EDUCATION-PARTNERSHIP EVENT REPORT AND RECOMMENDATIONS

Event:
Digital Library for Earth Systems Education (DLESE) Annual Conference

Attendee and Report Writer's Name:
Joseph Kerski, Geographer:
Education/GIS, Denver, USGS.

Location: University of Colorado, Boulder

Other USGS Attendees:
Robert Ridky—USGS Director of Education, Reston VA

Chris Polloni–USGS Research Scientist, Woods Hole, MA

Event Dates: 2-5 August 2003

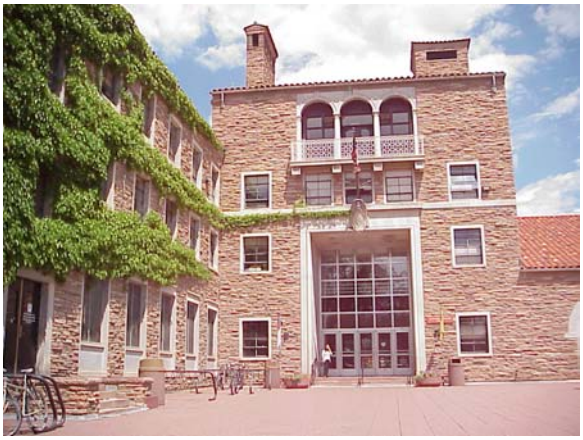
Purpose of Event:
To strengthen and broaden DLESE by networking with Earth Systems researchers and educators in an annual conference.

About DLESE

DLESE is an endeavor to improve the quality, quantity, and efficiency of teaching and learning about the Earth by developing, managing, and providing access to high-quality educational resources and supporting services through a community-based, distributed digital library. This is quite an ambitious task! Fortunately, those in the DLESE community are experts in their fields, they are dedicated, and they have NSF support for their activities. The library at http://www.dlese.org includes thousands of resources contributed by educators, sophisticated search tools that allow searching on science standards, topic, and much more, and detailed metadata about the resources. DLESE is much more than an online digital library, however. It is a community of learners who continually review the collection, and provide support and networking for issues and specific users.

Interested persons can participate in DLESE by contributing a resource to the library, creating a special collection in the library, reviewing a resource, joining a discussion group, attending the annual conference, acting on the recommendations from the strands in the 2003 meeting (see below), publicizing DLESE, and in other ways.

About the DLESE Annual Conference



The DLESE conference was held at the University of Colorado Boulder (my alma mater!) and rotates among different university campuses each year.

Over 210 people attended the DLESE conference, including university professors, researchers, K-12 instructors, educational outreach staffpersons from nonprofit, government, and private industry, and others who support education and earth

systems science. The backgrounds of the attendees include oceanography, geography, biology, chemistry, climatology, paleontology, geology, hydrology, and other sciences. Obviously, this was a fascinating group to be working with!

The conference theme was Broadening DLESE. The conference goals were to develop strategies to expand the number and diversity of users and contributors to DLESE, facilitate efforts to develop Earth Science data and tools for educational use, expand DLESE's collection and collections development activities, and strengthen ties between research and educational practice, evaluation, and assessment.

The conference spanned four days. Day 1 was comprised of a series of hands-on skills workshops in field methods, GIS, GLOBE, ArcIMS, GPS, DLESE collection building, EarthKAM, atmospheric visualization, imagery, and a variety of other tools and skills. It ended with a reception and networking time at NCAR—the National Center for Atmospheric Research. Day 2 opened with welcomes and a keynote address.

Slide from the opening conference session on Day 2.

Dr Susan Buhr, Conference Site Host, Cooperative Institute for Research in the Environmental Sciences (CIRES) at the University of Colorado, welcomes the attendees to the conference. After Dr Buhr, Christopher DiLeonardo from Foothill College spoke; he was the steering committee chair.

Mary Marlino, Director of the DLESE Program Center. I first heard her speak about DLESE in 2000 at the GIS Education conference at California State University San Bernardino. She stated that the DLESE vision was easy access, services to help users create, use, and evaluate, interfaces for exploration, and a community center that fosters interaction. She officially released DLESE version 2.0, a substantially improved digital library interface.

Following Dr Marlino, Thomas Reeves from the University of Georgia spoke about "Digital Libraries as Cognitive Tools—The Case for

DLESE." He stated that DLESE is aligned with authentic learning, national standards in education, constructionism, and showed some examples in the DLESE collection to back up these claims.

Day 2 began with keynote addresses, whole group sessions, and ending with further strand working sessions. Every attendee was included in a subgroup, called a strand, related to one of the four goals. I participated in the strand to Broaden the User Base of DLESE, and under that strand, the group of the DLESE Ambassadors program. We strategized about how

Participants in my strand, the DLESE ambassadors, led by Dr Ashanti Pyrtle from the University of South Florida (at arrow).

Mike Mayhew from the National Science Foundation. The NSF is the organization that supports DLESE.

Day 2 ended with the Share Fair (see section below).

Other strands were: Broadening Earth Science Data and Tools Development for Education, Broadening the DLESE collection, Broadening Ties Between Research and Educational Practice, Evaluation, and Assessment. Each strand was assigned the task of making specific recommendations pertinent to the goals of DLESE and of the conference.

DLESE Share Fair

The share fair was a grouping of developers, private companies, individuals, universities, and organizations that have developed something of value to share with the earth systems science community. It was a four hour valuable time of networking and learning about what members of the DLESE community are creating—very impressive tools, curricula, and products.

Joseph Kerski works with an educator at the Share Fair at the USGS information exhibit. We were adjacent to ESRI, with whom we have worked for years on educational endeavors.

Our USGS information exhibit featured GIS, geography, and science-based lessons that I and others have written, guidelines as to how to use USGS spatial data, USGS fact sheets, educational posters and publications, and sample thematic maps.

Other tools illustrated at the Share Fair were My World, Worldwatcher, Dynamic Digital Maps, CruiseViewer, new ESRI Press books including Mapping Our World and Community Geography (both of which we had a small part in as technical editor), EarthKAM, Rich Annotation Service for Images, the National Science Digital Library, and Discover Our Earth.

Conference Day 3

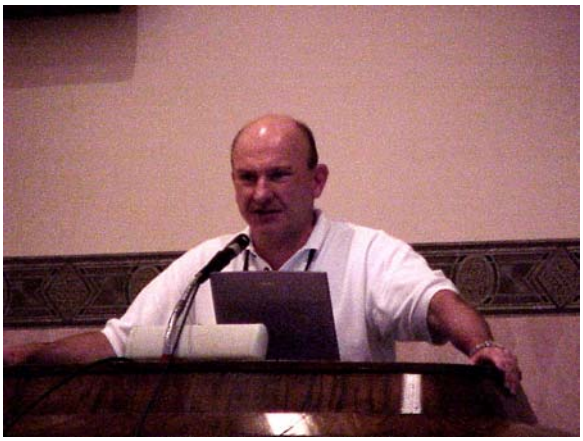
Day 3 began with Dr Ed Geary speaking about DLESE core services. These include community, evaluation, data, and collection services.

Dr Ed Geary is one of the major participants in the DLESE effort. He is a professor at Colorado State University, and we have worked together on educational institutes and teacher training over the years. I first met him when he was education coordinator at the Geological Society of America. I hope to work with Dr Geary on the inclusion of GIS in the GLOBE program, since he is the new GLOBE education director.

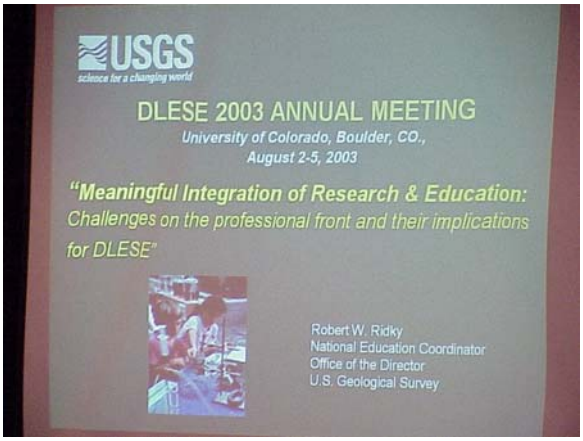
What I considered to be Dr Geary's most important point was that we really need a revolution in the way that earth systems education is taught in this country for educators to fully appreciate and embrace the types of lessons in DLESE. Dr Geary was instrumental in the "Revolution in Earth Systems Education" conference in 2001. In other words, a sample DLESE lesson is not, "What is a volcano" etc., but rather, "what is the temporal and spatial relationship of volcanoes to earthquakes, and why?" So, we need to work on the DLESE collection, but also encourage change in educational instruction at K-12 and university levels.

Day 3 continued with three more strand working sessions, Dr Ridky's keynote address (see below), and an evening reception time of networking.

Dr Robert Ridky's Keynote Address



Dr Robert Ridky, Education Director, USGS, gives keynote address. He was approved as one of six new DLESE steering committee members during the conference. It has been a privilege to work with Dr Ridky over his first year as our education director; I definitely support the words he spoke, and he made me feel proud to be a part of the USGS and a part of the Earth systems science community.



Dr Ridky's keynote theme was the necessity for research and education to be linked. Education and research are always in the public service, at every age and culture. Dr Ridky stated that DLESE is well situated for a more expansive role in mobilizing the broader community in demonstrating our discipline's national importance.

Dr Ridky began with Albert Einstein's assertion that the public needs to experience the results of scientific research, and education is the way to enable them to do that. Dr Ridky listed criteria for establishing impacts of proposed educational activities, including such things as if it is national in scope, enhances opportunities for involvement, addresses issues of wide importance, and so on. He mentioned some excellent examples of educational projects that he, the USGS, and others have been involved with. He kept the challenge that we are facing at the forefront—there are three times more dance majors than geoscience majors at universities. Only NASA, the Department of Education, and NSF have specific educational mandates. Other organizations such as the USGS must work to integrate education into the mainstream of research, not hang education out as a peripheral, sidebar activity. The implications for educational work are enormous—the USA has 92,000 schools. Dr Ridky challenges us to think about consider adjusting some science education content to what the public is concerned about, such as energy and climate change. He said that DLESE has the potential to make meaningful contributions because of its technical resources, products, and established community of educators.

Day 4 was comprised of reports from the strand spokespersons. The conference ended with a field trip to Rocky Mountain National Park, which I did not attend due to my activities mentioned below.

My Activities at the DLESE Conference

(1) Participate in DLESE ambassadors strand discussion and recommendations.

(2) Operate USGS exhibit at Share Fair.

(3) Network with researchers and educators at the conference.

Post Conference Activities

I was interviewed by the newspaper the

Boulder Daily Camera on 5 August 2003 about my activities in the world confluence project. I took the opportunity to discuss the need for earth systems education and the DLESE conference. The article will run on Sunday 17 August 2003 in the newspaper.

I met with David Neufeld, GIS specialist at the University of Colorado Museum, who is working on a Natural History Museums Biodiversity Data project. This project, funded by NSF, has accumulated over 200,000 coordinates and plant and animal specimen data descriptions on an ArcIMS site. I have participated for three years in a biodiversity project in Colorado, and touched base with David on the relationships of the two projects.

Acknowledgements

I thank the DLESE program staff for inviting me to the conference and especially Tammy Palmer for her assistance. Over and above the excellent content of the conference, the DLESE staff showed us all how a conference *should* be organized and run. They were incredibly helpful and efficient. I appreciated the attendees for their enthusiasm, expertise, and hard work. I enjoyed working with Dr Ashanti Pyrtle and others in my DLESE ambassadors strand. I thank the USGS for approving my attendance at this event.

Recommendations and What I Learned

How DLESE fit into the goals and mission of the USGS, and how can the USGS contribute to its agenda? Our "Future Science Directions" and our USGS strategic plan each indicate how GIS in education ties into our mission. Our emphasis is integrated information for societal needs. DLESE provides one of the best tools and science for integrating land-based information. Furthermore, integrated studies are recommended by education scholars in K-12 curricula also, rather than the traditional model of separate subjects that do not overlap.

Data from the USGS Customer Satisfaction-Outcome Survey showed that for 18 products, an average of 55% of the customers reported that they use our products for educational use.

I believe we should support DLESE by participating in their future annual meetings, by joining and contributing to their strand activities, by contributing our resources and lessons to their database, by publicizing DLESE in our travels and workshops, and by tapping into the DLESE expertise to help us organize and catalog some of our USGS web resources. For example, the President of the Buckminster Fuller Institute wants to catalog all USGS urban growth animations and write educational lessons based on them. At present, the animations are scattered on various places on the USGS web. Why not tap into what the Institute wants to do with these resources and thereby make them more accessible by the USGS and by the educational community?

By participating in this conference, we demonstrated the contribution that the USGS can make in earth systems science education. We are the one of the largest producers and one of the largest users of data that is fundamental to this effort. This wealth of data that we create at the USGS will be worthless unless we proactively create a scientifically literate populace.

One reason for attending this conference was to illustrate USGS strength in integrating science with education. DLESE presents an excellent opportunity for the USGS to get our data and products into the hands of students and educators across the country. Students familiar with our data will form an expanded future USGS customer base. I definitely could see many linkages between the GIS in education research and development that I am involved with and the DLESE effort.

Some of the most valuable things I learned

about were the EarthView Explorer from Alan Sills, the Electronic Encyclopedia of Earthquakes, Earth Update from Rice Space Institute, Chris Polloni's Coastal mapping activities and information bank, and NASA's Practical Uses of Math and Science online journal at http://pumas.jpl.nasa.gov. I also learned about what Chris Polloni is working on at Woods Hole.

Each of the conference attendees received a copy of *Dr Art's Guide to Planet Earth,* by Art Sussman, WestEd Publishing Company, ISBN 1-890132-73-X. This outstanding book features content on planet Earth, matter cycles, energy flows, life webs, thinking globally, and acting locally—a combination of data and then encouraging students to think about and act upon what they have learned.

I also picked up a copy of the *Blueprint for Change: Report from the National Conference on the Revolution in Earth and Space Science Education*, from a 2001 conference in Snowmass, from TERC. I had been familiar with the recommendations, but this is the first time I had seen them printed in book form. This book reports on the goals that the conference attendees met to discuss—changing the nature of earth and space science education, and expanding the extent of student participation in these sciences. Science as inquiry, Earth as a system, and computer technologies all play a significant role in the important recommendations that the authors of the book state. For more information, see http://www.earthscienceedrevolution.org.

Some of the key contacts that I made at the conference were with Jim Simpson at Scripps, Rajul Pandya at DLESE, Dawn Adams from the Institute for Philosophy, Religion, and Life Sciences, Stephanie Stockman from NASA, and I also was able to continue discussions with people I already knew—James Rattling Leaf from Sinte Gleska University, Beverly Hunter from Piedmont Institute, Suzanne Larsen at the University of Colorado, Carl Katsu from NESTA, Ed Geary, the folks at ESRI, staff at GIS ETC, staff at TERC, Bob Ridky, and other educators with whom I have worked and with whom I hope to continue working.

As was clearly evident in the closing session where different individuals were thanked, this is a community that is passionate, knowledgeable, and dedicated to helping people learn about the Earth—our home.

Flatirons in Boulder, Colorado, taken on the final day of the conference, 5 August 2003.

* * End of DLESE 2003 Report * *