Long-term Monitoring Program for the City of Atlanta

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Overview

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- Recommended Long-term Monitoring Program
  - Station selection and gage installation
  - Water quality monitoring
  - Biological monitoring
  - Data management
  - Watershed management plan
  - Public involvement
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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)
Comprehensive Long-term Action Plan is a 25-year effort
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
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
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
Stream Gaging

- Total of 20 monitoring stations:
  - 10 real-time water quality and flow stations
  - 2 real-time flow stations
  - 8 intermittent water quality and flow monitoring stations

USGS, with support of CWA staff, to install, calibrate, and maintain gages.
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
“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

Watershed Data Management System (WDMS)

Data Analysis
- Map
- Trend Analysis
- Regression Analysis
- Summary Analysis
- Spatial Summary Analysis

Data Management

Data Analysis

Data Reporting

Activity Zoom In

Sampling Location

Search
Recommended Program

Application Flow Diagram

In Situ Data

Event Data

Biological Data

Import

Data Management Component

QA/QC

Export

Temp Storage

Security

Reporting

Analysis

Web-based Application
Watershed Data Management System (WDMS) will allow the City to...

- Import data of various sources
- Perform data analysis
  - Trend and compliance monitoring
  - Statistical Analysis (Regression & tabular)
  - Spatial Analysis
- Satisfy reporting requirements
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
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
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.
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
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.
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Questions? Comments?