



X-stream Team

A collaboration
between the US
Forest Service and
the University of
Oregon
Environmental
Leadership Program

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THE ENVIRONMENTAL LEADERSHIP PROGRAM

The University of Oregon Environmental Leadership Program (ELP) offers professional opportunities for undergraduate students to get hands-on experience with Environmental Education (EE). The various missions of the ELP are to develop professional-level research, writing, and presentation skills, provide low-cost services to agencies and organizations in Lane County; and to create a network of professional relationships among UO students and the surrounding community. This unique program pairs undergraduate students with community partners including government agencies, non-profit organizations, and local businesses. Environmental monitoring, mapping, education and outreach projects allow students to put into practice the principles, knowledge, and skills learned in the classroom.

THE X-STREAM TEAM

In this particular project, the ELP's X-stream Team paired with the United States Forest Service for a two-term project aiming to educate students in Lane County about stream ecology. During the winter of this year we learned about EE practices and theories. In order to become effective teachers of EE, we explored various styles of learning such as experiential, inquiry, constructivism, and also learned how to reach students with various levels of intelligence. Furthermore, we investigated which techniques were best suited to approach these different modes of learning. In preparation for our teaching experiences we gained facilitation experience by designing our own lesson plan to administer to our class. By creating learning objectives, following a step- by- step content guideline, and evaluating ourselves and others as effective instructors we received real teaching experience while in the comfort of a classroom setting. A workshop provided by Project Learning Tree enabled us to develop activities that meet Oregon

state benchmark requirements. By the end of winter term, we had each designed our own lesson plans. After sufficient study of environmental education, we were prepared to implement our lesson plans and activities in Lane county classrooms.

During spring 2007, our team used the Stream Simulator, designed and crafted by Ernie Ledbetter of the US Forest Service, as a tool to successfully implement our lesson plans. With this teaching tool in hand, we were ready to head out to classrooms. During the first week of the term we pilot tested our lesson plans on fellow team members and developed contacts with schools order to set up classroom presentations. We got positive feedback from a variety of schools in the area, and were able to schedule visits to ten different programs.

The experiences in classrooms helped us gain knowledge about teaching EE to children, which proved challenging in some cases due to the varying needs, learning levels, and demands of the students. In the end we were able to adapt our lesson plans thanks to the experiential knowledge we gained as we practiced them in front of different audiences. In addition, we improved our presentation skills thanks to personal reflection as well as evaluation from teachers and our peers. After the completion of this portion of the project, our team had acquired the skills and confidence to effectively implement environmental education lessons and activities.

OUR COMMUNITY PARTNER: THE UNITED STATES FOREST SERVICE

Established in 1905, the Forest Service serves as an agency of the U.S. Department of Agriculture. The Forest Service manages a variety of public lands, with an overarching mission to provide the greatest amount of good for the greatest amount of people.

While many perceive the Forest Service to only be involved with forested lands, this is a misconception. They are also the managers of grasslands in the Midwest, glacial areas in

Alaska, and even collaborate in working with ski resorts that sit within National Forest boundaries. The X-Stream team's partnership with the US Forest Service focuses on rivers and their significance in the overall health of ecosystems.

The US Forest Service owns over a quarter of all the land in the state of Oregon. This includes multiple national forests, recreation areas, and even a volcanic monument. It also encompasses over 1,200 miles of wild rivers. Most residents of the state of Oregon encounter a river in their everyday lives, for they are in our backyards and they often serve as our playgrounds. Our team's goal in partnering with the Forest Service was to inform the Oregon community about overall stream health and how their personal actions affect the rivers around them.

Due to the close proximity of our neighborhoods to rivers, there is a real community need to inform and educate our youth about important river issues. By embarking on this project, our team has committed to educating Lane County students on topics of stream ecology including ideal salmon habitat, the various forces of erosion, importance of microorganisms, and the general history of the rivers that surround them. Relating the knowledge they already have of scientific processes to the impacts they can have on rivers, we hope to motivate them to be environmentally conscious individuals. By reaching out to the younger generations our team hopes to inspire the community to move from simple awareness of river issues to being a proactive society which strives for a healthy balance with the surrounding environment.

OUR LESSON PLANS

As part of the Environmental Leadership Program, we were asked to create educational lesson plans that incorporated the use of the Stream Simulator. These lessons were to be easily used by Forest Service employees as well as teachers across the state. In order to create lesson plans that would be useful to teachers with strict demands on class content, we researched Oregon state benchmark standards so that each activity would be addressing a required topic for the grade level. We also used our knowledge of education theories to produce effective activities for students of all ages. The lesson plans we created can be adapted to reach audiences of students K-12, with each lesson plan meeting Oregon state benchmark standards. Our full lesson plans can be found in Appendix A.

For younger audiences, the “River Raiders” lesson plan focuses on introducing students to general stream ecology topics, specifically salmon and their ideal habitat. This set of activities allows students to be fully engaged through a carefully designed role-play activity. Another lesson that is geared towards elementary school students is “Yes P.L.E.A.S.E. Trees,” a metaphor activity that helps students to understand the importance of stream vegetation. “Splash into the Willamette”, a set of activities that focuses on the history of salmon in the Willamette Valley, provides students of all ages with a clearer understanding of Oregon’s salmon resources.

For students in middle school we developed a lesson that focuses on the different factors that influence erosion, such as water, wind, and gravity. “Erosion Loco Motion”, closely examines water erosion by allowing students to witness a large simulated flood.

“Diatomation” is a lesson designed for students with a more developed understanding of science, specifically biology. The activity discusses the importance of micro-organisms within a stream system. The activity requires students to develop a vivid understanding of these organisms using actual samples of algae, and by viewing water samples under a microscope.

COMMUNITY INVOLVEMENT

This spring we were able to take the lesson plans we developed into schools and gain valuable teaching experience. We visited six different schools and participated in four outreach activities. We estimate that we reached over 300 students; a short synopsis of each visit is included below.

Lincoln Middle School

We visited Lincoln Middle School's 7th and 8th grade science classes. The teacher explained that the previous day, she gave a lesson about erosion, and therefore she would like us to do a follow up activity and present the "Erosion Loco Motion" lesson plan. We were responsible for teaching six different classes of approximately 30 students per class. This was our first experience in a teaching atmosphere and it went quite well.

Kennedy Middle School

Three of our X-stream team members visited Kennedy Middle School in Eugene. The teacher of a 7th grade special education class wanted us to present the activity "Yes P.L.E.A.S.E. Trees." We began by discussing the metaphor activity indoors, and then took the students outside in order to have hands-on time with the Stream Simulator. We received very positive feedback from the teacher about our presentation for the class, stating that the activity made it easier for her to gauge what the students had learned from their previous discussion on stream ecology.

Agnes Stewart Middle School

Agnes Stewart Middle School invited us to come for their annual Aquatic Education Field Day. We presented our lesson plans during four different sessions throughout the day, conducting "Yes P.L.E.A.S.E. Trees," a modified version of "Diatomination," "Splash into the Willamette,"

as well as an adapted activity from the “River Raiders” lesson plan. On this day we estimate we reached over 50 students with our fun and engaging education programs.

Oakridge Outdoor Experience

Two of our members were lucky enough to be able to participate in the 2007 Oakridge Outdoor Experience at the Oakridge Fish Hatchery. On this day team members presented “Splash” and “River Raiders.” This presentation was set up for us by our community partner, who participates in this event annually and was excited to have us there.

The River House

This event was brought to our attention by a member of the ELP’s Forest Team. The River House is an after school science education center that presents fun, but educational activities to students of various ages. Instead of presenting a lesson plan that we created to use in part with the Stream Simulator, our team member opted to create a new activity entitled, “River Doctors.” Students imagine they are doctors that need to help cure an unhealthy stream represented in the Stream Simulator. This activity proved successful in engaging the students to think about characteristics of a healthy river system.

Springfield B Street Head Start

Our last education outreach experience was at the Head Start center in Springfield. Our team attended both a morning and afternoon session, working with children under the age of five, to teach them basic stream terminology and processes. Instead of conducting one of our lesson plans, due to the age level of the students, we opted to focus on stream ecology basics. The children had a great time getting their hands wet and playing with the educational tool.

Willamette Valley Folk Festival

The Willamette Valley Folk Festival allowed us to participate in a number of workshops throughout the day. We set up the Stream Simulator and invited people passing by to learn more about our project as well as to engage in the Simulator. On this wet and rainy day we experienced a very wide range of age groups (from two years to 7th grade) and had fun watching them learn about river systems.

Joint Campus Conference

We took the Simulator to the UO, OSU and PSU Environmental Studies Graduate Joint Campus Conference to give afternoon workshops to those participating in various talks and lectures. The first part of our presentation explained the work of the Environmental Leadership Program and our involvement with the US Forest Service. We used the rest of the time to demonstrate the facilitation of a selected lesson plan. Our presentation informed graduate students and professors of the usefulness of a hands-on educational tool such as the Stream Simulator as well as the importance of educational opportunities for the community at large.

The H.O.P.E.S. Architecture Conference

The Holistic Options for Planet Earth Sustainability, or H.O.P.E.S. conference, was another outreach opportunity we participated in. Those attending this conference were mostly graduate students and professors. We used this opportunity to inform the public of our project as well as to advertise for prospective contacts.

University of Oregon, Fluvial Geomorphology Class

The University of Oregon's Fluvial Geomorphology class borrowed the Stream Simulator in order to broaden their knowledge base about how water moves over land. The class designed and conducted experiments about dam collapse, flooding, and drought in order to study the erosive effects of water. This allowed our team to become more familiar with the Stream Simulator, as

well as opened our eyes to its potential as an educational tool with older audiences. It was fascinating to see the wide range of class levels that the Simulator can be used with.

CONCLUSION

This program brought forth many realizations for our team including the recognition of the importance of environmental education. The extent in which EE has been excluded from our educational system is discouraging, however, many advocates are currently working on its integration into our schools. EE provides children with an clear understanding of the effects their actions have on the world. During the program children actively participated in learning about the environment and made impressive observations. Although our team's contribution may have been a small step, it is part of a larger movement that seeks to make society more aware of the impacts they have on the natural world. We are grateful to the US Forest Service and the ELP for this opportunity and look forward to seeing this program continue in future. Both the students of the University of Oregon and the students of Lane County have much to gain from this partnership.