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The Fellow's Institute gave me the confidence to include water quality topics and testing in my curriculum. I created a lesson about water quality testing which I have used twice with two different classes. Each class went to the Wolf River and tested the dissolved oxygen at different locations. One class also tested the turbidity and macro invertebrate population; the other class could not do this because of colder weather conditions.

The materials used to do the testing came from the Water Action Volunteers (WAV) organization. WAV provided the nets, turbidity tubes, and HACH dissolved oxygen (DO) testing kits. The students practiced using the DO kits in the classroom with various mock water samples. The results from each mock sample were compared and discussions on what could be implied about where each mock sample came from were performed. We discussed how DO enters the water through waves and ripple action. We also discussed how temperature and decomposition influence DO. It was important to develop an understanding of how the environment contributes to water quality before we went out into the field, so the students could have some idea of what the field results would be before we started.

While in the field I needed to walk the freshmen students (a class of 55 students) through the DO tests, but my senior class (a class of 18 students) was able to complete the testing on their own. In each situation the DO testing spurred great discussions and helped the students analyze what was happening in the river. For example, we tested in a slow moving section above a waterfall, fast moving water below a waterfall, and stagnant water on a river bank. The students were able to identify how the different physical characteristics of the river were contributing to the results. The students were able to explain why the temperatures and DO levels were different.

I also noticed that the process of completing the tests and analyzing the results helped build the students' confidence as scientists. One student said she "felt like a scientist" as she was doing the DO titrations, which indicated that she has not had many experiences to work with chemicals in this way. This student was pleased with herself for being able to do "real science." The students who were comfortable enough to do the test on their own also displayed great self-satisfaction with their ability to collect field data and interpret their results. Overall, it was a great example of empowerment through education.

The biotic index testing was a lot of fun for the students as well. It was a great activity for students that feel a connection with the natural world. The students really enjoyed being out in the water catching the "bugs" and identifying each one to a particular family. Students that often have trouble staying focused on classroom "book work" were able to spend time completing this task without a lot of trouble because it was all hands-on. Explaining how we can use these organisms as indicators of the health of the ecosystem struck a cord with those who see the natural world as an important part of their lives. Some students became excited with their newly gained knowledge about how to interpret what they see in nature.

I will be bringing my seniors out again in the spring and early summer on regular intervals to continue the testing. My goal is to have them all be comfortable enough to complete all the tests on their own and write simple reports of their results. We will choose a local river system and monitor how it changes from a tributary to a spot down river near an industrial plant. I will also expand our testing to include pollutants like total nitrogen,

coliforms, and phosphorous. I plan to use the water quality PowerPoint presentations that I received at the Institute to build a complete unit on water quality issues for my senior class. Ultimately, I would like to have all the students (freshmen to seniors) involved with various environmental monitoring projects in the community.

Since the equipment I am borrowing has been so successful with the students, I will be using some of the mini-grant funds to purchase the same type of equipment. This includes HACH DO kits, D-nets, turbidity tubes, backpacks for carrying equipment, collection basins, hip-waders, and kits for testing pollutants. In addition to the water quality equipment, I will also be purchasing kits to demonstrate alternative energy concepts including fuel cells, solar energy, and wind energy. I will be able to use the alternative energy kits to help supplement the concepts related to preserving healthy water ways.

I have shared my work with my two administrators, two fellow science teachers, and three other freshmen core subject teachers. All have enjoyed hearing about the water quality project and have tried to help support it. Even though they have not been directly involved in the project, they have been very supportive and encouraging. This project has the potential to continue to grow to help our students become environmental stewards.