

# Water-Related Educational and Outreach Resources for Georgia

In our increasingly complex and interconnected world, a wealth of information is available on water resources to meet the needs of science educators, interested citizens, and government managers and policy makers. This is an attempt to compile the vast array of resources about water conservation and management. It is broken down into three sections: programs for primary and secondary education, outreach programs and general information for all Georgia residents, and green infrastructure resources for homeowners and governments. Among the items are State of Georgia-sponsored programs with classroom curriculum materials, opportunities to get in the creek with citizen science and volunteering, interactive websites, catalogs specializing in science learning materials, conservation organizations with outreach programs, and outstanding publications.

## 1. Water Resource Education for Grades K-12

### Project WET (Water Education Today)

This foundation provides teachers across the country with training and supplies to teach students about water conservation. The website includes interactive materials about water science for students. It also contains resources to find local training sessions for teachers. The Georgia DNR partners with this foundation to support training teachers and using these materials in the classroom as Georgia Project Wet, Water Education for Teachers. Project Wet also provides materials for homeschooling and distance learning.

Project Wet Guides: <https://www.projectwet.org/what-we-do/publications/guides>

Examples:

- Project WET Curriculum and Activity Guide 2.0: a guide for teachers K-12 to implement water conservation into their educational curriculum.
- Clean and Conserve Activity Guide for Educators: Contains lessons on conservation and hygiene, as well as material about what Project WET is.
- Clean and Conserve Water Science Project Guide: Contains projects for high school students that require multiple methods of thinking to establish the importance of water conservation and disease prevention.
- Conserve Water Educators Guide: This guide gives real life examples through case studies to teach middle and high schoolers about water conservation.
- Discover a Watershed: The Watershed Manager: Provides activities to help teach what a watershed is and how people should take the initiative to protect and manage it.
- Healthy Water Healthy People Water Quality Educators Guide: Activity guide for educators teaching sixth grade to university level to help students increase their awareness of water quality management and conservation.
- Healthy Water, Healthy Habits, Healthy People Educators Guide: A guide to help teachers take a more active role in teaching their students the importance of water conservation and management.

Project WET Activity Booklets: <https://www.projectwet.org/what-we-do/publications/kids-activity-booklets>

Activity books aimed at kids to teach them the importance of water conservation through math, reading, and other exercises.

Story Books: <https://www.projectwet.org/what-we-do/publications/story-books>  
For younger children

Project Wet Discover Water: <https://www.discoverwater.org/>  
Online interactive lessons for ages 7-12.

## Project Wild

The Association of Fish and Wildlife Agencies provides this source of educational materials and training to teachers across the US. The Georgia DNR supports this effort and provides coordination for K-12 teachers and homeschool parents to receive training in hands-on exploration of wildlife resources issues that include field investigations, STEM components, and career connections. <https://www.fishwildlife.org/projectwild>

Resource Highlights:

- Project WILD K-12 Guide: <https://www.fishwildlife.org/projectwild/project-wild>
- Project WILD activities: <https://www.fishwildlife.org/projectwild/step-stem-and-wild-work>
- Aquatic WILD activities: <https://www.fishwildlife.org/projectwild/aquatic-wild/activity-resources.aw>
- Project WILD Correlations to Girl Scout Badges: [https://www.fishwildlife.org/application/files/2415/7073/5402/WILD-Girl Scout Badge Alignment.pdf](https://www.fishwildlife.org/application/files/2415/7073/5402/WILD-Girl%20Scout%20Badge%20Alignment.pdf)

## US EPA Website

The Environmental Protection Agency has a wealth of educational information online. <https://www.epa.gov/>

WaterSense for Kids <https://www.epa.gov/watersense/watersense-kids>. Materials for learning about water conservation in the home. Includes teacher guides, worksheets, and WaterSense game.

## US Geological Survey (USGS):

The Geological Survey is tasked with gathering information about our nation's natural resources, including water. <https://www.usgs.gov/>

US Geological Survey's Water Science School Covers topics like groundwater, surface water, and the water cycle with teachers' resources, pictures, maps, data and publications. <https://www.usgs.gov/special-topic/water-science-school>

## National Oceanic and Atmospheric Administration (NOAA)

This federal agency has a focus on weather and climate, and water is a huge part of that. <https://www.noaa.gov/>

NOAA is tasked with educating all ages about the wonders of our natural world. They provide a wealth of materials, including grants, real-classroom ready data, and field trip destinations like the “Science on a Sphere” at the Museum of Arts and Sciences in Macon, Georgia.

<https://www.noaa.gov/education>

Highlights:

- NOAA Live! Webinars range of topics from marine mammals to hurricanes, especially designed for learning at home. <https://seagrant.whoi.edu/suggested-educational-resources-for-use-during-school-closures/webinars-noaa-live/>
- NOAA Teachers at Sea: Pre-K through 12 teachers apply for an all-expense-paid voyage of discovery on a NOAA research vessel <https://teacheratsea.noaa.gov/#/home/>

## Water Footprint Network

This non-profit foundation is dedicated to addressing growing water scarcity and water pollution around the world. Educational materials increase public awareness of water consumption and how individuals, households, businesses, and agriculture can use less water.

<https://waterfootprint.org/en/>

Highlights:

- Educational Resources: <https://waterfootprint.org/en/resources/school-resources/> School resources including a game, handouts, and textbook materials on water footprint education.
- Water Footprint Assessment Tool: <https://www.waterfootprintassessmenttool.org/assessment/> An interactive map that looks at the scarcity of blue water in regions, water footprints based on different industries, and annual nitrogen pollution levels.
- WaterStat: <https://waterfootprint.org/en/resources/waterstat/> Statistics on water use throughout the world, including:
  - Product Water Footprint Statistics-how much water it takes to make various products, from apples to wheat
  - National Water Footprint Statistics
  - Water Scarcity Statistics
  - Water Pollution Level Statistics

## Water Footprint Calculator

This calculator is a project of the non-profit GRACE Communications Network. The online questionnaire allows the participant to estimate their daily water use and compares it to the average American. Suitable as a college resource as well. <https://www.watercalculator.org/>

Educational Resources:

- For Teachers: <https://www.watercalculator.org/educational-resources/for-teachers/> Lesson plans using the Water Calculator
- For Students: <https://www.watercalculator.org/educational-resources/for-students/> Featured research and reports, recommended websites, and career information
- Kids' Corner: <https://www.watercalculator.org/educational-resources/kids-corner/> Educational video and selected water-related websites for kids

## American Water Works Association

This professional organization for those working in public water supply and wastewater treatment has activity books for classroom and field trip use. <https://www.awwa.org/store>

Examples:

- The Story of Water: how drinking water is treated and supplied to homes
- Water Fun for You Coloring Book: puzzles and games with a drinking water theme
- Water Wonderful: A Water Activity Book for ages 5-8: water-related science activities

## Trout Unlimited

This nonprofit organization focuses on the conservation of trout fisheries, improvement of trout habitat, and increasing fishing opportunities <https://www.tu.org/>

Outreach and Education-Headwaters Youth Program:

<https://www.tu.org/conservation/outreach-education/headwaters-youth-program/> An education program aimed at K-12 students wanting to understand their local water bodies and conservation.

Highlights:

- STREAM Girls: <https://www.tu.org/conservation/outreach-education/headwaters-youth-program/explore-watersheds/stream-girls/> - partnership with Girl Scouts USA.
- Trout in the Classroom: <https://www.tu.org/conservation/outreach-education/headwaters-youth-program/explore-watersheds/trout-in-the-classroom/> - curriculum centered around raising trout in classroom and releasing them.
- Save our Streams Clubs: <https://www.tu.org/conservation/outreach-education/headwaters-youth-program/explore-watersheds/sosclub/> student-lead citizen science for 8<sup>th</sup> grade through high school.
- Boy Scout Merit Badge Program: <https://www.tu.org/conservation/outreach-education/headwaters-youth-program/explore-fishing/boy-scouts-fly-fishing-merit-badge/>

## Stroud Water Research Center

Non-profit organization that conducts freshwater research, environmental education, and watershed restoration in Pennsylvania and beyond. Suitable as a college resource as well. <https://stroudcenter.org/>

Education resources: <https://stroudcenter.org/education/>

Highlights:

- Leafpack Network: <https://leafpacknetwork.org/> teachers and students around the world use leafpacks to collect and study insects to assess the health of their streams.
- WikiWatershed: <https://wikiwatershed.org/> Watershed modeling as a classroom exercise for middle and high school. Includes curriculum materials such as labs, teacher guides, and worksheets.
- Water Quality Mobile App: <https://wikiwatershed.org/water-quality-app/> water quality data collection and learning tool.

- Macroinvertebrate identification guide <https://www.macroinvertebrates.org/> See photos of the common aquatic insects of Eastern North America

## Educational Resources Suppliers and Equipment Catalogs

There are many sources of outdoor education activity supplies and field equipment. The list below is a good starting point. No specific endorsement implied.

- Acorn Naturalist: <https://www.acornnaturalists.com/> games, activity kits, field equipment, displays, and posters
- Nature Watch: <https://www.nature-watch.com/> games, water sampling kits, Project Wet activity booklets, nature craft kits
- Carolina Biological Supply: <https://www.carolina.com/> equipment, supplies, live material
- Fisher Science Education: <https://www.fishersci.com/us/en/education-products.html> STEM equipment, supplies, aquatic leafpack insect sampling kits
- Bioquip: <https://www.bioquip.com/> Aquatic insect sampling supplies

## 2. Water Resources Information for Georgians of All Ages, including College

### Georgia Adopt A Stream

The state of Georgia runs the Adopt A Stream program as its premier citizen science water monitoring effort, in which volunteers are trained to sample water bodies and submit their data online. The data is available for anyone to access. Workshops for training around the state are also posted on the website. Suitable as a college resource. <https://adoptastream.georgia.gov/>

The manuals support the many types of sampling available.

<https://adoptastream.georgia.gov/data-forms-old/manuals>.

- Getting to Know your Watershed (available in Spanish)
- Visual Stream Survey (available in Spanish)
- Macroinvertebrate and Chemical monitoring (available in Spanish)
- Bacterial Monitoring
- Amphibian Monitoring
- Wetland Monitoring
- Coastal Adopt A Wetland

### Rivers Alive

State of Georgia program that supports annual stream and river cleanups organized by volunteers around the state. Registered cleanups get free Rivers Alive tee shirts, banners, and other helpful materials. Website shows map of registered cleanups so you can locate one near you. <https://riversalive.georgia.gov/>

### Georgia River Network

The Georgia River Network helps people experience the state's rivers and advocate for clean, flowing water. Their website presents the state's Water Trails, where federal, state, and local governments have partnered with outfitting companies and river groups to create access points for boating along many of Georgia's outstanding waterways. The River Network organizes paddling trips, including Paddle Georgia, the annual multiday canoeing trip on a different river each year. <https://garivers.org/>.

Just a few of the Water Trails:

Chattahoochee River National Water Trail <https://garivers.org/water-trails-and-paddling/chattahoochee-river-water-trail/> the first national water trail in the country.

Chattooga Wild and Scenic River <https://garivers.org/water-trails-and-paddling/chattooga-river-water-trail/>. Whitewater river on the border of Georgia and South Carolina

Etowah River Water Trail <https://garivers.org/water-trails-and-paddling/etowah-river-water-trail/> This trail runs for 163 miles out of the Blue Ridge Mountains in North Georgia to Rome, Georgia.

## US EPA

The US Environmental Protection Agency has publications, data, and interactive materials to help citizens understand water issues, report problems and to stay safe and healthy regarding drinking water. Suitable as a college resource. <https://www.epa.gov/>

Examples:

- EPA WaterSense Product rating system that allows consumers to select facets, showerheads, and other household equipment that conserve water. Also includes building specifications and certifications and information on landscaping to save water. <https://www.epa.gov/watersense>
- How's My Waterway? Interactive maps of your local area showing streams with low water quality, fish consumption restrictions and more <https://www.epa.gov/waterdata/how-s-my-waterway>

## US Geological Survey

This federal agency is tasked with mapping, inventorying, and studying the nation's natural resources. Hydrologic data collection is a major focus. Listed below is a small sample of the huge range of free resources available. Suitable as a college resource. <https://www.usgs.gov/>

Highlights:

- With every topic from snow and ice cover to aquifers, the USGS has data, maps, and publications <https://www.usgs.gov/science/science-explorer/Water>
- Get stream gauge data on rivers and streams throughout the US. [https://waterwatch.usgs.gov/?id=ww\\_current](https://waterwatch.usgs.gov/?id=ww_current)
- The National Map: view US topo maps online with access to a host of additional GIS layers <https://www.usgs.gov/core-science-systems/national-geospatial-program/national-map>

## National Oceanic and Atmospheric Administration (NOAA)

NOAA collects and interprets information about the weather, climate, and the animals and plants on land and in the oceans. <https://www.noaa.gov/>

NOAA has an enormous range of data sets, maps, and publications useful for the college classroom. <https://www.noaa.gov/education>

## Tennessee Aquarium Conservation Institute Freshwater Information Network (TACI FIN)

This website provides photos of fish species, distribution maps, and life history information. You can participate in citizen science by uploading your fish photos. <https://tnacifin.com/>

## Georgia Aquarium

The Georgia Aquarium has online materials for learning at home, teacher materials, and webcams for Beluga Whales, Sea Lions, barrier reef, and more. <https://www.georgiaaquarium.org/>

## Izaak Walton League of America

This environmental organization promotes conservation and sustainable use of natural resources, including water. The website includes free webinars and information on current legislative and regulatory issues. Suitable as a college resource.

<https://www.iwla.org/about/about-us>

Their volunteer stream monitoring program provides resources and support for citizens who want to gather data on water quality in their local streams and rivers.

<https://www.iwla.org/water/stream-monitoring>

## American Rivers

This environmental organization seeks to protect and restore rivers and work for clean water for all. Recreation and enjoyment of rivers is a focus. Suitable as a college resource.

<https://www.americanrivers.org/>

Highlights:

- Discover Rivers by learning about hydrology, river ecology, paddle-worthy rivers, and Blue Trails <https://www.americanrivers.org/rivers/discover-river/>
- Award-winning films about people and their rivers around the nation <https://www.americanrivers.org/rivers/films/>
- Blog posts on river management issues, current events, and seasonal recreation tips <https://www.americanrivers.org/blog/>

## The Nature Conservancy

This conservation organization seeks to protect natural areas and their wildlife on land and water by acquisition, conservation agreements, or other arrangements with local landowners. The website offers opportunities to volunteer and visit local preserves.

<https://www.nature.org/en-us/>

The Sustainable Rivers project focuses on managing dams more sustainably. One river in the program is the Savannah. <https://www.nature.org/en-us/what-we-do/our-priorities/protect-water-and-land/land-and-water-stories/sustainable-rivers-project/>

## Trout Unlimited

This nonprofit organization is devoted to river conservation, fish conservation, and the enjoyment of fishing <https://www.tu.org/>

Trout Unlimited Service Partnership <https://www.tu.org/conservation/outreach-education/trout-unlimited-service-partnership/> Program to provide fishing experiences to veterans, first responders, and medical personnel, to allow them the healing benefits of outdoor recreation.

## 3. Green Infrastructure for Homeowners and Governments

### US EPA Website

The US Environmental Protection Agency provides a wealth of information for homeowners and local governments on implementing green infrastructure methods. Included on this site are planning materials, design, research, and technical assistance. <https://www.epa.gov/green-infrastructure>

Highlights:

- GIWIZ <https://cfpub.epa.gov/giwiz/> database on all aspects of green infrastructure, with a questionnaire to help the user tailor their search to specific categories
- Campus RainWorks Challenge <https://www.epa.gov/green-infrastructure/campus-rainworks-challenge-0> This design competition for colleges and universities across the US aims to provide hands-on experience for students learn about solving runoff issues with green infrastructure.
- Green Infrastructure Collaborative <https://www.epa.gov/green-infrastructure/green-infrastructure-collaborative> An initiative encouraging federal agencies, private organizations and business interests to work together on green infrastructure to improve water quality for communities.
- G3 Initiative: Green Streets, Green Jobs, Green Towns Initiative and Approach. <https://www.epa.gov/G3/green-streets-green-jobs-green-towns-g3-initiative-and-approach> This initiative provides support for small to medium-sized urban community to control stormwater runoff through green infrastructure and design.

### Regional Green Infrastructure Planning in Georgia

City of Atlanta Green Infrastructure Program

<https://www.atlantawatershed.org/greeninfrastructure/>

The city of Atlanta has made sustainability a priority with the adoption of the Green Infrastructure Strategic Action Plan in 2017. The city has begun carrying out this plan by installing features like bioswales, rain gardens, green roofs, and permeable pavement to help the conservation of water.

Go to their interactive map for examples:

<https://coadwm.maps.arcgis.com/apps/MapSeries/index.html?appid=db24b57c2d7146c2a3f039d37d539737>

- Natural Green Infrastructure
- Stormwater Ponds & Constructed Wetlands
- Bioretention
- Green Roofs
- Permeable Pavement
- Rainwater Harvesting
- Map of Atlanta Green Infrastructure Projects

## Coastal Georgia Green Infrastructure Planning

Georgia's Coastal Regional Commission, serving ten counties on or near Georgia's Atlantic Coast, has developed planning guidelines for this critical interface with land and ocean to help manage stormwater runoff and protect the area from storm surges, and sea-level rise.

"Green Infrastructure Planning Guidelines for Coastal Georgia":

<http://www.crc.ga.gov/departments/planning/Docs/GreenInfrastructurePlanningGuidelinesV1.pdf>

## American Society of Civil Engineers

This professional organization has many webinars and other educational materials on green infrastructure design and implementation <https://www.asce.org/templates/2-column-pb.aspx?pageid=5315&mssearch=green%20infrastructure#/ea995b1af8db5407d43153987555edeb>

## Books and other publications

1. Albro, S.L. (2019). *Vacant to Vibrant: Creating Successful Green Infrastructure Networks*. Washington, DC: Island Press.  
The author demonstrates how urban vacant lots can be transformed into gardens which both add beauty and food production to the city, as well as helping with stormwater runoff.
2. Benedict, M. A. and E. T. McMahon. (2006). *Green Infrastructure: Linking Landscapes & Communities*. Washington, DC: Island Press.  
Envisioning green infrastructure as a "natural life support system", the authors lay out how to successfully incorporate green infrastructure into the landscape from a planning perspective.
3. Biebighauser, T.R. (2015). *Wetland Drainage, Restoration, and Repair*. Lexington: The University Press of Kentucky.  
This book includes a history of wetland drainage in the US, then covers the process of reversing these drainage efforts by creating wetlands. Highlights include case studies with photographs of the process of restoration.
4. Biebighauser, T.R. (2011). *Wetland Restoration and Construction: A Technical Guide*. Oswego, New York: Upper Susquehanna Coalition.  
This practical guide leads landowners step-by-step through the process of building and maintaining a wetland. The book covers selecting a location, equipment, and native wetland plants, and even finding funding. This book is suitable for the private landowner as well as the public land manager.
5. Brears, R. C. (2018). *Blue and Green Cities: The Role of Blue-Green Infrastructure in Managing Urban Water Resources*. United Kingdom: Palgrave Macmillan.

The author outlines cities' past reliance on gray infrastructure, then discusses ways cities have incorporated various types of green infrastructure in managing water, wastewater and stormwater as urban policy innovations.

6. Clary, J. and H. Piza. (2017). *Cost of Green Infrastructure*. Reston, Virginia: American Society of Civil Engineers.  
The editors use survey results and literature search to provide costs for using green infrastructure for controlling stormwater runoff. Useful for city and county water managers.
7. Center for Neighborhood Technology and American Rivers. (2010). *The Value of Green Infrastructure: A Guide to Recognizing its Economic, Environmental, and Social Benefits*. [https://www.cnt.org/sites/default/files/publications/CNT\\_Value-of-Green-Infrastructure.pdf](https://www.cnt.org/sites/default/files/publications/CNT_Value-of-Green-Infrastructure.pdf) General introduction to green infrastructure and its benefits to clean water, with formulas to calculate the effectiveness of various practices on water conservation.
8. Coutts, C. (2016). *Green Infrastructure and Public Health*. New York: Routledge Taylor and Francis Group.  
By viewing green infrastructure methods in light of the ecosystem services provided, the author shows how community health benefits from this more natural infrastructure, with case studies from Europe.
9. Sinnett, D, N. Smith, and S. Burgess. (2016). *Handbook on Green Infrastructure: Planning, Design, and Implementation*. Northampton, MA; Edward Elgar Publishing.  
Extensive coverage of green infrastructure for urban planners, architects, and landscape designers.
10. US EPA. (2015). *Tools, Strategies and Lessons Learned from EPA Green Infrastructure Technical assistance Projects*. EPA 832-R-15-016.  
[https://www.epa.gov/sites/production/files/2016-01/documents/gi\\_tech\\_asst\\_summary\\_508final010515\\_3.pdf](https://www.epa.gov/sites/production/files/2016-01/documents/gi_tech_asst_summary_508final010515_3.pdf)  
A resource for acceleration of green infrastructure as business-as-usual for stormwater management, infrastructure investment and community development.
11. Welch, C.L. (2010). *The Green Utility: A Practical Guide to Sustainability*. American Water Works Association.