

# Water Quality in Everglades National Park, Part II: Status, Trends and Influence of Water Management

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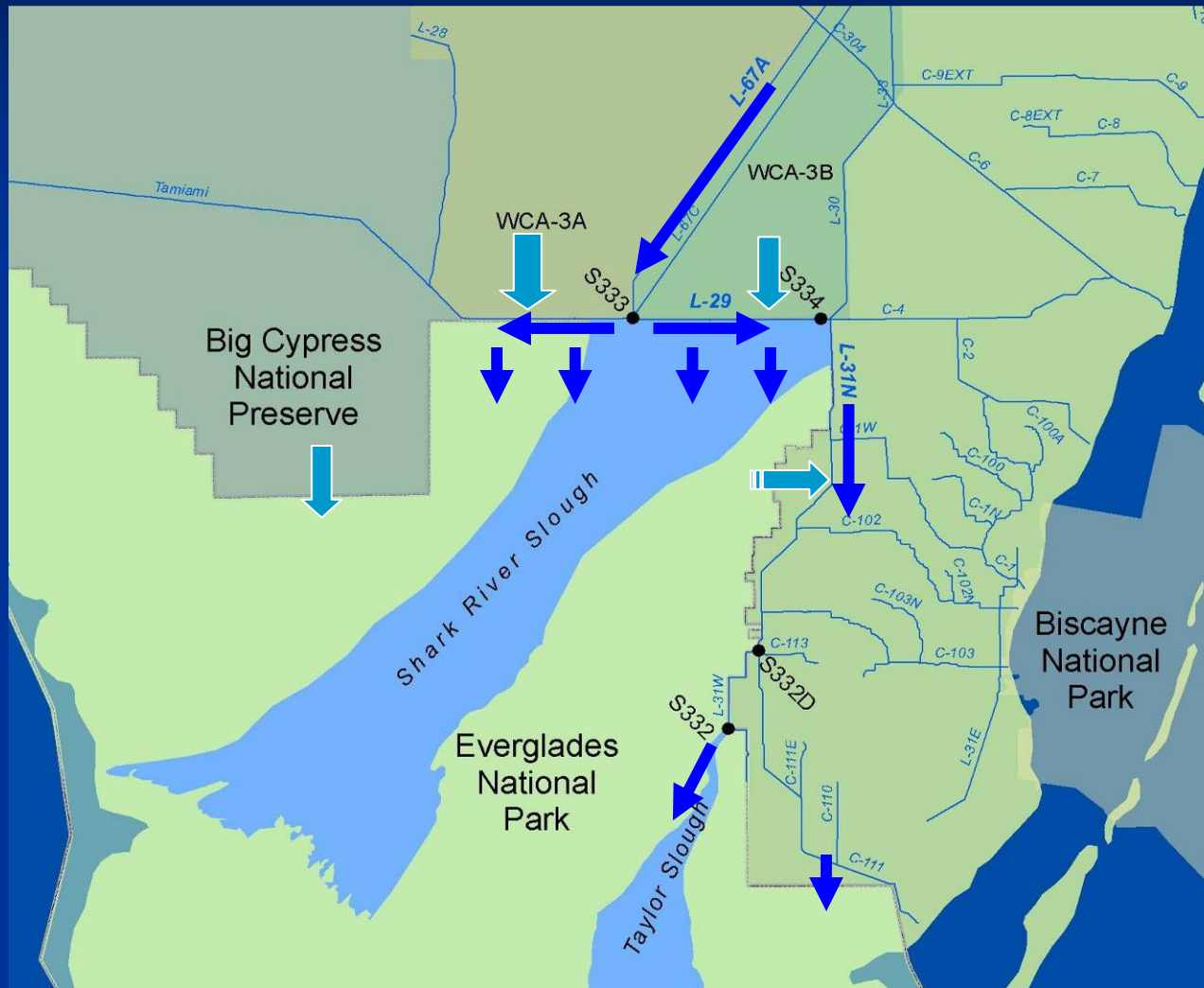
<sup>2</sup>SFNRC, Everglades National Park,  
Homestead, FL

# Overview

- Water Source
- WQ Status & Trends
  - Spatial (1986-07)
  - Temporal
    - 1986 - 1992
    - 1992 - 2000
    - 2000 - 2007
- Conclusions



# Water Delivery to Park



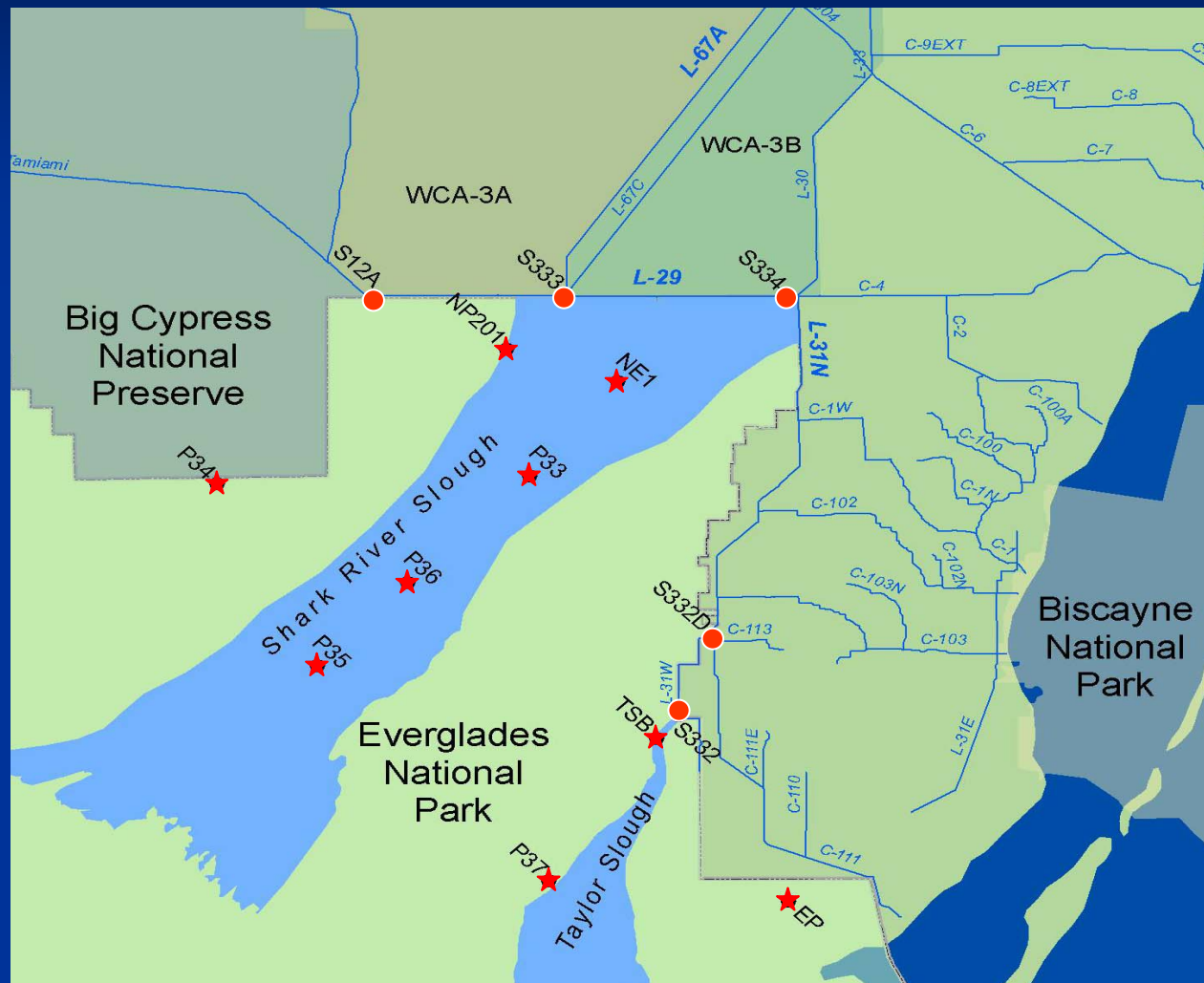
# Methods

- Data Source- DBHYDRO, SFWMD
- Summary Statistics (Censored)–
  - Multiple Limit Regression Method
  - Adjusted Maximum Likelihood Estimation
- Trend Analysis (Censored Seasonal)-
  - Box-Cox Transformation
  - Stage Adjustment
  - Seasonal Trends-
    - Kendall Tau ( $\leq 10\%$  censored data)
    - Tobit Regression Model ( $> 10\%$  censored data)

# Tools

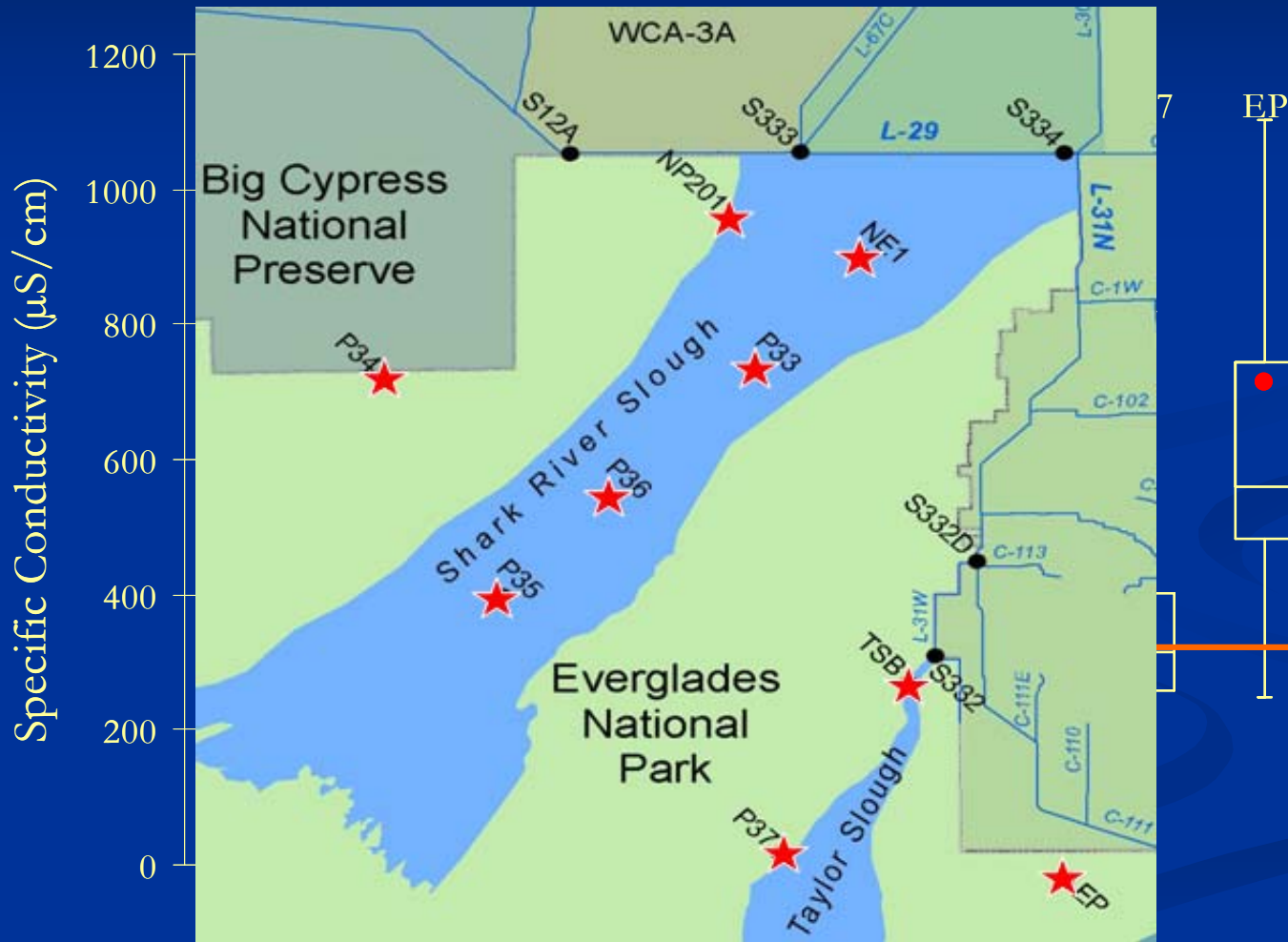
- USGS library: Add-in to S-PLUS
  - MDL Summary Statistics
  - ESTREND
- XLSTAT, Addinsoft: Add-in to MS Excel
  - Box-Cox Transform
  - Box Plots

# WQ Monitoring Stations



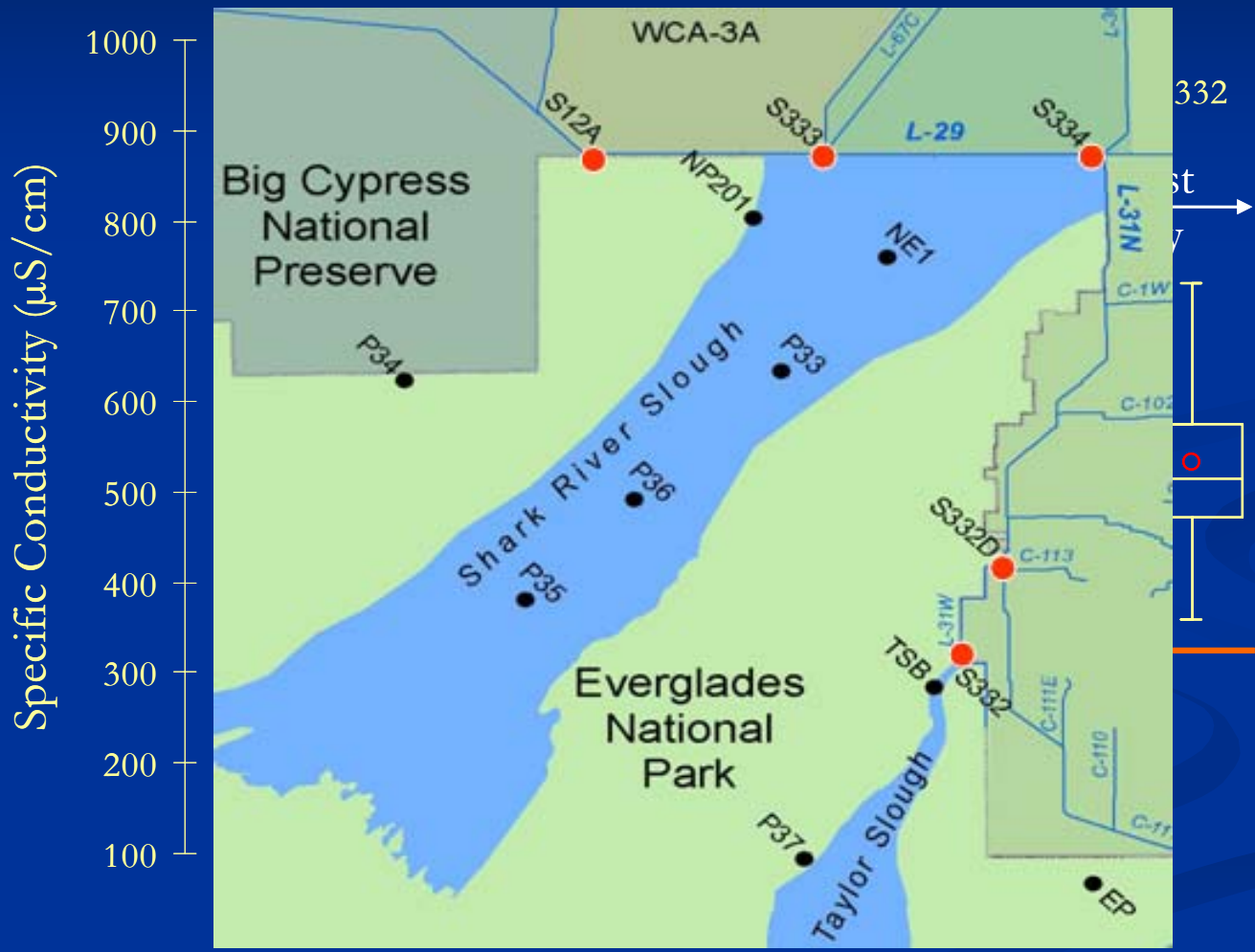
**Spatial Patterns of WQ  
Inside the Park and at  
Water Delivery Structures  
(1986-2007)**

# Specific Conductivity, Internal Stations

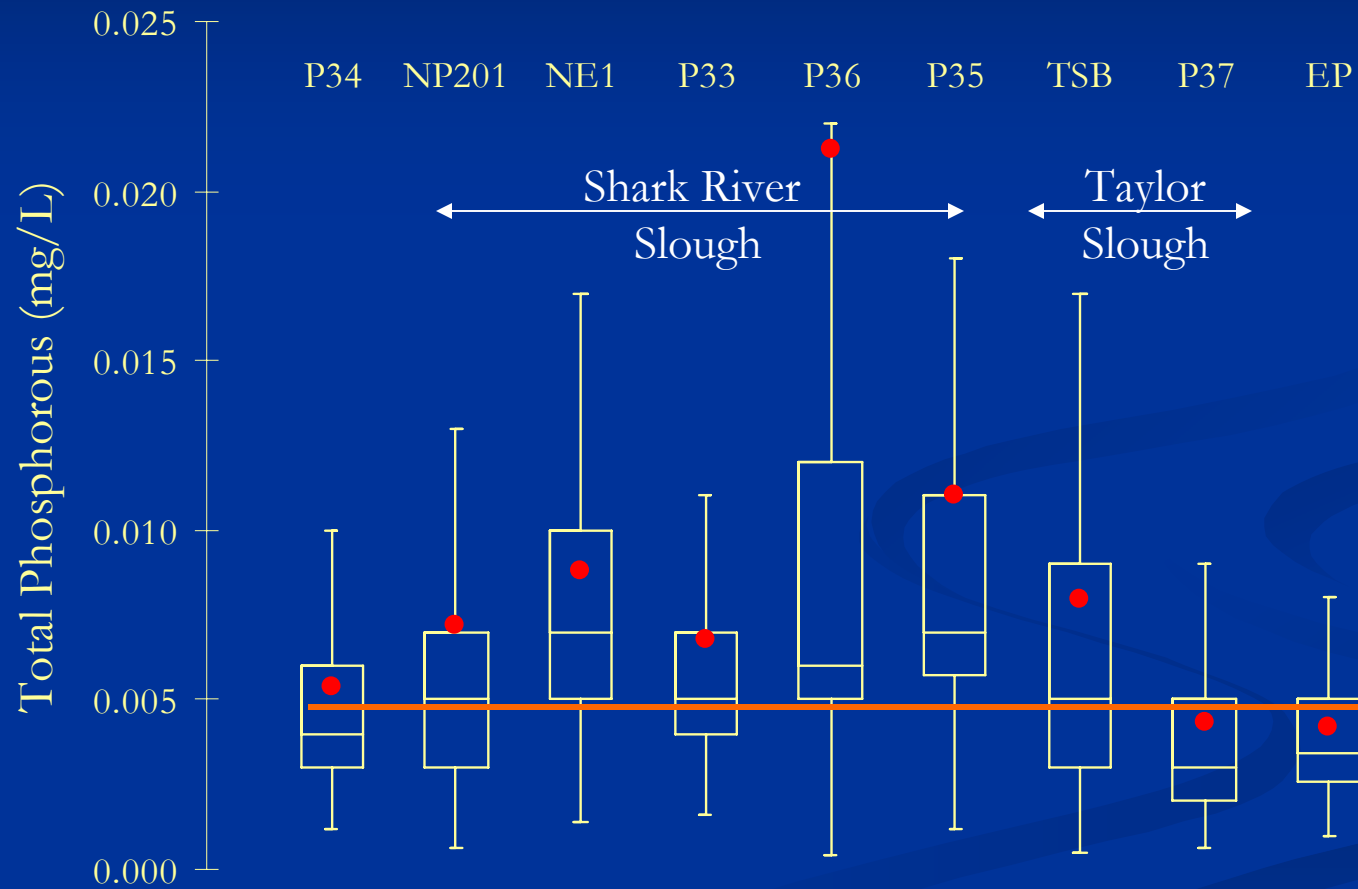




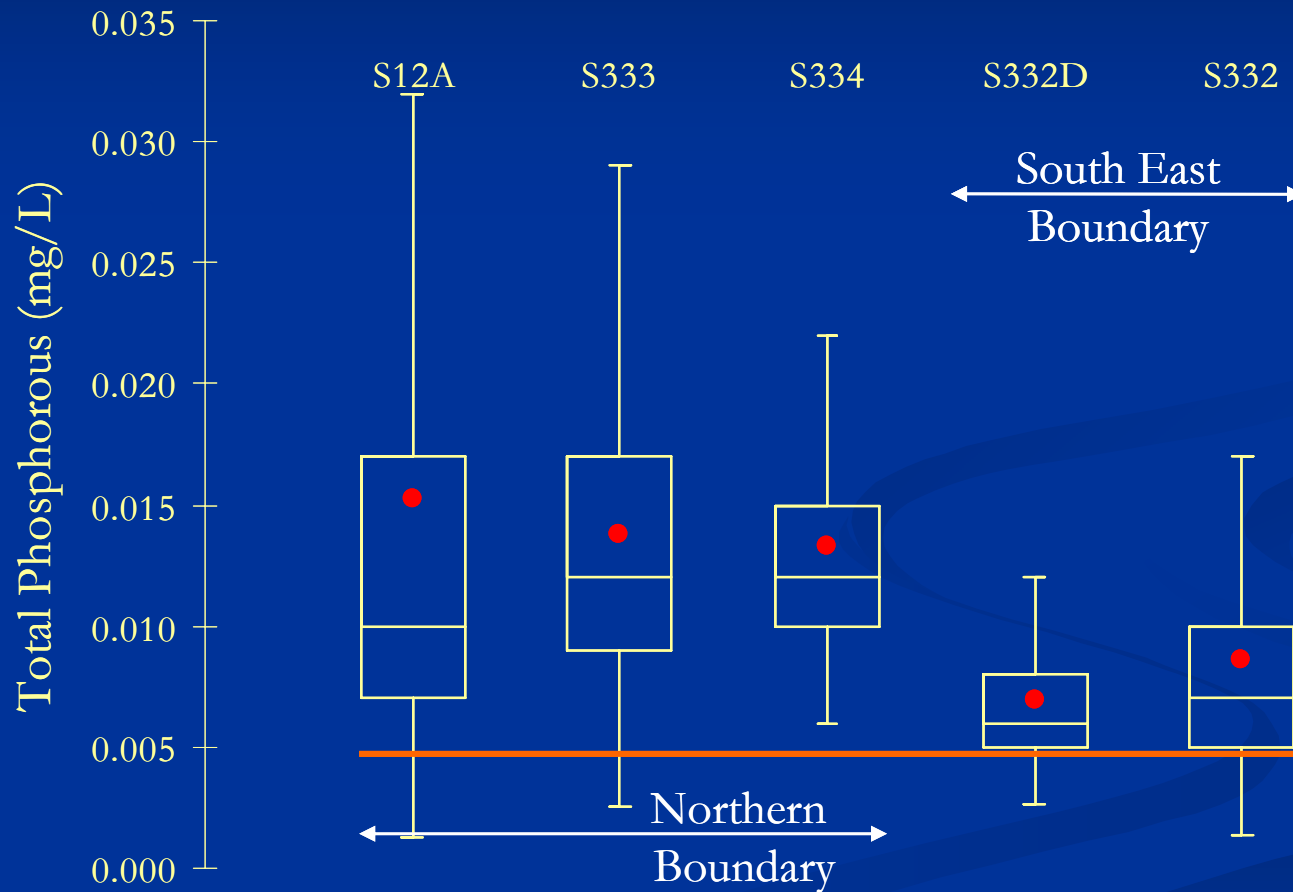
# Specific Conductivity, Delivery Stations



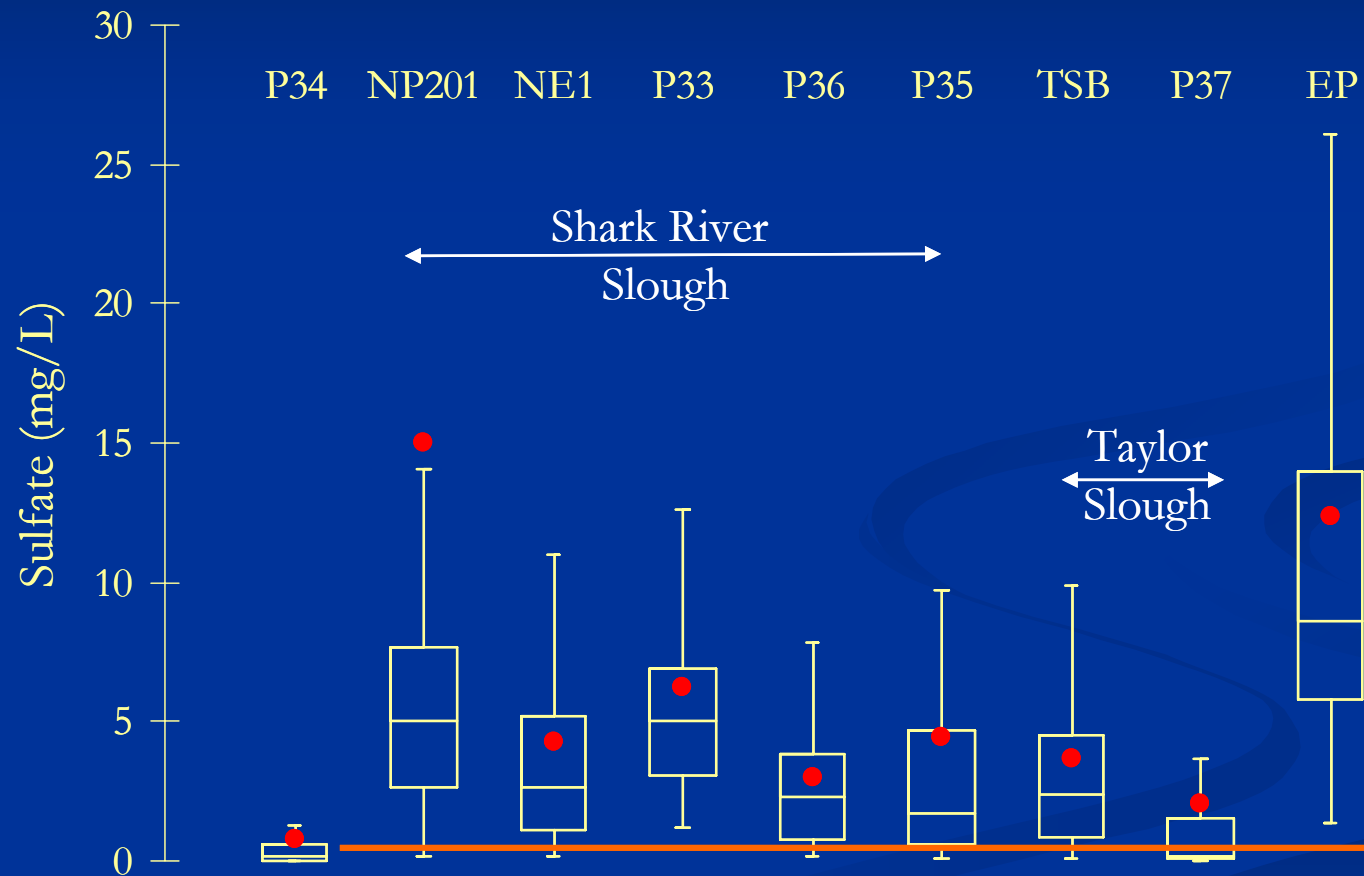
# Total Phosphorus, Internal Stations



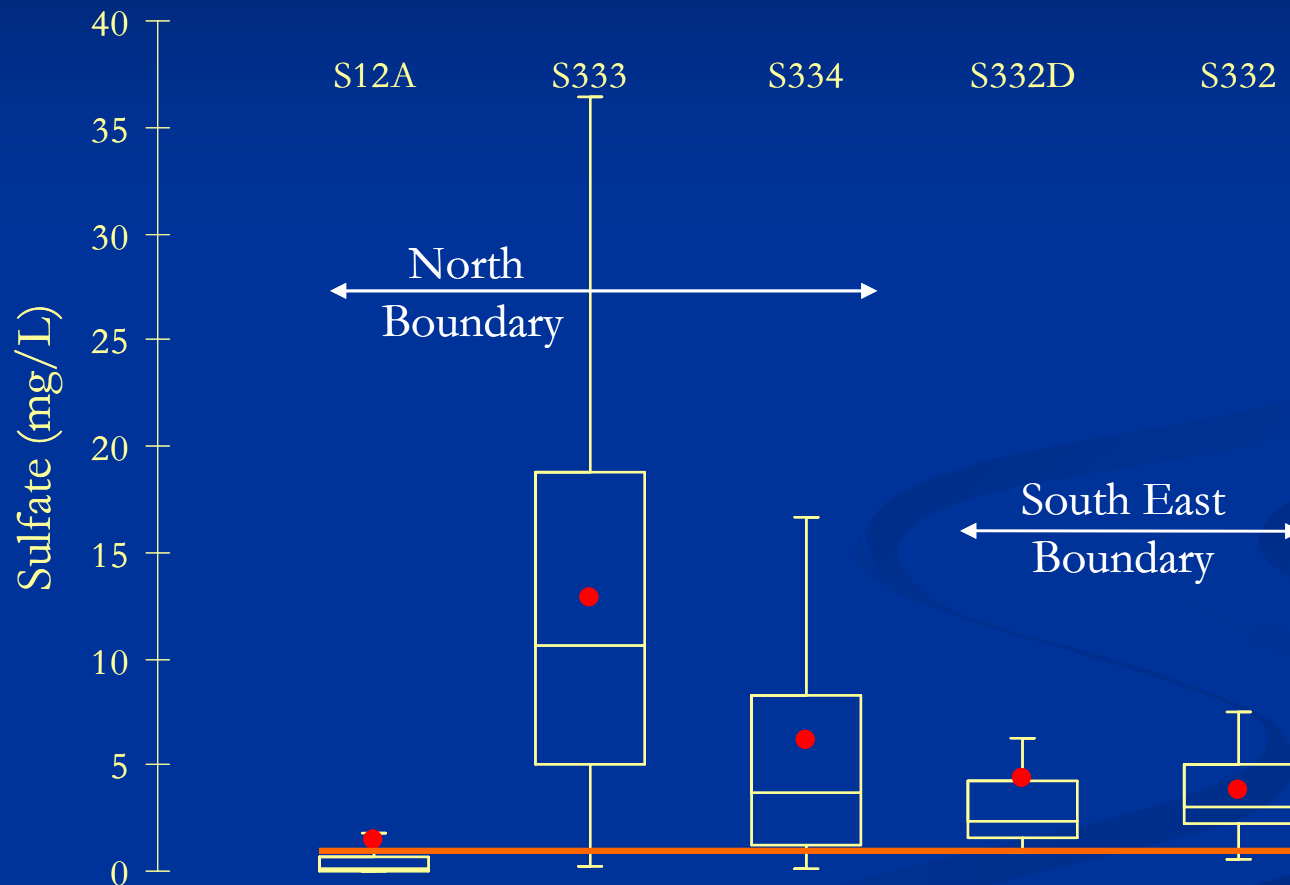
# Total Phosphorus, Delivery Stations



# Sulfate, Internal Stations



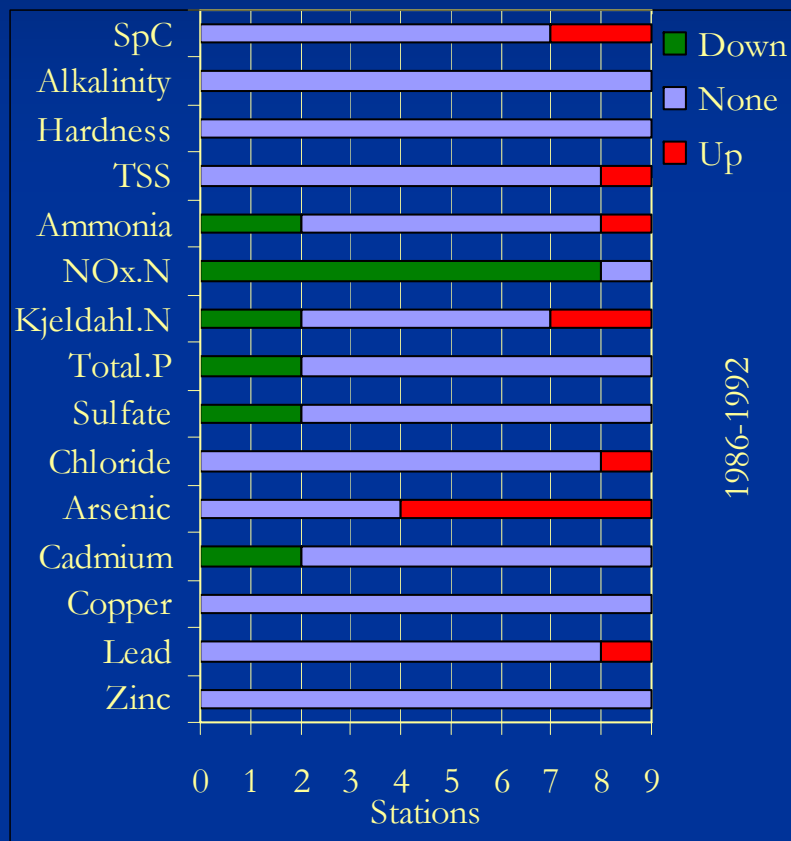
# Sulfate, Delivery Stations



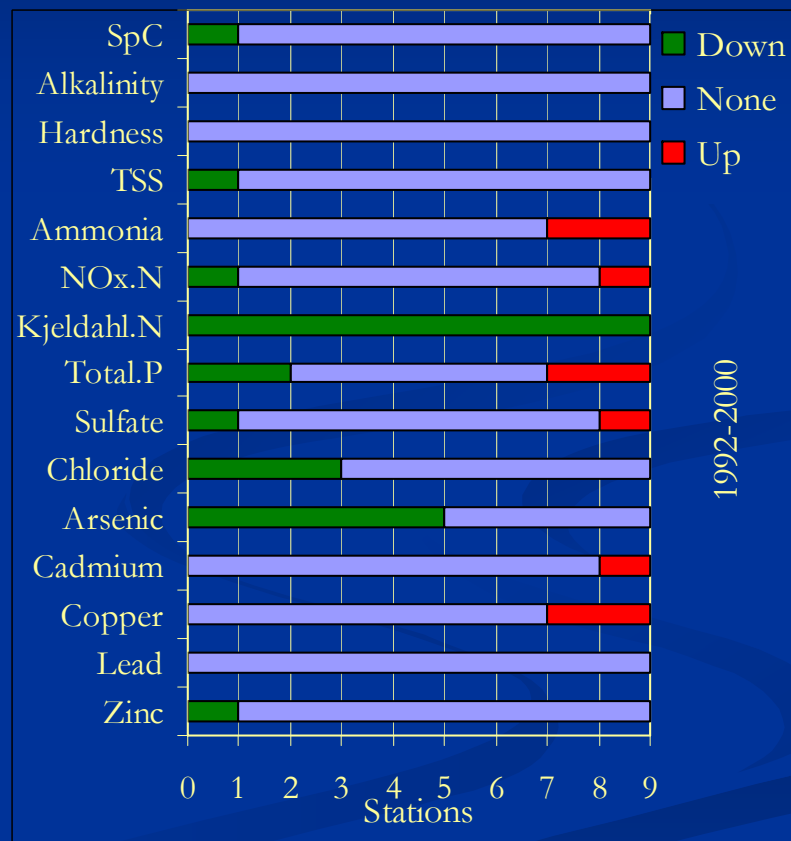
# **Temporal Trends of WQ Constituents at Internal Network**

# Trends

1986-1992

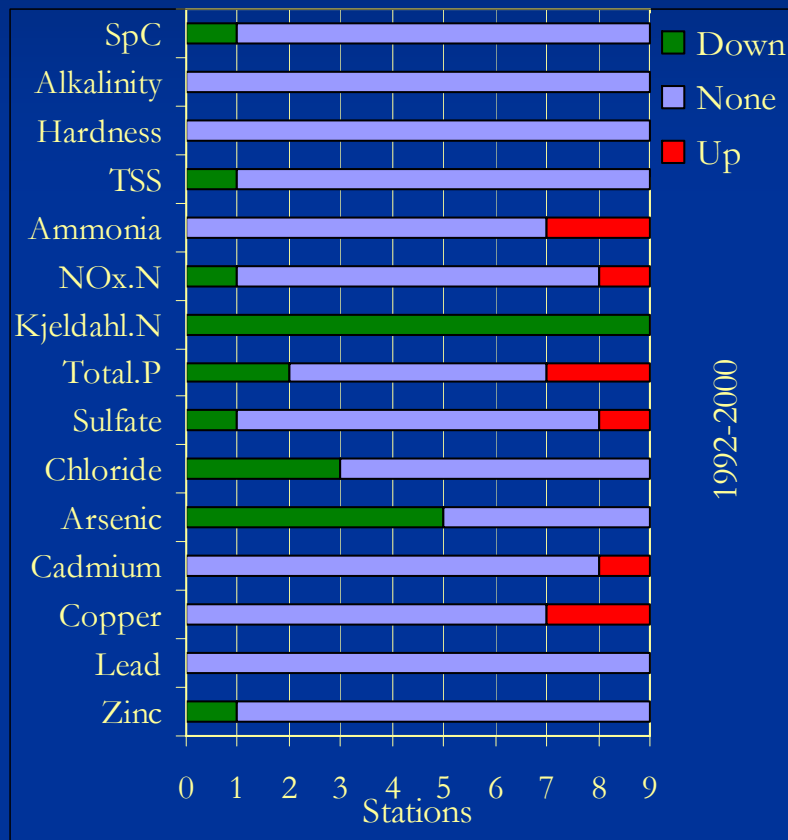


1992-2000

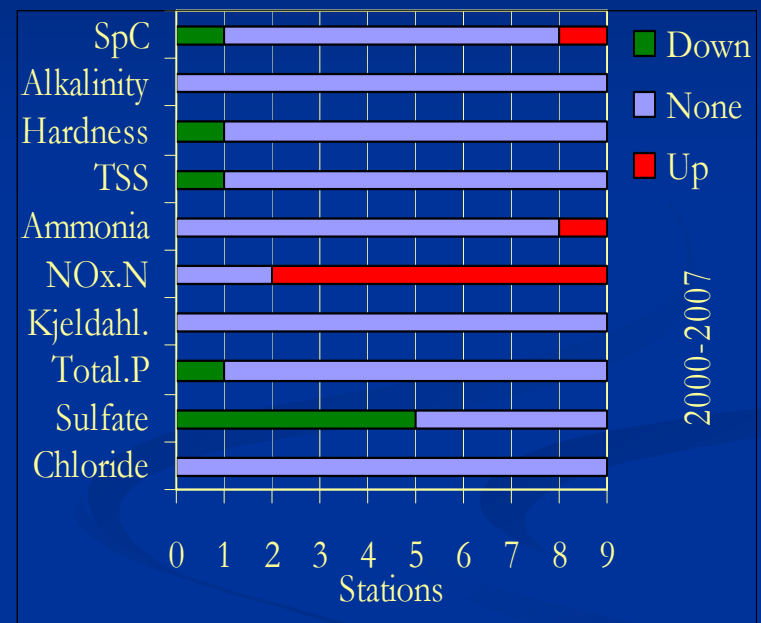


# Trends

1992-2000

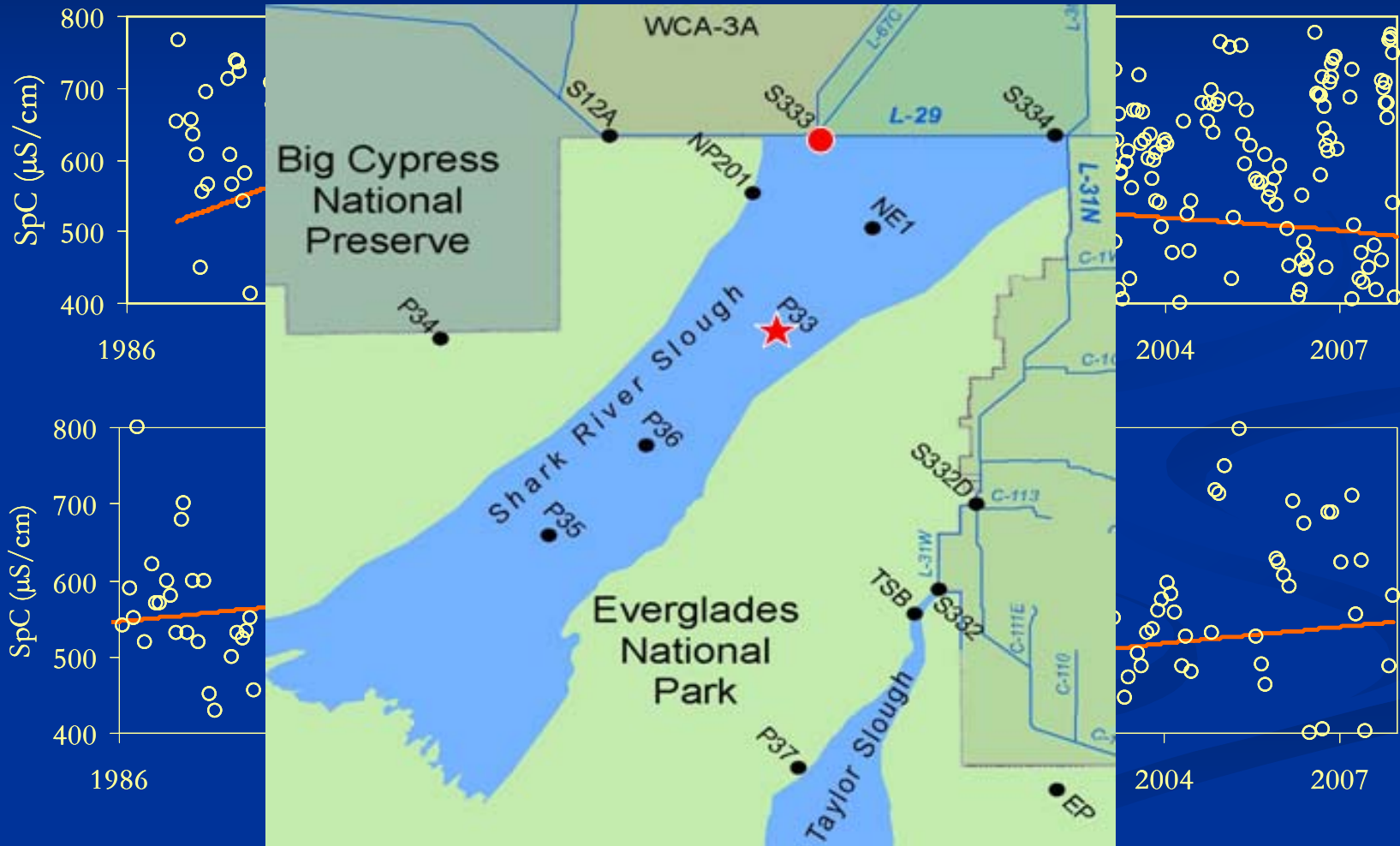


2000-2007

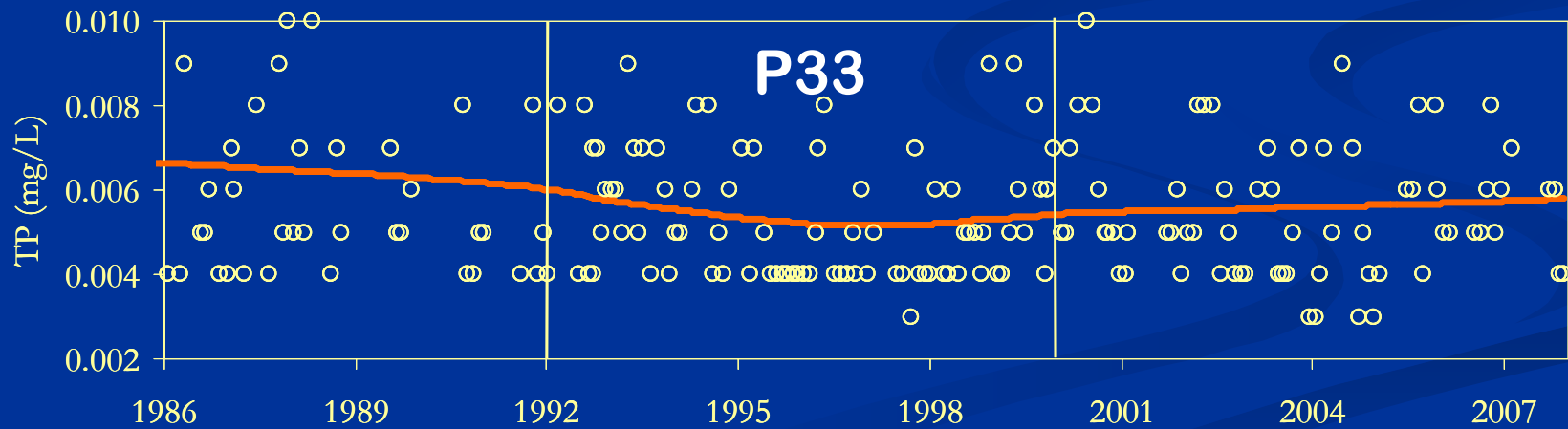
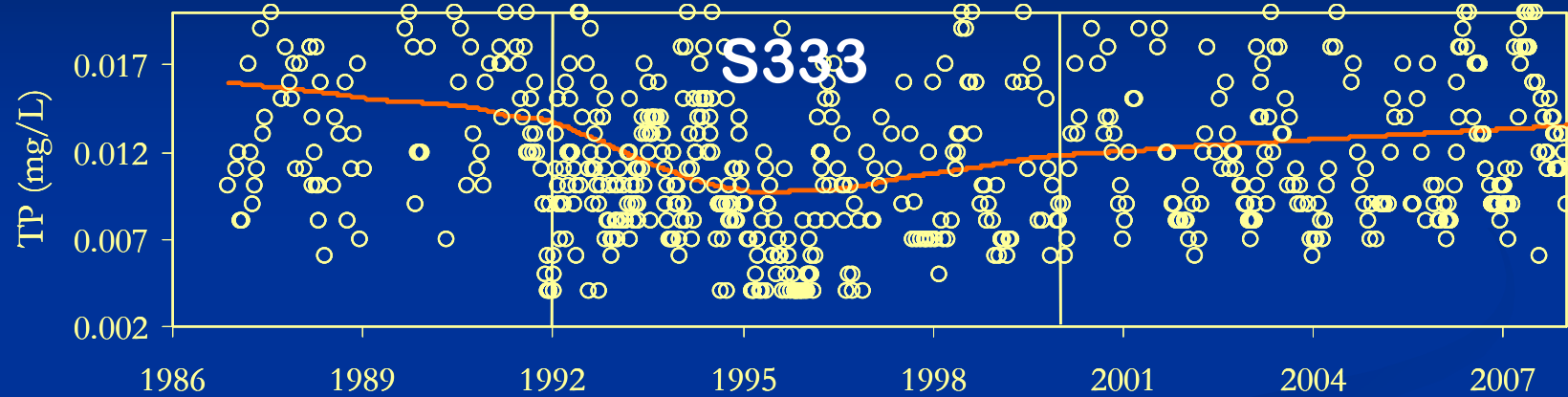




# Specific Conductivity



# Total Phosphorus



# Conclusions

- Impact of land-use and water management
- Influence of marsh (WCA) seepage-
  - S12A, West of S333
  - S334, East of S333
- Seepage from Park to L31N & C111

# Conclusions

- WQ Status
  - Shark River Slough vs. Taylor Slough
  - North vs. South
  - P34 – Best WQ & EP- Worst WQ
  - S333- Highest concentration ranges
- Other Concerns
  - Elevated sulfate concentrations
  - Pesticides: Endosulfan

# Conclusions

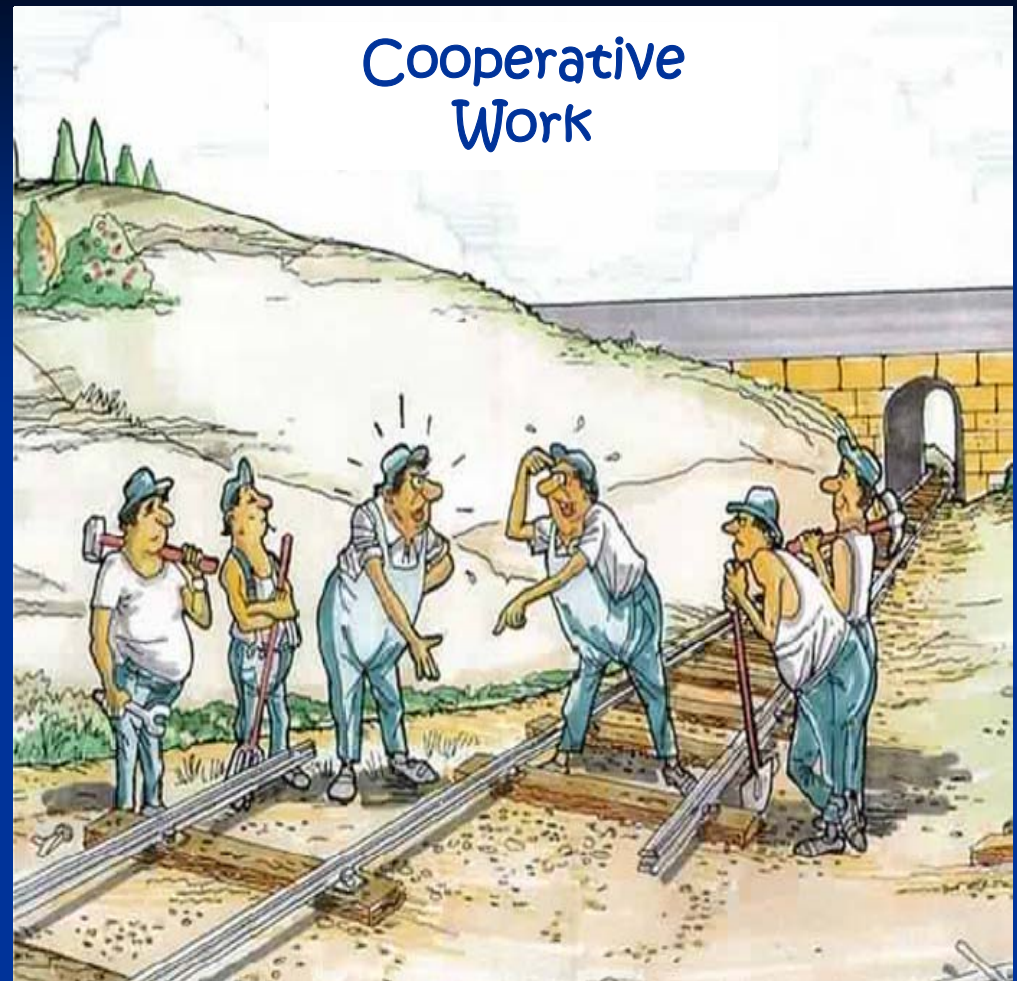
## ■ Trends

- Since 2000, trace metals improved
- In 1980s deteriorating trends
- In 1990s improving trends
- In 2000s slightly deteriorating trends

## ■ Impact of water deliveries plans

- MSWDP (1970-83)
- EWDP (1984-99)
- ISOP (2000-02)
- IOP (2002-...)

**Funding for  
this  
Cooperative  
Work  
was provided  
by**



**Everglades National Park**  
***South Florida Natural Resources Center***

National Park Service  
U.S. Department of the Interior

