Category 5 CAP Grant – 2007
ARDC - Laurentian GIS Collaborative
Final Project Report

Cooperative Agreement Number: 07HQAG0092

Project title: Laurentian GIS Collaborative – Final Report

Report Date: 01/13/09

Project start and end dates: 07/01/07 – 12/30/08

Organization: Arrowhead Regional Development Commission (ARDC)
221 W. 1st Street
Duluth, MN 55802

Project Lead: Kara Kent, ARDC GIS Specialist
Phone: (218) 529-7539 / Email: kkent@ardc.org

Collaborating Organizations:

Arrowhead Regional Development Commission
Kara Kent
221 West First Street
Duluth, MN 55802
www.ardc.org

Arrowhead Regional Development Commission
Andy Hubley
221 West First Street
Duluth, MN 55802
www.ardc.org

City of Babbitt, Minnesota
Pete Pastika, City Administrator
71 South Drive
Babbitt, MN 55706

City of Biwabik, Minnesota
Jeff Jacobson, Administrator
Box 529
Biwabik, MN 55708

City of Chisholm, Minnesota
Jason Fisher, City Engineer
316 West Lake Street
Chisholm, MN 55719

City of Eveleth, Minnesota
Jackie Monahan-Junek, City Administrator
413 Pierce Street
Eveleth, MN 55734

City of Keewatin, Minnesota
Tom Sampson, Mayor
Box 190
Keewatin, MN 55753

City of Mountain Iron, Minnesota
Craig Wainio, City Administrator
City of Mountain Iron
8586 Enterprise Drive South
Mountain Iron, Minnesota 55768

City of Nashwauk, Minnesota
Ed Bolf, City Clerk
301 Central Avenue
Nashwauk, Minnesota 55769-1193

Iron Range Resources (IRR)
Dan Jordan, Supervisor
801 SW Highway 169, Suite 2
Chisholm, MN 55719

Itasca County, Minnesota
Dave Bily, GIS Coordinator
123 NE 4th St. Room 156
Grand Rapids, MN 55744-2600

State of Minnesota – Department of Natural Resources (DNR)
Craig Perreault, GIS Specialist
1201 E. Highway 2
Grand Rapids, MN 55744

St. Louis County, Minnesota
David Yapel, Planner II
227 W. 1st Street, Suite 100
Duluth, MN 55802

USGS Mapping State Liaison:
Ron Wencl
763-783-3207
rwencl@usgs.gov

Project Summary:
The main objective of the Laurentian GIS Collaborative is to provide an opportunity for Iron Range Communities of northeast Minnesota to take advantage of Geographic Information Systems (GIS). Benefits of GIS implementation for these communities include supporting community and economic development and future land use planning efforts, thus increasing their ability to accommodate future growth and industrial activities. Providing Iron Range communities with the opportunity to implement municipal GIS gives them the ability to take advantage of numerous GIS resources that are available to them locally without incurring a serious financial burden as is typical with such efforts at the state and national level.

Following is a summary of the project, objectives, tasks (phases), accomplishments, and challenges of the ARDC - Laurentian GIS Collaborative.

Project Objectives:
The following objectives for the Laurentian GIS Collaborative were each successfully met. The following summary of Phases I – V details the methods used to fulfill these objectives.

➢ Effectively utilize GIS technologies at the community level

➢ Create low cost solutions for the communities to quickly design maps, analyze data, and see infrastructure details

➢ Establish a collaborative by creating a regional forum

➢ Set up a long-term plan for maintenance of the mapping interface and developed data sets

➢ Periodic updates of data made available to USGS for use in the National Map

Phase I – Creation of GIS Collaborative Steering Committee
Phase I consisted of establishing a committee that would oversee the process and provide input throughout this project. Seven pilot communities on the Mesabi Iron Range were chosen to participate in this collaborative and a representative from each community was selected to be part of the steering committee. Other professionals working in GIS, mining and economic development were invited to attend committee meetings, creating an overall member pool of city engineers, city administrators, county GIS specialists, state agency GIS specialists, and a GIS software representative.

Phase II – Identifying and Evaluating Community Data Needs
Phase II addressed the data needs of the communities. An information technology survey was distributed to each of the seven communities to identify: 1) the needs of each community, 2) their ability to access the web, and 3) the latest versions of software they used for browsing the internet. The surveys were collected and an answer matrix was created. The results of the matrix showed that all communities were prepared to support a web-based GIS application with the ability to print.

Feedback sessions were held with the steering committee to identify GIS data needs for local government decision makers. The committee identified all base map layers that would be necessary such as aerial photography, roads, water, mining layers and other divisional boundaries. It was determined that some data needed to be converted into GIS data, including municipal zoning and parcels. For all of the pilot communities, there were initiatives at the county level to create and convert zoning and parcel data. In support of these efforts, a partnership was developed between the Laurentian GIS Collaborative and Itasca and St. Louis County to share this data and get frequent updates.

The steering committee identified utility data as the most desired GIS data for municipalities. Deficits in inventories such as catch basins, curb stops, shut off valves, storm manholes, sanitary manholes, lift stations, hydrants were common among all communities.

ARDC hired a consultant to start the development of an ESRI ArcGIS Server application which would be used to serve up the GIS data hosted at ARDC to each community via the web. This consultant was also responsible for developing utility data sets identified by the Laurentian GIS Collaborative and in conjunction with each collaborating county.

Phase III and IV – Analysis and Development of Support for GIS Applications
Phase III and IV included analysis of the hardware and software at ARDC to make sure it could easily support applications of the Laurentian GIS Collaborative. A new GIS server was purchased with adequate processing capabilities and a large capacity to service the current needs of the Laurentian GIS Collaborative, including future growth. ARDC's server license with ESRI was upgraded to the enterprise level to allow for standard and developed web publications to be served up internally and externally. The server was installed and prepared for implementation of the Laurentian GIS Collaborative Web Applications. The IT Team at ARDC received training for proper use and maintenance of the ArcGIS Server. To keep data organized for this project, a library was created for the base map, converted and created data and metadata. The library was populated as data was collected, converted, and created. Community GIS began the Research & Development (R&D) of the web applications for each community. At several steering committee meetings, demonstrations of the applications were given so members could give feedback about its design and usability. When the applications had reached their fullest potential in the R & D, they were moved over to the new server at ARDC.

Community GIS worked with ARDC staff to implement the applications from their new location and began adding the data sets.

To provide the participating communities with access to their GIS applications, a web page was created to deliver a link at www.ardcgis.org/laurentian . ARDC provided communities with training on how to use the web-based applications through demonstrations during meetings and on-site visits.

Phase V – Maintenance Planning
Phase V involved developing a plan for maintaining the continued high quality of for the Laurentian GIS Collaborative. To maintain input and involvement from communities, the Laurentian GIS Collaborative Committee plans on meeting a few times a year to maintain the excellent relationships which have been created as a result of this project.

To maintain the quality of data and web applications, ARDC has developed a maintenance agreement for each community for the upkeep of GIS data and web applications. It is the intention of ARDC to provide each community with 2 hours of labor per month for software upgrades to browsers and any software that needs to be updated (i.e. GIS or SQL Server). Every June and December, the most current GIS data will be placed into the web applications.

Project Accomplishments:
In addition to fulfilling all project objectives, the Laurentian GIS Collaborative included several additional key accomplishments, including:

- Invaluable relationships that were created between community leaders, area experts, and state and regional governments.
- Access to the GIS data provided and data which was corrected and/or developed during the project.
- Periodic updates of data will be made available to USGS for use in the National Map
- Teaching end users how these GIS applications can increase efficiency and support better decision making.

ARDC now has the ability to support GIS initiatives, provide GIS support, and make valuable GIS data accessible to communities to support their planning efforts. Using only the internet, ARDC has been able to provide the user with GIS capabilities without implementing their own GIS.

As a result of the Laurentian GIS Collaborative, the following data sets have been integrated and improved with the help of the counties and state agencies involved:

Boundaries: Cities, Parks and Forests
From the minor civil division layer, provided by the Land Management Information Center of Minnesota (LMIC), each city limit has been extracted and applied. The State of Minnesota Department of Natural Resources (DNR) has a park and forest boundary layer we

have inserted because much of the land in Northeastern Minnesota contains one of these boundaries.

Imagery: 2008 FSA one meter, St. Louis County High Resolution six inch
The Land Management Information Center of Minnesota has provided NAIP 2008 air photograph county mosaics for the two counties involved in this project. In addition, St. Louis County provided high resolution aerial imagery for most of the municipalities in their county.

Transportation: Highways, County Roads, Streets, Railroads, Runways
The most current road data from the Minnesota Department of Transportation provides strong alignments for all roads from interstates to streets. The latest airport and railroad files have also been downloaded from the MNDOT and applied. ARDC created a combined trail file which includes the current major trail alignments in the region and inserted it into the applications.

Zoning: Municipal
The counties provided what zoning they have for the communities of the Laurentian GIS Collaborative. There is an initiative in St. Louis County to get all of their municipal zoning files into GIS formats that can be widely used. When ARDC receives all of the zoning files from the county, they will be applied to the web applications.

Utilities: Municipal
All of the pilot communities will have utility data applied to their web application. This is another county/ARDC initiative spearheaded by communities of the Laurentian GIS Collaborative which includes the creation of GIS utility data. This initiative is still underway and will be added to the web applications upon completion. The data will include an inventory of storm water and sewer pipe databases including things such as the locations and information about catch basins, manhole covers, lines and other attributes.

Parcels: County
Both counties involved in this project have provided ARDC with their latest parcel data and it will be added to the web applications. It is the responsibility of the counties to keep these records up to date and monthly updates of this data will be applied

Environmental: Mining, Hydrography
Iron formations and mining features are data layers provided from the DNR for mining locations and iron formation analysis. Lakes and rivers are also provided by the DNR and are included in the base map for the web applications.

Project Challenges:
GIS has been widely used in a variety of disciplines, but it remains little used in the governments of smaller municipalities. To try and educate the participating communities**,** GIS was presented in show-and-tell demonstrations and also through technical training.   Maintaining clear communication between all of the entities involved was one of our larger challenges. There were numerous consultants working for the

county as well as for ARDC, and occasionally local communities were confused of the roles at times.

ARDC had to constantly make sure data sources, data type and format, data transfer and security were considered with the utmost quality at all times. In some cases this was the first time a community was taking its framed zoning file off of the wall and trusting someone else with this information. Fear of releasing information to the outside world was one of the main topics the committee addressed. Sharing information was not a concern for the pilot communities but how some organization with bad intentions could use the data in a negative way was discussed.

Ongoing challenges for the Laurentian GIS Collaborative will continue to document the benefits of regional data sharing. Seeing how GIS collaboration is economically rewarding is simple but measuring direct and indirect benefits to maintain the collaborative is a more complex issue.