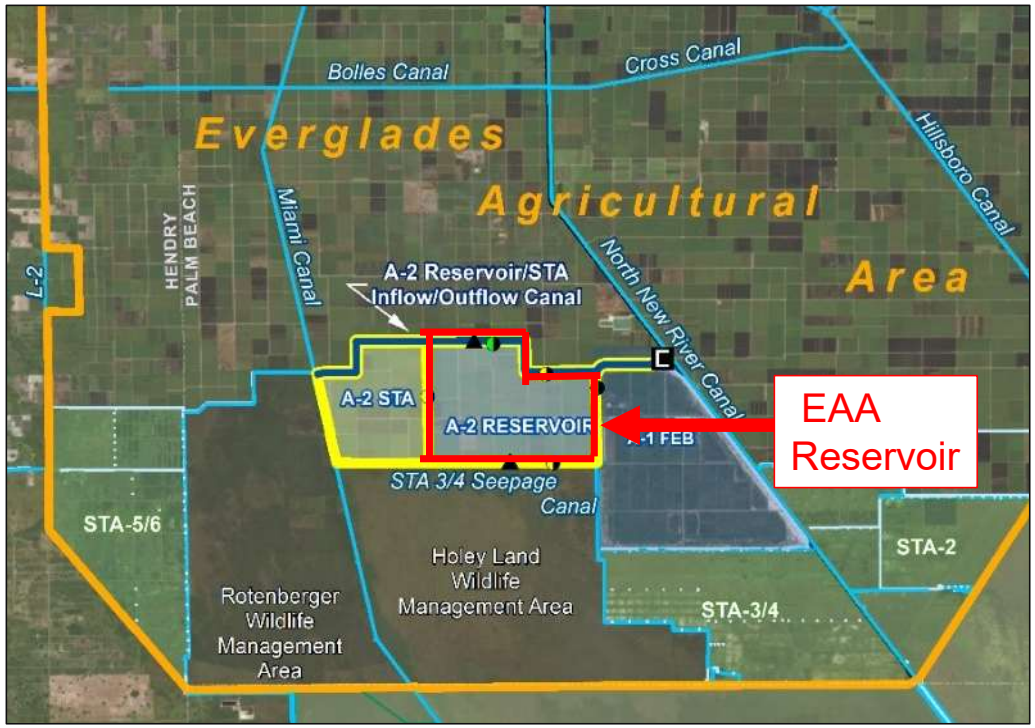
Presenter: Don Medellin

EAA STORAGE RESERVOIR

Protection of Project Waters

Water Stored Within Reservoir

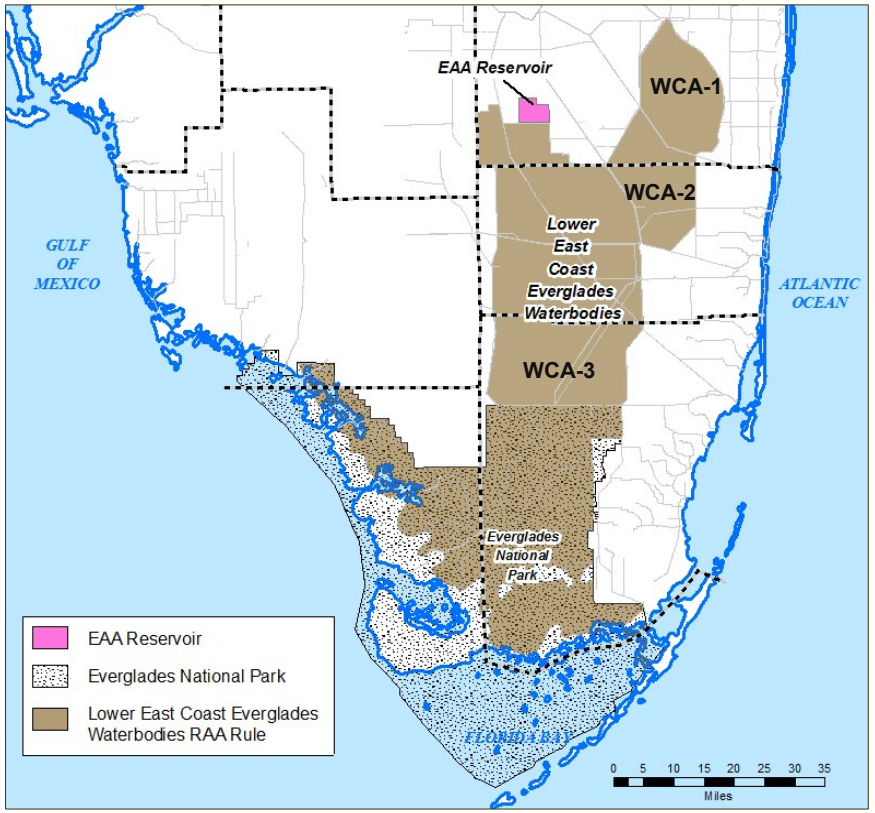
- Evaluated to ensure water within the reservoir would be protected from future withdrawals
- Ensure withdrawals surrounding the reservoir do not induce seepage effects on water within the reservoir
- No new allocations or increases in allocations due to the existing LOSA rule



Presenter: Don Medellin

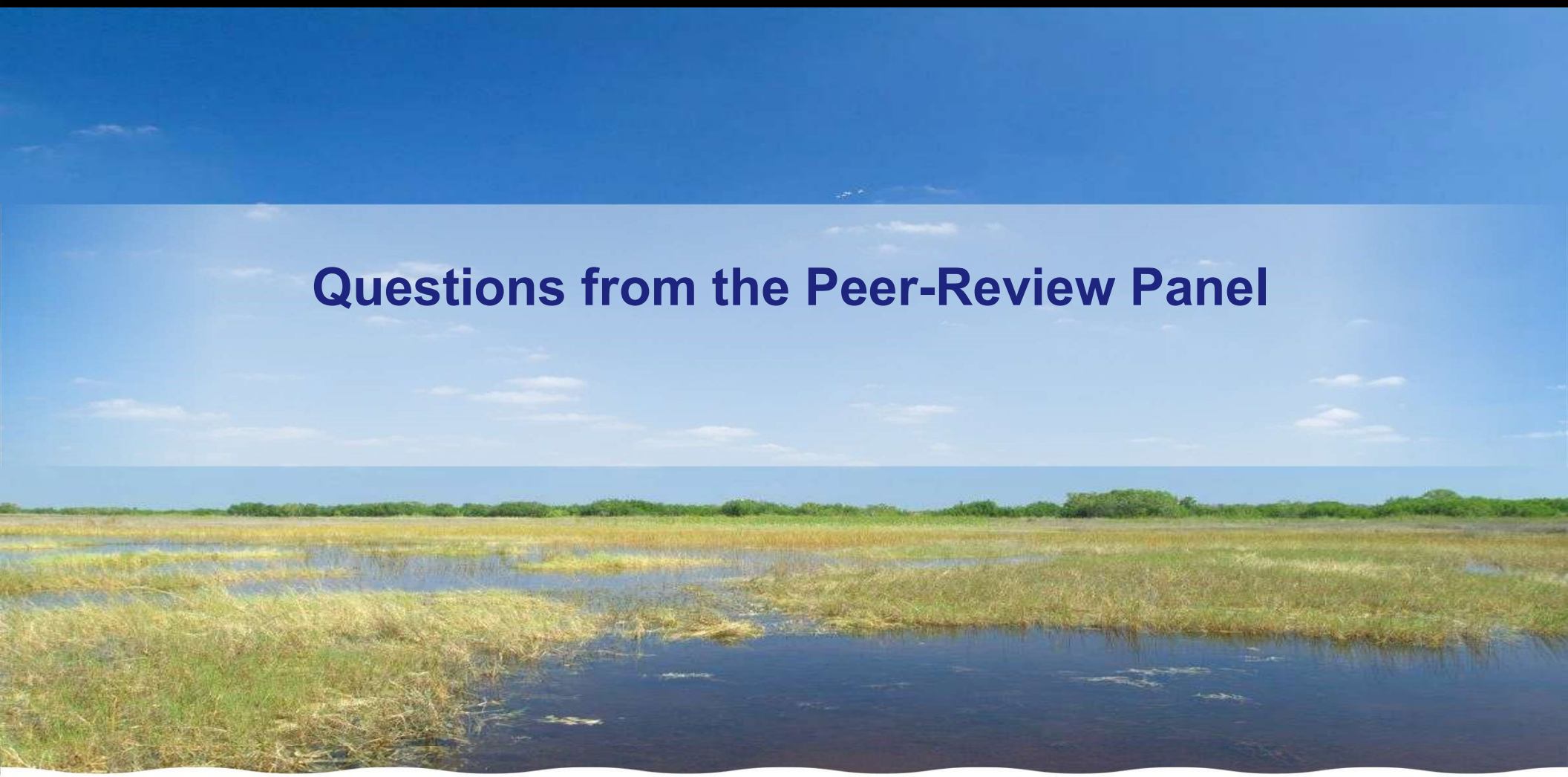
Downstream Watershed Evaluation

- Water discharged from the EAA Reservoir and stormwater treatment areas
- All areas south are within a different Restricted Allocation Area: Lower East Everglades Waterbodies
- Most of these lands are currently under public ownership or contain an flowage easement
  - Water Conservation Areas 1, 2, and 3
  - Everglades National Park



Presenter: Don Medellin

EAA STORAGE RESERVOIR



Questions from the Peer-Review Panel

Public Peer-Review Session for the EAA Reservoir Water Reservation
May 29, 2020

Summary of Preliminary Peer-Review Comments

Don Medellin
Applied Sciences Bureau

Overview of the Peer-Review Process

- **Purpose:**
  - Receive a non-biased scientific technical review
  - Ensure the scientific approach is solid
- **Peer-Review Objective:**
  - Review 1) technical document, and 2) water reservation approach
  - Answer several key questions on both categories
  - Provide preliminary comments
  - Complete a final report
- **SFWMD Response:**
  - Complete a Question/Answer matrix to address each question or comment
  - Revise the draft technical document

Summary of Peer-Review Questions and Comments

Hydrologic/Modeling-Related	
Topic	**Question or Comment**
Ponding Depths/Hydroperiods	• What are the targets? • Compare Northeast Shark River Slough with other regions to understand type of wetland habitat supported by additional water • Two different sets of normalized ponding curves (Indicator Regions and gauge curves) provided somewhat conflicting • How do the target depths for the Northeast Shark River Slough relate to currently intact vs. degraded ridge and slough systems? • Report indicates ecologically significant increases in annual hydroperiods are not present in Blue Shanty Flow-way despite added water difference from 0.3- to 0.7-foot difference during ponding times • Does this plan exacerbate the deep flooding (i.e., ponding problems) in southeast WCA-3A? • The depths in south and southeast WCA-3B need to be clarified
Future Modeling	Are there plans to extend the hydrologic simulations beyond 1965-2005?

Summary of Peer-Review Questions and Comments

Wildlife/Modeling-Related

Topic	Question or Comment
Coastal Salinities/Mangrove Movement	• Are there quantitative estimates available on the possible effects on coastal salinities, which can counter mangrove inland movement? Can you use the MANTRA Model?
Caple Sable Seaside Sparrow Habitat	• There is a mixed picture wet marl prairie habitat change and positive versus negative effects on this species. Explain in further detail. • Changes in vegetation or timing of water depth during the Caple Sable Seaside Sparrow breeding season is not clear. • Possibility of reducing dispersal between different subpopulations?
Joint Ecosystem Modeling	• More detail needed to understand what the models are based on (habitat suitability, average yearly conditions, hydrologic structure, etc.) • Consider using the crayfish model developed by the USGS
Difference Maps/Ecological Evaluations	• Synthesizing some of the ecological responses with the hydrological responses was challenging because of differences in evaluation periods. Is there a way to standardize?

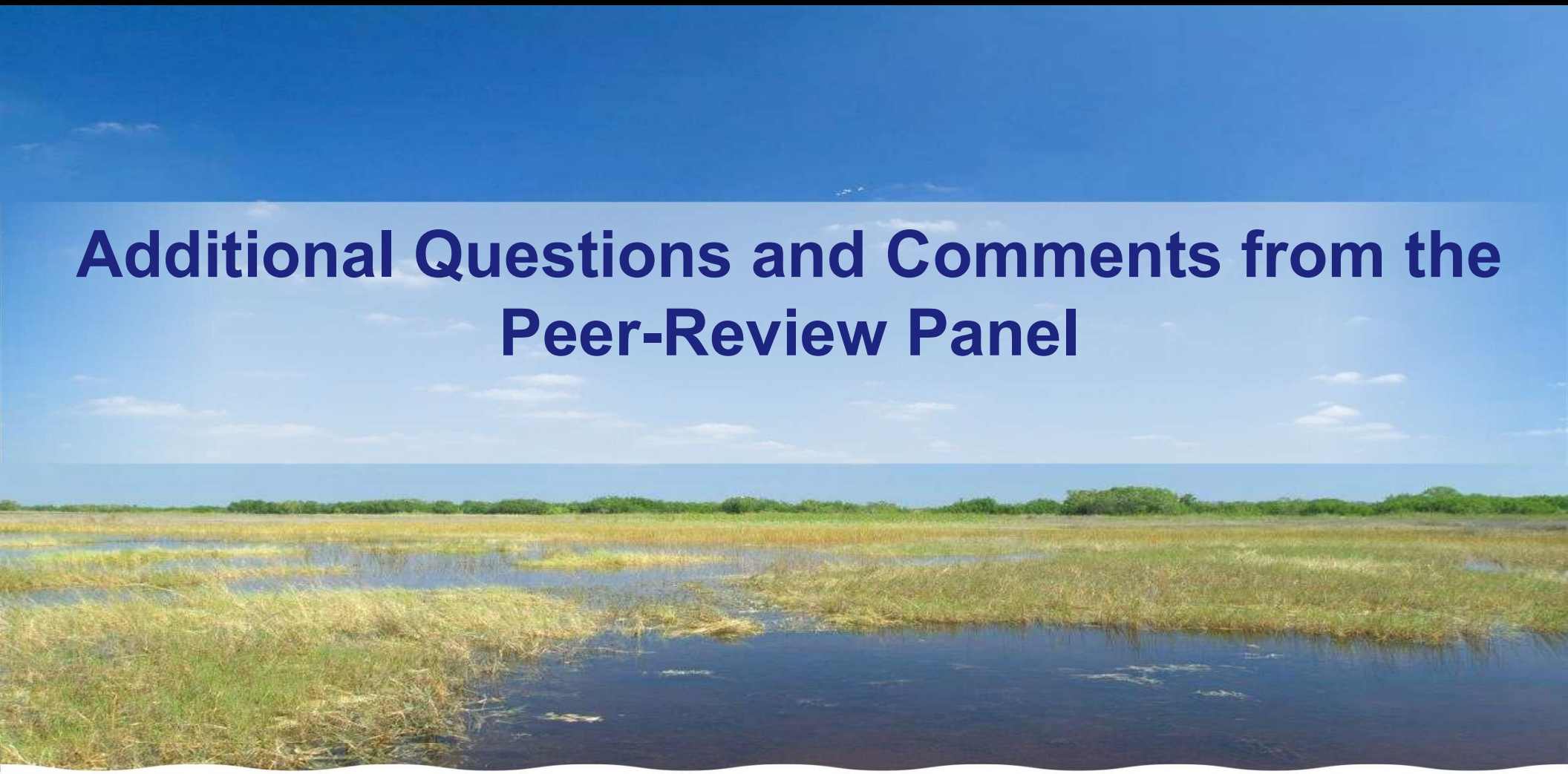
Summary Peer-Review Questions and Comments

Wildlife/Modeling-Related (cont.)	
Topic	**Question or Comment**
Crayfish Suitability Model	• Since crayfish were not modeled is there a possibility of using a crayfish model developed by the USGS (Joint Ecosystem Model program)? If so, what approach? • Can examination of altered hydroperiods of the eastern and western marl prairies be used to constitute an additional pair of Indicator Regions for re-evaluation? • Can a spatial evaluation of the changes in hydroperiod be captured to predict the change in crayfish productivity?

Summary of Peer-Review Questions and Comments

Other	
Topic	**Question or Comment**
Water Quality – Phosphorus	• Do not explicitly mention the detrimental effects of phosphorus inflow. • Can you explain the potential negative effects associated with increased mobilization of phosphorus due to increased flows? • Why won't the same negative effects of phosphorus release as northwestern WCA-3A occur here? • More information on periphyton community change needed

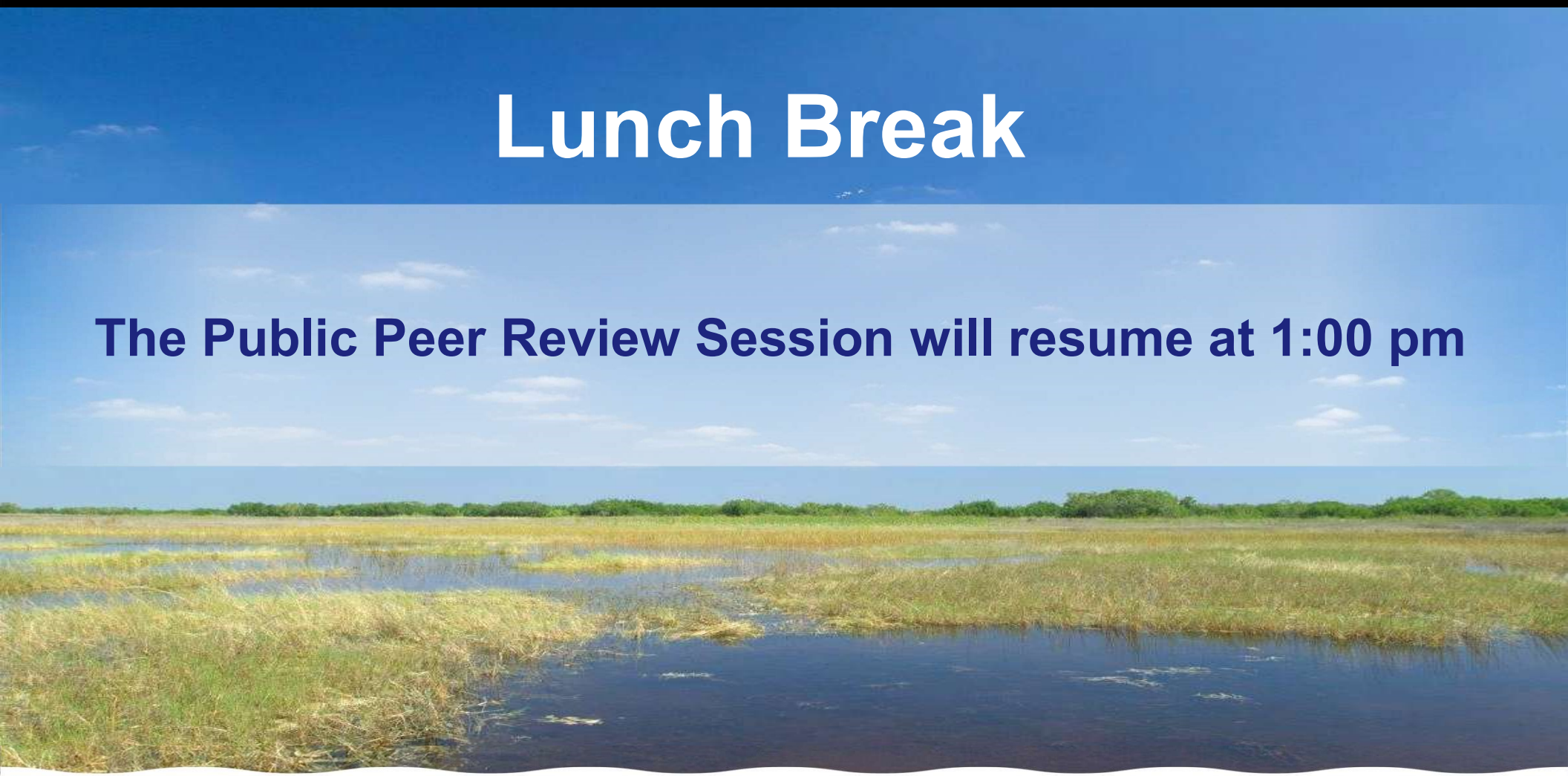
Additional Questions and Comments from the Peer-Review Panel



Public Comment Period

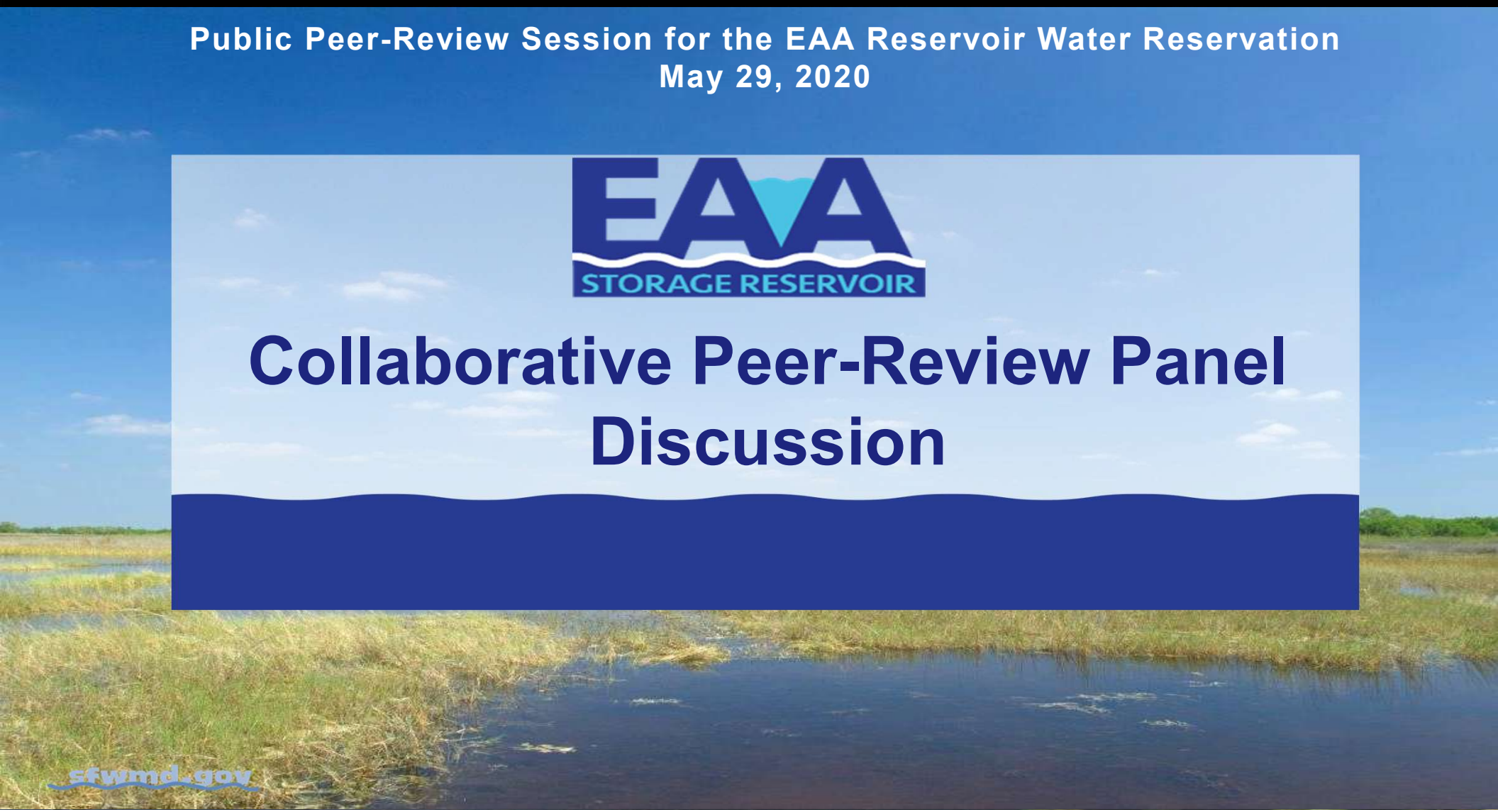
Please use the “Q & A” (question and answer) feature on the Zoom tool bar to submit a question about presentations, the technical document, or peer-review comments

Lunch Break



The Public Peer Review Session will resume at 1:00 pm

Public Peer-Review Session for the EAA Reservoir Water Reservation
May 29, 2020



Collaborative Peer-Review Panel Discussion

Public Comment Period

Please use the “Q & A” (question and answer) feature on the Zoom tool bar to submit a question about presentations, the technical document, or peer-review comments

Public Peer-Review Session for the EAA Reservoir Water Reservation
May 29, 2020

Next Steps

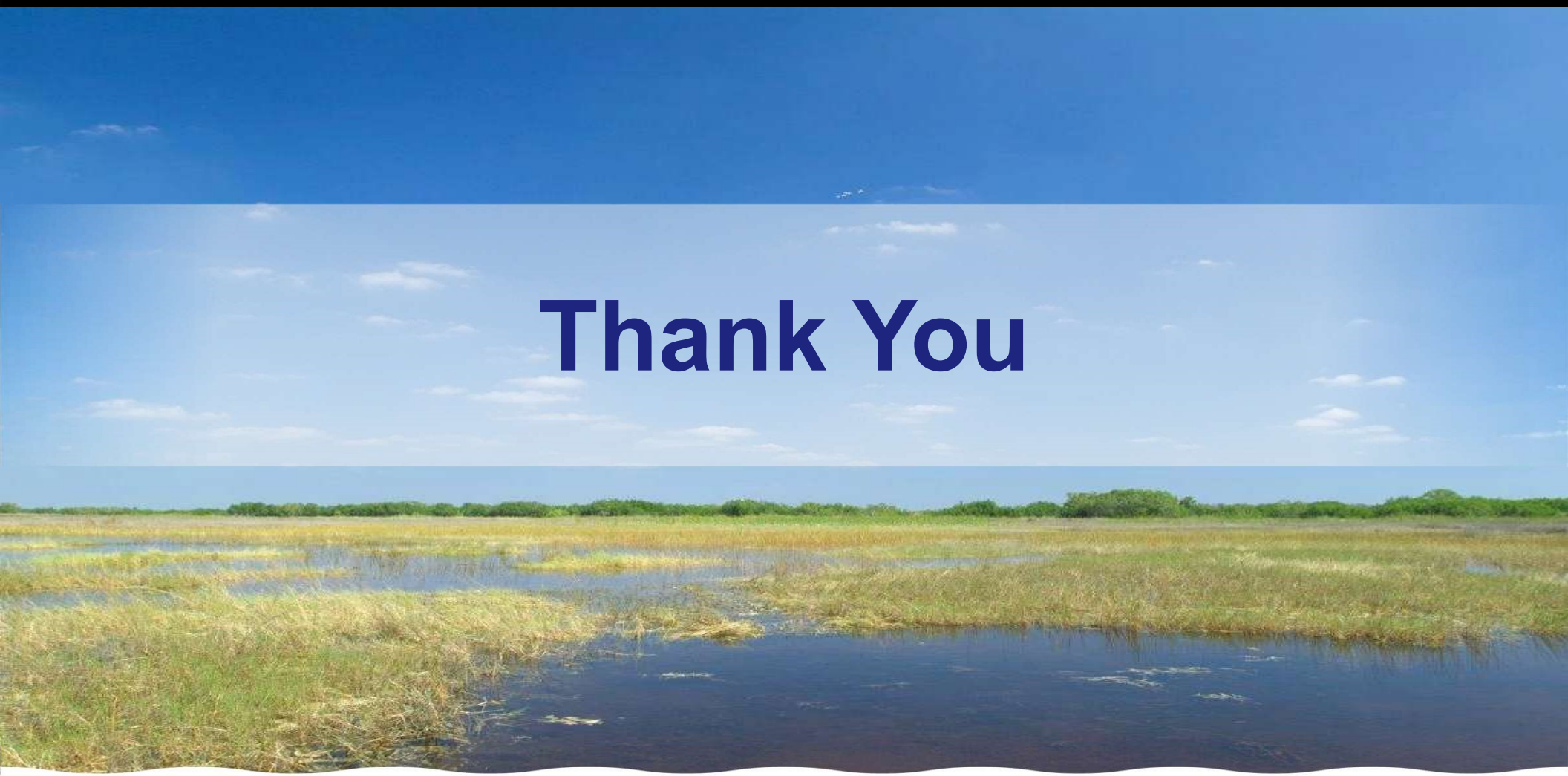
Don Medellin
Applied Sciences Bureau

Next Steps

- May 29 peer review session presentations will be posted on the Water Reservations webpage at https://www.sfwmd.gov/our-work/water-reservations (under EAA Reservoir tab) by June 3, 2020
- SFWMD will finalize the question/answer matrix by June 5, 2020
- Public comments **due Friday, June 12, 2020** (submit to Toni Edwards at tedwards@sfwmd.gov)
- Final peer-review report due June 18, 2020
- Finalize technical document by June 25, 2020
- **Rulemaking Workshop: July 14, 2020**
  Location to be Determined

Additional Information

- Water Reservations webpage (under EAA Reservoir tab)
  https://www.sfwmd.gov/our-work/water-reservations
- SFWMD Web Board (under SFWMD MFL and Water Reservation Categories/Water Reservation for EAA Reservoir)
  http://sfwmd.websitetoolbox.com/
- SFWMD rules webpage
  https://www.sfwmd.gov/rules



Thank You