

Extension IDAH₂O water quality program “Mobile Bug Lab”

The Situation

Results of recent research by Idaho’s Micron Corporation and University of Idaho found Idaho teachers and parents often underprepared to fully support their students or children’s needs in science, technology, engineering, and mathematics (often abbreviated as, “STEM”) concepts. Idaho’s workforce future needs include large increases in high school and college graduates who have strong “STEM” backgrounds. Teachers seek innovative programs to bring textbook lessons to life. After-school programs and summer camps are looking to science-based organizations for real-world, fun, interactive lessons that spark a love of science in kids.

Governmental, Tribal, and nonprofit organizations often are limited in curricular programs that align with their mission and students’ STEM learning needs. University of Idaho Extension Water Quality programs provide curricular resources to: a) facilitate high-quality hands-on learning experiences, and b) help teachers and parents “get” the STEM concepts to provide robust support for their kids.

One such program, the Mobile Bug Lab, was hatched from a working partnership between Extension’s Water Quality Office and the Coeur d’Alene Tribe Lake Management Department. During one kids field day event, the Extension Water Educator was having a hard time carrying all the equipment. A friendly comment made by a Tribal staff member, “Gee, Jim, you should get a little red wagon to help you move all your bugs and microscopes around...” was all it took to spark the idea.

Our Response

In early Summer 2013, University of Idaho Extension, Northern District water quality program developed a



IDAH₂O Program Assistant Marie Pengilly teaches Gear-Up students how to use microscopes. Photo by Jim Ekins

low-tech approach to bring the creek into the classroom. The Mobile Bug Lab utilizes a garden cart to tote live macroinvertebrates (periwinkles, stonefly, and may fly larvae) from a local creek and microscopes to K-12 audiences anywhere. Kids are introduced to the concepts of water quality and types of pollution, and then to the idea of aquatic macroinvertebrates; insect larvae live in the water, eat leaves and algae, and then in turn feed trout and salmon. The students use medium-power microscopes to understand differences among macroinvertebrates. Students are asked to describe and document what they see, through writing and drawing. This helps to meet science literacy standards and improves technical drawing skills.

IDAH₂O partners with curricular organizations such as Idaho’s Project WET to provide additional coordinated learning activities. A favorite of the IDAH₂O staff (and students, too) is “Macroinvertebrate May-

hem," found in Project WET's Curriculum and Activity Guide 2.0, on page 343.

Program Outcomes

During Summer, and Fall 2013, Extension delivered Mobile Bug Lab lessons to 272 K-12 students and science camp attendees; 42 parents and chaperones were directly involved with the kids' activities. These included the Benewah 4-H Natural Resources Camp, Coeur d'Alene Tribal Rockin' the Rez program, and multiple local school-based science days.

After each activity, K-12 students were able to answer a standard list of pre/post-activity questions more completely and quickly, with a greater level of detail than before. Adults also indicated a new knowledge about the presence and importance of benthic macroinvertebrates to area fisheries.

Two hundred eighty-two additional adults had a Bug Lab experience through organized demonstrations or educational presentations. These included an invited presentation at a monthly meeting of the Coeur d'Alene Chamber of Commerce. Adults often remark that they had no idea that so much life exists in creeks, and most express a strong interest in learning basic ways to protect surface water resources.



Stonefly larvae as magnified by a bug viewer. Photo by Jim Ekins

The Future

Mobile Bug Lab equipment is now being incorporated in IDAH2O Master Water Stewards workshops and will be available for other organized adult education and citizen scientist programs. Curriculum and new activities are constantly being added. The program is in the process of being expanded in equipment available, and in Extension offices that have their own versions. Extension continues to work with area school districts to incorporate the Mobile Bug Lab into classroom science curriculum.

Cooperators and Co-Sponsors

University of Idaho Extension, Northern District
University of Idaho Coeur d'Alene
Community Water Resources Center at UI Cd'A
Idaho Department of Environmental Quality
Coeur d'Alene Tribe Lake Management Dept.
Idaho Project WET
iSTEM from Excellence, Lakeland School Dist.
City of Coeur d'Alene

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