



# Lakewatch

The Alberta Lake Management Society  
Volunteer Lake Monitoring Program



## Chestermere Lake Report 2024

Updated November 27, 2025

Lakewatch is made possible  
with support from:



# ALBERTA LAKE MANAGEMENT SOCIETY'S LAKEWATCH PROGRAM

LakeWatch has several important objectives, one of which is to collect and interpret water quality data from Alberta's Lakes. Equally important is educating lake users about aquatic environments, encouraging public involvement in lake management, and facilitating cooperation and partnerships between government, industry, the scientific community and lake users. LakeWatch reports are designed to summarize basic lake data in understandable terms for the widest audience, and are not meant to be a complete synopsis of information about specific lakes. Additional information is available for many lakes that have been included in LakeWatch, and readers requiring more information are encouraged to seek those sources.

ALMS would like to thank all who express interest in Alberta's aquatic environments, and particularly those who have participated in the LakeWatch program. These leaders in stewardship give us hope that our water resources will not be the limiting factor in the health of our environment.

If you require data from this report, please contact ALMS for the raw data files.

## ACKNOWLEDGEMENTS

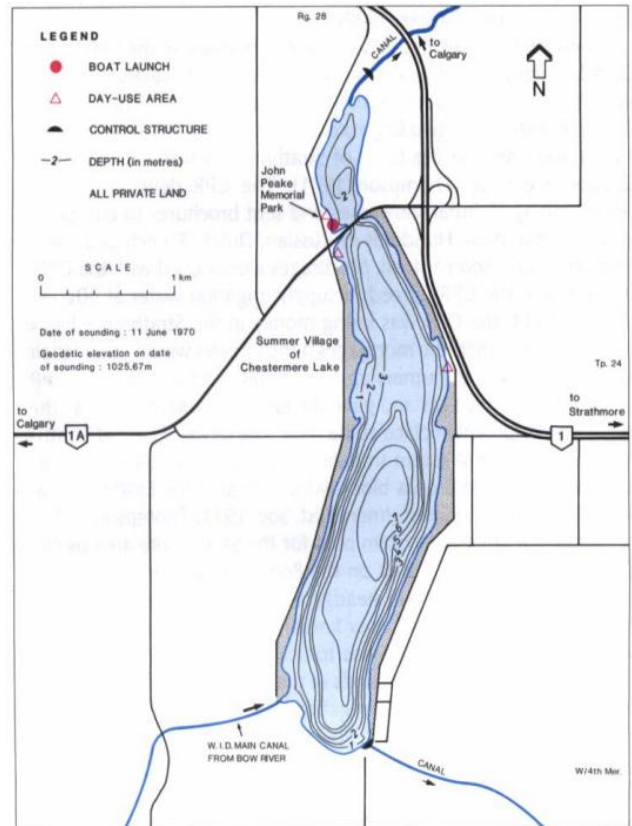
The LakeWatch program is made possible through the dedication of its volunteers. A special thanks to Kathy and Jay Speck for their commitment to collecting data at Chestermere Lake. We would also like to thank Katherine Cundict and Jordyn Lajeunesse, who were summer technicians in 2024. Executive Director Bradley Peter and Program Manager Brittany Onysyk were instrumental in planning and organizing the field program. This report was prepared by Brittany Onysyk and Bradley Peter.

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INTRODUCTION TO LIMNOLOGY](#)

## CHESTERMERE LAKE

Situated in the City of Chestermere just minutes east of Calgary, Chestermere Lake is a very popular recreational lake and a highly developed, urban, man-made reservoir.

Chestermere Lake was originally built by the Canadian Pacific Railroad in the 1880's for irrigation purposes. Before this time, the area that is now Chestermere Lake was a small slough. Construction of the reservoir included a weir on the Bow River within the city of Calgary, canals, and two dams. The irrigation system was turned over to the Western Irrigation District (WID) in 1944, which currently owns and operates the structures feeding water to and from Chestermere Lake.<sup>1</sup> The drainage basin for the lake is only 7.65 km<sup>2</sup> including the 'reservoir' at its maximum capacity (2.65 km<sup>2</sup>). Chestermere Lake is surrounded by urban development. The area surrounding the lake is entirely developed as agricultural land.



Bathymetric map of Chestermere Lake obtained from The Atlas of Alberta Lakes.

Chestermere Lake is shallow over most of its depth (<2.0 m over 50% of its area). The lake has a maximum depth of 7 m. Likely due to its shallow depth, aquatic vegetation (macrophytes) is prevalent in Chestermere Lake. Because Chestermere Lake is a popular site for recreation, mechanical removal of aquatic vegetation using harvesters is maintained on a continuous basis.<sup>1</sup>

Chestermere Lake receives a large volume of water from the Bow River during summer months, enough to replace the entire lake volume in as little as 4.7 days.<sup>1</sup> Flushing of this magnitude may actually help to maintain the water's clarity and thus the success of aquatic vegetation in comparison to other Alberta lakes of similar depth.

As a point of interest, in 2016, two species of bryozoans were identified in Chestermere Lake: *Plumatella sp.* and *Cristatella mucedo*.

<sup>1</sup> Mitchell, P. and E. Prepas. 1990. Atlas of Alberta Lakes.

## WATER CHEMISTRY

*ALMS measures a suite of water chemistry parameters. Phosphorus, nitrogen, and chlorophyll-*a* are important because they are indicators of eutrophication, or excess nutrients, which can lead to harmful algal/cyanobacteria blooms. One direct measure of harmful cyanobacteria blooms are Microcystins, a common group of toxins produced by cyanobacteria. See Table 2 for a complete list of parameters.*

The average total phosphorus (TP) concentration for Chestermere Lake was 7 µg/L (Table 2), falling into the oligotrophic, or minimally productive trophic classification. This value falls below all previously observed historical averages going back to 1983 (Table 2). TP ranged from a minimum of 3 µg/L on July 4 to a maximum of 13 µg/L on September 27 (Figure 1).

Average chlorophyll-*a* concentration in 2024 was 4.92 µg/L (Table 2), falling into the mesotrophic, or moderately productive trophic classification. Chlorophyll-*a* was lowest at 1.4 µg/L on July 4 and peaked at 9 µg/L on September 27 (Figure 1).

The average Total Kjeldahl Nitrogen TKN concentration in 2024 was 0.1 mg/L (Table 2), increasing by only about 0.1 mg/L throughout the season (Figure 1).

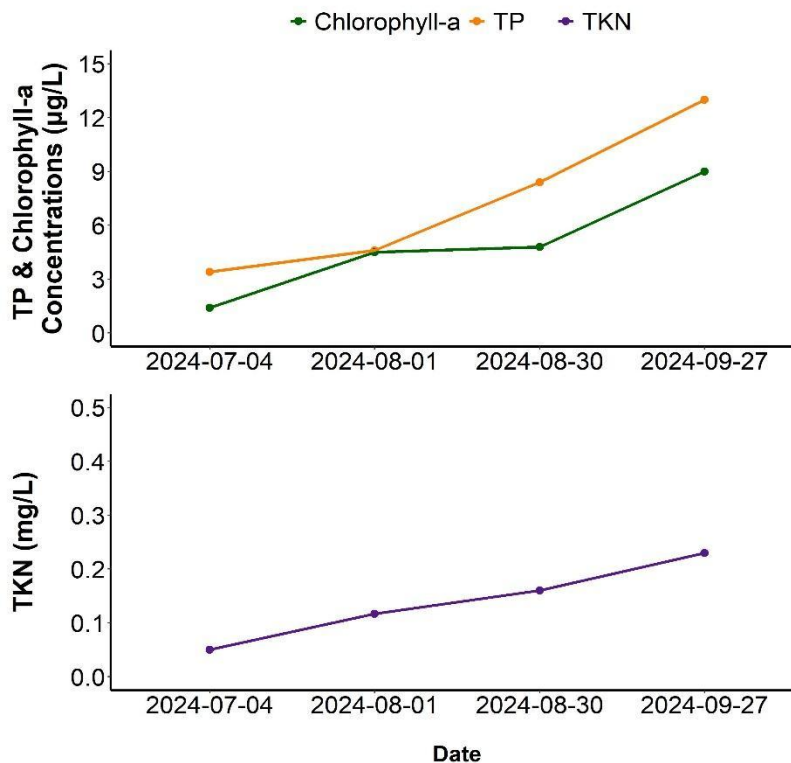


Figure 1. Total Phosphorus, Chlorophyll-*a*, and Total Kjeldahl Nitrogen concentrations measured over the course of the summer at Chestermere Lake in 2024.

Average pH was measured as 7.9 in 2024, buffered by low alkalinity (128 mg/L CaCO<sub>3</sub>) and bicarbonate (152 mg/L HCO<sub>3</sub><sup>-</sup>). Aside from bicarbonate, sulphate and calcium were higher than all other major ions, and contributed to a moderate conductivity of 382 μS/cm (Figure 2, top; Table 2). Chestermere Lake falls in the low-moderate range of ion levels compared to other LakeWatch lakes sampled in 2024 (Figure 2, bottom).

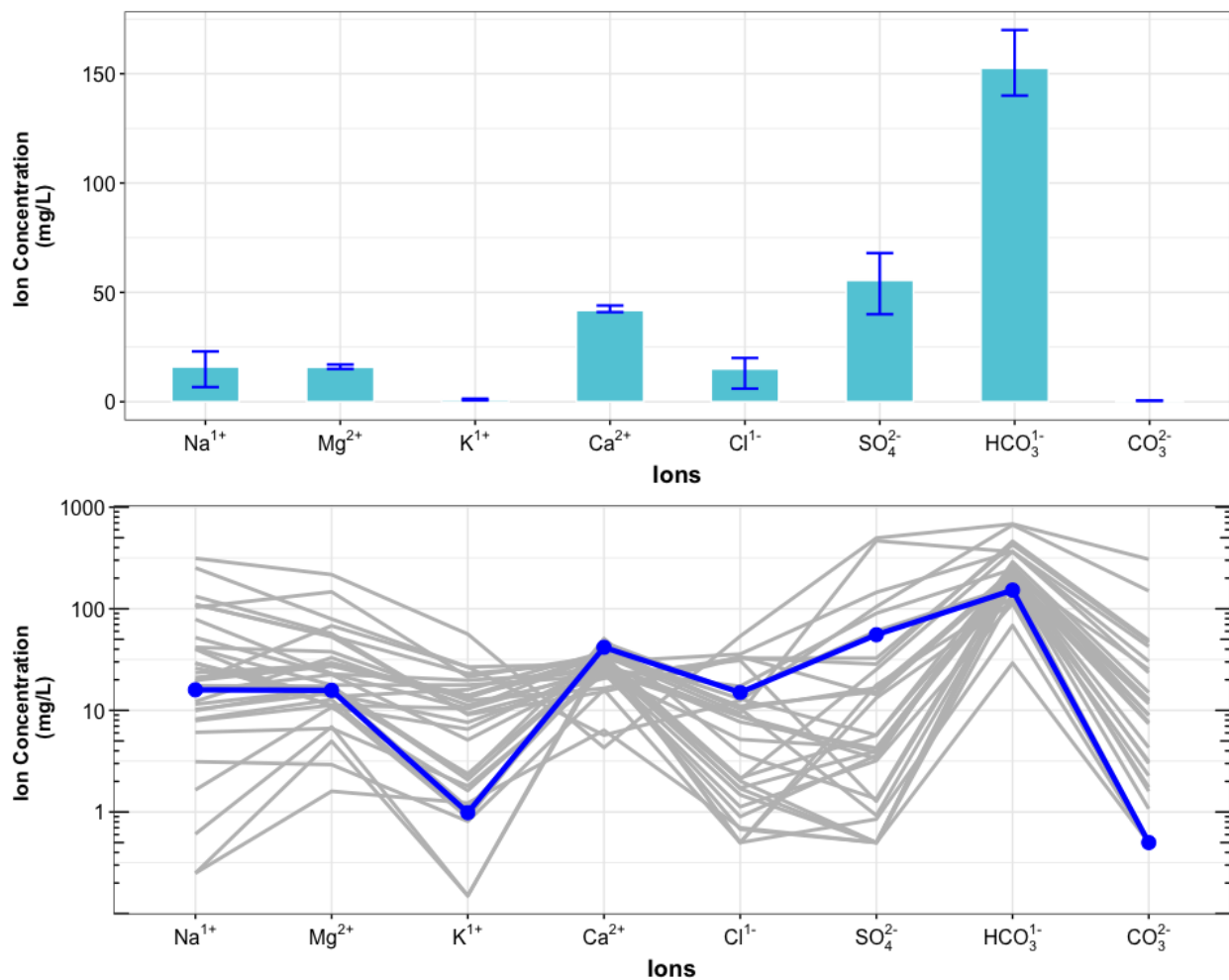


Figure 2. Average levels of cations (sodium = Na<sup>1+</sup>, magnesium = Mg<sup>2+</sup>, potassium = K<sup>1+</sup>, calcium = Ca<sup>2+</sup>) and anions (chloride = Cl<sup>1-</sup>, sulphate = SO<sub>4</sub><sup>2-</sup>, bicarbonate = HCO<sub>3</sub><sup>1-</sup>, carbonate = CO<sub>3</sub><sup>2-</sup>) from 4 measurements over the course of the summer at Chestermere Lake. Top) bars indicate range of values measured, and bottom) Schoeller diagram of average ion levels at Chestermere Lake (blue line) compared to 26 lake basins (gray lines) sampled through the LakeWatch program in 2024 (note log<sub>10</sub> scale on y-axis of bottom figure).



## Metals

*Metals will naturally be present in aquatic environments due to in-lake processes or the erosion of rocks, or introduced to the environment from human activities such as urban, agricultural, or industrial developments. Many metals have a unique guideline as they may become toxic at higher concentrations. Where current metal data are not available, historical concentrations for 27 metals have been provided (Table 3).*

Metals were not measured at Chestermere Lake in 2024, but historical levels are available in Table 3.

## WATER CLARITY AND EUPHOTIC DEPTH

*Water clarity is influenced by suspended materials, both living and dead, as well as dissolved colored compounds in the water column. During the melting of snow and ice in spring, lake water can become turbid (cloudy) from silt transported into the lake. Lake water usually clears in late spring, but then becomes more turbid with increased algal growth as the summer progresses. The easiest and most widely used measure of lake water clarity is the Secchi depth. Two times the Secchi depth equals the euphotic depth – the depth to which there is enough light for photosynthesis.*

The average euphotic depth of Chestermere Lake in 2024 was 4.55 m, corresponding to an average Secchi depth of 2.27 m (Table 2). Euphotic depth varied over the season, ranging from as shallow as 2.6 m on September 27 to as deep as 6 m (lake bottom) on August 30 (Figure 3). On August 30, the euphotic depth is not recorded as double the Secchi depth (3.6 m) because euphotic depth cannot be greater than the lake bottom. When the euphotic depth is equal to the bottom depth, light is likely able to penetrate all the way to the bottom of the lake. This impacts the amount of habitat that could support the growth of rooted macrophytes, as well as sediment dwelling algae and cyanobacteria.

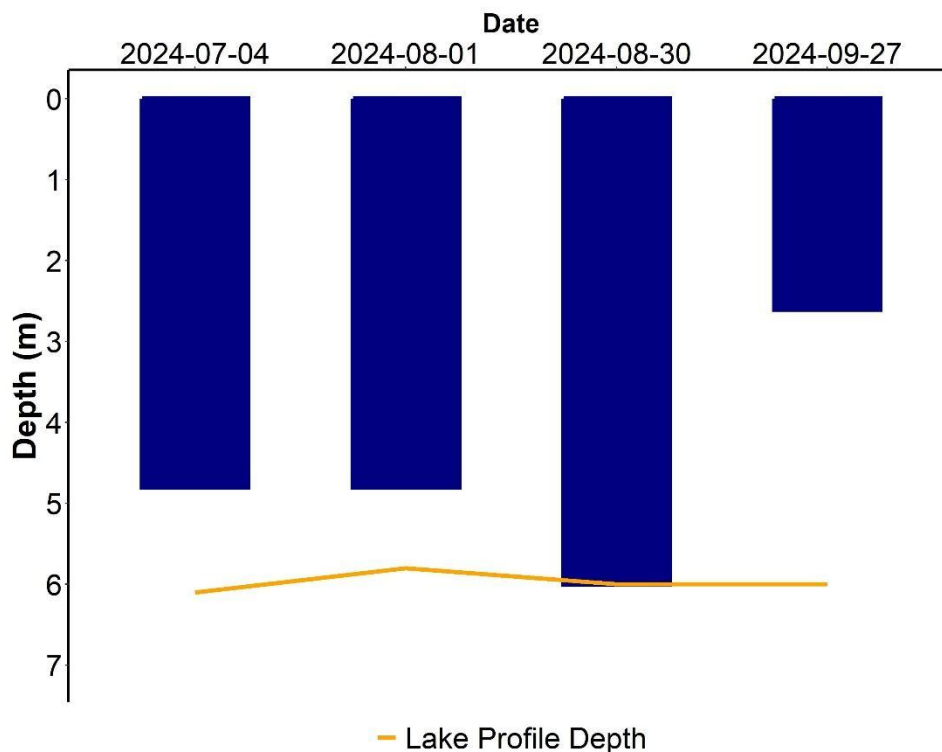


Figure 3. Euphotic depth values measured over the course of the summer at Chestermere Lake in 2024.

## WATER TEMPERATURE AND DISSOLVED OXYGEN

*Water temperature and dissolved oxygen (DO) profiles in the water column can provide information on water quality and fish habitat. The depth of the thermocline is important in determining the depth to which dissolved oxygen from the surface can be mixed. Please refer to the end of this report for descriptions of technical terms.*

Surface temperatures of Chestermere Lake showed some variation throughout the summer, with the August 1 sampling event having the warmest temperatures at 19.14°C (Figure 4). The lake was well mixed during all sampling trips.

Due to the lack of thermal stratification, Chestermere Lake was well oxygenated in the surface waters on all sampling dates, measuring above the CCME guidelines of 6.5 mg/L dissolved oxygen<sup>2</sup> (Figure 4). Slight oxygen depletion was observed during the August sampling events below 4 m depth.

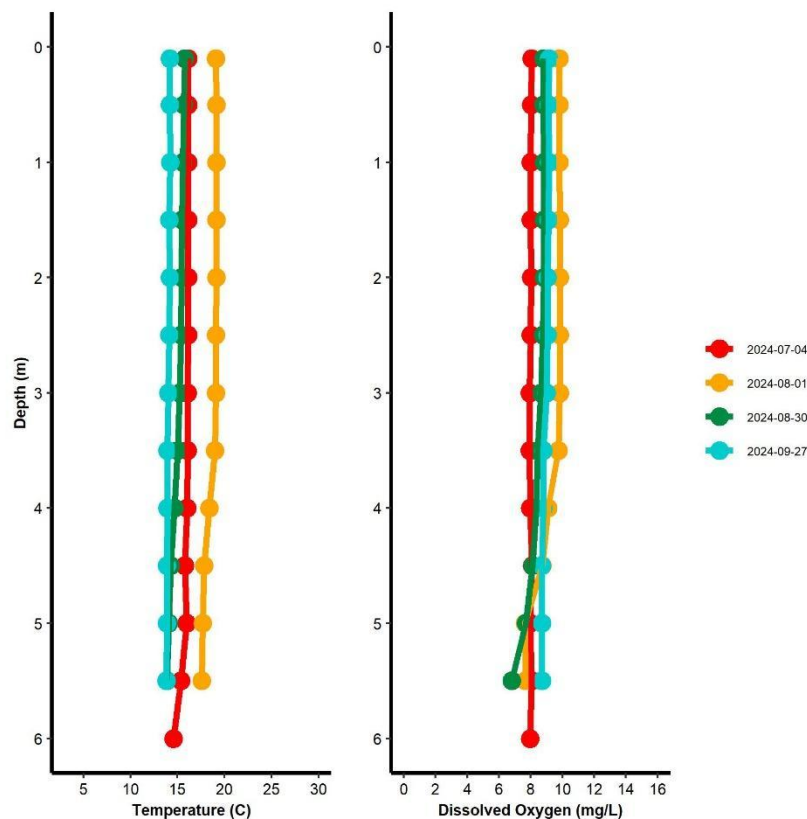


Figure 4. Temperature (°C) and dissolved oxygen (mg/L) profiles for Chestermere Lake measured over the course of the summer of 2024.

<sup>2</sup> Canadian Council of Ministers of the Environment. 1999. Canadian water quality guidelines for the protection of aquatic life: Dissolved oxygen (freshwater).

## MICROCYSTIN

*Microcystins are toxins produced by cyanobacteria (blue-green algae) which, when ingested, can cause severe liver damage. Microcystins are produced by many species of cyanobacteria which are common to Alberta's Lakes, and are thought to be one of the most common cyanobacteria toxins. In Alberta, recreational guidelines for microcystin are set at 10 µg/L. Blue-green algae advisories are managed by Alberta Health Services. Recreating in algal blooms, even if microcystin concentrations are not above guidelines, is not recommended.*

Microcystin levels in Chestermere Lake fell below the recreational guideline of 10 µg/L<sup>3</sup> during every sampling event in 2024. For each sampling event, microcystin levels were below the laboratory detection limit of 0.10 µg/L, so a value of 0.05 µg/L is assigned to each date that is below detection in order to calculate an average.

Table 1. Microcystin concentrations measured four times at Chestermere Lake in 2024.

Date	Microcystin Concentration (µg/L)
07/04/2024	< 0.1
08/01/2024	< 0.1
08/30/2024	< 0.1
09/27/2024	< 0.1
<b>Average</b>	<b>0.05</b>

<sup>10</sup> Health Canada. 2022. Guidelines for Canadian Recreational Water Quality.



## INVASIVE SPECIES

*Dreissenid mussels pose a significant concern for Alberta because they impair the function of water conveyance infrastructure and adversely impact the aquatic environment. These invasive mussels can change lake conditions which can then lead to toxic cyanobacteria blooms, decrease the amount of nutrients needed for fish and other native species, and cause millions of dollars in annual costs for repair and maintenance of water-operated infrastructure and facilities. Spiny water flea pose a concern for Alberta because they alter the abundance and diversity of native zooplankton, as they are aggressive zooplankton predators. Through over-predation, they will impact higher trophic levels such as fish. They also disrupt fishing equipment by attaching in large numbers to fishing lines.*

Monitoring for aquatic invasive species involved sampling with a 63 µm plankton net. This monitoring is designed to detect juvenile Dreissenid mussel veligers and spiny water flea. No mussels or spiny water flea were detected at Chestermere Lake in 2024.

*Eurasian watermilfoil is a non-native aquatic plant that poses a threat to aquatic habitats in Alberta because it grows in dense mats preventing light penetration through the water column, reduces oxygen levels when the dense mats decompose, and outcompetes native aquatic plants. Eurasian watermilfoil can look similar to the native Northern watermilfoil, thus genetic analysis is ideal for suspect watermilfoil species identification.*

Watermilfoil was not collected from Chestermere Lake in 2024.

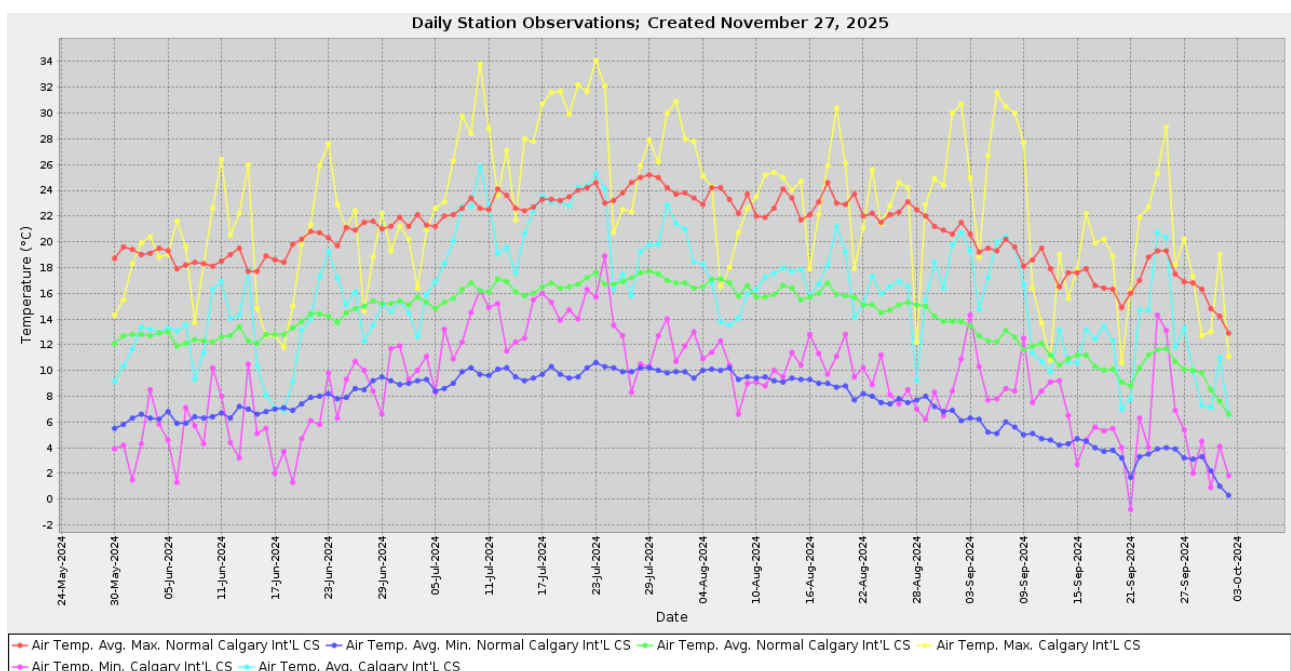
## WEATHER AND LAKE STRATIFICATION

*Air temperature will directly impact lake temperatures, and result in different temperature layers (stratification) throughout the lake, depending on its depth. Wind will also impact the degree to which a lake mixes, and how it will stratify. The amount of precipitation that falls within a lake's watershed will have important implications, depending on the context of the watershed and the amount of precipitation that has fallen. Solar radiation represents the amount of energy that reaches the earth's surface, and has implications for lake temperature & productivity.*

In 2024, Chestermere Lake experienced a warmer and windier summer compared to normal, with about normal accumulated precipitation (Figure 5). July was the warmest month, with the average temperature being 20.2°C. 2024 also broke numerous heat records, including the hottest day recorded on July 23 at 34.1°C. September was also a warmer than average month, with the average temperature being 14.0°C.

Chestermere Lake received about normal precipitation in the summer of 2024 (260 mm total). Precipitation was sporadic over the summer months, and generally fell a bit at a time, with the exception of August 5 and September 12, when over 50 mm and nearly 40 mm of precipitation fell, respectively (Figure 5).

Strong winds were also observed throughout the sampling season.



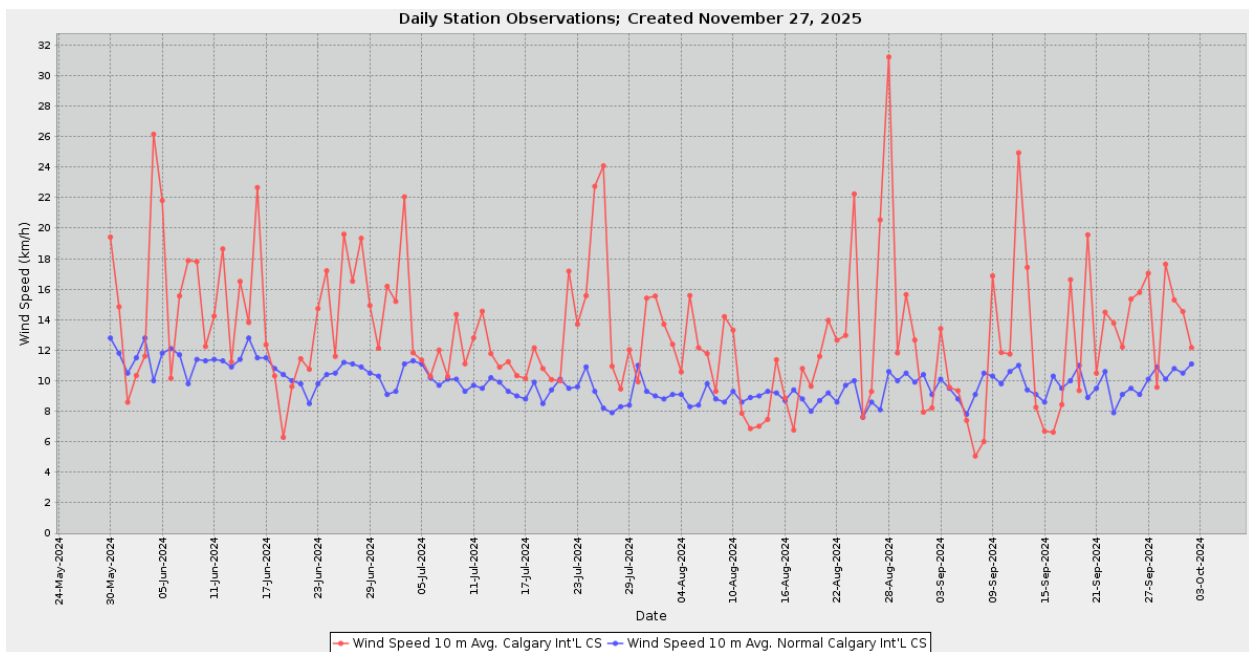
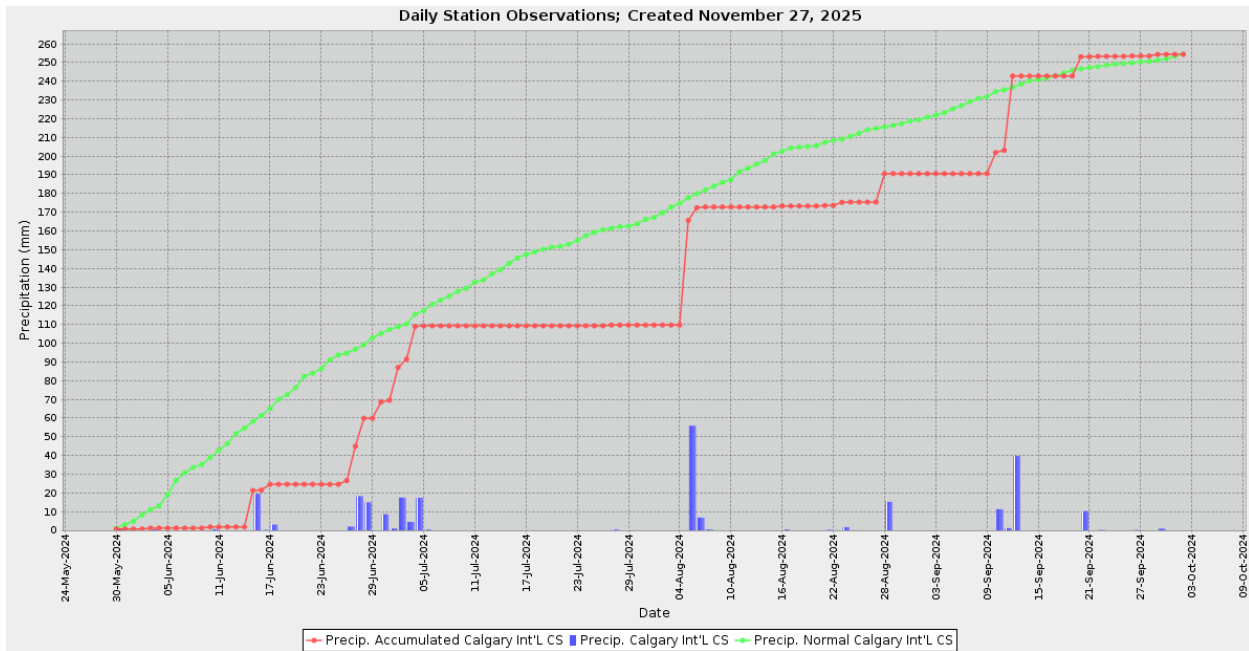


Figure 5. Air temperature ( $^{\circ}\text{C}$ ), wind speed (km/h), and precipitation (mm) measured from the Calgary Int'L CS weather station northwest of Chestermere Muriel Lake. Weather data provided by Agriculture, Forestry and Rural Economic Development, Alberta Climate Information Service (ACIS) <https://acis.alberta.ca>.

## WATER LEVELS

*There are many factors influencing water quantity. Some of these factors include the size of the lake's drainage basin, precipitation, evaporation, water consumption, ground water influences, and the efficiency of the outlet channel structure at removing water from the lake. Requests for water quantity monitoring should go through Alberta Environment and Parks Monitoring and Science division.*

As Chestermere Lake is a man-made reservoir, water levels are controlled and have remained relatively stable since water level monitoring began in 1991 (Figure 6). Water levels of the reservoir are controlled each year between about 1023.5 masl and 1025.7 masl, and have seen a historical range of 3.9 m.

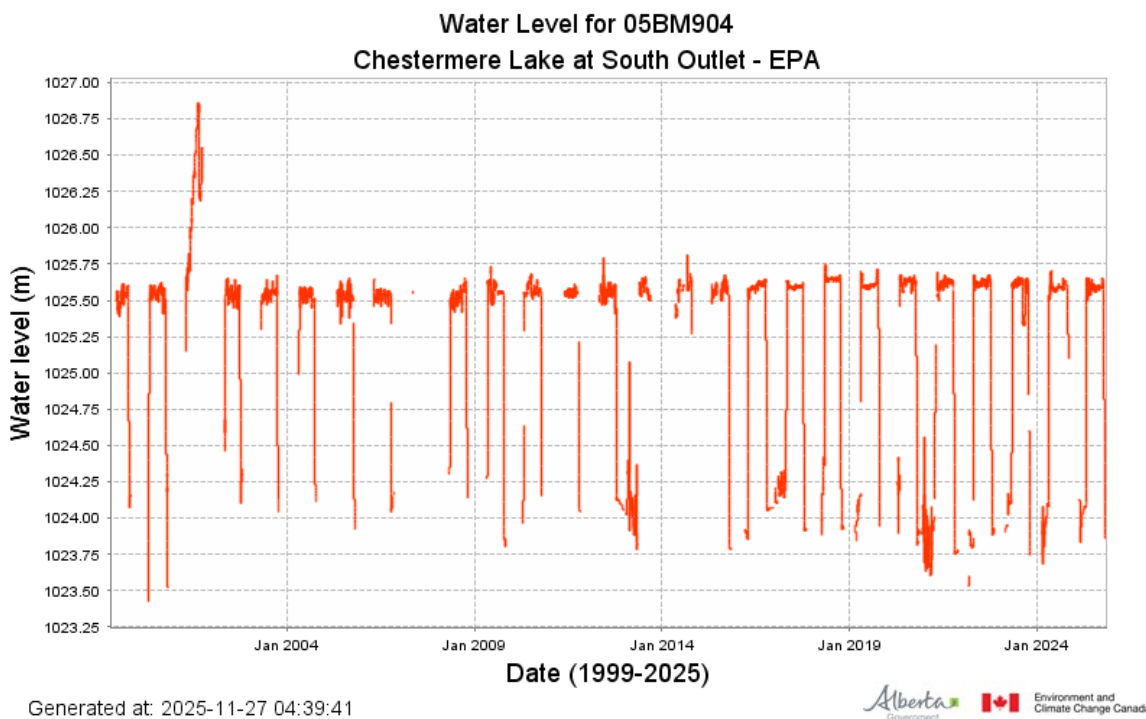


Figure 6. Water levels measured at Muriel Lake in metres above sea level (masl) from 1999-2025. Obtained from Alberta River Basins (<https://rivers.alberta.ca/>).

Table 2. Average Secchi depth and water chemistry values for Chestermere Lake.

Parameter	1983	1984	1989	1992	1993	1999	2007	2010
TP ( $\mu\text{g/L}$ )	36	28	16	28	31	39	30	24
TDP ( $\mu\text{g/L}$ )	-	-	8	6	10	7	11	7
Chlorophyll-a ( $\mu\text{g/L}$ )	5.5	6.5	-	5.6	6.9	9.1	2.7	3.4
Secchi depth (m)	2.9	2.71	-	2.64	1.86	2.58	3.9	4.25
TKN (mg/L)	0.4	0.5	0.2	0.4	0.3	0.3	0.5	0.3
NO <sub>2</sub> -N and NO <sub>3</sub> -N ( $\mu\text{g/L}$ )	33	46	30	63	75	74	-	30
NH <sub>3</sub> -N ( $\mu\text{g/L}$ )	-	-	-	-	-	-	-	-
DOC (mg/L)	-	2	2	2	3	-	4	2
Ca <sup>2+</sup> (mg/L)	35	37	33	36	40	37	42	-
Mg <sup>2+</sup> (mg/L)	12	13	12	13	14	15	19	-
Na <sup>+</sup> (mg/L)	7	13	6	10	18	15	46	19
K <sup>+</sup> (mg/L)	1	1	1	1	1	1	2	1
SO <sub>4</sub> <sup>2-</sup> (mg/L)	38	52	33	46	56	59	100	58
Cl <sup>-</sup> (mg/L)	4	10	3	6	11	7	37	13
CO <sub>3</sub> <sup>2-</sup> (mg/L)	-	-	-	-	-	2.5	1.7	0.5
HCO <sub>3</sub> <sup>2-</sup> (mg/L)	-	-	-	-	-	146.67	158.25	146
pH	7.61	7.81	8.05	8.10	8.00	8.37	8.30	8.42
Conductivity ( $\mu\text{S/cm}$ )	303	351	285	323	379	374	562	375
Hardness (mg/L)	-	145	131	145	160	-	-	-
TDS (mg/L)	-	-	-	-	-	208	330	212
Microcystin ( $\mu\text{g/L}$ )	-	-	-	-	-	-	-	0.03
Total Alkalinity (mg/L CaCO <sub>3</sub> )	111	115	108	116	124	122	132	120

Parameter	2011	2013	2015	2016	2019	2020	2022	2024
TP (µg/L)	23	18	16	13	12	9	7	7
TDP (µg/L)	8	5	4	4	4	2	2	2
Chlorophyll-a (µg/L)	8	3.1	6.4	8.7	4.9	7.3	4.6	4.9
Secchi depth (m)	3.42	2.98	2.22	2.7	2.36	1.79	3.35	2.42
TKN (mg/L)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1
NO <sub>2</sub> -N and NO <sub>3</sub> -N (µg/L)	87	85	-	33	48	27	22	51
NH <sub>3</sub> -N (µg/L)	-	-	-	25	17	18	10	8
DOC (mg/L)	3	3	2	2	3	2	3	2
Ca <sup>2+</sup> (mg/L)	-	-	39	42	41	43	40	42
Mg <sup>2+</sup> (mg/L)	-	-	16	18	16	18	16	16
Na <sup>+</sup> (mg/L)	23	18	18	24	15	20	14	16
K <sup>+</sup> (mg/L)	2	1	1	2	1	1	1	1
SO <sub>4</sub> <sup>2-</sup> (mg/L)	66	49	60	74	51	60	52	56
Cl <sup>-</sup> (mg/L)	16	11	14	17	14	18	17	15
CO <sub>3</sub> <sup>2-</sup> (mg/L)	1.5	2.2	0.8	0.8	1	0.8	0.5	0.5
HCO <sub>3</sub> <sup>2-</sup> (mg/L)	162.25	175.25	142	150	147.5	160	155	152.5
pH	8.34	8.38	8.31	8.29	8.27	8.22	7.96	7.90
Conductivity (µS/cm)	432	421	392	430	375	412	355	382
Hardness (mg/L)	-	-	-	180	168	178	160	168
TDS (mg/L)	251	227	220	254	218	240	215	225
Microcystin (µg/L)	0.08	0.04	0.05	0.05	0.05	0.05	0.05	0.05
Total Alkalinity (mg/L CaCO <sub>3</sub> )	135	147	116	122	122	132	128	128

Table 3. Concentrations of metals measured in Chestermere Lake. The CCME heavy metal Guidelines for the Protection of Freshwater Aquatic Life (unless otherwise indicated) are presented for reference. Note that metal sample collection method changed in 2016 from composite to single surface grab at the profile location.

Metals	2013	2015	2016	Guidelines
Aluminum (µg/L)	95.6	227	28.5	100 <sup>a</sup>
Antimony (µg/L)	0.116	0.148	0.145	/
Arsenic (µg/L)	0.58	0.63	0.8	5
Barium (µg/L)	54.5	51.2	46.7	/
Beryllium (µg/L)	0.0015	0.0065	0.004	100 <sup>c,d</sup>
Bismuth (µg/L)	0.0077	0.0023	0.012	/
Boron (µg/L)	14.2	18.6	18.7	1500
Cadmium (µg/L)	0.023	0.033	0.019	0.36 <sup>b</sup>
Chromium (µg/L)	0.317	0.57	0.21	/
Cobalt (µg/L)	0.06575	0.1055	0.047	500, 1000 <sup>c,d</sup>
Copper (µg/L)	1.303	4.295	1.32	4 <sup>b</sup>
Iron (µg/L)	90.15	298.5	73.7	300
Lead (µg/L)	0.136	0.338	0.107	7 <sup>b</sup>
Lithium (µg/L)	4.89	5.12	6.21	2500 <sup>d</sup>
Manganese (µg/L)	7.19	19.9	9.71	130 <sup>e</sup>
Molybdenum (µg/L)	0.994	1.08	1.08	73
Nickel (µg/L)	0.438	0.387	0.302	150 <sup>b</sup>
Selenium (µg/L)	0.903	0.58	0.92	1
Silver (µg/L)	0.0255	0.0055	0.008	0.25
Strontium (µg/L)	237	225.5	239	/
Thallium (µg/L)	0.0057	0.0094	0.0528	0.8
Thorium (µg/L)	0.021	0.025	0.035	/
Tin (µg/L)	0.03	0.06	0.03	/
Titanium (µg/L)	1.35	4.875	0.91	/
Uranium (µg/L)	1.065	1.16	1.25	15
Vanadium (µg/L)	0.505	0.655	0.36	100 <sup>c,d</sup>
Zinc (µg/L)	1.58	3.35	1.5	30 <sup>f</sup>

Values represent means of total recoverable metal concentrations.

<sup>a</sup> Based on pH ≥ 6.5

<sup>b</sup> Based on 2016 avg. water hardness (as CaCO<sub>3</sub>) with CCME equation

<sup>c</sup> Based on CCME Guidelines for Agricultural use (Livestock).

<sup>d</sup> Based on CCME Guidelines for Agricultural Use (Irrigation).

<sup>e</sup> Based on CCME Manganese variable calculation ([https://ccme.ca/en/chemical/129#\\_aqf\\_fresh\\_concentration](https://ccme.ca/en/chemical/129#_aqf_fresh_concentration)) using 2016 avg. water hardness (as CaCO<sub>3</sub>) and avg. pH

<sup>f</sup> Based on 2016 avg. water hardness (as CaCO<sub>3</sub>), avg. pH, and avg. DOC with CCME equation

A forward slash (/) indicates an absence of data or guidelines.

## LONG TERM TRENDS

Trend analysis was conducted on the parameters total phosphorus (TP), chlorophyll-*a*, total dissolved solids (TDS), and Secchi depth to look for changes over time in Chestermere Lake. In sum, a decreasing trend was detected for TP. No significant trend was detected for chlorophyll-*a*, TDS, or Secchi depth. Note that TDS was not collected at Chestermere Lake until 1999. Data is presented below as both line and box-and-whisker plots. Detailed methods are available in the [ALMS Guide to Trend Analysis on Alberta Lakes](#).

Table 4. Summary table of trend analysis on Chestermere Lake Lake data from 1983 to 2024.

Parameter	Date Range	Direction of Significant Change
Total Phosphorus	1983-2024	Decreasing
Chlorophyll- <i>a</i>	1983-2024	No Change
Total Dissolved Solids	1999-2024	No Change
Secchi Depth	1983-2024	No Change

## Definitions

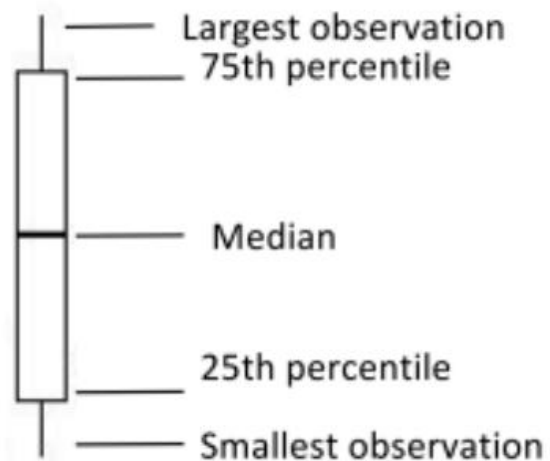
**Median:** the value in a range of ordered numbers that falls in the middle.

**Trend:** a general direction in which something is changing.

**Monotonic trend:** a gradual change in a single direction.

**Statistically significant:** The likelihood that a relationship between variables is caused by something other than random chance. This is indicated by a *p*-value of <0.05. **Variability:** the extent by which data is inconsistent or scattered.

**Box and Whisker Plot:** a box-and-whisker plot, or boxplot, is a way of displaying all of our annual data. The median splits the data in half. The 75th percentile is the upper quartile of the data, and the 25th percentile is the lower quartile of the data. The top and bottom points are the largest and smallest observations.



## Total Phosphorus (TP)

Trend analysis of TP over time suggests it has significantly decreased in Chestermere Lake since 1983 (Tau = -0.5991,  $p < 0.001$ ).

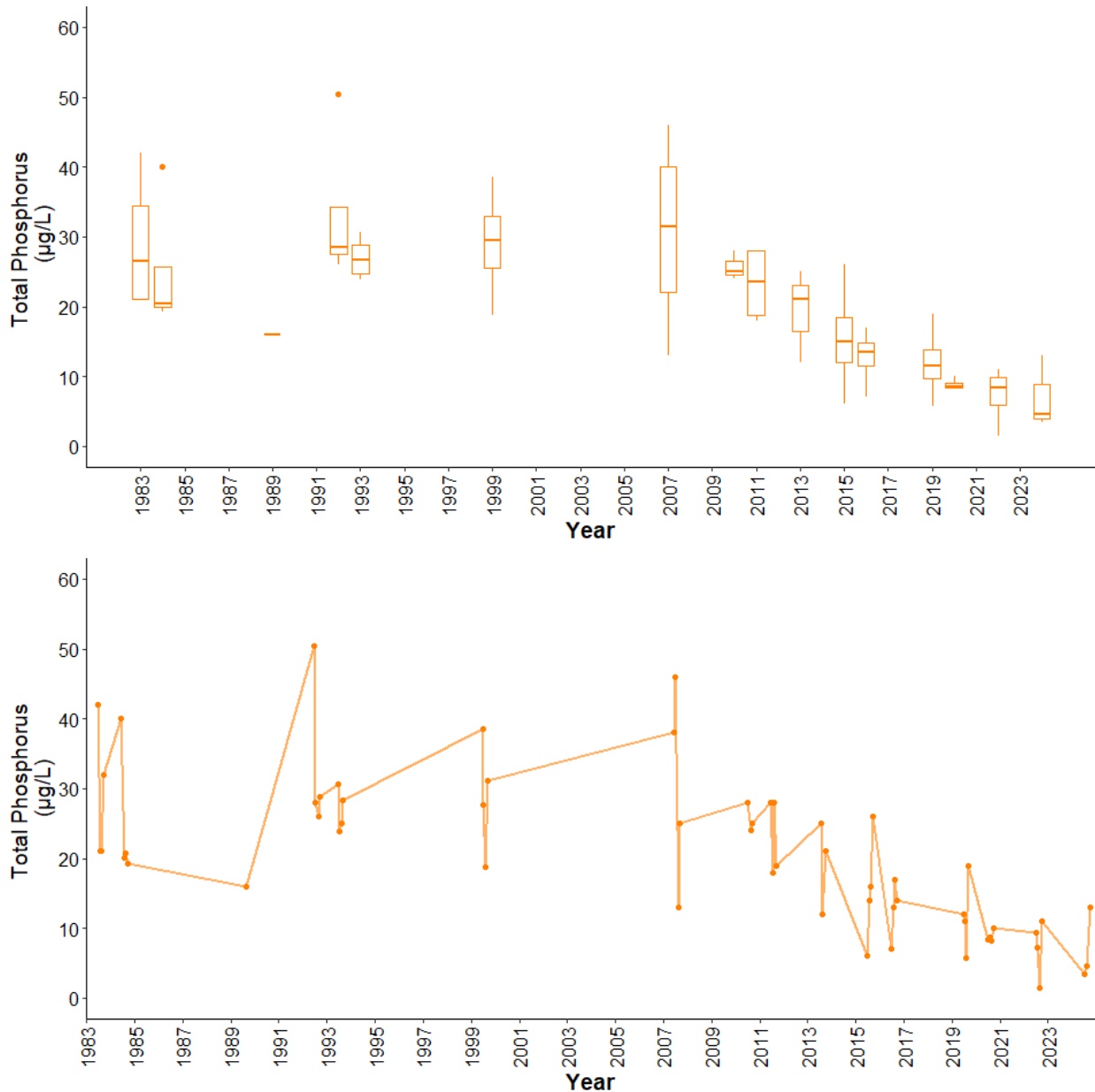


Figure 7. Monthly total phosphorus (TP) concentrations measured between June and September over the long term sampling dates between 1983 and 2024 (n = 58). The value closest to the 15<sup>th</sup> day of the month was chosen to represent the monthly value in cases with multiple monthly samples.

## Chlorophyll-*a*

Trend analysis of chlorophyll-*a* over time suggests it has not significantly changed at Chestermere Lake from 1983 (Tau = 0.072,  $p = 0.4924$ ).

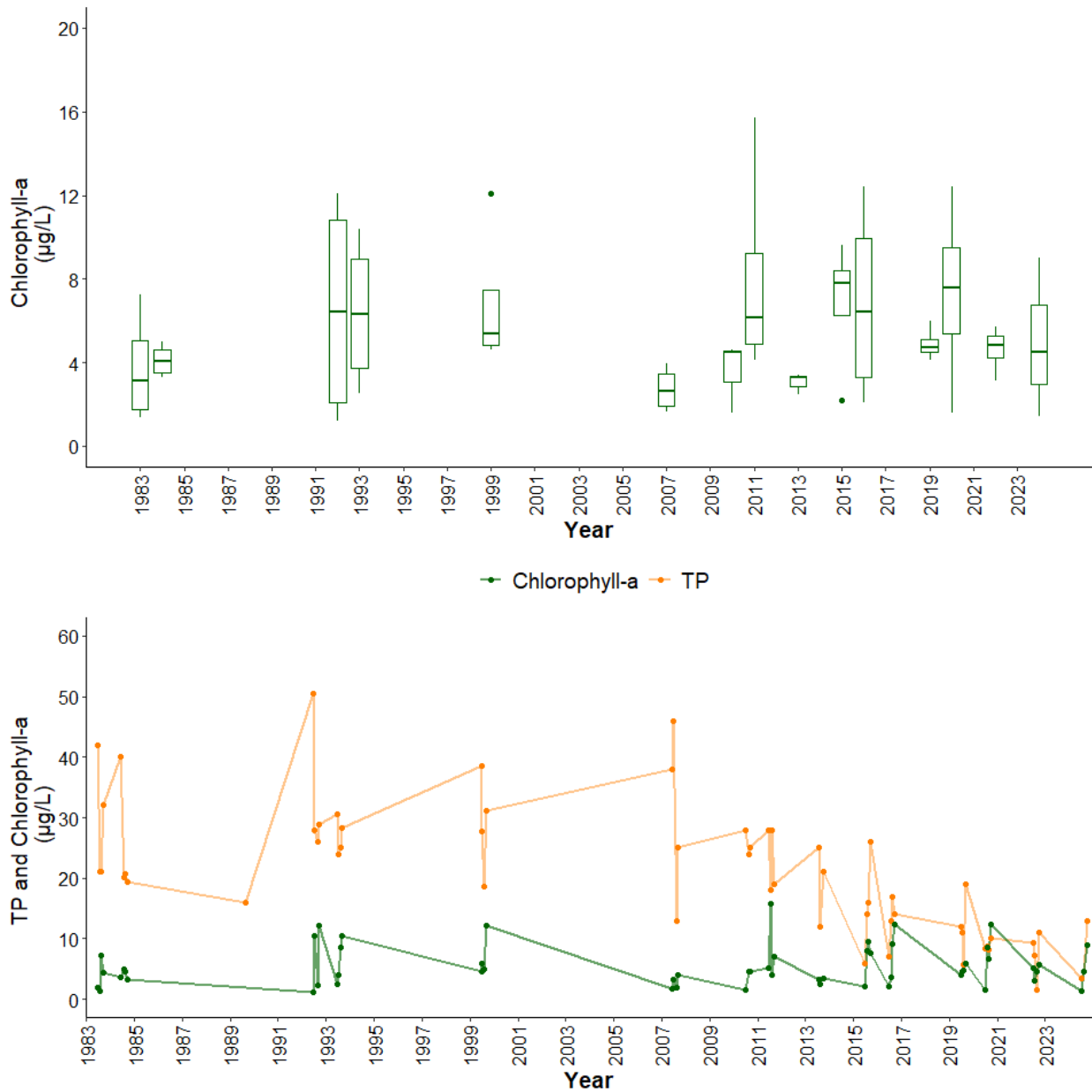


Figure 8. Monthly chlorophyll-*a* concentrations measured between June and September over the long term sampling dates between 1983 and 2024 ( $n = 57$ ). The value closest to the 15<sup>th</sup> day of the month was chosen to represent the monthly value in cases with multiple monthly samples. Line graph is overlain by TP concentrations.

## Total Dissolved Solids (TDS)

Trend analysis of TDS suggests it has not significantly changed in Chestermere Lake since 1999 (Tau = 0.0163,  $p = 0.8865$ ).

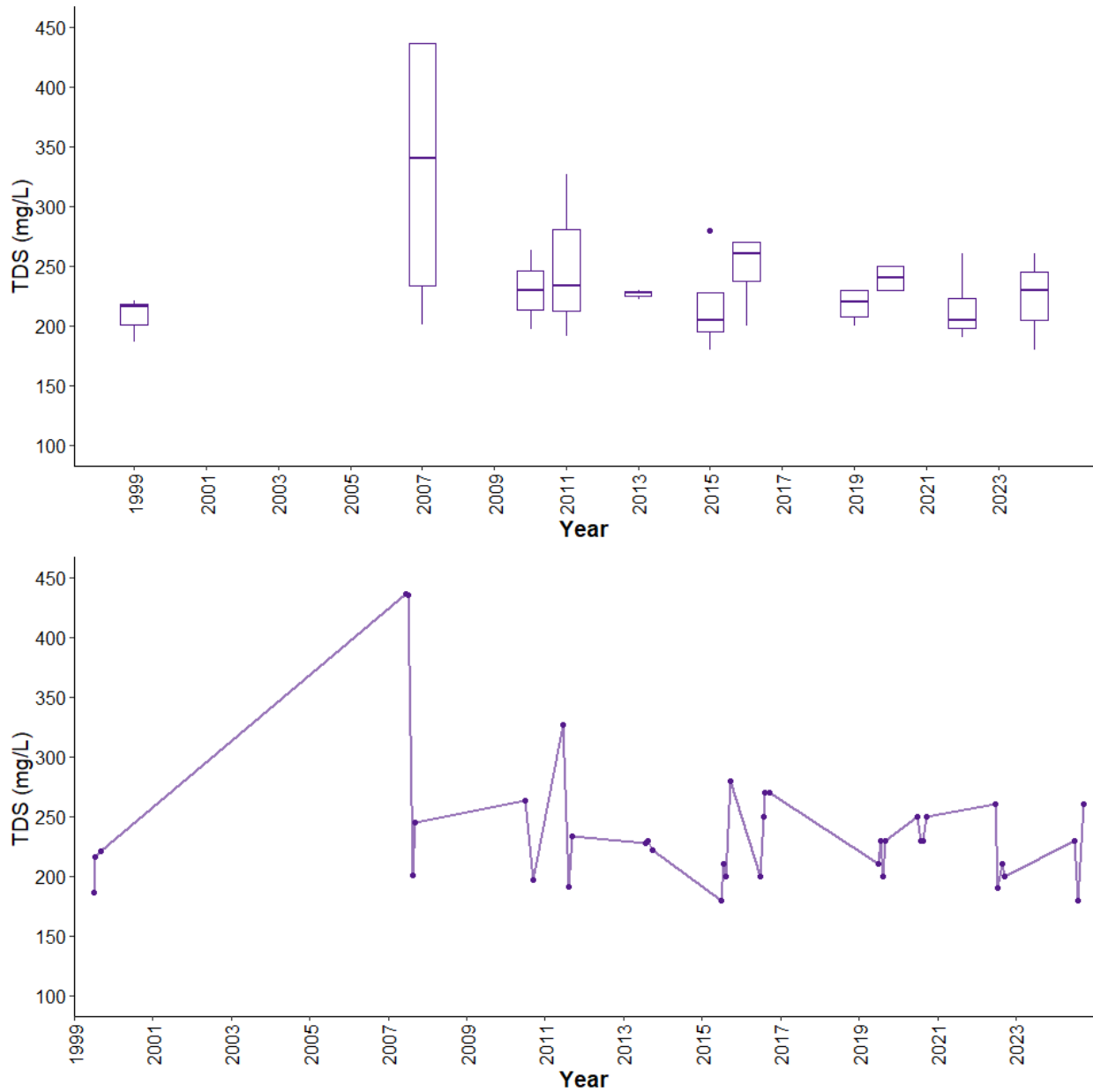


Figure 9. Monthly TDS values measured between June and September over the long term sampling dates between 1983 and 2024 ( $n = 38$ ). The value closest to the 15<sup>th</sup> day of the month was chosen to represent the monthly value in cases with multiple monthly samples.

Although no significant increasing trend was detected for TDS in Chestermere Lake, exploring the specific major ions that influence TDS can give us more information about the lake (Figure 10).

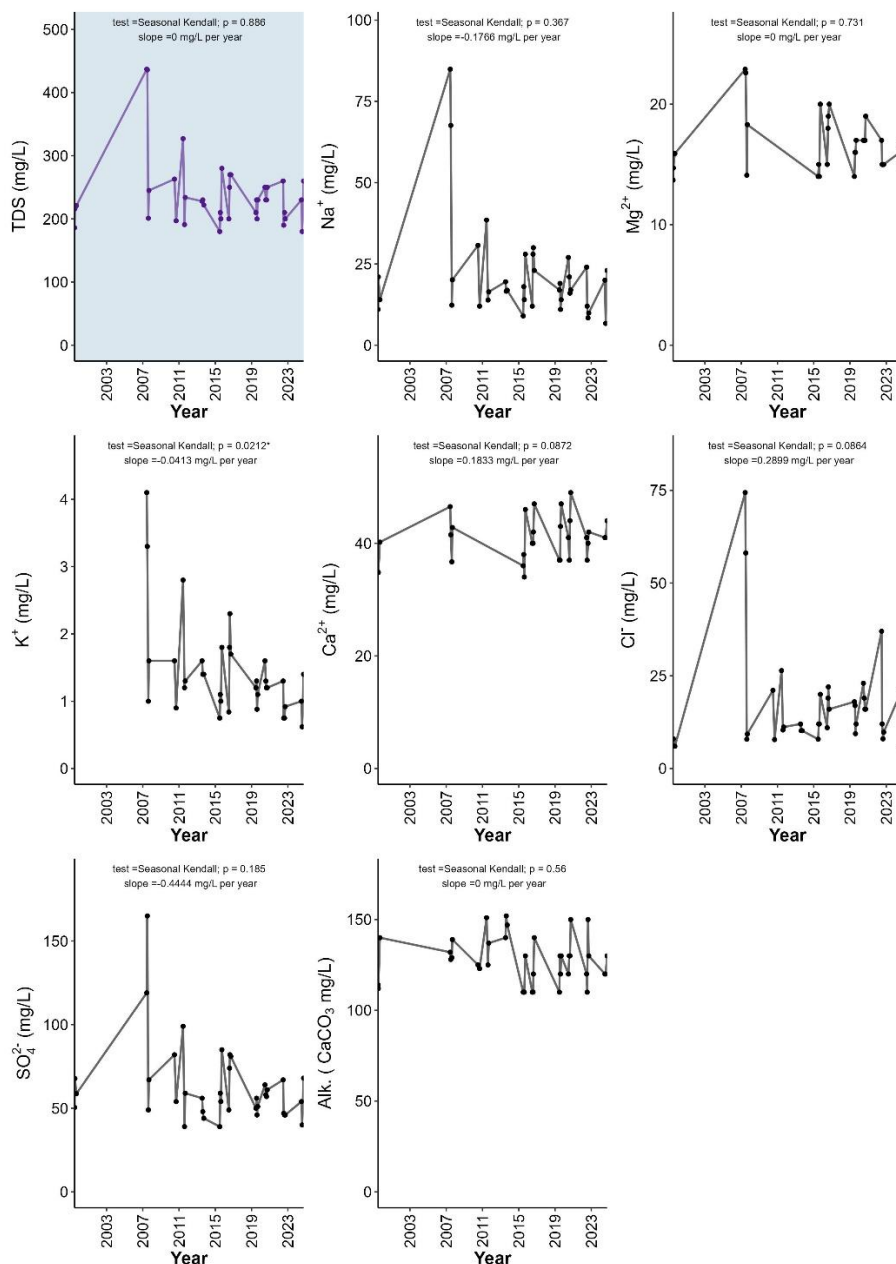


Figure 10. Concentrations of TDS (top left, blue panel), major ions (sodium = Na<sup>+</sup>, magnesium = Mg<sup>2+</sup>, potassium = K<sup>+</sup>, calcium = Ca<sup>2+</sup>, chloride = Cl<sup>-</sup>, sulphate = SO<sub>4</sub><sup>2-</sup>), and total alkalinity (Alk., as mg/L CaCO<sub>3</sub>) measured monthly between June and September on sampling dates between 1983 and 2024. Also represented is the monotonic trend results for each parameter; test used (MK = Mann Kendall, SK = Seasonal Kendall), significance of test ( $p$ ; assessed as significance when  $p < 0.05$ , marked with '\*' if significant), and the slope of the trend. Test selection follows method outline in the ALMS Guide to Trend Analysis on Alberta Lakes. Note that some ions had insufficient data (I.D.) therefore trends were not calculated. The value closest to the 15<sup>th</sup> day of the month was chosen to represent the monthly value in cases with multiple monthly samples.

## Secchi Depth

Trend analysis of Secchi depth suggests it has not significantly changed in Chestermere Lake since 1983 (Tau = -0.0818,  $p = 0.3280$ ).

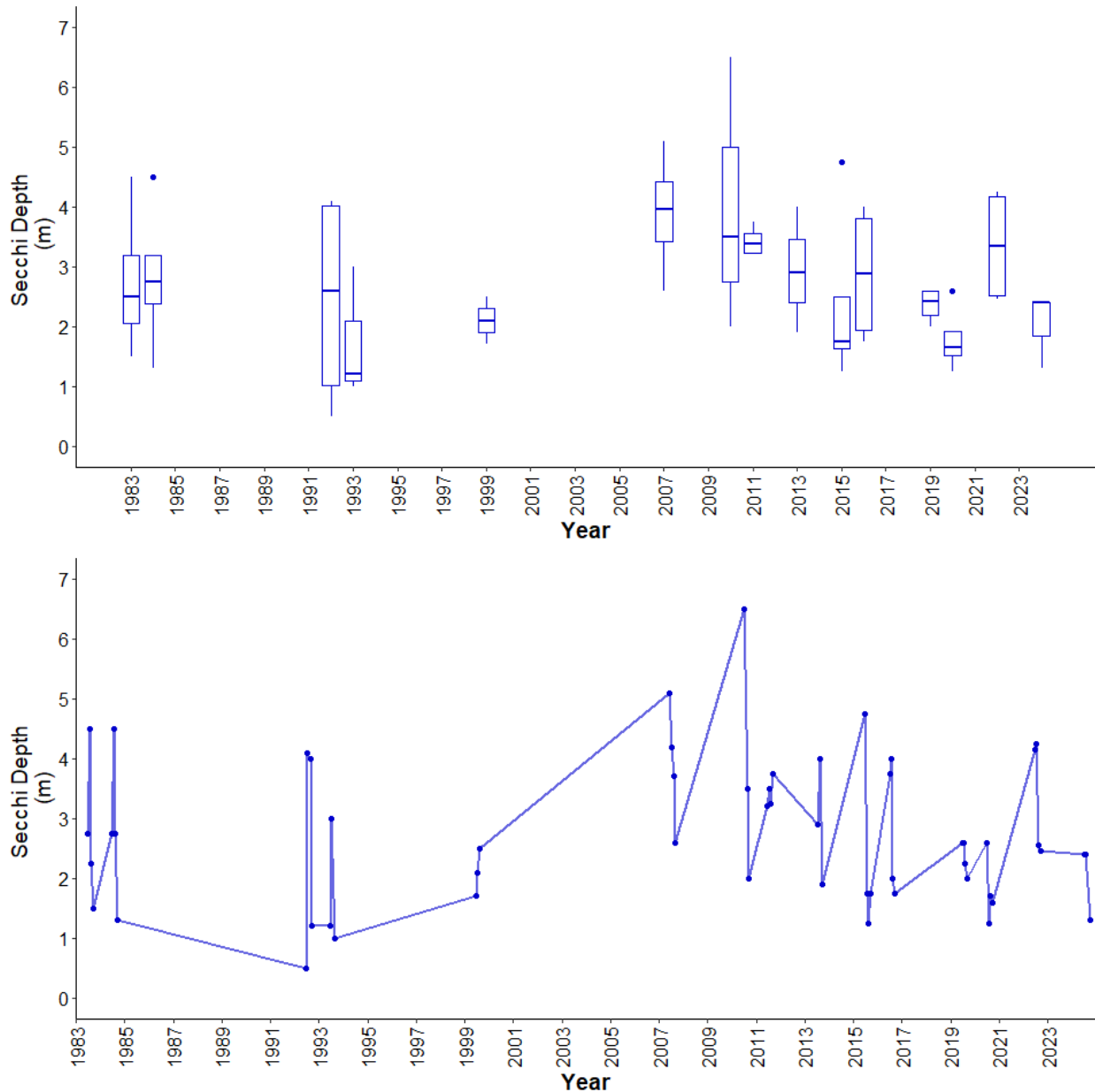


Figure 11. Monthly Secchi depth values measured between June and September over the long term sampling dates between 1983 and 2024 ( $n = 55$ ). The value closest to the 15<sup>th</sup> day of the month was chosen to represent the monthly value in cases with multiple monthly samples.

Table 5. Results of trend tests using total phosphorus (TP), chlorophyll-*a*, total dissolved solids (TDS), and Secchi depth data from June to September for sampled years from 1983-2024 on Chestermere Lake data.

Definition	Unit	Total Phosphorus (TP)	Chlorophyll- <i>a</i>	Total Dissolved Solids (TDS)	Secchi Depth
Statistical Method	-	Seasonal Kendall	Seasonal Kendall	Seasonal Kendall	Seasonal Kendall
The strength and direction (+ or -) of the trend between -1 and 1	Tau	-0.5991	0.072	0.0163	-0.0818
The extent of the trend	Slope (units per Year)	-0.6024	0.0107	0	-0.01
The statistic used to find significance of the trend	Z	-6.0559	0.6864	0.1427	-0.9782
Number of samples included	n	58	57	38	55
The significance of the trend	<i>p</i>	1.4e-09*	0.4924	0.8865	0.3280

\**p* < 0.05 is significant within 95%