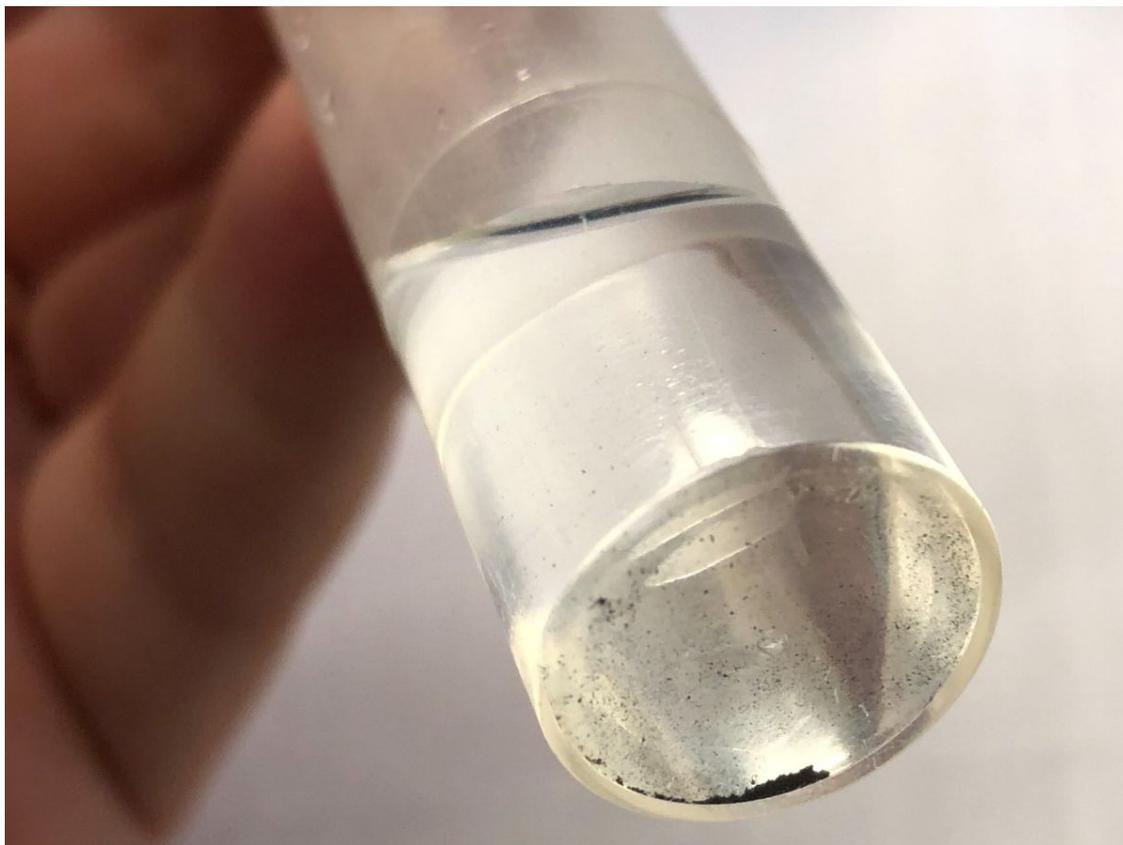


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Cadmium Particles While Testing Nitrates

By Blake Vowler, Allegheny College student

At the core, Creek Connections is science! Recently, some schools noticed that Cadmium particles were forming in the Nitrates test for the first time. The Creekers (Allegheny College student interns) went to work to determine why there was a sudden change.

The questions they asked:

Creekers performed the nitrates test with water samples from different sources, fish tank and distilled water, and used chemical packets that were on hand and newly purchased. Science, and scientists, at work!

What the Creekers found:

1. The distilled water had LOTS of Cadmium and much more than the fish tank water.
2. Remove all of the Cadmium particles or the test does not detect any nitrates.
3. Shake tubes hard enough and long enough (the full 3 minutes) AND wait 30 seconds for Cadmium particle formation for accurate results.

Takeaways:

1. Follow the test directions carefully.
2. Cadmium particles appear following the 3-minute shake and 30-second wait period and look similar to small pencil graphite shavings on the bottom of the test tube.
2. Dispose of any Cadmium properly -- in a separate container that is given to Wendy or Laura or a Creeker.
3. Newer reagents may be producing more Cadmium than older reagents.
4. The amount of Cadmium in water is inversely proportional to the amount of Nitrates.
5. Remove all Cadmium particles or the final result will not be accurate (nitrates will not register).

Cadmium is a heavy metal, which is an element on the periodic table that is generally a transition metal or a metalloid. Heavy metals are required for biological function but only in trace amounts. An over abundance of heavy metals can disrupt biological processes. In large quantities, they can damage nucleic acids - most importantly DNA - and many other important biological molecules like lipids and proteins.

Sources

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4144270/>

<https://www.hach.com/nitrogen-nitrate-color-disc-test-kit-model-ni-14/product?id=7640220990&callback=qs>



Trees Planted by Mosside Middle School Students

Ninety 7th & 8th grade students from Mosside Middle School (Gateway School District) planted 40 trees at Settlers Cabin Park this fall. Students learned how to plant large trees -- many were more than 15 feet tall and weighed more than 300 pounds -- using teamwork, communication, and muscle to get the job done! The trees were from the Allegheny County Health Department's Clean Air Fund. The Allegheny County Park Rangers and Allegheny County Landscape Architects partnered with the school to make this project a reality. Allegheny County Parks Foundation provided grant funding for transportation. The Robinson Run watershed was improved with this addition of native tree species which included American Beech, Hackberry, Eastern Red Cedar, and Chinkapin Oak.



Feature Creature

By: Alex Clifford, Allegheny College student

I'm an aquatic beetle who you can find swimming on the surface of the water in streams, ponds, and other wetlands when I'm in my adult form. As an adult my body is blackish, brownish, or metallic in color and is normally smaller than half an inch. I'm usually found in big groups of my kin, moving erratically across the water. I'm carnivorous and often prey on unsuspecting land insects who fall in the water, detecting them from the ripples they make. I hatch from eggs on the leaves of aquatic plants, and after my larval stage (which looks very different than my adult form!), I mature on land before returning to the water. When squeezed, I release a smell reminiscent of apples that tastes bad to my potential predators. Who am I? See answer in the green box at end of the newsletter.

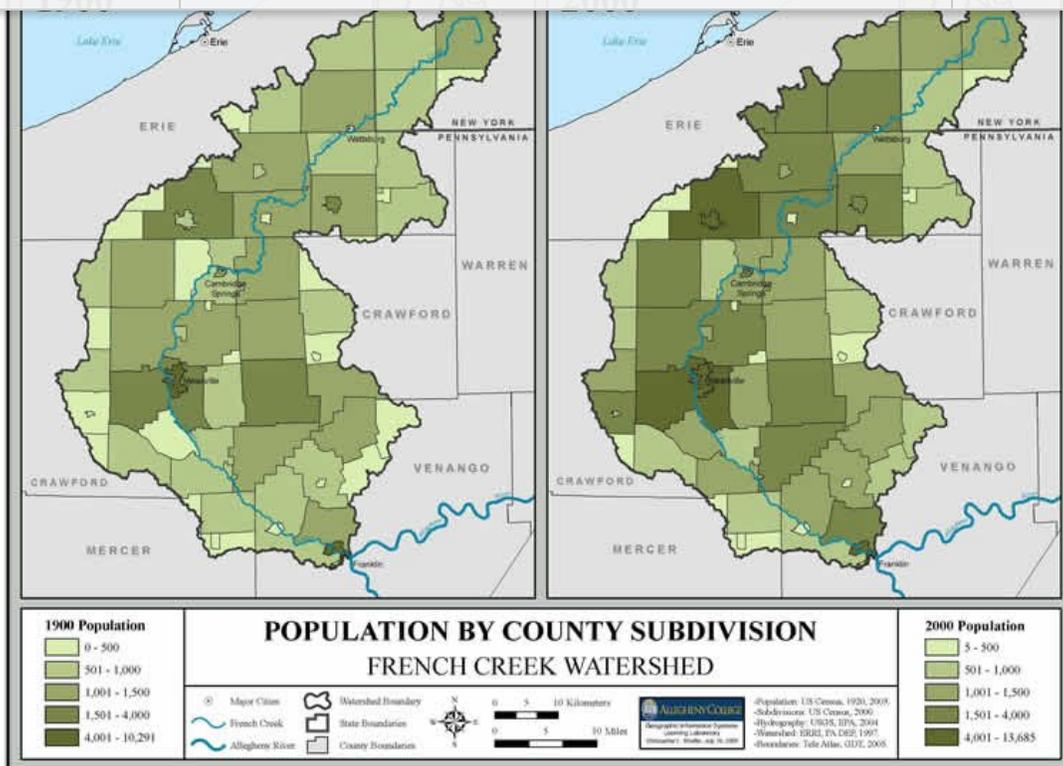
Nighttime Electrofishing on Cussewago Creek



By Madison Sherman, Allegheny College student

On an evening in October, a group of Creekers were given the opportunity to assist John Tautin, a retired Fish and Wildlife Service biologist and French Creek Valley Conservancy board member, with his independent fish survey of Cussewago Creek. Mr. Tautin holds the proper permits for electrofishing, which involves an apparatus that electrically stuns fish, making them easier to catch in a net. We supplemented the electrofishing with seining (driving fish into a large net) as well. Creekers tagged along for this special nighttime survey of Cussewago Creek within the property owned by the French Creek Valley Conservancy called Cussewago Riffle.

The results of that night's collection included a total of 22 fish species and 139 individuals, including one Ohio Lamprey. The lamprey was a unique and exciting find for us, especially because in Pennsylvania is a candidate species (in consideration for listing under the Endangered Species Act), and can be a rare find. Ohio Lampreys are parasitic, but their native establishment in the stream results in relatively low impacts/casualties on host fish populations. They are one of the only native parasitic lampreys, whereas most other lamprey species are non-parasitic. Parasitic lampreys have circular, toothy mouths for suctioning and latching onto their hosts. The habitat range of the Ohio Lamprey is both the Ohio and Allegheny River watersheds. The sea lamprey is another parasitic species, but it is invasive via introduction into the Great Lakes, so they are less likely to be found in our local streams.



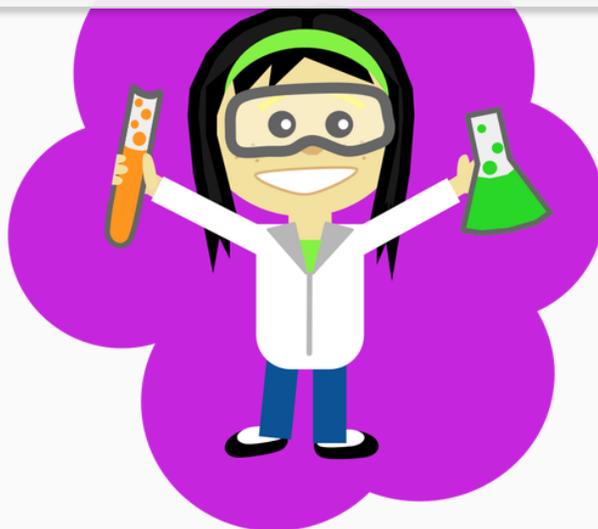
Meet a Module - WATERSHEDS

By Blake Vowler, Allegheny College student

The [Watersheds Module](#) is a great way to introduce students to what a watershed is and the broader idea of “we all live downstream”. Intended to make students aware of how water flows through the water cycle and potential impacts, the module includes two 3-dimensional models: one of a general watershed and one specifically made to model Pennsylvania's major watersheds. Students will learn how small changes to an area upstream can have a large impact on the ecosystem downstream. This is not only limited to the “natural” world; it discusses the impacts on humans as well. It is a smaller module with six activities but still full of information. This kit pairs well with our water chemistry testing kits, which would allow for the students to see what is normal for their creek and encourage broader discussions about how events upstream may impact the results they just recorded. To use this module and others, check its availability on the [Creek Connections website](#) and then complete the [online request form](#).

Testing Tip

By Kaitlyn Royal, Allegheny College student



Many of the tests we perform with Creek Connections require the student to shake the sample in order to dissolve the chemicals that were added. This can seem like a simple procedure step, but with just a slip of your finger, your sample could end up all over the ground or yourself! A few tips can help students avoid this disaster. First, before shaking, tightly secure the cap or stopper that is used to close the glassware.

Second, place your finger on top of the cap or stopper to avoid it popping off when shaking. Never use your finger or thumb to seal the container before shaking (swirl the liquid if no stopper or cap is provided -- Orthophosphate and Alkalinity test kits). Always use the provided stopper or cap. Third, when shaking the glassware, do so away from your face, down by your waist. This can avoid launching chemicals and creek water into your eyes, mouth, and the rest of your face. Also, turn the bottle upside down (invert) while shaking to better dissolve the chemicals. By taking a few simple moments, you can successfully complete your testing procedure without spills and splashes!

Current in the Creek



measurements, scavenger hunt, and Pennsylvania mammals.

The answer to this edition's Feature Creature is a Whirligig beetle, Order:
Coleoptera, Family: Gyrinidae.

Photo source: http://beneficialbugs.org/bugs/Whirligig_Beetle/Whirligig.htm

Information sources: <https://mdc.mo.gov/discover-nature/field-guide/whirligig-beetles>
<https://texasinsects.tamu.edu/whirligig-beetle/>

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