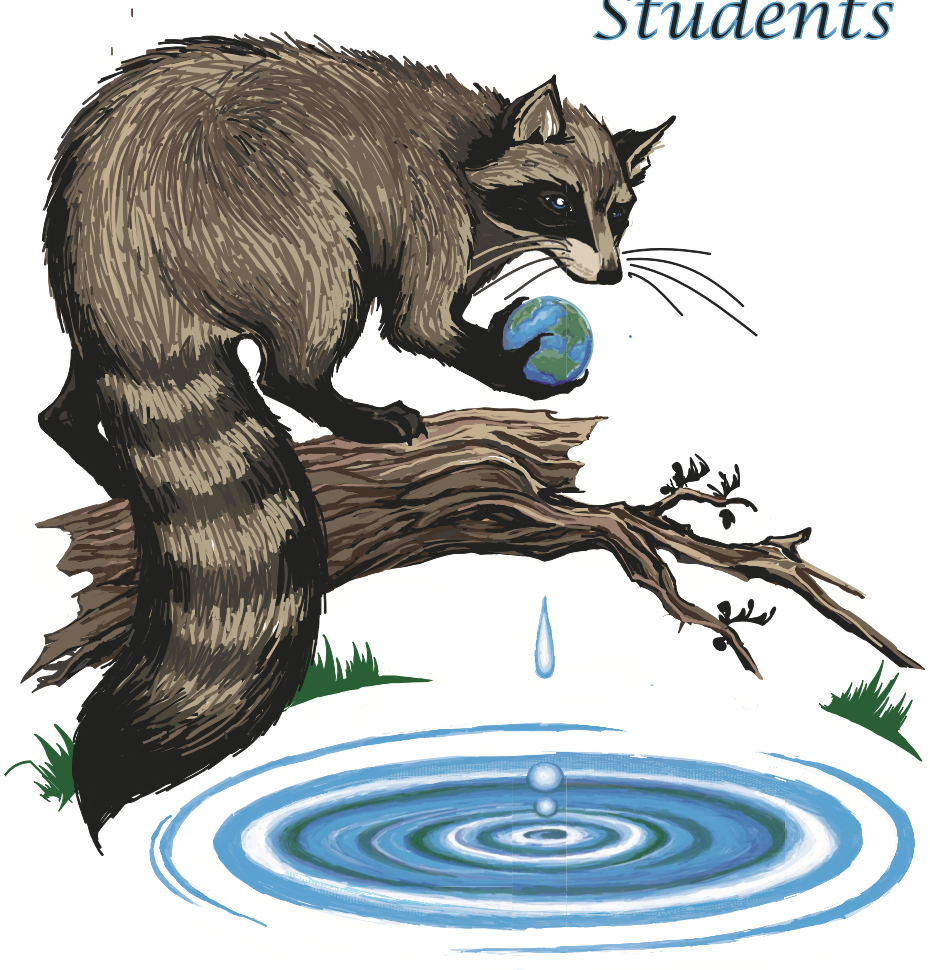
COBB COUNTY WATER SYSTEM
Watershed Stewardship Program

Environmental Exploration
for
Students



Middle and High School Programs

about us

The Cobb County Water System Watershed Stewardship Program offers **free** outreach programs for classrooms and community groups in Cobb County. These hands-on programs promote respect for our environment by educating participants about the connection between behavior and water quality. Our focus is on ecological literacy, including topics such as pollution prevention, biodiversity, and environmental health.

Contact a Watershed Educator to schedule a free program
water_rsvp@cobbcounty.org
(770) 528-1482

We provide education on issues impacting local water quality, foster good habits and responsible behavior, and cultivate an appreciation for and a connection to our natural resources. We can also assist you with your community service projects, provide teacher workshops, and loan curriculum resources for your use.

contents

green school initiative

The Green School Initiative recognizes Cobb County schools with an active environmental education program and encourages other schools to develop environmentally-based education initiatives within their schools. The primary focus of the program is conservation, preservation, and beautification of our environment.

How can I become a Cobb County Green School?

To qualify as a *Green Classroom* a teacher must complete five environmentally-based lesson plans per year. This can be any environmentally beneficial project, a lesson plan of your own, a facility tour, or presentations by the Cobb County Watershed Stewardship Program. In order to qualify as a *Green School*, five teachers in your school must each complete five earth-friendly activities throughout the year.

For more details, please visit
www.cobbwater.org/greenschool.htm

Cobb County Green School

Beautify Conserve Protect

classroom activities

Adopt-A-Stream Water Chemistry Study

Time: 1.5 hours, Requirements: Access to sink

Learn to collect water samples and perform water quality experiments including dissolved oxygen, pH, temperature, and conductivity. This hands on chemistry activity incorporates the scientific method. Data collected from monitoring groups will be entered into the Georgia Adopt-A-Stream statewide database.

Vocabulary/Concepts: *watershed, point source pollution, non-point source pollution, pH, dissolved oxygen, temperature, conductivity*

Macroinvertebrate Lab

Time: 2 hours, Requirements: Space for 10 small stations

Macroinvertebrates (stream bugs) are excellent indicators of water quality. Learn to identify and categorize aquatic insects by pollution tolerance levels to determine stream health. Introduce your students to these fascinating water bugs before taking a water monitoring field trip to a local pond or stream. Data collected from monitoring groups will be entered into the Georgia Adopt-A-Stream statewide database.

Vocabulary/Concepts: *bioindicator, biodiversity, macroinvertebrates, benthic, life cycle, metamorphosis, larva, assessment, water quality, aquatic, habitat, taxonomy, classification*

What is a Watershed?

Time: 1.5 hours, Requirements: Space for max 30 students to sit around model

Explore your watershed and how topography influences the movement of water across the landscape. Students will create topographic maps, discuss water movement, and identify local water quality issues impacting streams and lakes.

Vocabulary/Concepts: *topography, topographic maps, watershed, point source pollution, non-point source pollution, runoff, riparian, erosion*

Bacteria Monitoring Lab- Waterborne Illnesses and Human Health

Time: 2 hours, Requirements: Space for incubator, electrical outlet

Across the globe, waterborne diseases have become an increasing threat to community health. This program explores different diseases present in the U.S. and in other countries and their impact on environmental health. Students will also have the opportunity to practice laboratory procedures by monitoring their local waterway for *E. coli*, and determining what levels exceed a healthy baseline.

Vocabulary/Concepts: *bacterium, waterborne disease, epidemiologist, pathogen, protozoan, virus*

What Do You Know About Where You live?

Time: 1-2 hours, Outdoor Space Preferred

What is a community? Students develop a working definition of a community and identify essential elements/characteristics of the community they live in. What biotic and abiotic factors are found in your community? Explore your campus to see what other organisms share their community.

Vocabulary/Concepts: *community, ecology, ecosystem, adaptations, biotic, abiotic*

Snakes of Georgia & Their Adaptations

Time: 1 hour, Requirements: Space for 5 separate stations

Some people fear them, some are attracted to them, but almost nobody is indifferent toward snakes. How have snakes adapted to survive in their environment? Which species in Georgia are venomous and how can you tell? Most importantly, how do they benefit our ecosystem? *This lab includes the use of live specimens.*

Vocabulary/Concepts: *habitat, diversity, adaptations, ecology, food webs*

Topography in a Box

Time: 1-2 hours, Requirements: Space for 10 small stations

Topographic maps are used extensively by a variety of people including geologists, field biologists, and outdoor enthusiasts. A hands-on 3-D model will be used by the students to demonstrate contour lines and elevation changes. Students will delineate their local watershed using a topographic map.

Vocabulary/Concepts: *topography, watershed, water quality, nonpoint source pollution, ecosystem dynamics*

Visual Stream Survey

Time: 1-2 hours, Requirements: Access to Stream

A healthy stream is a busy place and constantly changing. Learn how to assess a stream by examining different factors, such as stream bank, stream vegetation, stream channel, substrate type, etc. to better understand how your stream is functioning.

Vocabulary/Concepts: *watershed, topography, habitat, aquatic invertebrates, ecosystem, assessment, quantitative data, qualitative data*

Wetland Ecology

Time: 1 hour, Requirements: Space for max 30 students to sit around model

Wetlands have received greater attention in recent years, and there have been increasing concern for their protection. Are these cries warranted? How are wetlands important to global ecological health and biological diversity?

Vocabulary/Concepts: *food webs, transition zone, biodiversity, filtration, bioindicator*

River to River

Time: 1 hour, Requirements: Space for 30 students to sit around model

Where does our drinking water come from? What happens to our water after we use it? Explore how a drinking water and wastewater treatment facility function.

Vocabulary/Concepts: *aeration, coagulation, sedimentation, filtration, flocculation, source water, disinfection, sludge, potable water*

field trips

Investigating Urban Streams and Ponds

Time: 1.5 - 2 hours

Join us at a stream, pond or wetland to conduct a study about water quality and habitat. Activities may include water quality testing, sampling for aquatic insects, and investigating physical characteristics of the waterway. The group is responsible for its own transportation to the site. This program can be done at a schoolyard stream or pond, or at a local park.

Biodiversity and Butterflies: A Rain Garden Tour

Time: 1 hour

Visit our rain garden and learn how it filters pollution, slows down stormwater, and prevents erosion while beautifying the community, providing wildlife habitat and restoring biodiversity to the landscape. In the fall this site is host to many species of butterflies including the Monarch on its fall migration to Mexico. The Rain Garden is located at the Water Quality Lab and can be paired with a Water Quality Lab Tour.

Water Quality Laboratory Tours

Time: 1 - 1.5 hours

Cobb's Water Quality Laboratory is responsible for testing treated wastewater effluent and surface water samples. Join our Lab Analysts, Biologists and Chemists for a hands-on walk through water quality analysis. Call 770-419-6295 to schedule a tour.

Wastewater Treatment Plant Tours

Time: 1 - 1.5 hours

What happens after the flush? Find out where our water goes by visiting one of Cobb's four wastewater plants. Students will experience visually how a wastewater treatment plant works and how cleansed wastewater is recycled back into our rivers and streams. Call 770-419-6295 to schedule a tour.

service projects

Storm Drain Marking

We are calling for volunteers to help educate our citizens. Rain water runs off the landscape from roads, driveways, lawns, rooftops and parking lots is carrying pollution into our water. In addition, any litter on our roads will also wash into our streams through the storm drain system. To emphasize the connection between runoff and water pollution we need your help marking storm drains around Cobb County.

In Cobb County, **all storm drains lead to surface water**, not a treatment plant. It's very important for everyone to know that pouring oil, paint, or any other substance down a storm drain is illegal. Only rainwater should be in the storm drain system. Leaves and grass clippings also do not belong in the storm drain. They can cause flooding and pollution.

Help educate the community by marking the storm drains in your area. Cobb County Water System will provide marking kits including aluminum markers, adhesive pads, gloves, garbage bags, and education materials.

Waterway Cleanups

Is the creek in your area full of trash? Did you know all roadside litter eventually ends up in our waterways via storm drains and runoff? Help clean up local waters! It's easy, fun, and a great way to give back to the community. Cobb County Water System will provide gloves, bags, and other supplies to help with the project. Through a sponsorship by Cobb Water, if you register for a fall cleanup through Rivers Alive, you can received free t-shirts for your participants. Visit www.riversalive.org to register your event.

teacher workshops

Bring fun, interactive learning experiences to your classroom! Teacher curriculum classes are offered upon request for groups of 10 or more. Participants receive hands-on training, a curriculum guide, program resources and a certificate of completion. PLUs are available for workshops with 10 contact hours.

Leopold Education Project* | Grades 4-12 LEP is a conservation ethics curriculum that is based on the essays found in Aldo Leopold's *A Sand County Almanac*. The hands-on activities correspond to the month-by-month descriptions of Leopold's relationship with the natural world and strive to instill a land ethic among tomorrow's stewards.

Biodiversity Basics* | Grades 3-12 A component of the World Wildlife Fund's *Windows on the Wild* education initiative, Biodiversity Basics focuses on critical thinking and informed decision making, aimed mainly at middle school students. The curriculum explores the importance and status of biodiversity and why it should be protected.

Healthy Water, Healthy People* | Grades 6-12 This activity guide for older students raises the awareness and understanding of water quality issues and their relationship to personal, public, and environmental health. The field monitoring guide gives in-depth information and technical overviews on water testing parameters.

Project Learning Tree | Grades PreK-8 Use the forest as a "window on the world" to increase students' understanding of our environment, and help them acquire an appreciation and tolerance of diverse viewpoints on environmental issues. PLT encourages creativity, originality, and flexibility to resolve environmental problems and issues.

Project WET | Grades K-12 Develop awareness and respect for water resources through activities that focus on living and non-living systems, the importance of water for all users (energy producers, farmers and ranchers, fish and wildlife, manufacturers, recreationists, rural and urban dwellers), and sustainable water management.

Project WILD | Grades K-12 A wildlife-based conservation curriculum that fosters responsible actions toward wildlife and related natural resources. Project WILD strives to develop awareness, knowledge, skills, and commitment that results in the making of informed decisions, responsible behavior, and constructive action concerning wildlife and the environment.

**A small fee to cover the curriculum cost may be required for some of these workshops.*

resources for checkout

What's in the Water?

Includes two activities in which students role play a community where members are getting sick, and use clues to determine the perpetrator. These activities allow students to consider how land use impacts water quality.

Watershed/Nonpoint Source Model

The popular *Enviroscape* Watershed/Nonpoint Source Model is available for classroom and special event needs. Show your students how many small sources of pollution can have a real impact on our waterways through a hands-on demonstration. The model comes complete with an instructor's manual. We recommend pairing this with one of our Student Action Relays.

Student Action Relays: Pet Waste and FOG

These activities provide the stewardship component that all students can implement and teaches the importance of personal responsibility. In the *Pet Waste Relay* students learn how water quality is impacted by pet waste and practice picking up after their pets. The *FOG Relay* focuses on the impact Fats, Oil, and Grease (FOG) from residential kitchens has on stream health. FOG causes sewer blockages that lead to overflows that impact water quality. Students learn how their simple actions in the kitchen can reduce the problem.

A Drop in the Bucket and other Water Lessons

A visual demonstration of where water is located on Earth and how much of it is accessible to humans, a study of the characteristics of water, and an investigation of a mysterious illness affecting a community.

Wastewater Treatment Model

Experience the physical, chemical, and biological processes of a wastewater treatment plant without ever leaving the classroom. Using a non-hazardous organic solution to simulate sewage, students observe changes through the aeration, bioremediation, and filtration stages-without the odor. Students are actively engaged during the simulation by recording and graphing the decomposition of organic material over time.

The Watershed Stewardship Program has resources that educators can borrow to support lessons in their classrooms. Please visit www.cobbstreams.org for a full list and description of each activity.

Tree Study

A compilation of our favorite tree activities including several measurement exercises to determine tree age, height, and the benefits we receive from trees.

Macroinvertebrate Mayhem

Macroinvertebrates are aquatic insects that help us determine water quality. In this activity, students take on the role of these insects in a stream and discover how pollutants affect the survival of different species. This is a great pre-activity for a stream or pond study!

Water Cycle Activities: Incredible Journey and The Blue Traveler

Students have learned the basic steps of the water cycle, but what about the manmade component? Participants become water droplets and travel thought oceans, clouds, water treatment, and groundwater, just to name a few. This activity demonstrates how an understanding of water movement on the planet supports water conservation measures.

Stream Monitoring - Chemical Kit

Study a local stream and determine water quality with our monitoring kits. Tests include temperature, dissolved oxygen, pH, and conductivity. Practice on tap water first, then take a trip to a nearby stream! Adopt-A-Stream certification, site adoption and registration are required.

Stream Monitoring – Biological Kit

Collect and identify stream bugs in your stream with our monitoring kits. Equipment includes d-frame and/or kick seine nets, sorting trays, magnifying glasses, buckets and macroinvertebrate ID cards. Adopt-A-Stream certification, site adoption and registration are required.

Bacteria Monitoring Kit

Along with chemical and biological stream monitoring, bacteria monitoring can help answer the commonly asked question, "Is this water safe?" CCWS will provide you with the necessary equipment to test E. coli levels in your waterway, including sampling bags, cooler, petrifilm, and an incubator. Adopt-A-Stream certification, site adoption and registration are required.

Connecting Community to Local Ecology

662 South Cobb Drive • Marietta, Georgia 30060

www.cobbstreams.org

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Cobb County...Expect the Best!

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