

Reedy Creek Improvement District Environmental Services Monitoring/Support Programs



RCID Environmental Services



RCID Data

- **Special Taxing District (1967)**
- **39 Square Mile Area (25,000 Acres)**
- **8,000 Acres Conservation**
- **Home to Walt Disney World Resort**
- **< 300 Employees**

RCID

LOCATION

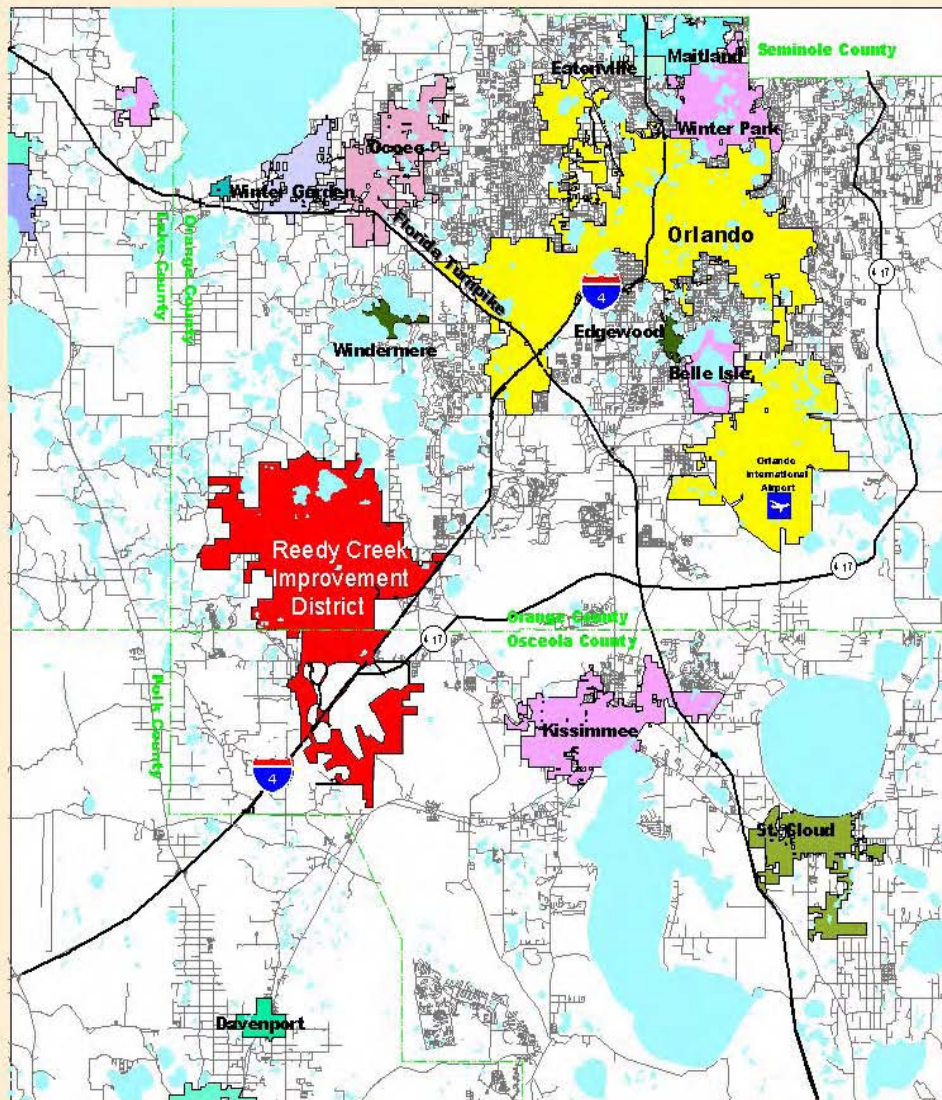


Figure 1-1
Regional Location Map



Prepared by: RCID Planning and Engineering

Reedy Creek Improvement District Comprehensive Plan -- 2008

Data and Analysis Document
INTRODUCTION

Reedy Creek Improvement District

Areas Of Responsibility

- **Surface Water Control & Drainage**
- **Utilities**
- **Mosquito Control**
- **Roads & Bridges**
- **Land Use Regulation & Planning**
- **Fire Protection**
- **Emergency Medical Services**
- **Environmental Services**
- **Data Collection & Evaluation**
- **Building & Construction Codes & Inspection**
- **Agency Interface**



NPDES PERMIT

Municipal Separate Storm Sewer System (MS4)

Phase I Permittee

Structural Controls

- 58 Miles of Canals
- 17 Aml Gates
- 3 Weirs



Environmental Services History:

- Established in 1970.
- Directed by a Pollution Control Officer and the Pollution Control Board.
- They determine the Pollution Control Program that includes sample collection, analysis, data generation, and record keeping.

Pollution Control Board

Kelly Smith
(Board Chairman)

Smith-Mackinnon, PA

Sam Ackley

Diversified Check Solutions

Jim Thomas

BioSphere Consulting, Inc.

Kermit Prime

Post, Buckley, Schuh & Jernigan

Grace Pierce

Traffic Systems, Inc.

Agencies We Interface With:

- USEPA
- FDEP
- USGS
- WMD (SFWMD, SJRWMD, SWFWMD)
- ACOE
- FFWCC
- USFWS
- FDOH
- Local County Environmental & Health (Orange, Osceola, Polk, Lake)
- Local City Environmental (Orlando, Kissimmee, Windermere)
- IFIS/University of Florida
- Stormwater Academy/University of Central Florida

Our Task:

Environmental Services provides timely and accurate data analyses and reporting to facilitate the goals of the RCID Pollution Control Program and meet the needs of the landowner.

Significant Programs:

- Permit/Compliance Monitoring
- Lake Management
- Hydrilla Management
- Fisheries Management
- Wetland Protection
- Stormwater Compliance
- TMDLs

Permit/Compliance Monitoring

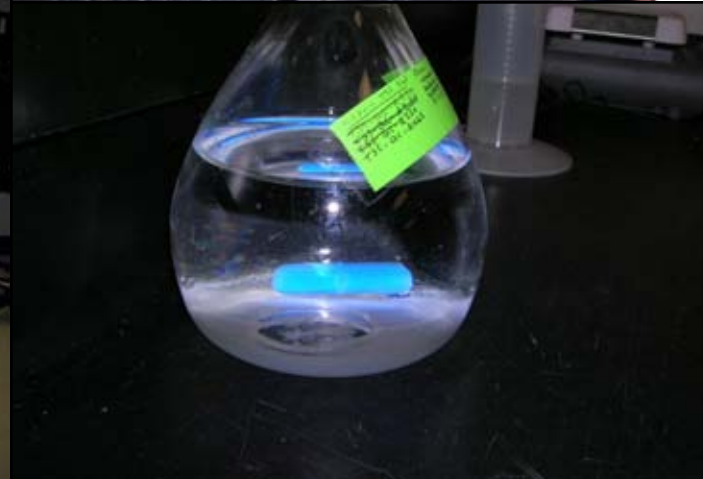
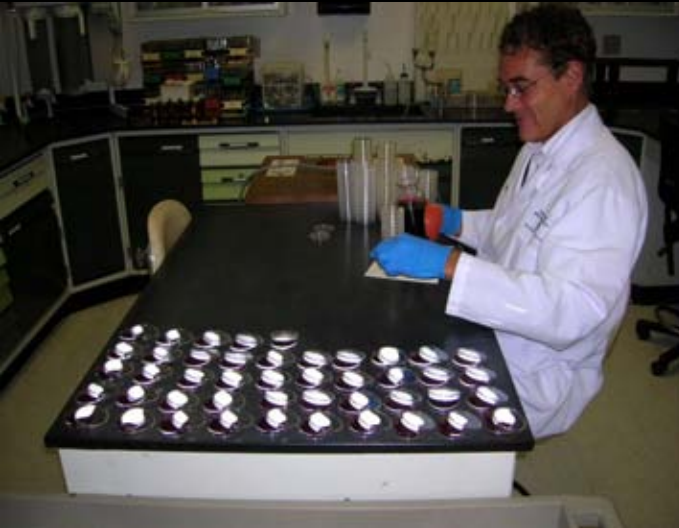


- > 100 Programs
- 1,700 Sites Monitored/Year
- 12,500 Samples/Year
- 90,000 Analyses/Year
- Fully Certified Lab (NELAC)



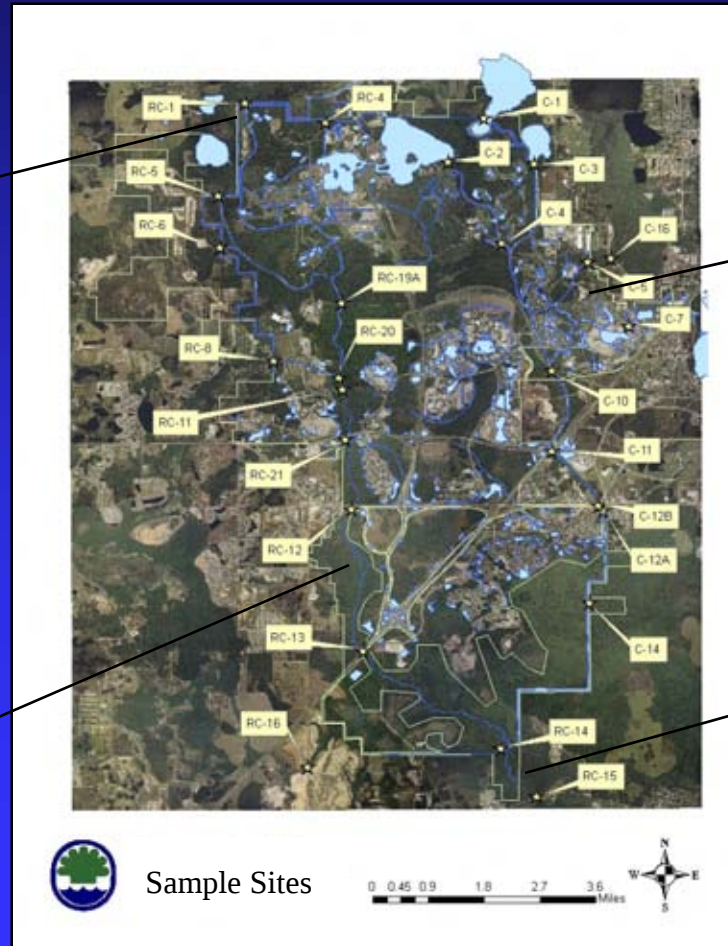
Environmental Services

Water Quality Monitoring By Environmental Services



Environmental Services

Long-Term Monitoring To Determine Water Quality Trends



BIOLOGICAL MONITORING

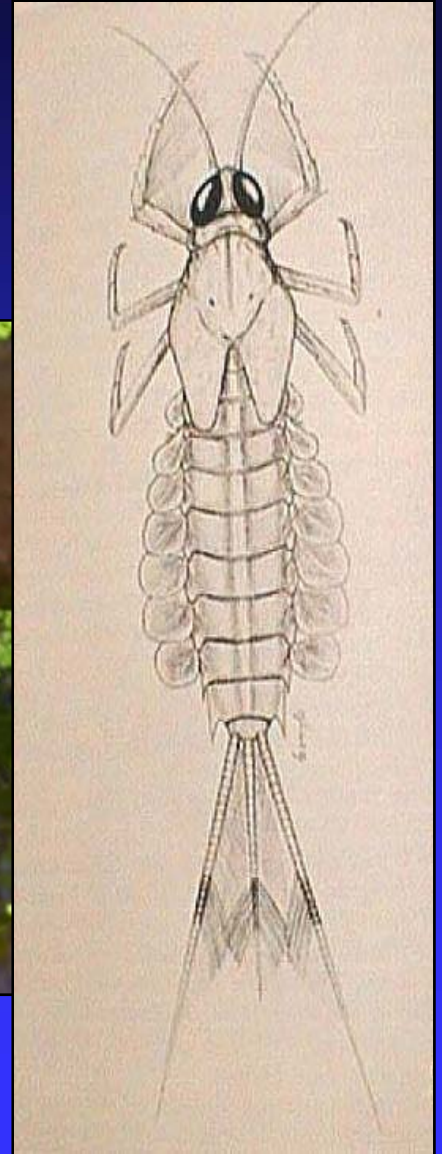
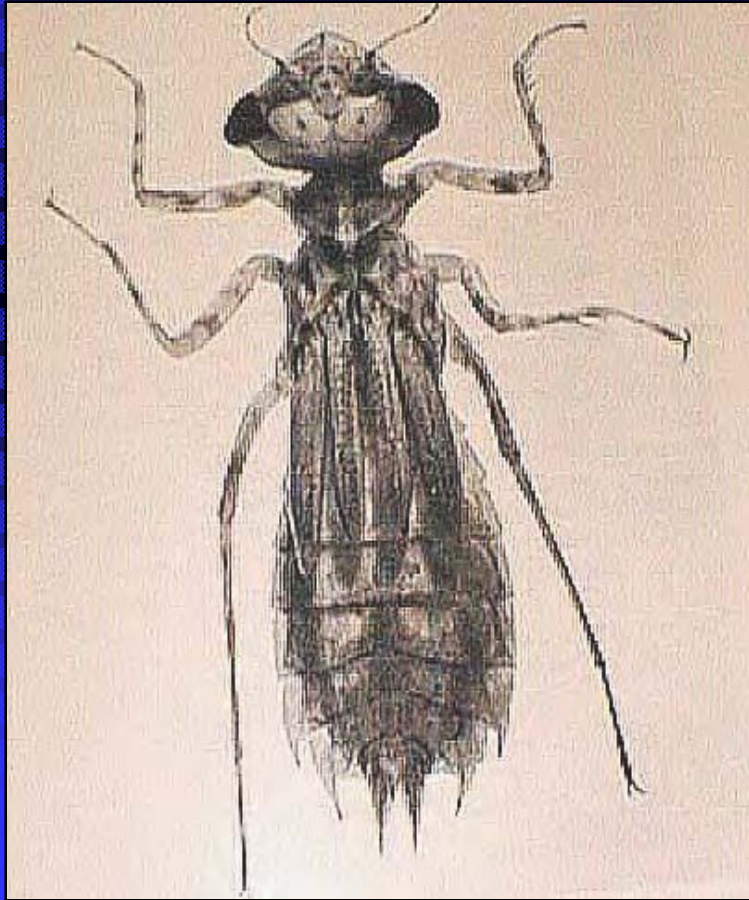
vs.

CHEMICAL MONITORING

- Detects Acute and Chronic Pollutant Impacts.
- Long Term Water Quality Monitoring.
- Data Comparable to Known Reference Station.

- Snapshot
- Short Term Water Quality Monitoring.
- Data Comparable to Site Only.

Macroinvertebrate Monitoring To Measure Ecosystem Health

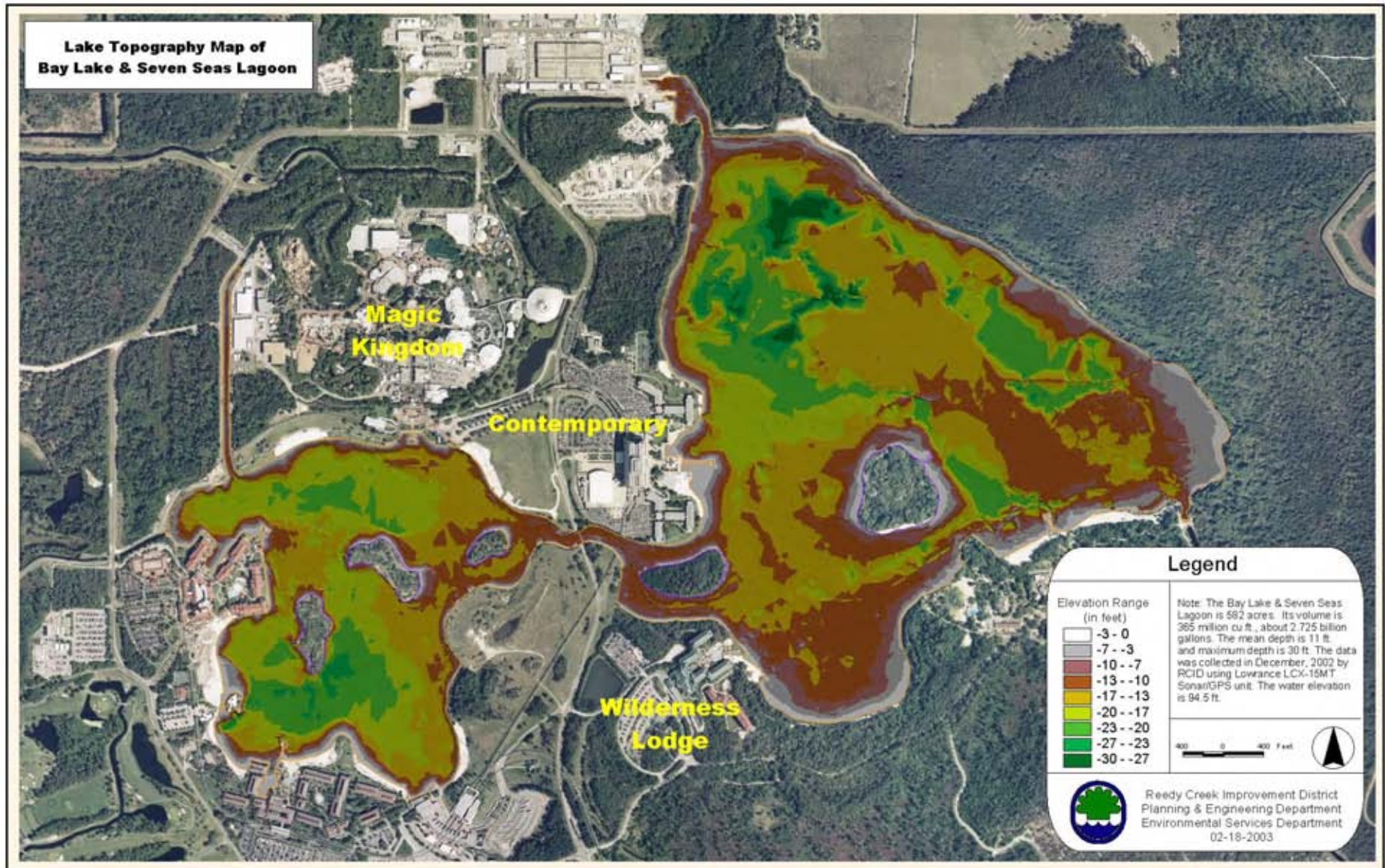


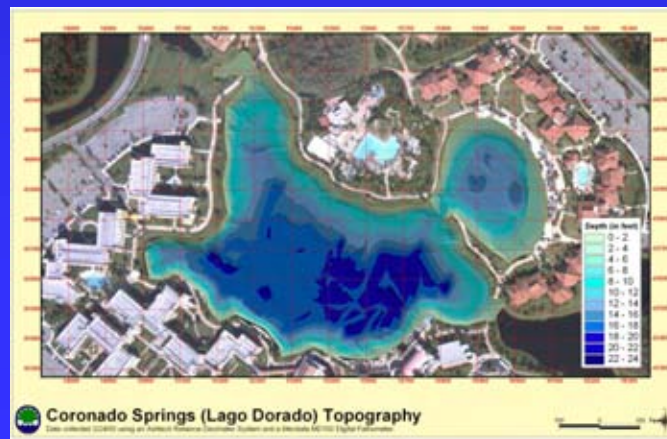
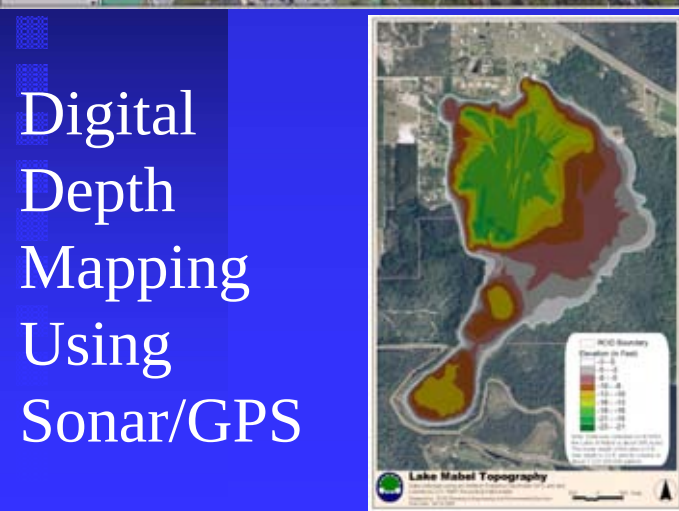
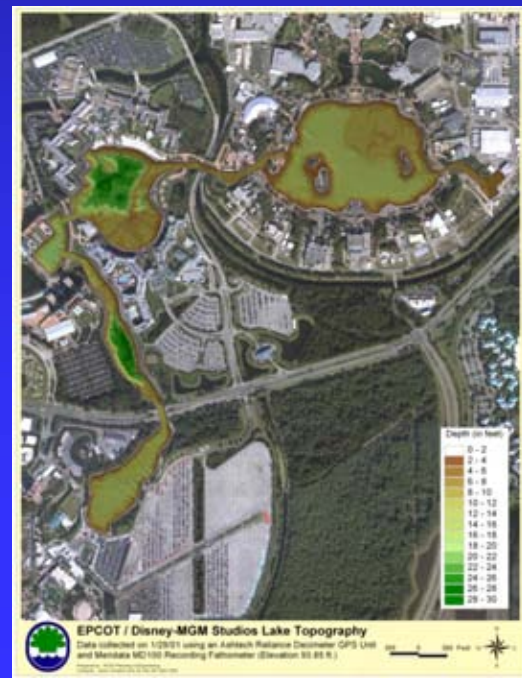
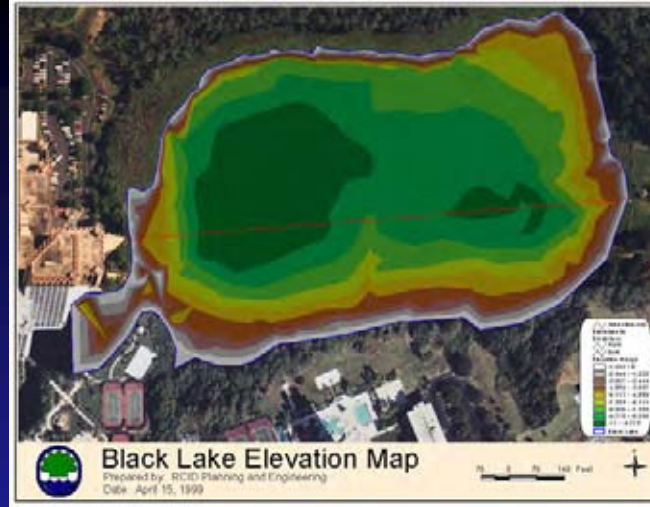
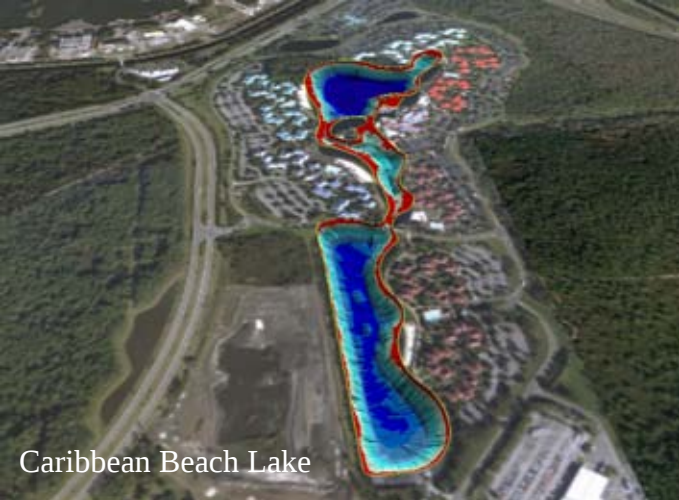
Lake Management

- Basin Characteristics
- Water Chemistry
- Biology
- Data History/Trends
- Nutrient & Pollutant Sources
- Impacts/Options



Basin Characteristics





Digital
 Depth
 Mapping
 Using
 Sonar/GPS



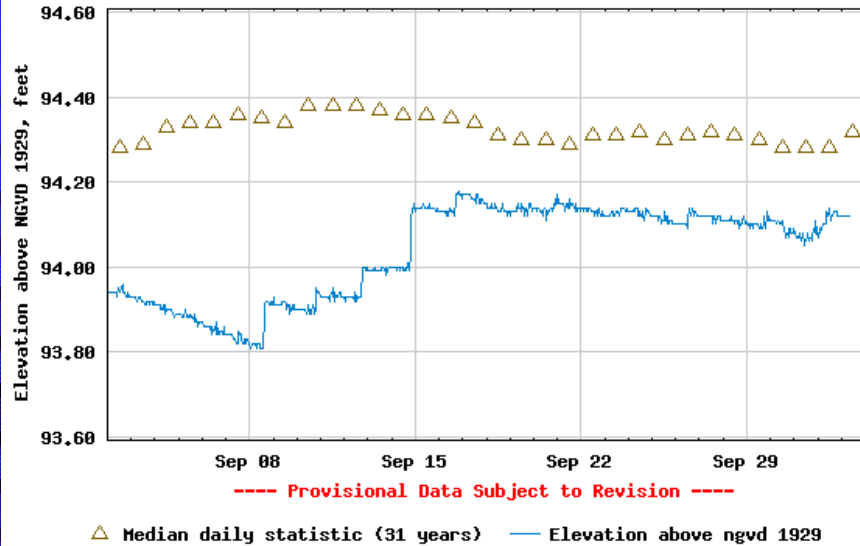
Water Chemistry



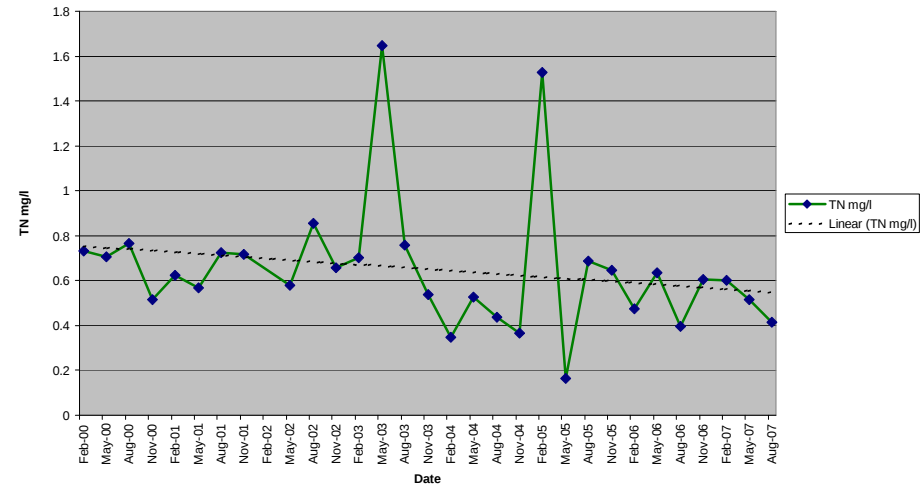


Data History/Trends

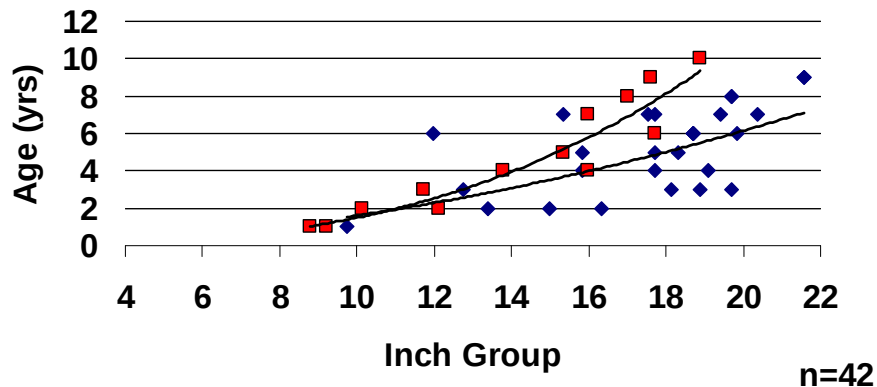
USGS 02263850 BAY LAKE NEAR VINELAND, FL



Site L-1 Total Nitrogen



Bay Lake/Seven Seas Lagoon
Bass Growth Rates



Nutrient & Pollutant Sources



Human Activities



Nutrient & Pollutant Sources



Rainfall



Flooding



Drought

Natural Activities



Hurricanes

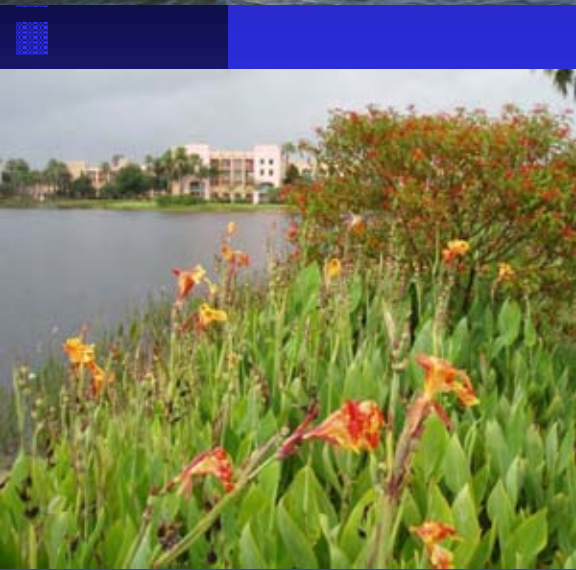


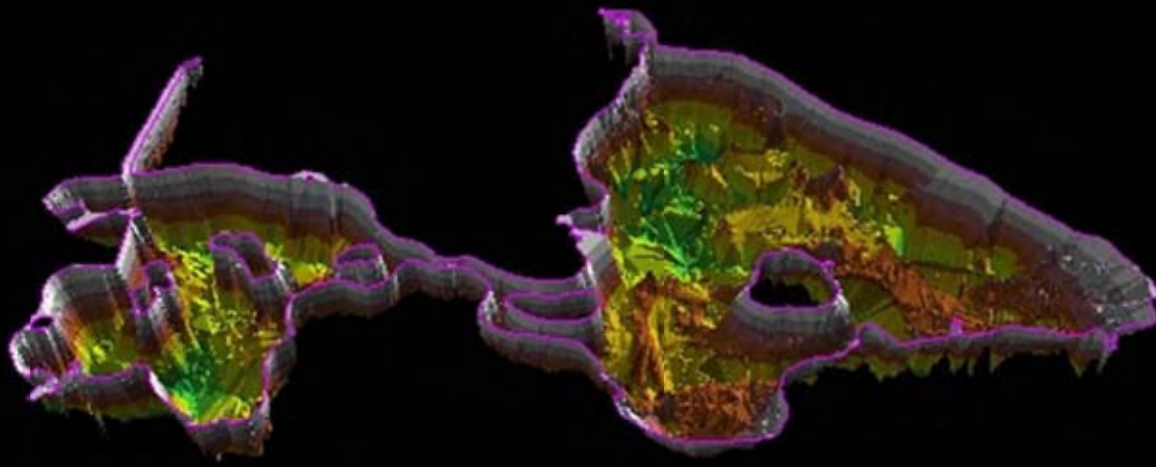
Freezes



Wildlife

Impacts & Options



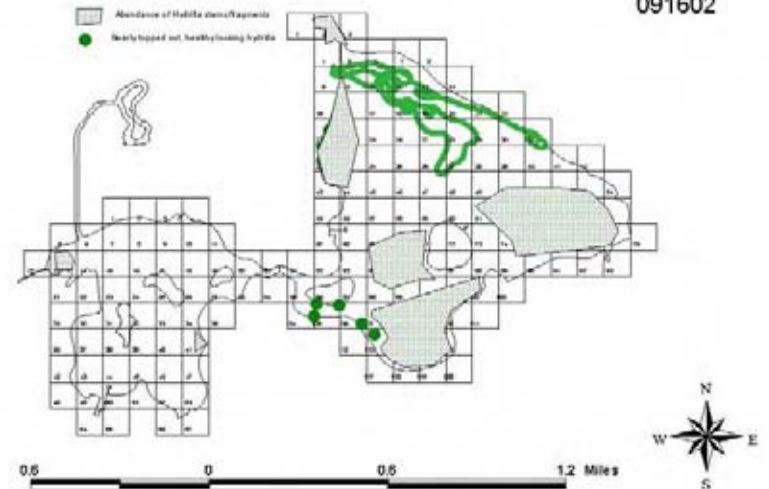


Hydrilla Management



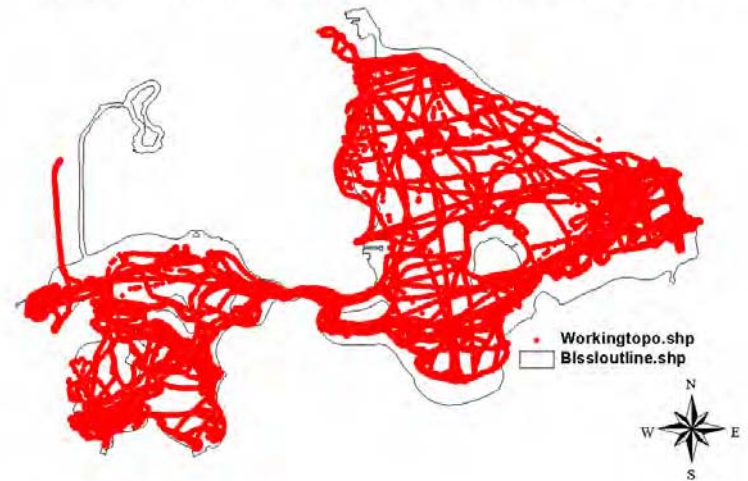
Extent of Nearly Topped Hydrilla

091602





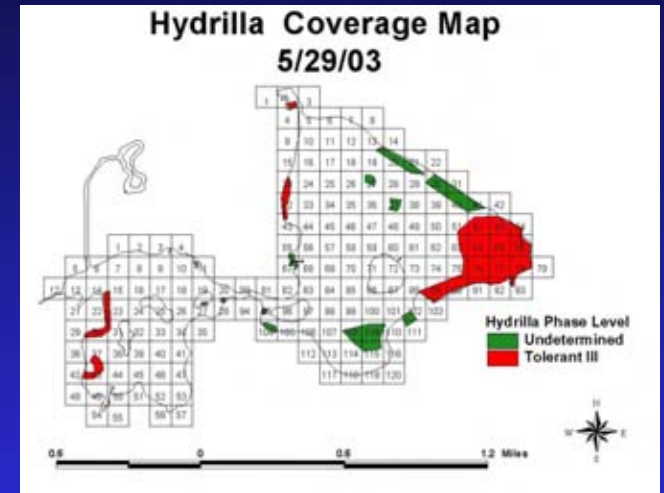
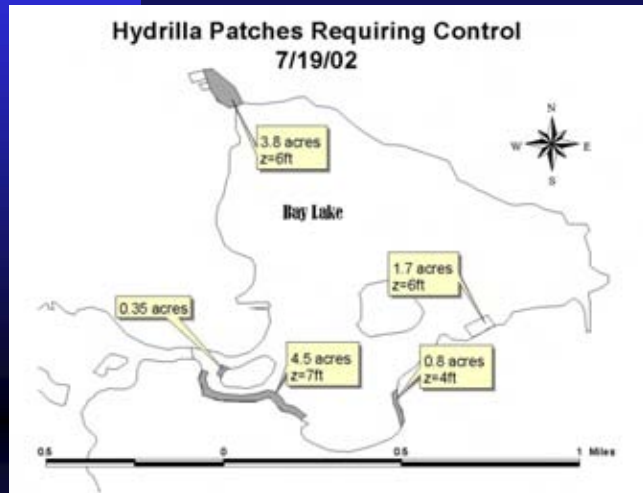
Recorded Transects using Lowrance LCX-15MT



Lake surveys are routinely conducted to map the presence of nuisance & exotic plants

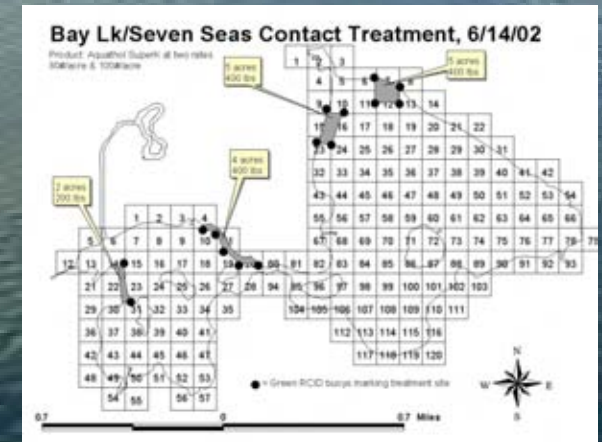


Herbicide Treatment & Response

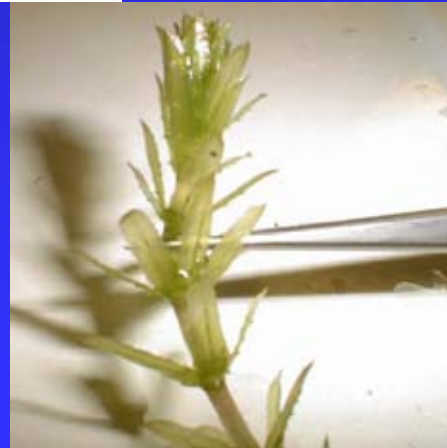


MK Dry Dock

Dark water indicates
open holes in hydrilla



Hydrilla has required over \$1 million dollars
to control in a single year.



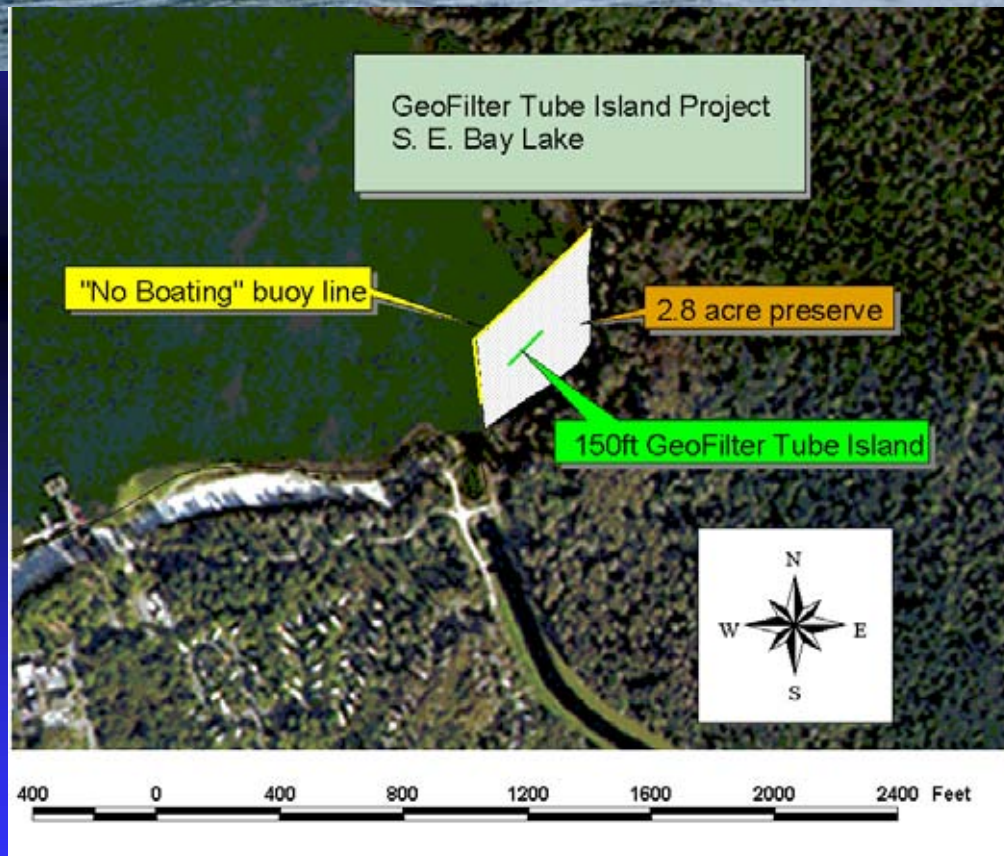
Results from field surveys and laboratory studies have been used to reduce weed control costs considerably.

This is an ongoing program.

When surveys began showing the loss of beneficial grasses, the idea of an “Aquatic Preserve” was formed.



90% Loss Of
Beneficial
Aquatic
Plants In East
Side Of Bay
Lake



New ideas for in-lake restoration efforts have been implemented on a trial basis, and are proving successful...



...Geo-Islands

Key Elements of Fisheries Management

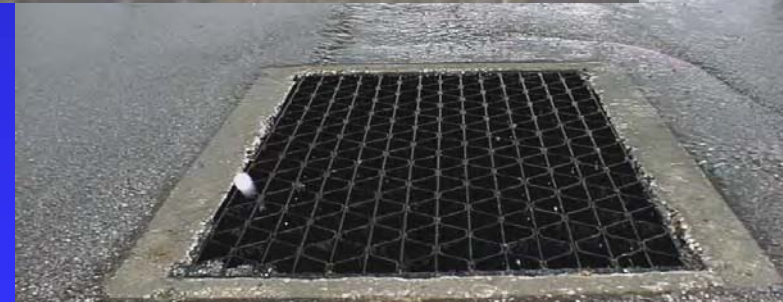
- 1) Protect Water Quality
- 2) Provide Good Habitat
- 3) Control Harvest

1. Protecting Water Quality

Lake Monitoring



Stormdrain Education



**STORM WATER DRAIN
IDENTIFICATION**

2. Good Habitat

GeoFilter Tubes help protect shorelines and allow beneficial plants to grow.



3. Controlling Harvest

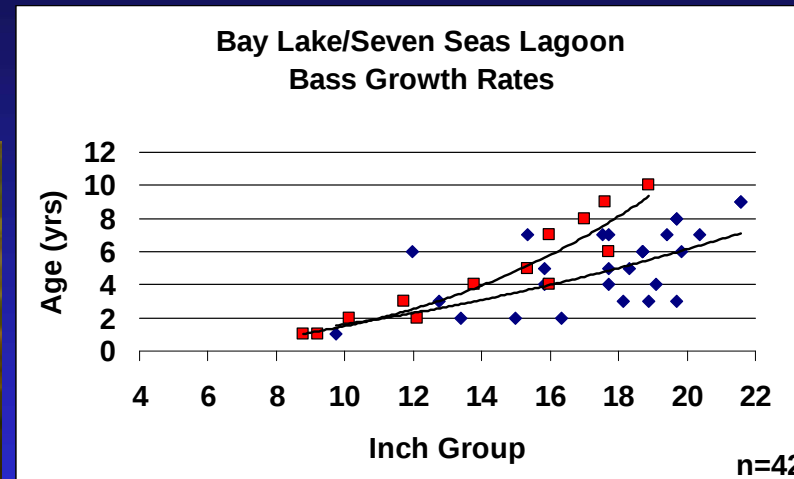
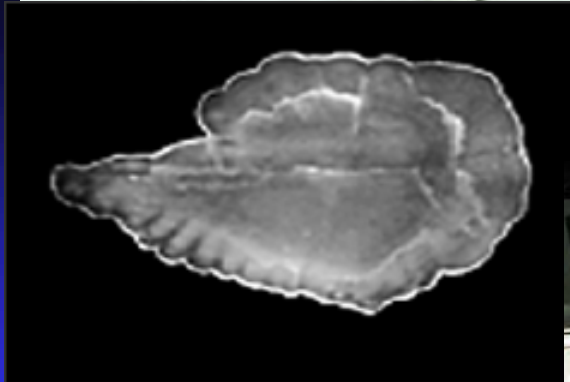
“Catch and Release” bass fishing guidelines have given fishery managers the ability to build unique and plentiful fish populations.



Electrofishing Surveys



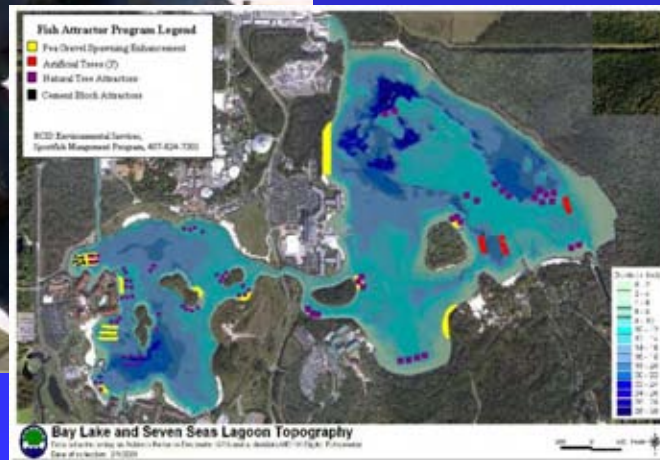
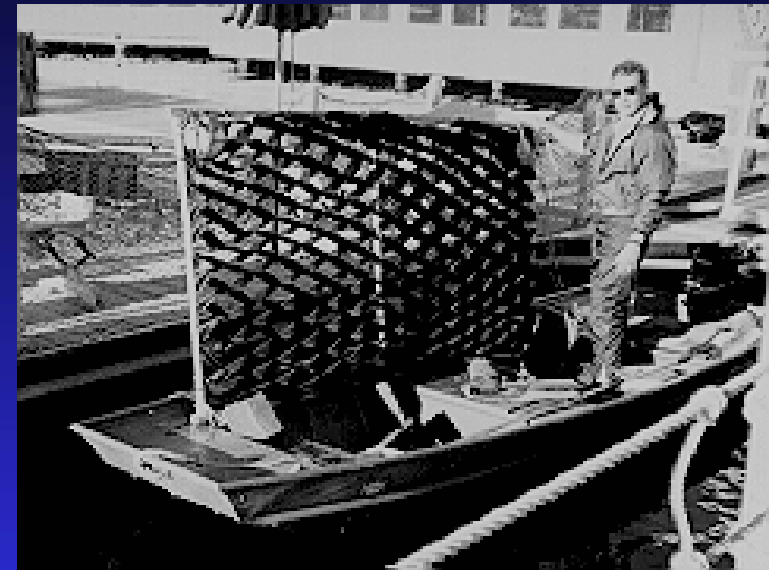
Age & Growth Analysis



Reproduction & Spawning Success

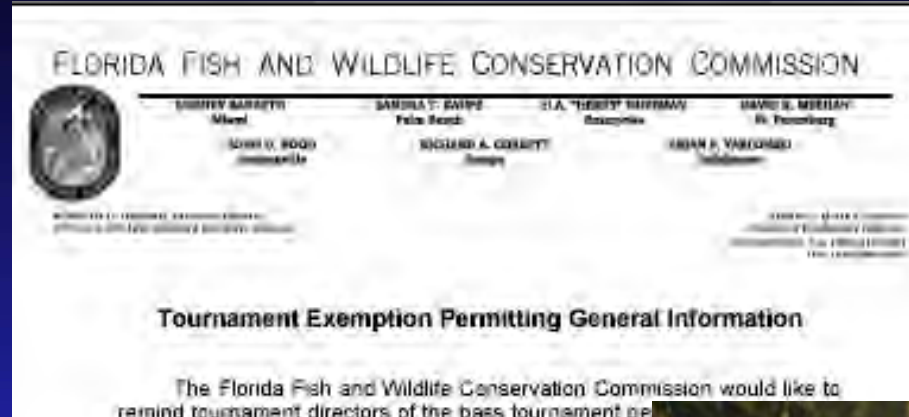


Attractors and Feeders



Permits

Fishing Tournaments



Grass Carp



10 or more participants
e limits shall submit a co
than 455 days in advance
sured of an exemption
if the application is rece
ay not be issued.

allows tournament angl
xemptions are available
County) from July throu
s agree to follow guideli
on Commission. Each
report detailing the c



Hauling & Releasing Fish



Nuisance Species Monitoring

- Walking Catfish
- Armored Catfish
- Blue Tilapia
- Longnose Gar
- Bowfin
- Sneakhead Fish



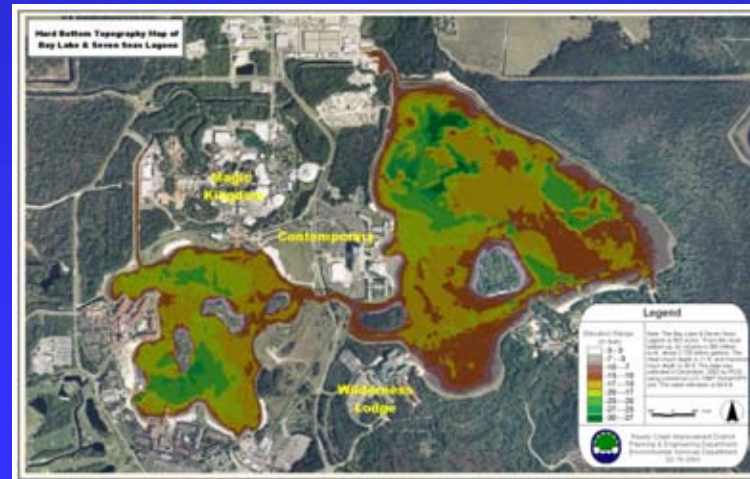
Latest Guest Catch Rates

4th Qtr, 2004 Creel Report Data

Average Number of Bass Caught per Angler per Hour

FFWCC Goal	Bay Lake	Village Lake	Epcot
0.25	2.1	2.6	2.4
4 Hours	29 min	23 min	25 min

Fish biologists work directly with guides



Provide Detailed Fishing Tips



First Quarter, 2004
(Jan-Mar)

Inside this Issue

- In-line Spinners
- Fish Biology 101: Spawning
- Creel Report Data
- Can You Name This Fish?



RCID Environmental Services
2001 South Service Lane
Lakeland, Florida FL 33801
888-424-7324
Go to <http://www.rcid.com>

RCID Environmental Services Quarterly

Sportfishing News

In-line Spinners

Somewhere along the way, you've seen a spinner lure and you've seen a spinner lure. One of the most common lures in the in-line spinner family is the in-line spinner. (Although there are many large spinners, we're going to focus on the in-line spinner.)

Schooling bass in WCV Lake are also known as "blue" or "blue"



Common prey that bass school on.

One of the most common prey items for bass are bluegills. Bluegills are a popular choice for bass anglers because they are easy to catch and they are a good source of food for bass.

Another common prey item for bass are bluegills. Bluegills are a popular choice for bass anglers because they are easy to catch and they are a good source of food for bass.

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If you have a bluegill on a spinner, you can use it as a bait for bass. Bluegills are a popular choice for bass anglers because they are easy to catch and they are a good source of food for bass.



An example of a bluegill.

Creel Report Data

Creel report data was collected from the WCV Lake. The data was collected from the WCV Lake. The data was collected from the WCV Lake. The data was collected from the WCV Lake.

Angler fishing Spots/Dance. The average size of the fish was 10.5 lbs. The average size of the fish was 10.5 lbs. The average size of the fish was 10.5 lbs.

Village Lake. The average size of the fish was 10.5 lbs. The average size of the fish was 10.5 lbs. The average size of the fish was 10.5 lbs.



Pickup truck parked in State 11.

Creel Sheet Summary Jan-Mar-04	WCV Lake Pond	WCV Lake Pond	WCV Lake Pond	WCV Lake Pond	WCV Lake Pond	WCV Lake Pond	WCV Lake Pond	WCV Lake Pond
Day Lake Season Total Loggers	591	114	1024	5085	15.0	2.75	9.1	2.0
Forest District Season Total Loggers	37	120	185	777	10.8	2.57	3.8	8.0
WCV Lake Season Total Loggers	112	242	1209	5862	9.5	1.39	4.5	3.5

Successful Program!!!



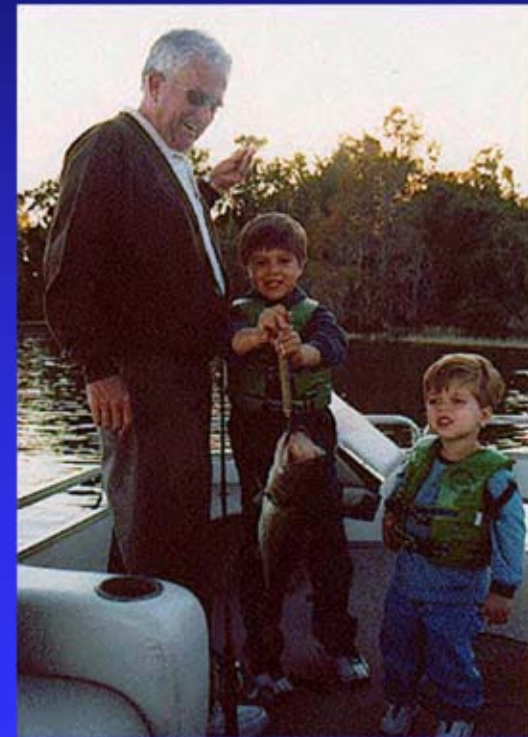
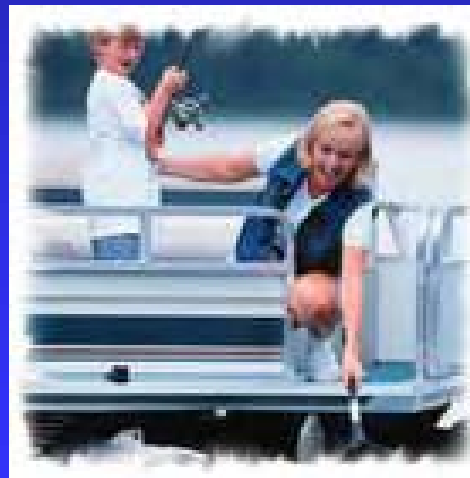
Bay Lake



Village Lake

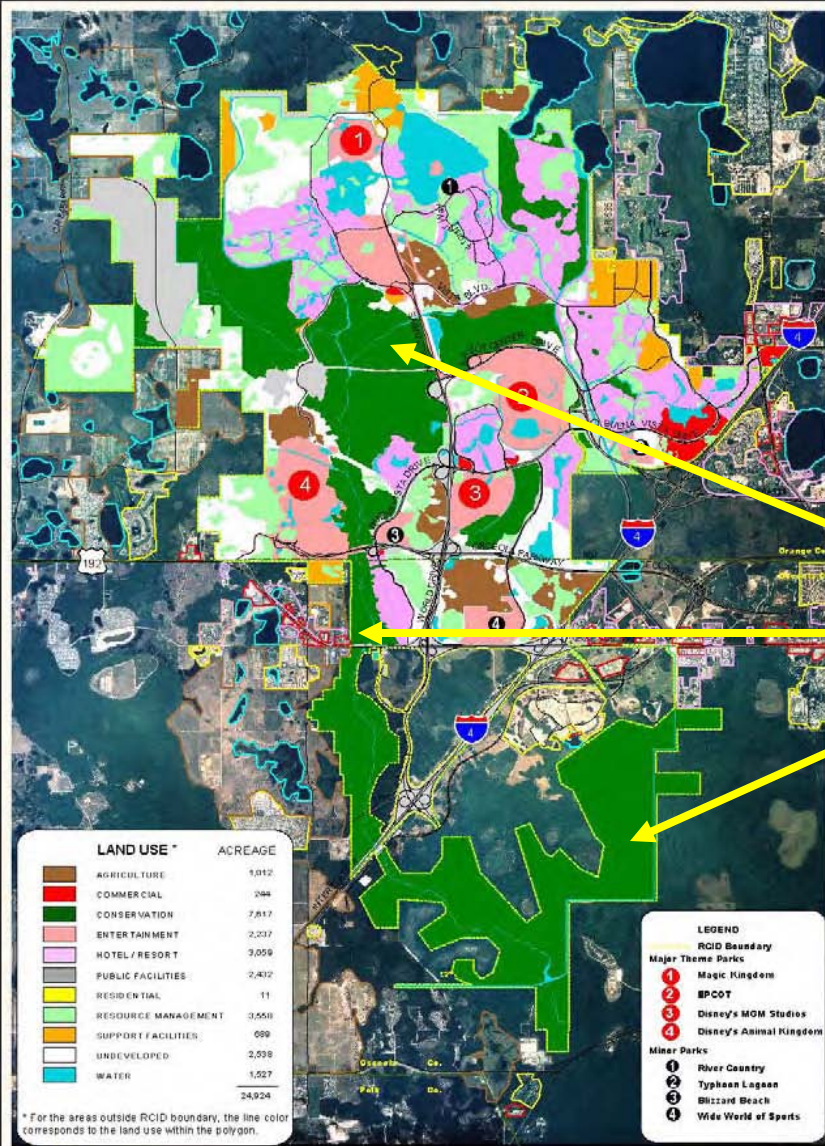


Epcot



Wetland Protection





Over 33% of
lands within the
District are
designated as
Permanent
Conservation Use

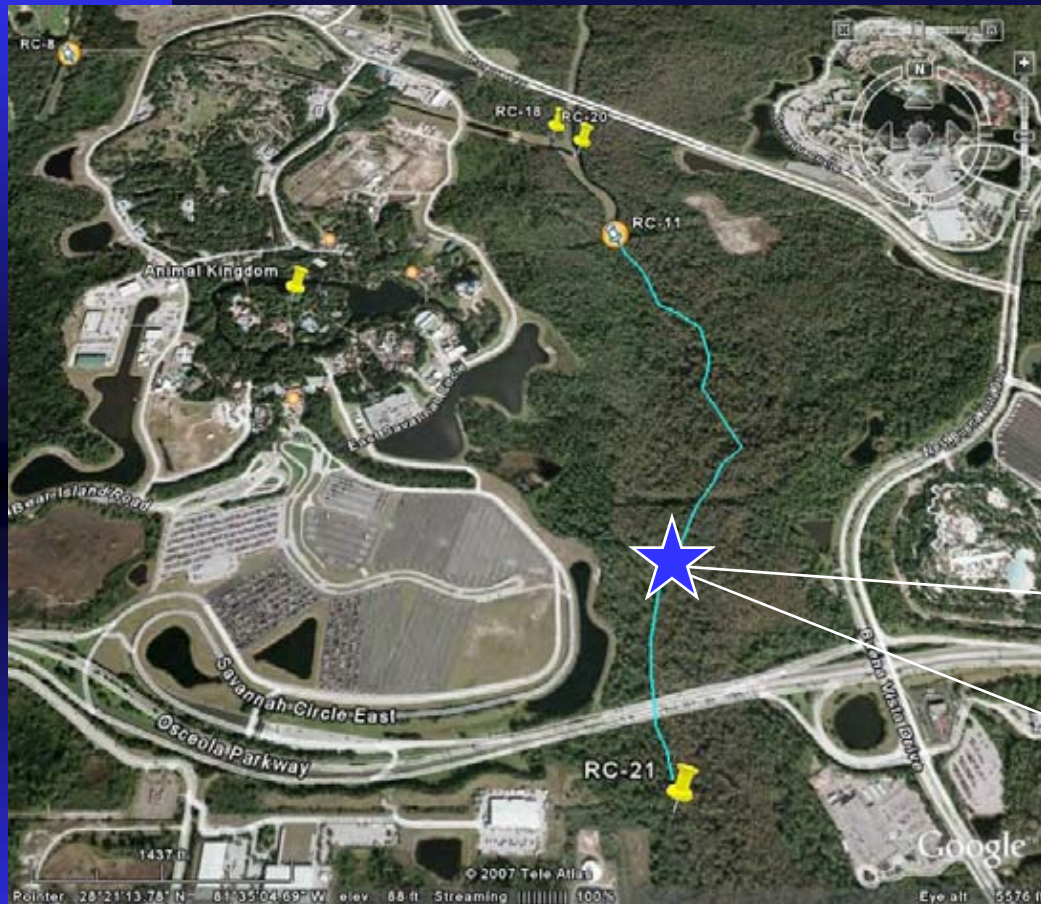


Figure 2-4
Existing Land Use 1998

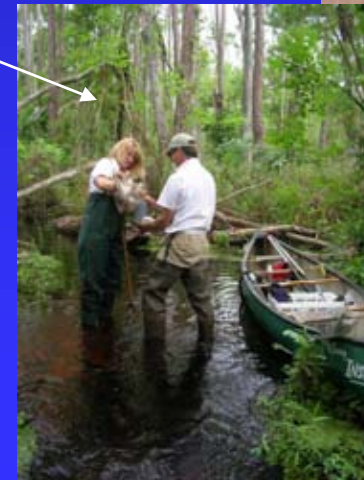
0 1 2 Miles



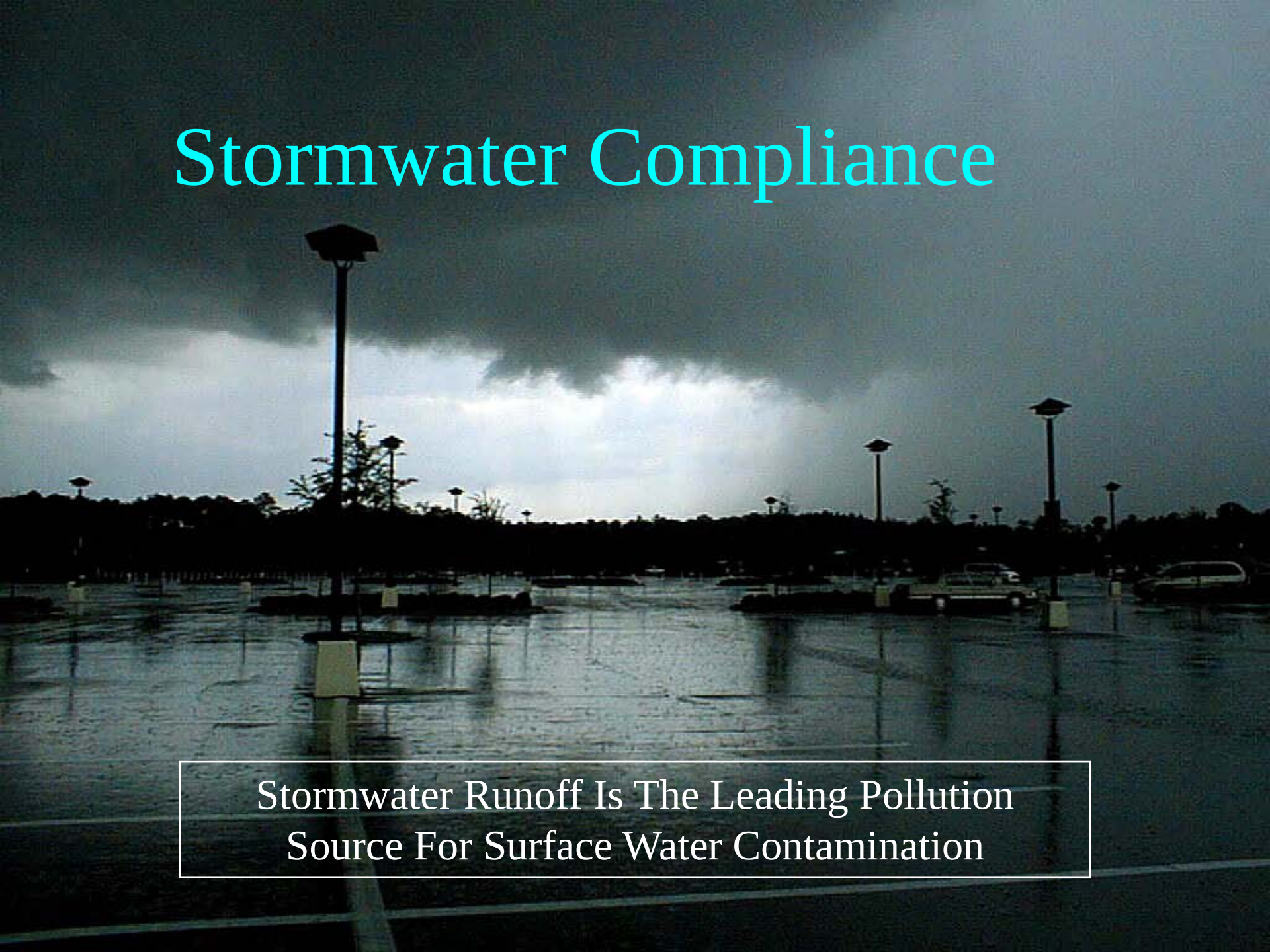
Prepared by: RCID Planning and Engineering



Wetlands serve as a living filter for stormwater pollutants. They are protected through the use of wetland lines, buffers, and biological monitoring.



Stormwater Compliance

A dramatic, low-key photograph of a parking lot during a storm. The sky is filled with heavy, dark clouds, with a bright patch of light breaking through in the center. The ground is wet and reflective, mirroring the sky and the silhouettes of several tall, black streetlights. A few cars are parked in the distance, their forms softened by the rain and low light. The overall mood is somber and urgent, emphasizing the theme of stormwater management.

Stormwater Runoff Is The Leading Pollution
Source For Surface Water Contamination

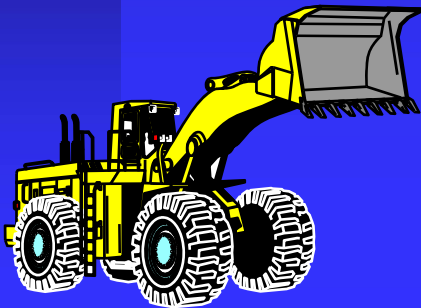
Compliance Achieved Through:

- Construction Runoff Management
- Post Construction Treatment
- Source Elimination
- Retrofitting
- Education



Construction Site Runoff

Eroding Construction Sites
Are A Major Cause Of
Stormwater Pollution.
Sediments Contain
Nutrients, Metals, Bacteria,
& Petroleum Products.



Construction Site Runoff Management





*Perimeter
Controls*



*Training &
Education*

Construction Site Runoff Management



Dewatering



*Inspection &
Communication*

Construction Techniques





Western Way Bridge @ Reedy Creek



Construction Techniques

New Erosion Control Technology Polyacrylamide (PAM)



- Turbidity Control
- Erosion/Dust Control
- Vegetation Establishment
- Nutrient Management



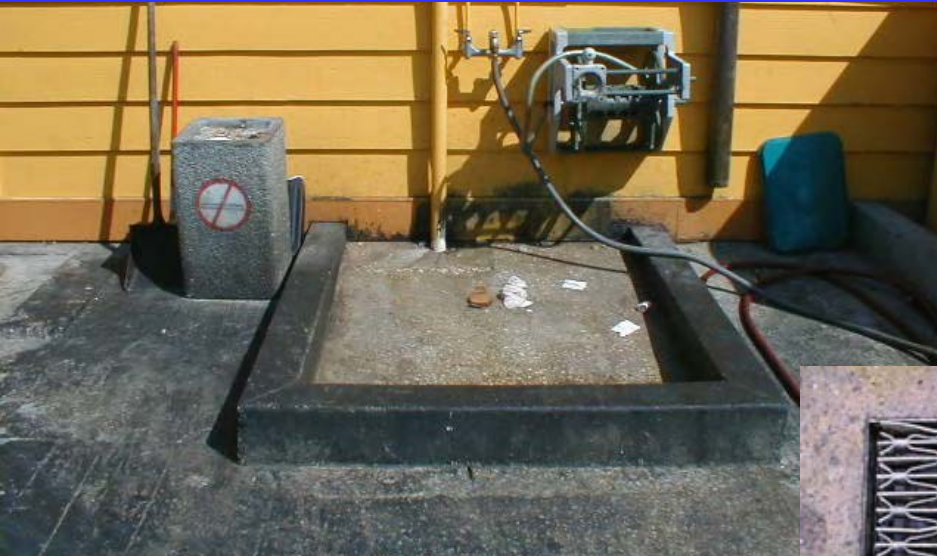
Post Construction Treatment



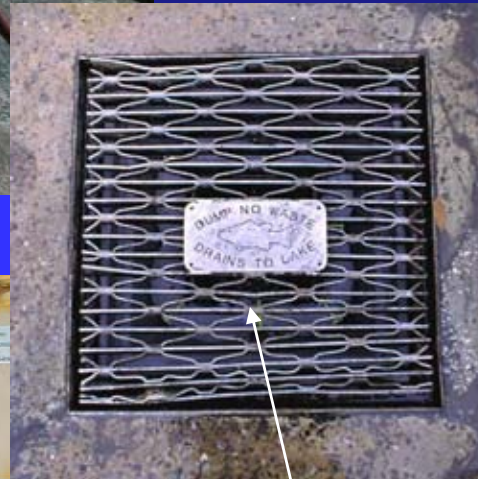
Stormwater ponds and vegetated conveyance systems are designed to treat post construction pollution. They capture and/or filter sediment and chemicals to achieve water quality compliance.



Retrofitting for Stormwater



Source Elimination



Only Rain
Down The
Drain



Inline Treatment



Florida Stormwater, Erosion & Sedimentation Control Training & Certification Program

Florida Department of Environmental Protection



Watershed Protection & TMDLs



Environmental Services

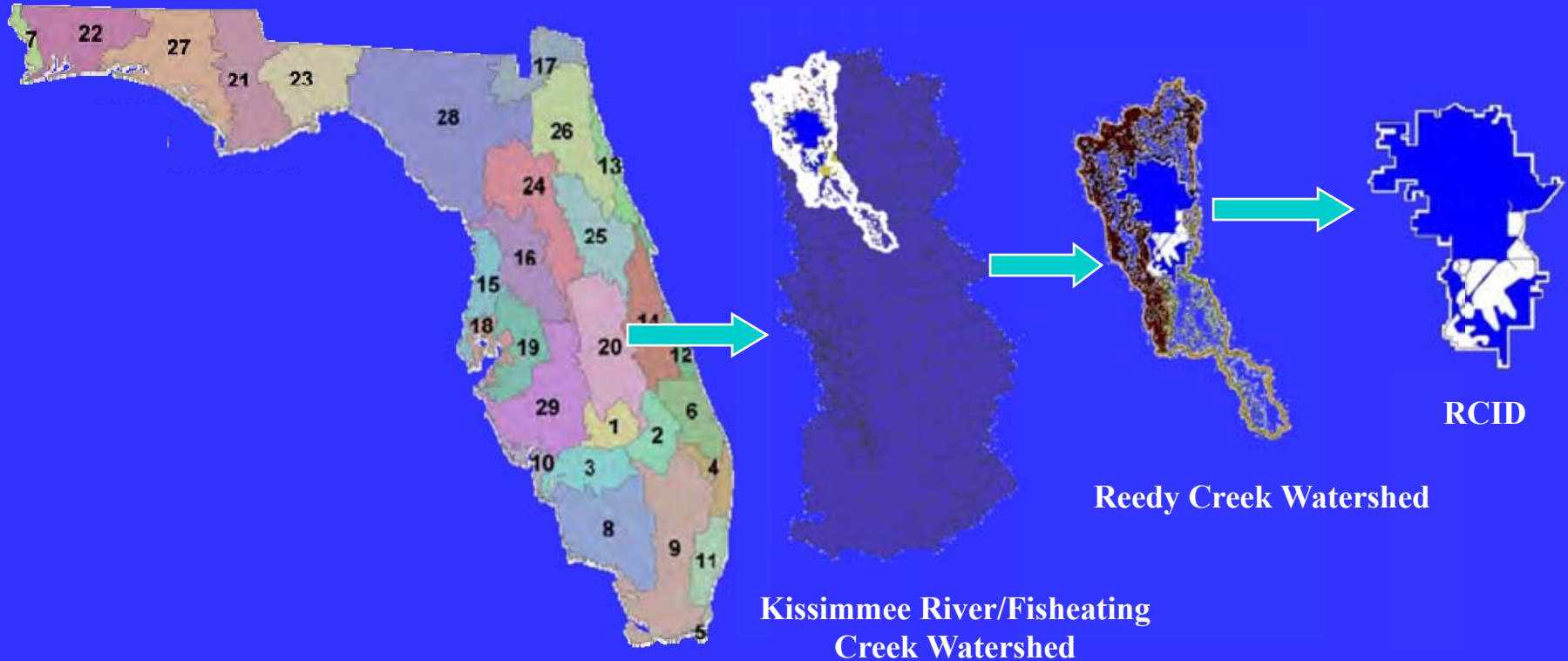
TMDLs

Total Maximum Daily Load

“A **TMDL** is the maximum amount of a **pollutant** that a water body can withstand and still maintain its designated use.”

Designated Uses: drinking, fishing, swimming,
shellfish harvesting.

Reedy Creek Watershed



Environmental Services

WBID 3170

Water Body

ID Numbers



Florida's TMDL Development Cycle

*Each Basin Group will undergo a cycle of
5 phases on a 5 year rotating schedule.*

Phase 1: Initial Basin Assessment

Phase 2: Strategic Monitoring

Phase 3: Data Analysis and TMDL Development

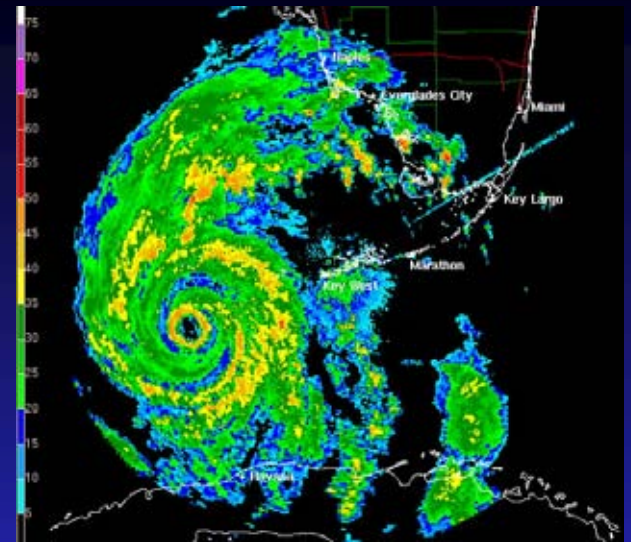
Phase 4: Basin Management Plan Development

Phase 5: Begin Implementation of Basin Mgmt Plan

Kissimmee River/Fisheating Creek

Group 4 Schedule

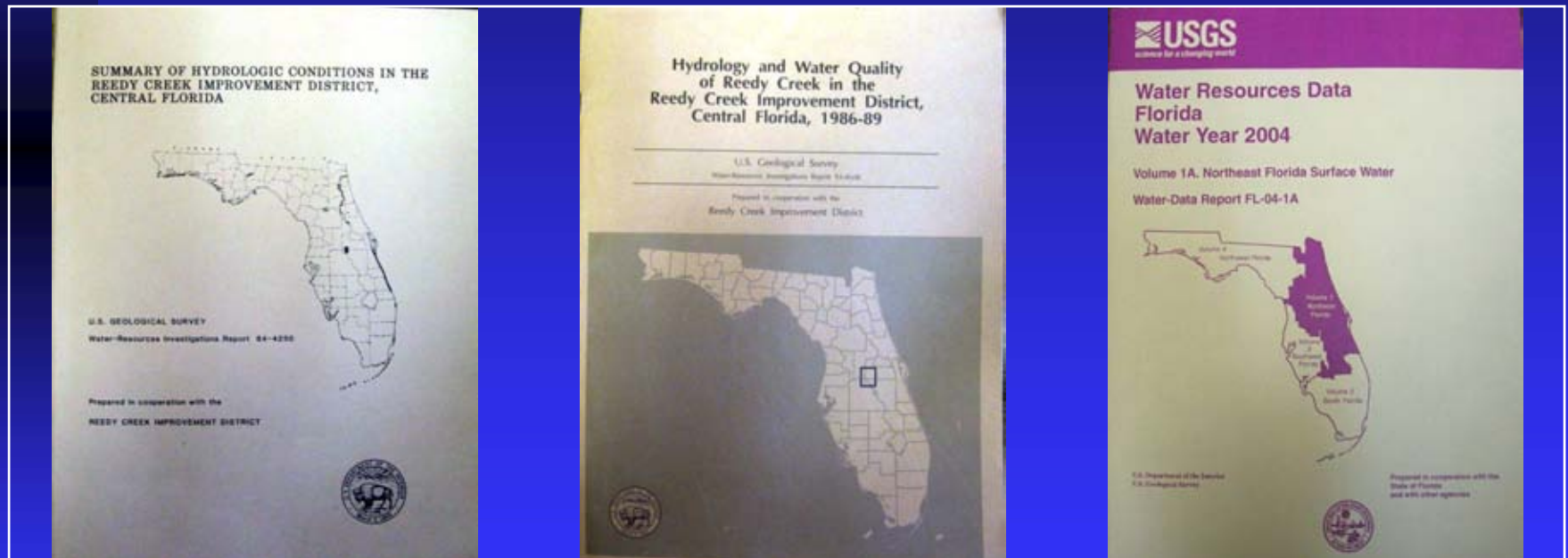
- | | |
|--|--------------------------|
| 1.Kick-off | Nov. 2003 |
| 2.Monitoring | through March 2005 |
| 3.TMDL Development | Mar - Nov 2005 |
| <i>*Reasonable Assurance</i> | |
| 4. Development of Basin Management Action Plan | Oct 2005 – Jun 2007 |
| 5.Implementation | July 1, 2007 - 2008..... |



- RCID/USGS Historical Data
- STORET Data Editing/Review
- Hurricane Impacts To Wetlands
- FDEP Data Review

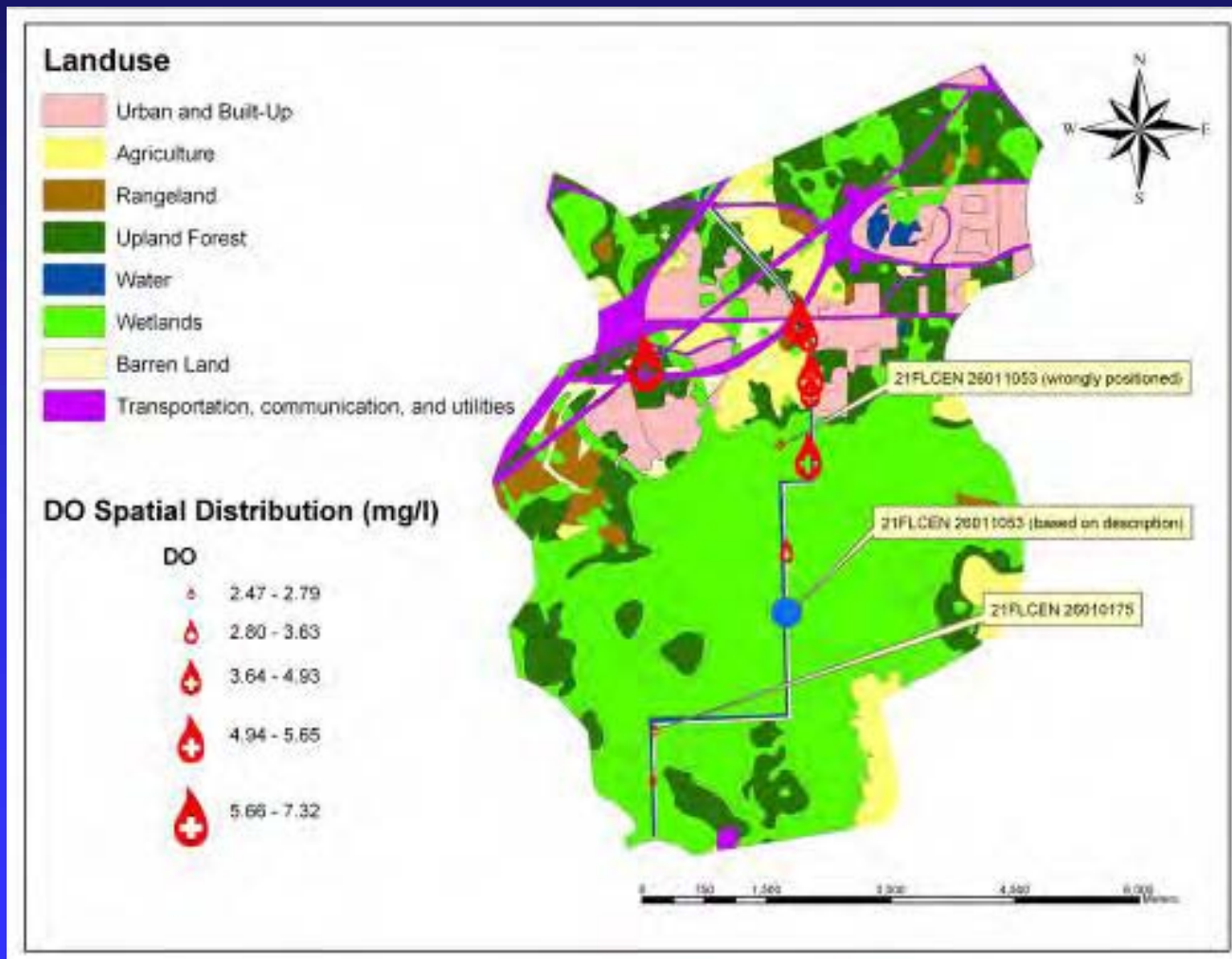


USGS Studies:

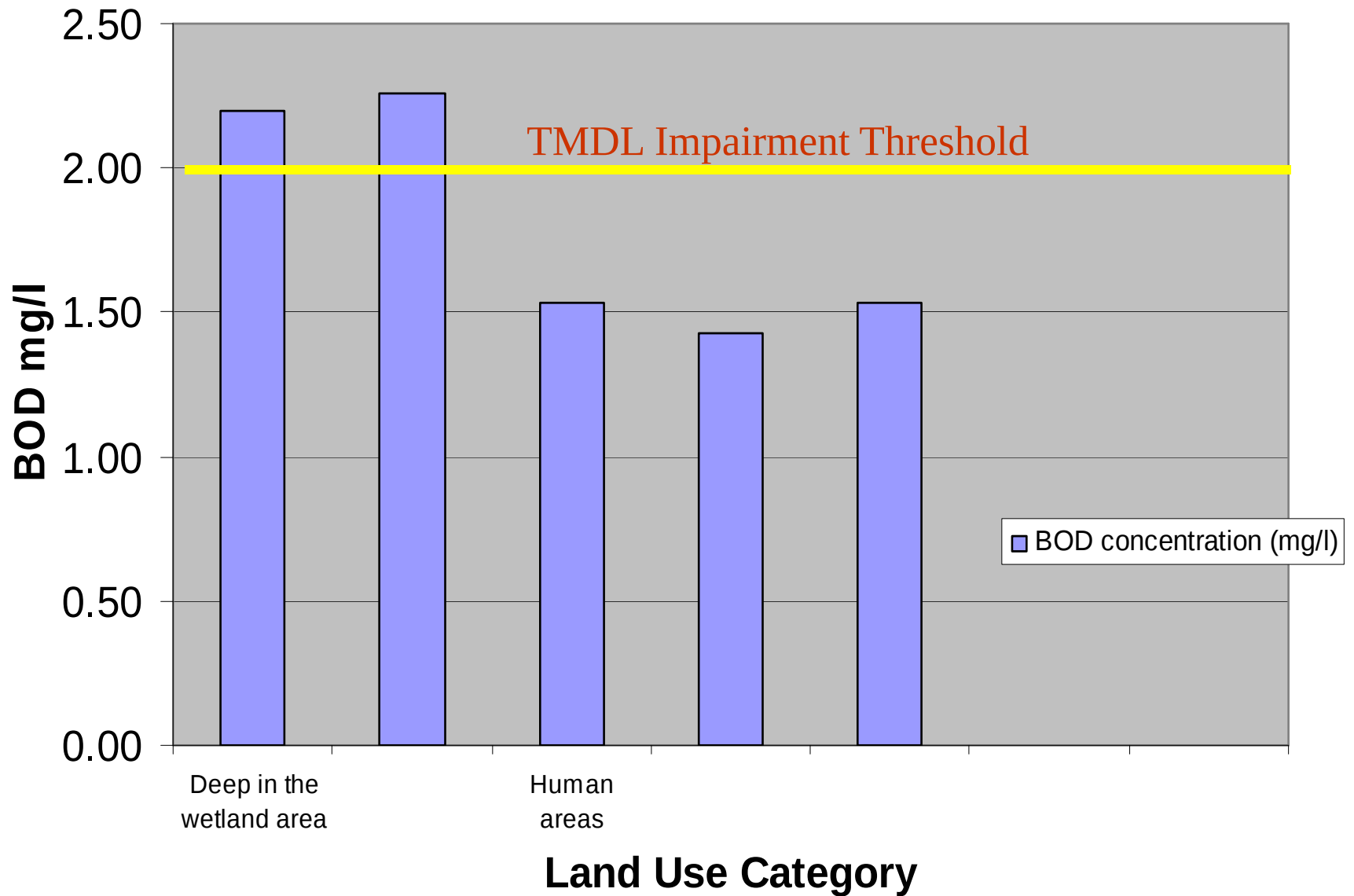


Reviewed By FDEP

FDEP Spatial Distribution Analysis of DO Concentration vs. Landuse



Bonnet Creek BOD



NO TMDLs
ASSIGNED!



Future

- Next TMDL Review Starts In 2008-2009
- Proactive Data Collection
- Outside Development Areas Mapped
- Outside Development Areas Monitored
- More Stringent WQ Limits In Future
- Everglades Restoration Driving Force In Reedy Creek Watershed

Watershed Protection Best Management Practices



Environmental Services

Future Choices To Avoid Unintended Consequences:

- Low Impact Development Retrofit & Design
- Water Conservation
- Green Technologies
- Integrated Management, Operation, Maintenance
- Education
- Partnerships for Watershed Protection

Low Impact Development



New American Green Home Orlando, FL 2007
Demonstrates New Technologies In Urban Setting

**UCF Green Roof Reduces
Stormwater Volume,
Pollutant Load, & Enhances
Roof Life/Insulation**





Pervious Concrete Parking Lot Reduces
Stormwater Volume & Pollutant Load



Solar Powered Water Circulator
Demonstrating Technology At RCID



Aquascaping With Native Plants To Stabilize Shoreline, Reduce Pollution, Provide Development Buffer

Low Impact Development



Bioretention Pond For
Stormwater Pollution Treatment



RCID/WDW

Educational Programs To Promote Stewardship & Smart Development

- Stormwater
- Erosion Control
- Dewatering
- Recycling
- Waste Reduction/Minimization
- Hazardous Materials
- Utility Permitting (water/sewer/reuse)
- Lake & Watershed Management



Environmental Services Provides:

- Historical Water Quality Data
- Water Analyses & Trends
- Lake Management
- Watershed Protection
- Management Options & Education

Providing Environmental Protection For Over 38 Years.



Environmental Services

Our Future Depends On Water!

Clean

Dependable

Renewable



Environmental Services