

US EPA ARCHIVE DOCUMENT



# **Long-term Monitoring Program for the City of Atlanta**

**EMAP Conference 2004**

May 6, 2004 - Newport, Rhode Island



# Overview

- Program Background
- Program Objectives
- Recommended Long-term Monitoring Program
  - ➡ Station selection and gage installation
  - ➡ Water quality monitoring
  - ➡ Biological monitoring
  - ➡ Data management
  - ➡ Watershed management plan
  - ➡ Public involvement
- Project Status and Available Results
- Summary and Conclusions



## *Program Background*

# 1995 Lawsuit Settled by Entry of Two Consent Decrees:

### ■ Consent Decree - Sep 1998

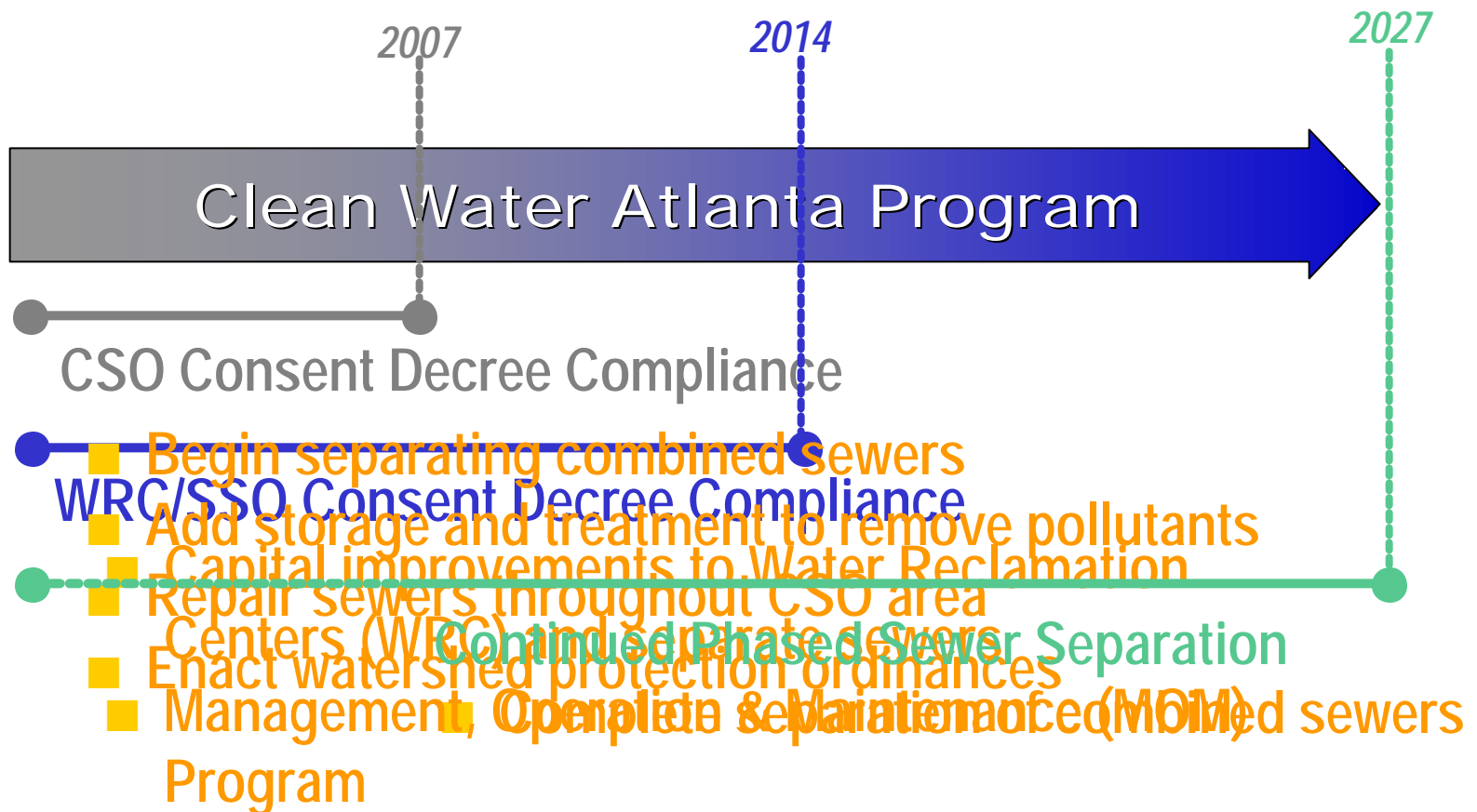
- ➔ led to development of a control plan that includes **storage/treatment** and **sewer separation** to reduce combined sewer overflows (CSOs)

### ■ First Amended Consent Decree - Dec 1999

- ➔ focused on improvements to **water reclamation centers** and **sewer rehabilitation** to reduce **I & I** leading to sanitary sewer overflows (SSOs)

## *Program Background*

# Comprehensive Long-term Action Plan is a 25-year effort







## *Program Background*

# Mayor Shirley Franklin Introduces Five Point Plan (October 2002)

- Clean Water Atlanta (CWA) - a \$3 Billion Program
  - ➡ Ensure professional management of the City's Consent Decree Projects
  - ➡ Reduce Flooding and pollution caused by storm water
  - ➡ Monitor water quality of major streams & rivers in Atlanta
  - ➡ Eliminate Sanitary Sewer Overflows (SSO)
  - ➡ Implement a Combined Sewer Overflow (CSO) solution that achieves high water quality, low costs and timely completion of Consent Decree obligations



## *Program Objectives*

# Regulatory Drivers for Long-term Watershed Monitoring

- Replace event driven sampling associated with SSO Consent Decree requirements
- Consolidate other water quality program sampling requirements (NPDES)
- Satisfy Watershed Management Plan requirements
  - ➡ GA EPD Requirements associated with future wastewater discharge permit expansions



## *Program Objectives*

# Other Objectives of Long-term Watershed Monitoring

- Assess baseline conditions
- Identify sources of impairment
- Document stream improvements
- Identify new programs to address streams requiring further action
- Provide public education on water quality





# **Recommended Long-term Monitoring Program**

## *Recommended Program*

# Program Components

- Station selection & gage installation
- Water quality monitoring
- Biological monitoring
- Data management, analysis, and reporting
- Watershed management plan
- Public involvement







## *Recommended Program*

# Station Selection

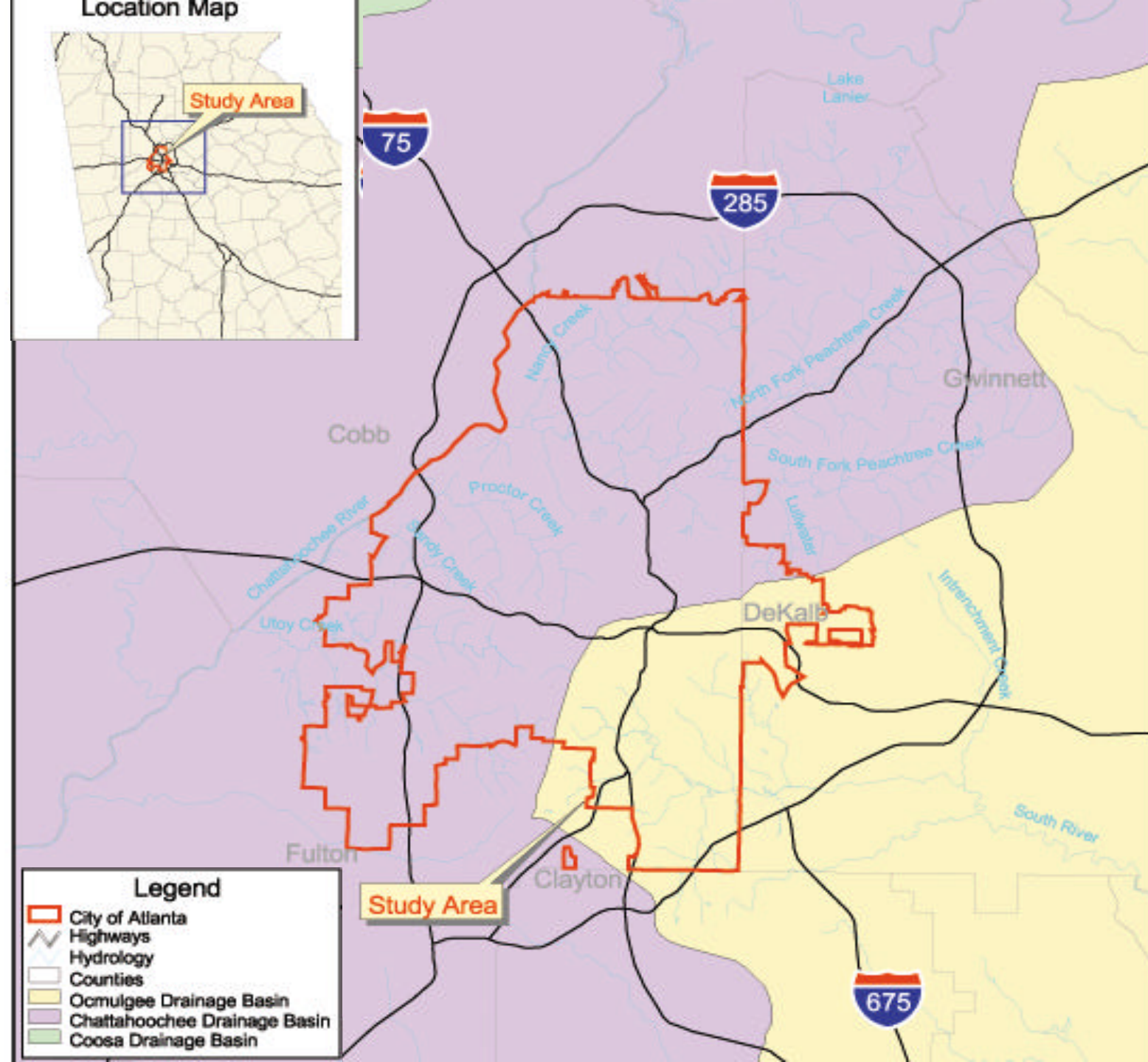
## ■ Phase 1

- ➡ Water quality status - GA EPD 303(d) list
- ➡ Existing monitoring programs (COA, USGS, GA EPD, and adjacent counties)
- ➡ Point source locations
- ➡ Non-point sources (ARC land use)
- ➡ City boundaries
- ➡ Proposed water quality improvement projects (CIP projects)

## ■ Phase 2

- ➡ Field reconnaissance

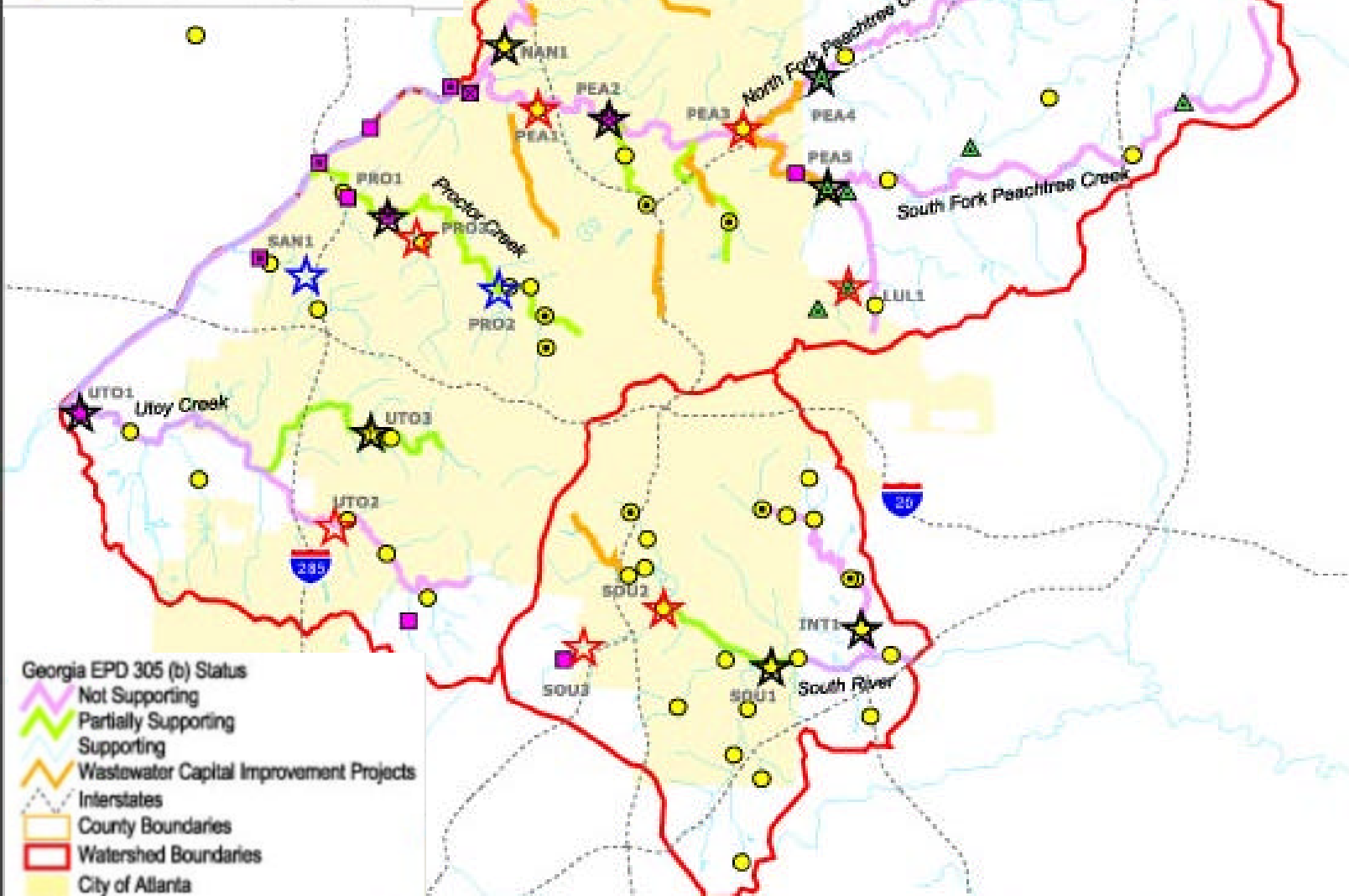
# Location Map



## Legend

- City of Atlanta
- Highways
- Hydrology
- Counties
- Ocmulgee Drainage Basin
- Chattahoochee Drainage Basin
- Coosa Drainage Basin

- Legend**
- ★ Real-Time Water Quality & Discharge Station
  - ★ Real-Time Discharge Station
  - ★ Intermittent Water Quality & Discharge Location
- Existing and Historical Sampling Stations**
- USGS
  - GA EPD
  - USGS / GA EPD
  - ▲ DeKalb County
  - CSO Program- City of Atlanta
  - MAUWI - City of Atlanta
  - ⊕ Long-Term Storm Water Program - City of Atlanta





*Recommen*

## Stream

### ■ Total

➔ 10 re

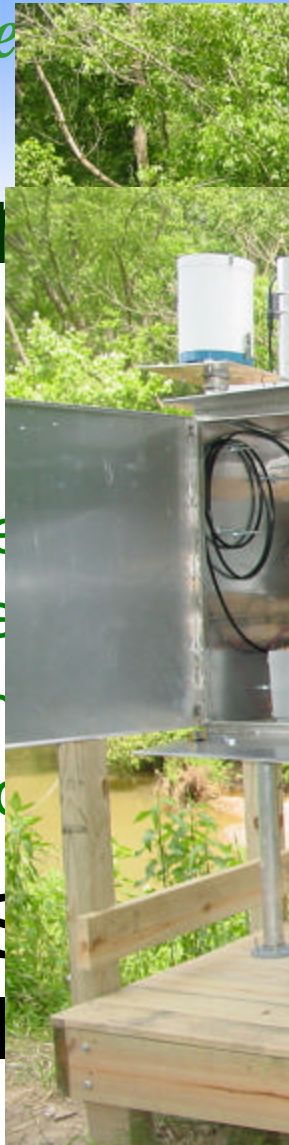
➔ 2 re

➔ 8 in

static

### ■ USGS

install





## *Recommended Program*

# Water Quality Sampling

- Hydrologically-based sampling using USGS protocols (12 samples/year)
  - ➡ Depth- and width-integrated
  - ➡ Grab
  - ➡ Storm
  - ➡ Synoptic
- USGS to initially collect and analyze water quality samples
- CWA Program and City staff to assist in sampling



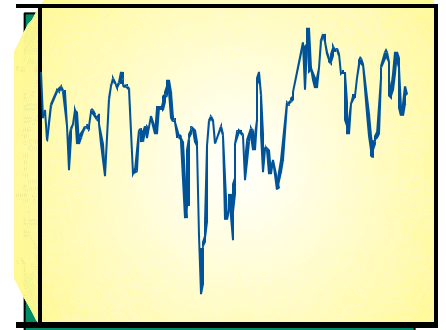
## *Recommended Program*

# “Health” of a stream includes...

### Habitat



### Water Quality



### Biology





## *Recommended Program*

# Biological Monitoring

- Biannual biological monitoring using State approved methods
  - ➔ **Habitat** assessments
  - ➔ **Fish** and **macroinvertebrate** community assessments
- Scoring protocol has recently transitioned from the use of a reference station to a “fixed” criteria:
  - ➔ located in the **same ecoregion**
  - ➔ selected from **least disturbed** streams & watersheds



## *Recommended Program*

# Biological monitoring uses multiparameter protocols

## ■ Stream habitat

- ➡ GADNR standard operating procedures
- ➡ Uses a one-to-one comparison to a reference condition

## ■ Benthic macroinvertebrates

- ➡ GADNR/EPA RBP-III
- ➡ Expectation criteria developed based on five sample stations evaluated by GAEPD

## ■ Fish

- ➡ EPA RBP-V/ Index of Biotic Integrity
- ➡ Uses a reference database



## *Recommended Program*

# Data Management

FrameViewer - Microsoft Internet Explorer provided by CH2M HILL

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print View Source

Address <http://piedmont.coawdms/FrameViewer.aspx?formid=0> Go Links

Welcome Sean ! [Logout](#)

[Data Management](#) [Data Analysis](#) [Data Reporting](#) [Admin](#)

**Data Analysis**

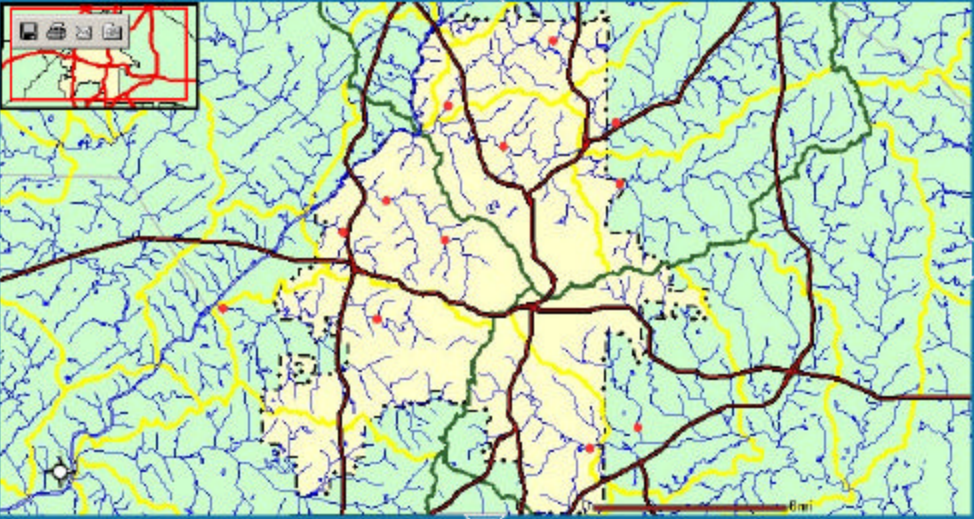
- [Map](#)
- [Trend Analysis](#)
- [Regression Analysis](#)
- [Summary Analysis](#)
- [Spatial Summary Analysis](#)

**Map Layers**

Visible Layers

- ☒ COAWDMS DEB WD
- ☒ Interstates
- ☐ Streets
- ☒ Streams (ARC)
- ☐ Sewersheds
- ☒ HUC8
- ☒ HUC12
- ☒ City of Atlanta Bound
- ☒ Counties

REFRESH MAP



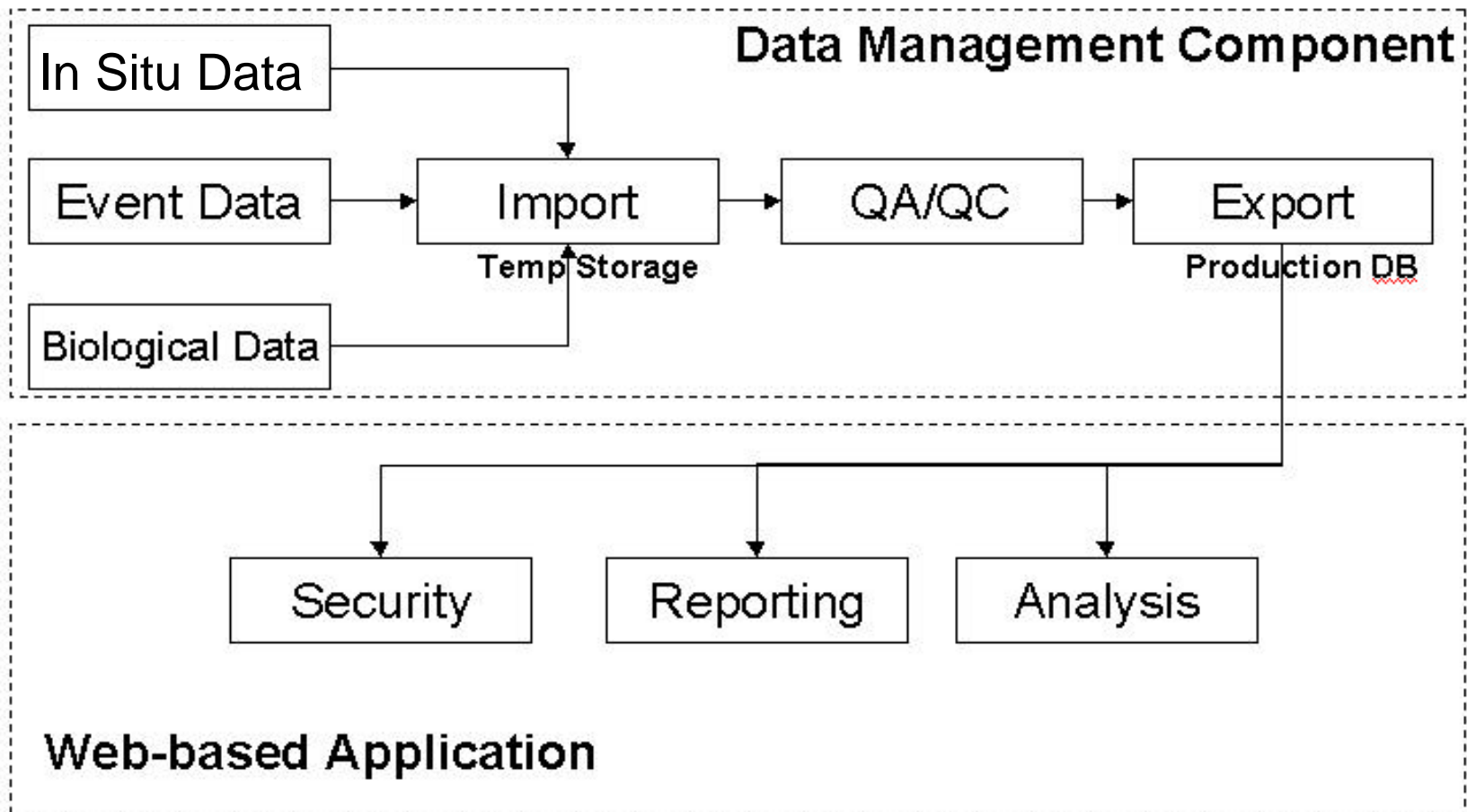
Activity: Zoom In

Sampling Location  **SEARCH**

Done Local intranet

## *Recommended Program*

# Application Flow Diagram





## Recommended Program

# Watershed Data Management System (WDMS) will allow the City to...

- Import data c various sourc
- Perform data
  - ➔ Trend and cor
  - ➔ Statistical Ana
  - ➔ Spatial Analys
- Satisfy repor



## GA Environmental Protection Division Annual Report

Station Name	CH1	Road Crossing		Brock Rd			
Major Tributary	Suwannee Creek	Drainage Basin		Chattahoochee Basin			
Stream Name	Jacks Creek						
<u>In-Situ Data</u>	Flow (CFS)	DO (mg/L)	Temp (Deg C)	Turbidity (NTU)	Conductivity (ms/cm)	pH (std units)	
Count	2	3	2	2	2	2	
Average	4.35	5.67	14.00	39.50	15.00	6.5	
Minimum	3.30	1.00	13.00	30.00	15.00	6.5	
Maximum	5.40	8.00	15.00	49.00	15.00	6.5	
Std Deviation	1.48	4.04	1.41	13.44	0.00	0.0	
Dry Mean	5.40	8.00	13.00	49.00	15.00	6.5	
Wet Mean	3.30	4.50	15.00	30.00	15.00	6.5	
<u>Laboratory</u>	TSS (mg/L)	TP (mg/L)	TKN (mg/L)	NH3-N (mg/L)	NO2+NO3-N (mg/L)	Fecal C. (#/100ml)	BOD (mg/L)
Count	2	2	2	2	2	3	2
Average	40.50	1.51	1.10	0.75	0.55	630	12.50
Minimum	22.00	0.81	0.59	0.40	0.30	0	8.00
Maximum	59.00	2.20	1.61	1.10	0.81	1,380	17.00
Std Deviation	26.16	0.98	0.72	0.49	0.36	698	6.36
Dry Mean	22.00	0.81	0.59	0.40	0.30	510	8.00
Wet Mean	59.00	2.20	1.61	1.10	0.81	690	17.00



## *Recommended Program*

# Watershed Management Plan

### ■ Phase 1

- Update MAUWI Study based on current land use

### ■ Phase 2

- Water quality modeling
- Update impacts assessment
- Evaluate watershed management scenarios
- Develop watershed management plan

# Public Involvement

- The public involvement program consists of three components:
  - ➡ Stakeholder committee
  - ➡ Fact Sheets
  - ➡ Speaker's Bureau
- In addition, a Technical Advisory Committee (TAC) provides oversight





# **Project Status and Initial Results**

# Current Project Status

- Installation of **real-time monitors** is complete
- **Water quality sampling** began in June 2003
- **Biological sampling** was initiated in December of 2001, and was conducted again in October of 2003
- **Management Plan** will be completed once one year of data has been collected (Winter 2004)
- Presented **recommended program** and selected monitoring stations to:
  - ➡ **Stakeholders** in December 2001
  - ➡ TAC in April 2003
  - ➡ Fully Initiated in June 2003



## *Project Status and Initial Results*

# Habitat assessments continues showing signs of urbanization

- With widespread signs of degradation found at nearly all 20 stations
  - ➔ 9 stations were rated “dissimilar”, 6 stations were rated “partially similar”, 4 stations were rated “similar”, 1 station was rated “comparable to reference”
- Several parameters were consistently rated as poor, including:
  - ➔ riparian buffer zones
  - ➔ bank vegetative protection
  - ➔ bank stability
  - ➔ embeddedness

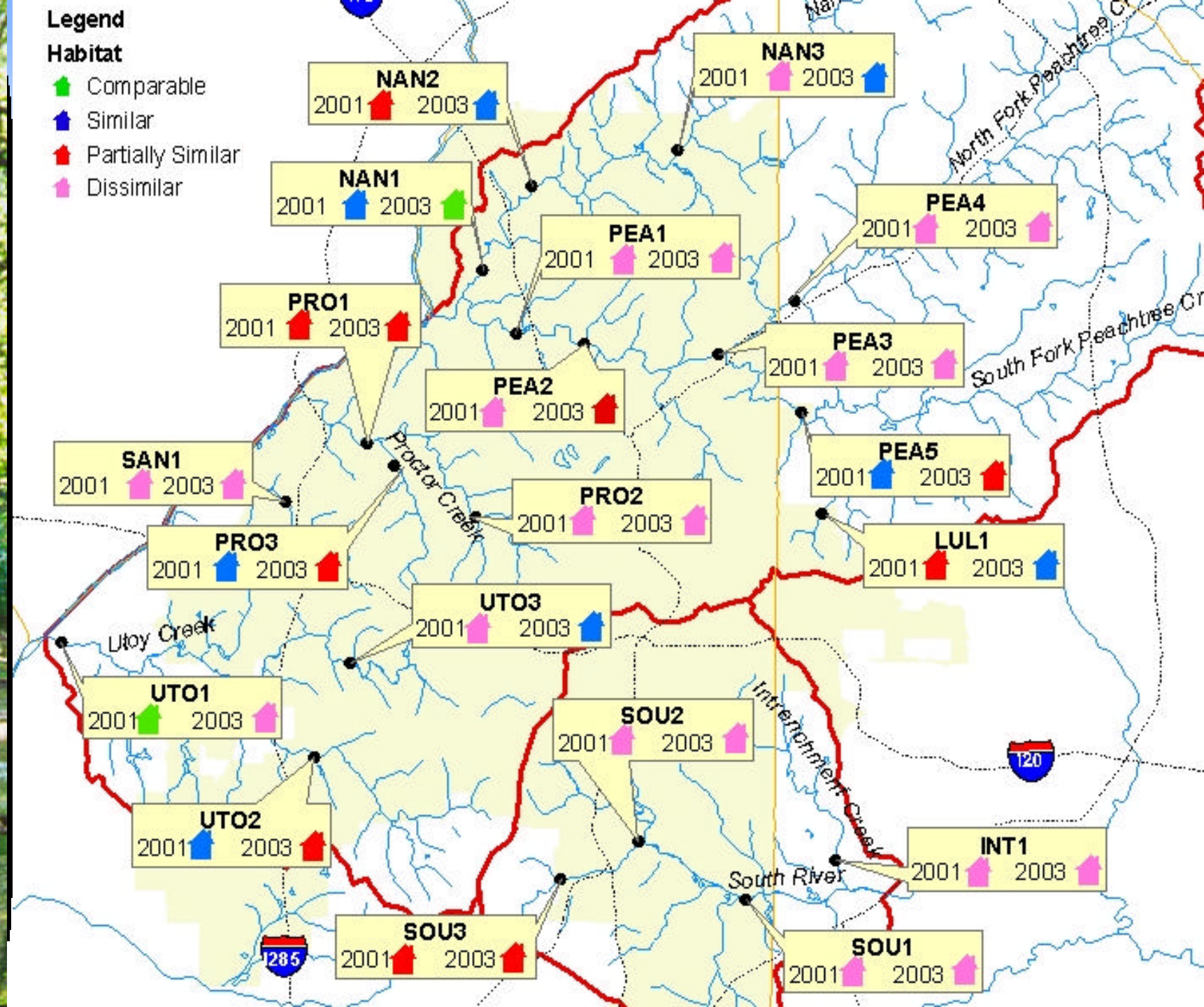




# Legend

## Habitat

- Comparable
- Similar
- Partially Similar
- Dissimilar



## *Project Status and Initial Results*

# Macroinvertebrate communities also show signs of impact

- The biotic integrity was rated “very poor” at 2 stations, “poor” at 10 stations
- The greatest number of taxa found was 43 (UTO-2) and the least number of taxa found was nine (SOU-3). The average number of species found was 29.
- Very few sensitive species were noted during the analysis

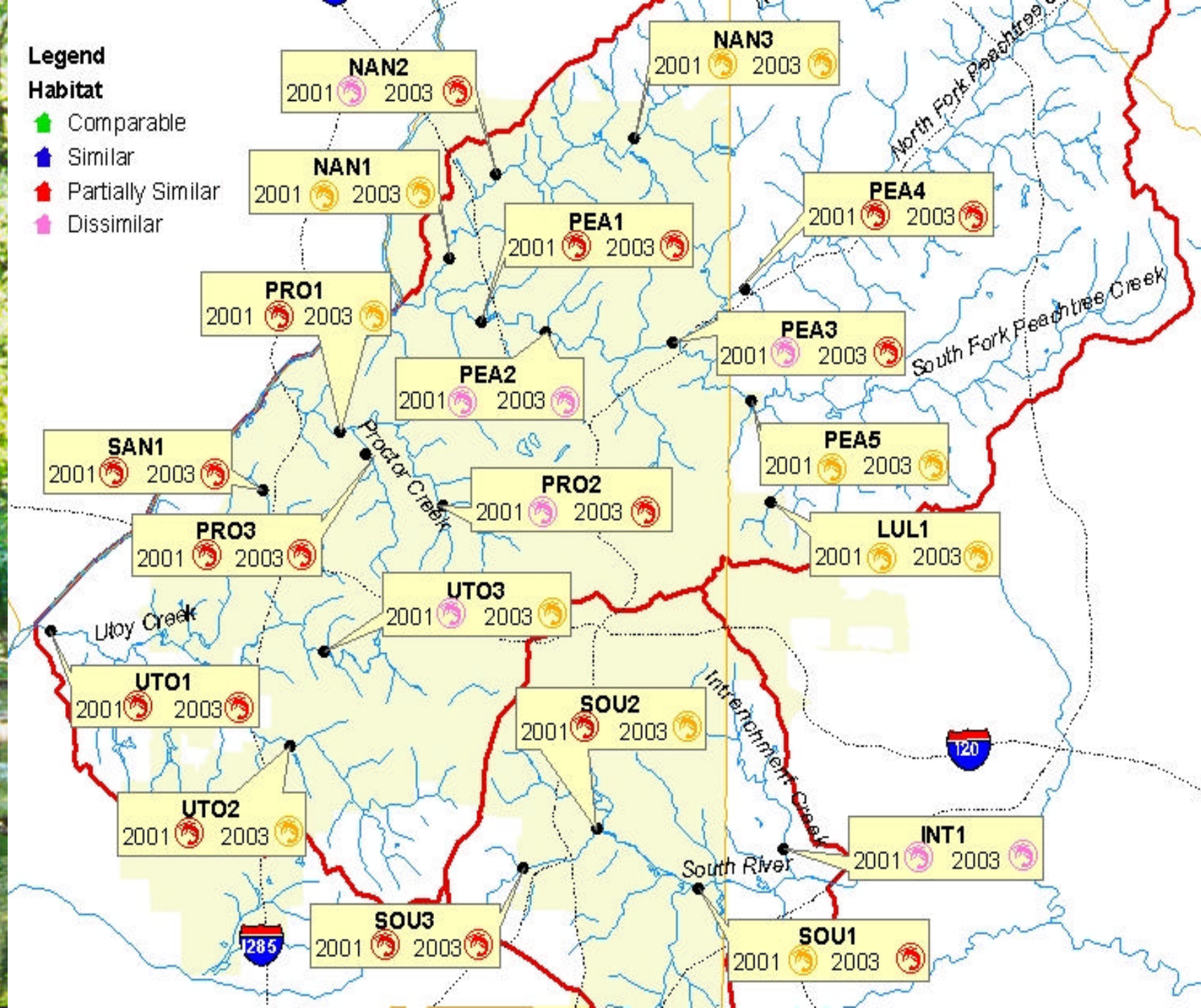




## Legend

### Habitat

- Comparable
- Similar
- Partially Similar
- Dissimilar



## *Project Status and Initial Results*

# Fish community analysis also impacted

- 28 fish species and one hybrid were found during the sampling
- Species richness was greatest among tolerant groups (i.e., minnows, sunfishes and basses, suckers, and catfishes)
- 14 stations rated “very poor” and 2 “poor”, and in the Chattahoochee Basin
- 3 stations rated “very poor”, and 1 “no fish” in the South River Basin

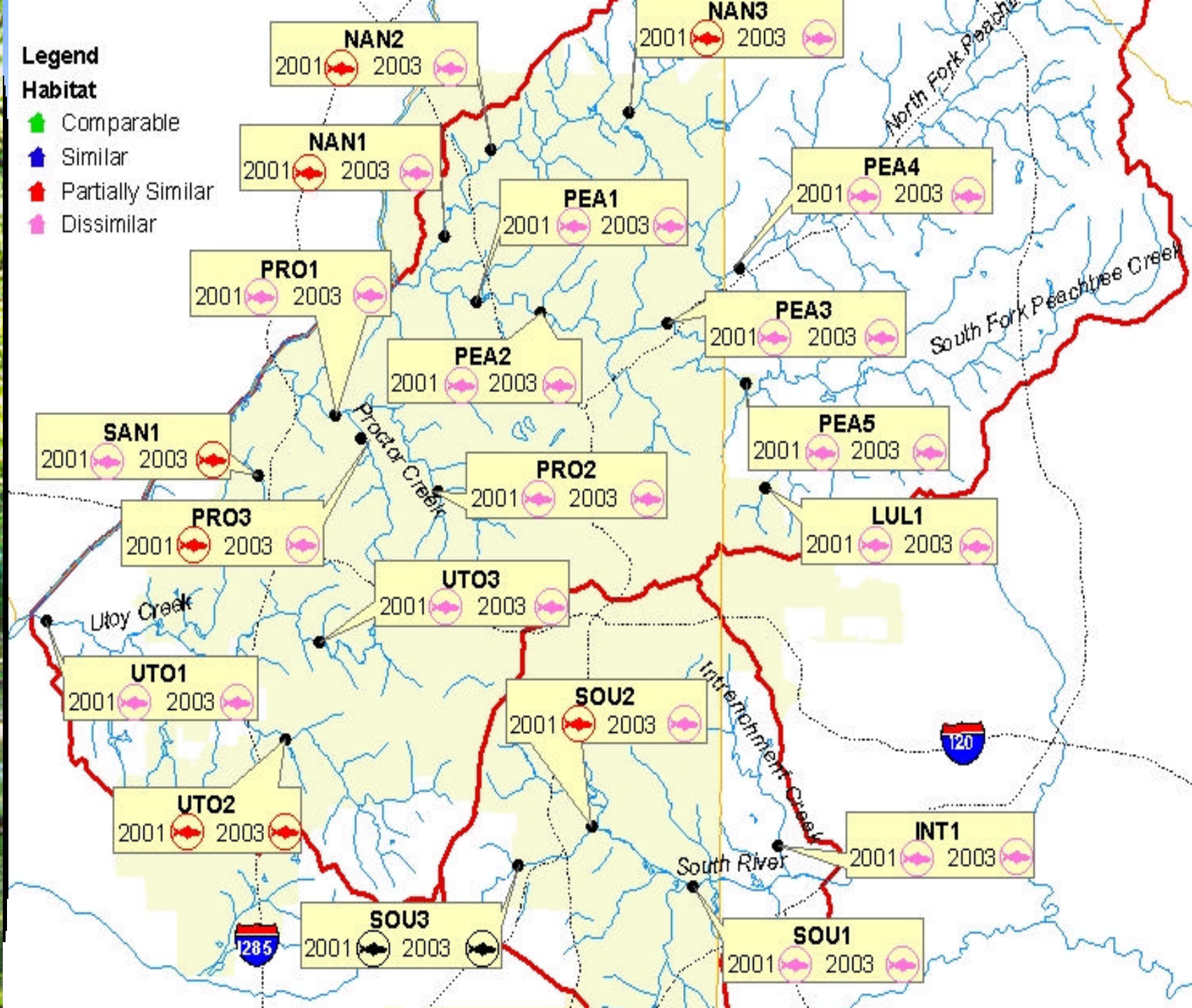




## Legend





### Habitat

- Comparable
- Similar
- Partially Similar
- Dissimilar











**Legend****Habitat 2003**

-  Comparable
-  Similar
-  Partially Similar
-  Dissimilar



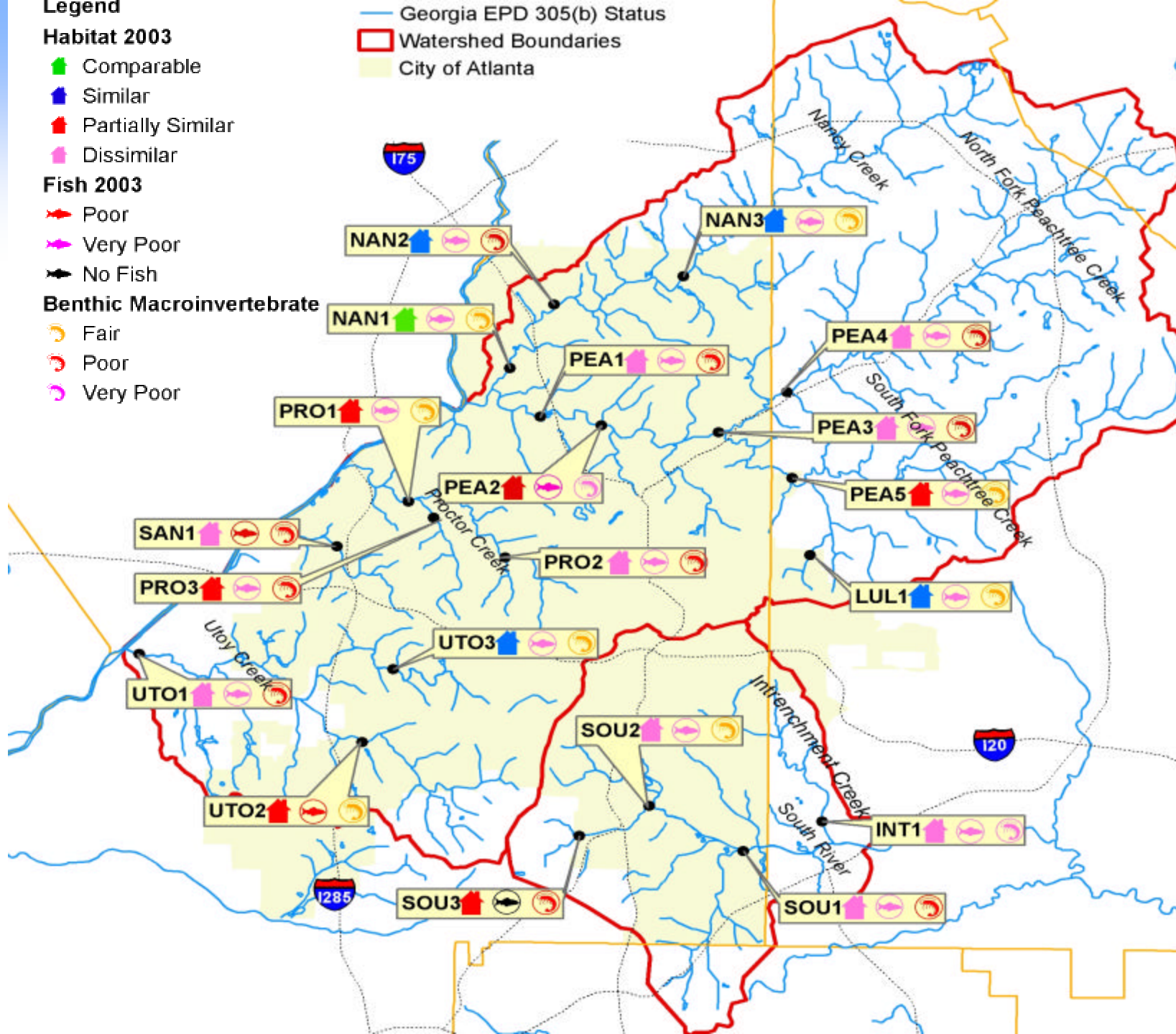
**Fish 2003**

-  Poor
-  Very Poor
-  No Fish

**Benthic Macroinvertebrate**

-  Fair
-  Poor
-  Very Poor

Georgia EPD 305(b) Status

 Watershed Boundaries City of Atlanta





# **Summary and Conclusions**



## *Summary and Conclusions*

# Summary of Program Design

### ■ Designed to:

- ➔ **consolidate multiple existing requirements** into a single, comprehensive monitoring strategy,
- ➔ **determine baseline conditions** to establish trends and help **demonstrate improvement** in water quality and/or biotic integrity,
- ➔ potentially **develop new programs** to address **identified sources of impairment**, and
- ➔ **provide reliable data** consistent with on-going regional monitoring networks.



# Long-term Monitoring Program for the City of Atlanta



Questions?

Comments?