Fall 2010

the Thalweg

Watershed Stewardship Program

Volume 7 ◦ Issue 4

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Cobb County Watershed Stewardship Program

662 South Cobb Drive
Marietta, Georgia 30060

770.528.1482
water_rsvp@cobbcounty.org

Staff

Jennifer McCoy
Vicki Culbreth
Catherine Mercier-Baggett

www.cobbstreams.org

Stop the Clog!

Fats, Oils, and Grease damage more than just your arteries

Fats, oils, and grease (FOG) are the by-products of the food preparation, cooking, and baking process. Some sources of FOG include ice cream, cheese, peanut butter, gravy, and salad dressing. When poured down the drain, FOG can cause blockages in the sewer pipes that move wastewater from homes and business to one of the County's four water reclamation facilities. The sewer collection system includes a network of pipes that lead from the sinks, toilets, showers, tubs and some appliances in the home. Anything that goes down a drain enters this sewer collection system. Any solids in the pipes (including hardened grease) can catch on existing blockages or tree roots that have infiltrated the system. The resulting process is much like an artery slowly becoming blocked because of high cholesterol foods. As the size of the clog increases, space in the pipe decreases. Eventually, the sewage will back up, either through an outdoor manhole or into a nearby home. The resulting mess is unsightly, unsanitary, creates huge problems for homeowners, and is very damaging to the environment. When raw sewage enters a stream or pond, it causes an influx of dangerous bacteria as well as a nutrient overload that could disrupt the metabolic balance of the water, resulting in fish kills. Residential use is responsible for 85% of grease-related sanitary sewer overflows. Luckily, this problem is easily preventable by being aware of how to properly dispose of food grease.

The Cobb County Grease Management Program will be presenting information and tips on managing your cooking scraps and by-products. Take a break from preparing for holiday feasts to learn how you can help alleviate the stress on our wastewater system. This workshop is free and will be held on Tuesday, November 16 at 6:30 pm at the Cobb County Water Quality Lab. For questions or to RSVP, call 770-528-1482 or email water_rsvp@cobbcounty.org.

Citizen Science Can Renew A Child's Love of Nature

By Mike Mueller

We all know that humans are making a negative impact on the environment. In fact, worldwide, we lose plant and insect species at an alarming rate-something on the order of 10,000 species annually. The U.S. ranks high among nations in the loss of biodiversity; the per capita 'ecological footprint' (a measure of how much land is needed for a population's lifestyle) is almost five times the world's average-far beyond sustainable. Richard Louv, author of No Child Left in the Woods, attributes our disregard for the Earth to a decreasing number of children who play outside, build forts, or explore nature. In 2006, the Kaiser Family Foundation concluded that "the multitasking generation" spends their time juggling TV/DVD, videogames, music, and computers. When considered separately, these activities add up to more than a 24-hour day. Childhood experiences with nature frame how we think about the natural world and how we treat people, the Earth's other species, and physical environments.

My eldest son knows that I enjoy the outdoors, yet he also knows that I am a busy adult. Working hard also equates to personal sacrifices, which means my son is exposed to a lot more television, movies, and video games than I'd prefer. How can we, as parents, help improve the environment and instill in our children a love for nature and conservation?

Teaching Children to Value Nature

My university life is centered on ways to collaborate with science teachers in order to promote responsibility for cultural diversity, biodiversity, habitats, and nature's harmony. I have recently learned how to incorporate these values into my relationship with my son by collecting data while hiking, playing outside, or bird watching. About a year ago we began doing citizen science by selecting different methods of investigating, collecting, and analyzing data on regional birds, insects, plants, and rocks.

What is Citizen Science?

Citizen scientists are predominately involved in monitoring environmental indicators and the biodiversity of species related to regional climate change, which range in scope

from the micrometer to the cosmos. There are now over 200 citizen science projects available worldwide, allowing for ordinary adults and their children to collect data that supports scientific studies and local policymaking. In fact, the longest running citizen science project is more than 100 years old.

What Are Some Citizen Science Projects I Can Do With My Child?

- Monarch larva and butterfly migration monitoring
- Ant surveys
- Worm and weed watches
- Lake ice and weather monitoring
- Weather reports
- Municipal air and water quality
- Bird surveys
- Bird feeder watches

Global Reach of Projects

Beyond developing an appreciation and understanding of what scientists themselves do, citizen science projects help adults and youth investigate the social and environmental impacts of scientific practices. These programs provide an opportunity for students to become pen pals and share data internationally. For example, "Our Shared Forests" gets youth in Georgia and Ecuador to collaboratively study the impacts of coffee trees on migratory birds and insects. Through citizen science, youth begin to recognize how the choices we make in our kitchens can impact species biodiversity both locally and around the world.

Citizen Science Encourages Civic Engagement

The educational literature suggests that citizen science cultivates citizen development. This means that while youth are engaged as citizen scientists they are also being engaged as participants in the democratic process of decision-making in their local communities. This participation equates to civic responsibility later in life when children become voters. In other words, when youth are engaged in tangible opportunities to develop as citizens, they are more likely to participate in making choices about adverse environmental issues. Our children may eventually be the only advocates for the flora and fauna that lack economic worth. With fewer agricultural and natural resources per capita on the horizon, today's kids will soon be making important choices about where to invest scarce resources. If we are diligent about finding ways to renew our children's love for nature, they will help do their part to ensure a more sustainable future.

Above: 5th graders from Powers Ferry Elementary School test oxygen levels in Sewell Mill Creek.

Below: 7th graders at Dodgen Middle School search their campus pond for aquatic macroinvertebrates.

Citizen Science Projects for Parents, Teachers, and Young Citizens

The Citizen Science Toolkit is the most comprehensive clearinghouse for news, project ideas, and resources in support of citizen science projects worldwide (http://www.birds.cornell.edu/citscitoolkit).

The Society for Amateur Scientists is an organization to support citizen scientists (http://www.sas.org/).

The Citizen Scientist is a published bi-weekly by the Society for Amateur Scientists (http://www.sas.org/tcs/).

A Citizen Science Weblog that connects citizen scientists with the latest news, archival weblogs, citizen science by category, multimedia, and comprehensive articles on upcoming events, equipment, and resource books (http://citizensci.com/).

Dynamic Patterns Research Institute supports and guides citizen science, and offers educational references and opportunities to engage in authentic scientific investigations (http://research.dynamicpatterns.com/).

National Aeronautics and Space Administration mentoring and inquiry using NASA data on atmospheric and earth science for teachers and citizen scientists (http://mynasadata.larc.nasa.gov/citsci_index.php).

The U.S. Youth Network for Sustainable Development is an organization to support young people advancing sustainable development and youth empowerment in the United States, with a citizen science paper competition, listserv, and partnership building (http://sustainus.org/content/view/16/128).

*This article was reprinted with permission from **www.education.com**. Dr. Michael Mueller is a professor of Mathemetics and Science Education at the University of Georgia.*

The Watershed Stewardship Program offers citizen science initiatives in water quality monitoring (Adopt-A-Stream) and Anuran Monitoring. Contact us to see how you or your students can get involved!

A good indicator of the negative reactions most people get when thinking of goldenrod (*Solidago* spp.) can be found by doing a simple online search for the plant. Google lists "ragweed" as a related search. Indeed, many people get runny noses and itchy eyes from just imagining the bright yellow weed that graces any sort of disturbed area: roadside ditches, open fields, abandoned lots, and the back corner of a garden that is neither cultivated nor mowed.

Because of *Solidago's* unusual ability to crossbreed with other plants there are nearly 130 species, all native to some portion of North America. Nearly half of these can be commonly found in the southeastern United States. There are also varieties native to Europe, which have spread to Asia. Goldenrod is a clonal plant, spreading through seeds as well as underground rhizomes. These rhizomes produce clumps of stems that are genetically identical. An individual stem within a clone is called a ramlet. In a meadow (a literal "field of gold") there may be thousands of ramlets, but only a few clones.

Through the spring and most of the summer it is a rather inconspicuous plant, growing upwards of 30 inches tall, with thin, lance like leaves that whirl outwards from a single stem. It is in the late summer that goldenrod shows its true colors, blooming with large, panicle-shaped clusters of tiny yellow flowers. From a distance a line of goldenrod looks like a sunny haze floating above a mass of gray-green leaves. Unfortunately, it's these bold flowers that have given goldenrod its undeserved reputation. It's easy enough to blame the season's hay fever on such an obvious source, but the real culprit is ragweed (*Ambrosia* spp.). Since ragweed is wind pollinated, the flowers do not need to be colorful or fragrant in order to attract insects. They are small and green and easy to overlook. People suffering from allergies in September look for a flower to blame and goldenrod gets the rap because it is so visible and abundant. However, goldenrod pollen is too sticky and heavy to be wind pollinated. The yellow flowers attract a host of insects to do the work instead, creating a mini-habitat that supports a diverse ecosystem. In fact, goldenrod is said to support 115 species of wildlife and was named one of the top ten herbaceous plants for a wildlife garden.

In addition to the butterflies that hover over this tasty fall nectar source, a careful observer might notice swollen lumps on the stems of goldenrod. These are galls, a biological response from the plant when something has disrupted its normal metabolic processes. Galls are like vegetative tumors, and many plant species produce them in when they are affected by funguses, insects, chemicals, or mechanical damage. In goldenrod, there are fifty insect species that lay their eggs on the plant, stimulating the gall forming process. The

goldenrod gall fly (*Eurosta solidaginis*) larva hatches from its egg and eats into the plant tissue, eventually burrowing out a living chamber inside the stem. A round gall forms at the site, which benefits the insect by proving more space and specialized tissue for the grub to feed on. Like a tumor, the gall cells exhibit abnormal growth. Eventually it turns dark and woody, and the leaves near it may wither and die. The gall protects the larva during the winter. When warm spring weather arrives the grub begins to tunnel towards the outside of the stem, stopping just short of leaving the gall. Then it returns to the interior chamber to pupate. In a few weeks, the newly emerged adult fly is able to exit through the thinly walled tunnel it dug as a larva. The dependence of the goldenrod gall fly on its host plant brings even more diversity into this community. It is said that for every species of gall forming insect, there are three species of parasites for it. A parasitoid wasp (*Eurytoma gigantean*) is able to penetrate the gall chamber and lay its egg inside, allowing the wasp larva to feed on the fly. Woodpeckers and chickadees are also known to peck open the gall in order to feast on the grubs inside. Some species of beetle also prefer to feed on gall fly larva. Similarly, the goldenrod gall moth (*Gnorimoschema gallaesolidaginis*) caterpillar forms a spindle shaped gall on the goldenrod stem. After the adult moth emerges, the empty gall is often used as winter shelter by spiders and other small insects. The goldenrod gall midge (*Rhopalomyia solidaginis*) has been referred to as an "ecosystem engineer" for its ability to inadvertently provide habitat for a diverse group of arthropods. Its presence prevents the growing stem from elongating, but still allows it to produce leaves. The result is a tightly packed whirl of vegetation that becomes a home for many insects. Even the death of a goldenrod benefits the ecosystem around it. When its nitrogen rich tissues decompose they replenish much needed nutrients in the soil. In communities where goldenrod is outcompeted by other meadow species, nitrogen is often depleted.

Goldenrod also boasts an impressive array of medicinal uses. In fact, the genus name Solidago comes from the word "solidare", which means to make whole. Indeed, the list of maladies traditionally treated with goldenrod looks like every symptom you'd read walking down the aisles of a pharmacy. The dried leaves are used as a diuretic and anti-imflammatory, to treat slow healing wounds and muscle spasms. The plant has also been used to treat asthma, tuberculosis, diabetes, gout, hemorrhoids, internal bleeding, kidney stones, high blood pressure, arthritis, cold and flu, and eczema. Although few modern medical studies have been performed to determine goldenrod's effectiveness in humans, traditional folk medicine has been touting its benefits for years, both in Europe and in Native American populations. Dried leaves are seeped to make a tea, which can be consumed to treat digestive problems or gargled to treat an inflammation of the mouth or throat. Fluid extracts, tinctures, and capsules are also available. For skin maladies, it is applied topically.

It's easy enough to dismiss goldenrod as a common roadside weed, but upon closer inspection it reveals itself to be a beautiful and functional plant.

References

Great Plains Nature Center - www.gpnc.org/goldenro.htm
University of Maryland Medical Center - www.umm.edu/altmed/articles/goldenrod-000251.htm
Garden Guides - www.gardenguides.com/461-goldenrod-solidago-virgaurea.html
The Solidago Eurosta Gall - www.facstaff.bucknell.edu/abrahmsn/solidago/main.html
USDA Plant Profile - plants.usda.gov/
Hilton Pond Center for Piedmont Natural History - www.hiltonpond.org/ThisWeek051001.html
Effects of Predator Hunting Mode on Grassland Ecosystem Function - biodiversity.sd-initiative.org
www.botanical.com

Examples of gall formation in *Solidago*. Left to Right: The spherical gall of a goldenrod gall fly (*Eurosta solidaginis*), the spindle-shaped gall of the goldenrod gall moth (*Gnorimoschema gallaesolidaginis*), and the stunted leaf floret galls of the goldenrod gall midge (*Rhopalomyia solidaginis*) .

Technically called "Ladybird Beetles," ladybugs sneak inside houses through cracks to escape cold weather. Older, light-colored houses that face south or west are especially attractive to ladybugs. When handled, these insects may ooze a smelly, yellow liquid that stains ~ which is actually some of their blood. Use a wet/dry vacuum to capture and release these beneficial aphid-eaters outside with less mess. Since ladybugs also exude pheromones (a scent that attracts other ladybugs), seal up any cracks in your house ~ otherwise you'll have lots more of these beetles in your house! Erecting a ladybug hibernating box in your yard may help too.

Linda May,
Environmental Outreach Coordinator,
Georgia DNR, Wildlife Resources Division

Welcome New Staff!

The Watershed Stewardship Program would like to welcome our newest staff members, Mary Perry and Jennifer Hutcheson. Mary and Jennifer will be joining our education staff to present the Brooke & Branch Puppet Show to third grade classrooms across the county.

Mary graduated from the University of North Carolina at Charlotte with degrees in biology and education. She previously taught high school science and has done research in water quality and aquatic ecology.

Jennifer graduated from Kennesaw State University with a degree in middle grades education and is certified in language arts and social science.

We look forward to working with both of them!

No Dumping, Drains to Creek

You might have noticed bright blue markers on storm drains across Cobb County. These markers are placed by volunteers to inform their neighbors that stormwater is diverted to the nearest stream via these drains without any treatment. Along the way, the rainwater can pick up any materials on the ground, including those items we carelessly toss away without thought. If we do not curb our bad habits, lawn clippings, dirt, litter, pet waste bacteria, and motor oil will end up directly in our waterways! These pollutants can negatively impact our streams and creeks, and inadvertently affect our source of drinking water, the Chattahoochee River. By educating the residents about this problem, we can help curb this problem and beautify our community at the same time.

This volunteer project is an easy way to improve water quality and aquatic habitats. To get involved, please visit our website (www.cobbstreams.org, under Initiatives), or call us at 770 528-8214.

Photography Spotlight

In late winter Cormorants (*Phalacrocorax spp.*) look out over Apalachee Bay in the Gulf of Mexico near St. Marks, Florida.

Submitted by Wolfgang Tiedtke

Have a great photo to share?
Send it to water_rsvp@cobbcounty.org.

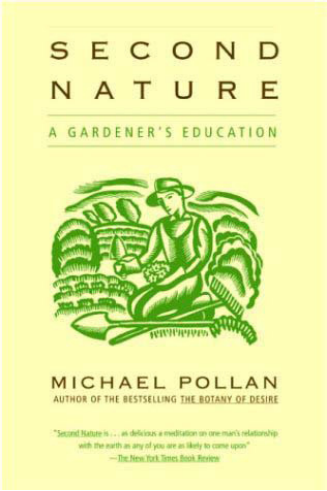
Correction: In the Spring 2010 issue, credit for the black locust photo should be given to Erin Feichtner.

STUDENT SUBMISSIONS

Wet Buddy
John Langmack
Grade 12, The Walker School
2010 River of Words National Finalist

K-12 students can submit art or poetry to water_rsvp@cobcounty.org

RECOMMENDED RESOURCE



This isn't so much a how-to on gardening as a how-to on thinking about gardening. It follows the course of the natural year, from spring through winter, as Pollard, an editor at Harper's , chronicles his growth as a gardener in Connecticut's rocky Housatonic Valley. Starting out as a "child of Thoreau," Pollard soon realized that society's concept of culture as the enemy of nature would get him a bumper crop of weeds and well-fed woodchucks but no vegetables to eat. Far more serviceable materially and philosophically, he now finds, is the metaphor of a garden, where nature and culture form a harmonious whole. Pollard finds ample time for musing on how his own tasks fit in with the overall scheme of existence; thus, there are chapters titled "Compost and Its Moral Imperatives" and "The Idea of a Garden."

- From Publisher's Weekly

ECOPEDIA

Community - Communities in nature are convenient groupings of different organisms regularly found in the same place at the same time. For example, in an Eastern mixed hardwood conifer forest community, we expect maples, hickories, pines, oaks, bears, woodpeckers, deer, and salamanders. Under this forest's soil there is a vast matching population of insects, worms, and bacterial and fungal decomposer species. *From Ecology: A Pocket Guide*

CONSERVATION TIP

If you're planning to buy holiday decorations this year, consider a decor of seasonal plants, decorations that can be reused or donated, or vintage items from an antiques shop. Two-thirds of households buy new decorations each year and spend over $7.5 billion. If each household diverted just $6 to reusable items, the money saved could pay to heat 5.9 New England homes between Christmas and New Years Day. *From The Green Book*

REMINDERS

- Check out our new Facebook page and become a fan! Search **Cobb County Watershed Stewardship Program.**
- If you're recieving a paper version of this newsletter, you can sign up for the electronic version at www.cobbstreams.org. Click on the link at the bottom of the homepage and fill out the form. We'll automatically remove you from our paper mailing list.

welcome

new watershed stewards

Girl Scout Troop 2910
marked storm drains in Eastbrooke Subdivision

Girl Scout Troop 2529
marked storm drains in Avonshire Subdivision

Girl Scout Troop 2933
marked storm drains in Old Hickory Bluffs Subdivision

Girl Scout Troop 2443
marked storm drains in Casteel Subdivision

Girl Scout Troop 2068
marked storm drains in Battle Creek Subdivision

Girl Scout Troop 25255
marked storm drains in Melrose Square Subdivision and Autumn Run Subdivision

Girl Scout Troop 2914
marked storm drains in Park at Lake Forrest Subdivision

Cobb County
Watershed Stewardship Program
662 South Cobb Drive
Marietta, Georgia 30060

Cobb County...Expect the Best!

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

Calendar of Events

September

21 Tree Identification Workshop ◦ 5:30pm-7:30pm ◦ NPS Johnson Ferry National Recreation Area
25 Sierra Club Rivers Alive Cleanup ◦ 9am-11am ◦ Life University
25 Document Shredding Day ◦ 9am-12pm ◦ For locations, visit http://kcb.cobbcountyga.gov

October

2 Adopt-A-Stream Biological Monitoring Workshop ◦ 9am-2pm ◦ Cobb County Water Quality Lab
12 Adopt-A-Stream Bacteria Monitoring Workshop ◦ 6pm-8:30pm ◦ Cobb County Water Quality Lab
18 Curriculum Workshop (Part 1) Leopold Education Project ◦ 3:30pm-8:30pm ◦ Cobb County Water Quality Lab
19 Winterizing Your Garden Workshop ◦ 9am-12pm ◦ Cobb County Water Quality Lab
23 Medication Disposal Day ◦ 10am-2pm ◦ Cobb County Government Offices - Powder Springs Station
26 Curriculum Workshop (Part 2) Native Seasons ◦ 3:30pm-8:30pm ◦ Cobb County Water Quality Lab

November

16 Fats, Oils, and Grease - Stop the Clog! Workshop ◦ 6:30pm-8pm ◦ Cobb County Water Quality Lab

Events in red are Cobb County Watershed Stewardship events.
More information can be found on our Calendar at www.cobbstreams.org.