

the Thalweg

Watershed Stewardship Program

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Cobb County Board of Commissioners

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Preventing Stormwater Pollution Through Storm Drain Marking- Volunteers Needed

Summer is here, and all the rain and sunshine means people are busy landscaping. After you're finished mowing the lawn or leaf blowing what should you do with the yard waste? Dispose of it properly through composting, or have your waste collector pick it up. Whatever you do, refrain from letting these items go into our storm drains. You might have noticed blue aluminum markers with the message "No Dumping, Drains to Creek" on your local storm drains. These markers were placed by volunteers to educate and remind community members that storm drains lead directly to local creeks, rivers and ponds. This means everything that enters the storm drain has an impact on water quality.

Stormwater runoff often contains dirt, lawn clippings, fertilizers, bacteria, household chemicals and pathogens from pet waste. Since the debris that enters the storm drains is transported to local creeks, rivers and ponds without treatment, it's important to limit our impact through stormwater runoff. Polluted stormwater runoff has been identified by the U.S. EPA (Environmental Protection Agency) as the nation's main cause of water quality problems.

A great way to help protect our water quality is to organize your own storm drain marking event! The Watershed Stewardship Program hosts Storm Drain Marking Mobs throughout Cobb County, but you don't have to wait to begin a project. You can request to do an independent storm drain marking project and the

WSP provides all the supplies. This service project is great for families, clubs, and community organizations! During your event you'll mark storm drains and hang educational materials on nearby mailboxes. Recording the storm drains you mark during your service project has been made faster and easier through the use of our new *Collector App*. This app can be used during the event on any device with an internet connection. Next time you're enjoying a walk, see if you notice any marked storm drains!

To find more information or request an independent project, visit our website www.cobbstreams.org. Details can be found under "Volunteer." A new instructional video, created by our intern, **Gourav Divan**, can be found at <https://tinyurl.com/y7c77hyx>. Check it out and see how easy it is to volunteer and make a difference!





Photo Source: <https://tinyurl.com/ydyqhx9>

Honeybees have evolved an extraordinary method of communication that is one of the most fascinating behaviors observed in nature. Because bees are deaf, they don't use auditory language to communicate. Instead, they dance to share information and to make requests. Scout bees use dance to let the colony know the distance and location of food and water, or the location of a possible new home. Commonly known as the "waggle dance", this detailed dance lets hive-mates know where to find the best sources of food. The two pieces of information, distance and direction, are translated into separate components of the dance. This form of bee communication was first decoded by Austrian ethologist Karl von Frisch in about 1967. Since then, more information and research has been conducted into understanding the dance of honeybees and how the colony members communicate with each other.

Distance

The distance of a food source is communicated through very distinct dances. If a food source is close to the hive (less than 50-80m away) the scout bee will perform a "round dance." This dance is performed by running around in narrow circles, suddenly reversing direction to her original course. The bee may repeat the dance several times at the same location or some other location. The round dance communicates distance, but not direction. After the dance is finished, the scout bee often shares pollen with the other bees, which they "taste" with their antennae to better know what food they are looking for.



*The Round Dance:
Short Distance*



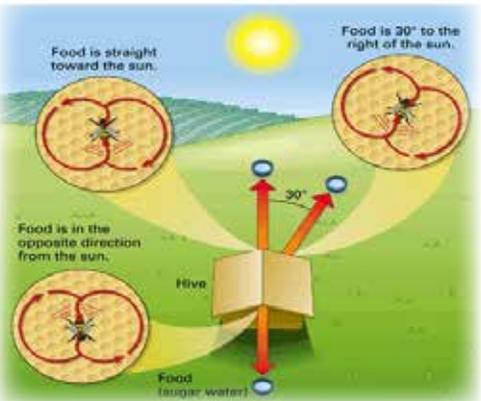
*The Waggle Dance:
Long Distance*

If the distance to the source is a greater distance from the hive, the bee will perform the more intricate waggle dance. This dance, unlike the round dance, communicates both distance and direction to the other bees. To perform the waggle dance the bee runs straight ahead for a short distance, returns in a semicircle to the starting point, runs again through the straight course, then makes a semicircle in the opposite direction to complete a full, figure-eight circuit. While in the straight section, the bee's body wags vigorously sideways. This movement gives the bee a tail-wagging like motion. The bee also creates buzzing sounds, produced by wing beats, at a low frequency.

Several aspects of the waggle dance convey the distance of the food from the hive, but the duration of the straight run portion is the simplest and most reliable indicator. The longer the waggle portion, the farther from the hive the source of food is. A one-second waggle would tell the worker bees to fly for 750 meters, nearly 2,500 feet! Bees will even take into account the amount of wind. If the bees will have to fly into a strong headwind, the waggle will be longer, indicating that more energy will be expended to reach the source of food.

Direction

Although the representation of distance conveyed through the waggle dance is relatively easy to understand, the method of communicating the direction of the food source is more complicated and abstract. The bee indicates the direction of the food source in the straight portion of the waggle dance. They do this by communicating the angle between the sun and the line of flight to the bees watching the dance. With the hive hanging vertical and typically dark inside, the bees use the top of the hive to indicate the direction of the sun. For example, a food source located due east will have scout bees dance approximately straight up in the morning, because the sun rises in the East and the bees will need to fly directly towards the sun. Because the position of the sun changes throughout the day, the dance will adjust based on the current location of the sun. The dance performed late in the day, leading to the same food source, will have the scout dancing straight down, directing the bees to fly directly opposite the setting sun. Also, any angle to the right or left of the sun is shown by a corresponding angle to the right or left of the upward direction. For example, if the dancer waggles at an angle 60 degrees to the left of upward the flower may be found 60 degrees to the left of the sun.



The round dance and waggle dance are not the only dances used by bees to share information and make requests.

Cleaning dance: To ask another bee for a grooming. The bee stomps her feet and shakes her body.

Joy dance: To celebrate, for example, when a new queen emerges from her cell. The bees will place their front legs on one another and pulse their abdomen up and down.

Massage dance: To request a massage from the other bees. The bee will move her head in a certain angle. Other bees respond by pulling her leg joints and touching her sides.

Alarm Dance: To warn other bees of the danger of a contaminated food source. The bee vibrates vigorously and runs in a zigzag, spiral motion.

Tremble Dance: To inform other bees that a large load of nectar has arrived in the hive for processing. The bee walks leisurely and wiggles their legs, causing their bodies to quiver and tremble.

Shake Dance: To inform house bees to help the foragers collect nectar from a particularly rich source. The Foragers shudder in front of one house bee at a time, to notify up to 20 per minute.

Whir Dance: To motivate the colony to leave the hive and swarm. The bee runs in zigzags, whirs its wings and shakes its body.

References:

- <http://www.pbs.org/wgbh/nova/bees/hivecomm.html>
- <https://www.theguardian.com/environment/2014/apr/03/honeybees-fly-further-in-summer-to-find-food-study-shows>
- <https://www.buzzaboutbees.net/Honey-Bee-Dance.html>
- <https://www.sciencenewsforstudents.org/article/decoding-bee-dances>
- <https://content.ces.ncsu.edu/honey-bee-dance-language>
- <https://bigislandbees.com/blogs/bee-blog/14137357-bee-dances>



Photo Source: <https://tinyurl.com/y7dtzt9a>

ECOPEDIA

Ethology

Ethology is an approach to the study of animal behavior that differs considerably from and complements the Functionalist and Behaviorist traditions in psychology. Developed by zoologists primarily in Europe, Ethology emphasizes observation of many different species, including humans, in something close to their natural habitat (as opposed to artificial laboratory settings). The founders of Ethology, Karl von Frisch, Konrad Lorenz, and Nikolaas Tinbergen, won the Nobel prize for their work in 1973.

Source: <http://www.indiana.edu/~p1013447/dictionary/ethology.htm>

OBSERVATIONS

Orfelia fultoni was first identified by Entomologist B. B. Fulton in 1939-40. The only bioluminescent species of fly found in North America, the larvae emit the bluest light of any terrestrial bioluminescence from its head and tail. The translucent fly larvae are about 1 cm long and live on stream banks primarily in the Appalachian Mountains and the Cumberland Plateau. They build a sticky web adorned with little ampules (tubes) filled with oxalic acid. When a flying insect sees the lights, it lands on the web of ampules to investigate, disturbs the ampules which then rupture, spilling the toxic fluid onto the insect prey and providing a meal for the larvae. The larvae require a select habitat to survive: humidity to prevent it from drying out; hanging surfaces to allow it to build sticky webs to trap the food; an adequate food supply of insects; a still atmosphere to prevent lines from tangling; and darkness to allow it to show a light. The *Orfelia fultoni* are able to find this select habitat primarily in the states of Alabama, North Carolina, Tennessee, Virginia, and in Georgia at Anna Ruby Falls.



Photo credit: Alan Cressler, taken on June 25, 2014
https://www.flickr.com/photos/alan_cressler/14325930737/in/photostream/



Home Energy Monitoring

Source: <http://www.stphomeperformance.com/energy-monitoring>

Photo Source: <https://tinyurl.com/y7ga6okw>

Why Do Monitors Help?

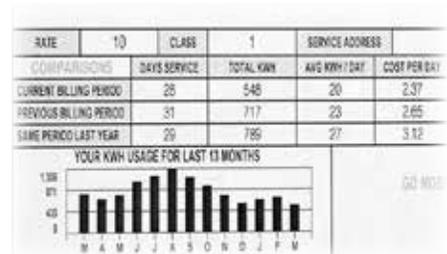
For most of us, electricity is invisible, and utility bills are at best cryptic, and at worst complete mysteries. Energy monitors make electricity use tangible - much like a thermometer makes the air temperature visible. And like a thermometer, a monitor does not reduce electricity use on its own - it simply prompts a response from you. If it's cold outside, you throw on gloves. If your monitor displays a spike in electricity use, you find out why and turn some energy hog in the house off.

What Energy Monitors do:

- Help you locate things that are always on, even when they aren't doing anything.
- Help you notice that the kids forgot to turn off the TV.
- Help you become aware of how electricity is used.

What Energy Monitors prompt us (homeowners) to do:

- Understand what goes on when we use electricity in our houses.
- Pay attention to our usage and reduce it.



Studies show that people using electricity monitors will save between 5% and 20% on their bill. How much you save is a matter of how much you use now, and whether you pay attention to what the monitor tells you. That's why it's key to find the monitor that meets your needs.

What's the Difference Between Different Monitor Types?

Monitors come in four different categories:

1. Measure Just One Appliance: "Plug In" type. Monitors that measure just one appliance (e.g. the Kill a Watt) isolate energy usage. You plug the appliance you want to measure into the "plug in" type meter, and then plug the meter into the wall. We think this is a vital tool for understanding individual appliance draws.



2. Measure the Whole House in the last minute or so: "Instant Readout" type. A major step up from the single-appliance meters are monitors that measure the whole house. Electricity usage monitors like the Blue Line PowerCost Monitor and Wattvision Power Monitor attach right onto your electric meter and instead of reading it monthly like your electric company, measure it every few seconds. Other instant read monitors, such as The Owl, or The Owl Micro, and The Energy Detective (TED 5000) connect inside your electrical box and most send their readings to a table-top display.



3. Measure the Whole House at the Moment and Track History: "Readout + History" type. A step up from the instant read monitors are monitors that track usage over time. Being able to track energy usage history - whether month-to-date or month-over-month - can be extremely useful in that it provides you with a benchmark (say, for example, "Let's try to do better this month than we did last month.") It is also a means to assess your progress and make adjustments accordingly (for example: "We've used more in the first two weeks of this month than we did in the first two weeks of last month; let's try to really cut back in the next two weeks to make up the difference.") The TED 5000 series was the first to effectively do this trick, even allowing storage of your energy data on Google PowerMeter -- a free service that provides nice charts, evaluation, assessment and comparative data to help you truly understand your power usage. The TED 5000 has proven to be tricky for many people, but other options are available since late 2010, including a WiFi connection that can be added to the BlueLine PowerCost Monitor, Wattvision, and CurrentCost Envi.



4. Monitors that Measure Circuit by Circuit of the Whole House at the Moment and Track History: All of these levels of measuring your electricity consumption are like having increasingly detailed picture of how energy from electricity ebbs and flows. But for a truly detailed picture, you can see your electrical use on a circuit-by-circuit basis, with a new, first-of-its-kind product called eMonitor, as well as a similar product by Bru!Tech. A modern house typically has 20 or more separate electrical circuits, all leading back to the main breaker box where the electrical feed comes into your house. Circuits feed the power to an individual room, and often for larger loads, a single appliance, such as a dishwasher, dryer, or refrigerator. eMonitor provides all of the instant data collection and history, but is able to break readings down to individual circuits. Power House Dynamics, the maker of eMonitor, describes their system as a tool for "electricity management", which is a step above monitoring. The level of detail is really important -- we have heard reports from customers who say that they have found significant unneeded power users, and easily saved the cost of the product by being able to quickly isolate the source.

We think this real-time information is indispensable for understanding and reducing electricity consumption. You will know exactly how many kilowatts your house is using. The question is, what do you do with that information?

Which Monitor is Right For You?

If you live in a city apartment, or just want to know about how a few of the things you plug into the wall use electricity, the Kill-a-Watt is probably your best choice. Simply plug it in between the fixture you want to measure, and plug the fixture into it. It has an LCD display, so you can see right away how much power a single fixture uses. Simple as pie.

If you live in a house, and want a super simple installation process, either the Blue Line PowerCost Monitor or Wattvision electricity monitor would be a great choice. They both are designed to read most electrical meters in the US and Canada -- even the older models that have a spinning dial! Installation is quick and easy -- a screwdriver is all you need (to attach a special gizmo to the meter). The BlueLine has a display that can be placed anywhere in the house, within 100 feet or so of the meter, depending on what's in between.

If you have a special requirement, such as solar, a whole house electricity usage monitor connected to your electric box is the way to go. These monitors are installed in the electrical breaker-box (or even old fashioned fuse-box) serving your house. While working in the electrical panel can be daunting, and you should check local regulations before doing it, it's actually a simple job. Hire an electrician if you're at all uncomfortable, but it's a quick and easy task for anyone reasonably handy. The TED 1000 series has a nice display and does a good job. The TED 5000 can handle sub-panels, and solar or wind inputs, and The Owl and Owl Micro are inexpensive and simple to install.

If you love data, want access to your historical use, and want Google PowerMeter integration, opt for Wattvision, eMonitor, TED 5000, and now even BlueLine's WiFi connection. eMonitor and TED will need a standard router and Ethernet cable to plug the device into. Wattvision and BlueLine Wifi use wireless networking. Setup is usually straightforward -- you do it right through your web browser!

Various models have different costs -- the Owl Micro and the BlueLine (no WiFi) both cost less than \$100. Generally, the greater the detail in information, the higher the cost. Those providing whole house readings that transmit data to the Internet run about \$250, eMonitor and fully configured Bru!Tech meter both will cost significantly more. It is important to remember that if your electricity bill is \$80/month (average for the US), and you can reduce only 20% of your electricity use, you'll save \$140 per year. You might break even the first year, but motivated homeowners can do far better than 20% -- and any savings you make, pay back, year after year after year.

CONSERVATION TIP

How to Select Your Sunscreen

Coral reefs all over the world are not only beautiful, their fragile ecosystem plays a vital role in the health of the ocean. More than a quarter of all known marine species spend at least some of their lifecycle in coral reefs. More than 500 million people depend on coral reefs for food or fishing income. Corals also protect shorelines from unchecked erosion and fuel local tourism industries. Harmful chemicals leaching into the water are bleaching once-thriving reefs and human visitors may even be carrying some of these toxins on their skin. When you swim with sunscreen on, chemicals like oxybenzone can seep into the water, where they're absorbed by corals. These substances can disrupt coral's reproduction and growth cycles, ultimately leading to bleaching. Even if you don't go swimming after applying sunscreen, it can still go down drains when you shower. Aerosols can often spray large amounts of sunscreen onto sand, where it gets washed into our oceans. Each year, about 14,000 tons of sunscreen end up in our oceans. What can you do to protect coral reefs, but also protect yourself from the risk of burns or skin cancer?



Photo Source: <https://tinyurl.com/yavqogow>

- Choose a sunscreen that contains zinc oxide or titanium dioxide. These are safer than the oxybenzone-containing alternatives.
- Sunscreens with "non-nano" size particles are safer because they can't be ingested by corals.
- Wear sun blocking clothing instead of using sunscreen, just make sure to cover the entire body.

Source: <https://www.nationalgeographic.com/travel/features/sunscreen-destroying-coral-reefs-alternatives-travel-spd/>

Farewell to Penny Costanzo

The Watershed Stewardship Program wishes a fond farewell to our good friend and colleague Penny Costanzo. Since 2015, Penny has performed the 3rd grade puppet show in nearly every Cobb County elementary school for three puppet show seasons. Outside of the puppet show, she supported the program in many additional ways both as an employee and a volunteer. We wish you the best of luck and will miss working with you.



Farewell to Taylor Dove

For the past year, Taylor has been our part-time Environmental Program Specialist. She has been responsible for the middle and high school outreach programs and overseen stewardship projects such as waterway cleanups, privet pull projects, stormdrain marking, and other community outreach. In the Fall, Taylor will begin teaching 6th grade science in a Cobb County school as well as beginning graduate school at Georgia State. We will miss working with you, but know you will be a wonderful educator to your future students.

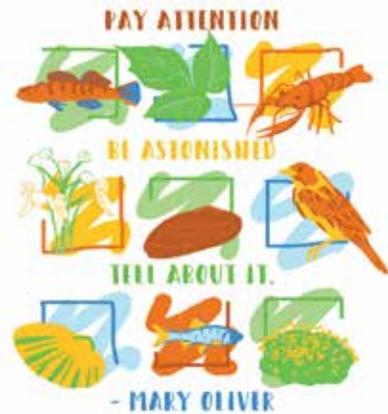
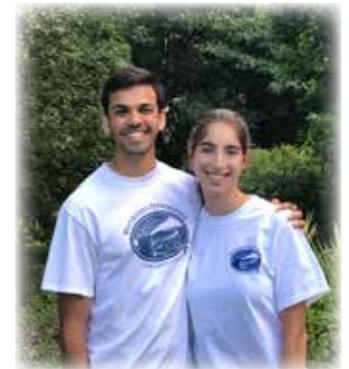
WSP Welcomes Summer Interns

The Watershed Stewardship Program would like to welcome summer interns **Amanda Howard**, **Sydney Marks**, and **Gourav Divan**.

Amanda has completed her first year at UGA and is majoring in Environmental Economics and Management. She is participating in the Experiencing Cobb County Hands On (ECCHO) internship program. She will be helping with summer programming, Storm Drain Marking projects, and in the Wildlife & Rain Garden.

Gourav has completed his fourth year at Louisiana State University and is majoring in Coastal Environmental Science. He will be helping with summer programming, Storm Drain Marking projects, and in the Wildlife & Rain Garden.

Sydney is a sophomore at Georgia College & State University majoring in the biological sciences. She will be working in the Adopt-A-Stream Monitoring program and the Wildlife & Rain Garden.



Congratulations to Reagan Langston, KSU graphic design student, winning artist in our contest to select the design for our 2018 Volunteer T-shirt.

Announcing the 2017-18 Chattahoochee Challenge Winner!

Thank you to all three of our 2017-18 Chattahoochee Challenge teams for your hard work and volunteer hours. A special congratulations to this year's winner, Osborne High School. Rachel Sheldon, Osborne science teacher, led students from the Science Olympiad team, AP Biology class, and Environmental Science class in serving 124 hours. These hours included organizing and completing two cleanups at Tramore Park on Olley Creek, and participating in a community stewardship mob cleanup at Tramore Park. Winning Osborne students were rewarded with a river float through the Chattahoochee River National Recreation area on May 5th.



Osborne HS students enjoy a float on the Chattahoochee.

welc  me
KeptClean
 Chemical Monitoring in the Noses Watershed
The Awesomes
 Chemical, Bacterial, & Frog Monitoring in the Allatoona Watershed
Sydney Stream
 Chemical Monitoring in the Sope Creek Watershed

Find out what we've been up to!
 Our 2017-18 Annual Report is now available online.
 Visit www.cobbstreams.org, under "About."

Pre-registration required: www.cobbstreams.org, click on calendar

Summer Fairy Habitat Workshops

July 11 • Sweat Mountain Park • 9:00am - 11:00am
 July 18 • Water Quality Lab • 9:00am - 11:00am
 July 27 • Heritage Park • 9:00am - 11:00am

Become a certified fairy habitat helper! Our youngest environmental stewards will have a chance to use natural materials to create shelters for fairies and other small creatures. Designed to foster a foundation of service, an appreciation for being outdoors, and a sense of wonder for the natural world, Cobb's Fairy Habitat Helpers is a youth service project that helps ensure all creatures have a healthy and secure home place.

Family Creek Stomp-Appropriate for ages 7 and up.

July 10 • Leone Hall Price Park • 10:00am - 12:00pm

Take a closer look and discover what lives between the banks of our creeks. Who lives under a rock, log, or in a pile of leaves? This is no ordinary creek hike! Walk a section of creek in search of aquatic organisms and improve habitat and water quality by picking up the litter we find. This location is ideal for shallow wading.



Lunch and Learn-Understanding the Snakes & Frogs Living in Your Garden

July 20 • Water Quality Lab • 12:00pm - 12:45pm

Recognizing the snakes and frogs that commonly visit our gardens can provide comfort and enjoyment. Snakes are more often seen than heard. Frogs are more often heard than seen. Can you identify which ones are visiting your yard and garden? Join us for a brief overview of our reptile and amphibian garden visitors while gaining a better understanding of safety, recognition, and biodiversity.

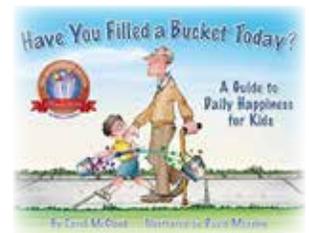
RECOMMENDED RESOURCE

Have You Filled a Bucket Today?: A Guide to Daily Happiness for Kids

by Carol McCloud

"Through simple prose and vivid illustrations, this heartwarming book encourages positive behaviour as children see how rewarding it is to express daily kindness, appreciation, and love. Bucket filling and dipping are effective metaphors for understanding the effects of our actions and words on the well being of others and ourselves."

Source: https://www.goodreads.com/book/show/1043218.Have_You_Filled_a_Bucket_Today_



**Stewardship Stars
 Excellence in Data Collection**

The following volunteers have submitted data each month during the March, April, and May quarter:

- Birney16** - Chemical Monitoring in the Olley Watershed
- Connie Ghosh** - Chemical, Bacterial, & Macroinvertebrate Monitoring in the Rubes Watershed
- Cobb Progressives** - Chemical & Bacterial Monitoring in the Allatoona and Noonday Watersheds
- ERM Atlanta** - Chemical Monitoring in the Chattahoochee Watershed
- Georgia Lake Monitoring** - Chemical Monitoring in the Lake Acworth Watershed
- John Keiler** - Chemical Monitoring in the Allatoona Watershed
- Keep Smyrna Beautiful AAS** - Chemical Monitoring in the Nickajack Watershed
- Lakewood Colony** - Chemical & Bacterial Monitoring in the Rubes Watershed
- Nancy Payne** - Chemical Monitoring in the Noses Watershed
- Ochala Family** - Chemical & Bacterial Monitoring in the Noses Watershed
- Richard's Creek** - Chemical Monitoring in the Allatoona Watershed
- Rosco Peters** - Chemical & Bacterial Monitoring in the Rottenwood Watershed
- Sedalia Park Elementary** - Chemical Monitoring in the Sope Watershed
- Sierra Club Centennial Group** - Chemical, Bacterial, & Macro Monitoring in the Rottenwood Watershed
- Simon Locke** - Chemical & Bacterial Monitoring in the Butler Watershed
- SG5** - Chemical & Bacterial Monitoring in the Nickajack Watershed
- Village North Highlands Subdivision** - Chemical, Bacterial, & Macro Monitoring in the Willeo Watershed

Thank you for your hard work and dedication!



**Cobb County Water System
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.

July

- 10 Family Creek Stomp • 10:00am - 12:00pm • Leone Hall Price Park
- 11 Fairy House Workshop • 9:00am - 11:00am • Sweat Mountain Park
- 11 Adopt-A-Stream Chemical Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 12 Rain Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 13 Rain Barrel Make & Take Workshop • 9:00am - 10:00am • Cobb County Water Quality Laboratory
- 18 Fairy House Workshop • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 20 Lunch & Learn: Snakes and Frogs in the Garden • 12:00pm - 12:45pm • Cobb County Water Quality Laboratory
- 26 Rain Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 27 Fairy House Workshop • 9:00am - 11:00am • Heritage Park
- 31 Rivers Alive cleanup registration deadline • www.riversalive.georgia.gov

August

- 2 Rain Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 4 Back to the Chatt Race, Big Float & Festival • www.chattahoochee.org
- 9 Rain Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 15 Adopt-A-Stream Bacteria Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 16 Rain Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 20 Rain Barrel Make & Take Workshop • 9:00am - 10:00am • Cobb County Water Quality Laboratory
- 23 Rain Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 30 Rain Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory

Calendar of Events

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