

**MECP Open Data
Metadata Template**

Fill out the following form for metadata. This will then be translated into an accessible PDF file.

Those items with asterisks (**) are required.

Please fill out the metadata for all items that are appropriate. If no information is provided the complete row will be deleted from the metadata that goes public.

Title**	Multi-Watershed Nutrient Study
Alternate Title	N/A
Abstract**	<p>The Multi-Watershed Nutrient Study run by the Ontario Ministry of the Environment, Conservation and Parks (MECP) collected stream water samples and water level/quantity data from 11 small (10-100 km²) agricultural watersheds between 2014 and 2020. This study aimed to examine how agricultural land management and features of the landscape relate to nutrient losses in agriculturally dominated areas of the Great Lakes basin. These watersheds represent a range of agricultural conditions in Southern Ontario, and deliberately excluded point sources of pollution to focus on the effects of non-point source nutrient release.</p> <p>Continuous water sensor data (water temperature, turbidity and water level) was collected at the 11 watersheds for the MWNS. Data is provided for 3 parameters:</p> <ul style="list-style-type: none">• Water Temperature (recorded every 15 minutes)• Turbidity (recorded every 15 minutes)• Water Flow (derived from water level data recorded every 5 minutes) <p>Flow data were determined by using the water level readings collected by both Water Survey of Canada (WSC) and Ministry of the Environment, Conservation and Parks (MECP) and calculated using developed rating curves at each site. Corrected flow data is posted in this data set. For level data and rating curves, please contact MECP or WSC. Garvey Glen Creek was gauged by the Maitland Valley Conservation Authority.</p> <p>Eight meteorological stations were established to complement the 11 MWNS water monitoring sites. Each water monitoring site was paired with an MECP Meteorological (MET) Station, with the exception of Larches Creek and Smith Creek. These two creeks had a MET station nearby that was owned and operated by the Grand River Conservation Authority (GRCA). For MET data for these two sites, please contact GRCA.</p>

The sites collected a suite of parameters at 15-minute intervals.

- Solar Radiation, incoming longwave
- Relative Humidity
- Air Temperature
- Temperature, dew point
- Wind direction
- Wind gust speed
- Wind speed
- Precipitation
- Soil Temperature – Depths of 0.05m, 0.1m, 0.25m, 0.5m
- Soil Moisture – Depths of 0.1m, 0.25m, 0.5m

Water samples were collected during flow events like rainfall and snow melt, as well as during baseflow conditions, during all seasons. The water quality data set includes year-round information from high-flow, mid-flow, low-flow, and baseflow conditions.

Discrete water samples were collected using a temperature controlled automated sampler at a set frequency over the rise, peak, and fall of the hydrograph during these events. Although base-flow samples were collected, the MWNS emphasized high frequency sampling during high-flow stream conditions, which is less common in ambient stream water monitoring. Users will encounter multiple samples per day/event and should consult associated water quantity files for matched flow conditions. See Supplementary Data for station numbers and relevant information.

Sample analysis included total phosphorus, total filtered phosphorus, metals, total nitrogen, dissolved nitrogen, turbidity, suspended solids, dissolved carbons, and sulphate. Microbiology data were also collected at opportune times are included in the dataset.

Six of the watersheds in the Multi-Watershed Nutrient Study were also sampled during the Pollution from Land Use Activities Reference Group (PLUARG) study conducted in the 1970s. More information on PLUARG can be found by visiting <https://atrium.lib.uoguelph.ca/> and searching for PLUARG or Nelligan et al., 2021 (<https://doi.org/10.1016/j.jglr.2021.08.010>)

Study design, site information, sampling procedures and data management information can be found in the Supplementary Data.

Purpose

This study aimed to examine how agricultural land use, land management and features of the landscape relate to nutrient losses in agriculturally dominated areas of the Great Lakes basin. A large component of the MWNS was to examine how changes in land-use, land management and climate affect water

	<p>quality and nutrient loading over time by revisiting some of the same watersheds monitored in the PLUARG study over 40 years ago. The MWNS selected sentinel headwater watersheds in the basins of Lakes Huron, Erie, and Ontario for detailed study. These watersheds represent a range of agricultural conditions in Southern Ontario.</p>
Status	Complete
Frequency of Updates**	N/A
Contact	<p>Name: Grace Arabian Email: pwqmn@ontario.ca Organisation: Ontario Ministry of the Environment, Conservation and Parks Position: Data Management Officer, Groundwater and Surface Water Monitoring Unit, Environmental Monitoring and Reporting Branch Role: Data Manager</p>
Cited Responsible Parties**	<p>Name: Grace Arabian Email: pwqmn@ontario.ca Organisation: Ontario Ministry of the Environment, Conservation and Parks Position: Data Management Officer, Groundwater and Surface Water Monitoring Unit, Environmental Monitoring and Reporting Branch Role: Data Manager</p>
Keywords	<p>nutrients, phosphorus, surface water, water quality, agricultural, non-point source, EMRB, stream water quality, watersheds, turbidity, runoff, water quantity, flow</p>
Use Limitations	<p>Data users should cite the data set as the following: <i>Multi-Watershed Nutrient Study</i>. Ontario: Ministry of Environment, Conservation and Parks, 2026</p>

Data users should review the Supplemental Information package to get necessary context for sensor data collection and quality control, water quality information, sampling protocols and analytical method information. The Read Me files should also be referenced to understand parameter specific and site-specific nuances and quality control methods.

Data provided are the highest quality available. Users should use the information provided with caution and do so at their own risk. It is the responsibility of all persons who use this data to independently confirm the accuracy of the data, information, or results obtained through its use.

There are no restrictions on the publication of work based on the analysis of MWNS dataset(s).

Data disclaimer for Water Survey of Canada WSC4 data:

Disclaimer for Near Real-Time and historical water level and streamflow Information

Please Read Before Proceeding:

Users should use the information provided with caution and do so at their own risk. The Government of Canada accepts no liability for the accuracy, availability, suitability, reliability, usability, completeness or timeliness of the data or graphical depictions rendered from the data.

It is the responsibility of all persons who use this data to independently confirm the accuracy of the data, information, or results obtained through its use.

The Government of Canada does not warrant the quality, accuracy, or completeness of any information, data or product from these web pages. It is provided 'AS IS' without warranty or condition of any nature. The Government of Canada disclaims all other warranties, expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the information, data, product or accompanying materials retrieved from this web site. In no event will the Government of Canada or its employees, servants or agents have any obligation to the user for any reason including claims arising from contract or tort, or for loss of revenue or profit, or for indirect, special, incidental or consequential damages arising from the use of this information.

Information presented on this web site is considered public information and may be distributed or copied. No agency or individual can bundle the raw information and resell the raw information. However, agencies and individuals may add value to the data and charge for the value-added options. An appropriate byline acknowledging Environment Canada is required. For further details, please refer to [copyright terms and conditions here](https://www.canada.ca/en/transparency/terms.html):

<https://www.canada.ca/en/transparency/terms.html>

Legal Constraints	See the Open Government Licence - Ontario
Geographic Bounds**	
Supplemental Information	Link to supplemental info
Date Stamp**	12-Nov-25