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
St. Lucie River Watershed Protection Plan

Working Team Meeting #8
June 24, 2008

Proposed Schedule

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

**Alternative 1**

**Alternative 2**

**Alternative 3**

**Alternative 4**

- Working Team Meeting Dates in ovals
  - 3/25
  - 4/22
  - 5/27
  - 6/24
  - 7/22

- 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
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

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
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

Questions

my.sfwmd.gov/northerneverglades
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
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
Interim Action Plan
- Estuary Heath
- Effects of the 1998 Discharge event
- Available Local & Regional Programs
- Long Term Projects
- Short Term Project List

Short Term Projects
Project Categories
- Stormwater Retrofits
- Water Storage Areas
- Restoration
- Programs
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

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

C-44
C-23
C-24
C-25
Indian River Lagoon
St. Lucie River
Lake Okeechobee
C-44

4
Baffle box construction

Vacuum Truck
**Bank Stabilization**

**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
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

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
Questions?
Update on Hydrologic Modeling For St. Lucie River Watershed Protection Plan
(by Larry Brion, HESM, SFWMD)
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).
  - 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.

6/24/08
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

6/24/08
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.
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.
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

6/24/08
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.”

6/24/08
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
Node-Link Representation of the St. Lucie Sub-watershed in the NERSM for SLRWPP Base

- Simulated Flow
- Imposed Flow
- Demand/Target Flow
- Simulated Basin or Res+Sta

LOK → LOK
C44 RES+STA → C23
C24 RO → C23
C24 DMD → C24
C23 DMD → C23
C24 RO → C24
TMC RO → TMC
C23 RO → C23
C44 DMD → C44
C44 RO → C44
TMC RES+STA → TMC
NF+SF+B456 → SLEST
SLEST → Target Flow

Simulated Flow
Imposed Flow
Demand/Target Flow
Simulated Basin or Res+Sta
Node-Link Representation of the St. Lucie Sub-watershed in the NERSM for SLRWPP Alternative 1

- Simulated Flow
- Imposed Flow
- Demand/Target Flow
- Simulated Basin or Res+Sta
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)

6/24/08
Estuary-Specific Performance Measures

Number of Times St. Lucie High Discharge Criteria Exceeded
(mean monthly flows > 2000 cfs from 1970 - 2005)

Note: A favorable maximum monthly flow was developed for the estuary (2000 cfs) that will theoretically provide suitable salinity conditions which promote the development of important benthic communities (e.g. oysters & shoalgrass). Mean monthly flows above 3000 cfs result in freshwater conditions throughout the entire estuary causing severe impacts to estuarine biota.
Estuary-Specific Performance Measures

Number of Times Salinity Envelope Criteria NOT Met for the St. Lucie Estuary (mean monthly flows 1970 - 2005)

- Number of months average flow < 350 cfs
- Number of times 14-day moving average flow > 2000 cfs for >= 14 days from local basis
- Additional number of times 14-day moving average flow > 2000 cfs >= 14 days from Lake Regulatory releases

Each data label represents the number of times the Minimum (<350 cfs) & the Maximum (>2000 cfs) discharge criteria were not met for 1, 2, 3, ..., consecutive months & 14-day periods respectively.

For Planning Purposes Only
Script used: estuaryscr_IDA405
Filename: stluc_salinity_flow_bar.out.png

6/24/08
## 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)

<table>
<thead>
<tr>
<th>Source Description</th>
<th>CBASE</th>
<th>RWPPB</th>
<th>ALT1</th>
<th>Operational Target (OPTI-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basins bet. 2000 &amp; 3000 cfs</td>
<td>25</td>
<td>22</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Add'l LOK bet. 2000 &amp; 3000 cfs</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Add'l (Basins + LOK) bet. 2000 &amp; 3000 cfs</td>
<td>11</td>
<td>8</td>
<td>8</td>
<td>N/A</td>
</tr>
<tr>
<td>Total bet. 2000 &amp; 3000 cfs</td>
<td>37</td>
<td>32</td>
<td>25</td>
<td>17</td>
</tr>
<tr>
<td>Basins &gt; 3000 cfs</td>
<td>13</td>
<td>12</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Add'l LOK &gt; 3000 cfs</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Add'l (Basins + LOK) &gt; 3000 cfs</td>
<td>14</td>
<td>8</td>
<td>9</td>
<td>N/A</td>
</tr>
<tr>
<td>Total &gt; 3000 cfs</td>
<td>28</td>
<td>20</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Tot. Flow &lt;350 cfs</td>
<td>134</td>
<td>140</td>
<td>171</td>
<td>196</td>
</tr>
</tbody>
</table>

6/24/08
Performance Indicators (Lake Okeechobee)
Performance Indicators (Lake Okeechobee)

Number of Times LOK Proposed Minimum Water Level & Duration Criteria were Exceeded During the 1970-2005 Simulation

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
Script used: lok_stage_events.sor ID:465
Filename: lok_minl_bar.sp
Performance Indicators (Water Supply)

Water Year (Oct-Sep) LOSA Demand Cutback Volumes
for the 7 Years in Simulation Period with Largest Cutbacks

- CURRENT_BASE
- RWFFB
- ALT1

Cutback Vol (1000 acft)

<table>
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<tr>
<th>Ending Water Year</th>
<th>Current_Base</th>
<th>RWFFB</th>
<th>ALT1</th>
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<tbody>
<tr>
<td>1973</td>
<td>6.6%</td>
<td>0.1%</td>
<td>0.4%</td>
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<tr>
<td>1974</td>
<td>10.1%</td>
<td>0.4%</td>
<td>1.1%</td>
</tr>
<tr>
<td>1981</td>
<td>10.9%</td>
<td>3.4%</td>
<td>1.8%</td>
</tr>
<tr>
<td>1982</td>
<td>30.4%</td>
<td>8.1%</td>
<td>8.2%</td>
</tr>
<tr>
<td>1990</td>
<td>18.6%</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
<tr>
<td>1991</td>
<td>6.0%</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
<tr>
<td>2001</td>
<td>28.1%</td>
<td>17.7%</td>
<td>12.8%</td>
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For Planning Purposes Only
Script used: losa_cutback_yrs.scr V370
Filename: losa_cutback_yrs_bar.asp

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 Isokpoga
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

<table>
<thead>
<tr>
<th>LO</th>
<th>Sub-Watershed</th>
<th>Project Feature/Activity</th>
<th>Level</th>
<th>Alternative</th>
<th>TP (mt/yr)</th>
<th>TN (mt/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>C-44</td>
<td>CERP - IRL South: C-44 Reservoir/STA</td>
<td>B</td>
<td>0</td>
<td>26.1</td>
<td>85.01</td>
</tr>
<tr>
<td>66</td>
<td>Outside of SLE Watershed</td>
<td>L-8 Reservoir Phase I</td>
<td>B</td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>101</td>
<td>Outside of SLE Watershed</td>
<td>ECP Diversions</td>
<td>B</td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td>102</td>
<td>Outside of SLE Watershed</td>
<td>EAA Reservoir</td>
<td>B</td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>North Fork</td>
<td>10 Mile Creek - Reservoir and STA</td>
<td>B</td>
<td>0</td>
<td>4.45</td>
<td>18.5</td>
</tr>
<tr>
<td>3</td>
<td>SLE Watershed</td>
<td>Agricultural BMPs - Owner Implemented, Funded Cost Share, and Cost Share Future Funding (Combined LO 1, 2, and 49</td>
<td>1</td>
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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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<th>MM#</th>
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<th>Level</th>
<th>Alternative</th>
<th>TP (mt/yr)</th>
<th>TN (mt/yr)</th>
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*No specific water storage features are sited within the St. Lucie Watershed for Alternative 2.*

### Alternative 3 - Water Quality

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*u - unable to quantify load reduction estimate*

*n/a - located within estuary*
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<td>1.91</td>
<td>0.00</td>
<td>1.91</td>
<td>0.00</td>
<td>1.91</td>
</tr>
<tr>
<td>Lake Okeechobee</td>
<td>-</td>
<td>414.754</td>
<td>96.25</td>
<td>188.14</td>
<td>67.39</td>
<td>170.805</td>
<td>188.14</td>
<td>96.25</td>
<td>0.00</td>
<td>0.00</td>
<td>28.86</td>
<td>28.86</td>
<td>0.00</td>
<td>28.86</td>
<td>0.00</td>
<td>28.86</td>
</tr>
<tr>
<td>Total</td>
<td>514.287</td>
<td>1,113.771</td>
<td>372.76</td>
<td>271.33</td>
<td>97.95</td>
<td>369.921</td>
<td>271.33</td>
<td>372.76</td>
<td>0.00</td>
<td>19.82</td>
<td>257.22</td>
<td>27.59</td>
<td>229.63</td>
<td>3.39</td>
<td>226.24</td>
<td>42.24</td>
</tr>
</tbody>
</table>

* When reductions were projected to results in concentrations less than 81 ppb, the remaining load was estimated by multiplying 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

#### (3) Current Base Condition

| Subwatershed | (2) Area (acres) | (3a) Average Annual Discharge (1995-2005) (Acre-ft) | (3b) Average Annual TN Load (1995-2005) (Mtons) | (3c) Average Annual TN Conc. (ppm) | (3d) Load Red. (Mtons) | (4a) Remaining Discharge (acre-ft) | (4b) Remaining Load (Mtons) | (4c) Remaining Conc. (ppm) | (4d) Adjusted Remain. Load* (Mtons) | Load Red. (%) | (4e) Base Projects Load Reduction (%) | (5a) Owner Implemented BMPs** | (5b) Cost-Share BMPs*** | (5c) Local Projects | (5d) Regional Projects | (5e) Summary of Alternative 1 | (6a) Adjusted Remain. Load (Mtons) | (6b) Local Projects | (6c) Regional Projects | (6d) Summary of Alternative 2 | (7a) Local Projects | (7b) Regional Projects | (7c) Summary of Alternative 3 |
|--------------|-----------------|-----------------------------------------------|-----------------------------------------------|---------------------------------|-------------------------|-----------------------------------|--------------------------|-------------------------------|------------------------------|----------------|-----------------------------------|---------------------------|----------------------------|-----------------|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Basins 4 5 6 | 55,095          | 25,620                                       | 34.43                                         | 1.18                             | 0.00                     | 23,620                           | 1.18                      | 34.43                          | 0%                           | 4.03          | 30.49                             | 4.11                       | 72.47                      | 1.12             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |
| C-23         | 112,675         | 112,765                                      | 329.78                                        | 1.75                             | 0.00                     | 112,675                          | 1.75                      | 329.78                         | 0%                           | 34.37          | 299.41                             | 24.68                       | 72.74                      | 1.75             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |
| C-24         | 119,168         | 119,132                                      | 185.31                                        | 1.19                             | 0.00                     | 112,675                          | 1.19                      | 185.31                         | 0%                           | 19.23          | 147.58                             | 25.91                       | 175.68                     | 1.19             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |
| C-24&S-153   | 129,719         | 129,152                                      | 300.49                                        | 1.54                             | 0.75                     | 129,152                          | 1.54                      | 300.49                         | 0%                           | 11.43          | 158.07                             | 17.05                       | 175.68                     | 1.54             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |
| North Fork   | 119,168         | 119,132                                      | 185.31                                        | 1.19                             | 0.00                     | 112,675                          | 1.19                      | 185.31                         | 0%                           | 19.23          | 147.58                             | 25.91                       | 175.68                     | 1.19             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |
| South Fork   | 49,965          | 49,408                                       | 91.13                                         | 1.24                             | 0.00                     | 49,965                           | 1.24                      | 91.13                          | 0%                           | 11.43          | 79.70                              | 10.75                       | 68.95                      | 1.24             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |
| Lake Okeechobee | 414,754      | 922.00                                       | 623.91                                        | 1.41                             | 0.00                     | 414,754                          | 1.41                      | 623.91                         | 0%                           | 0.00           | 258.09                             | 0.00                        | 258.09                     | 1.41             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |
| Total        | 574,202         | 1,119,777                                    | 1,508.14                                      | 3.44                             | 0.72                     | 1,119,777                        | 3.44                      | 1,508.14                       | 0%                           | 134.51         | 1,374.25                           | 146.74                       | 1,228.24                    | 3.44             | 135.70          | 30.79             | 29.61           | 13.57            | 29.61           |

* Adjusted Remain. Load* = Load Red. (Mtons) + Remaining Load (Mtons)

** Owner implemented BMPs 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%).

*** 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%).

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(5) Alternative 1

(6) Alternative 2

(7) Alternative 3

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* When reductions were projected to results in concentrations less than 0.72 ppm, the remaining load was estimated by multiplying 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%).