

IMPACT

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IDAH₂O Master Water Stewards: Experiential science training for K-12 teachers

AT A GLANCE

IDAH₂O Master Water Stewards Program brings water science principles and guided-inquiry teaching training to life for dozens of Northern Idaho area K-12 teachers.

The Situation

There is a significant need to inspire as much as equip students to understand science, technology, engineering, and math (“STEM”) subjects to meet future Idaho workforce needs. 67% of industry leaders in STEM professions stated in one study that they experienced a transformative moment in elementary or middle school that set them on the course toward their career. If it weren’t for early impactful experiences, they may have lost interest in STEM subjects by high school. This excitement needs to be engaged early, and sustained throughout youth development, in an abundance of classroom- and after school offerings. Educators, too, must be equipped with the knowledge, adaptive expertise and confidence in teaching strategies to create learning environments where transformative experiences are possible. Recent research in Idaho demonstrates that many educators have had little cohesive coursework and experiences related to science education, and those who do have such training are hungry for more. This concern is compounded by recent projections of large increases of STEM-related jobs in Idaho’s future.

Our Response

In response to the immediate need for overcoming barriers to STEM education in Idaho and in the nation, University of Idaho Extension Area Water Educator, Jim Ekins, worked with multiple organizations and school districts to bring IDAH₂O Master Water



A little rain didn't stop these in-Service high school teachers with Adventure Learning@ from learning the IDAH₂O science protocol. Photo credit Jim Ekins.

Steward workshops to a whole new audience: K-12 teachers and their students. Lakeland School District and University of Idaho Extension, landed grant funding from Micron Corp. to develop a model, *iSTEM from Excellence*, that increases STEM literacy for 3rd – 5th grade teachers, students, and parents. Extension also partnered with the U-Idaho Adventure Learning@ program, funded through an NSF MILES grant, to bring science literacy training to N. Idaho area high school teachers. Extension delivered training to a wide selection of pre-service teachers through a partnership with U-Idaho Curriculum and Instruction (College of Education). Finally, Extension partnered with the Confluence Project/GK-12 Fellows program, providing science graduate students placed in area classrooms to be “experts, advisors, and mentors” for teachers and students alike. Finally, Kellogg School District provided certification to teachers throughout the district. Canyon Elemen-

tary and Kellogg High School students are already collecting and analyzing data on water quality on streams that flow directly through the schoolyards. IDAH₂O is a powerful and accessible way to learn more about the science behind watershed processes and water quality. Many K-12 elementary teachers have had little science training in college, or have been away from a science classroom for a long time. IDAH₂O was built to be accessible to people without any science background. It also aligns well with other Extension curriculum, such as the 4-H "There's No New Water" program. The basic science, and science education, principles taught in the IDAH₂O workshops inform all sorts of STEM-related topics beyond just water.

Program Outcomes

38 K-12 teachers throughout Idaho's panhandle, as well as 15 were trained as Master Water Stewards. Through these partnerships, Extension's program reached into ten regional high schools, and 360 total estimated high school students and 8 elementary schools, totaling at least 200 students. The regular IDAH₂O workshops were enhanced with discussions of specific ways the science can be taught using the program. These teachers have already developed and implemented field experiences for their students. With IDAH₂O program support, the teachers break down the concepts into age-appropriate, bite-sized chunks. The program has demonstrated an increase in student depth of knowledge in water science principles from students in 4th grade, 6th grade, and high school science courses.

In addition, data from our research demonstrate that teachers also remember the material over time better than in traditional science classroom settings. IDAH₂O provided support for a select group of teachers in one study throughout the 2013-2014 school year. These teachers a) improved water science knowledge on a 100-point test by an average of 41 points, and then kept that knowledge when tested again twice over the school year.

Finally, these teachers are also ready to become volunteer citizen scientists, able to contribute valuable water quality monitoring data on local streams as the program was initially designed. And many of their students will likely, too.

Cooperators and Co-Sponsors

- Micron Corp.
- Adventure Learning@
- MILES/EPSCoR
- School Districts: Lakeland, Kellogg, Post Falls, Coeur d'Alene, Gar-Pal, St. Maries, Lewiston, Potlatch, Troy, Moscow
- University of Idaho Dept. of Curriculum and Instruction
- University of Idaho Waters of the West Program
- Idaho Water Resources Research Institute

FOR MORE INFORMATION

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