

Submitted Title:

**Best Management Practices for 4-H Community Mapping Projects**

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Paper: # 1722  
Session Title: Community Mapping  
Date: Sunday, June 17, 2007  
Time: 8:30 AM - 9:45 AM  
Room: Balboa

**Abstract:**

*Geospatial Technologies are quickly spreading throughout the Oklahoma 4-H community. Four county 4-H programs have implemented community mapping projects and GIS educational programs through the generosity of the ESRI/4-H software grant program. Our community mapping projects range from; locating and mapping community storm shelters, mapping recreational trails on public lands, to mapping a community golf course. These projects involve partnerships between 4-H Educators, agency personnel, local government officials, volunteers and youth. Community mapping projects are an excellent tool to pull all these collaborators together for a common cause. This presentation will illustrate the successes and the pitfalls of 4-H community mapping projects. Come learn from our mistakes, and our achievements. We will show you the Best Management Practices for implementing a successful community mapping project.*

## **Best Management Practices for 4-H Community Mapping Projects**

The Oklahoma 4-H program was the recipient of four ESRI Community Mapping Software Grants. Four county 4-H programs took on the task of developing a community mapping project and a 4-H club. The first grant recipient (A) planned to map the hiking trails within the local wildlife refuge. The second recipient (B) planned to locate historical Native American sites within tribal lands. The third recipient (C) planned to map the horse trails within the recreation area of a local lake. The fourth and last recipient (D) planned to map community storm shelters.

### **Data Collection and Analysis**

The following case studies were compiled using qualitative research methodology. The data was collected from artifacts related to the projects. The data sources were: ESRI software grant applications, project report summaries, and personal communications with the author including emails, phone calls and personal project visits. The data was summarized into short case studies, and analyzed by the author for common themes regarding the strengths and weaknesses of the projects. All identifying information was removed to maintain the anonymity of the participants.

### **Project A**

Recipient A worked with a group of about 30 youth in the 6<sup>th</sup> through 9<sup>th</sup> grade. These youth voluntarily participate in an after-school program which provides technology based educational programming and childcare. This program allows the youth to explore the internet and play computer games as a part of their protocols. This particular program has access to a computer lab and GPS units. However, they are also associated with the military so there are rules and regulations which limit who can work with the youth, when, and how.

This program wrote their ESRI software grant based on the plan that the youth would map the hiking trails in the nearby wildlife refuge. They also planned to partner with the refuge staff and create a map which would be available for the public to use. A long term goal of this project was to develop a website which the GPS data for each trail could be downloaded and used for hiking using GPS units.

The coordinator of this program has trained these youth to identify and locate places using GPS units and then download the locations into the software to create a map. Over the past year they have completed small projects of places the youth frequently visit to prepare for a larger project. According to the coordinator, they have had great difficulty motivating the youth to participate in this project. The youth have been more interested in playing computer games. They have also had a hard time working with the refuge staff. This project has not been abandoned but is struggling due to lack of youth participation and additional adult assistance. The coordinator hopes to continue with this educational effort throughout the upcoming year, but complains that the youth are not showing much interest past the fun stuff because the youth are “consumed with school activities.”

## **Project B**

The second recipient (B) planned to locate historical Native American sites within tribal lands. The planned project would locate and map historical locations important to the XXXXX (Tribal) Nation. The XXXXX Nation Museum curator would assist the club with identifying and locating sites to be mapped. Sites would be historically important to XXXXX Culture. Examples include; cemeteries, stomp grounds, home sites, council grounds, battle fields and any other sites significant to the Nation's history.

The target population for this project was youth from three Oklahoma Counties, primarily from three schools. These schools are small rural schools with limited resources. There would be approximately 25-30 students, with ages ranging from 13-18 yrs old.

This project was intended to be an introductory program for geospatial activities in the area. Teachers and students who expressed interest in GPS-GIS technology where asked for program suggestions. The Extension Educator, who developed this project, discovered, the students and teachers were aware of the technology, but were not fully aware of how to apply the technology. By getting hands-on access to the new technology, the students began to better understand "how it works and fits in to future careers."

The long range plan is for the Club to be ongoing with activities concentrated in the summer months. Mapping sites of historical significance to the XXXXX Nation will be the main activity. As students become familiar with the technology and its capabilities, suggestions will be taken from the students for further activities. Expanding the GIS program into new clubs, with the original students doing the teaching will be an important goal.

Currently this project has consisted of teaching students and teachers to use GPS technology. The programs have focused on how GPS works, using GPS to Geocache, and teaching geospatial concepts through outdoor events and activities. This project is continuing to work toward its goals of mapping historical locations and developing maps for the museum.

## **Project C**

The third project plan was to map XXXXX Lake Recreational Areas. The plan included partnering with the Corp of Engineers at the lake. After the project has been concluded, the maps could be made available to the public to better identify where specific facilities are located at the lake. Maps would be posted at information sites and made available to hand out at the gated entries to the lake. This project also includes a website containing information about the project, the learning opportunities that have been made available to the youth, and the information that has been produced from the project.

Over the past several months this Community Atlas project has taken a new direction. The commisioners of XXXXX County have asked that the project club help them in their quest to better serve the citizens of the county. The project will map the bridges of the county in a form that will allow for rapid information retrival of Oklahoma Department of Transprotation Bridge Inspection Information. Location, Bridge Inspection Report data and digital pictures will be combined into a usable format to meet the needs of the county commisioners.

Educational activities over the past year have included Summer day camps where 135 youth discovered how the hand-held GPS monitors could be used in their daily lives. Sixty teachers from local schools participated in a training to discuss how GPS/GIS could be incorporated into classroom activities. Extension Educators have attended three state trainings to learn the basics of ESRI software and how the technologies can be incorporated into county based programming. Sixty 4-H members have participated in trainings to discover the basics of GIS and how the technologies will influence the future.

The planning of the new project has now been completed. Information gathering has been completed "Oklahoma Department of Transportation-Bridge Inspection Report" for the 200 plus bridges of the county. Discussions with the XXXX Engineering firm, the County Commissioners, 4-H Club leaders, school administrators and Extension staff to reach an agreement on what are the expectations of the community mapping projects have been conducted.

The community mapping project will be a huge undertaking for the youth. Mapping the 200 plus bridges of the county plus collecting the digital pictures along with the attributes of: age, load rating, structure type and material. This project will enhance both the basic mapping skills and advances GIS for all the youth, teachers and 4-H leaders involved. The project will move forward in 3 phases as our county is divided into three separate commissioner districts. Each district will be completed before the next one is started.

### **Project D**

In 2001, a small Oklahoma community was hit by a tornado. Within and close to the 6-mile path, 132 single family homes, 32 businesses, eight mobile homes and six public buildings were considered uninhabitable; 477 single family homes, 40 businesses, 27 mobile homes and 10 public buildings were damaged (Oklahoma Emergency Management, 2001). One of the public buildings destroyed was the XXXXX County Fairgrounds including the 4-H Building. Luckily, there were no 4-H events underway during the storm. Through this incident, local 4-H members were made aware that people from outside of the area had no idea where to go in case of a tornado. There were no storm procedures posted at any of the public meeting places. The 4-H members received an ESRI grant and planned to map public storm shelters in each community in the county.

The 4-H members with their Extension Educator completed the community service project in which they mapped the community storm shelters in the county. The information was made available to the public through a brochure and on the 4-H website. Storm procedures with a map to the public storm shelter were posted at the County Fairgrounds, the local Activity Center, and other public meeting places.

After completing their first Community Atlas projects, which included the storm shelter map as well as mapping of points of interest in the County, the team moved on to an additional mapping project.

In the summer of 2006, project D, 4-H members in cooperation with another youth organization, a local rural development agency, Oklahoma Department of Environmental Quality and USDA Rural Development conducted an Illegal Dumpsite Project. The

project involved 25 youth investing 143 hours and was part of a grant received from a local rural development organization. They created three brochures, two PowerPoint presentations, an elementary recycling education program, and a speaker's notebook. The youth mapped 12 dumpsites making written descriptions, taking digital pictures and recording the GPS locations. This information was compiled and given to the county commissioners and also presented at a Regional Recycling Workshop.

### **Project Analysis and Future Applications**

Partnerships are often the key to any successful project. For any of these projects to work, partners are necessary. The projects first needed a facilitator, someone willing to organize the project. Second, the projects needed a group of youth who were willing to work on the project, collect the data, and create the maps. Third, the projects needed additional adults to work with the youth. These adults may be teachers, local agency personnel, or volunteers.

These crucial elements were identified based on the analysis of the four described Oklahoma projects. Project A, mapping trails in the Wildlife Refuge only had two of these partners, the youth and the facilitator. This project ran into difficulty when the youth didn't participate. Project A only had one adult involved. Several adults (volunteers, park rangers, or others) may have been able to provide the motivation and other youth needs to make this project a greater success.

Project B, mapping the historical Native American sites, had a project facilitator but was lacking in committed youth and other adults. Due to this lack of participation the project was off to a slow start. However, the project is making progress by training youth and adult to use GPS units and increasing their awareness of the value of community mapping, but the project has been slow to begin the actual map making process.

Project C, mapping local lake recreational trails, has more adult partners than any of the other projects, but has been lacking in a committed group of youth who are willing to spend time creating community maps. Although this project has changed directions it may have the most potential to come to completion.

Project D, mapping storm shelters, was the most successful of all the projects. This project had all the elements suggested: willing youth partners, project facilitator, and participation by other adult partners. An interesting note about this project is, not only did they complete their original project they also expanded into other project areas.

### **Identified Issues in Implementing Community Mapping Projects**

By analyzing these projects, the strengths and weaknesses of each approach can be determined. The greatest obstacles in these projects were the lack of youth participation, and more adult participation was needed.

Through these four projects, successes and failures can be identified. The first issue that should be considered is time. Three of these projects (A,B,& C) have the potential to be completely successful but haven't had time to mature. The ESRI grants are based upon a one year time frame. One year is not a lot of time for a project leader/facilitator to create awareness of geospatial technologies, train people and develop a team of youth and adult partners to map a community project. It takes time to recruit a team of youth

and adults and develop them to the point they can implement and complete a community mapping project.

The second issue identified through these projects is youth participation. Youth should be involved in selecting the project. If they are not involved from the beginning they may not take an interest in completing the project. If a project is selected the youth are excited about, they are more likely to complete it.

The third issue is partnerships. These types of projects require adults and youth who are committed and working together to meet the community need. Without proper support the project may fall short of meeting its full potential.

### **Youth-Adult Partnerships as a Best Management Practice**

Youth-Adult partnerships are a fostered relationship between youth and adults where both parties have equal potential in making decisions, utilizing skills, mutual learning and promoting change through civic engagement, program planning and/or community development initiatives (Jones & Perkins, 2004, p.5).

Youth-Adult partnerships involve youth in the decision making process from the very beginning of a project. Logic would indicate that if youth and adults work together to select a project, and the project is important to both the youth and the adults, the likelihood of the project success will increase.

Youth-Adult partnerships are particularly applicable in community mapping projects. This type of project can interest youth, but youth must be involved in project selection. In order to increase youth participation, their unique needs must be considered. These needs are scheduling, transportation and financial constraints (Innovation Center, 2003). If these needs are considered and met, youth participation should increase. The sponsoring community organizations (such as 4-H) can benefit from these partnerships in community mapping by implementing programs which are more relevant to the youth. Communities benefit by developing youth who are more prepared to become active members in their communities (Wright, 2000). The participating adults experience the competency of youth first hand and begin to perceive them as legitimate contributors to society and the decision making process (Innovation Center, 2003).

### **Best Management Practices**

Project D can serve as an example of the best management practices in community mapping projects. Project D conducted the following five steps in implementing their community mapping project:

- Formed quality partnerships with youth, adults, and experts in the field – this team consisted of youth from two organizations, two local agencies, and a school district. All these partners provided input and expertise to the projects. Each partner, including the youth, had a specific purpose and value, in the project.
- Secure adequate funding to support the project – through the partnerships, this team used multiple funding sources to provide finances for data collection, map development, flyers, brochures, and travel expenses.

- Involve the public to create an excitement and awareness – the team also involved the public in identifying storm shelters and the illegal dumpsites. Adding public awareness generated and additional excitement for all involved. The participants felt like they were contributing to the welfare of the community.
- Develop an educational program to present project outcomes and findings to multiple audiences- after the mapping projects were completed the team developed educational programs for schools and public organizations to raise awareness of the issues they selected for their project.
- Evaluate the project to determine impact – the last step in this process was evaluation. The team found it important to look back and see their accomplishments. This step also gave the team the opportunity to ‘showcase’ their accomplishments within their respective organizations.

Through these projects, the identified best management practices for community mapping projects are; allow enough time and financial resources for a project to mature and develop, recruit committed partners of youth and adults to provide input into the design and implementation of the community project, generate public awareness and develop the educational value of the project, and evaluate the outcomes. Implementing these Best Management Practices should enhance any community mapping project.

### References

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### Acknowledgements:

I would like to acknowledge the County Extension Educators and volunteers who participated in the four community mapping projects; Chris Burgamy, Rick Clovis, Mike Jeffcoat, and Mary Peck.