EDUCATION OUTREACH EVENT REPORT AND RECOMMENDATIONS

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

Location: Dallas TX

Other USGS Attendees: David Roach

Event Date(s):
21-24 January 2004

Purpose of Travel:
16th Annual Geo-Tech Texas Conference

Purpose of Event:

Geosciences Educational Technology Conference

Department of the Interior Highlight That Was Sent to the White House:

USGS Supports Technology in Education at GeoTech 16

The USGS will conduct several workshops on geographic information systems and operate an information exhibit for science and geography educators at the 16th Annual GeoTech Conference in Dallas, Texas, 21-24 January 2004. The conference, which attracts several hundred science, history, and geography teachers from elementary to university level, provides a forum to inspire and motivate educators to teach about the Earth--its structure, societies, environments, and their connections--using a wide range of technologies. USGS Geographer Joseph Kerski will offer technology integration information, training, lessons, and new USGS maps including those of Mars and Hawaii's volcanoes. (Joseph Kerski, Denver, Colorado, 303-202-4315, jkerski@usgs.gov)

My Activities at the Event:

(1) Saturday: Conduct workshop about the Global GIS CD project and the lessons that I am creating to accompany the wealth of spatial data that Trent Hare and others at the USGS developed. Dave Roach conducted a presentation on EPA Regional Response Center GeoSpatial Activities.

(2) Thursday-Friday: Assist with training teachers in GIS technology and tools, including the co-teaching of 4 workshops: GIS Through Time, Site selection with Stipa comata, Downloading and Formatting Earthquake, Census, and Imagery data, and Fire Tower site selection.

(3) Wednesday: Participate in GIS Technology Session with ESRI and other GIS educators.

(4) Saturday: Operate USGS exhibit in exhibit hall.

Participants at the GeoTech conference represented teachers, community college and university professors, and educational consultants.

GeoTech is held at Bishop Dunne Catholic School in the south part of Dallas, Texas. This venue encourages teacher and student participation, ample time to prepare for the conference, and access to the GIS labs, and keeps the costs lower than holding the conference at a hotel or convention center

Conference organizer Christine Voigt, left, of Compass Educational Technologies, and Kate Dailey, Principal of Bishop Dunne School. Both have been tireless over the past decade in encouraging students to analyze the Earth with GPS, GIS, and remote sensing technologies, and we in the GIS education community are very appreciative of their efforts.

Conference Overview

The Geo-Tech conference is unique for several reasons. First, it is one of the few conferences that is specifically focused on geoscience and technology in education. Obviously, that is well suited for organizations like the USGS to be involved in, given our scientific mission and commitment to education and technology, specifically, GIS and remote sensing.

Second, GeoTech is one of the few conferences where students *and* teachers are both welcomed and fully participate. In fact, this year's GeoTech brought in 150 students and 150 teachers from all across the state of Texas. This was an absolutely fantastic sight to see.

Third, GeoTech brings in well-known educators who share their vision with all of the participants. This report describes what Dr Kamlesh Lulla and Jodi Cobb spoke about. In the past, Dr Sally Ride from NASA, Dayton Duncan, the biographer of a book on Lewis and Clark and the director of the PBS special on the explorers, Ann E. Bancroft, the first woman to ski to both the North and the South Poles, and Bob Ballard, the discoverer of the *Titanic* and the *Bismarck*, have spoken at GeoTech. I have had personal contact with many of these individuals after the conference has ended. I supplied Ann Bancroft with Antarctica maps for her historic trip across the continent during the Winter of 2001. I sent Dr Lulla some of my favorite USGS maps.

Fourth, GeoTech not only provides us an opportunity to share with other educators what our organization can offer, but by bringing the ESRI Education Team to the conference, we have the opportunity to gain experience with the latest ESRI products and tools. This professional development is

very helpful to me and will enhance all future trainings.

The main conference lasts one day, with GIS in education training offered in beginning, intermediate, and advanced strands during the two days before the main conference.

Fifth, this unique blend of geoscience, geography, technology, education, and internationally renowned guests takes place at a high school! Bishop Dunne High School, Dallas, is where principal Kate Collins Dailey has become one of the foremost proponents of educational technology in geography. Her transformation of the school's performance, attendance, technology, and curriculum is a testament to what one principal with vision can accomplish.

Day One—GIS Train-The-Trainer Workshop

On the first day, about a dozen people that I have been working with for nearly a decade gathered to share technical information about GIS. All of the participants were involved with GIS in education training, curriculum development, and research. Most of us gave short demonstrations for the group, such as Charlie Fitzpatrick of ESRI, who is shown above demonstrating ArcGlobe software. I gave a demonstration of the Terraserver automated tool for both ArcGIS 8. We also had the opportunity to try it for ArcView 3. The Day 1 workshop was very helpful; I share the highlights on what I learned below.

We discussed many GIS-related items, such as historical boundary files and census data back to the 1790 Census, pie chart maps in ArcGIS, table summaries, external hard drive storage, the Animation Toolbar within 3D analysis, and the Dallas Central Appraisal District's ArcIMS site. Charlie gave us a "how to set up an ArcIMS site" demo. I gave an ArcGIS 8 Terraserver tool demo and had my first chance to test it in ArcView 3. I learned that Dr Kamlesh Lulla co-edits the journal GeoCarto International, and they are seeking educational articles. I will follow up on this.

Participants in the Train-The-Trainer workshop included representatives from ESRI, private GIS education consulting companies, science organizations (such as USGS, NASA, and the Missouri Botanical Garden), K-12 schools, and universities.

GIS Training for Educators—Day 2 and 3

Christine Voigt, far center, begins the two-day training event for educators that preceded the main conference. Approximately 60 teachers gathered for this event. Three tracks were set up for this training, representing a total of 12 separate hands-on sessions from which teachers could choose.

Above, Anita Palmer works through a land ownership no-tech GIS lesson as an introduction to layering and real-world spatial problem solving. Ms Palmer, with Lyn Malone (left, back) and Christine Voigt were the three authors of the books Mapping Our World and Community Geography, both from ESRI Press. These books have helped thousands of students analyze the world, the region, and their communities with GIS in just the past 2 years.

Above left, Judy Behrens from Texas State University Department of Geography greets the educators. She has done much work to encourage spatial analysis in K-12 schools, community colleges, and universities in Texas, and wrote a series of grants to bring teachers and students to GeoTech 16.

Two guests that we were privileged to have at GeoTech 16 were Dr Yichun Xie (left), Eastern Michigan University GIS professor, and Dr. Kamlesh Lulla, Chief Scientist and Director of Earth Science Remote Sensing at NASA Johnson Space Center. We were honored that both of them spent time with us.

It has been my pleasure to work with Dr Xie on the NSF Virtual Immersion in Science Inquiry for Teachers (VISIT) project over the past 4 years. Dr Xie conducted a VISIT workshop at the conference.

Dr Lulla gave a keynote address entitled "People, Places, and Pixels—Geospatial Technologies in Our Future." He emphasized GIS and remote sensing in smart decisions, homeland security, diplomacy, urban growth, refugees, crops, water, and even on Mars.

Some of the teachers and students pictured with Dr Lulla following his keynote address. His address focused on the importance of remotely sensed imagery in society. It was incredibly gracious of Dr Lulla to spend time with us, particularly given all of his duties surrounding the Mars Rover Mission at the time. Dr Lulla's position in NASA is a testament to the contribution that geography makes to organizations and society. More importantly, Dr Lulla has a gift for remembering individual people and for sharing his experiences with the students and all of us.

Day 4: Main Conference

One of the best things about GeoTech is the participation of Bishop Dunne students. They introduce the speakers, participate in workshops, help with conference logistics, provide directions, help with the set up of workshops and exhibits, and help in other ways as well. Their professionalism and enthusiasm impresses me each year.

Students at the school present the door prizes at the end of the conference, including these clever "Lost?" shirts with latitude-longitude coordinates on the reverse of the school and other centers of geographic education in the state.

Saturday Keynote Address

Jodi Cobb, staff photographer from the National Geographic, *emphasized her work of photographing people and places in her keynote address, including her 2003 work with the women of Saudi Arabia. We were all hoping that her can-do attitude and her curiosity about the Earth would resonate in particular with the female students in the audience listening to her*

It was good to see Ms Sunday of Bishop Dunne High School being her usual, efficient self at the front desk. Ms Sunday and the other BDHS staff help the conference run smoothly and make all of us visitors feel welcome.

Roger Palmer, right, science teacher at Bishop Dunne, works with students from across the state as they compile aerial photographs, maps, tables, and narratives to explain to the world what makes their community unique, from a geographic perspective.

Above, audiovisual team documents GeoTech in film and photographs. Below, I was pleased to be included in the video they created!

Several views of students from all across Texas, working on their Community Atlas projects. The Community Atlas program, sponsored by ESRI, encourages teachers and students to get involved with telling the story of their communities via maps, images, and text. These atlases are posted to the Web on www.esri.com/communityatlas. ESRI provides free software in return for school contributions to the effort.

Above, Charlie Fitzpatrick trains the students on the Community Atlas program.

I admit that these students somewhat exaggerated their interest in the USGS Circular Water Quality in the Trinity River Basin, Texas, *for my benefit. However, they were quite enthusiastic about learning, about studying the Earth, their personal growth, and beginning their professional development at the GeoTech conference.*

Teachers work through the "where is the missing theme?" lesson.

Teachers work through lessons on climate, economic geography, school bus routing, crime, and other topics.

USGS Information Exhibit and Materials

It is very rewarding to work with the students at the conference.

Students examine materials at the USGS exhibit at GeoTech Texas. Professors, teachers, and educational consultants also visited our information exhibit. As in the past, our presence at the conference was much appreciated.

Our exhibit emphasis was on USGS resources to support GIS in education and real-world scientific investigations in the classroom. Other exhibitors included ESRI, the Texas Alliance for Geographic Education, and others.

I handed out the following materials: GIS-based lessons on using USGS data sets, the Titanic, hurricanes, tornadoes, USA historical population change, world earthquakes, world demographics, locating fire tower, site selection in riparian environments, Map Mysteries lessons, Teaching With Topographic Maps Lessons, paper on the Implementation and Effectiveness of GIS, USGS information on web sites, Lewis and Clark, our map catalog and map store, educational items, several water quality books on the Trinity River, water-related posters and circulars, map and GIS-related posters and booklets, information on rocks and minerals, and teachers packets.

I shipped and distributed thematic maps, teachers packets, research on the Edwards-Trinity aquifer, The National Map, booklets, water education posters, miscellaneous topographic maps, thematic maps for the door prizes, fact sheets, GPS setup and issues handouts, GPS in education articles, water resources circulars, posters, and Texas map indexes.

GIS In Education at Conference Site

When one is involved with a program for many years, it is rewarding to see some of the fruits of that effort. Brad Baker attended a GIS-for-educators institute that we co-conducted with the ESRI staff in 1998 at Southwest Texas State University. To see what he and his students have done with GIS technology just a few years later at Bishop Dunne is truly amazing. It is extra special to know that we had at least a small part in helping Mr. Baker to realize his dreams of conducting real-world spatial analysis with his students. He acknowledges that Principal Kate Dailey's support of his efforts have been critical. Mr. Baker's students conducted demonstrations of their GIS-based investigations throughout the conference. We used Mr. Baker's computer lab for part of the training.

One of the GIS projects from Mr. Baker's students, which shows the location of the school in relationship to downtown Dallas, with a DOQ and 3D Analyst.

Recommendations

One of the trainers, from the San Antonio Water System, sent in this comment:

"Here is the best praise I have seen for all of the work that went into GeoTech:

I called my home after the kids had finished school. My son said, "Guess what my friend and I are doing?" Expecting to hear a report such as playing video games or watching TV, I was pleasantly surprised when he said, "We are making maps with ArcVoyager!"

The above illustrates the impact that spatial analysis with GIS can have. It empowers students to investigate the world using 3D fly-throughs, maps, images, and databases that are interesting to them. A glance at the conference program illustrates the wide applications of GIS in education—history, math, geography, environmental studies, earth science, biology, and more. Sample workshops included the David Rumsey historical map collection, the geography network, mapping and the environment, making maps on the web, the Middle East, Literature and American Foundings, redistricting, ecological assessment, visual impairments and geographic knowledge, Lewis and Clark, and more.

The GeoTech conference emphasizes interdisciplinary linkages between geography and science. It also emphasizes examining real-world issues in education and standards-based education. Therefore, it is important that we remain involved with this conference.

I believe that the USGS and other federal organizations have a role to play in preparing teachers and students to use our data and products, and spatial data and technologies. I believe that it is also our responsibility to do so as a public service agency. Our relationship with the GeoTech conference organizers and participating are some of our longest and most fruitful of all of our educational relationships and needs to continue.

The reason we must conduct workshops at this and other conferences is to add value to our presence above and beyond our information exhibit. The traffic at the exhibit is, as is the case during many of the conferences we attend, is lighter than during break times. By conducting workshops, we have the opportunity of working one-on-one with the teachers. We have the opportunity of obtaining their feedback on curricular materials that we develop. We work with educators to demonstrate ***how*** our products and spatial data in general can be used in conjunction with national science and geography standards. It does more than telling folks ***what*** products are available.

I attempted to emphasize USGS strength in real-world data and technology in education, particularly geospatial and scientific

information. Both the growth in educational technology and the curricular content standards present excellent opportunities for us to introduce our data and products to students and educators across the country. Educators who are trained in the types and applications of our data are a powerful lobby for the USGS. Students familiar with our data will form a geospatially-literate society. Another objective was to "train the trainers"--teachers--to magnify our effectiveness and maximize our limited resources. These trainers will themselves network with and train other teachers, administrators, and students.

By participating in this event, the attention generated from teachers and students across the country for the USGS and for science could be enormous, given current concern with teaching about globalization and technology.

We need to remain involved in education as an agency. Education shows our relevance to Congress and the general public. Education serves the needs of diversity, recruitment, and retention. Education ties into all six major outreach audiences.

This conference was the first time I had the opportunity to see onboard GPS-GIS in a vehicle (above) in action, as well as a NavMan GPS working with ArcPad inside a Windows CE Ipaq handheld computer.

Acknowledgements

I appreciated the USGS' support of the time for my attendance at this event. I thank the organizers of GeoTech, particularly Christine Voigt, for her support of our exhibit and workshops, Kamlesh Lulla, Yichun Xie, Lyn Malone, Charlie Fitzpatrick, Anita and Roger Palmer, Jean Palmer-Moloney, Brad Baker, Dave Hester and David Roach of the USGS, and the others who made it so memorable. I also thank Kate Dailey, principal of Bishop Dunne High School, for hosting the conference, and to all of the students for their enthusiasm and hope for the future.

The event would not be complete without a bit of geographic fieldwork—here, to latitude 34 north, longitude 97 west with Dr Bob Coulter, Missouri Botanical Garden.

*** End of GeoTech 16 Conference Report ***