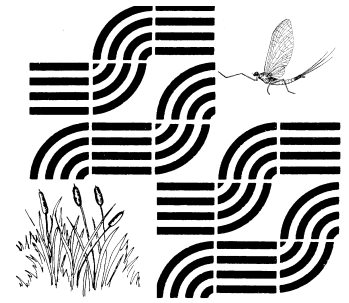


GEORGIA

# Adopt-A-Stream

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Department of Natural Resources  
Environmental Protection Division

## Paddle Georgia 2008

Two hours south of the Atlanta's Hartsfield-Jackson airport in the town of Oglethorpe, I loaded my kayak into a large tractor-trailer filled with a mass of other kayaks. I boarded the shuttle bus which took me north to where our campsite was, just east of Woodbury - and began the adventure of Paddle Georgia 2008.

This year's Paddle Georgia journey took us down 95 miles of the Flint River over seven days during the month of June, traversing the Piedmont and Coastal Plain regions. The Flint River's headwaters begin underneath Hartsfield-Jackson airport and continue south, joining the Chattahoochee River at the border of Florida to form the Apalachicola River. The first four days of paddling were around Pine Mountain through the Piedmont region, where geologic faulting caused an uplift millions of years ago that created rock bluffs and fall line ravines, which meant a lot of shoals and rapids for us paddlers. Yet this area is considered to have some of the most scenic river views in Georgia as it cuts through Spirewell Bluff State Park.

The coastal region is marked by the fall line, and the transition from the granitic rock outcrops to deep, slow-flowing water, sandy banks and forested floodplains. The periodic flooding of the plains has formed the Great Swamp; we passed through the region known as Magnolia Swamp, indicated by wetlands. The meandering of the river from erosion and deposition of fine sediment increases the river's length (350 miles of boating, while the basin is only 212 miles in length), and gives the Flint River the prestige of being one of only 40 rivers with over 200 miles of unobstructed flow.

Sunday morning, prior to taking the shuttle to our launch site, we debriefed our volunteers who were

interested in learning about water quality monitoring and how to become certified in Adopt-A-Stream (AAS) chemical monitoring protocols. The chemical parameters tested at each site were pH, dissolved oxygen, air and water temperature and conductivity. In addition, water samples were collected for later analysis of *E. coli* counts.

Upon return to the campsite each evening and after having dinner, we plated water samples on 3M Petrifilm plates and IDEXX plates and incubated them for 24 hours in order to obtain a reading on the number of *E. coli*. Volunteers from the group would assist in the processing of samples and were shown how to use both techniques to determine the number of colony forming-units (cfu).

Along the 95 mile journey, AAS volunteers took approximately 28 samples in order to get a quick assessment of the water quality along the Flint River. Sites were tentatively chosen prior to the event near areas of increased interest, such as tributaries that flow into the Flint River, and by their proximity to major intersections and roads, mines, underground pipelines, potentially large industrial runoff, wastewater treatment plants or agricultural lands. In sum, the water quality of the Flint River appeared to be in excellent condition.

In addition to the creation of baseline data to be used for comparison, the AAS program works to increase awareness of nonpoint source pollution, provide tools to the public by which to become involved, take an active interest in the protection of their local waterways and to promote new partnerships between the public and local government. Twelve volunteers were certified in AAS protocols over the Paddle Georgia event, which included

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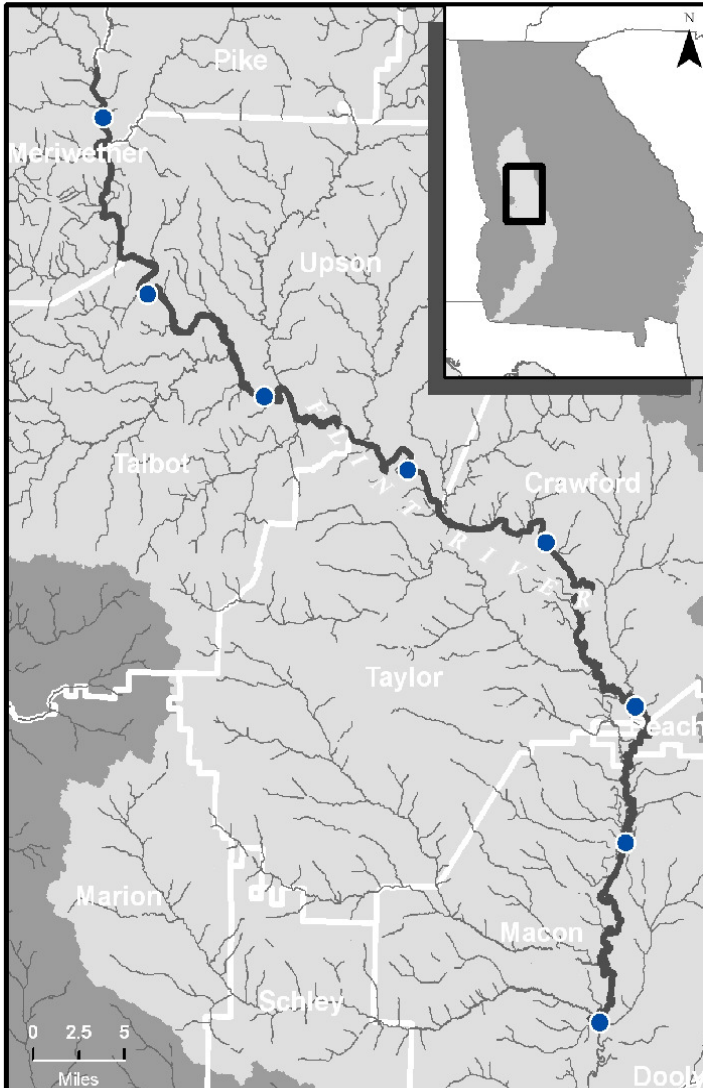
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teachers, retirees, students and parents.

At the finale in the town of Oglethorpe, President Jimmy Carter spoke of a new movement attempting to put three dams along the Flint River – a project he successfully staved off years ago during his term as governor of Georgia in the 1970's. Paddle Georgia 2008 was a fundraiser for Georgia River Network with proceeds supporting the creation of a Flint River protection group

The camaraderie and sense of community that was shared between fellow paddlers was obvious and made the Paddle Georgia experience all the more interesting and fun. It was not difficult to make friends along the way, and many I still keep in touch with today. You felt like you were part of something larger than yourself. To learn more about this year's Paddle Georgia trip, information on protecting the Flint River and for dates of next year's Paddle Georgia event visit the Georgia River Network website at [www.garivers.org](http://www.garivers.org).

*Contributed by Helen Mayoral*



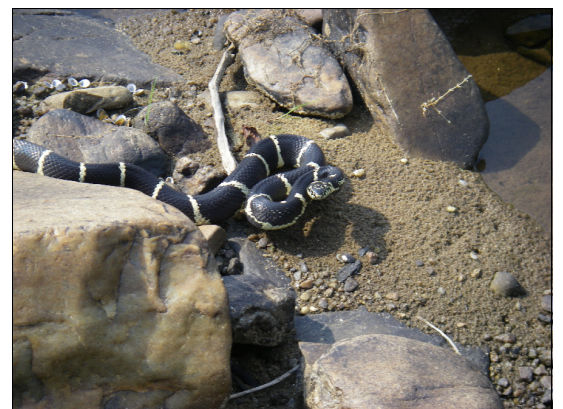
*The 2008 Paddle Georgia route with sampling locations indicated. Map by Phillip Ulbrich.*



*Forsyth County coordinator and trainer Kevin Smith samples for dissolved oxygen .*



*Dr. Chris Skelton, a biology professor at GC&SU, holds up a federally protected Purple Bank Climber .*



*Eastern King Snake found swimming the Flint.*

# By the numbers: Adopt-A-Stream data from Paddle Georgia

Adopt-A-Stream volunteers monitored four different chemical and physical parameters and sampled for bacteria during Paddle Georgia 2008. Their findings are explained in detail below. Contributed by Helen Mayoral.

## pH

The pH of water is an indication of the acidity of a sample, with measurements varying between 0 and 14, 7 being neutral. Bases are those samples with pH higher than 7, and acids have pH below 7. Readings at either extreme of the spectrum for pH can be damaging to aquatic life by affecting egg hatchings or killing a food source. The recommended pH levels vary by region. Given that, it came as no surprise to see varying pH levels, with those located in the Piedmont region being between 6.2 and 7.8, to those within the Coastal Plain region being as low as 5.5 to 6.6. Water with low pH levels can increase the solubility of nutrients such as phosphates and nitrates, causing harmful overgrowths and eutrophication.

## Dissolved Oxygen

Dissolved oxygen is the measure of the amount oxygen available to aquatic life for respiration. While a level of 3 parts per million (ppm) is stressful to aquatic organisms, levels of 5 to 6 ppm are generally required to sustain aquatic life. Throughout our sites, dissolved oxygen levels never fell below 5.5 ppm. Increased dissolved oxygen levels can be affected by several factors such as increased turbulence or respiration of algae; while low levels of dissolved oxygen can be indicative of oxygen demand from sewage leaks, decaying organic material or high water temperatures.

## Temperature

Temperatures for air varied from 21 to 37 °C, dependent on time of day and cloud cover; while water temperatures varied less in the range of 21 to 30 °C. The upper limit for temperature in Georgia's rivers is 32.2 °C, and the high readings obtained during Paddle Georgia were the result of sampling in wide, shallow shoal areas. The preferred temperature of water for different organisms varies, but all species prefer a slow, gradual change in temperature rather than a rapid change, which is when thermal stress or shock can occur. Temperature changes can sometimes be associated with discharge from industrial plants or from runoff sources such as roads and parking lots. Water temperature has an effect on the level of dissolved oxygen within the system. The higher the temperature, the less dissolved oxygen that can be retained, which is why low levels of dissolved oxygen are prevalent during the summer.

## Conductivity

Conductivity is a measure of the ability of water to pass an electric current, and readings for Georgia can range between 0 and 1500 µs/cm. Conductivity increases with the presence of inorganic dissolved solids such as nitrate, phosphate, sodium and aluminum; and decreases with the presence of organic compounds such as oil or phenol. The Coastal Plain sites had levels between 20 and 70 µs/cm, with a mean of 35 µs/cm. The conductivity readings for sites within the Piedmont region ranged from 50 to 110 µs/cm, with a mean of 76 µs/cm.

## Bacteria

*Escherichia coli* (*E. coli*), a type of coliform, is naturally occurring in most streams, coming from the defecation of warm-blooded animals. While *E. coli* is natural, it is used as an indicator of water quality and of other pathogens that could cause disease, such as *Giardia*. Based on our readings, there were two sites of concern; one site having levels above the EPA recommended standards for single samples in recreational waters, and another potentially having a large *E. coli* count except the sample did not process correctly. In the case of the first site, the 3M Petrifilm read 330 cfu/mL, which is just above the EPA recommended standard of 235 cfu/mL for single samples. This number equates to 8 persons in 1000 swimmers potentially becoming ill. Readings from samples run using IDEXX produced similar results. One of the theories as to why this particular site had higher levels of *E. coli* is the presence of cattle in the river just upstream of the site location evidenced by the condition of the riverbank and tell-tale hoof prints. As for the other site, it is still unknown – yet it is more likely the result of human error.

Paddle Georgia Data Summary		
Test	Coastal	Piedmont
pH	5.5-6.6	6.2-7.8
Dissolved Oxygen (ppm)	≥ 5.5	
Conductivity (µs/cm)	20-70	50-110
Air Temperature (°C)	21-37	
Water Temperature (°C)	21-30	

# Troubleshooting the Adopt-A-Stream database

Since the Adopt-A-Stream database came online last spring, over 100 new groups have registered 164 new sites. Today, 181 QA/QC volunteers actively utilize the database (*Note: All QA/QC volunteers may access the database*). Here are a few updates on using the database with tips on how to resolve some of the most common issues:

- **Logging into the Adopt-A-Stream Online Database:**

*New Users* : Enter your e-mail address and click the “E-mail my password” button. Your password will be sent to you immediately. If you don't see it, be sure to check your junk mail or spam folder.

*Forgot your password?*

Follow the instructions above for new users.

*Do you get an "Unknown e-mail address" warning?*

Contact your local Adopt-A-Stream coordinator, who can help you register.

*Has your e-mail address changed?*

Log in with your original address, and then make changes on the “People” screen. You'll use your new e-mail address for future logins.

- **Browsers:**

The Adopt-A-Stream database supports Internet Explorer 6 or higher and Mozilla Firefox 2 or higher. If you are using one of these versions but still have problems with the database, let us know.

- **Submitting Data:**

When submitting monitoring data or registering groups and sites, always proof your work. Remember, a database is useful only when its data is reasonably accurate. A misplaced decimal could have a dramatic effect on the statistical analysis of a watershed, which could lead to unnecessary time and expense in troubleshooting and retesting.

**Remember: When you encounter a problem with a database, click the “Contact” button and send us an e-mail.**

For more information as well as the time and location of upcoming workshops, visit [www.GeorgiaAdoptAStream.org](http://www.GeorgiaAdoptAStream.org).

The Georgia Adopt-A-Stream Newsletter is published six times per year. For more information about the Georgia Adopt-A-Stream program or to contribute to the newsletter, call or write to:

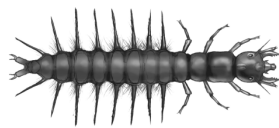
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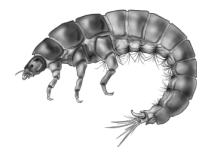
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