AGENDA
St. Lucie River Watershed Protection Plan
Working Team Meeting #8

Tuesday, June 24, 2008
1330 - 1630

SFWMD Martin/St. Lucie Service Center
780 Southeast Indian Street
Stuart, FL 34997
(772) 223-2600

Conference Call Information:
Local: 561-682-6700
Toll-Free: 866-433-6299
MEETING ID# 3447

1. Introduction and Opening Remarks
2. Coordinating Agencies Update
3. Project Status and Schedule
4. Summary of St. Lucie River Issues Team Projects
5. Status of Regional Simulation Modeling
6. Management Measures and Alternative Development
7. Water Quality Spreadsheet Analysis
8. Public Comment Period*
9. Closing Remarks and Action Items (Next Meeting – Tuesday, July 22, 2008)

* As time permits, brief Public Comment Periods may be held after major discussion items in the agenda

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St. Lucie River Watershed Protection Plan

Working Team Meeting #8
June 24, 2008

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Proposed Schedule

- **Formulation and Evaluation – April through July**
- **DRAFT Plan - October 2008**
- **Final Plan - December 2008**
- **Submit by January 1, 2009**

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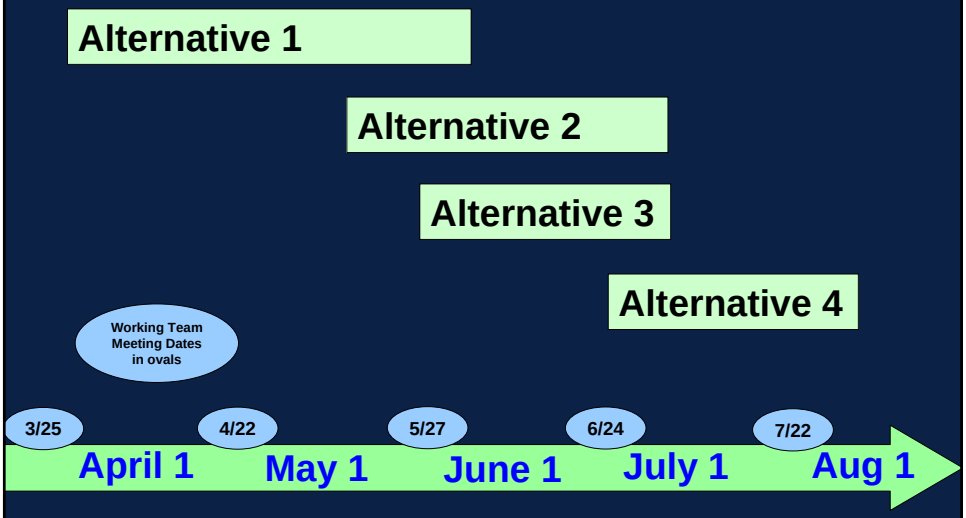
Project Alternatives Formulation and Evaluation



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Draft Plan Development & Status

Project Area Map

- Completed

Chapter 2: Introduction

- Incorporation of Working Team comments in process

Chapter 3: Planning Process

- Incorporation of Working Team comments in process

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Draft Plan Development & Status

MM Sheets

- Preliminary draft completed; released to working team for comments on June 12

Chapter 6.1: Summary of MMs

- Preliminary draft completed; released to working team for comments on June 12

Chapter 6.2 and 6.3: Water Quality and Quality Analysis

- Drafted; scheduled to be released to the working team for comments by June 27

Chapter 6.4: Formulation of Alternatives

- In process; preliminary draft anticipated in July

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Draft Plan Development & Status

Chapter 6.5: Alternative Plan Evaluation and Comparison

- Preliminary draft anticipated in July

Chapter 6.6: Planned Projects and Actions

- Preliminary draft anticipated in August

Chapter 7.0: Watershed Pollutant Control Program

- Preliminary draft anticipated in July

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Draft Plan Development & Status

Chapter 8.0: Watershed Research and Water Quality Monitoring Program

- Sections 8.1 through 8.3 have been drafted and District internal review in-progress; Schedule for remaining sections under development (NOTE – Entire R&WQ Section may be included as an Appendix and summarized in Chapter 8.0 of the Final Plan)

Chapter 9.0: Recommended Projects and Actions

- Preliminary draft anticipated in August

SLRWPP Complete Document

- Preliminary draft anticipated in September

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Questions

my.sfwmd.gov/northerneverglades

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St. Lucie River Watershed Protection Plan
Draft Outline – 6/24/2008

1.0 Executive Summary: To be written following completion of the Draft Plan

2.0 Introduction: Final revisions in process

- 2.1 Background
  - 2.1.1 Historical Conditions
  - 2.1.2 Current Conditions
- 2.2 Northern Everglades and Estuaries Protection Program
  - 2.2.1 Lake Okeechobee Watershed Protection Plan
  - 2.2.2 St. Lucie River Watershed Protection Plan
  - 2.2.3 Caloosahatchee River Watershed Protection Plan
- 2.3 Purpose and Scope
- 2.4 Study Area
  - 2.4.1 St. Lucie River Estuary
  - 2.4.2 St. Lucie River Watershed
  - 2.4.3 South Fork Sub-Watershed
  - 2.4.4 C-44 and S-153 Sub-Watershed
  - 2.4.5 4-5-6 Sub-Watershed
  - 2.4.6 C-23 Sub-Watershed
  - 2.4.7 C-24 Sub-Watershed
  - 2.4.8 North Fork Sub-Watershed
  - 2.4.9 C-25 Sub-Watershed and C-25 East Sub-Watershed
  - 2.4.10 Basin 1 Sub-Watershed

3.0 Planning Process: Final revisions in process

- 3.1 Ongoing Restoration Efforts and Other Relevant Projects
  - 3.1.1 Federal and State Partnership Efforts
  - 3.1.2 State and Local Efforts
  - 3.1.3 Stormwater Master Programs
- 3.2 Problems
  - 3.2.1 Ecological Problems in the St. Lucie River Estuary
  - 3.2.2 Potential Causes
- 3.3 Planning Objectives
  - 3.3.1 St. Lucie River Estuary Salinity Envelope Objective
  - 3.3.2 St. Lucie River Watershed Water Quality Objective
- 3.4 Planning Constraints
  - 3.4.1 Water Supply and Flood Protection
  - 3.4.2 Minimum Flows and Levels
  - 3.4.3 State Water Quality Standards
- 3.5 Performance Measures and Indicators

4.0 Interagency Coordination and Public Involvement: Preliminary Draft scheduled for 9/08

4.1 Interagency Coordination
4.2 Public and Stakeholder Involvement

5.0 Total Maximum Daily Loads: Preliminary Draft scheduled for 8/08

5.1 Development of TMDLs for the Watershed
5.2 Basin Management Action Plan Coordination
5.3 Recommendations

6.0 Watershed Construction Project

6.1 **Summary of Management Measures:** Preliminary Draft undergoing Working Team review

6.1.1 Management Measures Toolbox
6.1.2 Types of Management Measures
6.1.2.1 Watershed Water Quality Projects
6.1.2.1.1 Source Control
6.1.2.1.2 Stormwater Treatment Areas
6.1.2.1.3 Chemical Treatment
6.1.2.1.4 Hybrid Wetland Treatment Technology
6.1.2.1.5 Alternative Treatment
6.1.2.2 Estuary Water Quality Projects
6.1.2.2.1 Muck Sediment Removal
6.1.2.2.2 Oyster Habitat Creation
6.1.2.3 Water Quantity/Storage
6.1.2.3.1 Reservoirs
6.1.2.3.2 Aquifer Storage and Recovery
6.1.2.3.3 Alternative Water Storage Facilities
6.1.2.4 Water Disposal
6.1.2.5 Land Management and Restoration
6.1.2.5.1 Wetland Restoration
6.1.2.5.2 Land Conservation
6.1.2.5.3 Integrated Growth Management and Restoration

6.2 **Water Quantity Analysis Method and Base Condition Characterization:** Preliminary Draft completed and is scheduled for working team review by June 27, 2008

6.2.1 Analysis Method
6.2.1.1 Northern Everglades Regional Simulation Model (NERSM)
6.2.1.1.1 Model Setup
6.2.1.1.2 Conceptualization
6.2.1.1.3 Boundary Conditions
6.2.1.1.4 NERSM Model Scenarios

6.2.1.2 Long Term Salinity Model
6.2.1.3 Oyster Model
6.2.2 Water Quantity Base Conditions Characterization
6.2.2.1 High Discharge Criteria
6.2.2.2 Salinity Envelope
6.2.2.3 Supplemental Irrigation Requirements
6.2.3 Water Quantity Conclusions

6.3 **Water Quality Analysis Method and Base Condition Characterization:** Preliminary Draft completed and is scheduled for working team review by June 27, 2008

6.3.1 Water Quality Spreadsheet
6.3.1.1 Current Base Condition
6.3.1.2 River Watershed Base Condition
6.3.1.3 Alternative Condition
6.3.2 SLR Watershed Water Quality Current Base Condition Characterization
6.3.2.1 SLR Watershed Water Quality Profile
6.3.2.2 Sub-Watershed Water Quality Profiles
6.3.2.3 Benefits from Base Projects
6.3.2.4 Comparison of Flows and Loads from Sub-watersheds
6.3.3 Water Quality Conclusions

6.4 **Formulation of Alternatives:** Writing of Preliminary Draft in process and anticipated in July

6.5 **Alternative Plan Evaluation and Comparison:** Preliminary Draft scheduled for July

6.6 **Planned Projects and Actions:** Preliminary Draft scheduled for August

6.6.1 Summary
6.6.2 Plan Features
6.6.3 Real Estate
6.6.4 Operations & Maintenance
6.6.5 Monitoring
6.6.6 Permitting
6.6.7 Implementation
6.6.8 Preliminary Cost Estimates
6.6.9 Funding Opportunities

7.0 Watershed Pollutant Control Program: Preliminary draft scheduled for July

7.1 Non-Point Source BMPs
7.1.1 Innovative Technologies
7.2 Compliance with Water Quality Standards, TMDLs, BMPs
7.3 Public-Private Partnerships

7.4 Current Practices
7.5 St. Lucie River Wastewater Residuals
7.6 St. Lucie River Watershed Septage
7.7 St. Lucie River Watershed Animal Manure Rule

8.0 Watershed Research and Water Quality Monitoring Program: Sections 8.1 through 8.3 have been drafted and District internal review in progress; Schedule for remaining sections under development (NOTE – Entire R&WQ Section may be included as an Appendix and summarized in Chapter 8.0 of the Final Plan)

8.1 Introduction
- 8.1.1 Description of Enabling Legislation
- 8.1.2 Document Structure

8.2 Goals and Objectives of Monitoring and Research
8.3 The River and Its Watershed: Status, Trends and Targets in Hydrology, Water Quality and Aquatic Habitat
- 8.3.1 Delineation of Study Area
- 8.3.2 Watershed Hydrology and Loading
- 8.3.3 River/Estuary Salinity, Water Quality and the Related Aquatic Habitats
- 8.3.4 Salinity Envelopes and Freshwater Inflow Targets
- 8.3.5 Influence of Lake Okeechobee and Watershed Discharge on Freshwater Inflow to Estuaries

8.4 Monitoring on a Regional Scale
- 8.4.1 Definition of Regional Scale Monitoring
- 8.4.2 Nutrient Loading and Water Quality Monitoring Program
- 8.4.3 Freshwater Inflows Monitoring Program
- 8.4.4 Aquatic Habitat Monitoring Program
- 8.4.5 Power Analysis

8.5 Monitoring on the Project Scale
- 8.5.1 Definition of Project Level Monitoring
- 8.5.2 Projects Considered in the Plan (these are examples at this point)
- 8.5.3 Monitoring for Load Reduction-removal efficiency, permit requirements

8.6 Research for Adaptive Management
- 8.6.1 Purpose of Research
- 8.6.2 Status of Current Research Related to Water Quality
- 8.6.3 Status of Current Assessment Tools

8.7 Recommendations
- 8.7.1 Recommendations
- 8.7.2 Plan Implementation

9.0 Recommended Projects and Actions: Preliminary draft scheduled for August

9.1 Watershed Construction Project
9.2 Watershed Pollutant Control Program
9.3 Watershed Research and Water Quality Monitoring Program
9.4 Plan Refinement and Revision

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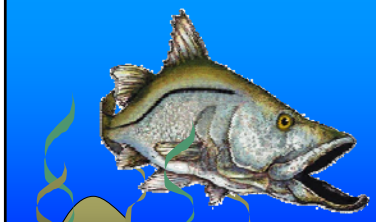
St. Lucie River Issues Team

St. Lucie River Watershed Protection Plan Working Team



June 24, 2008

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St. Lucie River Issues Team

- Issue Team formed by South Florida Ecosystem Restoration Working Group, 1998
- Develop an Interim Action Plan to accelerate improving water & habitat quality in SLE

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Interim Action Plan

- Estuary Heath
- Effects of the 1998 Discharge event
- Available Local & Regional Programs
- Long Term Projects
- Short Term Project List

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Short Term Projects

Project Categories

- Stormwater Retrofits
- Water Storage Areas
- Restoration
- Programs

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St. Lucie River Issues Team Membership*

*the voting members represent 17 different organizations

- Indian River Citrus League
- Martin County
- Florida Department of Environmental Protection
- US Environmental Protection Agency
- St. Lucie River Initiative
- US Geological Services
- Florida Fish & Wildlife Conservation Commission
- US Army Corps of Engineers
- National Marine Fisheries Services
- Florida Department of Agriculture and Consumer Services
- South Florida Water Management District
- Florida Marine Research Institute
- Rivers Coalition
- US Fish and Wildlife Service
- Natural Resources Conservation Service
- University of Florida – IFAS
- St. Lucie County

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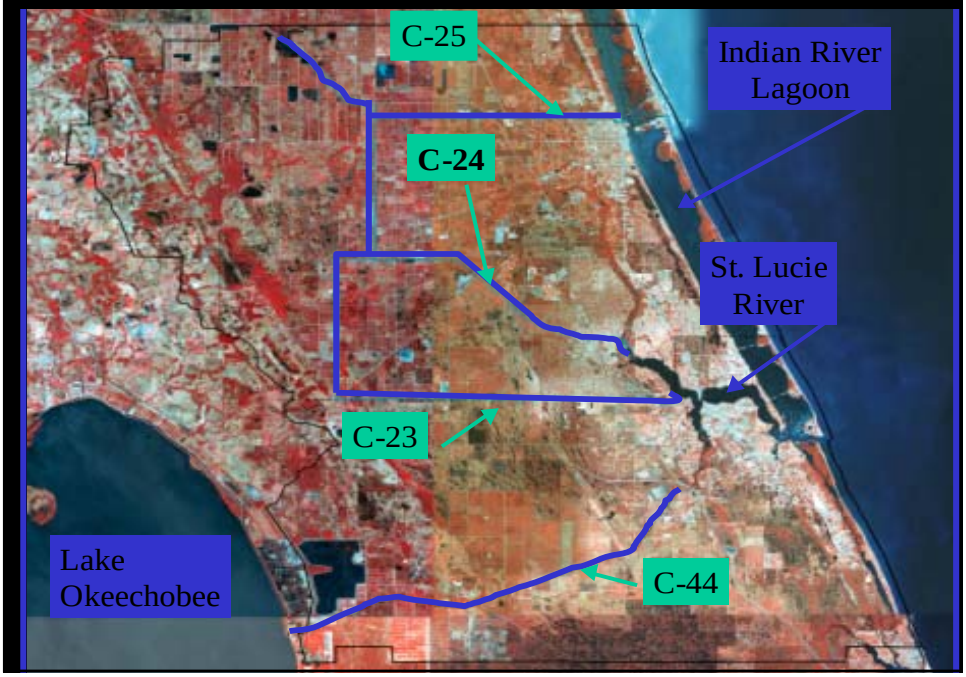

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Baffle box construction

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Vacuum Truck

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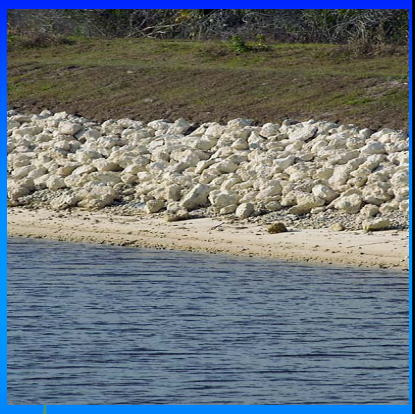
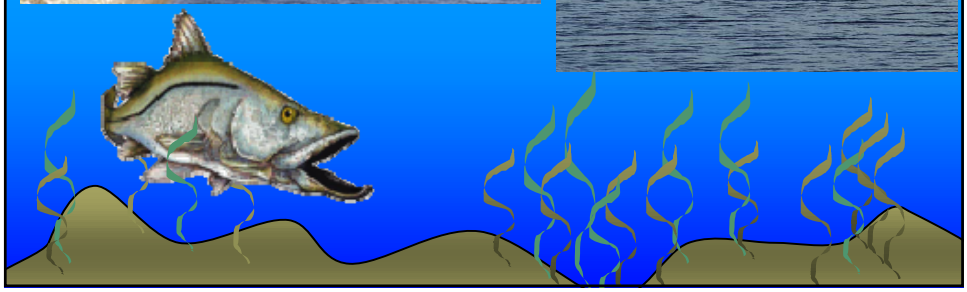
Bank Stabilization





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St. Lucie Issues Team Projects

Other Projects Past & Present

- Mobile Irrigation Labs (Martin & St. Lucie Co.)
- Decommissioning of Florida Wells
- Florida Yards & Neighborhoods Programs
- Research of Agricultural BMP's

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St. Lucie River Issues Team

- 111 individual projects funded to date
- Total project dollars to date: - $126 Million
  - $61 million – State Allocations
  - $ 2 million – Federal Funding
  - $63+ million – Local Match Dollars

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FY Funding Process

- RFP went out May 1, 2008
- Deadline for Submittals August 22, 2008
- Presentations, September 19, 2008
- Ranked List October 2008
- Expected Award Date, July 1, 2009

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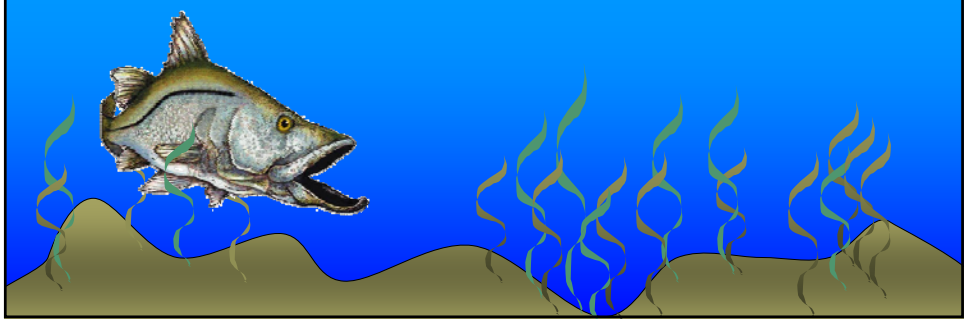
Questions?



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Update on Hydrologic Modeling For St. Lucie River Watershed Protection Plan

(by Larry Brion, HESM, SFWMD)

6/24/08

- **Presentation Outline**
  - Modeling Assumptions
  - Performance Measures
  - Performance Indicators
  - Modeling Results:
    - LOWCP P2TP Current Base
    - RWPP Base Run
    - RWPP Alternative 1

Modeling Assumptions

- The link-node version of the Regional Simulation Model (RSM) is the regional tool used to evaluate alternatives for St. Lucie River Watershed Protection Plan (SLRWPP)
- NERSM = specific implementation of RSM covering the northern extent of the District down to Lake Okeechobee
- Current Base:
  - Represents conditions as they exist in the Northern Everglades Watershed in 2005.
  - Assumes no projects as defined by the Comprehensive Everglades Restoration Plan (CERP).
  - Period of record: 1970 to 2005.
  - Lake Okeechobee flood control releases to estuary and Water Conservation Areas are based on the existing WSE regulation schedule.
  - Same as LOWCP P2TP current base scenario.

- **Modeling Assumptions (con't)**
  - **SLRWPP Base Run:**
    - **Represents conditions likely to exist in Northern Everglades Watershed after implementation of Acceler8, Lower & Upper Kissimmee water resources projects such as:**
      - **C-44 reservoir and STA**
      - **C-43 reservoir**
      - **EAA Phase A-1 Reservoir**
      - **Kissimmee River Restoration Project and the Kissimmee River Headwaters Revitalization Project**
      - **Other projects south of Lake Okeechobee such as authorized MODWATERs and C-111 projects**

- **Modeling Assumptions (con't)**
  - **SLRWPP Base Run (con't):**
    - **Represents future base conditions plus implementation of projects described in the Lake Okeechobee Watershed Construction Project Phase II Technical Plan**
      - **C-44 reservoir & STA operating with 50.25 kaf of effective storage; 9,700 acres; 1,060/1,060 cfs inflow/outflow capacity**
      - **C-43 reservoir used solely to meet EST05 targets in the Caloosahatchee estuary as in the C43 reservoir Phase I PIR**
    - **Based on the LOWCP P2TP ALT4 with refinements in the simulation of the St. Lucie River watershed**
      - **Additional level of detail in conceptualizing the St. Lucie River sub-watershed into component basins**
      - **Fewer boundary conditions driving the model, e.g. backflows from C-44 basin are now simulated relative to water level fluctuations in Lake Okeechobee**

- **Modeling Assumptions (con't)**
  - **SLRWPP Base Run (con't):**
    - **Based on the LOWCP P2TP ALT4 with refinements in the simulation of the St. Lucie River watershed**
      - **Addition of Ten-mile Creek Reservoir and STA:**
        - **Reservoir/STA footprints: 620 /132 Acres**
        - **Reservoir/STA operating depths: 10 / 2 ft**
      - **Update of C-44 reservoir and STA**
        - **Reservoir/STA footprints: 3,400 / 6,300 Acres**
        - **Reservoir/STA operating depths: 12 / 1.5 ft**
      - **Lake Okeechobee is not used in making environmental deliveries to the St. Lucie Estuary.**

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- **Modeling Assumptions (con't)**
  - **SLRWPP Alternative 1:**
    - **SLRWPP Base Run plus CRWPP Alt1 management measures and components of the Indian River Lagoon-South Recommended Plan**
      - **Combined C-23/C-24 Reservoir:**
        - **Reservoir footprint: 6,940 Acres**
        - **Reservoir operating depth: ~ 13 ft**
      - **C-23/C-24 Stormwater Treatment Area (STA)**
        - **STA footprints: 2,568 Acres**
        - **STA operating depths: 1.5 ft**
      - **Natural Floodplain Restoration and creation of natural storage and water quality areas.**

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Management Measures in Alternative 1

IRL-South Recommended Plan

C-44 Basin Components

1 C-44 - Reservoir
2 C-44 - Stormwater Treatment Area(East)
3 C-44 - Stormwater Treatment Area(West)
4 Palmar Complex - Natural Storage and Water Quality Area

C-23/24 Basin Components

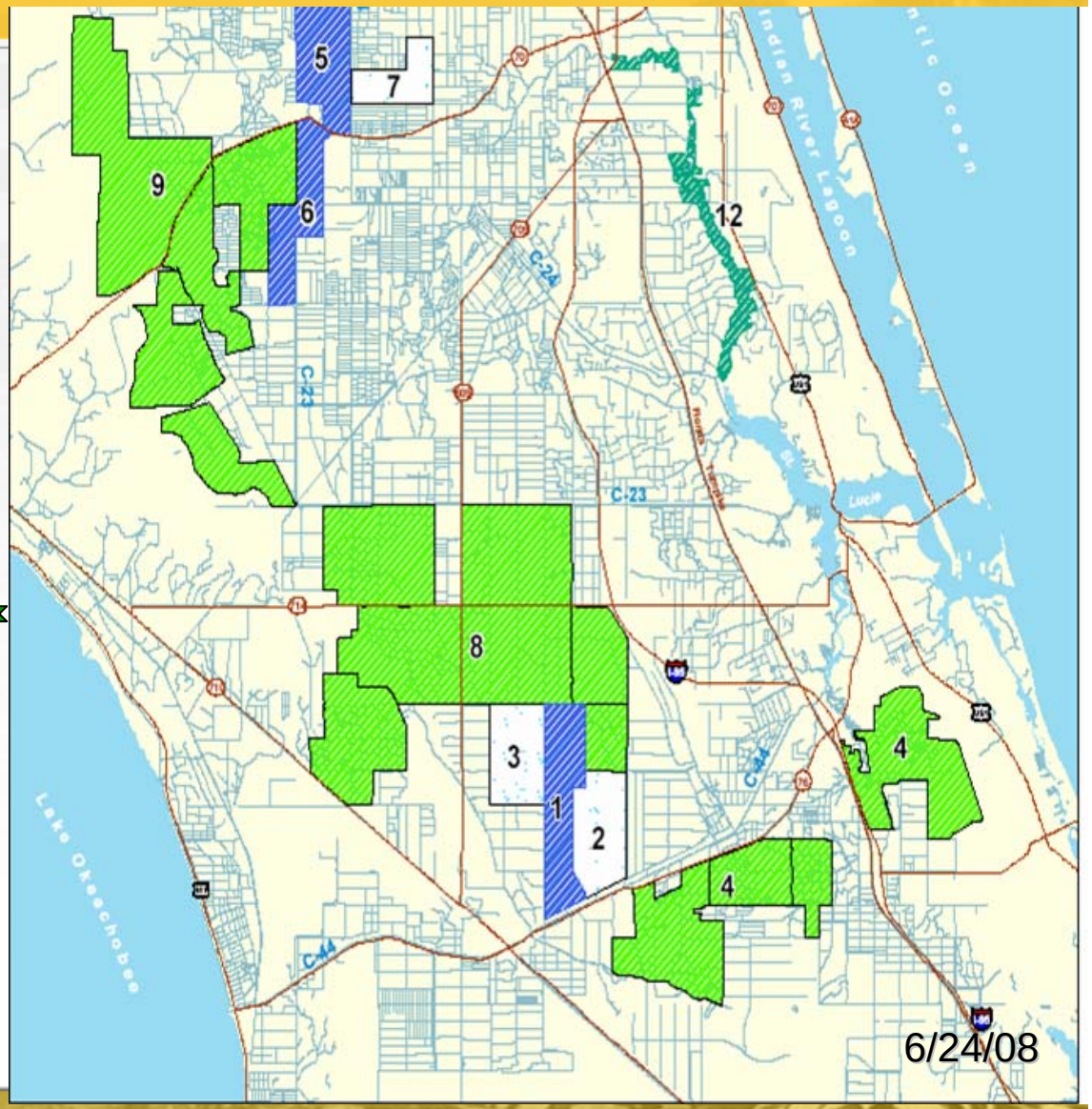
5 C-23/C-24 - North Reservoir
6 C-23/C-24 - South Reservoir
7 C-23/C-24 - Stormwater Treatment Area
8 Allapattah - Complex Natural Storage and Water Quality Area
9 Cypress Creek/Trail Ridge Complex - Natural Storage and Water Quality Area

C-25, Northfork and Southfork Basin Components

10 C-25 - Reservoir
11 C-25 - Stormwater Treatment Area
12 Northfork Natural Floodplain Restoration
13 Muck Remediation and Artificial Habitat

Natural Floodplain Restoration
Natural Storage and Water Quality Area
Reservoir
Stormwater Treatment Area

Included in RSM as Runoff Reduction
Excluded in RSM



Performance Measures Specific to SLRWPP

- An objective of the St. Lucie River Watershed Protection Plan is to reduce frequency and duration of harmful freshwater releases into the St. Lucie Estuary.
  - Number of Times St. Lucie Estuary High Discharge Criteria Exceeded (mean monthly flows > 2000 & 3000 cfs from 1970 – 2005)
    - Goal is to reduce the frequency of damaging discharges
    - > 2,000 cfs causes stress to the ecosystem and > 3,000 cfs causes severe damage
    - Targets of no more than twenty-one (21) occurrences between 2,000 and 3,000 cfs and six (6) occurrences over 3,000 cfs are used.
  - Number of Times Salinity Envelope Criteria NOT met for the St. Lucie Estuary
    - Goal is to have salinity concentrations that are conducive to estuary ecologic health by maintaining inflows to the estuary. Specifically, "the goal is to avoid mean monthly flows less than 350 cfs and 14-day rolling average discharges from exceeding 2,000 cfs."

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Performance Indicators

- **Maintain other water-related needs for the other parts of the system; provides a way to evaluate water supply impacts of different alternatives.**
  - **Lake Okeechobee performance measures as used in LOWCP P2TP**
  - **Mean annual EAA/LOSA supplementation irrigation (4-in-1)**
  - **LOSA demand cutback volumes for 7 water years in the simulation period with the largest cutbacks**

- **Modeling Domain**

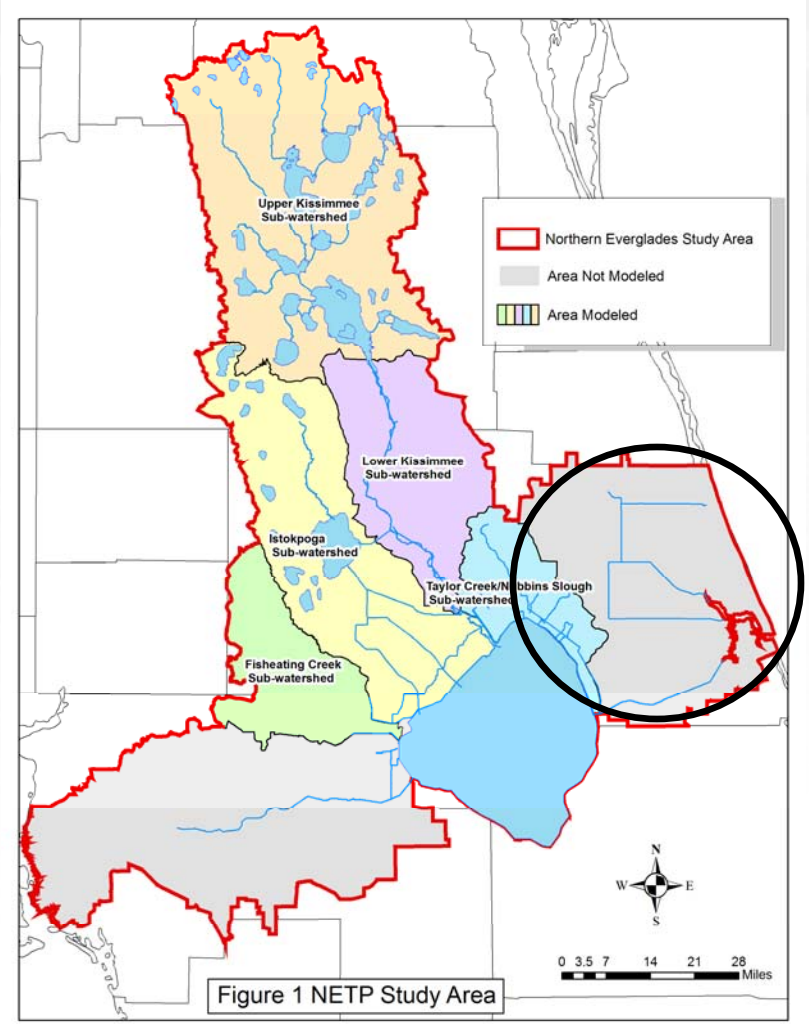

Figure 1 NETP Study Area

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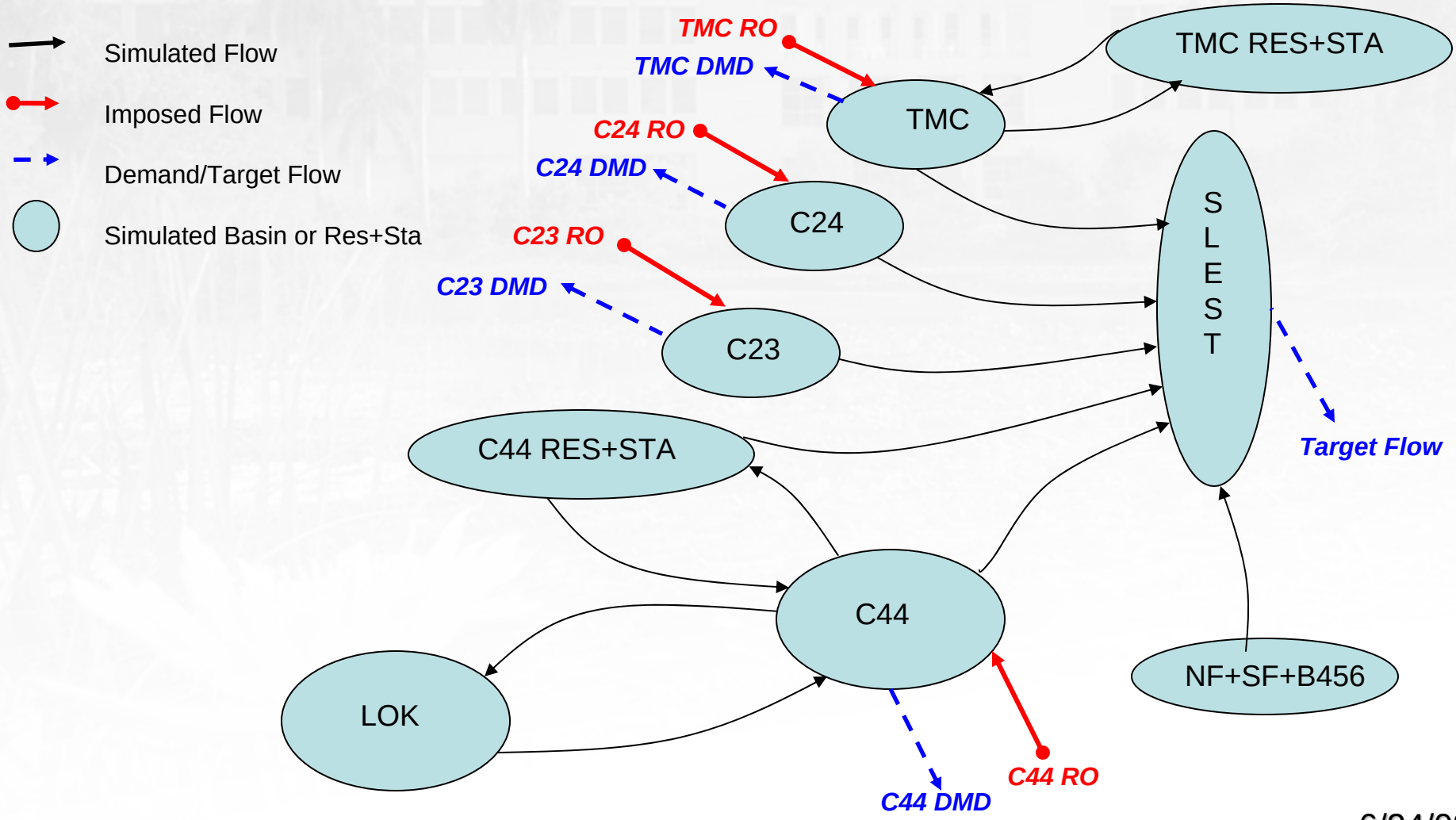
Node-Link Representation of the St. Lucie Sub-watershed in the NERSM for SLRWPP Base



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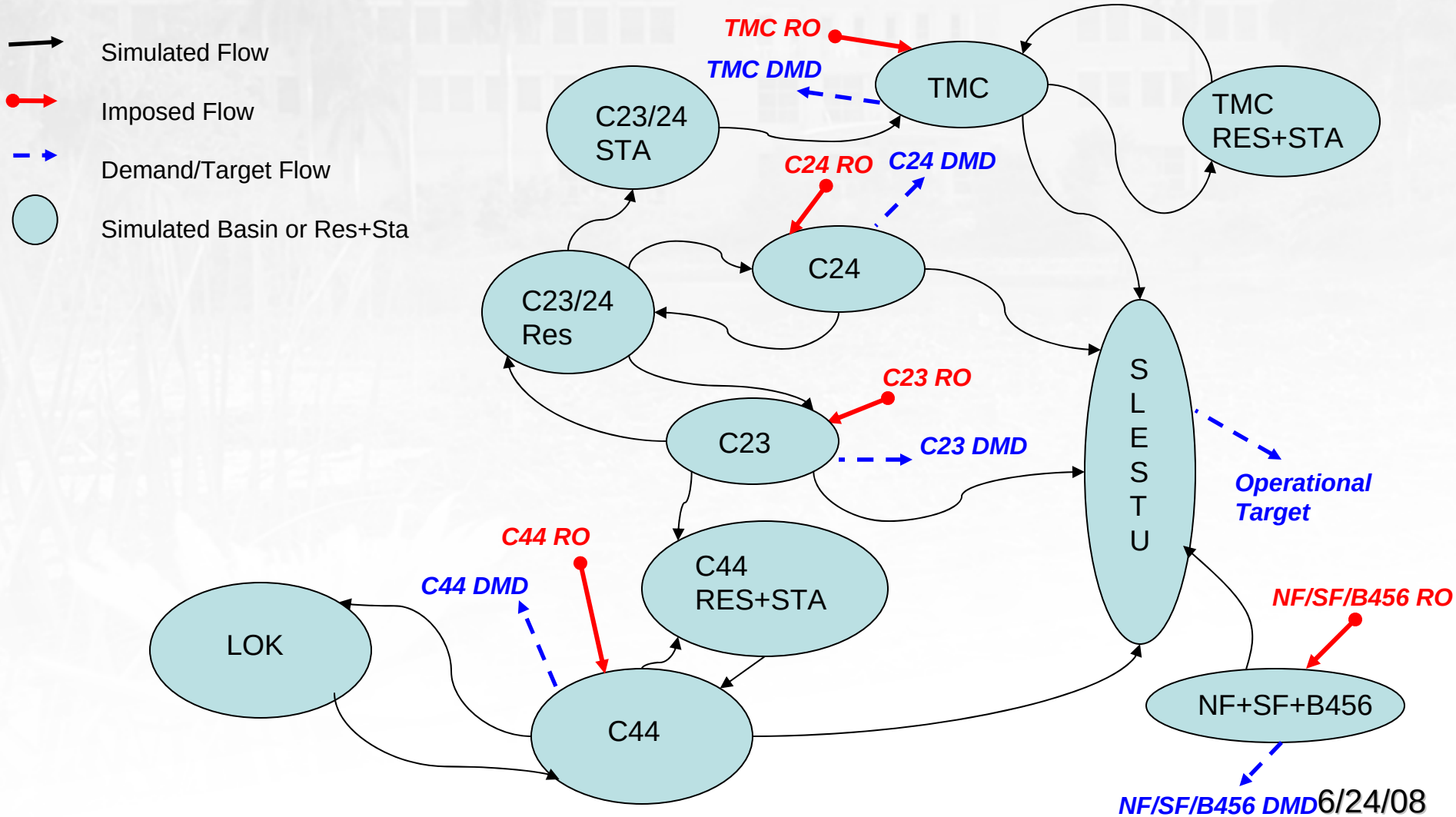
Node-Link Representation of the St. Lucie Sub-watershed in the NERSM for SLRWPP Alternative 1



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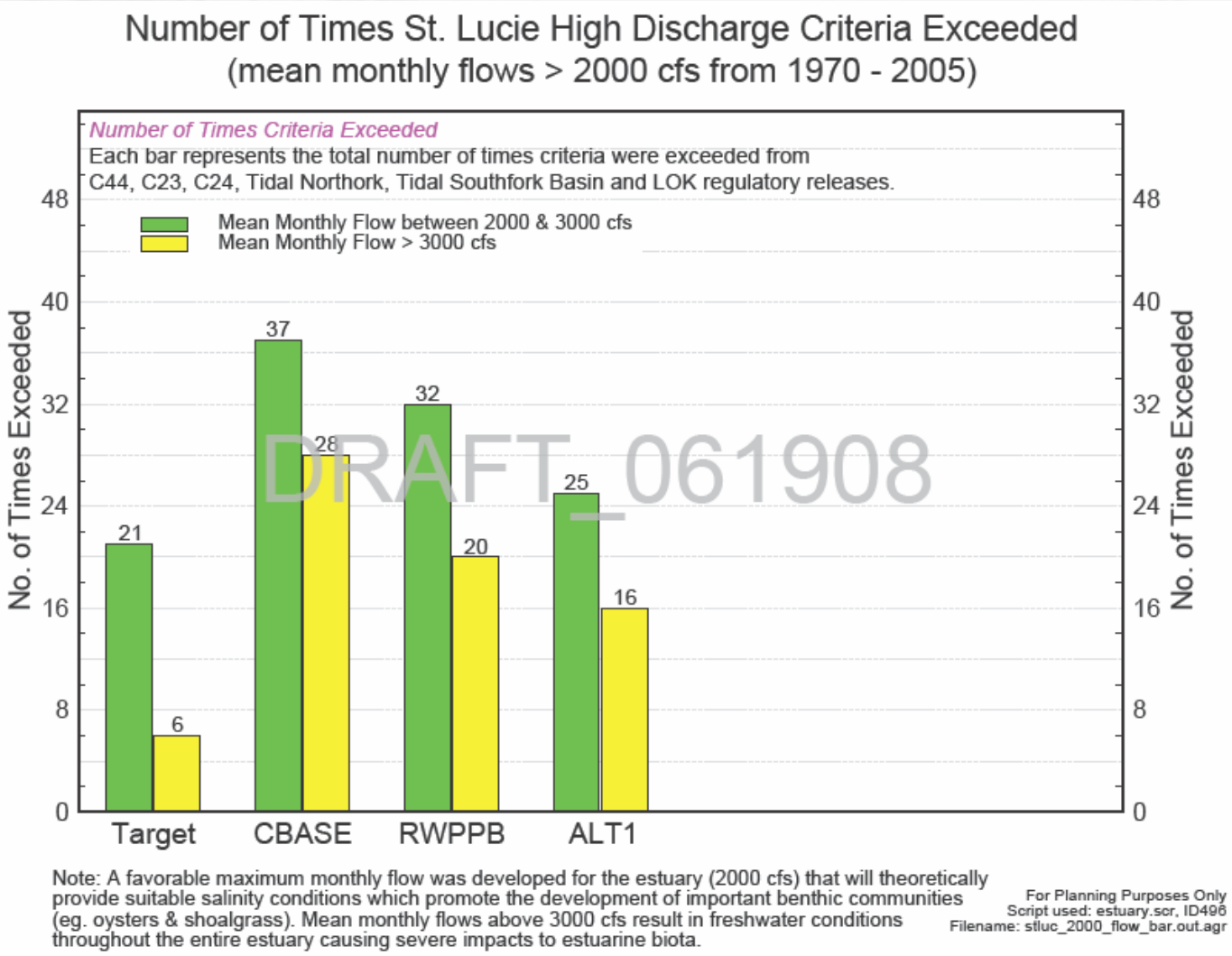
Modeling Results

- Comparison of LOWCP P2TP Current Base Scenario {CBASE}, RWPP Base Run {RWPPB} and RWPP Alternative1 {ALT1} using performance measures and indicators
- Additional alternative scenarios will be compared against CBASE and RWPPB incrementally as they become available

Recap: Scenario Comparison Using Performance Measures and Indicators

- goal is to re-establish salinity regimes suitable for the maintenance of healthy, naturally-diverse and well-balanced estuarine ecosystems while meeting the other water related needs of the region including water supply.
  - Number of times SLE Estuary High Q Criteria Exceeded
  - Number of times salinity envelope criteria NOT met for SLE estuary
  - Water year (Oct-Sep) LOSA demand cutback volumes (7-worst years)
  - Mean annual EAA/LOSA supplemental Irrigation: demands and demands-not-met (4-in-1 ws indicator)

Estuary-Specific Performance Measures



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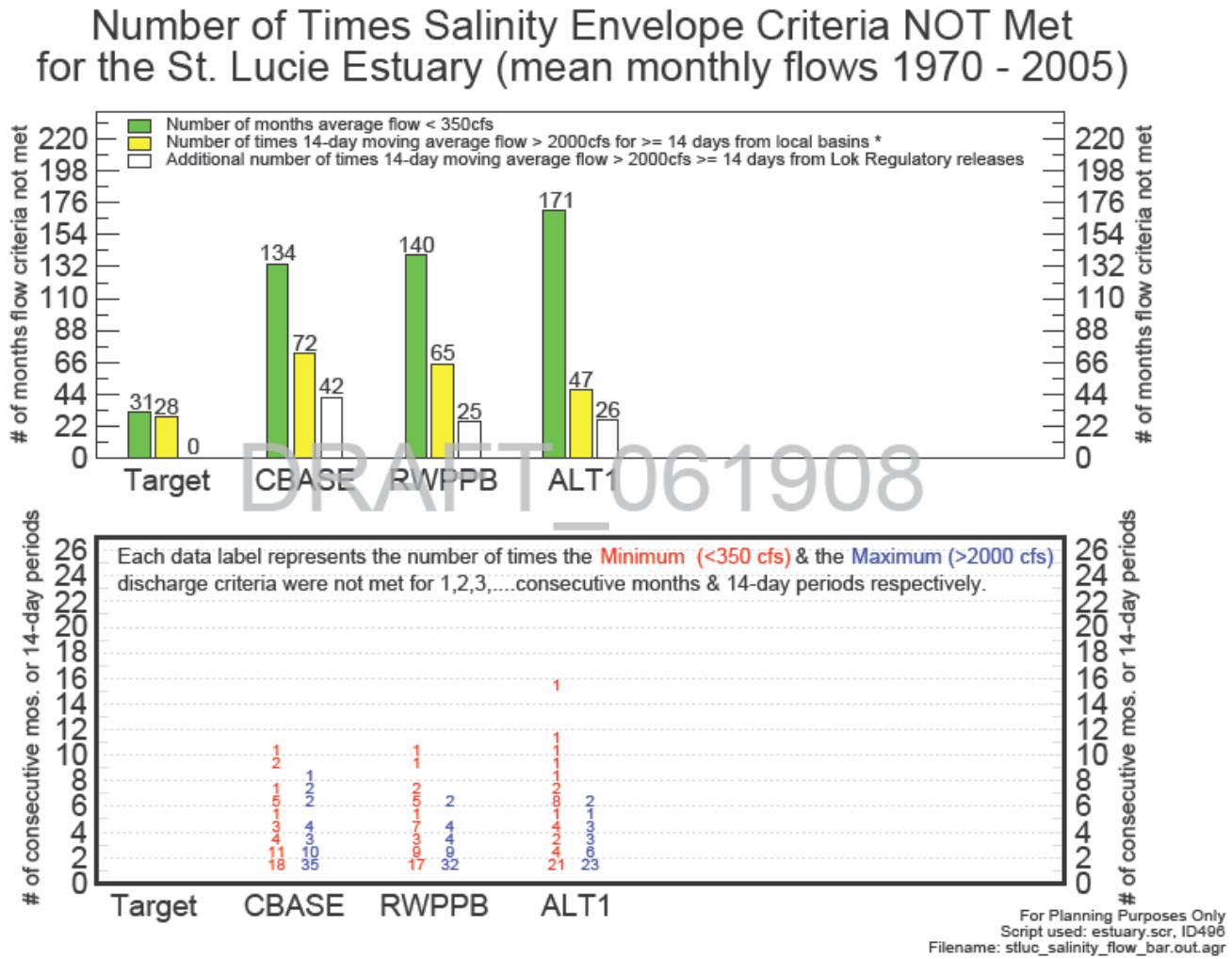
Estuary-Specific Performance Measures



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Estuary-Specific Performance Measures

- **Breakdown of Flows to Estuary By Source (Number of months out of 432 total months of simulation for 1970-2005 period of record)**

	CBASE	RWPPB	ALT1	Operational Target (OPTI-6)
Basins bet. 2000 & 3000 cfs	25	22	17	**17**
Add'l LOK bet. 2000 & 3000 cfs	1	2	0	**N/A**
Add'l (Basins + LOK) bet. 2000 & 3000 cfs	11	8	8	**N/A**
Total bet. 2000 & 3000 cfs	**37**	**32**	**25**	**17**

	CBASE	RWPPB	ALT1	Operational Target (OPTI-6)
Basins > 3000 cfs	13	12	7	**5**
Add'l LOK > 3000 cfs	1	0	0	**N/A**
Add'l (Basins + LOK) > 3000 cfs	14	8	9	**N/A**
Total > 3000 cfs	**28**	**20**	**16**	**5**

	CBASE	RWPPB	ALT1	Operational Target (OPTI-6)
Tot. Flow <350 cfs	**134**	**140**	**171**	**196**

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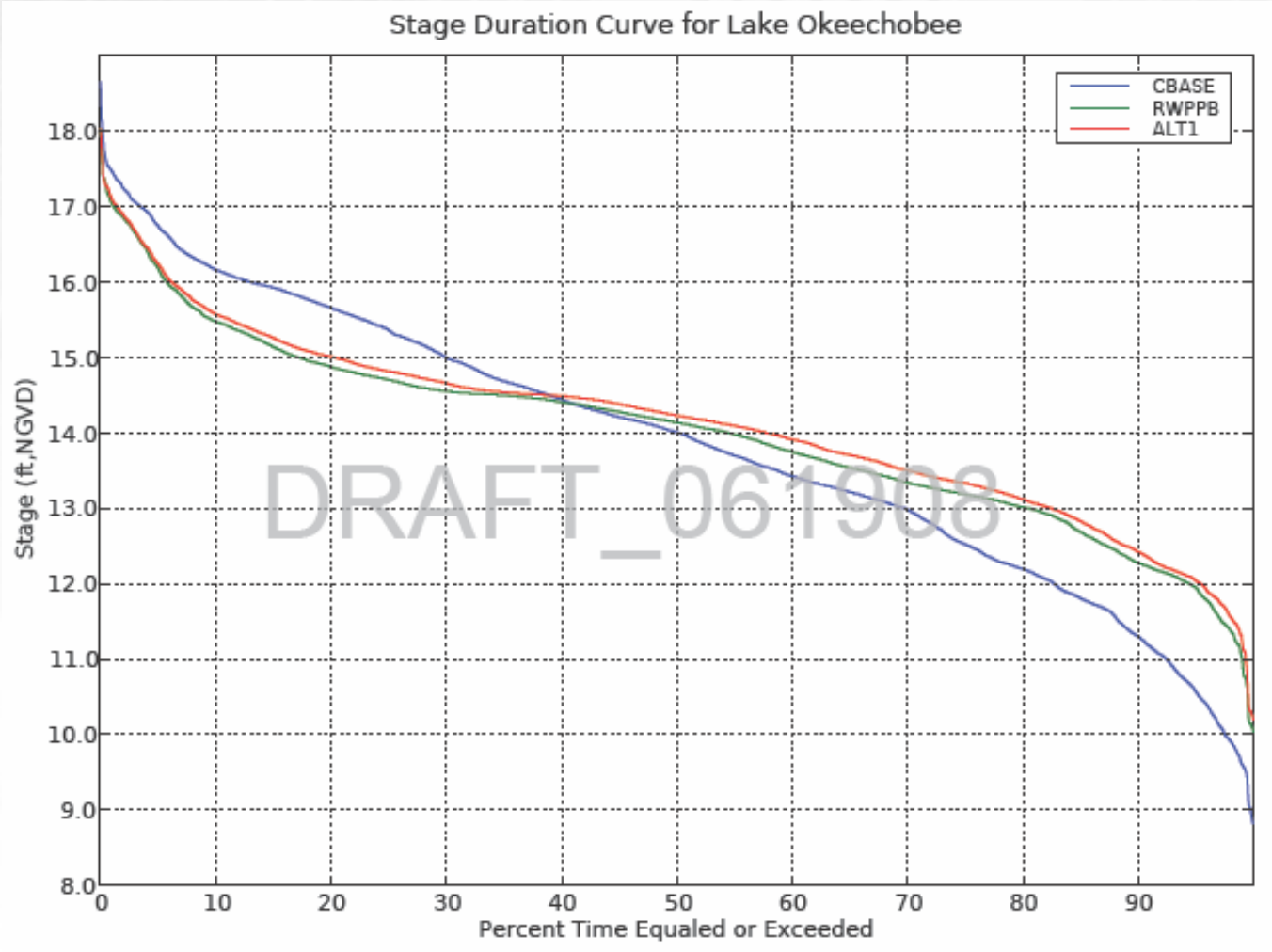
Performance Indicators (Lake Okeechobee)



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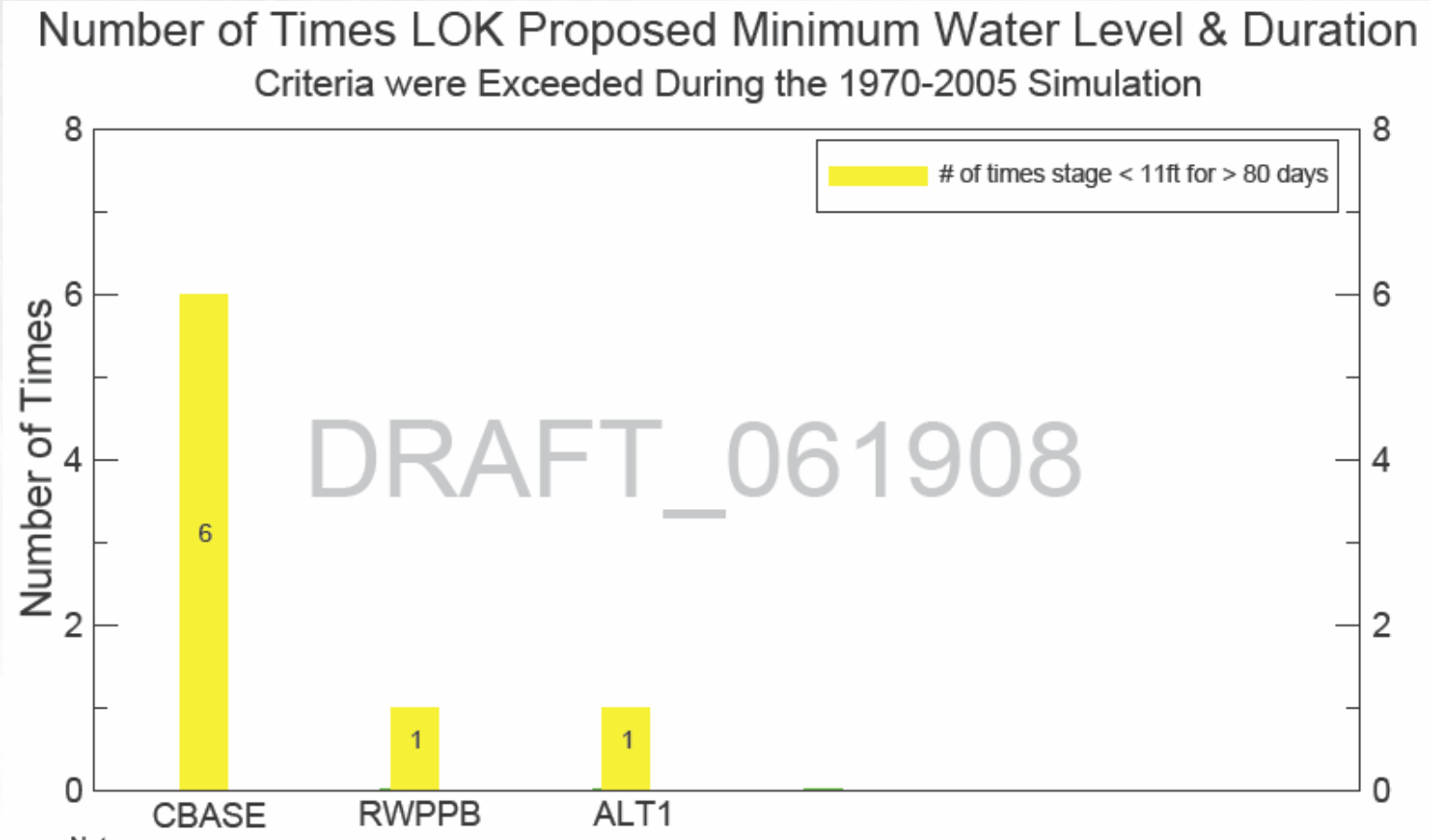
Performance Indicators (Lake Okeechobee)



Note:
Target: Minimum Level, duration and Return Frequency - Water levels in Lake Okeechobee should not fall below 11ft NGVD for greater than 80 days more often than once every six years (Target derived from 1952-1995 historical stage data for Lake Okeechobee).

For Planning Purposes Only
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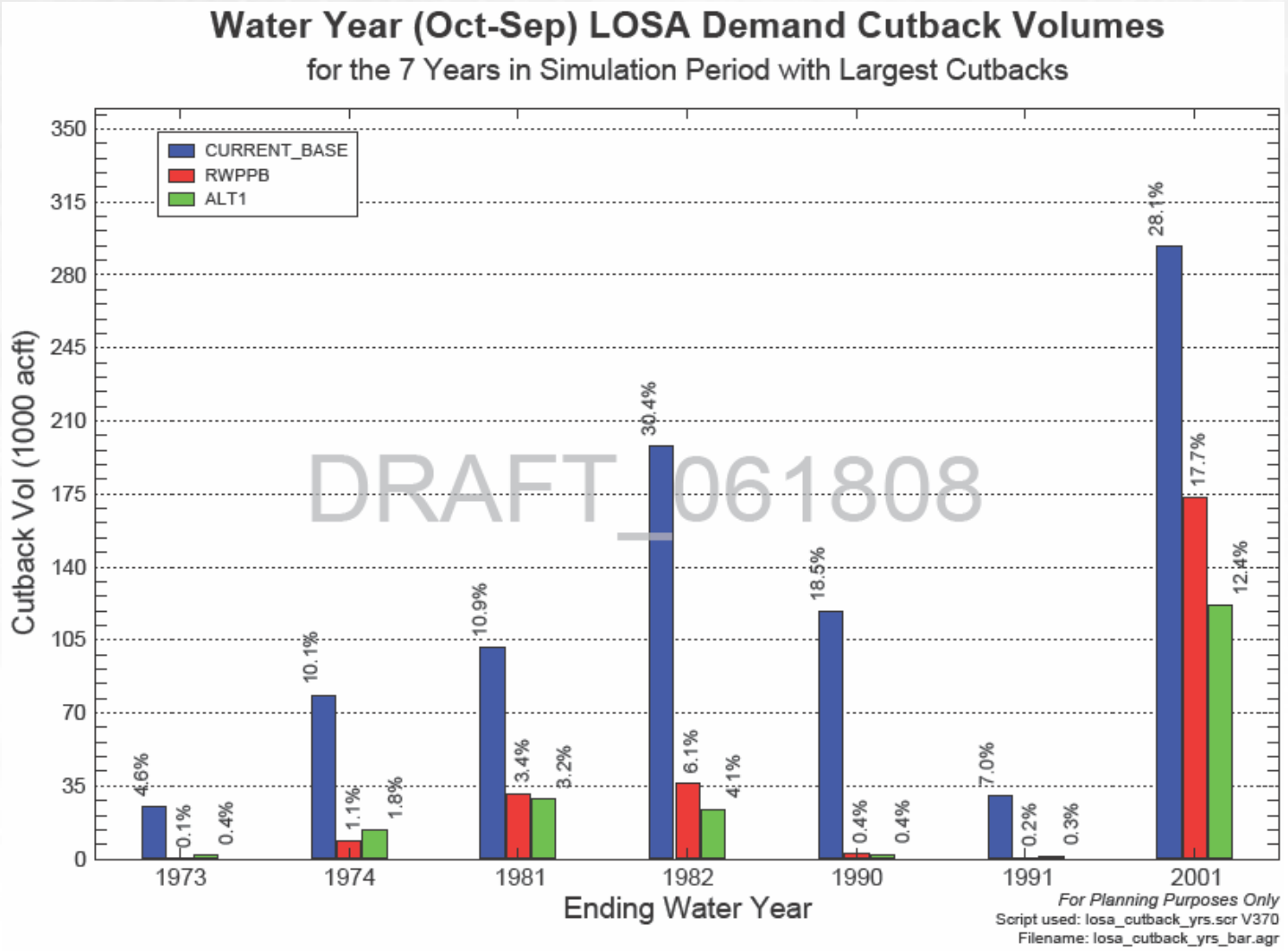
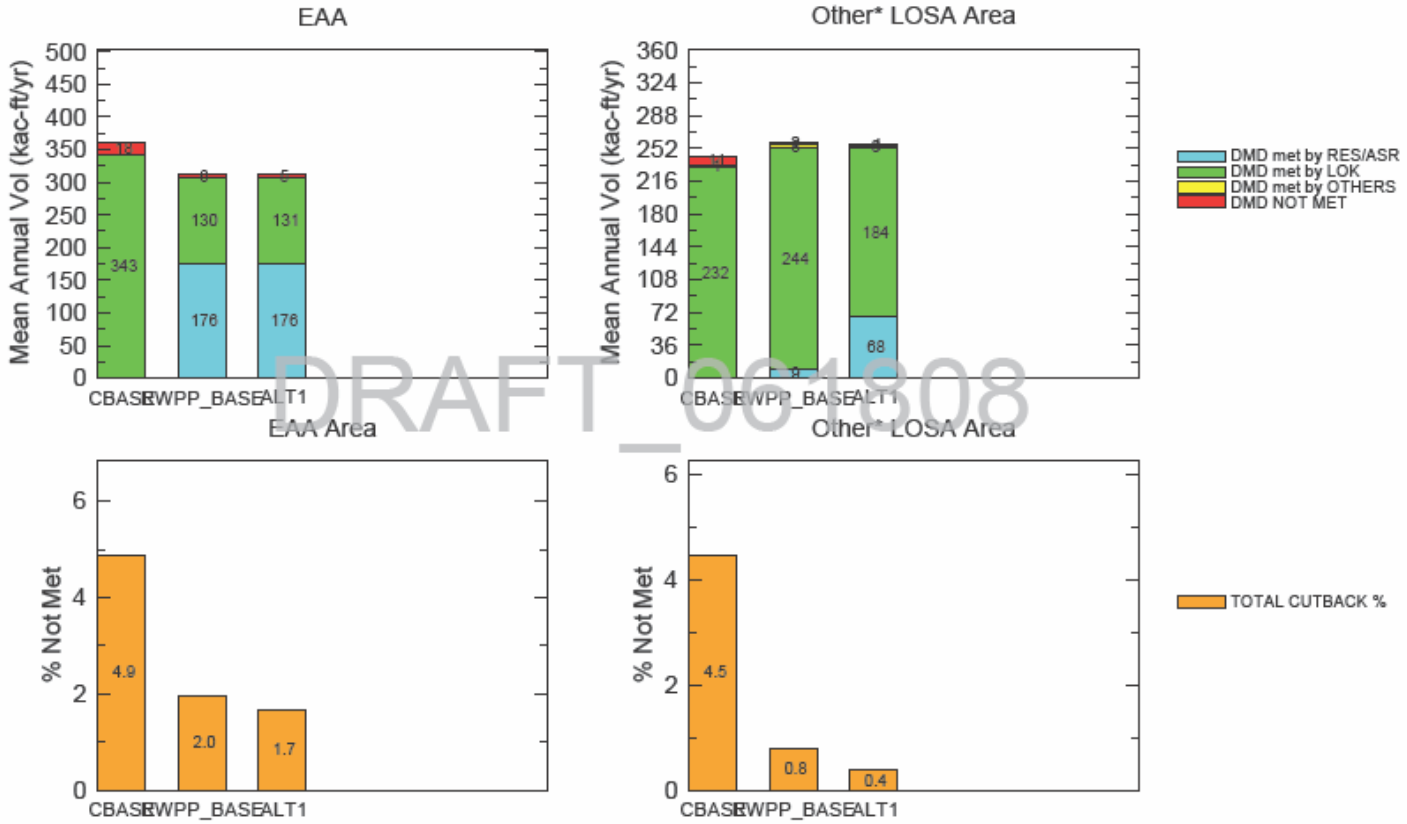
Performance Indicators (Water Supply)



6/24/08

Performance Indicators (Water Supply)

Mean Annual EAA/LOSA Supplemental Irrigation: Demands & Demands Not Met for 1970 - 2005



Other LOSA Areas: S236, S4, L8, C43, C44, North & Northeast Lakeshore, & Lower Istokpoga

For Planning Purposes Only
Script used: ssm_4in1.scr, ID327
Filename: losa_dmd_4in1.agr

6/24/08

Future Modeling Using NERSM

- Incorporation of SLRWPP-specific Alternative 2 management measures
- Integration with Alternative 2 management measures for the Caloosahatchee River Watershed Protection Plan (CRWPP)
- Continued alternative formulation, simulation and evaluation

- **Website: www.sfwmd.gov/northerneverglades**
- **Questions?**

St. Lucie River Watershed Protection Plan

Alternative 1
DRAFT

MM#	Sub-Watershed	Project Feature/Activity	Level	Alternative	TP (mt/yr)	TN (mt/yr)
LO 14	C-44	CERP - IRL South: C-44 Reservoir/STA	B	0	26.1	85.01
LO 66	Outside of SLE Watershed	L-8 Reservoir Phase I	B	0	n/a	n/a
LO 101	Outside of SLE Watershed	ECP Diversions	B	0	n/a	n/a
LO 102	Outside of SLE Watershed	EAA Reservoir	B	0	n/a	n/a
SLE 45	North Fork	10 Mile Creek - Reservoir and STA	B	0	4.45	18.5
LO 1	SLE Watershed	Agricultural BMPs - Owner Implemented , Funded Cost Share, and Cost Share Future Funding (Combined LO 1, 2, and 49	1	1	Roll-up	Roll-up
LO 3	SLE Watershed	Urban Turf Fertilizer Rule (LOER)	1	1	Roll-up	Roll-up
LO 4	SLE Watershed	Land Application of Residuals	1	1	Roll-up	Roll-up
LO 5	SLE Watershed	Florida Yards and Neighborhoods	1	1	Roll-up	Roll-up
LO 7	SLE Watershed	ERP Regulatory Program	1	1	Roll-up	Roll-up
LO 8	SLE Watershed	NPDES Stormwater Program	1	1	Roll-up	Roll-up
LO 9	SLE Watershed	Coastal and Estuarine Land Conservation Program	1	1	Roll-up	Roll-up
LO 12		Alternative Water Storage (AWS) - Lake Okeechobee and Estuary Recovery	-	1	n/a	n/a
LO 12f		AWS - Indiantown Citrus Growers Association	1	1	n/a	n/a
LO 12j		AWS - Dupuis	4	1	n/a	n/a
LO 12m		AWS - Waste Management St. Lucie Site	4	1	n/a	n/a
LO 12q		AWS - Caulkins	4	1	n/a	n/a
LO 15	SLE Watershed	St. Lucie River Watershed Works of the District Rule Regulatory Phosphorus Source Control Program	2	1	Roll-up	Roll-up
LO 21	SLE Watershed	LO and Estuary Watershed Basin Rule (LOER)	3	1	Roll-up	Roll-up
LO 50	SLE Watershed	Agricultural BMPs - Additional Agricultural BMPs	1	1	Roll-up	Roll-up
LO 63	SLE Watershed	Wastewater and Stormwater Master Plans	4	1	Roll-up	Roll-up
LO 64	SLE Watershed	Unified Statewide Stormwater Rule	4	1	Roll-up	Roll-up
LO 68	SLE Watershed	Comprehensive Planning-Land Development Regulations	3	1	Roll-up	Roll-up
LO 87 Revised		Florida Ranchlands Environmental Services Project- existing, future, and full implementation		1	n/a	n/a
LO 87a_1	C-25	Alderman-Deloney Ranch (C-25 basin)	1	1	n/a	n/a
LO 87c	SLE Watershed	Florida Ranchlands Environmental Services Project- full implementation	5	1	n/a	n/a
SLE 02	North Fork	White City Drainage Improvements (canals B, C,D, E, F, G) SLE2a and 2b	2	1	u	u
SLE 03	North Fork	White City Drainage Improvements (Citrus/Saeger)	1	1	0.01	0.03
SLE 06	North Fork	Indian River Estates/Savannas Ecosystem Management Project	1	1	0.76	0.83
SLE 07	North Fork	Platt's Creek Wetland Restoration	1	1	0.03	0.11
SLE 09		Natural Lands in CERP IRL-South Project		1	n/a	n/a
SLE 09a	C-44, South Fork	CERP - IRL South: PalMar Complex - Natural Storage and Water Quality Area	1	1	3.43	13.39
SLE 09b	C-23	CERP - IRL South: Allapattah Complex - Natural Storage and Water Quality Area	1	1	8.47	32.73
SLE 09c	C-23	CERP - IRL South: Cypress Creek/Trail Ridge Complex - Natural Storage and Water Quality Area	2	1	6.49	25.29
SLE 11	Estuary	Creation of suitable oyster substrate in the St. Lucie Estuary at Various sites identified in IRL-South PIR (Artificial Habitat Creation)	1	1	n/a	n/a
SLE 16	C-23/C-24	Improved management of sludge disposal in St. Lucie County through the use of an innovative technology (Plasma-Arc)	1	1	n/a	n/a
SLE 22	North Fork	North River Shores Vacuum Sewer System	1	1	2.18	8.57
SLE 24	C-23, C-24, North Fork	CERP - IRL South: C-23/24 Reservoir/STA	1	1	24	104.2
SLE 26	North Fork	CERP - IRL South: Northfork Natural Floodplain Restoration	2	1	0.57	2.23
SLE 27	Estuary	CERP - IRL South: Muck Remediation	3	1	n/a	n/a
SLE 28	South Fork	Tropical Farms Roebuck Creek Stormwater Quality Retrofit	1	1	0.04	0.21
SLE 29	4, 5, & 6	Old Palm City Phase III Stormwater Quality Retrofit	1	1	0.03	0.07
SLE 30	South Fork	Manatee Pocket Dredging Project	1	1	n/a	n/a
SLE 38	SLE Watershed	Urban BMP Program	1	1	Roll-up	Roll-up
SLE 40	C-23, C-44	CERP – IRL South: Southern Diversion C-23 to C-44 interconnect	1	1	n/a	n/a
SLE 42	North Fork	Jensen Beach Retrofit	1	1	0.01	0.03
SLE 43	North Fork	Leilani Hts/ Warner Creek Retrofit - Phase 1, 2 & 3	1	1	0.16	0.41
SLE 44	South Fork	Manatee Creek Water Quality Retrofit; PhII & PhIII; New Monrovia, Dixie Park	1	1	0.08	0.2
SLE 52	North Fork	E-8 Canal Storm Water Retrofit	1	1	u	u
SLE 53	South Fork	Frazier Creek Water Quality	1	1	0	0.02
SLE 54	South Fork	Haney Creek Wetland Restoration	1	1	u	u
SLE 55	South Fork	Poppleton Creek	1	1	0.09	0.16

Roll-up - benefit included in BMP reductions

u - undetermined

n/a - located within estuary or outside of local watershed

St. Lucie River Watershed Protection Plan

Alternative 2 - Water Storage

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MM#	Sub-Watershed	Project Feature/Activity	Level	Alternative	TP (mt/yr)	TN (mt/yr)
No Specific Water Storage Features are sited within the St. Lucie Watershed for Alternative						

Alternative 3 - Water Quality

DRAFT

MM#	Sub-Watershed	Project Feature/Activity	Level	Alternative	TP (mt/yr)	TN (mt/yr)
SLE 13	SLE Watershed	On-site Sewage Treatment and Disposal System (OSTDS) inspection and pump-out program	4	3	u	u
SLE 18	TBD	Additional Reservoir Storage and WQ Treatment Areas	-			
SLE 18b	C-24	C-23/C-24 Water Quality Treatment Project	5	3	30	100
SLE 19	SLE Watershed	Conversion of existing canals into "linear wetland treatment areas"	4	3	u	u
SLE 31		Stormwater Baffle Box Retrofit - City of Stuart	1	3	u	u
SLE 32	4, 5, & 6	Danforth Creek Stormwater Quality Retrofit	3	3	0.01	0.03
SLE 33	North Fork	North St. Lucie River Water Control District Stormwater Retrofit; Structures 81-1-2 and 85-1-2	1	3	u	u
SLE 35	4, 5, & 6	All American Boulevard Ditch Retrofit	3	3	0.08	0.2
SLE 41	South Fork, 4-5-6, North Fork	Martin County Baffle Boxes	4	3	u	u
SLE 46	SLE Watershed	Small Acreage Manure Management	3	3	u	u
SLE 48	Estuary	Danforth Creek Muck Removal Dredging project	2	3	n/a	n/a
SLE 49	Estuary	Warner Creek Muck Removal Dredging Project	2	3	n/a	n/a
SLE 50	Estuary	Hidden River Muck Removal Dredging Project	2	3	n/a	n/a

u - unable to quantify load reduction estimate

n/a - located within estuary

TABLE TP
Summary of Estimated Total Phosphorus Load Reductions to the St. Lucie Estuary
Working DRAFT

(1) Subwatershed	(2) Area (acres)	(3) Current Base Condition			(4) River Watershed Base Condition					(5) Alternative 1											
		(3a) Average Annual Discharge (1995-2005) (Acre-ft)	(3b) Average Annual TP Load (1995-2005) (Mtons)	(3c) Average Annual TP Conc. (Calculated) (ppb)	(4a) Load Red. (Mtons)	(4b) Remain. Discharge (acre-ft)	(4c) Remain. Conc. (ppb)	(4d) Adjusted Remain. Load* (Mtons)	(4e) Base Projects Load Reduction (%)	(5a) Owner Implemented BMPs**		(5b) Cost-Share BMPs***		(5c) Local Projects		(5d) Regional Projects		(5e) Summary of Alternative 1			
										Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Conc. - (ppb)	Adjusted Remain. Load* (Mtons)	Alt 1 Load Reduction (%)
Basins 4 5 6	15,055	23,620	6.38	218.96	0.00	23,620	218.96	6.38	0%	0.40	5.98	0.46	5.52	0.03	5.49	0.00	5.49	0.89	188.30	5.49	14%
C-23	112,675	152,789	90.57	480.55	0.00	152,789	480.55	90.57	0%	6.88	83.69	10.17	73.52	0.00	73.52	38.96	34.56	56.01	183.36	34.56	62%
C-24	87,706	178,853	75.73	343.25	0.00	178,853	343.25	75.73	0%	6.41	69.32	9.14	60.17	0.00	60.17	0.00	60.17	15.55	272.75	60.17	21%
C-44&S-153	129,719	158,194	39.69	203.38	26.10	158,194	81.00	15.81	60%	2.41	13.40	3.48	9.92	0.00	9.92	2.71	7.21	8.60	81.00	15.81	0%
North Fork	119,168	126,152	43.26	278.00	4.45	126,152	249.40	38.81	10%	1.82	36.99	2.05	34.95	3.15	31.80	0.57	31.23	7.58	200.68	31.23	20%
South Fork	49,965	59,408	20.90	285.16	0.00	59,408	285.16	20.90	0%	1.91	18.99	2.28	16.70	0.21	16.49	0.00	16.49	4.40	225.06	16.49	21%
Lake Okeechobee	-	414,754	96.25	188.14	67.39	170,805	136.96	28.86	70%	0.00	28.86	0.00	28.86	0.00	28.86	0.00	28.86	0.00	136.96	28.86	0%
Total	514,287	1,113,771	372.76	271.33	97.95	869,821	256.14	277.04	26%	19.82	257.22	27.59	229.63	3.39	226.24	42.24	184.00	93.04	171.49	192.60	30%

(1) Subwatershed	Alt 1 Adjusted Remain. Load* (Mtons)	(6) Alternative 2								(7) Alternative 3							
		(6a) Local Projects		(6b) Regional Projects		(6c) Summary of Alternative 2				(7a) Local Projects		(7b) Regional Projects		(7c) Summary of Alternative 3			
		Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Conc. - (ppb)	Adjusted Remain. Load* (Mtons)	Alt 2 Load Reduction (%)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Conc. - (ppb)	Adjusted Remain. Load* (Mtons)	Alt 3 Load Reduction (%)
Basins 4 5 6	5.49	0.00	5.49	0.00	5.49	0.00	188.30	5.49	0%	0.09	5.40	0.00	5.40	0.09	185.21	5.40	2%
C-23	34.56	0.00	34.56	0.00	34.56	0.00	183.36	34.56	0%	0.00	34.56	0.00	34.56	0.00	183.36	34.56	0%
C-24	60.17	0.00	60.17	0.00	60.17	0.00	272.75	60.17	0%	0.00	60.17	30.00	30.17	30.00	136.76	30.17	50%
C-44&S-153	15.81	0.00	15.81	0.00	15.81	0.00	81.00	15.81	0%	0.00	15.81	0.00	15.81	0.00	81.00	15.81	0%
North Fork	31.23	0.00	31.23	0.00	31.23	0.00	200.68	31.23	0%	0.00	31.23	0.00	31.23	0.00	200.68	31.23	0%
South Fork	16.49	0.00	16.49	0.00	16.49	0.00	225.06	16.49	0%	0.00	16.49	0.00	16.49	0.00	225.06	16.49	0%
Lake Okeechobee	28.86	0.00	28.86	0.00	28.86	0.00	136.96	28.86	0%	0.00	28.86	0.00	28.86	0.00	136.96	28.86	0%
Total	192.60	0.00	192.60	0.00	192.60	0.00	179.51	192.60	0%	0.09	192.51	30.00	162.51	30.09	151.46	162.51	16%

** When reductions were projected to results in concentrations less than 81 ppb, the remaining load was estimated by mulitplying the basin flow by 81 ppb.*
*** Owner implemented BMPs reduction is adjusted by (1) urban pervious area percentage and (2) the percentage of the BMPs has already been achieved in citrus (80%), ornamentals/nursery (50%), and row crops (30%).*
**** Cost-share reduction is adjusted by (1) the percentage of urban area in 1988 to current and (2) the percentage of the BMPs has already been achieved in citrus (80%), ornamentals/nursery (50%), and row crops (30%).*

TABLE TN
Summary of Estimated Total Nitrogen Load Reductions to the St. Lucie Estuary
Working DRAFT

(1) Subwatershed	(2) Area (acres)	(3) Current Base Condition			(4) River Watershed Base Condition					(5) Alternative 1											
		(3a) Average Annual Discharge (1995-2005) (Acre-ft)	(3b) Average Annual TN Load (1995 2005) (Mtons)	(3c) Average Annual TN Conc. (Calculated) (ppm)	(4a) Load Red. (Mtons)	(4b) Remain. Discharge (acre-ft)	(4c) Remain. Conc. (ppm)	(4d) Adjusted Remain. Load* (Mtons)	(4e) Base Projects Load Reduction (%)	(5a) Owner Implemented BMPs**		(5b) Cost-Share BMPs***		(5c) Local Projects		(5d) Regional Projects		(5e) Summary of Alternative 1			
										Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Alt 1 Load Reduction (Mtons)	Remain. Conc. (ppm)	Adjusted Remain. Load* (Mtons)	Alt 1 Load Reduction (%)
Basins 4 5 6	15,055	23,620	34.43	1.18	0.00	23,620	1.18	34.43	0%	4.03	30.40	4.71	25.69	0.07	25.62	0.00	25.62	8.81	0.88	25.62	26%
C-23	112,675	152,789	329.78	1.75	0.00	152,789	1.75	329.78	0%	34.37	295.41	24.68	270.73	0.00	270.73	162.22	108.51	221.27	0.72	135.70	59%
C-24	87,706	178,853	355.00	1.61	0.00	178,853	1.61	355.00	0%	43.30	311.70	28.31	283.40	0.00	283.40	0.00	283.40	71.61	1.28	283.40	20%
C-44&S-153	129,719	158,194	300.49	1.54	85.01	158,194	1.10	215.48	28%	22.15	193.33	17.68	175.66	0.00	175.66	10.58	165.08	50.40	0.85	165.08	23%
North Fork	119,168	126,152	185.31	1.19	18.50	126,152	1.07	166.81	10%	19.23	147.58	25.91	121.67	9.98	111.69	2.23	109.46	57.35	0.72	112.04	33%
South Fork	49,965	59,408	91.13	1.24	0.00	59,408	1.24	91.13	0%	11.43	79.70	10.75	68.95	0.57	68.38	0.00	68.38	22.75	0.93	68.38	25%
Lake Okeechobee	-	414,754	922.00	1.80	623.91	170,805	1.41	298.09	68%	0.00	298.09	0.00	298.09	0.00	298.09	0.00	298.09	0.00	1.41	298.09	0%
Total	514,287	1,113,771	2,218.14	1.61	727.42	869,821	-	1,490.72	33%	134.51	1,356.22	112.04	1,244.18	10.62	1,233.56	175.03	1,058.53	432.19	0.99	1,088.30	27%

(1) Subwatershed	Alt 1 Adjusted Remain. Load* (Mtons)	(6) Alternative 2								(7) Alternative 3							
		(6a) Local Projects		(6b) Regional Projects		(6c) Summary of Alternative 2				(7a) Local Projects		(7b) Regional Projects		(7c) Summary of Alternative 3			
		Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Alt 1 Load Reduction (Mtons)	Remain. Conc. (ppm)	Adjusted Remain. Load* (Mtons)	Alt 1 Load Reduction (%)	Load Red. (Mtons)	Remain. Load (Mtons)	Load Red. (Mtons)	Remain. Load (Mtons)	Alt 1 Load Reduction (Mtons)	Remain. Conc. (ppm)	Adjusted Remain. Load* (Mtons)	Alt 1 Load Reduction (%)
Basins 4 5 6	25.62	0.00	25.62	0.00	25.62	0.00	0.88	25.62	0%	0.23	25.39	0.00	25.39	0.23	0.87	25.39	1%
C-23	135.70	0.00	135.70	0.00	135.70	0.00	0.72	135.70	0%	0.00	135.70	0.00	135.70	0.00	0.72	135.70	0%
C-24	283.40	0.00	283.40	0.00	283.40	0.00	1.28	283.40	0%	0.00	283.40	100.00	183.40	100.00	0.83	183.40	35%
C-44&S-153	165.08	0.00	165.08	0.00	165.08	0.00	0.85	165.08	0%	0.00	165.08	0.00	165.08	0.00	0.85	165.08	0%
North Fork	112.04	0.00	112.04	0.00	112.04	0.00	0.72	112.04	0%	0.00	112.04	0.00	112.04	0.00	0.72	112.04	0%
South Fork	68.38	0.00	68.38	0.00	68.38	0.00	0.93	68.38	0%	0.00	68.38	0.00	68.38	0.00	0.93	68.38	0%
Lake Okeechobee	298.09	0.00	298.09	0.00	298.09	0.00	1.41	298.09	0%	0.00	298.09	0.00	298.09	0.00	1.41	298.09	0%
Total	1,088.30	0.00	1088.30	0.00	1088.30	0.00	1.01	1088.30	0%	0.23	1088.07	100.00	988.07	100.23	0.92	988.07	9%

** When reductions were projected to results in concentrations less than 0.72 ppm, the remaining load was estimated by mulitplying the basin flow by 0.72 ppm.*
*** Owner implemented BMPs reduction is adjusted by (1) urban pervious area percentage and (2) the percentage of the BMPs have already been achieved in citrus (80%), ornamentals/nursery (50%), and row crops (30%).*
**** Cost-share reduction is adjusted by (1) the percentage of urban area in 1988 to current and (2) the percentage of the BMPs have already been achieved in citrus (80%), ornamentals/nursery (50%), and row crops (30%).*