EDUCATION OUTREACH EVENT REPORT AND RECOMMENDATIONS

Participant and Report Writer's Name:
Joseph J. Kerski - USGS - Denver Geographer

Location: Boulder County, Colorado

Event Date: 28 June 2005

Purpose of Event:
Earthworks GIS and GPS Workshop for Educators

Other USGS Participants:
Dr Pete Modreski, Central Region Office of Communications

Summary

I taught a GIS and GPS class as a component to the Earthworks course conducted by the University of Colorado's Cooperative Institute for Research in the Environmental Sciences (CIRES) at the Cal-Wood Environmental Education Center in Boulder County, June 2005.

Dr Susan Buhr (CIRES Education Outreach Director) and Joseph Kerski (USGS). It was a pleasure to work with Dr Buhr and with Dr Genevieve Healy at the workshop and I thank them for inviting me.

CalWood, site of Earthworks. I was so impressed by the facility and staff that I have chosen it for the site of the 2006 GeoTech Colorado institute. This is scheduled for 30 July-4 August 2006. For more information on Cal-Wood, see: http://www.calwood.org/

Since 1967, CIRES has provided a productive setting for collaborative research and teaching in the wide-ranging disciplines of the environmental sciences. The goal is to improve understanding of the Earth as a system. I have kept in touch with CIRES over the years and it was excellent to work with them on Earthworks.

I have a great deal of respect for CIRES' commitment to education. CIRES strongly supports and encourages education outreach. They have established programs for K-12 school districts, teachers and students, undergraduates at the University of Colorado and elsewhere, and other community groups. They support exemplary science education at all levels, encourage curiosity and understanding about our environment, and bring CIRES research to bear as a resource in service of societal needs, including education. CIRES K-12 Outreach Program combines rigorous

science with innovative teaching practices.

Earthworks is a one-week workshop for secondary science teachers from around the country. With the help of practicing Earth scientists, participants design and conduct a field-based interdisciplinary study. Participants apply for Earthworks, and there is no cost to the participants, as it is funded by grants via CIRES.

The goals of Earthworks workshop are to: provide teachers with an introduction to Earth system science that will encourage and enable them to pursue learning about our planet with their students, guide teachers through a learner-centered experience in which they can develop an understanding of Earth systems and share that understanding with others, connect teachers with scientists who study Earth systems and develop an Earth system science learning community.

Science Lab at Earthworks.

During Earthworks, teachers conduct research projects in Earth system science topics. Equipment and resources are provided by CIRES and CalWood, and the diversity and wonder of the local environment provides a unique setting for investigations of soils, geology, wildlife, weather, water quality, aquatic life, and more.
CIRES staff is flexible and the workshop is adjusted each day to meet participants' needs. In group discussions, they focus on practical strategies for classroom implementation, pedagogical ideas, and development of individual plans for the subsequent school year.

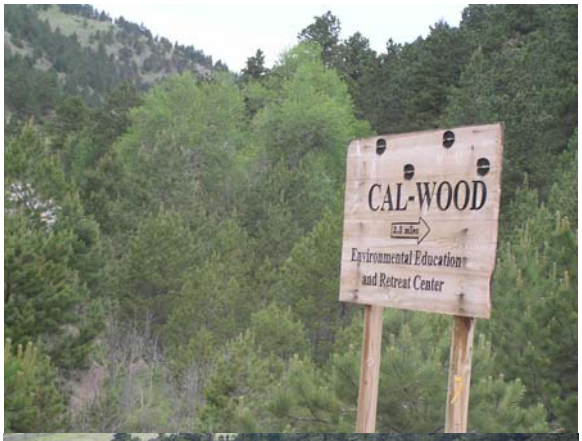
Earthworks is primarily designed for new teachers, those in their first three years of classroom teaching, but highly-experienced and mid-career teachers are also encouraged to apply.

For more information about Earthworks, see:
http://cires.colorado.edu/education/k12/earthworks/

Participants uploading their GPS coordinates and field data into the GIS for spatial analysis. As I expected, they were enthusiastic, intelligent, and inquisitive. They dove right into spatial analysis. Before we went into the field, we analyzed earthquakes and plate tectonics using ArcGIS 9. This mobile laptop lab was the result of efforts by Dr Bob Ridky, USGS education director, and I and all participants appreciated the use of these computers. This is the perfect setting for a mobile setup.

Joseph Kerski, left, with some of the participants during our fieldwork with GPS.

Downstairs lab at Cal-Wood.



I brought USGS lessons, maps, and books for the participants and encouraged them to use our resources in the future.

The Cal-Wood Environmental Education Center, in the Rocky Mountains about 20 miles northwest of Boulder, Colorado.

The Cal-Wood 1040-acre site includes

hiking trails, forests, ponds, streams, an old homestead, and an abandoned mica mine. Active populations of deer, elk, mountain lions, black bears, bobcats, and numerous species of birds reside at Cal-Wood.

Much time is spent outdoors during any workshop at Cal-Wood, Earthworks included. Participants can stay in Cal-Wood's log cabins or can camp in their own tents. Shower and bathroom facilities are located in the main lodge, approximately 30 yards from the cabins. Each cabin is equipped with 8 bunk beds, lights, modern propane stoves, and a front deck with benches.

Dining Room at Cal-Wood.

Joseph Kerski at Longs Peak lookout at Cal-Wood.

More wonderful vistas at the training site.

Summary

Earthworks illustrated the sustained, growing interest that educators have in using geotechnologies in education. GIS can be used in an innovative, inquiry-driven, problem-solving manner in many different subject areas. As more teachers become interested in these tools, students will benefit through increased critical thinking, problem-solving strategies, interdisciplinary thinking, and career opportunities.

Acknowledgements

I thank the USGS for their support of the time for my attendance at this event and to Bob Ridky for the computers. I thank the participants and Pete Modreski for his annual commitment to Earthworks and for supporting the educators there. I appreciated Gayle Langan's help with the computer configurations.

Recommendations

The power of spatial thinking and geotechnologies help students to investigate the world using 3D fly-throughs, maps, images, and databases about topics that are interesting, relevant, and provide good career opportunities. This workshop emphasized interdisciplinary linkages between geography, mathematics, history, and science. It also emphasized examining real-world issues in standards-based education. These tenets can continue to transform education to help students to be the problem-solvers we need to solve 21st Century problems.

I believe that federal organizations have a role and responsibility in helping people to use our data and products. Our relationship with CIRES is longstanding, and I will do all I can to ensure that it continues. We need to remain involved in education as an agency.

View of the Front Range from Cal-Wood.

*** End of Earthworks Workshop Report ***