

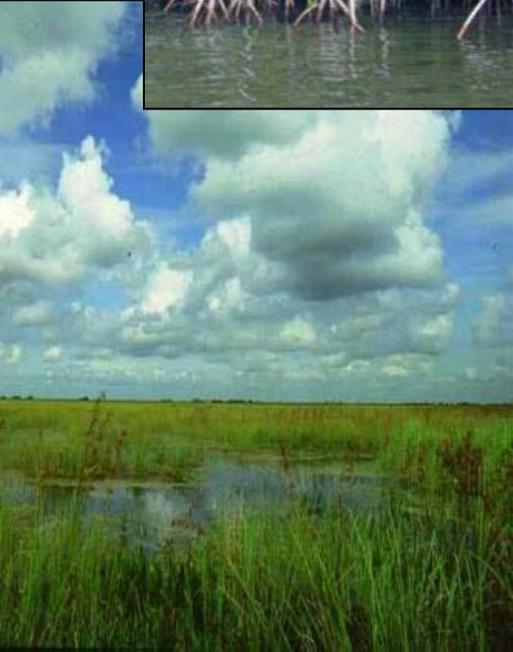


Water Supply Augmentation - Supplemental Environmental Flows

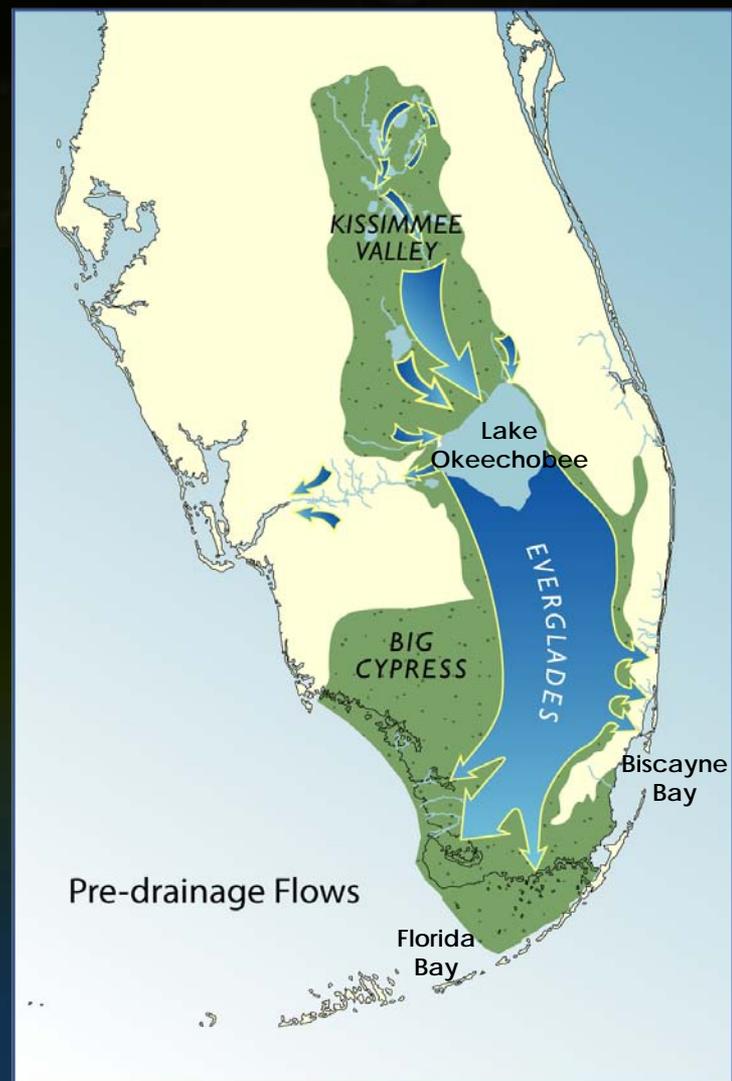
Melissa L. Meeker, SFWMD Executive Director

August 9, 2012

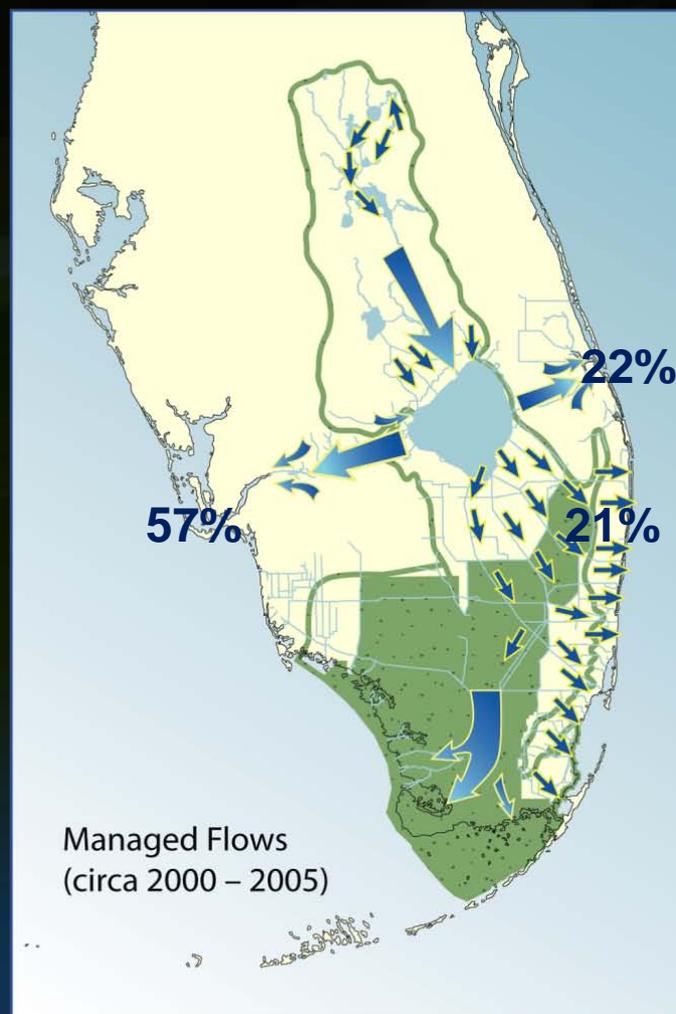
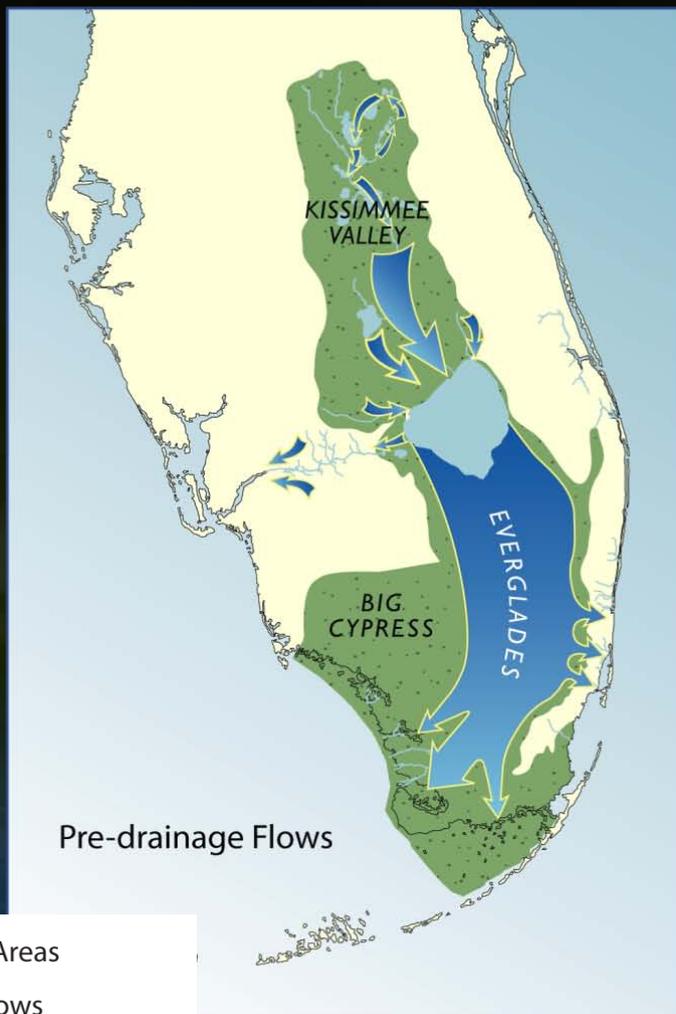
South Florida Ecosystem Pre-Drainage Flows



- Water flowed from central Florida through Lake Okeechobee and south into Florida Bay
- Natural system composed of over 9 million acres of lakes, rivers and wetlands
- Unique and diverse mosaic of habitat



South Florida Ecosystem Managed Water Flows



-  Natural Areas
-  Water Flows
-  Pre-drainage Boundary

C&SF Flood Control System Impacts of Alterations on the Natural System

- Disruption in timing, distribution, quality and quantity of water
 - Impacts to natural flora and fauna
 - Extreme high and low Water Conservation Area and Lake Okeechobee levels
- Harmful freshwater discharges to St. Lucie & Caloosahatchee estuaries
- Insufficient water supply to the Caloosahatchee Estuary during dry periods
 - High salinities
 - Loss of tape grass
 - Loss of fish habitat
 - Potential for harmful algal blooms during low-flow, summer conditions
- Solution: Comprehensive Everglades Restoration Plan (CERP)



C&SF Flood Control System Lake Management Challenges

- Lake Okeechobee is a critical multi-use body of water
- Dike integrity and concern for impacts to lake ecology at high levels has resulted in lowered average lake depths and exacerbated lake management challenges
 - Safety concerns
 - Extended drought
 - Lack of basin storage
- Continued challenge: Insufficient storage of water to meet human and natural system needs
- Exploring feasible opportunities to realize environmental improvements while CERP is implemented and within the constraints of existing infrastructure operational flexibility

Lake Management Challenges

Strategies for Addressing Estuary Conditions

■ Immediate

- Minor improvements through changes to Adaptive Protocols
- Utilize existing flexibility in lake operations (recommendations to the USACE)

■ Short/Medium Term

- Capture and release of “new water”
 - Operational changes
 - Water Supply Augmentation-Supplemental Environmental Flows

■ Medium/Long Term

- Basin storage projects
- Construction of C-43 West Basin Reservoir
- Revised Lake Regulation Schedule (within ecological envelope)
- Herbert Hoover Dike Rehabilitation

Strategies for Addressing Estuary Conditions

Activities To Date

- Screening level analysis of thousands of options to determine the effectiveness of different concepts
 - LORS-2008 flexibility
 - Adaptive Protocol modifications
 - Lake Okeechobee Service Area water shortage management
 - Water Supply Augmentation
 - Refined Water Supply Augmentation (additional constraints to minimize effects on Everglades)
- ~12 informal meetings with various stakeholders to solicit feedback; develop, evaluate and refine options
- 7 presentations to Governing Board and WRAC

Strategies for Addressing Estuary Conditions

Stakeholder Feedback

- Generally positive support from WRAC members to move Environmental Water Supply Augmentation option forward as viable solution
- Environmental community concerns regarding two key issues:
 - Impacts to deliveries of water to the Everglades
 - Water quality
- Additional concerns
 - Interim or temporary in nature while projects are constructed
 - Assurances

Screening Level Analysis Performance Summary

				PERFORMANCE CHANGES RELATIVE TO AP5.50				
	WSE	LORS08	AP5.50	EWSA6	EWSA8	EWSA12	AP5.5R	TA524R
LOK: Peak stage (ft)	18.51	17.25	17.31	-0.03	-0.02	-0.03	-0.01	-0.01
LOK: Days>17.25'	483	0	11	-8	-8	-8	-1	-6
LOK: MFL Exc	4	10	7	-2	-1	-1	0	0
LOSA: Cutback Mos	26	42	37	-4	1	0	0	1
CE-I75: Mos>10psu	118	79	58	-58	-56	-56	-7	-7
CE-FM: Mos>10psu	200	176	163	-45	-41	-41	-1	-3
SLE: Mos>2000cfs	72	78	79	-1	-1	-1	0	-2
CE: Mos>2800cfs	95	88	97	0	-1	-1	-1	-7
WSA (kaf/yr)	0	0	0	69	54	51	0	0
EWS to CE (kaf/yr)	0	0	13	45	38	38	3	4
WCA inflow (kaf/yr)	5585	5585	5585	-69 (1.2%)	-54 (1.0%)	-51 (0.9%)	0	0

Performance Summary Modifications to Adaptive Protocols

Modifications to Adaptive Protocols

- Focuses on relaxing Tributary Hydrologic Condition constraint in the late dry season (April – May)

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	EWSA6	EWSA8	EWSA12	AP5.5R	TA524R			
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Performance Summary Modifications to Adaptive Protocols

Modifications to Adaptive Protocols

- Focuses on relaxing Tributary Hydrologic Condition constraint in the late dry season (April – May)
- Minor environmental improvements with limited impact on other performance measures
 - Only 1-3 months of additional flows to estuary (Ft. Myers) over 41- year period of record
 - No improvements for Lake Okeechobee MFL

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	EWSA6	EWSA8	EWSA12	AP5.5R	TA524R
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	-2	-1	-1	0	0
	-4	1	0	0	1
	-58	-56	-56	-7	-7
	-45	-41	-41	-1	-3
	-1	-1	-1	0	-2
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Performance Summary Environmental Water Supply Augmentation

Water Supply Augmentation

- Focuses on “new water” made available from the EAA

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Performance Summary Environmental Water Supply Augmentation

Water Supply Augmentation

- Focuses on “new water” made available from the EAA
- Additional flows to the estuary increases to >40 months over 41-year period of record

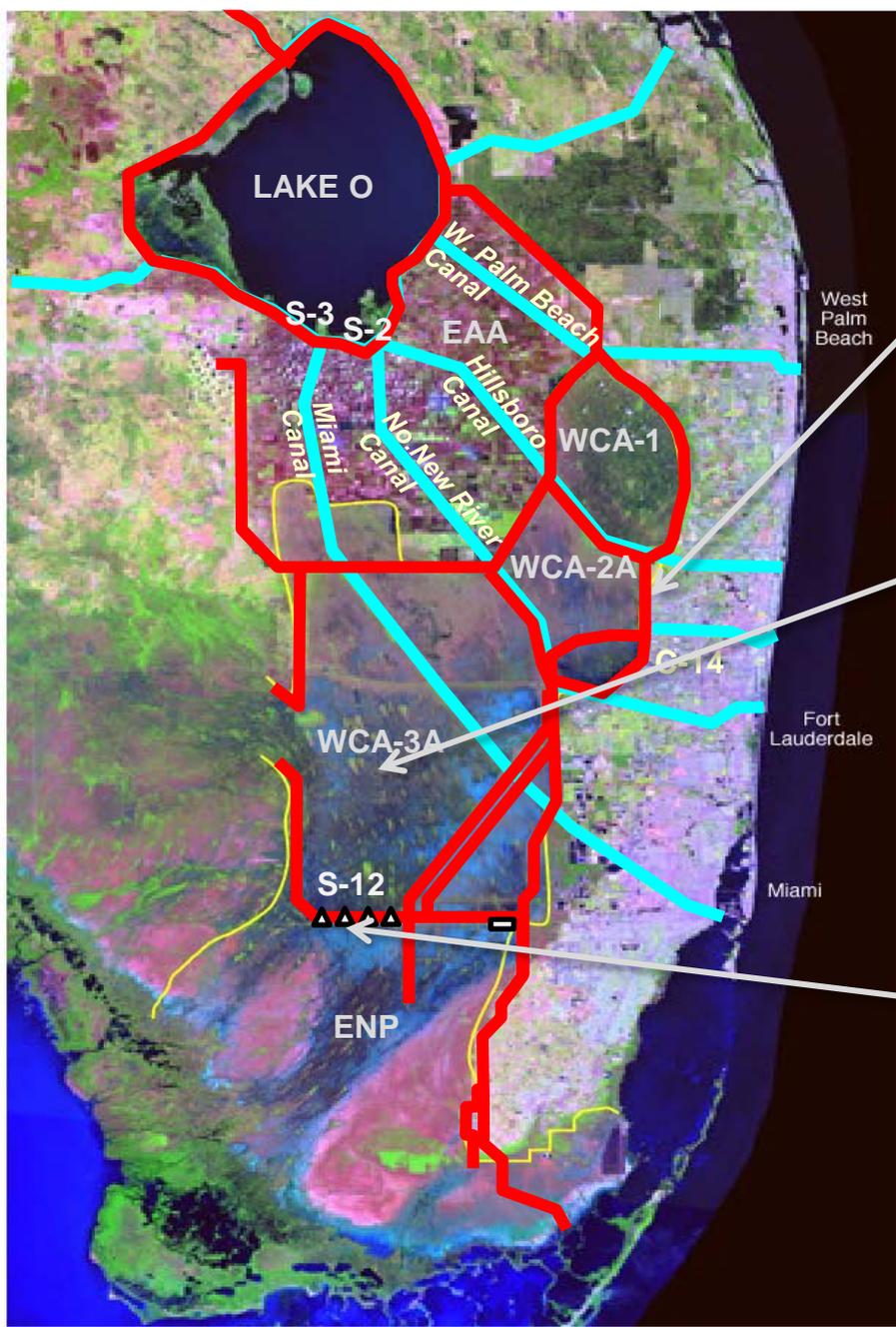
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Performance Summary Environmental Water Supply Augmentation

Refined Water Supply Augmentation

- Focus analysis to allow WSA only when WCA-2A or WCA-3A stages are above regulation schedule and high probability of discharging to tide
- Limit/eliminate impacts to the Everglades
- 30-50,000 acre-feet of “new water”

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	-8	-8	-8	-1	-6
	-2	-1	-1	0	0
	-4	1	0	0	1
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Limitations on southward movement of WCA-3A water results in losses to tide

• **WCA Regulation Schedules**

- WCA-2A or WCA-3A above respective regulation schedule more than 80% of the time

• **Everglades Restoration Transition Plan (ERTP)**

- Lowers WCA-3A regulation schedule as an interim risk reduction measure
- Reduces maximum from elevation 10.0-10.75 to 9.5-10.5, FT-NGVD

• **S-12 Operations**

- Discharges limited for Cape Sable Seaside Sparrow

Strategies for Addressing Estuary Conditions Potential Opportunity

- Refined WSA modeling to target times when WCA-2A and WCA-3A are above regulation schedule and water south of the lake is going to tide
- Requires a higher level effort to complete appropriate verification
 - Lake Okeechobee Water Quality Model, extend period of record, detailed analysis of WSA years
 - Water Management Model (2x2), coding modifications to determine volumes and timing when water is going to tide from WCAs
- Coordinate with Everglades National Park and other stakeholders

Staff Recommendation

1. Adaptive Protocols

- Revise Adaptive Protocols to implement immediate measures (AP 5.5R)

2. Environmental Water Supply Augmentation

- Conduct in-depth modeling on WSA when WCAs are above regulation schedule and water is being discharged to tide
- Determine operational constraints
- Extend WQ model period of record to show detailed results for WSA years
- Define options for water quality mitigation/treatment
- Seek regulatory approvals

3. Other

- Work with new Corps leadership to seek opportunities for interim operational flexibility
- Pursue sources of funding for construction of storage projects in the Caloosahatchee basin, including C-43 West Reservoir



Governing Board Discussion