Dragonfly Gazette

GEORGIA PROJECT WET Environmental Protection Division SUMMER 2005

CITY OF ATLANTA MAYOR SHIRLEY FRANKLIN ON THE URBAN WATERSHED

Dragonfly Gazette:

1) What is an urban watershed?

Mayor Franklin: **An urban watershed is an area of land in a city or town that catches rain and snow and drains or seeps into a marsh, stream, river, lake or groundwater. Atlanta's watershed is comprised of many, many smaller watersheds since each creek, stream, river and lake forms its own watershed.**

Dragonfly Gazette:

2) What is the City of Atlanta doing to protect its urban watershed?

Mayor Franklin: **We are in the middle of a $3.2 billion program to completely overhaul our water and sewer systems to ensure that the water that we take from the Chattahoochee River and the water we put back into our rivers is as clean as it can possibly be. As part of the Clean Water Atlanta program, we also are buying greenways, which are natural spaces that border creeks and streams and help filter pollutants. These greenways will be protected from development in perpetuity, which means forever.**

Dragonfly Gazette:

3) How can teachers and other educators help students, young and old, understand their urban watershed? What do you most want those students to learn and be able to do?

Mayor Franklin: **Students can best understand our urban watershed by seeing it up close ... participating in stream cleanups and other environmental activities ... learning about water and the many, many threats to it. I read that the amount of water in existence now is the same amount that existed a billion years ago. When you think of it that way, you realize how important it is to protect such a precious resource.**

Dragonfly Gazette:

4) Please tell our readers about the partnership between the City of Atlanta Department of Watershed Management and Georgia Project WET. What is The Urban Watershed - A Supplement to the Project WET Curriculum and Activity Guide for Teachers in Atlanta?

Mayor Franklin: **The Department of Watershed Management has partnered with the Environmental Protection Division's Water Education for Teachers Program, Project WET, to develop curriculum that explains how Atlanta provides drinking water to its residents and businesses, reclaims the dirty or wastewater, cleans the water and then returns it to the river. Atlanta's drinking water treatment, wastewater collection and wastewater treatment systems are unique so the curriculum was tailored to focus on the City's systems, as well as ways to protect water resources in an urban environment.**

Dragonfly Gazette:

5) What is the Department of Watershed Management doing to provide this resource to Atlanta teachers?

Mayor Franklin: **The Department will co-host teacher training sessions during the summer and provide the curriculum and other supporting materials.**

Dragonfly Gasette: **How can they bring this resource into their classrooms?**

Mayor Franklin: **Teachers can attend the workshop to learn how to use the curriculum, which includes fun ways to teach important concepts. The teachers can use the curriculum for all areas of study – Math, English, Social Studies, Science etc. – to teach the Georgia Performance Standards.**

EDITORS: Deron Davis, Petey Giroux and Monica Kilpatrick WRITERS: Diane Badger, Anna Salzberg and Jessica Stelzner PRODUCTION ARTIST: Jacob Escobedo

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River of Words

Four National Finalists and 34 State Winners Recognized at Awards Ceremony

On Sunday, May 22 at the Atlanta Botanical Garden, 38 students and their teachers were recognized for creating award-winning art and poetry through the River of Words competition. 1,442 Georgia students participated in the watershed discovery and art and poetry program this year. For a complete list of winners visit http://eeingeorgia.org/net/content/item.aspx?s = 29839.

Jesus Damian - 1st Grade
Bolton Academy, Atlanta
Teacher: Bart Susany

The international River of Words organization selected four finalists from Georgia. The finalists in art are seven-year-old Jesus Damian from Bolton Academy in Atlanta, and seventeen-year-old Emilia Economou and eighteen-year-old Stephen Kesler, both from Druid Hills High School in Decatur. Twelve-year-old Scott Laffler from Haynes Bridge Middle School in Alpharetta is a finalist in poetry. Scott was also recognized as a finalist in 2003. In addition to these national winners, thirty-four students were recognized at the State level, including one Starbucks Power of Literacy Prize Winner and one Urban Watershed Prize Winner. The Starbucks Power of Literacy Prize is given to a student who created poetry through the watershed field trip program at Oatland Island Education Center in Savannah. The Urban Watershed Prize Winner is given to a student in the City of Atlanta who most creatively expressed concern for the urban watershed through art or poetry.

The Award Ceremony is coordinated by the Georgia Environmental Protection Division's Project WET program and the Georgia Center for the Book and is sponsored by the Starbucks Foundation and the Starbucks Coffee Company with support from the Atlanta Botanical Garden, the City of Atlanta's Department of Watershed Management and the Environmental Education Alliance of Georgia.

Earth's Angel

You may speak up moon,
The flow of your change is welcome.
Push past the distance of the children.
The stones purity is out to help.
The seeds of truth serve the path,
Saving the breeze of motionless joy,
Saving the breeze of motionless joy, resisted by your fire.
Imagine the color of your tears as the alone become proud.
Prove that your restless silver gates will bridge the answer of your dance.

Scott Laffler • 7th grade • Haynes Bridge Middle School • Alpharetta • Teacher: Christie Pratt

2004 Art and Poetry Journal Hits the Streams

These beautiful books help celebrate the students who were recognized for their talents last year. Students put them in their portfolios. Parents show them off to family and friends. Teachers use them to inspire students to participate in the program. To receive a copy of the 2004 journal, contact Anna Salzberg at 404-675-1629, Anna_Salzberg@dnr.state.ga.us or Petey Giroux at 404-675-1638, Petey_Giroux@dnr.state.ga.us.

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.EEinGEORGIA.org CALENDAR FOR THE LATEST INFORMATION ON AVAILABLE WORKSHOPS

Combined Adopt-A-Stream Train-the-Trainer and Healthy Water, Healthy People Facilitator Workshop

August 5-7, Charlie Elliot Wildlife Center in Mansfield

Adopt-A-Stream and Project WET are teaming up to present this exciting workshop opportunity to all volunteers and environmental educators! During this combined workshop at Charlie Elliot Wildlife Center August 5-7, participants will become AAS Trainers and Healthy Water, Healthy People Facilitators. Participants will receive the Healthy Water, Healthy People Educator Guide and Testing Kit Manual, a facilitator handbook, the Adopt-A-Stream Train-the-Trainer handbook, all AAS publications, networking opportunities, as well as PLU credit. You may choose to combine HWHP and AAS in your future workshops, or you may hold separate workshops. However, **HWHP facilitators are required to hold at least one workshop per year and AAS trainers are required to hold one workshop per year.** Registration for this workshop closes on July 20, but there are financial incentives for early birds! Please use the worksheet on the registration form below to calculate your registration, meal, and lodging costs, and return the completed form with your check. Lodging costs are per room, double occupancy. If you have coordinated a roommate, please indicate this on both forms and only include lodging payment with one of the registrations.

Adopt-A-Stream and Healthy Water, Healthy People Workshop Registration Form

Name: _____

Organization: _____

E-Mail: _____

Daytime Phone: _____

Email: _____

Address: _____

City, State, Zip: _____

Are you QA/QC Certified?: _____
(If not, plan to attend a certification workshop prior to this workshop.
Visit www.riversalive.org/aas_workshops.htm for a schedule.)

Are you a Vegetarian: _____ Vegan? _____

Do you need PLU credit? _____

FEE PAYMENT CALCULATOR			
Registration and Meals Before 7/1	EEA Member	$75	
	Non-members	$85	
Registration and Meals 7/1 - 7/20	EEA Member	$85	
	Non-members	$95	
Lodging at Charlie Elliot Wildlife Center	Friday 8/5	$78.40	
	Saturday 8/6	$78.40	
	TOTAL DUE		

Return forms and checks to:
EEA/Project WET c/o Jessica Stelzner, 4220 International Parkway, Suite 101, Atlanta, GA 30354

Questions may be addressed to Jessica at (404) 362-6536 or Jessica_Stelzner@dnr.state.ga.us.

All checks are payable to: Project WET/Environmental Education Alliance of GA.

MAKE THE GEORGIA CONNECTION

Make the Georgia Connection provides state-specific background information for some of your favorite Project WET lessons. In this issue we focus on drinking water in Georgia. The information below may be used with The Price is Right, The Pucker Effect and Reaching Your Limits.

The Price is Right p. 333, The Pucker Effect p. 338, and Reaching Your Limits p. 344 Project WET Curriculum and Activity Guide

Where does our drinking water come from?

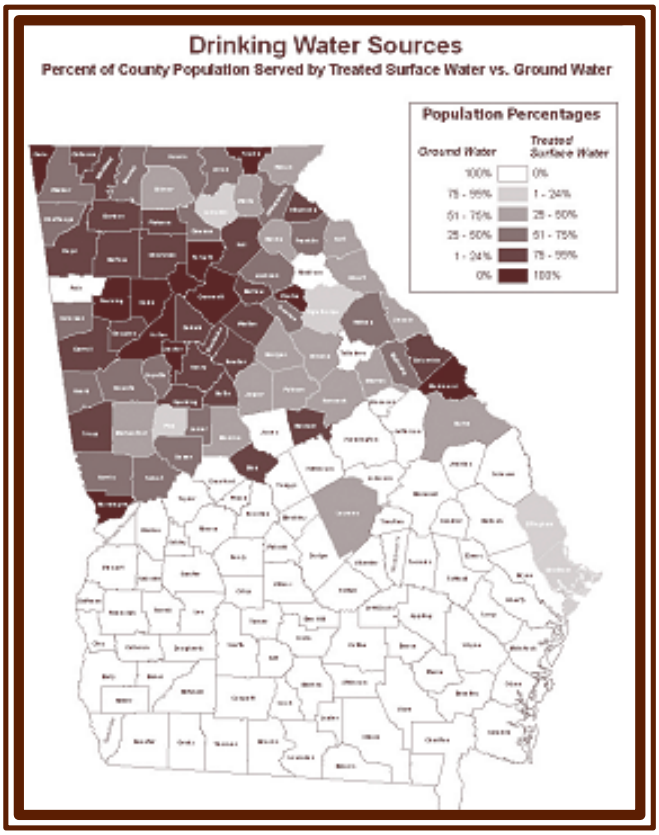
Anna Salzberg, Environmental Outreach Assistant, Georgia EPD

Drinking water in Georgia comes from both treated surface and groundwater. Surface water refers to any intake located on a stream or river. Water is withdrawn from these sources and pumped to a treatment plant where it undergoes extensive chemical and tertiary treatment that rids the water of harmful contaminants. Then, this water is pumped to homes, schools, and businesses that have pipes hooked up to a particular treatment system.

Groundwater is water that serves people through both private and public water wells. The public wells are regulated by the Georgia Environmental Protection Division, while the private wells are not subject to their regulations and permit process.

Groundwater is pumped up through wells from aquifers located under the earth's surface. The largest aquifer system in Georgia is called the Floridan aquifer and it is located in middle and southern Georgia.

Today, there are 1,666 community water systems in Georgia. 194 are supplied by surface water and 1, 472 are supplied by groundwater (UGA 2002). Although there are more ground water than surface water intakes in Georgia, 78% of the state is served by the 194 surface water treatment intakes, while only 22% is served by groundwater (UGA 2002).



Map Author: Barbara Stitt-Allen, GIS Branch Coordinator - EPD Watershed Protection Branch

Refer to the map for an illustration. The shaded areas on the map reveal the percentage of the population in that county that is served by surface and groundwater. The system used depends on that regions' geology, soil type, and many other land features,

The northern regions rely heavily on surface water intakes. Groundwater is used less in these regions because the aquifers are shallow and require deep, expensive drilling. The headwaters, which are where the watersheds start, are located in these regions as well, which results in fairly inexpensive treatment because the water has not yet passed through any major cities. Once the water passes through a city and its users, it becomes much more expensive to clean.

The fault line is located through the middle of the state, and separates the geology of the southern and coastal regions. These lower and coastal regions rely heavily on groundwater wells with intakes scattered above the Floridan aquifer.

The Floridan aquifer is composed of the Upper and Lower Floridan aquifers. The Upper Floridan aquifer is the preferred location for an intake, as it is positioned on top of the Lower Floridan and only requires 100-450 feet drilling depth as opposed to the much deeper depths required to reach the Lower Floridan (Anderson and Snyder 1996).

In recent years this aquifer has reached its capacity for withdrawal and is unable to naturally recharge its water volume. In an effort to reduce this negative impact, Georgia has imposed restrictions on groundwater pumping in 24 coastal counties. People and industry in these areas will be forced to drill deeper to the lower aquifer, or they will hook up to treated surface water intakes.

An additional problem that faces the coastal region is saltwater intrusion in the Floridan aquifer. This has the potential to force many more groundwater users to switch over to surface water intakes, which will put more pressure on already strained surface water resources.

Works Cited : *Anderson, Terry L. and Pamela S. Snyder. "Issue Analysis A Free Market Solution To Groundwater Allocation in Georgia". Georgia Public Policy Foundation. 6 May 1996. 19 April 2005 <http://www.gppf.org/article.asp?RT=20&p=pub/Water/aquifer.html>. UGA. "Drinking Water Protection in Georgia". Report to the Governor on the Efficacy Of Georgia's Drinking Water System Capacity Development Program. August 2002. 12 April 2005 <http://64.233.179.104/search?q=cache:jESWVWO_NAEJ:pubs.case.uga.edu/caespubs/>.*

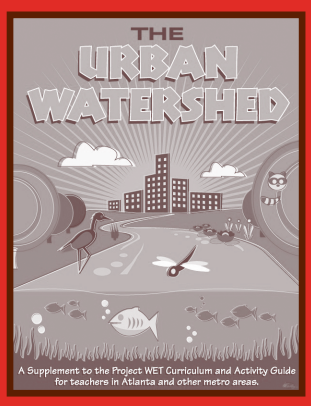
Editor's note: Anna has also developed a Power Point presentation on this topic. If you are interested in receiving a copy of it on a CD, email her at Anna_Salzberg@dnr.state.ga.us.

Lesson Plans

In July, Georgia Project WET will release *The Urban Watershed: A Supplement to the Project WET Curriculum and Activity Guide for Teachers in Atlanta and other Metro Areas*. The Urban Watershed features engaging, real world learning activities for 4-8th grade students about urban watershed issues such as impervious surfaces, impacts on water quality and the challenges of developing delivery systems for water and wastewater systems.

The curriculum was developed by Petey Giroux with support from interns Anna Salzberg and Jessica Stelzner and former interns Kathryn Byrnes and Alex Size. The Urban Watershed was developed in partnership with the City of Atlanta Department of Watershed Management. For more information, see the cover article with Atlanta Mayor Shirley Franklin.

The activity and song below are one of a dozen lessons you will find in *The Urban Watershed.*



JUST PIPE UP

Activity and Song

Summary

Students will build a pipeline using tubes for pipes to make a delivery and collection system in an activity that mimics the journey water takes from river to river in the man-made water cycle.

Objectives

Students will: Sequence the water supply and wastewater collection through infrastructure placement in an urban watershed through puzzle matches.

Assessments

Give a complete set of infrastructure cards to students working in teams of three and four. Ask them to sequence the infrastructure for the man-made water cycle by ordering the cards from river to river. Remind them that they should begin and end with the river. Each team's list should be ordered like the team's list should be ordered like the table in #1 of the activity procedure. Use the Piping Up Chart as your answer key. Use the Just Pipe It Up song to help students prepare for the assessment.

Materials

Paper towel tubes of varied lengths correctly labeled
Markers – 2 colors
Just Pipe Up Piping Chart for each team
Marbles or ball that is small enough to roll through the tubes
Pipes/tubes (1 pipe set = 13 tubes)
Stopwatch or watch with a second hand
1 set of infrastructure placement cards per team
Infrastructure definitions for each student that matches the infrastructure stops on their tube.

Making Connections

Students may be aware their water source is the river but they may not know that water must be pumped and stored at various locations as it flows through pipes to drinking water and wastewater treatment. They will get a sense of the infrastructure and processes in water delivery and wastewater collection.

Background:

In Atlanta the Chattahoochee River is the source of 80% of Atlanta's drinking water and is the lifeblood of the metropolitan area. There are three raw water intakes for drinking water at the Chattahoochee, Hemphill and the Atlanta-Fulton Drinking Water Treatment Plants. After drinking water treatment, water is pumped to homes, schools, and businesses and the wastewater flows mostly by gravity through sewer pipes to the wastewater treatment plant and back to the river. The Wastewater Treatment plants are R.M. Clayton, Utoy Creek, and the South River and Intrenchment Creek Wastewater Reclamation Facilities. In Atlanta there are over 2,000 miles of sewer lines of which 85% are separated and the remaining 15% are combined sewer lines. There are more than 300 miles of combined sewer lines in Atlanta and they are concentrated in the central business district. A separate sewer line collects wastewater in one pipe and stormwater in another pipe. A combined sewer pipe carries both wastewater and stormwater in the same pipe.

The Atlanta metropolitan area has grown dramatically over the past decade adding pressure to a very small watershed and river basin. The city has permits to withdraw 80 million gallons of water daily from the river.

Water movement through the man-made (pipe) water cycle system depends on the land's topography. Sometimes water requires pumping and sometimes water in the sewer system can move by gravity. The term **raw water** in this activity refers to water from the river before drinking water treatment. Water is pumped from the river and goes to a **raw water pumping station** before arriving at the drinking water treatment plant. A **raw water reservoir** is a place where water is held or collected prior to treatment. **Drinking water treatment** involves coagulation, sedimentation, filtration, and disinfection. (see the lesson "What is Your Standard" and "River to River" for more detail on these processes). Treated water for drinking is held in **clear wells**, and then goes to a **pumping station** prior to being transported to **storage tanks**, before it flows to homes, schools, and businesses.

Wastewater is used water from homes, schools, and businesses, and travels in a wastewater collection system that includes wastewater sewer lines (pipes). Along the way it might encounter a pumping station before it flows to the **wastewater treatment facility**.

The first stage of treatment at the wastewater treatment facility is **primary treatment** where most of the solids are screened out through the physical processes of screening, skimming, and settling. Sand, grit and gravel are small enough to move through the screens but are picked up at the next stage in the grit chamber. In the grit chamber the water slows down and the grit drops to the bottom. **Grit** is made up of small pieces of sand, gravel, and other hard material small enough to get through the first screening process. Next the water goes through the sedimentation process where suspended solids drift to the bottom of the tank. Grease and oil rise to the surface and are skimmed off. Sedimentation is the end of the primary process of wastewater treatment.

During **secondary treatment**, biological processes are used to clean the water. During the activated sludge process, wastewater and microorganisms are mixed in a tank where air is added. (aeration and agitation) The microorganisms in turn eat the organic pollutants in the water. A second round of sedimentation occurs followed by disinfection through the use of chlorine or ultra violet lights.

Advanced treatment occurs when there is a higher degree of treatment through filtration. The water is filtered through sand and crushed stone to remove any small particles. When the filters become clogged with solids they are backwashed and then the collected solids are reprocessed in the plant.

PROCEDURE

Warm Up

Divide students into teams and give each team a set of Infrastructure Placement Cards (See copy pages and cut out the infrastructure placement cards) to trace the flow of water (create a man-made water cycle) from the river to their homes and back to the river. Give each team 10 minutes to create the actual flow using the infrastructure placement cards. Ask each team to explain their design to the class. Ask them to describe what the water moves in and what is needed to keep it moving. Each team will present their design to the class. Discuss the topography of land and the need at some point for pumping water and at other points for gravity to do the work. Generally, water is under pressure when it moves to drinking water treatment and is moving mostly by gravity to wastewater treatment. Drinking water pipes are under different regulations than wastewater pipes and are completely different pipe systems. Allow a few minutes for each team to give their explanations of the pipe order they have created. After team explanations hand out the **Piping Chart** to each team and ask them to place their infrastructure cards on the correct answers on the **Piping Chart**. Students are now ready to build the actual pipe systems using the knowledge they now have about the drinking water and wastewater pipe systems. They will sequence the pipes in order by doing the *Just Pipe Up* activity and connecting the pipes end to end.

The Activity

1. Prior to the activity make sure that the tubes are color coded with drinking water tubes/pipes in blue marker for example and wastewater tubes/pipes in brown or black marker. Drinking water pipes/tubes are 1-8 and wastewater sewer pipes are tubes 9-14. Label the tubes/pipes in the correct order (table below) repeating the last station so that each tube can make a match with the next infrastructure stop. If the first tube has river at one end and *raw pumping station* at the other end, then the next tube should be labeled *raw pumping station* and *raw water reservoir*. The next tube begins *raw water reservoir* and has *water treatment plant* at the other end. Continue labeling tubes using the infrastructure names from Table 1 below. The names to be written on the tubes are as follows: **River, Raw Pumping Station, Raw Water Reservoir, Water Treatment Plant, Clear Wells, Pumping Station, Storage Tanks, Homes and Schools and Businesses, Wastewater Pump Station, Wastewater Treatment Plant, Primary Wastewater Treatment, Secondary Wastewater Treatment, Advanced Wastewater Treatment, River.**

Table 1: Below is a table of how each tube should be labeled and ordered

TUBE	BEGINNING HALF OF TUBE	LAST HALF OF TUBE
Drinking Water Pipes	COLOR THEM BLUE	
1	River	Raw Pumping Station
2	Raw Pumping Station	Raw Water Reservoir
3	Raw Water Reservoir	Water Treatment Plant
4	Water Treatment Plant	Clear Wells
5	Clear Wells	Pumping Station
6	Pumping Station	Storage Tanks
7	Storage Tanks	Homes, Schools, and Businesses
8	Homes, Schools, and Businesses	Wastewater Pump Station
Wastewater Collection Pipes	COLOR THEM BROWN	
9	Wastewater Pump Station	Wastewater Treatment Plant
10	Wastewater Treatment Plant	Primary Wastewater Treatment
11	Primary Wastewater Treatment	Secondary Wastewater Treatment
12	Secondary Wastewater Treatment	Advanced Wastewater Treatment
13	Advanced Wastewater Treatment	River

The Activity (contd.)

2. Ask students and parents to recycle their paper towel and tissue holders and collect enough to make two pipelines, or 26 tubes. Use different colored markers to indicate drinking water delivery pipes (1-8) and wastewater collection pipes (8-13).

3. Hand out the tubes randomly (one tube per student) and if you have more than 13 students you will need 2 sets of pipes or tubes. If you have a class of 26 students for example, you will need 2 sets of pipeline puzzles.

4. Ask students to find their match and make a pipeline. Keep a stopwatch nearby and time the number of minutes it takes for them to construct the pipeline man-made water cycle. Tell them there are many community members who need to get their water and are quite anxious for this project to be completed.

5. When everyone has made a match, note the number of minutes it took. Then ask students to read their infrastructure definition (see infrastructure definition copy page) to the class beginning at the River and discuss what happens at their section of man-made water cycle. If they have the tube that says Clear Wells and Pumping Station discuss what a Clear Well is and why a Pumping Station might be needed at that point in the man-made water cycle.

6. Tell the students that you are going to see what kind of condition the water delivery and treatment system is in and that you will be putting water through the system (a marble or two) and everyone will have a chance to see if the water can pass from pipe to pipe. At this point the teacher puts a marble or two in the man- made water cycle to see if the marble can pass all the way to the end of the pipeline system. If the marble falls through it opens discussion about pipes that crack or break and the need for people in careers that will keep pipes, stations, and the delivery system in good repair. If there is a break, discuss where it is and how that break could affect the health of people and animals. Students may have to use gravity to get the marble through the pipe.

7. Collect the pipe puzzles and do the activity a second time and see if students can build their man-made water system quicker now that they are more knowledgeable about the man-made water cycle and the infrastructure placement.

8. Time students with the stopwatch. They should be able to build their pipeline with more efficiency and knowledge this time because they are experienced.

Wrap Up

Leave one pipeline connected and in view for all the teams to see. Now have each team compare their original plan or design to the actual pipeline and its infrastructure placements. Ask each team to correct their infrastructure placement cards and share what they had correct and what was incorrect. Then remove the pipeline and have the team try and place it together again without looking at the diagram or model. Sing the Just Pipe Up song and let the students use the song to prepare for the assessment.

Sources:

Information from the City of Atlanta Department of Watershed Management, www.cleanwateratlanta.org
Water Education Federation, Preserving and Enhancing the Global Water Environment, www.wef.org

INFRASTRUCTURE DEFINITIONS: Provide these definitions to students to read when they have completed the pipe puzzle.

RIVER – the Chattahoochee river is the source of most of Atlanta's drinking water

RAW WATER RESERVOIR – a place where raw water is held before drinking water treatment

RAW WATER PUMPING STATION – a place where raw water (river water before treatment) is pumped to the raw water reservoir

WATER TREATMENT PLANT – drinking water treatment is primarily a chemical treatment. Water goes through coagulation, sedimentation, filtration, and disinfection

CLEAR WELLS – a place where water is held after drinking water treatment

PUMPING STATION – a place where water is put under pressure and pumped to a storage tank before delivery to homes, schools, and businesses

STORAGE TANKS – a storage area for treated water prior to delivery to homes, schools, and businesses

HOMES, SCHOOLS, BUSINESSES – water users who create wastewater

WASTEWATER PUMP STATION – a place where wastewater is pumped to the wastewater treatment facility

WASTEWATER TREATMENT PLANT – a wastewater treatment facility that cleans the water through physical and biological processes prior to return of the water to the river

PRIMARY WASTEWATER TREATMENT – physical process of screening where most of the solids are removed through skimming and settling

SECONDARY WASTEWATER TREATMENT - biological processes in secondary treatment include the use of microorganisms that eat the pollutants after air is added to the treatment process

ADVANCED WASTEWATER TREATMENT – a higher degree of treatment through filtration. Water is moved through layers of sand and crushed stone to remove any remaining small material or pollutants

RIVER – the treated wastewater is returned to the Chattahoochee River clean so that the water is safe for aquatic animals and downstream water users

Working for Clean Water

This recurring section of the Dragonfly Gazette will highlight professionals in the Georgia Environmental Protection Division, their careers, expertise and educational experiences.

ANNA SALZBERG, ENVIRONMENTAL OUTREACH ASSISTANT, GEORGIA EPD

There are many projects that the Georgia Project WET program could not provide if it were not for the informative staff of patient environmental specialists and engineers at EPD. This was certainly true when it came to writing our new and upcoming Urban Water shed curriculum (see the cover article and lesson plan in this newsletter for more information).

So grateful are we to them, that we started asking where such wonderful and educated people come from? What spurred their love for the environment and motivated them to dedicate their lives and careers to protecting it?

The environmental specialists and engineers interviewed share a profound love for the environment that started at an early age. Emily Wingo, an environmental specialist, said that her interest started simply from playing with her friends in a Cobb County creek as a child. Josh Welte has a similar story and says as a child, he and his friends used to play in the creeks around the subdivision where he lived and caught crawdads, built dams, and threw rocks, etc.

The story gets a little more unique when scientist K. Scott Robertson explains that his interest began while he was bathing around 5-6 years old and thought how wasteful it was for all the water in the tub to drain away. He told his mother and she suggested he take a shower to use less water. "I thought there needed to be an organization that can conserve water, and where does it go after it leaves the tub? Who takes care of that? Well, now I know, it's all of us!"

For others, the story begins with family influence. Mark Bebee tells us that he has two uncles who are engineers. "They instilled in me the fun and the challenge of solving community problems through engineering solutions. Engineering is a people serving profession." Randy Durham, an environmental engineer shares a similar family story. His father is an electrical engineer, and encouraged Randy to pursue related subjects in school. Randy combined mathematics with his love for water, and the result was his environmental engineer career and passion.

We are certainly lucky to have such valuable resources at our fingertips for writing the Urban Watershed curriculum. Many of the lessons in this supplement deal with wastewater and drinking water technical issues that could not have correctly been explained without the help of our EPD colleagues. For example, many EPD specialists and engineers gathered around the table in a conference room one day while Project WET Coordinator, Petey Giroux, laid out materials in stations, designed to simulate the functions of a drinking water and wastewater treatment plant from the lesson River to River. All of the participants had great suggestions for making this lesson all the more accurate and fun. In the end, River to River is one of the most anticipated lessons in the new curriculum.

Many thanks to these hard-working professionals for their support of Georgia Project WET!

Emily Wingo-Environmental Specialist
Agnes Scott College: B.S. in Biology

K.Scott Robertson, P.G-Environmental Specialist
Edinboro University of Pennsylvania: B.S. in Geology
Oklahoma State University: M.S. in Geology
Professional Geologist (P.G) State of Georgia No. 1035

Mark D. Beebe-Environmental Engineer
Clemson University: B.S. Civil Engineering, Environmental Engineer major, Coastal Engineering minor

Glen R. Behrend-Environmental Engineer
Mercer University: B.S.E. Environmental Engineering
University of Florida: M.E. in Systems Ecology

Josh Welte-Environmental Engineer
Georgia Tech: B.S. in Civil Engineering

Randy Durham-Environmental Engineer
Georgia Tech: B.S. Civil Engineering

Dominic Weatherill, Environmental Specialist
Hand in Land and Environment,
Lowestoft College, Lowestoft England
BSC in Natural Resources
Roehampton Institute, London, England

Soaking Wet

This section of the Dragonfly Gazette recognizes Project WET Facilitators, Teachers and Schools and provides a place for them to share their ideas and accomplishments.

Award-Winning Facilitator, Teachers and School

On Saturday, March 12 at the Georgia Environmental Education Awards Ceremony at the Environmental Education Alliance of Georgia annual conference, Georgia Project WET presented the Facilitator of the Year award to **Sharon Cowden Smith** for her steadfast commitment to training teachers about water. **Renee Gracon** and **Eric Mau** received WET Teacher of the Year awards for giving their students life-changing water education experiences. And **North Habersham Middle School's** long-term involvement with the Soque River earned it recognition as the Project WET School of the Year

A Word from Sharon Cowden Smith on Using Enviroscape Models

Sharon Cowden Smith is with the Fulton County Water Quality Monitoring Program and provides Adopt-A-Stream and Project WET training for citizens and teachers. She can be reached at 404-730-8006.

"I arrived in a classroom yesterday to do an enviroscape presentation only to discover that my cocoa, cool aid, etc had not been packed back into the case after the last time it was used. I had everything I needed to do the presentation except the pollution! I explained my dilemma to the teacher and asked her if she by any chance had any kind of powder that I could use. She didn't, but she did have tempura paint.

I watered it down a little in a jar and let the kids pass the jar around (we only had one color, but we were making do with what we had) and "paint" on the pollution. Since the paint was already in liquid form, it ran off during the "rain storm" really easily and turned the lake all mucky. The clean up was easy, with little odor and it wasn't sticky. In the summer it will be good too because the sugar in the cool aid attracts bees and other insects.

The most important reason that I liked using the paint besides all I described above is that I avoided all those pesky questions by the children as to what we are using to simulate the pollution. The candy sprinkles and cocoa are exciting for the children to see and smell, but they can sometimes detract from the message when their curiosity as to what we are using overpowers their concentration on the lesson. I established from the beginning that we were going to use paint as pretend pollution and I needed them to use their imaginations. They agreed and it went really well.

I plan to get several colors of paint to represent the various pollutants and water them down a little so they aren't so thick. I will use maybe some paint squirt bottles or even plastic film canisters and paint brushes."

Editor's Note: Enviroscapes are classroom models that help students understand nonpoint source pollution, wetlands and other environmental issues. Visit www.enviroscapes.com for more information. The nonpoint source and wetlands models can be borrowed from Georgia Project WET. Contact Monica Kilpatrick at monica_kilpatrick@dnr.state.ga.us to schedule them.

A Word from Renee Gracon on Project WET

Renee Gracon is the Science Department Chair and an Environmental Science teacher at Holy Innocent's Episcopal School in Atlanta.

"I wish to express my deepest gratitude to the committee which selected me as one of Project WET's Outstanding Educators for 2005. This award means so much to me because it reflects on many wonderful people who trained me and work to provide guidance and support for the teaching that I do. The lessons I am able to implement are great because of the quality materials that Project WET provides. My thanks go to the people who developed and designed Project WET's curriculum. My thanks also go to Madeline Reamy, Sharon Cowden, and others who have taught me so much. My current principal, Tony Jordan has been supportive of the experiential learning style that is integral to my daily lessons. Please express my gratitude to all – the Project WET design team, editors, facilitators and of course to the Georgia committee which selected me for this wonderful honor."

What are Eric Mau's Students Saying about Him?

"Mr. Mau's fish club is an exciting club exploring the wonders of our underwater sea life. Every day the club meets and has an adventure to enjoy. Mr. Mau's classroom has a great deal of biodiversity. He has many types of fish and plants that we, the students, take care of. Each student gets his or her own tank. Everyday in his class we record the water temperature, feed the fish, and take care of them. We also research the fish to learn more about them and where they live. The school schedule says that Mr. Mau's class is study skills, but although we do study things in his class it is nowhere near what the schedule says. His class is so unique, that the school system has no name for it in their computers. Mr. Mau is not like other teachers, he cares about who and what he teaches and makes it fun. He and his students have built 3 outdoor classrooms. Two of the outdoor classrooms are in courtyards and have small ponds; the third one is next to a creek at our school. He also takes us on hikes and shows us first hand what he's teaching. He also lets us put on these really big boots and get into the water and catch living things such as crayfish.

Not only do we learn about cool animals and the environment we also get a chance to do something about it. For the past 5 years students, teachers, and community members participate in a program called Rivers Alive. Every year we jump into the creek by our school and clean it up. We get real dirty and have a great time. Over the past 5 years we have collected over 500 tires and about 100 bags of trash. We have found some crazy stuff such as a motorcycle, an 8-track cassette tape, a kitchen sink, baby dolls, old shoes, basketballs, and even a toy car. Everyone that helps gets a great breakfast and a free t-shirt."

Eric Mau is a Science teacher at Cedar Grove Middle School in DeKalb County.

What are they saying about North Habersham Middle School in the newspaper?

NHMS named Project WET School of the Year
By Nathan Long, nlong@thenortheastgeorgian.com
Thursday, March 17, 2005 4:33 PM EST
North Habersham Middle School is wild about rivers.

The school recently was recognized statewide for efforts to keep local streams clean and educate students on their importance.
At the Habersham County Board of Education meeting on MondayMarch 14, teacher Brenda Hunt and other school representatives were commended for having received the statewide Project WET School of the Year award, including a $3,000 grant to sponsor a water festival in September.

The school was nominated for the award by Duncan Hughes, watershed coordinator for the Soque River Watershed Association.

Hughes said that NHMS beat many larger schools with more resources to win the award, but that the school did have one natural advantage.

"They're very fortunate in their location; they're right there on the river, and they're making use of that gift that they have," he said. Hughes said he'd been impressed by how NHMS science teachers had brought environmental concepts to the classroom - especially Hunt, who has spearheaded the efforts.

Some of the school's work has included stenciling storm drains to remind the public that they flow to rivers, conducting chemical and biological studies of the Soque River and the school's dragonfly pond, and examining insect larvae.
But Hunt pointed out the biggest factor in the school's winning the award.

"The Rivers Alive was what got us the ticket," she said, referring to the yearly cleanup along the Soque River, which this year involved 39 students and required a bus to handle them all.

The cleanup was part of a statewide effort, and students collected about 250 pounds of trash from the area around Jackson Bridge on Highway 197.

According to an award letter, of 658 students who attend the school, 456 had participated in one of the water education programs.

Superintendent Dr. Judy Forbes congratulated Hunt and other school representatives on their hard work.

You know you're an environmental educator if (or when)

...You think "hip" clothes are waders.

...The décor in your home consists of rocks, pinecones, shells and lichens.

...You read field guides more often than fiction.

...Your garden contains mostly "weeds" – Milkweed, Jewelweed, Ironweed...

...An interesting summer is trekking students through mosquito infested swamps.

...When reading the cereal box at breakfast, you find yourself wondering if the text is multidisciplinary, factually accurate, and unbiased.

...On walks outdoors you pick up things other people wouldn't touch.

...You believe it's not just dirt, it's soil!

...You can quote "The Lorax" chapter and verse for any environmental situation.

...Someone says you're "outstanding in your field," and they mean you are out, standing in a field.

...Reduce, Recycle, Reuse is more than a phrase, it's a way of life.

...You check "Other" where it asks for the science you teach.

...You work with the Pollution Control Agency and the Arts Council on the same project (or similarly strange grouping of organizations).

...You come up with a lesson plan every time you go for a walk.

...Your binoculars cost more than your car.

...After you say "Okay, everyone, gather up in a circle", you get this dazed feeling wondering what's next this time.

...When owl pellets and scat samples are a great "hands on" find – or you drool when you hear about these things.

...You've ever talked to a friend into salting the school's outdoor learning lab with feathers, bones, and animal tracks

...Almost nothing in your classroom is now being used for its original purpose.

...90% of the books on your bookshelf are for kids as well as half the tapes in your audio collection.

...You know all the words to "Bats Eat Bugs"

...You jump at any chance to answer a "why" question (you get excited when ANYONE asks "why" to an ecological question (ie Why should I recycle? What makes the difference whether X species exists? etc.)

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Water Education for Teachers

What's Inside this Issue?