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Bacteria Monitoring Debuts in Cobb County

Georgia Adopt-A-Stream has recently developed and finalized protocol for a new bacteria monitoring initiative. Volunteers will be able to quickly and effectively monitor their waterways to determine the level of fecal coliform bacteria.

Some strains of coliform bacteria live in the intestinal tracts of warm blooded animals and can be pathogenic. These bacteria can enter waterways through the waste of pets, wildlife and livestock, as well as through human sources such as failing septic tanks, leaking sewer pipes, and urban runoff. Low levels of fecal coliform bacteria are normal and do not pose a threat to human health unless they exceed levels recommended by the Environmental Protection Agency.

The Georgia Adopt-A-Stream Bacteria Monitoring initiative utilizes *Escherichia coli* as an indicator for potentially pathogenic bacteria. *E. coli* is associated with warm-blooded animal waste, found in higher numbers, and lives longer than pathogens. While the presence of *E. coli* does not necessarily mean that pathogens are present, it can indicate that there is a potential risk to human health.

Excessive fecal coliform levels in water can cause gastrointestinal conditions, skin disease, respiratory infections, and eye, ear, and throat problems. Also, other pathogens may be present in animal waste, such as Salmonella, Cryptosporidium, Giardia, and hepatitis A.

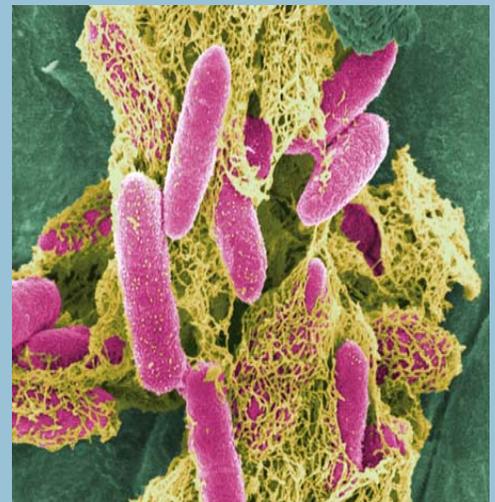
The bacteria monitoring protocol involves culturing and counting *E. coli* colonies to determine if their numbers are within safe levels. The Watershed Stewardship Program will provide all the necessary equipment for volunteers, including an incubator, pipette and tips, sterile sample bags, and plating media. Our first public bacteria monitoring workshop will take place on Saturday, April 25th at the Cobb County Water Quality Laboratory from 10:00 am to 1:00 pm. Please call 770-528-1482 or email water_RSVP@cobbcounty.org if you have any questions or wish to RSVP. We hope to see you there!

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Special Events of Interest...

- ◆ AAS Chemical Workshop 3/7
- ◆ Household Hazardous Waste 3/24
- ◆ AAS Biological Workshop 3/21
- ◆ Frog Monitoring 4/9 & 4/14
- ◆ Rain Barrel Workshop 4/24
- ◆ Bacteria Workshop 4/25



E. coli bacteria are used as an indicator to determine the potential health threat from other pathogens.

E. Coli is Tops!...is Fecal Coliform No. 2?

by Adam Sukenick, Cobb County Watershed Monitoring

The most widely used method for detecting sanitary conditions of food and water is testing for the presence of coliform bacteria. Found in the feces of warm blooded mammals, coliform bacteria are easy to test for and widely used as an indicator of water contamination. Although contact with coliform bacteria may not lead to illness and does not necessarily indicate fecal origins, water contaminated with coliform is likely to also be contaminated with other pathogens, such as bacteria and viruses, which could potentially cause serious illness.



Sites that might contain potentially pathogenic bacteria are sampled for *E. coli*. Recently, *E. coli* has surpassed fecal coliform bacteria as the preferred indicator species for water contamination.

To better assess the risk associated with exposure to contaminated water, scientists have studied many bacteria to determine which ones are most likely linked with sickness in humans. For water quality purposes, fecal coliform (a subset of coliform) testing is used to indicate contamination from sewage. Water polluted with human waste poses a significant threat to our health and fecal coliform is the standard for current testing in Georgia.

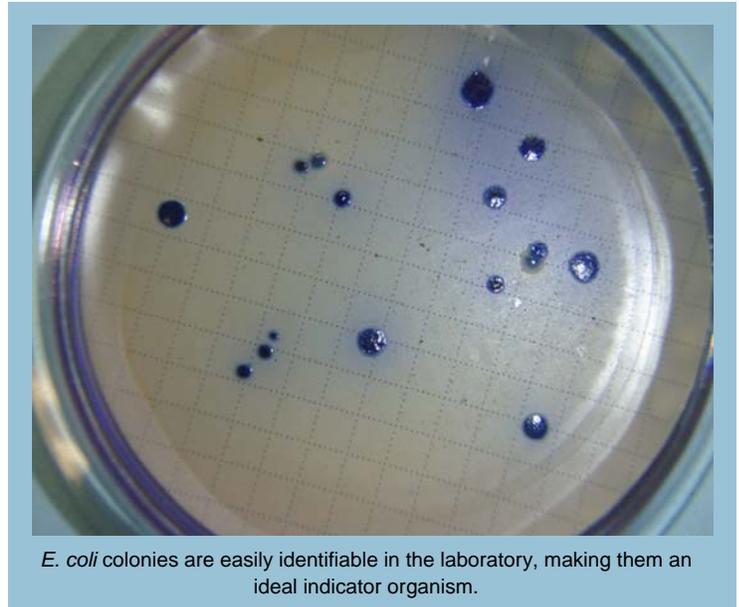
In the late 1940's a study was conducted by the United States Public Health Service (USPHS) to determine what levels of coliform bacteria posed a significant risk to human health. The results indicated that swimmers at public beach study sites were more likely to develop illness (gastrointestinal, respiratory, skin irritations, etc) after swimming in water on days following high coliform density than on days following low density. The data and conclusions from the USPHS were used again in 1968 when the National Technical Advisory Committee (NTAC) of the Department of the Interior first proposed water quality criteria recommendations. At this time, fecal coliform (a more fecal specific indicator) was

determined to be the best organism for assessing risk to human health. Since the original study tested for coliform, a ratio of fecal coliform to coliforms was determined by collecting and testing samples from one of the original USPHS study sites on the Ohio River. It was decided that 18% of coliforms were fecal coliforms and based on detectable risk thresholds from the original study, the equivalent level at which a "statistically significant swimming-associated gastrointestinal illness was observed" would be 400 fecal coliforms per 100 mL. Because a detectable risk was undesirable, the NTAC proposed using half of the level at which a health risk occurred and 200 fecal colonies per 100 ml was established as the water quality criteria.

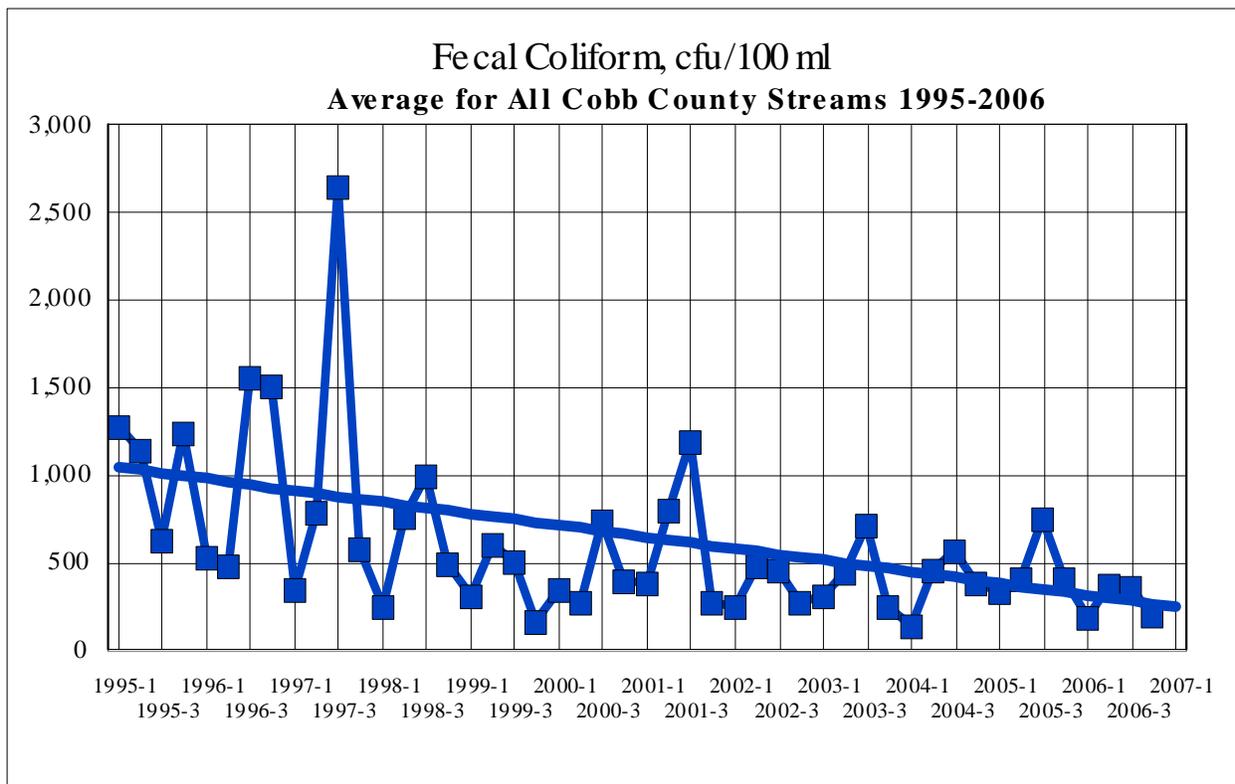
Although this standard has been recommended again since it was originally established and, in fact, is still being used today, it is widely recognized that there are several criticisms of the initial study. In 1972 the Environmental Protection Agency (EPA) began a series of studies to address these issues. As with the original study, each selected location for study included two beaches. The freshwater sites were located at lake beaches and each included a relatively unpolluted beach and one contaminated by a single point-source effluent. During the course of the study, no gastrointestinal illness was reported by swimmers frequenting the relatively unpolluted beaches; however, 7 out of 17 trials at the contaminated beaches reported excess illness. These results concluded that there was an increased risk of illness from swimming in sewage contaminated water.

The EPA study also addressed the indicator organisms used to identify water contaminated with sewage. Using correlation coefficients it was determined there was no correlation with gastrointestinal illness and high densities of fecal coliform and that the best indicators of contamination from human waste are *Enterococci* and *Escherichia coli* (more commonly called *E. coli*). Both of these bacteria are found in the intestines of warm blooded animals and exposure in high densities may cause illness to humans.

As a result of the EPA study, it was recommended that *E. coli* become the new standard for water quality testing. Its specific association with human waste, the ability to survive outside the body, and the ease with which they can be identified in the laboratory make them an ideal indicator organism.



Fecal coliform testing is entrenched in the field of water quality and because of the existing regulatory requirements, fecal colony forming units per 100 mL of sample is still the standard unit for reporting results. For surface water monitoring it is still an effective tool for identifying streams contaminated by leaking sewer lines or overflowing manholes and is frequently used when investigating customer complaints regarding contaminated water. During recent years, the desire to use *E. coli* testing has gained momentum. Studies have shown the advantages of using *E. coli* and the relative ease of testing should ensure *E. coli* is the indicator species of the future.



Levels of fecal coliform bacteria have steadily been decreasing in Cobb.

Biodiversity Spotlight: Canada Goose, Not “Canadian”

by Erin Feichtner, Cobb County Watershed Monitoring

The Canada Goose (*Branta canadensis*) (not “Canadian” as they have come to be commonly called) is the most well known and widespread goose in North America. Less than a century ago overhunting and habitat loss resulted in a serious decline in the numbers of this bird, especially here in the Southeast. With improved game laws and preservation programs, populations have recovered in most of their range. In recent years, Canada Geese have become so ubiquitous that many consider them pests due to their large volume of bacteria-laden fecal waste, noise and confrontational behavior. This problem is due partially to the removal of natural predators and an abundance of safe, manmade bodies of water on golf courses, public parks and beaches, and in planned communities.



The Canada Goose has a brownish back, cream breast, and white undertail. A black head and neck with white chinstrap distinguishes the Canada Goose from other common goose species. The male, or *gander*, usually weighs seven to fourteen pounds while the female goose is identical in appearance, only slightly smaller. The call of the Canada Goose is a loud honk. Average life span in the wild is 10-24 years and pairs mate for life. The nest is a large open cup lined with plant material and down, and is usually placed on a slightly

elevated site near water. The average clutch size is five eggs with a 26 day incubation period. Adult geese are often seen leading their goslings in a line, usually with one parent at the front and the other at the back. Parents will often give a warning hiss, then violently chase away any animal or person that they perceive as a threat. Food habits include foraging for grasses, cultivated grains, and aquatic vegetation. Bread should not be fed to geese as it provides little nutrition; cracked corn is a better alternative. Furthermore, moldy food may harm birds. Aspergillosis, transmitted to waterfowl by ingestion of moldy grain, such as bread, is a fungus that grows in the birds' lungs and air sacs causing respiratory distress and, eventually, suffocation.

In 1975, the Georgia Department of Natural Resources began a program to re-establish Canada Geese in Georgia and released thousands of wild birds in the following years. The birds quickly adapted to the available habitats in Georgia, and our resident goose population began to grow and expand into new areas. Practically all of the Canada Geese seen in Georgia are resident birds; they are not migratory. Historically, migratory Canada Geese passed through Georgia (with a few stopping over) on their way from James Bay in Canada to an important wintering area, St. Marks National Wildlife Refuge in Florida. Over time, the migratory population of Canada geese began to decline, and fewer and fewer geese passed through Georgia. Today, there are virtually no migratory Canada Geese present in Georgia during the winter.

Currently, Georgia's Canada Goose population is estimated at approximately 45,000 birds. These birds spend all year in our state, even though they may use different habitats during the summer and the winter. The geese breed throughout the state in habitat ranging from isolated ponds and wetlands to major reservoirs. Resident Canada Geese benefit from Georgia's temperate environment where weather and breeding habitat conditions are relatively stable and a prolonged breeding season provides opportunities for re-nesting in the event of a nest failure. Resident geese do not have the energy expenditures associated with long migration and live in essentially predator-free environments. Urban birds are afforded additional protection through the absence of waterfowl hunting in these areas. All of these factors increase survival rates and have contributed to the population boom of Canada Geese.

Some may find Canada Geese a nuisance due to their sheer numbers, fecal deposits, noise, and confrontational behavior. Geese have prospered in habitats such as golf courses, beaches, lawns, and manmade ponds in subdivisions and apartment complexes, where the potential for goose-human interactions are likely. Sources report that an average goose produces a pound and a half of fecal matter a day. This fecal matter litters lawns and washes, or is deposited directly, into bodies of water, polluting them with fecal coliform bacteria and pathogens including *Cryptosporidium*, *Giardia* and *Salmonella*. The City of Atlanta employs trained herding dogs to dispatch flocks and convince them that the city's drinking water reservoirs are not good goose habitat.



Abundant food and habitat in Georgia's many manmade ponds and lawns has negated the need for the geese to migrate to better feeding or breeding areas, allowing the birds to become permanent residents of the state. These human-induced changes to the landscape have provided Canada Goose populations with ideal living conditions, allowing populations to expand. Canada Geese are protected by the United States Fish and Wildlife Service under the Migratory Bird Treaty Act of 1918 and the Migratory Bird Conservation Act of 1929. The first permitted fall hunting of Canada Geese began in 1991 and has grown in popularity since then. In situations where geese are causing problems, the Georgia Department of Natural Resources, Wildlife Resources Division, has trained personnel who can provide technical guidance and assistance to solve these problems.

Attention All Watershed Stewards!

The Cobb County Watershed Stewardship Program has recently launched its new website: www.cobbstreams.org. You can find up to date information about our workshops and events and resources about local water quality.

Because our program is driven by the dedication of our volunteers, we would like to recognize all of the hard working stewards who have selflessly dedicated their time to improving our local ecology. Each group will have their own page to explain their history and goals. We hope this will be a way for our groups to connect with each other in the future.

To submit your group's information, please go to:
www.cobbstreams.org and click on the
Volunteer Profile Form at the
bottom of the page.

Schedule of Events

**Adopt-A-Stream Workshop:
Chemical Monitoring**

Date: Saturday, March 7th
 Time: 10:00 am - 1:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-528-1482

**Adopt-A-Stream Workshop:
Biological Monitoring**

Date: Saturday, March 21st
 Time: 10:00 am - 2:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-528-1482

**Household Hazardous
Waste Workshop**

Date: Tuesday, March 24th
 Time: 6:00 pm - 8:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-528-8214

March 2009

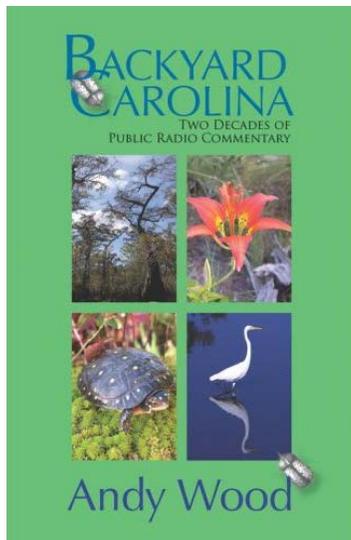
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7  Chemical Monitoring
8	9	10	11	12	13	14
Environmental Education Alliance Conference						
15  World Water Day www.worldwaterday.org	16	17	18	19	20	21  Biological Monitoring
22	23	24  Household Hazardous Waste Workshop	25	26	27	28
29	30	31				

Recommended Reading

Backyard Carolina: Two Decades of Public Radio Commentary by Andy Wood

"I came across this wonderful book while visiting my mom at her home in Sunset Beach, North Carolina over the holiday. I started thumbing through this book lying on her table. It's full of vivid, short essays about nature. Before I knew it, I'd read half the book! The author, Andy Wood, spoke at last fall's N.C. Master Gardener Conference. Mom had so enjoyed his lecture, she decided to order his book and she'd just picked it up at the local bookstore." - Jennifer McCoy

"Andy Wood is the education director for Audubon North Carolina. He lives in Hampstead, North Carolina. Beginning in 1987, Andy Wood began reporting his observations on nature as a weekly commentator on WHQR, the public radio station for the coastal Carolinas. Backyard Carolina includes Wood's most memorable commentaries and observations on nature from his own backyard to the larger backyard of various communities in North and South Carolina. Populating this book of essays is a colorful cast of crickets, moles, songbirds, toads, owls, loggerhead turtles, and one of Wood's "closest friends," the rams-horn snail." - Publisher review



This publication, like all those profiled in our Recommended Reading feature, is available for checkout from the Watershed Stewardship Library, housed in the Water Quality Laboratory.

Children & Nature Awareness Month
www.childrenandnature.org

April 2009

Schedule of Events

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9 	10	11
12	13	14 	15	16	17	18
19	20	21	22 	23	24 	25 
26	27	28	29	30		

Frog Monitoring: Classroom Presentation

Date: Thursday, April 9th
 Time: 6:30 pm - 8:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-528-8214

Frog Monitoring: Field Demonstration

Date: Tuesday, April 14th
 Time: 6:30 pm - 8:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-528-8214

Rain Barrel Workshops

Date: Friday, April 24th
 Time: 10:30 am, 1:00 pm, 3:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-528-8214

Bacteria Monitoring Workshop

Date: Saturday, April 25th
 Time: 10:00 am - 1:00 pm
 Location: Water Quality Lab
 Cost: free
 Call: 770-528-1482

Welcome, New Watershed Volunteers!

Jackie Belwood will be monitoring Allatoona Creek.

Pat Young will be monitoring a tributary of Willeo Creek.

Eric M. Lee will be monitoring seven sites on Bishop Lake and its tributaries.

Mike Petelle and his students at North Cobb High School will be monitoring Proctor Creek at Kennworth Park.

Donna Long and her 3rd grade students at Chalker Elementary School will be monitoring a tributary of Noonday Creek

Debbie Amodeo and her 8th grade students at Dodgen Middle School will be monitoring Dodgen Pond.

Amy Boggs will be monitoring Upper Indigo Lake, and Sope Creek with her **students at East Cobb Christian School.**



Cobb County Watershed Stewardship Program

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This is an official publication of the Cobb County Water System, an agency of the Cobb County Board of Commissioners.

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David Hankerson, County Manager



Cobb County...Expect the Best!



Thank You, Coca-Cola!

Cobb County Water System has been able to offer free rain barrel workshops every spring for several years. With the reduction in our budget this year, we feared this program would be dramatically cut or even eliminated entirely. Thanks to Marietta's Coca-Cola Bottling Company, we will be able to continue providing free hands-on community workshops to our customers this spring. Their generous donation of 55-gallon syrup barrels will reduce the expense of this project to less than \$10.00 per rain barrel. Thank you, Marietta Coca-Cola Bottling Company!

To celebrate Earth Day 2009, the Watershed Stewardship Program will be facilitating three make-and-take Rain Barrel Workshops on Friday, April 24th. To signup for a session, contact **Emily Toriani-Moura** at **770-528-8214**. This workshop is open to Cobb County residents only. Limit one per household.

Workshop times and location:
10:30 am | 1:00 pm | 3:00 pm

Cobb County Water Quality Laboratory
660 South Cobb Drive • Marietta 30060



Last year's rain barrel workshops were a great success!
We hope you'll join us this year!