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Student and Teacher Created GIS as Curriculum Tools

Developing K-12 and Public Ocean Education Programs which make full use of current technologies such as the Internet and Internet delivered GIS has been a focus of our work over the past 5 years. Through a combination of funding from USDA, Department of Education and USGS we have been able to setup the hardware, bandwidth and support staff for a Central California Metadata Clearinghouse. A large part of our work with GIS involves education, both community level and in the classroom. We have found the use of Data Visualization tools such as GIS and Internet delivered GIS has created a new set of training and application needs. For State and Federal agencies to make best use of new tools like GIS requires a framework embracing community level public education and public school level education.

During the past year the Camp Internet program has brought GIS and related data-visualization technologies into classrooms serving over 20,000 California and Southwest K-12 students, (primarily 4th – 12th grade). Every teacher working with these students receives training in the use of GPS, Internet Map Server and ArcView resources. To accomplish this Camp Internet setup a campus in Santa Barbara, California with computers and other tools in a lab setting for teacher training. Additionally year long classroom Project oriented training activities were used to establish proficiency on both teacher and students part in the use of gps and gis tools.

Most useful tools during this time have been the custom Internet Map Server maps setup by Camp to permit live, online editing of school, community and special project GIS maps. Our school Garden GIS has a completely interactive database permitting students to work on the dataset from school as they change the character of their map. Our current work with the Oxnard Housing Authority, Ventura County Health and RAIN Network to establish a Central Coast Health and Wellness GIS makes use of live data input from the field by staff when meeting with families and taking sound and emission recordings.

Use of actual teacher and student generated data as part of the dataset for the main Camp Internet gis map has permitted the creation of an online map which leads to photos, text and mapping information on many student field trips throughout California and the Southwest as well as all Teacher Training field trips and Field Reports. This has created a GIS map of immediate interest to our end users, creating an improved learning curve and understanding of GIS as a learning and decision making tool.

Teachers are taken to the Channel Islands, to the Rigley Institute on Catalina Island and on Channel Cruises with the purpose of taking gps readings, creating field reports and building datasets and GIS maps reflecting their field work. This begins a level of understanding of the Channel Region that is reflected in the quality of environmental and science education skills which the teacher then brings back to their school., to the benefit of their students and other teachers. And, at the same time, they are building a new and expanded dataset of information on coastal and island habitats and ecology.

In working to establish a possible Framework standard for public agency use of GIS as a community education tool we have found two challenges: Multi-Agency data merging to create GIS for public information and education and second, developing a successful method for educating the public on the value and use of GIS as a community planning and decision making tool. Our work with USDA has provided excellent results and possible new models that address both of these issues.

As part of our work with USDA Rural Utilities Service we are responsible for 120 rural communities in California and the Southwest. Our work involves one medical clinic, one school and one community center for each location. Use of GIS for Project Management has been central to the effective distribution and management of resources throughout such a large region.

We have, as well, found the use of GIS mapping within the schools to have not only had a predictable impact on science learning but as well cause students to take a more active and project oriented approach to their technology learning and Internet use. We have seen middle and high school students take on Community Capacity and School Capacity and Resource mapping that has lead to direct results.

As part of the Environmental education focus within Camp Internet we have found the use of GIS and related data-visualization tools, to measurably impact on the scope and effectiveness of public education regarding Federal Marine Sanctuary as well as Federal and State Parks.

Issues such as sanctuary boundries, if presented to the public using visual tools such as GIS, become more understandable, and in that way encourage citizen participation and understanding of State and Federal environmental regulations.

The Framework for Public education level GIS application has not been fully established. We are still working agency by agency and school district by school district. There is a need to use programs such as Camp Internet to provide on-going studies and recommendations for creating the National Framework for Public Environmental Education.

.Camp Internet recognizes the larger, historical significance of this point in the history of American education. This is the juncture when educators and public deserve to demand that the online technology finally PROVE itself as a learning tool unmatched by traditional print, television, or even earlier computer media. The Camp's consortia of teachers, researchers, and educators work to develop and deliver a live and online training program, one that establishes a new methodology for promoting teacher skill development and paves the way for the actual integration of 21st century learning tools into the classroom and community.

One of Camp Internet's most valuable strengths is that it combines live teacher training with immediate, tangible online classroom applications. This methodology stimulates the teacher's professional skill development and fosters higher student academic achievement. When taken out into the community it then creates strong parent support and understanding of environmental lessons and projects.

The Camp's distinctive training and content delivery framework establishes an environment where technology becomes a catalyst that empowers teachers to discover new and *more rewarding uses* for computers in their classrooms. At Camp, mastering hardware and software is the not the ultimate goal. Experiencing positive new ways of learning and teaching in a supportive distance learning community is the goal.

With the millions of dollars being invested for hardware and connectivity in schools and communities across the country, it is now time to demonstrate real, concrete methodologies that integrate technology as a core classroom and community education tool, a tool which challenge teachers and community members to use the technology to make significant improvements in how they teach core curriculum subjects and how they go about making informed decisions about their communities environment.

Our main Metadata Clearinghouse and Map library is located at:

<http://ims.rain.org/projects/warehouse/>

Camp Internet is located at <http://www.rain.org/campinternet>

RAIN Network is located at <http://www.rain.org>

Participating Agencies in the RAIN Network GIS Metadata Clearinghouse and GIS Education Program:

USDA Rural Utilities Service

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