Tables

A1 Data Sources

Over the years, a number of agencies associated with Central Lake Ontario Conservation Authority (CLOCA), and municipal, provincial, federal, and other agencies have collected and assessed data regarding ecosystem health and function. This report was developed based on a number of these data sources, including those obtained sources named below. The data was used for purposes described in **Table A-1.**

A1.1 Municipal Government

CLOCA's municipal partners and Durham's Agricultural Advisory Committee are involved in the SWP initiative. These include:

- Regional Monitoring Program (includes PGMN and PWQMN components);
- Coastal Wetlands Monitoring Database;
- Aquatic Resource Monitoring Program (ARMP);
- Oak Ridges Moraine Groundwater Program Database;
- Field collection data (i.e., Terrestrial Natural Heritage, aquatic), and internal GIS system;
- Municipal Land use parcel fabric; and
- Water quality assessments.

A1.2 Provincial Government

Provincial agencies and programs that contribute directly to the SWP initiative or that will be involved in various levels of consultation with the CTC and CLOSPA include:

- Ministry of the Environment, Ontario Ministry of the Environment and Climate Change (MOECC), Ontario Ministry of Environment and Parks (MECP);
- Water Well Information System (WWIS);
- Permit to Take Water Database (PTTW);
- Provincial Groundwater Monitoring Network (PGMN);
- Provincial Water Quality Monitoring Network (PWQMN);
- Drinking Water Surveillance Program (DWSP);
- Waste Disposal Inventory (Landfills);
- Ontario Benthos Biomonitoring Network (OBBN);
- Ontario Ministry of Natural Resources and Forestry (MNRF);
- Digital Elevation Model;

- Natural Heritage Information Centre (NHIC);
- Aggregate Resource Inventory Maps (ARI);
- Evaluated Wetlands;
- Environment Canada;
- Canadian Land Use Monitoring Program (CLUMP);
- Natural Resources and Values Information (NRVIS);
- Southern Ontario Land Resources (SOLRIS);
- Environmentally Sensitive Areas (ESA);
- Parcel Assessment Data (MPAC);
- Aquatic Resources Areas (ARA);
- Water Resources Information Program (WRIP);
- Ontario Geological Survey (OGS);
- Surficial Geologic Interpretation;
- Ontario Ministry of Northern Development, and Mines (MNDM),
- Petroleum, Oil Surface and Aggregates;
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA);
- Canada Soils Information System (CANSIS);
- Ontario Ministry of Municipal Affairs and Housing (OMMAH); and
- Conservation Ontario (CO) and neighbouring Conservation Authorities.
    - Toronto and Region Conservation Authority (TRCA),
    - Lakes Simcoe Region Conservation Authority (LSRCA),
    - Kawartha Region Conservation Authority (KRCA),
    - Otonabee Region Conservation Authority (ORCA), and
    - Ganaraska Region Conservation Authority (GRCA).

A1.3 Federal Government

Federal agencies that have been or will be involved in the SWP initiative include:

- Statistic Canada;
- Census of Agriculture and Population;
- Geological Survey of Canada (GSC);
- Surface and Subsurface Geologic Interpretation for Southern Ontario;
- Environment Canada;
- Water Survey of Canada; and
- Department of Fisheries and Oceans.

A1.4 Other Agencies

The CLOSPA Assessment Report benefits from work completed through the CAMC-YPDT initiative and other data sources, including:

- Oak Ridges Moraine Groundwater Program (ORMGP);
- Ontario Water Treatment Plants (WTP);
- Ontario Sewage Treatment Plants (STP);
- Ontario Road Network (ORN);
- Ontario Land Information (LIO);
- Ontario Geospatial Data Exchange (OGDE);
- Atmospheric Environment Service (AES); and
- Community Development Council Durham (CDCD).

The data was used for purposes described in **Table A-1.**

Table A-1: Purpose of Data Collected

Purpose	Boundaries								
Data Sets	**Water Resources Information Program (WRIP)**	**Land Ownership**	**Watershed, Quaternary**	**Municipal Boundary**	**Provincial Digital Elevation Model (DEM) — Tiled**	**Provincial DEM —Tiled (Version 2)**	**Ortho/DTM DEM**	**Local DEM (Municipalities — Orthos)**	**River Cross Sections**
Short Data Description	Identifies the associated Conservation Authorities working cooperatively on Source Water Protection objectives.	Identifies ownership and general use of the land. It includes crown land, private land, and federal land (e.g., Indian Reserves). Indian Reserves and other federal lands were derived from the OBM.	A fourth level drainage area. They are subdivisions of tertiary watersheds.	Extents of the following municipal units: 1) Upper Tier Municipality, 2) Lower Tier Municipality	A DEM raster data set that covers the province of Ontario.	DEM that provides greater elevation information where Digital Terrain Models (DTM), SPOT heights, and constant lake elevations are incorporated.	A DEM generated from the 2002 orthophotography project for Southern Ontario.	DEM products developed independently of federal/provincial government initiatives.	Cross section data that includes depth and position of rivers and streams.
Purpose	Soils & Geology							Census	
Data Sets	ELC Aggregate Extraction	CANSIS — Ontario Soil Surveys	Geological Survey of Canada (GSC)				Physiography of Southern Ontario	Census of Agriculture	Census of Population

Purpose	Boundaries								
Data Sets	**Water Resources Information Program (WRIP)**	**Land Ownership**	**Watershed, Quaternary**	**Municipal Boundary**	**Provincial Digital Elevation Model (DEM) — Tiled**	**Provincial DEM —Tiled (Version 2)**	**Ortho/DTM DEM**	**Local DEM (Municipalities — Orthos)**	**River Cross Sections**
Short Data Description	Digitized from air photos. Shows the boundary of actual extraction at the time of photography.	Soil surveys generated mainly for agricultural areas across Ontario, all housed within the Canadian Soils Information System (CANSIS). Data is available by county.	Surficial deposit types, material types, and geological features (e.g., drumlins, eskers, hummocky moraine, hummocky glaciofluvial).	Updated surficial geology mapping for the ORM based on new fieldwork and aerial photographic interpretation, complemented by archival field data.	The distribution of bedrock units and geological rock types.	Seamless coverage of bedrock topography and sediment thickness surfaces.	Major physiographic units include, among others, till plains, till moraines, sand plains, kame moraines, and glacial spillways.	Describes the agriculture industry (e.g., number and type of farms, farm operator characteristics, and land management practices). Data is tied to spatial Census Area boundaries.	Population and dwelling counts as well as information regarding demographic, social, and economic characteristics. Data is tied to spatial census area boundaries.

Purpose	**Land Cover**									
Data Sets	Ecological Land Classification (ELC) Community Series	Southern Ontario Land Resource Information System (SOLRIS)	Evaluated Wetland (Supplemented by Wetland Unit)	Coastal Wetland Monitoring Database	Water Polygon Segment	Oak Ridges Moraine — Wetlands	Environmentally Sensitive Areas (ESA)	Significant Natural Areas	Areas of Natural and Scientific Interest (ANSI)	Zoning By-Law (Muni/City)
Short Data Description	ELC mapping developed by local municipalities or conservation authorities.	SOLRIS is ELC mapping to the community series / community class level based on remotely sensed imagery and air photo interpretation.	Lands that are seasonally or permanently flooded by shallow water or are close to the water table surface and have been evaluated under the Ontario Wetland Evaluation process. Wetland units are the geospatial component and contain the basic classification (i.e. marsh, bog, fen, or swamp).	Monitoring water quality, level, and ecology	Wetlands will exist in Water Polygon Segment (GUTs 1802/1803) that have not been evaluated through the Southern Ontario Wetland Evaluation process, therefore are unevaluated wetlands.	A dataset of all wetlands within a 2km buffer of the ORM Boundary.	Identifies an area with values that are of local interest and may be designated and managed by a municipality.	Various biological inventories have been undertaken by Conservation Authorities. Often these involve air photo interpretation and field inventories.	ANSIs represent lands and waters that contain important natural landscapes or features that are important for natural heritage, protection, appreciation, scientific study, or education.	Created on paper maps of various scales depending on municipality. Sometimes digitized depending on sophistication of municipality.

Purpose	Land Cover				Hydrography & Drainage				Groundwater Levels	
Data Sets	Municipal Parcel Assessment Data (MPAC)	Canada Land Inventory (CLI) - NRCan	Land Information Ontario (LIO)	Official Plan (Future)	Waterbody Note: must be supplemented by Water Polygon Segment and Water Line Segment)	Water Virtual Flow	Tile Drains	Municipal Drains	Provincial Groundwater Monitoring Network (PGMN)	Groundwater Elevation (GW Studies)
Short Data Description	Assessment data collected for individual parcels that describe the property type and multiple structures located on the parcel. Data can only be purchased through MPAC or obtained in partnership through municipalities.	Contains land use (1966-88) & land capability for agriculture, forestry, recreation, ungulates, waterfowl, sport fish, etc. up to 14 classes (1968-90).	Types of land units, soils, prime, and classifications developed from soil types and landscape conditions.	Land use designations that provide information on the future development scenario. Sometimes digitized depending on the sophistication of municipality.	Waterbody is a collection of one or more waterbody segments. If an official name exists for a waterbody, it will be recorded on the consolidation, not on each individual segment. Water line segments and water polygon segments are the geospatial components of a waterbody (OBM source with some district updates).	Identifies bodies of water, such as rivers or streams, and is stored in a network format. Virtual segments incorporated to establish directional flow through water features, Water Resources Information Program (WRIP).	Spatial location of tile drains. Tile drains are matched to lots and concessions (cadastral data).	Digitized from the old OMAF paper maps, this coverage is not updated and may be incomplete.	A monitoring network that provides data on groundwater level and groundwater quality for the province.	A groundwater elevation map is developed by collecting numerous measurements of the static water level in an aquifer and interpolating these data points.

Purpose	Climate		Water Withdrawals			Infrastructure — Water				
Data Sets	CA Gauge Stations	Atmospheric Environment Service (AES)	Permit To Take Water (PTTW) — C of A Database	Water Well Information System (WWIS)	Water Well Information System (WWIS) — Improved	Storm Sewers and/or Combined Sewers and Outflows	Ontario Water Treatment Plants (WTP)	Ontario Sewage Treatment Plants (STP)	Water Structure	Dam
Short Data Description	Meteorological data collected by local municipalities or conservation authorities.	Provides forecasts and/or warnings of possible weather-related emergencies.	Permitted water takings (> 50,000 litres/day) from surface and groundwater sources.	Georeferenced wells, including groundwater wells, test wells, and abandoned wells.	New and previous spatial and tabular database improvements are being incorporated into the WWIS data.	Conduits for stormwater within municipally serviced areas.	Location of WTPs in Ontario based on a compilation of 1997 and 2000 MOECC datasets.	Location of STPs in Ontario based on a compilation of 1997 and 2000 MOECC datasets.	Man-made structures inside a waterbody. Minimal descriptive detail provided.	Man-made structures inside a waterbody under MNRF jurisdiction. Includes structures not found in water structure.

Purpose	**Groundwater Quality**					**Surface Water Quality**			**Vulnerability**		
Data Sets	Provincial Groundwater Monitoring Network (PGMN)	Water Well Information System (WWIS)	Site Scale Monitoring	Microbiological Sampling & Analysis	OMAF Water Quality Study	Provincial Water Quality Monitoring Network (PWQMN)	Local CA Sampling	Ontario Benthic Biomonitoring Network (OBBN)	Provincial Water Quality Monitoring Network (PWQMN)	Provincial Groundwater Monitoring Network (PGMN)	CA Water Quality Monitoring
Short Data Description	A monitoring network that provides data on groundwater level and groundwater quality for the province.	Georeferenced wells, including groundwater wells, test wells, and abandoned wells. New and previous spatial and tabular database.	Varies according to terms of reference for the contaminated site studies (e.g., municipal landfills, petroleum sites, and gas stations).	For health-related water quality incidents that involve microbiological detections. Generally test samples brought in by the public from private wells.	Generally, bottle testing through accredited laboratories. Varies on a site-to-site basis. Available in hard copy only.	Water quality sample collections that are undertaken across the province at approximately two hundred sites.	Local water samples and field/lab tests.	Monitors the state of organisms living in or on the bottom of waterbodies.	Water quality sample collections undertaken across the province at approximately two hundred sites.	Designed to provide good quality data (current and historical) on geological/ stratigraphic groundwater level and groundwater quality for the province.	CA collects water samples and conducts some field and lab tests. Samples are sent to an accredited laboratory for additional testing.

Purpose	Streamflow					Groundwater				
Data Sets	CA Gauge Stations	Water Survey of Canada (WSC)/HYDAT — daily	Water Survey of Canada (WSC)/HYDAT — hourly	Baseflow (CAs/Private)	Enhanced Flow Direction (EFDIR)	CA Mapped Aquifer Recharge/Discharge Areas	3-D Mapping for Aquifer Distribution and Thickness (Kitchener-Waterloo, Oro Moraine area)	Water Well Information System (WWIS)	Historical Stream Mapping	Potential Springs in the ORM, Southern Ontario from Aerial Thermography
Short Data Description	Gauge data stored in a variety of formats depending on the conservation authority.	Daily measures of river flow and records of lake/river levels.	Hourly measures of river flow and records of lake/river levels.	Captured by various methodologies depending on authority (e.g. Panel Method, Culvert Method, or Bucket Method).	A flow-corrected flow direction grid based on mapped hydrography based on the Provincial DEM. A fundamental dataset for ArcHydro and therefore a recommended dataset for Source Water Protection.	Recharge areas are where precipitation readily infiltrates an aquifer. Discharge areas are where groundwater is released to the surface.	The collection of numerous measurements of the aquifer thickness, which is then interpolated.	Georeferenced wells, including groundwater wells, test wells, and abandoned wells. New and previous spatial and tabular database	Historical stream mapping completed by the CA/municipality. Data exists in varying formats.	Data extracted from thermal infrared images showing a contrast in surface temperatures. Warm areas on the thermal image coincide with portions of streams and may indicate significant groundwater discharge locations.

Purpose	Threats & Contaminants				Fisheries Data			
Data Sets	Cemeteries Windshield Survey (GWS)	Petroleum Well	Waste Disposal Site	Unserviced Areas	Ontario Stream Assessment Protocol (OSAP)	Aquatic Resource Monitoring Program (ARMP)	Aquatic Resource Area (ARA)	
Short Data Description	A windshield survey was conducted to identify potential contaminant sources, including cemeteries.	LIO class: Petroleum Well. Full details in the Ontario Oil, Gas, and Salt Resources Library.	A site dedicated to the systematic destruction, transformation, burial, or storage of waste material. Some districts have made updates since the initial NRVIS load.	Areas that do not have municipal sewage and water services.	Field data such as species, temperature, habitat, geomorphology, and baseflow stored in the HABPROGS database.	Data from a variety of sources regarding past and present conditions of this system. The results of the field program are presented to assess current condition/health of the watershed's aquatic resources.	ARA describes an area of a waterbody (e.g., identifies the thermal regimes for a stream and physical characteristics of the water). ARA Line Segment and ARA Polygon Segment are the geospatial components of the ARA.	Thermal classification of streams and waterbodies.