



CREEK CONNECTIONS LINK

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Newsletter for CREEK CONNECTIONS

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Allegheny College's
CEED
Meadville, Pennsylvania

Fort LeBoeuf Gears Up for Symposium

by Ryan Mayle, Fort LeBoeuf High School

Now that it's time to start planning for the symposium in the spring, I'm sure everyone has been getting to work. However, independent projects in Mr. Dobi's Biology class at Fort LeBoeuf High School have been given a different twist. Not only are we coming up with a project, but, working with partners, we are incorporating it into a classroom lesson, complete with a lab. These lessons will then be taken to a middle school and taught to 6th and 7th grade science classes.

Sue McGuire and Jenn Martin are creating a lesson about the usefulness of macroinvertebrates. "It's about macroinvertebrates, their food chains, and how to do PTI problems," Sue said. "The students will look at macros that are alive and some that are pickled and complete a PTI problem."

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One of Mr. Dobi's Fort LeBoeuf Creek Connections classes on their way to kick net at their site.

Factory Farms and Your Water

by Lindsay Herendeen, Allegheny Student

The scene: rural western Pennsylvania. The landscape is dotted with farmland and farmhouses. Family farms continue to operate throughout much of the state and their owners are familiar faces in their communities. Perhaps you enjoy going to your local farmer's market and buying products directly from the farmer that grew or raised them. Connected to the land, many of these farmers are among our most important environmental stewards, using sustainable practices to ensure that their land continues to support their livelihood, year after year. They might use pesticides and fertilizers occasionally and in moderation, and some farms are mechanized. Many of these farmers understand the impact of their practices on nearby waterways and many main-



Factory farms, such as this chicken factory, can pose a host of threats, not the least of which is water pollution. Source: <http://www.sierraclub.org/factoryfarms/>

Learn more about factory farms at www.thematrix.com

tain robust riparian buffers, which protect water quality and prevent erosion.

The scene: rural North Carolina or Texas. Huge factory farms extend to the horizon and dominate the landscape in some areas. A factory farm is a large scale, industrialized operation that raises livestock. The owners of some of these farms often live far away and rarely interact with the local community. In some areas, only a few relic family farms remain; their survival in the age of agribusiness and factory farms is a day-to-day struggle. Work on the huge factory farms is often mechanized and can in-

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CREEKER CREATIVITY

This section of the *Creek Connections Link* features pieces by participating students related to their watershed discovery experiences. Let the poetry, prose, songs, limericks, drawings and other forms of creative writing flow from your pens like water running downstream. Become famous and have your creek creativity published in the next issue of the *Link*!

Catching Macroinvertebrates

by Caleb Hudspath, Seneca Valley Intermediate High School

The last time we visited the creek
We left a leaf bag there and let it be.
We left it there for a couple of weeks
Then went back to get it to identify the
creatures we would see.

There were many creatures, some big and small.
Some had many legs and some were found in homes.
The leaf bag was all muddy, slimy, and wet.
You wouldn't believe all the creatures we caught in this homemade net.

We identified them all and we made a mess.
We had tons of fun and found more creatures than the rest.
We then tested the water to see if it was clean.
It wouldn't be good if it was dirty and the creatures would think we were mean.

Catching Creek Creatures

by Jen Poletti, Seneca Valley Intermediate High School

Over the past month, there have been mesh bags submerged in the waters of the Little Connoquenessing Creek. These bags were stuffed with leaves and tied to tree trunks and other objects at various places in the creek to collect creatures.

But what creatures were Seneca Valley students capturing? Why? Well, for starters, we weren't "capturing" anything, but we were causing macroinvertebrates to gather in our leaf bags so we could study them. All four categories of macroinvertebrates (grazers, collectors, shredders, and predators) came to our bags to feed on the leaves and each other.

We retrieved our bags out of the creek after about one month by putting the mesh bag in a bucket then opening the bags and pouring the contents into smaller buckets. In those containers, we could study the macroinvertebrates found in the area of the creek where our bag had been tied.

In the murky, slow moving parts of the creek, we uncovered creatures such as midge fly larvae, while in the faster moving sections, we found mayfly nymphs. When we examined the creatures we found in our creek, we determined that we have a pretty healthy creek. It is interesting how you can determine how healthy creeks are just by examining the macroinvertebrates that live there!



The source of their inspiration: Seneca Valley Intermediate High School students that work with Ms. Griest sample this waterway--Little Connoquenessing Creek.

The Mystery of the Creek Creature

by Matt Carroll & Brian Shank, Seneca Valley Intermediate High School

Sitting on the surface of the water, this insect can be found waiting for its prey to come. What is this creature, you ask? Maybe the following clues will help you to solve the mystery of the Creek Creature.

A nickname for this insect is the Jesus bug. They can be found sitting on the surface of quiet, calm lakes, streams and ponds. When their water habitat dries up, these creepy crawlers burrow into the muddy pond floor until their natural home is replenished.

Are you fooled? The following may also help you. The insect is $\frac{1}{4}$ to $\frac{1}{2}$ inches long. Their narrow body is covered with hairs and they are dark brown or black in color. Their front legs are used for feeding, and their back legs for locomotion, or moving. Covering this creature's legs are hairs that are not easily saturated with water. This helps him to "walk on water."

Preying on backswimmers, midges, leafhoppers, springtails, and mosquito larvae, this insect waits for its main course to fall into the water, and then dines.

Can you solve the Mystery of the Creek Creature, or are you puzzled? Think hard and you may find the answer, or you could just look on page 8.



Source: McCafferty, W. Patrick. *Aquatic Entomology*, 1981.

Untitled

by Jessica Gereshenski, West Mifflin Area High School

This place was once beautiful;
now it makes me sick.
The smell and the slime,
so dirty and so slick.

I grind my teeth in anger
and turn my head away;
I wish, I wish, I wish,
it would all go away.

But the world spins wild,
the Earth's moving too fast.
This place was once beautiful,
but it didn't last.

Now it's my turn
to wipe away this waste,
and restore the beauty
of this wonderful place.

Factory Farms and Your Water- *continued from pg. 1*

volve the extensive use of chemical pesticides and fertilizers.

What are the potential impacts of factory farms on water quality? Large amounts of waste sludge and animal feces are generated on factory farm land and stored in underground storage tanks. While this eliminates the fear of direct runoff into streams or lakes, leaky underground storage tanks (LUST) create groundwater and drinking water pollution crises. As the tanks leak, manure and feces leach into the surrounding soil and percolate down into the groundwater. Once the groundwater is contaminated, it is possible for contamination to spread to nearby bodies of water and well systems. This then becomes a threat to recreational and drinking water.

Animal feces carry bacteria that, upon contact with water used for drinking or recreation, can pose a human health risk. Water-borne diseases such as *Cryptosporidium*, *E. coli*, and *Giardia*, are resistant to chlorine and other common wastewater disinfectants. The effects of these diseases range from mi-

nor discomfort to death. As soon as the manure and sludge leak from the storage tanks, drinking and recreational water is contaminated and humans are put at risk.

Another source of water contamination comes from the runoff of fertilizers pesticides, steroids, and antibiotics that factory farms use in production methods. Excess amounts of these chemicals exist on the surface of the land and in storage tanks. These chemicals may enter waterways by leaking out of tanks and leaching through the soil, or may enter bodies of water in the form of runoff. Nutrients found in these chemicals can cause algal blooms, fish kills, and eutrophication in nearby bodies of water.

Not all factory farms degrade water quality; however, their increasing dominance in the agricultural sector threatens to drive family farms out of business. With the loss of family farms comes the loss of numerous environmental stewards. You can help protect your local waterway by supporting family farms in your community.

Mastodons and Mussels in Conneaut Lake

by Nicole Mason, Creek Connections

Conneaut Lake is home to much more than ice fishermen this winter and the Blue Streak roller coaster and jet-skis in the summer: archaeologists have found evidence of woolly mammoths, mastodons, and wapiti in the lake and current populations are hailed for their biodiversity. The Lakeland Museum at Conneaut Lake Park may soon feature an interactive display of native mussels

Woolly mammoths once graced the shores of Conneaut Lake. The Lakeland Museum hopes to feature an exhibit on these creatures and other "mega-fauna," such as wapiti and mastodons. The display will also include freshwater mussels.



as well as other reference materials. Two research associates from the Carnegie Museum of Natural History, Carl Burkett and Gerald Lang, plan to conduct a mussel survey and may potentially involve Creek Connections students at Conneaut Lake and/or Conneaut Valley High Schools. In addition, the paleobiology (a branch of paleontology that deals with the origin and growth and structure of fossil animals and plants as living organisms) of Conneaut Lake will be synthesized in the display. The remains of five woolly mammoths have been discovered in the lake and mastodons and wapiti (a relative of deer and elk) are also thought to have inhabited the body of water. Evidence suggests that Native Americans may have used these animals for food. In the winter, Lang explained that they also used the lake as a refrigerator of sorts; in fact, the word "Conneaut" means "melted snow water".

Creek Connections in the "Spotlight"

by Nicole Mason, Creek Connections

Creek Connections was featured in the "Watershed Spotlight: Weekly Splash" of the March 5, 2004 edition of Watershed Weekly, an on-line newsletter produced by the Harrisburg-based Pennsylvania Organization for Watersheds and Rivers (POWR). The full text of this article is available on-line at <http://www.pawatersheds.org/Wweekly/issue.asp?ID=186>. The following is excerpted from that article:

Postal workers aren't the only ones who are braving the elements this winter; thousands of regional middle and high school students have been spotted on the shores of western Pennsylvania waterways. What could these students possibly feel so passionately about that they would leave the warmth of their indoor classrooms to explore the frigid streams in their own backyards? Water quality monitoring with Creek Connections, of course!

Despite the low temperatures outside, things are really heating up for Creek Connections schools. By the end of February, most participating classes will have conducted at least four water quality monitoring trips to their local waterways, many with the assistance of Allegheny College student interns. As a result of these water quality monitoring experiences, many students have started to explore some of the factors that might be affecting temperature, pH, total dissolved solids, dissolved oxygen, nitrogen, phosphorous, turbidity and alkalinity readings. Other students' interests have been piqued in learning about aquatic life, biodiversity, and bioindicators, stream geology, stormwater, water pollution, drinking water, watersheds and their topography and countless other water-related issues. Creek Connections students, or "Creekers" as they are often referred to, will engage in independent research to explore these topics and, just like professional hydrologists, biologists, and geologists, they will convene in April to share their findings at the 6th Annual Student Research Symposia.



CREEK CONNECTIONS STUDENT RESEARCH SYMPOSIA

Pittsburgh Area Symposium:

Friday, April 16, 2004, Camp Kon-O-Kwee, Zelienople

Northwestern Pennsylvania & Southwestern New York Region Symposium:

Friday, April 23, 2004, Henderson Campus Center, Allegheny College

Visit our website for more information. Events open to the public from 10 am to noon.

Drinking Water Fill in the Blank & Word Search by Nicole Scatena, Allegheny student

Complete the fill-in-the-blanks, then locate your answers in the word search.

Email Creek Connections (creek@allegheny.edu) for an Answer Key.

- _____ is water in gaseous form in the atmosphere.
- Water that is found below the surface of the earth is known as _____.
- _____ is water that is not absorbed into the ground and is found in rivers, streams, lakes, and ponds.
- Unpolluted freshwater that is safe for consumption is _____.
- _____ is the process by which particles settle out of water.
- The last step in removing unwanted particles from waste water is called _____.
- _____ is the last treatment process that uses a chemical to kill off any remaining bacteria. (Hint: this chemical is used to clean bacteria out of pools)
- Preservation of limited natural resources is known as _____.
- A disease that is spread through untreated water that has been contaminated by human or animal feces, is known as a _____ illness.
- A disease-causing organism is known as a _____.
- Presence of any coliform bacteria serves as a (an) _____ that the dangerous strains of the bacteria could be present in the water and that fecal contamination probably occurred.
- _____ is one test that helps us determine the amount of certain dissolved minerals. Water with high levels of this parameter is known to leave behind a white film on showerheads and faucets.
- Microorganisms that do not have internal cell membranes with the ability to live on the surface of marsh mud that can be seen clearly with the naked eye without a microscope are known as _____.

S U R G R O U N D W A T E R N A H
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 F B D C N A I I P A O O C O B L D
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 F K H H T S A D D A T M A T J D H
 D A K G Y W M E R O T A C I D N I

WORD BANK

Sedimentation	Surface Water	Potable
Indicator	Groundwater	Bacteria
Chlorination	Pathogen	Hardness
Water Vapor	Waterborne	Filtration
	Conservation	

Feature Creature

by Cassandra Hamilton, Allegheny student

I generally live in wooded streams, ponds, swamps, and marshes.

The male's plumage is very colorful and is composed of a rich blend of reds, glossy greens and purples, and some burgundy-brown. Two white "straps" are located on the chin and throat. Also, they have bright orange eyes and a reddish colored bill. The female's plumage is a rather dull brown color. But they do have a distinct white tear-shaped eye mark. The females are not as colorful as the males because they need to blend into their surroundings in order to protect their young.

The females lay up to 10 to 15 eggs, which are pale olive green or brown in color. The eggs generally hatch in four weeks. Since this type of bird generally nests in tree cavities or in man-made nest



boxes, the day old fledglings have to free-fall as much as 60 feet in order to make it to nearby water. A fledgling may bounce once or twice on the ground, but being made out of fluff and cartilage, they are rarely injured.

Can you guess what creature I am?

Answer can be found on page 8.

Testing Tips

by Nicole Mason, Creek Connections

Is your turbidity test out of range? Even after reducing the volume of water to the 25 mL line or even to the 12.5 mL line, is the water still too cloudy to see the dot?

If so, the LaMotte Company suggests a dilution: dilute the turbid water with distilled water (keeping track of the volumes of turbid and distilled water used) until the water is clear enough that you can see the black dot. Determine the turbidity of the diluted sample, then calculate the turbidity of the real sample by multiplying by the dilution factor.

Also, when collecting test kit waste, e.g., cadmium waste from the nitrates test, or barium waste from the sulfate test, be sure to store the waste in a container with a screw top, not a pop top.

Fort LeBoeuf Gears Up for Symposium

- continued from pg. 1

The properties of water are being explored by Jessica Havern and her partner, Matt Biedler. They're doing several activities to demonstrate various aspects of H₂O. "We're going to have the students put as many drops of water on a penny as possible, to demonstrate cohesion. Then we're going to make wax paper tracks and drop four different substances to show the importance of adhesion." Their lesson also includes other demonstrations. Jessica continued, "We are also going to show how a paper clip can sit on the water if you place it carefully. This shows how surface tension works."

As you can see, they are also making sure it's a lesson that keeps the kids' interest. Matt added, "There are fun experiments involved that show how special of a substance water is in an entertaining way."

Amy Russell and Jared Northrop are designing a lesson that teaches students the importance of riparian zones. "We are planning on having pictures and modules that demonstrate what a riparian zone does and what it looks like. Also, we are going to discuss how a good riparian zone affects water quality," Amy said. "It's important because kids need to know how to preserve water quality and an easy way for them to preserve it is to understand riparian zones and learn how to maintain them properly."

My partner, Lauren Morell, and I are doing our project on pH. We are teaching the kids the ideas behind pH, and then allowing them to hypothesize and then test the pH of many common household liquids. "It's more than writing a report; it allows them to learn new concepts with hands on activities. It also allows us to learn alongside them," Lauren observed.

Other projects deal with topographic maps, the effects of phosphorus and nitrogen, the basics of riparian zones, the effects of photosynthesis and respiration on pH, and pollution.

All in all, Biology 2 has been busy getting things together in order to become the teacher for a short while. However, the extra work pays off. A lot more is learned when you become the teacher compared to when you remain the student.

Best of luck to everyone as you work on your projects!

A Creek Connections Year at Fort LeBoeuf High School

by Sean McCartney, Fort LeBoeuf High School

Greetings from Mr. Dobi's advanced biology class from Fort Le Boeuf High School! So far in our Creek Connections year, we have gone to French Creek in order to study the creek's diverse macroinvertebrate life forms along with many other fascinating and educational activities. Each week we have had a couple of students go down to the beautiful French Creek so that we can test the creek for various water quality parameters. Some of these parameters that we check for include hardness, temperature, dissolved oxygen, and total dissolved solids. Of course there are many other tests that weren't mentioned, yet they are still done by our class on a regular basis.

Creek Connections has given our entire class some new experiences that dealt with water quality in our local waterway. A representative from Allegheny College named Jackie showed us some really fascinating things dealing with water quality indexes, watersheds, and how water permeates through the ground and into the water table. On one of her visits, she demonstrated the processes by which pollutant runoff enters into the water table. Along with this, she talked to us about the nonliving factors that are important for a healthy waterway. By understanding these things, my fellow classmates and I have not only been able to view

French Creek as a plentiful habitat to many aquatic and non aquatic organisms, but also we have learned about the delicate state that all waterways have. Since we have just learned this, we now have a more profound respect for French Creek. Without proper care, a waterway could easily end up with eroding riparian buffer zones and high pollution levels.

Additional activities done by our class include pollution tolerance indexing of a waterway by studying the macro invertebrates that inhabit the stream. We even took a field trip to French Creek so that we could catch some of these organisms and thus use them to find the amount of pollution in French Creek. I am happy to say that the creek is as healthy as it has ever been.

Right now, the biology class is working on trifold presentations that will be presented to people from our own school along with other schools. The trifold presentations are on a variety of topics dealing with water flow, watersheds, and waterways. Some of the trifold presentations in our class include themes on the riparian buffer zone and topographical maps. While there are a lot more themes than just this, the majority of them are still a work in progress. These concepts that are on our trifold presentations will be taught to a group of Middle School students hopefully sometime in January. This is a very important thing for us to do because it teaches younger students valuable information on what the Creek Connection program is about.

After many hours of studying French Creek, we have learned beyond what makes our creek a community treasure. With activities like fishing, kayaking, canoeing, and even swimming; it is no wonder why French Creek is such a valuable asset that must be protected from harm. The community would surely miss the serenity that comes from French Creek if it were to ever be harmed. I believe that local waterways everywhere should be thought of at an extremely high level by the local inhabitants. I am very pleased to say that Creek Connections has helped my class in viewing our creek.

Lauren Morell and her Fort LeBoeuf High School classmates are ready for the Symposia. Are you? Symposia are right around the corner so dive into your creek research today!

Stay Tuned...

by David Hall & Nicole Mason, Creek Connections

Look for these and other stories in our next issue, due out in May:

- In response to flooding at Wyman's Run-bridge near Cochranton in July of 2003, the Pennsylvania Department of Transportation (PennDOT) is working with the United States Geologic Survey (USGS) to assess the causes of the flooding and develop a plan to reduce flood potential. This flooding has become a problem since homes have been built adjacent to the stream within the flood plain. The stream channel in this area has been highly modified by gravel removal that occurred up until 1979. The USGS is now conducting studies to assess the sources of sediment, stream channel characteristics, and peak flow patterns. Once this work is completed, proposals for stream restoration and flood control alternatives will be developed. Students from Mr. Grzegorzewski's classes at Cochranton Jr./Sr. High School might be involved with the project, conducting a preliminary macroinvertebrate assessment on this site.
- The tree planting tradition goes on at Maplewood High School on April 28th as students will continue work begun last spring on a natural snow fence along I-79. Other schools in the area will be jumping on the riparian restoration wagon, too, with Linesville scheduled for May 6th on a tributary of the Shenango River and Titusville on May 11th on a tributary of Oil Creek.
- Complete coverage of the Creek Connections Student Research Symposia, slated for April 16th at Camp Kon-O-Kwee and April 23rd at Allegheny College.

MYSTERY OF THE CREEK CREATURE ANSWER

This creature (pg. 2) is a Water Strider, Family Gerridae.

FEATURE CREATURE ANSWER

This issue's Feature Creature (pg. 4) is a Wood Duck, *Aix sponsa*.

Connect to

CREEK CONNECTIONS

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