

# CLEAN WATER TAKES MUSSELS: A PEEK BENEATH THE WAVES TO WATCH FRESHWATER MUSSELS AT WORK

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Native freshwater mussels are inconspicuous, clean-water champions of our aquatic ecosystems. As filter feeding grazers, they continuously take in water through a siphon to feed on organic particles suspended in the water. As the water passes through their gills, it filters out not only their food, but also harmful bacteria, algae, pollutants, excessive nutrients (primarily nitrogen and phosphorus), and even metals, all of which accumulate in their tissues. The clean, enhanced water is then flushed through their exit siphon and back into the water column. A single freshwater mussel can filter at least 10 gallons of water a day. More mussels means more clean water. This results in improved water quality, improved food webs, and overall healthier lakes, rivers, streams and creeks. The critical role that mussels play in keeping our aquatic ecosystems clean and thriving is just as vital as



Student, Vinnie Terlizzi, displays this big guy, a Fluted Shell Mussel.

pollinators are to the food we eat.

But, exactly how fast can mussels in our local waterbodies clean the water? The answer to this question came on a cold, gloomy day in September, when ten students from Mr. Votis' Global Science Class from Three Lakes High School, got out of the classroom and into the field to study stream ecology. Ninemile Creek was their sampling site and field station for the day.

One of projects was to study freshwater mussels. For the first half of the study, the students conducted a timed mussel survey to identify and quantify the mussel species in Ninemile Creek. Before

they began the survey, the students received mussel monitoring training utilizing the Department of Natural Resource's Wisconsin Mussel Monitoring Program survey protocols. The



students then spread out in the creek, with their mussel collection bags in tow, and searched the sediment for mussels. They kept their eyes open for aquatic invasive species (AIS) as well. Within the twenty minutes, they collected 150 mussels and identified 9 different species that includes: Eastern Pondmussel, Fatmucket, Flutedshell, Giant Floater, Plain Pocketbook, Round Pigtoe, Spike, Three-ridge, and Wabash Pigtoe.

For the second half of the study, they conducted an experiment to see firsthand the changes in water clarity as a result of the mussels filter feeding behavior. The students filled two clear 50 liter containers with equal amounts of sediment and creek water. They carefully placed the mussels in in



Paul Matthie, far left joined the young scientists who helped with the mussel survey. Mr. Votis, far right is the science teacher at Three Lakes High School.



A tank shows the creek water with mussels in it and the other shows it without.



As their day progressed, students saw how mussels clarify creek water.

just one of the two containers of murky water and started timing the filtering process at 10:55 a.m. The students then carried on with the rest of their stream studies and stopped by the tanks often to evaluate the filtering process. By 1:15 p.m., the water in the mussel-filled tank was crystal clear and the water in the controlled tank was still murky. In fact, the time-lapse photos taken showed no change in the murkiness of the water at all. At that point, we ended the study before the mussels ran out of oxygen. The mussels were quickly, and gently, returned to the creek. No mussels were harmed during the survey or experiment!

The extreme change in water clarity that occurred during the 2-hour and 20 minute study demonstrated how the mussels act as tiny water-treatment plants because of their constant filtering of microscopic organisms and debris out of the water, cleaning lakes, rivers, and creeks in the process. The study provided a better understanding of the crucial role mussels play in cleaning and enhancing aquatic ecosystems. The study also provided an opportunity for the students to engage in a conversation about the devastating impacts that AIS, such as zebra mussels, can have on the freshwater mussel populations.

For the rest of the day, the young scientists collected stream data including water chemistry and stream flow, searched for aquatic invasive species, studied shoreline structure, collected macroinvertebrates and viewed them under their microscopes, and removed trash from the creek. Mussel monitoring data is reported to the Wisconsin Mussel Monitoring project in INaturalist.

This Global Science field day took place on September 13th, on Ninemile Creek, in Oneida County, WI. Instructors were Mr. Votis from Three Lakes High School; Paul Matthiae, volunteer instructor; and Stephanie Boismenu, Aquatic Invasive Species Coordinator & Conservation Technician, Oneida County Land & Water Conservation Department.

Please note: Freshwater mussels and clams are protected species in Wisconsin and it is illegal to harvest live mussels and clams from inland waters of the state. Of the 52 mussel species that occur within Wisconsin's lakes, rivers, streams, and creeks, 24 mussels are listed as threatened, endangered, or of special concern.