

Scope of Work
for
Waccamaw River Volunteer Water Quality Monitoring Project
submitted by
Waccamaw Watershed Academy
Coastal Carolina University
Conway, SC
on
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Objectives

The objective of the project is to initiate and stabilize a volunteer-based, water quality monitoring program for the Waccamaw Watershed. This program will fulfill three needs:

1. Address NPDES Phase II program measures for public education and involvement,
2. Assist in illicit discharge detection (an NPDES Phase II program requirement), and
3. Increase geographic and temporal coverage of water quality monitoring in the Waccamaw River to assist in development of site specific water quality standards.

This work will be done in collaboration with SC DHEC Bureau of Water and the USGS who already perform routine water quality measurements in the Waccamaw. This project will also be an official component of SC DHEC's Waterwatch program, a US EPA 319 funded state requirement. A US EPA approved Quality Assurance Project Plan will be used to ensure a high level of quality assurance and quality control. An effort will be made to meet SC DHEC's quality requirements for inclusion of data in their biennial 305(b) reports.

The following partners have agreed to provide funding: (1) US EPA through a four-year Wetlands Program Development grant (2005-2009), (2) the City of Conway, (3) Horry County, and (4) Georgetown County. The US EPA seeks to fund this monitoring to build environmental awareness throughout the Waccamaw Basin.

Project Plan

SC DHEC and the USGS perform routine water quality measurements in the Waccamaw River as shown in Table 1. In 2005 SC DHEC sampled 6 sites monthly along approximately 70 river miles with an additional 3 sites in tributary streams (Buck Creek, Simpson Creek and Kingston Lake). The USGS maintains four continuous water quality monitoring gaging stations in the river and two in tributary streams (Crabtree Canal and Buck Creek with dissolved oxygen, conductivity, turbidity, pH and a rain gage).

Table 1. Sampling Site Summary for Waccamaw River Water Quality Monitoring

Site	SC DHEC (sampling frequency)	USGS continuous monitoring stations (parameters sampled)	Volunteer Monitoring (sampling frequency)
Hwy 9	Monthly		Biweekly
Reaves Ferry	Monthly		Biweekly
Santee Cooper Recreational Facility	Monthly		
Bus 501 Bridge		Temperature, Dissolved Oxygen	Biweekly
Pitch Landing			Biweekly
Enterprise Landing			Biweekly
Bucksville	Monthly		
Bucksport		Temperature, Dissolved Oxygen	Biweekly
Collins Creek	Monthly		
Wachesaw Landing			Biweekly
Butler Island	Monthly		
Pawleys Island		Temperature, Dissolved Oxygen, Conductivity	
Hagley		Temperature, Dissolved Oxygen, Conductivity	Biweekly

We propose to augment this coverage with volunteer monitoring at the following locations: Highway 9, Reaves Ferry, Business 501 bridge, Pitch Landing, Enterprise Landing, Bucksport, Wachesaw Landing, Hagley, and the Sampit River at East Bay Park for dissolved oxygen, conductivity, turbidity, pH, nitrate, nitrite and phosphate. These parameters are also monitored monthly by SC DHEC at their sampling sites. We will sample at times other than DHEC’s routine monthly monitoring to provide better temporal coverage at overlap sites. At USGS overlap sites, we will be monitoring for additional constituents not currently included in their work at these sites.

Samples will be collected monthly for the first two months of the project while the volunteer monitors complete their training. After this period, sampling will be conducted biweekly year round with all samples collected on the same day as synchronously as is practical. Some post-rain event sampling will also be conducted.

As the program stabilizes, additional parameters will be added including bacteria (Fecal coliform or *E. Coli*), chlorophyll, and optical brighteners. The latter tracks the presence of detergents. It is also anticipated that the frequency of sampling will be increased to weekly, along with the number of sampling sites. These increases will require additional funding to cover supplies.

Quality Assurance

By requirement of the lead funding agency, US EPA, this project will have an approved Quality Assurance Project Plan (QAPP) and Standard Operating Procedures (SOPs) in place. The QAPP follows standard EPA guidelines for volunteer monitoring projects and the SOPs are based on US EPA approved methods where possible. Sampling for temperature, conductivity, dissolved oxygen, and pH will be done at the sampling site with Hach Sension meters. Nitrate, nitrite, phosphate, and ammonium will be measured on site with Hach test strips. Samples will be returned to the laboratory within 48 hours for measurement of turbidity.

The Waccamaw Watershed Academy's Environmental Quality lab (EQL) is responsible for generating and following the QAPP, training the volunteers, maintaining and calibrating the equipment, managing the data, and taking corrective action if quality problems arise. The EQL maintains QAPPs and SOPs for regulatory programs and is certified by SC DHEC for several of the parameters in this project.

Volunteer Recruitment and Training

The following groups have expressed interest in supplying volunteers: (1) The Winyah Rivers Foundation, (2) Surfriders, and (3) Sierra Club. Two recruitment sessions have already been held at Coastal Carolina University and the Pawleys Island Library in May 2006 and a third will be conducted at the Sierra Club's monthly meeting in June 2006. A sufficient number of volunteers have committed to work on the project. Their laboratory training sessions are scheduled for June 6th and 7th. Field training sessions are scheduled for June 15 and 16th. These training sessions are mandatory and will involve a demonstration of capability for each volunteer. No volunteer will be permitted to sample without having demonstrated adequate performance.

The volunteers will be grouped into teams so that duties can be shared. If a volunteer is unavailable on a particular sampling day, the rest of the team should be able to provide coverage. A sampling kit containing the meters, sampling bottles, a sampling pole, and instruction and data sheets will be delivered to the volunteers a day before the scheduled sampling date. The volunteers who live near the university will be invited to pick up their test kit from CCU's EQL. Water samples, meters and field data will either be collected from the volunteers towards the end of the sampling day by EQL staff or dropped off at the lab by the volunteers.

Data Reporting

The data generated by this project will be archived in a digital database accessible to the public via the internet at the Waccamaw Watershed Academy's website (www.coastal.edu/wwa). These data will be presented in graphical format along with statistical analyses of temporal trends. Also provided will be a scorecard comparing the results to federal and state water quality standards.

An annual report will be produced and distributed in January to each of the funding partners in a format suitable for inclusion in their annual reports NPDES Phase II Stormwater programs reports. The project manager (Dr. S. Libes) and volunteer coordinator (Davinder Randhawa) will also be available for meetings to further discuss or present the data.

The data will also be submitted to SC DHEC Bureau of Water for potential inclusion in their biennial 305(b) reports and for assistance in the development of site specific water quality standards for the Waccamaw River. An annual report will also be submitted to SC DHEC's Waterwatch program.

Deliverables and Timeline

The following products will be generated by this project during Year 1 as per the timeline presented in Table 2.

1. Quality assurance project plan approved by US EPA.
2. Data access via public website that can be linked to city and county websites.
3. Annual monitoring report formatted for inclusion in annual NPDES Phase II storm water program report including inclusion of numbers of volunteers involved, number of meetings, number of sampling and number of people accessing data via public website.
4. Digital data archive.
5. Notification of potential illicit discharge detection to municipalities where the water quality problem has been observed.

Table 2: Year Project Timeline

Activity	J	F	M	A	M	J	J	A	S	O	N	D
Preparation of QAPP and SOPs. Assemble equipment	X	X	X	X	X							
Volunteer Recruitment and training/meeting					X		X				X	
Field Sampling						X	X	X	X	X	X	X
Lab Analysis						X	X	X	X	X	X	X
Data Evaluation/Processing and Reporting							X		X			X
Review of Sampling and Analysis (S&A) Plan									X			X
QAPP team meeting					X		X					X
Implementation of Revised S&A plan									X			X

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