

the Thalweg

Watershed Stewardship Program

Summer 2017

Volume 14 Issue 3

Cobb County Board of Commissioners

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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
Mike Kahle
Angie Marcus
Penelope Costanzo
Jake Ehrie
Jeremy Kearse

www.cobbstreams.org



A Hidden Gem on Display

The Cobb County Water System's Wildlife & Rain Garden was one of seven gardens featured on the 2017 Master Gardener Volunteers of Cobb County Annual Garden Tour. This year's tour took place on May 13th and traditionally occurs on the Saturday preceding Mother's Day. More than 600 people toured this year's featured Wildlife & Rain Gardens. Trained garden volunteers (a.k.a. Garden Angels) shared their knowledge with visitors and highlighted the garden's main themes: Landscaping for Diversity, Gardening for Wildlife Habitat, and Stormwater Control.



Though our garden is a natural fit for a formal tour, visitors can enjoy the garden any day of the week. Designed as a demonstration site featuring gardening methods that help prevent water pollution and encourage urban wildlife, visitors can see which



plants do well without the use of chemical fertilizers, pesticides, and herbicides. Perhaps more impressive, is that our garden has not used irrigation for over two years. Once established, our plants have not needed any supplemental water. Planting the right plants for the conditions of the site helps ensure a successful and healthy garden. We invite you to stop by soon and see what is blooming. Designed to

have something in bloom during all four seasons, visit throughout the year and see how the garden changes from month to month.

The garden is open to the public year-round and is free to visit. Volunteers are always needed and welcomed. Work days are typically held on Thursday mornings. If you'd like to lend a hand call the Watershed Stewardship office at 770.528.1482.



Congratulations to our Watershed Award Winners for 2017!

Each year the Watershed Stewardship Program hosts the Stewardship Fair to express appreciation for our amazing volunteers. On March 30th, 2017, the WSP recognized three groups and partners who have significantly contributed to the success and effectiveness of our pollution prevention and education efforts.

Watershed Award Winners for Service during the 2016 Calendar Year:

**Keheley Elementary School 3rd Grade Target
Cobb County Watershed School Group of the Year**

For several years, Ms. Simpson has been taking her 3rd grade target class to Rubes Creek where it flows through the McCleskey Middle School Campus. Parent helpers were involved to facilitate driving, unloading, walking the stream, set up/breakdown, and the actual testing procedures. Ms. Simpson's students have performed stream habitat surveys, macroinvertebrate monitoring, and chemical monitoring. They picked up trash when present and continuously exhibited ownership over their program. For each field trip, students and parents knew exactly what they were supposed to be doing, demonstrating that a good deal of time was spent in the classroom preparing for their stream visits. Thank you for your hard work and dedication!



Ms. Simpson and students from Keheley Elementary were awarded School Group of the Year.

**Keep Smyrna Beautiful Adopt-A-Stream
Cobb County Watershed
Volunteer Group of the Year**



Ann Kirk and Angie Bolton of Keep Smyrna Beautiful Adopt-A-Stream accepted the Volunteer Group of the Year award.

Congratulations to the Keep Smyrna Beautiful Adopt-A-Stream for earning the Watershed Group of the Year 2016 Award! The group submitted data from more than 463 monitoring events since 2011, mostly in the Nickajack Creek Watershed. With 12 sites to monitor each month, the group represents all the wards within the City of Smyrna and encourages residents to become involved in the program. The group has also done considerable work with stream clean-ups and other community service. Way to go KSBAAS!

**Anne Ledbetter
Stewardship in Action**

Anne has been monitoring Poplar Creek in Smyrna since August of 2012. She has regularly submitted her data, and continually seeks to improve her skills and knowledge regarding her testing techniques and data interpretation. The effort Anne has put into the AAS program and her diligence with recertification and seeking input and advice on her monitoring results have developed her ability to recognize and effectively react to problematic situations that have occurred in Poplar Creek. On February 13, 2016 Anne reported that her creek had high flow and was very turbid, with no recent rain. Her report was accompanied with a map of the suspected location and photos. This documentation allowed inspectors to quickly determine the source of the problem. Anne submitted her report to EPD and Cobb Water, who notified the City of Smyrna. Within two days, the City reported that they addressed the problem. On February 24, 2016 Anne again noticed and quickly reported that the issue had reoccurred and the detention pond at the construction site was again spilling into Poplar Creek. After notifying Cobb Water, the City of Smyrna issued a stop work order. The situation was monitored by the City and has not been a problem since. Great job Anne!



Anne Ledbetter sharing her story during the Stewardship Fair.

The Great Total Solar Eclipse

On Monday, August 21st, all of North America will experience a total or partial eclipse of the sun. A solar eclipse occurs when the moon passes directly between the earth and the sun, casting the moon's shadow on the earth. While this eclipse's "path of totality", the area that will experience a total solar eclipse, will be only 70 miles wide, all 50 states will be treated to some degree of partial eclipse. The total eclipse will pass through 14 states from Oregon to South Carolina. The last solar eclipse in the United States occurred in February 1979, but was much different than the upcoming eclipse with the path of totality only crossing five states in the northwest United States. The last coast to coast total solar eclipse occurred in 1918, making this truly a once in a lifetime event for most.

Optimum viewing of the eclipse may take some planning, depending on your location. In the path of totality, the length of the total eclipse will be only around 2 minutes long, but throughout the United States the time from the beginning of the partial eclipse to the end of the partial eclipse will be around 3 hours. There are two ways to view the eclipse, through direct viewing and indirect viewing. Direct viewing allows you to look directly at the sun, but requires some type of filter, solar viewing glasses, or a handheld solar viewer. In order to prevent damage to your eyes, these glasses should meet the ISO 12312-2 international standard. Properly certified viewing glasses can be easily purchased online and should be checked for scratches or damage before use. The eclipse should not be directly viewed through an unfiltered camera, telescope, or with sunglasses. Another widely available filter for safe direct viewing is a number 14 welder's glass. The glass must be a #14 or darker filter and you should not use glass if you do not know, or cannot determine, its shade number. Arc welders typically use glass with a shade much less than a number 14.

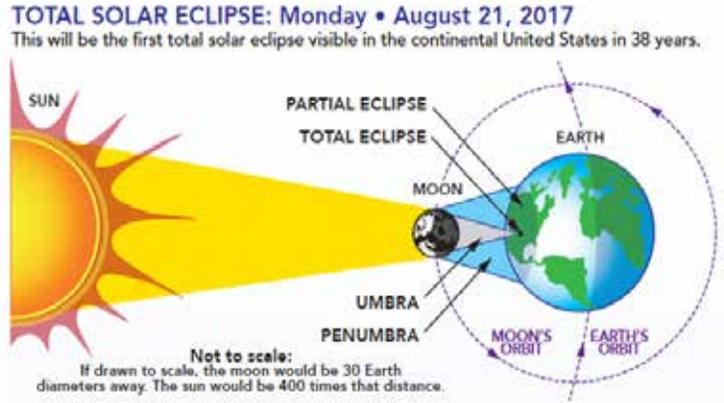


Photo Source: <http://tinyurl.com/k7d6lcg>

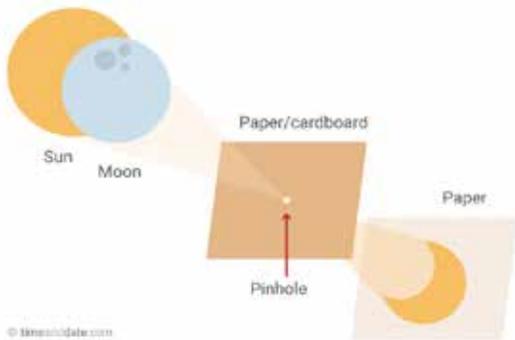


Photo Source: <http://tinyurl.com/y86bmb6v>

The eclipse can also be viewed through indirect viewing with a pinhole camera or projector. Pinhole cameras can be made using common household items and are a great way to involve children. Directions on building your own pinhole camera, and how to use one, can be found in numerous places on the internet. Many planetariums, observatories, libraries, and astronomy clubs across the country are already planning special events to view the eclipse. Many will provide viewing glasses or solar telescopes for safe direct viewing. Local festivals with educational activities throughout the day are also being planned in many areas. The U.S. Postal Service is even celebrating with a newly released Total Eclipse of the Sun stamp. The stamp utilizes thermochromic ink to transform the image of the blacked-out sun into the moon when you touch the stamp. Remove your finger and the eclipse reappears. While there will be other solar eclipses in the future, this coast to coast total solar eclipse is a unique and exciting event. For more information and to start planning your viewing experiences, see the resources below.

	Eclipse Begins	Totality Begins	Totality Ends	Eclipse Ends	
<i>Madras, OR</i>	09:06 a.m.	10:19 a.m.	10:21 a.m.	11:41 a.m.	PDT
<i>Idaho Falls, ID</i>	10:15 a.m.	11:33 a.m.	11:34 a.m.	12:58 p.m.	MDT
<i>Casper, WY</i>	10:22 a.m.	11:42 a.m.	11:45 a.m.	01:09 p.m.	MDT
<i>Lincoln, NE</i>	11:37 a.m.	01:02 p.m.	01:04 p.m.	02:29 p.m.	CDT
<i>Jefferson City, MO</i>	11:46 a.m.	01:13 p.m.	01:15 p.m.	02:41 p.m.	CDT
<i>Carbondale, IL</i>	11:52 a.m.	01:20 p.m.	01:22 p.m.	02:47 p.m.	CDT
<i>Paducah, KY</i>	11:54 a.m.	01:22 p.m.	01:24 p.m.	02:49 p.m.	CDT
<i>Nashville, TN</i>	11:58 a.m.	01:27 p.m.	01:29 p.m.	02:54 p.m.	CDT
<i>Clayton, GA</i>	01:06 p.m.	02:35 p.m.	02:38 p.m.	04:01 p.m.	EDT
<i>Columbia, SC</i>	01:13 p.m.	02:41 p.m.	02:44 p.m.	04:06 p.m.	EDT

References:

- <http://www.accuweather.com/en/weather-news/100-days-until-the-solar-eclipse-where-and-how-to-view-the-once-in-a-lifetime-event/70001636>
- <https://eclipse2017.nasa.gov/eclipse-who-what-where-when-and-how>
- <https://eclipse2017.nasa.gov/event-locations>
- <https://www.jpl.nasa.gov/edu/learn/project/how-to-make-a-pinhole-camera/>



The Master Timeline

Stepping Through Climate Change

Photo Source: <http://tinyurl.com/y8j3u6fe>

Project Learning Tree® (PLT), the environmental education program of the American Forest Foundation, uses forests as a window into the world and provides educators with environmental education curriculum resources that can be integrated into lesson plans for all grades and subject areas. PLT teaches students how to think, not what to think, about complex environmental issues, and helps them acquire the skills needed to make sound choices about the environment.

Developed in 1976, PLT’s 50-state network includes more than 500,000 trained educators using PLTs peer-reviewed and award-winning curriculum materials which cover the total environment. PLT also works with elected officials to fund environmental education in our schools. The activity, Stepping Through Climate Change, provides background on climate change and introduces the ways in which forests in the Southeast United States will likely be impacted by climate change. In this activity, students explore connections between climate and southeastern forests through class discussions, a climate timeline, role-play, and web-based atlases.

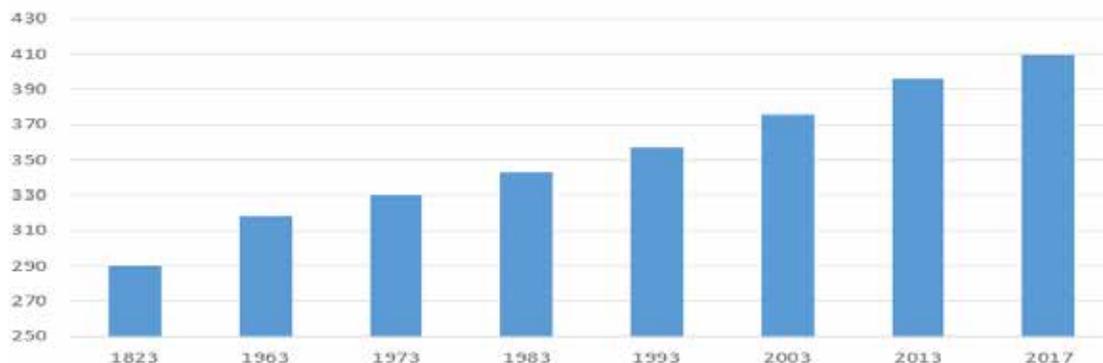
Scientists have been exploring the greenhouse effect and climate change for nearly two centuries. Many current projects are testing strategies for reducing impact of climate change and for helping people to adapt to these changes. Over the past decade, many scientific studies and reports have been published on climate change. This subject has been covered by the media, debated by politicians and community leaders, and discussed over dinner tables. But this doesn’t mean that climate change is a “new” topic. In fact, scientists began to think about the science of climate as early as 1824, when a French scientist, Jean Baptiste Joseph Fourier, began studying greenhouse gases in our atmosphere and coined the term “greenhouse effect.” Since that time, our understanding of the atmosphere, the greenhouse effect, the carbon cycle, and climate change has continued to grow.

Most of the events listed in the timeline below came from *The Discovery of Global Warming* by S. Weart (2010) and *The History of Climate Science* by J. Mason (2013).

Year	Event
1824	Jean Baptiste Joseph Fourier, a French scientist, described Earth’s atmosphere as an insulating blanket for the planet. He was the first to use the phrase “greenhouse effect” to illustrate how the greenhouse gases keep the Earth a comfortable temperature despite our great distance from the sun.
1859	John Tyndall, an Irish physicist, discovered that carbon dioxide is very good at trapping heat in the atmosphere. He worked with a variety of gases found in the atmosphere and found that carbon dioxide can block heat radiation.
1896	Svante Arrhenius, a Swedish scientist, was the first to say that increases in carbon dioxide in our atmosphere due to burning coal would cause a global warming effect. Coal replaced as the predominant energy source in the United States.
1917	Alexander Graham Bell, a Scottish scientist and inventor of the telephone, wrote, “The unchecked burning of fossil fuels would have a sort of greenhouse effect” and “The net result is the greenhouse becomes a sort of hothouse.” While Bell was most famous for the invention of the telephone, he worked in many fields of science. The 1917 paper was about natural resource depletion and demonstrated that many scientists were concerned about the impacts of greenhouse gases.
1931	E.O. Hulburt, an American scientist, continued the work of Arrhenius, to include atmospheric water vapor and found that increases in carbon dioxide levels would increase global average temperatures by as much approximately 4 degrees Celsius. This is equivalent to 7.2 degrees Fahrenheit.
1938	Guy Callendar, an English engineer, looked at historical temperature records and carbon dioxide levels from around the world and concluded that levels had increased almost 10 percent since the 19 th century and temperatures were warming globally.
1956	Gilbert Plass, an American physicist, published <i>The Carbon Dioxide Theory of Climate Change</i> , and said that more carbon dioxide in the atmosphere would increase global warming.
1957	Roger Revelle, a scientist in California, said that there is a limit to how much carbon dioxide the ocean could absorb from the atmosphere and remain healthy.
1958	Charles David Keeling, a scientist from California, used new technology to measure levels of carbon dioxide in the atmosphere. Keeling measured atmospheric carbon dioxide levels to be 315 parts per million in 1958.

1967	Syukuro Manabe, a meteorologist from Tokyo University, created the first computer model simulation of Earth's climate. This complex model included many variables and reaffirmed that the climate was changing, not only at Earth's surface but also throughout the atmosphere.
1981	Climatologists Tom Wigley and Phil Jones wrote that "the effects of carbon dioxide may not be detectable until around the turn of the century. By this time, atmospheric carbon dioxide concentration will probably have become sufficiently high that a climatic change significantly larger than any which has occurred in the past century could be unavoidable."
1985	A group of Russian scientists at the Vostok Station in Antarctica drilled an ice core about 2 kilometers (more than 1,980 meters or 6,500 feet) deep. This ice core held approximately 150,000 years of history trapped in air bubbles. This is how we knew the carbon dioxide levels in 1823 when we started the timeline.
1988	The Intergovernmental panel on Climate Change (IPCC) was started. This international organization includes scientists and government officials from around the world who help synthesize climate science and make recommendations about how greenhouse gas emissions and climate change will impact the Earth and its inhabitants.
1992	A significant number of the world's nations recognized that climate change needed to be addressed globally and formed the United Nations Framework Convention on Climate Change. Nearly every country, including the United States, signed the agreement.
1993	Ice cores from Greenland showed that in the past, drastic climate changes occurred in a span of only 10 years. This greatly changed impressions that a climate only happens on a slow, gradual basis.
1997	Negotiations at the United Nations' Conference on Climate Change in Kyoto, Japan, resulted in the Kyoto Protocol, and international agreement to reduce greenhouse gases. The U.S. signed the Kyoto Protocol on November 12, 1998, However, the Protocol met opposition in the U.S. Congress and was never ratified.
2003	Scientists reported that the increase in atmospheric carbon dioxide resulted in increased absorption of carbon dioxide in the oceans, causing a change in the pH of the oceans. The change in pH, which continues today, is larger than anything in the geological record for the last 300 million years (Caldeira & Wickett, 2003). Recall Roger Revelle from 1957, who thought the oceans can only absorb so much carbon and be healthy. This was proof that he was correct.
2005	The European Union Emissions Trading System was launched to reduce greenhouse gas emissions through a "cap and trade" program. A cap and trade program created incentives for companies to reduce emissions and forces companies to pay for the privilege.
2007	Scientists reported that the melting of Arctic sea ice had been faster than models originally predicted. They showed the rate of melting was accelerating (Strove et. Al., 2007)
2007	The United Nations Framework Convention on Climate Change made decisions on a climate change mitigation solution that seeks to reduce emissions from deforestation in developing countries. The initiative is called REDD+ (Red Plus). This policy agreement is helping countries that still have forests to keep them.
2008	The U.S. Forest Service published a report called a "Strategic Framework for Responding to Climate Change," which outlined strategies that support adaptation to climate change in our national forests.
2009	The U.S. Interagency Climate Adaptation Task Force was created to develop recommendations for the U.S. president to prepare for and adapt to the effects of climate change at the national level.
2013	Scientists measured the mean global temperature at 14.6 degrees Celsius, the warmest it has been in thousands of years. This average global temperature is equivalent to approximately 58 degrees Fahrenheit.
2013	The United States president, Barack Obama, signed an executive order that created the Council on Climate Preparedness and Resilience. The council works to help federal; programs prepare for climate-related changes and provide information for the public. The new Council replaced the Interagency Climate Change Adaptation Task Force.
2014	While much of the eastern United States experienced a colder than normal winter, it was warmer than normal in the Arctic (National Snow and Ice Data Center, 2014) It was so warm in the Arctic that the sea ice did not extend as it typically does. The winter of 2014 was the fourth lowest extent of Arctic sea ice ever recorded by satellites during February.

The Annual Average of Carbon Dioxide in the Atmosphere
in Parts Per Million



References:

Project Learning Tree, Secondary Environmental Education Module, Activity 1. Southeastern Forests and Climate Change. ©2014 University of Florida Press and American Forest Foundation.
NOAA's Global Greenhouse Gas Reference Network (Tans & Keeling, 2014)

What I See Around Me

I see the river flowing down.
 I see the grass on the ground.
 I see the leaves flying around.
 I see the rain coming down.

Saniya Virani
 Grade 1

Casa Montessori School, Marietta
 Teacher: Cyndia Hunnicutt

2017 Georgia River of Words State Poetry Winner



SEASONAL HAPPENINGS

Summer Fairy Habitat Workshop

July 20 • Terrell Mill Park • 9:30am - 11:30am
 RSVP required: www.cobbstreams.org, click on calendar

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.

ANNOUNCEMENTS

WSP Welcomes Summer Interns



Announcing the 2016-17 Chattahoochee Challenge Winner!

Thank you to all nine of our 2016-17 Chattahoochee Challenge teams for your hard work and volunteer hours. A special congratulations to this year's winner, Lassiter High School. Jennifer Mercure, Lassiter science teacher, and Raghav Shyam, Lassiter GREEN Club President, led students in serving 768.5 hours. These hours included the chemical monitoring of a nearby stream, mulching the plants in their school's landscape, and assisting with creek explorations for 6th graders. Winning Lassiter students were rewarded with a river float through the Chattahoochee River National Recreation area on June 3rd.



Lassiter HS students enjoy a float on the Chattahoochee.

Quarterly Award Winners for Volunteer Service

Most Unusual Debris Found:

Shelly Banks, the coordinator of a Starbucks employee creek cleanup at Shaw Park, discovered this metal record player with a record melted onto it.



Most Debris Collected:

Sixteen members of Hillgrove High School's Navel JROTC participated in the Earth Day Creek Cleanup at Tramore Park. Led by Naval Science Instructor Allen Harris, they collected 19 bags of trash including a metal drum, tires, and sports gear.



Watershed Spirit Award:

Josh Siegla has coordinated students and staff from North Cobb Christian High School, as well as extended family and friends, for several cleanups on Butler Creek. He recruits the participants, submits his data so we can share it with Georgia Rivers Alive, and has pulled hundreds of pounds of trash from Butler Creek.



The Watershed Stewardship Program would like to welcome summer interns Jeremy Kearse and Jake Ehrie. They are participating in the Experiencing Cobb County Hands On Program (ECCHO) internship program.

Jeremy is a student at Morehouse College and is majoring in Computer Science. Jake is a student at Chattahoochee Technical College majoring in Environmental Technology.

In addition to helping with summer programs, Jake and Jeremy will be working on specific projects within the Adopt-A-Stream and the Storm Drain Marking programs.

w e l c o m e 

Citizen Science: Princeton Lakes
 Chemical Monitoring in the Willeo Watershed

Find out what we've been up to!

Our 2016-17 Annual Report is now available online. Visit www.cobbstreams.org, under "About Us."



CONSERVATION TIP

Now That's Cookin'!

What would summer be without barbecues, picnics, and spur-of-the-moment meals eaten outdoors? Take the "heat" out of summer cooking with these simple ideas:

- Use less energy. Take advantage of the summer's garden-fresh produce to whip up salads and other side dishes that require little or no cooking.
- Consider a gas grill. If you barbecue frequently, consider replacing your charcoal grill with a gas one. Gas grills generate fewer air pollutants.
- Choose meals that don't need to be reheated to be enjoyed as leftovers.
- Get a burner feature. When buying an outdoor grill, choose one that also has a burner feature. You'll be able to cook as well as grill outside, helping to keep your kitchen cool and minimize indoor air conditioning needs.
- Choose green materials. When hosting friends at your house, use reusable or biodegradable cups and encourage recycling of cans and bottles.
- Encourage guests to bike or carpool to your event. Hold it at a location convenient to public transportation.
- Fill up pitchers of water and other beverages instead of buying individual portions.
- Buy organic and locally grown vegetables and meat as often as possible.

Source: www.earthshare.org

RECOMMENDED RESOURCE

The Sound of a Wild Snail Eating

by Elisabeth Tova Bailey

"In a work that beautifully demonstrates the rewards of closely observing nature, Elisabeth Tova Bailey shares an inspiring and intimate story of her encounter with a *Neohelix albolabris*—a common woodland snail.

While an illness keeps her bedridden, Bailey watches a wild snail that has taken up residence on her nightstand. As a result, she discovers the solace and sense of wonder that this mysterious creature brings and comes to a greater understanding of her own place in the world.

The Sound of a Wild Snail Eating is a remarkable journey of survival and resilience, showing us how a small part of the natural world can illuminate our own human existence, while providing an appreciation of what it means to be fully alive."

Source: <http://tinyurl.com/mhhtvyu>

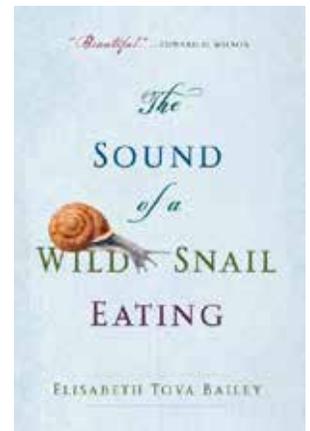


Photo Credit: <http://tinyurl.com/ydb8cf7t>

Stewardship Stars Excellence in Data Collection

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

- Connie Ghosh** - Chemical, Bacterial, & Macroinvertebrate Monitoring in the Rubes Watershed
- ERM Atlanta** - Chemical Monitoring in the Chattahoochee Watershed
- Fairfax Consulting** - Chemical & Bacterial Monitoring in the Powder Springs Watershed
- Keep Smyrna Beautiful AAS** - Chemical Monitoring in the Nickajack Watershed
- Lakewood Colony** - Chemical & Bacterial Monitoring in the Rubes Watershed
- Ochala Family** - Chemical & Bacterial Monitoring in the Noses Watershed
- Richard's Creek** - Chemical Monitoring in the Allatoona Watershed
- Arden & Jeremy** - Chemical Monitoring in the Allatoona Watershed
- Sierra Club Centennial Group** - Chemical, Bacterial, & Macro Monitoring in the Rottenwood Watershed
- Simon Locke** - Chemical & Bacterial Monitoring in the Butler Watershed
- Village North Highlands Subdivision** - Chemical, Bacterial, & Macro Monitoring in the Willeo Watershed

Thank you for your hard work and dedication!



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

July

- 6 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 7 Homeschool Summer Science Series • Creek Study • 10:00am - 12:00pm • Nickajack Creek
- 11 Adopt-A-Stream Bacterial Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 13 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 13 Fairy House Workshop Library Reading Program • 11:30pm - 12:30pm • Kennesaw Public Library
- 20 Fairy House Workshop • 9:30am - 11:30am • Terrell Mill Park
- 24 Rain Barrel Make & Take Workshop • 9:00pm - 10:00pm • Cobb County Water Quality Laboratory
- 27 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory

August

- 10 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 17 Adopt-A-Stream Chemical Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 21 *Solar Eclipse throughout the United States*
- 21 Rain Barrel Make & Take Workshop • 10:00am - 11:00am • Cobb County Water Quality Laboratory
- 31 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory

September

- 6 Adopt-A-Stream Bacterial Monitoring Workshop • 6:30pm - 9:00pm • Cobb County Water Quality Laboratory
- 7 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 14 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 14 Rain Barrel Make & Take Workshop • 11:00am - 12:00pm • Cobb County Water Quality Laboratory
- 21 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 28 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory

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