Educational Outreach Event Report

Name: Technology in Geography Institute

Participant and Author of Report:
Joseph Kerski, Geographer, USGS

Dates: 30 June - 4 July 2001

Location:
Kane, Pennsylvania

Executive Summary:

I was invited by Dr Ruth Shirey, Executive Director of the National Council for Geographic Education, to help teach a Technology in Geography institute for geography teachers from across the state of Pennsylvania. Thirty-one teachers participated in the institute, which was held in the Allegheny National Forest town of Kane. The week-long institute included an intensive two days and evenings of hands-on work with GIS to begin the week. In addition, participants went on a field trip to Kane Hardwoods, a lumber company with an extensive GIS. During the remainder of the institute, participants received hands-on training in Remote Sensing, PowerPoint, and in web development.

Dr Ruth Shirey Executive Director of the National Council for Geographic Education, addresses institute participants.

Institute participants analyze the path of hurricanes in Pennsylvania during the last 200 years using GIS.

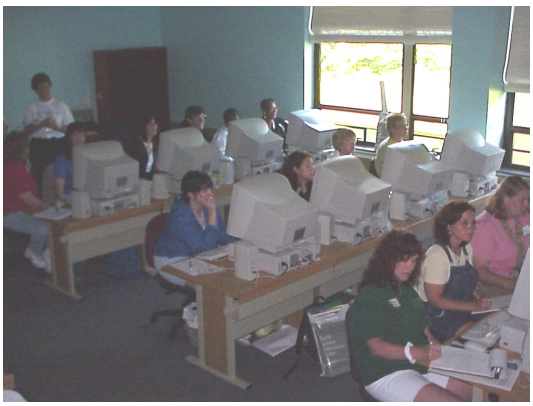
Working with me to facilitate the GIS component were Dr. Bob Ziegenfus from Kutztown University Department of Geography, and Mary Sacavage from Alvernia College. I had come to know Bob through AAG and NCGE conferences, and Mary through a GIS institute for educators that the USGS participated in at Southwest Texas State University in 1998. This is an excellent example of how contacts made through educational outreach bear fruit and become colleagues and coworkers. I learned a great deal from Bob and Mary, and the institute participants.

It was a distinct pleasure working as a team over the past half year to plan and implement this institute. We plan to follow up with the participants in future supportive roles, and in future institutes, particularly since GIS requires a long-term commitment and set of contacts.

As evidenced by several key events this year, GIS in the curriculum is a growing phenomenon. These events included the National Academy of Science's K12 GIS initiative (see my March 2001 report), and the ESRI Education GIS conference that attracted 465 people (see my July 2001 report).

Kane Area High School, site of the Technology in Geography Institute.

Collecting GPS coordinates and attributes for later input into a GIS.

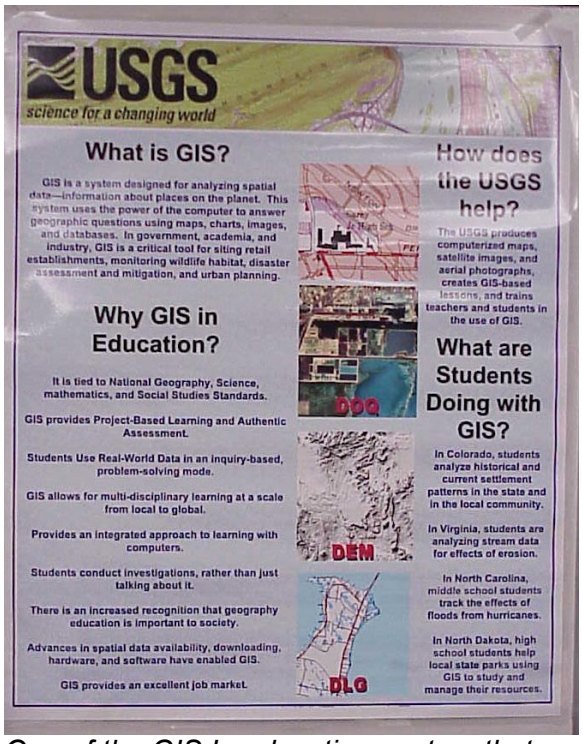


Half of the participants in the institute; we also operated a resource room down the hallway, where all materials were placed for the participants to take back to their own schools.

My trip was funded by the Indiana University of Pennsylvania, which for a decade has been the headquarters of the National Council for Geographic Education.

Institute participants learning about local flora and fauna near the institute site.

We devoted some time during the institute examining the PASDA site http://www.pasda.psu.edu/, which is one of the best, in my opinion, state resource sites for spatial data in the country. In addition, I spent more time on examining historical data sets, as many of these teachers (1) had a personal interest in history, and/or (2) taught history in the classroom as well as geography.



One of the GIS In education posters that I created for the institute.

The resource room we created included books, maps, software, data, posters, teachers packets, lessons, information sheets, and other resources from the USGS and those that I created myself.

It was a privilege working with educators from such a variety of geographic areas, curricular areas, grade levels, and backgrounds. These people were very talented; for example, one teacher with his students has developed an incredibly rich historical geography site at: www.smethporthistory.org

Recommendations

I found out about and received a copy of an excellent book: *Using Internet Primary Sources to Teach Critical Thinking Skills In Geography,* by Martha B. Sharma and Gary S. Elbow. 2000. Westport, CT: Greenwood Press. ISBN: 0-313-30899-3. I recommend that all those interested in geography, education, and technology purchase this book! Much more than a listing of websites, this book links standards, critical thinking, educational research to primary sources and Internet resources. The authors explain in detail how each resource can be used in the curriculum.

Two teachers, who instructed the PowerPoint and web design portions of the institute, set up a lab at the conference center containing laptop computers and a wireless Internet connection. This was fantastic and avoids the issues of working in an off-site lab that you are borrowing from someone else, such as we did at Kane High School. These issues include building access, room access, system security, and loading data. ***I recommend that the USGS explore the potential of wireless mobile labs such as this for future off-site training and institutes.***

Conducting an institute such as this involves multiple organizations, and is an excellent example of a long-term educational project that is destined to bring about fundamental changes in the school curriculum. It has more to do with systemic change and networking than strictly with the use of inquiry-based tools such as GIS.

The positive feedback, both informally during the institute, via the written evaluations we handed out on the last day, and from emails since the institute ended from the 31 participants confirmed that this type of educational outreach is a good opportunity for the USGS. We are working here with educators at a value-added level--not just telling them what is available, but actually showing them with lessons and activities we've created. The evaluations gathered at the end of the GIS segment showed appreciation that hands-on work was the central component.

This also provided a great opportunity to network further with the NCGE director and teachers active in the Pennsylvania geographic alliance. For years, I and others such as Roger Barlow have been working with the NCGE and the geographic alliances. The alliances were created in 1986 with funding from National Geographic Society. While NGS has recently curtailed much of this support, nevertheless, the alliances remain a viable means for teachers to network among themselves in each state, as well as provide a venue for training "inservices."

Increased spatial awareness and training is essential for the future of all agencies such as the USGS, who rely on a geographically informed public and Congressional funding. When we work with a group in a long-term relationship such as this, I firmly believe this brings us more benefit than a one-time presentation, particularly in the case of providing educators the opportunity to use and apply our digital data.

What is GIS?

GIS is a system designed for storing, updating, analyzing, displaying, and manipulating information about places on the planet, otherwise known as spatial data. This system uses the power of the computer to answer geographic questions by arranging and displaying data about places in a variety of ways with maps, charts, and tables.

How is GIS being used in the classroom?

Colorado's Boulder High School students use GIS to analyze historical floodplains, neighborhoods, and earthquakes.

Working with the Colorado Division of Wildlife, high school freshmen conducted public surveys and open houses and used GIS to draft a comprehensive wildlife area management plan, including presenting their final recommendations to the Wildlife Commission.

Rhode Island students analyze the distribution of trees on their school grounds, and the economic impact of rivers in their communities.

In North Dakota, high school students helped local state parks use GIS to study and manage their resources. Middle school students mapped out alternative sites for a local landfill and ways to monitor its operation.
Vermont middle school students used GIS technology, science journals, and photos to determine the origin of a local pond and its ecological relationship to the community.

Acknowledgements

I would like to thank Dr Ruth Shirey for inviting me to this institute and paying my travel costs. I also thank my co-instructors for their excellence in preparing and conducting this institute: Mary Sacavage of Alvernia College, and Bob Ziegenfus of Kutztown University. I appreciated the assistance of Diane Miller from the Olmsted Conference Center, and Bryan Halsted from the Kane Area Schools for his technical assistance. I thank the teachers for their zest for knowledge and for their dedication to teaching and learning.

Technology Institute Agenda

We chose ArcVoyager and ArcView GIS software for the institute. The agenda for the GIS portion of the institute is as follows:

Day 1

8 Introductions
Goals of the GIS Segment

840 What is GIS?
Who uses GIS?

Applications of GIS.

Review materials in resource room.

915 Hands on exercise: Build maps and conduct queries using Internet Map Server sites.

1015 Thematic Mapping with ArcVoyager: Human Geography

1115 Thematic Mapping with ArcVoyager: Physical Geography

1 Watch and Discuss K12 GIS Movie

130 Earthquakes Everyday with ArcView

330 Hurricane Analysis, with emphasis on Pennsylvania historical hurricanes.

7 GPS discussion; Collecting GPS points, bringing GPS points into GIS. Overlaying on USGS DOQ and DRGs. Hotlinking ground photos to GPS points.

Day 2

8 Goals for the Day

815 Review of Bringing GPS Points into ArcView GIS.

1 CD Description. Examining state and national and international spatial data sites, including PASDA.

2 Examining Online GIS-based lessons. Africa Regional Geography Lesson.

3 County Demographic Pattern Analysis, 1900-2000; USA and Pennsylvania.

4 Pennsylvania (McKean County and counties where the participants are from) TIGER and 1990 and 2000 Census data analysis.

7 Exploration of Data sets and topics that participants are interested in, on their own.

8 Discussion on Implementation of GIS in the curriculum;

830 Future Training opportunities;
GIS Data Resources
GIS Lesson Resources
Future Opportunities
EDGIS Listserve:
Post to edgis@list.terc.edu. Info on: https://list.terc.edu/mailman/listinfo/edgis

9 Evaluations and Closure.

Joseph Kerski and Diane Miller, one of the institute organizers and our host at the Olmsted Conference Center, in front of the magnificent Kinzua River Bridge.

end of report