Mapping our Home Waters

Statement of Need
The world is a challenging and complex place these days, and young people are less connected to their home communities than they were in the past. Even through their experiences in school, students learn more about the history, geography and ecology of far away places than they do about our own Puget Sound region. Opportunities to learn locally are further limited by the ability of many public schools to plan and fund field trips for their students. The Homewaters Project addresses each of these issues through our Community Mapping program.

In Community Mapping, students learn about the geography and ecology of their local environment though classroom-based activities that utilize Geographical Information Systems (GIS). Our Community Mapping activities address Essential Academic Learning Requirements, and we provide training and resources to schools throughout the Seattle area free of charge. For the 2003-2004 school year, a key element of our Community Mapping work plan is to create a GIS module in which students use maps and data to analyze the relationships between land use, human impacts and water quality in the Puget Sound region. This replicable module will improve student understanding of the importance of our local water bodies and introduce them to sophisticated techniques for analyzing how human behaviors impact our most essential natural resource.

Goal of the Project
To create and provide high-quality curricular materials and teacher trainings that promote the use of maps and mapping to teach students from Seattle Public Schools how land use and human behaviors affect water resources in the Puget Sound region.

Project Objectives and Activities to Accomplish Them
- Design an effective, inquiry-based, classroom-based Geographical Information Systems (GIS) module for middle school students from Seattle Public Schools to learn about local land use and how human behaviors impact water quality.
  - Hire a Technology Intern for the Homewaters Project with expertise in Geographic Information Systems and interest in K-12 education to take the lead on the module (October ’03)
• Acquire up-to-date GIS data from the city of Seattle and King County (October-November ’03)
• With input from Seattle School District social studies and technology specialists and GIS professionals, create the module and supporting educational materials (November-December ’03)
• Complete draft of module and supporting materials (January ’04)
• Recruit and train 2-3 students from the University of Washington’s Department of Geography to assist teachers in the classroom (January ’04)
• Pilot the module with a classroom of middle school students; assess student understanding before and after completion (February ’04)
• Revise module based on results of pilot (February-March ’04)

➢ Prepare and empower six middle-school teachers to successfully implement the module with their own classrooms.
  • Advertise workshops and curricular materials to Seattle Public School teachers; recruit and select participating schools (January-February ’04)
  • Provide two three-hour workshops at North Seattle Community College or a participating school for teachers to learn the basics of GIS and how to use it to implement the module (March-April ’04)
  • Install software and data in labs and classrooms at participating schools (March-April ’04)
  • Meet with teachers before they teach the module to ensure that they have everything they need to succeed; schedule and coordinate UW volunteer support (Spring ’04)
  • Survey teachers for feedback after the workshops and upon completion of the module with their classrooms (Spring ’04)
  • Post student results on Homewaters website (Spring ’04)

➢ Improve student knowledge of how people affect water quality in the Puget Sound region and what individuals can do to make a difference. Enhance student knowledge of local geography and foster a sense of place.
  • Ensure the quality of the module’s content by seeking input from local scientists (e.g. Profs. Marina Alberti and Tim Nyerges from UW; Jonathan Frodge from King County) (November-December ’03)
  • Integrate student-driven investigations into the content of the module by allowing them to pursue their own questions and draw their independent conclusions. (Ongoing)
  • Assess student knowledge and attitudes before and after completing the module through pre and post tests (Spring ’04)
  • Share student results with other students through the Homewaters Project website. (Spring ’04)
- Contact participating students, when possible, one year from their completion of the module to assess their knowledge and attitudes regarding how humans affect water quality in the Puget Sound region (Spring ’05)

Evaluation Plan
In order to evaluate our success in reaching our objectives, it will be necessary to take a deliberate and proactive approach to soliciting feedback from participating educators, students and volunteers. We are aware of the importance of assessing what students learn through our educational programs, and our success is also dependent on whether we are meeting the needs of teachers. Therefore, we have included specific plans for gathering teacher feedback and evaluating student learning into the work plan above.

The definition of a successful module is one that is simple for a teacher with a minimum of technological background to implement in the classroom. Therefore, the GIS data need to be easy to load and interpret, the module instructions need to be easy to follow, and the teacher workshops must be well-organized, engaging and thorough.

We will design the module to have clear, age-appropriate learning objectives focused on helping students understand how changes in our local landscape (i.e. the construction of impervious surface) affect water quality. Success is contingent upon whether the majority of the students in the program demonstrate (through pre and post-tests) improved understanding of our local geography and hydrology, as outlined in the learning objectives. In addition, though following-up with students beyond the project year presents a challenge, we are committed to surveying a portion of the participating students in subsequent years to determine whether their experiences with the mapping module had lasting impact. If our results with these students indicate that they did retain knowledge and/or attitudes from their experience with the module, we will consider this an indication of success.

Not only will it be essential to the viability of the program to receive feedback from teachers, students and volunteers, it is also a priority for us to pose questions that are scientifically sound and produce results that are useful information to the broader community. GIS and scientific experts will help us evaluate our success in this area through providing advice on the content of the module during its design and in evaluating student results at year’s end.