

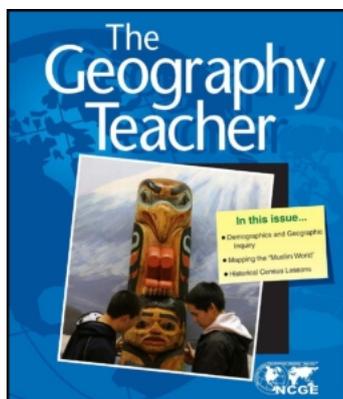
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### Community Mapping: Putting the Pieces Together

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# Community Mapping: Putting the Pieces Together

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## INTRODUCTION

*Check out the Community Mapping Program to see how students can become involved in a community-based project that incorporates geospatial technology and other characteristics of active and inquiry-based curriculum.*

Many geography and technology educators have been attracted to geospatial technologies because of the potential to help students develop and demonstrate spatial and higher order thinking skills, only to be frustrated with implementation at the school level. Even when teachers have overcome the technical hurdles of hardware, software, and data, they often find their classroom or lab activities do not always produce the desired outcomes. The Community Mapping Program (CMaP), developed by the Orton Family Foundation, addresses this and many other curriculum issues.

The Community Mapping Program was developed to engage students in a community-based project that incorporates geospatial technology and other hallmarks of active and inquiry-based curriculum. These hallmarks include place-based education, project-based learning, community-based projects, inquiry-based education, service learning, fieldwork, community partnerships, state and national standards, school-to-career paths, geospatial technologies, mapping, and authentic assessments. Because of the ability to put so many engaging curriculum pieces together in one project, the Utah Geographic Alliance has used CMaP as the basis for its professional development in geographic information systems (GIS) and global positioning systems (GPS) since 2002.

## Methodology

The methodology and training materials used in the Community Mapping Program were developed, tested, and evaluated with the expertise and financial assistance of many individuals and organizations. Much of the original work was completed by Connie Knapp and the Orton Family Foundation with input and field testing by the Vermont Institute of Science. Other organizations involved in the development and refinement of

the program include the Place-based Education Evaluation Collaborative, Program Evaluation and Education Research Associates, and the Institute for Technology Development. Training materials were developed and compiled by Amanda Gierow and others. While these organizations no longer support the program through funding or training, CMaP projects continue at the grassroots level for two simple reasons. First, teachers find the methodology works. It delivers on the program's basic premise: "When students, educators, and community organizations engage in a planned process of local investigation to create a product needed by the community, then participants will increase their: connection to where they live; knowledge; skills; and capacity to create community sustainability and well being."<sup>1</sup> In addition, teachers find that their students become engaged in geospatial technologies in the process of discovering and answering questions about their community rather than learning technology for technology's sake. GIS and GPS become important tools in a natural and authentic inquiry process.

### Inquiry-Based Education

The Community Mapping Program models inquiry-based education for both teachers and students. Teachers begin the inquiry process through a series of questions:

1. What are some social, economic, or ecological issues in my local area?
2. Who are some local individuals or organizations that are concerned about or involved in addressing the (selected) issue?
3. What individuals or organizations might be willing to help students investigate and address the issue?
4. What skills, concepts, and experiences will students need in order to investigate and address the issue?
5. What curriculum standards and goals will be addressed through a project investigating the issue?
6. What spatial aspects are involved in the issue?
7. How will geospatial technologies help students investigate the issue?
8. What student-produced products will help address the issue?
9. What expertise and resources could community partners (individuals or organizations) bring to the project?
10. How much time will we be able to spend on the project?
11. How will the students and project be assessed?
12. How will we celebrate/report our work?

Through this inquiry process, Utah teachers have created projects in their local communities around recycling, historic preservation, safe school routes, emergency preparedness, water quality, wheelchair accessibility, city tree surveys, cemetery markers, trails, and invasive species, among others. Most projects are cross-curricular and often involve teachers of different subjects.

One project in Lindon, Utah, involved History and English classes. Students identified local historic buildings, researched descriptions, interviewed residents for personal stories, mapped the locations using GPS and GIS, and published a book of the maps, descriptions, and stories (see Figure 1).

### Combining Place-Based, Community-Based, Project-Based, and Service Learning

One of the most engaging aspects of CMaP is the power of combining place and community-based projects with service learning. Place-based education helps students make

*"[S]tudents become engaged in geospatial technologies in the process of discovering and answering questions about their community rather than learning technology for technology's sake."*

## The HISTORIC WADLEY FARMS



The historic sites we investigated for our class project each had a special story or angle that made our research interesting and meaningful, but for various reasons, we found the Wadley Family Farms story a little more intriguing and rewarding. This historical site's story began with one early pioneer, Joseph Wadley, in the 1850's, who had a dream, an aspiration of transforming a small piece of Utah's desert into a fruitful oasis. Joseph, a single man, was a horticulturist by trade and a Mormon pioneer by choice. With a knowledge of plants from his homeland country of England, and his determination to see it through, he created a bit of heaven here in the boundaries of our country town of Lindon.

Figure 1. Jon Winget and Sue Jones's 7th grade Utah history and English classes used the Community Mapping model to research and report the local history of Lindon, Utah. This student-produced page is one of ten historic locations published in a booklet that was distributed to the community.



As the story develops, Joseph was a single man but longed for sharing his piece of heaven with some young lady he knew back in England. The absence from each other made their hearts grow fonder and he sent encouraging letters back to England. With certain confidence that he was "on to something special" here in Lindon, he convinced her to join him here in Utah Valley to enjoy this special piece of land along with the promise of marriage. She knew it wouldn't be easy, but she never imagined it could be as hard as it was as she journeyed with the Willey and Martin Handcart Company. Many of her friends died of exposure and starvation, but she was one of the lucky ones who made it

alive. Her health never was completely restored, but her love of this special land in our valley, and Joseph Wadley, made it all worth it. Joseph built a traditional English country home there on the property in early 1880's and planted many trees. They had a son, Joseph Daniel Wadley and he carried on nurturing the land long after his mother died and eventually also his father Joseph in 1904. Before Joseph Daniel Wadley died he sold the 32 acre farm to his son, Joseph Daniel Wadley Jr. in 1925.

Through the Depression, world war and other world wide distractions, the property became dilapidated and neglected over 50 years or so. Then in 1988, a grandson of Joseph Daniel Wadley Jr.'s purchased the property and determined to bring it back to its original beauty and potential.

Alan and Kristine Colledge and their family are continuing the original family legacy and are doing a remarkable job creating a place of beauty while providing great community service to countless people around them. Their efforts inspire many of us to reflect on the great heritage of our forefathers and their respect for the land.

connections between what is studied in the classroom and what they observe, or read or hear about in their own area. Community-based learning advocates helping students understand individual roles and responsibilities in communities and creating relationships with caring adults. Students and adults work together for the betterment of the community. Project-based learning involves teachers guiding students investigating authentic problems that require application of cognitive, social, and technical skills. Service learning integrates community service with instruction to enrich learning, teach civic responsibility, strengthen communities, and promote students' lifelong engagement in civic affairs and community development.

Utah teachers involved in Community Mapping have been able to articulate the educational value and community benefits of their projects using the language of place-based, community-based, project-based, and service learning philosophies. Not only have they won the support of administrators and community partners, but also have secured thousands of dollars in grants. Connections to School to Careers and Partnership for 21st Century Skills initiatives may provide extra leverage for developing and funding a Community Mapping project.

## Community Partnerships

Utah teachers have been impressed by the amount of interest and support of individuals and organizations willing to partner with their school, class, or club. In fact, teachers are cautioned that some community members are so enthusiastic about a potential partnership that a project could easily grow far beyond the scope they would be able to complete. It is important that teachers and community partners carefully identify what each will be able to do in the partnership.

The Utah Geographic Alliance has partnered with Utah State University Extension's Water Quality Program for its CMaP training. During the workshop, the Extension provides expertise, training, and equipment to test the water quality of a local river or stream. The Utah Geographic Alliance helps the Water Quality Extension in its outreach to provide teachers with experience and understanding of watersheds and water quality. Teachers gain experience in testing water temperature, dissolved oxygen, nitrates, turbidity, and in identifying aquatic life as indicators of water quality (see Figure 2).

*“Service learning integrates community service with instruction to enrich learning, teach civic responsibility, strengthen communities, and promote students’ lifelong engagement in civic affairs and community development.”*

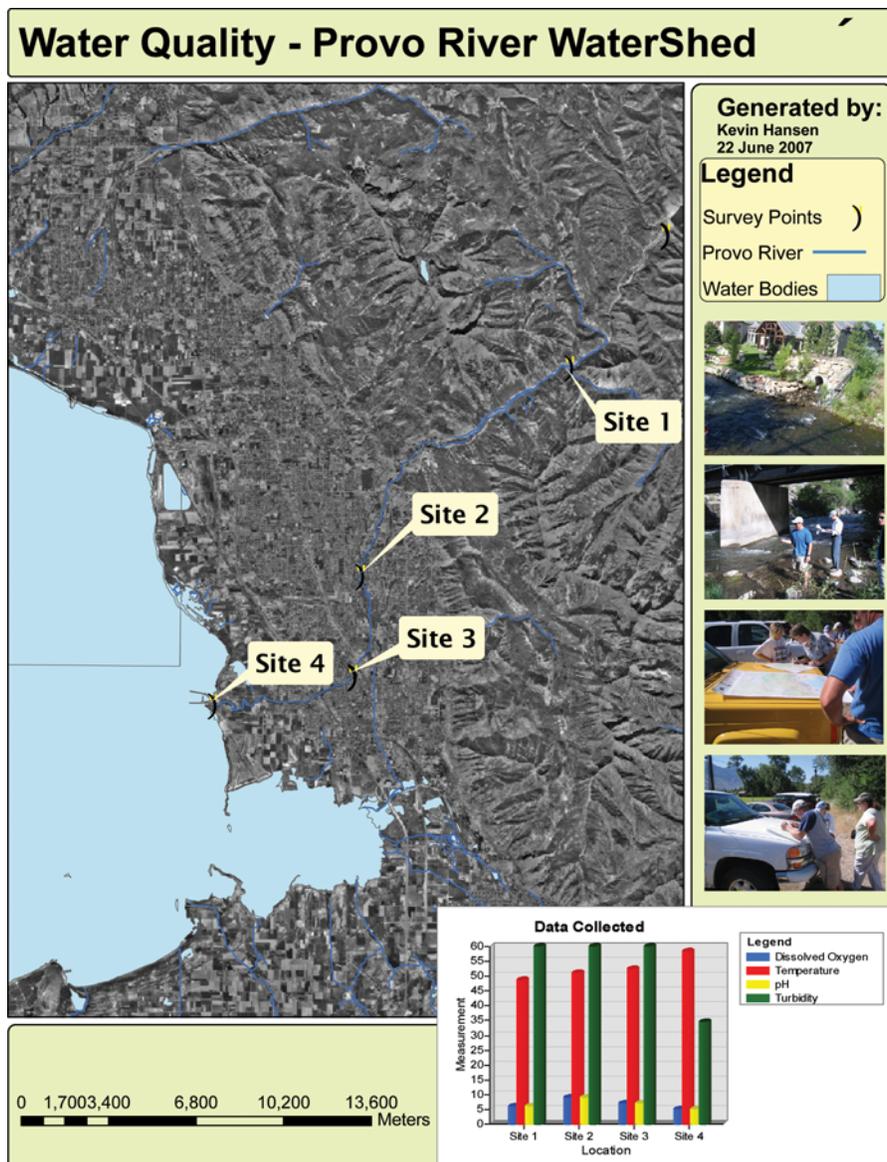


Figure 2. During the Community Mapping Workshop, participants use GIS and GPS to produce a map layout to help answer research questions. This layout includes a map identifying water quality testing sites, graphs, and photographs to help answer the question, “How is river water quality affected by an urban area?”

Another type of community partnership involved in CMaP training is a luncheon with GIS professionals in the community. The professionals explain how they use GIS in their work and help teachers brainstorm how the technology can aid inquiry in their classrooms. Teachers often continue the conversations beyond the luncheon as they develop their projects or face technical issues.

An exciting partnership has developed between the Utah Geographic Information Council (UGIC) and teachers. The UGIC K–12 Mentoring Program allows for GIS professionals to sign up to help school teachers and for teachers to gain technical assistance with GIS software and data.<sup>2</sup> National Geographic and ESRI have expanded the UGIC model to a national scale called the GeoMentor Program.<sup>3</sup>

Utah's Community Mapping Program is able to capitalize on another partnership. The UGIC, Utah Automated Geographic Reference Center, Utah Education Network, and Utah Geographic Alliance have partnered with ESRI for a state software license. Each trained teacher is provided with the latest release of ArcGIS software and access to the state GIS database.

### Geographic Inquiry, Data Collection, and Fieldwork

Geographic inquiry is the backbone of Community Mapping projects. Throughout the process students: (1) ask geographic questions, (2) acquire geographic resources, (3) explore geographic data, (4) analyze geographic information, and (5) act upon geographic knowledge.

An important part of acquiring geographic resources is data collection and fieldwork. Students often acquire data using surveys, recording observations, taking measurements, and documenting with digital images. The data is often tied to locations using handheld GPS units. The data and coordinates are entered, processed, and analyzed using GIS software. Project results are often communicated through maps.

One project illustrates the engaging nature of fieldwork in an unusual way. The community of Lehi, Utah, was experiencing such extreme traffic congestion on Main Street that emergency response vehicles could not respond to critical medical conditions quickly enough. As a result, life-flight helicopters were often called in to respond. The emergency response community needed a database of locations that were large enough to land the helicopters and a description of nearby hazards such as overhead wires. Local junior high school students used aerial photographs, GIS, and GPS to identify and measure safe landing locations throughout the city. While students were evaluating a potential site, a serious accident happened nearby. The emergency response team member advising the group called in the GPS coordinates the students had just collected. Students watched as the helicopter landed at the site they were evaluating.

*“[T]eachers can use the methodology, logic, and processes of Community Mapping to involve their students in active and engaging inquiry projects in their community.”*

### Conclusion

While each state may not have the same resources and partnerships to provide model Community Mapping workshops, teachers can use the methodology, logic, and processes of Community Mapping to involve their students in active and engaging inquiry projects in their community. Many teachers have experimented with different aspects of place-based, community-based, project-based, inquiry-based education and service learning. Many teachers help their students to learn about data collection, fieldwork, and geospatial technologies. Many teachers want their students to make connections between their curriculum and career paths and to develop skills needed in the twenty-first century. Many teachers hope to introduce students to conversations taking place in the community and help them make connections with concerned

## Community Mapping

adults while insuring that content standards are met. A well-planned Community Mapping project has the potential to bring all of these curriculum pieces together.

We have found that when teachers see the potential of a Community Mapping project, they immediately begin to imagine the loftiest application of a schoolwide, cross-curricular project involving every student. While a CMAP project has that potential, we suggest that teachers begin with a small, manageable project. A teacher's first project is often done with a small group of students in a club or class to enrich a topic that is already in the curriculum. This allows the teacher to gain experience with all the issues of project, time, and resource management as well as the technical issues of geospatial technology. Teachers often take one or two years of experimentation before they are ready to implement their first class project. But the potential of Community Mapping projects has been tested and realized by hundreds of teachers and thousands of students who achieve curriculum standards through active engagement in community issues. Students are empowered with the knowledge, skills, and desire to make a difference in their community. This model of life-long learning rewards both teachers and students and makes the efforts worthwhile.

For Community Mapping Program ideas and resources, visit <http://www.uen.org/cmap>.

*“Students are empowered with the knowledge, skills, and desire to make a difference in their community.”*

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**NOTES**

<sup>1</sup>“CMaP Logic Model—Simplified Version,” in Community Mapping Participant Notebook, PEEC, Peer Associates and Institute for Technology Development, 2004.

<sup>2</sup>To review the K–12 Mentoring Program and the Program Conditions Agreement, see <http://gis.utah.gov/ugic-mentoring-program> (last accessed 21 January 2011).

<sup>3</sup>For more information on the GeoMentor Program, see <http://edcommunity.esri.com/geomentor/index.cfm> (last accessed 21 January 2011).

**Doug Andersen** has been a ninth-grade geography classroom teacher for twenty years and is Co-coordinator of the Utah Geographic Alliance. He became a certified Community Mapping Instructor in 2005 and has been the state Community Mapping Coordinator since 2006. He has organized and conducted workshops throughout the state. He is grateful to his friends in the GIS community, his co-trainers, and their organizations that help improve students' geographic literacy and life skills. He currently works at Brigham Young University in the Teacher Education Department through a partnership with his school district. When his university assignment is complete, he will return to his World Geography and AP Human Geography classroom at Oak Canyon Junior High School in Lindon, Utah, USA.

