# AGENDA
# St. Lucie River Watershed Protection Plan
# Working Team Meeting #4

## Tuesday, February 26, 2008
## 1330 - 1630

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

1. Introduction and Opening Remarks
2. Coordinating Agencies Update
3. Performance Measures and Modeling Output examples
4. Regional Simulation Model Update
5. Water Quality Spreadsheet Analysis Update
6. Martin County - Proposed Projects for 5/5/5 Funding for 2008/2009
7. Discussion of DRAFT Management Measure Sheets
8. Public Comment Period*
9. Closing Remarks and Action Items

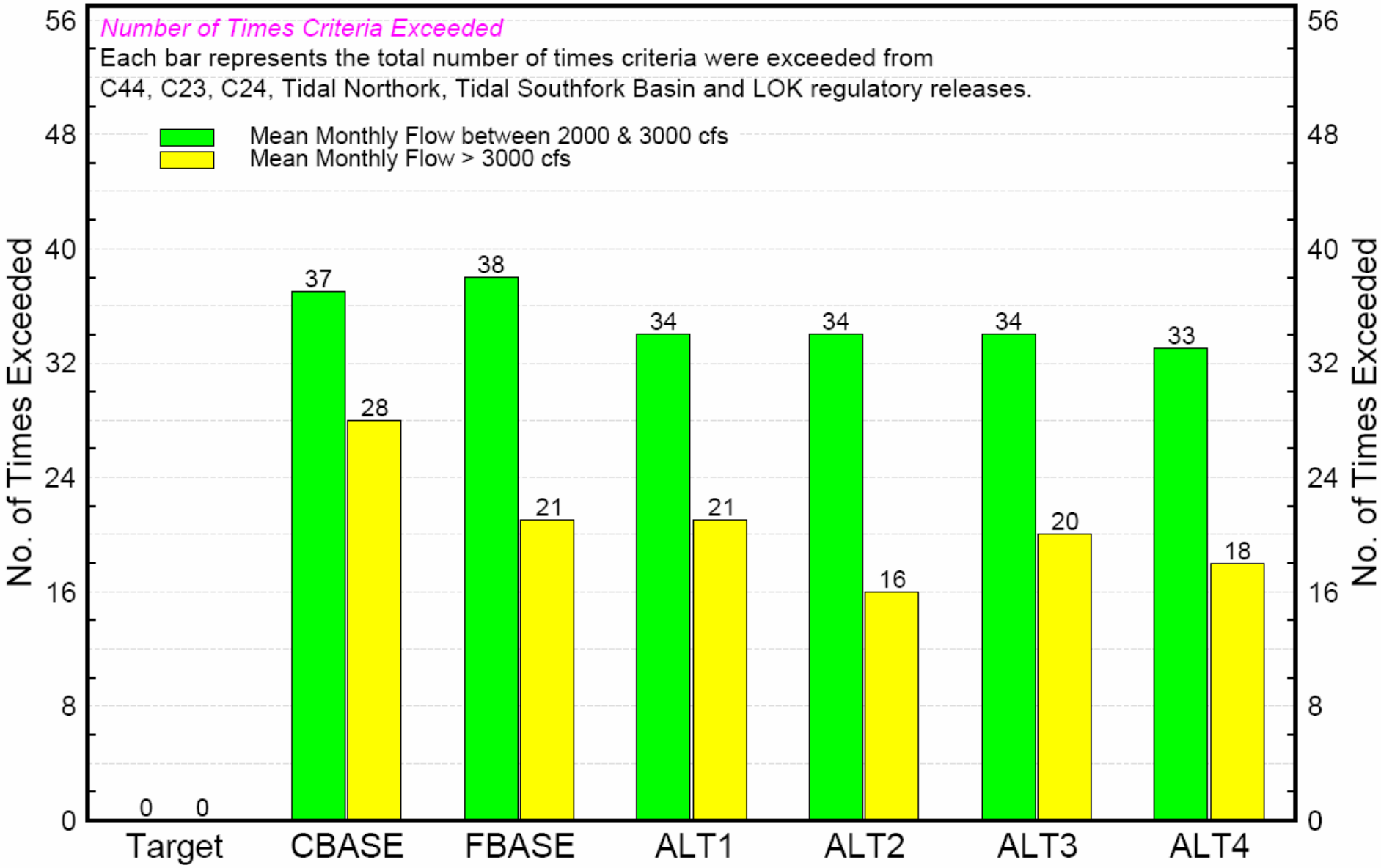
* As time permits, brief Public Comment Periods will also be held after major discussion items in the agenda

# St. Lucie River Watershed Protection Plan
# Performance Measures and Indicators
# Final DRAFT - 2/26/2008

| Problem | Objective | Performance Measure | Comments |
|---|---|---|---|
| Excess discharges resulting from local watershed run-off and Lake Okeechobee regulatory discharge events | Manage discharges to meet desirable salinity ranges for estuary | Number of times St. Lucie High Discharge Criteria Exceeded - Mean Monthly Flows greater than 2,000 cfs (14-day moving average)<br><br>(model results to show number of exceedances from both flows between 2,000 and 3,000 cubic feet per second (cfs) and flows greater than 3,000 cfs) | Model results will represent the total number of times criteria were exceeded from both the local watershed (includes C-44, C-23, C-24, Tidal Northfork, and Tidal Southfork Basins) and Lake Okeechobee regulatory releases |
| Excess Nutrient Loads to river and estuary | Meet Total Maximum Daily Loads (TMDLs) | Maximize load reduction and compare against TMDLs as appropriate | FDEP to determine parameters, basins and targets through their TMDL development efforts |

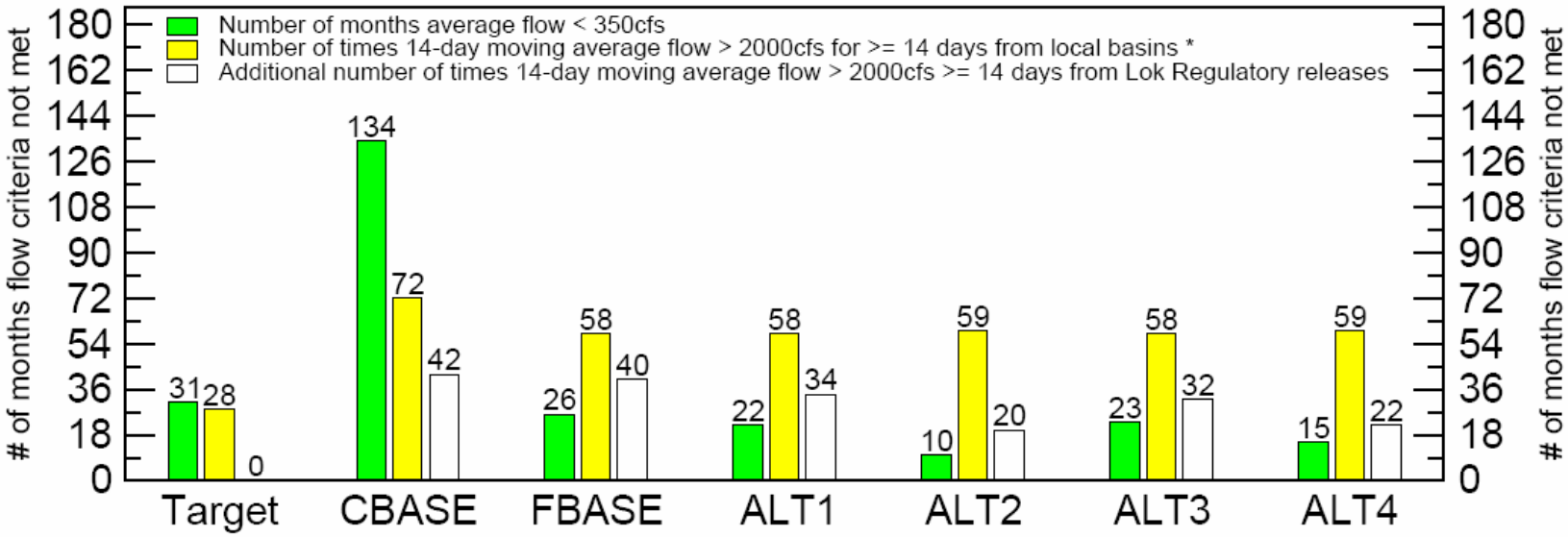
| Problem | Objective | Performance Indicator | Comments |
|---|---|---|---|
| Increased number of undesirable salinty conditions due to little or no flow from watershed to estuary (surface and/or ground water) | Manage watershed discharges to meet desirable salinity ranges for estuary (i.e. supplement groundwater flows as needed with surface water) | Number of months that desired salinity in St. Lucie Estuary (SLE) is not met due to little of no flow from watershed<br><br>This is calculated by determining number of times monthly mean flow of groundwater and surface water combined is less than 350 cfs as per RECOVER's Northern Estuaries Performance Measures - Salinity Envelopes (revised April 5, 2007)<br><br>(NOTE: the low flow target of 350 cfs is based upon the best available data and may be adjusted in the future as needed to ensure the desired salinity conditions in the SLE are achieved) | Surface water from the watershed may be needed to supplement groundwater flows if salinty targets are not met with the goal of providing the needed supplemental surface water flow to the SLE from either the north or south fork depending on the quality of the water |

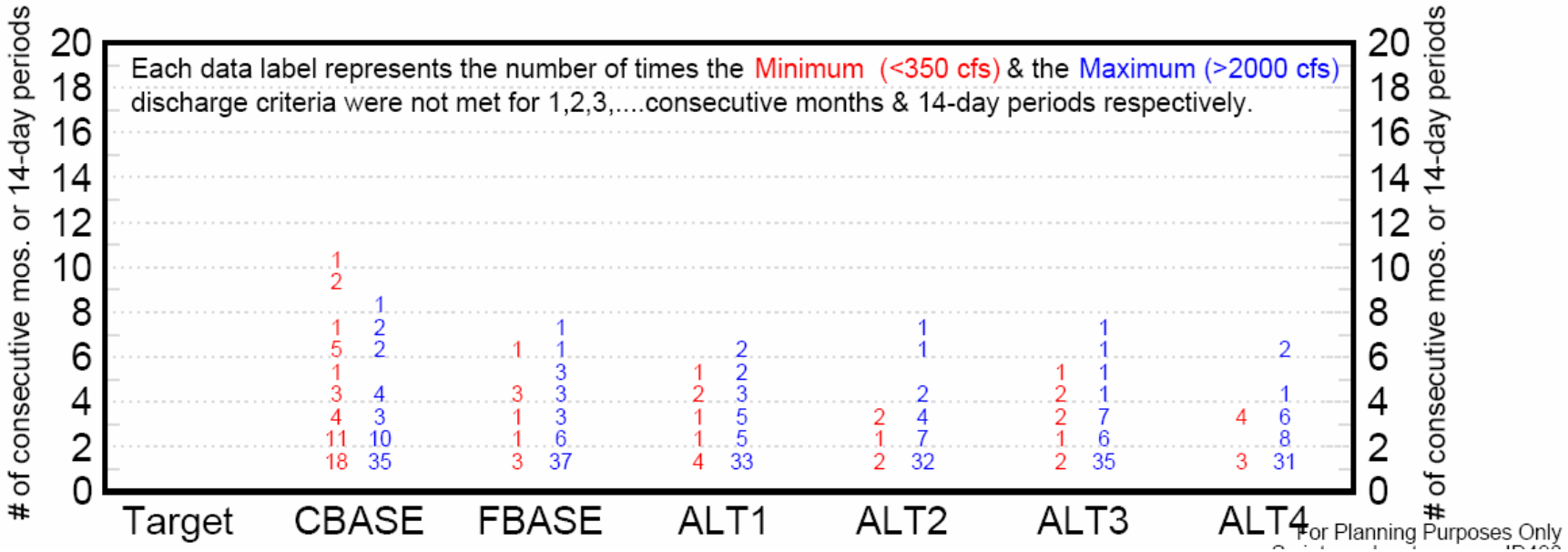
# Number of Times St. Lucie High Discharge Criteria Exceeded
## (mean monthly flows > 2000 cfs from 1970 - 2005)




*Source: Lake Okeechobee Watershed Construction Project Phase II Technical Plan - February 2008*

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




*Source: Lake Okeechobee Watershed Construction Project Phase II Technical Plan - February 2008*

**St. Lucie River Watershed Protection Plan**
**Regional Simulation Model (RSM)**
**Summary of Assumptions for Initial Model Runs**
**DRAFT – 02/26/2008**

The Regional Simulation Model will be used to evaluate project alternatives in terms of performance measures. Base conditions will be established to provide a starting point by which relative comparisons will be made between the project alternatives. The following is a summary of the various model runs that will be used to determine system-wide impacts likely to be associated with implementation of each alternative:

- **Current Base** – This scenario represents conditions as they exist in the Northern Everglades Watershed in 2005. This condition assumes that no projects contained in the Comprehensive Everglades Restoration Plan (CERP) have been implemented. Measured data for the 36-year Period of Record (1970-2005) will be used for this simulation. Regulatory (flood control) releases from Lake Okeechobee to the estuaries and to the Water Conservation Areas will be simulated based on the existing Water Supply and Environmental (WSE) Regulation Schedule.

- **Future Base** – This scenario is intended to represent conditions likely to exist in the Northern Everglades Watershed after the implementation of all Acceler8 (A8) and Lower and Upper Kissimmee Sub-watershed water resources projects, including :

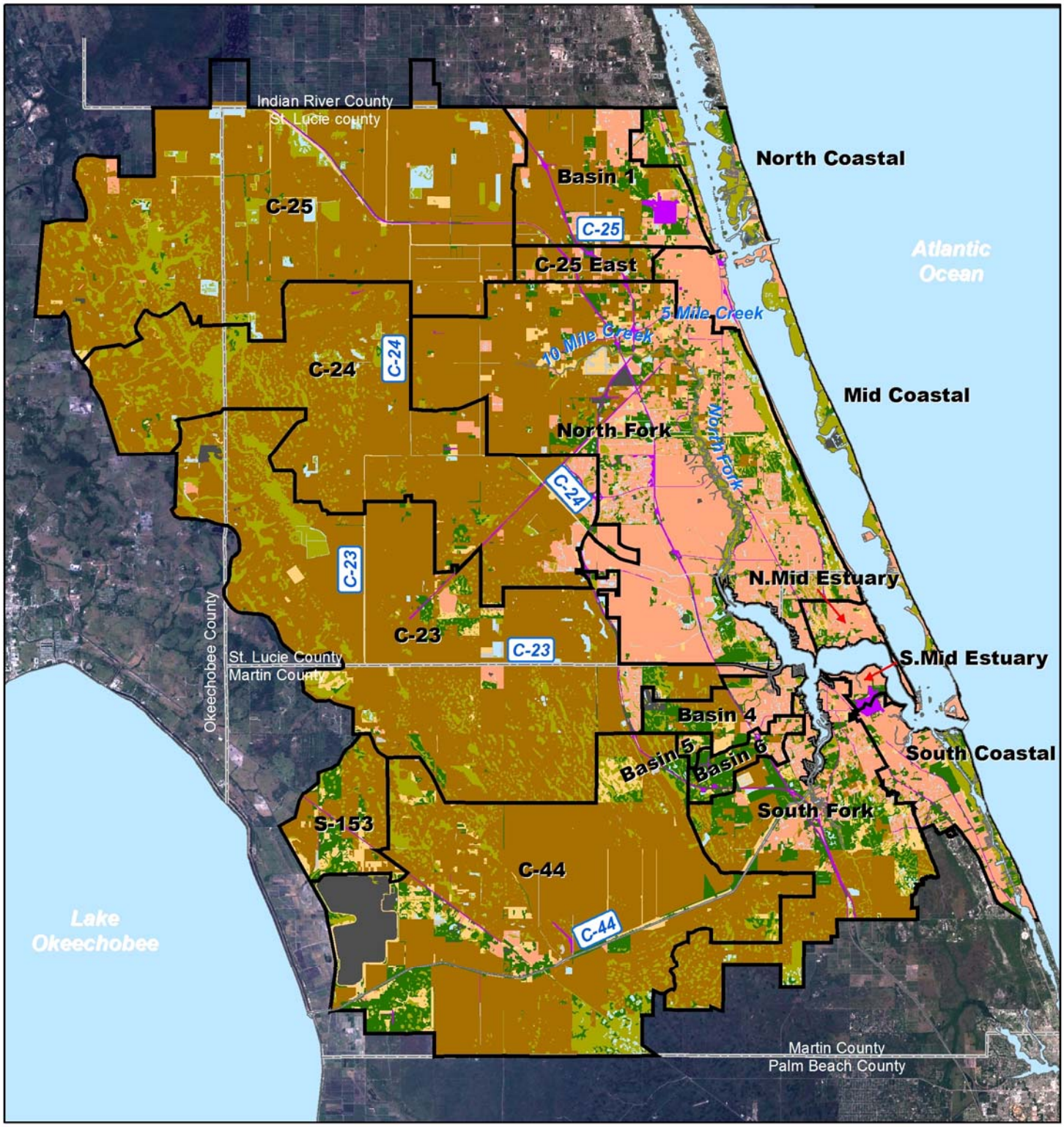
  - **A8 projects**: C-43 Reservoir, C-44 Reservoir and Stormwater Treatment Area, Broward Water Preserve Areas, Site 1 Reservoir, Modified Water Deliveries to Everglades National Park, limited version of Everglades rainfall deliveries, and Everglades Agricultural Area Phase A-1 Reservoir

  - **Kissimmee Projects**: Kissimmee River Restoration Project and the Kissimmee River Headwaters Revitalization Project including the headwaters revitalization stage regulation schedule.

- **Future Base with Lake Okeechobee Construction Projects -** This scenario, which builds upon the Future Base run described above, is intended to represent the conditions likely to exist with the implementation of the projects described in the Lake Okeechobee Watershed Construction Project Phase II Technical Plan. This alternative will also include the Ten Mile Creek Reservoir.

- **Alternative Plans** –Alternatives will be developed by combining management measures to achieve both water quantity and quality goals

The Lake Okeechobee Aquifer Storage & Recovery (ASR) project is not included in the future runs, however, it is anticipated that ASR will play an important role in meeting the storage goal identified in the ultimate plan. The results from Lake Okeechobee ASR pilots and the ASR Regional Study will be used to help determine the mix of surface and sub-surface storage needed to better manage Lake Okeechobee water levels.




## Indian River Lagoon and St. Lucie Watershed 2004/2005 Landcover

**Land Cover**

- Urban
- Agricultural
- Rangeland
- Upland Forested
- Water
- Wetlands
- Barren
- Communication/Utilities
- Transportation
- C-44 Primary Basins

N W E S

Miles

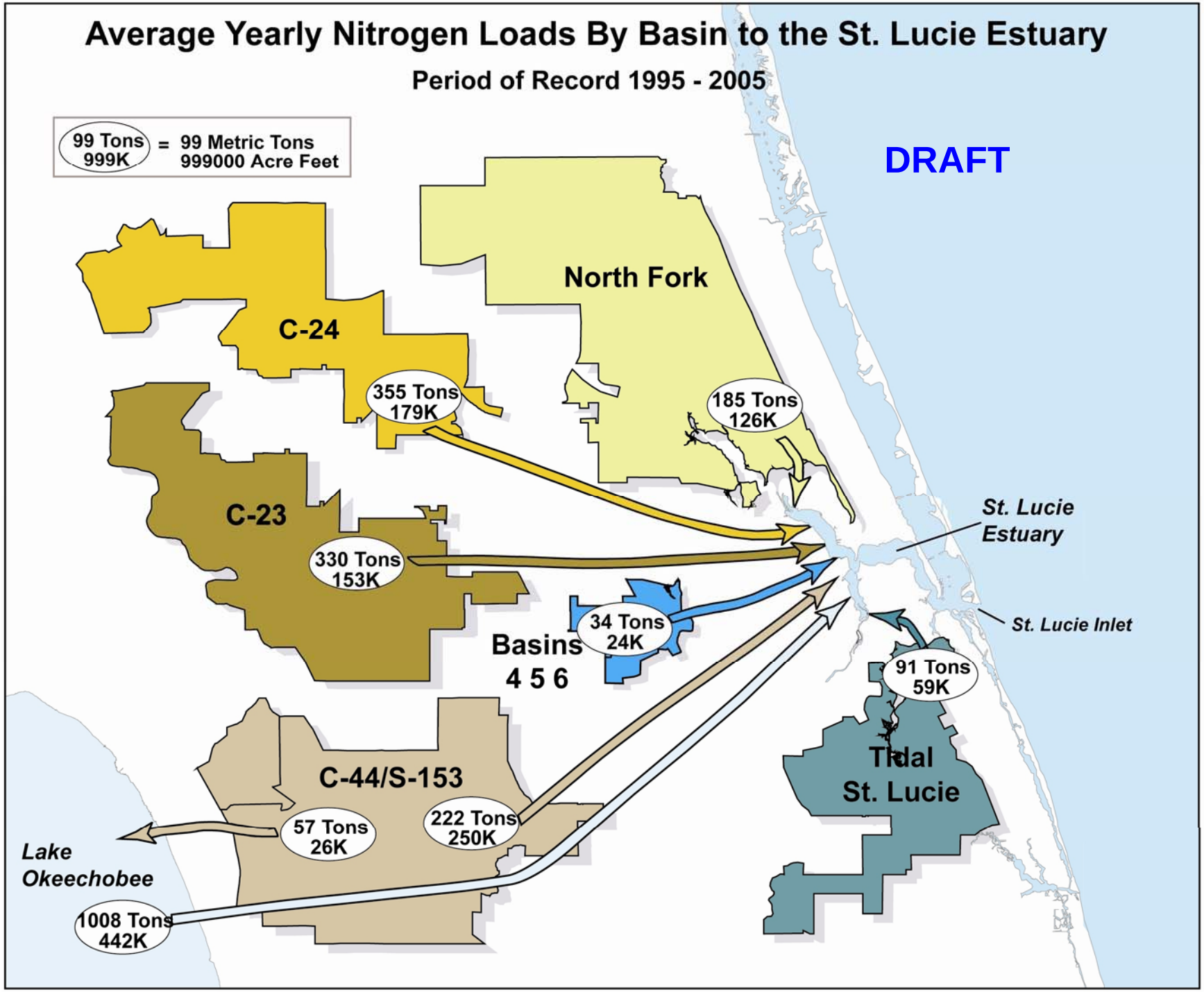
0 1 2 3 4 5 6 7 8 9 10

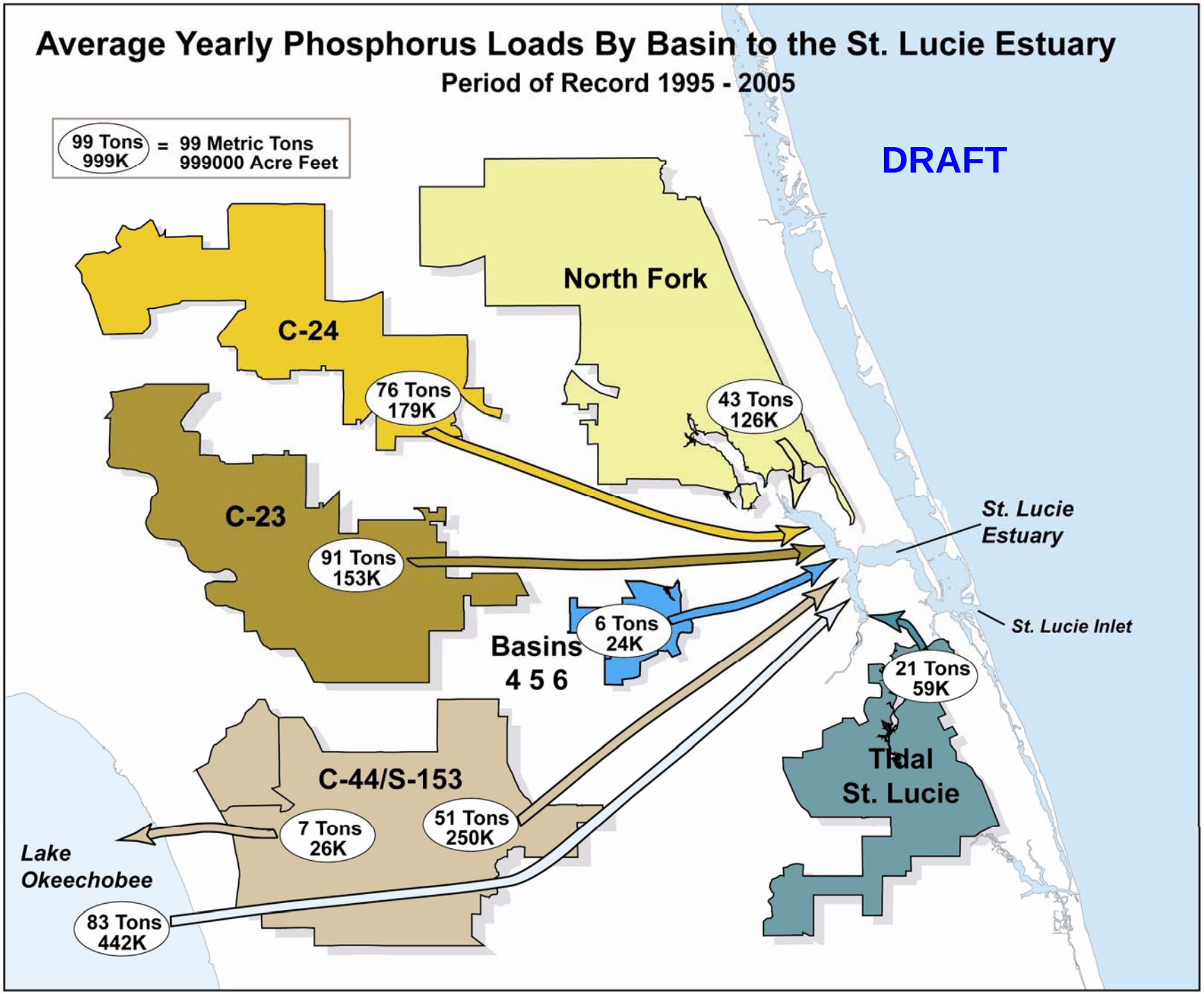
**St. Lucie River Watershed Protection Plan - Landcover Acreage For Each Primary Basin**
**DRAFT - 02/26/2008**

| Landuse Description | FLUCCS Codes | BASIN 1 | BASIN 4 | BASIN 5 | BASIN 6 | C-23 | C-24 | C-25 | C-25 EAST | C-44 | MID COASTAL | NORTH COASTAL | NORTH FORK | S-153 | SOUTH COASTAL | SOUTH FORK | WS Total Acres/LC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Urban | 1000 | 4859.35 | 3000.03 | 157.56 | 904.91 | 3246.21 | 4260.51 | 918.67 | 945.90 | 1133.22 | 8185.29 | 1660.31 | 51081.06 | 6.45 | 9720.93 | 8457.61 | 98538.03 |
| Ag Improved Pasture | 2110 | 1896.03 | 934.28 | 14.08 | 416.18 | 34222.74 | 34042.35 | 19449.13 | 1526.50 | 19928.79 | 31.06 | | 6109.47 | 3586.42 | 0.07 | 9677.24 | 131834.35 |
| Ag Unimproved Pasture | 2120 | 302.24 | 86.41 | | | 5155.27 | 6064.27 | 3227.17 | 346.90 | 1781.32 | | | 558.35 | 419.25 | | 1094.13 | 19035.32 |
| Ag Woodland Pasture | 2130 | 778.05 | 371.91 | 2.72 | 0.84 | 8710.10 | 6904.42 | 3412.99 | 628.84 | 4839.51 | 38.56 | | 1118.47 | 1623.80 | | 1782.02 | 30212.23 |
| Ag Row Crops | 2140 | 879.45 | 95.08 | | 61.02 | 1696.18 | 1550.25 | 346.00 | 390.83 | 5286.59 | | | 1166.19 | 306.34 | | 2459.91 | 14237.84 |
| Ag Field Crops | 2150 | | | | | 1574.61 | 834.67 | 1187.80 | | 353.12 | | | | 37.81 | | | 3988.01 |
| Ag Sugarcane | 2156 | | | | | | | | | 383.34 | | | | 116.32 | | 321.71 | 821.37 |
| Ag Citrus | 2210 | 10719.43 | | | 30.16 | 32528.30 | 17487.75 | 58935.30 | 995.76 | 41726.96 | 34.63 | | 20693.80 | 1187.84 | | 3025.43 | 187365.36 |
| Ag Fruit Orchards | 2220 | | | | | | | | | | | 280.64 | | | | | 280.64 |
| Ag Feeding Operations | 2230 | | 4.99 | | | 17.15 | | | | | | | 26.16 | | | | 48.30 |
| Ag Cattle Feeding Ops | 2310 | | | | | 100.89 | | | | | | | | | | | 100.89 |
| Ag Poultry Feeding Ops | 2320 | | | | | | 44.30 | | | 62.51 | | | | | | | 106.81 |
| Ag Tree Nurseries | 2410 | | 55.58 | | 44.64 | 153.77 | 55.47 | 157.85 | | 85.26 | | | 68.32 | | | 0.07 | 620.95 |
| Ag Sod Farms | 2420 | | | | | | | | | 294.09 | | | | | | | 294.09 |
| Ag Ornamentals | 2430 | 92.72 | 44.40 | 65.29 | 101.32 | | 25.09 | 21.33 | 38.90 | 230.14 | | | 237.88 | 37.46 | 16.23 | 504.40 | 1415.15 |
| Ag Specialty Farms | 2500 | | | | | | | | 14.80 | 14.12 | | | 23.91 | 14.62 | | 79.92 | 147.37 |
| Ag Horse Farms | 2510 | | 12.98 | 9.25 | 31.50 | 53.96 | 14.06 | | | 591.60 | | | | | | 71.06 | 784.41 |
| Ag Dairies | 2520 | | | | | 404.49 | | 603.68 | | | | | | | | | 1008.17 |
| Ag Aquaculture | 2540 | | 60.10 | | | 70.40 | 23.31 | | | | | 19.21 | 9.52 | | | 40.83 | 223.37 |
| Non Forested Uplands | 3000 | 1225.10 | 676.88 | 152.10 | 265.87 | 2757.02 | 851.72 | 1930.90 | 84.20 | 6640.12 | 743.85 | 436.30 | 6814.99 | 1755.62 | 552.64 | 2810.71 | 27698.03 |
| Upland Forest | 4000 | 2640.11 | 2285.22 | 415.99 | 2348.91 | 2974.77 | 1464.15 | 1028.28 | 436.42 | 9863.47 | 664.63 | 1992.23 | 13161.12 | 2415.85 | 2759.53 | 8512.45 | 52963.15 |
| Water | 5000 | 708.09 | 295.77 | 5.33 | 81.40 | 1784.40 | 1218.36 | 3407.89 | 169.78 | 1856.89 | 620.10 | 301.14 | 4344.10 | 33.81 | 646.42 | 1768.59 | 17242.08 |
| Wetlands | 6000 | 695.68 | 774.97 | 129.28 | 350.67 | 16292.66 | 12248.22 | 12742.46 | 191.25 | 13909.18 | 3240.38 | 3033.19 | 9531.92 | 1322.38 | 1962.88 | 6662.20 | 83087.31 |
| Barren | 7000 | 83.65 | | 7.52 | 10.63 | 356.93 | 31.23 | 63.67 | 21.94 | 202.47 | 35.66 | 69.14 | 609.31 | 67.73 | 35.76 | 25.59 | 1621.21 |
| Communications/Utilities | 8000 | 29.67 | 416.21 | | 3.66 | 519.51 | 64.55 | 79.30 | 8.56 | 6993.28 | 304.15 | 14.11 | 702.15 | | 41.14 | 82.92 | 9259.22 |
| Transportation | 8100 | 1172.31 | 86.43 | | 211.18 | 456.49 | 521.14 | 491.52 | 278.29 | 445.87 | 230.97 | 110.33 | 2622.28 | 165.34 | 979.32 | 883.64 | 8655.11 |
| | **WS Tota** | **26081.87** | **9201.24** | **959.13** | **4862.89** | **113075.85** | **87705.81** | **108003.94** | **6078.87** | **116621.86** | **14129.28** | **7916.61** | **118879.00** | **13097.07** | **16714.92** | **48260.44** | **691588.77** |

*There were no 1900 or 4400 Lancover Classes in the IRL/SLE Watershed
*Acreage does not include the area of the St. Lucie Estuary or the Indian River Lagoon

WS = Watershed
LC = Landcover
FLUCCS = Florida Landuse/Landcover Classification System
Basin 4 = Bessey Creek
Basin 6 = Danforth Creek


Average Yearly Nitrogen Loads By Basin to the St. Lucie Estuary
Period of Record 1995 - 2005
99 Tons 999K = 99 Metric Tons 999000 Acre Feet
DRAFT
North Fork
C-24
355 Tons 179K
185 Tons 126K
C-23
330 Tons 153K
St. Lucie Estuary
St. Lucie Inlet
34 Tons 24K
Basins 4 5 6
91 Tons 59K
Tidal St. Lucie
C-44/S-153
57 Tons 26K
222 Tons 250K
Lake Okeechobee
1008 Tons 442K


Average Yearly Phosphorus Loads By Basin to the St. Lucie Estuary
Period of Record 1995 - 2005
99 Tons 999K = 99 Metric Tons 999000 Acre Feet
DRAFT
North Fork
C-24
76 Tons 179K
43 Tons 126K
C-23
91 Tons 153K
St. Lucie Estuary
St. Lucie Inlet
6 Tons 24K
Basins 4 5 6
21 Tons 59K
Tidal St. Lucie
C-44/S-153
7 Tons 26K
51 Tons 250K
Lake Okeechobee
83 Tons 442K

# St. Lucie River Watershed Protection Plan
# DRAFT Management Measures
# 2/26/2008

| MM# | Project Feature/Activity | Level |
|---|---|---|
| LO 1 | Agricultural BMPs - Owner Implemented | 1 |
| LO 2 | Agricultural BMPs - Funded Cost Share | 1 |
| LO 3 | Urban Turf Fertilizer Rule (LOER) | 1 |
| LO 4 | Land Application of Residuals | 1 |
| LO 5 | Florida Yards and Neighborhoods | 1 |
| LO 7 | ERP Regulatory Program | 1 |
| LO 8 | NPDES Stormwater Program | 1 |
| LO 9 | Coastal and Estuarine Land Conservation Program | 1 |
| LO 12 | Alternative Water Storage (AWS) - Lake Okeechobee and Estuary Recovery | - |
| LO 12f | AWS - Indiantown Citrus Growers Association | 1 |
| LO 12j | AWS - Dupuis | 4 |
| LO 12m | AWS - Waste Management St. Lucie Site | 4 |
| LO 12q | AWS - Caulkins | 4 |
| LO 14 | CERP - IRL South: C-44 Reservoir/STA | B |
| LO 15 | St. Lucie River Watershed Works of the District Rule Regulatory Phosphorus Source Control Program | 2 |
| LO 21 | LO and Estuary Watershed Basin Rule (LOER) | 3 |
| LO 38 | C-44 Littoral | 4 |
| LO 49 | Agricultural BMPs - Cost Share Future Funding | 1 |
| LO 50 | Agricultural BMPs - Additional Agricultural BMPs | 1 |
| LO 62 | Florida Power and Light Martin Cooling Pond | |
| LO 63 | Wastewater and Stormwater Master Plans | 4 |
| LO 64 | Unified Statewide Stormwater Rule | 4 |
| LO 65 | L-65 Culvert to L-8 Tieback | 4 |
| LO 66 | L-8 Reservoir Phase I | B |
| LO 68 | Comprehensive Planning-Land Development Regulations | 3 |
| LO 87 | Florida Ranchlands Environmental Services Projects (FRESP) | - |
| LO 87a_1 | Alderman-Deloney Ranch (C-25 basin) | 1 |
| LO 87c | Florida Ranchlands Environmental Services Project- full implementation | - |
| LO 91 | Farm and Ranchland Protection Program Partnership | 4 |
| LO 96 | Deep Well Injection- C-44 St. Lucie Canal | 4 |
| LO 101 | ECP Diversions | B |
| LO 102 | EAA Reservoir | B |
| SLE 01 | Harmony Heights Subdivision (Phase II – V) | 1 |
| SLE 02 | White City Canal D | 1 |
| SLE 03 | White City Drainage Improvements (Citrus/Saeger) | 1 |
| SLE 04 | White City Drainage Improvements (canals B, C, E, F, G) | 2 |
| SLE 05 | Paradise Park Stormwater Improvements (Phase III – V construction) | 1 |
| SLE 06 | Indian River Estates/Savannas Ecosystem Management Project | 1 |
| SLE 07 | Platt's Creek Wetland Restoration | 2 |
| SLE 08 | Indian River Drive Stormwater Outfall Retrofits | 1 |
| SLE 09 | Natural Lands in CERP IRL-South Project | - |
| SLE 09a | CERP - IRL South: PalMar Complex - Natural Storage and Water Quality Area | 2 |

| MM# | Project Feature/Activity | Level |
|---|---|---|
| SLE 09b | CERP - IRL South: Allapattah Complex - Natural Storage and Water Quality Area | 2 |
| SLE 09c | CERP - IRL South: Cypress Creek/Trail Ridge Complex - Natural Storage and Water Quality Area | 2 |
| SLE 10 | St. Lucie Watershed Natural Area Registry Program | 1 |
| SLE 11 | Creation of suitable oyster substrate in the St. Lucie Estuary | 2 |
| SLE 12 | Increased retention/detention areas within the C-23 and C-24 Basins | 5 |
| SLE 13 | On-site Sewage Treatment and Disposal System (OSTDS) inspection and pump-out program | 4 |
| SLE 16 | Improved management of sludge disposal in St. Lucie County through the use of an innovative technology (Plasma-Arc) | 1 |
| SLE 18 | Additional Reservoir Storage and Treatment Areas | - |
| SLE 18a | Reservoir and/or Stormwater Treatment Area along the south side of the C-44 Canal | 5 |
| SLE 19 | Conversion of existing canals into “linear wetland treatment areas” | 3 |
| SLE 22 | North River Shores Vacuum Sewer System | |
| SLE 23 | CERP - IRL South: PalMar Complex - Natural Storage and Water Quality Area | 1 |
| SLE 24 | CERP - IRL South: C-23/24 Reservoir/STA | 1 |
| SLE 26 | CERP - IRL South: Northfork Natural Floodplain Restoration | 1 |
| SLE 27 | CERP - IRL South: Muck Remediation and Artificial Habitat | 1 |
| SLE 28 | Tropical Farms Roebuck Creek Stormwater Quality Retrofit | |
| SLE 29 | Old Palm City Phase III Stormwater Quality Retrofit | |
| SLE 30 | Manatee Pocket Dredging Project | |
| SLE 31 | Stormwater Baffle Box Retrofit - City of Stuart | |
| SLE 32 | Old Palm City/Danforth Creek Stormwater Quality Retrofit | |
| SLE 33 | North St. Lucie River Water Control District Stormwater Retrofit; Structures 81-1-2 and 85-1-2 | |
| SLE 34 | Indiantown Citrus Growers Water Conservation Project, Phase II | |
| SLE 35 | All American Boulevard Ditch Retrofit | |
| SLE 37 | Living Shoreline Initiative | |
| SLE 38 | Urban BMP Program | 1 |
| SLE 39 | Aquifer Storage and Recovery (ASR) | 4 |
| SLE 39a | ASR at C-44 Reservoir (IRL-S) | |
| SLE 39b | ASR at C-23/24 Reservoir (IRL-S) | |

**Levels:**

B - Base condition; Project included in base model runs

Level 1- Already constructed/implemented or construction/implementation imminent

Level 2- Construction/implementation likely; Detailed design/activity development ongoing; Location well defined

Level 3- Implementation certainty unknown; Conceptual level of design/activity development complete; Location defined

Level 4- Implementation certainty unknown- Conceptual idea; May have rough order of magnitude cost and/or general basin location

Level 5- Implementation certainty unknown-Conceptual idea with limited information