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Mapping Is Central to Community Service

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Sault Ste. Marie, Ontario, Canada, a city of 75,000 located at the hub of the Great Lakes, sits on the Canada/U.S. border within a day's drive to several major North American cities, including Chicago, Detroit, Cleveland, Minneapolis and Toronto--the economic center of Canada. Sault Ste. Marie is a city that's rich with history and culture, and it's famous for the four-season outdoor activities of the Algoma Region.

During the 1990s, the municipality and Public Utilities Commission (PUC) of Sault Ste. Marie were evaluating the benefits and potential of GIS. By the late 1990s, both organizations were prepared to move forward with requests for proposals to implement GIS solutions.

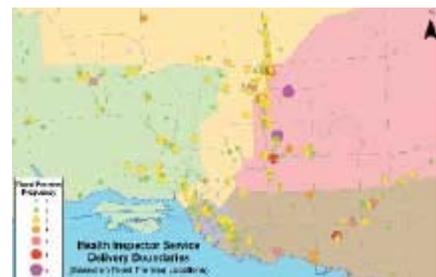
During this time, the economy in Sault Ste. Marie was not fairing well, and Algoma Steel, the major employer in the community, was about to lay off almost 1,000 people. This situation initiated the creation of the Sault Ste. Marie Innovation Centre (SSMIC).

The SSMIC is a not-for-profit organization created in 1998 with a mandate to diversify the local economy with an emphasis on information technology. The SSMIC had several business lines, including developing an IT-related business incubator, supporting IT-related companies and pursuing market-development projects.

When it was learned that the city and PUC of Sault Ste. Marie were about to hire Southern Ontario GIS consulting firms to implement a multi-year GIS solution, the SSMIC stepped forward with an interesting alternative. Why not hire the Southern Ontario GIS consulting firms to provide knowledge transfer only to seed local GIS expertise in Sault Ste. Marie and implement one GIS for the city and PUC?

An Innovative Solution

In 1999, EDS Canada, ESRI Canada, Terra Viva Inc. and J.D. Barnes were contracted for a two-year period to initiate the GIS implementation as well as provide training and knowledge transfer to locally hired staff. Candidates were selected based on their experience, and consideration was given to their ability to learn and commitment to the community. The mayor of Sault Ste. Marie and the president of the PUC mandated the GIS solution from the "top down" to be shared by all departments of both organizations.



The CGC helped the Algoma Health Unit by using GIS for health-inspector caseload distribution.

This also was the ideal time to undertake such an approach, with ESRI in the process of beta testing its new ArcGIS 8 technology. With ArcGIS 8, GIS was revolutionized with ArcSDE and the use of industry-standard database-management software, object-oriented data modeling, mainstream IT programming languages and the advancement of Web-based GIS with ArcIMS. With the assistance of the consultants, the SSMIC staff became experts in ArcGIS 8 before the software was officially released.

The GIS implementation was a five-year, \$5 million project that involved creating a central data warehouse for the city and PUC. Data capture included a complete inventory of all water, wastewater, electric, transportation, telecom, land base and administrative features. About two years into this project, the external consultants were phased out, and the project went forth with SSMIC staff.

At the end of five years, the GIS implementation was complete. The resulting solution is, according to ESRI Canada, the most comprehensive municipal/utilities GIS solution in all of Canada, possibly the world. The city and PUC were sharing the costs, and, with multi-enterprise licensing agreements, the costs were less for both.

Unleashing the Potential

After the initial five years, the GIS implementation progressed to become the Community Geomatics Centre (CGC). The CGC's mission statement is to promote partnerships among community organizations and establish the technological means to efficiently share geospatial data, tools, technology and knowledge to create a safer, healthier and more prosperous community.

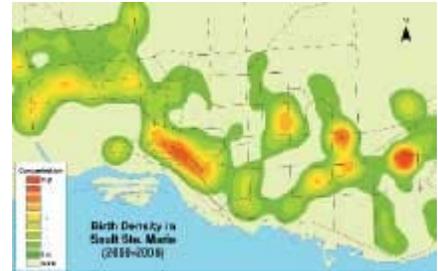


An image shows the Sault Ste. Marie sanitary and storm-sewer infrastructure, which includes sewer mains, hyperlinked laterals to each house, manholes, fittings and catch basins.

The CGC expanded to serve the Economic Development Corp., the Fire and Police Departments, and the local Conservation Authority. Additional partners were coming on board for a reasonable monthly fee and no up-front cost. The city and PUC were paying most of the costs and allowing other organizations to benefit from the GIS. Most of the data and GIS tools were being shared among the organizations.

The CGC was responsible for maintaining the data warehouse, providing user training and support, creating custom GIS tools as required, and all data maintenance and updating. The city, PUC and other organizations were GIS viewers only.

In the data editing process, it was determined that to provide such a comprehensive GIS solution to many organizations, it was necessary to understand all aspects of the data and interrelationships among them. For example, changing a parcel boundary line may affect coincident geometry with more than 20 other features, such as easements, subdivision boundaries, voting subdivision boundaries, postal-code boundaries, etc. Changing an address also could affect more than 20 other features that pertain to several organizations.



The CGC can help the Algoma Health Unit visualize data through GIS software. A birth-density analysis based on ISCIS data enables all of the health and social-service organizations to plan resource allocation and outreach programs to serve the community more efficiently and effectively.

Many water, wastewater and electric features have relationships to addresses that allow tracing functions to bring users to the property level. In addition, nearly a half million documents are hyperlinked to address locations.

No one person at the city could understand the needs at the PUC or other organizations, so the CGC maintains all data in a consistent manner. At present, all new building permits, work orders, engineering plans, etc., flow to the CGC, where data editing occurs. For most features, the data are no more than 30 days out of date from reality.

A Safer, Healthier Community

During the last two years, the CGC expanded the municipal/utilities GIS in innovative ways to address health and social issues in Sault Ste. Marie. Using the established CGC GIS solution and the municipal dataset as background layers, health and social agencies were approached to join the CGC partnership to improve the community's overall health.

New partners included the Algoma Health Unit, Child Care Algoma, the Children's Aid Society, Sault Area Hospitals, Communities Quality Improvement, Sault Ste. Marie District Social Services Administration Board and Algoma Manitoulin Early Years. Problems addressed through GIS projects include early childhood development, handicap accessibility, elderly abuse, public safety and environmental health.



The Community Geomatics Centre serves a large and diverse number of clients.

This approach of combining health and social-related data with municipal and utilities data brought about improvements in services from all sides. Instead of delivering services with a "broad-brush" approach, these services can be optimally delivered to areas where they're most needed.

This would include the prioritization of municipal services based on demographic and health data, the establishment of outreach programs in neighborhoods where the incidents of certain health or social problems are occurring, improved methods to distribute inspector case loads, and the reduction of municipal and utilities liabilities such as slips, falls and tripping. Early results indicate improvements in public safety and health delivery, reductions in municipal liabilities, and more effective use of budgetary resources.

Sharing the Expertise

The CGC has, in the last three years, packaged up this multi-enterprise, community-based GIS approach and

assisted several other smaller communities in Northern Ontario to implement multi-community GIS solutions. The first implementation involved the creation of the Northern Information Technology and GeoMatics Cooperative, which serves the communities of Wawa, White River, Hornepayne, Chapleau and Dubreuilville. The second implementation is the East Algoma GeoMatics Initiative, including the communities of Blind River, Spanish, Huron Shores and North Shore.

The CGC, as a department of the SSMIC, works in cooperation with the SSMIC's newly opened Business Incubation Centre and with other private-sector partners. In this role, the CGC assists a start-up GIS company, for example, within the incubator and other private-sector companies to realize new areas of opportunity in the GIS sector. Leveraging its experience with the city, PUC and other quasi-government organizations in Sault Ste. Marie, the CGC can help local GIS firms bid on municipal and utilities projects in other communities.

The SSMIC also accesses federal and provincial internship programs. This allows the CGC to train new GIS staff that can be groomed for the private sector or allow the CGC to expand into new areas such as health care. During the training of these individuals, GIS products are created that are delivered to the community as in-kind contributions. Examples include the following Web GIS applications: Address Locator, Where to Vote, Official Plan Online, Comprehensive Zoning Online and Heritage Features Online.

Award-Winning GIS

The CGC model of GIS implementation is unique and difficult to implement. It requires a strong commitment by all partner organizations in data and cost sharing. The benefits, however, are vast.

The CGC is delivering a community-based GIS solution to more than a dozen organizations at affordable costs. Enormous amounts of data are being shared by all organizations to solve enterprise and inter-enterprise issues. GIS expertise is well entrenched in the area, and it's being transferred to the private sector. In addition, the community as a whole is benefiting from the enhancement of the IT expertise.

In recognition of these accomplishments, the CGC has won several awards of recognition, including the Most Comprehensive Municipal/Utilities GIS in Canada 2003, the Best Municipal GIS in Ontario 2003 and 2006, Leadership in the Field of GIS in Ontario 2006, and the ESRI Award of Excellence for GIS in Health Care 2006.