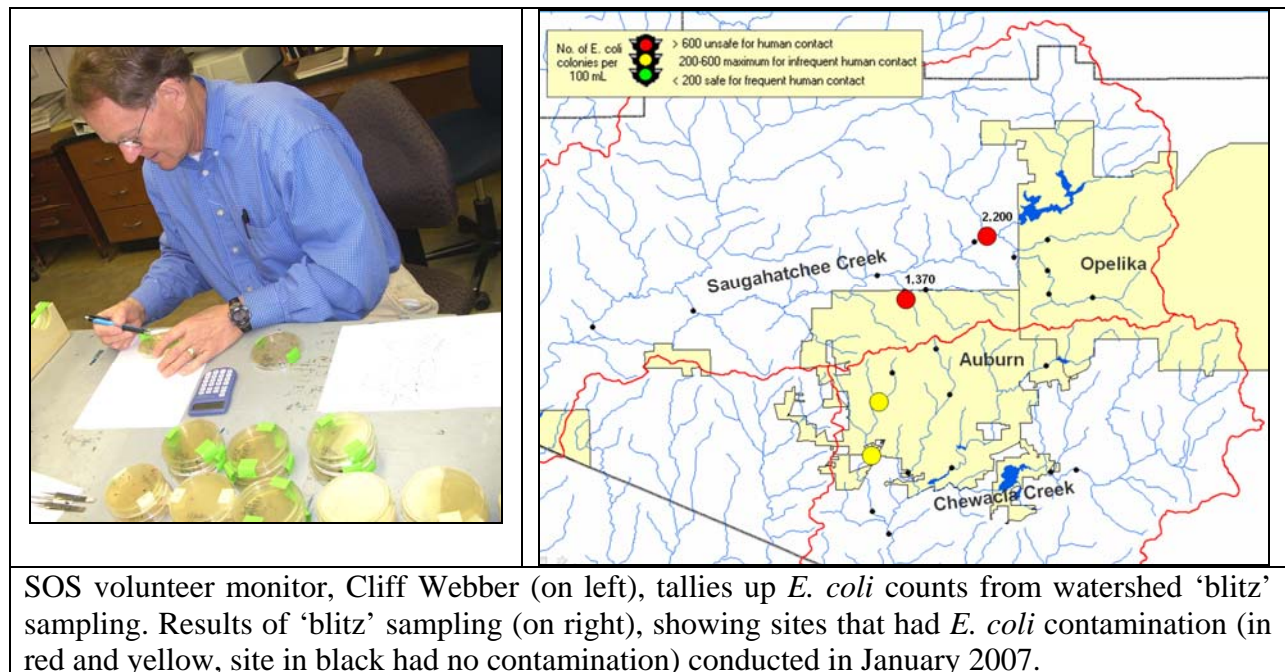


## Community Volunteers Mobilize to Monitor Watersheds for *E. coli* Bacteria

Citizen groups in communities across Alabama are getting actively involved in local watershed management issues. With technical assistance from the Alabama Water Watch (AWW) Program, individuals are being trained to test the water quality of their local streams, rivers and lakes.

AWW is a citizen volunteer, water quality monitoring program that is coordinated from the Auburn University Fisheries Department, with support from the Alabama Department of Environmental Management (ADEM), U.S. EPA (Region 4) and the Alabama Cooperative Extension System. The mission of AWW is to improve both water quality and policy through citizen monitoring and action. The AWW vision is to have a citizen monitor on every stream, lake, and bay in Alabama. Since the Program began in 1992, 250 citizen groups have participated, cumulatively sampling more than 1,900 sites on about 750 waterbodies and submitting more than 53,000 water quality data records to the AWW statewide database. Several groups have submitted water data for more than 10 years. For many waterbodies in Alabama, citizen data are the primary or only source of water quality information.

Two citizen monitoring groups in the Auburn area (east-central Alabama), Save Our Saugahatchee (SOS) and Friends of Chewacla Creek and Uphapee Watershed (CHEWUP) have organized a seasonal bacteria 'blitz' sampling event to monitor the Saugahatchee and Chewacla watersheds encompassing the Auburn area. Earlier in 2006, interest in bacteria monitoring greatly increased after a pair of trained monitors reported high *E. coli* levels at a couple of stream sample sites in the watershed. Several additional citizen monitors got trained and certified by AWW in bacteria monitoring using the Coliscan Easygel® technique. The two citizen groups then teamed up to conduct seasonal bacteria monitoring at 25-30 sites in the Chewacla and Saugahatchee watersheds in the Auburn area.



The groups have conducted watershed ‘blitz’ sampling four times since early 2007 and identified five local stream sites with high levels of *E. coli* contamination (greater than 600 *E. coli* per 100 milliliters of water, which is considered unsafe for human contact by U.S. EPA). Data are provided to local municipal officials, who work closely with SOS and CHEWUP in tracking and resolving contamination sources. Testing at one site on a small stream at a popular municipal park in Auburn indicated high levels of *E. coli* contamination. Investigations upstream revealed a leaking sewer line that was reported to municipal officials and promptly repaired. Subsequent testing at the park indicated that the contamination had been resolved and that the stream was safe for local children that frequent the park. Additional sites contaminated with bacteria have been tracked down and resolved, others are more elusive and require further vigilance and monitoring.

Several other citizen monitoring groups around the state, from the Tennessee River to the Gulf Coast, employ the AWW bacteriological monitoring method to monitor *E. coli* contamination in their watersheds. To explore the growing body of citizen water quality data, go to [www.alabamawaterwatch.org](http://www.alabamawaterwatch.org) and click ‘Water Data.’

Save Our Saugahatchee (SOS) is a stream-monitoring group in east-central Alabama. SOS formed in 1997 to address local impacts to the Saugahatchee Creek Watershed, and began monitoring water chemistry at about 10 sites. Saugahatchee Creek originates near the city of Opelika, Alabama, and flows westward to the Tallapoosa River. In 2006, interest in bacteria monitoring greatly increased after a few monitors reported high *E. coli* levels in a couple of streams in the watershed. Several citizen monitors got trained and certified by AWW in bacteria monitoring. A retired school teacher began monitoring at multiple sites, particularly city parks that had streams flowing through them (Figure 5). She measured high levels of *E. coli* at a city park in Auburn, Alabama, that is a popular playground area for local children. Investigations in the upstream watershed revealed what appeared to be waste water oozing from a suburban roadside slope and flowing into the stream that drained to the city park. Bacteria testing verified that this water was indeed highly contaminated. Armed with the *E. coli* data, the citizen monitor contacted local city authorities, who were pleased with the citizen monitor effort in detecting and sourcing the contamination. The city promptly fixed the underground sewer leak, which resolved the bacteria contamination in the city park downstream.

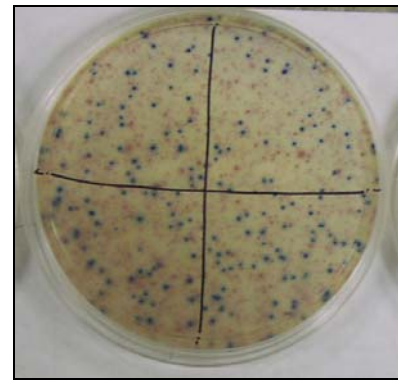


FIGURE 5. Volunteer Monitor Measuring Bacteria in a Local Stream. Save Our Saugahatchee citizen monitor testing local stream for *E. coli* (left), and results of incubated sample (right) showing extensive *E. coli* contamination (blue colonies).

Dr. Bill Deutsch, Auburn University School of Agriculture professor of aquaculture and aquatic environments.

A researcher at Auburn University, Deutsch works with the Alabama Cooperative Extension Service, giving talks about how to maintain clean water. He is also director of Alabama Water Watch, a volunteer-based group dedicated to monitoring Alabama's inland and coastal waterways.

Alabama Water Watch is a citizen volunteer water quality monitoring program that provides training, data management, information exchange and other means of support for the public to become personally involved in water issues. Since 1992, AWW has certified more than 4,600 monitors in 254 Citizen Groups that have collected over 50,000 data records from 1,900 sites on 755 waterbodies. Water quality information collected by citizen volunteers is applied to local activities such as environmental education, protection and restoration activities, and development of waterbody reports and watershed management plans. The university-based AWW Program works closely with the nonprofit AWW Association and other groups and agencies to achieve these goals.

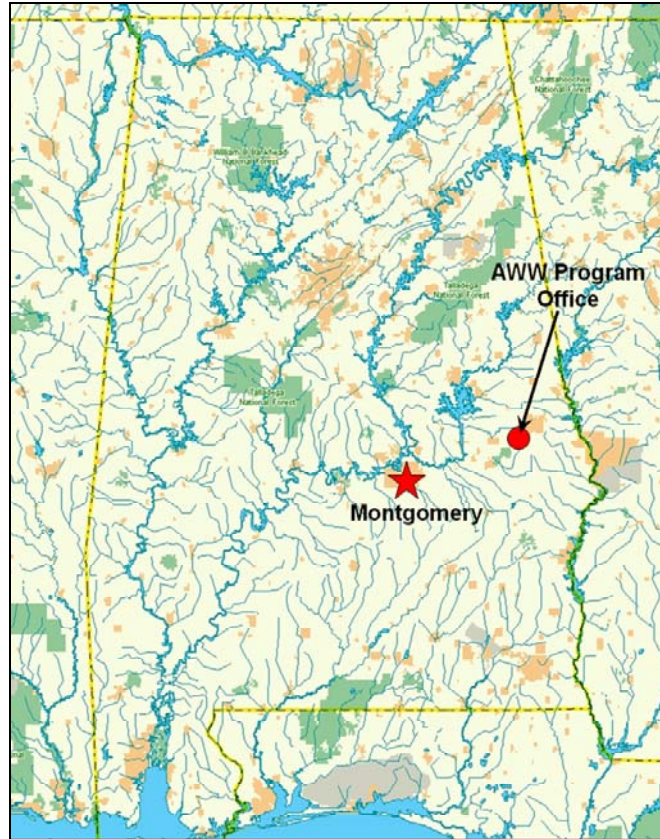
Certified monitors can enter data online, and custom graphs and statistical trends of statewide water quality data can be easily generated. Hundreds of summary graphs and maps of water data, training opportunities, special meetings and other aspects of water monitoring are available to citizens via the AWW website.

## **Background of the Alabama Water Watch Program**

Alabama Water Watch (AWW) is a citizen volunteer, water quality monitoring program that began in 1992. The Program is coordinated from the Auburn University Fisheries Department, with primary funding from the Alabama Department of Environmental Management (ADEM, the state's environmental regulatory agency) and the U.S. Environmental Protection Agency (EPA), Region IV. The Program grew out of a strong grassroots movement of local groups that had formed for the protection of waterbodies throughout the state. Many citizens feel it is their right and responsibility to become actively involved in protecting and restoring Alabama's water resources. These groups realize that advocacy for local waters requires strong community-based knowledge and action. Since its inception, AWW has developed strong relationships with water-based groups and worked with them to enhance their capabilities in watershed stewardship.

The mission of AWW is to improve both water quality and policy through citizen monitoring and action. Citizen volunteers attend one or more AWW workshops to become certified monitors of water quality. In the workshops, participants learn simple techniques for measuring various chemical, physical and biological characteristics of water, such as water temperature, dissolved oxygen (DO), alkalinity, hardness, turbidity, pH and bacterial concentrations.

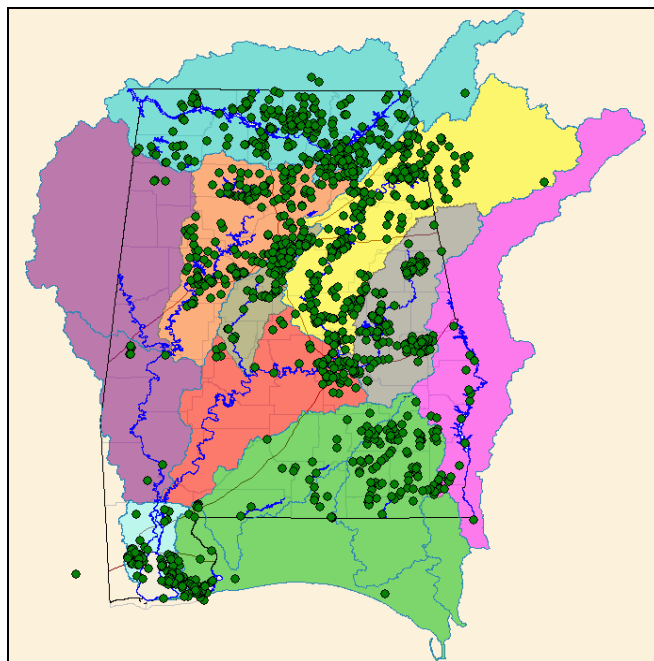
AWW's vision is to have a citizen monitor on every stream, river, lake, and bay in Alabama. This is a lofty goal since Alabama is such a water-rich state. There are over 75,000 miles of streams and rivers and 490,000 acres of lakes in the state. The state's rivers and stream convey about 8% of the surface water that flows through the continental United States.



**Alabama, a water-rich state.**

Alabama's surface waters cut through a wide variety of landscapes, including Appalachian valleys and ridges, prairie soils of the Black Belt, sandy soils of the Coastal Plain and other physiographic provinces. All this physical diversity in soil types, topography, geology and vegetative land cover leads to an impressive diversity of aquatic life. More than 700 species of fish, mussels, snails, and crawfish live in Alabama's rivers and streams, which ranks it as the number one state in abundance of these aquatic species. Some of these organisms are endemic, meaning that they occur only in Alabama.

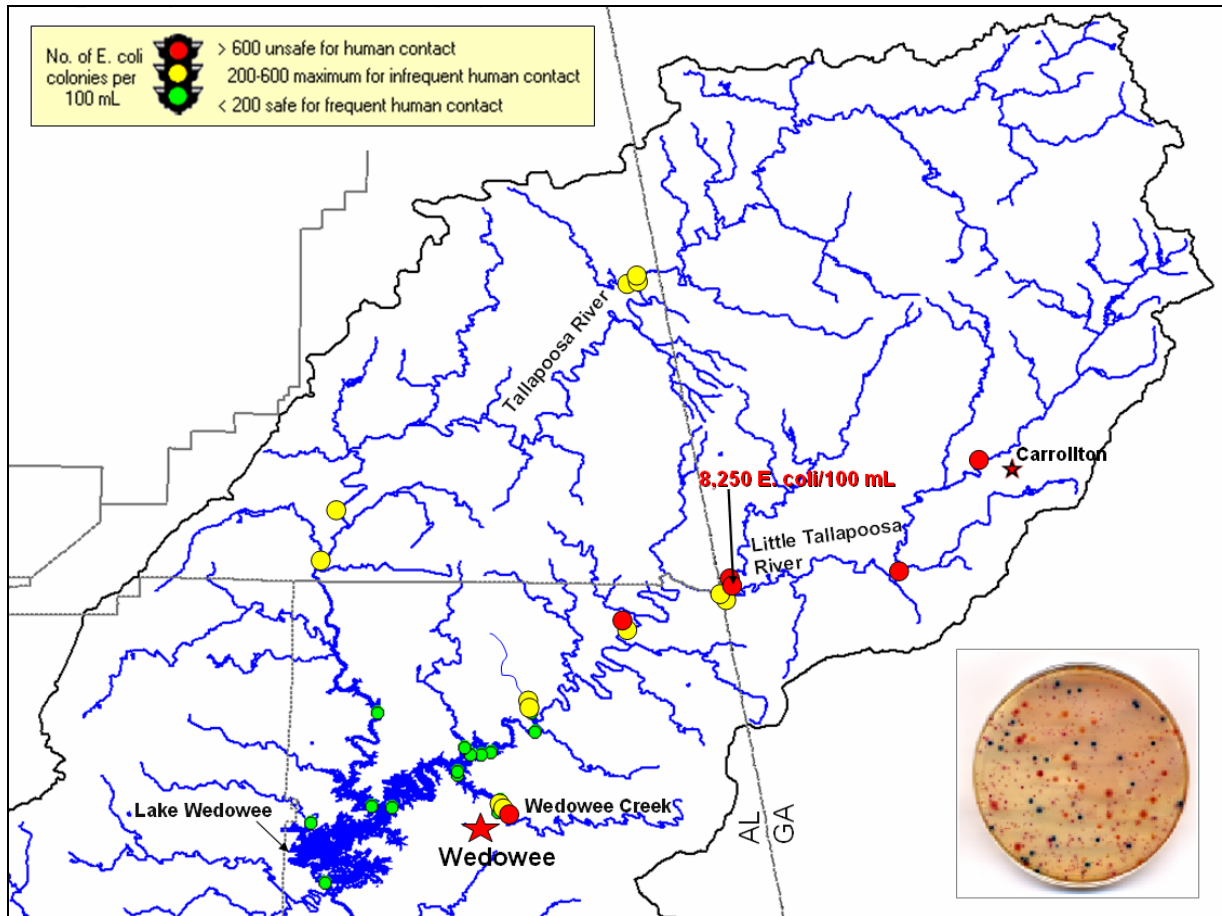
Since AWW began, more than 240 citizen groups have participated, cumulatively sampling more than 1,900 sites on about 700 waterbodies and submitting more than 52,000 water quality data records to the AWW database. The Program has certified about 4,700 citizen monitors, who have monitored over 1,950 sites on 700 waterbodies in Alabama, Georgia, Florida and Tennessee. Several groups have submitted water data for more than 10 years. For many waterbodies in Alabama, citizen data is the primary or only source of water quality information available. Citizen water quality data can be explored at the AWW website, [www.alabamawaterwatch.org](http://www.alabamawaterwatch.org).



AWW citizen volunteer monitor sites.

#### Watershed-level Bacteria Monitoring

Citizen monitors of the Lake Wedowee Property Owners Association (LWPOA) have been monitoring the waters of Lake Wedowee in Randolph County, Alabama since 1998. Spurred by a growing concern about bacterial contamination of the lake from septic systems, waste water treatment facilities, campgrounds, and nonpoint source runoff from poultry and cattle rearing operations, six LWPOA monitors received training and certification in bacteriological monitoring from AWW in March 2006. The group drafted a bacteriological sampling plan to test for levels of *E. coli* at 22 sites throughout the Lake Wedowee Watershed (see map below). At the completion of their *Upper Tallapoosa Watershed Bacteria Study*, LWPOA citizen monitors had taken about 100 samples, in triplicate according to the AWW protocol, throughout the growing season (April-October). Results indicated that 1) the highest *E. coli* levels (up to 8,250 colonies/100 mL of water) occurred in the Little Tallapoosa River just upstream of the Alabama-Georgia state line, 2) high levels of *E. coli* were also measured in Wedowee Creek (up to 2,786 colonies/100 mL of water) and in the Tallapoosa River (up to 506 colonies/100 mL of water), 3) the sources appeared to be from nonpoint source runoff because high levels of *E. coli* were detected following rainfall/runoff events, and 4) *E. coli* were not measured in the main body of Lake Wedowee, only in its tributary rivers and streams. Armed with this wealth of information, LWPOA citizen monitors plan to determine the sources of *E. coli* in tributaries entering the lake, and work on solutions to eliminate bacteria contamination in the watershed.



Map showing sites in the Lake Wedowee Watershed that had harmful levels of *E. coli* (sites in red had > 600 colonies/100 mL of water, sites in yellow had 200-600 colonies/100 mL, sites in green had < 200 colonies/100mL) during the 2006 growing season.