GEORGIA
# Adopt-A-Stream

Volume 24, Number 3 July– September 2017
*Adopt-A-Stream Staff, Editors*

Department of Natural Resources
Environmental Protection Division

## Paddle Georgia 2017: Etowah River

### Jesse Demonbreun-Chapman, Executive Director and Riverkeeper, Coosa River Basin Initiative

The Coosa River Basin Initiative (CRBI) is incredibly proud of the waterways we work to protect every day and was thrilled at the opportunity to host Paddle GA in 2017. Not only do our rivers sustain 27 endemic species found nowhere else on earth, but they also provide drinking water to Northwest Georgia and support ever-increasing water recreation. CRBI has long been an advocate for getting people out on the water, particularly through the Etowah River Water Trail. In 2006, Paddle GA ventured down the Etowah and was only able to utilize 3 public access points. This year, Paddle GA's 400 participants were able to launch, lunch, and stretch their legs at 13 public ramps along their journey. Increased access to this beautiful river has led to a sharp increase in paddlers on the Etowah.

*Jesse Demonbreun-Chapman on the Etowah River, Paddle Georgia 2017. Photo by Joe Cook.*

While many people fear that water trails will result in increased trash along the river banks, CRBI has noticed the complete opposite. People care more about the waterways they paddle. In fact, many paddlers who appreciate our waterways long for a deeper way to be involved in their protection, and Adopt-A-Stream provides the perfect outlet. Our AAS volunteers are eager to collect baseline data on our rivers precisely because they have fallen in love with these ancient highways that carry them away from their worries each weekend. We can't help but agree and are incredibly grateful for our volunteers and the Adopt-A-Stream program.

# *Paddle Georgia 2017: Etowah River Continued…*

**Brett Albanese, Senior Aquatic Biologist, Wildlife Resources Division, GA DNR**

This June, Brett Albanese participated in 4 days of Paddle Georgia, an annual weeklong paddling event that takes place on a different river each year. Brett joined hundreds of paddlers on a 57 mile stretch of the upper Etowah River and made 8 fish collections along the way. Thirty-seven species were collected, including listed species such as the Etowah Darter, Frecklebelly Madtom (aka "Coosa Madtom"), and Coosa Chub. Brett gave a short talk each night about the ecology and conservation of these species to Paddle Georgia participants. Camm Swift (DNR volunteer Ichthyologist), Katie Owens of The Nature Conservancy, and many Paddle Georgia participants assisted with fish collection efforts.

*A frecklebelly madtom from the Paddle GA seining on the Etowah River. Photo by Brett Albanese.*

"The best aquatic species outreach I have ever been involved with has been on Paddle Georgia. Being able to show people beautiful fishes that they may have never seen before is part of the magic, but the most inspiring thing is that Paddle Georgia participants are excited to learn about Georgia's native fishes. These folks are some of the best advocates in the state for protecting aquatic species and their habitats and it has been great to hang out with them on the river. Another bonus is that we have been able to collect some really valuable species distribution data from sections of the river that are rarely sampled due to access constraints." - Brett Albanese

*Paddle GA participants help seine for fish. Photo by Katie Owens.*

## Water Quality Monitoring Results

Adopt-A-Stream staff and volunteers have been conducting side-by-side comparisons of data collected in targeted monitoring events using Orion Star A329 electronic meters and the standard Adopt-A-Stream field testing kits. This comparative sampling has created a reliable data set supporting accuracy of both methods. Using the Orion meters has allowed the sampling teams to save time while sampling chemical parameters during events like Paddle Georgia with many sites per day. You can read more about how AAS is using these meters in the October– December 2016 issue of the AAS newsletter.

**Paddle Georgia 2017: Etowah River *(Min-Max)***

| Parameter | Mainstem | Tributary |
|---|---|---|
| Water Temp. (◦C) | 19.3-28.1 | 16.5-24.4 |
| pH | 6.07-7.91 | 5.34-8.08 |
| Dissolved Oxygen (mg/L) | 7.28-9.04 | 3.89-8.94 |
| Conductivity (µS/cm) | 26.76-253.0 | 20.01-314.2 |
| 3M Petrifilm *E. coli* (cfu/100mL) | 0.0-433.3 | 0.0-266.0 |
| IDEXX *E. coli* (MPN) | 2.0-161.8 | 24.3-275.5 |
| Turbidity (NTU) | 0.88-8.7 | 0.67-33.2 |
| Nitrates (ppm) | 0.0-0.50 | 0.0-1.00 |

During the Paddle Georgia Etowah trip, the AAS monitoring teams sampled 38 mainstem sites, 41 tributary sites and 10 additional sites of interest resulting in 89 sampling sites in total. Samples were tested for AAS core chemical parameters (water temperature, pH, dissolved oxygen and conductivity) as well as nutrients and *E.coli* bacterial levels. A first step to understanding monitoring results is to reference the State of Georgia's surface water quality standards or recommended levels for specific parameters. These are available online from EPD: https://epd.georgia.gov/georgia-water-quality-standards.

Congratulations to all the paddlers who participated in our volunteer workshop! Eleven people practiced using AAS monitoring protocol for sampling water chemistry in a beautiful setting on the banks of the Etowah, became certified volunteer monitors, and learned how to get involved in AAS in their own communities. Also, we'd like to thank Paddle Georgia, AAS trainers, volunteers and the monitoring team for another fun and successful trip!

# *Is it Safe to Swim?*
# *How AAS and Swim Guide Can Help Answer this Simple Question*

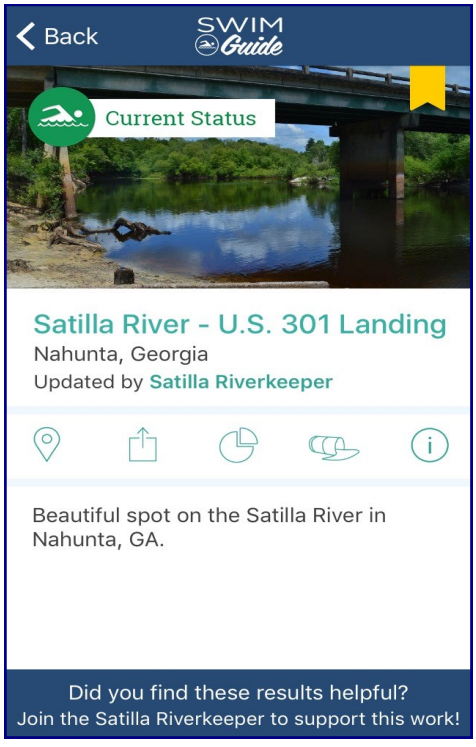
**Rachael Thompson, Watershed Outreach and Development Assistant, Satilla Riverkeeper**

When you visit a beach in coastal Georgia, you will find that each access point is equipped with a sign that displays current water quality data. Have you noticed these signs when going to the beach? What if you wanted to know before you go out to the beach that the water is safe for swimming? What if you aren't swimming at a 'beach' but are swimming at one of the thousands of beautiful and unique freshwater swimming holes throughout Georgia? How do you know that the water is safe for swimming?


*Photo found at [https://www.gachd.org/environmental-health/beach_water_testing/](https://www.gachd.org/environmental-health/beach_water_testing/).*

Well, in 2011, Lake Ontario Waterkeeper set out to answer that exact question: Is it safe to swim in Lake Ontario? As it turned out, this was a surprisingly difficult question to answer. Reliable facts and figures on water quality that were both easy to understand and easily accessible to the public were hard to come by. So they started to compile their own data and they created Swim Guide. The program grew very quickly because this was a common issue, people everywhere wanted to know that their water was safe to swim in. Today, with 70 active affiliates in 5 countries reporting water quality information on over 7,000 beaches, Swim Guide is the most popular beach information service in the world.

So, what is Swim Guide? Swim Guide is a website and free smartphone APP (iPhone and Android) that provides reliable and easy to understand water quality data to the public. When you access Swim Guide, either from their website or APP, it automatically brings up the nearest publicly accessible swim spots, some of which users may not have been previously aware of. Each site is equipped with an easy to read, color-coded icon that lets users know when the site has or has not met government water quality standards. Through the APP, users have the option to 'flag' or save their favorite swim spots for easy access later. Swim Guide has helped prevent possible waterborne illnesses by making it easier for people to know when you shouldn't swim, and when the water is clean and safe for swimming.




*Screenshot of a Satilla River sampling site from the Swim Guide phone app.*

For Adopt-A-Stream bacterial monitoring volunteers, Swim Guide will help bring your already existing water quality program to the next level. It will allow you to share your water quality data with your community in a way that is easy to understand, highlight clean swimming areas, or raise awareness about chronic water quality problems. Any civic groups, non-profit organizations, or government agencies with a shared desire for swimmable, drinkable, fishable waterways can become a Swim Guide affiliate for free. The results can easily be shared on social media, and they even have a widget that can be added to your group's website. Lastly, affiliates can also use the free ads service that Swim Guide provides to assist in funding your water quality monitoring program.

Swim Guide in Georgia has over 5,000 users already, and with the addition of other Adopt-A-Stream monitoring groups, this number will continue to grow. Every person should be able to know when their water is safe to swim in and not have to worry about potential health risks. "Without current, reliable data about water quality, people are vulnerable to illness and infection. When water isn't safe to touch, people withdraw from it. And when the connection between us and our water fades, so does our instinct to protect it" (TheSwimGuide.org).

Does Swim Guide sound like a good addition to your Adopt-A-Stream monitoring program? Contact the Satilla Riverkeeper Watershed Outreach Coordinator at Rachael@SatillaRiverkeeper.org. We can answer any preliminary questions you may have, and help get you set up as a Swim Guide affiliate.

# Board Member Highlight: Lynn Cobb

My career really began as a volunteer serving in my community on the environmental committee of an organization. The commitment and passion I had for our environment catapulted me into a volunteer position on the newly formed statewide board of Georgia Clean and Beautiful now known as Keep Georgia Beautiful (KGB). Volunteering for KGB lead to a paid position and ultimately to the position of manager of Keep Georgia Beautiful, my dream job, which I held for 20 years.

Becoming partners with EPD's water outreach group back in the 90's was inevitable because the litter our Keep Georgia Beautiful programs were dealing with on the streets of their communities, if not picked up, was ending up in the streams and waterways. Our KGB network had the outreach through its affiliates and Adopt-A-Stream had the technical knowledge and tools. It was a great match. When KGB held state and regional meetings we would promote AAS and Rivers Alive. We encouraged city and county governments, through KGB affiliates and our state agency, the Department of Community Affairs, to monitor their local waterways and to support cleanups using KGB volunteers.

My passion for AAS goes back to the pond where I learned to swim and the creek in my backyard. Most every person in Georgia has a similar memory from their childhood. So the story we told at KGB was "Close your eyes. Think back to those waters you remember so well as a child. Now, think of them as they struggle today, muddy with runoff, polluted with wastewater or clogged with litter and debris. You can help save them by participating in a clean-up event and/or monitoring the health of your stream."

I've served on the board of AAS since the beginning. As a member I've had various roles to play over the years. First: (and these are in no order of importance…there're all important!) I served as an enthusiastic supporter of its formation because of the potential partnership with KGB. Second: I attended meetings, I participated in conversation giving my layman's opinion, I took on a task of the board when asked, and I wore the hat of AAS when representing them. Third, I served as a liaison to KGB, encouraging participation in AAS and Rivers Alive. Fourth: I offered a layman's opinion of materials being developed and messages created for the public. And Fifth: I donated my money in support of this program. In short, I feel I serve as any member of a board should….with commitment! And it is a privilege.

# Thank You and Best Wishes, Meredith!

July 28th was Meredith Whitten's last day with Georgia Adopt-A-Stream and once again we found ourselves saying goodbye to another exceptional State Coordinator. I would say that we were surprised she decided to leave the program, except that we knew all along Meredith's heart is in marine science and ultimately she was returning to school. This fall Meredith began her graduate studies at Duke University to receive a Master of Environmental Management concentrating in coastal environmental management.

*"My time here working with all of you has flown by much too quickly, and I have enjoyed every second. I am so grateful for the opportunities I have had to travel and experience some of the most beautiful parts of Georgia, and it is both impressive and encouraging to see the work that all of you are doing not just in Georgia, but throughout the Southeast to protect and preserve our water resources. When asked what I enjoy most about my job, I always respond that the people are the best part. Thank you for your dedication, hard work, and guidance which have helped the program blossom into one of the best citizen science programs in the nation. It has been an absolute pleasure to meet and learn from each of you!"* - Meredith

Though Meredith's time at EPD was short, we appreciate everything she did for our program, from handling the Rivers Alive shirt distribution to leading QA/QC and Trainer workshops, providing QC testing for our online database or creating ARC GIS maps for monitoring events, and much more. And, now that she lives in North Carolina, all she needs to do is launch the NC AAS program, hah! Best of luck Meredith and keep in touch, you're always welcome in Georgia!

Harold Harbert, EPD Watershed Outreach Manager

# Citizen Science for Dissolved Oxygen Monitoring: Case Studies from Georgia and Rhode Island

**Hannah Safford[1] and Catherine A. Peters[2]**

[1] *Department of Civil and Environmental Engineering, University of California, Davis, California*

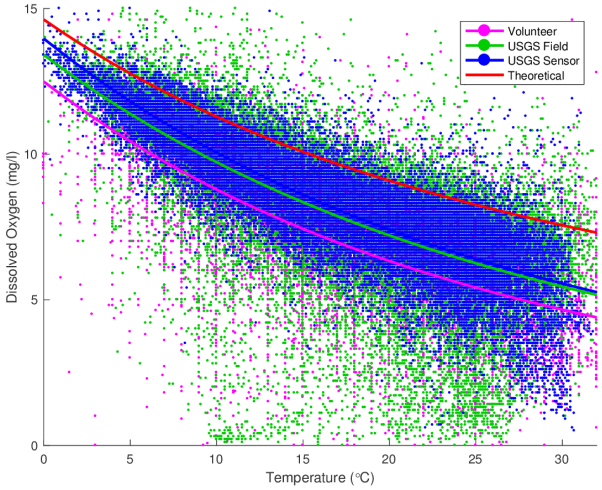
[2] *Department of Civil and Environmental Engineering, Princeton University, Princeton, New Jersey*

Georgia Adopt-A-Stream was one of the subjects of a new study, "Citizen Science for Dissolved Oxygen Monitoring: Case Studies from Georgia and Rhode Island," recently published online ahead of print in the journal *Environmental Engineering Science*. The study uses large-scale data analysis to assess the potential of citizen scientists to expand water monitoring networks across the United States. Below, the study's authors explain why they became interested in the topic, why it matters, and what they found.

## Can volunteers help fill water-data gaps?

All societies and ecosystems depend on clean water to survive and thrive. But ensuring high-quality water is a job that's easier said than done. In the United States, much of the responsibility for water-quality monitoring falls on government agencies like the U.S. Geological Survey (USGS) and Environmental Protection Agency (EPA). Though these agencies do an excellent job with the resources they have, they simply lack the capacity to monitor all parameters of interest for all waters of interest in our nation.

"Citizen science"—that is, science carried out by volunteer members of the public in collaboration with trained professionals—is emerging as an increasingly viable way to fill water-data gaps. An estimated 1,700 organizations nationwide conduct volunteer water-quality monitoring programs. Participants in these programs collect data on everything from water temperature and clarity to pH to the presence (or absence) of key nutrients and waterborne pathogens. Programs vary in the level of oversight, training, and equipment provided to volunteers.




*Data collected by Georgia AAS volunteers lies in roughly the same range as data collected by professionals, and exhibits the same expected trend. This indicates that volunteer-collected data could help support water management and research.*

The heterogeneity of volunteer water monitoring programs can raise concerns about the reliability of volunteer-collected data. Our research tests the validity of these concerns. We wondered: How does water-monitoring data collected by amateur volunteers using relatively inexpensive equipment compare to data collected by highly trained USGS scientists and by precisely calibrated USGS sensors?

To begin to answer this question, we compared USGS data to data collected from two of the largest and longest-running volunteer water monitoring programs in the country, Georgia Adopt-A-Stream and the University of Rhode Island Watershed Watch. Our analysis focused on dissolved oxygen (DO). DO is a critical measure of the health of freshwater bodies. Just as humans need adequate oxygen in the air, fish and other aquatic life need adequate DO in water. In addition to causing fish kills and dead zones, low DO levels can serve as an indicator of pollution, blocked streamflow, and other problems in a watershed. In addition, DO is directly related to water temperature. This relationship made it possible for us to justifiably compare USGS data to volunteer-collected data, even when these data were collected at different locations or times of day.

We found that volunteer- and USGS-collected data lay roughly in the same range and exhibit roughly the same dependency on temperature, although volunteer-collected data are slightly lower on average. These results are exciting because they indicate citizen science really could help close water-data gaps. If amateur volunteers are able to collect DO data that is reasonably close to DO data collected by trained professionals, then chances are good that amateur volunteers could collect reliable data on other key water-quality parameters as well.

It is also intriguing that the two volunteer-collected datasets used in our study looked remarkably similar, even though they were collected by volunteers participating in programs with different structures and protocols. This suggests that a variety of volunteer water monitoring programs can produce equally reliable results; i.e., that citizen science for water monitoring and data collection is a widely scalable approach.

Safford, Hannah and Peters, Catherine A. *Environmental Engineering Science*. September 2017, ahead of print.

To access the full text of this study, visit https://www.researchgate.net/publication/320216067_Citizen_Science_for_Dissolved_Oxygen_Monitoring_Case_Studies_from_Georgia_and_Rhode_Island.

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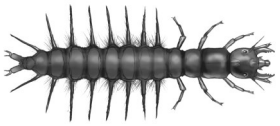
**Sign up for our e-newsletter by emailing us at AAS@dnr.ga.gov**


Dragonfly


Riffle Beetle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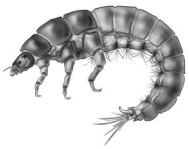
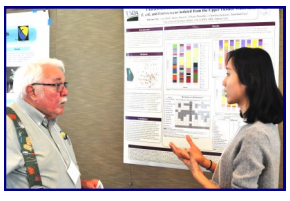

Net Spinning Caddisfly

# Confluence 2018: March 23-24

Adopt-A-Stream Annual Conference
Environmental & Heritage Center in Buford, GA
For more information, visit the Confluence page at www.AdoptAStream.Georgia.Gov

## AAS Water Science Poster Session: Call for Abstracts!

This year's Confluence Friday Social will include a special poster session open to students as well as AAS volunteers!



Guidelines and Abstract Submission Form are on the Poster Session page of the Confluence menu on the Georgia Adopt-A-Stream website at www.AdoptAStream.Georgia.Gov. Abstracts and posters of previous presenters can be viewed on the Water Science Poster Presenters & Winners page. Travel stipends are available for eligible participants.

**Abstract Submission Deadline:**
**MONDAY, JANUARY 15TH, 2018**

## AAS Award Nominations!

We need your help to recognize Adopt-A-Stream award winners for 2017. Submit a nomination for an active volunteer, trainer or watershed group that sets outstanding examples of the five goals of our program.

**See full award category descriptions and submit nominations on the AAS Awards Submission page at www.AdoptAStream.Georgia.Gov.**

**Deadline for Nominations:**
**MONDAY, JANUARY 15TH, 2018**