



## Our Streams: What You Want To Know

by Adam Sukenick, Cobb County Watershed Monitoring

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### Special points of interest:

- AAS Chemical and Biological Monitoring Workshops offered upon request
- Dragonfly Workshop on 8/6
- Composting Workshop on 9/6
- GA's 1st Annual Butterfly Symposium on 9/15

In recent years, water quality has been a growing concern within Cobb County and throughout the region. The topic has caught the attention of local citizens and policy makers alike. Residents are more informed than ever and want more input into the decisions that impact their neighborhood. Now, erosion and sediment controls are the business of everyone. The County has found it necessary to tighten controls and increase enforcement to protect waterways. Stormwater and runoff are nearly household terms. As land is cleared and developed, paved surfaces prevent water from soaking into the ground. Rain water hitting impervious surfaces picks up pollutants, increases in temperature, and

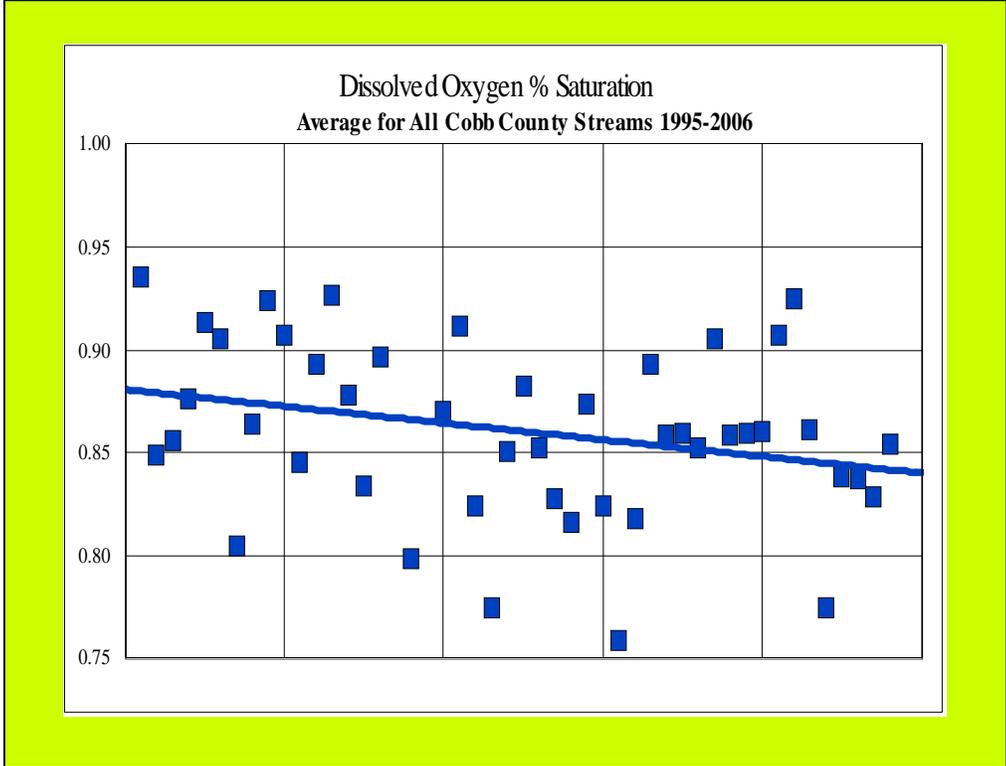
pours into streams. This causes higher peak flows, which can cause stream bank erosion. Recent studies indicate when the impervious surfaces account for more than 15% of a watershed, life within the stream will be negatively impacted. At this level, species sensitive to pollution disappear, water quality parameters and biological processes are affected by increased temperature of runoff, and higher stream flows and erosion decrease the stability of habitat. Sediment from failing stream banks settles on stream bottoms, filling in pools, smothering living spaces around rocks and covering breeding habitat of many fish. As excessive sediment covers the stream bottom, there are less riffles and white water in the stream. In addition to providing habitat, riffles act to aerate the water. Our watershed monitoring data has shown a declining trend in the percent dissolved oxygen. One explanation could be the smothering of riffles due to sediment deposition. Consequently, these impacts mean less diversity in macroinvertebrate and fish communities.

### **% Directly Connected Impervious Surface Area\* by Stream Basin**

Little Allatoona Creek	7.4
Allatoona Creek	16.5
Mud Creek	17.7
Butler Creek	22.1
Ward Creek	24
Rubes Creek	24.4
Noses Creek	25.2
Sweetwater Creek	27.8
Little Noonday Creek	27.8
Sope Creek	28.8
Tanyard Creek	29.5
Nickajack Creek	30.4
Powder Springs Creek	33.6
Olley Creek	34.5
Proctor Creek	36.5
Noonday Creek	46.1
Rottenwood Creek	56.9

\*The DCIA represents areas that are directly connected to conduits such as storm drains, drainage ditches, and streams. Therefore, the DCIA percentage will always be a fraction of the total impervious percentage since impervious surfaces such as roofs and driveways will generally be adjacent to lawns and other pervious areas.

While sampling streams throughout Cobb County, often we are asked if the streams are healthy and safe. Residents living by streams frequently tell us there are differences since they first moved into their homes. It's obvious, even to the casual observer, the stream channel is changing. When considering the changes that have occurred in Cobb and the metro area, it's understandable that streams are changing and seeking a new equilibrium. After observing these changes over time, residents look to us to inform them about the quality of local streams. Data collected by the Watershed Monitoring Program indicate most water quality parameters analyzed in our laboratory have gotten slightly better or remained the same over the past 15 years. But are our streams healthy and safe?



Cobb Water employee William Norris collects a runoff sample in a local neighborhood.

The question is difficult, if not impossible, to answer. Historically, the most significant impact to water quality was point source pollution such as leaking pipes and industrial discharges to the stream. Today, pollution isn't as easy to detect. Non-point source pollution, such as runoff, is a more significant problem and it's harder to remedy. It is not as likely to find a toxic pollutant flowing through the neighborhood stream as it was 30 years ago, but that doesn't mean all is well. Generally speaking, any stream has potential to transport unsafe pollutants. After a rain event that potential increases significantly. When runoff reaches the stream it is carrying anything (and everything) it washed over along the way: fertilizers and pesticides from lawns and gardens, litter from roadways, fluids dripping from automobiles, and waste from pets. It's easy to fix a broken pipe or route an industrial discharge to the sewer, but not as easy to make people clean up after their pets, fix leaky autos or curtail use of lawn chemicals.

Yes, Cobb County has changed over the years. Currently it is the second most densely populated county in the state with population growing from 447,745 in 1990 to 607,751 in 2000. During the same period we saw a 25% increase in housing units. Commute times, miles of road inventory, and number of vehicles owned are all on the rise. The growth here in Cobb has led to widening stream channels, increased sediment in local waterways, and a decline in species diversity. Macroinvertebrate data show sampled sites are predominately ranked Fair (never higher) and sometimes Poor. A few fish sites rank Fair (never higher) but most are in the Poor or Very Poor category.

## Stream Quality as Ranked by Stream Assessments

<b><u>Top Ranked Sites by Macroinvertebrate, Fish, and Habitat Assessment Scores</u></b>						
<b>Macroinvertebrates</b>	<b>Score</b>	<b>Fish</b>	<b>Score</b>	<b>Habitat Assessment</b>	<b>Score</b>	
1	Allatoona Creek at Midway Road 11/10/99	3.62	Rubes Creek at Blackwell Road 7/14/04	34	Nancy Creek at Paces Mill 8/1/99	149.67
2	Allatoona Creek at Due West Rd 10/12/01	3.66	Noonday Creek at Chastain Road 10/27/04	32	Nickajack Creek at Covered Bridge 7/24/02	146.33
3	Allatoona Creek at Midway Road 10/31/03	3.79	(t) Allatoona Creek at County Line Rd 6/20/01	30	Nickajack Creek at Cooper Lake Rd 11/18/02	140.33
			(t) Sewell Mill Creek at Holly Springs Rd 5/27/99	30		
			(t) Sope Creek at Indian Hills Drive 5/10/99	30		
			(t) Sope Creek at Lower Roswell Rd 5/10/99	30		
<b><u>Worst Ranked Sites by Macroinvertebrate, Fish, and Habitat Assessment Scores</u></b>						
<b>Macroinvertebrates</b>	<b>Score</b>	<b>Fish</b>	<b>Score</b>	<b>Habitat Assessment</b>	<b>Score</b>	
1	Tanyard Creek at Cherokee Street 12/16/99	7.17	Ward Creek at Highland Avenue 5/19/03	12	Noonday Creek at Chastain Road 11/9/01	54.33
2	Butler Creek at Jim Owens Road 12/19/02	7.02	(t) Poplar Creek at Interstate Parkway N 5/11/99	18	Noonday Creek at Shallowford Road 4/10/02	58.00
			(t) Rottenwood Creek at Akers Mill Rd 5/11/99	18		
3	Noonday Creek at Chastain Road 2/20/03	6.84	(t) Rottenwood Creek at Terrell Mill Rd 5/27/99	20	Sewell Mill Creek at Robinson Road 2/24/03	72.00
			(t) Nickajack Creek at Cooper Lake Rd 6/5/03	20		
			(t) Proctor Creek at Baker Road 5/27/03	20		
			(t) Noonday Creek at Kurtz Road 7/12/04	20		
			(t) Rubes Creek at Steinhauer Road 7/14/04	20		

(t) - tie score

Hilsenhoff/Macroinvertebrate Score - (a measure of macroinvertebrate diversity) Lower scores represent healthier communities

IBI/Fish Score - (Index of Biotic Integrity) Very Poor (8-24); Poor (26-32); Fair (34-42); Good (44-50); Excellent (52-60)

Habitat Assessment Score - Higher scores represent better conditions; Maximum of 200

Efforts are being made to minimize the impacts to our streams. In 2002, Cobb County instituted a Watershed Protection Plan to evaluate the current water quality and identify future water quality concerns. Also, Cobb is an active participant in the Etowah River Habitat Conservation Plan (established to mitigate harmful impacts of impervious surfaces and stormwater runoff they create upon fish species endemic to the Etowah River), and is part of the Metropolitan North Georgia Water Planning District (established in 2001 to create planning initiatives designed to ensure the Metropolitan Atlanta Region will have safe, sufficient water resources for the growing population while maintaining a sound natural environment well into the future).

Recently, growth rates have slowed and there has been an increase in awareness of water quality issues. Streams are not as healthy as they were historically, but with continued focus they may be healthier in 10 years than they are today.

Sources: Atlanta Regional Commission  
 Cobb County Data Report (2000)  
 CCWS Watershed Monitoring Program Annual Report (2003)

*The Cobb County Water System collects quarterly data at 94 sites throughout Cobb County. Chemical, Biological and Habitat data is published and reported along with site descriptions and field observations made during sampling. These reports are available upon request.*

## Biodiversity Spotlight: Water Moccasin vs. Water Snake An Unfortunate Case of Mistaken Identity

by Erin Feichtner, Cobb County Watershed Monitoring

Are there Water Moccasins/Cottonmouths in Cobb County? Luckily, the answer is no. Our most common resident water snake is the non-venomous Northern Water Snake, *Nerodia sipedon*. Unfortunately for the harmless Northern Water Snake, it looks a lot like the venomous Water Moccasin, so is often killed in a case of mistaken identity. The intent of this article is to educate the public on the differences between the Water Moccasin and the Water Snake to avoid the needless killing of non-venomous snakes (which is illegal in Georgia).

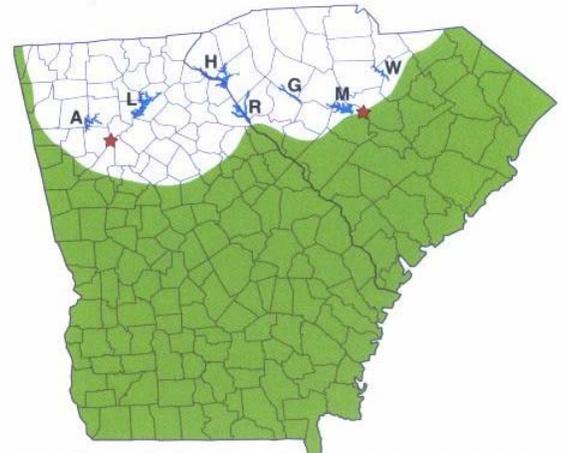
Adult Water Snakes and Water Moccasins may be similar in appearance. They are large, heavy-bodied species with rough scales and varying color, often gray, reddish-brown, brown, or black. There are several differences that help distinguish the two snakes:

**Range and Habitat:** Water Snakes inhabit aquatic habitats all over Georgia. The Water Moccasin does not naturally occur in most of the northern half of Georgia except for the very western portion. Water Moccasins do not prefer large open reservoirs, as some Water Snakes do. Water Moccasins tend to prefer slow moving-streams and swamps. From the range maps, one can gather that Cobb County, Lake Allatoona, Lake Lanier, and the entire north-eastern region of Georgia, should be Water Moccasin free, and any snake we see in the water is most likely the harmless Water Snake. However, as distributions are not static, we will examine physical characteristics and behavior that distinguish the two groups of snakes.

**Swimming Behavior:** Water Moccasins swim with their heads elevated above the water and their bodies riding on or nearly on the water surface. Water Snakes do not swim high on the water and do not keep their heads as elevated as the Water Moccasin. If given the chance, the Water Snake will flee by diving under the water and swimming away.



Juvenile Northern Water Snake, commonly found in Cobb County  
photo by Erin Feichtner



Range (in green) of the Water Moccasin (Cottonmouth) in Georgia and South Carolina. State capitals are indicated by red stars; major reservoirs outside of the Water Moccasin's range are as follows: A—Lake Allatoona; L—Lake Lanier; H—Lake Hartwell; R—Lake Russell; G—Lake Greenwood; M—Lake Murray; W—Wateree Lake.



Water Moccasin  
photo by J. D. Wilson

**Head Positioning and Mouth-Gaping Behavior:** When threatened, a Water Moccasin will keep its head at a 45° angle and gape its mouth to reveal the white mouth lining (hence the name Cottonmouth). Although the Water Snake also has a white mouth lining, it will not display it in this manner. Hence, a dead snake cannot be identified on the white mouth lining characteristic. Be careful, even a dead snake can transfer venom.

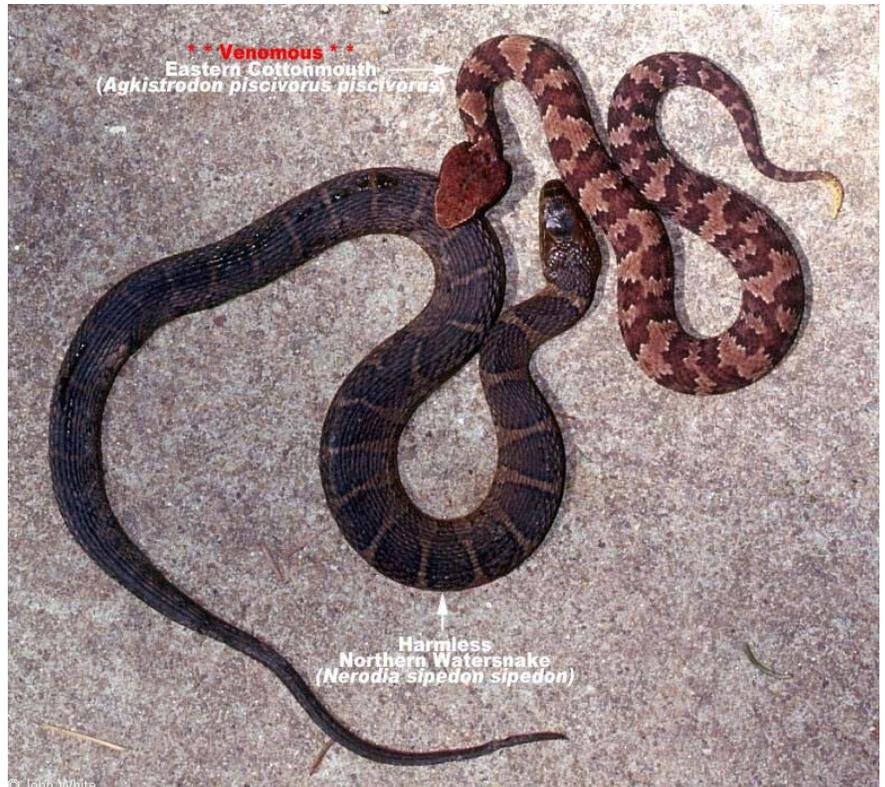
### Snake Fact:

Did you know that snakes have no eyelids?

Instead of eyelids, snakes have a transparent scale protecting their eye.

**Banding Pattern:** Water Moccasins have “hollow” bands that are widest on the sides and appear to be “hourglass shaped.” The Northern Water Snake has bands that are widest on top. Remembering this distinguishing mark came in handy the other day. I was climbing out of Noonday Creek, over large rocks covered in kudzu. I paused in mid-step when I realized there was a snake just where I was going to put my foot. It was under the kudzu, so I could only see bits and pieces of the snake, and not the head. Excited, I got out my camera thinking I had a Northern Water Snake. It was then that I noticed the banding. It got narrower on the top of the snake; it was not a Northern Water Snake, but a venomous Copperhead. I slowly took a step back and gave this snake plenty of room. He never moved. The best thing to do with a snake is to leave it alone.

**Head Shape and Features:** Often venomous snakes have triangular heads. Water Snakes can flare out their head when they feel threatened, making it look triangular. Venomous snakes have elliptical pupils and a pit between the eye and nostril while Water Snakes have round pupils and no heat-sensing pit.



Eastern Cottonmouth vs. Northern Watersnake  
Source: Virginia Tech



Copperhead  
photo by Dallas Stromberg

Perhaps we can all rest easier knowing that there are no Water Moccasins in Cobb County. However, we still have venomous snakes such as the afore mentioned Copperhead and the Canebrake or Timber Rattlesnake. The best thing to do with a snake is to leave it alone. Most bites happen when someone is trying to capture a snake to harass or kill it, or when someone unknowingly steps on a snake. If bitten by a venomous snake, stay calm and get to the hospital as quickly as possible. Although most of Cobb’s snakes are non-venomous, they can still give a nasty bite and may warrant a trip to the doctor for a tetanus shot.

**Source:** <http://www.uga.edu/srelherp/index.htm>  
Water Moccasin Distribution Map from GA DNR & Savannah River Ecological Laboratory (SREL)

**Snake Fact:**

Did you know that snakes are completely deaf?

All snakes are deaf to air born sounds but they do pick up vibrations in their jawbones and on their scent molecules on their tongue. These molecules are connected to the Jacobson’s Organ.

**Schedule of Events**

**Propagation from Cuttings:  
Creating a Diverse Landscape**

Date: Thursday, August 2nd  
 Time: 7:00 pm - 9:00 pm  
 Location: Water Quality Lab  
 Cost: Free  
 Call: 770-528-4070

**Dragonflies 101**

Date: Monday, August 6th  
 Time: 6:30 pm - 8:30 pm  
 Location: Water Quality Lab  
 Cost: Free  
 Call: 770-528-1482

**Chattahoochee River  
Summer Festival 2007**

Date: Saturday, June 25-26th  
 Time: 11:00 am - 5:00 pm  
 Location: Chattahoochee  
 River EE Center  
 Cost: Free  
 Call: 678-538-1200

# August 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	AAS Workshops upon request		1	2	3	4
5	6 Dragonfly Workshop	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	Chattahoochee River Summer
Festival 2007						

## Welcome, New Adopt-A-Stream Volunteers!

Cobb County Adopt-A-Stream would like to extend a warm welcome to our newest volunteers!

*Peggy Higgins and the Willeo Trib Tribe*  
 Peggy and her Tribe will be monitoring Willeo Creek.

*Andy Smith*  
 Andy will be monitoring Ward Creek near Whitlock Avenue.

*Mark Sullivan and Cub Scout Pack 61*  
 Mark and his Cub Scouts will be monitoring Nickajack Creek below the Silver Comet Bridge.

*Joannie Buchanan*  
 Joannie will be monitoring two sites on Rubes Creek.

*The Lindsey Family*  
 The Lindseys will be monitoring a portion of Allatoona Creek that runs in their backyard.

*Tony Lazzaro with Vinings Rotary*  
 Tony will be monitoring Orchard Lake which borders his property in Vinings.

Cobb County currently has 42 AAS groups registered, with volunteers monitoring 62 sites across the county. Data provided by volunteers is an important supplement to the 94 sites visited quarterly by the Watershed Monitoring Program. Your observations and stream health measurements provide valuable information about the state of the streams. Thank you for giving your time, assisting Cobb Water with watershed protection, and community education.

Nickajack Creek  
at Covered Bridge Road...



is a beautiful segment of stream adjacent to the Silver Comet Trail. We highly recommend visiting this historic site and enjoying the setting.

# September 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3 Holiday	4	5	6 Compost Workshop	7	8 PLT Educator Workshop
9	10	11	12	13	14	15 Butterfly Symposium
16	17 World Water Monitoring Day	18	19	20	21	22 Pollution Prevention Week
23 30 Fall Begins	24	25	26	27	28	29 Rivers Alive

## Schedule of Events

### Compost Workshop

Date: Thursday, Sept. 6th  
 Time: 6:30 pm - 8:00 pm  
 Location: Water Quality Lab  
 Cost: Free  
 Call: 770-528-4070

### Project Learning Tree Educator Workshop

Date: Saturday, Sept. 8th  
 Time: 9:30 am - 3:30 pm  
 Location: Water Quality Lab  
 Cost: \$25.00  
 Call: 404-388-8228

### Butterfly Symposium

Date: Saturday, Sept. 15th  
 Time: 9:00 am - 3:00 pm  
 Location: Fernbank Sci Cntr  
 Cost: \$30.00  
[www.monarchsacrossga.org](http://www.monarchsacrossga.org)

### Rivers Alive Celebration

Date: Saturday, Sept. 29th  
 Time: 9:00 am - 1:00 pm  
 Location: Sweetwater Park  
 Cost: Free  
 Call: 770-528-1135  
[www.riversalive.org](http://www.riversalive.org)

## Recommended Reading

### Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder by Richard Louv

"I like to play indoors better — cause that's where all the electrical outlets are," reports a fourth grader. But it's not only computers, television, and video games that are keeping kids inside. It's also their parents' fears of traffic, strangers, Lyme disease, and West Nile virus; their schools' emphasis on more and more homework; their structured schedules; and their lack of access to natural areas. Local governments, neighborhood associations, and even organizations devoted to the outdoors are placing legal and regulatory constraints on many wild spaces, sometimes making natural play a crime.

As children's connections to nature diminish and the social, psychological, and spiritual implications become apparent, new research shows that nature can offer powerful therapy for such maladies as depression, obesity, and attention deficit disorder. Environment-based education dramatically improves standardized test scores and grade-point averages and develops skills in problem solving, critical thinking, and decision making. Anecdotal evidence strongly suggests that childhood experiences in nature stimulate creativity.

In [Last Child in the Woods](#), Louv talks with parents, children, teachers, scientists, religious leaders, child-development researchers, and environmentalists who recognize the threat and offer solutions. Louv shows us an alternative future, one in which parents help their kids experience the natural world more deeply — and find the joy of family connectedness in the process."

*Publisher Comments from [www.Powells.com](http://www.Powells.com)*



# Cobb County Watershed Stewardship Program

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*Cobb County...Expect the Best!*



## Shallow Water Monitoring Kit Swap Out

Summer is here and everyone is headed to the sunny outdoors, whether it be to the beach or just out to the backyard. Here at Adopt-A-Stream, it's the time of year when we inventory and clean our kits to make sure they are ready for another year of monitoring.

Our first and foremost responsibility is to make sure that all our volunteers have the support and equipment they need to continue their data collection. The chemicals in our Shallow Water Kits do expire, which could affect the quality of your data. Age, exposure to heat and elements, and bacterial contamination may negatively impact your monitoring. To prevent this, we want to give all our volunteers fresh chemicals for the upcoming year.



Don't forget to send your data to Cobb Water each month.

If you have one of our kits, please contact Vicki Culbreth (770-528-1482) to arrange a time to have it swapped for a fresh, clean kit. Here's to another year of successful monitoring!