

# Climate Impacts Workshop

## May 10, 2012



Nancy Gallinaro  
Director, Strategic Planning

# Institutionalizing Climate Change Impacts



# WUD Overview

- Began in the 1970's with the purchase of several developer plants
- Initiated regionalization program in the 1990's
- Florida's third largest water and wastewater utility
- 6 Water and 2 Wastewater Plants
- 470,000 people, 2,000 miles of water mains, 1,500 miles of wastewater mains
- 496 personnel, operating budget of \$150M and > \$1B in assets
- Recognized as an industry leader



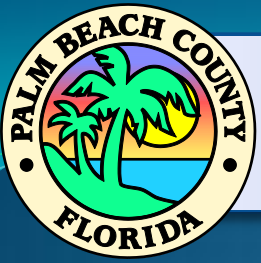




# Utility Issues & Challenges

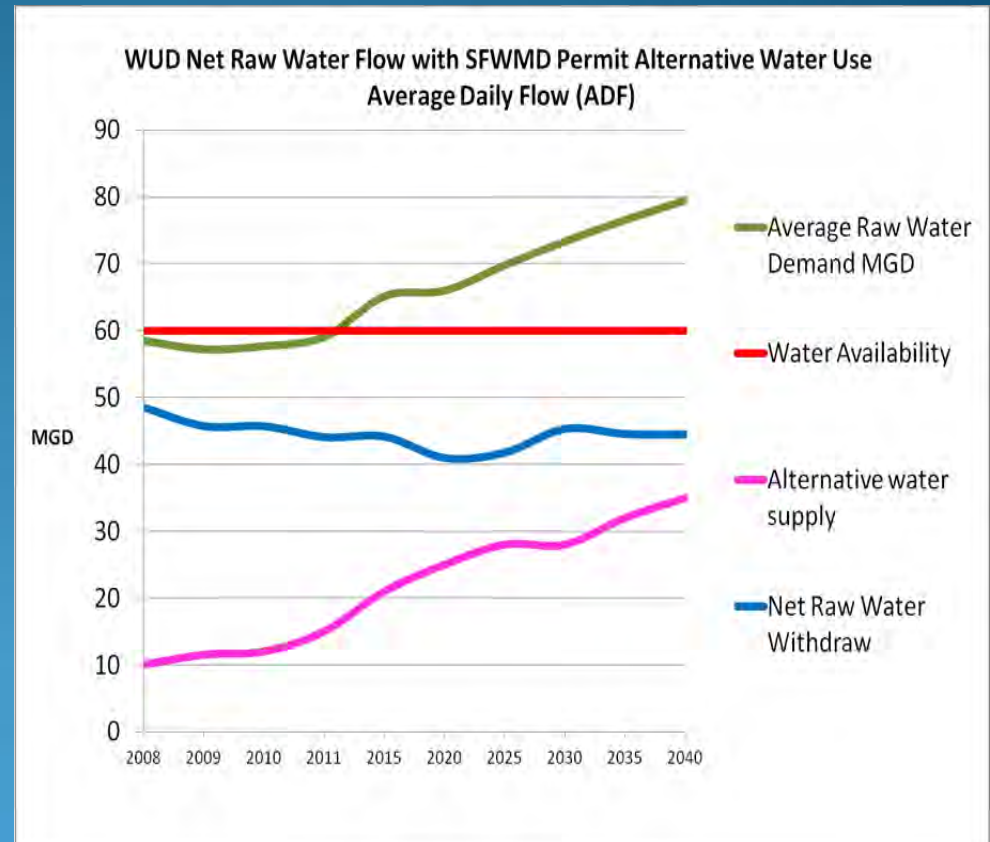
- **Raw Water Demands**
- **Population/Growth**
  - Water Supply, Revenue
- **Conservation/Reuse**
- **Regulations**
  - NNC, Water Availability Rule ,Emerging Contaminants
- **Technology [Cost/Benefit]**
- **Climate Change**





# RAW WATER FLOW DEMANDS

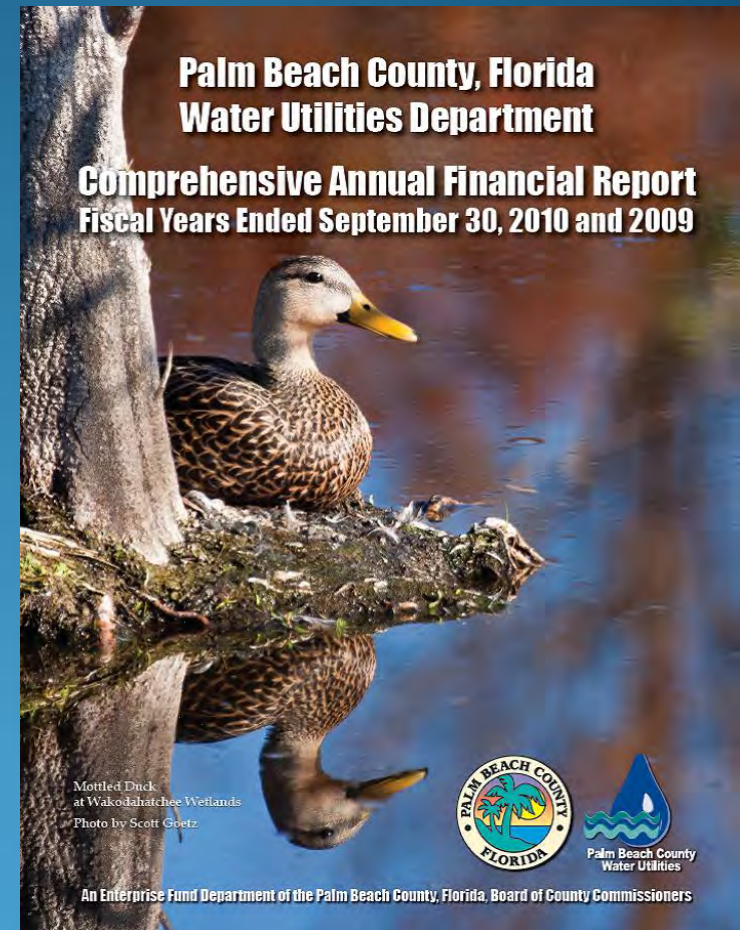
In spite of disappointing economic forecasts and increased regulatory pressure to move toward AWS, WUD has achieved sustainable total water management of those resources entrusted to it...





# REVENUE

- Develop sufficient revenue for long-term financial stability amid declining population & water restrictions
- Maintain affordable customer rates
- Achieve positive net income
- Build cash reserves



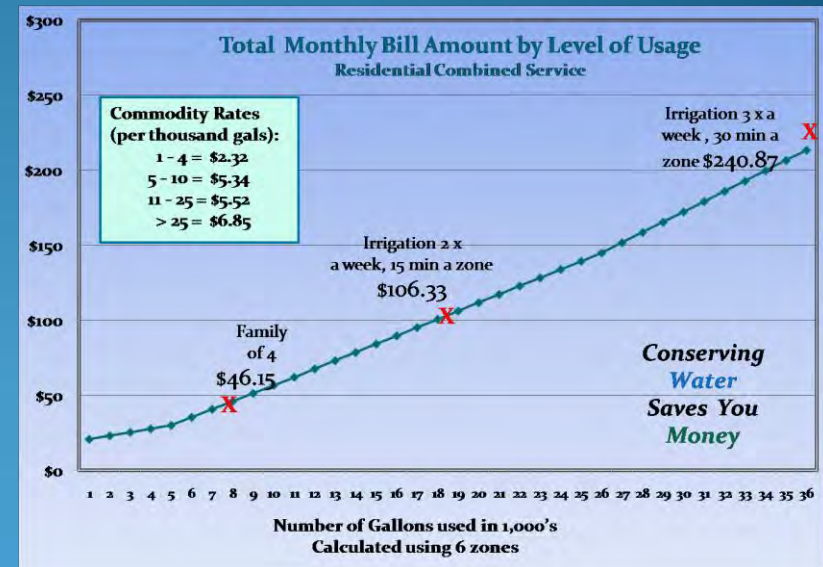


# REVENUE



- Added new revenue sources (bulk water, revenue grants, etc.)
- Stabilized personnel costs

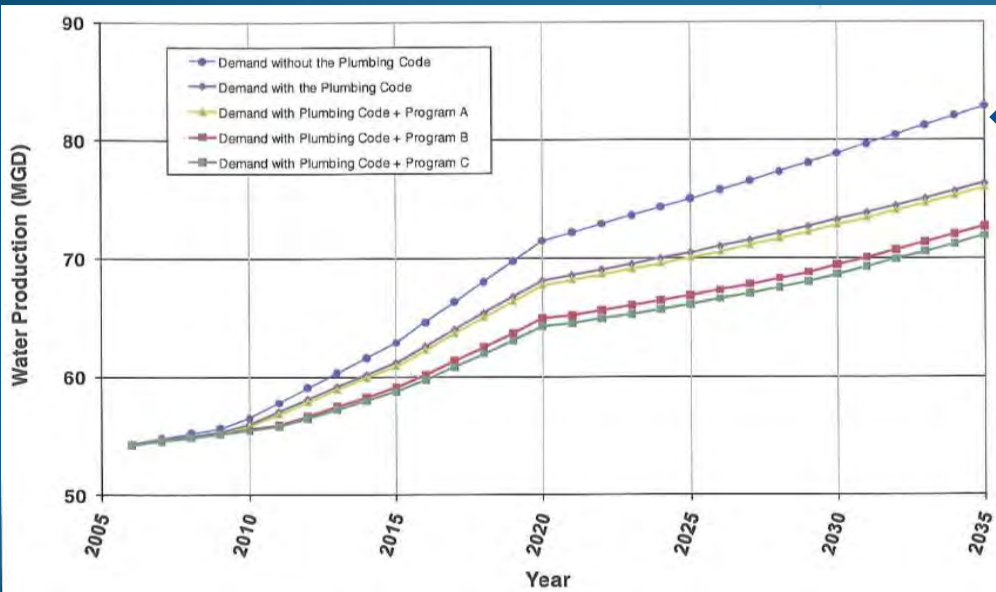
- Established strong conservation rate structure
- Tied rate structure to Utility CPI (75%)
- Prioritized O&M; CIP







# CONSERVATION



**Projected Demand Savings of 6.9 MGD by 2035; Current WUD Conservation Program With National Plumbing Code Changes**



## Current WUD Conservation Program

- AMR System Leak Detection
- Toilet Leak Detection
- Public Information Program
- Rain Sensors on New Development Irrigation Systems
- Conservation Tiered Rate Structure
- Biofilm Management-Chlorine/System Flush

## National Plumbing Code

- Toilet – 1.6 Gal/Flush
- Urinals – 1.0 Gal/Flush
- Showerhead – 2.5 GPM (80 psi)
- Resident Faucets – 2.2 GPM (60 psi)
- Public Faucets – 0.5 GPM (60 psi)
- Dishwashing – 1.6 GPM (60 psi)



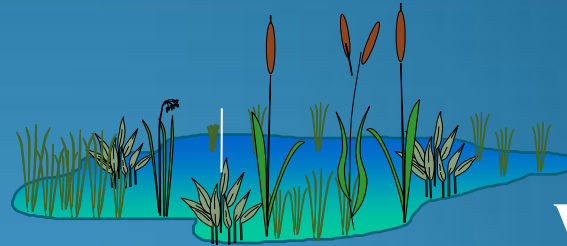


# Reuse

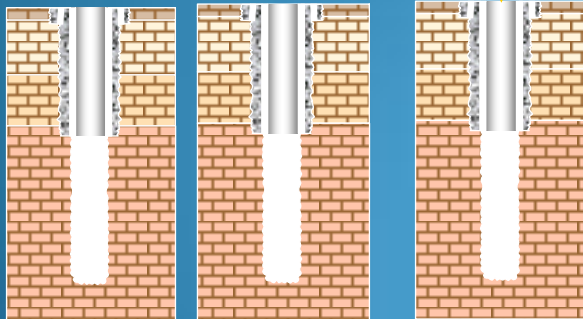
**SRWRF**  
**35 (22.5) MGD**



**Reuse**  
**22 (13.0) MGD**



**Wetlands**  
**5 (1.5) MGD**



**Deep Injection Wells**  
**34.5 (8.0) MGD**



# CONSERVATION AND REUSE

## 5.2 BILLION gallons in 2011

- Service to 8 golf courses and 22 communities
- Average daily demand = 14 million gallons
- Maximum daily demand = 22 million gallons
  - 100% Reuse
- Minimum daily demand = 4 million gallons
- MRWSA = 20 square miles (1 sq mi in 1995)





# FPL West County Energy Center



- Three new natural gas combined-cycle power units
- Units 1 & 2 online 2009
- Unit 3 online 2011
- Total facility capacity of 3,800 megawatts
- Cooling water source is major issue for FPL
- ADF 17mgd

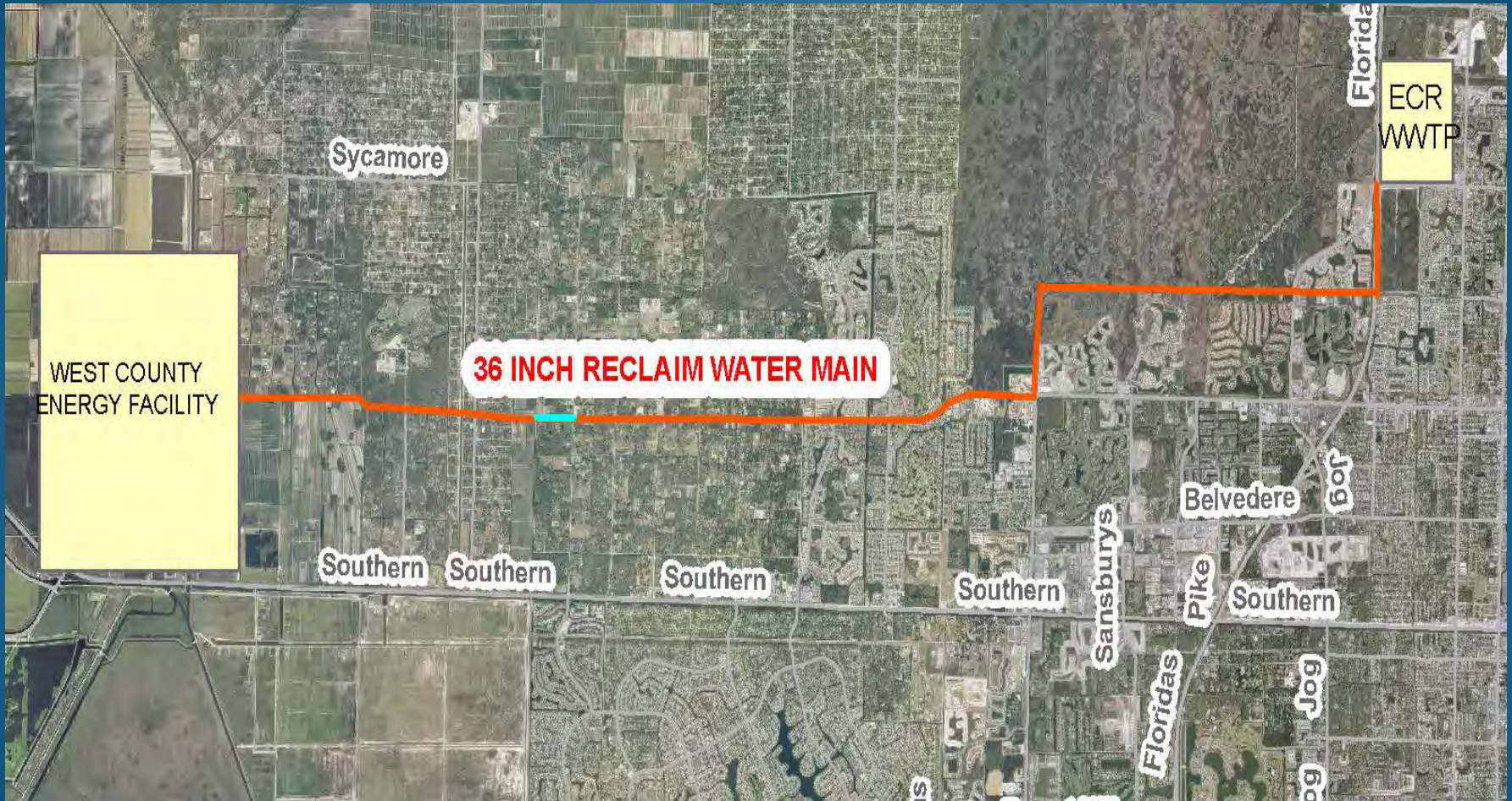






# Environmental Stewardship

FPL Project – reclaiming our resources while providing new source of funding for Utility





# Regulations

## Numeric Nutrient Criteria (NNC)

- Technology
- Cost
- Green House Gas



# LIMITS OF TECHNOLOGY FOR NITROGEN AND PHOSPHORUS

Level	Treatment	Total Nitrogen	Total Phosphorus
1	Conventional Activated Sludge	20 mg/L	2 mg/L
2	3 Stage BNR	8 mg/L	1 mg/L
3	5 Stage BNR + Filtration	4-8 mg/L	0.1-0.3 mg/L
4	5 Stage BNR + Denite Filtration	3 mg/L	0.1 mg/L
5*	5 Stage BNR + Denite Filtration + MF/RO	< 2 mg/L	< 0.02 mg/L

\* MF/RO for half the flow

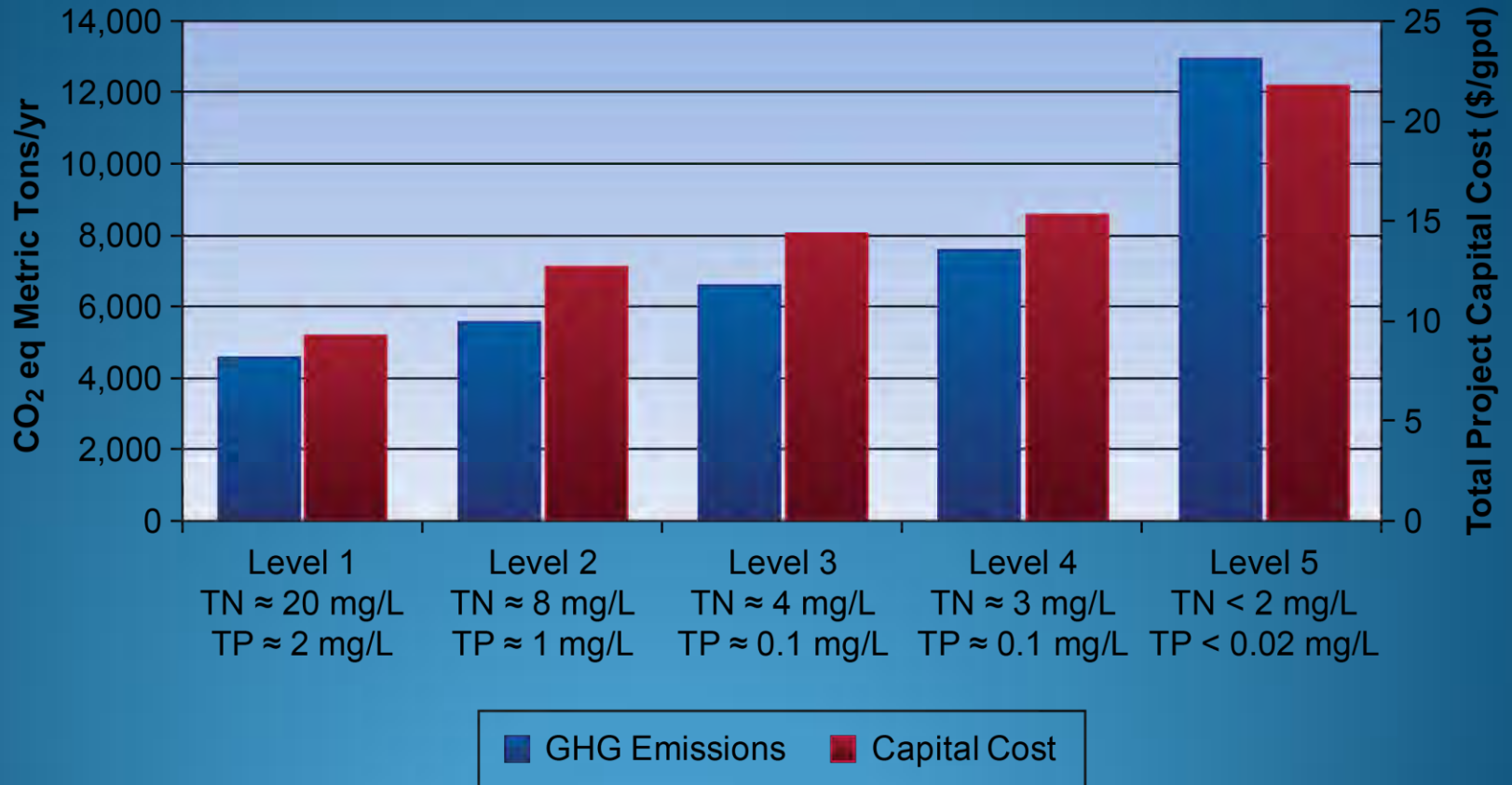
*Reference: WERF NUTR1R06n 2011: Striking The Balance Between Nutrient Removal In Wastewater Treatment And Sustainability 2011*

*Provided by Patrick Davis, P.E.; Hazen & Sawyer*





# GHG EMISSIONS & CAPITAL COST



Reference: WERF NUTR1R06n 2011: Striking The Balance Between Nutrient Removal In Wastewater Treatment And Sustainability 2011

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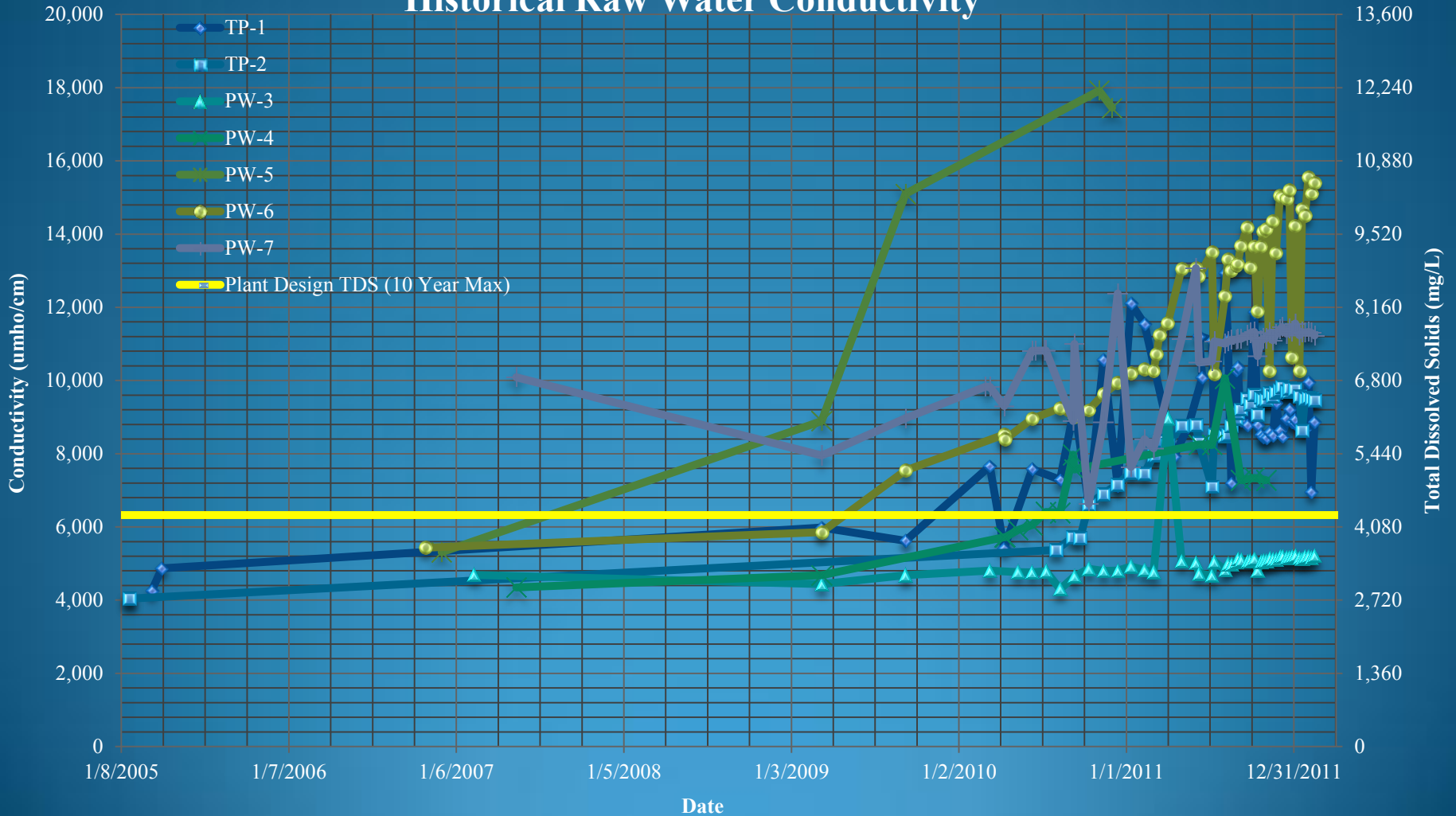
# WATER AVAILABILITY RULE

- **Surficial Aquifer – Wells**
- **Floridan Aquifer**
- **Chloride Issues**



# Chloride

## Lake Region Wells Historical Raw Water Conductivity



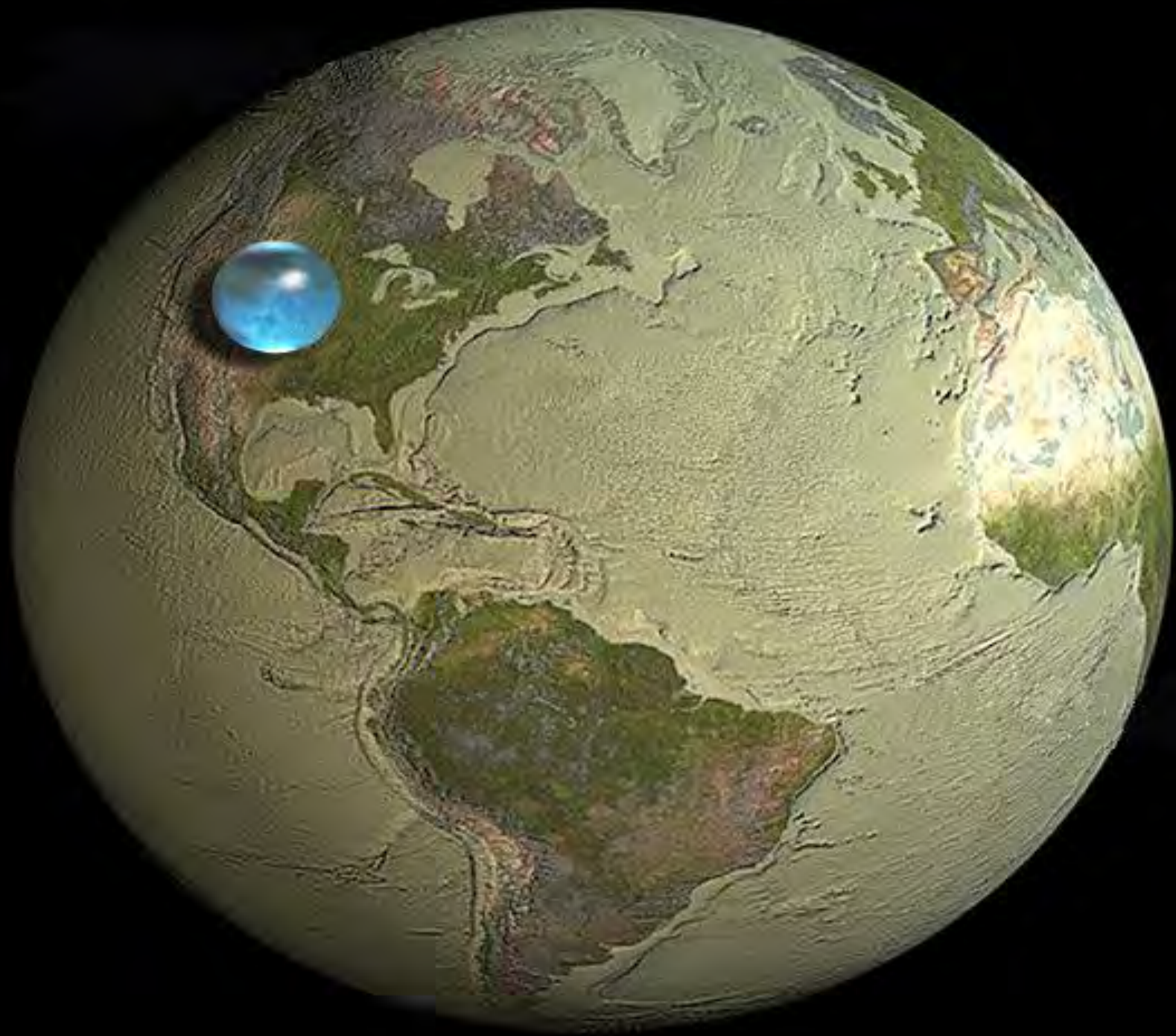




# Technology

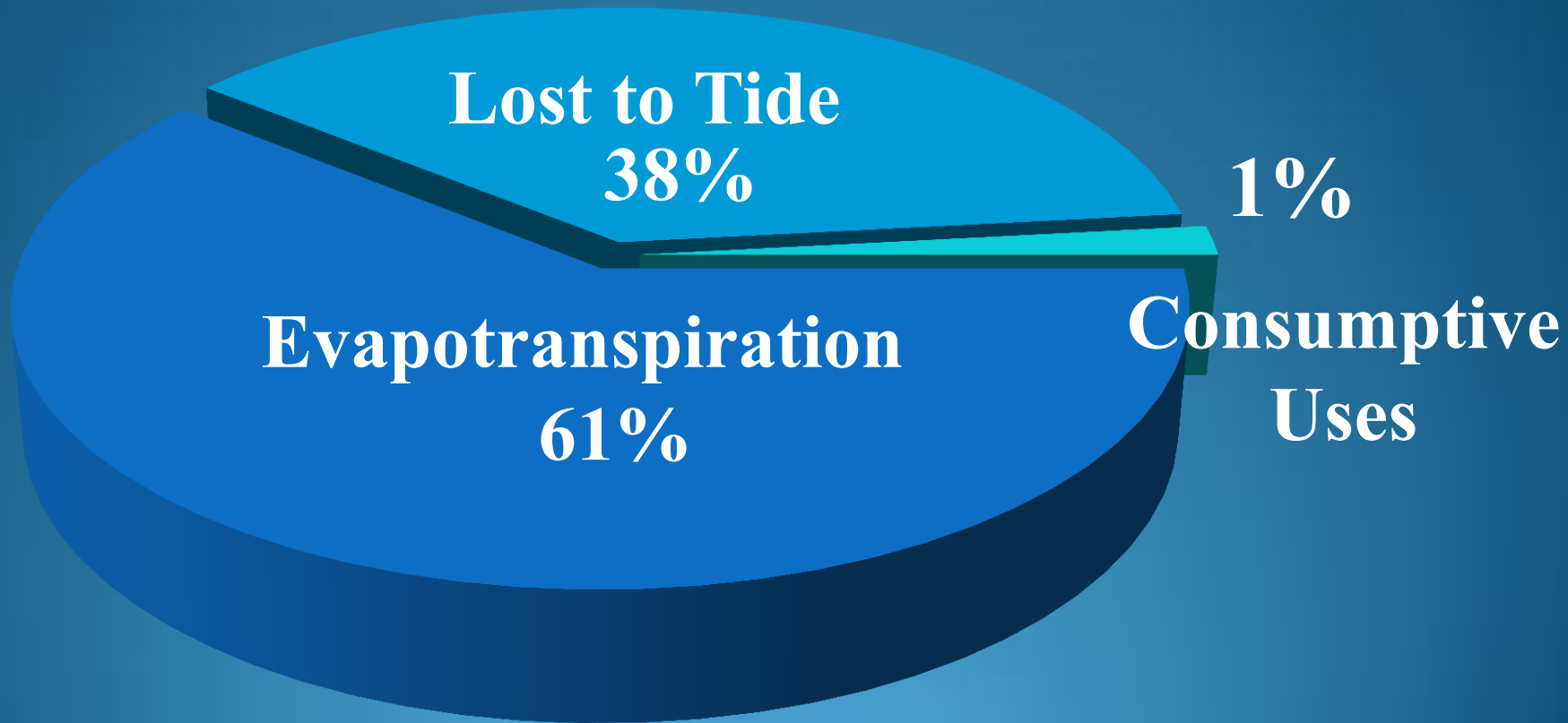
- Water Treatment
- Wastewater Treatment
- Energy Recovery
- Energy Conservation
- Asset Management Best Practices
- Computerized Maintenance Management System (CMMS)







# Florida Water Budget

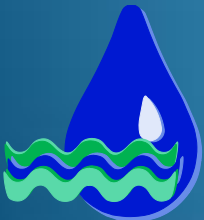






# Water: New Reservoir Benefits?

- Improved Regional System Management Flexibility
- Potential for Improved Water Quality & Flows to the Refuge
- Water Supply Offsets to Help Lower Future Drinking Water Supply Costs
- Adaptation to climate change



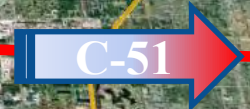


Lake Okeechobee

L-8 Basin

Loxahatchee River

Grassy Waters



STA 1W

STA 1E

Loxahatchee National Wildlife Refuge



Florida's Turnpike

Google earth

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Image © 2012 TerraMetrics  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

26°43'30.47" N 80°23'17.42" W elev 14 ft

Imagery Date: 3/21/2011

27

Eye alt 39.82 mi



Lake Okeechobee

Loxahatchee River

L-8 Basin #3

Flow-way #4

Flow-way #3

Flow-way #2

L-8

C-18

Grassy Waters

C-17

M Canal

L-8 Res

Flow-way #1

C-51

STA 1W

STA 1E

Loxahatchee National Wildlife Refuge

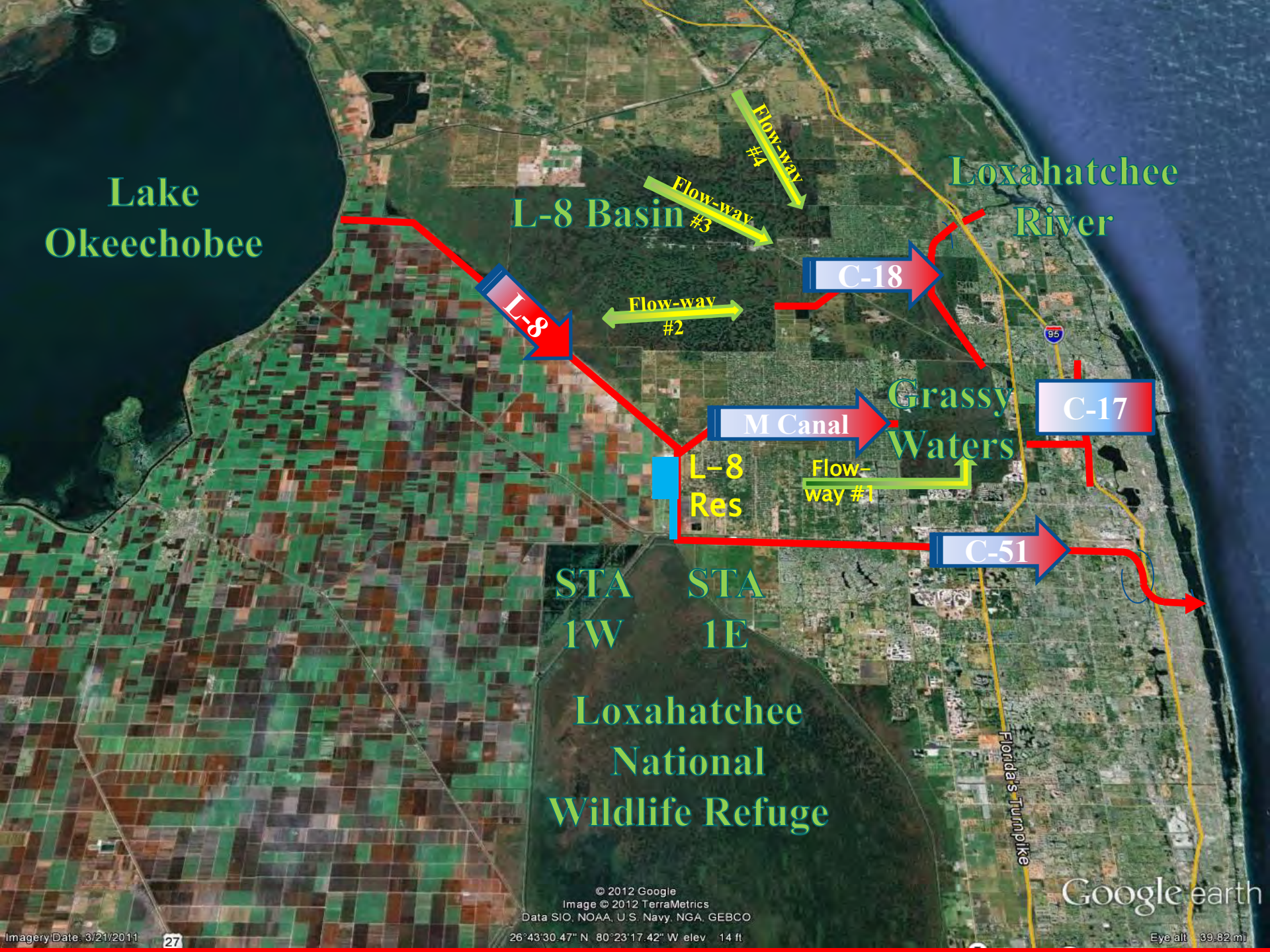
Florida's Turnpike

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C-51  
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L-8  
Res

C-51

STA  
1W

STA  
1E

Loxahatchee  
National  
Wildlife Refuge

LWDD  
E  
Canals

rida's Turnpike



# What are the Issues?

- **Timing**
- **Water Quality**
- **Project Cost**
- **Participation**
- **Leadership & Governance**



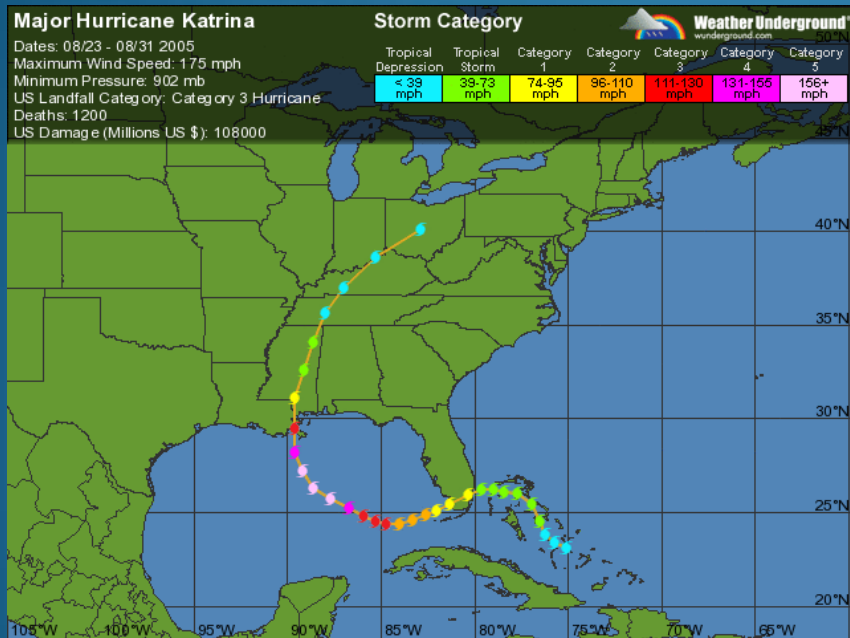


# Climate Change Areas Of Study

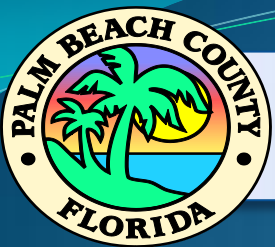
- **Temperature Impacts**
- **Rainfall Impacts**
- **Storms/Hurricanes Sea Level Rise**



# Using Models

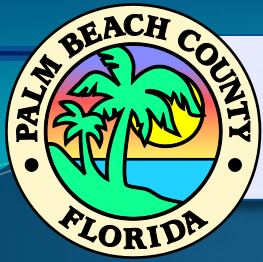


- KATRINA
- Number of named storms
- Predicting rainfall/inches
- Predicting likely path of hurricane or tropical storm
- Intensity
- Wind Speed
- Duration



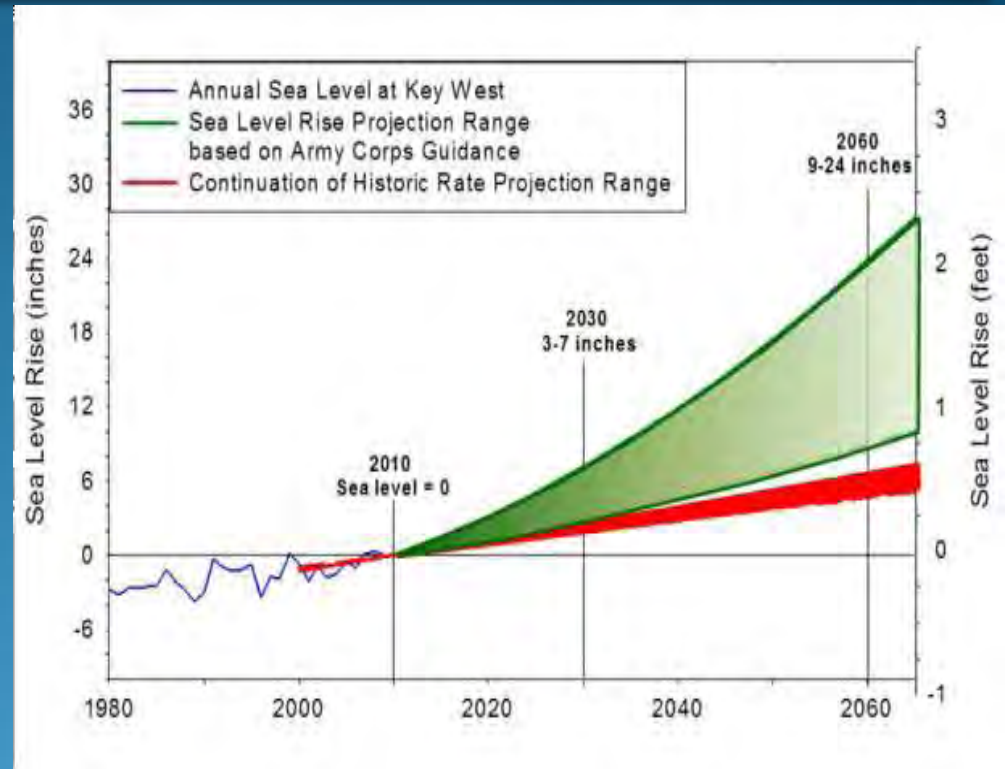
# WET WEATHER & FLOODING

- **Vulnerability of existing infrastructure**
- **Frequency & magnitude of extreme events**
- **Appropriate level of redundancy and safety factors**



# CLIMATE CHANGE

- Develop strategies to respond to climate change impacts
- Participate in SE FL Regional Climate Change Compact
- Work on federal and state climate policies







# QUESTIONS

Nancy Gallinaro

PBCWUD Director, Strategic Planning

Email: [ngallinaro@pbcwater.com](mailto:ngallinaro@pbcwater.com)

(561) 493-6090

