

# Conservation Today For Tomorrow

## Education Edition

Fall, 2007  
Lafayette, Indiana

### Make-A-Splash Festival A Success For Area Schools At Ross Camp



A student shows off her bracelet that she made after going on her "Incredible Journey". This activity demonstrates the water cycle as students travel around the earth as water in a liquid, solid, or gaseous state.

### Grants, Grants, Grants

Educators are always looking for more resources for the classroom. Why not take advantage of these grant opportunities to increase the knowledge of your students by applying for a few of the many grants that are available.

#### Cargill Water Matters Mini-Grant

Water Matters is an international program to engage Cargill employees and community members in projects that promote water quality education and action. Cargill provides grants up to \$3,000 to nonprofit organizations working to raise awareness of and find solutions to water quality and management issues. Applications are available online at <http://www.cargill.com> in the Citizen section.

#### Outstanding Outdoor Classroom Competition Seeks Nominations

Each year the Indiana Tree Farm Committee recognizes an outstanding outdoor classroom by giving out the Outdoor Lab of the Year award. The Tree Farm Committee strongly encourages the development of outdoor education facilities. Nominations are due to Tom Thake, USDA Forest Service, by November 1.

The award will be presented at the annual convention of the Hoosier Association of Science Teachers (HASTI) in February 2008. Any questions may be directed to Donna Rogler, Project Learning Tree Coordinator, 317.549.0354.

For more information about grant opportunities, please visit:

<http://www.grantsalert.com>  
<http://www.ed.gov/fund>  
<http://www.nsf.gov>

#### Over 600 third and fourth grade students visited Ross Camp to celebrate water.

Busses from all over Tippecanoe County converged on Ross Camp for the annual Make-A-Splash Day. During the event, sponsored by Nestles and Project WET (Water Education for Teachers), students learned about water's chemical and physical properties, the water cycle, ground water, and aquatic life through hands-on activities.

"Looking ahead at the water available, quality, and resources will be one of the biggest issues kids will deal with as adults," says Mary Cutler, naturalist with the Tippecanoe County Parks and Recreation Department.

Purdue College of Science and Department of Agronomy, Tippecanoe County Soil and Water Conservation District, and Tippecanoe County Partnership for Water Quality also took part in educating the students.

The hands-on activities not only got the students out of the school building but also into nature where students can use their senses to learn many things that can not be taught inside a classroom. This helps students relate to text they read in class.

Whether it was learning about water absorption by squeezing sponges or about density and surface tension by stacking colored water in straws, the activities are things teachers can come back to later in the year.

Schools that participated in this year's Make-A-Splash Festival included Happy Hollow, Battle Ground, Lafayette Christian, St. James, Glen Acres, St. Lawerance, and Klondike Elementary Schools. The Festival was almost filled to capacity as the event continues to grow and gain in popularity with teachers. There is no substitute for the education learned in an outdoor setting.

Each students was given a goodie bag filled with learning material to take home and a special "critter catcher" that is actually a baby food jar and two straws. The students lure the critter into the straw and watch it walk into the jar where it can be observed.

If your class would like more information about Make-A-Splash Day, please contact Don Emmert at the Tippecanoe SWCD.

## Absorbing the Problem

To address the problems of storm-water runoff, more and more municipalities and commercial developers are switching to pervious concrete—a material that offers the durability and low life-cycle costs of a typical concrete pavement while retaining storm-water runoff and replenishing local watersheds. Pervious concrete pavements also are safer for drivers and pedestrians. Because pervious concrete absorbs water rather than allowing it to puddle, it reduces hydroplaning, tire spray and winter ice buildup.

Pervious concrete is a structural-concrete pavement with a large volume (15 to 35%) of interconnected voids. Like conventional concrete, it's made from a mixture of cement, coarse aggregates and water. However, it contains little or no sand, which results in a porous open-cell structure that water passes through readily. These factors allow porous pavement to approach natural ground cover in heat absorption and storage capacity. Unlike traditional concrete or asphalt, pervious pavements provide improved filtration and an enormous amount of surface area to catch oils and chemical pollutants. Certain types of porous pavement can pass 3-5 gal of water per minute, which is far greater than most conceivable rain events and highly



**A stream of water is dispersed through a piece of pervious concrete.**

effective in controlling stormwater drainage.

Pervious concrete, however, is not appropriate for full-scale use on heavily traveled roadways, since its void structure does not have the load-bearing features of traditional concrete. But for low-volume applications, such as parking lots and residential side streets, pervious concrete improves road safety due to prompt drainage of rain and melt water. Using pervious concrete also requires less curbing and storm sewers in the right configuration.

Article from *Concrete Today*, Volume 1, Number 1, November 2005

## Watershed Moment

Indiana Watershed Leadership Academy Class of 2008 Open for Enrollment

The [Indiana Watershed Leadership Academy](http://www.ces.purdue.edu/waterquality/iwlp.html) is an outstanding opportunity for individuals interested in gaining the necessary tools, resources and to maximize their efforts in watershed management. Designed as a distance learning course, the Academy offers a series of training oriented modules developed to provide practical information you will use right out of the box. The online modules are coupled with a series of 'face-to-face' sessions with the other Academy participants and technical specialists which will provide an engaging professional network of passionate individuals.

The Academy is designed to accommodate varying levels of experience. I encourage you to learn more through <http://www.ces.purdue.edu/waterquality/iwlp.html>.

Elizabeth Trybula, Watershed Information Specialist

## Water Quality Logo Contest Winner

Walkers may have noticed the small, round markers placed by storm drains in downtown Lafayette, Purdue, Battle Ground, and many local subdivisions.

The blue, green, and white markers are designed to remind people to think about what is going down the drain and where it will end up.

The slogan: "No Dumping, Drains to River".

Soon more round markers will pop up in other areas featuring a new logo in the center. The logo, featuring a fish fashioned into part of the shape of a heart, was designed by Purdue University student Ryan Cambridge.

The junior majoring in landscape architecture was awarded \$500 for the new



design by the Tippecanoe County Partnership for Water Quality (TCPWQ).

He hopes his design will help people to associate the need to love the Wabash River and all the animal and plant life in it with not dumping grease, debris, used motor oil, and other things down storm drains that drain directly to the river.

County Commissioner KD Benson said the contest was designed to continue to bring attention to the need to protect the water quality of the Wabash River.

She said the county and other local governments have made some significant steps since the enactment of "Phase II" of the Clean Water Act two years ago. Phase II mandated that local governments try to teach the public about ways to prevent polluted stormwater from entering river, lakes, and streams.

Water quality educator Don Emmert of the TCPWQ said all these measures are very important in keeping the biodiversity, or all the animal and plant life, of the Wabash River thriving.

Read more about Tippecanoe County's efforts to keep our rivers and streams clean at <http://www.tippecanoesw.org>.

**-Beth Stutsman, Journal and Courier**

## **Soil and Water Conservation Programs in the Classroom**

Do you have a need for a soil and water conservation program in your curriculum this year? The District can alter programs to meet your specific grade level. Below are good examples of grade specific programs. Water is used everyday by everyone and learning how to respect and conserve it is a major priority of the Soil and Water Conservation District's Education Committee. With many opportunities for both indoor and outdoor hands-on activities, the District seeks your interest throughout the year. For a full listing of available programs including Soil Pizza, Wetland in a Pan, It's Raining Cats & Dogs, and more please visit our website. Here are a few of our most popular programs:

### **Kindergarten, First, Second Grade: FREDDIE THE FISH:**

Students listen to a story while watching a demonstration about Freddie the Fish and his journey down the Wabash River. Students learn first hand what happens to the river when Freddie encounters water pollution. Students learn how their actions along with those of others affect water quality and ways they can help prevent water pollution.

### **Second, Third, Fourth, Fifth: INCREDIBLE JOURNEY:**

Students become water molecules and simulate the movement of water within the water cycle. By rolling a cube, students visit places water can move throughout the Earth. Students will also identify the physical states of water as it moves through the water cycle. A beaded water cycle bracelet records each student's journey.

### **Fourth, Fifth, Sixth, Seventh, Eighth Grade: SUM OF THE PARTS:**

Students demonstrate how everyone contributes to the pollution of a river as it flows through a watershed. Through a hands-on activity, students will learn how to distinguish between point source and nonpoint source and recognize everyone contributes to and is responsible for the water quality of a river or lake.

### **Fifth, Sixth, Seventh, Eighth, HS Grade: ENVIROSCAPE:**

Using the EnviroScape's Nonpoint Source Pollution Model, students learn about watersheds and water pollution. The three dimensional model landscape illustrates residential, recreational, agricultural, and industrial areas and how they represent possible sources of water pollution. Students see first hand how their actions and those of others may affect our water quality. The EnviroScape uses water in the demonstration so prepare to have fun.

### **Fifth, Sixth, Seventh, Eighth Grade: H<sub>2</sub>OLYMPICS:**

Students compete in "Water Olympics" to investigate the properties of water. Students participate in three events by performing simple experiments that demonstrate adhesion and cohesion. Events include the pole vault, balance beam and backstroke. Students will be able to demonstrate the chemical bonding properties of water while also relating these properties to daily activities.

### **Ninth, Tenth Grade: BIOLOGICAL WATER QUALITY MONITORING:**

Students are introduced to water quality by performing biological water monitoring. Students learn about various macroinvertebrates and how scientists use these aquatic insects to test our waterways. By examining and identifying these insects, students decide if the water quality is excellent, good, fair or poor.

### **Eleventh, Twelfth Grade: CHEMICAL WATER MONITORING:**

Students are introduced to water quality by performing simple chemical water monitoring procedures. Students use the LaMotte Standard GREEN kits in order to perform chemical tests of a waterway. These chemical tests include dissolved oxygen, pH, temperature, turbidity, phosphates, and nitrates. By examining the chemical test results, students decide if the water quality is excellent, good, fair, or poor.

### **ALL: STORM DRAIN STENCILING:**

Students learn about nonpoint source pollution and watersheds by marking storm drains in their communities. This activity reminds the community not to dump waste into our storm drains, as it eventually drains to our waterways. Students use stencils that read "Dump No Waste, Drains to River" to paint this permanent reminder to the community. This is a great community service activity for afterschool clubs!

**Contact Don Emmert for more information about having a presentation in your classroom. Please do not hesitate to e-mail or call the office if you have any questions about the available programs. I look forward to hearing from school teachers, home school teachers, scout troop leaders, after-school program directors, and more.**

## **FREDDIE THE FISH**

**This program teaches students how their actions along with those of others affect our water quality and ways they can help prevent water pollution. While listening to a story and watching a demonstration, students are able to see first hand what happens to the Wabash River when Freddie encountered water pollution.**

**Students learn:**

- **What the words water pollution means.**
- **The big river that we live closest to is called the Wabash River.**
- **Several examples of water pollution including fertilizer, waste from our toilets and bath tubs, oil from leaking cars, salt from icy highways, trash or litter detergent from factories, and waste from wastewater treatment plant overflows.**
- **We can help prevent water pollution! By all doing our part we can prevent pollution from getting into the Wabash River. Some examples of things we can do to help include:**
  - **put our trash in the proper trash containers**
  - **plant trees and grasses to filter out pollution**
  - **fix our leaking cars**
  - **factories have rules or laws to follow that tell them they have to clean their waste before allowing it to go into our waterways**

## **WATER MATCH**

**Students learn about the three phases of water: as a solid, a liquid, and as a gas. This program teaches students to identify the three states of water and recognize that water can become polluted and some water can be cleaned. Students are shown each phase of water and discussed where each was found. A “memory” game follows where the students would match cards of each phase. First a match would consist of the same exact phase such as rain /rain. A more challenging example of a match is the rain and a wave because both pictures demonstrate water as a liquid.**

**Students learn:**

- **What the three states of water are: solid, liquid, and gas**
- **Water is the only substance on Earth that can exist naturally in all three forms**
- **Water can transfer from one state to the next, such as a solid to a liquid by melting or from a liquid to a gas by heating it (evaporation)**

## **SOIL PIZZA**

This program teaches students to identify what it takes to make a pizza and where the ingredients originate from, either the ground (soil) or in the water. Students were given cards with flour, pepperoni, mushrooms, tomato paste, cheese, etc and are asked where each ingredient came from. For instance tomato paste came from tomatoes that were grown in the soil and needed water to grow! Once the students have identified all the ingredients, they line up and can see the XXXL 3 foot pizza I bring into the classroom (not real of course).

Today your student learned:

- All your groceries come from somewhere else other than the grocery store
- Pizza is made from ingredients that grow in the soil and use clean water
- How to describe where the pizza ingredients come from and how ingredients grow

## **THE INCREDIBLE JOURNEY**

Students participate in the education program entitled “The Incredible Journey”. In this activity, students become water molecules and simulate the movement of water within the water cycle. By rolling a cube, students visit places water can move throughout the earth. Students identify the physical states of water as it moves through the water cycle. A beaded water cycle bracelet records the student’s journey through the water cycle.

Students learn:

- The Water Cycle
- Evaporation
- Precipitation
- Condensation
- All living things need water to survive
- The Water Cycle does not move in a circle
- Why water is stuck in the clouds and the ocean
- Why it is important to keep water clean since it is continually recycled
- We have the same water now as we did when the dinosaurs lived here
- The Physical States of water

## **RAINING CATS AND DOGS**

This is a great warm-up for youth and adults alike. Index cards with “water related” pictures are handed out to each person. In 30 second to a minute, each person tries to meet as many people as possible by guessing the water phrase that describes the picture on the index card. This demonstrates how languages use figurative and literal translations of various water sayings. A few examples are:

Water off a duck’s back

Break the ice

Mind in a fog

Raining cats and dogs (the name of the game)

Students learn:

- What is a proverb and metaphor
- Funny and witty saying about water
- Cultural and generational usages of language
- Literal vs. figurative meanings

## **SOIL EROSION SIMULATOR**

Particularly used in an outdoor setting or science fair, this project demonstrates erosion and how bare soil loses more soil particles than a soil covered with grass. Two plastic boxes are placed next to each other. One box has soil without any cover (grasses) in a box and sits on an incline next to a plastic box of soil full with planted grasses. A watering can makes it “rain” as the water flows over each box of soil. The incline causes the water to flow downhill due to gravity and takes with it soil particles. A funnel at the bottom of each soil box catches the water and displays how differently the water looks. Which glass of water will look clearer?

Students learn:

- The process of erosion
- Why it is important to have roots stabilizing soil
- Why losing topsoil is not good for farming
- The power of water

## **THE ENVIROSCAPE**

**This program teaches students how their actions along with those of others affect our water quality and ways that they can help prevent water pollution. Using the EnviroScape Nonpoint Source Pollution Model, students learn about watersheds and water pollution. The three-dimensional model illustrates residential, recreational, agricultural, and industrial areas and how they represent possible sources of water pollution. Students see first hand how their actions affect our water quality. One of my most requested presentations.**

**Students learn:**

- **What is a watershed**
- **What is the different between point source and non point source pollution**
- **Various areas that cause pollution including farmland, residential areas, and recreational areas**
- **Best Management Practices (BMP's)**
- **Thing we can do to prevent pollution from occurring.**
- **Understand that we all affect water quality**

## **GROUNDWATER MOVEMENT**

**The students compare movement of water through diverse substrates. This program allowed students to act as groundwater as they move through clay, gravel, and sand particles. They will also learn why water flows across pavement and not through it. Students compared the speeds in which the water moved through these different soil materials. During an activity the students are able to see first hand how soil particle size affects the movement of water and water quality. We have done this activity at the County AG Days for 4th graders.**

**Students learn:**

- **How water moves through soil under their feet**
- **Water runs off driveways and roads**
- **Water moves through soil at different speeds**
- **What is saturation**

## **AQUIFER IN A CUP**

Students are introduced to the topic of wells and well water. Students work in teams of 2-3 and are given a clear cup of water filled with rice. The rice represents the ground and the water is the groundwater. Next pipettes are lowered into the ground and water is drawn up into the pipette. The water should be near clean. We discuss possible sources of contamination and food coloring is added to the water. Water is drawn up into the well again and the water will be “polluted”.

Students learn:

- What is a well and where does the water come from
- What does well water taste like
- How polluted water can contaminate your neighbor’s well
- Where is the water table
- Delineation time (for older students)

## **H2OLYMPICS**

Students compete in “Water Olympics” to investigate the properties of water. Students participate by performing simple experiments that demonstrate why water “sticks” to other things and why water is attracted to itself. Examples include placing drops of water on a penny until no more water can be held; how many pennies does it take to overfill a cup; and how many paperclips can you float in a pan of water. Each of these experiments demonstrates different properties of water.

Students learn:

- What is cohesion. Cohesion is when water molecules bind to each other
- What is adhesion. Adhesion is when water molecules bind to other substances
- What is surface tension. Surface tension is the cohesive forces between water molecules
- What is a meniscus
- Why properties of water are important and how they relate to daily activities

## **SUM OF THE PARTS**

Students are given a piece of paper with a river on one side. They are asked to draw whatever they want to do with the land. After drawing their picture, they are collected and lined on the floor to make a river. Each student sits behind their picture and describes how they would use the land. For every instance that pollution contributes to dirtying the river as it flows through a watershed the student is handed a pencil, paperclip, napkin, etc. These items represent pollution. By the end of the discussion the students at the end of the river will be holding the pollution. Through hands on activity, creative thinking, and discussion, students will learn that “everything flows downstream”.

Students learn:

- The difference between point and non-point source pollution
- Everyone contributes to and is responsible for the health of the river
- Choices on how to respect the land
- How to identify Best Management Practices
- What is a watershed

## **WETLAND IN A PAN**

Students will make a model that demonstrates the flood-buffering and filtering effects of wetlands. The model is made of modeling clay, a pie tin, sponges, and water. While discussing the benefits of wetland and why Indiana has lost 86% of their original wetlands, students will realize why it is important to save the remaining wetlands and learn about mitigation.

Students learn:

- What is a wetland
- How wetlands function as an ecosystem
- Why wetlands are not breeding grounds for mosquitoes

## **WEB OF LIFE**

In this activity, students will use creative thinking to show how different things found in nature make up an ecosystem. Each student will be given an index card representing something outside. All of the items on the index cards can be related to each other. The student holding the ‘sun’ card begins by telling what he/she does for an ecosystem. He/she throws a ball of rope to anyone they want but holds on to the end of the rope. The next person must describe a relationship between it and the sun. Then they hold on to the end of the rope and toss it to someone else. The game continues until everyone is holding a piece of the rope. The students will pull the rope tighter and feel that they are all connected to somebody else. The teacher will cut the rope and the ecosystem will “collapse”.

**Students learn:**

- Relationships between living and non living things in the environment
- How to think creatively and describe a real scenario of nature
- Each ecosystem is fragile and is dependent on each individual part
- Why it is important to keep from losing biodiversity

## **DROP IN THE BUCKET**

Do you know how much water there is on the earth? Do you know how much of that water is drinkable? How much is frozen at the polar ice caps? There is only a small fraction of freshwater on earth and students are able to use this experiment to demonstrate how small the number is compared to all the water on earth.

**Students learn:**

- How much of that water is available for human consumption
- Math concepts to visualize small ratios
- Wise use of water resources and smart decision making



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## **Tippecanoe County Drainage Board Awarded Grant Funds to Improve Water Quality in the Lauramie Creek Watershed**

The Tippecanoe County Drainage Board (TCDB) and the Tippecanoe County Surveyor's Office have been awarded grant funds as part of the Indiana Department of Environmental Management's (IDEM) Non-point Source Pollution Management Section 319 Grants Program. This federal program provides funding for various types of projects that work to reduce non-point source water pollution. Funds may be used to conduct assessments, develop and implement TMDLs and watershed management plans, provide technical assistance, demonstrate new technology and provide education and outreach. The funding will be utilized to implement Best Management Practices prioritized through the development of the Lauramie Creek Watershed Management Plan (WMP) completed in 2005.

The Lauramie Creek Watershed drains portions of Tippecanoe and Clinton County and is a tributary to the South Fork of Wildcat Creek. The Lauramie Creek Watershed covers approximately 23 square miles within the larger area of the Wildcat Creek Watershed and is located east and southeast of the City of Lafayette. Lauramie Creek has been identified as a priority watershed for four key reasons:

- Lauramie Creek is listed on the IDEM's list of impaired waters due to the presence of *E. coli*.
- Lauramie Creek is a tributary to the South Fork of Wildcat Creek, which is listed as an Outstanding State Resource Water.
- According to a recent study by Purdue University, the Lauramie Creek Watershed has the highest potential pollution ranking of all watersheds within the larger Wildcat Creek Watershed.
- Lauramie Creek receives runoff from both the Town of Clarks Hills and Stockwell, which have long histories of water quantity and quality problems.

Grant funds will be utilized to develop outreach and educational materials regarding water quality impacts specific to the Lauramie Creek Watershed. Cost share opportunities, which will provide watershed landowners with monetary assistance to implement conservation practices, are currently being developed by the Lauramie Creek Watershed Steering Committee composed of local leaders from both Clinton and Tippecanoe Counties.

For more information on the Lauramie Creek Watershed Implementation project, please contact Heather Buck from CBBEL at 317-266-8000 or [hbuck@cbbel-in.com](mailto:hbuck@cbbel-in.com).