Coosa River Modeling Project

2006 Field Study Plan
Module 7
Basin-Wide Phosphorus Data

Georgia Department of Natural Resources
Environmental Protection Division
Watershed Protection Branch
Watershed Planning & Monitoring Program
4220 International Parkway
Suite 101
Atlanta, Georgia 30354

Introduction

The primary objective of this module is to understand the magnitude and location of phosphorus loads entering the Coosa River Basin from point sources and non-point sources located in the Coosa River Basin. Available phosphorus data will be examined. These data will include instream data, as well as data from the various discharges located within the Coosa River Basin. In addition, selected tributaries will be studied to identify potential sources of phosphorus loadings. The phosphorus data will be analyzed to calculate the phosphorus loadings from various sources at specific locations throughout the watershed.

Study Area and Reconnaissance

Six tributaries were identified for intensive sampling due to their significant drainage area and elevated phosphorus concentrations measured in the past. These six tributaries include Coahulla Creek, Holly Creek, Oothkalooga Creek, Pumpkinvine Creek, Euharlee Creek, and Cedar Creek.

A total of 53 sites distributed on these tributaries were examined during January 2005. An attempt was made to select an unimpacted headwater site on each tributary, as well as bracket major cities and major drainage areas. Most sites were located on the tributary mainstem, but some sites located on major sub-drainages to the tributary mainstem were also examined.

The GPS coordinates were determined for all 53 sites. Reference points for streamflow measurements were established where one did not already exist. Of these 53 sites, a total of 29 sampling stations were selected. A list of the tributary sampling stations is provided in Table 7-1.

Methodology

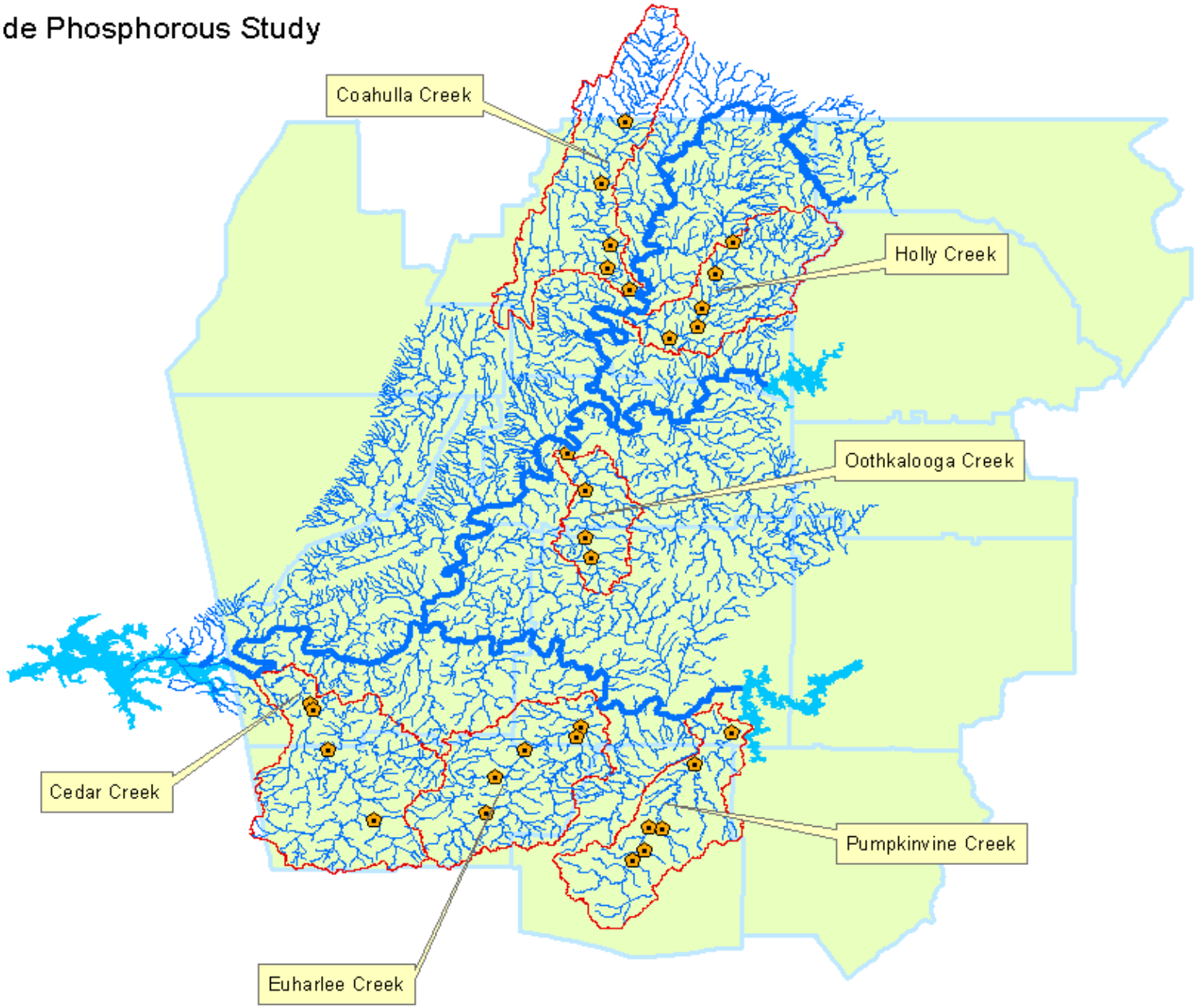
Flow measurements will be made at the tributary sampling stations using a current meter and an Aquacalc datalogger. Sounding equipment will also be used from bridges when wading is not possible. Flow measurement methods to be used are described in the publication, Techniques of Water Resources Investigations of the United States Geological Survey, General Procedures for Gaging Streams: Book 3, Chapter A6. Flow for the Holly Creek sampling station located upstream of the junction with Chicken Creek will be obtained from the USGS gaging station located on Holly Creek near Chatsworth (USGS Gaging Station # 02385800). Tapedowns will be made from reference points already established for each station.

Instantaneous dissolved oxygen (DO) concentration, pH, water temperature, and conductivity will be measured at each sampling station using a Hydrolab Minisonde. The Minisondes will be pre-calibrated and post-calibrated each day, in the office, by the air saturation method and with pH and conductivity standards.

Table 7-1. Basin-Wide Phosphorus Data Tributary Sampling Stations

Station ID	Station Description	Latitude	Longitude
Conasauga Sub-Basin Coahulla Creek Tributary			
CA1	Coahulla Creek at Keith Mill Road	34.743444	-84.880750
MC1	Mill Creek at Holland Parkway	34.773467	-84.912767
CA2	Coahulla Creek at Dawnville Road	34.807639	-84.908639
CA3	Coahulla Creek at GA Highway 2	34.896167	-84.920722
CA4	Coahulla Creek at Emerson Road	34.985750	-84.887000
Conasauga Sub-Basin Holly Creek Tributary			
HC1	Holly Creek at GA Highway 225	34.671917	-84.824528
RC1	Rock Creek upstream junction with Holly Creek	34.687861	-84.785917
HC2	Holly Creek at Smyrna Ramhurst Road	34.716556	-84.779502
HC3	Holly Creek at GA Highway 52	34.766278	-84.760694
HC4	Holly Creek at Tom Terry Road	34.811750	-84.735528
Oostanaula Sub-Basin Oothkalooga Creek Tributary			
OK1	Oothkalooga Creek at GA Highway 156	34.505389	-84.968500
OK2	Oothkalooga Creek at Salem Road	34.451361	-84.943750
OK3	Oothkalooga Creek at Woody Road	34.384250	-84.943528
OK4	Oothkalooga Creek at Lacey Road	34.355194	-84.935528
Etowah Sub-Basin Pumpkinvine Creek Tributary			
PK1	Pumpkinvine Creek at GA Highway 293 North Bridge	34.100944	-84.737083
PK2	Pumkinvine Creek at Harmony Grove Church Road	34.054944	-84.790111
LA1	Lawrence Creek 200 Yards Downstream Dallas North WPCP Outfall	33.962389	-84.835778
PK3	Pumpkinvine Creek at Georgia Highway 61	33.962667	-84.854222
WE1	Weaver Creek at Norfolk Southern Railroad Crossing near Pumpkinvine Creek Junction	33.930733	-84.861600
PK4	Pumpkinvine Creek at US Highway 278	33.916083	-84.877972
Etowah Sub-Basin Euharlee Creek Tributary			
EU1	Euharlee Creek at Old Alabama Road (CR32)	34.108083	-84.950361
HL1	Hills Creek at GA Highway 113	34.094750	-84.956167
EU2	Euharlee Creek at Taylorsville Road	34.075917	-85.029222
FC1	Fish Creek at Prospect Road	34.035944	-85.071583
EU3	Euharlee Creek at Government Farm Road	33.985111	-85.082528
Upper Coosa Sub-Basin Cedar Creek Tributary			
CE1	Cedar Creek at Spout Springs Road	34.141944	-85.330778
LC1	Little Cedar Creek at Spout Springs Road	34.133972	-85.326083
CE2	Cedar Creek at Kings Bridge Road	34.076333	-85.306194
CE3	Cedar Creek at Huntington Road	33.972889	-85.240083

Module 7
Basin Wide Phosphorous Study



Legend

- Phosphorus Stations

Air temperature will be measured at each sampling station using a standard laboratory grade thermometer.

Grab samples will be collected at each sampling station for total phosphorus and ortho phosphorus analyses. All samples will be placed on wet ice upon collection and transported to the EPD Laboratory within 24 hours for analysis. Each sample will have a separate lab sheet assigned to it and each set of samples delivered to the laboratory will have a corresponding chain of custody form.

Available Phosphorus Data Collection

All instream phosphorus data and instantaneous flow measurements collected, as part of Module 3 will also be analyzed. These data will be used to calculate the instream phosphorus loads at specific locations throughout the watershed.

All available phosphorus data from the various discharges into the Coosa River Basin will be obtained. The retrieval and compliation of flow and phosphorus data from the wastewater Treatment facilities Discharge Monitoring Reports and Operation Monitoring Reports will be performed as outlined in Module 5. These data will be used to calculate the phosphorus loadings from the point sources.

Schedule

Fieldwork for the tributary phosphorus sampling is scheduled from May 2006 through October 2006. Table 7-2 contains the tributary sampling schedule.
It is estimated that 850 man-hours are needed to conduct the fieldwork during the 6-month sampling period. An additional 160 man-hours are estimated to be needed to download and process the data in the office as it is collected during the 6-month period.

EPD Laboratory Support

The EPD Laboratory will process all 174 phosphorus samples collected from the tributaries during the 6-month sampling period. Total phosphorus and ortho phosphorus analyses will be conducted on each sample according to the EPD Laboratory's *Data Quality Objectives.*

Quality Control

All fieldwork will be performed in accordance with the EPD Quality Assurance/Quality Control (QA/QC) procedures maintained by the Watershed Protection and Management Program. Equipment used will be calibrated in the laboratory prior to and after sampling is conducted according to the manufacturer's instructions. Sampling data will be documented in a bound field book. Data will be put in spreadsheets following each

Table 7-2. Basin Wide Phosphorus Data Tributary Sampling Schedule
May 2 – October 31, 2006

												5/2/06	5/3/06	5/8/06	5/9/06	5/15/06	5/16/06	6/6/06	6/7/06	6/12/06	6/13/06	6/28/06	6/29/06
Tributary																							
Coahulla Creek (5)																X						X	
Holly Creek (6)																	X						X
Oothkalooga Creek (5)															X						X		
Pumpkinvine Creek (6)													X						X				
Euharlee Creek (5)														X						X			
Cedar Creek (5)												X						X					

	7/11/06	7/12/06	7/18/06	7/19/06	7/25/06	7/26/06	8/1/06	8/2/06	8/8/06	8/9/06	8/15/06	8/16/06	9/12/06	9/13/06	9/19/06	9/20/06	9/26/06	9/27/06	10/3/06	10/4/06	10/17/06	10/18/06	10/24/06	10/31/06
Tributary																								
Coahulla Creek (5)					X						X						X						X	
Holly Creek (6)						X						X						X						X
Oothkalooga Creek (5)				X						X						X						X		
Pumpkinvine Creek (6)		X						X						X						X				
Euharlee Creek (5)			X						X						X						X			
Cedar Creek (5)	X						X						X						X					

Number of sampling stations on each tributary indicated in parentheses.

sampling day, reviewed by the Watershed Modeling Unit, and entered and maintained in the Watershed Protection Branch's Water Resources Data-Base (WRDB).

Safety

The EPD Safety Manual will be utilized to ensure safety of personnel during the study.

Equipment

The equipment to be used for the project includes:

- Vehicle 117899.
- Field Book, waterproof permanent pens
- County maps (8)
- GPS Unit
- Briefcase
- Project Packet
- First Aid Kit
- Orange safety vests (2)
- Wading CO_2 Safety vest
- Day pack
- Machete
- Waders (2)
- Raingear (2)
- Medium Size Cooler
- Nutrient Bottle (174)
- Labels (174)
- Lab Sheets (174)
- Chain of Custody Forms (36)
- Hydrolab Minisonde
- Hydrolab Carboy
- Laboratory grade Thermometer
- Set Stream Gaging Equipment
- Aquacalc 5000 Datalogger