

# Dragonfly Gazette

The Dragonfly Gazette is a biennial publication of the Georgia Department of Natural Resources Environmental Protection Division, Project WET (Water Education for Teachers) program.

## THE FUTURE OF ENVIRONMENTAL PROTECTION IN GEORGIA

**F**or this issue of the Dragonfly Gazette, we interviewed Dr. Carol A. Couch. Here she discusses the important role educators play in protecting Georgia's environment, by preparing future leaders. In November 2003, with the approval of Governor Sonny Perdue, the Board of Natural Resources appointed Dr. Couch as the Director of the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources.

**Will you share a story with our readers about a teacher in elementary, middle, or high school who particularly influenced you?**

During the 1960s, I attended a small elementary school with an equally small library. My sixth grade teacher noticed that in a short period of time I had rapidly read my way through all the science-related books. She began providing me with additional books that were far above my grade level. The school did not have a ready or routine way to supplement resources, and she went beyond these limitations to encourage me and stretch my learning.

**When did you decide to pursue a career in science?**

My interest in science, particularly biology, started as a child as I fished, hunted and rambled with my father, and spent every possible minute in the woods and creek near my house. I fear that children have fewer opportunities today to explore the natural world in the way I did. I decided to pursue a career in science during high school, but I did not have any real role models and counseling to help me understand what would be necessary. So my idea was to try to get into the best college science program I could and figure it out from there.

**How do you see the role of education in protecting the environment? What should EPD do to address the need for public education?**

Many of the most difficult environmental problems we face today result from the cumulative effects of individual decisions and behaviors. Education, kindergarten through college, can provide the information and understanding of how individual actions are tied to environmental consequences. Over the

long-term, such education can have significant impacts on taxpayer and voter expectations for public investment in environmental protection. EPD needs to take every opportunity to facilitate, encourage and support educators to integrate environmental content into lessons and activities.



EPD Director, Dr. Carol A. Couch

photos: Wayne Parham / Georgia Trend

**What do you think every student should know about environmental protection before they graduate from high school?**

Every high school graduate needs to be armed with the knowledge that his or her individual, everyday choices do influence the environment.

**Project WET provides teachers with water education training. What is the #1 thing you would like teachers and their students to know about water issues in Georgia?**

As a start, every student should know what a watershed is and how water flows through watersheds. Everyone should know what watershed they live in as readily as they know what county or city they live in, they should know what river or aquifer their drinking water comes from and where their sewage is discharged. Issues of water resources management are complex, but this basic knowledge is generally lacking and must be understood by students (our future taxpayers and voters.)

(See the definition of a watershed on pg. 2, and Beth Cook's award-winning lesson plan in the *Protecting My Watershed* insert)



Editors: Deron Davis, Petey Giroux, Monica Kilpatrick and Chris Sedgwick Production artist: Jacob Escobedo  
THE DRAGONFLY GAZETTE IS PRINTED ON RECYCLED PAPER. PASS IT ON TO A FRIEND, AND RECYCLE IT WHEN YOU'RE DONE.



The Dragonfly Gazette is distributed to Georgia Project WET Facilitators and Educators in April and October.

## HELPFUL INFORMATION FOR TEACHING STUDENTS ABOUT WATER

- Water is clear, colorless, tasteless, odorless and is made up of two atoms of hydrogen and one of oxygen-
  - Molecules constantly move. Heat contributes to the motion of molecules = kinetic energy-
  - When water feels warm, molecules are moving rapidly. Water molecules with little heat energy, such as those in an ice cube, move more slowly-
  - The motion of molecules determines the state of water. In the gaseous state (water vapor), water molecules have a large amount of heat energy and move rapidly. Rapid movement causes molecules to bounce off one another, resulting in greater distance between molecules-
  - Molecules in liquid water move slowly. Molecules in ice contain the least amount of heat energy, so their movement is very slow-
  - Water changes from one state to another when energy is added or lost-
  - Water is deceptively simple in structure and form, but performs an incredibly complex role in nature-
  - Every organism is composed mainly of water. The human body is about 70 percent water and a cactus is nearly 90 percent-
  - Water moves through living and nonliving things and binds them together in a complex web of life-
  - Water of sufficient quality and quantity is important for all water users (energy producers, farmers, fish and wildlife, manufactures, recreational users and urban and rural dwellers)-
  - A watershed is the land area from which surface runoff drains into a stream channel, lake, reservoir, or other body of water-
  - A wetland is land where water saturation is the dominant factor determining the nature of soil development and the types of plant and animal communities-
- Source: Project WET Activity and Curriculum Guide

## WHAT PARENTS ARE SAYING ABOUT ROW

"As a parent, artist, lover of the outdoors, and volunteer and promoter of the arts in our public schools I would like to commend your group for all the work you have done to promote River of Words in our schools and to our children. My daughter, Maisy Arena, an eight-year-old lover of nature and creative spirit was featured on your statewide poster which you sent to us a few weeks ago. The poster is now in our schools for other children to enjoy and gives them an opportunity to create once again this year. I have received phone calls and congratulations for my daughter. She is very quiet in her ways and does not like any attention for creating art and taking care of her pet frogs, crickets, and bugs. It is simply what she does. It is simply who she is. I feel with the River of Words program you have given these children a path for which to express their ideas and identity through art and nature. I thank you for this. And in many ways my daughter thanks you for this, too. We will be sure to enter your 2004 contest!"

Sincerely,  
Pam Arena

## ROW BOOK HITS STORES

*River of Words: Images and Poetry in Praise of Water* edited by Pamela Michael with introductory essays by Robert Hass and Thacher Hurd offers a powerful selection of the finest work from the contest's first six years. With selections by children from places as diverse as Azerbaijan and the United States, China and The Ivory Coast, as well as Thailand and the Ukraine, it is colorful and passionate evidence of fertile minds creating fertile visions of the world. From the hearts and minds of children come expressions of pure joy and exultation, as well as sorrow and longing, all inspired by water. Pamela Michael is the executive director and co-founder of River of Words. Robert Hass, U.S. Poet Laureate from 1995 to 1997 and a co-founder of River of Words, is a professor of English at the University of California, Berkeley. Thacher Hurd, who selects the art winners for the annual River of Words contest, has written and illustrated over twenty-five books, including *Mama Don't Allow*, which won the Boston Globe Horn Book award, and *Zoom City*, which was chosen as the New York Times Best Illustrated Book in 1998. *River of Words: Images and Poetry in Praise of Water* is available through your local bookstore, major book distributors, or by calling Heyday Books directly at (510) 549-3564.

## RIVER OF WORDS TIMELINE



FEBRUARY 15

Annual deadline for entries

APRIL

National winners announced and State winners selected

MAY

Georgia's National and State Winners recognized at Awards Ceremony

JUNE - DECEMBER

ROW exhibit travels to libraries across the state

AUGUST

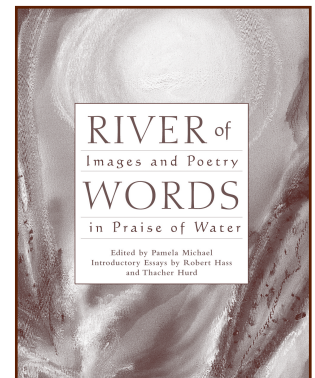
Georgia ROW brochure produced and distributed

SEPTEMBER

Georgia ROW Teacher's Guide produced and distributed

NOVEMBER - JANUARY

Georgia ROW Poetry and Art Journal produced and distributed



# WET WORKSHOPS

VISIT THE [www.EEMGEORGIA.org](http://www.EEMGEORGIA.org) CALENDAR FOR THE LATEST INFORMATION ON AVAILABLE WORKSHOPS

## Project WET is Going Underground **JUNE 26-27**

### Chattanooga, TN: The Tennessee Aquarium

Join us on a learning adventure that explores the fascinating journey of water underground. We will focus on groundwater, karst topography, geology and cave ecology in this 2-day hands-on workshop. Special emphasis will be placed on problem-solving strategies to meet population needs and minimize the negative impacts on water quality in karst areas. Participants will receive the Project WET Curriculum and Activity Guide, The Project Underground Natural Resource Education Guide, a tour of Raccoon Mountain Caverns, Admission to the Tennessee Aquarium, lunch, and snacks both days, and additional resources.

### What is KARST?

Karst is a landscape with sinkholes, springs, sinking streams, and caves. Gain a better understanding of caves and karst lands, including their geological, hydrological, biological, and historical value.

### Take a 2-hour Raccoon Mountain Eco-Adventure Tour

Go beyond the ordinary and explore the little seen sections of Raccoon Mountain Caverns. The Eco-Tour focuses on the wildlife in the cave and is the least strenuous of the wild cave expeditions. You will crawl, scramble over rocks, and slide down slopes. You will see amazing cave formations, large rooms, and muddy serpentine passages and careful examination may reveal salamanders,

millipedes, little brown bats, spring tails, and on rare occasions, the Crystal Caverns cave spider.

### Ancient Cave Art

Make your very own cave art using ancient methods and natural materials.

### Get the Groundwater Picture

Find out how groundwater moves through karst lands and how it is effected by point and non-point pollution. Learn why karstlands have such a high pollution potential and why successful cleanups are difficult and rare.

**Registration fee of \$65 dollars** includes both the Project WET Curriculum and Activity Guide and the Project Underground Natural Resource Education Guide, lunch and snacks both days, a two-hour tour of Raccoon Mountain Caverns\*, admission to the Tennessee Aquarium, workshop materials, and additional resources.

1 SDU credit Available for GA Educators

**Registration must be postmarked by June 12th.** First Come, First Served. Registration Cancellation Policy: Cancellations on or before June 18th will receive a refund less 15% for administration fees. No refunds will be processed after June 18th.

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: W \_\_\_\_\_ H \_\_\_\_\_ Fax \_\_\_\_\_

Email: \_\_\_\_\_

Are you Currently A Project WET: (circle one) **FACILITATOR** **EDUCATOR**

Meal Options: (circle one) **Non-Vegetarian** **Vegetarian** **Vegan**

*Please mail this form along with registration fee of \$65 to:*

Georgia Project WET, Georgia Environmental Protection Division,  
4220 International Parkway, Suite 101, Atlanta, GA 3035.

Make Checks Payable to Environmental Education Alliance of Georgia.

Confirmation of registration will be sent as registration forms and fees are received. Confirmation packets will include directions, exact locations of workshop, agenda, detailed list of nearby lodging, dining, entertainment, and attractions. In the meantime, Please visit [http://travel.yahoo.com/p-map-479361-map\\_of\\_chattanooga\\_tn-1](http://travel.yahoo.com/p-map-479361-map_of_chattanooga_tn-1) for an interactive map of Chattanooga that includes lodging, dining, entertainment, and attractions.

For more information in Georgia contact:  
Chris Sedgwick  
404-675-1635  
[Chris\\_sedgwick@dnr.state.ga.us](mailto:Chris_sedgwick@dnr.state.ga.us)

For more information in Tennessee contact:  
Laurina Lyle  
931-221-6480  
[Lylel@apsu.edu](mailto:Lylel@apsu.edu)



# MAKE THE GEORGIA CONNECTION



In March 2004, Georgia Project WET held the inaugural meeting of its Facilitator's Council at the Environmental Education Alliance of Georgia conference. The council members made many wonderful suggestions to strengthen the program, and this section is a direct response to one of their recommendations. *Make the Georgia Connection* will provide state-specific background information for some of your favorite Project WET lessons. In this issue we will focus on Sum of the Parts and nonpoint source pollution in Georgia.

## SUM OF THE PARTS P. 267 PROJECT WET CURRICULUM & ACTIVITY GUIDE

The impact that pollution has had on Georgia's streams has dramatically shifted over the past few decades. Streams are no longer dominated by untreated or partially untreated sewage discharges, which diminished oxygen levels and left little or no aquatic life. Fortunately, sewage is now treated, helping to raise oxygen levels and increase fish populations. However, another source of pollution, known as nonpoint source, is now affecting Georgia's streams. Whereas point source pollution can be traced back to a source, such as a pipe, nonpoint source pollution comes from a broad area and thus can be difficult to identify. This type of pollution consists of silt, litter, bacteria, pesticides, fertilizers, metals, oils, detergents and other pollutants that make their way into rivers and streams through storm water runoff. Although less harmful than raw sewage, nonpoint source pollution must be reduced to help protect the rivers, streams, lakes and wetlands in Georgia's four sensitive regions: Blue Ridge Mountains, Piedmont, Coastal Plain, and Coastal Marsh.

### BLUE RIDGE MOUNTAINS

Georgia's Blue Ridge mountain region is dominated by four major river systems; the Chatooga, Chattahoochee, Etowah, and Hiwassee. These four rivers all possess similar water chemistry with moderate acidity (6.4-6.9) and low phosphorous and nitrogen levels. These rivers are low in calcium, manganese and iron and are not especially rich in other minerals. Though the rivers carry insufficient organic nutrients, the waters are well oxygenated, offering habitats to stoneflies, mayflies, caddisflies, water pennies and dobsonflies.

### PIEDMONT

The Piedmont region is home to the Chattahoochee, Coosa, Savannah, Chattahoochee, Flint, Altamaha and small portions of the Ogeechee Rivers. These rivers have a more basic pH (6.9-7.2), contain more organic matter and can be more turbid (44 NTU) than the mountain streams. As the

rivers flow further south temperatures rise, offering new habitats for various species. This region is also characterized by the red clay subsoil, which can be exposed during heavy agricultural practices.

### COASTAL PLAIN

The Coastal Plain can be divided into three groups based on water chemistry. First, the Oconee and Ocmulgee rivers are weakly acidic (pH 6.8), have high phosphorous (.07) and nitrogen (.24) levels and contain moderate amounts of organic matter. They also carry heavy runoff and can form large floodplains up to four miles wide. They also carry heavy loads of silt, clay and sand. The second group contains Rocky Creek and Ichawaynochaway streams. They have a basic pH (7.25) are low in organics, moderately turbid (15.5 NTU) and have moderate loads of nutrients. The third group consists of the Little, Alapaha, Satilla, St. Marys and Suwannee. These rivers have a high content of organic matter, a relatively high acidic level (pH 4.59), low levels of oxygen, due to the warmer, slower-moving waters, and have low amounts of inorganic matter (sand, silt and clay). The common macroinvertebrates in this region include the stonefly, mayfly, dragonfly, dobsonfly, caddisfly, midge and black fly.

### COASTAL MARSH

The fourth and final region is known as the Coastal Marsh and includes 4.9-7.7 million acres of wetlands, including more than 600,000 acres of open water habitats. The marsh contains a mixture of tidal creeks, canals and rivers that form the areas between the coastal barrier islands and the mainland. Temperature and oxygen levels can fluctuate greatly due to tidal influences and the source and amount of freshwater entering the creek. This region carries streams that are relatively acidic (pH 4.59) and have a high percentage of organic material.

*Source: Georgia Adopt-A-Stream: Getting to Know your Watershed*

# Lesson Plans

This section of the Dragonfly Gazette usually highlights lessons that teachers can use with outdoor classroom ponds. Instead, in this issue, we highlight an award-winning lesson for high school students that challenges them to learn more about their watershed. Of the more than 80 new EE lesson plans published on EEinGEORGIA and Georgia Learning Connections (GLC) in 2003, Beth Cook's lesson is one of only four selected as an "Outstanding EE Lesson."

*Protecting My Watershed is reprinted with permission from [www.EEInGEORGIA.org](http://www.EEInGEORGIA.org),*

*Georgia Learning Connections, [www.glc.k12.ga.us](http://www.glc.k12.ga.us), and Beth Cook, a ninth grade geography teacher at Stewart-Quitman High School in Lumpkin, Georgia, [bethtiger2@aol.com](mailto:bethtiger2@aol.com).*

## Protecting My Watershed

*A 9-12th Grade Environmental Science, Social Studies and Geography lesson by Beth Cook*

In the third lesson of this Watershed within a Watershed unit, each student will use the Internet to investigate a watershed, develop a plan to protect or improve its water quality, write a research paper or create a multi-media presentation to document his or her findings and propose a solution or class project.

### Primary Learning Outcomes

What are the characteristics of my watershed? What is the condition of my watershed and what issues is it facing? Who are the players (stakeholders) in my watershed? What can I do to protect or improve the quality of water or other natural resources in my watershed?

### Additional Learning Outcomes

How can I use the Internet to research my watershed? How can I write effectively enough to promote understanding of the findings of my investigation and to gain support for the solution I propose?

### Assessed QCC Standards:

#### Grade: 9-12

##### *Science*

##### *Environmental Science*

11

*Topic: Environmental Problems*

*Standard: Recognizes major environmental problems 11.1 Identifies the environmental conditions that favor*

*life. 11.2 Describes the factors that contribute to the major environmental problems. 11.3 Explains how ozone is formed in the stratospheric layer and on earth's surface. 11.4 Experimentally determines the effects of acid precipitation on the environment. 11.5 Compares global warming to greenhouse effect and the impact of temperature changes on living things in a lab or field setting.*

#### Grade: 9-12

##### *Social Studies*

##### *Current Issues*

10

*Topic: Environment and Energy*

*Standard: Suggests solutions to problems of the environment and energy.*

##### *World Geography*

17

*Topic: Physical Characteristics*

*Standard: Identifies the physical characteristics of a place. - land forms - climates, and - vegetation.*



# Lesson Plans {continued }

## Procedures/Activities

### *Step: 1 Duration: 10 minutes*

Explain to students that they will be determining in what watershed they live and then researching their watershed using the Internet, to investigate its features and characteristics, identify its problems, and propose solutions. Each student will present his or her findings and a plan of action by writing a paper or creating a multi-media presentation with PowerPoint or other available software. Remind students that a watershed is the entire area that drains into a river or stream. Provide the Protecting My Watershed Research Project handout, where students will find directions for this project and links to Web resources which may be useful. Distribute Research Findings Worksheet, on which they are to record information they find.

### *Step: 2 Duration: 2 - 3 hours*

**Research:** Divide class into groups of 3-4 students who would like to work together (or, if preferred, make this an individual assignment). Provide students with access to Internet-connected computers to begin their investigation. Tell students that they might also want to ask people who live in the area about conditions, problems, and solutions associated with their watershed.

### *Step: 3 Duration: 2 - 3 hours*

**Writing:** Provide class with the following Web links, which have tips for writing research papers and creating multi-media presentations. Allow each student or group to decide which they would like to prepare and present. Remind students that a completed Research Findings Worksheet can be used as an outline for either project.

#### Web Resources for Step 3

*Title: Guide for Writing a Research Paper*

*URL: <http://webster.comnet.edu/mla/format.shtml>*

*Annotation: A guide for writing research papers prepared by Capital Community College.*

*Title: Creating a PowerPoint Presentation*

*URL: <http://www.lyncburg.edu/public/docs/userguid/tutorial/ppt97/contents.html>*

*Annotation: A tutorial on the use of PowerPoint.*

### *Step: 4 Duration: 90 minutes*

Have students present their findings to the class. Each student or group should emphasize their proposed solutions. Keep a running list of proposed solutions on the board. After all the students have presented, ask the class to discuss the feasibility of each solution as a class project (in terms of cost, time, skill level required, ability to involve everyone, equipment and supplies needed, logistics, including transportation, impact on the environment, etc). Remind students that some ideas have great merit but are not doable by the class during school. Adopt one solution as a class project and discuss how to implement it. Set aside class time within the next two weeks when students can plan and prepare for this project. (Possibilities might include stenciling storm drains to say, "Don't dump. Drains to River," arranging for Adopt-A-Stream training and starting a water quality testing program, or organizing a school-wide / neighborhood creek clean-up.

### *Step: 5 Duration: 90 minutes*

Allow students to implement the project they selected.

#### *Materials and Equipment*

1. One copy of Protecting My Watershed Research Project handout for each student;
2. One copy Research Findings Worksheet, for each student;
3. One computer with Internet connection for each student, or for small groups of 2 or 3.

#### *Total Duration*

5 1/2 - 7 1/2 hours

#### *Assessment*

Student will demonstrate competency in assessed standards through work products, including Research Findings Worksheet and research paper or presentation. Students will also design a class project, based on understanding of assessed standards. A checklist/scoresheet is attached for the teacher to use in evaluating whether student has met the benchmarks for this lesson can be found at <http://www.glc.k12.ga.us/BuilderVO3/Attachments/Assesment%20Checklist%20for%20Protecting%20watershed.doc>

# Student Copy Page

## Protecting My Watershed Research Project

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Students will use these web links to identify and research characteristics of their watershed, determine conditions in their watershed, and explore possible solutions to watershed problems. Following the research activity, students will use their findings to write a paper or create a multi-media presentation, which concludes with a proposal for a specific class project to improve watershed quality.

### 1. Watershed Map for Georgia

Site Location: <http://www.dca.state.ga.us/environmental/watersheds2.jpg>

(This web site contains helpful info for Research Finding 1A) Use the colorful map to identify and locate your watershed. Look for the outline of your county, by shape and location. Click on the icon with arrows to enlarge map. **FIND AND RECORD THE NAME OF YOUR WATERSHED.**

### 2. Scale Maps of Georgia Watersheds

Site Location: <http://www.gah2o.org/static/watersheds.pdf>

(1C,D) Using the map and scale provided at this web site, **MEASURE THE LENGTH OF THE MAJOR RIVER IN YOUR WATERSHED AND CALCULATE THE GEOGRAPHICAL AREA COVERED BY YOUR WATERSHED, IN ACRES.** (Requires Adobe Acrobat Reader to open. A ruler will be helpful). Use the scale at the bottom of the map to measure approximate length and width of watershed in miles. Multiply length x width to get area in square miles. Convert square miles to acres using this web link, which you will need to copy and paste in your browser: <http://www.easysurf.cc/cnvr5.htm#acr5>

### 3. Georgia Transportation Maps

Site Location: <http://www.gis.state.ga.us/emaps/dotmaps/>

(1B,F) Downloadable transportation maps of state. Statewide maps require Adobe Acrobat or WINZIP-type utility to read, although city and county maps download more quickly and without special software. **IDENTIFY BODIES OF WATER, MAJOR ROADS, AND CITIES IN YOUR WATERSHED.**

### 4. TopoZone Topographic Maps

Site Location: <http://www.topozone.com/findplace.asp>

(1B, E, F) **FIND LATITUDE AND LONGITUDE COORDINATES** by typing in your city for “place name” and selecting GA from pull-down menu. Then click Search. When new page opens, elevation, latitude and longitude will be listed across the top of the page, just below the tool bar. Click on place name link at top left corner, to view a topographic map of the area. Choose larger scale to move around until you find the right place on a map. Then choose a smaller scale to effectively zoom in on site. Use navigation arrows on sides of map to move the image, and **LOCATE RIDGES, HEADWATERS, AND MOUTH OF YOUR WATERSHED’S MAJOR RIVER. LOCATE YOUR SCHOOL AND THEN FIND THE NEAREST CREEK.**

### 5. Surf Your Watershed site / Locate your Watershed page

Site Location: <http://cfpub.epa.gov/surf/locate/index.cfm>

(1E) To confirm the identity of and learn about your watershed, scroll to bottom of page and click on “zip code;” type your zipcode in box below the words “zip code” and click “Search” Review watershed name and watershed profile informations. **RECORD THE EIGHT-DIGIT HUC CODE NUMBER FOR YOUR WATERSHED.** Check the profile and maps to determine whether there are any upstream or downstream watersheds that connect with yours. Click on various links for additional info about watershed.

### 6. Georgia Soils Map

Site Location: <http://csat.gatech.edu/statewide/layers/statsgo.html>

(1G) This web site features a color coded soils map. Click on small map for screen sized image. Click on large map to read key (scroll to right, and look for key under scale) better. **FIND THE PREDOMINATE SOIL TEXTURE TYPE AND/OR TYPICAL VEGETATIVE COVER IN YOUR WATERSHED.**

### 7. Georgia Land Use Map

Site Location: <http://csat.gatech.edu/statewide/layers/landuse2.html>

(1H) Color-coded map showing county lines, land uses (25 year old data base) and vegetation. Click on small map to view color-coded areas in your watershed. Click on large map to read key to all color codes (in upper right section of map, under scale) or use this information: Residential = Yellow; Commercial = Red; Industrial = Gray; Public/ Institutional = Blue; Transportation / Communication / Utilities = Black; Park / Recreation / Conservation = Green; Agricultural / Forestry = Brown **IDENTIFY THE THREE MOST COMMON LAND USES IN THE AREA OF THE WATERSHED NEAR YOUR SCHOOL, AND EXTRAPOLATE WHO SOME OF THE WATERSHED “STAKEHOLDERS” ARE LIKELY TO BE.**



## 8. Impairments and TMDLs for GA Waters

Site Location: [http://oaspub.epa.gov/waters/state\\_rept.control?p\\_state=GA](http://oaspub.epa.gov/waters/state_rept.control?p_state=GA)

(2A,C) This map provides information about which watersheds have permitted and unpermitted discharges (point source) of pollutants. Scroll all the way down to Waters Listed by Watershed. Find your watershed (river basin) name. There is a color bar next to watershed name. Click on the blue number to right of the color bar. (Or click on blue # to right of “watershed name not reported”) & look for the name of the creek nearest your school. When “List of Impaired Waters” appears, click on waterbody name for a list of impairments and potential sources. Or click on “303d map” for an interactive map which can be made to label creeks, road, watershed boundaries, and a number of other features in your watershed. LIST THE IMPAIRMENTS FOR THE CREEK NEAREST SCHOOL AND FIND THE POLLUTANTS FOR WHICH MAXIMUM TOTAL DAILY LOADS HAVE BEEN SET.

## 9. The Health of Georgia’s Major Watersheds

Site Location: <http://www.forestry.uga.edu/warnell/service/library/for91-001/>

(2D,E,F) This site provides information on the health of all major Georgia watersheds, as indicated by % of state land in watershed, % of state population in watershed, Watershed Stress Values (% stressed), and Watershed Risk Classification. FIND OUT WHAT PERCENTAGE OF THE STATE’S POPULATION LIVES IN YOUR WATERSHED. FIND THE WATER STRESS VALUE FOR YOUR WATERSHED AND USE IT TO DETERMINE THE WATERSHED RISK CLASSIFICATION.

## 10. Georgia Ground Water Susceptibility to Pollution

Site Location: <http://csat.gatech.edu/statewide/layers/drastric.html>

(2B) This web site features a color coded map which shows ground water susceptibility to pollution, by county. Click on large map to read key and explanation. Note: areas of high susceptibility (DRASTIC rating > 181) = orange; average susceptibility (141-181) = yellow; low susceptibility.

## 11. Laws Protecting Rivers in Georgia

Site Location: [http://outreach.ecology.uga.edu/tools/buffers/riparian\\_protection\\_ga\\_law.htm](http://outreach.ecology.uga.edu/tools/buffers/riparian_protection_ga_law.htm)

(3C) This site provides a summary of legislation protecting river zones in Georgia. DISCOVER EXACTLY WHAT THESE FOUR TYPES OF LAWS DO TO PROTECT YOUR WATERSHED.

## 12. EPA Waters, Oceans and Wetlands -What You can Do to Help

Site Location: <http://www.epa.gov/owow/ucando.html>

(3E,F,G) An array of ideas for citizen involvement in ways that can make a difference. BRAINSTORM IDEAS FOR A CLASS PROJECT THAT WILL PROTECT OR IMPROVE YOUR WATERSHED, WITH INSPIRATION FROM SUCCESS STORIES ON THIS WEB SITE. LOOK FOR IDEAS RELATED TO CLEANING UP STORM WATER RUNOFF AND NONPOINT SOURCE POLLUTION.

## 13. Search for Active Adopt-A-Stream Group

Site Location: [http://www.riversalive.org/active\\_adopt\\_groups.htm](http://www.riversalive.org/active_adopt_groups.htm)

(3A,B) To see if your creek or river has any active adopt-a-stream groups, click here and look under watershed name (listed near right side of chart). To see if your creek had a recent volunteer clean-up registered with the Rivers Alive program, go to this web site and then click on statewide clean-ups or metro Atlanta area clean-ups. Search by county name for your body of water. This site may also be used to identify monitoring groups, River Watch groups, Riverkeepers, and Watershed Alliance groups in your area. <http://www.riversalive.org/> SAVE THE NAMES OF VOLUNTEER GROUPS WORKING NEARBY IN YOUR WATERSHED FOR POSSIBLE FUTURE COLLABORATION. (The absence of any citizen groups in your watershed may point out a need which your project could meet).

## 14. Clean Up Storm Water Runoff

Site Location: <http://clean-water.uwex.edu/pubs/stormie/cleaning.pdf>

(3F) This document features ideas and solutions for stormwater run-off problems. (Requires Adobe Acrobat Reader). FIND AT LEAST ONE GOOD IDEA HERE TO CONSIDER FOR THE CLASS PROJECT YOU WILL PROPOSE.

## 15. Nonpoint Source Pollution

Site Location: <http://www.epa.gov/owow/nps/whatis.html>

(3G) This site gives a definition for, and identifies problems and solutions associated with, non-point source pollution. FIND AT LEAST ONE GOOD IDEA TO CONSIDER FOR A CLASS PROJECT YOU WILL PROPOSE.

> When you have completed this research, use your findings as an outline for a paper or multi-media presentation you will submit. Conclude with a recommendation about how your class can help.





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## Research Findings and Outline for Watershed Project

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### I. FEATURES AND CHARACTERISTICS OF MY WATERSHED

- A. Name of my watershed: \_\_\_\_\_ HUC # \_\_\_\_\_
- B. Significant bodies of water in my watershed
- i. Name of major river or lake in watershed: \_\_\_\_\_
  - ii. Name of tributary closest to school: \_\_\_\_\_
  - iii. Is another watershed connected downstream \_\_\_\_\_  
or upstream?: \_\_\_\_\_
- C. Length of major river in my watershed: \_\_\_\_\_
- D. Geographic area covered by watershed
- i. Length \_\_\_\_\_ miles x Width \_\_\_\_\_ miles = \_\_\_\_\_ square miles
  - ii. Conversion of square miles to acres: \_\_\_\_\_ acres
- E. Location within watershed: Name of place \_\_\_\_\_  
Latitude: \_\_\_\_\_, Longitude: \_\_\_\_\_, Elevation: \_\_\_\_\_
- F. Route of major river in my watershed
- i. Headwaters located near: \_\_\_\_\_
  - ii. Mouth of river empties into: \_\_\_\_\_
- G. Soils: Predominate soil texture type in watershed: \_\_\_\_\_
- H. Land Uses and vegetation in watershed
- i. according to map: \_\_\_\_\_
  - ii. observed: \_\_\_\_\_
- I. Presumed players (stakeholders) based on land use: \_\_\_\_\_

### II. CONDITIONS IN MY WATERSHED

- A. Water quality
- i. Impairments in creek/river: \_\_\_\_\_
  - ii. Substances for which TMDLs approved for creek: \_\_\_\_\_
- B. Ground water susceptibility to pollution from surface: \_\_\_\_\_
- C. Extent of non-point source pollution / run-off: \_\_\_\_\_
- D. Watershed stress value (% stressed): \_\_\_\_\_
- E. % of state population (indicator of % built or paved): \_\_\_\_\_
- F. Watershed risk class: \_\_\_\_\_
- G. Other issues or problems: \_\_\_\_\_
- H. Conclusion about conditions (biggest problem?): \_\_\_\_\_

### III. SUPPORTERS AND SOLUTIONS FOR MY WATERSHED

- A. Any active Adopt-A-Stream groups?: \_\_\_\_\_
- B. Recent river clean-up? \_\_\_\_\_
- C. Laws for rivers in Georgia: \_\_\_\_\_
- D. River protection status? \_\_\_\_\_
- E. Ideas from watershed protection success stories: \_\_\_\_\_
- F. Ideas for storm water runoff clean-up: \_\_\_\_\_
- G. Ideas for nonpoint source pollution prevention: \_\_\_\_\_
- H. What I propose: \_\_\_\_\_

# Soaking Wet

## 2004 GEORGIA PROJECT WET FACILITATOR, TEACHER, AND SCHOOL OF THE YEAR

On Saturday, March 13, at the Environmental Education Alliance of Georgia's annual awards ceremony, Georgia Project WET honored Leslie Poythress, Stephanie Mack, and Centennial Place Elementary School for their contributions to water education.

### FACILITATOR OF THE YEAR



Leslie Poythress has taught third grade, worked as a parent coordinator, and served as an assistant principal. She has also worked as a science consultant and written articles for Georgia Family Magazine. Currently she is an early intervention teacher at Gray Elementary School and reviews environmental lesson plans for EEinGEORGIA.org. Leslie trained 67 teachers in Project WET last year. She has been married to Michael, an environmental consultant for nine years; they have a four-year-old son, Avery and are expecting their second child.

### TEACHER OF THE YEAR

Stephanie Mack is a 5th grade teacher at Shakerag Elementary School in Fulton County. She plans an entire report card period around water issues in her Language Arts classes so that students will have a large block of time to integrate the language arts objectives together with the science objectives using "water" as the main theme. Stephanie engages her students in water education from the water cycle to the human cycle involving water treatment to wastewater



treatment. She uses the natural settings of the school and surrounding community to involve students in a process driven science curriculum. She is a Project WET facilitator, participates in River of Words, is Project Learning Tree trained and is certified in both the biological and chemical components of Adopt-A-Stream. She is member of Shakerag's "Using the Environment as an Integrating Context for Learning (EIC)" team and has written six water-related lessons which are published on the Georgia Learning Connections website.

### SCHOOL OF THE YEAR

Centennial Place Elementary School is an Atlanta Public School that committed in 2003 to participate in the "Using the Environment as an Integrating Context for Learning (EIC)" school improvement initiative. The fifth grade team made water the focus of their teaching. They researched and created models of their community highlighting the changes that have occurred ecologically, socially and economically. They partnered with the Georgia Aquarium and Georgia Adopt-A-Stream to engage their students in standards-based lessons about the school watershed, the Chattahoochee River, and water quality. Georgia Adopt-A-Stream spoke to their students about the water cycle, watersheds and nonpoint source pollution, and the students participated in a Rivers Alive cleanup event in Candler Park where they removed over 320 pounds of garbage. In addition, gifted 4th graders are writing a play about water on the theme of Charles Dickens' Christmas Carol - A Water Carol and the entire 4th grade participated in the 2004 Winning Water Children's Festival.



# \* NEWS, NOTES AND UPCOMING EVENTS \*

## WHAT DO GEORGIANS THINK?

Over the last year, the Pollution Prevention Assistance Division (P2AD) of the Department of Natural Resources took on the monumental task of finding out what the citizens of Georgia really think with regard to water resource issues. With the help of the Responsive Management, a survey research firm, 1,000 Georgia households were surveyed to better understand 1) their attitudes and opinions, 2) willingness to participate in water conservation measures and 3) incentives and constraints to water conservation.

As a result, the study found the following major findings:

- Both water quality and quantity were found to be important issues to Georgia residents, however there was greater concern for water quality than quantity.
- Georgia residents were concerned about water quality and quantity in Georgia because of the potential effects on human well-being more so than the potential effects on environmental well-being.
- Overall, the Georgia public had positive attitudes toward the general need to conserve water. Most importantly, the public agreed and strongly supported the statewide water conservation efforts.
- The survey research demonstrated that Georgia residents are already undertaking and are likely to undertake a variety of water conservation measures.

In addition, the Responsive Management and P2AD asked post survey focus groups their thoughts on water conservation messaging. Their response included the idea of concise, positive messages to encourage people to act now in an urgent manner verse scaring them into something. They also felt to have a successful campaign, it must encourage people to act and provide them with water conservation tips.

For a copy of this report – *Understanding Georgia Public's Perception of Water Issues and the Motivational Messages to Which They Will Respond* – go to P2AD's website at [www.p2ad.org/watermessaging.html](http://www.p2ad.org/watermessaging.html)

## NEW LICENSE PLATES 2004

Redesigned for 2004, the Georgia Department of Natural Resources unveiled the two tags in October 2003 and tags went on sale December 1, 2003. The new wildlife tags feature the American bald eagle silhouetted in front of the American flag on one tag, and a bobwhite quail, Georgia's state game bird, in natural habitat on the other. Both tags help support important conservation work currently underway throughout the state of Georgia. To date, Georgians have purchased more than 840,000 nongame wildlife tags raising more than \$13 million for nongame and endangered wildlife. Both wildlife license plates are available at local county tag offices and can be purchased for a one-time special tag fee of \$20 per tag. The Department of Motor Vehicles Services annual registration fee and ad valorem tax fee still apply. The wildlife license plates can be purchased at the office counter or by indicating your selection on your license plate renewal form.

For more information on Georgia's wildlife license plates and the important projects they support, log onto [www.georgiawildlife.com](http://www.georgiawildlife.com) or contact the Georgia Department of Natural Resources, Wildlife Resources Division at 2070 U.S. Highway 278 SE, Social Circle, GA 30025 or by calling (770) 918-6400.

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# ENVIRONMENTALIST OR CONSERVATIONIST?

{ an excerpt from an article by Jane Eller,  
Kentucky Environmental Education Council }

*The research findings discussed below provide environmental educators in schools, nature centers and state agencies, with interesting information to consider as they deliver messages to the public.*

When you speak out for environmental protection, are you an environmentalist, or a conservationist, and does it really make that much of a difference? To some people in the field, there is a huge difference, and they will make a considerable effort to distinguish themselves. Usually, it is a conservationist claiming that they aren't an environmentalist; and most self-described environmentalist don't care that much about which label they are assigned. But, before I spark off a huge debate about Pinchot and Muir, and how hunting license fees pay for conservation and all the other things that feed into this well-worn discussion, let me call a time out. Let's not talk about the inside-the-family debate, because I doubt we'll settle it here. Instead, let's look at how the public sees these labels.

The public does see a difference between conservationist and environmentalist, but it doesn't necessarily see the distinctions we do. In our focus groups conducted by Belden Russonello & Stewart over the last two years we've seen a consistent pattern in how people characterize the two labels. (These observations are echoed in findings from other research projects throughout the U.S.) Here is a quick and cursory overview of general public impressions.

**Environmentalist:** Someone whose agenda and work is driven by a set of over-arching beliefs- an ideology

**Conservationist:** Someone who is working on a practical solution to a particular problem

**Environmentalist:** The environment is to be saved, preserved, set aside, protected from human abuse.

**Conservationist:** The environment is something we use, so we have to conserve it and take care of it, so that others can use it in the future.

**Environmentalist:** From somewhere else - a national, international, or state capitol group

**Conservationist:** Local, a neighbor or community member

**Environmentalist:** Extreme, radical, impassioned

**Conservationist:** Practical, balanced

**Environmentalist:** Rarely satisfied

**Conservationist:** Pragmatic

**Environmentalist:** Gloomy

**Conservationist:** Solution-oriented

**Environmentalist:** Plays a necessary role - a public conscience and watchdog. Makes a difference.

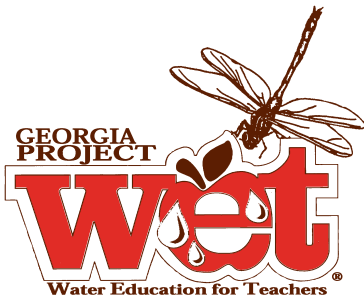
**Conservationist:** Contributes to the community. Makes a difference.

**Environmentalist:** Slightly superior/righteous (I don't waste energy, eat GMO food, why do you!?)

**Conservationist:** Just one of us

**Environmentalist Stereotype:** Greenpeace activist

**Conservationist Stereotype:** Local duck hunter



4220 International Parkway, Suite 101, Atlanta, Georgia 30354

## What's Inside this Issue?

- *Dr. Carol A. Couch & Georgia students: The future of Environmental Protection in Georgia*
- *What parents are saying about River of Words*
- *Project WET is going underground June 26-27*
- *Make the Georgia Connection when you teach Sum of the Parts*
- *Protecting My Watershed - a 9-12 lesson plan*
- *Award-Winning Educators*
- *What do Georgians think about water resource issues?*

