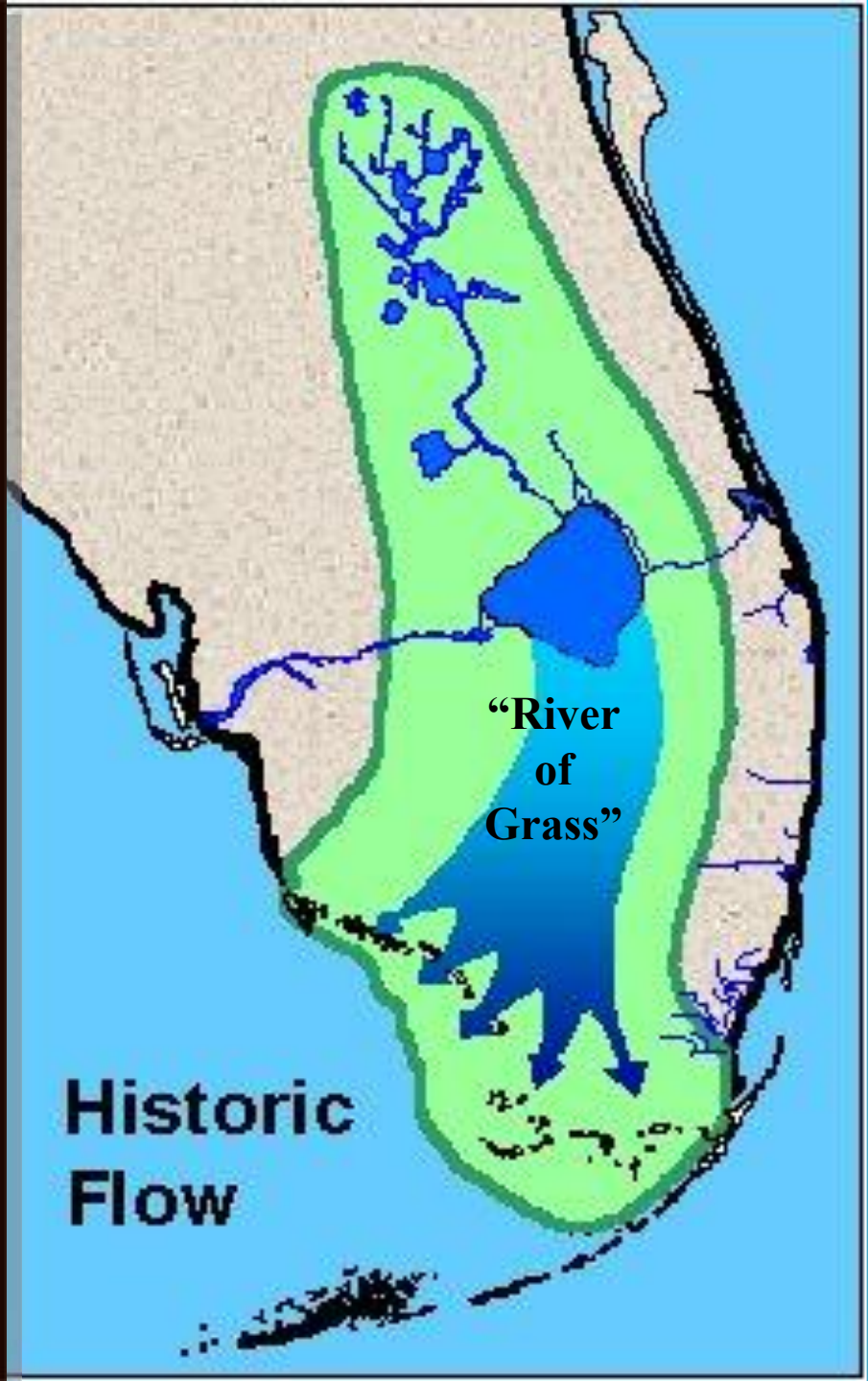


# The Everglades and the St. Lucie River: Flows & Current Issues

Rivers Coalition  
April 25, 2013





Upper Chain of Lakes (8) flow south  
into Lake Kissimmee

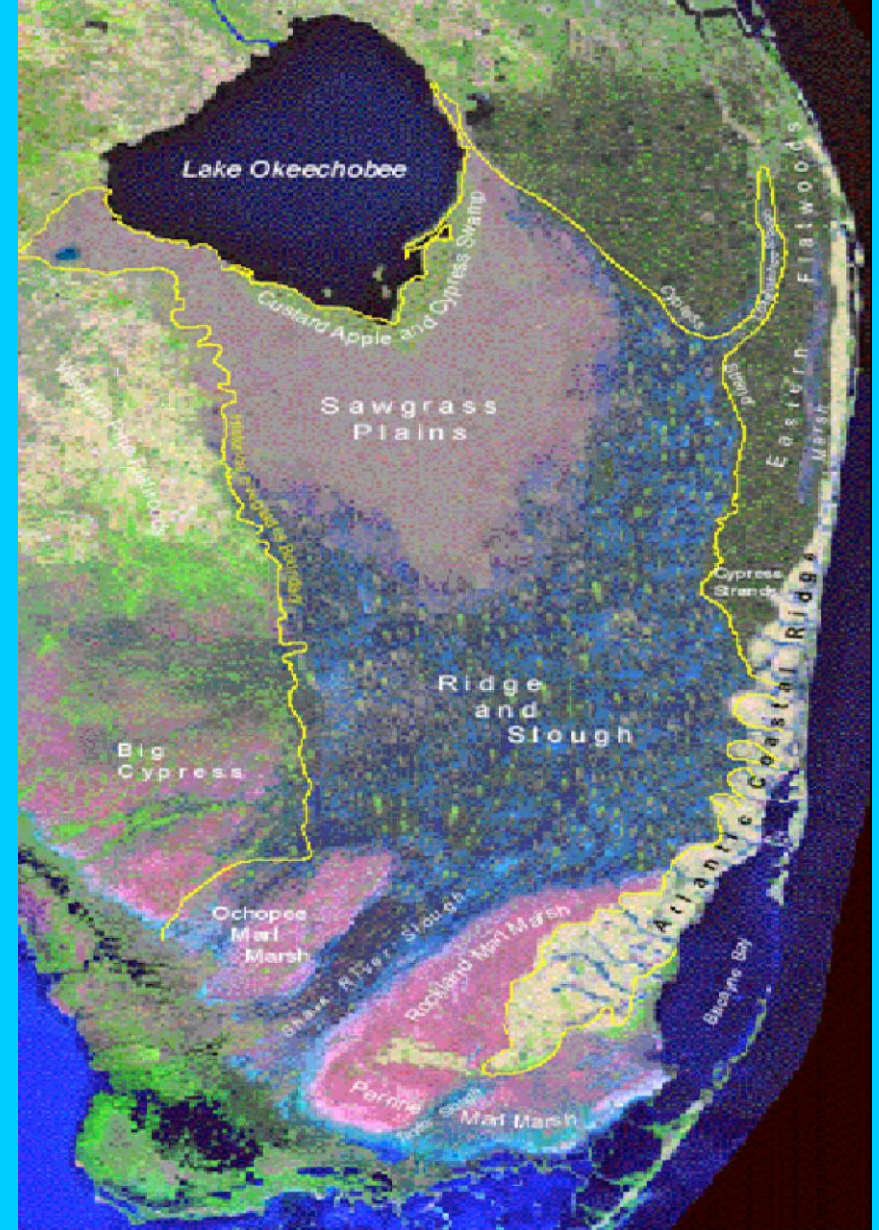
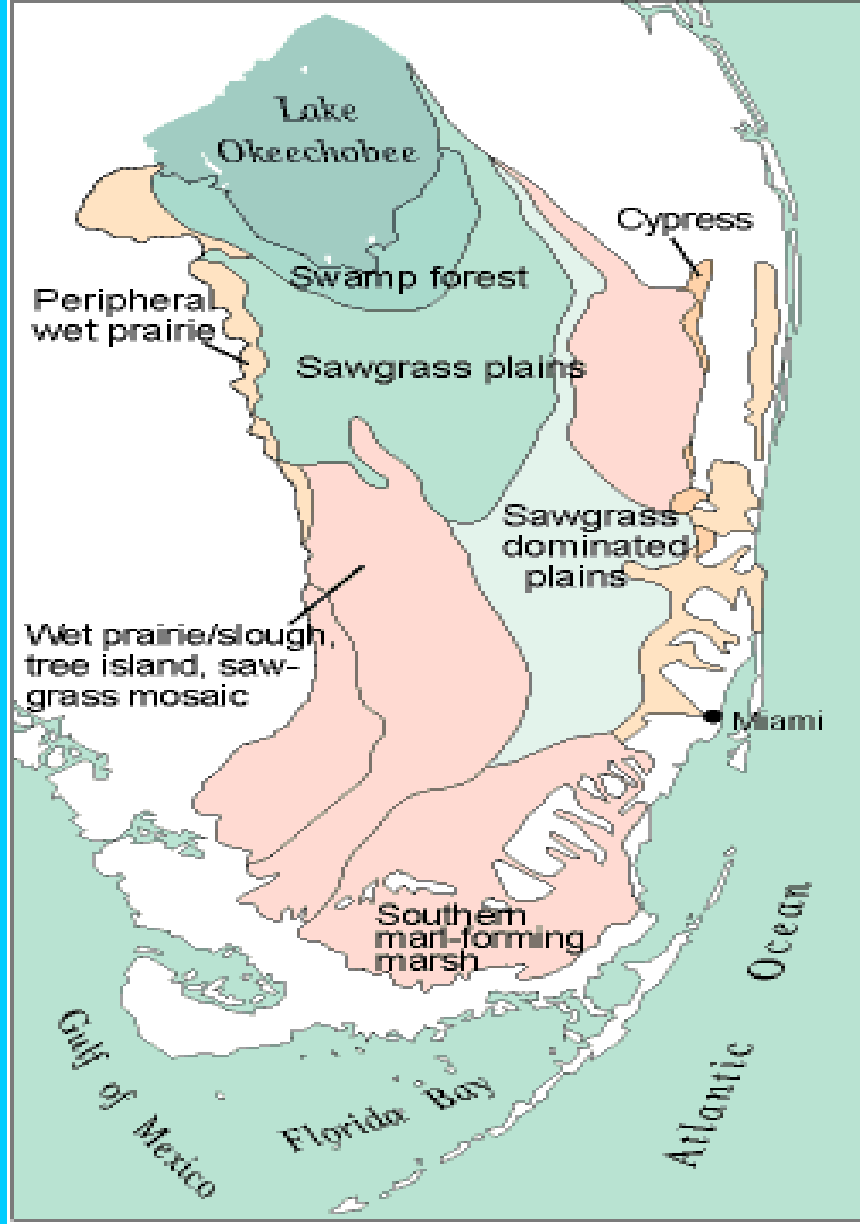
Lake Kissimmee flows south into the  
Kissimmee River – 105-mile Oxbow  
River with 2-mile-wide floodplain

Water takes 6-8 Months to reach Lake  
Okeechobee

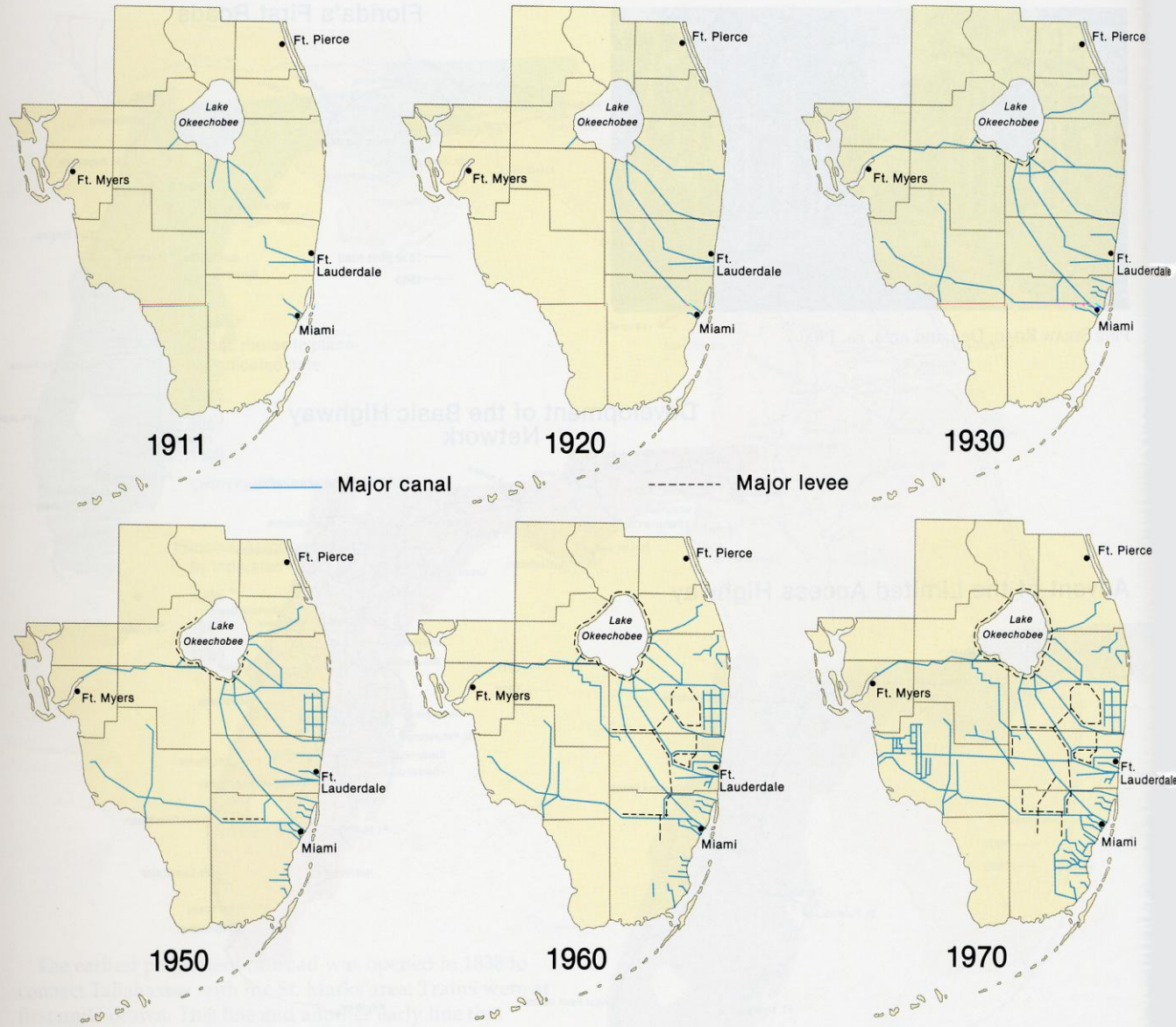
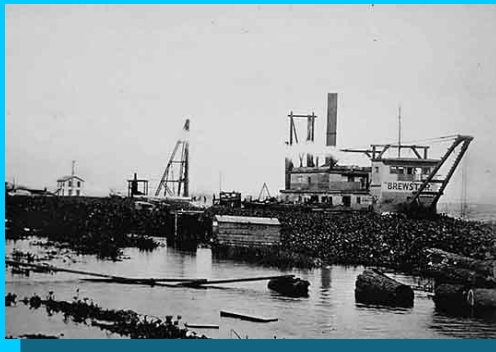
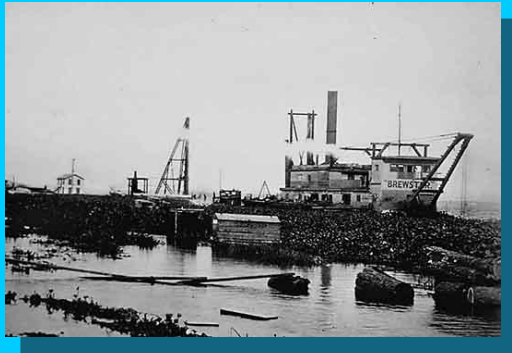
Lake Okeechobee flows south through “River  
of Grass”, 60-mile-wide shallow (1 ft deep)  
river flowing at 1 mile in 4 days.

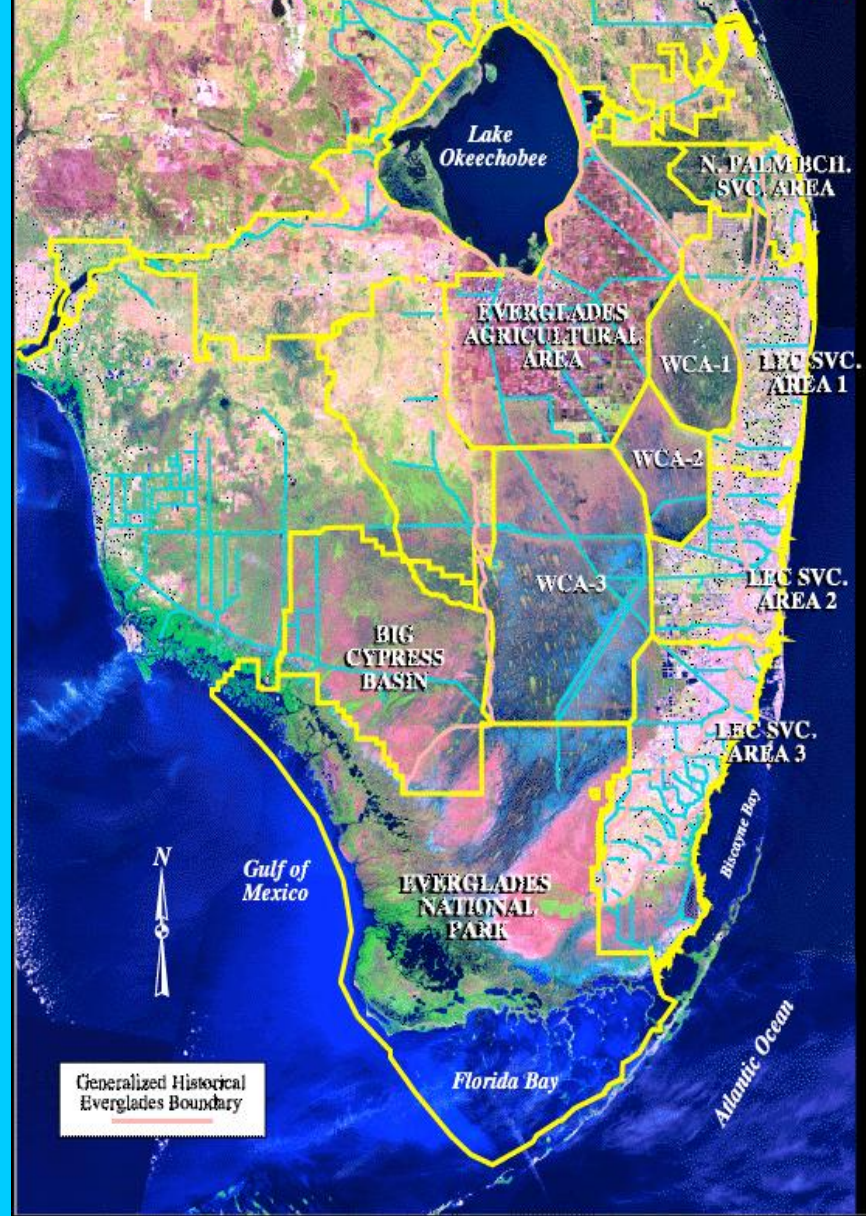
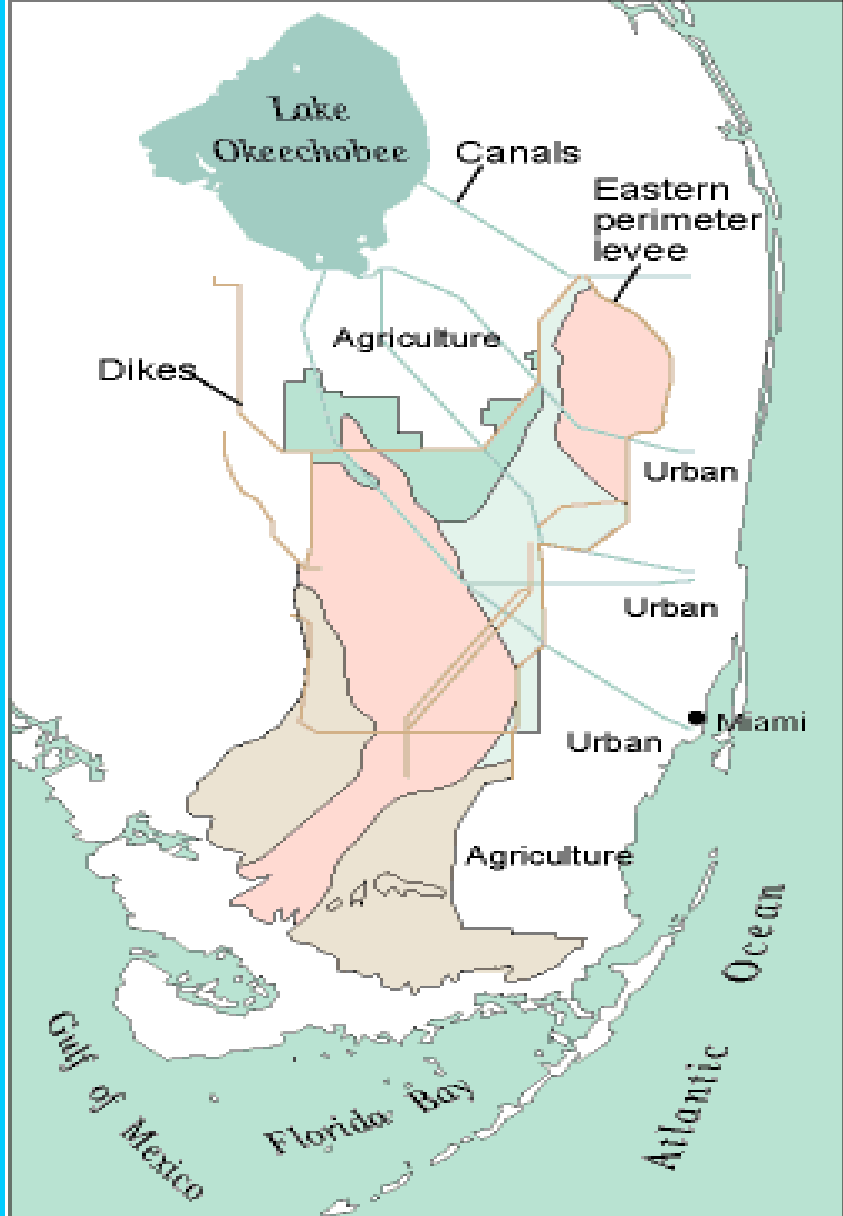
Water takes 16 Months to reach Florida  
Bay

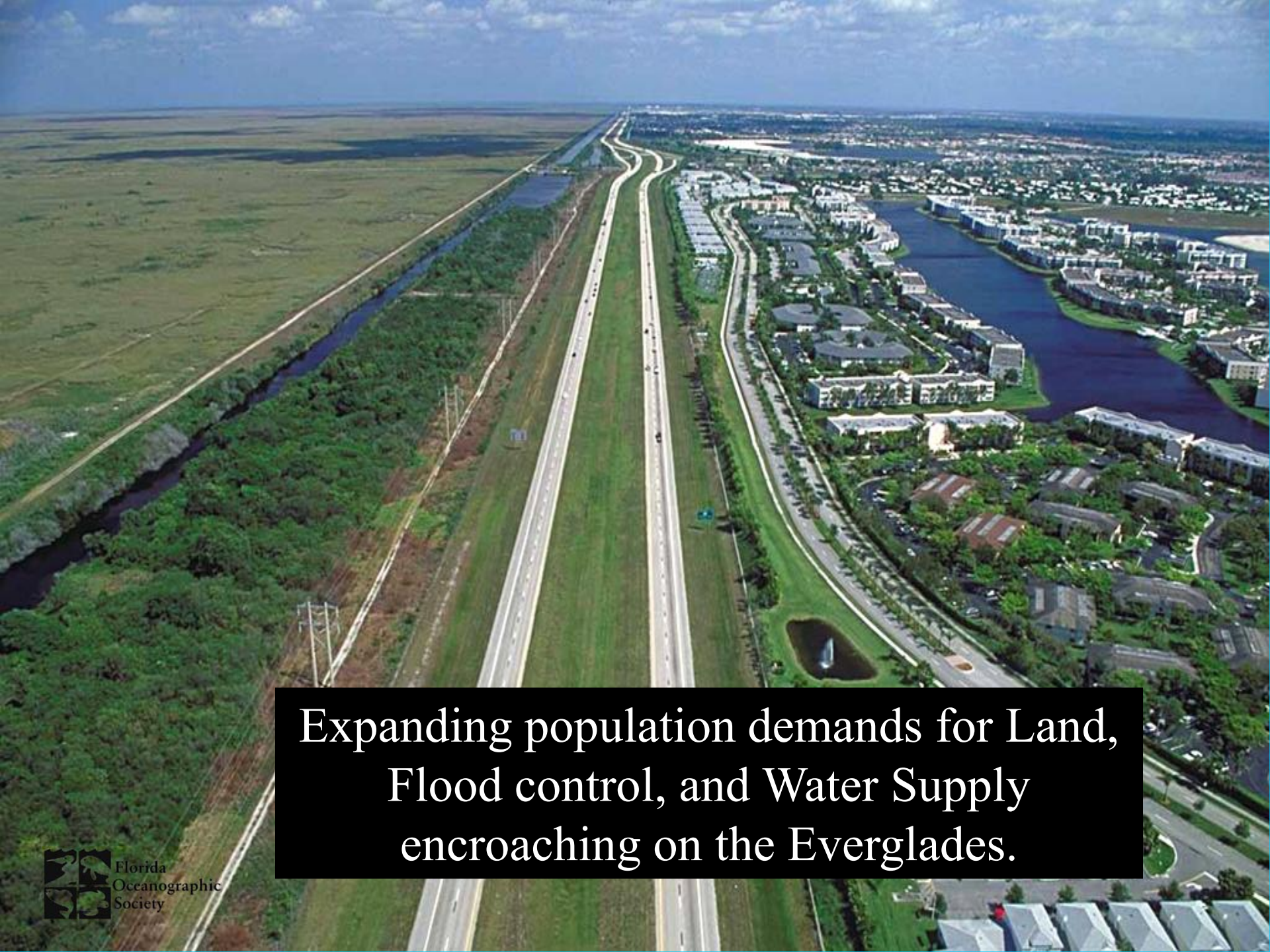




# Expansion of the Canal and Levee System







Expanding population demands for Land, Flood control, and Water Supply encroaching on the Everglades.

# Hurricanes in 1926 & 1928

1926 AND 1928  
DEVASTATING HURRICANES  
... LOSS OF 2,500 LIVES

HOOVER DIKE AUTHORIZED 1930

... COMPLETED 1937

A historical poster with a blue and white color scheme. At the top, it reads '1926 AND 1928' in large white letters on a blue background. Below this, 'DEVASTATING HURRICANES' is written in red, followed by '... LOSS OF 2,500 LIVES' in black. The central part of the poster features a black and white photograph of a long dike extending from a town towards the ocean. To the right of the dike, the text 'HOOVER DIKE AUTHORIZED 1930' is written in red inside a jagged, starburst-shaped border. At the bottom, '... COMPLETED 1937' is written in blue.



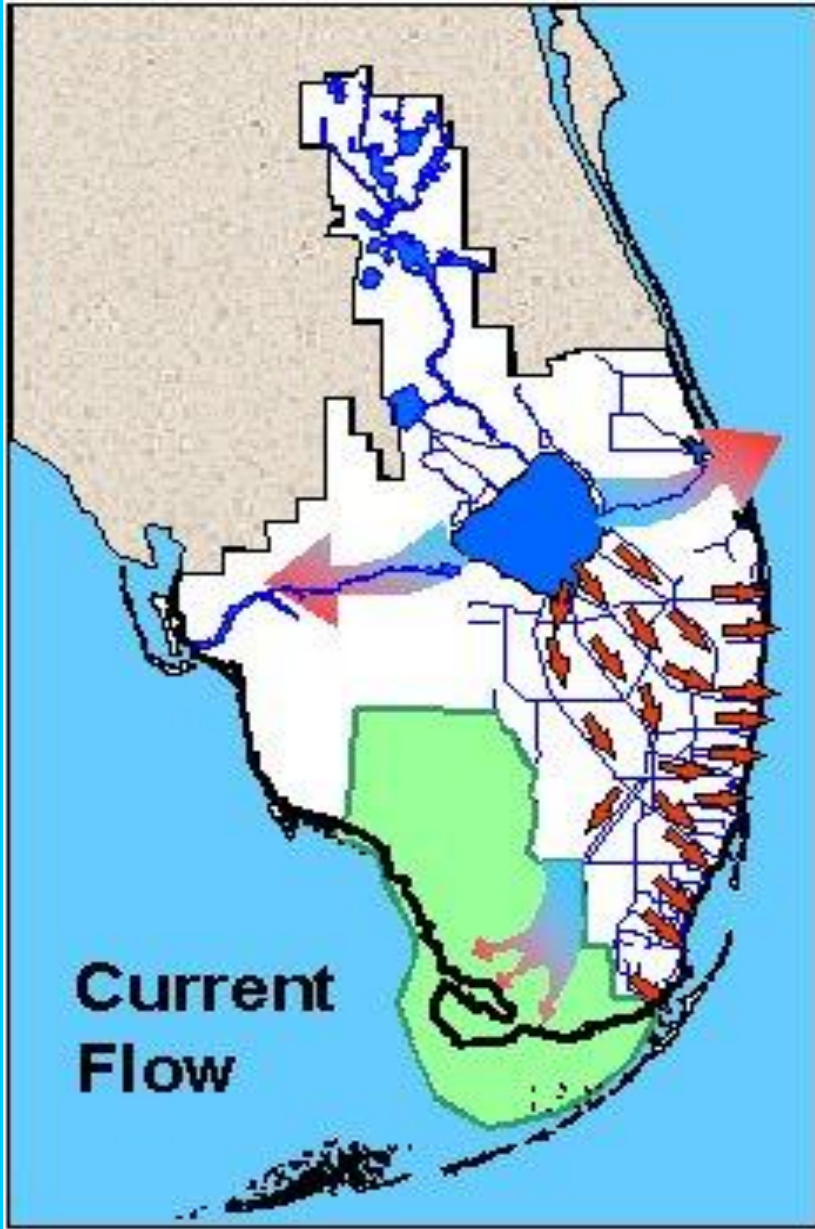




Dam Lake Okeechobee- Stop the flow to the River of Grass (Killed the River of Grass)



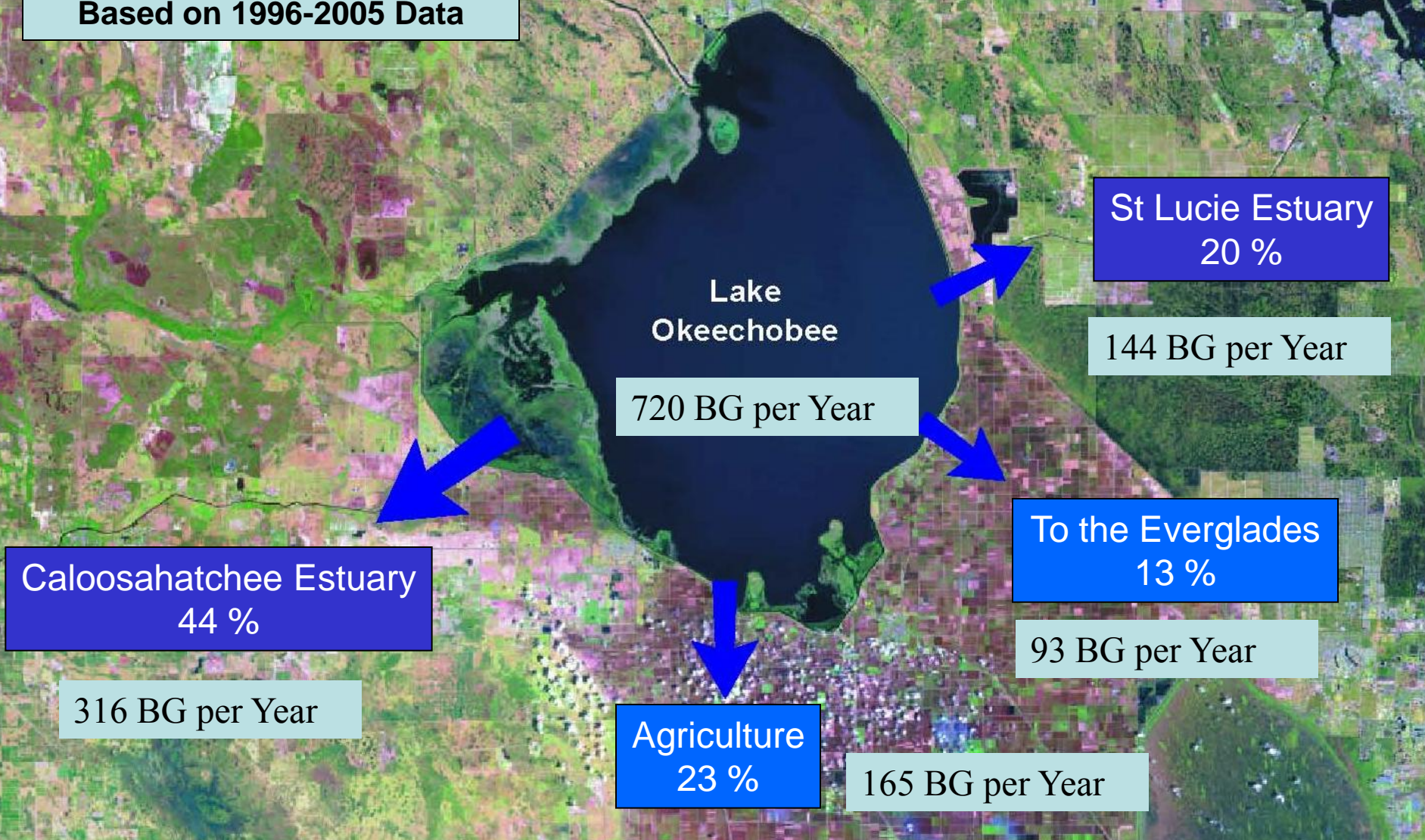
Killed the Kissimmee River- 1962-1970 Dug C-38 Canal up 105 mile oxbows-drained floodplain



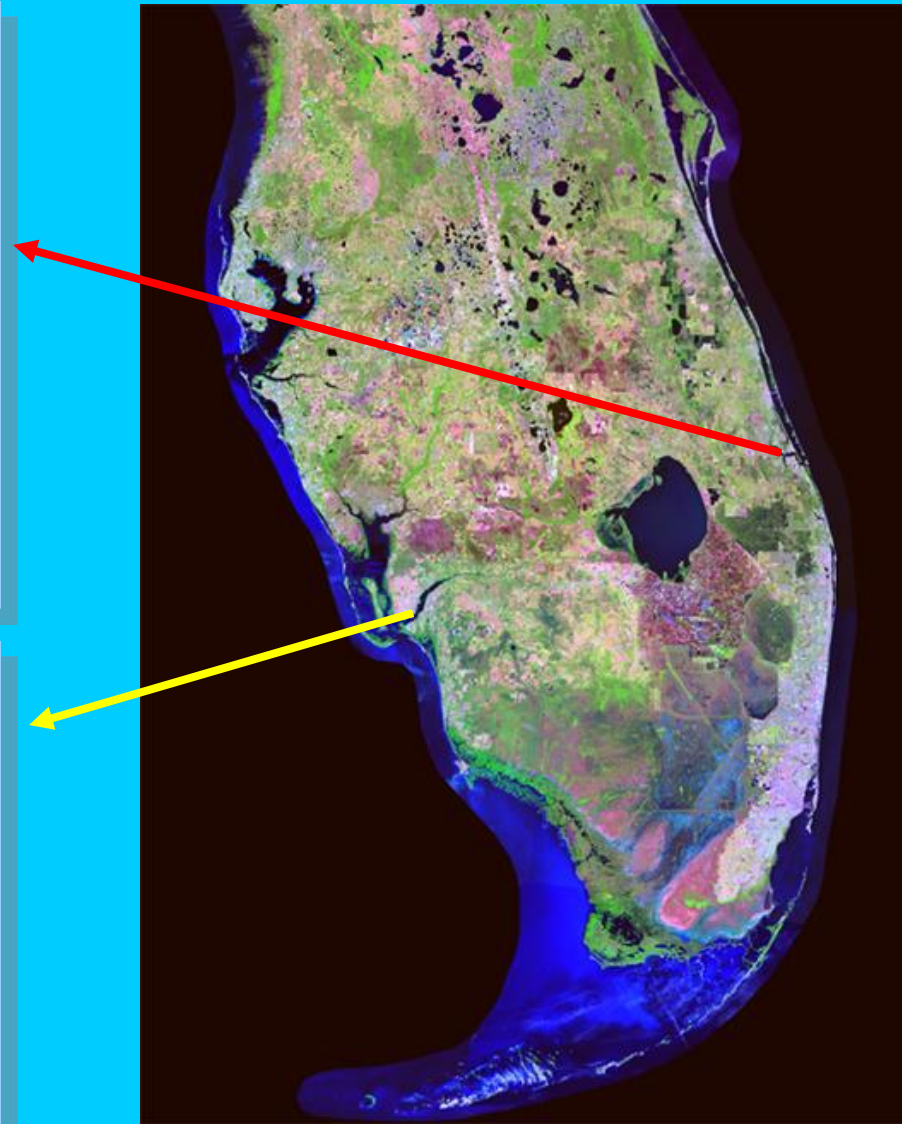
**1.7 Billion Gallons per Day of freshwater is wasted to the Atlantic Ocean and Gulf of Mexico! (\$5.9**

# Where the Water Goes

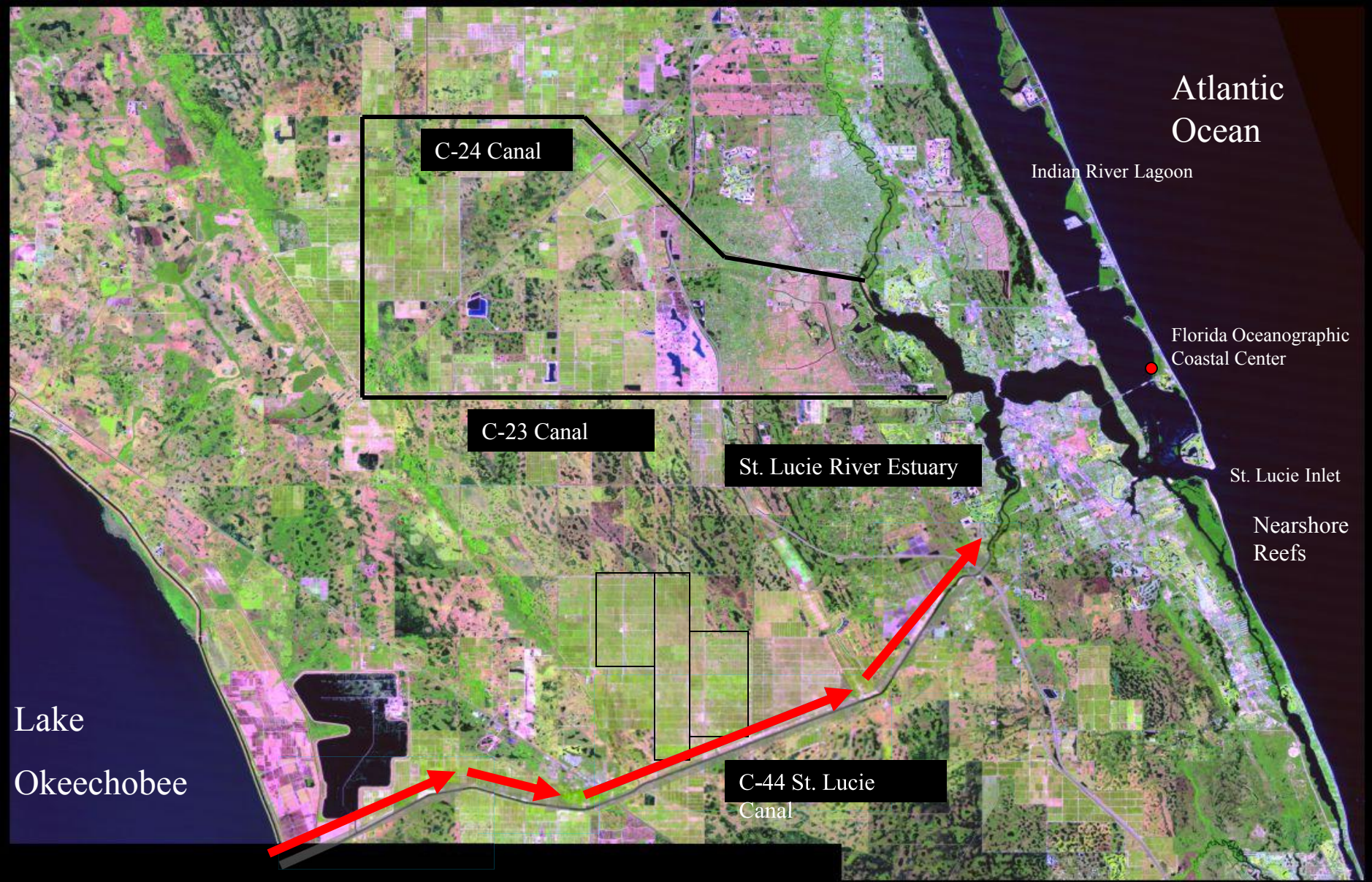
Based on 1996-2005 Data



# South Florida Coastal Estuaries



Killing the Coastal Rivers



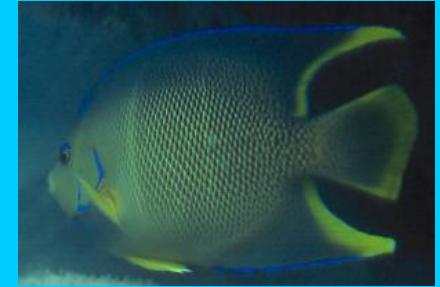
Discharges from Lake Okeechobee to the St. Lucie River Estuary and Indian River Lagoon

St.

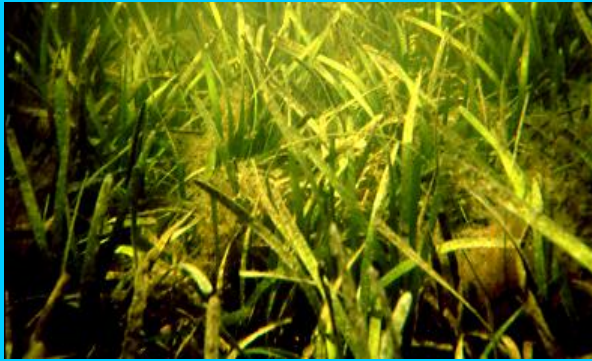


**Discharges from Lake Okeechobee and St. Lucie Canal to the Estuary. Up to 4.6 Billion Gallons per Day!**

# Loss of Fisheries & Coastal Habitat



**Seagrass Beds**



**Oyster Reefs**



**Mangroves**

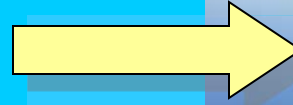
**Coral Reefs**





# Indian River Lagoon Seagrass Beds

Before Discharges

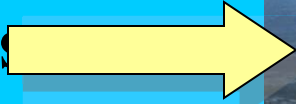


During Discharges



# St. Lucie Inlet Nearshore Reefs

Before Discharges



Sediment Plume 6-8 miles offshore



During Discharges

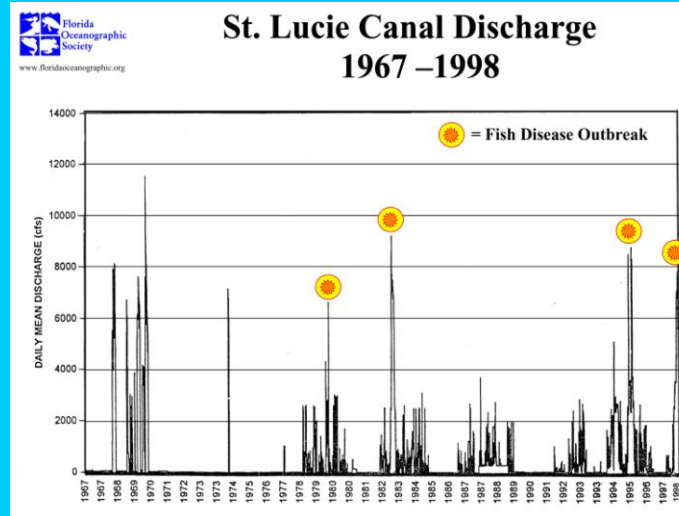
# St. Lucie River Estuary Muck Bottom



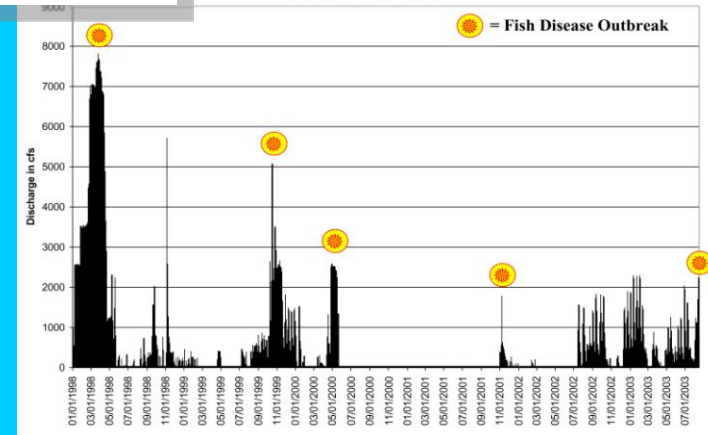
4-8 ft. thick on bottom

7.9 million cubic yards ++

# Fish Lesions and Abnormalities



### St. Lucie Canal Discharge 1998 - 2003






**33 Species of Fish**  
**6% of the population**

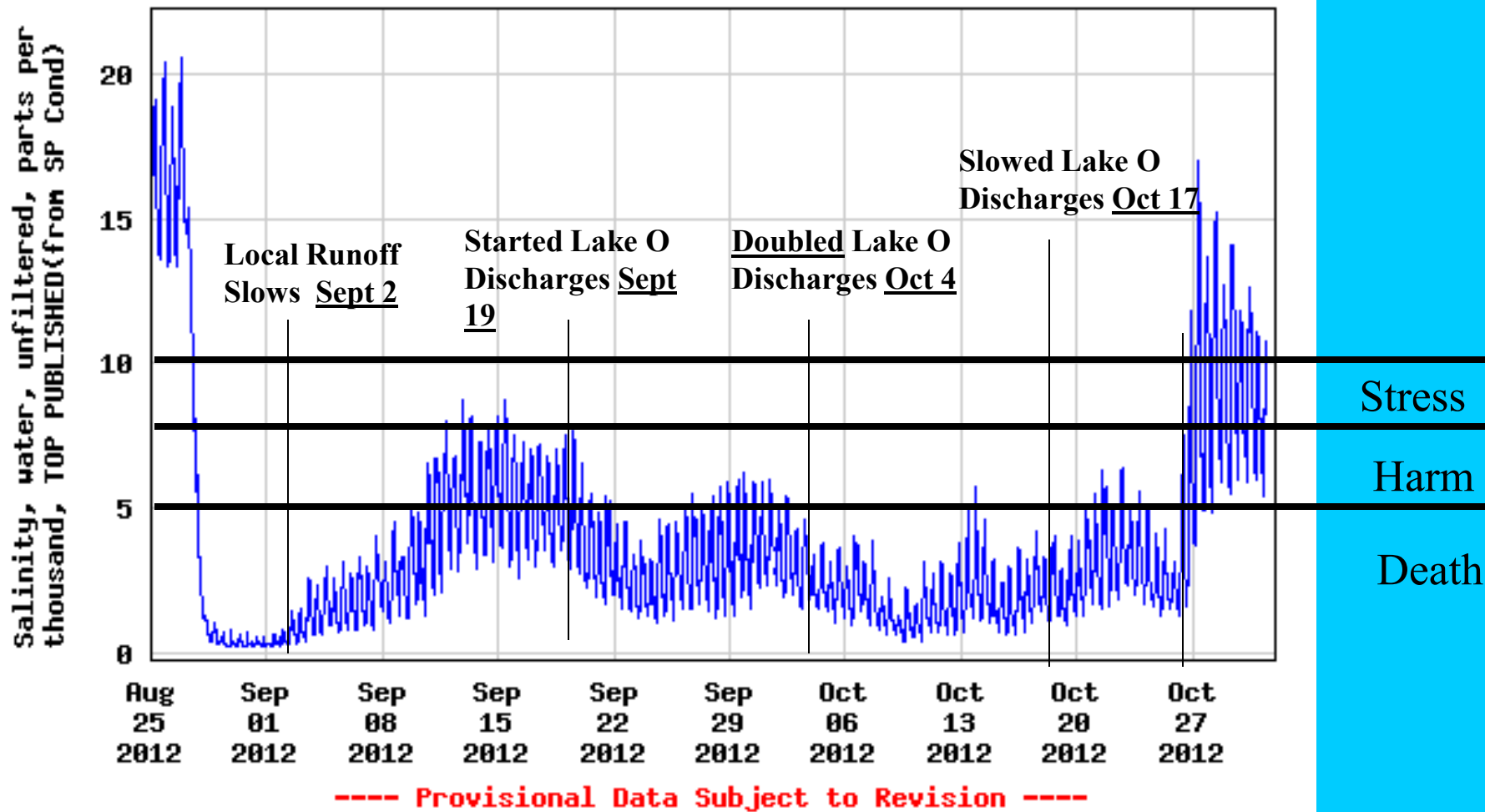


0 0.5 1 2 Miles

FOS 

	Florida Oceanographic Coastal Center
	Martin Co./NOAA Reefs
	Historic Oyster Reefs





Death

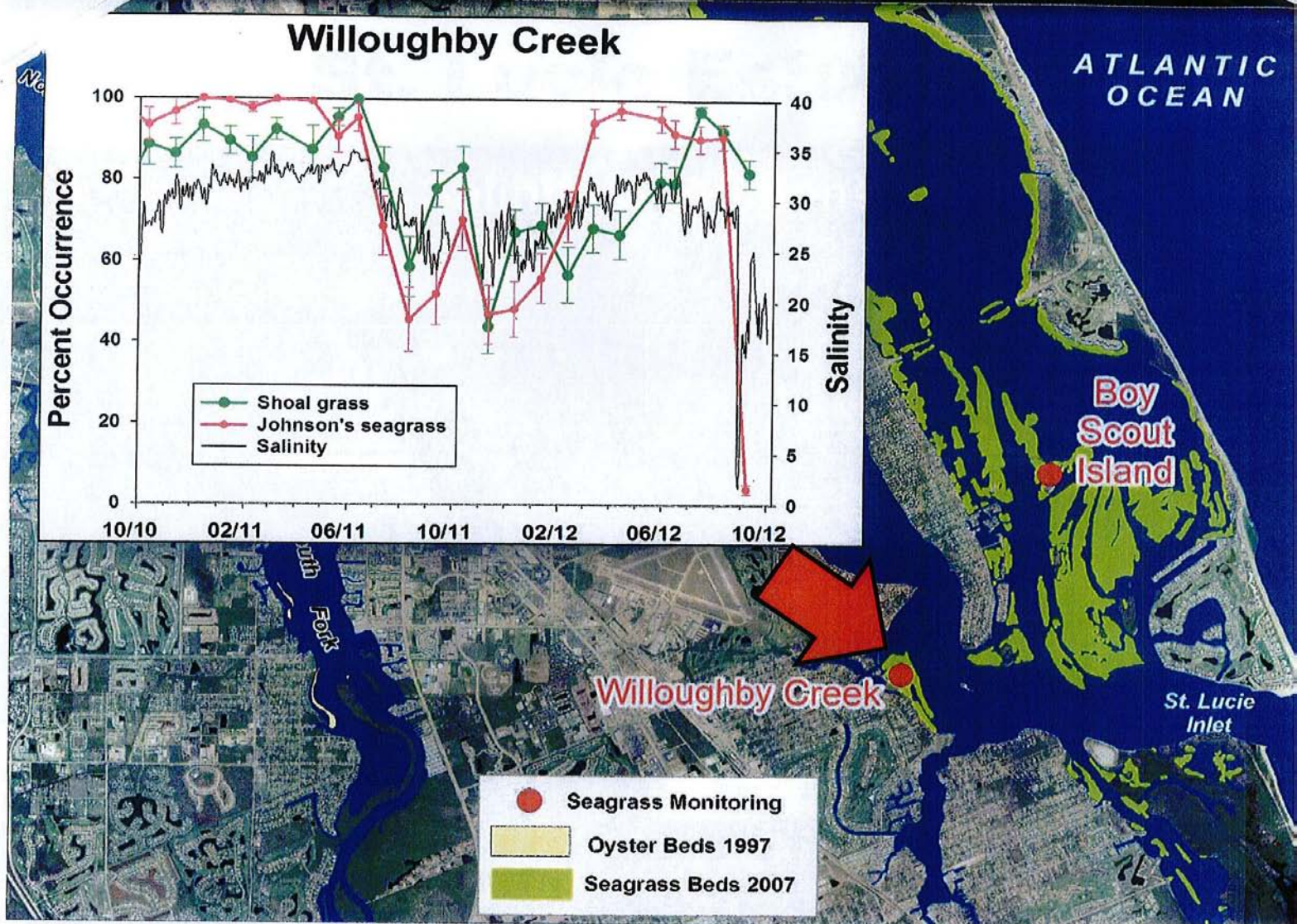
# Salinity Tolerance for Oysters

7 Days-Spat & Juveniles

14 – 28 Days – Adults

(Aug 26 – Oct 31 66 Days)

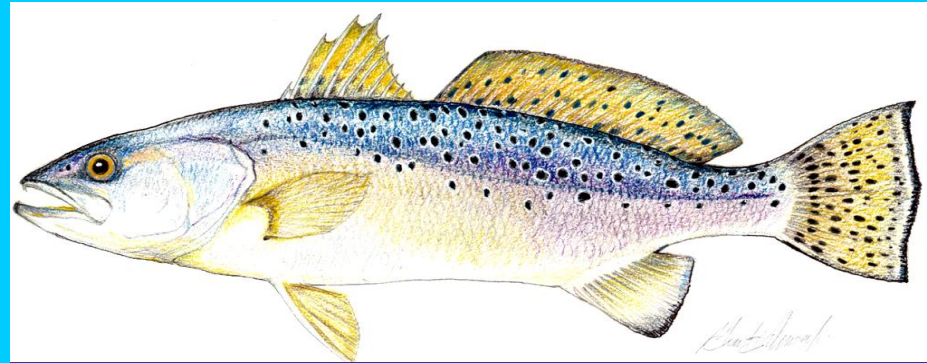




# Direct Effects on Fisheries

Economically important Spotted Seatrout

Reproduction is inhibited by low salinity levels in the estuary.





**WARNING**

HIGH BACTERIA AND BLUE-GREEN ALGAE LEVELS.  
WARNING. AVOID CONTACT WITH WATER IN THE ST. LUCIE RIVER

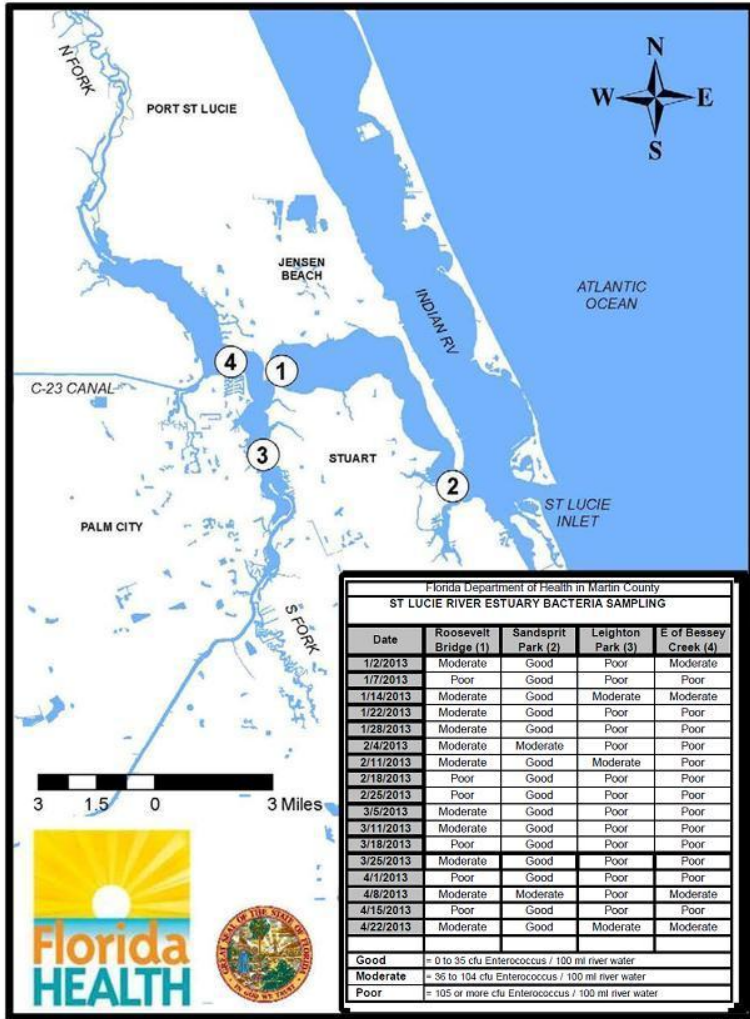


MARTIN CO. HEALTH DEPT. 221-4030

Office phone:

Health Warnings posted in the St. Lucie River Estuary – 2004, 2005, 2006, 2010 and 2012

MARTIN COUNTY HEALTH DEPARTMENT  
ST LUCIE ESTUARY BACTERIA MONITORING



 **ADVISORY**

**HIGH BACTERIA LEVELS**  
**AVOID CONTACT WITH WATER IN THE AREA OF THE ROOSEVELT BRIDGE**



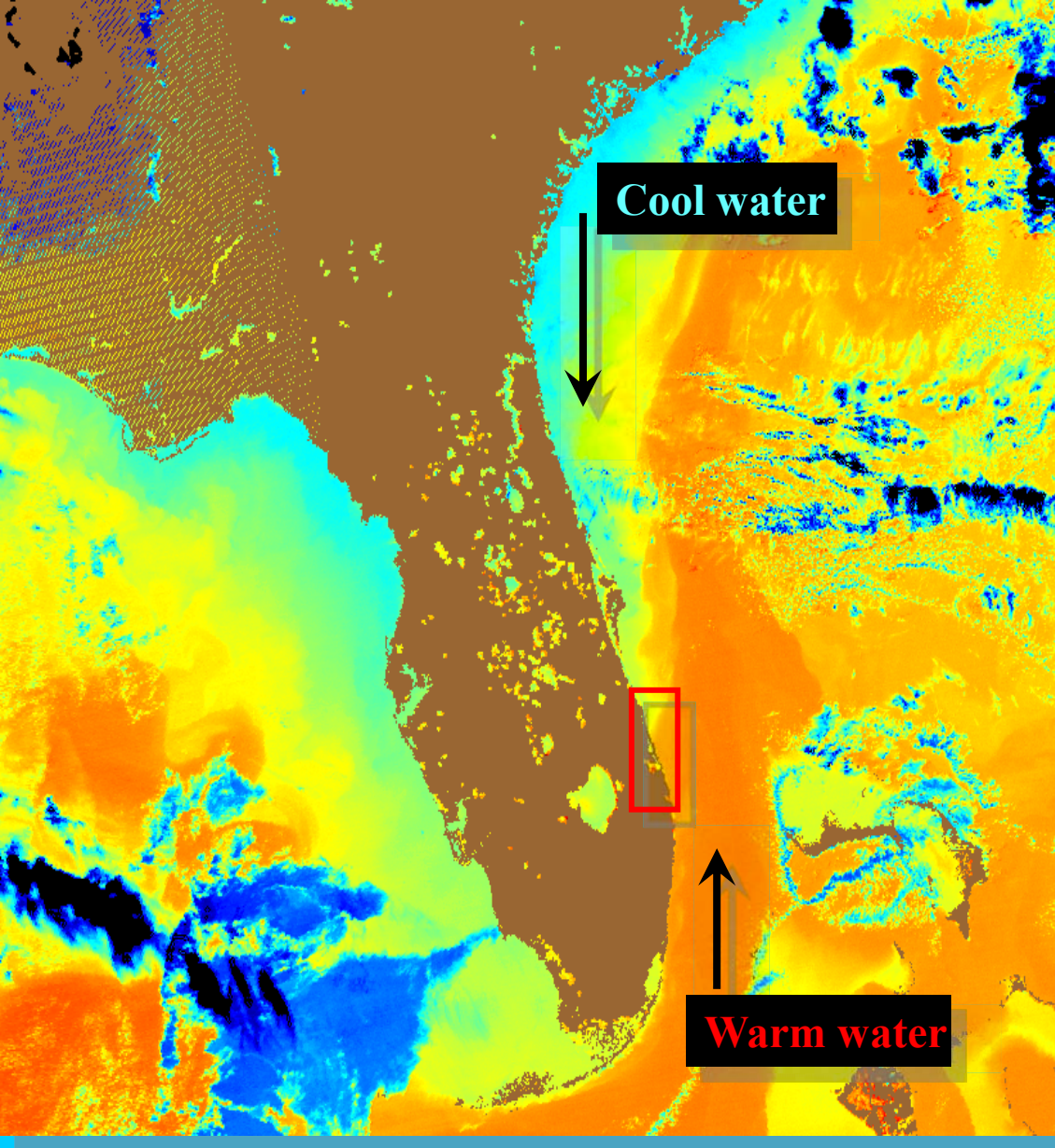
**MARTIN CO. HEALTH DEPT. 221-4090**



Martin County Health Department Warnings

# Most Biodiverse Ecosystem in North America

- 2100 plant species
- 2200 animal species
  - 800 fish species
  - 310 bird species



Uniqueness of the Indian River Lagoon Estuary



# Indian River Lagoon Economic Assessment and Analysis Update

Contract No. 24706

For the  
Indian River Lagoon National Estuary Program

In cooperation with  
St. Johns River Water Management District  
South Florida Water Management District

Final Report  
August 18, 2008



**HAZEN AND SAWYER**  
Environmental Engineers & Scientists

## Executive Summary

The Indian River Lagoon is an Estuary of National Significance and one of twenty-eight (28) national estuary programs in the U.S. The Indian River Lagoon National Estuary Program is working toward the goals of attaining and maintaining the water and sediment quality needed to support a healthy seagrass-based ecosystem, endangered and threatened species, fisheries and recreation in the Lagoon.

### Study Purpose

This study updated the economic values of the Indian River Lagoon that were estimated in 1995. The study area for this project is the Indian River Lagoon, including Mosquito Lagoon and Banana River Lagoon, and associated tributaries including but not limited to the St. Lucie River Estuary, St. Sebastian River, Turkey Creek, Crane Creek, Moore's Creek, and the inlets of Ponce de Leon Inlet, Port Canaveral Inlet, Sebastian Inlet, Ft. Pierce Inlet, St. Lucie Inlet, and Jupiter Inlet. The residents surrounding the Indian River Lagoon are located in the counties of Volusia, Brevard, Indian River, St. Lucie and Martin. The uses and values presented in this study represent the year 2007.

### Economic Value of the Indian River Lagoon

The 2007 economic value of the Indian River Lagoon is provided in Table ES.1. Overall, residents and visitors of the five Indian River Lagoon counties received about \$3.7 billion in benefits in 2007 because of the existence of the Indian River Lagoon in its 2007 environmental condition.

Table ES.1  
Estimated Annual Economic Value of the Indian River Lagoon  
in its Existing Environmental Condition, 2007

Indian River Lagoon Related-	Value
(1) Recreational Expenditures	\$1,302,000,000
(2) Recreational Use Value	\$762,000,000
(3) Non-Use Value of Lagoon	\$3,400,000
(4) Real Estate Value, annualized	\$934,000,000
(5) Income Generated in IRL Counties	\$629,700,000
(6) Restoration, Research, Education Expenditures	\$91,000,000
(7) Commercial Fishing Dockside Value	\$3,800,000
<b>Total Annual Value</b>	<b>\$3,725,900,000</b>

40548-001\Wpdocs\Report\R2 Final



# Indian River Lagoon – Economic Value \$ 3.725 Billion 2007



## Water-Related Benefits to Martin and St. Lucie Counties

***TOTAL: \$840 million annually***

Sales - ***\$519 million/yr***

Marinas

Boat sales/repairs

Fishing tackle/bait/charters

Personal income - ***\$206 million/yr***

***6,600*** jobs supported—Marine Industries

Guide/commercial fishing

Repair personnel

***20,500*** jobs supported—Tourism

Food/beverage services

Hotel/motel personnel

Tourism - ***\$115 million/yr***

Visitation to beaches/hotels

Recreational fishing/boating

PLUS-Property Values - ***\$588 million Plus (Martin County)***



# Now What?

## Restoration Plans & Efforts for the Greater Everglades Ecosystem



# Kissimmee River

**Channalized 1962-1971**

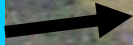
C-38 Canal



# Kissimmee River

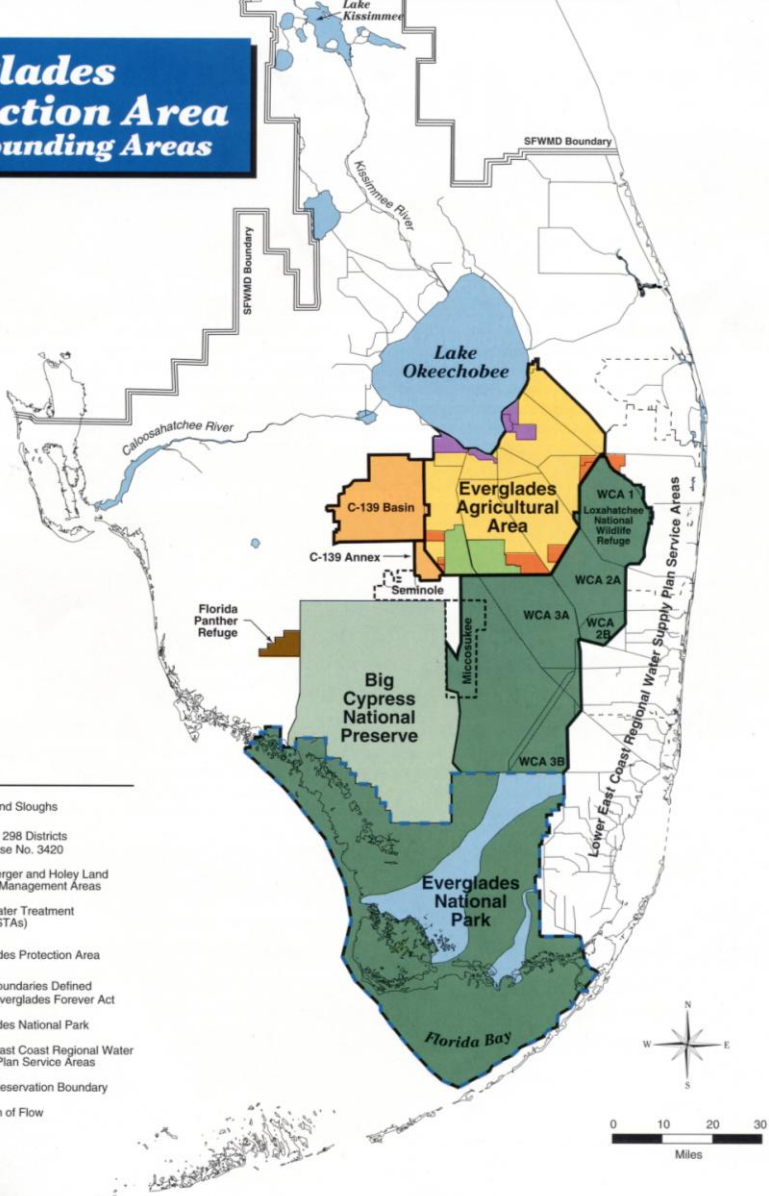
**Restoration- July 11, 2001**

C-38 Canal  
(filled in)



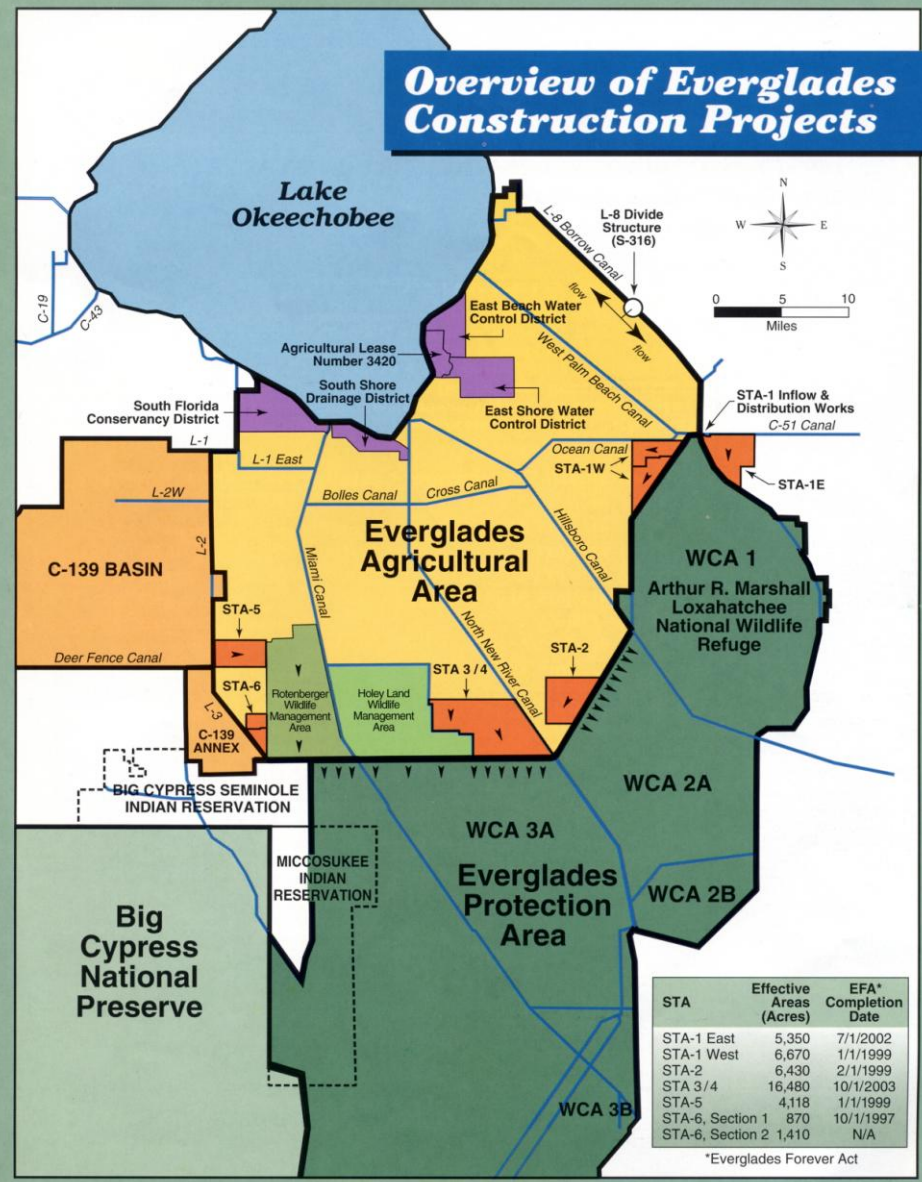


# Everglades Protection Area & Surrounding Areas



- LEGEND**
- Lakes and Sloughs
  - Chapter 298 Districts and Lease No. 3420
  - Rotenberger and Holy Land Wildlife Management Areas
  - Stormwater Treatment Areas (STAs)
  - Everglades Protection Area
  - Legal Boundaries Defined by the Everglades Forever Act
  - Everglades National Park
  - Lower East Coast Regional Water Supply Plan Service Areas
  - Indian Reservation Boundary
  - Direction of Flow

# Overview of Everglades Construction Projects



STA	Effective Areas (Acres)	EFA* Completion Date
STA-1 East	5,350	7/1/2002
STA-1 West	6,670	1/1/1999
STA-2	6,430	2/1/1999
STA 3/4	16,480	10/1/2003
STA-5	4,118	1/1/1999
STA-6, Section 1	870	10/1/1997
STA-6, Section 2	1,410	N/A

\*Everglades Forever Act



**1994 Everglades Forever Act – Projects \$ 1.8 Billion**

*Rescuing an Endangered Ecosystem:  
The Plan to Restore America's  
Everglades*



*The Central and Southern Florida Project  
Comprehensive Review Study  
(The Restudy)*

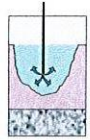
On December 11, 2000, the President signed the Water Resources Development Act (WRDA) of 2000, approving:

## Comprehensive Everglades Restoration Plan

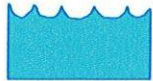
A series of environmental and other improvements over 30+ years with an estimated cost of ~~\$7.8 billion~~ (**\$ 11.5 billion**)

# Comprehensive Everglades Restoration Plan

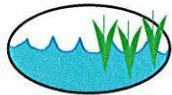
## 68 Components



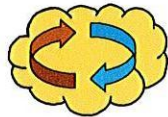
**Aquifer Storage & Recovery – 330 Wells**



**Surface Water Storage Reservoir – 170,000 acres**



**Stormwater Treatment Areas (STAs) – 36,000 acres**



**Reuse Wastewater at 2 Regional Plants**



**Seepage Management**

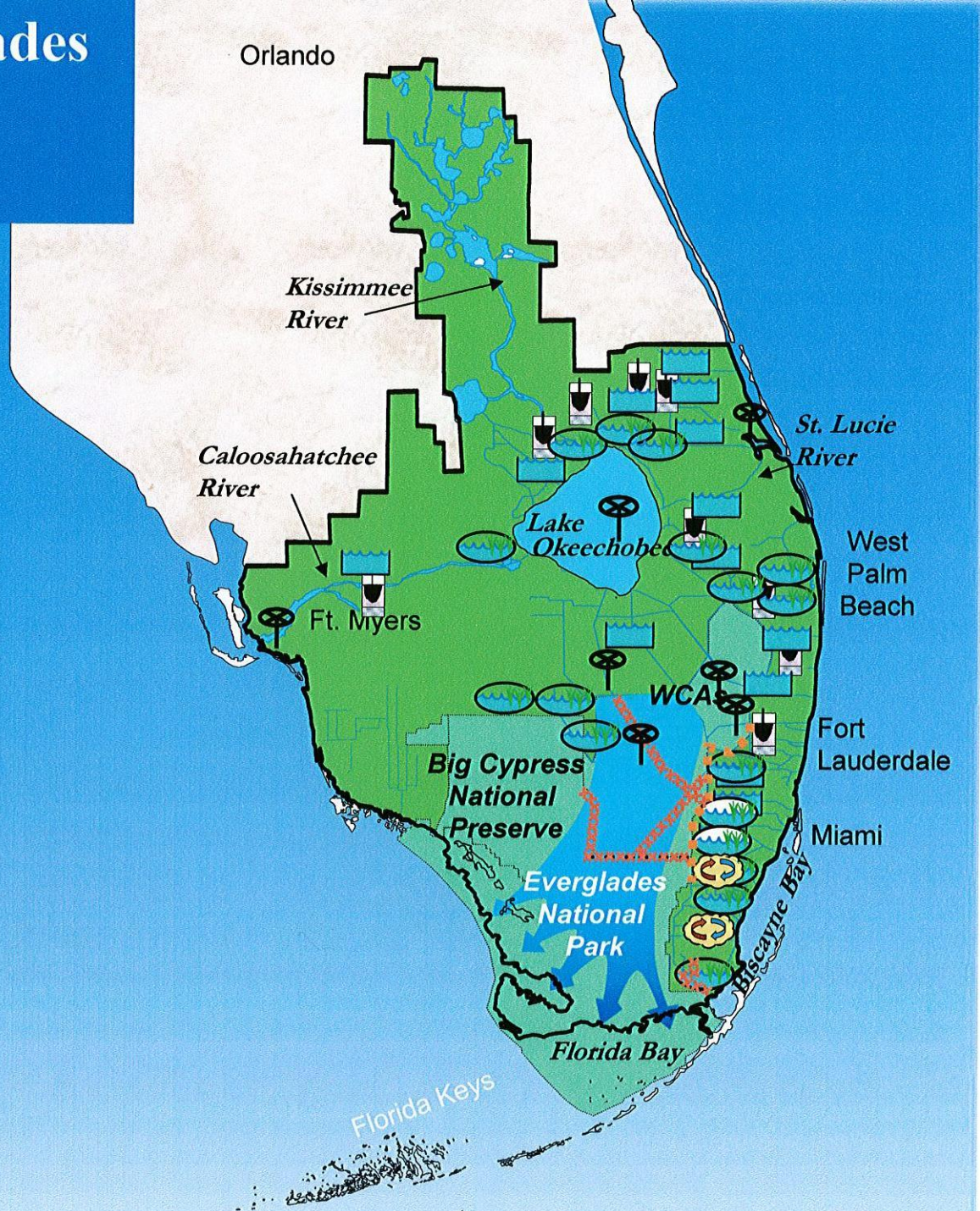


**Removing 240 miles of Barriers to Sheetflow**



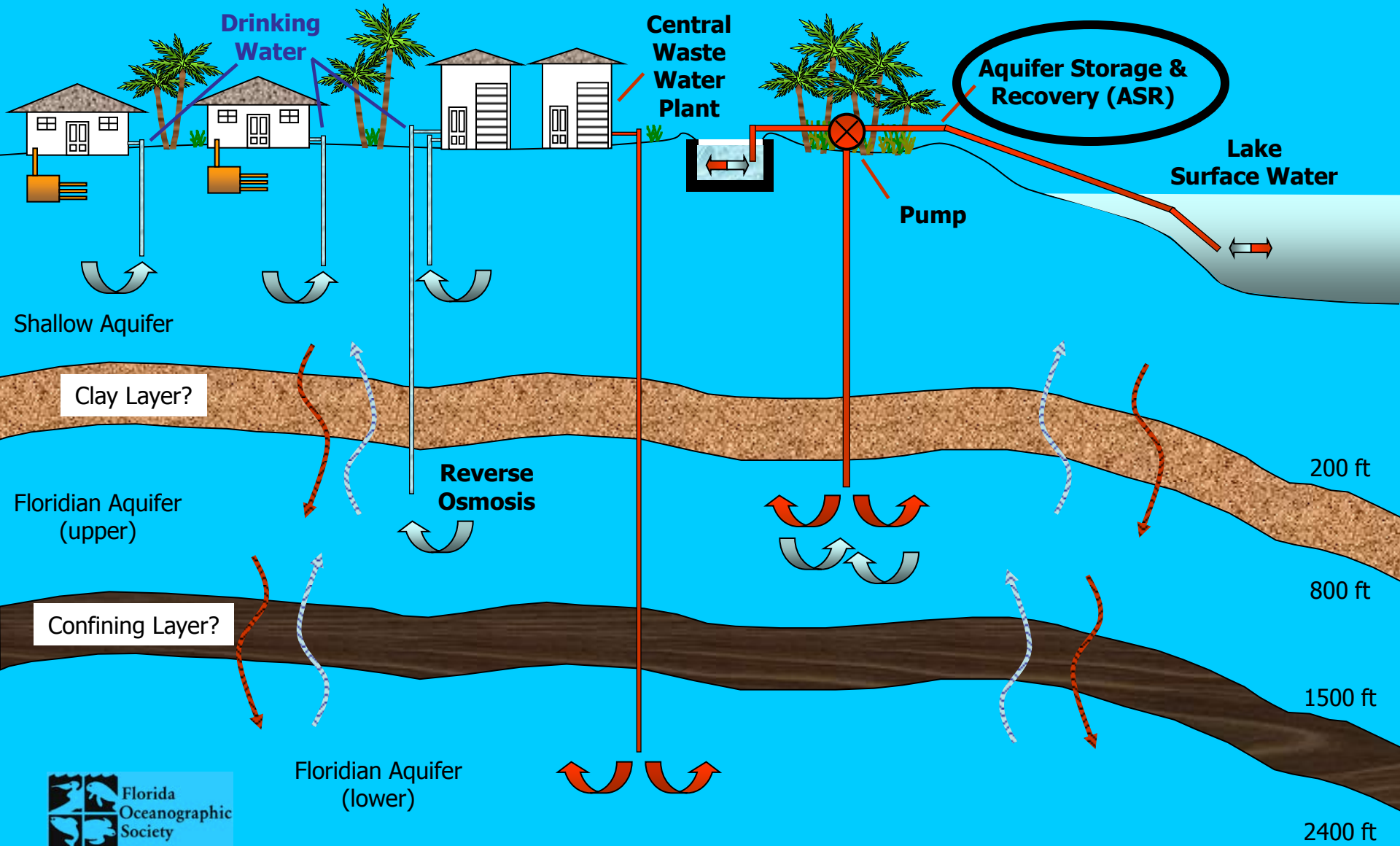
**Operational Changes**

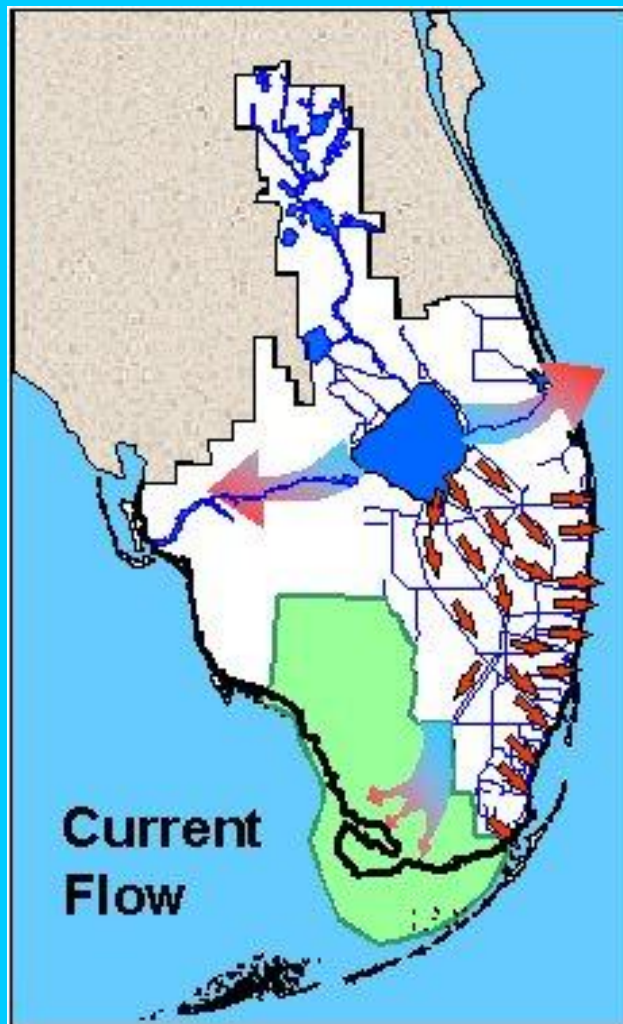
Florida  
Seepage  
Society





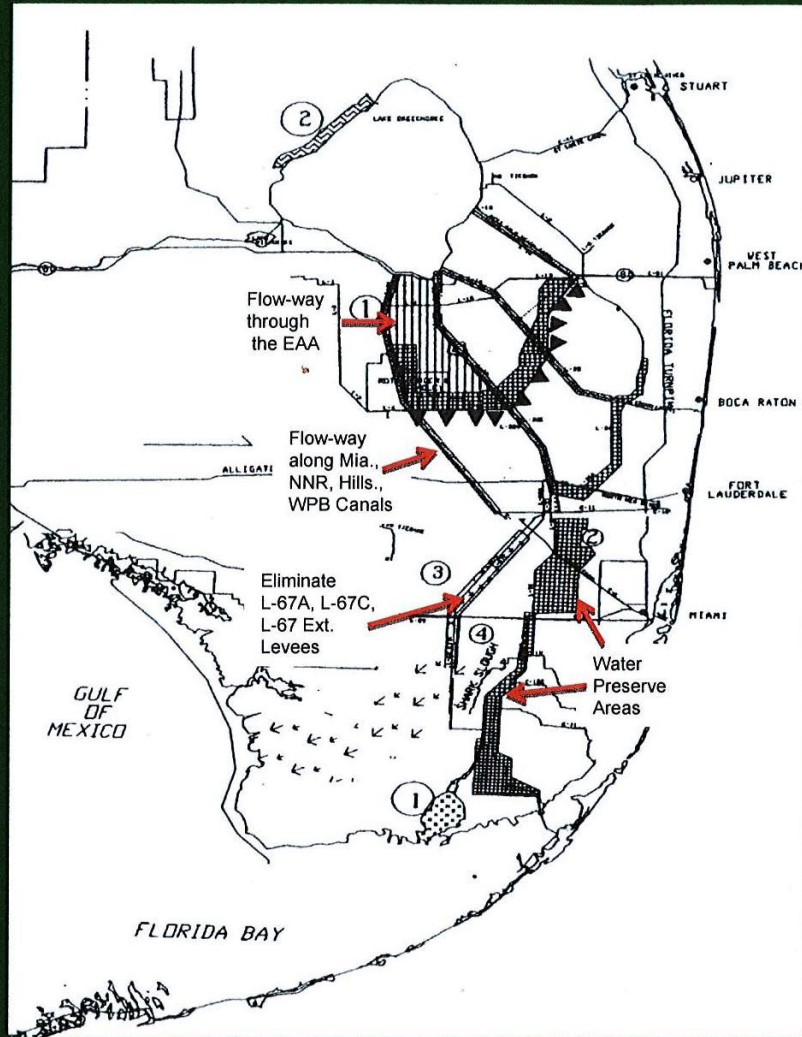
55 inches of Rainfall



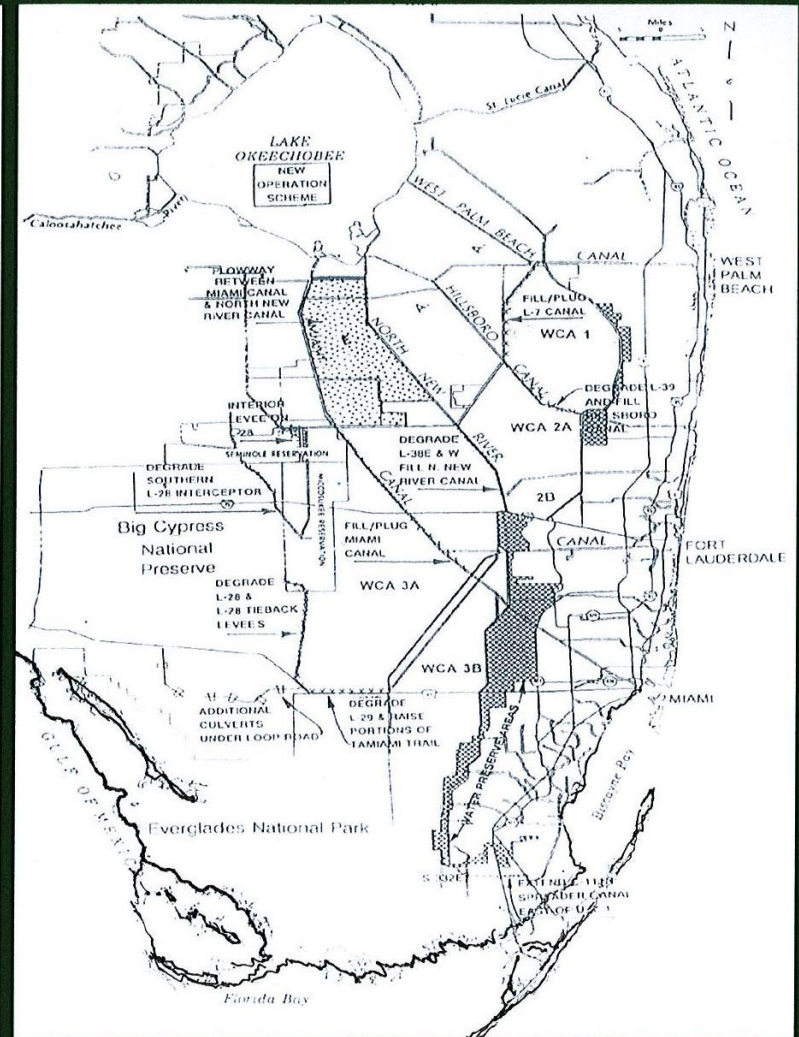


## Historic, Current & Planned Flow for the Comprehensive Everglades Restoration Plan

# Early Conceptual Plans - Everglades Restoration



Science Sub-Group Report, Minimum Plan, 1993.

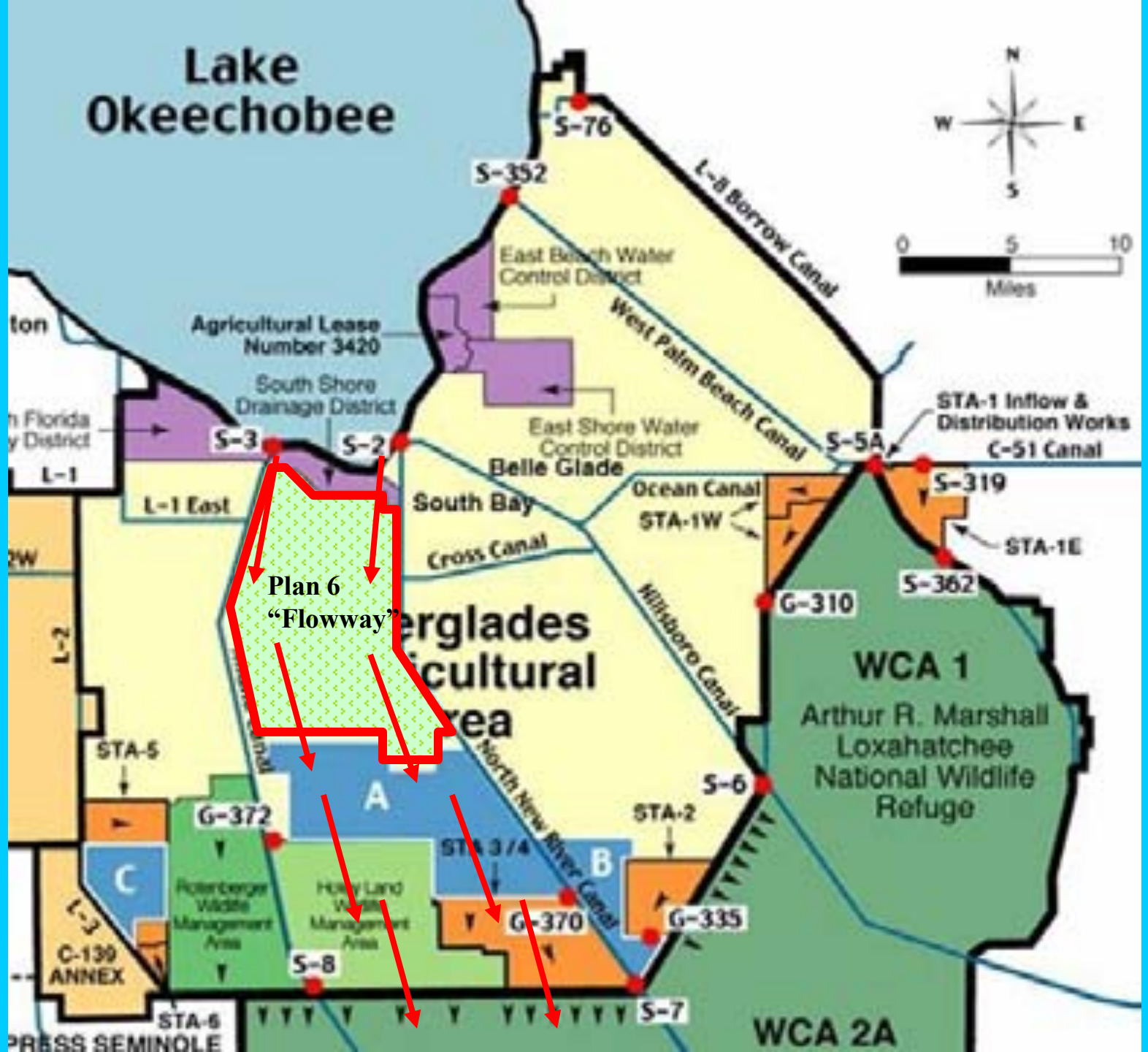


C&SF Restudy Recon. Report, Plan 6, 1994.



Reconnect Lake Okeechobee to the Everglades-  
River of Grass- Move Water South

# Lake Okeechobee



# \$1.75 billion deal aims to protect Everglades

Florida would pay U.S. Sugar to get out of business and get firm's land.

**BRIAN SKOFOFF**  
THE ASSOCIATED PRESS  
WELLINGTON, Fla. — U.S. Sugar Corp., the nation's largest producer of cane sugar, would go out of business in a \$1.75 billion deal to sell its nearly 300 square miles of land to Florida for Everglades restoration, the company and the state's governor said Tuesday.

Under the deal, announced at a news conference with Republican Gov. Charlie Crist and company representatives, the state would buy U.S. Sugar's holdings in the Everglades south of Lake Okeechobee, the virtual heart of the ecosystem.

Negotiations are still ongoing, but officials hope to sign an agreement by September. Once the deal is in place, U.S. Sugar would be allowed to farm the 187,000 acres of land for six more years before closing.

Crist said the deal is "as monumental as the creation of our nation's first national park, Yellowstone."

"This represents, if we're successful, and I believe we will be, the largest conservation purchase in the history of the state of Florida," Crist said.

The land would be used to help restore a more natural flow to the wetlands that has been stymied for years by agriculture and development. Farming in the region has long been considered a hindrance to restoration.

The deal wouldn't end sugar production in the Everglades. At least 250,000 acres of land used by other companies would remain operational.

U.S. Sugar CEO Robert Buker called the deal "monumental" but also was saddened to see the demise of his company, which



BILL BRONKHORST/The Associated Press  
U.S. Sugar Corp. CEO Robert Buker, left, walks with Florida Gov. Charlie Crist, and South Florida Water Management District Board Vice Chair Shannon Estonoz at a news conference Tuesday.

employs 1700 people.

"We built a company that right now is the pillar of the agriculture community in Florida," Buker said. "Because of that, I stand here today with mixed feelings — On the other hand, I'm excited about what we're doing here today."

He said the company's decision to sell had nothing to do with profits, though the entire American sugar industry has struggled with stiff competition from cheap foreign imports.

U.S. Sugar has also in recent years been facing hefty bills to clean up its water before it enters the Everglades ecosystem.

Buker acknowledged that the sugar industry's presence in the Everglades has led to years of "partial fixes" as the state works to restore the once famed River of Grass.

David Guest, an attorney who has fought over Everglades res-



McIntosh Newspapers 2007 file photo

The nearly 300 square miles of land that U.S. Sugar owns would be used to help restore a more natural flow to the Everglades, which is threatened by agriculture and residential development.

restoration for years and is a long-time foe of U.S. Sugar, called Tuesday's announcement a victory.

"In the old days, you didn't just beat your opponent, you also ate them," Guest said. "Today, we're eating U.S. Sugar."

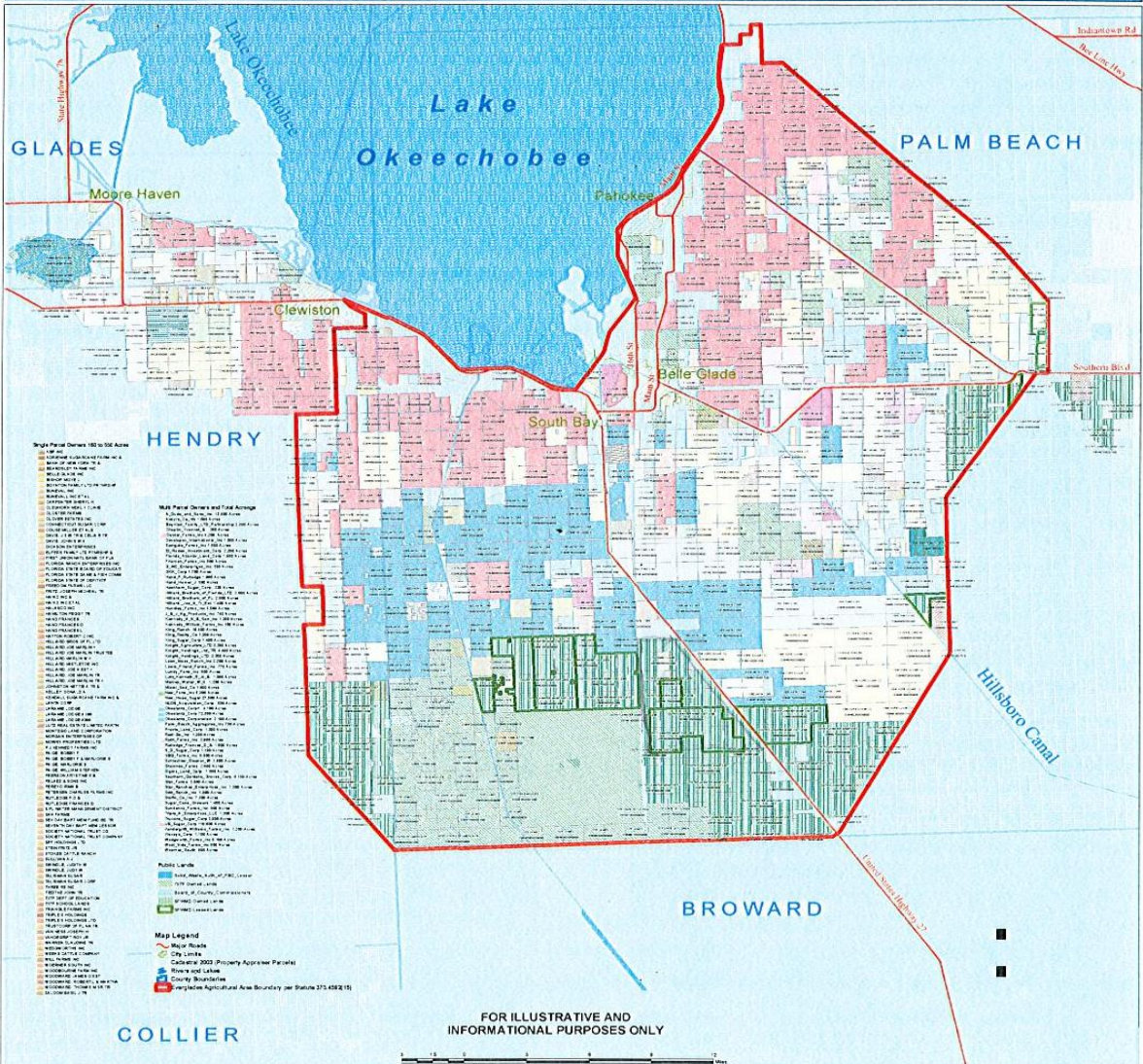
## June 24, 2008

## 187,000 acres

# US Sugar Corp. farmlands

## (red color on map)

Aggregate Ownership Greater than 160 Acres  
Located Within the Everglades Agricultural Area  
Based on 2003 Department of Revenue County Tax Parcel Data



FOR ILLUSTRATIVE AND INFORMATIONAL PURPOSES ONLY

Information from:  
Florida Department of Revenue - 2003 County Tax Parcel Data  
Division of State Lands - GIS Land Records Mapping System  
Division of State Lands - Board of Triview Land Data System  
DEP Geographic Information Systems - Enterprise Data  
SPWMD GIS Ownership and Lease Data

Details information about individual parcels depicted on this map can be found at the GIS Web Map:  
<http://gisweb.dep.state.fl.us/dsl/florida/florida/>

NOTICE:  
This map depicts ownership of and areas greater than 160 acres located within the Everglades Agricultural Area. Ownership and acreage calculations are based primarily on 2003 county tax parcel data provided by the Florida Department of Revenue.

Current ownership may differ from the 2003 tax data that this map is based on.

Acreage calculations for aggregate ownership areas of over 1000 acres are rounded down to the nearest 100 acres.

Prepared by Timothy Patterson, GIS Coordinator  
March 9, 2006  
Florida Department of Environmental Protection  
Division of State Lands  
Bureau of Survey and Mapping  
GIS and Land Records Mapping Section  
6th 23rd Court Building  
3800 Governmental Blvd.  
Tallahassee, FL 32399  
Phone: 850-245-2579



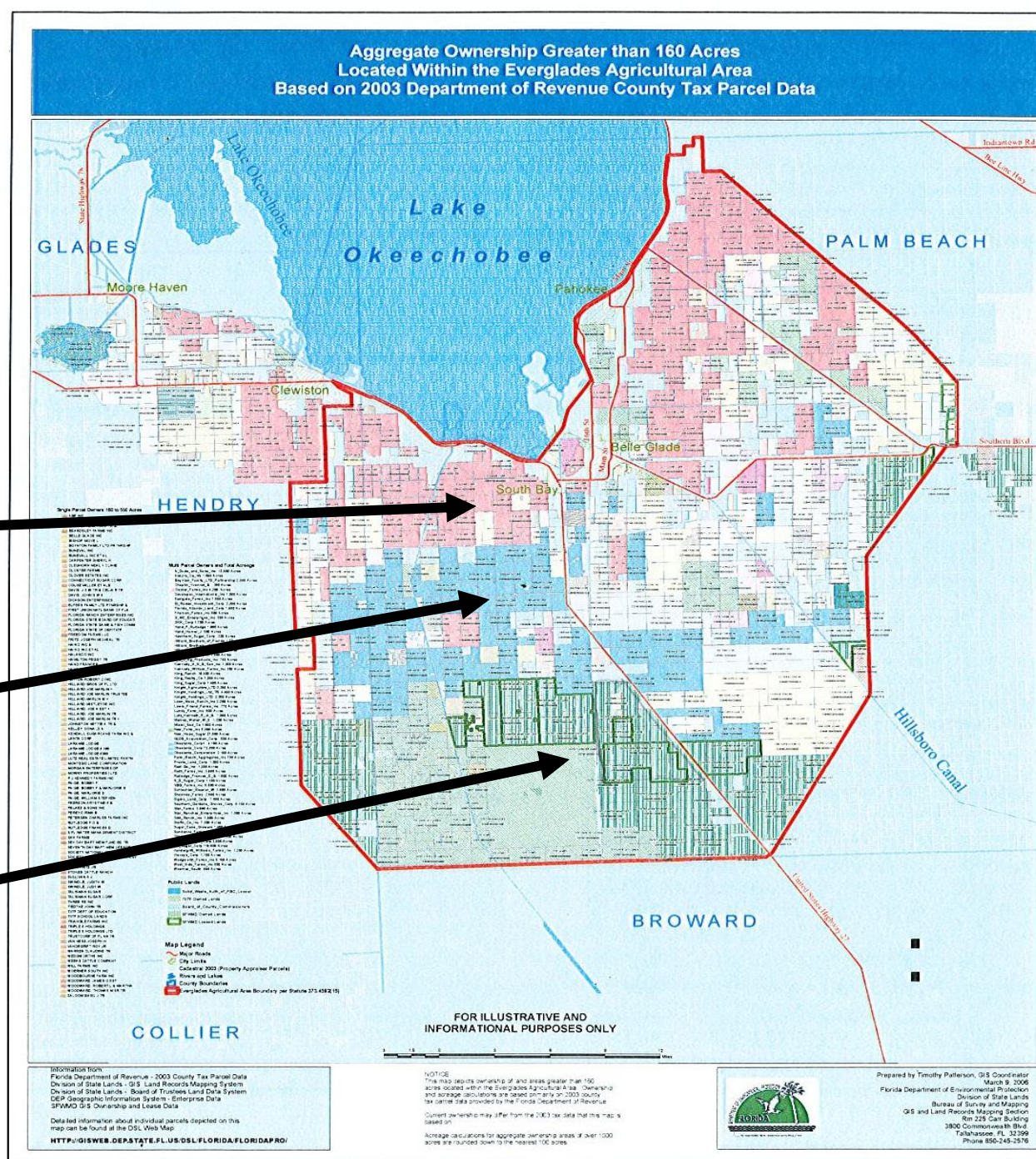


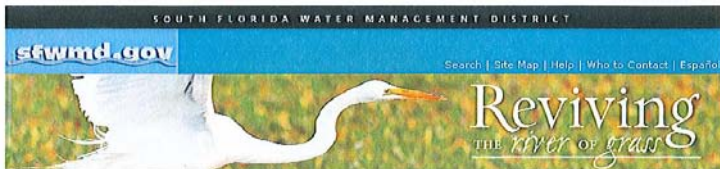
187,000 acres  
 US Sugar Corp.  
 farmlands  
 (red color on map)

US Sugar  
 23,000 acres

Florida Crystals  
 32,000 acres

State-Public  
 76,000 acres





**Governor Shares Proposal to Achieve Everglades Restoration Vision in Tough Economic Climate - APRIL 1, 2009**

TALLAHASSEE – After gathering key input from the public, legislators and South Florida’s communities and in recognition of the nation’s current economic climate, Governor Charlie Crist today shared details of a revised strategy to acquire land for Everglades restoration from the United States Sugar Corporation. The approach incorporates today’s fiscal realities by saving \$800 million at closing, providing ready access to strategically located acreage for restoration projects and preserving thousands of jobs.

“By taking this fiscally conservative approach, we can secure this once-in-a-lifetime opportunity to restore and revive the Everglades despite continued economic challenges,” said Governor Crist. “The proposal represents a balance for both the environment and the economy by allowing us to acquire hundreds of square miles of prime property in affordable steps.”

Under the proposal, the district would initially invest approximately \$530 million for 72,500 acres of property south of Lake Okeechobee – a land mass nearly twice the size of Orlando. Approximately 32,000 acres of that land, currently in citrus production, would be available to the district within a year after closing. The United States Sugar Corporation would lease back the other approximately 40,500 acres of sugar cane land for \$150 per acre per year for at least seven years. The district would have an option to purchase the remaining 107,500 acres of United States Sugar Corporation property for restoration within the first 10 years after closing.

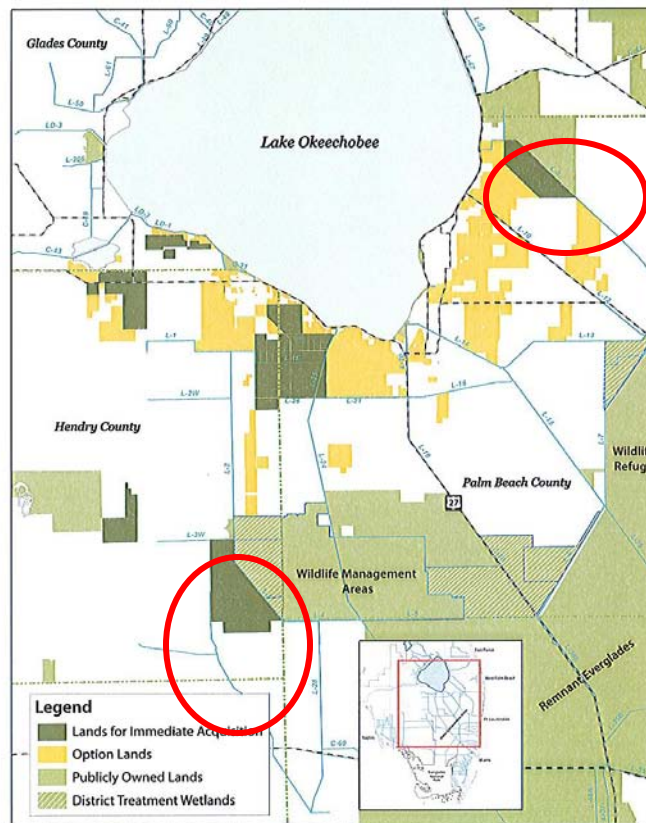
**Highlights of the proposed acquisition terms include:**

- Reducing the immediate public investment by 60 percent, or \$800 million, in addition to reducing annual debt service payments by an estimated \$65 million.
- Tripling the land lease rate to \$150 an acre per year to generate a minimum of \$40 million in revenue and avoid at least \$11 million in land management costs.
- Potentially freeing up revenue over the coming years for “shovel-ready” restoration projects that could create jobs and deliver environmental benefits to the Everglades Protection Area and Florida’s coastal estuaries.
- Sustaining regional agriculture.
- Keeping 1,700 direct jobs intact and protecting 10,000 indirect jobs for at least another decade with the continued operation of the United States Sugar Corporation’s mill and refinery.

**Environmental goals of the acquisition include:**

- Increasing the availability of water storage, significantly reducing the potential for harmful discharges from Lake Okeechobee to the St. Lucie and Caloosahatchee rivers and estuaries when lake levels are high.
- Delivering cleaner water to the Everglades during dry times and greater water storage to protect the natural system during wet years.
- Preventing tons of phosphorus from entering the Everglades every year.
- Significantly reducing the need for “back-pumping” water into Lake Okeechobee from the Everglades Agricultural Area.
- Relieving some pressures on the Herbert Hoover Dike while the federal government undertakes repairs by providing alternative water storage alternatives.
- Improved flexibility in managing Lake Okeechobee levels in a more environmentally friendly way.

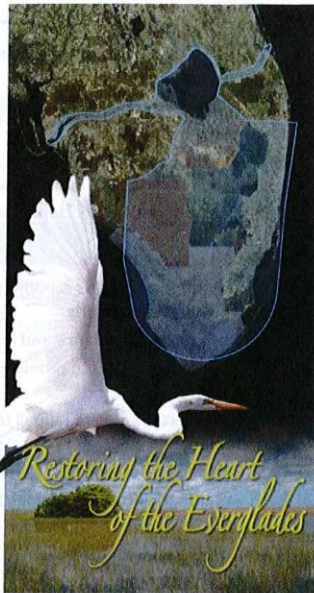
[www.sfwmd.gov/riverofgrass](http://www.sfwmd.gov/riverofgrass)



**US Sugar Corp purchase reduced- 73,000 ac \$530 M in April 2009  
 Then to 27,000 acres for \$197 M - October 2010- 10-year option**



# CENTRAL EVERGLADES PLANNING PROJECT



*Restoring the Heart of the Everglades*

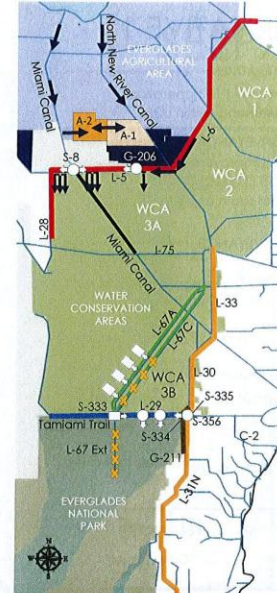
## Central Everglades Planning Project (CEPP)

### Proposed Final Array of Alternatives

Kim Taplin, Chief  
Central Everglades Branch  
U.S. Army Corps of Engineers  
Jacksonville District

December 7, 2012

•CENTRAL EVERGLADES



## PROPOSED ALTERNATIVE 3

### STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

### DISTRIBUTION/CONVEYANCE

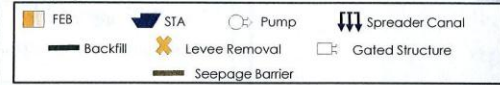
- Diversion of L-6 flows and L-5 canal improvements
- Spreader canal: ~3 miles west of S-8 (3,000 cfs), ~3 miles east of S-8 (800 cfs) and ~1.5 miles east of G-206 (400 cfs)
- Backfill Miami Canal from S-8 to I-75

### DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 3,000 cfs
- Four 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A north and south of structures
- 6,000-ft gaps in L-67C levee at each structure
- Two 500 cfs pumps out of WCA-3B at existing agricultural canals with improvements to agricultural canals in WCA-3B
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Degrade entire L-67 extension levee

### SEEPAGE MANAGEMENT

- Increase S-356 to 1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail 5 miles along L-31N
- Full depth penetrating seepage barrier from S-335 to S-334
- G-211 operational refinements and use coastal canals to convey seepage



RESTORING THE HEART OF THE EVERGLADES

CENTRAL EVERGLADES

35

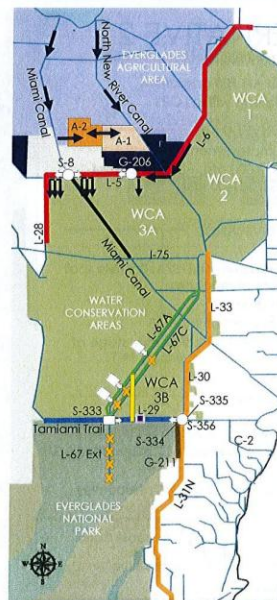
## WHAT'S NEXT? CENTRAL EVERGLADES

- Reduce undesirable discharges to east and west coast estuaries
- Deliver "new" sources of clean water to the Central Everglades and Everglades National Park
- To restore habitat in the Central Everglades and Everglades National Park, focusing on the "River of Grass"

2

RESTORING THE HEART OF THE EVERGLADES

CENTRAL EVERGLADES



## PROPOSED ALTERNATIVE 4

### STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

### DISTRIBUTION/CONVEYANCE

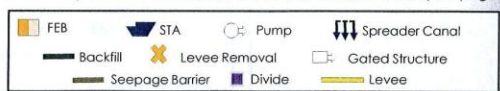
- Diversion of L-6 flows and L-5 canal improvements
- Spreader canal: ~3 miles west of S-8 (3,000 cfs), ~3 miles east of S-8 (800 cfs) and ~1.5 miles east of G-206 (400 cfs)
- Backfill Miami Canal from S-8 to I-75

### DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 3,000 cfs
- Two 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A north and south of structures
- Include levee in WCA 3B
- Degrade L-67C levee in Blue Shanty flowway
- One 500 cfs gated structure north of Blue Shanty levee and 6,000-ft gap in L-67C levee
- Degrade L-29 levee in Blue Shanty flowway, divide structure east of Blue Shanty levee at terminus of western bridge
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Degrade entire L-67 extension levee

### SEEPAGE MANAGEMENT

- Increase S-356 to 1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail 5 miles along L-31N
- G-211 operational refinements; use coastal canals to convey seepage



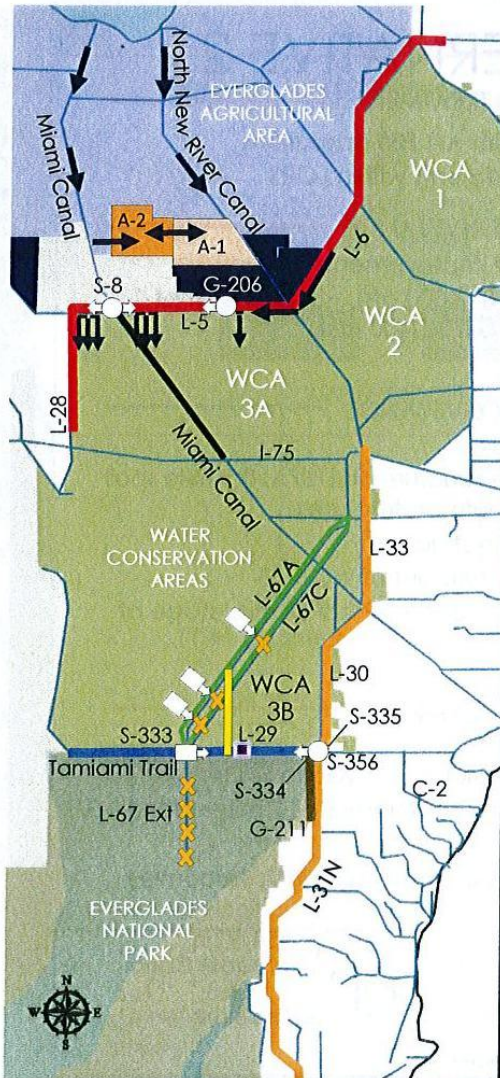
RESTORING THE HEART OF THE EVERGLADES

CENTRAL EVERGLADES

36



Central Everglades Planning Project – Nov. 2011 to Apr. 2013  
Including "Key Projects" Mandated State WQ Improvements



## PROPOSED ALTERNATIVE 4

### STORAGE AND TREATMENT

- Construct A-2 FEB and integrate with A-1 FEB operations
- Lake Okeechobee operation refinements within LORS

### DISTRIBUTION/CONVEYANCE

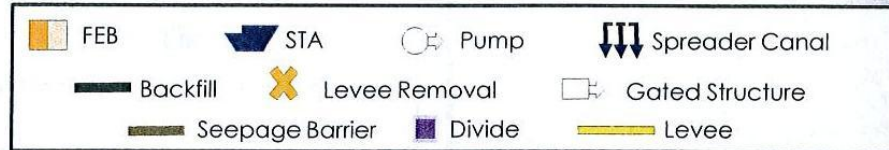
- Diversion of L-6 flows and L-5 canal improvements
- Spreader canal: ~3 miles west of S-8 (3,000 cfs), ~3 miles east of S-8 (800 cfs) and ~1.5 miles east of G-206 (400 cfs)
- Backfill Miami Canal from S-8 to I-75

### DISTRIBUTION/CONVEYANCE

- Increase S-333 capacity to 3,000 cfs
- Two 500 cfs gated structures in L-67A, 0.5 mile spoil removal west of L-67A north and south of structures
- Include levee in WCA 3B
- Degrade L-67C levee in Blue Shanty flowway
- One 500 cfs gated structure north of Blue Shanty levee and 6,000-ft gap in L-67C levee
- Degrade L-29 levee in Blue Shanty flowway, divide structure east of Blue Shanty levee at terminus of western bridge
- Tamiami Trail western 2.6 mile bridge and L-29 canal max stage at 9.7 ft (FUTURE WORK BY OTHERS)
- Degrade entire L-67 extension levee

### SEEPAGE MANAGEMENT

- Increase S-356 to 1,000 cfs
- Partial depth seepage barrier south of Tamiami Trail 5 miles along L-31N
- G-211 operational refinements; use coastal canals to convey seepage



# Fertilizer Pollution in the Everglades Agricultural Area

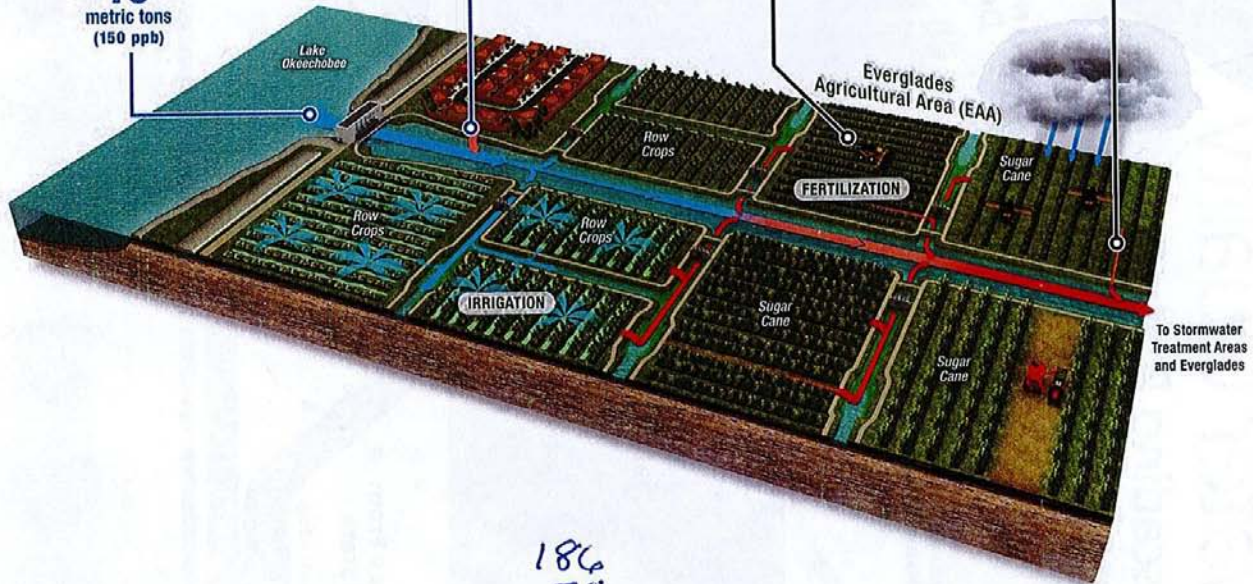
*(Aq) 506K AF (?) x 187 = 95 MT  
(Aq + 2V) 722 K m.t. (?) x 187 = 148 MT*

IRRIGATION WATER FROM LAKE OKEECHOBEE  
**78**  
metric tons  
(150 ppb)

URBAN RUNOFF  
**17**  
metric tons

FERTILIZER APPLICATION  
**2,640**  
metric tons

POLLUTED RUNOFF FROM FARMS  
**186**  
metric tons  
(140 ppb)



NOTE: All numbers are yearly averages.  
Source of data: South Florida Water Management District Database and Reports.

*From Lake O*  
Cal. SLE  
968K AF - 442K AF → 1.4M AF/yr.  
181M P - 83M P → 264M P  
2,207MTN - 1008MTN → 3,215MTN

# POLLUTION COMES FROM EAA

*186  
78  
108 MT Net Export @ 140 ppb.  
What About Nitrogen?*

*District  
Av. Cost per Pounds  
\$ 3-20 per pound  
(SFWMD 3-7-12)*



# COST OF EAA WQ TREATMENT

Everglades Forever Act (1994)  
Existing 6 – Stormwater Treatment  
Areas (STAs) Cost \$ 1.2 Billion

New WQ Mandated Projects (2013 –  
2026) 2 – Flow Equalization Basins  
(FEB) Cost \$ 890 Million

\$ 220 Million SFWMD Reserves

\$ 292 Million New Ad Valorem

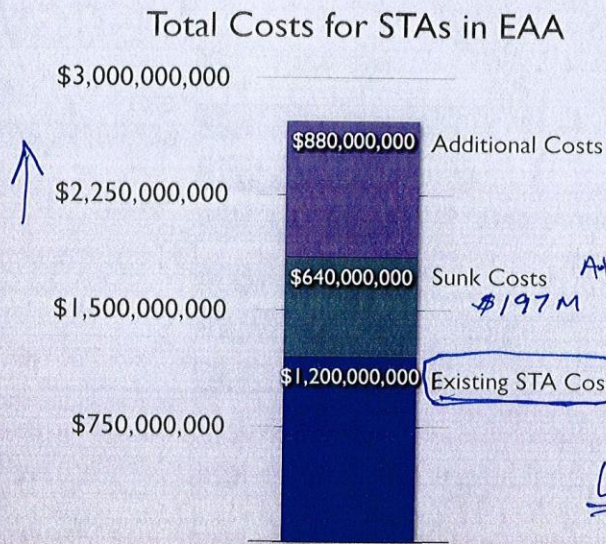
\$ 379 Million State Appropriation

Agricultural Privilege Tax is \$ 25  
per Acre = \$ 11 Million per Year  
Over 13 Years = \$ 143 Million

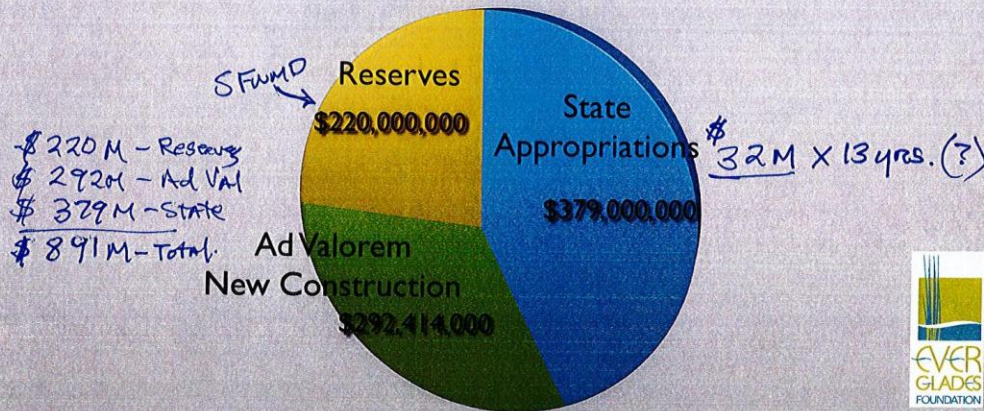
(NOT ENOUGH)



\$ 1.2 B on STAs



Sources of Revenue for New Projects "Key Projects"



# Indian River Lagoon-South Plan

12,000 acres above ground Storage Reservoirs

9,000 acres STA manmade wetlands

90,000 acres Natural Area Storage

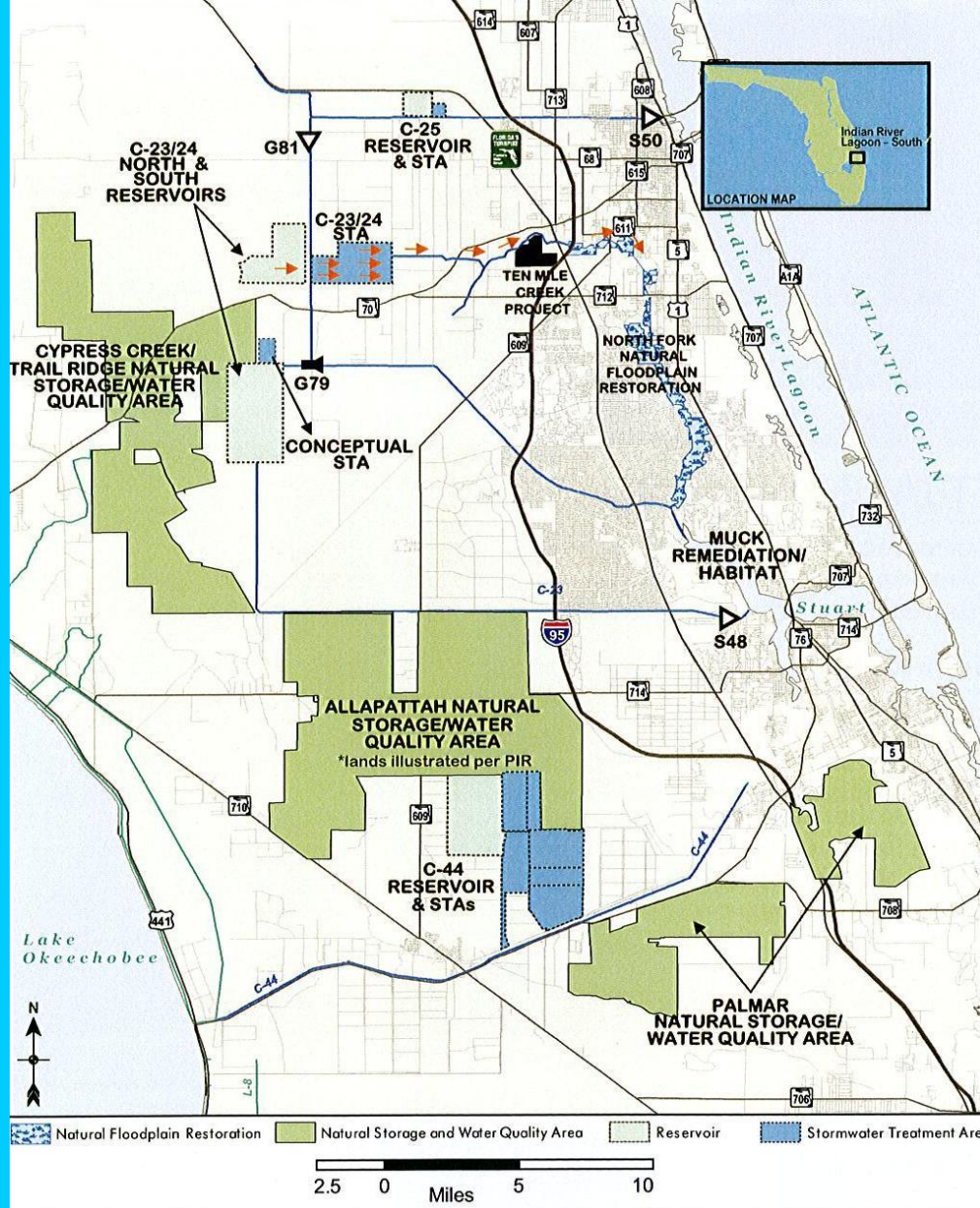
2,650 acres benthic habitat created- 922 acres submerge aquatic habitat restored

7.9 million cubic yards of muck removed

889 acres of restored oyster habitat

41% reduction in Phosphorus

26% reduction in Nitrogen



## C-44 BASIN COMPONENTS

- C-44 – Reservoir
- C-44 – Stormwater Treatment Area
- Palmar Complex – Natural Storage and Water Quality Area

## C-23/24 BASIN COMPONENTS

- C-23/24 – North and South Reservoirs
- C-23/24 – Stormwater Treatment Area
- Allapattah, Cypress Creek and Trail Ridge Complex – Natural Storage and Water Quality Area

## C-25, NORTH FORK AND SOUTH FORK BASIN COMPONENTS

- C-25 – Reservoir
- C-25 – Stormwater Treatment Area
- North Fork Natural Floodplain Restoration Muck Remediation and Artificial Habitat



Part of Comprehensive Everglades Restoration Plan

# ST. LUCIE WATERSHED ASSESSMENT

## VOLUME B: BASIN PRIORITIES

Prepared for:

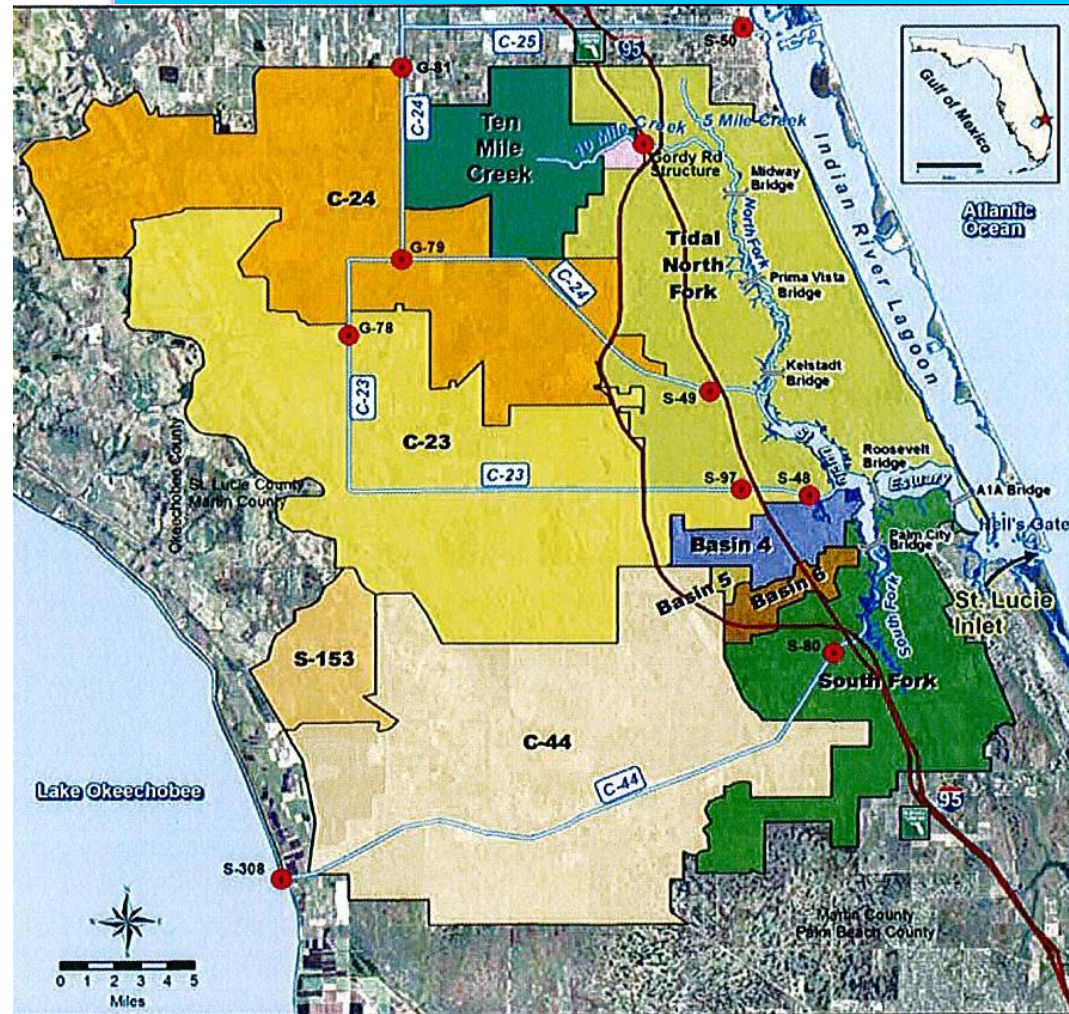
South Florida Water Management District  
P.O. Box 24680  
3301 Gun Club Road  
West Palm Beach, Florida 33416-4680

Prepared by:

Anthony Janicki, David Wade, J. Raymond Pribble, Pam Latham  
PBS&J  
5300 West Cypress Street  
Suite 300  
Tampa, Florida 33607-1712

FINAL REPORT

February, 1999



# St. Lucie River Watershed

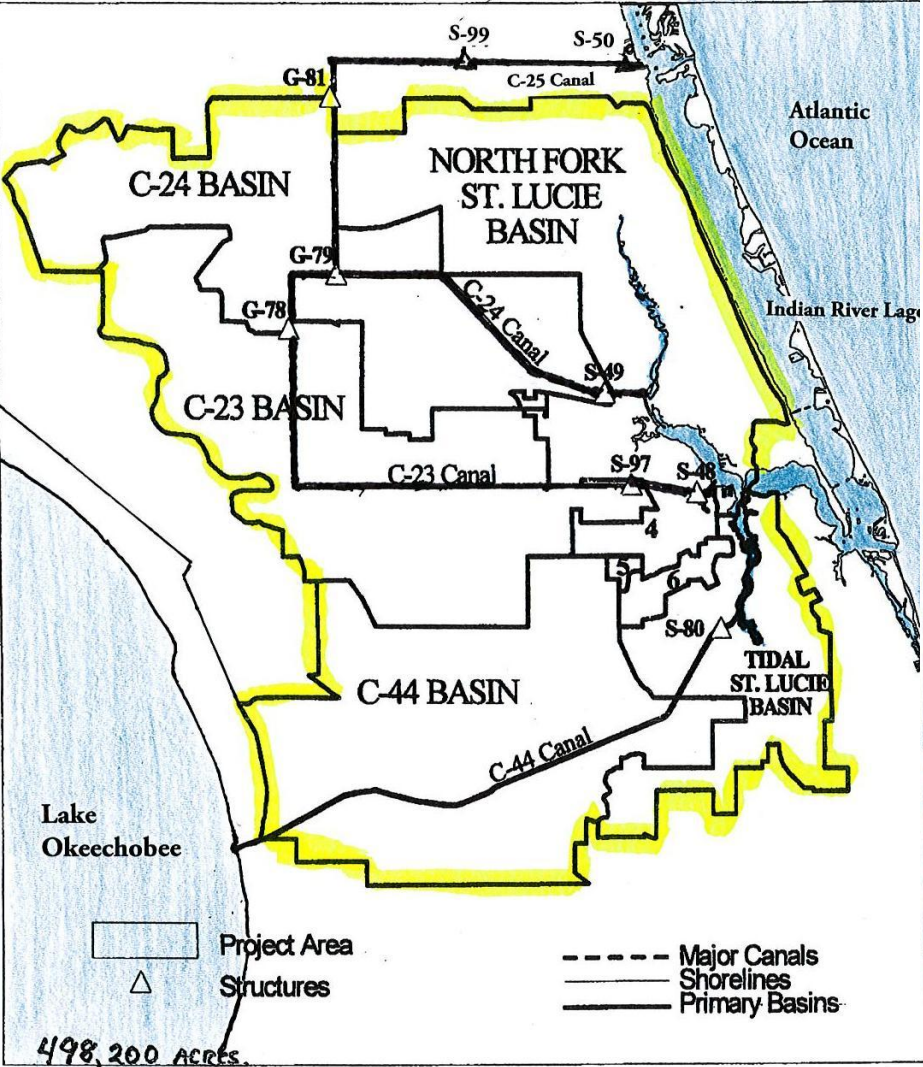
## 514,646 Acres

### Watershed Assessment - February 1999



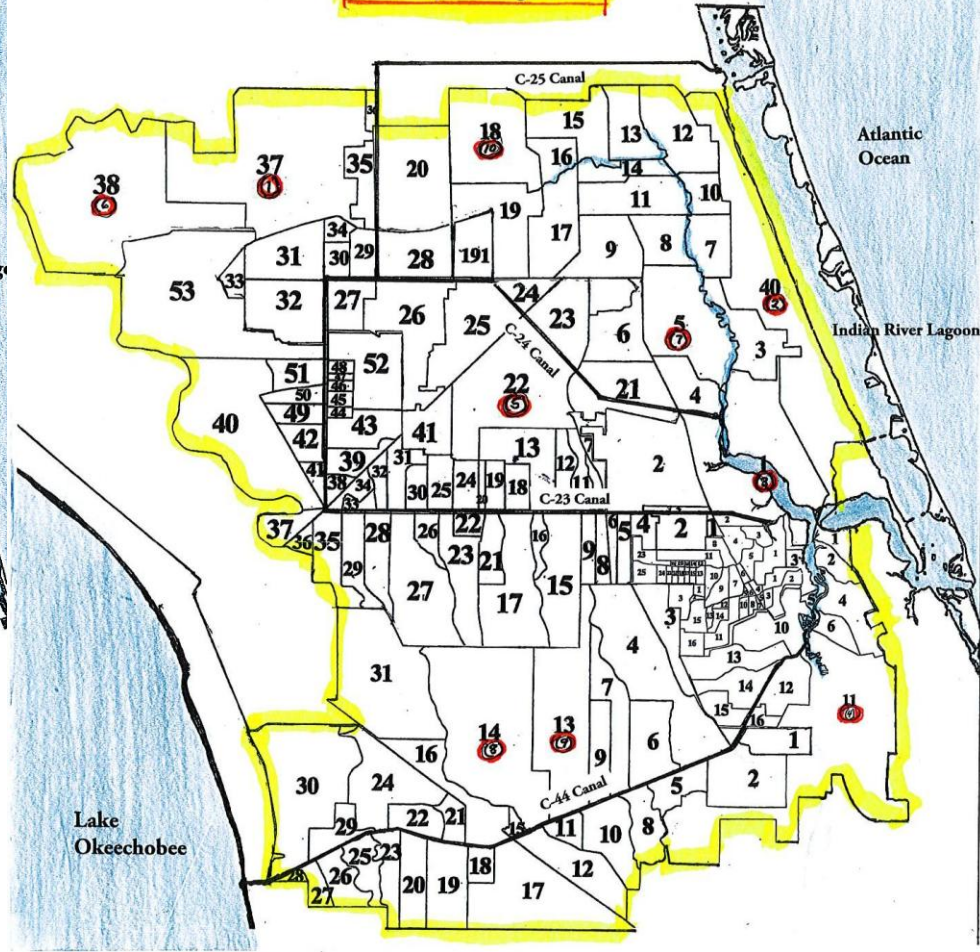
# St. Lucie River Estuary Watershed

## Primary Drainage Basins



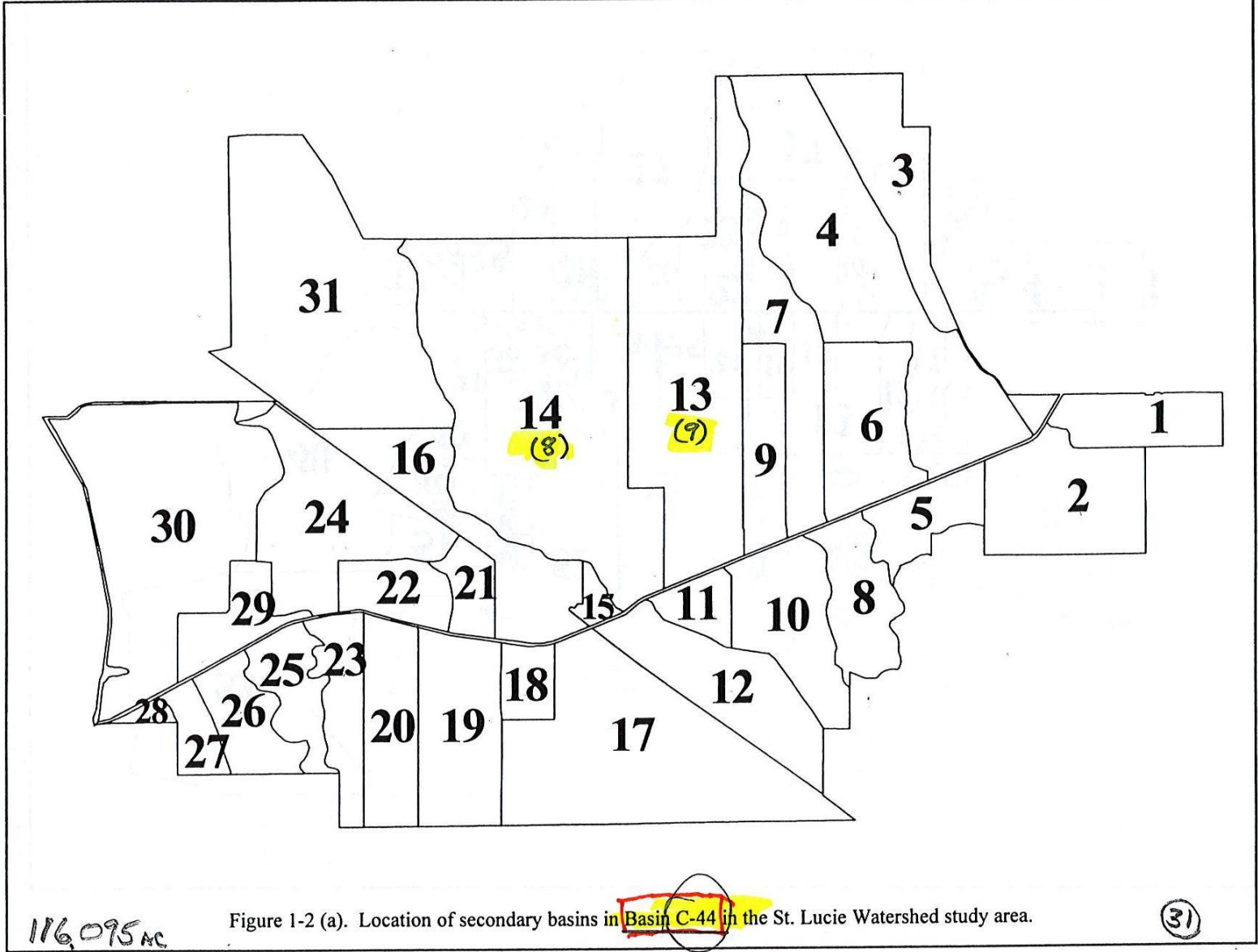
# St. Lucie River Estuary Watershed

## Secondary Drainage Basins



8 Basins – 186 Secondary Basins

# St. Lucie River Estuary Watershed



# C-44 Basin - 31 Secondary Drainage Basins

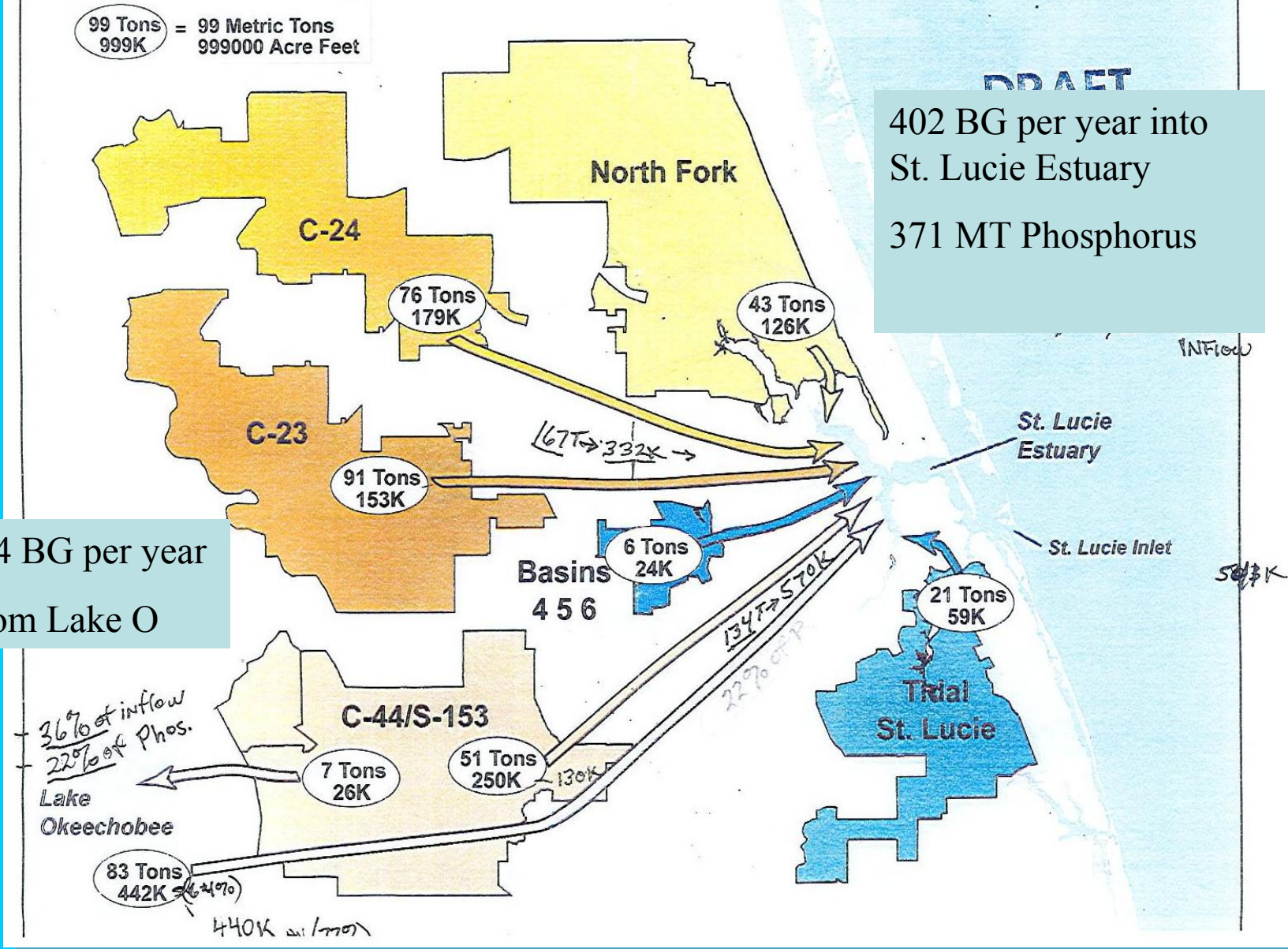
## 25 Pump Stations for Agriculture Irrigation



99 Tons = 99 Metric Tons  
999K = 999000 Acre Feet

**DDA ET**  
402 BG per year into  
St. Lucie Estuary  
371 MT Phosphorus

144 BG per year  
From Lake O



# Annual Phosphorus Loads by Basin to the St. Lucie Estuary

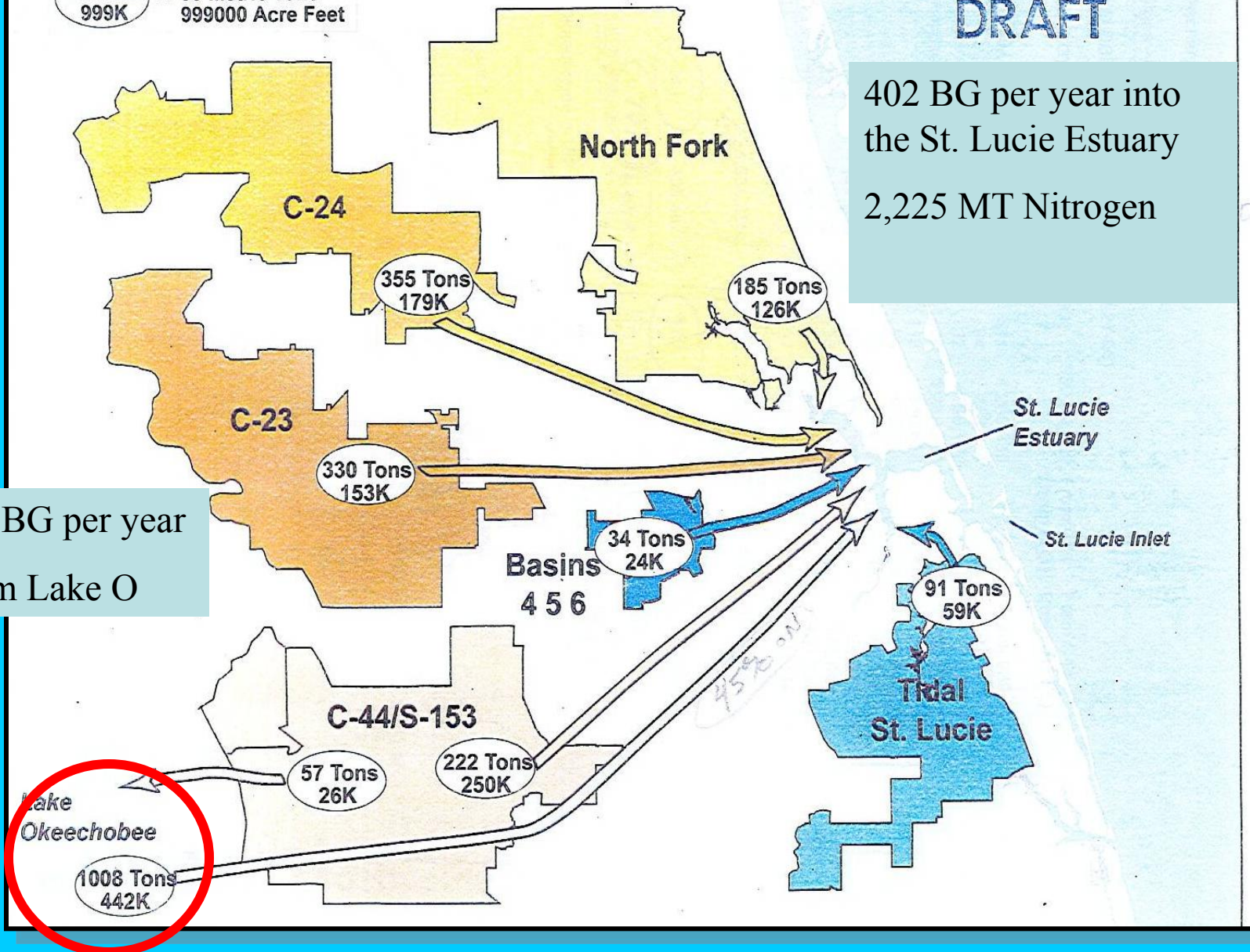
Period of Record 1995-2005 SFWMD

99 Tons = 99 Metric Tons  
999K = 999,000 Acre Feet

DRAFT

402 BG per year into the St. Lucie Estuary  
2,225 MT Nitrogen

144 BG per year  
From Lake O



# Annual Nitrogen Loads by Basin to the St. Lucie Estuary

Period of Record 1995-2005 SFWMD

DRAFT

## BASIN MANAGEMENT ACTION PLAN

for the Implementation of Total Maximum Daily Loads for Nutrients and Dissolved Oxygen Adopted by the Florida Department of Environmental Protection

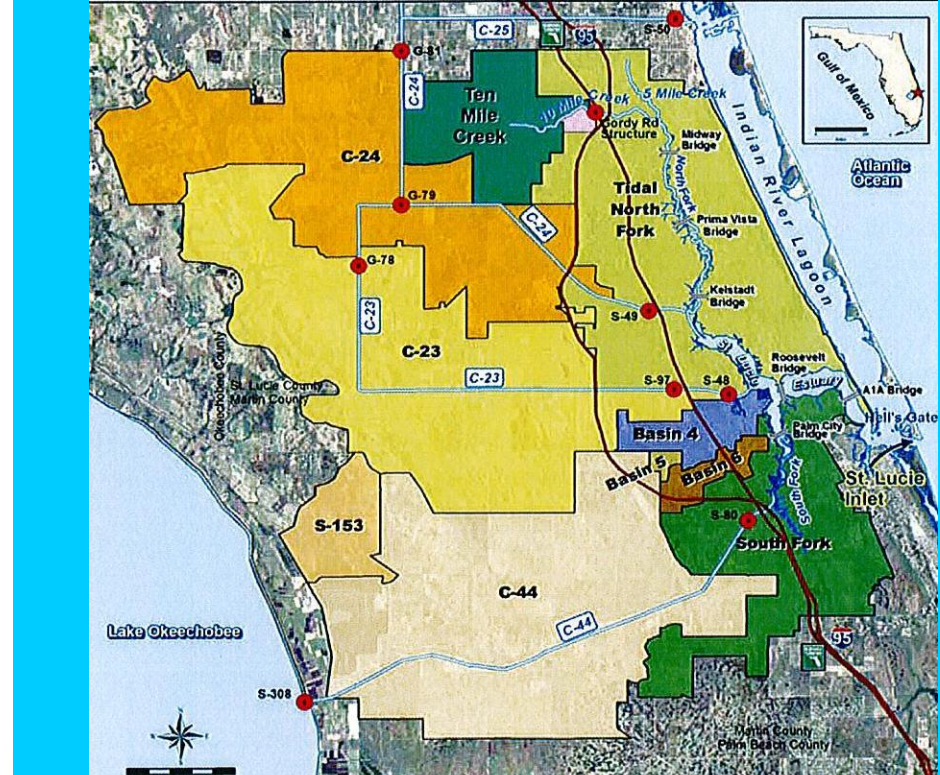
in the

# St. Lucie River and Estuary Basin

developed by the  
St. Lucie River and Estuary Basin Technical Stakeholders

in cooperation with the  
**Florida Department of Environmental Protection**  
Division of Environmental Assessment and Restoration  
Bureau of Watershed Restoration  
Tallahassee, Florida 32399

April 2013



Draft St. Lucie River and Estuary Basin Management Action Plan – April 2013

TABLE 8: ACRES BY ENTITY

ENTITY	BASINS 4, 5, AND 6 (ACRES)	C-23 (ACRES)	C-24 (ACRES)	C-44 S-153 (ACRES)	NORTH FORK (ACRES)	SOUTH FORK (ACRES)	TOTAL (ACRES)
Agriculture	2,445	84,744	63,488	65,937	3,967	18,176	238,757
Copper Creek CDD	-	-	2	-	-	-	2
FDOT District 4	171	306	137	270	864	636	2,384
Fort Pierce MS4	-	-	-	-	3,706	-	3,706
FPL Pond	-	-	-	6,501	-	-	6,501
Hobe St. Lucie Conservancy District	-	-	-	2,949	-	1,945	4,894
Martin County MS4	4,989	1,738	-	2,231	4,378	7,763	21,099
Natural Lands	7,830	23,706	15,701	37,163	33,129	18,987	136,516
North St. Lucie River WCD	-	-	4,028	-	-	32,491	36,519
Okeechobee County MS4	-	574	30	-	-	-	604
Pal Mar WCD	-	-	-	1,161	-	4	1,165
Port St. Lucie MS4	-	326	1,258	-	34,118	-	35,702
Sewall's Point MS4	-	-	-	-	457	-	457
St. Lucie County MS4	-	-	-	-	3,995	-	3,995
St. Lucie County Non-MS4	-	763	2,172	-	1,146	-	4,081
Stuart MS4	-	-	-	-	353	2,386	2,739
Tradition CDD	-	-	923	-	6	-	929
Troup-Indiantown WCD	-	-	-	13,649	-	-	13,649
Turnpike	147	10	-	-	528	226	911
Verano CDD	-	-	36	-	-	-	36
<b>Total</b>	<b>15,582</b>	<b>112,167</b>	<b>87,775</b>	<b>129,861</b>	<b>119,138</b>	<b>50,123</b>	<b>514,646</b>

TABLE 6: TN STARTING LOADS BY ENTITY

ENTITY	BASINS 4, 5, AND 6 (LBS/YR)	C-23 (LBS/YR)	C-24 (LBS/YR)	C-44 S-153 (LBS/YR)	NORTH FORK (LBS/YR)	SOUTH FORK (LBS/YR)	TOTAL (LBS/YR)	TOTAL (MT/YR)
<b>Agriculture</b>	17,051	470,081	574,852	350,703	24,355	126,080	1,563,122	709.02
Copper Creek CDD	-	-	14	-	-	-	14	0.01
FDOT District 4	952	1,510	950	1,176	4,277	3,649	12,514	5.68
Fort Pierce MS4	-	-	-	-	17,041	-	17,041	7.73
FPL Pond	-	-	-	41,022	-	-	41,022	18.61
Hobe St. Lucie Conservancy District	-	-	-	13,374	-	10,819	24,193	10.97
Martin County MS4	26,394	5,947	-	8,243	19,806	40,423	100,813	45.73
Natural Lands	15,128	14,991	24,792	49,942	43,326	26,980	175,159	79.45
North St. Lucie River WCD	-	-	37,251	-	160,152	-	197,403	89.54
Okeechobee County MS4	-	3,184	121	-	-	-	3,305	1.50
Pal Mar WCD*	-	-	-	6,758	-	22	6,780	3.08
Port St. Lucie MS4	-	1,515	8,275	-	146,691	-	156,481	70.98
Sewall's Point MS4	-	-	-	-	1,771	-	1,771	0.80
St. Lucie County MS4	-	-	-	-	18,114	-	18,114	8.22
St. Lucie County Non-MS4	-	1,594	16,757	-	5,409	-	23,760	10.78
Stuart MS4	-	-	-	-	1,614	12,384	13,998	6.35
Tradition CDD	-	1	7,057	-	31	-	7,089	3.22
Troup-Indiantown WCD	-	-	-	62,219	-	-	62,219	28.22
Turnpike	789	51	-	-	2,651	1,286	4,777	2.17
Verano CDD	-	-	257	-	-	-	257	0.12
<b>Total</b>	<b>60,314</b>	<b>498,874</b>	<b>670,326</b>	<b>533,437</b>	<b>445,238</b>	<b>221,643</b>	<b>2,429,832</b>	<b>1,102.18</b>

## Draft St. Lucie River and Estuary Basin Management Action Plan – April 2013

TABLE 7: TP STARTING LOADS BY ENTITY

ENTITY	BASINS 4, 5, AND 6 (LBS/YR)	C-23 (LBS/YR)	C-24 (LBS/YR)	C-44 S-153 (LBS/YR)	NORTH FORK (LBS/YR)	SOUTH FORK (LBS/YR)	TOTAL (LBS/YR)	TOTAL (MT/YR)
<b>Agriculture</b>	3,920	150,255	136,471	66,809	5,988	26,869	390,312	177.04
Copper Creek CDD	-	-	3	-	-	-	3	0.00
FDOT District 4	200	464	226	175	818	659	2,542	1.15
Fort Pierce MS4	-	-	-	-	3,879	-	3,879	1.76
FPL Pond	-	-	-	8,361	-	-	8,361	3.79
Hobe St. Lucie Conservancy District	-	-	-	2,689	-	2,563	5,252	2.38
Martin County MS4	5,930	2,250	-	1,431	4,339	8,419	22,369	10.15
Natural Lands	3,383	19,795	11,341	3,525	9,639	5,054	52,737	23.92
North St. Lucie River WCD	-	-	9,063	-	36,821	-	45,884	20.81
Okeechobee County MS4	-	937	38	-	-	-	975	0.44
Pal Mar WCD	-	-	-	1,008	-	4	1,012	0.46
Port St. Lucie MS4	-	518	2,206	-	32,292	-	35,016	15.88
Sewall's Point MS4	-	-	-	-	384	-	384	0.17
St. Lucie County MS4	-	-	-	-	4,127	-	4,127	1.87
St. Lucie County Non-MS4	-	838	3,961	-	1,273	-	6,072	2.75
Stuart MS4	-	-	-	-	379	2,727	3,106	1.41
Tradition CDD	-	-	1,903	-	7	-	1,910	0.87
Troup-Indiantown WCD	-	-	-	12,623	-	-	12,623	5.73
Turnpike	170	16	-	-	506	233	925	0.42
Verano CDD	-	-	63	-	-	-	63	0.03
<b>Total</b>	<b>13,603</b>	<b>175,073</b>	<b>165,275</b>	<b>96,621</b>	<b>100,452</b>	<b>46,528</b>	<b>597,552</b>	<b>271.03</b>

DRAFT

## BASIN MANAGEMENT ACTION PLAN

for the Implementation of Total Maximum Daily Loads for Nutrients  
and Dissolved Oxygen Adopted by the Florida Department of  
Environmental Protection

in the

# St. Lucie River and Estuary Basin

developed by the  
St. Lucie River and Estuary Basin T

in cooperation with  
Florida Department of Environr  
Division of Environmental Assessme  
Bureau of Watershed Res  
Tallahassee, Florida 3

April 2013

**TABLE 24: AGRICULTURAL TN AND TP LOAD REDUCTION ALLOCATIONS AND ESTIMATED REDUCTIONS IN TN AND TP LOAD IN THE FIRST 5 YEARS**

ESTIMATED LOADS	TN (LBS/YR)	TP (LBS/YR)
Agricultural Starting Load	1,563,122.0	390,312.0
Agricultural Required Reduction	812,924.0	307,059.0
Required Reduction for First Phase of BMAP	243,877.2	92,117.7
Estimated Load Reductions via BMPs, 90% Target Enrollment*	197,216.6	40,442.0
Estimated Load Reduction Credit for Land Use Changes*	171,776.4	54,191.1
<b>Total Estimated Reductions</b>	<b>368,993.0</b>	<b>94,663.1</b>
Remaining Load Reductions Needed for First Phase of BMAP	-125,115.8 (credit)	-2,515.4 (credit)

\* Note: Load reduction estimates/credits do not include agricultural lands within WCDs.

TMDL – BMAP Implementation

June 2013 - Adopted & Enforceable –

2013 – 2018 “First Phase” -30% Reduction

2018 – 2028 “Second & Third Phase” Remaining 70% Reduction



**ST. LUCIE WATERSHED ASSESSMENT**

**VOLUME B: BASIN PRIORITIES**

Prepared for:

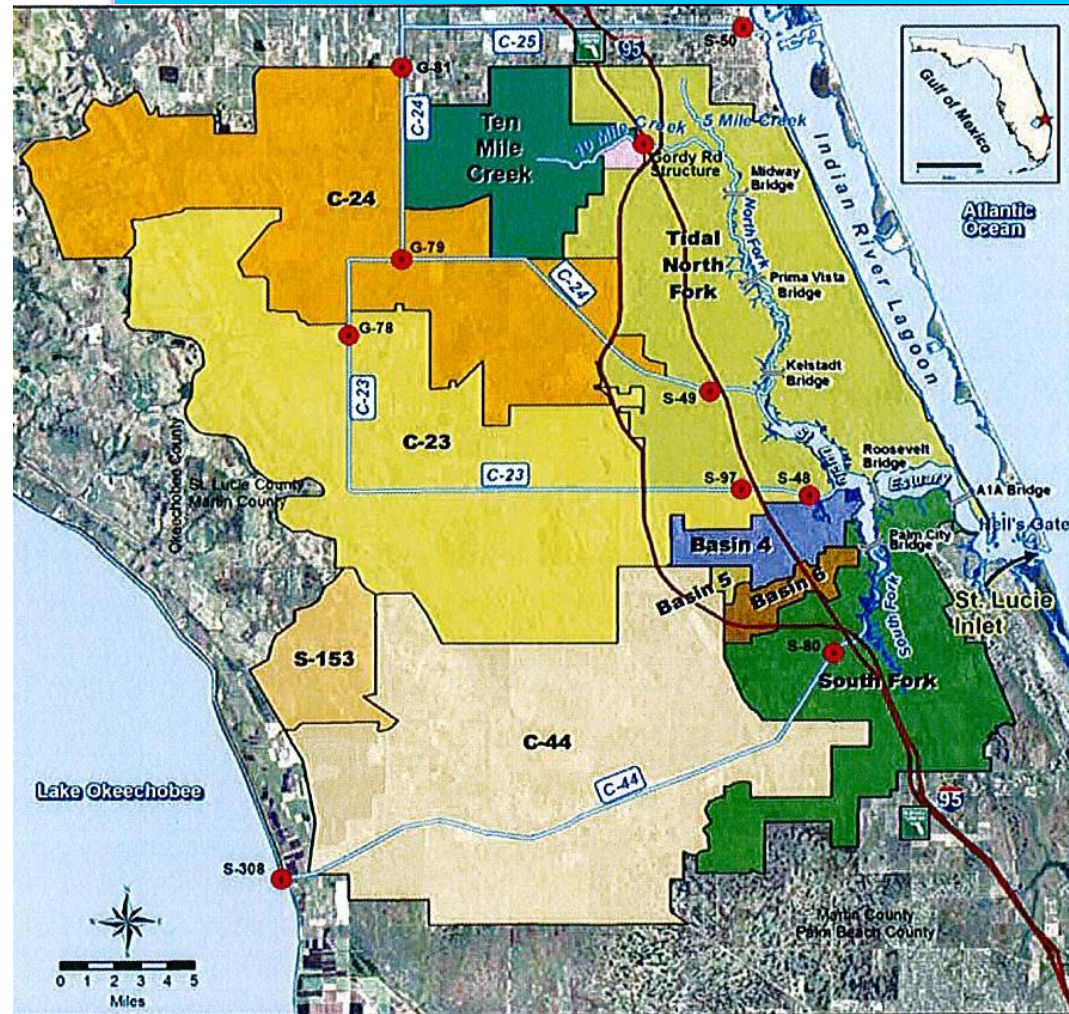
South Florida Water Management District  
P.O. Box 24680  
3301 Gun Club Road  
West Palm Beach, Florida 33416-4680

Prepared by:

Anthony Janicki, David Wade, J. Raymond Pribble, Pam Latham  
PBS&J  
5300 West Cypress Street  
Suite 300  
Tampa, Florida 33607-1712

**FINAL REPORT**

**February, 1999**



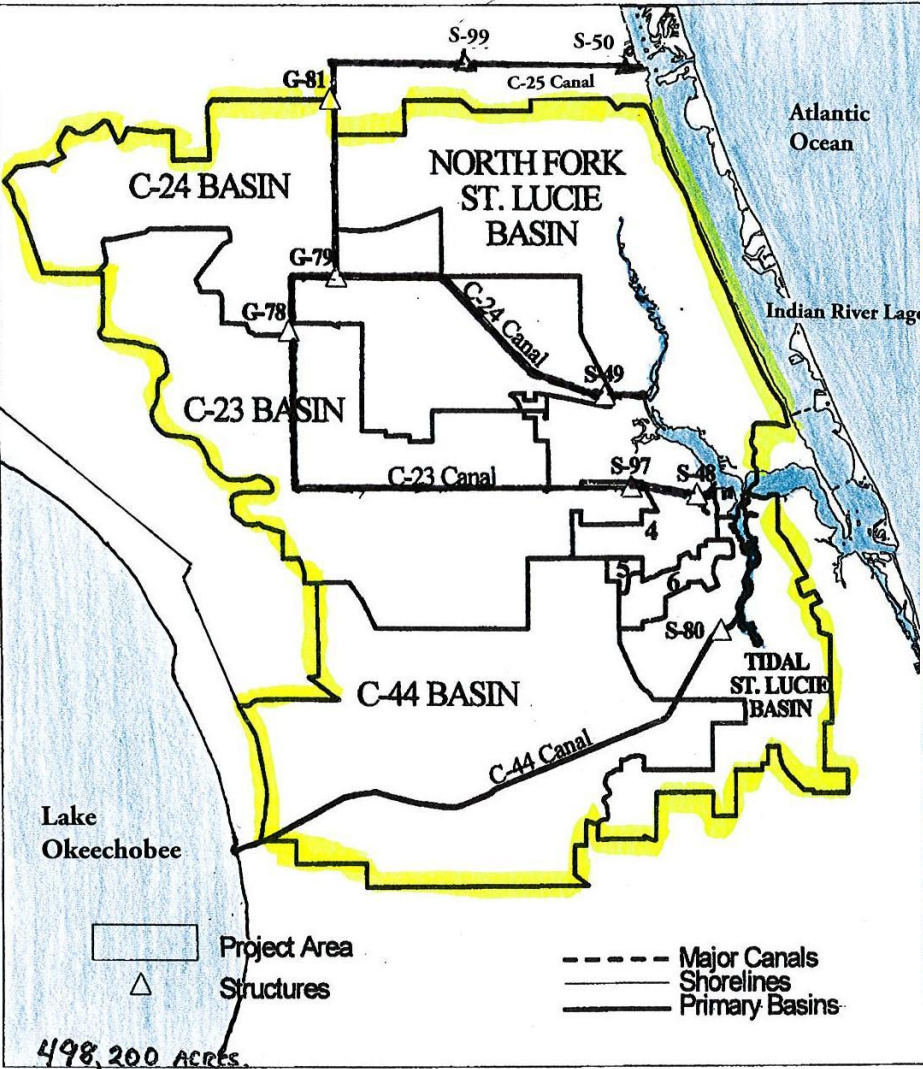
**St. Lucie River Watershed  
514,646 Acres**

**Watershed Assessment - February 1999**



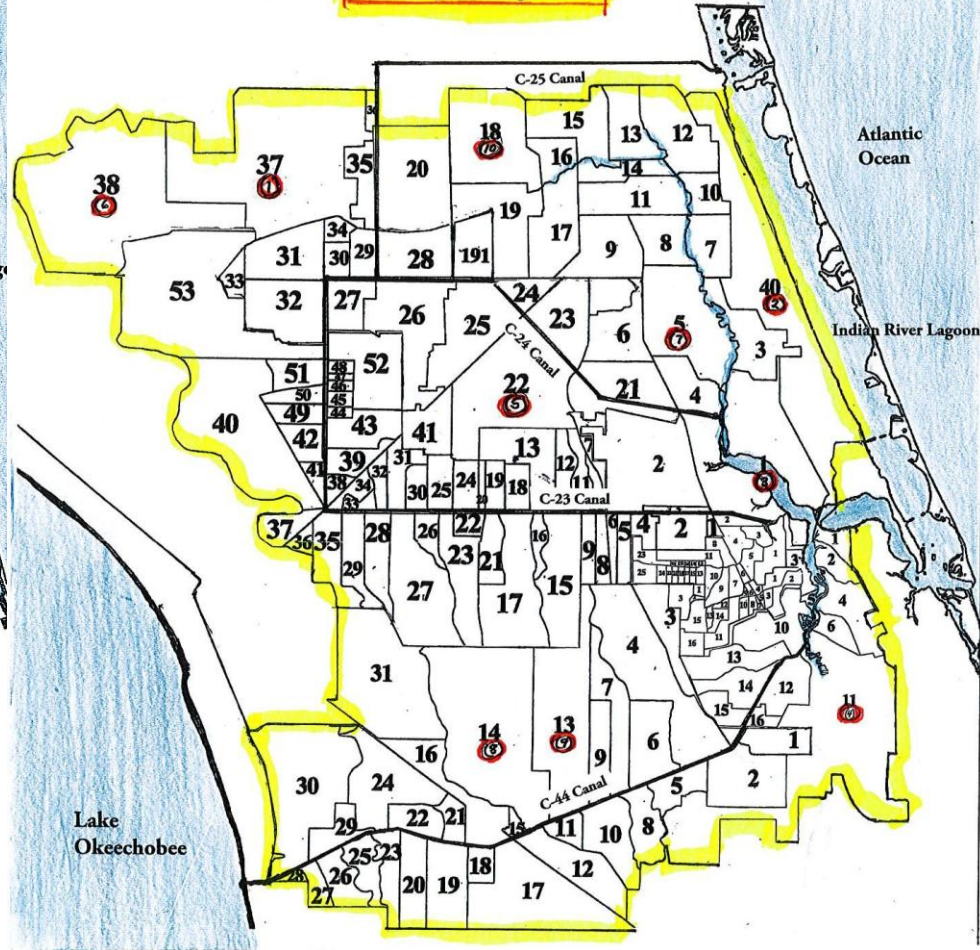
# St. Lucie River Estuary Watershed

## Primary Drainage Basins



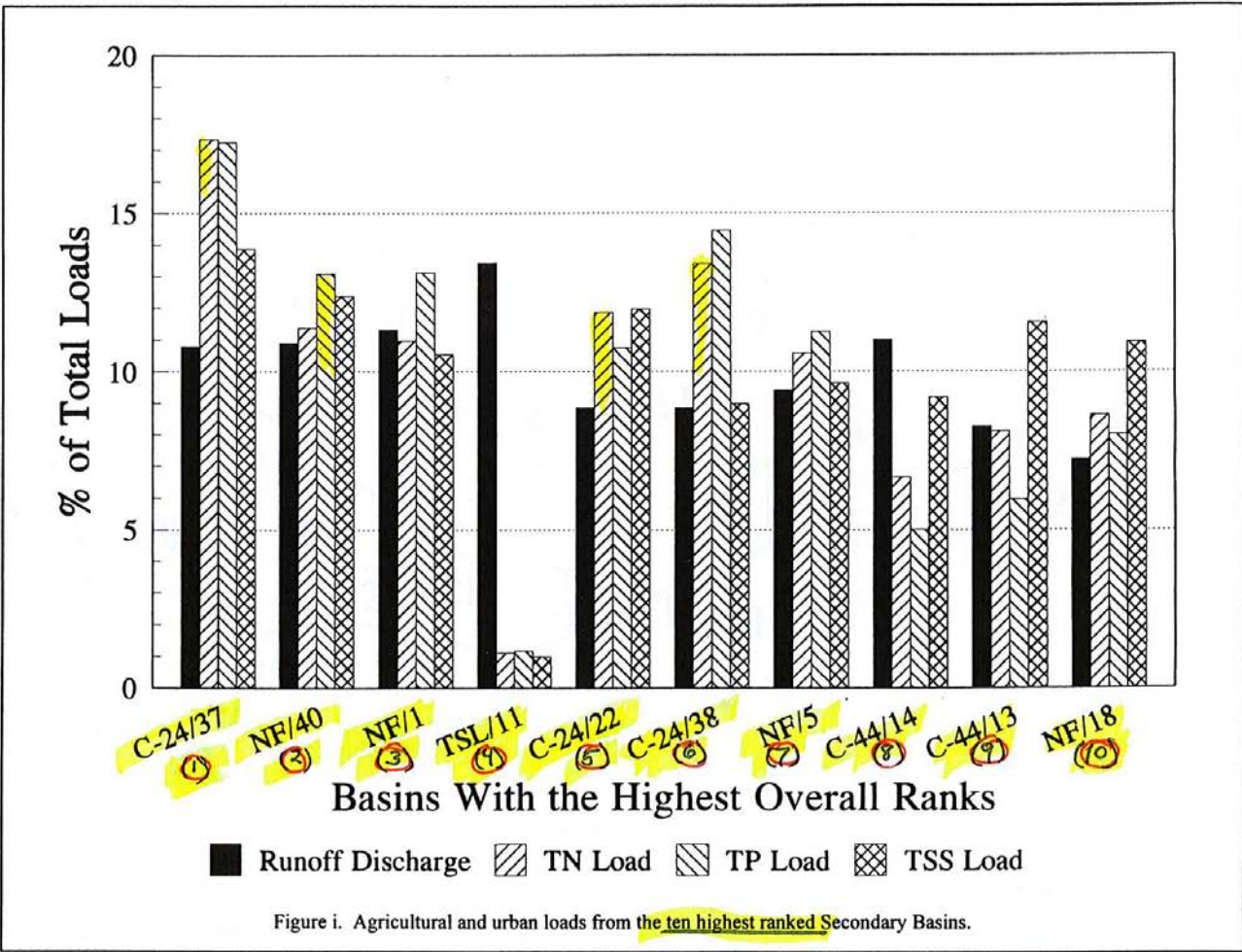
# St. Lucie River Estuary Watershed

## Secondary Drainage Basins



8 Basins – 186 Secondary Basins

# St. Lucie River Estuary Watershed



x

# Greater Everglades Ecosystem Restoration

1 - Reconnect the “River of Grass” between Lake Okeechobee and the Everglades.

2- Restore the Kissimmee River valley and flood plain.

3 - Manage Lake Okeechobee between 12.5 ft and 15.5 ft.

4 - Enforce treating water pollution at the source of the problem, not downstream.



Advocacy of Florida  
Oceanographic Society  
since March 2001



# Current Everglades & Related Issues

1- Secure Everglades restoration funding in State Budget- \$70 million -Florida Legislature & Governor

2 - Implement EPA and Florida Numeric Nutrient Criteria in state water quality standards - Florida Legislature & Governor

3 –Move forward with USACOE & USDOJ Central Everglades Planning Project-”MOVE WATER SOUTH” (start)- U.S. Congress & President

4 – Secure Appropriation of USDOJ 5.5 mile bridge Tamiami Trail Project- Authorized \$349 M- U.S. Congress & President

5 – Secure continuing Appropriation of USACOE for C-44 Project- Indian River Lagoon-South Plan- U.S. Congress & President

6 – STOP ALL DISCHARGES INTO the St. Lucie Estuary FROM C-44, C-23 and C-24 Canals



April 2013



- HOME
- ABOUT US
- SUPPORT US
- GET INVOLVED**
- BUSINESS SUPPORTERS
- EDUCATION
- RESEARCH
- ENVIRONMENT
- WEATHER
- EVENTS
- NEWS
- PHOTO GALLERY
- SHOP
- LOGIN
- CONTACT US

## Welcome to Florida Oceanographic Society

Join our mission to *inspire environmental stewardship of Florida's coastal ecosystems through education and research.*



Welcome to Florida Oceanographic Society. With more than 8,500 miles of tidal shorelines, 2.1 million acres of estuaries and 30% of the state's land cover consisting of wetlands, Florida's relationship to water is vital to the prosperity of our state.

Since 1964, Florida Oceanographic Society has worked to protect our coastal ecosystems through education and research. I invite you to get involved today - [VISIT THE COASTAL CENTER](#), [BECOME A MEMBER](#), and [VOLUNTEER](#). Together let's inspire environmental stewardship for generations to come.

### FEATURED EVENTS



Florida  
 January  
 4 Full-D  
 2 Exec  
 & Labs  
 Transp  
 Very Li  
 \$170 M  
 \$200 Ne  
 For Reg  
 Ca  
 (772)

- HOME
- ABOUT US
- SUPPORT US
- GET INVOLVED
  - [Become a Member](#)
  - [Volunteer](#)
  - [Young Friends](#)
  - [Contact Your Legislators](#)**
- BUSINESS SUPPORTERS
- EDUCATION
- RESEARCH
- ENVIRONMENT
- WEATHER
- EVENTS
- NEWS
- PHOTO GALLERY
- SHOP
- LOGIN
- CONTACT US

WHA

- HOME
- ABOUT US
- SUPPORT US
- GET INVOLVED
- BUSINESS SUPPORTERS
- EDUCATION
- RESEARCH
- ENVIRONMENT
- WEATHER
- EVENTS
- NEWS
- PHOTO GALLERY
- SHOP
- LOGIN
- CONTACT US

fos > get involved > contact your legislators

### Contact Your Legislators

#### Contact Your Legislators

#### U.S. Congress

U.S. House of Representatives - (435)

[http://www.house.gov/house/MemberWWW\\_by\\_State.shtml](http://www.house.gov/house/MemberWWW_by_State.shtml)

U.S. Senators - (100)

[http://www.senate.gov/general/contact\\_information/senators\\_cfm.cfm](http://www.senate.gov/general/contact_information/senators_cfm.cfm)

#### State of Florida Legislature

State of Florida Senators - (40)

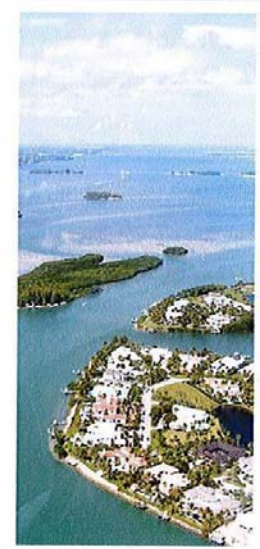
<http://www.flsenate.gov/Legislators/index.cfm?Mode=Member%20Pages&Submenu=1&Tab=legislators&CFID=26112135&CFTOKEN=33260436>

State of Florida House of Representatives - (120)

<http://www.myfloridahouse.gov/Sections/Representatives/representatives.aspx>

#### Florida Governor

<http://www.flgov.com/contact-gov-scott/>



Follow us:   



Learn More at [www.FloridaOcean.org](http://www.FloridaOcean.org)

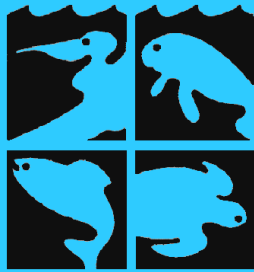
# What about our Future?



# Our Mission:

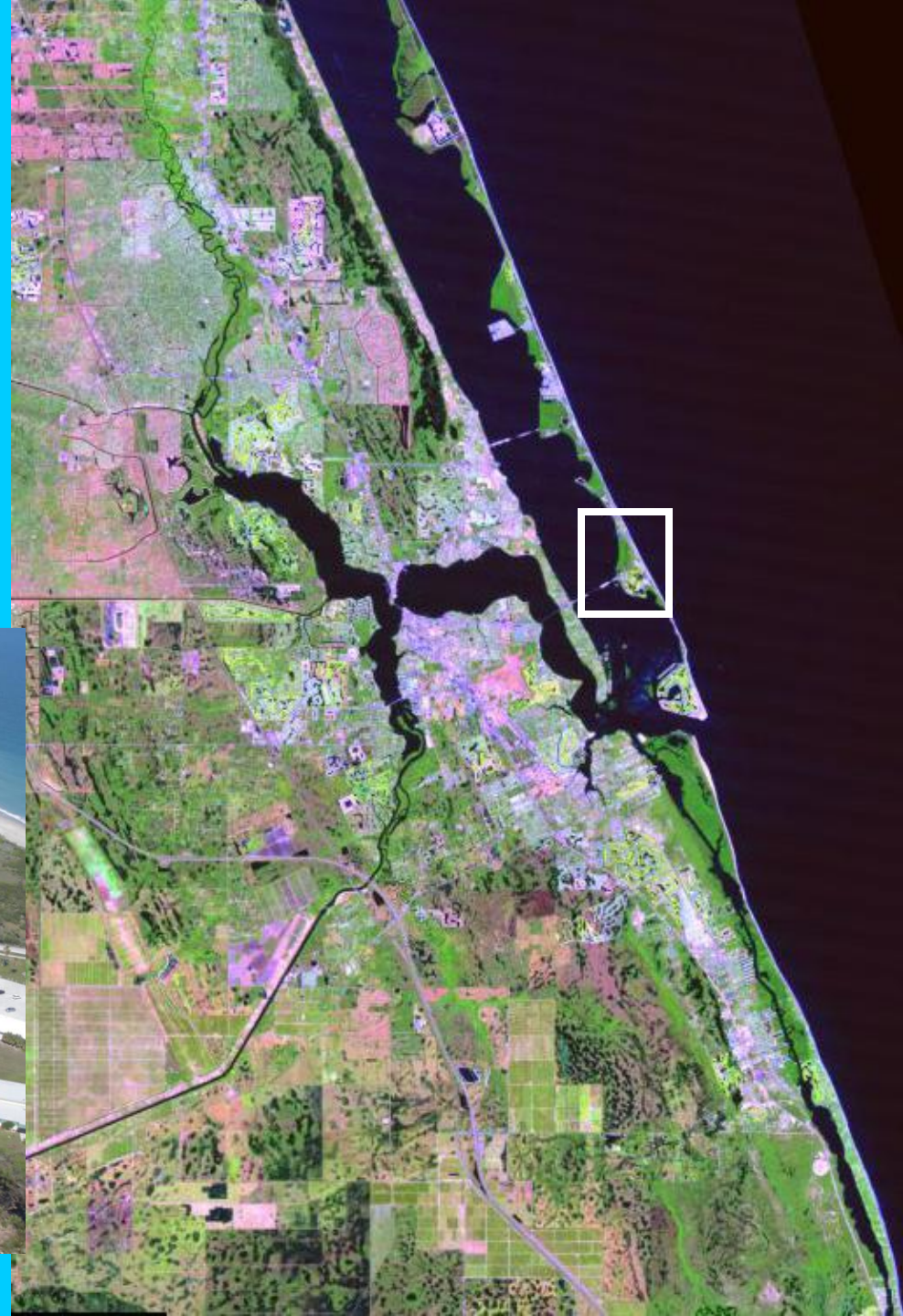
*To inspire  
environmental  
stewardship of  
Florida's coastal  
ecosystems through  
education and  
research.*





# Florida Oceanographic Coastal Center

Florida Oceanographic Coastal Center  
located on Hutchinson Island in Stuart,  
Florida.







750,000 gallon Game Fish Lagoon

## Education & Programs

*Hands-on learning for  
children and adults*

- *Ray Feeding Programs*
- *Sea Turtle Programs*
- *Game Fish Lagoon Feeding Programs*
- *Guided Nature Trail Walks*



## Research & Conservation

- *Water Quality Monitoring*
- *Oyster Reef Restoration*
- *Native Plant Restoration*
- *St. Lucie Estuary/Indian River  
Lagoon & Everglades Conservation  
Efforts*



# St. Lucie River Estuary Water Quality Outlook

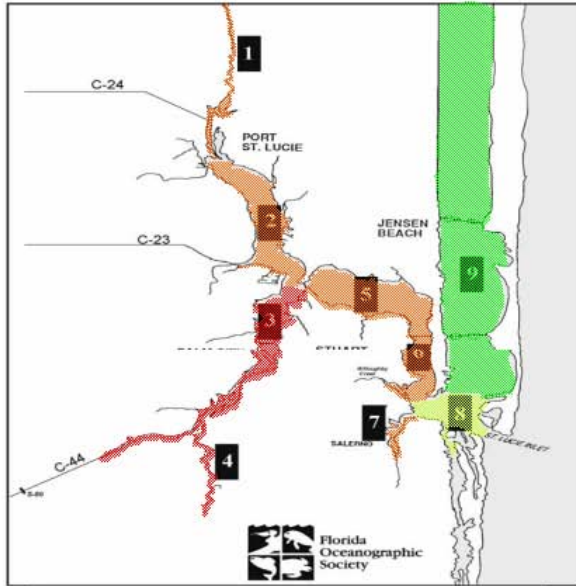
This information is provided by the Florida Oceanographic Society with support of the Marine Resources Council. It is collected by the Citizen Volunteer Water Quality Monitoring Network. For complete data go to our website at:

<http://www.floridaoceanographic.org/water.htm>

Posted: **06/17/10**

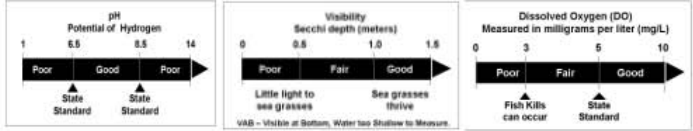
Overall Grade: **67.9%** **D+** **POOR**

Zone/Location	Water Temp. Deg. F	pH	visibility (Secchi) Meters	Salinity ppt	Dissolved Oxygen mg/L	Score	Grade
1. Winding North Fork	87	7.7	0.70 Fair	0.0 Poor	4.8 Fair	61%	D Poor
2. North Fork	88	7.7	0.79 Fair	0.0 Poor	4.5 Fair	61%	D Poor
3. South Fork	89	8.0	0.35 Poor	0.7 Poor	6.4 Good	56%	F Destructive
4. Winding South Fork	85	7.3	0.55 Fair	0.0 Poor	2.0 Poor	56%	F Destructive
5. Wide Middle River	89	8.0	0.60 Fair	2.0 Poor	5.8 Good	66%	D Poor
6. Narrow Middle River	86	8.3	0.95 Fair	13.0 Poor	6.9 Good	66%	D Poor
7. Manatee Pocket	90	8.1	0.90 Fair	18.0 Poor	7.1 Good	66%	D Poor
8. Inlet Area	86	8.4	1.15 Good	27.5 Fair	4.9 Fair	81%	B Good
9. IRL	88	8.5	1.45 Good	30.0 Good	6.8 Good	97%	A Ideal



Grading				
A	B	C	D	F
90-100	80-89	70-79	60-69	0-59
IDEAL	GOOD	SATISFACTORY	POOR	DESTRUCTIVE

Salinity (Parts per Thousand)				
Zones	Description	Good	Fair	Poor
1 & 4	Winding North & South Forks	2 to 8	1 to 2 or 8 to 15	< 1 or > 15
2 & 3	Inner St. Lucie Estuary (North & South Fork)	15 to 25	10 to 15 or > 25	< 10
5	Wide Middle St. Lucie River	> 20		
6	Narrow Middle St. Lucie River	> 25		
7	Manatee Pocket	> 27.5		
8 & 9	Inlet and Indian River Lagoon (to Jensen Beach Causeway)	>30		

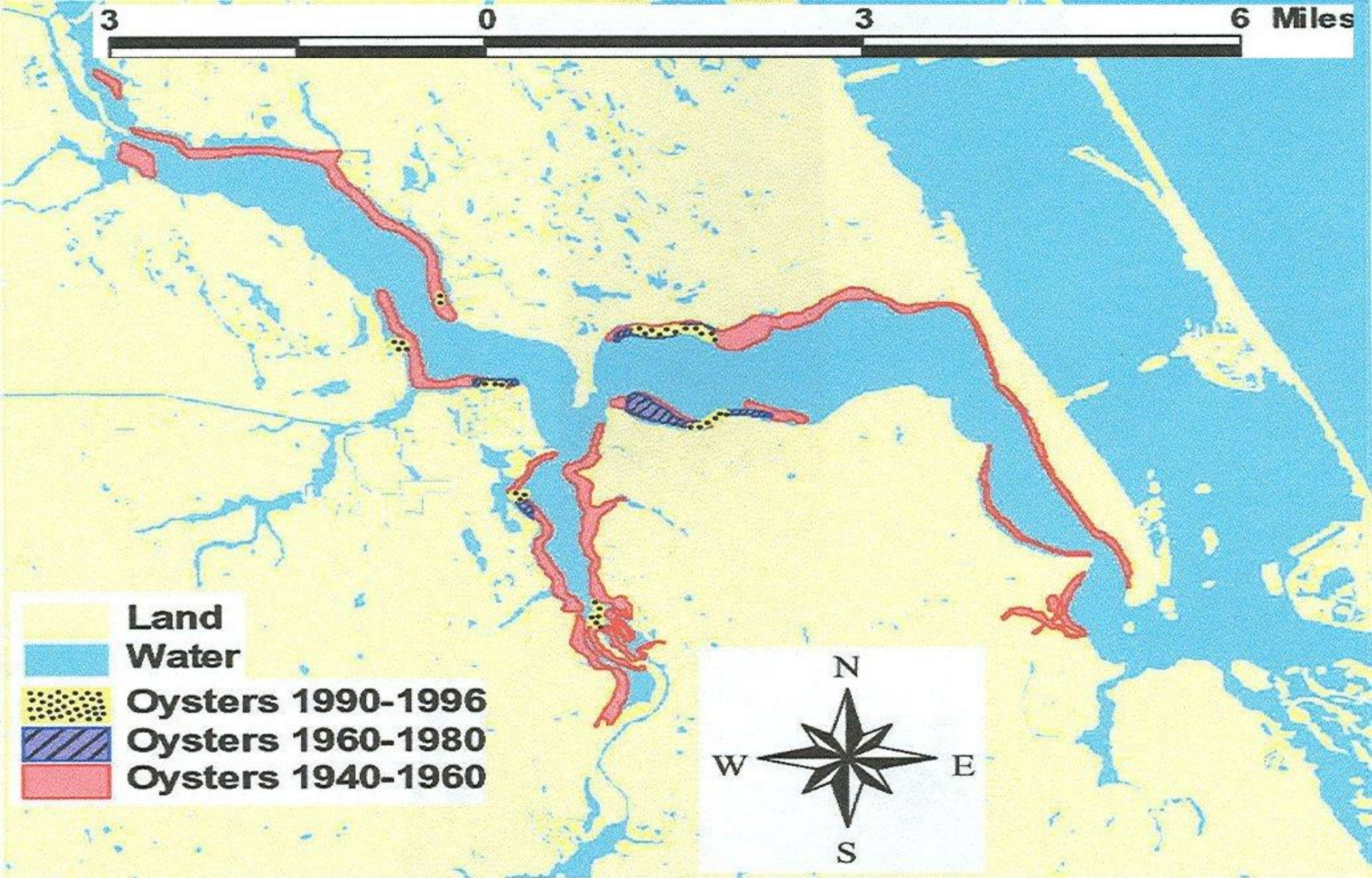


Comment: The data above may indicate areas of concern in the St. Lucie Estuary. Citizens should call the Florida Department of Environmental Protection (DEP) at 871-7662 or the South Florida Water Management District (SFWMD) 223-2600 to ask about the quality of a specific area and report observations of pollution.

*Water Quality Monitoring preformed weekly by volunteers throughout Martin County.*

*Results published weekly in The Stuart News.*

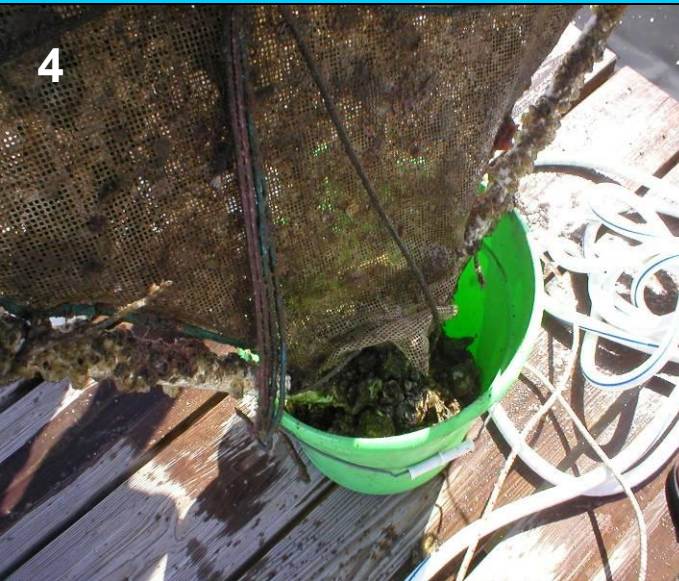




# St. Lucie River Estuary Oyster Reef

1940s **Habitat** 470 acres    1996 – 260 acres    2003 – 116 acres

# Oyster Gardening Habitat Restoration Program – Started 2005



# Oyster Reef Restoration

*Oyster Shells collected from local restaurants are bagged and deployed to designated reef restoration sites by staff and volunteers. New oyster growth is monitored by staff*

*1 adult oyster can filter 50 gallons per day, and oyster reefs provide shoreline stabilization and habitat to over 300 estuarine species*



**In partnership with  
Martin County Oyster  
Reef Restoration**





0 0.5 1 2 Miles

North Fork

Middle Estuary

FOS 

US Oyster Reef

Lower Estuary

South Fork



Florida Oceanographic Coastal Center



Martin Co./NOAA Reefs

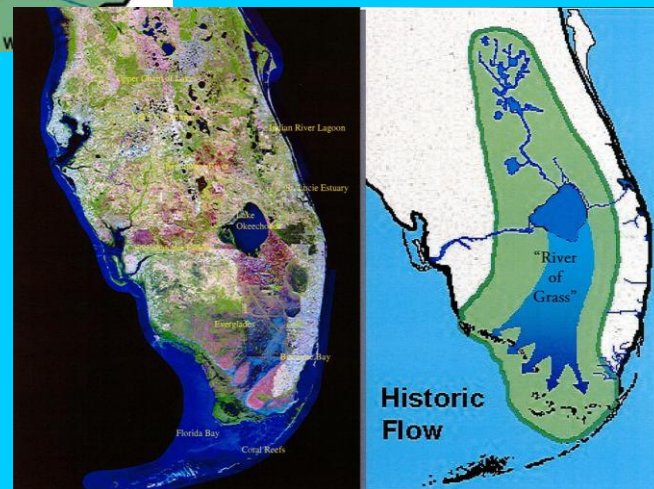
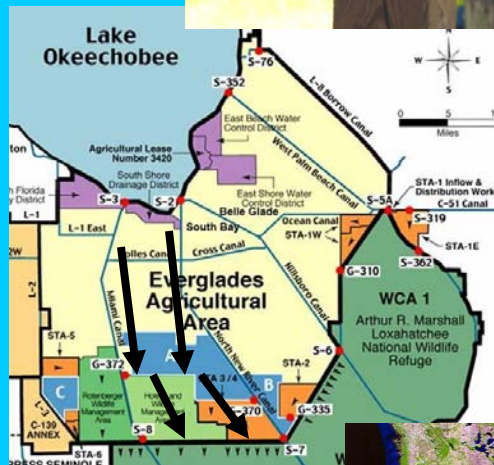


Historic Oyster Reefs



# Mark Perry Executive Director Conservation Advocacy

- *Member of the Everglades Coalition*
- *Member of the State Water Resource Advisory Commission*
- *Member of the Rivers Coalition*
- *Testified to U.S. Senate Committee and in Federal Courts as to value of the Everglades and Florida's coastal ecosystems*







HOME

ABOUT US

SUPPORT US

GET INVOLVED

BUSINESS  
SUPPORTERS

EDUCATION

RESEARCH

ENVIRONMENT

WEATHER

EVENTS

NEWS

PHOTO GALLERY

SHOP

LOGIN

CONTACT US

## Welcome to Florida Oceanographic Society



Join our mission to *inspire environmental stewardship of Florida's coastal ecosystems through education and research.*



Welcome to Florida Oceanographic Society. With more than 8,500 miles of tidal shorelines, 2.1 million acres of estuaries and 30% of the state's land cover consisting of wetlands, Florida's relationship to water is vital to the prosperity of our state.

Since 1964, Florida Oceanographic Society has worked to protect our coastal ecosystems through education and research. I invite you to get involved today – [VISIT THE COASTAL CENTER](#), [BECOME A MEMBER](#), and [VOLUNTEER](#). Together let's inspire environmental stewardship for generations to come.

## FEATURED EVENTS

**SAVE THE DATE**  
February 23, 2013  
6-10:30 p.m.

**TICKETS:**  
\$175 members  
\$225 non-members

**Birding 101**  
at  
**Florida Oceanographic Society**

January 9, 16, 23 & 30  
4 Full-Day Classes  
2 Excursions, Presentations  
& Labs Per Day  
Transportation Included  
Very Limited Enrollment  
\$170 Members  
\$200 Non-Members

For Registration & Details  
Call Ellie Van Os  
(772)225-0505 ext. 113

WHAT'S GOING ON?



Florida  
Oceanographic  
Society

Join us in Supporting  
Florida Oceanographic Society