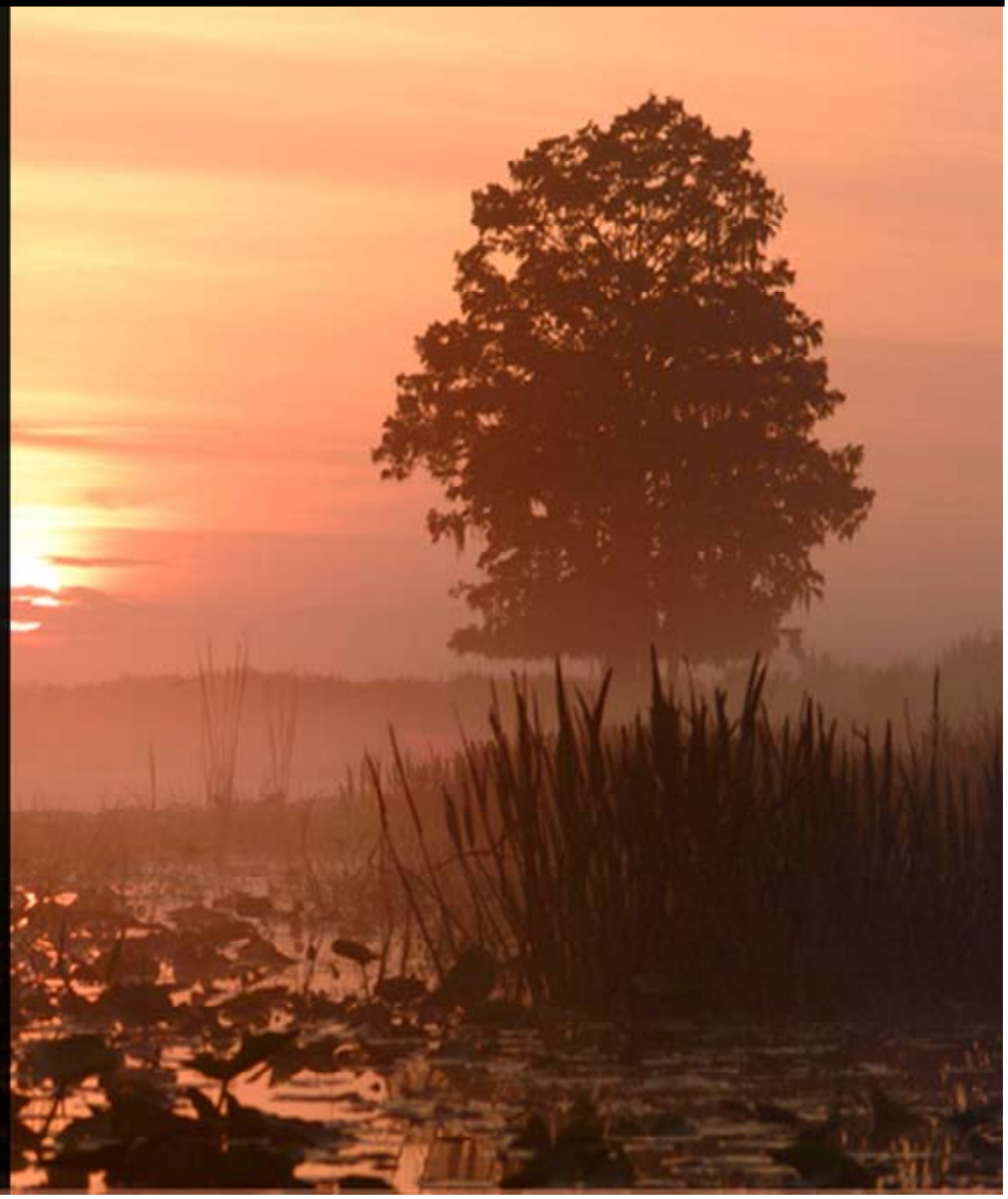
Northern Everglades Initiative

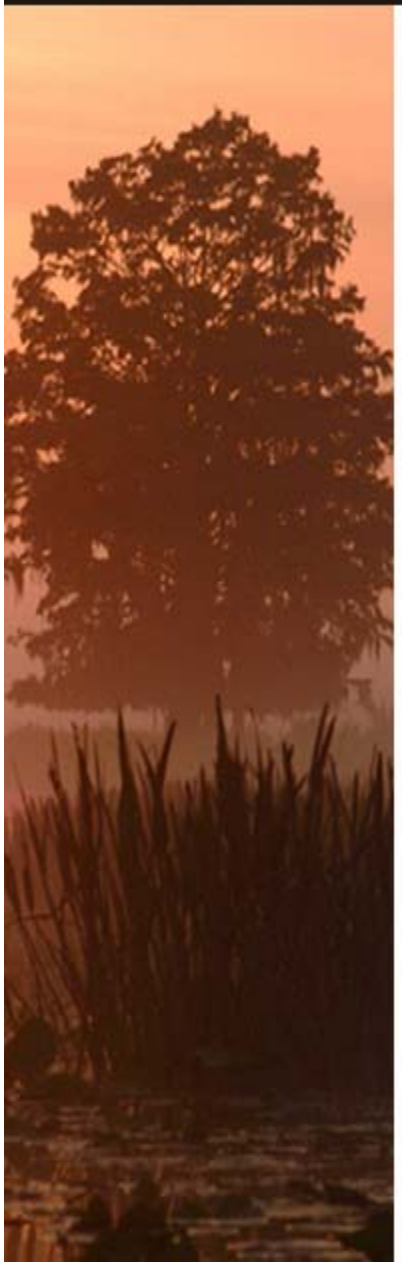
Lake Okeechobee Phase II Draft Technical Plan Update

John Mitnik, Northern Everglades Division Director

Ten County Coalition
November 30, 2007

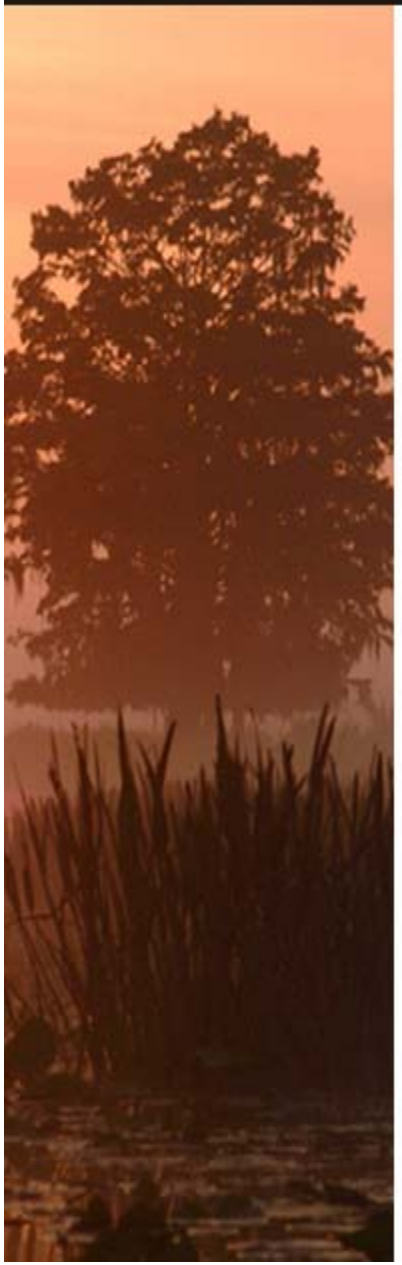


Lake Okeechobee Phase II Technical Plan



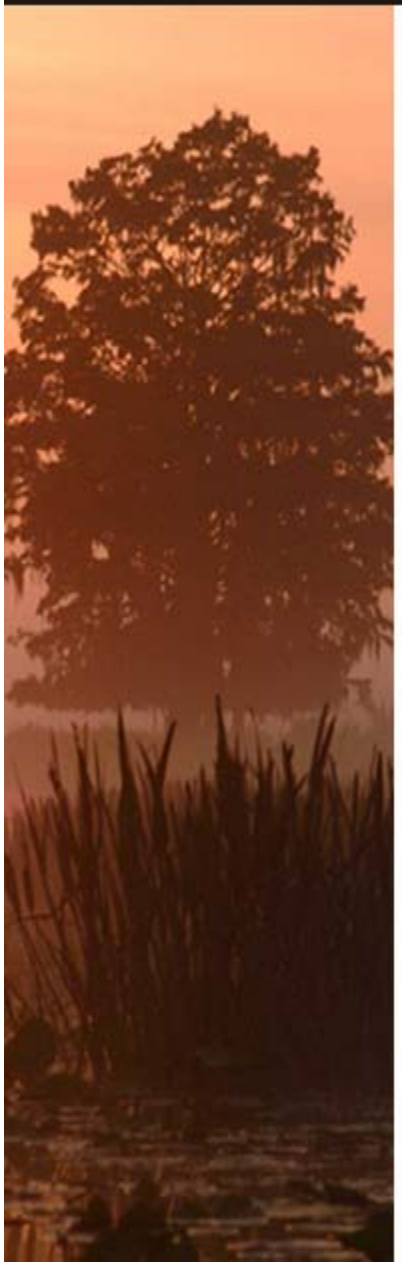
- **Requires development of Phase II Technical Plan for Lake Okeechobee Watershed Construction Project**
  - **Due by February 1, 2008**
  - **Developed by South Florida Water Management District, in cooperation with the Florida Department of Environmental Protection and Florida Department of Agriculture and Consumer Services**

Lake Okeechobee Phase II Technical Plan

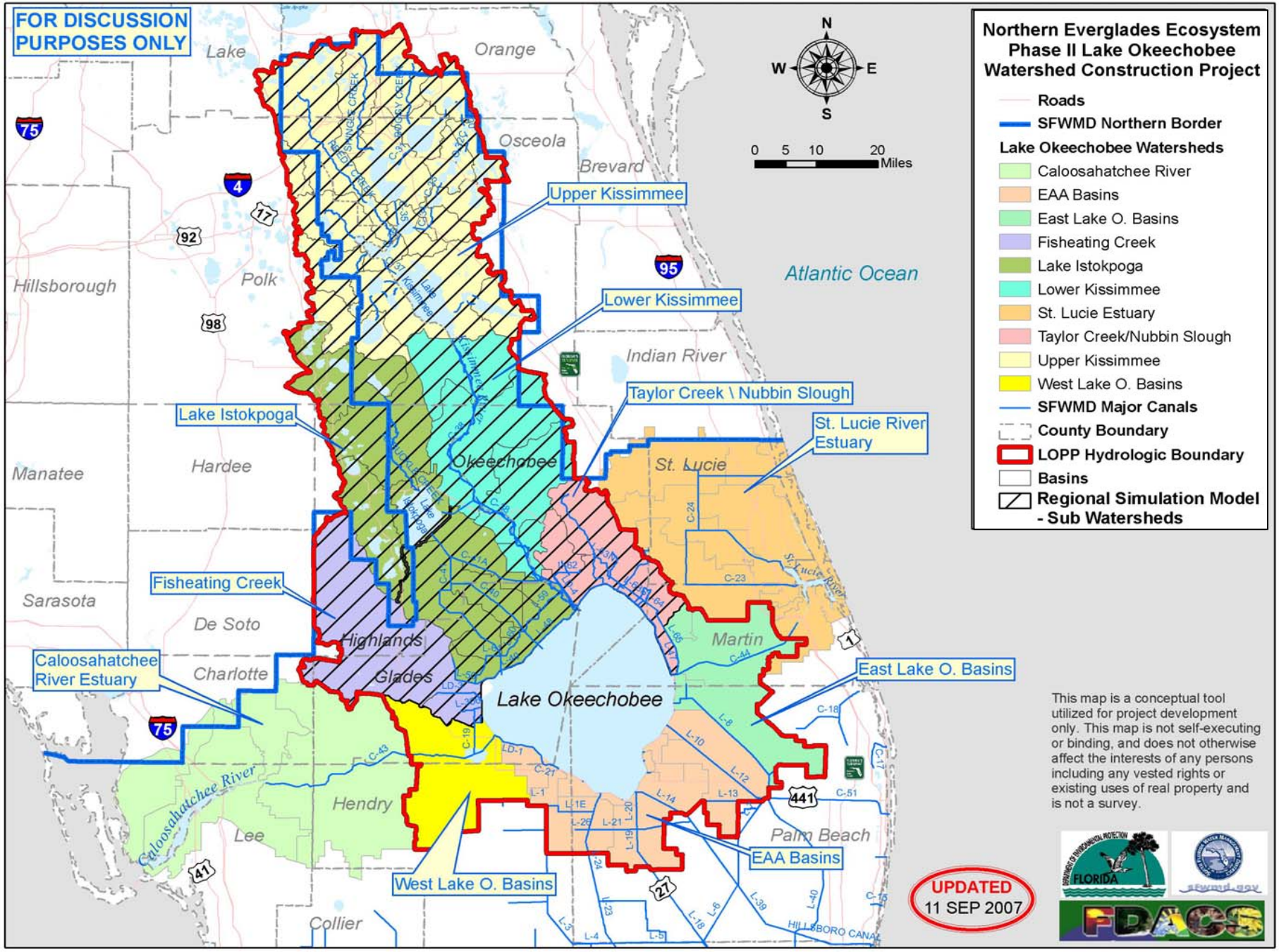


- **Technical Plan "shall include measures for the improvement of the <u>quality, quantity, timing, and distribution of water</u> in the northern Everglades ecosystem, including <u>Lake Okeechobee watershed and the estuaries</u>, and for <u>facilitating the achievement of water quality standards</u>."**

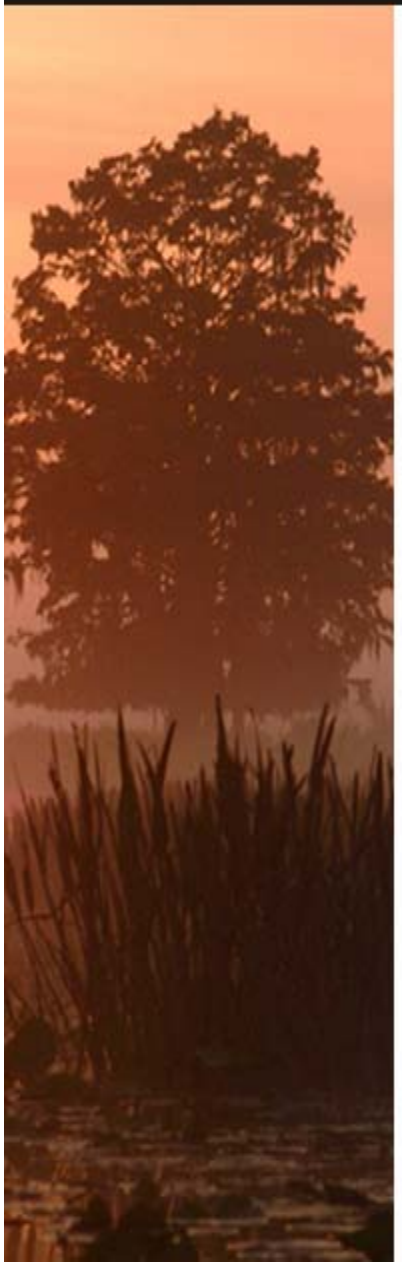
Lake Okeechobee Technical Plan Requirements



- **Identify facilities to achieve Lake Okeechobee Total Maximum Daily Load**
- **Provide additional measures to increase water storage and reduce excess water levels in lake and discharges to estuaries**
  - **Identify storage goal to achieve desired lake levels and inflow volumes to estuaries while meeting other water related needs**


FOR DISCUSSION PURPOSES ONLY
Northern Everglades Ecosystem Phase II Lake Okeechobee Watershed Construction Project
Roads
SFWMD Northern Border
Lake Okeechobee Watersheds
Caloosahatchee River
EAA Basins
East Lake O. Basins
Fisheating Creek
Lake Istokpoga
Lower Kissimmee
St. Lucie Estuary
Taylor Creek/Nubbin Slough
Upper Kissimmee
West Lake O. Basins
SFWMD Major Canals
County Boundary
LOPP Hydrologic Boundary
Basins
Regional Simulation Model - Sub Watersheds
N
W
E
S
0 5 10 20 Miles
Lake
Orange
Osceola
Brevard
Hillsborough
Polk
Atlantic Ocean
Indian River
Manatee
Hardee
Okeechobee
St. Lucie
Sarasota
De Soto
Highlands
Martin
Charlotte
Glades
Lake Okeechobee
Hendry
Lee
Palm Beach
Collier
Upper Kissimmee
Lower Kissimmee
Taylor Creek \ Nubbin Slough
St. Lucie River Estuary
Lake Istokpoga
Fisheating Creek
Caloosahatchee River Estuary
East Lake O. Basins
EAA Basins
West Lake O. Basins
This map is a conceptual tool utilized for project development only. This map is not self-executing or binding, and does not otherwise affect the interests of any persons including any vested rights or existing uses of real property and is not a survey.
UPDATED
11 SEP 2007
FLORIDA
FDACS

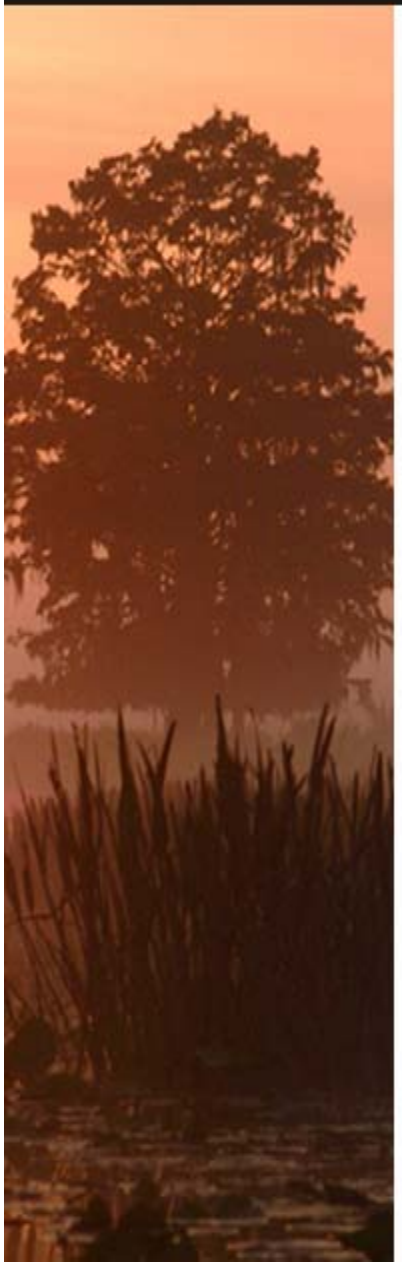
Water Quality- Defining the Magnitude of the Problem



- **Phosphorus TMDL for Lake Okeechobee**
  - **140 metric tons 5-year rolling average**
  - **35 metric tons attributed to atmospheric deposition**
  - **105 metric tons allowable from all surface water inflows**

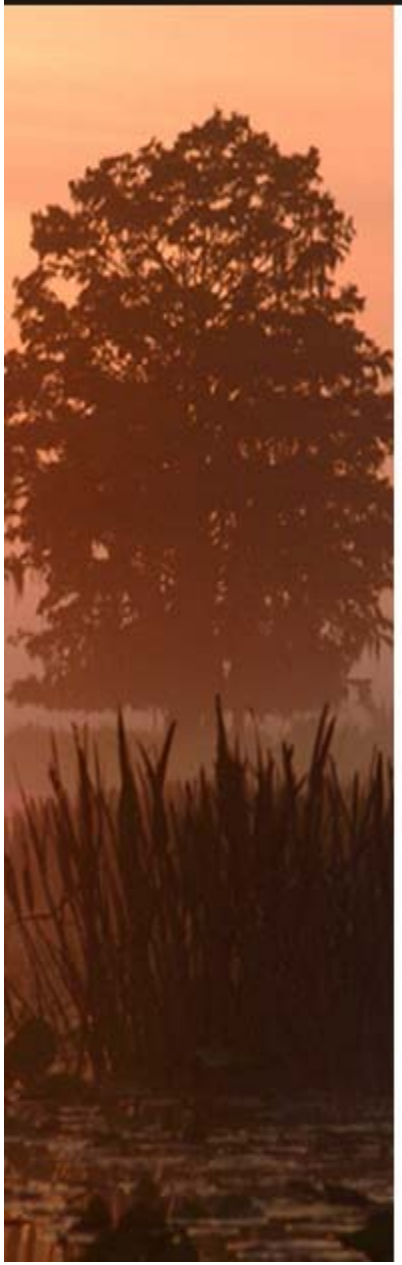
- **Phosphorus Load (Annual average)**
  - **Current analysis 1991–2005 = 514 metric tons**
  - **Lake Okeechobee Protection Plan update based on 1991 – 2000 = 433 metric tons**
  - **Annual Average Phosphorus loading will vary as period of record is updated**

Water Quantity- Defining the Magnitude of the Problem



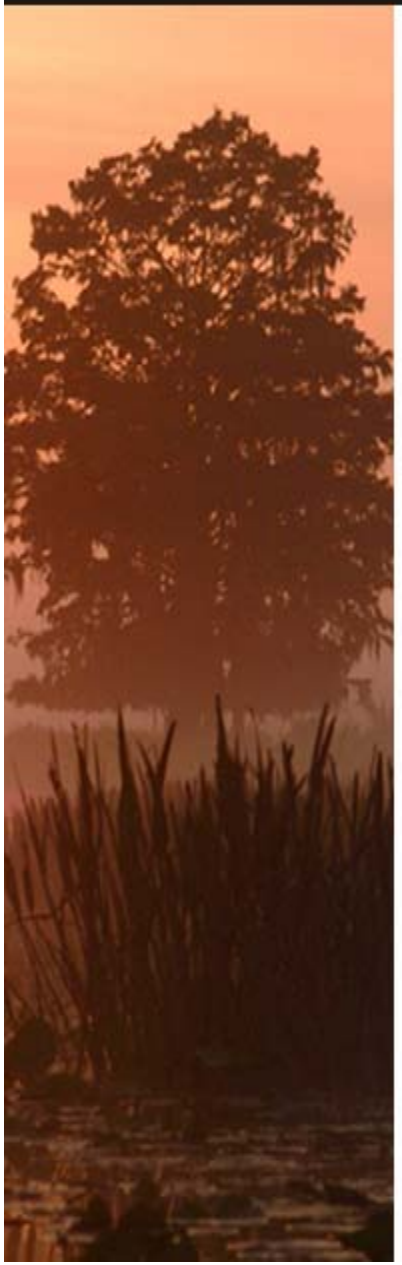
- **Analyses performed to determine amount of water needed to be stored in watershed to**
  - **Improve lake stage management**
  - **Reduce excess damaging freshwater releases to estuaries**
  - **While meeting other water related needs**
- **Analyses indicate there is a breakpoint between 900,000-1.3 million acre-ft**
- **Plan identifies a water quantity storage goal with an upper ceiling of approximately 1.3 million acre-ft**

Alternative Formulation



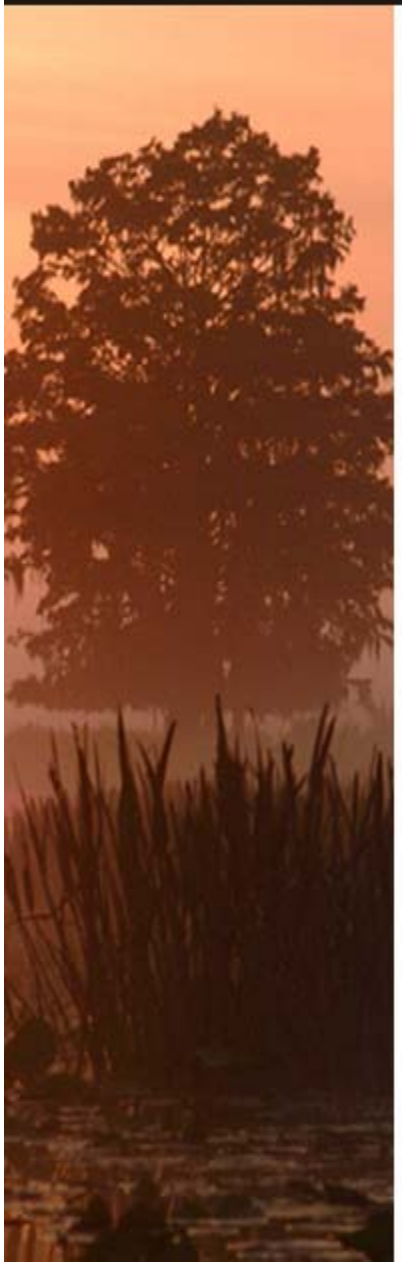
- **Alternatives were formulated using a series of management measures**
- **Evaluated 4 alternatives**
  - **Alternative 1- Common Elements (Existing or Planned Projects and Programs)**
  - **Alternative 2- Emphasis on Water Storage**
  - **Alternative 3- Emphasis on Water Quality**
  - **Alternative 4- Integrates Alternative 2 (Storage) and Alternative 3 (Quality)**

Water Quality and Quantity Analyses



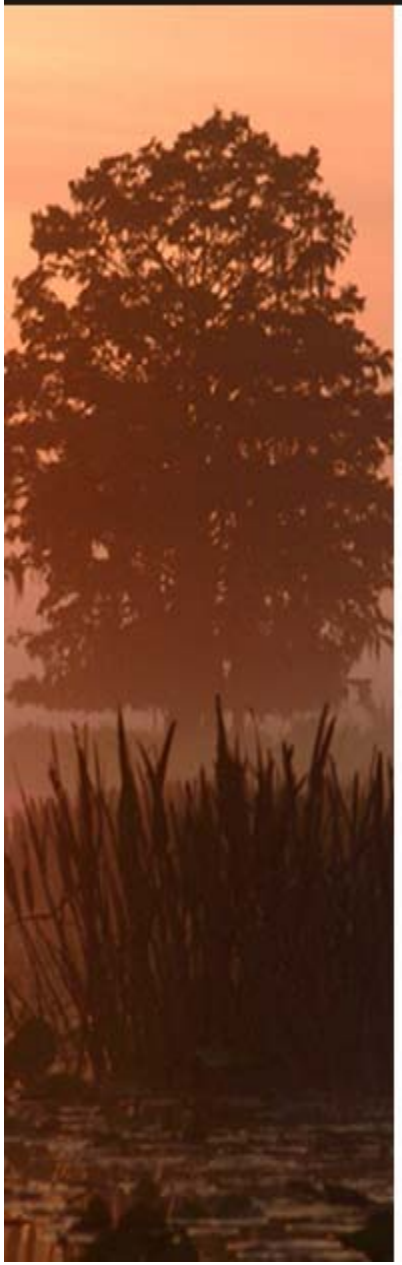
- **Water Quality**
  - **Spreadsheet evaluation of phosphorus reduction**
  - **Builds upon 2007 Lake Okeechobee Protection Plan Update**
- **Water Quantity**
  - **Water Budget analysis using Regional Simulation Model**

Identification of Plan Best Meeting Legislative Goals



- **Modified version of Alternative 4**
- **Builds upon existing and planned programs and projects**
- **Emphasizes cost effective local features**
- **Includes select regional projects to complement and build upon local features**
- **Represents best plan that current technology allows us to implement**
- **Recognizes need to further optimize and refine plan features**

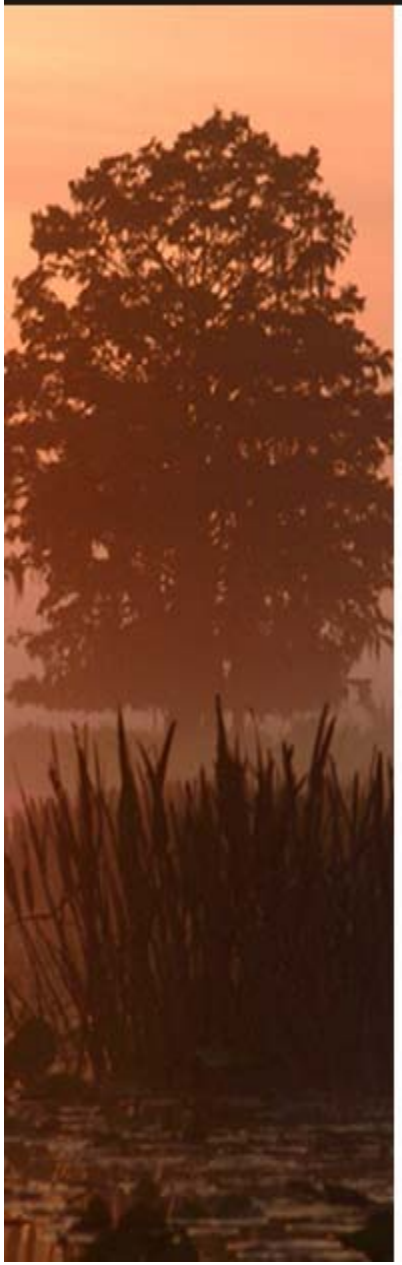
Overview of Plan



- **Water Quality (measures toward meeting 105 metric ton Total Phosphorus TMDL)**
  - **Source Control**
  - **Stormwater Treatment Areas**
  - **Deep Injection Wells**
  - **Innovative Nutrient Control Technologies**

- **Water Quantity (measures toward meeting 900,000-1,300,000 ac-ft storage goal)**
  - **Alternative water storage on public and private lands**
  - **Storage need could be met by reservoirs and ASR**

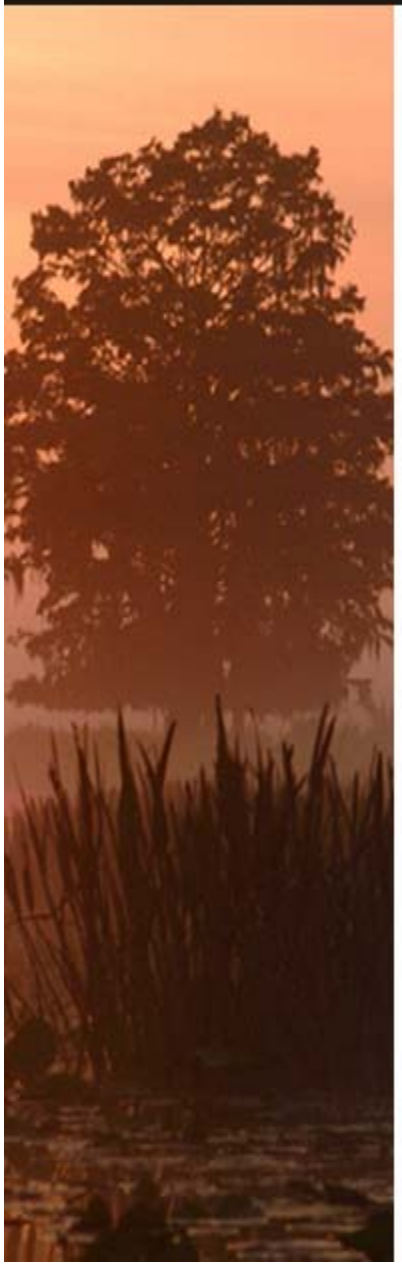
Summary of Plan Features



- **Includes local features, regional features, and other features**

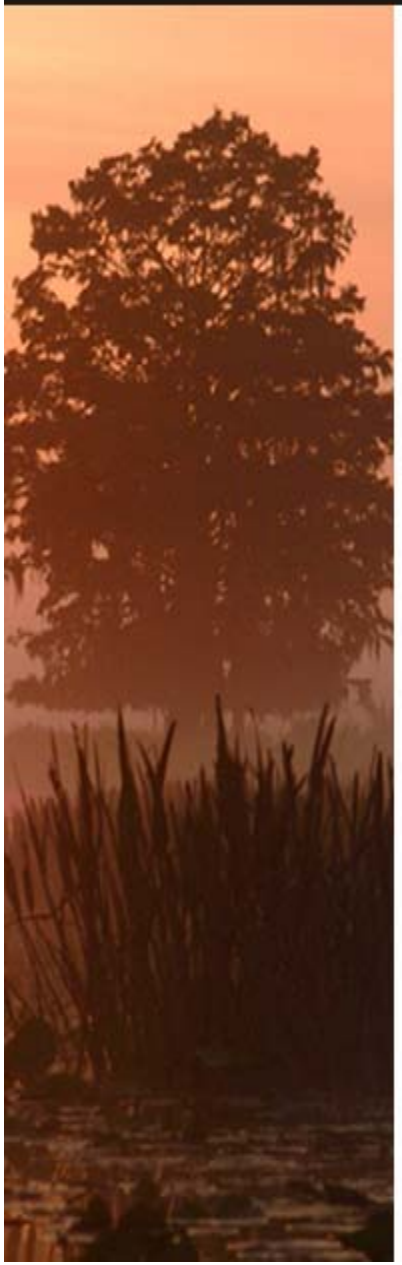
- **Local Features**
  - **Source Control (Agricultural and Urban BMPs and regulatory programs)**
  - **Land Management Activities**
  - **Alternative Water Storage Projects**
  - **Florida Ranchlands and Environmental Services Program**
  - **Local Government Initiatives**

Summary of Plan Features



- **Regional Features**
  - **Reservoir Assisted Stormwater Treatment Areas (RASTAs)**
  - **Reservoirs**
  - **Stormwater Treatment Areas (STAs)**
  - **Aquifer Storage and Recovery (ASR) Wells**
  - **Deep Injection Wells**
- **Other Features**
  - **Managed Aquatic Plant Systems**
  - **Hybrid Wetland Treatment Technology**
  - **Chemical Treatment**
  - **Wetland Restoration**

Summary of Total Estimated Costs



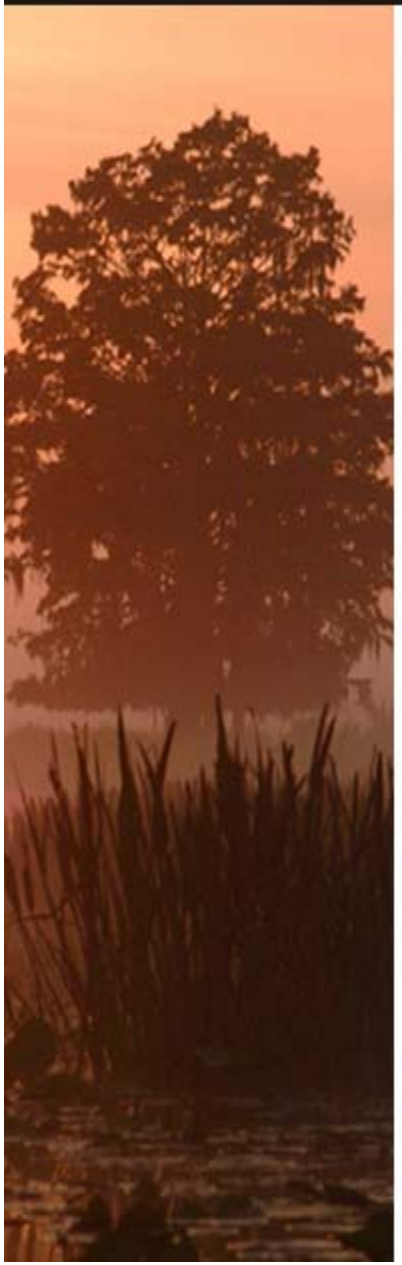
- **Initial Implementation Measures**
  - •Non-CERP Cost= $260-320 Million
  - •CERP Cost= $1-1.4 Billion*
    - CERP costs are eligible for 50 percent cost share with the federal government

- **Mid-Term Implementation Measures**
  - •To be determined based on Technology and Model Refinement Studies and Initial ASR Feasibility
  - •Initial Estimates to be provided in 2010 Lake Okeechobee Protection Plan Update

- **Long-Term Implementation Measures**
  - •To be determined based on Final ASR Feasibility
  - •Estimates to be provided in 2013 Lake Okeechobee Protection Plan Update

*LOFT projects included are eligible for federal cost share, however those funds will be needed in advance of the CERP project from State and SFWMD sources

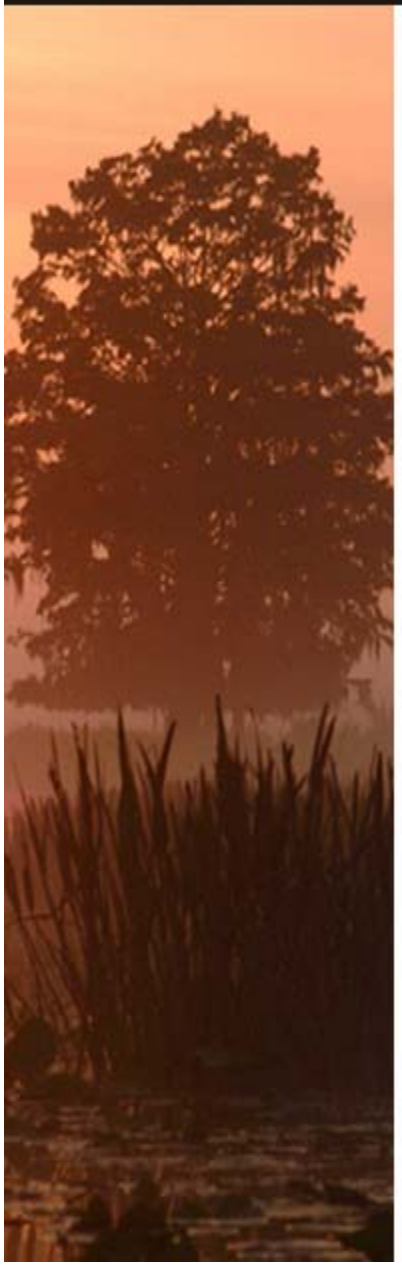
Accessing Technical Plan and Providing Comments



- **Technical Plan is available online at https://my.sfwmd.gov/northerneverglades**
- **Public comments may be submitted via**
  - **Website (webboard)**
  - **U.S. Mail to-**

    Armando Ramirez
    c/o SFWMD, MS 7640
    3301 Gun Club Road
    West Palm Beach, FL 33406

Technical Plan Development Schedule



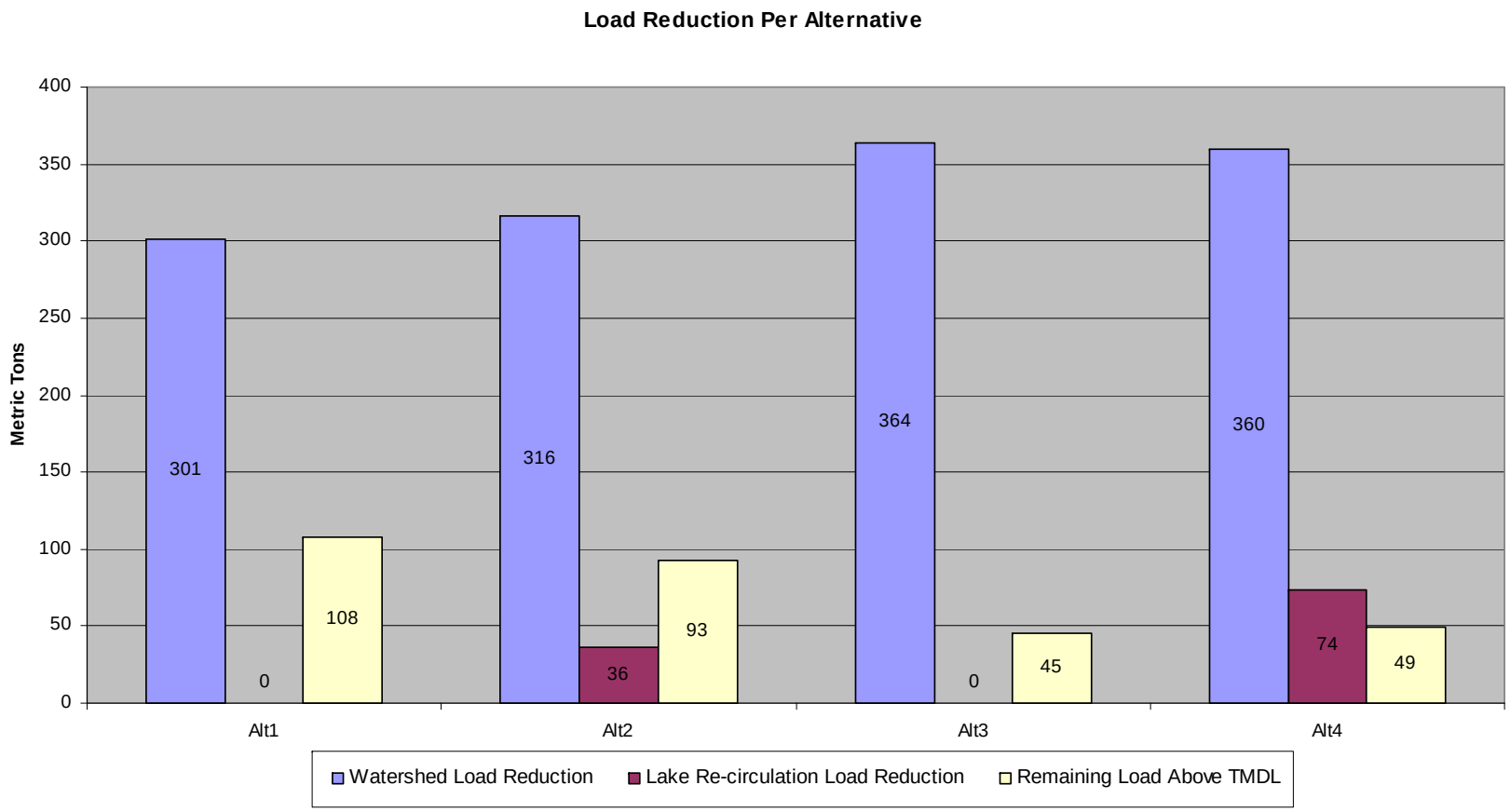
▪End of Public Comment Period	December 13th
▪Review comments and revise draft	Dec-Jan 2007
▪Final Plan to Governing Board	January 2008
▪Submit Plan to Legislature	February 1, 2008

Questions

Phosphorus Results Summary

Lake Okeechobee Load Reduction Per Alternative

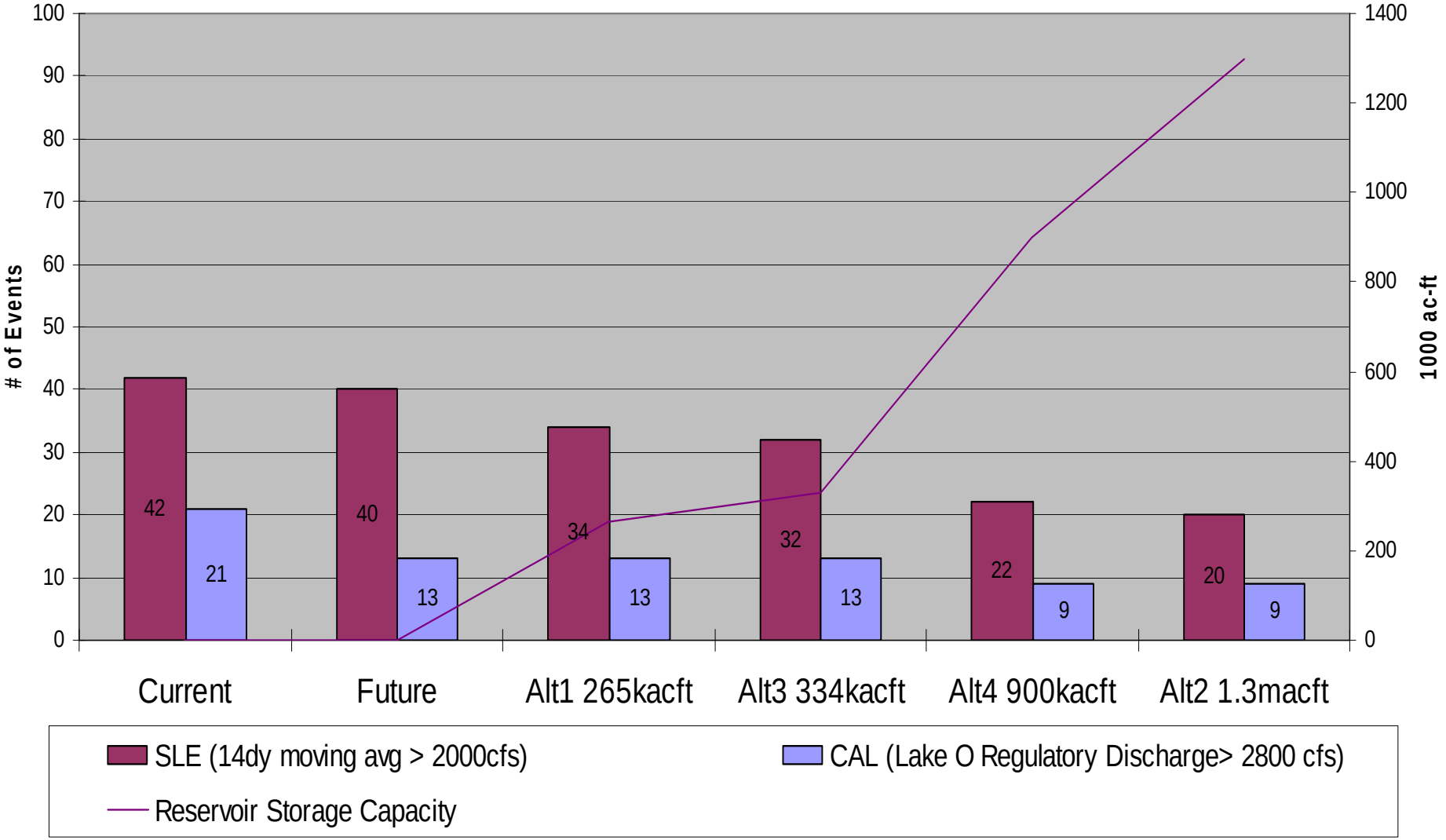
Note- Lake re-circulation load reduction not included in TMDL calculation



Water Quantity Results

St. Lucie and Caloosahatchee Estuary Salinity Envelopes

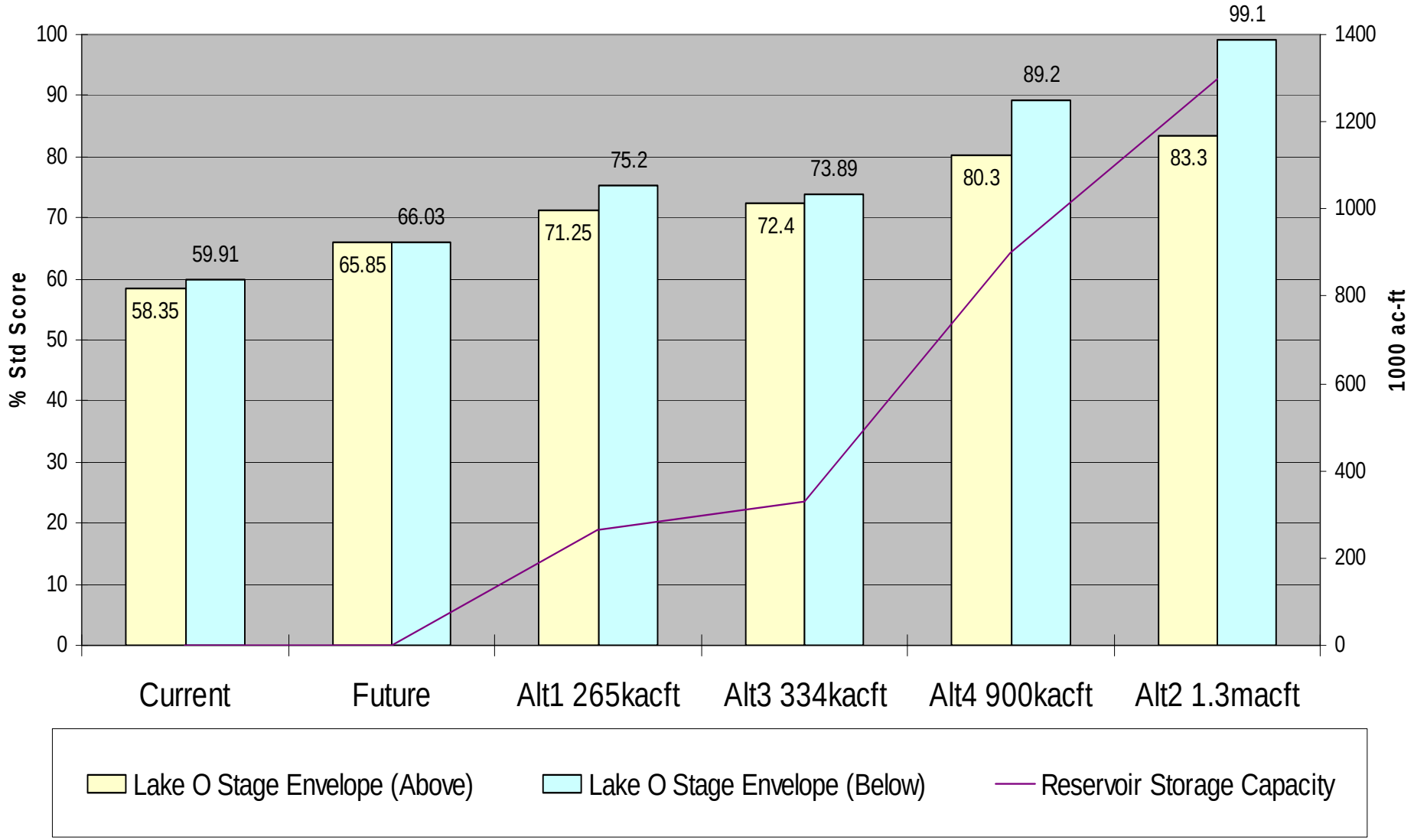
Note-Bars represent number of harmful events therefore fewer events are preferred



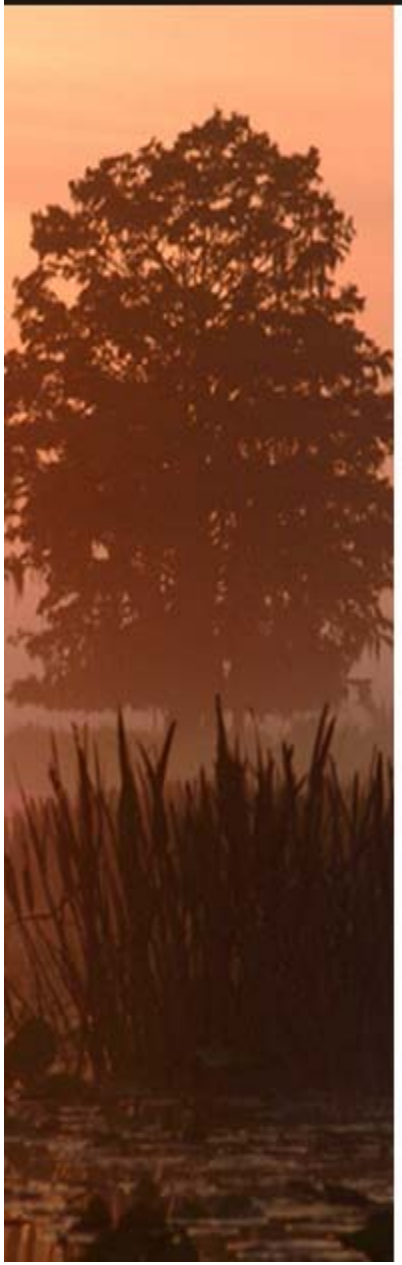
Water Quantity Results

Lake Okeechobee Stage Envelope

Note-Bars represent time spent within the preferred stage envelope, therefore higher scores are preferred

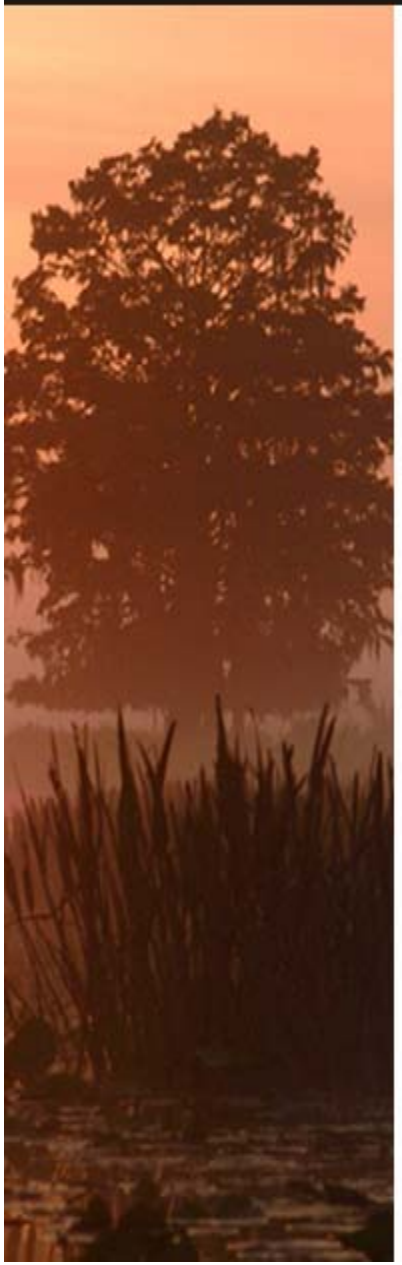


Modifications to Alternative 4



- **Modifications incorporated to-**
  - **address the shortfall in phosphorus load reduction necessary to achieve the total maximum daily load**
  - **define a storage range to provide hydrologic performance comparable to Alternatives 2 and 4**

Modifications to Alternative 4



- **Water Quality**
  - **BMP Refinement and Optimization**
  - **STA Integration and Refinement**
  - **Expanded application of ASR and Deep Well Technology (if necessary)**
  - **Limited Application of Chemical Treatment (if necessary)**
- **Water Quantity**
  - **Refining Alternative 4 storage to a range between 900,000 and 1.3 million acre ft**
  - **Storage may be achieved through combination of alternative storage, surface storage, and ASR**