Hope Bay Mine

2025 Aquatic Effects Monitoring Program—Annual Report

PREPARED FOR

AGNICO EAGLE

DATE
March 2026

REFERENCE
0814026-01

SIGNATURE PAGE

Hope Bay Mine

2025 Aquatic Effects Monitoring Program—Annual Report

March 2026

Prepared by:

Alexis Marti, M.Sc.
Senior Consultant, Scientist

Reviewed by:

Michael J. Ryan, Ph.D.
Principal Consultant, Scientist

Reviewed by:

Kevin Murphy, M.Sc.
Principal Consultant, Project Manager

Reviewed by:

Craig Neufeld, B.Sc.
Partner in Charge

ERM Consultants Canada Ltd.
#2700-685 Centre Street S
Calgary, AB
Canada T2G 1S5

T +1 403 705 1926

EXECUTIVE SUMMARY

The Hope Bay Mine (the Mine) is a gold mining development, owned and operated by Agnico Eagle Limited (Agnico Eagle), in the West Kitikmeot region of mainland Nunavut. Although the Mine is currently under Care and Maintenance, per the *Hope Bay, Care and Maintenance Plan* (Agnico Eagle 2022), certain compliance management and monitoring activities continue, including the Aquatic Effects Monitoring Program (AEMP).

The AEMP is outlined in the *Hope Bay Project: Aquatic Effects Monitoring Plan* (the Plan; TMAC Resources Inc. [TMAC] 2018). The Plan defines Mine-related activities that trigger monitoring of aquatic components under a detailed monitoring framework. The Plan also includes a Response Framework. This framework includes low action level conditions that, if exceeded, can trigger the development of a Response Plan to adaptively manage the potential Mine-related effects.

The 2025 AEMP included monitoring of lakes adjacent to the Doris and the Madrid North Development areas of the Mine, including Doris, Little Roberts, Patch, Imniagut, PO, Ogama, Windy, and Glenn lakes, as well as the reference lake (Reference Lake B). Aquatic components evaluated in 2025 included fish habitat (i.e., water level, ice thickness, and stream hydrology), under-ice dissolved oxygen (DO) concentration, water temperature, water quality, sediment quality, phytoplankton biomass, and benthic invertebrates. The sediment quality and benthic invertebrate components are monitored every three years and will be sampled next for the 2028 AEMP study. Although, water levels and ice thickness measurements during the 2025 ice-covered season (a fish habitat variable) could not be evaluated for Glenn, Imniagut, PO, Ogama, and Little Roberts lakes due to weather and safety concerns, lake-level measurements from the Doris Lake-2 hydrology station were used to calculate the reduction in under-ice lake surface elevation in Doris Lake for 2025.

Due to incomplete under-ice water level and ice thickness data, potential Mine-related effects to fish habitat were evaluated for Doris, Windy, and Patch lakes in 2025. No effects to fish habitat in any of the three exposure lakes were observed. No effects were detected for DO concentrations, water temperature, water quality variables, sediment quality variables, or benthic invertebrate indicators for the exposure lakes (Table 1). In 2025, statistically significant changes in phytoplankton biomass in Doris Lake were observed compared to the reference lake. However, this was determined not to be a Mine-related effect as 2025 data were within the historical range for phytoplankton biomass in Doris Lake.

No low action level exceedances were identified for the two physical limnological variables (water temperature and dissolved oxygen profiles), the 26 water quality variables evaluated, the seven sediment quality variables evaluated, phytoplankton biomass, or the four benthic invertebrate indicators in 2025. No further investigation was required.

TABLE 1 SUMMARY OF EVALUATION OF EFFECTS FOR THE 2025 AQUATIC EFFECTS MONITORING PROGRAM

Component	Exposure Lakes Included in Evaluation of Effects	Conclusion of Effect	Low Action Level Triggered?
Fish habitat (water level, ice thickness, and stream hydrology)	Windy Lake, Patch Lake, Doris Lake	No effect	No effect
	Glenn Lake, Imniagut Lake, PO Lake, Ogama Lake, Little Roberts Lake	Not Evaluated[a]	Not Evaluated[a]
Physical limnology (under-ice dissolved oxygen and water temperature)	Windy Lake, Patch Lake, Doris Lake	No effect	No
Water quality	Windy Lake, Patch Lake, Doris Lake	No effect	No
Sediment quality	Patch Lake, Doris Lake	No effect	No
Phytoplankton biomass (chlorophyll *a*)	Patch Lake, Doris Lake	No effect	No
Benthic Invertebrates	Patch Lake, Doris Lake	No effect	No

Note:
[a] Mine-related effects could not be assessed for these lakes due to the absence of under-ice water level and ice thickness data.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS, ABBREVIATIONS, SYMBOLS, AND UNITS

°C	degree Celsius
>	greater than
≥	greater than or equal to
<	less than
≤	less than or equal to
µg/L	microgram per litre
%	percent
AEMP	Aquatic Effects Monitoring Program
Agnico Eagle	Agnico Eagle Mines Limited
ALS	ALS Laboratory Group
BA	before-after
BACI	Before-After/Control-Impact
CCME	Canadian Council of Ministers of the Environment
chl *a*	chlorophyll *a*
cm	centimetre
CPRT	Crown Pillar Recovery Trench
DL	detection limit
DO	dissolved oxygen
Doris Mine	Doris North Gold Mine
ERM	ERM Consultants Canada Ltd.
ISQG	interim sediment quality guidelines
km	kilometre
LME	linear mixed effects
L	litre
Madrid–Boston FEIS	*Madrid–Boston Final Environmental Impact Statement*
m	metre
m^2	metres squared
mg/L	milligram per litre
NA	not applicable
NTU	nephelometric turbidity unit
PEL	Probable Effect Level
Plan, the	the approved *Hope Bay Project: Aquatic Effects Monitoring Plan*

Mine, the	Hope Bay Mine, the
TMAC	TMAC Resources Inc.
QA/QC	quality assurance/quality control
RPD	relative percent difference
SD	standard deviation
TSS	total suspended solids

GLOSSARY

Action level	The Response Framework includes three tiers of action levels: low, medium, and high. The low action level for each monitored component is based on baseline data, and/or water or sediment quality guidelines, and/or recommended critical effects sizes for that component.
Benthic	Pertaining to the bottom region of a waterbody, on or near bottom substrates such as sediments or rocks.
Benthic invertebrates	A diverse group of small (non-vertebrate) aquatic organisms that live on, or close to, the bottom substrates of lakes or streams. Benthic invertebrates are an important food source for fish.
Biomass	The amount of living matter as measured on a weight or concentration basis. Biomass is an indication of the amount of food available for higher trophic levels, including fish. In the AEMP, phytoplankton biomass is estimated by measuring chlorophyll *a.*
Censored value	A value that is only partially known, e.g., a variable concentration that is reported as being below a specified detection limit, although the actual concentration is not known. Interchangeably used with 'less than detection limit' in this report.
Chlorophyll *a*	An essential light-harvesting pigment for photosynthetic organisms, including phytoplankton. Because of the difficulty involved in the direct measurement of plant carbon, chlorophyll *a* is routinely used as a "proxy" estimate for plant biomass in aquatic studies.
Reference site	Site located beyond any Mine influence (i.e., Reference Lake B).
Exposure site	Site potentially influenced by Mine-related activities (e.g., Doris Lake, Patch Lake, and Windy Lake).
Low action level benchmark	One condition that triggers a low action level exceedance when the concentration of a water or sediment quality variable exceeds 75% of the current respective benchmark.
Phytoplankton	Microscopic primary producers that live free-floating in water. Most of these organisms are single-celled algae that use chlorophyll *a* for the process of photosynthesis.
Seasons	When not specified, "seasons" refer to winter (under-ice) and spring/summer/fall (open-water) conditions.

1. INTRODUCTION

The Hope Bay Mine (the Mine) is a gold mining development in the West Kitikmeot region of mainland Nunavut. The Mine has been operated by Agnico Eagle Mines Limited (Agnico Eagle) since February 2021 and is currently in Care and Maintenance with advanced exploration activities. A requirement of the *Hope Bay, Care and Maintenance Plan* (Agnico Eagle 2022) includes the completion of an Aquatic Effects Monitoring Program (AEMP).

The Mine is located approximately 153 kilometres (km) southwest of Cambridge Bay on the southern shore of Melville Sound. The Mine consists of three developments: Doris, Madrid (North and South), and Boston. Current, permitted, and planned infrastructure associated with the Mine is provided (Figure 1-1).

Doris is the northernmost development and is situated near Roberts Bay and includes the Doris Camp, lodging and support facilities for the Mine, and the Doris North Gold Mine (Doris Mine). Construction of the Doris development began in 2010 and commercial operations were conducted from 2017 to 2022.

The Madrid developments are in the north-central area of the Project and accessible by road from the Doris development. Construction at the Madrid North development began in April 2019 and operation began in August 2019. All mining and development activity was suspended at Madrid North in March 2020, except for a brief period of activity at the Madrid North portal in January and February 2021.

The Boston development is the southernmost part of the Mine. As of December 2025, no construction has begun at the Madrid South or Boston developments.

The Mine operates under Project Certificate No. 009 issued by the Nunavut Impact Review Board, and two Type A water licences (2AM-DOH1335 and 2AM-BOS1835) issued by the Nunavut Water Board. In April 2022, the *Hope Bay, Care and Maintenance Plan* (Agnico Eagle 2022) was submitted to the Nunavut Water Board and Nunavut Impact Review Board, as required under Project Certificate No. 009 and by the water licences. Approval of that plan was received on 1 September 2022.

The Hope Bay AEMP is a requirement of Agnico Eagle's Type A Water Licence and is outlined in the *Hope Bay Project: Aquatic Effects Monitoring Plan* (the Plan; TMAC Resources Inc. [TMAC] 2018). The Plan includes a Response Framework to adaptively manage potential Mine-related effects. The Response Framework includes environmental threshold levels that, if exceeded, trigger further investigation and/or mitigation. The Plan also includes the Environment Effects Monitoring requirements under the *Metal* and *Diamond Mining Effluent Regulations* (SOR/2022-159), when applicable to Mine-related activities.

This Annual Report includes:

- A summary of 2025 Mine-related activities relevant to the AEMP;
- A brief overview of the AEMP monitoring design;
- The evaluation of effects methods and the Response Framework criteria; and
- The results and conclusions of the evaluation of effects and a comparison to action level conditions.

FIGURE 1-1 THE HOPE BAY MINE, 2025

ERM

CLIENT: Agnico Eagle Mines Ltd.
GIS NUMBER: HB-01-304-01

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:300,000 when printed at 8.5x11

Monitoring data, methods of sample collection, quality assurance and quality control measures, and results of the 2025 AEMP sampling are provided in the 2025 Data Report (Appendix A), except for the stream hydrology monitoring and results, which are provided in the 2025 Hydrology Compliance Monitoring Summary (Appendix B). Details for the evaluation of effects dataset, statistical methods, and the results of the statistical analyses are provided in the 2025 Evaluation of Effects—Historical Dataset Summaries, Statistical Methods, and Results (Appendix C).

1.1 OBJECTIVES

The primary goals of the AEMP are to evaluate potential Mine-related effects on the surrounding freshwater environment during the construction and operation of the Mine, verify predictions from the *Madrid–Boston Final Environmental Impact Statement* (Madrid–Boston FEIS; TMAC 2017), support current and future *Fisheries Act* (1985) authorizations, and provide a mechanism to respond to potential Mine-related effects in the freshwater environment through mitigation and management actions.

1.2 MINE ACTIVITIES IN 2025

The Mine remained in Care and Maintenance in 2025. Agnico Eagle continued the management of facilities to remain in regulatory compliance with permits, licences, and approvals for the Mine, and conducted advanced exploration activities.

Mine-related activities (by development) relevant to the AEMP that occurred in 2025 are listed below.

Doris

- Milling activities remained suspended (since October 2021).
- Underground ore extraction in the Doris Mine remained suspended (since February 2022).
- Effluent from underground dewatering and/or the tailings impoundment area was captured and treated to comply with the *Metal and Diamond Mining Effluent Regulations* (SOR/2022-159) prior to being discharged to Roberts Bay.
- Sealift operation with delivery of supplies, including delivery of bulk diesel fuel and Jet-A, was completed.
- The Doris Air Quality Station operated at an acceptable level throughout the year.
- Quarry blasting occurred at quarries AF (Roberts Bay) and D (Madrid Area) to support Care and Maintenance activities and exploration projects (e.g., the exploration track and the Naartok infrastructure pad, and expansion work at Patch 7).
- Preconstruction activities were completed at Doris, which included mill dismantling, several new pads, new accommodations, improvement of the tailings impoundment area at the North Dam, new fabrication shop, new sewage treatment plan, and new Potable Water Treatment Plant.

Madrid

- Exploration surface drilling occurred on the bottom of Patch Lake during the ice-covered season in 2025. Additional drilling was focused on the Madrid Deposit, including the Patch 7, Patch South, and Suluk target areas. Drill sites were reclaimed following decommissioning of the drills, which included the placement of overburden material to level the drill hole area.
- A year-round, 4x4-accessible exploration track was built in 2024 to support drilling activities in this area. The track was extended along the southern shoreline of Patch Lake in 2025.
- Construction began on an all-weather road from Madrid to the tailings impoundment area.

Madrid North

- Ore extraction and development at Madrid North remained suspended (since October 2021).
- Dewatering from the Naartok Crown Pillar Recovery Trench (CPRT) was conducted in 2025 and water was transported to the sedimentation pond at Doris via tanker trucks, then pumped to the tailings impoundment area.
- Construction of infrastructure to support operations, including an infrastructure pad adjacent to the Naartok CPRT, was completed.
- Waste rock coming from underground was transported to the Madrid Waste Rock Storage facility.

Madrid South

- Civil work to build a new portal to access Patch 7 deposit began and is ongoing. This included the development of a gravel track, blasting a rock face, and construction of a rock fill pad to store material.

Boston

- As of December 2025, construction of the Boston development had not yet commenced.
- The Hope Bay Project Boston Advanced Exploration site was maintained but not occupied in 2025. Regular site visits were completed to ensure there was no damage or issues on site from weather or wildlife, diesel storage containers remained intact with no spills or leaks, surface water collection ponds were not overflowing, and water sampling and analysis from pad seeps were completed.

2. METHODS

2.1 MONITORING DESIGN

Mine-related activities in targeted development areas trigger monitoring for specific lakes, as defined in the AEMP (Table 2.1-1; TMAC 2018). Monitored sites included exposure lakes (i.e., lakes potentially influenced by Mine-related activities) and a reference lake (Figure 2.1-1; TMAC 2018). Exposure lakes include sites proximate to infrastructure that have the potential to receive non-point-source inputs, such as runoff or dust. Additionally, monitoring includes sites that could be affected by water loss due to permitted water withdrawal and groundwater seepage into the underground developments. AEMP monitoring has been triggered at the Doris and Madrid North developments in response to ongoing Care and Maintenance activities (Table 2.1-1). Exposure lakes included Doris and Little Roberts lakes (associated with the Doris Mine Development), and Imniagut, Patch, PO, Ogama, Windy, and Glenn lakes (associated with the Madrid North Development; Figure 2.1-1).

The 2025 AEMP included assessment of the following components (Table 2.1-2):

- Fish habitat (ice thickness, water level, and stream hydrology)
- Under-ice physical limnology and water quality variables
- Open-water
    - Physical limnology and water quality variables;
    - Sediment quality variables;
    - Phytoplankton; and
    - Benthic invertebrate taxonomy.

Not all components are monitored on an annual basis, nor are they applicable at each sampling site (Table 2.1-2; TMAC 2018). Sediment quality and lake benthic invertebrates are monitored every 3 years; these components were sampled in 2025 and will next be sampled in 2028.

The 2025 AEMP was conducted in accordance with the Plan (TMAC 2018), except for under-ice water level measurements. These measurements could not be collected in 2025 at any site except for Patch and Windy lakes due to thin ice. Water level measurements, and consequently the reduction in under-ice lake surface elevation, for Doris Lake only were estimated based on lake-level measurements collected in April from the Doris Lake-2 hydrology monitoring station (Appendix B).

Comprehensive details of the 2025 AEMP sampling design, schedule, sampling sites, and monitoring methods for aquatic and hydrological components are provided (Appendices A and B, respectively).

2.1.1 BASELINE SAMPLING AT WOLVERINE LAKE

Supplemental baseline sampling was completed at Wolverine Lake during the 2025 open-water season. Sampling was conducted in anticipation of construction and operation activities at Madrid South triggering monitoring within the upcoming years. Sampling methods and results for the Wolverine Lake baseline sampling are discussed in the 2025 Data Report (Appendix A). These results were not evaluated for effects and will not be further discussed in this AEMP Annual Report.

TABLE 2.1-1 RATIONALE FOR AQUATIC EFFECTS MONITORING PROGRAM SAMPLING SITES BASED ON DEFINED MONITORING TRIGGERS FOR THE HOPE BAY MINE, 2025

Watershed	Sampling Site	Sampling Rationale	Monitoring Trigger	2025 Monitoring Requirement and Rationale
Doris	Wolverine Lake	Drawdown from Madrid South mine groundwater inflow; inputs (e.g., dust deposition, runoff) due to proximity to infrastructure.	Madrid South construction and operations	No[a]
	Patch Lake	Drawdown from Madrid North and South mines groundwater inflow; inputs (e.g., dust deposition, runoff) due to proximity to infrastructure.	Madrid North and South construction and operations	Yes, Care and Maintenance activities at Madrid North
	Imniagut Lake	Drawdown from Madrid North mine groundwater inflow.	Madrid North and South operations	Yes, Care and Maintenance activities at Madrid North
	PO Lake	Drawdown from Madrid North mine groundwater inflow.	Madrid North and South operations	Yes, Care and Maintenance activities at Madrid North
	Ogama Lake	Drawdown from Madrid North mine groundwater inflow.	Madrid North and South operations	Yes, Care and Maintenance activities at Madrid North
	Doris Lake	Water withdrawal for industrial use (e.g., dust suppression, wash bays and machine shops, process water); drawdown from Doris mine groundwater inflow; inputs (e.g., dust deposition, runoff) due to proximity to infrastructure.	Doris, Madrid North, and Madrid South construction and operations; Boston operations	Yes, Care and Maintenance activities at Doris and Madrid North
	Little Roberts Lake	Little Roberts Lake is downstream of Doris Lake; therefore, indirect effects may be observed in Little Roberts Lake as a result of drawdown and water withdrawal from Doris Lake.	Doris, Madrid North, and Madrid South construction and operations; Boston operations	Yes, Care and Maintenance activities at Doris and Madrid North

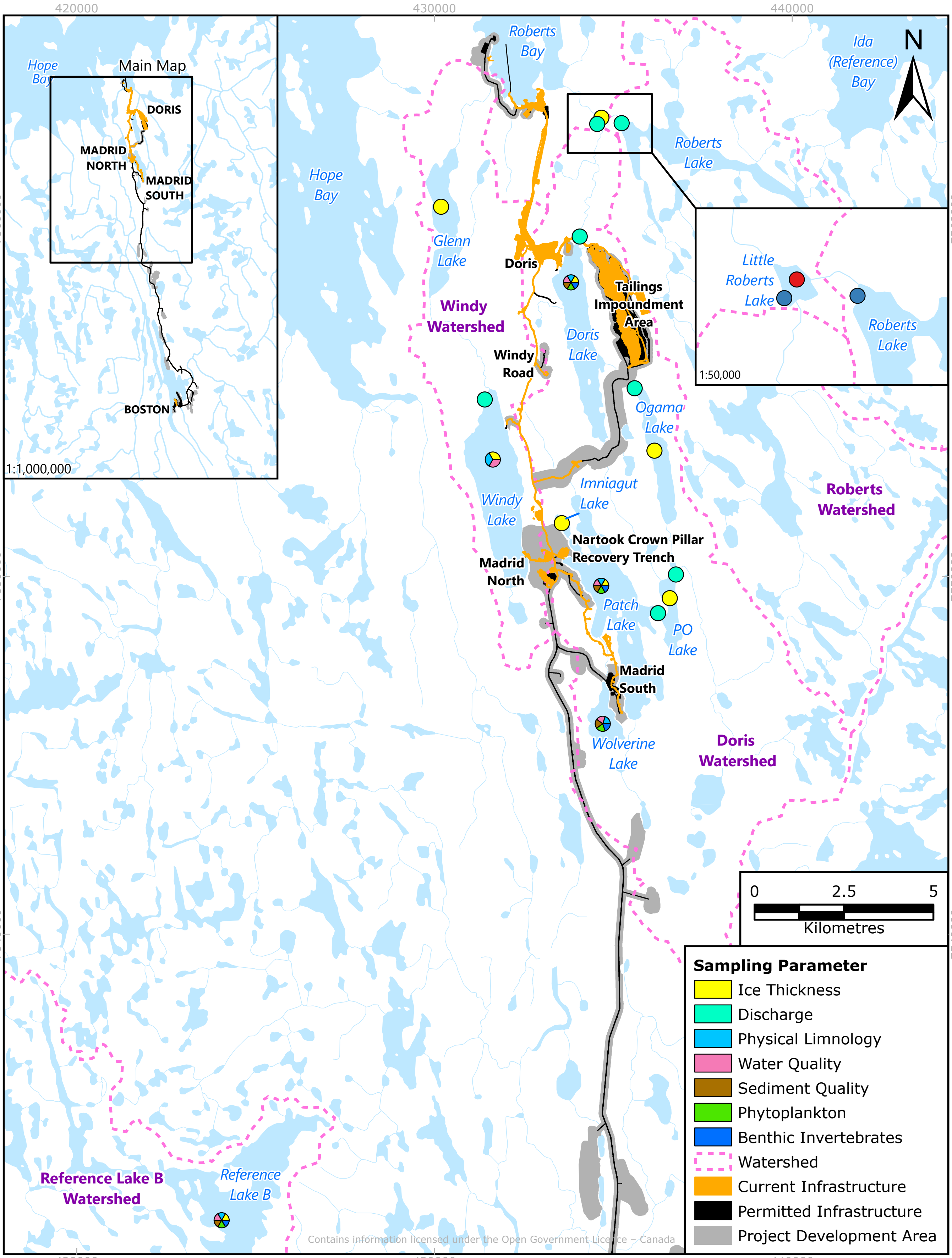
Watershed	Sampling Site	Sampling Rationale	Monitoring Trigger	2025 Monitoring Requirement and Rationale
Windy	Windy Lake	Water withdrawal for domestic use (potable water); drawdown from Madrid North mine groundwater inflow.	Doris, Madrid North, and Madrid South construction and operations	Yes, Care and Maintenance activities at Doris and Madrid North
	Glenn Lake	Glenn Lake is downstream of Windy Lake; therefore, indirect effects may be observed in Glenn Lake as a result of water withdrawal from Windy Lake.	Doris, Madrid North, and Madrid South construction and operations	Yes, Care and Maintenance activities at Doris and Madrid North
Aimaokatalok	Stickleback Lake	Inputs (e.g., dust deposition, runoff) due to proximity to infrastructure.	Boston construction and operations	No
	Aimaokatalok Lake	Inputs (e.g., dust deposition, runoff) due to proximity to infrastructure; permitted discharge.	Boston construction and operations	No
Reference	Reference Lake B	Reference area for AEMP located outside of the zone of Mine influence.	Doris, Madrid, and Boston construction and operations	Yes, Care and Maintenance activities at Doris and Madrid North

Notes:

AEMP = Aquatic Effects Monitoring Program; Mine = Hope Bay Mine

[a] Monitoring was not required for Wolverine Lake under the AEMP, but baseline sampling was conducted at this site in 2025.

FIGURE 2.1-1 SAMPLING SITES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025



ERM

CLIENT: Agnico Eagle Mines Ltd.
GIS NUMBER: HB-01-304-02

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:150,000 when printed at 8.5x11

TABLE 2.1-2 AQUATIC EFFECTS MONITORING PROGRAM SAMPLING LOCATIONS AND MONITORED COMPONENTS FOR THE HOPE BAY MINE, 2025

Site	Ice Thickness	Water Level	Streamflow	Physical Limnology	Water Quality	Sediment Quality	Phytoplankton	Benthic Invertebrates
Doris Watershed								
Patch Lake	X	X	-	X	X	X	X	X
Patch Outflow Hydro	-	-	X	-	-	-	-	-
Imniagut Lake	-[a]	-[a]	-	-	-	-	-	-
Imniagut Lake Hydro	-	-	-	-	-	-	-	-
PO Lake	-[a]	-[a]	-	-	-	-	-	-
PO Outflow Hydro	-	-	X	-	-	-	-	-
Ogama Lake	-[a]	-[a]	-	-	-	-	-	-
Ogama Outflow Hydro	-	-	X	-	-	-	-	-
Doris Lake	X	X	-	X	X	X	X	X
Doris Lake-2 Hydro	-	-	-	-	-	-	-	-
Doris Creek TL-2 Hydro	-	-	X	-	-	-	-	-
Little Roberts Lake	-[a]	-[a]	-	-	-	-	-	-
Little Roberts Outflow Hydro	-	-	X	-	-	-	-	-
Wolverine Lake[b]	-	-	-	X	X	X	X	X
Windy Watershed								
Windy Lake	X	X	-	X	X	X	-	X
Windy Outflow Hydro	-	-	X	-	-	-	-	-
Glenn Lake	-[a]	-[a]	-	-	-	-	-	-
Glenn Lake Hydro	-	-	-	-	-	-	-	-

Site	Ice Thickness	Water Level	Streamflow	Physical Limnology	Water Quality	Sediment Quality	Phytoplankton	Benthic Invertebrates
Reference Lake								
Reference Lake B	X	-[a]	-	X	X	X	X	X

Notes:
Plan = approved *Hope Bay Project: Aquatic Effects Monitoring Plan*
Dashes (-) indicate that monitoring is either not triggered by the Plan or not required at the specific site.
X indicates that monitoring completed in 2025.
[a] Ice thickness and water level measurements during the ice-covered season were not obtained in 2025 due to weather and safety concerns.
[b] Wolverine Lake was sampled in 2025 for baseline data collection.

2.2 EVALUATION OF EFFECTS

2.2.1 EVALUATED VARIABLES

The variables evaluated for fish habitat, physical limnology, water quality, sediment quality, phytoplankton, and benthic invertebrates are outlined in the Plan (TMAC 2018). Mine-related water use, such as water withdrawal and seepage in underground mining, has the potential to reduce lake water levels and affect stream hydrology, which could adversely affect fish habitat. Therefore, fish habitat is evaluated through water level and ice thickness, and open-water season streamflow (Table 2.2-1; Appendix B). Under-ice water level measurements were only evaluated at Doris, Patch, and Windy lakes in 2025 as part of the fish habitat evaluation of effects due to issues discussed above (Section 2.1).

TABLE 2.2-1 EVALUATED VARIABLES FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Category	Evaluated Variable	
Fish Habitat	Water level[a]	
	Ice thickness	
	Stream hydrology	
Physical Limnology	Under-ice dissolved oxygen	
	Temperature	
Water Quality	pH	Total chromium
	Total Suspended Solids	Total copper
	Turbidity	Total iron
	Chloride	Total lead
	Fluoride	Dissolved manganese
	Total ammonia	Total mercury
	Nitrate	Total molybdenum
	Nitrite	Total nickel
	Total phosphorus[b]	Total selenium
	Total aluminum	Total silver
	Total arsenic	Total thallium
	Total boron	Total uranium
	Total cadmium	Dissolved zinc

Category	Evaluated Variable	
Sediment Quality	% Moisture	Lithium
	pH	Magnesium
	Particle Size	Manganese
	Total Nitrogen	Mercury
	Total Organic Carbon	Molybdenum
	Aluminum	Nickel
	Antimony	Phosphorous
	Arsenic	Potassium
	Barium	Selenium
	Beryllium	Silver
	Bismuth	Sodium
	Boron	Strontium
	Cadmium	Sulphur
	Calcium	Thallium
	Chromium	Tin
	Cobalt	Titanium
	Copper	Uranium
	Iron	Vanadium
	Lead	Zinc
Phytoplankton	Biomass (chlorophyll *a*)	
Benthic Invertebrates	Total density	
	Simpson’s Evenness Index	
	Taxa Richness	
	Bray-Curtis Similarity Index	

Notes:
TMAC = TMAC Resources Inc.
[a] Water level measurements during the ice-covered season were only evaluated at Doris, Patch, and Windy lakes in 2025 due to weather and safety concerns.
[b] Total phosphorus was assessed in 2025 as a supporting parameter and is not an annual effects variable under the *Hope Bay Project: Aquatic Effects Monitoring Plan* (TMAC 2018).

Variables evaluated for physical limnology, water quality, and sediment quality included those with guidelines established by the Canadian Council of Ministers of the Environment (CCME) for the protection of aquatic life (Section 2.2-4; CCME 2024). Dissolved oxygen (DO) concentrations are typically lowest during the under-ice period, representing “worst-case scenario” conditions. Lower DO concentrations during the under-ice season can be attributed to microbial decomposition and respiration, exclusion of atmospheric oxygen exchange, and decreased photosynthetic activity from phytoplankton due to ice and snow cover, which reduces light penetration (Wetzel 2001).

Total phosphorus does not have a CCME guideline but is included in the evaluation of effects as a supporting parameter due to its association with phytoplankton productivity (measured as biomass; CCME 2004). Phytoplankton biomass is estimated using the main photosynthetic pigment, chlorophyll *a* (chl *a*). Total phosphorus was assessed in 2025 to support the evaluation of effects for phytoplankton biomass.

Variables evaluated for benthic invertebrates included community metrics (e.g., density, taxa richness, Simpsons Diversity index and Bray-Curtis similarity index) calculated from the taxonomic data according to methods described in the Metal Mining Technical Guidance for Environmental Effects Monitoring (Environment and Climate Change Canada [ECCC] 2012; Appendix A).

2.2.2 DATASETS

Physical limnology, water quality, sediment quality, and biological data have been collected in the Doris and Madrid development areas of the Mine since 1995. Over time, historical samples collected have varied by location, depth, sampling date, and method of collection (Appendix C). Therefore, historical data were evaluated for relevancy and compared to the current sampling framework, as detailed in the Plan (TMAC 2018) and were included in evaluation of effects when applicable (Appendix C).

Data from baseline years included in data analyses were as follows:

- All years up to and including 2009 for the Doris development, as Doris Mine construction began in 2010; and
- All years up to and including 2018 for the Madrid North Development, as construction and operations began in 2019.

2.2.3 EFFECTS ASSESSMENT

This section provides an overview of the evaluation of effects methods. A detailed description of the statistical analyses, methods, and results are provided in Appendix C.

2.2.3.1 FISH HABITAT

The potential effects for fish habitat variables (i.e., water level, ice thickness, and stream hydrology) were assessed relative to the predictions in the Madrid–Boston FEIS (TMAC 2017).

2.2.3.2 PHYSICAL LIMNOLOGY

The evaluation of effects for physical limnology was conducted using graphical analyses to detect temporal changes in variables evaluated for the exposure lakes relative to the reference lake (Figure 4.2-1 in TMAC 2018). Temporal trends were assessed for the physical limnology variables (DO and temperature profiles). The absolute values (concentration in milligrams per litre [mg/L] or temperature [°C]) and water column profiles in each exposure lake were visually assessed relative to the absolute values observed during baseline years and/or in the reference lake.

2.2.3.3 WATER QUALITY, SEDIMENT QUALITY, PHYTOPLANKTON, AND BENTHIC INVERTEBRATES

The evaluation of effects for water quality, sediment quality, phytoplankton, and benthic invertebrate variables was conducted using statistical and graphical analyses to detect temporal changes in variables evaluated for the exposure lakes relative to the reference lake (Figure 4.2-1 in TMAC 2018).

A two-step statistical analysis was conducted for water quality, sediment quality, phytoplankton, and benthic invertebrate variables. The first step investigated any change in the variable over time, while the second step evaluated any trends for that variable in the exposure lake compared to the reference lake. The second step was conducted only for the years in which sampling was completed at both lakes for the applicable variable. A result was considered statistically different if the significance level (*p* value) for analysis was less than 0.05.

Either linear mixed-effects regression or Tobit regression models were used to examine temporal trends over the monitoring period for Doris Lake (10 or more years for most variables; Appendix C). Tobit regression was used when 10 to 50 percent of the data for a given analysis were below the analytical detection limit (DL). Statistical analyses were not conducted if more than 50 percent of the monitoring data, or the current year’s observations, were less than the DL.

Patch and Windy lakes had less than 10 years of continuous historical data available for most variables, with nonsequential years of collection. For these lakes, the statistical analysis consisted of a before-after (BA) analysis where the *before* period included the baseline data (i.e., up to and including 2018; Section 2.2.2) and the *after* period included data collected in the years since Mine-related activities may have affected the exposure lakes (i.e., since 2019). If there was a significant difference between the before and after periods for an exposure lake in a given season, the analysis proceeded to a Before-After/Control-Impact (BACI) analysis. The BACI analysis compares the BA trends between the exposure and reference lake (Appendix C) and can only assess data from the same collection years at the exposure and reference lakes.

The evaluation of effects figures for water quality, sediment quality, phytoplankton, and benthic invertebrate variables included graphing all observations from each year. Additionally, the annual fitted mean (and 95 percent confidence intervals) was plotted for Doris Lake, while the BA fitted means were plotted for Patch and Windy lakes. If applicable, the corresponding fitted mean was plotted for the reference lake. Observations that were below the sample DL were plotted at half the DL and indicated by a hollow symbol (O or Δ). In cases where statistical analyses were not completed, graphical analyses were used to visually assess for potential changes in variables.

Statistical assessments, graphical assessments, and professional judgment were used in the evaluation of effects to assess whether an effect occurred and if action level conditions would be triggered by the Response Framework (Figure 4.2-1 in TMAC 2018). Statistical assessments themselves are not conclusive evidence of an effect. Therefore, if an evaluated variable had a statistically significant result, graphical analyses were used to identify the direction of the change. For most variables, only an increasing concentration over time would be considered an adverse effect (e.g., for total suspended solids [TSS] and total metals). However, for other variables (e.g., phytoplankton biomass or pH), either an increasing or a decreasing trend could be considered adverse. Additionally, for any statistically significant result, the 2025 observations were compared to the baseline range to assess whether the detected change was outside of historical ranges. If an effect was detected based on statistical and graphical analyses, supporting data were interpreted using professional judgment to assess the potential cause of the effect. Several factors unrelated to Mine-related activities could influence the detection of a significant temporal change in an exposure lake, and relative to the reference lake. Local differences in meteorological conditions (e.g., microclimates), overland runoff or naturally variable inputs related to weathering and erosion, and variation due to lake morphology can all influence changes over time.

The Response Framework (TMAC 2018; Section 2.2.5) outlines the steps to assess whether an effect is Mine-related. The purpose of the Response Framework is to pre-empt significant adverse effects to aquatic life. If a Mine-related effect, or an inconclusive but potentially adverse change had been identified, the data were compared to the Madrid–Boston FEIS (TMAC 2017) predictions.

2.2.4 BENCHMARKS

Annual AEMP results are compared to the CCME water quality guidelines for the protection of aquatic life (Table 2.2-2; CCME 2025b), which are used as the benchmarks for physical limnology and water quality variables, as outlined by the Plan (TMAC 2018). Given that the Hope Bay Project remains in Care and Maintenance, no additional benchmarks outside of CCME guidelines have been included in the evaluation of effects. When multiple guidelines exist (e.g., short- and long-term or acute and chronic exposure values), the most conservative (i.e., lowest) guideline is used as the AEMP benchmark. The CCME guidelines for TSS and turbidity are lake specific, based on background concentrations (Table 2.2-2), and are calculated for both the under-ice and open-water seasons for each exposure lake (Table 2.2-3). The guideline for total ammonia is both pH- and temperature-dependent (Table 2.2-4).

TABLE 2.2-2 WATER QUALITY BENCHMARKS

Water Quality Variable	Benchmark[a]
Dissolved Oxygen	9.5 mg/L (cold-water biota: early life stages) 6.5 mg/L (cold-water biota: other life stages)
Temperature	Thermal additions must not alter thermal stratification regime, turnover date(s), and maximum weekly temperature
pH	6.5 to 9.0
Total Suspended Solids	Maximum average increase of 5 mg/L from background (for clear-flow waters; long-term exposure); Table 2.2-3
Turbidity	Maximum average increase of 2 NTU from background (for clear-flow waters; long-term exposure)
Chloride	120 mg/L (long term)
Fluoride	0.12 mg/L
Total ammonia	Temperature- and pH-dependent; Table 2.2-4
Nitrate	3.0 mg/L (long term)

Water Quality Variable	Benchmark[a]
Nitrite	0.06 mg/L
Total aluminum	0.005 mg/L (if pH < 6.5); 0.1 mg/L (if pH ≥ 6.5)
Total arsenic	0.005 mg/L
Total boron	1.5 mg/L
Total cadmium	0.00004 mg/L for hardness (as $CaCO_3$) of < 17 mg/L; $10^{(0.83[\log(hardness)]-2.46)}$/1,000 mg/L for hardness of ≥ 17 to ≤ 280 mg/L; 0.00037 mg/L for hardness of > 280 mg/L (long term)
Total chromium	0.001 mg/L for chromium (VI); 0.0089 mg/L for chromium (III)
Total copper	0.002 mg/L for hardness (as $CaCO_3$) of < 82 mg/L; $e^{(0.8545[\ln(hardness)]-1.465)}$/1,000 mg/L for hardness of ≥ 82 to ≤ 180 mg/L; 0.004 mg/L for hardness of > 180 mg/L
Total iron	0.3 mg/L
Total lead	0.001 mg/L for hardness (as $CaCO_3$) of ≤ 60 mg/L; $e^{(1.273[\ln(hardness)]-4.705)}$/1,000 mg/L for hardness of > 60 to ≤ 180 mg/L; 0.007 mg/L for hardness of > 180 mg/L
Dissolved manganese	Hardness- and pH-dependent benchmark is found in look-up table in CCME (2019). At hardness (as $CaCO_3$) of 50 mg/L and pH of 7.5, the benchmark is 0.43 mg/L. The values in the look-up table are valid between hardness 25 and 670 mg/L and pH 5.8 and 8.4
Total mercury	0.026 µg/L
Total molybdenum	0.073 mg/L
Total nickel	0.025 mg/L for hardness (as $CaCO_3$) of ≤ 60 mg/L; $e^{(0.76[\ln(hardness)]+1.06)}$/1,000 mg/L for hardness of > 60 to ≤ 180 mg/L; 0.15 mg/L for hardness of > 180 mg/L
Total selenium	0.001 mg/L
Total silver	0.00025 mg/L
Total thallium	0.0008 mg/L
Total uranium	0.015 mg/L
Dissolved zinc	$e^{(0.947[\ln(hardness)]-0.815[pH]+0.398[\ln(DOC)]+4.625)}$/1,000 mg/L for hardness of 23.4 to 399 mg/L, pH of 6.5 to 8.13, and DOC of 0.3 to 22.9 mg/L; 0.007 mg/L for hardness (as $CaCO_3$) of 50 mg/L, pH of 7.5, DOC of 0.5 mg/L

Note:
> = greater than; ≥ = greater than or equal to; < = less than; ≤ = less than or equal to; µg/L = microgram per litre; mg/L = milligram per litre
$CaCO_3$ = calcium carbonate; CCME = Canadian Council of Ministers of the Environment; DOC = dissolved organic carbon; NTU = nephelometric turbidity unit(s)
[a] Source: *Canadian Water Quality Guidelines for the Protection of Aquatic Life: Summary Table* (CCME 2025b).

TABLE 2.2-3 TOTAL SUSPENDED SOLIDS AND TURBIDITY BENCHMARKS FOR EXPOSURE LAKES

Lake	Season	Total Suspended Solids Benchmark (mg/L)	Turbidity Benchmark (NTU)
Doris	Under-ice	7.18	4.91
	Open-water	9.85	5.69
Patch	Under-ice	6.11	3.10
	Open-water	7.06	4.77
Windy	Under-ice	6.21	2.46
	Open-water	6.10	3.04

Notes:
mg/L = milligram per litre
NTU = nephelometric turbidity unit(s)

TABLE 2.2-4 TOTAL AMMONIA BENCHMARK AS A FUNCTION OF PH AND TEMPERATURE

Temperature (˚C)	pH							
	6.0	6.5	7.0	7.5	8.0	8.5	9.0	10.0
0	190	60	19	6.0	1.9	0.62	0.21	0.035
5	126	40	13	4.0	1.3	0.41	0.14	0.028
10	84	27	8.5	2.7	0.86	0.28	0.10	0.024
15	57	18	5.7	1.8	0.59	0.20	0.073	0.021
20	39	13	4.0	1.3	0.41	0.14	0.055	0.020
25	28	8.7	2.8	0.89	0.29	0.10	0.044	0.018
30	19	6.2	2.0	0.63	0.21	0.077	0.035	0.017

Notes:
°C = degree Celsius; mg/L = milligram per litre;
CCME = Canadian Council of Ministers of the Environment;
Total ammonia concentration units are in mg/L total ammonia-N.
Values outside the shaded area should be used with caution, owing to a lack of toxicity data to accurately assess toxic effects at the extreme of these ranges (CCME 2025b).

Sediment quality results are compared to the CCME sediment quality guidelines for the protection of aquatic life (CCME 2025a; Table 2.2-5). The CCME guidelines include a lower guideline, the Interim Sediment Quality Guidelines (ISQG), and an upper guideline, the Probable Effects Level (PEL). These guidelines provide a flexible, interpretive tool for evaluating the toxicological significance of sediment chemistry data.

TABLE 2.2-5 SEDIMENT QUALITY BENCHMARKS

Sediment Quality Variable	Benchmark[a] (mg/kg)	
	ISQG	PEL
Arsenic	5.90	17.0
Cadmium	0.60	3.50
Chromium	37.3	90.0
Copper	35.7	197
Lead	35.0	91.3
Mercury	0.170	0.486
Zinc	123.0	315.0

Notes:

mg/kg = milligram per kilogram; ISQG = interim sediment quality guidelines; PEL = Probable Effects Level

[a] Source: *Canadian Sediment Quality Guidelines for the Protection of Aquatic Life: Summary Table* (CCME 2025a)

2.2.5 RESPONSE FRAMEWORK

The Response Framework is an early-detection system with defined action levels that initiate monitoring and/or management actions within an adequate time frame to pre-empt significant adverse effects to aquatic life (Figure 4.2-1 in TMAC 2018). Significance thresholds (e.g., an unacceptable level of change in a monitored variable) are outlined in the Plan for water quality, sediment quality, phytoplankton biomass, and benthic invertebrates (TMAC 2018).

Evaluated physical limnology, water quality, sediment quality, phytoplankton, and benthic invertebrate variables were compared to the conditions required to trigger an action level response through the Response Framework (TMAC 2018). If the conditions of an action level response had been met, follow-up actions would be triggered, as described in the Response Framework (TMAC 2018).

2.2.5.1 ACTION LEVEL CONDITIONS

The action level conditions by monitoring component required to trigger a low action level are outlined in the Response Framework (TMAC 2018). The annual AEMP results are compared to these conditions. When one condition is not met, the conditions for that variable are not assessed further. All conditions must be met to trigger a low action level response. However, a specific variable may not be capable of triggering every condition. In such cases, a low action level response may be triggered when all relevant conditions have been met, excluding those that are not applicable to that specific variable.

Water Quality and Sediment Quality

The conditions required to trigger a low action level response for water quality included the following:

- **Condition 1:** A statistically significant and potentially adverse change from baseline concentrations has been identified.
- **Condition 2:** The concentration of the water quality variable is outside the normal range, based on baseline concentrations.
- **Condition 3:** The concentration of the water quality variable exceeds 75 percent of a benchmark.
- **Condition 4:** If a potentially adverse change is detected at the exposure site, there is no similar change at the reference site.

Similar to the effects assessment (Section 2.2.3), only a statistically significant increase in concentration would be considered a potentially adverse change for most evaluated water quality variables to fulfill Condition 1. However, for DO concentration, only a decrease would be considered potentially adverse, while for pH, a change in either direction would be considered potentially adverse. To fulfill Condition 2, all observations are required to be outside the baseline range, trending in the same direction. Regarding Condition 3, the low action level is set at 75 percent of the water quality benchmark. This allows adaptive management measures to be implemented before concentrations could negatively affect the most sensitive freshwater life.

No Response Plans for water quality variables have been initiated to date. No medium or high action level conditions have been established for water quality or sediment quality variables.

Phytoplankton

The conditions required to trigger a low action level response for phytoplankton biomass included the following:

- **Condition 1:** A statistically significant change from baseline concentrations has been identified.
- **Condition 2:** The concentration of chl *a* is outside of the normal range based on baseline concentrations.
- **Condition 3:** If a change has been detected at the exposure site, there is no similar change at the reference site.

For comparison to the baseline concentrations for phytoplankton biomass, the 2025 mean concentration was compared to the range of observations from the baseline period.

Results of the 2023 and 2024 AEMP indicated that phytoplankton biomass (chl *a* concentrations) in Doris Lake significantly increased in 2022. This increase was beyond the historical baseline range (ERM Consultants Canada Ltd. [ERM] 2023), which triggered a low action level Response Plan (Agnico Eagle 2023) and led to the *Hope Bay Project: Aquatic Effects Monitoring Program Aquatic Response Plan for Phytoplankton Biomass* (ERM 2024). The Response Plan for phytoplankton biomass indicates that when the mean chl *a* concentration is outside of the normal range based on the baseline observations (Condition 2), a supplemental statistical test (two-tailed t-test) will be used in the AEMP to confirm if Condition 1 has been fulfilled (i.e., that the current year mean is statistically different from the baseline mean). If the low action level conditions are triggered for phytoplankton biomass, the AEMP results are compared to the medium action level conditions defined in the Response Plan (ERM 2024). Currently, there are no high action levels established for phytoplankton biomass.

Benthic Invertebrates

The conditions required to trigger a low action level response for benthic invertebrates included the following:

- **Condition 1:** A statistically significant decrease from baseline conditions has been identified.
- **Condition 2:** The benthos indicator is less than the normal range based on baseline conditions.
- **Condition 3:** If a change has been detected at the exposure site, there is no similar change at the reference site.
- **Condition 4:** The magnitude of the decrease exceeds the critical effects size of ±2 within-reference-area standard deviations (SD), as recommended by ECCC (2012).

Potential effects for benthic invertebrates are evaluated for each community indicator (i.e., density, Simpson's evenness index, taxa richness, and Bray-Curtis similarity index). A Response Plan for benthic invertebrates was developed in 2017 due to an observed increase in benthos density in Doris Lake from 2010 to 2017 (ERM 2018). However, an increase in benthos density was not seen as an adverse effect on the benthic community, since the increase in prey-items for benthic-feeding fish can have a positive effect on fish populations. Medium and high action level responses defined in the Response Plan are triggered by decreases in benthos density (ERM 2018).

3. EVALUATION OF EFFECTS

The evaluation of effects for fish habitat (Section 3.1), physical limnology (Section 3.2), water quality (Section 3.3), sediment quality (Section 3.4), phytoplankton biomass (Section 3.5), and benthic invertebrates (Section 3.6) are discussed. Detailed statistical results for the assessment of Mine-related effects for water quality, sediment quality, phytoplankton biomass, and benthic invertebrate metrics are provided in Appendix C (see Section C.3).

3.1 FISH HABITAT

The evaluation of effects on fish habitat during the ice-covered season was limited in 2025 due to the absence of under-ice water level and ice thickness data at Glenn, Imniagut, PO, Ogama, and Little Roberts lakes (Table 3.1-1). Ice thickness observed in 2025 at Windy, Patch, and Doris lakes was less than the maximum baseline ice thickness (Table 3.1-1; TMAC 2017). With the exception of Doris, Windy, and Patch lakes, the reduction in under-ice lake surface elevation could not be calculated due to an absence of under-ice water levels measurements (Section 2.1).

TABLE 3.1-1 LAKE WATER LEVEL FLUCTUATION AND ICE THICKNESS, COMPARED TO *MADRID-BOSTON FINAL ENVIRONMENTAL IMPACT STATEMENT* PREDICTIONS, 2025

Lake	Madrid–Boston FEIS[a]			2025 AEMP Under-ice Season		
	A	B	A + B	A	B	A + B
	Maximum Baseline Water Level Fluctuation (m)	Maximum Baseline Ice Thickness (m)	Maximum Reduction in Under-ice Lake Surface Elevation (m)	Observed Water Level Fluctuation (m)[e]	Ice Thickness (m)	Reduction in Under-ice Lake Surface Elevation (m)
Windy	0.24	1.90	2.14	0.05	1.5	1.55
Glenn	0.26	1.95[c]	2.21	NA	NA	NA
Patch	0.44	2.05	2.49	0.62	1.6	2.22
Imniagut	0.09[b]	1.91[b] (1.99[c])	2.00 (2.08)	NA	NA	NA
PO	0.64	1.85	2.49	NA	NA	NA
Ogama	0.46	1.95	2.41	NA	NA	NA
Doris	0.74	2.00 (2.4[d])	2.74 (3.89)	0.90[f]	1.8	2.70[f]
Little Roberts	0.63	2.30[d]	2.93	NA	NA	NA

Notes:
m = metre
AEMP = Aquatic Effects Monitoring Program; Madrid–Boston FEIS = *Madrid–Boston Final Environmental Impact Statement*; NA = not applicable; Rescan = Rescan Environmental Services Ltd.; TMAC = TMAC Resources Inc.
(continued on next page)

Notes *(completed)*:
Values in parentheses indicate updates of baseline predictions from the Madrid–Boston FEIS based on the more complete baseline dataset of ice thickness.
[a] Unless otherwise indicated, data source: Table 1.2.6 of Volume 5, Chapter 1 (Surface Hydrology) and Table 6.5-10 of Volume 5, Chapter 6 (Freshwater Fish) in the Madrid–Boston FEIS (TMAC 2017).
[b] Field-collected baseline data are not available; variation in open-water lake surface elevation is calculated as the average difference between simulated baseline lake surface elevation in September and June (Years 1 to 22), and ice thickness is estimated as the average of all other lakes with baseline data (TMAC 2017).
[c] Data source: Rescan (2010).
[d] Data source: Golder Associates Ltd. (2007).
[e] Under-ice water level measurements were not obtained in 2025 at Glenn, Imniagut, PO, Ogama, and Little Roberts lakes due to poor weather and safety issues.
[f] Under-ice water level measurements for Doris Lake were estimated from the mean daily water levels collected at the Doris Lake-2 hydrological monitoring station (Appendix B).

The calculated reduction in under-ice lake surface elevation for Doris, Windy, and Patch lakes was less than the Madrid–Boston FEIS predictions (TMAC 2017). No effects related to fish habitat, based on the predictions for water level fluctuation, ice thickness, and the reduction in under-ice lake surface elevation, were observed in 2025 in Doris, Windy, or Patch lakes (Table 3.1-1).

3.2 PHYSICAL LIMNOLOGY

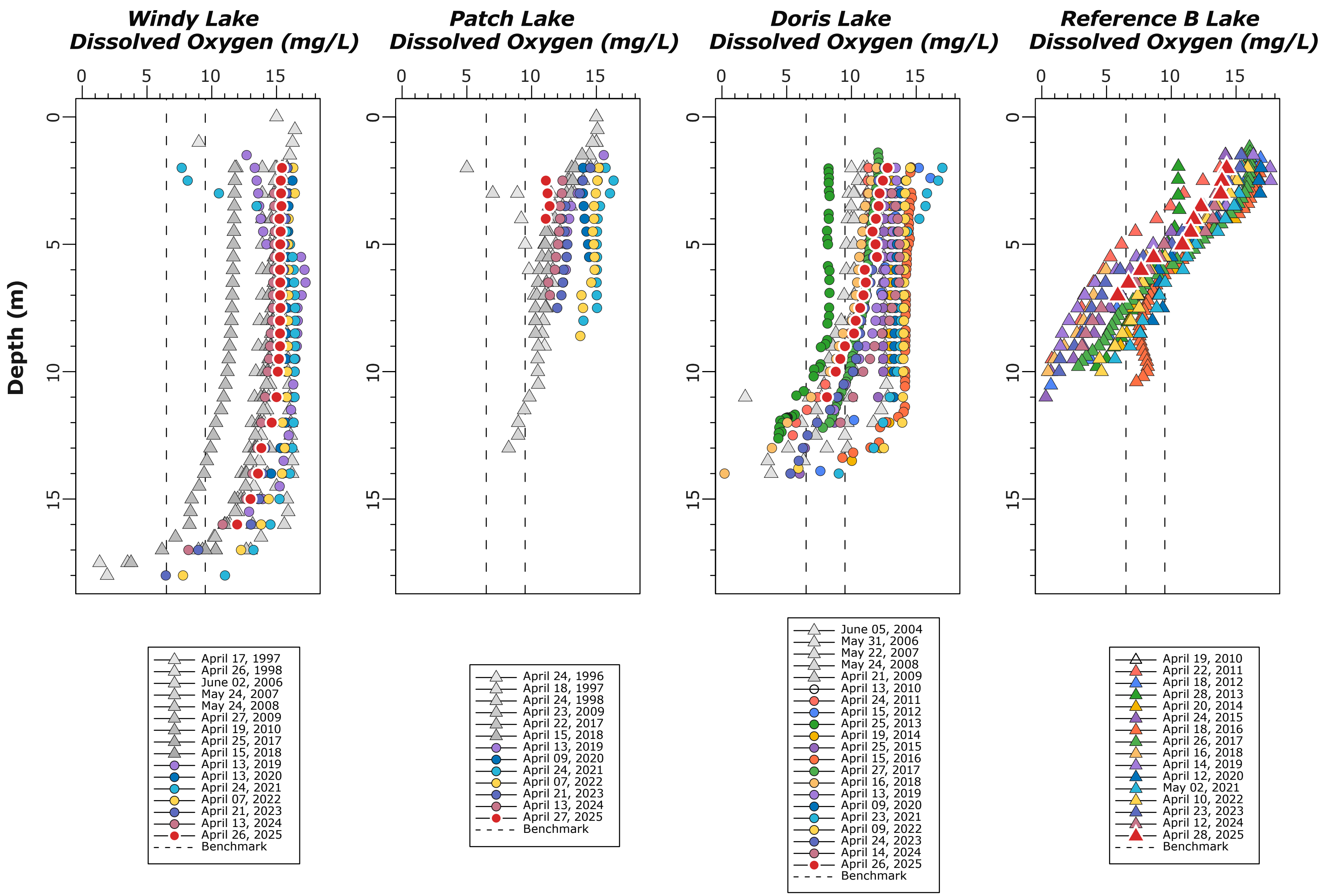
3.2.1 DISSOLVED OXYGEN

Under-ice DO concentrations in 2025 were within the range of baseline concentrations in all exposure lakes (Figures 3.2-1a and 3.2-1b). Graphical observations indicated that under-ice DO in both the reference and exposure lakes followed similar profiles when compared to their respective within-lake historical data (Figures 3.2-1a and 3.2-1b).

Although the 2025 profile is similar to the baseline profiles, overall Patch Lake DO concentrations post-baseline have been consistently higher compared to baseline values (Figure 3.2-1b). Patch Lake baseline DO concentrations were measured in the same basin but at a different station from 1996 to 1998 (Figure C.1-1 in Appendix C), resulting in the variation in the DO-depth profile (Figure 3.2-1b). No significant adverse temporal trends were observed for any of the exposure lakes and under-ice DO concentrations in 2025.

Open-water DO concentrations in 2025 were within the range of baseline concentrations throughout the water column in all exposure lakes (Figures 3.2-2a and 3.2-2b).

FIGURE 3.2-1A UNDER-ICE DISSOLVED OXYGEN PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

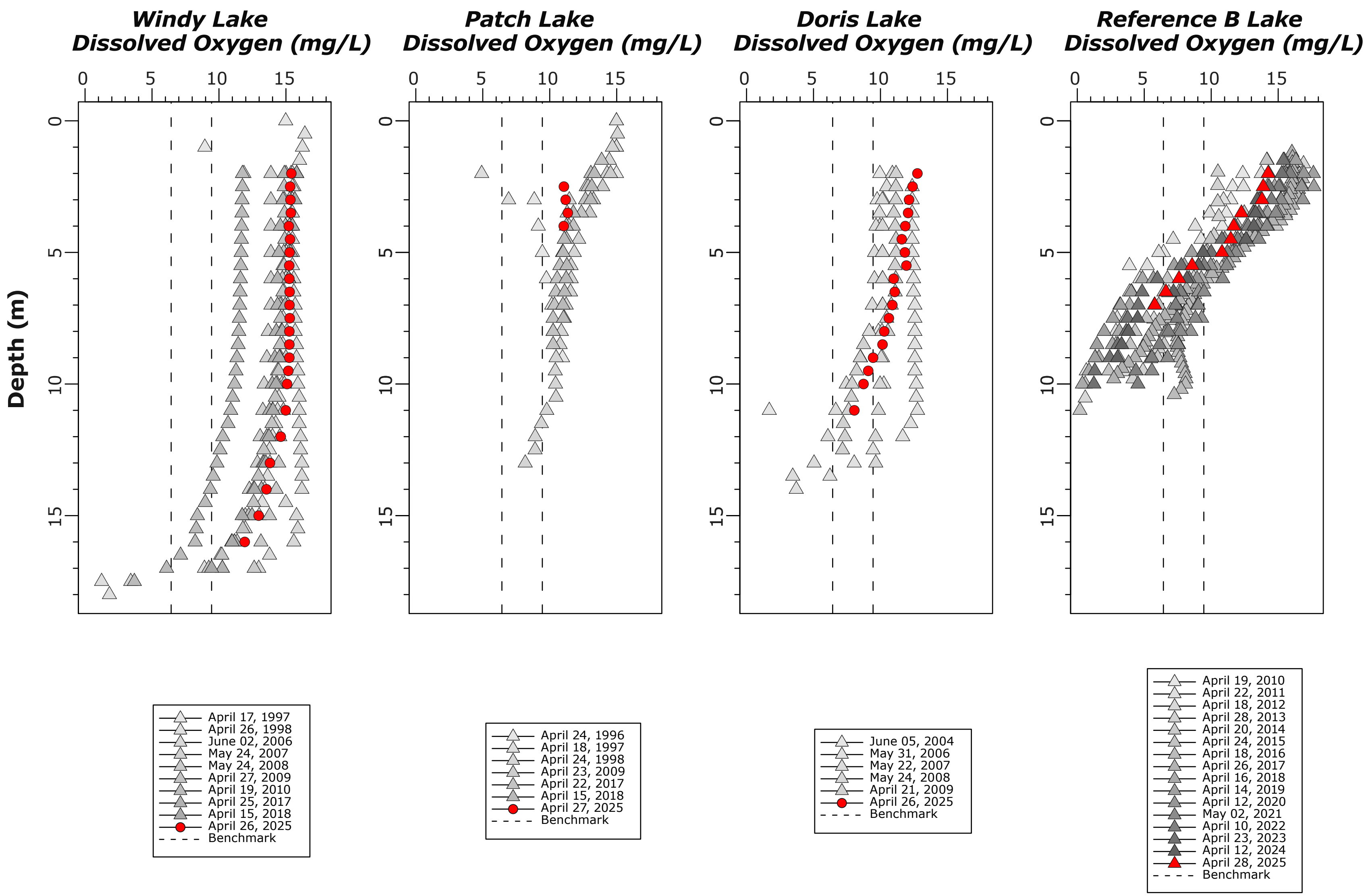


Notes: The benchmarks are 9.5 mg/L and 6.5 mg/L.
Triangle symbols represent baseline years (designated baseline years differ for each lake).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:1

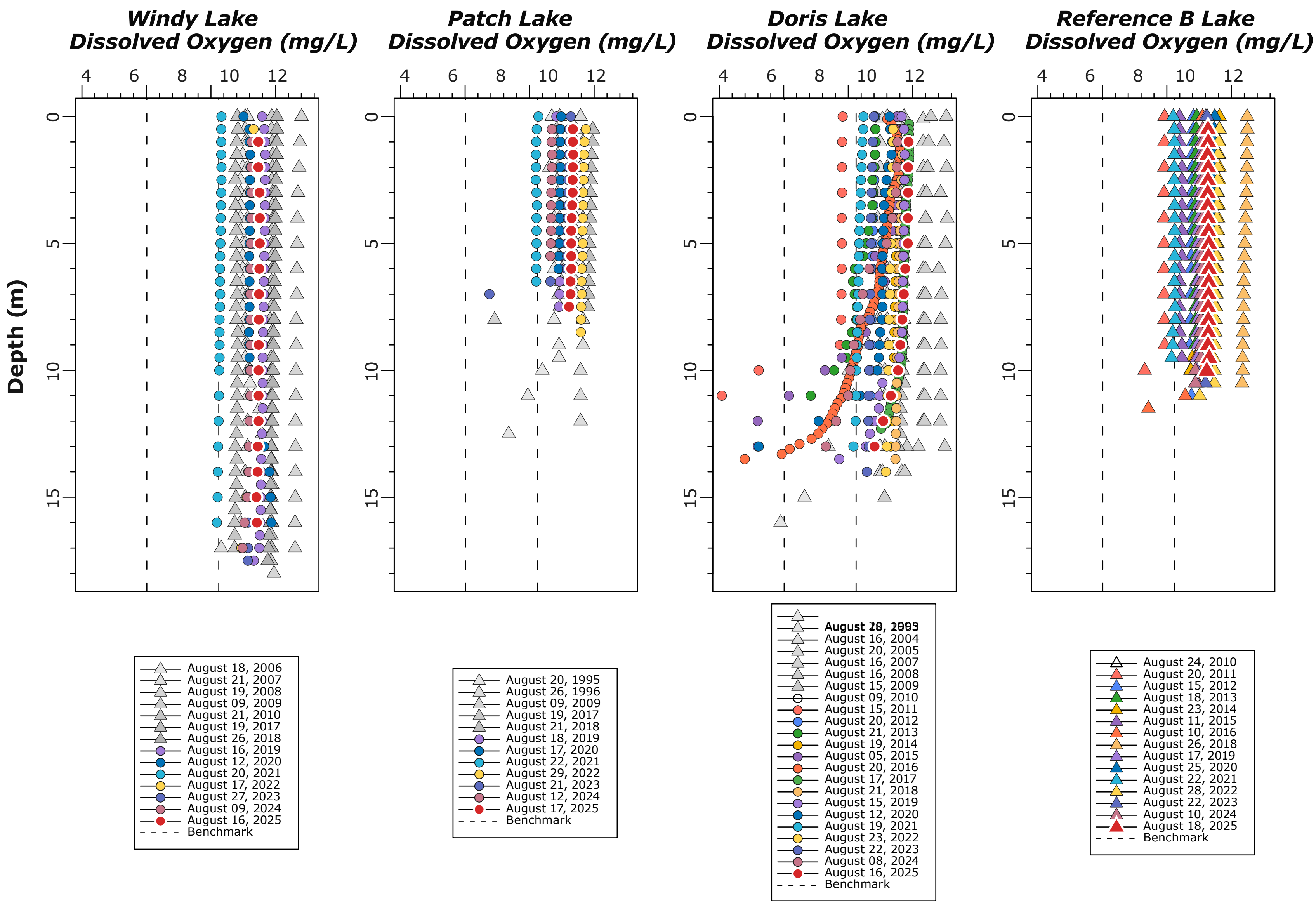
FIGURE 3.2-1B UNDER-ICE DISSOLVED OXYGEN PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, BASELINE AND 2025



Notes: The benchmarks are 9.5 mg/L and 6.5 mg/L.
Triangle symbols represent baseline years (designated baseline years differ for each lake).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:2

FIGURE 3.2-2A OPEN-WATER DISSOLVED OXYGEN PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

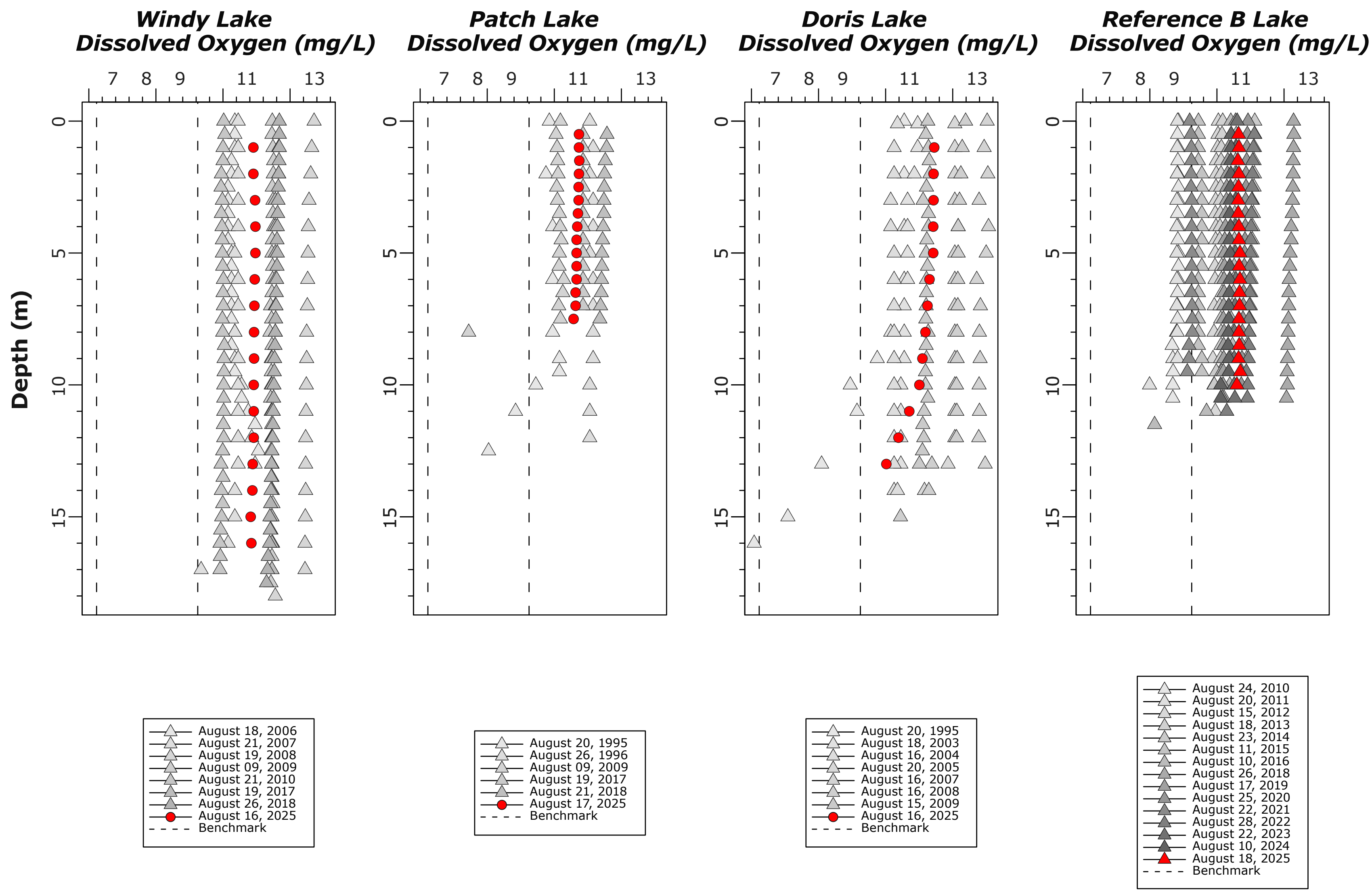


Notes: The benchmarks are 9.5 mg/L and 6.5 mg/L.
Triangle symbols represent baseline years (designated baseline years differ for each lake).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:3

FIGURE 3.2-2B OPEN-WATER DISSOLVED OXYGEN PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, BASELINE AND 2025



Notes: The benchmarks are 9.5 mg/L and 6.5 mg/L.
Triangle symbols represent baseline years (designated baseline years differ for each lake).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:4

In 2025, DO concentrations were greater than the 9.5 mg/L benchmark throughout the entire water column in Windy and Patch lakes during the under-ice season and in all exposure lakes during the open-water season (Figures 3.2-1a and 3.2-2a, respectively). Concentrations were below the 9.5 mg/L benchmark during the under-ice season in Doris Lake at 9.5 m depth to the bottom (Table A.3-2 in Appendix A). None of the exposure lakes had DO concentrations below the 6.5 mg/L benchmark in any season in 2025, whereas Reference Lake B decreased below the 6.5 mg/L benchmark at 7 m depth (DO = 5.86 mg/L). Concentrations below the 6.5 mg/L benchmark at depths greater than 10 m were observed during the baseline years in:

- Doris Lake (under-ice in 2004, 2006, 2007, and 2009, and open-water in 1995);
- Windy Lake (under-ice in 1998, 2006, and 2009); and
- Patch Lake (open-water in 1995 and 2009; Figures 3.2-2 and 3.2-4).

Under-ice DO concentrations in the reference lake have been below the benchmarks nearly every year and were observed most frequently at depths greater than 5 m (Figures 3.2-1a and 3.2-1b). In 2025, under-ice DO concentrations in the reference lake were below the 6.5 mg/L benchmark at 7 m depth (Figures 3.2-1a and 3.2-1b; Table A.3-2 in Appendix A).

No potentially adverse effects were detected for DO concentrations in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for DO concentrations were not exceeded in 2025.

3.2.2 WATER TEMPERATURE

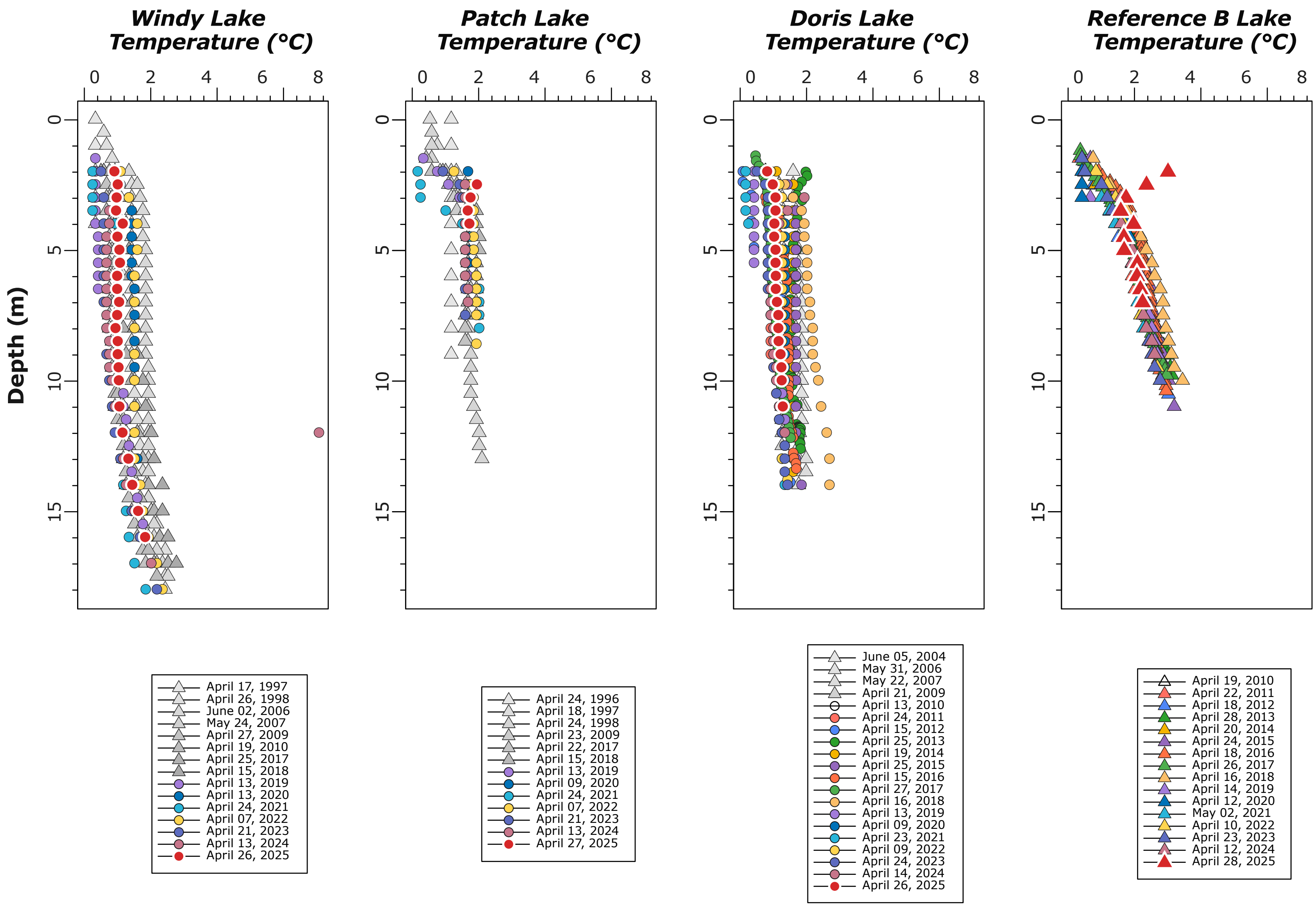
Under-ice temperatures in Doris Lake in 2025 were colder than baseline years by 0.4 to 1 °C throughout the upper 8.5 m of the water column (Figures 3.2-3a and 3.2-3b). Under-ice temperatures in Windy Lake in 2025 were within the range of baseline and historical temperatures (Figures 3.2-3a and 3.2-3b). In Patch Lake, under-ice temperature at 2.5 m (e.g., immediately under the ice) was approximately 1 °C warmer in 2025 compared to 2009, 2017, and 2018 baseline temperatures. However, temperatures throughout the water column in Patch Lake were similar to those observed during baseline years.

Graphical observations indicated that the under-ice temperatures in the exposure lakes followed similar profiles compared to their respective within-lake historical data (Figure 3.2-3a). In 2025, under-ice temperatures in the reference lake at 2 m were greater than 2 °C warmer compared to historical years (Figures 3.2-3a and 3.2-3b). However, temperatures at depths greater than 2 m were within the historical range.

In 2025, open-water temperatures in exposure lakes were within the range of baseline and historical temperatures (Figures 3.2-4a and 3.2-4b).

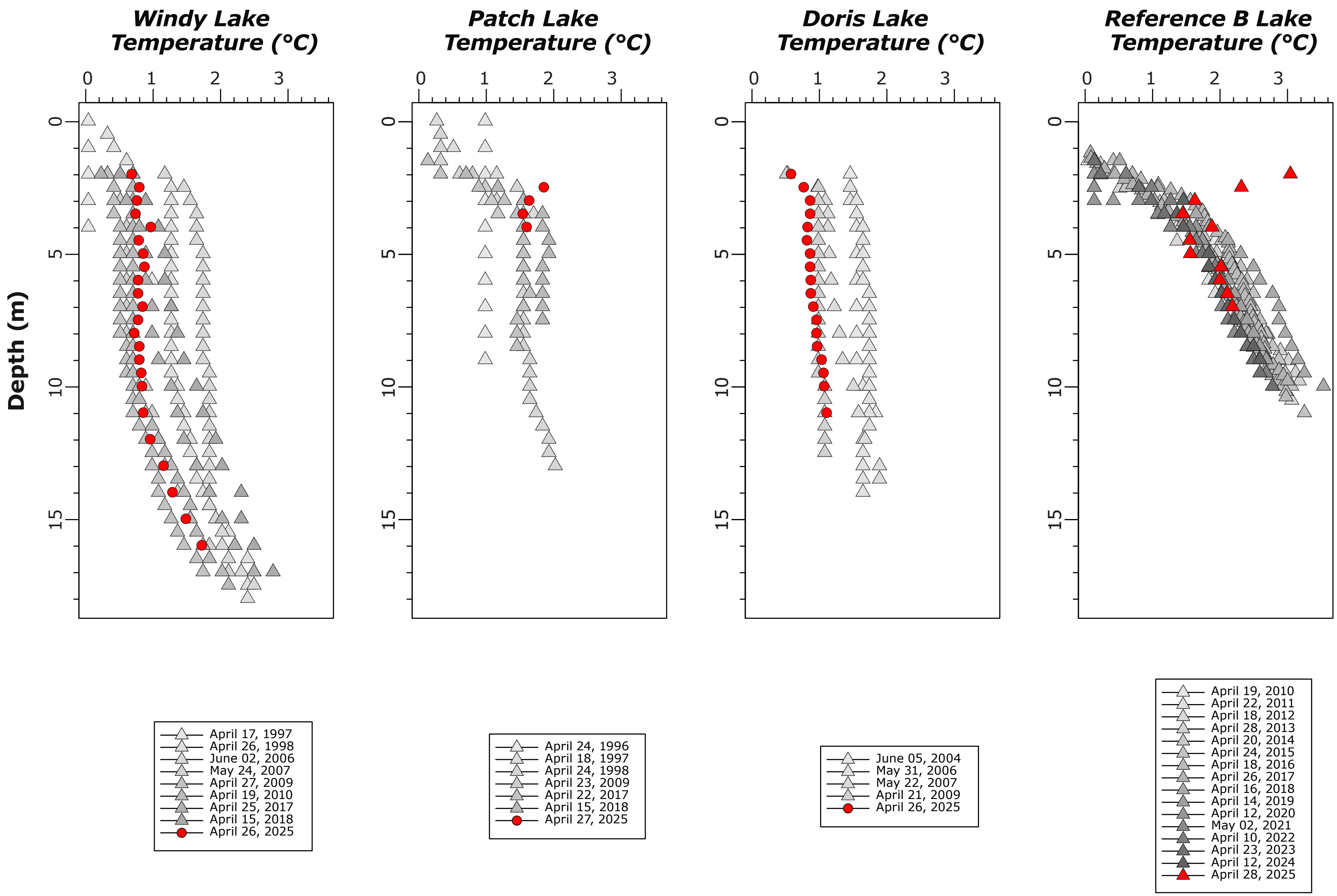
No potentially adverse effects were detected for water temperature in Doris, Windy, or Patch lakes in 2025. The conditions required to consider a low action level for water temperature were not exceeded in 2025.

FIGURE 3.2-3A UNDER-ICE TEMPERATURE PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



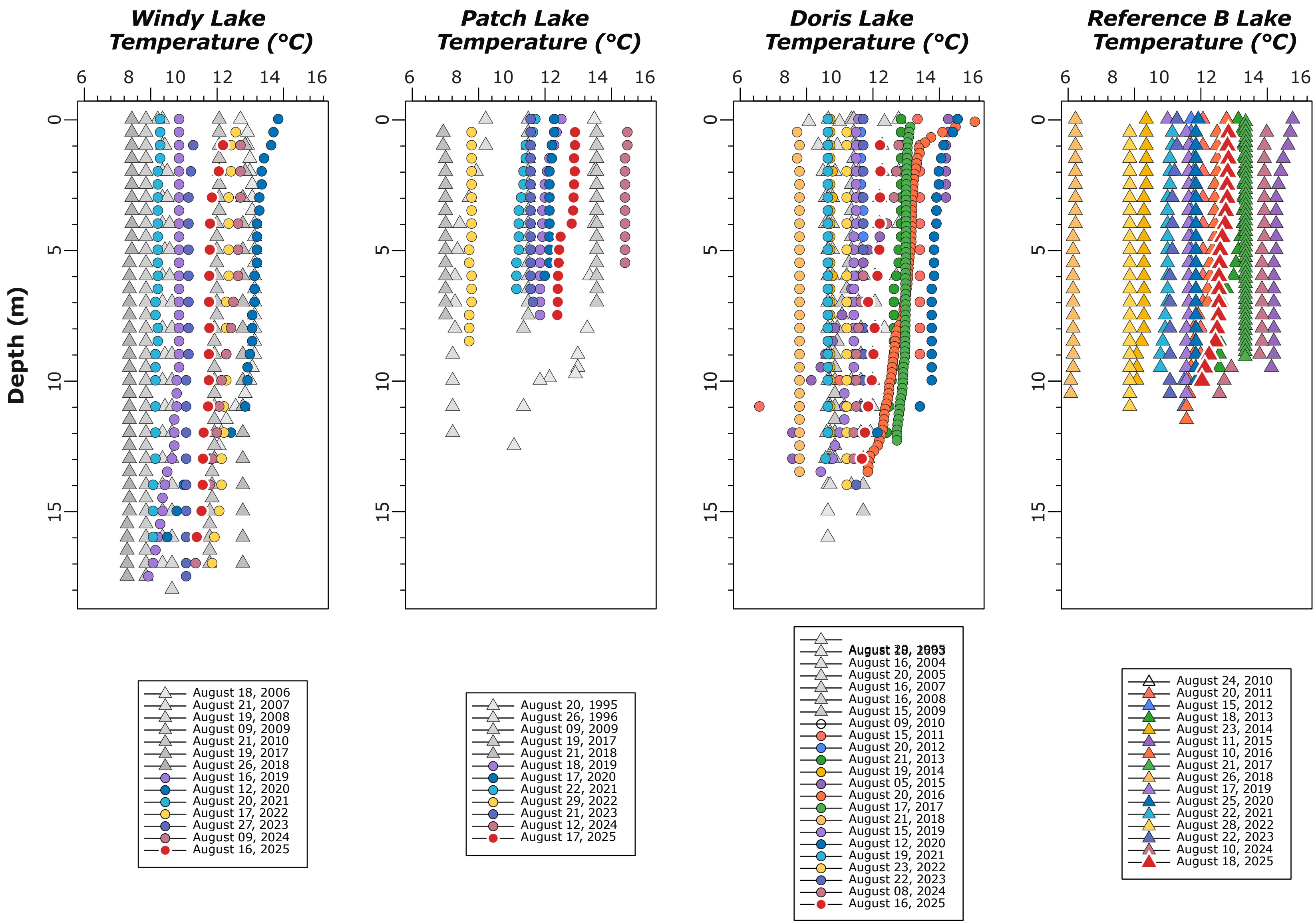
Notes: Triangle symbols represent baseline years (designated baseline years differ for each lake).

FIGURE 3.2-3B UNDER-ICE TEMPERATURE PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, BASELINE AND 2025



Notes: Triangle symbols represent baseline years (designated baseline years differ for each lake).

FIGURE 3.2-4A OPEN-WATER TEMPERATURE PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025

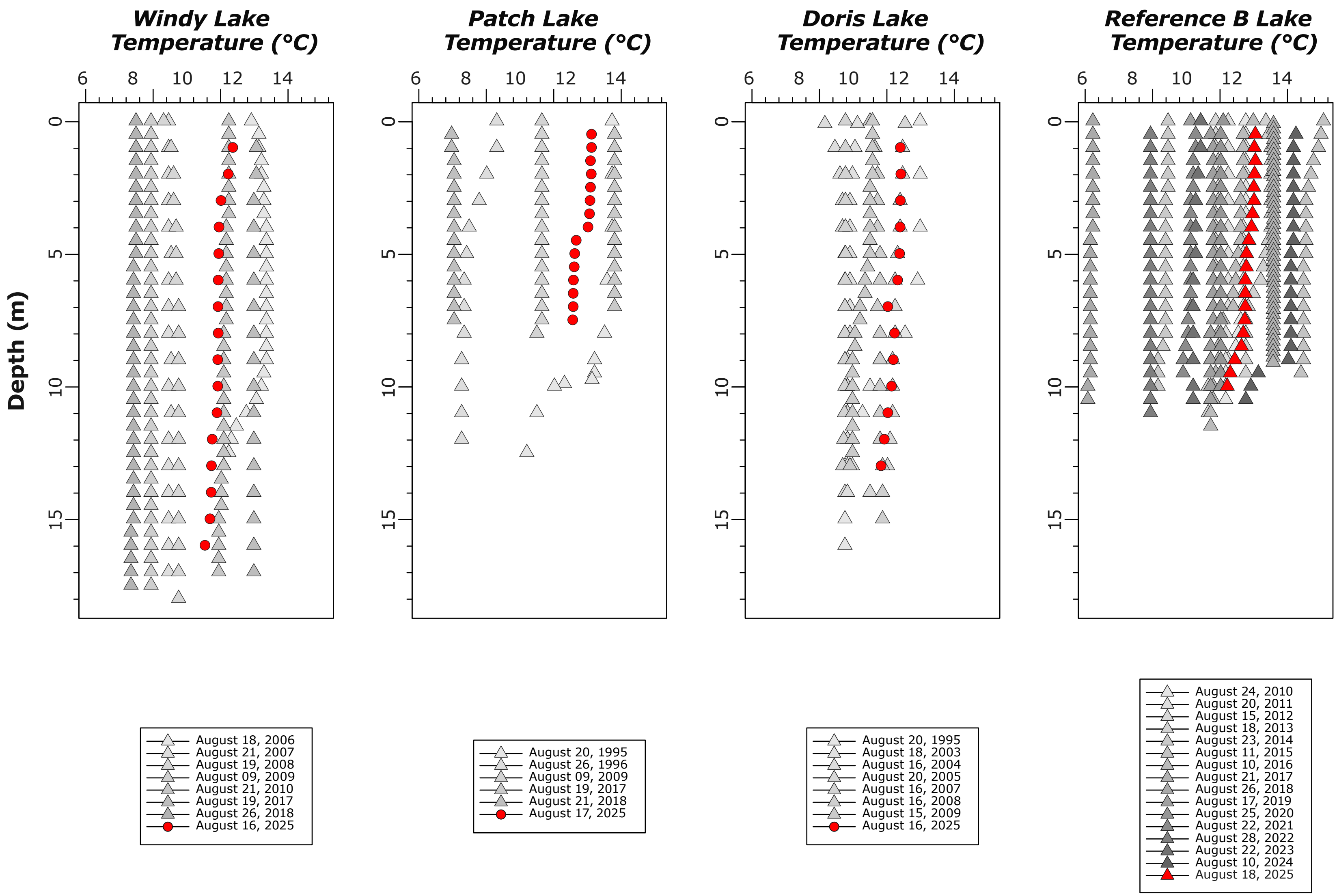


Notes: Triangle symbols represent baseline years (designated baseline years differ for each lake).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:7

FIGURE 3.2-4B OPEN-WATER TEMPERATURE PROFILES FOR LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, BASELINE AND 2025



Notes: Triangle symbols represent baseline years (designated baseline years differ for each lake).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:8

3.3 WATER QUALITY

3.3.1 PH

Statistical analyses indicated a significant change over time for pH in Doris Lake during the under-ice season, but no significant change was detected relative to the reference lake (Table 3.3-1). Statistical analyses indicated a significant change over time for pH in Doris Lake during the open-water season and relative to the reference lake. Graphical analyses indicated pH concentrations in 2025 in Doris Lake were within the baseline range during both seasons (Figures 3.3-1a and 3.3-1b).

Statistical analyses indicated no significant difference between the before and after period means for pH in Patch or Windy lakes during either season (Table 3.3-1). Graphical analyses indicated pH concentrations in Patch and Windy lakes were within the baseline range during both seasons (Figures 3.3-1a and 3.3-1b). All under-ice and open-water pH observations for monitored lakes were within the benchmark range in 2025.

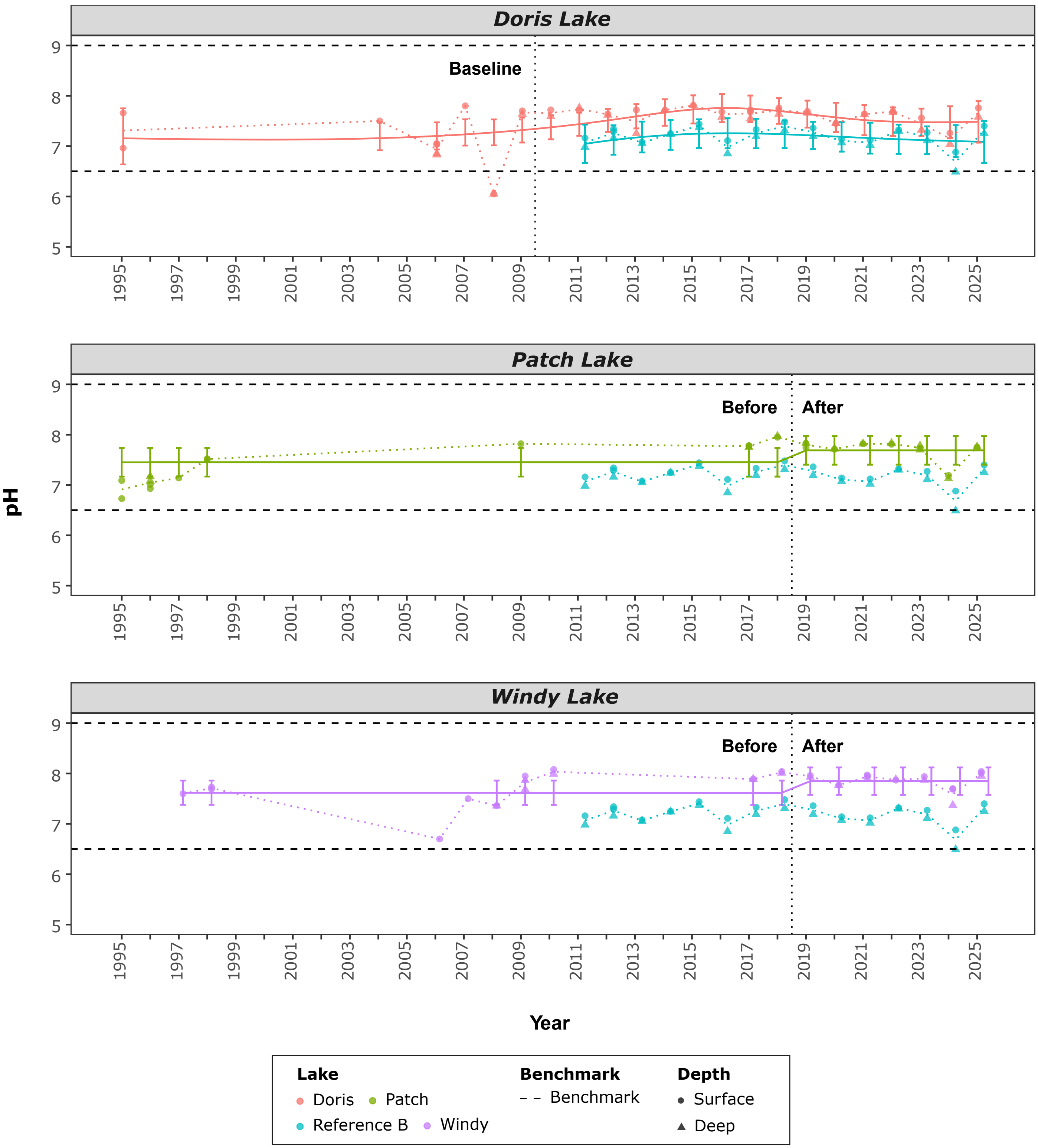
Although the statistical analyses indicated a significant change in Doris Lake during the open-water season, concentrations were within the baseline range and did not exceed the benchmark. Therefore, no effects were detected for pH in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for pH were not exceeded in 2025.

TABLE 3.3-1 STATISTICAL RESULTS FOR PH IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	Yes (0.002)	No (0.615)	NA	NA
	Open-water	Yes (< 0.001)	Yes (0.039)	NA	NA
Patch	Under-ice	NA	NA	No (0.224)	-
	Open-water	NA	NA	No (0.124)	-
Windy	Under-ice	NA	NA	No (0.196)	-
	Open-water	NA	NA	No (0.081)	-

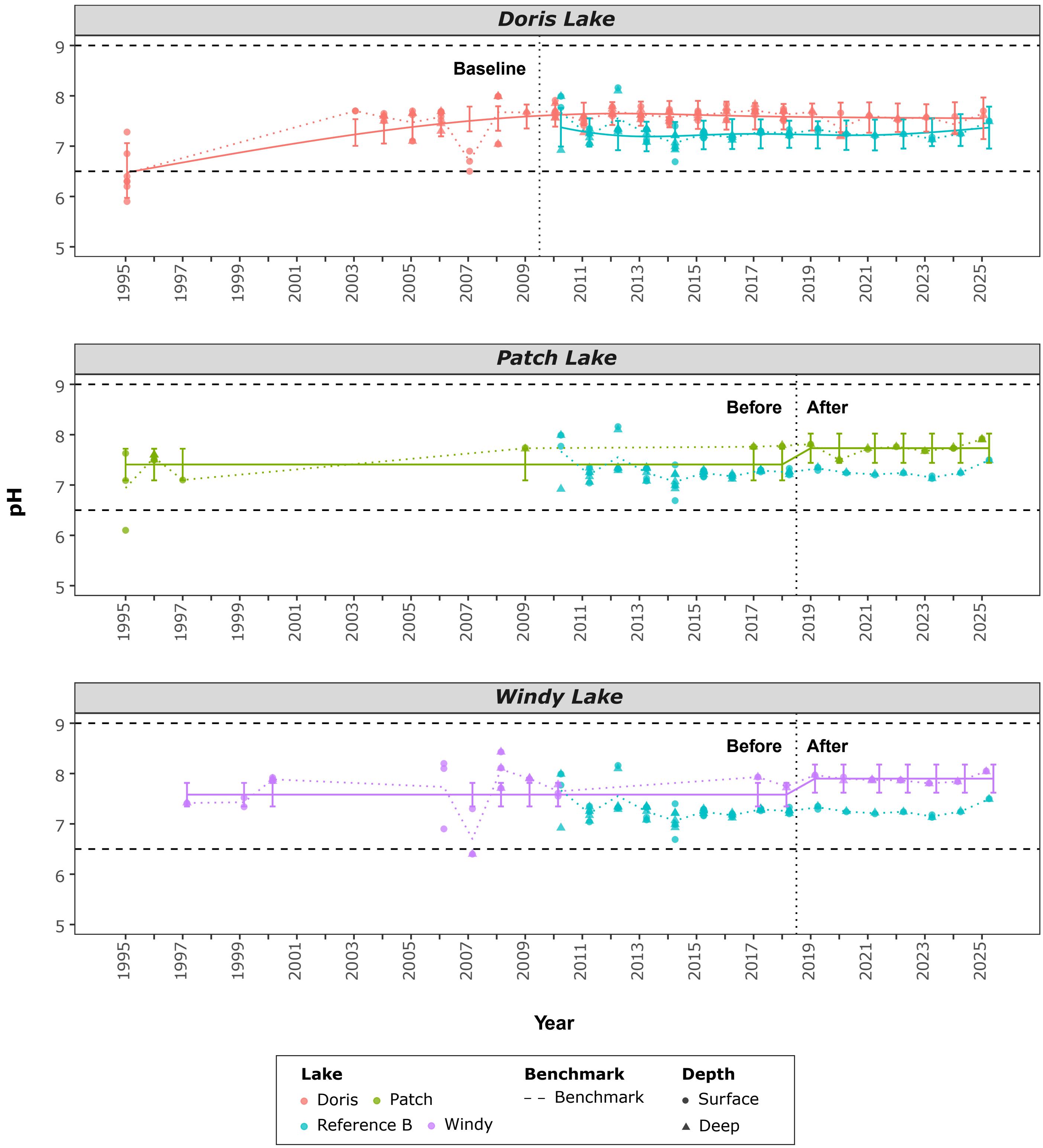
Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-1A UNDER-ICE PH IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 6.5 to 9.0

FIGURE 3.3-1B OPEN-WATER PH IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 6.5 to 9.0

3.3.2 TOTAL SUSPENDED SOLIDS

Statistical analyses indicated no significant change over time for TSS concentrations in Doris Lake during the open-water season (Table 3.3-2). Statistical comparison to the reference lake was not completed as more than 50 percent of observations from the monitoring period, including 100 percent of the 2025 observations, were less than the DL (less than [<] 1 to < 5 mg/L; Section C.3.1.2 in Appendix C). Graphical analyses indicated that TSS concentrations in Doris Lake were within the baseline concentrations (Figures 3.3-2a and 3.3-2b). Mean open-water TSS concentrations in 2025 (5.3 mg/L) were within the observed baseline range (< 1 to 4 mg/L) for Doris Lake.

Statistical analyses for Patch Lake and Windy Lake were not completed because more than 50 percent of observations from the monitoring period and 100 percent of the 2025 observations were less than the DL (Table 3.3-2; Section C.3.1.2 in Appendix C). Graphical analyses indicated that TSS concentrations in Patch and Windy lakes in 2025 were within the baseline concentrations, as most concentrations have been at or below the DL since sampling began (Figures 3.3-2a and 3.3-2b).

In 2025, under-ice and open-water TSS for all three exposure lakes were less than the benchmark (Tables 2.2-2 and 2.2-3; Figures 3.3-2a and 3.3-2b).

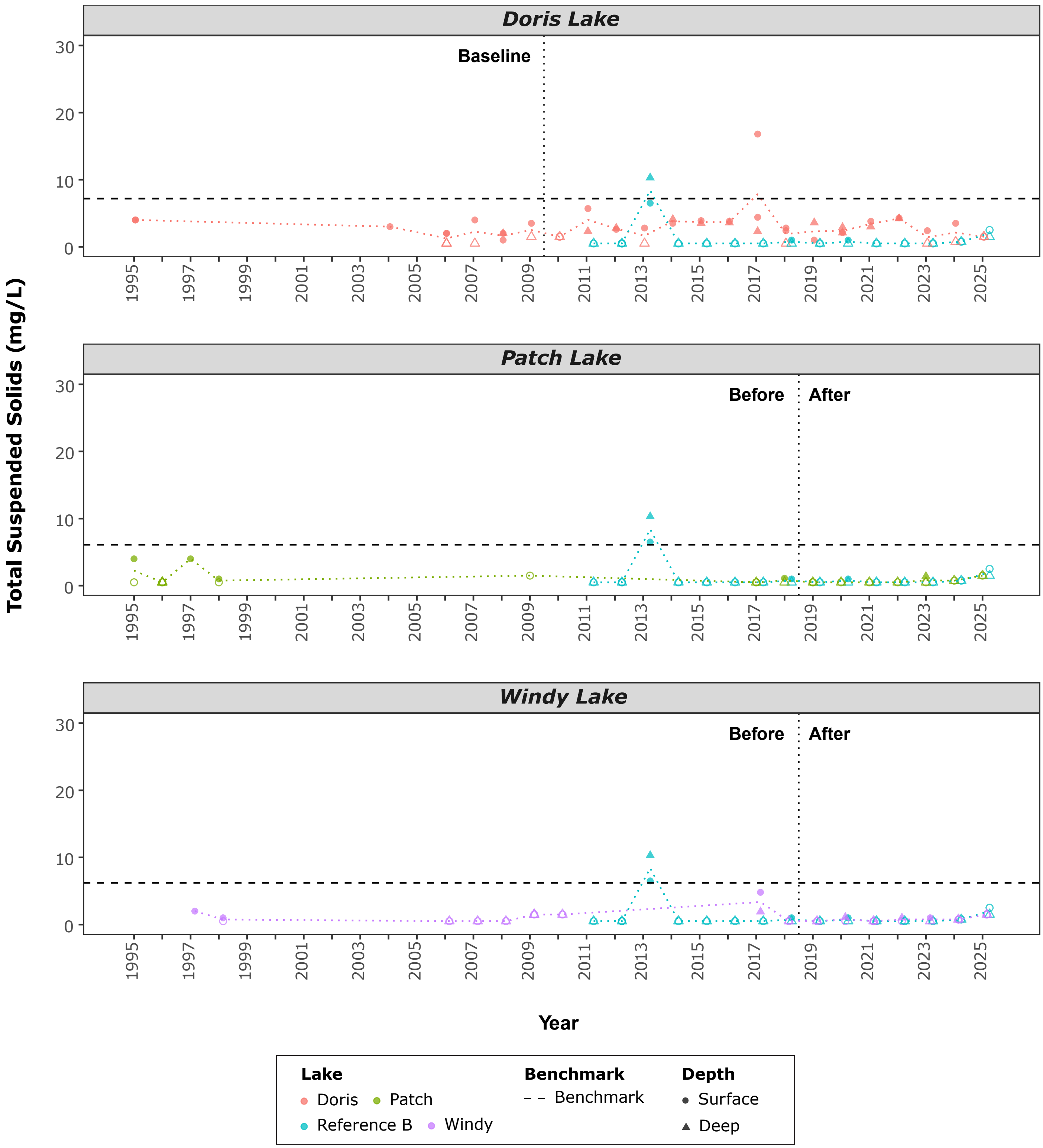
No effects were detected for TSS concentrations in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for TSS were not exceeded.

TABLE 3.3-2 STATISTICAL RESULTS FOR TOTAL SUSPENDED SOLIDS IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	-	-	NA	NA
	Open-water	No (0.073)	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

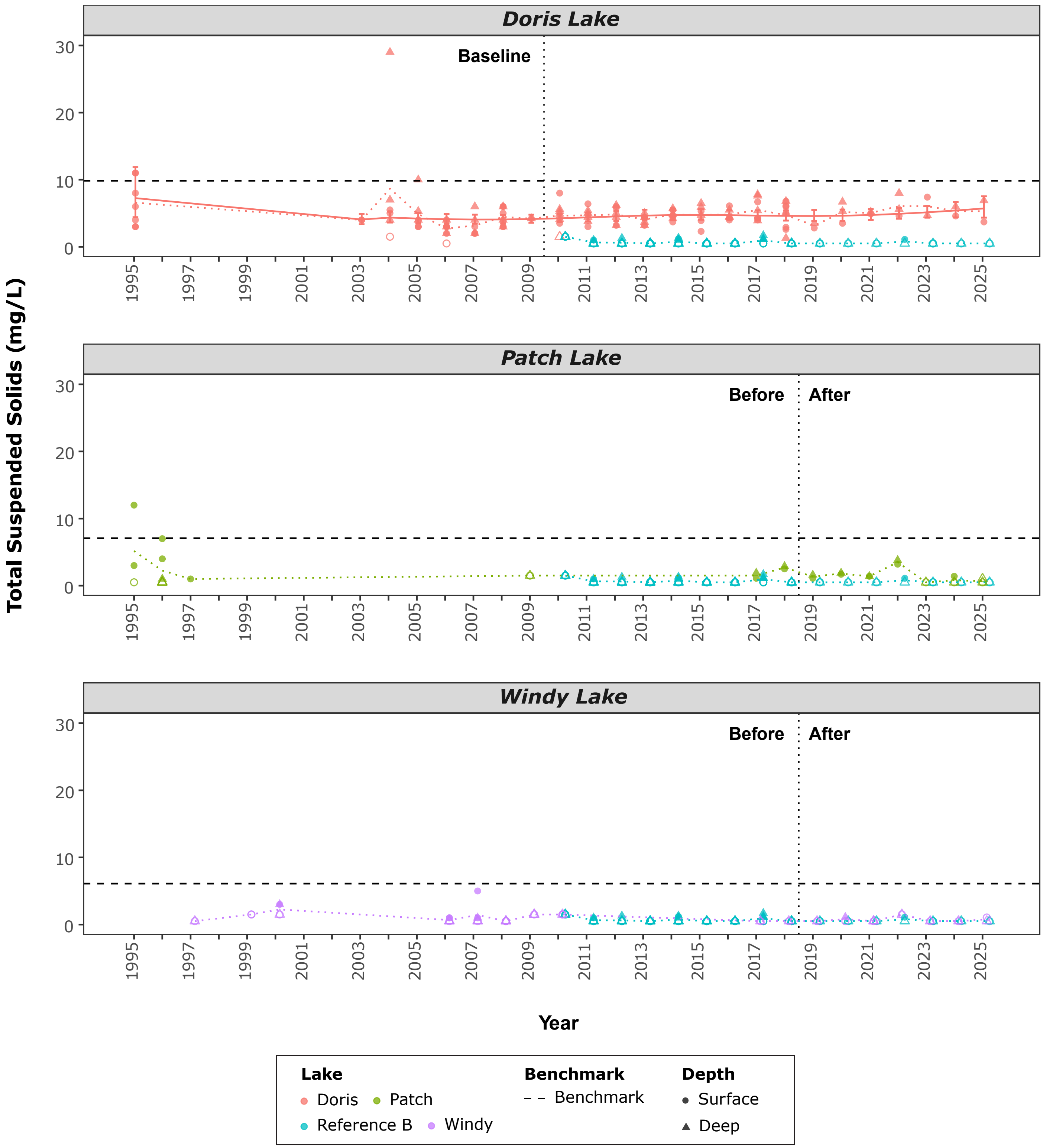
FIGURE 3.3-2A UNDER-ICE TOTAL SUSPENDED SOLIDS IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is lake-specific (see Table 2.2-2).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:11

FIGURE 3.3-2B OPEN-WATER TOTAL SUSPENDED SOLIDS IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is lake-specific (see Table 2.2-2).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:12

3.3.3 TURBIDITY

Statistical analyses indicated no significant change over time for turbidity in Doris Lake (Table 3.3-3). In 2025, the under-ice surface sample (5.77 nephelometric turbidity units [NTU]) and the open-water deep sample (10.5 NTU) were above their respective benchmarks (Figures 3.3-3a and 3.3-3b). The benchmark for turbidity is based on an increase of 2 NTU from the mean turbidity observed during baseline years for each season (Tables 2.2-2 and 2.2-3). However, there are also limited background data to establish benchmark concentrations. The open-water season in Doris Lake has only two years of baseline data (2003 and 2009; mean 3.7 NTU) and the under-ice season has only one year of baseline data (2009; mean of 2.9 NTU). Graphical analyses of the fitted means slope suggested a potential increasing trend in turbidity in the open-water season at Doris Lake since 2021 (Figure 3.3-3b). However, the trend analysis indicated there was no significant change over time. (Table 3.3-3). In addition, the lack of corresponding increases in TSS (Section 3.3.2) confirms that water quality conditions remained stable in 2025.

In 2024, there was no significant change between the before and after period means in Patch or Windy lakes (Table 3.3-3). In 2025, the under-ice deep (4.02 NTU) and surface samples (3.50 NTU) in Patch Lake were above the under-ice benchmark (Figure 3.3-3a). All turbidity concentrations in Windy Lake were below the respective benchmarks (Figures 3.3-3a and 3.3-3b). Graphical analyses indicated an increase in Patch Lake under-ice mean turbidity concentrations in 2025 (3.76 NTU) and elevated values since 2023 compared to historical measurements (Figure 3.3-3a).

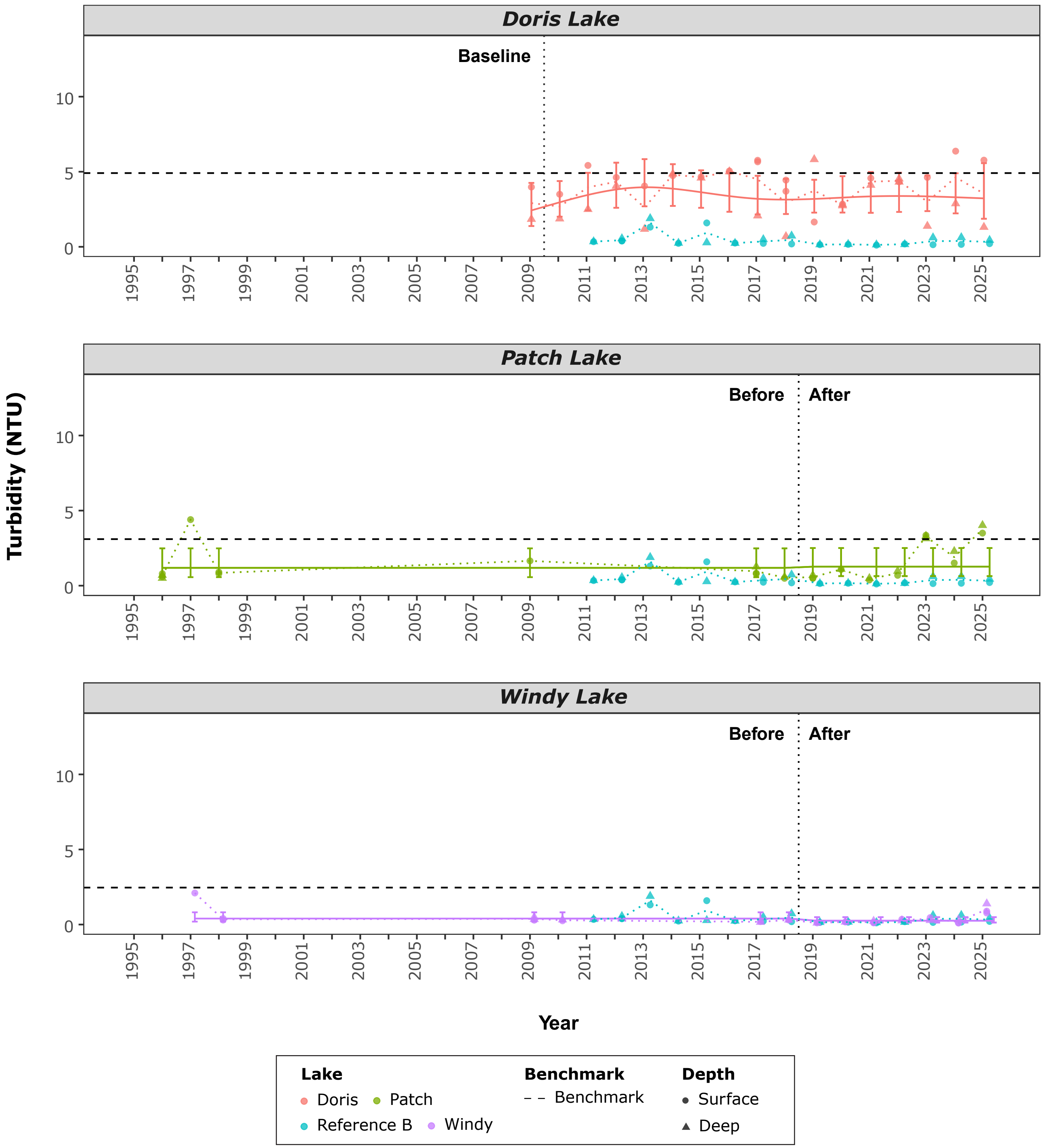
No effects were detected for turbidity in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for turbidity were not exceeded in 2025.

TABLE 3.3-3 STATISTICAL RESULTS FOR TURBIDITY IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	No (0.682)	-	NA	NA
	Open-water	No (0.199)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.892)	-
	Open-water	NA	NA	No (0.527)	-
Windy	Under-ice	NA	NA	No (0.336)	-
	Open-water	NA	NA	No (0.116)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-3A   UNDER-ICE TURBIDITY IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

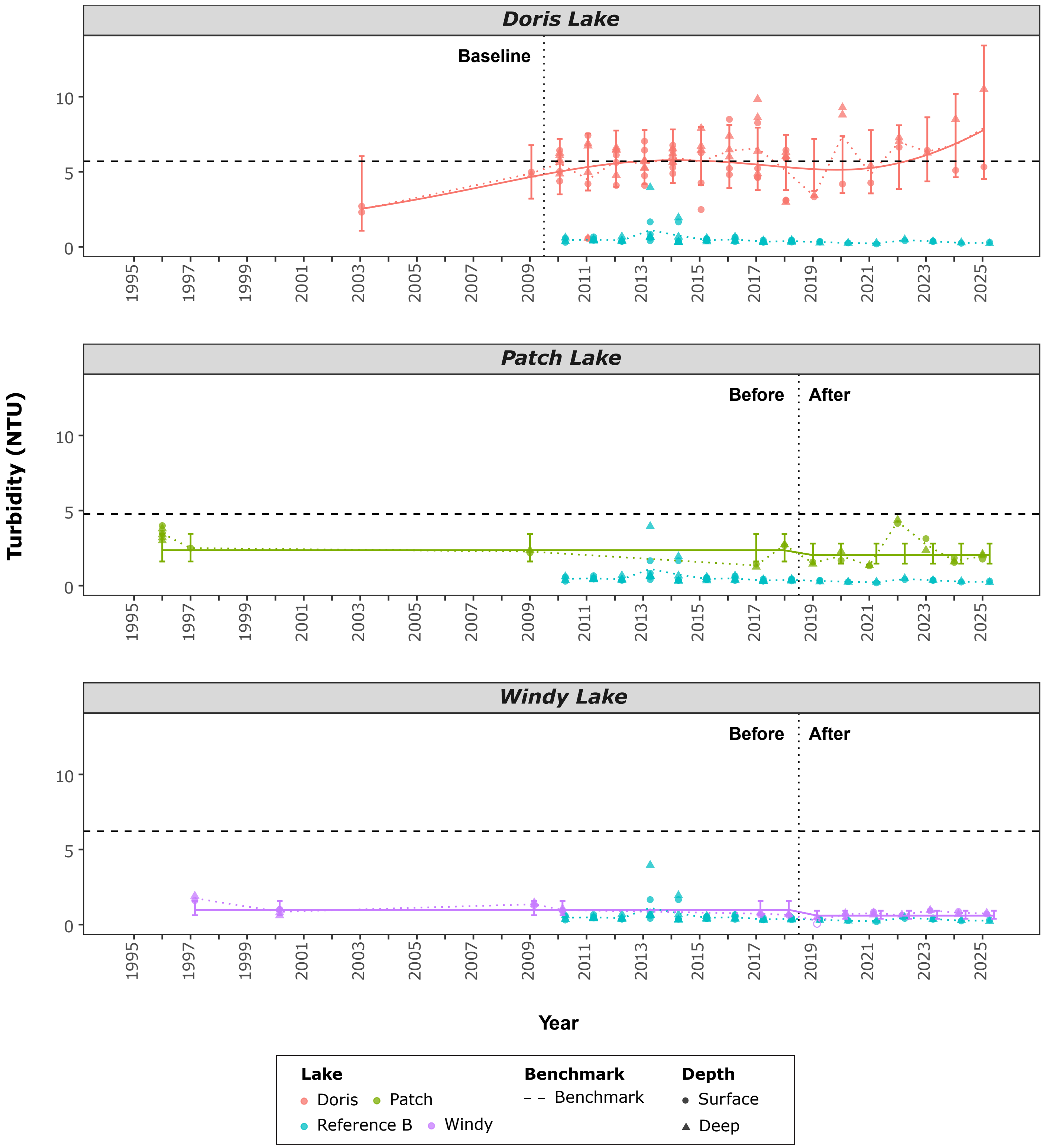


Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is lake-specific (see Table 2.2-2).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:13

FIGURE 3.3-3B OPEN-WATER TURBIDITY IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is lake-specific (see Table 2.2-2).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:14

3.3.4 CHLORIDE

Statistical analyses indicated a significant change over time for chloride concentrations in Doris Lake during both seasons, and relative to the reference lake (Table 3.3-4). Graphical analyses indicated that chloride concentrations in Doris Lake decreased from 2015 to 2019, and that concentrations have been stable (within 10 percent of each annual measurement) since 2020 (Figures 3.3-4a and 3.3-4b). Chloride concentrations in 2025 were near-identical to concentrations observed since 2020. It is noted that a decrease in chloride concentrations is not considered to be an adverse effect (TMAC 2018).

Statistical analyses indicated no significant difference between the before and after period means for chloride concentrations in Patch or Windy lakes during either season (Table 3.3-4).

Under-ice and open-water chloride concentrations for all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-4a and 3.3-4b).

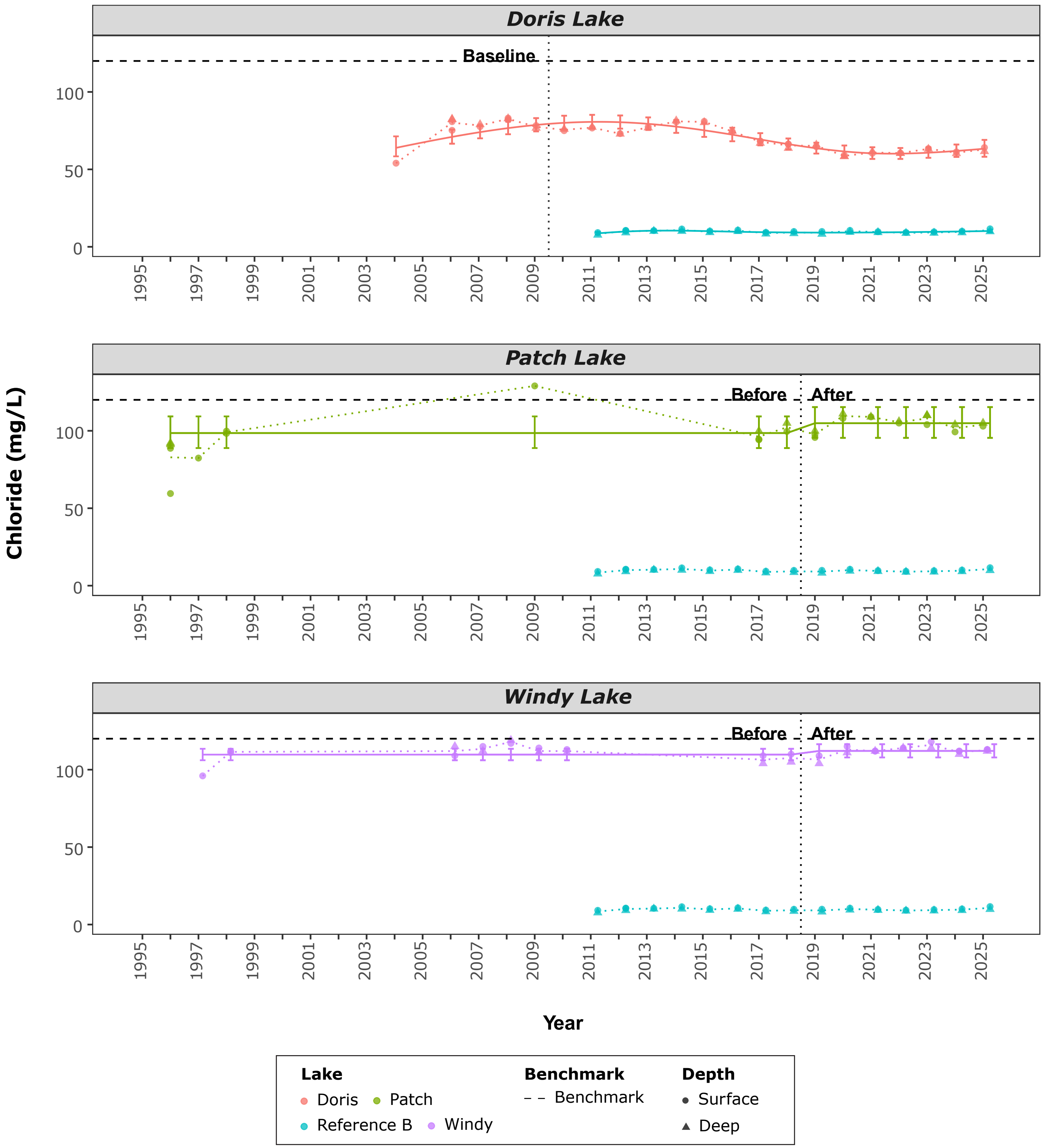
No potentially adverse effects were detected for chloride in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for chloride were not exceeded in 2025.

TABLE 3.3-4 STATISTICAL RESULTS FOR CHLORIDE IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	Yes (< 0.001)	Yes (< 0.001)	NA	NA
	Open-water	Yes (< 0.001)	Yes (< 0.001)	NA	NA
Patch	Under-ice	NA	NA	No (0.350)	-
	Open-water	NA	NA	No (0.658)	-
Windy	Under-ice	NA	NA	No (0.382)	-
	Open-water	NA	NA	No (0.457)	-

Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates statistical analysis was not relevant to the dataset.

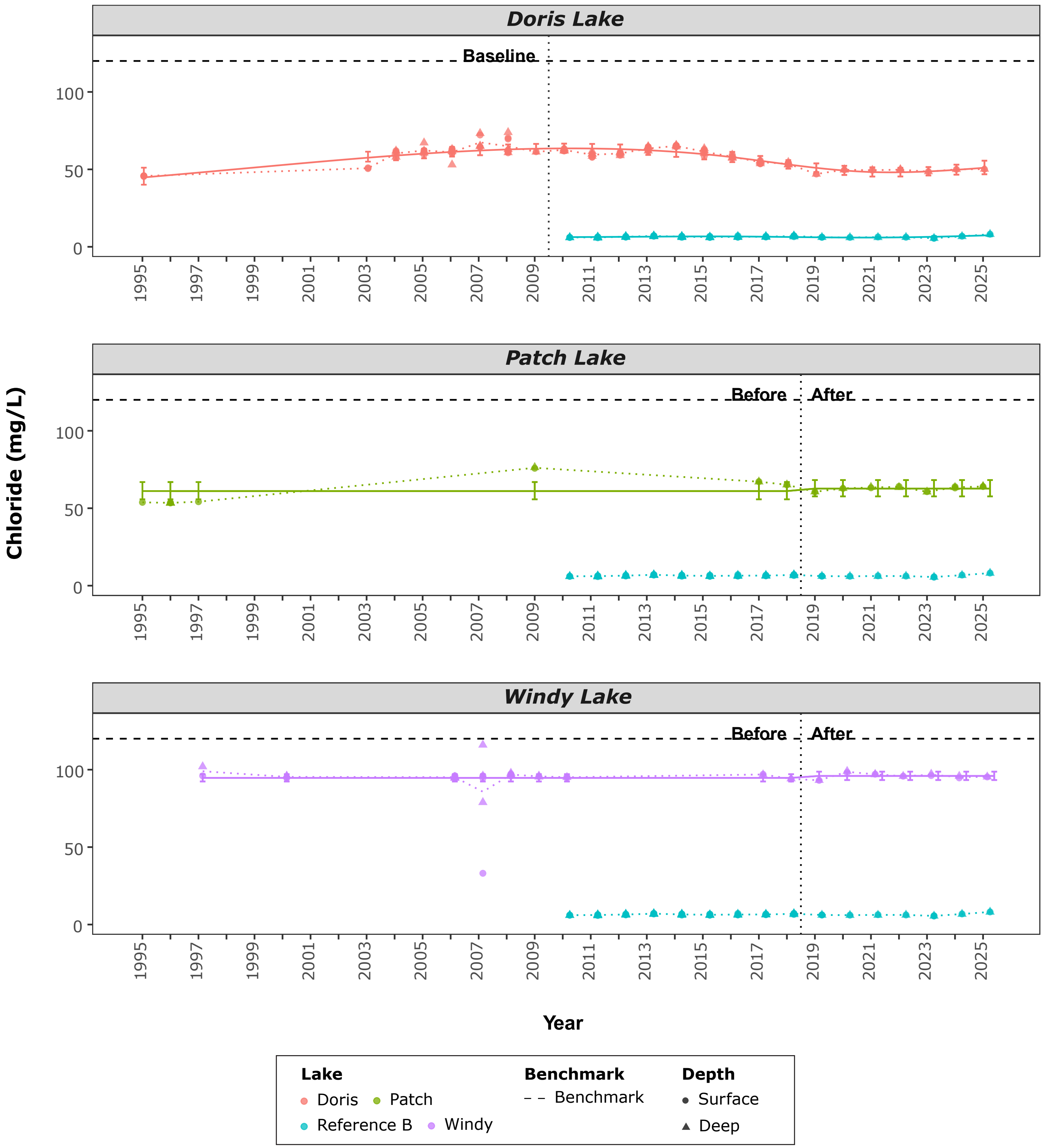
FIGURE 3.3-4A UNDER-ICE CHLORIDE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 120 mg/L

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:15

FIGURE 3.3-4B OPEN-WATER CHLORIDE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 120 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:16

3.3.5 FLUORIDE

Statistical analyses indicated no significant change over time for fluoride concentrations in Doris Lake, or between the before and after period means in Patch and Windy lakes (Table 3.3-5). Graphical analyses indicated no changes in fluoride outside of historical ranges over the monitoring period in both seasons (Figures 3.3-5a and 3.3-5b). Fluoride concentrations in all three exposure lakes were less than the benchmark in 2025.

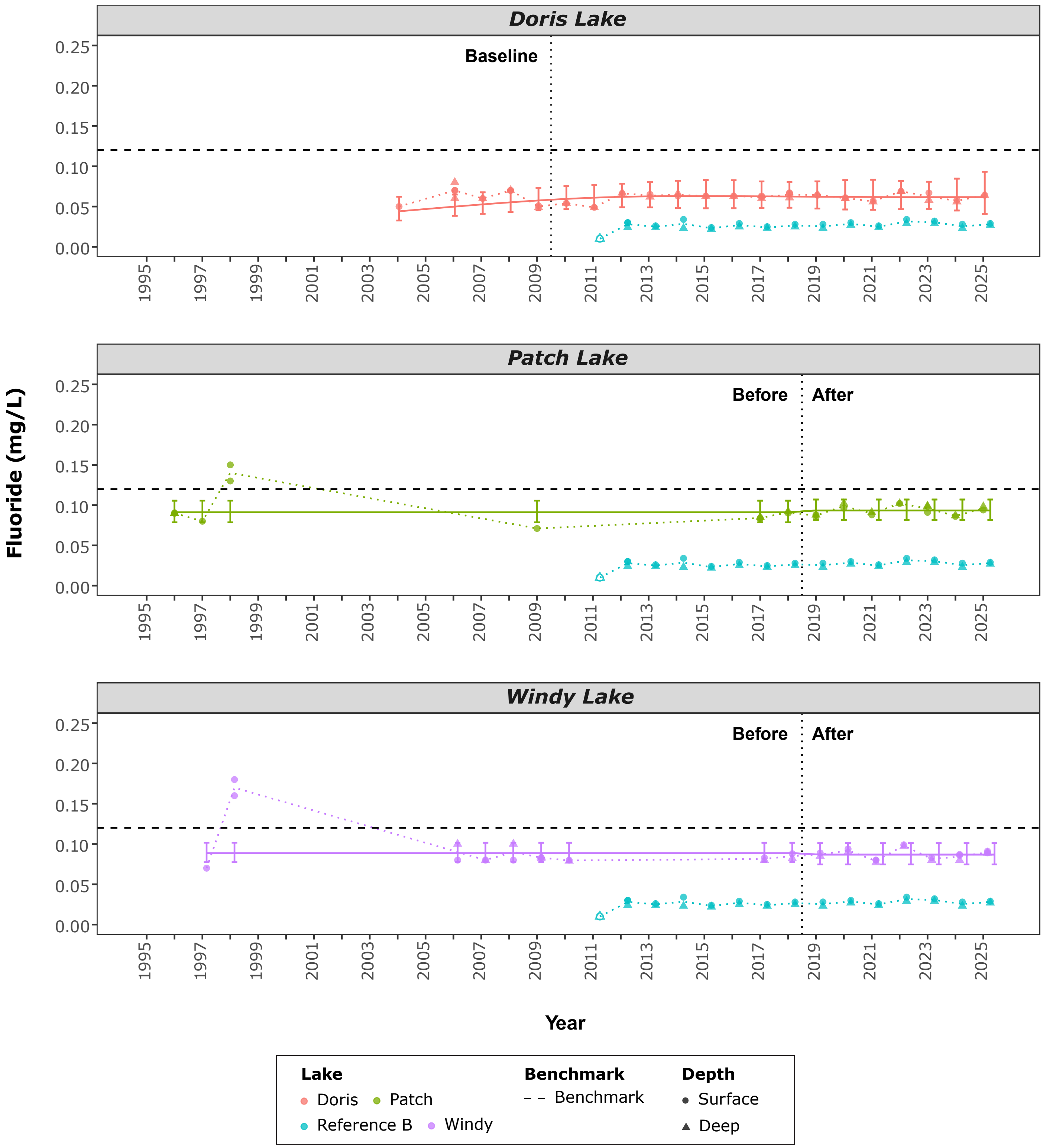
No effects were detected for fluoride in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for fluoride were not exceeded in 2025.

TABLE 3.3-5 STATISTICAL RESULTS FOR FLUORIDE IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	No (0.125)	-	NA	NA
	Open-water	No (0.843)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.791)	-
	Open-water	NA	NA	No (0.563)	-
Windy	Under-ice	NA	NA	No (0.833)	-
	Open-water	NA	NA	No (0.248)	-

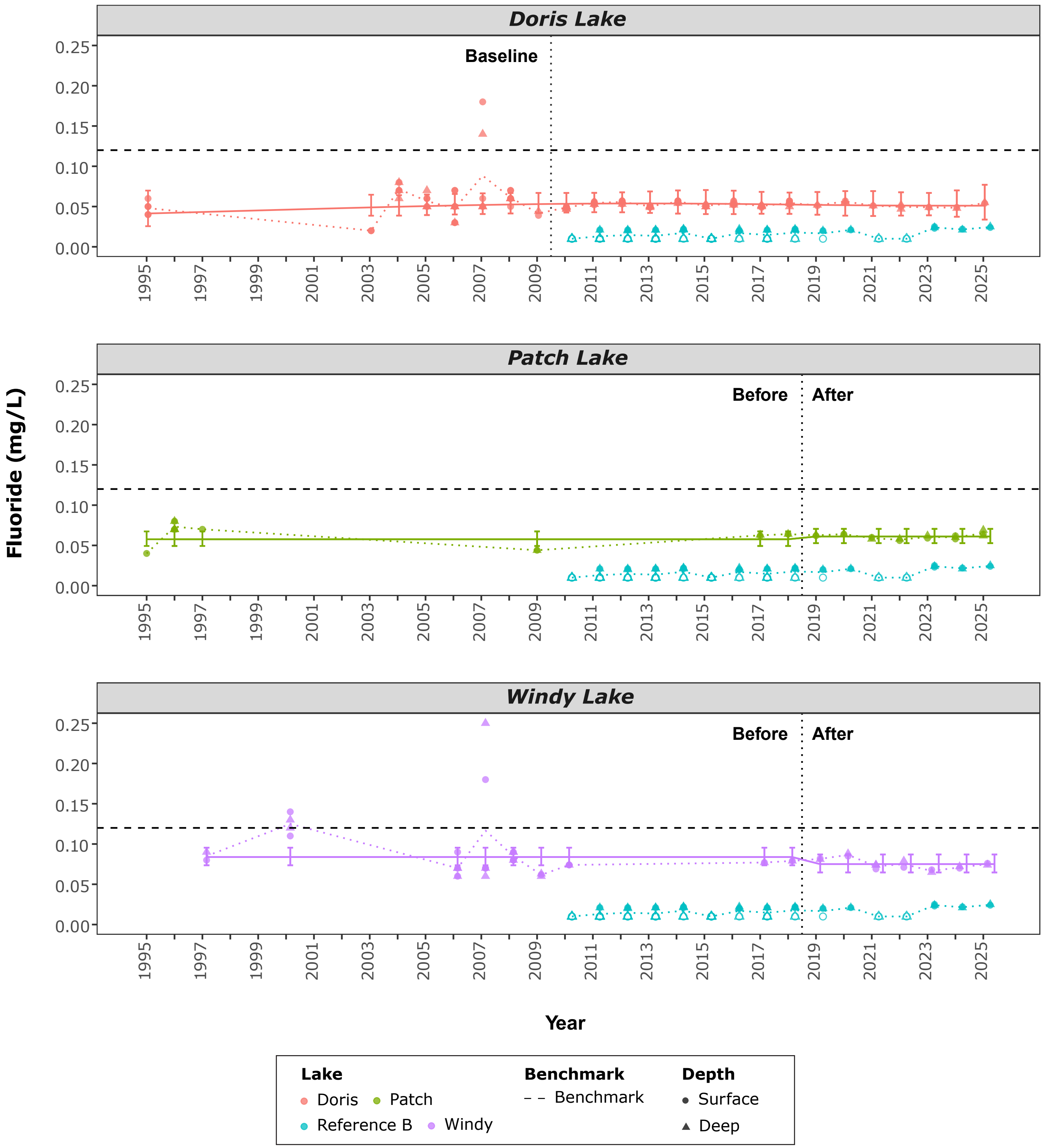
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-5A UNDER-ICE FLUORIDE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.12 mg/L

FIGURE 3.3-5B OPEN-WATER FLUORIDE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.12 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:18

3.3.6 TOTAL AMMONIA

Statistical analyses indicated no significant changes over time for under-ice total ammonia concentrations in Doris Lake or between the before and after period means in Patch or Windy lakes (Table 3.3-6). Statistical analyses were not completed for the open-water season in Doris and Patch lakes due to the high proportion of data, including greater than 50 percent of the 2025 observations, which were less than the DL (< 0.0050 mg/L; Section C.3.1.6 in Appendix C).

The total ammonia benchmark is both pH- and temperature-dependent (Table 2.2-4). The minimum benchmark based on the observed temperature and pH in 2025 was 6 mg/L during the under-ice season and 0.59 mg/L during the open-water season (Table 2.2-4). Graphical analyses indicated that ammonia concentrations in all three exposure lakes were less than their respective benchmarks in 2025 (Figures 3.3-6a and 3.3-6b; Table A.3-5 in Appendix A).

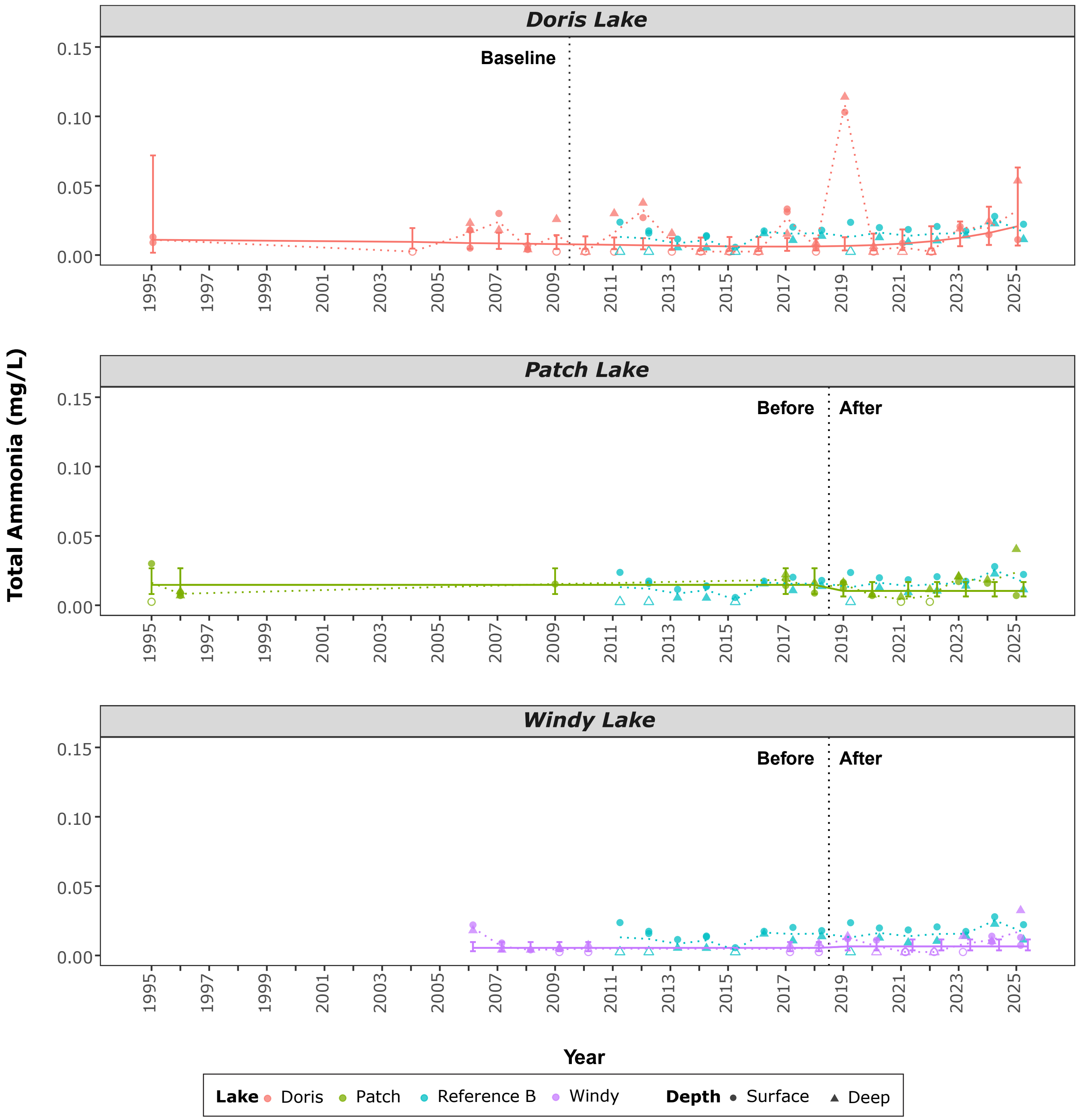
No effects were detected for total ammonia in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total ammonia were not exceeded in 2025.

TABLE 3.3-6 STATISTICAL RESULTS FOR TOTAL AMMONIA IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	No (0.310)	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	No (0.327)	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	No (0.649)	-
	Open-water	NA	NA	No (0.910)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

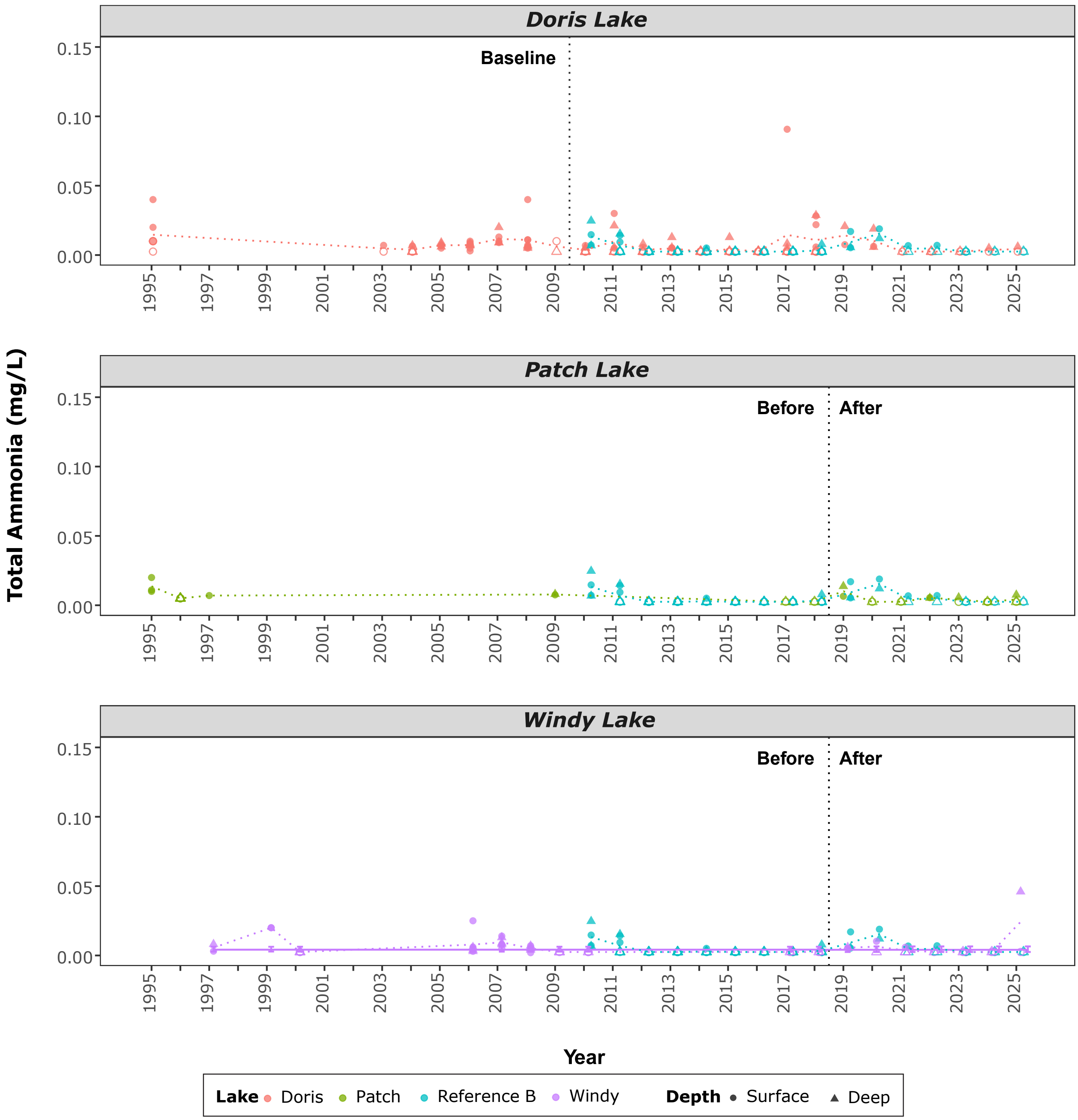
FIGURE 3.3-6A UNDER-ICE TOTAL AMMONIA IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is pH and temperature dependent (see Table 2.2-2).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:19

FIGURE 3.3-6B OPEN-WATER TOTAL AMMONIA IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is pH and temperature dependent (see Table 2.2-2).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:20

3.3.7 NITRATE

Statistical analyses indicated no significant change over time for under-ice nitrate concentrations in Doris Lake or between the before and after period means in Patch and Windy lakes (Table 3.3-7). Statistical analyses were not completed for the open-water season in any exposure lake due to the high proportion of data, including 100 percent of the 2025 observations, which were less than the DL (< 0.005 mg/L; Section C.3.1.7 in Appendix C). Graphical analyses indicated nitrate concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-7a and 3.3-7b).

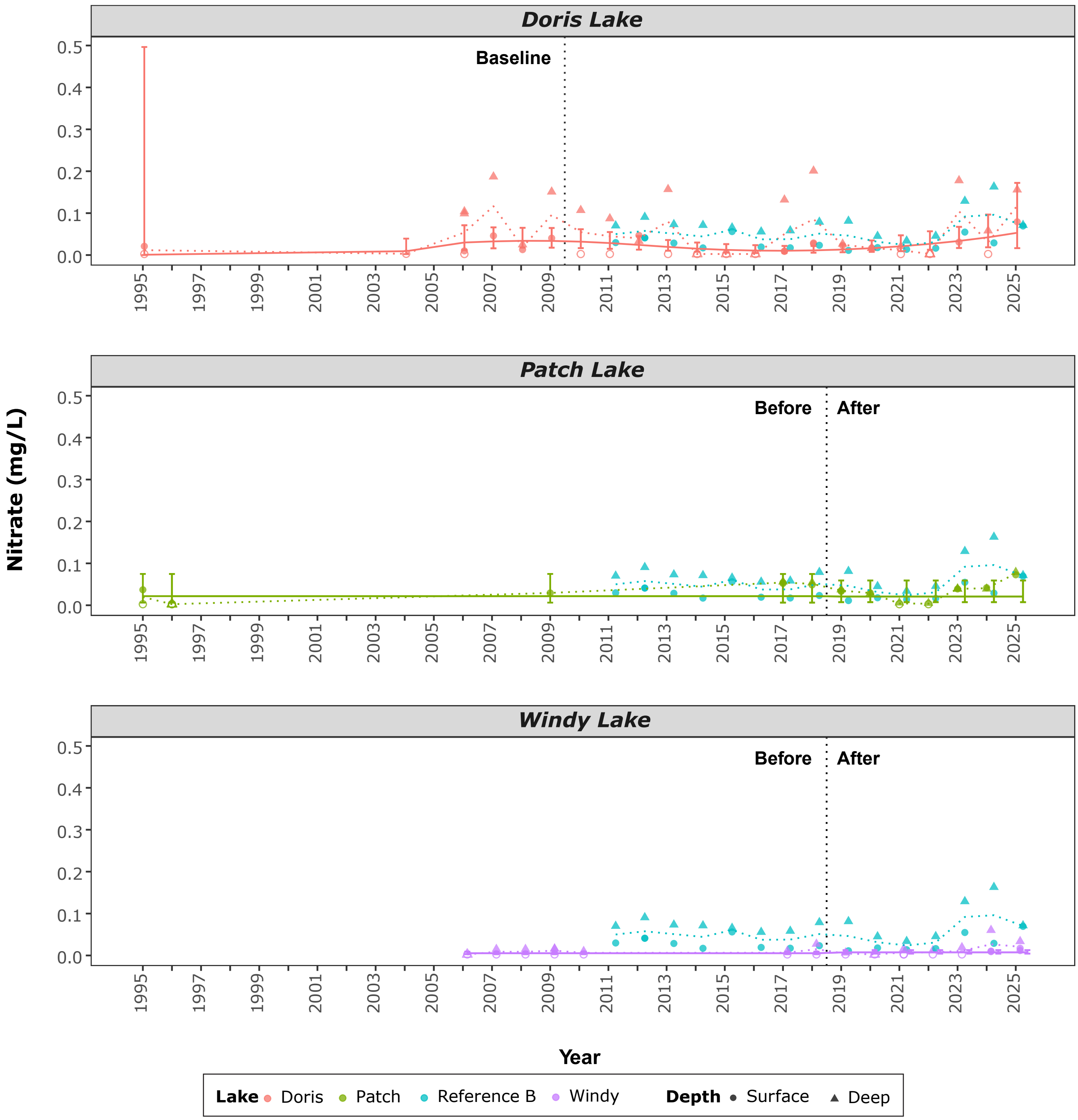
No effects were detected for nitrate in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for nitrate were not exceeded in 2025.

TABLE 3.3-7 STATISTICAL RESULTS FOR NITRATE IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	No (0.101)	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	No (0.958)	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	No (0.358)	-
	Open-water	NA	NA	-	-

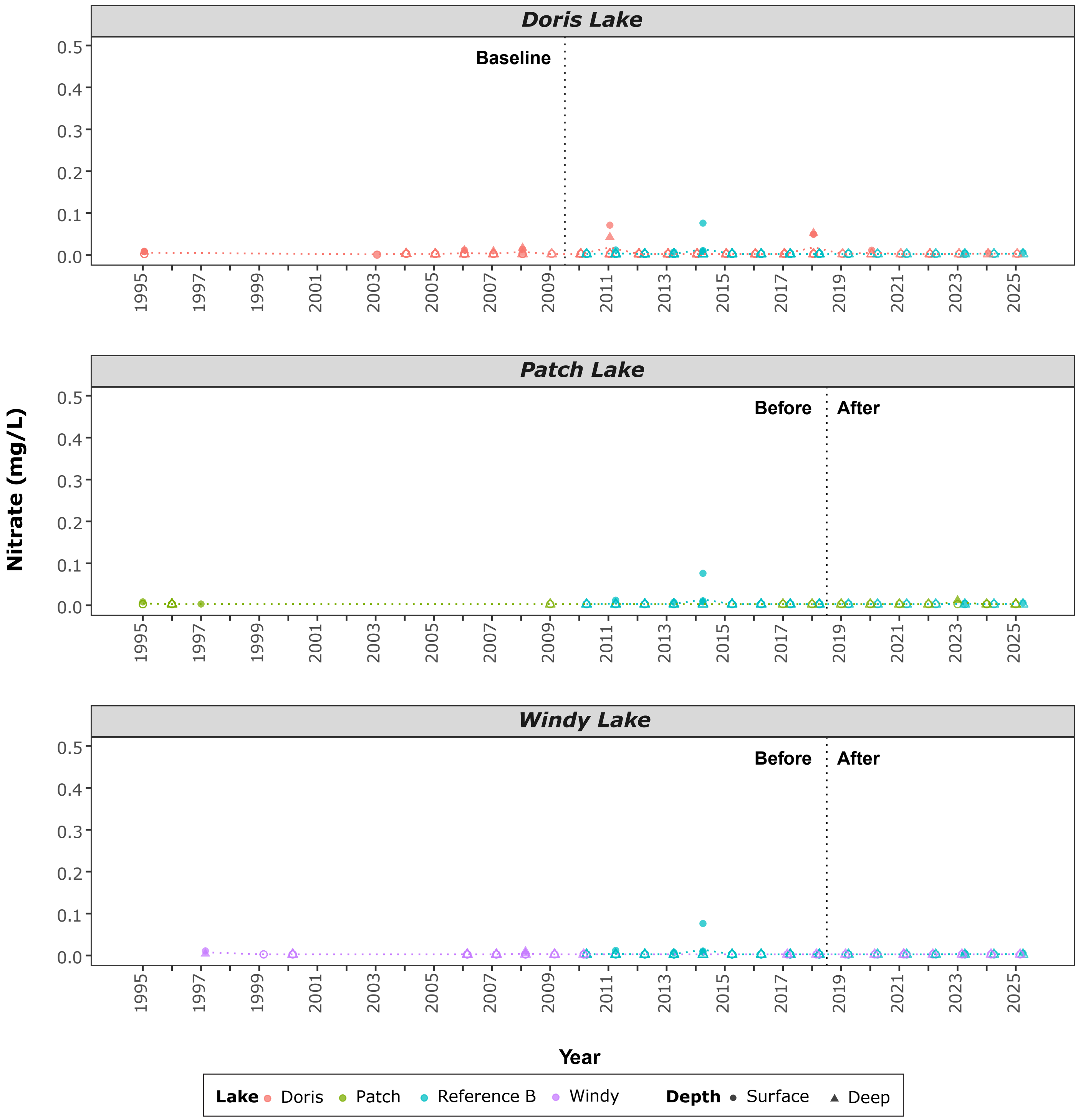
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-7A UNDER-ICE NITRATE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 3 mg/L

FIGURE 3.3-7B OPEN-WATER NITRATE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 3 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:22

3.3.8 NITRITE

Statistical analyses for nitrite were not completed for any exposure lakes due to the high proportion of data, including 100 percent of the 2025 observations, that were less than the DL (< 0.0010 mg/L; Table 3.3-8; Section C.3.1.8 in Appendix C). Graphical analyses indicated that all nitrite observations were below the benchmark in 2025 (Table 2.2-2; Figures 3.3-8a and 3.3-8b).

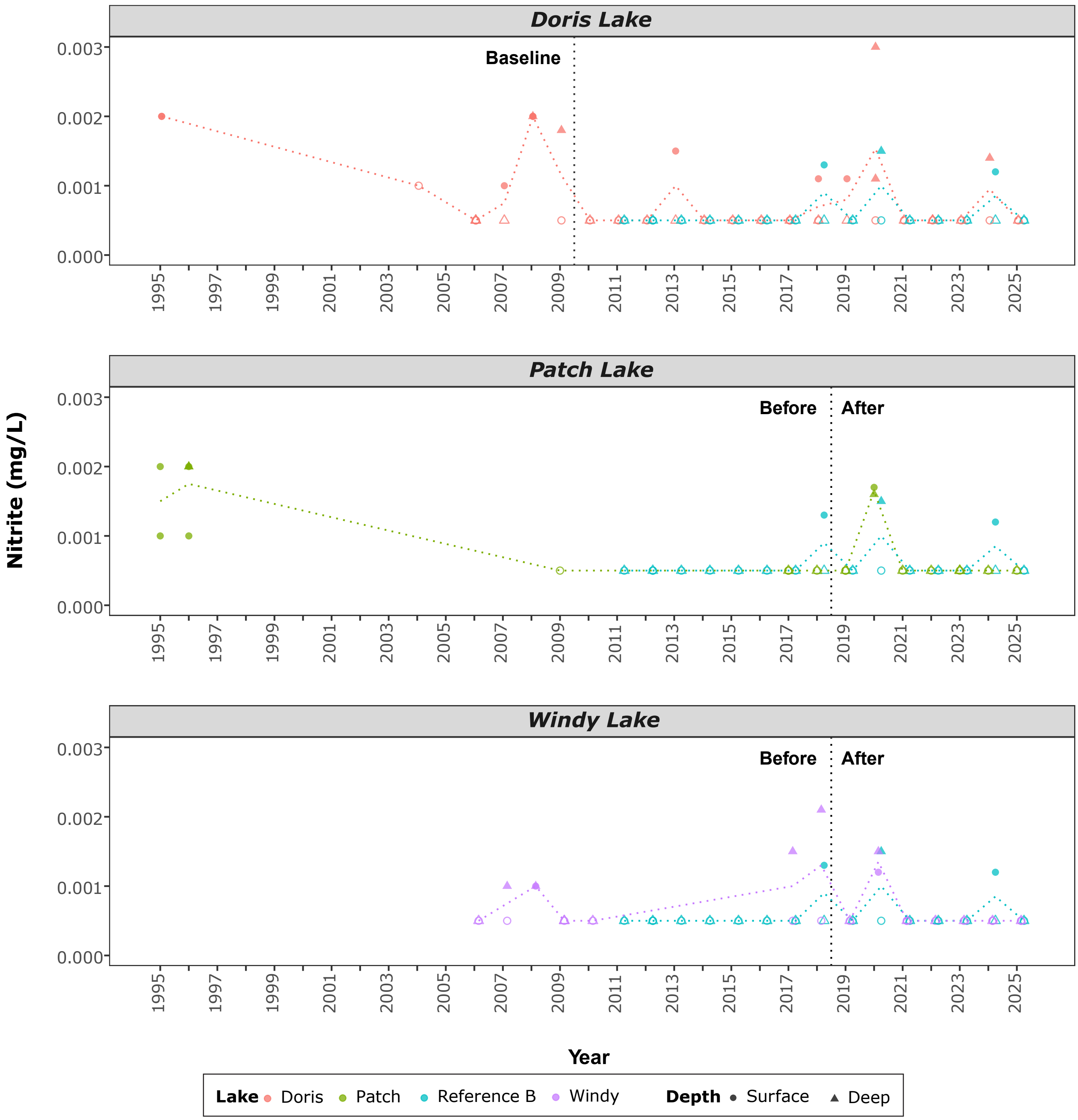
No effects were detected for nitrite in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for nitrite were not exceeded in 2025.

TABLE 3.3-8 STATISTICAL RESULTS FOR NITRITE IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	-	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

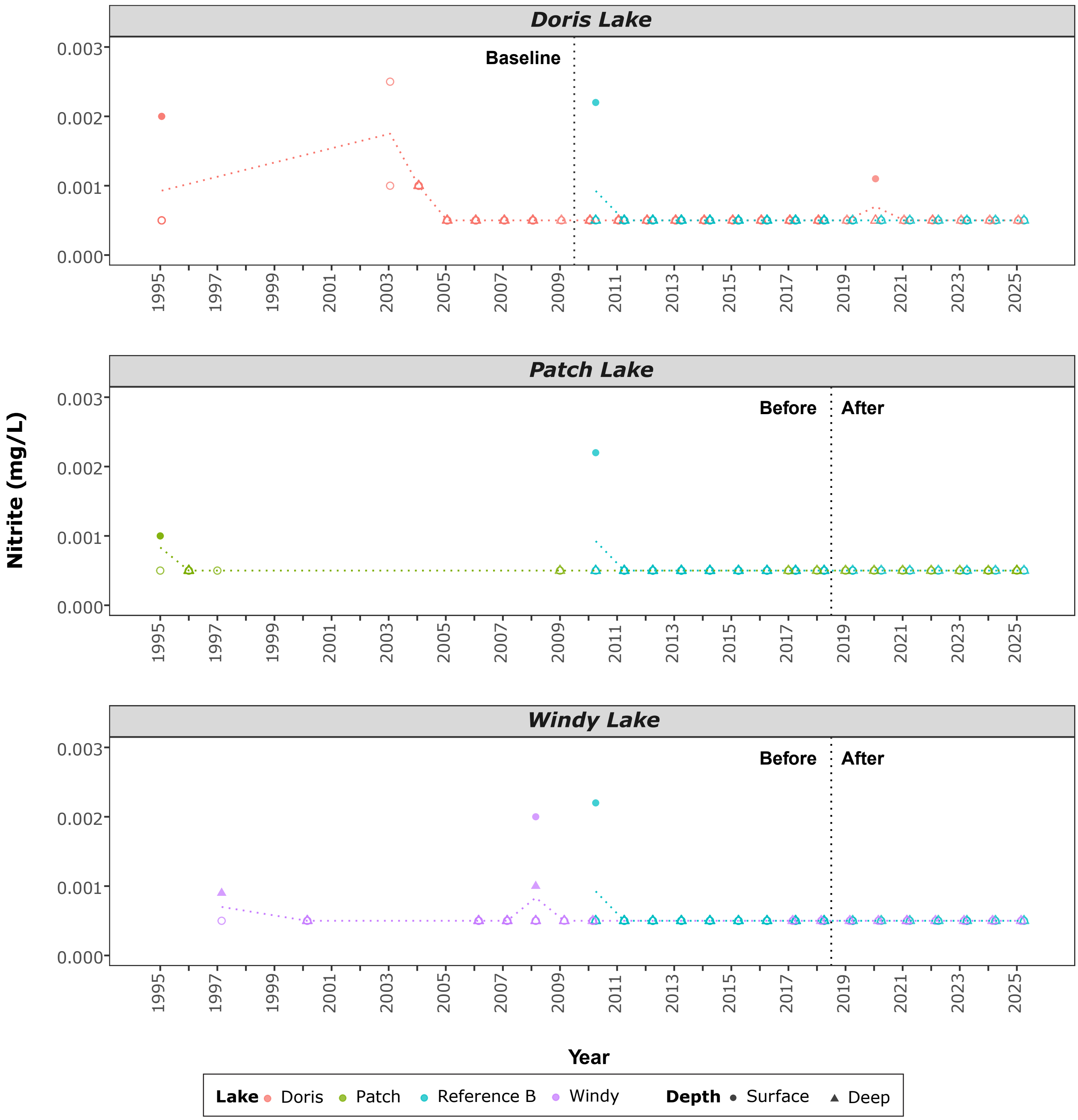
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) = The statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-8A UNDER-ICE NITRITE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.06 mg/L

FIGURE 3.3-8B OPEN-WATER NITRITE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.06 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:24

3.3.9 TOTAL PHOSPHORUS

Statistical analyses indicated no significant change over time for total phosphorus concentrations in Doris Lake (Table 3.3-9). Mean total phosphorous concentrations in Doris Lake during the open-water season were elevated in 2025 compared to 2024 (0.0442 and 0.0336 mg/L, respectively). Graphical analyses of the fitted means slope of Doris Lake indicated elevated mean total phosphorous concentrations during the under-ice and open-water seasons since 2020 and a potential increasing trend in the open-water season at Doris Lake since 2021 (Figures 3.3-9a and 3.3-9b). However, the trend analysis indicated there was no significant change over time (Table 3.3-9). A measurement of total phosphorus at depth in the reference lake during the open-water season in 2025 was also elevated compared to previous years and was the highest on record (Figure 3.3-9b), suggesting that regional or outside influences may be impacting phosphorus concentrations independent of Mine-related activities.

TABLE 3.3-9 STATISTICAL RESULTS FOR TOTAL PHOSPHORUS IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	No (0.788)	-	NA	NA
	Open-water	No (0.063)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.972)	-
	Open-water	NA	NA	Yes (0.031)	No (0.270)
Windy	Under-ice	NA	NA	No (0.264)	-
	Open-water	NA	NA	No (0.517)	-

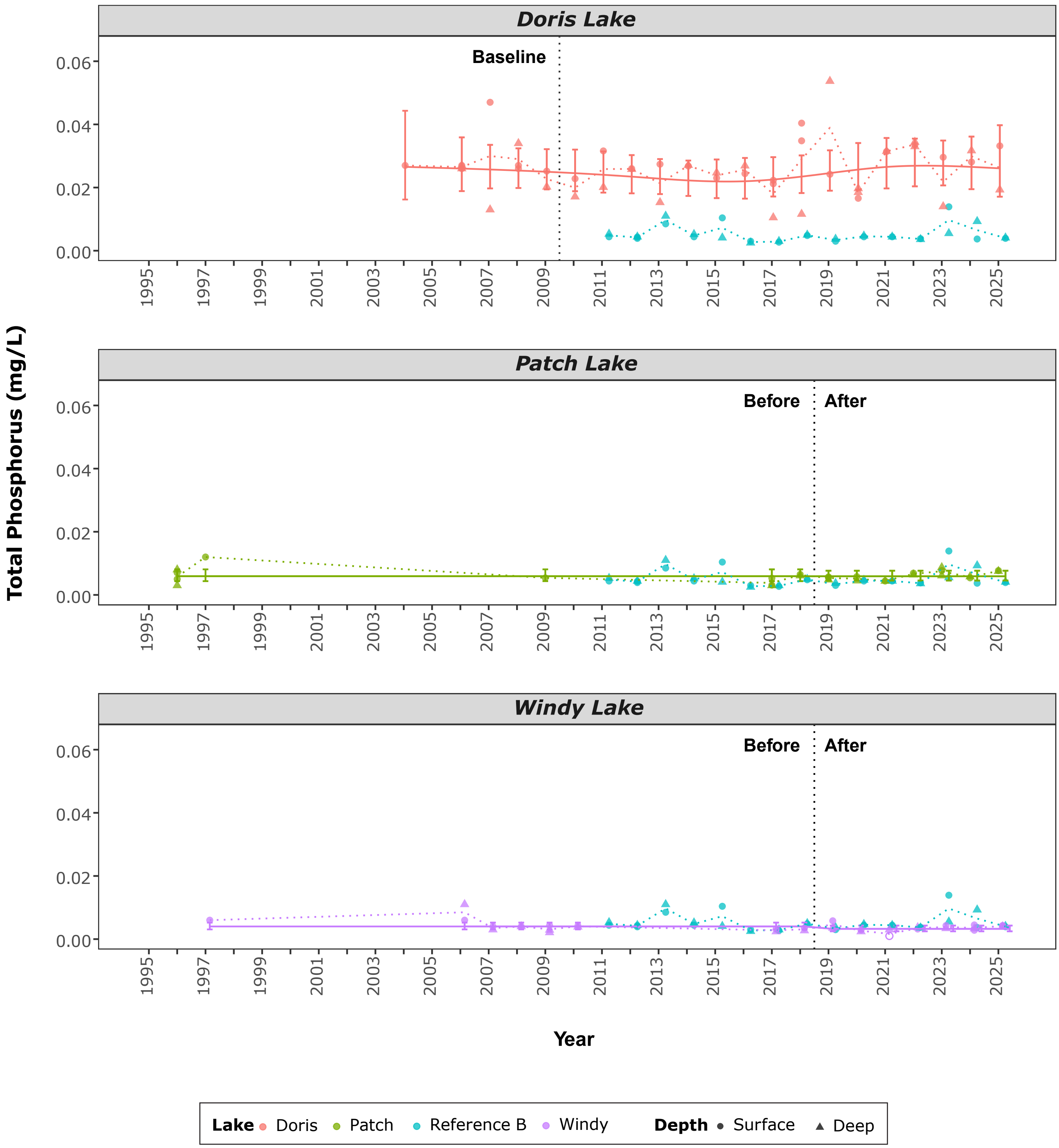
Notes: BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

Statistical analyses indicated no significant difference between the before and after period means for the under-ice season in Patch Lake, and for both seasons in Windy Lake (Table 3.3-9). A significant difference was detected between the before and after period means for the open-water season in Patch Lake, but not relative to the reference lake. Mean total phosphorous concentrations in Patch Lake during the open-water season were elevated in 2025 compared to 2024 (0.0114 and 0.0054 mg/L, respectively). However, mean total phosphorous concentrations also increased in the reference lake during this season, increasing by 164 percent in 2025 compared to 2024. The mean concentration of total phosphorous in the 2025 open-water season at Patch Lake and the reference lake were within 10 percent (Patch Lake mean = 0.0114 mg/L; Reference Lake B mean = 0.0103 mg/L; Table A.3.5).

There are no benchmarks for comparing total phosphorous concentrations as it is used only as a supporting parameter for phytoplankton biomass (Section 2.2-4).

No effects were detected for total phosphorus in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total phosphorus were not exceeded in 2025.

FIGURE 3.3-9A UNDER-ICE TOTAL PHOSPHORUS IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

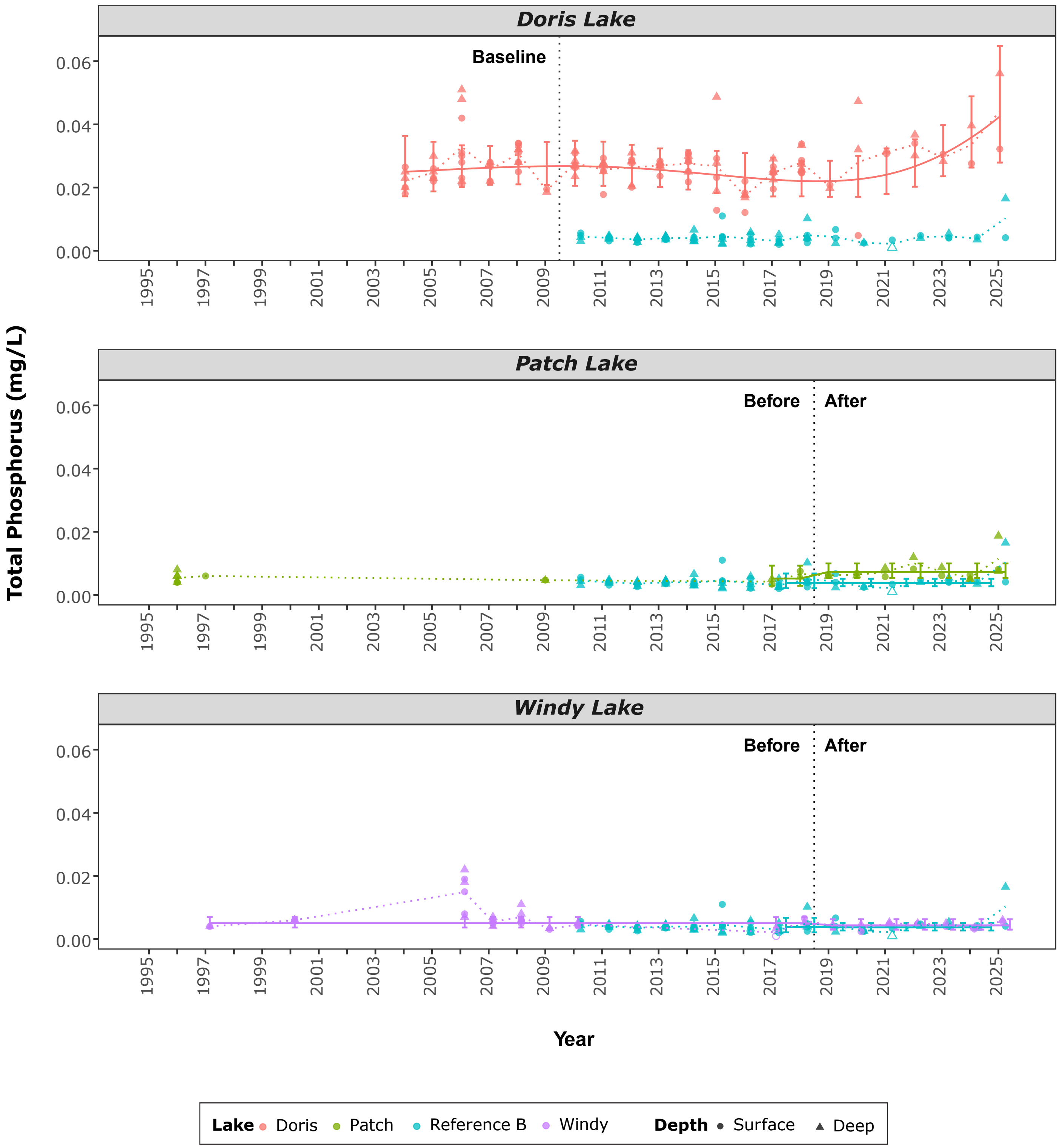


Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:25

FIGURE 3.3-9B   OPEN-WATER TOTAL PHOSPHORUS IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.

3.3.10 TOTAL ALUMINUM

Statistical analyses indicated no significant changes over time for total aluminum concentrations in Doris Lake or between the before and after period means in Patch or Windy lakes (Table 3.3-10). Graphical analyses indicated that total aluminum concentrations were less than the benchmark in Doris and Windy lakes, but greater than the benchmark in Patch Lake during both seasons in 2025 (Figures 3.3-10a and 3.3-10b). In 2025, under-ice mean total aluminum concentrations increased by 45 percent in Doris Lake compared to 2024 concentrations (Figure 3.3-10a). However, mean concentrations were still 50 percent lower than the elevated concentrations observed in 2023.

In 2025, under-ice total aluminum concentrations in Windy Lake increased by approximately 4.5 times (deep) and 8.8 times (surface) compared to the 2024 concentrations (Figure 3.3-10a). Open-water concentrations in Windy Lake, however, decreased by 50 percent (deep) and 25 percent (surface) in 2025 compared to 2024 concentrations (Figure 3.3-10b).

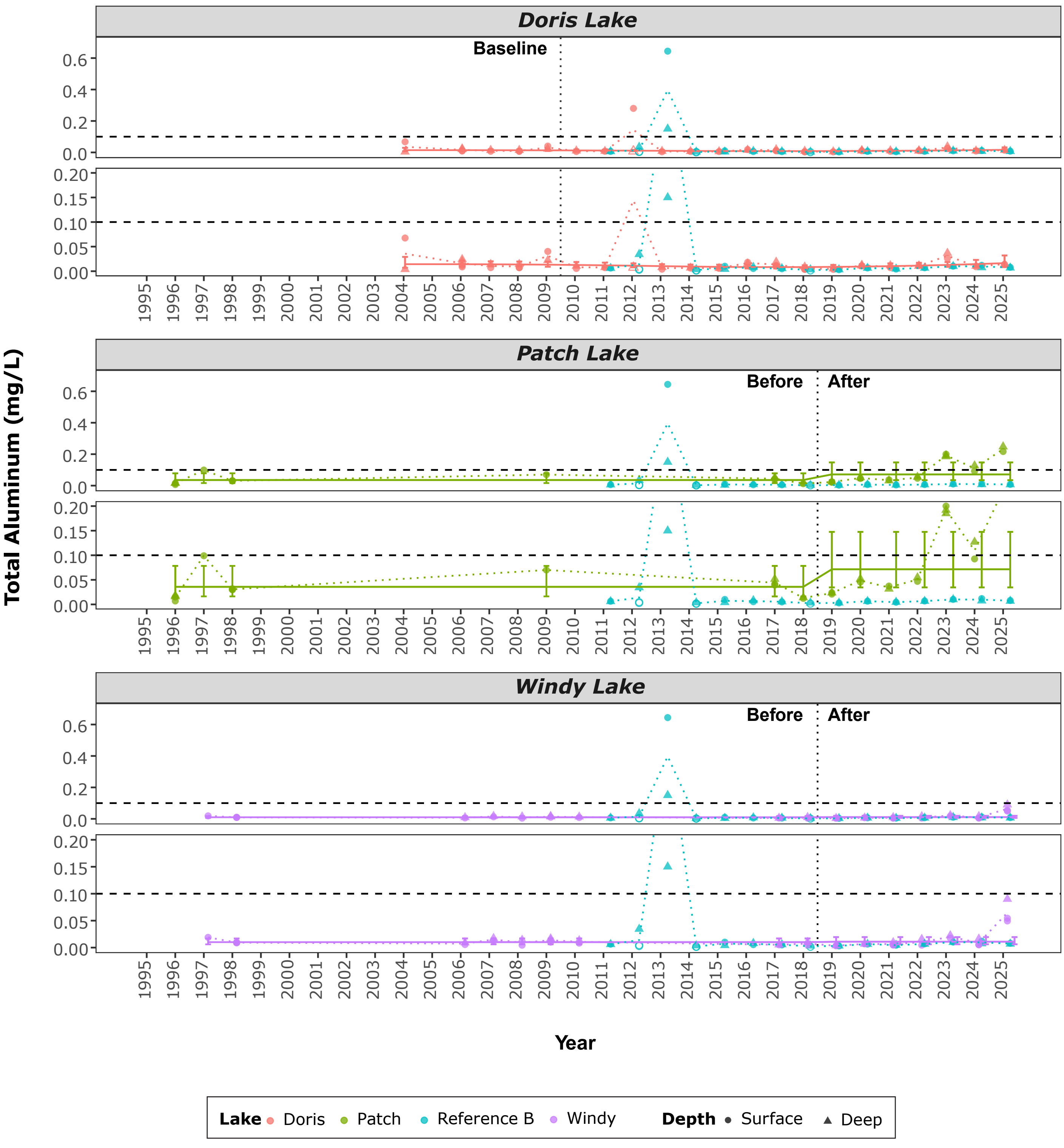
No effects were detected for total aluminum in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total aluminum were not exceeded in 2025.

TABLE 3.3-10 STATISTICAL RESULTS FOR TOTAL ALUMINUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	No (0.218)	-	NA	NA
	Open-water	No (0.938)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.182)	-
	Open-water	NA	NA	No (0.108)	-
Windy	Under-ice	NA	NA	No (0.846)	-
	Open-water	NA	NA	No (0.968)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-10A UNDER-ICE TOTAL ALUMINUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

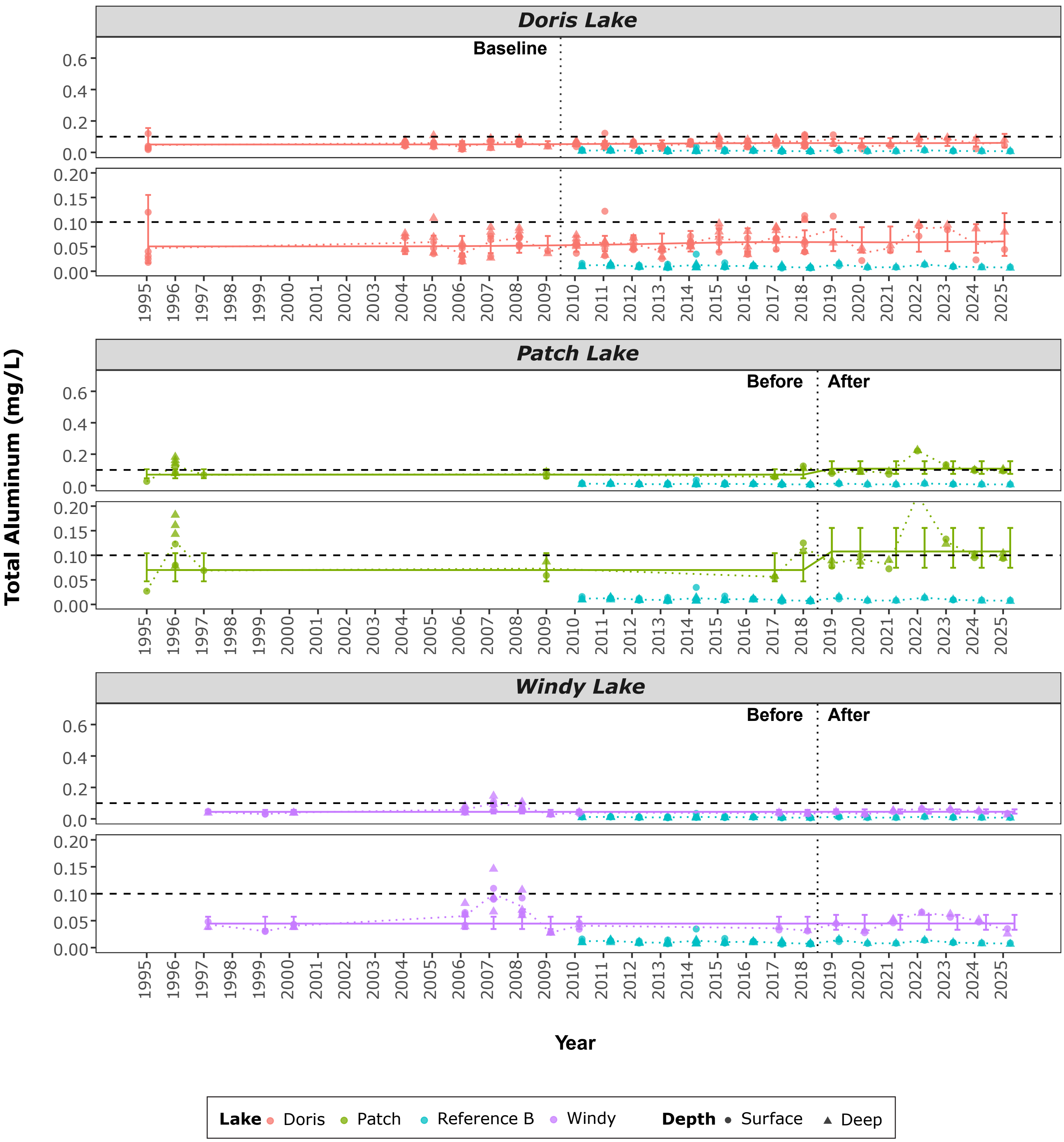


Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.1 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:27

FIGURE 3.3-10B OPEN-WATER TOTAL ALUMINUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.1 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:28

3.3.11 TOTAL ARSENIC

Statistical analyses indicated a significant change over time for total arsenic concentrations in Doris Lake during both seasons and relative to the reference lake during the under-ice season (Table 3.3-11). Graphical analyses indicated that the fitted means for total arsenic decreased in Doris Lake during the baseline years (1995 to 2009) and that concentrations in Doris Lake have been stable (within 10 percent of each annual measurement) since 2012 (Figures 3.3-11a and 3.3-11b). It is noted that a decrease in total arsenic concentrations is not considered to be an adverse effect (TMAC 2018).

Statistical analyses indicated no significant difference between the before and after period means for total arsenic concentrations in Patch Lake or in the open-water season in Windy Lake (Table 3.3-11). A significant difference between the before and after period means for total arsenic was observed during the under-ice season in Windly Lake but not relative to the reference lake (Table 3.3-11).

Graphical analyses indicated that total arsenic concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-11a and 3.3-11b).

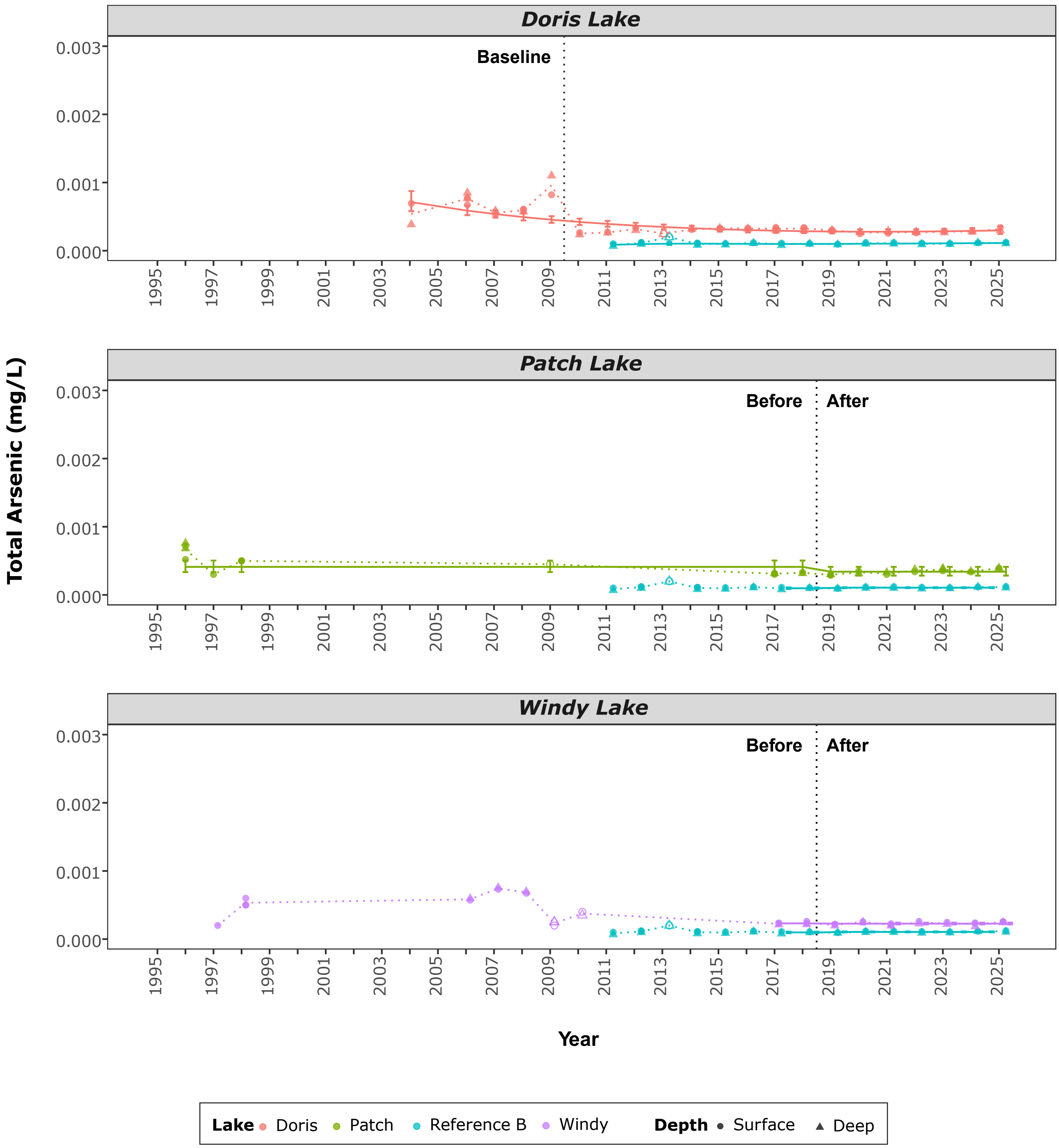
No potentially adverse effects were detected for total arsenic in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total arsenic were not exceeded in 2025.

TABLE 3.3-11 STATISTICAL RESULTS FOR TOTAL ARSENIC IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	Yes (< 0.001)	Yes (0.003)	NA	NA
	Open-water	Yes (< 0.001)	Yes (0.035)	NA	NA
Patch	Under-ice	NA	NA	No (0.170)	-
	Open-water	NA	NA	No (0.580)	-
Windy	Under-ice	NA	NA	Yes (0.033)	No (0.157)
	Open-water	NA	NA	No (0.139)	-

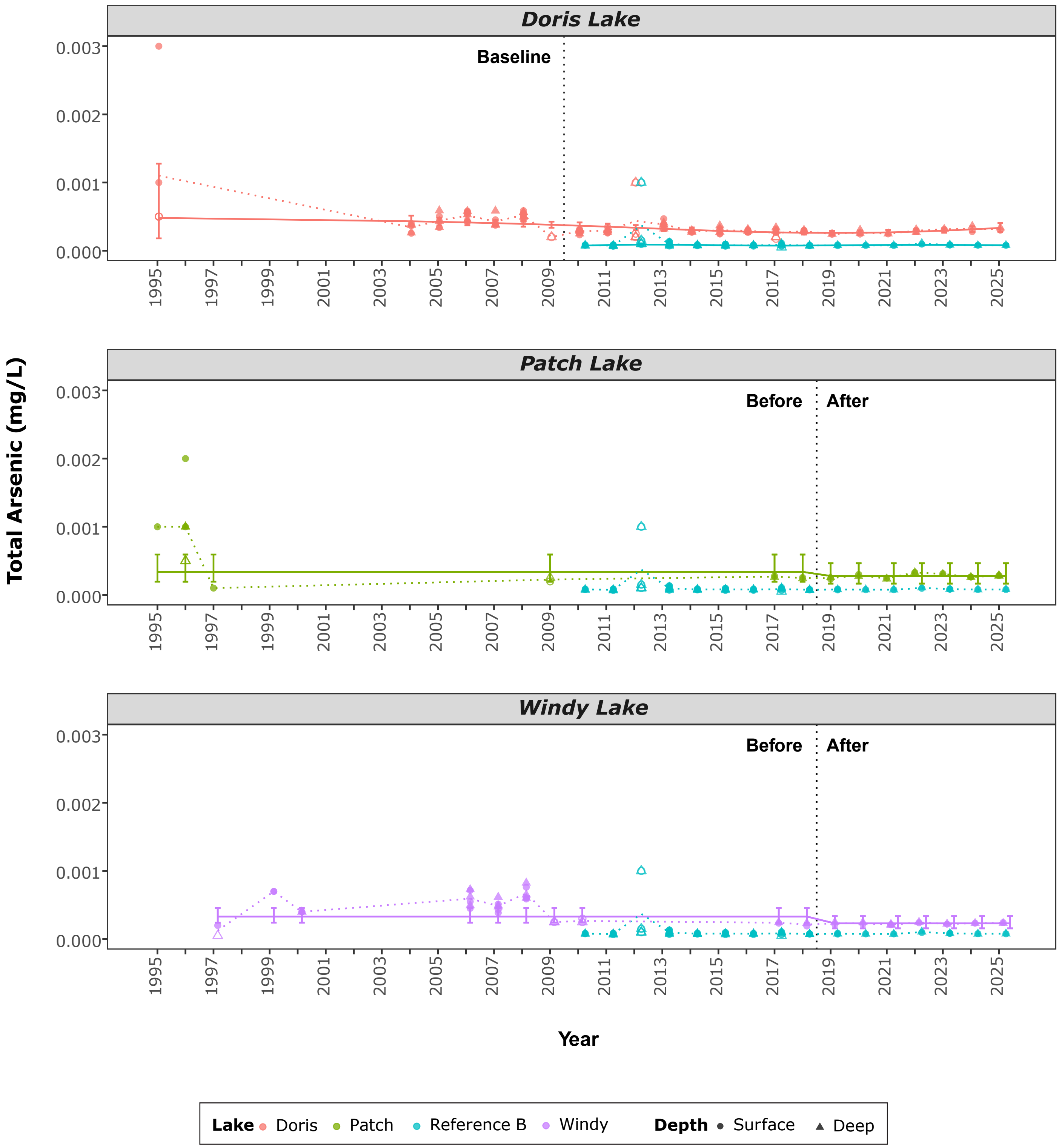
Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-11A UNDER-ICE TOTAL ARSENIC IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.005 mg/L

FIGURE 3.3-11B OPEN-WATER TOTAL ARSENIC IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.005 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:30

3.3.12 TOTAL BORON

Statistical analyses indicated a significant change over time for total boron concentrations in Doris Lake during both seasons (Table 3.3-12). Statistical comparison to the reference lake was not completed, as all 2025 data collected at Reference Lake B were less than the DL (< 0.010 mg/L; Section C.3.1.12 in Appendix C). Graphical analyses indicated that total boron concentrations in Doris Lake increased from 2010 to 2015 (under-ice from 0.027 to 0.037 mg/L and open-water 0.029 to 0.041 mg/L) but have decreased since 2015 (Figures 3.3-12a and 3.3-12b). Total boron concentrations in 2025 were within the baseline range for Doris Lake.

Statistical analyses indicated no significant difference between the before and after period means for total boron concentrations in Patch or Windy lakes (Table 3.3-12).

Graphical analyses indicated that total boron concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-12a and 3.2-12b).

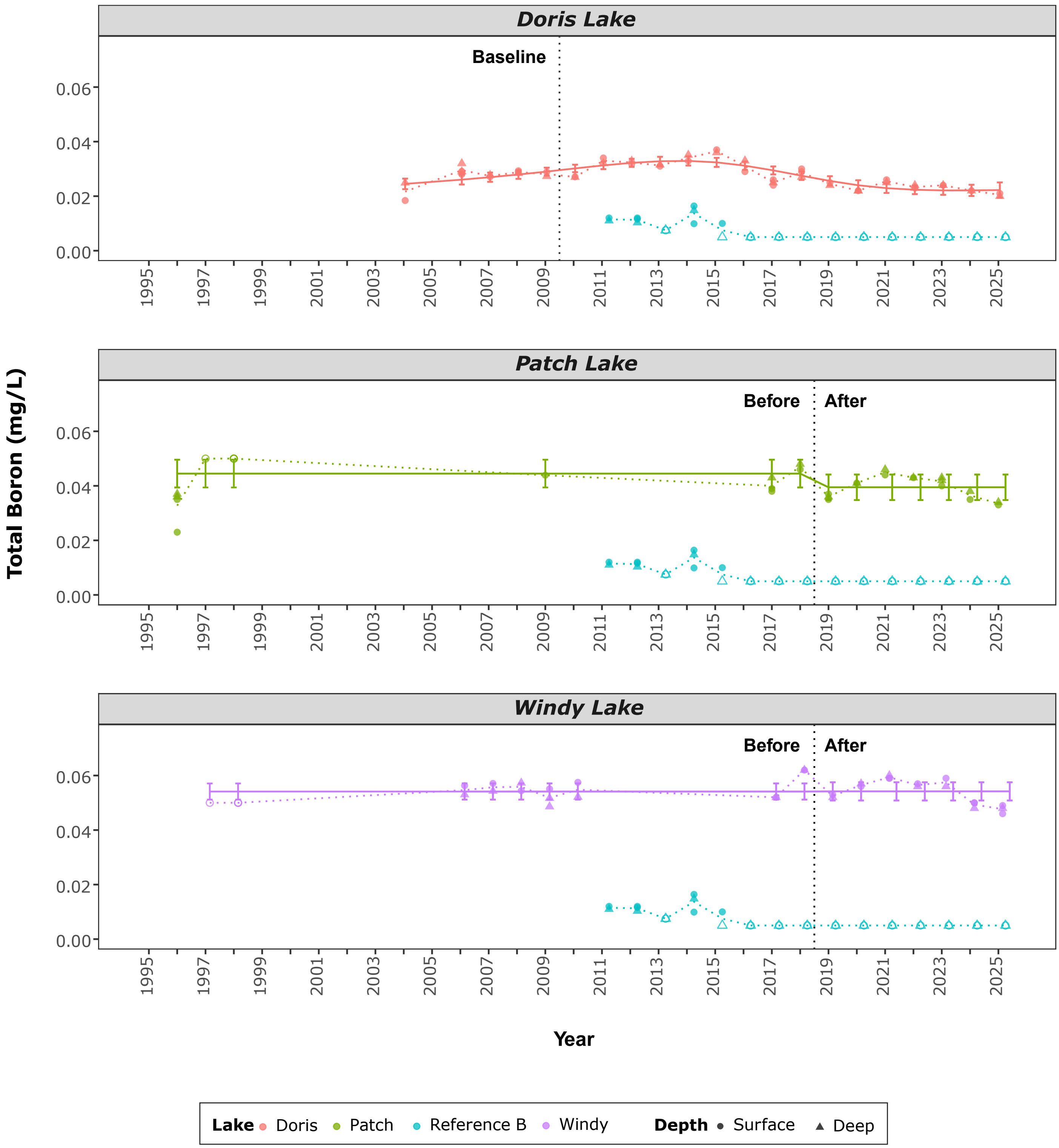
No effects were detected for total boron in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total boron were not exceeded in 2025.

TABLE 3.3-12 STATISTICAL RESULTS FOR TOTAL BORON IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	Yes (< 0.001)	-	NA	NA
	Open-water	Yes (< 0.001)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.137)	-
	Open-water	NA	NA	No (0.262)	-
Windy	Under-ice	NA	NA	No (0.982)	-
	Open-water	NA	NA	No (0.113)	-

Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

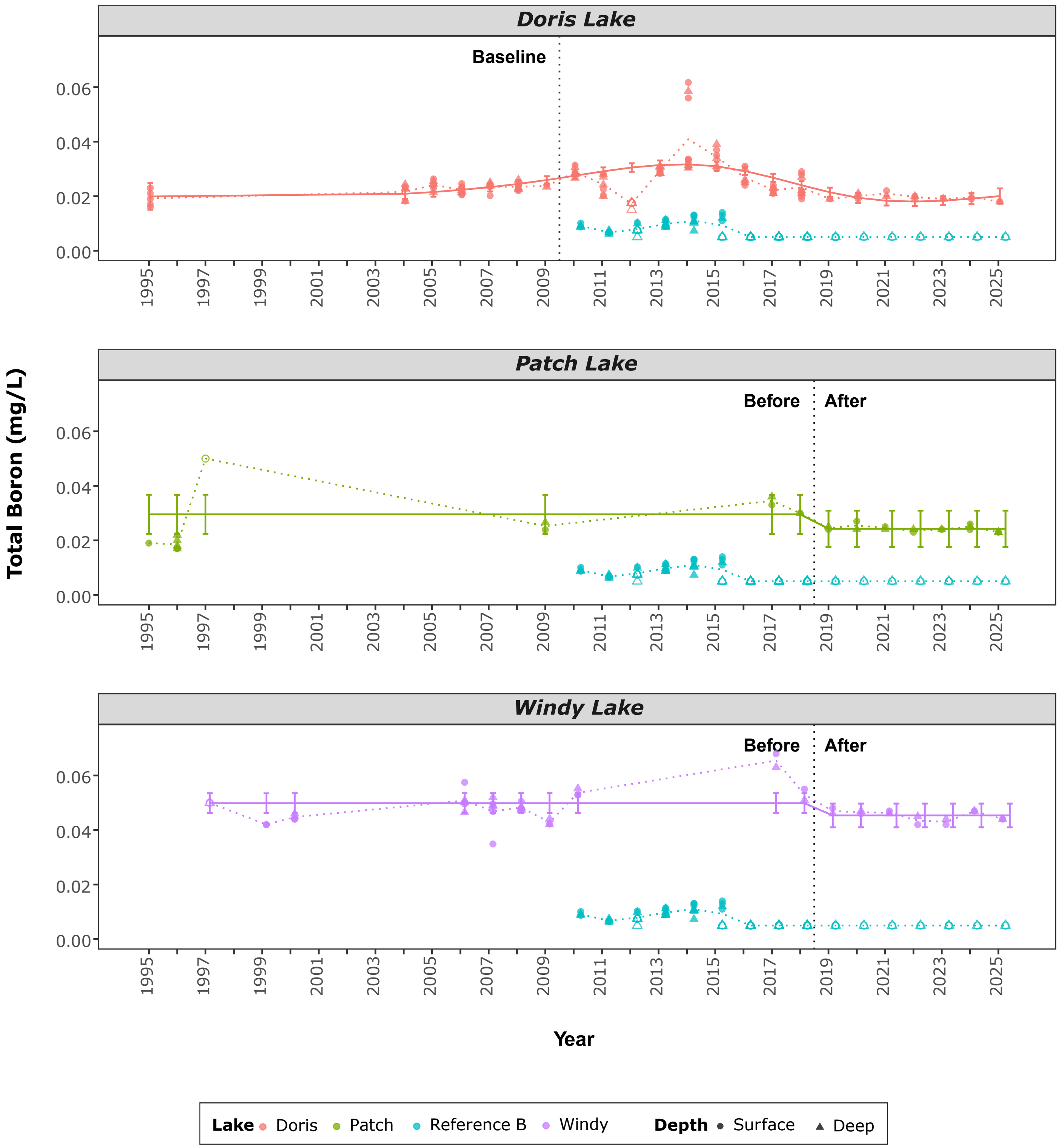
FIGURE 3.3-12A UNDER-ICE TOTAL BORON IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 1.5 mg/L

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:31

FIGURE 3.3-12B OPEN-WATER TOTAL BORON IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 1.5 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:32

3.3.13 TOTAL CADMIUM

Statistical analyses for total cadmium were not completed for any exposure lakes due to the high proportion of data, including all the 2025 observations, which were less than the DL (< 0.000005 mg/L; Table 3.3-13; Section C.3.1.13 in Appendix C). Graphical analyses indicated that total cadmium concentrations in all three exposure lakes were below the DL and the benchmark in 2025 (Figures 3.3-13a and 3.3-13b).

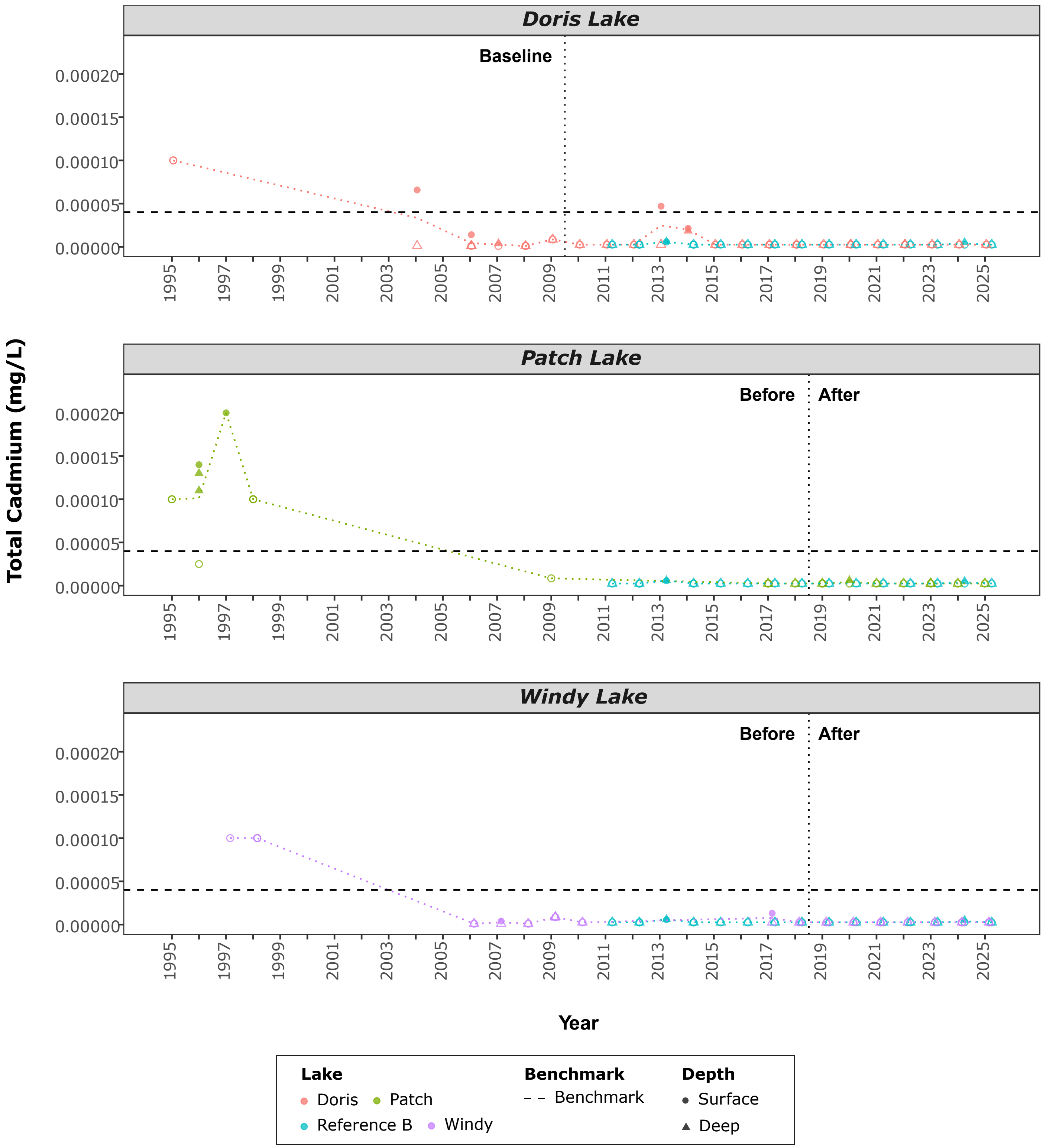
No effects were detected for total cadmium in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total cadmium were not exceeded in 2025.

TABLE 3.3-13 STATISTICAL RESULTS FOR TOTAL CADMIUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	-	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

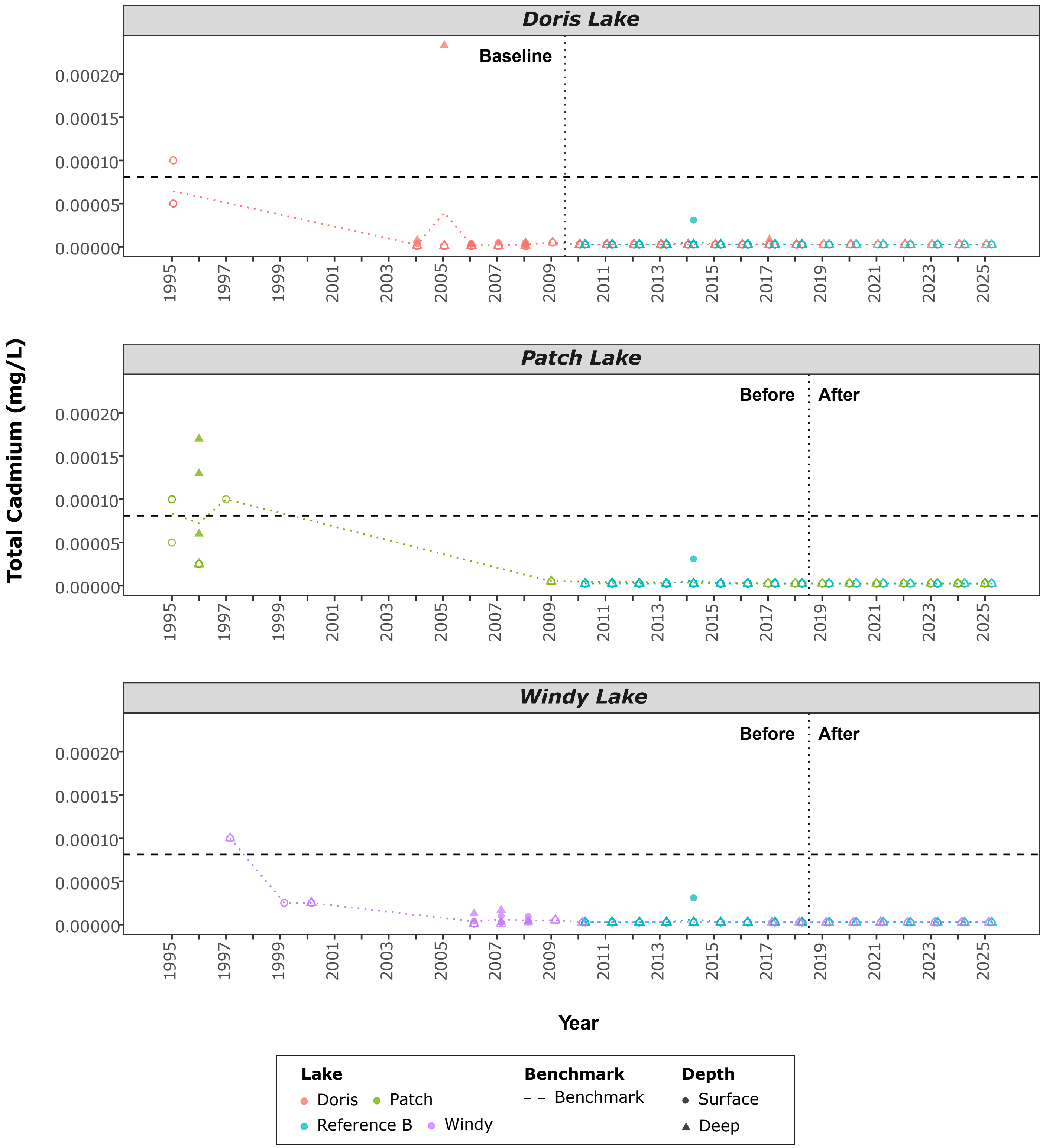
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-13A UNDER-ICE TOTAL CADMIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

FIGURE 3.3-13B OPEN-WATER TOTAL CADMIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

3.3.14 TOTAL CHROMIUM

Statistical analyses for total chromium were not completed for any exposure lakes due to the high proportion of data, including the 2025 observations, which were less than the DL (< 0.0005 mg/L; Table 3.3-14; Section C.3.1.14 in Appendix C). Graphical analyses indicated that total chromium concentrations in all three exposure lakes were below the DL and the benchmark in 2025 (Figures 3.3-14a and 3.3-14b; Appendix A).

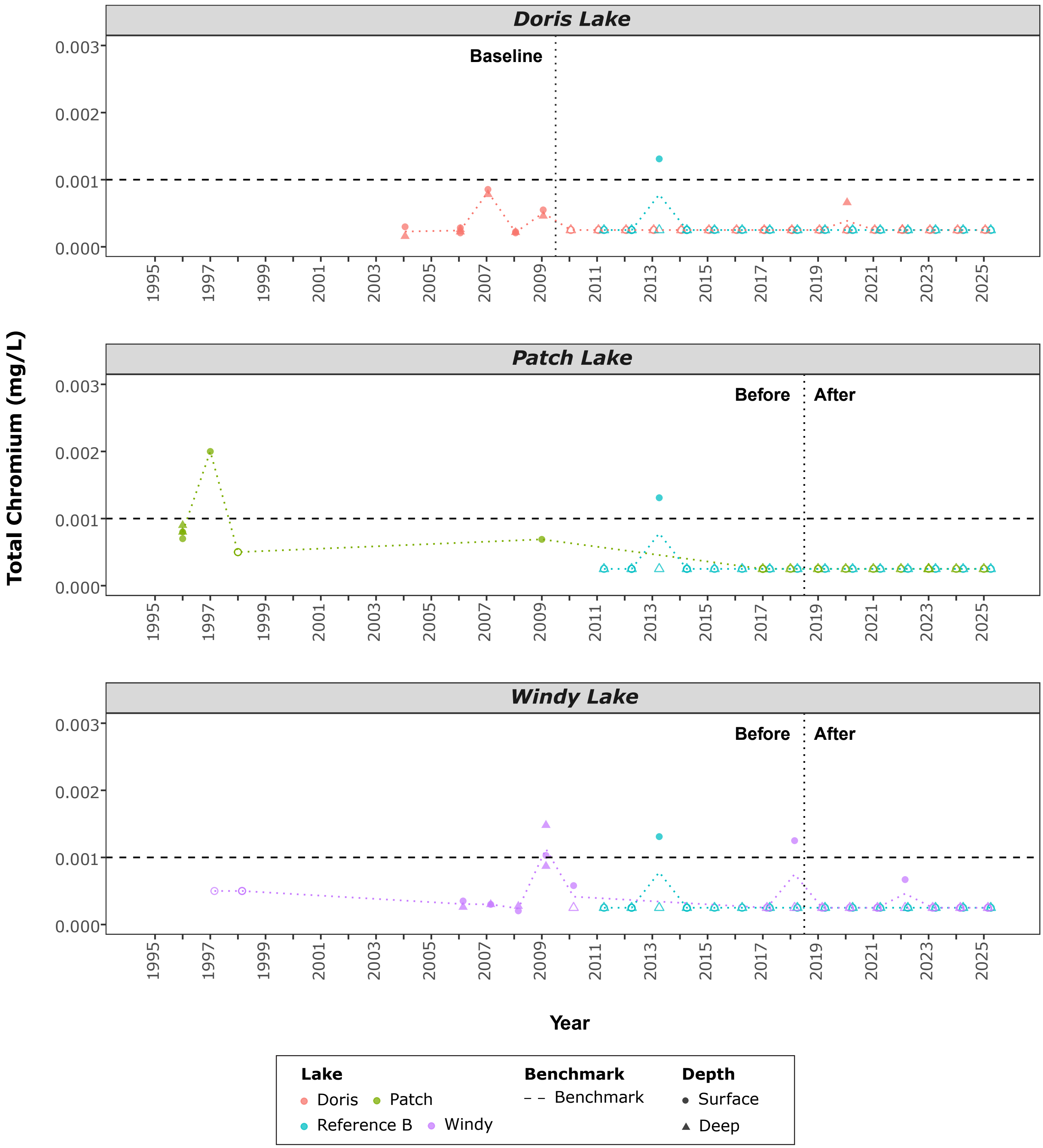
No effects were detected for total chromium in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total chromium were not exceeded in 2025.

TABLE 3.3-14 STATISTICAL RESULTS FOR TOTAL CHROMIUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	-	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

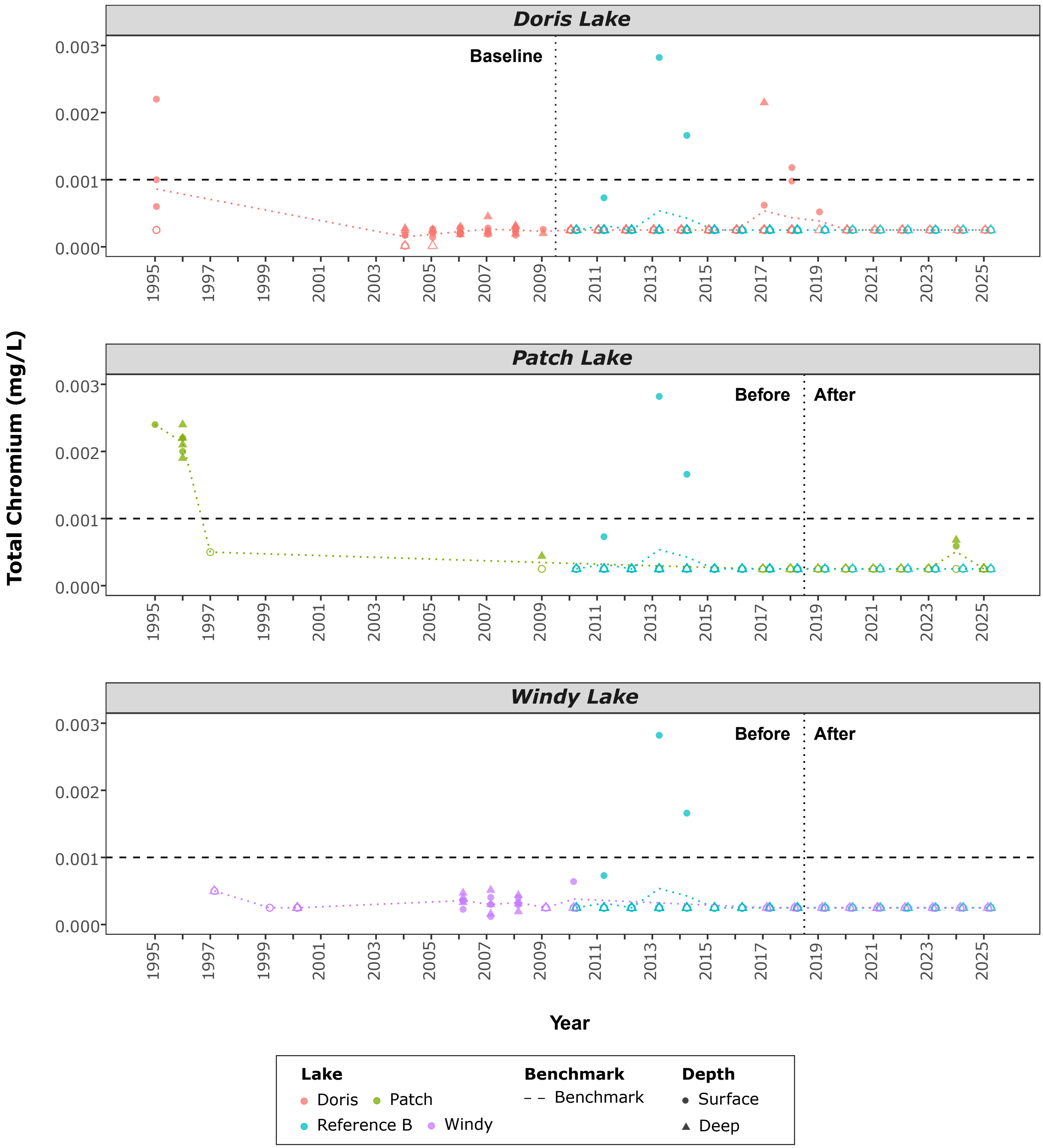
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-14A UNDER-ICE TOTAL CHROMIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.001 mg/L

FIGURE 3.3-14B OPEN-WATER TOTAL CHROMIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.001 mg/L

3.3.15 TOTAL COPPER

Statistical analyses indicated no significant changes over time for total copper concentrations in Doris Lake or between the before and after period means in Patch or Windy lakes (Table 3.3-15). Graphical analyses indicated that total copper concentrations in Doris Lake during the open-water season, and in Patch and Windy lakes during both seasons were below their respective benchmarks (Figures 3.3-15a and 3.3-15b; Appendix A). The total copper concentration in the surface sample collected in Doris Lake during the under-ice season was minimally above the benchmark by approximately 1.5 percent (Figure 3.3-15a).

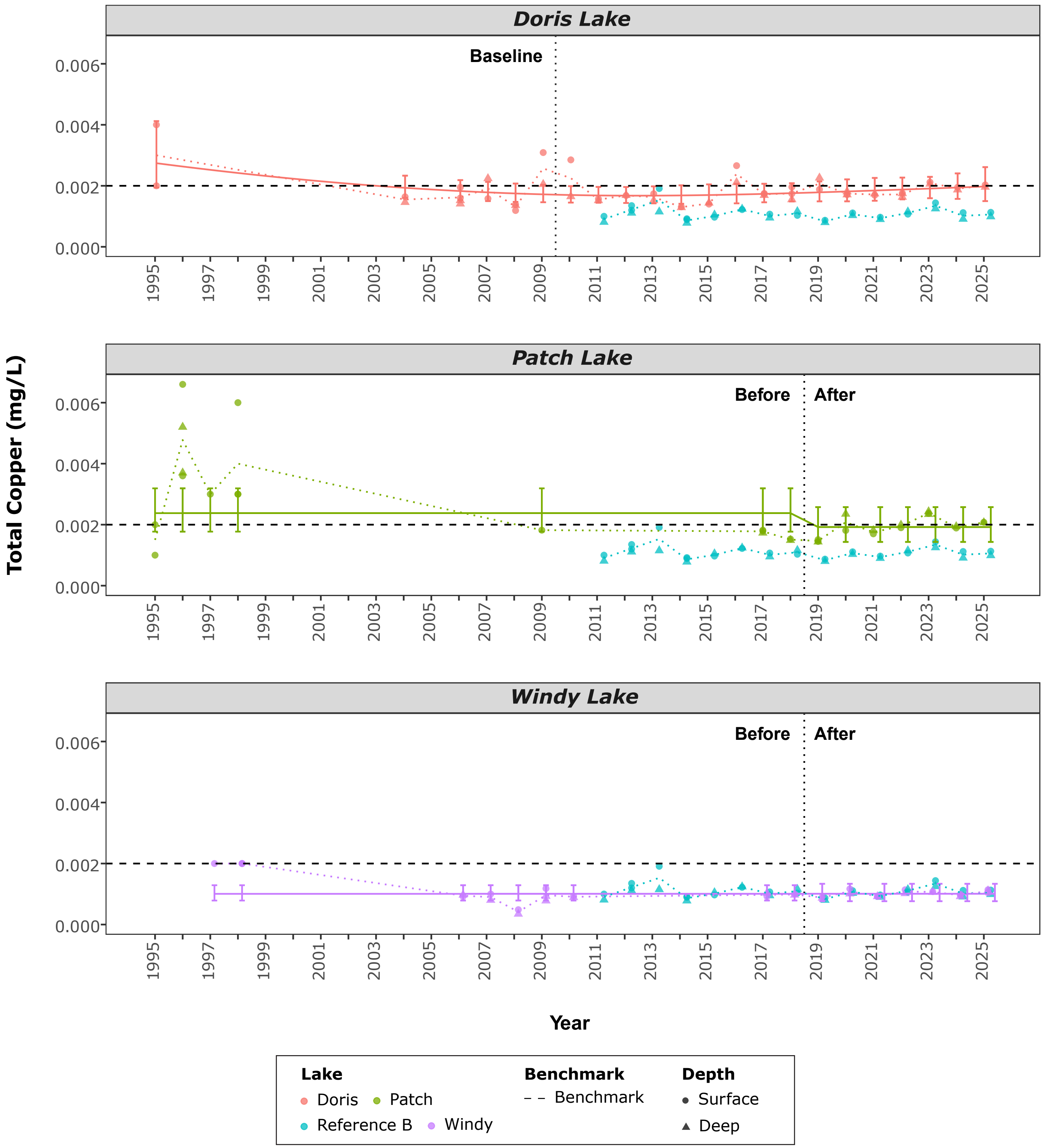
No effects were detected for total copper in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total copper were not exceeded in 2025.

TABLE 3.3-15 STATISTICAL RESULTS FOR TOTAL COPPER IN THE EXPOSURE LAKES, 2025

Lake	**Season**	**Trend Analysis**		**BACI**	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	No (0.051)	-	NA	NA
	Open-water	No (0.759)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.286)	-
	Open-water	NA	NA	No (0.080)	-
Windy	Under-ice	NA	NA	No (0.986)	-
	Open-water	NA	NA	No (0.058)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-15A UNDER-ICE TOTAL COPPER IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

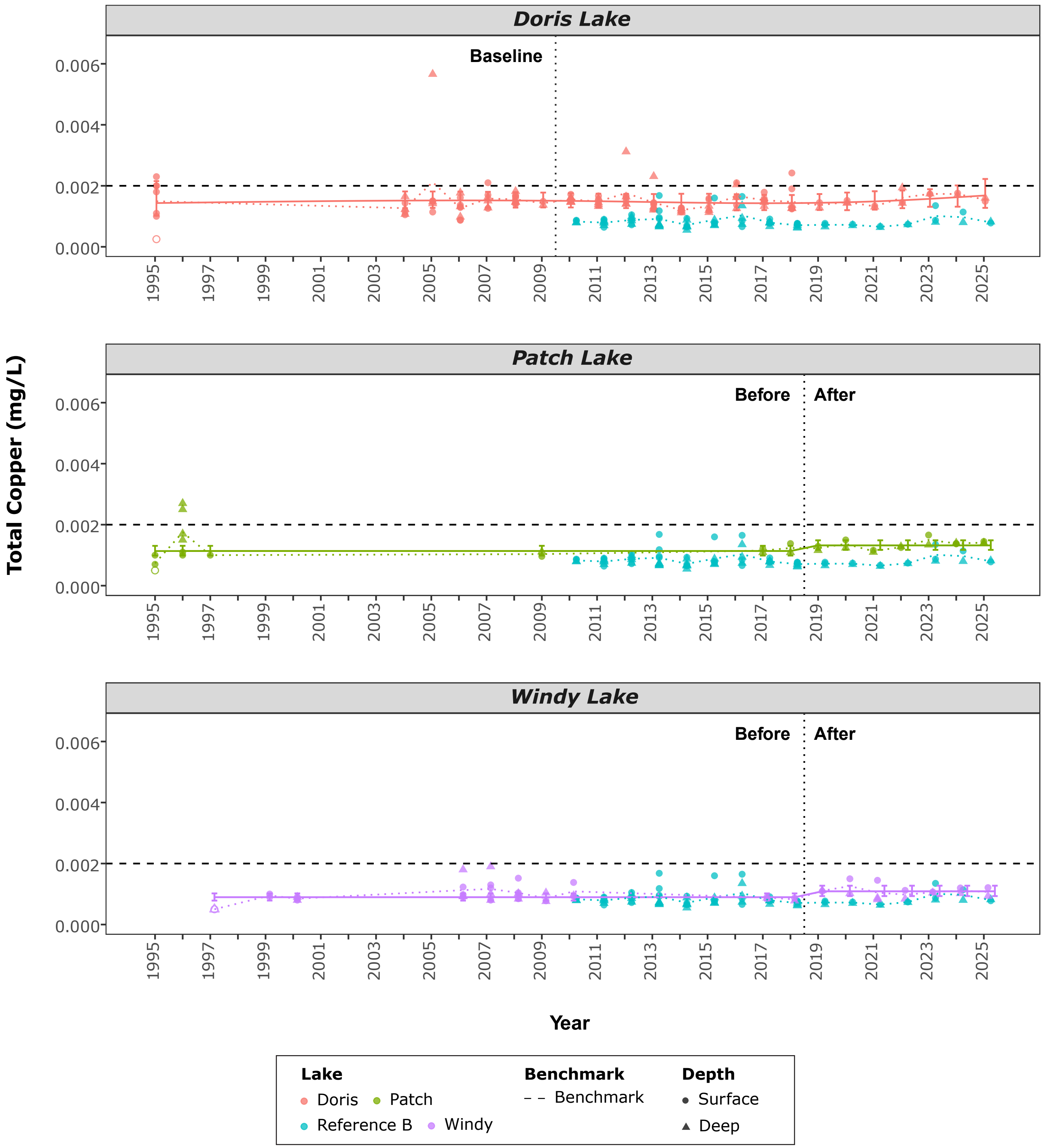


Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:37

FIGURE 3.3-15B OPEN-WATER TOTAL COPPER IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

3.3.16 TOTAL IRON

Statistical analyses indicated no significant changes over time for total iron concentrations in Doris Lake, or between the before and after period means in Patch Lake (both seasons) and Windy Lake (open-water season; Table 3.3-16). Statistical analyses were not completed for the under-ice season in Patch Lake due to the high proportion of data that were less than the DL (Section C.3.1.16 in Appendix C).

Graphical analyses indicated that total iron concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-16a and 3.3-16b). Mean total iron concentrations increased by 30 percent in Doris Lake and 52 percent in Patch Lake during the under-ice season in 2025 compared to 2024, while mean concentrations decreased by 19 percent, 26 percent, and 46 percent in Doris, Patch, and Windy lakes, respectively, during the open-water season (Figures 3.3-16a and 3.3-16b).

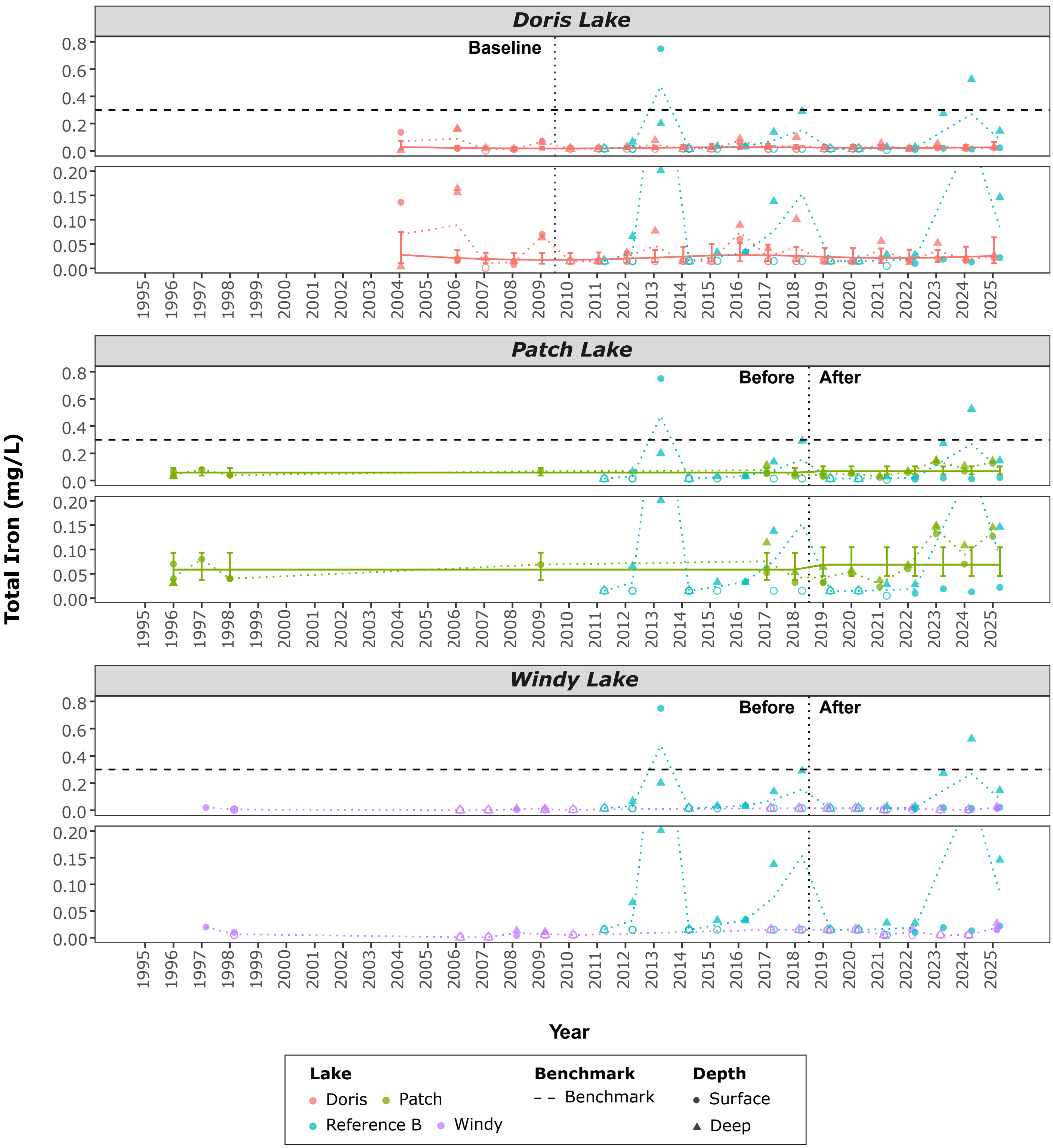
No effects were detected for total iron in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total iron were not exceeded in 2025.

TABLE 3.3-16 STATISTICAL RESULTS FOR TOTAL IRON IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	No (0.937)	-	NA	NA
	Open-water	No (0.890)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.588)	-
	Open-water	NA	NA	No (0.326)	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	No (0.514)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-16A UNDER-ICE TOTAL IRON IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

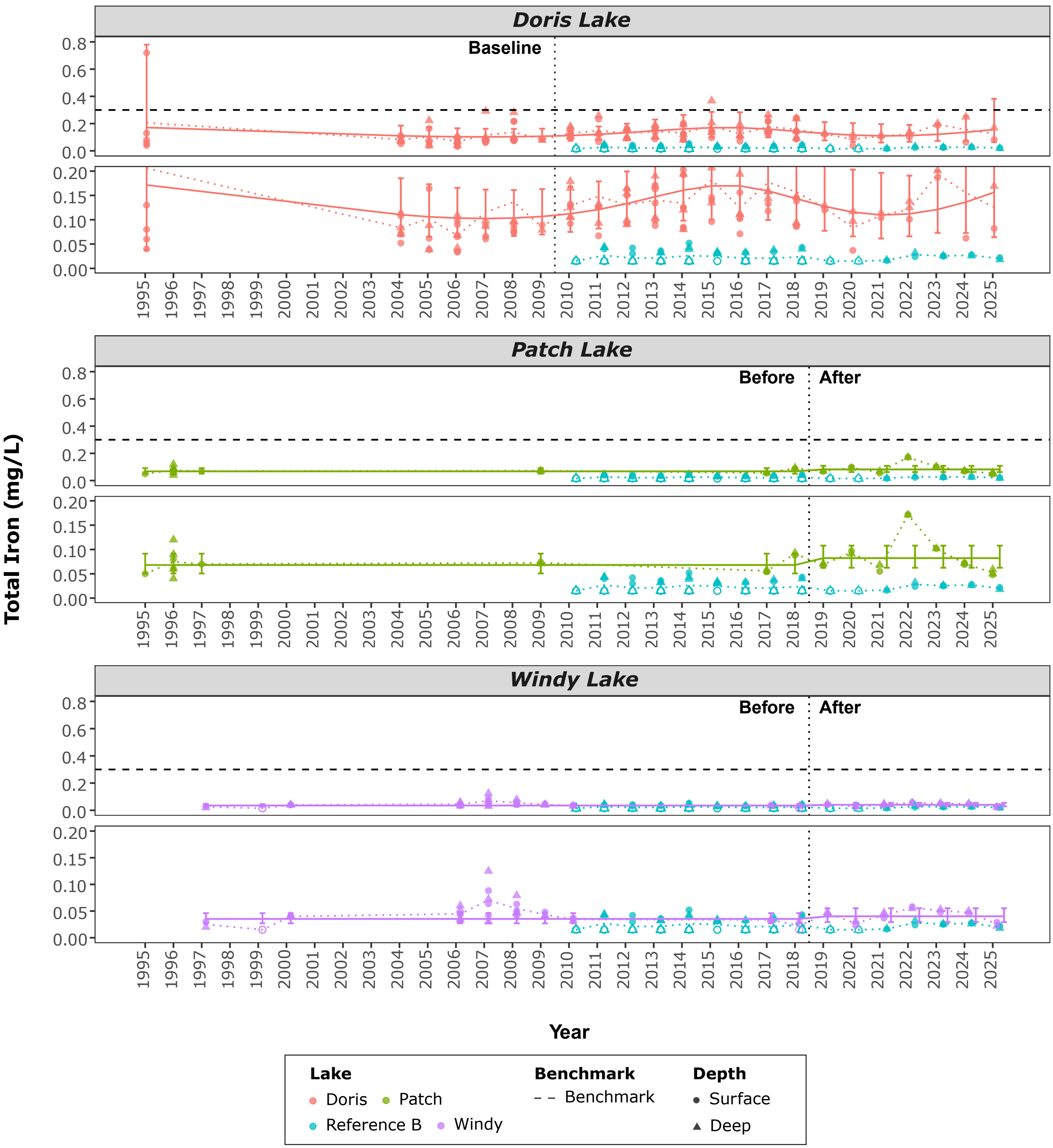


Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.3 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:39

FIGURE 3.3-16B OPEN-WATER TOTAL IRON IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.3 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:40

3.3.17 TOTAL LEAD

Statistical analyses for total lead were not completed for Doris Lake during both seasons or for the under-ice seasons for Patch and Windy lakes as the data collected in 2025 were less than the DL (< 0.000050 mg/L; Table 3.3-17; Section C.3.1.17 in Appendix C). Statistical analyses indicated no significant differences between the before and after period means during the open-water season for Patch and Windy lakes (Table 3.3-17). Total lead concentrations in the reference lake during the open-water season was greater than the DL for the first time since 2018 (Figure 3.3-17a).

Graphical analyses indicated that all three exposure lake samples were less than their respective, calculated total lead benchmarks (0.001 to 0.0027 mg/L; Figures 3.3-17a and 3.3-17b).

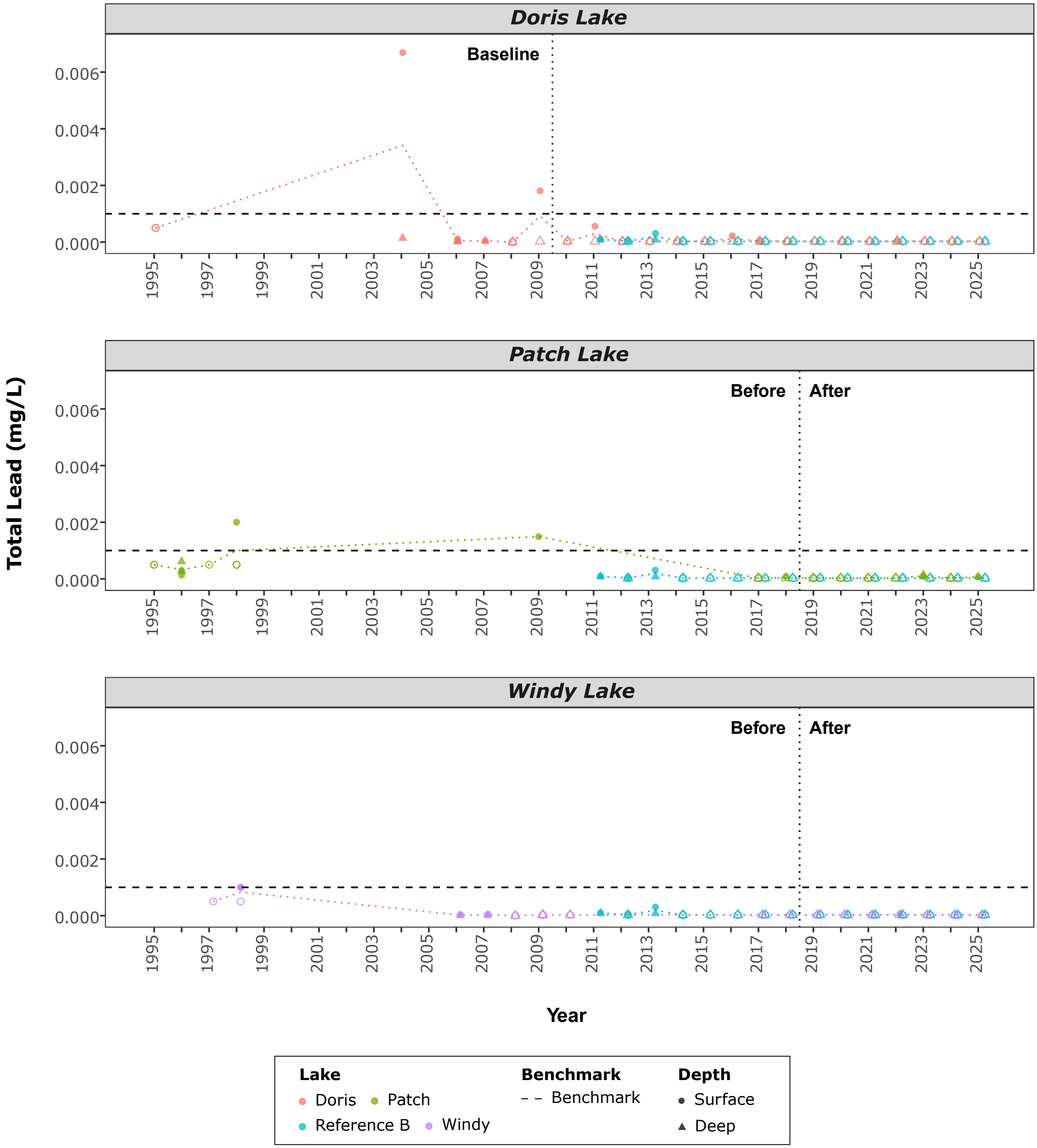
No effects were detected for total lead in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total lead were not exceeded in 2025.

TABLE 3.3-17 STATISTICAL RESULTS FOR TOTAL LEAD IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	-	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	No (0.070)	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	No (0.004)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

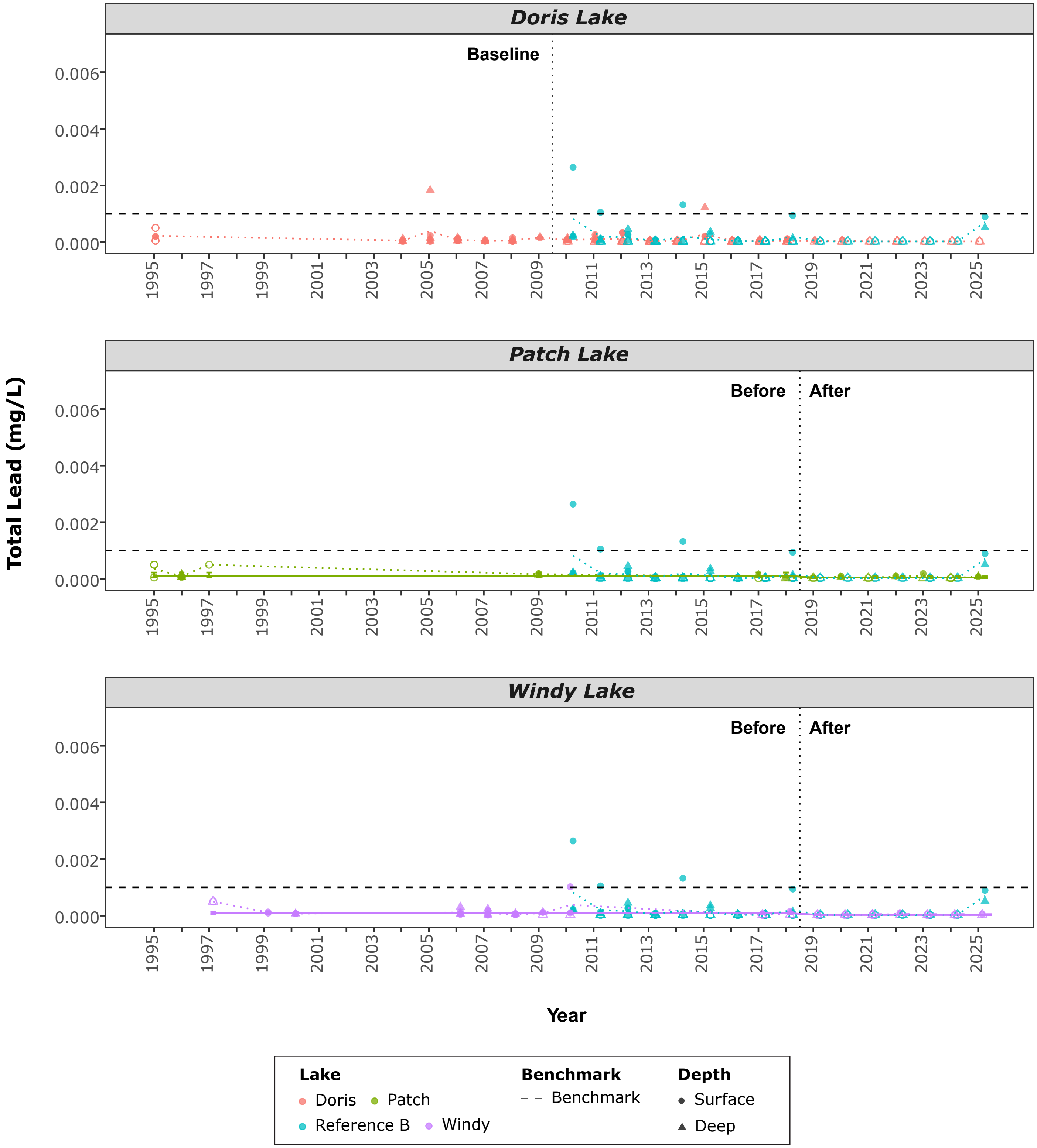
FIGURE 3.3-17A UNDER-ICE TOTAL LEAD IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:41

FIGURE 3.3-17B OPEN-WATER TOTAL LEAD IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

3.3.18 DISSOLVED MANGANESE

Statistical analyses indicated a significant change over time for dissolved manganese concentrations in Doris Lake during the open-water season, but no change relative to the reference lake was observed (Table 3.3-18). Statistical analyses indicated no significant change over time for dissolved manganese concentrations in Doris Lake during the under-ice season or between the before and after period means in Patch or Windy lakes.

Graphical analyses indicated that all three exposure lake samples were less than their respective calculated dissolved manganese benchmarks (0.19 to 0.39 mg/L; Figures 3.3-18a and 3.3-18b).

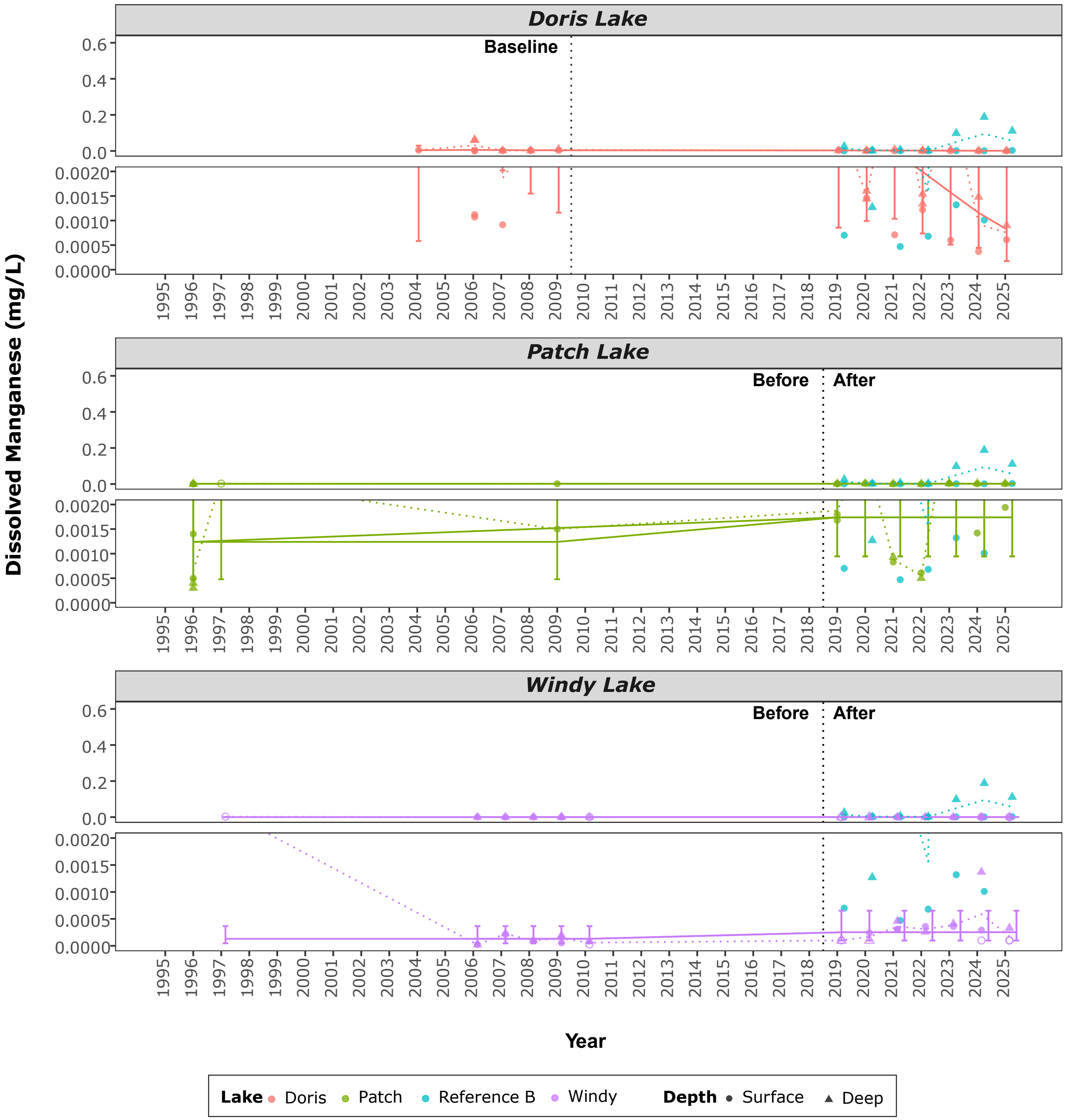
No effects were detected for dissolved manganese in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for dissolved manganese were not exceeded in 2025.

TABLE 3.3-18 STATISTICAL RESULTS FOR DISSOLVED MANGANESE IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (p value)	Significant Trend Relative to Reference Lake B (p value)	Significant Before-After Change (p value)	Significant Before-After Change Relative to Reference Lake (p value)
Doris	Under-ice	No (0.126)	-	NA	NA
	Open-water	Yes (< 0.001)	No (0.447)	NA	NA
Patch	Under-ice	NA	NA	No (0.513)	-
	Open-water	NA	NA	No (0.312)	-
Windy	Under-ice	NA	NA	No (0.328)	-
	Open-water	NA	NA	No (0.095)	-

Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-18A UNDER-ICE DISSOLVED MANGANESE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

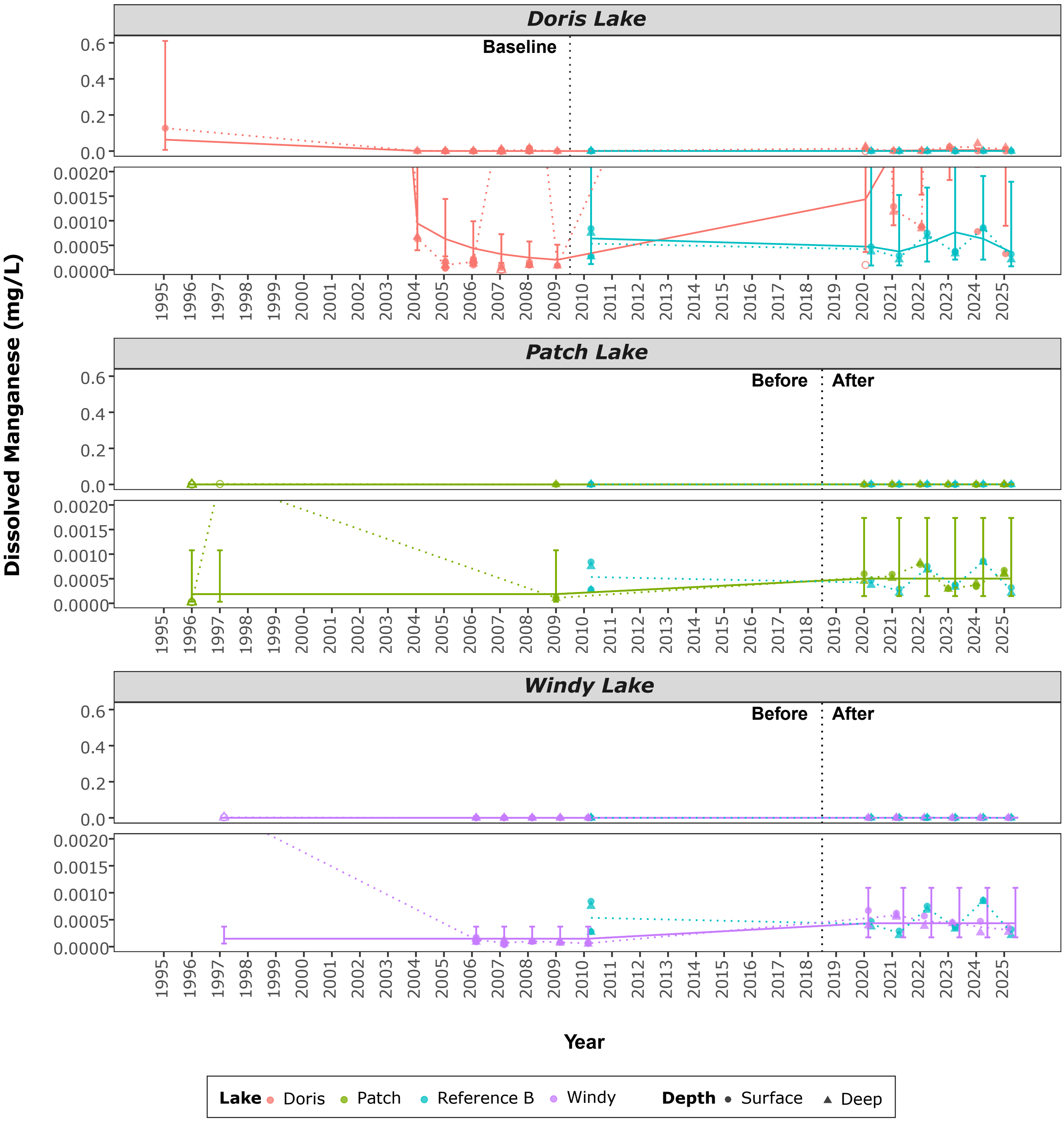


Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is pH and hardness dependent (see Table 2.2-2).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:43

FIGURE 3.3-18B OPEN-WATER DISSOLVED MANGANESE IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is pH and hardness dependent (see Table 2.2-2).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:44

3.3.19 TOTAL MERCURY

Statistical analyses indicated a significant change over time for total mercury concentrations in Doris Lake during both seasons, but no change relative to the reference lake (Table 3.3-19). Statistical analyses indicated no significant change between the before and after period means in Patch Lake during the open-water season (Table 3.3-19). Analyses were not completed for Patch Lake during the under-ice season and for Windy Lake during both seasons due to the high proportion of data that were less than the DL over time (Table 3.3-19; Section C.3.1.19 in Appendix C). The DLs have varied over time (0.00005 to 0.0000001 mg/L) as laboratory precision for trace mercury has improved. From 1995 to 2000, the DL was as high as 0.00005 mg/L, and baseline observations for Patch and Windy lakes are biased by the higher DLs in those years (Figures 3.3-19a and 3.3-19b). Total mercury concentrations remained low (< 0.00000057 mg/L) in Patch and Windy lakes, while the highest concentrations were observed during the open-water season in Doris Lake in 2025 (mean total mercury 0.00000077 mg/L).

Graphical analyses indicated that total mercury concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-19a and 3.3-19b).

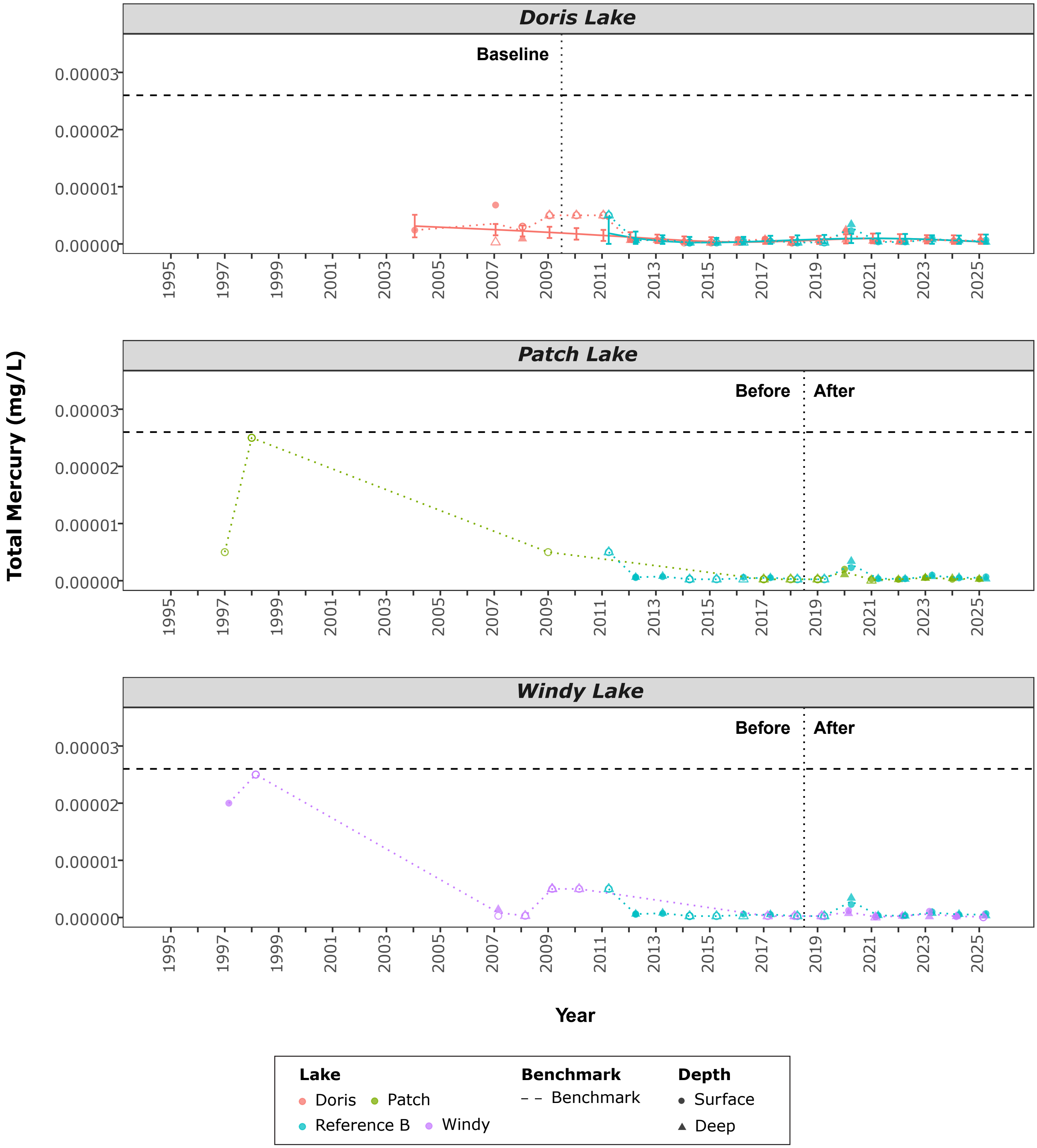
No effects were detected for total mercury in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total mercury were not exceeded in 2025.

TABLE 3.3-19 STATISTICAL RESULTS FOR TOTAL MERCURY IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	Yes (0.012)	No (0.830)	NA	NA
	Open-water	Yes (< 0.001)	No (0.837)	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	No (0.993)	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-19A UNDER-ICE TOTAL MERCURY IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

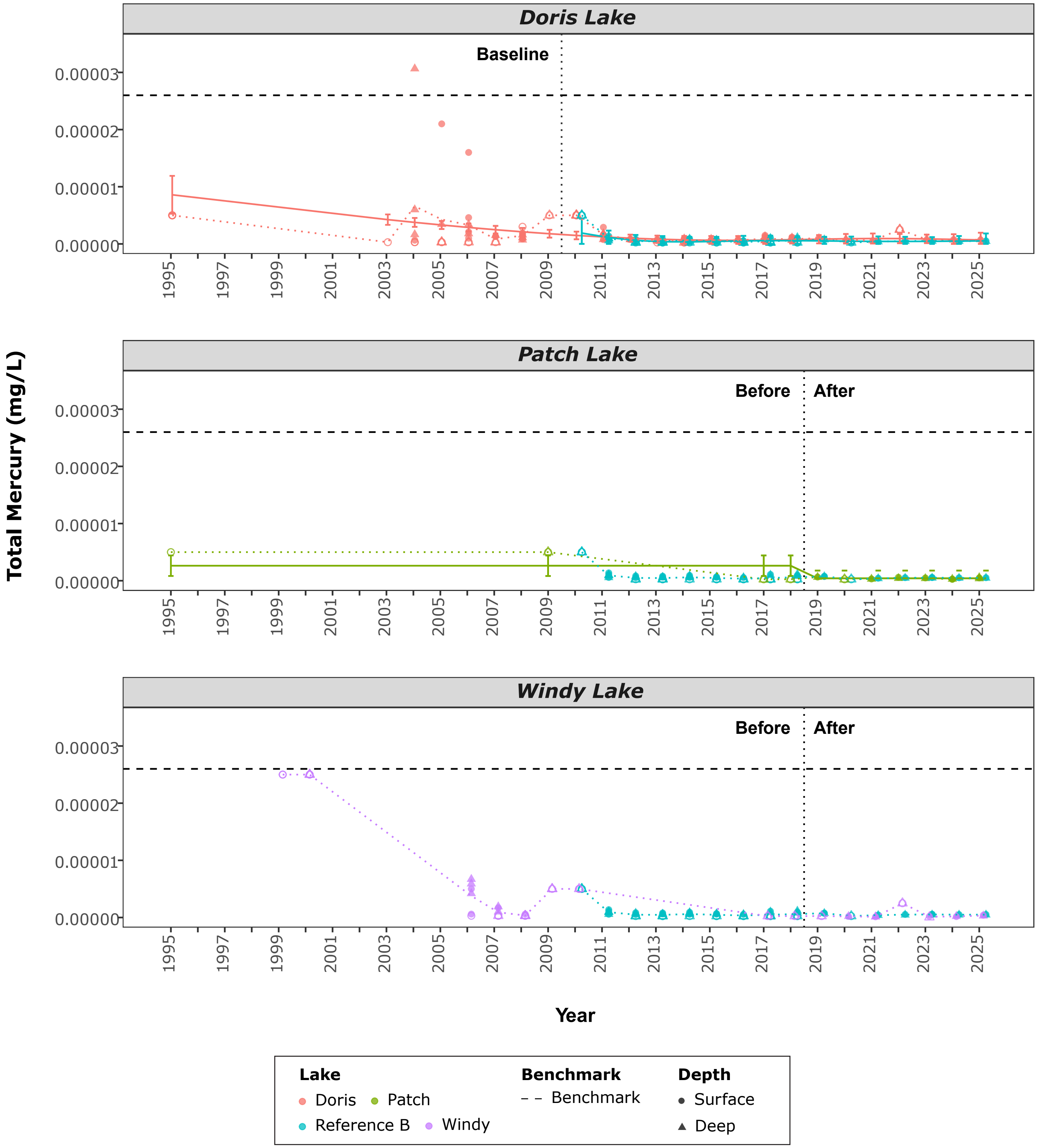


Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.000026 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:45

FIGURE 3.3-19B   OPEN-WATER TOTAL MERCURY IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.000026 mg/L

3.3.20 TOTAL MOLYBDENUM

Statistical analyses indicated a significant change over time for total molybdenum concentrations in Doris Lake during both seasons (Table 3.3-20). Statistical comparison to the reference lake was not completed due to the high proportion of data that were less than the DL (Section C.3.1.20 in Appendix C). Graphical analyses of mean total molybdenum concentrations for Doris Lake indicated a potential increasing trend during both seasons since 2022 (Figures 3.3-20a and 3.3-20b). Concentrations observed in 2025 (under-ice mean = 0.000290 mg/L; open-water mean = 0.000261 mg/L) were elevated by 12 to 15 percent compared to 2024 concentrations (under-ice mean = 0.000252 mg/L; open-water mean = 0.000232 mg/L). However, an increase in concentrations was also observed at the reference lake during both seasons since 2023 (2023 under-ice mean = 0.000065 mg/L; 2023 open-water mean = 0.000060 mg/L; Table A.3.5), suggesting that regional or outside influences may be impacting molybdenum concentrations independent of Mine-related activities. Statistical analyses indicated there was no significant difference between the before and after period means for total molybdenum concentrations in Patch or Windy lakes (Table 3.3-20).

Graphical analyses indicated that total molybdenum concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-20a and 3.3-20b).

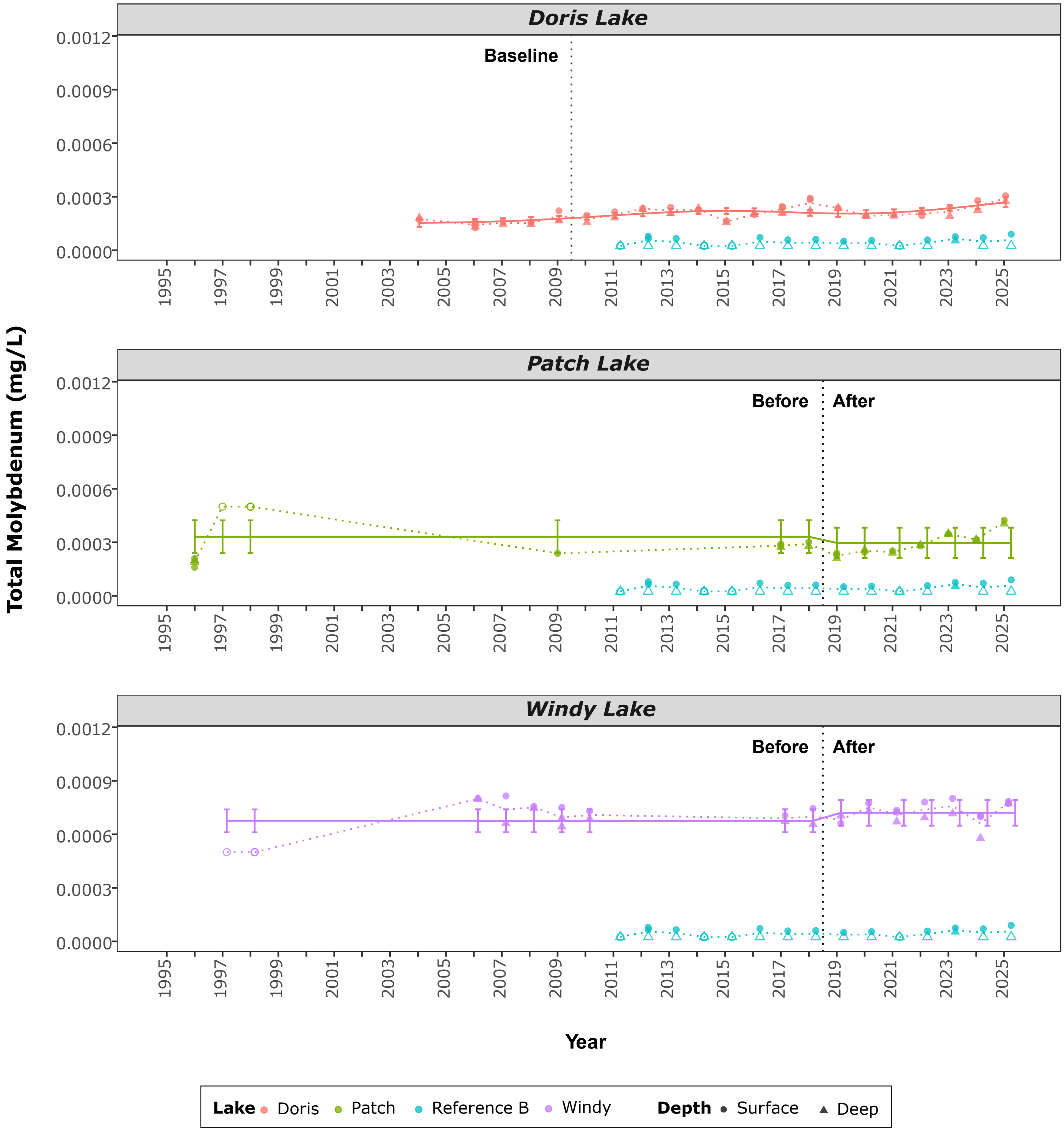
No effects were detected for total molybdenum in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total molybdenum were not exceeded in 2025.

TABLE 3.3-20 STATISTICAL RESULTS FOR TOTAL MOLYBDENUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	Yes (< 0.001)	-	NA	NA
	Open-water	Yes (< 0.001)	-	NA	NA
Patch	Under-ice	NA	NA	No (0.552)	-
	Open-water	NA	NA	No (0.945)	-
Windy	Under-ice	NA	NA	No (0.225)	-
	Open-water	NA	NA	No (0.603)	-

Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-20A UNDER-ICE TOTAL MOLYBDENUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

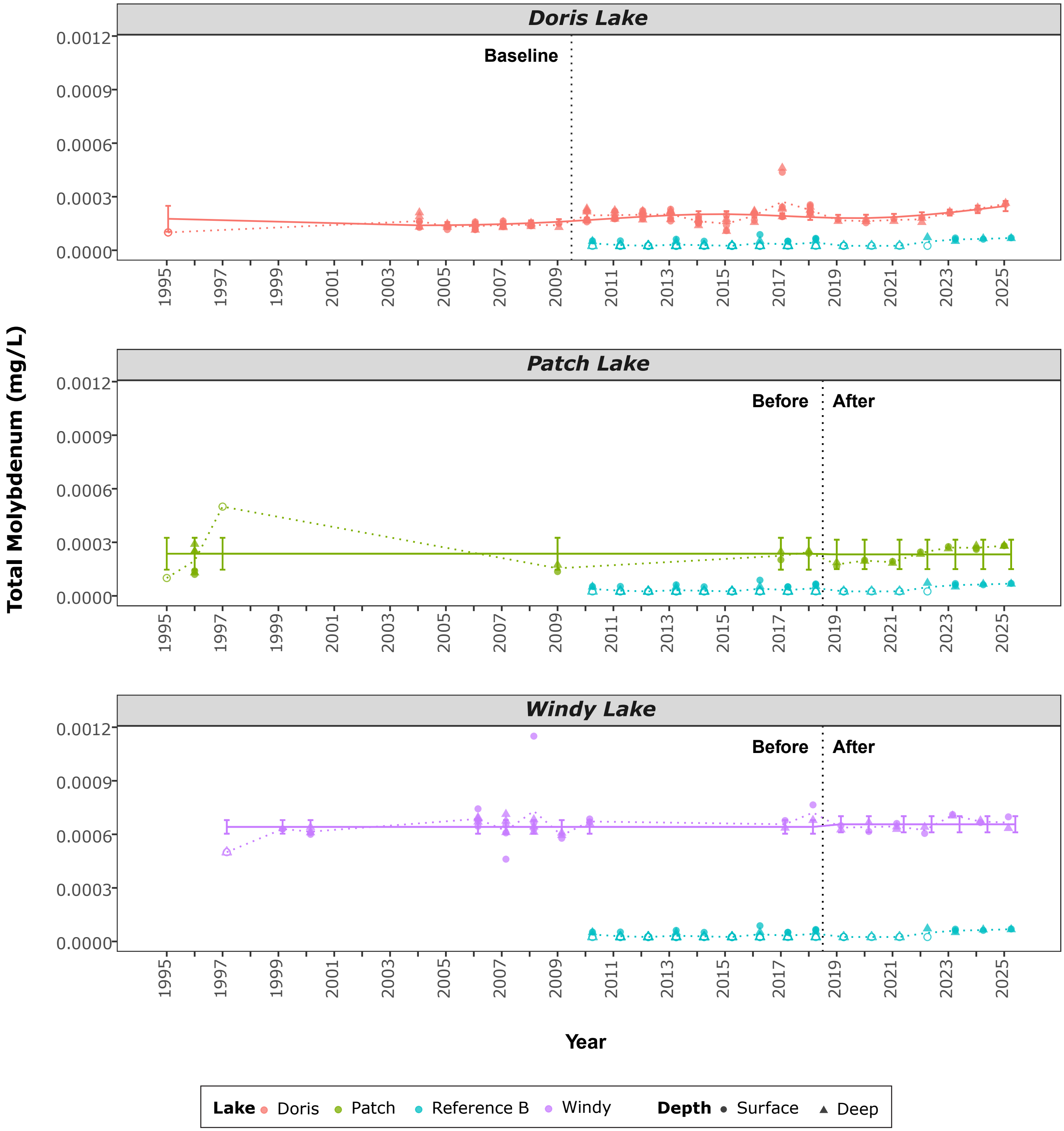


Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.073 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:47

FIGURE 3.3-20B OPEN-WATER TOTAL MOLYBDENUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.073 mg/L

3.3.21 TOTAL NICKEL

Statistical analyses indicated no significant changes over time for total nickel concentrations in Doris Lake or between the before and after period means during the open-water season in Patch Lake and during both seasons in Windy lakes (Table 3.3-21). Statistical analyses indicated a significant difference between the before and after period means during the under-ice season in Patch Lake, but not relative to the reference lake (Table 3.3-21).

Graphical analyses indicated that 2025 mean under-ice concentrations (surface = 0.00120 mg/L; deep = 0.0.00121 mg/L) in Patch Lake were elevated compared to baseline values (Figure 3.3-21a). Patch Lake under-ice values in 2025 did not exceed 75 percent of the calculated benchmarks (0.0641 to 0.0653 mg/L).

Total nickel concentrations in all three exposure lakes were less than their calculated benchmarks in 2025 (Figures 3.3-21a and 3.3-21b).

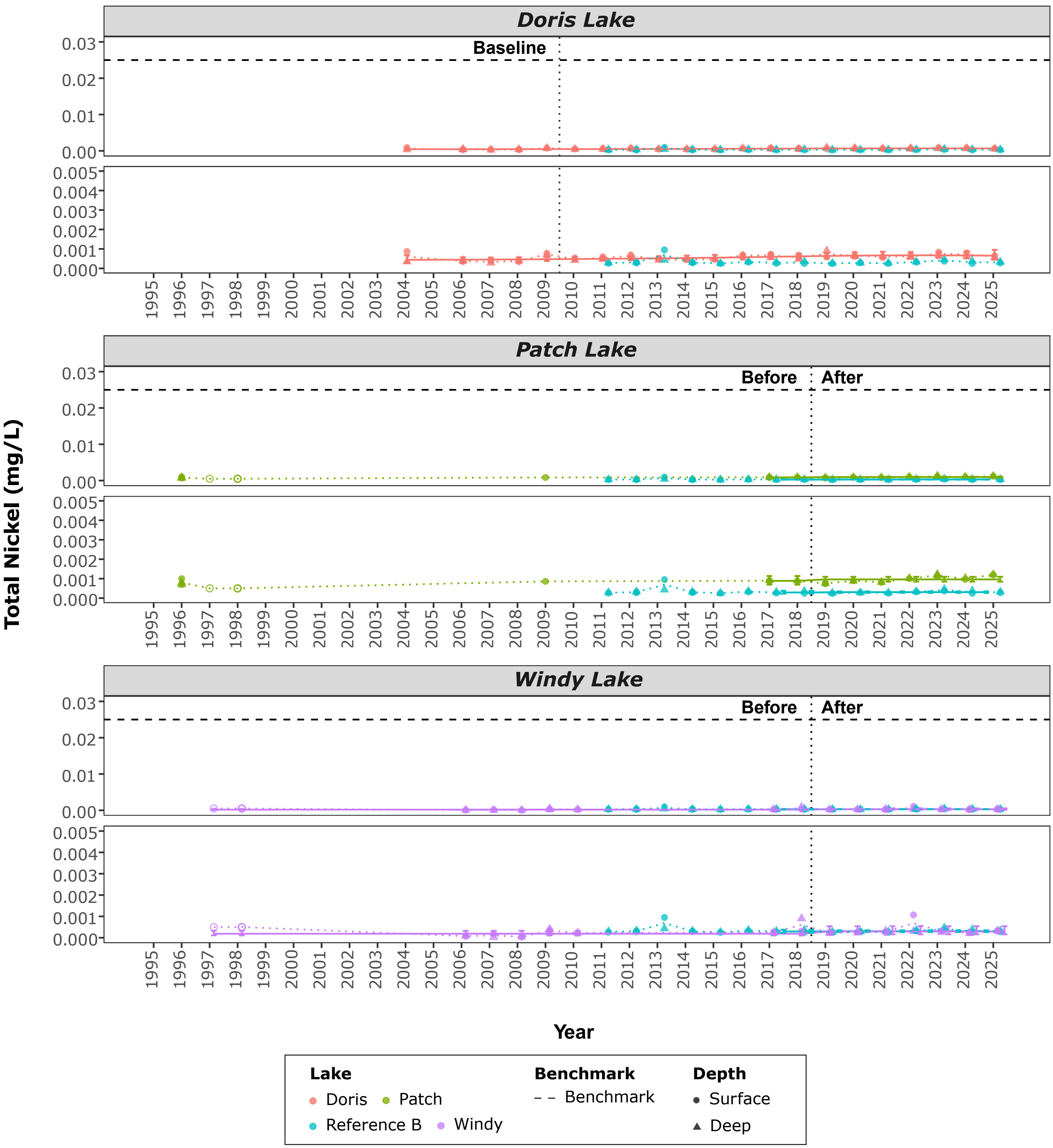
No effects were detected for total nickel in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total nickel were not exceeded in 2025.

TABLE 3.3-21 STATISTICAL RESULTS FOR TOTAL NICKEL IN THE EXPOSURE LAKES, 2025

Lake	**Season**	**Trend Analysis**		**BACI**	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	No (0.051)	-	NA	NA
	Open-water	No (0.068)	-	NA	NA
Patch	Under-ice	NA	NA	Yes (0.043)	No (0.634)
	Open-water	NA	NA	No (0.380)	-
Windy	Under-ice	NA	NA	No (0.245)	-
	Open-water	NA	NA	No (0.111)	-

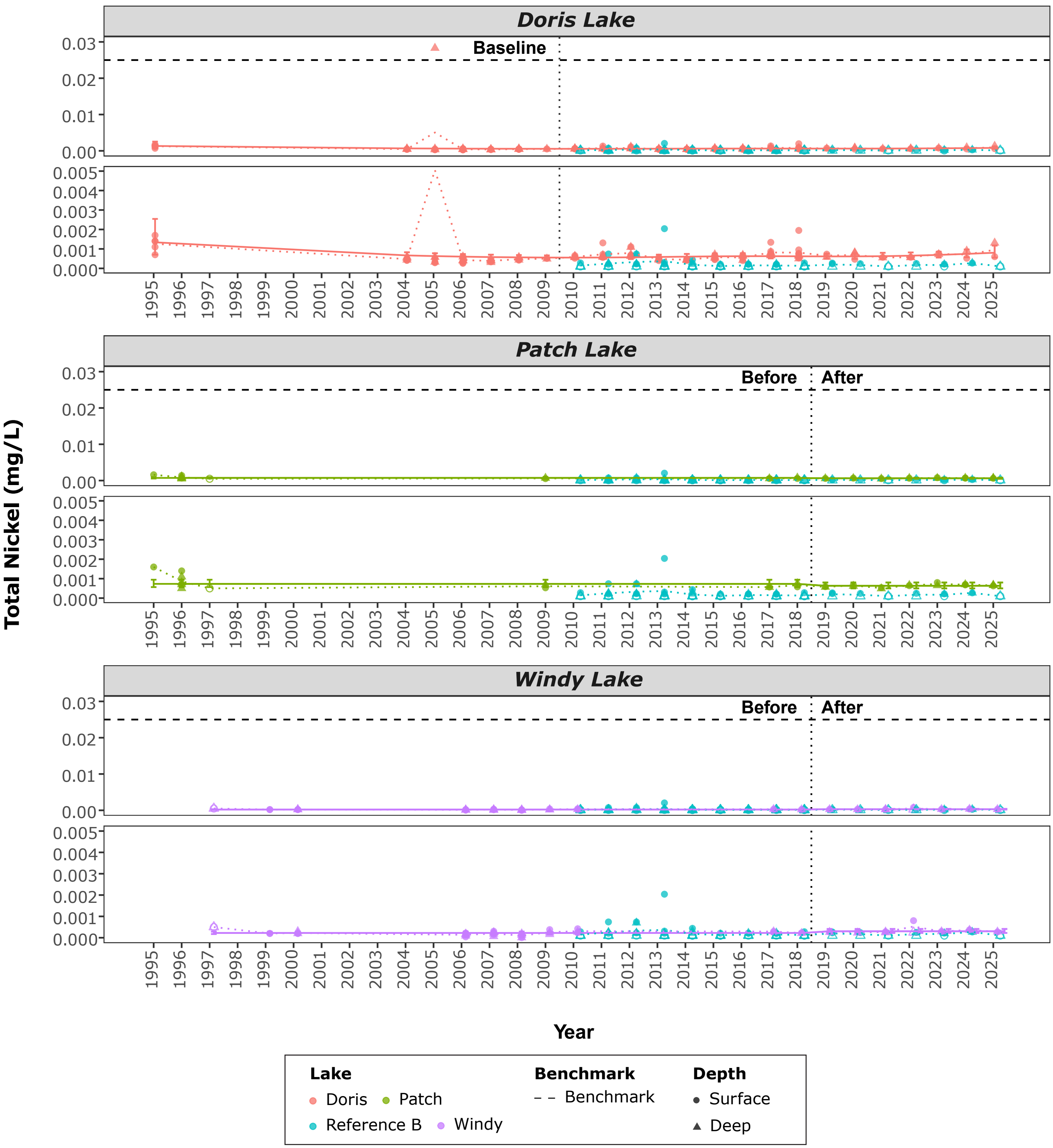
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-21A UNDER-ICE TOTAL NICKEL IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

FIGURE 3.3-21B OPEN-WATER TOTAL NICKEL IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is hardness dependent (see Table 2.2-2).

3.3.22 TOTAL SELENIUM

Statistical analyses for total selenium were not completed for any exposure lakes due to the high proportion of data which were less than the DL (Table 3.3-22; Section C.3.1.22 in Appendix C).

Graphical analyses indicated that total selenium concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-22a and 3.3-22b).

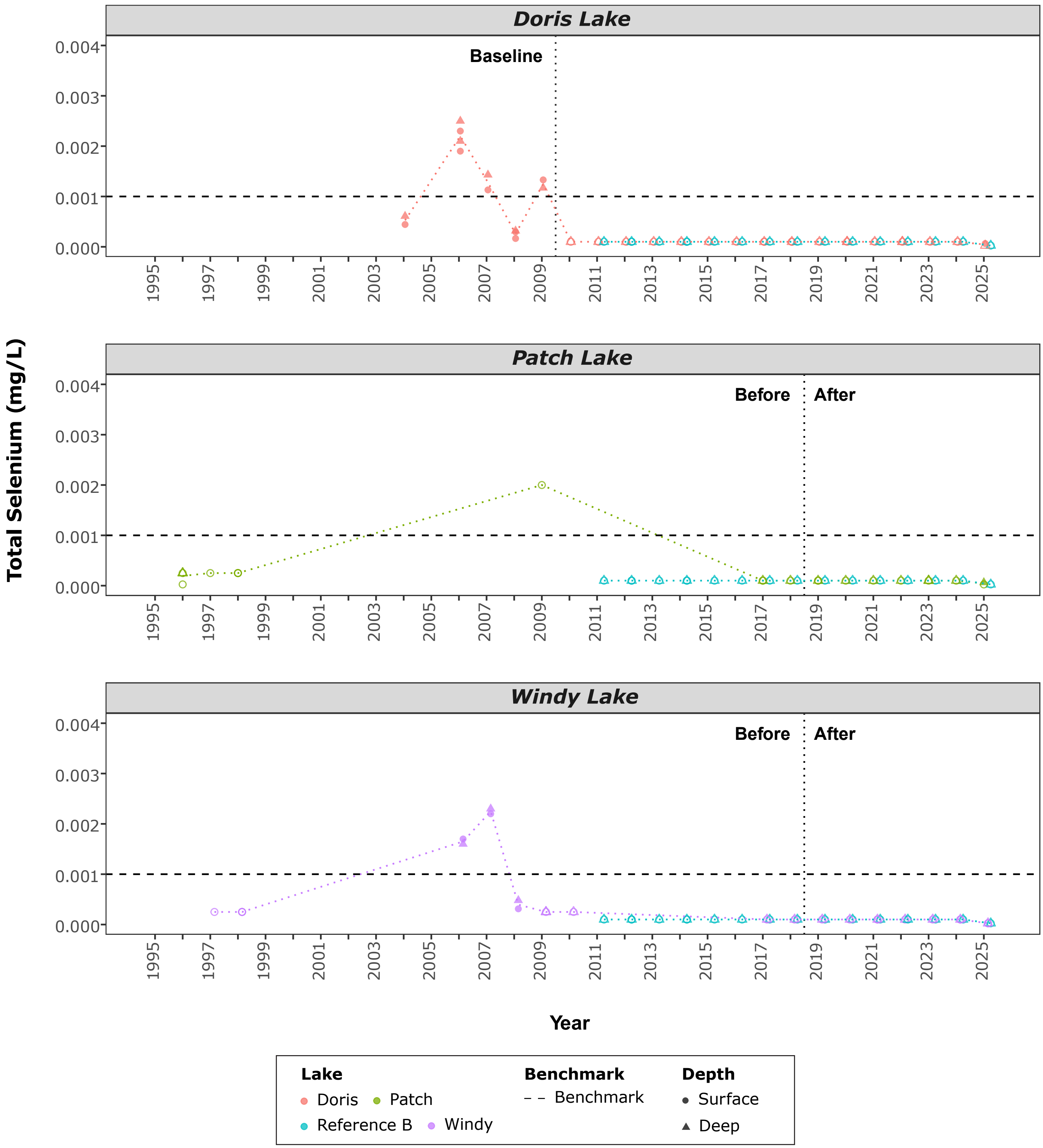
No effects were detected for total selenium in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total selenium were not exceeded in 2025.

TABLE 3.3-22 STATISTICAL RESULTS FOR TOTAL SELENIUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	-	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

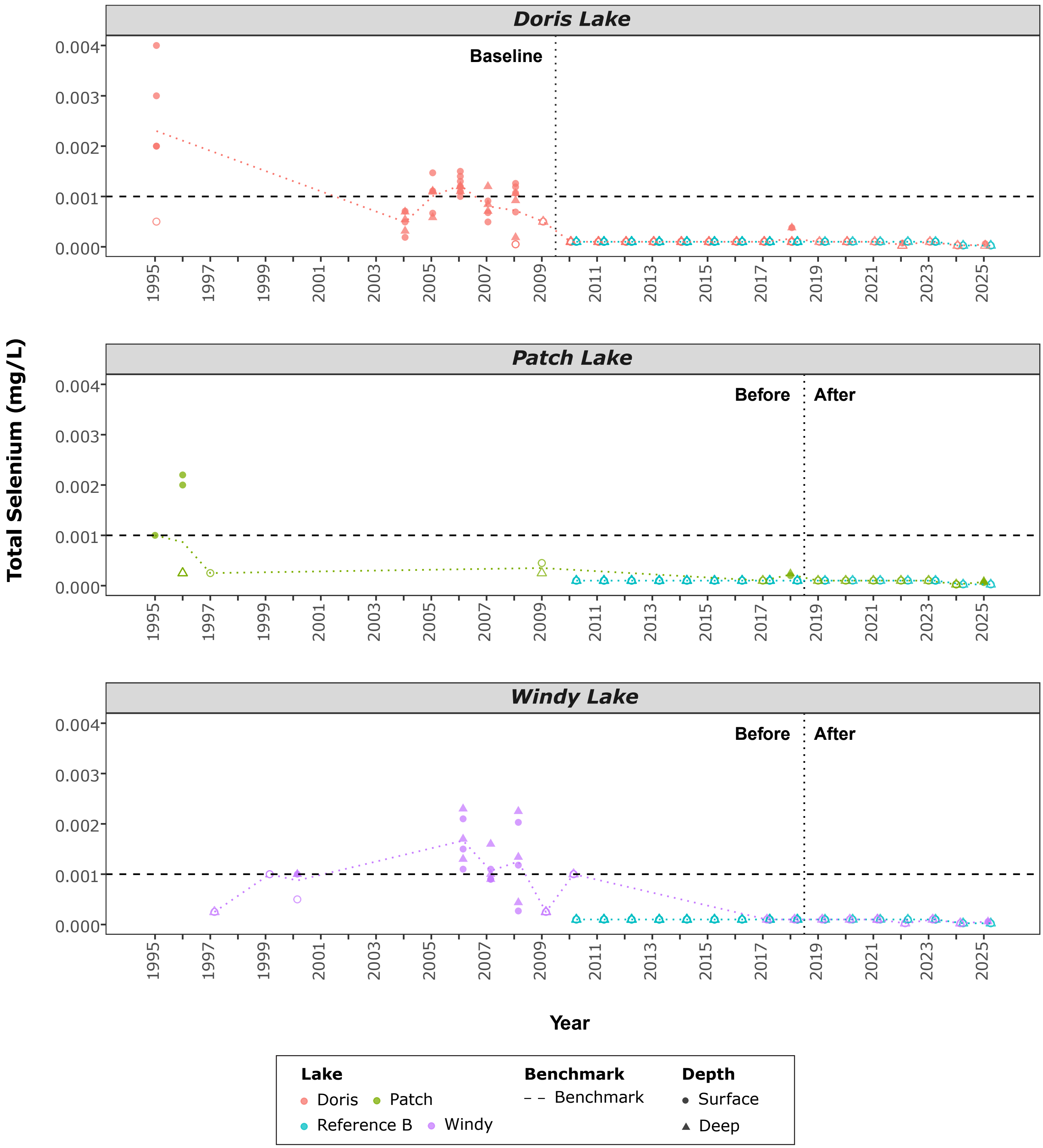
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-22A UNDER-ICE TOTAL SELENIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.001 mg/L

FIGURE 3.3-22B OPEN-WATER TOTAL SELENIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.001 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:52

3.3.23 TOTAL SILVER

Statistical analyses for total silver were not completed for any exposure lakes as all data collected in 2025 were less than the DL, with the exception of Doris under-ice (< 0.0000050 mg/L; Table 3.3-23; Section C.3.1.23 in Appendix C).

Graphical analyses indicated that total silver concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-23a and 3.3-23b).

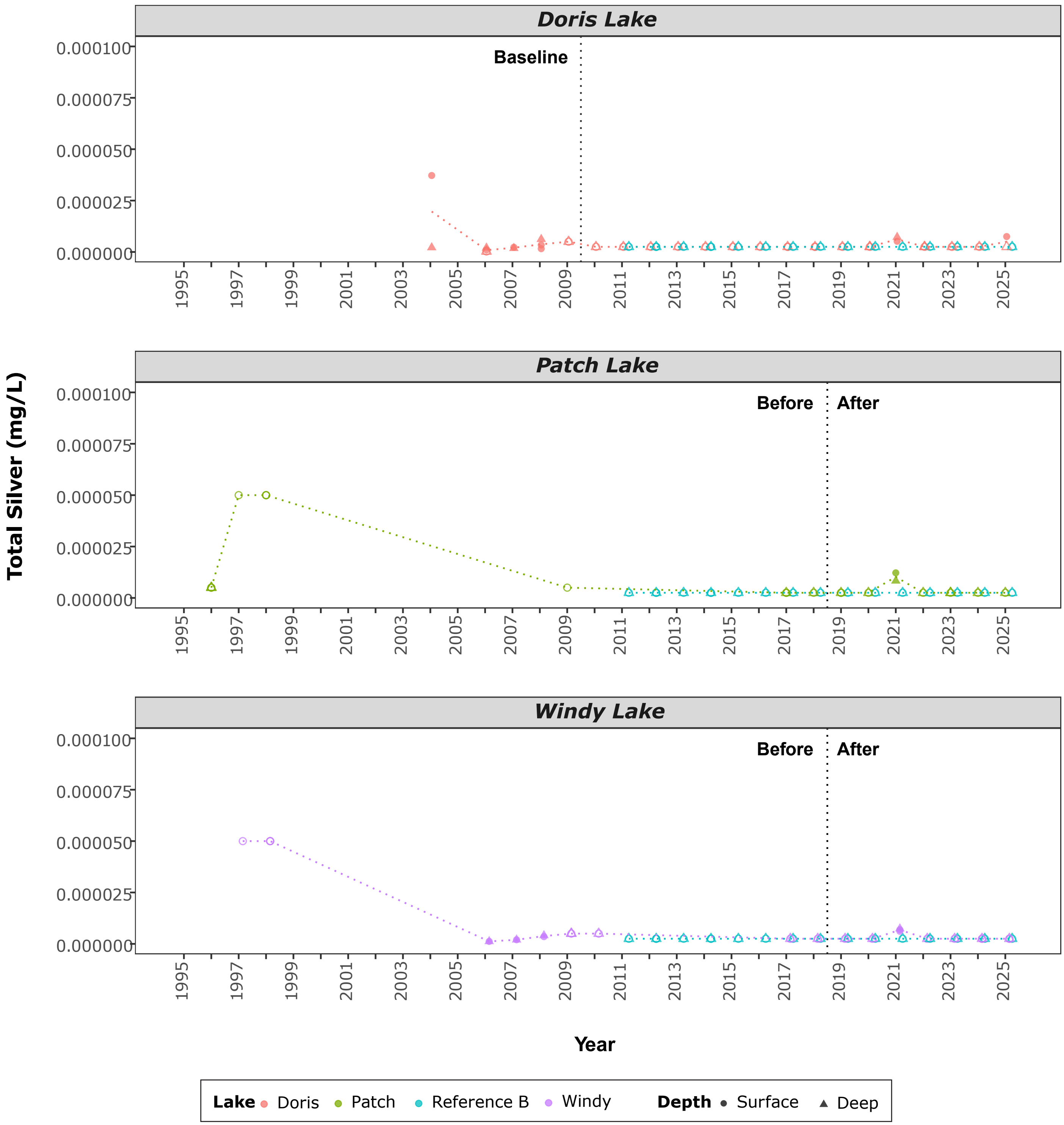
No effects were detected for total silver in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total silver were not exceeded in 2025.

TABLE 3.3-23 STATISTICAL RESULTS FOR TOTAL SILVER IN THE EXPOSURE LAKES, 2025

Lake	**Season**	**Trend Analysis**		**BACI**	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	-	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

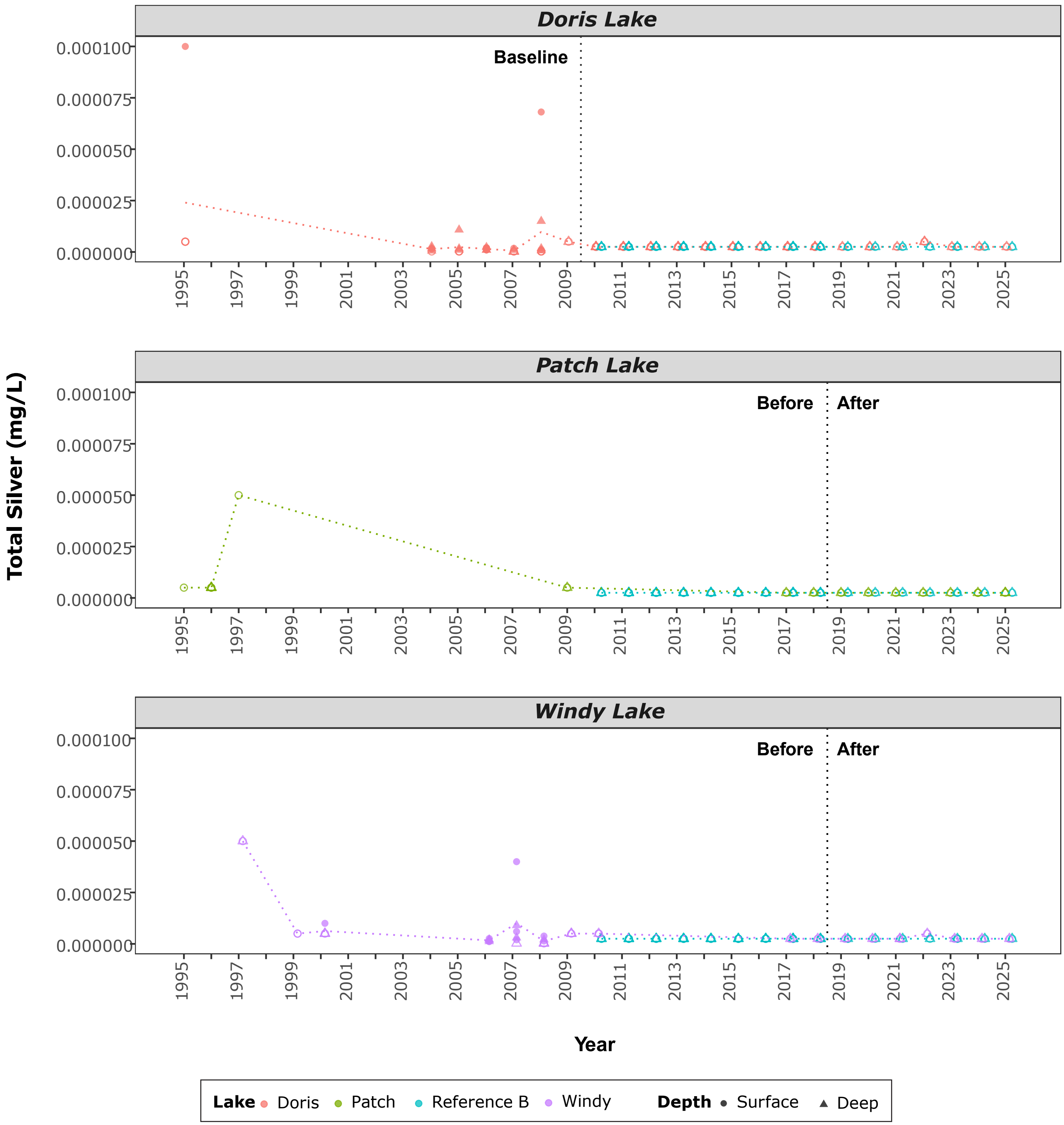
FIGURE 3.3-23A UNDER-ICE TOTAL SILVER IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.00025 mg/L

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:53

FIGURE 3.3-23B OPEN-WATER TOTAL SILVER IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.00025 mg/L

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:54

3.3.24 TOTAL THALLIUM

Statistical analyses for total thallium were not completed for any exposure lakes due to the high proportion of data, including all 2025 observations, which were less than the DL (< 0.0000050 mg/L; Table 3.3-24; Section C.3.1.23 in Appendix C).

Graphical analyses indicated that total thallium concentrations in all three exposure lakes were less than the DL and the benchmark in 2025 (Figures 3.3-24a and 3.3-24b).

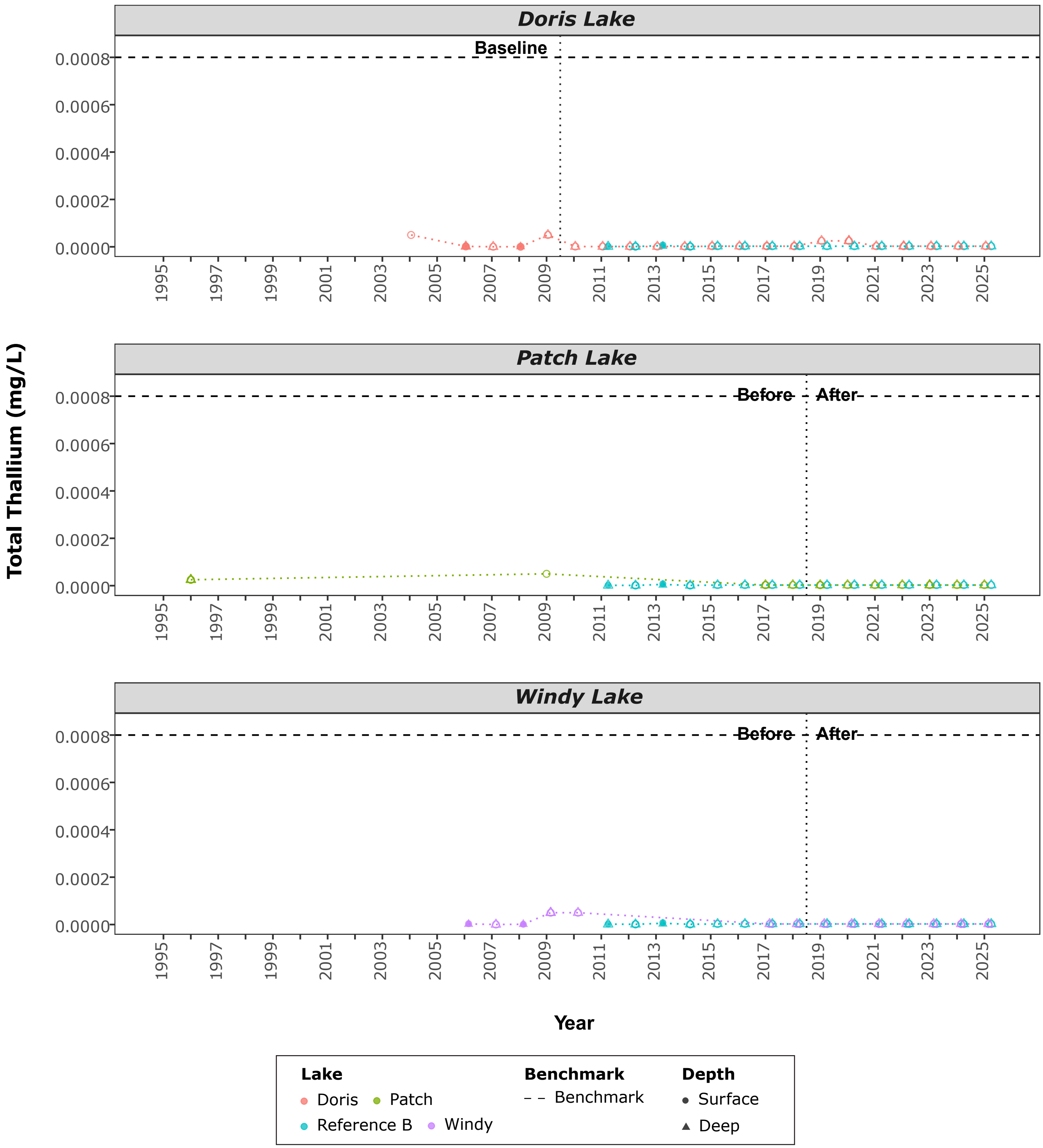
No effects were detected for total thallium in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total thallium were not exceeded in 2025.

TABLE 3.3-24 STATISTICAL RESULTS FOR TOTAL THALLIUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	-	-	NA	NA
	Open-water	-	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

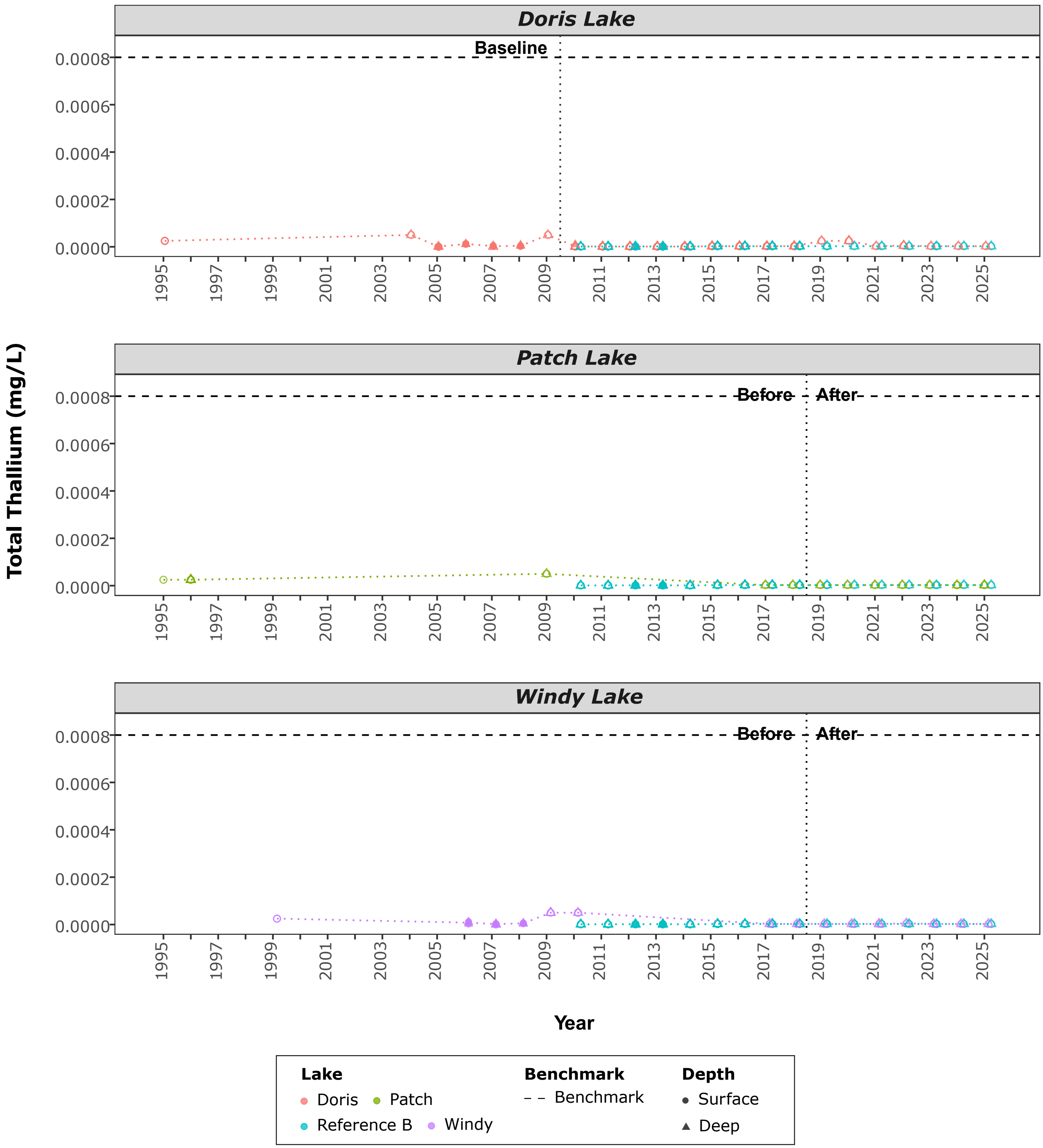
Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-24A UNDER-ICE TOTAL THALLIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.0008 mg/L

FIGURE 3.3-24B OPEN-WATER TOTAL THALLIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.0008 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:56

3.3.25 TOTAL URANIUM

Statistical analyses indicated a significant change over time for total uranium concentrations during the under-ice season in Doris Lake and relative to the reference lake (Table 3.3-25). There are no data for total uranium during baseline years during the under-ice season at the reference lake for comparison (Figures 3.3-25a and 3.3-25b). A significant change over time for total uranium concentrations was also observed during the open-water season, but not relative to the reference lake (Table 3.3-25). Graphical analyses indicated that mean total uranium concentrations in 2025 were within the baseline range for Doris Lake and that concentrations have been stable, ranging within 10 percent year over year, since 2016 (Figures 3.3-25a and 3.3-25b). However, graphical analyses indicated an increase in the fitted means of total uranium in the reference lake since 2021, which may account for the significant change results of the trend analysis with Doris Lake (Figures 3.3-25a and 3.3-25b). Graphical observations indicated a potential increasing trend in total uranium for both seasons in the reference lake since 2022, suggesting that regional or outside influences may be impacting uranium concentrations independent of Mine-related activities.

Statistical analyses indicated no significant change between the before and after period means in Patch and Windy lakes during both seasons (Table 3.3-25). Total uranium concentrations in all three exposure lakes were less than the benchmark in 2025 (Figures 3.3-25a and 3.3-25b).

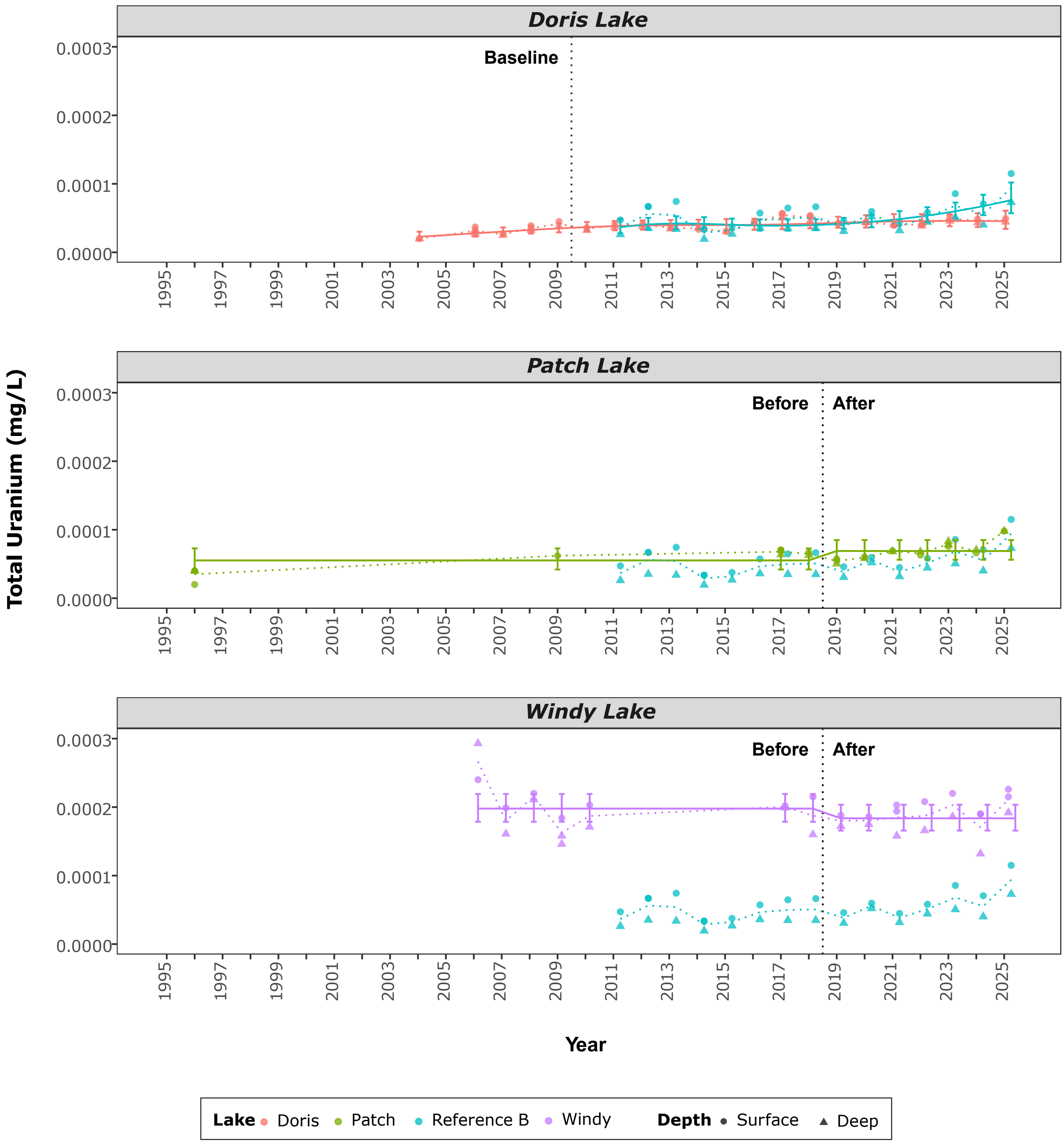
No effects were detected for total uranium in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for total uranium were not exceeded in 2025.

TABLE 3.3-25 STATISTICAL RESULTS FOR TOTAL URANIUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Under-ice	Yes (< 0.001)	Yes (0.002)	NA	NA
	Open-water	Yes (0.011)	No (0.283)	NA	NA
Patch	Under-ice	NA	NA	No (0.179)	-
	Open-water	NA	NA	No (0.123)	-
Windy	Under-ice	NA	NA	No (0.285)	-
	Open-water	NA	NA	No (0.212)	-

Notes:
< = less than; BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.3-25A UNDER-ICE TOTAL URANIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

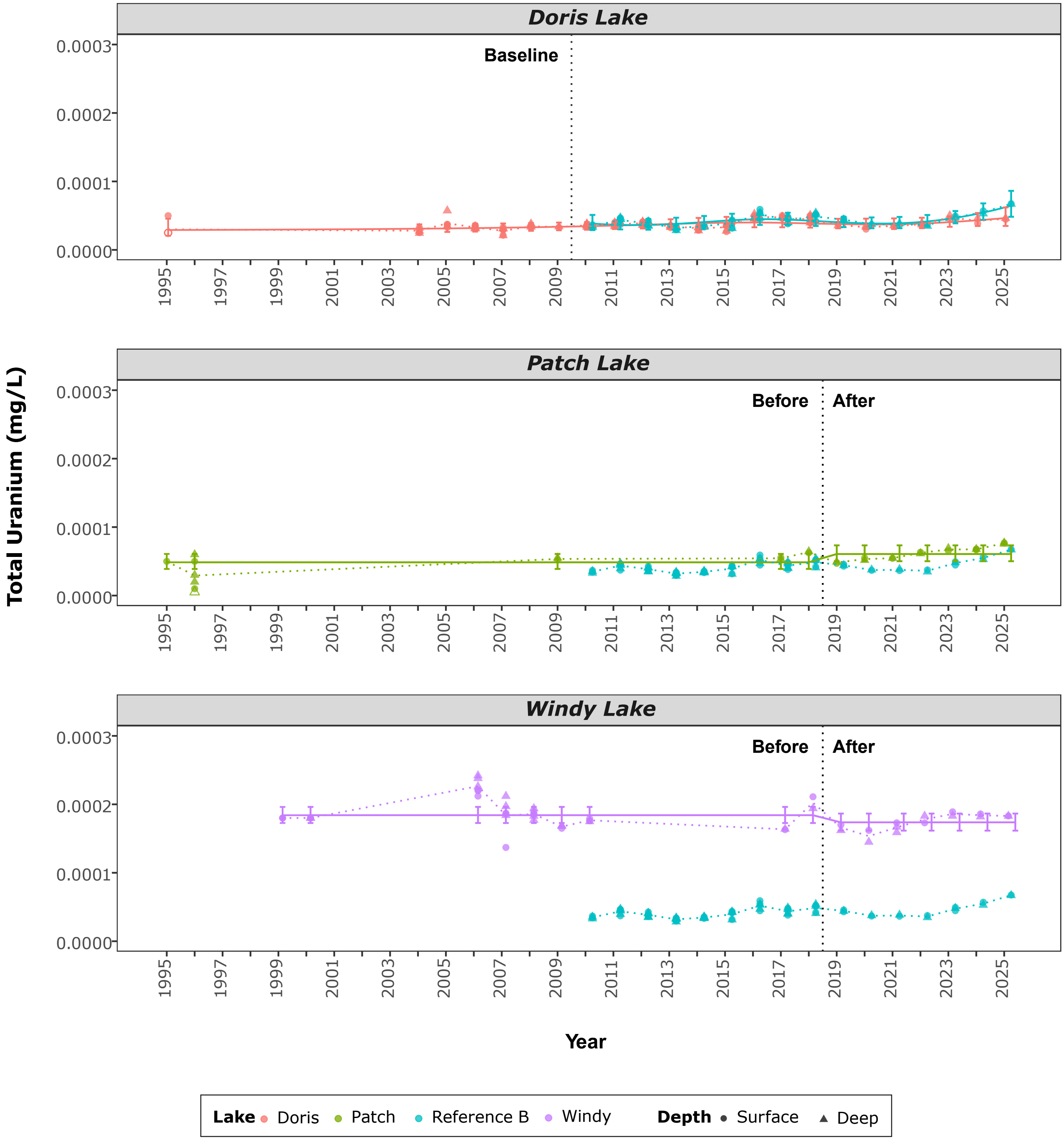


Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.015 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:57

FIGURE 3.3-25B OPEN-WATER TOTAL URANIUM IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is 0.015 mg/L

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:58

3.3.26 DISSOLVED ZINC

Statistical analysis indicated a significant change over time for dissolved zinc concentrations in Doris Lake during the under-ice season but not relative to the reference lake (Table 3.3-26). During the baseline years (1995 to 2009), under-ice dissolved zinc concentrations decreased in Doris Lake (0.0161 to < 0.00005 mg/L) and concentrations have been low (< 0.0010 to 0.0056 mg/L) during the available monitoring period years (2019 to 2025; Figures 3.3-26a and 3.3-26b). A decrease in dissolved zinc concentrations is not considered to be an adverse effect (TMAC 2018).

Statistical analyses were not completed for Patch and Windy lakes due to the high proportion of data that were less than the DL (Section C.3.1.14 in Appendix C).

Graphical analyses indicated that dissolved zinc concentrations were below the DL (< 0.0010 mg/L) during the open-water season during both seasons in Patch Lake (Figures 3.3-26a and 3.3-26b). Concentrations in all exposure lakes were less than their respective calculated dissolved zinc benchmarks (0.007 to 0.030 mg/L; Table 2.2-2; Table A.3-5 in Appendix A).

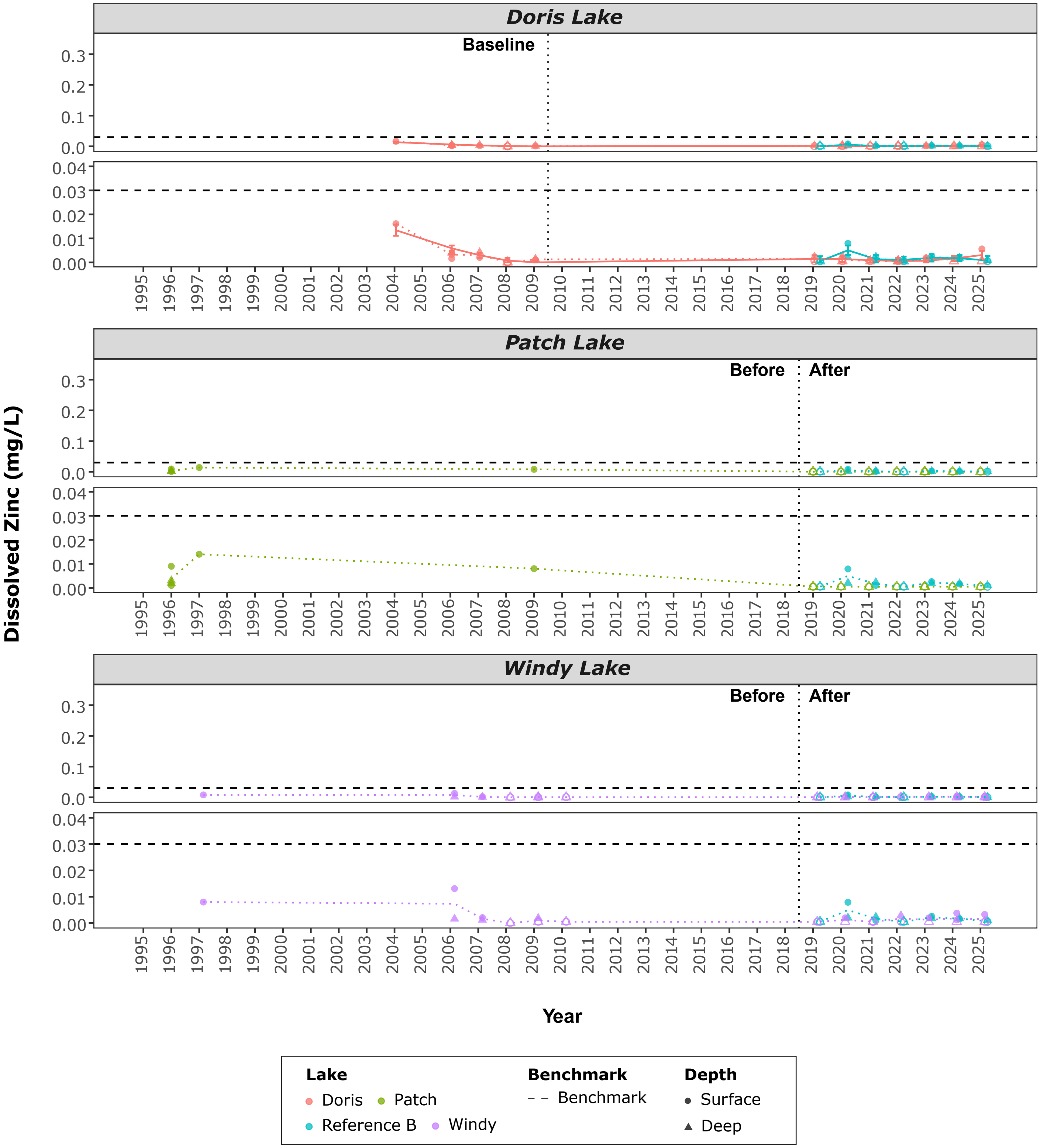
No effects were detected for dissolved zinc in Doris, Patch, or Windy lakes in 2025. The conditions required to consider a low action level for dissolved zinc were not exceeded in 2025.

TABLE 3.3-26 STATISTICAL RESULTS FOR DISSOLVED ZINC IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Under-ice	Yes (< 0.001)	No (0.083)	NA	NA
	Open-water	No (0.248)	-	NA	NA
Patch	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-
Windy	Under-ice	NA	NA	-	-
	Open-water	NA	NA	-	-

Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

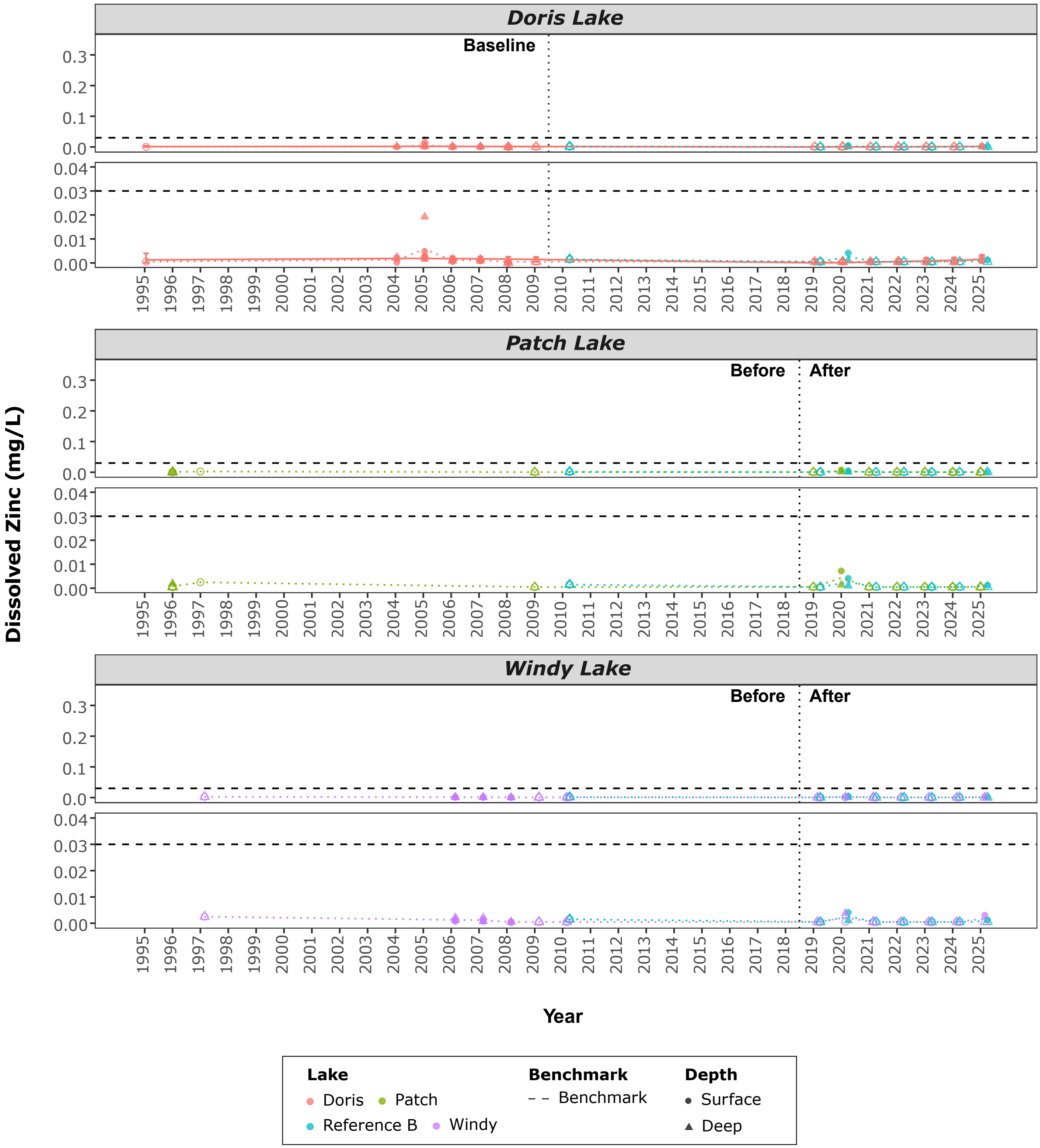
FIGURE 3.3-26A UNDER-ICE TOTAL ZINC IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is pH, hardness, and DOC dependent (see Table 2.2-2).

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:59

FIGURE 3.3-26B OPEN-WATER DISSOLVED ZINC IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
The benchmark is pH, hardness, and DOC dependent (see Table 2.2-2).

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:60

3.4 SEDIMENT QUALITY

3.4.1 ARSENIC

Statistical analyses indicated a significant change over time for sediment arsenic concentrations in Doris Lake, but no change relative to the reference lake (Table 3.4-1). Graphical analyses indicated a decrease in sediment arsenic concentrations in 2025 compared to 2022 and the 2009 baseline year (Figure 3.4-1). Mean sediment arsenic concentrations in Doris Lake decreased by 22 percent in 2025 compared to 2022. It is noted that a decrease in sediment arsenic concentrations is not considered an adverse effect (TMAC 2018).

Statistical analyses indicated no significant difference between the before and after period means for sediment arsenic concentrations in Patch Lake (Table 3.4-1). Graphical observations indicated a decrease in sediment arsenic concentrations in Patch Lake in 2025 compared to 2022 and the 2017 and 2018 baseline years (Figure 3.4-1). Mean sediment arsenic concentrations in Patch Lake in 2025 were the lowest observed since 2009. Although arsenic concentrations in Doris and Patch lake sediments exceeded the ISQG benchmark in 2025, concentrations remained below the PEL low action condition (75 percent PEL benchmark = 12.75 mg/kg; Figure 3.4-1; TMAC 2018).

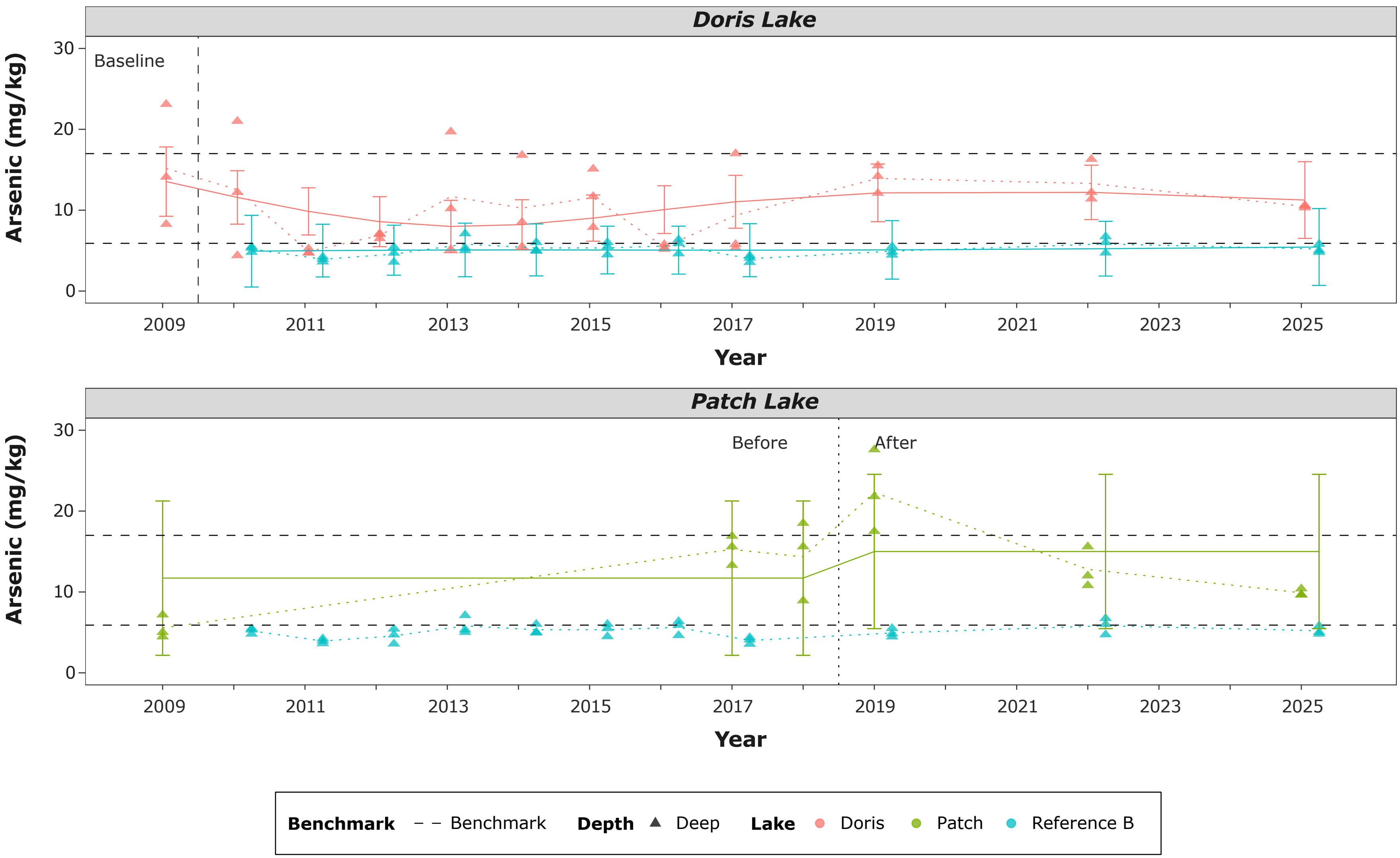
No effects were detected for arsenic in Doris or Patch lake sediments in 2025. The conditions required to consider a low action level for sediment quality arsenic were not exceeded in 2025.

TABLE 3.4-1 STATISTICAL RESULTS FOR ARSENIC IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	Yes (0.029)	No (0.397)	NA	NA
Patch	Open-water	NA	NA	No (0.536)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.4-1 ARSENIC CONCENTRATIONS IN LAKE SEDIMENTS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
PEL guideline (17 mg/kg)

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:61

3.4.2 CADMIUM

Statistical analyses indicated no significant change over time for cadmium concentrations in Doris Lake (Table 3.4-2). Graphical observations indicated minimally higher (< 1 percent) mean cadmium concentrations in Doris Lake sediments in 2025 compared to 2024, but 36 percent lower concentrations compared to the 2009 baseline year (Figure 3.4-2). A decrease in sediment cadmium concentrations is not considered an adverse effect (TMAC 2018).

Statistical analyses indicated no significant difference between the before and after period means for sediment cadmium concentrations in Patch Lake (Table 3.4-2). Graphical analyses indicated stable cadmium concentrations in Patch Lake sediments since 2009 (Figure 3.4-2); however, mean sediment cadmium concentrations in 2025 decreased by 24 percent compared to 2022. Sediment cadmium concentrations in Doris or Patch lakes have never exceeded the ISQG benchmark (Figure 3.4-2).

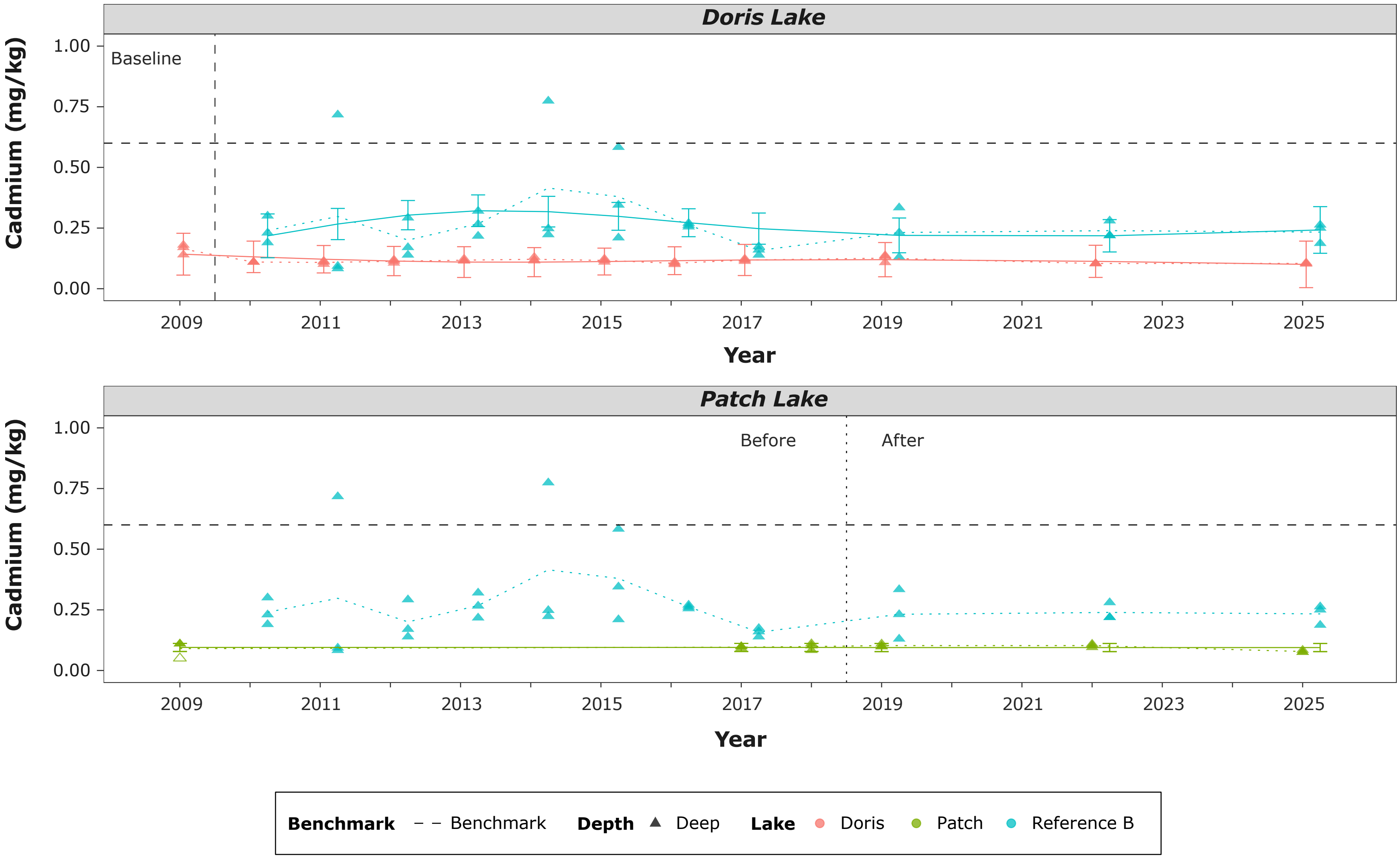
No effects were detected for cadmium in Doris or Patch lake sediments in 2025. The conditions required to consider a low action level for sediment quality cadmium were not exceeded in 2025.

TABLE 3.4-2 STATISTICAL RESULTS FOR CADMIUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	No (0.866)	-	NA	NA
Patch	Open-water	NA	NA	No (0.961)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.4-2 CADMIUM CONCENTRATIONS IN LAKE SEDIMENTS, HOPE BAY AQUATIC EFFECTS



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
PEL guideline (3.5 mg/kg) is not shown on figure

3.4.3 CHROMIUM

Statistical analyses indicated no significant change over time for chromium concentrations in Doris Lake (Table 3.4-3). Graphical analyses indicated minimally higher (< 2 percent) mean chromium concentrations in 2025 compared to 2024 and overall stable concentrations in Doris Lake since 2009 that have varied less than 10 percent (Figure 3.4-3).

Statistical analyses indicated no significant difference between the before and after period means for sediment chromium concentrations in Patch Lake (Table 3.4-3). Graphical analyses indicated mean sediment chromium concentrations in Patch Lake were 14 percent lower in 2025 compared to 2024 (Figure 3.4-3). Mean sediment chromium concentrations in Patch Lake in 2025 were the lowest since sampling began in 2009 (Table A.3-9).

All sediment chromium samples in Doris and Patch lakes exceeded the PEL low action level benchmark (75 percent PEL = 67.5 mg/kg; Figure 3.4-3). Additionally, all sediment chromium samples in the reference lake exceeded the ISQG benchmark, indicating that chromium concentrations in lake sediments around the Mine area may be naturally elevated in chromium.

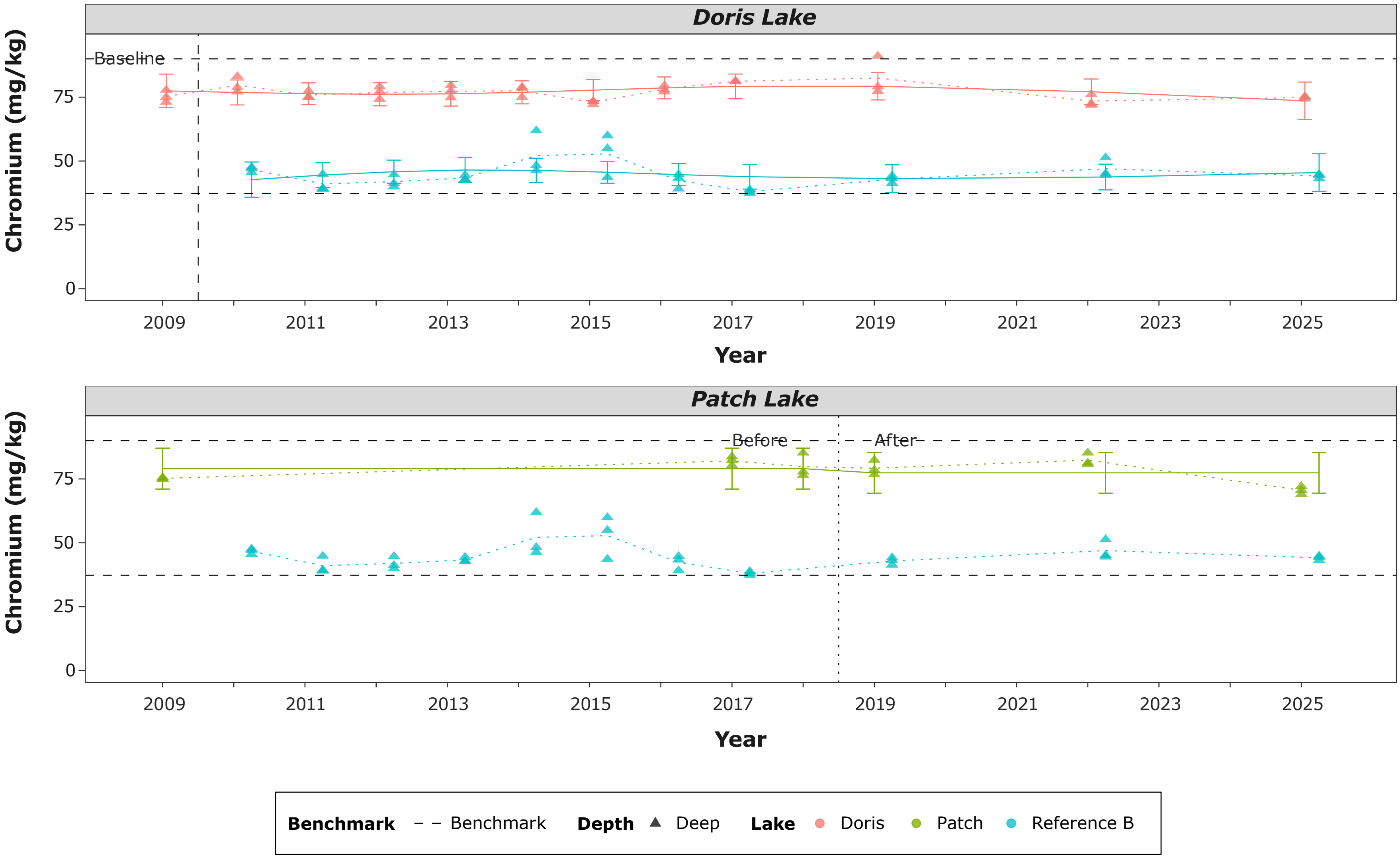
No effects were detected for chromium in Doris or Patch lake sediments in 2025. The conditions required to consider a low action level for sediment quality chromium were not exceeded in 2025.

TABLE 3.4-3 STATISTICAL RESULTS FOR CHROMIUM IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	No (0.497)	-	NA	NA
Patch	Open-water	NA	NA	No (0.707)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.4-3   CHROMIUM CONCENTRATIONS IN LAKE SEDIMENTS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
PEL guideline (90 mg/kg)

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:63

3.4.4 COPPER

Statistical analyses indicated a significant change over time for sediment copper concentrations in Doris Lake, but no change relative to the reference lake (Table 3.4-4). Graphical analyses indicated minimally lower (2 percent) mean sediment copper concentrations in 2025 compared to 2024 in Doris Lake (Figure 3.4-4). Mean sediment copper concentrations in 2025 were 18 percent lower compared to the 2009 baseline year.

Statistical analyses indicated no significant change between the before and after period means for sediment copper concentrations in Patch Lake (Table 3.4-4). Graphical analyses indicated an overall decrease in sediment copper concentrations in Patch Lake and 2025 concentrations were 13 percent lower compared to 2022 (Figure 3.4-4).

In 2025, sediment copper concentrations in Doris Lake exceeded the ISQG benchmark, but not the PEL low action level benchmark (75 percent PEL benchmark = 147.75; Figure 3.4-4). No sediment copper concentrations in Patch Lake exceeded the ISQG benchmark.

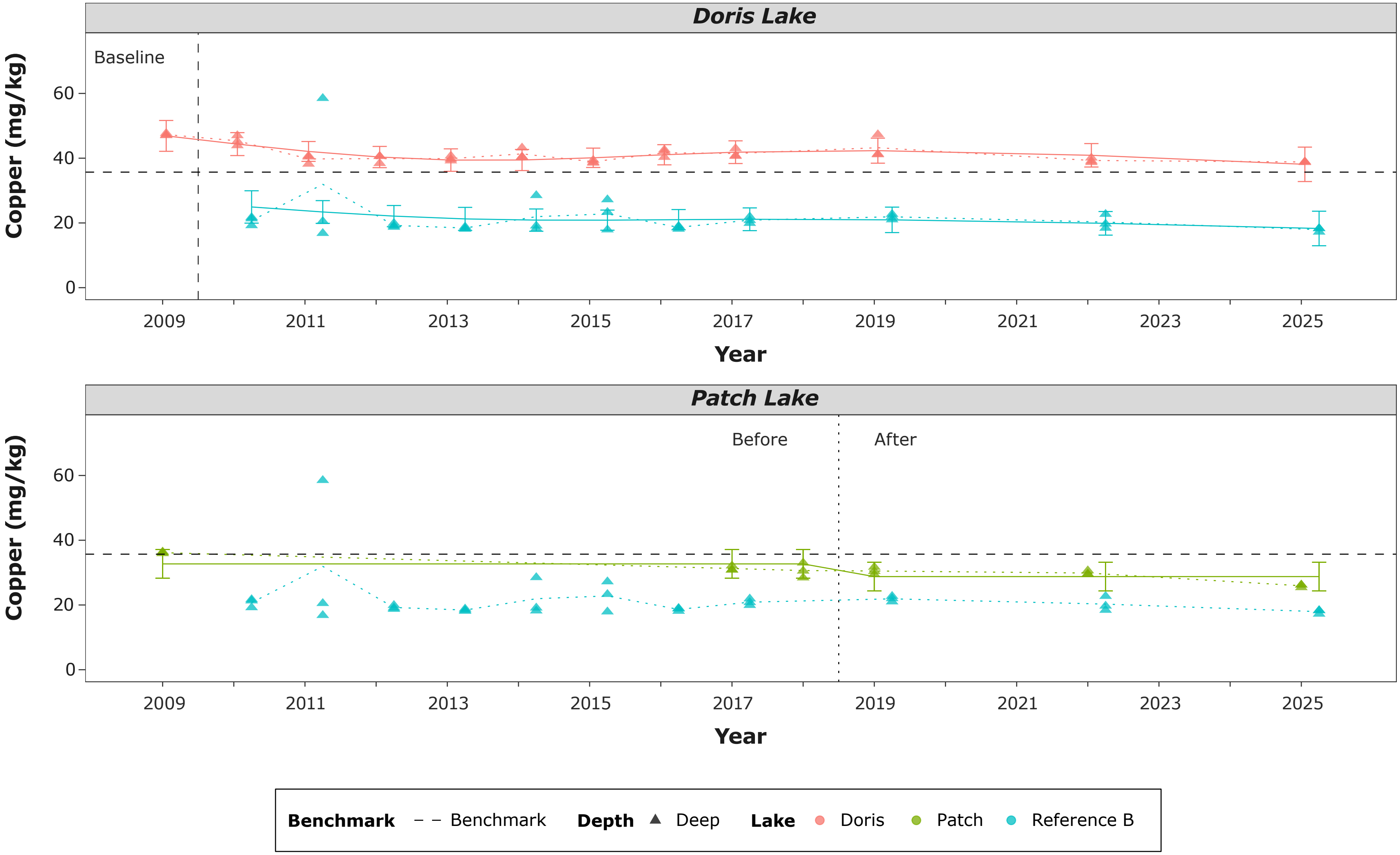
No effects were detected for copper in Doris or Patch lake sediments in 2025. The conditions required to consider a low action level for sediment quality copper were not exceeded in 2025.

TABLE 3.4-4 STATISTICAL RESULTS FOR COPPER IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Open-water	Yes (0.014)	No (0.823)	NA	NA
Patch	Open-water	NA	NA	No (0.157)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.4-4 COPPER CONCENTRATIONS IN LAKE SEDIMENTS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
PEL guideline (197 mg/kg) is not shown on figure

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:64

3.4.5 LEAD

Statistical analyses indicated a significant change over time for sediment lead concentrations in Doris Lake and relative to the reference lake (Table 3.4-5). Graphical analyses indicated mean sediment lead concentrations in Doris Lake were minimally lower (< 2 percent) in 2025 compared to 2024 but were 27 percent lower compared to the 2009 baseline year (Figure 3.4-5). Sediment lead concentrations in 2025 were comparable to concentrations observed in 2011 and 2012, with concentrations ranging within 5 percent. It is noted that a decrease in sediment lead concentrations is not considered an adverse effect (TMAC 2018).

Statistical analyses indicated no significant change between the before and after period means for sediment lead concentrations in Patch Lake (Table 3.4-5). Graphical analyses indicated an overall decrease in mean sediment lead concentrations in Patch Lake and 2025 concentrations were 13 percent lower in 2025 compared to 2024 (Figure 3.4-5).

No sediment lead concentrations in Doris or Patch lake have ever exceeded the ISQG benchmark (Figure 3.4-5).

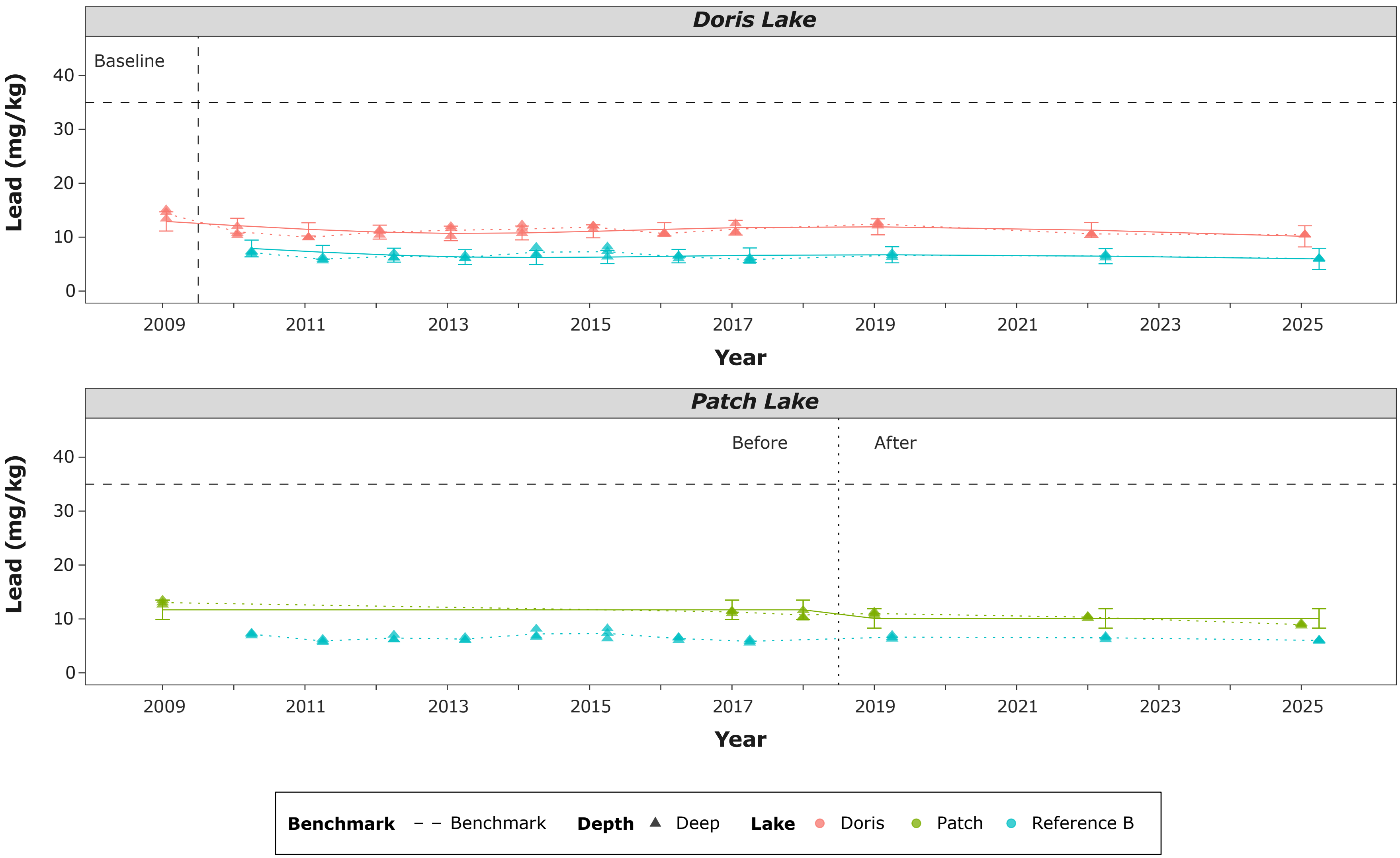
No effects were detected for lead in Doris or Patch lake sediments in 2025. The conditions required to consider a low action level for sediment quality lead were not exceeded in 2025.

TABLE 3.4-5 STATISTICAL RESULTS FOR LEAD IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Open-water	Yes (0.023)	Yes (0.039)	NA	NA
Patch	Open-water	NA	NA	No (0.158)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) = The statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.4-5 LEAD CONCENTRATIONS IN LAKE SEDIMENTS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
PEL guideline (91.3 mg/kg) is not shown on figure

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:65

3.4.6 MERCURY

Statistical analyses indicated a significant change over time for sediment mercury concentrations in Doris Lake, but no change relative to the reference lake (Table 3.4-6). Graphical analyses indicated an increase in sediment mercury concentrations in 2025 compared to 2022 (Figure 3.4-6). Mean concentrations in 2025 were 19 percent greater than 2022 concentrations, but only 11 percent greater compared to the 2009 baseline year (Figure 3.4-6). Mean sediment mercury concentrations were also elevated in the reference lake, as concentrations observed in 2025 were 45 percent greater than concentrations observed in 2022 (Figure 3.4-6). The concurrent increase in the reference lake suggests that regional or outside influences, rather than Mine-related activities, may be impacting sediment mercury concentrations.

Statistical analyses indicated no significant change between the before and after period means for sediment mercury concentrations in Patch Lake (Table 3.4-6). Graphical analyses indicated an increase in mean sediment mercury concentrations in Patch Lake in 2025 and concentrations were 45 percent greater compared to 2022 (Figure 3.4-6).

No sediment mercury concentrations in Doris or Patch lake have ever exceeded the ISQG benchmark (Figure 3.4-5).

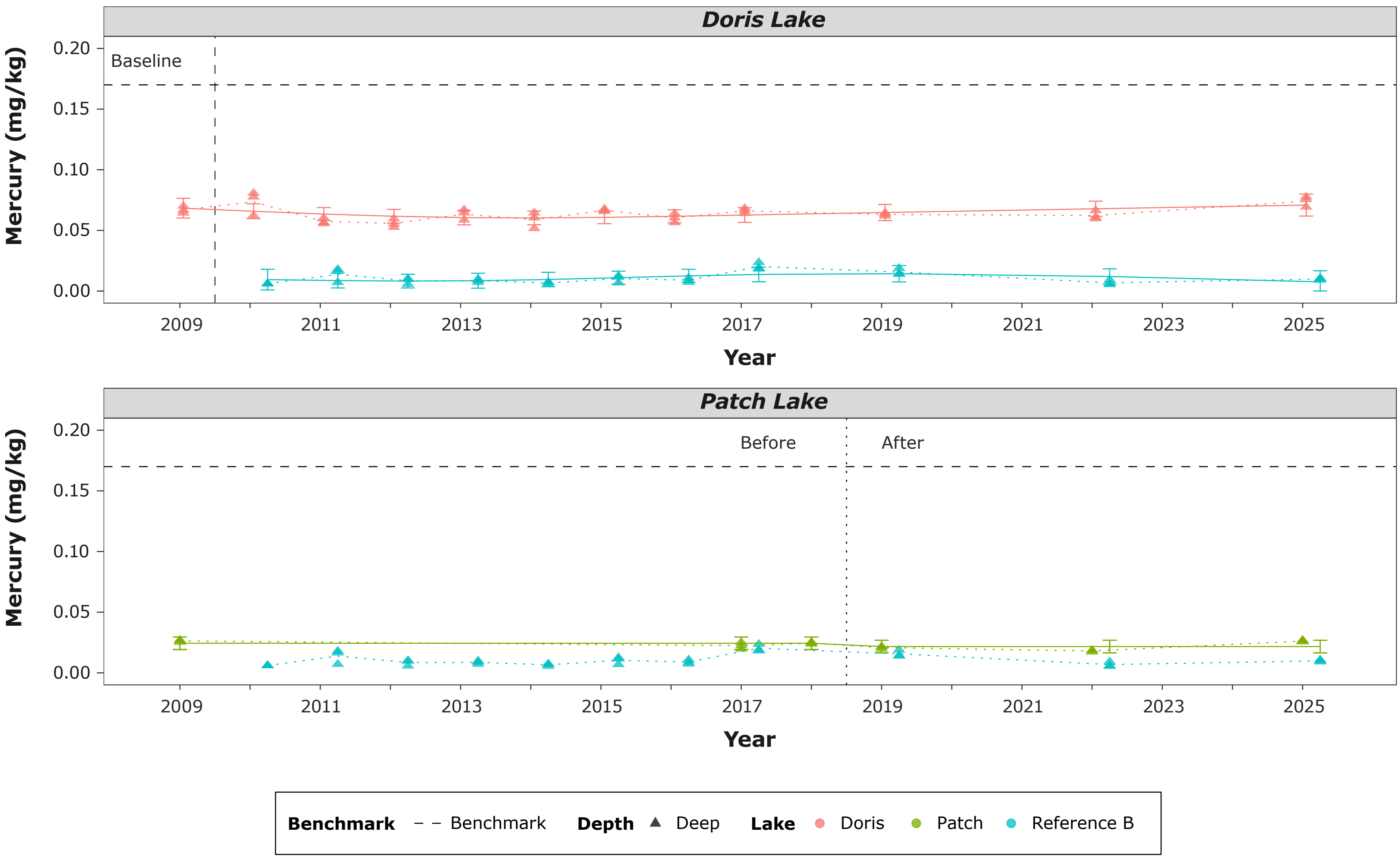
No effects were detected for mercury in Doris or Patch lake sediments in 2025. The conditions required to consider a low action level for sediment quality mercury were not exceeded in 2025.

TABLE 3.4-6 STATISTICAL RESULTS FOR MERCURY IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	Yes (0.041)	No (0.111)	NA	NA
Patch	Open-water	NA	NA	No (0.366)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.4-6 MERCURY CONCENTRATIONS IN LAKE SEDIMENTS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
PEL guideline (0.486 mg/kg) is not shown on figure

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:66

3.4.7 ZINC

Statistical analyses indicated no significant change over time for sediment zinc concentrations in Doris Lake (Table 3.4-7). Graphical analyses indicated minimal change (1 percent) in mean sediment zinc concentrations in 2025 compared to 2024 (Figure 3.4-7).

Statistical analyses indicated no significant change between the before and after period means for sediment zinc concentrations in Patch Lake (Table 3.4-7). Graphical analyses indicated a 14 percent decrease in mean sediment zinc concentrations in 2025 compared to 2024 (Figure 3.4-7).

Sediment zinc concentrations in Doris Lake exceeded the 75 percent ISQG benchmark (92.25 mg/kg), but not the PEL benchmark. No sediment zinc concentrations in Patch Lake exceeded the ISQG benchmark.

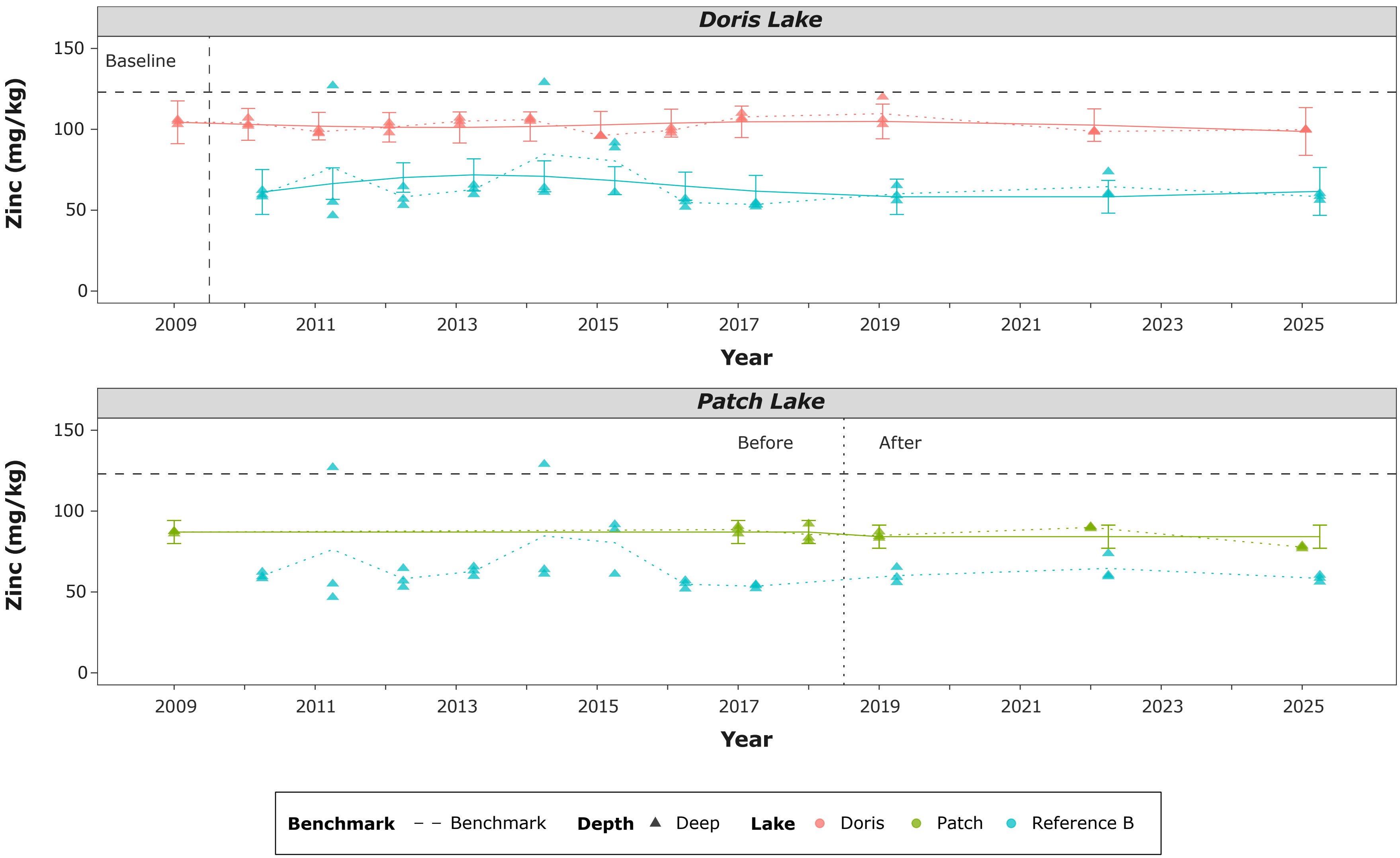
No effects were detected for zinc in Doris or Patch lake sediments in 2025. The conditions required to consider a low action level for sediment quality zinc were not exceeded in 2025.

TABLE 3.4-7 STATISTICAL RESULTS FOR ZINC IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	No (0.858)	-	NA	NA
Patch	Open-water	NA	NA	No (0.478)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.4-7 ZINC CONCENTRATIONS IN LAKE SEDIMENTS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.
PEL guideline (315 mg/kg) is not shown on figure

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:67

3.5 PHYTOPLANKTON

3.5.1 BIOMASS

Statistical analyses indicated a significant change over time for phytoplankton biomass in Doris Lake (as measured by chl *a*), and relative to the reference lake (Table 3.5-1). Graphical analyses of mean chl *a* concentrations in Doris Lake indicated that the mean phytoplankton biomass decreased from 2011 to 2014 (range of 4.94 to 6.91 microgram per litre [μg/L]) compared to 2009 and 2010 (8.11 and 11.01 μg/L, respectively; Figure 3.5-1). Subsequently, chl *a* concentrations increased between 2014 and 2016 (from 5.43 to 16.76 μg/L). Since 2016, chl *a* concentrations have consistently been greater than baseline (2009) and earlier monitoring mean concentrations, ranging from 11.05 to 22.81 μg/L. Graphical observations provide evidence of a potential decline in mean chl *a* concentrations since it reached the highest recorded concentration (22.81 μg/L) in 2022. Additionally, mean chl *a* concentrations observed in 2025 (10.14 μg/L) were 56 percent lower compared to elevated 2022 mean concentrations (13.30 μg/L), and 4 percent lower compared to 2024 concentrations (10.56 μg/L; Figure 3.5-1).

In accordance with the *Hope Bay Project: Aquatic Effects Monitoring Plan* (TMAC 2018), a low action level was not triggered in 2025, as mean concentrations of chlorophyll *a* were within the normal range of baseline conditions (i.e., 5.78 to 12.10 μg/L; 2009), thus not fulfilling Condition 2 of the Response Framework (Section 2.2.5.1).

Statistical analyses indicated no significant difference between the before and after period means for phytoplankton biomass in Patch Lake (Table 3.5-1).

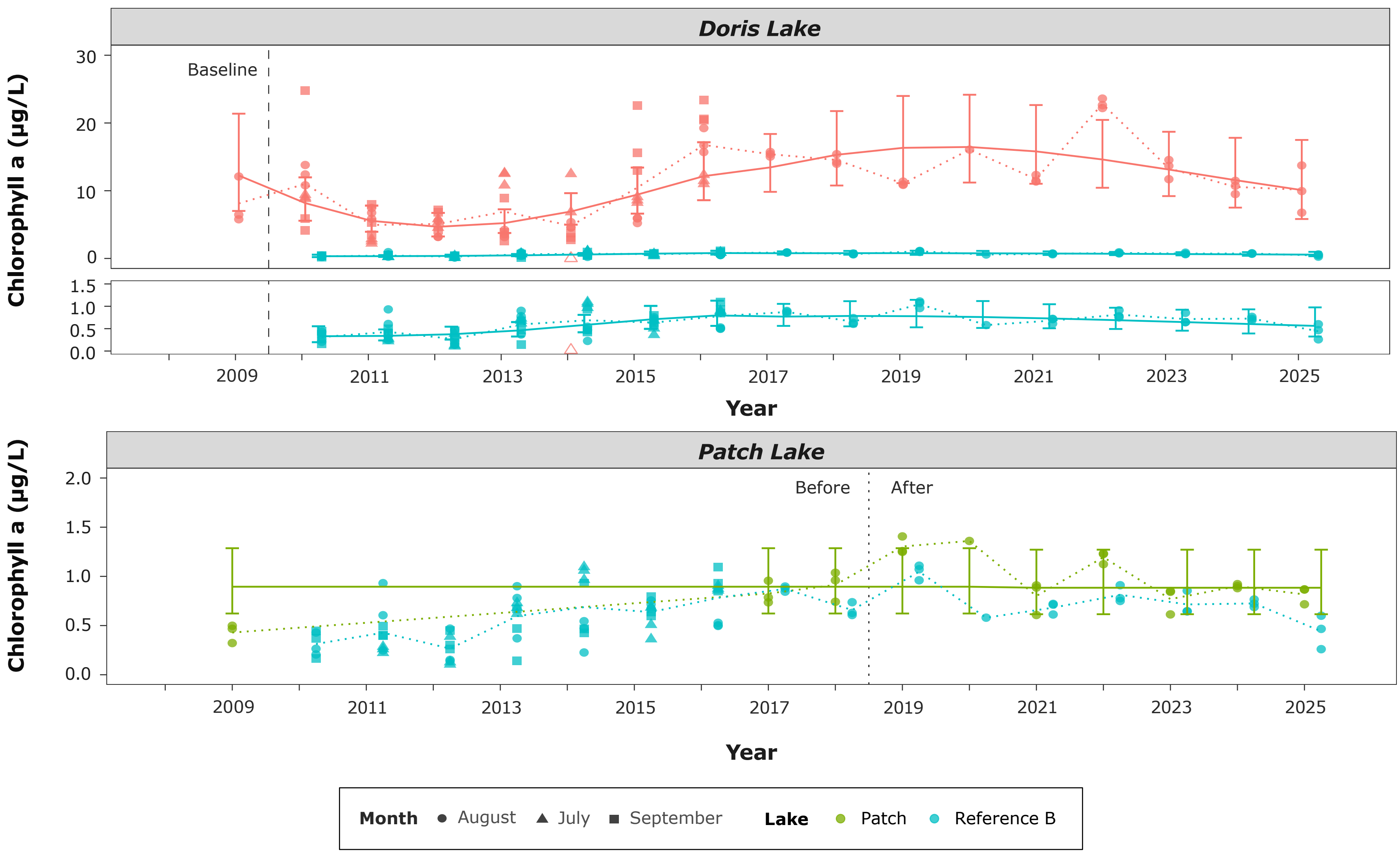
TABLE 3.5-1 STATISTICAL RESULTS FOR PHYTOPLANKTON BIOMASS IN THE EXPOSURE LAKES, 2025

Lake	Trend Analysis		BACI	
	Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Yes (< 0.001)	Yes (0.012)	NA	NA
Patch	NA	NA	No (0.959)	-

Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

No potentially adverse effects were detected for phytoplankton biomass in Doris or Patch lakes in 2025. The conditions required to consider a low action level for phytoplankton biomass in Doris or Patch lakes were not exceeded in 2025.

FIGURE 3.5-1 PHYTOPLANKTON BIOMASS IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: *Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.*
Observations less than the detection limit are shown by hollow symbols and plotted at half the detection limit.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch Lake.
The error bars are the 95% confidence intervals of the fitted means.

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:68

3.6 BENTHIC INVERTEBRATES

3.6.1 DENSITY

Statistical analyses indicated a significant change over time in benthic invertebrate density in Doris Lake and relative to the reference lake (Table 3.6-1). Benthic invertebrate density has increased over time, with the lowest value recorded in the 2009 baseline year (607 organisms per metres squared [/m^2]). Since 2015, mean density has stabilized and values have fluctuated between 3,300 organisms/m^2 and 5,100 organisms/m^2 (Figure 3.6-1). The mean density observed in 2025 was 4,335 organisms/m^2 (Figure 3.6-1). Conversely, a decrease over time in mean density has been observed in the reference lake. The Response Framework that outlines the conditions for a low action level response requires a statistically significant decrease in benthic invertebrate density over time, with no similar decrease observed at the reference lake (Section 2.2.5.1; TMAC 2018). Since increases in benthos densities were observed over time, the conditions required for a low action level response in Doris Lake in 2025 were not fulfilled.

Statistical analyses indicated no significant difference in the before and after period means in benthic invertebrate density in Patch Lake (Table 3.6-1). Graphical analyses indicated an increase (64 percent) in mean density in Patch Lake in 2025 compared to 2022 (Figure 3.6-1). Highest mean densities were observed in 2017 (1,407 organisms/m^2) and decreased through 2022 (350 organisms/m^2) before increasing in 2025 (575 organisms/m^2), indicating fluctuating values in mean benthos density were also occurring in Patch Lake (Figure 3.6-1).

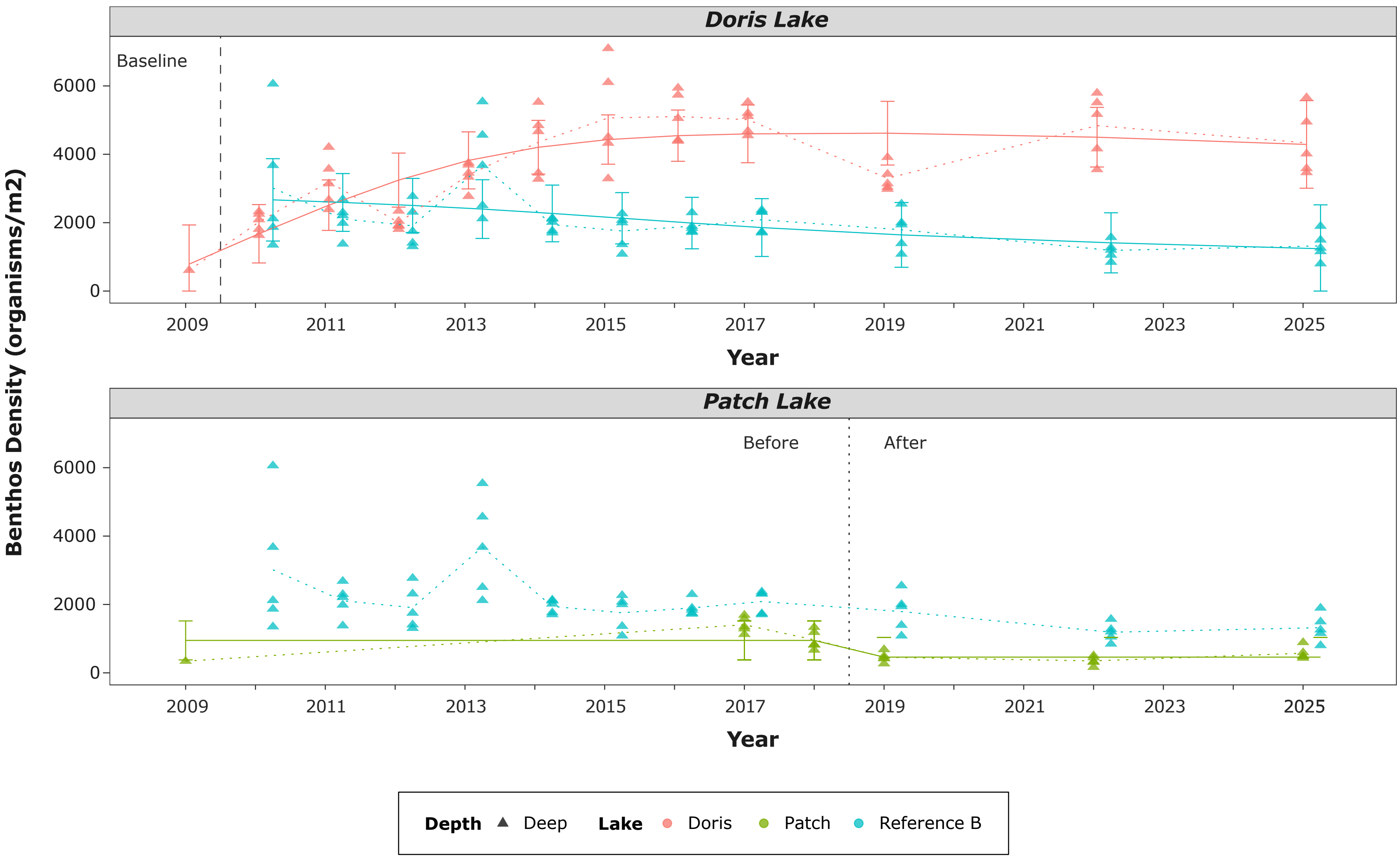
No effects were detected for benthic invertebrate density in Doris or Patch lakes in 2025. The conditions required to consider a low action level for benthic invertebrate density in Doris or Patch lakes were not exceeded in 2025.

TABLE 3.6-1 STATISTICAL RESULTS FOR BENTHIC INVERTEBRATE DENSITY IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	Yes (< 0.001)	Yes (< 0.001)	NA	NA
Patch	Open-water	NA	NA	No (0.182)	-

Notes:
< = less than;
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.6-1 BENTHIC INVERTEBRATE DENSITY IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:69

3.6.2 FAMILY RICHNESS

Statistical analyses indicated no significant change over time for benthic invertebrate family richness in Doris Lake (Table 3.6-2). Graphical analyses indicated stable values in mean family richness in Doris Lake in 2025 compared to 2022 (Figure 3.6-2); however, there was a slight (8 percent) decrease in mean family richness in 2025 (mean = 2.40 families/sample) compared to 2022 (mean = 2.60 families/sample) and a 20 percent decrease compared to the 2009 baseline year (mean = 3.00 families/sample).

Statistical analyses indicated no significant difference between the before and after period means for benthic invertebrate family richness in Patch Lake (Table 3.6-2). Graphical analyses indicated a slight (7 percent) decrease in mean family richness values in 2025 (mean = 2.60 families/sample) compared to 2022 (mean = 2.80 families/sample; Figure 3.6-2).

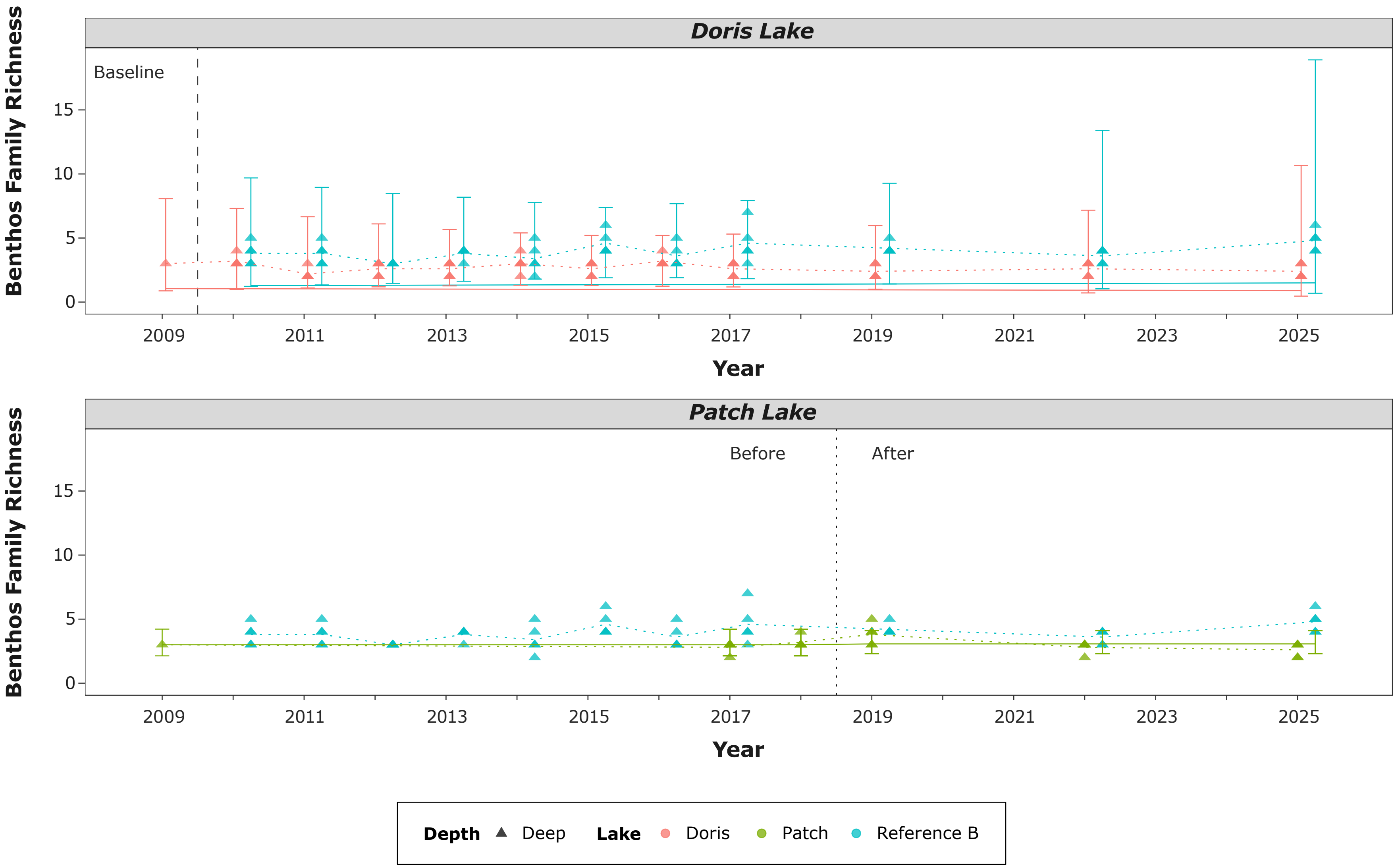
No effects were detected for benthic invertebrate family richness in Doris or Patch lakes in 2025. The conditions required to consider a low action level for benthic invertebrate family richness in Doris or Patch lakes were not exceeded in 2025.

TABLE 3.6-2 STATISTICAL RESULTS FOR BENTHIC INVERTEBRATE FAMILY RICHNESS IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	No (0.895)	-	NA	NA
Patch	Open-water	NA	NA	No (0.923)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.6-2 BENTHIC INVERTEBRATE FAMILY RICHNESS IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:70

3.6.3 FAMILY EVENNESS

Statistical analyses indicated no significant change over time in benthic invertebrate family evenness in Doris Lake (Table 3.6-3). Graphical analyses indicated an increase (38 percent) in mean family evenness in 2025 (mean = 0.69) compared to 2022 (mean = 0.50; Figure 3.6-3). Mean family evenness in 2025 was also 40 percent greater (mean = 0.69) compared to the 2009 baseline year (mean = 0.49). Concurrently, the mean family evenness in the reference lake decreased in 2025 (mean = 0.59) compared to earlier sampling years, where 2010 to 2014 mean evenness ranged from 0.70 to 0.75.

Statistical analyses indicated a significant difference in the before and after period means in benthic invertebrate family evenness in Patch Lake, but no change relative to the reference lake (Table 3.6-3). Graphical analyses indicated an increase in mean family evenness values from 2019 to 2025 compared to the baseline years (Figure 3.6-3).

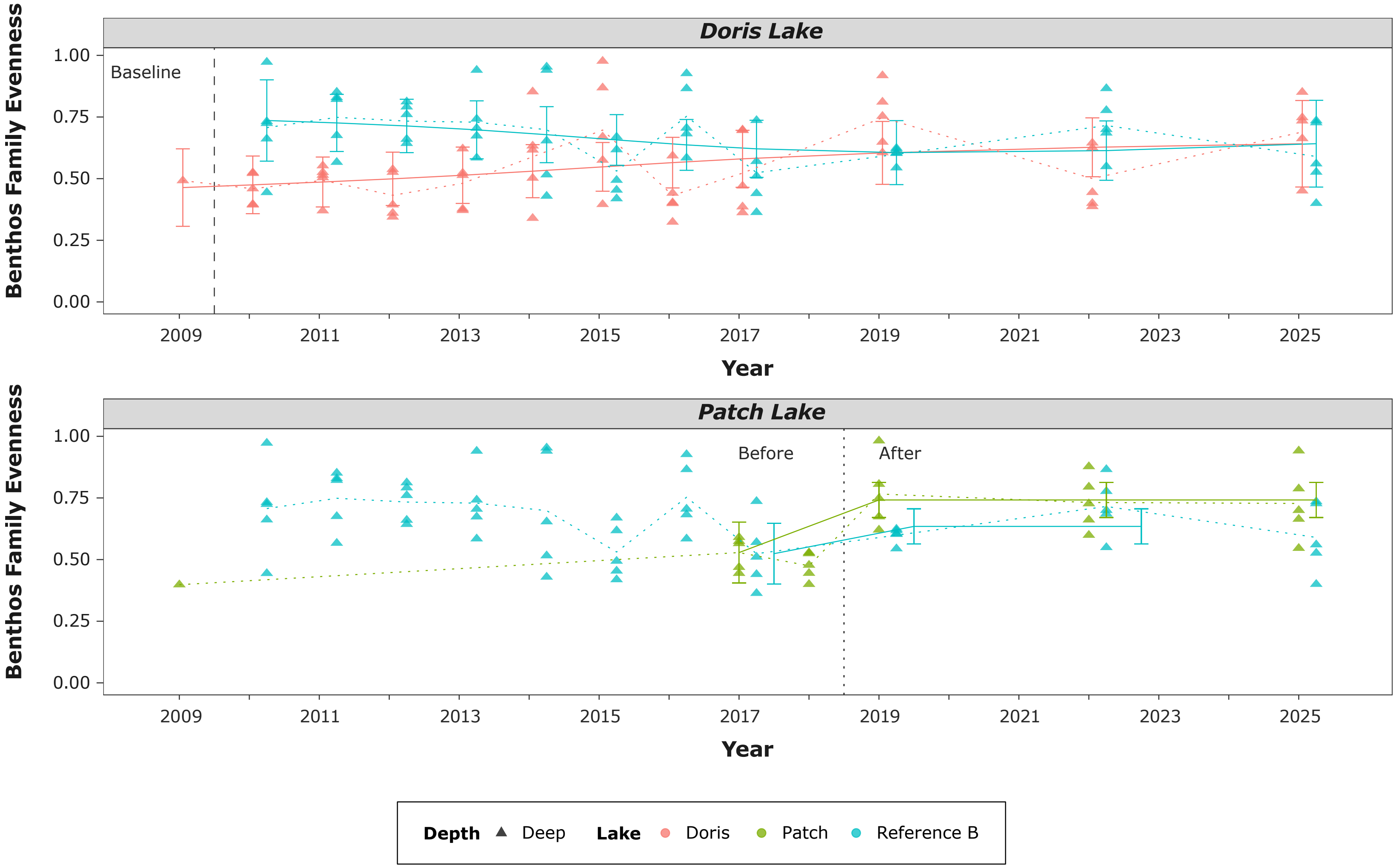
No effects were detected for benthic invertebrate family evenness in Doris or Patch lakes in 2025. The conditions required to consider a low action level for benthic invertebrate family evenness in Doris or Patch lakes were not exceeded in 2025.

TABLE 3.6-3 STATISTICAL RESULTS FOR BENTHIC INVERTEBRATE FAMILY EVENNESS IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	**Significant Trend Relative to Reference Lake B (*p* value)**	**Significant Before-After Change (*p* value)**	**Significant Before-After Change Relative to Reference Lake (*p* value)**
Doris	Open-water	No (0.103)	-	NA	NA
Patch	Open-water	NA	NA	Yes (< 0.001)	No (0.243)

Notes:
< = less than
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.6-3 BENTHIC INVERTEBRATE FAMILY EVENNESS IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.

ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-005:71

3.6.4 BRAY-CURTIS INDEX

Statistical analyses indicated no significant change over time in the Bray-Curtis dissimilarity index in Doris Lake (Table 3.6-4). Graphical analyses indicated a higher (i.e., more dissimilar) mean Bray-Curtis value in Doris Lake in 2025 compared to the reference lake (Figure 3.6-4). The mean Bray-Curtis index in Doris Lake in 2025 was 8 percent lower than the values observed in 2022. Data were not collected for the reference lake in 2009 and therefore the Bray-Curtis index could not be calculated for that year.

Statistical analyses indicated no significant differences in the before and after period means in benthic invertebrate Bray-Curtis index in Patch Lake (Table 3.6-4). Graphical analyses indicated no change in mean Bray-Curtis index in Patch Lake in 2025 compared to 2022 (Figure 3.6-4). A decrease in mean Bray-Curtis index was observed in 2025 compared to baseline; however, the Bray-Curtis index could only be calculated for one baseline year (2017), as no samples were collected in the reference lake in 2009 and 2018.

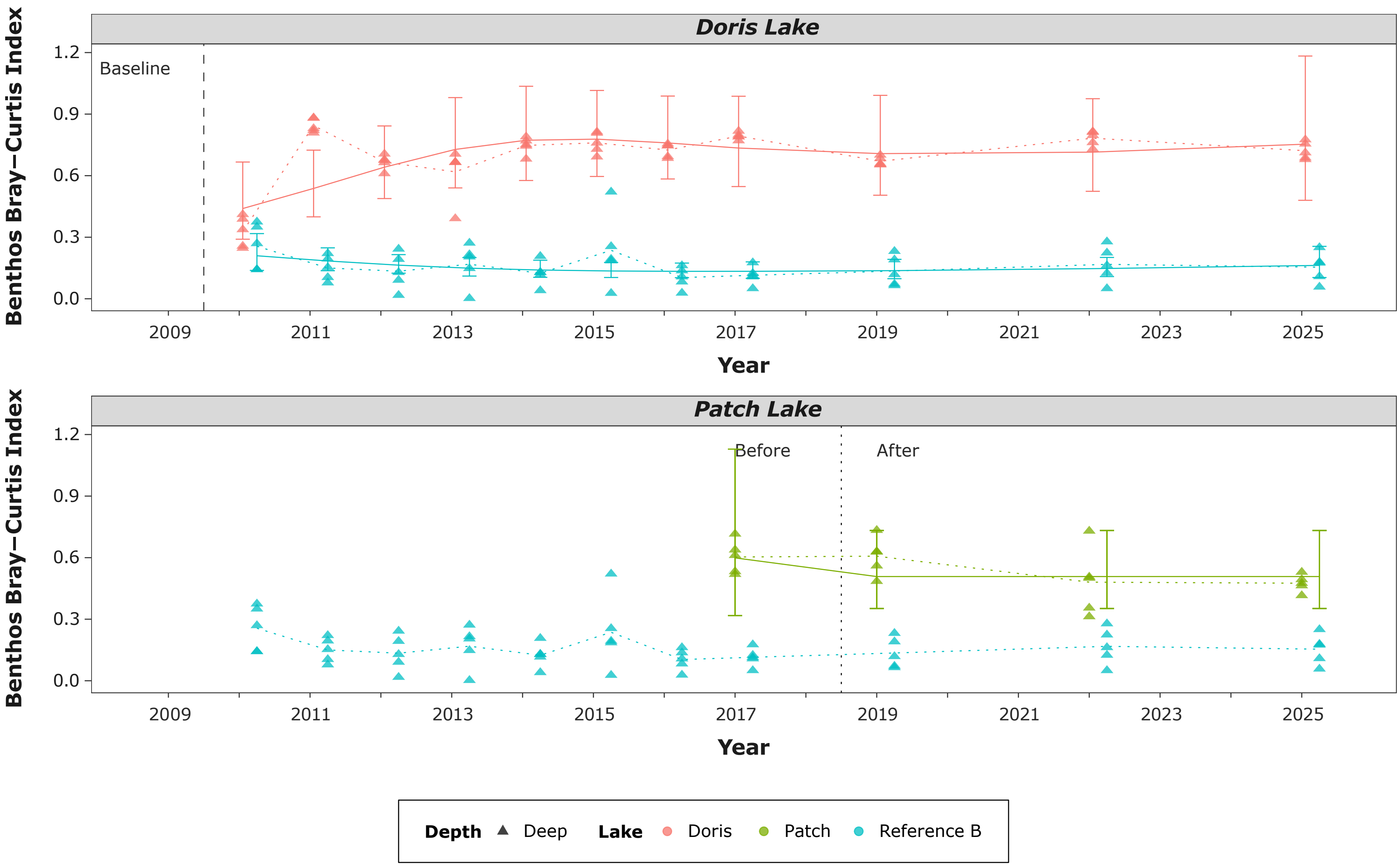
No effects were detected for benthic invertebrate Bray-Curtis index in Doris or Patch lakes in 2025. The conditions required to consider a low action level for benthic invertebrate Bray-Curtis index in Doris or Patch lakes were not exceeded in 2025.

TABLE 3.6-4 STATISTICAL RESULTS FOR BENTHIC INVERTEBRATE BRAY-CURTIS INDEX IN THE EXPOSURE LAKES, 2025

Lake	Season	Trend Analysis		BACI	
		Significant Change Relative to a Slope of Zero (*p* value)	Significant Trend Relative to Reference Lake B (*p* value)	Significant Before-After Change (*p* value)	Significant Before-After Change Relative to Reference Lake (*p* value)
Doris	Open-water	No (0.052)	-	NA	NA
Patch	Open-water	NA	NA	No (0.435)	-

Notes:
BACI = Before-After/Control-Impact; NA = not applicable
Dash (-) indicates that the statistical analysis was not completed due to limitations or because the first step of the statistical analysis indicated no significant difference (Appendix C).
NA indicates that the statistical analysis was not relevant to the dataset.

FIGURE 3.6-4 BENTHIC INVERTEBRATE BRAY-CURTIS INDEX IN LAKES, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2009 TO 2025



Notes: Symbols represent observed data values, observations are slightly jittered along the x-axis for legibility.
Dotted lines connect the annual observed means.
Solid lines represent the the annual fitted mean for Doris Lake and the fitted before and after means for Patch and Windy lakes.
The error bars are the 95% confidence intervals of the fitted means.

4. SUMMARY OF EFFECTS ANALYSIS

No Mine-related effects were identified for the variables evaluated in 2025, including physical limnological, water quality, sediment quality, phytoplankton biomass, and benthic invertebrate metrics (Table 4-1).

There were no under-ice water level or ice thickness measurements collected in 2025 at Glenn Lake, Imniagut Lake, PO Lake, Ogama Lake, or Little Roberts Lake due to weather and safety issues and consequently, under-ice surface elevation could not be calculated for these lakes. The calculated reduction in under-ice lake surface elevation for Doris, Windy, and Patch lakes was less than the Madrid–Boston FEIS predictions (TMAC 2017).

No effects related to fish habitat were observed in 2025 in Doris, Windy, or Patch lakes (Table 4-1).

TABLE 4-1 SUMMARY OF EVALUATION OF EFFECTS, 2025

Variable	Exposure Lakes Included in Evaluation of Effects	Conclusion of Effect	Low Action Level Triggered?
Fish Habitat			
Water level and ice thickness	Doris Lake, Patch Lake, Windy Lake	No effect	No effect
	Glenn Lake, Imniagut Lake, PO Lake, Ogama Lake, Little Roberts Lake	Not Evaluated[a]	Not Evaluated[a]
Physical Limnology			
Under-ice dissolved oxygen	Doris Lake, Patch Lake, Windy Lake	No effect	No
Temperature		No effect	No
Water Quality			
pH	Doris Lake, Patch Lake, Windy Lake	No effect	No
Total Suspended Solids		No effect	No
Turbidity		No effect	No
Chloride		No effect	No
Fluoride		No effect	No
Total ammonia		No effect	No
Nitrate		No effect	No
Nitrite		No effect	No
Total phosphorus		No effect	No
Total aluminum		No effect	No
Total arsenic		No effect	No
Total boron		No effect	No

Variable	Exposure Lakes Included in Evaluation of Effects	Conclusion of Effect	Low Action Level Triggered?
Water Quality *(cont'd)*			
Total cadmium	Doris Lake, Patch Lake, Windy Lake	No effect	No
Total chromium		No effect	No
Total copper		No effect	No
Total iron		No effect	No
Total lead		No effect	No
Dissolved manganese		No effect	No
Total mercury		No effect	No
Total molybdenum		No effect	No
Total nickel		No effect	No
Total selenium		No effect	No
Total silver		No effect	No
Total thallium		No effect	No
Total uranium		No effect	No
Dissolved zinc		No effect	No
Sediment Quality			
Arsenic	Doris Lake, Patch Lake	No effect	No
Cadmium		No effect	No
Chromium		No effect	No
Copper		No effect	No
Lead		No effect	No
Mercury		No effect	No
Zinc		No effect	No
Phytoplankton			
Biomass (chl *a*)	Doris Lake, Patch Lake	No effect	No
Benthic Invertebrates			
Density	Doris Lake, Patch Lake	No effect	No
Family Richness		No effect	No
Family Evenness		No effect	No
Bray-Curtis Index		No effect	No

Notes:
chl *a* = chlorophyll *a*
[a] Mine-related effects were unable to be assessed for these lakes due to the absence of under-ice water level data.

Water column profiles for DO and temperature in the exposure lakes were either within the baseline observations, or any change observed in 2025 was not considered to be adverse. Water column profiles for DO and temperature in the exposure lakes overlapped with the values observed during their respective baseline years.

The evaluation of effect results for water quality and sediment quality variables indicated the following:

- There was no significant change over time in Doris Lake, or between the before and after periods in Patch and Windy lakes; or
- If a significant change was detected, the trend was not considered a potentially adverse change for that variable; or
- Concentrations remained within the baseline range for the evaluated lake in the respective season.

Annual variations in sampling data are expected, and observed variability in water quality parameters in 2025 did not require further investigation. None of the variables evaluated in 2025 exceeded low action level conditions (Tables 4-1 and 4-2).

No adverse effects were observed in sediment quality parameters in 2025. None of the sediment quality variables evaluated exceeded low action level conditions (Tables 4-1 and 4-3).

Although significant changes were observed in the phytoplankton biomass in Doris Lake in 2025 compared to the reference lake, the conditions for a low action level response were not fulfilled, as chl *a* concentrations in exposure lakes were within the baseline range (Tables 4-1 and 4-4; ERM 2024). No effect was detected for phytoplankton biomass in 2025, and no update was required for the Response Plan for phytoplankton biomass (ERM 2024).

Although statistically significant changes were observed in the benthic invertebrate density in Doris Lake in 2025 compared to the reference lake, the conditions for a low action level response were not fulfilled, as the change observed was an increase in density, which is not considered an adverse effect. Additionally, it is not one of the conditions required to trigger a low action level in the Response Framework (Section 2.2.5; TMAC 2018). No effects were observed for any of the benthic invertebrate variables evaluated (Tables 4-1 and 4-5).

TABLE 4-2 COMPARISON OF WATER QUALITY TO RESPONSE FRAMEWORK CONDITIONS FOR TRIGGERING A LOW ACTION LEVEL RESPONSE, 2025

Exposure Lake	Doris Lake						Patch Lake						Windy Lake					
Season	Under-ice			Open-water			Under-ice			Open-water			Under-ice			Open-water		
Low Action Level Assessment	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]
pH	1	2	3, 4	1	2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4
TSS	-	1, 2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4
Turbidity	2, 3	1	4	2, 3	1	4	2, 3	1	4	-	1, 2	3, 4	-	1, 2	3, 4	-	1, 2	3, 4
Chloride	1	2	3, 4	1	2	3, 4	-	1, 2	3	-	1, 2	3, 4	-	1, 2	3	-	1, 2	3, 4
Fluoride	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total ammonia	-	1	2, 3, 4	-	3	1, 2, 4	-	1	2, 3, 4	-	3	1, 2, 4	-	1	2, 3, 4	-	1	2, 3, 4
Nitrate	-	1	2, 3, 4	-	3	1, 2, 4	-	1	2, 3, 4	-	3	1, 2, 4	-	1	2, 3, 4	-	3	1, 2, 4
Nitrite	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4
Total phosphorus[a]	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	1	4	2, 3	-	1	2, 3, 4	-	1	2, 3, 4
Total aluminum	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total arsenic	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total boron	1	2	3, 4	1	2	3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total cadmium	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4
Total chromium	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4
Total copper	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total iron	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	3	1, 2, 4	-	1	2, 3, 4
Total lead	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	1	2, 3, 4	-	3	1, 2, 4	-	1	2, 3, 4
Dissolved manganese	-	1	2, 3, 4	1	2	3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total mercury	1	2	3, 4	1	2	3, 4	-	2	1, 3, 4	-	1	2, 3, 4	-	2	1, 3, 4	-	2	1, 3, 4
Total molybdenum	1, 2	3	4	1, 2	3	4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total nickel	-	1	2, 3, 4	-	1	2, 3, 4	1, 2	3	4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Total selenium	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4
Total silver	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4

Exposure Lake	Doris Lake						Patch Lake						Windy Lake					
Season	Under-ice			Open-water			Under-ice			Open-water			Under-ice			Open-water		
Low Action Level Assessment	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[b]
Total thallium	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4
Total uranium	1	2	3, 4	1	2	3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4	-	1	2, 3, 4
Dissolved zinc	-	1	2, 3, 4	-	1	2, 3, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4	-	3	1, 2, 4

Notes:
% = percent
DL = detection limit; Plan = approved *Hope Bay Project: Aquatic Effects Monitoring Plan*; TMAC = TMAC Resources Inc.; TSS = total suspended solids
Dash (-) indicates that there are no conditions to report for that category.
Condition 1: A statistically significant and potentially adverse change from baseline conditions has been identified.
Condition 2: The concentration of the water quality variable is outside of the normal range based on the baseline concentration.
Condition 3: The concentration of the water quality variable exceeds 75% of the benchmark.
Condition 4: If a potentially adverse change is detected at the exposure site, there is no similar change at the reference site.
[a] Total phosphorus was assessed only for 2025 as a supporting parameter and is not an annual effects variable under the Plan (TMAC 2018).
[b] Condition was not evaluated either because it was not necessary (i.e., at least one condition was not met) or because all 2025 observations were less than the DL).

TABLE 4-3 COMPARISON OF SEDIMENT QUALITY TO RESPONSE FRAMEWORK CONDITIONS FOR TRIGGERING A LOW ACTION LEVEL RESPONSE, 2025

Exposure Lake	Doris Lake			Patch Lake		
Conditions for Low Action Level Response	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[a]	Conditions Exceeded	Conditions Not Exceeded	Conditions Not Evaluated[a]
Arsenic	1, 3	2	4	3	1, 2	4
Cadmium	-	1	2, 3, 4	-	1, 2, 3	4
Chromium	3	1, 2	4	-	1, 2, 3	4
Copper	1, 3	2	4	-	1, 2, 3	4
Lead	1	2, 3	4	-	1, 2, 3	4
Mercury	1	2, 3	4	-	1, 2, 3	4
Zinc	3	1, 2	4	-	1, 2, 3	4

Notes:
% = percent
DL = detection limit; TMAC = TMAC Resources Inc.
Dash (-) indicates that there are no conditions to report for that category.
Condition 1: A statistically significant and potentially adverse change from baseline conditions has been identified.
Condition 2: The concentration of the water quality variable is outside of the normal range based on the baseline concentration.
Condition 3: The concentration of the water quality variable exceeds 75% of the benchmark.
Condition 4: If a potentially adverse change is detected at the exposure site, there is no similar change at the reference site.
[a] Condition was not evaluated because it was not necessary (i.e., at least one other condition was not met).

TABLE 4-4 COMPARISON OF PHYTOPLANKTON BIOMASS TO RESPONSE FRAMEWORK CONDITIONS FOR TRIGGERING A LOW ACTION LEVEL RESPONSE, 2025

Exposure Lake	Doris Lake			Patch Lake		
Conditions for Low Action Level Response	**Conditions Exceeded**	**Conditions Not Exceeded**	**Conditions Not Evaluated[a]**	**Conditions Exceeded**	**Conditions Not Exceeded**	**Conditions Not Evaluated[a]**
Biomass	1	2	3	-	1	2, 3

Notes:
Dash (-) indicates that there are no conditions to report for that category.
Condition 1: A statistically significant change from baseline conditions has been identified.
Condition 2: The concentration is outside that the normal range based on baseline conditions.
Condition 3: If a change is detected, there is no similar change at the reference site.
[a] Condition was not evaluated because it was not necessary (i.e., at least one other condition was not met).

TABLE 4-5 COMPARISON OF BENTHIC INVERTEBRATE INDICATORS TO RESPONSE FRAMEWORK CONDITIONS FOR TRIGGERING A LOW ACTION LEVEL RESPONSE, 2025

Exposure Lake	Doris Lake			Patch Lake		
Conditions for Low Action Level Response	**Conditions Exceeded**	**Conditions Not Exceeded**	**Conditions Not Evaluated[a]**	**Conditions Exceeded**	**Conditions Not Exceeded**	**Conditions Not Evaluated[a]**
Density	-	1, 2	3, 4	2	1, 3	4
Family Richness	2, 3	1	4	2, 3	1	4
Family Evenness	-	1, 2, 3	4	-	1, 2, 3	4
Bray-Curtis Index	-	1, 3	4	-	1, 2, 3	4

Notes:
Dash (-) indicates that there are no conditions to report for that category.
Condition 1: A statistically significant decrease from baseline conditions has been identified.
Condition 2: The benthos indicator is less than the normal range based on baseline conditions.
Condition 3: If a change is detected, there is no similar change at the reference site.
Condition 4: The magnitude of the decrease exceeds the critical effects size of ±2 within-reference-area standard deviations (SD), as recommended by Environment and Climate Change Canada (ECCC; 2012)
[a] Condition was not evaluated because it was not necessary (i.e., at least one other condition was not met).

5. REFERENCES

Legislations and Regulations

Fisheries Act, RSC 1985, c F-14.

Metal and Diamond Mining Effluent Regulations, SOR/2022-222.

Other Sources

Agnico Eagle (Agnico Eagle Mines Limited). 2022. *Hope Bay, Care and Maintenance Plan*. Version 1*.* Toronto, ON.

Agnico Eagle. 2023. *Hope Bay Project: Proponent's Response to Comments Received on the NIRB 2022 Annual Report*. Prepared for Nunavut Water Board. Toronto, ON.

CCME (Canadian Council of Ministers of the Environment). 2004. "Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems." *Canadian Environmental Quality Guidelines, 2004.* Winnipeg, MB.

CCME. 2025a. *Canadian Sediment Quality Guidelines for the Protection of Aquatic Life: Summary Table.* Accessed October 2025. Retrieved from: https://ccme.ca/en/summary-table.

CCME. 2025b. *Canadian Water Quality Guidelines for the Protection of Aquatic Life: Summary Table.* Accessed October 2025. Retrieved from: https://ccme.ca/en/summary-table.

ECCC (Environment and Climate Change Canada). 2012. *Metal Mining Techinical Guidance for Environmental Effects Monitoring.* Accessed November 2025. Retrieved from: https://www.canada.ca/en/environment-climate-change/services/managing-pollution/environmental-effects-monitoring/metal-mining-technical-guidance/metal-mining-technical-guidance-environmental-effects-monitoring.html.

ERM (ERM Consultants Canada Ltd.). 2018. *Doris Project: 2017 Aquatic Effects Monitoring Program Report.* Prepared for TMAC Resources Inc. Toronto, ON.

ERM. 2023. *Hope Bay Project: 2022 Aquatic Effects Monitoring Program Report*. Prepared for TMAC Resources Inc. Toronto, ON.

ERM. 2024. *Hope Bay Project: Aquatic Effects Monitoring Program Aquatic Response Plan for Phytoplankton Biomass*. Prepared for Agnico Eagles Mines Ltd. Toronto, ON.

Golder Associates Ltd. 2007. *Doris North Project Aquatic Studies 2006*. Prepared for Miramar Hope Bay Ltd. Report No. 06-1373-026.

Rescan (Rescan Environmental Services Ltd.). 2010. *2009 Freshwater Baseline Report, Hope Bay Belt Project*. Prepared for Hope Bay Mining Ltd. Yellowknife, NT.

TMAC (TMAC Resources Inc.). 2017. *Madrid–Boston Project Final Environmental Impact Statement*. Toronto, ON.

TMAC. 2018. *Hope Bay Project: Aquatic Effects Monitoring Plan*. Toronto, ON.

Wetzel, R.G. 2001. *Limnology Lake and River Ecosystems*. Third Editon. New York, NY: Academic Press.

APPENDIX A DATA REPORT (2025)

Hope Bay Mine

2025 Aquatic Effects Monitoring Program—Annual Report

Appendix A: Data Report (2025)

March 2026

ERM Consultants Canada Ltd.
#2700-685 Centre Street S
Calgary, AB
Canada T2G 1S5

T +1 403 705 1926

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX A: DATA REPORT (2025)

A.1 INTRODUCTION

This data report presents the winter ice measurements, water quality, sediment quality, and biota sampling methods (Section A.2) and monitoring data (Section A.3) for the 2025 Aquatic Effects Monitoring Program (AEMP) for the Hope Bay Project (the Project). Baseline data collected at Wolverine Lake is also presented (Section A.4). Although Wolverine Lake is not currently triggered by the AEMP, sampling methods were identical to those of the AEMP and sampling was completed within the time frame of the AEMP. All methods and data relating to water level and stream hydrological monitoring are provided in Appendix B (Hydrology Compliance Monitoring Summary 2025).

A.1.1 SAMPLING PROGRAM SUMMARY

The 2025 Hope Bay AEMP was conducted according to the *Hope Bay Project Aquatic Effects Monitoring Plan* (the Plan; TMAC 2018), which includes monitoring the following components:

- Fish habitat (ice thickness, water level, and stream hydrology);
- Under-ice physical limnology and water quality variables;
- Open-water physical limnology and water quality variables;
- Open-water sediment quality variables;
- Open-water phytoplankton; and
- Open-water benthic invertebrates.

Sampling occurs in the fall and/or spring depending on the monitoring component. Methods for the frequency and timing (e.g., seasonality) of sampling, the specific sampling devices used, the number of replications collected, and the depths at which samples were collected (if applicable) for each individual monitoring component are provided (Table A.1-1).

TABLE A.1-1 SAMPLING PROGRAM SUMMARY FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Monitoring Component	Sampling Frequency	Month	Sampling Device(s)	Sample Replication and Depths
Ice Thickness				
Ice thickness measurement	1× per year	April	Metered rod	n = 1 measurement/site
Physical Limnology				
Secchi depth, Dissolved oxygen and temperature profiles	2× per year	April (profiles only), August	Secchi disk, Aqua TROLL Multiparameter Sonde	n = 1 profile/site throughout water column

Monitoring Component	Sampling Frequency	Month	Sampling Device(s)	Sample Replication and Depths
Water Quality				
Physico-chemical variables, nutrients, metals	2× per year	April, August	Kemmerer (under ice) or Niskin (open water) water sampler	n = 1 at 1 m below the surface n = 1 at 2 m above water-sediment interface + 10% replication per sampling event
Sediment Quality				
Particle size, metals	1x every 3 years	August	Ekman grab sampler	n = 3 grabs per site
Phytoplankton				
Biomass (chl *a*)	1× per year	August	Niskin water sampler, vacuum filtration equipment	n = 3 per site at 1 m below the surface
Benthic Invertebrates				
Density, taxonomy	1x every 3 years	August	Ekman grab sampler, 500 µm sieve bag	n = 5 per site (3 composite subsamples per replicate)

Notes:
% = percent; m = metre; chl a = chlorophyll *a*

A.1.2 SAMPLING SITES

Monitoring in 2025 was conducted in the Doris and Windy watersheds and at Reference Lake B (Table A.1-2). Monitoring was conducted in distinct areas of each watershed and/or lake depending on the component being assessed (Figures A.1-1 to A.1-5).

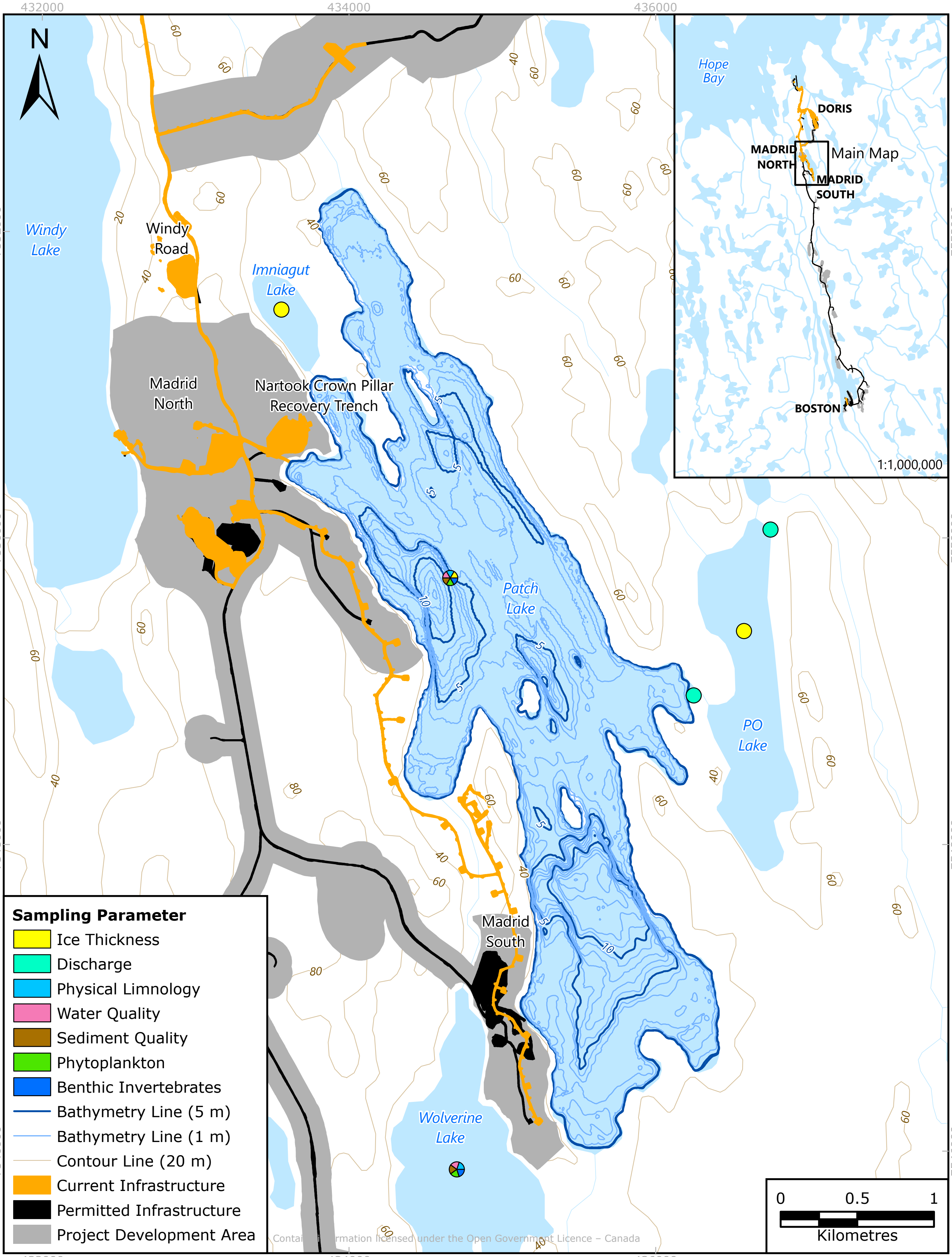
TABLE A.1-2 SAMPLING LOCATIONS AND MONITORING COMPONENTS FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Sampling Locations	UTM[a]		Ice Thickness	Water Level	Streamflow	Physical Limnology	Water Quality	Sediment Quality	Phytoplankton	Benthic Invertebrates
	Easting	Northing								
Doris Watershed										
Wolverine Lake[b]	434703	7545881	-	-		X	X	X	X	X
Patch Lake	434660	7549739	X	X	-	X	X	X	X	X
Patch Outflow Hydro	436248	7548973	-	-	X	-	-	-	-	-
Imniagut Lake	433559	7551490	-[c]	-[c]	-	-	-	-	-	-
Imniagut Lake Hydro	433403	7551421	-	-	-	-	-	-	-	-

Sampling Locations	UTM[a]		Ice Thickness	Water Level	Streamflow	Physical Limnology	Water Quality	Sediment Quality	Phytoplankton	Benthic Invertebrates
	Easting	Northing								
Doris Watershed *(cont'd)*										
P.O. Lake	436576	7549393	-[c]	-[c]	-	-	-	-	-	-
P.O. Outflow Hydro	436749	7550055	-	-	X	-	-	-	-	-
Ogama Lake	436148	7553517	-[c]	-[c]	-	-	-	-	-	-
Ogama Outflow Hydro	435595	7555262	-	-	X	-	-	-	-	-
Doris Lake	433815	7558222	-[c]	-[c]	-	X	X	X	X	X
Doris Lake-2 Hydro	433547	7558601	-	-	-	-	-	-	-	-
Doris Creek TL-2 Hydro	434059	7559504	-	-	X	-	-	-	-	-
Little Roberts Lake	434665	7562826	-[c]	-[c]	-	-	-	-	-	-
Little Roberts Outflow Hydro	434548	7562652	-	-	X	-	-	-	-	-
Windy Watershed										
Windy Lake	431630	7553269	X	-[c]	-	X	X	-	-	-
Windy Outflow Hydro	431404	7554948	-	-	X	-	-	-	-	-
Glenn Lake	430183	7560337	-[c]	-[c]	-	-	-	-	-	-
Glenn Lake Hydro	430410	7562001	-	-	-	-	-	-	-	-
Reference Lake										
Reference Lake B	424050	7532000	-[c]	-[c]	-	X	X	X	X	X

Notes:
Dashes (-) = Monitoring is either not triggered by the Plan or not required at the specific station.
X = Monitoring completed in 2025.
[a] Coordinates are NAD83, UTM Zone 13N.
[b] Sampling on Wolverine Lake was completed for baseline assessment and was not a required monitoring component of the 2025 AEMP sampling.
[c] Water level measurements were not obtained in 2025 due to weather and safety concerns.

FIGURE A.1-1 PATCH LAKE, IMNIAGUT LAKE, AND PO LAKE SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025



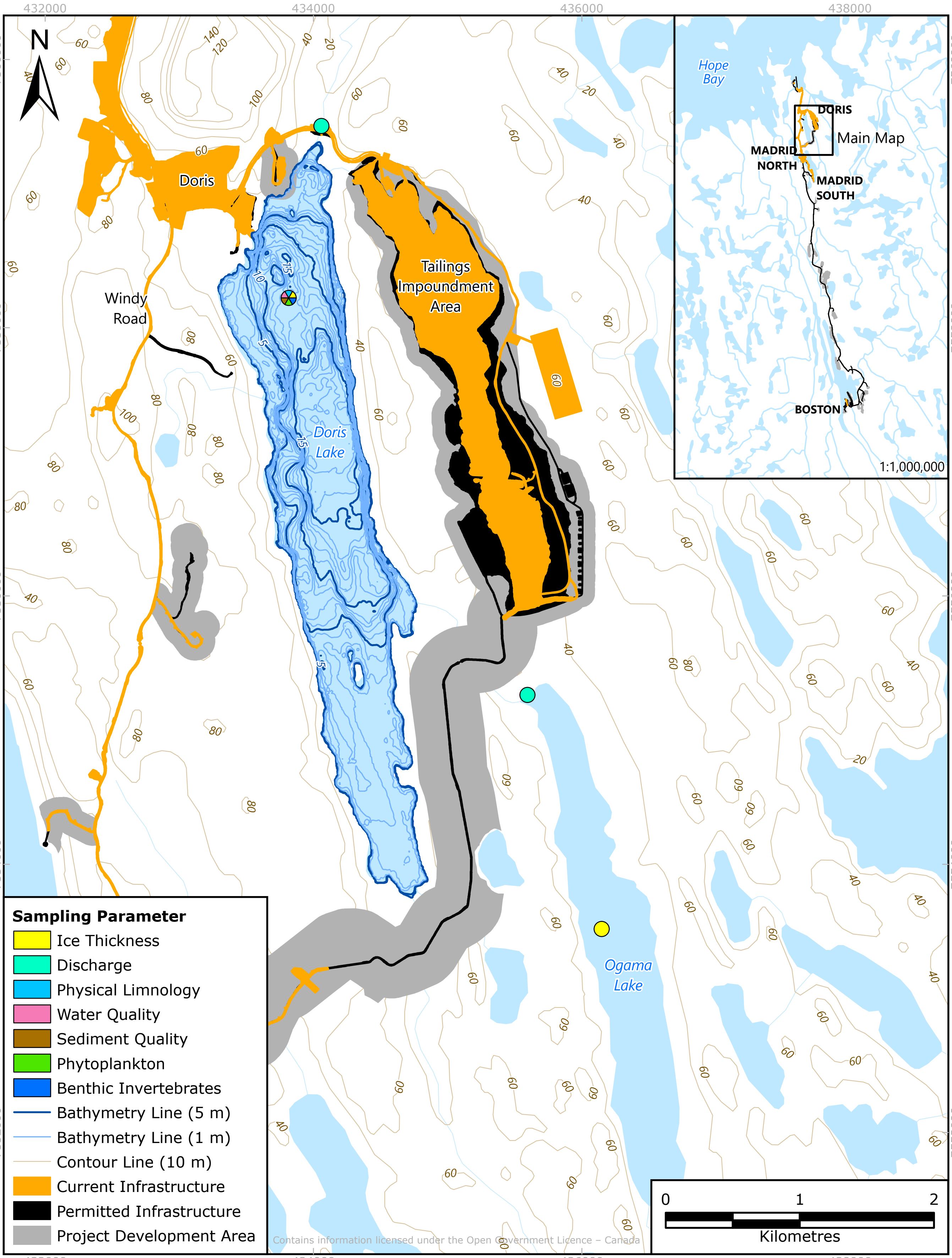
ERM

CLIENT: Agnico Eagle Mines Ltd.
GIS NUMBER: HB-01-304-03

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:35,000 when printed at 8.5x11

FIGURE A.1-2 DORIS LAKE AND OGAMA LAKE SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025



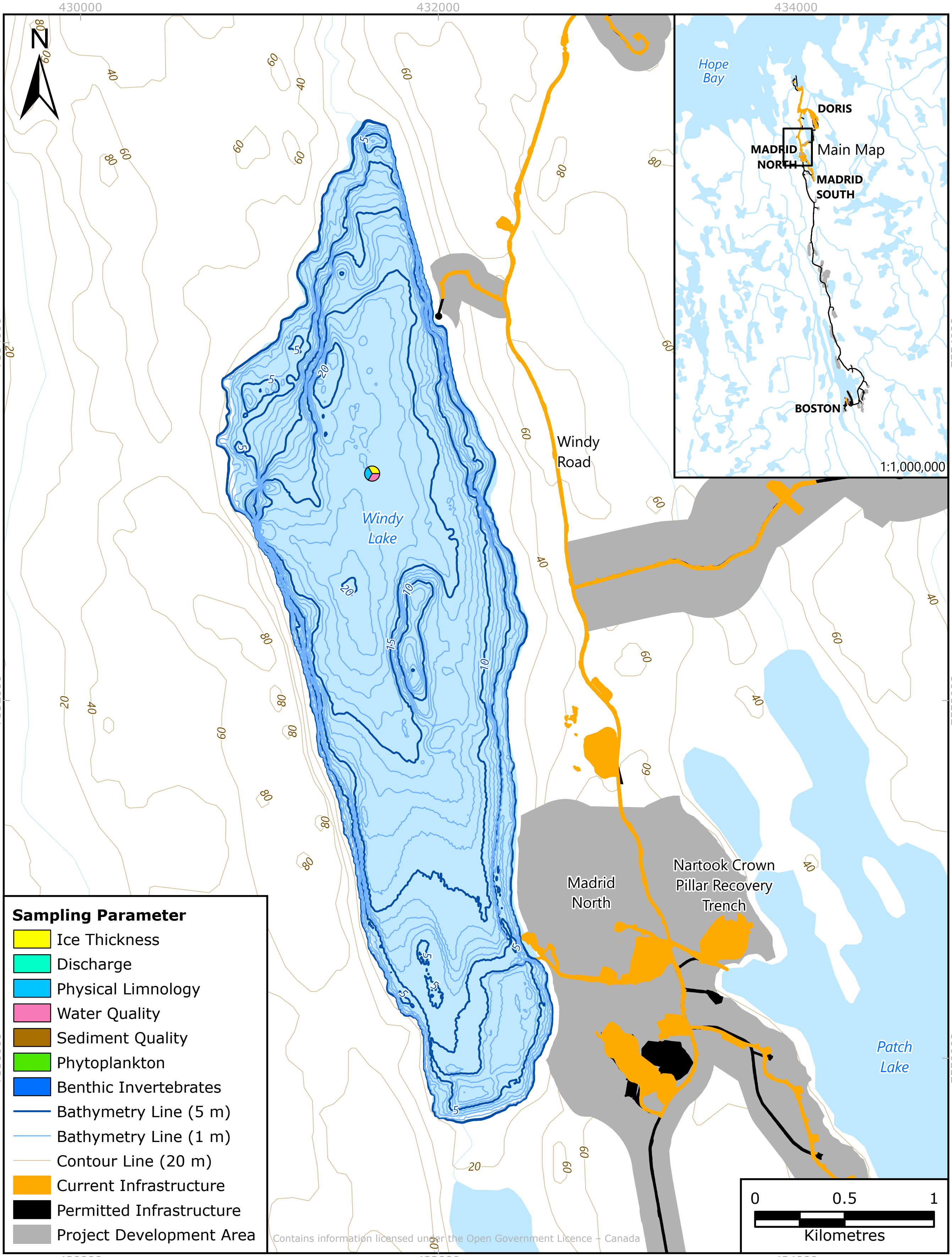
ERM

CLIENT: Agnico Eagle Mines Ltd.
GIS NUMBER: HB-01-304-04

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:40,000 when printed at 8.5x11

FIGURE A.1-3 WINDY LAKE SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

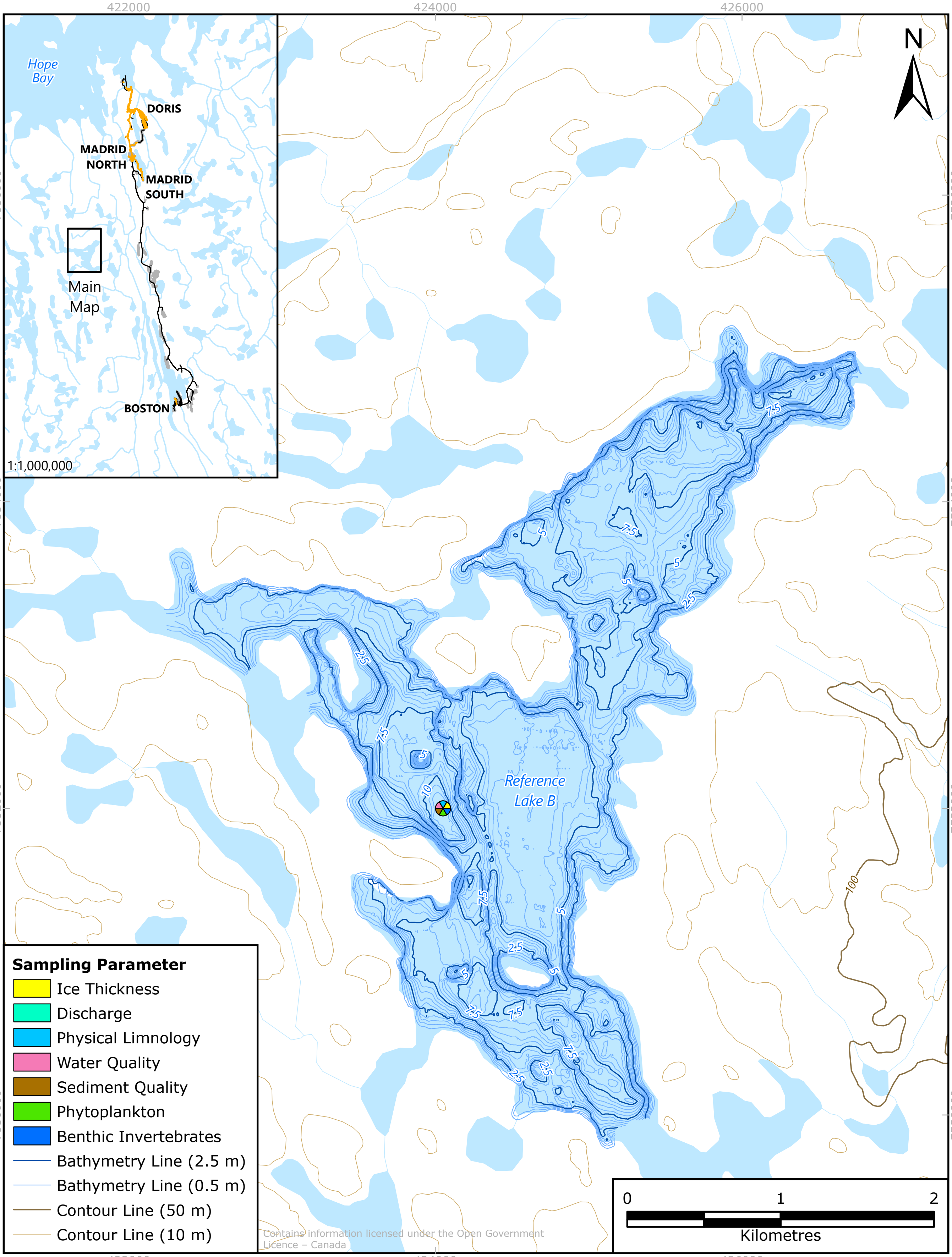


CLIENT: Agnico Eagle Mines Ltd.
GIS NUMBER: HB-01-304-05

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:30,000 when printed at 8.5x11

FIGURE A.1-4 REFERENCE LAKE SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

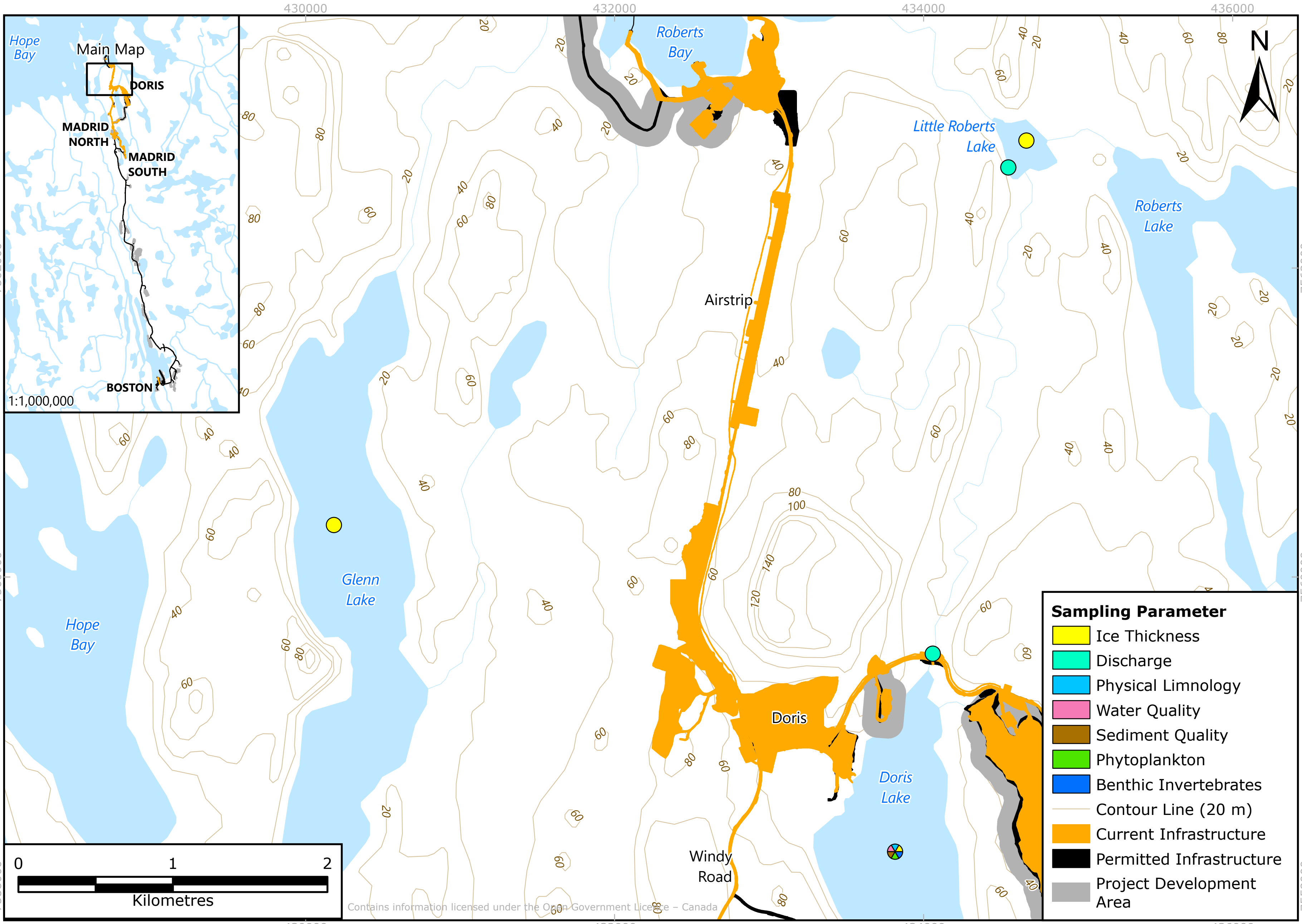


CLIENT: Agnico Eagle Mines Ltd.
GIS NUMBER: HB-01-304-06

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:35,000 when printed at 8.5x11

FIGURE A.1-5 GLENN LAKE AND LITTLE ROBERTS LAKE SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025



CLIENT: Agnico Eagle Mines Ltd.
GIS NUMBER: HB-01-304-07

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:35,000 when printed at 8.5x11

A.2 METHODS

Sampling for the 2025 AEMP was completed during April (under-ice) and August (open-water).

Under-ice sampling was conducted from April 26 to 28, 2025 at stations listed in the AEMP (Tables A.1-1 and A.1-2; Figures A.1-1 to A.1-6). Under-ice sampling for ice thickness, physical limnology, and water quality was conducted by auguring a hole through the ice. Ice chips and snow were cleared from the ice surface and from the augured hole using a clean, plastic ice scoop (e.g., slotted spoon) prior to ice thickness measurements and sample collection.

Open-water sampling was conducted from August 15 to 20, 2025 at stations listed in the AEMP (Tables A.1-1 and A.1-2; Figures A.1-1 to A.1-6). Open-water sampling for physical limnology, water quality, sediment quality, phytoplankton biomass, and benthic invertebrates was conducted from a boat.

A.2.1 ICE THICKNESS

Ice thickness was measured using a metered rod fitted with a hook. The measuring rod was “hooked” to the bottom of the ice layer and the thickness reading was recorded from the ice surface (not the snow surface). Ice thickness measurements at Windy Lake, Patch Lake, Doris Lake, and Reference Lake B were collected concurrently with water column profiling (physical limnological metrics) and water quality sampling.

A.2.2 PHYSICAL LIMNOLOGY

Temperature and DO profiles were collected after water quality sampling using a calibrated Aqua TROLL multiparameter meter. The probe was calibrated daily for DO saturation following the manufacturer’s instructions. Profiles extended either from the bottom of the ice layer (under-ice season) or from the water surface (open-water) to approximately 1 m above the sediment-water interface. Depth was monitored using metered markings on the cable. Data were recorded at 0.5 m intervals for lakes less than 10 m deep and 1 m intervals from lakes greater than 10 m deep.

A.2.2.1 UNDER-ICE SEASON

The water column depth under the ice was measured using a depth sounder attached to the metered rod fitted with a hook. The measuring rod was “hooked” to the bottom of the ice layer and the under-ice water column depth was recorded. Temperature and DO profiles were collected as described in Section A.2.2.

A.2.2.2 OPEN-WATER SEASON

The water column depth was measured using a handheld depth sounder from the surface of the water. Temperature and DO profiles were collected as described in Section A.2.2.

The euphotic zone depth was estimated from the light attenuation in each lake using Secchi depth (D_s). The Secchi depth was measured at each site by lowering a standardized Secchi disk (20 cm diameter) on a metered line through the water column on the shaded side of the boat until it was no longer visible. The depth of disappearance was recorded. The disk was lowered further to ensure it was beyond visual perception, then slowly raised until it became visible. This depth was also recorded, and the two depths were averaged to calculate D_s.

The light extinction coefficient (k) was calculated using D_s (Equation 1), then used to calculate the 1% euphotic depth ($Z_{1\%}$; Equation 2; Parsons et al. 1984). The 1% euphotic zone depth is the depth of the water column to which 1% of the surface irradiance reaches and is often referred to as the compensation depth. There is net photosynthesis above this depth as the integrated gross water column photosynthetic production is equivalent to the integrated gross water column respiration.

Equation 1

$$\textit{Light extinction coefficient: } k\ (m^{-1}) = 1.7/D_s$$

Equation 2

$$\textit{Euphotic depth (1\%): } Z_{1\%}\ (m) = 4.6/k$$

A.2.3 WATER QUALITY

Water quality sampling was completed prior to measuring physical limnology metrics to avoid the potential for sediment suspension with near-lake bottom activity.

Two discrete water samples were collected from each site (surface and deep). Samples were collected from either 1 m below the ice-water interface (under-ice) or 1 m below the water surface (open-water) and approximately 1 to 2 m from the water-sediment interface (lake bottom). A 2.5 L Teflon-lined Kemmerer water sampler was used during the under-ice season and a 2.5 L Niskin water sampler was used during the open-water season. Each water sampler was acid washed prior to the first day of the sampling event. The water sampler was set to open and lowered through the water column to the desired depth before being triggered to close using a Teflon-coated messenger on the line.

Samples were collected from the water sampler and decanted in the field into clean sample bottles provided by ALS Laboratory Group (ALS; a certified laboratory under Canadian Association for Laboratory Accreditation). Several sample handling methods were used to reduce potential contamination during sampling, including:

- Using new clean gloves when handling each sampling set.
- Never contacting the bottle or cap with the spigot.
- Using the “clean hands-dirty hands” technique for filling the total mercury sample bottles.

Cold temperatures during the under-ice sampling have the potential to freeze filters when filtering the dissolved samples. For the under-ice season only, an additional bottle of raw sample water was collected and processed at Doris Camp (e.g., filtered and preserved) for the dissolved samples using clean syringe filters. For the open-water season, dissolved samples were filtered in the field.

All samples were kept cool and in the dark by placing them in coolers while in the field, using ice packs as appropriate. Samples were refrigerated at Doris Camp until the first available transport offsite. Sample analyses were provided by ALS in Burnaby, British Columbia (metal parameters analyses), and Edmonton, Alberta (inorganic parameters analyses). Reported detection limits (DLs) were provided by ALS (Table A.2-1).

TABLE A.2-1 WATER QUALITY VARIABLES AND REPORTED DETECTION LIMITS ANALYSED FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Variable	Units	Reported Detection Limits	Variable	Units	Reported Detection Limits
Physical Tests					
Total Alkalinity (as $CaCO_3$)	mg/L	1	Total Suspended Solids	mg/L	1-5
Conductivity	µS/cm	2	Turbidity	NTU	0.1
Dissolved hardness (as $CaCO_3$)	mg/L	0.5	pH	pH units	0.1
Total hardness (as $CaCO_3$)	mg/L	0.5			
Anions and Nutrients					
Total Ammonia (as N)	mg/L	0.005	Nitrate (as N)	mg/L	0.005
Bromide	mg/L	0.05	Nitrite (as N)	mg/L	0.001
Chloride	mg/L	0.5	Total Phosphorus	mg/L	0.002
Fluoride	mg/L	0.02	Sulfate (as SO_4)	mg/L	0.3
Organic Carbon					
Dissolved Organic Carbon	mg/L	0.5	Total Organic Carbon	mg/L	0.5
Total Metals					
Aluminum	mg/L	0.003			
Antimony	mg/L	0.00003			
Arsenic	mg/L	0.00005			
Barium	mg/L	0.0001			
Beryllium	mg/L	0.000005			
Bismuth	mg/L	0.00005			
Boron	mg/L	0.01			
Cadmium	mg/L	0.000005	Niobium	mg/L	0.0001
Calcium	mg/L	0.02	Phosphorus	mg/L	0.05
Cesium	mg/L	0.000005	Potassium	mg/L	0.03
Chromium	mg/L	0.0005	Rhenium	mg/L	0.000005
Cobalt	mg/L	0.00005	Rubidium	mg/L	0.00002
Copper	mg/L	0.0005	Selenium	mg/L	0.00005
Gallium	mg/L	0.00005	Silicon	mg/L	0.1
Iron	mg/L	0.01	Silver	mg/L	0.000005
Lanthanum	mg/L	0.00005	Sodium	mg/L	0.02

Variable	Units	Reported Detection Limits	Variable	Units	Reported Detection Limits
Total Metals *(cont'd)*					
Strontium	mg/L	0.0002	Titanium	mg/L	0.0002
Sulfur	mg/L	0.5	Tungsten	mg/L	0.00001
Tantalum	mg/L	0.0001	Uranium	mg/L	0.000002
Tellurium	mg/L	0.00005	Vanadium	mg/L	0.0002
Thallium	mg/L	0.000005	Yttrium	mg/L	0.00001
Thorium	mg/L	0.000005	Zinc	mg/L	0.003
Tin	mg/L	0.0002	Zirconium	mg/L	0.00005
Dissolved Metals					
Manganese	mg/L	0.0001-0.0002	Zinc	mg/L	0.001

Notes:
$CaCO_3$ = calcium carbonate; mg/L = milligrams per litre; NTU = nephelometric turbidity unit(s); μS/cm = microSiemens per centimetre

A.2.3.1 QUALITY ASSURANCE AND QUALITY CONTROL

Field

Aside from sample handling methods outlined in Section A.2.3, the quality assurance/quality control (QA/QC) program for water quality sampling also included the collection of replicates, blanks, and the use of chain of custody forms to track samples.

Field sample variability was accounted for by collecting replicate samples representing 10% of the total samples collected (e.g., one replicate per sampling season). Replicate samples provide a measure of field sampling precision and environmental heterogeneity (BC MOE 2013).
The variance between primary (A) and replicate (B) samples are measured using Relative Percent Difference (RPD; Equation 3).

Equation 3

$$RPD = 2*|A-B|/(A+B)*100\%$$

The RPDs were calculated for specific water quality variables if at least one replicate concentration was greater than five times the analytical DL (BC MOE 2013). Any RPD values >20% may indicate a potential issue that required follow-up investigation for evidence of sample contamination, field notation of sampling errors, transcription and/or data entry errors, laboratory anomalies, or any other determination of potential cause for effects on sample data interpretation. Best professional judgement may be applied in the interpretation of the results.

One travel blank, one field blank, and one equipment blank were collected or processed during each trip (~25% of total samples) and submitted with the water samples as part of the QA/QC program. These blanks were used to identify potential sources of contamination relating to insufficiently clean equipment, local environmental field conditions, or laboratory contamination. The travel blank was provided by ALS as pre-filled sample bottles and remained closed throughout the entire sampling effort. The travel blank was transported with the other sample bottles for each day of sampling. The field blank was collected in the field using distilled, deionized water and handled as a regular sample. The equipment blank was collected prior to any water samples being collected in the water sampler by rinsing the water sampler three times with distilled, deionized water to remove acid residue. Then, the water sampler was again filled with distilled, deionized water and collected with the same handling methods as a regular sample.

Laboratory

The laboratory QA/QC program included reviews of maximum holding times, and the use of method blanks, laboratory replicates, certified reference materials, internal reference materials, laboratory control samples, matrix spikes, and calibration verification standards. ALS has set data quality objectives (DQOs) for QA/QC samples with acceptable limits for sample recovery, precision, and accuracy. When DQOs are not met, ALS flags the sample for follow-up or adjusts the DL as required.

A.2.4 SEDIMENT QUALITY

Sediment quality samples were collected concurrently with benthic invertebrate samples using an Ekman grab sampler (15 cm x 15 cm; surface sampling area of 0.0225 m^2). For each lake, three sediment samples were collected approximately 10 to 20 m apart. One sample for sediment quality and one sample for benthic invertebrate samples were collected from the same location, then approximately 10 to 20 m of line was let out and the boat repositioned. Due to the large sample size required by the ALS containers, two Ekman grabs were collected for each sample. The Ekman was opened and the trigger mechanism carefully set. The sampler was then gradually lowered to the sediment surface using a metered line and triggered to close with a messenger. The sampler was slowly lifted through the water column, brought aboard the boat and inspected to ensure the sample collected was intact and undisturbed. Water from the sample surface was carefully decanted using tubing and a syringe, and the top 2 to 3 cm of sediment was collected using a plastic spoon and transferred to a plastic bowl. The Ekman was cleaned and then the process was repeated for the collection of a composite sample. Once the two composite sample were collected, the sample was homogenized and placed into sample containers provided by ALS, which included two 500 mL glass jars and one HDPE sample bag. All samples were kept cool and in the dark by placing them in coolers while in the field, using ice packs as appropriate. Samples were refrigerated at Doris Camp until the first available transport offsite. Sediment samples were shipped to ALS in Edmonton, Alberta for analysis. Reported DLs were provided by ALS (Table A.2-2).

TABLE A.2-2 SEDIMENT QUALITY VARIABLES AND REPORTED DETECTION LIMITS ANALYSED FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Variable	Units	Reported Detection Limit	Variable	Units	Reported Detection Limit
Physical Tests			**Metals *(cont'd)***		
Moisture	%	0.25	Copper	mg/kg	0.50
pH (1:2 soil:water)	pH units	0.10	Iron	mg/kg	50
Particle Size			Lead	mg/kg	0.50
Gravel (>2mm)	%	1.0	Lithium	mg/kg	2.0
Sand (2.0mm - 0.063mm)	%	1.0	Magnesium	mg/kg	20
Silt (0.063mm - 0.004mm)	%	1.0	Manganese	mg/kg	1.0
Clay (<0.004mm)	%	1.0	Mercury	mg/kg	0.0050
Anions and Nutrients			Molybdenum	mg/kg	0.10
Nitrogen, total	%	0.020	Nickel	mg/kg	0.50
Organic / Inorganic Carbon			Phosphorus	mg/kg	50
Carbon, total organic [TOC]	%	0.064 to 0.634	Potassium	mg/kg	100
Inorganics			Selenium	mg/kg	0.20
Sulfur, total	mg/kg	500	Silver	mg/kg	0.10
Metals			Sodium	mg/kg	50
Aluminum	mg/kg	50	Strontium	mg/kg	0.50
Antimony	mg/kg	0.10	Sulfur	mg/kg	1000
Arsenic	mg/kg	0.10	Thallium	mg/kg	0.050
Barium	mg/kg	0.50	Tin	mg/kg	2.0
Beryllium	mg/kg	0.10	Titanium	mg/kg	1.0
Bismuth	mg/kg	0.20	Tungsten	mg/kg	0.50
Boron	mg/kg	5.0	Uranium	mg/kg	0.050
Cadmium	mg/kg	0.020	Vanadium	mg/kg	0.20
Calcium	mg/kg	50	Zinc	mg/kg	2.0
Chromium	mg/kg	0.50	Zirconium	mg/kg	1.0
Cobalt	mg/kg	0.10			

Notes: % = percent; mg/kg = milligrams per kilogram

A.2.4.1 QUALITY ASSURANCE AND QUALITY CONTROL

The QA/QC program for sediment quality sampling included the collection of replicates to account for sample and sampling variability, and the use of chain of custody forms to track samples. Sample handling methods to reduce contamination included wearing gloves for each sample and thoroughly cleaning the Ekman grab in between samples.

The laboratory QA/QC program for sediment quality samples included the use of method blanks, laboratory replicates, certified reference materials, internal reference materials, laboratory control samples, matrix spikes, and calibration verification standards. ALS has set DQOs for QA/QC samples with acceptable limits for sample recovery, precision, and accuracy. When DQOs are not met, ALS flags the sample for follow-up or adjusts the DL as required.

A.2.5 PHYTOPLANKTON BIOMASS

Chlorophyll *a* (chl *a*) samples were collected in opaque, clean, 1-L sample bottles that were rinsed with surface water at each site. For each chl *a* sample, the water sampler was lowered to approximately 1 m below the water surface and triggered to close with a messenger. Once retrieved, a subsample was decanted from the sampler into the sample bottle.

All samples were kept cool and in the dark by being placed in coolers while in the field, using ice packs as appropriate. Samples were brought to Doris Camp and were filtered using vacuum filtration with a manually operated hand pump. The chl *a* samples were filtered onto 47 mm diameter, 0.45 μm pore size nitrocellulose membrane filters until there was an observed colour change on the filter or the full litre of water was filtered. The filters were folded in half using forceps and placed into a black plastic tube to prevent light penetration. The filters were kept frozen and sent to ALS Edmonton for analysis.

A.2.5.1 Quality Assurance and Quality Control

The field QA/QC program for chl *a* sampling included the collection of replicates and the use of chain of custody forms to track samples.

The laboratory QA/QC program included the use of method blanks and laboratory control samples. ALS has set DQOs for QA/QC samples with acceptable limits for sample recovery, precision, and accuracy. When DQOs are not met, ALS flags the sample for follow-up or adjusts the DL as required.

A.2.6 BENTHIC INVERTEBRATES

Benthic invertebrate samples were collected concurrently with sediment samples. For each lake, five samples were collected using an Ekman grab sampler (surface sampling area of 0.0225 m^2). Samples were collected approximately 10 to 20 m apart to capture the heterogeneity of the benthic community within the lake sediments. Each sample consisted of three composite subsamples. The Ekman was opened and the trigger mechanism carefully set. The sampler was then gradually lowered to the sediment surface using a metered line and triggered to close with a messenger. The sampler was slowly lifted through the water column, brought aboard the boat and inspected to ensure the sample collected was intact and undisturbed. The entire sample was transferred into a 500 μm sieve bag and rinsed with lake water until as much sediment as possible was sieved out. The sample within the sieve bag was transferred to a labeled plastic jar; multiple jars were used as necessary for one sample and labeled appropriately (e.g., Rep 1, Jar 1 of 2). Samples were placed in a cooler while in the field then preserved with buffered formalin to a final concentration of 10% upon return to Doris Camp. Benthic invertebrate samples were shipped to Environmental Research and Consulting (Summerland, BC) for enumeration and identification.

Benthic invertebrate taxonomic counts were processed to exclude cladocerans, copepods, ostracods, and nematodes. Cladocerans and copepods were excluded as these groups are generally planktonic; ostracods and nematodes were excluded as these groups belong to the meiofauna size class (63 µm to 500 µm) and are not consistently sampled with the 500 µm sieve used in the AEMP sampling method.

Community metrics, including total benthic invertebrate density, family richness, Simpson's evenness index, and the Bray-Curtis similarity index, were calculated from the taxonomic data according to the methods described in Environment Canada (Environment Canada 2012). Total benthic invertebrate density was calculated for each sample by dividing the sum of all benthic organisms by three times the surface area of the Ekman grab sampler (i.e., 3 x 0.0225 m^2). This calculation provided benthic invertebrate density in units of organisms per square metre, as each replicate consisted of three composite Ekman grab samples. Family richness was calculated as the total number of benthic invertebrate families present in each composite sample.
The Simpson's Evenness Index (E) was calculated as:

$$\mathrm{E} = 1/\sum_{i=1}^{F}(\mathrm{p}_i)^2/\mathrm{F}$$

where F is the number of families present (i.e., family richness), and p_i is the relative density of each family calculated as n_i/N (where n_i is the number of individuals in family I and N is the total number of individuals).

The Bray-Curtis Index (BC) was calculated as:

$$\mathrm{BC} = \sum_{i=1}^{n}|y_{i1} - y_{i2}| \,/\, \sum_{i=1}^{n}(y_{i1} + y_{i2})$$

where BC is the Bray-Curtis distance between Sites 1 and 2, n is the total number of families present at the two sites, y_{i1} is the count for family i at Site 1 and y_{i2} is the count for family i at Site 2. This calculation compares the community composition at each exposure or reference lake to the median reference community composition. As a measurement of the percent difference between sites, the greater the dissimilarity value between a site and the median reference community, the more dissimilar those benthos communities are. The Bray-Curtis index ranges from 0 to 1, with 0 representing identical communities and 1 representing dissimilar communities.

A.2.6.1 QUALITY ASSURANCE AND QUALITY CONTROL

The QA/QC program for the benthic invertebrate sampling included the collection of replicates to account for within-site variability and the use of chain of custody forms to track samples.

A re-sorting of randomly selected sample residues was conducted by the taxonomist on a minimum of 10% of the benthos samples to determine the level of sorting efficiency. The criterion for an acceptable sorting was that more than 95% of the total number of organisms was recovered during the initial sort. The number of organisms initially recovered from the sample was expressed as a percentage of the total number after the re-sort. Any sample not meeting the 95% removal criterion was re-sorted a third time.

Percent sorting efficiency was calculated according to Environment Canada (2002):

$$\%\text{ Sorting Efficiency} = [1 - \{\#\ in\ QA/QC\, re\text{-}sort\ /(\#\ sorted\ originally + \#\ in\ QA/QC\, re\text{-}sort)\}] * 100$$

A.3 2025 AEMP DATA RESULTS

A.3.1 ICE THICKNESS

Ice thickness data (Table A.3-1) is presented.

TABLE A.3-1 ICE THICKNESS MEASUREMENTS IN MONITORED LAKES FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake	Sampling Date	Ice Thickness (m)
Reference Lake B	28 April 2025	1.5
Windy lake	26 April 2025	1.5
Patch Lake	27 April 2025	1.6
Imniagut Lake	NA	NA
Doris Lake	26 April 2025	1.8
Ogama Lake	NA	NA
Little Roberts Lake	NA	NA
Glenn Lake	NA	NA
P.O. Lake	NA	NA

Note:
m = metres; NA = not applicable

A.3.2 PHYSICAL LIMNOLOGY

Physical limnology data for under-ice (Table A.3-2), open-water (Table A.3-3), and Secchi depth sampling with calculated euphotic depths (Table A.3-4) are presented.

TABLE A.3-2 UNDER-ICE TEMPERATURE AND DISSOLVED OXYGEN PROFILES IN MONITORED LAKES FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Patch – 27 April 2025			
Depth (m)	Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
2.5	1.92	11.1	79.96
3	1.69	11.23	80.18
3.5	1.59	11.39	81.23
4	1.65	11.09	79.16

Windy – 26 April 2025			
Depth (m)	Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
2	0.68	15.42	106.5
2.5	0.8	15.33	106.16
3	0.76	15.35	106.13
3.5	0.74	15.38	106.43
4	0.98	15.23	106.03
4.5	0.79	15.32	106.92
5	0.86	15.29	105.97
5.5	0.88	15.26	105.35
6	0.78	15.27	105.72
6.5	0.78	15.29	105.81
7	0.85	15.28	105.92
7.5	0.78	15.3	105.92
8	0.72	15.27	105.79
8.5	0.8	15.27	105.76
9	0.8	15.27	105.73
9.5	0.83	15.19	105.51
10	0.84	15.1	104.73
11	0.86	15	104.14
12	0.97	14.63	101.68
13	1.18	13.83	96.82
14	1.32	13.57	95.05
15	1.53	12.99	91.75
16	1.78	11.96	85.08

Doris – 26 April 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
2	0.57	12.79	88.28
2.5	0.77	12.43	85.92
3	0.87	12.17	84.48
3.5	0.87	12.1	83.9
4	0.83	11.89	82.17
4.5	0.82	11.63	80.56
5	0.87	11.86	82.26
5.5	0.87	11.97	83.03
6	0.88	11.03	81.34
6.5	0.88	11.11	76.9
7	0.92	10.93	75.4
7.5	0.97	10.67	74.07
8	0.97	10.33	71.97
8.5	0.98	10.2	71.05
9	1.05	9.5	66.01
9.5	1.08	9.14	63.73
10	1.09	8.79	61.33
11	1.13	8.11	56.62

Reference B – 28 April 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
2	3.18	14.27	108.15
2.5	2.41	13.91	103.15
3	1.68	13.82	100.38
3.5	1.49	12.29	88.74
4	1.95	11.72	85.79
4.5	1.6	11.5	83.39
5	1.61	10.85	71.86
5.5	2.09	8.63	63.37
6	2.07	7.66	56.31
6.5	2.19	6.69	49.3
7	2.27	5.86	43.26

Notes:
% = percent; °C = degree Celsius; m = metres; mg/L = milligrams per litre

TABLE A.3-3 OPEN-WATER TEMPERATURE AND DISSOLVED OXYGEN PROFILES IN MONITORED LAKES FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Windy – 16 August 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
1	11.96	11.15	103.26
2	11.78	11.15	103.05
3	11.49	11.2	102.89
4	11.41	11.21	102.7
5	11.4	11.21	102.46
6	11.38	11.19	102.47
7	11.37	11.18	102.46
8	11.38	11.17	102.29
9	11.36	11.17	102.38
10	11.36	11.16	102.22
11	11.33	11.16	102.03
12	11.14	11.16	101.71
13	11.11	11.13	101.34
14	11.1	11.12	101.08
15	11.05	11.07	100.63
16	10.85	11.09	100.29

Doris – 16 August 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
1	12.01	11.69	108.41
2	12.03	11.67	108.39
3	12.01	11.67	108.35
4	12	11.66	108.12
5	11.98	11.66	107.93
6	11.9	11.55	106.68
7	11.51	11.49	106.32
8	11.78	11.43	105.4
9	11.73	11.34	104.33
10	11.66	11.25	103.39

Doris – 16 August 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
11	11.51	10.95	100.16
12	11.37	10.63	96.7
13	11.24	10.27	92.97

Patch – 17 August 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
0.5	12.98	10.98	104.19
1	12.98	10.98	104.18
1.5	12.94	10.99	104.35
2	12.97	10.98	104.24
2.5	12.94	10.97	103.96
3	12.92	10.97	103.91
3.5	12.9	10.95	103.83
4	12.84	10.93	103.46
4.5	12.37	10.91	102.31
5	12.31	10.91	101.95
5.5	12.29	10.91	101.86
6	12.26	10.91	101.7
6.5	12.25	10.88	101.49
7	12.25	10.88	101.53
7.5	12.23	10.82	101.08

Reference B – 18 August 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
0.5	12.88	10.89	104.4
1	12.84	10.9	104.36
1.5	12.88	10.87	104.42
2	12.85	10.9	104.3
2.5	12.82	10.89	104.21
3	12.83	10.88	103.99
3.5	12.77	10.88	104.2
4	12.73	10.9	104.13

Reference B – 18 August 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
4.5	12.62	10.9	103.96
5	12.53	10.93	103.8
5.5	12.52	10.91	103.74
6	12.48	10.93	103.81
6.5	12.48	10.92	103.72
7	12.48	10.92	103.6
7.5	12.46	10.9	103.48
8	12.4	10.9	103.31
8.5	12.33	10.91	103.16
9	12.06	10.89	102.27
9.5	11.88	10.94	102.4
10	11.76	10.84	101.22

Notes:
% = percent; °C = degree Celsius; m = metres; mg/L = milligrams per litre

TABLE A.3-4 SECCHI DEPTHS AND EUPHOTIC ZONE DEPTHS FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake	Sampling Date	Lake Depth (m)	Secchi Depth (m)	Euphotic Zone Depth 1% Light Level (m)
Doris	15-Aug-25	13.8	1.00	2.71
Patch	17-Aug-25	8.0	2.35	6.36
Reference B	18-Aug-25	10.5	7.70	20.84*
Windy	16-Aug-25	17.5	4.50	12.18

Notes:
* Indicates that the euphotic zone extended to the bottom of the water column.
% = percent; m = metres

A.3.3 WATER QUALITY

Water quality sampling results are presented (Table A.3-5). Results for samples that exceed the applicable benchmark (Tables 2.2-2 to 2.2-4 in main report) are highlighted.

TABLE A.3-5 WATER QUALITY DATA FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake		**Doris Lake**				**Patch Lake**				
Sampling Date		**4/26/2025**	**4/26/2025**	**8/16/2025**	**8/16/2025**	**4/27/2025**	**4/27/2025**	**8/17/2025**	**8/17/2025**	**8/17/2025**
Sampling Depth		**11 (Deep)**	**3 (Surface)**	**13 (Deep)**	**1 (Surface)**	**4 (Deep)**	**3 (Surface)**	**7 (Deep)**	**7 (Deep)**	**1 (Surface)**
Replicate		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**
ALS Sample ID	**Units**	**EO2503265-004**	**EO2503265-003**	**EO2507460-004**	**EO2507460-003**	**EO2503265-006**	**EO2503265-005**	**EO2507460-006**	**EO2507460-009**	**EO2507460-005**
Physical Tests										
Alkalinity, total (as $CaCO_3$)	mg/L	35.4	37.2	28.0	27.1	59.7	58.8	34.9	35.4	35.6
Conductivity	μS/cm	287	298	220	219	471	466	277	276	274
Hardness (as $CaCO_3$), from total Ca/Mg	mg/L	53.4	55.6	44.6	43.8	88.5	86.3	54.6	55.2	56.2
Solids, total suspended [TSS]	mg/L	<3.0	<3.0	6.9	3.7	<3.0	<3.0	<2.1	<1.0	<1.0
Turbidity	NTU	1.31	5.77	10.5	5.32	4.02	3.50	2.00	2.10	1.77
Hardness (as $CaCO_3$), dissolved	mg/L	46.6	48.6	42.0	42.2	77.4	75.6	52.6	51.8	53.5
pH	pH units	7.58	7.76	7.61	7.70	7.76	7.75	7.91	7.90	7.92
Anions and Nutrients										
Ammonia, total (as N)	mg/L	0.0536	0.0111	0.0060	<0.0050	0.0404	0.0070	0.0075	<0.0050	<0.0050
Bromide	mg/L	0.166	0.179	0.216	0.212	0.272	0.282	0.232	0.250	0.269
Chloride	mg/L	61.6	64.1	50.2	50.1	105	103	64.1	64.0	64.0
Fluoride	mg/L	0.064	0.064	0.055	0.054	0.098	0.094	0.062	0.069	0.064
Nitrate (as N)	mg/L	0.156	0.0793	<0.0050	<0.0050	0.0790	0.0727	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sulfate (as SO_4)	mg/L	3.50	3.71	2.58	2.57	5.13	5.11	2.84	2.82	2.86
Phosphorus, total (nutrient)	mg/L	0.0193	0.0332	0.0561	0.0322	0.0075	0.0077	0.0187	0.0075	0.0081
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	mg/L	7.38	8.08	6.04	6.34	8.26	7.94	5.11	5.07	4.94
Carbon, total organic [TOC]	mg/L	7.78	8.58	6.57	6.60	8.29	8.74	5.16	4.98	5.17
Total Metals										
Silver, total	mg/L	<0.0000050	0.0000075	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Aluminum, total	mg/L	0.0144	0.0141	0.0799	0.0442	0.248	0.217	0.0945	0.104	0.0935
Arsenic, total	mg/L	0.000296	0.000340	0.000337	0.000301	0.000396	0.000390	0.000286	0.000279	0.000285
Boron, total	mg/L	0.020	0.021	0.018	0.018	0.034	0.033	0.023	0.023	0.023
Barium, total	mg/L	0.00279	0.00259	0.00331	0.00280	0.00614	0.00629	0.00307	0.00308	0.00308
Beryllium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000063	0.0000053	<0.0000050	<0.0000050	<0.0000050

Lake		**Doris Lake**				**Patch Lake**				
Sampling Date		**4/26/2025**	**4/26/2025**	**8/16/2025**	**8/16/2025**	**4/27/2025**	**4/27/2025**	**8/17/2025**	**8/17/2025**	**8/17/2025**
Sampling Depth		**11 (Deep)**	**3 (Surface)**	**13 (Deep)**	**1 (Surface)**	**4 (Deep)**	**3 (Surface)**	**7 (Deep)**	**7 (Deep)**	**1 (Surface)**
Replicate		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**
ALS Sample ID	**Units**	**EO2503265-004**	**EO2503265-003**	**EO2507460-004**	**EO2507460-003**	**EO2503265-006**	**EO2503265-005**	**EO2507460-006**	**EO2507460-009**	**EO2507460-005**
Total Metals *(cont'd)*										
Bismuth, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Calcium, total	mg/L	9.85	10.2	7.79	7.72	15.5	15.1	9.46	9.40	9.73
Cadmium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Cobalt, total	mg/L	<0.000050	<0.000050	0.000059	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Chromium, total	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cesium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000094	0.0000092	<0.0000050	<0.0000050	<0.0000050
Copper, total	mg/L	0.00196	0.00203	0.00160	0.00149	0.00207	0.00208	0.00140	0.00138	0.00145
Iron, total	mg/L	0.027	0.021	0.169	0.082	0.145	0.127	0.050	0.059	0.048
Gallium, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Mercury, total	mg/L	0.00000064	0.00000058	0.00000077	0.00000071	0.00000028	0.00000032	0.00000057	0.00000037	0.00000049
Potassium, total	mg/L	2.39	2.49	2.02	2.00	3.89	3.83	2.51	2.50	2.62
Lanthanum, total	mg/L	0.000057	0.000055	0.000103	0.000060	0.000205	0.000214	0.000098	0.000112	0.000093
Lithium, total	mg/L	0.00318	0.00338	0.00292	0.00302	0.00572	0.00556	0.00378	0.00386	0.00380
Magnesium, total	mg/L	6.99	7.33	6.12	5.96	12.1	11.8	7.52	7.71	7.74
Manganese, total	mg/L	0.00496	0.00236	0.0552	0.0175	0.00688	0.00512	0.00983	0.0105	0.00898
Molybdenum, total	mg/L	0.000274	0.000305	0.000264	0.000257	0.000404	0.000424	0.000279	0.000281	0.000281
Sodium, total	mg/L	32.6	33.4	26.6	26.8	54.5	53.2	32.7	33.9	34.1
Niobium, total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Nickel, total	mg/L	0.00056	0.00065	0.00131	0.00060	0.00121	0.00120	0.00067	0.00066	0.00063
Phosphorus, total (metal)	mg/L	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000075	0.000066	0.000086	0.000084	0.000074
Rubidium, total	mg/L	0.00156	0.00162	0.00129	0.00123	0.00234	0.00229	0.00148	0.00152	0.00150
Rhenium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sulfur, total	mg/L	1.38	1.43	1.20	1.21	1.92	1.91	1.25	1.26	1.29
Antimony, total	mg/L	<0.000030	0.000039	<0.000030	0.000034	0.000039	0.000038	<0.000030	<0.000030	<0.000030
Selenium, total	mg/L	<0.000050	0.000065	<0.000050	0.000060	0.000064	<0.000050	0.000088	0.000070	0.000060
Silicon, total	mg/L	2.03	1.99	1.69	1.54	1.42	1.34	0.53	0.54	0.51

Lake		**Doris Lake**				**Patch Lake**				
Sampling Date		**4/26/2025**	**4/26/2025**	**8/16/2025**	**8/16/2025**	**4/27/2025**	**4/27/2025**	**8/17/2025**	**8/17/2025**	**8/17/2025**
Sampling Depth		**11 (Deep)**	**3 (Surface)**	**13 (Deep)**	**1 (Surface)**	**4 (Deep)**	**3 (Surface)**	**7 (Deep)**	**7 (Deep)**	**1 (Surface)**
Replicate		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**
ALS Sample ID	**Units**	**EO2503265-004**	**EO2503265-003**	**EO2507460-004**	**EO2507460-003**	**EO2503265-006**	**EO2503265-005**	**EO2507460-006**	**EO2507460-009**	**EO2507460-005**
Total Metals *(cont'd)*										
Tin, total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Strontium, total	mg/L	0.0429	0.0444	0.0344	0.0336	0.0779	0.0764	0.0466	0.0466	0.0479
Tantalum, total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tellurium, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Thorium, total	mg/L	0.0000101	0.0000107	0.0000230	0.0000174	0.0000468	0.0000446	0.0000170	0.0000215	0.0000184
Titanium, total	mg/L	0.00021	0.00021	0.00186	0.00085	0.00317	0.00318	0.00190	0.00212	0.00168
Thallium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Uranium, total	mg/L	0.0000444	0.0000492	0.0000463	0.0000445	0.0000980	0.0000980	0.0000754	0.0000771	0.0000769
Vanadium, total	mg/L	<0.00020	<0.00020	0.00024	<0.00020	0.00027	0.00027	<0.00020	<0.00020	<0.00020
Tungsten, total	mg/L	<0.000010	<0.000010	0.000040	0.000011	0.000014	0.000015	0.000016	0.000016	0.000017
Yttrium, total	mg/L	0.000033	0.000032	0.000037	0.000025	0.000066	0.000066	0.000029	0.000031	0.000028
Zinc, total	mg/L	<0.0030	0.0041	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium, total	mg/L	0.000058	0.000056	0.000071	0.000055	0.000130	0.000201	0.000073	0.000057	0.000054
Dissolved Metals										
Manganese, dissolved	mg/L	0.00090	0.00061	0.0196	0.00033	0.00223	0.00194	0.00059	0.00061	0.00067
Zinc, dissolved	mg/L	<0.0010	0.0056	0.0012	0.0025	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Lake		Reference B Lake				Windy Lake				
Sampling Date		**4/28/2025**	**4/28/2025**	**8/18/2025**	**8/18/2025**	**4/26/2025**	**4/26/2025**	**4/26/2025**	**8/16/2025**	**8/16/2025**
Sampling Depth		**7 (Deep)**	**4 (Surface)**	**9 (Deep)**	**1 (Surface)**	**16 (Deep)**	**4 (Surface)**	**4 (Surface)**	**16 (Deep)**	**1 (Surface)**
Replicate		**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
ALS Sample ID	**Units**	**EO2503265-002**	**EO2503265-001**	**EO2507460-002**	**EO2507460-001**	**EO2503265-008**	**EO2503265-007**	**EO2503265-009**	**EO2507460-008**	**EO2507460-007**
Physical Tests										
Alkalinity, total (as $CaCO_3$)	mg/L	18.8	18.8	12.2	12.4	59.2	60.2	59.8	48.8	45.1
Conductivity	µS/cm	80.2	85.7	58.4	63.6	500	511	510	412	410
Hardness (as $CaCO_3$), from total Ca/Mg	mg/L	23.1	23.7	16.2	16.6	87.0	85.4	85.0	74.5	79.6
Solids, total suspended [TSS]	mg/L	<3.0	<5.0	<1.0	<1.0	<3.0	<3.0	<3.0	<1.0	<2.1
Turbidity	NTU	0.44	0.21	0.22	0.30	1.39	0.89	0.77	0.77	0.70
Hardness (as $CaCO_3$), dissolved	mg/L	20.4	21.1	15.6	16.2	73.0	73.7	76.8	69.0	70.7
pH	pH units	7.25	7.40	7.49	7.50	7.95	8.04	8.01	8.04	8.05
Anions and Nutrients										
Ammonia, total (as N)	mg/L	0.0113	0.0222	<0.0050	<0.0050	0.0325	0.0073	0.0130	0.0460	<0.0050
Bromide	mg/L	<0.050	<0.050	<0.050	<0.050	0.395	0.413	0.387	0.426	0.468
Chloride	mg/L	9.88	11.6	8.11	8.14	112	113	113	95.4	95.3
Fluoride	mg/L	0.027	0.029	0.025	0.024	0.089	0.089	0.091	0.074	0.076
Nitrate (as N)	mg/L	0.0714	0.0694	<0.0050	0.0057	0.0337	0.0172	0.0117	<0.0050	<0.0050
Nitrite (as N)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sulfate (as SO_4)	mg/L	2.41	3.00	1.88	1.91	10.3	10.5	10.5	8.32	8.36
Phosphorus, total (nutrient)	mg/L	0.0041	0.0039	0.0165	0.0041	0.0040	0.0043	0.0042	0.0060	0.0056
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	mg/L	3.68	4.43	2.93	3.06	2.46	2.57	2.84	2.10	2.23
Carbon, total organic [TOC]	mg/L	3.96	4.72	3.32	3.25	2.50	2.71	2.76	2.09	2.03
Total Metals										
Silver, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Aluminum, total	mg/L	0.0069	0.0080	0.0066	0.0085	0.0900	0.0545	0.0494	0.0257	0.0352
Arsenic, total	mg/L	0.000106	0.000122	0.000079	0.000079	0.000244	0.000257	0.000255	0.000233	0.000242
Boron, total	mg/L	<0.010	<0.010	<0.010	<0.010	0.048	0.046	0.049	0.044	0.044
Barium, total	mg/L	0.00282	0.00264	0.00151	0.00155	0.00355	0.00309	0.00325	0.00256	0.00269
Beryllium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050

Lake		Reference B Lake				Windy Lake				
Sampling Date		**4/28/2025**	**4/28/2025**	**8/18/2025**	**8/18/2025**	**4/26/2025**	**4/26/2025**	**4/26/2025**	**8/16/2025**	**8/16/2025**
Sampling Depth		**7 (Deep)**	**4 (Surface)**	**9 (Deep)**	**1 (Surface)**	**16 (Deep)**	**4 (Surface)**	**4 (Surface)**	**16 (Deep)**	**1 (Surface)**
Replicate		**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
ALS Sample ID	**Units**	**EO2503265-002**	**EO2503265-001**	**EO2507460-002**	**EO2507460-001**	**EO2503265-008**	**EO2503265-007**	**EO2503265-009**	**EO2507460-008**	**EO2507460-007**
Total Metals *(cont'd)*										
Bismuth, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Calcium, total	mg/L	5.71	5.85	3.87	3.93	15.4	15.4	14.9	13.5	13.9
Cadmium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Cobalt, total	mg/L	0.000200	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Chromium, total	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cesium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000068	0.0000076	0.0000069	<0.0000050	<0.0000050
Copper, total	mg/L	0.00099	0.00113	0.00082	0.00078	0.00111	0.00114	0.00104	0.00093	0.00121
Iron, total	mg/L	0.146	0.022	0.018	0.022	0.027	0.016	0.015	0.022	0.029
Gallium, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Mercury, total	mg/L	0.00000033	0.00000068	0.00000047	0.00000053	0.00000028	<0.0000001	<0.0000001	0.00000029	0.0000004
Potassium, total	mg/L	0.705	0.733	0.536	0.538	4.49	4.44	4.45	3.80	4.03
Lanthanum, total	mg/L	0.000070	0.000064	<0.000050	<0.000050	0.000073	<0.000050	0.000060	<0.000050	0.000055
Lithium, total	mg/L	0.00064	0.00067	0.00050	0.00054	0.00303	0.00308	0.00322	0.00294	0.00300
Magnesium, total	mg/L	2.15	2.21	1.58	1.65	11.8	11.4	11.6	9.91	10.9
Manganese, total	mg/L	0.125	0.00379	0.00166	0.00180	0.00080	0.00047	0.00049	0.00216	0.00256
Molybdenum, total	mg/L	<0.000050	0.000090	0.000067	0.000070	0.000772	0.000784	0.000772	0.000634	0.000698
Sodium, total	mg/L	6.19	6.74	5.03	5.14	62.1	60.8	60.5	48.8	54.8
Niobium, total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Nickel, total	mg/L	0.00033	0.00028	<0.00020	<0.00020	0.00032	0.00033	0.00031	0.00028	0.00027
Phosphorus, total (metal)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead, total	mg/L	<0.000050	<0.000050	0.000510	0.000893	<0.000050	<0.000050	<0.000050	<0.000050	0.000052
Rubidium, total	mg/L	0.00116	0.00120	0.000776	0.000808	0.00228	0.00221	0.00224	0.00181	0.00196
Rhenium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sulfur, total	mg/L	1.00	1.12	0.87	0.86	3.65	3.60	3.71	3.43	3.46
Antimony, total	mg/L	<0.000030	<0.000030	<0.000030	<0.000030	0.000085	0.000088	0.000089	0.000076	0.000074
Selenium, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000059	0.000058
Silicon, total	mg/L	0.87	0.34	0.12	0.13	0.67	0.47	0.46	0.37	0.39

Lake		**Reference B Lake**				**Windy Lake**				
Sampling Date		**4/28/2025**	**4/28/2025**	**8/18/2025**	**8/18/2025**	**4/26/2025**	**4/26/2025**	**4/26/2025**	**8/16/2025**	**8/16/2025**
Sampling Depth		**7 (Deep)**	**4 (Surface)**	**9 (Deep)**	**1 (Surface)**	**16 (Deep)**	**4 (Surface)**	**4 (Surface)**	**16 (Deep)**	**1 (Surface)**
Replicate		**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**
ALS Sample ID	**Units**	**EO2503265-002**	**EO2503265-001**	**EO2507460-002**	**EO2507460-001**	**EO2503265-008**	**EO2503265-007**	**EO2503265-009**	**EO2507460-008**	**EO2507460-007**
Total Metals *(cont'd)*										
Tin, total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Strontium, total	mg/L	0.0271	0.0276	0.0184	0.0195	0.0717	0.0712	0.0707	0.0595	0.0649
Tantalum, total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tellurium, total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Thorium, total	mg/L	0.0000098	0.0000124	<0.0000050	0.0000054	0.0000144	0.0000070	0.0000106	0.0000076	0.0000111
Titanium, total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00135	0.00077	0.00072	0.00114	0.00159
Thallium, total	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Uranium, total	mg/L	0.0000730	0.000115	0.0000670	0.0000675	0.000192	0.000215	0.000226	0.000183	0.000183
Vanadium, total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tungsten, total	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000013	<0.000010
Yttrium, total	mg/L	0.000025	0.000029	<0.000010	<0.000010	0.000021	0.000017	0.000018	0.000014	0.000015
Zinc, total	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0030
Zirconium, total	mg/L	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dissolved Metals										
Manganese, dissolved	mg/L	0.111	0.00263	0.00021	0.00032	0.00033	<0.00020	<0.00020	0.00027	0.00035
Zinc, dissolved	mg/L	0.0010	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	0.0033	<0.0010	0.0030

Notes:
Gray shading indicates value was greater than the benchmark (see Tables 2.2-2 to 2.2-4 in the main report).
< = less than; µS/cm = microSiemens per centimetre; mg/L = milligrams per litre; NTU = nephelometric turbidity unit(s)

A.3.3.1 QUALITY ASSURANCE AND QUALITY CONTROL

Field QA/QC

Field replicates were collected at Windy Lake (surface) during the under-ice season and Patch Lake (deep) during the open-water season in 2025. The RPDs were calculated for 53 variables (Table A.3-6). No variable had an RPD greater than 20%, indicating that there was no evidence of sample contamination and that samples had an acceptable environmental homogeneity.

A subset of variables was detected in the under-ice equipment blank, including conductivity, nitrate, total calcium, total magnesium, total sodium, total strontium, and total uranium at a concentration greater than five times the DL (Table A.3-7). The only variable detected in the open-water equipment blank at a concentration greater than five times the DL was dissolved zinc (Table A.3-7). Although there were several variables detected in the equipment blank, the data from April and August are still considered reliable and data from the equipment, field, and travel blanks from the under-ice and open-water season indicated that there was no evidence to support the hypothesis of sample contamination from field handling, storage, and transportation in 2025. Data were considered acceptable for use in the AEMP evaluations.

Laboratory QA/QC

Holding time recommendations were exceeded for pH, turbidity, total suspended solids, nitrate, and nitrite during both sampling seasons (Table A.3-8). Recommended hold times for these variables range from 15 minutes for pH to 7 days for total suspended solids, with the remaining variables having a 3-day recommended holding time. These recommended holding times are often unattainable when sampling in remote environments. Data are reviewed for extreme outliers during data assessment and any applicable variables are compared to known DQO exceedances during investigations of cause. All laboratory QA/Q C samples met ALS DQOs.

TABLE A.3-6 RELATIVE PERCENT DIFFERENCES FOR REPLICATE WATER QUALITY SAMPLES FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake	**Units**	**Windy Lake**		**RPD**	**Patch Lake**		**RPD**
Date Sampled		**26-Apr-2025**	**26-Apr-2025**		**17-Aug-2025**	**17-Aug-2025**	
Sampling Depth (m)		**3**	**3**		**7**	**7**	
Replicate		**1**	**2**		**1**	**2**	
ALS Sample ID		**EO2503265-007**	**EO2503265-009**		**EO2507460-006**	**EO2507460-009**	
Analyte		**Results**	**Results**		**Results**	**Results**	
Physical Tests							
Conductivity	µS/cm	511	510	0.2	277	276	0.4
Total alkalinity (as $CaCO_3$)	mg/L	60.2	59.8	0.7	34.9	35.4	1.4
Dissolved hardness (as $CaCO_3$)	mg/L	73.7	76.8	4.1	52.6	51.8	1.5
Total hardness (as $CaCO_3$)	mg/L	85.4	85.0	0.5	54.6	55.2	1.1
Total suspended solids	mg/L	<3.0	<3.0	-	<2.1	<1.0	-
Turbidity	NTU	0.89	0.77	14.5	2.00	2.10	4.9
pH	pH units	8.04	8.01	0.4	7.91	7.90	0.1
Anions and Nutrients							
Ammonia, total (as N)	mg/L	0.0073	0.0130	-	0.0075	<0.0050	-
Bromide	mg/L	0.413	0.387	6.5	0.232	0.250	-
Chloride	mg/L	113	113	0.0	64.1	64.0	0.2
Fluoride	mg/L	0.089	0.091	-	0.062	0.069	-
Nitrate (as N)	mg/L	0.0172	0.0117	-	<0.0050	<0.0050	-
Nitrite (as N)	mg/L	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Phosphorus, total	mg/L	0.0043	0.0042	-	0.0187	0.0075	-
Sulfate (as SO_4)	mg/L	10.5	10.5	0.0	2.84	2.82	0.7

Lake	Units	Windy Lake		RPD	Patch Lake		RPD
Date Sampled		26-Apr-2025	26-Apr-2025		17-Aug-2025	17-Aug-2025	
Sampling Depth (m)		3	3		7	7	
Replicate		1	2		1	2	
ALS Sample ID		EO2503265-007	EO2503265-009		EO2507460-006	EO2507460-009	
Analyte		Results	Results		Results	Results	
Organic / Inorganic Carbon							
Dissolved organic carbon	mg/L	2.57	2.84	10.0	5.11	5.07	0.8
Total organic carbon	mg/L	2.71	2.76	1.8	5.16	4.98	3.6
Total Metals							
Aluminum	mg/L	0.0545	0.0494	9.8	0.0945	0.104	9.6
Antimony	mg/L	0.000088	0.000089	-	<0.000030	<0.000030	-
Arsenic	mg/L	0.000257	0.000255	0.8	0.000286	0.000279	2.5
Barium	mg/L	0.00309	0.00325	5.0	0.00307	0.00308	0.3
Beryllium	mg/L	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Bismuth	mg/L	<0.000050	<0.000050	-	<0.000050	<0.000050	-
Boron	mg/L	0.046	0.049	-	0.023	0.023	-
Cadmium	mg/L	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Calcium	mg/L	15.4	14.9	3.3	9.46	9.40	0.6
Cesium	mg/L	0.0000076	0.0000069	9.7	<0.0000050	<0.0000050	-
Chromium	mg/L	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Cobalt	mg/L	<0.000050	<0.000050	-	<0.000050	<0.000050	-
Copper	mg/L	0.00114	0.00104	-	0.00140	0.00138	-
Gallium	mg/L	<0.000050	<0.000050	-	<0.000050	<0.000050	-
Iron	mg/L	0.016	0.015	-	0.050	0.059	16.5

Lake	Units	Windy Lake		RPD	Patch Lake		RPD
Date Sampled		26-Apr-2025	26-Apr-2025		17-Aug-2025	17-Aug-2025	
Sampling Depth (m)		3	3		7	7	
Replicate		1	2		1	2	
ALS Sample ID		EO2503265-007	EO2503265-009		EO2507460-006	EO2507460-009	
Analyte		Results	Results		Results	Results	
Total Metals *(cont'd)*							
Lanthanum	mg/L	<0.000050	0.000060	-	0.000098	0.000112	-
Lead	mg/L	<0.000050	<0.000050	-	0.000086	0.000084	-
Lithium	mg/L	0.00308	0.00322	4.4	0.00378	0.00386	2.1
Magnesium	mg/L	11.4	11.6	1.7	7.52	7.71	2.5
Manganese	mg/L	0.00047	0.00049	-	0.00983	0.0105	6.6
Mercury	ng/L	<0.10	<0.10	-	0.57	0.37	-
Molybdenum	mg/L	0.000784	0.000772	1.5	0.000279	0.000281	0.7
Nickel	mg/L	0.00033	0.00031	-	0.00067	0.00066	-
Niobium	mg/L	<0.00010	<0.00010	-	<0.00010	<0.00010	-
Phosphorus	mg/L	<0.050	<0.050	-	<0.050	<0.050	-
Potassium	mg/L	4.44	4.45	0.2	2.51	2.50	0.4
Rhenium	mg/L	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Rubidium	mg/L	0.00221	0.00224	1.3	0.00148	0.00152	2.7
Selenium	mg/L	<0.000050	<0.000050	-	0.000088	0.000070	-
Silicon	mg/L	0.47	0.46	-	0.53	0.54	1.9
Silver	mg/L	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Sodium	mg/L	60.8	60.5	0.5	32.7	33.9	3.6
Strontium	mg/L	0.0712	0.0707	0.7	0.0466	0.0466	0.0

Lake	Units	Windy Lake		RPD	Patch Lake		RPD
Date Sampled		26-Apr-2025	26-Apr-2025		17-Aug-2025	17-Aug-2025	
Sampling Depth (m)		3	3		7	7	
Replicate		1	2		1	2	
ALS Sample ID		EO2503265-007	EO2503265-009		EO2507460-006	EO2507460-009	
Analyte		Results	Results		Results	Results	
Total Metals *(cont'd)*							
Sulfur	mg/L	3.60	3.71	3.0	1.25	1.26	0.8
Tantalum	mg/L	<0.00010	<0.00010	-	<0.00010	<0.00010	-
Tellurium	mg/L	<0.000050	<0.000050	-	<0.000050	<0.000050	-
Thallium	mg/L	<0.0000050	<0.0000050	-	<0.0000050	<0.0000050	-
Thorium	mg/L	0.0000070	0.0000106	-	0.0000170	0.0000215	-
Tin	mg/L	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Titanium	mg/L	0.00077	0.00072	-	0.00190	0.00212	10.9
Tungsten	mg/L	<0.000010	<0.000010	-	0.000016	0.000016	-
Uranium	mg/L	0.000215	0.000226	5.0	0.0000754	0.0000771	2.2
Vanadium	mg/L	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Yttrium	mg/L	0.000017	0.000018	-	0.000029	0.000031	-
Zinc	mg/L	<0.0030	<0.0030	-	<0.0030	<0.0030	-
Zirconium	mg/L	<0.000050	<0.000050	-	0.000073	0.000057	-
Dissolved Metals							
Manganese	mg/L	<0.00020	<0.00020	-	0.00059	0.00061	3.3
Zinc	mg/L	<0.0010	0.0033	-	<0.0010	<0.0010	-

Notes:
Dashes (-) = RPDs were not calculated (one or both replicates less than five times the detection limit)
> = greater than; m= metres; RPD = Relative Percent Difference

TABLE A.3-7 WATER QUALITY DATA FOR QUALITY ASSURANCE AND QUALITY CONTROL BLANKS FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

QA/QC Sample	Units	Equipment Blank	Field Blank	Travel Blank	Equipment Blank	Equipment Blank	Field Blank	Travel Blank
Sampling Date		24-Apr-2025	27-Apr-2025	26-Apr-2025	24-Apr-2025	16-Aug-2025	18-Aug-2025	19-Aug-2025
ALS Sample ID		EO2503265-010	EO2503265-011	EO2503265-012	EO2503303-001	EO2507460-010	EO2507460-011	EO2507460-012
Analyte								
Physical Tests								
Conductivity	µS/cm	340	<2.0	<2.0	5.5	<2.0	<2.0	<2.0
Total alkalinity (as $CaCO_3$)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved hardness (as $CaCO_3$)	mg/L	0.58	<0.50	-	<0.50	<0.50	<0.50	<0.50
Total hardness (as $CaCO_3$)	mg/L	1.51	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total suspended solids	mg/L	<3.0	<3.0	<1.0	<3.0	<1.0	<1.0	<1.0
Turbidity	NTU	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
pH	pH units	3.09	5.28	5.65	4.82	5.50	5.58	5.59
Anions and Nutrients								
Ammonia, total (as N)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Bromide	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrate (as N)	mg/L	10.8	<0.0050	<0.0050	0.248	0.0144	<0.0050	<0.0050
Nitrite (as N)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

QA/QC Sample	Units	Equipment Blank	Field Blank	Travel Blank	Equipment Blank	Equipment Blank	Field Blank	Travel Blank
Sampling Date		**24-Apr-2025**	**27-Apr-2025**	**26-Apr-2025**	**24-Apr-2025**	**16-Aug-2025**	**18-Aug-2025**	**19-Aug-2025**
ALS Sample ID		**EO2503265-010**	**EO2503265-011**	**EO2503265-012**	**EO2503303-001**	**EO2507460-010**	**EO2507460-011**	**EO2507460-012**
Analyte								
Anions and Nutrients *(cont'd)*								
Phosphorus, total	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Sulfate (as SO_4)	mg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Organic / Inorganic Carbon								
Dissolved organic carbon	mg/L	0.61	<0.50	-	0.88	<0.50	<0.50	-
Total organic carbon	mg/L	<0.50	<0.50	<0.50	1.09	<0.50	<0.50	<0.50
Total Metals								
Aluminum	mg/L	0.0033	<0.0030	<0.0030	0.0056	<0.0030	<0.0030	<0.0030
Antimony	mg/L	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030
Arsenic	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Barium	mg/L	<0.00010	<0.00010	<0.00010	0.00018	<0.00010	<0.00010	<0.00010
Beryllium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Bismuth	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium	mg/L	0.128	<0.020	<0.020	0.034	<0.020	<0.020	<0.020
Cesium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Chromium	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050

QA/QC Sample	Units	Equipment Blank	Field Blank	Travel Blank	Equipment Blank	Equipment Blank	Field Blank	Travel Blank
Sampling Date		**24-Apr-2025**	**27-Apr-2025**	**26-Apr-2025**	**24-Apr-2025**	**16-Aug-2025**	**18-Aug-2025**	**19-Aug-2025**
ALS Sample ID		**EO2503265-010**	**EO2503265-011**	**EO2503265-012**	**EO2503303-001**	**EO2507460-010**	**EO2507460-011**	**EO2507460-012**
Analyte								
Total Metals *(cont'd)*								
Copper	mg/L	<0.00050	<0.00050	<0.00050	0.00104	<0.00050	<0.00050	<0.00050
Gallium	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Iron	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lanthanum	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lead	mg/L	0.000052	<0.000050	<0.000050	0.000096	<0.000050	<0.000050	<0.000050
Lithium	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium	mg/L	0.289	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Manganese	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Mercury	ng/L	0.25	<0.10	-	0.38	0.21	<0.10	0.34
Molybdenum	mg/L	<0.000050	0.000082	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Niobium	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Phosphorus	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium	mg/L	0.090	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Rhenium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Rubidium	mg/L	0.000024	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Selenium	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

QA/QC Sample	Units	Equipment Blank	Field Blank	Travel Blank	Equipment Blank	Equipment Blank	Field Blank	Travel Blank
Sampling Date		24-Apr-2025	27-Apr-2025	26-Apr-2025	24-Apr-2025	16-Aug-2025	18-Aug-2025	19-Aug-2025
ALS Sample ID		EO2503265-010	EO2503265-011	EO2503265-012	EO2503303-001	EO2507460-010	EO2507460-011	EO2507460-012
Analyte								
Total Metals *(cont'd)*								
Silver	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium	mg/L	2.46	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Strontium	mg/L	0.00193	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Sulfur	mg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tantalum	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tellurium	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Thallium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Thorium	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Tin	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Titanium	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tungsten	mg/L	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	<0.000010	<0.000010
Uranium	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Vanadium	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Yttrium	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Zinc	mg/L	0.0064	<0.0030	<0.0030	<0.0030	0.0096	<0.0030	<0.0030
Zirconium	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050

QA/QC Sample	Units	Equipment Blank	Field Blank	Travel Blank	Equipment Blank	Equipment Blank	Field Blank	Travel Blank
Sampling Date		**24-Apr-2025**	**27-Apr-2025**	**26-Apr-2025**	**24-Apr-2025**	**16-Aug-2025**	**18-Aug-2025**	**19-Aug-2025**
ALS Sample ID		**EO2503265-010**	**EO2503265-011**	**EO2503265-012**	**EO2503303-001**	**EO2507460-010**	**EO2507460-011**	**EO2507460-012**
Analyte								
Dissolved Metals								
Manganese	mg/L	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00010
Zinc	mg/L	0.0025	<0.0010	-	0.0032	0.0082	<0.0010	0.0020

Notes:

Dash (-) = no data as analysis was not completed

> = greater than; μS/cm = microSiemens per centimetre; mg/L = milligrams per litre; DL = detection limit; NTU = nephelometric turbidity unit(s)

Detectable concentrations greater than 5 times the DL are shaded gray.

TABLE A.3-8 LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL RESULTS FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Sampling Event	ALS Reference	Hold Time Exceedance Details	ALS DQO Exceedance Details	AEMP Data Quality Details
Under-ice	EO2503265	pH, turbidity, total suspended solids, alkalinity, nitrite, and nitrate	None	-
	EO2503303	pH, turbidity, total suspended solids, nitrite, and nitrate	None	-
Open-water	EO2507460	pH, turbidity, total suspended solids, nitrite, nitrate,	None	-

Notes:
ALS = ALS Laboratory Group; DQO = data quality objective; AEMP = Aquatic Effects Monitoring Program

A.3.4 SEDIMENT QUALITY

Sediment quality sampling results are presented (Table A.3-9). Results for samples that exceed the applicable benchmark (Tables 2.2-2 to 2.2-4 in main report) are highlighted.

A.3.4.1 QUALITY ASSURANCE AND QUALITY CONTROL

All laboratory QA/QC samples met their respective DQOs for sediment quality in 2025. The sediment quality results are considered reliable.

TABLE A.3-9 SEDIMENT QUALITY DATA FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake		**Doris Lake**			**Patch Lake**			**Reference Lake B**		
Sampling Date		**15-Aug-2025**	**15-Aug-2025**	**16-Aug-2025**	**17-Aug-2025**	**17-Aug-2025**	**17-Aug-2025**	**18-Aug-2025**	**18-Aug-2025**	**20-Aug-2025**
Replicate		**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Sampling Depth		**14**	**13.9**	**13.8**	**8.2**	**8.5**	**8.9**	**10.4**	**10.5**	**10.4**
ALS Sample ID		**EO2507461-001**	**EO2507461-002**	**EO2507461-003**	**EO2507461-004**	**EO2507461-005**	**EO2507461-006**	**EO2507461-007**	**EO2507461-008**	**EO2507461-009**
Analyte	**Units**									
Physical Tests										
Moisture	%	75.7	78.0	75.4	75.1	75.4	74.4	45.6	47.8	47.0
pH (1:2 soil:water)	pH units	5.96	6.01	5.95	6.50	6.42	6.35	5.72	5.82	5.94
Particle Size										
Gravel (>2mm)	%	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0
Sand (2.0mm - 0.063mm)	%	1.4	1.2	1.8	2.9	2.5	3.1	11.2	10.5	11.3
Silt (0.063mm - 0.004mm)	%	50.4	49.4	52.5	52.9	51.7	54.3	54.8	53.4	54.4
Clay (<0.004mm)	%	48.2	49.4	45.7	44.2	45.8	42.6	33.4	35.0	33.8
Anions and Nutrients										
Nitrogen, total	%	0.406	0.422	0.396	0.251	0.283	0.236	0.075	0.082	0.089
Organic / Inorganic Carbon										
Total organic carbon	%	3.08	3.20	3.09	1.87	1.90	1.74	0.458	0.474	0.478
Inorganics										
Total sulfur	mg/kg	970	920	940	820	780	840	1770	1700	1580
Metals										
Aluminum	mg/kg	27400	26400	26800	23800	24200	24900	16400	16700	16400
Antimony	mg/kg	<0.10	<0.10	<0.10	0.13	0.12	0.11	0.18	0.19	0.14
Arsenic	mg/kg	10.5	10.3	10.6	9.68	10.4	9.62	5.02	5.80	4.80
Barium	mg/kg	159	146	148	141	142	147	82.9	87.7	84.7
Beryllium	mg/kg	0.85	0.87	0.90	0.76	0.78	0.79	0.52	0.56	0.54
Bismuth	mg/kg	0.25	0.25	0.24	0.21	0.21	0.22	<0.20	<0.20	<0.20
Boron	mg/kg	17.7	18.4	18.8	19.1	19.6	19.6	14.1	14.7	14.0
Cadmium	mg/kg	0.102	0.107	0.104	0.075	0.084	0.076	0.263	0.250	0.187
Calcium	mg/kg	5740	5780	5890	5480	5410	5490	4060	4360	4140
Chromium	mg/kg	74.3	75.0	75.3	70.6	69.0	72.1	43.1	44.8	44.4
Cobalt	mg/kg	14.7	14.4	14.4	13.8	13.7	14.0	15.0	15.1	16.0

Lake		Doris Lake			Patch Lake			Reference Lake B		
Sampling Date		15-Aug-2025	15-Aug-2025	16-Aug-2025	17-Aug-2025	17-Aug-2025	17-Aug-2025	18-Aug-2025	18-Aug-2025	20-Aug-2025
Replicate		1	2	3	1	2	3	1	2	3
Sampling Depth		14	13.9	13.8	8.2	8.5	8.9	10.4	10.5	10.4
ALS Sample ID		EO2507461-001	EO2507461-002	EO2507461-003	EO2507461-004	EO2507461-005	EO2507461-006	EO2507461-007	EO2507461-008	EO2507461-009
Analyte	Units									
Metals *(cont'd)*										
Copper	mg/kg	38.7	38.9	38.9	26.2	25.4	26.2	18.3	18.3	17.2
Iron	mg/kg	51100	50100	51700	39500	39900	40800	27800	31100	27600
Lead	mg/kg	10.5	10.4	10.5	8.94	8.72	9.19	6.09	6.08	5.89
Lithium	mg/kg	40.0	41.7	40.6	42.6	43.3	43.1	26.2	27.7	29.4
Magnesium	mg/kg	15100	14900	15100	14100	14000	14200	8600	9030	8910
Manganese	mg/kg	804	782	854	1350	1270	1250	241	255	243
Mercury	mg/kg	0.0693	0.0755	0.0776	0.0256	0.0261	0.0269	0.0106	0.0100	0.0091
Molybdenum	mg/kg	0.98	0.96	1.11	1.42	1.32	1.31	1.79	2.08	1.62
Nickel	mg/kg	45.6	45.1	44.6	40.1	39.6	40.9	25.7	26.0	27.0
Phosphorus	mg/kg	1180	1270	1260	880	1050	972	573	645	633
Potassium	mg/kg	6270	6180	6220	6050	6100	6100	3870	4030	3960
Selenium	mg/kg	0.30	0.27	0.31	0.24	0.26	0.24	0.38	0.36	0.30
Silver	mg/kg	0.38	0.27	0.28	0.17	0.17	0.19	<0.10	<0.10	<0.10
Sodium	mg/kg	1410	1340	1330	1120	1100	1160	473	491	479
Strontium	mg/kg	41.5	40.6	42.4	40.2	39.4	40.5	30.6	32.4	31.6
Sulfur	mg/kg	<1000	<1000	<1000	<1000	<1000	<1000	1800	1500	1200
Thallium	mg/kg	0.275	0.276	0.270	0.249	0.243	0.252	0.270	0.266	0.236
Tin	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium	mg/kg	1030	1190	1280	1120	1180	1070	988	1030	997
Tungsten	mg/kg	<0.50	0.59	0.80	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	mg/kg	2.17	2.15	2.12	1.73	1.73	1.82	1.72	1.74	1.55
Vanadium	mg/kg	78.8	79.6	80.6	71.3	70.6	71.2	46.8	48.2	47.5
Zinc	mg/kg	100	99.9	99.5	77.8	76.8	78.6	58.6	60.4	56.2
Zirconium	mg/kg	7.4	8.0	8.2	6.7	6.9	6.4	12.2	13.1	12.0

Notes:
% = percent; mm = millimetre; mg/kg = milligram per kilogram; < = less than
Shaded cells indicate values that exceeded the ISQG benchmark (see Table 2.2-5 in Main Report). No values exceeded the PEL benchmark.

A.3.5 PHYTOPLANKTON BIOMASS

The measured chl *a* mass per sample results are presented (Table A.3-10). Phytoplankton biomass results were calculated (µg chl *a*/L).

A.3.5.1 QUALITY ASSURANCE AND QUALITY CONTROL

There were no occurrences of laboratory QA/QC samples not meeting DQOs for chl *a* in 2025. The chl *a* results are considered reliable.

TABLE A.3-10 PHYTOPLANKTON BIOMASS RESULTS FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake	Sampling Date	Sampling Depth (m)	Replicate	ALS Sample ID	Chl *a* (µg/sample)	Volume Filtered (L)	Phytoplankton Biomass (µg chl *a*/L)
Doris Lake	15 August 2025	1	1	EO2507474-001	10.3	750	13.733
			2	EO2507474-002	4.97	500	9.940
			3	EO2507474-003	3.38	500	6.760
Patch Lake	17 August 2025	1	1	EO2507474-004	0.358	500	0.716
			2	EO2507474-005	0.434	500	0.868
			3	EO2507474-006	0.433	500	0.866
Reference Lake B	18 August 2025	1	1	EO2507474-007	0.300	500	0.600
			2	EO2507474-008	0.233	500	0.466
			3	EO2507474-009	0.130	500	0.260

Notes:
L = litre; m = metres; µg = microgram; chl a = chlorophyll a

A.3.6 BENTHIC INVERTEBRATES

Benthic invertebrate taxonomic data is presented (Table A.3-10). Calculated benthic invertebrate metrics and community composition are also presented (Tables A.3-11 and A.3-12, respectively).

A.3.6.1 QUALITY ASSURANCE AND QUALITY CONTROL

Benthic invertebrate sorting efficiencies for the QA/QC program are presented (Table A.3-13).

TABLE A.3-11 BENTHIC INVERTEBRATE TAXONOMIC DATA FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake					**Doris Lake**					**Patch Lake**					**Reference B Lake**				
Sampling Date					**15-Aug-25**		**16-Aug-25**			**17-Aug-25**			**18-Aug-25**		**18-Aug-25**	**19-Aug-25**			
Sampling Depth					**14.0**	**13.9**	**13.8**	**14.0**	**13.9**	**8.2**	**8.5**	**8.9**	**6.8**	**7.0**	**10.4**	**10.5**	**10.4**	**10.4**	**10.4**
Replicate					**Rep-1**	**Rep-2**	**Rep-3**	**Rep-4**	**Rep-5**	**Rep-1**	**Rep-2**	**Rep-3**	**Rep-4**	**Rep-5**	**Rep-1**	**Rep-2**	**Rep-3**	**Rep-4**	**Rep-5**
Major Group	**Family**	**Subfamily**	**Tribe**	**Genus**															
Oligochaeta - cocoon	-	-	-	-	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0
	Lumbriculidae	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Naididae	Naidinae	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Naididae	Tubificinae	-	-	36	170	70	68	54	8	13	15	8	5	49	20	29	4	29
Gastropoda	Valvatidae	-	-	*Valvata sincera*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pelecypoda	Pisidiidae	-	-	(i/d)	0	0	0	0	0	4	2	0	1	0	14	9	5	3	1
		-	-	*Sphaerium*	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
		-	-	*Pisidium*	0	0	0	0	0	2	0	0	2	0	39	31	31	33	16
Hydracarina	-	-	-	(i/d)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Hygrobatidae	-	-	*Hygrobates*	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lebertiidae	-	-	*Lebertia*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mideopsidae			*Mideopsis*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Oxidae	-	-	*Oxus*	0	1	0	0	0	0	0	0	0	0	1	4	1	1	0
	Pionidae	-	-	*Piona*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sperchontidae	-	-	*Sperchon*	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Diptera	Chironomidae	-	-	(pupa)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tanypodinae	Procladiini	*Procladius*	1	1	1	0	1	8	33	23	8	16	1	1	1	0	0
		Diamesinae	Diamesini	*Potthastia longimana* group	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Protanypini	*Protanypus*	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0
		Prodiamesinae	-	*Monodiamesa*	0	0	0	1	0	0	2	0	4	0	0	0	0	0	0
		Orthocladiinae	Orthocladiini	*Cricotopus / Orthocladius*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Paracladius	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
				Psectrocladius	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0
				Zalutschia	0	0	0	0	0	0	0	0	0	0	14	14	24	8	24
		Chironominae	Chironomini	(i/d)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Chironomus	202	209	263	164	215	0	0	0	1	0	0	0	0	0	0
				Polypedilum	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0

Lake					**Doris Lake**					**Patch Lake**					**Reference B Lake**				
Sampling Date					**15-Aug-25**		**16-Aug-25**			**17-Aug-25**			**18-Aug-25**		**18-Aug-25**	**19-Aug-25**			
Sampling Depth					**14.0**	**13.9**	**13.8**	**14.0**	**13.9**	**8.2**	**8.5**	**8.9**	**6.8**	**7.0**	**10.4**	**10.5**	**10.4**	**10.4**	**10.4**
Replicate					**Rep-1**	**Rep-2**	**Rep-3**	**Rep-4**	**Rep-5**	**Rep-1**	**Rep-2**	**Rep-3**	**Rep-4**	**Rep-5**	**Rep-1**	**Rep-2**	**Rep-3**	**Rep-4**	**Rep-5**
Major Group	**Family**	**Subfamily**	**Tribe**	**Genus**															
Diptera *(cont'd)*	Chironomidae *(cont'd)*	Chironominae *(cont'd)*	Chironomini *(cont'd)*	*Sergenta*	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
				Stictochironomus	0	1	0	1	0	5	4	2	5	6	0	0	0	0	0
				Tribelos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			Tanytarsini	*Corynocera*	0	0	0	0	0	0	0	0	0	0	7	3	6	4	6
				Paratanytarsus	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
				Stempellinella	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Tanytarsus	0	0	0	0	1	3	4	0	1	1	0	1	0	0	1
	Simulidae	-	-	*adult*	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
Excluded Taxa																			
Nematoda	-	-	-	-	0	1	0	0	0	1	0	1	0	0	96	128	162	110	110
Copepoda - Calanoida	-	-	-	-	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Copepoda – Cyclopoida	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Ostracoda	-	-	-	-	0	4	9	6	3	14	3	4	7	7	0	2	0	2	0
Cladocera	Daphnidae	-	-	*Daphnia*	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0
	Holopedidae	-	-	*Holopedium gibberum*	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	Macrothricidae	-	-	-	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
Fish	Gasterosteidae			*Pungitius pungitius* (Ninespine stickleback)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total					**242**	**389**	**344**	**240**	**277**	**49**	**63**	**46**	**40**	**36**	**227**	**215**	**267**	**167**	**188**

Note:
i/d = small or damaged

TABLE A.3-12 BENTHIC INVERTEBRATE METRICS FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Lake	Sampling Date	Sampling Depth	Replicate	Metric			
				Density (Organisms per m^2)	Family Richness	Family Evenness	Bray-Curtis Index
Doris Lake	15-Aug-2025	14.0	1	3,585.19	3	0.45	0.69
	15-Aug-2025	13.9	2	5,659.26	3	0.66	0.78
	16-Aug-2025	13.8	3	4,948.15	2	0.75	0.75
	16-Aug-2025	14.0	4	3,466.67	2	0.85	0.68
	16-Aug-2025	13.9	5	4,014.81	2	0.73	0.71
Patch Lake	17-Aug-2025	8.2	1	488.89	3	0.79	0.46
	17-Aug-2025	8.5	2	888.89	3	0.55	0.49
	17-Aug-2025	8.9	3	592.59	2	0.94	0.42
	18-Aug-2025	6.8	4	474.07	3	0.66	0.48
	18-Aug-2025	7.0	5	429.63	2	0.70	0.53
Reference B Lake	18-Aug-2025	10.4	1	1,896.30	5	0.56	0.17
	19-Aug-2025	10.5	2	1,259.26	4	0.74	0.11
	19-Aug-2025	10.4	3	1,496.30	6	0.53	0.06
	19-Aug-2025	10.4	4	800.00	5	0.40	0.25
	19-Aug-2025	10.4	5	1,155.56	4	0.73	0.18

Note:
m = metre

TABLE A.3-13 BENTHIC INVERTEBRATE QUALITY ASSURANCE AND QUALITY CONTROL SORTING EFFICIENCIES FOR THE HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 2025

Sample	Abundance from Initial Sort	Abundance from Re-sort	Initial Sort Efficiency (%)	Re-sort Required?
Doris Lake, Replicate 4	240	4	98.4	No
Patch Lake, Replicate 3	46	0	100	No

A.4 WOLVERINE LAKE BASELINE DATA RESULTS

A.4.1 ICE THICKNESS

Ice thickness was not collected at Wolverine Lake.

A.4.2 PHYSICAL LIMNOLOGY

Physical limnology data for open-water and Secchi depth sampling with calculated euphotic depths are presented (Tables A.4-1 and A.4-2, respectively). No under-ice physical limnology data was collected in 2025 for Wolverine Lake.

TABLE A.4-1 OPEN-WATER TEMPERATURE AND DISSOLVED OXYGEN PROFILES IN WOLVERINE LAKE FOR BASELINE DATA COLLECTION, 2025

Wolverine – 19 August 2025			
Depth (m)	**Temperature (°C)**	**Dissolved Oxygen (mg/L)**	**Dissolved Oxygen Saturation (%)**
0.5	14.48	11.43	112.54
1	14.43	11.46	112.59
1.5	14.3	11.51	112.84
2	14.27	11.53	112.7
2.5	13.99	11.69	114.24
3	13.94	11.83	115.6
3.5	13.88	12.01	116.44

Notes:
% = percent; °C = degree Celsius; m = metres; mg/L = milligrams per litre

TABLE A.4-2 SECCHI DEPTHS AND EUPHOTIC ZONE DEPTHS FOR THE WOLVERINE LAKE BASELINE DATA COLLECTION, 2025

Lake	**Sampling Date**	**Lake Depth (m)**	**Secchi Depth (m)**	**Euphotic Zone Depth 1% Light Level (m)**
Wolverine Lake	19 August 2025	3.8	4.00	10.82*

Notes:
* Indicates that the euphotic zone extended to the bottom of the water column.
% = percent; m = metres

A.4.3 WATER QUALITY

Water quality sampling results for Wolverine Lake are presented (Table A.4-3). Water quality samples for Wolverine Lake were submitted with the AEMP samples; therefore, water quality QA/QC results are applicable (Section A.3.3.1).

TABLE A.4-3 WATER QUALITY DATA FOR THE WOLVERINE LAKE BASELINE DATA COLLECTION, 2025

Lake		**Wolverine Lake**	
Sampling Date		**19-Aug-2025**	**19-Aug-2025**
Sampling Depth		**1**	**3**
Replicate		**1**	**1**
ALS Sample ID		**EO2507460-013**	**EO2507460-014**
Analyte	**Units**		
Physical Tests			
Conductivity	µS/cm	303	299
Total alkalinity (as $CaCO_3$)	mg/L	35.4	36.8
Dissolved hardness (as $CaCO_3$)	mg/L	52.1	52.3
Total hardness (as $CaCO_3$)	mg/L	55.6	57.6
Total suspended solids	mg/L	<2.1	<2.1
Turbidity	NTU	0.87	0.79
pH	pH units	8.13	8.29
Anions and Nutrients			
Ammonia, total (as N)	mg/L	0.0179	0.0074
Bromide	mg/L	0.191	0.199
Chloride	mg/L	73.1	73.2
Fluoride	mg/L	0.055	0.062
Nitrate (as N)	mg/L	<0.0050	<0.0050
Nitrite (as N)	mg/L	<0.0010	<0.0010
Phosphorus, total	mg/L	0.0140	0.0146
Sulfate (as SO_4)	mg/L	0.48	0.48
Organic / Inorganic Carbon			
Dissolved organic carbon	mg/L	6.14	6.37
Total organic carbon	mg/L	6.28	6.50
Total Metals			
Aluminum	mg/L	0.0226	0.0226
Antimony	mg/L	<0.000030	<0.000030
Arsenic	mg/L	0.000306	0.000311
Barium	mg/L	0.00312	0.00304

Lake		**Wolverine Lake**	
Sampling Date		**19-Aug-2025**	**19-Aug-2025**
Sampling Depth		**1**	**3**
Replicate		**1**	**1**
ALS Sample ID		**EO2507460-013**	**EO2507460-014**
Analyte	**Units**		
Total Metals *(cont'd)*			
Beryllium	mg/L	<0.0000050	<0.0000050
Bismuth	mg/L	<0.000050	<0.000050
Boron	mg/L	0.016	0.016
Cadmium	mg/L	<0.0000050	<0.0000050
Calcium	mg/L	8.15	8.26
Cesium	mg/L	<0.0000050	<0.0000050
Chromium	mg/L	<0.00050	0.00085
Cobalt	mg/L	<0.000050	<0.000050
Copper	mg/L	0.00084	0.00072
Gallium	mg/L	<0.000050	<0.000050
Iron	mg/L	0.035	0.039
Lanthanum	mg/L	<0.000050	<0.000050
Lead	mg/L	0.000099	<0.000050
Lithium	mg/L	0.00367	0.00384
Magnesium	mg/L	8.55	8.99
Manganese	mg/L	0.00628	0.00621
Mercury	ng/L	0.27	0.37
Molybdenum	mg/L	0.000120	0.000117
Nickel	mg/L	0.00046	0.00045
Niobium	mg/L	<0.00010	<0.00010
Phosphorus	mg/L	<0.050	<0.050
Potassium	mg/L	1.94	1.91
Rhenium	mg/L	<0.0000050	<0.0000050
Rubidium	mg/L	0.000745	0.000754
Selenium	mg/L	0.000050	<0.000050
Silicon	mg/L	0.13	0.14

Lake		Wolverine Lake	
Sampling Date		**19-Aug-2025**	**19-Aug-2025**
Sampling Depth		**1**	**3**
Replicate		**1**	**1**
ALS Sample ID		**EO2507460-013**	**EO2507460-014**
Analyte	**Units**		
Total Metals *(cont'd)*			
Silver	mg/L	<0.0000050	<0.0000050
Sodium	mg/L	39.0	39.9
Strontium	mg/L	0.0413	0.0409
Sulfur	mg/L	<0.50	<0.50
Tantalum	mg/L	<0.00010	<0.00010
Tellurium	mg/L	<0.000050	<0.000050
Thallium	mg/L	<0.0000050	<0.0000050
Thorium	mg/L	0.0000061	0.0000068
Tin	mg/L	<0.00020	<0.00020
Titanium	mg/L	0.00041	0.00036
Tungsten	mg/L	<0.000010	<0.000010
Uranium	mg/L	0.0000450	0.0000468
Vanadium	mg/L	<0.00020	<0.00020
Yttrium	mg/L	<0.000010	<0.000010
Zinc	mg/L	<0.0030	<0.0030
Zirconium	mg/L	<0.000050	<0.000050
Dissolved Metals			
Manganese	mg/L	0.00069	0.00052
Zinc	mg/L	<0.0010	<0.0010

Notes:
mg/L = milligrams per litre; ng/L = nanograms per litre; < = less than

A.4.4 SEDIMENT QUALITY

Sediment quality sampling results for Wolverine Lake are presented (Table A.4-4). Sediment quality samples for Wolverine Lake were submitted with the AEMP samples; therefore, sediment quality QA/QC results are applicable (Section A.3.4.1).

TABLE A.4-4 SEDIMENT QUALITY DATA FOR THE WOLVERINE LAKE BASELINE DATA COLLECTION, 2025

Lake		**Wolverine Lake**		
Sampling Date		**20-Aug-2025**	**20-Aug-2025**	**20-Aug-2025**
Replicate		**1**	**2**	**3**
Sampling Depth		**3.3**	**3.4**	**3.3**
ALS Sample ID		**EO2507461-010**	**EO2507461-011**	**EO2507461-012**
Analyte	**Units**			
Physical Tests				
Moisture	%	86.0	83.8	84.5
pH (1:2 soil:water)	pH units	5.71	5.77	5.60
Particle Size				
Gravel (>2mm)	%	<1.0	<1.0	<1.0
Sand (2.0mm - 0.063mm)	%	<1.0	<1.0	<1.0
Silt (0.063 mm - 0.004 mm)	%	72.4	70.8	72.2
Clay (<0.004mm)	%	27.3	29.0	27.6
Anions and Nutrients				
Nitrogen, total	%	0.770	0.685	0.722
Organic / Inorganic Carbon				
Total organic carbon	%	8.11	7.05	7.61
Inorganics				
Total sulfur	mg/kg	2200	2110	2260
Metals				
Aluminum	mg/kg	21400	23600	23600
Antimony	mg/kg	<0.10	0.12	<0.10
Arsenic	mg/kg	3.99	4.64	4.20
Barium	mg/kg	119	139	130
Beryllium	mg/kg	0.72	0.79	0.73
Bismuth	mg/kg	<0.20	0.21	0.21
Boron	mg/kg	19.4	20.5	20.0
Cadmium	mg/kg	0.083	0.085	0.084
Calcium	mg/kg	5240	6170	5700
Chromium	mg/kg	59.4	65.1	62.7

Lake		Wolverine Lake		
Sampling Date		**20-Aug-2025**	**20-Aug-2025**	**20-Aug-2025**
Replicate		**1**	**2**	**3**
Sampling Depth		**3.3**	**3.4**	**3.3**
ALS Sample ID		**EO2507461-010**	**EO2507461-011**	**EO2507461-012**
Analyte	**Units**			
Metals *(cont'd)*				
Cobalt	mg/kg	11.2	12.5	12.0
Copper	mg/kg	29.9	33.0	31.8
Iron	mg/kg	29300	32600	31300
Lead	mg/kg	8.19	8.74	8.76
Lithium	mg/kg	35.3	40.8	38.0
Magnesium	mg/kg	12200	13600	13200
Manganese	mg/kg	419	492	410
Mercury	mg/kg	0.0272	0.0287	0.0289
Molybdenum	mg/kg	0.90	1.06	0.99
Nickel	mg/kg	33.6	37.5	36.2
Phosphorus	mg/kg	917	994	894
Potassium	mg/kg	5640	5850	6020
Selenium	mg/kg	0.24	0.27	0.20
Silver	mg/kg	<0.10	<0.10	<0.10
Sodium	mg/kg	1230	1220	1300
Strontium	mg/kg	36.5	40.8	40.0
Sulfur	mg/kg	1600	1900	1900
Thallium	mg/kg	0.231	0.248	0.247
Tin	mg/kg	<2.0	<2.0	<2.0
Titanium	mg/kg	844	1060	843
Tungsten	mg/kg	<0.50	<0.50	<0.50
Uranium	mg/kg	1.84	1.97	1.96
Vanadium	mg/kg	59.5	66.7	63.7
Zinc	mg/kg	68.5	74.9	73.8
Zirconium	mg/kg	8.6	9.4	8.2

Notes:
% = percent; mm = millimetre; mg/kg = milligram per kilogram; < = less than

A.4.5 PHYTOPLANKTON BIOMASS

The measured chl *a* mass per sample results are presented (Table A.4-5). Phytoplankton biomass results were calculated (µg chl *a*/L). Phytoplankton biomass samples for Wolverine Lake were submitted with the AEMP samples; therefore, phytoplankton biomass QA/QC results are applicable (Section A.3.5.1).

TABLE A.4-5 PHYTOPLANKTON BIOMASS RESULTS FOR THE WOLVERINE LAKE BASELINE DATA COLLECTION, 2025

Lake	Sampling Date	Sampling Depth (m)	Replicate	ALS Sample ID	Chl *a* (µg/sample)	Volume Filtered (L)	Phytoplankton Biomass (µg chl *a*/L)
Wolverine Lake	19 August 2025	1	1	EO2507474-010	1.08	500	2.160
			2	EO2507474-011	1.09	500	2.180
			3	EO2507474-012	1.18	500	2.360

Notes:
L = litre; m = metres; µg = microgram; chl a = chlorophyll a

A.4.6 BENTHIC INVERTEBRATES

Benthic invertebrate taxonomic data for Wolverine Lake is presented (Table A.4-6). Calculated benthic invertebrate metrics and community composition are also presented (Tables A.4-7 and A.4-8, respectively). Benthic invertebrate samples for Wolverine Lake were submitted with the AEMP samples; therefore, benthic invertebrate QA/QC results are applicable (Section A.3.6.1).

TABLE A.4-6 BENTHIC INVERTEBRATE TAXONOMIC DATA FOR THE WOLVERINE LAKE BASELINE DATA COLLECTION, 2025

Lake					**Wolverine Lake**				
Sampling Date					**20-Aug-25**				
Sampling Depth					**3.3**	**3.4**	**3.3**	**3.3**	**3.4**
Replicate					**1**	**2**	**3**	**4**	**5**
Major Group	**Family**	**Subfamily**	**Tribe**	**Genus**					
Oligochaeta - cocoon	-	-	-	-	0	0	0	0	0
	Lumbriculidae	-	-	-	0	4	0	2	4
	Naididae	Naidinae	-	-	5	5	2	3	8
	Naididae	Tubificinae	-	-	2	3	1	0	3
Gastropoda	Valvatidae	-	-	*Valvata sincera*	51	84	139	142	225
Pelecypoda	Pisidiidae	-	-	(i/d)	8	21	6	6	17
		-	-	*Sphaerium*	0	0	0	0	0
		-	-	*Pisidium*	17	80	76	58	493
Hydracarina	-	-	-	(i/d)	0	1	0	0	0
	Hygrobatidae	-	-	*Hygrobates*	0	0	0	0	0
	Lebertiidae	-	-	*Lebertia*	0	0	1	0	0
	Mideopsidae			*Mideopsis*		1	0	0	0
	Oxidae	-	-	*Oxus*	0	0	0	0	0
	Pionidae	-	-	*Piona*	2	7	3	5	4
	Sperchontidae	-	-	*Sperchon*	0	0	0	0	0
Diptera	Chironomidae	-	-	(pupa)	0	0	0	0	0
		Tanypodinae	Procladiini	*Procladius*	0	0	1	2	3
		Diamesinae	Diamesini	*Potthastia longimana* group	0	1	0	0	1
			Protanypini	*Protanypus*	0	0	0	0	0

Lake					**Wolverine Lake**				
Sampling Date					**20-Aug-25**				
Sampling Depth					**3.3**	**3.4**	**3.3**	**3.3**	**3.4**
Replicate					**1**	**2**	**3**	**4**	**5**
Major Group	**Family**	**Subfamily**	**Tribe**	**Genus**					
		Prodiamesinae	-	*Monodiamesa*	0	0	0	0	0
		Orthocladiinae	Orthocladiini	*Cricotopus / Orthocladius*	0	0	0	0	1
				Paracladius	0	0	0	0	0
				Psectrocladius	0	0	1	0	0
				Zalutschia	0	0	0	3	6
		Chironominae	Chironomini	(i/d)	0	0	0	0	1
				Chironomus	0	3	5	3	10
				Polypedilum	0	0	0	0	0
				Sergenta	0	0	0	0	0
				Stictochironomus	0	0	0	0	0
				Tribelos	0	6	3	15	14
			Tanytarsini	*Corynocera*	0	0	0	0	0
				Paratanytarsus	0	0	0	0	0
				Stempellinella	0	0	0	0	0
				Tanytarsus	0	0	0	0	0
	Simulidae	-	-	*adult*	0	0	0	0	0
Excluded Taxa									
Nematoda	-	-	-	-	1	1	2	4	5
Copepoda - Calanoida	-	-	-	-	0	0	0	0	0

Lake					**Wolverine Lake**				
Sampling Date					**20-Aug-25**				
Sampling Depth					**3.3**	**3.4**	**3.3**	**3.3**	**3.4**
Replicate					**1**	**2**	**3**	**4**	**5**
Major Group	**Family**	**Subfamily**	**Tribe**	**Genus**					
Copepoda – Cyclopoida	-	-	-	-	0	0	1	0	1
Ostracoda	-	-	-	-	66	139	102	29	108
Cladocera	Daphnidae	-	-	*Daphnia*	0	0	0	0	0
	Holopedidae	-	-	*Holopedium gibberum*	0	0	0	0	0
	Macrothricidae	-	-	-	0	0	0	0	0
Fish	Gasterosteidae			*Pungitius pungitius* (Ninespine stickleback)	0	0	1	0	0
Total					**152**	**356**	**344**	**272**	**904**

Note:
i/d = small or damaged

TABLE A.4-7 BENTHIC INVERTEBRATE METRICS FOR THE WOLVERINE LAKE BASELINE DATA COLLECTION, 2025

Lake	Sampling Date	Sampling Depth (m)	Replicate	Metric			
				Density (organisms per m^2)	Family Richness	Family Evenness	Bray-Curtis Index
Wolverine	20-Aug-2025	3.3	1	1,259.26	4	0.55	0.63
Wolverine	20-Aug-2025	3.4	2	3,185.19	7	0.38	0.65
Wolverine	20-Aug-2025	3.3	3	3,525.93	6	0.36	0.70
Wolverine	20-Aug-2025	3.3	4	3,540.74	6	0.38	0.62
Wolverine	20-Aug-2025	3.4	5	11,703.70	6	0.33	0.84

Note:
m = metre

A.5 REFERENCES

British Columbia Ministry of Environment (BC MOE). 2013. *British Columbia Field Sampling Manual Part A—Quality Control and Quality Assurance.* Victoria, BC.

Environment Canada. 2002. *Revised Guidance for Sample Sorting and Subsampling Protocols for EEM Benthic Invertebrate Community Surveys.* https://www.canada.ca/content/dam/eccc/migration/main/esee-eem/f919d331-078f-4882-8fa6-72c4faa31d73/revised-20sampling-20and-20subsampling-20benthos_e.pdf (accessed December 2025).

Environment Canada. 2012. *Metal Mining Techinical Guidance for Environmental Effects Monitoring.* https://www.canada.ca/en/environment-climate-change/services/managing-pollution/environmental-effects-monitoring/metal-mining-technical-guidance/metal-mining-technical-guidance-environmental-effects-monitoring.html (accessed November 2025).

Parsons, T. R., M. Takahashi, and B. Hargrave. 1984. *Biological Oceanographic Processes.* Oxford, UK: Pergamon Press.

TMAC (TMAC Resources Inc.). 2018. *Hope Bay Project: Aquatic Effects Monitoring Plan*. Prepared by TMAC Resources Inc.: Toronto, ON.

APPENDIX B 2025 HYDROLOGY COMPLIANCE MONITORING SUMMARY

#2700-685 Centre Street S
Calgary, AB
Canada T2G 1S5

T +1 403 705 1926
F +1 604 687 4277

erm.com

MEMO

TO	Agnico Eagle Mines Limited—Hope Bay Mine
FROM	Michael Willcock (ERM); Cameron Evans (ERM)
DATE	March 2026
REFERENCE	0814026-02
SUBJECT	Hope Bay Mine 2025 Hydrology Compliance Monitoring Summary

1. INTRODUCTION

The Hope Bay Mine (the Mine) is a gold mining development in the West Kitikmeot region of mainland Nunavut. The Mine property is approximately 153 kilometres (km) southwest of Cambridge Bay on the southern shore of Melville Sound. The property contains a greenstone belt that runs 80 km in a north–south direction, varying in width between 7 and 20 km. Agnico Eagle Mines Limited (Agnico Eagle) operates the Mine and acquired the mining development through the purchase of TMAC Resources Inc. (TMAC) on 2 February 2021.

The Mine operates under Project Certificate No. 009 issued by the Nunavut Impact Review Board (NIRB), and two Type A water licences (2AM-DOH1335 and 2AM-BOS1835) issued by the Nunavut Water Board (NWB). The Hope Bay Aquatic Effects Monitoring Program (AEMP) is a requirement of Agnico Eagle's Type A Water Licence and is outlined in the *Hope Bay Project: Aquatic Effects Monitoring Plan* (the Plan; TMAC Resources Inc. [TMAC] 2018).

The Plan prescribes hydrology monitoring requirements based on Project development phases. In February 2022, the Mine transitioned into Care and Maintenance and Agnico Eagle submitted the *Hope Bay, Care and Maintenance Plan* (Agnico Eagle 2022) to the NWB and NIRB, in compliance with Type A Water Licence 2AM-DOH1335 and Project Certificate No. 009. Prior to entering Care and Maintenance, the Doris development was in its operations phase, while Madrid North was in both its Construction and Operations phases. Operations at Madrid North were subsequently suspended in February 2021 to allow for a thorough review of the proposed work plan.

There are two main watersheds currently monitored, namely the Windy Lake watershed and the Doris Lake watershed. Windy Lake watershed contains two lakes, Windy Lake which flows into Glenn Lake which then flows into the ocean. The Doris Lake watershed contains a chain of lakes that flow into the ocean. Monitored lakes within the Doris Lake watershed listed from upstream to downstream are: Imniagut Lake, Patch Lake, PO Lake, Ogama Lake, Doris Lake and Little Roberts Lake. Roberts Lake also flows into Little Roberts Lake. The Construction and Operations phases triggered water level monitoring at Glenn and Imniagut lakes, as well as water level and outflow monitoring at Doris, Little Roberts, Ogama, Patch, PO, and Windy lakes. These requirements are outlined in Tables 3.1-1 and 3.2-1 of the Plan (TMAC 2018). Additionally, Roberts Lake is monitored as it provides a control for comparison to the lakes monitored through the Plan.

This memorandum provides a summary of the 2025 hydrometric monitoring program components of the Plan. The objective of the 2025 hydrometric monitoring program is to monitor lake levels, lake outflows, and streams near the Mine following the requirements of the Plan. The data collected are used to evaluate potential Mine-related effects on the surrounding freshwater environment during the construction and operation of the Mine and verify predictions from the *Madrid-Boston Final Environmental Impact Statement* (Madrid-Boston FEIS; TMAC 2017). This is accomplished by collecting field data to generate mean daily water level and discharge data for all monitoring stations as required, and comparing annual monitoring data to baseline values. Key data used are under-ice water level, mean daily water level, mean daily discharge, and hydrometric indices such as annual runoff and monthly runoff distribution.

The following sections present the 2025 hydrometric monitoring program methods, data analysis, and results. Results presented are based on comparisons of 2025 hydrometric monitoring data to past monitoring data and the predicted Project effects presented in the Madrid-Boston Project FEIS (TMAC 2017).

In 2025, Agnico Eagle personnel completed hydrometric monitoring fieldwork. ERM Consultants Canada Ltd. (ERM) completed data review, analysis, and report development.

2. METHODS

The following subsections summarize the methods used to complete the 2025 hydrometric monitoring program at the Mine. The *Doris North Project 2013 Hydrology Compliance Monitoring Report* (ERM Rescan Environmental Services Ltd. 2014) provides details of the standard methods used for installation of hydrometric stations, development of stage-discharge rating equations, and development of daily flow hydrographs for the Mine.

2.1 MONITORING STATIONS

The 2025 hydrometric monitoring program consisted of 10 hydrometric monitoring stations, as presented in Tables 2.1-1 and 2.1-2. Water level surveys and manual discharge measurements are typically conducted at these stations throughout the open-water season, after the installation of the pressure transducers in June. In 2025, pressure transducers were pulled from stations in early September, which is several weeks earlier than usual, due to helicopters leaving the Mine in early September.

TABLE 2.1-1 STATION TYPES

Station	Station Type	Monitoring Period
Windy Outflow	Discharge and Water Level	Seasonal
Glenn Lake	Lake Level Only	Seasonal
Imniagut Lake	Lake Level Only	Seasonal
Patch Outflow	Discharge and Water Level	Seasonal
PO Outflow	Discharge and Water Level	Seasonal

Station	Station Type	Monitoring Period
Ogama Outflow	Discharge and Water Level	Seasonal
Doris Lake-2	Lake Level Only	Year-Round
Doris Creek TL-2	Discharge Only	Seasonal
Roberts Hydro-2	Discharge and Water Level	Seasonal[a]
Little Roberts Outflow	Discharge and Water Level	Seasonal

Note:
[a] Roberts Hydro-2 was previously monitored year-round, but the pressure transducer was destroyed by ice in 2020; the station was monitored seasonally from 2021 through 2025.

TABLE 2.1-2 2025 STATION LOCATIONS

Station	UTM Zone 13W		Watershed Area (km^2)	Lake Coverage (%)
	Easting	Northing		
Windy Outflow	431404	7554948	13.73	41
Glenn Lake	430410	7562001	20.59	13
Imniagut Lake	433403	7551421	1.31	12
Patch Outflow	436248	7548973	32.16	23
PO Outflow	436749	7550055	35.30	23
Ogama Outflow	435595	7555262	74.93	18
Doris Lake-2	433547	7558601	90.29	19
Doris Creek TL-2	434059	7559504	90.29	19
Roberts Hydro-2	435231	7562674	97.83	18
Little Roberts Outflow	434548	7562652	194.15	18

Notes:
% = percent; km^2 = square kilometre; UTM = Universal Transverse Mercator

In 2025, hydrometric stations monitored either lake level, lake outflow (discharge), or both. Most hydrometric stations operate seasonally (during the open-water season); however, Doris Lake-2 operates year-round. Roberts Hydro-2 previously operated year-round; however, the station was destroyed by ice and was subsequently operated seasonally from 2021 through 2025.

Seasonal hydrometric stations consisted of an Onset MX-2001 unvented pressure transducer placed on the lake or streambed in a weighted assembly, recording water level readings every 15 minutes. The Doris Lake-2 stations consisted of two Solinst Leveloggers, unvented pressure transducers, installed at depths of approximately 7 metres (m) to monitor the lake level year-round. The Leveloggers were coupled with a Solinst Barologger, located at Doris Camp, to compensate for changes in atmospheric pressure. The MX-2001 pressure transducers have built-in barometric pressure sensors that compensate water level data internally.

2.2 STAGE-DISCHARGE MEASUREMENTS

Manual water level surveys and discharge measurements are completed at stations detailed in Table 2.1-1 a minimum of three times a year (TMAC 2018). Water level surveys were performed using an engineer's level and stadia rod using a minimum of three local benchmarks at each station. All benchmarks were tied to geodetic elevation. Manual discharge measurements were performed using the velocity area method with a SonTek FlowTracker2 acoustic doppler velocimeter.

2.3 RATING CURVES

Rating curves are empirical equations unique to each monitoring station that convert stage (water level) data recorded by the monitoring station to discharge. These rating curves are developed using concurrent manual measurements of stage and discharge. Measurements from 2017 to 2025 are used in the development of these rating curves. Measurements that no longer align with existing conditions are excluded from the rating curves. These adjustments are common when developing rating curves, as erosion and aggradation of the channel change the stage-discharge relationship over time. Rating curves at the Mine are generally stable with only minor adjustments made from year to year.

The quality of the rating curve (which directly impacts the quality of the associated hydrograph) depends on the number, accuracy, and distribution of the data points used to generate the curve as well as the hydraulic characteristics of the monitoring locations. Although a rating curve can theoretically be developed with as few as two points, it is recommended that at least six measurements per rating segment be obtained (Water Survey of Canada [WSC] 2016).

2.4 HYDROGRAPHS

Hydrographs are graphical representations that show how the water level or discharge of a lake, river, or stream varies over time. Hydrographs plot time on the horizontal axis and discharge on the vertical axis, allowing for the visualization of how water levels and flow change in response to snow melt, rainfall, or other hydrological events.

Water level data collected by the monitoring station pressure transducers are used to generate mean daily stage (water elevation) and discharge hydrographs for each station as appropriate. Seasonal stations were reinstalled in June 2025 and removed in early September. To produce complete annual data sets, data were estimated for periods before and after the seasonal monitoring period. Complete data sets are necessary for generating hydrologic indices and statistics to compare data with baseline monitoring data and predicted Mine impacts. The following methods were used when estimating discharge or water level where data were not available:

- Missing discharge at monitoring station Doris Creek TL-2 was modelled using linear regression with the Doris Lake-2 year-round monitoring station.
- Discharge during the open-water season that was not monitored at the other stations was modelled using a linear regression with Doris Creek TL-2.
- For the periods where ice was known or suspected to have impacted flow, discharge was estimated using exponential growth/decay curves.

- For the open-water period outside of the observed data, lake levels were back-calculated using the station rating curves for the periods when discharge had been modelled.
- For stations with no discharge monitoring, the lake level was modelled using a linear regression with lake level station Doris Lake-2. For the periods where ice was known or suspected to have impacted flow, the lake level was estimated using exponential or linear growth/decay curves, stabilizing at the average under-ice water level from previous years for the period of January to break up.
- From October to December, the last recorded water level was carried to the end of the year.
- In situations where the winter water level was not surveyed, lake level was assumed to stabilize on the last day of modelled data.

2.5 HYDROLOGIC INDICES

Annual runoff is the volume of streamflow over the year normalized by drainage area and reported as depth. The annual runoff is a useful index for comparing the hydrologic responses of basins of different sizes. Estimates of annual runoff in 2025 were calculated from the available data and interpolated using the following equation:

$$Ro = \frac{(Q * t)}{A}$$

where:
runoff (Ro; units = millimetres [mm]) is calculated as streamflow (Q; units = cubic metres per second [m^3/s]) multiplied by time (t; units = seconds) divided by basin area (A; units = square kilometres [km^2]). Runoff is also broken down by month to show the distribution of flow throughout the year.

Peak daily flows are the highest mean daily flow during the year and typically occur during freshet. The lowest 7-day averaged flow during the open-water season typically occurs during late summer or early fall. Annual low flows are zero and are not reported, as the streams freeze solid in winter.

2.6 UNDER-ICE MEASUREMENTS

Under-ice water levels at all monitored lakes are surveyed in April, when ice is thickest, to determine the elevation of the bottom of the ice and the under-ice water volume. Field measurements include water level, ice thickness, and distance from ice surface to water surface. For Doris Lake, data from the year-round monitoring station can be used in lieu of a water level survey.

As the hydrometric station benchmarks are buried in snow and not necessarily close to the under-ice water level survey location, surveys were performed using a real-time kinematic (RTK) system. The RTK system has a lower accuracy—up to several centimetres, depending on distance from the base station—than the water level surveys completed during the open-water season, which could lead to some discrepancies in the results.

The under-ice volume was determined using subsurface contours created for the lakes, based on bathymetric survey information collected in 2006 and 2008. The bathymetric survey elevations were not referenced to a geodetic elevation; therefore, the lake surface elevation in the bathymetric dataset for each lake was estimated from the mean August water elevation for all years from 2016 to 2020 with available geodetic water level measurements. This approach provided a means to relate bathymetric data with no elevation reference to the surveyed water levels tied to a geodetic datum. The under-ice value used remains constant and does not impact the comparison of water levels from year to year.

3. 2025 ANALYSIS AND RESULTS

Tables 3.1-1 to 3.4-2 present the 2025 compliance monitoring results that include stage-discharge measurements, observed lake levels, rating equations, annual runoff, peak and low flows, and monthly runoff while Table 3.5-1 presents a summary of under-ice water level survey results. Appendix A and Appendix B present the lake level graphs and the daily flow hydrographs, respectively. Appendix C and Appendix D present the mean daily lake level and the mean daily discharges, respectively. Appendix E presents a summary of historical lake levels since 2020 and Appendix F presents historical mean daily discharge results since 2010.

3.1 STAGE-DISCHARGE MEASUREMENTS

Manual measurements of stage and discharge, where appropriate (see Table 2.1-1), were completed at all stations in June during station deployment, August, and September when stations were removed for winter. Additionally, a July measurement was completed at Doris Creek TL-2. Manual measurements are presented in Table 3.1-1.

TABLE 3.1-1 SUMMARY OF 2025 STAGE AND DISCHARGE MEASUREMENTS

Station	Date	Stage (m)	Discharge (m^3/s)
Windy Outflow	23 Jun. 2025	18.363	0.232
	10 Aug. 2025	18.250	0.016
	1 Sep. 2025	18.228	-
Glenn Lake	22 Jun. 2025	9.760	NA
	11 Aug. 2025	9.478	NA
	2 Sep. 2025	9.442	NA
Imniagut Lake	21 Jun. 2025	27.131	NA
	9 Aug. 2025	27.053	NA
	3 Sep. 2025	27.028	NA
Patch Outflow	21 Jun. 2025	26.374	0.661
	9 Aug. 2025	26.141	0.081
	4 Sep. 2025	26.078	0.089

Station	Date	Stage (m)	Discharge (m^3/s)
PO Outflow	22 Jun. 2025	26.267	0.490
	9 Aug. 2025	26.100	0.021
	5 Sep. 2025	26.023	0.099
Ogama Outflow	23 Jun. 2025	24.327	1.100
	10 Aug. 2025	24.062	0.056
	5 Sep. 2025	24.077	0.129
Doris Lake-2	20 Jun. 2025	22.065	NA
	25 Aug. 2025	21.633	NA
	23 Sep. 2025	21.700	NA
Doris Creek TL-2	20 Jun. 2025	21.706	-
	6 Jul. 2025	21.877	1.060
	1 Aug. 2025	21.645	0.159
	1 Sep. 2025	21.605	0.202
Roberts Hydro-2	24 Jun. 2025	6.507	1.500
	11 Aug. 2025	6.302	0.206
	9 Sep. 2025	6.244	0.116
Little Roberts Outflow	24 Jun. 2025	4.929	3.220
	11 Aug. 2025	4.504	0.413
	2 Sep. 2025	4.454	0.295

Notes:
- = measurement not completed or invalid; m = metre; m^3/s = cubic metre per second; NA = not applicable: lake level station only, no discharge measured at this site

3.2 RATING CURVES

Minor updates to rating curves were made where appropriate, based on the data collected in 2025. Stage data collected in 2025 were converted to discharge using the equations listed in Table 3.2-1.

TABLE 3.2-1 STAGE-DISCHARGE RATING EQUATIONS FOR HYDROMETRIC STATIONS IN 2025

Station	Rating Equation[a] $Q = C(h - a)^b$	Number of Measurements Used[b]	Root Mean Square Error (%)
Windy Outflow	$Q = 5.400\ (h - 18.147)^{2.239}$	13	19.62
Patch Outflow	$Q = 3.360\ (h - 25.998)^{1.998}$	16	11.62
PO Outflow	$Q = 6.455\ (h - 25.890)^{2.521}$	6	10.65

Station	Rating Equation[a] $Q = C(h - a)^b$	Number of Measurements Used[b]	Root Mean Square Error (%)
Ogama Outflow	$Q = 8.719\ (h - 23.994)^{1.780}$	8	12.6
Doris Creek TL-2	$Q = 6.228\ (h - 21.442)^{2.015}$	24	7.76
Roberts Outflow-2	$Q = 5.943\ (h - 6.150)^{1.594}$ $h<6.640$ $Q = 17.109\ (h - 6.190)^{2.745}$ $h>6.640$	23	11.66
Little Roberts Outflow	$Q = 5.470\ (h - 4.260)^{1.911}$ $h<4.94$ $Q = 12.989\ (h - 4.400)^{2.609}$ $h>4.94$	17	11.97

Notes:
> = greater than; < = less than; m^3/s = cubic metre per second
[a] Equation $Q = C(h - a)^b$: Q is the discharge (m^3/s), C and b are dimensionless coefficients, h is the stage in metres (m), and a is the approximate stage at zero flow (m).
[b] The 2025 stage-discharge rating equations were developed using measurements from 2017 to 2025, where available.

3.3 HYDROGRAPHS

Water level and flow rates at monitored stations followed a typical Arctic nival flow regime, with peak flows occurring during freshet, a steady decline through the summer, with a minor increase in flow in the fall due to precipitation. Based on site photos taken at Doris Creek TL-2 every 3 to 5 days in the spring, flow was estimated to begin on 29 May 2025. Freshet occurred as expected, compared to previous years, which resulted in a relatively normal peak and an as-expected freshet period. Flow was estimated to have ended on 4 November 2025, based on the Doris Lake water level no longer dropping, as well as a significant cold weather period.

As stations were installed in late June and removed in early September, mean daily water levels and flow rates were estimated when station data were unavailable (see Section 2.4). Tables 3.3-1 and 3.3-2 present the timing and approach for estimating discharge and the lake level, respectively. Tables 3.3-3 and 3.3-4 present the regression analysis summary for hydrograph and lake level estimation, respectively. Table 3.3-5 presents monthly mean, maximum, and minimum lake levels, along with the maximum water level fluctuation during the open-water season, and over the full calendar year.

These monthly statistics include observed, modelled, and estimated data. Appendices A and B provide the lake levels graphs and hydrographs for each monitored station in 2025. Appendices C and D provide the mean daily lake level tables and the mean daily discharge tables. Appendices E and F provide historical lake level graphs and hydrographs for comparing data with previous years.

TABLE 3.3-1 2025 OBSERVED, MODELLED, AND ESTIMATED DISCHARGE

Station	Observed	Modelled	Estimated
Windy Outflow	23 Jun. – 1 Sep.	29 May – 22 Jun. 2 Sep. – 25 Oct.	1 Jan. – 28 May 26 Oct. – 31 Dec.
Patch Outflow	21 Jun. – 4 Sep.	29 May – 20 Jun. 5 Sep. – 25 Oct.	1 Jan. – 28 May 26 Oct. – 31 Dec.
PO Outflow	22 Jun. – 5 Sep.	29 May – 21 Jun. 6 Sep. – 25 Oct.	1 Jan. – 28 May 26 Oct. – 31 Dec.
Ogama Outflow	23 Jun. – 5 Sep.	29 May – 22 Jun. 6 Sep. – 25 Oct.	1 Jan. – 28 May 26 Oct. – 31 Dec.
Roberts Hydro-2	24 Jun. – 2 Sep.	29 May – 23 Jun. 3 Sep. – 25 Oct.	1 Jan. – 28 May 26 Oct. – 31 Dec.
Little Roberts Outflow	24 Jun. – 2 Sep.	29 May – 23 Jun. 2 Sep. – 25 Oct.	1 Jan. – 28 May 26 Oct. – 31 Dec.
Doris Creek TL-2	20 Jun. – 1 Sep.	29 May – 19 Jun. 2 Sep. – 25 Oct.	1 Jan. – 28 May 26 Oct. – 31 Dec.

TABLE 3.3-2 2025 OBSERVED, MODELLED, AND ESTIMATED LAKE LEVELS

Station	Observed	Modelled	Estimated
Windy Outflow	23 Jun. – 1 Sep.	23 May – 22 Jun. 2 Sep. – 25 Oct.	1 Jan. – 22 May 26 Oct. – 31 Dec.
Patch Outflow	21 Jun. – 4 Sep.	22 May – 20 Jun. 5 Sep. – 25 Oct.	1 Jan. – 21 May 26 Oct. – 31 Dec.
PO Outflow	22 Jun. – 5 Sep.	22 May – 21 Jun. 6 Sep. – 25 Oct.	1 Jan. – 21 May 26 Oct. – 31 Dec.
Ogama Outflow	23 Jun. – 5 Sep.	22 May – 22 Jun. 6 Sep. – 25 Oct.	1 Jan. – 21 May 26 Oct. – 31 Dec.
Roberts Hydro-2	24 Jun. – 2 Sep.	23 May – 24 Jun. 4 Sep. – 25 Oct.	1 Jan. – 22 May 26 Oct. – 31 Dec.
Little Roberts Outflow	24 Jun. – 2 Sep.	22 May – 23 Jun. 3 Sep. – 25 Oct.	1 Jan. – 21 May 26 Oct. – 31 Dec.
Imniagut Lake	22 Jun. – 2 Sep.	23 May – 21 Jun. 3 Sep. – 25 Oct.	1 Jan. – 22 May 26 Oct. – 31 Dec.
Glenn Lake	1 Jun. – 22 Aug.	24 May – 23 Jun. 23 Aug. – 25 Oct.	1 Jan. – 23 May. 26 Oct. – 31 Dec.
Doris Lake-2	1 Jan. – 31 Dec.	NA	NA

Note:
NA = not applicable

TABLE 3.3-3 2025 REGRESSION ANALYSIS SUMMARY FOR HYDROGRAPH ESTIMATION

Station	Concurrent Period	Reference Station / Estimation Method Used for Infilling	Regression Equation	R2	Estimated Periods
Doris Creek (TL-2)	NA	Exponential Growth	NA	NA	26 May – 28 May
	20 Jun. – 31 Jul.	Doris Lake/Modelled	y = 4.367x - 94.548	0.99	29 May – 20 Jun.
	1 Aug – 1 Sep.	Doris Lake/Modelled	y = 2.2601x - 48.734	0.99	1 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 5 Nov.
Little Roberts Outflow	NA	Exponential Growth	NA	NA	26 May – 28 May
	24 Jun. – 2 Sep.	Doris Creek/Modelled	y = 1.5363x + 0.0144	0.99	29 May – 24 Jun.
	24 Jun. – 2 Sep.	Doris Creek/Modelled	y = 1.5363x + 0.0144	0.99	2 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 5 Nov.
Ogama Lake Outflow	NA	Exponential Growth	NA	NA	26 May – 28 May
	23 Jun. – 12 Jul.	Doris Creek/Modelled	y = 0.8435x - 0.3994	0.99	29 May – 22 Jun.
	1 Aug. – 5 Sep.	Doris Creek/Modelled	y = 0.182x + 0.0718	0.27*	6 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 5 Nov.
Patch Lake Outflow	NA	Exponential Growth	NA	NA	26 May – 28 May
	21 Jun. – 4 Sep.	Doris Creek/Modelled	y = 0.2645x + 0.0121	0.99	29 May – 20 Jun.
	1 Aug. – 4 Sep.	Doris Creek/Modelled	y = 0.4047x - 0.0206	0.97	5 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 5 Nov.
PO Lake Outflow	NA	Exponential Growth	NA	NA	26 May – 28 May
	22 Jun. – 31 Jul.	Doris Creek/Modelled	y = 0.1773x + 0.153	0.99	29 May – 21 Jun.
	1 Aug. – 5 Sep.	Doris Creek/Modelled	y = 0.7441x - 0.0556	0.97	5 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	25 Oct. – 5 Nov.

Station	Concurrent Period	Reference Station / Estimation Method Used for Infilling	Regression Equation	R2	Estimated Periods
Roberts Lake Outflow	NA	Exponential Growth	NA	NA	26 May – 28 May
	24 Jun. – 2 Sep.	Doris Creek/Modelled	y = 0.7252x + 0.0427	0.99	29 May – 23 Jun.
	1 Aug. – 2 Sep.	Doris Creek/Modelled	y = 0.979x - 0.0298	0.99	3 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 5 Nov.
Windy Lake Outflow	NA	Exponential Growth	NA	NA	26 May – 28 May
	23 Jun. – 1 Sep.	Doris Creek/Modelled	y = 0.1161x + 0.015	0.98	29 May – 22 Jun.
	23 Jun. – 1 Sep.	Doris Creek/Modelled	y = 0.1161x + 0.015	0.98	2 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 5 Nov.

Notes:
NA = not applicable
A concurrent period represents the complete data range used in the regression analysis, where data from a reference station is used to model daily discharge for a station with the missing data.
*Low R2 value is due to outliers in the linear regression caused by differences in water level response to a precipitation event.

TABLE 3.3-4 2025 REGRESSION ANALYSIS SUMMARY FOR LAKE LEVEL ESTIMATION

Station	Concurrent Period	Reference Station / Estimation Method Used for Infilling	Regression Equation	R2	Estimated Periods
Glenn Lake	NA	Linear Growth	NA	NA	1 Jan. – 23 May
	24 Jun. – 22 Aug.	Doris Lake/Modelled	y = 0.9499x - 11.157	0.99	24 May – 23 Jun.
	24 Jun. – 22 Aug.	Doris Lake/Modelled	y = 0.9499x - 11.157	0.99	23 Aug. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 31 Dec.

Station	Concurrent Period	Reference Station / Estimation Method Used for Infilling	Regression Equation	R2	Estimated Periods
Imniagut Lake	NA	Linear Growth	NA	NA	1 Jan. – 22 May
	22 Jun – 31 Jul.	Doris Lake/Modelled	y = 0.1312x + 24.248	0.83	23 May – 21 Jun.
	22 Jun. – 2 Sep.	Doris Lake Modelled	y = -1.0201x2 + 44.774x - 464.16	0.97	3 Sep. – 25 Oct.
	NA	Linear Decay	NA	NA	26 Oct. – 31 Dec.

Notes:
NA = not applicable
A concurrent period represents the complete data range used in the regression analysis, where data from a reference station is used to model daily discharge for a station with the missing data.

TABLE 3.3-5 SUMMARY OF 2025 LAKE LEVELS

Station	Parameter	2025 Monthly Lake Level[a] (m)												Lake Level Fluctuation[b]	
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jun. – Sep.	Annual
Windy Outflow	Mean	18.385	18.385	18.385	18.385	18.397	18.407	18.318	18.255	18.255	18.270	18.273	18.273	0.223	0.223
	Max	18.385	18.385	18.385	18.385	18.465	18.466	18.367	18.274	18.265	18.275	18.273	18.273		
	Min	18.385	18.385	18.385	18.385	18.385	18.362	18.275	18.243	18.248	18.261	18.273	18.273		
Glenn Lake	Mean	9.691	9.691	9.691	9.691	9.749	9.893	9.576	9.416	9.405	9.451	9.465	9.465	0.781	0.781
	Max	9.691	9.691	9.691	9.691	10.159	10.164	9.701	9.475	9.433	9.469	9.465	9.465		
	Min	9.691	9.691	9.691	9.691	9.691	9.707	9.481	9.383	9.386	9.423	9.465	9.465		
Imniagut Lake	Mean	27.127	27.127	27.127	27.127	27.135	27.155	27.113	27.049	27.050	27.078	27.085	27.085	0.170	0.170
	Max	27.127	27.127	27.127	27.127	27.192	27.193	27.144	27.090	27.068	27.088	27.085	27.085		
	Min	27.127	27.127	27.127	27.127	27.127	27.128	27.093	27.023	27.036	27.062	27.085	27.085		

Station	Parameter	2025 Monthly Lake Level[a] (m)												Lake Level Fluctuation[b]	
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jun. – Sep.	Annual
Patch Outflow	Mean	25.828	25.828	25.828	25.828	25.949	26.417	26.245	26.139	26.124	26.170	26.182	26.182	0.430	0.696
	Max	25.828	25.828	25.828	25.828	26.522	26.524	26.334	26.189	26.155	26.185	26.182	26.182		
	Min	25.828	25.828	25.828	25.828	25.828	26.338	26.192	26.100	26.094	26.145	26.182	26.182		
PO Outflow	Mean	26.225	26.225	26.225	26.225	26.241	26.264	26.179	26.085	26.065	26.124	26.138	26.138	0.292	0.292
	Max	26.225	26.225	26.225	26.225	26.319	26.320	26.224	26.144	26.106	26.141	26.138	26.138		
	Min	26.225	26.225	26.225	26.225	26.225	26.219	26.145	26.034	26.028	26.094	26.138	26.138		
Ogama Outflow	Mean	24.147	24.147	24.147	24.147	24.200	24.358	24.154	24.077	24.081	24.087	24.089	24.089	0.426	0.426
	Max	24.147	24.147	24.147	24.147	24.491	24.493	24.254	24.099	24.101	24.090	24.089	24.089		
	Min	24.147	24.147	24.147	24.147	24.147	24.258	24.100	24.067	24.075	24.081	24.089	24.089		
Doris Lake-2	Mean	21.865	21.911	21.912	21.896	21.959	22.161	21.822	21.660	21.646	21.694	21.679	21.679	0.843	0.843
	Max	21.905	21.926	21.919	21.905	22.440	22.446	21.967	21.717	21.676	21.714	21.702	21.689		
	Min	21.822	21.892	21.904	21.888	21.873	21.971	21.720	21.623	21.626	21.665	21.662	21.669		
Roberts Hydro-2	Mean	6.504	6.504	6.504	6.504	6.521	6.585	6.393	6.265	6.251	6.291	6.302	6.302	0.464	0.464
	Max	6.504	6.504	6.504	6.504	6.689	6.691	6.489	6.310	6.277	6.305	6.302	6.302		
	Min	6.504	6.504	6.504	6.504	6.504	6.481	6.319	6.227	6.233	6.268	6.302	6.302		
Little Roberts Outflow	Mean	4.725	4.725	4.725	4.725	4.767	4.984	4.698	4.491	4.480	4.537	4.553	4.553	0.657	0.657
	Max	4.725	4.725	4.725	4.725	4.988	5.093	4.875	4.570	4.517	4.557	4.553	4.553		
	Min	4.725	4.725	4.725	4.725	4.725	4.875	4.574	4.436	4.455	4.505	4.553	4.553		

Notes:
m = metre; max = maximum; min = minimum
[a] Water levels include observed, modelled, and estimated data.
[b] Change in lake level refers to the difference between the highest June 2025 and the lowest July to September 2025 lake levels.

3.4 HYDROLOGIC INDICES

Table 3.4-1 presents the 2025 hydrologic indices of annual runoff, peak flows, and 7-day low flows. Table 3.4-2 presents the monthly runoff distributions from the seven hydrometric stations that record discharges.

TABLE 3.4-1 SUMMARY OF 2025 ANNUAL RUNOFF, PEAK FLOWS, AND LOW FLOWS

Station	Annual Runoff (mm)	Annual Peak Daily Flows[a]		7-Day Low Flows[b]	
		Peak Flow (m^3/s)	Date	7-Day Low Flow (m^3/s)	Date
Windy Outflow	106	0.420	1 Jun.	0.030	25 Aug.
Patch Outflow	94	0.930	1 Jun.	0.040	4 Sep.
PO Outflow	96	0.770	1 Jun.	0.050	5 Sep.
Ogama Outflow	86	2.530	1 Jun.	0.090	28 Aug.
Doris Creek TL-2	116	3.472	1 Jun.	0.152	6 Sep.
Roberts Outflow-2	85	2.560	1 Jun.	0.110	28 Aug.
Little Roberts Outflow	85	5.350	1 Jun.	0.220	29 Aug.

Notes:
m^3/s = cubic metre per second; mm = millimetre
[a] Peak flows refer to peak daily discharges in 2025 and are based on estimated and observed data.
[b] Seven-day low flows are June peak to 30 September 2025 data only.

TABLE 3.4-2 SUMMARY OF 2025 MONTHLY RUNOFF DISTRIBUTIONS

Station	2025 Monthly Runoff (mm)							
	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Windy Outflow	10	51	21	7	7	9	0	0
Patch Outflow	9	49	18	6	4	8	0	0
PO Outflow	7	40	22	8	6	12	0	0
Ogama Outflow	10	51	12	4	4	4	0	0
Doris Creek TL-2	10	64	22	7	5	8	0	0
Roberts Outflow-2	8	44	17	5	4	7	0	0
Little Roberts Outflow	9	46	16	5	4	5	0	0

Note:
mm = millimetre

Peak flow occurred on 1 June 2025 across all stations, though this was estimated for all stations based on data from the Doris Lake-2 year-round monitoring station. The timing of the 7-day low flow ranged from 25 August to 6 September 2025. Annual runoff details showed a generally below average year for all stations, with Doris Creek showing the highest runoff value of all the sites. The spread in annual runoff between stations is larger than usual and can likely be attributed to greater uncertainty due to the later-than-usual installation of the monitoring stations resulting in longer estimated periods. A large spread in annual runoff between monitoring stations could indicate water losses due to mine impacts; however, this would result in Doris Lake and Windy Lake having lower runoff than surrounding stations. Since Doris and Windy lakes have the highest runoff, it is more likely that this is due to uncertainty due to data estimation.

Breaking runoff down by month shows that most flow occurs during and shortly after freshet, with much less water flowing during late summer and fall, with a small increase in late fall due to precipitation. This flow distribution is typical of Arctic streams.

3.5 UNDER-ICE MEASUREMENTS

Between 26 April and 28 April 2025, Agnico Eagle conducted under-ice water level surveys at Windy Lake and Patch Lake, in conjunction with under-ice aquatic sampling. Completion of under-ice surveys at all monitored lakes was not feasible due to poor weather and eventual dangerous ice conditions. The water level for Doris Lake was determined using the year-round monitoring station. Table 3.5-1 presents the surveyed water level, ice thickness, and water gap for each monitored lake.

TABLE 3.5-1 SUMMARY OF 2025 UNDER-ICE LAKE LEVEL SURVEYS WITH UNDER-ICE VOLUMES OF MONITORED LAKES WITH BATHYMETRY INFORMATION

Station	**2025**				
	Water Surface Elevation[a] (masl)	**Ice Thickness (m)**	**Water Gap (m)**	**Ice Bottom Elevation (masl)**	**Under-Ice Volume (mm^3)**
Windy Outflow	18.39	1.5	0.03	16.92	52.12
Glenn Lake	-	-	-	-	NA[b]
Imniagut Lake	-	-	-	-	-
Patch Outflow	25.96	1.71	0.02	24.27	12.84
PO Outflow	-	-	-	-	-
Ogama Outflow	-	-	-	-	-
Doris Lake-2	21.89	1.8	0.18	20.27	21.90
Little Roberts Outflow	-	-	-	-	-

Notes:
- = data not collected; m = metre; masl = metres above sea level; mm^3 = cubic millimetre; NA = not applicable; UTM = Universal Transverse Mercator
[a] UTM Zone 13W.
[b] No bathymetric data available.

4. COMPARISON WITH FINAL ENVIRONMENTAL IMPACT STATEMENT PREDICTIONS

4.1 PRECIPITATION INFLUENCE

Table 4.1-1 presents the precipitation at the Hope Bay meteorological station (referred to as the Doris Hydrometric Station) for the 2025 hydrologic year. The hydrologic year is the period where precipitation will contribute to the runoff of that year. It generally spans October of the prior year (2024) to September of the current reporting year (2025), starting at the beginning of freeze-up, when precipitation will be stored until the spring, and ending at the start of freeze-up the following year.

TABLE 4.1-1 DORIS HYDROMETRIC STATION PRECIPITATION OCTOBER 2024 TO SEPTEMBER 2025

Month	Total Rainfall (mm)	Total Snowfall (SWE; mm)	Total Precipitation (mm)	Expected Mean Monthly Precipitation[a] (mm)
24 Oct.	11.6	24.5	36	24
24 Nov.	0	10.7	10.7	16
24 Dec.	0	11.5	11.5	11
25 Jan.	0.0	11.0	11.0	10
25 Feb.	0.0	9.3	9.3	9
25 Mar.	0.0	7.7	7.7	11
25 Apr.	0.0	6.8	6.8	11
25 May	3.6	11.8	15.4	14
25 Jun.	19.5	0.0	19.5	18
25 Jul.	12.4	0.0	12.4	29
25 Aug.	24.9	0.0	24.9	31
25 Sep.	17.5	0.0	17.5	26
Total	**89.5**	**93.3**	**182.7**	**210**

Notes:
mm = millimetre; FEIS = Final Environmental Impact Statement; SRK = SRK Consulting (Canada) Inc.; SWE = snow water equivalent
[a] Package P5-2 (Table 5) of the Hope Bay FEIS (SRK 2017a).

The precipitation gauge at the meteorology station, which was upgraded in June 2023, operated as expected for the duration of the 2025 hydrometric monitoring program.

Table 4.1-2 presents the precipitation return periods from the *Climate and Hydrological Parameters Summary Report, Hope Bay Project*, Package P5-2 (SRK Consulting (Canada) Inc. [SRK] 2017a) of the Hope Bay FEIS (TMAC 2017).

TABLE 4.1-2 HOPE BAY EXTREME PRECIPITATION DEPTHS

Return Period	Annual Precipitation (mm)
200 Wet	324
100 Wet	311
50 Wet	297
25 Wet	282
20 Wet	277
10 Wet	261
5 Wet	243
Average MAP	210
2 Wet	210
3 Dry	195
5 Dry	182
10 Dry	168
20 Dry	158
25 Dry	155
50 Dry	147
100 Dry	140
200 Dry	134

Source: Package P5-2 (Table 6) of the Hope Bay FEIS (SRK 2017a).

Notes:
MAP = mean annual precipitation; FEIS = Final Environmental Impact Statement; SRK = SRK Consulting (Canada) Inc.
Annual precipitation values are based on calendar year totals. While the hydrologic year is October to September, total precipitation statistics are comparable when using a large data set.

The total annual precipitation for the 2025 hydrometric monitoring program is 183 mm. This falls in a dry year with a return period of close to 5 years, compared to an average year that would see 210 mm. This is below average, which is reflected in the observed annual runoff across the site.

A considerable amount of precipitation fell during October 2024—50 percent (%) more than the expected mean monthly value of 24 mm. All other months received expected or below-expected precipitation.

4.2 RUNOFF

A portion of the precipitation is converted to runoff, which enters the lakes and streams, resulting in streamflow. Runoff is the volumetric outflow normalized by the catchment area to allow comparison between different sized catchments.

Table 4.2-1 presents the comparison of 2025 runoff to historical baseline data (averages and predicted values) collected between 2004 and 2015, as well as the 2019 through 2025 monitoring data.

The runoff value in 2025 was lower than the 2004 to 2015 average, except for at the Doris Creek TL-2 station. A substantial portion of freshet occurred prior to the installation of the monitoring stations, which increased the uncertainty of the annual runoff estimates and likely contributed to the larger spread of annual runoff between monitoring stations.

Table 4.2-2 presents predicted impacts based on modelling results from the *Madrid-Boston Project Water and Load Balance, Hope Bay Project* (SRK 2017b). The timeline of the FEIS predicted effects have deviated from the real world timeline as construction of the Madrid North mine has been suspended since 2021. The predicted impacts presented in Table 4.2-2 are those predicted prior to Operation of the Madrid North Mine. Effects to Doris Lake were predicted due to water-withdrawal and mine-dewatering activities. If there were water level drawdowns in Doris Lake, the drawdown could result in downstream effects to Little Roberts Outflow. Effects to Windy Lake were predicted due to the withdrawal of water from Windy Lake.

Drawdown to the Doris Lake water level was not detected in 2025 (Table 3.2-3 and Figure A-8 in Appendix A). An estimation of the annual runoff (Table 4.2-1) indicates a below average year, with freshet beginning at a similar time as previous years. Water withdrawal from Windy Lake did not cause a detectable impact in 2025. The total withdrawal for the year was 19,064 m^3, which represents 1.31% of the total volumetric discharge for the year, compared to 0.61% in 2024.

In 2025, there were no detectable Project impacts to lake levels and lake outflow rates as part of the compliance monitoring program.

TABLE 4.2-1 COMPARISON OF 2025 RUNOFF WITH HISTORICAL AVERAGES AND PREDICTED VALUES

Station	Previous Years Data								FEIS Predicted Runoff[a]		
	2019	2020	2021	2022	2023	2024	2025	2004–2015 Average[a]	Predicted Average Runoff	Predicted 20-Year Dry Runoff	Predicted 20-Year Wet Runoff
Windy Outflow	174	107	166	86	111	132	105	130	58	21	119
Patch Outflow	189	82	105	118	117	111	93	112	77	40	137
PO Outflow	222	102	157	117	89	116	96	153	80	41	143
Ogama Outflow	167	58	128	95	122	104	86	117	100	46	199
Doris Creek TL-2	191	75	153	121	130	120	116	110	101	48	213
Roberts Outflow-2	156	NA	141	127	130	132	85	112	NA	NA	NA
Little Roberts Outflow	175	83	144	100	113	115	85	93	161	64	347

Notes:
FEIS = Final Environmental Impact Statement; NA = not applicable; TMAC = TMAC Resources Inc.
[a] Data source: V5-S1 (Tables 1.2-7 and 1.5-7 to 1.5-12) of the Hope Bay FEIS (TMAC 2017).

TABLE 4.2-2 PREDICTED IMPACT TO ANNUAL OUTFLOW FROM MONITORED LAKES

Station	FEIS Predicted Impact[a] to Annual Flow in 2025 Under Average Climate Conditions (% Change)
Windy Outflow	-6.7
Patch Outflow	0
PO Outflow	0
Ogama Outflow	0
Doris Creek TL-2	-13.4
Little Roberts Outflow	-7.8
Glenn Outflow	-2.0

Source: V5-S1 (Tables 1.2-7, and 1.5-7 to 1.5-12) of the Hope Bay FEIS (TMAC 2017).

Notes:

% = percent; FEIS = Final Environmental Impact Statement; TMAC = TMAC Resources Inc.

[a] Project phase: Predicted impacts were assessed for both existing and permitted projects.

5. CLOSING

We trust that the hydrometric monitoring summaries and recommendations for improvement at the Project site are sufficient for your needs. Please contact us if you have any questions.

Prepared by:

Michael Willcock	Cameron Evans, BASc
Senior Consultant	Managing Technical Consultant
ERM Consultants Canada Ltd.	ERM Consultants Canada Ltd.

6. REFERENCES

Legislation and Regulations

Fisheries Act, RSC 1985, c F-14.

Other Sources

Agnico Eagle (Agnico Eagle Mines Limited). 2022. *Hope Bay, Care* and *Maintenance Plan*. Version 1. April 2022. Toronto, ON.

ERM Rescan Environmental Services Ltd. 2014. *Doris North Project 2013 Hydrology Compliance Monitoring Report*. Prepared for TMAC Resources Inc. Yellowknife, NT.

SRK (SRK Consulting (Canada) Inc.). 2017a. *Climate and Hydrological Parameters Summary Report, Hope Bay Project.* Prepared for TMAC Resources Inc. November 2017.

SRK. 2017b. *Madrid-Boston Project Water and Load Balance, Hope Bay Project*. Prepared for TMAC Resources Inc., 1CT022.013. November 2017.

TMAC (TMAC Resources Inc.). 2017. *Madrid-Boston Project Final Environmental Impact Statement.* Toronto, ON.

TMAC. 2018. *Hope Bay Project: Aquatic Effects Monitoring Plan.* Toronto, ON.

Water Survey of Canada (WSC). 2016. *Hydrometric Manual – Data Computations, Stage-Discharge Model Development and Maintenance*. Environment and Climate Change Canada. QSOP-NA049-01-2016. Version 1. 14 April 2016.

APPENDIX A LAKE LEVELS GRAPHS

FIGURE A-1 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION WINDY OUTFLOW

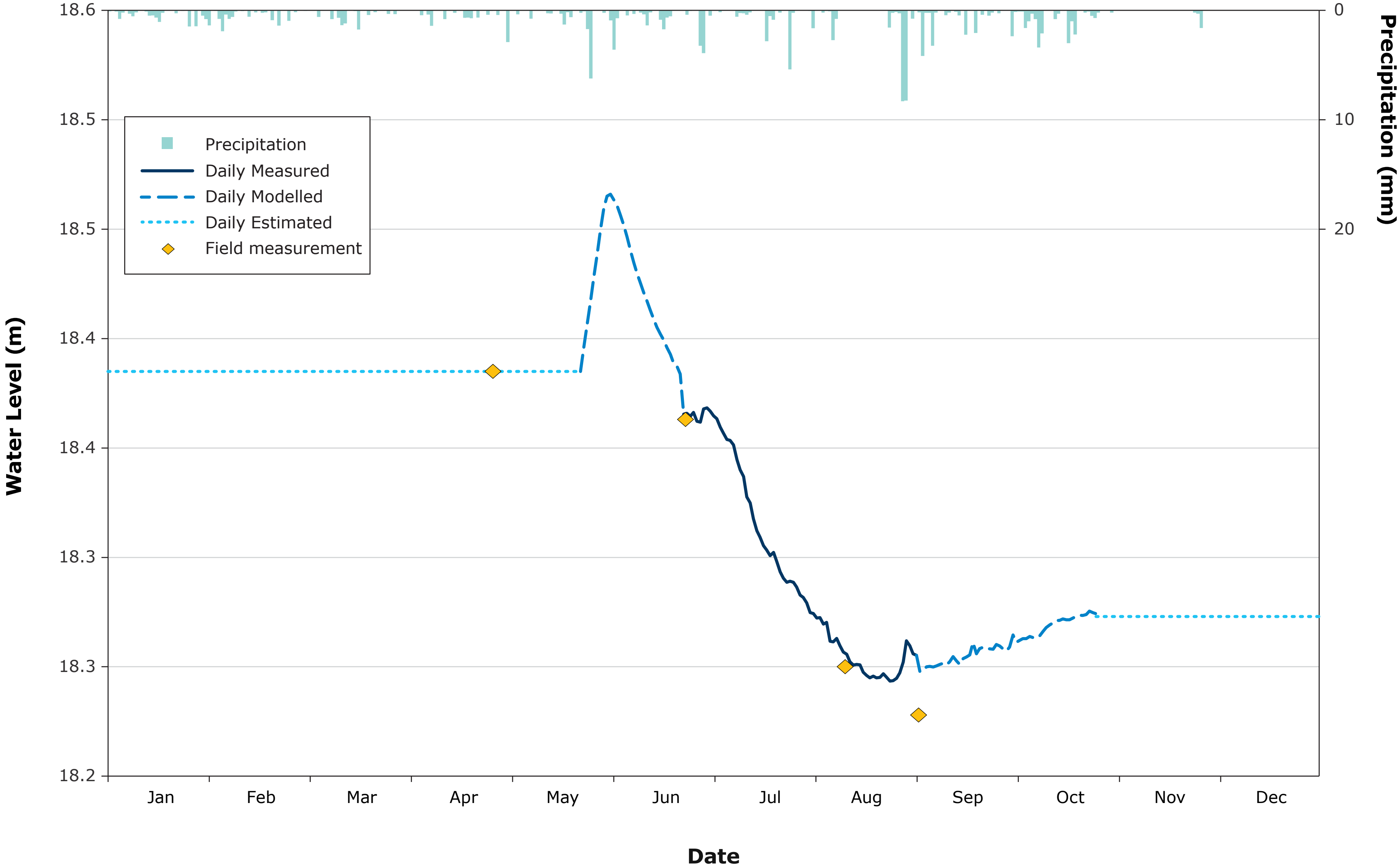
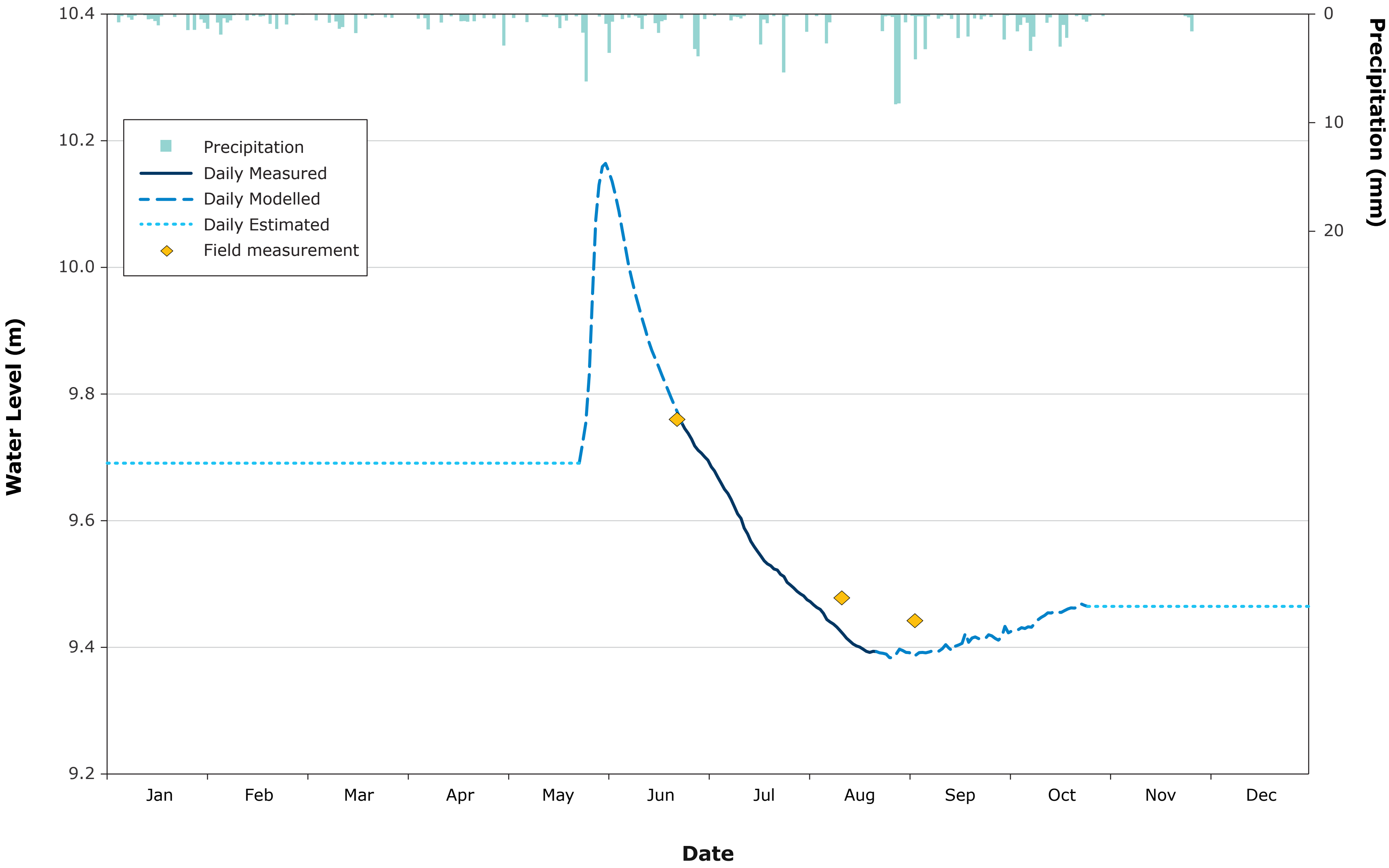


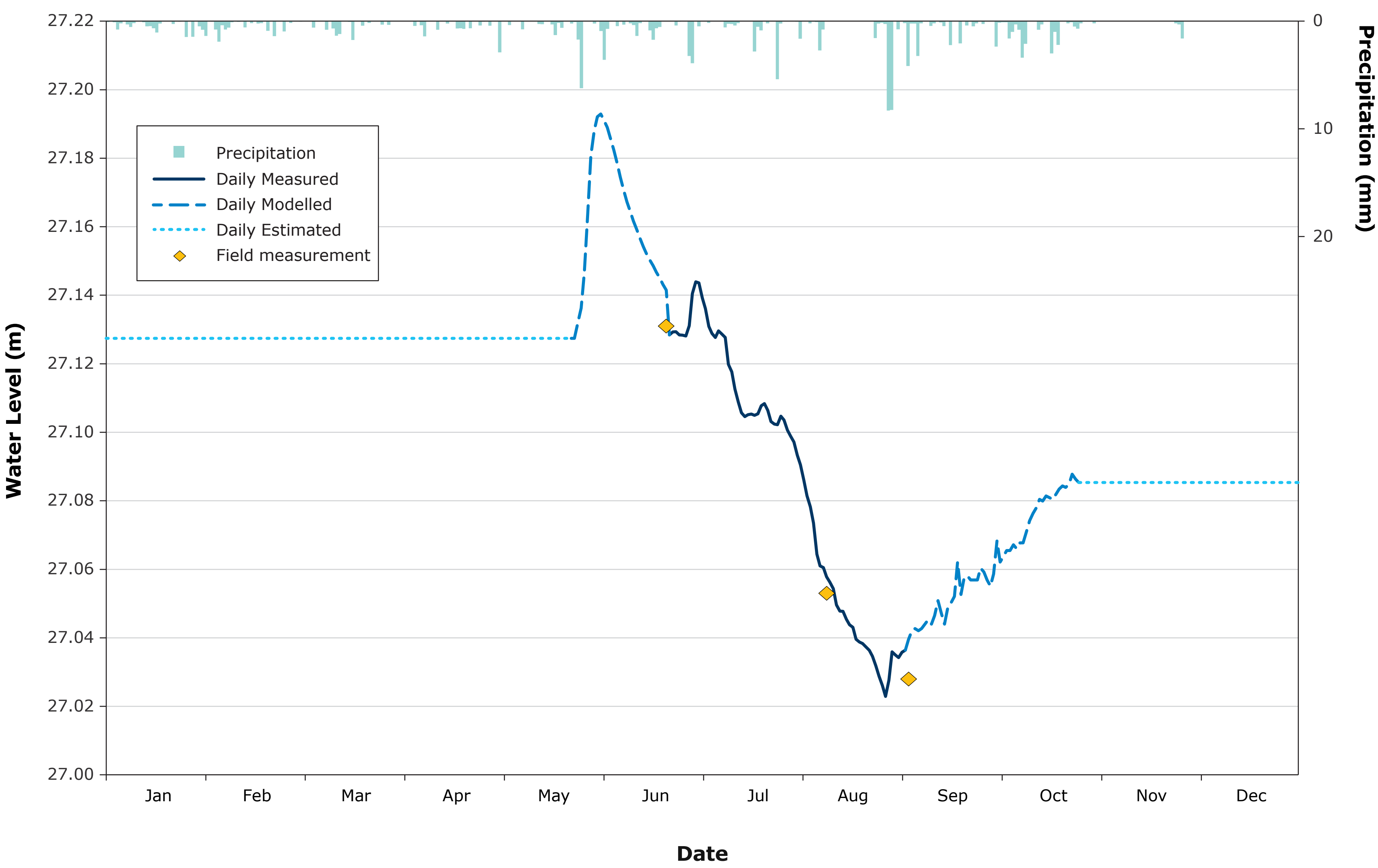
FIGURE A-2 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION GLENN LAKE



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-001:2

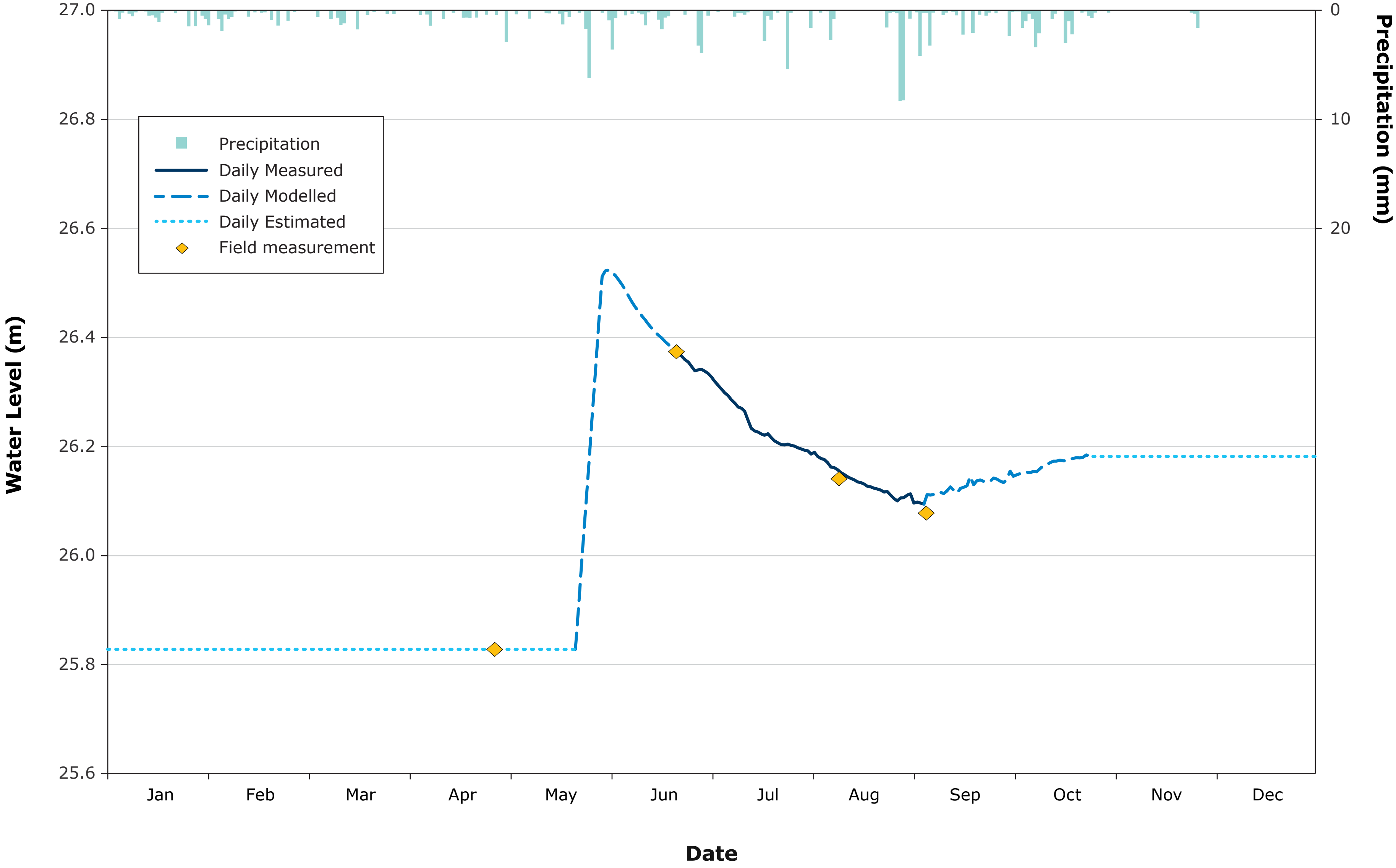
FIGURE A-3 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION IMNIAGUT LAKE



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-001:3

FIGURE A-4 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION PATCH OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-001:4

FIGURE A-5 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION PO OUTFLOW

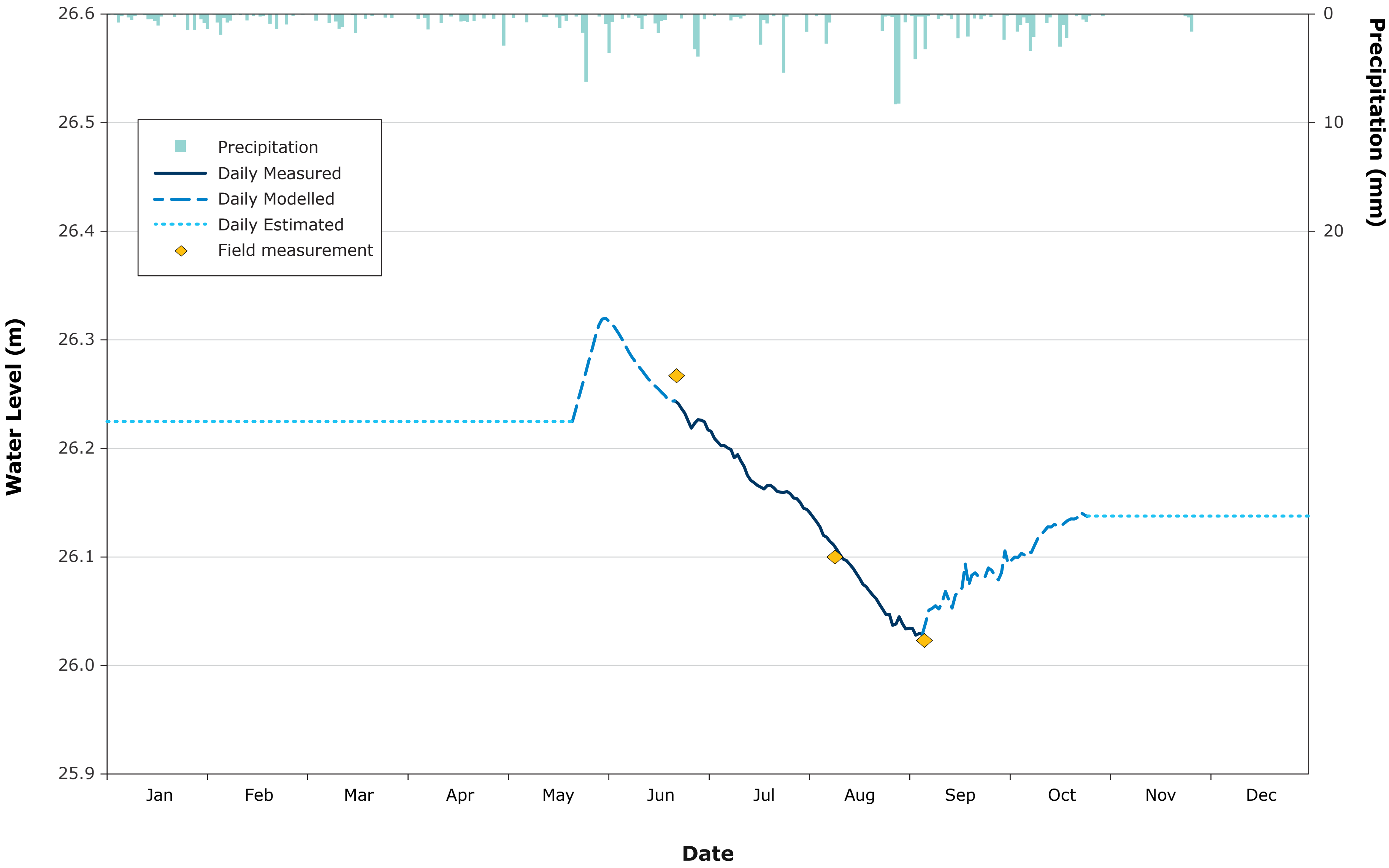
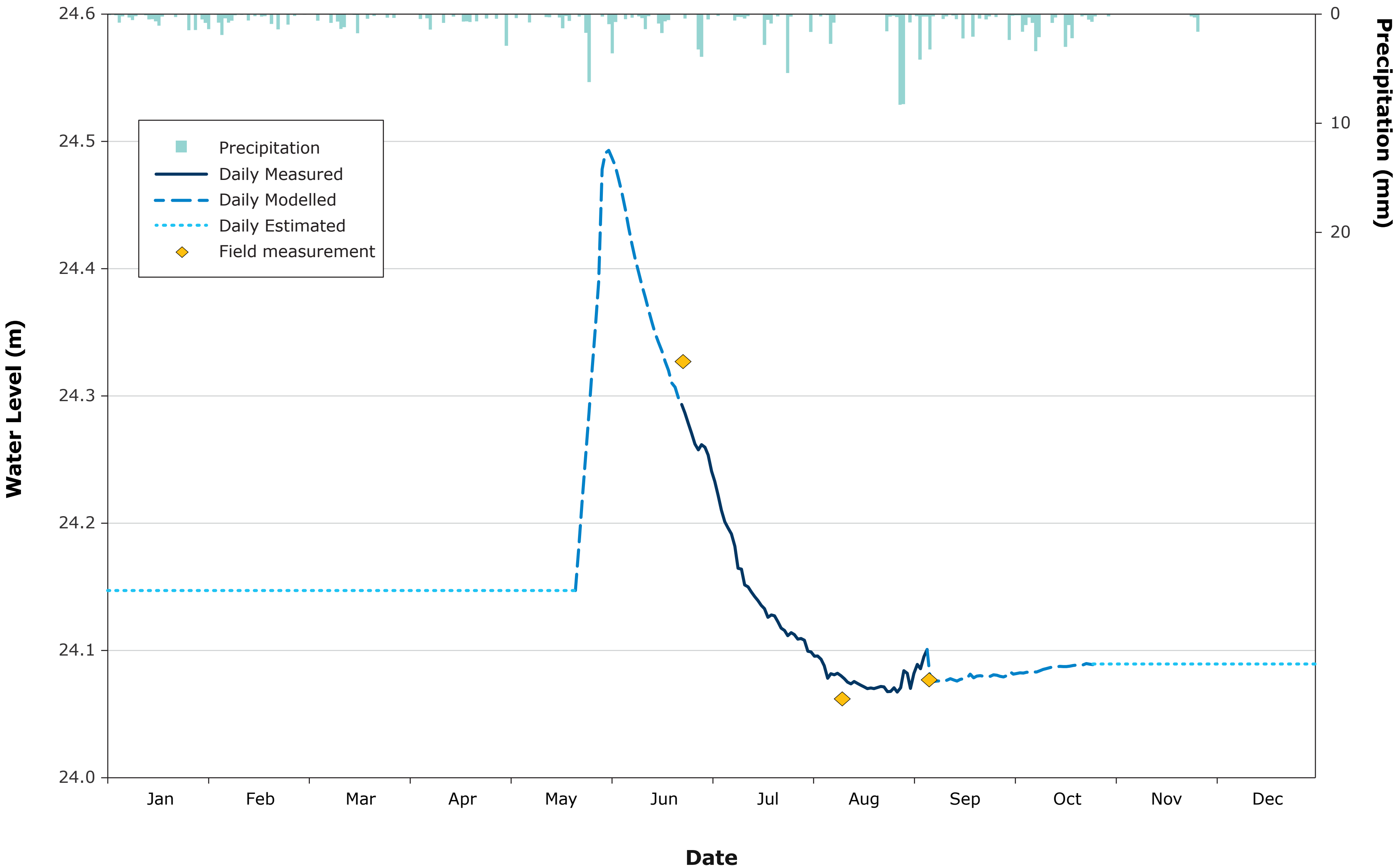


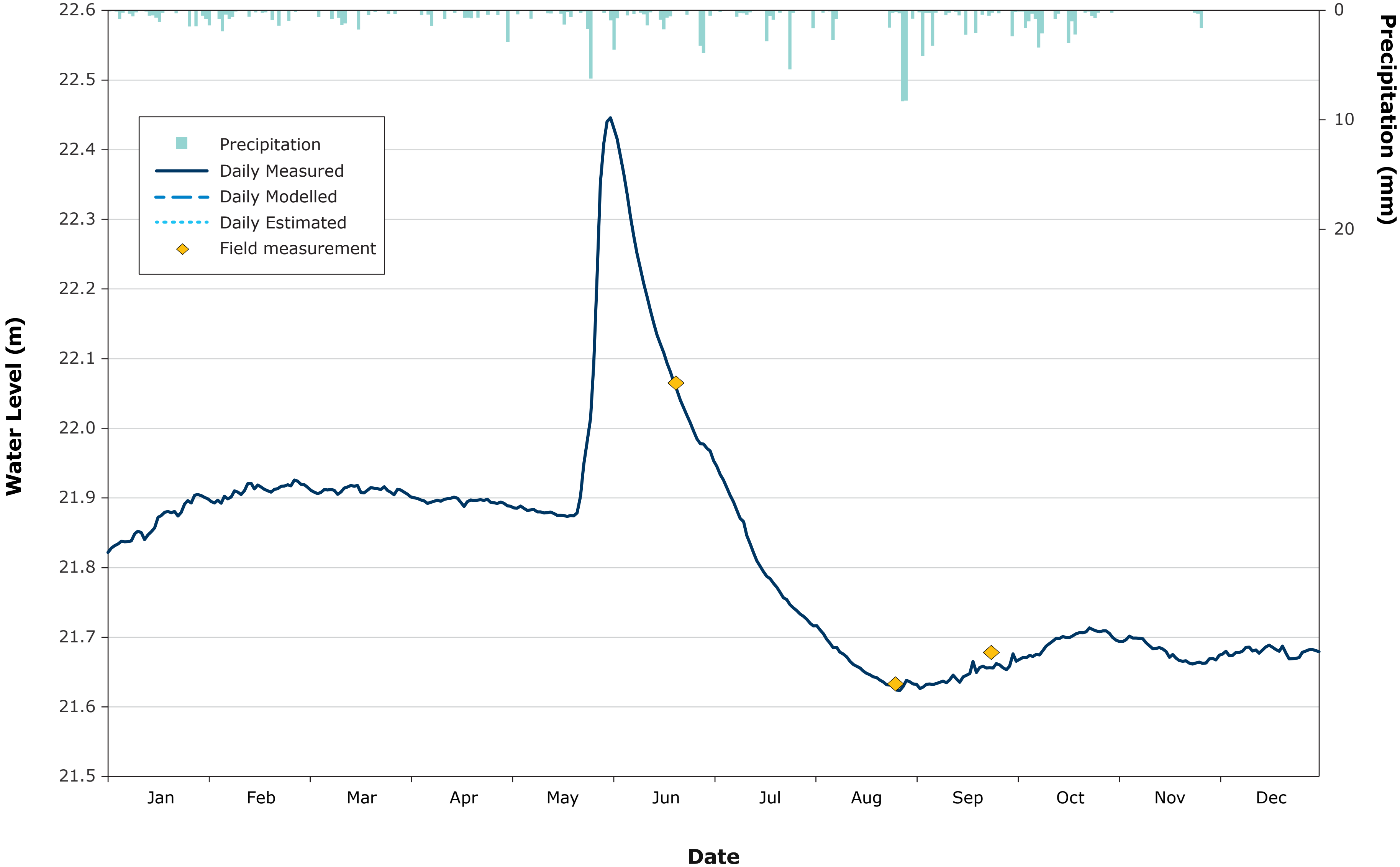
FIGURE A-6   2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION OGAMA OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-001:6

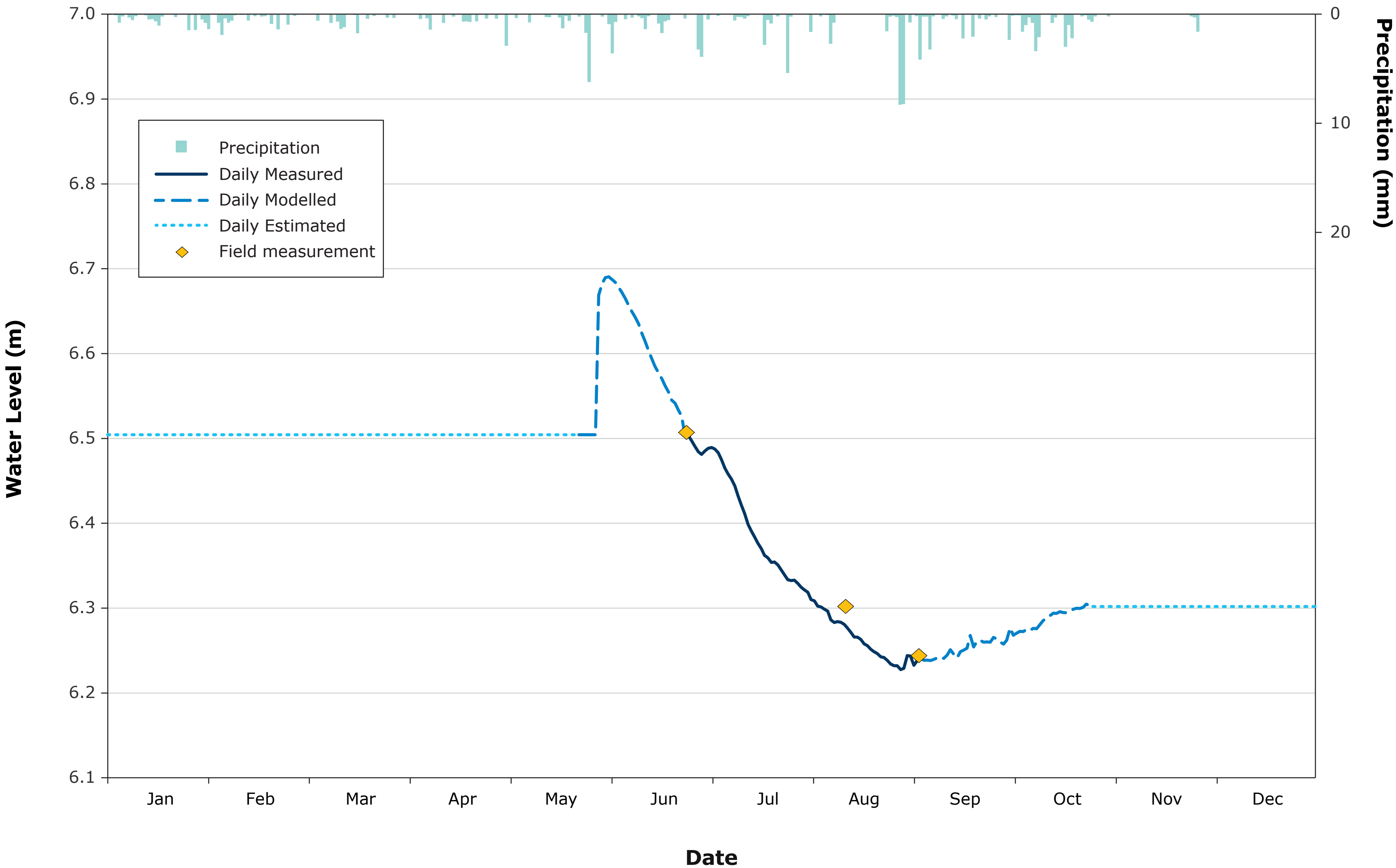
FIGURE A-7 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION DORRIS LAKE-2



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-001:7

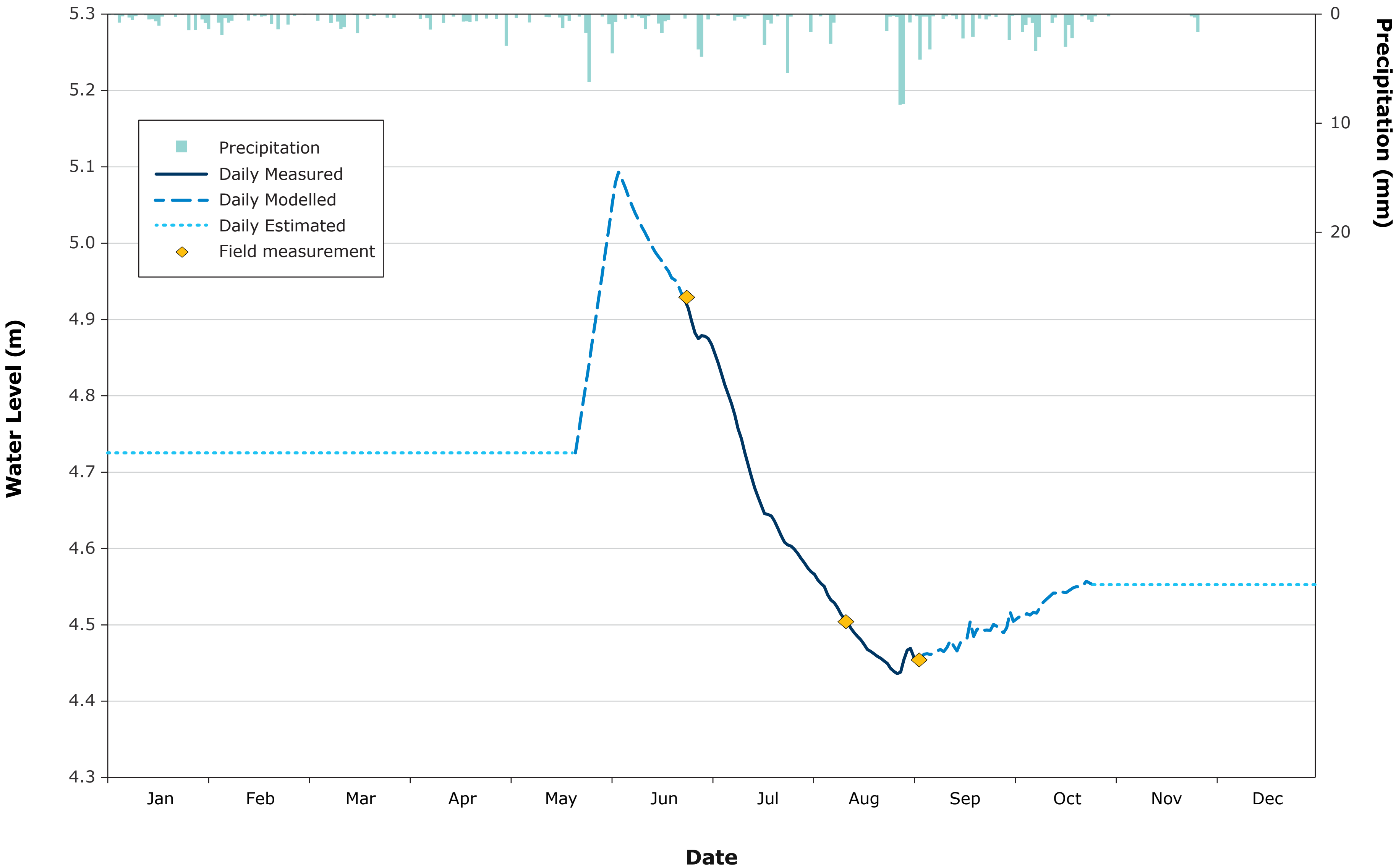
FIGURE A-8 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION ROBERTS HYDRO-2



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-001:8

FIGURE A-9 2025 MEAN DAILY LAKE LEVEL FOR MONITORING STATION LITTLE ROBERTS OUTFLOW

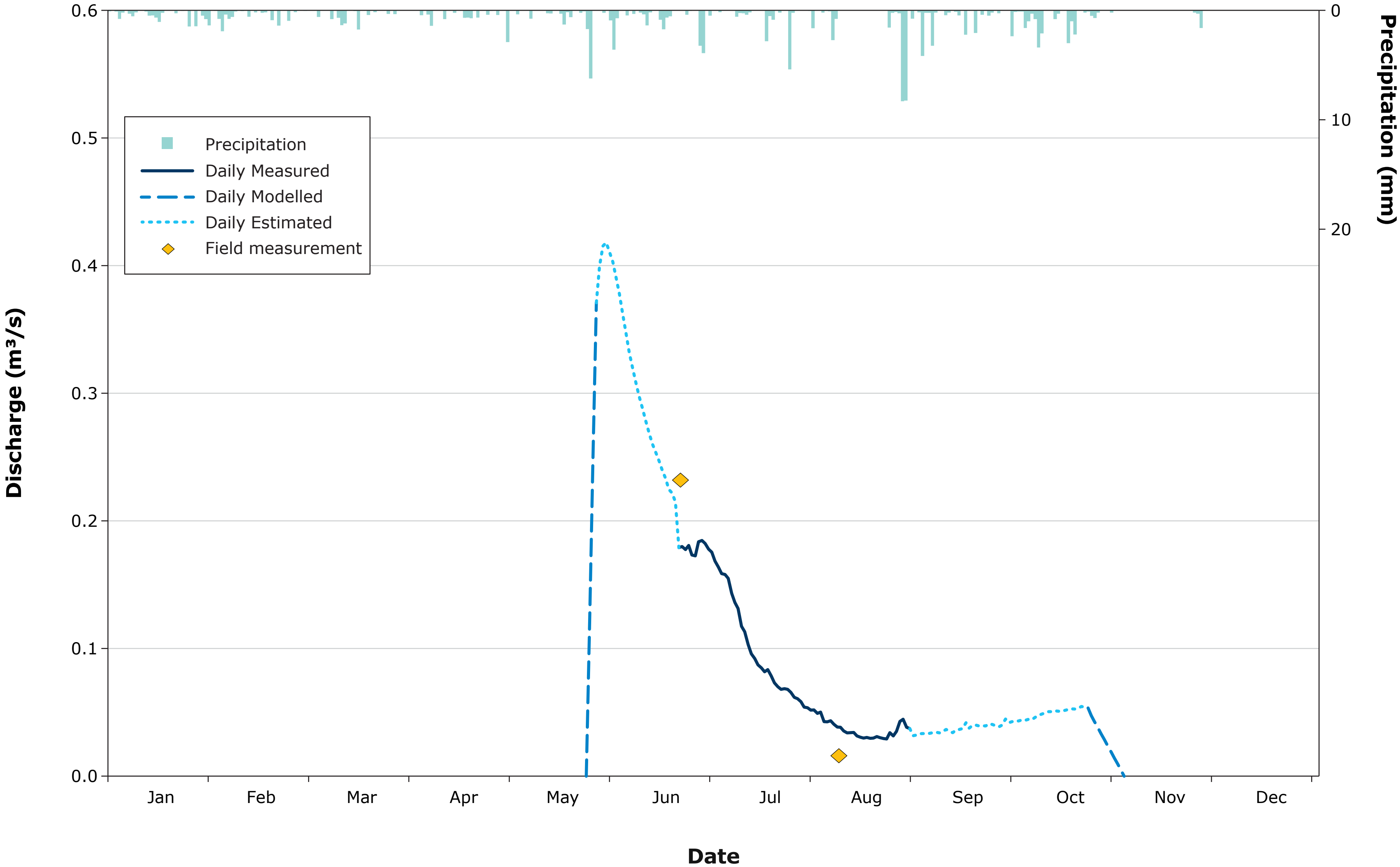


ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-001:9

APPENDIX B HYDROGRAPHS

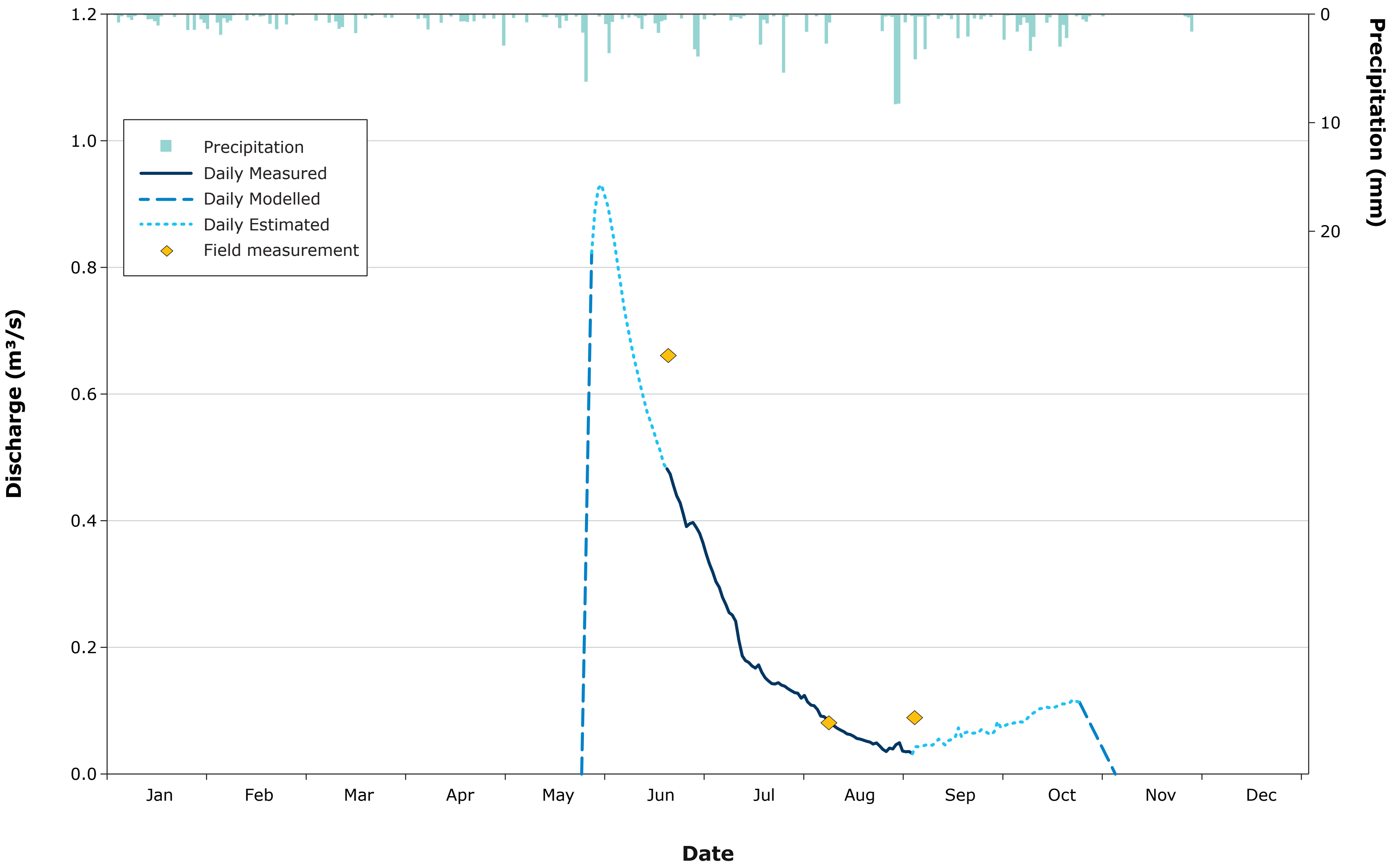
FIGURE B-1 2025 MEAN DAILY HYDROGRAPH AT MONITORING STATION WINDY LAKE OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-002:1

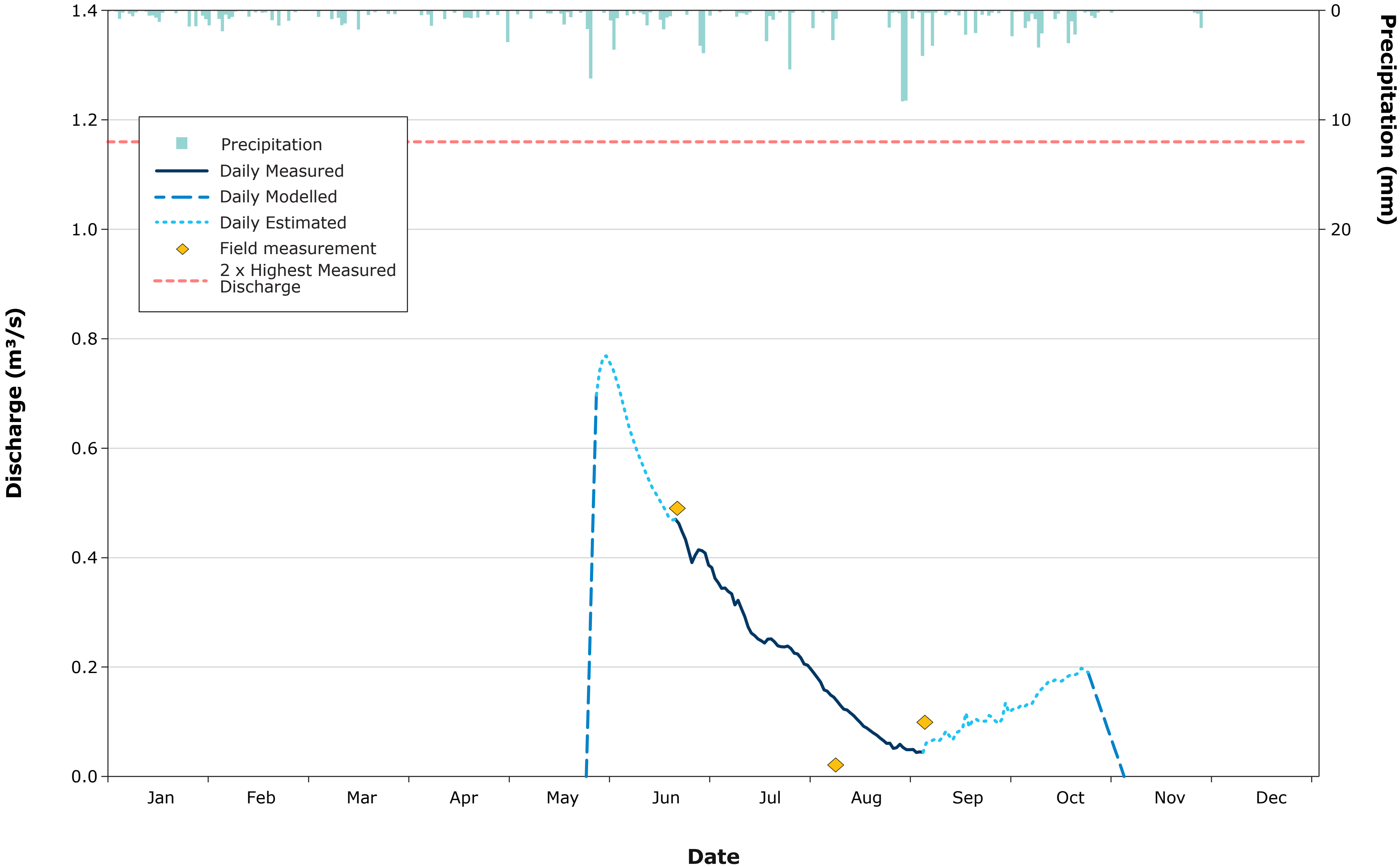
FIGURE B-2   2025 MEAN DAILY HYDROGRAPH AT MONITORING STATION PATCH OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-002:2

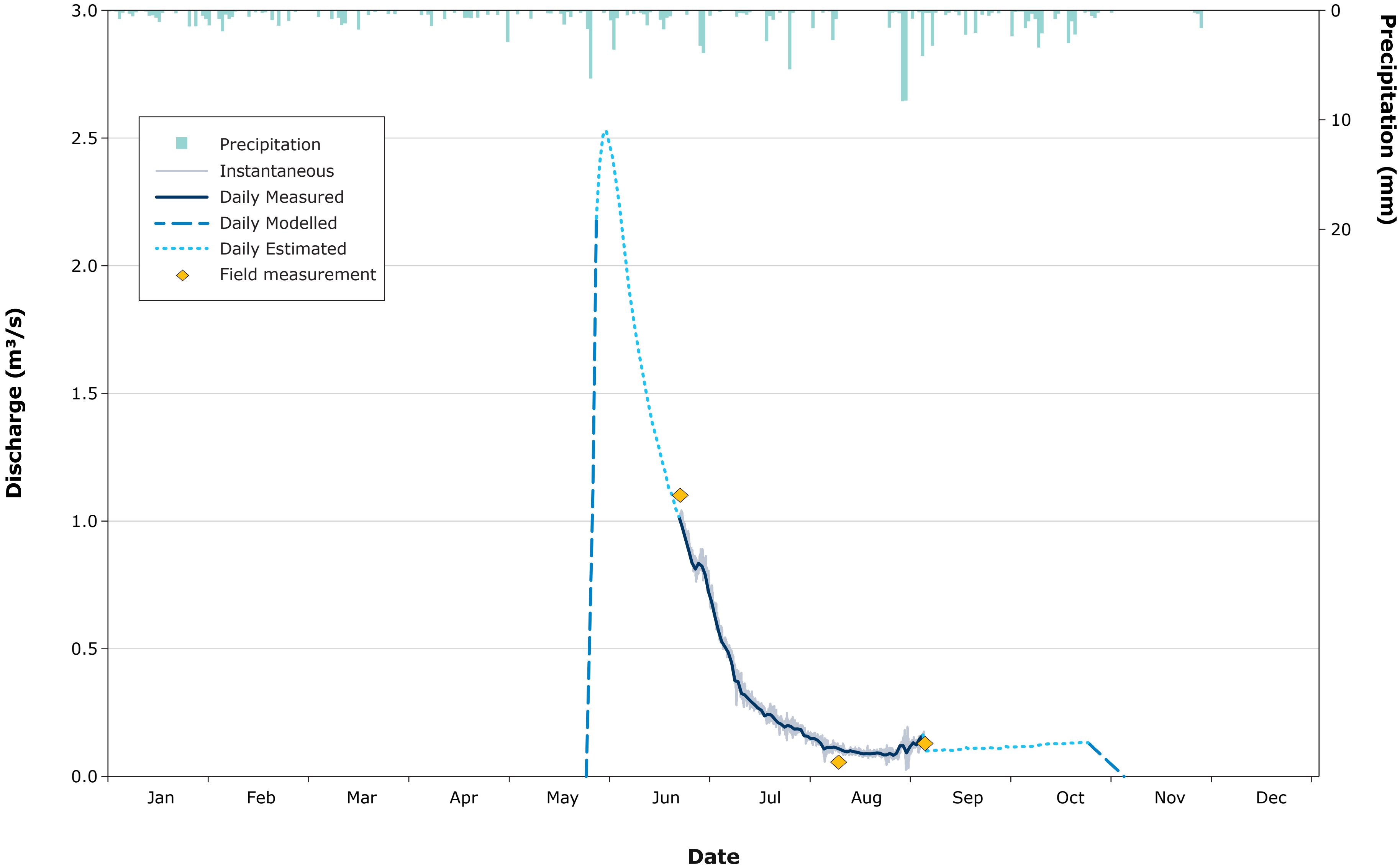
FIGURE B-3 2025 MEAN DAILY HYDROGRAPH AT MONITORING STATION PO OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-002:3

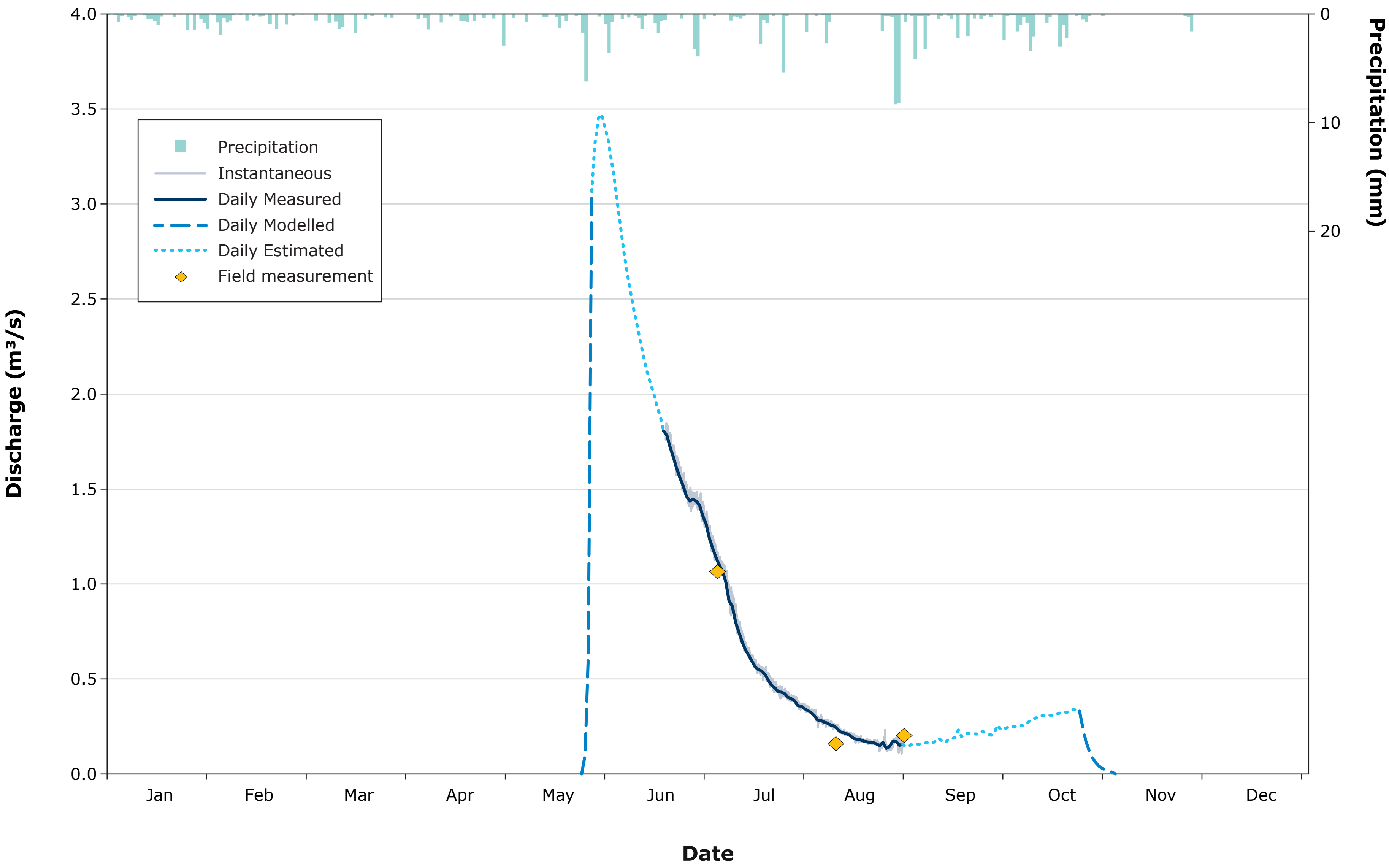
FIGURE B-4   2025 MEAN DAILY HYDROGRAPH AT MONITORING STATION OGAMA OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-002:4

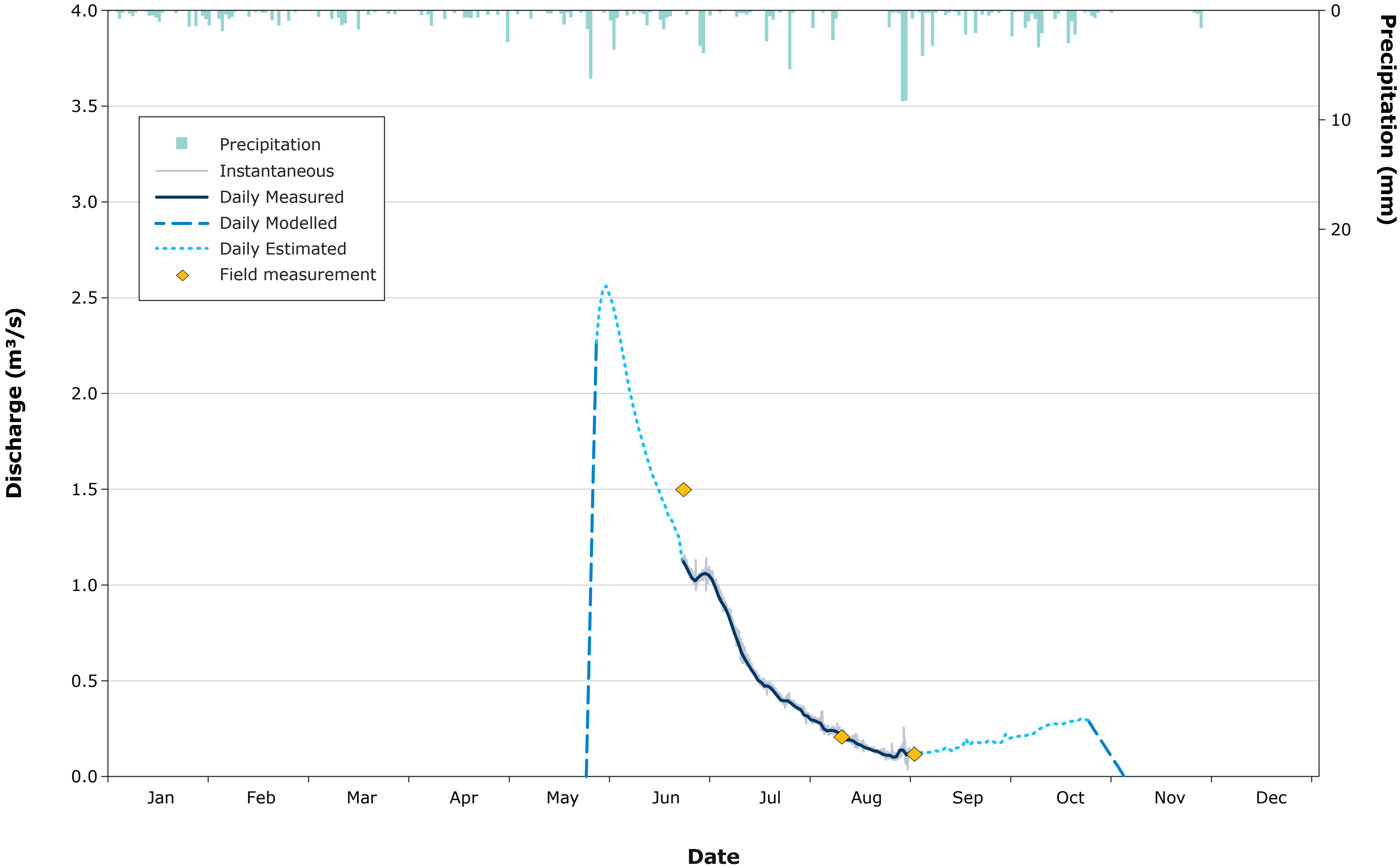
FIGURE B-5 2025 MEAN DAILY HYDROGRAPH AT MONITORING STATION DORRIS CREEK



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-002:5

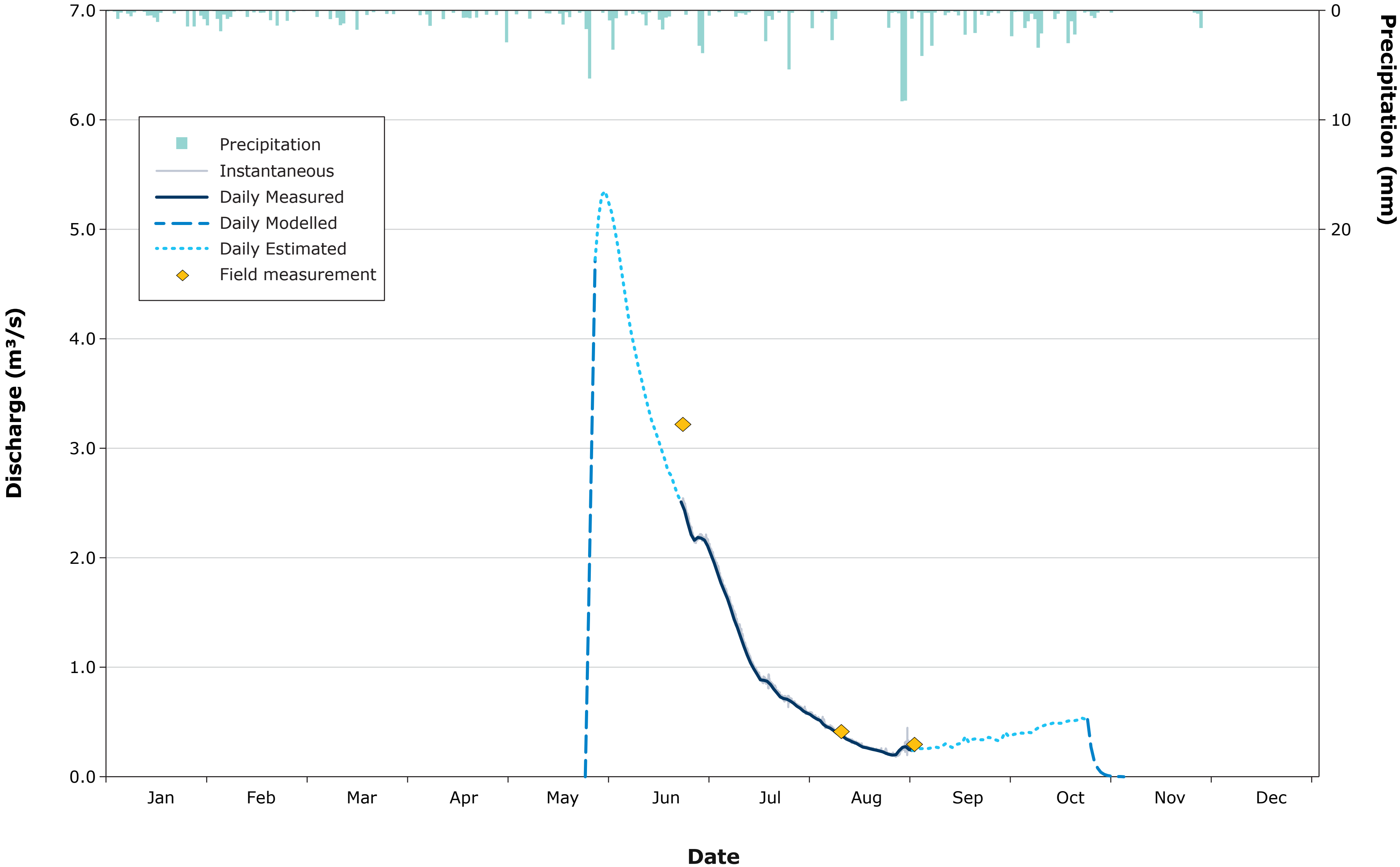
FIGURE B-6 2025 MEAN DAILY HYDROGRAPH AT MONITORING STATION ROBERTS HYDRO-2



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-002:6

FIGURE B-7 2025 MEAN DAILY HYDROGRAPH AT MONITORING STATION LITTLE ROBERTS OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-26ERM-002:7

APPENDIX C MEAN DAILY LAKE LEVEL TABLES

APPENDIX C-1: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION WINDY OUTFLOW, 2025

Drainage Area = 13.73 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.466*	18.367	18.274	18.255	*18.261*	*18.273*	*18.273*
2	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.464*	18.365	18.272	*18.248*	*18.262*	*18.273*	*18.273*
3	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.461*	18.363	18.272	*18.249*	*18.263*	*18.273*	*18.273*
4	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.457*	18.360	18.270	*18.250*	*18.263*	*18.273*	*18.273*
5	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.452*	18.357	18.270	*18.250*	*18.264*	*18.273*	*18.273*
6	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.446*	18.354	18.262	*18.250*	*18.263*	*18.273*	*18.273*
7	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.440*	18.353	18.261	*18.250*	*18.264*	*18.273*	*18.273*
8	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.435*	18.351	18.263	*18.251*	*18.264*	*18.273*	*18.273*
9	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.430*	18.345	18.260	*18.252*	*18.266*	*18.273*	*18.273*
10	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.425*	18.340	18.257	*18.251*	*18.268*	*18.273*	*18.273*
11	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.421*	18.337	18.256	*18.252*	*18.269*	*18.273*	*18.273*
12	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.417*	18.328	18.252	*18.255*	*18.270*	*18.273*	*18.273*
13	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.413*	18.325	18.251	*18.253*	*18.271*	*18.273*	*18.273*
14	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.409*	18.318	18.251	*18.251*	*18.271*	*18.273*	*18.273*
15	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.405*	18.312	18.251	*18.254*	*18.272*	*18.273*	*18.273*
16	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.402*	18.309	18.247	*18.255*	*18.272*	*18.273*	*18.273*
17	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.399*	18.305	18.246	*18.255*	*18.271*	*18.273*	*18.273*
18	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.396*	18.303	18.245	*18.261*	*18.272*	*18.273*	*18.273*
19	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.393*	18.301	18.246	*18.256*	*18.273*	*18.273*	*18.273*
20	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.389*	18.302	18.245	*18.258*	*18.274*	*18.273*	*18.273*
21	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.387*	18.298	18.245	*18.259*	*18.273*	*18.273*	*18.273*
22	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	*18.384*	18.293	18.247	*18.258*	*18.274*	*18.273*	*18.273*
23	*18.385*	*18.385*	*18.385*	*18.385*	*18.385*	18.365	18.291	18.245	*18.258*	*18.275*	*18.273*	*18.273*
24	*18.385*	*18.385*	*18.385*	*18.385*	*18.396*	18.366	18.289	18.243	*18.258*	*18.275*	*18.273*	*18.273*
25	*18.385*	*18.385*	*18.385*	*18.385*	*18.406*	18.365	18.289	18.244	*18.260*	*18.274*	*18.273*	*18.273*
26	*18.385*	*18.385*	*18.385*	*18.385*	*18.417*	18.366	18.289	18.245	*18.260*	*18.273*	*18.273*	*18.273*
27	*18.385*	*18.385*	*18.385*	*18.385*	*18.428*	18.362	18.286	18.247	*18.258*	*18.273*	*18.273*	*18.273*
28	*18.385*	*18.385*	*18.385*	*18.385*	*18.439*	18.362	18.283	18.252	*18.257*	*18.273*	*18.273*	*18.273*
29	*18.385*		*18.385*	*18.385*	*18.449*	18.368	18.282	18.262	*18.259*	*18.273*	*18.273*	*18.273*
30	*18.385*		*18.385*	*18.385*	*18.460*	18.368	18.279	18.260	*18.265*	*18.273*	*18.273*	*18.273*
31	*18.385*		*18.385*		*18.465*		18.275	18.256		*18.273*		*18.273*
Mean	**18.385**	**18.385**	**18.385**	**18.385**	**18.397**	**18.407**	**18.318**	**18.255**	**18.255**	**18.270**	**18.273**	**18.273**
Max	**18.385**	**18.385**	**18.385**	**18.385**	**18.465**	**18.466**	**18.367**	**18.274**	**18.265**	**18.275**	**18.273**	**18.273**
Min	**18.385**	**18.385**	**18.385**	**18.385**	**18.385**	**18.362**	**18.275**	**18.243**	**18.248**	**18.261**	**18.273**	**18.273**

Note:
Estimated and modelled values are italicized.

APPENDIX C-2: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION GLENN LAKE, 2025

Drainage Area = 20.59 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.164*	9.701	9.475	*9.392*	*9.423*	*9.465*	*9.465*
2	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.151*	9.695	9.472	*9.386*	*9.426*	*9.465*	*9.465*
3	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.136*	9.685	9.467	*9.388*	*9.428*	*9.465*	*9.465*
4	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.113*	9.679	9.463	*9.392*	*9.428*	*9.465*	*9.465*
5	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.088*	9.668	9.460	*9.392*	*9.431*	*9.465*	*9.465*
6	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.060*	9.660	9.454	*9.391*	*9.430*	*9.465*	*9.465*
7	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.030*	9.650	9.444	*9.393*	*9.433*	*9.465*	*9.465*
8	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*10.003*	9.643	9.440	*9.394*	*9.432*	*9.465*	*9.465*
9	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.979*	9.634	9.437	*9.396*	*9.438*	*9.465*	*9.465*
10	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.958*	9.622	9.432	*9.394*	*9.444*	*9.465*	*9.465*
11	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.939*	9.611	9.427	*9.398*	*9.447*	*9.465*	*9.465*
12	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.920*	9.604	9.420	*9.404*	*9.451*	*9.465*	*9.465*
13	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.902*	9.588	9.414	*9.399*	*9.454*	*9.465*	*9.465*
14	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.884*	9.579	9.410	*9.394*	*9.454*	*9.465*	*9.465*
15	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.869*	9.567	9.405	*9.402*	*9.457*	*9.465*	*9.465*
16	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.856*	9.559	9.402	*9.404*	*9.455*	*9.465*	*9.465*
17	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.844*	9.552	9.401	*9.406*	*9.455*	*9.465*	*9.465*
18	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.830*	9.544	9.397	*9.423*	*9.458*	*9.465*	*9.465*
19	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.818*	9.537	9.394	*9.408*	*9.461*	*9.465*	*9.465*
20	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.804*	9.532	9.392	*9.415*	*9.462*	*9.465*	*9.465*
21	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.792*	9.529	9.394	*9.416*	*9.462*	*9.465*	*9.465*
22	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.780*	9.524	9.393	*9.414*	*9.463*	*9.465*	*9.465*
23	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	*9.769*	9.522	*9.391*	*9.414*	*9.469*	*9.465*	*9.465*
24	*9.691*	*9.691*	*9.691*	*9.691*	*9.691*	9.755	9.515	*9.391*	*9.414*	*9.466*	*9.465*	*9.465*
25	*9.691*	*9.691*	*9.691*	*9.691*	*9.723*	9.746	9.512	*9.389*	*9.420*	*9.465*	*9.465*	*9.465*
26	*9.691*	*9.691*	*9.691*	*9.691*	*9.754*	9.738	9.503	*9.384*	*9.418*	*9.465*	*9.465*	*9.465*
27	*9.691*	*9.691*	*9.691*	*9.691*	*9.829*	9.729	9.498	*9.383*	*9.414*	*9.465*	*9.465*	*9.465*
28	*9.691*	*9.691*	*9.691*	*9.691*	*9.953*	9.718	9.494	*9.389*	*9.411*	*9.465*	*9.465*	*9.465*
29	*9.691*		*9.691*	*9.691*	*10.076*	9.711	9.488	*9.397*	*9.416*	*9.465*	*9.465*	*9.465*
30	*9.691*		*9.691*	*9.691*	*10.130*	9.707	9.485	*9.395*	*9.433*	*9.465*	*9.465*	*9.465*
31	*9.691*		*9.691*		*10.159*		9.481	*9.392*		*9.465*		*9.465*
Mean	**9.691**	**9.691**	**9.691**	**9.691**	**9.749**	**9.893**	**9.576**	**9.416**	**9.405**	**9.451**	**9.465**	**9.465**
Max	**9.691**	**9.691**	**9.691**	**9.691**	**10.159**	**10.164**	**9.701**	**9.475**	**9.433**	**9.469**	**9.465**	**9.465**
Min	**9.691**	**9.691**	**9.691**	**9.691**	**9.691**	**9.707**	**9.481**	**9.383**	**9.386**	**9.423**	**9.465**	**9.465**

Note:
Estimated and modelled values are italicized.

APPENDIX C-3: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION IMNIAGUT LAKE, 2025

Drainage Area = 1.31 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.193*	27.144	27.090	27.036	*27.062*	*27.085*	*27.085*
2	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.191*	27.139	27.086	27.036	*27.064*	*27.085*	*27.085*
3	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.189*	27.136	27.081	*27.040*	*27.066*	*27.085*	*27.085*
4	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.186*	27.131	27.078	*27.042*	*27.066*	*27.085*	*27.085*
5	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.182*	27.129	27.073	*27.043*	*27.067*	*27.085*	*27.085*
6	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.178*	27.128	27.064	*27.042*	*27.066*	*27.085*	*27.085*
7	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.174*	27.130	27.061	*27.043*	*27.068*	*27.085*	*27.085*
8	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.171*	27.129	27.060	*27.044*	*27.068*	*27.085*	*27.085*
9	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.167*	27.128	27.058	*27.045*	*27.071*	*27.085*	*27.085*
10	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.164*	27.120	27.056	*27.044*	*27.074*	*27.085*	*27.085*
11	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.162*	27.118	27.054	*27.047*	*27.076*	*27.085*	*27.085*
12	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.159*	27.113	27.050	*27.051*	*27.078*	*27.085*	*27.085*
13	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.157*	27.109	27.048	*27.047*	*27.080*	*27.085*	*27.085*
14	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.154*	27.106	27.048	*27.044*	*27.080*	*27.085*	*27.085*
15	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.152*	27.105	27.045	*27.049*	*27.081*	*27.085*	*27.085*
16	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.150*	27.105	27.044	*27.050*	*27.081*	*27.085*	*27.085*
17	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.149*	27.105	27.043	*27.052*	*27.080*	*27.085*	*27.085*
18	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.147*	27.105	27.040	*27.062*	*27.082*	*27.085*	*27.085*
19	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.145*	27.105	27.039	*27.053*	*27.083*	*27.085*	*27.085*
20	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.143*	27.108	27.038	*27.057*	*27.084*	*27.085*	*27.085*
21	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	*27.141*	27.108	27.037	*27.058*	*27.084*	*27.085*	*27.085*
22	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	27.128	27.106	27.036	*27.057*	*27.085*	*27.085*	*27.085*
23	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	27.129	27.103	27.035	*27.057*	*27.088*	*27.085*	*27.085*
24	*27.127*	*27.127*	*27.127*	*27.127*	*27.127*	27.129	27.102	27.032	*27.057*	*27.086*	*27.085*	*27.085*
25	*27.127*	*27.127*	*27.127*	*27.127*	*27.132*	27.128	27.102	27.029	*27.060*	*27.085*	*27.085*	*27.085*
26	*27.127*	*27.127*	*27.127*	*27.127*	*27.136*	27.128	27.105	27.026	*27.059*	*27.085*	*27.085*	*27.085*
27	*27.127*	*27.127*	*27.127*	*27.127*	*27.147*	27.128	27.104	27.023	*27.057*	*27.085*	*27.085*	*27.085*
28	*27.127*	*27.127*	*27.127*	*27.127*	*27.164*	27.131	27.101	27.028	*27.055*	*27.085*	*27.085*	*27.085*
29	*27.127*		*27.127*	*27.127*	*27.181*	27.140	27.099	27.036	*27.059*	*27.085*	*27.085*	*27.085*
30	*27.127*		*27.127*	*27.127*	*27.188*	27.144	27.097	27.035	*27.068*	*27.085*	*27.085*	*27.085*
31	*27.127*		*27.127*		*27.192*		27.093	27.034		*27.085*		*27.085*
Mean	**27.127**	**27.127**	**27.127**	**27.127**	**27.135**	**27.155**	**27.113**	**27.049**	**27.050**	**27.078**	**27.085**	**27.085**
Max	**27.127**	**27.127**	**27.127**	**27.127**	**27.192**	**27.193**	**27.144**	**27.090**	**27.068**	**27.088**	**27.085**	**27.085**
Min	**27.127**	**27.127**	**27.127**	**27.127**	**27.127**	**27.128**	**27.093**	**27.023**	**27.036**	**27.062**	**27.085**	**27.085**

Note:
Estimated and modelled values are italicized.

APPENDIX C-4: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION PATCH OUTFLOW, 2025

Drainage Area = 32.16 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.524*	26.334	26.186	26.096	*26.145*	*26.182*	*26.182*
2	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.519*	26.327	26.189	26.098	*26.148*	*26.182*	*26.182*
3	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.514*	26.319	26.182	26.096	*26.150*	*26.182*	*26.182*
4	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.506*	26.312	26.178	26.094	*26.150*	*26.182*	*26.182*
5	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.497*	26.305	26.176	*26.112*	*26.153*	*26.182*	*26.182*
6	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.487*	26.298	26.170	*26.111*	*26.152*	*26.182*	*26.182*
7	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.476*	26.294	26.163	*26.112*	*26.154*	*26.182*	*26.182*
8	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.465*	26.286	26.161	*26.114*	*26.154*	*26.182*	*26.182*
9	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.456*	26.280	26.158	*26.116*	*26.159*	*26.182*	*26.182*
10	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.448*	26.272	26.152	*26.114*	*26.164*	*26.182*	*26.182*
11	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.440*	26.270	26.149	*26.118*	*26.167*	*26.182*	*26.182*
12	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.432*	26.265	26.145	*26.126*	*26.170*	*26.182*	*26.182*
13	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.425*	26.248	26.142	*26.120*	*26.173*	*26.182*	*26.182*
14	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.417*	26.233	26.139	*26.115*	*26.173*	*26.182*	*26.182*
15	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.410*	26.229	26.135	*26.123*	*26.175*	*26.182*	*26.182*
16	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.404*	26.227	26.134	*26.125*	*26.174*	*26.182*	*26.182*
17	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.399*	26.223	26.131	*26.128*	*26.174*	*26.182*	*26.182*
18	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.393*	26.221	26.127	*26.145*	*26.176*	*26.182*	*26.182*
19	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.387*	26.223	26.126	*26.130*	*26.178*	*26.182*	*26.182*
20	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	*26.379*	26.216	26.124	*26.137*	*26.180*	*26.182*	*26.182*
21	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	26.376	26.210	26.122	*26.139*	*26.179*	*26.182*	*26.182*
22	*25.828*	*25.828*	*25.828*	*25.828*	*25.828*	26.373	26.207	26.120	*26.136*	*26.180*	*26.182*	*26.182*
23	*25.828*	*25.828*	*25.828*	*25.828*	*25.912*	26.366	26.204	26.116	*26.137*	*26.185*	*26.182*	*26.182*
24	*25.828*	*25.828*	*25.828*	*25.828*	*25.997*	26.359	26.203	26.117	*26.136*	*26.183*	*26.182*	*26.182*
25	*25.828*	*25.828*	*25.828*	*25.828*	*26.082*	26.355	26.204	26.111	*26.142*	*26.181*	*26.182*	*26.182*
26	*25.828*	*25.828*	*25.828*	*25.828*	*26.168*	26.347	26.202	26.105	*26.140*	*26.182*	*26.182*	*26.182*
27	*25.828*	*25.828*	*25.828*	*25.828*	*26.253*	26.339	26.201	26.100	*26.137*	*26.182*	*26.182*	*26.182*
28	*25.828*	*25.828*	*25.828*	*25.828*	*26.339*	26.341	26.198	26.106	*26.134*	*26.182*	*26.182*	*26.182*
29	*25.828*		*25.828*	*25.828*	*26.425*	26.341	26.196	26.106	*26.139*	*26.182*	*26.182*	*26.182*
30	*25.828*		*25.828*	*25.828*	*26.512*	26.338	26.193	26.111	*26.155*	*26.182*	*26.182*	*26.182*
31	*25.828*		*25.828*		*26.522*		26.192	26.113		*26.182*		*26.182*
Mean	**25.828**	**25.828**	**25.828**	**25.828**	**25.949**	**26.417**	**26.245**	**26.139**	**26.124**	**26.170**	**26.182**	**26.182**
Max	**25.828**	**25.828**	**25.828**	**25.828**	**26.522**	**26.524**	**26.334**	**26.189**	**26.155**	**26.185**	**26.182**	**26.182**
Min	**25.828**	**25.828**	**25.828**	**25.828**	**25.828**	**26.338**	**26.192**	**26.100**	**26.094**	**26.145**	**26.182**	**26.182**

Note:
Estimated and modelled values are italicized.

APPENDIX C-5: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION PO OUTFLOW, 2025

Drainage Area = 35.3 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.320*	26.224	26.144	26.034	*26.094*	*26.138*	*26.138*
2	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.317*	26.217	26.140	26.034	*26.097*	*26.138*	*26.138*
3	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.315*	26.216	26.136	26.028	*26.100*	*26.138*	*26.138*
4	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.311*	26.209	26.132	26.029	*26.100*	*26.138*	*26.138*
5	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.306*	26.206	26.128	26.029	*26.103*	*26.138*	*26.138*
6	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.300*	26.202	26.120	*26.040*	*26.102*	*26.138*	*26.138*
7	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.295*	26.203	26.118	*26.051*	*26.105*	*26.138*	*26.138*
8	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.289*	26.200	26.114	*26.053*	*26.104*	*26.138*	*26.138*
9	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.284*	26.199	26.112	*26.055*	*26.111*	*26.138*	*26.138*
10	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.280*	26.191	26.107	*26.052*	*26.117*	*26.138*	*26.138*
11	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.276*	26.194	26.102	*26.058*	*26.121*	*26.138*	*26.138*
12	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.272*	26.188	26.098	*26.068*	*26.124*	*26.138*	*26.138*
13	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.268*	26.183	26.097	*26.060*	*26.128*	*26.138*	*26.138*
14	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.264*	26.175	26.093	*26.053*	*26.128*	*26.138*	*26.138*
15	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.260*	26.170	26.090	*26.065*	*26.130*	*26.138*	*26.138*
16	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.257*	26.169	26.085	*26.068*	*26.129*	*26.138*	*26.138*
17	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.255*	26.166	26.080	*26.071*	*26.129*	*26.138*	*26.138*
18	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.251*	26.164	26.075	*26.093*	*26.131*	*26.138*	*26.138*
19	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.249*	26.163	26.072	*26.074*	*26.134*	*26.138*	*26.138*
20	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.245*	26.166	26.068	*26.083*	*26.135*	*26.138*	*26.138*
21	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	*26.243*	26.166	26.065	*26.085*	*26.135*	*26.138*	*26.138*
22	*26.225*	*26.225*	*26.225*	*26.225*	*26.225*	26.244	26.164	26.061	*26.082*	*26.136*	*26.138*	*26.138*
23	*26.225*	*26.225*	*26.225*	*26.225*	*26.236*	26.241	26.160	26.056	*26.082*	*26.141*	*26.138*	*26.138*
24	*26.225*	*26.225*	*26.225*	*26.225*	*26.247*	26.237	26.160	26.052	*26.082*	*26.139*	*26.138*	*26.138*
25	*26.225*	*26.225*	*26.225*	*26.225*	*26.259*	26.233	26.159	26.047	*26.090*	*26.137*	*26.138*	*26.138*
26	*26.225*	*26.225*	*26.225*	*26.225*	*26.270*	26.226	26.160	26.047	*26.088*	*26.138*	*26.138*	*26.138*
27	*26.225*	*26.225*	*26.225*	*26.225*	*26.281*	26.219	26.158	26.037	*26.083*	*26.138*	*26.138*	*26.138*
28	*26.225*	*26.225*	*26.225*	*26.225*	*26.292*	26.223	26.154	26.038	*26.079*	*26.138*	*26.138*	*26.138*
29	*26.225*		*26.225*	*26.225*	*26.304*	26.226	26.154	26.045	*26.085*	*26.138*	*26.138*	*26.138*
30	*26.225*		*26.225*	*26.225*	*26.314*	26.226	26.150	26.038	*26.106*	*26.138*	*26.138*	*26.138*
31	*26.225*		*26.225*		*26.319*		26.145	26.034		*26.138*		*26.138*
Mean	**26.225**	**26.225**	**26.225**	**26.225**	**26.241**	**26.264**	**26.179**	**26.085**	**26.065**	**26.124**	**26.138**	**26.138**
Max	**26.225**	**26.225**	**26.225**	**26.225**	**26.319**	**26.320**	**26.224**	**26.144**	**26.106**	**26.141**	**26.138**	**26.138**
Min	**26.225**	**26.225**	**26.225**	**26.225**	**26.225**	**26.219**	**26.145**	**26.034**	**26.028**	**26.094**	**26.138**	**26.138**

Note:
Estimated and modelled values are italicized.

APPENDIX C-6: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION OGAMA OUTFLOW, 2025

Drainage Area = 74.93 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.493*	24.254	24.099	24.082	*24.081*	*24.089*	*24.089*
2	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.487*	24.241	24.096	24.089	*24.082*	*24.089*	*24.089*
3	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.481*	24.233	24.096	24.086	*24.082*	*24.089*	*24.089*
4	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.471*	24.222	24.093	24.095	*24.082*	*24.089*	*24.089*
5	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.460*	24.210	24.088	24.101	*24.083*	*24.089*	*24.089*
6	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.446*	24.201	24.078	*24.075*	*24.083*	*24.089*	*24.089*
7	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.433*	24.196	24.082	*24.076*	*24.083*	*24.089*	*24.089*
8	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.419*	24.192	24.081	*24.076*	*24.083*	*24.089*	*24.089*
9	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.408*	24.182	24.082	*24.076*	*24.084*	*24.089*	*24.089*
10	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.397*	24.165	24.080	*24.076*	*24.085*	*24.089*	*24.089*
11	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.387*	24.164	24.078	*24.077*	*24.086*	*24.089*	*24.089*
12	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.378*	24.152	24.075	*24.078*	*24.087*	*24.089*	*24.089*
13	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.368*	24.150	24.074	*24.077*	*24.087*	*24.089*	*24.089*
14	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.358*	24.146	24.076	*24.076*	*24.087*	*24.089*	*24.089*
15	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.350*	24.143	24.074	*24.077*	*24.088*	*24.089*	*24.089*
16	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.342*	24.139	24.073	*24.078*	*24.087*	*24.089*	*24.089*
17	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.335*	24.136	24.072	*24.078*	*24.087*	*24.089*	*24.089*
18	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.327*	24.133	24.070	*24.081*	*24.088*	*24.089*	*24.089*
19	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.320*	24.126	24.071	*24.079*	*24.088*	*24.089*	*24.089*
20	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.310*	24.128	24.070	*24.080*	*24.089*	*24.089*	*24.089*
21	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.307*	24.127	24.071	*24.080*	*24.089*	*24.089*	*24.089*
22	*24.147*	*24.147*	*24.147*	*24.147*	*24.147*	*24.299*	24.123	24.072	*24.080*	*24.089*	*24.089*	*24.089*
23	*24.147*	*24.147*	*24.147*	*24.147*	*24.182*	24.293	24.118	24.071	*24.080*	*24.090*	*24.089*	*24.089*
24	*24.147*	*24.147*	*24.147*	*24.147*	*24.216*	24.287	24.116	24.068	*24.080*	*24.089*	*24.089*	*24.089*
25	*24.147*	*24.147*	*24.147*	*24.147*	*24.251*	24.278	24.112	24.068	*24.081*	*24.089*	*24.089*	*24.089*
26	*24.147*	*24.147*	*24.147*	*24.147*	*24.286*	24.271	24.114	24.071	*24.081*	*24.089*	*24.089*	*24.089*
27	*24.147*	*24.147*	*24.147*	*24.147*	*24.320*	24.262	24.112	24.067	*24.080*	*24.089*	*24.089*	*24.089*
28	*24.147*	*24.147*	*24.147*	*24.147*	*24.355*	24.258	24.109	24.071	*24.079*	*24.089*	*24.089*	*24.089*
29	*24.147*		*24.147*	*24.147*	*24.390*	24.262	24.109	24.084	*24.080*	*24.089*	*24.089*	*24.089*
30	*24.147*		*24.147*	*24.147*	*24.478*	24.260	24.108	24.082	*24.083*	*24.089*	*24.089*	*24.089*
31	*24.147*		*24.147*		*24.491*		24.100	24.070		*24.089*		*24.089*
Mean	**24.147**	**24.147**	**24.147**	**24.147**	**24.200**	**24.358**	**24.154**	**24.077**	**24.081**	**24.087**	**24.089**	**24.089**
Max	**24.147**	**24.147**	**24.147**	**24.147**	**24.491**	**24.493**	**24.254**	**24.099**	**24.101**	**24.090**	**24.089**	**24.089**
Min	**24.147**	**24.147**	**24.147**	**24.147**	**24.147**	**24.258**	**24.100**	**24.067**	**24.075**	**24.081**	**24.089**	**24.089**

Note:
Estimated and modelled values are italicized.

APPENDIX C-7: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION DORIS LAKE-2, 2025

Drainage Area = 90.29 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	21.822	21.895	21.919	21.905	21.889	22.446	21.967	21.716	21.633	21.665	21.694	21.674
2	21.828	21.893	21.915	21.901	21.888	22.432	21.953	21.717	21.626	21.668	21.694	21.676
3	21.831	21.897	21.911	21.900	21.885	22.416	21.945	21.711	21.628	21.671	21.696	21.680
4	21.834	21.892	21.908	21.899	21.885	22.392	21.933	21.705	21.632	21.671	21.702	21.674
5	21.838	21.903	21.906	21.897	21.888	22.366	21.926	21.697	21.633	21.674	21.699	21.674
6	21.837	21.899	21.908	21.896	21.885	22.336	21.914	21.691	21.632	21.672	21.699	21.678
7	21.837	21.902	21.912	21.892	21.882	22.305	21.904	21.685	21.633	21.675	21.699	21.678
8	21.838	21.910	21.912	21.894	21.883	22.276	21.894	21.686	21.635	21.675	21.698	21.680
9	21.849	21.908	21.912	21.895	21.883	22.251	21.882	21.679	21.637	21.681	21.692	21.685
10	21.852	21.905	21.911	21.897	21.880	22.229	21.871	21.676	21.635	21.687	21.688	21.686
11	21.850	21.910	21.905	21.895	21.880	22.208	21.866	21.672	21.639	21.691	21.684	21.680
12	21.840	21.921	21.909	21.898	21.878	22.189	21.846	21.666	21.646	21.694	21.684	21.682
13	21.847	21.921	21.914	21.899	21.879	22.170	21.834	21.661	21.640	21.699	21.685	21.677
14	21.851	21.913	21.916	21.900	21.880	22.151	21.822	21.659	21.635	21.698	21.683	21.682
15	21.857	21.919	21.918	21.901	21.878	22.135	21.810	21.656	21.643	21.701	21.679	21.686
16	21.872	21.916	21.917	21.900	21.875	22.121	21.802	21.651	21.645	21.700	21.671	21.689
17	21.875	21.912	21.918	21.894	21.875	22.108	21.794	21.648	21.648	21.699	21.675	21.686
18	21.879	21.910	21.908	21.888	21.875	22.094	21.788	21.646	21.665	21.702	21.670	21.682
19	21.881	21.908	21.907	21.895	21.873	22.081	21.784	21.643	21.649	21.705	21.666	21.680
20	21.879	21.912	21.911	21.897	21.875	22.067	21.777	21.642	21.657	21.707	21.666	21.687
21	21.881	21.913	21.915	21.896	21.874	22.054	21.772	21.639	21.658	21.706	21.666	21.677
22	21.874	21.917	21.914	21.897	21.878	22.041	21.764	21.636	21.656	21.708	21.663	21.669
23	21.879	21.917	21.913	21.897	21.902	22.029	21.757	21.632	21.656	21.714	21.662	21.669
24	21.891	21.919	21.912	21.897	21.947	22.019	21.754	21.631	21.656	21.711	21.663	21.669
25	21.896	21.917	21.916	21.898	21.981	22.008	21.747	21.630	21.662	21.709	21.664	21.671
26	21.893	21.926	21.911	21.894	22.014	21.996	21.742	21.624	21.660	21.708	21.662	21.678
27	21.904	21.924	21.908	21.893	22.093	21.985	21.738	21.623	21.656	21.709	21.663	21.680
28	21.905	21.920	21.904	21.892	22.223	21.978	21.733	21.630	21.653	21.709	21.669	21.682
29	21.903		21.912	21.894	22.353	21.977	21.730	21.638	21.659	21.705	21.670	21.682
30	21.901		21.912	21.892	22.409	21.971	21.726	21.636	21.676	21.699	21.667	21.681
31	21.899		21.908		22.440		21.720	21.633		21.696		21.679
Mean	**21.865**	**21.911**	**21.912**	**21.896**	**21.959**	**22.161**	**21.822**	**21.660**	**21.646**	**21.694**	**21.679**	**21.679**
Max	**21.905**	**21.926**	**21.919**	**21.905**	**22.440**	**22.446**	**21.967**	**21.717**	**21.676**	**21.714**	**21.702**	**21.689**
Min	**21.822**	**21.892**	**21.904**	**21.888**	**21.873**	**21.971**	**21.720**	**21.623**	**21.626**	**21.665**	**21.662**	**21.669**

Note:
Estimated and modelled values are italicized.

APPENDIX C-8: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION ROBERTS HYDRO-2, 2025

Drainage Area = 97.83 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.691*	6.488	6.310	6.233	*6.268*	*6.302*	*6.302*
2	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.687*	6.489	6.309	6.238	*6.270*	*6.302*	*6.302*
3	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.684*	6.488	6.302	6.241	*6.273*	*6.302*	*6.302*
4	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.678*	6.483	6.302	*6.238*	*6.272*	*6.302*	*6.302*
5	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.672*	6.475	6.299	*6.239*	*6.275*	*6.302*	*6.302*
6	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.665*	6.465	6.296	*6.238*	*6.274*	*6.302*	*6.302*
7	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.657*	6.458	6.286	*6.239*	*6.276*	*6.302*	*6.302*
8	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.649*	6.452	6.283	*6.241*	*6.276*	*6.302*	*6.302*
9	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.643*	6.444	6.284	*6.243*	*6.281*	*6.302*	*6.302*
10	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.635*	6.432	6.283	*6.241*	*6.285*	*6.302*	*6.302*
11	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.624*	6.421	6.281	*6.244*	*6.288*	*6.302*	*6.302*
12	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.614*	6.411	6.277	*6.251*	*6.291*	*6.302*	*6.302*
13	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.604*	6.399	6.271	*6.246*	*6.294*	*6.302*	*6.302*
14	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.594*	6.391	6.266	*6.241*	*6.294*	*6.302*	*6.302*
15	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.585*	6.384	6.266	*6.249*	*6.296*	*6.302*	*6.302*
16	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.577*	6.377	6.263	*6.250*	*6.295*	*6.302*	*6.302*
17	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.570*	6.370	6.258	*6.253*	*6.295*	*6.302*	*6.302*
18	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.562*	6.362	6.256	*6.268*	*6.297*	*6.302*	*6.302*
19	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.555*	6.359	6.252	*6.254*	*6.299*	*6.302*	*6.302*
20	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.545*	6.354	6.249	*6.261*	*6.300*	*6.302*	*6.302*
21	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.542*	6.354	6.246	*6.262*	*6.300*	*6.302*	*6.302*
22	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.534*	6.351	6.243	*6.260*	*6.301*	*6.302*	*6.302*
23	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.526*	6.345	6.242	*6.260*	*6.305*	*6.302*	*6.302*
24	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	*6.503*	6.339	6.238	*6.260*	*6.303*	*6.302*	*6.302*
25	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	6.504	6.333	6.234	*6.265*	*6.302*	*6.302*	*6.302*
26	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	6.497	6.333	6.232	*6.264*	*6.302*	*6.302*	*6.302*
27	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	6.491	6.333	6.232	*6.260*	*6.302*	*6.302*	*6.302*
28	*6.504*	*6.504*	*6.504*	*6.504*	*6.504*	6.484	6.329	6.227	*6.258*	*6.302*	*6.302*	*6.302*
29	*6.504*		*6.504*	*6.504*	*6.669*	6.481	6.325	6.229	*6.262*	*6.302*	*6.302*	*6.302*
30	*6.504*		*6.504*	*6.504*	*6.682*	6.485	6.321	6.244	*6.277*	*6.302*	*6.302*	*6.302*
31	*6.504*		*6.504*		*6.689*		6.319	6.244		*6.302*		*6.302*
Mean	**6.504**	**6.504**	**6.504**	**6.504**	**6.521**	**6.585**	**6.393**	**6.265**	**6.251**	**6.291**	**6.302**	**6.302**
Max	**6.504**	**6.504**	**6.504**	**6.504**	**6.689**	**6.691**	**6.489**	**6.310**	**6.277**	**6.305**	**6.302**	**6.302**
Min	**6.504**	**6.504**	**6.504**	**6.504**	**6.504**	**6.481**	**6.319**	**6.227**	**6.233**	**6.268**	**6.302**	**6.302**

Note:
Estimated and modelled values are italicized.

APPENDIX C-9: SUMMARY OF MEAN DAILY WATER LEVEL (M) AT HYDROMETRIC STATION LITTLE ROBERTS, 2025

Drainage Area = 194.15 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.018*	4.875	4.570	4.458	*4.505*	*4.553*	*4.553*
2	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.048*	4.867	4.566	4.455	*4.508*	*4.553*	*4.553*
3	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.079*	4.856	4.559	*4.456*	*4.511*	*4.553*	*4.553*
4	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.093*	4.843	4.554	*4.462*	*4.511*	*4.553*	*4.553*
5	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.084*	4.829	4.550	*4.462*	*4.515*	*4.553*	*4.553*
6	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.072*	4.814	4.539	*4.461*	*4.513*	*4.553*	*4.553*
7	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.061*	4.803	4.533	*4.463*	*4.516*	*4.553*	*4.553*
8	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.049*	4.790	4.529	*4.466*	*4.515*	*4.553*	*4.553*
9	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.039*	4.775	4.523	*4.468*	*4.523*	*4.553*	*4.553*
10	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.030*	4.757	4.514	*4.465*	*4.530*	*4.553*	*4.553*
11	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.022*	4.744	4.508	*4.470*	*4.534*	*4.553*	*4.553*
12	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.013*	4.726	4.503	*4.480*	*4.537*	*4.553*	*4.553*
13	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*5.005*	4.710	4.495	*4.472*	*4.542*	*4.553*	*4.553*
14	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.996*	4.695	4.490	*4.466*	*4.541*	*4.553*	*4.553*
15	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.989*	4.679	4.485	*4.476*	*4.544*	*4.553*	*4.553*
16	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.983*	4.668	4.481	*4.479*	*4.543*	*4.553*	*4.553*
17	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.976*	4.656	4.474	*4.483*	*4.543*	*4.553*	*4.553*
18	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.969*	4.646	4.468	*4.504*	*4.545*	*4.553*	*4.553*
19	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.963*	4.644	4.465	*4.485*	*4.548*	*4.553*	*4.553*
20	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.955*	4.643	4.462	*4.494*	*4.550*	*4.553*	*4.553*
21	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.952*	4.636	4.459	*4.496*	*4.550*	*4.553*	*4.553*
22	*4.725*	*4.725*	*4.725*	*4.725*	*4.725*	*4.944*	4.626	4.456	*4.493*	*4.551*	*4.553*	*4.553*
23	*4.725*	*4.725*	*4.725*	*4.725*	*4.754*	*4.934*	4.617	4.453	*4.493*	*4.557*	*4.553*	*4.553*
24	*4.725*	*4.725*	*4.725*	*4.725*	*4.782*	4.925	4.608	4.449	*4.493*	*4.555*	*4.553*	*4.553*
25	*4.725*	*4.725*	*4.725*	*4.725*	*4.811*	4.914	4.605	4.443	*4.501*	*4.553*	*4.553*	*4.553*
26	*4.725*	*4.725*	*4.725*	*4.725*	*4.840*	4.898	4.603	4.439	*4.498*	*4.553*	*4.553*	*4.553*
27	*4.725*	*4.725*	*4.725*	*4.725*	*4.869*	4.883	4.599	4.436	*4.493*	*4.553*	*4.553*	*4.553*
28	*4.725*	*4.725*	*4.725*	*4.725*	*4.899*	4.875	4.594	4.438	*4.490*	*4.553*	*4.553*	*4.553*
29	*4.725*		*4.725*	*4.725*	*4.928*	4.879	4.587	4.454	*4.496*	*4.553*	*4.553*	*4.553*
30	*4.725*		*4.725*	*4.725*	*4.958*	4.878	4.581	4.467	*4.517*	*4.553*	*4.553*	*4.553*
31	*4.725*		*4.725*		*4.988*		4.574	4.469		*4.553*		*4.553*
Mean	**4.725**	**4.725**	**4.725**	**4.725**	**4.767**	**4.984**	**4.698**	**4.491**	**4.480**	**4.537**	**4.553**	**4.553**
Max	**4.725**	**4.725**	**4.725**	**4.725**	**4.988**	**5.093**	**4.875**	**4.570**	**4.517**	**4.557**	**4.553**	**4.553**
Min	**4.725**	**4.725**	**4.725**	**4.725**	**4.725**	**4.875**	**4.574**	**4.436**	**4.455**	**4.505**	**4.553**	**4.553**

Note:
Estimated and modelled values are italicized.

APPENDIX D MEAN DAILY DISCHARGE TABLES

APPENDIX D-1: SUMMARY OF DAILY DISCHARGE [Q, M³/S] AT HYDROMETRIC MONITORING STATION WINDY OUTFLOW, 2025

Drainage Area = 13.73 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-	-	-	-	-	*0.418*	0.182	0.054	0.037	*0.042*	*0.019*	-
2	-	-	-	-	-	*0.411*	0.178	0.052	*0.032*	*0.043*	*0.014*	-
3	-	-	-	-	-	*0.403*	0.175	0.052	*0.032*	*0.043*	*0.009*	-
4	-	-	-	-	-	*0.391*	0.169	0.049	*0.033*	*0.043*	*0.005*	-
5	-	-	-	-	-	*0.378*	0.164	0.050	*0.033*	*0.044*	*0.000*	-
6	-	-	-	-	-	*0.363*	0.159	0.043	*0.033*	*0.044*	-	-
7	-	-	-	-	-	*0.347*	0.158	0.043	*0.034*	*0.045*	-	-
8	-	-	-	-	-	*0.332*	0.155	0.044	*0.034*	*0.044*	-	-
9	-	-	-	-	-	*0.319*	0.143	0.041	*0.034*	*0.046*	-	-
10	-	-	-	-	-	*0.308*	0.136	0.038	*0.034*	*0.048*	-	-
11	-	-	-	-	-	*0.298*	0.131	0.038	*0.035*	*0.049*	-	-
12	-	-	-	-	-	*0.288*	0.117	0.035	*0.037*	*0.050*	-	-
13	-	-	-	-	-	*0.278*	0.113	0.034	*0.035*	*0.051*	-	-
14	-	-	-	-	-	*0.269*	0.103	0.034	*0.034*	*0.051*	-	-
15	-	-	-	-	-	*0.260*	0.096	0.034	*0.036*	*0.051*	-	-
16	-	-	-	-	-	*0.254*	0.092	0.032	*0.037*	*0.051*	-	-
17	-	-	-	-	-	*0.247*	0.087	0.031	*0.037*	*0.051*	-	-
18	-	-	-	-	-	*0.240*	0.085	0.030	*0.042*	*0.052*	-	-
19	-	-	-	-	-	*0.233*	0.082	0.030	*0.038*	*0.052*	-	-
20	-	-	-	-	-	*0.225*	0.083	0.030	*0.040*	*0.053*	-	-
21	-	-	-	-	-	*0.222*	0.079	0.030	*0.040*	*0.053*	-	-
22	-	-	-	-	-	*0.215*	0.073	0.031	*0.039*	*0.053*	-	-
23	-	-	-	-	-	0.179	0.070	0.030	*0.039*	*0.055*	-	-
24	-	-	-	-	-	0.180	0.068	0.029	*0.039*	*0.054*	-	-
25	-	-	-	-	-	0.177	0.069	0.029	*0.041*	*0.053*	-	-
26	-	-	-	-	*0.000*	0.181	0.068	0.034	*0.041*	*0.047*	-	-
27	-	-	-	-	*0.124*	0.173	0.066	0.032	*0.040*	*0.043*	-	-
28	-	-	-	-	*0.247*	0.173	0.062	0.035	*0.039*	*0.038*	-	-
29	-		-	-	*0.371*	0.184	0.061	0.043	*0.040*	*0.033*	-	-
30	-		-	-	*0.400*	0.185	0.058	0.045	*0.045*	*0.028*	-	-
31	-		-		*0.415*		0.054	0.038		*0.024*		-
Mean	**0.000**	**0.000**	**0.000**	**0.000**	**0.260**	**0.271**	**0.108**	**0.038**	**0.037**	**0.046**	**0.009**	**0.000**
Max	**0.000**	**0.000**	**0.000**	**0.000**	**0.415**	**0.418**	**0.182**	**0.054**	**0.045**	**0.055**	**0.019**	**0.000**
Min	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.173**	**0.054**	**0.029**	**0.032**	**0.024**	**0.000**	**0.000**

Note:
Estimated and modelled values are italicized.

APPENDIX D-2: SUMMARY OF DAILY DISCHARGE [Q, M³/S] AT HYDROMETRIC MONITORING STATION PATCH OUTFLOW, 2025

Drainage Area = 32.16 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-	-	-	-	-	*0.931*	0.380	0.120	0.036	*0.073*	*0.041*	-
2	-	-	-	-	-	*0.914*	0.365	0.124	0.035	*0.076*	*0.031*	-
3	-	-	-	-	-	*0.896*	0.347	0.114	0.036	*0.078*	*0.021*	-
4	-	-	-	-	-	*0.869*	0.333	0.109	0.032	*0.078*	*0.010*	-
5	-	-	-	-	-	*0.838*	0.319	0.108	*0.044*	*0.081*	*0.000*	-
6	-	-	-	-	-	*0.804*	0.304	0.102	*0.043*	*0.080*	-	-
7	-	-	-	-	-	*0.768*	0.295	0.092	*0.044*	*0.083*	-	-
8	-	-	-	-	-	*0.734*	0.279	0.091	*0.046*	*0.082*	-	-
9	-	-	-	-	-	*0.706*	0.268	0.086	*0.047*	*0.088*	-	-
10	-	-	-	-	-	*0.680*	0.255	0.080	*0.045*	*0.093*	-	-
11	-	-	-	-	-	*0.656*	0.251	0.076	*0.049*	*0.097*	-	-
12	-	-	-	-	-	*0.634*	0.241	0.073	*0.055*	*0.100*	-	-
13	-	-	-	-	-	*0.612*	0.211	0.070	*0.050*	*0.104*	-	-
14	-	-	-	-	-	*0.590*	0.187	0.067	*0.046*	*0.103*	-	-
15	-	-	-	-	-	*0.571*	0.179	0.063	*0.053*	*0.106*	-	-
16	-	-	-	-	-	*0.556*	0.176	0.062	*0.055*	*0.105*	-	-
17	-	-	-	-	-	*0.541*	0.171	0.060	*0.057*	*0.104*	-	-
18	-	-	-	-	-	*0.524*	0.167	0.056	*0.073*	*0.107*	-	-
19	-	-	-	-	-	*0.509*	0.172	0.055	*0.059*	*0.109*	-	-
20	-	-	-	-	-	*0.490*	0.161	0.053	*0.065*	*0.111*	-	-
21	-	-	-	-	-	0.482	0.152	0.052	*0.067*	*0.111*	-	-
22	-	-	-	-	-	0.474	0.147	0.050	*0.064*	*0.112*	-	-
23	-	-	-	-	-	0.455	0.143	0.048	*0.065*	*0.117*	-	-
24	-	-	-	-	-	0.439	0.142	0.049	*0.064*	*0.115*	-	-
25	-	-	-	-	-	0.429	0.144	0.044	*0.070*	*0.113*	-	-
26	-	-	-	-	-	0.411	0.140	0.039	*0.068*	*0.104*	-	-
27	-	-	-	-	*0.274*	0.391	0.139	0.036	*0.065*	*0.093*	-	-
28	-	-	-	-	*0.548*	0.395	0.135	0.041	*0.062*	*0.083*	-	-
29	-		-	-	*0.823*	0.397	0.132	0.040	*0.067*	*0.072*	-	-
30	-		-	-	*0.889*	0.389	0.129	0.047	*0.083*	*0.062*	-	-
31	-		-		*0.924*		0.128	0.049		*0.052*		-
Mean	**0.000**	**0.000**	**0.000**	**0.000**	**0.692**	**0.603**	**0.213**	**0.070**	**0.055**	**0.093**	**0.021**	**0.000**
Max	**0.000**	**0.000**	**0.000**	**0.000**	**0.924**	**0.931**	**0.380**	**0.124**	**0.083**	**0.117**	**0.041**	**0.000**
Min	**0.000**	**0.000**	**0.000**	**0.000**	**0.274**	**0.389**	**0.128**	**0.036**	**0.032**	**0.052**	**0.000**	**0.000**

Note:
Estimated and modelled values are italicized.

APPENDIX D-3: SUMMARY OF DAILY DISCHARGE [Q, M³/S] AT HYDROMETRIC MONITORING STATION PO OUTFLOW, 2025

Drainage Area = 35.3 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-	-	-	-	-	*0.769*	0.408	0.204	0.049	*0.117*	*0.070*	-
2	-	-	-	-	-	*0.758*	0.386	0.196	0.050	*0.122*	*0.052*	-
3	-	-	-	-	-	*0.745*	0.382	0.189	0.044	*0.126*	*0.035*	-
4	-	-	-	-	-	*0.727*	0.363	0.181	0.045	*0.126*	*0.017*	-
5	-	-	-	-	-	*0.707*	0.354	0.173	0.044	*0.131*	-	-
6	-	-	-	-	-	*0.684*	0.344	0.158	*0.061*	*0.129*	-	-
7	-	-	-	-	-	*0.660*	0.345	0.156	*0.063*	*0.134*	-	-
8	-	-	-	-	-	*0.637*	0.338	0.149	*0.066*	*0.132*	-	-
9	-	-	-	-	-	*0.618*	0.334	0.145	*0.069*	*0.144*	-	-
10	-	-	-	-	-	*0.601*	0.314	0.137	*0.066*	*0.154*	-	-
11	-	-	-	-	-	*0.585*	0.322	0.130	*0.072*	*0.160*	-	-
12	-	-	-	-	-	*0.570*	0.307	0.123	*0.084*	*0.166*	-	-
13	-	-	-	-	-	*0.555*	0.293	0.121	*0.074*	*0.173*	-	-
14	-	-	-	-	-	*0.541*	0.273	0.116	*0.067*	*0.172*	-	-
15	-	-	-	-	-	*0.528*	0.262	0.111	*0.080*	*0.177*	-	-
16	-	-	-	-	-	*0.517*	0.257	0.105	*0.083*	*0.175*	-	-
17	-	-	-	-	-	*0.508*	0.251	0.099	*0.087*	*0.174*	-	-
18	-	-	-	-	-	*0.496*	0.248	0.092	*0.117*	*0.179*	-	-
19	-	-	-	-	-	*0.486*	0.244	0.089	*0.090*	*0.183*	-	-
20	-	-	-	-	-	*0.473*	0.251	0.084	*0.102*	*0.187*	-	-
21	-	-	-	-	-	*0.469*	0.252	0.080	*0.105*	*0.186*	-	-
22	-	-	-	-	-	0.470	0.246	0.076	*0.101*	*0.189*	-	-
23	-	-	-	-	-	0.462	0.239	0.070	*0.101*	*0.198*	-	-
24	-	-	-	-	-	0.448	0.237	0.066	*0.101*	*0.194*	-	-
25	-	-	-	-	-	0.433	0.237	0.061	*0.112*	*0.191*	-	-
26	-	-	-	-	-	0.412	0.238	0.061	*0.108*	*0.174*	-	-
27	-	-	-	-	*0.233*	0.391	0.234	0.051	*0.101*	*0.157*	-	-
28	-	-	-	-	*0.465*	0.405	0.225	0.053	*0.097*	*0.139*	-	-
29	-		-	-	*0.697*	0.414	0.224	0.059	*0.105*	*0.122*	-	-
30	-		-	-	*0.741*	0.413	0.217	0.053	*0.135*	*0.104*	-	-
31	-		-		*0.765*		0.206	0.049		*0.087*		-
Mean	**0.000**	**0.000**	**0.000**	**0.000**	**0.580**	**0.549**	**0.285**	**0.111**	**0.083**	**0.155**	**0.043**	**0.000**
Max	**0.000**	**0.000**	**0.000**	**0.000**	**0.765**	**0.769**	**0.408**	**0.204**	**0.135**	**0.198**	**0.070**	**0.000**
Min	**0.000**	**0.000**	**0.000**	**0.000**	**0.233**	**0.391**	**0.206**	**0.049**	**0.044**	**0.087**	**0.017**	**0.000**

Note:
Estimated and modelled values are italicized.

APPENDIX D-4: SUMMARY OF DAILY DISCHARGE [Q, M^3/S] AT HYDROMETRIC MONITORING STATION OGAMA OUTFLOW, 2025

Drainage Area = 74.93 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-	-	-	-	-	*2.530*	0.791	0.158	0.115	*0.114*	*0.048*	-
2	-	-	-	-	-	*2.477*	0.722	0.149	0.132	*0.115*	*0.036*	-
3	-	-	-	-	-	*2.419*	0.682	0.149	0.124	*0.116*	*0.024*	-
4	-	-	-	-	-	*2.332*	0.626	0.143	0.148	*0.116*	*0.012*	-
5	-	-	-	-	-	*2.236*	0.571	0.130	0.162	*0.118*	*0.000*	-
6	-	-	-	-	-	*2.125*	0.529	0.107	*0.100*	*0.117*	-	-
7	-	-	-	-	-	*2.011*	0.508	0.115	*0.101*	*0.118*	-	-
8	-	-	-	-	-	*1.903*	0.486	0.113	*0.102*	*0.118*	-	-
9	-	-	-	-	-	*1.812*	0.445	0.115	*0.102*	*0.121*	-	-
10	-	-	-	-	-	*1.732*	0.375	0.111	*0.101*	*0.123*	-	-
11	-	-	-	-	-	*1.655*	0.372	0.106	*0.103*	*0.125*	-	-
12	-	-	-	-	-	*1.585*	0.325	0.100	*0.106*	*0.126*	-	-
13	-	-	-	-	-	*1.515*	0.320	0.097	*0.104*	*0.128*	-	-
14	-	-	-	-	-	*1.445*	0.306	0.101	*0.102*	*0.128*	-	-
15	-	-	-	-	-	*1.383*	0.292	0.097	*0.105*	*0.129*	-	-
16	-	-	-	-	-	*1.334*	0.281	0.095	*0.106*	*0.128*	-	-
17	-	-	-	-	-	*1.287*	0.268	0.092	*0.107*	*0.128*	-	-
18	-	-	-	-	-	*1.234*	0.259	0.089	*0.114*	*0.129*	-	-
19	-	-	-	-	-	*1.187*	0.237	0.090	*0.107*	*0.130*	-	-
20	-	-	-	-	-	*1.124*	0.244	0.089	*0.110*	*0.131*	-	-
21	-	-	-	-	-	*1.102*	0.241	0.091	*0.111*	*0.131*	-	-
22	-	-	-	-	-	*1.051*	0.226	0.093	*0.110*	*0.132*	-	-
23	-	-	-	-	-	1.018	0.211	0.092	*0.110*	*0.134*	-	-
24	-	-	-	-	-	0.978	0.205	0.084	*0.110*	*0.133*	-	-
25	-	-	-	-	-	0.930	0.194	0.085	*0.113*	*0.132*	-	-
26	-	-	-	-	-	0.886	0.201	0.091	*0.112*	*0.121*	-	-
27	-	-	-	-	*0.559*	0.838	0.196	0.083	*0.110*	*0.109*	-	-
28	-	-	-	-	*1.117*	0.812	0.186	0.091	*0.109*	*0.097*	-	-
29	-		-	-	*2.187*	0.835	0.187	0.120	*0.111*	*0.085*	-	-
30	-		-	-	*2.396*	0.824	0.183	0.122	*0.118*	*0.073*	-	-
31	-		-		*2.510*		0.159	0.092		*0.061*		-
Mean	**0.000**	**0.000**	**0.000**	**0.000**	**1.754**	**1.487**	**0.349**	**0.106**	**0.112**	**0.118**	**0.024**	**0.000**
Max	**0.000**	**0.000**	**0.000**	**0.000**	**2.510**	**2.530**	**0.791**	**0.158**	**0.162**	**0.134**	**0.048**	**0.000**
Min	**0.000**	**0.000**	**0.000**	**0.000**	**0.559**	**0.812**	**0.159**	**0.083**	**0.100**	**0.061**	**0.000**	**0.000**

Note:
Estimated and modelled values are italicized.

APPENDIX D-5: SUMMARY OF DAILY DISCHARGE [Q, M³/S] AT HYDROMETRIC MONITORING STATION DORIS CREEK TL-2, 2025

Drainage Area = 90.29 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-	-	-	-	-	*3.472*	1.414	0.357	0.157	*0.232*	*0.029*	-
2	-	-	-	-	-	*3.410*	1.355	0.344	*0.143*	*0.239*	*0.020*	-
3	-	-	-	-	-	*3.342*	1.314	0.335	*0.148*	*0.244*	*0.014*	-
4	-	-	-	-	-	*3.238*	1.241	0.324	*0.158*	*0.244*	*0.010*	-
5	-	-	-	-	-	*3.124*	1.186	0.309	*0.158*	*0.251*	-	-
6	-	-	-	-	-	*2.993*	1.141	0.284	*0.157*	*0.248*	-	-
7	-	-	-	-	-	*2.858*	1.100	0.282	*0.160*	*0.255*	-	-
8	-	-	-	-	-	*2.729*	1.068	0.273	*0.164*	*0.253*	-	-
9	-	-	-	-	-	*2.622*	1.007	0.268	*0.167*	*0.268*	-	-
10	-	-	-	-	-	*2.527*	0.909	0.258	*0.163*	*0.281*	-	-
11	-	-	-	-	-	*2.436*	0.884	0.253	*0.172*	*0.290*	-	-
12	-	-	-	-	-	*2.352*	0.798	0.238	*0.187*	*0.298*	-	-
13	-	-	-	-	-	*2.269*	0.747	0.221	*0.175*	*0.307*	-	-
14	-	-	-	-	-	*2.186*	0.694	0.217	*0.164*	*0.306*	-	-
15	-	-	-	-	-	*2.114*	0.654	0.211	*0.182*	*0.312*	-	-
16	-	-	-	-	-	*2.055*	0.624	0.202	*0.186*	*0.309*	-	-
17	-	-	-	-	-	*2.000*	0.592	0.188	*0.192*	*0.309*	-	-
18	-	-	-	-	-	*1.936*	0.562	0.183	*0.231*	*0.315*	-	-
19	-	-	-	-	-	*1.880*	0.550	0.181	*0.196*	*0.321*	-	-
20	-	-	-	-	-	1.806	0.541	0.173	*0.212*	*0.325*	-	-
21	-	-	-	-	-	1.780	0.523	0.169	*0.216*	*0.324*	-	-
22	-	-	-	-	-	1.720	0.492	0.167	*0.210*	*0.328*	-	-
23	-	-	-	-	-	1.664	0.466	0.166	*0.211*	*0.341*	-	-
24	-	-	-	-	-	1.607	0.453	0.158	*0.210*	*0.335*	-	-
25	-	-	-	-	-	1.557	0.433	0.150	*0.225*	*0.331*	-	-
26	-	-	-	-	-	1.515	0.431	0.167	*0.220*	*0.249*	-	-
27	-	-	-	-	*0.100*	1.462	0.422	0.135	*0.211*	*0.174*	-	-
28	-	-	-	-	*0.620*	1.436	0.403	0.144	*0.205*	*0.122*	-	-
29	-		-	-	*3.066*	1.446	0.397	0.173	*0.216*	*0.085*	-	-
30	-		-	-	*3.314*	1.436	0.385	0.172	*0.256*	*0.060*	-	-
31	-		-		*3.449*		0.359	0.151		*0.042*		-
Mean	**0.000**	**0.000**	**0.000**	**0.000**	**2.110**	**2.232**	**0.747**	**0.221**	**0.188**	**0.258**	**0.018**	**0.000**
Max	**0.000**	**0.000**	**0.000**	**0.000**	**3.449**	**3.472**	**1.414**	**0.357**	**0.256**	**0.341**	**0.029**	**0.000**
Min	**0.000**	**0.000**	**0.000**	**0.000**	**0.100**	**1.436**	**0.359**	**0.135**	**0.143**	**0.042**	**0.010**	**0.000**

Note:
Estimated and modelled values are italicized.

APPENDIX D-6: SUMMARY OF DAILY DISCHARGE [Q, M³/S] AT HYDROMETRIC MONITORING STATION ROBERTS HYDRO-2, 2025

Drainage Area = 97.83 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-	-	-	-	-	*2.561*	1.061	0.315	0.124	*0.197*	*0.107*	-
2	-	-	-	-	-	*2.516*	1.052	0.296	0.130	*0.204*	*0.080*	-
3	-	-	-	-	-	*2.466*	1.031	0.293	*0.115*	*0.209*	*0.054*	-
4	-	-	-	-	-	*2.391*	0.993	0.285	*0.124*	*0.209*	*0.027*	-
5	-	-	-	-	-	*2.308*	0.944	0.278	*0.125*	*0.216*	*0.000*	-
6	-	-	-	-	-	*2.213*	0.910	0.248	*0.124*	*0.213*	-	-
7	-	-	-	-	-	*2.115*	0.882	0.239	*0.127*	*0.220*	-	-
8	-	-	-	-	-	*2.022*	0.844	0.241	*0.131*	*0.218*	-	-
9	-	-	-	-	-	*1.944*	0.792	0.240	*0.134*	*0.232*	-	-
10	-	-	-	-	-	*1.875*	0.742	0.232	*0.130*	*0.246*	-	-
11	-	-	-	-	-	*1.809*	0.700	0.220	*0.138*	*0.254*	-	-
12	-	-	-	-	-	*1.748*	0.647	0.206	*0.153*	*0.262*	-	-
13	-	-	-	-	-	*1.688*	0.615	0.192	*0.141*	*0.271*	-	-
14	-	-	-	-	-	*1.628*	0.585	0.191	*0.131*	*0.270*	-	-
15	-	-	-	-	-	*1.576*	0.557	0.184	*0.148*	*0.276*	-	-
16	-	-	-	-	-	*1.533*	0.532	0.171	*0.153*	*0.273*	-	-
17	-	-	-	-	-	*1.493*	0.502	0.166	*0.158*	*0.272*	-	-
18	-	-	-	-	-	*1.447*	0.491	0.155	*0.197*	*0.279*	-	-
19	-	-	-	-	-	*1.406*	0.472	0.148	*0.162*	*0.285*	-	-
20	-	-	-	-	-	*1.353*	0.473	0.143	*0.178*	*0.289*	-	-
21	-	-	-	-	-	*1.334*	0.460	0.134	*0.182*	*0.288*	-	-
22	-	-	-	-	-	*1.290*	0.440	0.132	*0.176*	*0.292*	-	-
23	-	-	-	-	-	*1.249*	0.418	0.124	*0.177*	*0.304*	-	-
24	-	-	-	-	-	1.133	0.398	0.115	*0.176*	*0.298*	-	-
25	-	-	-	-	-	1.102	0.395	0.111	*0.190*	*0.294*	-	-
26	-	-	-	-	-	1.068	0.396	0.111	*0.186*	*0.268*	-	-
27	-	-	-	-	*0.756*	1.037	0.384	0.101	*0.177*	*0.241*	-	-
28	-	-	-	-	*1.512*	1.021	0.368	0.104	*0.170*	*0.214*	-	-
29	-		-	-	*2.266*	1.041	0.357	0.138	*0.182*	*0.188*	-	-
30	-		-	-	*2.446*	1.056	0.348	0.138	*0.221*	*0.161*	-	-
31	-		-		*2.544*		0.321	0.113		*0.134*		-
Mean	**0.000**	**0.000**	**0.000**	**0.000**	**1.905**	**1.647**	**0.617**	**0.186**	**0.155**	**0.244**	**0.054**	**0.000**
Max	**0.000**	**0.000**	**0.000**	**0.000**	**2.544**	**2.561**	**1.061**	**0.315**	**0.221**	**0.304**	**0.107**	**0.000**
Min	**0.000**	**0.000**	**0.000**	**0.000**	**0.756**	**1.021**	**0.321**	**0.101**	**0.115**	**0.134**	**0.000**	**0.000**

Note:
Estimated and modelled values are italicized.

APPENDIX D-7: SUMMARY OF DAILY DISCHARGE [Q, M³/S] AT HYDROMETRIC MONITORING STATION LITTLE ROBERTS OUTFLOW, 2025

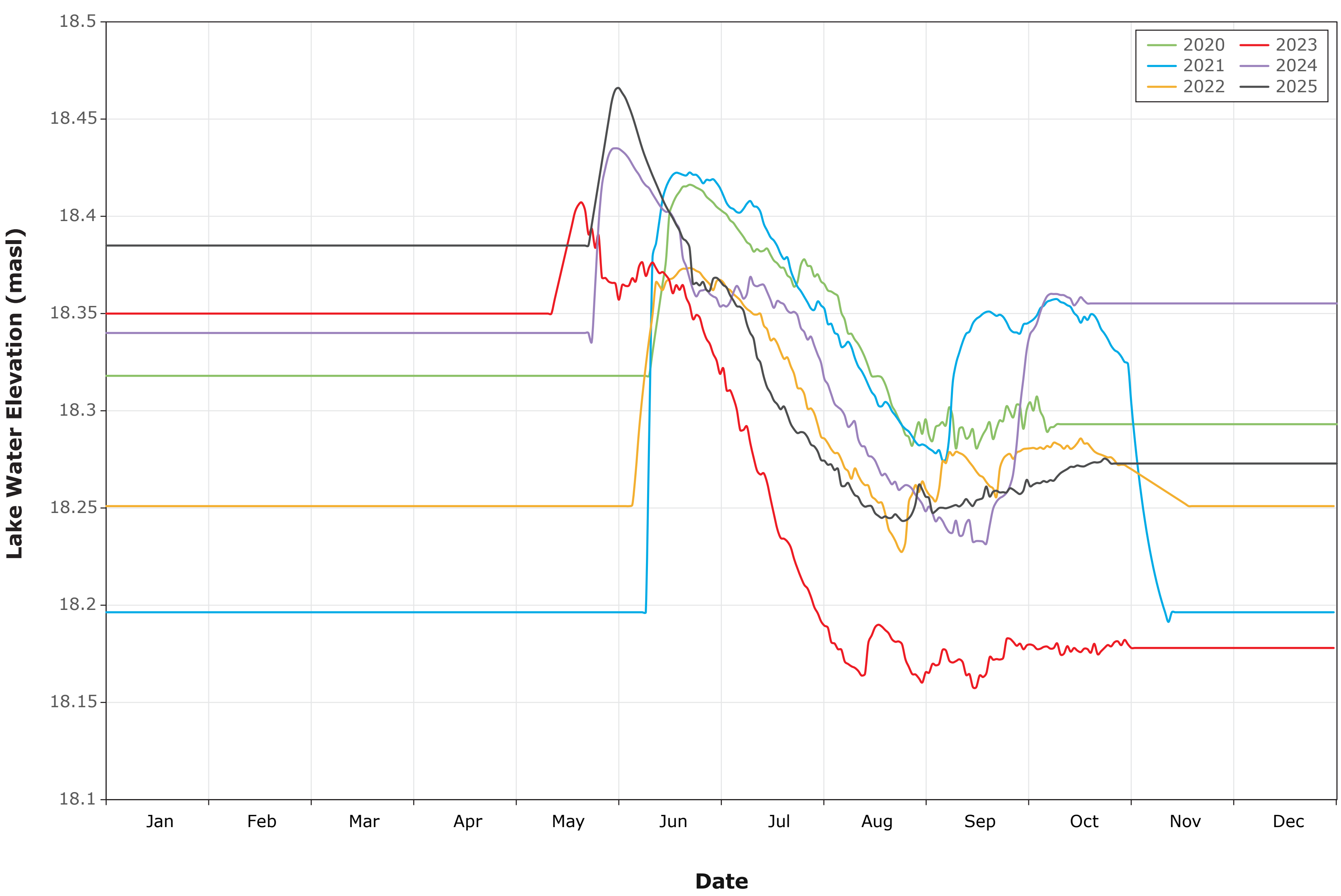
Drainage Area = 194.15 km^2

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-	-	-	-	-	*5.349*	2.162	0.582	0.247	*0.371*	*0.006*	-
2	-	-	-	-	-	*5.254*	2.109	0.570	0.242	*0.381*	*0.003*	-
3	-	-	-	-	-	*5.148*	2.033	0.545	*0.242*	*0.390*	*0.002*	-
4	-	-	-	-	-	*4.989*	1.951	0.528	*0.256*	*0.389*	*0.001*	-
5	-	-	-	-	-	*4.814*	1.865	0.515	*0.258*	*0.401*	-	-
6	-	-	-	-	-	*4.613*	1.771	0.478	*0.256*	*0.395*	-	-
7	-	-	-	-	-	*4.405*	1.701	0.456	*0.260*	*0.406*	-	-
8	-	-	-	-	-	*4.207*	1.626	0.445	*0.266*	*0.403*	-	-
9	-	-	-	-	-	*4.043*	1.538	0.425	*0.271*	*0.426*	-	-
10	-	-	-	-	-	*3.896*	1.438	0.399	*0.265*	*0.447*	-	-
11	-	-	-	-	-	*3.756*	1.365	0.380	*0.278*	*0.460*	-	-
12	-	-	-	-	-	*3.628*	1.274	0.367	*0.302*	*0.472*	-	-
13	-	-	-	-	-	*3.500*	1.189	0.345	*0.283*	*0.486*	-	-
14	-	-	-	-	-	*3.373*	1.113	0.329	*0.267*	*0.485*	-	-
15	-	-	-	-	-	*3.262*	1.040	0.316	*0.294*	*0.494*	-	-
16	-	-	-	-	-	*3.172*	0.986	0.305	*0.301*	*0.490*	-	-
17	-	-	-	-	-	*3.086*	0.933	0.288	*0.310*	*0.489*	-	-
18	-	-	-	-	-	*2.989*	0.886	0.272	*0.370*	*0.498*	-	-
19	-	-	-	-	-	*2.903*	0.880	0.265	*0.315*	*0.508*	-	-
20	-	-	-	-	-	*2.789*	0.873	0.257	*0.340*	*0.514*	-	-
21	-	-	-	-	-	*2.750*	0.842	0.249	*0.346*	*0.513*	-	-
22	-	-	-	-	-	*2.657*	0.802	0.243	*0.337*	*0.519*	-	-
23	-	-	-	-	-	*2.571*	0.763	0.235	*0.338*	*0.538*	-	-
24	-	-	-	-	-	2.510	0.729	0.227	*0.337*	*0.529*	-	-
25	-	-	-	-	-	2.433	0.715	0.213	*0.360*	*0.523*	-	-
26	-	-	-	-	*0.000*	2.320	0.708	0.204	*0.353*	*0.271*	-	-
27	-	-	-	-	*1.577*	2.212	0.693	0.198	*0.339*	*0.146*	-	-
28	-	-	-	-	*3.153*	2.160	0.671	0.202	*0.329*	*0.078*	-	-
29	-		-	-	*4.725*	2.187	0.646	0.239	*0.347*	*0.042*	-	-
30	-		-	-	*5.106*	2.181	0.625	0.269	*0.408*	*0.022*	-	-
31	-		-		*5.313*		0.599	0.275		*0.012*		-
Mean	**0.000**	**0.000**	**0.000**	**0.000**	**3.312**	**3.439**	**1.178**	**0.343**	**0.304**	**0.390**	**0.003**	**0.000**
Max	**0.000**	**0.000**	**0.000**	**0.000**	**5.313**	**5.349**	**2.162**	**0.582**	**0.408**	**0.538**	**0.006**	**0.000**
Min	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**2.160**	**0.599**	**0.198**	**0.242**	**0.012**	**0.001**	**0.000**

Note:
Estimated and modelled values are italicized.

APPENDIX E HISTORICAL LAKE LEVEL COMPARISON GRAPHS

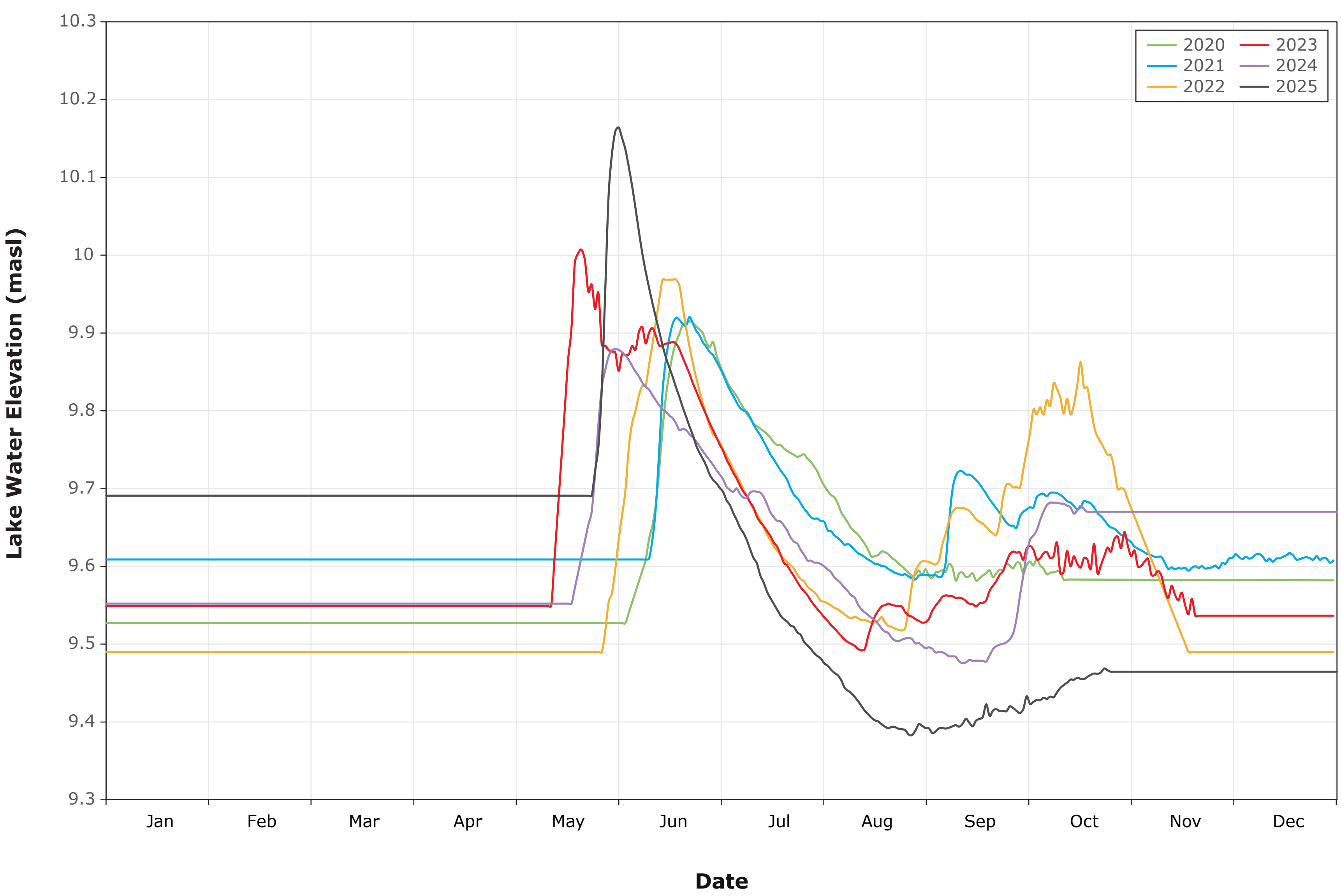
FIGURE E-1 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION WINDY OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-006:1

FIGURE E-2 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION GLENN LAKE



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-006:2

FIGURE E-3 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION IMNIAGUT LAKE

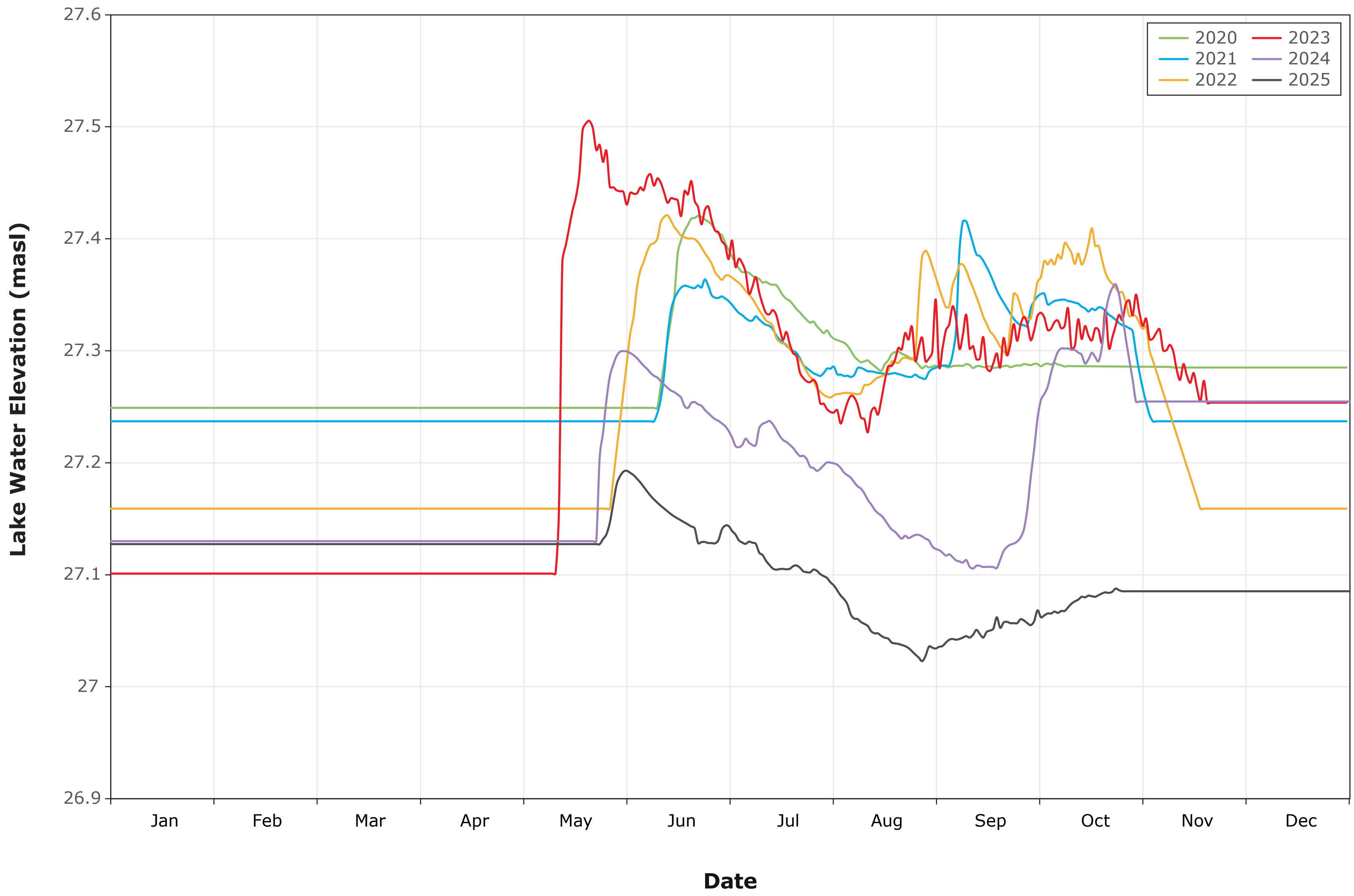
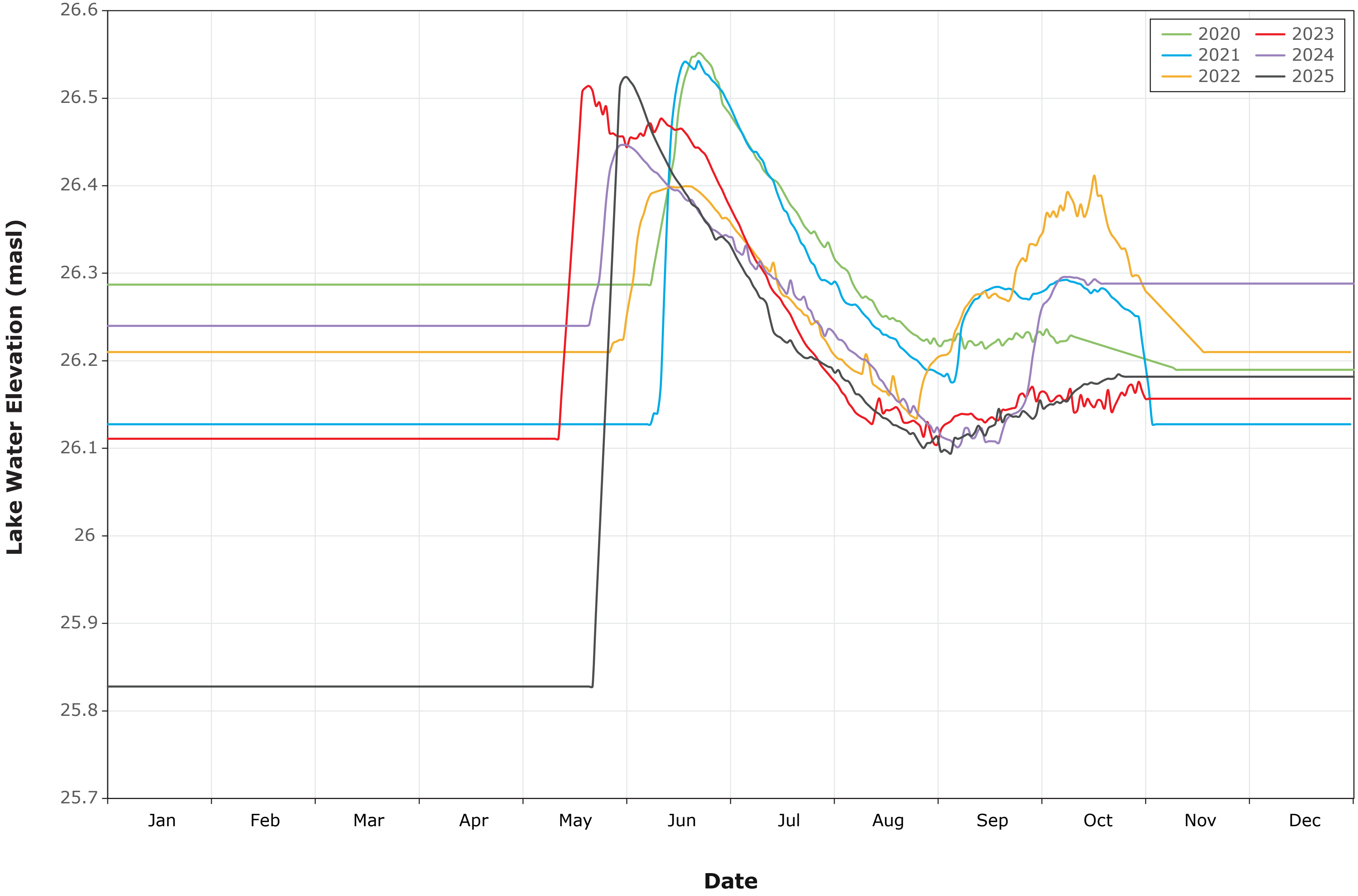


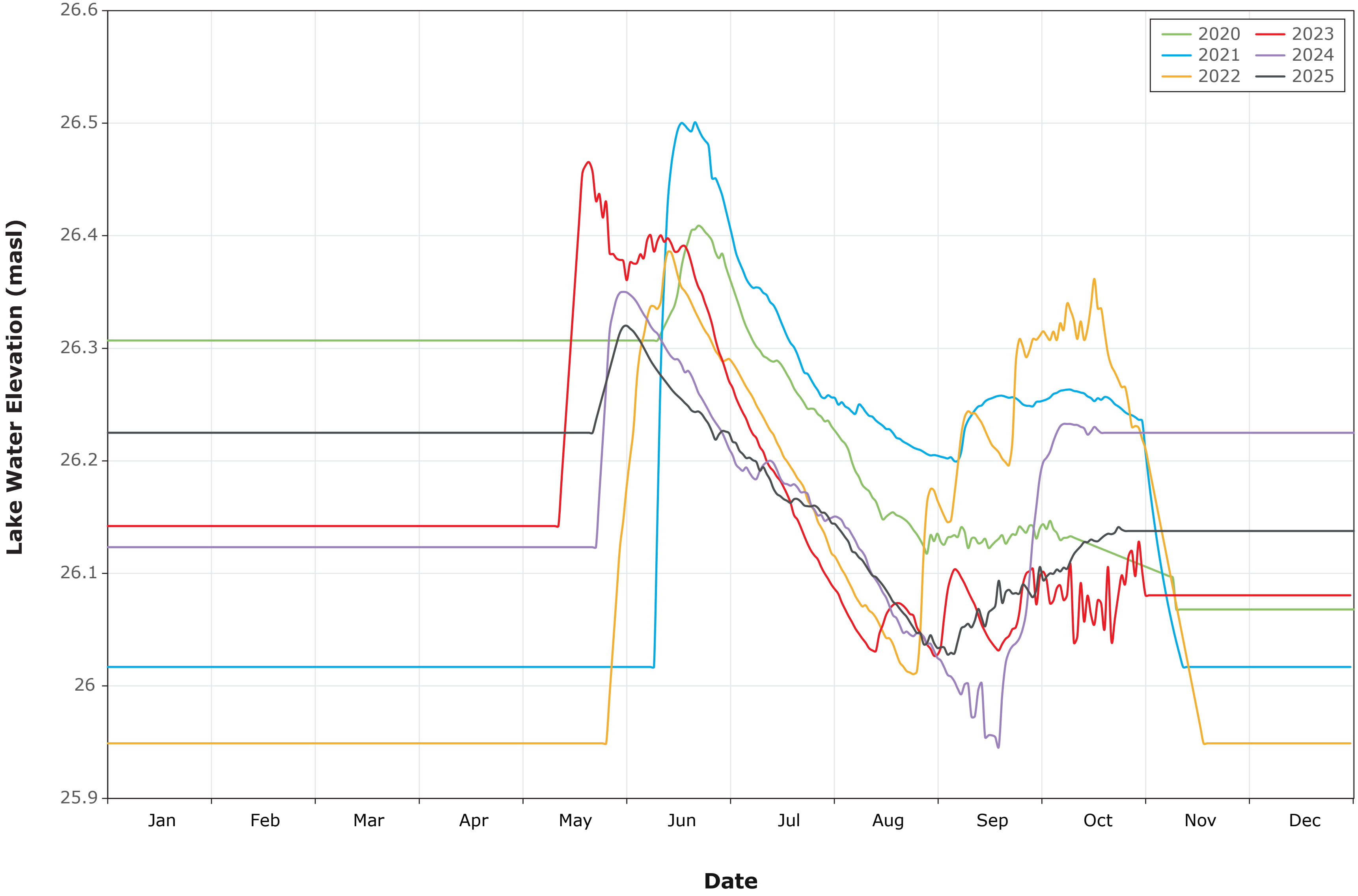
FIGURE E-4 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION PATCH OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-006:4

FIGURE E-5 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION PO OUTFLOW

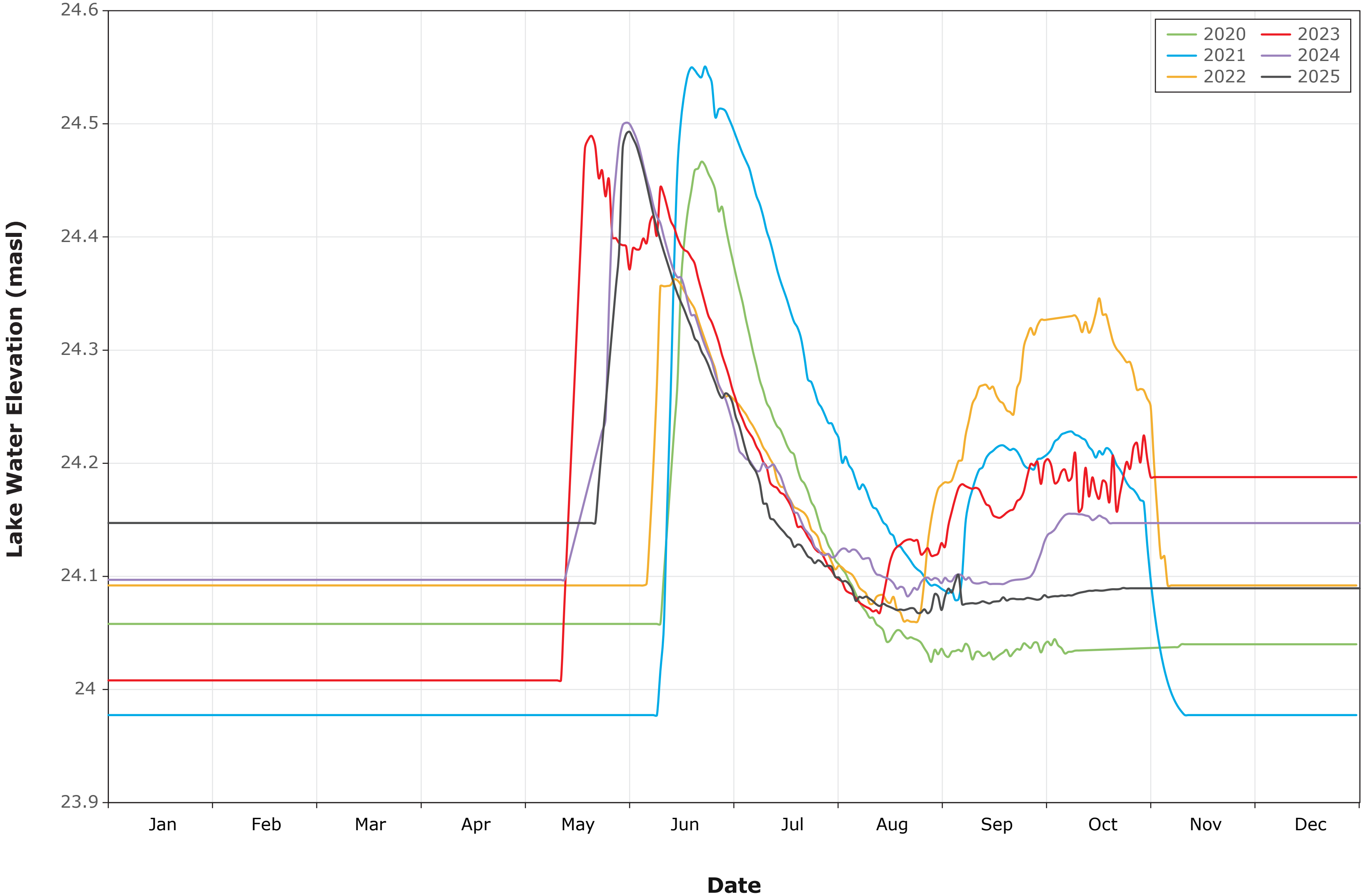


ERM

CLIENT: Agnico Eagle Mines Ltd.

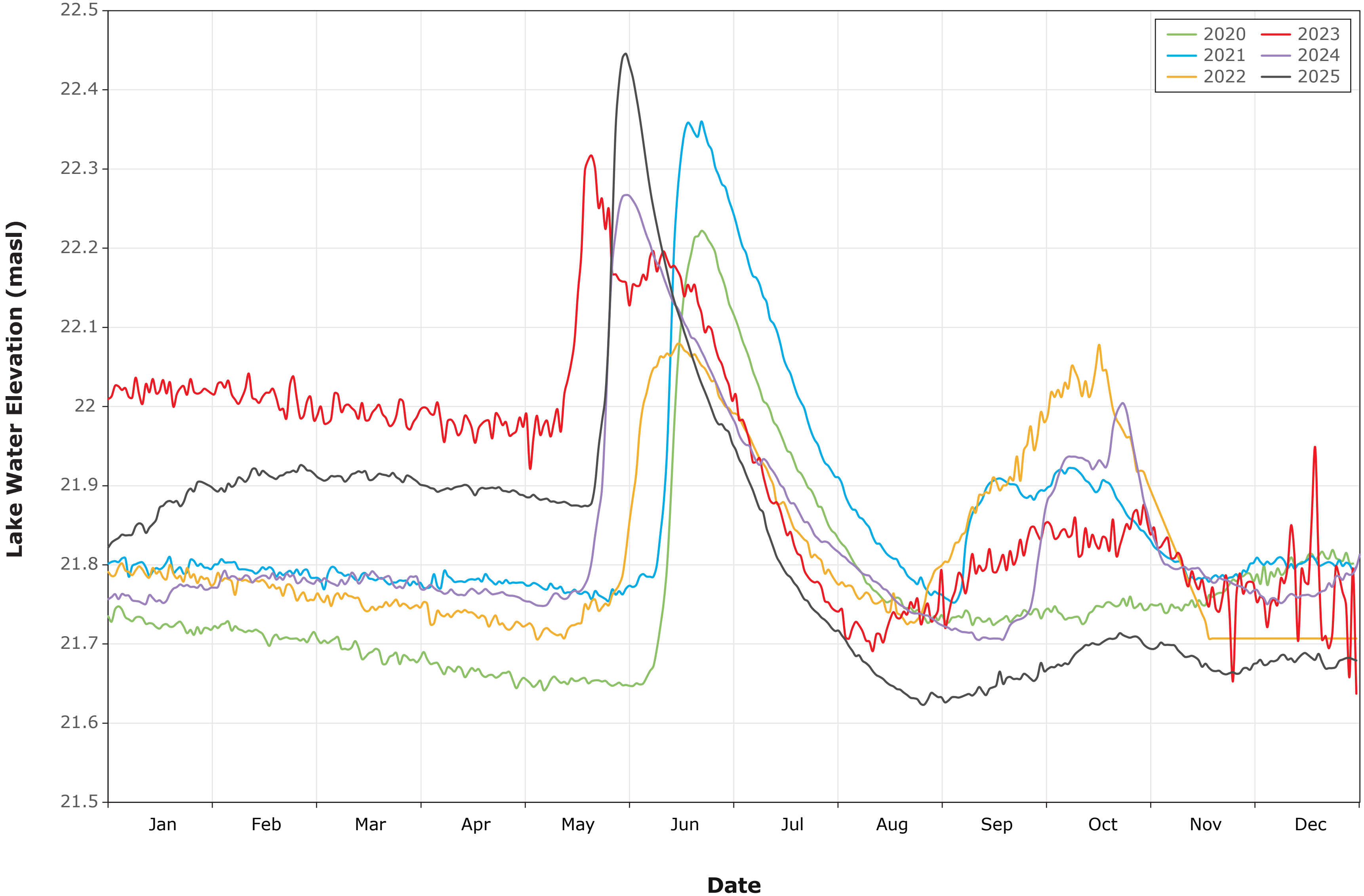
GRAPHICS NUMBER: HB-25ERM-006:5

FIGURE E-6 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION OGAMA OUTFLOW



CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-006:6

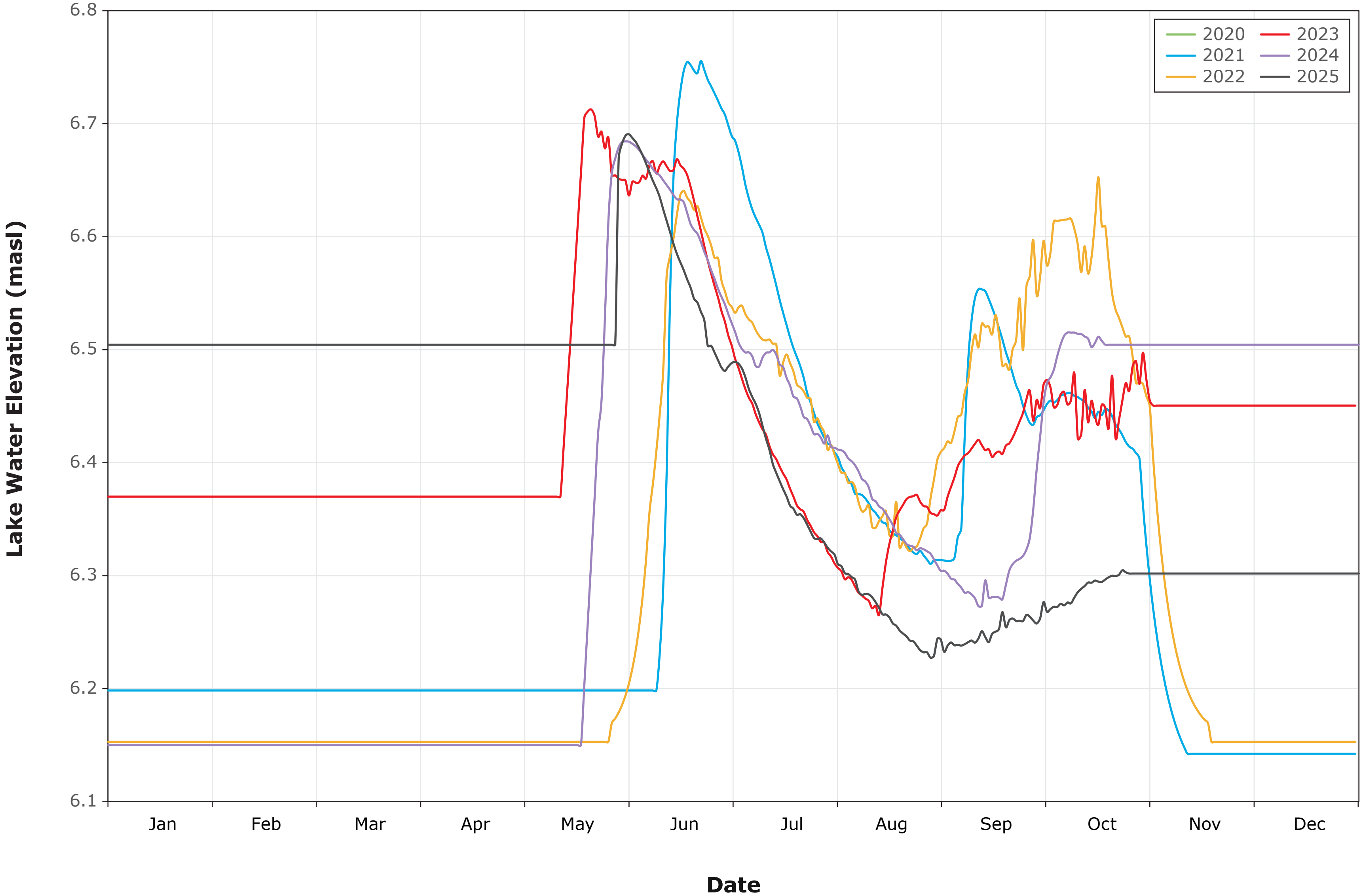
FIGURE E-7 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION DORIS LAKE



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-006:7

FIGURE E-8 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION ROBERTS HYDRO-2

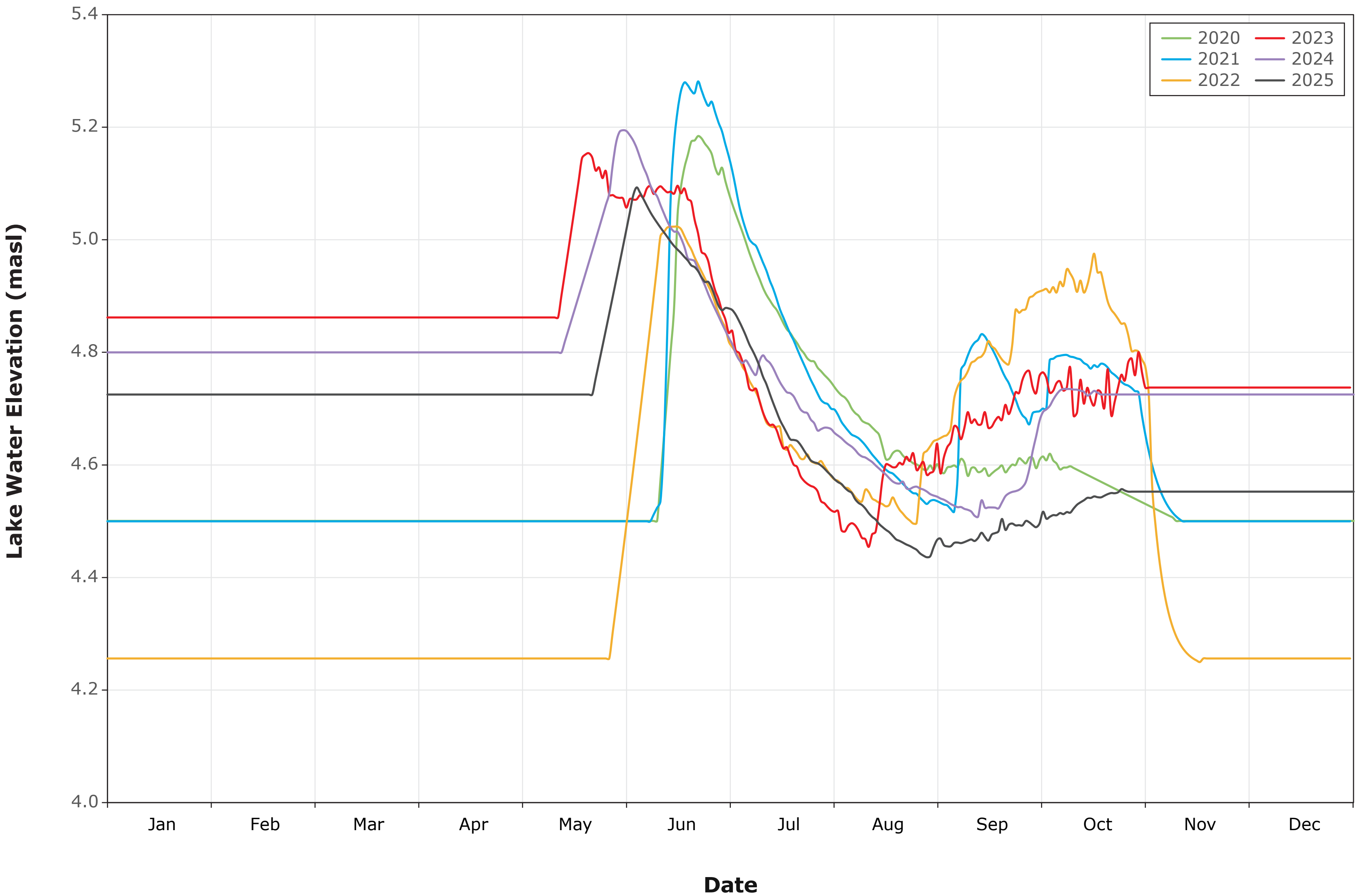


ERM

CLIENT: Agnico Eagle Mines Ltd.

GRAPHICS NUMBER: HB-25ERM-006:7

FIGURE E-9 HISTORICAL MEAN DAILY LAKE LEVEL FOR MONITORING STATION LITTLE ROBERTS OUTFLOW

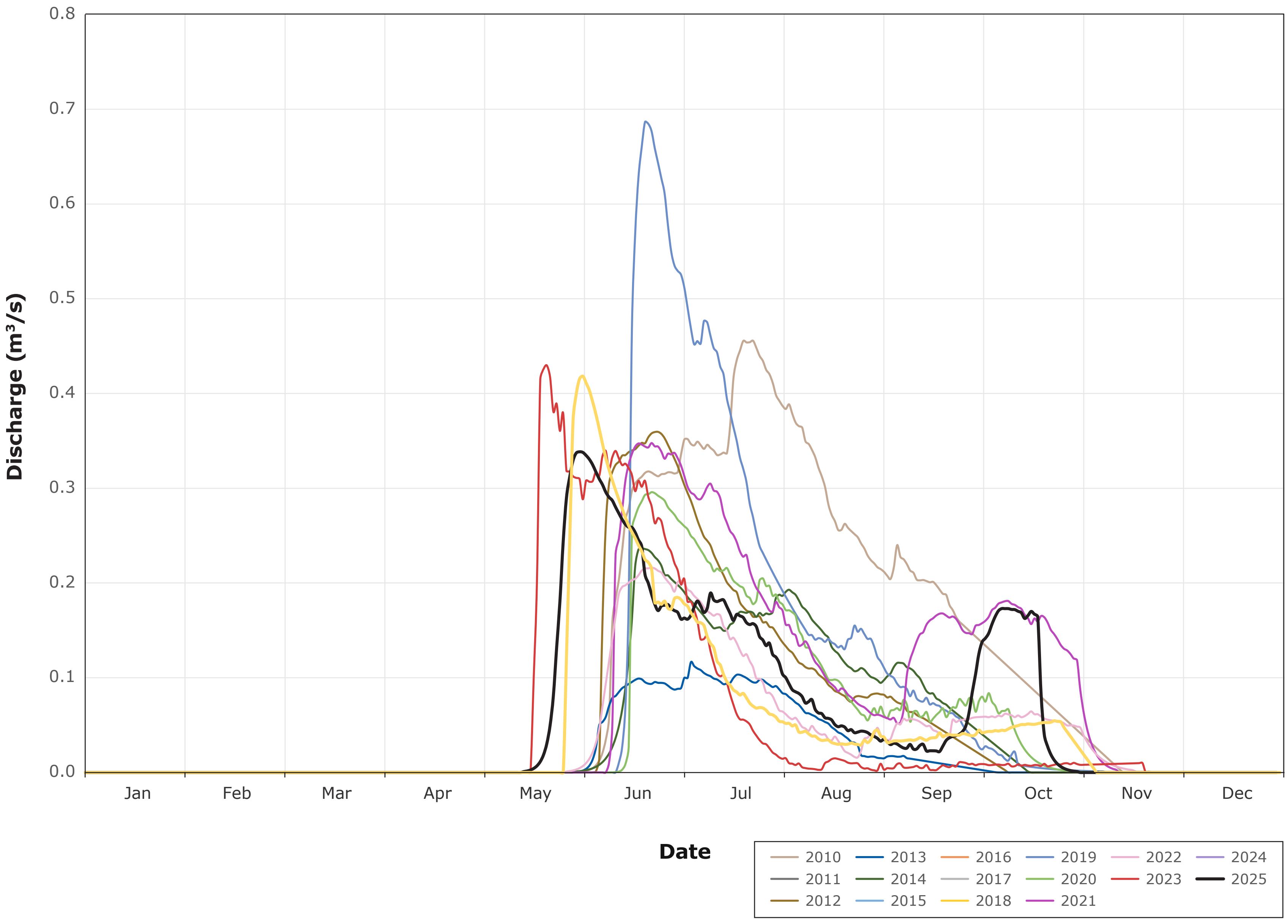


ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-006:7

APPENDIX F HISTORICAL MEAN DAILY DISCHARGE COMPARISON GRAPHS

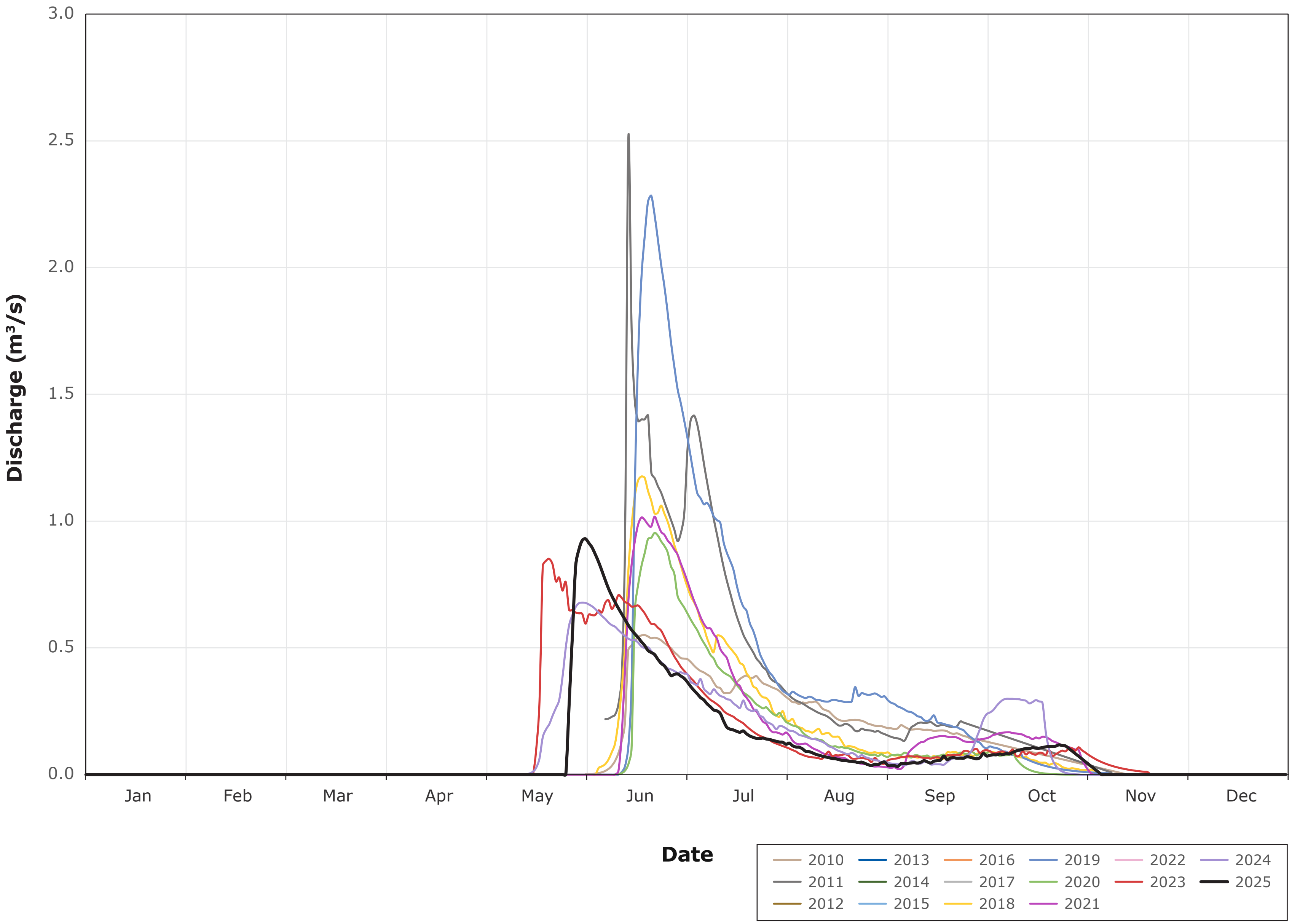
FIGURE F-1 HISTORICAL MEAN DAILY DISCHARGE FOR MONITORING STATION WINDY OUTFLOW



ERM

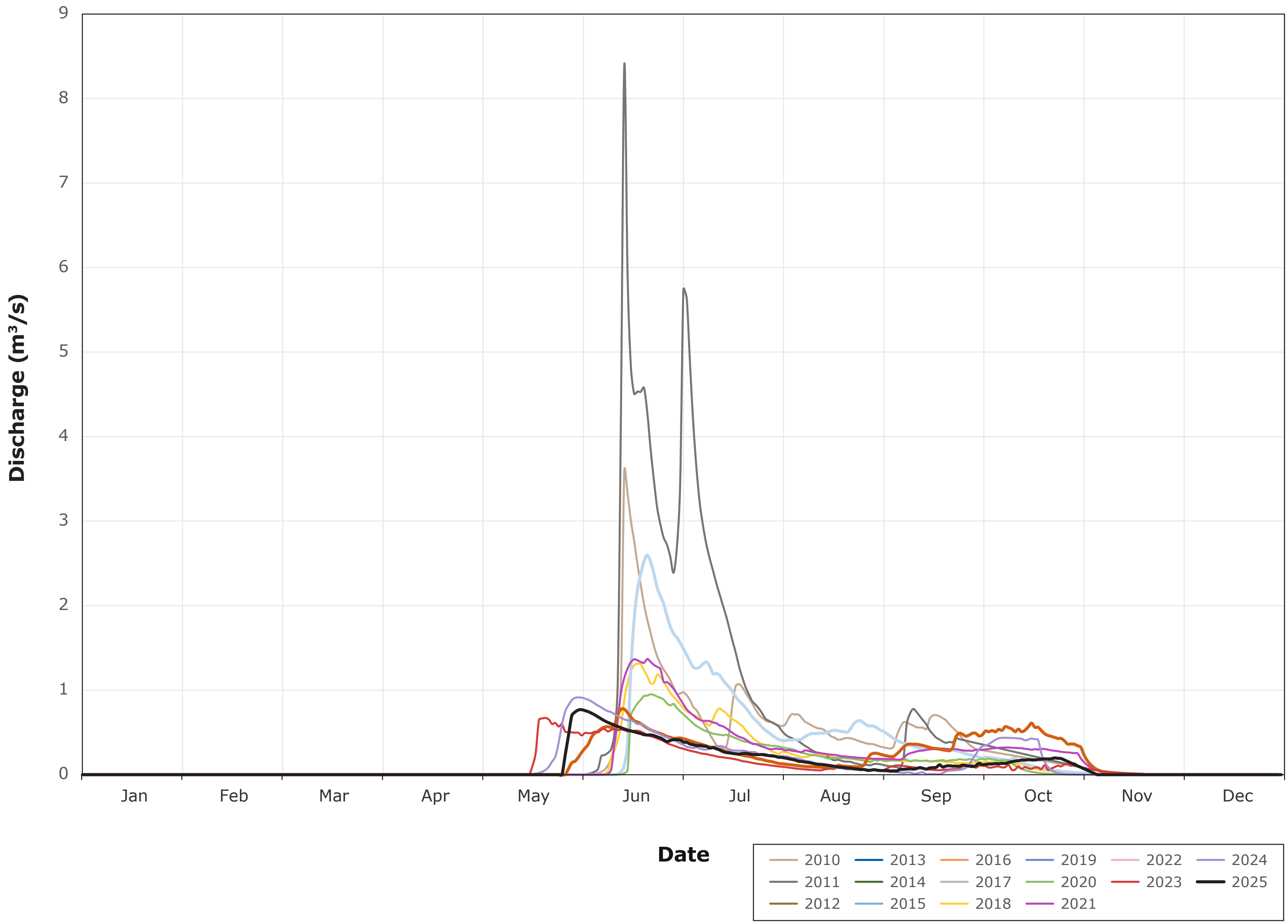
CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-007:1

FIGURE F-2 HISTORICAL MEAN DAILY DISCHARGE FOR MONITORING STATION PATCH OUTFLOW



CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-007:2

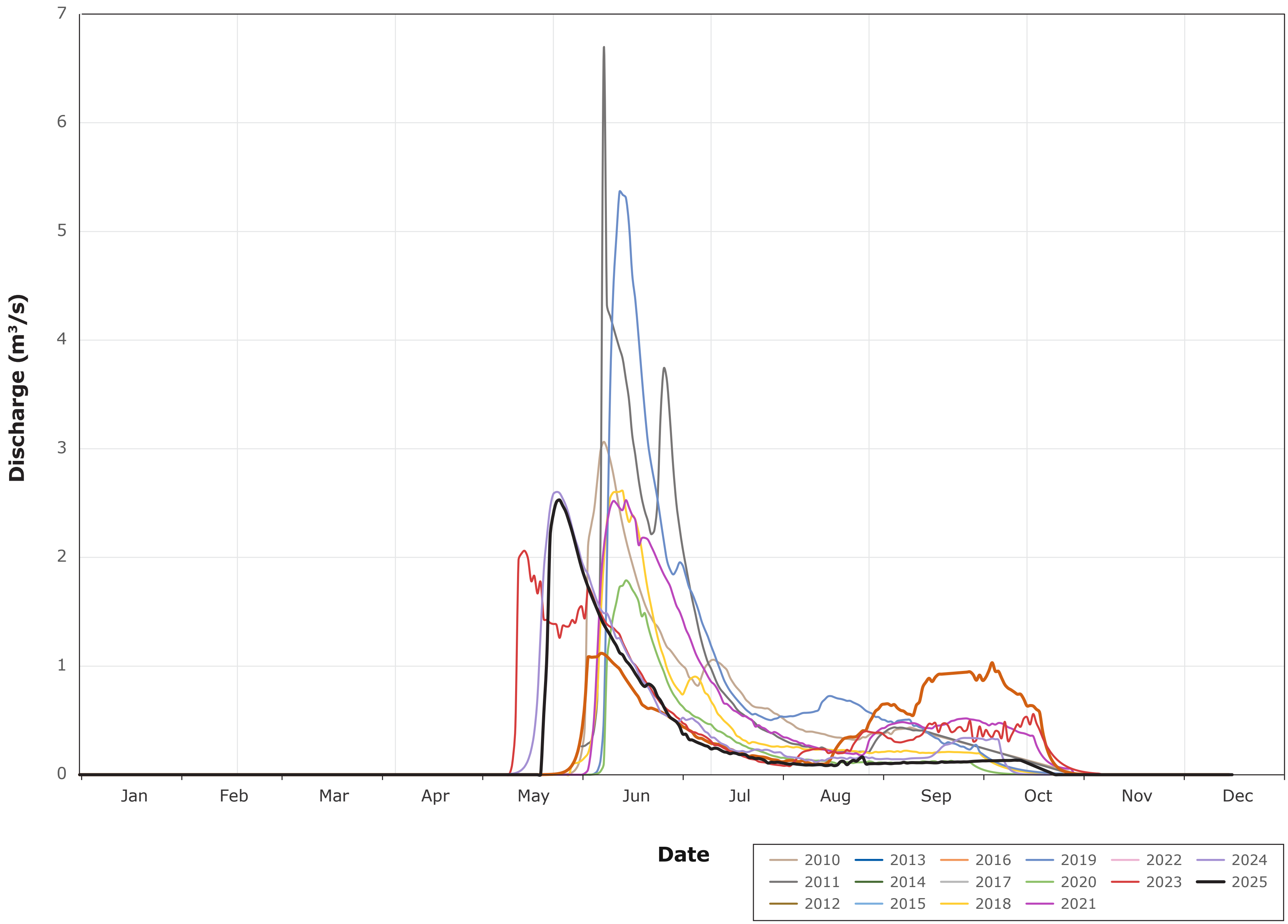
FIGURE F-3 HISTORICAL MEAN DAILY DISCHARGE FOR MONITORING STATION PO OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-007:3

FIGURE F-4 HISTORICAL MEAN DAILY DISCHARGE FOR MONITORING STATION OGAMA OUTFLOW

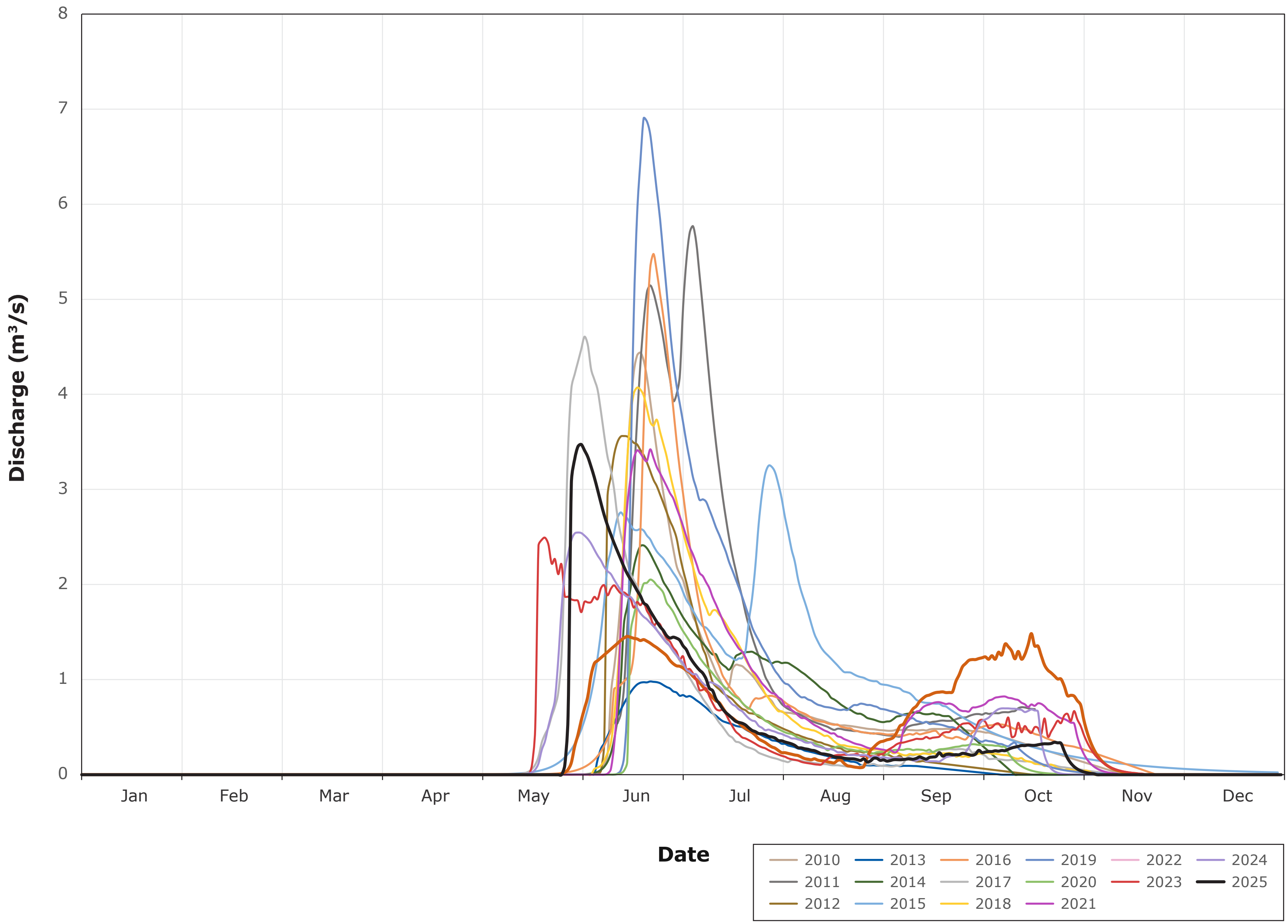


ERM

CLIENT: Agnico Eagle Mines Ltd.

GRAPHICS NUMBER: HB-25ERM-007:4

FIGURE F-5 HISTORICAL MEAN DAILY DISCHARGE FOR MONITORING STATION DORIS CREEK TL-2

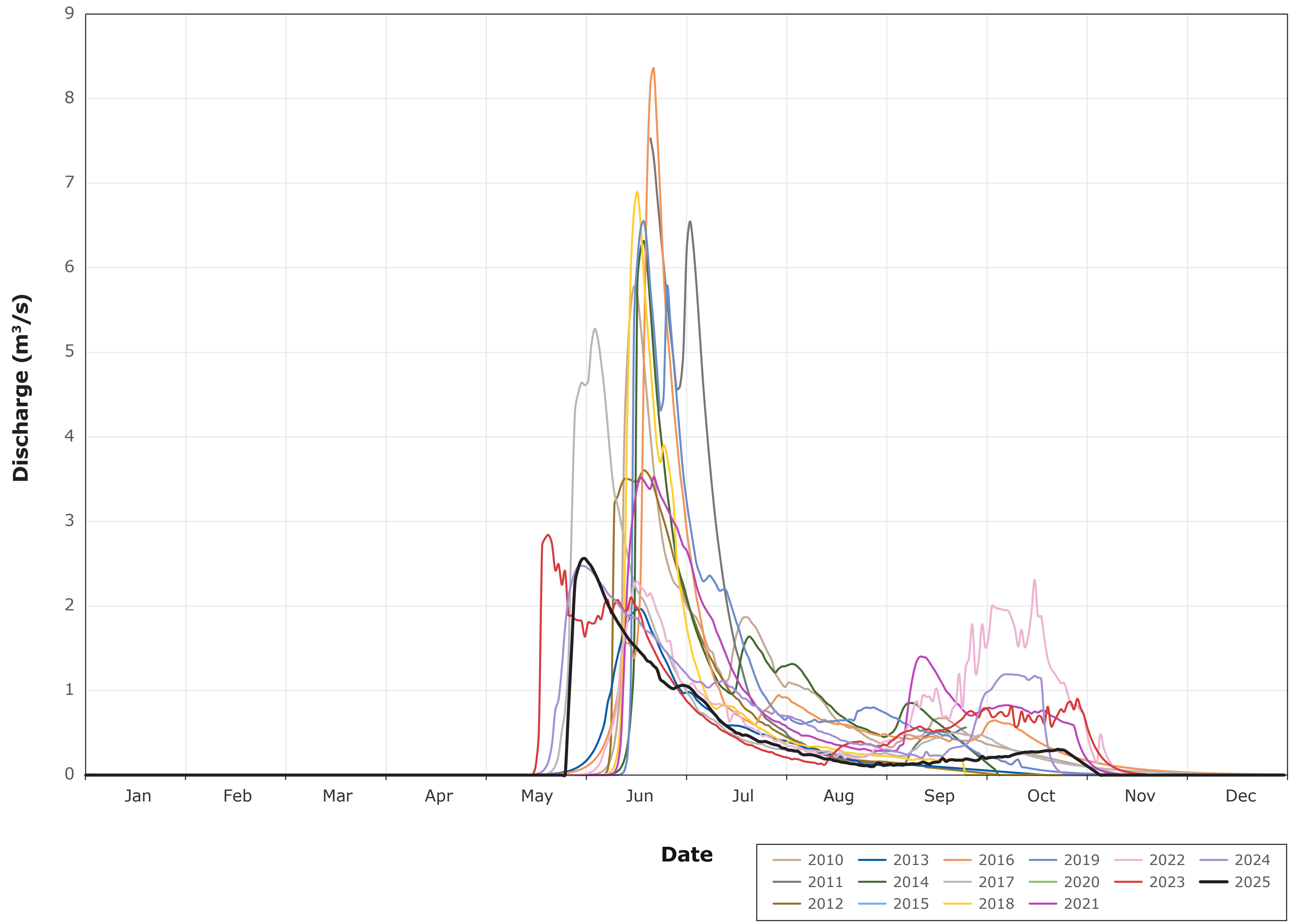


ERM

CLIENT: Agnico Eagle Mines Ltd.

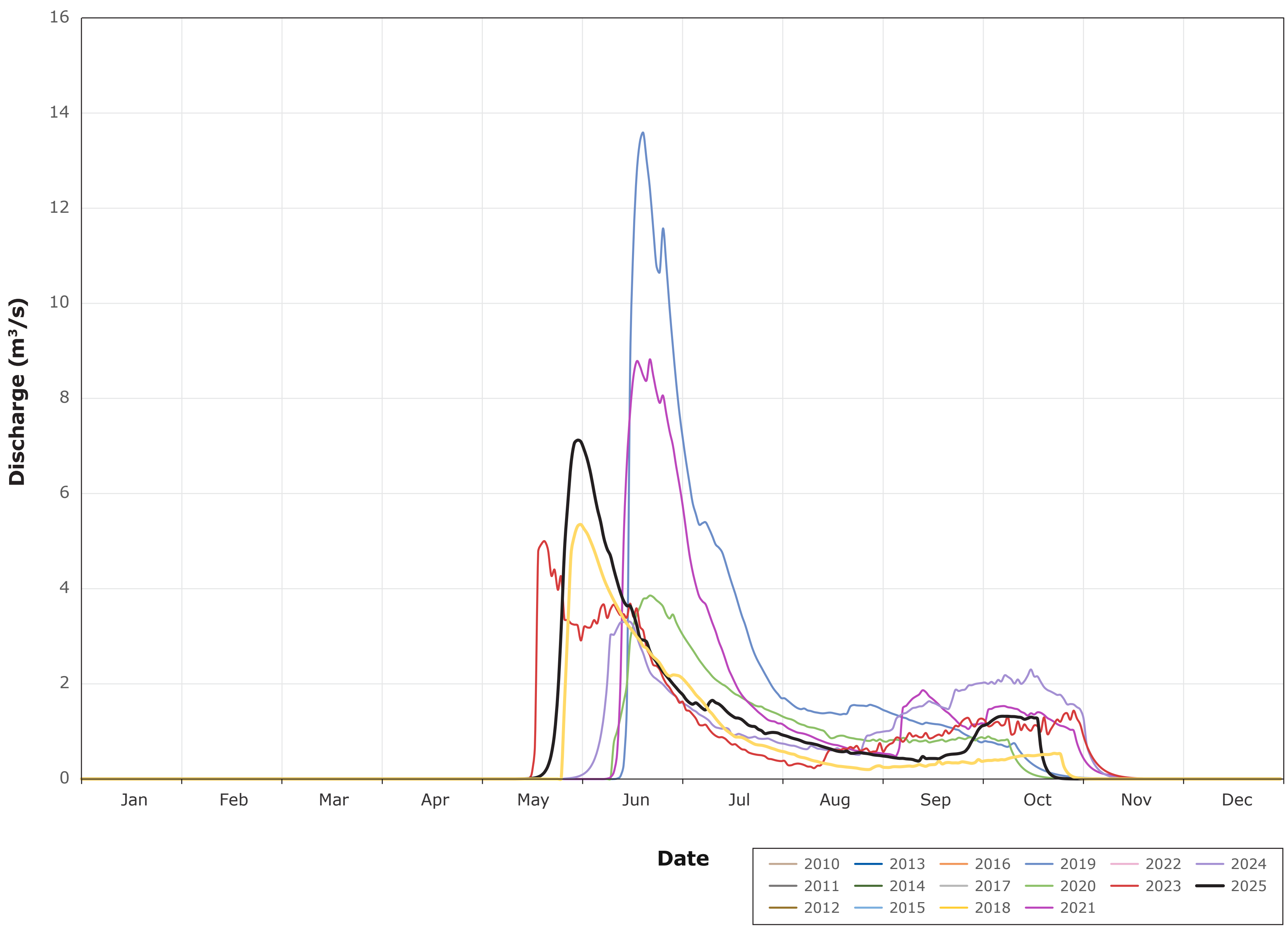
GRAPHICS NUMBER: HB-25ERM-007:5

FIGURE F-6 HISTORICAL MEAN DAILY DISCHARGE FOR MONITORING STATION ROBERTS HYDRO-2



CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-007:6

FIGURE F-7 HISTORICAL MEAN DAILY DISCHARGE FOR MONITORING STATION LITTLE ROBERTS OUTFLOW



ERM

CLIENT: Agnico Eagle Mines Ltd.
GRAPHICS NUMBER: HB-25ERM-007:7

APPENDIX C EVALUATION OF EFFECTS—HISTORICAL DATASET SUMMARIES, STATISTICAL METHODS, AND RESULTS (2025)

Hope Bay Mine

2025 Aquatic Effects Monitoring Program—Annual Report

Appendix C: Evaluation of Effects—Historical Dataset Summaries, Statistical Methods, and Results (2025)

February 2026

ERM Consultants Canada Ltd.
#2700-685 Centre Street S
Calgary, AB
Canada T2G 1S5

T +1 403 705 1926

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX C: EVALUATION OF EFFECTS—HISTORICAL DATASET SUMMARIES, STATISTICAL METHODS, AND RESULTS (2025)

C.1 INTRODUCTION

This appendix presents supporting information for the evaluation of effects conducted for the 2025 Aquatic Effects Monitoring Program (AEMP) for the Hope Bay Project (the Project). Comprehensive information for physical limnology, water quality, sediment quality, phytoplankton biomass, and benthic invertebrate variables, including applicable historical data (Section C.1.1), statistical methods for the evaluation of effects (Section C.2), and statistical results (Section C.3), are provided. All methods and data relating to water level and stream hydrological monitoring are presented in Appendix B - 2025 Hydrology Compliance Monitoring Summary.

C.1.1 HISTORICAL DATA SELECTION

The inclusion of historical data for the evaluation of effects was based on relevance to the current AEMP sampling sites, timing of sample collection, and comparability of sampling methods as implemented in the *Hope Bay Project Aquatic Effects Monitoring Plan* (the Plan; TMAC 2018). Not all historical data collected at the AEMP sites are necessary or appropriate for inclusion in the evaluation of effects. For the relevant components of the 2025 AEMP (i.e., temperature and dissolved oxygen profiles, water quality, sediment quality, phytoplankton biomass, and benthic invertebrates), the rationale for exclusion of historical data is provided, and data for the evaluation of effects are also presented (Tables C.1-1 to C.1-5, and Figures C.1-1 to C.1-5).

TABLE C.1-1 RATIONALE FOR SELECTION OF HISTORICAL TEMPERATURE AND DISSOLVED OXYGEN DATA FOR THE AQUATIC EFFECTS MONITORING PROGRAM EVALUATION OF EFFECTS FOR THE HOPE BAY PROJECT, 2025

Lake	Years Sampled	Months Sampled	Data Included in Graphs and Analyses	Data Excluded from Graphs and Analyses	Rationale for Exclusion
Doris	1995	August	Data from northern end of the lake	Data from southern end of the lake	Data that were collected from the southern end of Doris Lake were excluded, as the current AEMP sampling station is at the northern end of the lake.
	1996	April, August	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	1997	April, July, August	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	1998	April	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2000	August	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2003	July, August, September	Data from August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2004	June, July, August, September	Data from June and August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2005	July, August, September	Data from August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2006, 2007, 2008	May, July, August, September	Data from May and August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2009	April, August	Data collected at Doris North sampling location	Data collected at Doris South sampling location	Data that were collected from the southern end of Doris Lake were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2010 to 2016	April, July, August, September	April and August data collected at Doris North sampling location	All data collected at Doris South sampling location; all data from July and September	Data that were collected from the southern end of Doris Lake were excluded, as current AEMP sampling station is at the northern end of the lake. Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2017, 2018	April, July, August, September	Data from April and August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2019 to 2025	April, August	All	None	NA
Patch	1995	August	All	None	NA
	1996	April, August	All	None	Note: Data were estimated from plots of the profiles.
	1997	April, July	Data from April	Data from July	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded. Note: April data were estimated from plots of the profiles.
	1998	April	All	None	NA
	2006	June, July, and September	None	All	All data were collected from the southern end of Patch Lake and thus were excluded, as the current AEMP sampling station is at northern end of the lake.
	2007, 2008	May, July, August, September	None	All	All data were collected from the southern end of Patch Lake and thus were excluded, as the current AEMP sampling station is at northern end of the lake.
	2009	April, August	Data collected at Patch North sampling location	Data collected at Patch South sampling location	Data that was collected from the southern end of Patch Lake were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2017 to 2025	April, August	All	None	NA

Lake	Years Sampled	Months Sampled	Data Included in Graphs and Analyses	Data Excluded from Graphs and Analyses	Rationale for Exclusion
Windy	1995	August	None	All	All data were collected from the southern end of Windy Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	1996	August	None	All	All data were collected from the southern end of Windy Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	1997	April, July	Data from April	Data from July	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded. Note: April data were estimated from plots of the profiles.
	1998	April	All	None	NA
	2006	June, July, August, September	Data from June and August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2007, 2008	May, July, August, September	Data from May and August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2009, 2010, 2017 to 2025	April, August	All	None	NA
Reference B	2009	May, August	None	All	All data collected from the northeastern end of Reference Lake B were excluded, as the current AEMP sampling station is in the central basin of the lake.
	2010	April, July, August September	Data from April and August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded. Data collected from July and September were excluded, as these were collected from northeastern end of the lake.
	2011 to 2018	April, July, August, September	Data from April and August	Data from July and September	Currently, profiles for the open-water season are collected in August, so historical data collected in August were included and data from other months were excluded.
	2019 to 2025	April, August	All	None	NA

TABLE C.1-2 RATIONALE FOR SELECTION OF HISTORICAL WATER QUALITY DATA FOR THE AQUATIC EFFECTS MONITORING PROGRAM EVALUATION OF EFFECTS FOR THE HOPE BAY PROJECT, 2025

Lake	Years Sampled	Months Sampled	Data Included in Graphs and Statistical Analyses	Data Excluded from Graphs and Statistical Analyses	Rationale for Exclusion
Doris	1995	May, June, July, August	Data from northern end of the lake	Data from southern end of the lake, and all shoreline grab samples	Data that were collected from the southern end of Doris Lake were excluded, as the current AEMP sampling station is at the northern end of the lake. Shoreline grabs were excluded, as they are not comparable to samples collected from a boat over deep areas of the lake.
	1996	April, August	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	1997	April, July, August	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	1998	April	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2000	July, August	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2003	July, August, September	All	None	NA
	2004	June, July, August, September	All	None	NA
	2005	July, August, September	All	None	NA
	2006, 2007, 2008	May, July, August, September	All	None	NA
	2009	April, August	Data collected at current Doris Lake AEMP sampling location	Data collected at Doris South sampling location	Data that were collected from the southern end of Doris Lake were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2010 to 2016	April, July, August, September	Data collected at current Doris Lake AEMP sampling location	Data collected at Doris South sampling location	Data that were collected from the southern end of Doris Lake were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2017, 2018	April, July, August, September	All	None	NA
	2019 to 2025	April, August	All	None	NA
Patch	1995	May, June, July, August	Data from northern end of the lake	Data from southern end of the lake, and all shoreline grab samples	Data that were collected from the southern end of Patch Lake were excluded, as the current AEMP sampling station is at the northern end of the lake. Shoreline grabs were excluded, as they are not comparable to samples collected from a boat over deep areas of the lake.
	1996	April, August	All	None	NA
	1997	April, July	All	None	NA
	1998	April	All	None	NA
	2006	June, July, August, September	None	All	All data were collected from the southern end of Patch Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2007 and 2008	May, July, August, September	None	All	All data were collected from the southern end of Patch Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2009	April, August	Data collected at current Patch Lake AEMP sampling location	Data collected at Patch South sampling location	Data that were collected from the southern end of Patch Lake were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2017 to 2025	April, August	All	None	NA

Lake	Years Sampled	Months Sampled	Data Included in Graphs and Statistical Analyses	Data Excluded from Graphs and Statistical Analyses	Rationale for Exclusion
Windy	1995	May, June, July, August	None	All	All data were collected from the southern end of Windy Lake and thus were excluded, as the current AEMP sampling station is at northern end of the lake.
	1996	August	None	All	All data were collected from the southern end of Windy Lake and thus were excluded, as the current AEMP sampling station is at northern end of the lake.
	1997	April, July	All	None	NA
	1998	April	All	None	NA
	1999	July	Samples collected from boat	All shoreline grab samples	Shoreline samples were excluded, as they are not comparable to samples collected from a boat over deep areas of the lake.
	2000	July	All	None	NA
	2006	June, July, August, September	All	None	NA
	2007, 2008	May, July, August, September	All	None	NA
	2009, 2010, 2017 to 2025	April, August	All	None	.NA
Reference B	2009	May, August	None	All	All data were collected from the northeastern end of Reference Lake B and thus were excluded, as the current AEMP sampling station is in the central basin of the lake.
	2010	April, July, August September	Data from August and September	Data from April and July	Data that were collected from April and July were excluded, as these were collected from the northeastern end of the lake. The August and September samples were collected at the current AEMP sampling station.
	2011 to 2018	April, July, August, September	All	None	NA
	2019 to 2025	April, August	All	None	NA

TABLE C.1-3 RATIONALE FOR SELECTION OF HISTORICAL SEDIMENT QUALITY DATA FOR THE AQUATIC EFFECTS MONITORING PROGRAM EVALUATION OF EFFECTS FOR THE HOPE BAY PROJECT, 2025

Lake	Years Sampled	Month Sampled	Data Included in Historical Graphs and Statistical Analyses	Data Excluded from Historical Graphs and Statistical Analyses	Rationale for Exclusion
Doris	1996	August	None	All	Excluded data collected from southern end of Doris Lake, as current AEMP sampling station is at northern end of the lake.
	1997	July	None	All	Excluded data collected from southern end of Doris Lake, as current AEMP sampling station is at northern end of the lake.
	2009	August	Data from deep site at northern end of lake	Data from shallow sites and sites at southern end of lake	Excluded data collected from southern end of Doris Lake, as current AEMP sampling site is at northern end of the lake; excluded shallow sites (<5 m) as the current AEMP site is deep (>10 m).
	2010 to 2016	August	Data collected at "Doris" sampling location	Data collected at "Doris South" sampling location	Excluded data collected from southern end of Doris Lake, as current AEMP sampling site is at northern end of the lake.
	2017, 2019, 2022, 2025	August	All	None	NA
Patch	1996	August	None	All	Excluded deep samples (>10 m) as the current AEMP sample is collected at mid-depth (5 to 10 m).
	1997	July	None	All	Excluded shallow samples (< 5 m) as the current AEMP sample is collected at mid-depth (5 to 10 m).
	2007	August	None	All	Excluded deep and shallow samples as the current AEMP site sample is collected at mid-depth (5 to 10 m); excluded data collected from southern end of Patch Lake, as current AEMP sampling station is at northern end of the lake.
	2009	August	Data from mid-depth site at northern end of lake	Data from shallow sites and sites at southern end of lake	Excluded data collected from southern end of Patch Lake, as current AEMP sampling station is at northern end of the lake; excluded shallow and deep samples as the current AEMP sample is collected at mid-depth (5 to 10 m).
	2010	August	None	All	Excluded shallow samples and stations at the southern end of the lake as the current AEMP sample is collected at mid-depth (5 to 10 m) at the northern end of the lake.
	2017 to 2019, 2022, 2025	August	All	None	NA
Reference B	2009	August	None	All	Excluded data collected from northeastern end of Reference Lake B, as current AEMP sampling station is in the central basin of the lake; excluded shallow (< 5 m) samples as the current AEMP sample is collected at depth (> 10 m).
	2010	August	Data from deep site	Data from shallow site	Excluded shallow (< 5 m) samples as the current AEMP sample is collected at depth (> 10 m).
	2011 to 2017, 2019, 2022, 2025	August	All	None	NA

TABLE C.1-4 RATIONALE FOR SELECTION OF HISTORICAL PHYTOPLANKTON BIOMASS DATA FOR THE AQUATIC EFFECTS MONITORING PROGRAM EVALUATION OF EFFECTS FOR THE HOPE BAY PROJECT, 2025

Lake	Years Sampled	Months Sampled	Data Included in Historical Graphs and Statistical Analyses	Data Excluded from Historical Graphs and Statistical Analyses	Rationale for Exclusion
Doris	1997	July	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake. Additionally, there was a potential issue with sample integrity, as samples were lost and then found and analyzed more than one year after sample collection.
	2000	July	None	All	All data were collected from the southern end of Doris Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2003	July, August, September	None	All	All data were excluded because of methodological differences, as samples consisted of a composite of subsamples collected throughout the euphotic zone (not comparable to discrete surface samples currently collected in the AEMP).
	2006	September	None	All	The sampling methods from 2006 were not described. As such, the data have been assumed to be a composite sample from throughout euphotic zone (not comparable to discrete surface samples currently collected in the AEMP).
	2007, 2008	July, August, September	None	All	All data were excluded because of methodological differences, as samples consisted of a composite of subsamples collected throughout the euphotic zone (not comparable to discrete surface samples currently collected in the AEMP).
	2009	April, August	August data collected at current Doris Lake AEMP sampling location	All April data and August data collected at Doris South sampling location	All data that were collected from the southern end of Doris Lake were excluded, as the current AEMP sampling station is at the northern end of the lake. Currently, only open-water season chlorophyll *a*[1] data are included in the evaluation of effects, so historical under-ice data were excluded.
	2010 to 2016	April, July, August, September	July, August, September data collected at current Doris Lake AEMP sampling location	April data and all data collected at Doris South sampling location	All data that were collected from the southern end of Doris Lake were excluded, as the current AEMP sampling station is at the northern end of the lake. Currently, only open-water season chlorophyll *a*[1] data are included in the evaluation of effects, so historical under-ice data were excluded.
	2017 to 2025	August	All	None	NA
Patch	1997	July	None	All	There was a potential issue with sample integrity, as samples were lost and then found and analyzed more than one year after sample collection.
	2006	September	None	All	All data were collected from the southern end of Patch Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake.
	2007, 2008	July, August, September	None	All	All data were collected from the southern end of Patch Lake and thus were excluded, as the current AEMP sampling station is at the northern end of the lake. Data were excluded because of methodological differences, as samples consisted of a composite of subsamples collected throughout the euphotic zone (not comparable to discrete surface samples currently collected in the AEMP).
	2009	April, August	August data collected at current Patch Lake AEMP sampling location	All April data and August data collected at Patch South sampling location	All data that were collected from the southern end of Patch Lake were excluded, as the current AEMP sampling station is at the northern end of the lake. Currently, only open-water season chlorophyll *a*[1] data are included in the evaluation of effects, so historical under-ice data were excluded.
	2017, 2018	April, August	August data	April data	Currently, only open-water season chlorophyll *a*[1] data are included in the evaluation of effects, so historical under-ice data were excluded.
	2019	August	All	None	NA
	2020	August	Sample (n= 1) collected at 1 m	Sample collected at deeper depth	Samples that were collected at bottom depth (5 m) are not comparable to the discrete surface sample currently collected in the AEMP.
	2021 to 2025	August	All	None	NA

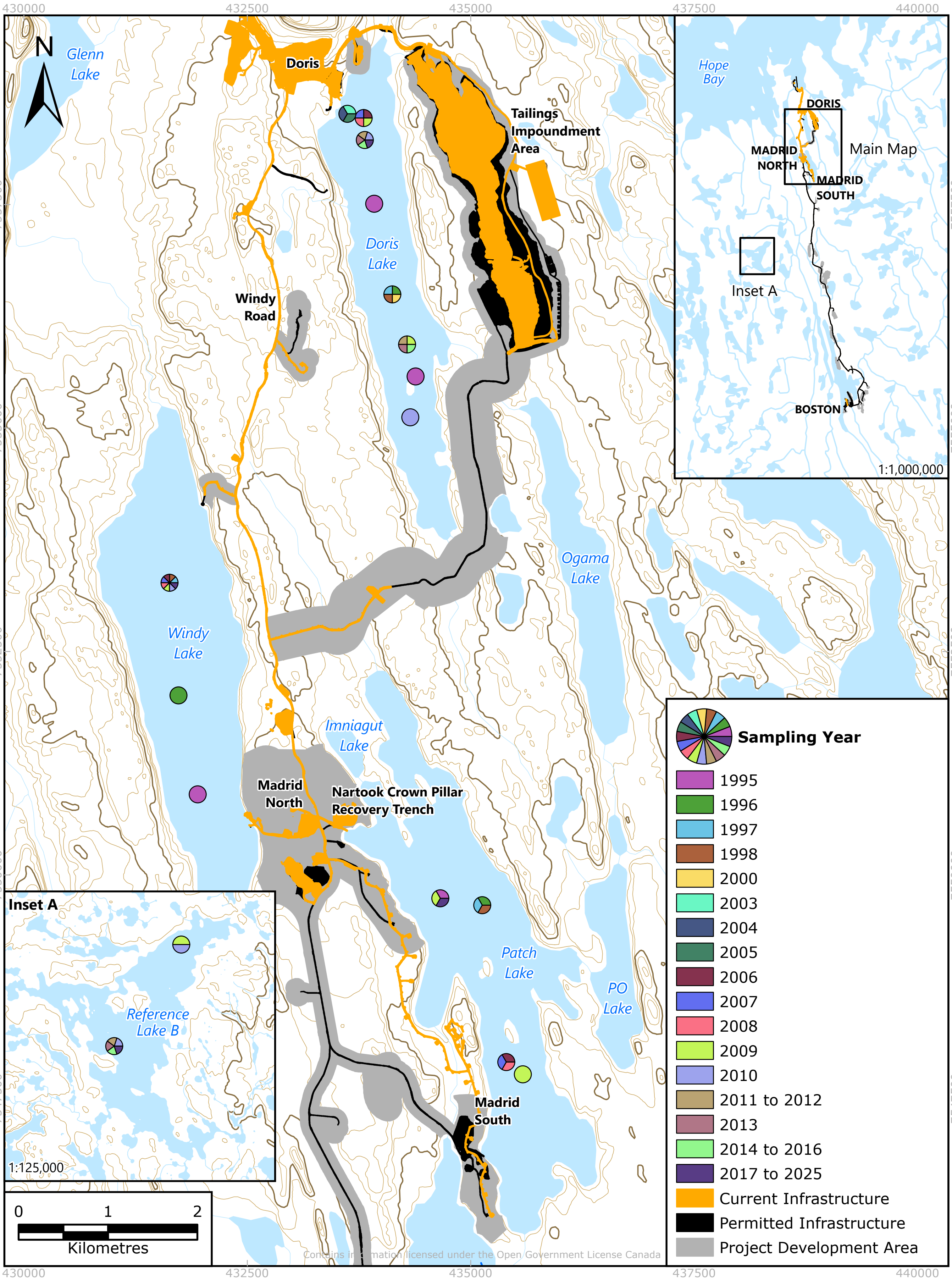
Lake	Years Sampled	Months Sampled	Data Included in Historical Graphs and Statistical Analyses	Data Excluded from Historical Graphs and Statistical Analyses	Rationale for Exclusion
Reference B	2009	August	None	All	All data were collected from the northeastern end of Reference Lake B and thus were excluded, as the current AEMP sampling station is in the central basin of the lake.
	2010	April, July, August, September	Data from August, September	Data from April, July	April and July data that were collected from the northeastern end of Reference Lake B were excluded, as the current AEMP sampling station is in the central basin of the lake. Currently, only open-water season chlorophyll *a*[1] data are included in the evaluation of effects, so historical under-ice data were excluded.
	2011 to 2016	April, July, August, September	Data from July, August, September	Data from April	Currently, only open-water season chlorophyll *a*[1] data are included in the evaluation of effects, so historical under-ice data were excluded.
	2017	April, August	Data from August	Data from April	Currently, only open-water season chlorophyll *a*[1] data are included in the evaluation of effects, so historical under-ice data were excluded.
	2018 to 2025	August	All	None	NA

Note:
[1] Phytoplankton biomass is represented as chlorophyll *a*.

TABLE C.1-5 RATIONALE FOR SELECTION OF HISTORICAL BENTHIC INVERTEBRATE DATA FOR THE AQUATIC EFFECTS MONITORING PROGRAM EVALUATION OF EFFECTS FOR THE HOPE BAY PROJECT, 2025

Lake	Years Sampled	Months Sampled	Data Included in Historical Graphs and Statistical Analyses	Data Excluded from Historical Graphs and Statistical Analyses	Rationale for Exclusion
Doris	1996	August	None	All	Excluded data collected from southern end of Doris Lake, as current AEMP sampling station is at northern end of the lake; unlike current AEMP sampling methods, samples consisted of single grab samples rather than composite samples.
	1997	July, August	None	All	Excluded shallow samples (<5 m) and stations at the southern end of the lake as the current AEMP sample is collected at depth (>10 m) at the northern end of the lake; unlike current AEMP sampling methods, samples consisted of single grab samples rather than composite samples.
	2000	July	None	All	Excluded data collected from southern end of Doris Lake, as current AEMP sampling station is at northern end of the lake; unlike current AEMP sampling methods, samples consisted of single grabs rather than composite samples.
	2009	August	Data collected at “Doris” sampling location	Data collected at “Doris South” sampling location	Excluded data collected from southern end of Doris Lake, as current AEMP sampling station is at northern end of the lake; although three discrete replicate samples were collected at each station in 2009, data from the three replicates were pooled to obtain a single composite sample comparable to the replicates in the current AEMP.
	2010 to 2016	August	Data collected at “Doris” sampling location	Data collected at “Doris South” sampling location	Excluded data collected from southern end of Doris Lake, as current AEMP sampling station is at northern end of the lake.
	2017, 2019, 2022, 2025	August	All	None	NA
Patch	1996	August	None	All	Excluded deep samples (>10 m) as current AEMP sampling is conducted at mid-depth (5 to 10 m); unlike current AEMP sampling methods, samples consisted of single grabs rather than composite samples.
	1997	July	None	All	Excluded shallow samples (<5 m) as current AEMP sampling is conducted at mid-depth (5 to 10 m); unlike current AEMP sampling methods, samples consisted of single grabs rather than composite samples.
	2007	August	None	All	Excluded deep and shallow samples as current AEMP sampling is conducted at mid-depth (5 to 10 m); excluded data collected from southern end of Patch Lake, as current AEMP sampling station is at northern end of the lake; unlike current AEMP sampling methods, samples consisted of single grabs rather than composite samples.
	2009	August	Data collected at mid-depth site in “Patch” sampling location	Data collected at shallow sites or in southern end of Patch Lake	Excluded shallow samples as current AEMP sampling is conducted at mid-depth (5 to 10 m); excluded data collected from southern end of Patch Lake, as current AEMP sampling station is at northern end of the lake; although three discrete replicate samples were collected at each station in 2009, data from the three replicates were pooled to obtain a single composite sample comparable to the replicates in the current AEMP.
	2010	August	None	All	Excluded shallow samples as current AEMP sampling is conducted at mid-depth (5 to 10 m); excluded data collected from southern end of Patch Lake, as current AEMP sampling station is at northern end of the lake.
	2017 to 2019, 2022, 2025	August	All	None	NA
Reference B	2009	August	None	All	Excluded data collected from northeastern end of Reference Lake B, as current AEMP sampling station is in the central basin of the lake.
	2010	August	Data from deep site	Data from mid-depth site	Excluded data from mid-depth (5 to 10 m) as current AEMP sampling is conducted at depth (>10 m);
	2011 to 2017, 2019, 2022, 2025	August	All	None	NA

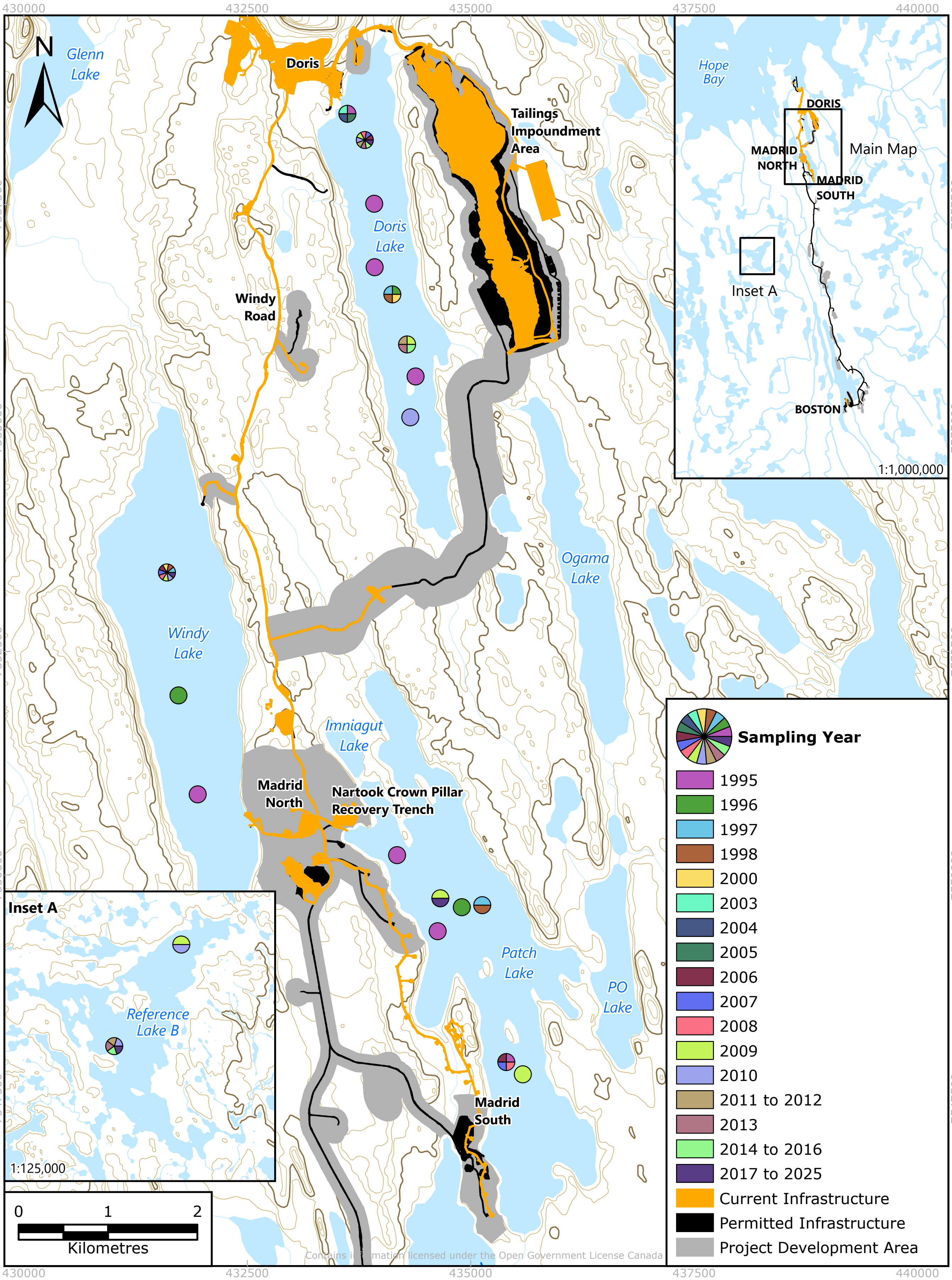
FIGURE C.1-1 HISTORICAL PHYSICAL LIMNOLOGY SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



ERM

CLIENT: AGNICO EAGLE MINES LIMITED
GIS NUMBER: HB-01-304-08
DATE: 11 March 2026
PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:60,000 when printed at 8.5x11

FIGURE C.1-2 HISTORICAL WATER QUALITY SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1995 TO 2025



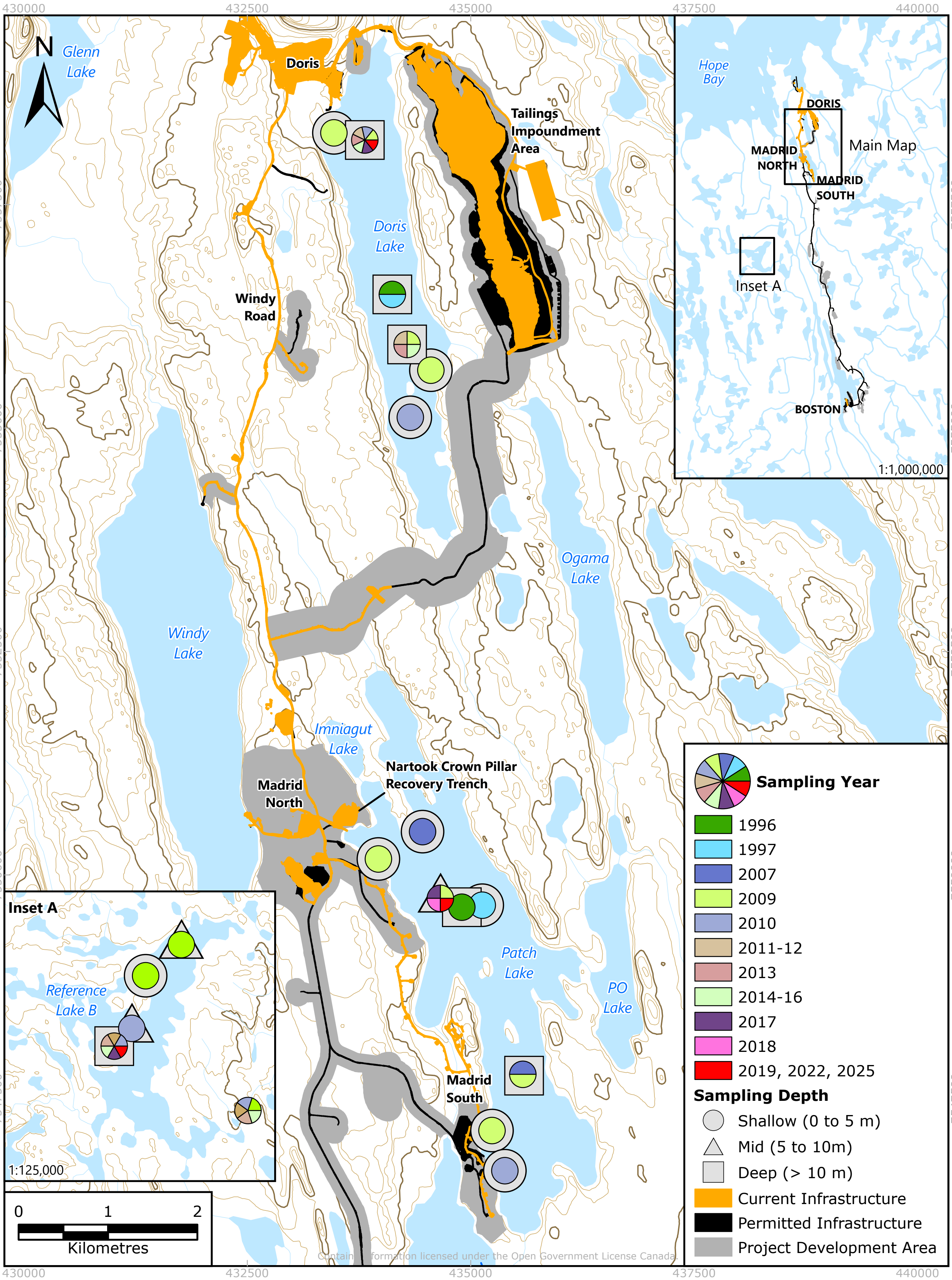
ERM

CLIENT: AGNICO EAGLE MINES LIMITED
GIS NUMBER: HB-01-304-09

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:60,000 when printed at 8.5x11

FIGURE C.1-3 HISTORICAL SEDIMENT QUALITY SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025

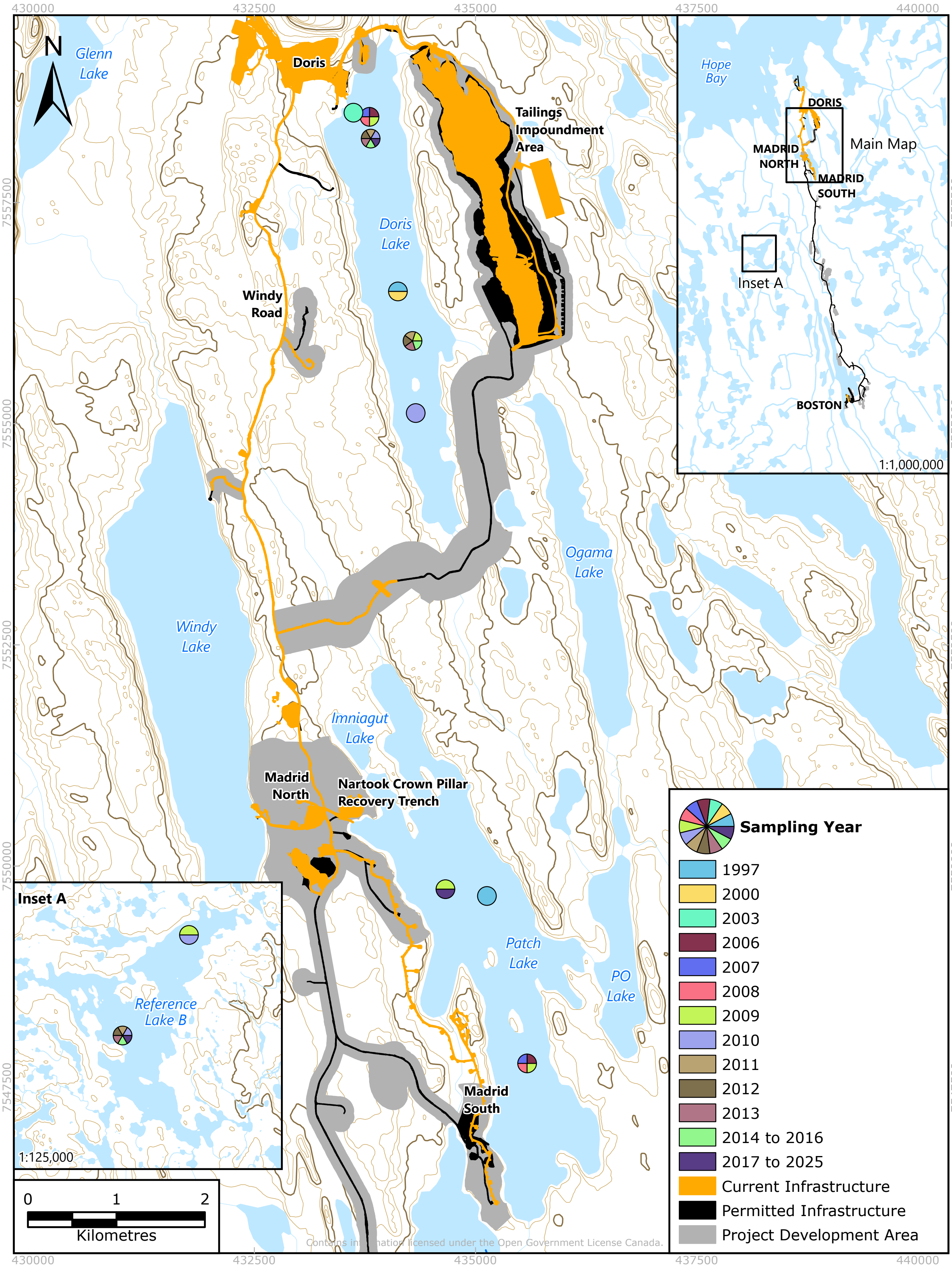


CLIENT: AGNICO EAGLE MINES LIMITED
GIS NUMBER: HB-01-304-10

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:60,000 when printed at 8.5x11

FIGURE C.1-4 HISTORICAL PHYTOPLANKTON SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1997 TO 2025



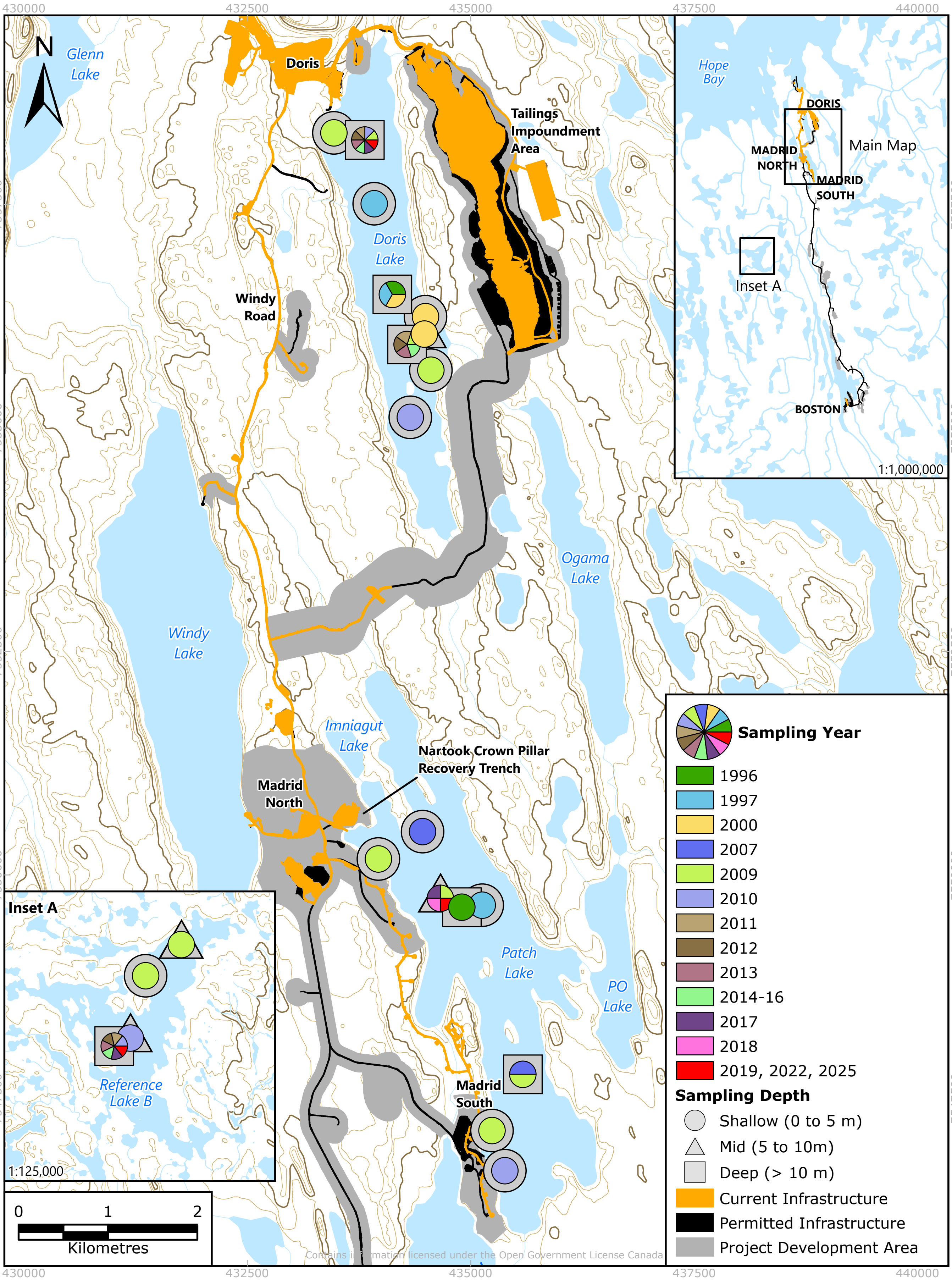
ERM

CLIENT: AGNICO EAGLE MINES LIMITED
GIS NUMBER: HB-01-304-11

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:60,000 when printed at 8.5x11

FIGURE C.1-5 HISTORICAL BENTHIC INVERTEBRATE SAMPLING LOCATIONS, HOPE BAY AQUATIC EFFECTS MONITORING PROGRAM, 1996 TO 2025



ERM

CLIENT: AGNICO EAGLE MINES LIMITED
GIS NUMBER: HB-01-304-12

DATE: 11 March 2026

PROJECTION: NAD 1983 UTM Zone 13N
SCALE: 1:60,000 when printed at 8.5x11

C.2 STATISTICAL METHODS FOR EVALUATION OF EFFECTS

Statistical analyses were completed for water quality, sediment quality, phytoplankton biomass, and benthic invertebrate variables in 2025. The analyses investigated whether a statistically significant change through time was present for the evaluated AEMP components. This statistical analysis supports the evaluation of effects and the determination of whether Project-related effects are present for a given variable or lake.

Unless there were limitations of the dataset due to censored values (Section 2.1.1), either a temporal trend analysis (Section C.2.2) or a before-after/control-impact (BACI) analysis (Section C.2.3) was used to assess the AEMP data. However, statistical assessments are not conclusive evidence of a Project-related effect. Graphical analyses and professional judgment are used in conjunction with the results of the statistical analyses to determine an effect. The results of the statistical analyses were plotted with the observed data to support the evaluation of effects (Sections C.2.4 and C.3).

Statistical analysis can result in a type I error (finding a significant effect where an effect is not present, i.e., false positive) or a type II error (failing to find a significant effect where an effect is present, i.e., false negative). In the context of environmental monitoring, a false positive is a preferred outcome to a false negative. There is a direct trade-off between the two error rates, as reducing one type of error generally increases the other type of error. No correction for the large number of statistical tests was applied to the false positive (type I) error rate. Therefore, there may be false positives in the analyses that were conducted, which is a conservative and environmentally protective approach. The unadjusted type I error rate (or significance level) was set to 0.05 for this AEMP, indicating that statistical results will show a significant effect (i.e., p value of < 0.05) approximately 5% of the time by random chance where an effect is not actually present.

C.2.1 CENSORED DATA

Censored data refers to the concentration of a measured variable that is reported as being below a specified detection limit. Although the actual concentration is not known, these values are often set to one-half the DL for data analyses (REF). If data have a sufficient number of censored values, it may not be feasible to conduct the analysis without having the statistical analyses create a biased result.

If all data in the current assessment year were below the analytical detection limit (DL), no statistical analysis was performed for that variable or lake. If a large amount of data (> 50% of the dataset) for any variable were below the DL for a lake, that lake was removed from the analyses. In cases where the reference lake data were removed, it was not possible to make comparisons between exposure and reference lakes, and inference about the exposure lake was based on the within-lake regression analysis and plots of the observed data when required.

A Tobit analysis was used if more than 10% of observations from a site were censored.
If censored data were included in the analyses, the data were set to half the DL unless indicated differently for a specific analysis method (Sections C.2.2 and C.2.3).

C.2.2 TEMPORAL TREND ANALYSIS

Regression models were used to assess data from lakes with 10 or more years of continuous historical data available for the majority of variables. The regression model examined temporal trends over the monitoring period and was applicable to Doris Lake for the 2025 Hope Bay AEMP. Hypothesis tests were conducted to assess temporal trends for variables. If there was a significant change over time (i.e., relative to a slope of zero), then the trend in the exposure lake (Doris Lake) was compared to the trend in the reference lake (Reference Lake B). Three or more comparable sampling years were required to compare a variable between exposure and reference lakes. Only the years in which both lakes were sampled were included in the analysis. All the observed and fitted data are presented graphically to support the interpretation of results (Section C.3).

Temporal effects were modelled using natural cubic regression spline curves to allow for nonlinearity. The first step of the regression analysis was to determine whether there was evidence of a change in a variable over time (i.e., is the fitted spline curve significantly different from no trend or a slope of zero). Note that the statistical result does not provide any information about the direction of the trend (e.g., increasing or decreasing). If the first step of the analysis determined that there was evidence of a significant change in a variable over time in the exposure lake (i.e., the trend was significantly different from zero), the variable was carried forward to the second step. The second step of the statistical analysis compared the exposure lake trend to the trend in the reference lake. This second step included modelling only the data for monitoring years in the exposure lake that align with monitoring in the reference lake.

Either linear mixed effects (LME) or Tobit regression analyses were applied to the data, depending on the fraction of samples that were less than the DL (censored). Tobit regression was used when a moderate amount of data (between 10 and 50%) from a given lake were below the DL. Tobit models account for the fact that each censored measurement ranges between zero and the DL to predict the estimated range for the mean in a given lake and year (as well as accounting for depth and season, if applicable). This interval was used in the Tobit regression analysis.

C.2.2.1 LINEAR MIXED EFFECTS REGRESSION

Model Form

The model fitted to the data have the basic regression model form as follows:

$$y = Lake + Season + Lake * Season * s(Year) + Depth\ Zone$$

where:

- y denotes a variable of interest, and
- $y_i(x)$ is an observation from lake *i* in year x.

The mean level of a variable is modelled with separate intercepts and time effects *s*(Year), for each lake and each season (under-ice and open-water).

Separate intercepts allowed for differences in the initial values of the variable between lakes and seasons. Temporal effects were modelled using natural cubic regression splines. Cubic regression splines consist of separate cubic polynomial segments connected at certain points, usually selected based on quantiles, and continuous up-to-the-second derivatives (i.e., where the slope changes). Natural cubic splines, which are a specific type of cubic splines, are linear beyond the range of the observed data. The advantage of using regression splines over linear and quadratic effects is improved flexibility in capturing fluctuations in the data where a quadratic relationship appears inadequate. Regression splines are an extension of linear and quadratic effects where, instead of representing an effect x with x and x^2, they employ functions of x, known as basis functions, to describe these effects.

Mathematically, the regression model can be written as:

$$E[y_{im}(x)] = \beta_{0im} + \sum_{n=1}^{K} \beta_{kim} h_k(x)$$

where:

- $E[y_i(x)]$ represents the expected mean value of the variable in lake *i* and season *m* in year *x*;
- β_{0im} represents the intercept for lake *i* and season *m*;
- β_{kim} represents the basis coefficients for lake *i* and season *m*; and
- $\{h_k\}$ are known functions called basis functions.

The regression model is linear in the new variables, $h_k(x)$, and usual LME or Tobit approaches for model fitting and inference may be used. The splines are represented as linear combinations of basis functions evaluated at *x* and the number of basis functions is dependent on the number of knots (*K*) chosen. The number of knots chosen was four for variables with 10 years of data and five for variables with more than 10 years of data. Plots of the fitted curves were used to assess the adequacy of the number of knots and to avoid over- or under-fitting the data.

Pseudoreplication

For water quality variables, the mean was calculated from all observations that corresponded to the same combination of lake, year, season, and depth zone. Since comparisons were conducted across years and across lakes, using the mean value from the lake had little effect on the tests of interest. For phytoplankton biomass, the mean was calculated using observations from the same lake on the same sampling date. If a sample result was less the DL, half the DL was substituted for calculating the mean.

Random Variation

Random sources of variation can affect variable measurements. Potential sources of variability include environmental factors affecting all lakes equally in a given year, sampling variation that affects samples taken from a lake in a single year, and true measurement errors from laboratory analysis. The main sources of variation can be broken down into two components: yearly effects that affect the measurements in all lakes and effects that affect each lake individually.
Random effects are included in the LME model to account for these sources of variation. The final model of the mean variable value observed in lake *i* and season *m* in year *x* becomes:

*y = Lake + Season + Lake*Season*s(Year) + Depth Zone + Year-R + Error-R* or mathematically:

$$y_{im}(x) = \beta_{0im} + \sum_{k=1}^{K} \beta_{kim} h_k(x) + \varepsilon_x + \varepsilon_{ix}$$

where ε_x and ε_{ix} represent random variables that affect all lakes identically in year *x*, and those that only affect lake *i*, respectively. These random variables are assumed to follow normal distributions with zero mean and variance σ_x^2 and σ_{ix}^2, respectively.

Assessing Model Fit and Outliers

The goodness-of-fit of the regression models was examined through plots of the residuals. Let $\widehat{y_i}(x)$ denote the fitted value for lake *i* in year *x*, defined as:

$$\widehat{y_{im}}(x) = \hat{\beta}_{0im} + \sum_{k=1}^{K} \hat{\beta}_{kim} h_k(x) + \varepsilon_x + \varepsilon_{ix}$$

The residual for each observation, denoted e_{ix}, is the difference between the fitted and observed values:

$$e_{ix} = y_i(x) - \widehat{y_i}(x)$$

The residuals estimate the true error or unexplained variation for lake *i* in year *x.* The key assumption is that the true errors are normally distributed with equal variance. That is, the residuals are normally distributed, and their variance does not depend on either lake or year. Normal quantile-quantile (QQ) plots were used to assess the distribution of residuals for each fitted model. Plots of the residuals by year and against the fitted values were used to assess homogeneity of variance over time and across values of the variable. A common deviation from this assumption is that variance increases as the value of the variable increases since values tend to vary more at larger scales. A natural logarithm transformation was use (when required) to smooth the variance which improves the probability of fulfilling the assumption of normally distributed residuals. Standardized residuals greater than three were identified as outliers and flagged to provide some caution during interpretation of results, but data were not removed from the analysis.

C.2.2.2 TOBIT REGRESSION

Often values below the DL are replaced with half the DL value and statistical analyses are performed as if the value is actually observed. Results from this type of analysis can be misleading, particularly when the DLs are not consistent from year to year. For example, if all observations for a given variable in one lake have been below the DL in every year but the DL for that variable has consistently decreased (perhaps due to improving technology), then the imputed observations will appear to decrease over time. There is no real information to conclude if the value is increasing, decreasing, or remaining constant. Further, replacing these values with half of the DL ignores any uncertainty in these observations and the analysis will tend to underestimate the standard deviation (SD) of the variables.

Model Form

Tobit regression accounts for the censoring below the DL. In a maximum likelihood analysis of a standard regression model (as above), the likelihood contribution of a single observation *y* given the covariates $x_1, \ldots, x_p$ and a single error term $\varepsilon \sim N(0, \sigma^2)$ is:

$$L(y) = (2\pi\sigma^2)^{-1/2} \exp\left(\frac{-1}{2\sigma^2}\left(y - \sum_{i=1}^{p}\beta_i x_i\right)^2\right)$$

which is simply a normal probability density function of an observation, *y*, with mean $\sum \beta_i x_i$ and variance σ^2 .

In the case where *y* is censored and is only known to lie in the interval (*a,b*), Tobit regression replaces the likelihood contribution with the integrated density:

$$L(y) = \int_a^b \exp\left(\frac{-1}{2\sigma^2}\left(y - \sum_{i=1}^{p}\beta_i x_i\right)^2\right) dy = \Phi\left(\frac{b - \sum_{i=1}^{p}\beta_i x_i}{\sigma}\right) - \Phi\left(\frac{a - \sum_{i=1}^{p}\beta_i x_i}{\sigma}\right)$$

where $\Phi(x)$ is the standard normal cumulative distribution function. The likelihood can then be formed by multiplying the appropriate censored or uncensored contributions for each observation. Maximum likelihood inference can be conducted to compute variable estimates and their standard errors and to perform hypothesis tests (Tobin 1958).

Pseudoreplication

The same concern with pseudoreplication in the LME regression models exists in the Tobit regression. However, when values were censored it was not possible to mean the observations in each lake to obtain a single value for each year or season and a different solution was necessary. Suppose that observations $y_1, \ldots, y_{n1}$ and $y'_1, \ldots, y'_{n2}$ are available from a given lake in a given year where each y_i is known exactly and each y'_i is censored so that y'_i belongs to the interval (a_i, b_i). Given these observations, the sample mean, $\bar{y}$, was bounded such that:

$$a = \frac{\sum_{i=1}^{n_1} y_i + \sum_{i=1}^{n_2} a_i}{n_1 + n_2} < \bar{y} < \frac{\sum_{i=1}^{n_1} y_i + \sum_{i=1}^{n_2} b_i}{n_1 + n_2} = b$$

and Tobit regression was performed with (*a, b*) as the censoring interval for the sample mean. If all measurements are known exactly, then $n_2 = 0$ and $a = b = \bar{y}$.

C.2.2.3 HYPOTHESIS TESTING

Once the LME or Tobit regression models were fitted, hypothesis tests were performed by computing the chi-square statistics from the variance-covariance matrix of the relevant modelled contrast values (see subsection, Structure of Tests). This determined if there was evidence that the mean variable values in the exposure lake (*E*) had changed over time. If there was no evidence of change over time, differences were attributed to random variation. If there was evidence of change over time, the temporal trend at the exposure lake was compared to the reference lake (*R*) to determine if there was a parallel trend over time. For comparisons between exposure and reference lakes, only years in which both lakes were sampled were included in the analysis.

Test 1: Comparison Within Exposure Lake

The fitted pattern of means in the exposure lake were compared to a constant value to determine if there was evidence suggesting the mean value of the variable had changed over time.

The hypothesis of this test was:

$$H_0: \beta_{kE} = 0 \textit{ for } k = 1 \ldots K$$

$$H_a: \beta_{kE} \neq 0 \textit{ for at least one } k = 1 \ldots K$$

Rejection of the null hypothesis provides evidence that the mean variable value in the exposure lake changed over time and the analysis proceeded with Test 2. If the reference lake was removed from the analysis, then plots of the fitted and observed values were used to identify the changes.

Test 2: Comparison to Reference Lake

If there was sufficient evidence to suggest that the variable changed over time, the fitted patterns of means in the exposure lake were compared to the reference lake. Only years in which both lakes were sampled were included in this comparison.

The hypotheses of these tests were:

$$H_0: \beta_{kE} = \beta_{kR} \textit{ for } k = 1 \ldots K$$

$$H_a: \beta_{kE} \neq \beta_{kR} \textit{ for at least one } k = 1 \ldots K$$

Rejection of the null hypothesis provides evidence that the time trend in the mean variable value in the exposure lake differed from the time trend in the reference lake.

Structure of Tests

All the hypothesis tests were performed using Wald-type chi-square tests based on the normal approximation for maximum likelihood estimation. Each null hypothesis can be written as a matrix equation with the form $L'\beta = 0$, where *L′* denotes the vector of regression coefficients. The Wald theory then states that the quantity:

$$X^2 = (L'\hat{\beta})(L'\Sigma L)(\hat{\beta}'L)$$

is approximately distributed as a chi-square with degrees of freedom equal to the row rank of L, where $\hat{\beta}$ is the vector of maximum likelihood estimates and Σ is its estimated variance-covariance matrix. The *p*-values for the tests are computed from the upper-tail probabilities of this distribution.

C.2.3 BEFORE-AFTER/CONTROL-IMPACT ANALYSIS

There were fewer than 10 years of continuous historical data available for most variables in Patch Lake and Windy Lake, and with nonsequential years of collection. For these lakes, BACI analyses were used for evaluation of effects. The BACI analysis first consisted of a before-after analysis for an exposure lake. The before represents the baseline years and after represents the period where there may be potential influence from Project-related activities (e.g., construction and operations). If there was no significant difference between time periods for an exposure lake, the analysis was concluded. However, if there was a significant difference, the analysis proceeded to the second step: the control-impact analysis. The control-impact analysis compared the before-after trend at the exposure lake with the before-after trend at the reference lake and included only the years of data that were comparable. Each lake and evaluated variable were treated independently.

Data Transformations

Initial model assessment was carried out to determine if data transformation was appropriate. The approach was to compare the normalized residuals and model performance for the basic linear model using both untransformed and natural log-transformed data. Plots of standardized residuals, fitted values, and normal Q-Q plots were examined to establish the most appropriate choice of transformation. A data transformation was conducted if it produced a more uniform random distribution of residuals and a closer distribution along the 1:1 reference line on the Q-Q plot.

Outliers

The standardized residuals from the model fit were examined and outliers were identified as standardized residuals greater than three. Any outliers were flagged to provide some caution during interpretation of results but data were not removed from the model.

Model Form—Before-After Design

Regression models were constructed for each exposure site based on a *before-after* (BA) design. A model was constructed for each exposure lake and season. The models follow the general form given the following equation:

$$y = period + \textit{Year-R} + \textit{Error-R}$$

This model identifies variation associated with different components, where *period* describes the differences between the before and after periods, or mathematically as follows:

$$E[y_p] = \beta_0 + \beta_p$$

where

- $\mathrm{E}[y_p]$ represents the expected mean value of the variable in period *p*;
- β_0 represents the intercept; and
- β_p represents the expected difference in the variable between the before and after periods.

Model Form—Before-After/Control-Impact Design

The LME models were constructed for each exposure site based on a BACI design. The models follow the general form as follows:

$$y = lake\ class + period + lake\ class{:}\ period.$$

This model identifies variation associated with different components, where

- *lake class* describes the differences between the reference and exposure lakes;
- *period* describes the differences between the before and after periods across all lakes (reference and exposure); and
- *lake class:period* is the interaction term describing reference and exposure lake-specific differences between periods (the BACI term).

The *lake class:period* term is the key statistical term that describes differential changes to the exposure lake during the period of potential mine effects relative to changes at the reference lake.

Let $y_{i\,sc\,p}$ denote observation *i* at lake *sc* in period *p*, where period is before or after. The basic regression model specifies:

$$E\left(y_{i\,sc\,p}\right) = \beta_0 + \beta_{sc} + \beta_p + \beta_{sc:p}$$

where β_0 is the intercept, β_{sc} is the expected difference between reference and exposure lake effects, β_p is the expected period effect, and $\beta_{sc:p}$ is a vector of expected lake-specific period effects.

Pseudoreplication

All observations from the same lake and season were presented in the plots of the observed data and modelled values. Repeated observations from each lake in each season were collected from similar locations at similar times. Thus, the variability among these observations may not reflect the true variation between random replicates from the entire lake in the given season. Analyzing these measurements as independent observations may underestimate the true variability and lead to overly sensitive statistical tests. Thus, LME models were used to incorporate random effects for lake and year and improve modelling of error variance.

Random Variation

Random effects were included in the model to control for natural interannual variation (*year*) and natural lake-to-lake variation. Including random effects for lake, year, and the interaction between lake and year provided an adjustment for dependence among observations in a given season, at a specific lake, and in a given year.

The model can be represented as:

$$E\left(y_{isp}\right) = \beta_0 + \beta_{sc} + \beta_p + \beta_{sc:p} + \varepsilon_s + \varepsilon_y + \varepsilon_{s:y}$$

Where:

- β_0 is the intercept,
- β_{sc} is the expected value for lake class *sc*,

- β_p is the expected value for period *p*,
- $\beta_{sc:p}$ is the expected value for lake class *sc* in period *p*, and
- $\varepsilon_s + \varepsilon_y + \varepsilon_{s:y}$ are the predicted random component for lake *s* and year *y*.

C.2.3.1 HYPOTHESIS TESTING

Test 1: Before-After Analysis—Comparison Within Exposure Lake

A Project-related effect would be expected to result in a significant difference between the *before-after* change observed at the exposure site. The period term describes the change from the *before* period to the *after* period. For each exposure lake, the period effect was assessed using an F-test.

The hypothesis of this test was as follows:

$$H_0: \beta_p = 0$$

$$H_a: \beta_p \neq 0$$

If the *p*-value for this *period* hypothesis test was less than α = 0.05, then it was concluded that a significant difference between the before and after periods was observed in the exposure lake and the analysis proceeded to a BACI analysis.

Test 2: Before-After/Control-Impact Analysis—Comparison of Exposure and Reference Lake

A Project-related effect would be expected to result in a significant difference between the *before-after* change observed at the exposure and reference lakes. For BACI comparisons, only years in which both lakes were sampled were included in the analysis. The *lake class:period* term describes the lake class-specific variability in the change from the before period to the after period.

The hypothesis of this test was as follows:

$$H_0: \beta_{sc:p} = 0$$

$$H_a: \beta_{sc:p} \neq 0$$

For each exposure lake, the overall *site class:period* effect was assessed using an F-test. If the *p*-value for this *lake class:period* hypothesis test was less than α = 0.05, then it was concluded that a significant lake class-specific difference between the before and after periods was observed.

Confidence Intervals for Contrast Terms

The BACI contrasts (the subtraction of *before-after* difference of the reference lake from the *before-after* difference of the exposure lake) were calculated to compare the difference between the change at the exposure and reference lake. In this approach, any contrast substantially different from zero would represent a differential before/after effect between the exposure lake and the reference lake being contrasted. For the contrasts, 95% confidence intervals were calculated to support the interpretation and identification of statistically significant lake-specific differences. If the confidence interval for a contrast did not cover zero, it was concluded that a significant lake-specific difference between the *before* and *after* periods was observed between the exposure and reference lakes.

C.2.4 PLOTS OF OBSERVED AND FITTED VALUES

Plots of the observed and fitted values were used to visually assess and compare the values within and among lakes, and aid in the interpretation of the hypothesis test results. Observations below the DL were plotted at half the DL and indicated by a hollow symbol.

For the temporal trend analyses (Doris Lake) the fitted mean values were represented with curves and error bars represented the 95% confidence intervals for the model estimate of the annual mean. For the BACI analyses (Patch Lake and Windy Lake) the fitted mean for the before and after periods were represented with curves and error bars represented the 95% confidence intervals for the fitted period mean. If a significant difference was observed for the BACI analyses, the fitted mean of the reference lake was also plotted with error bars representing the 95% confidence intervals for the fitted period mean.

C.2.5 R CODE PACKAGES

All steps of the analysis were performed using the statistical computing package R version 4.5.2. The following versions of packages were used for the analyses:

- dplyr (1.1.4)
- stringr (1.5.2)
- tidyr (1.3.1)
- lubridate (1.9.4)
- ggplot2 (4.0.0)
- knitr (1.50)
- readxl (1.4.5)
- here (1.0.2)
- survival (3.8-3)
- lme4 (1.1-37)
- Matrix (1.7-4)

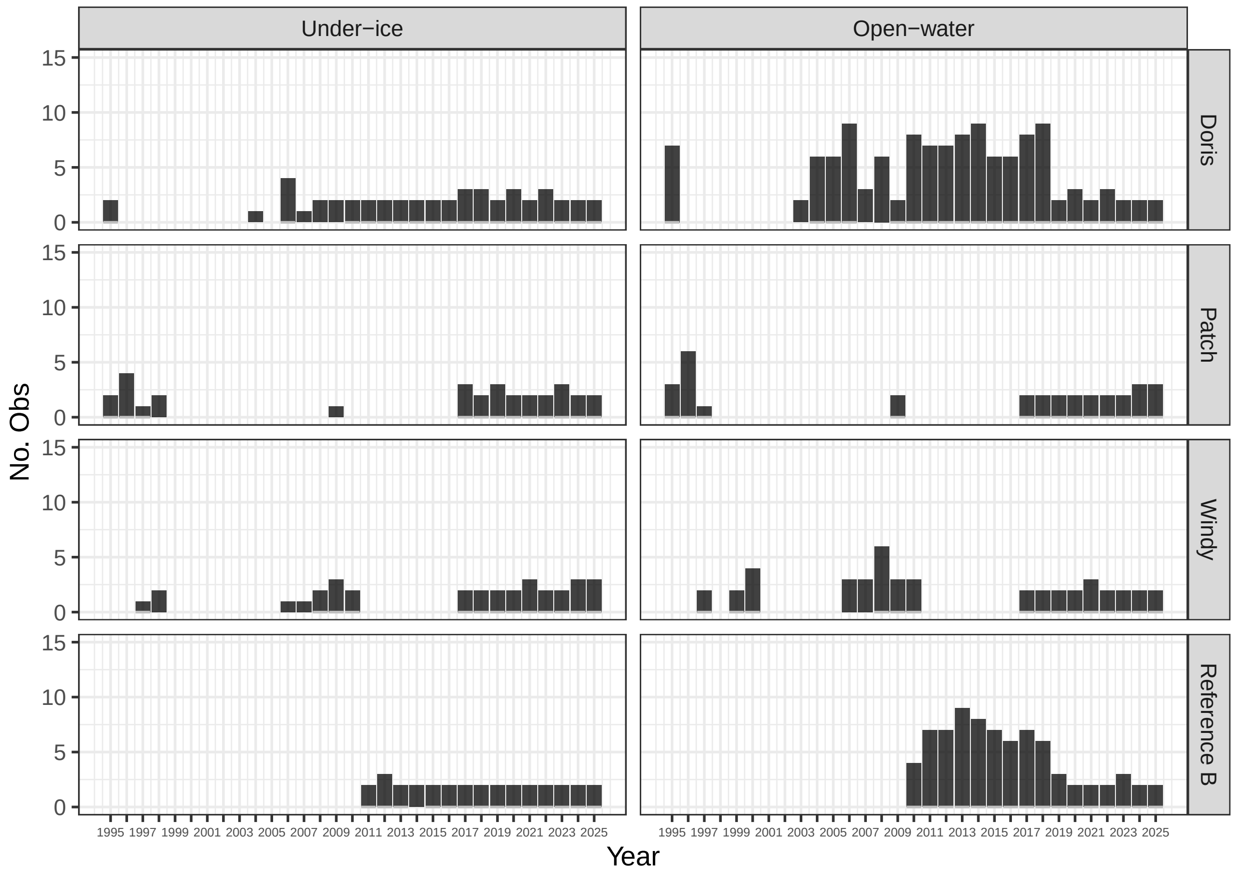
C.3 Statistical Results for Evaluation of Effects

C.3.1 Water Quality

C.3.1.1 pH

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

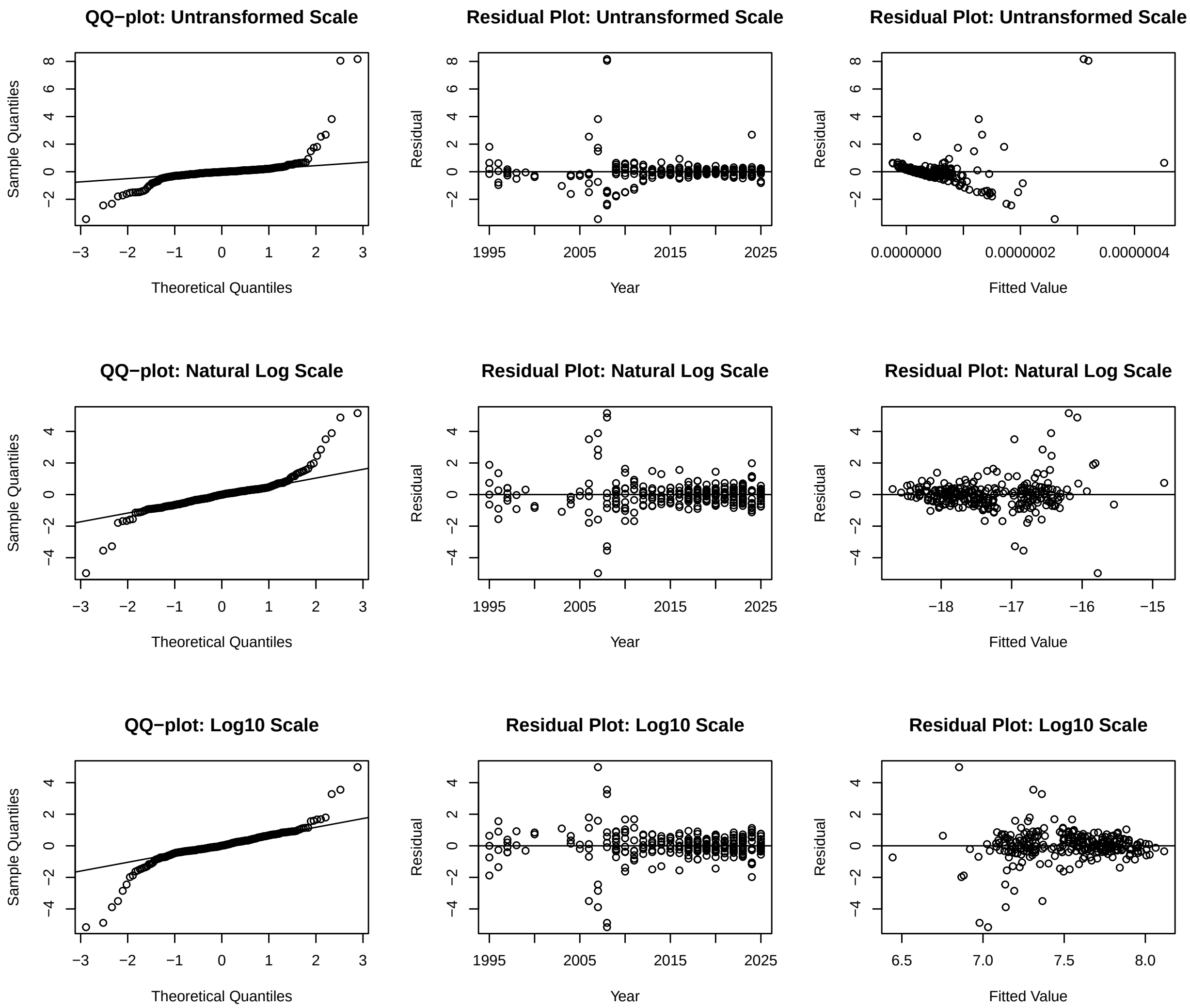
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	48	0	0	0
Doris	Open-water	125	0	0	0
Patch	Under-ice	31	0	0	0
Patch	Open-water	32	0	0	0
Reference B	Under-ice	31	0	0	0
Reference B	Open-water	77	0	0	0
Windy	Under-ice	33	0	0	0
Windy	Open-water	45	0	0	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2007	Under-ice	Surface	1.585e-08	0	-3.438
Doris	2008	Under-ice	Deep	8.913e-07	0	8.051
Doris	2008	Under-ice	Surface	8.913e-07	0	8.167
Windy	2007	Open-water	Deep	3.981e-07	0	3.816

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2007	Under-ice	Surface	1.585e-08	-15.779	-4.978
Doris	2008	Under-ice	Deep	8.913e-07	-16.069	4.880
Doris	2008	Under-ice	Surface	8.913e-07	-16.190	5.155
Windy	2006	Under-ice	Surface	1.995e-07	-16.962	3.501
Windy	2007	Open-water	Deep	3.981e-07	-16.441	3.889
Windy	2008	Open-water	Deep	1.033e-08	-16.832	-3.552
Windy	2008	Open-water	Surface	1.033e-08	-16.953	-3.277

Outliers on log10 scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2007	Under-ice	Surface	1.585e-08	6.853	4.978
Doris	2008	Under-ice	Deep	8.913e-07	6.979	-4.880
Doris	2008	Under-ice	Surface	8.913e-07	7.031	-5.155
Windy	2006	Under-ice	Surface	1.995e-07	7.366	-3.501
Windy	2007	Open-water	Deep	3.981e-07	7.140	-3.889
Windy	2008	Open-water	Deep	1.033e-08	7.310	3.552
Windy	2008	Open-water	Surface	1.033e-08	7.363	3.277

The log10 data meets residual assumptions better than the untransformed data. Analysis proceeds with log10 data since pH is in log base 10 units.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	16.84	4	0.00210	sig.
Compare to Reference B	2.67	4	0.61450	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Doris Open-Water

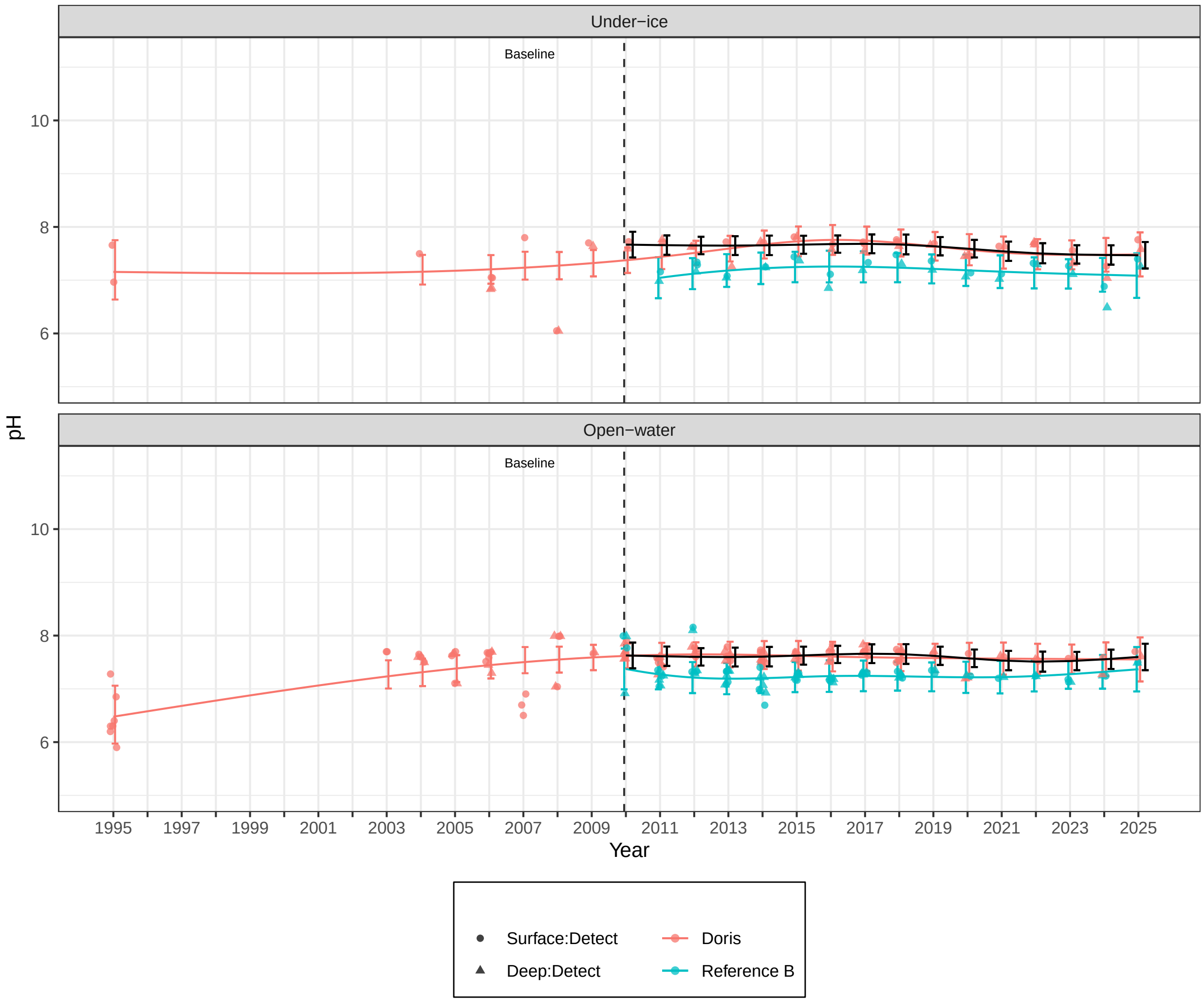
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	23.584	4	0.00010	sig.
Compare to Reference B	10.116	4	0.03850	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

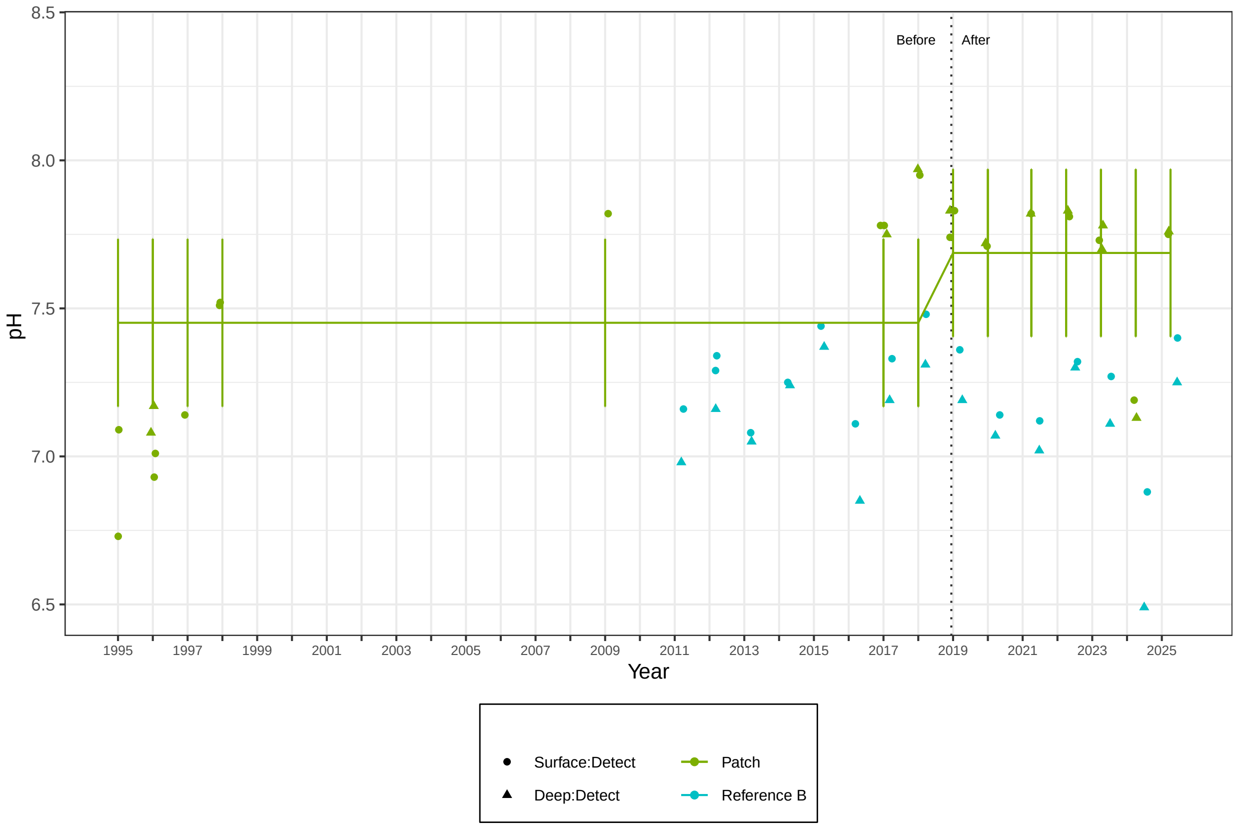
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.2359	0.1838	12	1.284	0.2235	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

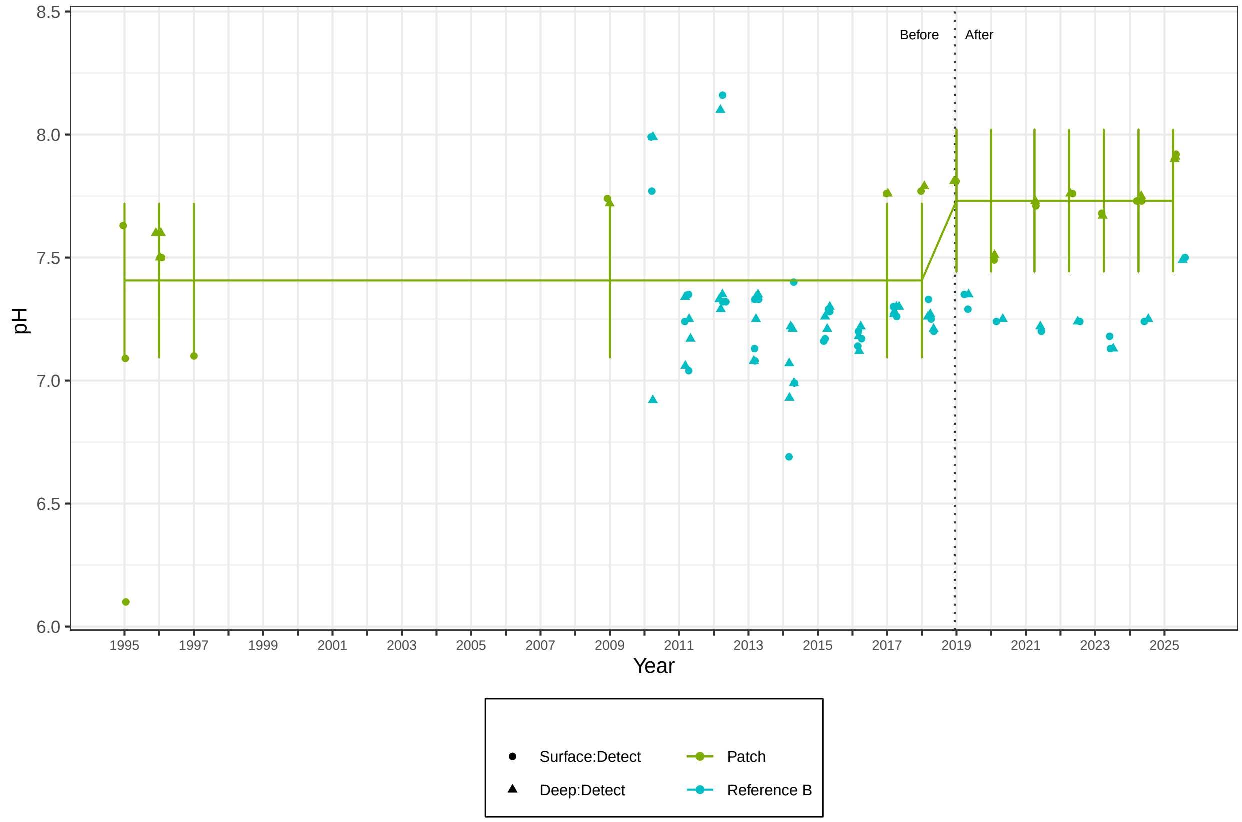
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.3242	0.1944	10.98	1.668	0.1236	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

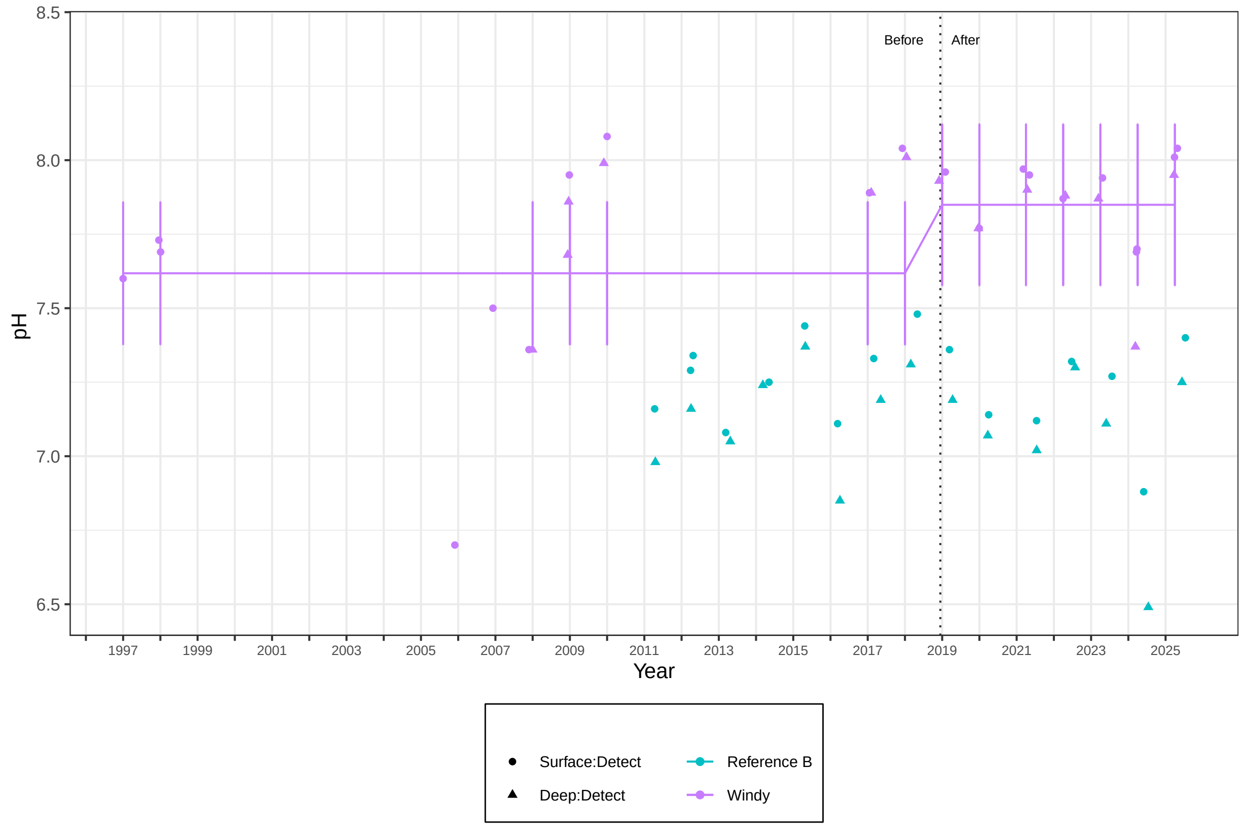
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.2313	0.1701	13.78	1.359	0.1959	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

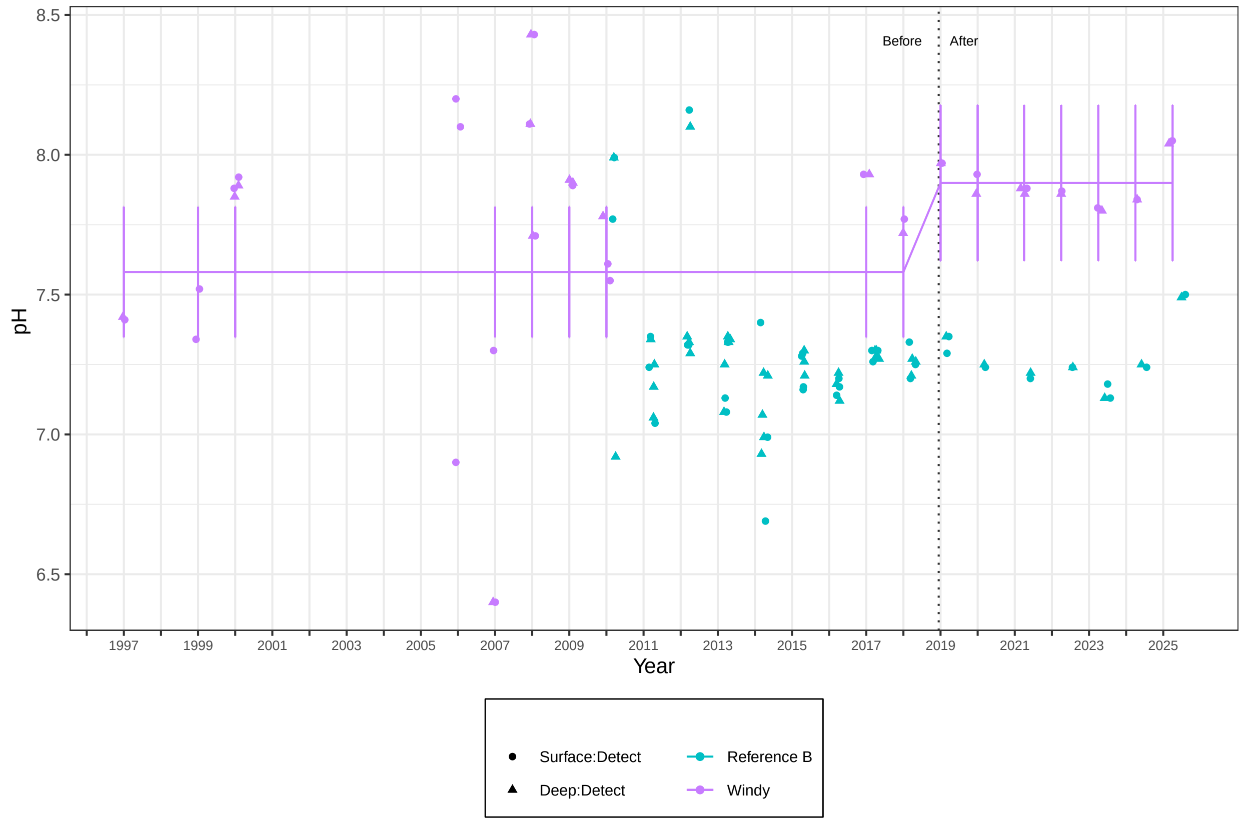
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.3186	0.1705	15.02	1.868	0.0814	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

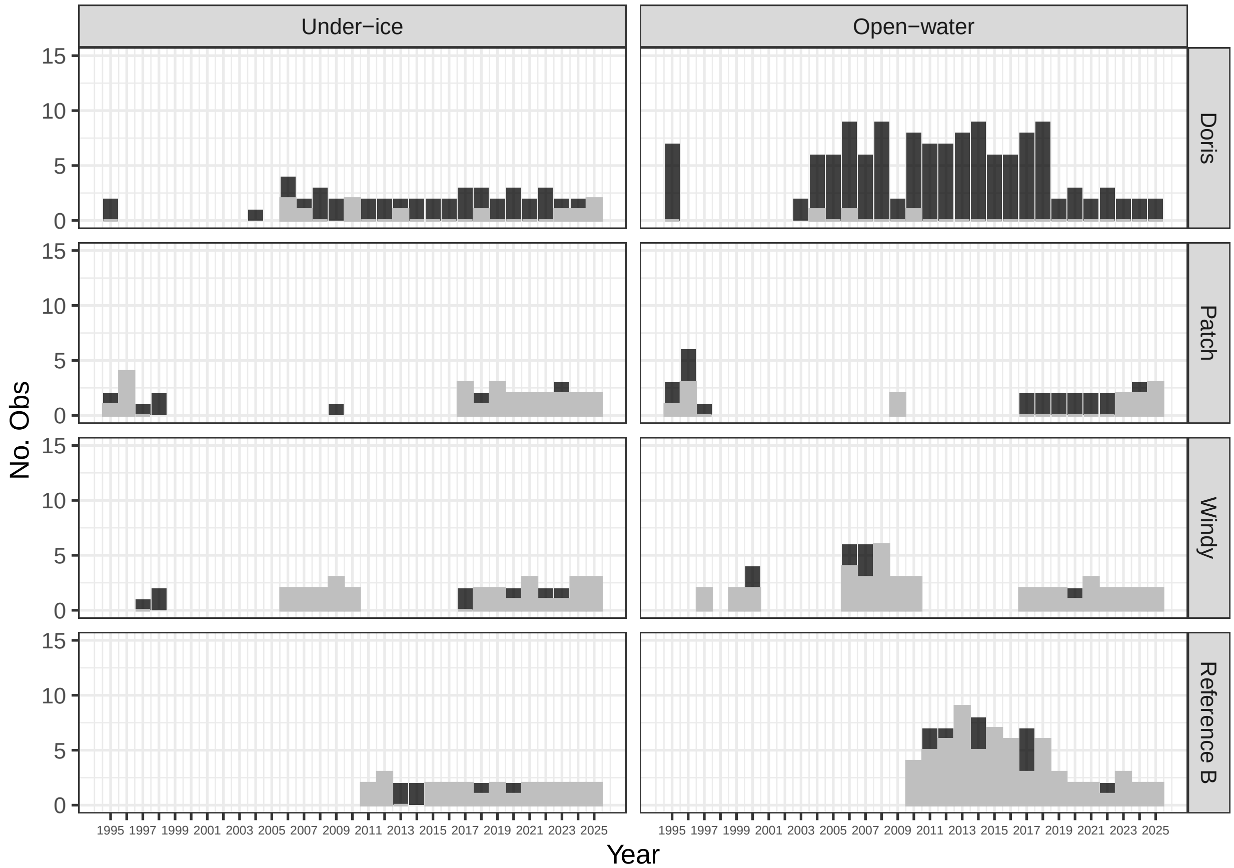
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


8.5
8.0
7.5
7.0
6.5
pH
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Surface:Detect
Deep:Detect
Reference B
Windy

C.3.1.2 Total Suspended Solids

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

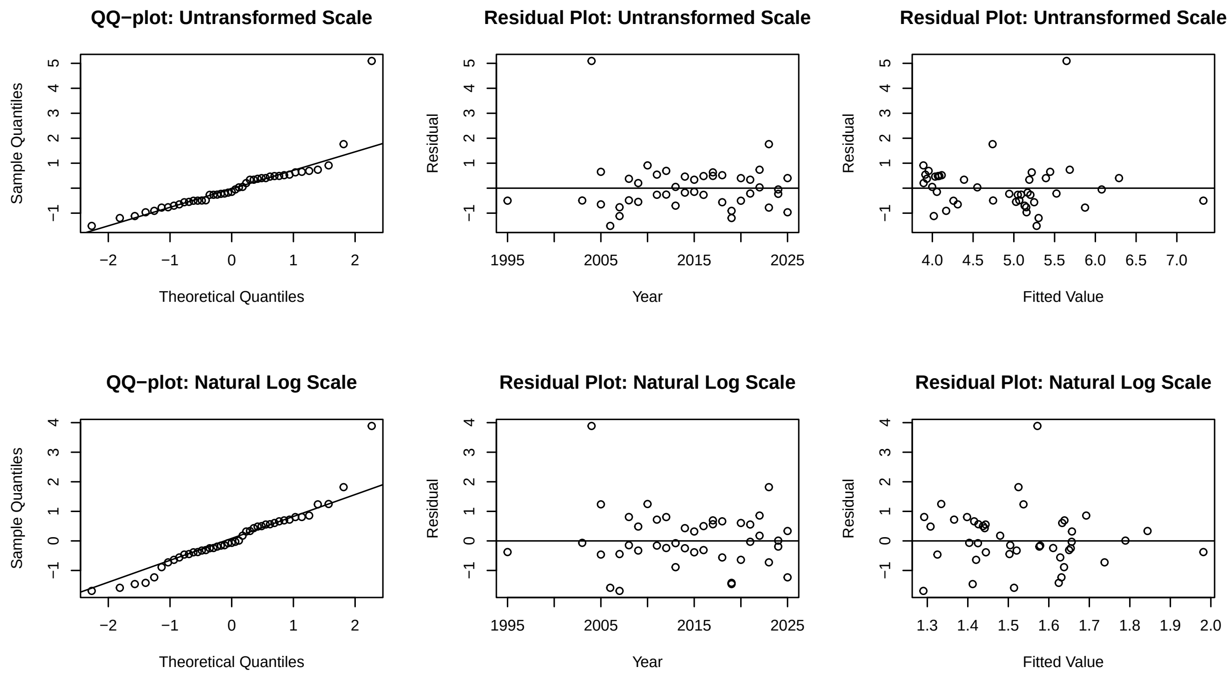
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	50	12	24	100
Doris	Open-water	131	3	2	0
Patch	Under-ice	31	26	84	100
Patch	Open-water	32	13	41	100
Reference B	Under-ice	31	27	87	100
Reference B	Open-water	77	66	86	100
Windy	Under-ice	35	28	80	100
Windy	Open-water	51	43	84	100

More than 50% of data was under detection limit in Doris North Under-ice, Patch Under-ice, Patch Open-water, Reference B Under-ice, Reference B Open-water, Windy Under-ice, and Windy Open-water. Data from those site-season groupings will be removed from the analysis. Doris North Under-ice and Patch

Open-water exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Open-water	Deep	13.33	5.647	5.095

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Open-water	Deep	13.33	1.572	3.888

The natural log transformed model better meets the residual assumptions. Analysis proceeds with natural log transformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

All data from Doris under-ice removed from the analysis. No analysis performed.

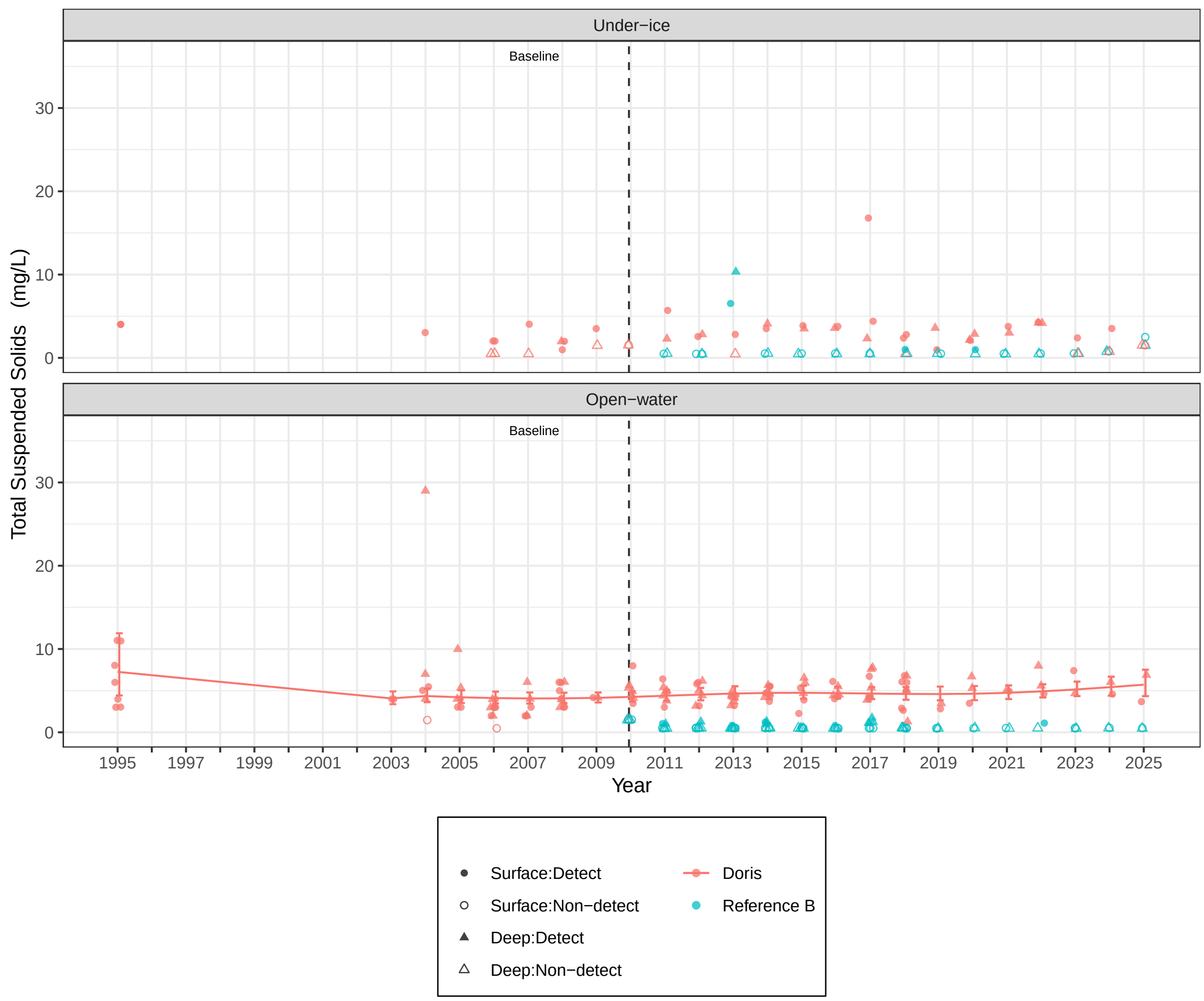
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	6.981	3	0.07250	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis Analysis was not performed.

Patch Open-Water Before-After Analysis Analysis was not performed.

Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

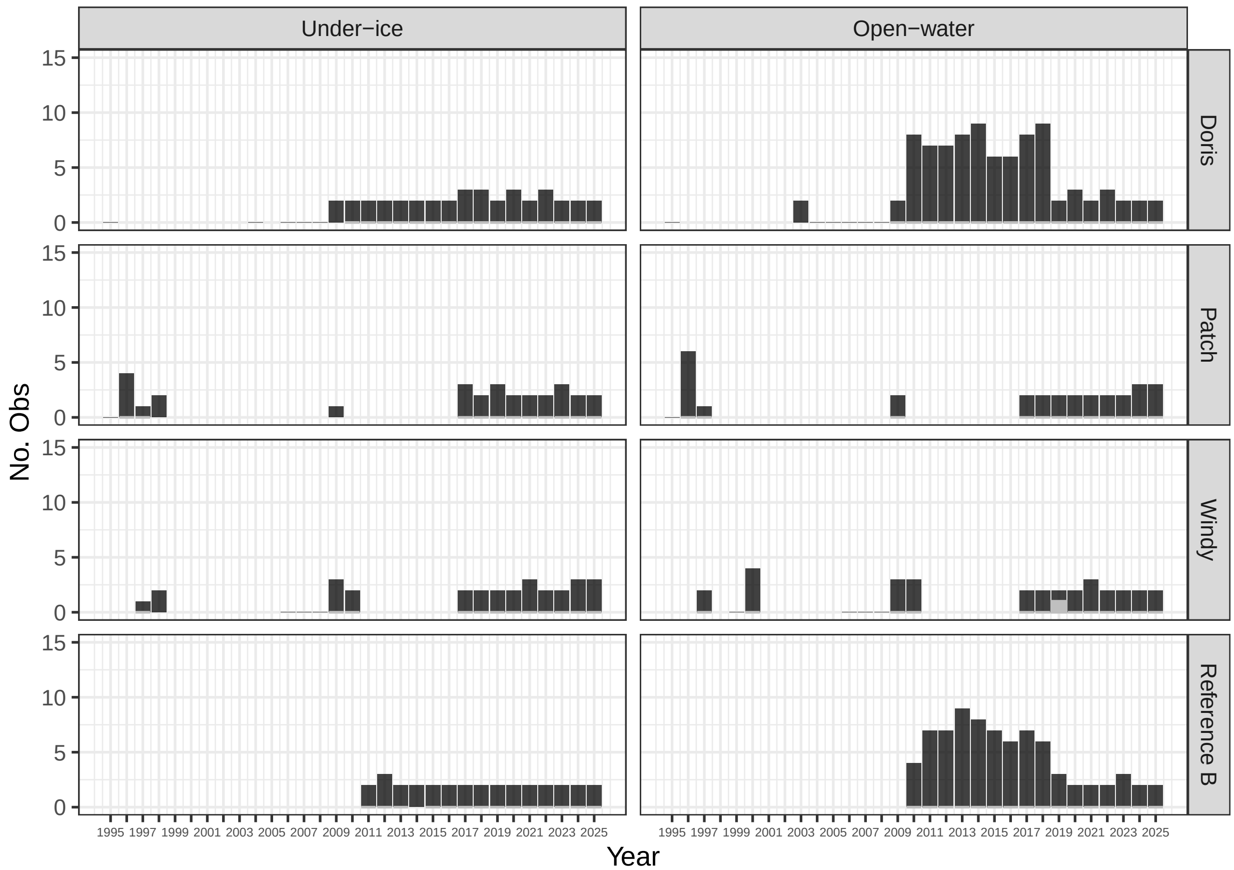
Windy Under-Ice Before-After Analysis Analysis was not performed.

Windy Open-water Before-After Analysis Analysis was not performed.

C.3.1.3 Turbidity

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

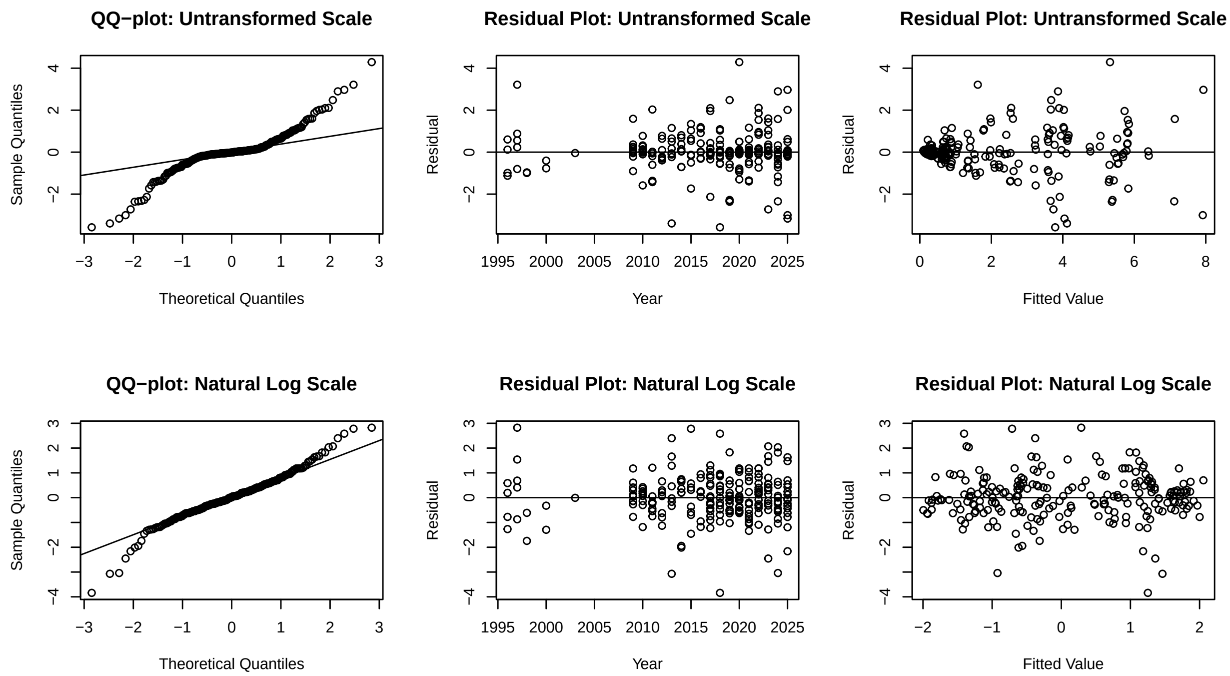
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	38	0	0	0
Doris	Open-water	88	0	0	0
Patch	Under-ice	29	0	0	0
Patch	Open-water	29	0	0	0
Reference B	Under-ice	31	0	0	0
Reference B	Open-water	77	0	0	0
Windy	Under-ice	29	0	0	0
Windy	Open-water	31	1	3	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2013	Under-ice	Deep	1.18	4.117	-3.396
Doris	2018	Under-ice	Deep	0.69	3.787	-3.581
Doris	2020	Open-water	Deep	9.03	5.321	4.289
Doris	2025	Under-ice	Deep	1.31	4.047	-3.165
Doris	2025	Open-water	Surface	5.32	7.916	-3.002
Patch	1997	Under-ice	Surface	4.40	1.621	3.213

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2013	Under-ice	Deep	1.18	1.463	-3.071
Doris	2018	Under-ice	Deep	0.69	1.252	-3.841
Windy	2024	Under-ice	Surface	0.11	-0.922	-3.040

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. However, there were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	2.296	4	0.68160	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

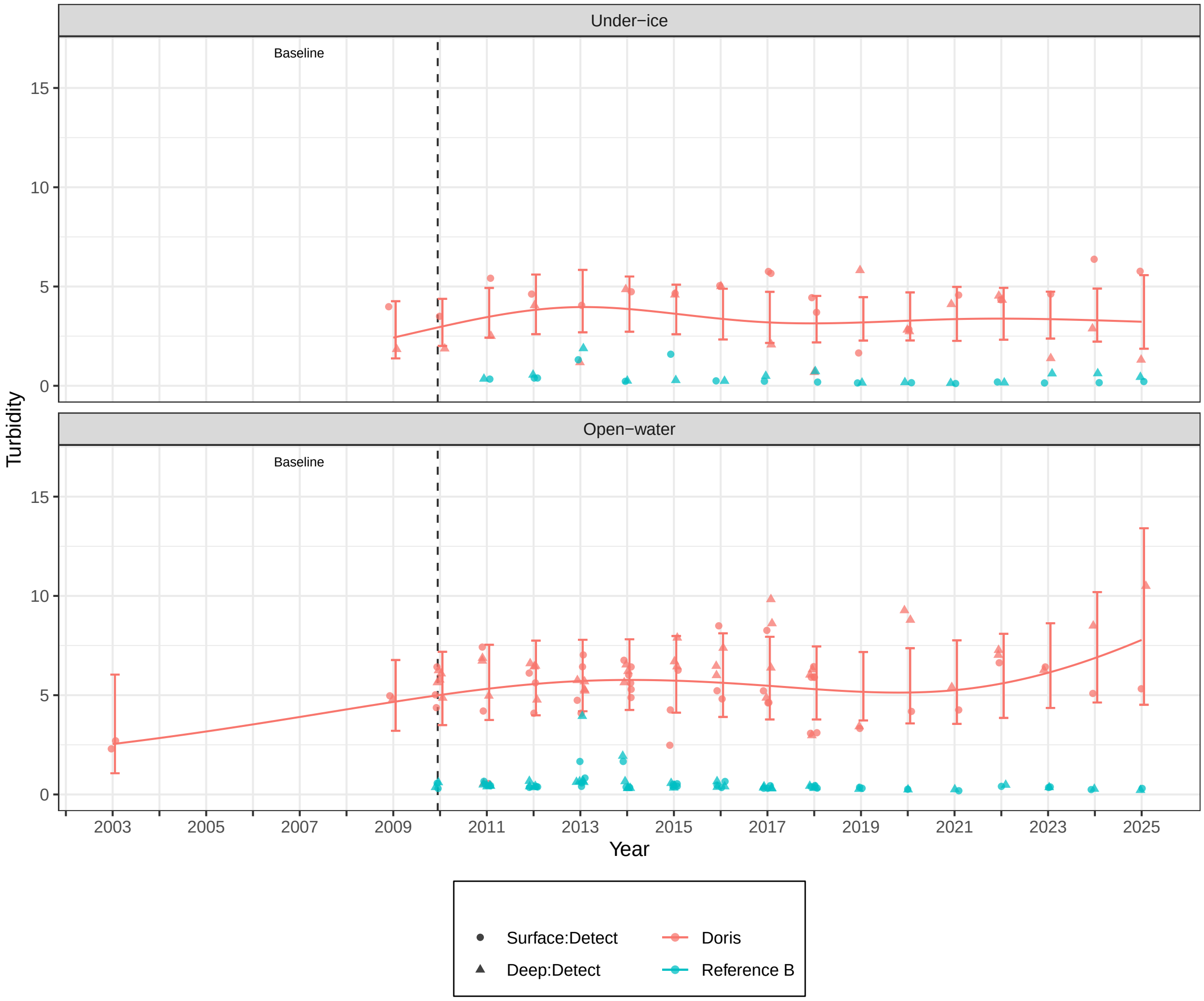
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	6.004	4	0.19890	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

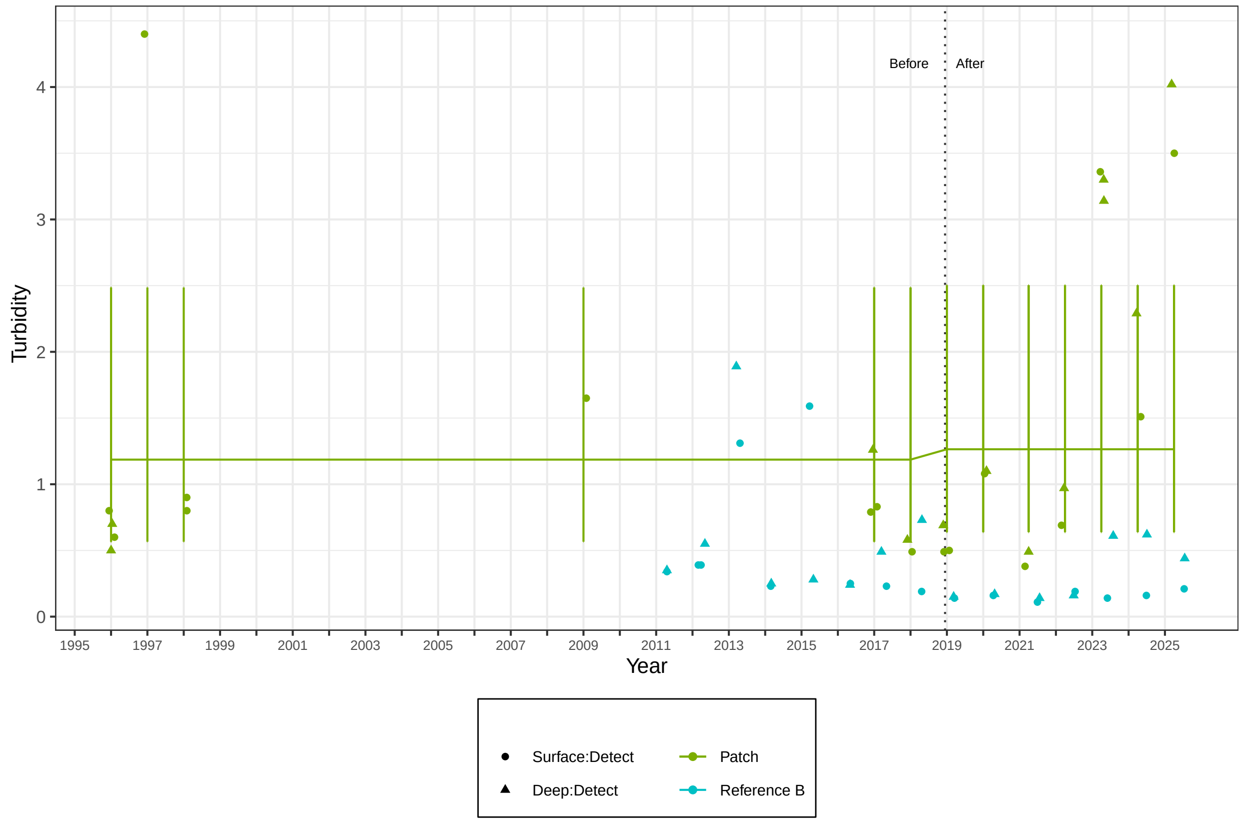
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0638	0.4578	11.01	0.1394	0.8917	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

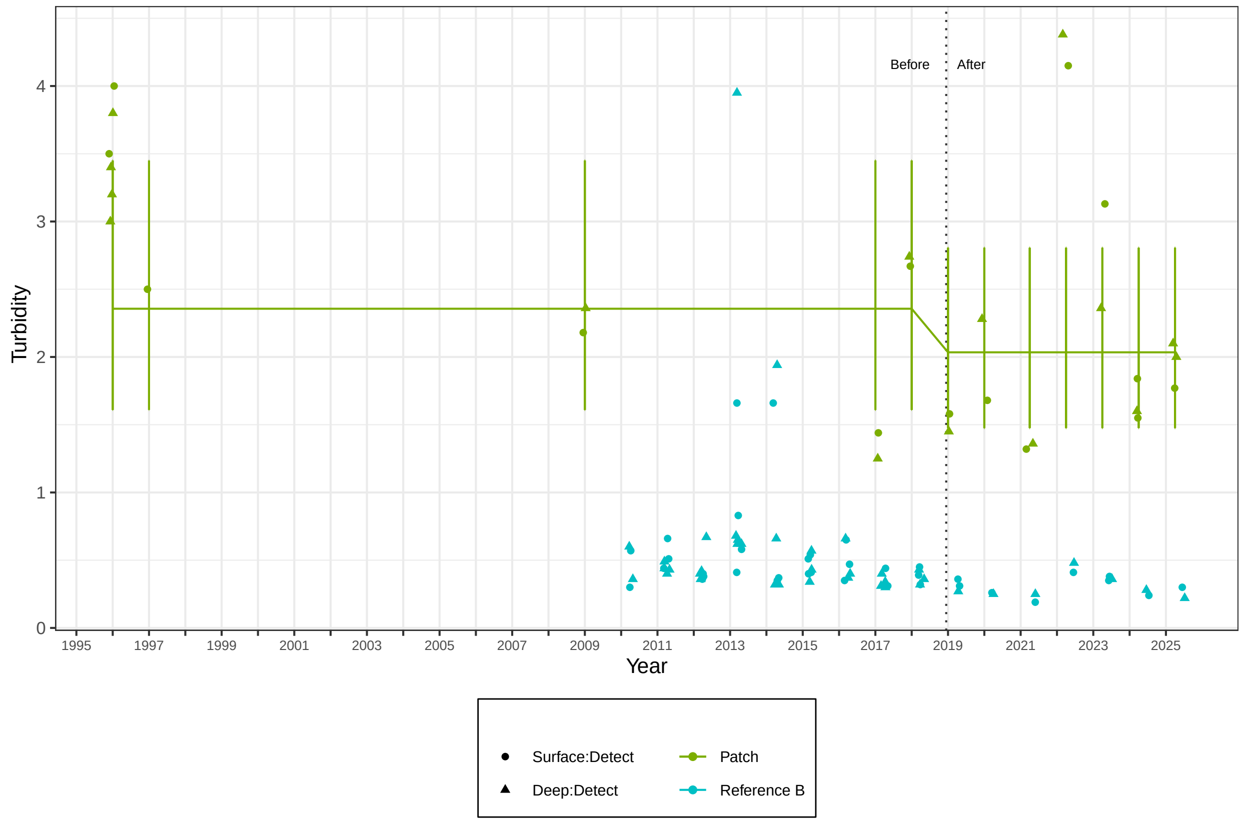
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.1468	0.224	10.1	-0.6553	0.5269	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

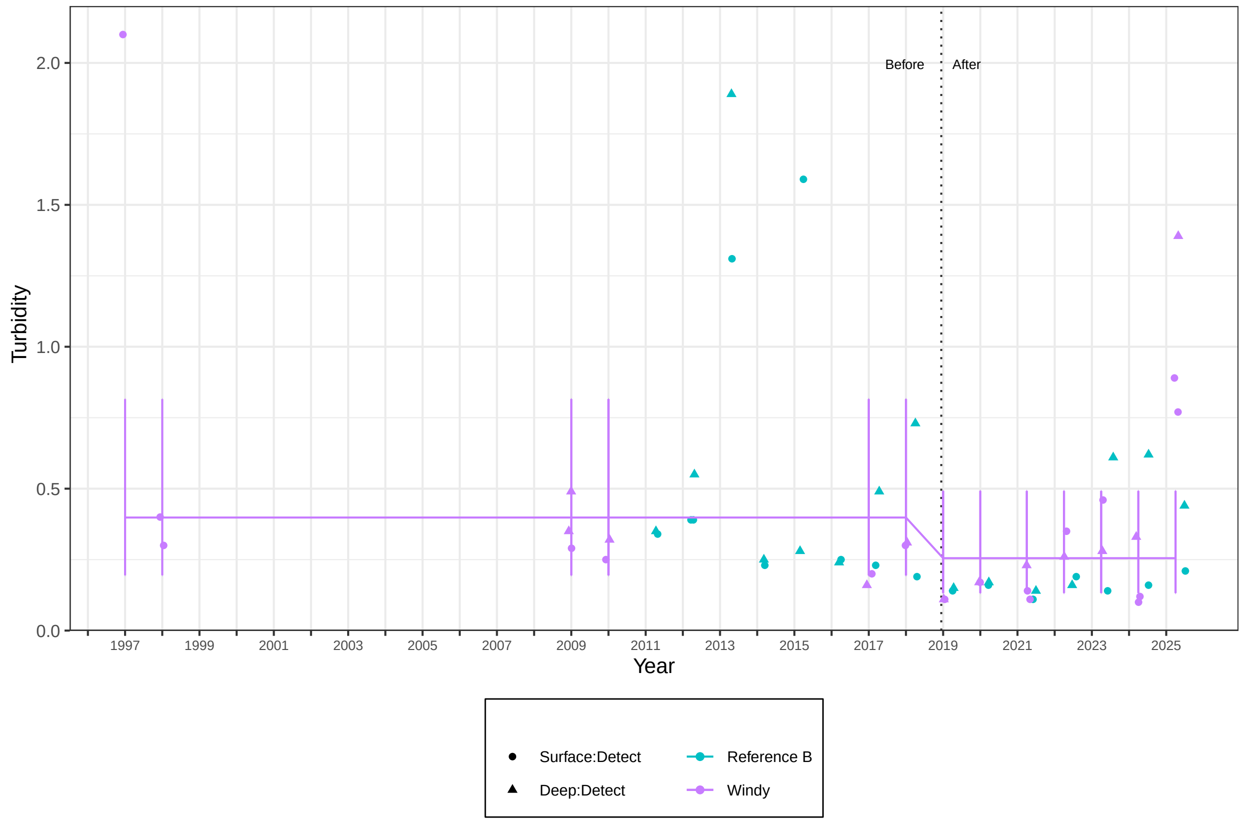
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.4458	0.4418	10.58	-1.009	0.3355	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

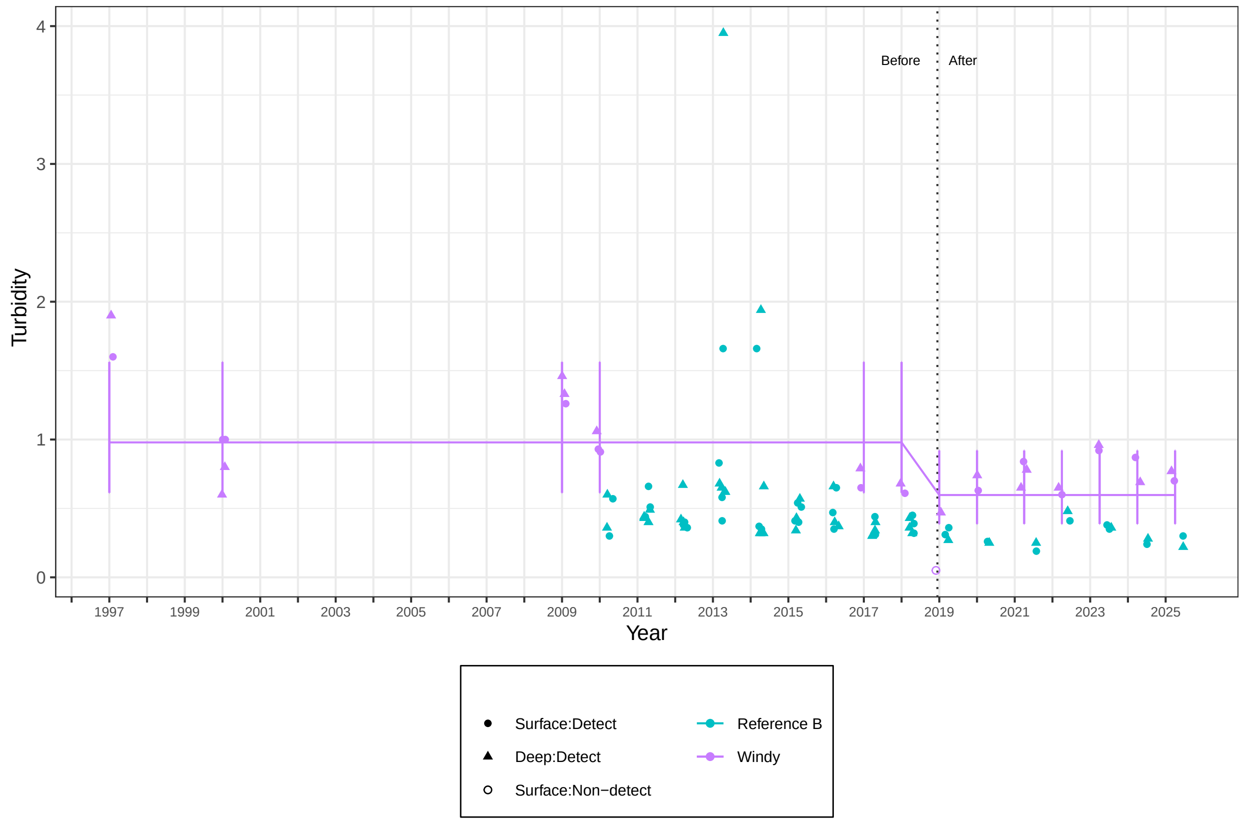
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.4945	0.2894	11	-1.709	0.1155	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

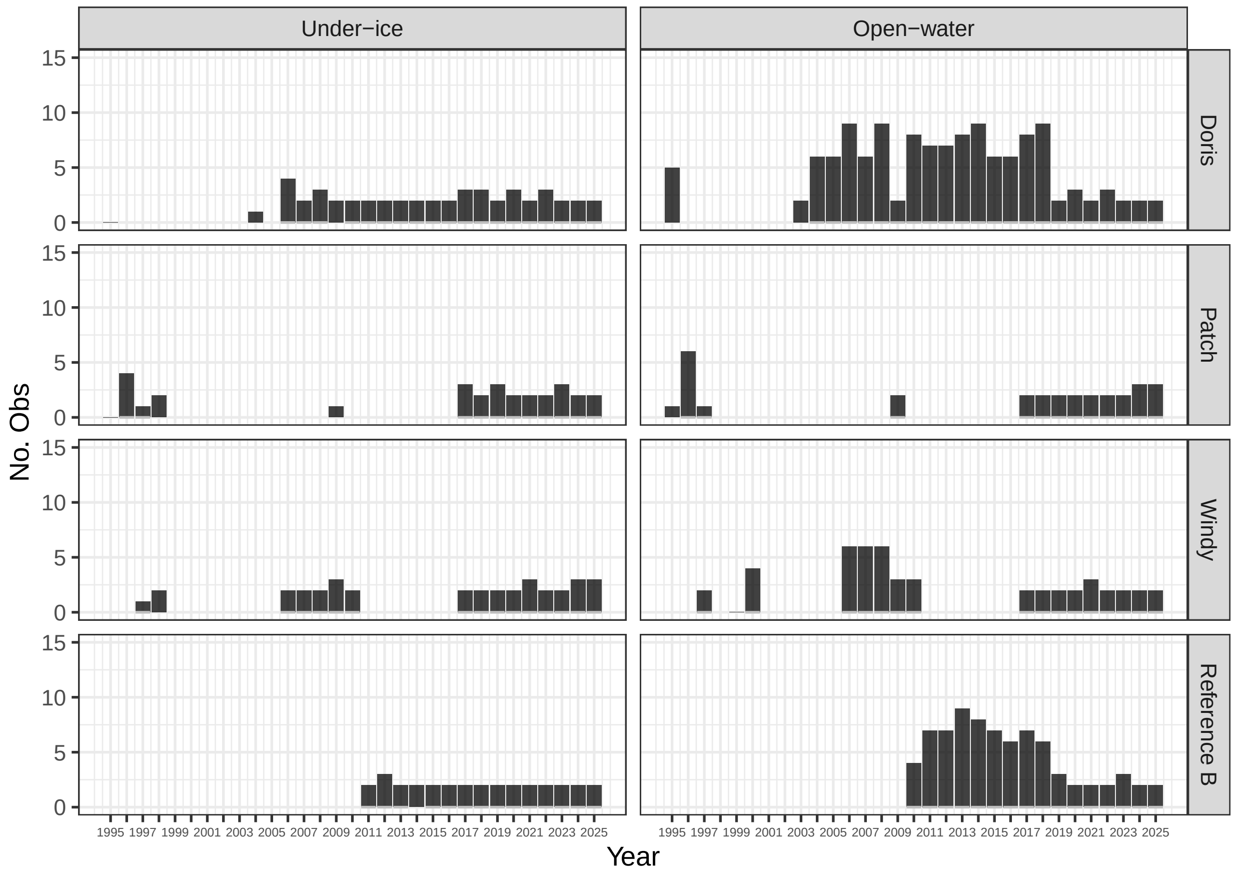
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Turbidity
4
3
2
1
0
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Surface:Detect
Deep:Detect
Surface:Non−detect
Reference B
Windy

C.3.1.4 Chloride

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

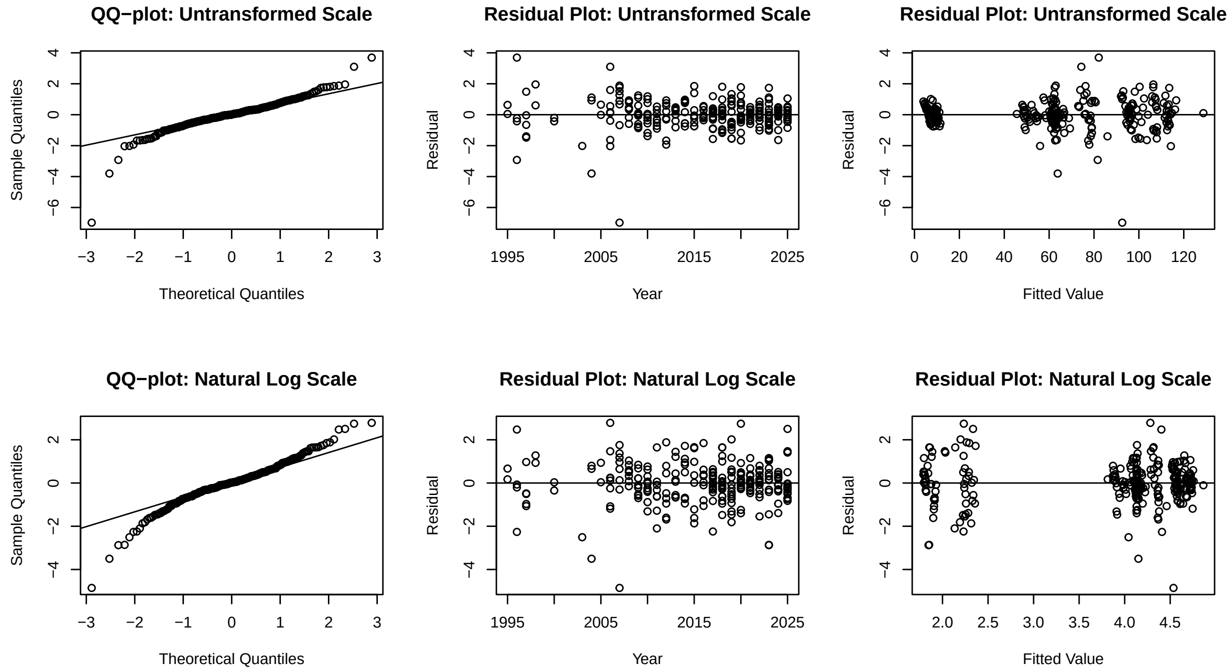
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	48	0	0	0
Doris	Open-water	129	0	0	0
Patch	Under-ice	29	0	0	0
Patch	Open-water	30	0	0	0
Reference B	Under-ice	31	0	0	0
Reference B	Open-water	77	0	0	0
Windy	Under-ice	35	0	0	0
Windy	Open-water	49	0	0	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Under-ice	Surface	54.00	63.81	-3.804
Doris	2006	Under-ice	Deep	82.35	74.35	3.099
Patch	1996	Under-ice	Deep	91.65	82.12	3.693
Windy	2007	Open-water	Surface	74.57	92.58	-6.980

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Under-ice	Surface	54.00	4.151	-3.503
Windy	2007	Open-water	Surface	74.57	4.536	-4.854

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. However, there was an outlier retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	125.99	4	<0.00001	sig.
Compare to Reference B	80.68	4	<0.00001	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Doris Open-Water

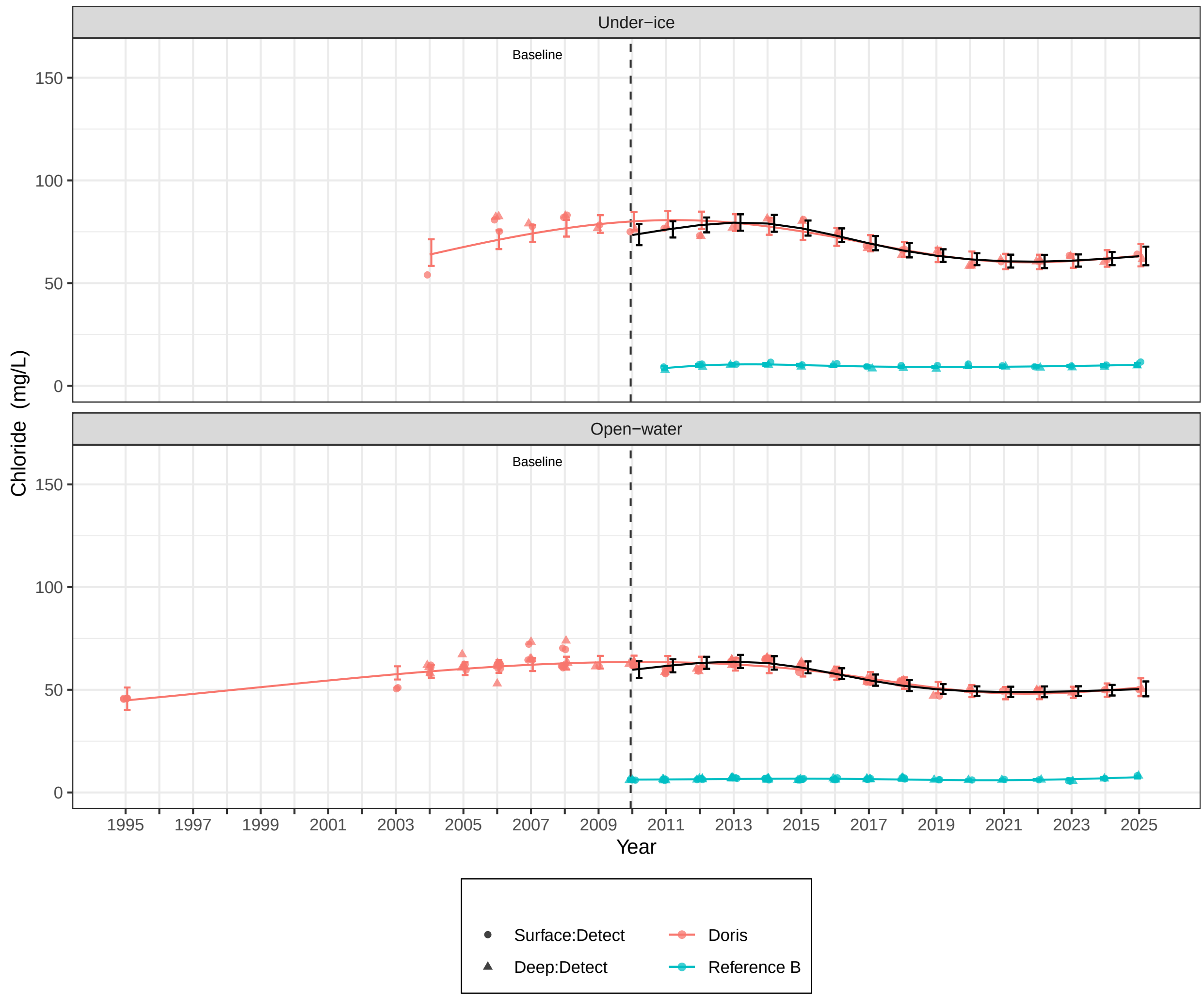
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	140.8	4	<0.00001	sig.
Compare to Reference B	105.7	4	<0.00001	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

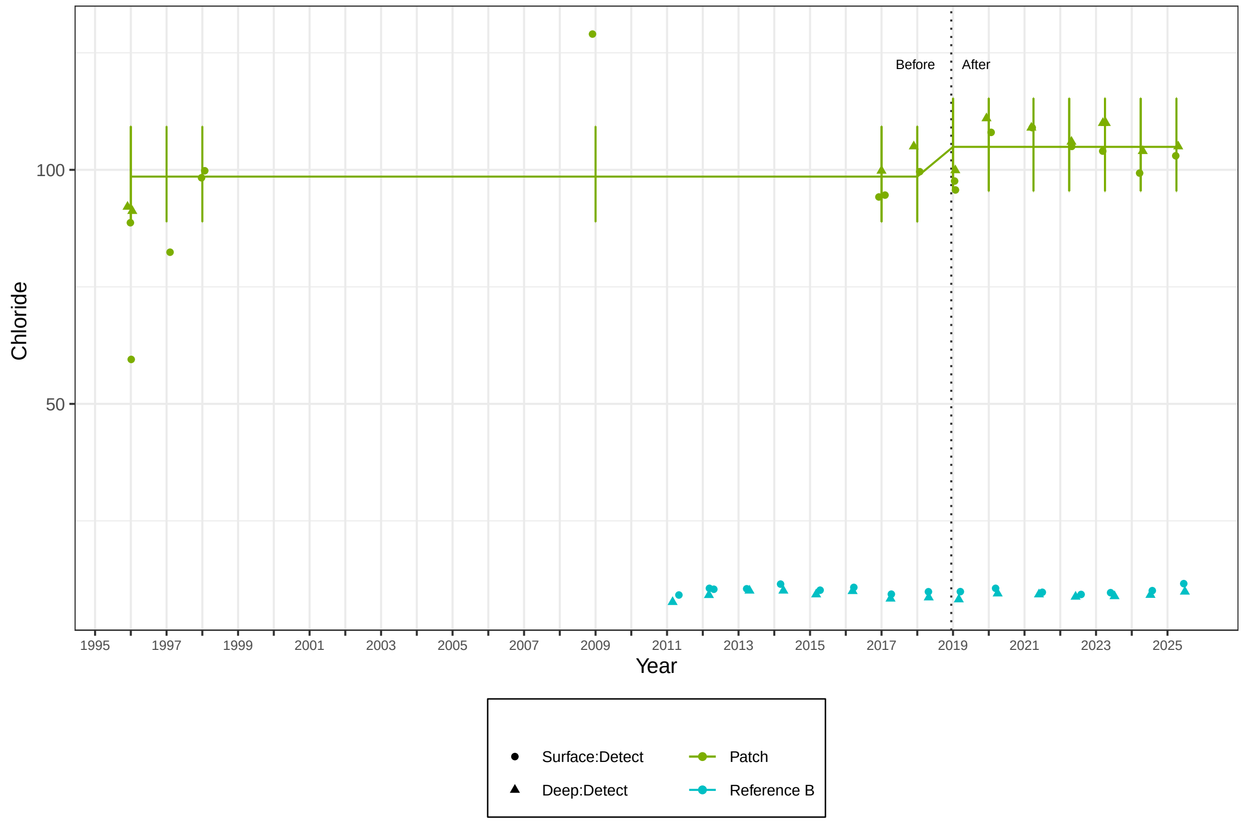
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0625	0.0638	10.35	0.9787	0.3501	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

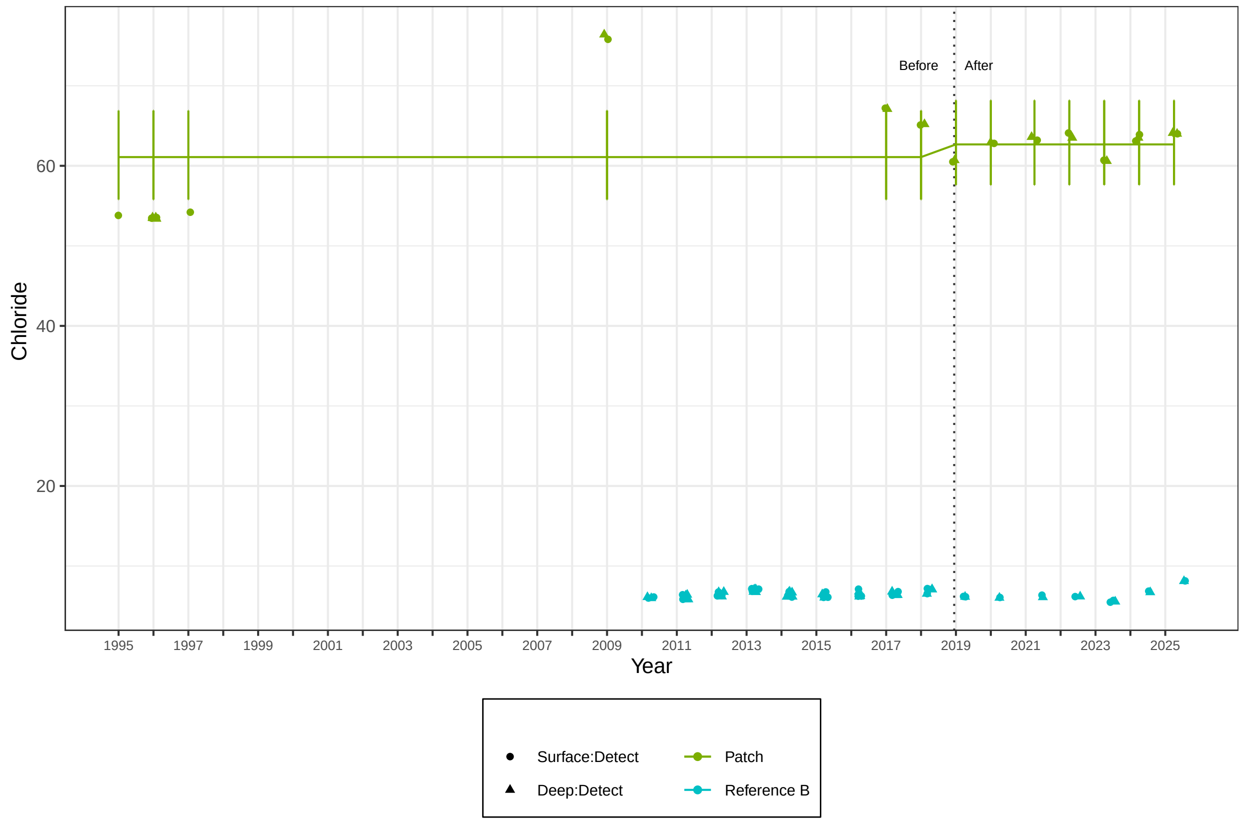
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0256	0.0563	11	0.4552	0.6579	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

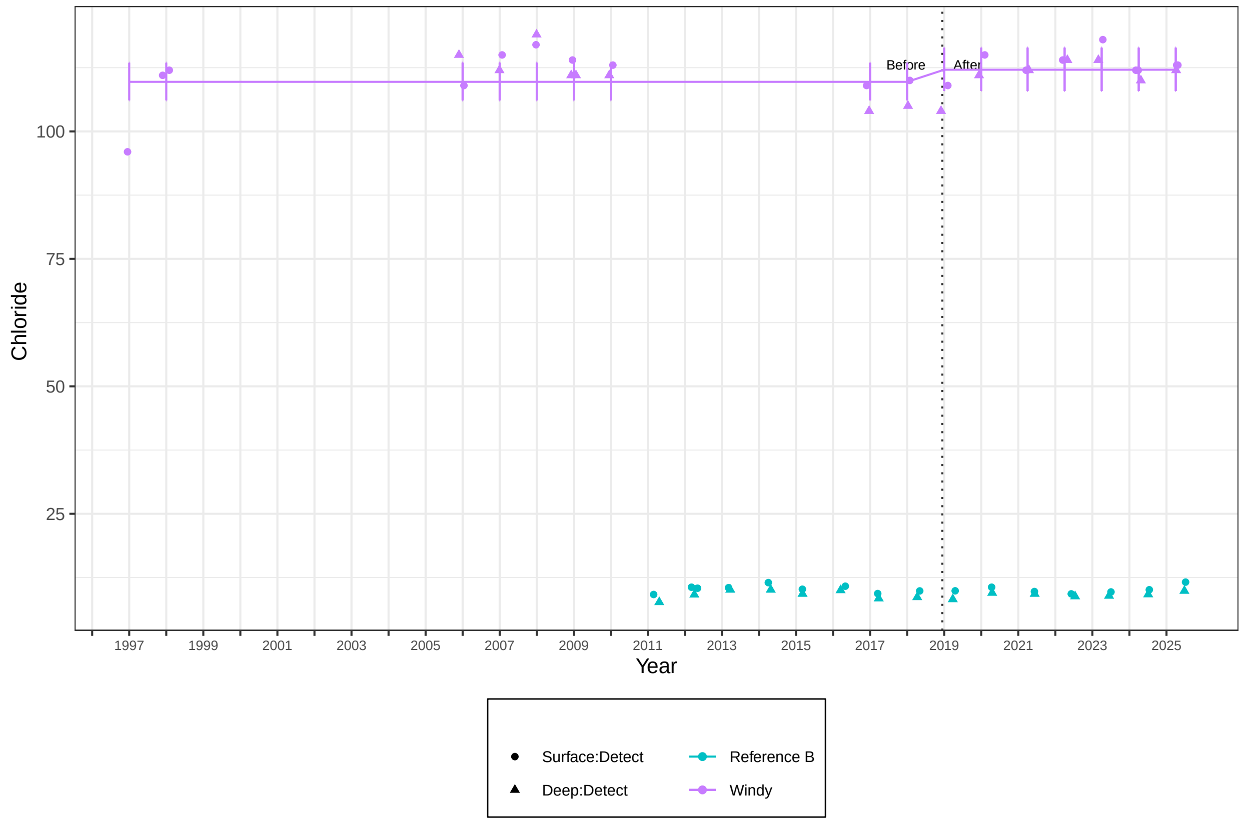
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0214	0.0237	12.68	0.9064	0.3816	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

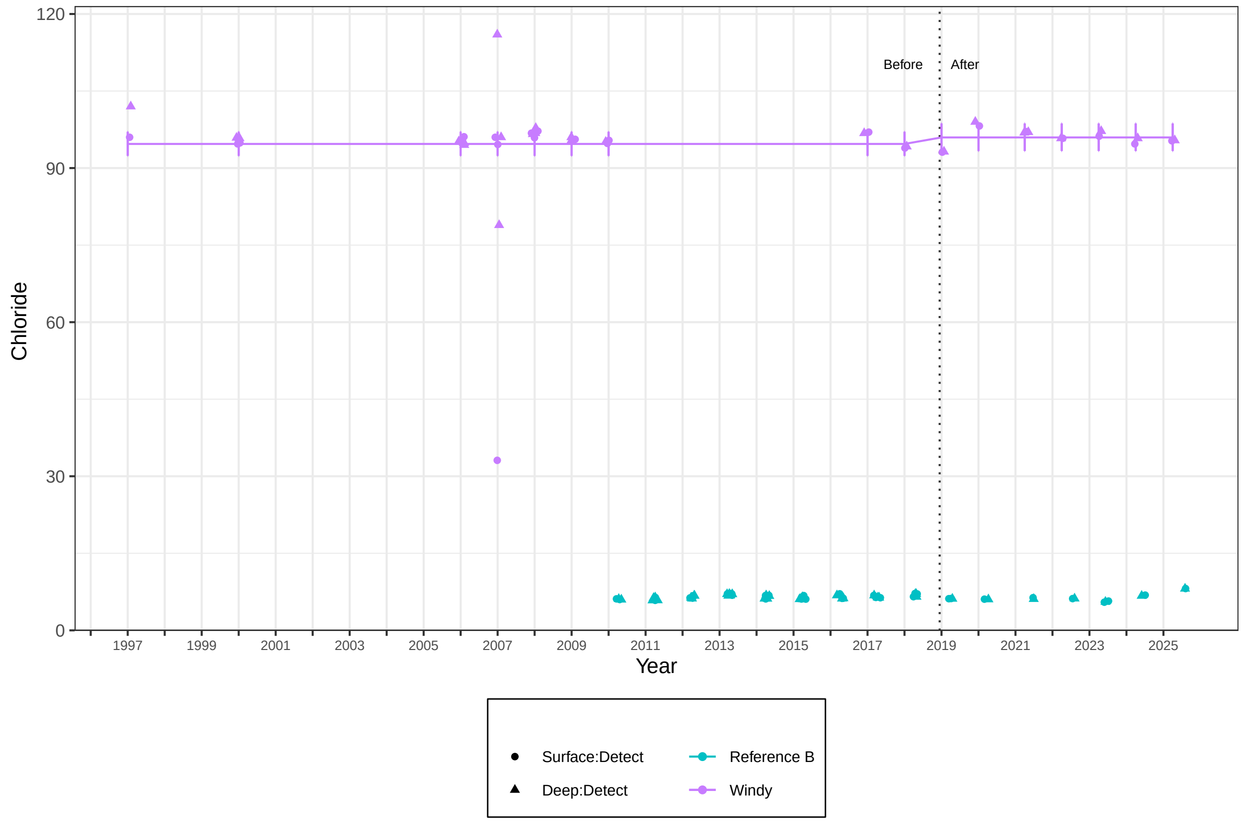
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0133	0.0174	14	0.7642	0.4574	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

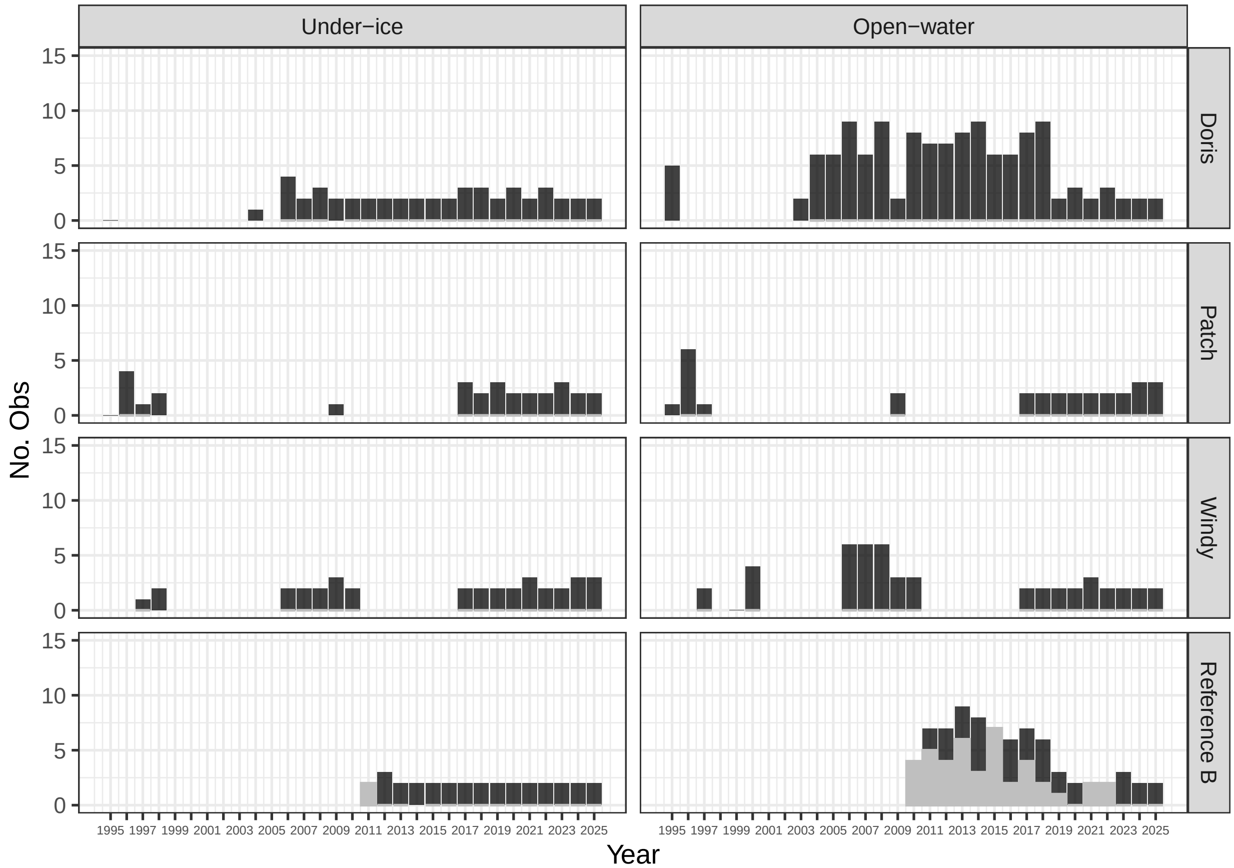
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Chloride
Year
Before
After
Surface:Detect
Deep:Detect
Reference B
Windy

C.3.1.5 Fluoride

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

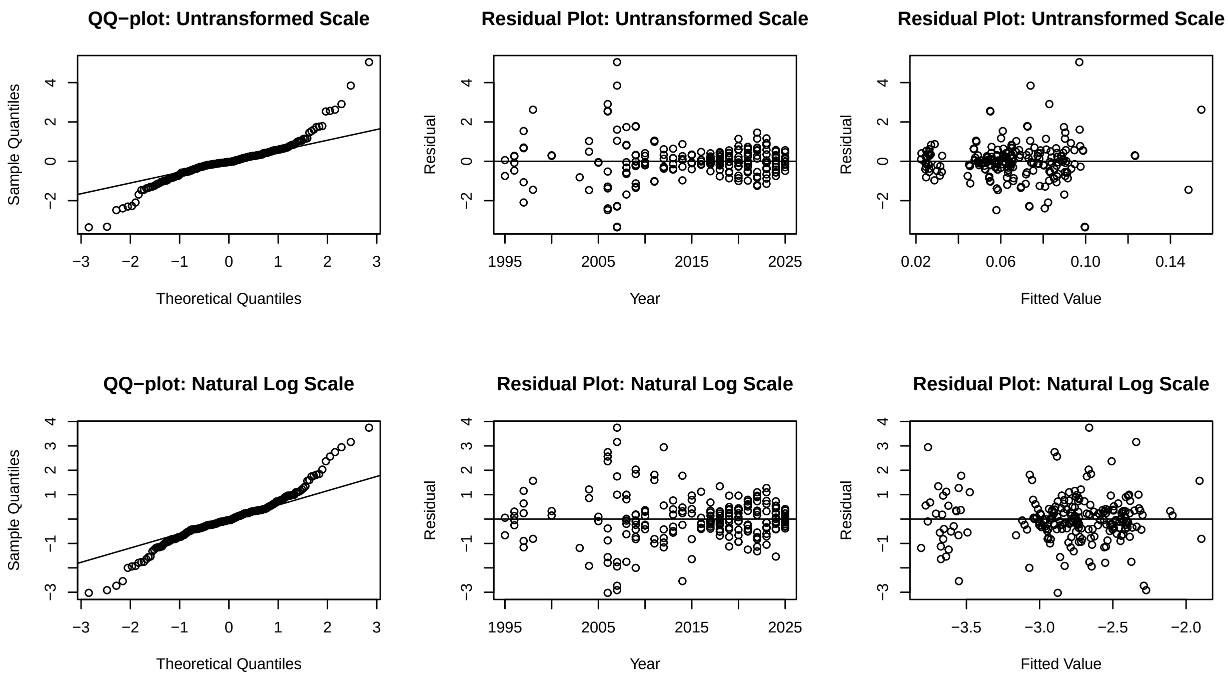
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	48	0	0	0
Doris	Open-water	129	0	0	0
Patch	Under-ice	29	0	0	0
Patch	Open-water	30	0	0	0
Reference B	Under-ice	31	2	6	0
Reference B	Open-water	77	42	55	0
Windy	Under-ice	35	0	0	0
Windy	Open-water	49	0	0	0

More than 50% of data was under detection limit in Reference B Open-water. Data from those site-season groupings will be removed from the analysis.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2007	Open-water	Surface	0.09667	0.074	3.847
Windy	2007	Under-ice	Deep	0.08000	0.100	-3.327
Windy	2007	Under-ice	Surface	0.08000	0.100	-3.357
Windy	2007	Open-water	Deep	0.12667	0.097	5.040

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2006	Open-water	Deep	0.04333	-2.876	-3.026
Doris	2007	Open-water	Surface	0.09667	-2.662	3.746
Windy	2007	Open-water	Deep	0.12667	-2.340	3.159

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. However, there were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	7.217	4	0.12480	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

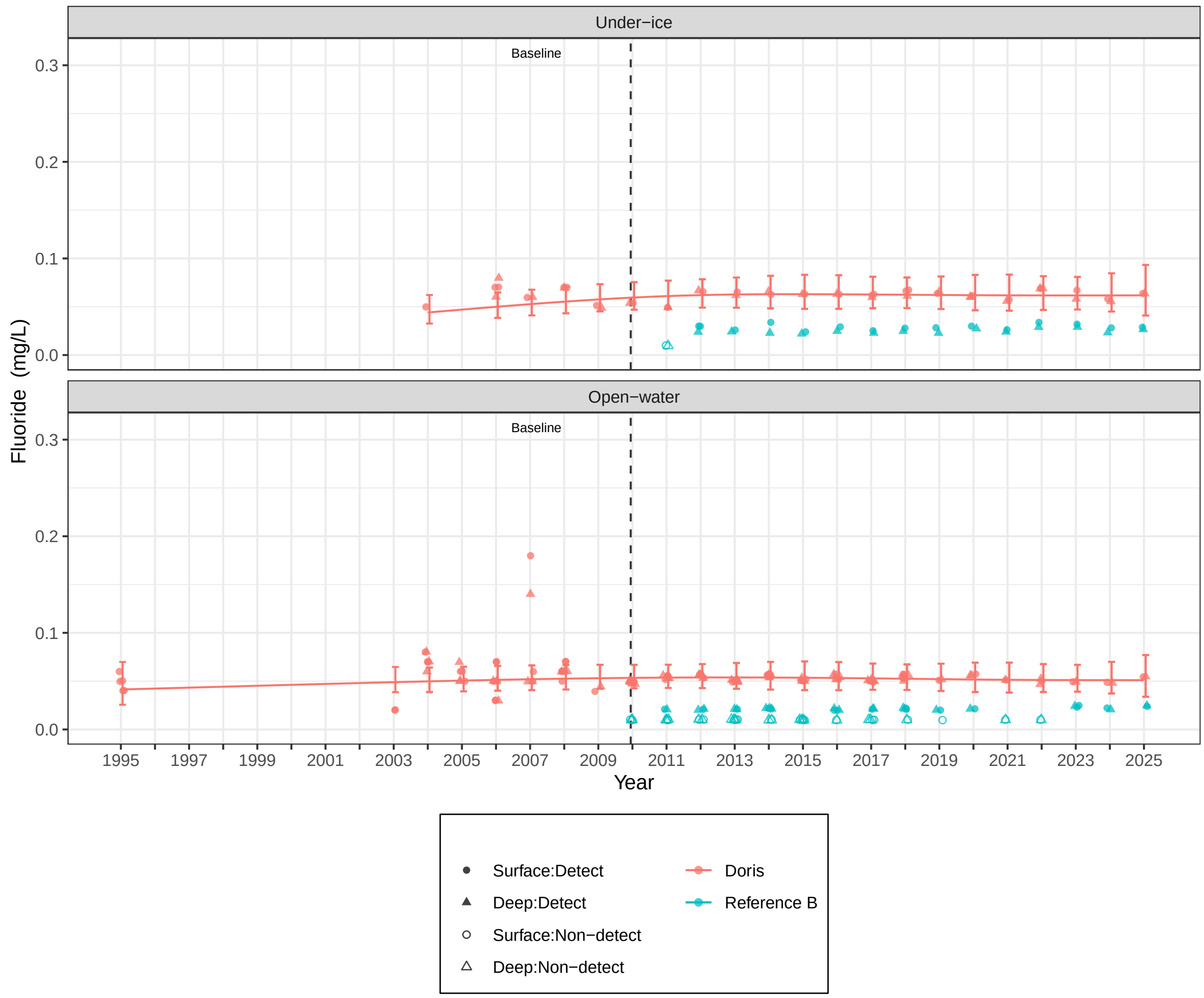
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	1.408	4	0.84270	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

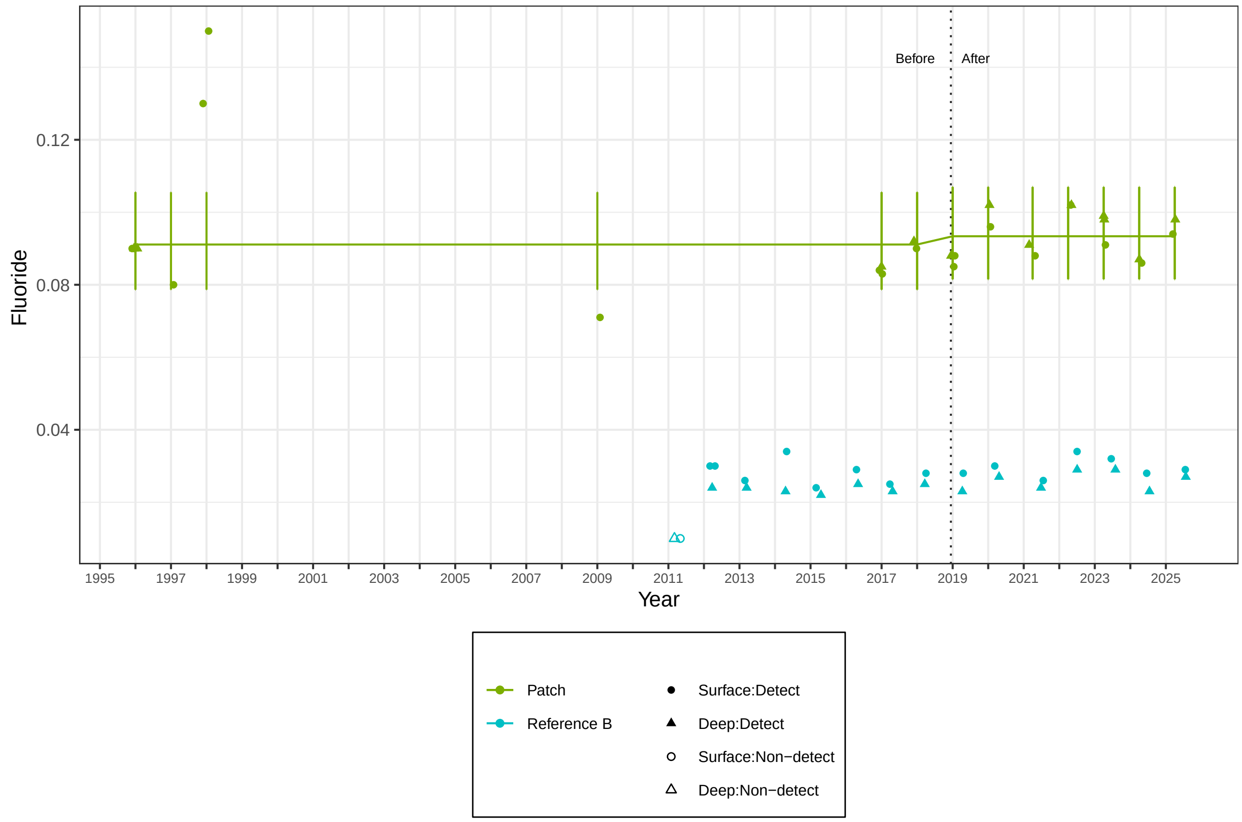
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0247	0.091	10.92	0.2711	0.7914	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

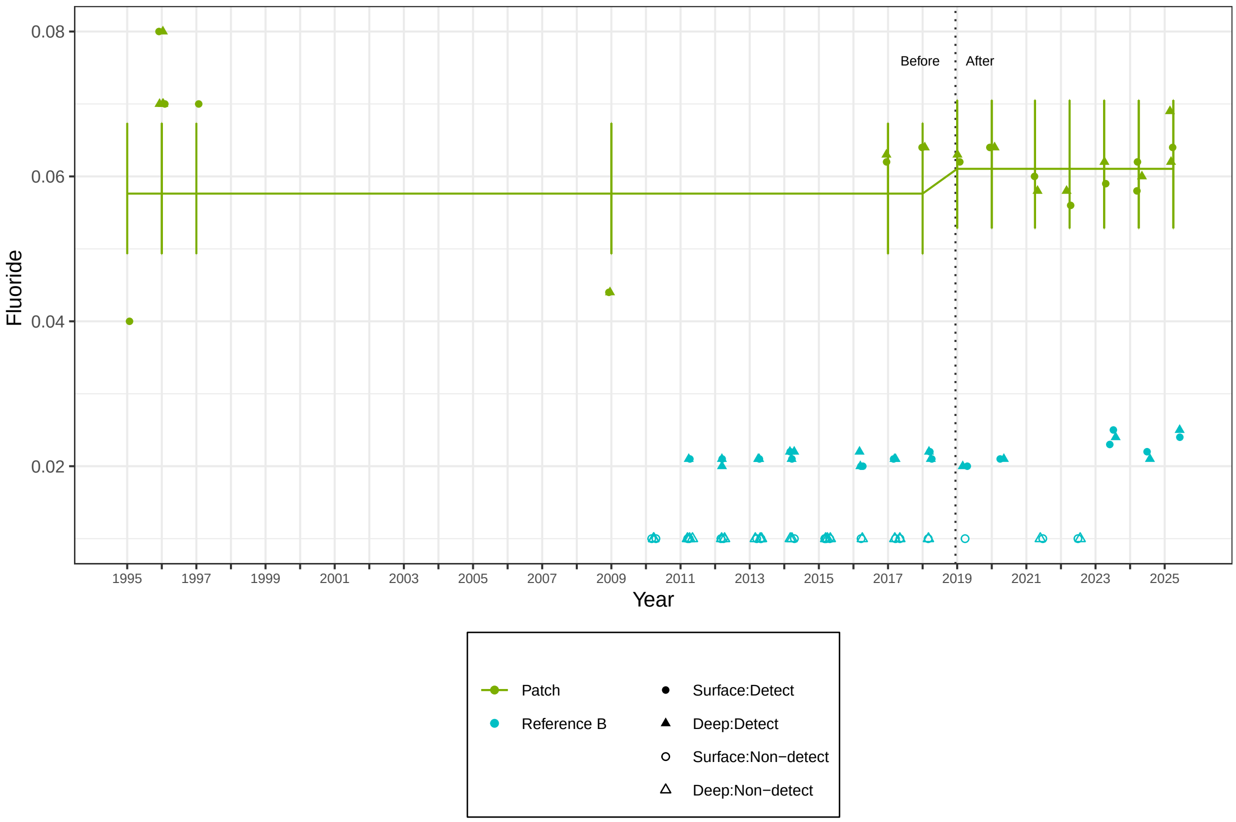
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0577	0.0967	10.96	0.5963	0.5631	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

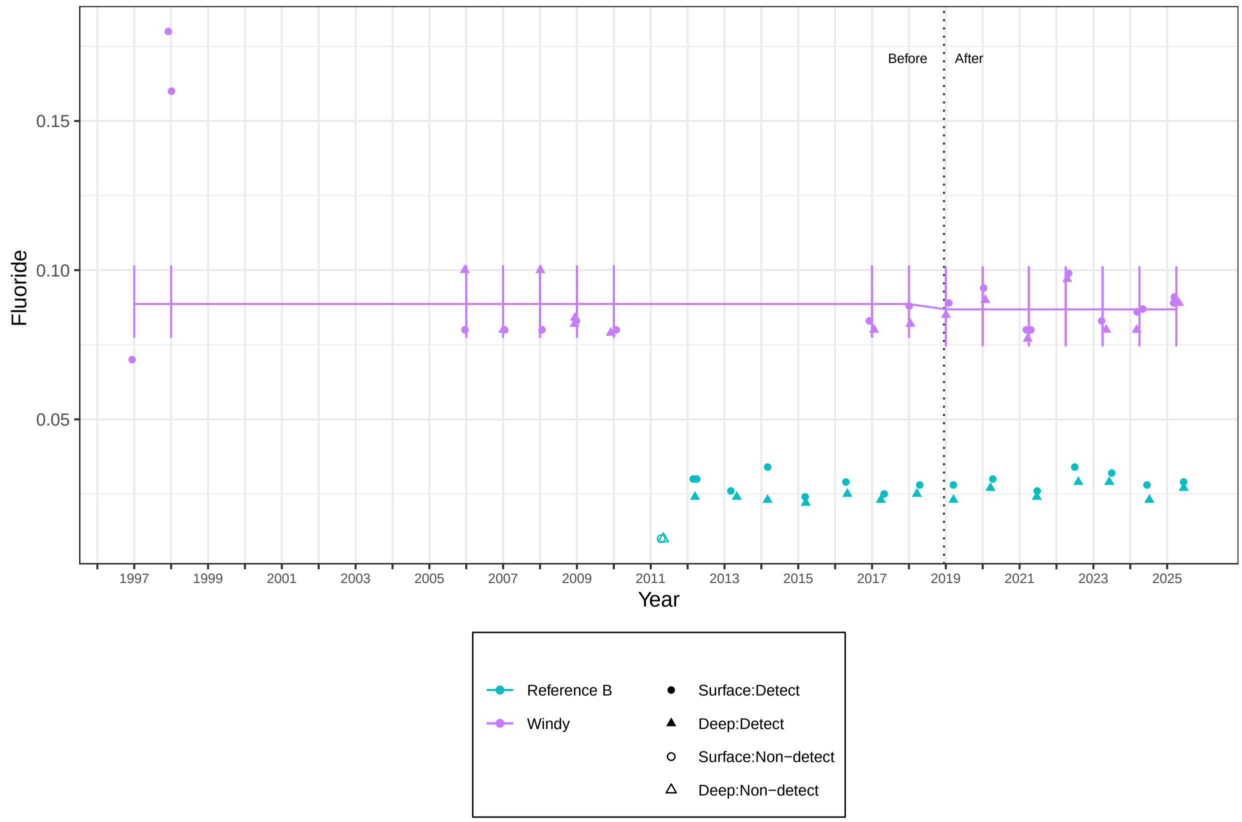
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0205	0.0951	12.43	-0.2153	0.833	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

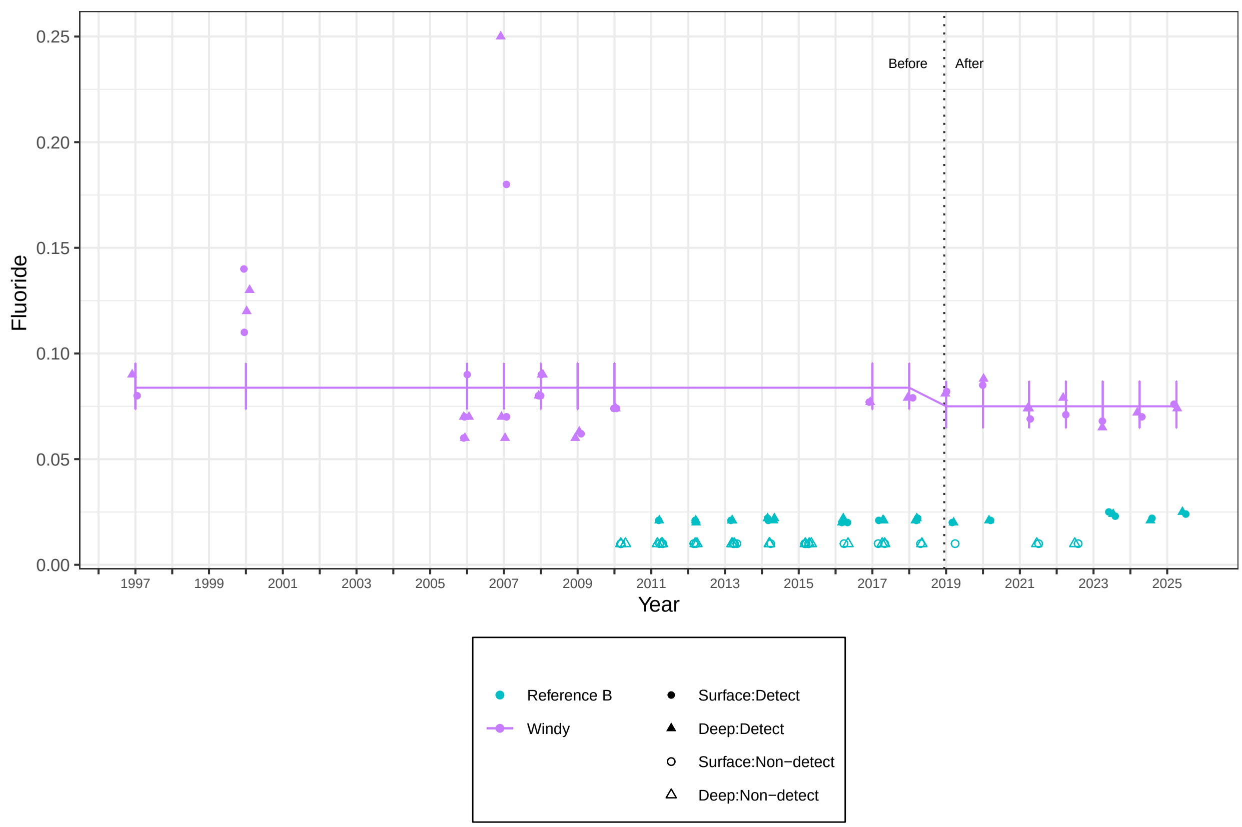
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.1108	0.092	14	-1.205	0.2483	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

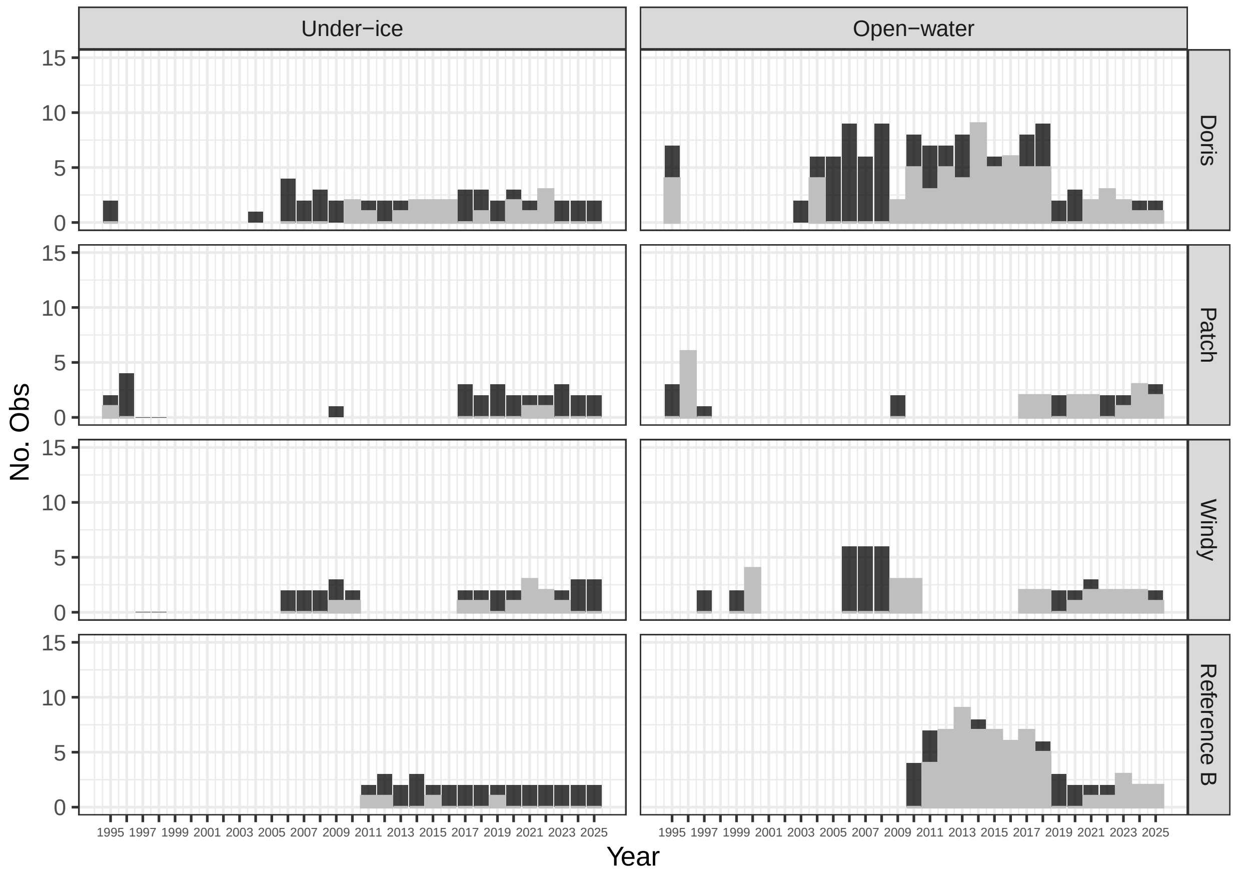
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Fluoride
0.25
0.20
0.15
0.10
0.05
0.00
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Reference B
Windy
Surface:Detect
Deep:Detect
Surface:Non−detect
Deep:Non−detect

C.3.1.6 Total Ammonia

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

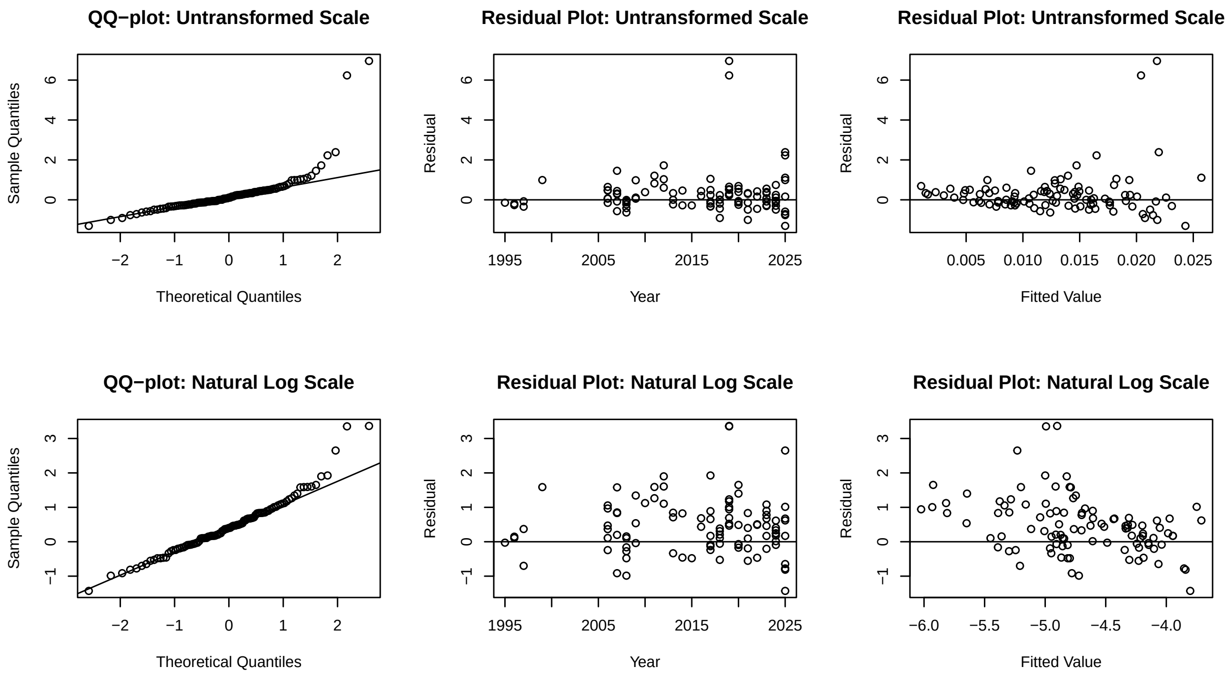
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	50	19	38	0
Doris	Open-water	131	67	51	50
Patch	Under-ice	28	3	11	0
Patch	Open-water	32	20	62	67
Reference B	Under-ice	32	4	12	0
Reference B	Open-water	77	61	79	100
Windy	Under-ice	32	11	34	0
Windy	Open-water	51	24	47	50

More than 50% of data was under detection limit in Doris North Open-water, Patch Open-water, and Reference B Open-water. Data from those site-season groupings will be removed from the analysis. Doris North Under-ice, Patch Under-ice, Reference B Under-ice, Windy Under-ice, and Windy Open-water exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2019	Under-ice	Deep	0.114	0.022	6.959
Doris	2019	Under-ice	Surface	0.103	0.020	6.234

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2019	Under-ice	Deep	0.114	-4.901	3.364
Doris	2019	Under-ice	Surface	0.103	-4.993	3.352

The natural log transformed model better meets the residual assumptions. Analysis proceeds with natural log transformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	3.582	3	0.31030	not sig.

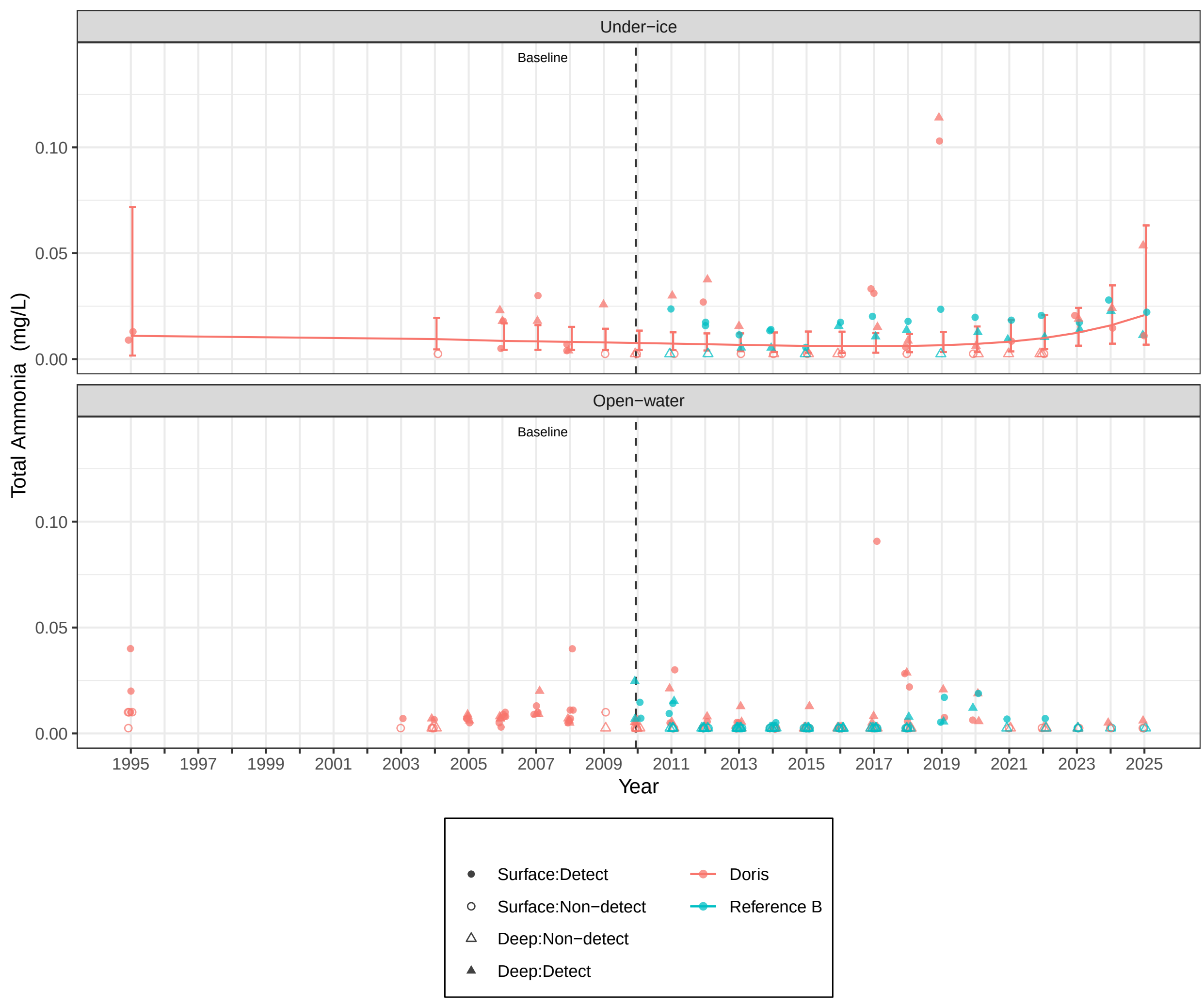
Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Doris Open-Water

All data from Doris Lake open-water removed from the analysis. No analysis performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

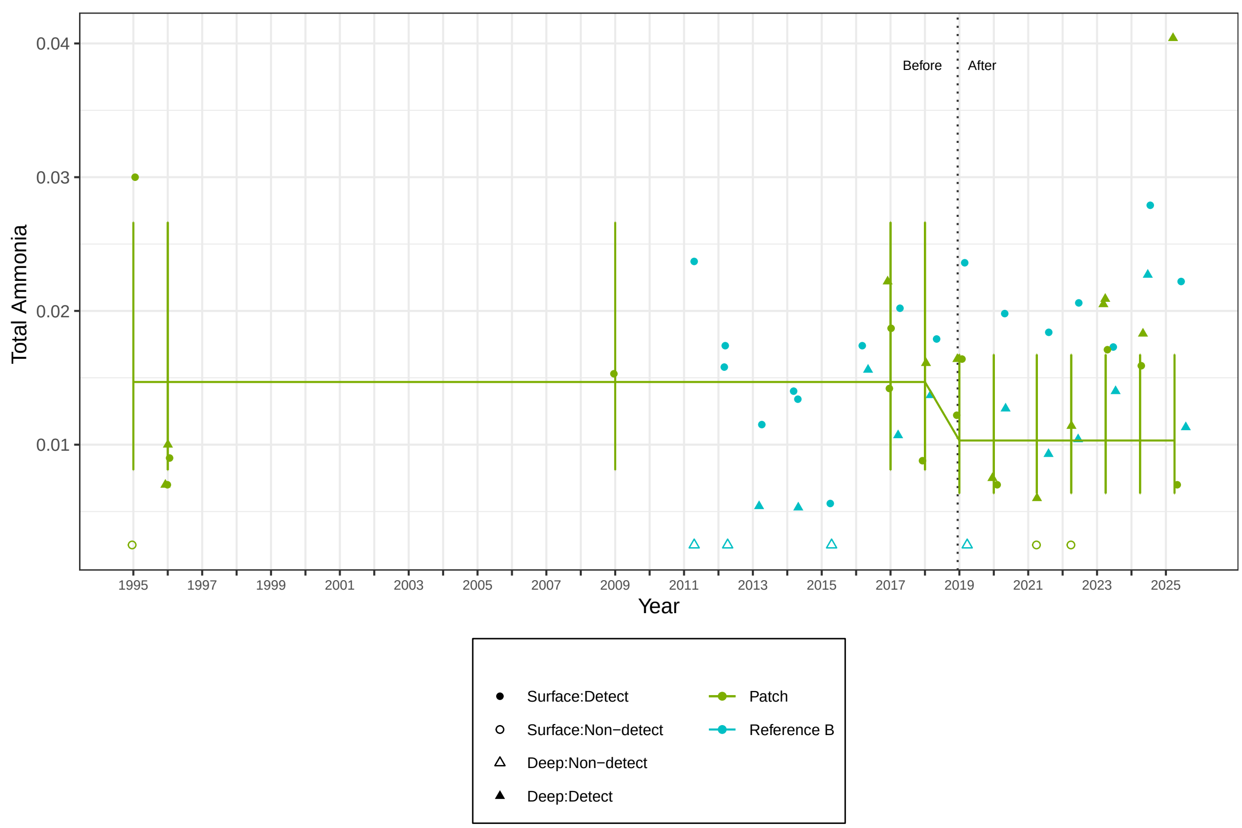
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.3538	0.3444	10.72	-1.027	0.3269	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis Analysis was not performed.

Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

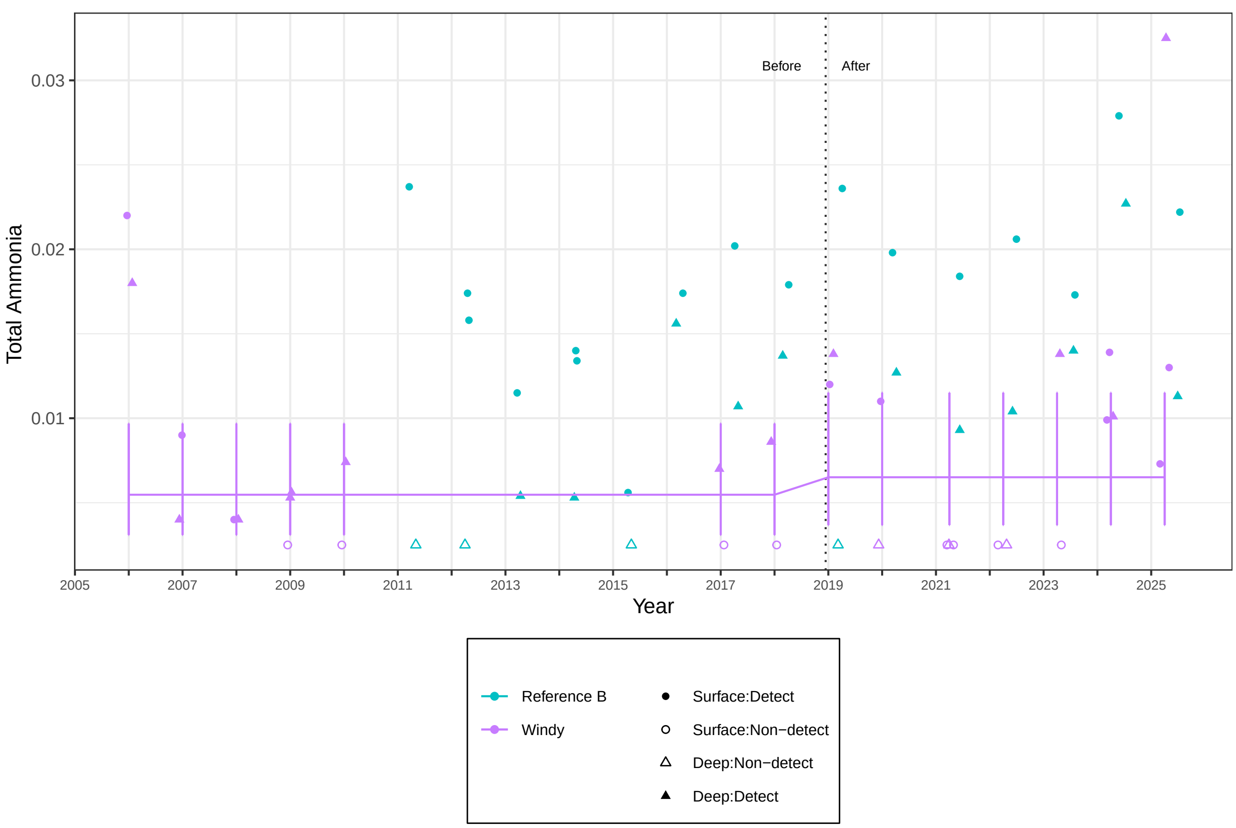
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.1729	0.3705	12	0.4666	0.6491	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

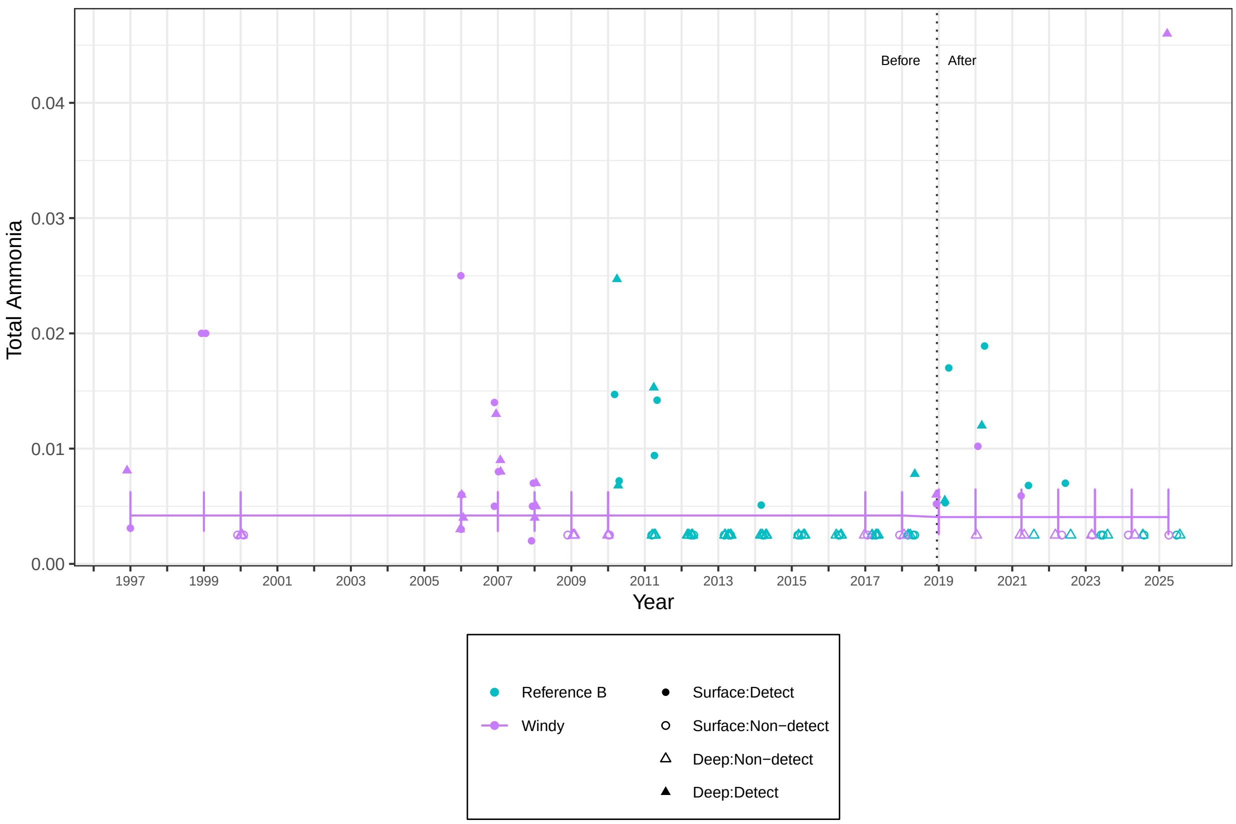
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0333	0.2899	12.68	-0.1148	0.9104	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

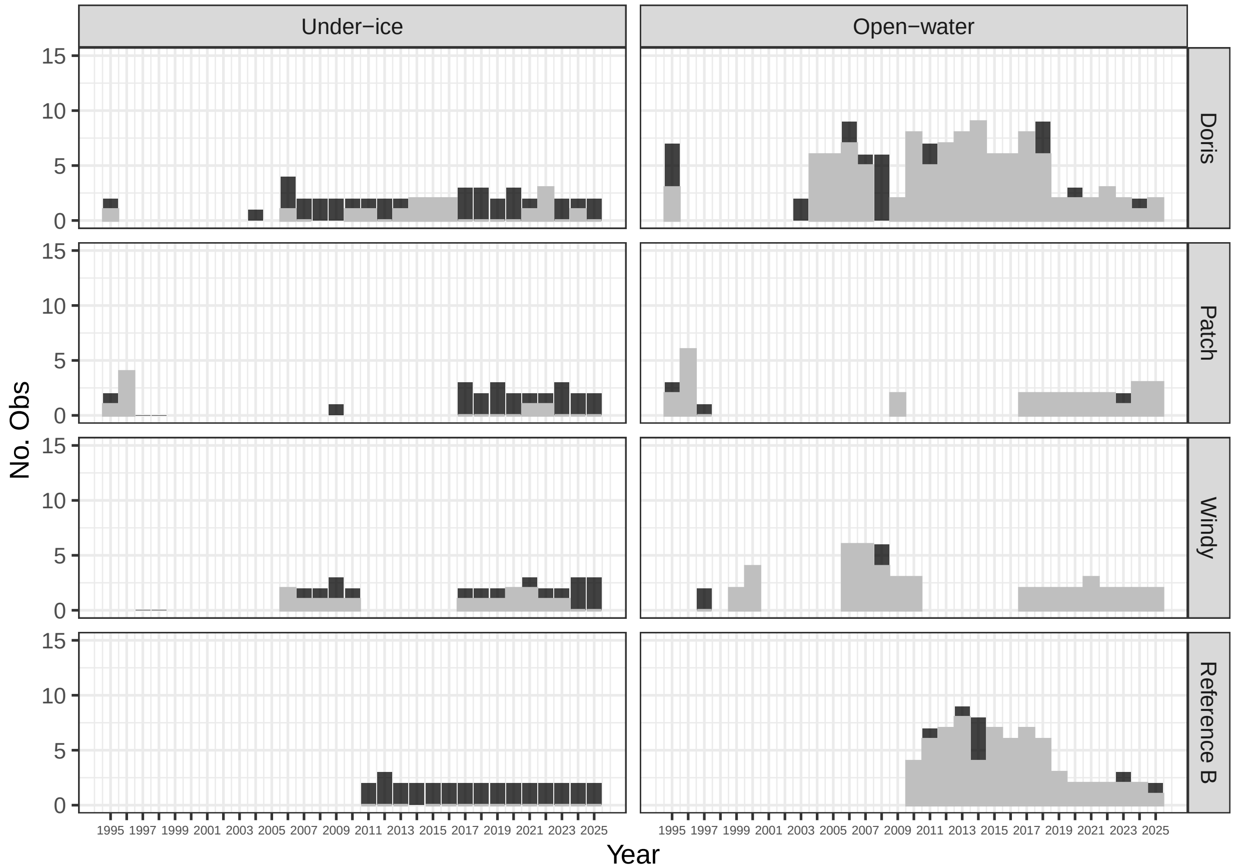
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.1.7 Nitrate

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

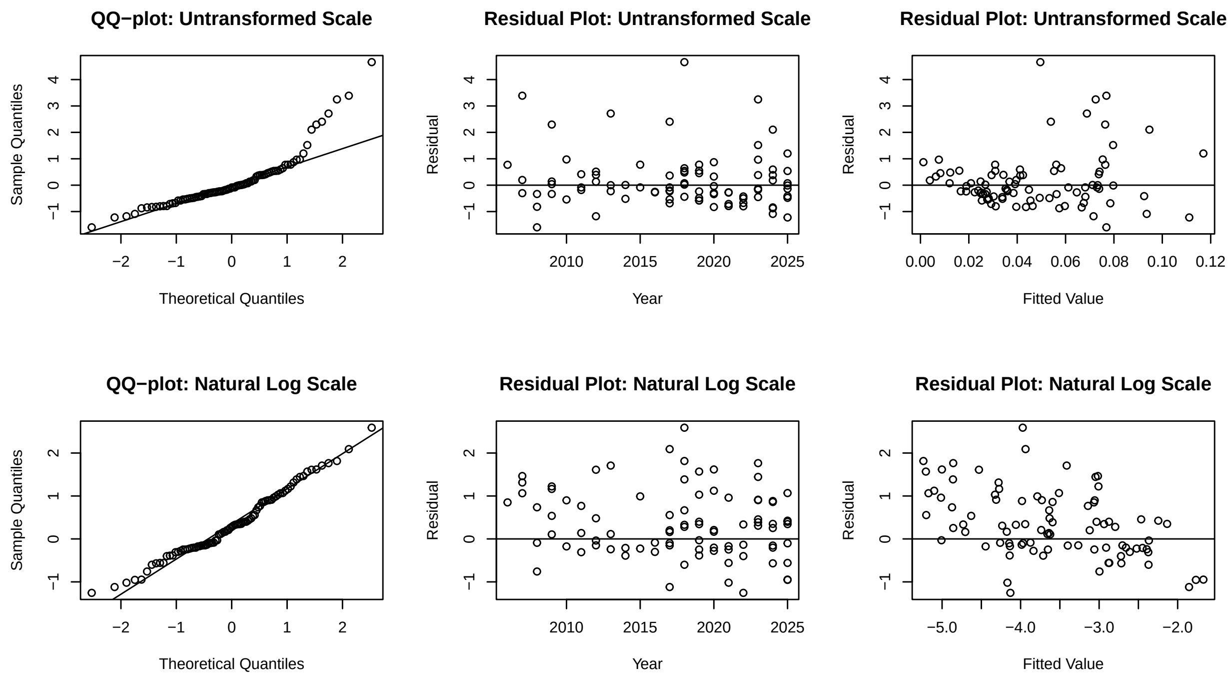
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	17	35	0
Doris	Open-water	128	110	86	100
Patch	Under-ice	28	7	25	0
Patch	Open-water	32	29	91	100
Reference B	Under-ice	31	0	0	0
Reference B	Open-water	77	69	90	50
Windy	Under-ice	32	15	47	0
Windy	Open-water	51	47	92	100

More than 50% of data was under detection limit in Doris North Open-water, Patch Open-water, Reference B Open-water, and Windy Open-water. Data from those site-season groupings will be removed from the analysis. Doris North Under-ice, Patch Under-ice, and Windy Under-ice exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2007	Under-ice	Deep	0.187	0.077	3.389
Doris	2018	Under-ice	Deep	0.201	0.050	4.660
Doris	2023	Under-ice	Deep	0.178	0.072	3.248

Outliers on natural log scale:

None

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	6.232	3	0.10090	not sig.

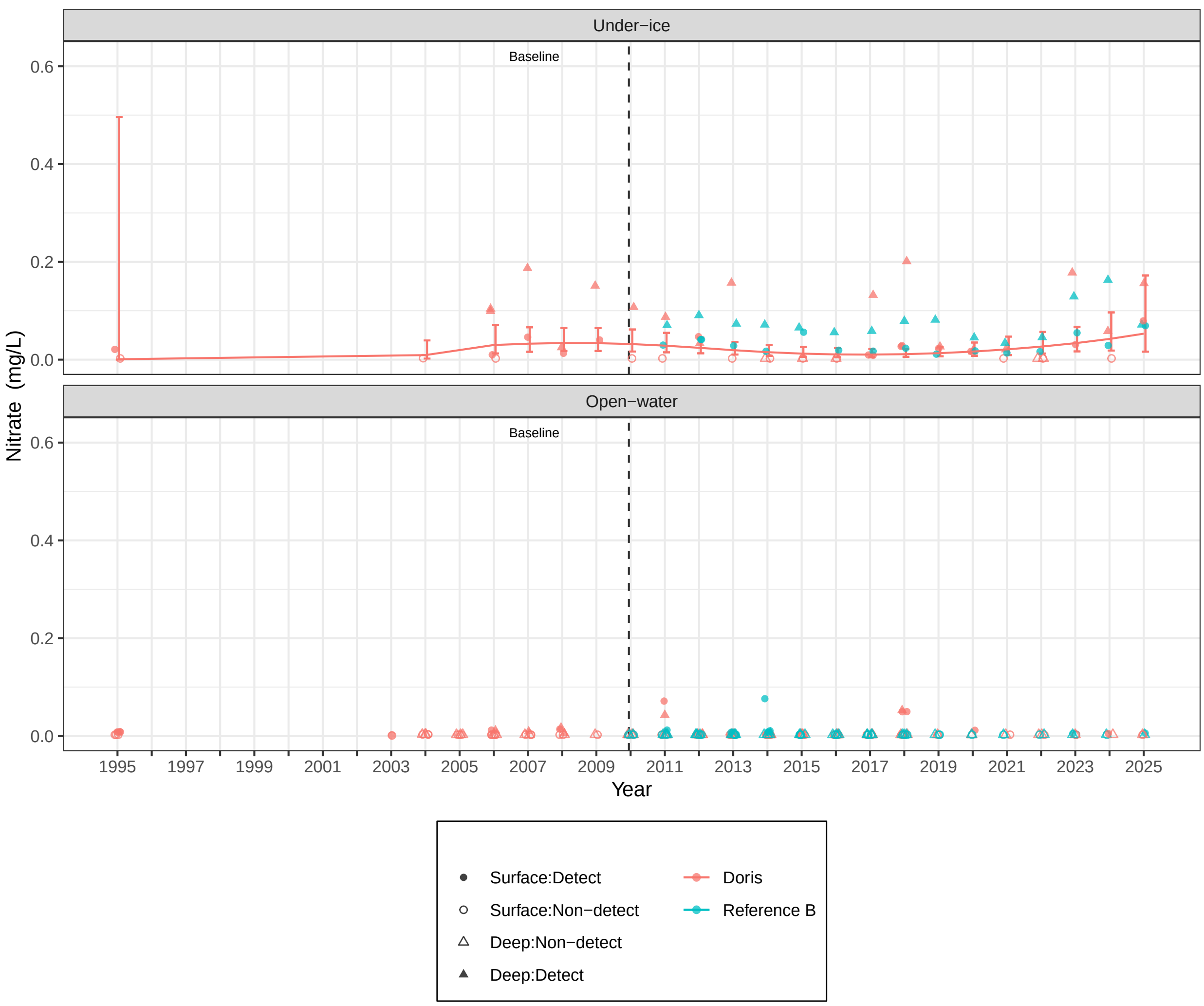
Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Doris Open-Water

All data from Doris Lake open-water removed from the analysis. No analysis performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

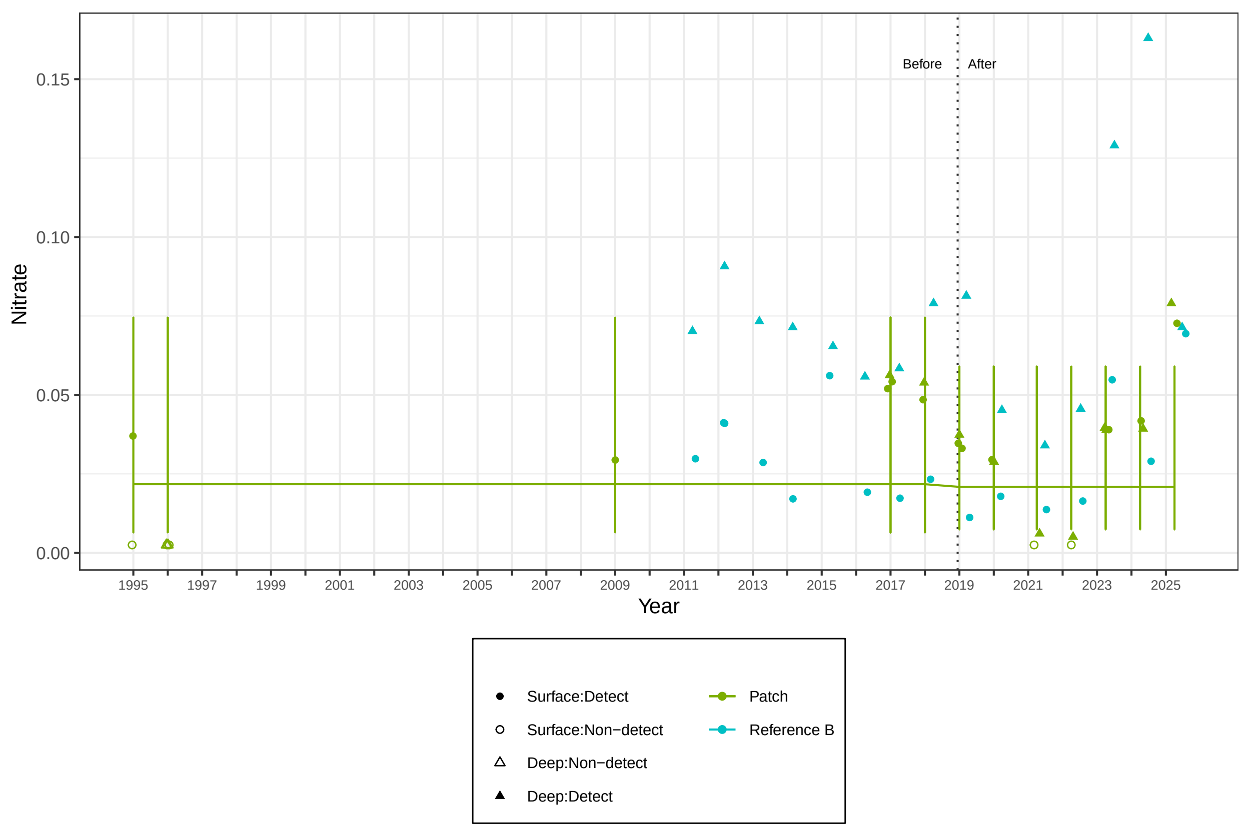
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0393	0.7255	10.09	-0.0541	0.9579	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis Analysis was not performed.

Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

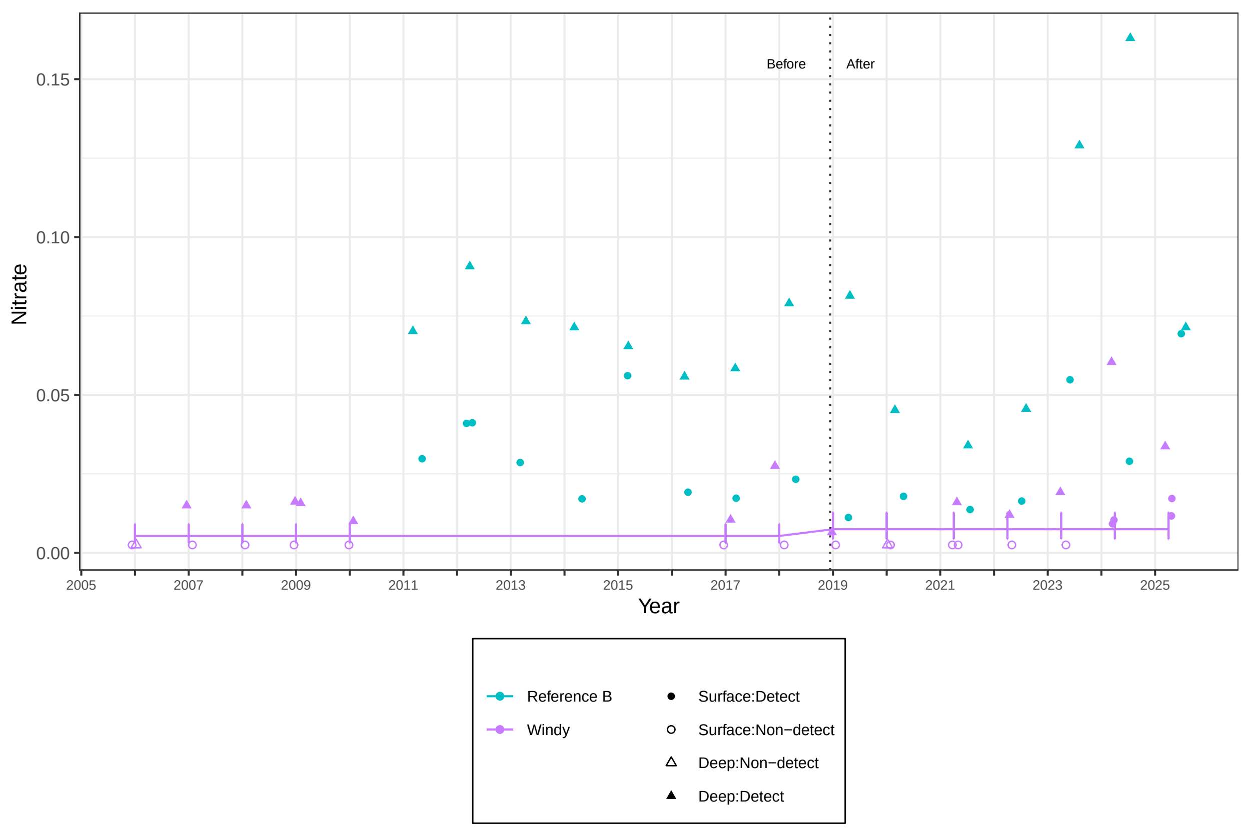
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.3335	0.3491	12	0.9555	0.3582	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.

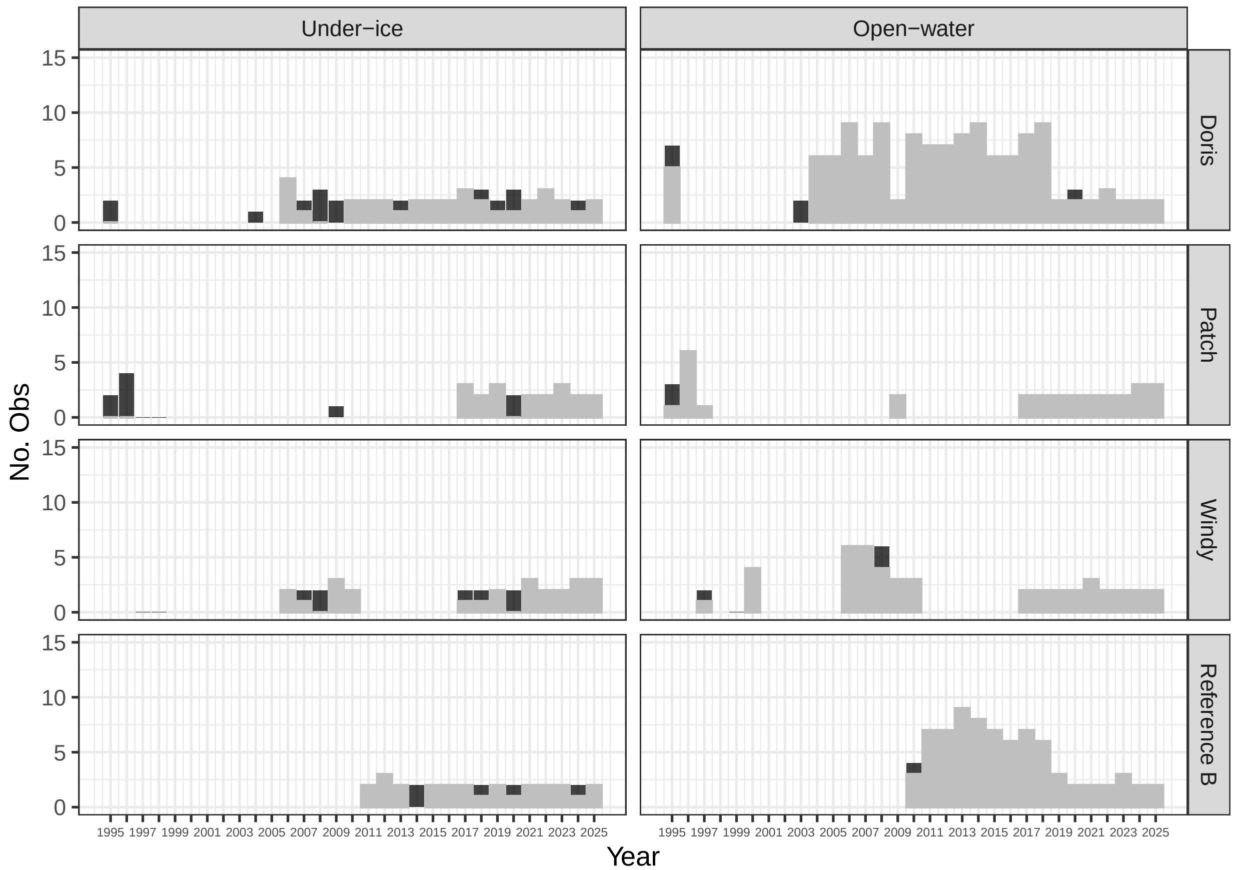


Windy Open-water Before-After Analysis Analysis was not performed.

C.3.1.8 Nitrite

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

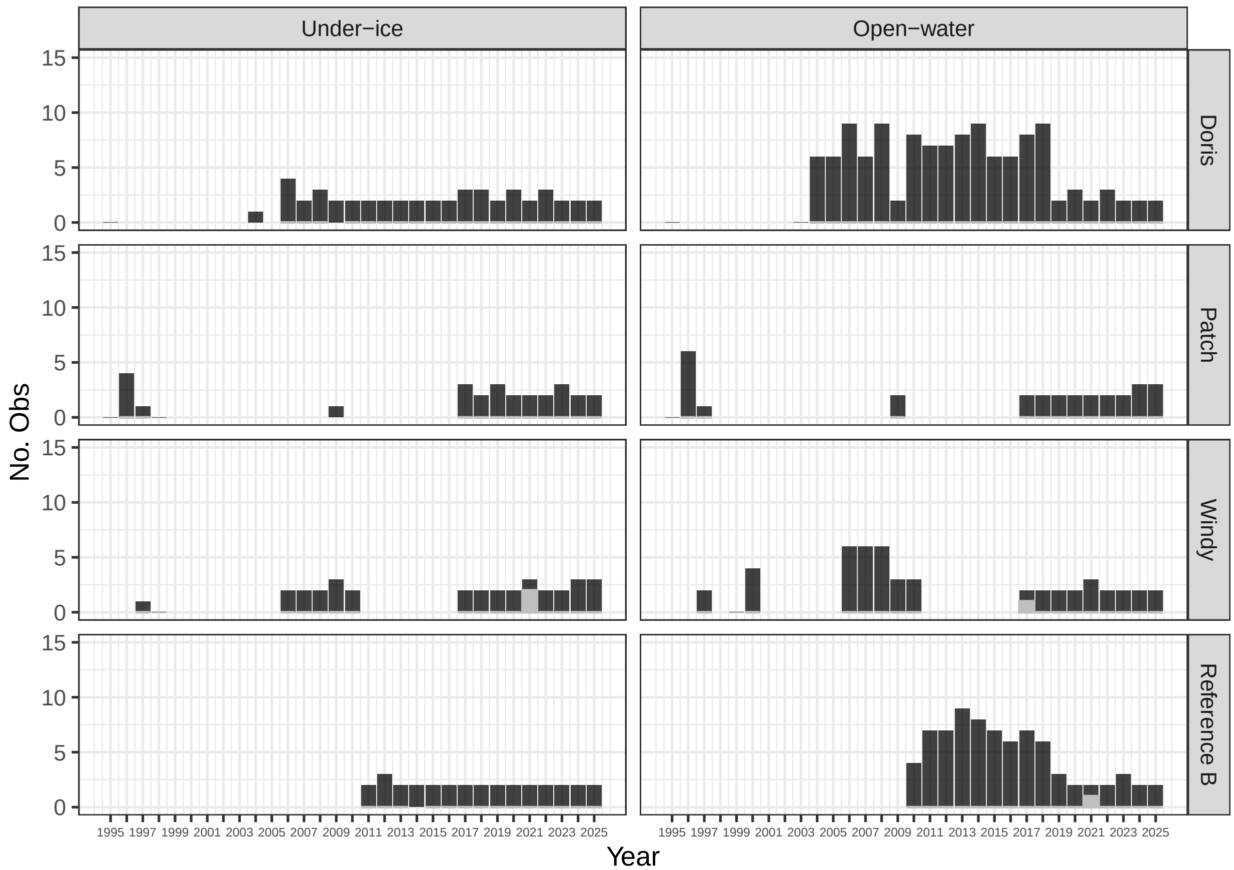
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	50	37	74	100
Doris	Open-water	131	128	98	100
Patch	Under-ice	28	20	71	100
Patch	Open-water	32	30	94	100
Reference B	Under-ice	31	28	90	100
Reference B	Open-water	77	76	99	100
Windy	Under-ice	32	25	78	100
Windy	Open-water	49	46	94	100

All data from Doris North, Patch and Windy were censored. All data removed from the analysis and no statistical analyses were performed.

C.3.1.9 Total Phosphorus

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

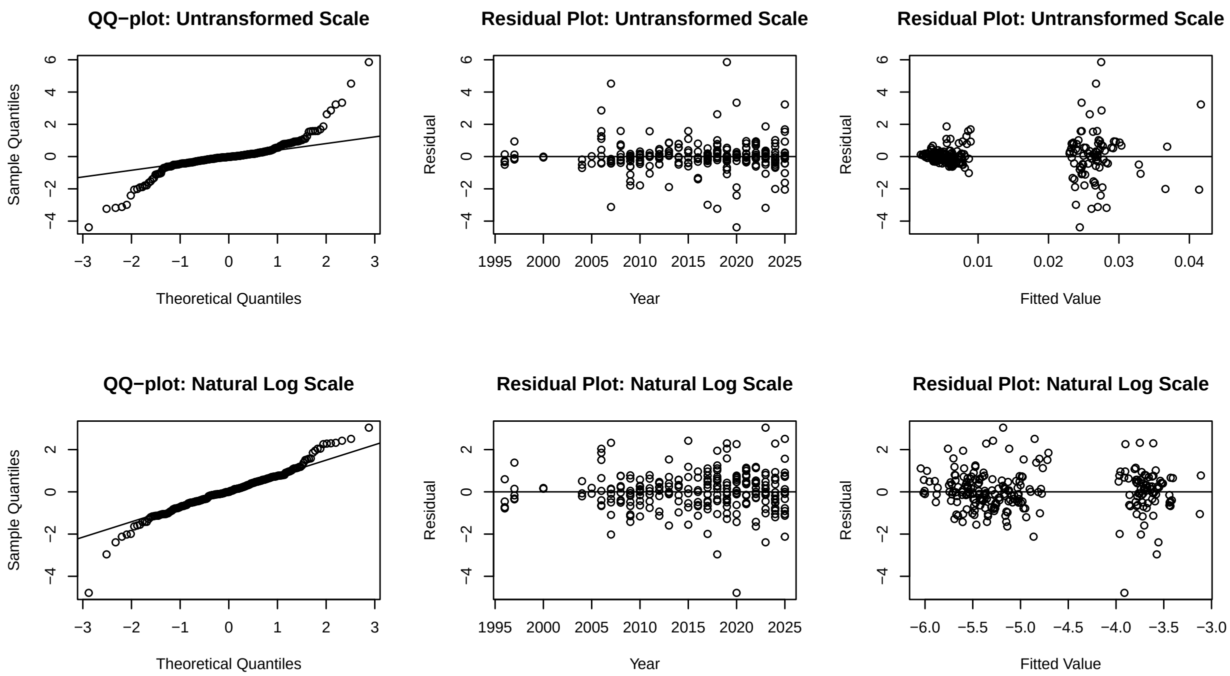
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	48	0	0	0
Doris	Open-water	122	0	0	0
Patch	Under-ice	27	0	0	0
Patch	Open-water	29	0	0	0
Reference B	Under-ice	31	0	0	0
Reference B	Open-water	77	1	1	0
Windy	Under-ice	33	2	6	0
Windy	Open-water	49	1	2	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2007	Under-ice	Deep	0.01300	0.027	-3.124
Doris	2007	Under-ice	Surface	0.04700	0.027	4.523
Doris	2018	Under-ice	Deep	0.01160	0.026	-3.238
Doris	2019	Under-ice	Deep	0.05370	0.027	5.854
Doris	2020	Open-water	Deep	0.03965	0.025	3.339
Doris	2020	Open-water	Surface	0.00480	0.024	-4.386
Doris	2023	Under-ice	Deep	0.01400	0.028	-3.180
Doris	2025	Open-water	Deep	0.05610	0.042	3.230

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2020	Open-water	Surface	0.0048	-3.912	-4.784
Reference B	2023	Under-ice	Surface	0.0139	-5.182	3.039

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. However, there was an outlier retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	1.714	4	0.78820	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

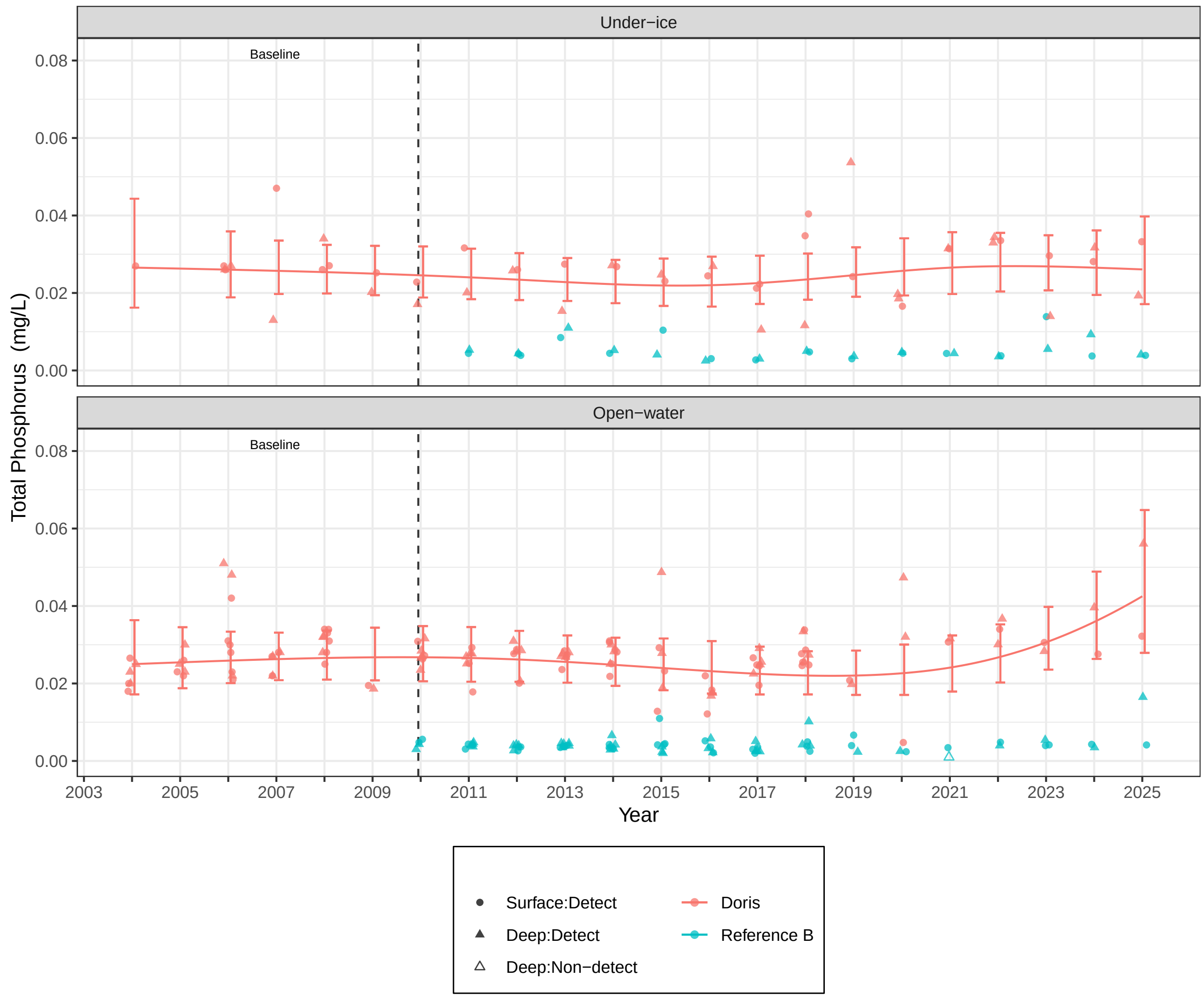
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	8.931	4	0.06280	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

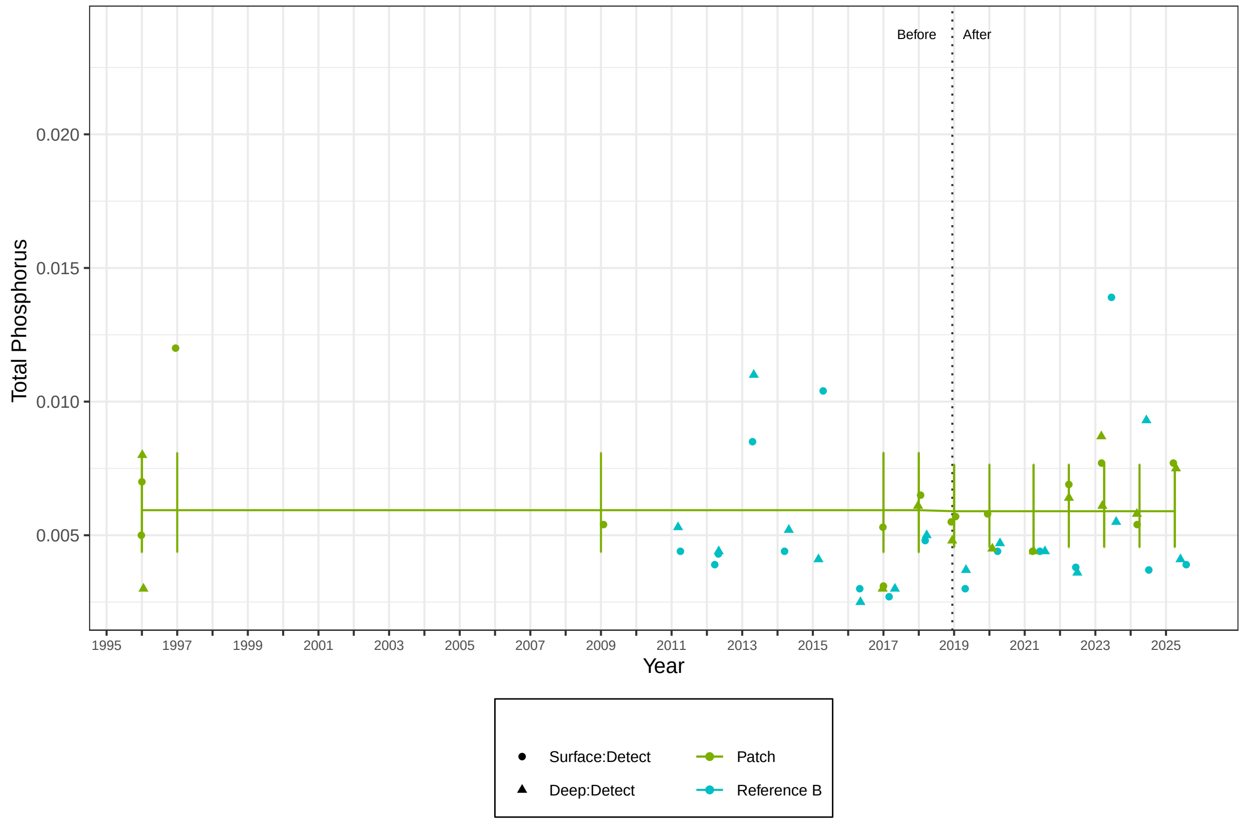
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0066	0.182	9.848	-0.0362	0.9719	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.3401	0.136	10.15	2.501	0.0311	sig.

Conclusion:

The change from before to after was significantly different.

BACI Analysis with Comparable Years

Results of the ANOVA test on the fixed effects of the model:

	Sum Sq.	Mean Sq.	NumDF	DenDF	F value	p
class	1.4905	1.4905	1	24	9.8694	0.0044
period	0.0591	0.0591	1	7	0.3912	0.5510
Depth.Zone	0.0461	0.0461	1	24	0.3055	0.5860
class:period	0.1923	0.1923	1	24	1.2733	0.2700

Estimated marginal means for site class by period:

Class	Period	LSmean	SE	DF	LowerCL	UpperCL
Monitored	after	-4.922	0.1432	12.43	-5.232	-4.611
Reference	after	-5.587	0.1432	12.43	-5.898	-5.276
Monitored	before	-5.261	0.2679	12.43	-5.842	-4.679
Reference	before	-5.574	0.2679	12.43	-6.156	-4.993

- Results are given on the natural log scale.

Summary of BACI contrasts for relative difference between changes from the before to after in Patch North and Reference Lake B, with 95% confidence intervals:

Patch North vs:	Estimate	Lower C.I.	Upper C.I.	Significance
Reference Sites	0.3516	-0.2915	0.9947	not sig.

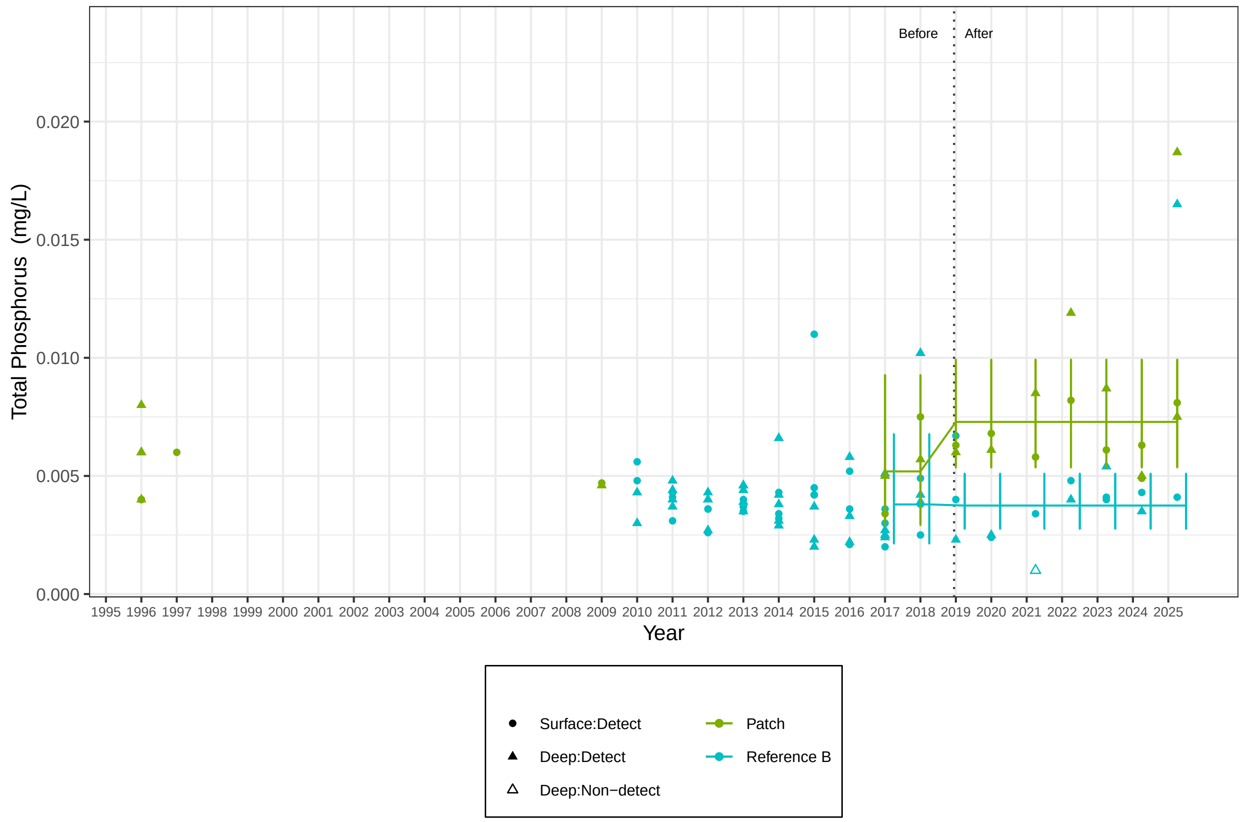
A BACI contrast is identified as *significant* if the confidence interval does not include 0.

Conclusion:

The change in Total Phosphorus concentrations at the Patch North site from before to after was not significantly (p = 0.27) different from the change at Reference Lake B, according to the test on the BACI term (*class:period*).

Observed Data and Fitted Values with Comparable Years

Depth was accounted for in the model but not evaluated since its effect is not of primary interest. Below are plots of the observed and fitted data. The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for monitored and reference sites.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

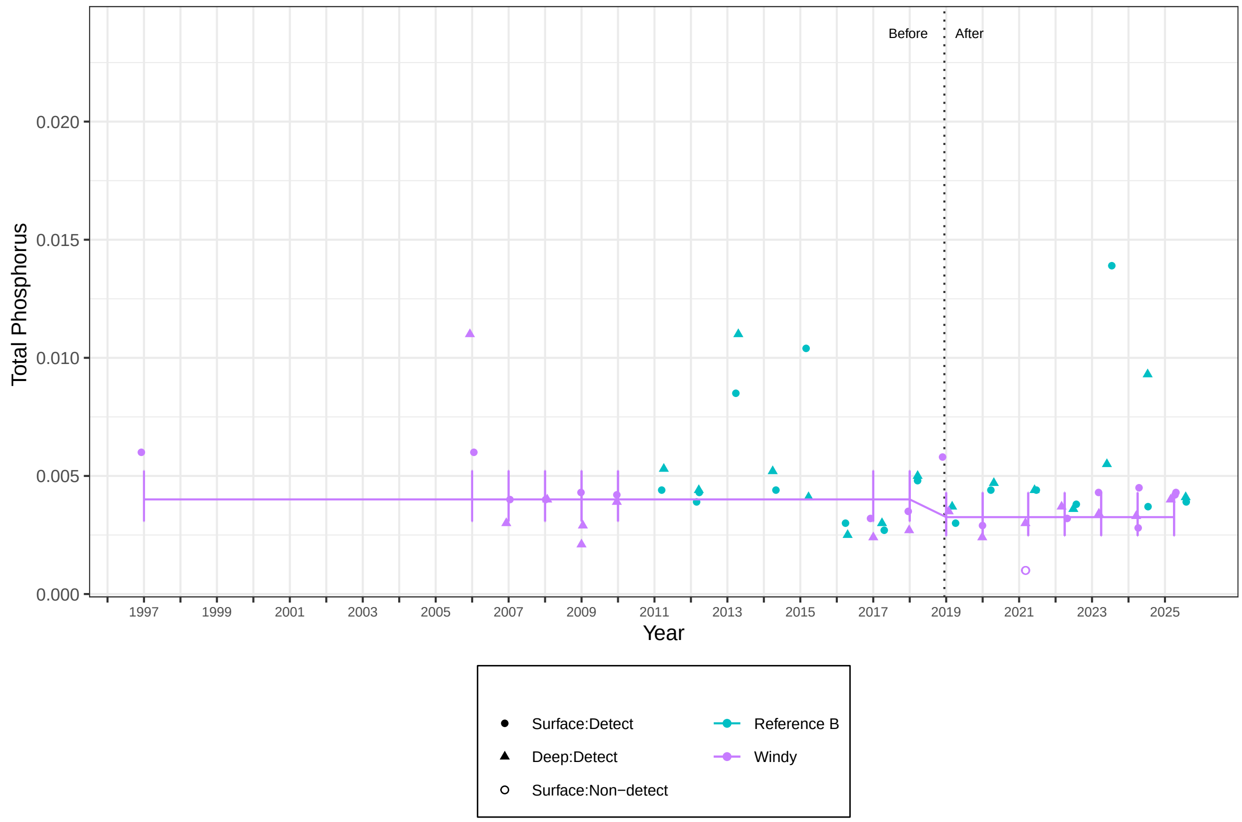
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.2075	0.1778	12.88	-1.168	0.2641	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

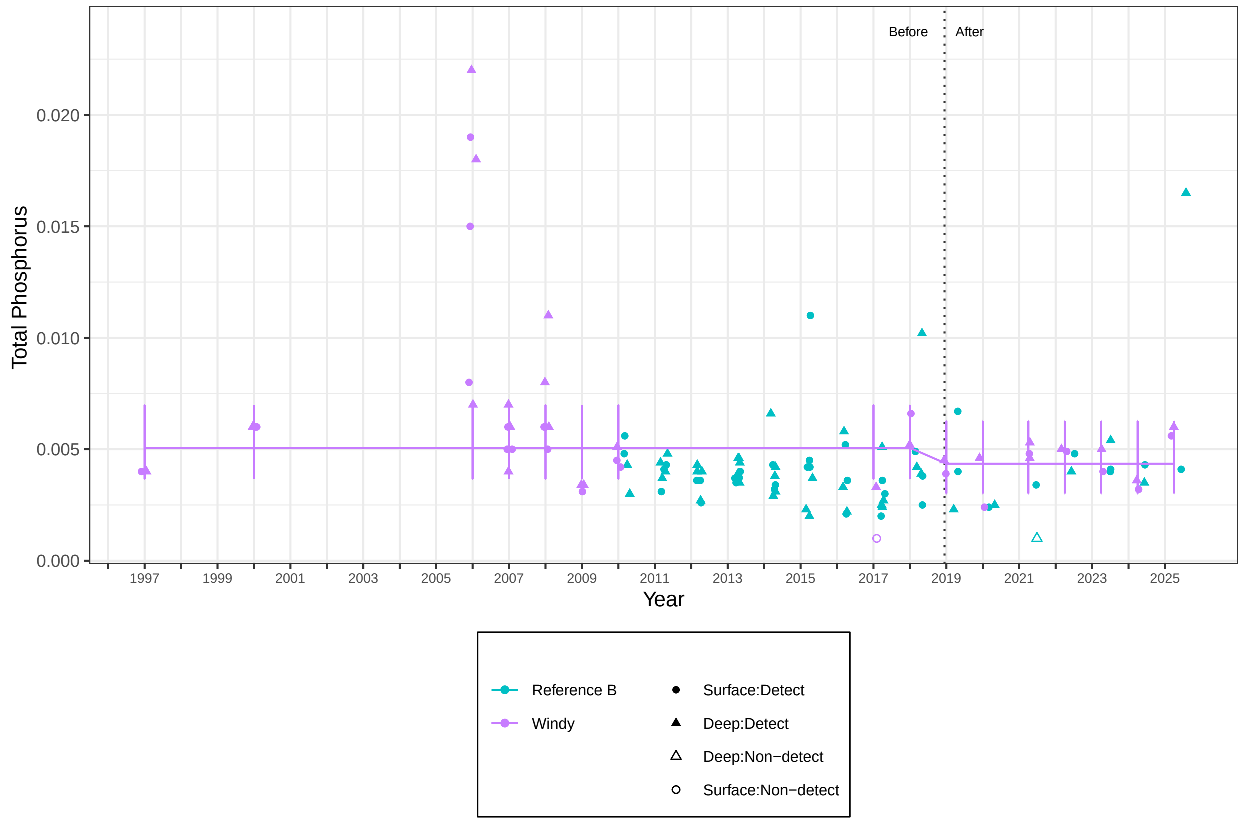
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.1514	0.2278	14	-0.6646	0.5171	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

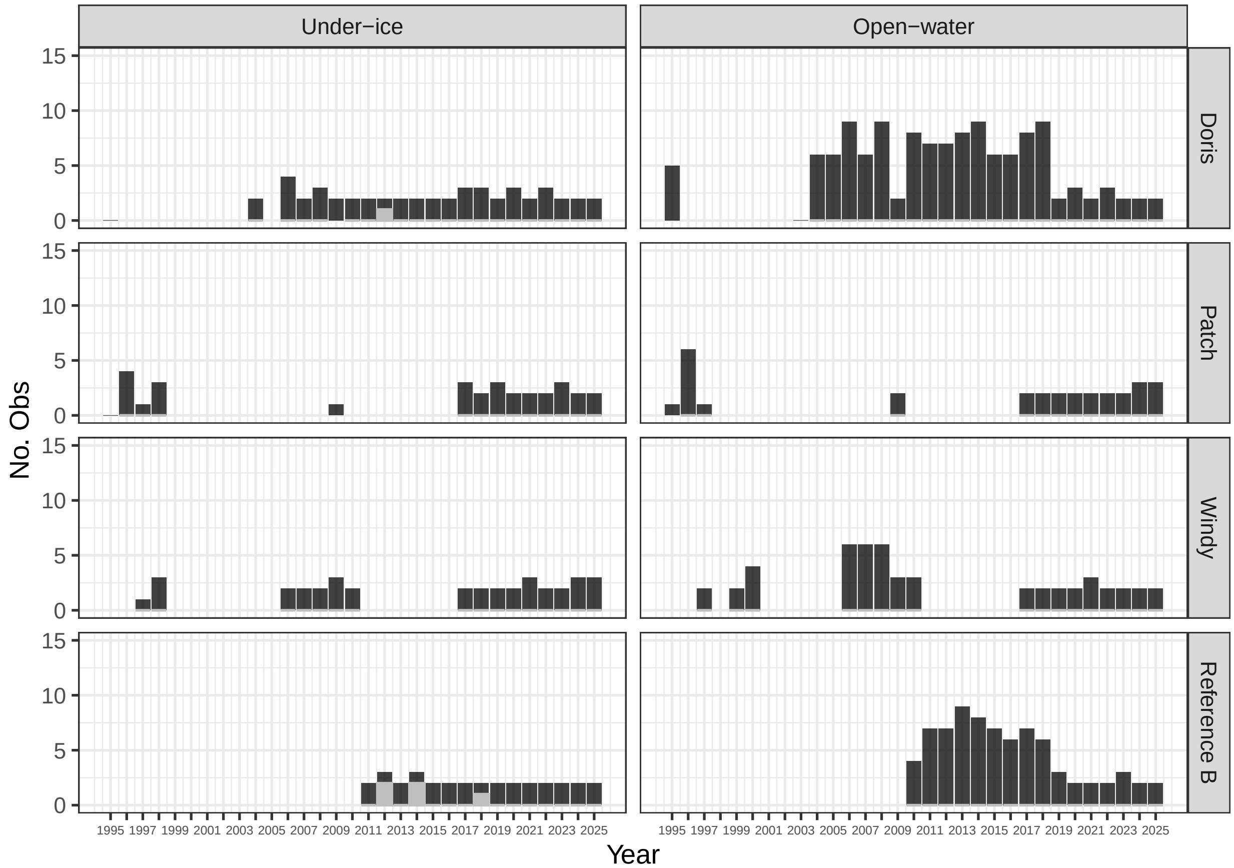
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Before
After
Total Phosphorus
0.000
0.005
0.010
0.015
0.020
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Reference B
Windy
Surface:Detect
Deep:Detect
Deep:Non−detect
Surface:Non−detect

C.3.1.10 Total Aluminum

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

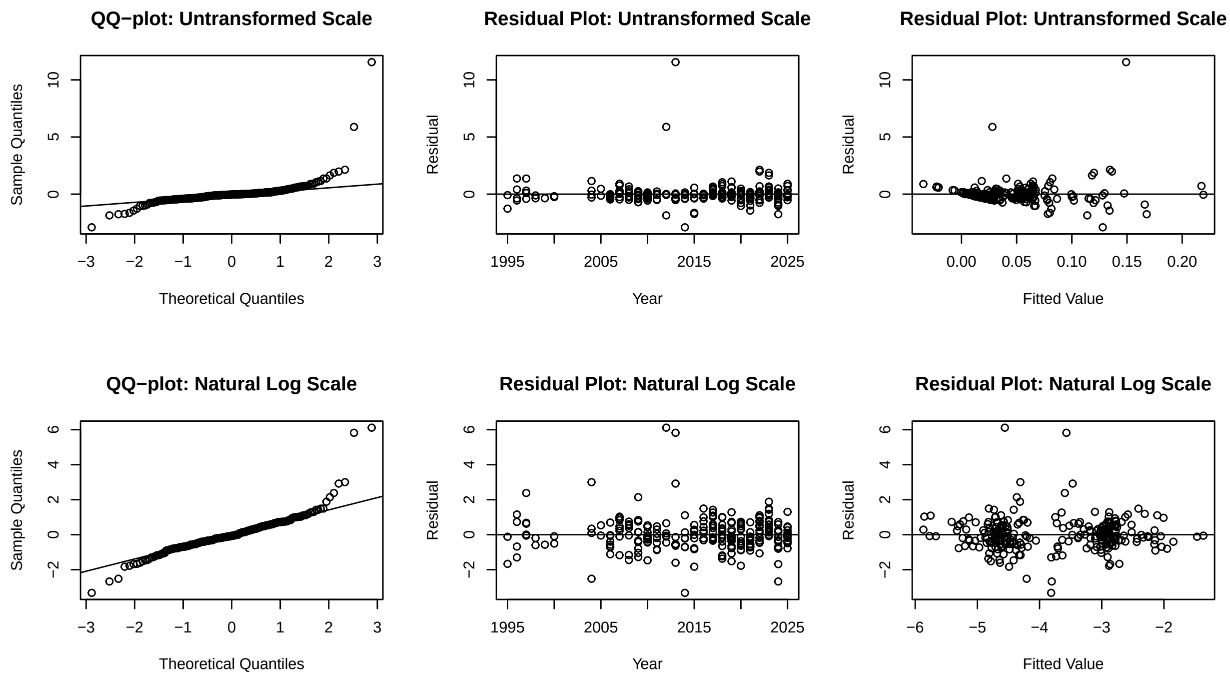
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	1	2	0
Doris	Open-water	127	0	0	0
Patch	Under-ice	30	0	0	0
Patch	Open-water	30	0	0	0
Reference B	Under-ice	32	5	16	0
Reference B	Open-water	77	0	0	0
Windy	Under-ice	36	0	0	0
Windy	Open-water	51	0	0	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2012	Under-ice	Surface	0.280	0.028	5.883
Reference B	2013	Under-ice	Surface	0.644	0.149	11.553

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Under-ice	Surface	0.0675	-4.309	3.002
Doris	2012	Under-ice	Surface	0.2800	-4.559	6.115
Reference B	2013	Under-ice	Surface	0.6440	-3.568	5.822
Reference B	2014	Under-ice	Deep	0.0037	-3.813	-3.324

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. There were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	4.441	3	0.21770	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

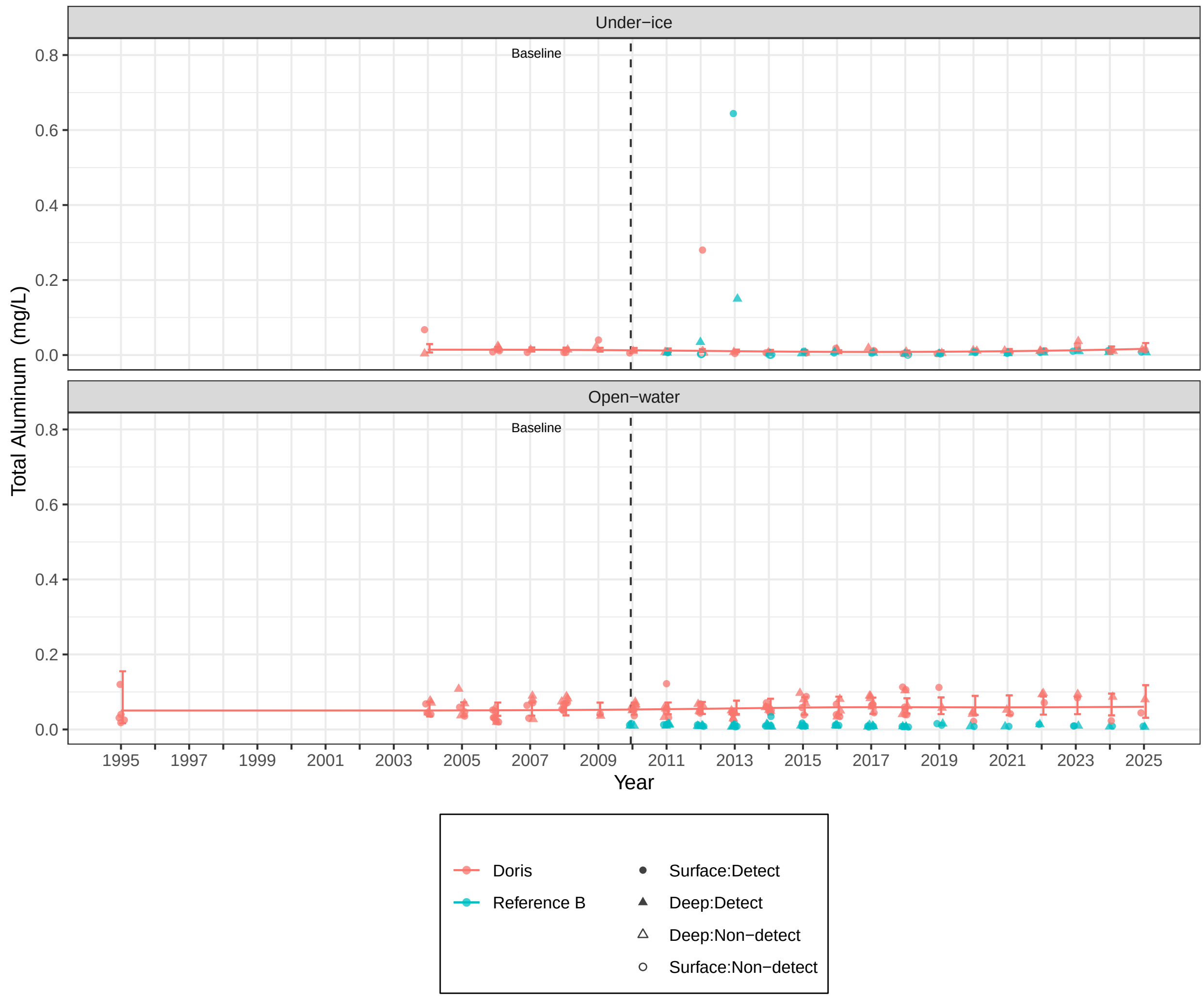
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	0.412	3	0.93780	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

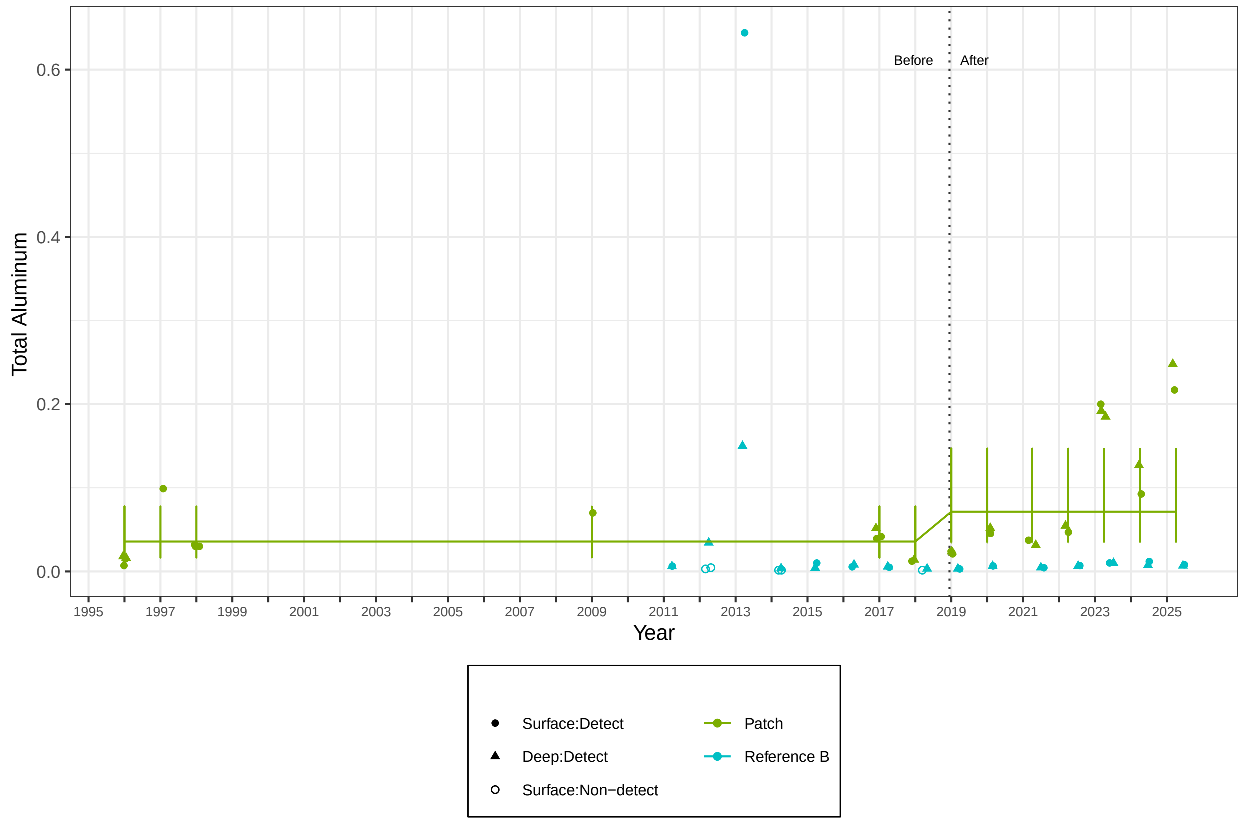
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.6922	0.4854	11.02	1.426	0.1815	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

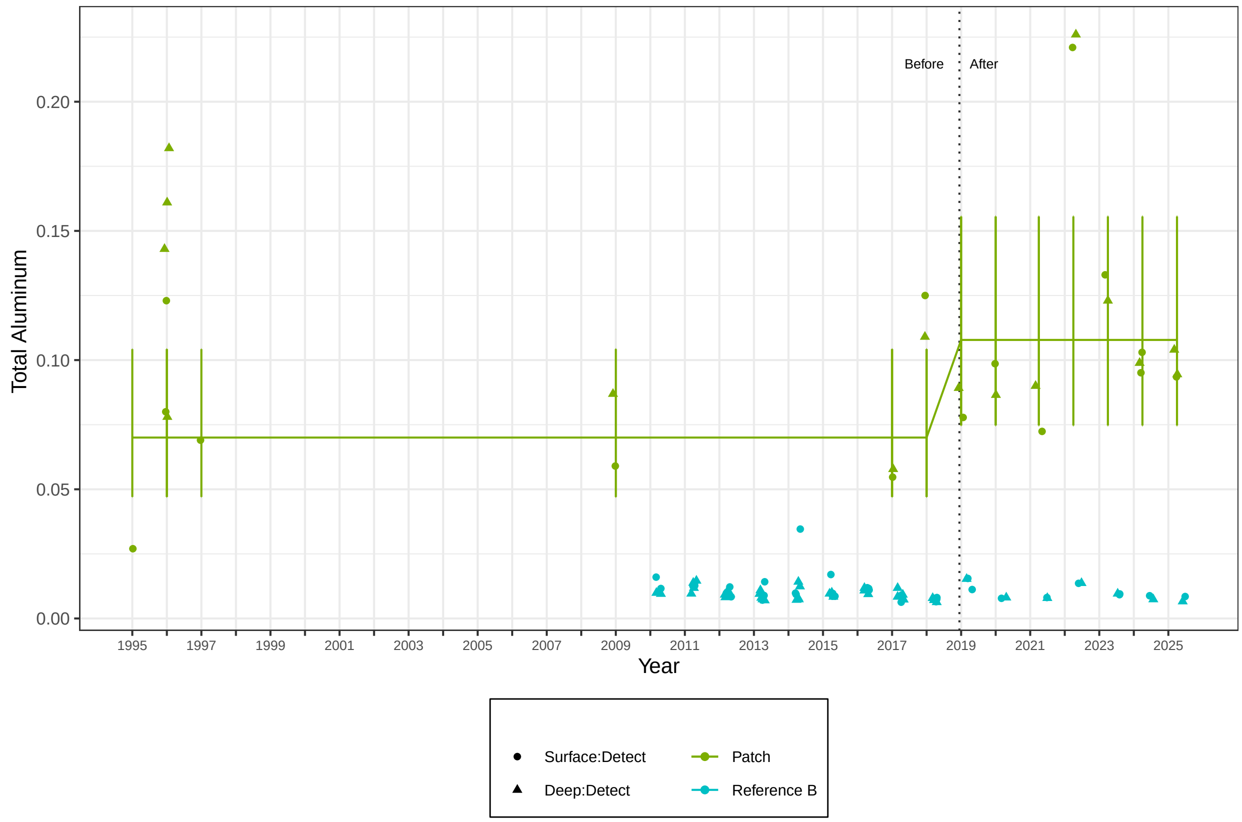
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.4315	0.246	10.83	1.754	0.1076	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

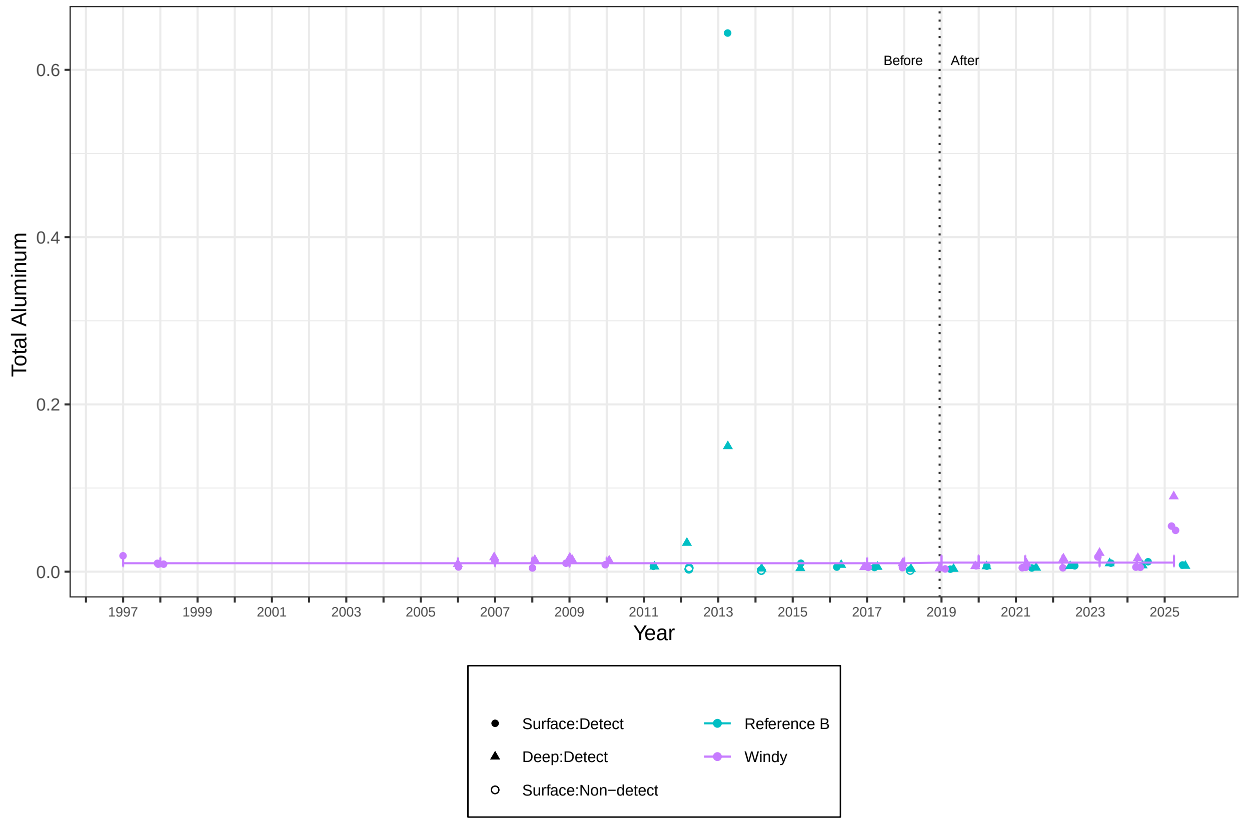
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0718	0.3634	13.98	0.1976	0.8462	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

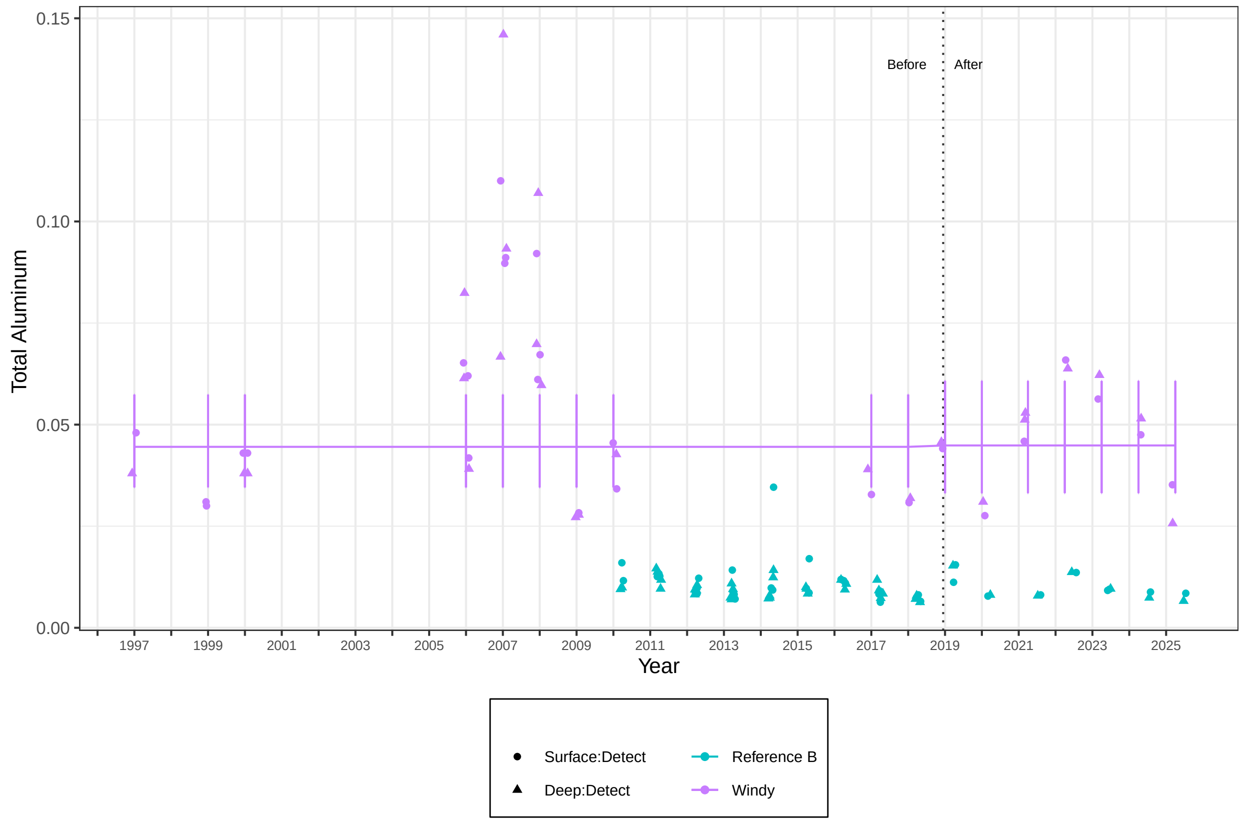
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0076	0.1854	14.98	0.041	0.9678	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

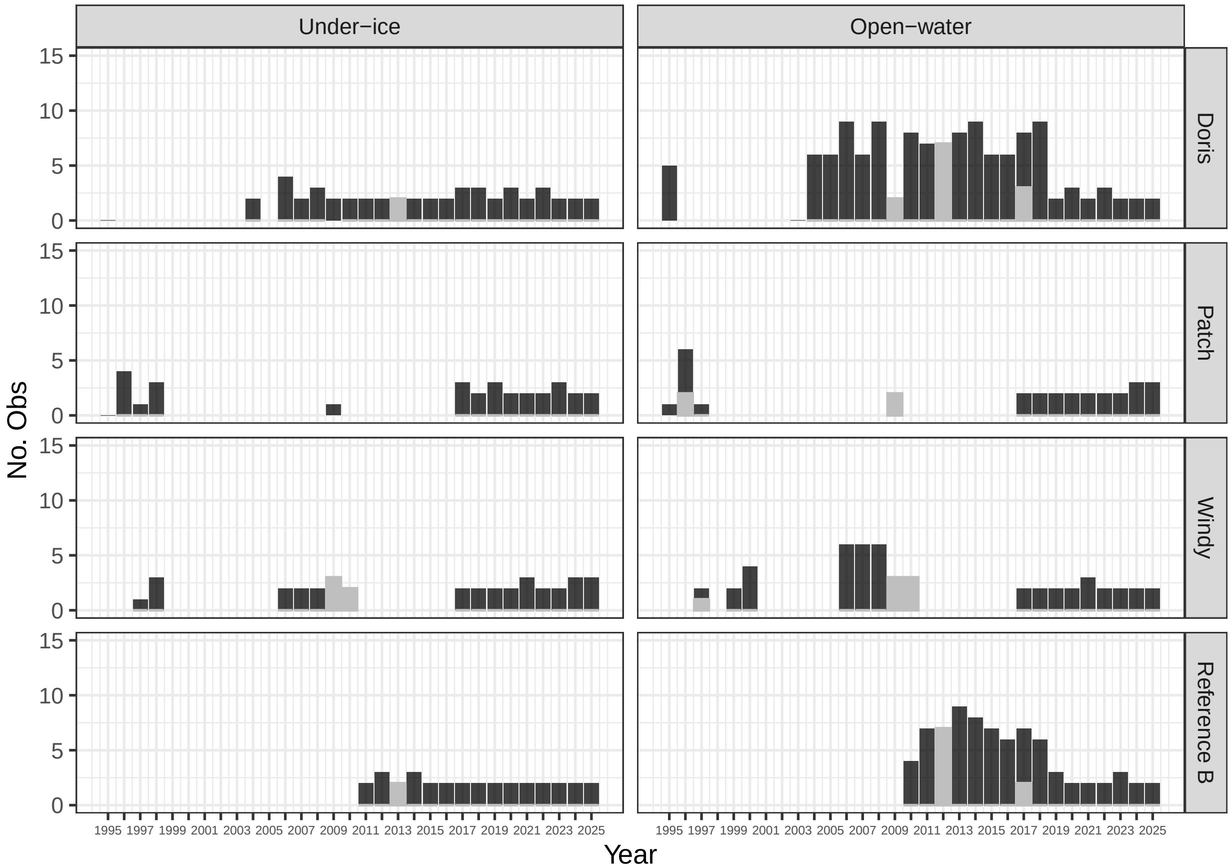
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


0.15
0.10
0.05
0.00
Total Aluminum
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Surface:Detect
Deep:Detect
Reference B
Windy

C.3.1.11 Total Arsenic

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

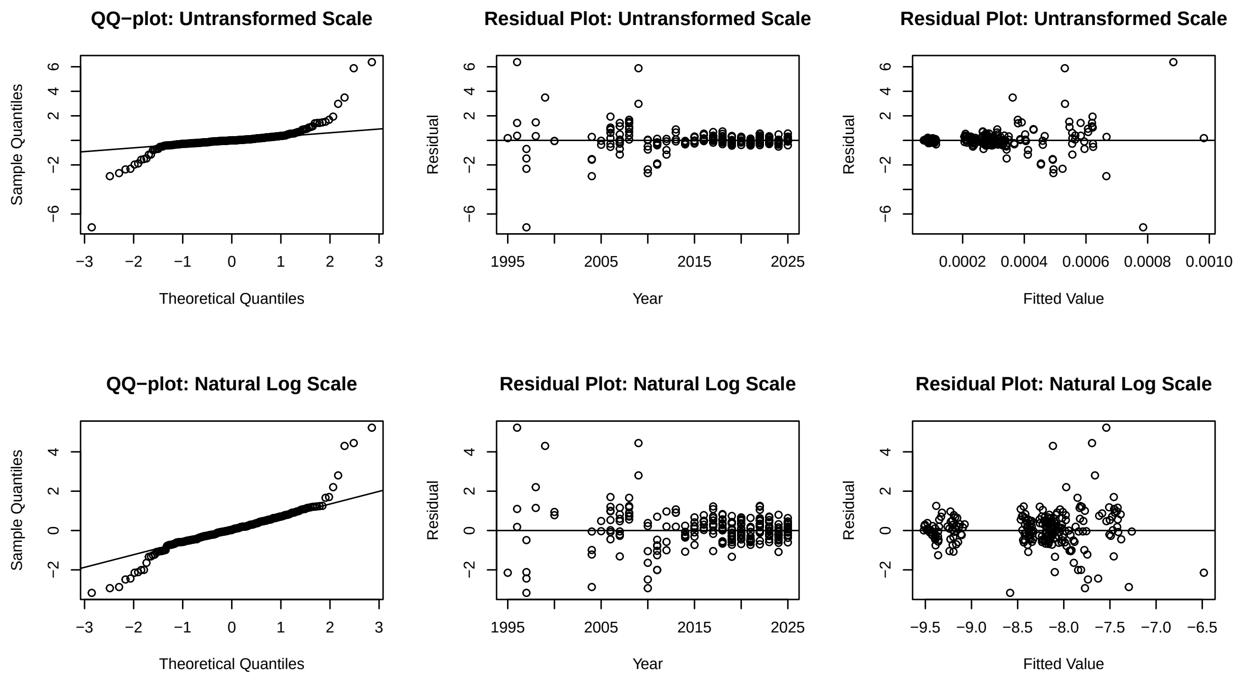
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	2	4	0
Doris	Open-water	127	15	12	0
Patch	Under-ice	30	1	3	0
Patch	Open-water	30	4	13	0
Reference B	Under-ice	32	2	6	0
Reference B	Open-water	77	9	12	0
Windy	Under-ice	36	5	14	0
Windy	Open-water	51	7	14	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression. Doris North Open-water, Patch Open-water, Reference B Open-water, Windy Under-ice, and Windy Open-water exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2009	Under-ice	Deep	0.0011	0.001	5.880
Patch	1996	Open-water	Surface	0.0015	0.001	6.376
Patch	1997	Open-water	Surface	0.0001	0.001	-7.087
Windy	1999	Open-water	Surface	0.0007	0.000	3.492

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2009	Under-ice	Deep	0.0011	-7.694	4.445
Patch	1996	Open-water	Surface	0.0015	-7.539	5.228
Patch	1997	Open-water	Surface	0.0001	-8.582	-3.169
Windy	1999	Open-water	Surface	0.0007	-8.118	4.301

The natural log transformed model better meets the residual assumptions. Analysis proceeds with natural log transformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	102.15	3	<0.00001	sig.
Compare to Reference B	13.69	3	0.00340	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Doris Open-Water

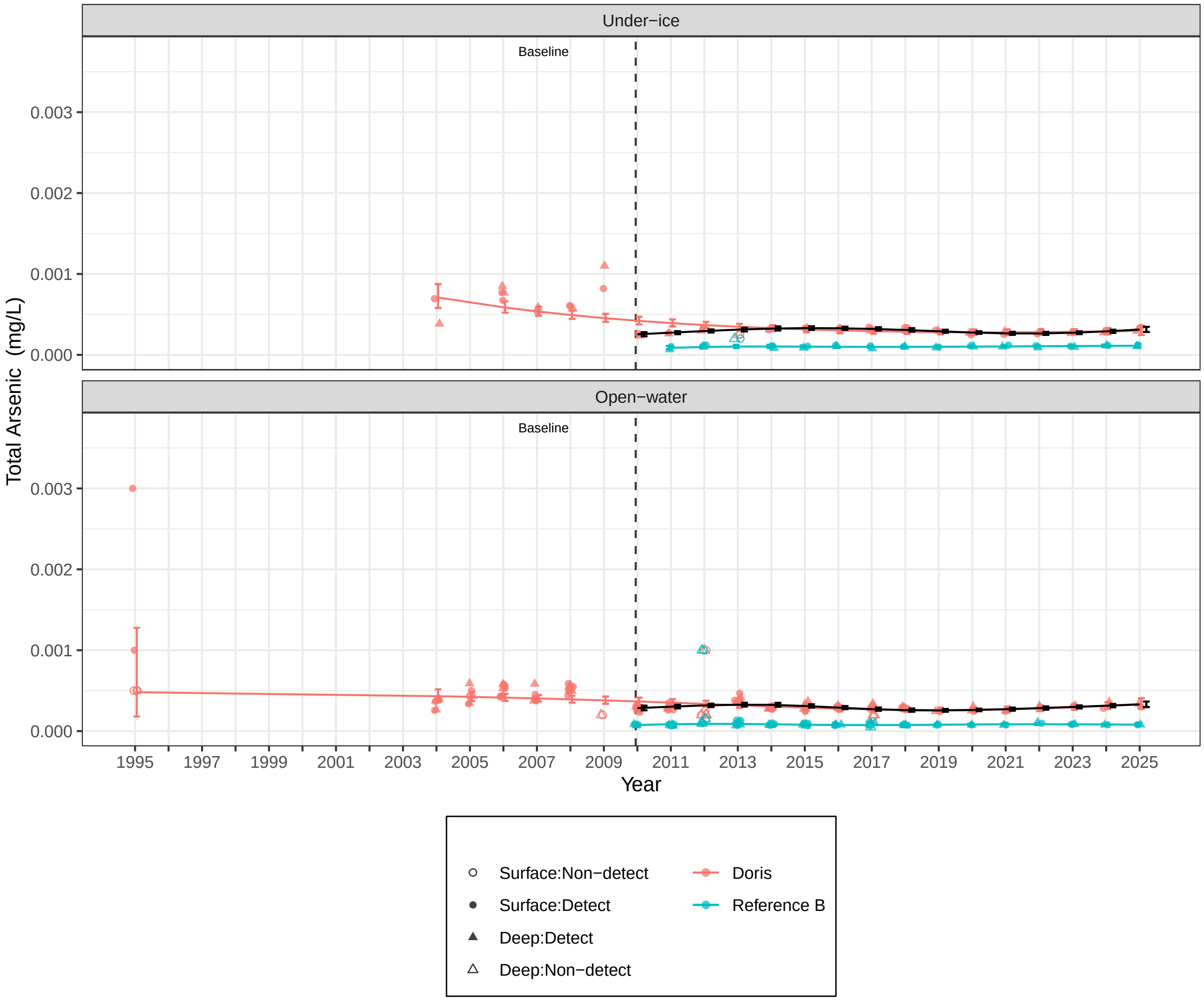
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	37.775	3	<0.00001	sig.
Compare to Reference B	8.592	3	0.03520	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

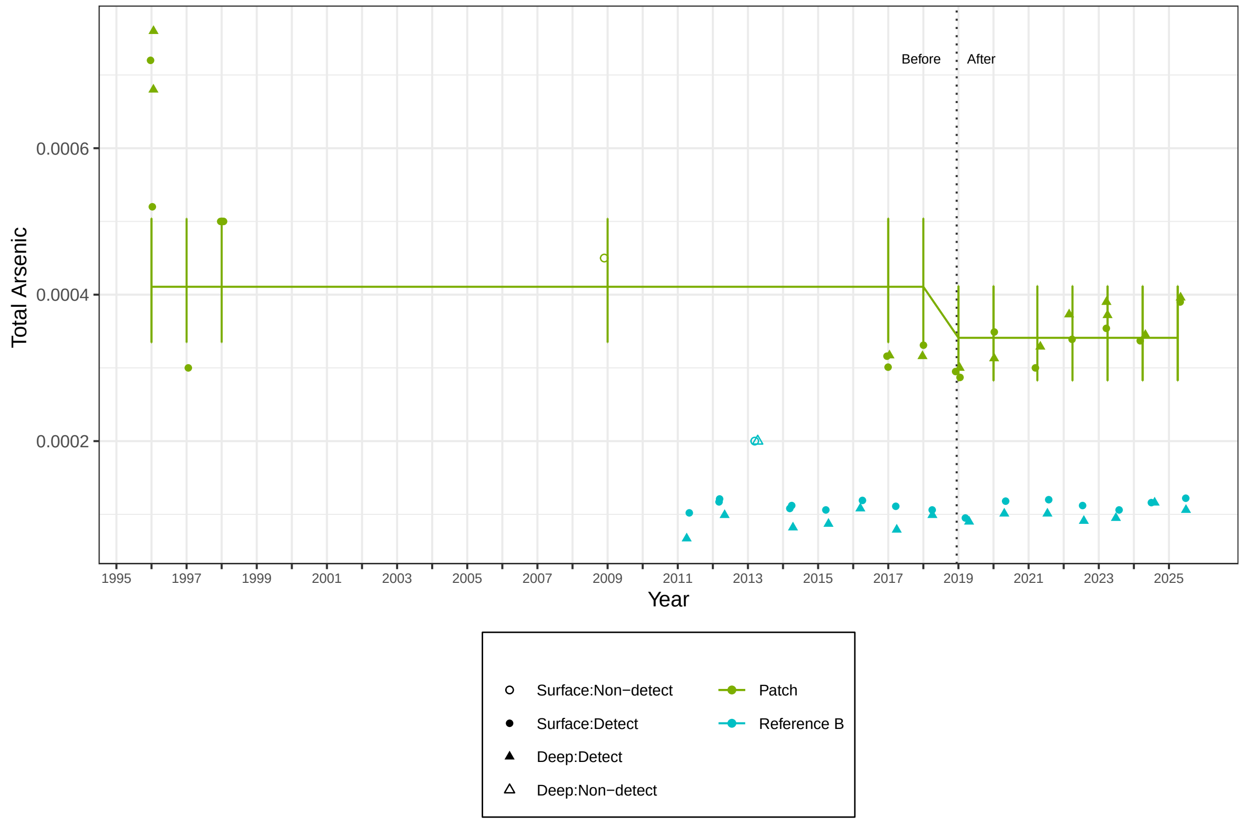
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.186	0.1267	11.06	-1.467	0.1701	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

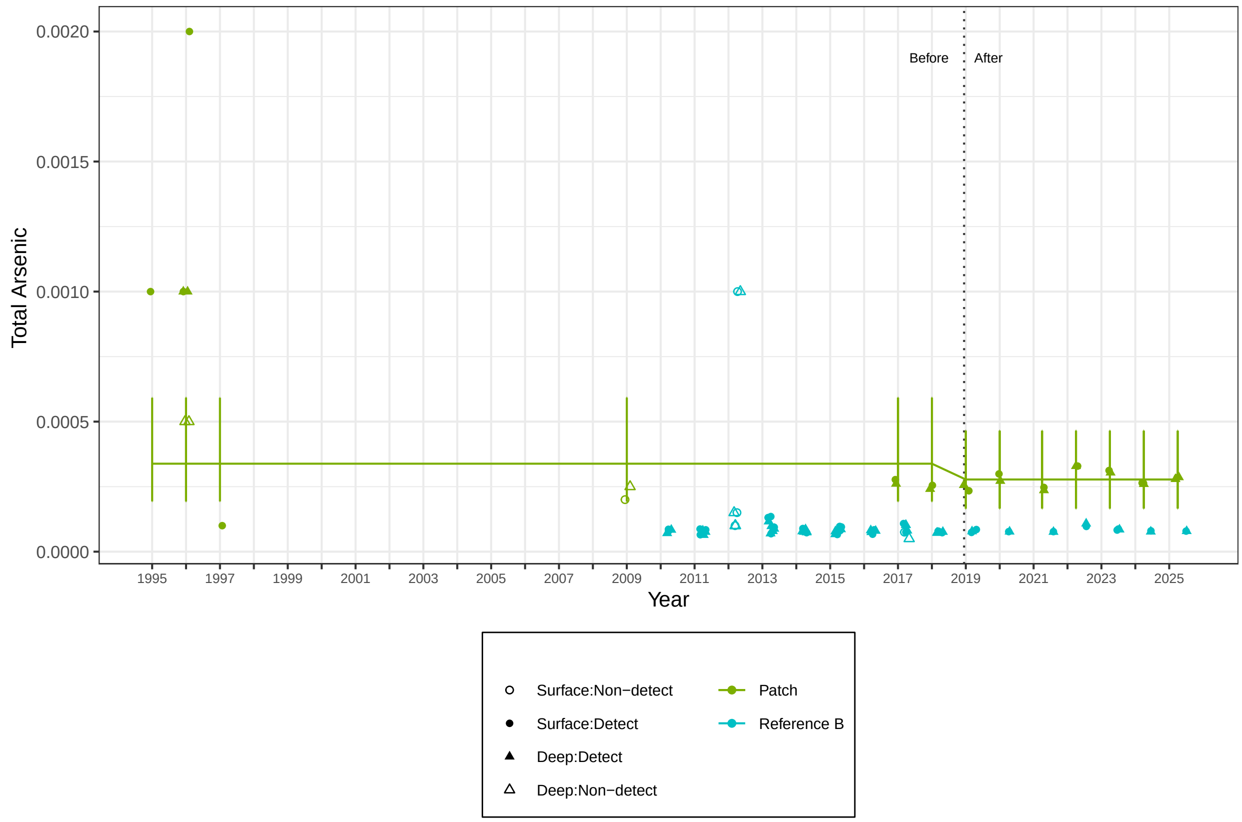
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.1978	0.3461	10.71	-0.5715	0.5795	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.4896	0.2067	13.93	-2.369	0.0328	sig.

Conclusion:

The change from before to after was significantly different.

BACI Analysis with Comparable Years

Results of the ANOVA test on the fixed effects of the model:

	Sum Sq.	Mean Sq.	NumDF	DenDF	F value	p
class	4.0801	4.0801	1	24	699.5212	<0.001
period	0.0023	0.0023	1	7	0.3981	0.548
Depth.Zone	0.1491	0.1491	1	24	25.5564	<0.001
class:period	0.0125	0.0125	1	24	2.1348	0.157

Estimated marginal means for site class by period:

Class	Period	LSmean	SE	DF	LowerCL	UpperCL
Monitored	after	-8.389	0.0283	12.35	-8.450	-8.327
Reference	after	-9.154	0.0283	12.35	-9.215	-9.092
Monitored	before	-8.377	0.0529	12.35	-8.492	-8.262
Reference	before	-9.231	0.0529	12.35	-9.346	-9.116

- Results are given on the natural log scale.

Summary of BACI contrasts for relative difference between changes from the before to after in Windy Deep and Reference Lake B, with 95% confidence intervals:

Windy Deep vs:	Estimate	Lower C.I.	Upper C.I.	Significance
Reference Sites	-0.0895	-0.2158	0.0369	not sig.

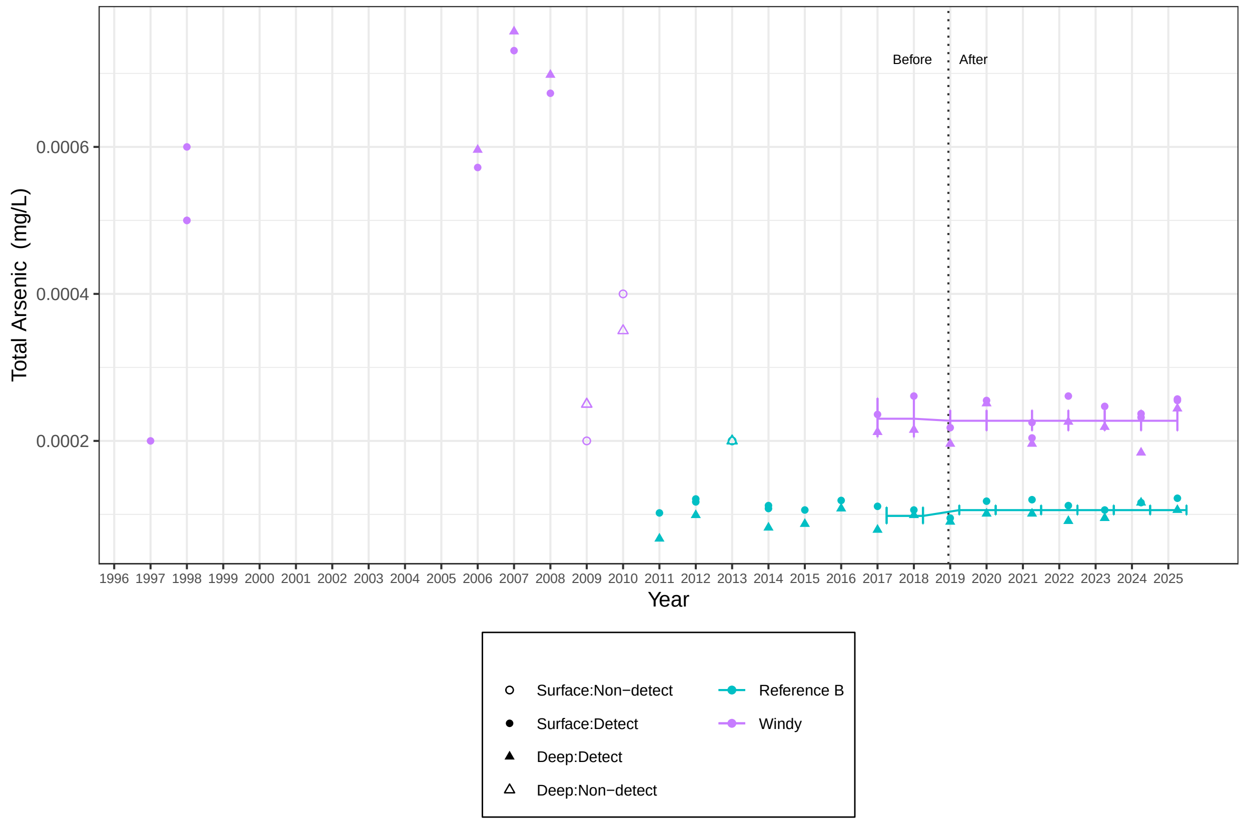
A BACI contrast is identified as *significant* if the confidence interval does not include 0.

Conclusion:

The change in Total Arsenic concentrations at the Windy Deep site from before to after was not significantly (p = 0.157) different from the change at Reference Lake B, according to the test on the BACI term (*class:period*).

Observed Data and Fitted Values with Comparable Years

Depth was accounted for in the model but not evaluated since its effect is not of primary interest. Below are plots of the observed and fitted data. The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for monitored and reference sites.



Windy Open-water Before-After Analysis

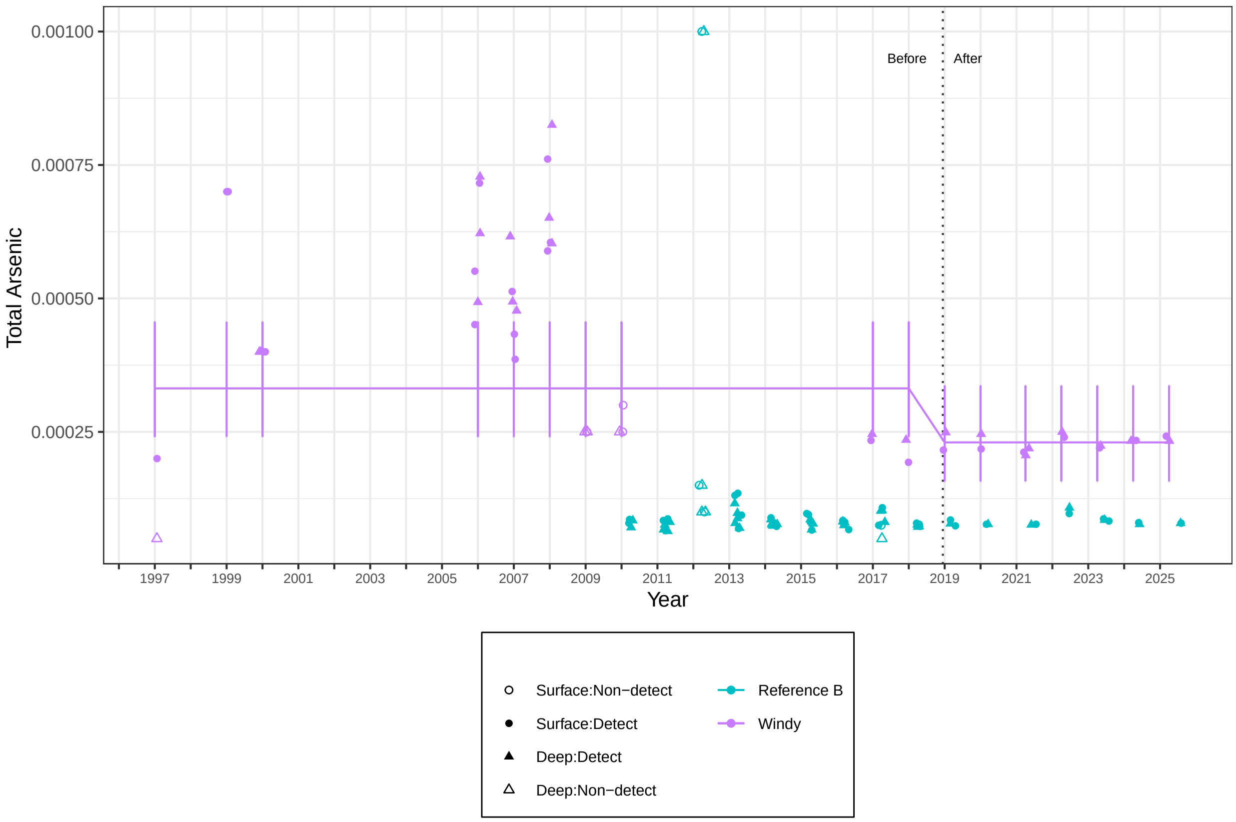
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.3642	0.2325	14.62	-1.566	0.1387	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

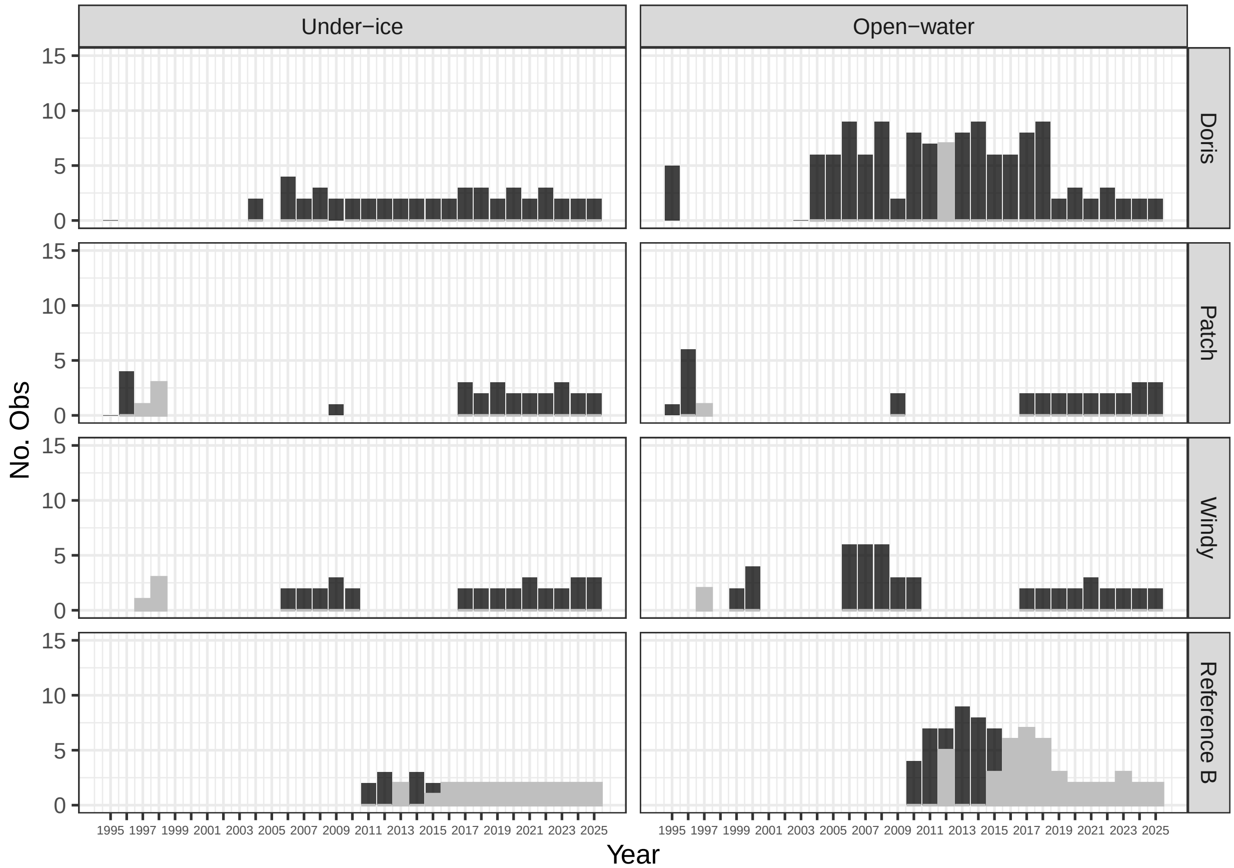
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Total Arsenic
0.00100
0.00075
0.00050
0.00025
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Surface:Non−detect
Surface:Detect
Deep:Detect
Deep:Non−detect
Reference B
Windy

C.3.1.12 Total Boron

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

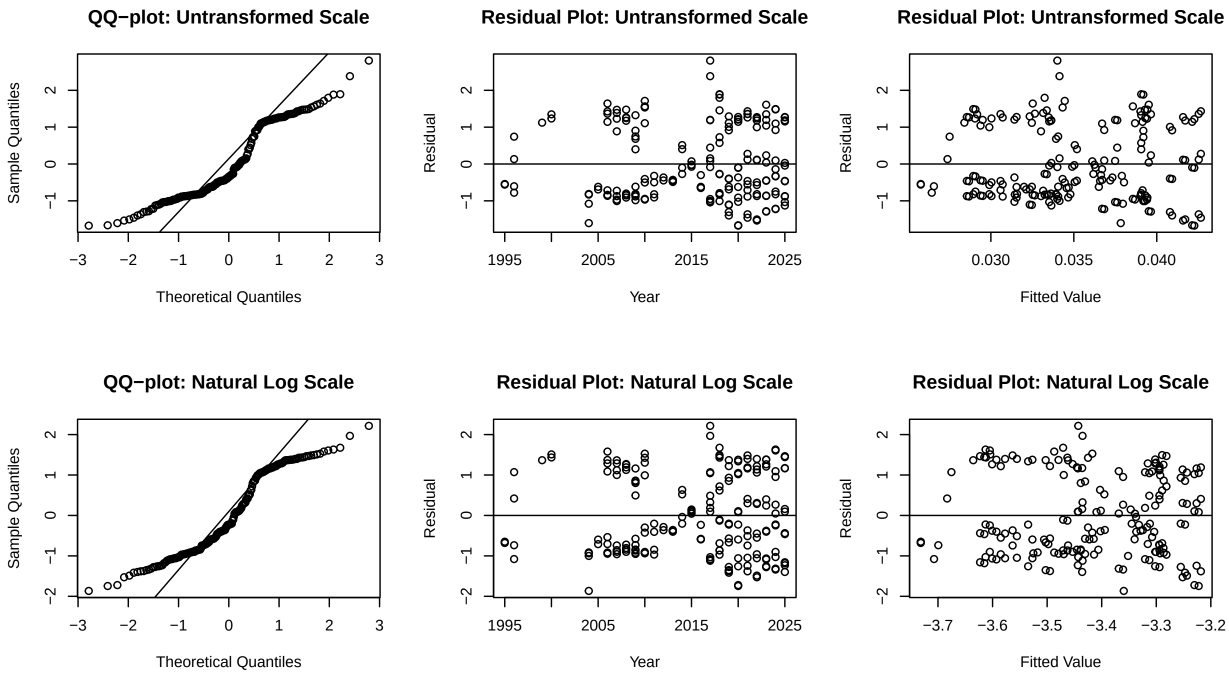
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	0	0	0
Doris	Open-water	127	7	6	0
Patch	Under-ice	30	4	13	0
Patch	Open-water	30	1	3	0
Reference B	Under-ice	32	23	72	100
Reference B	Open-water	77	43	56	100
Windy	Under-ice	36	4	11	0
Windy	Open-water	51	2	4	0

More than 50% of data was under detection limit in Reference B Under-ice and Reference B Open-water. Data from those site-season groupings will be removed from the analysis.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	54.31	3	<0.00001	sig.

Doris Lake exhibited significant deviation from a slope of zero. Comparison to the trend in Reference Lake B was not completed due to Reference Lake B being excluded from analysis.

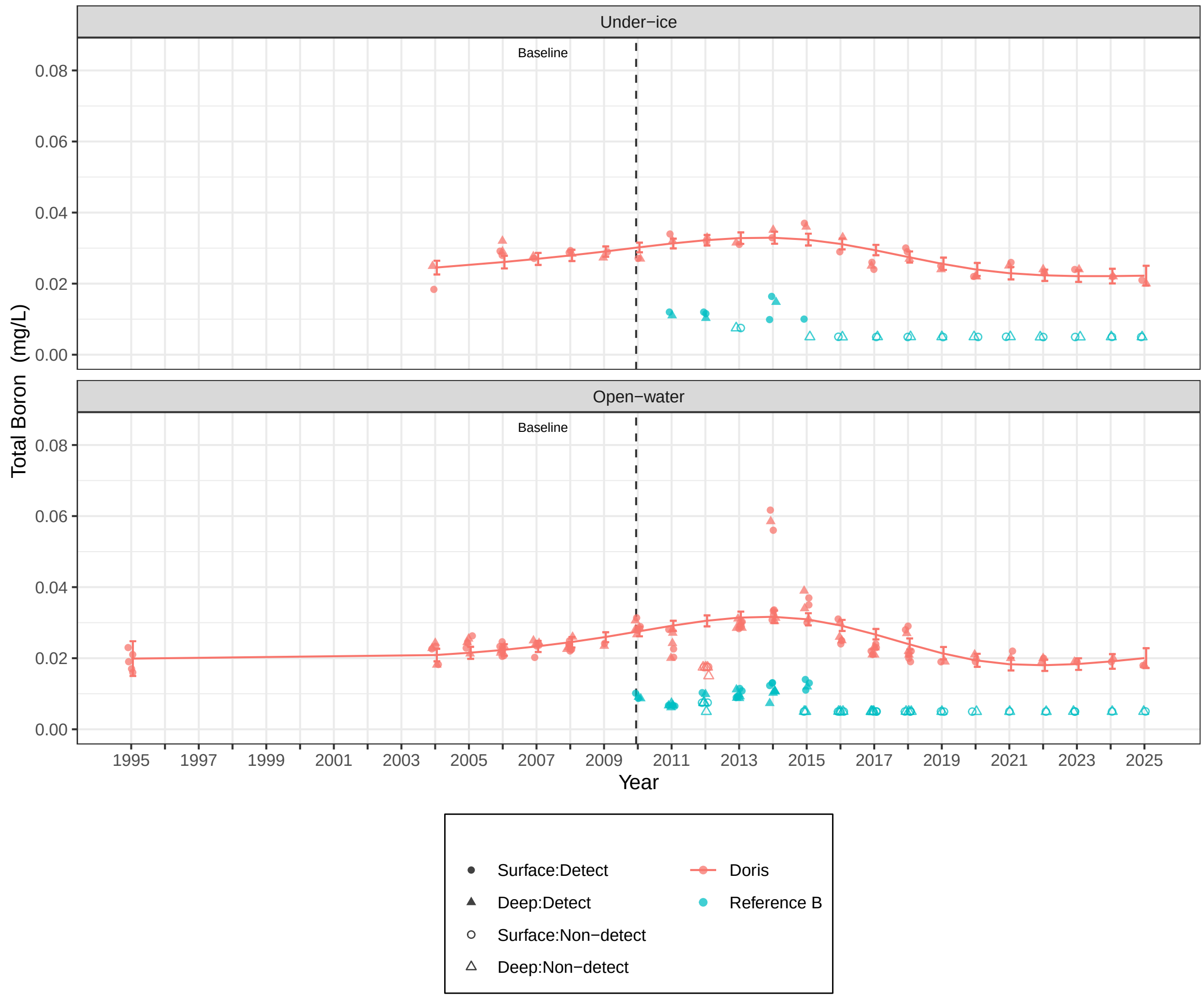
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	48.58	3	<0.00001	sig.

Doris Lake exhibited significant deviation from a slope of zero. Comparison to the trend in Reference Lake B was not completed due to Reference Lake B being excluded from analysis.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

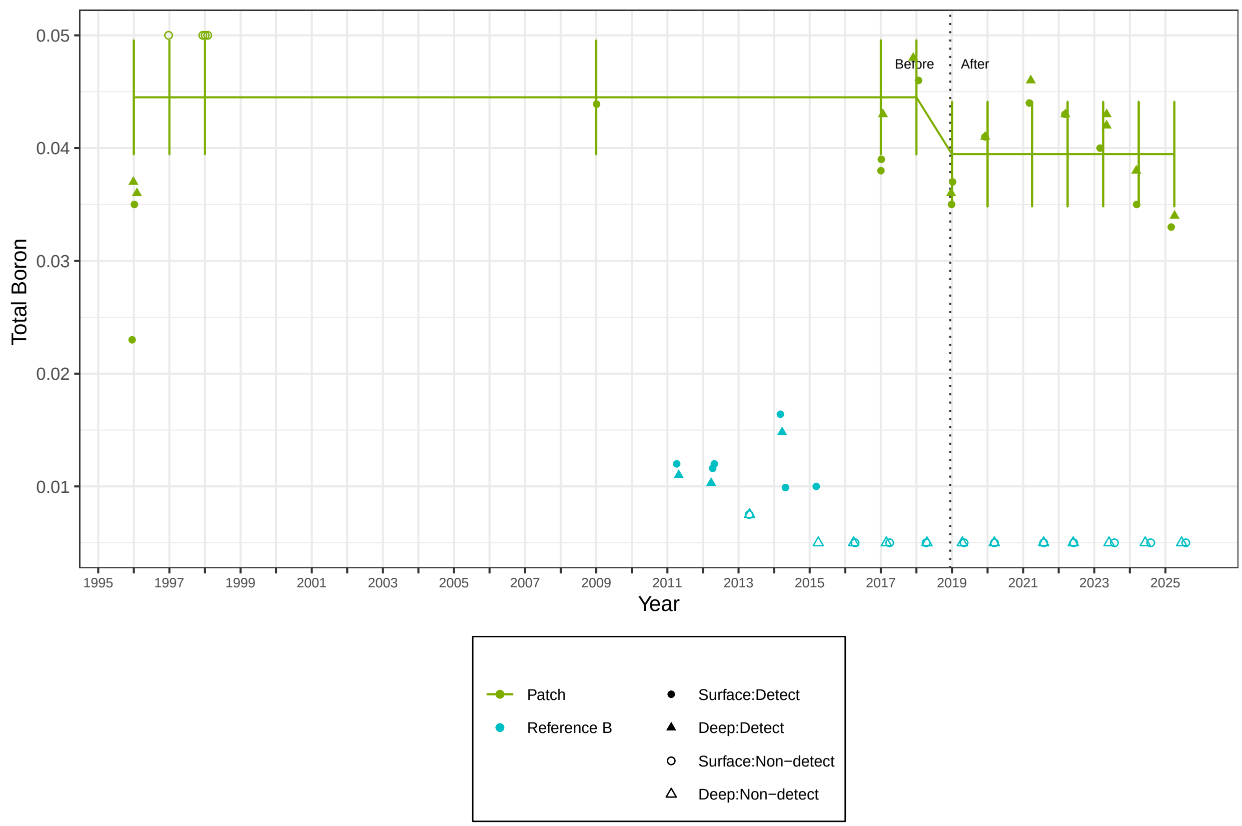
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.005	0.0031	11.05	-1.603	0.1372	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

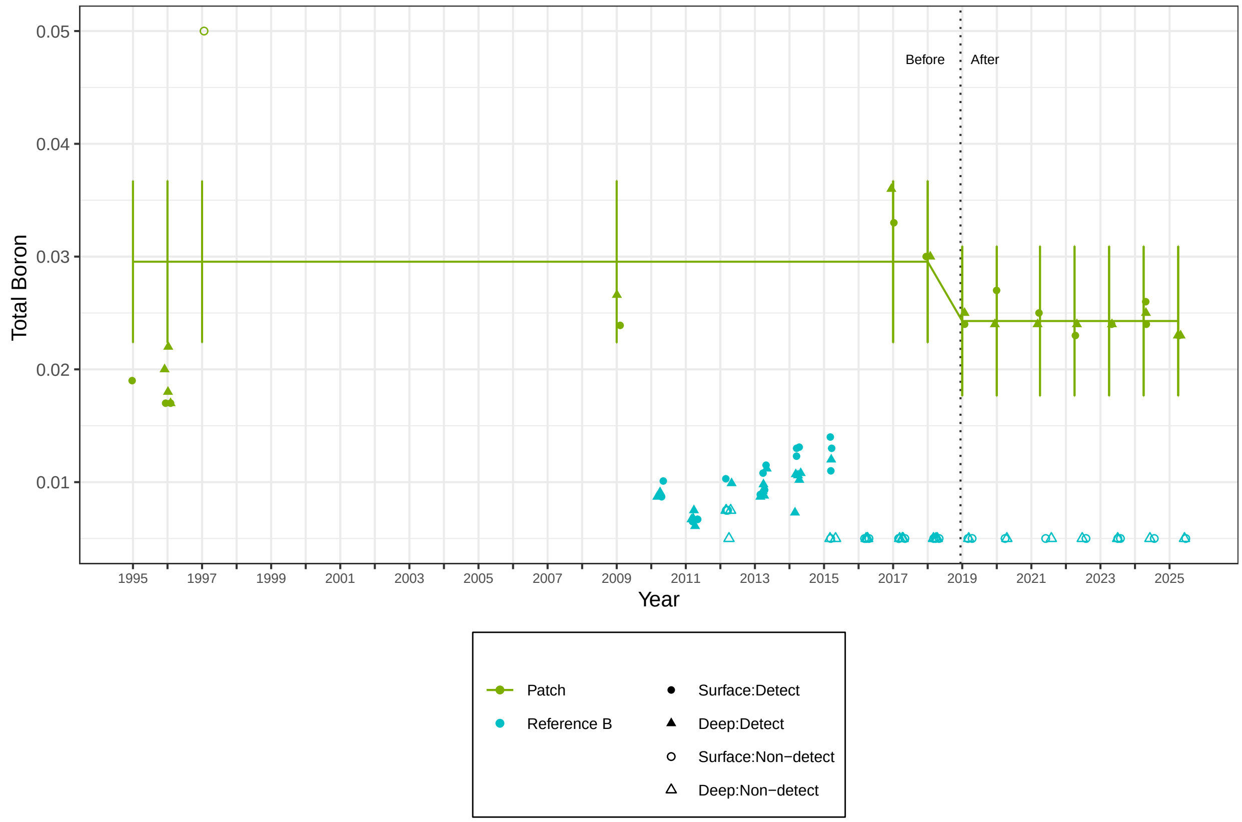
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0053	0.0044	10.85	-1.182	0.2624	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

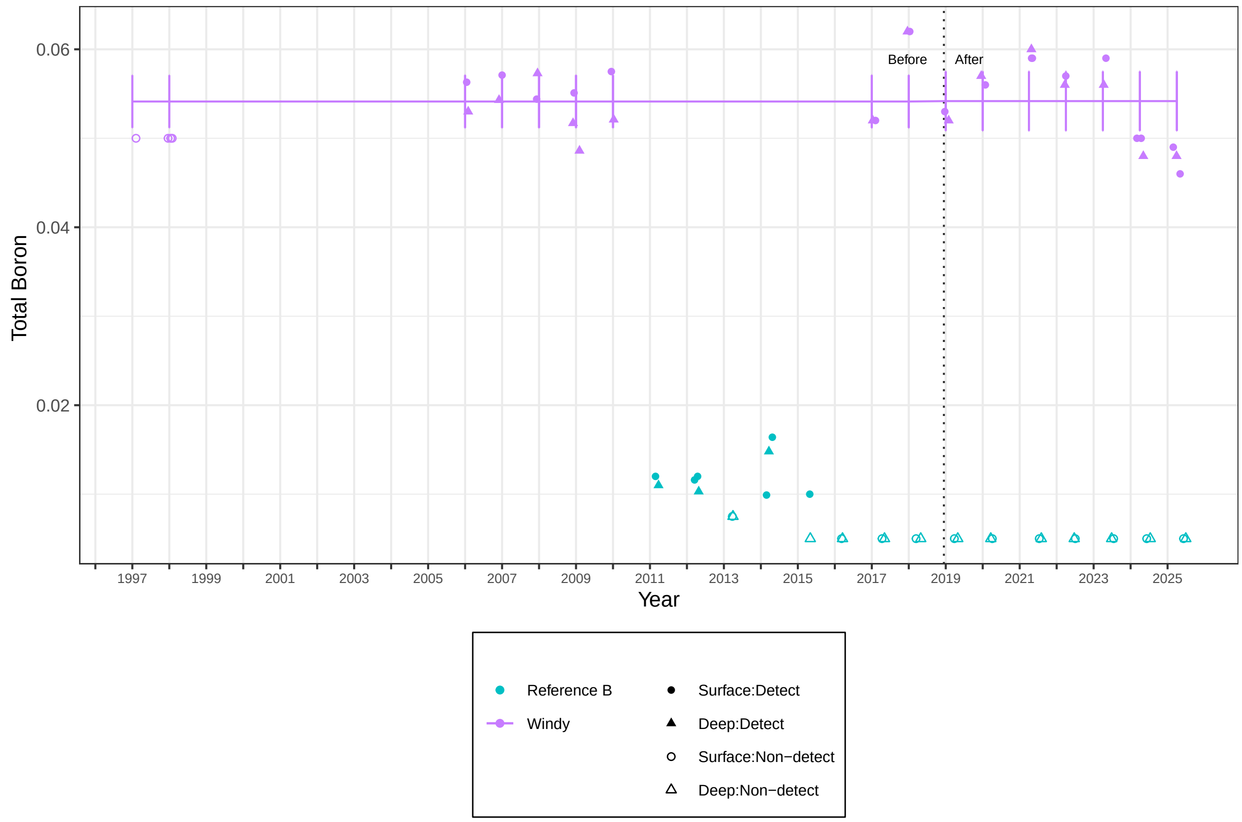
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0	0.0021	13.8	0.0224	0.9824	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

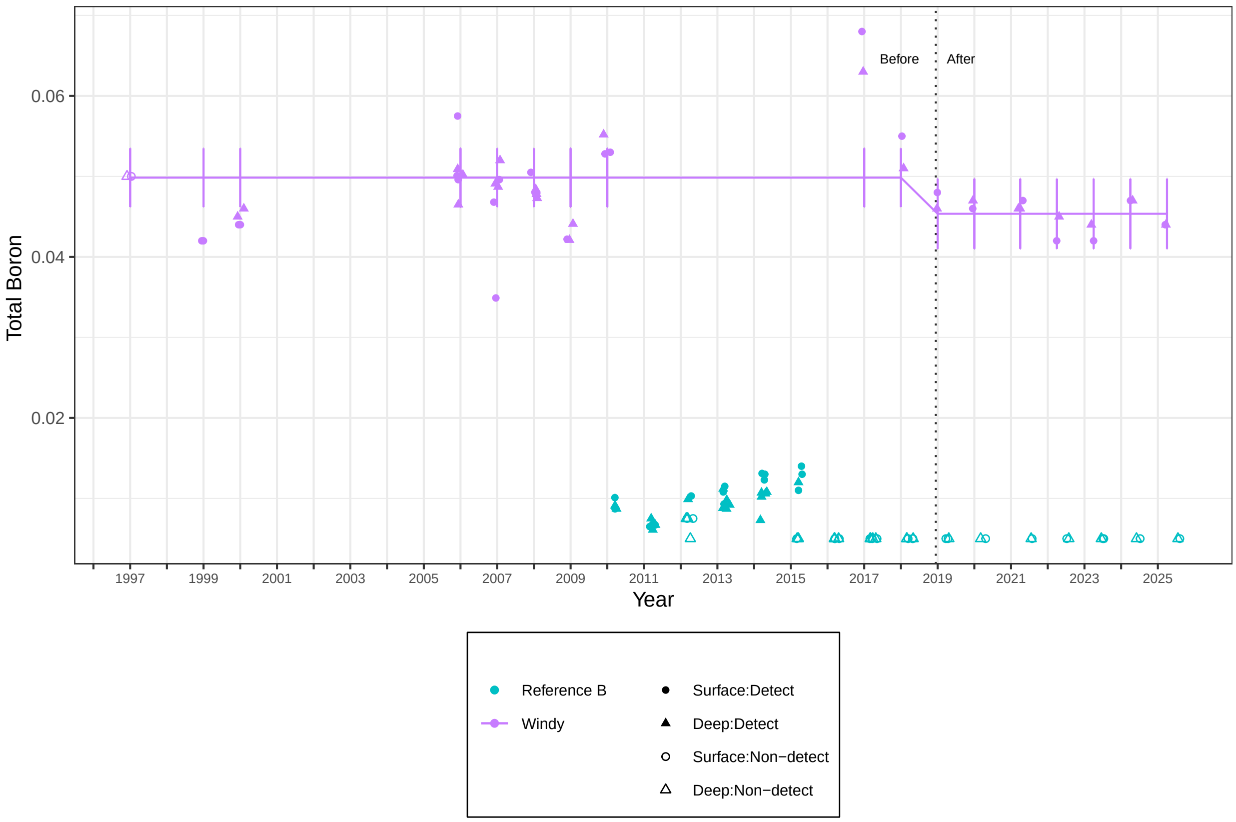
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0045	0.0027	14.82	-1.686	0.1127	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

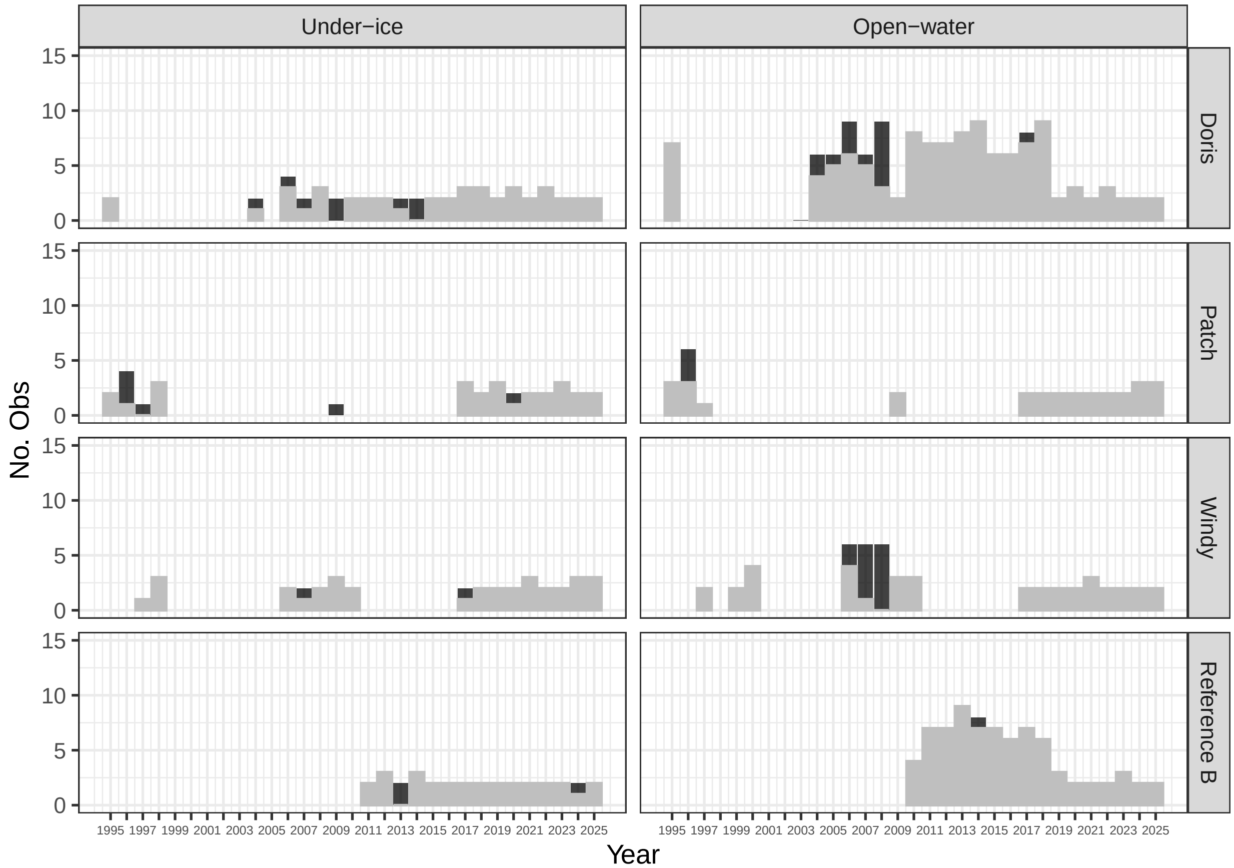
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Before
After
0.06
0.04
0.02
Total Boron
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Reference B
Windy
Surface:Detect
Deep:Detect
Surface:Non−detect
Deep:Non−detect

C.3.1.13 Total Cadmium

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

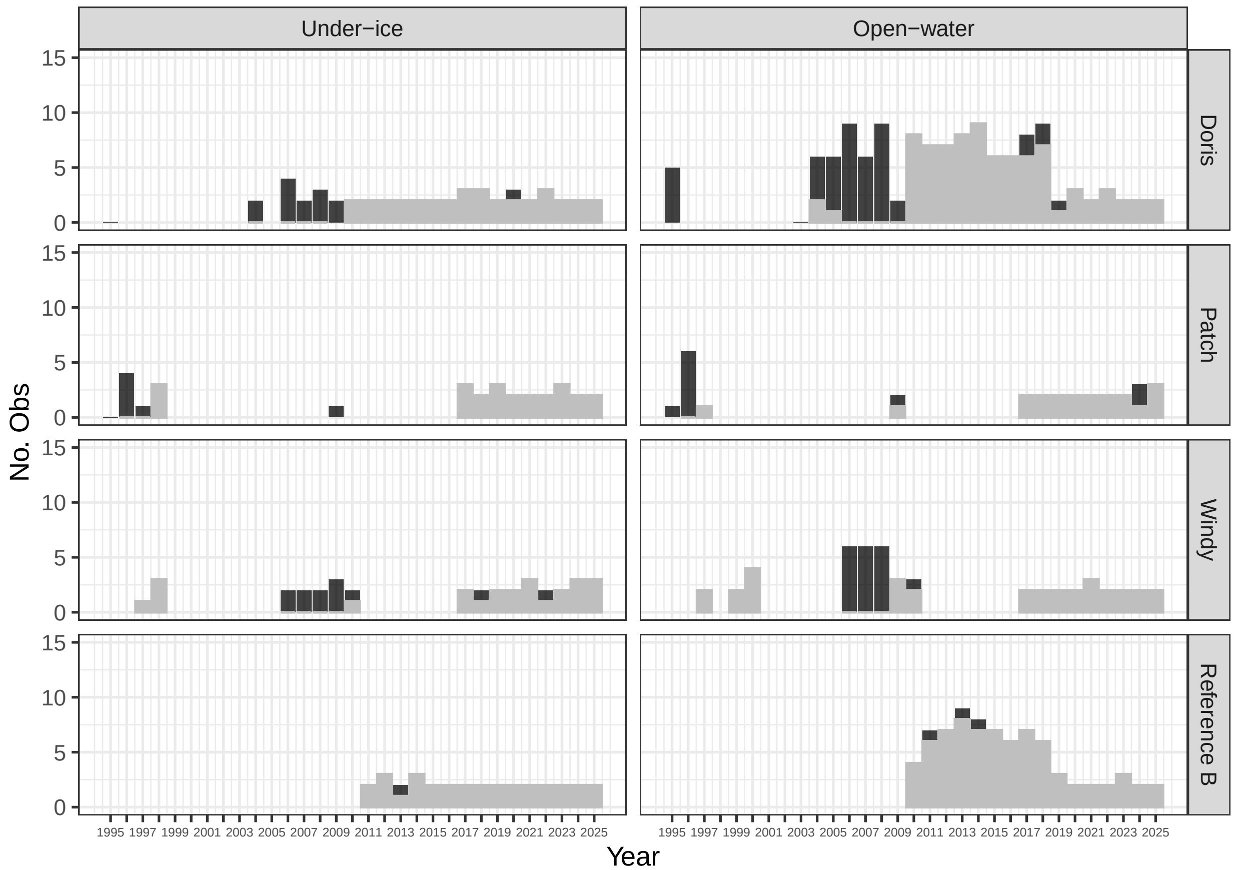
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	51	45	88	100
Doris	Open-water	129	115	89	100
Patch	Under-ice	32	27	84	100
Patch	Open-water	32	29	91	100
Reference B	Under-ice	32	29	91	100
Reference B	Open-water	77	76	99	100
Windy	Under-ice	36	34	94	100
Windy	Open-water	51	38	75	100

All data from Doris North, Patch and Windy were censored. All data removed from the analysis and no statistical analyses were performed.

C.3.1.14 Total Chromium

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

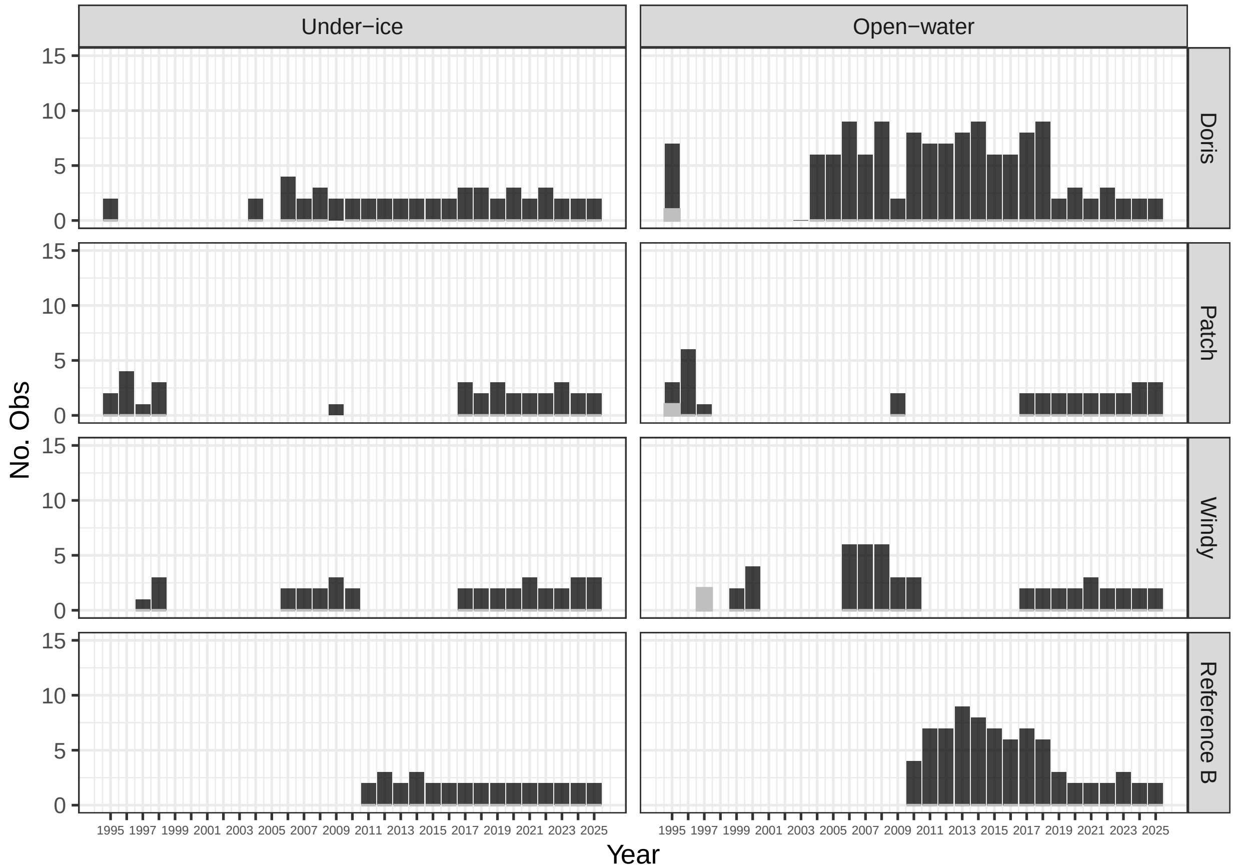
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	35	71	100
Doris	Open-water	127	84	66	100
Patch	Under-ice	30	24	80	100
Patch	Open-water	30	20	67	100
Reference B	Under-ice	32	31	97	100
Reference B	Open-water	77	74	96	100
Windy	Under-ice	36	24	67	100
Windy	Open-water	51	32	63	100

All data from Doris North, Patch and Windy were censored. All data removed from the analysis and no statistical analyses were performed.

C.3.1.15 Total Copper

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

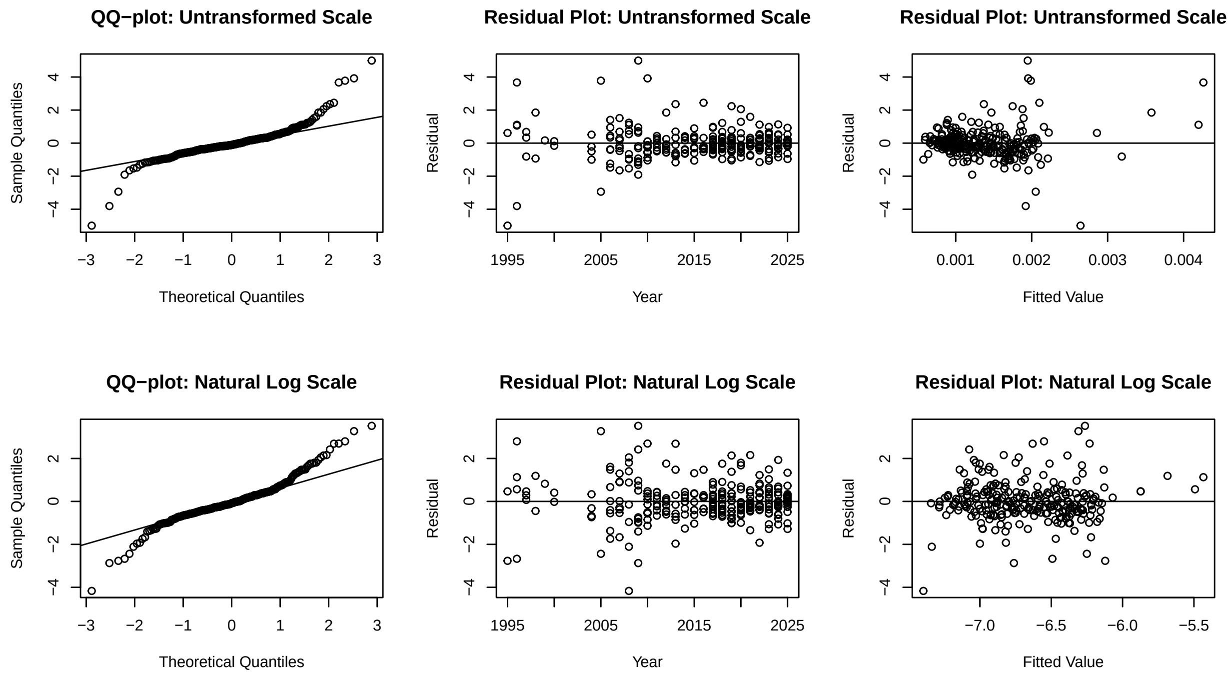
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	51	0	0	0
Doris	Open-water	129	1	1	0
Patch	Under-ice	32	0	0	0
Patch	Open-water	32	1	3	0
Reference B	Under-ice	32	0	0	0
Reference B	Open-water	77	0	0	0
Windy	Under-ice	36	0	0	0
Windy	Open-water	51	2	4	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2005	Open-water	Deep	0.002853	0.002	3.778
Doris	2009	Under-ice	Surface	0.003090	0.002	4.994
Doris	2010	Under-ice	Surface	0.002850	0.002	3.920
Patch	1995	Under-ice	Surface	0.001500	0.003	-4.994
Patch	1996	Under-ice	Surface	0.005100	0.004	3.670
Patch	1996	Open-water	Surface	0.001050	0.002	-3.807

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2005	Open-water	Deep	0.002853	-6.309	3.273
Doris	2009	Under-ice	Surface	0.003090	-6.263	3.519
Windy	2008	Under-ice	Deep	0.000346	-7.396	-4.168

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. However, there were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	9.459	4	0.05060	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

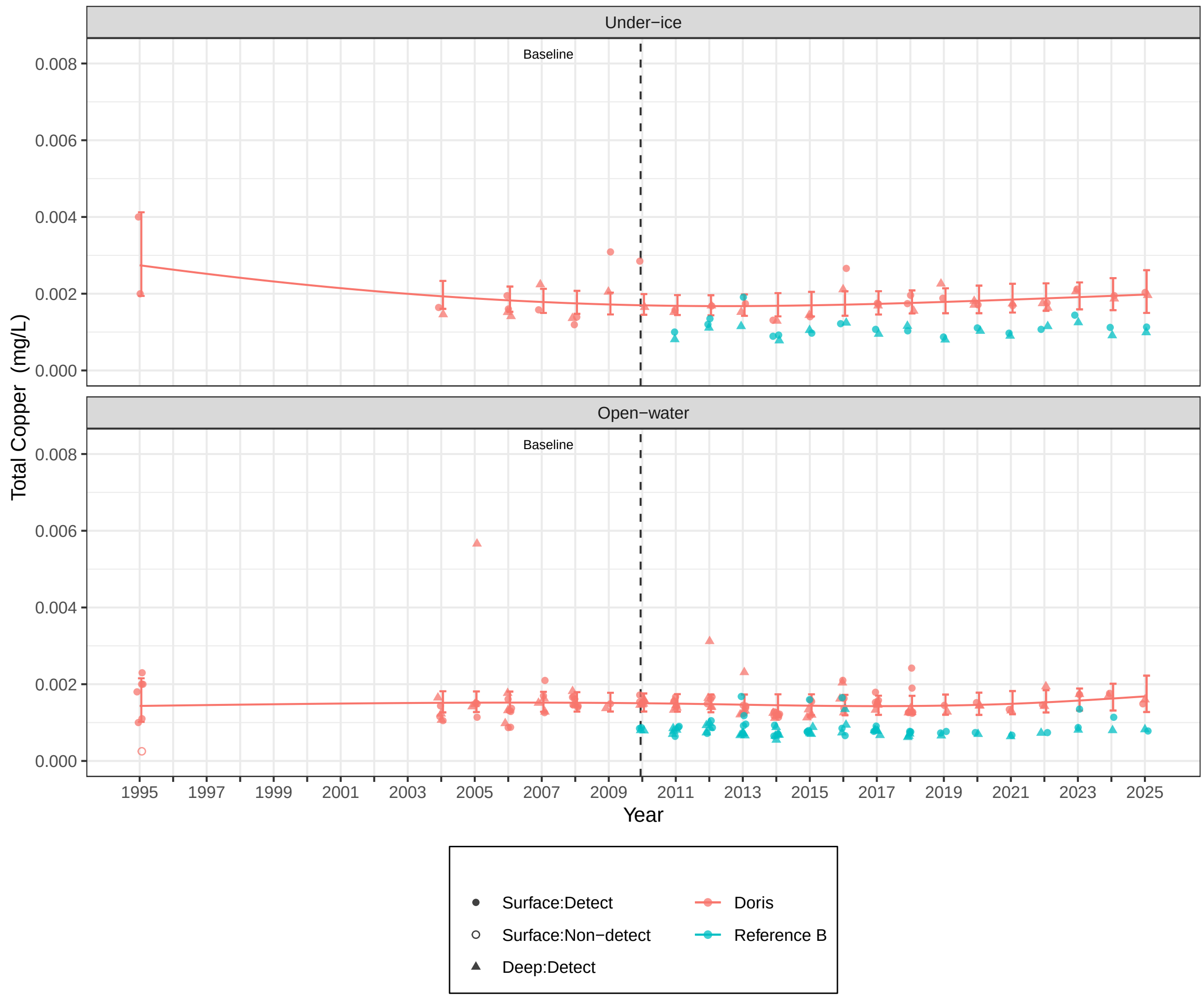
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	1.875	4	0.75880	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

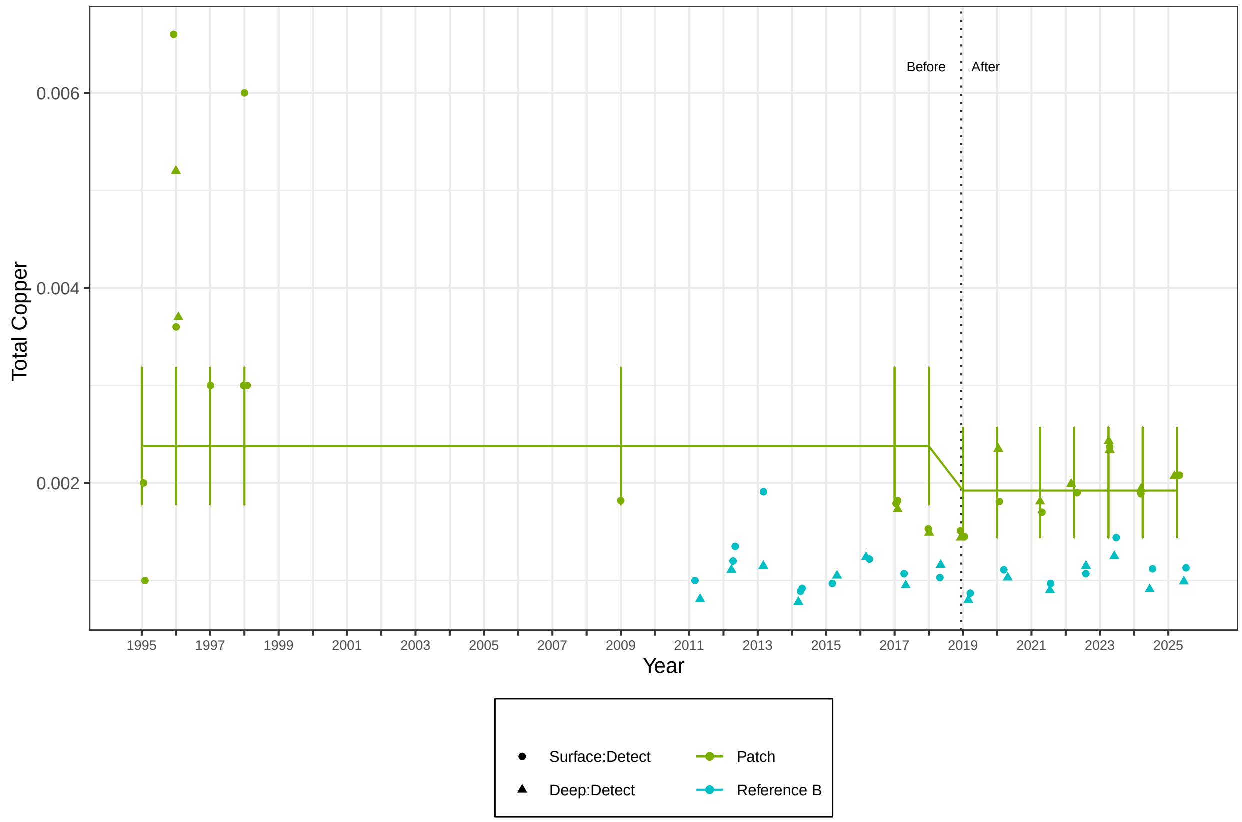
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.2126	0.1905	12	-1.116	0.2862	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

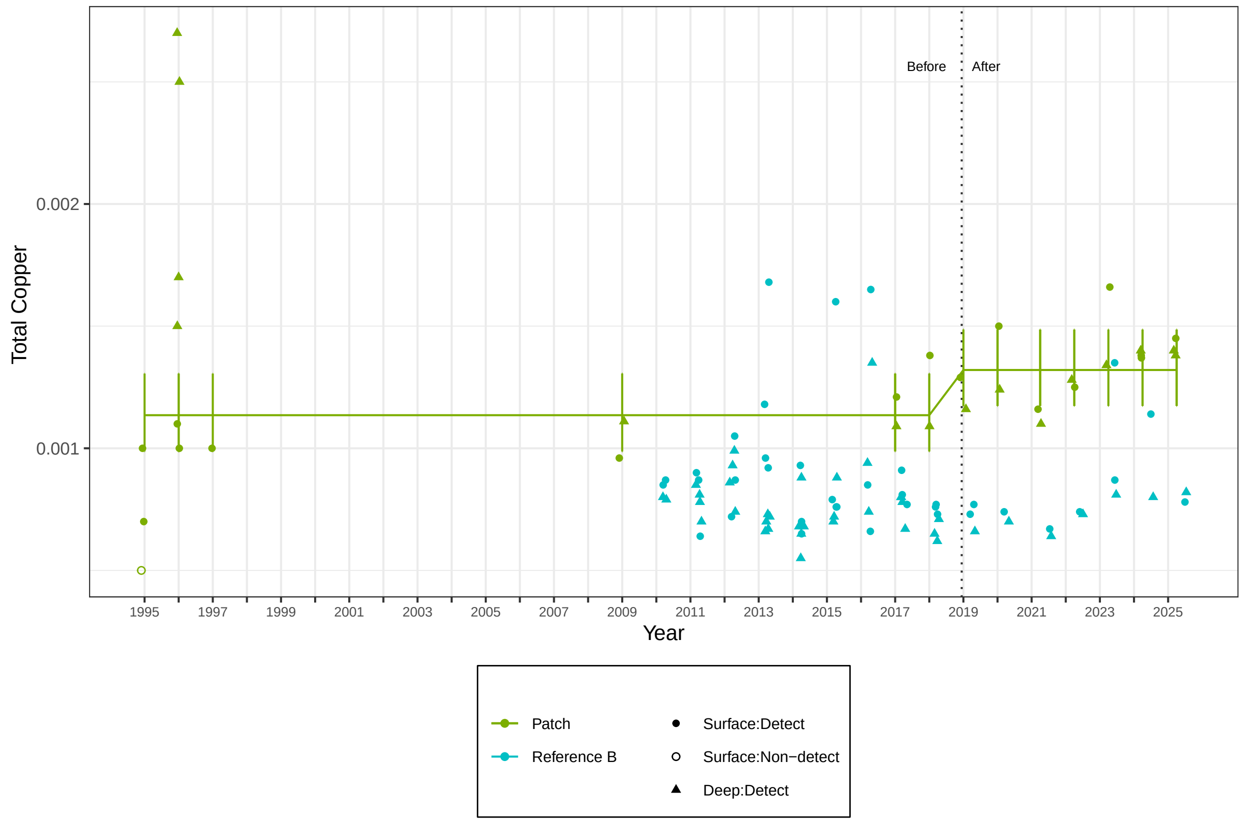
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.151	0.082	21	1.841	0.0798	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

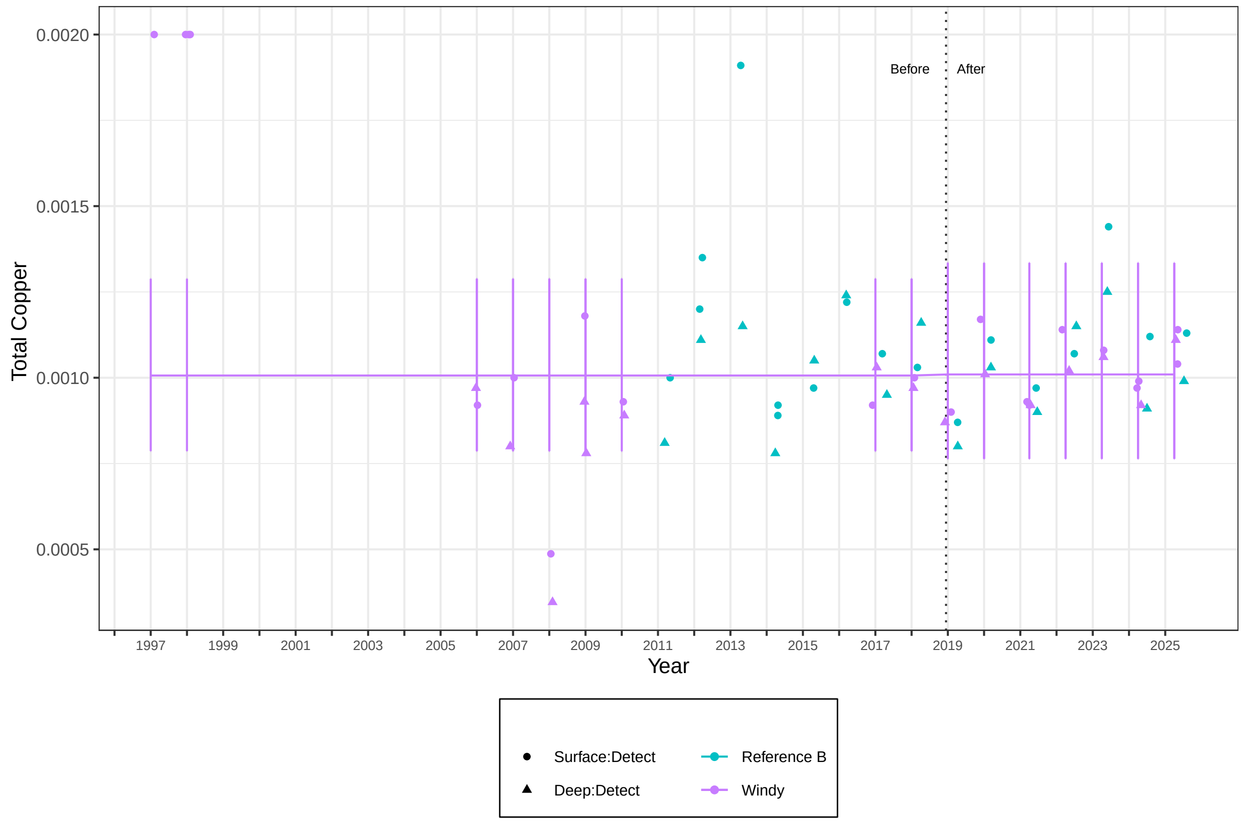
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.0031	0.1737	13.54	0.018	0.9859	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

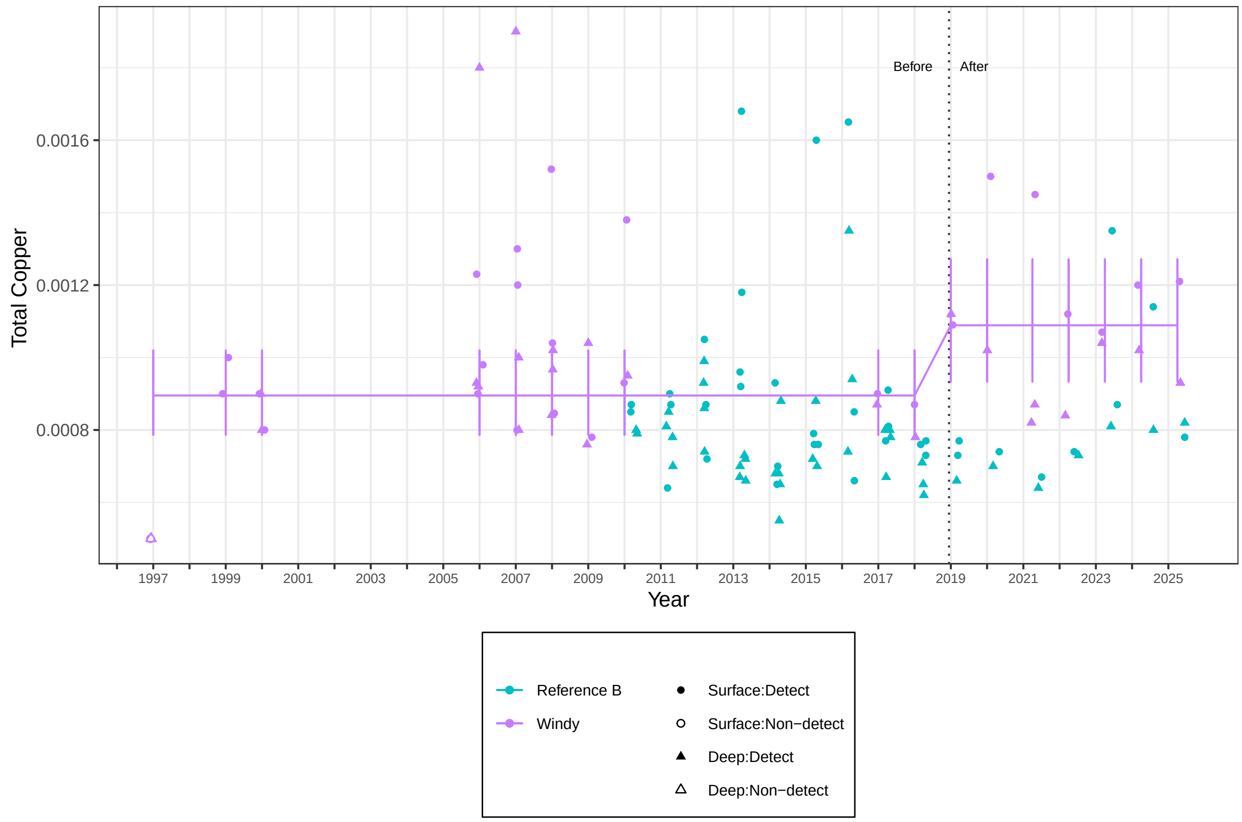
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.196	0.0956	15.17	2.051	0.058	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

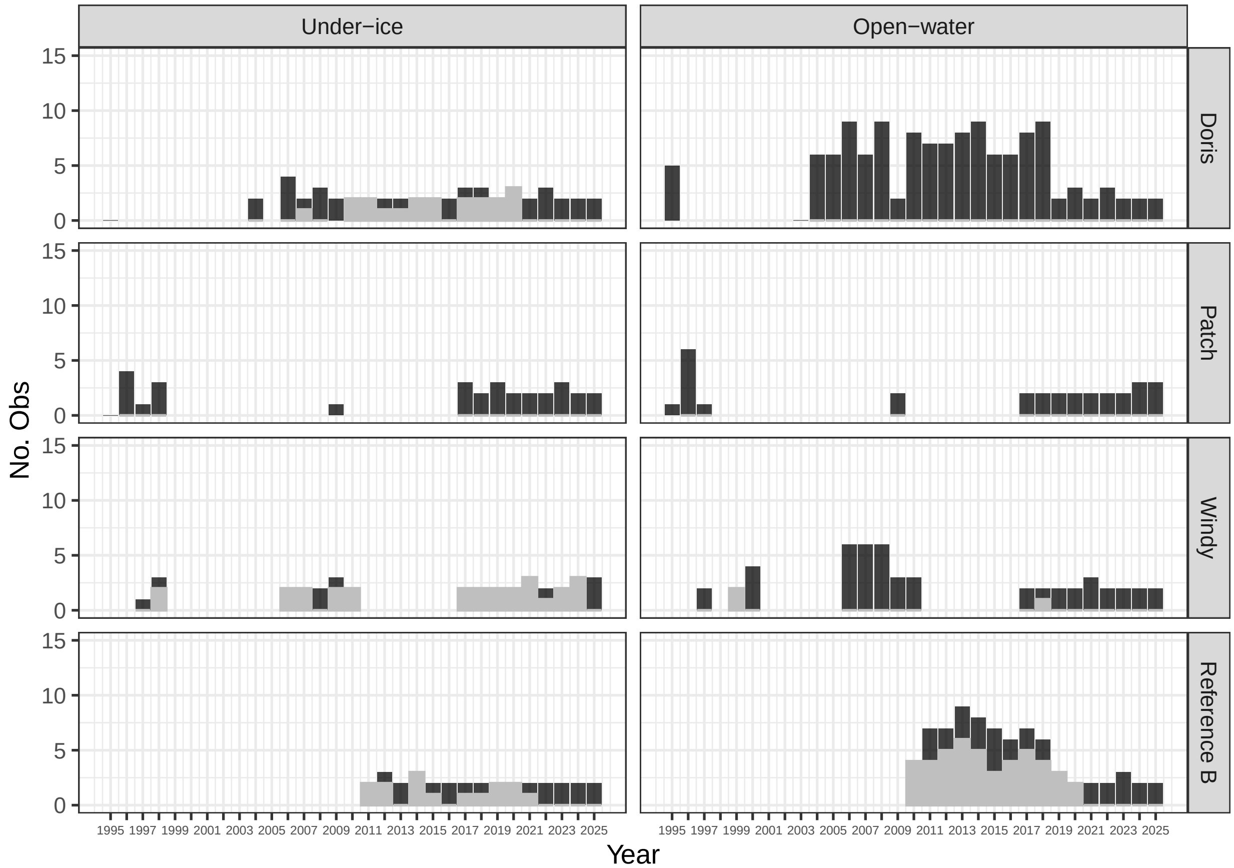
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Before
After
Total Copper
0.0016
0.0012
0.0008
Year
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Reference B
Windy
Surface:Detect
Surface:Non−detect
Deep:Detect
Deep:Non−detect

C.3.1.16 Total Iron

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

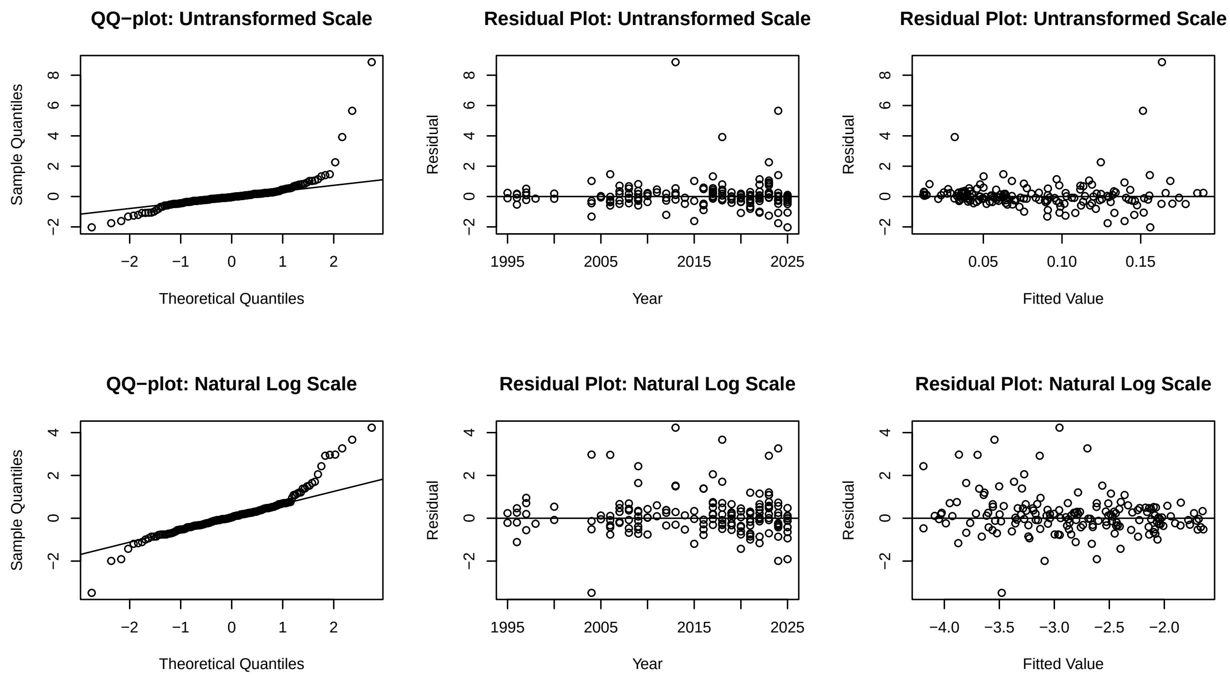
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	20	41	0
Doris	Open-water	127	0	0	0
Patch	Under-ice	30	0	0	0
Patch	Open-water	30	0	0	0
Reference B	Under-ice	32	15	47	0
Reference B	Open-water	77	45	58	0
Windy	Under-ice	36	27	75	0
Windy	Open-water	51	3	6	0

More than 50% of data was under detection limit in Reference B Open-water and Windy Under-ice. Data from those site-season groupings will be removed from the analysis. Doris North Under-ice and Reference B Under-ice exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Reference B	2013	Under-ice	Surface	0.749	0.164	8.861
Reference B	2018	Under-ice	Deep	0.291	0.032	3.922
Reference B	2024	Under-ice	Deep	0.525	0.151	5.653

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Under-ice	Deep	0.00344	-3.478	-3.485
Reference B	2013	Under-ice	Surface	0.74900	-2.953	4.231
Reference B	2018	Under-ice	Deep	0.29100	-3.544	3.668
Reference B	2024	Under-ice	Deep	0.52500	-2.699	3.263

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. There were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	0.417	3	0.93670	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

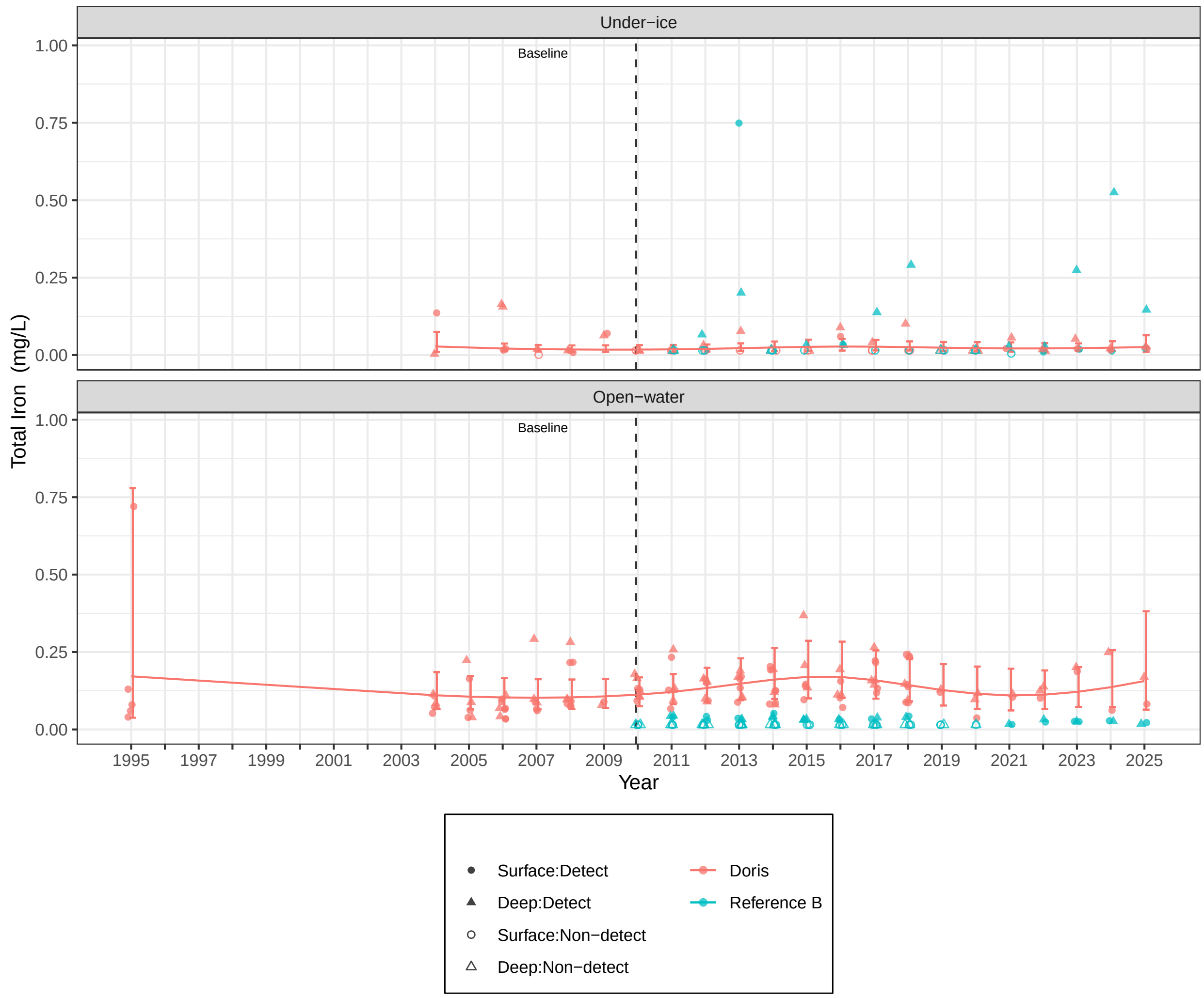
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	0.627	3	0.89030	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

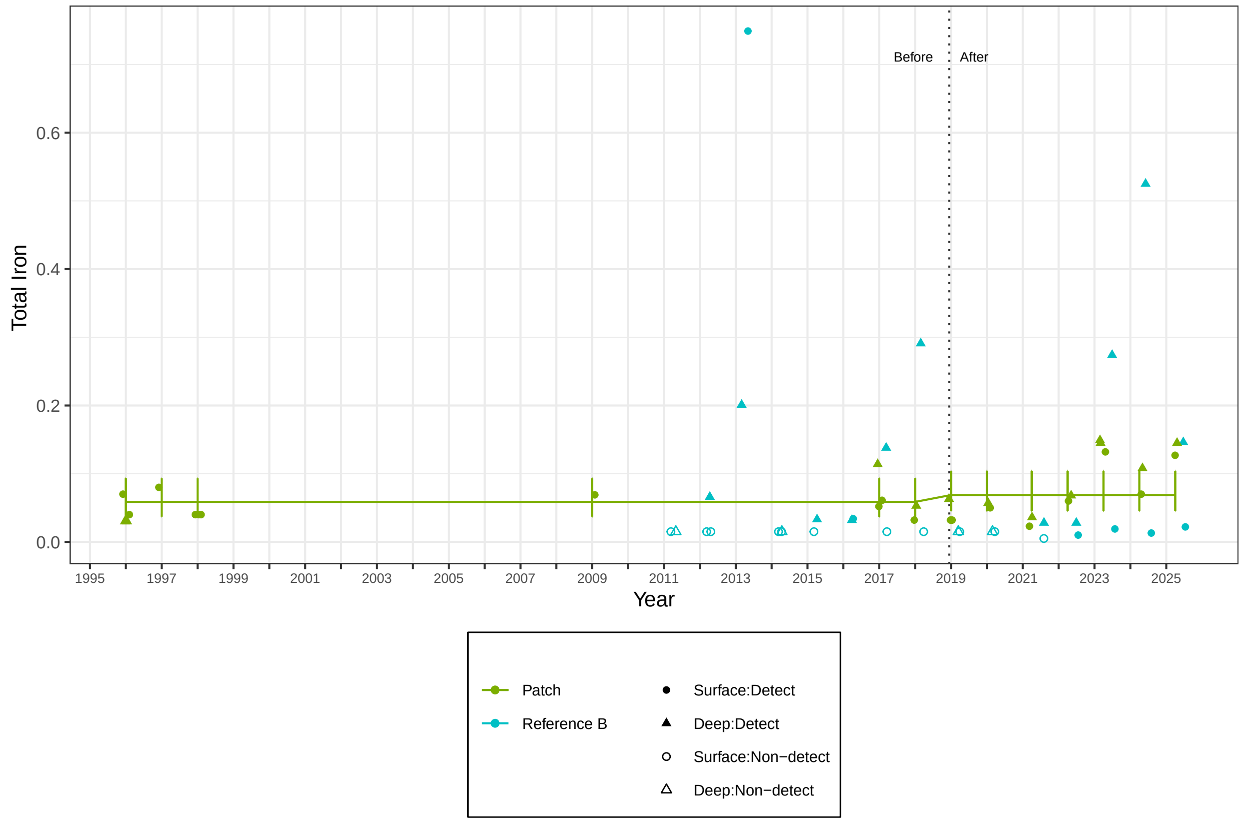
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.1578	0.2834	11.57	0.5569	0.5882	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

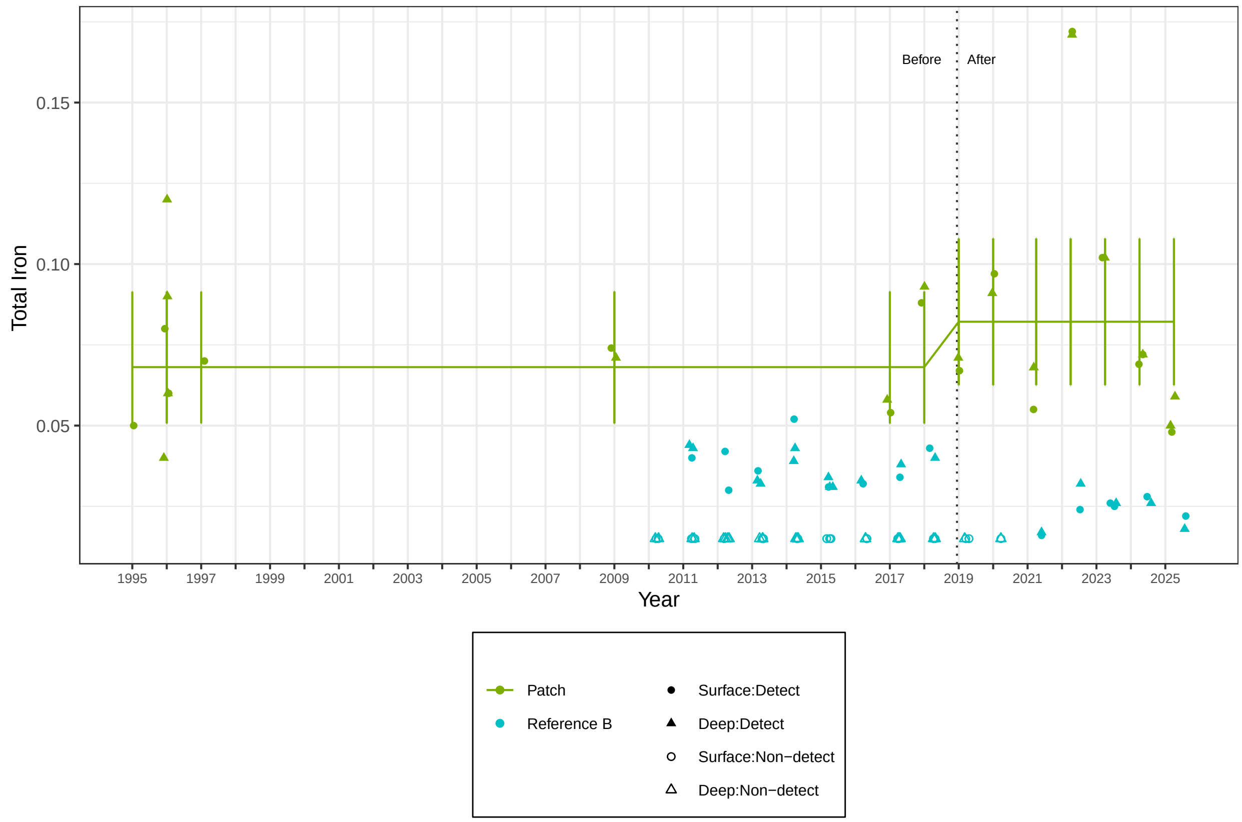
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.1877	0.1827	11.04	1.027	0.3262	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis Analysis was not performed.

Windy Open-water Before-After Analysis

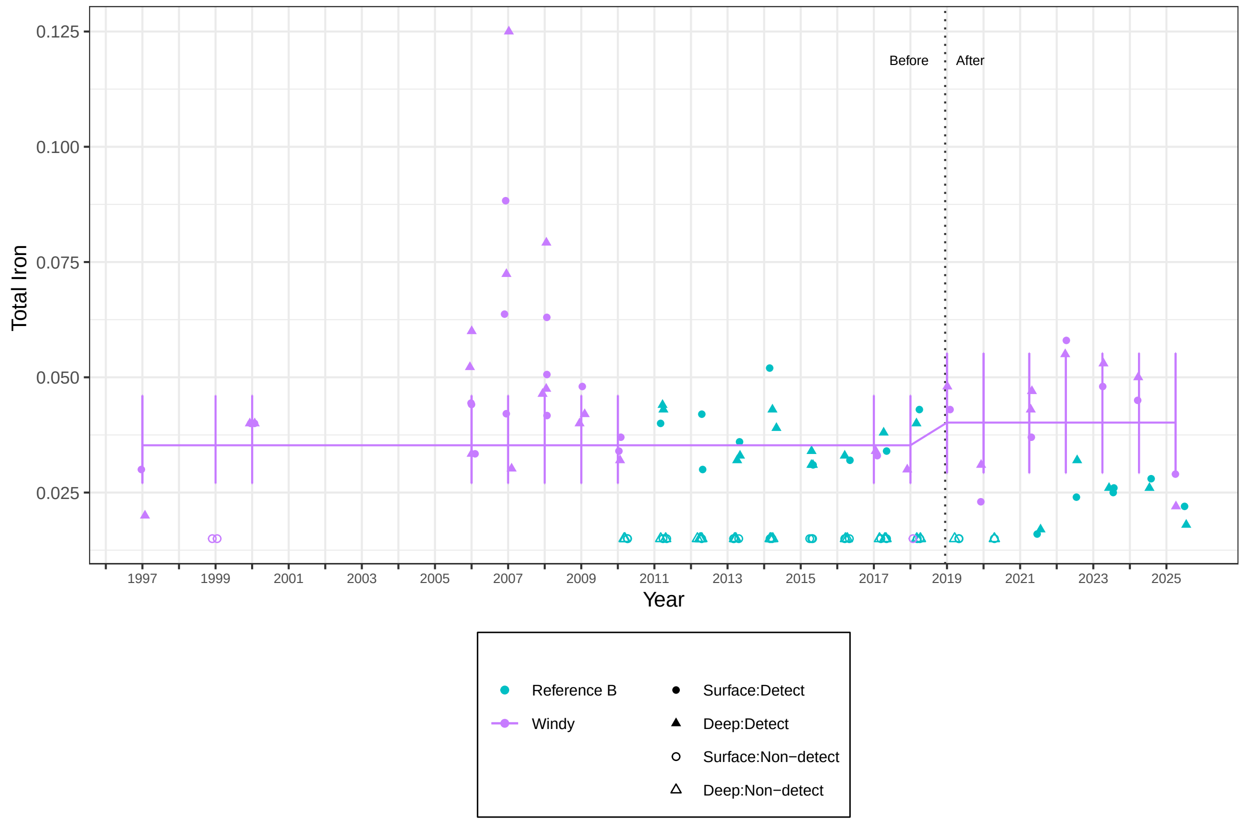
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.1307	0.1951	14.38	0.6698	0.5136	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

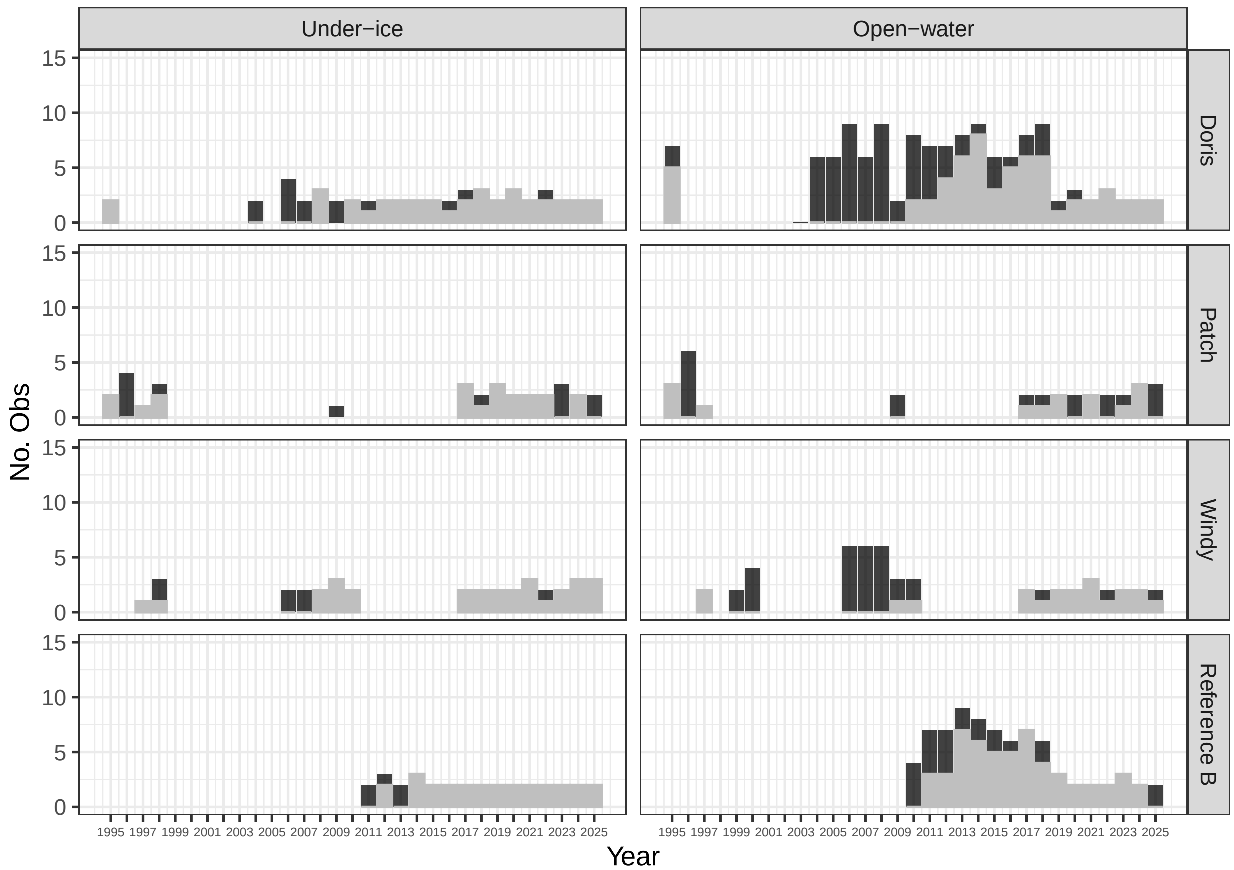
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Total Iron
0.125
0.100
0.075
0.050
0.025
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Reference B
Windy
Surface:Detect
Deep:Detect
Surface:Non−detect
Deep:Non−detect

C.3.1.17 Total Lead

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

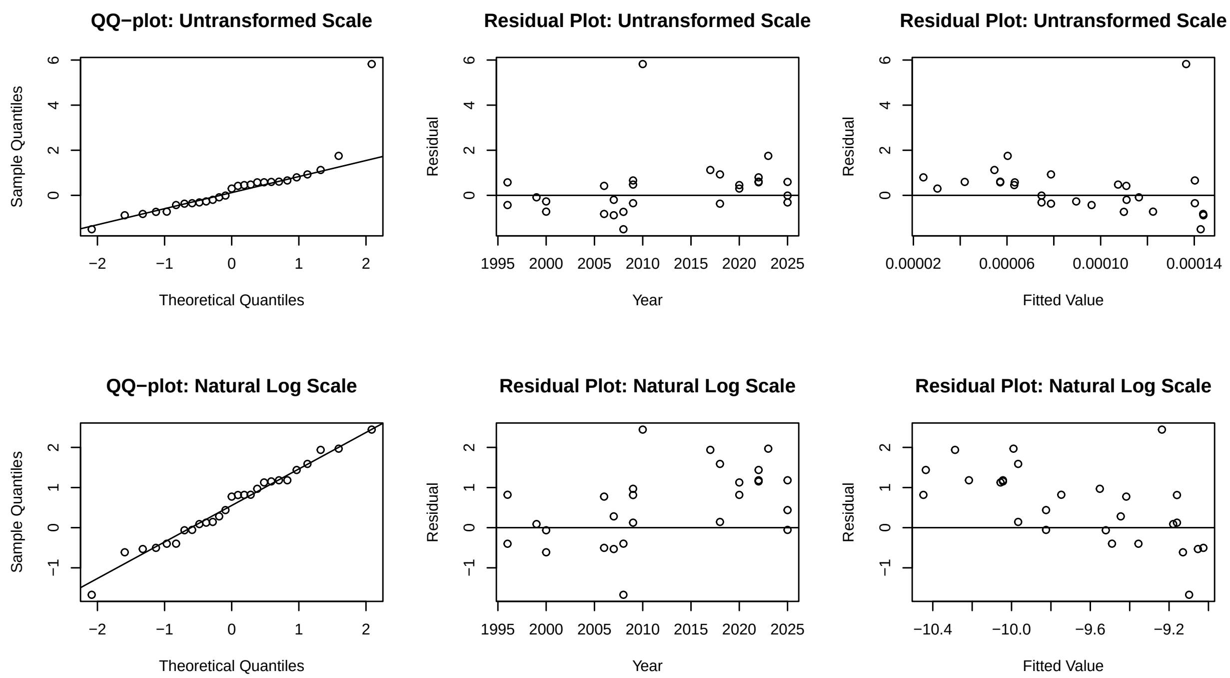
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	51	38	75	100
Doris	Open-water	129	61	47	100
Patch	Under-ice	32	20	62	0
Patch	Open-water	32	14	44	0
Reference B	Under-ice	32	27	84	100
Reference B	Open-water	77	54	70	0
Windy	Under-ice	36	29	81	100
Windy	Open-water	51	20	39	50

More than 50% of data was under detection limit in Doris North Under-ice, Doris North Open-water, Patch Under-ice, Reference B Under-ice, Reference B Open-water, and Windy Under-ice. Data from those site-season groupings will be removed from the analysis. Doris North Open-water, Patch Open-water, and

Windy Open-water exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Windy	2010	Open-water	Surface	0.000558	0	5.822

Outliers on natural log scale:

None

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data.

Doris Lake

Doris Under-Ice

All data from Doris under-ice removed from the analysis. No analysis performed.

Doris Open-Water

All data from Doris Lake open-water removed from the analysis. No analysis performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis Analysis was not performed.

Patch Open-Water Before-After Analysis

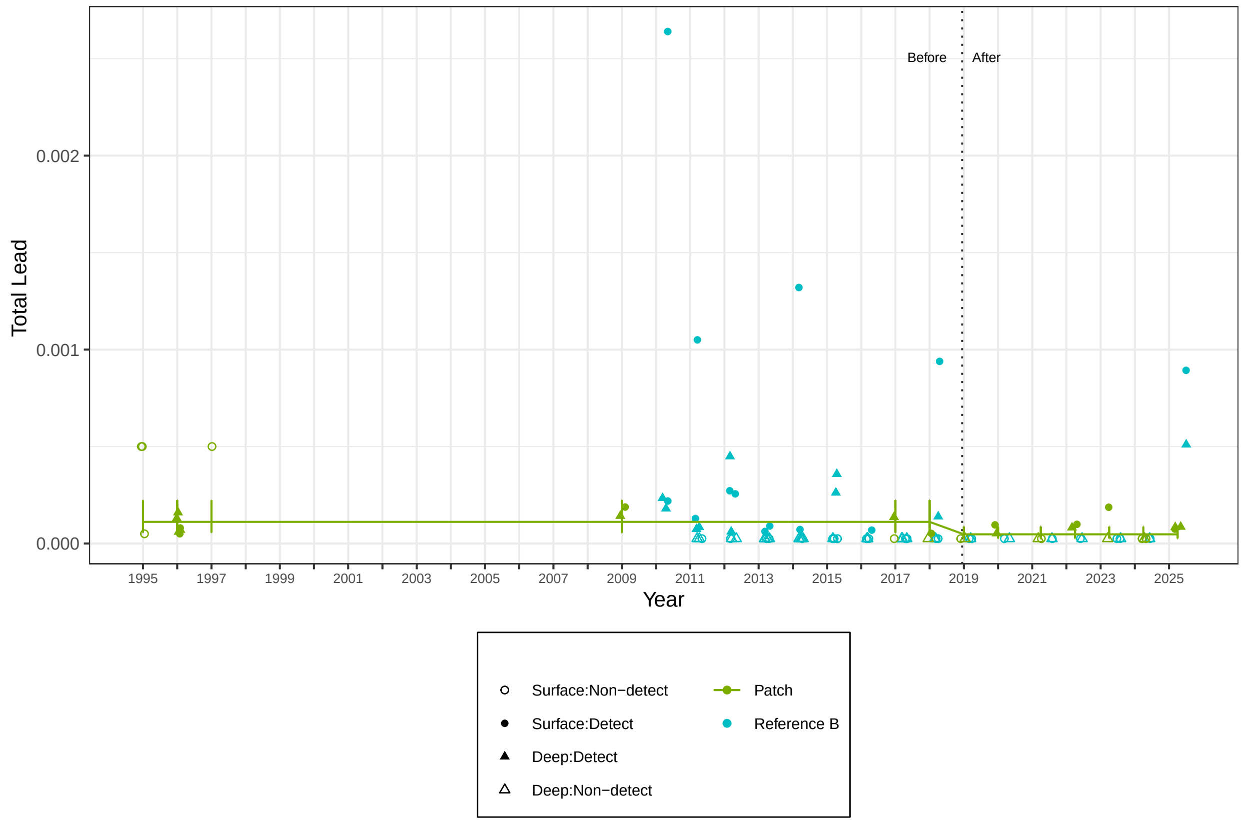
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.855	0.4199	9.588	-2.036	0.0703	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis Analysis was not performed.

Windy Open-water Before-After Analysis

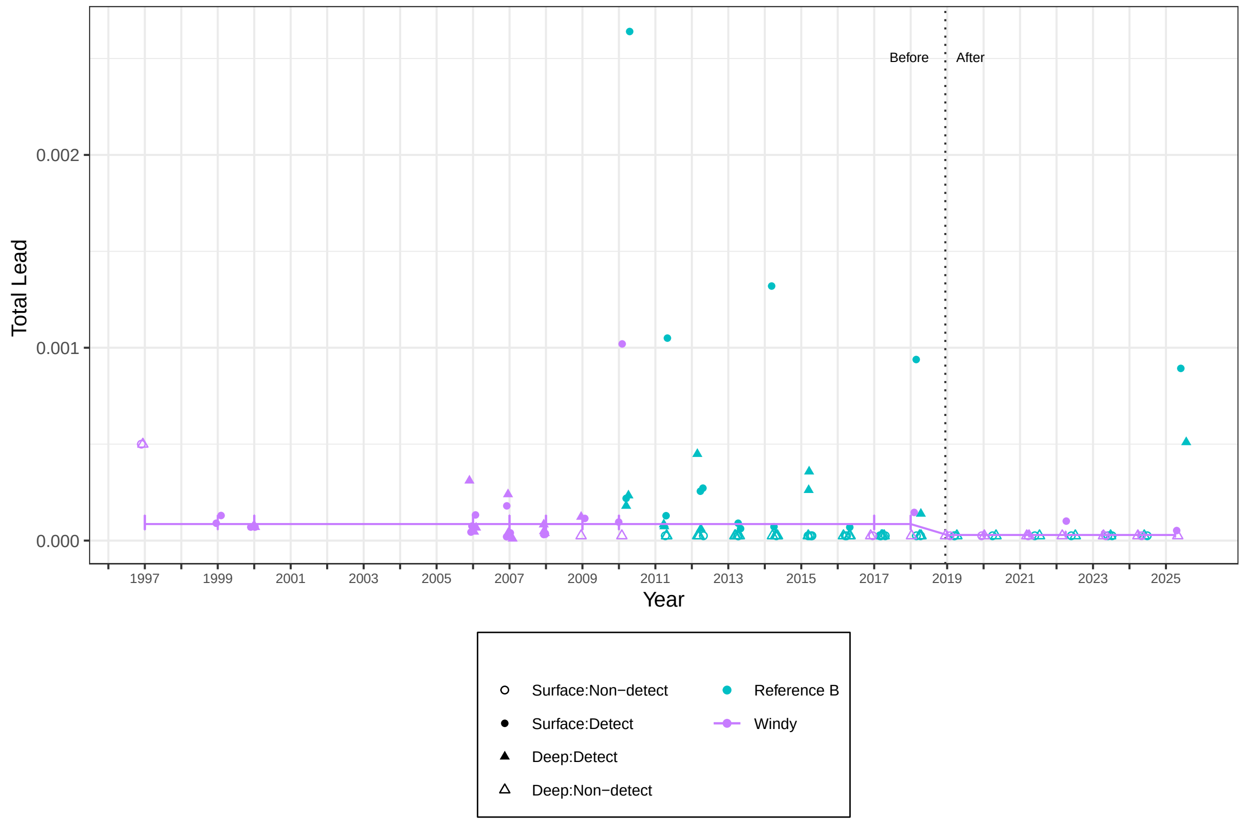
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-1.081	0.3143	15.18	-3.439	0.0036	sig.

Conclusion:

The change from before to after was significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

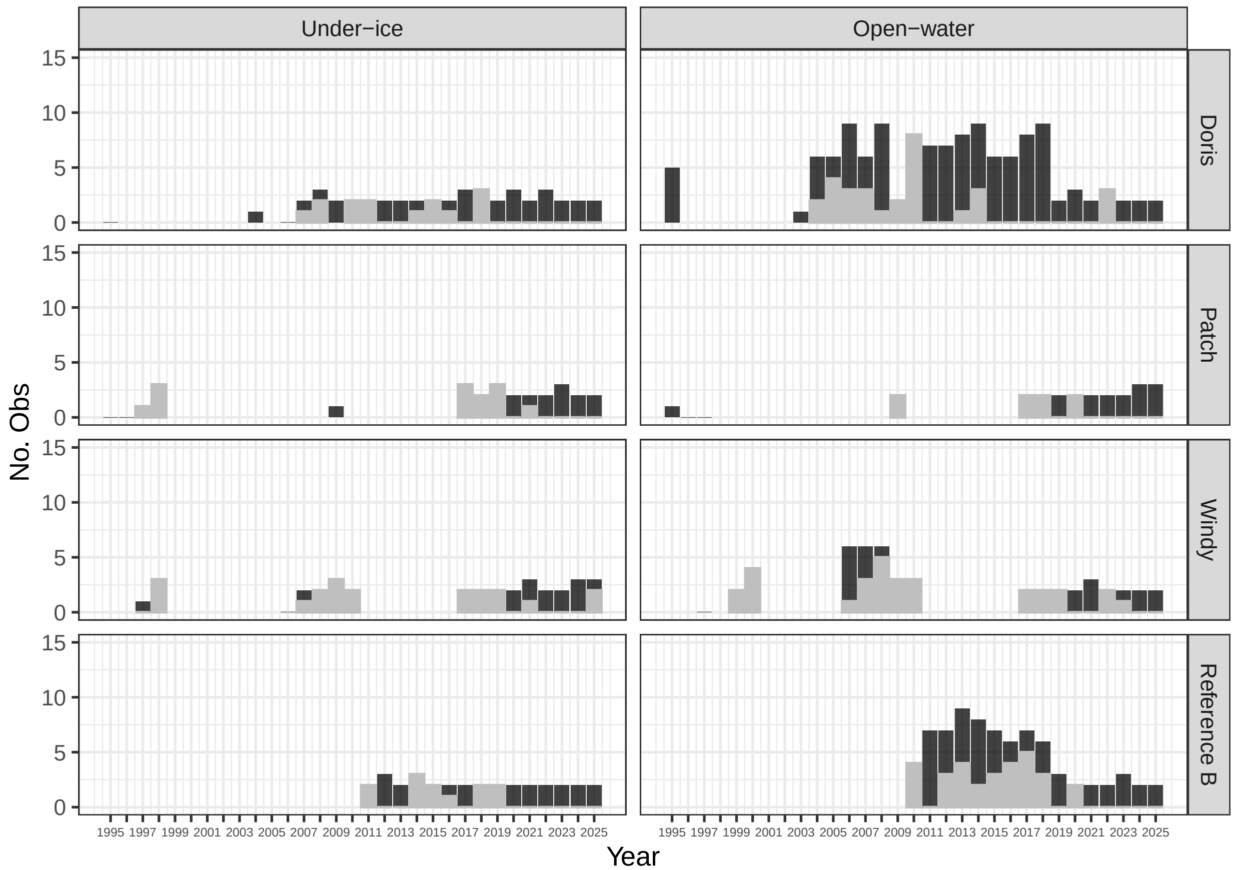
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Before
After
0.002
0.001
0.000
Total Lead
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Surface:Non−detect
Surface:Detect
Deep:Detect
Deep:Non−detect
Reference B
Windy

C.3.1.18 Total Mercury

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

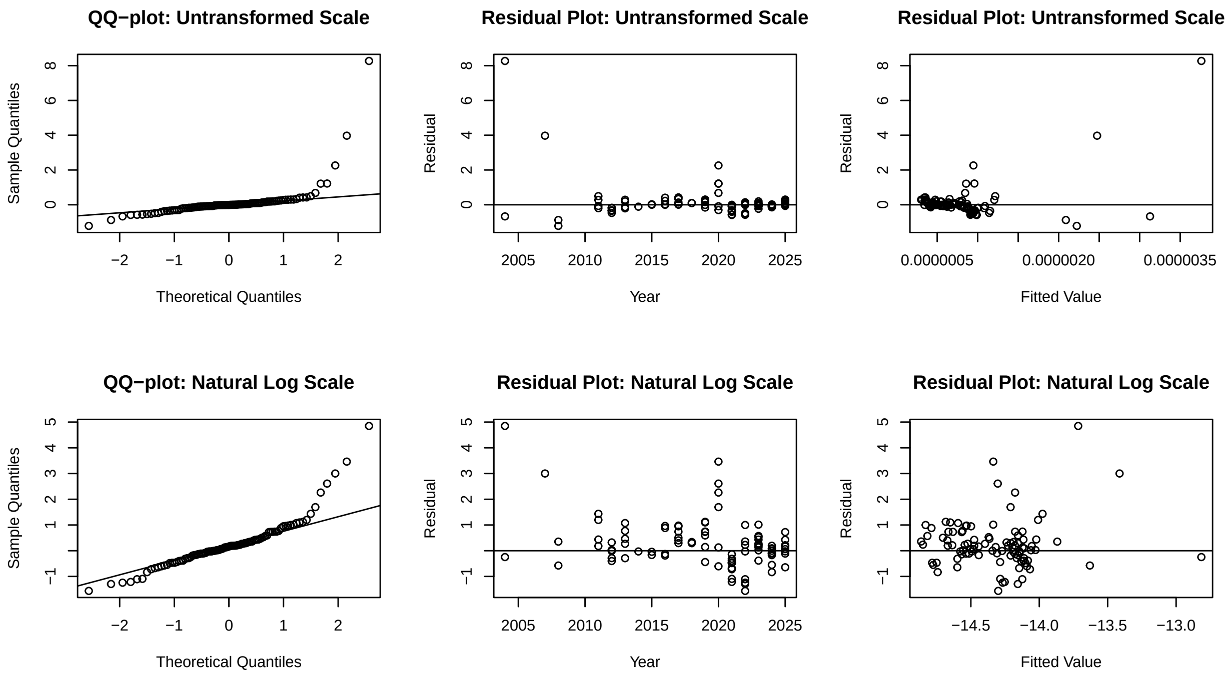
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	44	16	36	0
Doris	Open-water	128	36	28	0
Patch	Under-ice	26	14	54	0
Patch	Open-water	23	9	39	0
Reference B	Under-ice	32	12	38	0
Reference B	Open-water	77	30	39	0
Windy	Under-ice	34	20	59	67
Windy	Open-water	49	30	61	0

More than 50% of data was under detection limit in Patch Under-ice, Windy Under-ice, and Windy Open-water. Data from those site-season groupings will be removed from the analysis. Doris North Under-ice, Doris North Open-water, Patch Open-water, Reference B Under-ice, and Reference B

Open-water exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Open-water	Deep	0.00001277	0	8.271
Doris	2007	Under-ice	Surface	6.800e-06	0	3.973

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2004	Open-water	Deep	0.00001277	-13.71	4.849
Doris	2007	Under-ice	Surface	6.800e-06	-13.41	3.002
Reference B	2020	Under-ice	Deep	3.410e-06	-14.34	3.463

There were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results. The untransformed data better meets the residual assumptions. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	10.922	3	0.01220	sig.
Compare to Reference B	0.881	3	0.83000	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Doris Open-Water

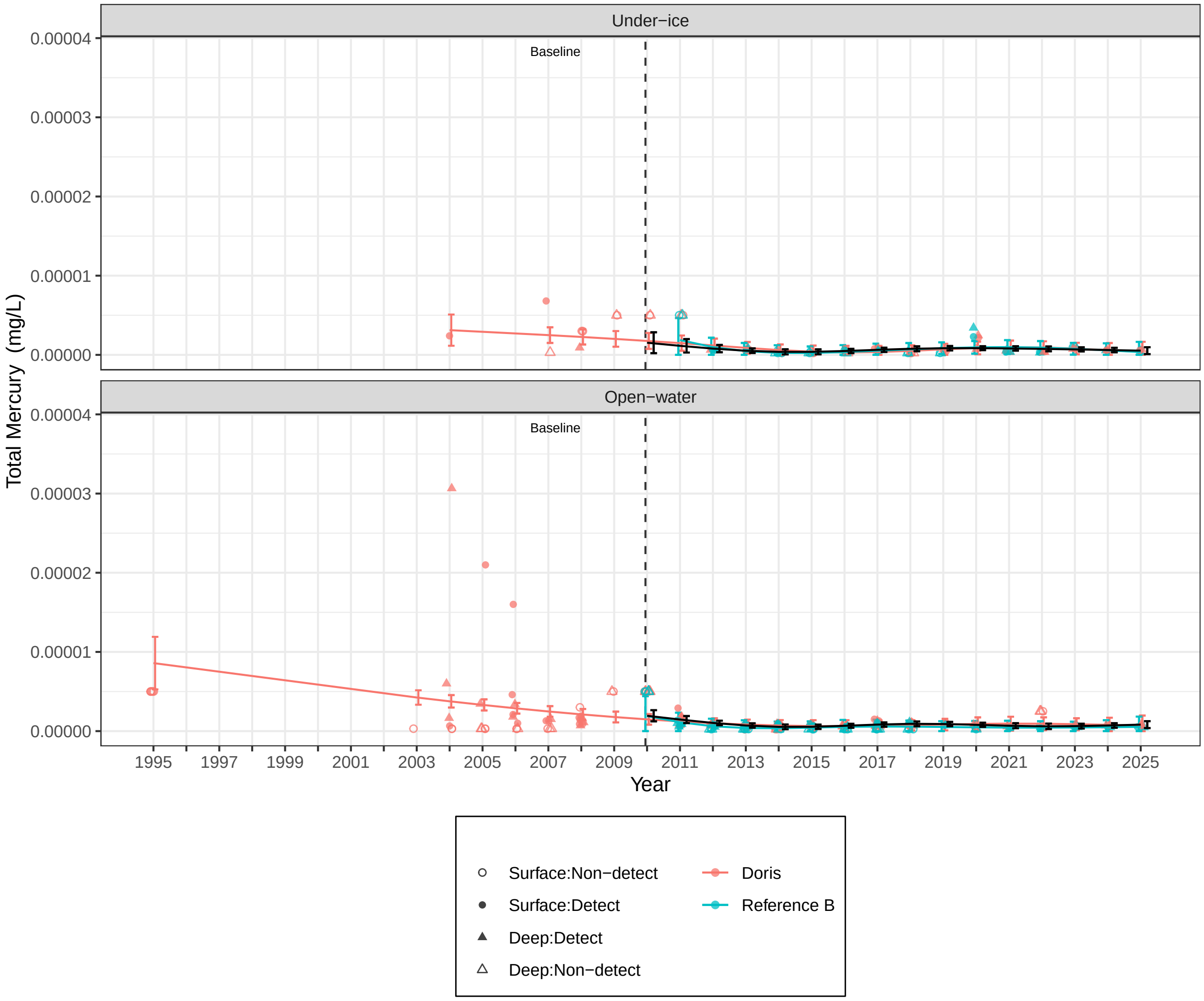
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	47.008	3	<0.00001	sig.
Compare to Reference B	0.854	3	0.83650	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis Analysis was not performed.

Patch Open-Water Before-After Analysis

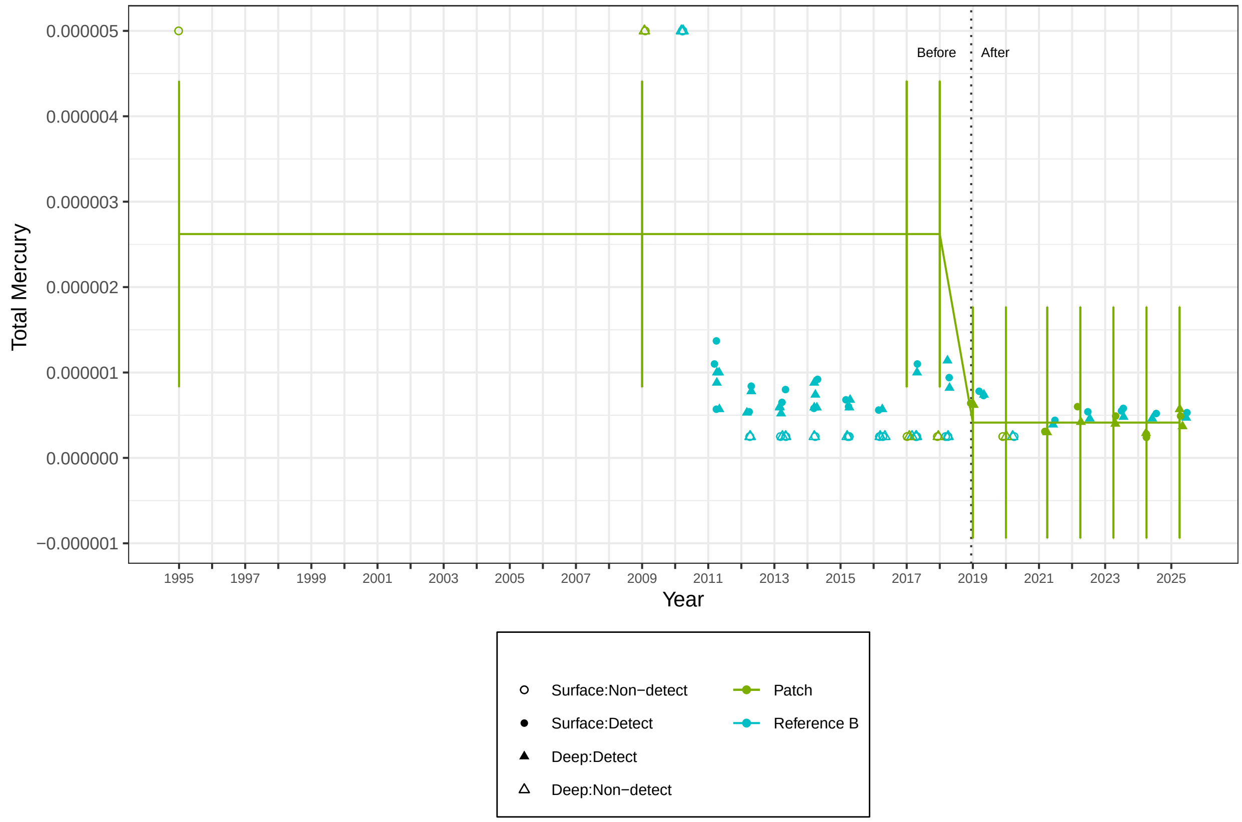
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0	0	0.0015	-2.222	0.993	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

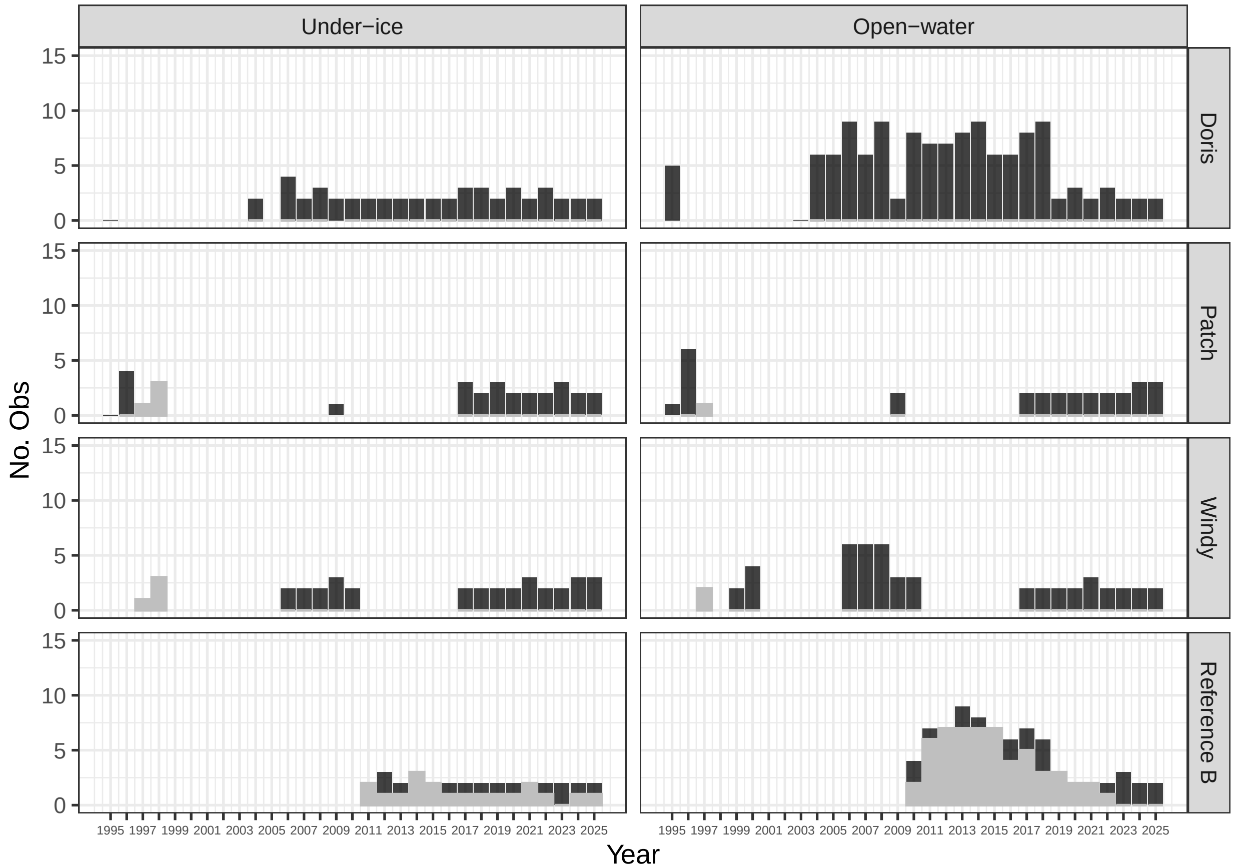
Windy Under-Ice Before-After Analysis Analysis was not performed.

Windy Open-water Before-After Analysis Analysis was not performed.

C.3.1.19 Total Molybdenum

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

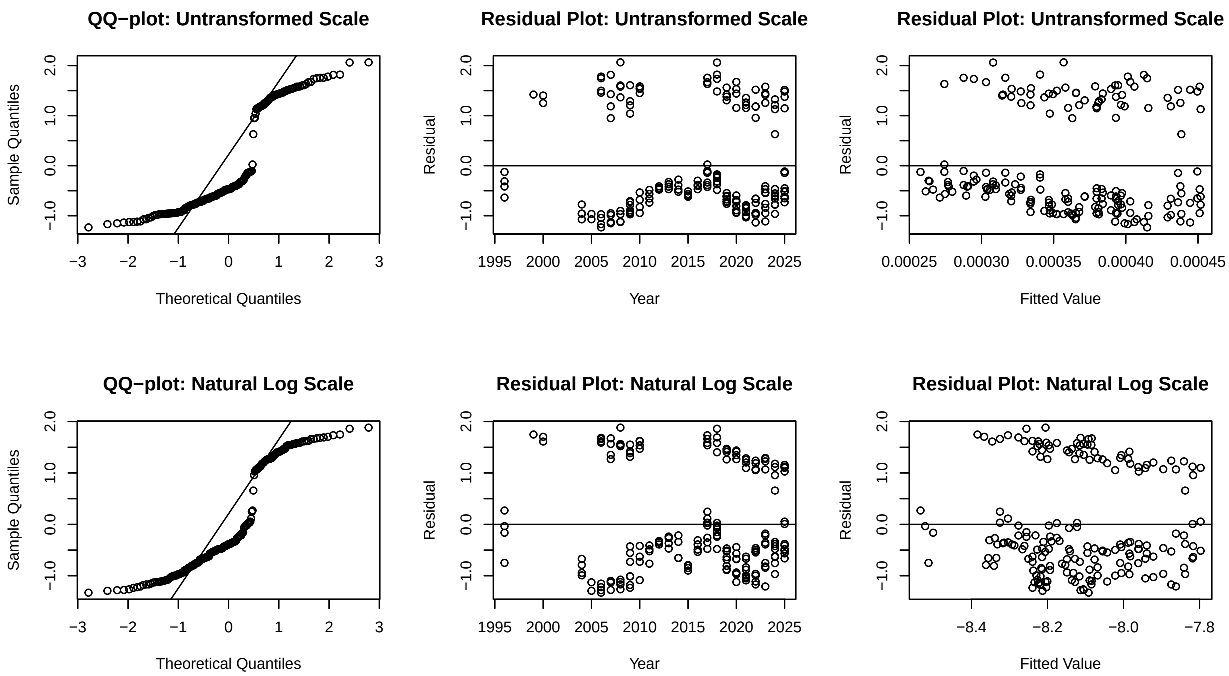
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	0	0	0
Doris	Open-water	127	5	4	0
Patch	Under-ice	30	4	13	0
Patch	Open-water	30	2	7	0
Reference B	Under-ice	32	19	59	50
Reference B	Open-water	77	56	73	0
Windy	Under-ice	36	4	11	0
Windy	Open-water	51	2	4	0

More than 50% of data was under detection limit in Reference B Under-ice and Reference B Open-water. Data from those site-season groupings will be removed from the analysis.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	43.73	3	<0.00001	sig.

Doris Lake exhibited significant deviation from a slope of zero. Comparison to the trend in Reference Lake B was not completed due to Reference Lake B being excluded from analysis.

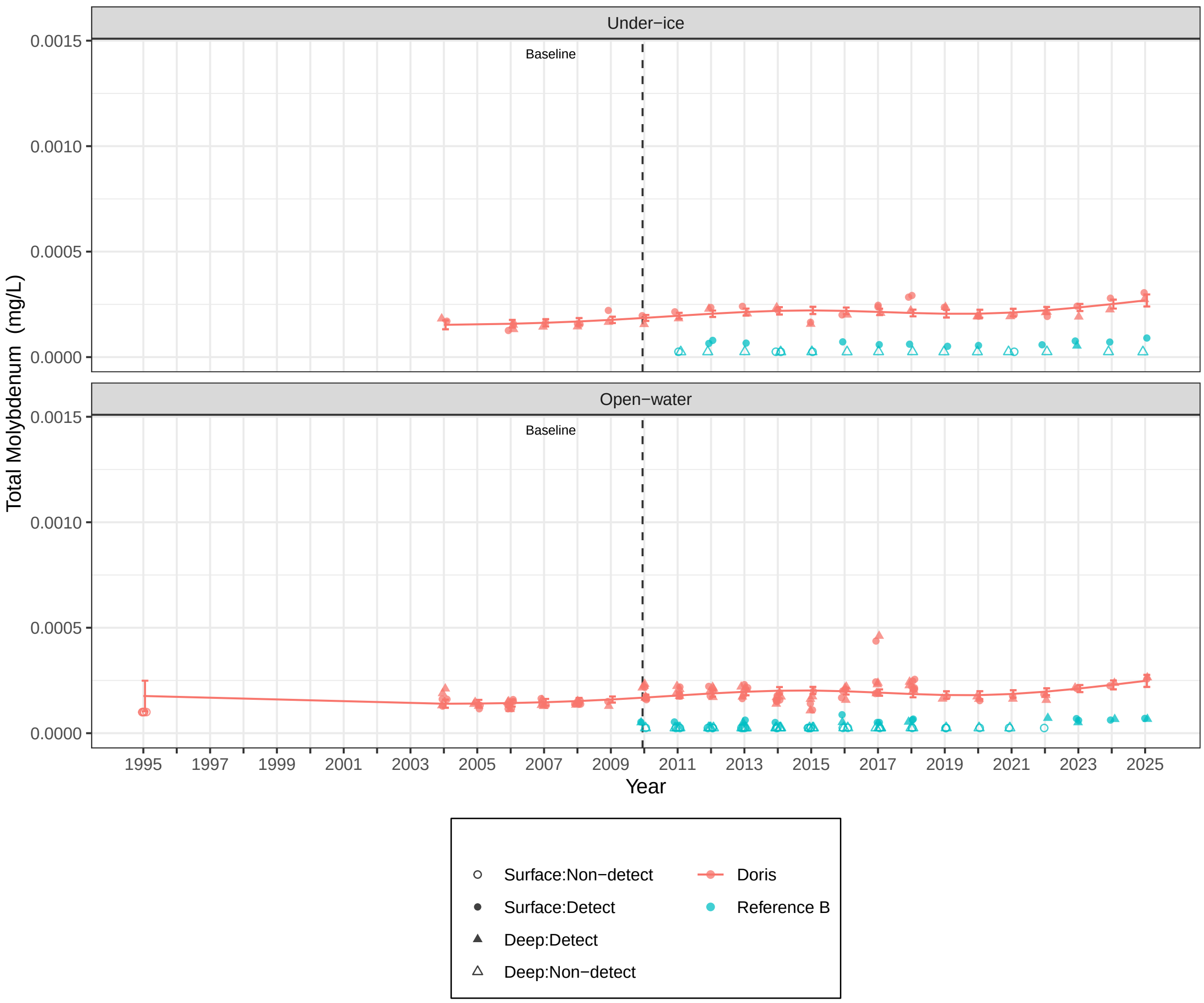
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	36.46	3	<0.00001	sig.

Doris Lake exhibited significant deviation from a slope of zero. Comparison to the trend in Reference Lake B was not completed due to Reference Lake B being excluded from analysis.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

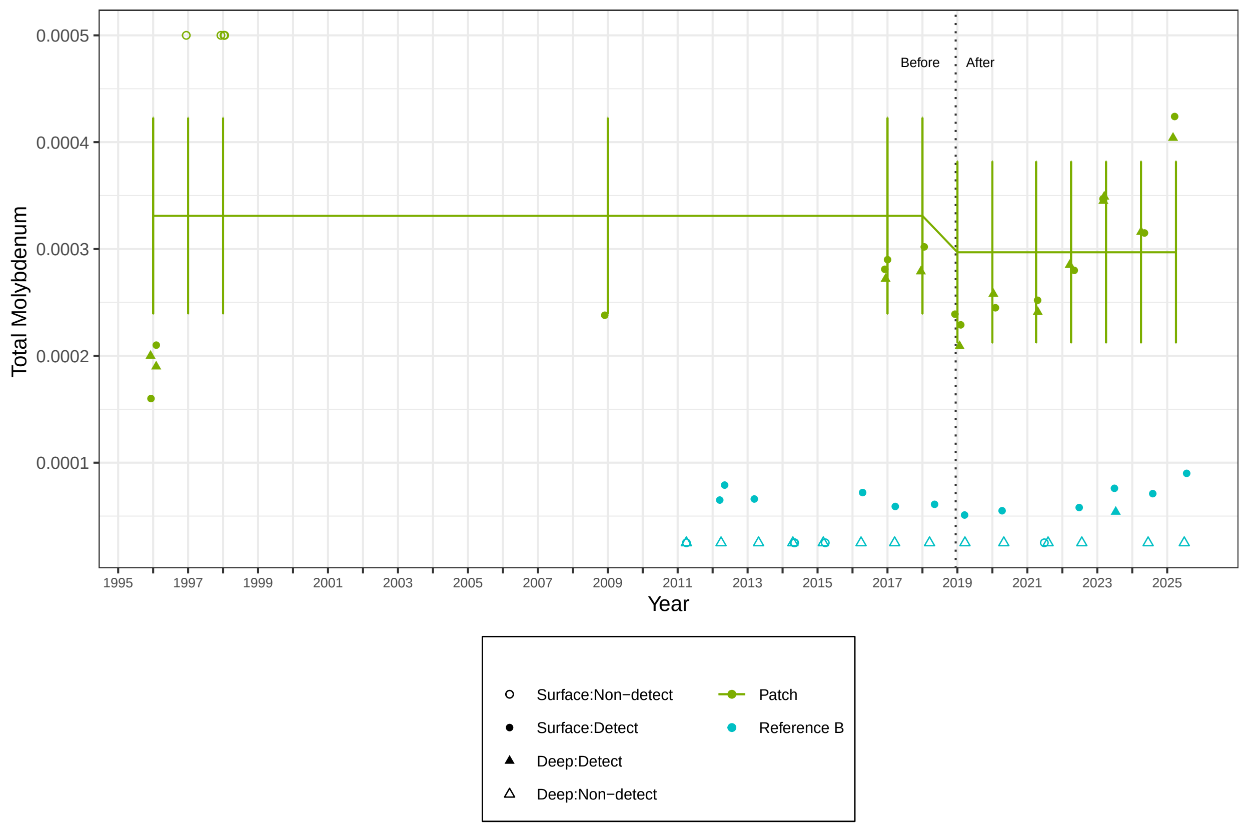
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0	0.0001	43.96	-0.5993	0.5521	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

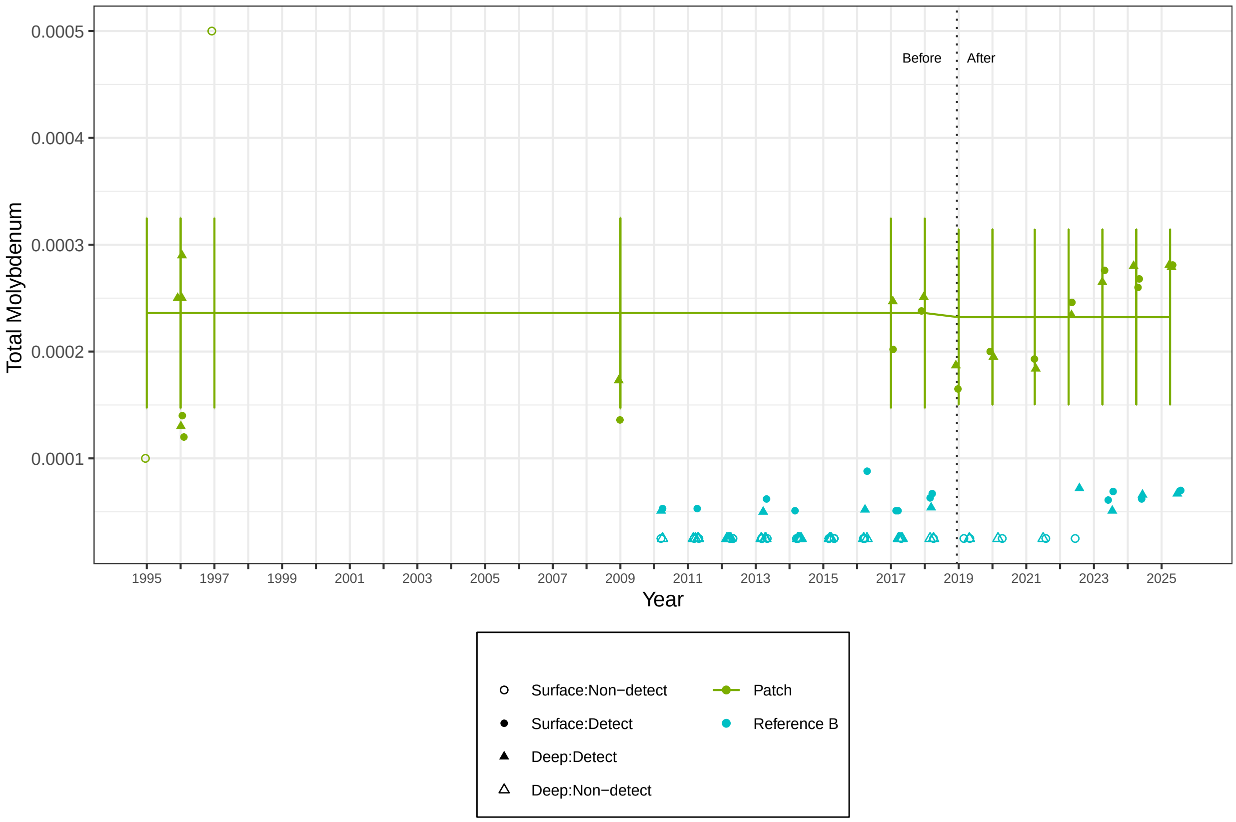
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0	0.0001	10.6	-0.071	0.9448	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

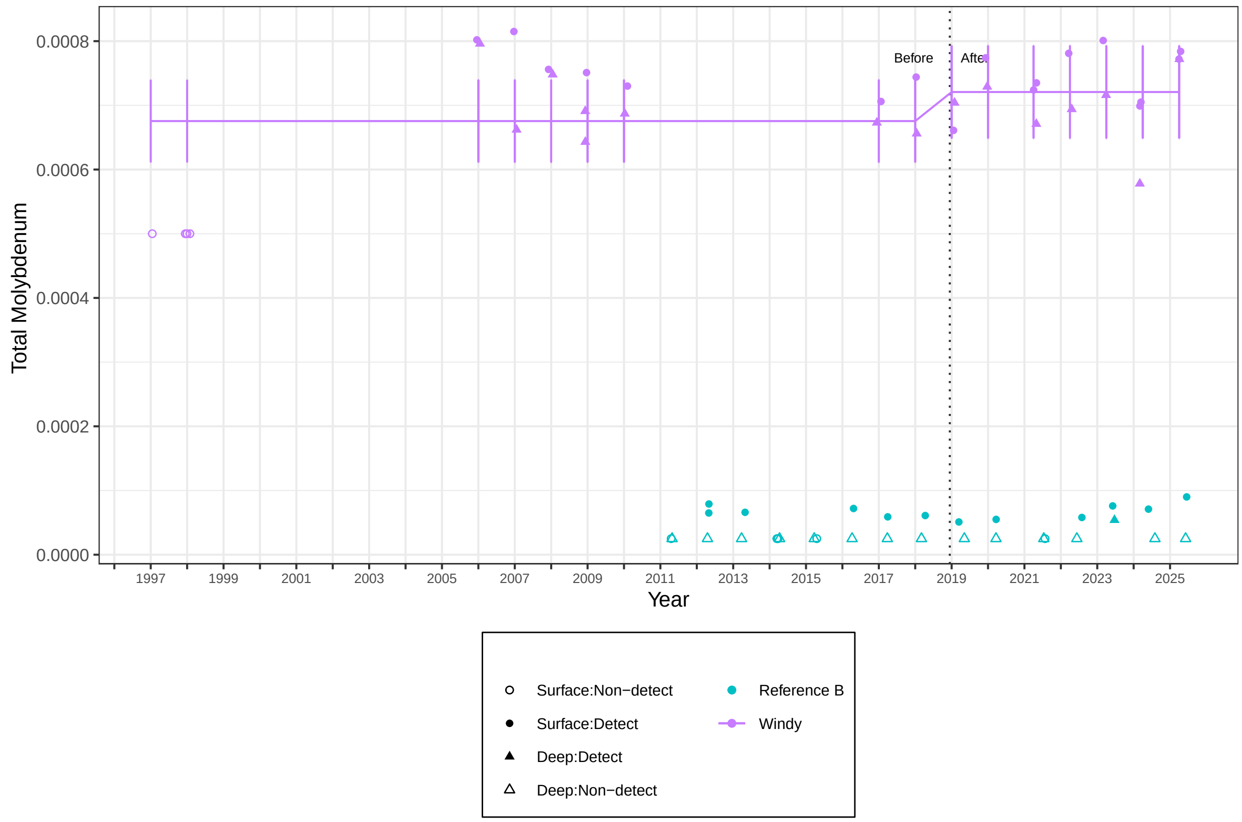
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0	0	12.38	1.004	0.3348	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

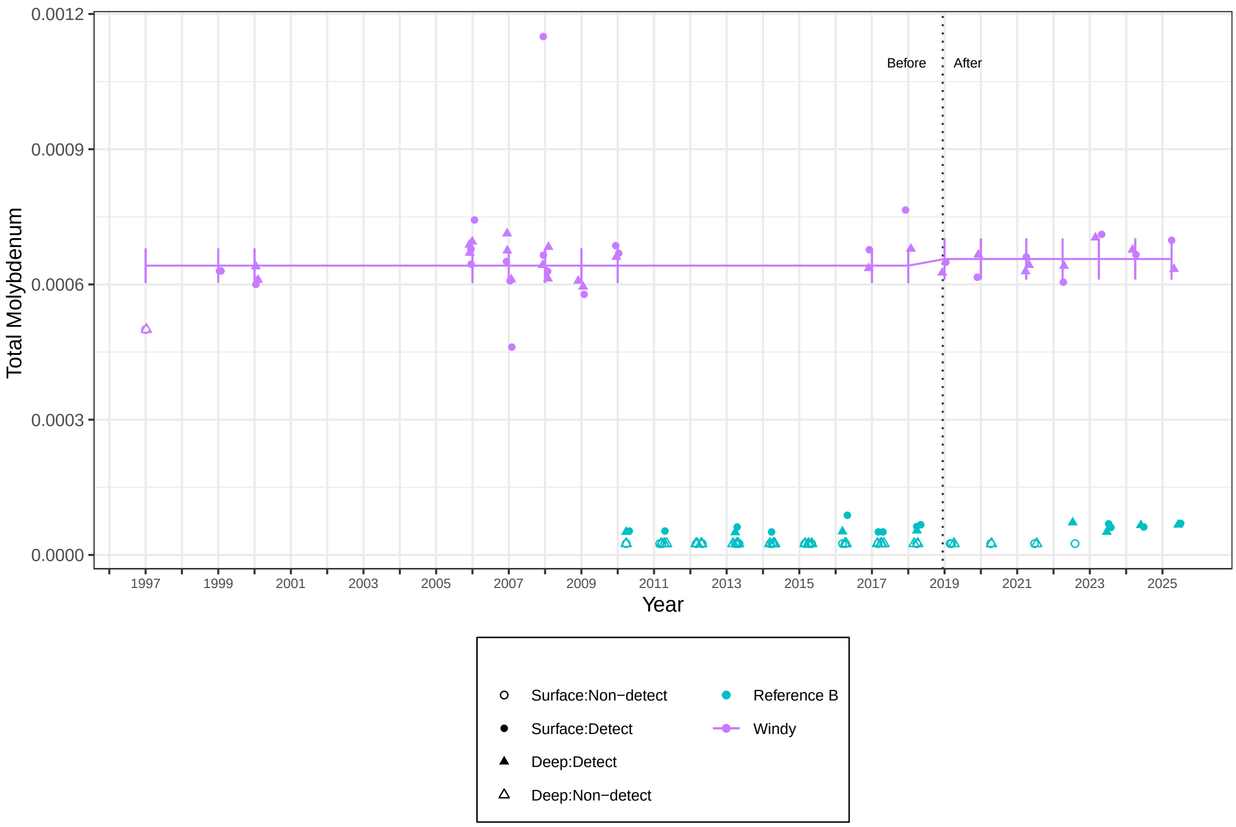
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0	0	15.15	0.5314	0.6028	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

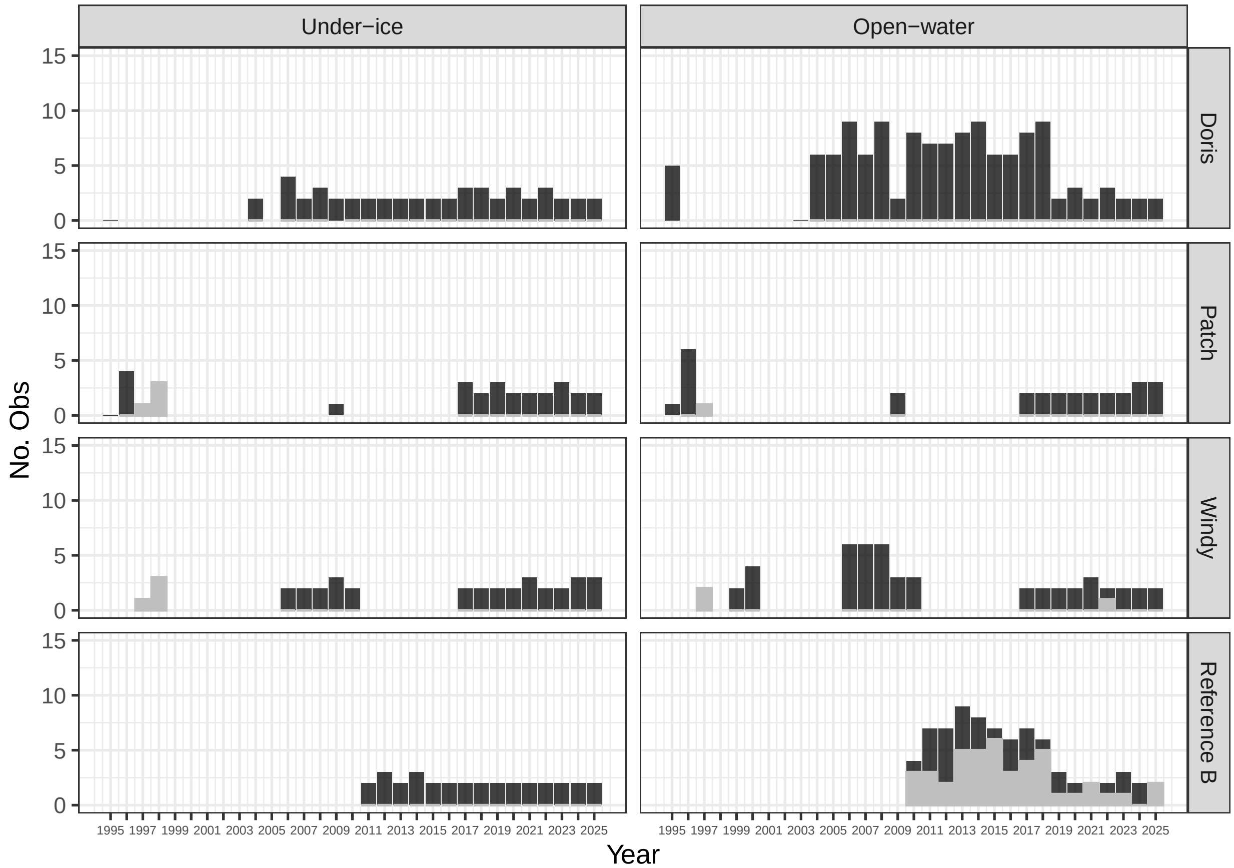
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


0.0012
0.0009
0.0006
0.0003
0.0000
Total Molybdenum
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Surface:Non−detect
Surface:Detect
Deep:Detect
Deep:Non−detect
Reference B
Windy

C.3.1.20 Total Nickel

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

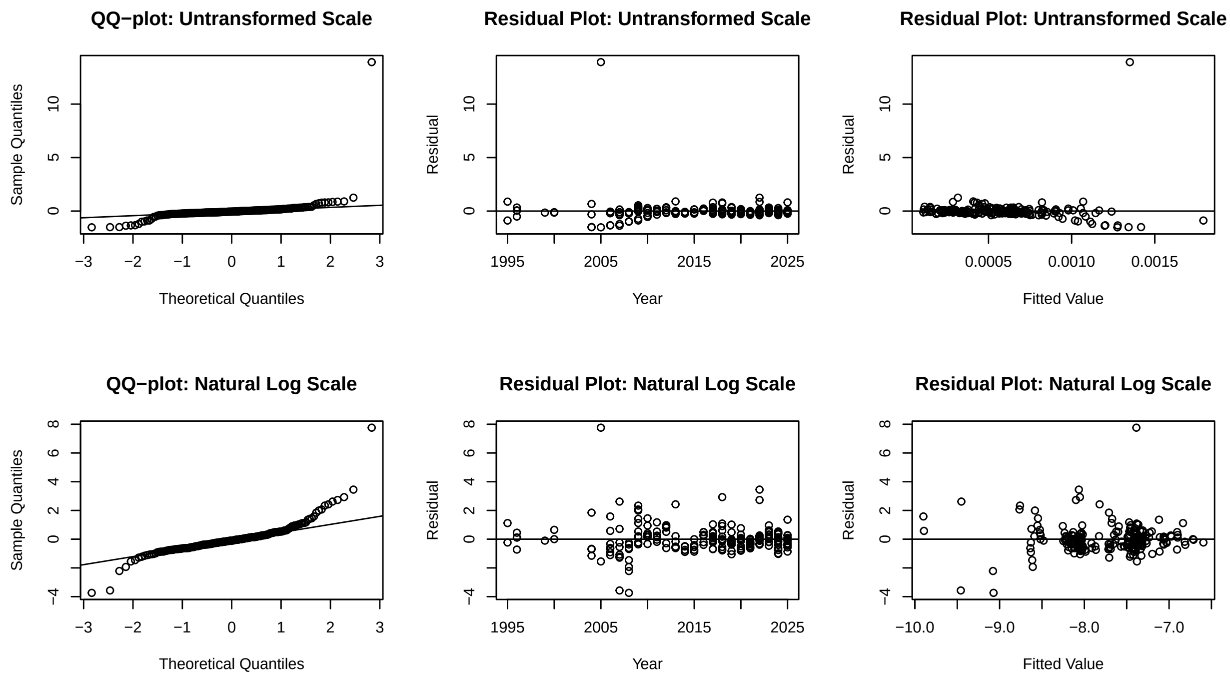
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	0	0	0
Doris	Open-water	127	0	0	0
Patch	Under-ice	30	4	13	0
Patch	Open-water	30	1	3	0
Reference B	Under-ice	32	0	0	0
Reference B	Open-water	77	44	57	100
Windy	Under-ice	36	4	11	0
Windy	Open-water	51	3	6	0

More than 50% of data was under detection limit in Reference B Open-water. Data from those site-season groupings will be removed from the analysis.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2005	Open-water	Deep	0.009736	0.001	13.92

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2005	Open-water	Deep	0.0097363	-7.386	7.761
Windy	2007	Under-ice	Deep	0.0000220	-9.458	-3.569
Windy	2008	Under-ice	Surface	0.0000305	-9.072	-3.737
Windy	2022	Under-ice	Surface	0.0010700	-8.065	3.451

There were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results. The natural log data better meets the residual assumptions. Analysis proceeds with natural log data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	7.783	3	0.05070	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

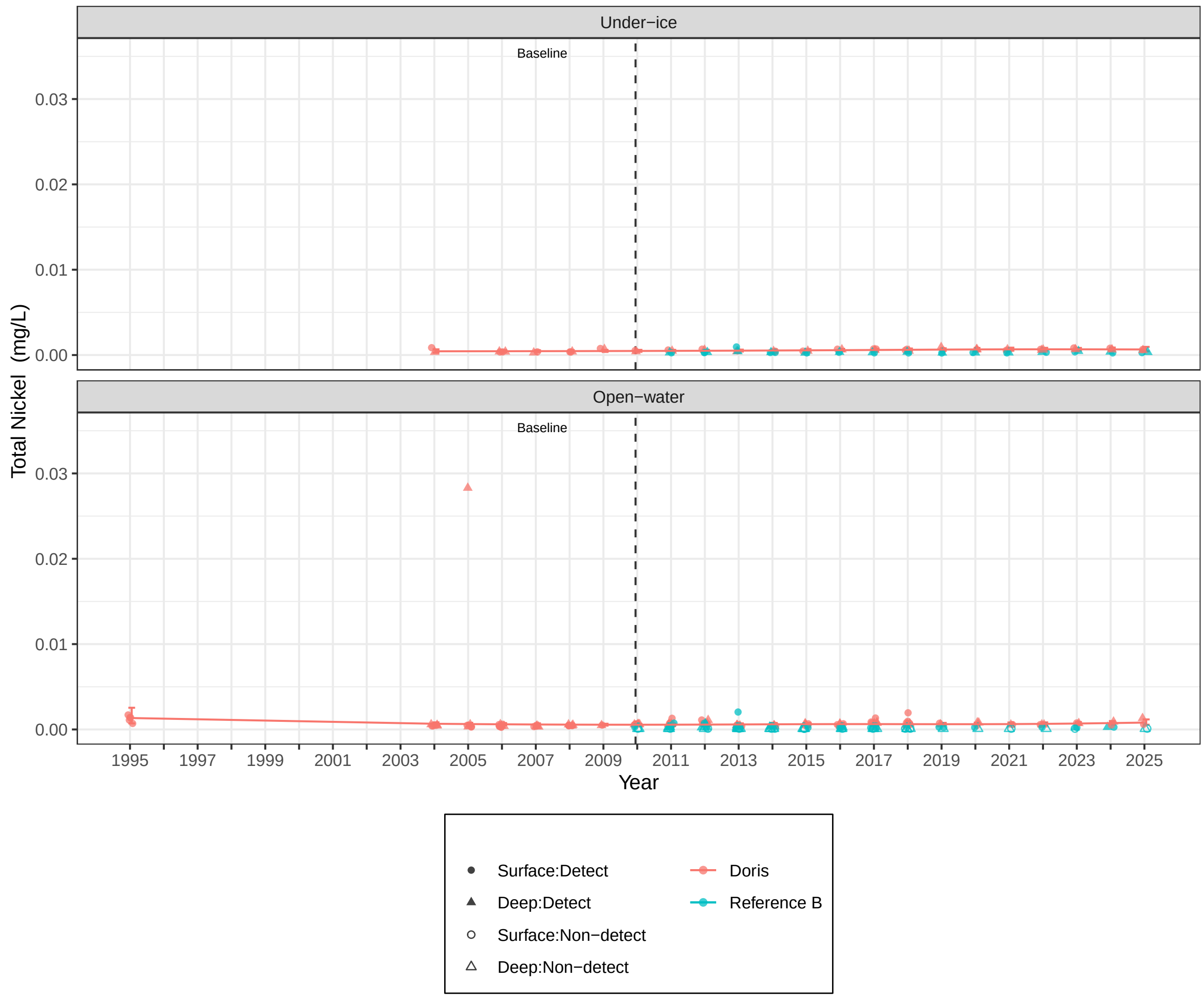
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	7.119	3	0.06820	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.2889	0.1261	10.93	2.29	0.0429	sig.

Conclusion:

The change from before to after was significantly different.

BACI Analysis with Comparable Years

Results of the ANOVA test on the fixed effects of the model:

	Sum Sq.	Mean Sq.	NumDF	DenDF	F value	p
class	7.9620	7.9620	1	24	918.8429	<0.001
period	0.0024	0.0024	1	7	0.2747	0.616
Depth.Zone	0.0973	0.0973	1	24	11.2278	0.00266
class:period	0.0020	0.0020	1	24	0.2320	0.634

Estimated marginal means for site class by period:

Class	Period	LSmean	SE	DF	LowerCL	UpperCL
Monitored	after	-6.947	0.0581	8.458	-7.079	-6.814
Reference	after	-8.096	0.0581	8.458	-8.229	-7.963
Monitored	before	-7.026	0.1087	8.458	-7.274	-6.778
Reference	before	-8.139	0.1087	8.458	-8.388	-7.891

- Results are given on the natural log scale.

Summary of BACI contrasts for relative difference between changes from the before to after in Patch North and Reference Lake B, with 95% confidence intervals:

Patch North vs:	Estimate	Lower C.I.	Upper C.I.	Significance
Reference Sites	0.0359	-0.1181	0.19	not sig.

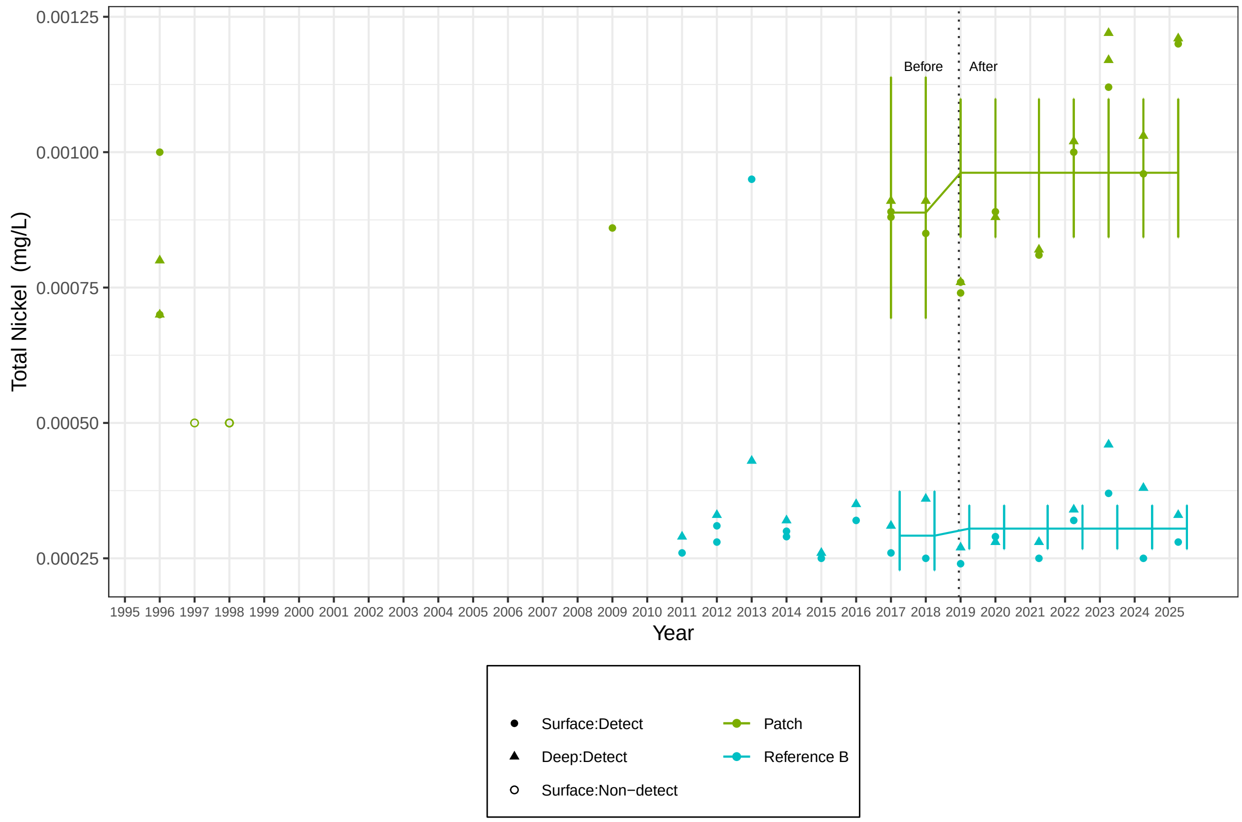
A BACI contrast is identified as *significant* if the confidence interval does not include 0.

Conclusion:

The change in Total Nickel concentrations at the Patch North site from before to after was not significantly (p = 0.634) different from the change at Reference Lake B, according to the test on the BACI term (*class:period*).

Observed Data and Fitted Values with Comparable Years

Depth was accounted for in the model but not evaluated since its effect is not of primary interest. Below are plots of the observed and fitted data. The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for monitored and reference sites.



Patch Open-Water Before-After Analysis

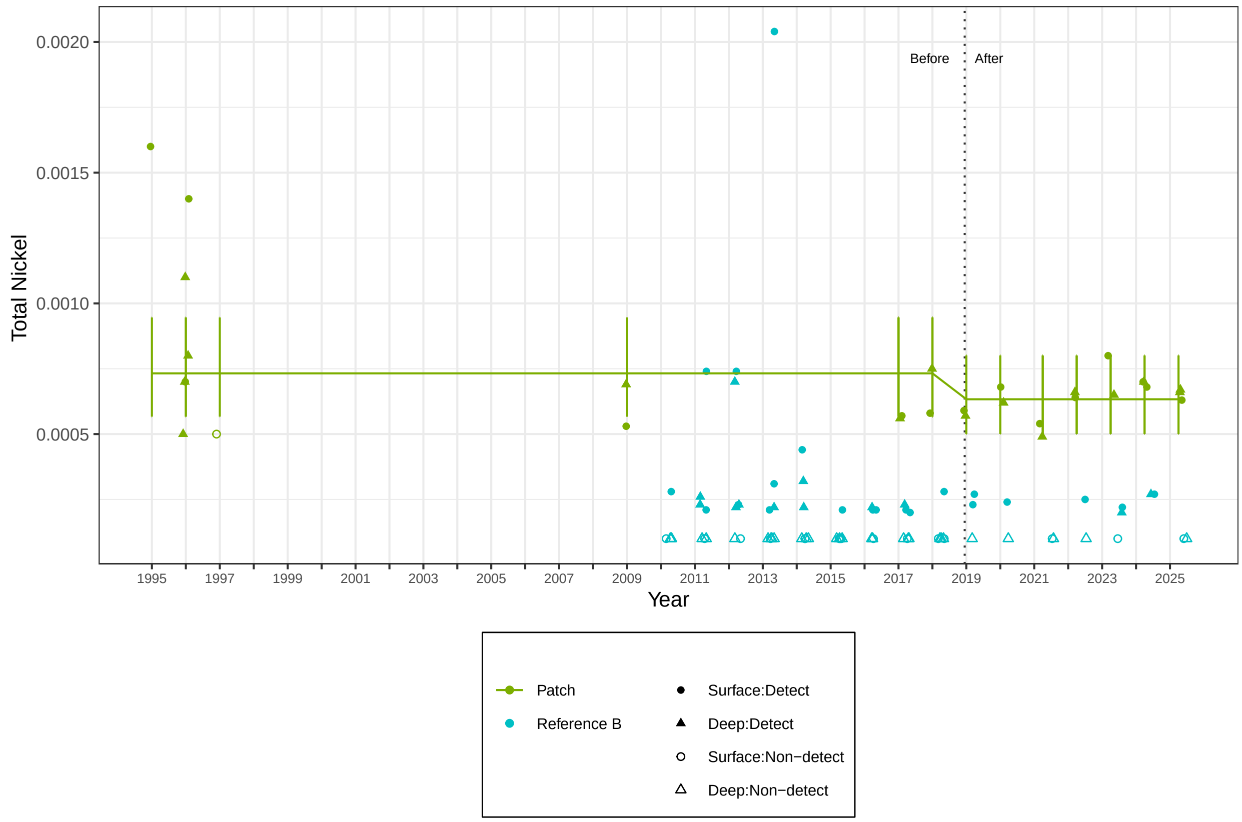
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.1454	0.158	9.748	-0.9203	0.3796	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

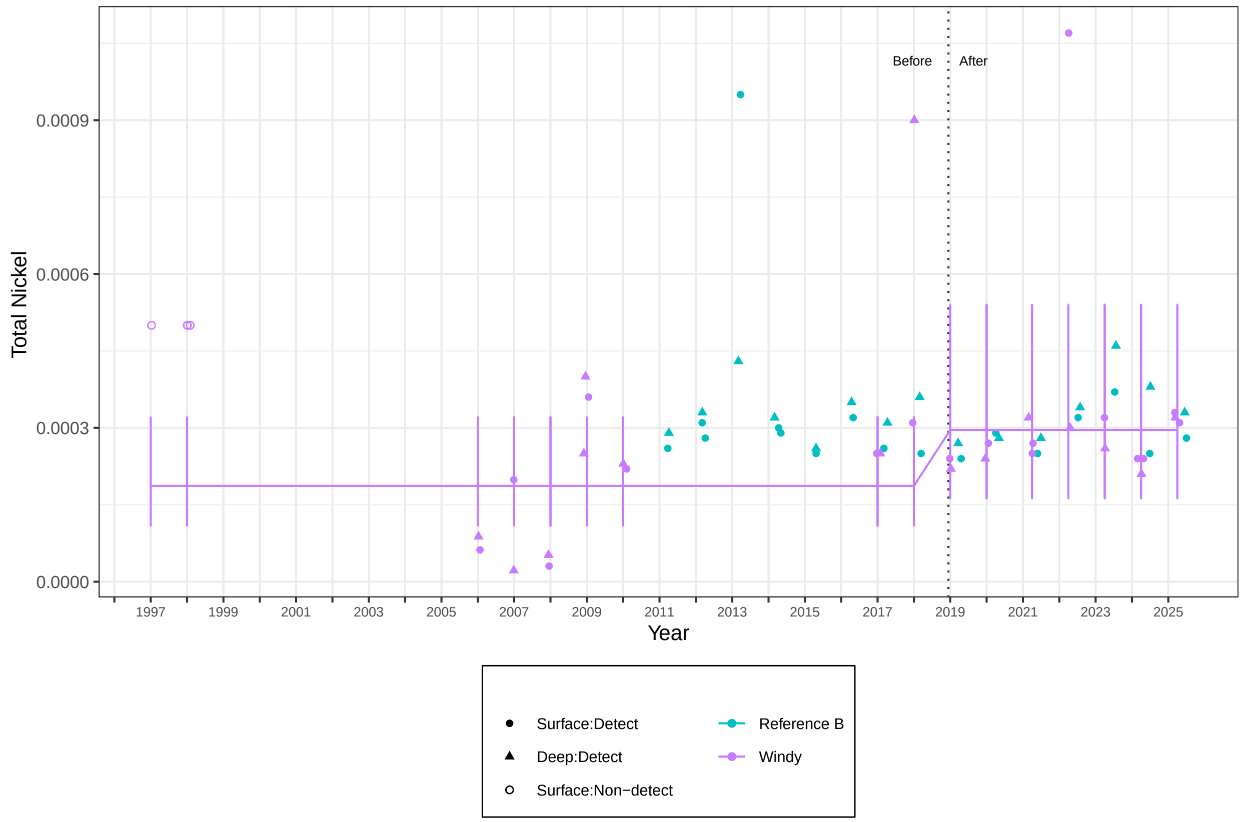
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.4597	0.3778	13.53	1.217	0.2445	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

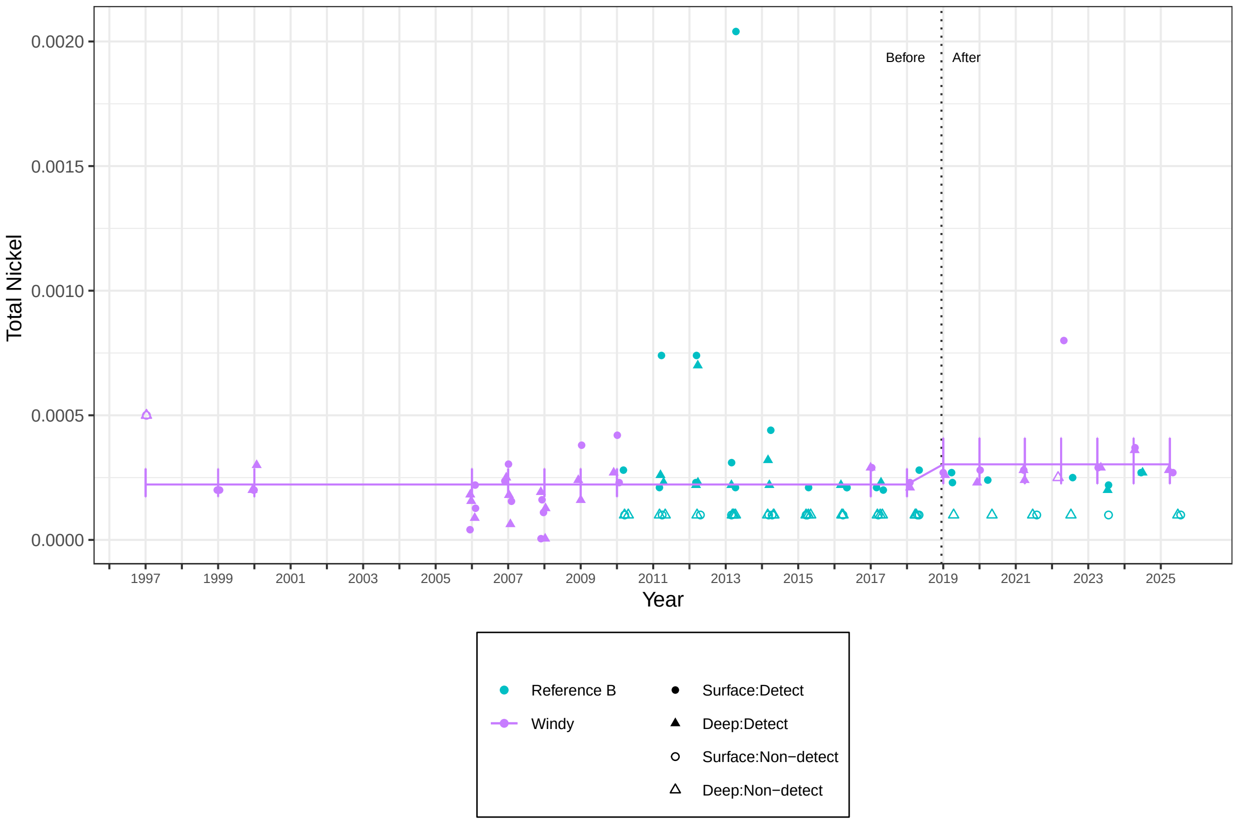
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.3105	0.1836	15.1	1.691	0.1113	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

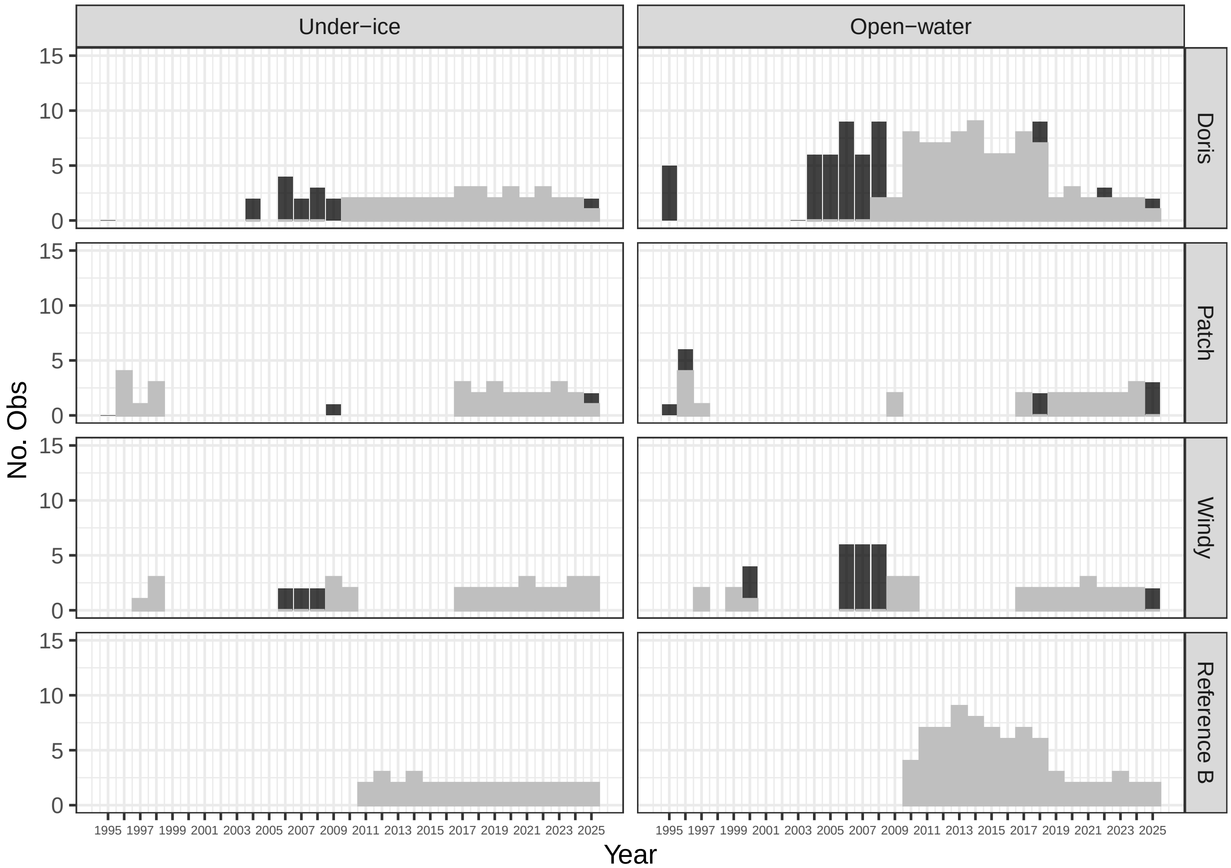
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Total Nickel
0.0020
0.0015
0.0010
0.0005
0.0000
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Reference B
Windy
Surface:Detect
Deep:Detect
Surface:Non−detect
Deep:Non−detect

C.3.1.21 Total Selenium

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

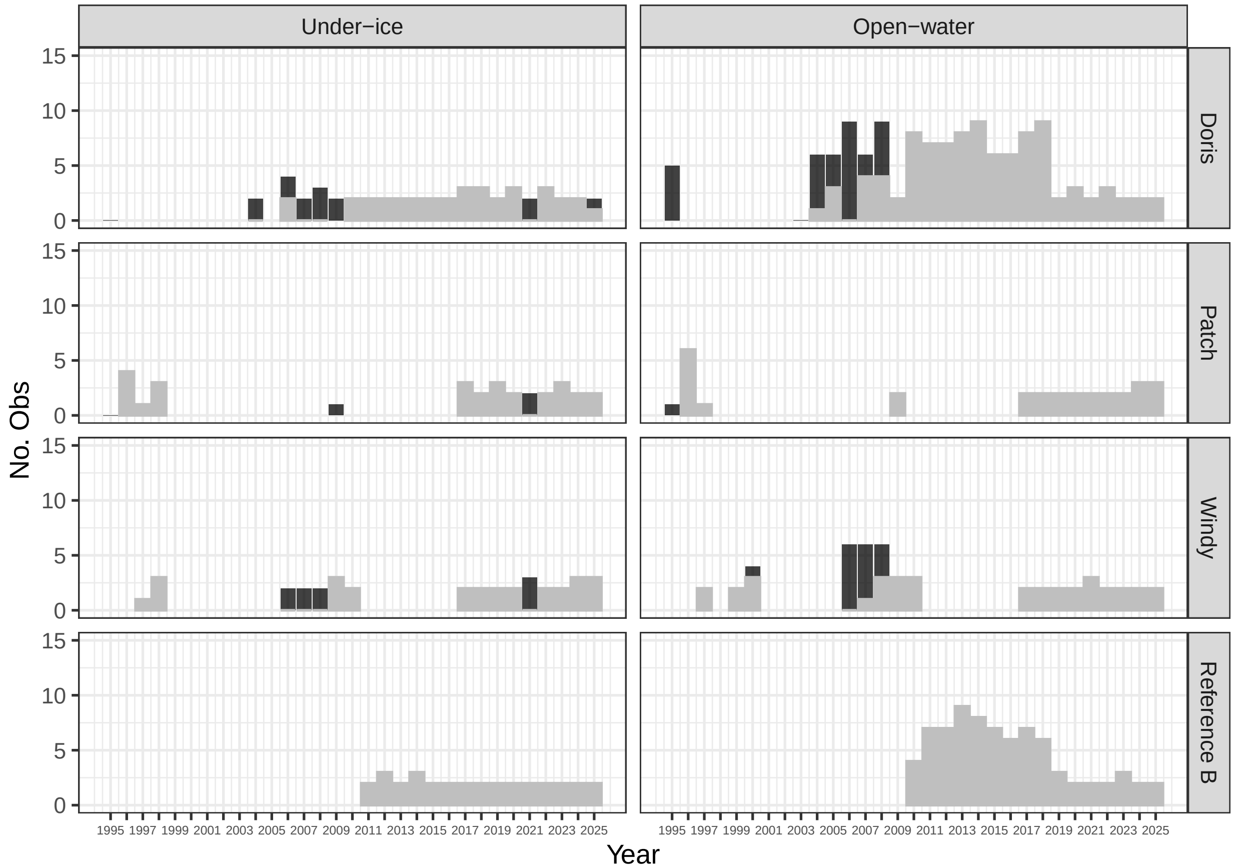
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	35	71	50
Doris	Open-water	127	85	67	50
Patch	Under-ice	30	29	97	50
Patch	Open-water	30	22	73	0
Reference B	Under-ice	32	32	100	100
Reference B	Open-water	77	77	100	100
Windy	Under-ice	36	30	83	100
Windy	Open-water	51	28	55	0

All data from Doris North, Patch and Windy were censored. All data removed from the analysis and no statistical analyses were performed.

C.3.1.22 Total Silver

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

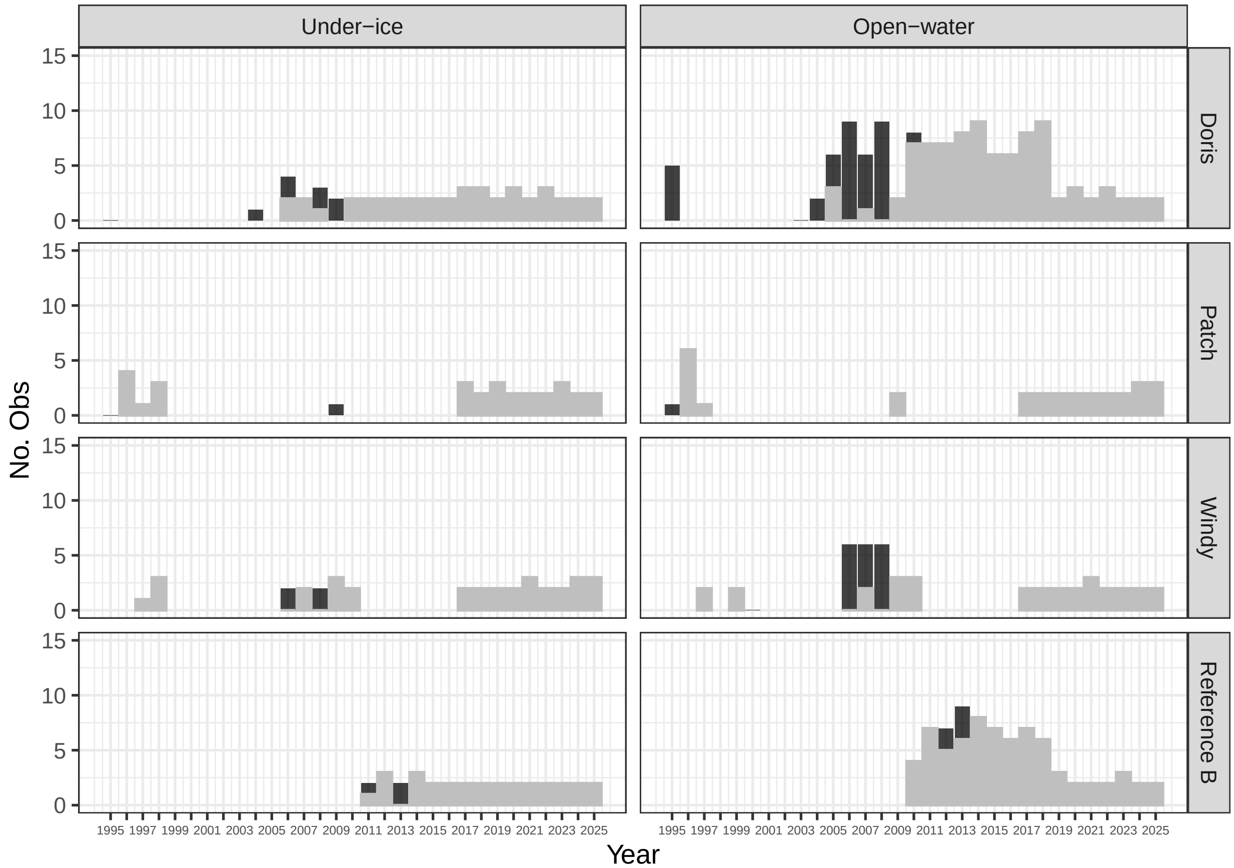
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	37	76	50
Doris	Open-water	127	102	80	100
Patch	Under-ice	30	28	93	100
Patch	Open-water	30	30	100	100
Reference B	Under-ice	32	32	100	100
Reference B	Open-water	77	77	100	100
Windy	Under-ice	36	27	75	100
Windy	Open-water	51	36	71	100

All data from Doris North, Patch and Windy were censored. All data removed from the analysis and no statistical analyses were performed.

C.3.1.23 Total Thallium

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

The sample sizes per lake and season are summarized in the table below.

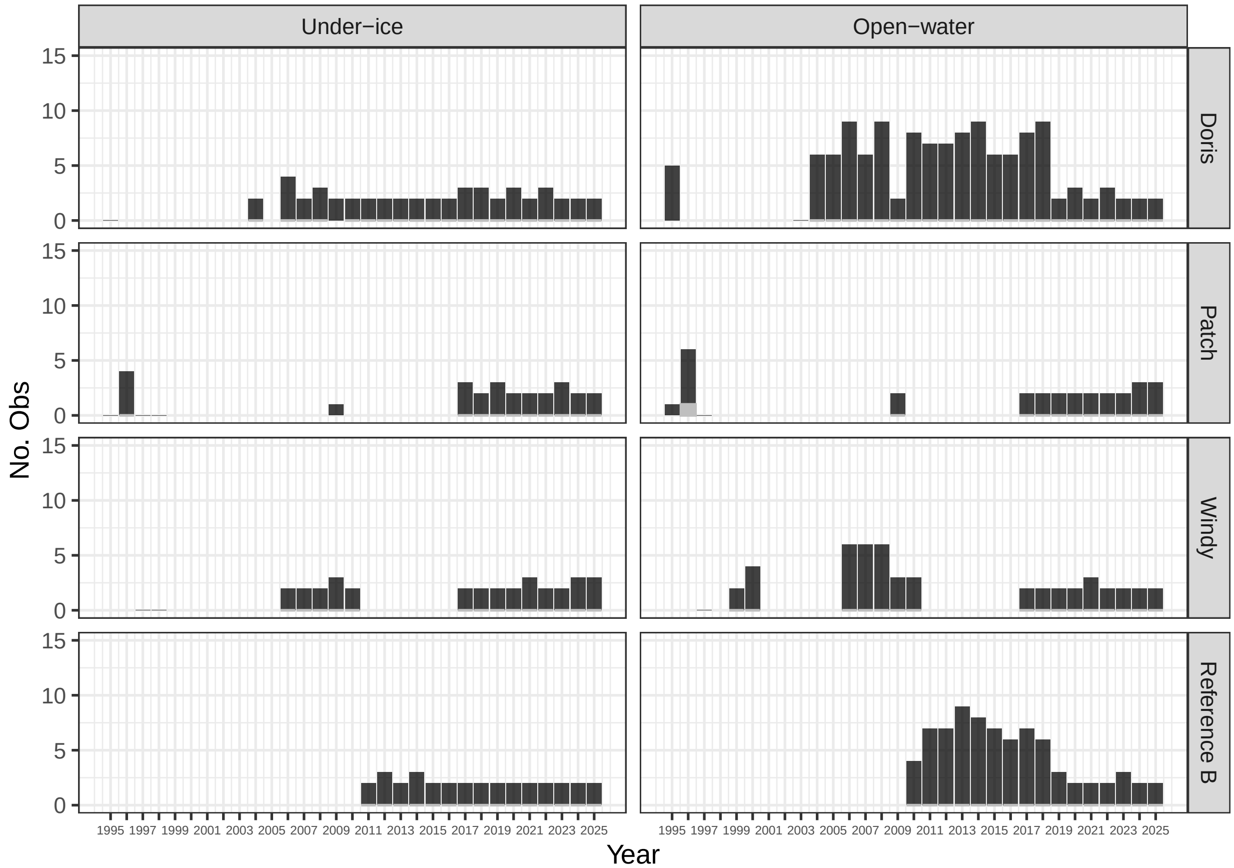
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	48	44	92	100
Doris	Open-water	123	96	78	100
Patch	Under-ice	30	30	100	100
Patch	Open-water	30	30	100	100
Reference B	Under-ice	32	29	91	100
Reference B	Open-water	77	72	94	100
Windy	Under-ice	36	32	89	100
Windy	Open-water	47	31	66	100

All data from Doris North, Patch and Windy were censored. All data removed from the analysis and no statistical analyses were performed.

C.3.1.24 Total Uranium

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

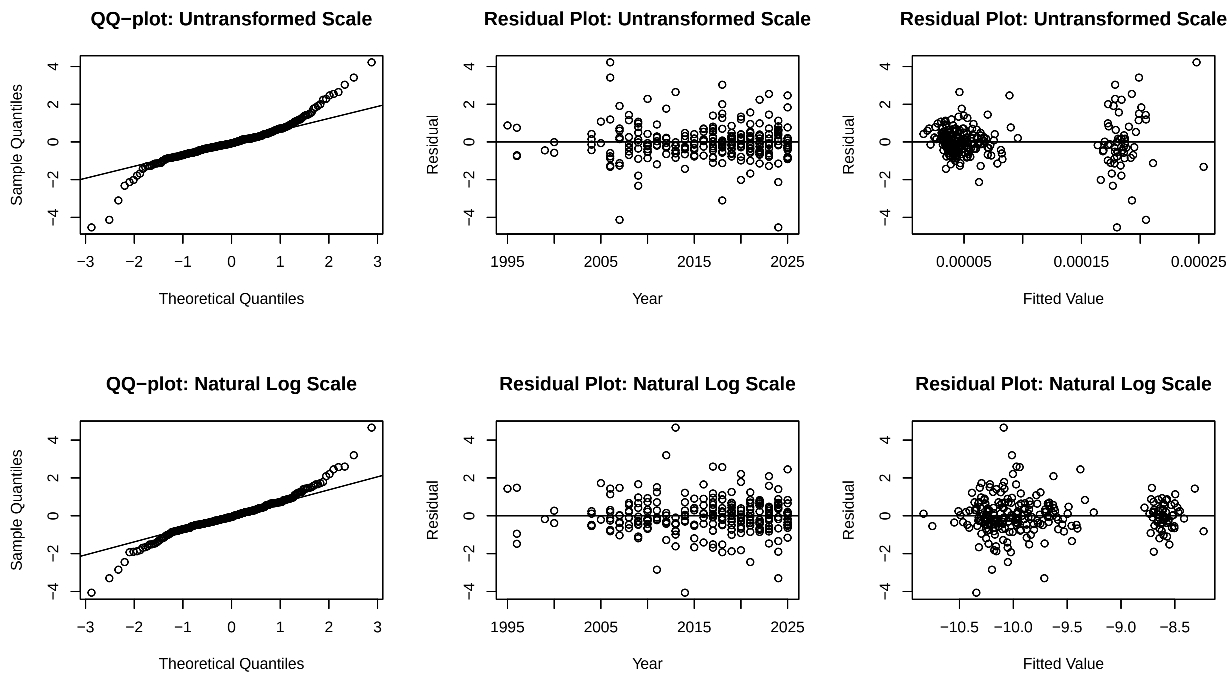
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	49	0	0	0
Doris	Open-water	127	4	3	0
Patch	Under-ice	26	0	0	0
Patch	Open-water	29	1	3	0
Reference B	Under-ice	32	0	0	0
Reference B	Open-water	77	0	0	0
Windy	Under-ice	32	0	0	0
Windy	Open-water	49	0	0	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Windy	2006	Under-ice	Deep	0.0002930	0	4.224
Windy	2006	Open-water	Deep	0.0002353	0	3.416
Windy	2007	Under-ice	Deep	0.0001610	0	-4.132
Windy	2018	Under-ice	Deep	0.0001600	0	-3.103
Windy	2018	Open-water	Surface	0.0002110	0	3.036
Windy	2024	Under-ice	Deep	0.0001320	0	-4.534

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Reference B	2012	Under-ice	Surface	0.00006685	-10.013	3.199
Reference B	2013	Under-ice	Surface	0.00007430	-10.089	4.658
Reference B	2014	Under-ice	Deep	0.00001940	-10.343	-4.061
Reference B	2024	Under-ice	Deep	0.00004010	-9.712	-3.298

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. However, there were outliers retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	35.28	4	<0.00001	sig.
Compare to Reference B	16.90	4	0.00200	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Doris Open-Water

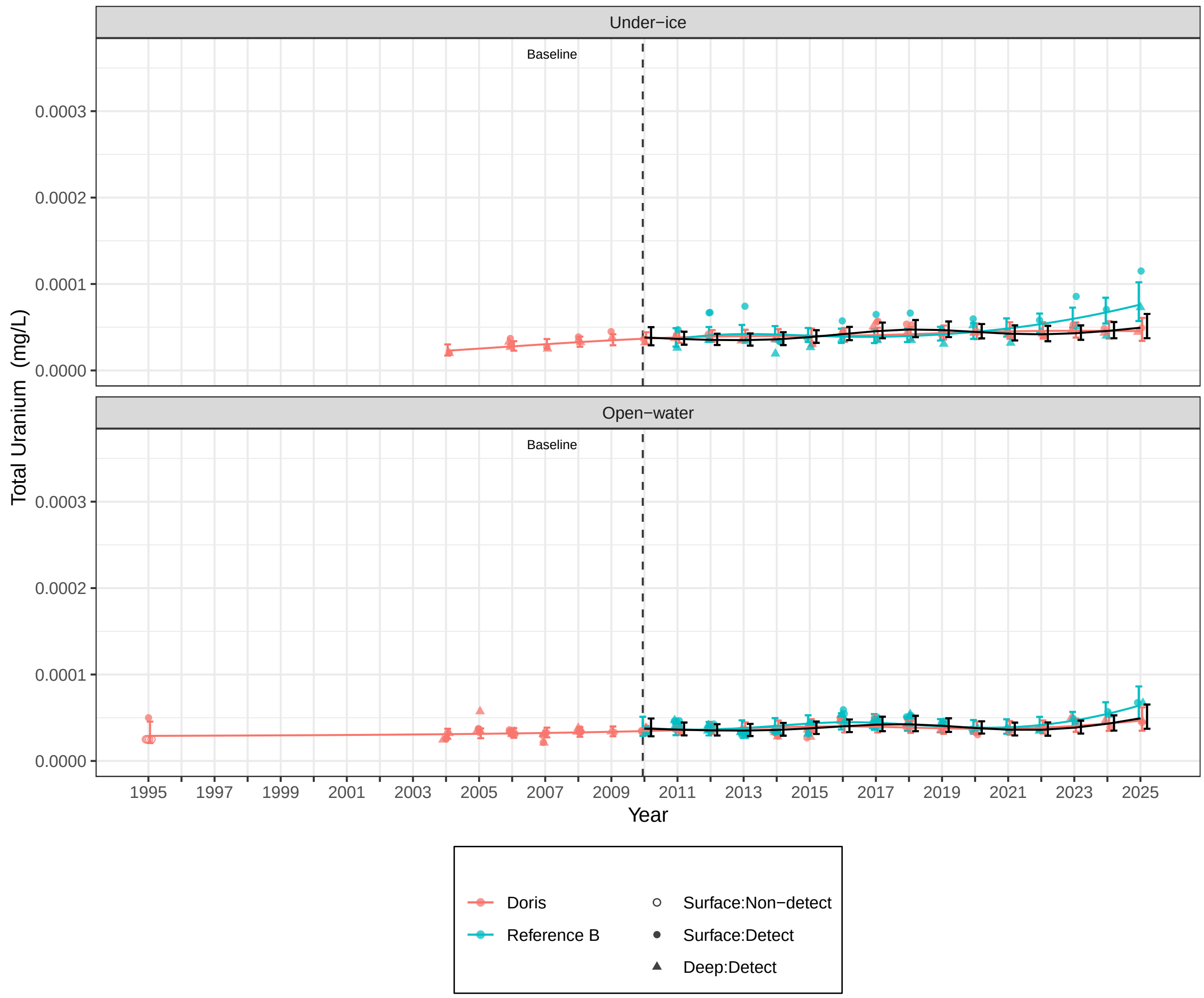
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	13.065	4	0.01100	sig.
Compare to Reference B	5.039	4	0.28330	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

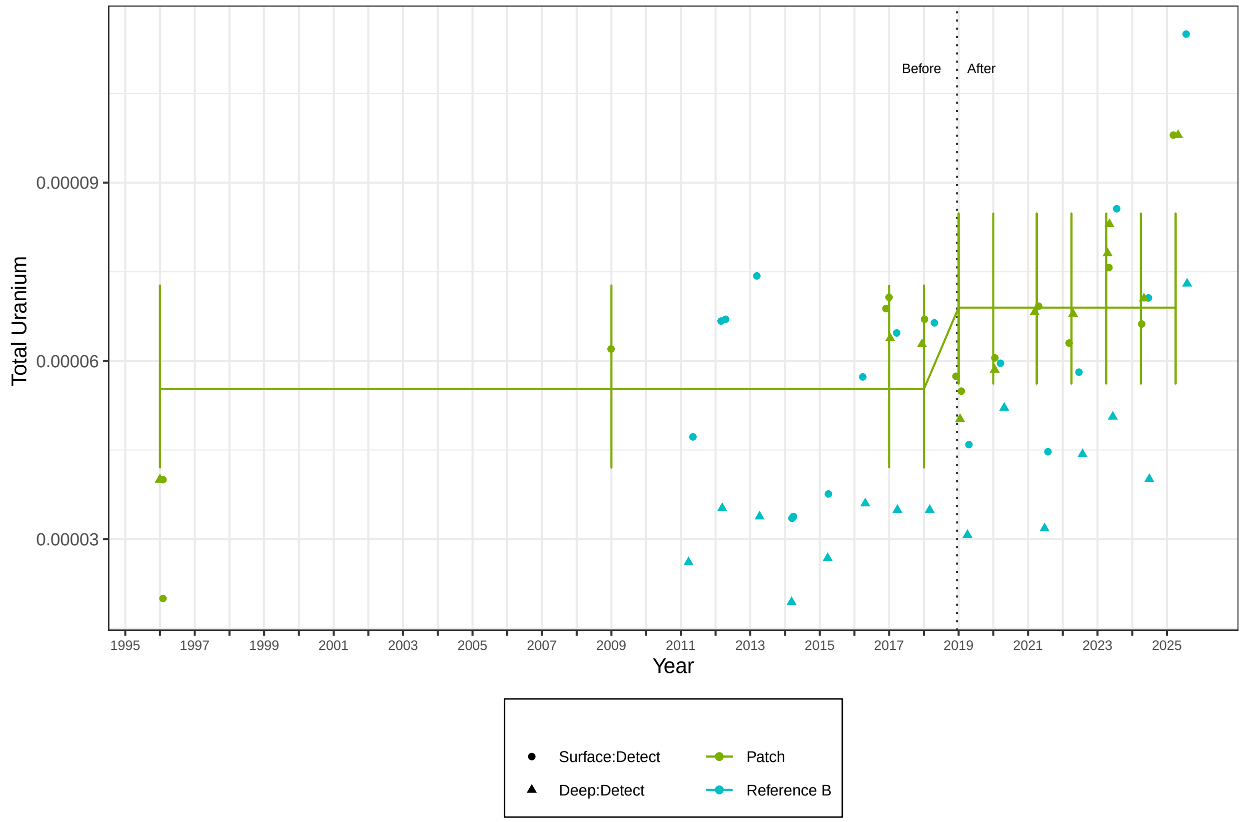
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.222	0.1525	9.132	1.456	0.1788	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

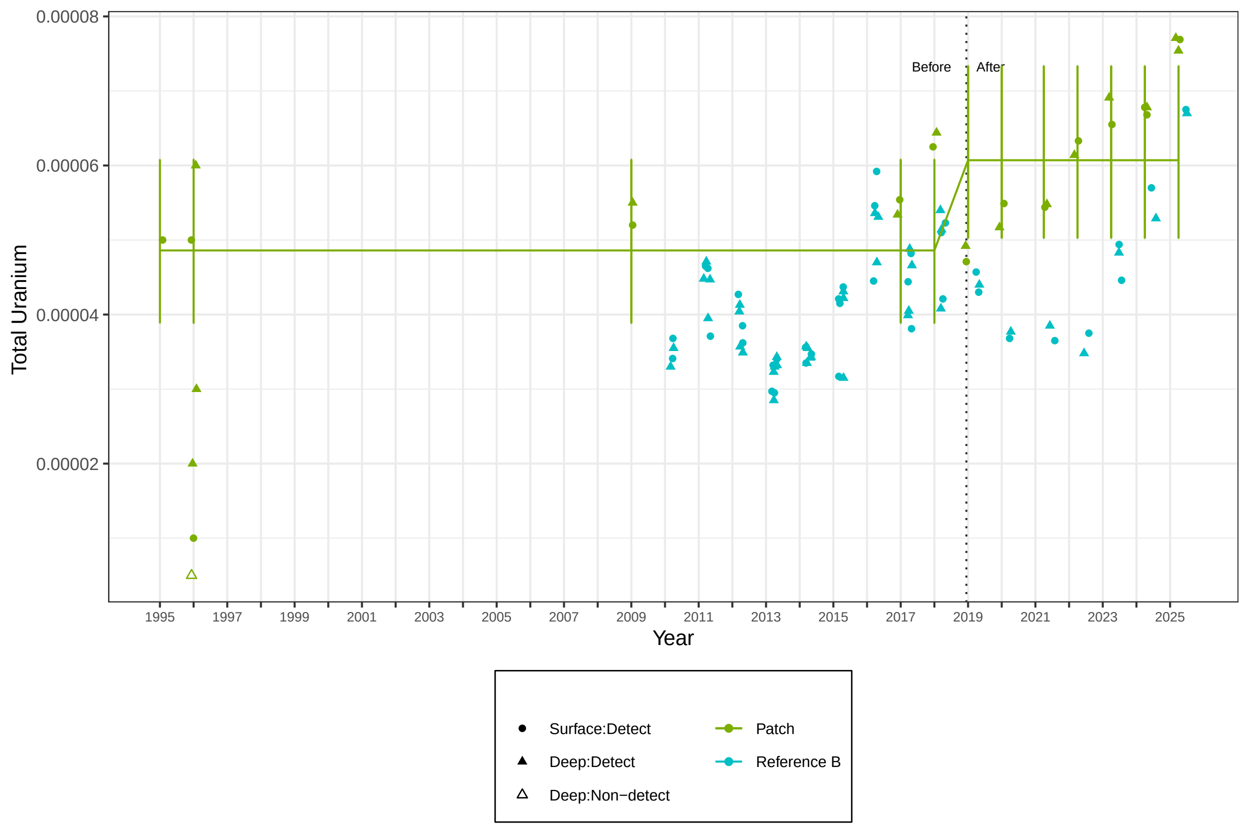
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.2224	0.1318	10.02	1.687	0.1225	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

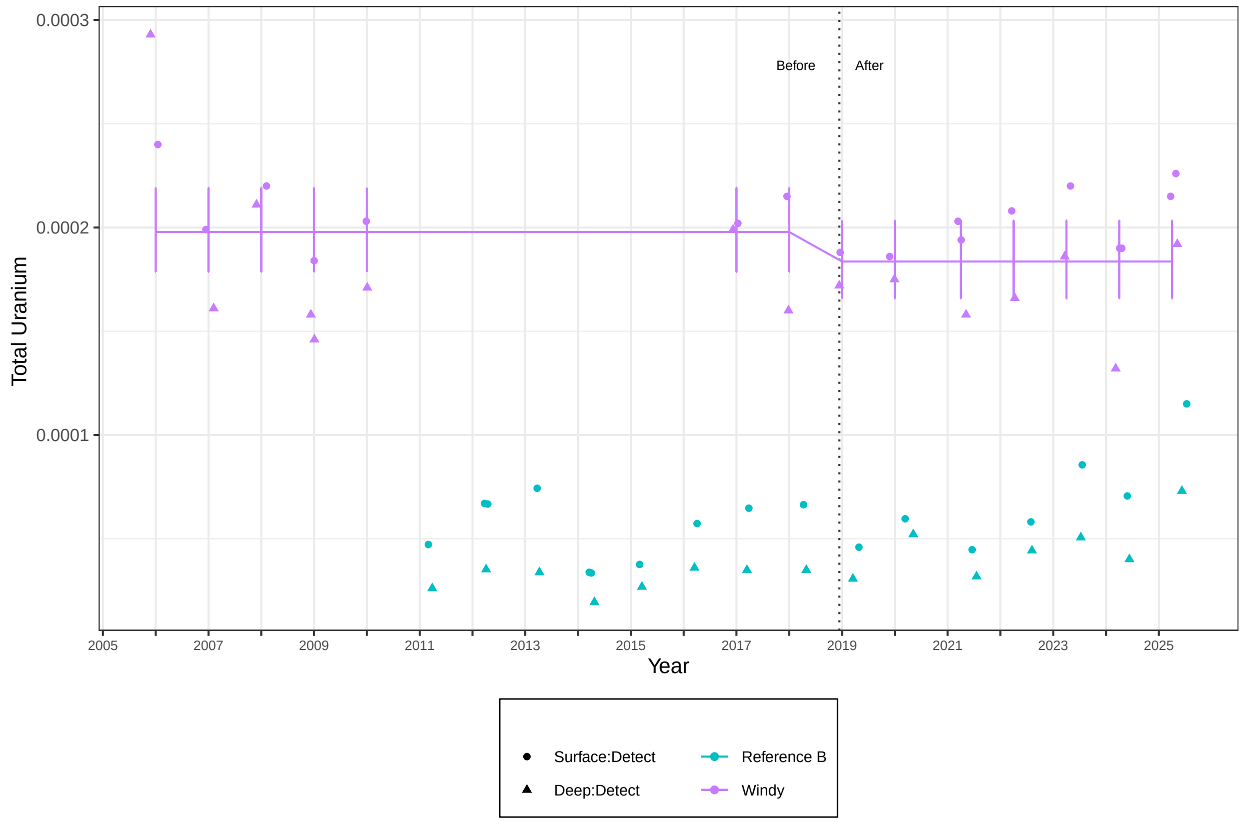
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0744	0.0665	12	-1.119	0.2849	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

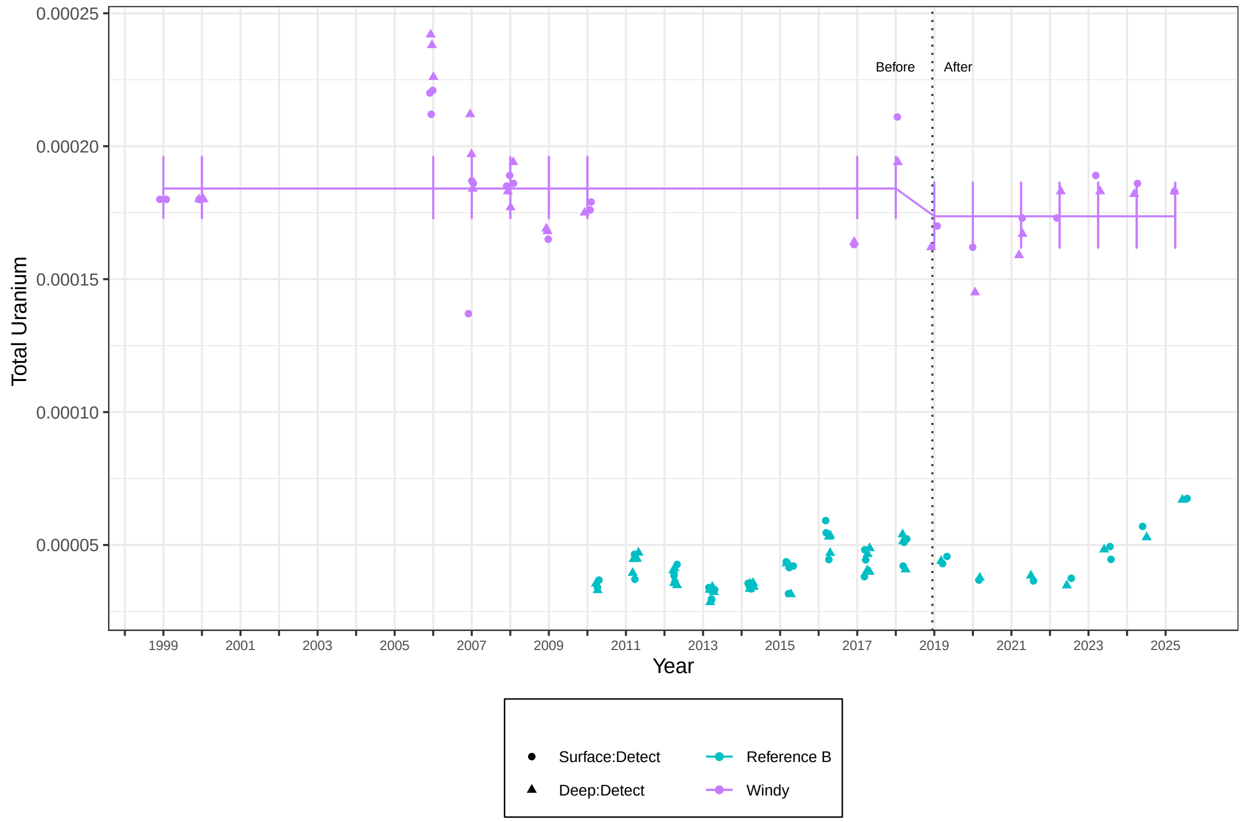
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0585	0.0447	14.12	-1.308	0.2118	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

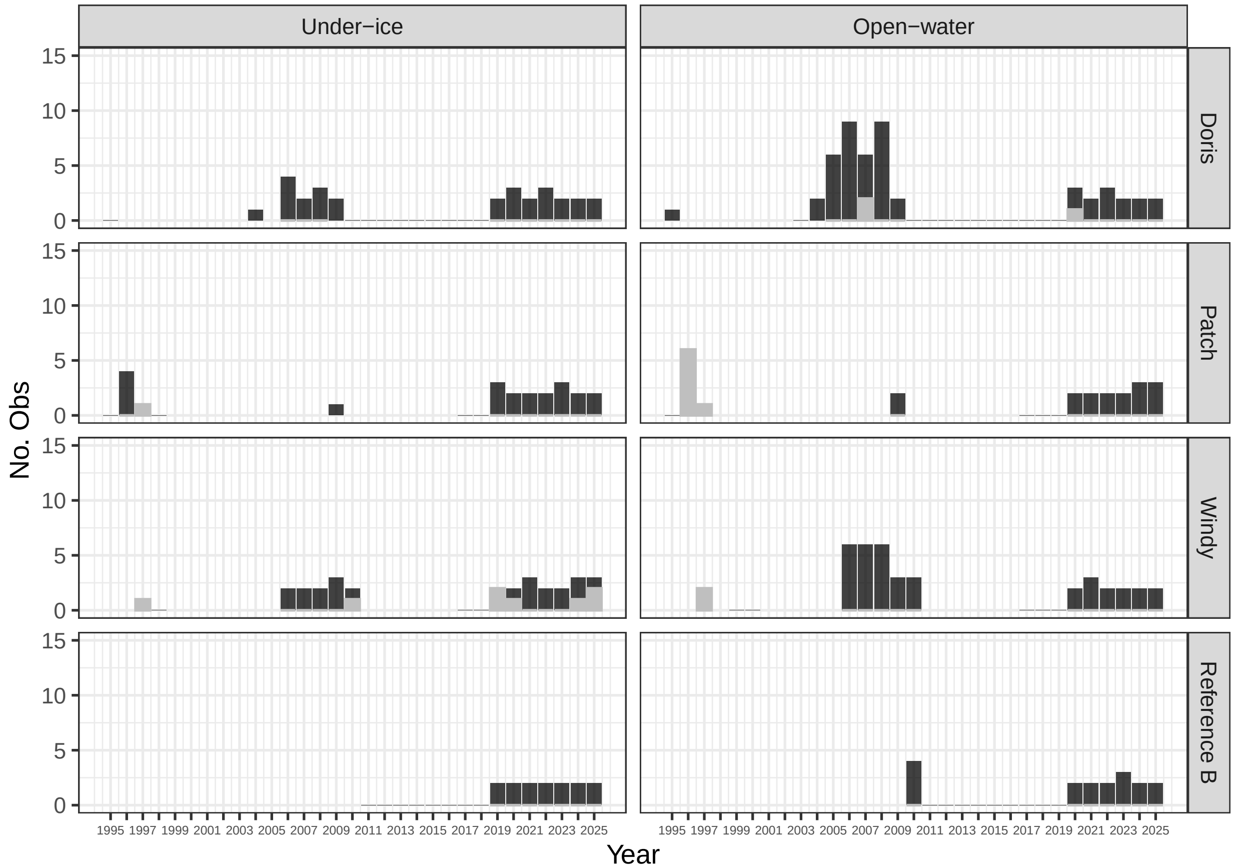
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Total Uranium
0.00025
0.00020
0.00015
0.00010
0.00005
Before
After
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Surface:Detect
Deep:Detect
Reference B
Windy

C.3.1.25 Dissolved Manganese

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

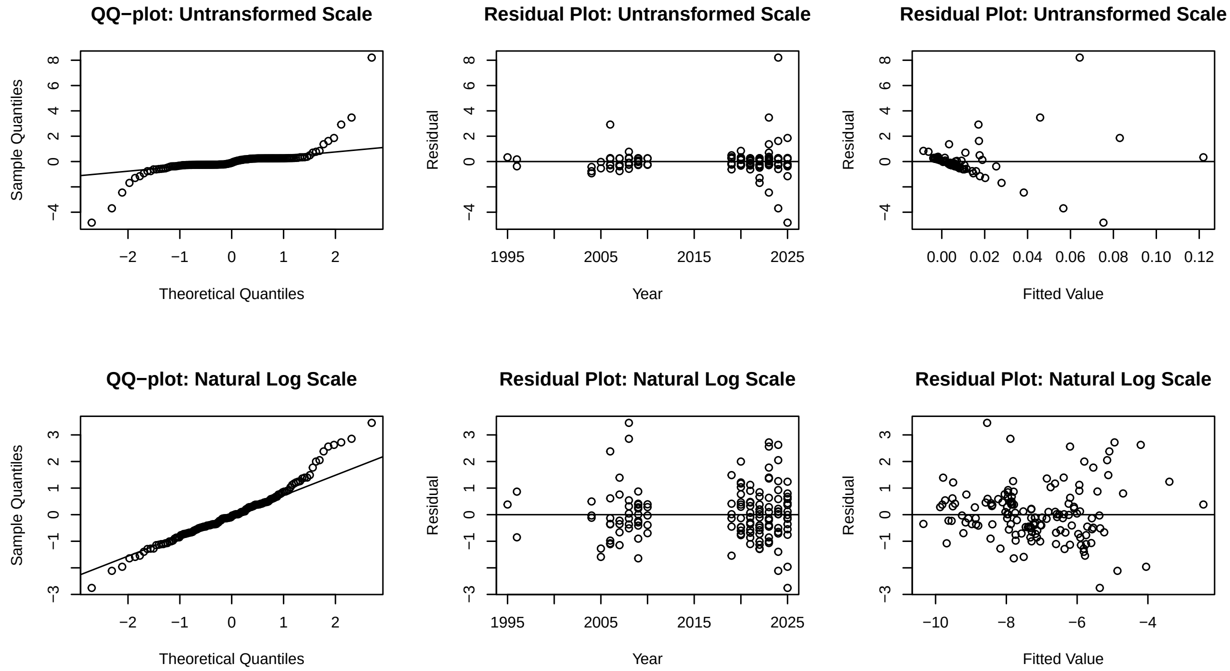
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	28	0	0	0
Doris	Open-water	49	3	6	0
Patch	Under-ice	22	1	5	0
Patch	Open-water	23	7	30	0
Reference B	Under-ice	14	0	0	0
Reference B	Open-water	17	0	0	0
Windy	Under-ice	29	8	28	67
Windy	Open-water	39	2	5	0

None of the sites exhibited greater than 50% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Reference B	2023	Under-ice	Deep	0.09820	0.046	3.473
Reference B	2024	Under-ice	Deep	0.18800	0.064	8.207
Reference B	2024	Under-ice	Surface	0.00101	0.057	-3.693
Reference B	2025	Under-ice	Surface	0.00263	0.075	-4.825

Outliers on natural log scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2008	Open-water	Surface	0.005445	-8.543	3.453

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data. However, there was an outlier retained in the analysis. Results should be interpreted with caution and along with graphical results.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	5.715	3	0.12630	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Doris Open-Water

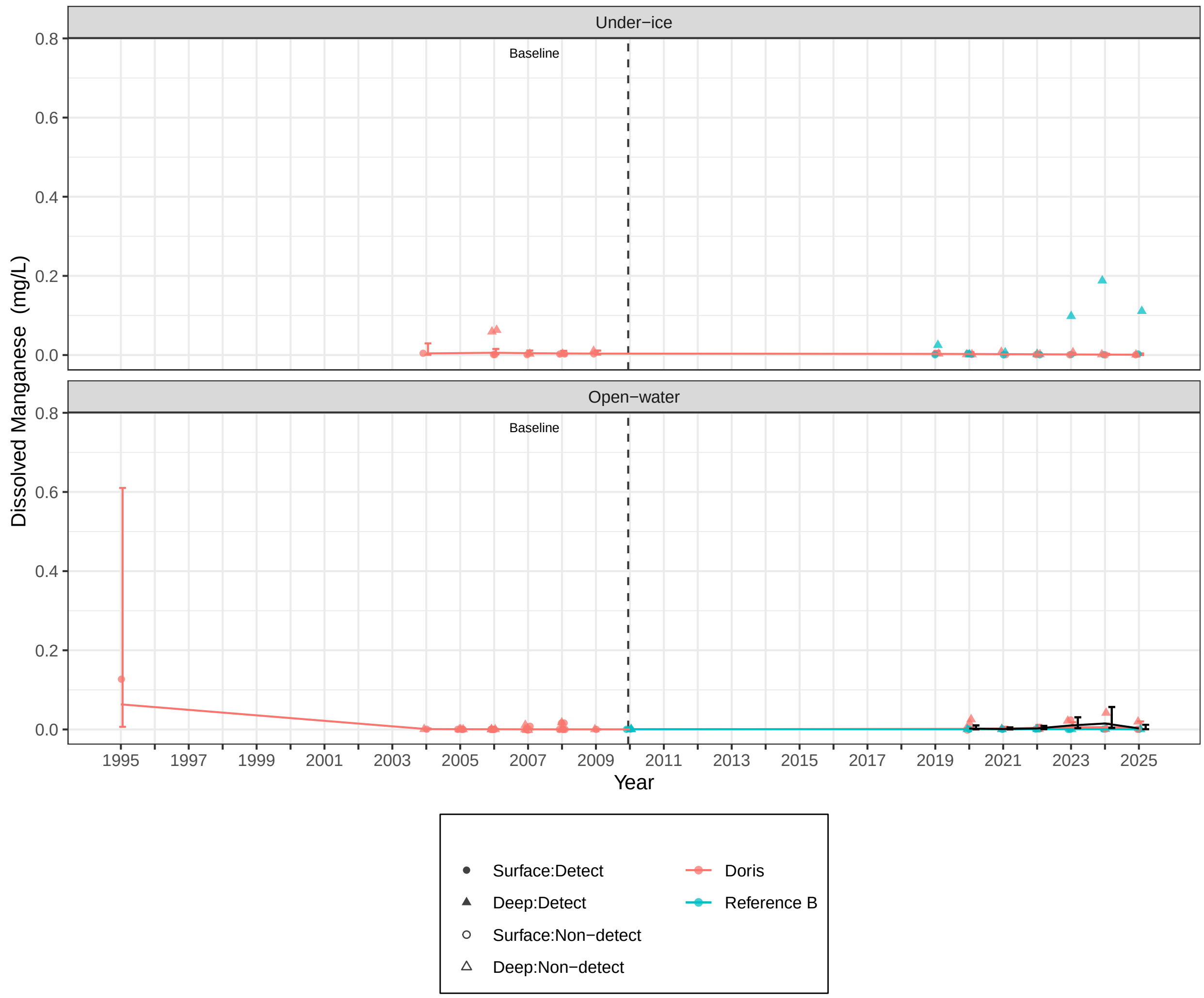
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	33.468	3	<0.00001	sig.
Compare to Reference B	2.661	3	0.44690	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis

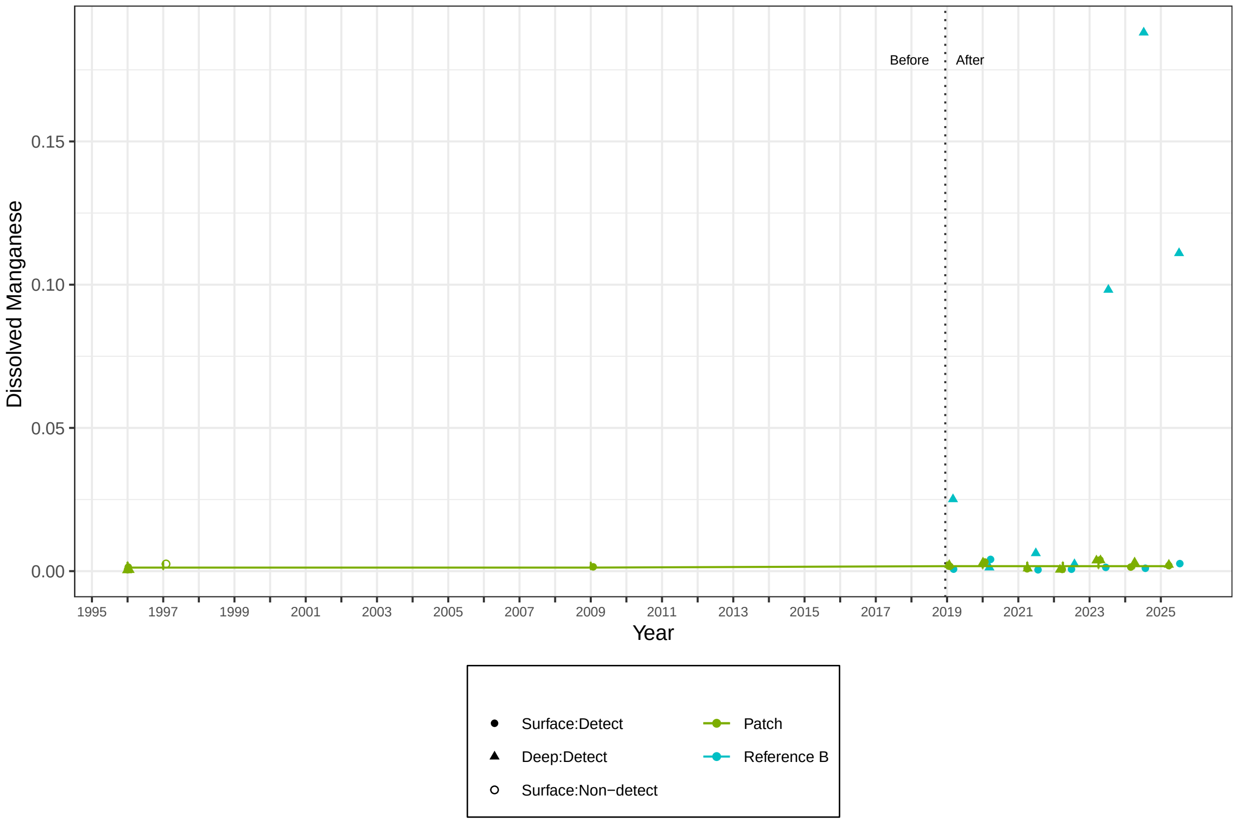
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.338	0.4961	8.776	0.6812	0.5133	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Patch Open-Water Before-After Analysis

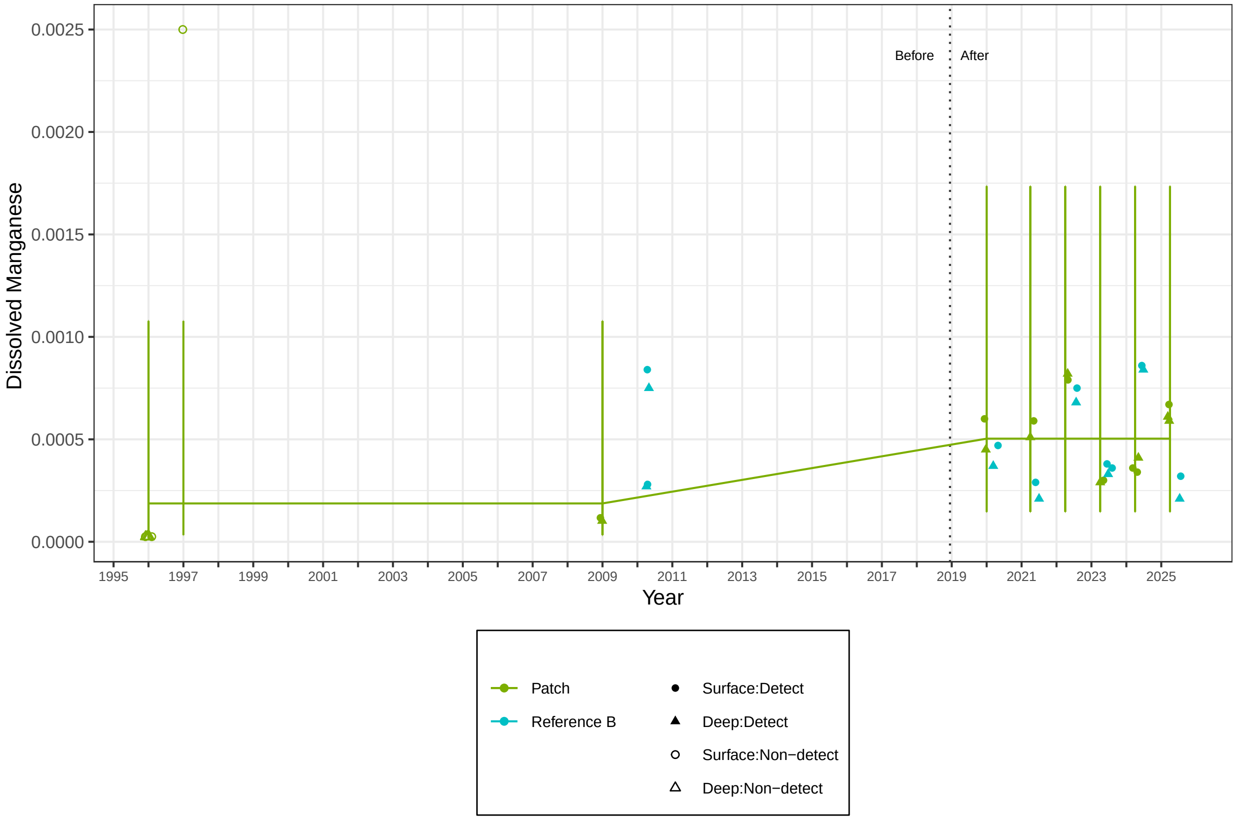
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.9892	0.9068	6.985	1.091	0.3116	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis

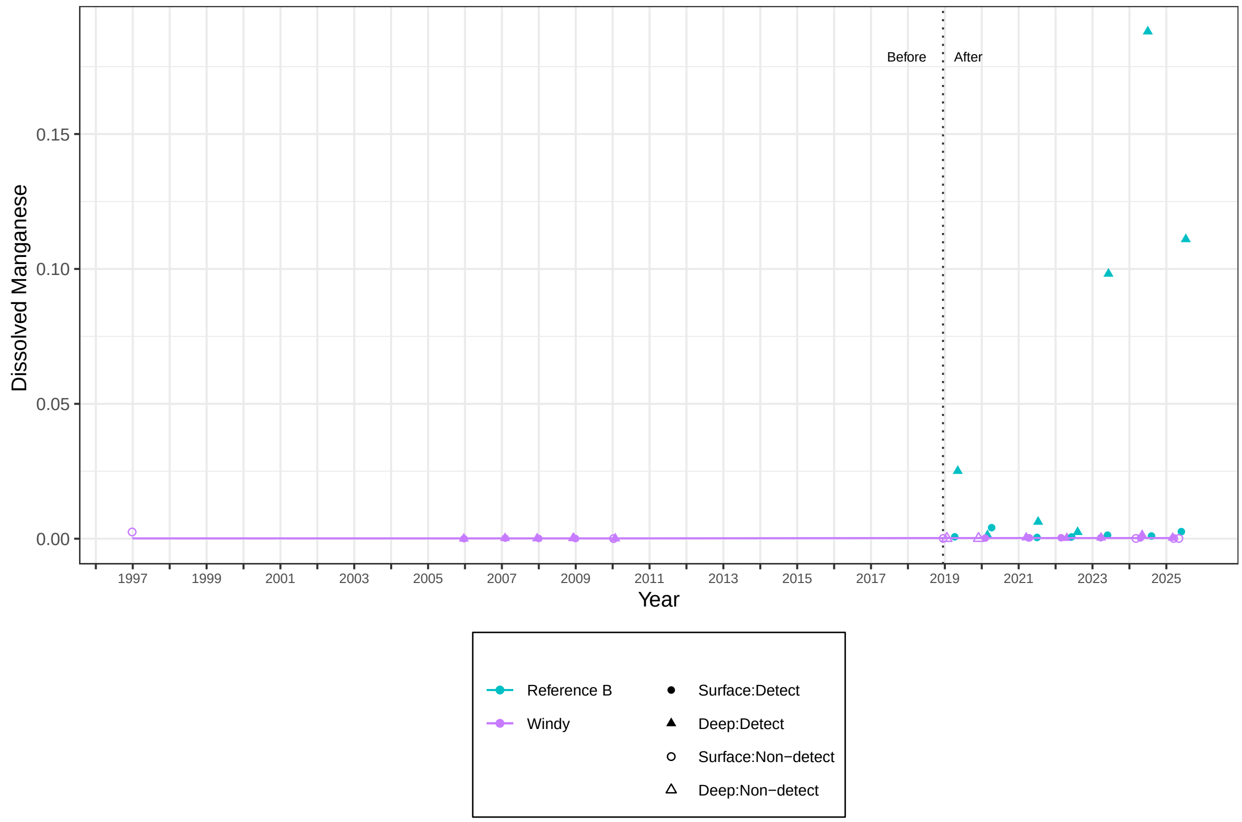
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.6571	0.6377	9.457	1.03	0.3284	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



Windy Open-water Before-After Analysis

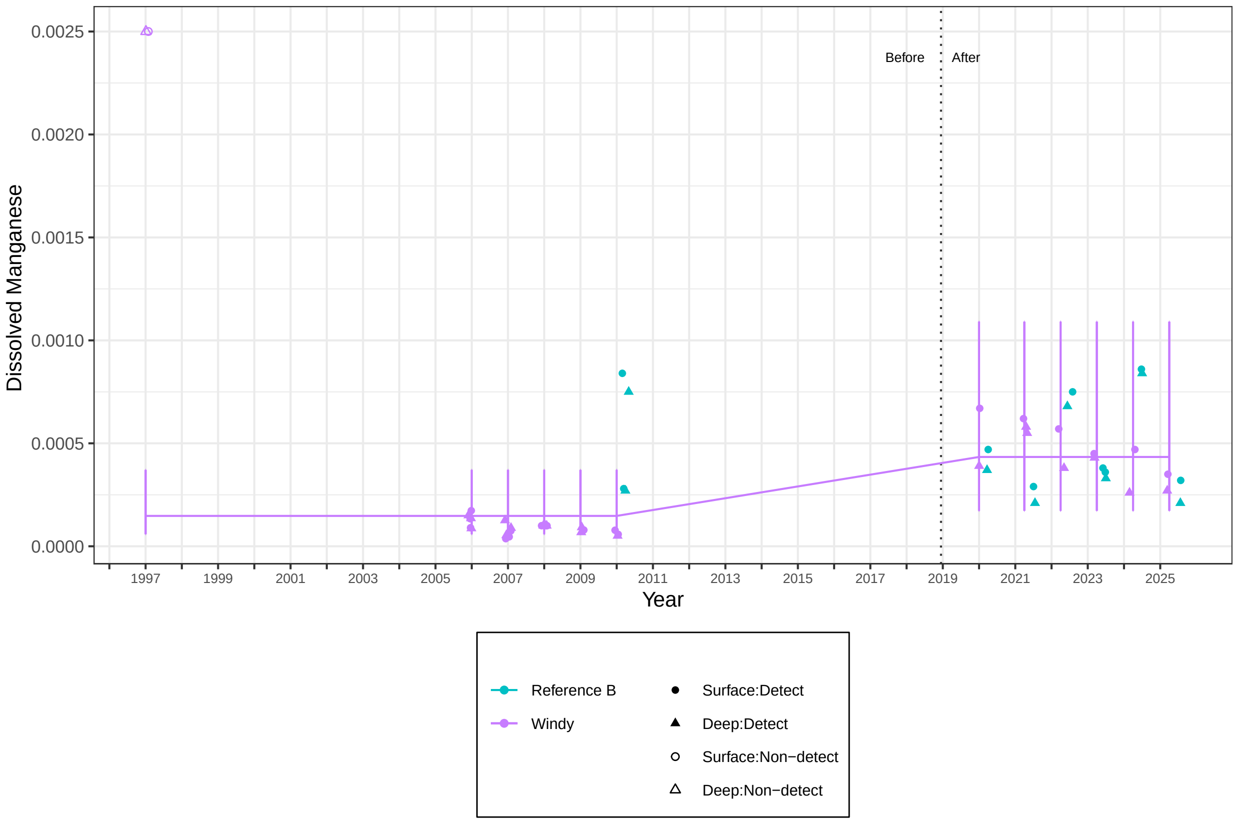
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	1.078	0.5855	10	1.842	0.0953	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

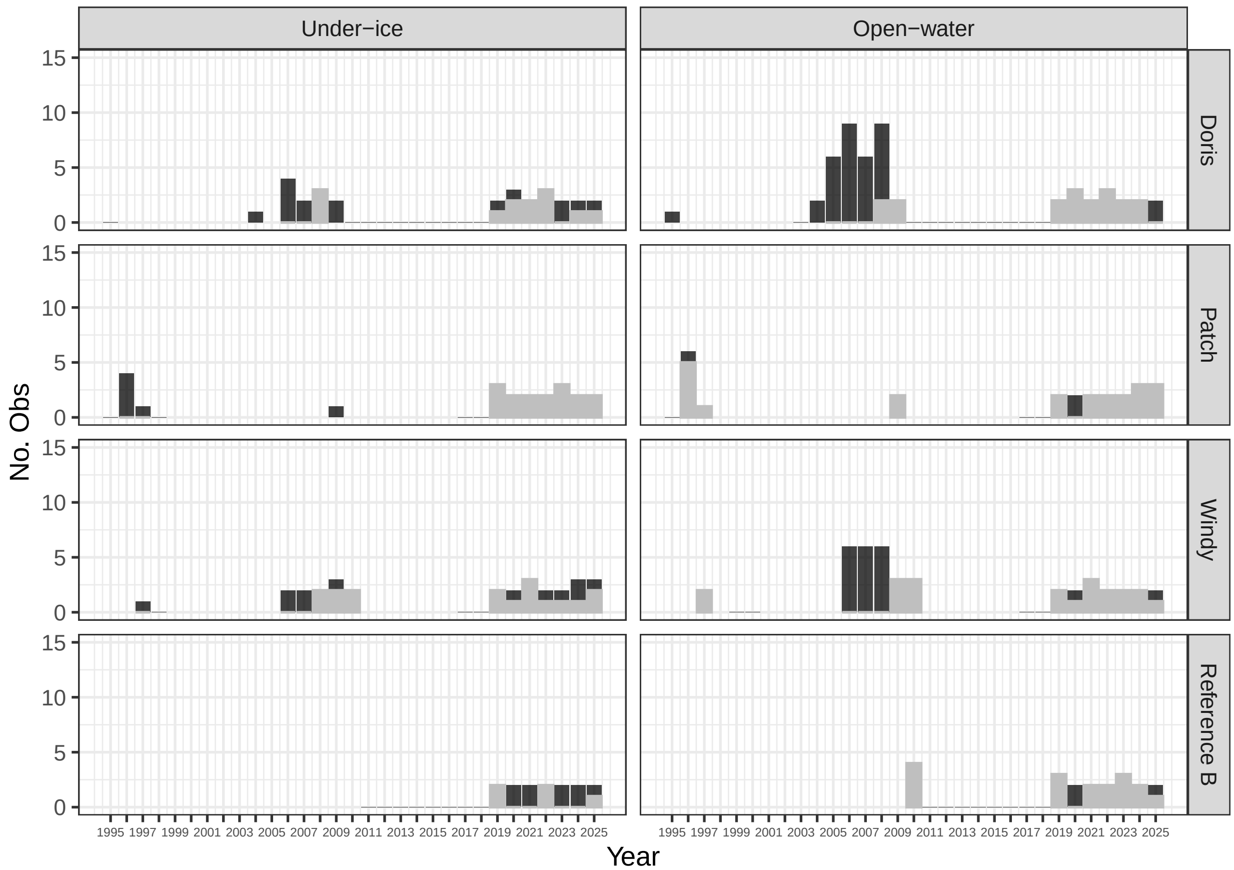
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.


Dissolved Manganese
0.0025
0.0020
0.0015
0.0010
0.0005
0.0000
Before
After
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Year
Reference B
Windy
Surface:Detect
Deep:Detect
Surface:Non−detect
Deep:Non−detect

C.3.1.26 Dissolved Zinc

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

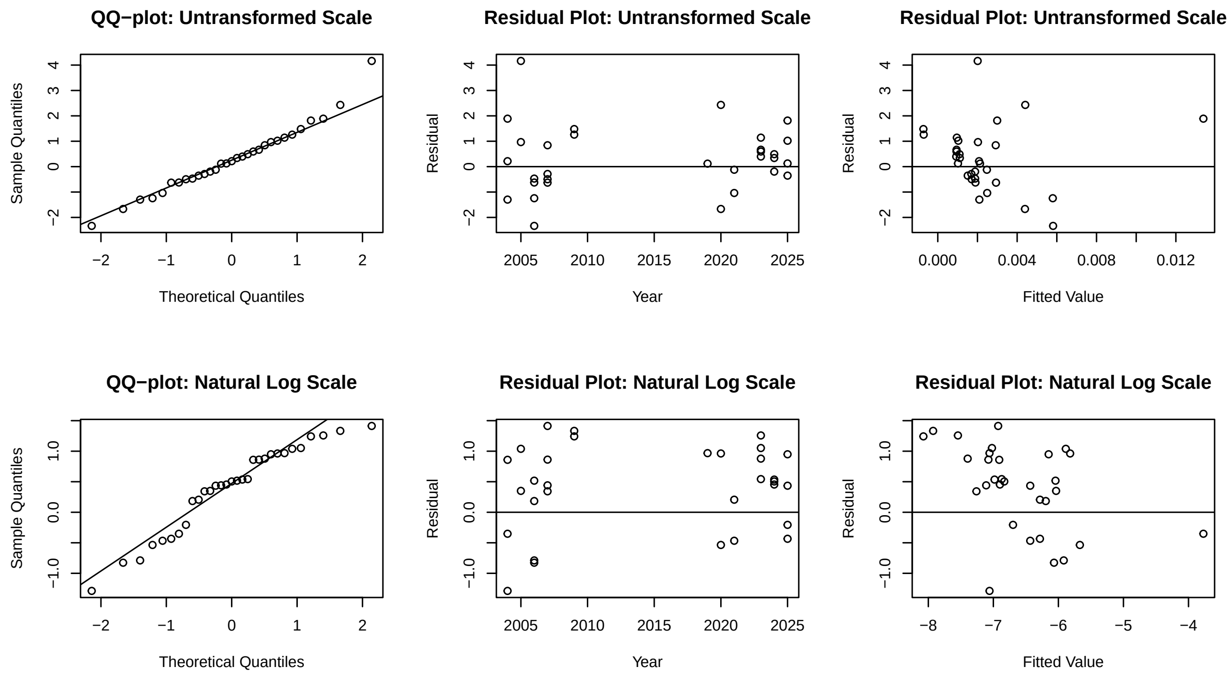
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Under-ice	28	13	46	50
Doris	Open-water	51	19	37	0
Patch	Under-ice	22	16	73	100
Patch	Open-water	25	22	88	100
Reference B	Under-ice	14	5	36	50
Reference B	Open-water	20	17	85	50
Windy	Under-ice	29	17	59	67
Windy	Open-water	41	21	51	50

More than 50% of data was under detection limit in Patch Under-ice, Patch Open-water, Reference B Open-water, Windy Under-ice, and Windy Open-water. Data from those site-season groupings will be removed from the analysis. Doris North Under-ice, Doris North Open-water, and Reference B Under-ice exhibited more than 10% of data under detection limit. The analysis proceeds with tobit regression for Doris Lake.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2005	Open-water	Deep	0.007987	0.002	4.162

Outliers on natural log scale:

None

The untransformed data better meets the residual assumptions. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Under-Ice

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	70.870	3	<0.00001	sig.
Compare to Reference B	6.666	3	0.08330	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Doris Open-Water

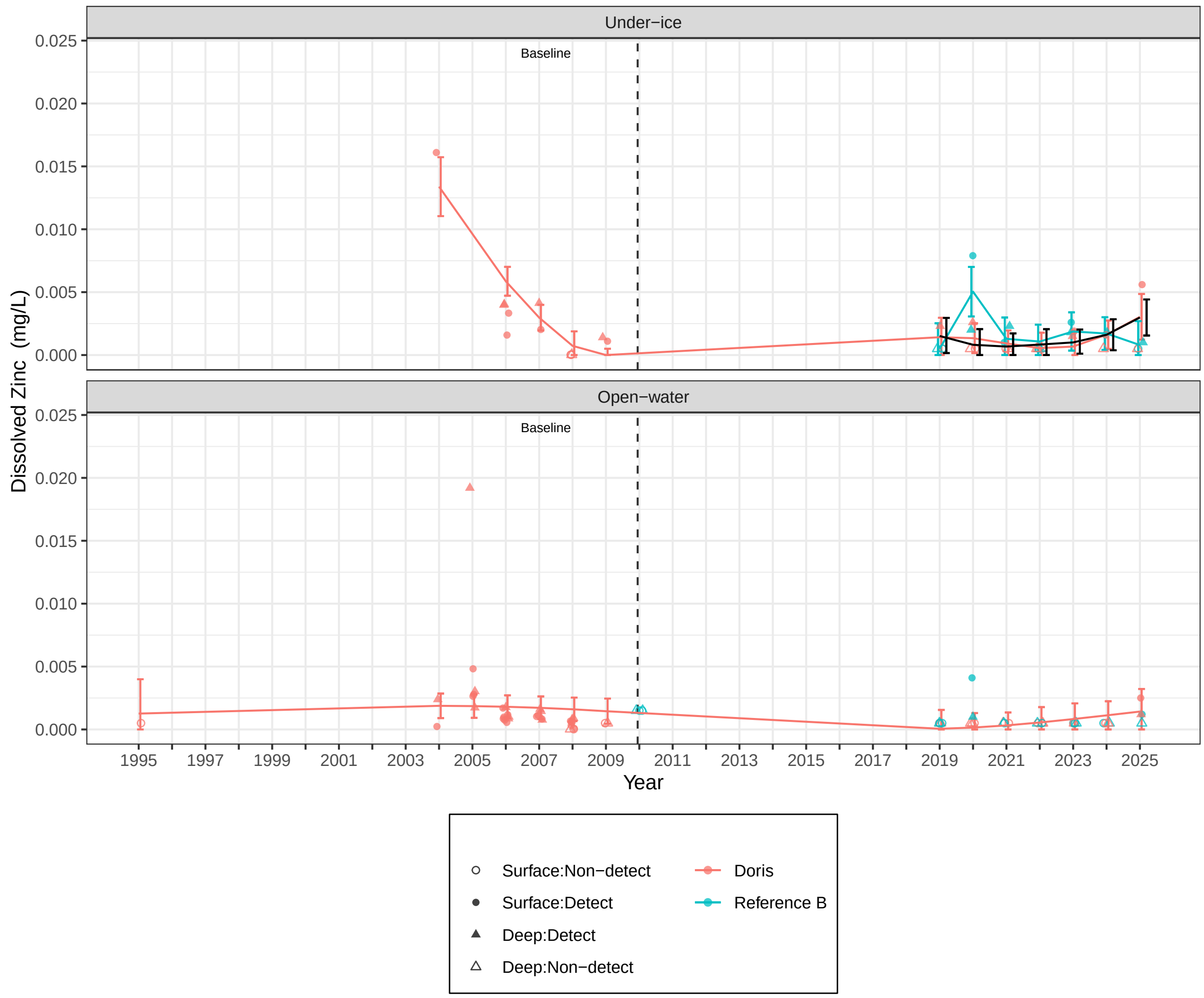
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	4.129	3	0.24780	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.

As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Patch Under-Ice Before-After Analysis Analysis was not performed.

Patch Open-Water Before-After Analysis Analysis was not performed.

Windy Lake

Before-after analyses were first performed to compare the change in the before and after period in the exposure lake. If a change was detected then before-after-control-impact linear modeling would be applied to compare the change in before and after periods relative to Reference Lake B. Models were fit separately for each season.

Windy Under-Ice Before-After Analysis Analysis was not performed.

Windy Open-water Before-After Analysis Analysis was not performed.

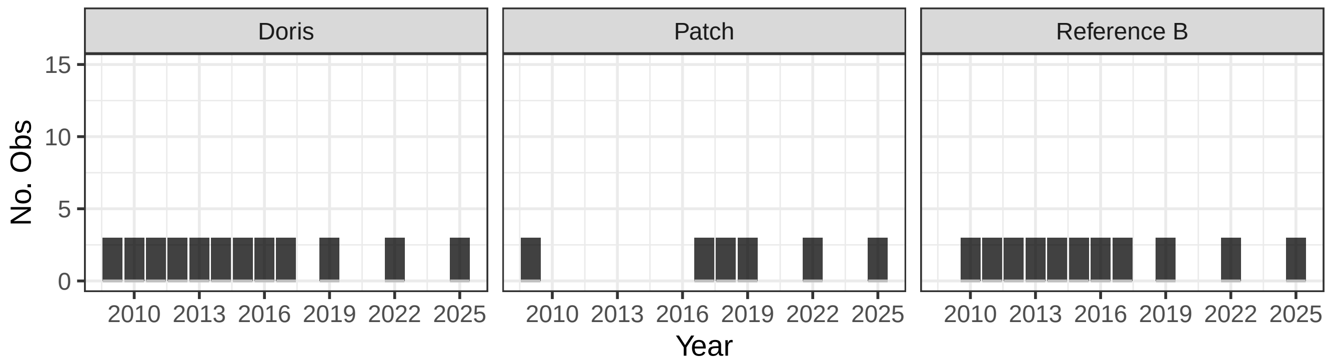
C.3 Statistical Results for Evaluation of Effects

C.3.2 Sediment Quality

C.3.2.1 Arsenic

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

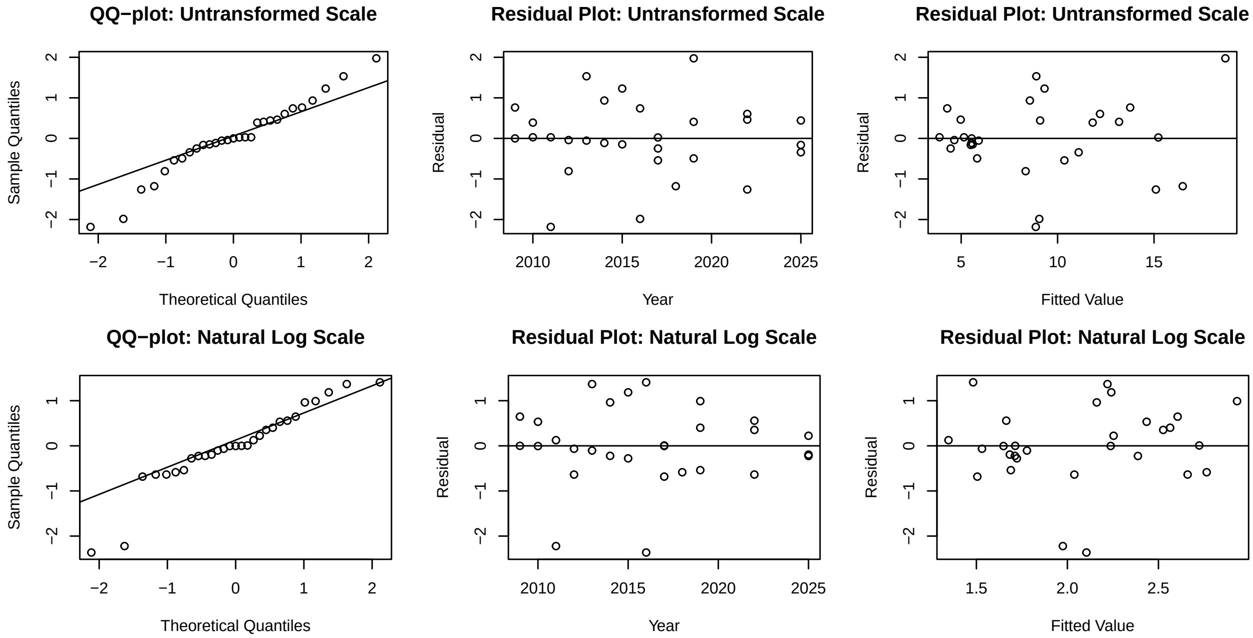
The sample sizes and median values per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL (2025)
Doris	Open-water	36	0	0	0
Patch	Open-water	18	0	0	0
Reference B	Open-water	33	0	0	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Open-Water

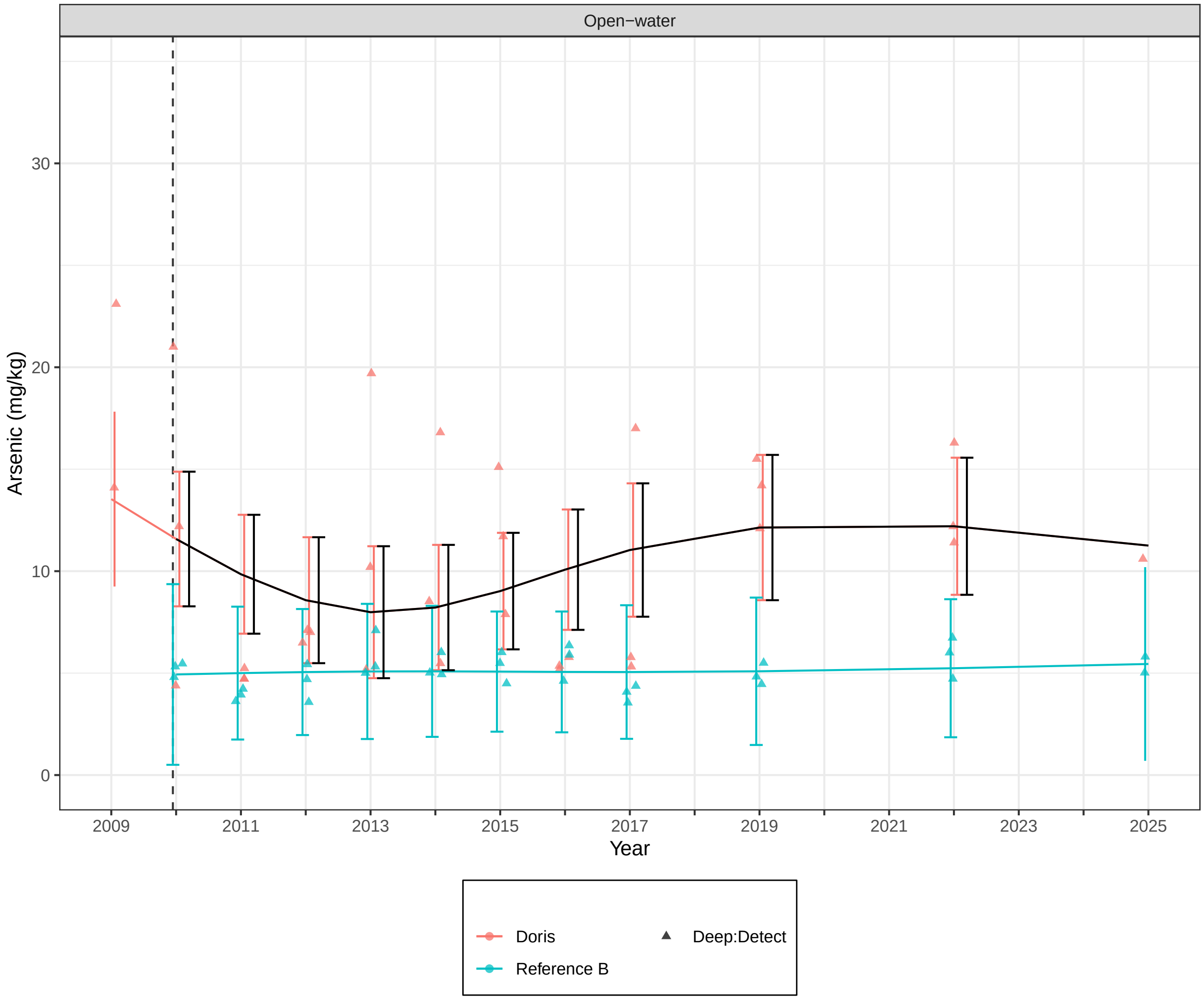
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	9.035	3	0.02880	sig.
Compare to Reference B	2.968	3	0.39650	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95%

confidence intervals of the modelled concentrations. As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

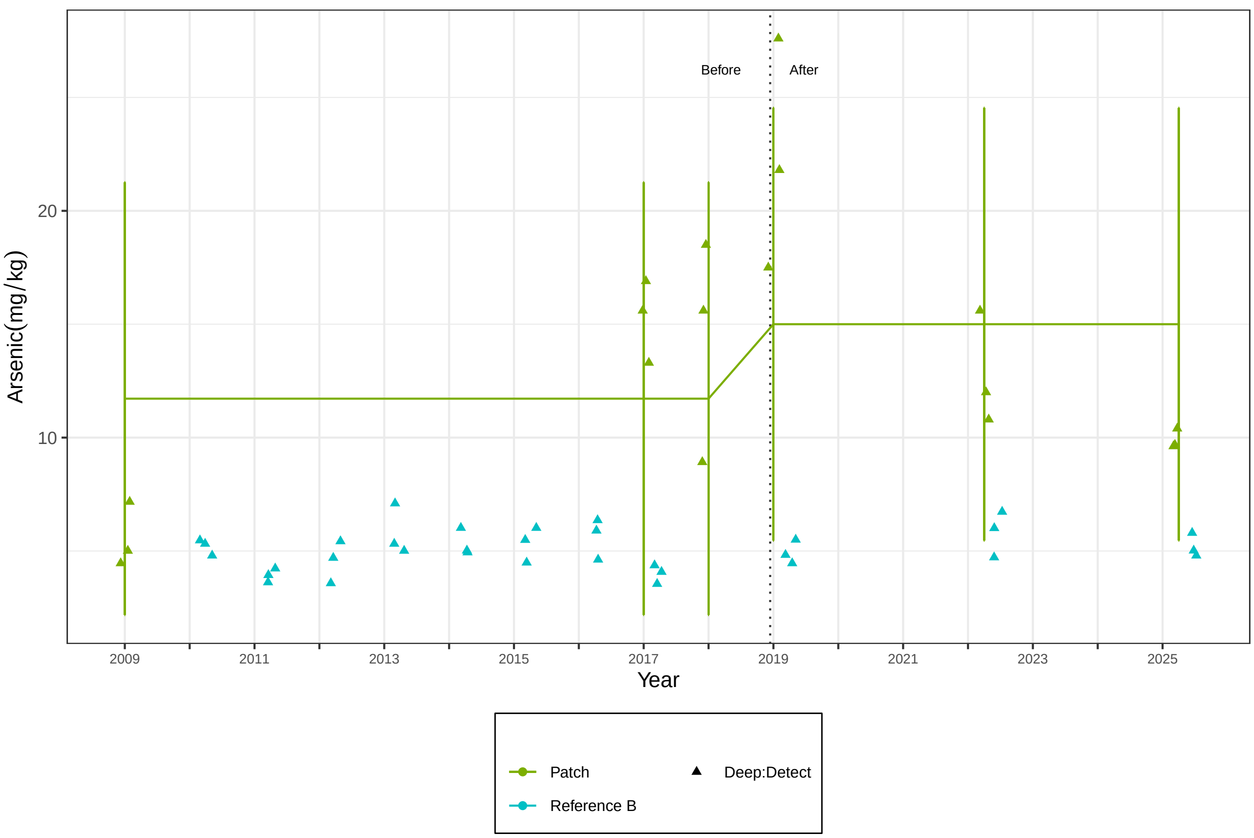
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	3.282	4.86	4	0.6754	0.5364	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

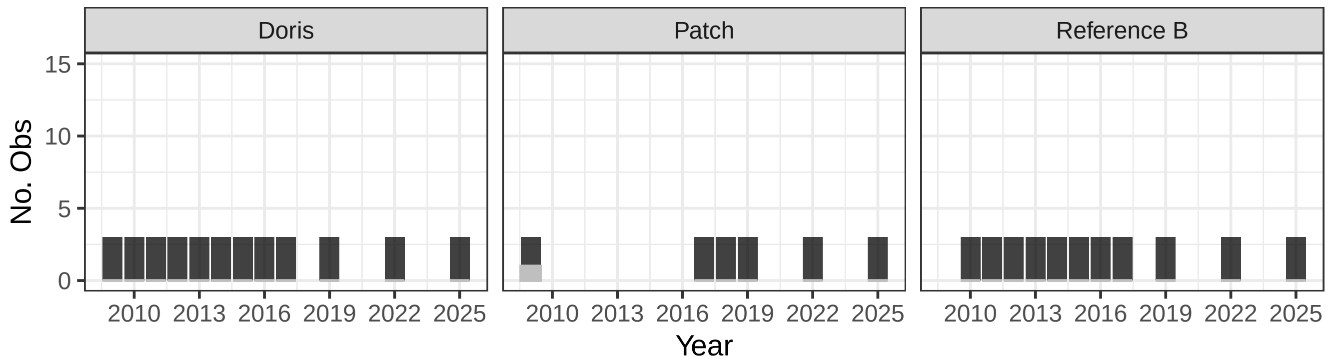
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.2.2 Cadmium

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

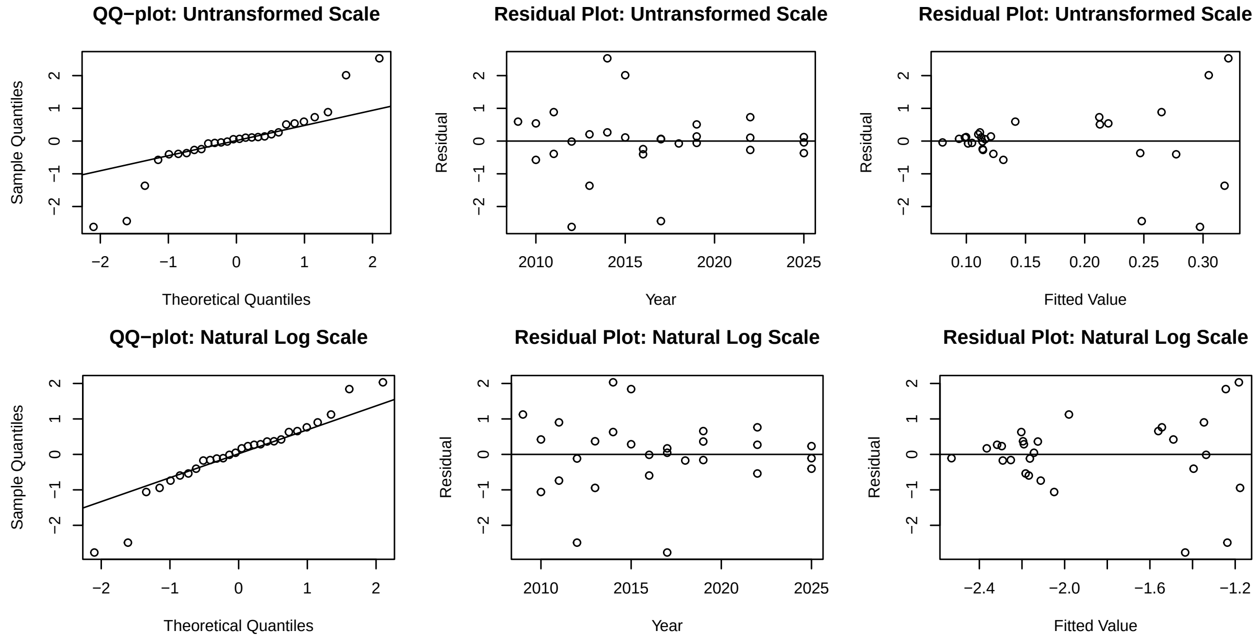
The sample sizes and median values per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL (2025)
Doris	Open-water	36	0	0	0
Patch	Open-water	18	1	6	0
Reference B	Open-water	33	0	0	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Open-Water

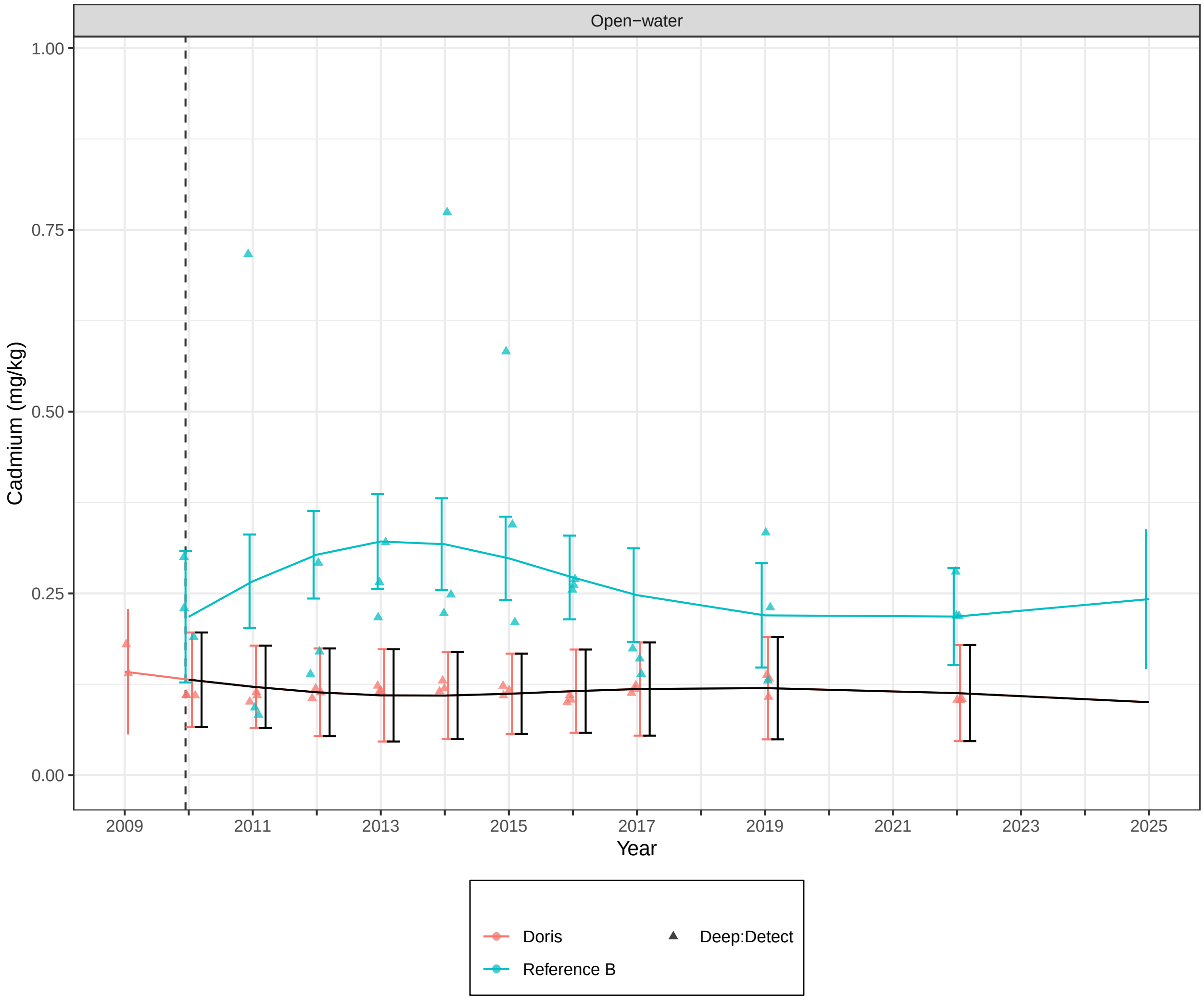
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	0.731	3	0.86580	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations. As Doris Lake exhibited significant deviation from a

slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

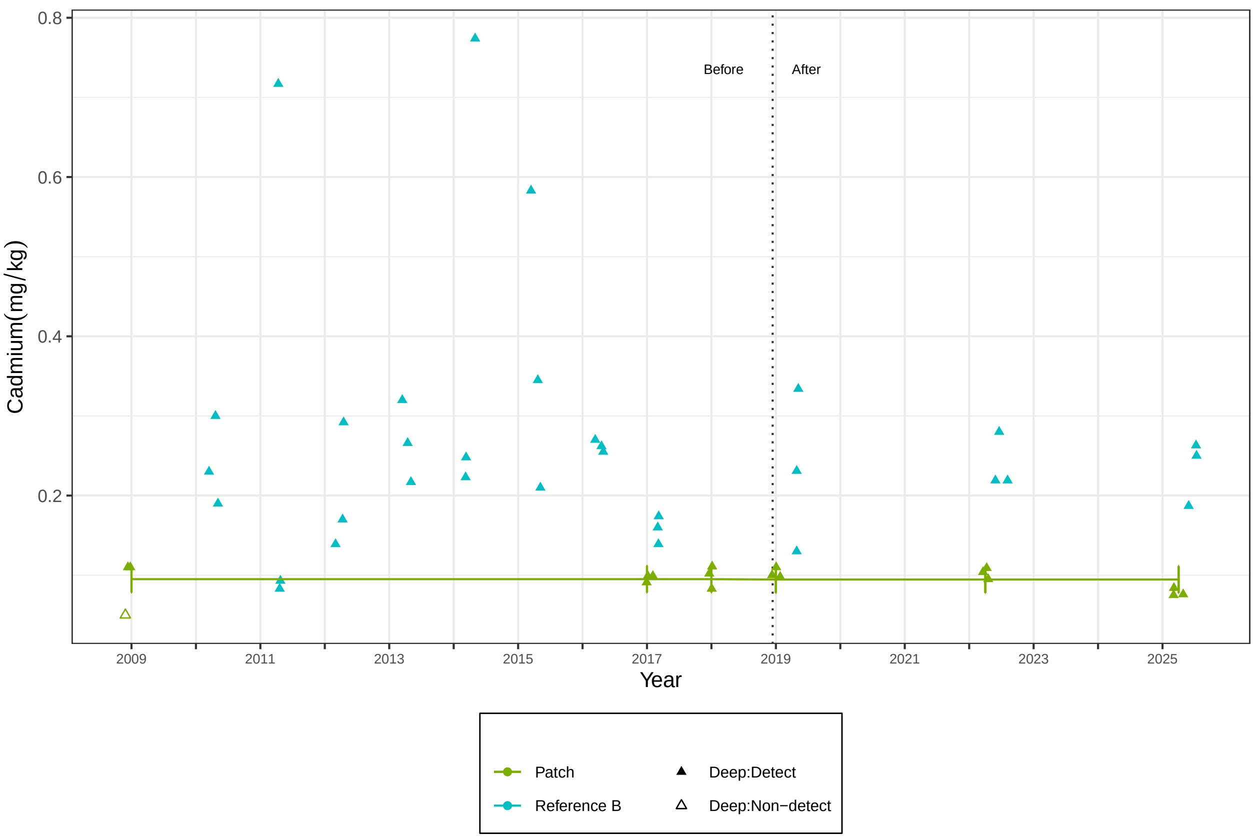
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0004	0.0085	4	-0.0522	0.9609	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

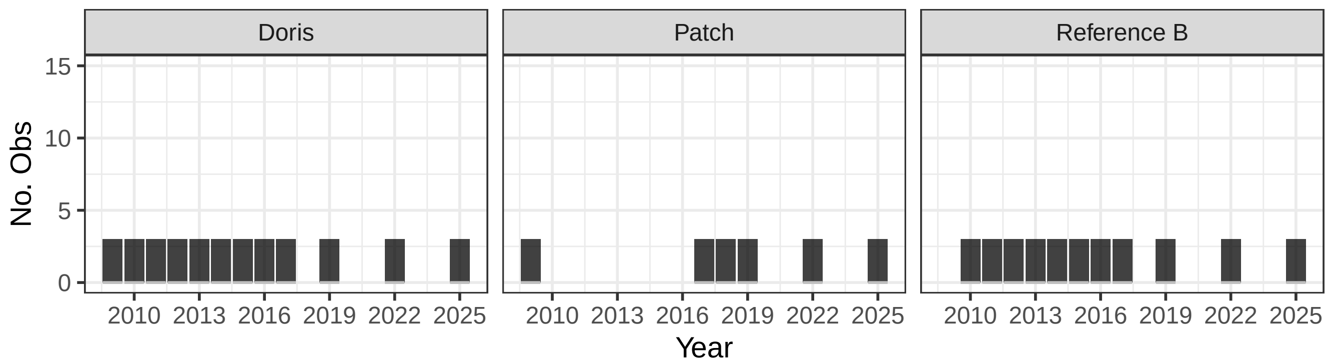
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.2.3 Chromium

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

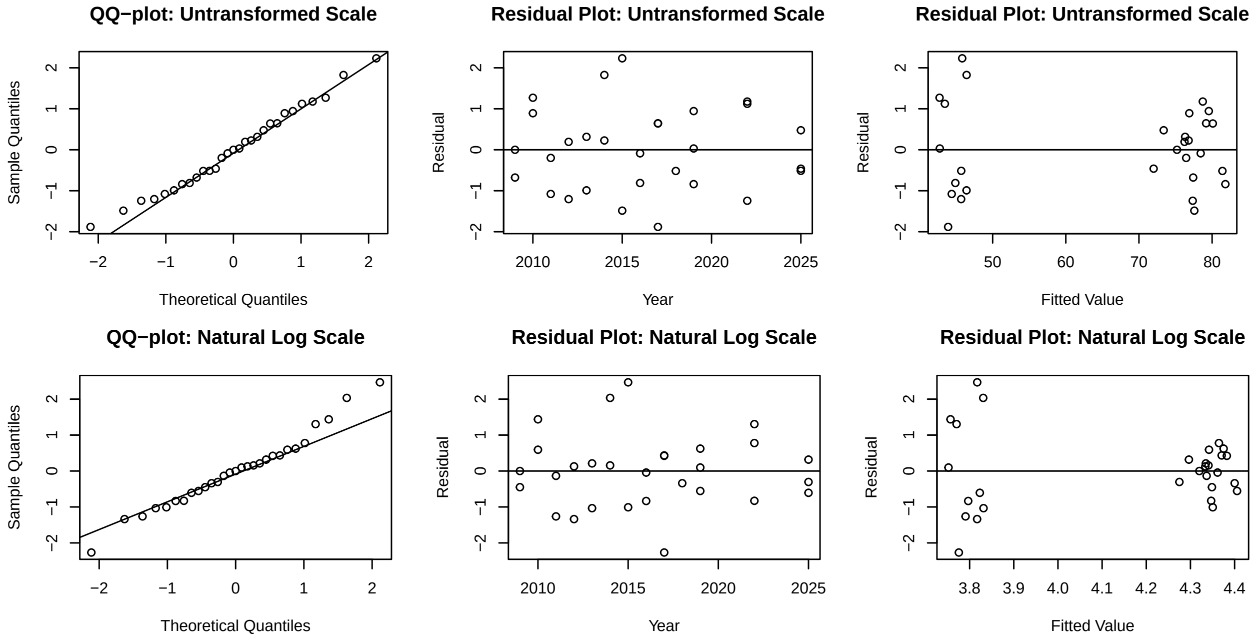
The sample sizes and median values per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL (2025)
Doris	Open-water	36	0	0	0
Patch	Open-water	18	0	0	0
Reference B	Open-water	33	0	0	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Open-Water

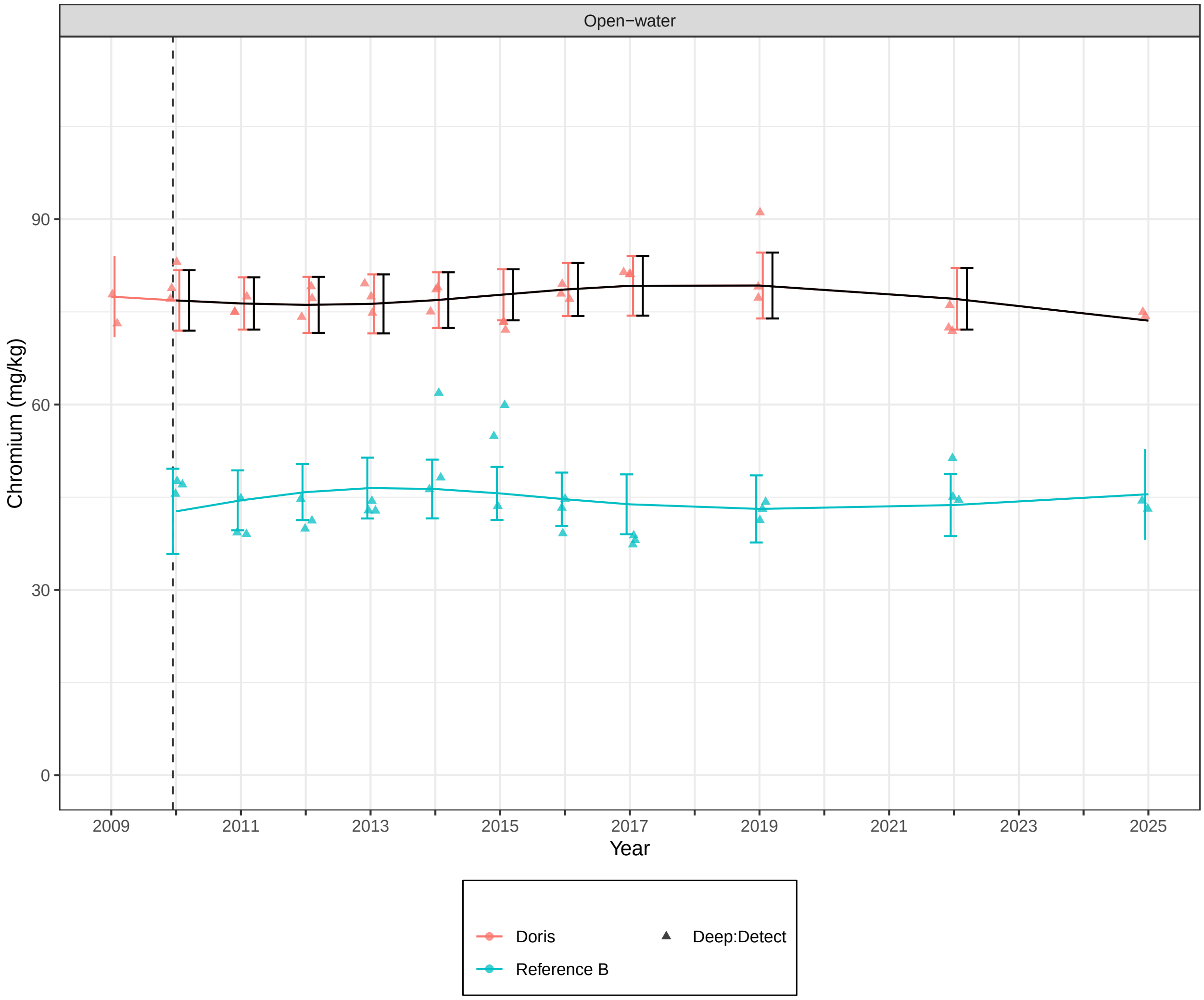
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	2.383	3	0.49680	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations. As Doris Lake exhibited significant deviation from a

slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

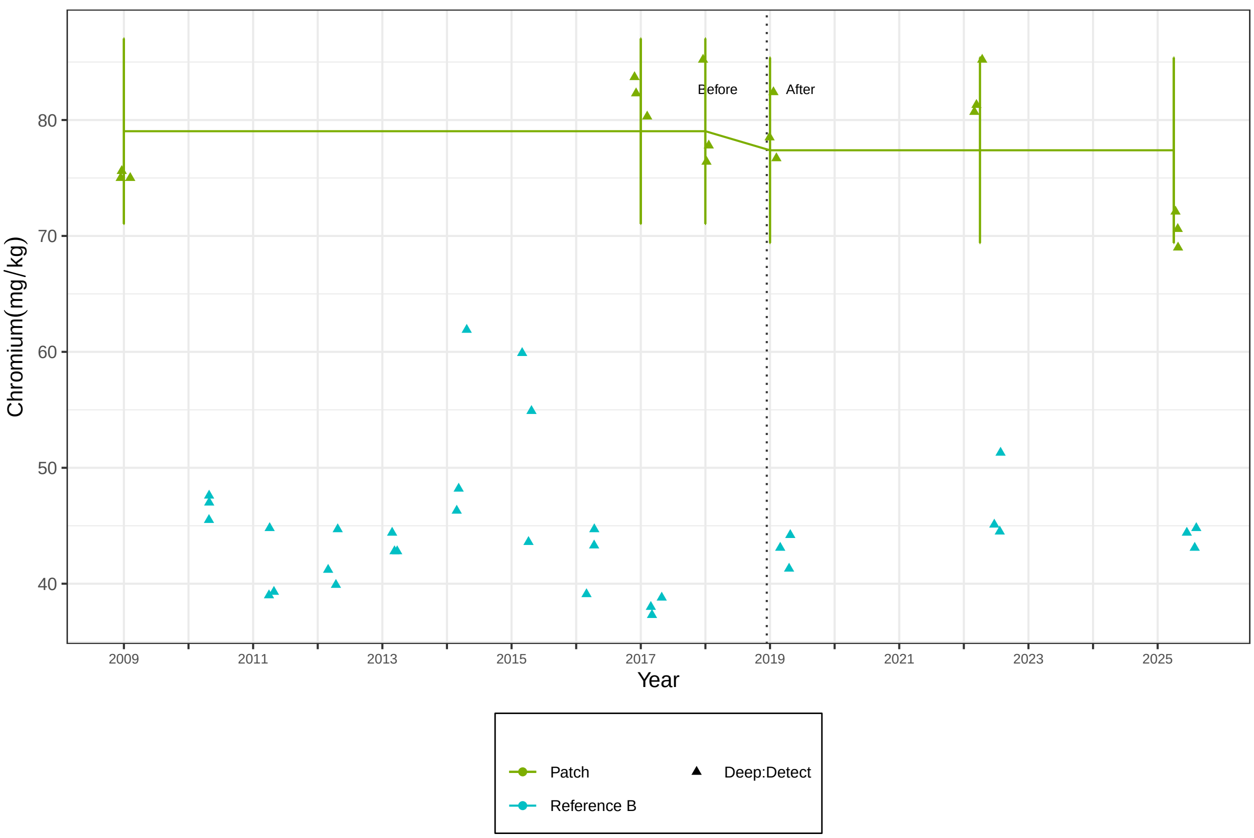
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-1.644	4.075	4	-0.4036	0.7072	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

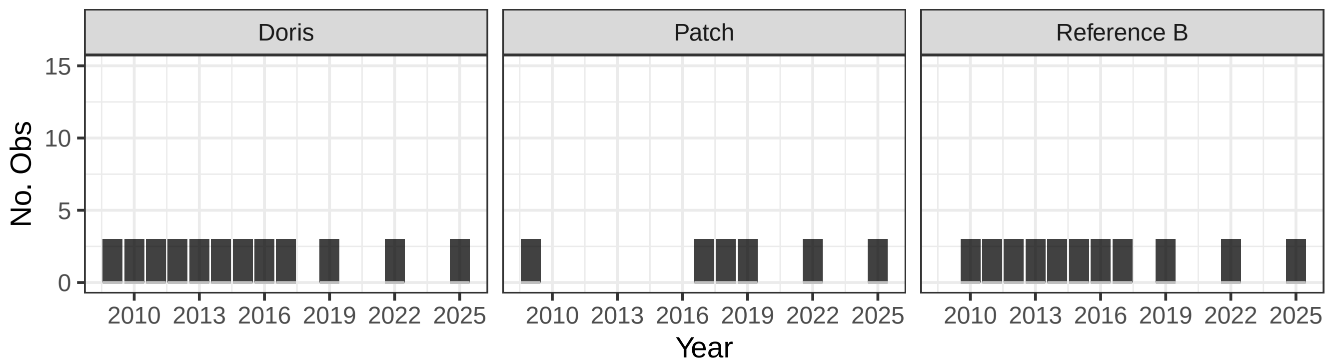
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.2.4 Copper

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

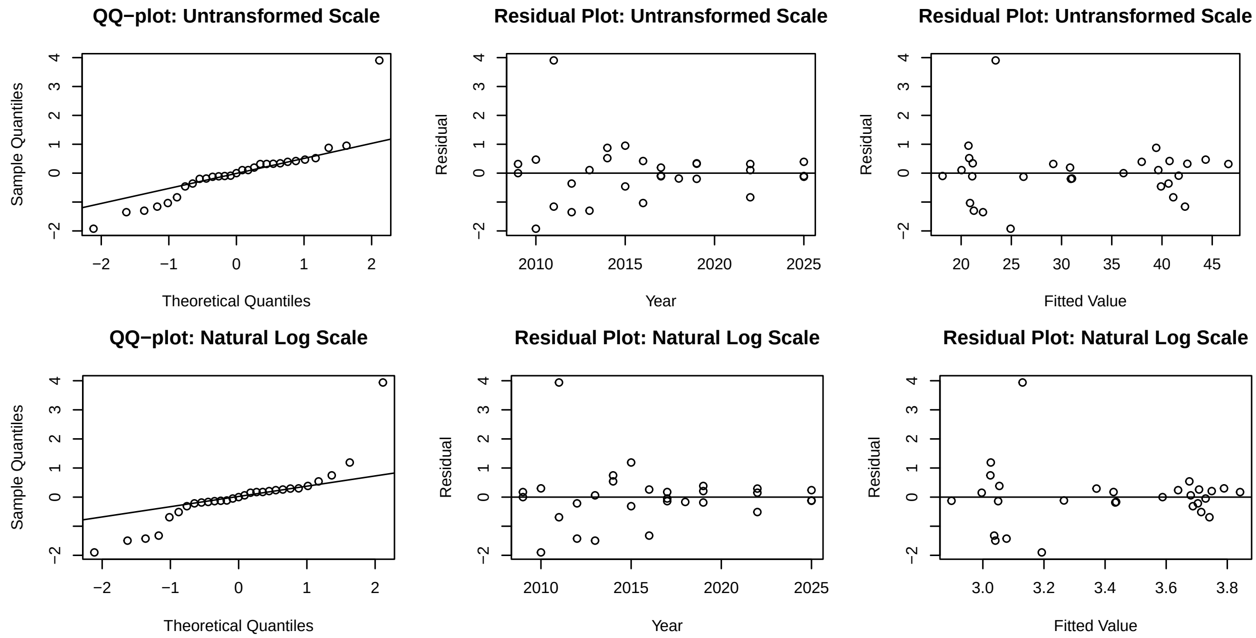
The sample sizes and median values per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL (2025)
Doris	Open-water	36	0	0	0
Patch	Open-water	18	0	0	0
Reference B	Open-water	33	0	0	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

	Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
20	Reference B	2011	Open-water	Deep	31.93	23.43	3.903

Outliers on natural log scale:

	Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
20	Reference B	2011	Open-water	Deep	31.93	3.13	3.94

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

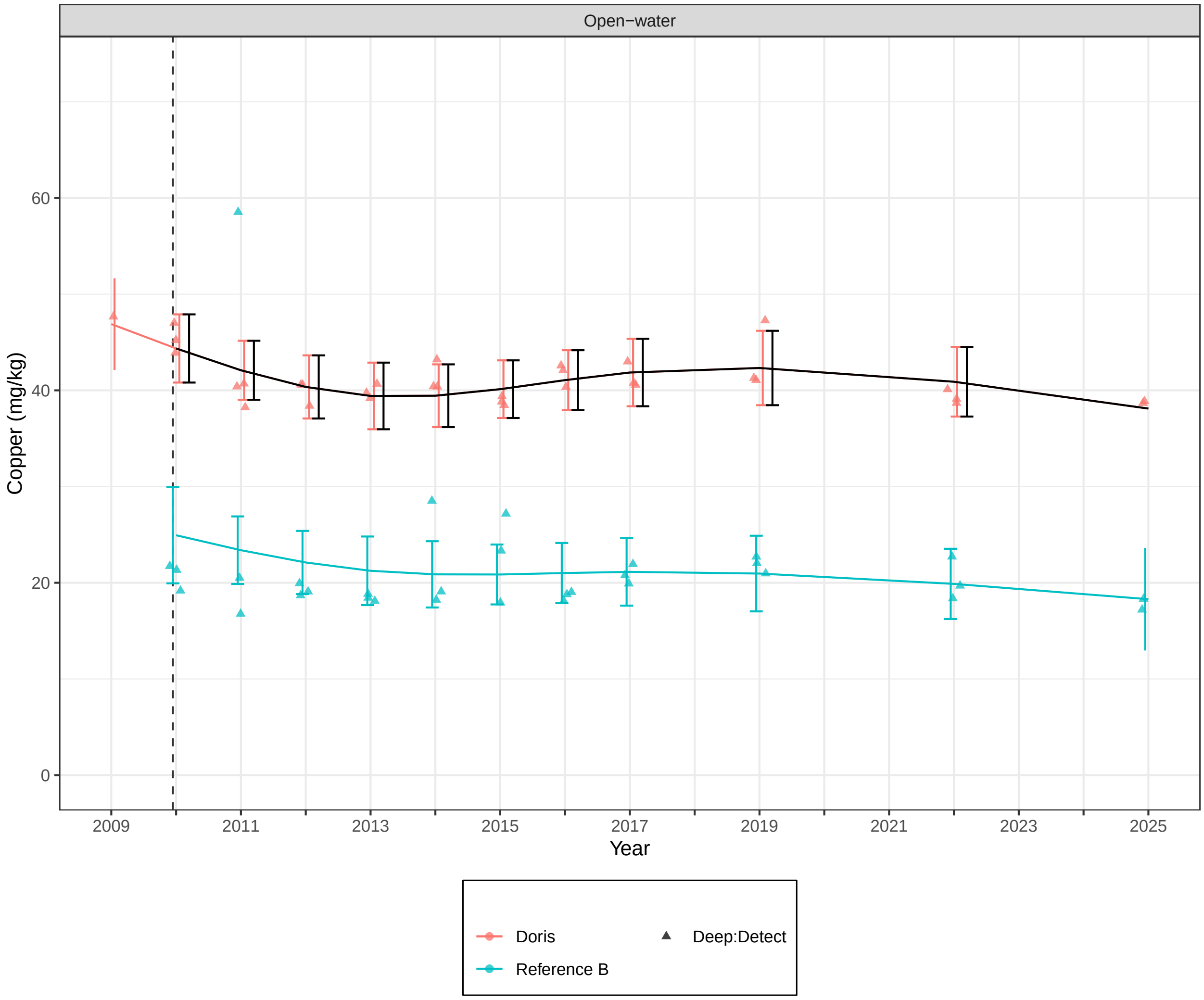
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	10.565	3	0.01430	sig.
Compare to Reference B	0.909	3	0.82330	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations. As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

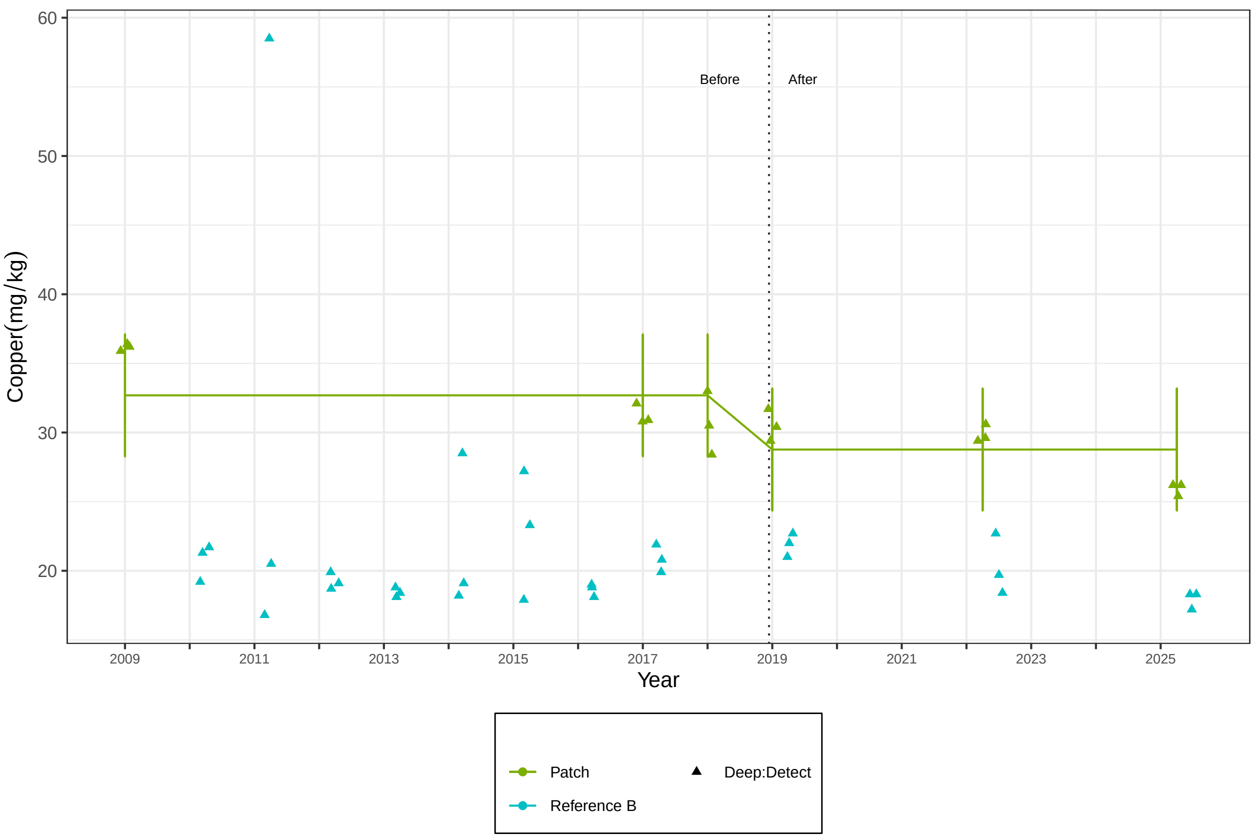
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-3.922	2.258	4	-1.737	0.1574	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

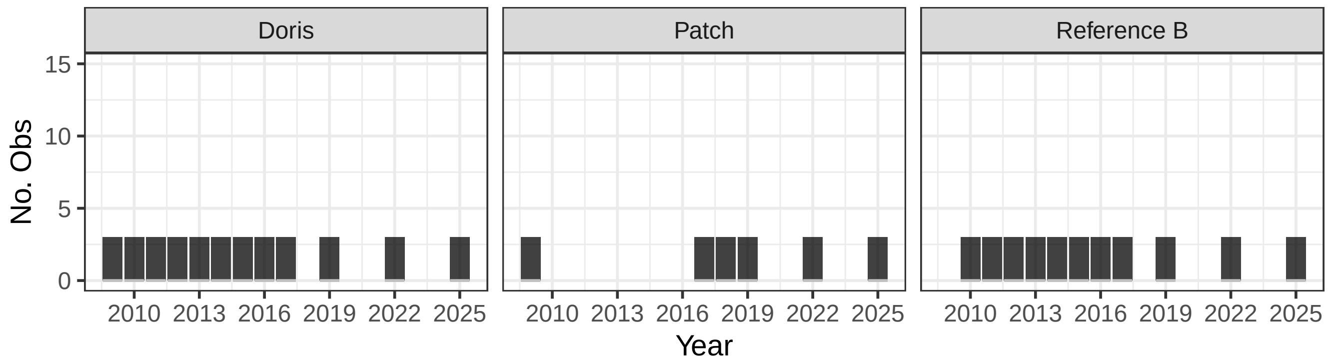
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.2.5 Lead

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

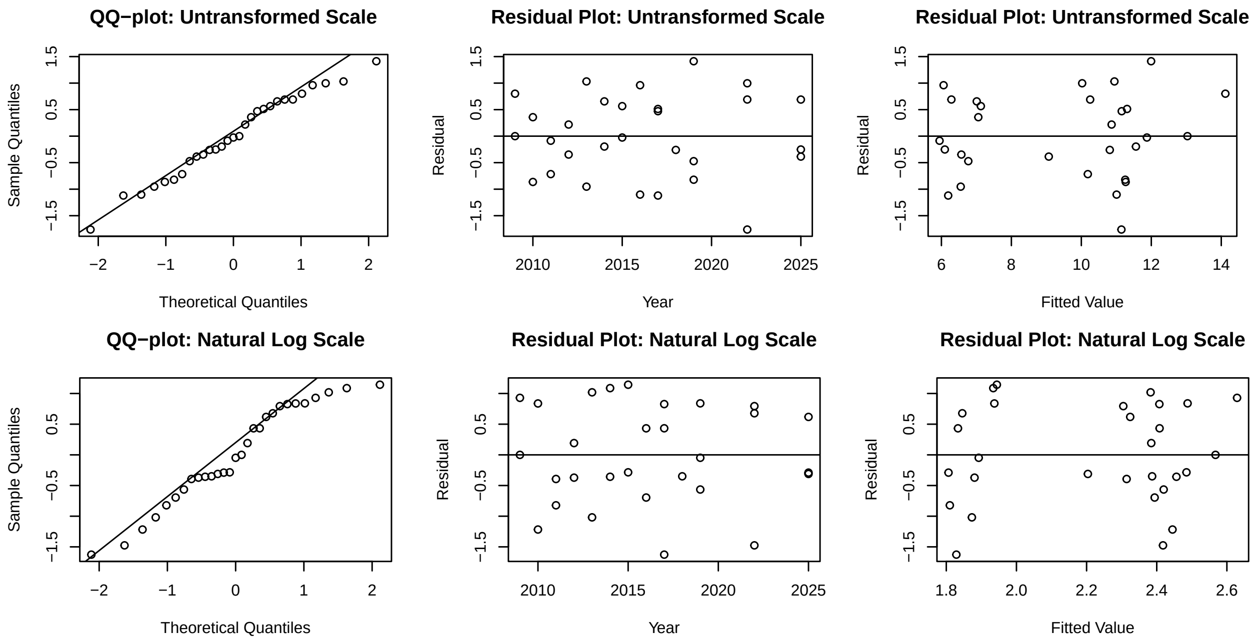
The sample sizes and median values per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL (2025)
Doris	Open-water	36	0	0	0
Patch	Open-water	18	0	0	0
Reference B	Open-water	33	0	0	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Open-Water

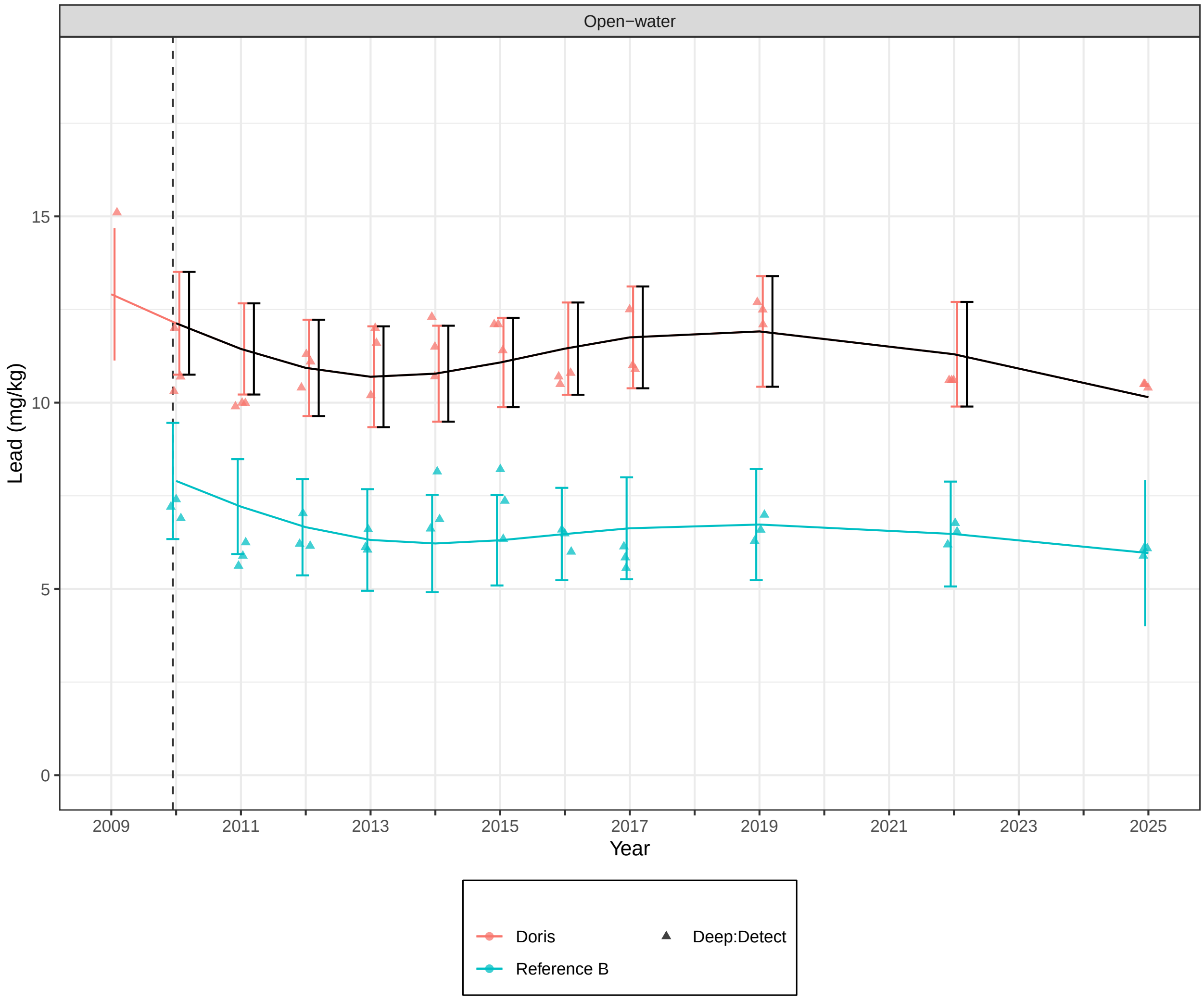
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	9.508	3	0.02330	sig.
Compare to Reference B	8.375	3	0.03890	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95%

confidence intervals of the modelled concentrations. As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

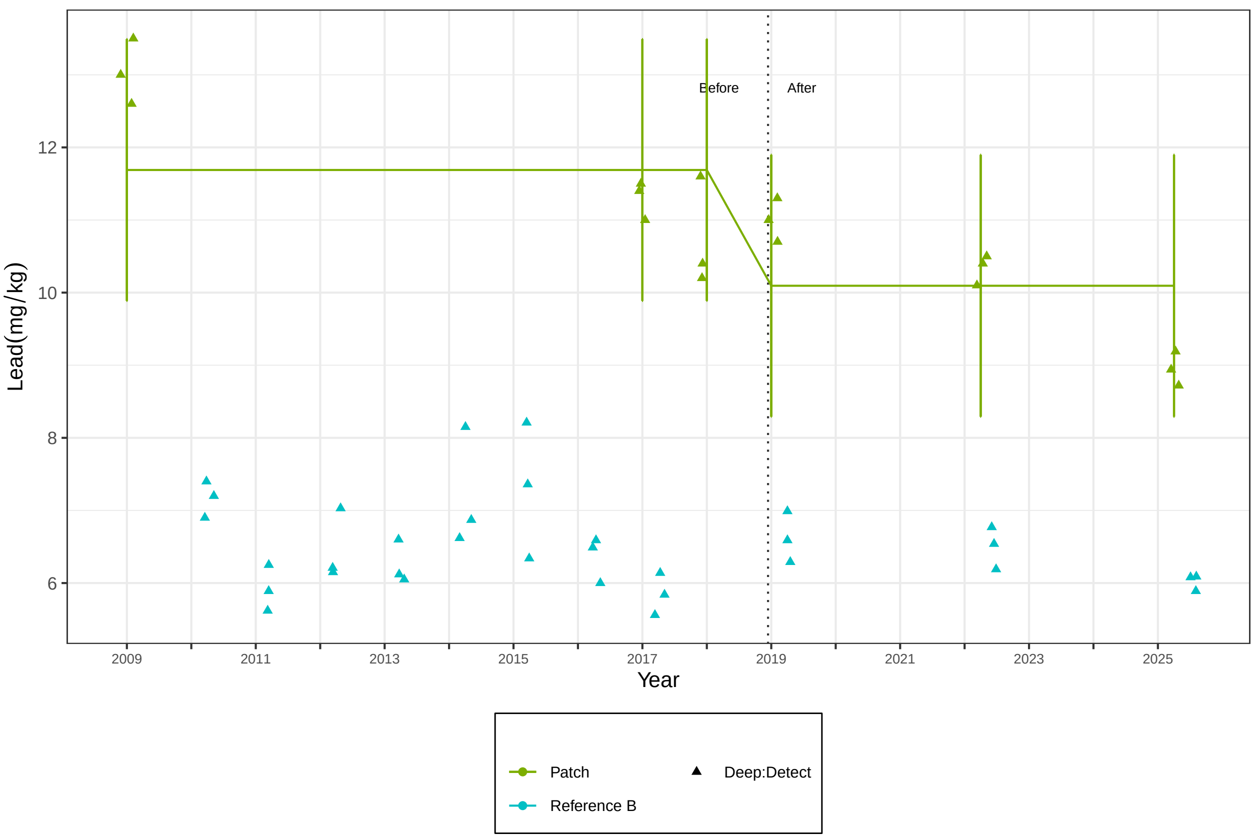
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-1.594	0.9182	4	-1.736	0.1575	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

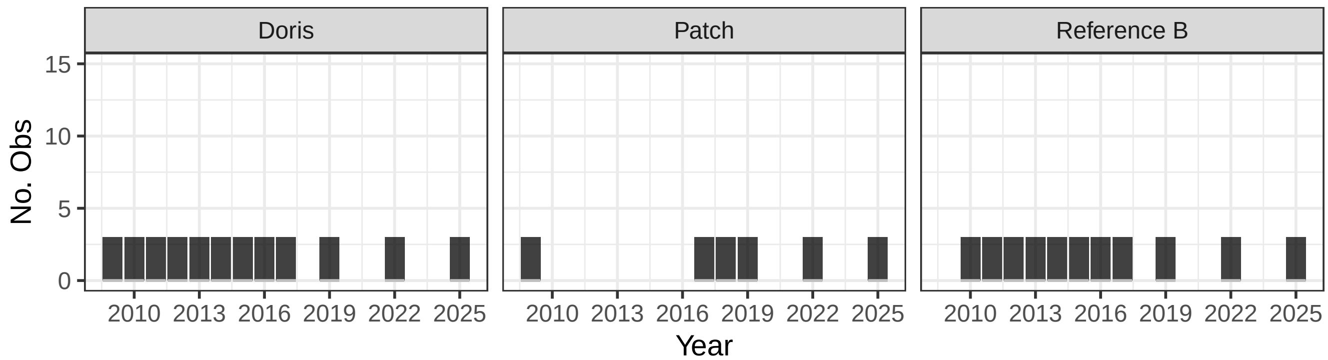
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.2.6 Mercury

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

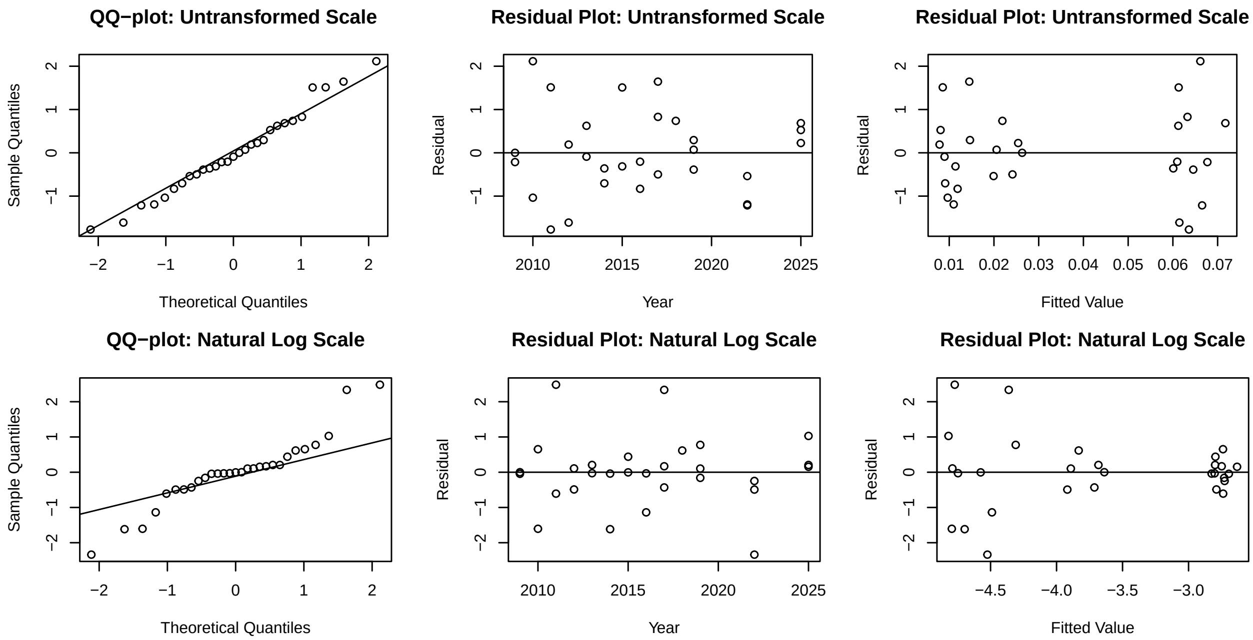
The sample sizes and median values per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL (2025)
Doris	Open-water	36	0	0	0
Patch	Open-water	18	0	0	0
Reference B	Open-water	33	0	0	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Open-Water

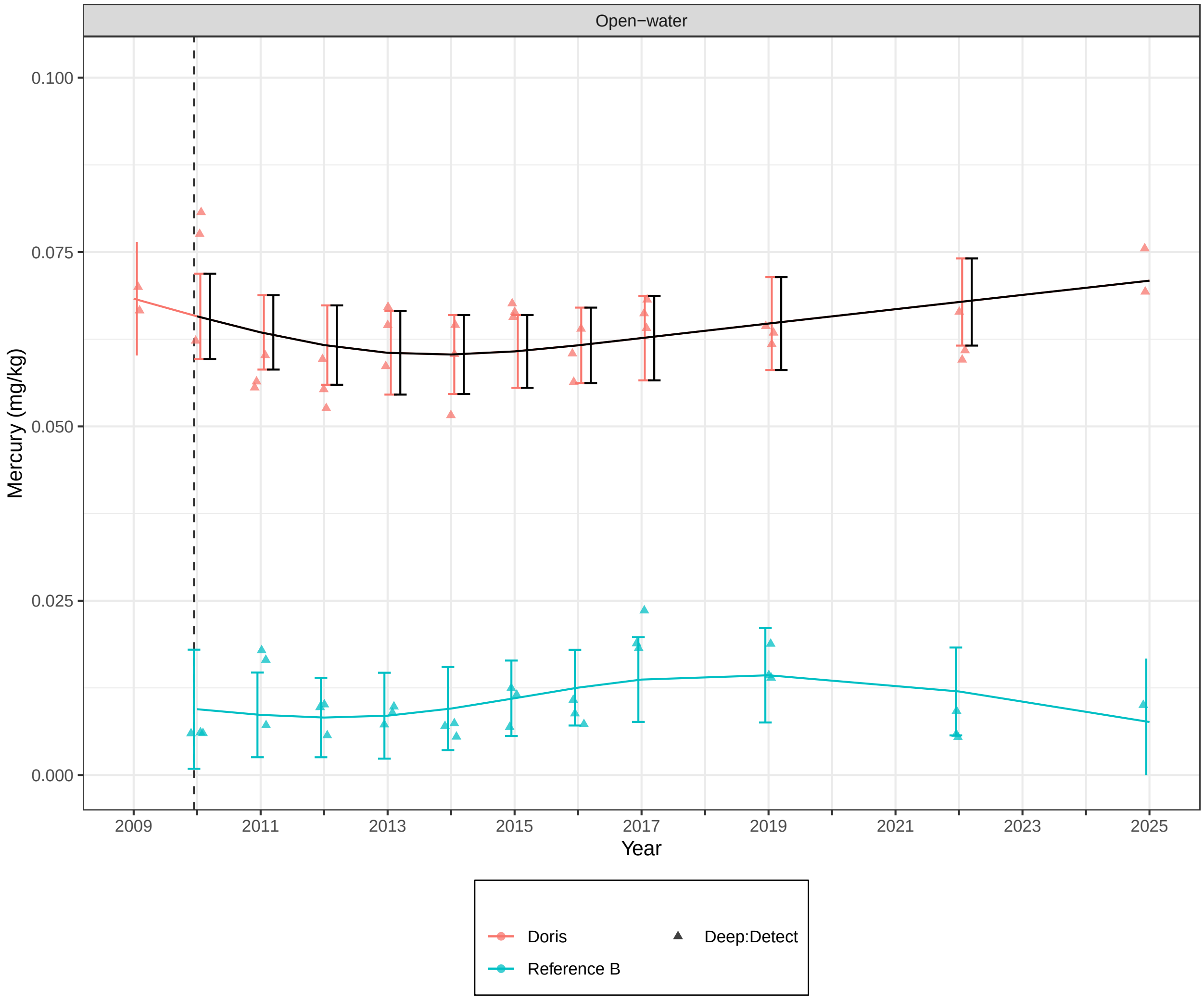
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	8.283	3	0.04050	sig.
Compare to Reference B	6.008	3	0.11120	not sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake did not exhibit significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95%

confidence intervals of the modelled concentrations. As Doris Lake exhibited significant deviation from a slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

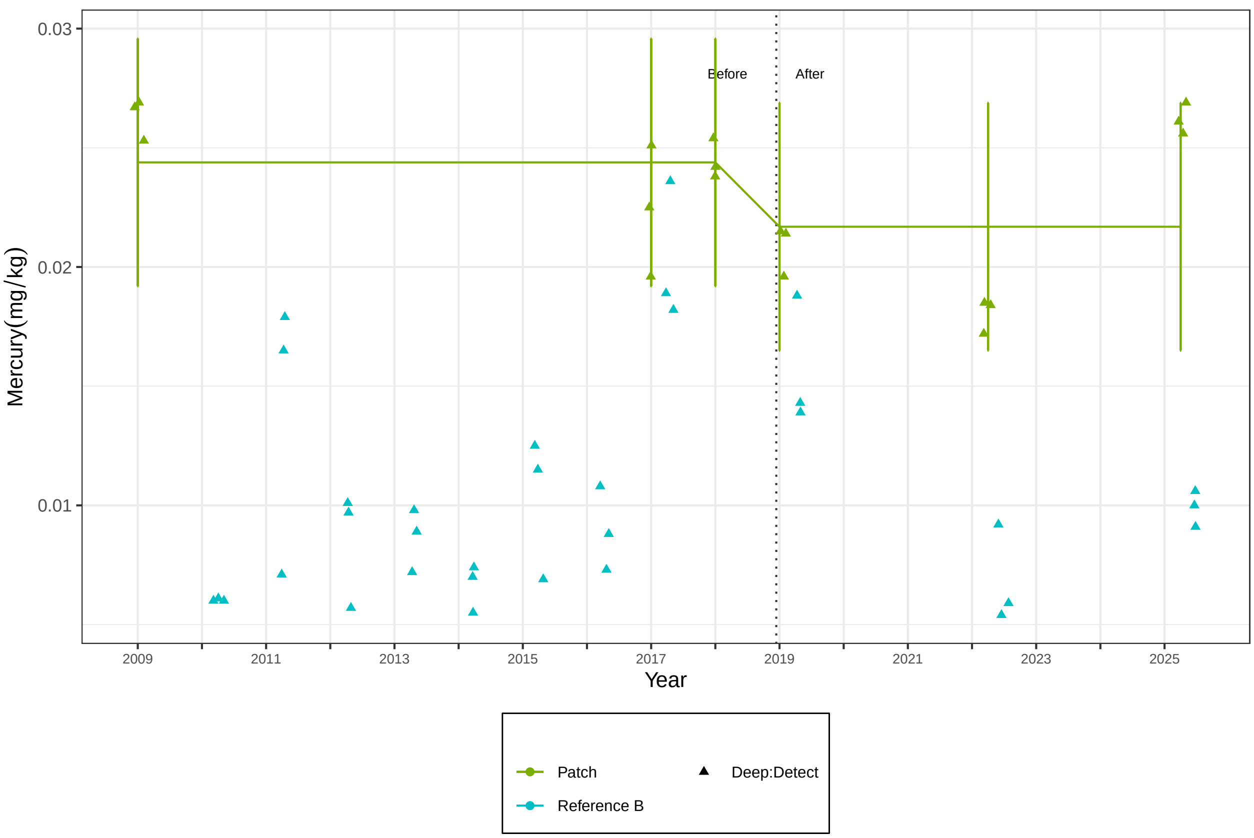
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.0027	0.0026	4	-1.02	0.3655	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

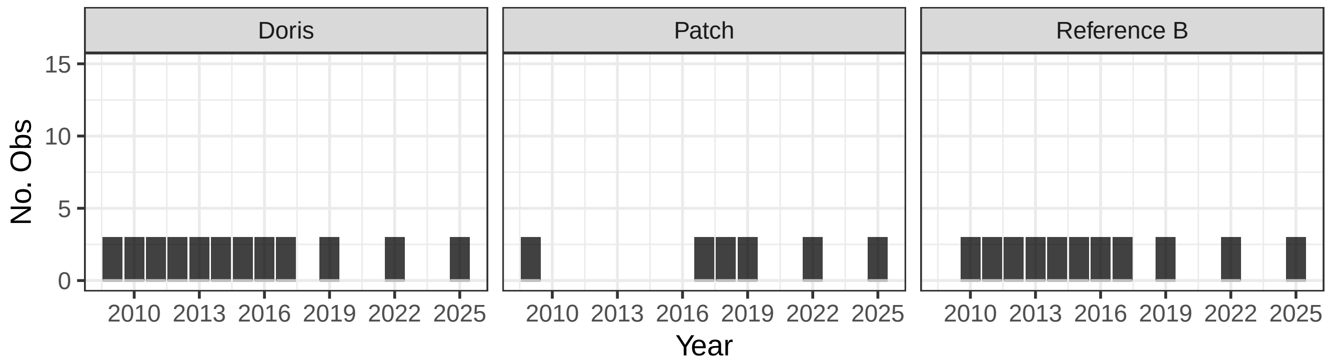
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.2.7 Zinc

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

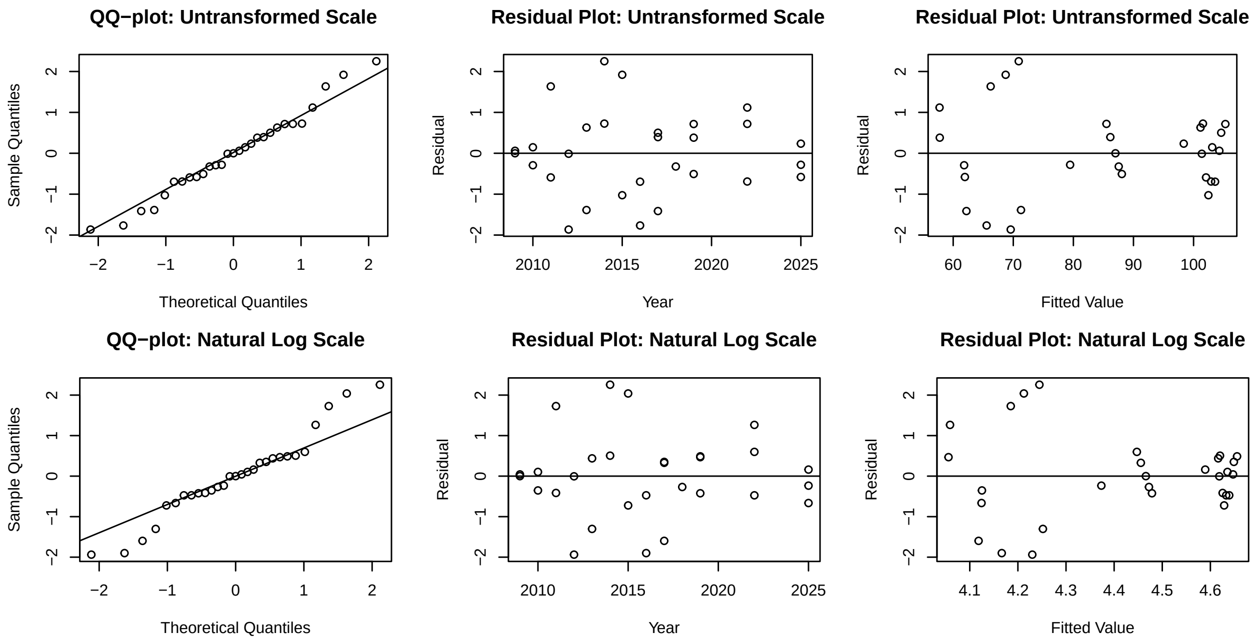
The sample sizes and median values per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL (2025)
Doris	Open-water	36	0	0	0
Patch	Open-water	18	0	0	0
Reference B	Open-water	33	0	0	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Doris Open-Water

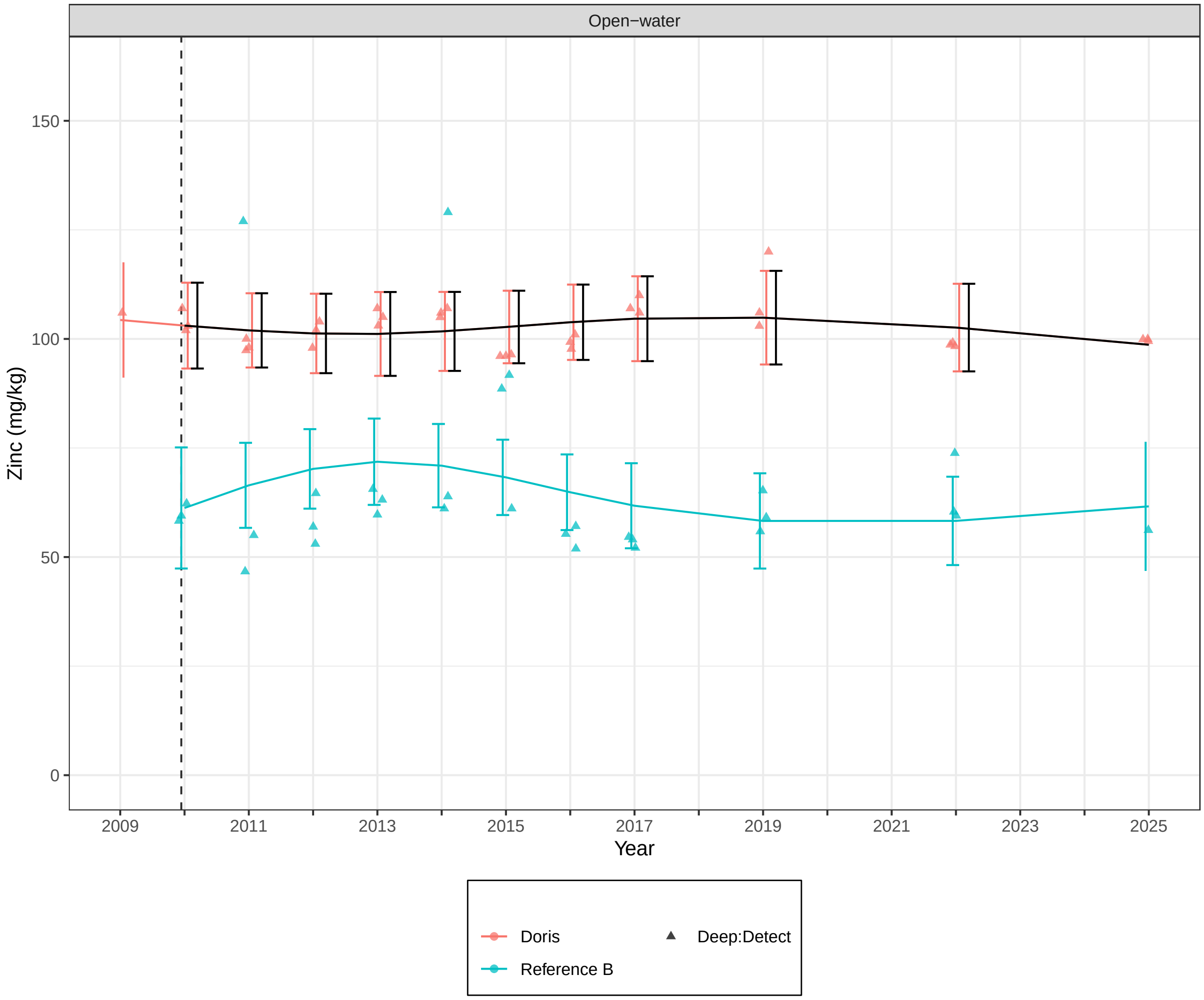
Analysis	Chi.sq	df	p	Significance
Compare to slope zero	0.766	3	0.85760	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations. As Doris Lake exhibited significant deviation from a

slope of zero in at least one season, the black lines and error bars represent the model built with Doris Lake data from comparable sampling years with Reference Lake B only.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

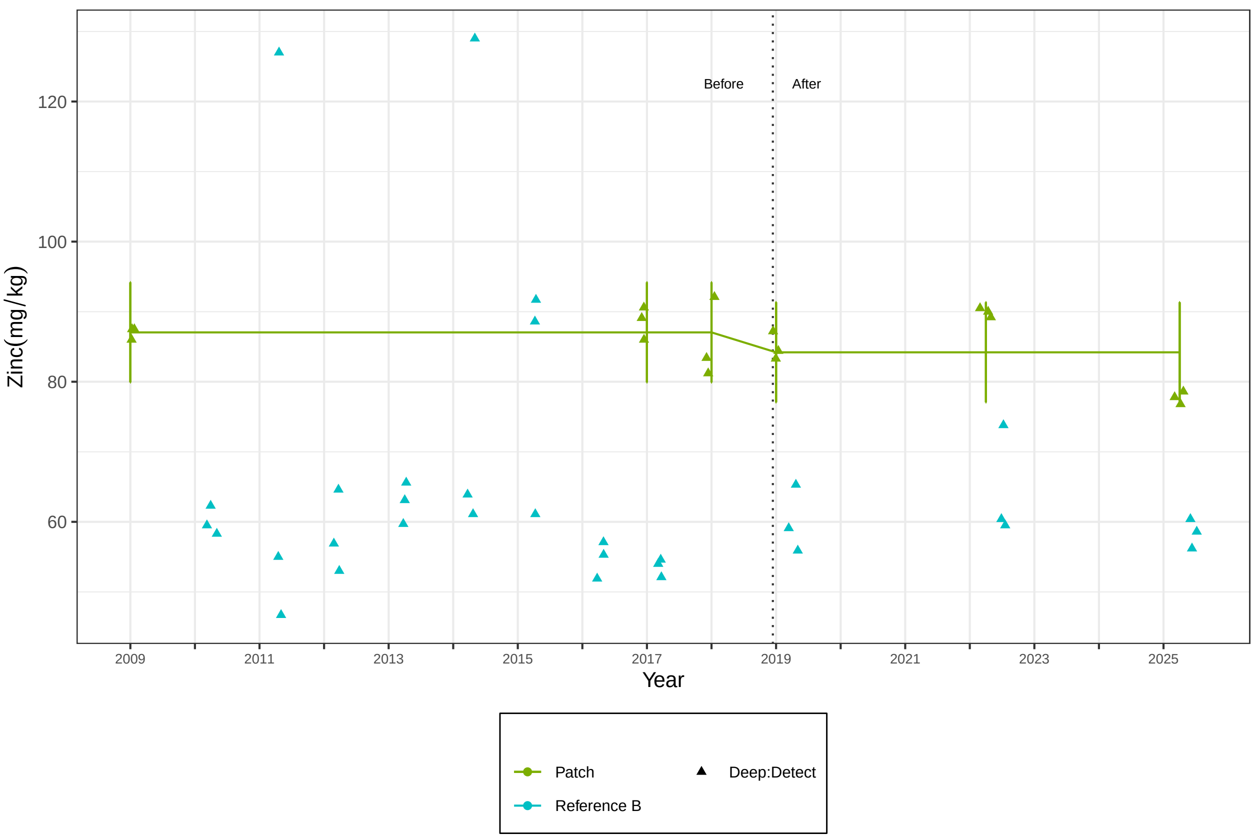
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-2.844	3.638	4	-0.7819	0.478	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.

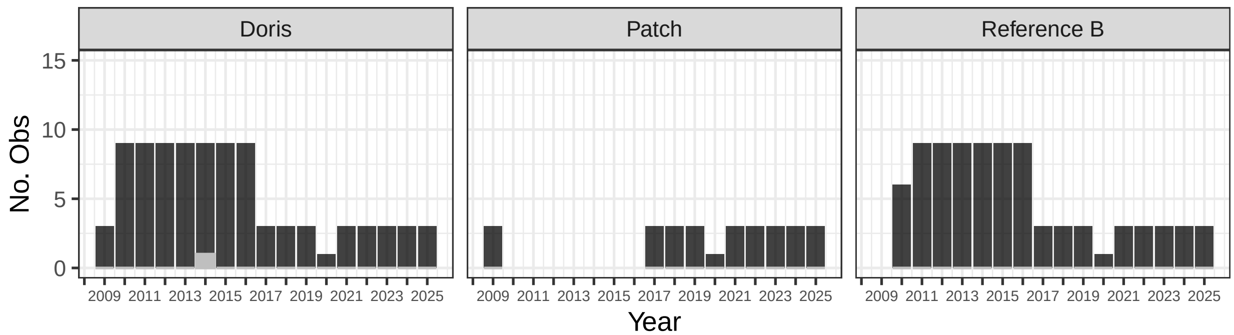


C.3.3 Phytoplankton

C.3.3.1 Phytoplankton Biomass

Censored Values and Sample Sizes

The following plots indicate the number of measurements taken in each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations at or below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e., 2025) were censored.

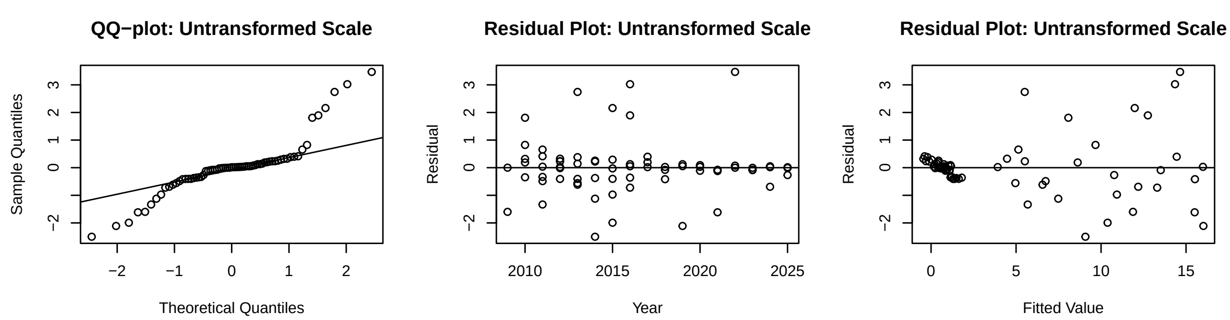
The sample sizes and median values per lake are summarized in the table below.

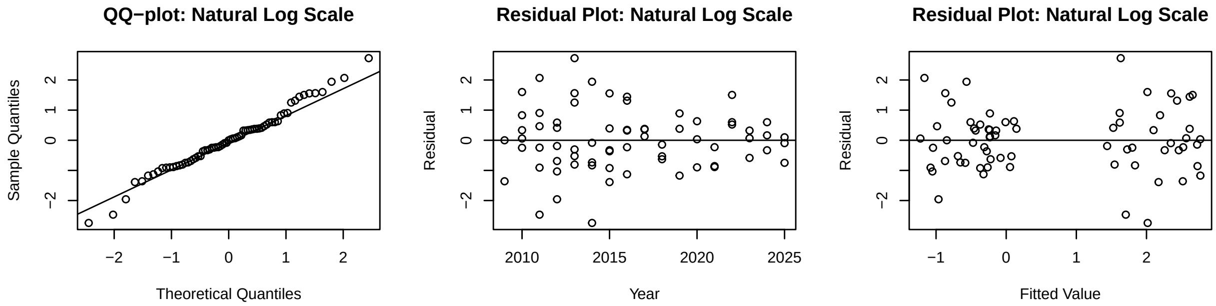
Lake	Season	# Obs (total)	# < DL (total)	% < DL (total)	% < DL (2025)
Doris	Open-water	91	1	0.01	0
Patch	Open-water	28	0	0.00	0
Reference B	Open-water	85	0	0.00	0

None of the lakes exhibited greater than 10% of data less than the detection limit. The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the model fit as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.





Outliers on untransformed scale:

Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
Doris	2016	Open-water	Deep	21.46667	14.35099	3.023256
Doris	2022	Open-water	Deep	22.81111	14.64787	3.468336

Outliers on natural log scale:

None

The natural log data better meets the residual assumptions. Analysis proceeds with natural log data.

Doris Lake

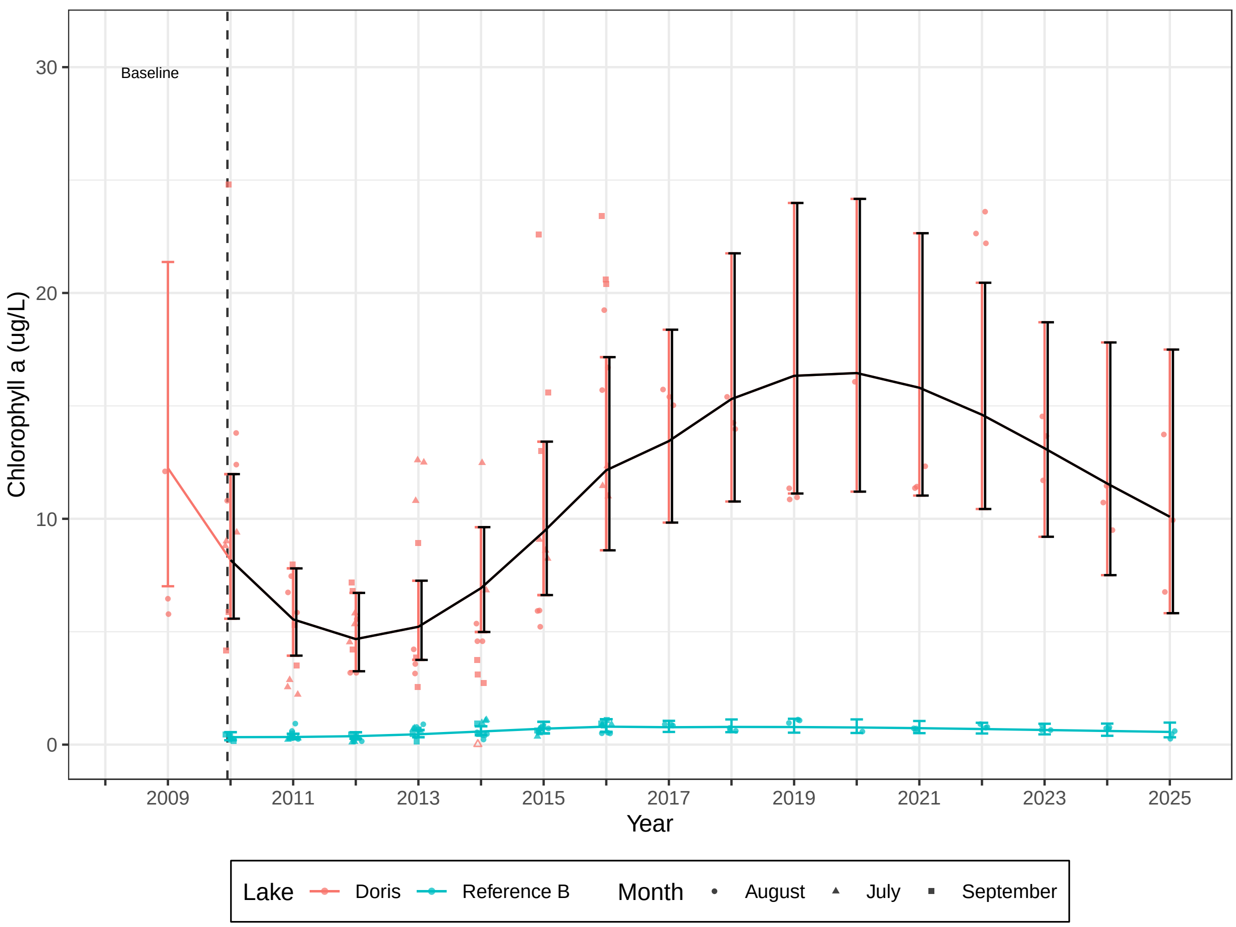
The trend of Doris Lake was compared to a slope of 0. If there is a significant trend, then the trend of Doris Lake is compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

Analysis	Chi.sq	df	p	Significance
Compare to slope 0	48.462	4	<0.00001	sig.
Compare to Reference B	12.840	4	0.01210	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B

Observed Data and Fitted Values

Symbols represent the observed data values. Observations under detection limit are shown by hollow symbols and plotted at half the detection limit. Solid lines represent the fitted curves and the error bars indicate the upper and lower 95% confidence intervals.



Patch Lake

Before-after analyses were first performed to compare the change in concentrations in the before and after period in the monitoried site. If a change has been detected then before-after-control-impact linear modeling was applied to compare the change in concentrations before and after baseline years between Reference B and Patch lakes.

Before-vs-After Analysis

Coefficient	Estimate	Std. Error	t value	p	Significance
periodafter	-0.0117	0.2226	-0.0526	0.9594	not sig.

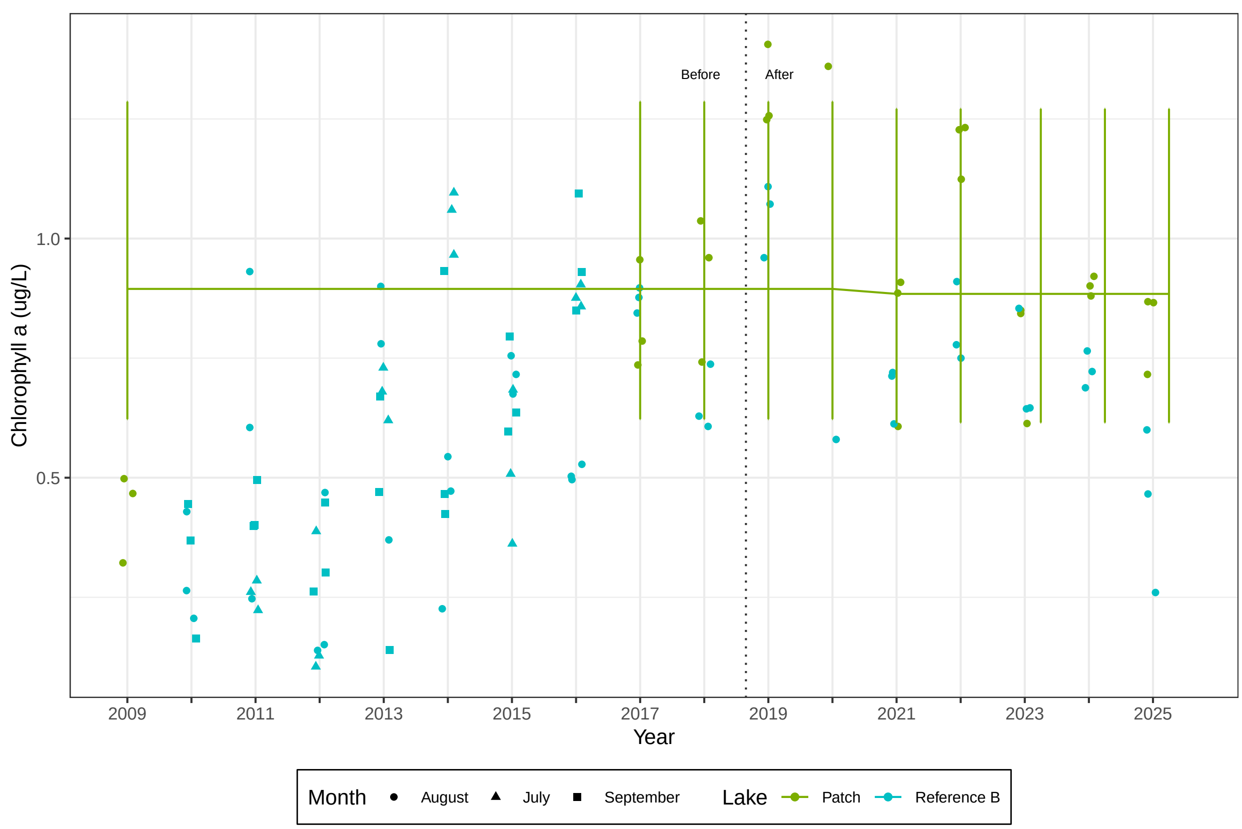
Conclusion:

The change at Patch North Lake from before to after was not significantly different.

BACI analysis not performed.

Observed data and fitted values

Below are plots of the observed and fitted data. The symbols represent the observed data values. Solid lines represent the fitted means and error bars indicate the upper and lower 95% confidence intervals.



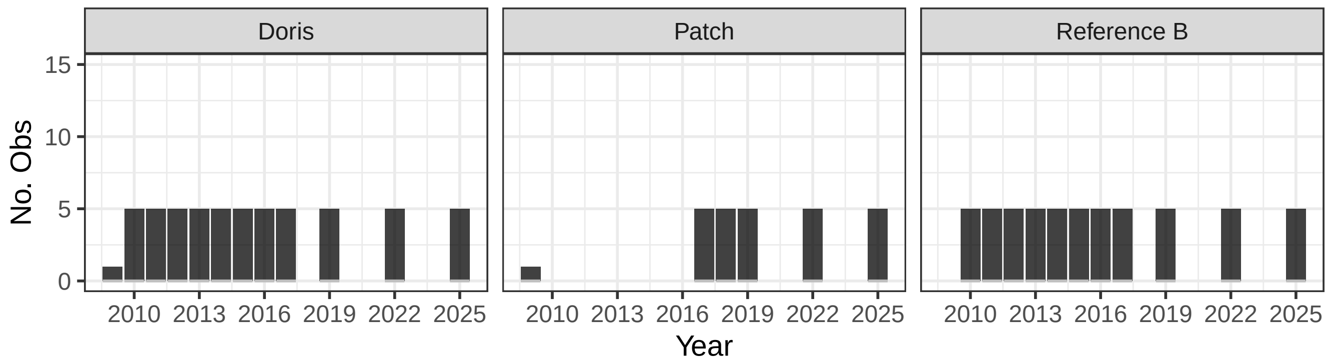
C.3 Statistical Results for Evaluation of Effects

C.3.4 Benthic Invertebrates

C.3.4.1 Benthos Density

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e.,) were censored.

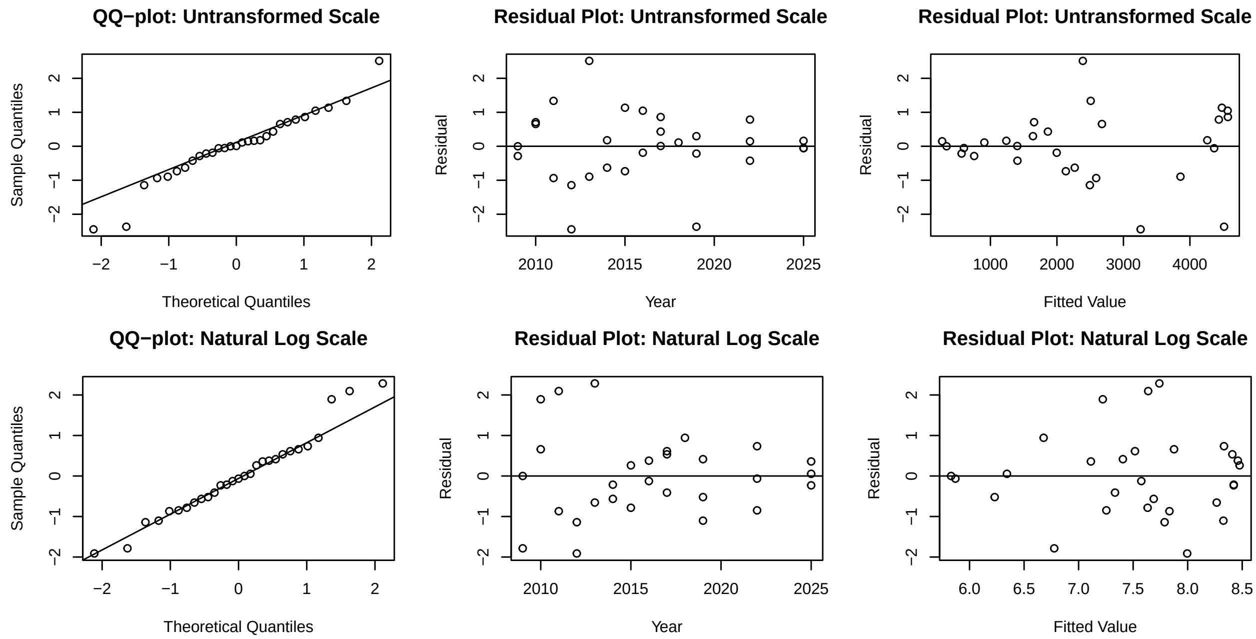
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL ()
Doris	Open-water	56	0	0	0
Patch	Open-water	26	0	0	0
Reference B	Open-water	55	0	0	0

The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

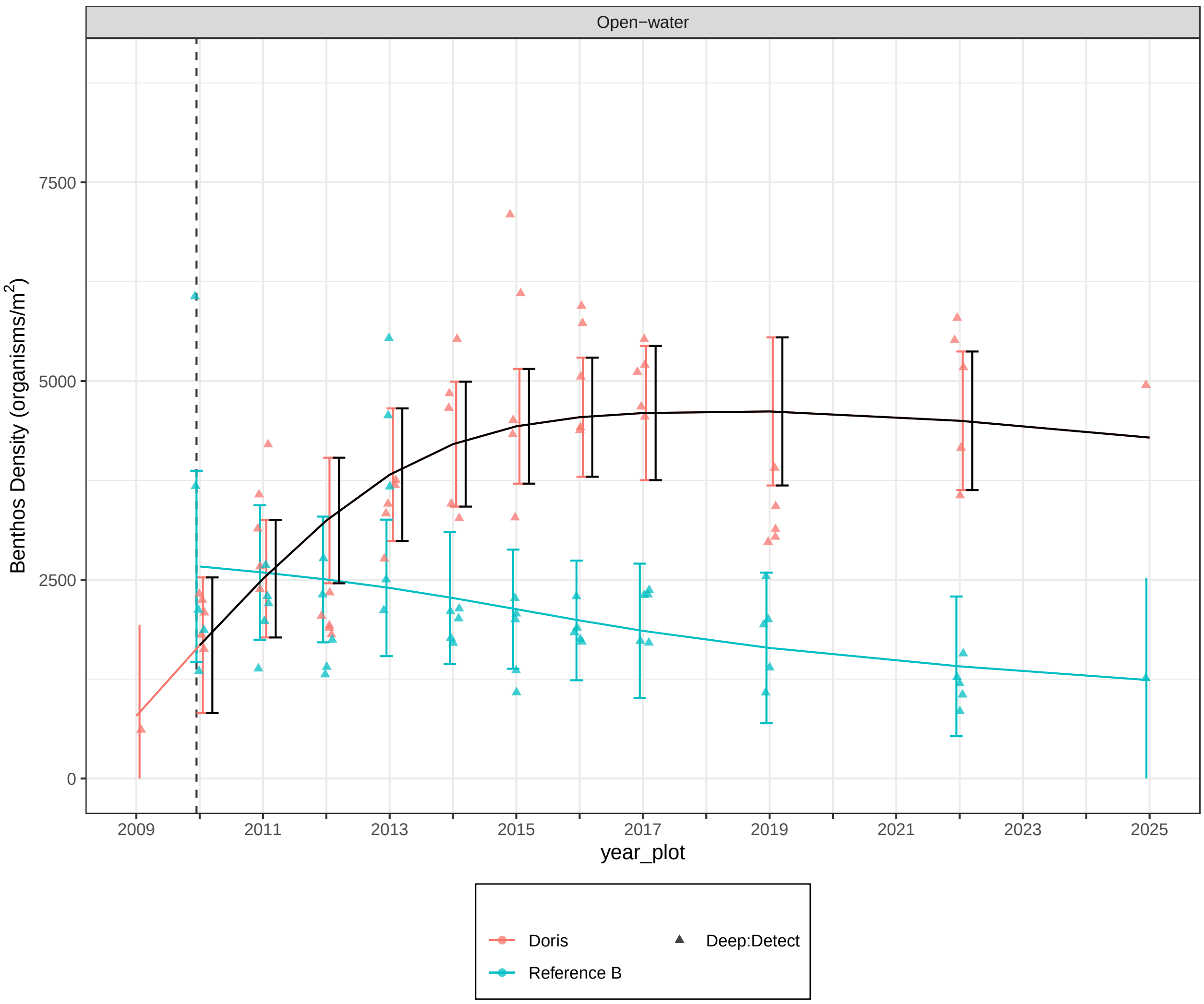
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	53.492	3	<0.00001	sig.
Compare to Reference B	25.321	3	<0.00001	sig.

Doris Lake exhibited significant deviation from a slope of zero. Doris Lake exhibited significant deviation from the trend of Reference Lake B.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.


Open−water
Benthos Density (organisms/m2)
7500
5000
2500
0
2009
2011
2013
2015
2017
2019
2021
2023
2025
year_plot
Doris
Reference B
Deep:Detect

Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

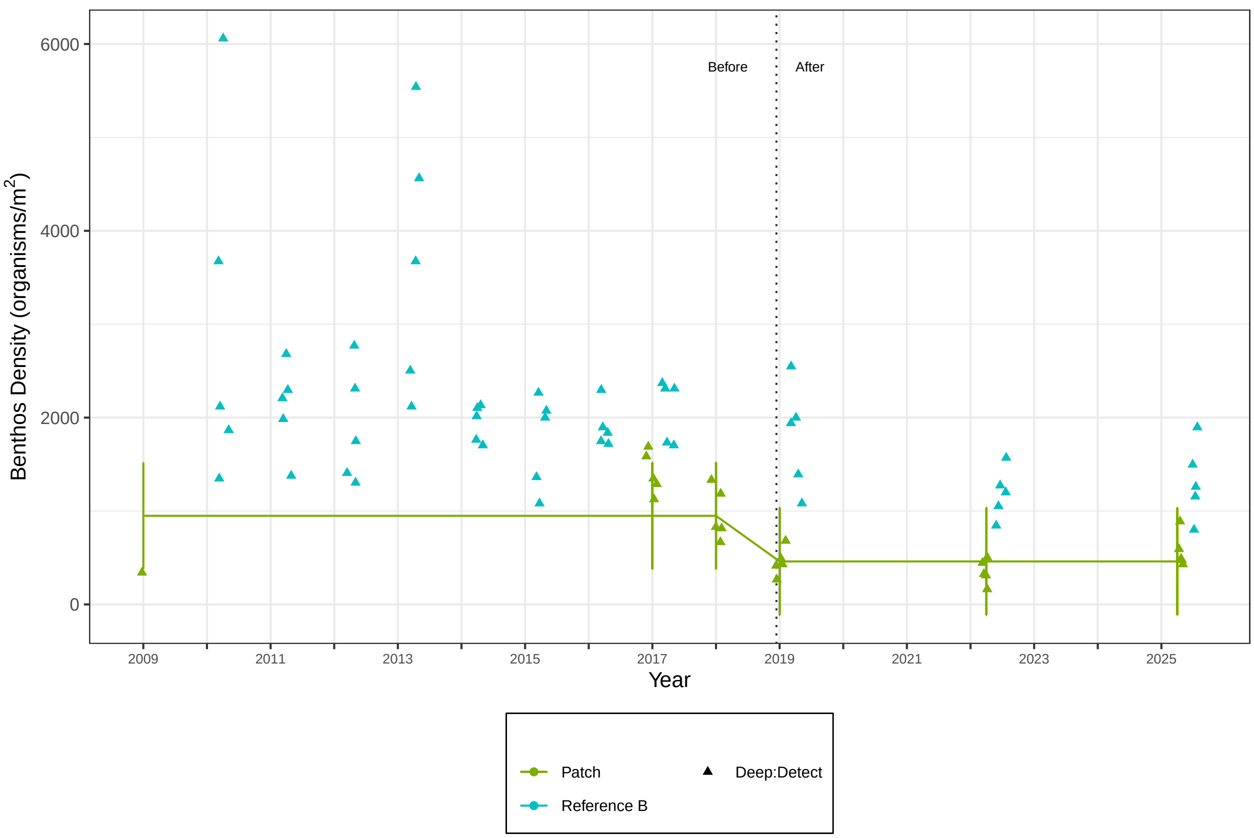
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-488.4	288.7	3.277	-1.692	0.1815	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

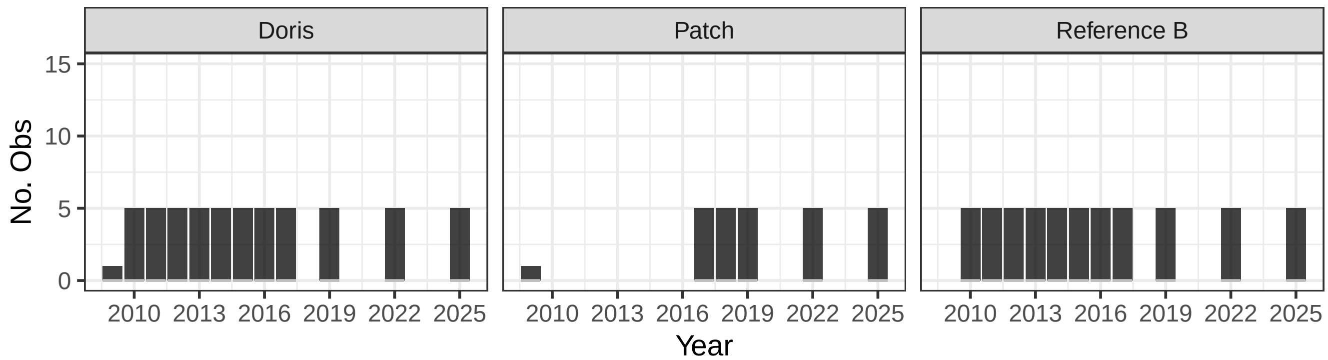
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.4.2 Benthos Family Richness

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e.,) were censored.

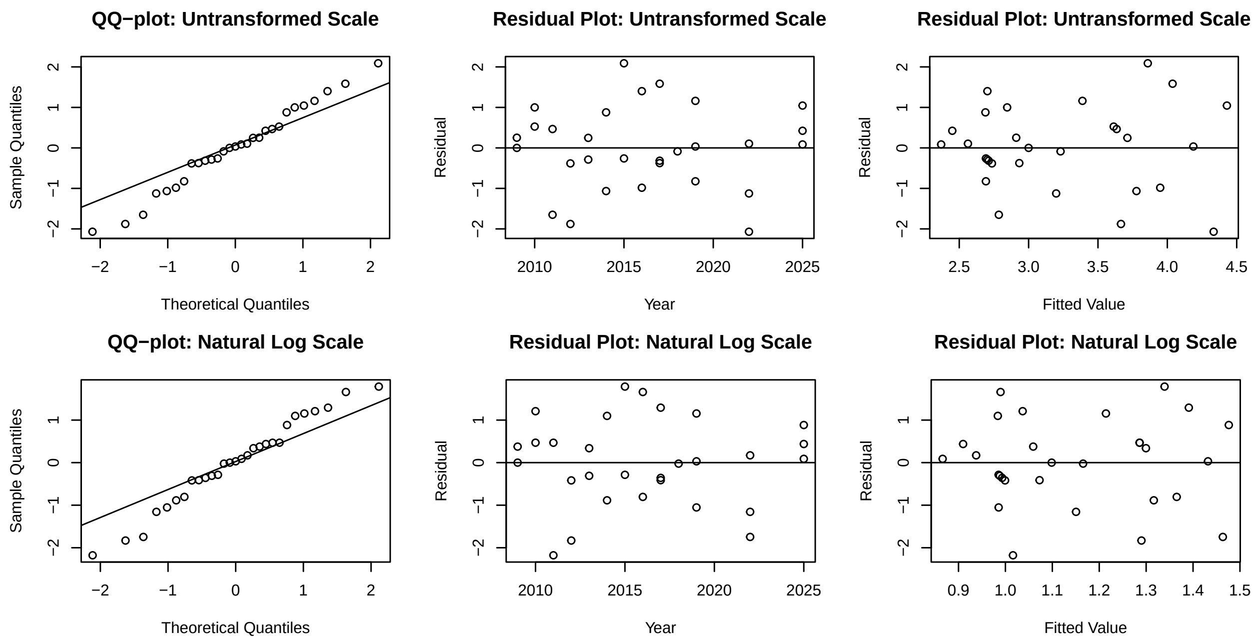
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL ()
Doris	Open-water	56	0	0	0
Patch	Open-water	26	0	0	0
Reference B	Open-water	55	0	0	0

The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

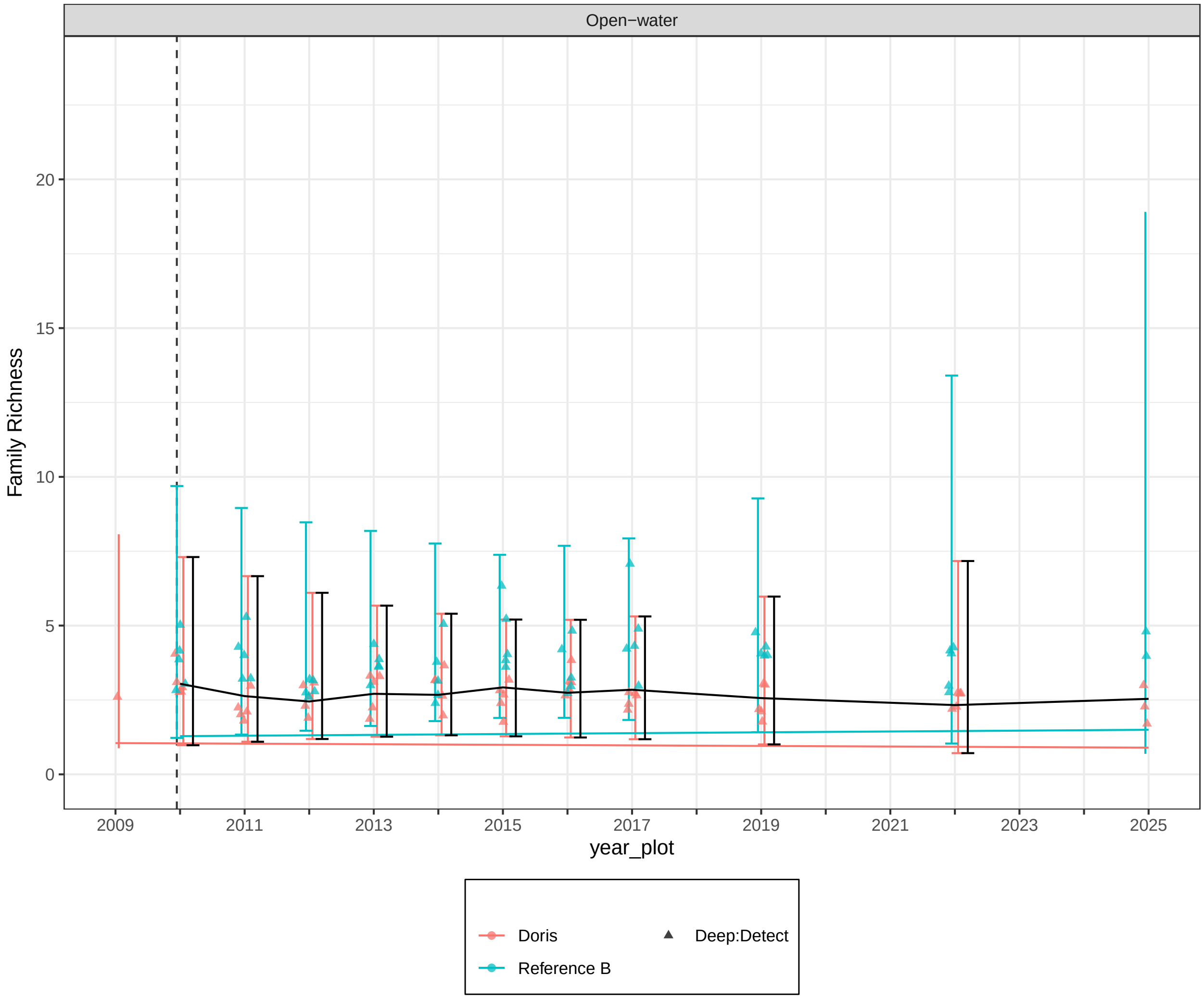
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	0.017	1	0.89540	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.


Open−water
Family Richness
0
5
10
15
20
2009
2011
2013
2015
2017
2019
2021
2023
2025
year_plot
Doris
Reference B
Deep:Detect

Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

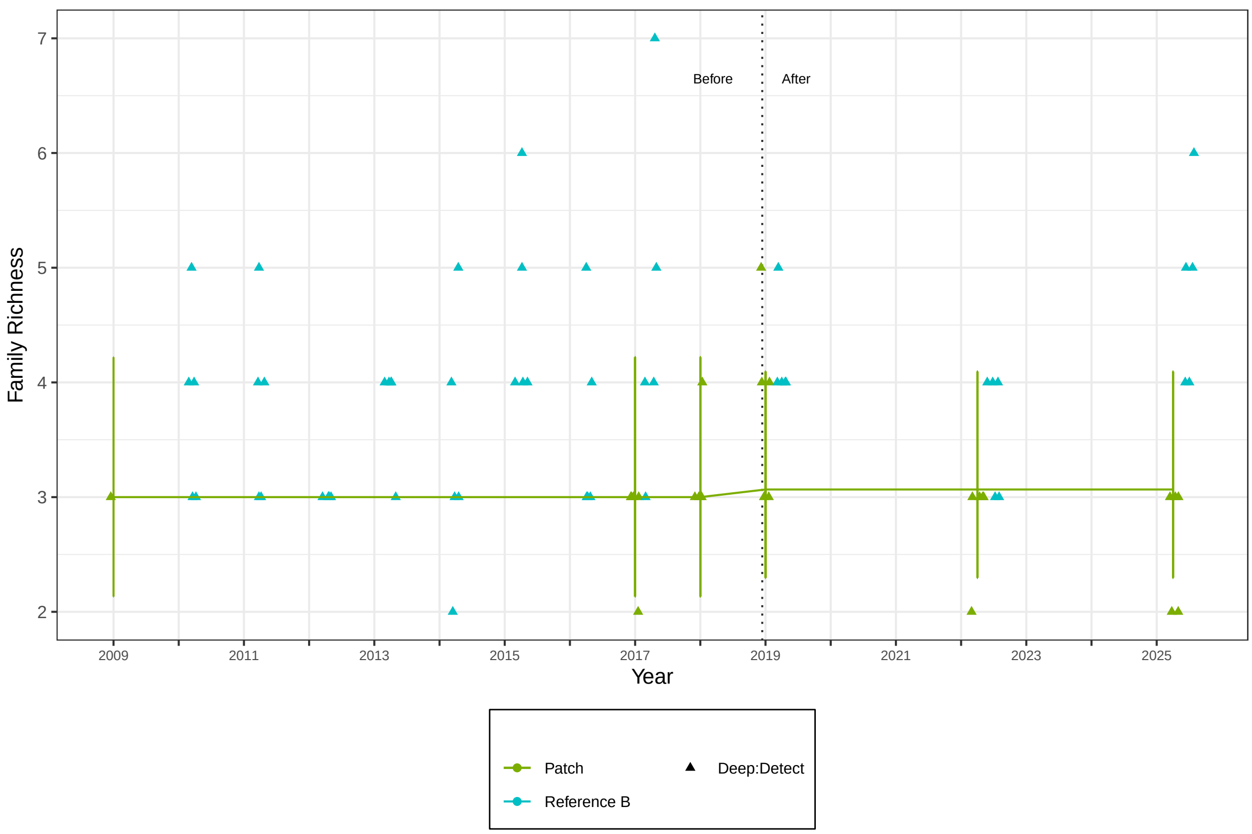
Coefficient	Estimate	Std. Error	z value	p	Significance
periodafter	0.022	0.2281	0.0963	0.9232	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

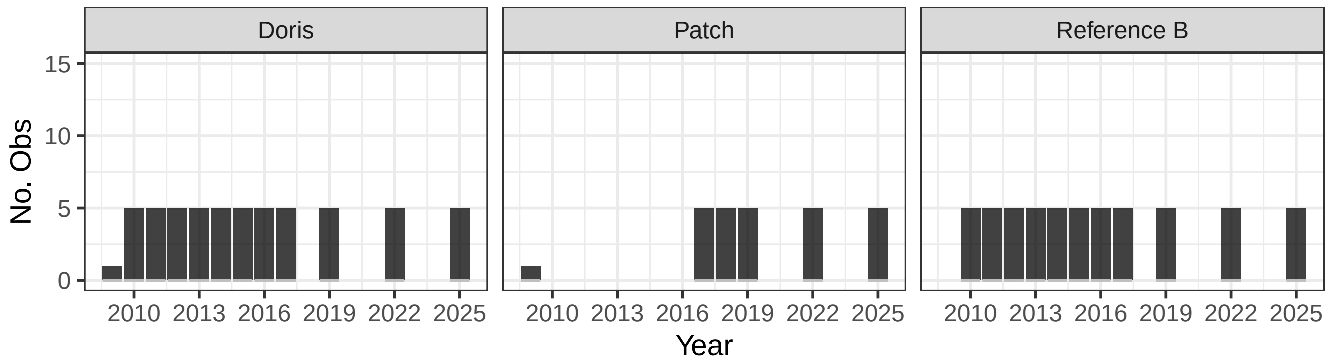
The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.3.4.3 Benthos Family Evenness

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e.,) were censored.

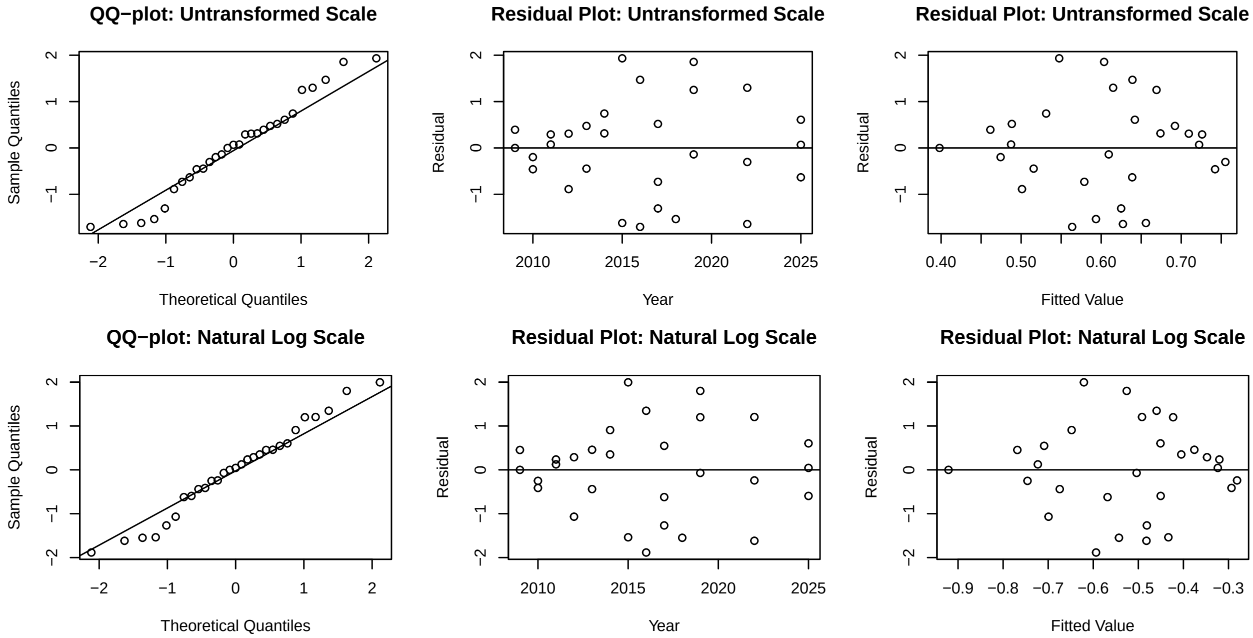
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL ()
Doris	Open-water	56	0	0	0
Patch	Open-water	26	0	0	0
Reference B	Open-water	55	0	0	0

The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

None

Outliers on natural log scale:

None

The untransformed and natural log-transformed model fit the data equally well. Analysis proceeds with untransformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

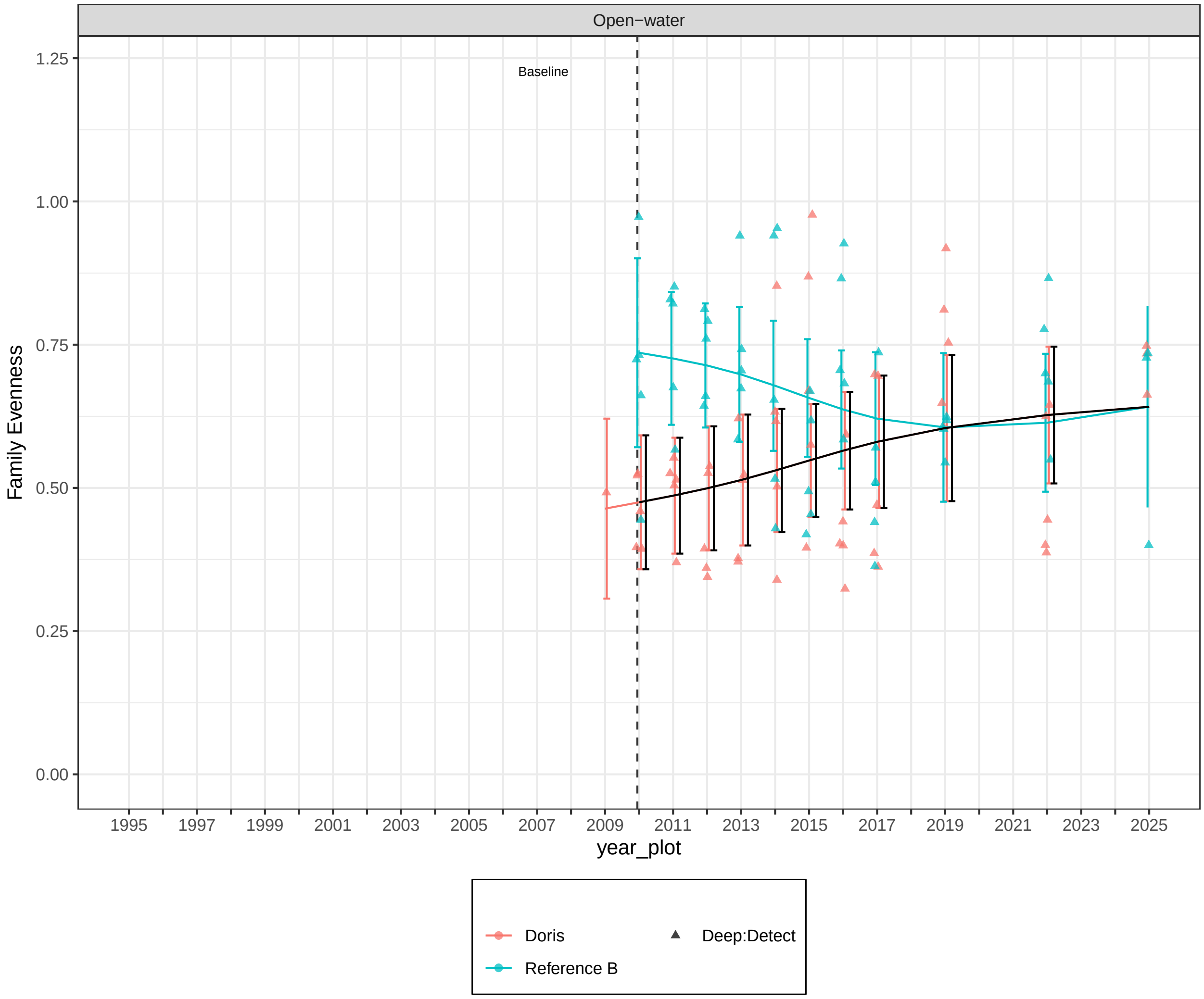
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	6.178	3	0.10330	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.


Open−water
Baseline
Family Evenness
1.25
1.00
0.75
0.50
0.25
0.00
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
year_plot
Doris
Reference B
Deep:Detect

Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	0.2495	0.0416	24	5.994	<0.001	sig.

Conclusion:

The change from before to after was significantly different.

BACI Analysis with Comparable Years

Results of the ANOVA test on the fixed effects of the model:

	Sum Sq.	Mean Sq.	NumDF	DenDF	F value	p
class	0.0234	0.0234	1	34	1.666	0.2050
period	0.1967	0.1967	1	2	14.036	0.0644
class:period	0.0198	0.0198	1	34	1.411	0.2430

Estimated marginal means for site class by period:

Class	Period	LSmean	SE	DF	LowerCL	UpperCL
Monitored	after	0.7418	0.0306	7.556	0.6706	0.8130
Reference	after	0.6346	0.0306	7.556	0.5634	0.7059
Monitored	before	0.5285	0.0529	7.556	0.4051	0.6518
Reference	before	0.5240	0.0529	7.556	0.4007	0.6474

Summary of BACI contrasts for relative difference between changes from the before to after in Patch and Reference Lake B, with 95% confidence intervals:

Patch vs:	Estimate	Lower C.I.	Upper C.I.	Significance
Reference Sites	0.1027	-0.073	0.2784	not sig.

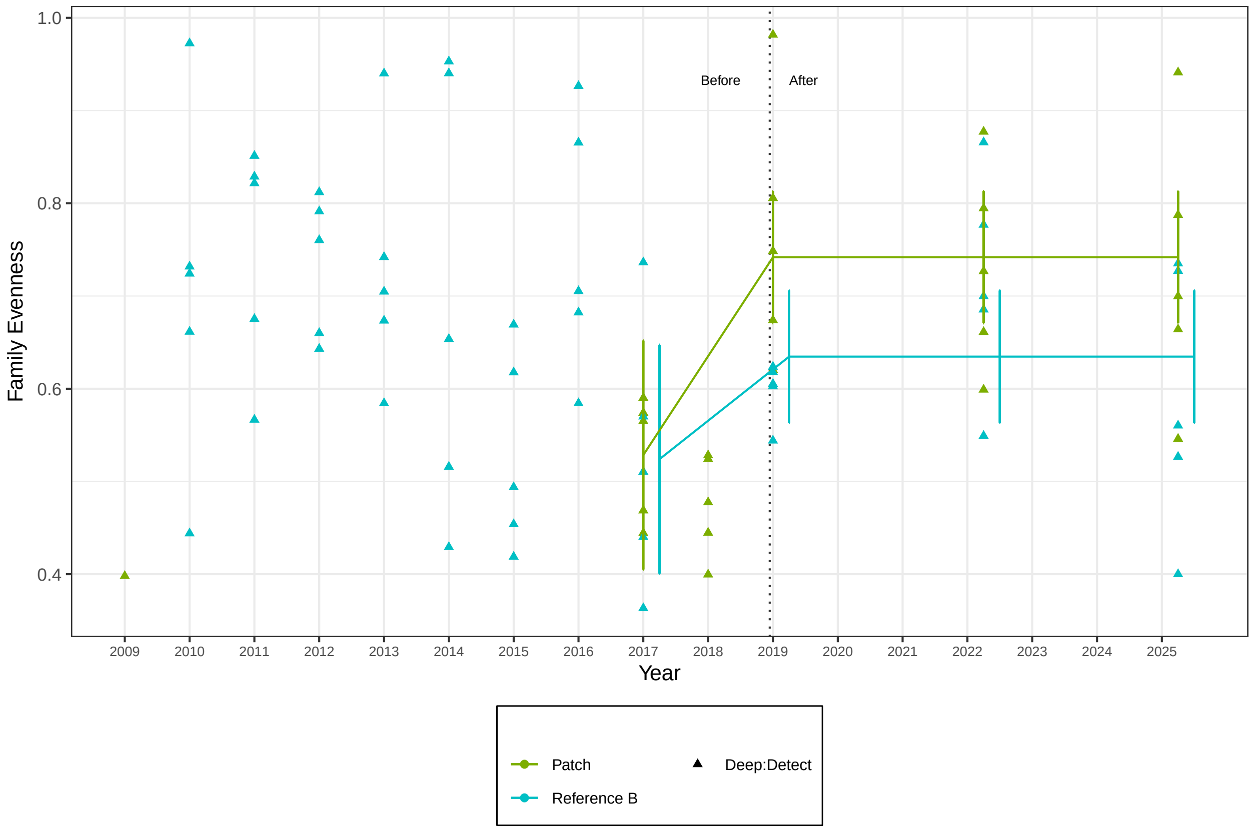
A BACI contrast is identified as *significant* if the confidence interval does not include 0.

Conclusion:

The change in Benthos Family Evenness concentrations at the Patch site from before to after was not significantly (p = 0.243) different from the change at Reference Lake B, according to the test on the BACI term (*class:period*).

Observed Data and Fitted Values with Comparable Years

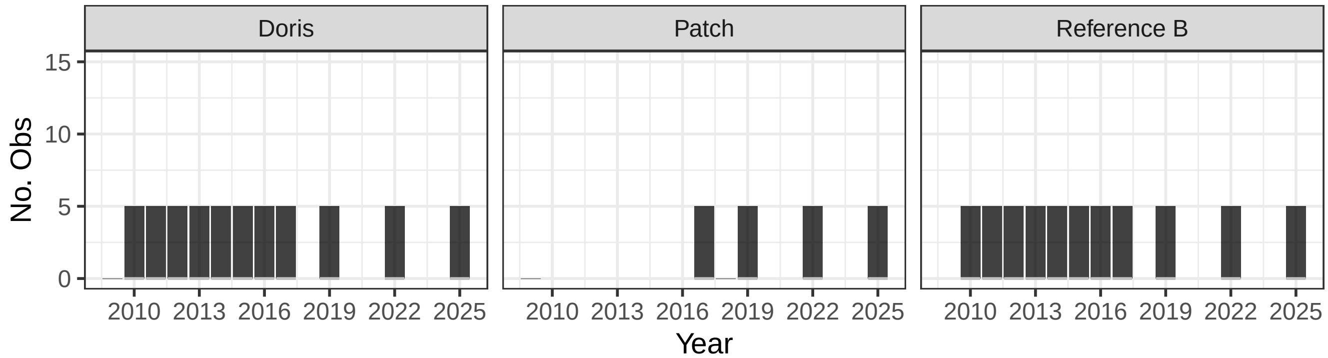
Below are plots of the observed and fitted data. The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for monitored and reference sites.


Family Evenness
1.0
0.8
0.6
0.4
Before
After
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Year
Patch
Reference B
Deep:Detect

C.3.4.4 Benthos Bray-Curtis Index

Censored Values and Sample Sizes

The following plots indicate the number of observations for each year from each lake that were less than the detection limit (light gray) or greater than the detection limit (dark gray). Observations below the analytical detection limit were considered censored.



Analysis was not performed if greater than 50% of observations from a site-season grouping were censored or if 100% of observations from the current assessment year (i.e.,) were censored.

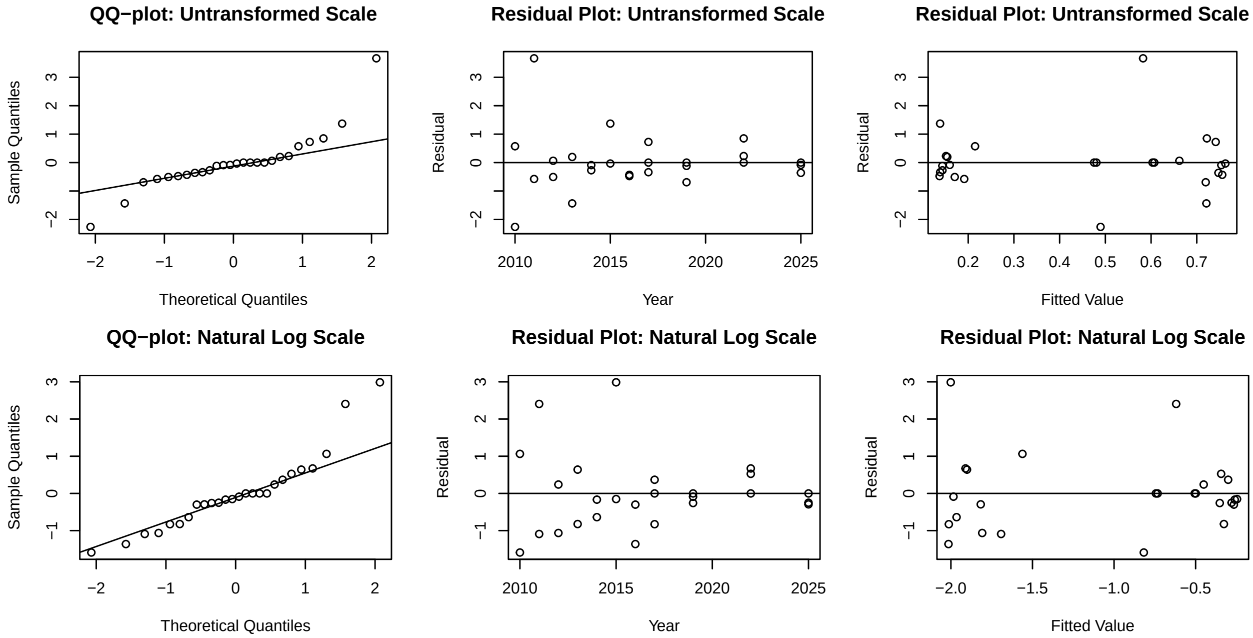
The sample sizes per lake and season are summarized in the table below.

Lake	Season	# Obs (total)	# < DL (total)	% DL (total)	% < DL ()
Doris	Open-water	55	0	0	0
Patch	Open-water	20	0	0	0
Reference B	Open-water	55	0	0	0

The analysis proceeds with linear mixed model regression.

Initial Model Fit

A model was fit both on the untransformed and natural log scale to assess the need for transformations. Outliers were identified from the fitted model as standardized residuals greater than 3, and flagged to caution interpretation of results but not removed from the analysis.



Outliers on untransformed scale:

	Lake	Year	Season	Depth.Zone	Impute	Fitted	Std. Residual
3	Doris	2011	Open-water	Deep	0.8442	0.5825	3.666

Outliers on natural log scale:

None

The natural log-transformed data better meets the residual assumptions. Analysis proceeds with natural log-transformed data.

Doris Lake

The trend for Doris Lake was compared to a slope of zero. If there was a significant trend, then the trend for Doris Lake was compared to the trend in Reference Lake B. This contrast does not test for differences in intercepts between lakes.

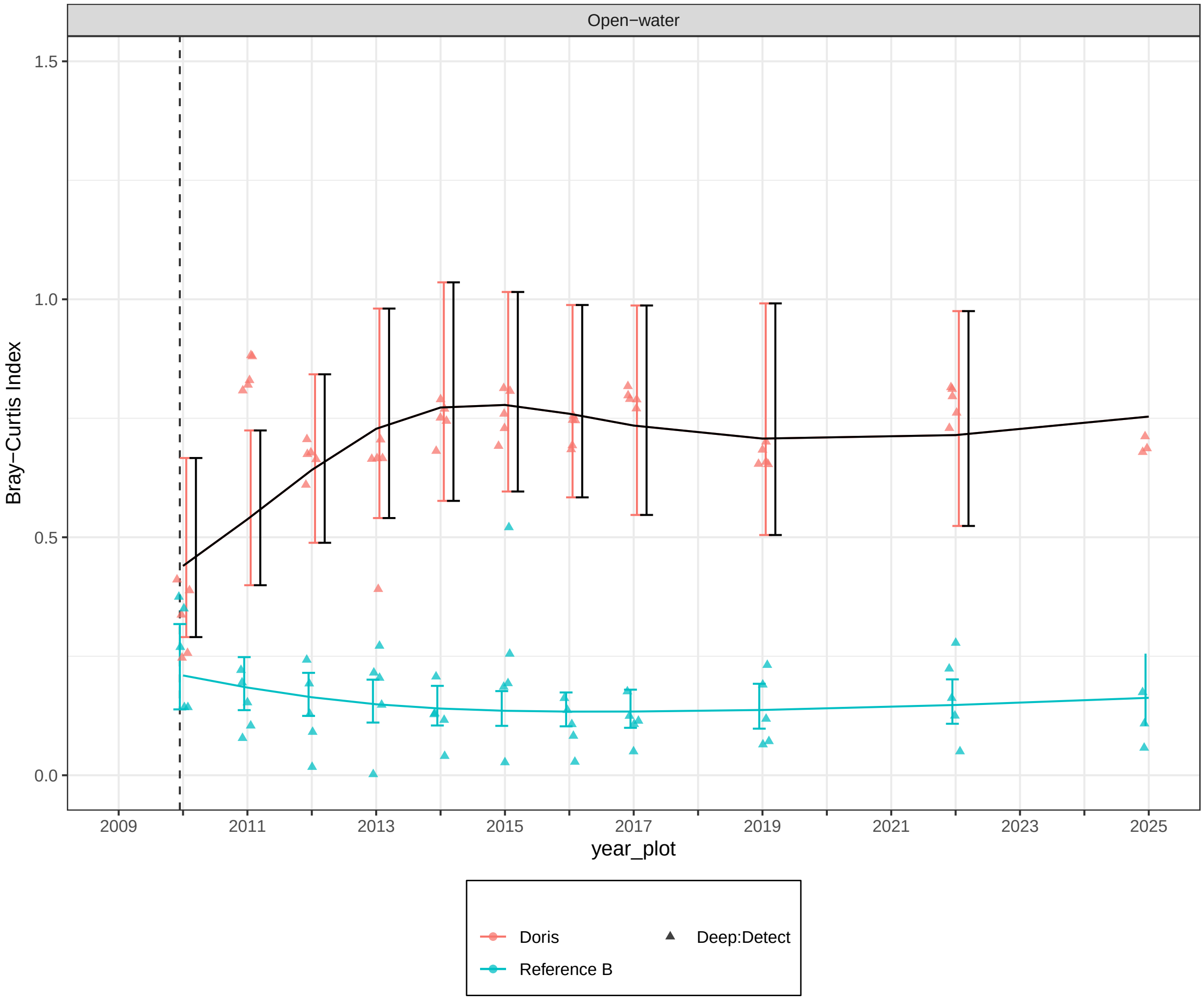
Doris Open-Water

Analysis	Chi.sq	df	p	Significance
Compare to slope zero	7.735	3	0.05180	not sig.

Doris Lake did not exhibit significant deviation from a slope of zero and thus comparison to the trend in Reference Lake B was not completed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols are values presented at half the detection limit. Solid lines represent the fitted curves. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations.



Patch Lake

Before-after analyses were first performed to compare the change in the before and after period for the exposure site. If a change was detected, then before-after-control-impact linear modelling was applied to compare the change in before and after periods relative to Reference Lake B.

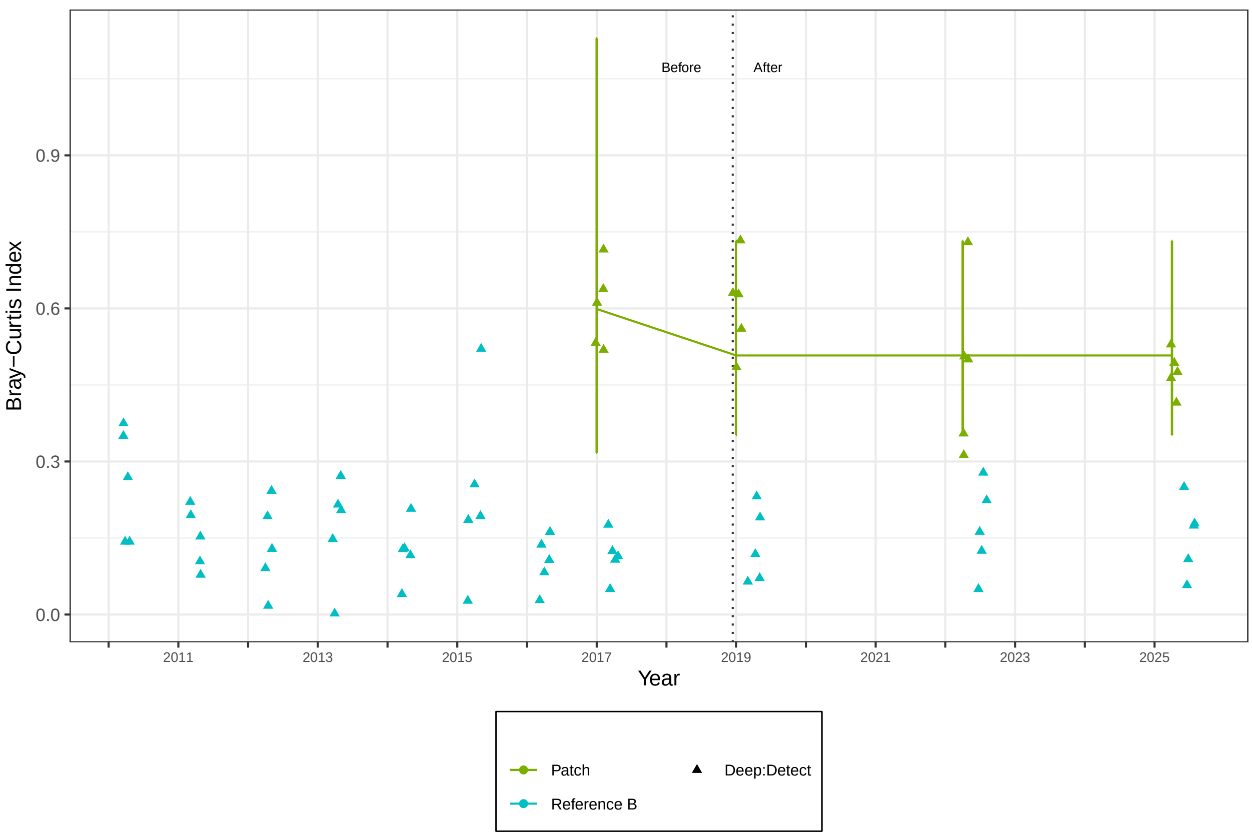
Coefficient	Estimate	Std. Error	df	t value	p	Significance
periodafter	-0.165	0.1702	2	-0.9693	0.4347	not sig.

Conclusion:

The change from before to after was not significantly different.
BACI analysis not performed.

Observed Data and Fitted Values

The symbols represent the observed data values and hollow symbols at half the detection limit. Solid lines represent the fitted means. Error bars indicate the upper and lower 95% confidence intervals of the modelled concentrations in the before and after periods for the exposure site.



C.4 REFERENCES

TMAC (TMAC Resources Inc.). 2018. *Hope Bay Project: Aquatic Effects Monitoring Plan*. Prepared by TMAC Resources Inc.: Toronto, ON.

Tobin. 1958. "Estimation of Relationships for Limited Dependent Variables." *Econometrica* 26 (1): 24 – 36.

ERM HAS OVER 140 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
Denmark
France
Germany
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
Netherlands
New Zealand
Panama
Peru
Poland
Portugal
Romania
Singapore
South Africa
South Korea
Spain
Switzerland
Taiwan
Thailand
UAE
UK
US
Vietnam

ERM's Calgary Office
#2700-685 Centre Street S
Calgary, AB
Canada T2G 1S5

T +1 403 705 1926

www.erm.com