



Tales from the Field  
PLACE-BASED EDUCATION IN ACTION

*Tale #7: Remediating  
Shoreline Erosion*



This residential school on the south shore of a northern Michigan inland lake prides itself on its environmental stewardship of the school grounds and surrounding natural areas. Efforts have been made to design new buildings and paved access systems in ways that prevent silting and other pollution of the lake, as well as yard and building maintenance policies and procedures to reduce possible lake contamination. Students and teachers have been alert to areas that still need attention. The environmental science teacher at this school has identified potential problem areas and previously engaged students in remedial actions.

Two high school teachers from this school—biology and chemistry—participated in the DTE Freshwater Institute. In planning their place-based project, they consulted with the environmental science teacher for possible school site projects. A sandy embankment near the lake, where students frequently access the lake shore was suffering from a major erosion problem. School maintenance personnel had placed some large rocks in the eroded ditch as a temporary, but ineffective, solution. The DTE teachers decided to engage their students in a project to improve this site. After surveying the situation and identifying the major problems, they approached the school administration and maintenance staff to present their project idea. It was agreed that students could develop a plan and begin work on the site.

The chemistry teacher developed a detailed timeline for the project during the month of April. To organize the class into a project team, they identified a series of “jobs” that would need to be done for the project, including “site plotter,” “photographer,” “sample collection coordinator,” “lab chemist/coordinator,” “data compiler,” “report preparer,” and “presenter.” Students applied for the positions by indicating their top three choices, giving qualifications, and providing dates available to work on the project. Students collected soil samples from various locations at the site and at different elevations on the embankment. They did both a wet and dry sort of the samples; measured pH, phosphate, and nitrogen levels; and analyzed leaf and organic matter at the top and bottom of the embankment. They concluded that the erosion problem had dramatically diminished the soil quality at the top of the embankment. They developed a PowerPoint slide show of their findings for presentation to school administrators.

The biology teacher, using the soil quality information, consulted with the local conservation district to determine the best way to re-establish natural plant growth on the slope. Through the conservation district (using Institute classroom grant funds), various native shrubs were purchased for planting.

At the same time, students designed a wooden stairway to direct foot traffic to the beach. They made measurements, developed materials specifications, and created a budget. This plan, along with planting specifications and the soil analysis was presented to the school administration. The plan was accepted. Students obtained and planted shrubs, mulching and watering them as needed. The school agreed to build the stairs and install a rustic fence along the top of the embankment to prevent access to the shore except via the stairs.

In addition to this cooperative project between the biology and chemistry teacher, the biology teacher had organized a study of water quality in nearby lakes to identify biological and physical changes. This

involved four visits to identify changes. It was part of a larger study of lake succession and the factors affecting different stages in the process. The project resulted in students preparing reports on eutrophication and lake succession.

Because the curriculum at this school is a rigorous college prep program, teachers are sensitive to need to address core subject matter in both biology and chemistry. The place-based education project was primarily conducted outside the regular class schedule. It provided students with opportunities to apply subject-matter knowledge and skills to a real-world situation.

This is one of several *Tales from the Field* prepared by the external evaluators of the DTE Freshwater Institute, Science and Mathematics Program Improvement (SAMPI) at Western Michigan University. This vignette is based on a site visit to the school, interviews with the teachers, and review of student work and final products. It is part of a comprehensive evaluation that was conducted during the 2005-06 school year of the entire DTE Energy Freshwater Institute. For more information about the evaluation, contact Dr. Mark Jenness, SAMPI—Western Michigan University (269-387-3791 or [mark.jenness@wmich.edu](mailto:mark.jenness@wmich.edu)). For more information about the DTE Freshwater Institute, contact Becky Ewing, Great Lakes Water Studies Institute, Northwestern Michigan College (231-995-1787 or [bewing@message.nmc.edu](mailto:bewing@message.nmc.edu)). Prepared 7-06.