

## NAAEE 2004 CONFERENCE PROCEEDINGS GUIDELINES

Watershed/ Forests/ Topical Strand

Community Mapping for Sustainable Systems  
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Community Mapping Program

### Abstract

The Community Mapping Program supports students, educators, and community groups in a process of place-based inquiry to address local needs. In a community mapping project critical elements are advanced to build capacity for local wellbeing and sustainable systems. These projects focus on school-community partnerships, place-based learning methods, spatial tools (including Geographic Information Systems and Global Positioning Systems), and creating products for sustainability. Brief descriptions are offered of over one hundred projects to date. Resources and an extensive Gallery of projects is available at [www.communitymap.org](http://www.communitymap.org)

The Community Mapping Program (CMP) supports students (Grades 6-12), educators, and community groups in a process of local inquiry. Middle and high school students work with their community partners, conduct field work, and use tools including Geographic Information Systems (GIS), and Global Positioning Systems (GPS), to explore their communities and address specific local needs.

CMP is based on a partnership of The Orton Family Foundation (TOFF) and the Vermont Institute of Natural Science (VINS). TOFF is based in Rutland, Vermont, and Steamboat Springs, Colorado and has been the primary sponsor of the program's development, infrastructure, and evaluation to date.

VINS is a research and education organization and the primary operating partner in the Northeast. Substantial support for the Community Mapping Program in the

Northeast has been provided by the Wellborn Ecology Fund of the Upper Valley Community Foundation, and the Canaday Educational and Charitable Trust.

Environmental Systems Research Institute has provided generous in-kind support for participating educators.

In 1999 the CM Program began in both Vermont and Colorado. We have now worked to initiate or support over one hundred projects in over a dozen states in the U.S..

Community mapping is world-wide and features an inclusive, participatory process focused on the needs and priorities of communities at a local scale. The Community Mapping Program systematically promotes and supports this opportunity for learning and capacity building.

Inspiration for the CM Program comes from numerous sources including the work of conservation biology, Parish Mapping, bioregional mapping, the Green Map System, asset mapping, participatory G.I.S., and numerous independent community mapping initiatives.

The Community Mapping Program is an expression of education for sustainability using the methods of place-based education. In succinct terms, place-based learning connects students, educators, and communities in a process of discovery and caring for where we live. Building from specific experiences of pieces, patterns, and observations of change, participants construct a conceptual understanding of vital systems. By meeting identified needs in our community, participants learn from the outcomes and gain competency to act. By working from local to global, and concrete to abstract, participants learn to act together effectively. By understanding local assets and building

equity in natural, economic, and social systems, project participants increase capacity for sustainable wellbeing.

As we enter the United Nation's Decade of Education for Sustainable Development in 2005 the CM Program is focused on how to inculcate and support community mapping as a capacity-building tool for sustainable systems.

Sustainable social, economic or ecological systems are of such a scale that people are familiar with them, observe them change, and feel responsibility toward them. Place-based learning posits that the domain of learning will be local first and then at more extended scales. To establish Environmentally Responsible Behaviors and sustainable practices we need to increase knowledge, and reinforce resonant bonds to place, but we also need knowledge of how to act, and a sense of individual and group efficacy. To increase capacity for sustainability the Community Mapping Program looks to connect educators and students to the assets and needs of the community so as to develop this critical learning and action cycle.

Community Mapping Program looks to increase community wellbeing and capacity for sustainability. Key elements for sustainable practice include good networks (social capital); capacity to use tools (the built capital of maps, phones, data, research equipment); shared language of place, change, and systems; and a history of action and learning.

The Community Mapping Program identifies four main elements:

- School and Community Partnerships
- Place-based Learning
- Spatial Tools

- Products for Sustainability and Wellbeing

School and community partnerships link specific educators and specific community groups on defined projects. Educators in rural sections of the Northeast frequently don't live in the town where they teach and so they don't know the place, the issues, the movers and shakers, or other resources. Community groups often feel shut out of the school by the school schedule, curricular pressures, poor communication, and the general insularity of schools. Community mapping projects require both parties in a joint project proposal.

Community groups have included planning boards, land trusts, farmers' markets, a health clinic, and watershed associations. These groups have more than enough to do and limited amounts of time and money. The work of students addresses a specific need that the group has identified.

By way of example, students in Colorado worked with the Carpenter Ranch of The Nature Conservancy. Students used Trimble Global Positioning Systems to document groundwater monitoring wells, irrigation ditches and research sites for the development of a master plan.

Place-based learning for the CM Program emphasizes the need to work at a scale where individuals can make a difference and see the outcome. Projects are best scaled to maximize access to the study area. By working together, participants see the pieces and patterns of the system, monitor the processes, and create the pre-conditions for shared awareness and action.

Community mapping projects often reinforce map reading, orthophoto interpretation, compass use, off-set mapping methods, digital technologies, and so on, but

they are not necessarily GIS nor cartography projects. The spatial tools are intended to support the process of getting out of the classroom and learning about local systems not to inhibit the process.

Project selection matches student learning needs and community needs. It is critical to edit back to a project that is doable. Each project has a timeline, involves field work and collaboration among the educators, students, community group members, community volunteers and usually CMP staff. By identifying a specific product as a project output – the development of the project can be focused on the experiences, skills and tools that the students (and community) needs.

The product of a project can range widely (e.g. new data, a design for water quality monitoring, a website, display, or trail design and interpretation). The product keeps the project directed and requires actual collaboration and learning. The product (and hence project) is useful and needed. From this experience the students learn about how people work to address community needs, the skills required to make a difference, and create work of value. Capacity for sustainable behaviors and community wellbeing are not just good ideas – but part of the process and product of a community mapping project.

The CM program model identifies four sets of agents: educators, community partners, students, and CMP staff. The educators can be individuals or a team. Some educators lead after-school programs, clubs, camps, or home-school networks.

The community partners represent a wide array of governmental and non-governmental groups addressing community needs around issues of social, economic or ecological concerns.

Community Mapping Program staff support the project through the planning process, the summer institute, developing spatial data and maps, supporting curricular and assessment planning, long-distance trouble-shooting, and with four visits to each project. These visits can be classroom, lab, or field-based as needed.

Here are a few brief project descriptions.

On a wooded parcel secondary students were asked to locate the boundaries of a school district property in Lebanon, New Hampshire. Using the warranty deed, tape measures, compasses, as well as a field map and GPS, the students found and flagged the survey pins. Their work allows other classes to utilize the site more effectively.

Hartford, Vermont social studies students worked with the Good Neighbor Health Clinic to design and interpret walking routes through downtown. The brochures help people addressing diabetes and obesity begin and maintain a practice of walking. The students' routes offer insights into the community and create an engaging experience of healthful exercise.

Enfield, New Hampshire Ecology Scouts used GPS to map locations of purple loosestrife (*Lythrum salicaria*) near Lake Mascoma. The scouts brought their work to the attention of the watershed association to highlight the issue of invasive exotics, recommend management practices, and reduce the impact of this invasive plant.

A conservation partnership in the Mad River area worked with students at Harwood Union High School. The students used the local agricultural economy as a case study for their class. Students also interviewed farmers in the watershed to document lands leased for cultivation, hay, or pasture. This information helped identify lands that are functionally valuable to this isolated and fragile dairy economy.

Community Mapping projects use existing spatial data as primary sources sometimes including original plat maps, atlas images from the 1860s, topographic maps (contemporary and historical), insurance maps, aerial photos, and satellite data. Projects often use Global Positioning Systems in their field work. Field maps and initial wall maps are often prepared with Universal Transverse Mercator (UTM) coordinates which allow for a more direct transfer to ground measurements (meters) than Latitude and Longitude.

Project outcomes are often displayed publicly and represented on the web. Visit the Gallery at [www.communitymap.org](http://www.communitymap.org) to learn more about a variety of projects. This community mapping model has been articulated at a project-level and a program-level in Making Community Connections (Knapp 2003).

By linking student learning needs, community assets, shared experiences of place and spatial tools, the Community Mapping Program contributes to sustainable systems promoting economic and social wellbeing and ecological integrity.

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