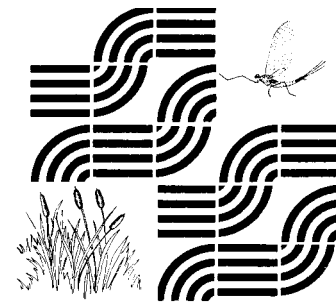


GEORGIA

Adopt-A-Stream

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Editor, Tara Muenz



Department of Natural Resources
Environmental Protection Division

Paddle Georgia 2013: The Lower Flint River



Photo by Stephen Golladay

The 2013 Paddle Georgia (PG) event, coordinated by the Georgia River Network (GRN), took over 300 paddlers down a 106-mile stretch of the Lower Flint River. We began the seven day journey on June 14th just south of the Dam in Warwick that flows through the towns of Albany, Newton and ended our journey at the boat basin in Bainbridge on June 21st.

For the Adopt-A-Stream (AAS) trainers and coordinators, this is a major event that includes chemical monitoring certifications, on the river instruction, education, and water quality sampling and sample processing. We value this opportunity to work with GRN and to meet the many citizens that experience the river with us. Preparation starts early with understanding the history and current status of the river, selecting sample sites, creating maps, assembling our team and getting the boats ready to tackle all our goals in this week-long experience.

Once again, we were fortunate to have one of EPD's Ambient Monitoring Unit managers along, Jeremy Smith, to contribute resources and knowledge during the event. Together we created the sampling strategy and also continued a special collaborative study examining and comparing volunteer water quality testing methods with those at the regulatory level. The Ambient Monitoring Unit also had goals to collect additional data pertaining to the Flint's discharge levels (more on page 3). To help with our outreach and monitoring goals, we recruited AAS certified trainers, board members and PG alumni. Our team this year (aka 'Team Victory') made it all happen, collecting and processing many water quality samples, and certifying fourteen PG participants in AAS chemical monitoring methods. We can't thank them enough for their contributions in making this an effective and fun event. Many thanks to trainers Dr. Tom Weiland (Georgia Southwestern University), Alexa Robinson (City of Griffin and Spalding County), Ruth Mead (Phinizy Swamp Nature Park), Chelsea Hopkins (EPD Outreach Unit) and Harold Harbert (EPD Outreach Unit) as well as AAS board members Steve Blackburn and Bob Bourne.

REALITY OF THE RIVER

The Flint River is one of Georgia's last long-running rivers, flowing over 220 miles unimpeded. Beginning its life underneath the Atlanta Hartsfield-Jackson Airport, the Flint flows through two physiographic provinces including the Piedmont and Coastal Plain before joining the Chattahoochee River at Lake Seminole to form the Apalachicola River which runs to the Gulf of Mexico. The Flint drains a watershed of 8,460 square miles and is easily subdivided into three unique river regimes (upper, middle, lower). This year's trip focused on the Lower Flint, a section of the river which cuts into the Ocala Limestone formation, and reaches into the Upper Floridan aquifer, one of the most productive aquifers in the world. Known for its occurrence of springs or blue holes, this stretch of the Flint also harbors a rich diversity of

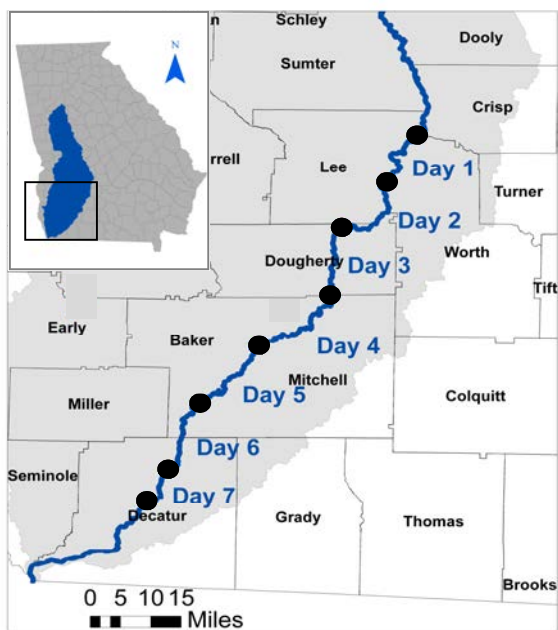
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Paddle Georgia 2013 Continued...

freshwater species including striped bass (*Morone saxatilis*), Barbour's map turtle (*Graptemys barbouri*), shoals spider lilies (*Hymenocallis coronaria*) and a number of mussels such as the washboard (*Megaloniais nervosa*), shinyrayed pocketbook (*Lampsilis subangulata*) and purple bankclimber (*Elliptioideus sloatianus*). The Lower Flint River is influenced primarily by agricultural operations with concerns of water withdrawals used for irrigation in addition to contributions of nonpoint source pollutants such as sediment, bacteria and nutrients. Some stretches of the river are on Georgia's 305(b)/303(d) list of impaired waters (refer to <http://gaepd.org/Documents/305b.html> for more information). The Lower Flint River and its tributaries are designated for the use of fishing. Some waterways are listed for violations of fecal coliform bacteria, dissolved oxygen and for not supporting fish communities due to nonpoint source pollution.

OUR RESULTS

Floating down the river along with the other paddlers, our sampling strategy targeted tributaries and sections of the mainstem that were 'listed as impaired' or had major discharges coming in that might influence the water quality. We sampled before and after



The 2013 Paddle Georgia Route from Warwick to Bainbridge, GA. The black dots denote the daily starting and stopping points.

Summary table of Paddle Georgia 2013 data (Min-Max) by tributaries (TRIB), mainstem (MAIN) and spring sites on the Flint River.

PARAMETER	SPRINGS	TRIB	MAIN
pH	7.25-7.55	6.0-8.0	6.3-7.5
Dissolved Oxygen (mg/L)	3.8-5.4	5.69-8.12	4.4-7.2
Conductivity (µs/cm)	240-300	60-310	77-160
Water Temperature (°C)	19.8-20.9	18.6-29.7	22-29.2
Turbidity (NTU)	1-1.4	0.9-62	5-19
Total Hardness (ppm)	X	50-350	50
Total Alkalinity (ppm)	X	40-120	40-80
<i>E. coli</i> (cfu/100 ml)	0-33.3	0-1367	0-67
Ammonia-N (mg/L)	0.83*	0.05-0.70	0.06-0.85
Nitrate-N (mg/L)	4.5*	0.3-1.3	0.22-0.93
TOC (mg/L)	5.32*	2.0-10.8	3.7-10.0
BOD (ppm)	2.1*	1.5-2.0	1.6-2.5
Total Phosphorus (mg/L)	0.02*	0.02-0.07	0.04-0.07
Metals & other nutrients (see AAS Website)			
Total No. Sites Sampled	3	54	57

*only 1 sample for these spring site parameters

tributaries and inputs to determine if there were any major influences to the river. These samples were used for screening purposes to give us an idea of the water quality of the watershed and to determine if there were any sites of concern. Fifty-four tributaries and fifty-seven main-stem sites were sampled along the paddle. We also took samples from pipe discharges, seeps and springs. We sampled over thirty-three different water quality parameters otherwise known as indicators, including pH, dissolved oxygen, air and water temperature, conductivity, nitrate-N, phosphate, ammonia-N, alkalinity, hardness, turbidity, BOD (biochemical oxygen demand), TOC (Total Organic Carbon), metals and *E. coli* bacteria.

During the daily journey we interacted with many of the paddlers who often asked, 'how is the water looking today?' The table above is a brief summary of tributary, mainstem and spring site water quality values for the Lower Flint River, and much more information can be

(continued on page 3)

Paddle Georgia 2013 Continued...

found on our website at www.georgiaadoptastream.org by clicking on 'Data Views' and navigating to 'Paddle Georgia,' then '2013 Map' or '2013 Data.'

HOW DO YOU INTERPRET THE DATA?

A first step to understanding the data we have is to reference the State of Georgia's surface water quality standards or recommended levels for certain parameters. You can find these standards by accessing this online document from EPD: <http://tinyurl.com/EPD-water-standards>.

We did find some sites with higher *E.coli* bacteria levels and immediately contacted the local Albany EPD office as well as partners in Lee County to find the source and resample. They are continuing to check on these sites. We also found at one of our spring sites, high levels of nitrates, which has been noted in the Lower Flint Basin. Overall, tributary sites had a broader range of values than the mainstem sites, which we tend to find year to year on PG. However, other than bacteria and a few nutrient levels, we found no sites of concern. An intact riparian zone, which runs along most of the river due to ownership of quail hunting plantations, adds the benefit of protecting the river. River flow was also above normal baseline levels, which could have affected our findings such that no major influences from the tributaries were detected.

Data from this event are shared with many partners including watershed organizations and the Environmental Protection Division. More frequent sampling would be welcomed to better understand what is occurring in the basin and to gather a solid base of background levels in this watershed.

SPECIAL PROJECTS: THE RIVER SURVEYOR

Article by Jeremy Smith, Ambient Monitoring Unit Manager

In addition to the main goals of our involvement with Paddle Georgia, we always look for more opportunities to capture other much needed data. This year, the Environmental Protection Division took time during the week to collect data on flow (velocity and river width) and bathymetry (channel shape) of the Lower Flint River. Together, this information is used to better understand the availability of instream habitat for aquatic life and is used to support water quantity modeling. Most models assume a uniform stream channel, however in reality this is not the case (see figure 1). So how did they collect the data? Jeremy and AAS board member Dr. Tom Weiland did over 40 cross-sections of the river using a YSI River Surveyor (see below image), given the nickname 'Flow Rida.' This uses high frequency acoustics to measure depth and water movement instantaneously. Below is one cross-section example where you can see the channel shape is not uniform throughout the cross-section. All this information is geo-referenced and the system computes discharge, defining the channel shape which is then given to engineers for developing the model to better understand water availability in the Lower Flint Basin.

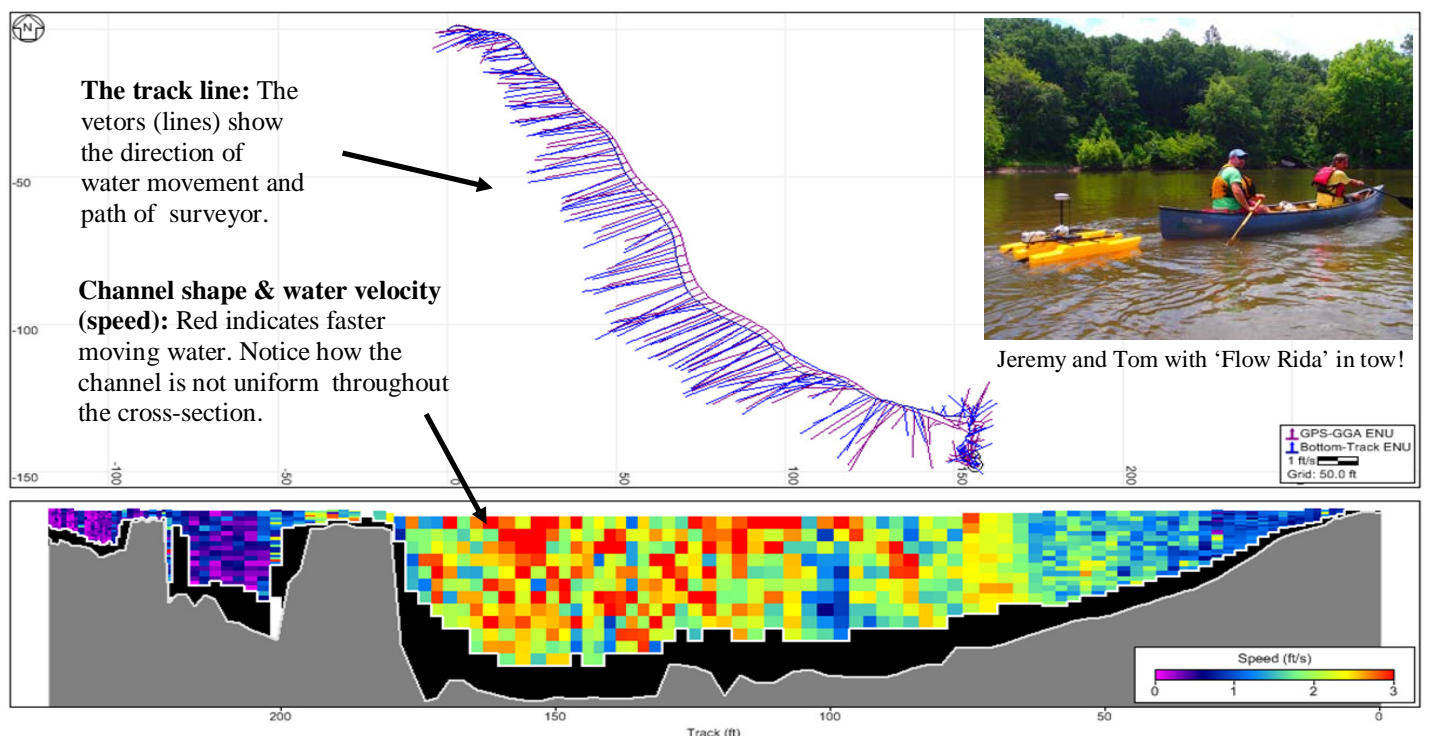


Figure 1. Example of a cross-section on the Lower Flint River taken by the river surveyor.

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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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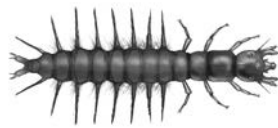
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Dragonfly



Riffle Beetle



Dobsonfly

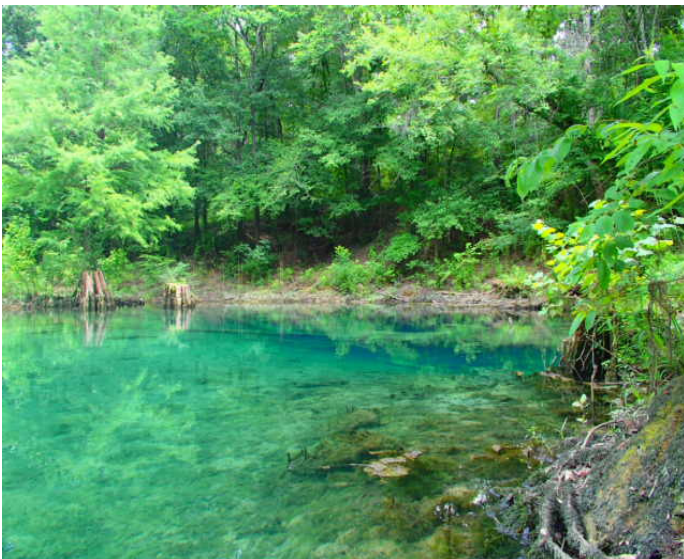


Stonefly



Net Spinning Caddisfly

Paddle Georgia 2013 Continued...



Springs on the Flint River, such as this one, are sensitive areas of the watershed that need protection as they provide refuge for rare species.

CALL FOR VOLUNTEERS ON THE FLINT

Our sampling throughout the week of Paddle Georgia was a snapshot of the water quality and health of these rivers, only scratching the surface of what was occurring. To collect further baseline data for the Flint Basin, we are looking for local volunteers to monitor sites throughout the watershed. If you are interested in adopting one of the Paddle Georgia monitoring sites or one of your own please contact us for more information.

See you in 2014

**when Paddle Georgia returns to the
Chattahoochee River!**

For more information visit www.garivers.org

**Please visit our website at www.GeorgiaAdoptAStream.org
for upcoming monitoring workshops and Adopt-A-Stream events.**