

**Lake Lanier Chlorophyll a TMDL Study**  
Module 3  
Continuous Water Quality Monitoring

**Lake Lanier Chlorophyll a TMDL Study**

**2007 Field Study Plan**  
**Module 3**  
**Continuous Water Quality Monitoring**

**Georgia Department of Natural Resources**  
**Environmental Protection Division**  
**Watershed Protection Branch**  
**Watershed Planning & Monitoring Program**  
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## **Introduction**

The objective of this module is to collect continuous water quality data at four water quality standard sites located on Lake Sydney Lanier. The Georgia EPD will operate and maintain these four sites and their associated equipment. These monitoring stations will be continuously operated from April through October. EPD personnel will collect the data from the continuous monitors approximately once a week. Data from these continuous monitors will be used in the hydrologic models being used for development of a chlorophyll a TMDL for the lake.

## **Study Area and Monitoring Locations**

The study area encompasses the main body of Lake Lanier from Buford Dam to the bridge at Boling Green Road on the Chestatee Arm and to the Lanier Bridge Crossing on the Chattahoochee River arm. Table 3-1 provides a description of the continuous water quality monitor locations.

**Table 1-1. Location of the EPD Permanent Continuous Water Quality Monitors**

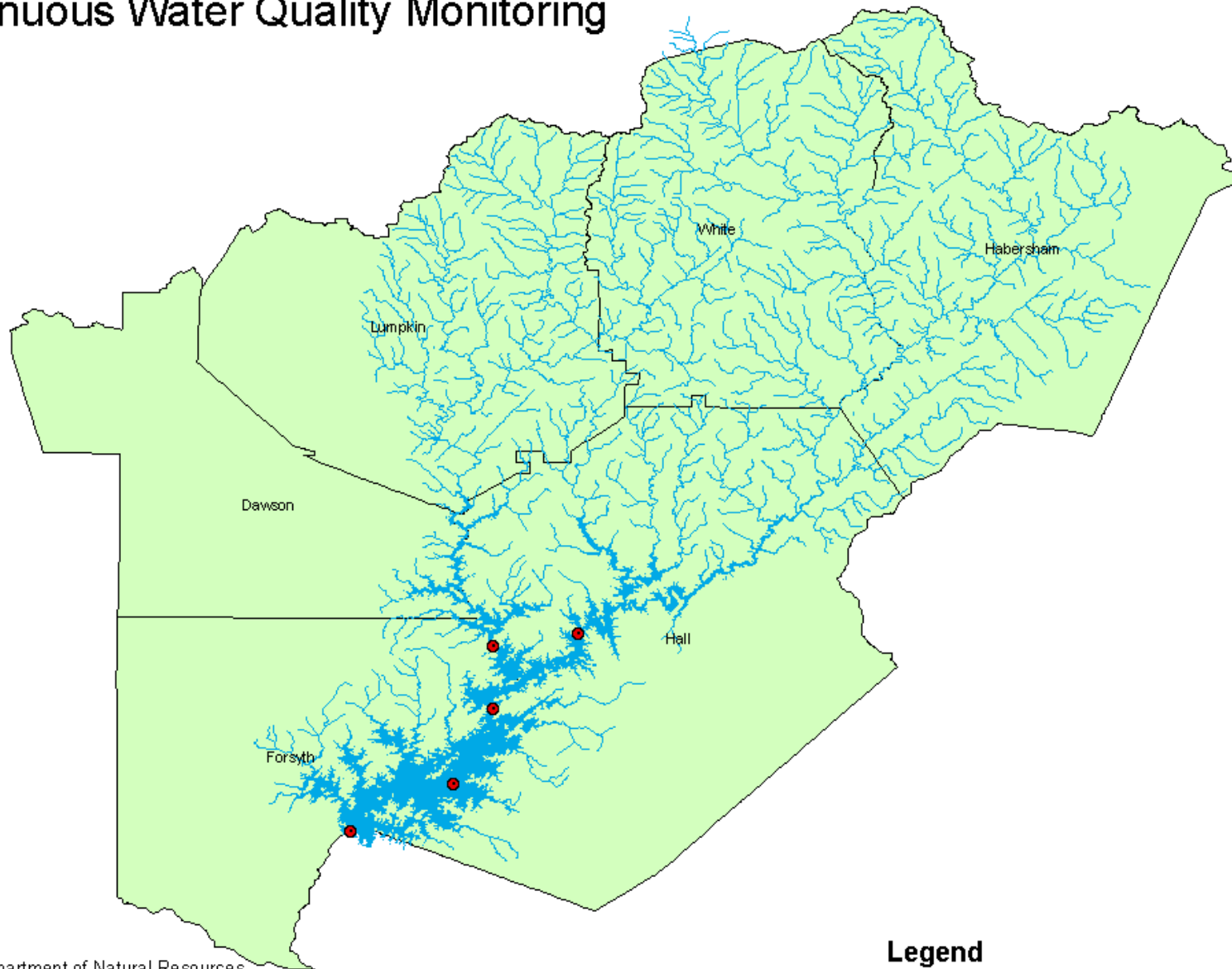
<b>Lake Lanier</b>	<b>Location</b>	<b>Latitude</b>	<b>Longitude</b>
Dam pool	Attached to US ACE buoy ~ 100' in front of dam	N	W
Browns Bridge	Attached to bridge pylon, center span over channel	N	W
Bolling Bridge	Attached to bridge pylon, center span over channel	N	W
Lanier Bridge	Attached to bridge pylon, center span over channel	N	W

Water quality measurements will be taken using programmable, in-situ, multi-parametric water quality monitoring devices, commonly referred to as sondes. The monitors will be programmed to record hourly dissolved oxygen, temperature, pH, conductivity, and depth readings.

## **General Monitoring Procedures**

The continuous monitors will be placed in mounting tubes located at each bridge sampling station and in a containment buoy at the dam pool site.

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### Legend

- Lake Continuous Monitor Locations

The mounting tubes will be placed in locations that allow collection of data to meet data quality objectives. These tubes will be mounted to the downstream side of bridge supports as suggested by *Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Site Selection, Field Operation, Calibration, Record Computation, and Reporting* (USGS 2000) when possible (Refer to Study area and Sample Location). Permission to mount such tubes has been obtained from both the US ACE and State DOT.

The containment buoy will consist of a bright yellow foam-filled buoy ring with a containment tube inserted through the middle of the buoy. The dam site placement will have an EPD buoy tethered to an existing United States Army Corps of Engineers (US ACE) buoy.

Prior to deployment, the continuous monitors (parametric Sondes) will be pre-calibrated according to the protocols found in the instrument's manual. At the time of deployment and retrieval of each sonde, an independently calibrated sonde will be used to take a co-reading of the 5 water quality parameters being recorded. This reading will be used to corroborate the final reading of the retrieved sonde as well as the initial reading of the newly deployed sonde. This additional instrument will also be pre-calibrated in the lab prior to each day's fieldwork. Upon removal, the sondes will be checked for calibration drift in the laboratory and then cleaned and prepared for the next deployment.

### **Measurements and Documentation of Field Data/Observations**

Parameters measured by the weekly-deployed units will be depth, water temperature, conductivity, dissolved oxygen, and pH. The recorded data from each sonde will be downloaded to a personal computer before being prepared for redeployment. The data will be reviewed by personnel of the Watershed Planning and Monitoring Unit and stored in electronic spreadsheets. The spreadsheets will include all data collected during the sampling period as well as graphs for temperature and dissolved oxygen.

Calibration histories for all sondes will be maintained in logbooks located at the EPD Watershed Protection Branch Headquarters.

### **Schedule**

Each of the four monitoring stations will be continuously monitored from April 1 through October 31. Each recording unit will remain in place for approximately one week, then be exchanged with a newly calibrated unit which has been programmed to overlap readings with the one removed. With the exception of unforeseeable equipment failures, this deployment schedule should provide a continuous data set for the seven-month period.

### **Quality Control**

All fieldwork will be performed in accordance with the Division's Quality Assurance/Quality Control (QA/QC) procedures maintained by the Watershed Planning and Monitoring Program. Equipment used will be calibrated in the laboratory prior to and after sampling according to the manufacturer's instructions. The deployed sonde's readings will be compared with the readings from an additional unit used for in-situ measurements at each deployment and retrieval. This data will be recorded in the field book and used to estimate instrument drift while deployed. Data will be put in spreadsheets following each sampling day, reviewed by the Watershed Modeling Unit, and ultimately entered and maintained in the Watershed Protection Branch's Water Resources Database (WRDB).

### **Safety**

Each vehicle and boat will be equipped with a first aid kit, fire extinguisher and other emergency equipment, as required. All safety procedures will be followed as outlined in EPD's Safety Manual. Boat operators will be proficient in all aspects of boat operation and safety. The recovery/deployment efforts may be canceled if extreme weather conditions exist.

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### **Equipment**

The equipment to be used for the project includes:

- Vehicle with tow rating higher than 4000 lbs.
- Boat capable of 40 mile round trip with anchor
- Thermometer
- Twelve Hydrolab Minisonde units with memory capable of long term deployment
- Field Book, waterproof permanent pens
- Secchi disk
- Li-Cor photometer
- Van Dorn sampler or similar instrument
- Mixing carboy
- Tool kit
- GPS unit
- Depth finder
- Life jackets and float cushion
- Emergency boat kit
- Digital Camera
- First Aid kit
- Deployment tubes and necessary mounting equipment
- Minisonde with Surveyor Display for readings collaboration