



Sault Ste. Marie Region Source Protection Authority

Geographic Information System (GIS) Strategy (Information Management & Information Technology)

December 2021

**Sault Ste. Marie Region Conservation Authority
CA and DWSP GIS Strategy
December 2021**

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Acknowledgements

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GIS Strategy / Information Management / Information Technology

INTRODUCTION

In 2005 the provincial initiative for 'capacity-building' within Conservation Authorities involved the addition of staff, the upgrading of computer equipment and software to enable the use of GIS in the day-to-day operations. This initiative was primarily to facilitate the watershed based source protection. This now supports the Drinking Water Source Protection Program as part of the *Clean Water Act, 2006* and the '*Ontario Regulation 176/06: Regulation for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses*' as part of the Conservation Authorities Act, 1946.

GIS services provide digital spatial information and database management support of the Drinking Water Source Protection Program (DWSP), of the Conservation Authority (CA) on hazard areas and flood plains (fill/development regulated areas) in accordance with 'Ontario Regulation 176/06: Regulation for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses' (2006), the Flood Plain Mapping Report (1977 Dillion) and of the Shoreline Management Plan (early 1990's) for the Sault Ste. Marie Region Conservation Authority (SSMRCA) area. As funding becomes available an engineering study will be scheduled to acquire digital elevation points (DEM) at 1 metre intervals with ½ metre vertical accuracy to update the base data layers with the current environment. The update of this data will also provide the base data for hazard area and flood plain mapping.

In the future SSMRCA GIS Services will be used for the ongoing support of the DWSP Program of the *Clean Water Act, 2006* and 'Ontario Regulation 176/06: Regulation for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses'. It will be most useful in the future initiatives of this CA as data on the area is accumulated and integrated with current data.

Related business areas that perform and engage in functions specific to CA's:

- Protect Life and property from flood and erosion (Generic Regulations, Ont. Reg. 176/06)
- Encourage Sustainable Water Supply (Drinking Water Source Protection Program)
- Inventory and Monitoring water quality (PWQMN, PGMN, Drinking Water Source Protection)
- Assess and Report on Water Conditions (Recreation, Flood, Drinking Water Source Protection)
- Protect / Enhance Water Quality (Drinking Water Source Protection)
- Provide Recreation / quality of life opportunities (Recreation, Drinking Water Source Protection)

COMMON TERMS DEFINED

Geomatics is the discipline of gathering, storing, processing, and delivering of geographic information. This broad term applies both to science and technology, and integrates the following more specific disciplines and technologies:

- Geodesy
- Surveying

- Mapping
- Positioning
- Navigation
- Cartography
- Remote sensing
- Photogrammetry
- Geographic information systems
- Global positioning system.

Geographic Information System (GIS) - Taken in its broadest sense, a geographic information system is any manual or computer-based set of procedures used to store and manipulate geographically referenced data. The definition is as follows: A GIS is a computer-based system that provides the following four sets of capabilities to handle georeferenced data:

1. input (data capture);
2. data management (data storage and retrieval);
3. manipulation and analysis; and
4. output.

There are many manual systems that are used routinely to perform these functions and are effective for the tasks they perform and under the conditions in which they operate. A GIS does not operate in a vacuum. To be successful it must reside within a suitable organizational framework. The GIS is operated by staff who report to a management. The management is given the mandate to operate the GIS system (hardware/software) in such a manner as to serve the users within the organization.

Global Positioning System (GPS) - GPS refers to satellite-based radio positioning systems that provide 24-hour three-dimensional position, velocity and time information to suitably equipped users anywhere on or near the surface of the Earth (and sometimes off the earth). The NAVSTAR system, operated by the U.S. Department of Defense, was the first GPS system widely available to civilian users. Applications include hand-held telematics, fleet tracking and vehicle management systems - wireless communication devices designed for automobiles providing drivers with personalized information, messaging, entertainment and location-specific travel and security services. GPS technology is used in a wide range of applications, including maritime, environmental, navigational, tracking, manufacturing and monitoring.

Remote Sensing - is a means of acquiring information using airborne equipment and techniques to determine the characteristics of an area. Aerial photographs from aircraft and satellite images are the most common form of remote sensing.

Information Management (IM) – is the ongoing range of organized activities undertaken by the CAs and Watershed Regions to efficiently and effectively manage information throughout the CA data lifecycle. This cycle includes the lifecycle phases of Design/ Planning, Collection/ Creation, Use / Dissemination, Storage / Maintenance, Archiving / Disposal, Analysis and Reporting while being cognizant of the hardware life cycle and potential legacy systems that must be maintained.

DIRECTIVES / GUIDANCE

Conservation Authorities Act, 1990 (current as of October 1, 2021)

Ontario Regulation 176/06: Regulation for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses

R.R.O. 1990 Reg. 134: Conservation Areas – Sault Ste. Marie Region

WRIP Information Management Roadmap 2010 to 2015: A Conservation Authority IM Strategy

Conservation Authority Information Management Core Principles V0.5.2 12Sep05

Large Scale Mapping Guidelines

Ontario Ministry of Natural Resources Cartography Guidelines

Drinking Water Source Protection Symbolology

Director's Technical Rules 2017 (amended regulation 2018) (formerly - Assessment Report

Outputs: Logical Data Specifications V5.5 June 9, 2011)

Clean Water Act, 2006, O. Reg. 287/07 General, O. Reg. 231/07 Service of Documents, O. Reg. 284/07 Source Protection Areas and Regions.

OBJECTIVES / GOALS

The vision of having a geographic information system (GIS) within the CA is to provide spatial analysis in a worldily referenced view of the CA data. In the day-to-day operations such as inquiries and applications under 'Ontario Regulation 176/06: Regulation for Development, Interference with Wetlands and Alterations to Shoreline and Watercourses' the GIS will provide a localized map to reference in the analysis of the proposed development. The ongoing gathering and organizing of data for the use in DWSP planning and implementation that will be supported by the ARC GIS (formerly ArcHydro toolset) and the other water models will determine the flood plain, fill regulated areas, catchments and watershed basin areas for planning.

GIS services use analytical and spatially referenced data that has been produced by the conservation authority staff, Municipal, Provincial and Federal governments. The data is then used in the analysis and mapping of the area features. These features include geology (such as bedrock and quaternary), natural resources (such as vegetation and waterbodies), hydrology (flow of water), cultural, infrastructure (roads, sewage management, constructed drainage, rail, etc.), Source Protection Area vulnerable areas and soils.

The power of GIS is in the analysis that can be performed with the real time mapping of the analysis result.

RECORD RETENTION/ARCHIVES AND ELECTRONIC RECORDS MANAGEMENT POLICY

Administration Policies and Procedures include the Electronic Records Management Policy that has the leeway incorporated for the GIS data and naming conformities within the data confines (in the ESRI software some processes or data formats only allow an eight character naming convention).

Record Retention and Archives information is available but is governed by the relevant act and regulation.

The SSMRCA records retention policy is generally seven years retention unless the record is part of a legal case where the records would be kept indefinitely as per the SSMRCA policy.

Drinking Water Source Protection Program – Fifteen (15) years after the latter, record creation or relevant report approval – Clean Water Act, 2006, S.54.(1); O.Reg. 287/07 General, S.11.1, S. 20, S. 53.1.

Analysis of Conservation Authority Core Business

In order to add value to the CA process for Generic Regulations (O.Reg. 176/06) and the DWSP process and maximize the return on investment of DWSP funds, SPA (Source Protection Authority) IM/GIS departments need to understand its role, its clients (primarily internal), its partners (primarily external) their needs, the current state of the organization and the desired future state of the organization. Since IM and GIS functions happen throughout the organization, leadership and support from the IM / GIS department is critical to enable individuals, teams, and the organization as a whole to deliver programs and services that are legislated through the *Conservation Authorities Act, 1946* and the *Clean Water Act, 2006* in the most efficient and effective manner.

Five key questions are considered in this strategy:

1. What services do the conservation authority (CA) and Source Protection Authority (SPA) GIS/IM/IT Department provide?
2. What resources are necessary to provide these services?
3. What data sources are used to provide these services?
4. What *Conservation Authority Act, 1946* and *Clean Water Act, 2006* business drivers and requirements are anticipated to apply to IM and GIS services?
5. What strategic goals will guide IM and GIS during a 3 to 5 year planning cycle?
 - a. Provide direction so CA/SPA can discuss as a board and determine which combination set of major strategic directions and goals applies to them.
 - b. Guidance on the development of a workplan to go with each goal outlined in above.
 - c. Provision of a generic maintenance strategy based on a common set of goals focusing on using IM and GIS as tools to organize, maintain and store the data
 - Hardware
 - Software
 - Netware
 - Data

Ensure components are within relevant acts or regulations noted;

- Provincial Policies and Mapping with regards to the Clean Water Act Regulations
- DWSP Data Uploads – Source Protection Plan, Assessment Report and Explanatory Document that now populates the MECP Source Protection Information Atlas

- MECP and NDMNRF (formerly MOE/MNR) Technical Requirements and Standards (DWSP and Generic Regulations)
- Clean Water Act, 2006
 - Records Retention S. 54.(1)
 - O. Reg. 287/07 General
 - Records Retention - Assessment Report S.11.1, SPP S. 20, Application Part IV of the Act, S.53.1

GIS SERVICE DELIVERY MODEL

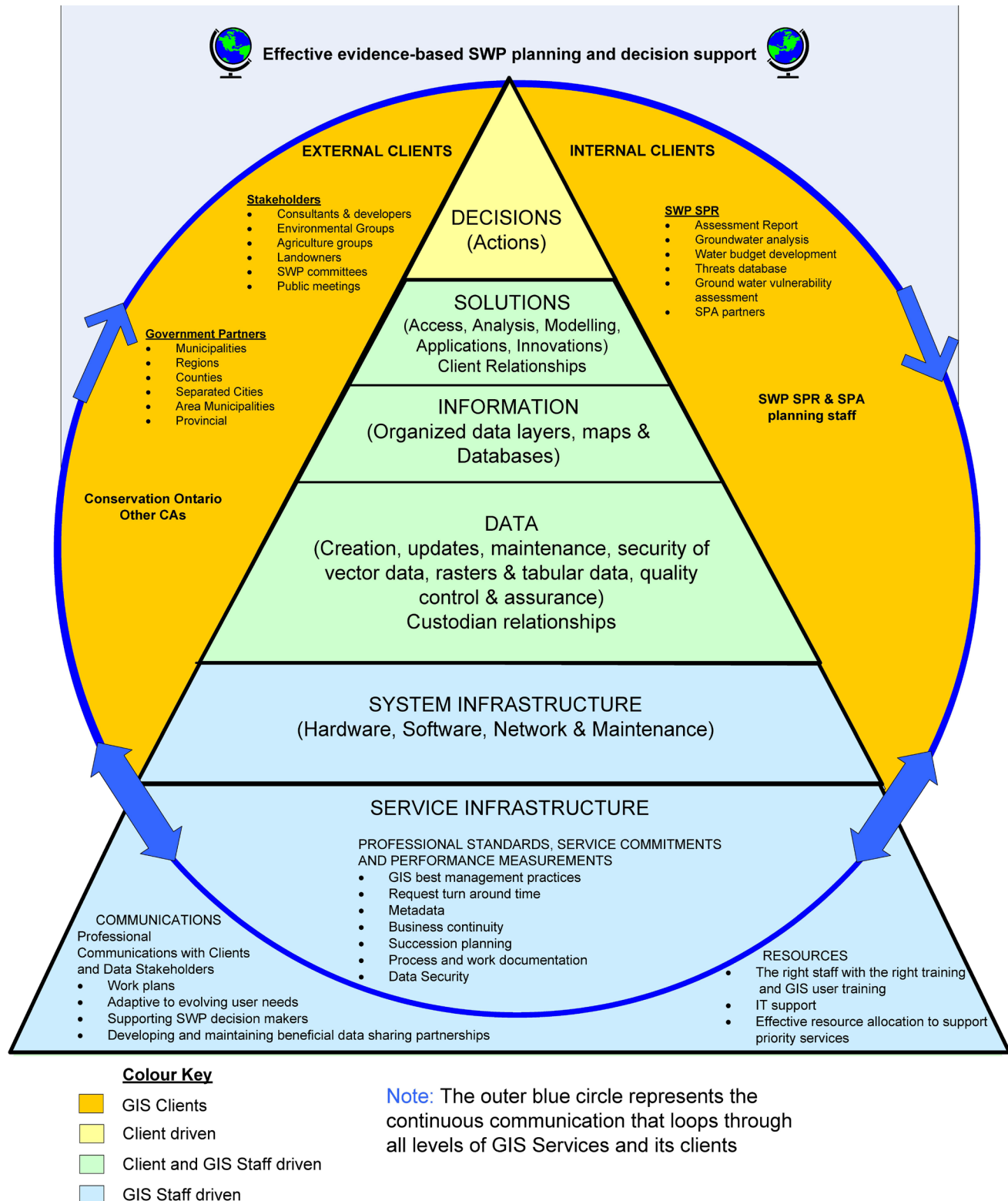
The GIS service delivery model (Figure 1) is based on six components in a hierarchy. In order to perform its role effectively, each component depends upon the others below it. This model is the cornerstone of the GIS strategy since all subsequent analysis (i.e., gap analysis and service impact assessments) is based on the functions and relationships of these components.

The decisions portion of the model (yellow area) represents the actions that result from and are supported by the entire GIS system. This is completely driven by clients (orange area). The green area represents how solutions, information and data support good decision making. Good evidence-based decisions depend on innovative solutions based on meaningful information derived from well organized and accessible data. This part of the process is what transforms raw data into useable information that can be visualized, queried, and used to develop solutions to support increasingly complex decision making. Both GIS staff and clients participate in these processes.

For accessible CA and DWSP data to be well organized and easily accessed, they depend upon a solid physical foundation in the form of servers, computers, databases, useful software, and an accessible network. This is the system infrastructure (included in the blue area).

Finally, all of the above components function effectively on a service infrastructure (included in the blue area). This is comprised of skilled staff, training, professional standards, documentation, and effective communication to make the whole system properly support the programs that it exists to serve. This area is managed entirely by the GIS department and is the most resource-intensive component of GIS service delivery.

Figure 1: GIS Service Delivery Model



Credit: Lake Simcoe Region Conservation Authority – 2009 The GIS Strategy Template

The GIS service is for the stakeholders of the CA that include municipal, provincial, federal governments and the public. SSMRCA has partnership agreements for the exchange of information with the City of Sault Ste. Marie, Township of Prince, the Sault North Planning Board, NDMNRF, MECP, MMAH (formerly MNR, MOE, MOH) and membership in Ontario Geospatial Data Exchange.

Client Service Model 2019

As per direction from the provincial government a Client Services Model has been created with tasks having specific timelines and outcomes. This is including tracking that is reported quarterly. THE MODEL AS DRAFTED (as of December 2021 the draft has not been approved).

APPLICATION TYPE	PRE-CONSULTATION	CIRCULATION (for pre-consultation, or after an application is deemed complete, or for any subsequent circulations)	COMMENTS AFTER FIRST CIRCULATION
Site specific Regional Official Plan amendments	Meeting scheduled with all parties and the applicant within x-21 calendar days of request ¹	Upper-tier municipality to circulate to all parties within x-3 business days	Parties to provide comments within X- 45 calendar days
Site specific local Official Plan Amendments	Same as above	Local municipality to circulate to all parties within x-3 business days	Parties to provide comments within X-45 calendar days
Site specific Zoning By-law Amendments	Same as above	Local municipality to circulate to all parties within x-3 business days	Parties to provide comments within X-30 calendar days
Draft Plans of Subdivision or Condominium	Same as above	Local municipality to circulate to all parties within x-3 business days	Parties to provide comments within x-45 calendar days

Site Plans	Same as above	Local municipality to circulate to all parties within x-3 business days	Parties to provide comments within x-14 calendar days unless the local municipality agrees there is a specific issue that requires additional time to resolve
Consents and Minor Variances		Local municipality to circulate to all parties within x-3 business days	Parties to provide comments within x-10 calendar days

¹ To convene a pre-consultation meeting, the lead agency must have sufficient information from the applicant so that the parties can provide advice.

The SSMRCA GIS team consists of the GIS Specialist, CA Assistant Manager (IT coordinator), CA General Manager, Drinking Water Source Protection Coordinator and Water Resources Engineer. As part of the IT function of the team, it is the members responsibility to work with the GIS Specialist to collect data and information (metadata) on the data collected in the appropriate format.

BOUNDARY DESCRIPTION / JURISDICTION

Conservation Authority jurisdiction (per Order in Council 21st November 1963)

The Honourable the Minister of Lands and Forests therefore recommends that under sections 3 and 5 of The Conservation Authorities Act, a conservation authority to be known as The Sault Ste. Marie Region Conservation Authority be established with jurisdiction over the area comprising the watersheds and parts of the watersheds which lie within the municipalities of the City of Sault Ste. Marie and the townships of Korah, Prince and Tarantorus of all streams entering the St. Mary River between Gros Cap and the point where the west boundary of the Root River meets the shore of the St. Mary River and that the participating municipalities in The Sault Ste. Marie Region Conservation Authority be the City of Sault Ste. Marie and the townships of Korah, Prince and Tarantorus.

The Conservation Authority jurisdiction has not changed.

The Drinking Water Source Protection Area (Figure 2) is defined as the entire Root River system (includes Black Creek, Cannon Creek, Crystal Creek, West Root River and Coldwater Creek), Little Carp River, Big Carp River, Bennett Creek, East Davignon Creek, Central Creek, West Davignon Creek and Fort Creek watershed basins incorporating all of Township of Prince, Batchewana First Nation (Rankin Reserve) and City of Sault Ste. Marie portions of Dennis, Pennefather, Aweres, Jarvis and Duncan Townships and the western portion of Garden River First Nation.

This has been defined scientifically with the assistance of the MNR Peterborough Geomatics Centre. Within the Townships of Prince and Dennis the area includes the shoreline of Lake Superior including the Thielman Creek watershed to Gros Cap.

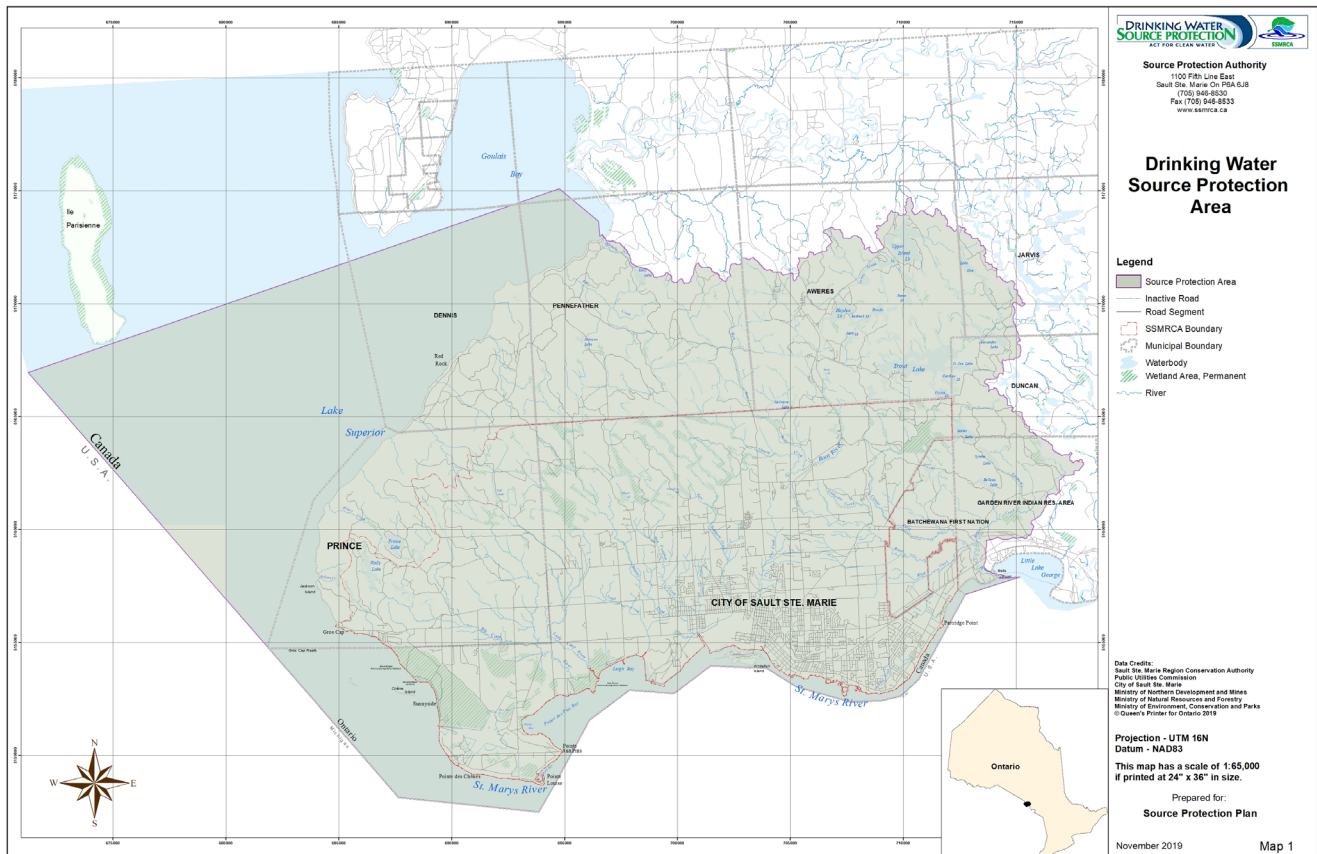


Figure 2 – Sault Ste. Marie Region Source Protection Area

STRATEGIC PLAN COMPONENTS

This GIS strategy has been developed to facilitate strategic IM and GIS planning by SSMRCA and DWSP Program to best support integrated watershed information management for the implementation of regulations within the *Conservation Authorities Act, 1946*, 'O.Reg. 176/06' and *Clean Water Act, 2006*. It is imperative that the GIS strategic plan align with and complement the objectives and related goals of these legislative requirements.

It is critical to the success of any strategic plan to first clearly understand where the organization is currently, and where it is that the organization needs to go into the future. In order to comprehensively address these needs, it is important to gather and understand this current state (both the current business and GIS climate) and to fully assess the business drivers that will impact desired future state of the organization's human resource complement.

Since the GIS function exists primarily to, directly and indirectly, support client needs, it is important that the services be established, maintained and monitored relative to client and partner requirements. In determining this, a very important step is to actively engage clients and partners in the process to obtain objective information about their needs, wants as well as current and anticipated gaps in terms of service delivery.

The recommended steps in the GIS strategic plan that need to be taken in developing the strategic actions are as follows:

1. Identify the consumers of the service provision (clients such as the SPA) –

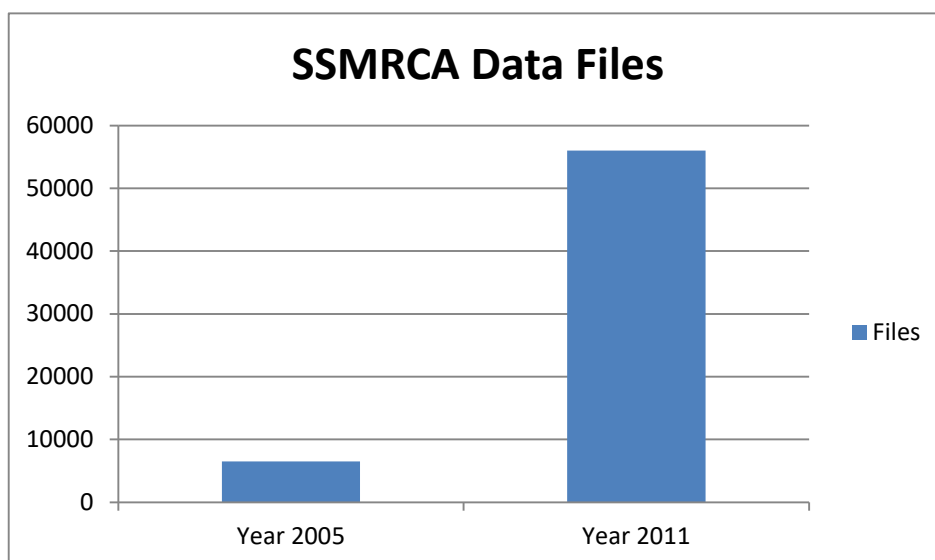
GIS staff will identify the internal and external clients that they serve. The process itself of identifying and describing clients can reveal insights as to their relative needs and support priority. There are also groupings that will emerge such as managers as a group which will likely have some different service needs than field staff for example.

Clients - Close to 95% of the work of the GIS department is performed for internal clients, mainly the divisional departments and programs of the CA and DWSP (SPA). GIS plays a major role in most of the 90% of the main projects and objectives currently conducted by the CA and SPA. Although we know who the clients are, we need to analyze how much effort is required for the different components of the CA and Source Water Protection (SWP) planning process to ensure enough support is applied to the key information / GIS management roles such as database development, data maintenance and data accessibility. This analysis is identified in the strategic goals.

2. Assess the current state of GIS within the organization –

GIS staff and clients will assess the current state of staff demographic, skill sets and competencies. There may be existing tools/data in place to prepare this analysis or these may need to be developed along with processes to assess this in the present and into the future.

Assess Current Geographic Information and Data Holdings – the amount of geographic data stored by the CA and SPA grew exponentially from 2005 to 2011.

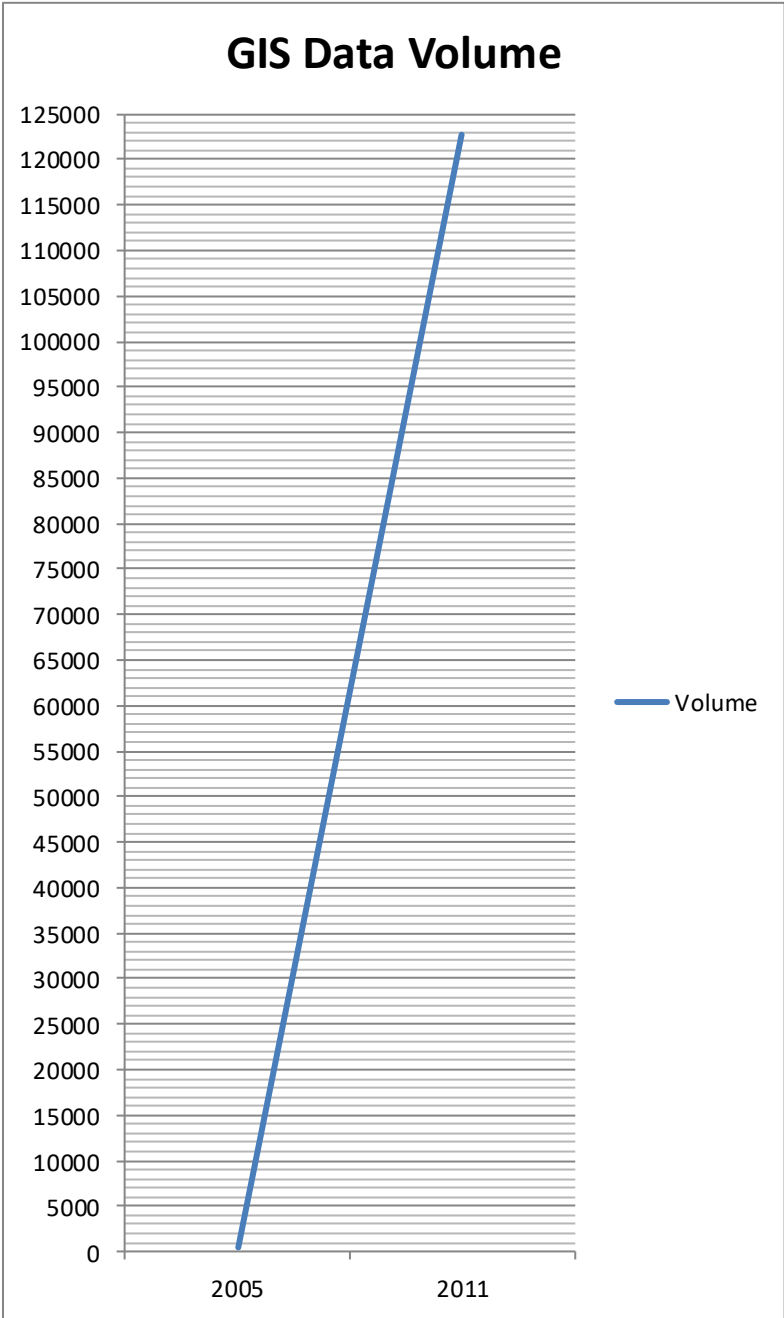


In 2005, the number of data files was approximately 6,500 with an approximate size of 522mb (522,000,000 bytes). By 2011 with the additional data for the Generic Regs and the DWSP the

data files had increased in number to approximately 55,993 with an approximate size of 122,800mb (122,800,000,000 bytes).

That has created an increase of 49,486 in the number of files or 760% increase and an increase in volume of 122,278mb or 23,424% increase.

In 2005 the data holdings consisted of shapefiles and coverages for City data layers, Fisheries and Recreation, Forest, Hiawatha, Gros Cap and Fort Creek Conservation Area data layers. Over the years the technology has changed, and the 2011 data holdings consist of shapefiles, geodatabases, tables, spreadsheets, grids, georeferenced images, orthophotography.



Current System Infrastructure – The system infrastructure represents the hardware, software and network that form the physical foundation upon which GIS is developed, maintained, and accessed.

A main challenge in this area is to secure consistent funding for the ongoing costs of GIS software, especially the initial license cost and the annual costs to keep the software current.

The other challenge in this area is to secure consistent funding for the regular replacement of hardware as it completes a life cycle or endures failures (or lightning strikes). In 2017 the last in-house server was retired. Since then, cloud storage has been utilized for office files but not the GIS data layers.

The current version of software allows the GIS end user to do their own data maintenance, develop, analyze, and maintain the GIS data and services.

3. Establish a listing of the baseline services currently provided

GIS staff will identify and list the services that they provide. This process should involve a review and analysis of where time is being spent by GIS support staff to determine the current operating supports being provided and the degree to which they are consuming the available resources. In order to identify all primary services, it will be important to reflect on the services provided over the previous twelve months to ensure that those services that are provided at specific times of the year are noted.

4. Confirm services provided/needed by clients and partners

Clients have an opportunity to validate the services provided and/or required. A very important part of this process is to engage in direct dialogue with a cross section of individuals representing the various client groups. This can also include a general distribution of a draft services listing to all clients requesting feedback.

5. Measure existing service delivery relative to client expectations

A survey process will have clients rate the service provision relative to their expectation. This is a very important step since it provides critical information regarding the client expectations. In some cases, expectations may be identified that are not addressed through the existing service delivery model.

The survey needs to look at the relevant SPA GIS needs in relation to which SPA expectations are not being met to a satisfactory level and which areas of service delivery should be targeted for improvement.

It is important to note that GIS staff driven components are not usually understood or can be rated by users (i.e., server performance or database structure). In general, SPA staff and partners are looking for greater access to GIS software without having to purchase expensive licenses.

Quality control on a large warehouse of data was seen by GIS staff to need more attention, especially since data is dispersed and shared with more and more people. As data are moved to a centralized database, they will be subjected to a rigorous quality assurance protocol.

GIS staff reported that the capture and storage of metadata lags behind the collection of data themselves, due primarily to the large volume of data managed by the SPA and tight DWSP project timelines. The term metadata refers to documented information that describes each layer of data, such as history, accuracy, currency, area of coverage, licensing, and conditions of use. This additional level of information provides confidence that the correct data are being used for each job. As data are moved into the centralized database, corresponding metadata will be captured and entered.

The survey also identified the need to maintain numerous data sharing partnerships. Data sharing partners play a key role in providing all the GIS information needed to support the Drinking Water Source Protection Program. The effort required to maintain effective data sharing related communication has become more demanding as the SWP has moved closer to the final Assessment Report deadline. While developing a web access, having a well organized, and accessible centralized database, was identified by many CA's as one of the keys to meeting the current needs of the SWP program. During the implementation phase of the Source Protection Plan (SPP) it was not a priority for this CA/SPA. This was due to the limited resources (human and financial) within this CA.

6. Identify current gaps

GIS staff will use client feedback to identify gaps between the existing/desired level of service and client expectations. The needs and objectives of the O.Reg. 176/06, the SPP and the future implementation phases of the DWSP need to be well understood to be able to properly identify present and future GIS service gaps. These gaps must be analyzed to find the most cost effective and successful solutions to support fill permit applications under O.Reg. 176/06 and the DWSP process.

7. Identify business drivers for the next planning cycle (three to five years)

GIS staff and clients will identify the key business drivers. These are anticipated forces that are expected to influence the program and service requirements as well as process and delivery options. The drivers may include anticipated need for information access and analysis, technology changes and the provincial guidelines for SWP process.

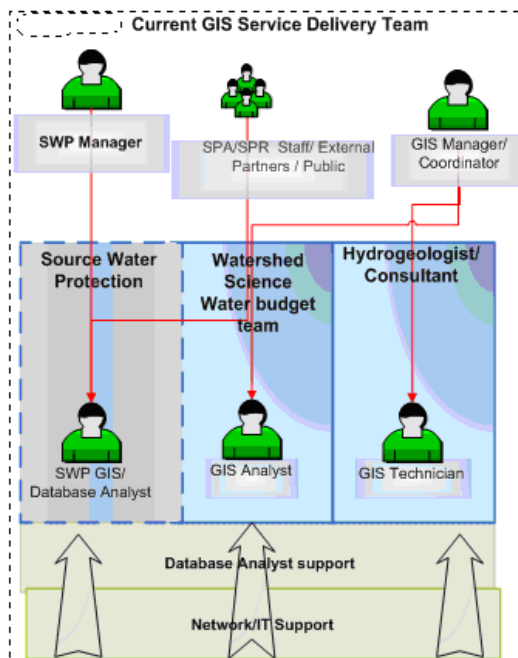
Key Business Drivers – Drinking Water Source Protection Program and implementation phase, Planning Acts Support –Green Belt Act, Places to Grow Act and Ontario Regulation 176/06; Assimilative Capacity Implementation to support sustainable growth/development; Basin wide planning and implementation; Major funding changes to SSMRCA; Major increase in stewardship programs throughout the CA; Science and Research Projects requiring key GIS support; Meeting increased client service expectations and challenges especially in the public realm.

Preparing for anticipated business drivers (beyond 2025) – Many GIS departments among the

SPAs are going through a transition to become a proactively planned and managed service with maintenance strategies and data standards developed for a comprehensive database. This new approach requires consistent funding and regular maintenance of the hardware, software and protocols to keep the core data sets up-to-date and readily accessible. A key overall objective of a cost-effective GIS service delivery model is to strive to “collect data once and use it many times”. This becomes evident in the overlap of required data and GIS services among the many different SPA and CA programs. These individual program requirements are integrated into this GIS strategy that will position the department to respond to the SPA’s GIS needs over the next 5 years.

8. Identify GIS human resource competencies and service requirements relative to business drivers

GIS staff will assess the impact of the identified business drivers on the support services required as well as staff complement. Some GIS strategy goals may require the hiring (directly or through consultants or SPA sharing) of Database specialists or IT skilled staff to meet their CA and SWP objectives



9. Determine strategic actions to close current gaps and plan for future service needs

GIS staff will define and review with CA/SPA managers the strategic actions that will be required to address any current service gaps as well as plan for anticipated requirements stemming from identified business drivers over the next five years. This will necessitate the estimation of any incremental resource requirements and the related timing. This may also include identified changes required to the core competencies of the GIS within the organization. GIS software update will include working with data within cloud storage.

10. Ongoing review and updates to strategic actions

Critical to the success of the plan is the establishment of metrics to measure performance over time. This will include using the output from the client service delivery assessment in step 5 as a benchmark for future assessments.

Next Steps – The GIS department will use these goals and objectives to develop work plans and timelines to achieve them successfully in a five-year schedule. These plans will include financial implications, project priorities and staff responsibilities.

The GIS Strategy will continue to be a 'living' document reviewed and modified annually in response to identified changes in the SPA's business needs and practices, technological developments, and changes in GIS data holdings.

Acquire source funding to sustain the data custodial requirements for CA, SWP and other core mandates.

Services and Clients of GIS Service at SSMRCA

		Primary GIS Functions - SSMRCA																				
		Program Decision Support	Map Production	GIS Analysis	Predictive Modeling	Adaptive GIS Services	User-friendly Access	User-friendly access	Awareness by GIS users	Information Quality	Database Management	GIS Data Management	Quality Control and Data Security	GIS Professional Standards	System Infrastructure	GIS Software Maintenance	Tracking GIS Technology Changes	Client Service Excellence	Maintaining Data Sharing Partnerships	Proactive Business Planning	GIS Staff Training	
		1	2a	2b	2c	2d	2e	3a	3b	3c	3d	4a	4b	4c	5a	5b	5c	6a	6b	6c	6d	Why: Uses, Actions, Decisions
		Decisions	Solutions					Information				GIS Data			System Infrastructure			Service Infrastructure				Dependent on GIS Information
Division	Departments/Projects																					Future work - Identification of priority environmentally sensitive lands critical to ecosystem
Land	Stewardship - Forestry (MIFTIP)																					Watershed education and communication and Conservation Ontario Watershed report card.
	Lands - Securement																					Protection of environmentally sensitive lands and ecosystem integrity
	Education and Outreach																					
	Lands - Management/Development																					
Watershed Management	Planning and Regulations																					Protection of environmentally sensitive lands, human life and property
	Engineering																					Protection of environmentally sensitive lands, human life and property
	Hazard Mapping																					Protection of environmentally sensitive lands, human life and property
	Watershed Plans																					Watershed management in relation to land use changes
	Assimilative Capacity Study **																					Watershed management in relation to land use changes
	Watershed Science																					Protection of St. Marys River and its contributing watershed within the SSMRCA jurisdiction
	Basin-wide Initiatives																					
	SWP																					Clean Water Act its regulations and Director Technical Rules
Office of the CAO																						Board information upon which they make decisions education and information for public partnership obligations and sharing of data/results for SSMRCA and Source Protection Authority.
	Board of Directors																					Protection of St. Marys River and its watershed within the SSMRCA jurisdiction.
	Stakeholder Relations																					Public Information and education as required
	Government Relations																					
Corporate Services	Communications																					Public Information and education as required
	Finance and Budget Planning																					Watershed analysis for budget allocations

** An assimilative capacity study (ACS) uses scientific modelling to support municipalities and other legislative authorities in predicting the impacts of land use. The assimilative capacity of a waterbody is related to flow conditions and nutrient loads during a specified period or over a range of expected variations in these conditions.

Legend

- Little or no requirement in this area
- Required function or service
- High requirement

Data Credit - original template created by Lake Simcoe Conservation Authority

Figure 3 : GIS Functions Image for SSMRCA

WHERE ARE WE GOING WITH OUR GIS SERVICES AND SUPPORT?

Drinking Water Source Protection Program 'capacity building' had provided funding for the acquisition of required hardware and software for the support of the GIS watershed analysis, for flood plains, fill regulated areas, waterflow, watersheds, subwatersheds, etc. which supports both the CA and DWSP programs. This supported the map production for the Source Protection Plan, Assessment Report and Explanatory Document. The MNR Peterborough Geomatics Centre has provided the Northern CA's with base information and an improved DEM for use in this analysis. The current funding of the GIS component of the Drinking Water Source Protection Program is a basic maintenance level as the program matured.

PROVINCIAL COMMUNITY INVOLVEMENT

- The SSMRCA and Drinking Water Source Protection team supported the staff in their involvement with the CO, NDMNRF and MECP (formerly MNR and MOE) provincial working groups. In this capacity the staff person, with input to the government, assisted in the 'user' capacity, in the initial development of guidance documents and data model.
- The staff has also been involved in the Information Management aspect at the regional and provincial level as chair of the Northern Ontario Chapter of the Conservation Ontario Provincial Information Management (Technology) working group (NOCA) and as chair of NOCA a member of Conservation Ontario Provincial Information Management (COPIM) group.
- A team member of the 'Symbology' project to develop guidance for map symbology for the Drinking Water Source Protection report mapping requirements.
- An MNR project for Hydrography Strategy on updating streams information within Ontario has also seen the involvement of this CA that will be translated into a federal project.
- Currently the GIS staff member is only a member and resource of the Northern CA's working group.

LOCAL COMMUNITY INVOLVEMENT

The SSMRCA is a member of the Acorn Information Solutions (formerly Community Geomatics Centre) in Sault Ste. Marie. This organization was formed by the City of Sault Ste. Marie and the PUC Services Inc. that had a common interest in developing a Municipal GIS. From that initial group the involvement has grown to where it now has a subgroup, Health and Social GIS, that involves groups, agencies or organizations that require assistance with data warehousing, data structure development, data analysis and finally the display with spatial reference this data. The Health and Social GIS group has members from police, fire, emergency services, children's aid, ministry services, social services, health unit programs and the conservation authority.

STAFF EXPERIENCE

The current staff has been involved in the information technology for over thirty years in various industries/businesses. Since 2000 the relevant experience has been GIS with involvement in MNDM projects, various MNR projects, MOE Municipal Groundwater Studies and municipal GIS projects with emphasis on water features (hydrologic and hydraulic features and municipal infrastructure). The work that was done with the MOE Municipal Groundwater Studies has provided insight and lessons learned for the development of the Source Protection Plan and its related documents. It also assisted in the development of the data deliverables. Skill development has involved training courses in Hydrologic and Hydraulic Analysis Using ArcGIS, ArcHydro and Advanced Analysis with ArcGIS. More and more ESRI is providing free webinars to inform and train. Team members are being cross trained for coverage of business requirements.

PRODUCTS AND SERVICES

Data infrastructure, organization, core data sets

- Data is in a variety of formats that are compatible with ESRI ArcDesktop that includes shapefile, dbf, dxf, personal Geodatabase mdb format, tiff, jpg.

Obtain the metadata from the start at the original source.

Gap analysis of all current holdings.

QA/QC for new layers – working and public directories/access.

SSMRCA MAP PRODUCTS

SSMRCA Mapping Products Price List				
	(Approved February 2021)			
Color Product	Contents (on draft bond paper)	Price	HST	Total
A - Letter (8.5x11)	Base information	11.04	1.44	\$12.48
B - Tabloid (11x17)	Base information	13.81	1.79	\$15.60
D - size (22x34)	B&W only - Base information	27.61	3.59	\$31.20
E - size (42x34)	B&W only - Base information	41.42	5.38	\$46.80
Photocopying	Black and White	\$0.44/page (0.39+ HST)		
Custom, photo paper and digital images	The cost will be negotiated based on the above schedule plus the requested layers and the cost of a CD. The map will be provided in a PDF format.			
* Map products A, B, C, D and E do not include the orthophotography.				

Base information datasets that would be available for use on the above listed maps would include:

- SSMRCA_ApproxReg176_06 (CA jurisdiction only)
- Urban Service Line (City of SSM only)
- Subdivision (City of SSM only)
- Street Centreline (City of SSM and Prince Township only)
- Roadedge (City of SSM only)
- Railwaycentreline
- Parcel boundary (City of SSM only)
- Lakes (OBM based)
- Rivers (OBM based)
- Municipal Boundary (City of SSM only)
- Townships
- Contours (10m OBM based)

Orthophotography images can be obtained from the City of Sault Ste. Marie Engineering Department.

DELIVERY STRATEGIES

Data requests are required to be in writing. The data request will be evaluated and ONLY the data that the authority has the permission to distribute will be processed. Other data layers will

have a response that will include the contact information for the requested data layers when available.

Not all data with the SSMRCA is available to be disseminated (e.g., licensed data, data sharing agreements), the owner/custodian of some data will need to be contacted by the requestor.

INTERNAL DATA HOLDINGS

Metadata dictionary / library – communicating changes and new data
SSMRCA Data Matrix

Data use and distribution policy – external vs. internal standards

OGDE

Sault North Planning Board

City of Sault Ste. Marie / PUC Inc.

Township of Prince

Proper use of and respect for licensed data, data sharing agreements, legal restrictions, web access, FOI requests

OGDE

Sault North Planning Board

City of Sault Ste. Marie

Township of Prince

FIPPA and MFIPPA

GIS Staff

- Marlene McKinnon

IT Staff Contact

- Christine Ropeter

SOFTWARE

Current:

ESRI Arc Standard 10.6 (desktop)

Extensions: Spatial Analyst, 3D Analyst, Geostatistical Analyst, ArcHydro

Other GIS Related Software:

Adobe Acrobat Professional – subscription to publish and save maps

MS Office 365 (Office suite 2016 (Word, PowerPoint, Excel) – Access is on workstation but is legacy associated with ARCGIS.

HARDWARE

Printer:

Brother MFC-J6510DW – up to 11x17inch scanning and printing capability

HP Designjet 5500ps (2006) – 42 inch – limited print capability – line or B&W only

Samsung – 8.5x11 and 8.5x14

Desktop:

Dell OptiPlex 7040 – Windows 10/Office 365

Adding MS Access to suite. Update to workstation due January 2022.

MAINTENANCE STRATEGIES – 3 to 5 year plan (lifecycle of the hardware/software)

IT maintenance is contracted with professionals to maintain our system. It includes email spam blockers, software upgrades, updates and patch installations as recommended. Staff also provide consultation for hardware upgrade. SSMRCA has opted to use Office 365 and Share Point for file sharing, storage and archiving.

Custodian – responsibilities to update other users

GIS specialist to inform communication specialist to inform users

Natural heritage updates from outside sources

Ordering and loading data as received

Developments of subwatershed plans (Source Water Protection Plan) – update with current versions and Approved SPP Sec.36 Update – April 2021, Assessment Report original approved November 25, 2011 – update approved April 2021, Assessment Report Database submitted prior to March 23, 2012 – update approved April 2021, Source Water Protection Plan submitted prior to August 20, 2012 original approved March 15, 2015 – update approved April 2021.

Capturing new data from watershed planning and natural heritage

Capturing metadata updates -

As data is collected then the information is to be updated in the data matrix as well as the metadata of the dataset.

SERVICE STANDARDS – Client Service Standards 2019 – timelines to be draft to be approved

Request turn around time

- O.Reg. 176/06 inquiry– within 10 business days
- Application process – within 30 days for a minor application or within 90 days for a major application

Map Template standards – SWP vs forestry vs. planning

Internal Partners:

Canadian Heritage River System

PARTNERSHIPS

ACORN (formerly Community Geomatics Centre Data Warehouse)

Township of Prince

Sault North Planning Board (SPA area includes the Unorganized Townships of Dennis, Pennefather, Aweres, Duncan and Jarvis)

City of Sault Ste. Marie

PUC Service Inc.

Ducks Unlimited

OGDE

Union Gas (Duke Energy)

Brookfield (Wind Power Generation)

INVENTORY OF DATA SHARING AGREEMENTS

Township of Prince

Sault North Planning Board (SPA area includes the Unorganized Townships of Dennis, Pennefather, Aweres, Duncan and Jarvis)

City of Sault Ste. Marie

Ducks Unlimited

INVENTORY OF LICENSE AGREEMENTS

OGDE

OLID - Metadata