



# Thunder Bay River Watershed Project

Teachers and students reach across school boundaries to focus on researching and monitoring the health of local waterways within their shared watershed.

**Give students the opportunity to teach themselves through inquiry-based learning with real, local issues and their progress is impressive! These elementary students thrive with hands-on projects that stir up science, technology, engineering and mathematics excitement and education.**

## It Starts With One

Bob Thomson saw a problem. It was a study that claimed 1/3 of students would lose interest in science before they enter fourth grade. As a science teacher himself, he and his students created a regional school/community collaboration called the Thunder Bay River Watershed Project in an effort to reverse this trend.

## Taking Class Action

In 2008, Thomson's class created the Watershed Project to focus on understanding the health of the Thunder Bay river watershed by learning how to test the health and to determine how invasive species disrupt the natural balance of an ecosystem. Goals for the project had students collecting river data, understanding aquatic invasive species' (AIS) impact on the foodweb, and creating their own projects to address relevant issues. Through their research, students immediately became interested in how zebra and quagga mussels had forever changed the ecology of the Thunder Bay River and the Great Lakes.

## Localized Learning

Student-driven interest initiated the first AIS project which landed them in the river turning over rocks, looking for zebra mussels with members of the US Fish & Wildlife Service. They

count and measure each mussel to identify age and gain an idea of population, distribution and reproduction. The following year, a student research team ventured from the river to Thunder Bay on Lake Huron to study the attachment preference of zebra and quagga mussels on various substrates below the surface. With partnership from the Thunder Bay National Marine Sanctuary, the team later deployed class-made underwater remotely operated vehicles (ROVs) from the NOAA research vessel *Storm*. The student's ROV was equipped with a video camera that allowed them to see how mussels had inhabited the different substrates near the shipwreck *Oscar T. Flint* at a depth of 30 feet.



A second student AIS project was started to tackle the problem or eutrophication within the Alpena Wildlife Sanctuary. Invasive aquatic plants plagued the 500-acre Wildlife Sanctuary, principally Eurasian Watermilfoil (*Myriophyllum spicatum*), forming impenetrable mats that alter the ecological and recreational value of the Sanctuary. Suspecting that this vegetative growth was related to inflows of phosphorous and other nutrients, the students sampled four river sites upstream to test for phosphorous and nitrates. To help explore and research this problem further, their ROVs are utilized in sampling, accessing specific locations, and continued monitoring and recording of data for the Michigan DNR Alpena Fisheries Research Station.

## Small Crayfish, Big Impact

When Brandon Schroeder, Michigan Sea Grant Educator, introduced the students to the problem of the invasive rusty crayfish within local waters, the class quickly chose to accept the challenge of researching the lesser-known invader species as their next project. This project, consisting of classroom studies, river visits, marking

*"I've learned that zebra mussels can be very bad for the Great Lakes and we have to limit their population to protect native species."*  
Claire Toth, 5th grade



## Project Partners



and capturing crayfish and education outreach to the community, became known as the Rusty Raiders. Dressed in waders and life jackets, students collected and counted rusty crayfish to estimate population density within the section of river using simple algebra. They found startling results: the invaders had almost completely evicted native crayfish from that space. It was a discovery of an ecological shift that was happening all around them.

### Inquiry-Based Experience

It is not the objectives that are the true goal of these projects, but rather the underlining inquiry process that makes the projects important to the development of the students involved. Implementing inquiry strategies allows students to generate questions, conduct investigations, and develop solutions to problems through their personal reasoning and observation. This process is woven through each experience in



the Watershed Project and is the reason why so many students respond with excitement to these local projects and partnerships!

Mr. Thomson has seen this endeavor improve his student's math and writing skills by developing the ability to collect, analyze, and report data results and by organizing their thoughts into formal conclusions. All of these outcomes exceed the school mission for student success.

*"Still, the greatest benefit of connecting stewardship to the classroom is getting the students outside - as involved citizens. They start thinking for themselves and begin to see school as an opportunity, not just something they have to sit through."*

-Bob Thomson, Teacher

### Class Efforts Expanded

The Watershed Project began with one teacher, 24 students and a few community partners. Now, the project has grown to 22 teachers, 750 students, and 35 community partners. Through multiple grants - both national and local awards - the Thunder Bay River Watershed Project has supplied training, materials, and transportation for each participating school. It has grown to not only sustain itself, directly impacting students, but has now come full circle in becoming a community partner for other educational projects by contributing underwater research equipment to the local education service district in support of additional education programs regionally.

### What is Place-Based Education?

Place-Based Education (PBE) or Community Based Education (CBE) utilizes the local, natural and built environments as a context for learning and in doing so brings students into closer contact with their communities. This method is proven to develop knowledgeable and active stewards of the environment. When schools and communities work together, everybody wins!

#### Why:

This education strategy protects Great Lakes ecosystems, strengthens Northeast Michigan communities and provides critical support to schools as they strive to serve the academic and developmental needs of their students.

#### How:

Teachers and students are supported through project mini grants, connection to resource partnerships, and high-quality Professional Development that provides essential tools and techniques for fostering a collaborative culture of place-based learning within and among schools and their communities.

### Supporting Community Development and Resource Stewardship Priorities through education:

Since 2006, numerous local and regional partners have engaged in Great Lakes education, networking and planning efforts across Michigan's "sunrise side." These efforts mobilized a network of school and community partners committed to identifying needs and developing strategies for enhancing coastal access, education, and sustainable resource management. Empowered through funding support from the Great Lakes Fishery Trust (GLFT), this collaboration now comprises the Northeast Michigan Great Lakes Stewardship Initiative, one of nine regional hubs through which GLFT furthers the principals and practices of place and community-based education as the Great Lakes Stewardship Initiative.

#### You are invited:

If you care about Northeast Michigan and want to make a difference for the future of our region, please contact NEMI GLSI to find out how you can get involved.

Phone: 989.356.8805 x41 or [daniel.moffatt@noaa.gov](mailto:daniel.moffatt@noaa.gov)

Northeast Michigan GLSI network programs and materials are open to all without regard to race, color, national or ethnic origin, gender, gender identity, religion, age, height, weight, disability, political beliefs, sexual orientation, marital status, family status, or veteran status.

How can I participate in the NE Michigan GLSI Network?



Many partners are currently exploring community- or place-based education development opportunities within the NE Michigan region. For more information, visit us on the web: [www.nemiglsi.org](http://www.nemiglsi.org)

Who Can I Contact?

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