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## **GIS Activities Energize Students - and Teachers**

TUCSON, Ariz. – In spite of health, time, and technology constraints, teachers from the East Coast brought a new tool to their classrooms – and triumphed.

Last summer 29 teachers attended the 2009 CoastLines Summer Institute in Washington DC, sponsored by the Tucson-based Science Approach LLC educational development company and funded by the National Science Foundation's Innovative Technology Experiences for Students and Teachers (ITEEST) program.

During the two-week event, based at Jefferson Middle School, the teachers learned how geographic information systems (GIS) and global positioning systems (GPS) are used in scientific studies of coastal ecosystems in the NSF's Long-Term Ecological Research (LTER) network.

In addition to learning the MyWorld GIS software, they gathered water samples from the Gwynn Falls watershed near Baltimore, MD, in Rock Creek Park, and along the Potomac and Anacostia rivers in Washington, DC, as well as counting and mapping tree locations. They then had a chance to teach the skills and lesson plans they'd developed when Student Youth interns from the DC Geographic Information System (DCGIS) office joined the project for a week.

During the fall, the teachers then tried out their newfound instructional tools in their own classrooms, and – in spite of swine flu, tight schedules, and occasional difficulty in getting access to computer labs – nearly all prevailed.

Sandra Busic is a teacher of the talented and gifted program in Sparta, S.C. Her students took samples from local creeks to compare pH, salinity, temperature, and more, then used GIS to plot and analyze the data on the county map. "They were really excited and were full of questions that we sometimes had to look up when we got back to the classroom," Busic said.

Karen Merritt teaches science in Vivian, La., and used the MyWorld software to track hurricanes. "Students loved doing this with My World, and felt quite accomplished. ... I had the students find a hurricane that hit Louisiana in the past four years and download the tracking data. ... then they used Google Earth to plot the path of the hurricane from the point that it became a hurricane until it became a tropical depression. This was very real to them as they realized the path that hurricanes can take."

She added, "I have had several students excel in this type of technology who do not excel in other areas of science."

Cheryl Rowlands developed an activity called "Connecting Oysters and the Chesapeake Bay" for her 6th, 7th and 8th grade students in Newport News, Va. "This lesson involved introducing our 'oyster gardening' elective students to the Chesapeake Bay watershed, and the role that oysters can play in water quality," she said. "I was impressed with how quickly students picked up the software. ... It was a great class for them because at the beginning of the year, they didn't understand latitude and longitude, or world geography."

It's probably not surprising that something called "geographic information systems" would help students with geography. But what about math? and other subject areas?

Jim Liptak, 7th-grade teacher in Westhampton, Mass., used GIS to teach the concepts of mean, mode, and median to his math classes. He said, "I have really had my "ah-ha" moment concerning GIS and GPS. The spatial connection of the data is what I think makes the connection for the students. This really works."

Using GIS also worked in unexpected ways for Joyce Zupko, who teaches science to 7th and 8th-graders in Sterling, Va. "I have been pleasantly surprised at how well the project has been integrating with my other subject area teachers," Zupko said. "My social studies teacher loves that I am reinforcing geography in the science classroom. My language arts teacher applauds my use of writing to analyze the data. And my math teacher is ecstatic that someone is actually applying what he is teaching in the math class. The students have been receptive to using the software and are gaining confidence in using data files to analyze data."

Liptak summed up the feelings of many of the teachers when he said that using GIS-based activities "open up the door for me as for the kind of activities I'll do next year.

"When you're a teacher, it makes you want to do this for another year – instead of retiring!"

Openings are still available for the 2010 CoastLines Summer Institute in Santa Barbara, Calif. For applications, or for more information about Science Approach, go to <http://www.science-approach.com>.

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