

Metadata for: Stream Neonicotinoid Monitoring Study

This table provides essential information about the program data.

Title	STREAM NEONICOTINOID MONITORING STUDY
Alternative Title	Multi-Media Monitoring Study
Abstract	<p>The Ministry of the Environment, Conservation and Parks (MECP) initiated the Multi-Media Monitoring Study in 2015 to measure changes in neonicotinoid insecticide concentrations in stream water and soil following restrictions on the use of neonicotinoid-treated corn and soybean seeds. The study is also measuring changes in aquatic benthic invertebrate communities. This dataset contains measurements of neonicotinoid insecticide concentrations in streamwater samples collected from streams in southern Ontario watersheds with primarily agricultural land use between 2015–2019. The data can be used to characterize neonicotinoid concentrations in streams at the study sites and to explore how stream neonicotinoid concentrations vary with season, between grab samples and wet weather event samples, and among watersheds. Data from soil and benthic invertebrates are presented separately.</p>
Purpose	This dataset contains measurements of neonicotinoid insecticide concentrations in streamwater samples collected from five agricultural streams in southern Ontario between 2015–2019.
Status	completed
Cited Responsible Parties	<p>Name: Melanie Raby Voice: (416) 235-6533 Email: melanie.raby@ontario.ca Organisation: Ontario Ministry of the Environment, Conservation and Parks Position: Senior Surface Water Scientist, Groundwater and Stream Water Monitoring Unit, Water Monitoring Section, Environmental Monitoring and Reporting Branch Role: Custodian</p> <p>Name: Georgina Kaltenecker Voice: 1 (800) 855-0511 then (416) 235-6162 Email: georgina.kaltenecker@ontario.ca Organization: Ontario Ministry of the Environment, Conservation and Parks Position: Group Lead, Groundwater and Stream Water Monitoring Unit, Water Monitoring Section, Environmental Monitoring and Reporting Branch Role: Custodian</p>
Use Limitations	<p>The results are applicable to the specific streams sampled and not to all streams or surface water in the province.</p> <p>Although high percentages of corn and soybean land use were targeted during site selection in order to focus monitoring efforts on crop types specified in the legislation, it is acknowledged that 1) there is variability in corn and soybean land use percentages among selected sites, 2) a variety of other land use types make up each watershed, and 3) crops will change from year to year. Consequently, the presence of neonicotinoids at any of these monitoring sites is not necessarily due solely to corn and soybean crop use and could in part be the result of neonicotinoid use on other crop or land use types in the watershed.</p> <p>Additional considerations: Drinking water, soil, and benthic invertebrate data for this study are available separately.</p>
Geographic Bounds	West bound: -95.15699 East bound: -74.30798 South bound: 41.6723 North bound: 56.850117
	Five Southern Ontario watersheds were included in the study: Big Creek, Little

Supplemental Information

Ausable Creek, White Ash Creek, North Creek and Garvey Glenn. Each stream had one sampling site. The five sites were selected because they most closely met the following criteria: existing infrastructure (automated samplers) to support frequent sampling; high proportion of corn and soybean crop in the watershed; and represent a range of soil types.

Grab samples were collected approximately bi-weekly from April/May to October/November.

Sampling via automated sampler targeted approximately three wet-weather Supplemental information events (at five points – two on the rising limb, one at the peak, two on the receding limb – on each event’s hydrograph) at each site, though three events were not necessarily captured as all sites. Grab samples were collected into amber glass 1L bottles from a depth of approximately 0.3 m. Wet weather event samples were triggered remotely and collected by Teledyne ISCO Avalanche transportable refrigerated automatic samplers. Each sampler intake pipe was installed using a fixed-mount system, mounting the intake at approximately 0.3–0.4 m above the streambed. In preparation for a forecasted wet-weather event, auto samplers were programmed to start sampling once stream level rose 0.025 m above the pre-event baseflow level (stream level measurements were taken at each site by automated ISCO Bubbler Flow Module, usually at 5-minute intervals). Auto samplers were typically paced to sample at 3-hour intervals (or a longer interval if the event was expected to last several days), to maximize the number of samples taken throughout the event hydrograph. Sampling continued until the last bottle in each auto sampler had been filled. Auto samplers were typically pre-loaded with 14 1L polyethylene plastic sample bottles for sampling each event. These samples were then manually decanted from the polyethylene bottles into 1L amber glass bottles.

Both grab samples and wet weather event samples were kept cool on ice while in transit to the laboratory, where they were kept refrigerated until analysis.

Neonicotinoid concentrations in water were determined using MECP Method E3544 with the following analytes (method detection limits in parentheses): Acetamiprid (5 ng/L), clothianidin (5 ng/L), dinotefuran (5 ng/L), flonicamid (10 ng/L), imidacloprid (5 ng/L), nitenpyram (5 ng/L), thiacloprid (2 ng/L) and thiamethoxam (5 ng/L).

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