Surface Water and Sediment Quality Monitoring

2023 Report

Prepared for: Veolia Waste Services Alberta Inc.

March 26, 2024

CPP ENVIRONMENTAL | Charette Pell Poscente

PROFESSIONAL SIGNOFF

This report was prepared exclusively for the client by CPP Environmental. The quality of the information, conclusions, and any estimates are based on information available at the time of the preparation of the report. This includes any data supplied by third party sources.

This report is to be used by the client for its identified intention, subject to any terms or agreements with CPP Environmental. Any other use of this report is at the users own risk.

Prepared by: Serena Farrugia, B.Sc., B.I.T.

Review and signoff by: Théo Charette, M.Sc., P.Biol.

To the best of my knowledge and the best of my professional ability, recognizing reasonable standard of care expected of a professional doing this work, it is my professional opinion that all the information contained in this report is accurate and complete, and contains all the relevant information for the purposes of this project or application.

This report, including all attachments, data and supplemental information, were prepared by me or under my direct supervision and has been reviewed and accepted by me.

All the information submitted is, to the best of my knowledge, true, accurate, and complete.

EXECUTIVE SUMMARY

The Swan Hills Treatment Centre (SHTC) provides comprehensive treatment and disposal for hazardous waste. It is owned by the Alberta Government and operated by Veolia Waste Services Alberta Inc. under EPEA Approval No. 1744-03-00. Environmental monitoring began in 1985, two years before the SHTC was opened, and it has evolved into an extensive program that provides early detection of potential contaminants on an annual basis. The goal of the monitoring program is to track changes over time to ensure that any facility-related environmental impacts are detected and addressed in a timely manner. This document outlines the surface water and sediment monitoring program conducted by CPP Environmental in mid-September of 2023.

Surface Water Monitoring

Surface water quality (i.e., that of lakes and streams) near the SHTC is important for both human health and the integrity of aquatic ecosystems. The surface water monitoring program evaluates spatial and temporal patterns in water quality relative to the SHTC. In 2023, monitoring occurred at one river (Coutts River) and two lakes (Edith Lake and Chrystina Lake) as part of the regulatory environmental monitoring program. The Coutts River and Chrystina Lake monitoring stations are located downgradient and downwind of the SHTC. Specifically, the Coutts River station (S5A) is approximately 5.0 km southeast of the SHTC, while the Chrystina Lake station (S12) is approximately 1.5 km northeast of the SHTC. Edith Lake is the background reference lake for the surface water monitoring program and is situated upwind and up-gradient from the SHTC, approximately 15 km from the facility.

Over 60 water quality parameters were measured in water samples collected from the Coutts River and the two lakes, including routine, nutrient, biological, and metal parameters. Due to low flow, hydrometric measurements were not collected at the time of sampling for any site. For each of the surface water quality parameters measured at each monitoring site, summary statistics were calculated to place the 2023 measurements in historical context (where adequate data were available). Values that were high relative to historic measurements were flagged. Measurements from 2023 were also compared to the *Alberta Surface Water Quality Guidelines for the Protection of Aquatic Life* (PAL; where applicable) and exceedances were noted and described. Finally, non-parametric monotonic trend analysis was conducted on parameters with at least 8 years of data and with fewer than 50% of those measurements being censored. The Mann-Kendall test was used to assess whether water quality parameters significantly increased, decreased, or lacked a distinct pattern over time. In 2023, a “moving window” trend analysis approach was implemented, where only the 10 most recent observations were included in the analysis to ensure that any trends detected are representative of current conditions.

A summary of historical range and regulatory guideline exceedances, as well as significant water quality trends, is outlined in **Table i**. Based on the 2023 monitoring results, surface water quality near the SHTC is largely comparable to historical conditions observed in the Coutts River, Chrystina Lake, and Edith Lake. The Coutts River had 1 parameter above historical conditions (silicon), Chrystina Lake had 2 parameters above historical conditions (hardness and total manganese), and Edith Lake had 7 parameters above historical conditions (hardness, dissolved calcium, chlorophyll-a, total barium, total calcium, total iron, and total manganese). PAL guidelines were met for all parameters, except total alkalinity and pH in Edith Lake and Chrystina Lake; and dissolved iron and total lead in the Coutts River (which was above guidelines). The low alkalinity value reflects the naturally low buffering capacity in the lakes, and the guidelines only apply if natural conditions are not normally low. Dissolved iron values are consistent with historical results for the Coutts

River. There is a decreasing trend for pH at Chrystina Lake; decreasing phosphorus and total organic carbon for Coutts River; decreasing total organic carbon in Edith Lake; increasing trends for total potassium, manganese, and chlorophyll-a in Edith Lake; and increasing total barium, sodium, strontium, and chlorophyll-a in Chrystina Lake. There are no guidelines for any of these parameters, except for pH. Since pH is decreasing at a test site (Chrystina Lake), and since pH can affect the toxicity of certain metals, it is worth exploring these trends more closely (see Recommendations section in this report).

Sediment Monitoring

Sediment quality in waterbodies near the SHTC is an important indicator of both current environmental conditions affecting aquatic biota and of cumulative pollutant deposition. The sediment monitoring program evaluates spatial and temporal patterns in water quality relative to the SHTC, with stream stations being monitored annually and lake stations monitored biannually. In 2023, sediment samples were collected from two streambed sites (Coutts River (S5A) and S6) and two lake sites (Edith Lake and Chrystina Lake (S12)) as part of the regulatory environmental monitoring program. Over 300 sediment quality parameters were measured, including nutrient, metal, and organic parameters. S6 is located approximately 700 m southwest of the SHTC and is along an unnamed tributary of the Coutts River. This tributary discharges into the main stem of the Coutts River downstream of S5A (Coutts River); thus, the two stations do not influence each other. The Edith Lake, Chrystina Lake (S12) and Coutts River (S5A) monitoring stations are as described above.

Similar to the surface water quality monitoring program, summary statistics were calculated for each sediment parameter at each site to place the 2023 measurements in historical context (where adequate data were available). Values that were high relative to historic measurements were flagged. Measurements from 2023 were also compared to *CCME Sediment Quality Guidelines for the Protection of Aquatic Life* (PAL; where available) and exceedances were noted and described. Finally, non-parametric monotonic trend analysis was conducted on parameters with at least 8 years of data and with fewer than 50% of those measurements being censored. The Mann-Kendall test was used to assess whether sediment quality parameters significantly increased, decreased, or lacked a distinct pattern over time. As with the surface water quality analysis, in 2021 a 10 year “moving window” trend analysis approach was implemented, highlighting contemporary trends in sediment quality instead of being driven by historically high values.

A summary of historical range and regulatory guideline exceedances, as well as significant sediment quality trends, is outlined in **Table ii**. Generally, sediment quality near the SHTC has not significantly changed, and is comparable to historical conditions observed in Chrystina Lake, Edith Lake, and the Coutts River (metals were only historically high at the reference site S6). The PCB TEQ was historically high at the Coutts River, but it is based on relatively few samples (9) taken in more recent years. Interim Sediment Quality Guideline (ISQG) exceedances were documented for arsenic at Chrystina Lake and S6; nickel at Chrystina Lake and Edith Lake, and manganese at Edith Lake and S6. Total PCBs remained unchanged at all four sites – likely because the historically high PCB values occurred several decades ago and the moving window trend analysis is now capturing baseline values. No significant trends in PCB or PCDD/F Toxic Equivalents (TEQs) occurred at any sites; however, PCDD/F TEQs exceeded the respective ISQG at Chrystina Lake and Edith Lakes, as has been the case for much of the data record. Exceedances occurred in both test and reference sites.

EXECUTIVE SUMMARY

Table i: 2023 surface water quality summary, including historically high values in 2023, regulatory guideline exceedances (AB chronic surface water quality guidelines, 2018), and significant (α = 0.1) water quality trends over 10 years for each of three monitoring sites.

	Above Historical Range			Exceeding Regulatory Guidelines			Mann-Kendall Trends		
Parameter	Chrystina L (S12)	Edith L	Coutts R (S5A)	Chrystina L (S12)	Edith L	Coutts R (S5A)	Chrystina L (S12)	Edith L	Coutts R (S5A)
Alkalinity, as CaCO3	-	-	-	**Below**	**Below**	-	NS	NS	NS
Aluminum, total	-	-	-	-	-	-	NS	NS	NS
Arsenic, total	-	-	-	-	-	-	NS	NS	NS
Barium, total	-	**Yes**	-	-	-	-	**Up**	NS	NS
Bicarbonate, diss	-	-	-	-	-	-	NS	NS	NS
Calcium, diss	-	**Yes**	-	-	-	-	NS	NS	NS
Calcium, total	-	**Yes**	-	-	-	-	NS	NS	NS
Chloride, diss	-	-	-	-	-	-	ID	ID	NS
Chlorophyll-a	-	**Yes**	-	-	-	-	**Up**	**Up**	NS
Copper, total	-	-	-	-	-	-	NS	NS	NS
Electrical conductivity	-	-	-	-	-	-	NS	NS	NS
Hardness	**Yes**	**Yes**	-	-	-	-	NS	NS	NS
Iron, dissolved	-	-	-	-	-	**Above**	NS	NS	NS
Iron, total	-	**Yes**	-	-	-	-	NS	NS	NS
Kjeldahl nitrogen, total	-	-	-	-	-	-	NS	NS	NS
Lead, total	-	-	-	-	-	**Above**	NS	NS	NS
Magnesium, diss	-	-	-	-	-	-	NS	NS	NS
Manganese, total	**Yes**	**Yes**	-	-	-	-	NS	**Up**	NS
Mercury, total	-	-	-	-	-	-	ID	ID	NS
Nickel, total	-	-	-	-	-	-	ID	NS	NS
Organic carbon, total	-	-	-	-	-	-	NS	**Down**	**Down**
pH	-	-	-	**Below**	**Below**	-	**Down**	**Down**	NS
Phosphorous, total	-	-	-	-	-	-	ID	ID	**Down**
Potassium, diss	-	-	-	-	-	-	NS	ID	NS
Silicon, total	-	-	**Yes**	-	-	-	NS	NS	**Up**
Sodium, diss	-	-	-	-	-	-	NS	ID	NS
Strontium, total	-	-	-	-	-	-	**Up**	ID	NS
Sulphur, total	-	-	-	-	-	-	ID	NS	NS
Suspended solids, total	-	-	-	-	-	-	NS	NS	NS
Titanium, total	-	-	-	-	-	-	ID	ID	NS

Note: ID = insufficient data available for trend calculation, NS= non-significant trend.

Table ii: 2023 sediment quality monitoring program summary, including variables that were high in 2023 relative to historical levels, exceedances of regulatory guidelines (ISQG = interim sediment quality guidelines; CCME 2001c), and significant (α = 0.1) trends over 10 years.

Parameter	Above Historical Range				Exceeding Regulatory Guidelines				Mann-Kendall Trends			
	Chrystina L. (S12)	Edith L.	Coutts R. (S5A)	S6	Chrystina L. (S12)	Edith L.	Coutts R. (S5A)	S6	Chrystina L. (S12)	Edith L.	Coutts R. (S5A)	S6
Aluminum	-	-	-	-	-	-	-	-	NT	NT	NT	**Up**
Arsenic	-	-	-	-	**Above**	-	-	**Above**	**Up**	NT	NT	ID
Barium	-	-	-	-	-	-	-	-	NT	NT	NT	NT
Cadmium	-	-	-	-	-	-	-	-	NT	**Up**	NT	NT
Calcium	-	-	-	**Yes**	-	-	-	-	NT	NT	NT	ID
Chromium	-	-	-	-	-	-	-	-	NT	NT	NT	ID
Cobalt	-	-	-	-	-	-	-	-	**Up**	**Up**	NT	NT
Copper	-	-	-	-	-	-	-	-	NT	NT	NT	NT
Iron	-	-	-	**Yes**	-	-	-	-	NT	NT	NT	NT
Lead	-	-	-	-	-	-	-	-	NT	NT	NT	NT
Magnesium	-	-	-	-	-	-	-	-	NT	NT	NT	NT
Manganese	-	-	-	**Yes**	-	**Above**	-	**Above**	NT	NT	NT	NT
Mercury	-	-	-	-	-	-	-	-	NT	NT	NT	NT
Molybdenum	-	-	-	-	-	-	-	-	NT	NT	ID	ID
Nickel	-	-	-	-	**Above**	**Above**	-	-	NT	NT	NT	NT
Organic carbon, total	-	-	-	**Yes**	-	-	-	-	NT	NT	NT	NT
PCB TEQ	-	-	**Yes**	-	-	-	-	-	ID	ID	NT	ID
PCBs, Total	-	-	-	-	-	-	-	-	NT	NT	NT	NT
PCDD/F TEQ	-	-	-	-	**Above**	**Above**	-	-	NT	NT	NT	NT
Phosphorus	-	-	-	**Yes**	-	-	-	-	NT	NT	NT	NT
Potassium	-	-	-	-	-	-	-	-	NT	NT	NT	NT
Sodium	-	-	-	-	-	-	-	-	**Down**	NT	NT	ID
Strontium	-	-	-	**Yes**	-	-	-	-	NT	NT	NT	ID
Sulphur	-	-	-	**Yes**	-	-	-	-	NT	NT	NT	ID
Uranium	-	-	-	-	-	-	-	-	NT	NT	NT	**Down**
Vanadium	-	-	-	-	-	-	-	-	**Up**	NT	NT	NT
Zinc	-	-	-	-	-	-	-	-	**Up**	**Up**	NT	NT

Note: ID = insufficient data available for trend calculation, NT= Non-significant trend.

CONTENTS

CONTENTS

List of Tables

List of Figures

List of Appendices

1 Introduction

The Swan Hills Treatment Centre (SHTC) provides comprehensive treatment and disposal for hazardous waste. It is owned by the Alberta Government and operated by Veolia Waste Services Alberta Inc. Since operations began in 1987, the SHTC has safely processed more than 500,000 tonnes of hazardous waste. Environmental monitoring began in 1985, two years before the SHTC was opened, establishing a baseline or pre-operation conditions for the environmental monitoring program. This program has evolved into an extensive environmental monitoring program that provides early detection of potential contaminants on an annual basis. The SHTC currently operates under EPEA Approval No. 1744-03-00.

The goal of the monitoring program is to track changes over time to ensure that any facility-related impacts are detected and addressed in a timely manner. This document outlines the water monitoring program conducted by CPP Environmental in 2023. In this report, two specific objectives are addressed, as follows:

- Evaluate the potential exposure of aquatic organisms to organic and inorganic compounds via surface water/sediments (i.e., guideline comparisons, and comparing up- and down-gradient sites); and
- Determine if SHTC plant operations have caused changes in water quality (i.e., trend analysis, and comparison of current values to historical ranges).

2 Project Location

The Swan Hills Treatment Center (SHTC) is located approximately 13.5 km northeast of the town of Swan Hills (**Figure 1**). The legal land description of the site is W½ 06-067-08 W5M. The SHTC is in the Upper Foothills Natural Subregion within the Athabasca River watershed. There is considerable human activity in the surrounding landscape (**Figure 1**), with local land uses including oil and gas, forestry, and recreation activities. Four sampling stations are included in the surface water and sediment monitoring program: Chrystina Lake, Edith Lake, S5A, and S6. S5A and Chrystina Lakes were selected as “test” sites by previous monitoring initiatives because these waterbodies were documented to be downgradient and downwind of the SHTC. Conversely Edith Lake and S6 were selected to be “reference” sites because they were documented to be located both upgradient and upwind of the SHTC.

2.1 Stream Station S5A

Station S5A is located approximately 5 km southeast and downwind of the SHTC on the Coutts River. Coutts River originates at Chrystina Lake and flows in a southeast direction, which eventually curves north and discharges into the Saulteaux River. Station S5 (now S5A) was moved in 2012 as a replacement for S5 due to flooding from a beaver dam. The Coutts River has been monitored since 1985.

2.2 Stream Station S6

Station S6 is located on an unnamed creek approximately 700 m southwest and upwind of the SHTC. The creek flows for approximately 7 km before discharging to the Coutts River. The confluence (discharge point) with the Coutts River is approximately 1 km downstream of station S5A. Thus, the two stations do not influence each other. This station has been monitored since 1987.

2.3 Chrystina Lake Station

Chrystina Lake (or station S12) is located approximately 1.5 km northeast of the SHTC. Access to the lake is from a gravel road spur off Hwy 33 leading to the SHTC. Chrystina Lake has no major streams flowing into it and the outflow, which feeds the Coutts River, is moderated by a flow control structure. Chrystina Lake has a surface area of 0.49 km^2, a watershed area of 1.6 km^2, a maximum depth of 10 m and a mean depth of 3.2 m. Chrystina Lake has been monitored since 1991.

2.4 Edith Lake Station

Edith Lake is located approximately 15 km west and upwind of the SHTC. Access to the lake is from a dirt road spur off Hwy 33 to the north of the Town of Swan Hills. Edith Lake has no major flows in or out of it. Edith Lake has a surface area of 0.26 km^2, a watershed area of 0.83 km^2, a maximum depth of 6.3 m and a mean depth of 2.6 m. Historically, Victor Lake was used as a reference station in 1997/1998, but due to access issues, it was replaced by Edith Lake in 1998.

3 Methods

The scope of the water and sediment monitoring program has varied over time. The current program focusses on late summer for two reasons: 1) to reduce the influence of flow on water chemistry; and 2) to capture sediments deposited during the summer season. Water sampling occurs annually at 3 stations: Coutts River (S5A), Chrystina Lake (S12), and Edith Lake. Sediment sampling occurs every other year at all stations (**Table 1**). CCME (2011) aquatic field sampling protocols were followed in 2023. A list of the sediment and water quality parameters measured is presented in **Appendix 1**.

3.1 Hydrology

A hydrograph of the Swan River near the Town of Swan Hills was generated to provide regional context regarding changes in local small rivers in 2023 (**Figure 2**). Generally, water levels and flow were tightly coupled with one another, and major changes in both occurred between late-May and late-June in response to spring freshet and summer precipitation events. Besides an increase in both flow and water levels in late July, these metrics remained at consistently low levels for the remainder of the recording period. It is expected that the monitored waterbodies of interest (e.g., the Coutts River) had similar hydrological patterns during 2023.

Water quality parameters in streams can be affected by the flow rate (Aroner, 2011). Stream flow measurement was attempted at S5A on September 18, 2023; however, flow velocities were too low to be measurable.

3.2 Water Quality

Surface water quality sampling was completed on September 18, 2023, for the Coutts River (S5A), and September 19, 2023, for Chrystina Lake (S12), and Edith Lake, as follows:

- Water samples were collected 30 cm below water surface into bottles supplied by Bureau Veritas Laboratories. Bottles were triple rinsed with sample water prior to collection (only when no

preservative was in the bottle) and samples were stored on ice in coolers and transported to Bureau Veritas Laboratories in Edmonton for routine, nutrient and metal analyses.

- Stream samples were collected from the Coutts River near shore in flowing water, approximately 50 m upstream of the access road.
- Lake samples were collected by boat at the deepest location of each lake.
- *In situ* water quality measurements of electrical conductivity, pH, temperature, and dissolved oxygen were taken using an In Situ Aquatroll multi-parameter sonde.

3.3 Sediment Quality

Sediment sampling was completed September 18, 2023, for the Coutts River (S5A); September 19, 2023 for Chrystina Lake (S12), and Edith Lake; and September 20, 2023 for S6 as follows:

- In river/stream sites, prior to sampling sites were walked to identify depositional pools in which to take the sample. A hand suction corer was used to collect approximately 20 short cores (approx. 20 cm each) of the sediment at multiple locations in the depositional pools, moving in an upstream direction.
- Each core was extruded, and the top 1 cm of sediment (representing recent deposition) was collected and pooled in a glass container.
- Pooled samples were transferred to jars supplied by the labs. Samples were stored on ice in coolers and transported to Bureau Veritas Laboratories and ALS Environmental in Edmonton for analysis of inorganic and organic components, respectively.

3.4 Quality Assurance and Quality Control

Our QA/QC program is consistent with standard protocols (AENV, 2006; CCME, 2011), where the total number of QA/QC samples represent a minimum of 10% of the total number of samples. The QA/QC program included:

- Standard laboratory QA/QC procedures completed by Bureau Veritas.
- A field duplicate water sample was taken from Coutts River (S5A) but disguised as “Bear River”. These duplicates were used to compare results from 2 samples from the same site to determine the variability in field protocols and laboratory tests. If results from the two samples are very similar, then sampling techniques are consistent from one sampling event to the next. The duplicate samples were sent to Bureau Veritas Laboratories for routine and metal analysis along with the original samples.
- A field blank prepared in the field using laboratory-supplied deionized water that is poured in the field and disguised as a water sample. This field blank is used to determine if contamination occurred during field sampling since results should be undetectable across the board. The field blank was sent to Bureau Veritas Laboratories for routine analysis.
- A trip blank was prepared by Bureau Veritas Laboratories and travelled with the sample bottles from the laboratory to the sample site and then back to the lab without being opened for routine analysis. Trip blanks indicate contamination within the bottle or from volatile compounds (AENV, 2006).

3.5 Data Analysis

We implemented the following analytical approach to address project objectives (see Section 1):

1. Prior to analysis, data were filtered so that the input files contained one value per site per year in late summer (August-October). Variables where greater than 50% of the dataset was censored (i.e., values were below the Method Detection Limit, or MDL) were excluded from trend analysis. For variables where less than 50% of the dataset was censored, the censored data were substituted with ½ of the MDL. If the dataset had multiple MDLs, we substituted all values below the highest MDL to ½ of the highest MDL to remain conservative and prevent the detection of false trends. Finally, variables that had over 50% missing values were excluded from trend analysis.
2. Summary statistics were calculated for historical data spanning 1985 to 2022, including 5th, 10th, 25th, 50th (median), 75th, 90th, and 95th percentiles for each variable. 2023 water quality values that were higher than the 1985-2022 95th percentiles were flagged as being high relative to the historical data. Parameters that were flagged were discussed in the context of water quality guidelines and trend analysis, as follows. Where censored values existed, these were replaced with ½ of their respective MDL to permit calculation of summary statistics; however, if more than 50% of the dataset was censored, summary statistics were not calculated for that variable. Additionally, summary statistics were only calculated for variables that met a minimum sample size criterion of 10 observation years (inclusive of 2022, or 8 years if all values were not censored).
3. To determine if there were changes in constituents over time, non-parametric trend analysis was conducted on variables with eight or more years of data available, as per Aroner (2011). The Mann-Kendall test was used on late summer data, representing low flow conditions, using the statistical software R v. 4.1.2 (R Core Team, 2021) and the "trend" analysis package v. 1.1.4 (Pohlert, 2020). A "moving window" method was used in 2023, wherein only the 10 most recent observations of a variable were included in the trend analyses (rather than the entire data record). The moving window approach focuses the analyses on current conditions and trends, rather than having historic values skew the analysis. Shaded regions on the trend plots indicates the 5-95th percentile range based on the moving window data subset rather than the 95th percentiles calculated using the entire variable data record (as described above). This was done to prevent excessive scaling of the vertical axes to accommodate historically high values that would impede render the plot illegible. For each site, the significance of trends over time (increasing or decreasing, assessed at 90% significance level) was calculated for each water or sediment quality variable and plotted with the estimated Sen's slope (see **Appendix 3**).
4. To evaluate the potential exposure of aquatic organisms to organic and inorganic constituents, water quality and sediment data were compared to provincial surface water quality guidelines (Government of Alberta, 2018) and federal sediment quality guidelines (CCME, 2001c) for the protection of aquatic life (PAL). Any exceedances were described and put into regional and historical context.
5. Toxic equivalency values for fish (TEQ_{fish}) were calculated for polychlorinated dibenzo-*p*-dioxin and -furan (PCDD/F) and polychlorinated biphenyl (PCB) sediment data to assess the potential toxicity of sediments to aquatic life. Briefly, the detected concentrations of each of 17 dioxin and furan congeners that have chlorine atoms attached in at least the 2, 3, 7, and 8 lateral positions of their chemical structure, as well as 12 dioxin-like PCBs, were multiplied by a Toxic Equivalency Factor (TEF) and summed to produce the PCDD/F and PCB $TEQf_{ish}$ values. TEFs expresses the toxicity of each compound relative to that of 2,3,7,8-TCDD, and follow the values assigned for fish by Van den Berg et al. (1998). Censored values (i.e., below the MDL) were replaced with ½ MDL prior to calculating TEQs (the "midpoint" approach), and years where any of the requisite variables required to calculate the TEQ were absent in the database censored were excluded from trend analysis.

Lastly, we compared TEQ values for both PCDD/Fs and PCBs to their respective freshwater interim sediment quality guidelines and probable effect levels (CCME, 2001a, b).

Other methods typically employed to determine the effects of pollution on the environment are not applicable to the dataset available through this project. For example, a “Before and After” study design can be used where pre- and post- operation data exist, or a “Reference Condition Approach” can be used when a population of reference sites is used as a comparison point to “test” sites. The dataset available to this study consists of two years of pre-operational data (1985-1987) at one site (S5A). This pre-operational data is difficult to compare to post-operational data since methods and measured parameters have changed over time. For instance, sediment quality and flow are not available in the pre-operational dataset. In addition, two years of pre-operational data at one site are insufficient to create a statistically representative population against which to compare effects.

4 Results and Discussion

4.1 Surface Water Quality

An examination of the field blank laboratory results (**Appendix 4**) indicates that all routine and metal parameters were below detection limits, except for aluminum, zinc, total alkalinity, and bicarbonate which were slightly above the detection limit.

The S5A and Bear River (duplicate) samples had comparable – if not identical – values for most assessed parameters. Relative Percent Difference Analysis (RPD) revealed 5 variables with a RPD > 30%: dissolved manganese (0.0065 mg/L in S5A vs 0.012 mg/L in Bear River sample), lead (0.007 mg/L vs 0.002 mg/L), total magnesium (0.007 mg/L vs 0.0002 mg/L), sulphur (<1.0 mg/L vs 4.6 mg/L), and phosphorus (0.034 mg/L vs 0.02 mg/L). However, in general, comparison of the two samples indicates reasonably consistent results.

4.1.1 Historical Water Data Comparison

4.1.1.1 Routine and Nutrients

The concentrations of the following routine and nutrient parameters exceeded the 95th percentile of historical data in 2023 (**Table 2**):

- Chrystina Lake: hardness.
- Edith Lake: hardness, calcium, and chlorophyll-a.

Chlorophyll-a was historically high at Edith Lake, which may be driven by nutrient (N and/or P) or climate (temperature, sunlight) dynamics. Nutrients do not appear to be higher than in past years, thus a climatic effect may have been at play in 2023. Although hardness is historically high in Chrystina and Edith Lakes, values are low relative to other lakes in Alberta.

4.1.1.2 Metals

The concentrations of the following metal parameters exceeded the 95th percentile of historical data and are thus considered to be high in 2023 (**Table 3**):

- Chrystina Lake: total manganese
- Edith Lake: barium, calcium, total iron, and total manganese

- S5A: silicon

In general, very few metals were historically high in 2023. Most of the historically high values were in the reference site (Edith Lake). Also, these constituents are relatively benign, as per the lack of guidelines.

4.1.2 Water Quality Guidelines Comparison

4.1.2.1 Routine and Nutrients

The following routine or nutrient parameters do not meet the relevant surface water quality PAL guidelines (where applicable) in 2023 (**Table 4**):

- Chrystina Lake: total alkalinity (as $CaCO_3$) and pH (below minimum guideline)
- Edith Lake: total alkalinity ($CaCO_3$) and pH (below minimum guideline)

Total alkalinity was measured as being below the minimum water quality guideline at Edith Lake and Chrystina Lake; however, the provincial guidelines indicate that the 20 mg/L guideline does not apply if natural conditions are less than this. These results align with the fact that Edith Lake is surrounded by peatlands, which are naturally acidic.

4.1.2.2 Metals

The following metal parameters have exceeded the relevant surface water quality PAL guidelines (where applicable) in 2023 (**Table 5**):

- S5A: dissolved iron and total lead

The dissolved iron exceedance at S5A is not out of the ordinary, since it is within the historical range and the 2023 value is below the historical median for this site (**Table 3**). Iron is a major element in soil and is naturally elevated in the Alberta geology, and surface water samples frequently exceed guidelines. Over the past ten years, only one dissolved iron measurement at S5A did not exceed the guideline.

Total lead has only been detected 3 times at S5A over 27 years and was not detected in the blind duplicate (Bear River). Thus, the exceedance may be related to a laboratory issue.

4.1.3 Water Trends

4.1.3.1 Routine and Nutrients

Routine and nutrient parameters have largely remained consistent over the past ten years at Edith and Chrystina Lakes and S5A (**Table 4**; **Appendix 2** and **3**). However, the following parameters had a significant (α = 0.1) trend:

- Chrystina Lake: Increasing trend in chlorophyll-a, and decreasing trend in lab measured pH and field-measured EC.
- Edith Lake: Increasing trend in chlorophyll-a, and decreasing trend in total organic carbon and field-measured EC.
- S5A: Increasing trend in field-measured pH and decreasing trend in total phosphorus and total organic carbon (TOC).

Field-measured pH appears to be increasing at S5A, though no trend is evident for lab-measured pH (**Appendix 2, 3**). Given the higher precision of lab measurements, and the sporadic field measurement records (several years of data are missing), we recommend interpreting pH trends from the lab measurements as opposed to the same parameters measured in the field. Of the parameters with increasing trends, chlorophyll-a in Edith Lake was high relative to historical values (**Table 2**). The lab measured pH for Chrystina Lake was low relative to the 10-year moving window subset. There are no guidelines for any of these parameters, except for pH. Since pH is decreasing at a test site (Chrystina Lake), and since pH can affect the toxicity of certain metals, it is worth exploring these trends more closely (see Recommendations section in this report).

4.1.3.2 Metals

Metal concentrations have largely remained consistent over the past ten years at Edith and Chrystina Lakes and S5A (**Table 5**; **Appendix 2** and **3**). However, the following metals had a significant (α = 0.1) trend:

- Chrystina Lake: Increasing trend in barium, sodium, and strontium (total).
- Edith Lake: Increasing trend in manganese and potassium (total).
- S5A: Increasing trend in silicon.

Edith Lake is a reference site and thus would not be under the influence of the SHTC. The test sites (Chrystina Lake and S5A) had three increasing metal trends but only silicon at S5A was historically high (**Table 3**). As described above, silicon and potassium are relatively benign. Also, barium, sodium, and manganese do not have guidelines. The strontium levels in Chrystina Lake are below the federal environmental quality guidelines of 2.5 mg/L (Environment and Climate Change Canada, 2020). Surface water quality results do not appear out of the ordinary.

4.2 Sediment Quality

The S5A and S4 (duplicate) samples had comparable – if not identical – values for all assessed parameters. Comparison of these samples does not raise any concerns regarding the precision and consistency of the sediment laboratory analyses.

4.2.1 Historical Sediment Data Comparison

4.2.1.1 Organics

The concentrations of the following organic parameters exceeded the 95th percentile of historical data in 2023 (**Table 6**):

- Chrystina Lake: 1,2,3,4,5,6,7,8-OCDF
- S5A: PCBs 156+157, total mono-, hexa- and Octa-CBs, and PCB TEQ
- S6: Total organic carbon

The laboratory report for sediment organics analyses (**Appendix 4**) noted that the laboratory duplicate had a RPD of 62 % for PCB 8, and 80% for PCB 15. The laboratory quality assurance report for inorganic analyses noted that the matrix spike for chromium and boron were under quality control limits; while total vanadium was above QC limits, indicating potential matrix interference in the analysis.

4.2.1.2 Metals

The concentrations of the following metal parameters exceeded the 95th percentile of historical data in 2023 (**Table 7**):

- S6 (reference site): Calcium, iron, manganese, phosphorus, strontium and sulphur.

4.2.2 Sediment Quality Guidelines Comparison

4.2.2.1 Organics

The following organic parameters have exceeded the relevant CCME sediment quality guidelines (where applicable) in 2023 (**Table 8**):

- Chrystina Lake: PCDD/F TEQ_{fish}
- Edith Lake: PCDD/F TEQ_{fish}

The PCDD/F (mid-point) TEQ_{fish} values at Chrystina Lake and reference site Edith Lake exceeded the ISQG value of 0.85 pg/g. These values are driven by the relative concentrations of the PCDD/F compounds that factor into the TEQ calculation, each of which is multiplied by a toxic equivalency factor (TEF). PCDD/F TEQ_{fish} values at Chrystina Lake have exceeded the guideline in all but two years of the data record for this site (1995 and 2005), while the values at Edith Lake were above the guideline for all years. As a safety factor of 10 was applied to the ISQG and PEL values, the calculated PCDD/F TEQ_{fish} values for Chrystina and Edith Lakes are not believed to represent conditions that may result in adverse biological in these lakes. Nonetheless, comparison with TEQ_{fish} values from fish tissues collected from these waterbodies should be undertaken to determine whether PCDD/F compounds are accumulating at potentially toxic levels.

4.2.2.2 Metals

The following metal parameters have exceeded the relevant CCME sediment quality guidelines (where applicable) in 2021 (**Table 9**):

- Chrystina Lake: arsenic and nickel
- Edith Lake: manganese and nickel
- S6: arsenic and manganese

The metals listed above were previously documented by CPP Environmental as variously exceeding guidelines at the same sites between 2016 and 2022, indicating that these metals occur in these sediments at concentrations regularly exceeding guidelines. For Edith Lake, two metals were just under the CCME guidelines for mercury and cadmium (0.16 mg/kg and 0.59 mg/kg, respectively). Arsenic is naturally elevated in groundwater in some locations in Alberta (Alberta Health, 2000), and has been linked to marine shales. In surface water, arsenic can be high in soils rich in clay and organic matter. Note that there was no significant trend in water-borne or sediment-borne arsenic (**Appendix 2** and **3**). Similarly, manganese is often naturally high in Alberta groundwater. Some of these metals can be released by anthropogenic combustions such as those of the SHTC; however, given that the concentrations are known to be relatively high in the reference site (S6), it is unlikely that the SHTC caused the exceedances. Similarly, the nickel exceedances are believed to be driven by other factors since they occur in the reference site (Edith Lake).

4.2.3 Sediment Trends

4.2.3.1 Organics

Organic parameters have declined considerably (i.e., by orders of magnitude) since monitoring for these compounds began. The declines are attributed to improvements in SHTC's emissions reduction technology. To characterize contemporary conditions and potential environmental impacts of the SHTC, a 10-year moving window approach was used for trend analysis. Consequently, the long-term downward trends in PCB and PCDD/F concentrations that have occurred over time may not be observable at this finer scale; within the 10-year moving window, concentrations of most parameters have remained consistent (i.e., no trend) at Edith and Chrystina Lakes and S5A and S6 (**Table 8**; **Appendix 2** and **3**). However, the following parameters had a significant (α = 0.1) trend:

- Chrystina Lake: Increasing trends in 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, and 2,3,4,7,8-PeCDF
- Edith Lake: Increasing trend in 1,2,3,6,7,8-HxCDD and total OctaCB. Decreasing trend in 1,2,3,6,7,8-HxCDF.
- S5A: Increasing trends in total octa-CBs, mono-CBs, hepta-CBs, hexa-CBs, HpCDFs, and 1,2,3,4,6,7,8-HpCDF.
- S6: Increasing trend in 1,2,3,4,5,6,7,8-OCDF. Decreasing trend in PCB 114.

Total PCBs had no significant trends at any of the four sampled sites. In addition to the parameters listed above, several individual PCB congeners had significant trends. These are listed in **Appendix 2**. While increasing trends were apparent for some PCB homologue groups and PCDD/Fs, there were no significant trends for PCB nor PCDD/F TEQ_{fish} values, which are composite measures for the toxicity of their respective compounds. Thus, there were no increasing trends in PCB nor PCDD/F toxicity in sediments at any of the sampling sites.

4.2.3.2 Metals

Metal concentrations have largely remained consistent over the past ten years at Edith and Chrystina Lakes and S5A and S6 (**Table 9**; **Appendix 2** and **3**). However, the following metals had a significant (α = 0.1) trend:

- Chrystina Lake: Increasing trends in arsenic, beryllium, cobalt, vanadium, and zinc. Decreasing trend in sodium.
- Edith Lake: Increasing trend in cadmium, cobalt, and zinc. Decreasing trend in antimony.
- S6: Increasing trends in aluminum. Decreasing trend in uranium.

No significant trends in sediment metals were reported at S5A. The decreasing trends in uranium at S6 is driven by censored data prior to 2017 (<50 mg/kg), which when substituted with ½ the MDL (25 mg/kg), were still higher than positive observations from 2017 onwards that were an order of magnitude lower.

Of the metals with increasing trends, the 2023 concentrations were not historically high (**Table 7**). There are no guidelines for beryllium, cobalt, and vanadium. Also, there are current and/or historical trends and guideline exceedances in both test and reference sites for arsenic and zinc. Thus, there are no unusual patterns in these results.

5 Recommendations

Recommendations for the 2023 surface water and sediment monitoring program are as follows:

1. There was a notable decrease in pH in 2023. Further investigation should be conducted, including:
    a. Additional duplicate samples
    b. Sampling additional sites and at different times of the year
    c. Comparing results to other data collected in the province (e.g., RAMP program).
2. Continue monitoring metals with toxicity related to hardness (i.e., cadmium, copper, lead, and nickel), since hardness is naturally low in the lakes.
3. Further carbon analysis (total inorganic, total organic, dissolved inorganic, dissolved organic) to help explain patterns in total organic carbon.
4. Continued measurement of flow at site S5A in the Coutts River so that flow-correction may be applied to the water quality data in the future, once enough flow-chemistry paired data points are obtained.
5. Values for dioxins, furans, and PCBs are well below Probable Effect Levels and are not expected to increase due to reduced processing at the plant. We recommend dropping these variables from this program since they are covered by the other programs.

6 References

(AENV) Alberta Environment. 2006. Aquatic Ecosystem Field Sampling Protocols. Report no. W0605. Edmonton, AB. 149 pp.

Alberta Health. 2000. Arsenic in Groundwater from Domestic Wells in Three Areas of Northern Alberta. Health Surveillance, Alberta Health and Wellness, Edmonton, AB. 50 pp.

Aroner, E.R. 2011. WQHYDRO: Water Quality/Hydrology Graphics/Analysis System. User's manual. Portland, OR. 176 pp.

(CCME) Canadian Council of Ministers of the Environment. 2011. Protocols Manual for Water Quality Sampling in Canada. Report no. PN 1461. Winnipeg, MB. 186 pp.

Environment and Climate Change Canada. July 2020. *Canadian Environmental Protection Act, 1999* Federal Environmental Quality Guidelines: Strontium

Government of Alberta. 2018. Environmental Quality Guidelines for Alberta Surface Waters. Water Policy Branch, Alberta Environment and Parks. Edmonton, AB. 53 pp.

Government of Alberta. 2023 Alberta River Basins [online mapping tool and dataset]. https://rivers.alberta.ca/

Pohlert, T. 2020. trend: Non-Parametric Trend Tests and Change-Point Detection. R package version 1.1.4. https://CRAN.R-project.org/package=trend

R Core Team. 2021. R: A language and environment for statistical computing. Version 4.1.2. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/

Van den Berg, M. et al. 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife. Environmental Health Perspectives 106 (12): 775-792.

Wildland Management Consultants Ltd. 2015. 2014 Wildlife Monitoring Program. Report prepared for the Swan Hills Treatment Centre, SENA Waste Services Ltd. Leduc County, AB. 213 pp.

Worley-Parsons. 2015. 2014 Surface Water, Sediment, and Fish Tissue Monitoring Program: Swan Hills Treatment Centre. Report prepared for SENA Waste Services Ltd. Calgary, AB. 399 pp.

Table 1: Summary of 2023 water monitoring efforts

Station ID	Station Name	Water Quality	Sediment Quality	Discharge	Location	
					Latitude	Longitude
S5A	Coutts River	✓	✓	✓*	54.74551°	115.15205°
S6	Unnamed Creek	-	✓	-	54.76703°	115.22267°
S12	Chrystina Lake	✓	✓	-	54.78587°	115.19350°
Edith	Edith Lake	✓	✓	-	54.80043°	115.38441°

* flow at Coutts River was minimal

Table 2: Routine and nutrient parameters measured in **WATER** in 2023 as compared to historical values

Parameter	Units	Sampling Station																	
		Station S12 (Chrystina Lake)						Edith Lake						Station S5A (Coutts River)					
			Historical (1985-2022)						Historical (1999-2022)						Historical (1985-2022)				
		2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max
Routine																			
Alkalinity, tot (as $CaCO_3$)	mg/L	17	29	12	16.7	21.325	22	8.2	25	3.5	6.4	10.865	11.2	50	29	15	39.45	72.3	84
Hydroxide (OH^-)	mg/L	<1	29	ID	ID	ID	ID	<1	25	ID	ID	ID	ID	<1	29	ID	ID	ID	ID
Bicarbonate (HCO_3^-)	mg/L	21	30	14	21	25.72	27	10	25	4.3	7.85	13.42	14	61	38	17.8	46.3	87.4	103
Carbonate (CO_3^-)	mg/L	<1	29	ID	ID	ID	ID	<1	25	ID	ID	ID	ID	<1	29	ID	ID	ID	ID
Hardness (as $CaCO_3$)	mg/L	**18**	28	13	16	17.14	18	**9.1**	25	5.7	7.9	8.9	9.2	11	28	15	43	71.2	85
Total Dissolved Solids (TDS)	mg/L	19	30	14	19	21.54	30	11	24	5	10	15.61	24	42	40	23.42	50	90.49	103
pH	pH units	6.34	31	6.29	7.21	7.461	7.74	6.26	25	5.91	6.8	6.957	7.06	6.73	41	6.02	7.12	7.6505	7.68
Electrical Conductivity (EC)	µS/cm	37	31	31	36.25	40.37	50	25	25	20	24	27.1	51	110	41	46	85.5	151.55	189
Sulphate, diss (SO_4^{2-})	mg/L	<1	31	ID	ID	ID	ID	<1	25	ID	ID	ID	ID	<4	38	0.1	1	5.2	24
Chloride, diss (Cl^-)	mg/L	<1	31	ID	ID	ID	ID	<1	25	ID	ID	ID	ID	6.2	39	0.3	5	15.365	19
Calcium, diss (Ca^{2+})	mg/L	5.1	31	3.5	4.35	5.155	5.3	**2.8**	25	1.7	2.35	2.7	2.8	3.2	39	6.1	11.05	19.15	24.4
Magnesium, diss (Mg^{2+})	mg/L	1.3	31	1	1.18	1.355	1.6	0.49	25	0.4	0.5	0.6	0.6	0.82	39	1.3	2.8	4.85	5.9
Potassium, diss (K^+)	mg/L	0.95	31	0.15	0.745	0.9695	1.7	0.5	25	0.15	0.64	0.885	2	<0.3	39	0.15	0.49	1.2	1.4
Sodium, diss (Na^+)	mg/L	1.5	31	0.25	1.15	1.51	2.3	1.7	25	0.25	1.8	2.2	2.3	1.3	39	1.3	4.1	8.13	9.2
Nutrients																			
Nitrate, diss (NO_3^-)	mg/L	<0.044	31	ID	ID	ID	ID	<0.044	25	ID	ID	ID	ID	<0.044	39	ID	ID	ID	ID
Nitrite, diss (NO_2^-)	mg/L	<0.033	28	ID	ID	ID	ID	<0.033	26	ID	ID	ID	ID	<0.033	27	ID	ID	ID	ID
Ammonia as nitrogen (NH_3)	mg/L	<0.015	15	ID	ID	ID	ID	<0.015	15	ID	ID	ID	ID	<0.015	15	ID	ID	ID	ID
Phosphorus, total (P)	mg/L	0.0091	26	ID	ID	ID	ID	0.011	25	ID	ID	ID	ID	0.047	26	ID	ID	ID	ID
Total Kjeldahl Nitrogen (TKN)	mg/L	**NC**	14	0.28	0.36	0.5304	0.546	**NC**	15	0.06	0.54	0.69205	0.72	**NC**	14	0.388	0.6	0.88	1
Total Organic Carbon (TOC)	mg/L	6.6	27	5.9	8.2	11.225	15	12	22	10	12.3	16	21	<50	27	9.6	19.75	25.85	27
Biological																			
Chlorophyll a	µg/L	7.3	15	2.62	6.53	7.88	8.4	**14**	15	1.56	7.08	11.775	16	1	13	0.25	1.54	3.8505	5

Notes: Shaded values are above the 95th percentile of historical data. These represent high values. Historical comparisons were conducted if <50% of the parameter's data record was censored and at least 8 non-censored observations, otherwise insufficient data were available to calculate summary statistics (ID). Censored data were replaced by 0.5 of their respective MDL to permit calculations of summary statistics. If the 2023 value was censored, the censored value was presented in the table, but comparisons to the 95th percentile were done using 0.5 of the value's MDL. NC indicates the lab analysis for that parameter was not conducted for 2023.

Table 3: Metals measured in **WATER** in 2023 as compared to historical values.

Parameter	Units	Sampling Station																	
		Station S12 (Chrystina Lake)						Edith Lake						Station S5A (Coutts River)					
		2023	Historical (1985-2022)					2023	Historical (1999-2022)					2023	Historical (1985-2022)				
		Value	N	Min	Median	95th %ile	Max	Value	N	Min	Median	95th %ile	Max	Value	N	Min	Median	95th %ile	Max
Aluminum (Al)	mg/L	0.02	26	0.01	0.021	0.206	0.286	0.04	25	0.01	0.0305	0.063	0.117	0.089	26	0.031	0.12	0.216	0.38
Antimony (Sb)	mg/L	<0.0006	27	ID	ID	ID	ID	<0.0006	25	ID	ID	ID	ID	<0.0006	27	ID	ID	ID	ID
Arsenic (As)	mg/L	0.00053	27	0.0001	0.000425	0.00063	0.0018	0.00059	25	0.0001	0.00044	0.0007195	0.0018	0.0016	27	0.0003	0.00115	0.002775	0.0034
Barium (Ba)	mg/L	0.026	27	0.013	0.0232	0.03	0.03	**0.025**	25	0.0035	0.0134	0.01985	0.021	<0.05	27	0.026	0.04055	0.0565	0.0639
Beryllium (Be)	mg/L	<0.001	27	ID	ID	ID	ID	<0.001	25	ID	ID	ID	ID	<0.001	27	ID	ID	ID	ID
Boron (B)	mg/L	<0.02	26	ID	ID	ID	ID	<0.02	25	ID	ID	ID	ID	<0.1	26	ID	ID	ID	ID
Cadmium (Cd)	µg/L	<0.02	27	ID	ID	ID	ID	<0.02	25	ID	ID	ID	ID	<0.02	27	ID	ID	ID	ID
Calcium (Ca)	mg/L	4.5	26	3.3	4.1	5.384	5.6	**2.9**	25	1.9	2.35	2.785	3.3	14	26	6.5	13	20.16	24.5
Chromium (Cr)	mg/L	<0.001	27	ID	ID	ID	ID	<0.001	25	ID	ID	ID	ID	<0.001	27	ID	ID	ID	ID
Cobalt (Co)	mg/L	<0.0003	27	ID	ID	ID	ID	<0.0003	25	ID	ID	ID	ID	<0.0003	27	0.00015	0.0007	0.0032	0.0048
Copper (Cu)	mg/L	<0.001	27	0.0001	0.00035	0.001825	0.0032	<0.001	25	0.0001	0.000385	0.000785	0.0009	<0.001	27	0.0001	0.0005	0.00355	0.006
Iron, Diss (Fe)	mg/L	<0.06	26	ID	ID	ID	ID	0.24	25	0.005	0.13	0.3355	0.48	0.33	26	0.005	1.1	2.94	3.4
Iron (Fe)	mg/L	0.23	27	0.02	0.145	0.2875	0.66	**0.58**	25	0.1	0.27	0.474	0.51	2	27	0.098	1.775	4.888	5.3
Lead (Pb)	mg/L	<0.0002	27	ID	ID	ID	ID	<0.0002	25	ID	ID	ID	ID	0.007	27	ID	ID	ID	ID
Lithium (Li)	mg/L	<0.02	26	ID	ID	ID	ID	<0.02	25	ID	ID	ID	ID	<0.1	26	ID	ID	ID	ID
Magnesium (Mg)	mg/L	1.2	26	0.98	1.1	1.3	1.7	0.5	25	0.39	0.5	0.6	0.7	3.7	26	1.7	3.3	5.26	5.9
Manganese (Mn)	mg/L	**0.052**	27	0.002	0.026	0.0398	0.061	**0.088**	25	0.008	0.025	0.03725	0.043	0.05	27	0.021	0.1295	0.86025	1.1
Manganese, Diss (Mn)	mg/L	<0.004	26	ID	ID	ID	ID	0.0082	25	0.0005	0.005	0.02365	0.043	0.0065	26	0.002	0.046	0.4856	1.1
Mercury (Hg)	µg/L	<0.0019	27	ID	ID	ID	ID	0.0023	25	ID	ID	ID	ID	0.0037	27	ID	ID	ID	ID
Molybdenum (Mo)	mg/L	<0.0002	27	ID	ID	ID	ID	<0.0002	25	ID	ID	ID	ID	0.00025	27	ID	ID	ID	ID
Nickel (Ni)	mg/L	<0.0005	27	ID	ID	ID	ID	0.0012	25	0.00025	0.000545	0.00157	0.004	0.0025	27	0.00025	0.004525	0.0056	0.0056
Potassium (K)	mg/L	0.76	26	0.15	0.72	0.9	1.7	0.62	25	0.15	0.62	1.58	2	<1.5	26	0.3	0.6	1.36	1.4
Selenium (Se)	mg/L	<0.0002	27	ID	ID	ID	ID	<0.0002	25	ID	ID	ID	ID	0.00021	27	ID	ID	ID	ID
Silicon (Si)	mg/L	0.57	26	0.1	0.32	0.762	0.99	<0.5	25	0.05	0.275	0.6965	0.71	**7.2**	26	0.38	4.28	6.62	8
Silver (Ag)	mg/L	<0.0001	27	ID	ID	ID	ID	<0.0001	25	ID	ID	ID	ID	<0.0001	27	ID	ID	ID	ID
Sodium (Na)	mg/L	1.2	26	0.25	1.1	1.516	1.6	1.8	25	0.25	1.75	2.185	2.3	6.2	26	3.3	5.2	8.16	9.9
Strontium (Sr)	mg/L	0.023	26	0.007	0.02	0.0238	0.025	<0.02	25	ID	ID	ID	ID	<0.1	26	0.02	0.051	0.0924	0.11
Sulphur (S)	mg/L	<0.2	26	0.1	0.23	2	661	0.33	25	0.1	0.56	0.797	1.3	<1	26	0.1	0.5	3.9	6.7
Thallium (Tl)	mg/L	<0.0002	27	ID	ID	ID	ID	<0.0002	25	ID	ID	ID	ID	<0.0002	27	ID	ID	ID	ID
Tin (Sn)	mg/L	<0.001	25	ID	ID	ID	ID	<0.001	25	ID	ID	ID	ID	<0.001	25	ID	ID	ID	ID
Titanium (Ti)	mg/L	<0.001	26	ID	ID	ID	ID	<0.001	25	ID	ID	ID	ID	0.0015	26	0.0005	0.002	0.0088	0.037
Uranium (U)	mg/L	<0.0001	26	ID	ID	ID	ID	<0.0001	25	ID	ID	ID	ID	<0.0001	26	ID	ID	ID	ID
Vanadium (V)	mg/L	<0.001	27	ID	ID	ID	ID	<0.001	25	ID	ID	ID	ID	<0.001	27	ID	ID	ID	ID
Zinc (Zn)	mg/L	<0.003	27	0.0005	0.00485	0.0269	0.0303	0.004	25	ID	ID	ID	ID	0.0033	27	0.0015	0.0075	0.03335	0.036

Notes: Shaded and bolded values, if present, are above the 95th percentile of historical data. These represent high values. Historical comparisons were conducted if <50% of the parameter's data record was censored and at least 8 non-censored observations, otherwise insufficient data were available to calculate summary statistics (ID). Censored data were replaced by 0.5 of their respective MDL to permit calculations of summary statistics. If the 2023 value was censored, the censored value was presented in the table, but comparisons to the 95th percentile were done using 0.5 of the value's MDL.

Table 4: Routine and nutrient chemistry measured in **WATER** in 2023 as compared to the Alberta Surface Water Quality Guidelines for the Protection of Aquatic Life (2018) and with results of trend analysis.

Parameter	Units	Sampling Station						AB Surface Water Quality Guidelines (Government of Alberta 2018)	
		Station S12 (Chrystina Lake)		Edith Lake		Station S5A (Coutts River)			
		2023 Value	Trend	2023 Value	Trend	2023 Value	Trend	Chronic	Acute
Routine									
Alkalinity, tot (as $CaCO_3$)	mg/L	**17**	NT	**8.2**	NT	50	NT	<20[1]	-
Hydroxide (OH^-)	mg/L	<1	ID	<1	ID	<1	ID	-	-
Bicarbonate (HCO_3^-)	mg/L	21	NT	10	NT	61	NT	-	-
Carbonate (CO_3^-)	mg/L	<1	ID	<1	ID	<1	ID	-	-
Hardness (as $CaCO_3$)	mg/L	18	NT	9.1	NT	11	NT	-	-
Total Dissolved Solids (TDS)	mg/L	19	NT	11	NT	42	NT	-	-
pH	pH units	**6.34**	↓**	**6.26**	NT	6.73	NT	6.5 - 9	-
Electrical Conductivity (EC)	µS/cm	37	NT	25	NT	110	NT	-	-
Sulphate, diss (SO_4^{2-})	mg/L	<1	ID	<1	ID	<4	ID	128-218[2]	-
Chloride, diss (Cl^-)	mg/L	<1	ID	<1	ID	6.2	NT	120	640
Calcium, diss (Ca^{2+})	mg/L	5.1	NT	2.8	NT	3.2	NT	-	-
Magnesium, diss (Mg^{2+})	mg/L	1.3	NT	0.49	NT	0.82	NT	-	-
Potassium, diss (K^+)	mg/L	0.95	NT	0.5	NT	<0.3	NT	-	-
Sodium, diss (Na^+)	mg/L	1.5	NT	1.7	NT	1.3	NT	-	-
Nutrients									
Nitrate, diss (NO_3^-)	mg/L	<0.044	ID	<0.044	ID	<0.044	ID	3	124
Nitrite, diss (NO_2^-)	mg/L	<0.033	ID	<0.033	ID	<0.033	ID	0.08[3]	0.24[3]
Ammonia as nitrogen (NH_3)	mg/L	<0.015	ID	<0.015	ID	<0.015	ID	2.48[4]	-
Phosphorus, total (P)	mg/L	0.0091	ID	0.011	ID	0.047	↓*	-	-
Total Kjeldahl Nitrogen (TKN)	mg/L	NC	NT	NC	NT	NC	NT	-	-
Total Organic Carbon (TOC)	mg/L	6.6	NT	12	↓*	<50	↓***	-	-
Biological									
Chlorophyll-a	µg/L	7.3	↑**	14	↑**	1	NT	-	-
Field Measurements									
Temperature	°C	12.7	NT	13.1	NT	9.3	NT	-	-
Dissolved Oxygen	mg/L	8.83	NT	10.81	NT	10.80	NT	<6.5[1]	<5[1]
pH	pH units	6.98	NT	**6.16**	NT	7.02	↑*	6.5 - 9	-
Electrical Conductivity (EC)[2]	µS/cm	26	↓*	17.6	↓***	72.1	NT	-	-

Notes: Shaded values, if present, represent data that do not meet water quality guidelines. Arrows with *** represent a significant upward or downward trend at a 99% confidence level. Arrows with ** represent a significant upward or downward trend at a 95% confidence level. Arrows with an * represent a significant upward or downward trend at a 90% confidence level. NT= no significant trends. ID = insufficient data available for trend calculation.

[1]A minimum value unless natural conditions are less. [2]Calculated at a Hardness of 0-30 mg/L for 128 mg/L (Edith and Chrystina Lake) and a Hardness of 31-75 mg/L for 218 mg/L (Coutts River) from Table 1.7 in Government of Alberta (2018). [3]Calculated at a Cl <2 mg/L and Cl 6-8 mg/L (Coutts River) from Table 1.4 in Government of Alberta 2018. [4]Calculated at pH of 7.5 and temperature of 11 °C.

Table 5: Metals measured in **WATER** in 2023 as compared to the Alberta Surface Water Quality Guidelines for the Protection of Aquatic Life (2018) and with results of trend analysis.

Parameter	Units	Sampling Station						AB Surface Water Quality Guidelines (Government of Alberta 2018)	
		Station S12 (Chrystina Lake)		Edith Lake		Station S5A (Coutts River)			
		2023 Value	Trend	2023 Value	Trend	2023 Value	Trend	Chronic	Acute
Aluminum (Al)	mg/L	0.02	NT	0.04	NT	0.089	NT	-	-
Antimony (Sb)	mg/L	<0.0006	ID	<0.0006	ID	<0.0006	ID	-	-
Arsenic (As)	mg/L	0.00053	NT	0.00059	NT	0.0016	NT	0.005	-
Barium (Ba)	mg/L	0.026	↑**	0.025	NT	<0.05	NT	-	-
Beryllium (Be)	mg/L	<0.001	ID	<0.001	ID	<0.001	ID	-	-
Boron (B)	mg/L	<0.02	ID	<0.02	ID	<0.1	ID	1.5	29
Cadmium (Cd)	µg/L	<0.02	ID	<0.02	ID	<0.02	ID	varies[1]	varies[1]
Calcium (Ca)	mg/L	4.5	NT	2.9	NT	14	NT	-	-
Chromium (Cr)	mg/L	<0.001	ID	<0.001	ID	<0.001	ID	-	-
Cobalt (Co)	mg/L	<0.0003	ID	<0.0003	ID	<0.0003	ID	varies[1]	varies[1]
Copper (Cu)	mg/L	<0.001	NT	<0.001	NT	<0.001	NT	-	varies[1]
Iron, diss (Fe)	mg/L	<0.06	ID	0.24	NT	**0.33**	NT	0.3	-
Iron (Fe)	mg/L	0.23	NT	0.58	NT	2	NT	-	-
Lead (Pb)	mg/L	<0.0002	ID	<0.0002	ID	**0.007**	ID	varies[1]	varies[1]
Lithium (Li)	mg/L	<0.02	ID	<0.02	ID	<0.1	ID	-	-
Magnesium (Mg)	mg/L	1.2	NT	0.5	NT	3.7	NT	-	-
Manganese (Mn)	mg/L	0.052	NT	0.088	↑**	0.05	NT	-	-
Manganese, diss (Mn)	mg/L	<0.004	ID	0.0082	NT	0.0065	NT	-	-
Mercury (Hg)	µg/L	<0.0019	ID	0.0023	ID	0.0037	NT	0.005	0.013
Molybdenum (Mo)	mg/L	<0.0002	ID	<0.0002	ID	0.00025	ID	0.073	-
Nickel (Ni)	mg/L	<0.0005	ID	0.0012	NT	0.0025	NT	varies[1]	varies[1]
Potassium (K)	mg/L	0.76	NT	0.62	↑**	<1.5	NT	-	-
Selenium (Se)	mg/L	<0.0002	ID	<0.0002	ID	0.00021	ID	0.001	-
Silicon (Si)	mg/L	0.57	NT	<0.5	NT	7.2	↑**	-	-
Silver (Ag)	mg/L	<0.0001	ID	<0.0001	ID	<0.0001	ID	0.0001	-
Sodium (Na)	mg/L	1.2	↑*	1.8	NT	6.2	NT	-	-
Strontium (Sr)	mg/L	0.023	↑**	<0.02	ID	<0.1	NT	-	-
Sulphur (S)	mg/L	<0.2	ID	0.33	NT	<1	NT	-	-
Thallium (Tl)	mg/L	<0.0002	ID	<0.0002	ID	<0.0002	ID	0.0008	-
Tin (Sn)	mg/L	<0.001	ID	<0.001	ID	<0.001	ID	-	-
Titanium (Ti)	mg/L	<0.001	ID	<0.001	ID	0.0015	NT	-	-
Uranium (U)	mg/L	<0.0001	ID	<0.0001	ID	<0.0001	ID	0.015	0.033
Vanadium (V)	mg/L	<0.001	ID	<0.001	ID	<0.001	ID	-	-
Zinc (Zn)	mg/L	<0.003	ID	0.004	ID	0.0033	ID	0.03	-

Notes: Shaded values, if present, represent data that exceed water quality guidelines. Arrows with *** represent a significant upward or downward trend at a 99% confidence level. Arrows with ** represent a significant upward or downward trend at a 95% confidence level. Arrows with an * represent a significant upward or downward trend at a 90% confidence level. NT= no significant trend. ID = insufficient data available for trend calculation.

[1] Variable guideline from Table 1.3 metal guidelines (Cadmium, Cobalt, Copper, Lead, and Nickel) for the PAL at varying hardness from the Government of Alberta (2018). Shaded values represent guideline exceedances at the respective hardness level, where applicable.

Table 6: Selected organics measured in **SEDIMENT** in 2023 as compared to historical values

Parameter	Units	Sampling Station																					
		Station S12 (Chrystina Lake)						Edith Lake						Station S5A (Coutts River)						Station S6 (Unnamed Creek					
			Historical (1993-2022)						Historical (1999-2022)						Historical (1985-2022)						Historical (1987-2022)				
		2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max
Carbon																									
TOC	%	14	22	0.34	14	18	20	12	16	9.95	18.08	22.27	25	3.5	23	0.3	1.55	3.8615	6.5	**12**	23	0.66	3.75	8.851	11
Dioxins (PCDDs)																									
2,3,7,8-TCDD	pg/g	<0.99	41	ID	ID	ID	ID	<1.1	33	ID	ID	ID	ID	<0.12	41	ID	ID	ID	ID	<0.14	43	ID	ID	ID	ID
1,2,3,7,8-PeCDD	pg/g	<1.3	25	ID	ID	ID	ID	<1.1	19	ID	ID	ID	ID	<0.12	25	ID	ID	ID	ID	<0.14	25	ID	ID	ID	ID
1,2,3,4,7,8-HxCDD	pg/g	0.9	25	ID	ID	ID	ID	1.43	19	ID	ID	ID	ID	<0.11	25	ID	ID	ID	ID	<0.09	25	ID	ID	ID	ID
1,2,3,6,7,8-HxCDD	pg/g	1.2	25	ID	ID	ID	ID	3.21	19	ID	ID	ID	ID	<0.12	25	ID	ID	ID	ID	<0.097	25	ID	ID	ID	ID
1,2,3,7,8,9-HxCDD	pg/g	2.51	25	ID	ID	ID	ID	2.9	19	ID	ID	ID	ID	0.14	25	ID	ID	ID	ID	0.12	25	ID	ID	ID	ID
1,2,3,4,6,7,8-HpCDD	pg/g	18	25	2.7	17.5	35.31	37	42	19	16	50.4	72.6	79	2.36	25	0.57	1.96	7.98	16	0.755	25	0.1	0.6615	1.208	1.82
1,2,3,4,6,7,8,9-OCDD	pg/g	124	25	24	108.5	168.2	240	307	19	110	328.5	463.2	470	26.4	25	2.8	22.5	80.85	250	6.93	25	1.3	6.85	14.034	16.3
Furans (PCDFs)																									
2,3,7,8-TCDF	pg/g	5.6	25	0.3	3.02	13.08	16.2	1.01	19	ID	ID	ID	ID	<0.078	25	ID	ID	ID	ID	<0.14	25	ID	ID	ID	ID
1,2,3,7,8-PeCDF	pg/g	1.2	25	ID	ID	ID	ID	<0.66	18	ID	ID	ID	ID	<0.098	25	ID	ID	ID	ID	<0.14	25	ID	ID	ID	ID
2,3,4,7,8-PeCDF	pg/g	2.89	25	0.1	1.915	4.375	5.9	<0.64	19	ID	ID	ID	ID	<0.093	25	ID	ID	ID	ID	0.682	25	ID	ID	ID	ID
1,2,3,4,7,8-HxCDF	pg/g	0.68	25	0.14	0.656	2.58	3.6	<0.73	19	ID	ID	ID	ID	<0.062	25	ID	ID	ID	ID	1.34	25	ID	ID	ID	ID
1,2,3,6,7,8-HxCDF	pg/g	0.6	24	ID	ID	ID	ID	1.05	19	ID	ID	ID	ID	<0.061	25	ID	ID	ID	ID	0.123	25	ID	ID	ID	ID
1,2,3,7,8,9-HxCDF	pg/g	<0.68	25	ID	ID	ID	ID	<1.1	19	ID	ID	ID	ID	<0.058	25	ID	ID	ID	ID	<0.058	25	ID	ID	ID	ID
2,3,4,6,7,8-HxCDF	pg/g	0.71	25	ID	ID	ID	ID	0.86	19	ID	ID	ID	ID	<0.074	25	ID	ID	ID	ID	<0.06	25	ID	ID	ID	ID
1,2,3,4,6,7,8-HpCDF	pg/g	4.4	25	0.4	2.21	5.04	6.2	6.5	19	0.385	4.94	10.2	11.3	0.17	26	ID	ID	ID	ID	<0.061	26	ID	ID	ID	ID
1,2,3,4,7,8,9-HpCDF	pg/g	<0.73	25	ID	ID	ID	ID	<1	19	ID	ID	ID	ID	<0.074	26	ID	ID	ID	ID	<0.062	26	ID	ID	ID	ID
1,2,3,4,5,6,7,8-OCDF	pg/g	**12**	25	0.6	3.355	11.355	15.6	20.1	19	1	8.72	21.71	33.1	0.52	25	ID	ID	ID	ID	<0.076	25	ID	ID	ID	ID
PCBs																									
Aroclor 1254	mg/kg	<0.123	12	ID	ID	ID	ID	<0.17	12	ID	ID	ID	ID	<0.012	14	ID	ID	ID	ID	<0.011	14	ID	ID	ID	ID
PCB Total	pg/g	8550	23	3100	10350	32687	65000	1770	19	300	2625	17536	17570	596	24	40	480	7025	12000	259	26	30	800	8880	12000
PCB 77	pg/g	26	23	5	28.25	82.35	96.85	6.9	18	0	5.03	24.6	35	2	24	0.4	2.02	12.84	26	0.78	24	0.38	2.57	7.95	130
PCB 81	pg/g	<2.2	21	ID	ID	ID	ID	<1.9	18	ID	ID	ID	ID	<0.17	22	ID	ID	ID	ID	<0.25	22	ID	ID	ID	ID
PCB 105	pg/g	186	25	115.9	255	611.7	786.0	32.4	19	9.99	43.8	298.5	407.8	15.3	26	0	12.01	428.8	500	6.18	28	0	17.6	369.8	500
PCB 114	pg/g	8.9	21	0	7.965	49.17	60	<2	18	ID	ID	ID	ID	0.62	23	0	0.5	4.956	5	0.41	23	0	0.93	5	5
PCB 118	pg/g	398	25	269.2	475.9	1242.5	1511.8	71	20	20.9	116	587.6	737.9	31.2	24	2.76	24.4	475.2	500	13.1	25	5.46	41.65	444.5	500
PCB 123	pg/g	4.7	8	ID	ID	ID	ID	<2	7	ID	ID	ID	ID	0.51	9	0.028	0.27	0.503	0.51	0.44	9	ID	ID	ID	ID
PCB 126	pg/g	5.5	23	ID	ID	ID	ID	<1.8	18	ID	ID	ID	ID	0.71	26	ID	ID	ID	ID	0.33	25	ID	ID	ID	ID
PCBs 156+157	pg/g	78.8	8	ID	ID	ID	ID	13	7	ID	ID	ID	ID	**5.81**	9	1.11	3.135	5.196	5.2	2.25	9	2.85	4.95	9.57	10
PCB 167	pg/g	30	21	5	27.9	118.6	290	4.4	18	1.2	4.8	50.5	60.4	2.34	23	0.1	1.465	25.79	29	0.9	22	0.15	2.12	5	22
PCB 169	pg/g	2.6	23	ID	ID	ID	ID	<1.4	18	ID	ID	ID	ID	0.71	24	ID	ID	ID	ID	0.78	24	ID	ID	ID	ID
PCB 189	pg/g	7.4	21	1.45	6.36	16.3	22.81	2.5	18	ID	ID	ID	ID	0.52	22	ID	ID	ID	ID	0.3	22	ID	ID	ID	ID
Total MonoCB	pg/g	21.8	8	ID	ID	ID	ID	30.6	7	ID	ID	ID	ID	6.**92**	9	0.52	1.36	3.158	3.55	4.24	9	1.08	4.38	6.492	6.65
Total DiCB	pg/g	158	8	ID	ID	ID	ID	130	7	ID	ID	ID	ID	19.5	9	2.53	8.78	47.38	49.8	9.09	9	4.2	13.7	50.56	55.5
Total TriCB	pg/g	385	8	ID	ID	ID	ID	159	7	ID	ID	ID	ID	29	9	7.47	15.35	39.12	40.1	13.7	9	13.9	25.95	59.44	60.8
Total TetraCB	pg/g	868	15	685	1145	3409.5	5600	254	12	90.1	378	3130	4900	50.1	16	12.8	53.8	198.4	253	21.4	16	30.1	79.5	385.5	452
Total PentaCB	pg/g	1970	15	1460	2270	3065.5	3670	417	12	153	440	1625	1800	150	16	13.8	98.7	239.9	263	63.6	16	56	152	470.8	699
Total HexaCB	pg/g	2980	15	768	2485	3779.5	4020	450	12	111	491	1425	1450	**206**	16	2.5	93.3	191.6	221	93.4	16	44	165	494.9	637
Total HeptaCB	pg/g	1710	15	930	1650	2582	2660	223	12	2.5	260	470	470	107	16	2.5	51.9	134.2	158	42.8	16	10	106	292.1	381
Total OctaCB	pg/g	409	15	25.5	390.5	651.4	654	80.3	12	2.5	16.5	90.05	98.2	**26.3**	16	2.5	9.74	26.16	35.4	9.35	16	2.5	15.8	58.49	77.6
Total NonaCB	pg/g	38.7	11	2.5	31.6	79.7	87	13	10	2.5	9	32.84	40	1.1	12	ID	ID	ID	ID	1.1	12	0.19	1.72	6.73	7.76
TEQs																									
PCB TEQ	pg/g	0.0343	7	ID	ID	ID	ID	0.0063	7	ID	ID	ID	ID	**0.0041**	9	0.00065	0.0010	0.0020	0.0023	0.00195	9	0.0011	0.00294	0.00635	0.00737
PCDD/F TEQ	pg/g	3.73	21	0.458	3.13	8.62	8.92	2.53	19	1.035	3.09	11.12	24.20	0.197	25	0.127	0.280	1.228	1.580	0.202	25	0.143	0.324	1.232	1.863

Notes: Shaded values, if present, are above the 95th percentile of historical data. These represent high values. Historical comparisons were conducted if <50% of the parameter's data record was censored and at least 8 non-censored observations, otherwise insufficient data were available to calculate summary statistics (ID). Censored data were replaced by 0.5 of their respective MDL to permit calculations of summary statistics. If the 2023 value was censored, the censored value was presented in the table, but comparisons to the 95th percentile were done using 0.5 of the value's MDL.

Table 7: Total metals measured in SEDIMENT in 2023 as compared to historical values

Parameter	Units	Sampling Station																					
		Station S12 (Chrystina Lake)						Edith Lake						Station S5A (Coutts River)						Station S6 (Unnamed Creek					
			Historical						Historical						Historical						Historical				
		2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max	2023 Value	N	Min	Median	95th %ile	Max
Aluminum (Al)	mg/kg	14000	22	4900	13000	16500	17000	9900	18	8800	11000	14020	14100	7300	24	2830	6390	10630	11000	9000	24	1480	6000	9940	13000
Antimony (Sb)	mg/kg	<0.5	25	ID	ID	ID	ID	0.65	19	ID	ID	ID	ID	<1	27	ID	ID	ID	ID	<1	26	ID	ID	ID	ID
Arsenic (As)	mg/kg	7.8	26	2.3	5.7	7.94	10	5.3	20	3	5	6.73	7	3.3	28	0.05	2.6	5.2	9	6.1	27	1.3	6.95	12.925	14
Barium (Ba)	mg/kg	200	26	100	210	283.4	517	180	20	120	220	282.1	517	120	26	45.8	100	203.6	250	150	27	88	185	362.5	642
Beryllium (Be)	mg/kg	0.86	26	0.01	0.77	0.984	1.8	0.68	20	0.2	0.63	0.917	1.7	<0.8	28	ID	ID	ID	ID	<0.8	27	ID	ID	ID	ID
Boron (B)	mg/kg	4.2	25	0.5	2	8.34	11.5	<4	20	0.3	2.9	5.64	6	2.6	25	ID	ID	ID	ID	<2	25	ID	ID	ID	ID
Cadmium (Cd)	mg/kg	0.38	26	0.08	0.37	0.708	0.9	0.59	20	0.15	0.58	0.803	1.1	0.15	28	0.01	0.1	0.348	0.5	0.17	27	0.02	0.2	0.455	0.7
Calcium (Ca)	mg/kg	4800	20	2700	4750	5849	6290	4500	17	2800	4750	5567.5	5650	3300	21	14	2135	4207	4340	**6800**	21	27.4	3380	5645	6500
Chromium (Cr)	mg/kg	13	26	8.6	13.9	38.78	73.7	15	20	12	14	29.2	31	11	28	3.4	9	24.2	70.3	7	27	0.82	8.85	40.475	149
Cobalt (Co)	mg/kg	7.1	26	3.35	6.1	8.72	10	7.5	20	4	6.8	8.01	8.1	5.3	28	1.36	5	11.7	12	8.4	27	4.02	11.5	21.7	26
Copper (Cu)	mg/kg	18	26	7.9	15	19.84	21	20	20	10	18.2	27.8	80	6.6	28	2	5.7	15.89	18.5	3.9	27	1	5.4	10.75	17.8
Iron (Fe)	mg/kg	17000	22	9670	15300	19000	19900	11000	18	7300	11000	13200	14000	11000	23	3830	9800	18975	19100	**28000**	23	7650	17150	27775	30000
Lead (Pb)	mg/kg	16	26	5.3	15.1	20.3	24	21	20	13	20	23.6	29	5.2	28	1	5.19	12.13	17	3.7	27	1.5	5.85	12.225	29.4
Lithium (Li)	mg/kg	<20	18	ID	ID	ID	ID	<20	15	ID	ID	ID	ID	<10	18	ID	ID	ID	ID	<10	18	ID	ID	ID	ID
Magnesium (Mg)	mg/kg	2300	21	18	2200	2538.5	2700	1400	18	4.5	1500	1844	1900	1600	21	4.2	1470	2800.5	2810	2100	21	6.1	1605	2425	2900
Manganese (Mn)	mg/kg	450	21	241	464	629.5	639	510	18	199	402	510.8	590	300	21	35.6	239.5	579.6	648	**6000**	21	0.05	1985	3928.5	4470
Mercury (Hg)	mg/kg	0.11	24	0.025	0.124	0.1879	0.191	0.16	18	0.11	0.184	0.2328	0.26	<0.1	25	0.01	0.025	0.08935	0.15	<0.1	24	0.01	0.03	0.1188	0.128
Molybdenum (Mo)	mg/kg	0.97	26	0.15	0.95	1.968	11	1	20	0.15	0.83	1.99	5.5	<0.8	28	ID	ID	ID	ID	<0.8	27	0.15	0.56	1.175	85.7
Nickel (Ni)	mg/kg	19	26	10	18.7	28.8	50.3	24	20	14.8	23	29.03	29.3	10	28	2.84	8	17.28	18	7.7	26	0.25	10	19.8	36.2
Phosphorus (P)	mg/kg	1500	20	320	1330	1782	3420	1400	17	700	1200	1817.5	1900	390	19	119	275	650	1500	**710**	19	147	360	598.5	760
Potassium (K)	mg/kg	1000	21	500	1130	1332.5	1380	770	18	189	773	1012	1060	460	21	0.8	468	917.6	1100	470	21	2.1	352	674	940
Selenium (Se)	mg/kg	0.67	26	0.1	0.6	1.5	2.5	1.1	20	0.5	1.1	2.14	2.5	<1	28	ID	ID	ID	ID	<1	27	ID	ID	ID	ID
Silver (Ag)	mg/kg	<0.2	26	ID	ID	ID	ID	<0.2	20	ID	ID	ID	ID	<0.4	27	ID	ID	ID	ID	<0.4	27	ID	ID	ID	ID
Sodium (Na)	mg/kg	<100	21	36	124	603.15	4140	<100	18	45	134	628.8	1500	55	21	4.1	66.5	331.2	373	<50	21	ID	ID	ID	ID
Strontium (Sr)	mg/kg	28	23	20	27.6	31	32.2	34	19	20	38.25	42.135	42.9	23	24	5	16	31.84	32.3	**40**	24	8.4	21	33.9	37
Sulphur (S)	mg/kg	2500	16	130	2280	2833	2910	3300	15	2100	2935	3705	3900	360	16	66	170	1106	2800	**740**	16	105	251	703	710
Thallium (Tl)	mg/kg	0.19	25	0.05	0.15	0.294	0.4	0.16	19	0.13	0.15	0.2	0.2	<0.2	25	ID	ID	ID	ID	<0.2	25	ID	ID	ID	ID
Tin (Sn)	mg/kg	1.2	20	ID	ID	ID	ID	2	17	ID	ID	ID	ID	<2	20	ID	ID	ID	ID	<2	20	ID	ID	ID	ID
Uranium (U)	mg/kg	1.8	24	0.61	1.8	22.703	143	1.5	19	0.5	1.55	5.45	25	0.83	23	0.29	0.5	1.865	25	0.51	23	0.16	0.5	1	25
Vanadium (V)	mg/kg	23	26	6.1	19.2	23.58	24	23	20	13.5	20.7	23.83	25	17	28	2.9	12	25.02	25.6	11	27	2	13	27.725	67.3
Zinc (Zn)	mg/kg	70	26	36	63	77.24	101	90	20	41.9	85.3	101	110	38	28	9.8	31	57.37	68	27	27	11	34	48.075	51.3

Notes: Shaded values, if present, are above the 95th percentile of historical data. These represent high values. Historical comparisons were conducted if <50% of the parameter's data record was censored and at least 8 non-censored observations, otherwise insufficient data were available to calculate summary statistics (ID). Censored data were replaced by 0.5 of their respective MDL to permit calculations of summary statistics. If the 2023 value was censored, the censored value was presented in the table, but comparisons to the 95th percentile were done using 0.5 of the value's MDL.

Table 8: Selected organics measured in **SEDIMENT** as compared to CCME sediment quality guidelines and with results of trend analysis

Parameter	Units	Sampling Station								CCME Sediment Quality Guidelines (2001c)	
		Station S12 (Chrystina Lake)		Edith Lake		Station S5A (Coutts River)		Station S6 (Unnamed Creek)			
		2023 Value	Trend	2023 Value	Trend	2023 Value	Trend	2023 Value	Trend	ISQG[1]	PEL[2]
Carbon											
TOC	%	14	NT	12	NT	3.5	NT	12	NT	-	-
Dioxins (PCDDs)											
2,3,7,8-TCDD	pg/g	<0.99	ID	<1.1	ID	<0.12	ID	<0.14	ID	-	-
1,2,3,7,8-PeCDD	pg/g	<1.3	ID	<1.1	ID	<0.12	ID	<0.14	ID	-	-
1,2,3,4,7,8-HxCDD	pg/g	0.9	NT	1.43	ID	<0.11	ID	<0.09	ID	-	-
1,2,3,6,7,8-HxCDD	pg/g	1.2	NT	3.21	↑**	<0.12	NT	<0.097	ID	-	-
1,2,3,7,8,9-HxCDD	pg/g	2.51	NT	2.9	NT	0.14	NT	0.12	ID	-	-
1,2,3,4,6,7,8-HpCDD	pg/g	18	NT	42	NT	2.36	NT	0.755	NT	-	-
1,2,3,4,6,7,8,9-OCDD	pg/g	124	NT	307	NT	26.4	NT	6.93	NT	-	-
Furans (PCDFs)											
2,3,7,8-TCDF	pg/g	5.6	↑***	1.01	ID	<0.078	ID	<0.14	NT	-	-
1,2,3,7,8-PeCDF	pg/g	1.2	↑**	<0.66	ID	<0.098	ID	<0.14	ID	-	-
2,3,4,7,8-PeCDF	pg/g	2.89	↑***	<0.64	ID	<0.093	ID	0.682	NT	-	-
1,2,3,4,7,8-HxCDF	pg/g	0.68	NT	<0.73	ID	<0.062	ID	1.34	ID	-	-
1,2,3,6,7,8-HxCDF	pg/g	0.6	NT	1.05	↓*	<0.061	ID	0.123	ID	-	-
1,2,3,7,8,9-HxCDF	pg/g	<0.68	ID	<1.1	ID	<0.058	ID	<0.058	ID	-	-
2,3,4,6,7,8-HxCDF	pg/g	0.71	NT	0.86	NT	<0.074	ID	<0.06	ID	-	-
1,2,3,4,6,7,8-HpCDF	pg/g	4.4	NT	6.5	NT	0.17	↑*	<0.061	NT	-	-
1,2,3,4,7,8,9-HpCDF	pg/g	<0.73	ID	<1	ID	<0.074	ID	<0.062	ID	-	-
1,2,3,4,5,6,7,8-OCDF	pg/g	12	NT	20.1	NT	0.52	ID	<0.076	↑*	-	-
PCBs											
Aroclor 1254	mg/kg	<0.123	ID	<0.172	ID	<0.012	ID	<0.011	ID	0.06	0.34
PCB Total	pg/g	8550	NT	1770	NT	596	NT	259	NT	34100	277000
PCB 77	pg/g	26	NT	6.9	NT	2	NT	0.78	NT	-	-
PCB 81	pg/g	<2.2	ID	<1.9	ID	<0.17	ID	<0.25	ID	-	-
PCB 105	pg/g	186	NT	32.4	NT	15.3	NT	6.18	NT	-	-
PCB 114	pg/g	8.9	NT	<2	ID	0.62	NT	0.41	↓*	-	-
PCB 118	pg/g	398	NT	71	NT	31.2	NT	13.1	NT	-	-
PCB 123	pg/g	4.7	ID	<2	ID	0.51	NT	0.44	ID	-	-
PCB 126	pg/g	5.5	NT	<1.8	ID	0.71	NT	0.33	NT	-	-
PCBs 156+157	pg/g	78.8	ID	13	ID	5.81	NT	2.25	NT	-	-
PCB 167	pg/g	30	NT	4.4	NT	2.34	NT	0.9	NT	-	-
PCB 169	pg/g	2.6	ID	<1.4	ID	0.71	NT	0.78	NT	-	-
PCB 189	pg/g	7.4	NT	2.5	ID	0.52	NT	0.3	NT	-	-
Total MonoCB	pg/g	21.8	ID	30.6	ID	6.92	↑**	4.24	NT	-	-
Total DiCB	pg/g	158	ID	130	ID	19.5	NT	9.09	NT	-	-
Total TriCB	pg/g	385	ID	159	ID	29	NT	13.7	NT	-	-
Total TetraCB	pg/g	868	NT	254	NT	50.1	NT	21.4	NT	-	-
Total PentaCB	pg/g	1970	NT	417	NT	150	NT	63.6	NT	-	-
Total HexaCB	pg/g	2980	NT	450	NT	206	↑**	93.4	NT	-	-
Total HeptaCB	pg/g	1710	NT	223	NT	107	↑**	42.8	NT	-	-
Total OctaCB	pg/g	409	NT	80.3	↑*	26.3	↑**	9.35	NT	-	-
Total NonaCB	pg/g	38.7	NT	13	NT	1.1	NT	1.1	NT	-	-
TEQs											
PCB TEQ	pg/g	0.0343	ID	0.00632	ID	0.00409	NT	0.00195	NT	-	-
PCDD/F TEQ	pg/g	**3.73**	NT	**2.53**	NT	0.197	NT	0.202	NT	0.853	21.53

Notes: Shaded values, if present, represent data that exceed CCME Sediment Quality Guidelines. Arrows with double asterisk represent a significant upward or downward trend at a 99% confidence level. Arrows with an asterisk represent a significant upward or downward trend at a 95% confidence level. Arrows represent a significant upward or downward trend at a 90% confidence level. NT= no significant trend. ID = insufficient data available to for trend calculation.

[1] ISQG = Interim Sediment Quality Guidelines are sediment quality guidelines where data are available but too limited to derive a formal Sediment Quality Guideline. A Sediment Quality Guideline is meant to represent the Threshold Effects Level, which is the concentration below which adverse biological effects are not likely to occur. ISQGs are derived using the weight of evidence of available toxicological data. [2] PEL = Probable Effect Level, above which adverse biological effects are usually or always observed. [3] Expressed on a TEQ basis using TEFs for fish as per Van Den Berg et al. (1998).

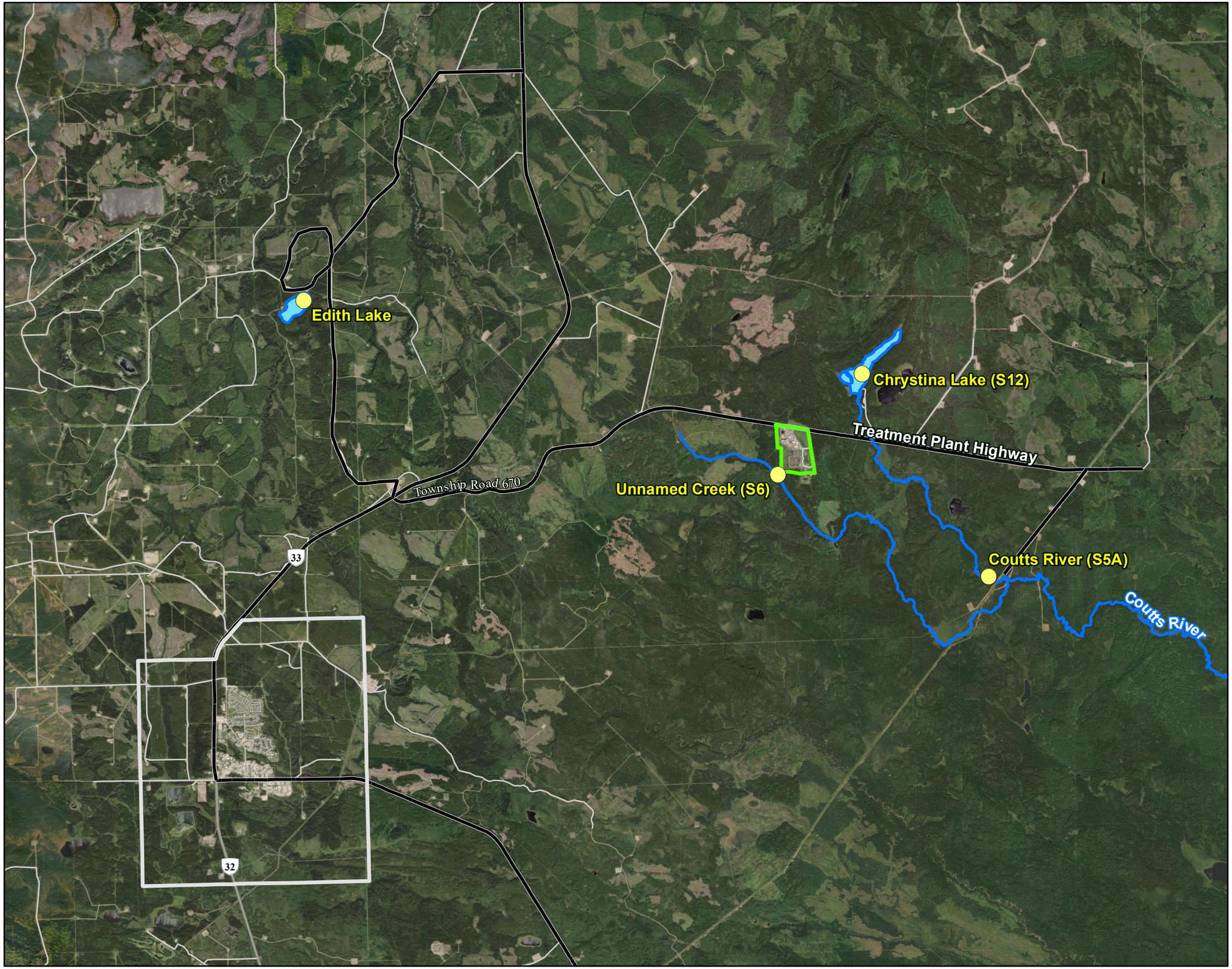
Table 9: Total metals measured in **SEDIMENT** in 2023 as compared to CCME sediment quality guidelines and with results of trend analysis

Parameter	Units	Sampling Station								CCME Sediment Quality Guidelines (2001c)	
		Station S12 (Chrystina Lake)		Edith Lake		StationS5A (Coutts River)		Station S6 (Unnamed Creek)			
		2023 Value	Trend	2023 Value	Trend	2023 Value	Trend	2023 Value	Trend	ISQG	PEL
Aluminum (Al)	mg/kg	14000	NT	9900	NT	7300	NT	9000	↑**	-	-
Antimony (Sb)	mg/kg	<0.5	ID	0.65	↓***	<1	ID	<1	ID	-	-
Arsenic (As)	mg/kg	**7.8**	↑*	5.3	NT	3.3	NT	**6.1**	NT	5.9	17
Barium (Ba)	mg/kg	200	NT	180	NT	120	NT	150	NT	-	-
Beryllium (Be)	mg/kg	0.86	↑*	0.68	NT	<0.8	ID	<0.8	ID	-	-
Boron (B)	mg/kg	4.2	NT	<4	NT	2.6	NT	<2	ID	-	-
Cadmium (Cd)	mg/kg	0.38	NT	0.59	↑*	0.15	NT	0.17	NT	0.6[1]	3.5[1]
Calcium (Ca)	mg/kg	4800	NT	4500	NT	3300	NT	6800	NT	-	-
Chromium (Cr)	mg/kg	13	NT	15	NT	11	NT	7	NT	37.3	90
Cobalt (Co)	mg/kg	7.1	↑**	7.5	↑*	5.3	NT	8.4	NT	-	-
Copper (Cu)	mg/kg	18	NT	20	NT	6.6	NT	3.9	NT	35.7	197
Iron (Fe)	mg/kg	17000	NT	11000	NT	11000	NT	28000	NT	-	-
Lead (Pb)	mg/kg	16	ID	21	NT	5.2	NT	3.7	NT	35	91.3
Lithium (Li)	mg/kg	<20	NT	<20	ID	<10	ID	<10	ID	-	-
Magnesium (Mg)	mg/kg	2300	NT	1400	NT	1600	NT	2100	NT	-	-
Manganese (Mn)	mg/kg	450	NT	**510**	NT	300	NT	**6000**	NT	460[2]	-
Mercury (Hg)	mg/kg	0.11	NT	0.16	NT	<0.1	ID	<NA	ID	0.17	0.486
Molybdenum (Mo)	mg/kg	0.97	NT	1	NT	<0.8	ID	<0.8	NT	-	-
Nickel (Ni)	mg/kg	**19**	NT	**24**	NT	10	NT	7.7	NT	16[2]	-
Phosphorus (P)	mg/kg	1500	NT	1400	NT	390	NT	710	NT	-	-
Potassium (K)	mg/kg	1000	NT	770	NT	460	NT	470	NT	-	-
Selenium (Se)	mg/kg	0.67	NT	1.1	NT	<1	ID	<1	ID	2	
Silver (Ag)	mg/kg	<0.2	ID	<0.2	ID	<0.4	ID	<0.4	ID	-	-
Sodium (Na)	mg/kg	<100	↓*	<100	NT	55	NT	<50	ID	-	-
Strontium (Sr)	mg/kg	28	NT	34	NT	23	NT	40	NT	-	-
Sulphur (S)	mg/kg	2500	NT	3300	NT	360	NT	740	ID	-	-
Thallium (Tl)	mg/kg	0.19	ID	0.16	NT	<0.2	ID	<0.2	ID	-	-
Tin (Sn)	mg/kg	1.2	ID	2	ID	<2	ID	<2	ID	-	-
Uranium (U)	mg/kg	1.8	NT	1.5	NT	0.83	NT	0.51	↓*	-	-
Vanadium (V)	mg/kg	23	↑*	23	NT	17	NT	11	NT	-	-
Zinc (Zn)	mg/kg	70	↑**	90	↑**	38	NT	27	NT	123	315

Notes: Shaded values, if present, represent data that exceed CCME Sediment Quality Guidelines. Arrows with double asterisk represent a significant upward or downward trend at a 99% confidence level. Arrows with an asterisk represent a significant upward or downward trend at a 95% confidence level. Arrows represent a significant upward or downward trend at a 90% confidence level. NT= no significant trend. ID = insufficient data available for trend calculation.

[1] Values are being compared to CCME guidelines. [2] Represents LEL (Lowest Effects Level) guidelines, not ISQG guidelines.

Figure 1: Location of 2023 surface water monitoring stations

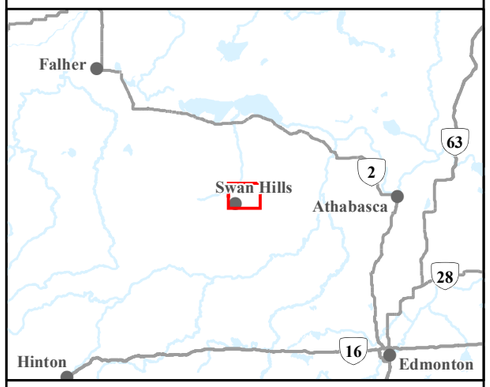


VEOLIA

Surface Water and
Sediment Quality Monitoring

Figure 1
2023 Monitoring Stations

- Sampling Stations
- Coutts River
- Sampling Station Access Road
- Study Lakes
- Swan Hills
- Swan Hills Treatment Center



Source: Contains information licensed under the Open Government Licences – Canada, Alberta and Maxar
Imagery Acquisition Date: Jul 3, 2013 - Aug 23, 2015
Coordinate System: NAD 1983 UTM Zone 11N

N W E S

1:80,000

0 1 2 3 4 km

Date: March 27, 2024

Prepared by: S. Farrugia

CPP ENVIRONMENTAL

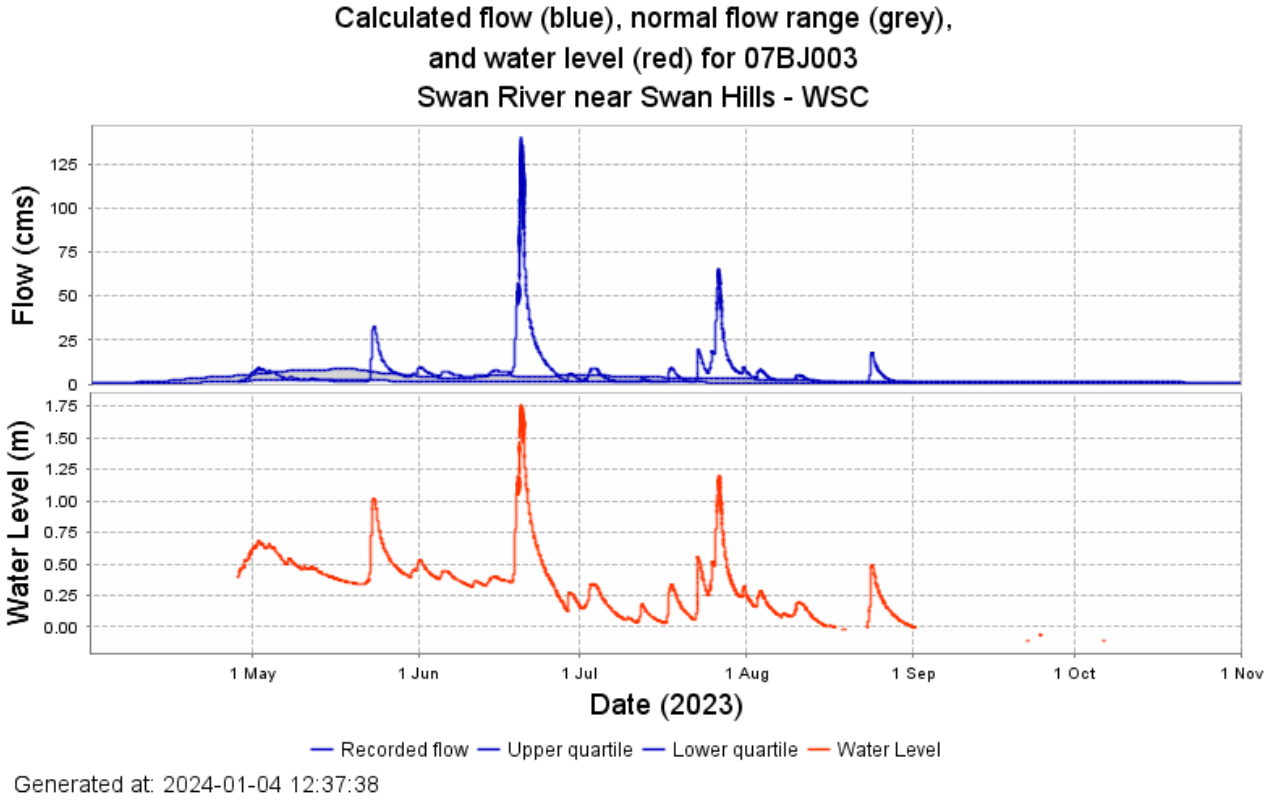
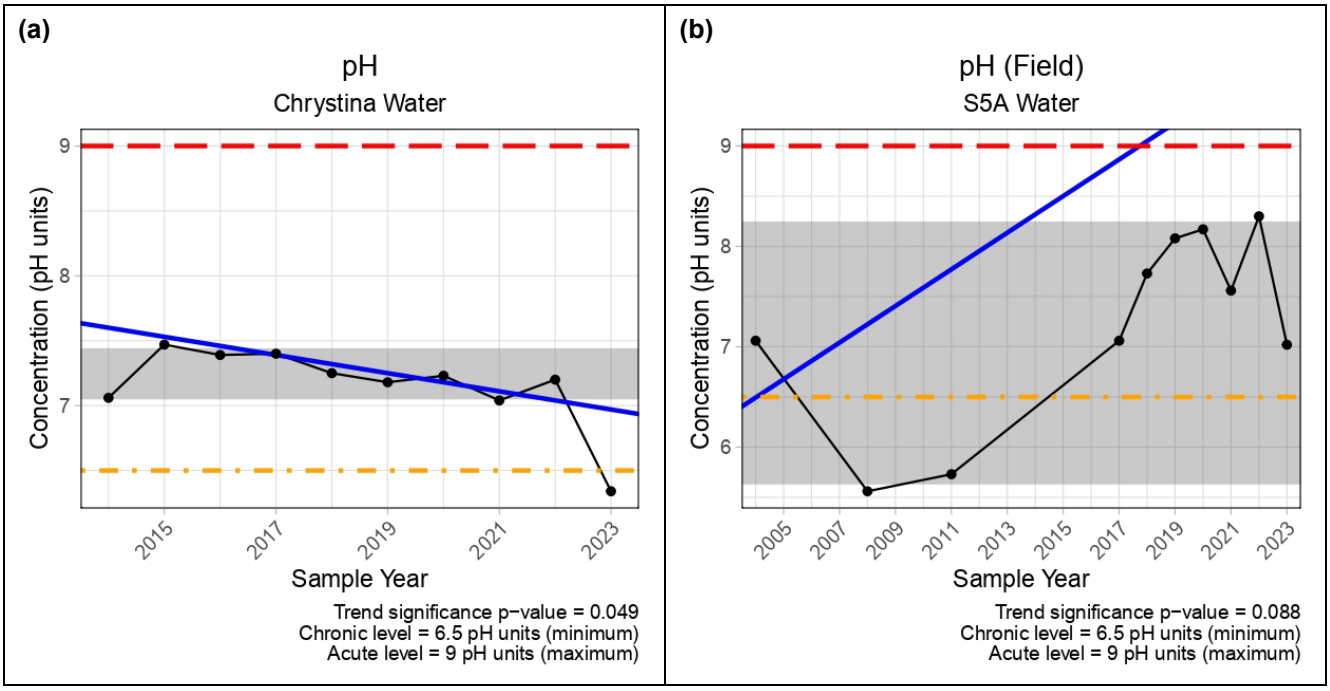
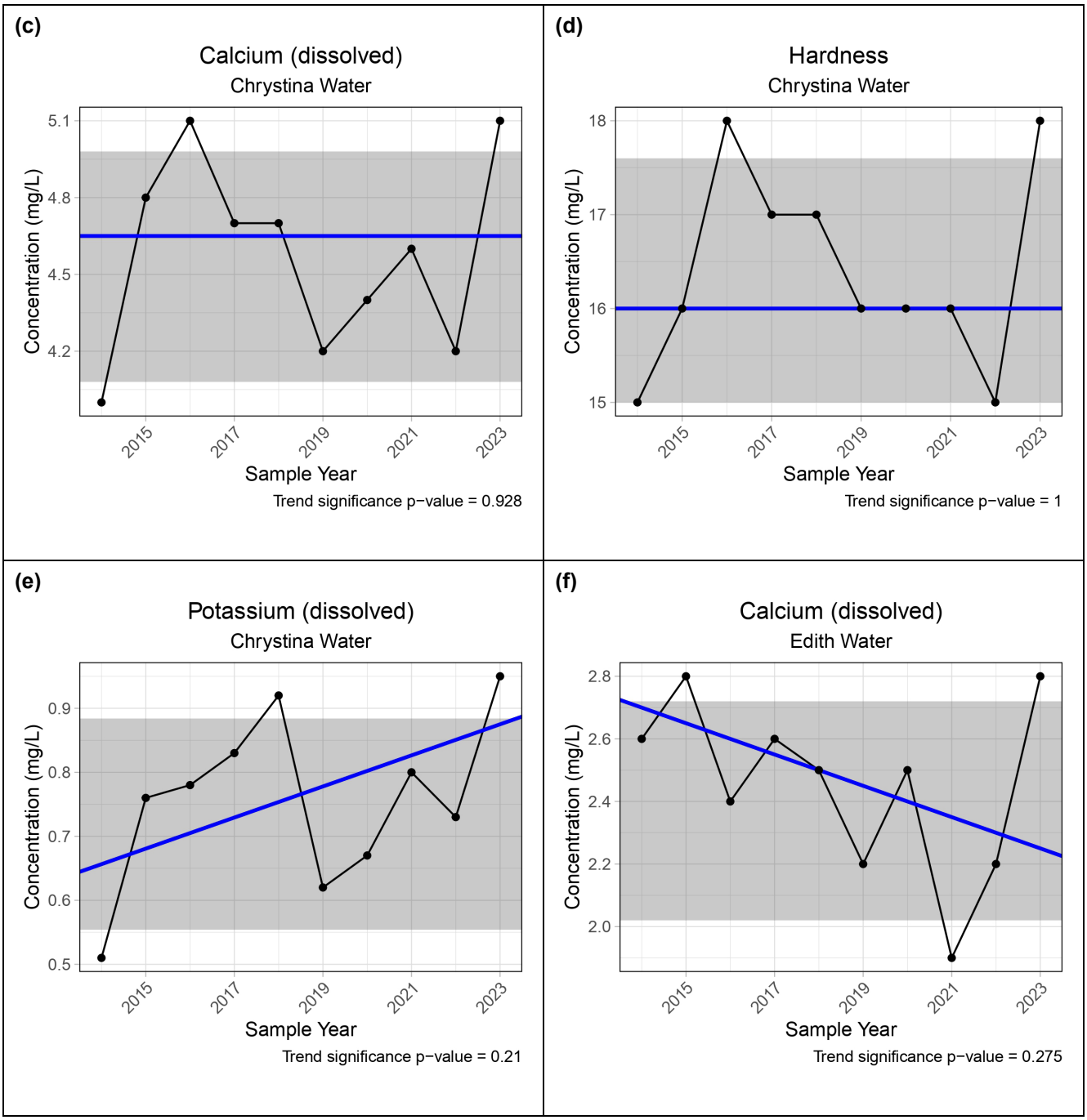
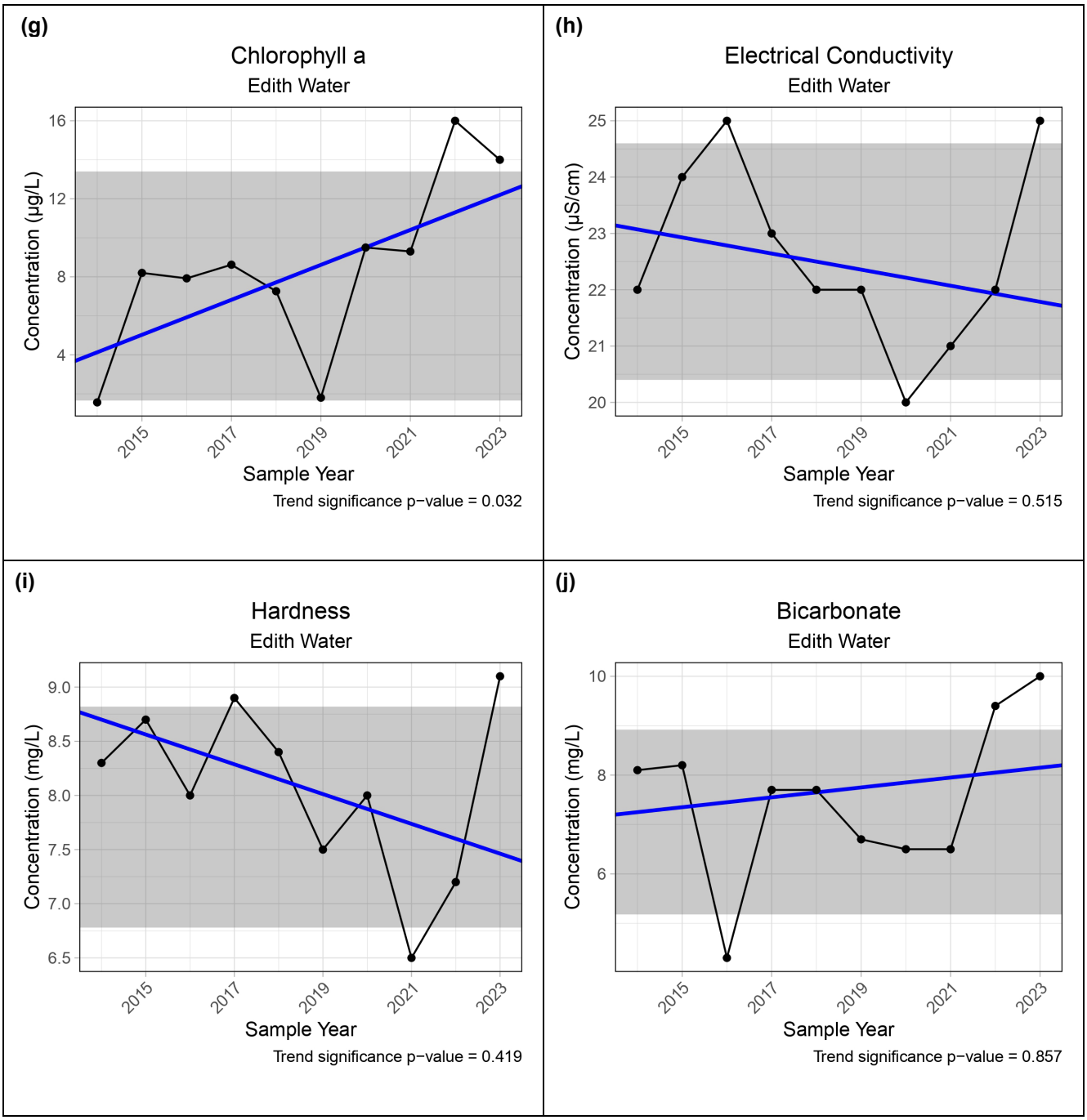


Figure 2: Hydrograph for the Swan River near Swan Hills for the 2023 open water season (April-November), showing daily flow and water levels (Government of Alberta, 2023).

Figure 3: Select trend analysis figures for water quality variables. Horizontal lines represent environmental guidelines; the shaded boxes represent values within the 5th to 95th percentiles within the ten-year moving window. Variables that had both significant trends and applicable guidelines are presented: pH in Chrystina Lake (a), pH (field) in in S5A surface water (b). Additionally, variables that were high compared to the 10-year moving window (above the 95th percentile): dissolved calcium and potassium, and hardness at Chrystina Lake (c-e); dissolved calcium, chlorophyll *a*, EC, hardness, bicarbonate, barium, total calcium. iron, and manganese at Edith Lake (f-n). Trend analysis figures for all variables analyzed in this study are presented in **Appendix 3**.




(c)
Calcium (dissolved)
Chrystina Water
Concentration (mg/L)
5.1
4.8
4.5
4.2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.928
(d)
Hardness
Chrystina Water
Concentration (mg/L)
18
17
16
15
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1
(e)
Potassium (dissolved)
Chrystina Water
Concentration (mg/L)
0.9
0.8
0.7
0.6
0.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.21
(f)
Calcium (dissolved)
Edith Water
Concentration (mg/L)
2.8
2.6
2.4
2.2
2.0
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.275


(g)
Chlorophyll a
Edith Water
Concentration (µg/L)
16
12
8
4
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.032
(h)
Electrical Conductivity
Edith Water
Concentration (µS/cm)
25
24
23
22
21
20
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.515
(i)
Hardness
Edith Water
Concentration (mg/L)
9.0
8.5
8.0
7.5
7.0
6.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.419
(j)
Bicarbonate
Edith Water
Concentration (mg/L)
10
8
6
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.857

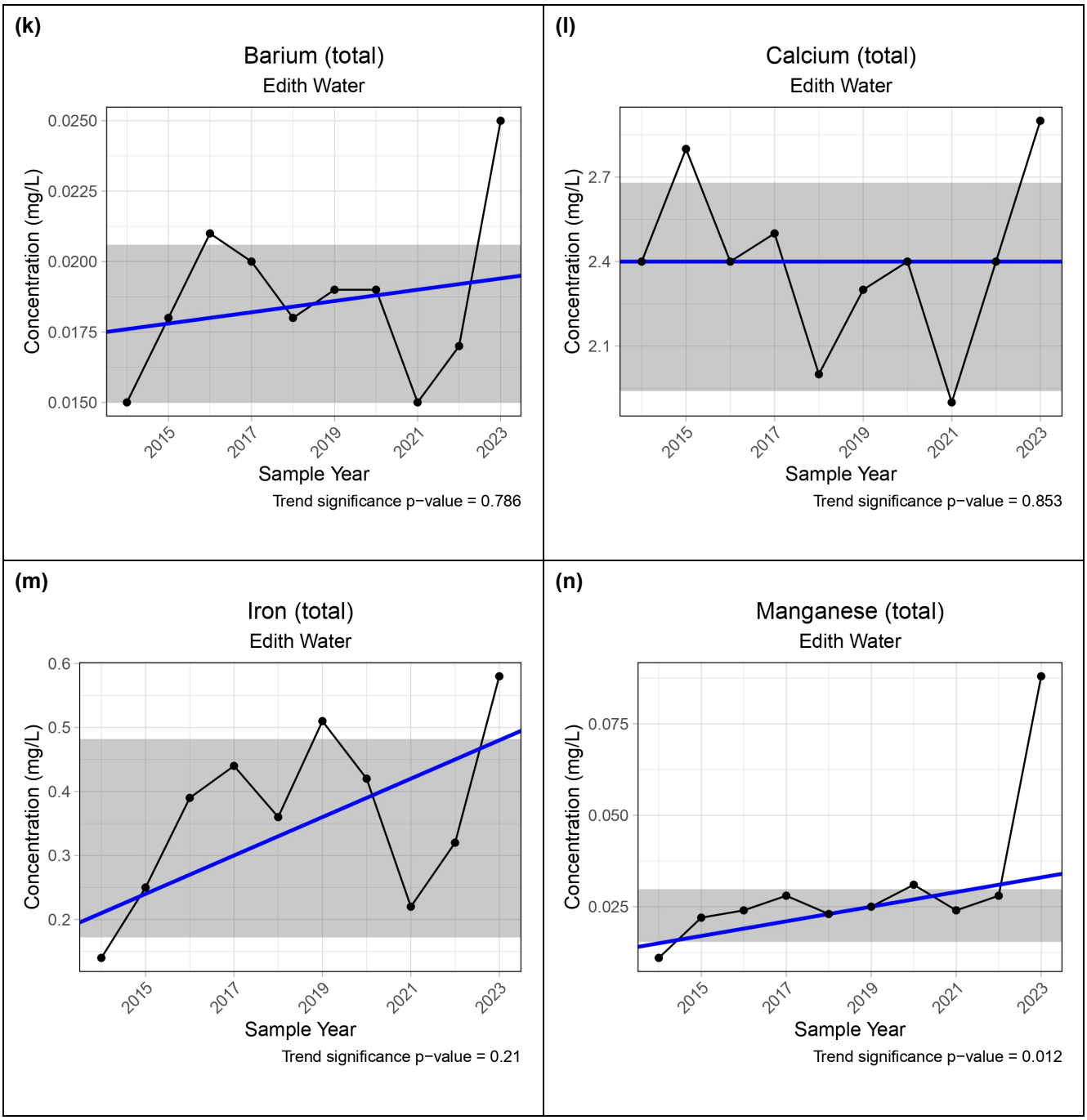
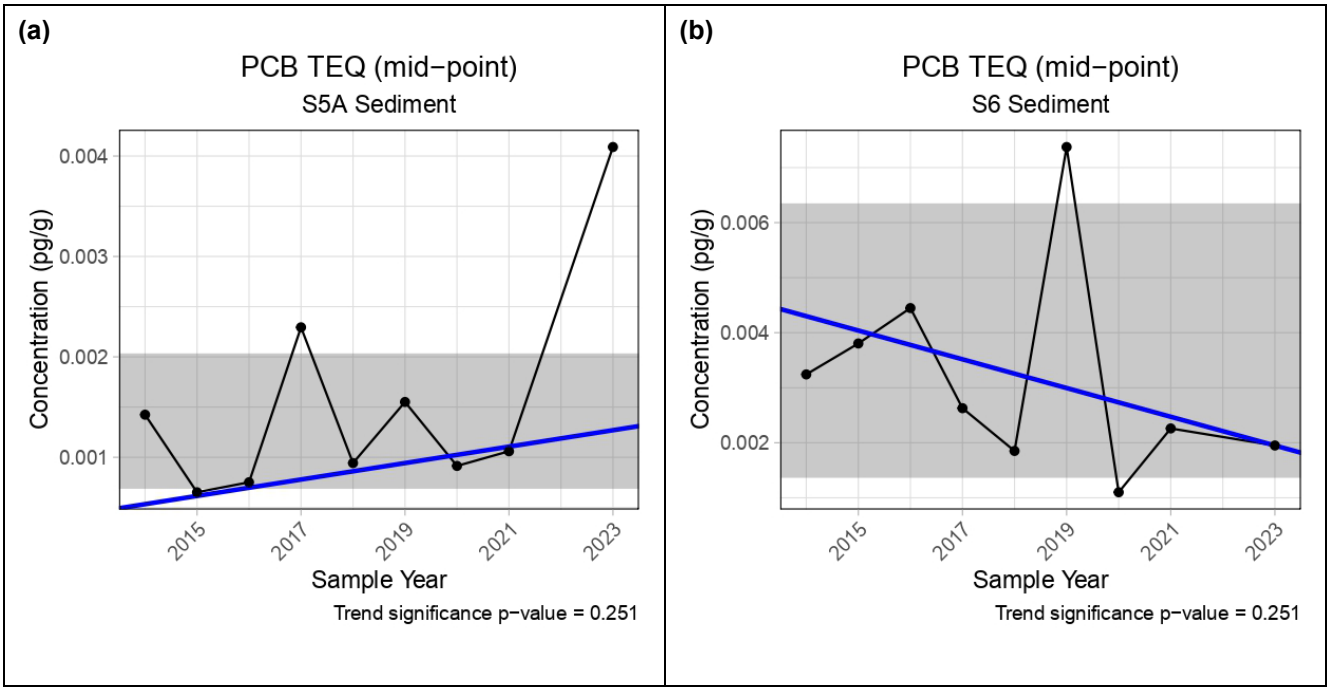
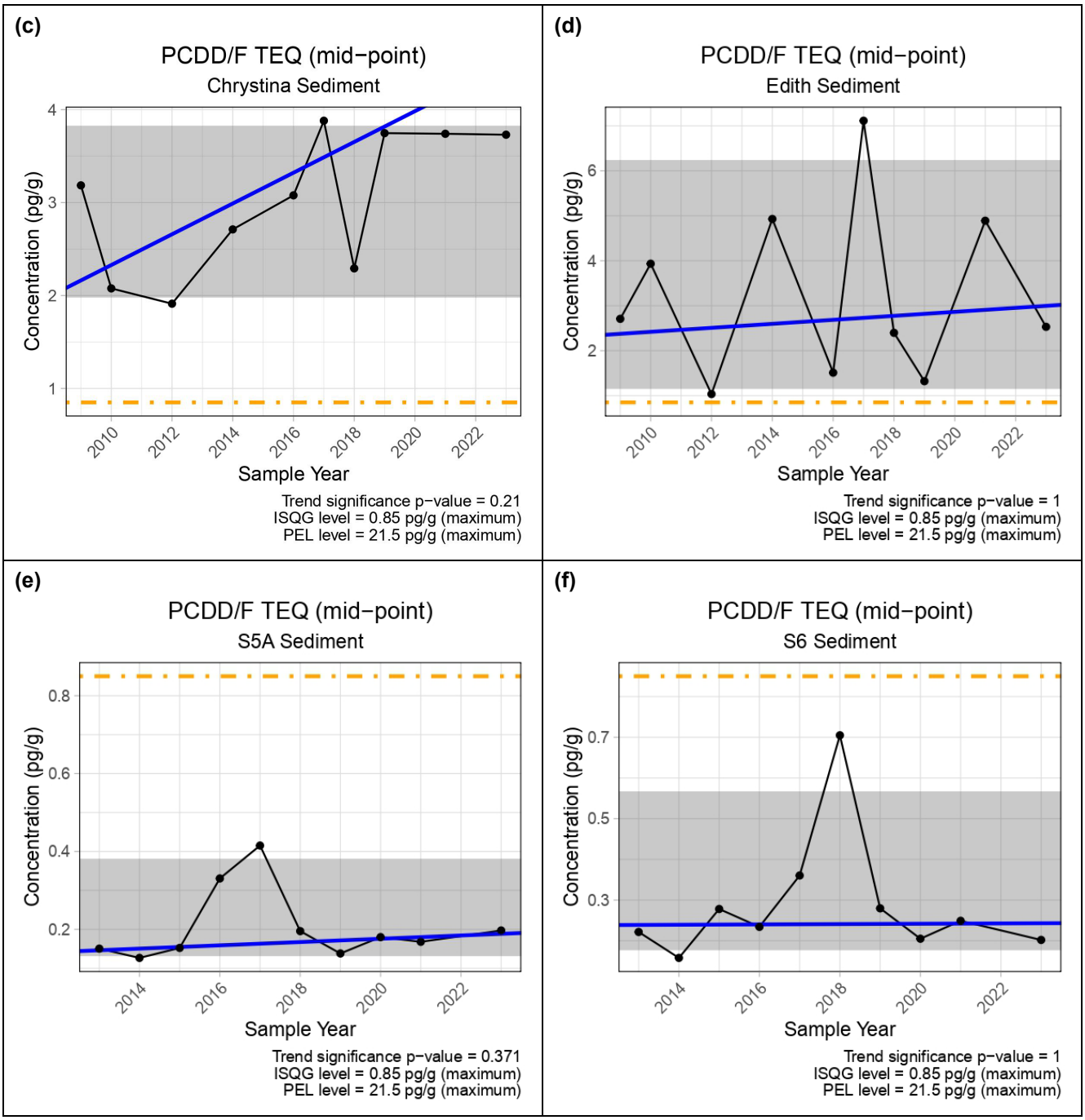
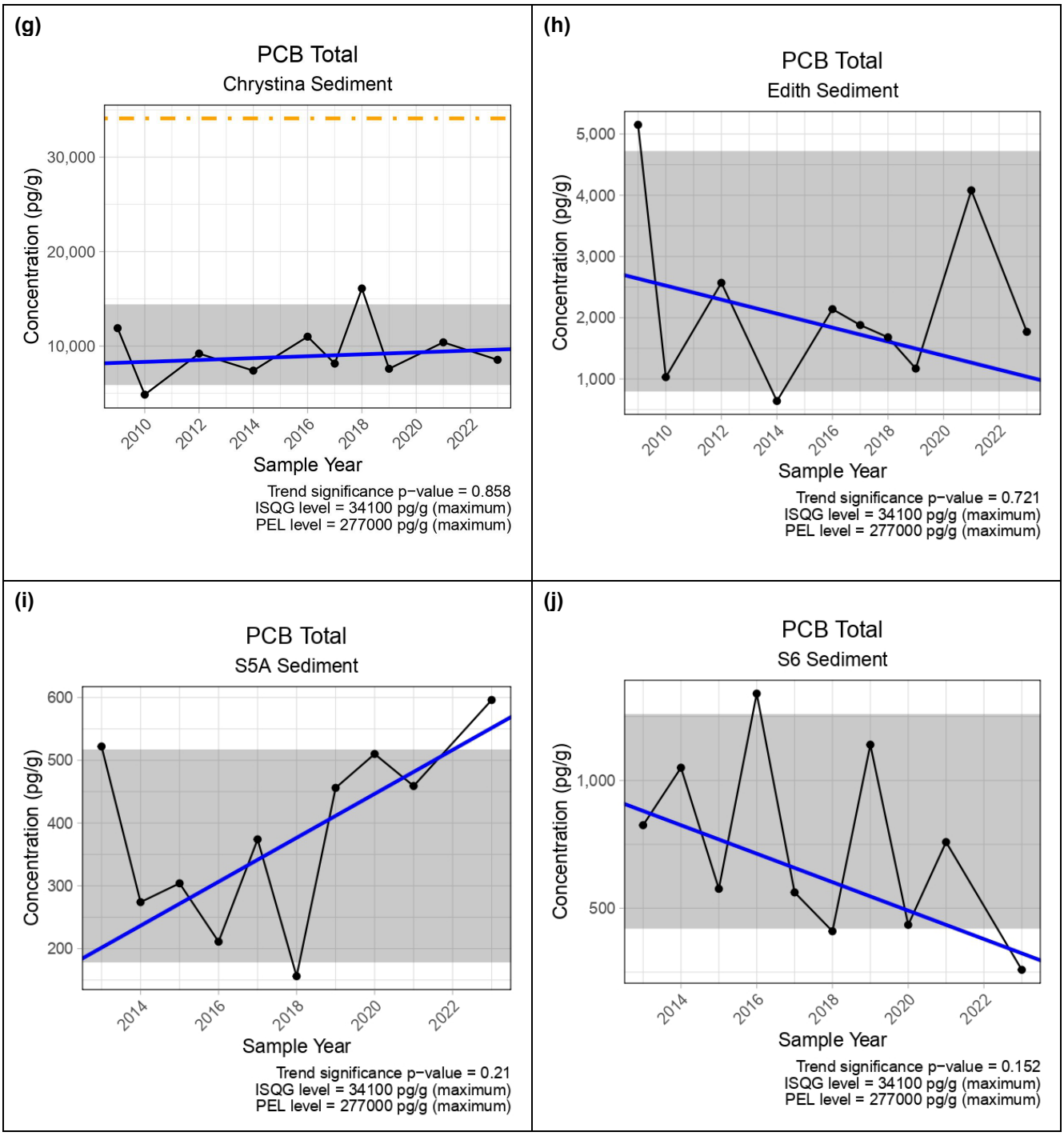
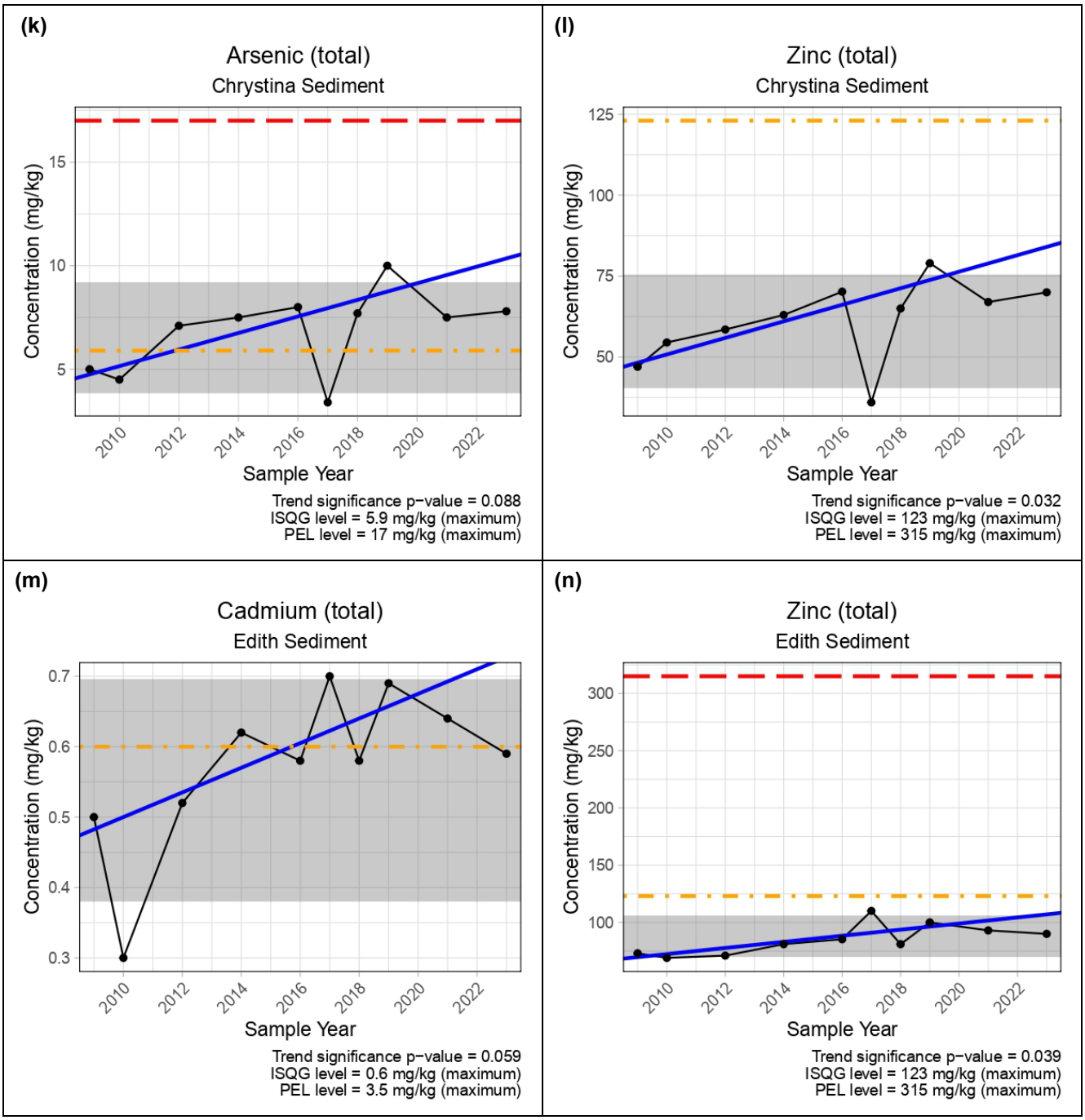

(k)
Barium (total)
Edith Water
Concentration (mg/L)
0.0250
0.0225
0.0200
0.0175
0.0150
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.786
(l)
Calcium (total)
Edith Water
Concentration (mg/L)
2.7
2.4
2.1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.853
(m)
Iron (total)
Edith Water
Concentration (mg/L)
0.6
0.5
0.4
0.3
0.2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.21
(n)
Manganese (total)
Edith Water
Concentration (mg/L)
0.075
0.050
0.025
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.012

Figure 4: Select trend analysis figures for sediment quality variables. Horizontal lines represent environmental guidelines; the shaded boxes represent values within the 5th to 95th percentiles within the ten-year moving window. PCB TEQ (a-b) trend figures are presented for S5A and S6; PCDD/F TEQ (c-f) and Total PCB (g-j) trend figures are presented for sediments at four sites. Variables that had both significant trends and applicable guidelines are presented: arsenic and zinc in Chrystina Lake (k-l); and cadmium and zinc in Edith Lake (m-n). Trend analysis figures for all variables analyzed in this study are presented in **Appendix 3**.




(c)
PCDD/F TEQ (mid−point)
Chrystina Sediment
Concentration (pg/g)
Sample Year
Trend significance p−value = 0.21
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)
(d)
PCDD/F TEQ (mid−point)
Edith Sediment
Concentration (pg/g)
Sample Year
Trend significance p−value = 1
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)
(e)
PCDD/F TEQ (mid−point)
S5A Sediment
Concentration (pg/g)
Sample Year
Trend significance p−value = 0.371
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)
(f)
PCDD/F TEQ (mid−point)
S6 Sediment
Concentration (pg/g)
Sample Year
Trend significance p−value = 1
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)


(g)
PCB Total
Chrystina Sediment
Concentration (pg/g)
30,000
20,000
10,000
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)
(h)
PCB Total
Edith Sediment
Concentration (pg/g)
5,000
4,000
3,000
2,000
1,000
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)
(i)
PCB Total
S5A Sediment
Concentration (pg/g)
600
500
400
300
200
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)
(j)
PCB Total
S6 Sediment
Concentration (pg/g)
1,000
500
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)


(k)
Arsenic (total)
Chrystina Sediment
Concentration (mg/kg)
Sample Year
Trend significance p−value = 0.088
ISQG level = 5.9 mg/kg (maximum)
PEL level = 17 mg/kg (maximum)
(l)
Zinc (total)
Chrystina Sediment
Concentration (mg/kg)
Sample Year
Trend significance p−value = 0.032
ISQG level = 123 mg/kg (maximum)
PEL level = 315 mg/kg (maximum)
(m)
Cadmium (total)
Edith Sediment
Concentration (mg/kg)
Sample Year
Trend significance p−value = 0.059
ISQG level = 0.6 mg/kg (maximum)
PEL level = 3.5 mg/kg (maximum)
(n)
Zinc (total)
Edith Sediment
Concentration (mg/kg)
Sample Year
Trend significance p−value = 0.039
ISQG level = 123 mg/kg (maximum)
PEL level = 315 mg/kg (maximum)

Appendix 1: Surface Water Analytical Parameters

Table A-1a: Analytical parameters for surface water quality. Note that not all parameters were eligible for trend analysis at each site.

Type	Parameters	
Biological	Chlorophyll-*a*	
Carbon	Total Organic Carbon	
Field Measurements	Dissolved Oxygen	pH
	Electrical Conductivity	Temperature
	Flow (stream sites only)	Water Depth
	Oxidation-Reduction Potential	
Nutrients	Nitrate as N	Total Ammonia as N
	Nitrate plus Nitrite as N	Total Kjeldahl Nitrogen
	Nitrite as N	Total Phosphorus
Routine/Ionic Chemistry	Bicarbonate	Dissolved Sodium
	Carbonate	Electrical Conductivity
	Chloride	Hardness
	Dissolved Calcium	Hydroxide
	Dissolved Iron	pH
	Dissolved Magnesium	Sulphate
	Dissolved Manganese	Total Alkalinity
	Dissolved Potassium	Total Dissolved Solids
Total Metals	Aluminum	Molybdenum
	Antimony	Nickel
	Arsenic	Potassium
	Barium	Selenium
	Boron	Silicon
	Cadmium (low level analysis)	Silver
	Calcium	Sodium
	Chromium	Strontium
	Cobalt	Sulphur
	Copper	Thallium
	Iron	Tin
	Lead	Titanium
	Lithium	Uranium
	Magnesium	Vanadium
	Manganese	Zinc
	Mercury (low level analysis)	

Table A-1b: Analytical parameters for sediment quality. Note that not all parameters were eligible for trend analysis at each site.

Type	Parameters	
Carbon and Nutrients	Total Carbon	Total Organic Carbon
	Nitrogen	Sulphur
Physical	Moisture Content	Grain Size
	Sieve Analysis (#10. #200, Pan)	Organic Matter
Polychlorinated Biphenyls (PCBs)	Total PCBs	Full congener analysis (209 congeners)
	Total MonoCB Homologues	Total HexaCB Homologues
	Total DiCB Homologues	Total HeptaCB Homologues
	Total TriCB Homologues	Total OctaCB Homologues
	Total TetraCB Homologues	Total NonaCB Homologues
	Total PentaCB Homologues	PCB TEQ (lower bound, midpoint, upper bound estimates)
	Aroclor 1016	Aroclor 1254
	Aroclor 1221	Aroclor 1260
	Aroclor 1232	Aroclor 1262
	Aroclor 1242	Aroclor 1268
	Aroclor 1248	
Polychlorinated Dibenzo-*p*-Dioxins and Dibenzofurans (PCDD/Fs)	2,3,7,8-TCDD	2,3,4,7,8-PeCDF
	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDF
	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDF
	1,2,3,6,7,8-HxCDD	2,3,4,6,7,8-HxCDF
	1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-HxCDF
	1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDF
	1,2,3,4,6,7,8,9-OCDD	1,2,3,4,7,8,9-HpCDF
	2,3,7,8-TCDF	1,2,3,4,5,6,7,8-OCDF
	1,2,3,7,8-PeCDF	PCDD/F TEQ (lower bound, midpoint, upper bound estimates)
	Total TetraCDD Homologues	Total TetraCDF Homologues
	Total PentaCDD Homologues	Total PentaCDF Homologues
	Total HexaCDD Homologues	Total HexaCDF Homologues
	Total HeptaCDD Homologues	Total HeptaCDF Homologues
Soluble Ions	Chloride	pH
	Calcium	Sodium
	Electrical Conductivity	Sodium Adsorption Ratio
	Magnesium	Sulphate
	Potassium	

Type	Parameters	
Total Metals	Aluminum	Magnesium
	Antimony	Manganese
	Arsenic	Mercury
	Barium	Molybdenum
	Beryllium	Phosphorus
	Boron	Potassium
	Cadmium	Selenium
	Calcium	Silver
	Chromium	Sodium
	Chromium (VI)	Strontium
	Cobalt	Thallium
	Copper	Tin
	Iron	Uranium
	Lead	Vanadium
	Lithium	Zinc

Appendix 2: Significant Trends in Surface Water Quality

Table A-2a: Summary of significant (α = 0.1) 10 year moving window trends for **surface water** parameters. All surface water trend analysis results are presented in **Appendix 3**.

Site	Parameter	Trend Direction	Trend Significance [1]	*p*-value
Chrystina	Chlorophyll *a*	up	**	0.049
Chrystina	Electrical Conductivity (field)	down	*	0.074
Chrystina	pH (lab)	down	**	0.049
Chrystina	Barium (total)	up	**	0.015
Chrystina	Sodium (total)	up	*	0.097
Chrystina	Strontium	up	*	0.079
Edith	Chlorophyll *a*	up	**	0.032
Edith	Electrical Conductivity (field)	down	***	0.002
Edith	Total Organic Carbon	down	*	0.079
Edith	Manganese (total)	Up	**	0.012
Edith	Potassium (total)	Up	**	0.032
S5A	Phosphorus (total)	Down	*	0.055
S5A	pH (field)	Up	*	0.088
S5A	Silicon (total)	Up	**	0.015
S5A	Total Organic Carbon	Down	***	0.007

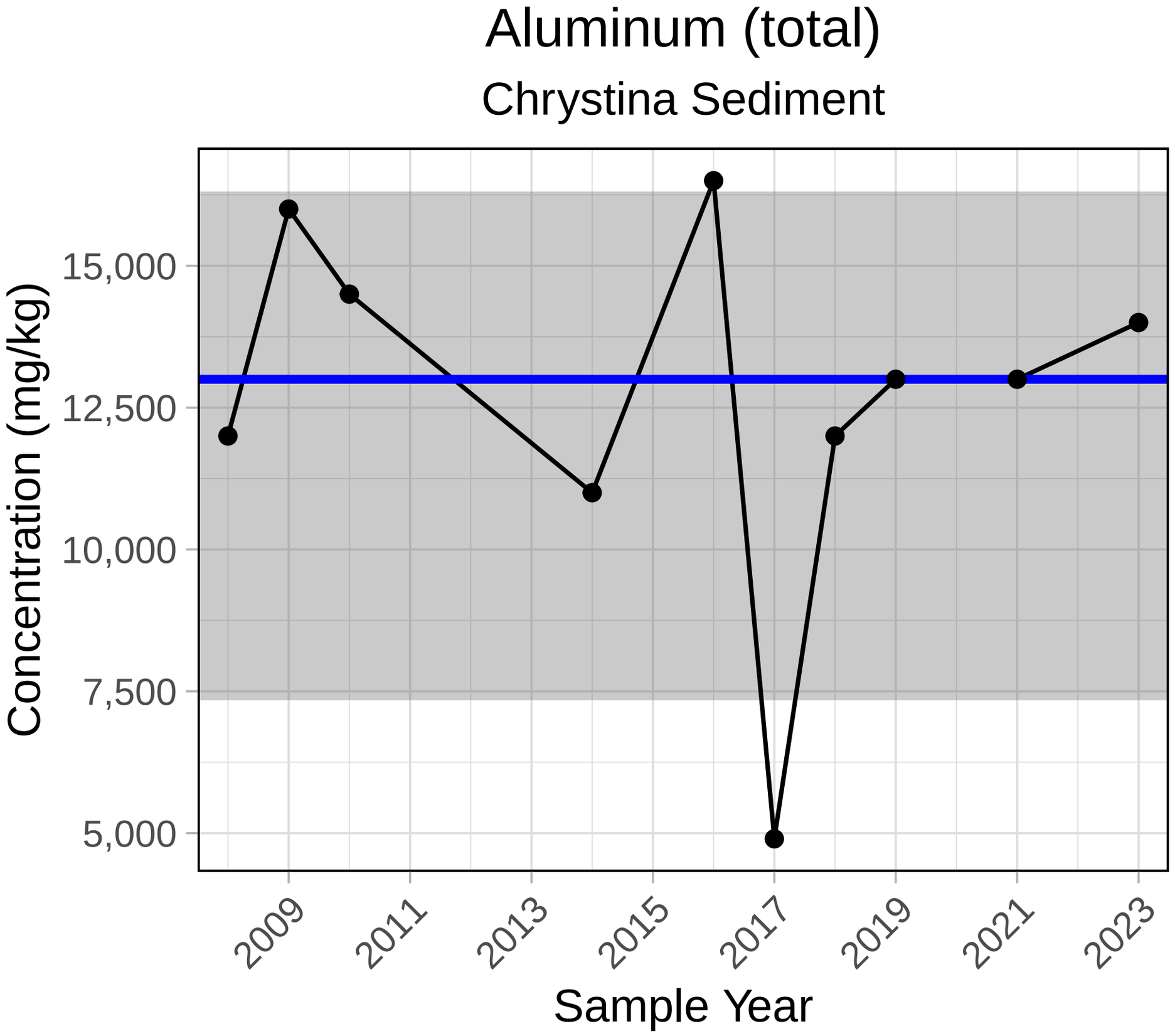
[1] Asterisks indicate level of significance: *** = p < 0.01; ** = p < 0.05; * = p < 0.1.

Table A-2b: Summary of significant (α = 0.1) 10 year moving window trends for **sediment** parameters. All sediment trend analysis results are presented in **Appendix 3**.

Site	Parameter	Trend Direction	Trend Significance [1]	*p*-value
Chrystina	Arsenic	up	*	0.088
Chrystina	Beryllium	up	*	0.074
Chrystina	Cobalt	up	**	0.039
Chrystina	Sodium	down	*	0.088
Chrystina	Vanadium	up	*	0.085
Chrystina	Zinc	up	**	0.032
Chrystina	2,3,7,8-TCDF	up	***	0.005
Chrystina	1,2,3,7,8-PeCDF	up	**	0.02
Chrystina	2,3,4,7,8-PeCDF	up	***	0.005
Edith	Antimony	down	***	0.007
Edith	Cadmium	up	*	0.059
Edith	Cobalt	up	*	0.088
Edith	Zinc	up	**	0.039
Edith	1,2,3,6,7,8-HxCDD	up	**	0.035
Edith	1,2,3,6,7,8-HxCDF	down	*	0.084
Edith	Total OctaCB	up	*	0.057
S5A	1,2,3,4,6,7,8-HpCDF	up	*	0.088
S5A	Total HeptaCB	up	**	0.049
S5A	Total HexaCB	up	**	0.049
S5A	Total HpCDF	up	*	0.084
S5A	Total MonoCB	up	**	0.016
S5A	Total OctaCB	up	**	0.032
S6	Aluminum	up	**	0.02
S6	Uranium	down	*	0.053
S6	PCB 114	down	*	0.071
S6	1,2,3,4,5,6,7,8-OCDF	up	*	0.074

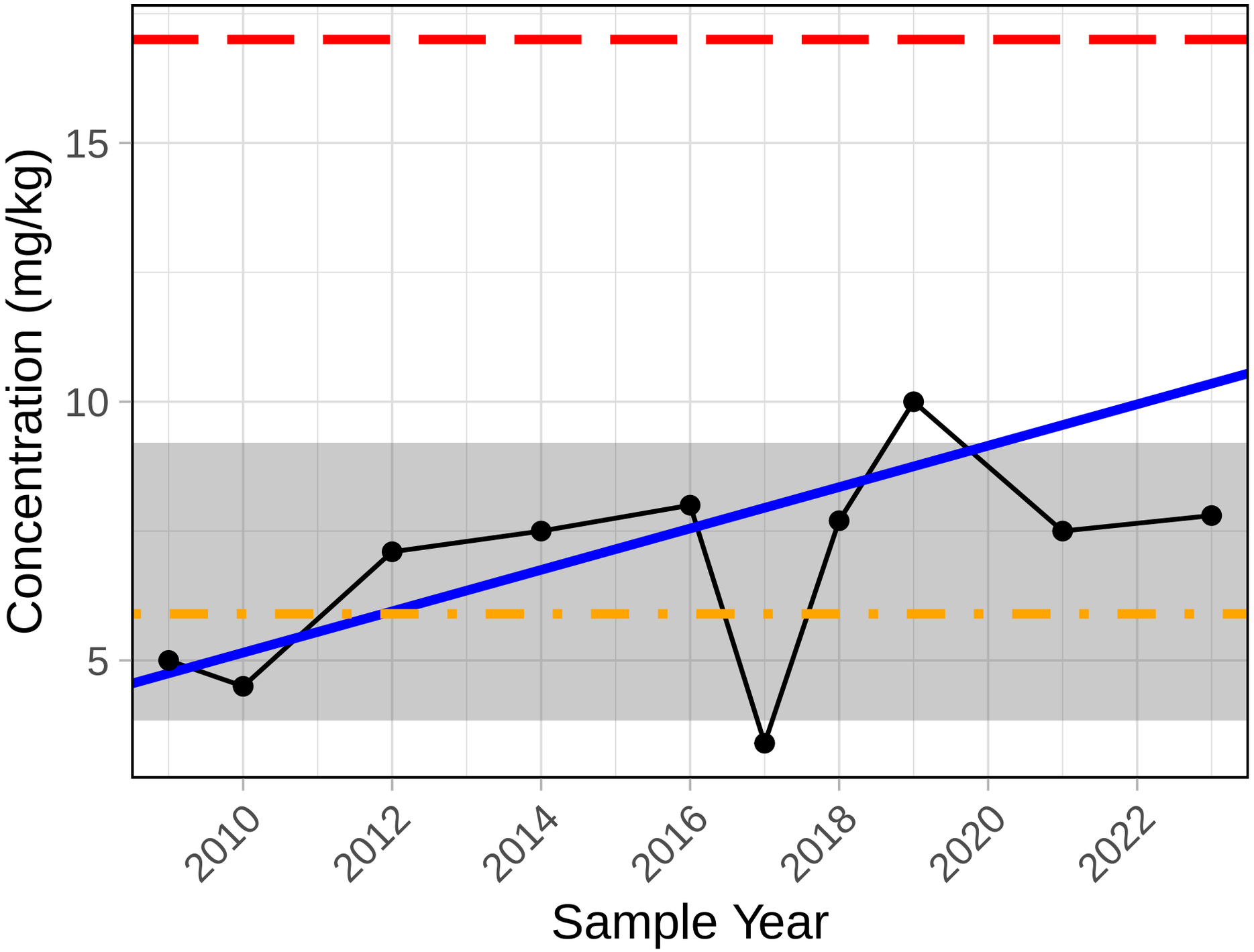
[1] Asterisks indicate level of significance: *** = $p < 0.01$; ** = $p < 0.05$; * = $p < 0.1$.

Appendix 3: Trend Analysis Figures


Aluminum (total)
Chrystina Sediment
Concentration (mg/kg)
15,000
12,500
10,000
7,500
5,000
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

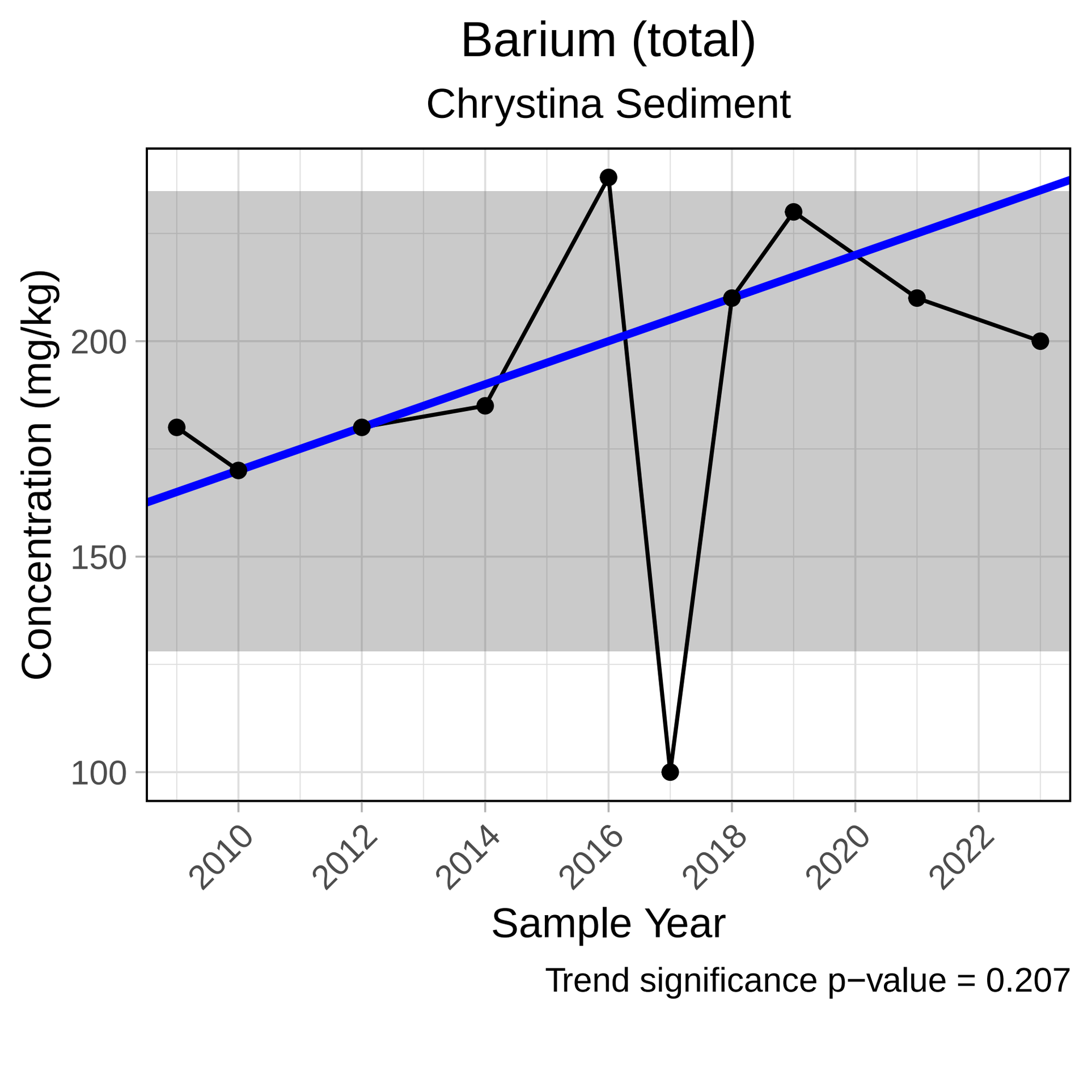
Arsenic (total)

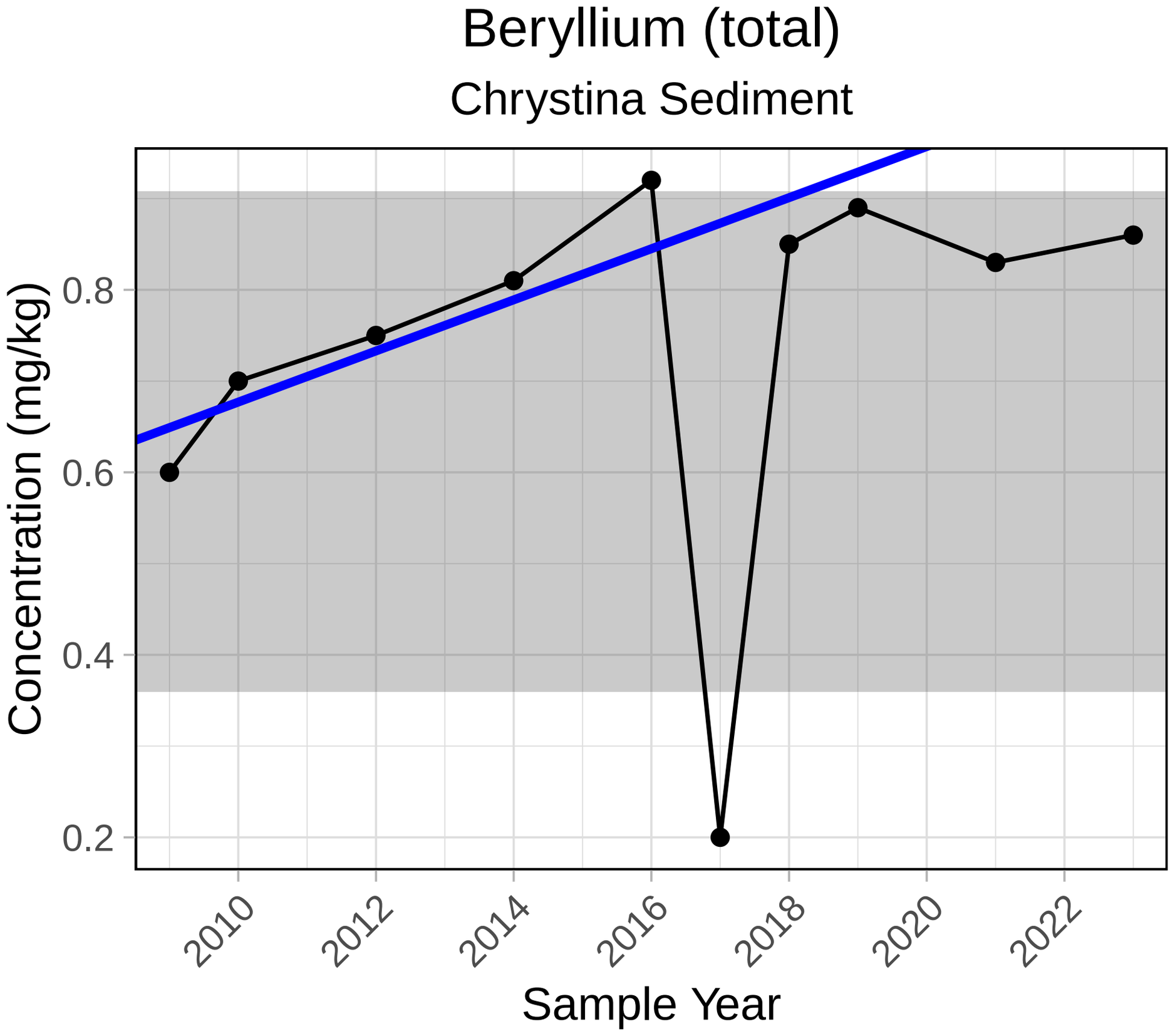
Chrystina Sediment

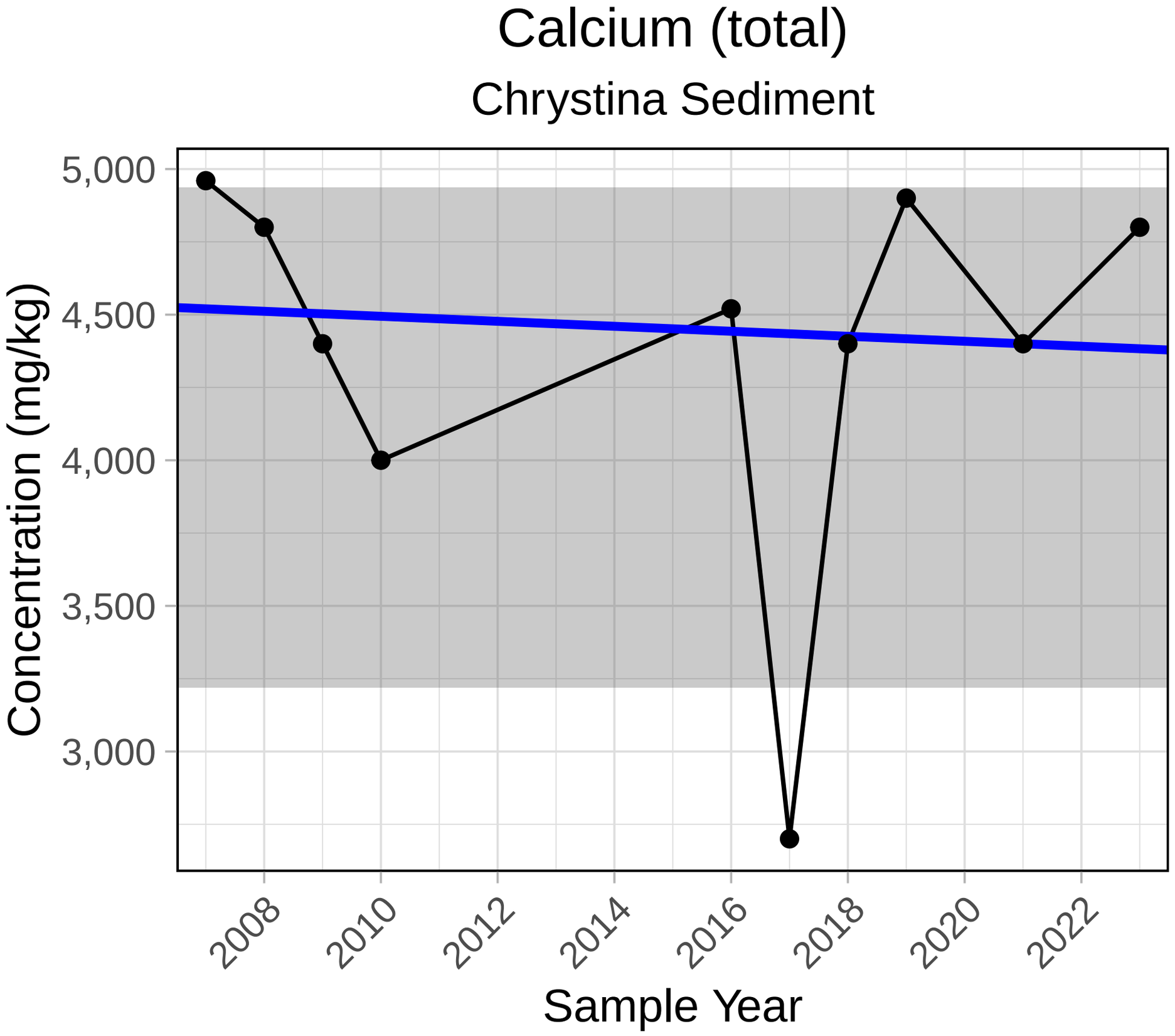


Trend significance p−value = 0.088
ISQG level = 5.9 mg/kg (maximum)
PEL level = 17 mg/kg (maximum)

Boron (total)
Chrystina Sediment
Concentration (mg/kg)
5
4
3
2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.138

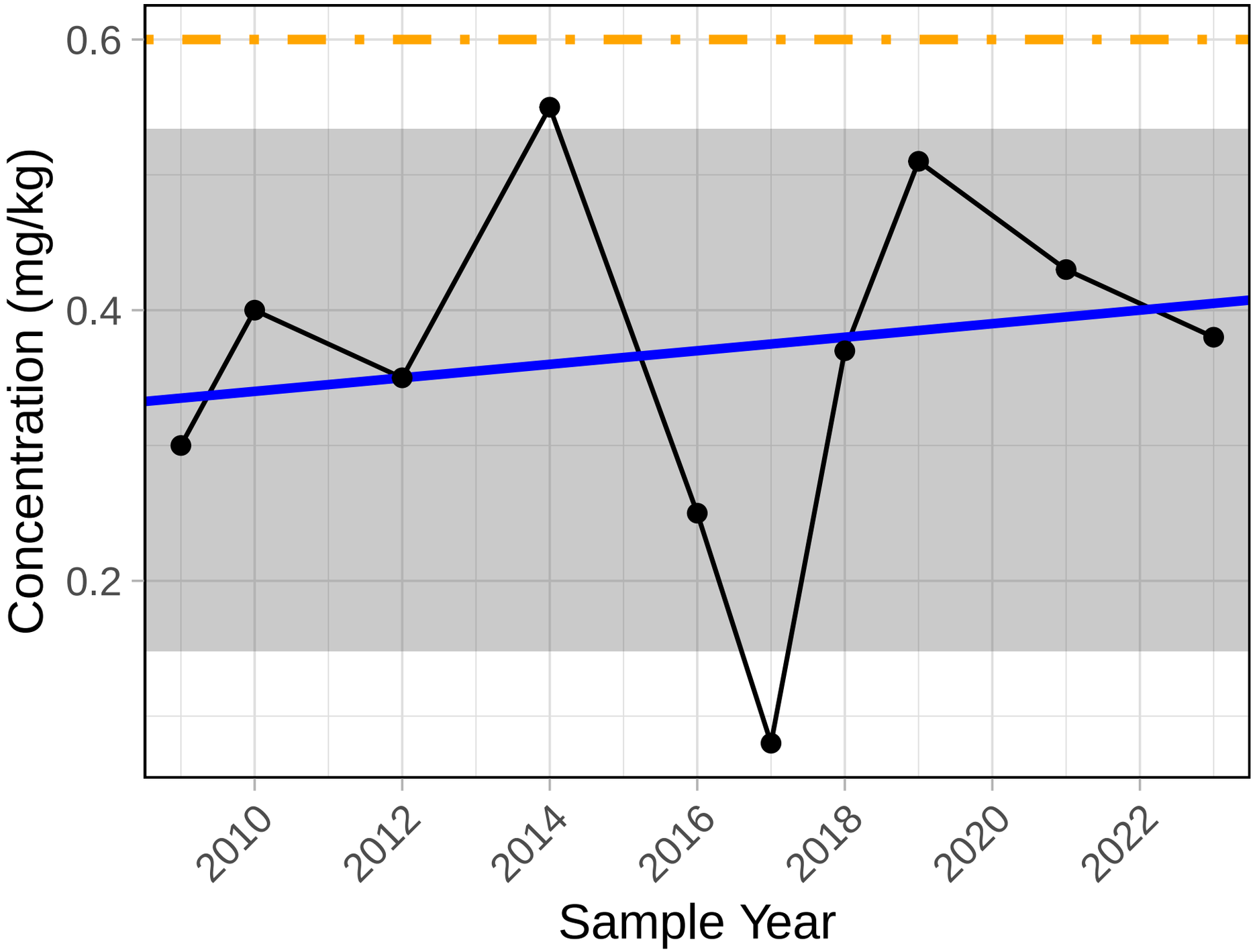

Barium (total)
Chrystina Sediment
Concentration (mg/kg)
200
150
100
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.207


Beryllium (total)
Chrystina Sediment
Concentration (mg/kg)
0.8
0.6
0.4
0.2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.074

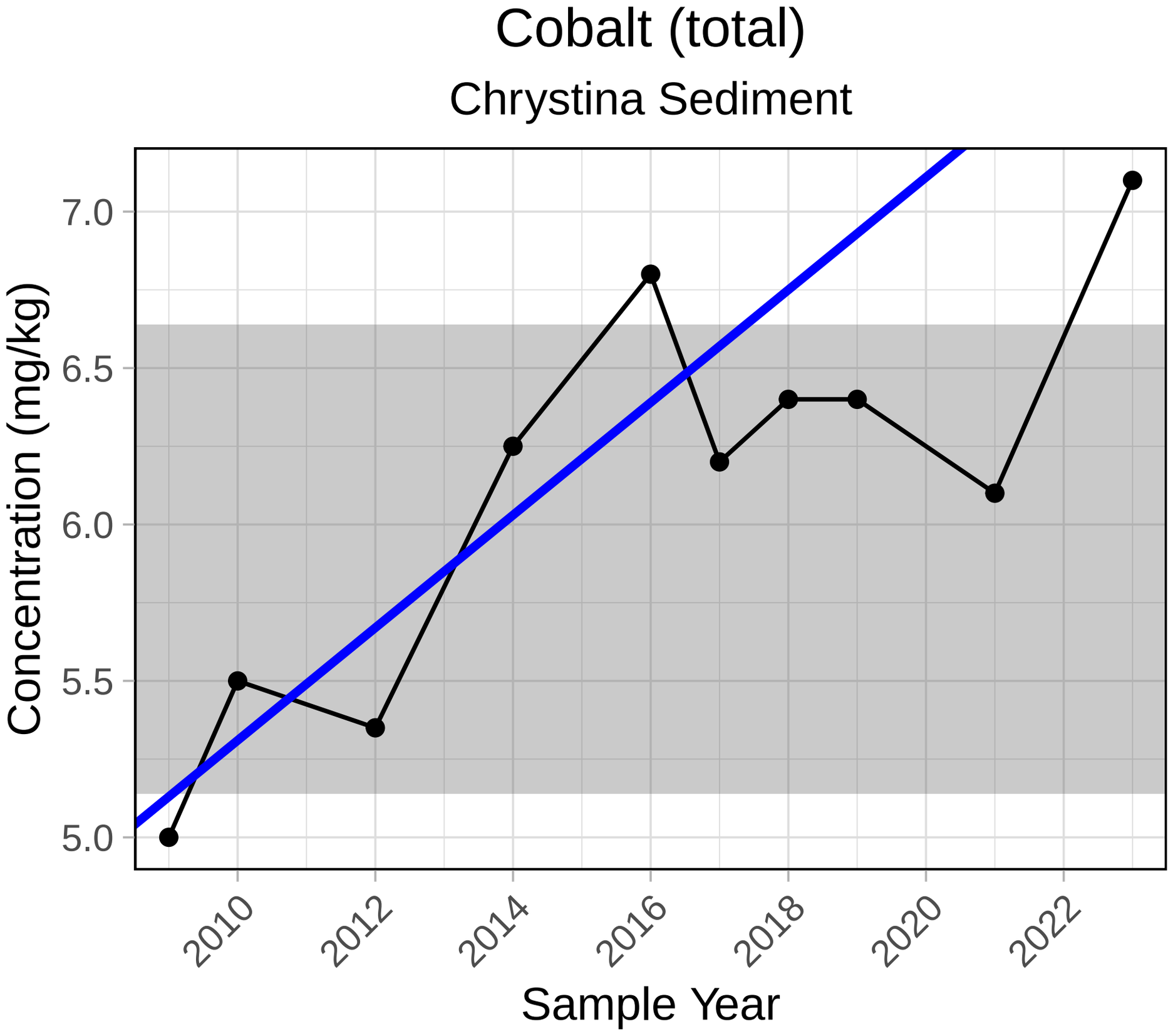

Calcium (total)
Chrystina Sediment
5,000
4,500
4,000
3,500
3,000
Concentration (mg/kg)
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.715

Cadmium (total)

Chrystina Sediment

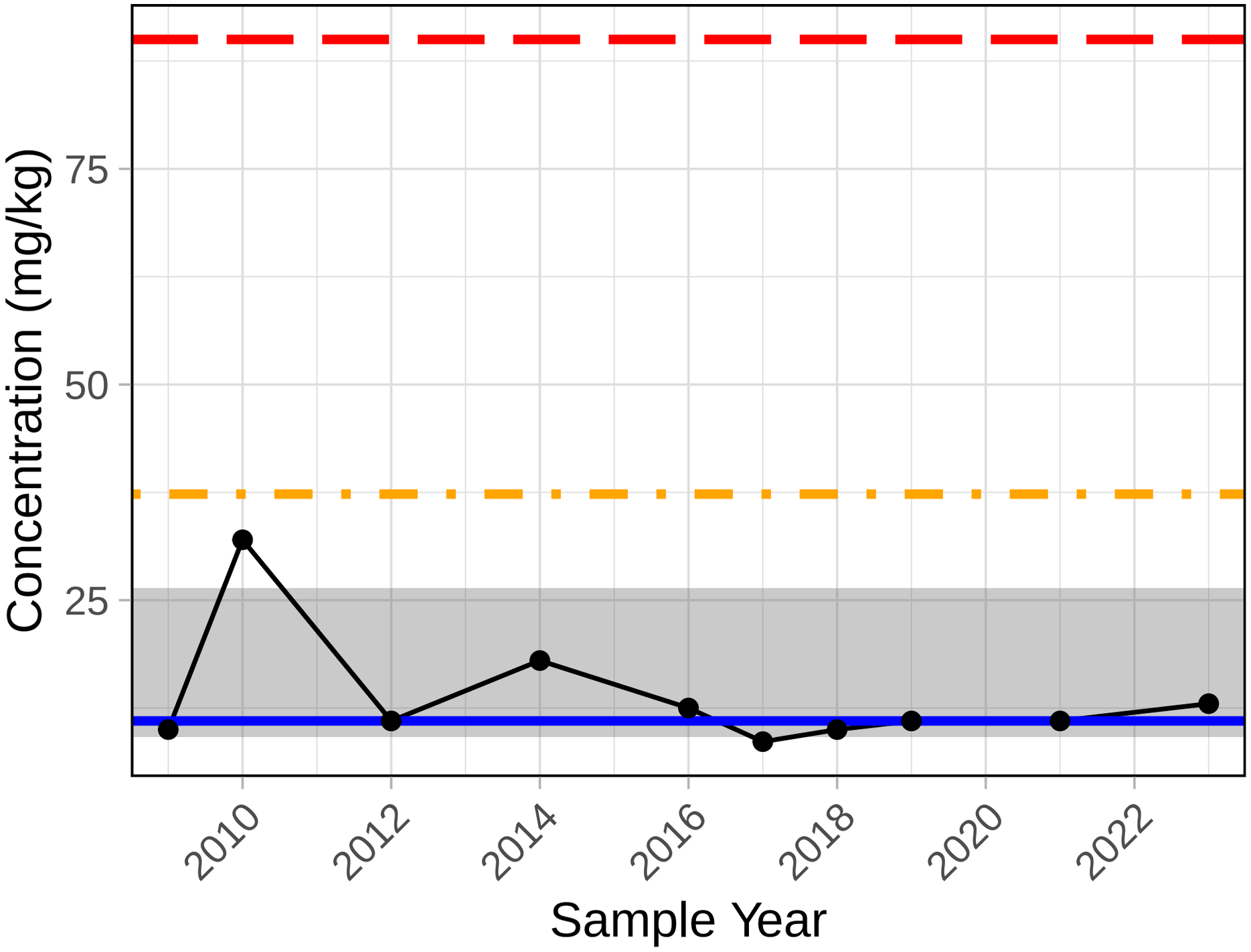


Trend significance p−value = 0.592
ISQG level = 0.6 mg/kg (maximum)
PEL level = 3.5 mg/kg (maximum)


Cobalt (total)
Chrystina Sediment
Concentration (mg/kg)
7.0
6.5
6.0
5.5
5.0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.039

Chromium (total)

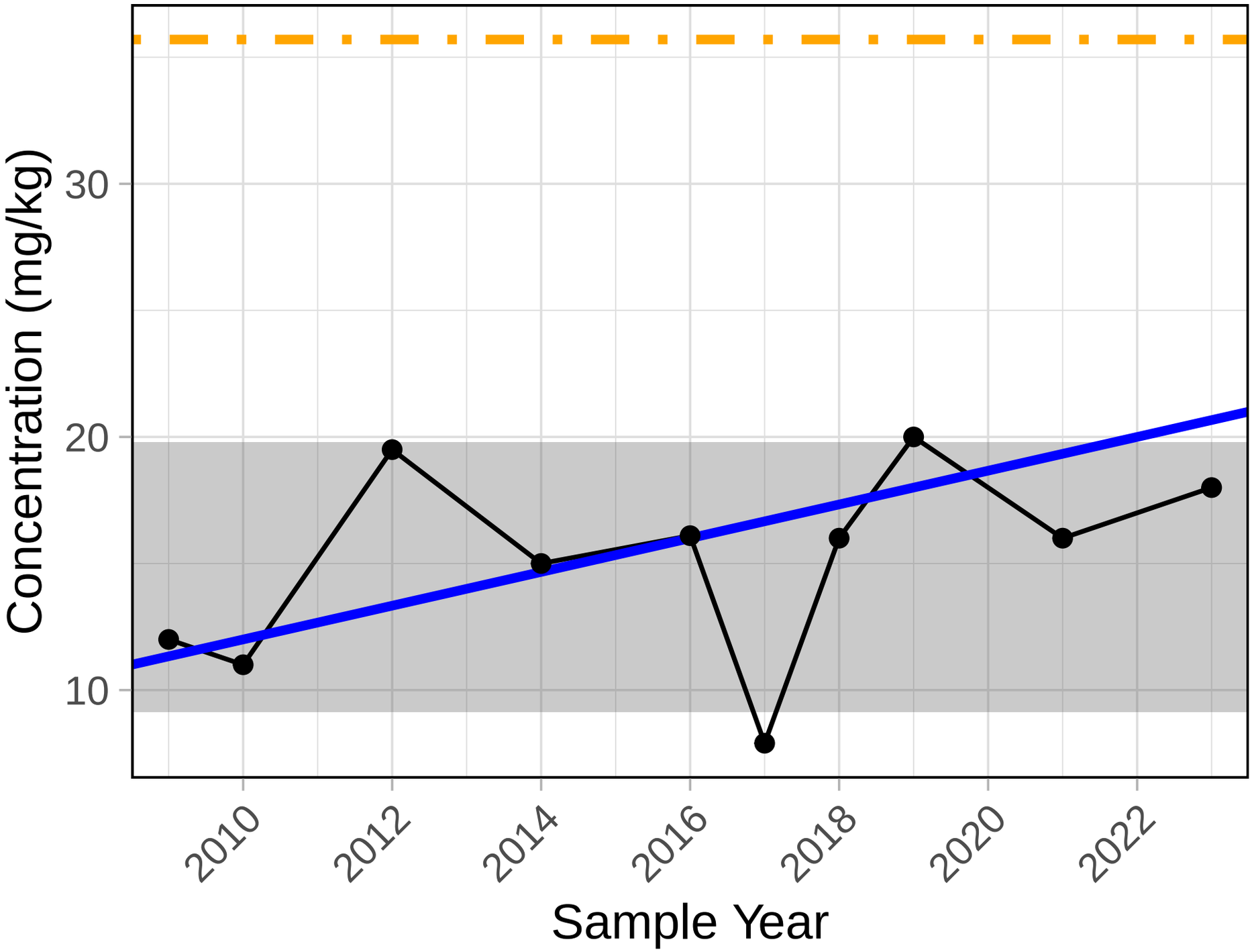
Chrystina Sediment



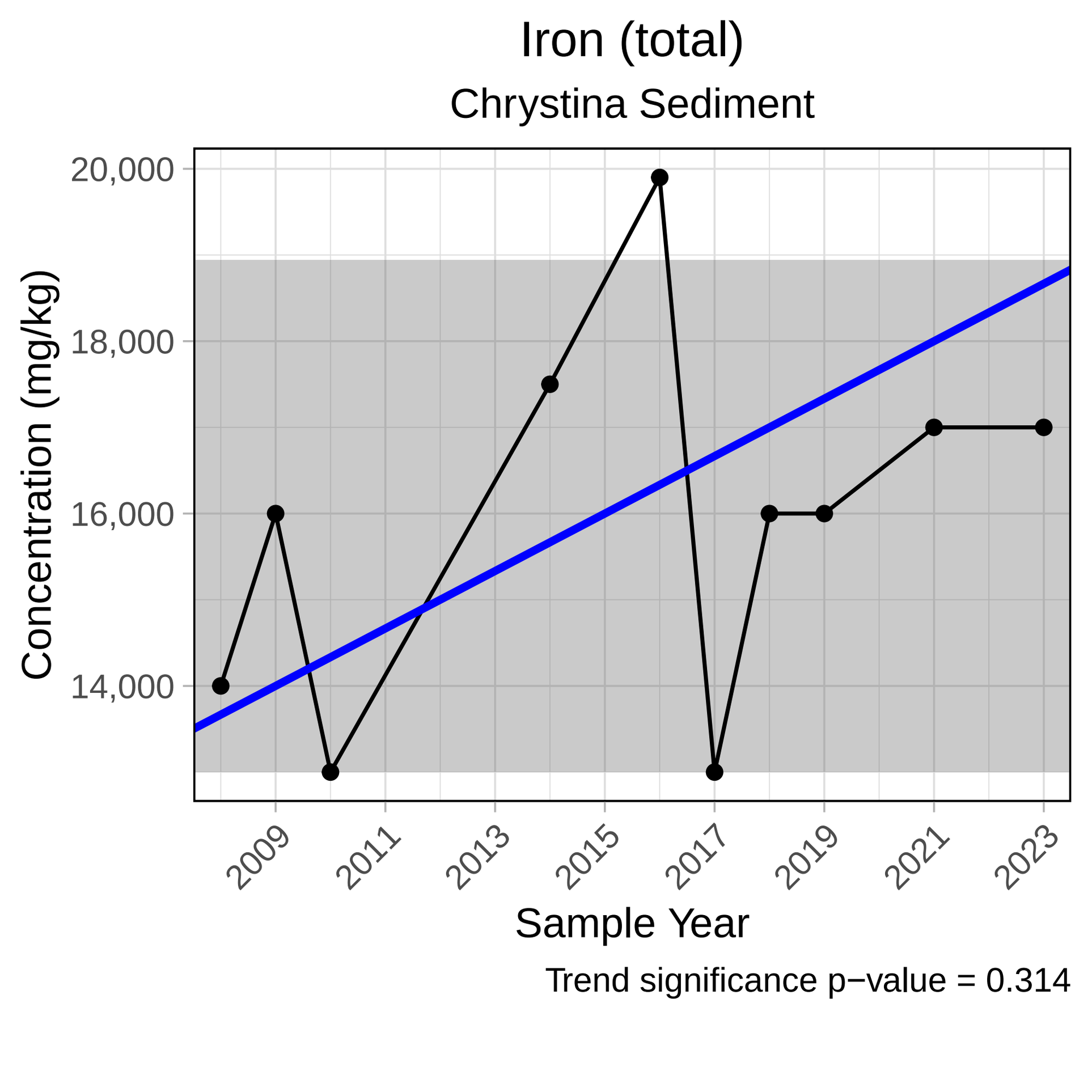
Trend significance p−value = 1
ISQG level = 37.3 mg/kg (maximum)
PEL level = 90 mg/kg (maximum)

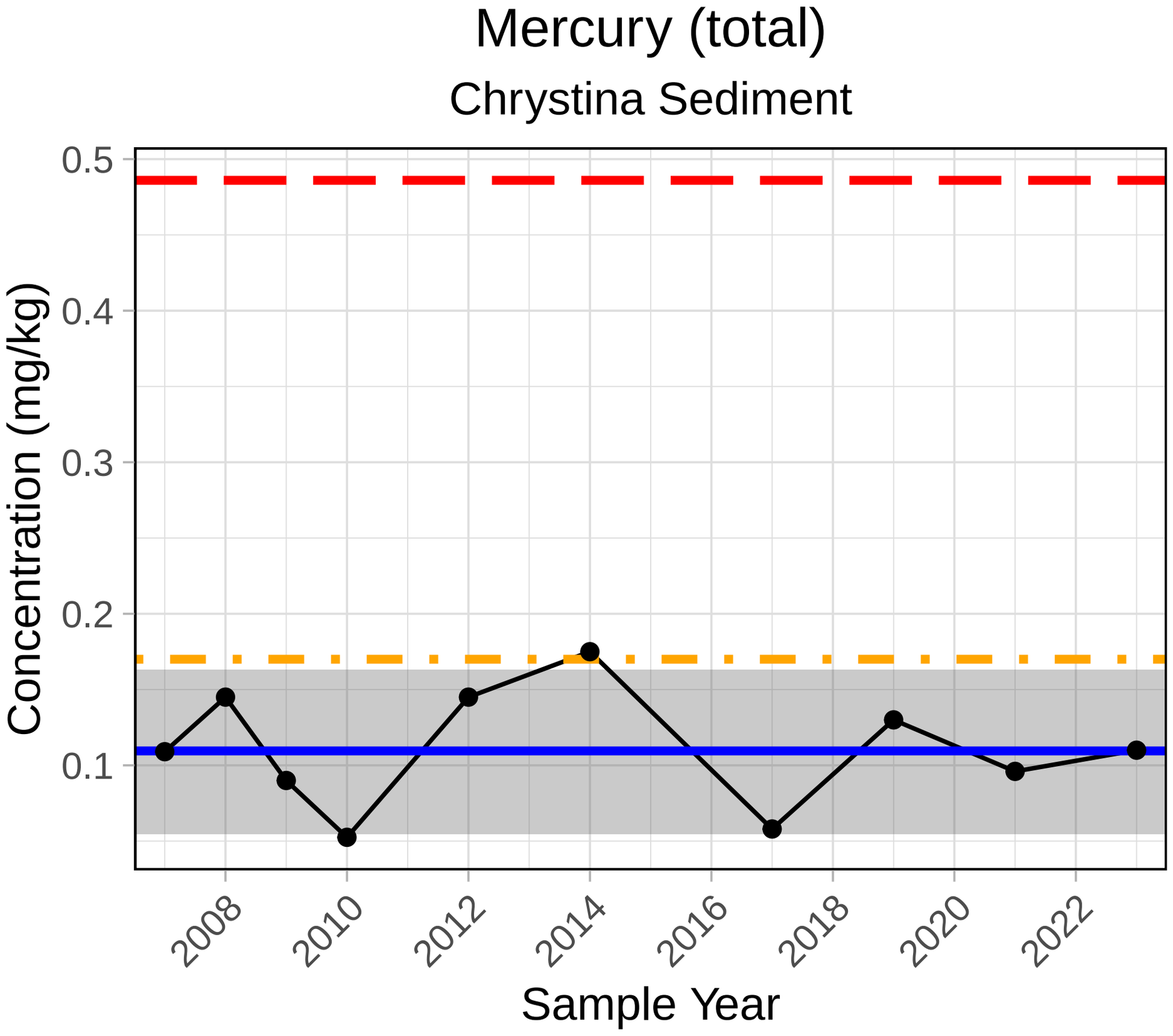
Copper (total)

Chrystina Sediment

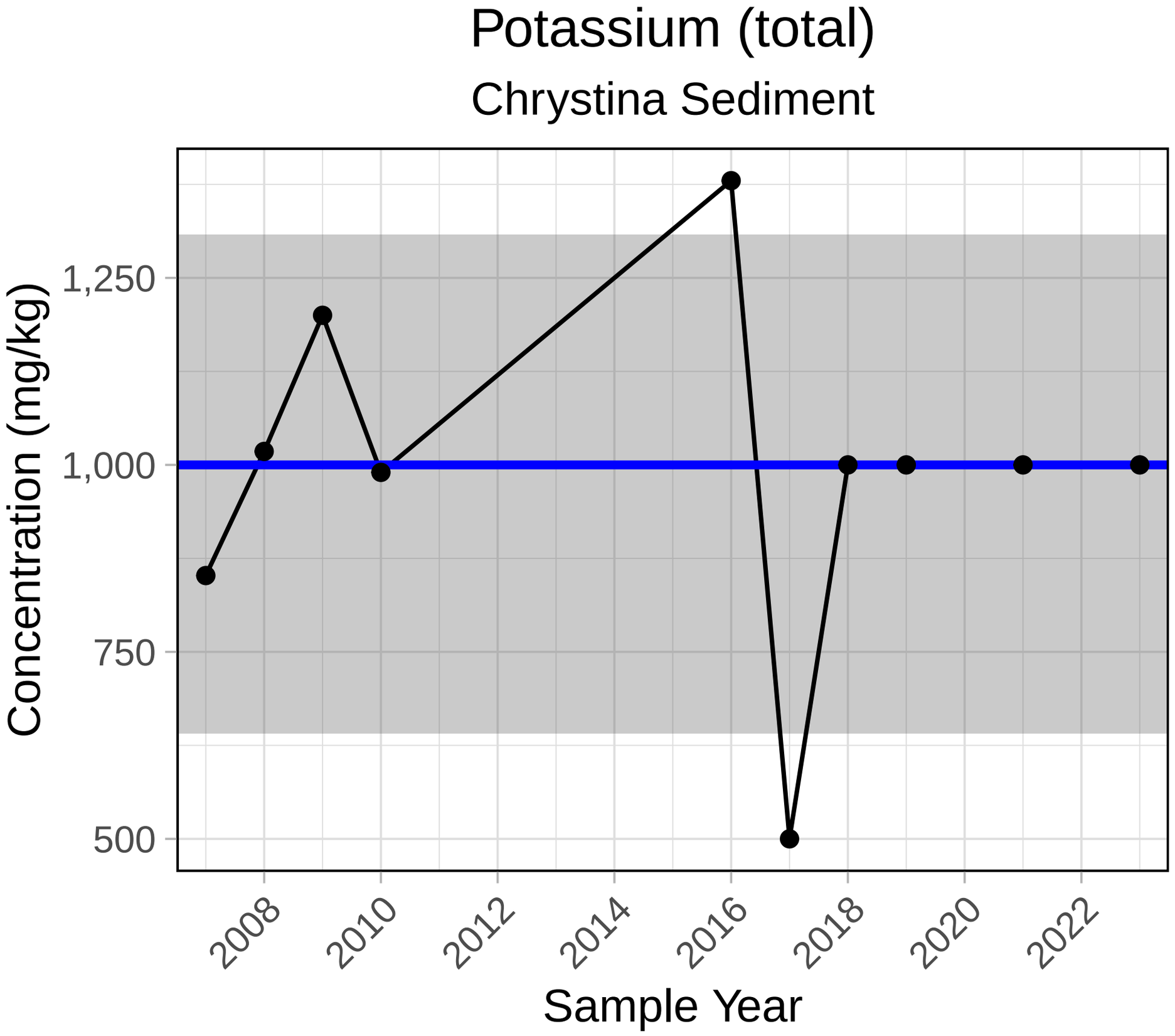


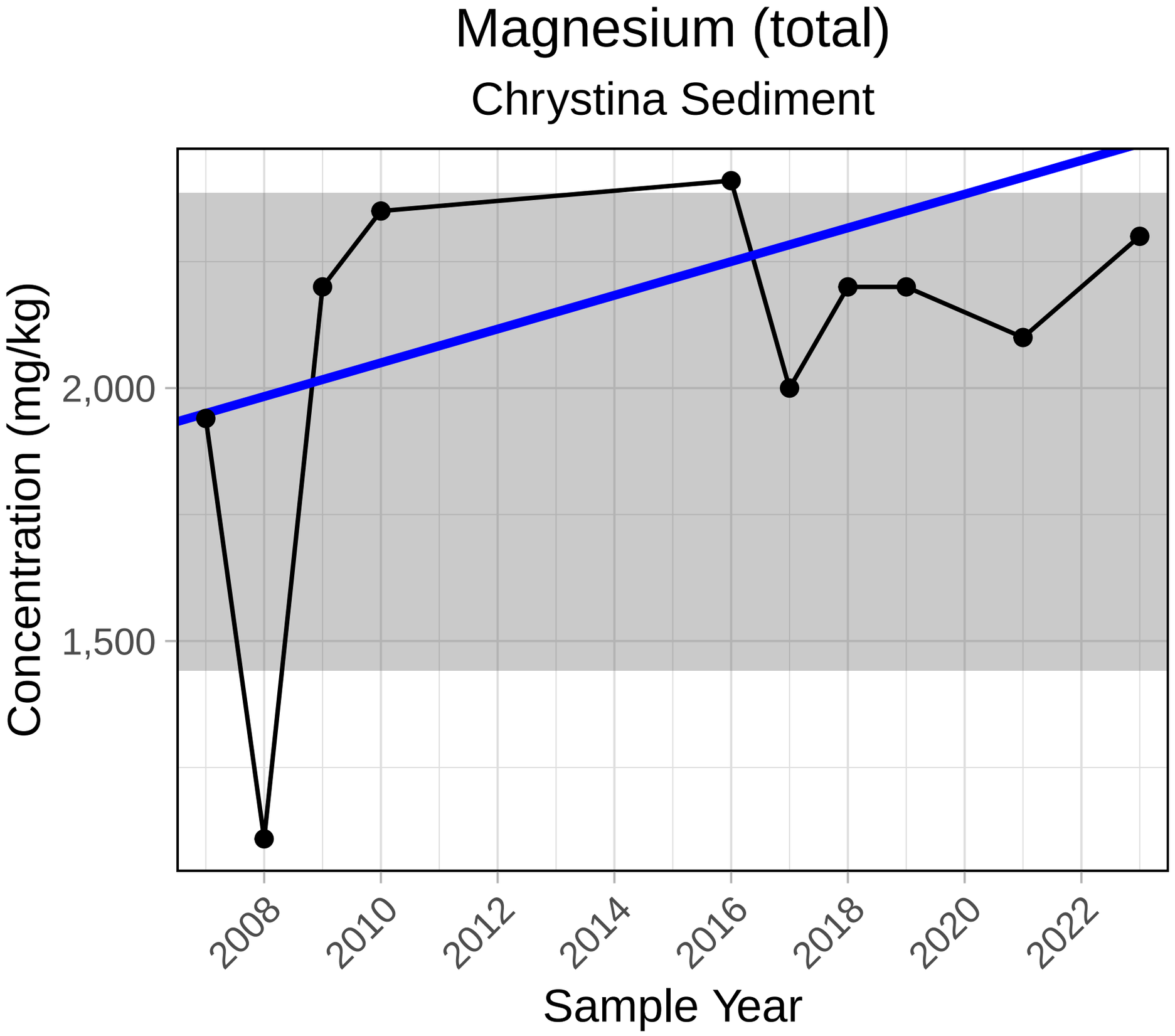
Trend significance p−value = 0.243
ISQG level = 35.7 mg/kg (maximum)
PEL level = 197 mg/kg (maximum)

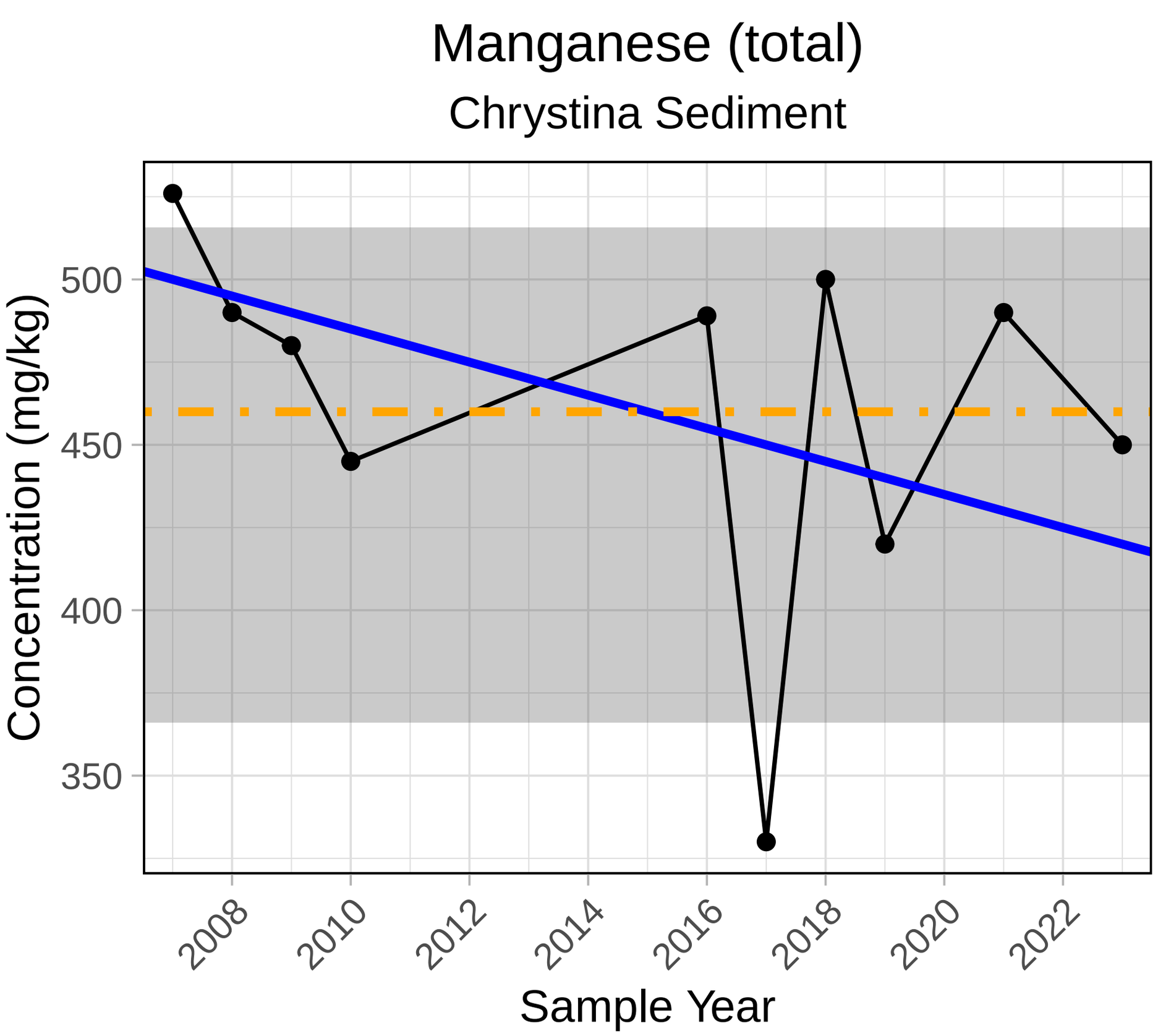

Iron (total)
Chrystina Sediment
20,000
18,000
16,000
14,000
Concentration (mg/kg)
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.314

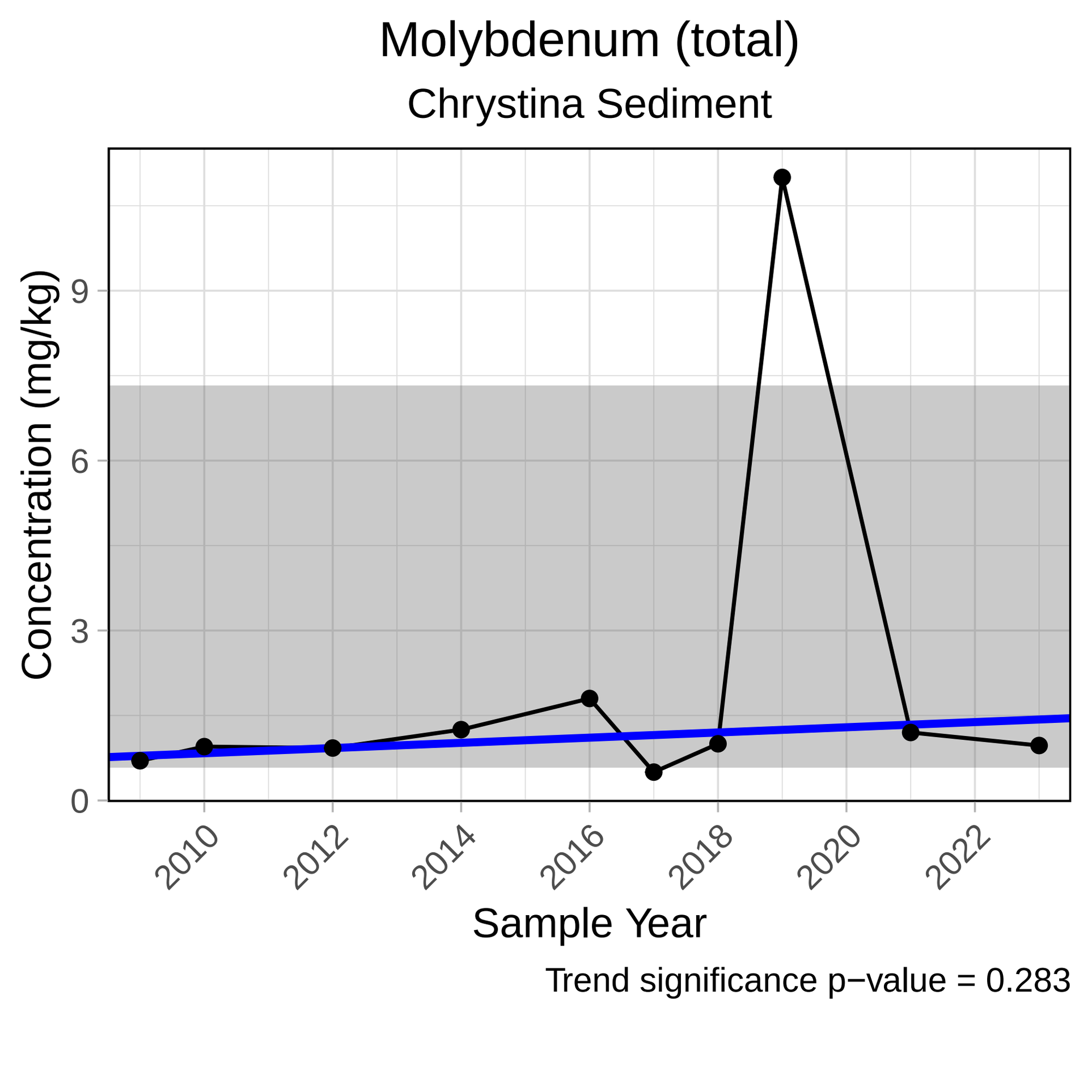


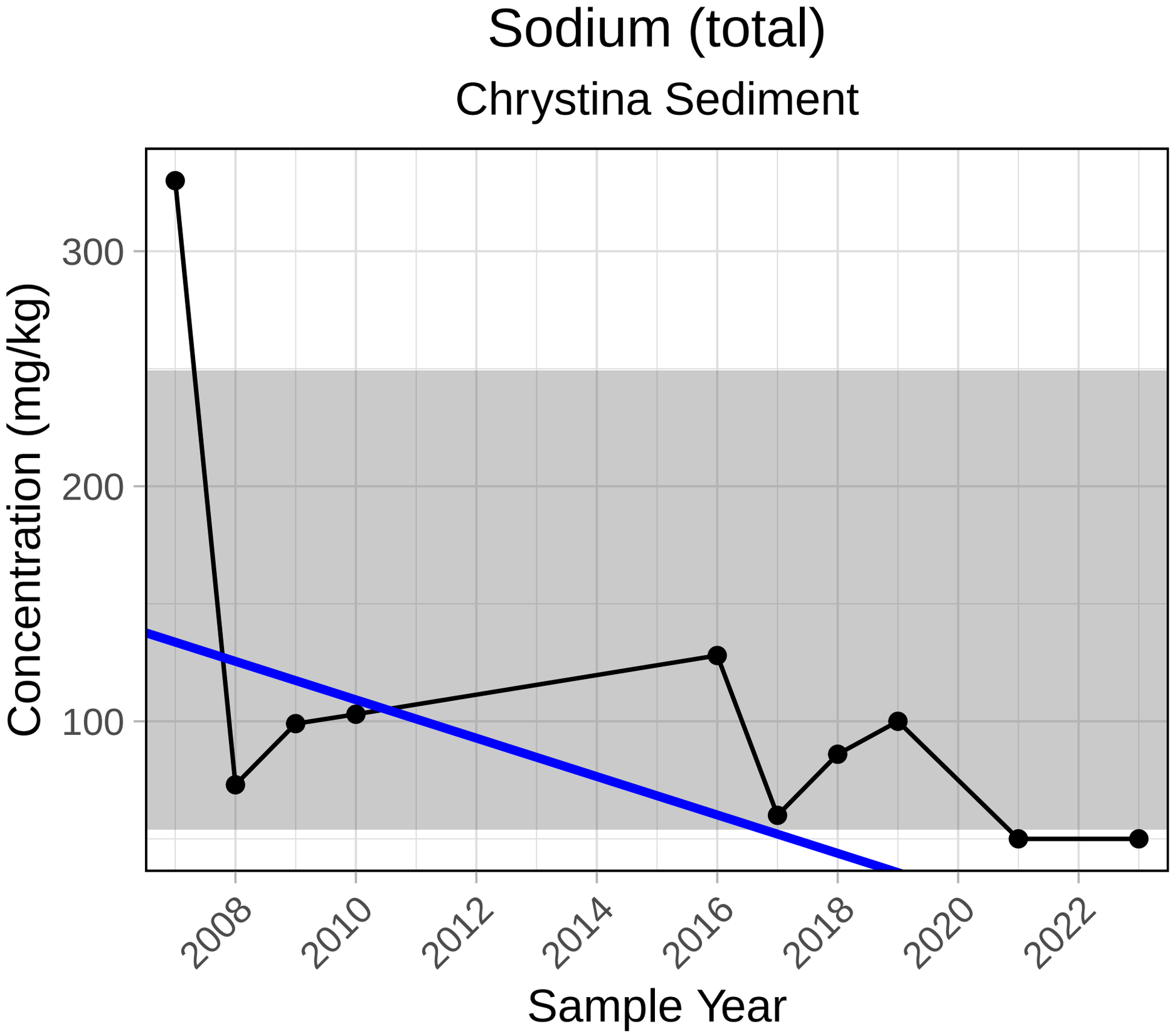
Trend significance p−value = 1
ISQG level = 0.17 mg/kg (maximum)
PEL level = 0.486 mg/kg (maximum)


Potassium (total)
Chrystina Sediment
Concentration (mg/kg)
1,250
1,000
750
500
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1


Magnesium (total)
Chrystina Sediment
Concentration (mg/kg)
2,000
1,500
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.318

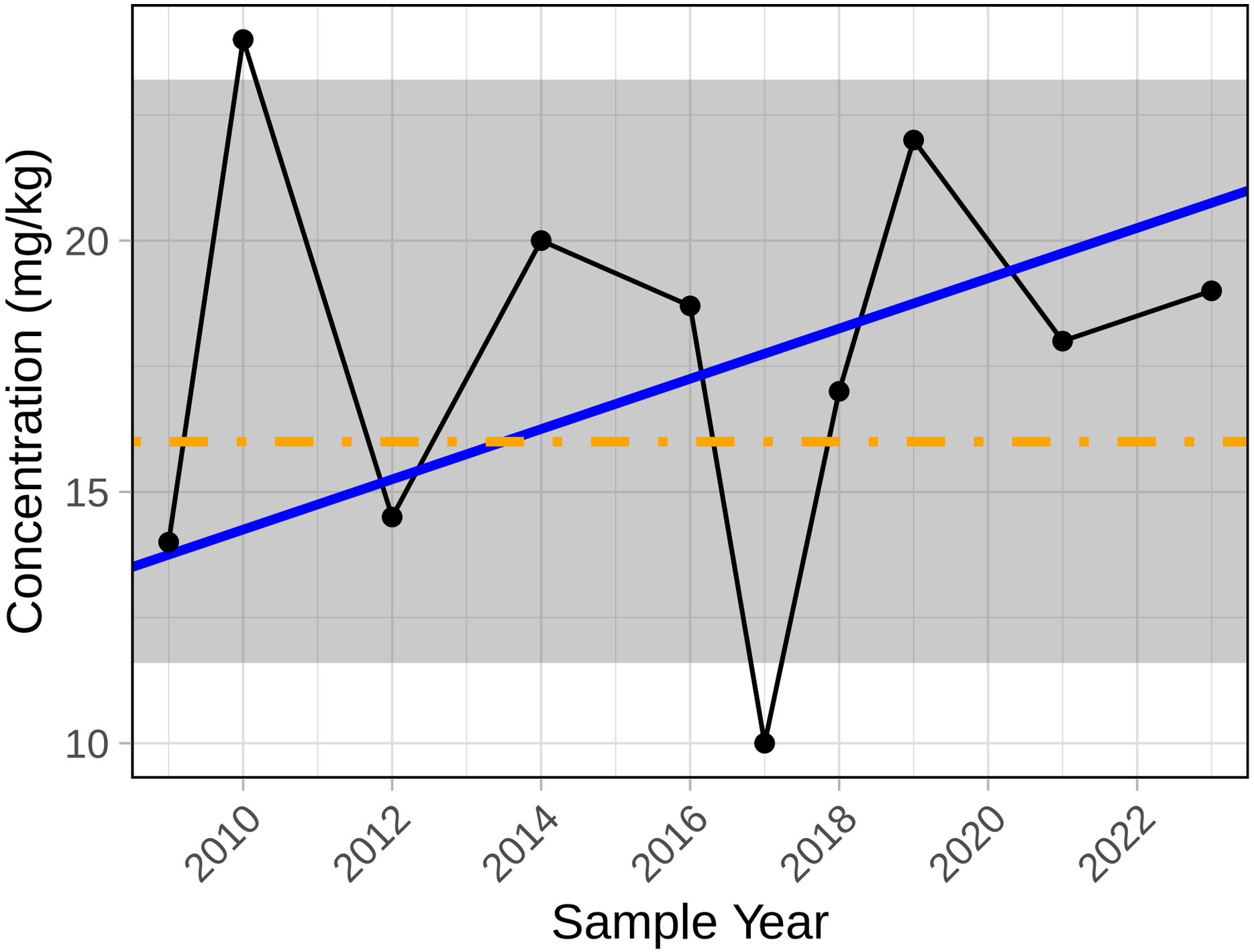

Manganese (total)
Chrystina Sediment
Concentration (mg/kg)
500
450
400
350
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.323
ISQG level = 460 mg/kg (maximum)


Molybdenum (total)
Chrystina Sediment
Concentration (mg/kg)
0
3
6
9
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

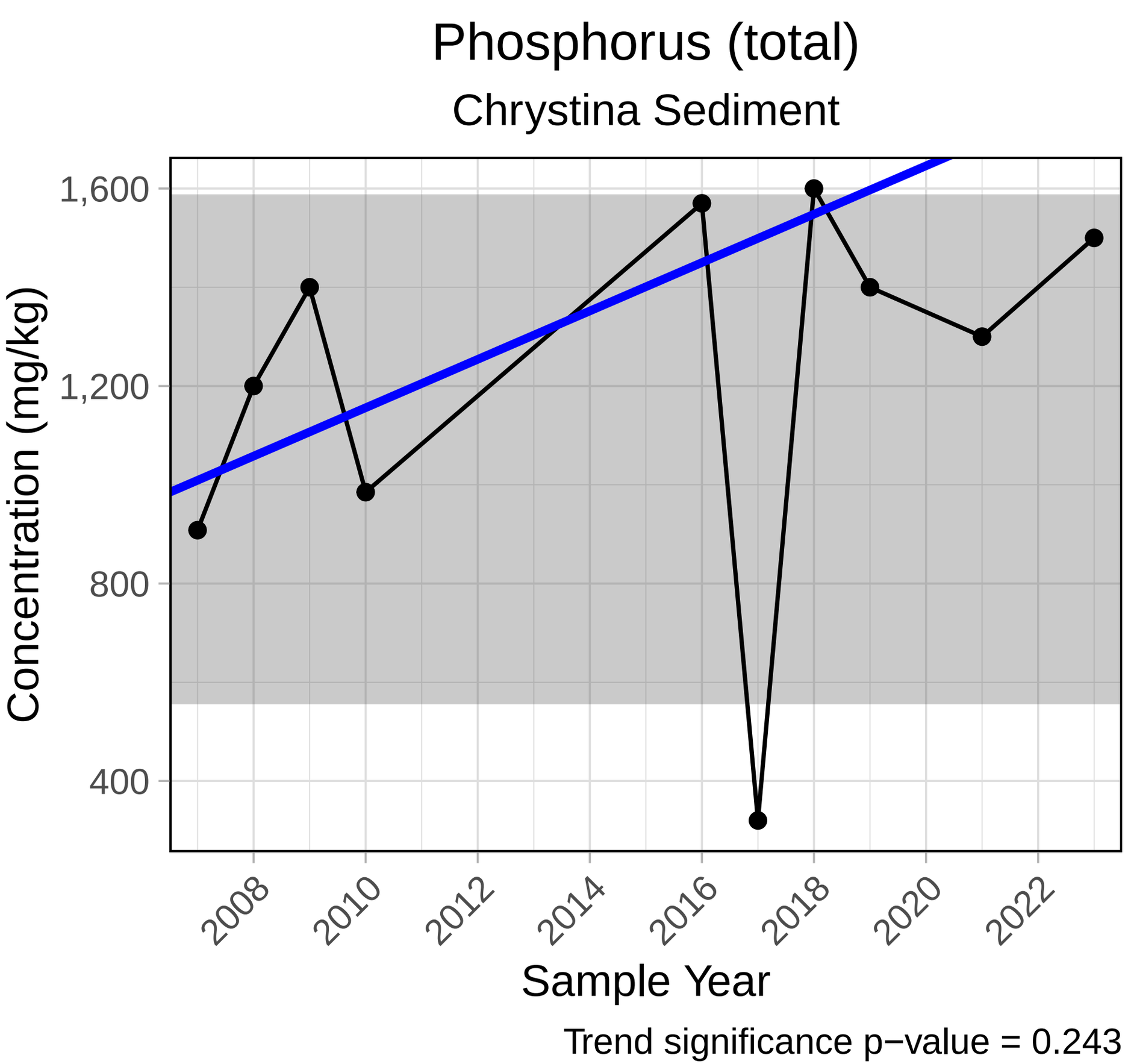

Sodium (total)
Chrystina Sediment
Concentration (mg/kg)
300
200
100
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.088

Nickel (total)

Chrystina Sediment

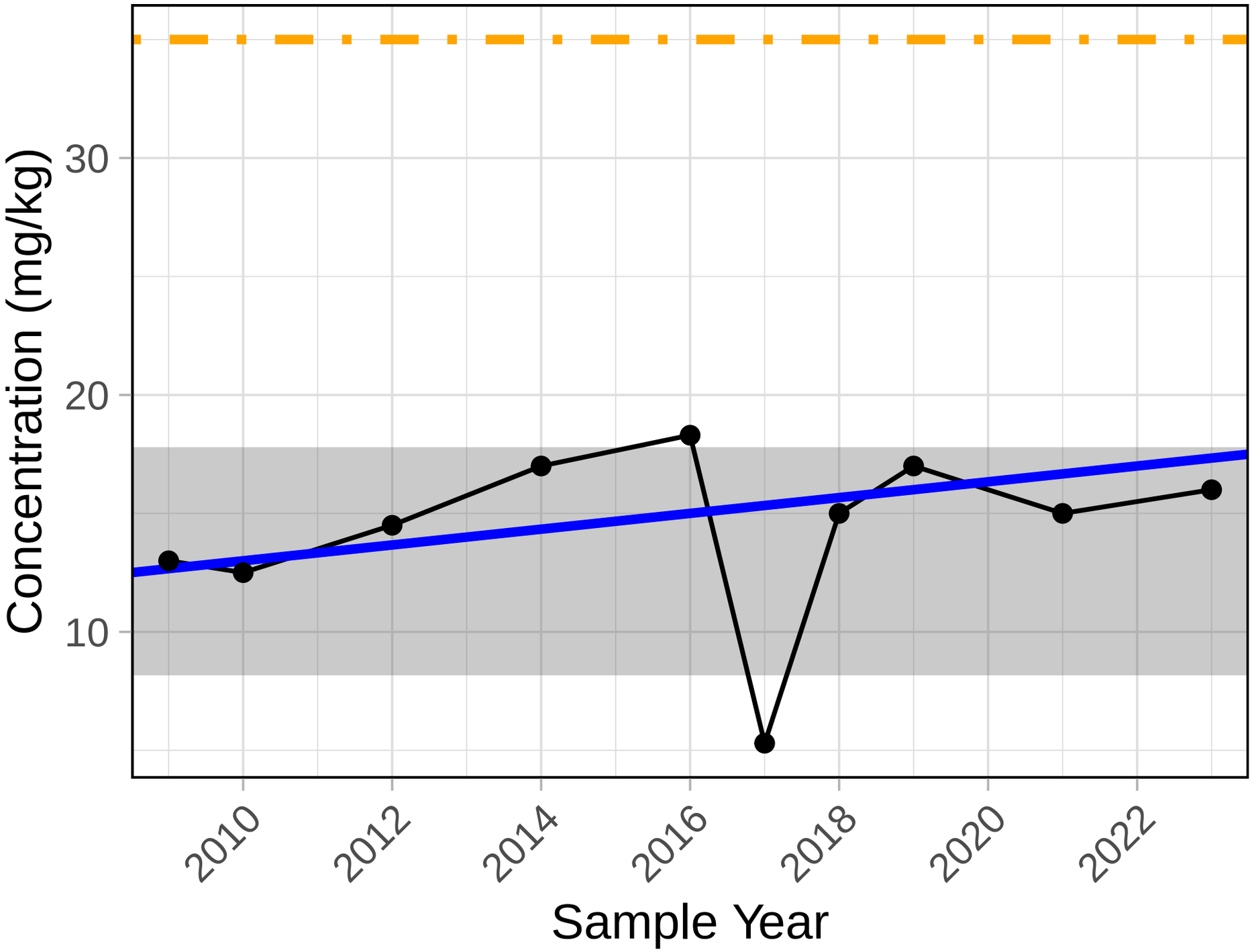


Trend significance p−value = 0.721
ISQG level = 16 mg/kg (maximum)

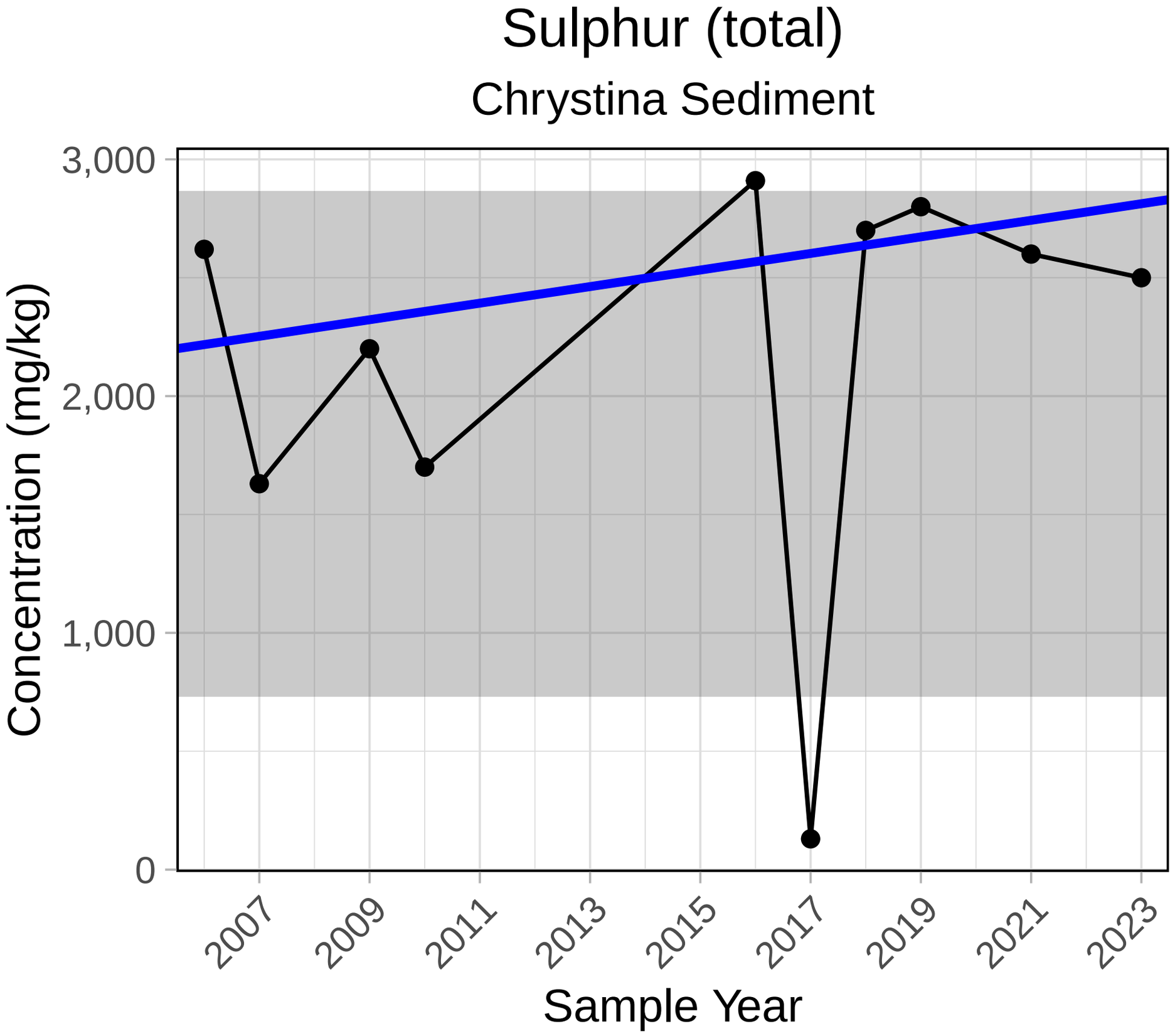

Phosphorus (total)
Chrystina Sediment
1,600
1,200
800
400
Concentration (mg/kg)
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.243

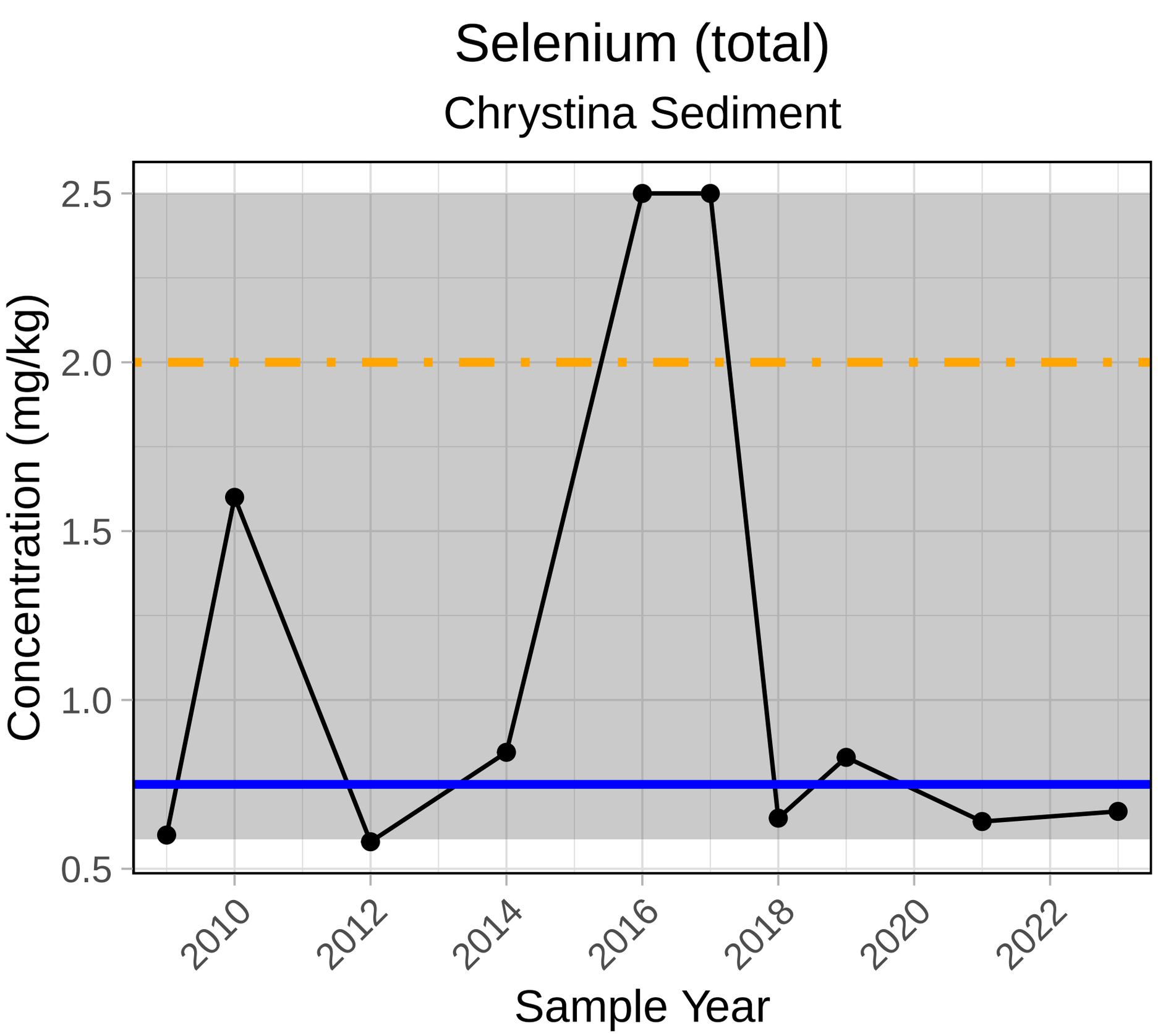
Lead (total)

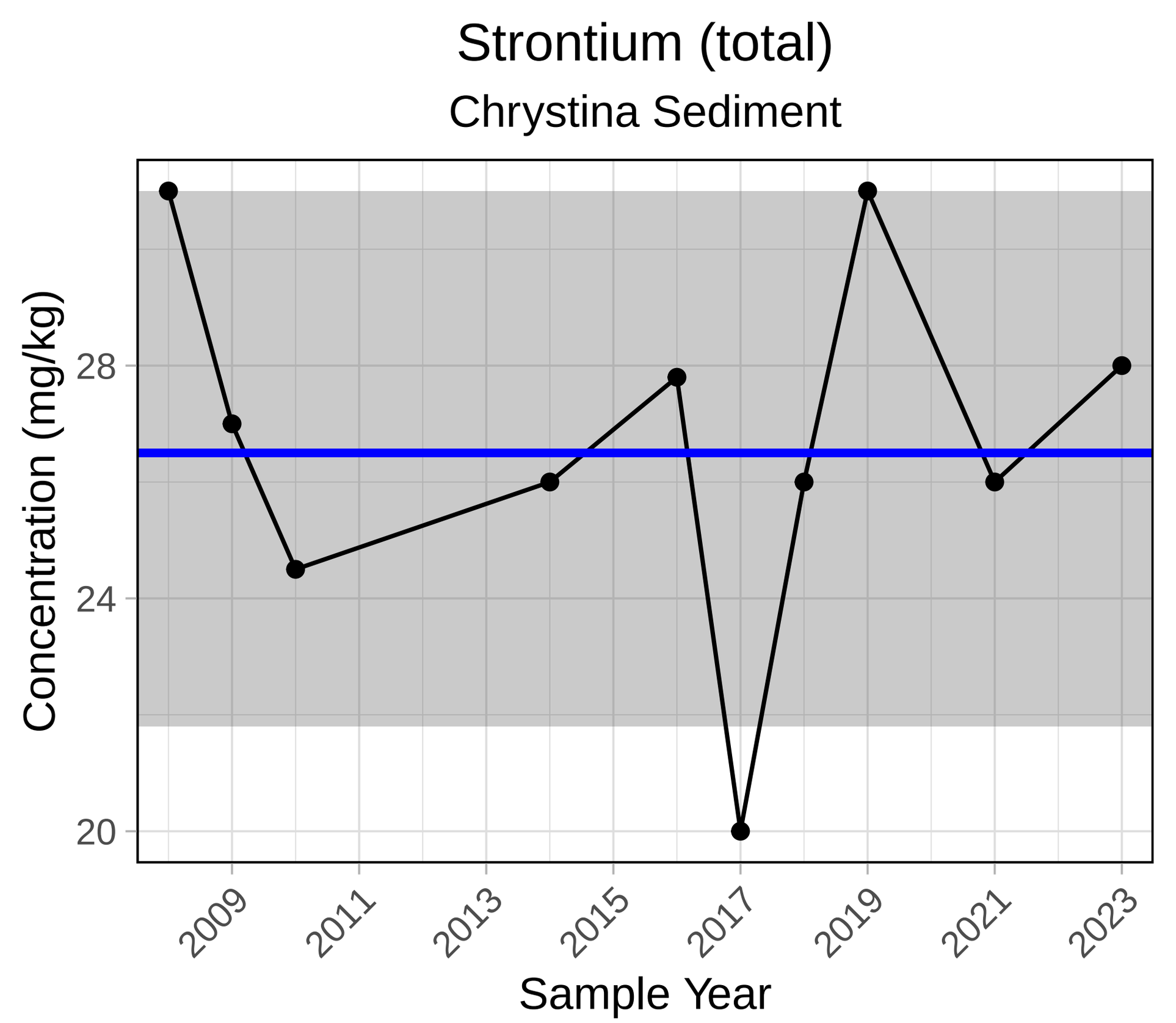
Chrystina Sediment

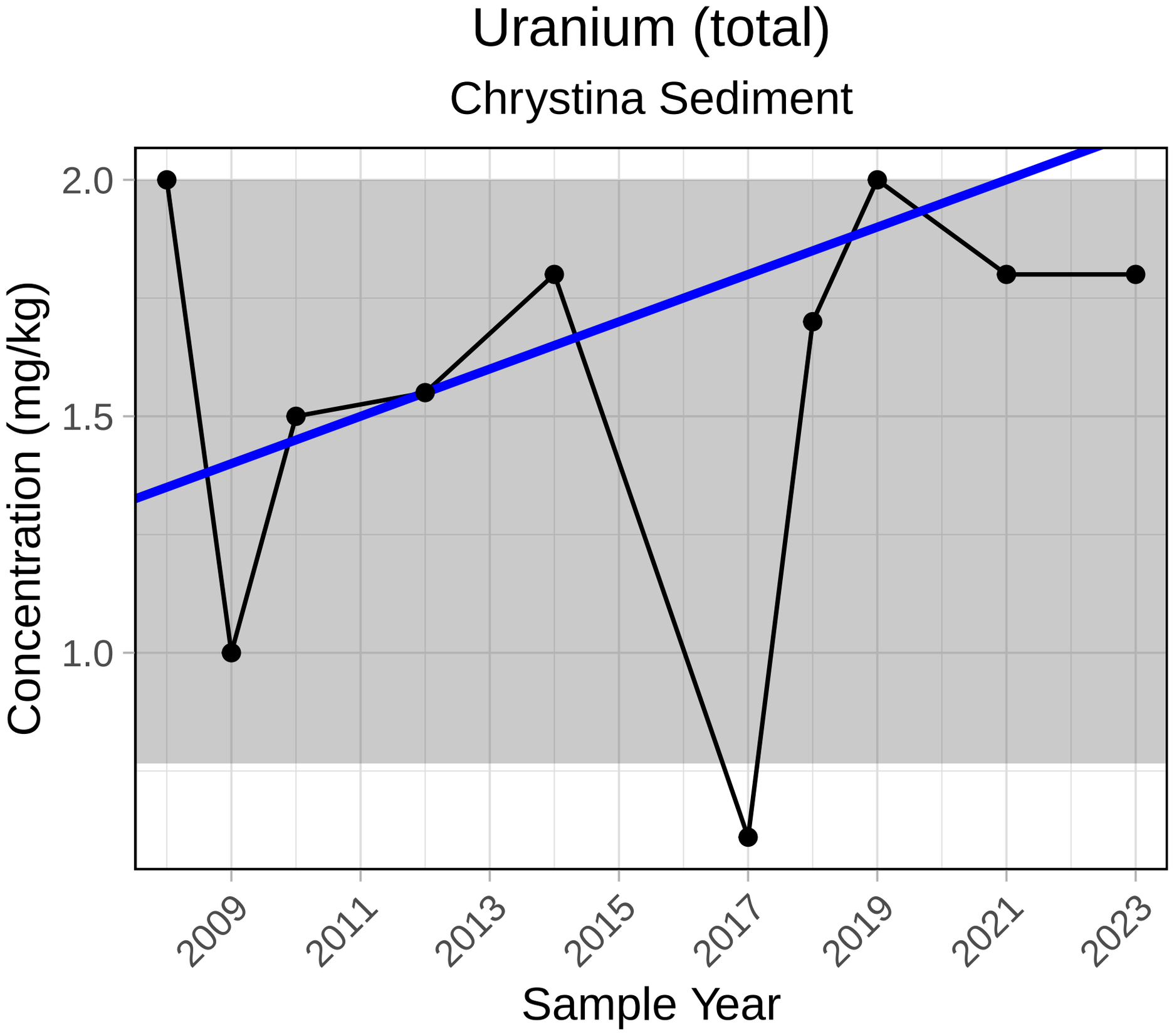


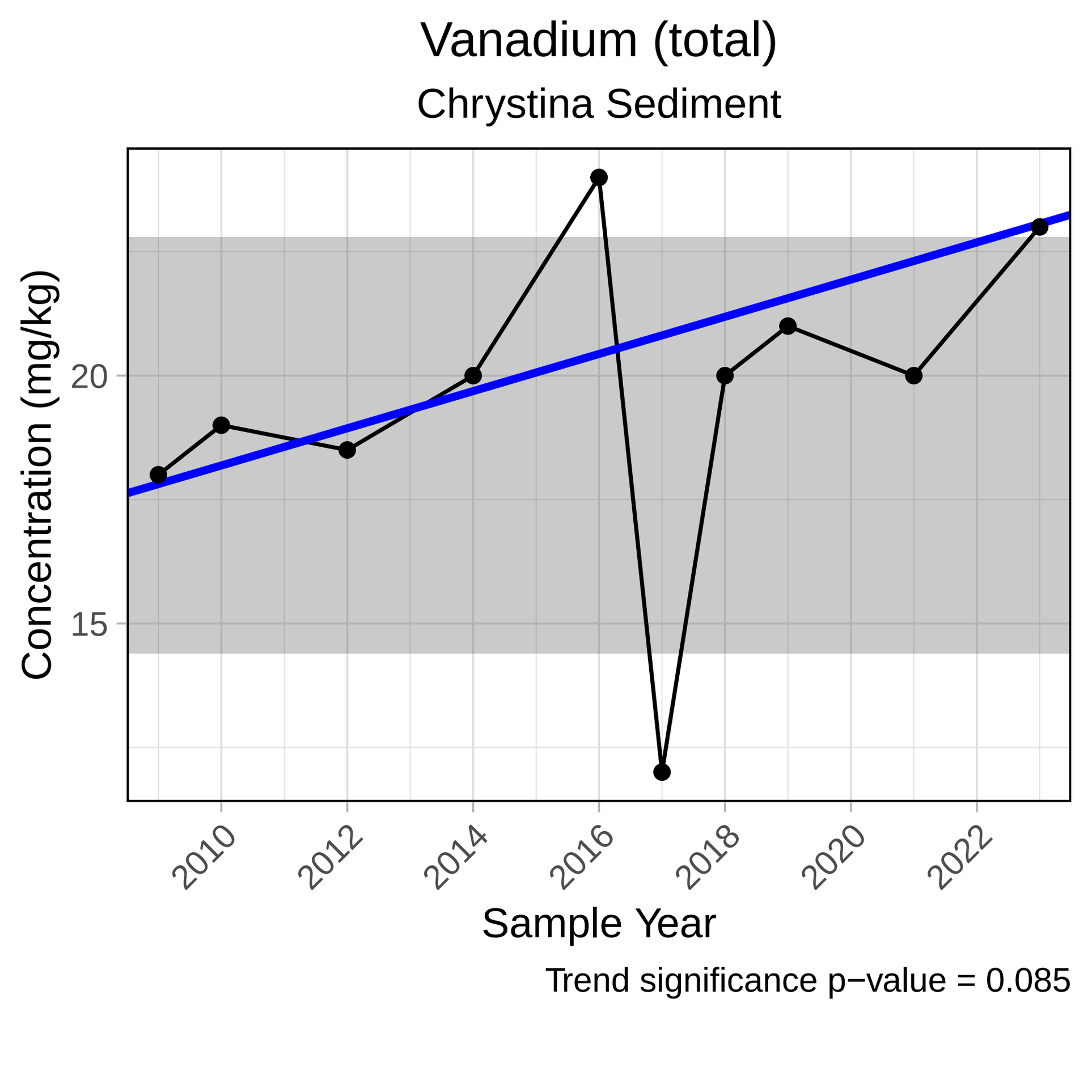
Trend significance p−value = 0.279
ISQG level = 35 mg/kg (maximum)
PEL level = 91.3 mg/kg (maximum)


Sulphur (total)
Chrystina Sediment
3,000
2,000
1,000
0
Concentration (mg/kg)
2007
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.721


Selenium (total)
Chrystina Sediment
Concentration (mg/kg)
2.5
2.0
1.5
1.0
0.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1
ISQG level = 2 mg/kg (maximum)

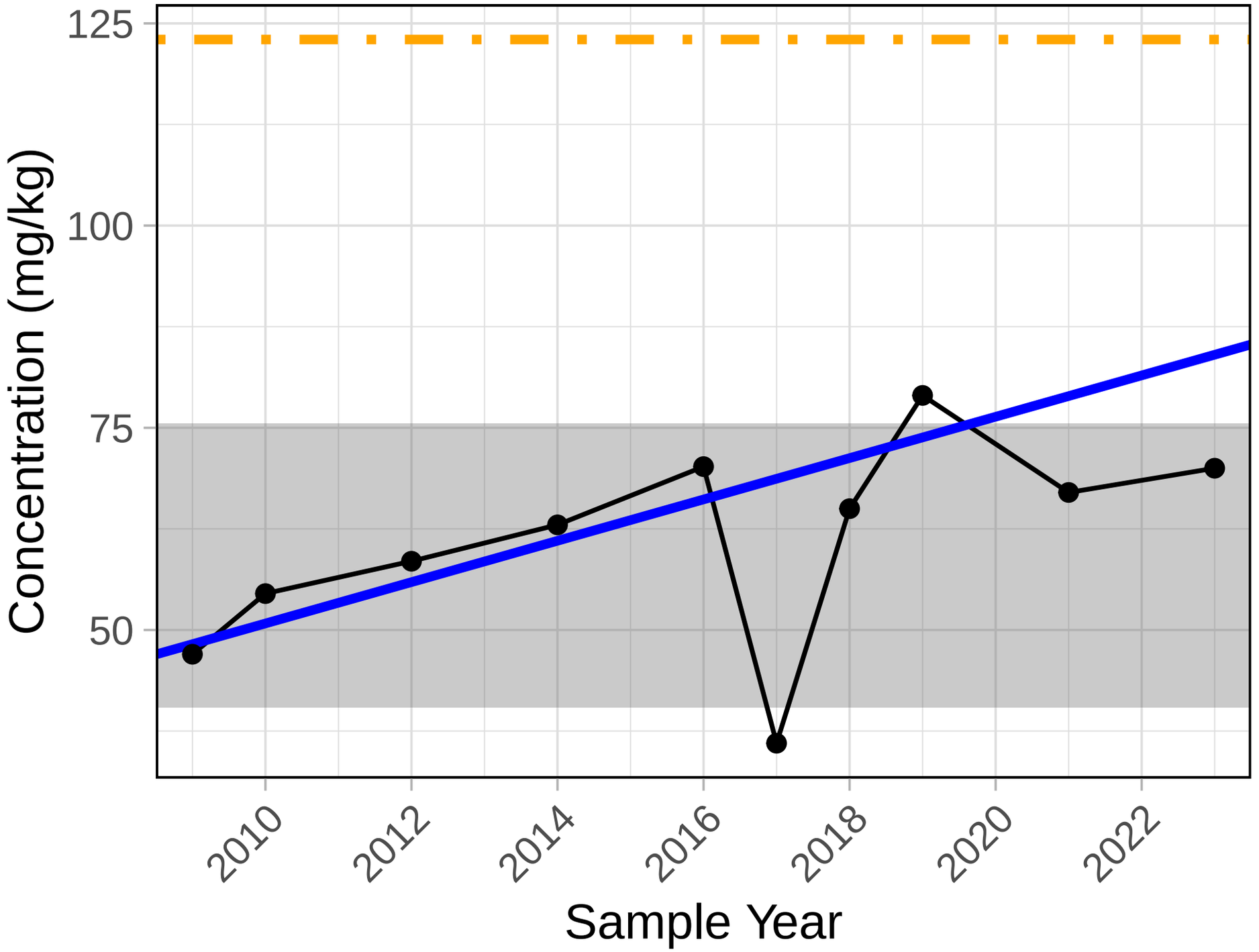

Strontium (total)
Chrystina Sediment
Concentration (mg/kg)
28
24
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1


Uranium (total)
Chrystina Sediment
Concentration (mg/kg)
2.0
1.5
1.0
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.362

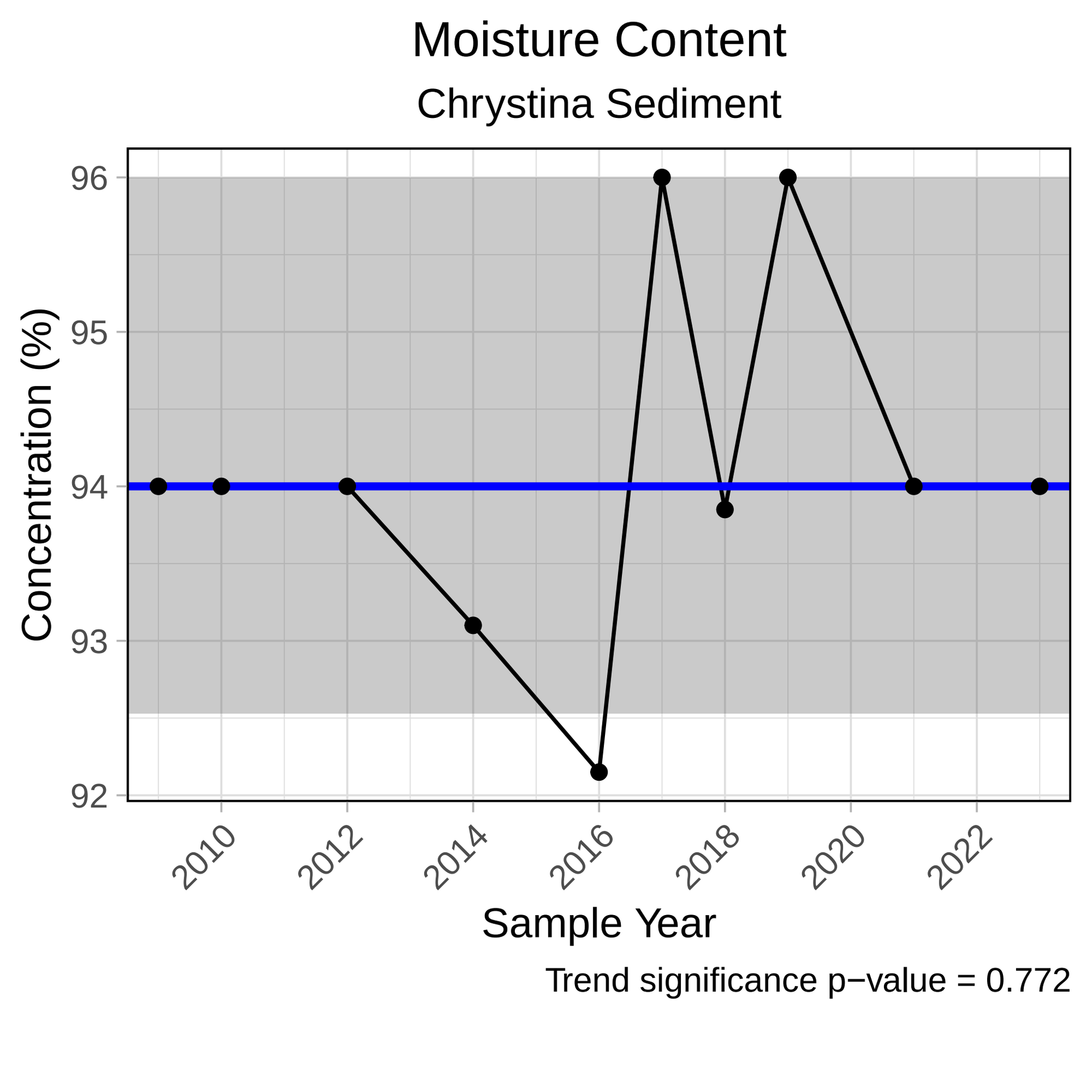

Vanadium (total)
Chrystina Sediment
Concentration (mg/kg)
20
15
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.085

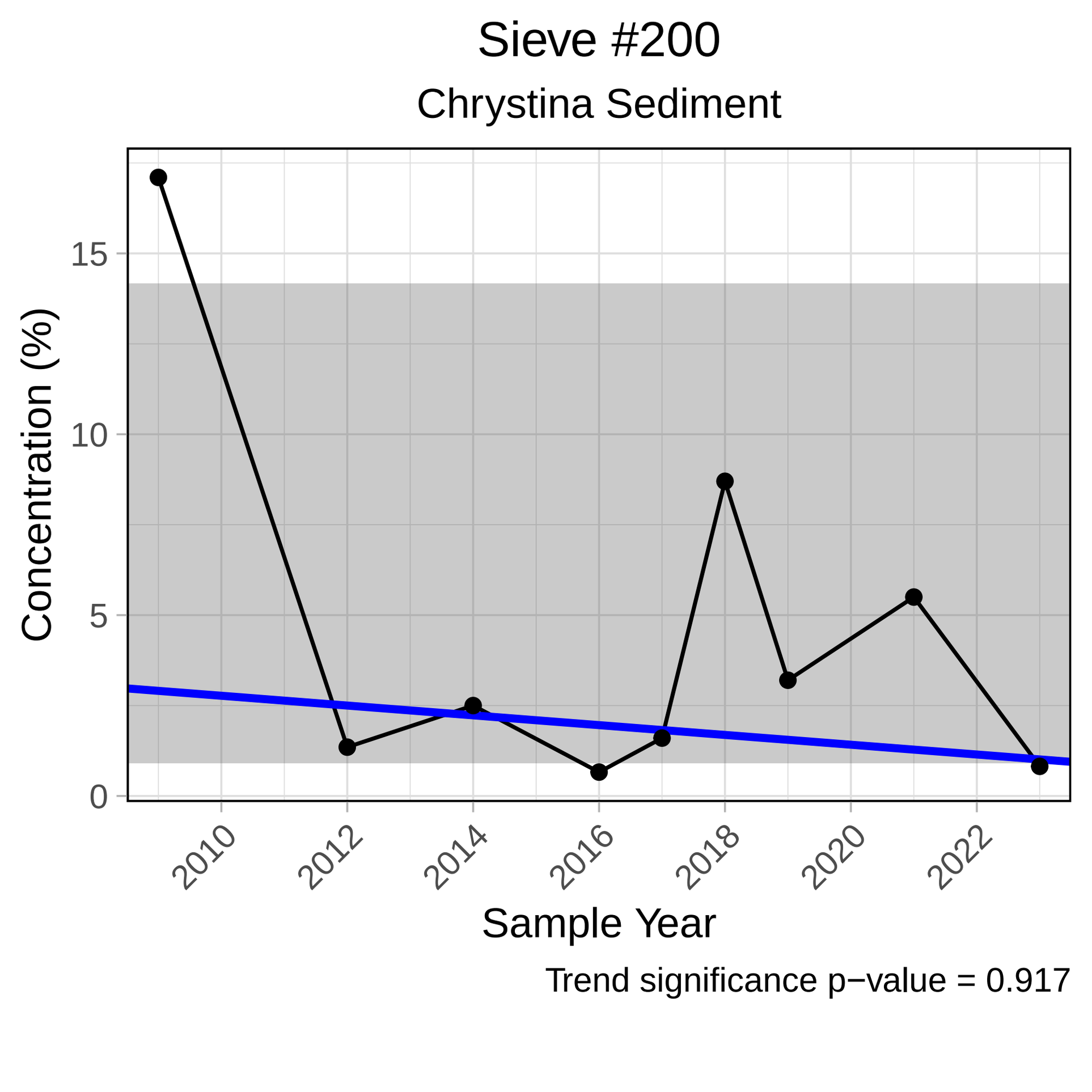
Zinc (total)

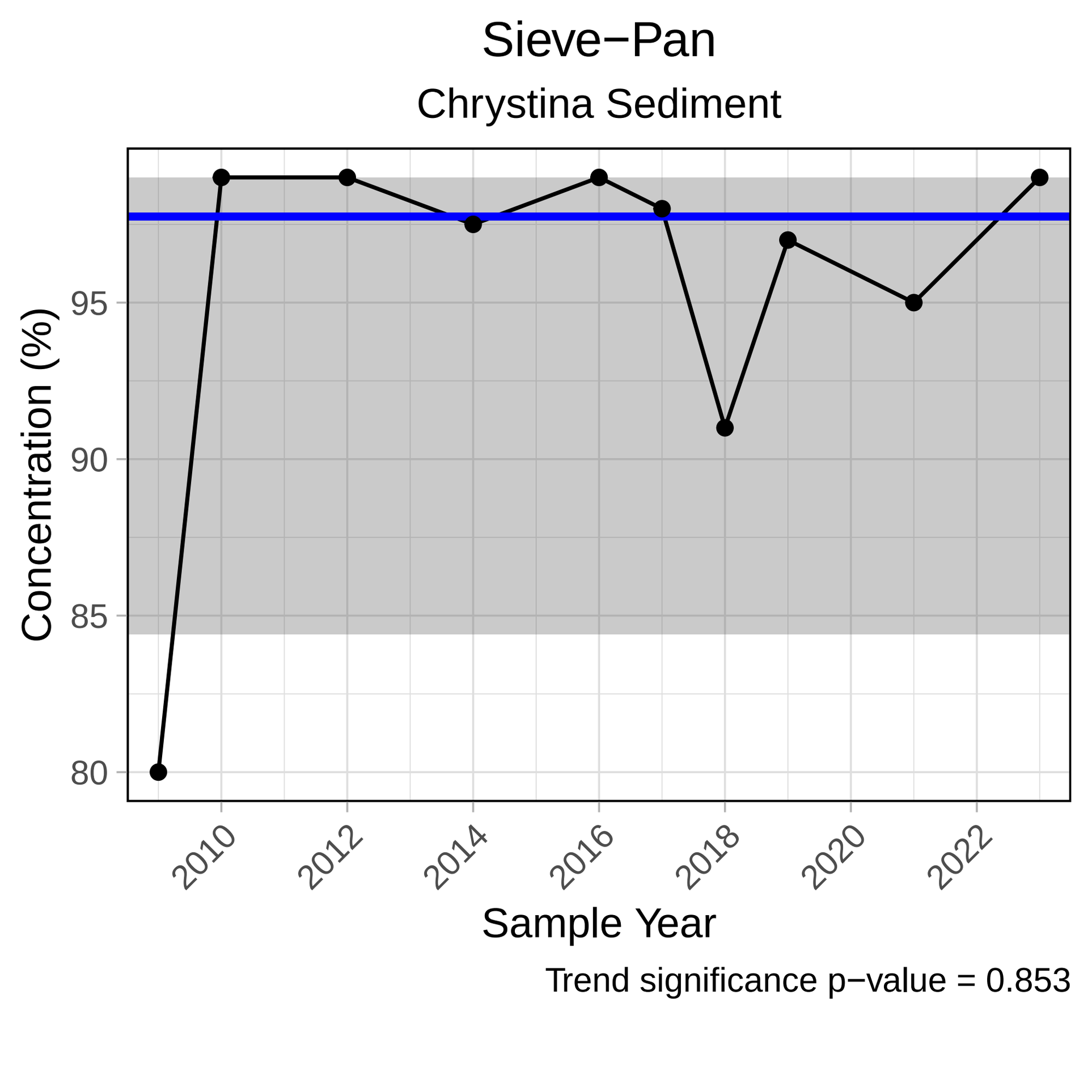
Chrystina Sediment

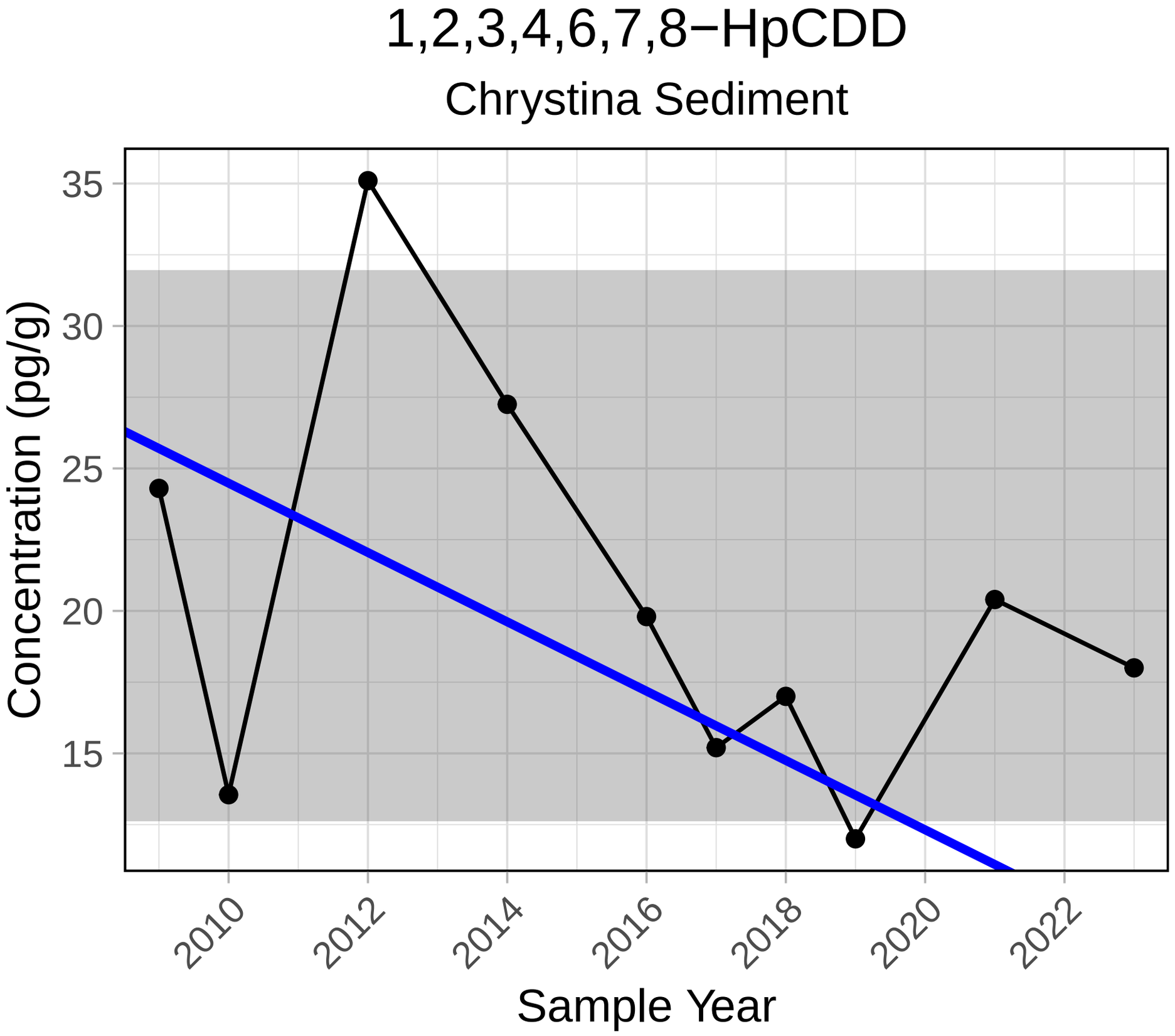


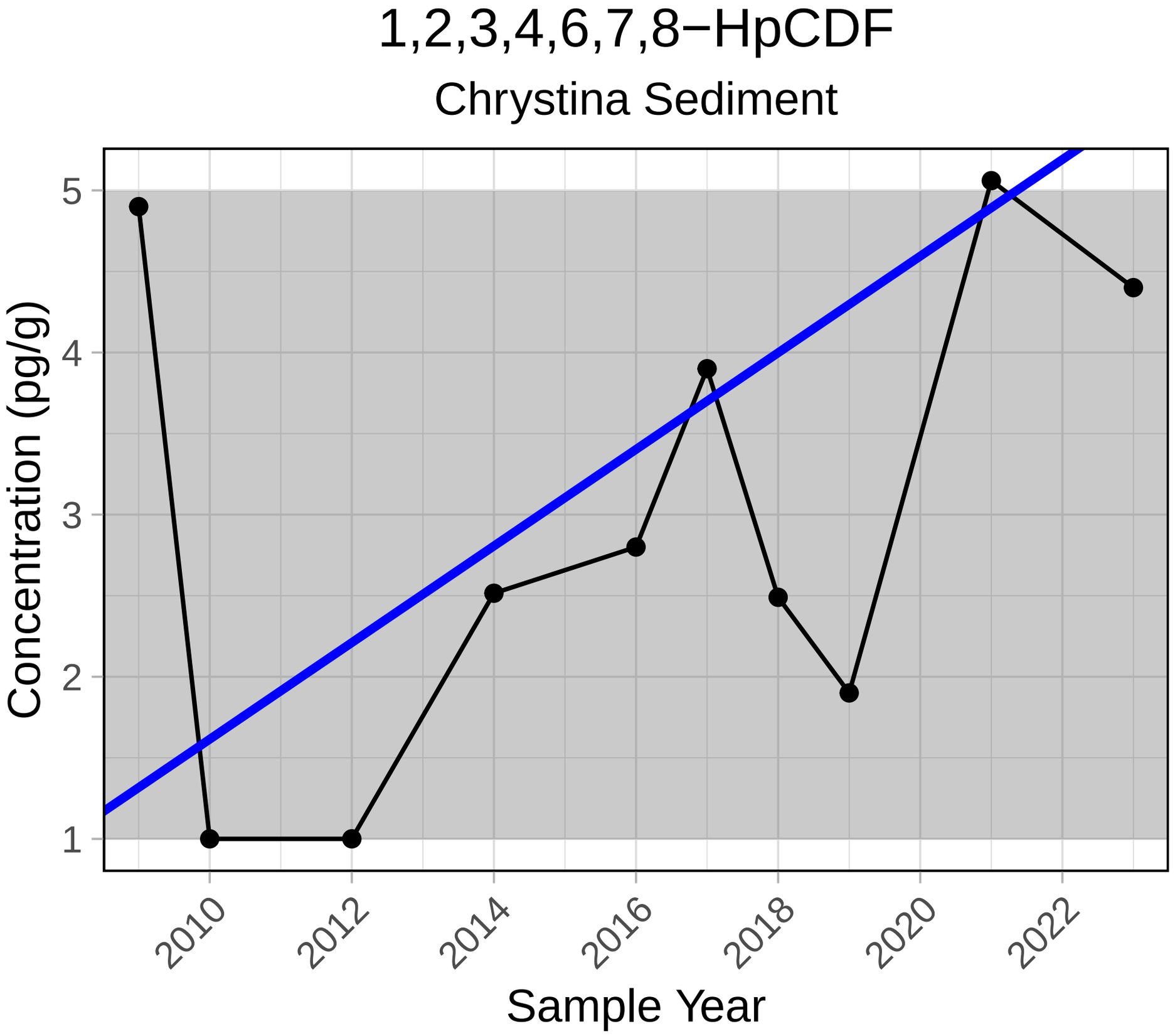
Trend significance p−value = 0.032
ISQG level = 123 mg/kg (maximum)
PEL level = 315 mg/kg (maximum)


Moisture Content
Chrystina Sediment
Concentration (%)
96
95
94
93
92
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.772

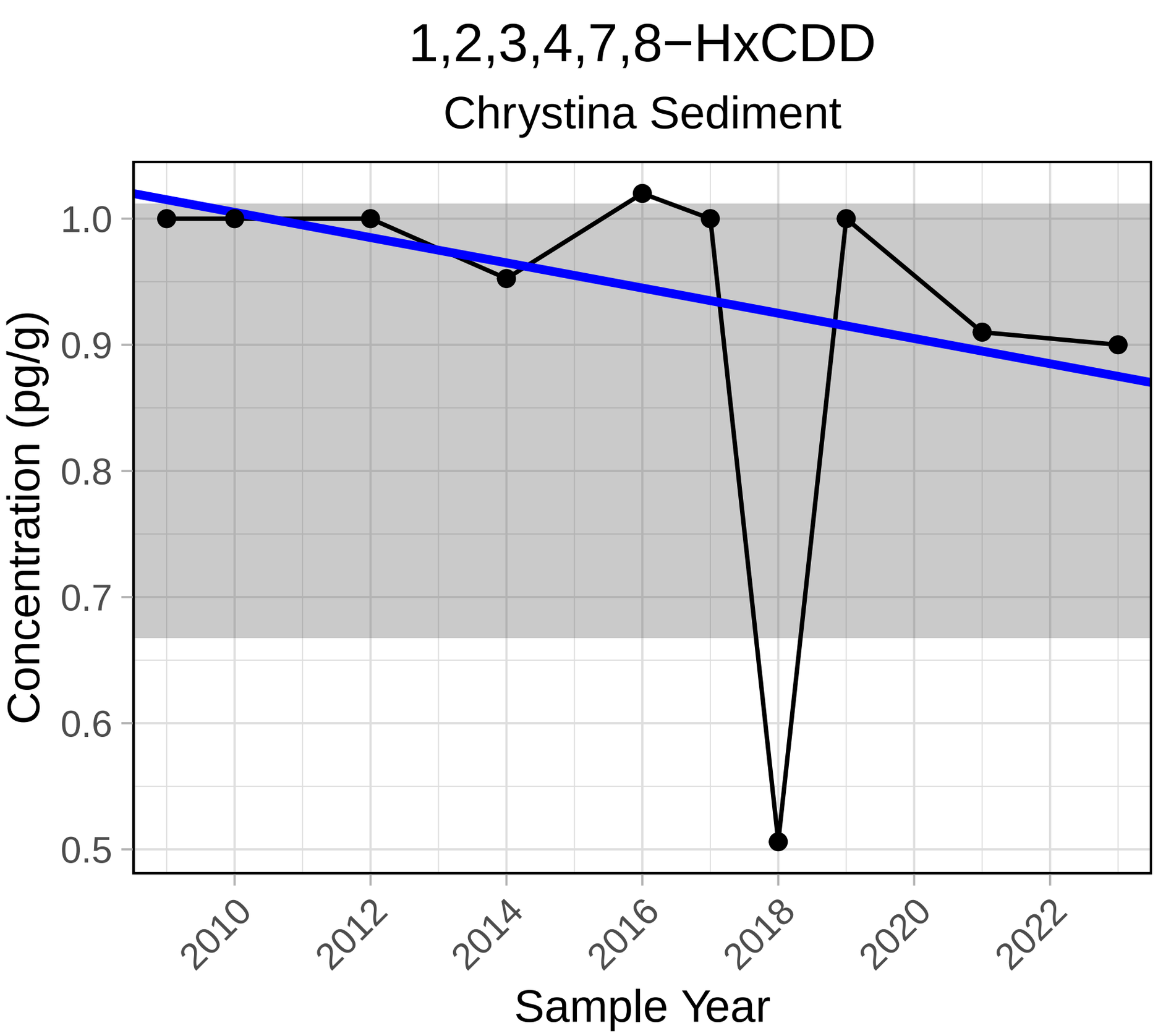

Sieve #200
Chrystina Sediment
Concentration (%)
0
5
10
15
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.917

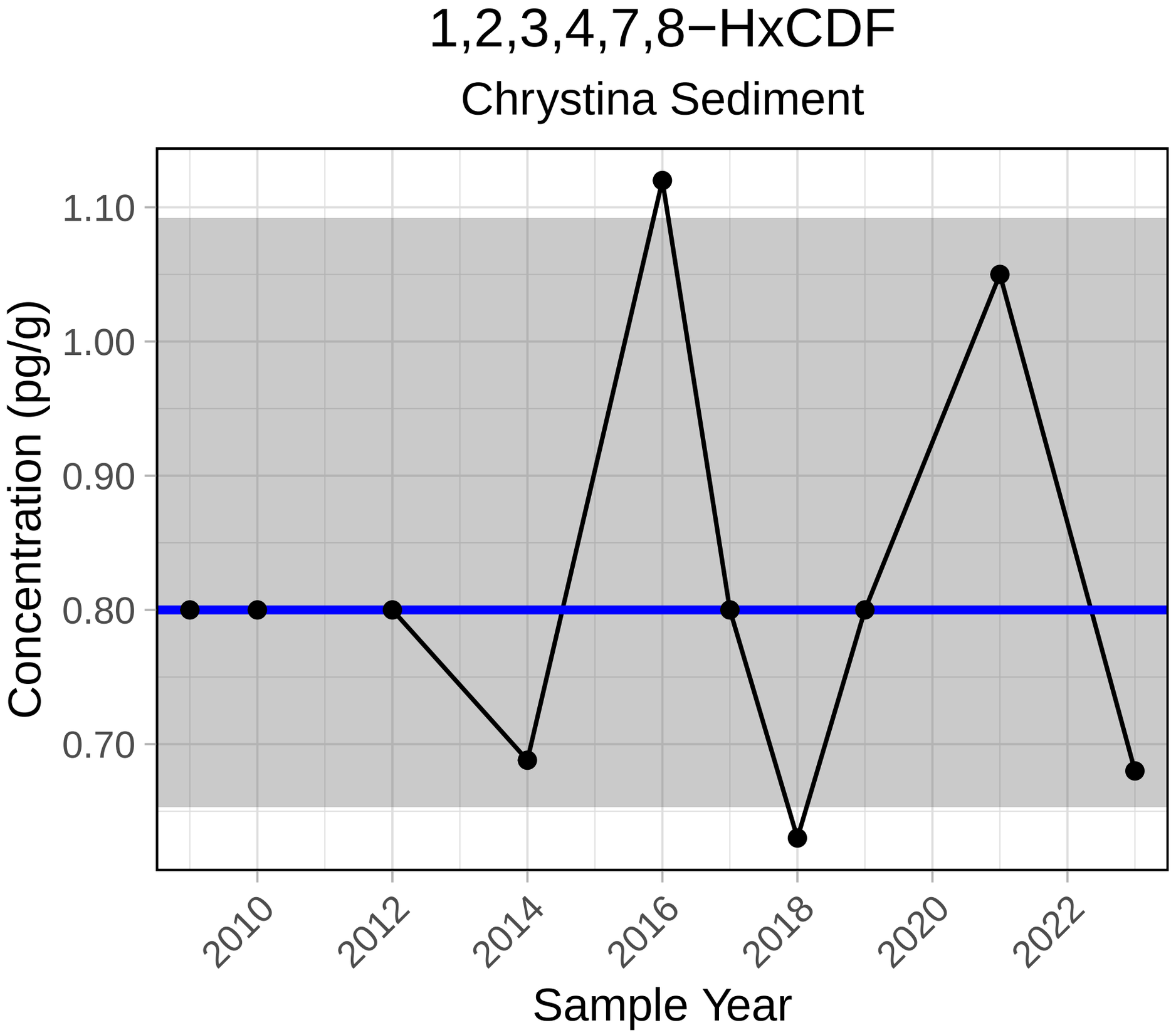

Sieve−Pan
Chrystina Sediment
Concentration (%)
95
90
85
80
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.853

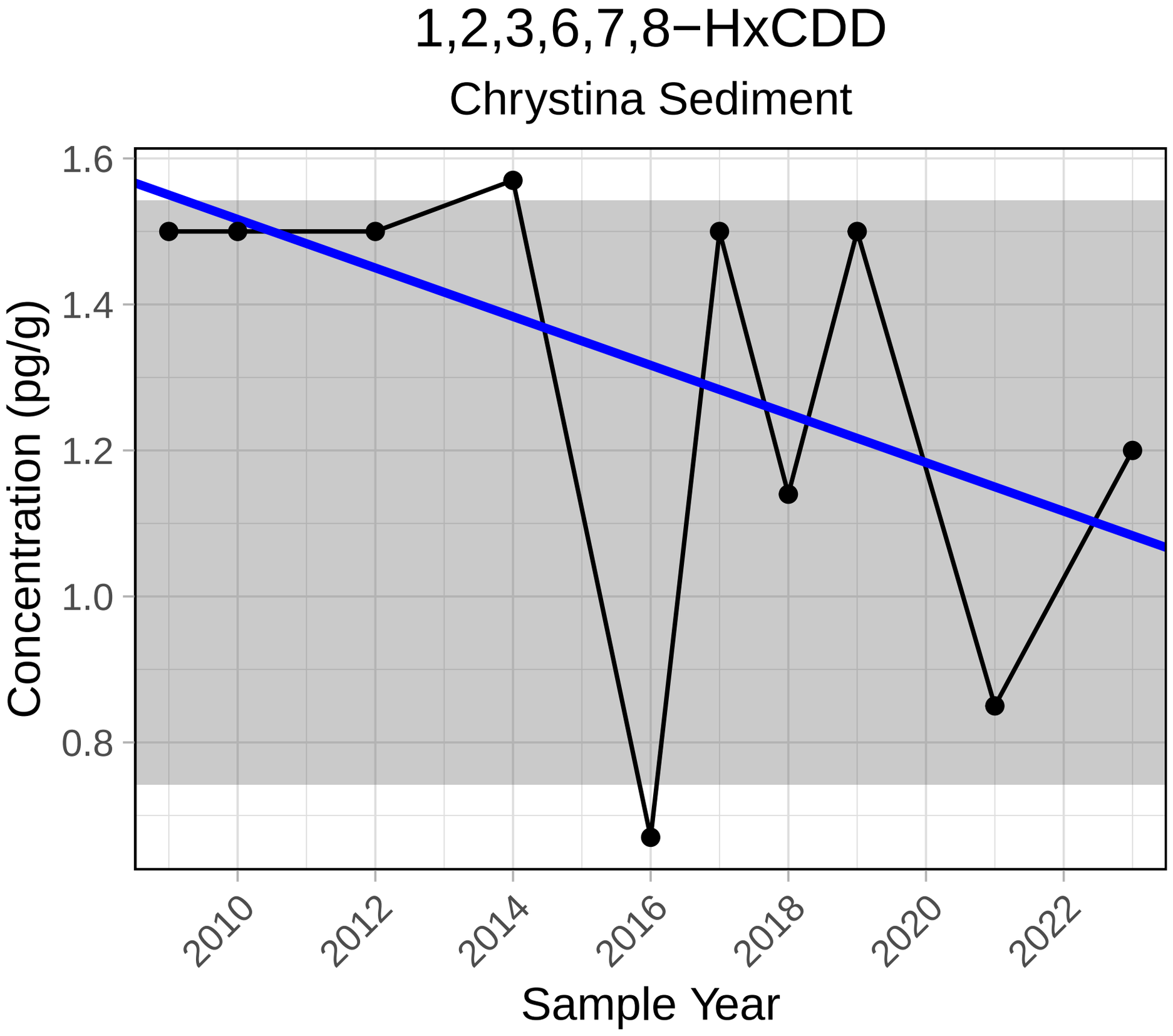

1,2,3,4,6,7,8−HpCDD
Chrystina Sediment
Concentration (pg/g)
35
30
25
20
15
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

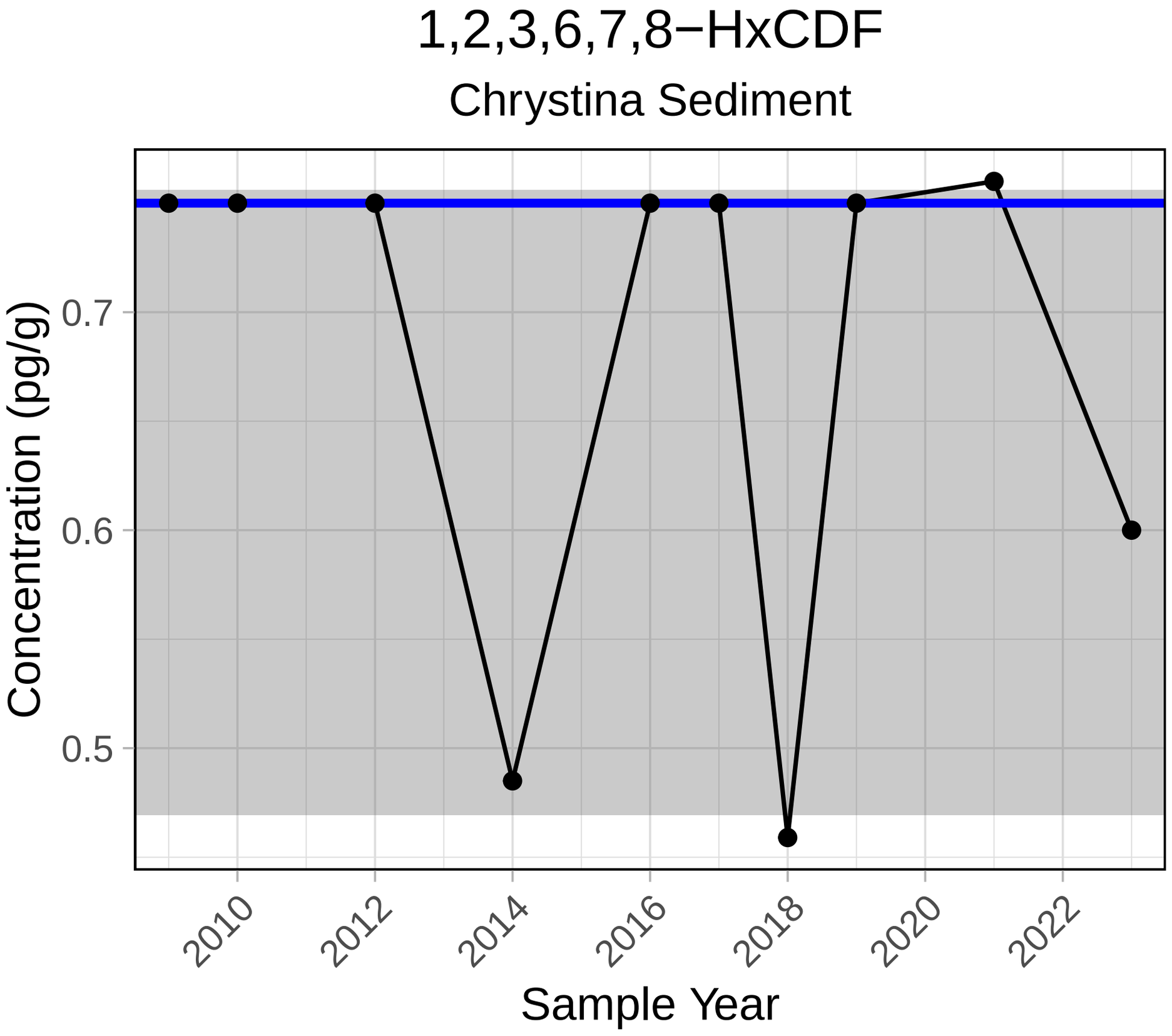


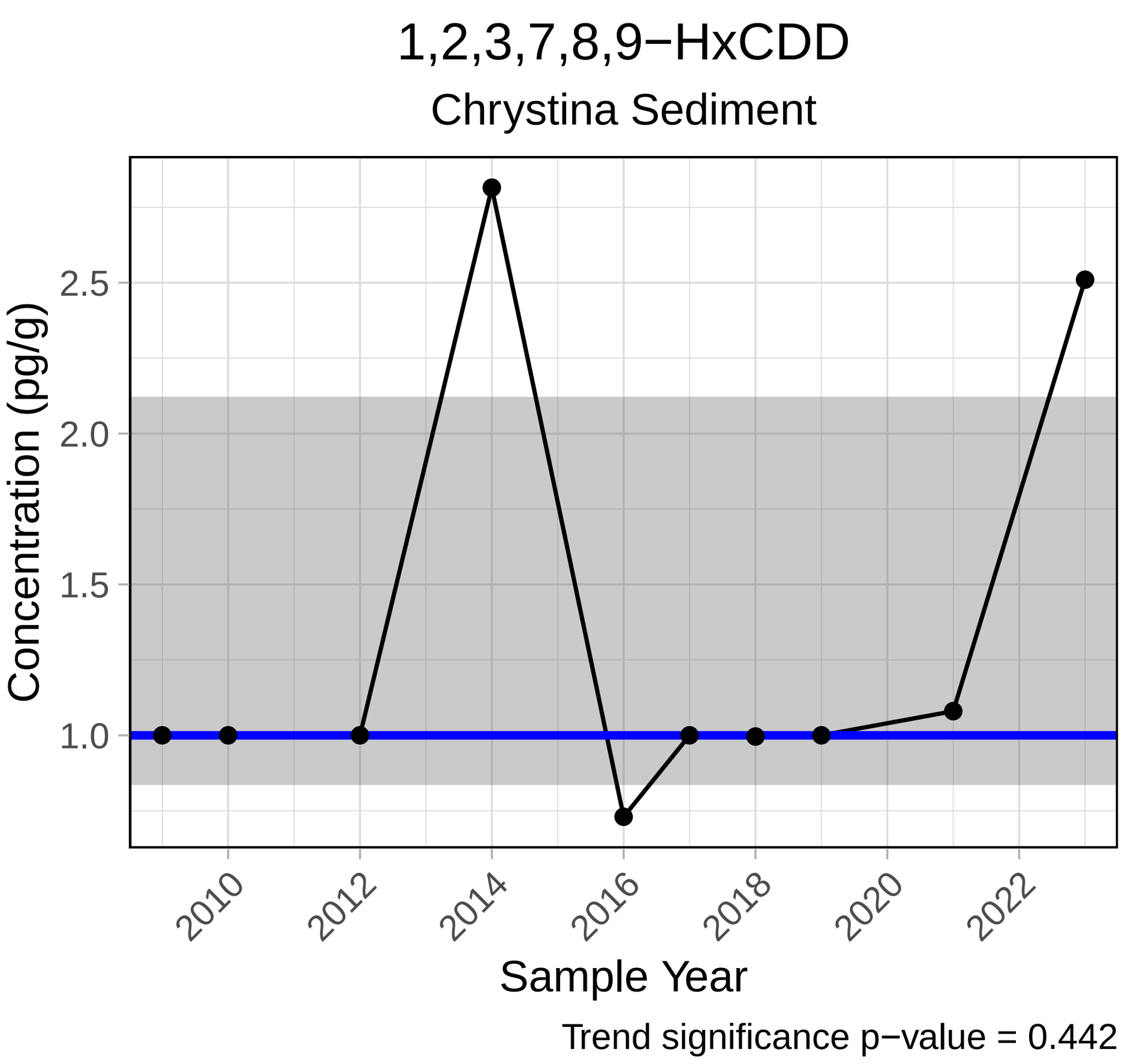
Trend significance p−value = 0.323

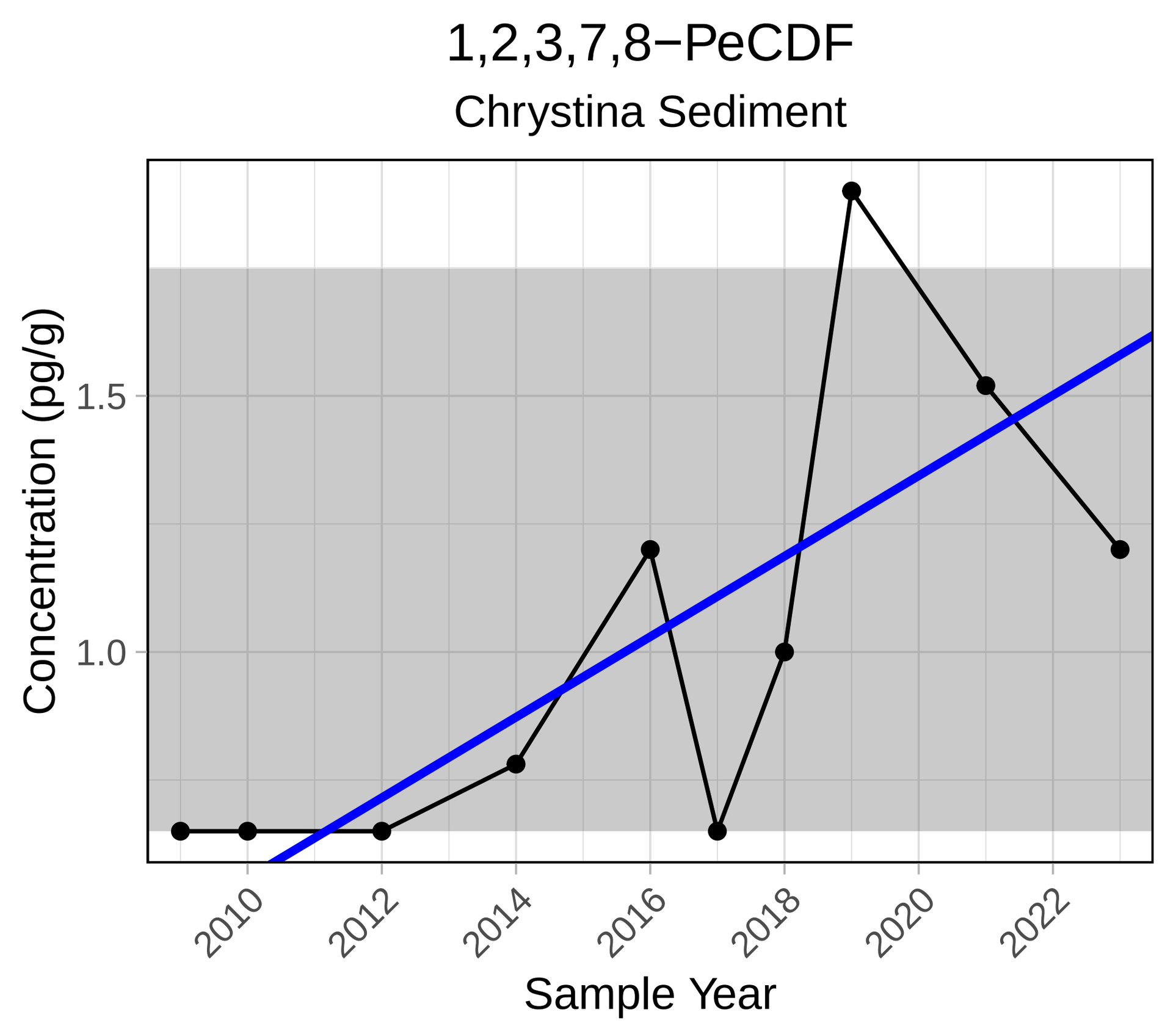

1,2,3,4,7,8−HxCDD
Chrystina Sediment
Concentration (pg/g)
1.0
0.9
0.8
0.7
0.6
0.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.124

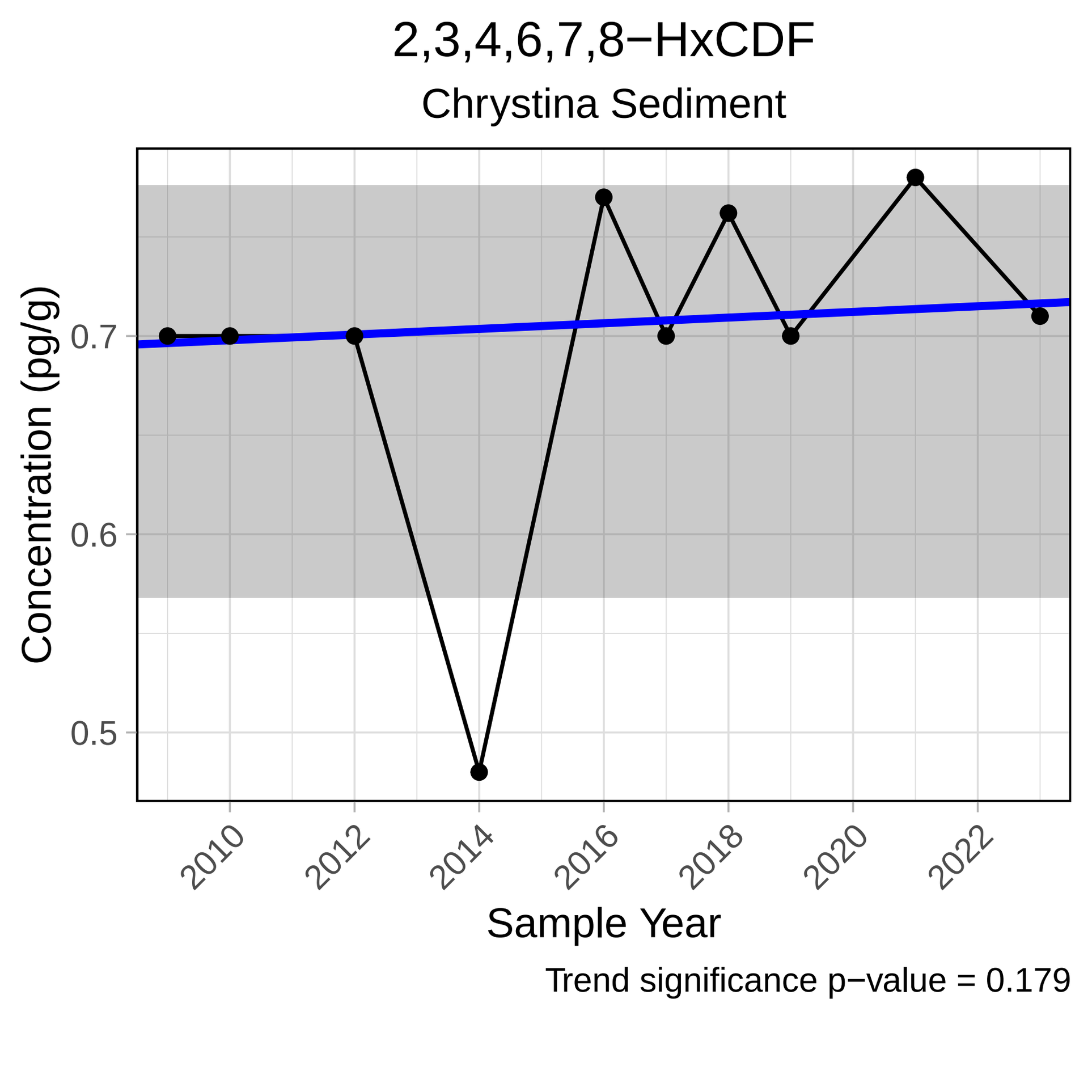

1,2,3,4,7,8−HxCDF
Chrystina Sediment
Concentration (pg/g)
1.10
1.00
0.90
0.80
0.70
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.701


1,2,3,6,7,8−HxCDD
Chrystina Sediment
Concentration (pg/g)
1.6
1.4
1.2
1.0
0.8
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.249

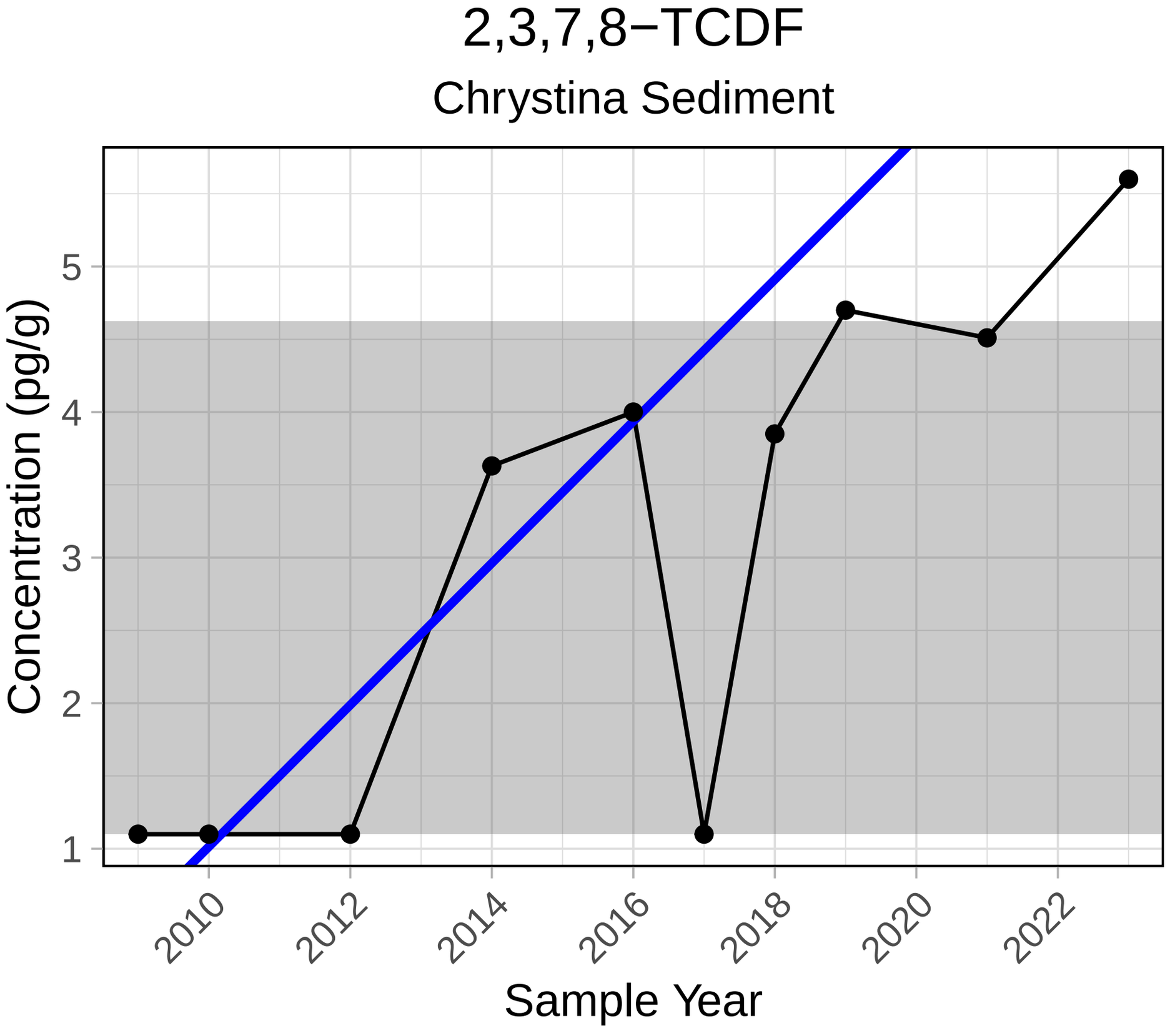

1,2,3,6,7,8−HxCDF
Chrystina Sediment
Concentration (pg/g)
0.7
0.6
0.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.919

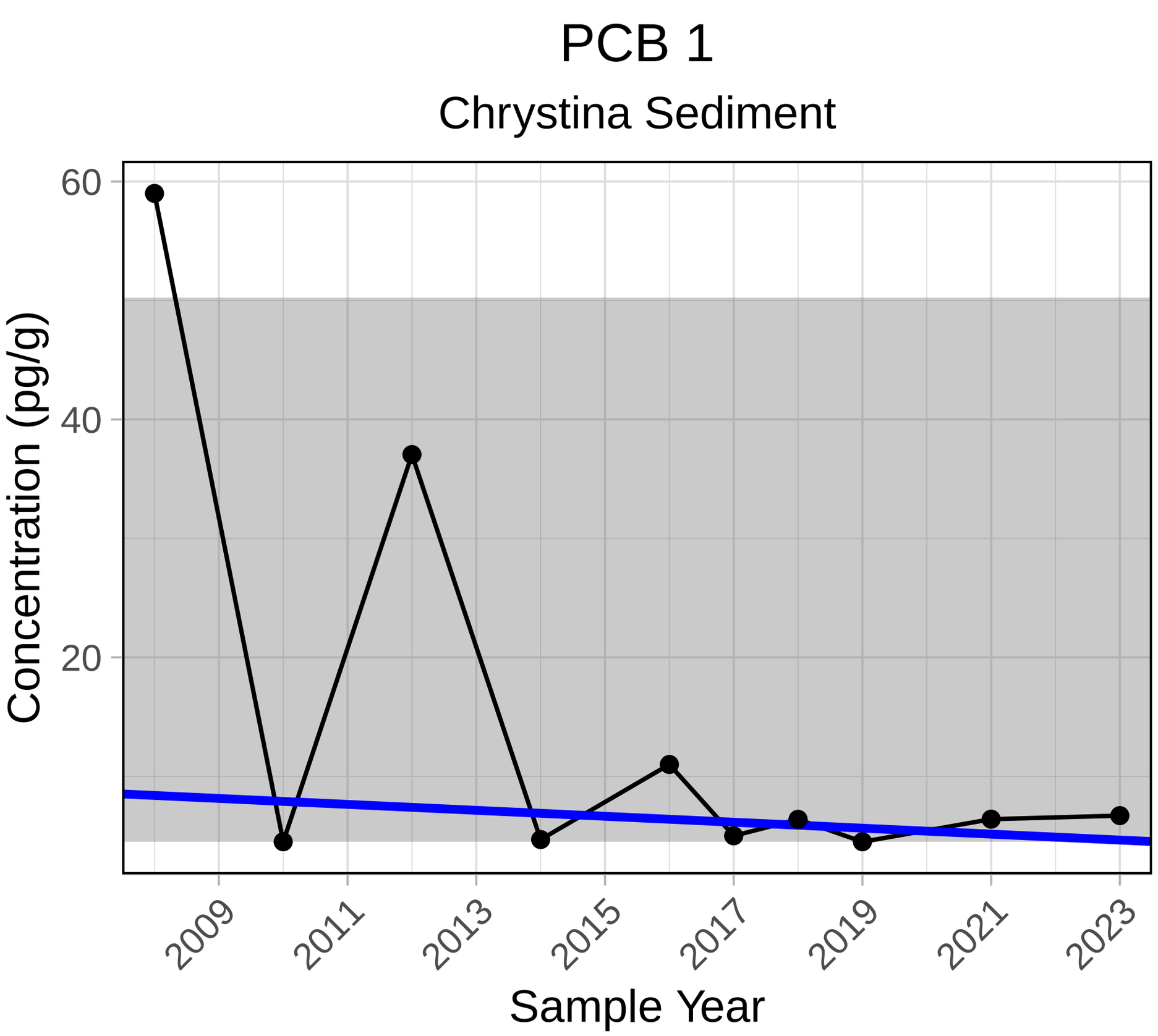

1,2,3,7,8,9−HxCDD
Chrystina Sediment
Concentration (pg/g)
2.5
2.0
1.5
1.0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.442

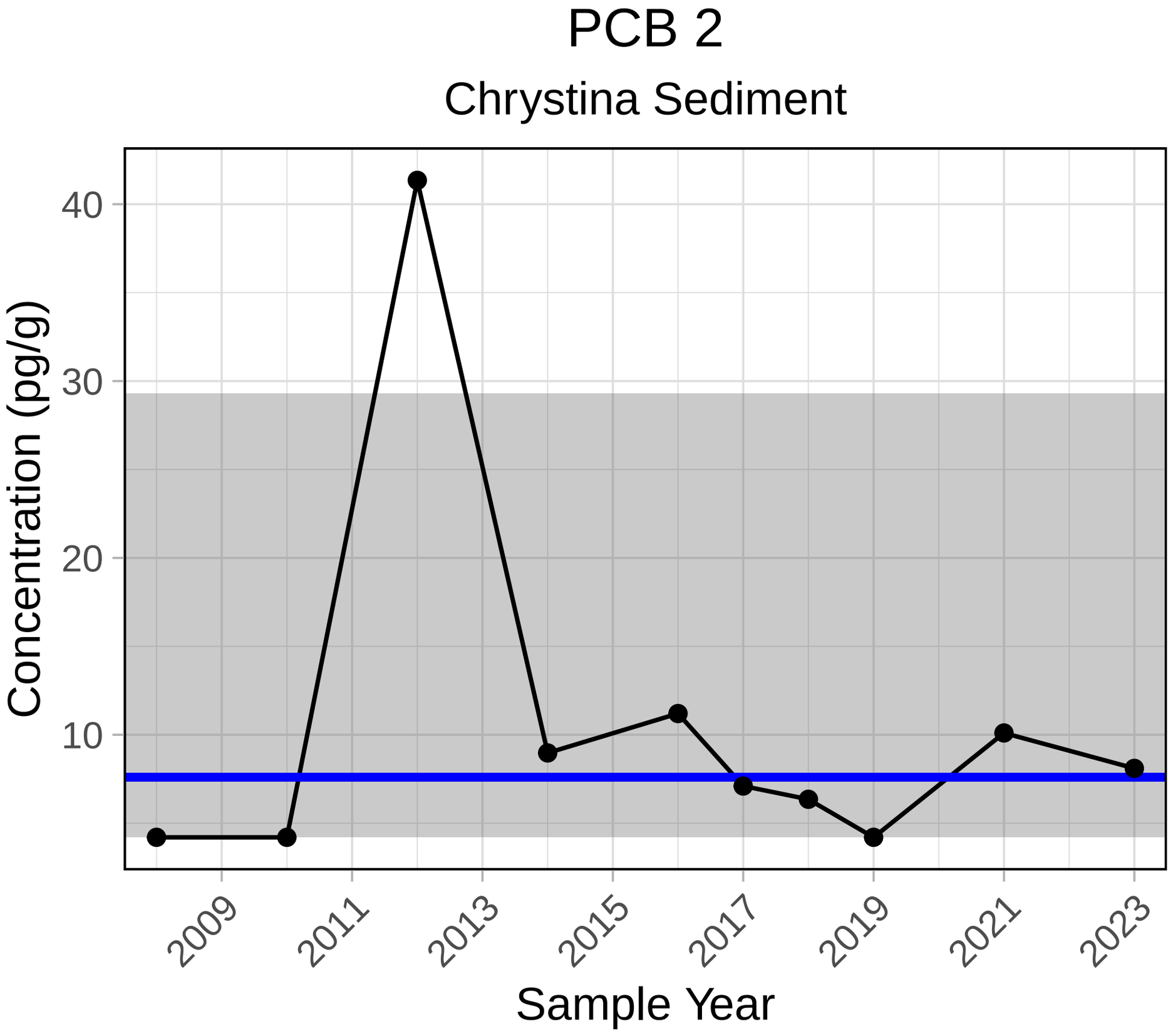

1,2,3,7,8−PeCDF
Chrystina Sediment
Concentration (pg/g)
1.5
1.0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.02

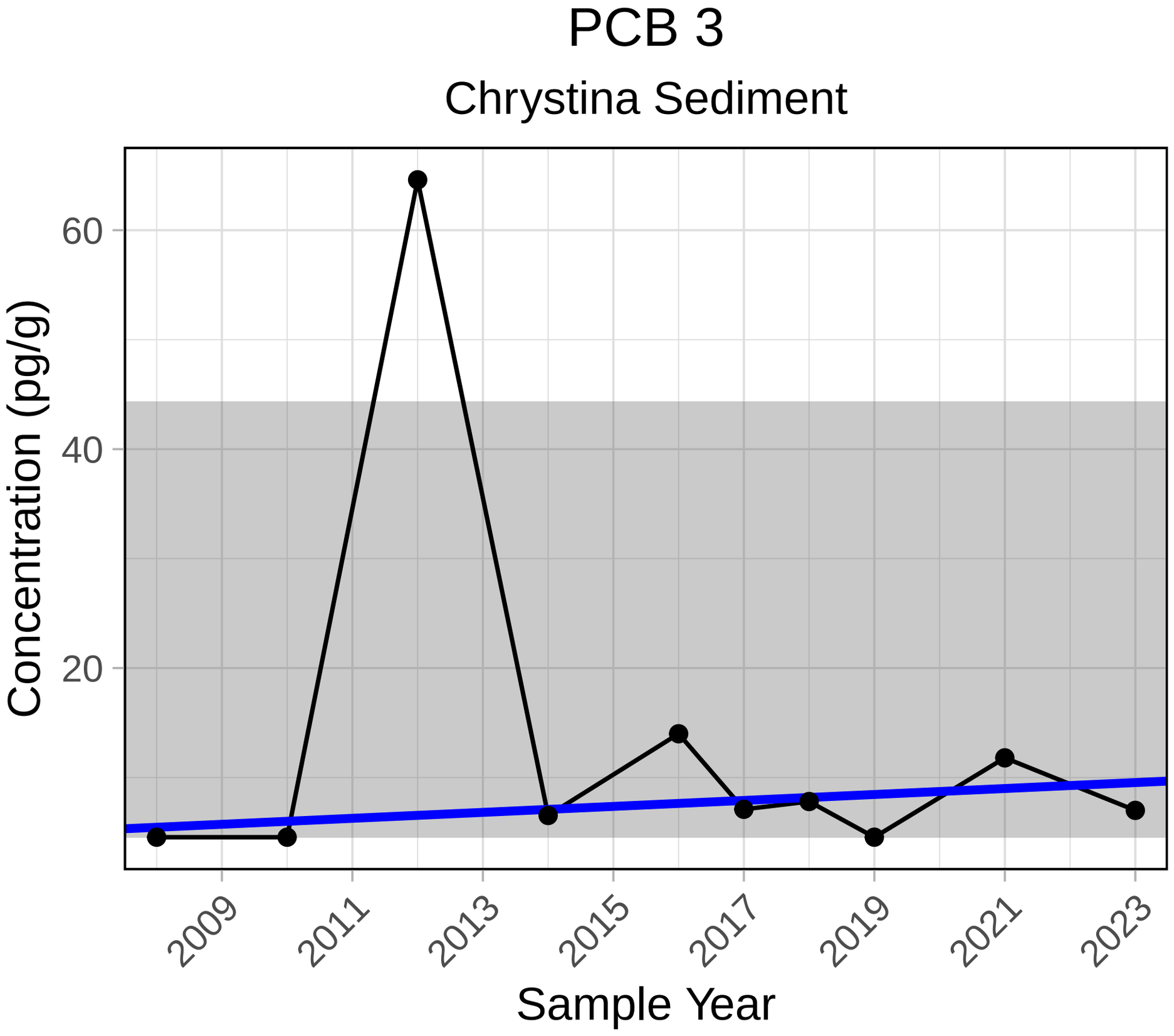

2,3,4,6,7,8−HxCDF
Chrystina Sediment
Concentration (pg/g)
0.7
0.6
0.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.179

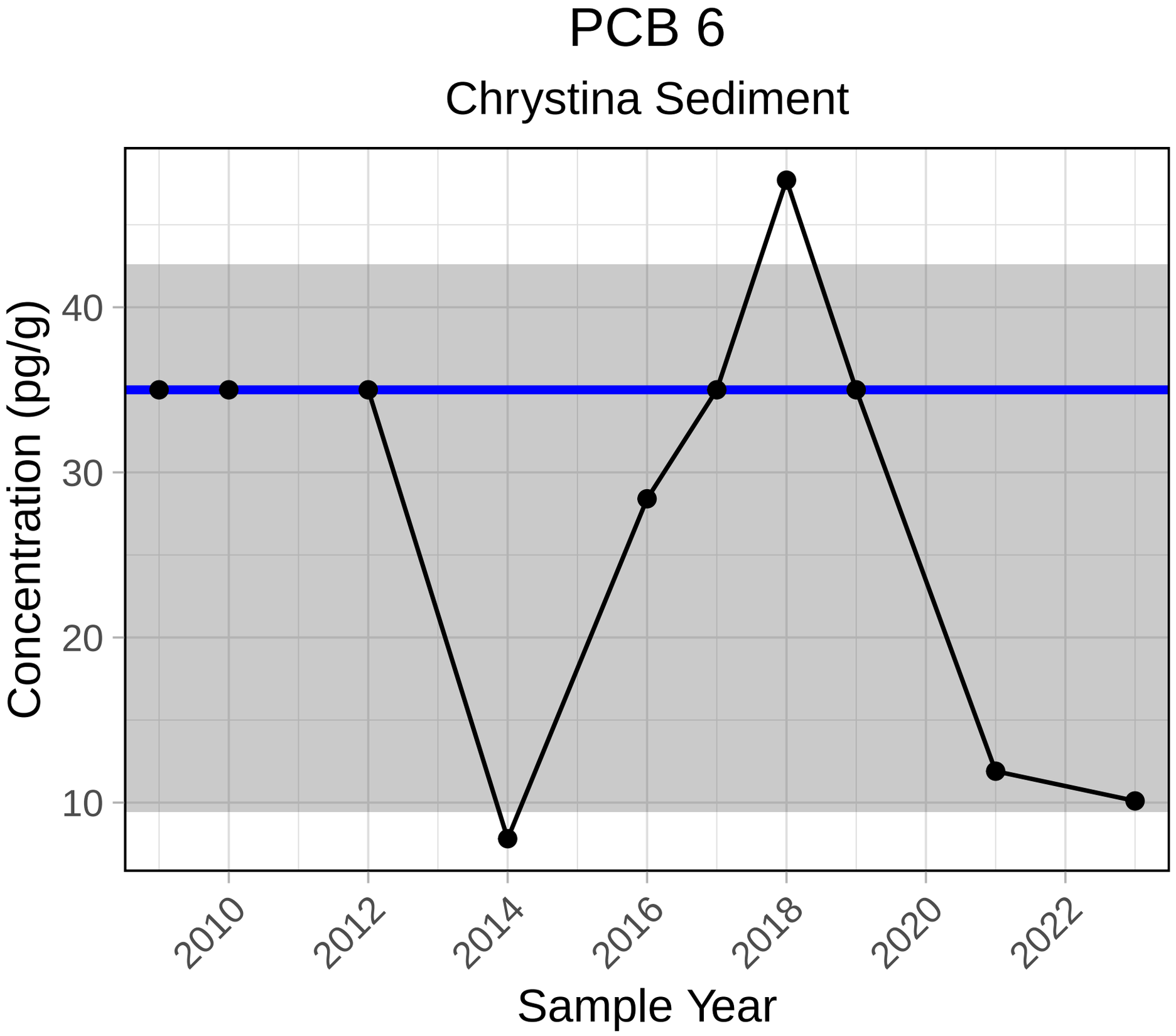
2,3,4,7,8−PeCDF
Chrystina Sediment
Concentration (pg/g)
3
2
1
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.005


2,3,7,8−TCDF
Chrystina Sediment
Concentration (pg/g)
5
4
3
2
1
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.005

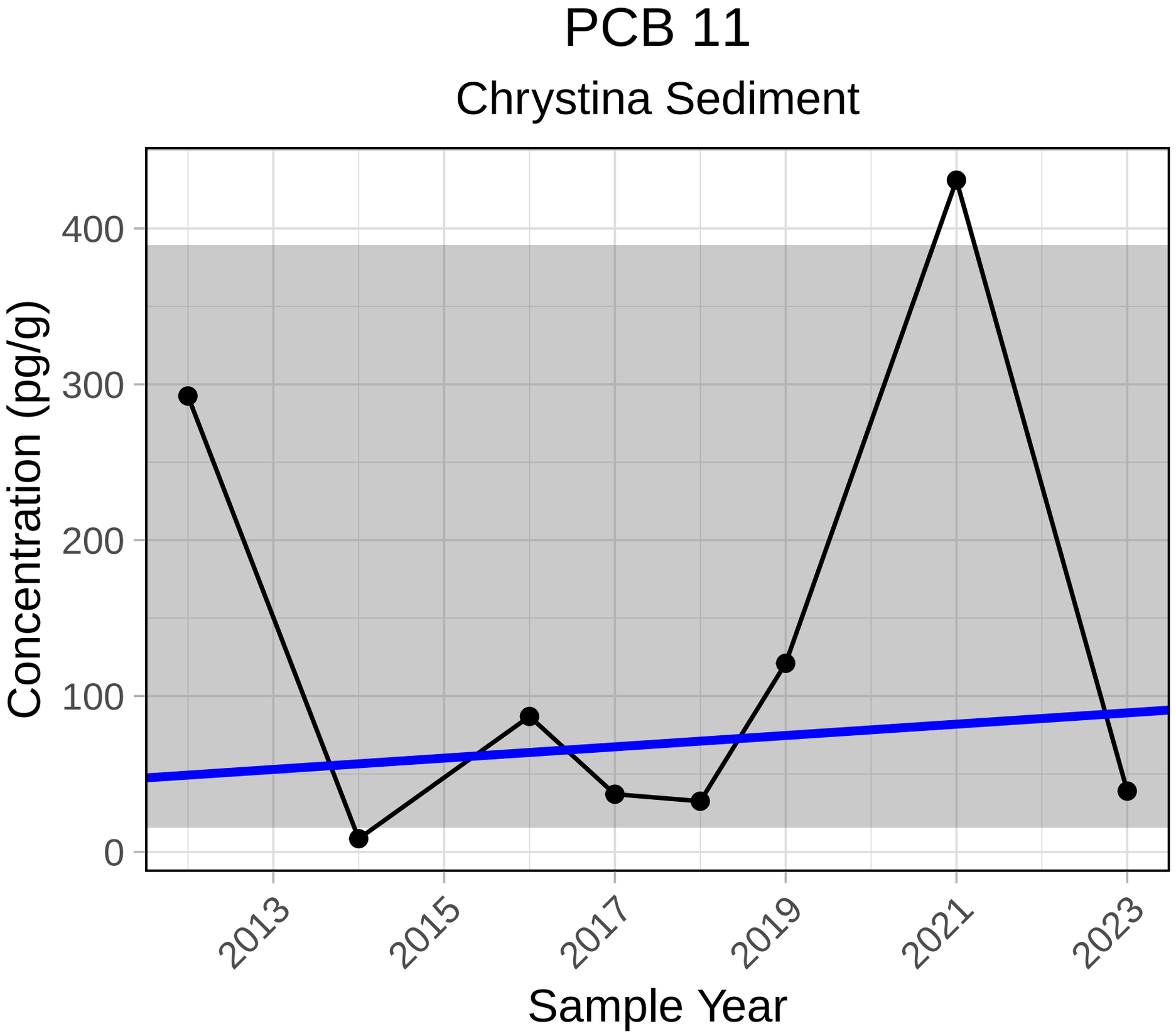

PCB 1
Chrystina Sediment
60
40
20
Concentration (pg/g)
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.788


PCB 2
Chrystina Sediment
Concentration (pg/g)
40
30
20
10
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.928


PCB 3
Chrystina Sediment
Concentration (pg/g)
60
40
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.65

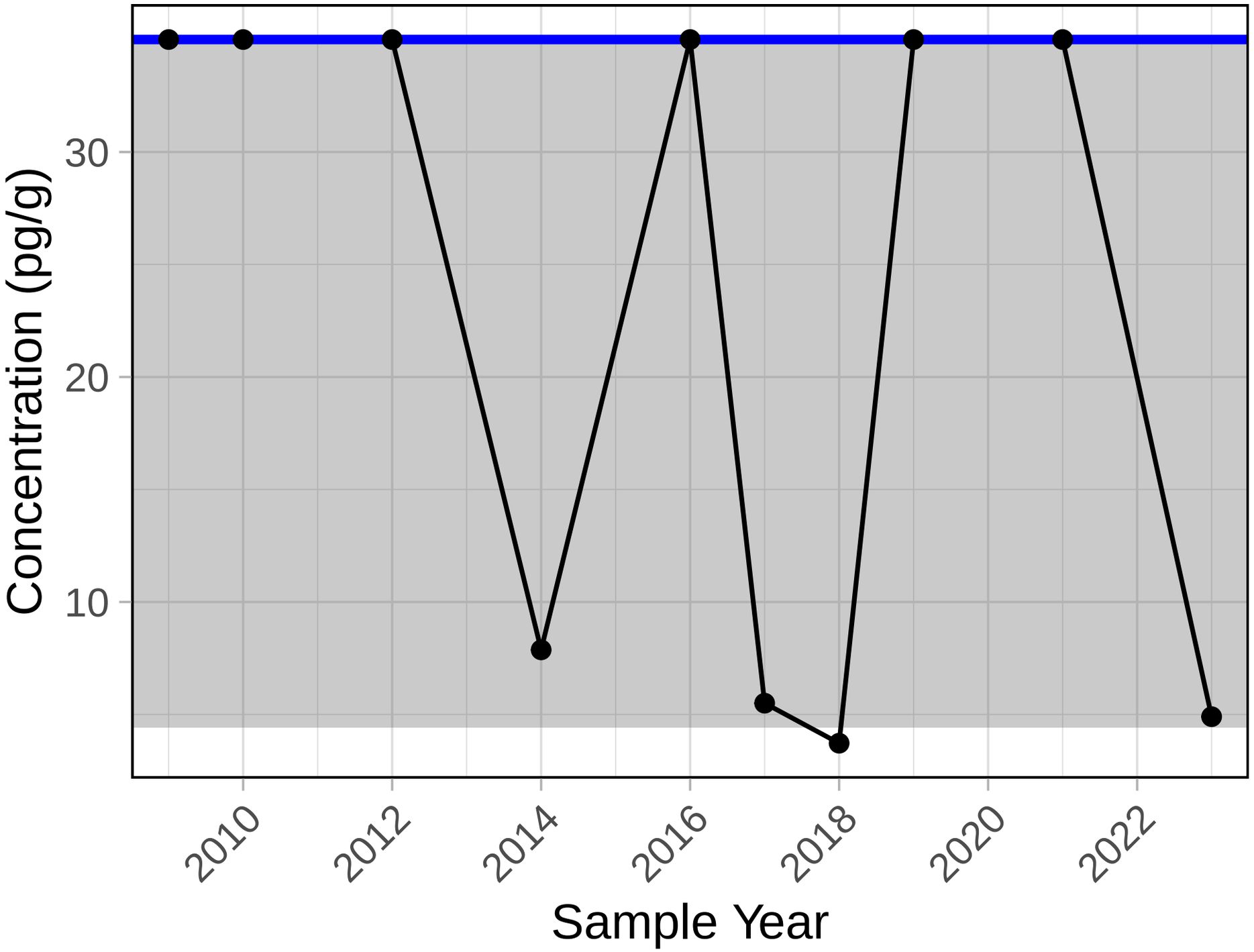

PCB 6
Chrystina Sediment
Concentration (pg/g)
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.442

PCB 8
Chrystina Sediment
Concentration (pg/g)
200
100
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.414

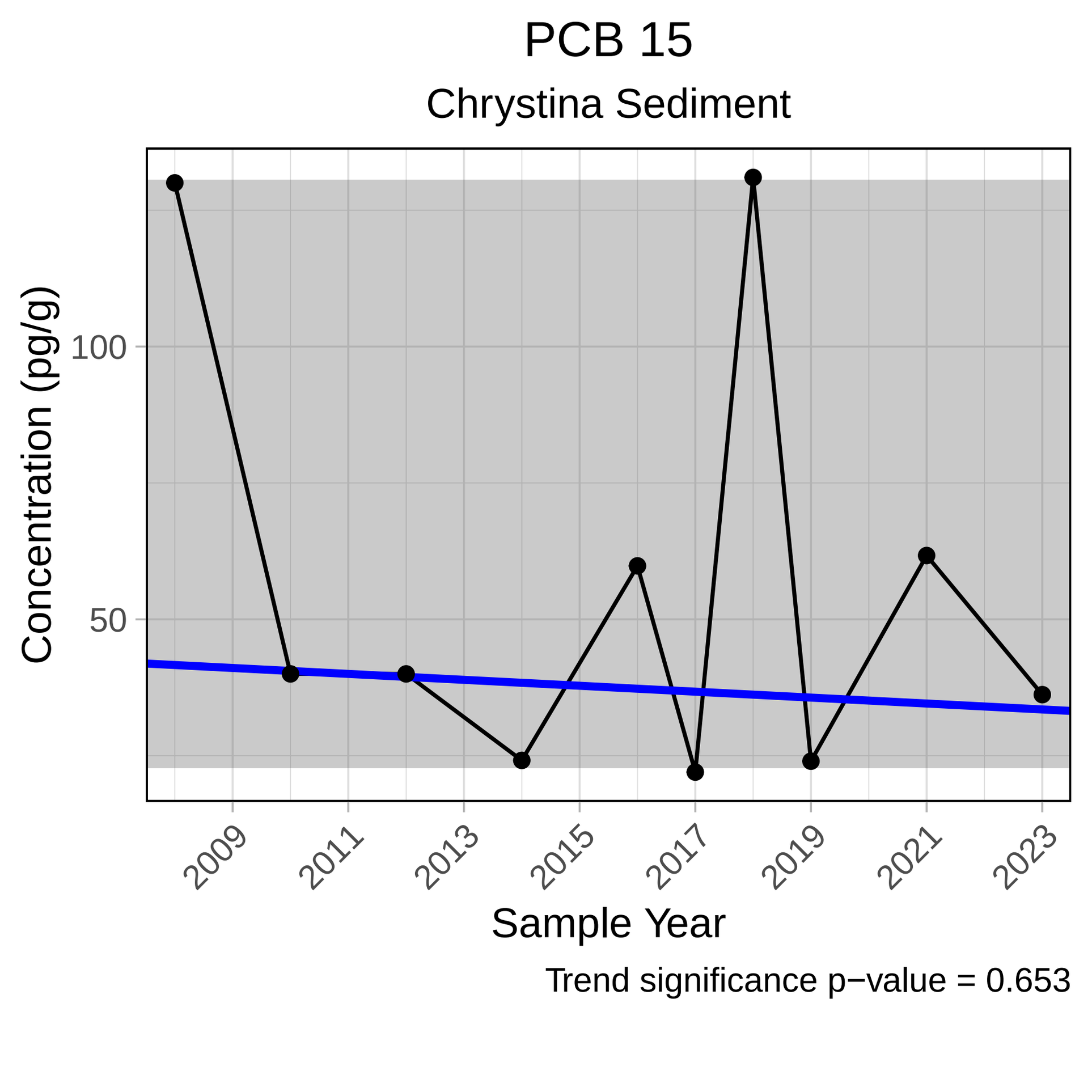

PCB 11
Chrystina Sediment
Concentration (pg/g)
400
300
200
100
0
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.711

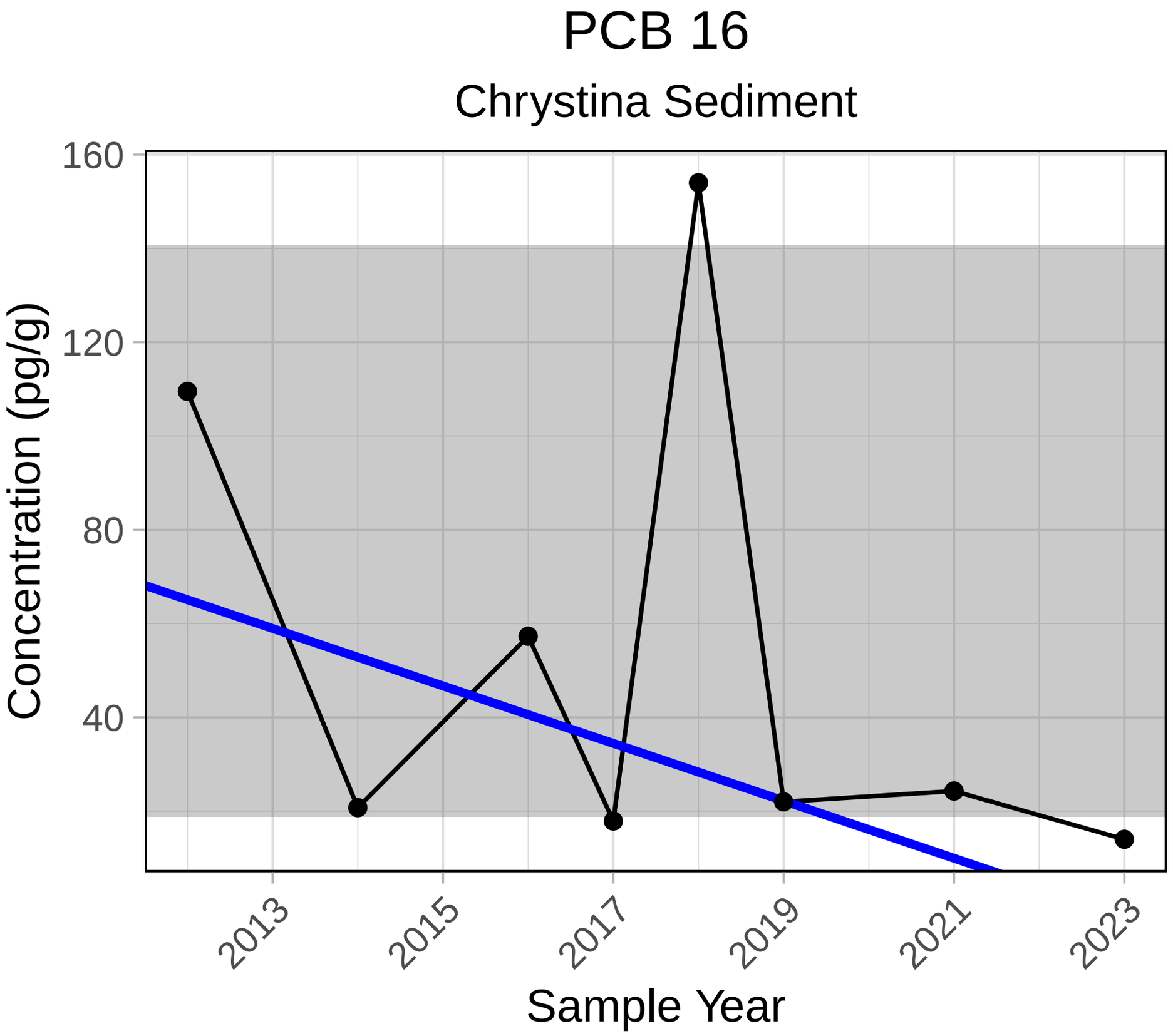
PCB 14

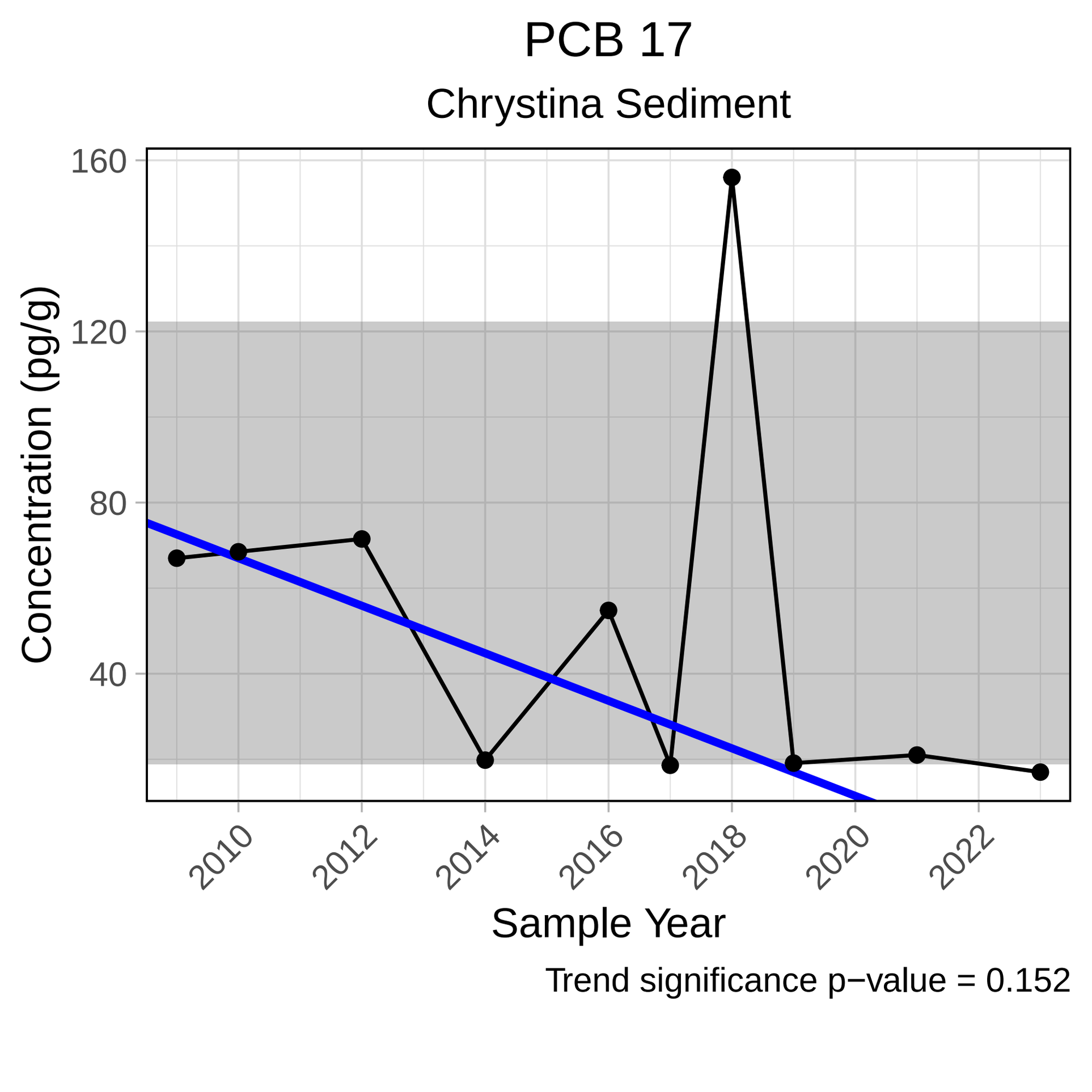
Chrystina Sediment

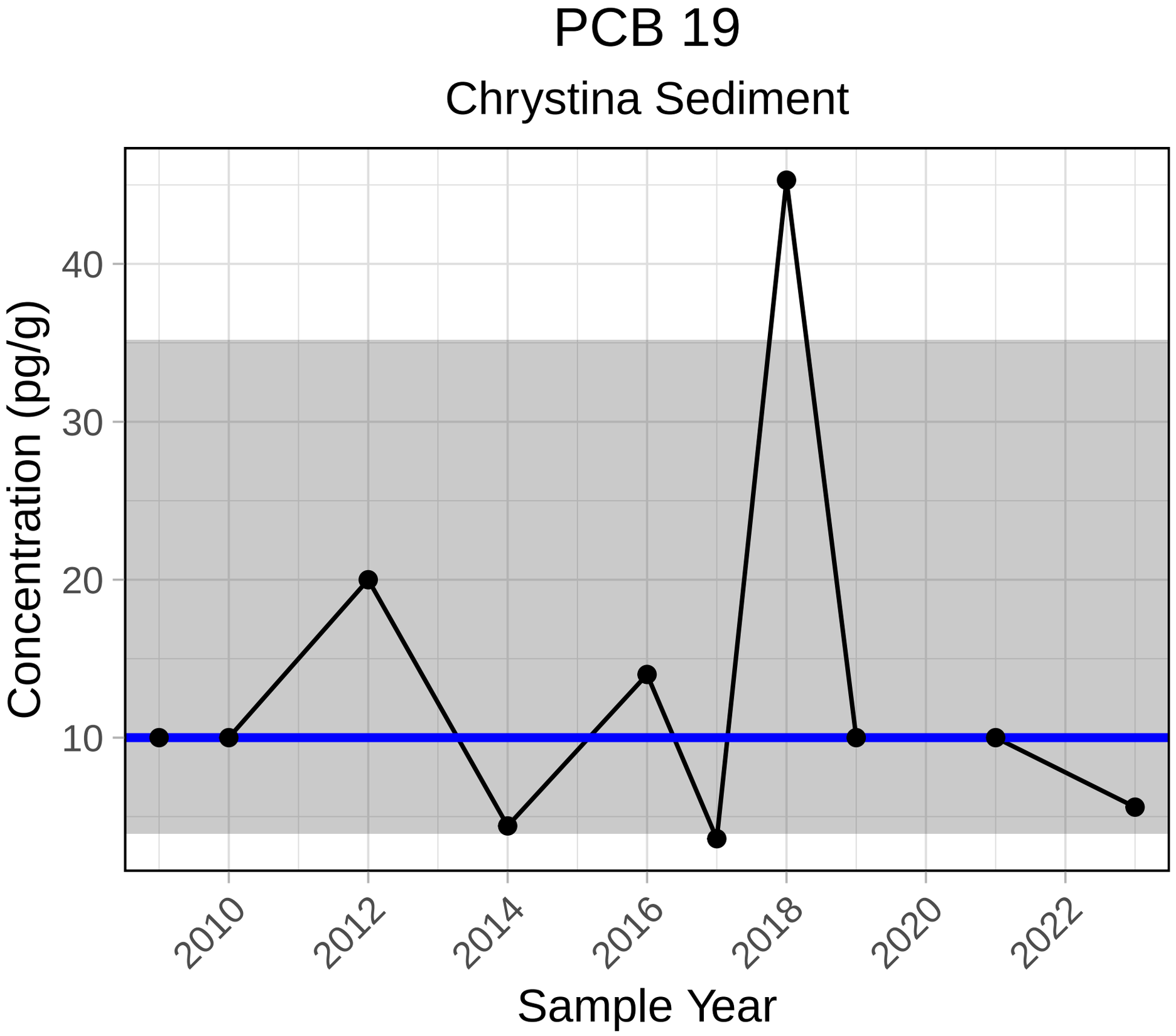


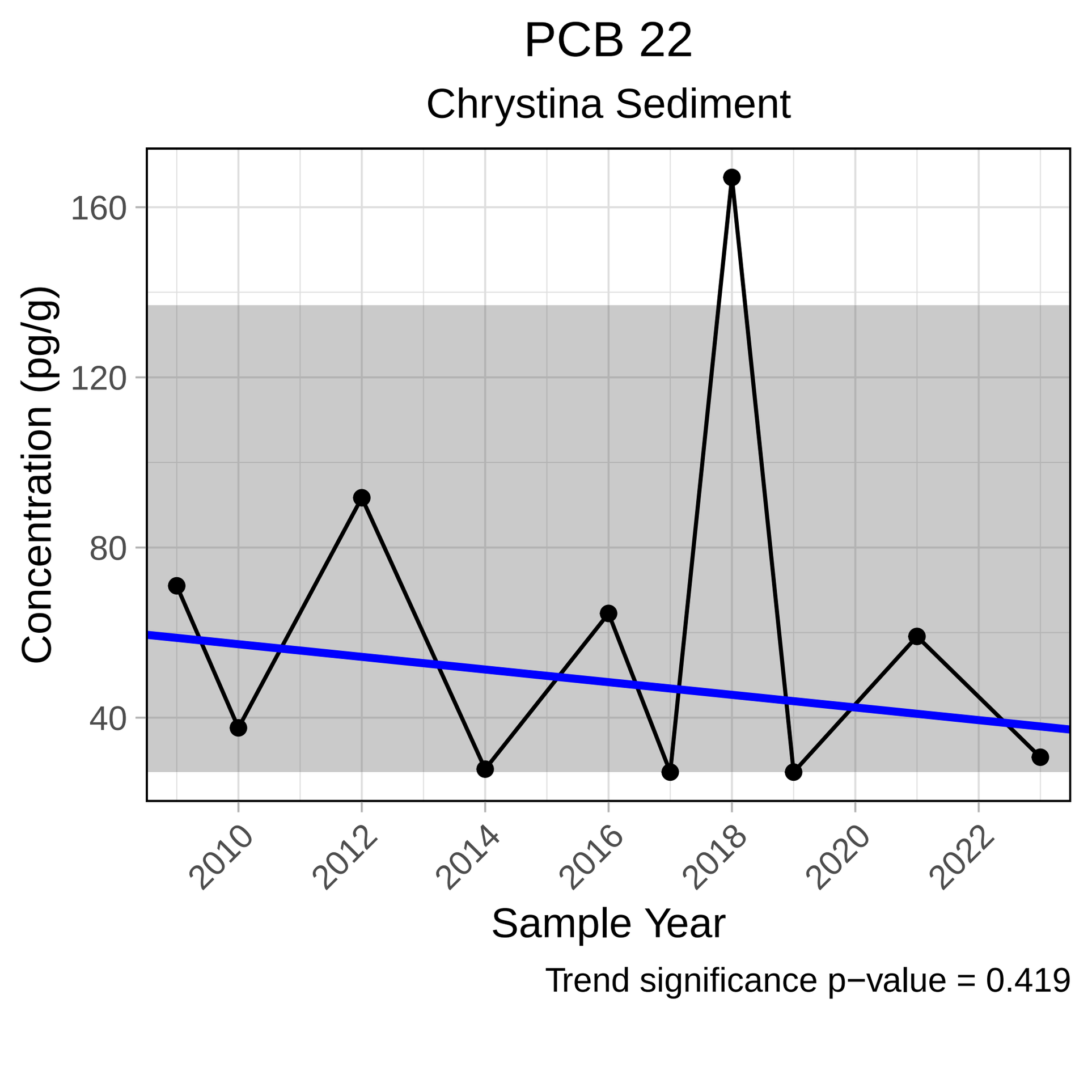
Trend significance p−value = 0.186

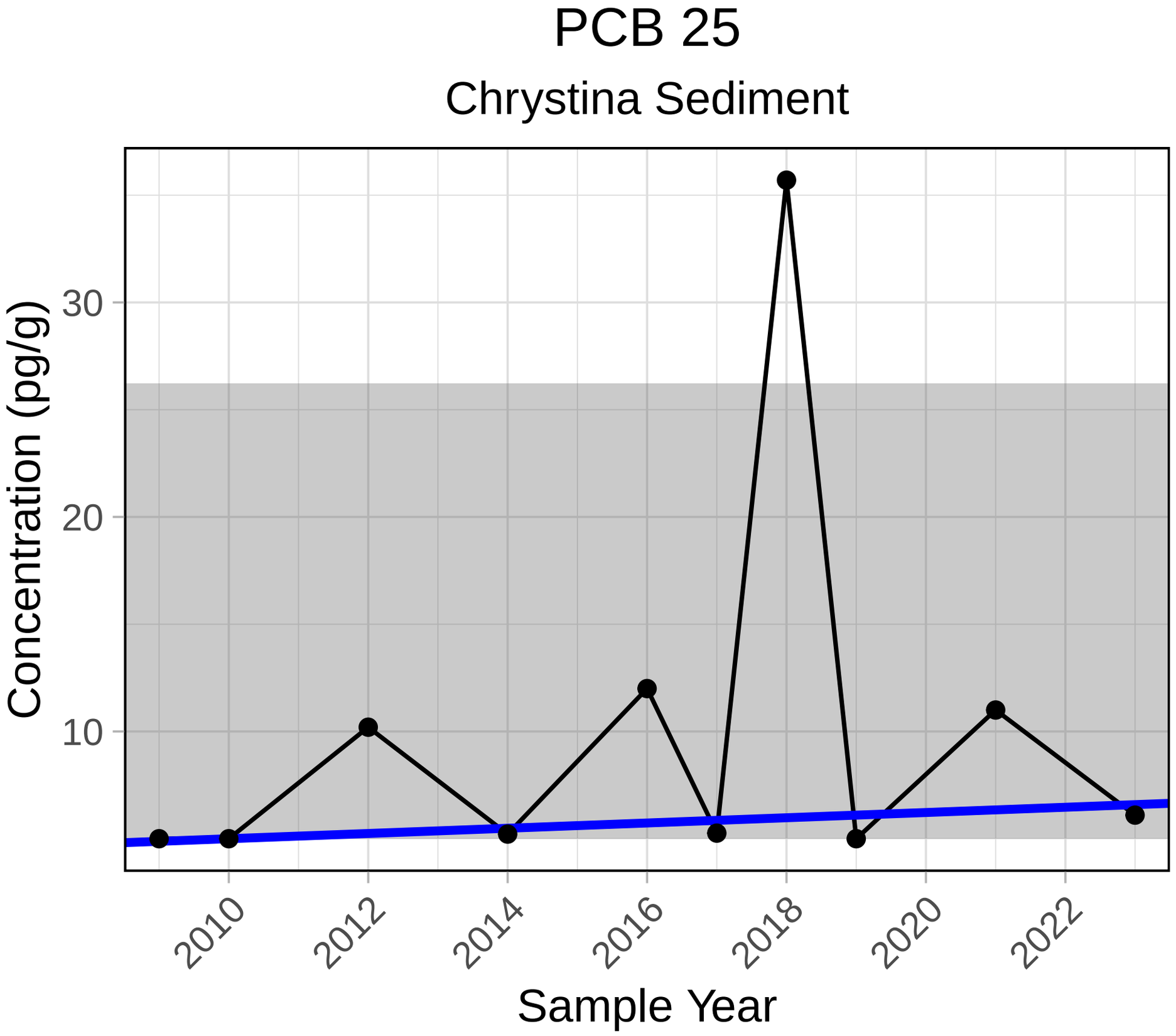

PCB 15
Chrystina Sediment
Concentration (pg/g)
100
50
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.653


PCB 16
Chrystina Sediment
160
120
80
40
Concentration (pg/g)
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.386


PCB 17
Chrystina Sediment
160
120
80
40
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152


PCB 19
Chrystina Sediment
Concentration (pg/g)
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.711


PCB 22
Chrystina Sediment
160
120
80
40
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.419

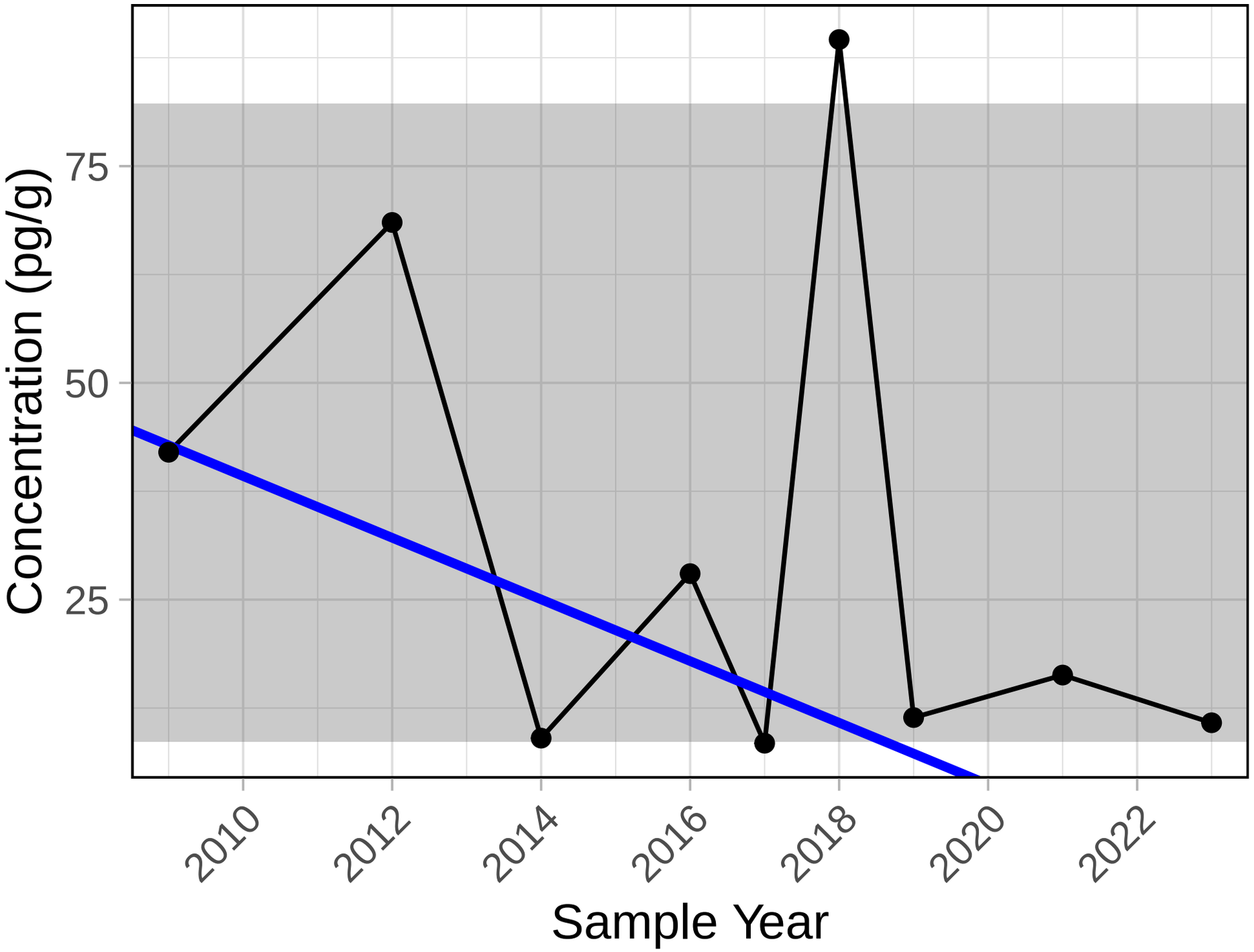

PCB 25
Chrystina Sediment
Concentration (pg/g)
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.238

PCB 27
Chrystina Sediment
Concentration (pg/g)
20
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

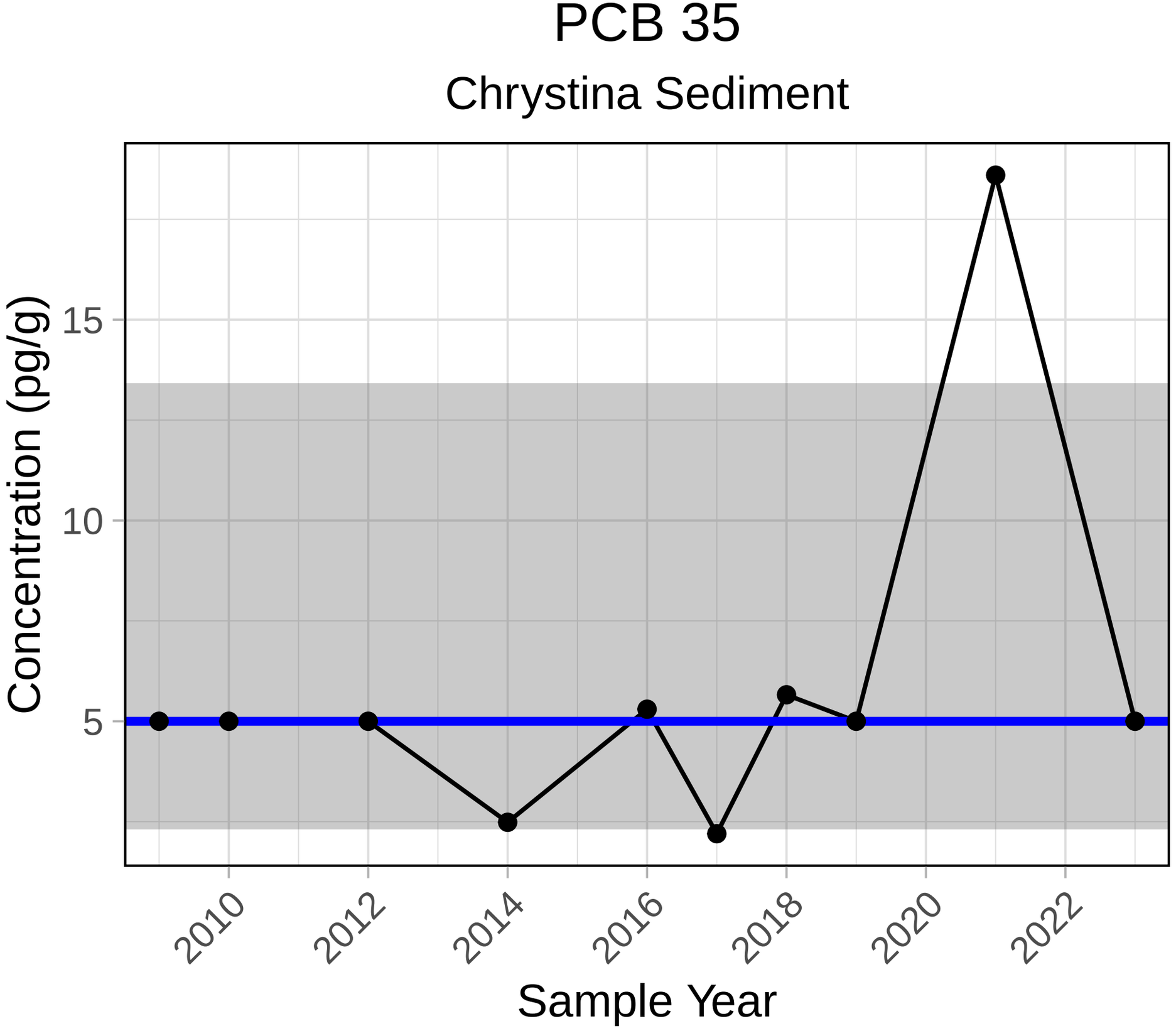
PCB 31
Chrystina Sediment
Concentration (pg/g)
300
200
100
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

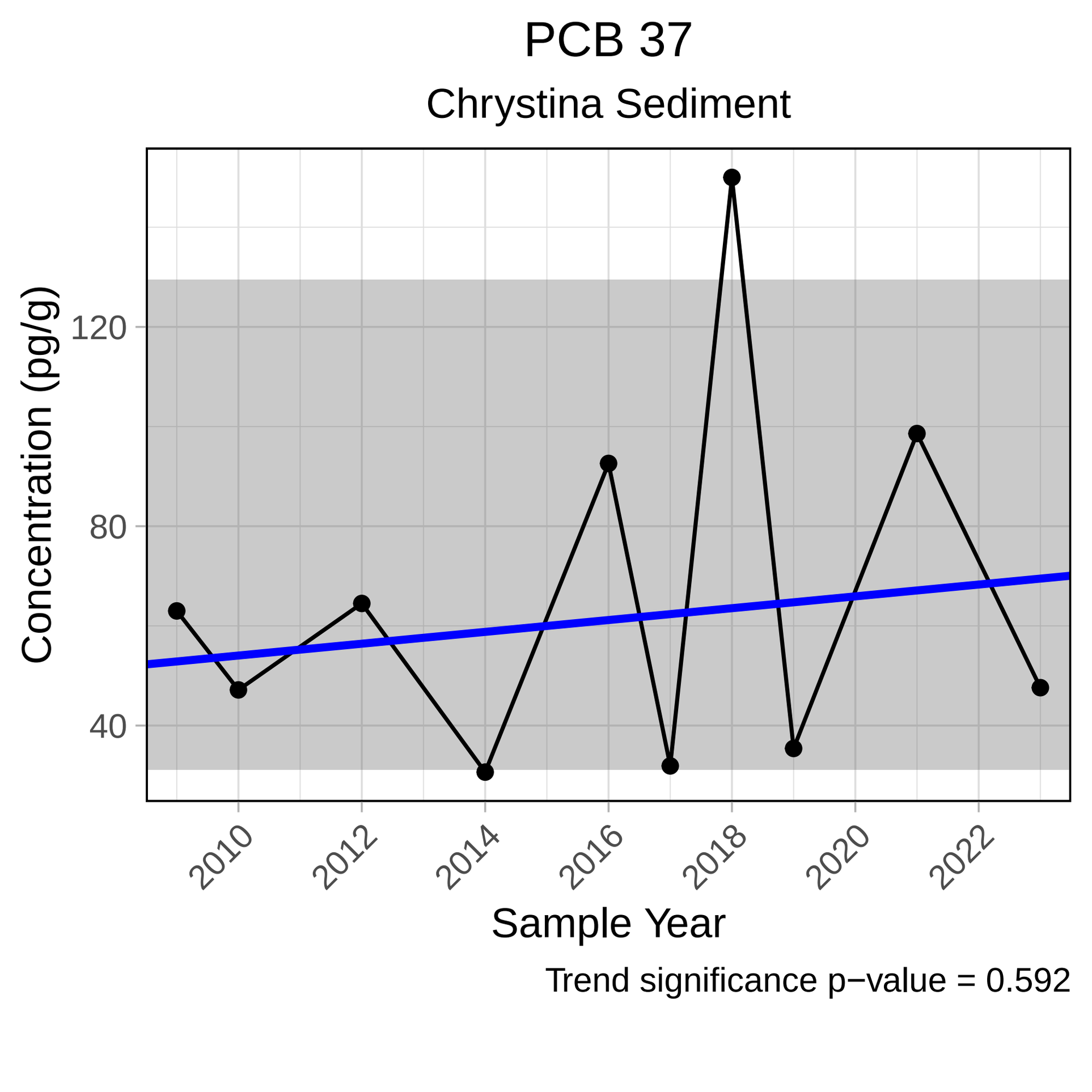
PCB 32

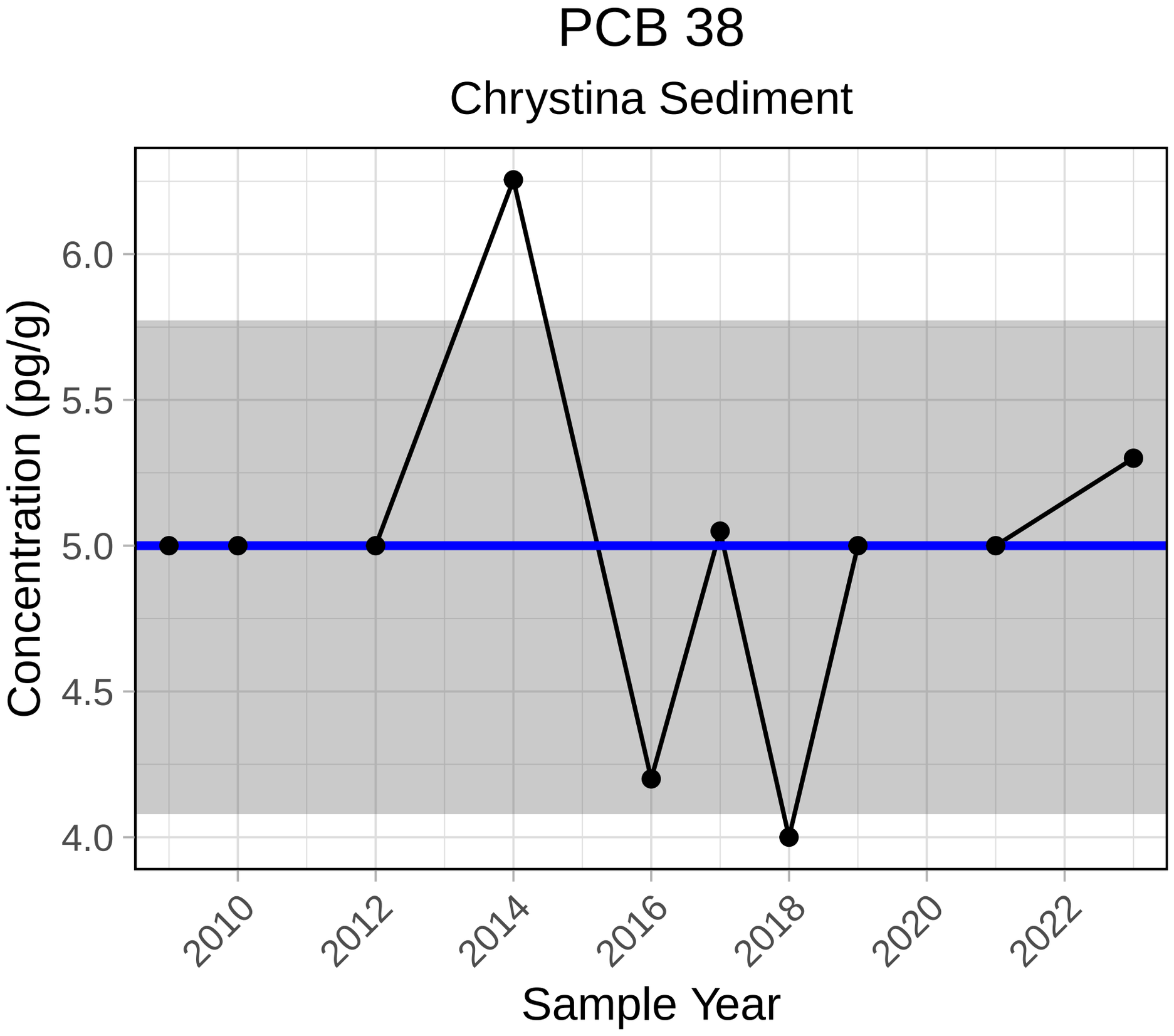
Chrystina Sediment

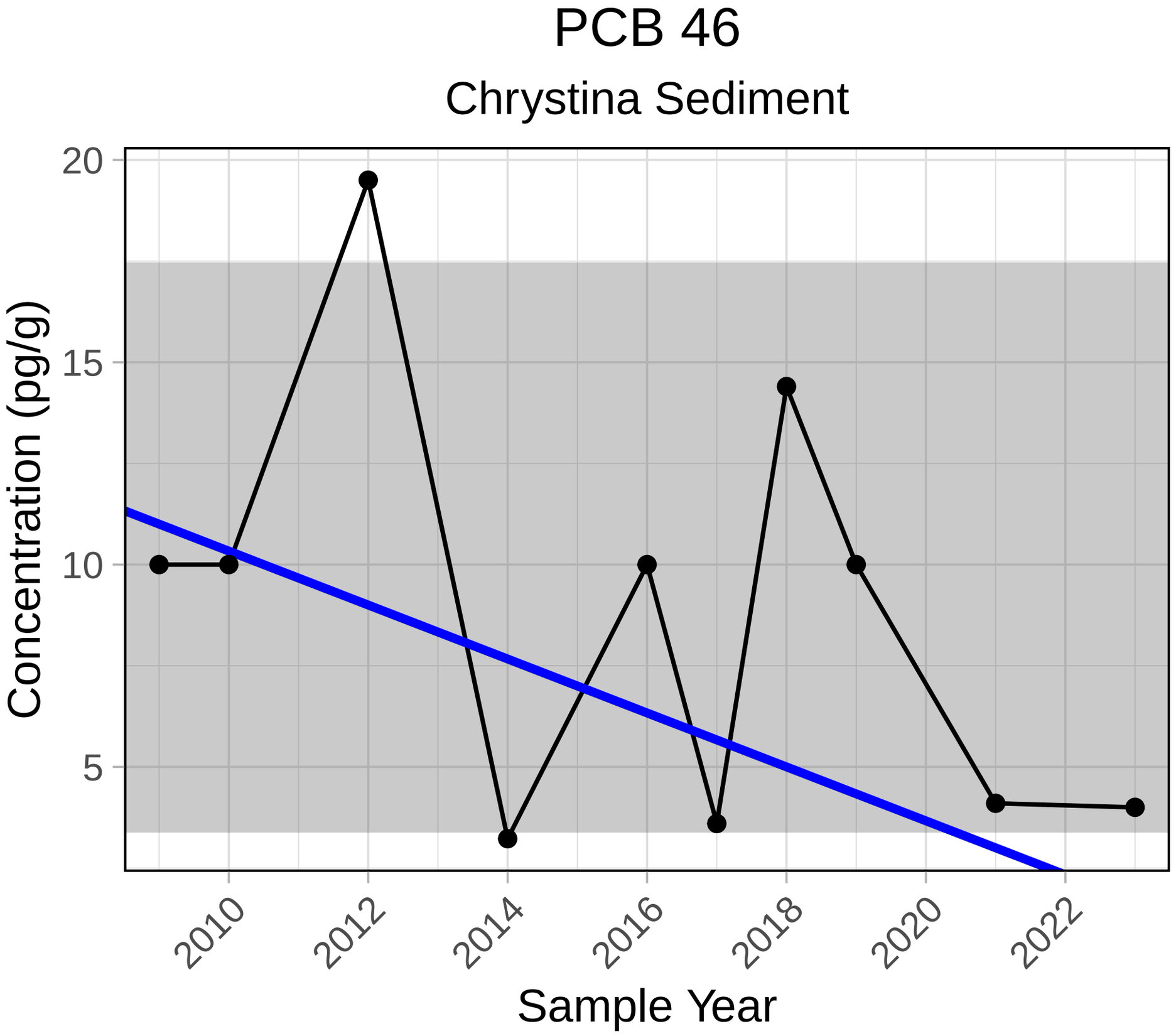


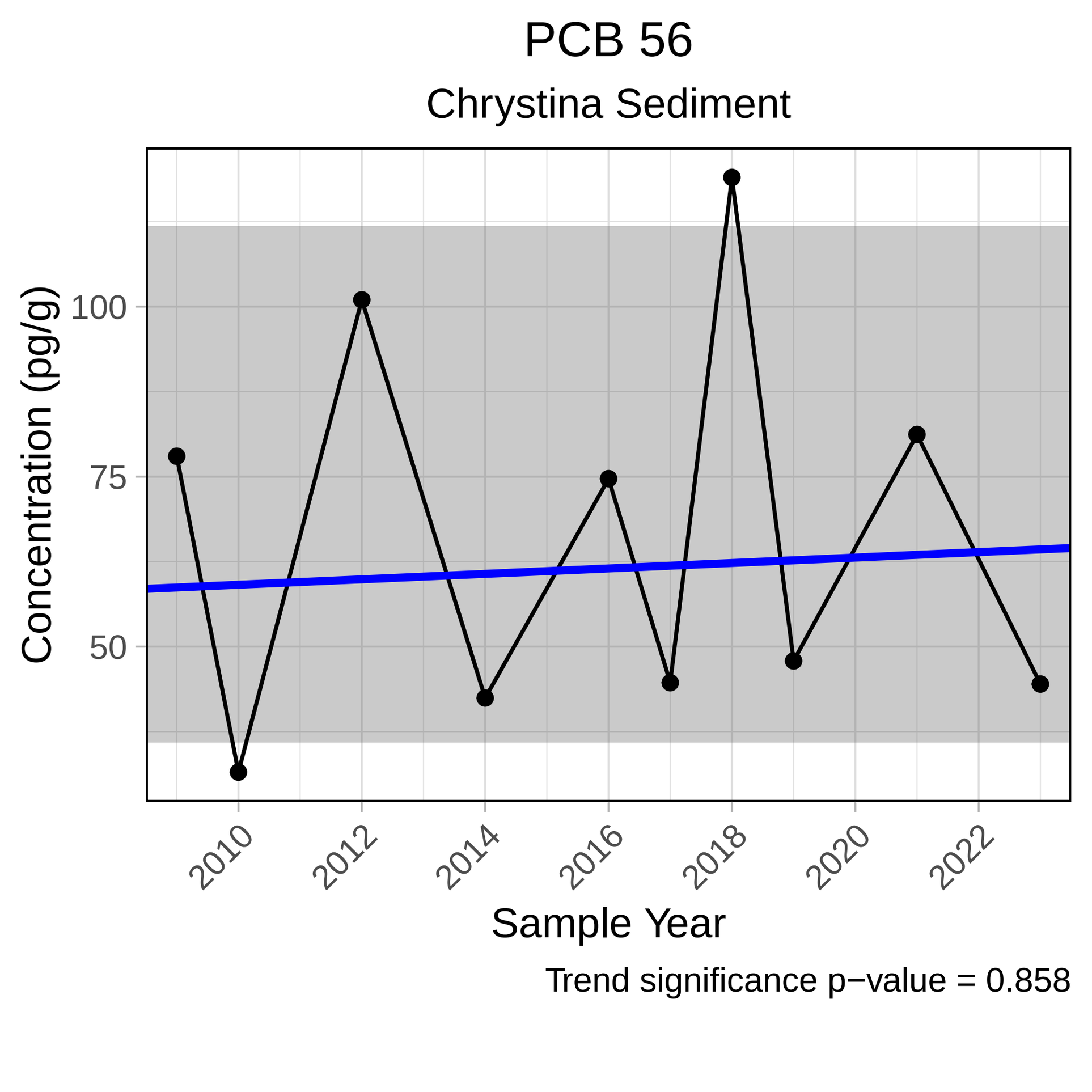
Trend significance p−value = 0.466

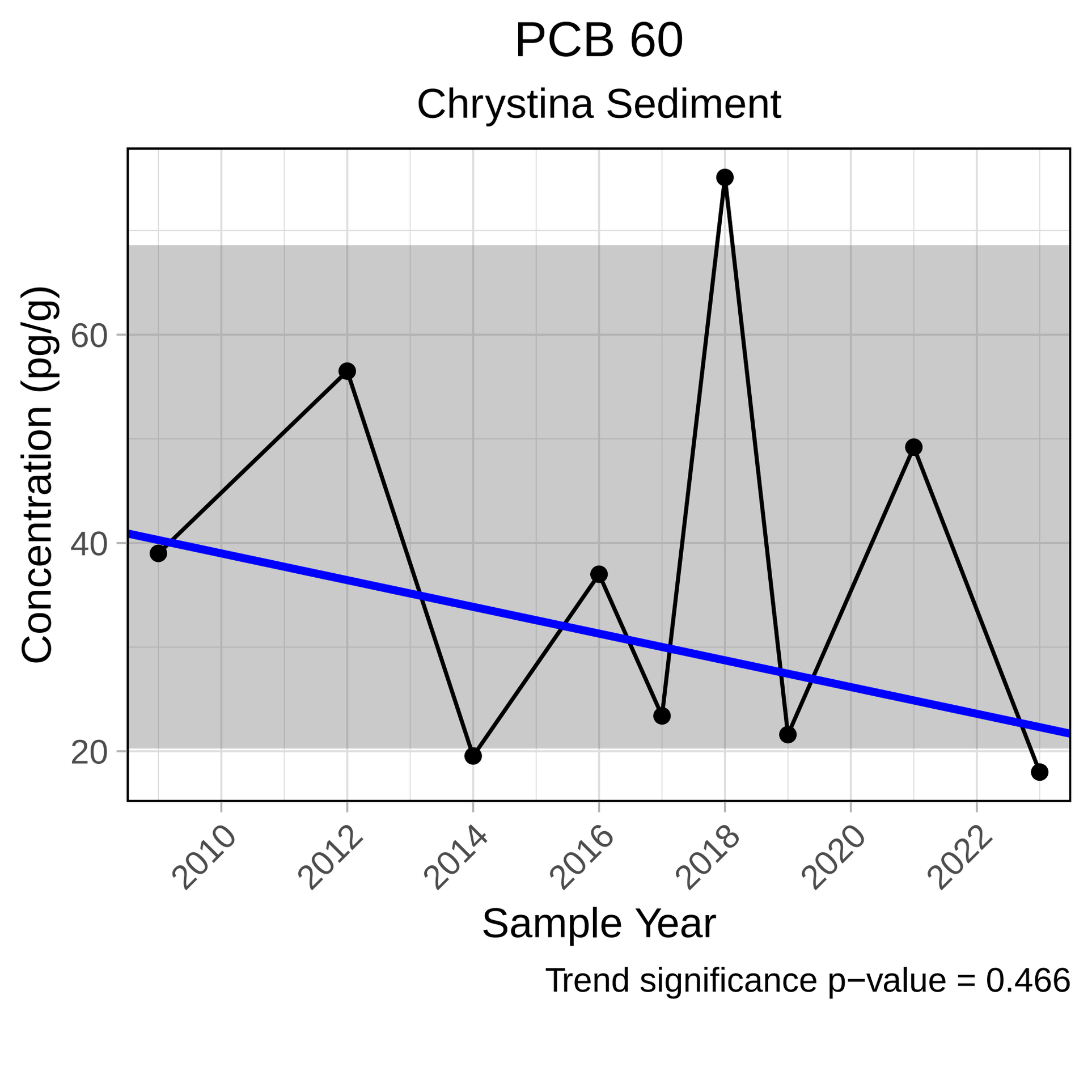

PCB 35
Chrystina Sediment
Concentration (pg/g)
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.442

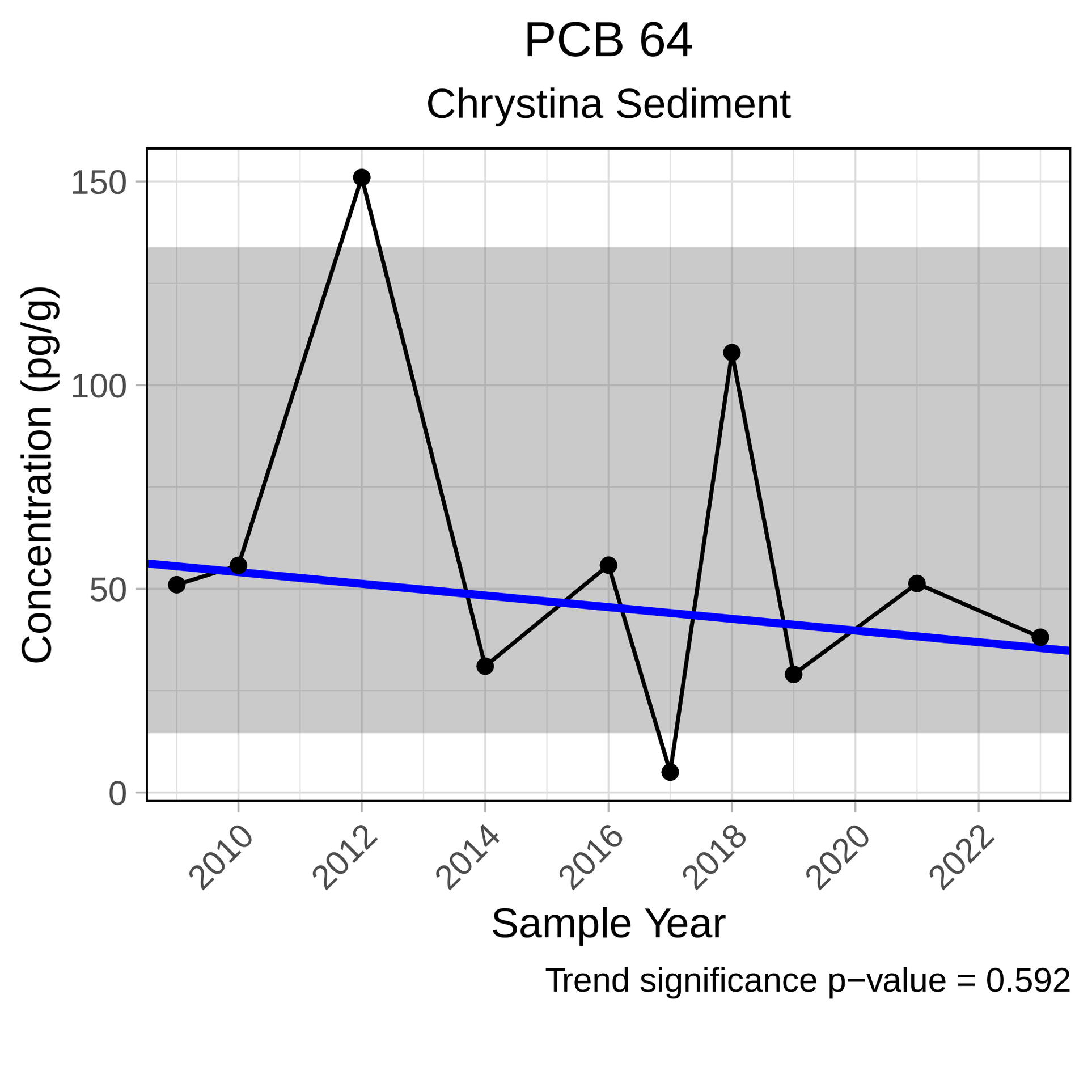

PCB 37
Chrystina Sediment
Concentration (pg/g)
120
80
40
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

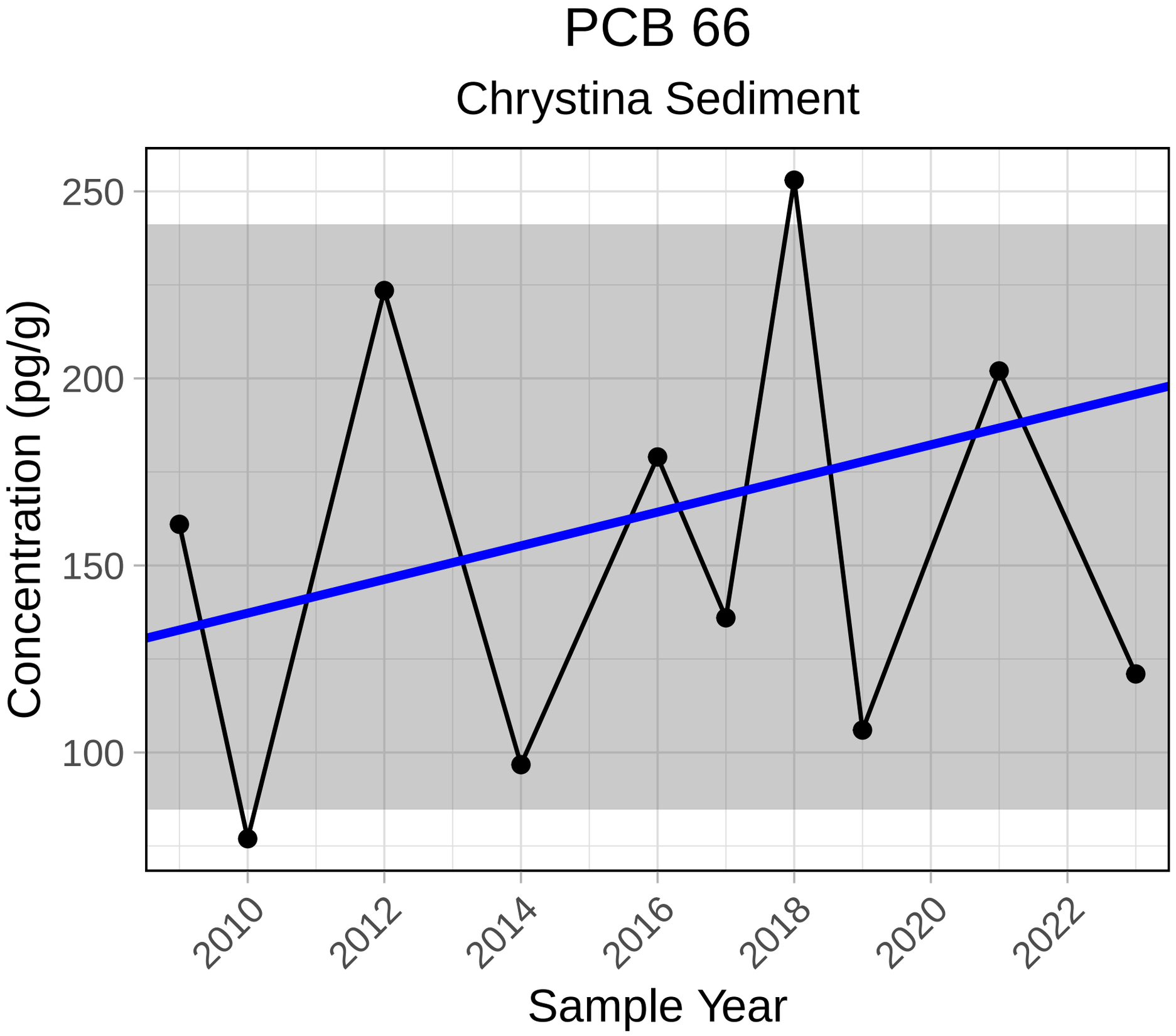

PCB 38
Chrystina Sediment
Concentration (pg/g)
6.0
5.5
5.0
4.5
4.0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.848

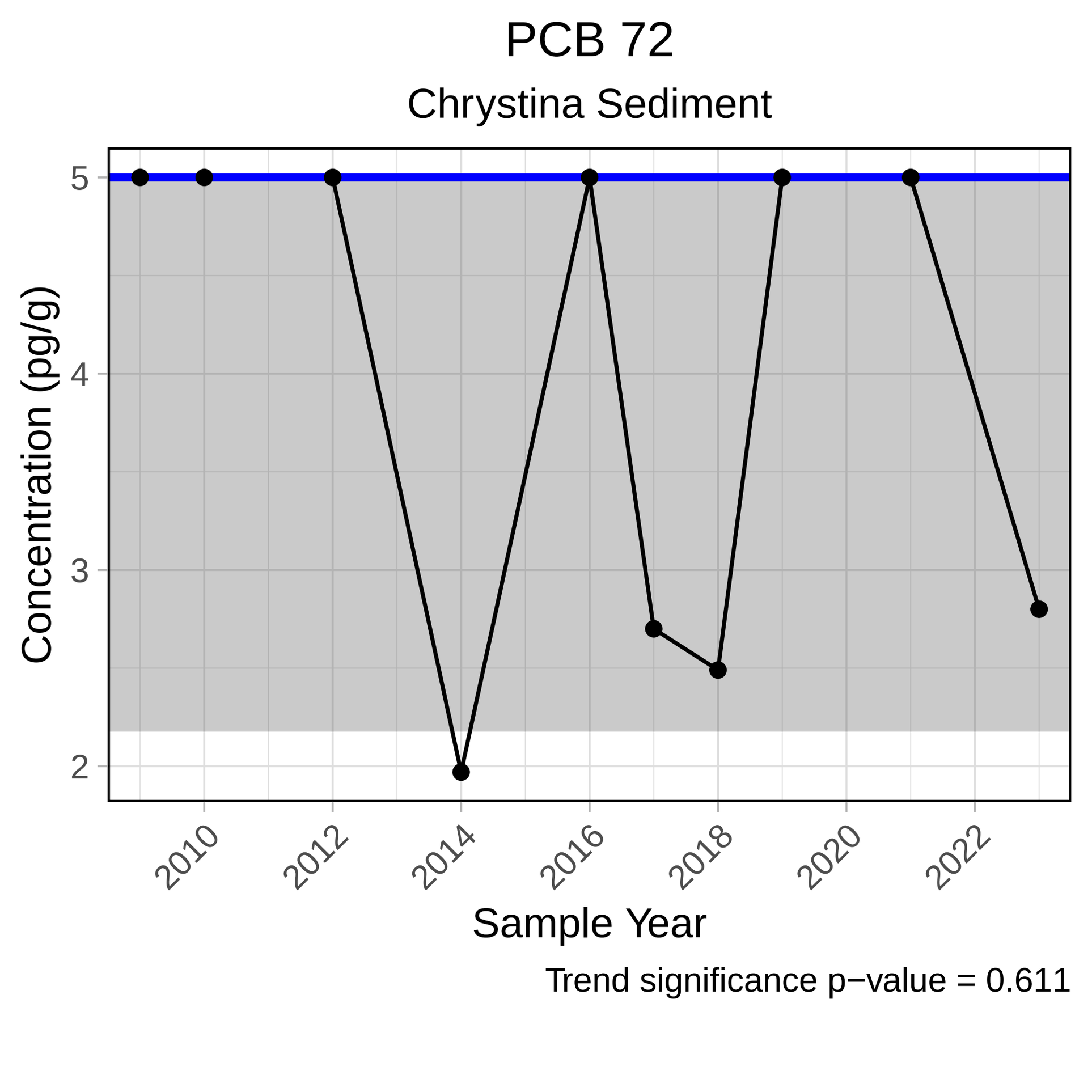

PCB 46
Chrystina Sediment
20
15
10
5
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.458

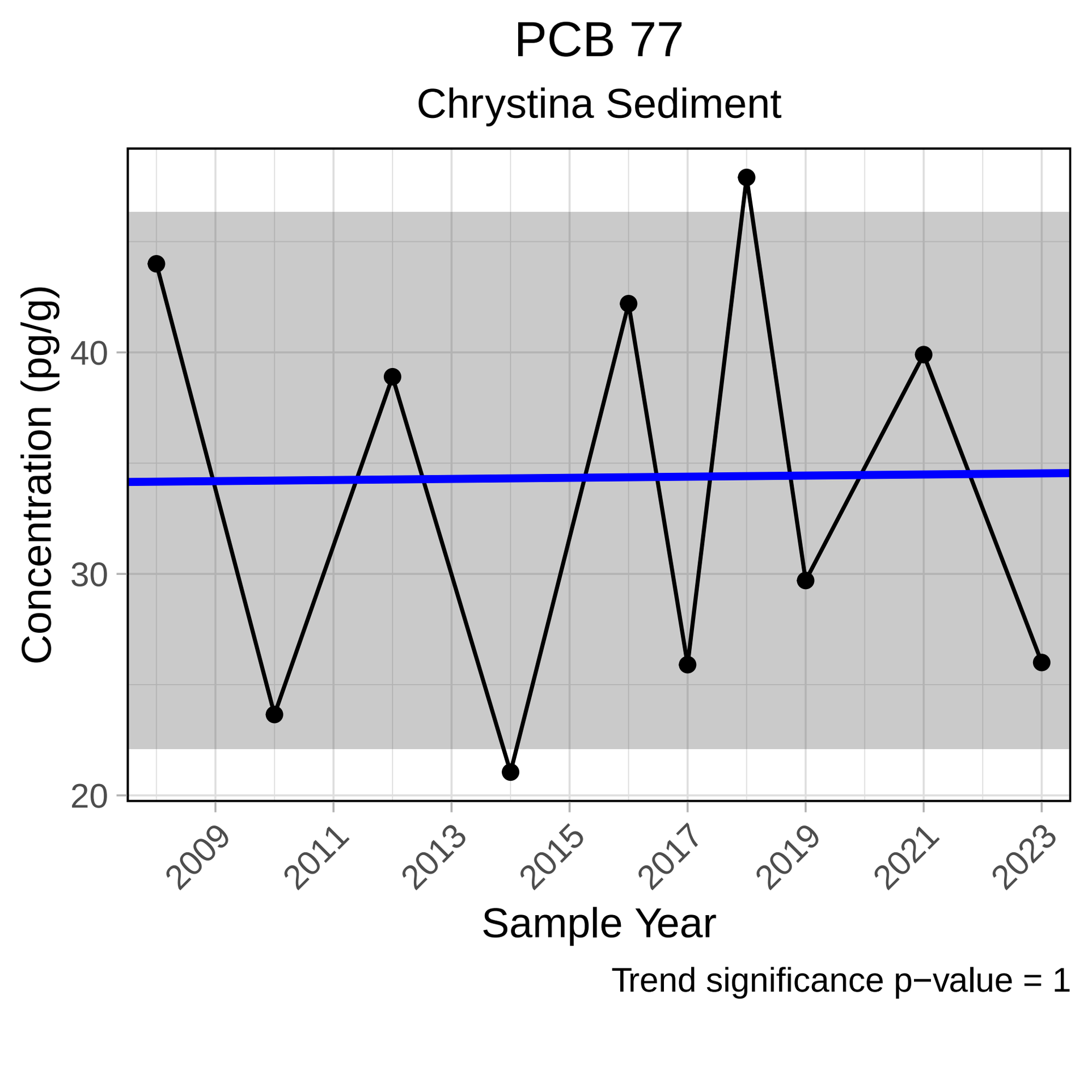

PCB 56
Chrystina Sediment
Concentration (pg/g)
100
75
50
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858


PCB 60
Chrystina Sediment
Concentration (pg/g)
60
40
20
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.466


PCB 64
Chrystina Sediment
150
100
50
0
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

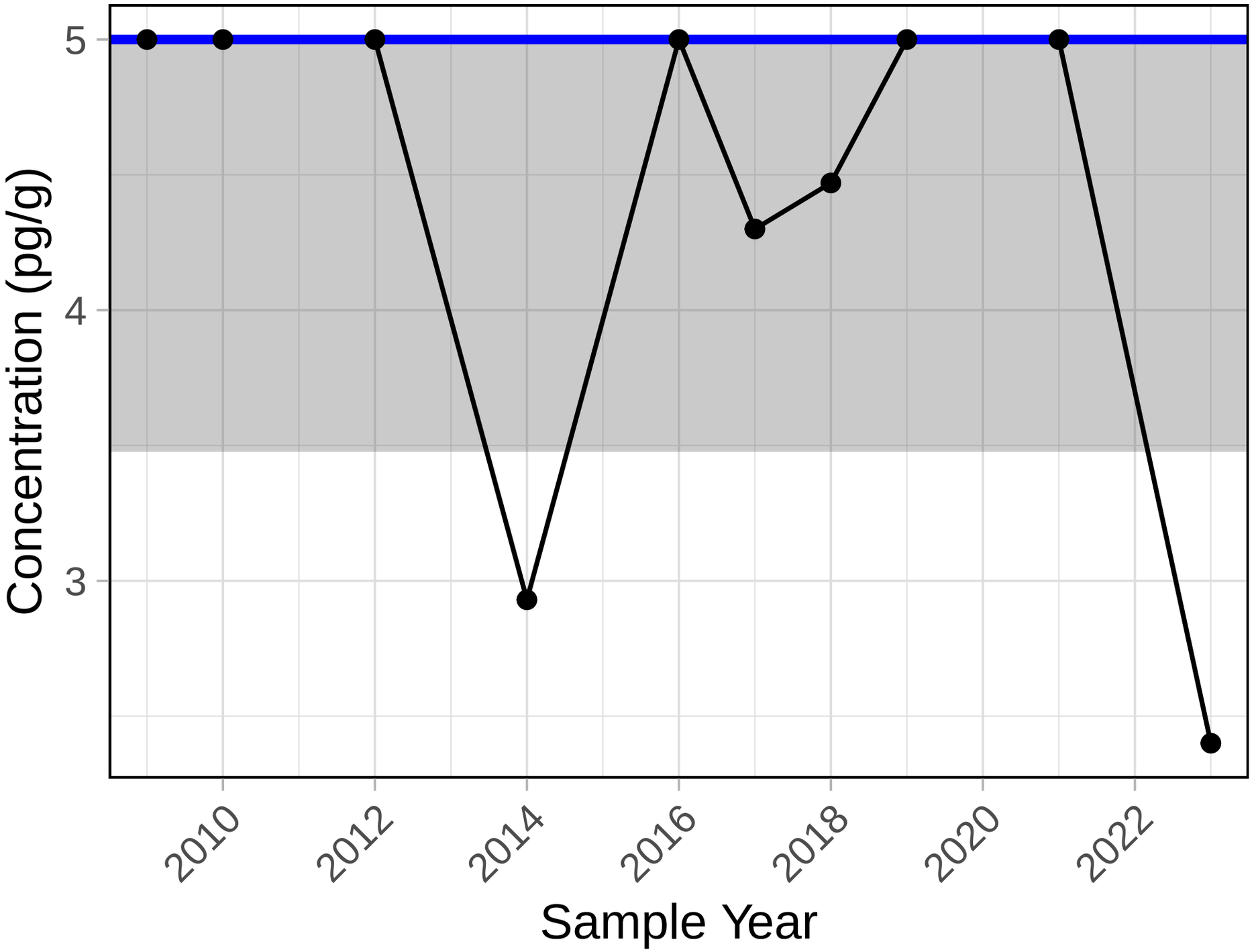

PCB 66
Chrystina Sediment
250
200
150
100
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721


PCB 72
Chrystina Sediment
Concentration (pg/g)
5
4
3
2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.611

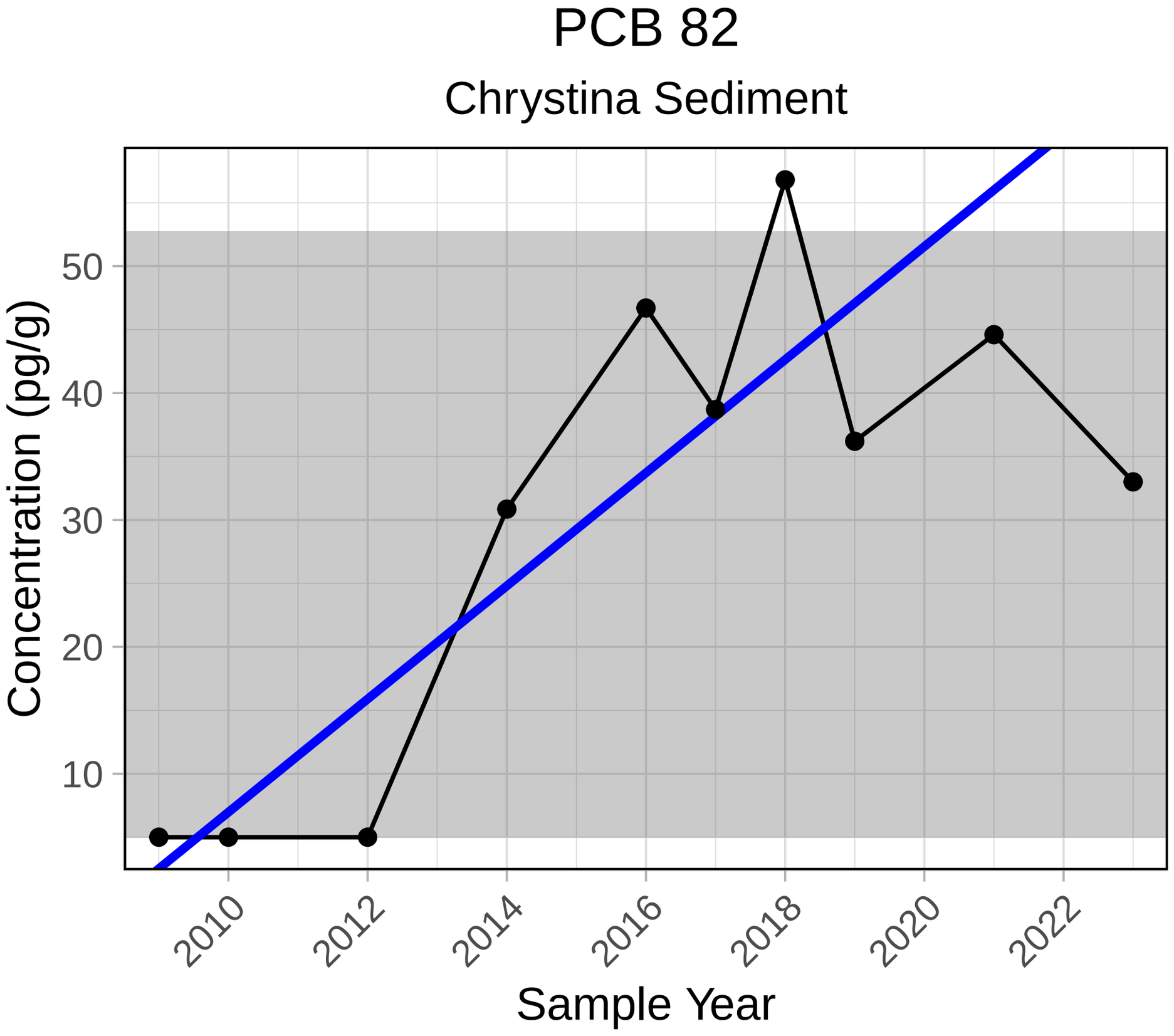

PCB 77
Chrystina Sediment
Concentration (pg/g)
40
30
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

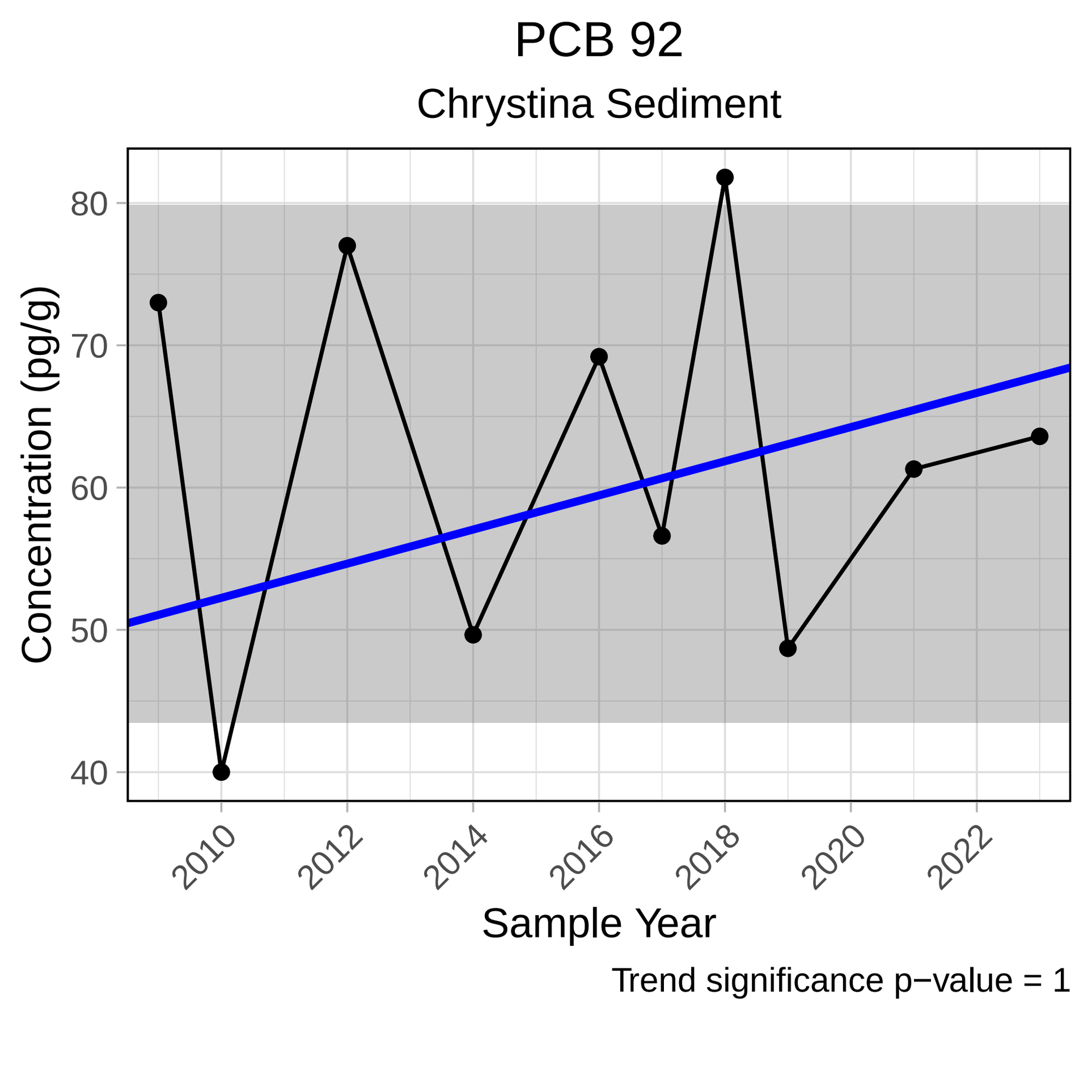
PCB 79

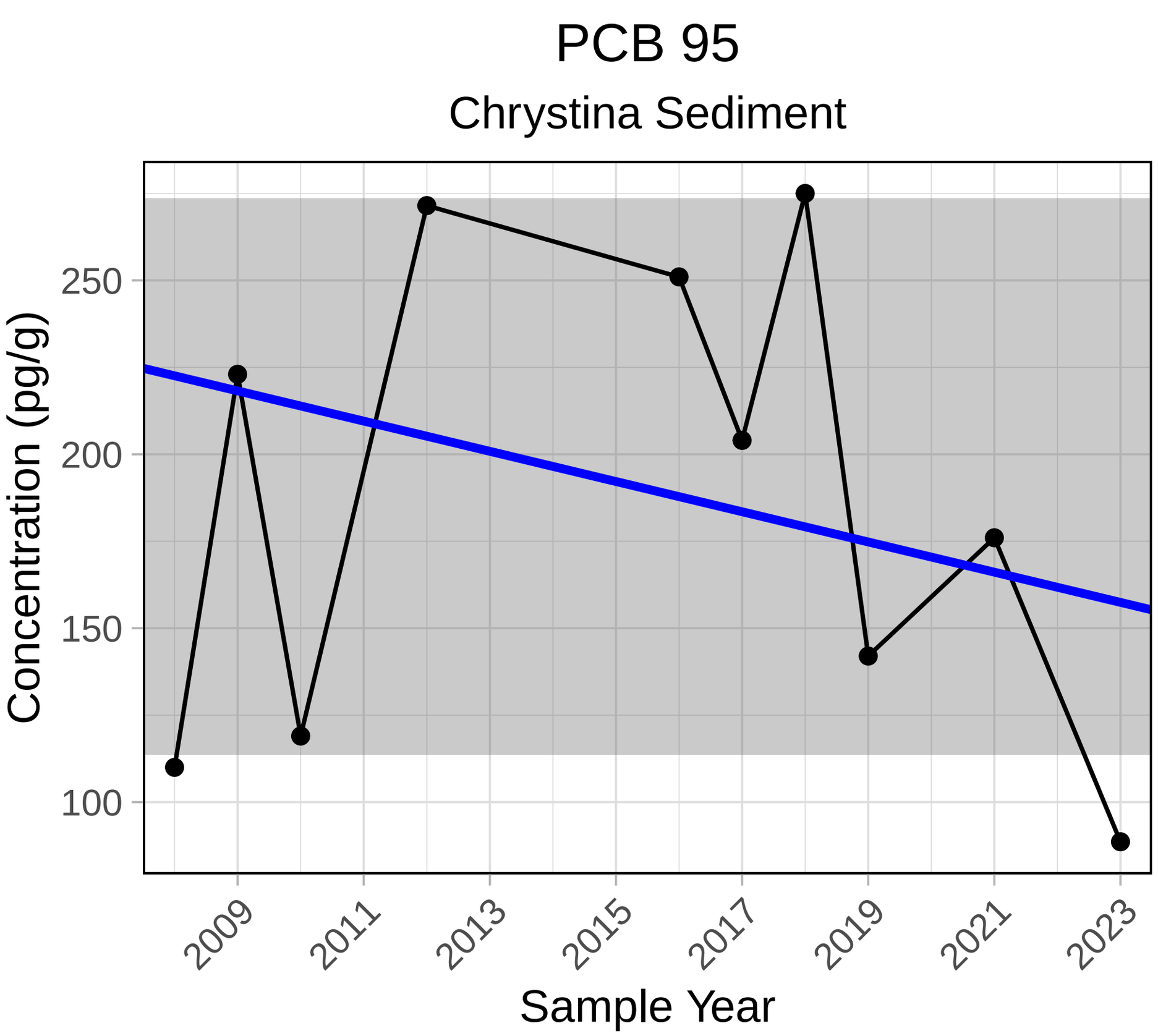
Chrystina Sediment

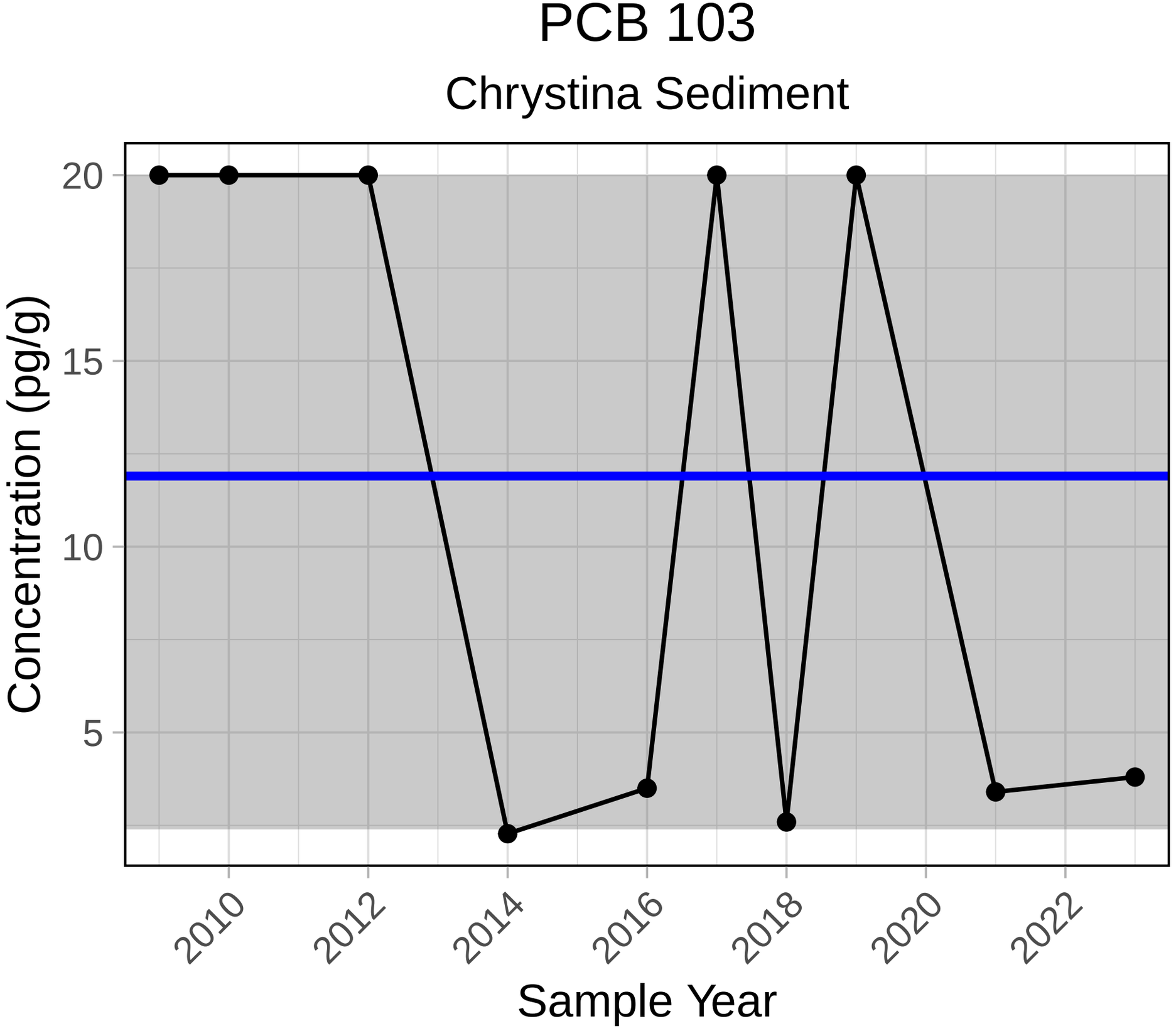


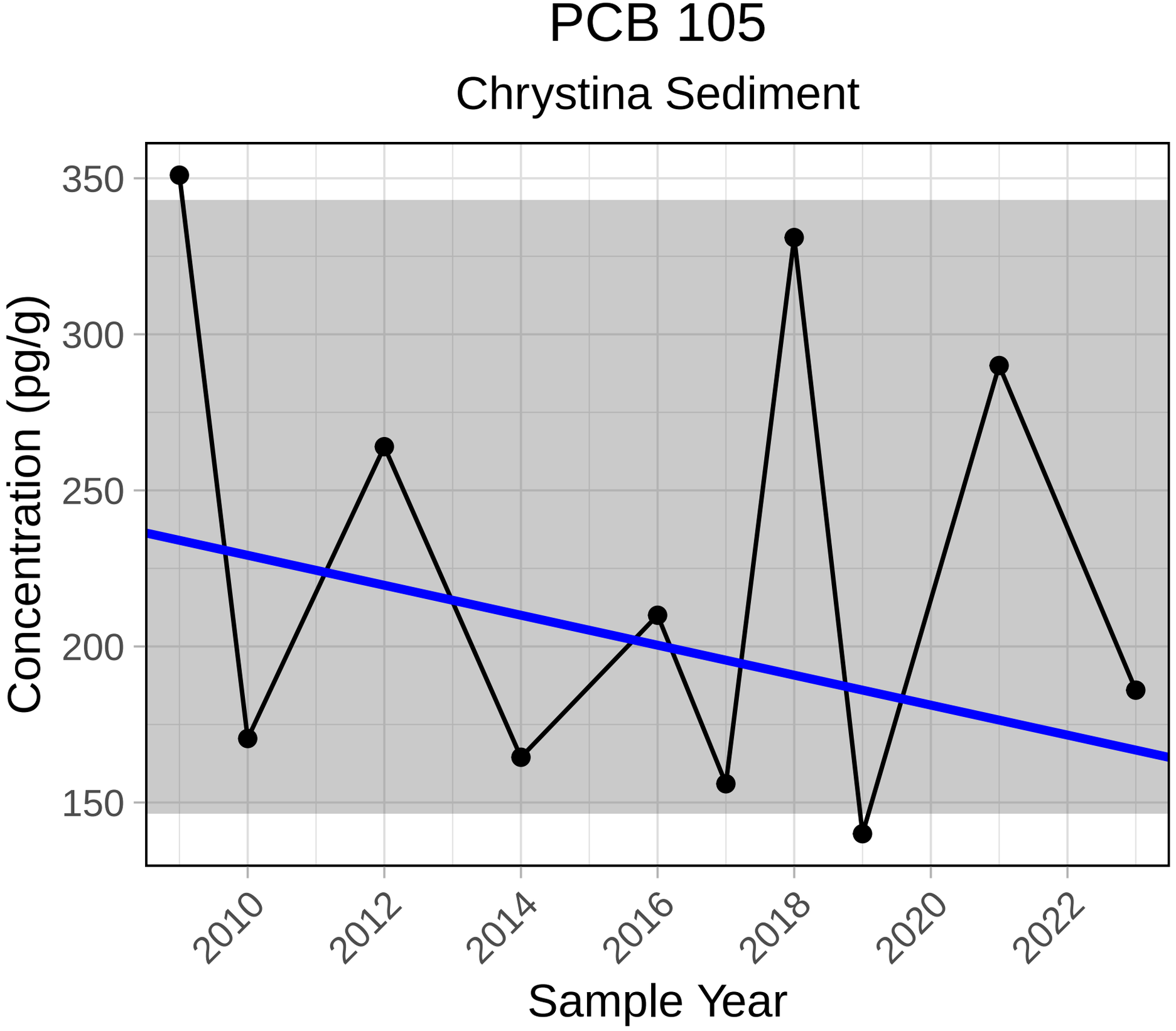
Trend significance p−value = 0.36

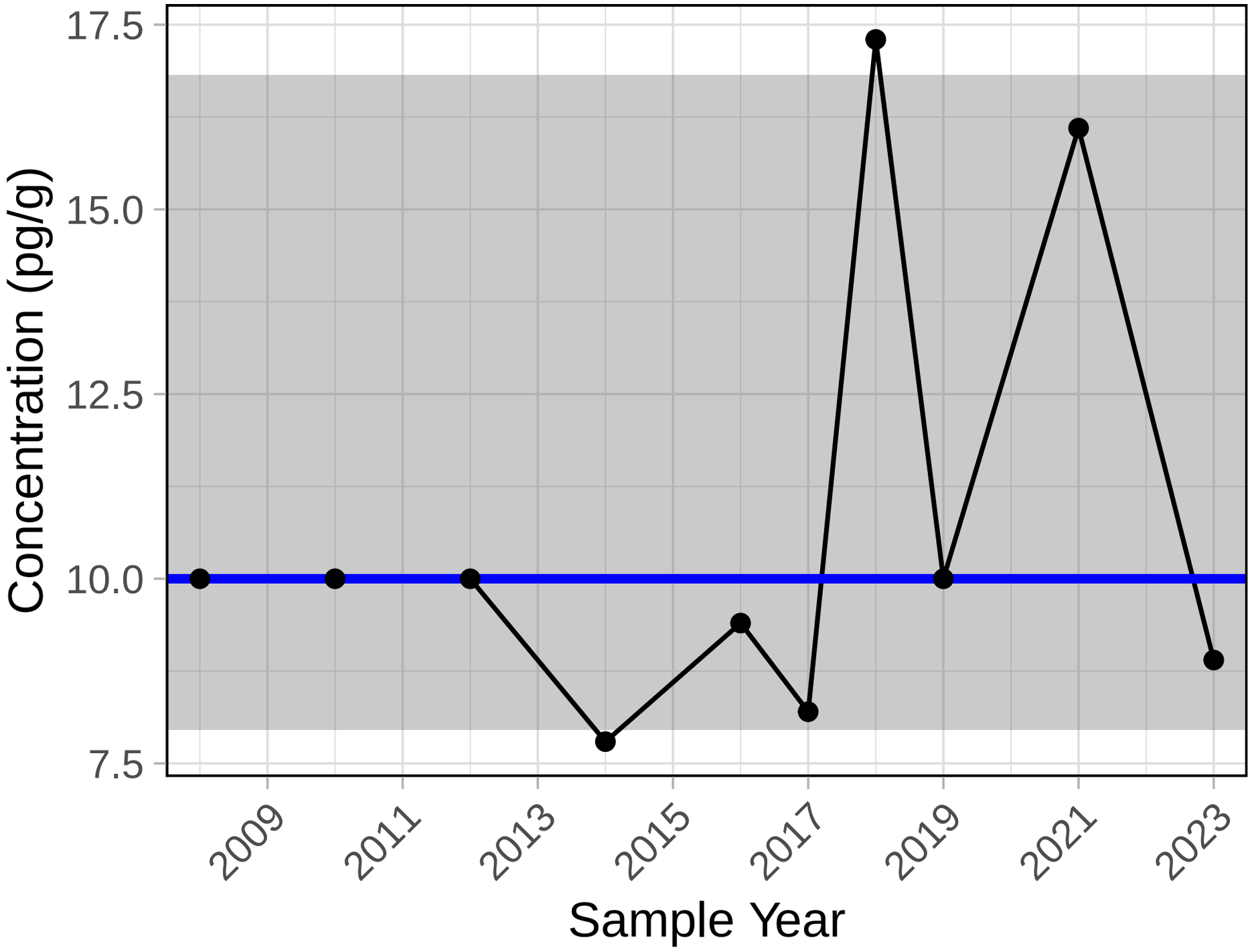

PCB 82
Chrystina Sediment
Concentration (pg/g)
50
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.085

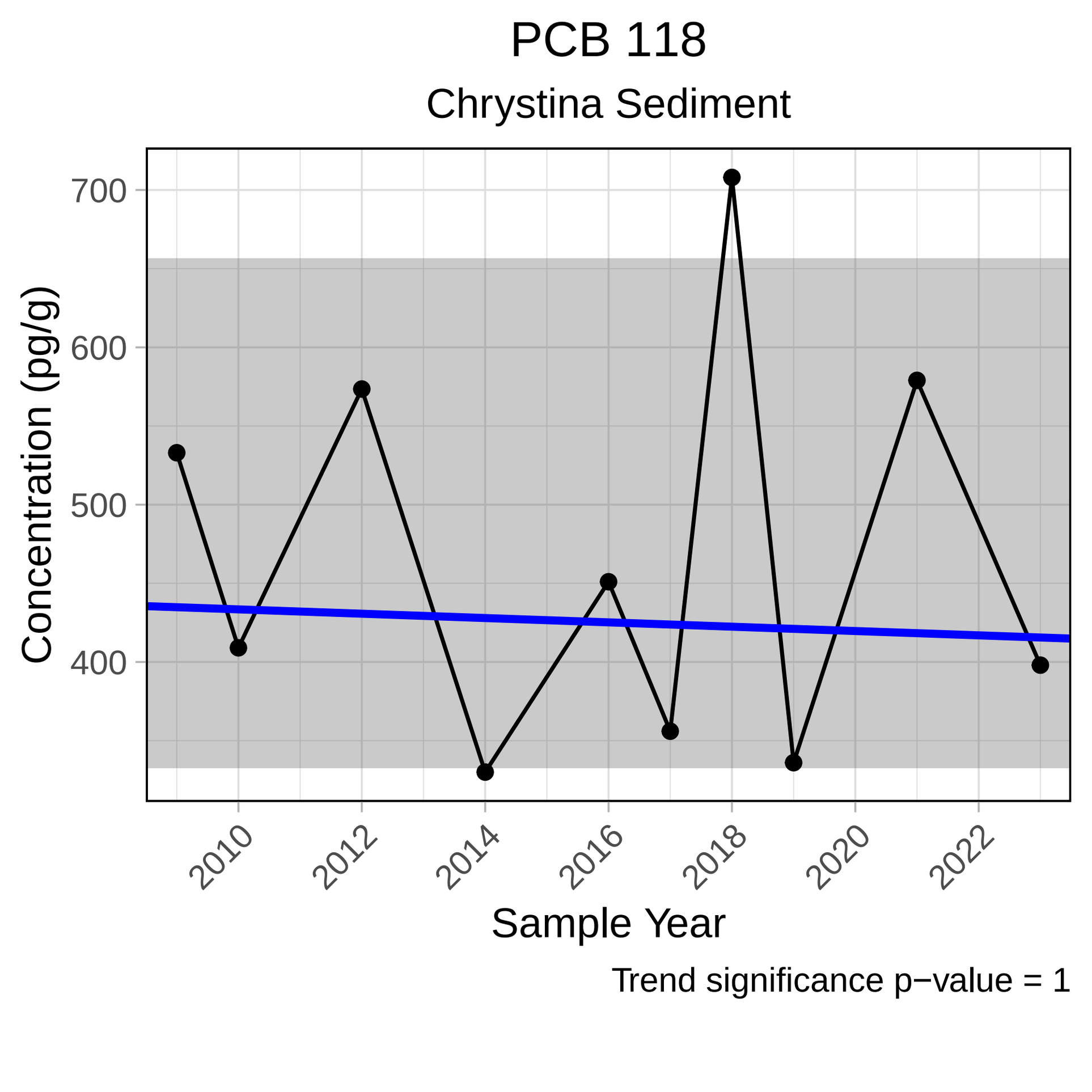

PCB 92
Chrystina Sediment
Concentration (pg/g)
80
70
60
50
40
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

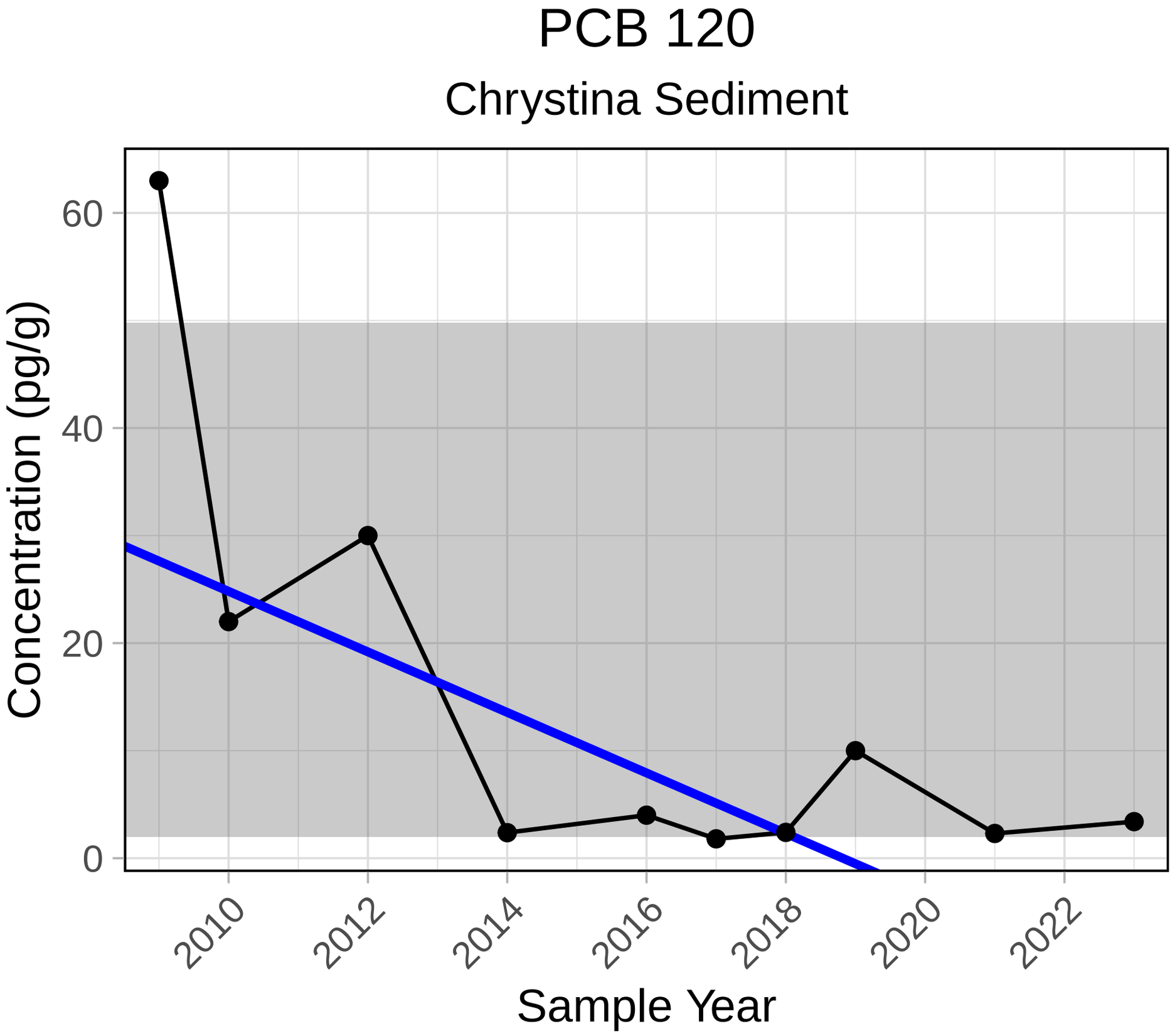

PCB 95
Chrystina Sediment
Concentration (pg/g)
250
200
150
100
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.858

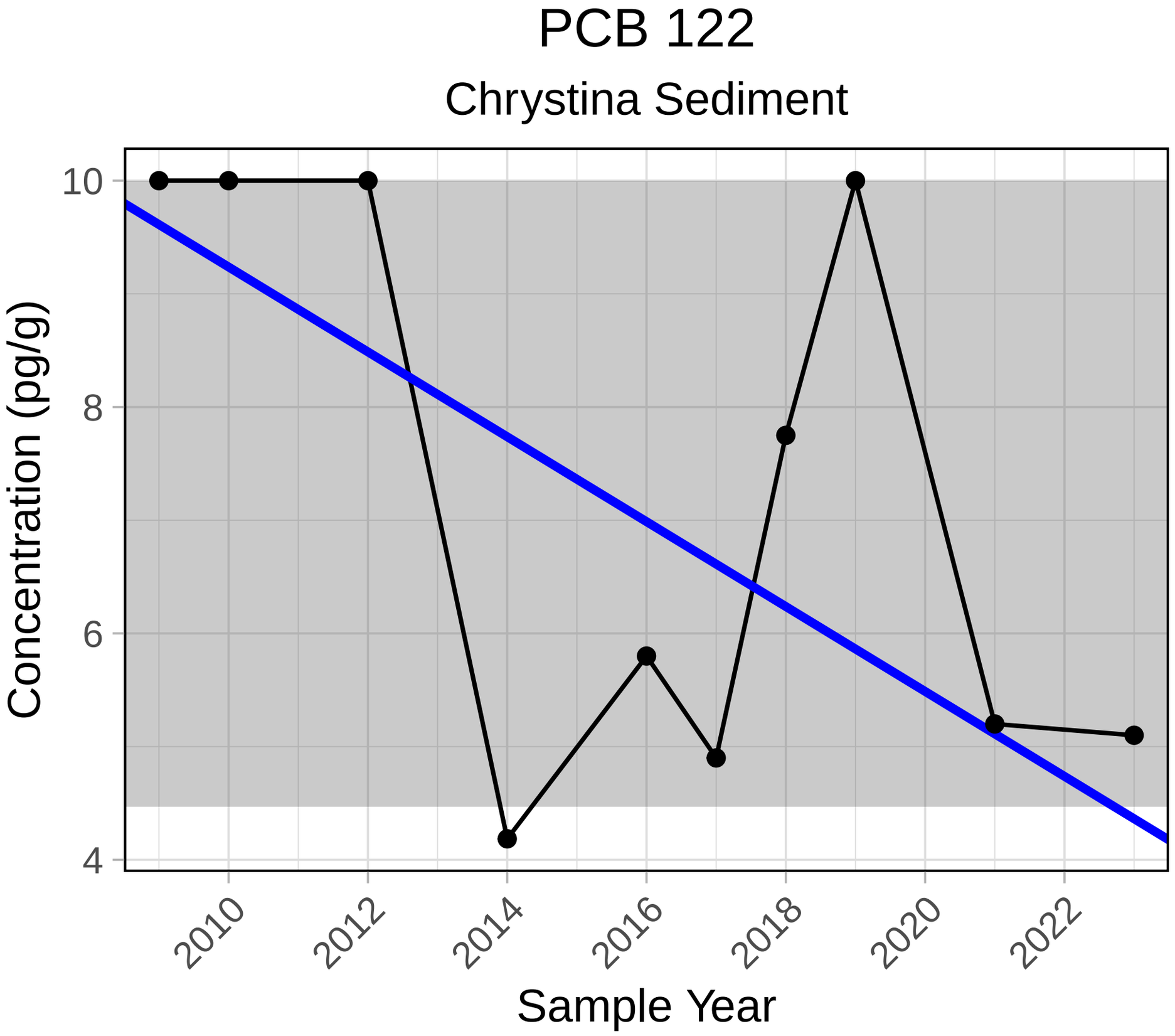

PCB 103
Chrystina Sediment
Concentration (pg/g)
20
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.442

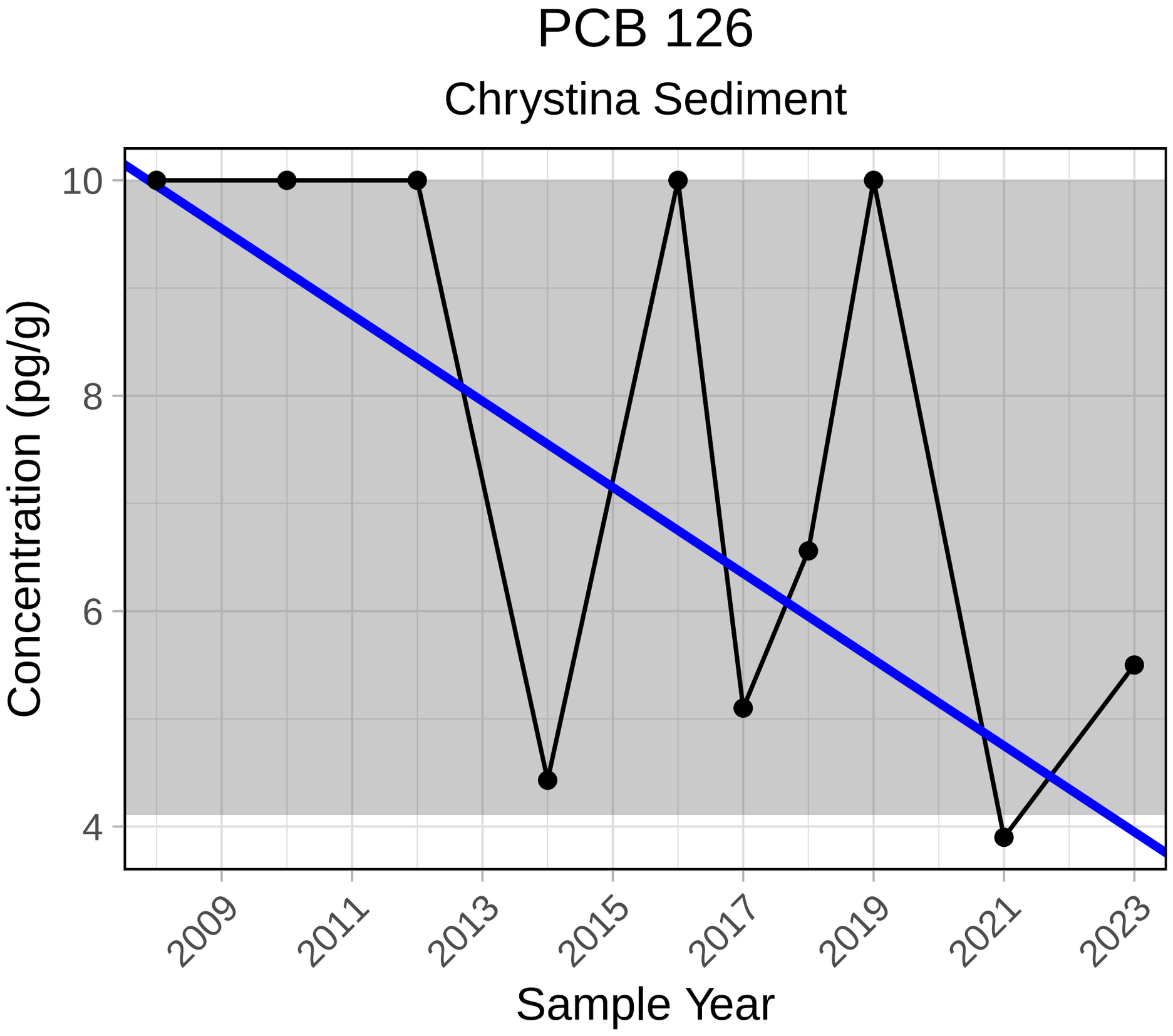

PCB 105
Chrystina Sediment
Concentration (pg/g)
350
300
250
200
150
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

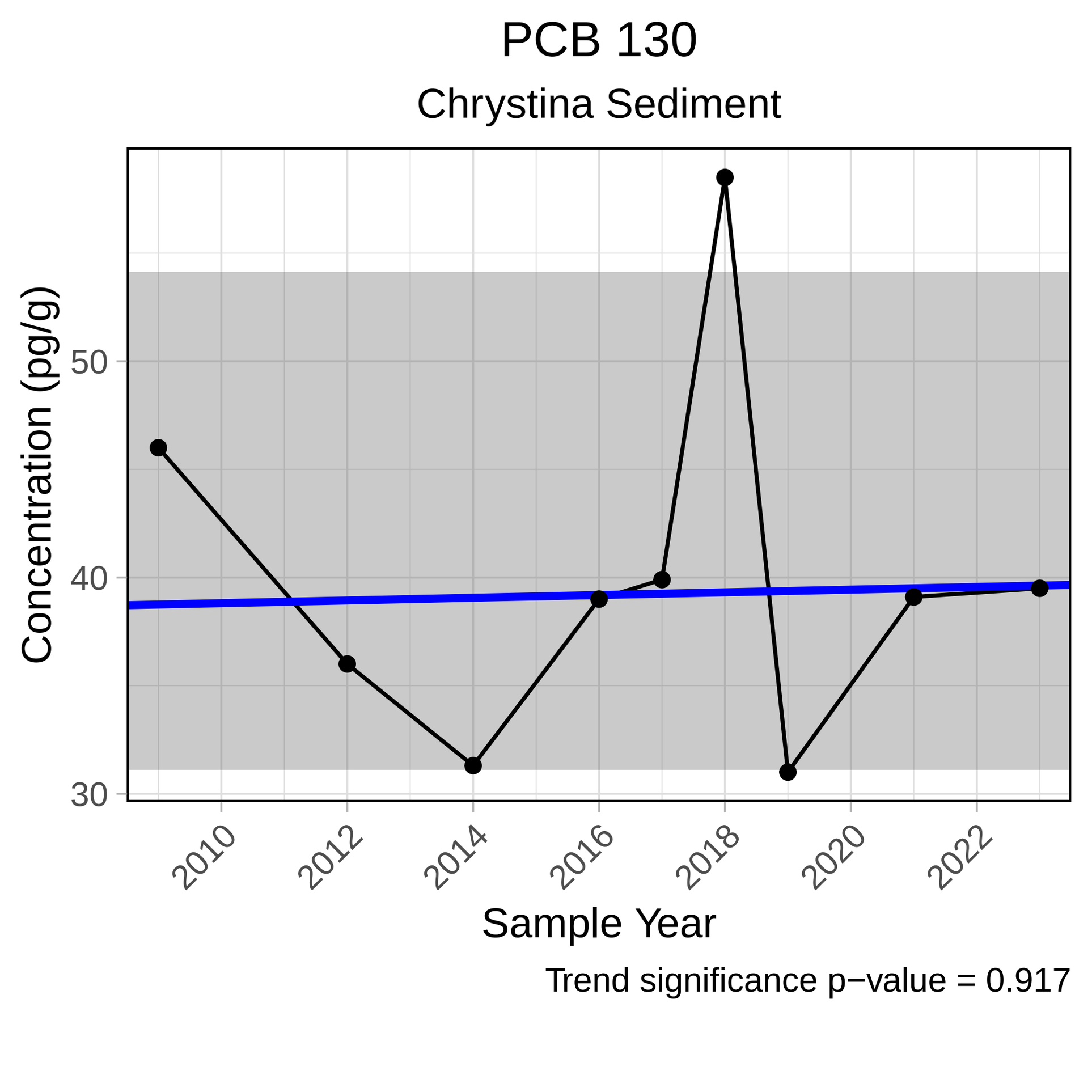

PCB 114
Chrystina Sediment
17.5
15.0
12.5
10.0
7.5
Concentration (pg/g)
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

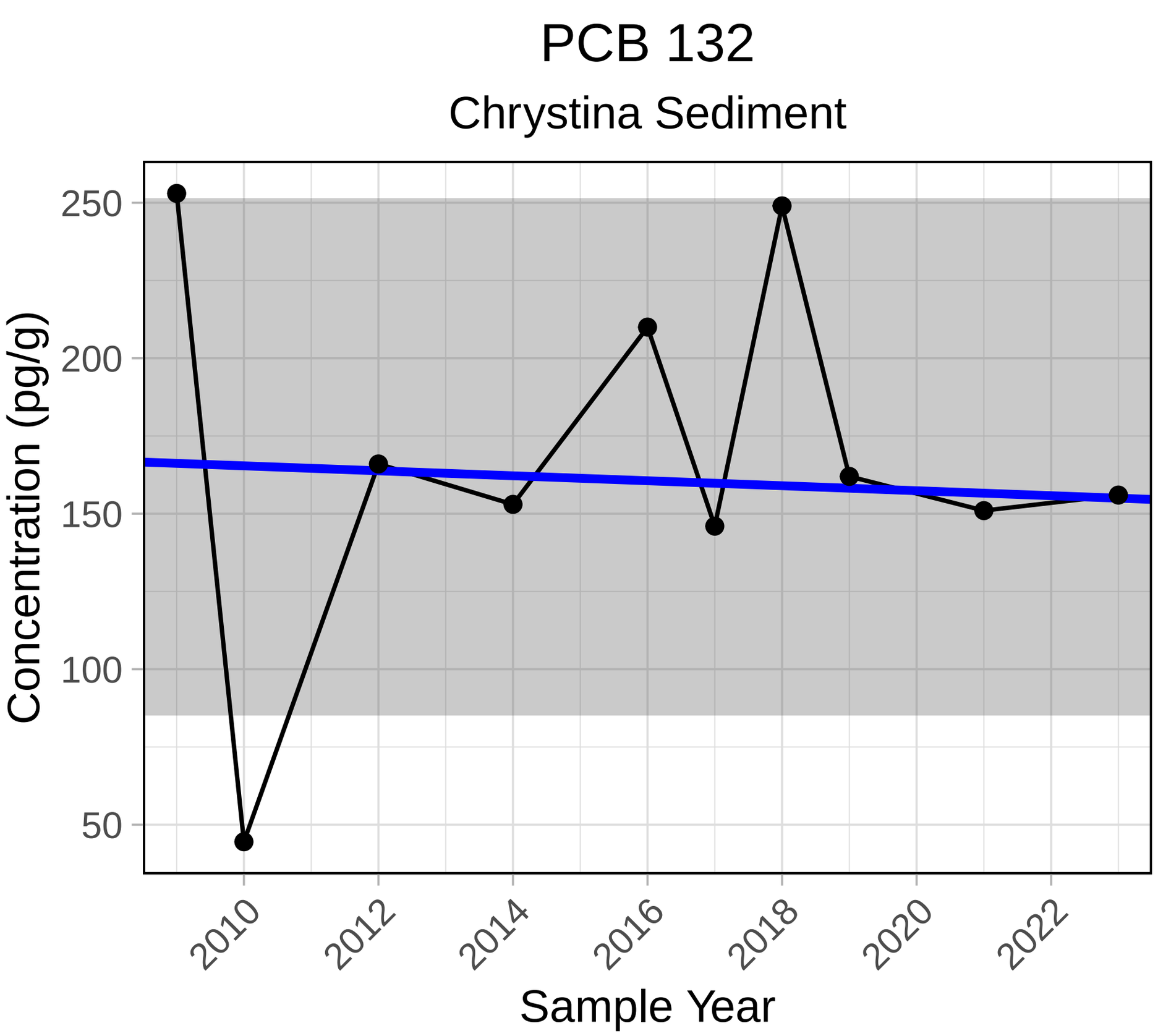

PCB 118
Chrystina Sediment
700
600
500
400
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

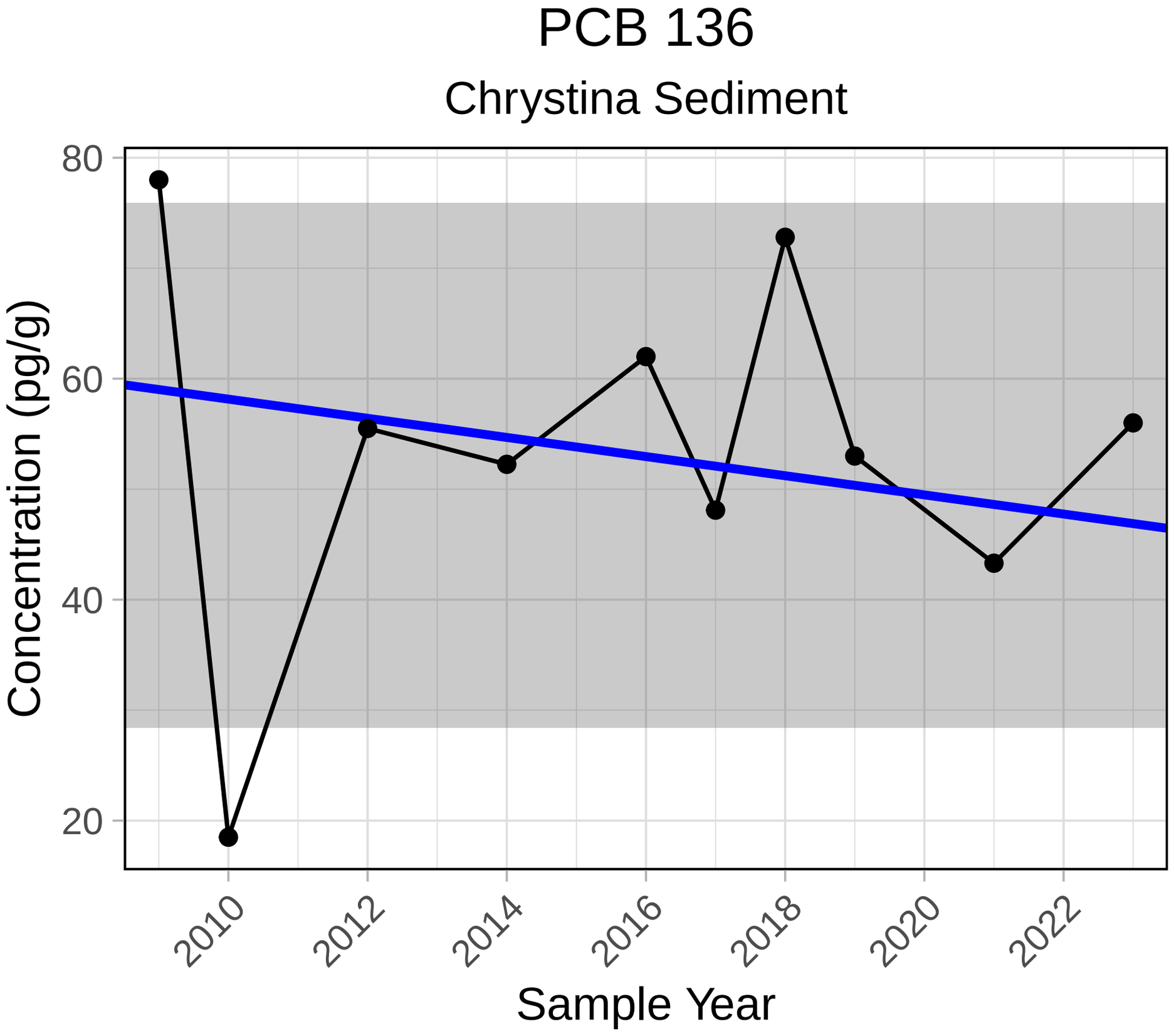

PCB 120
Chrystina Sediment
Concentration (pg/g)
60
40
20
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107

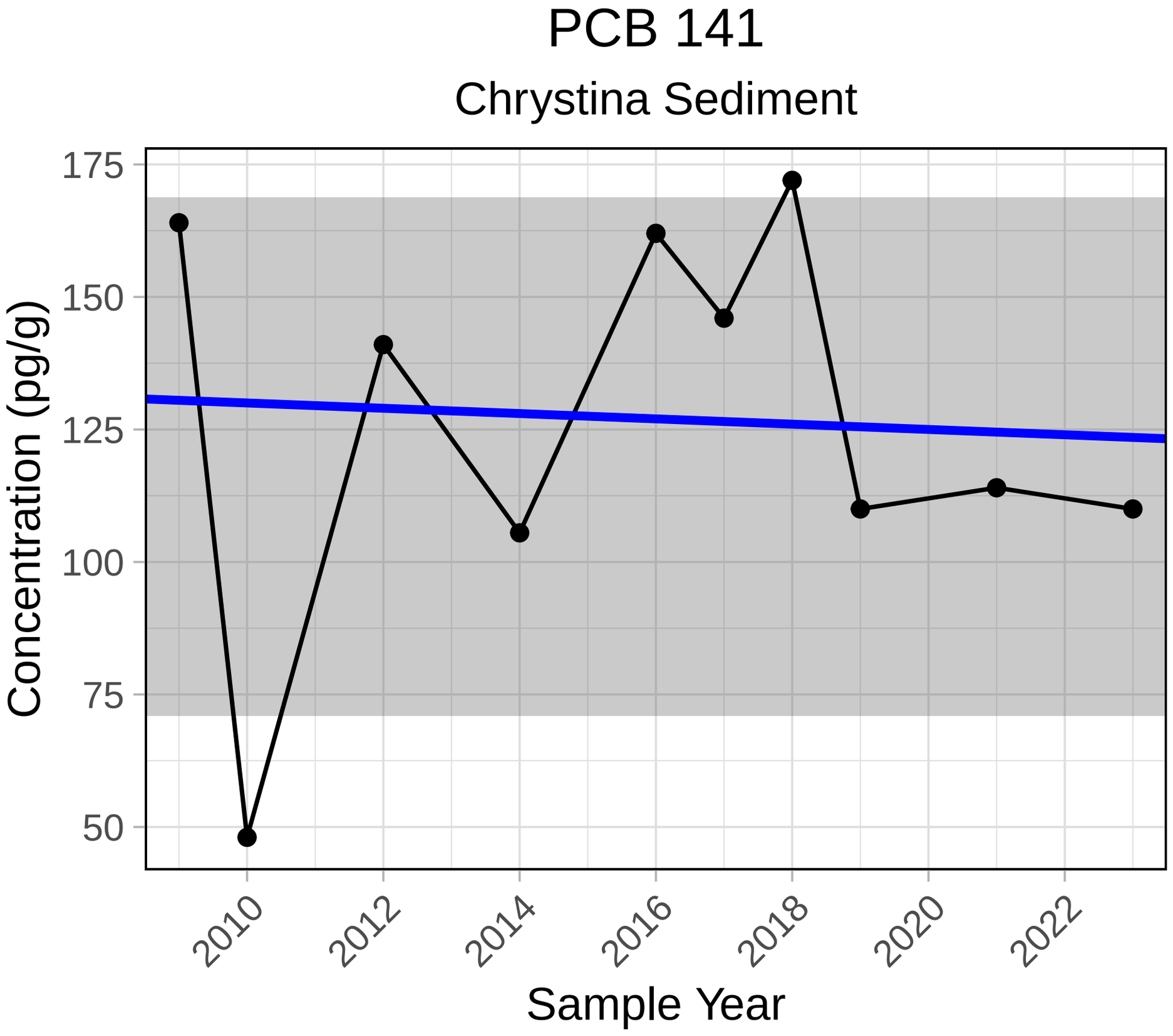

PCB 122
Chrystina Sediment
Concentration (pg/g)
10
8
6
4
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.266

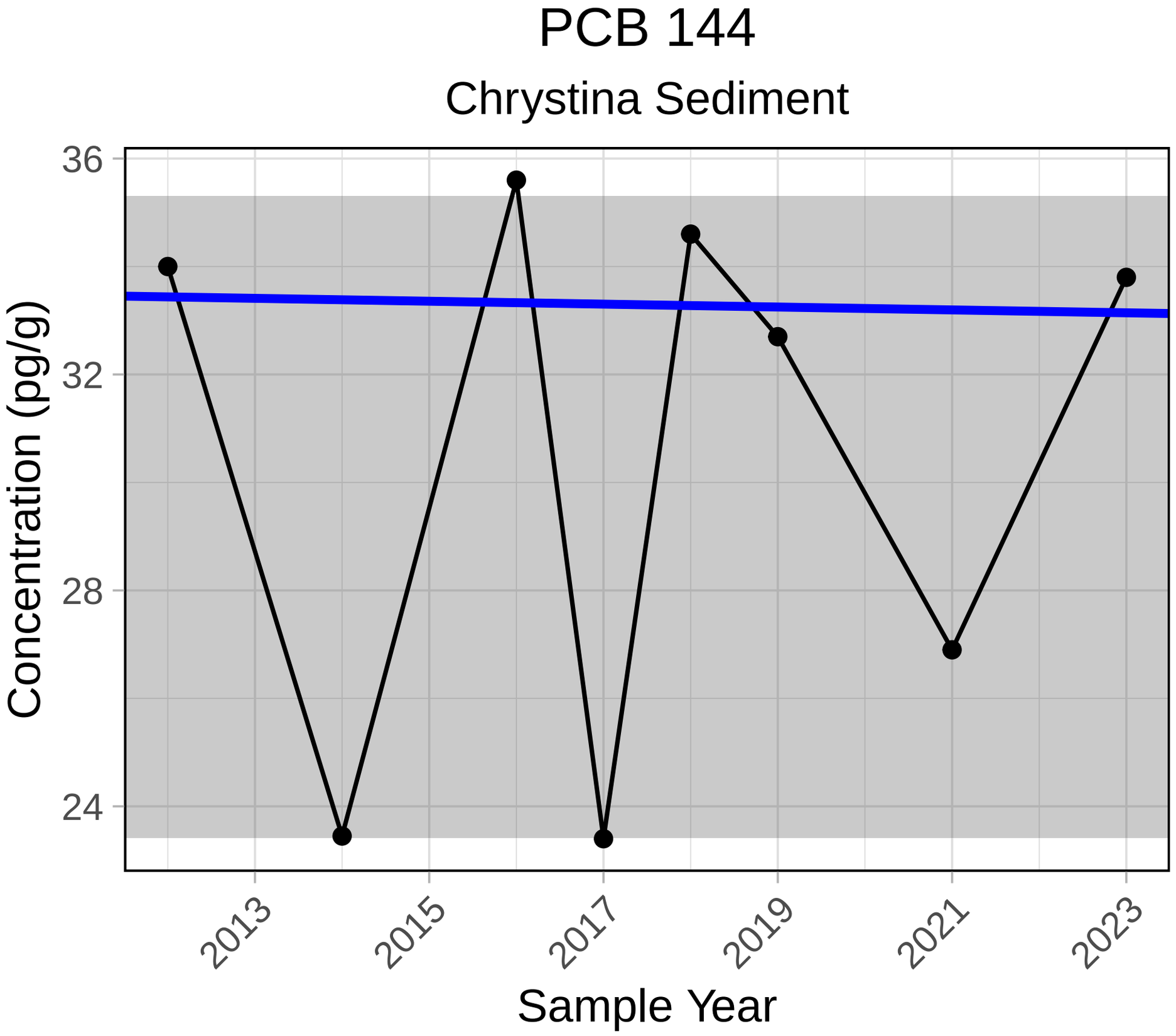

PCB 126
Chrystina Sediment
Concentration (pg/g)
10
8
6
4
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.179


PCB 130
Chrystina Sediment
Concentration (pg/g)
50
40
30
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.917

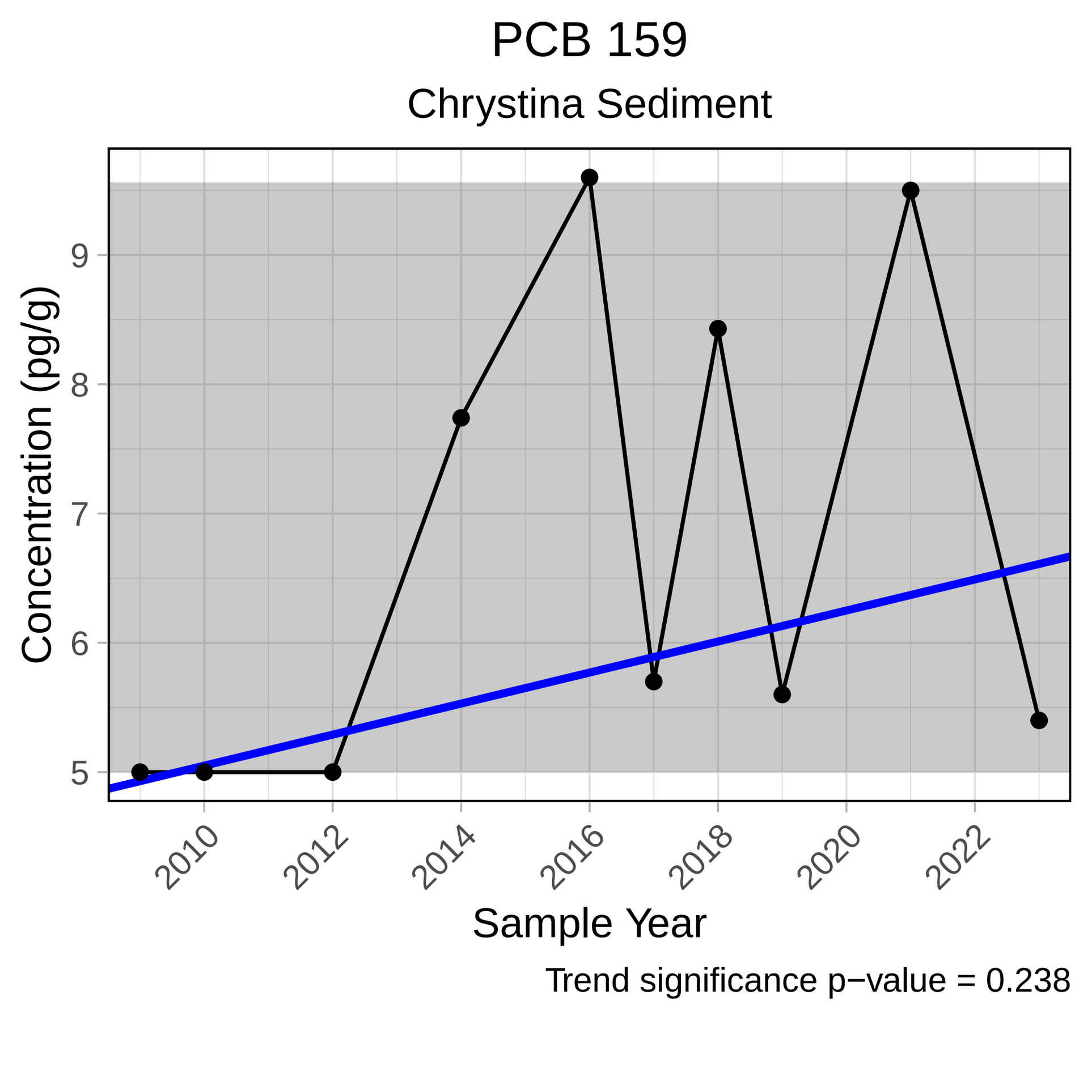

PCB 132
Chrystina Sediment
Concentration (pg/g)
250
200
150
100
50
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

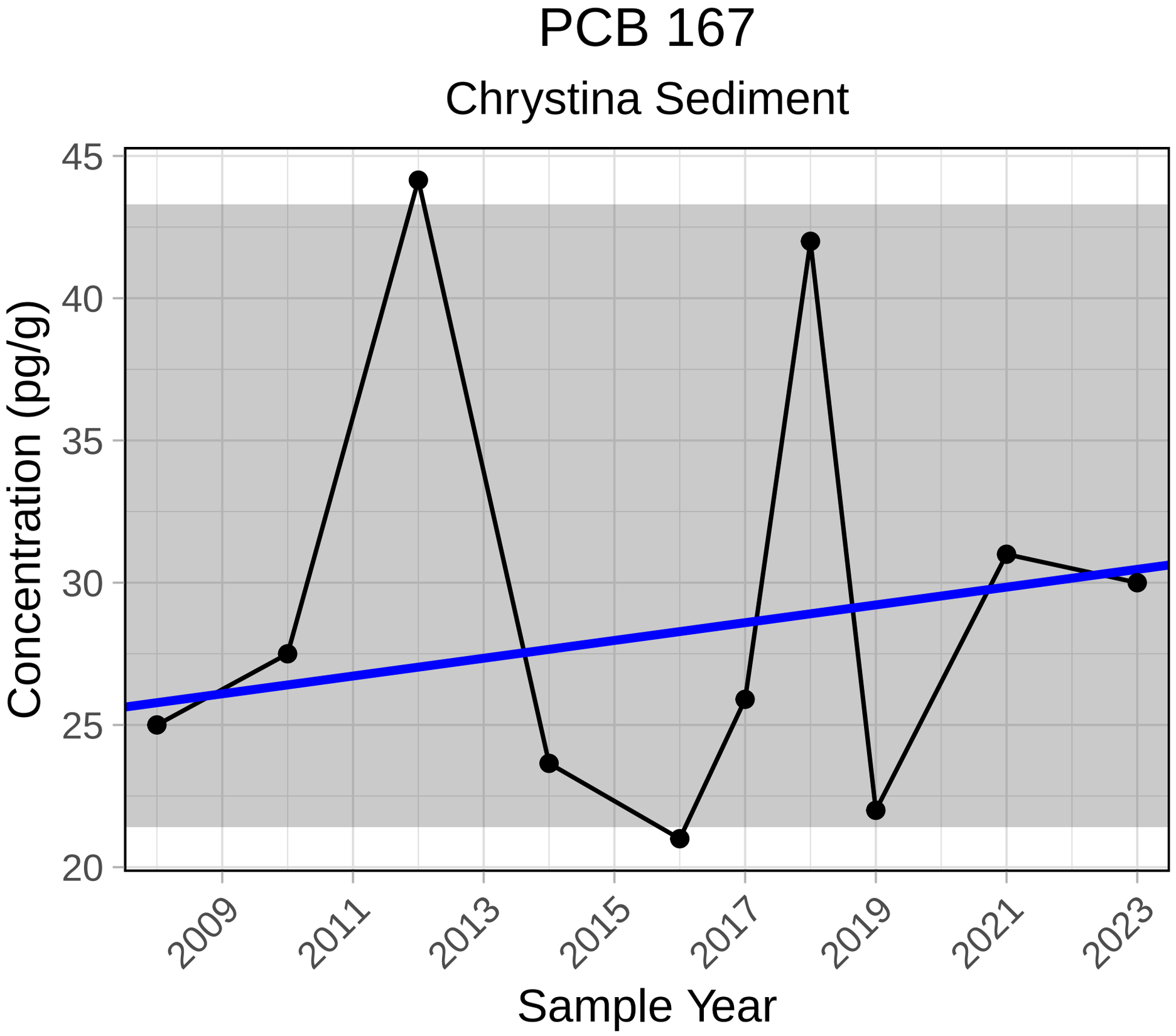

PCB 136
Chrystina Sediment
80
60
40
20
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

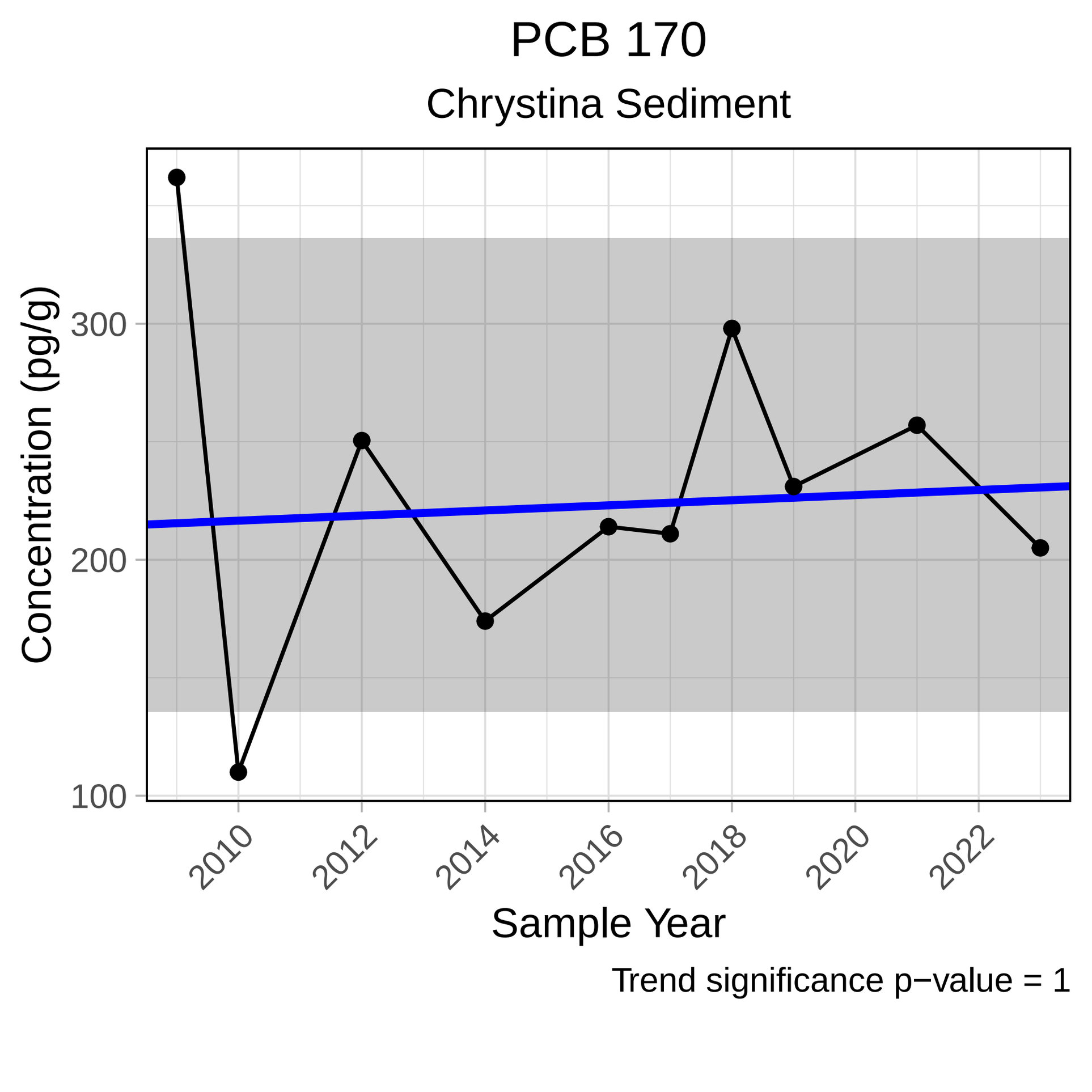

PCB 141
Chrystina Sediment
175
150
125
100
75
50
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928


PCB 144
Chrystina Sediment
36
32
28
24
Concentration (pg/g)
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.902

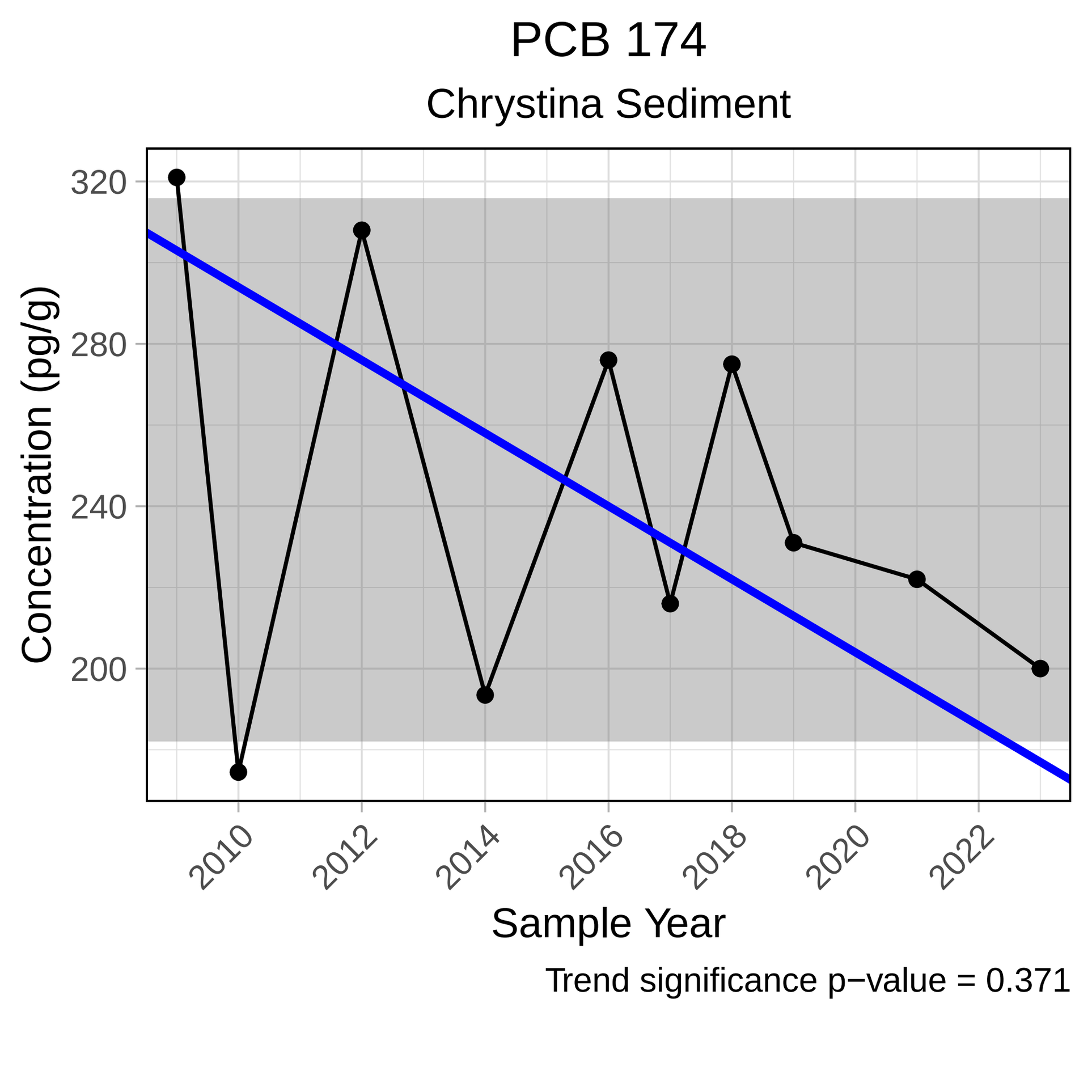
PCB 146
Chrystina Sediment
Concentration (pg/g)
120
100
80
60
40
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

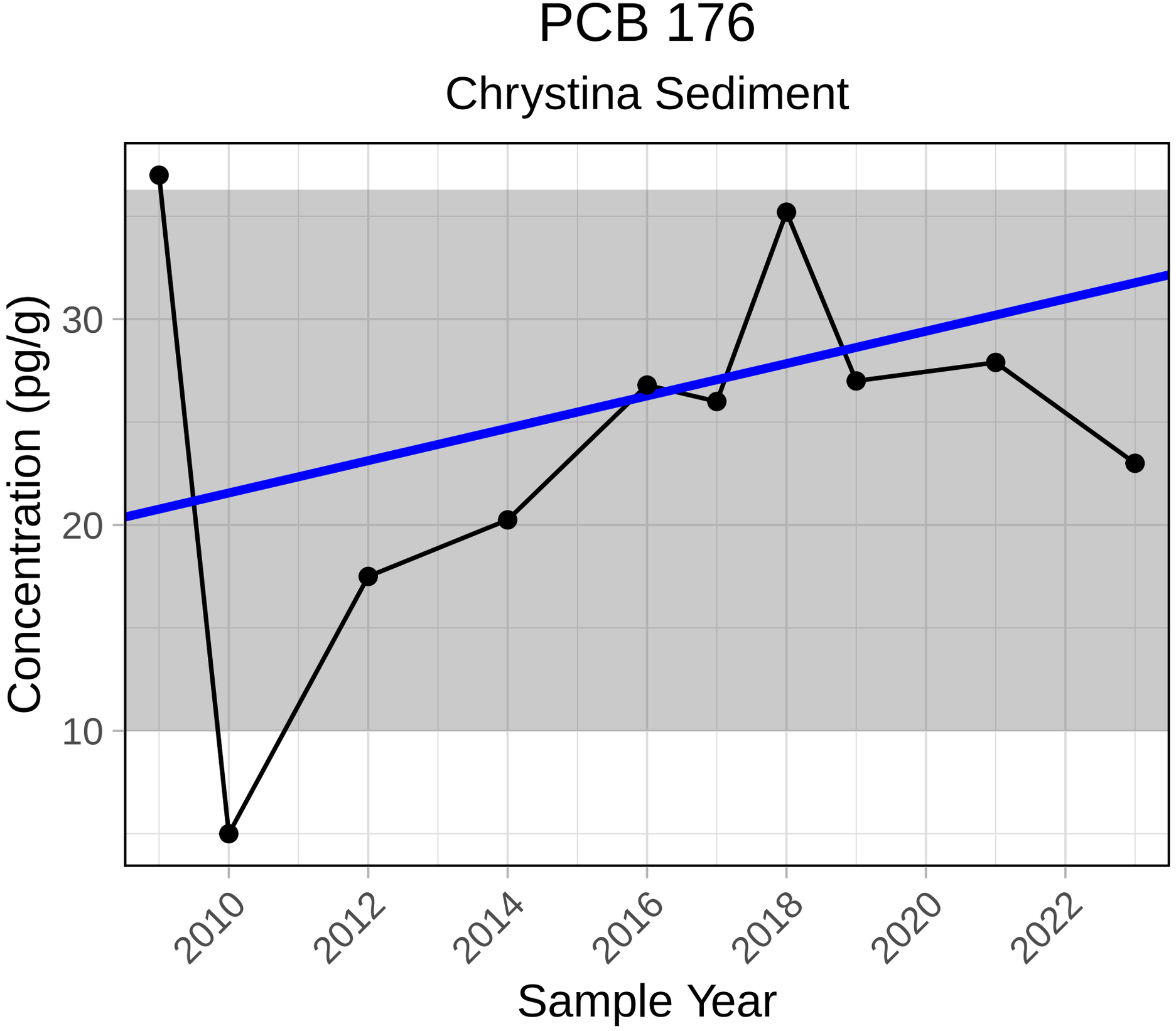

PCB 159
Chrystina Sediment
Concentration (pg/g)
9
8
7
6
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.238

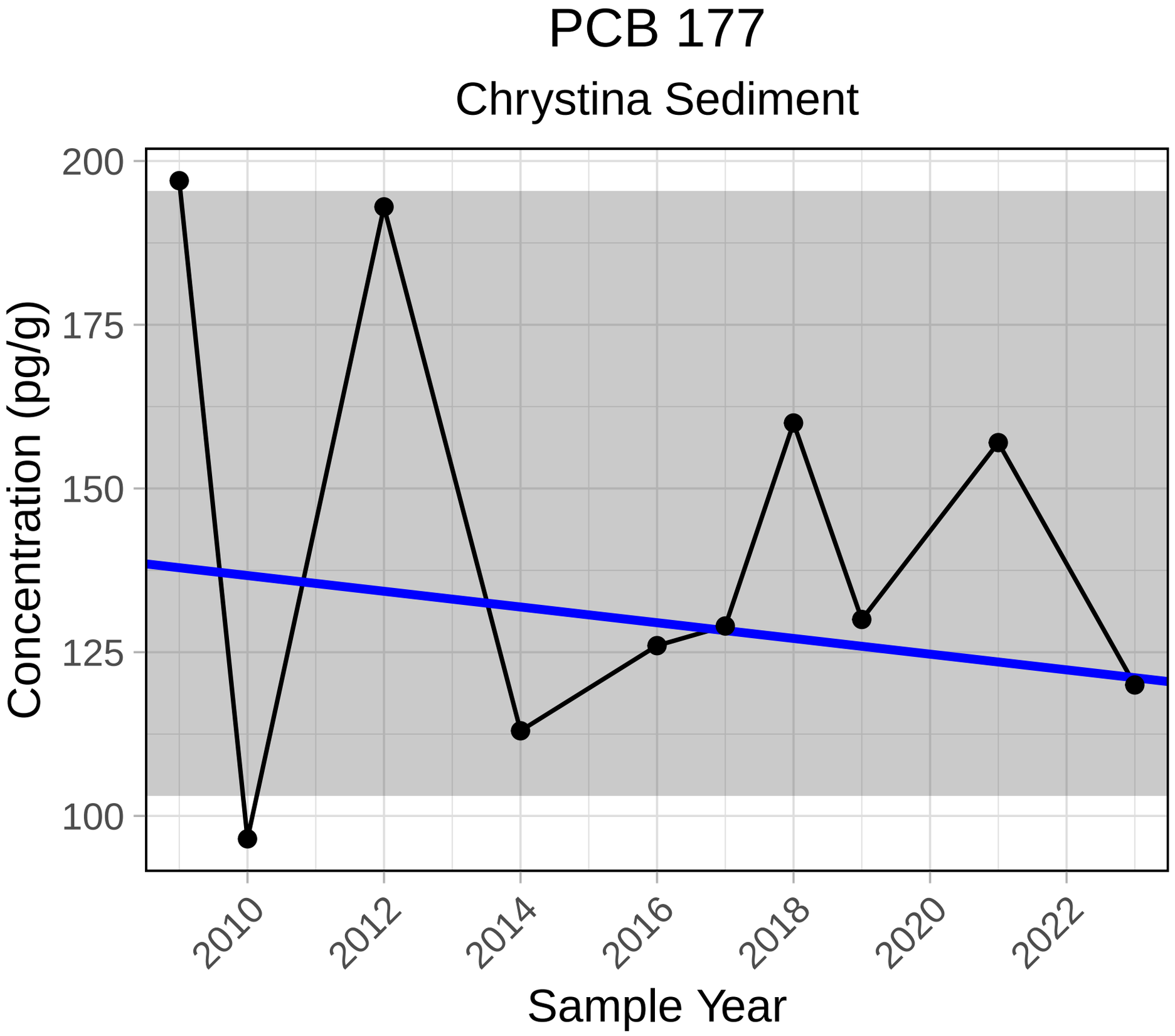

PCB 167
Chrystina Sediment
Concentration (pg/g)
45
40
35
30
25
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.858

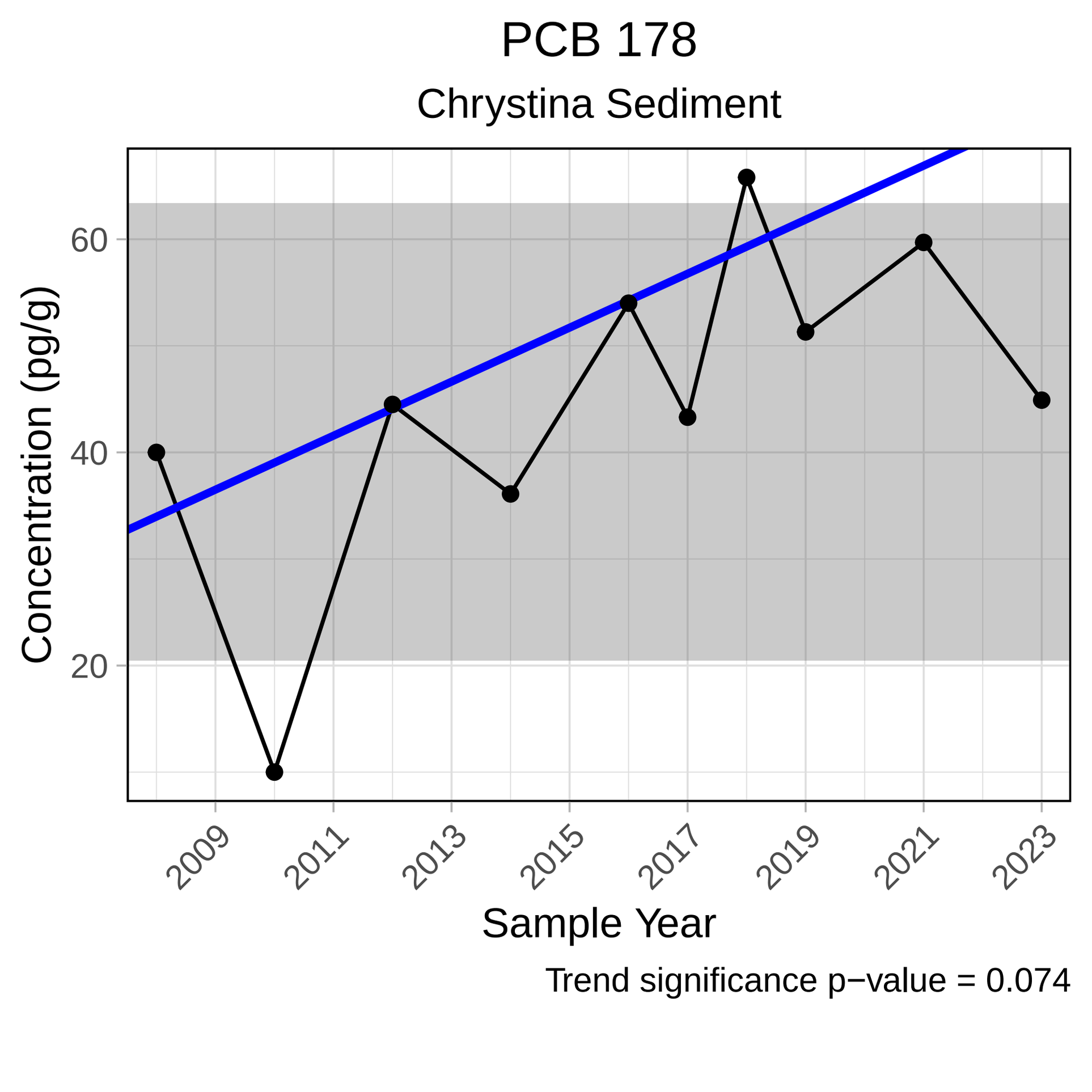

PCB 170
Chrystina Sediment
Concentration (pg/g)
300
200
100
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

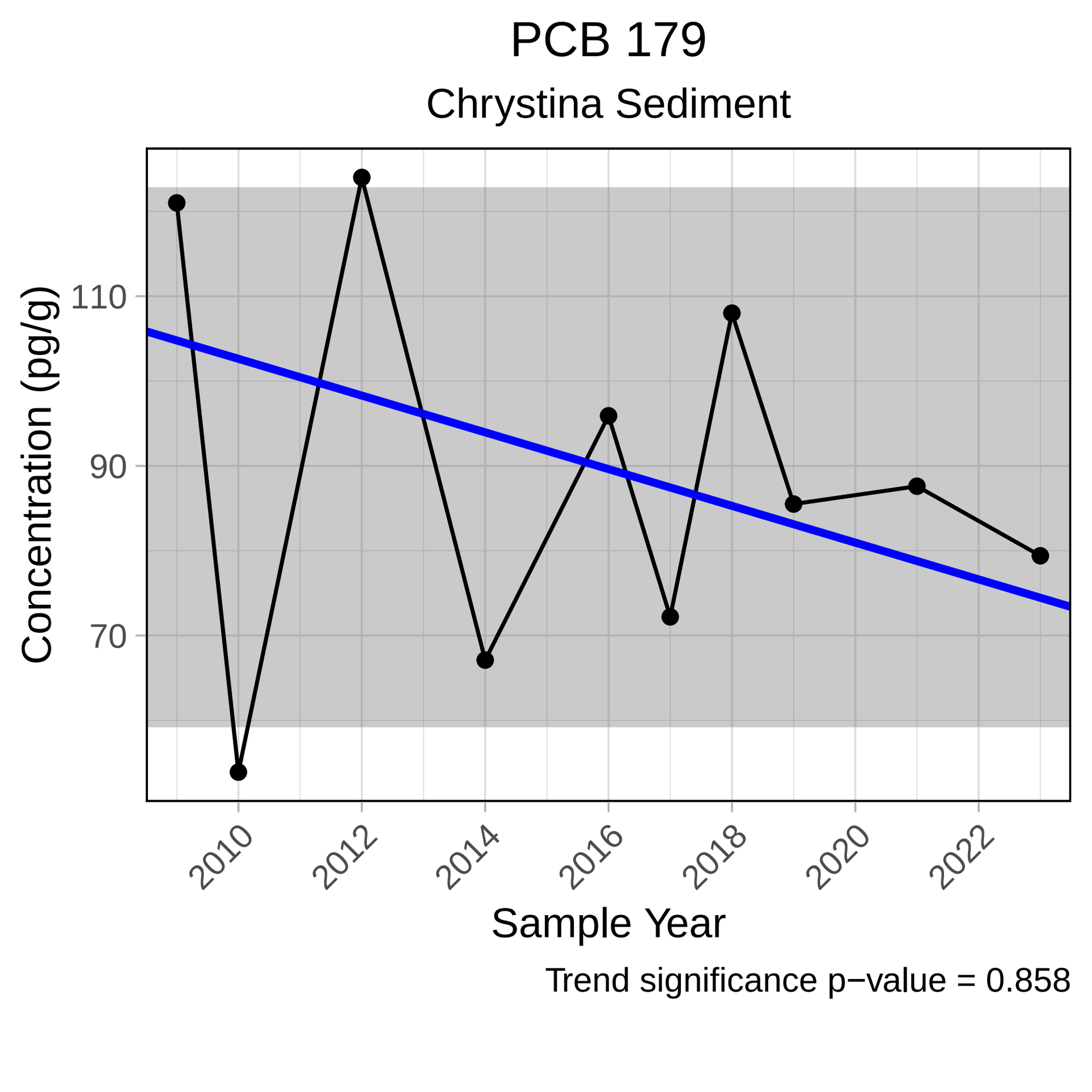
PCB 172
Chrystina Sediment
60
40
20
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

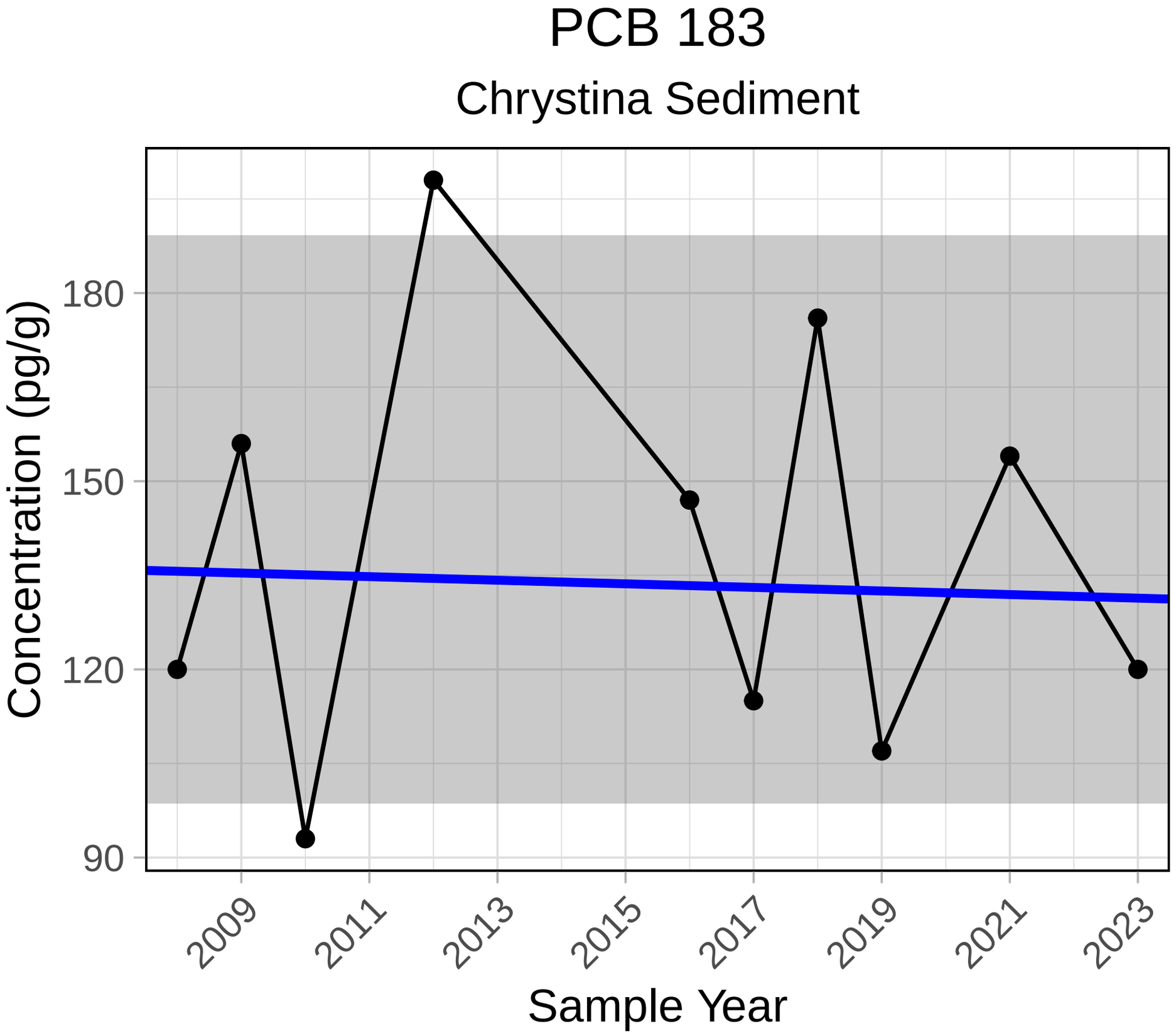

PCB 174
Chrystina Sediment
Concentration (pg/g)
320
280
240
200
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371


PCB 176
Chrystina Sediment
Concentration (pg/g)
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

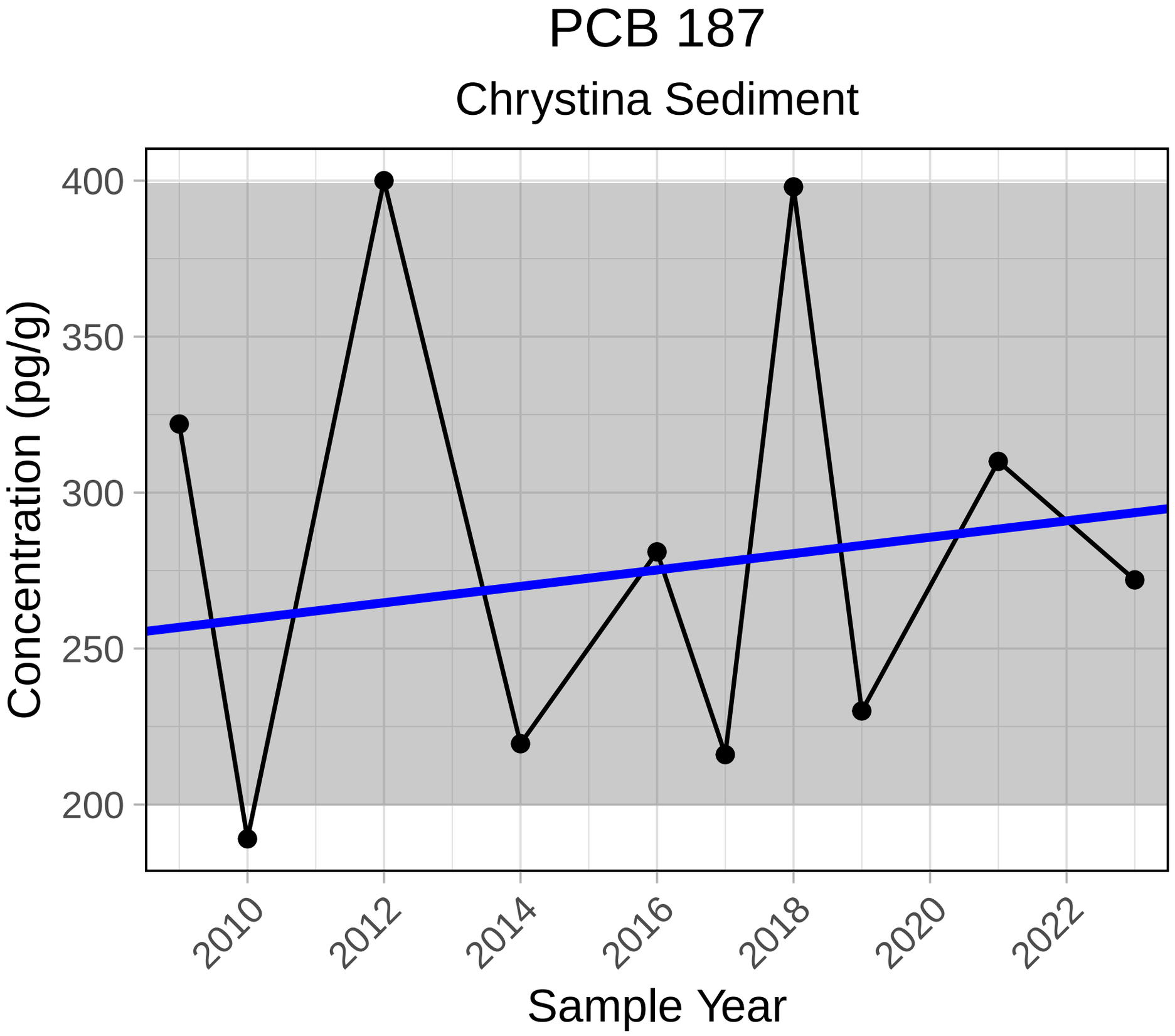

PCB 177
Chrystina Sediment
200
175
150
125
100
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

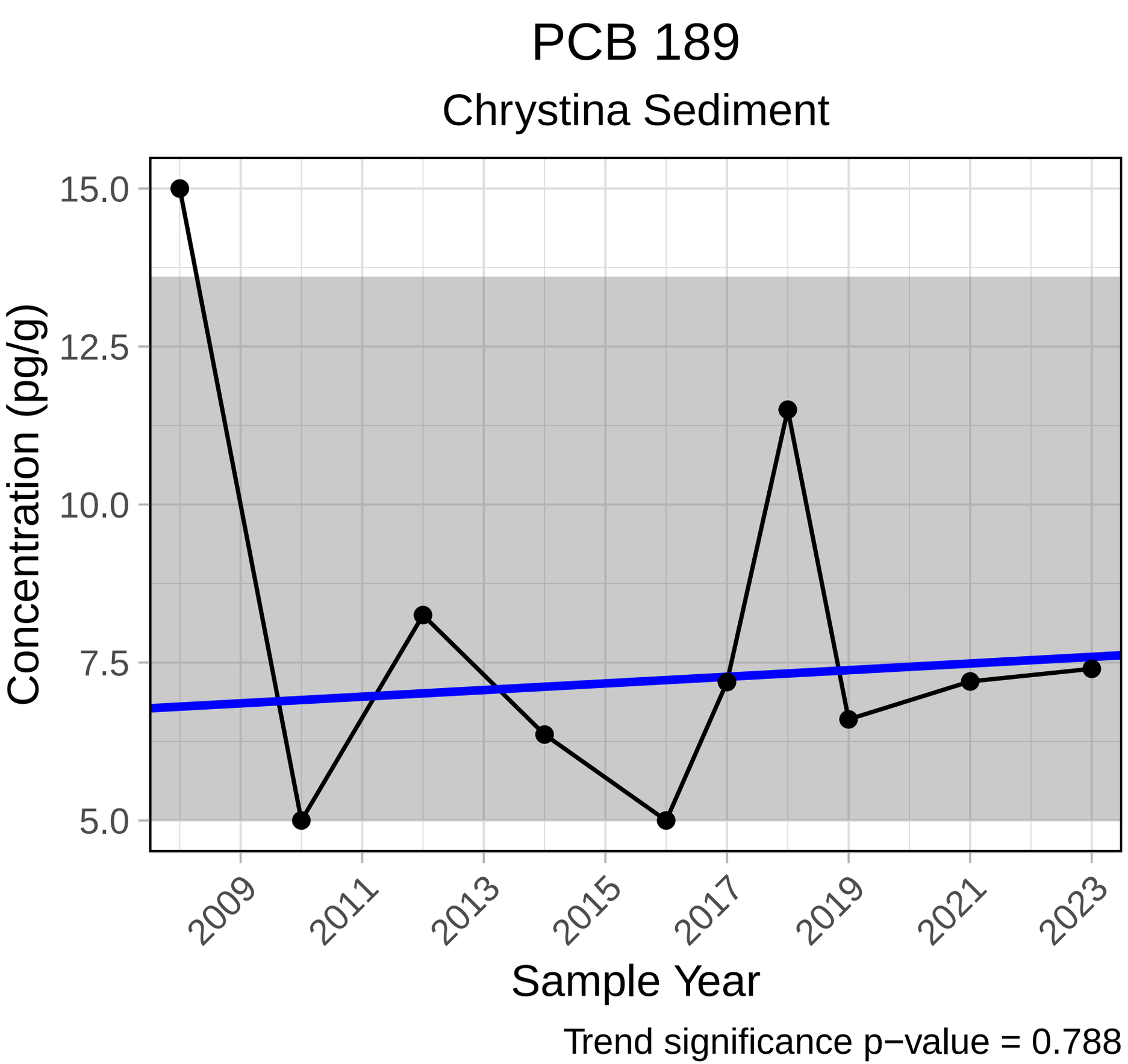

PCB 178
Chrystina Sediment
Concentration (pg/g)
60
40
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.074

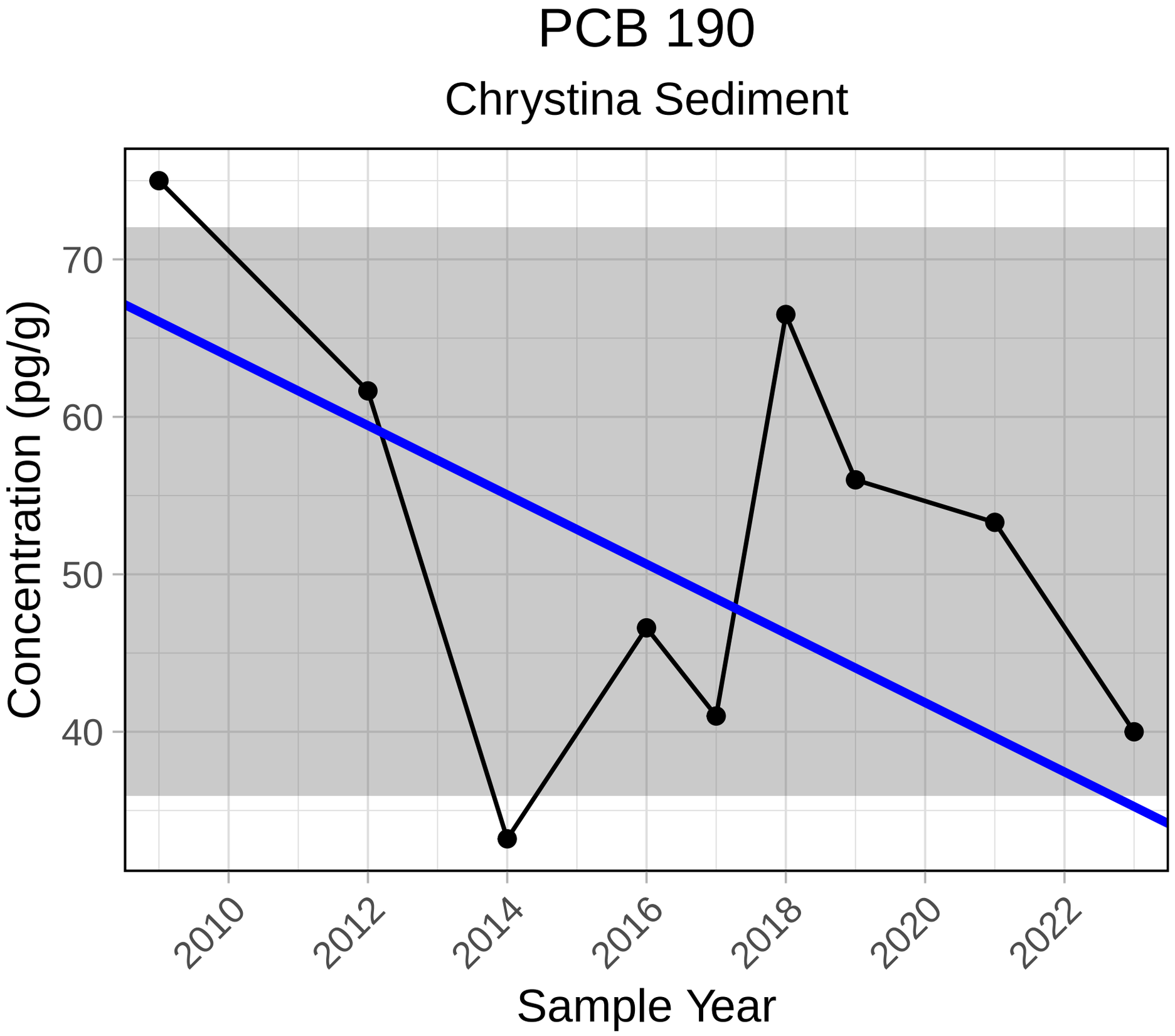

PCB 179
Chrystina Sediment
Concentration (pg/g)
110
90
70
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

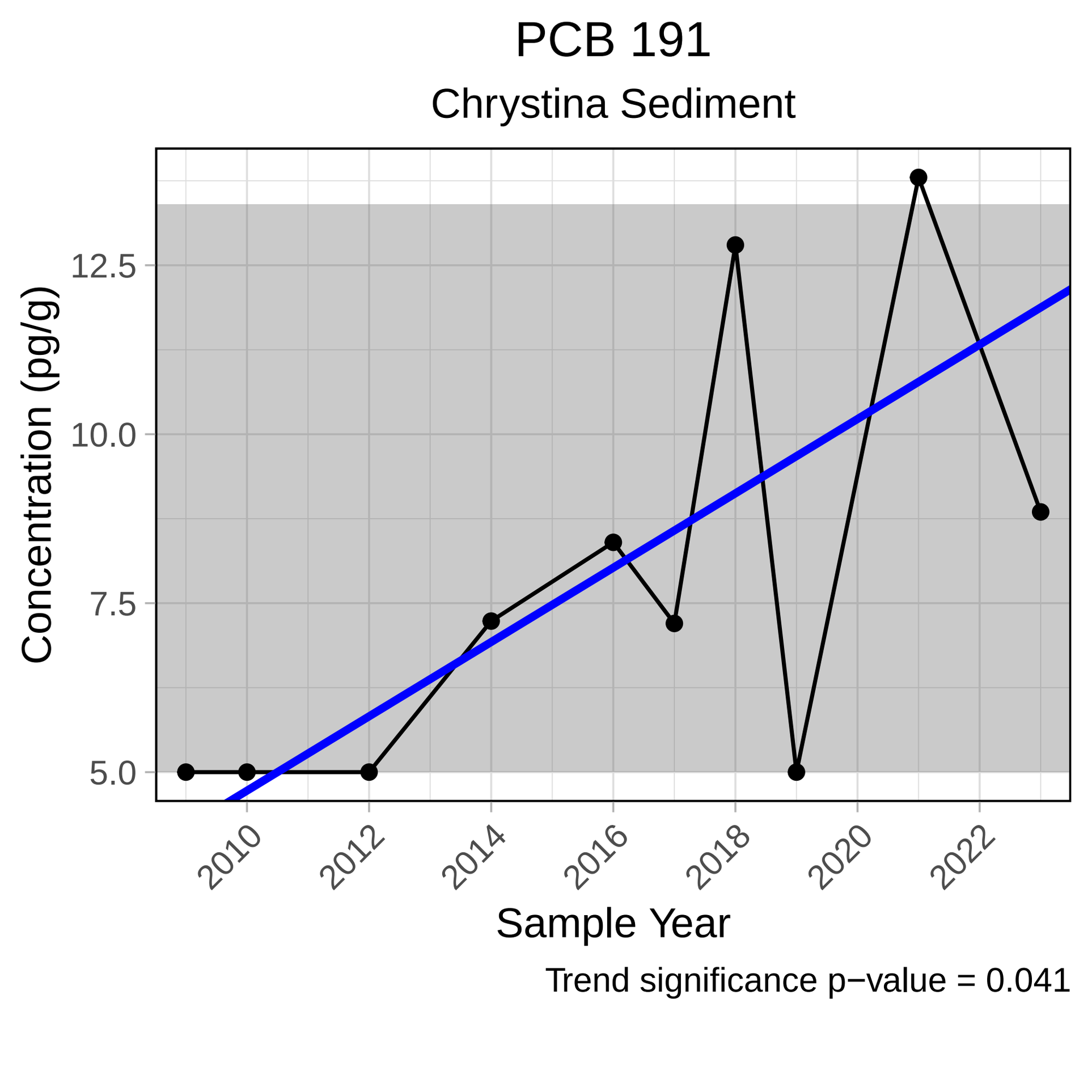

PCB 183
Chrystina Sediment
Concentration (pg/g)
180
150
120
90
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.928

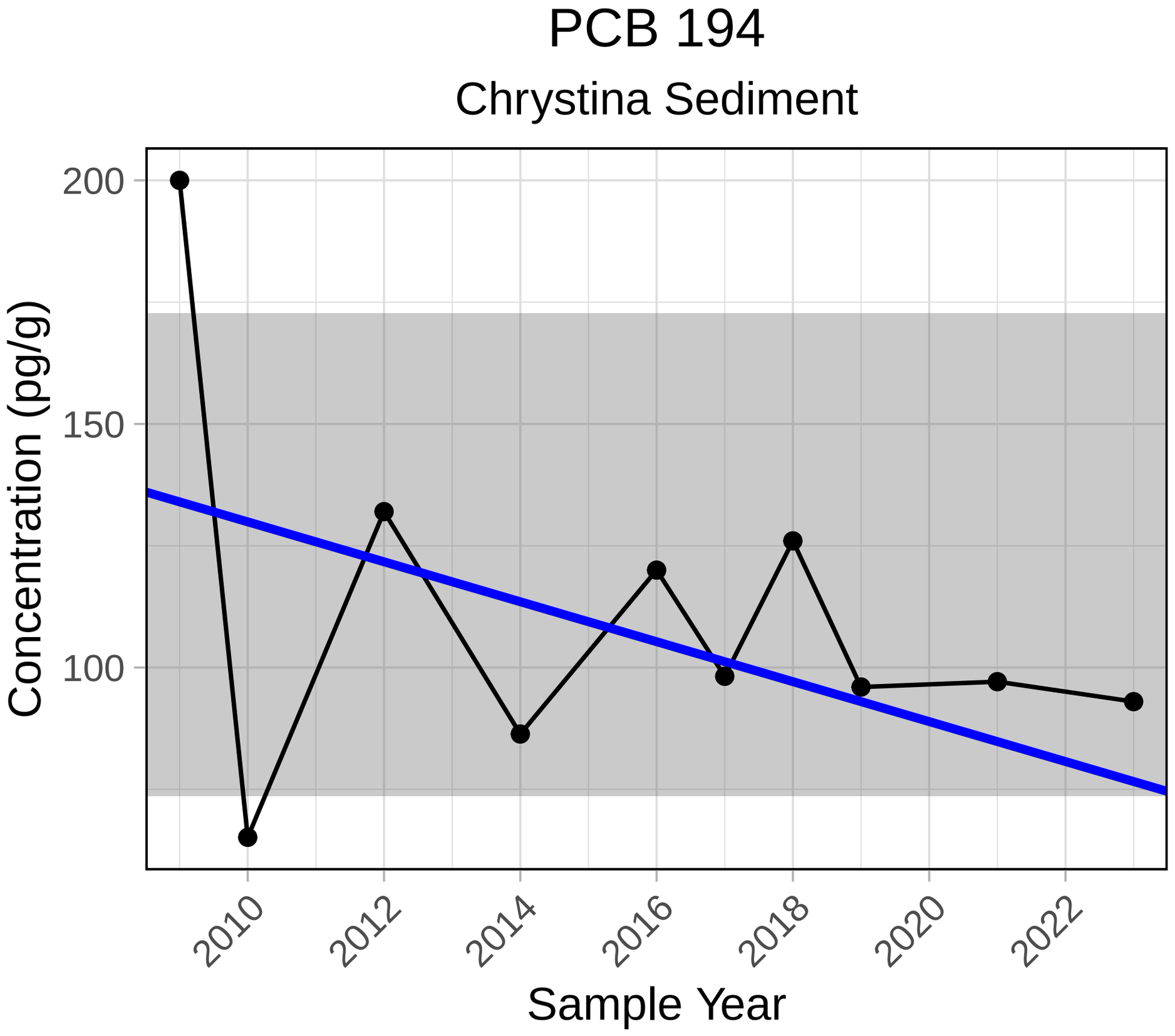
PCB 185
Chrystina Sediment
Concentration (pg/g)
30
20
10
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.419


PCB 187
Chrystina Sediment
Concentration (pg/g)
400
350
300
250
200
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

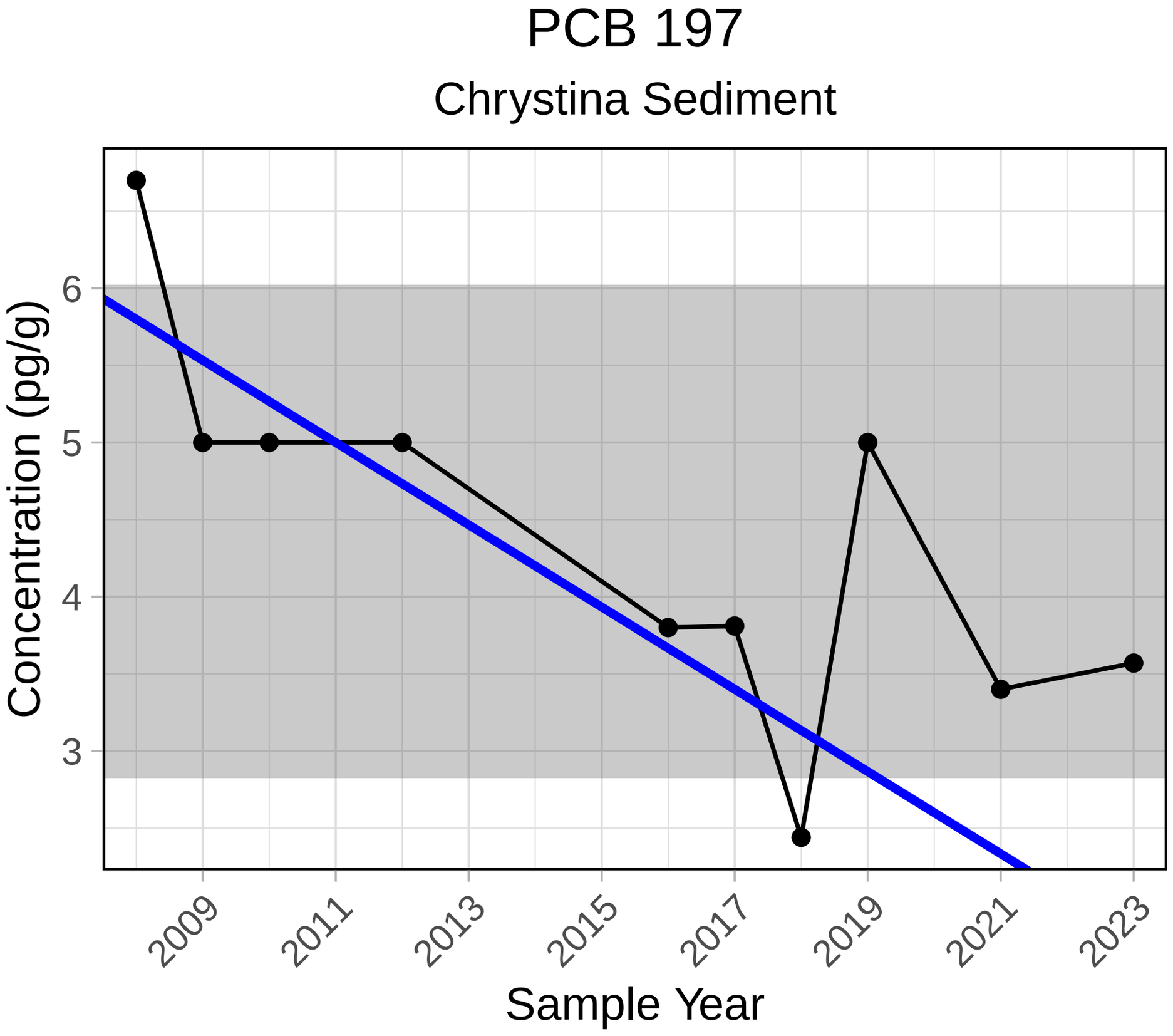

PCB 189
Chrystina Sediment
15.0
12.5
10.0
7.5
5.0
Concentration (pg/g)
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.788

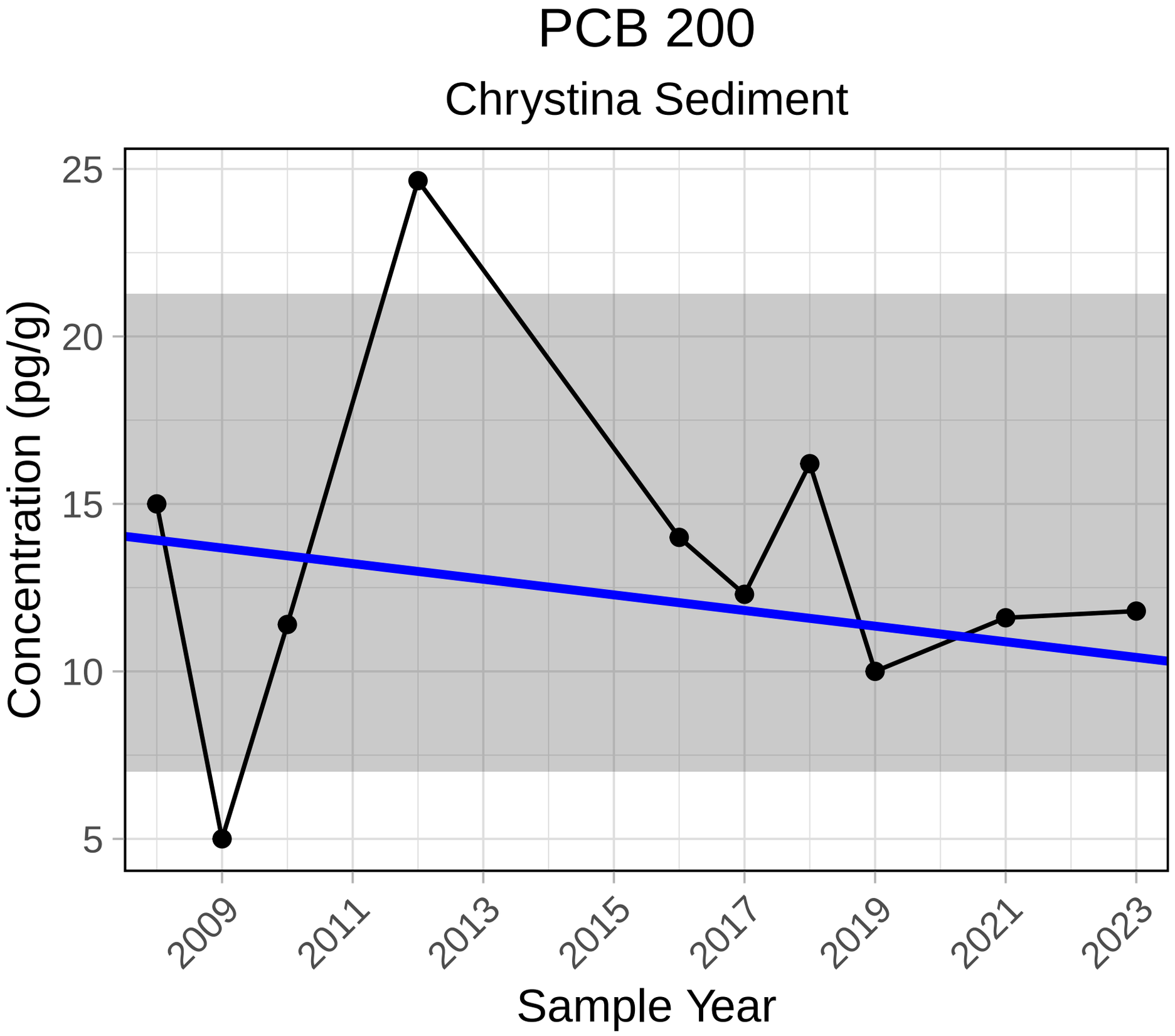

PCB 190
Chrystina Sediment
Concentration (pg/g)
70
60
50
40
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.348

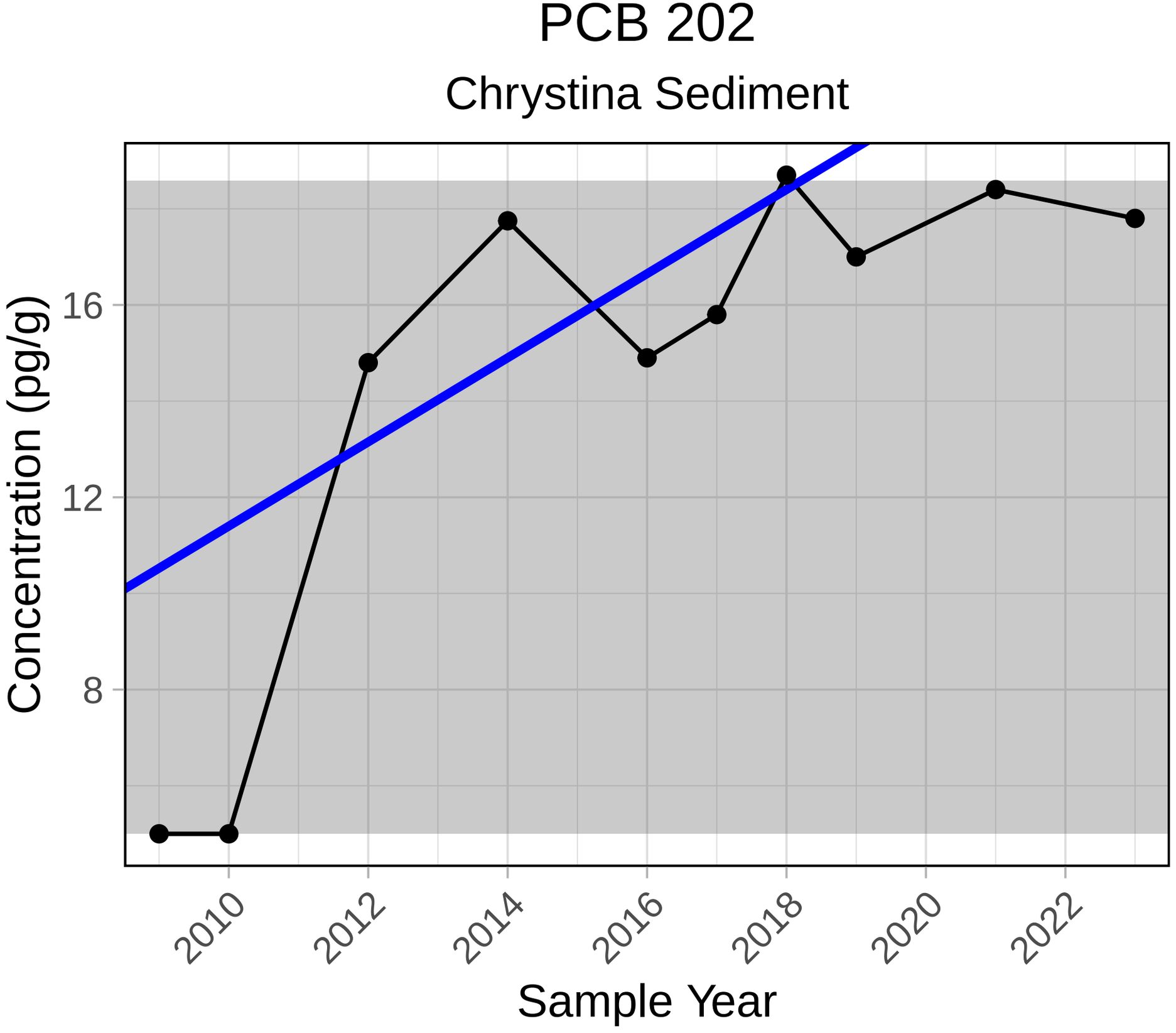

PCB 191
Chrystina Sediment
Concentration (pg/g)
12.5
10.0
7.5
5.0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.041

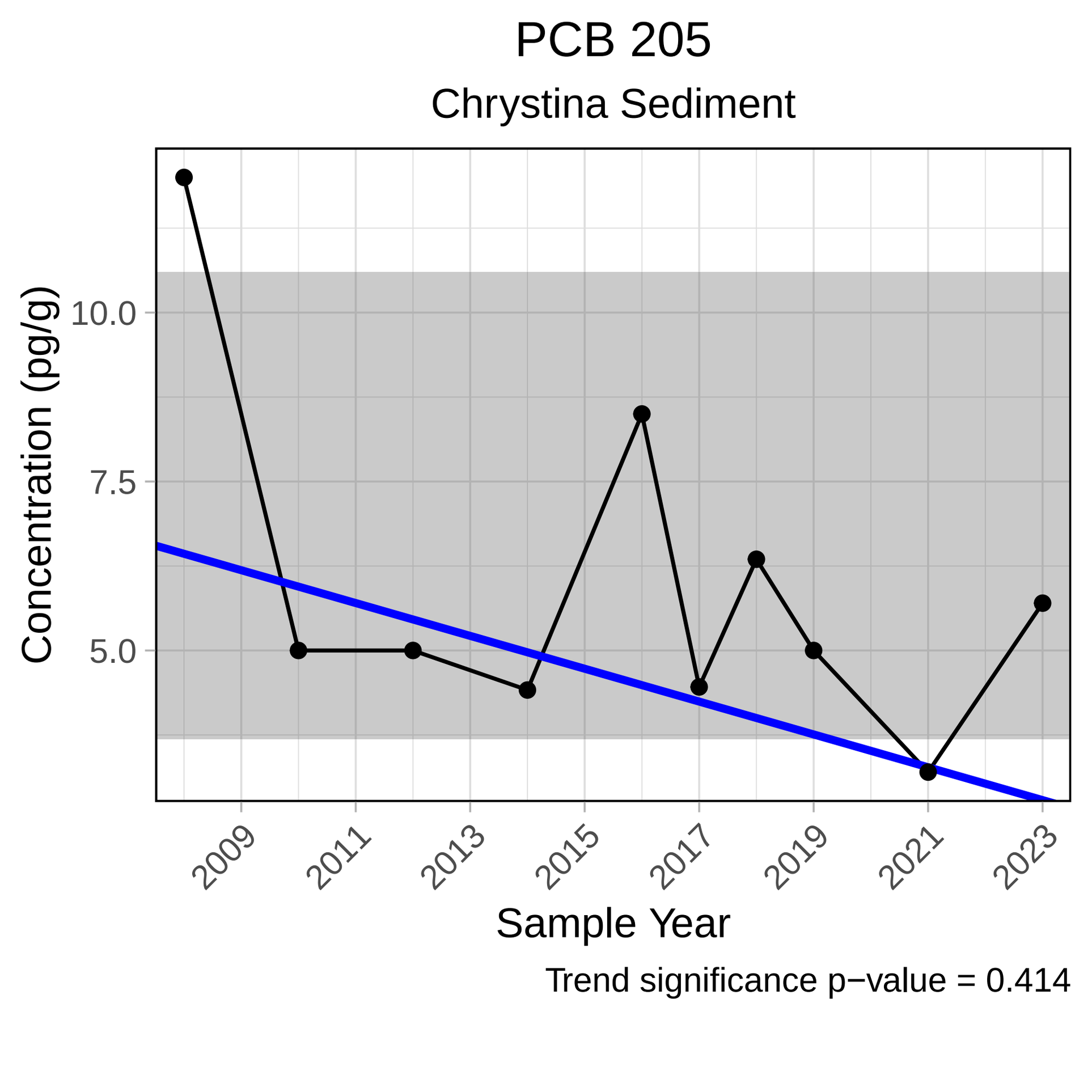

PCB 194
Chrystina Sediment
200
150
100
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

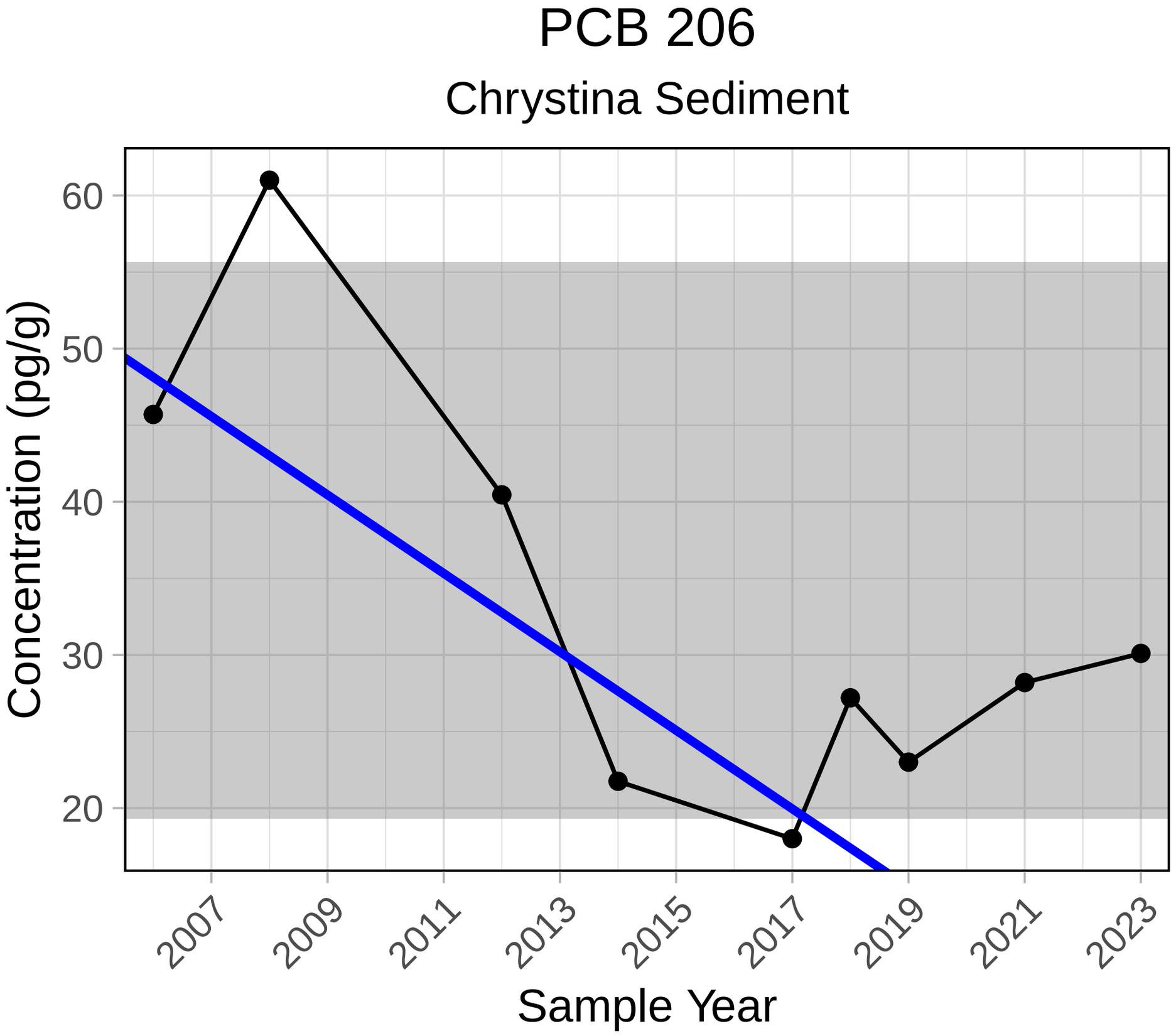
PCB 195
Chrystina Sediment
Concentration (pg/g)
80
60
40
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

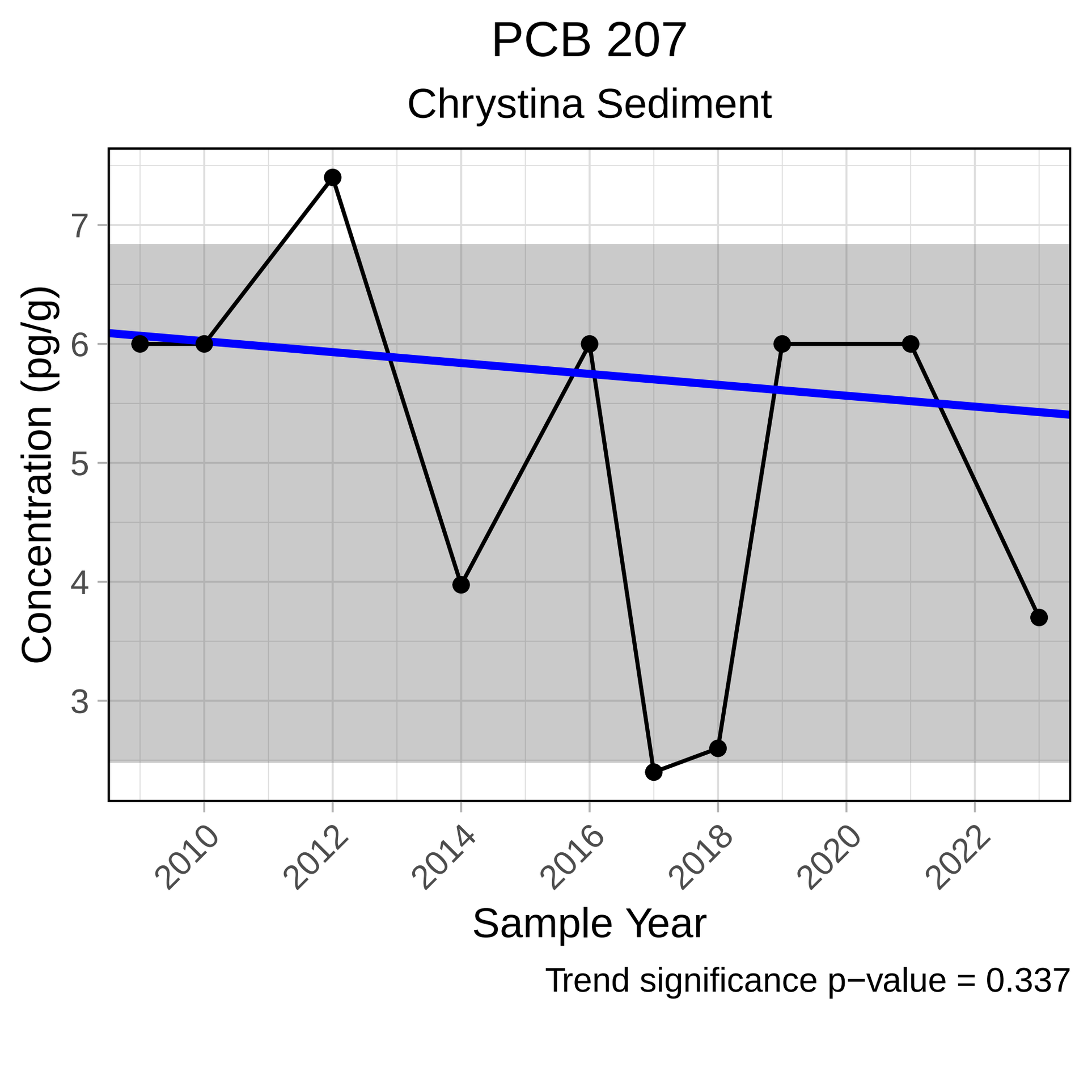

PCB 197
Chrystina Sediment
Concentration (pg/g)
6
5
4
3
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.026

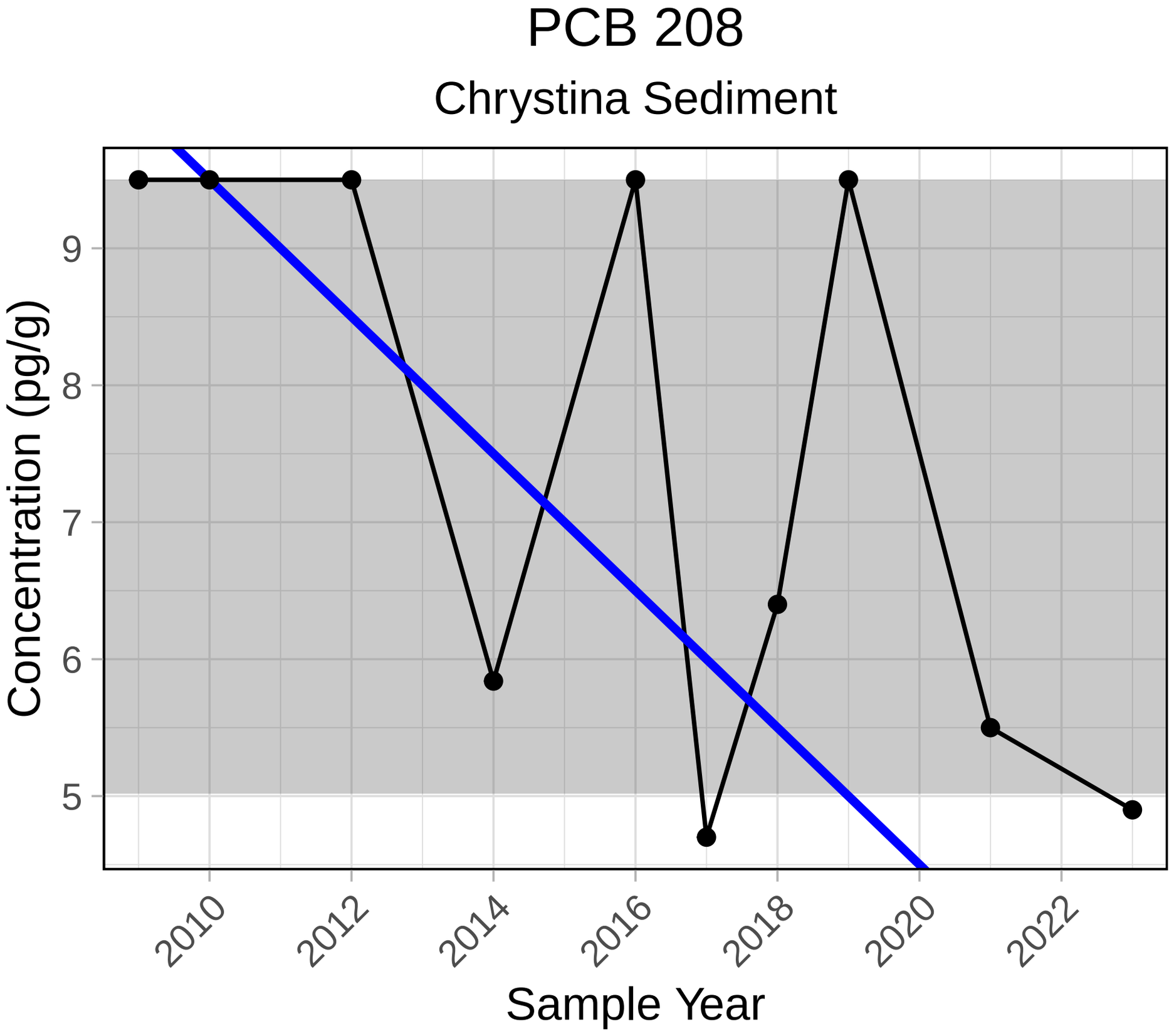

PCB 200
Chrystina Sediment
Concentration (pg/g)
25
20
15
10
5
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.858

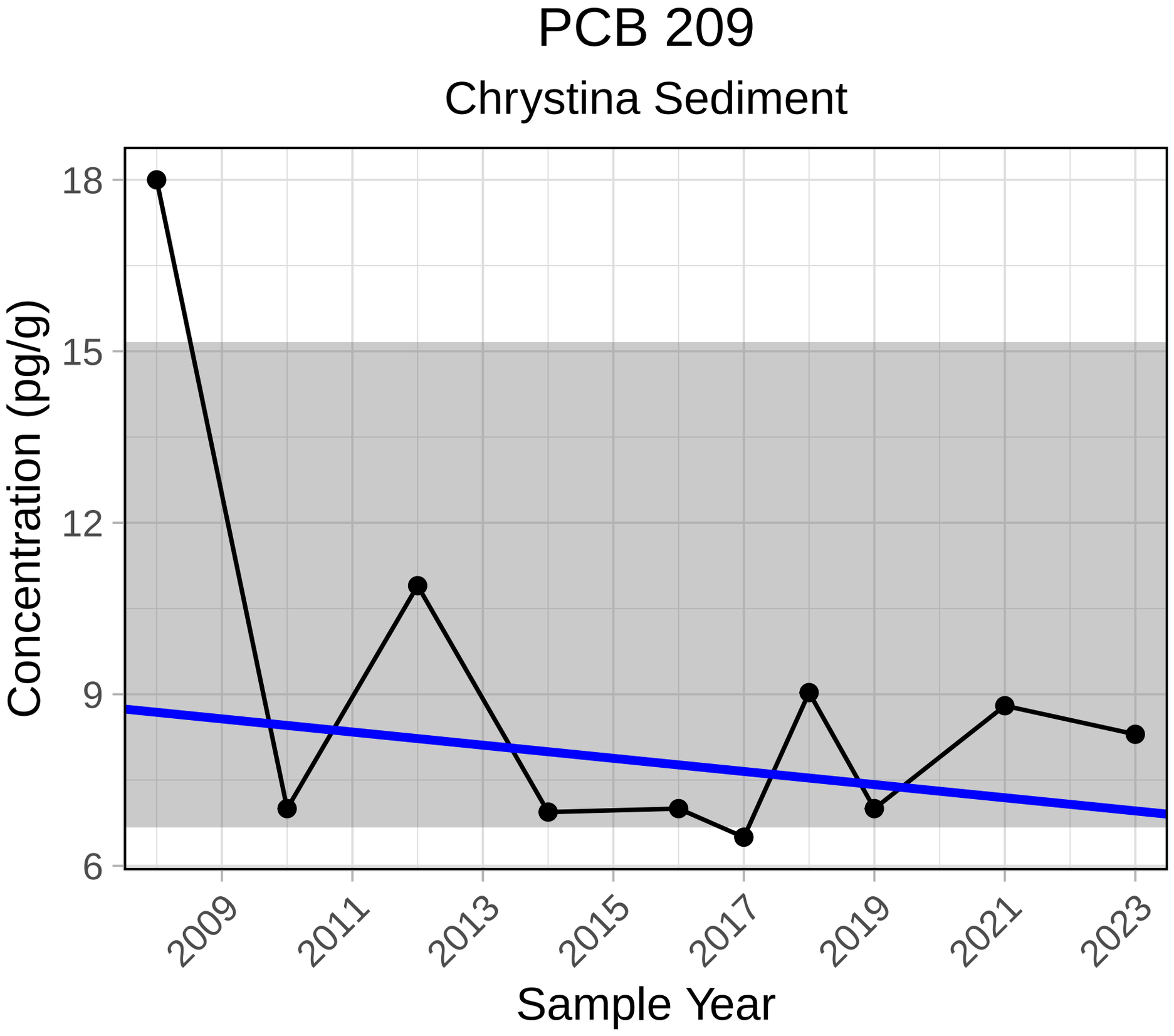

PCB 202
Chrystina Sediment
Concentration (pg/g)
16
12
8
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.009

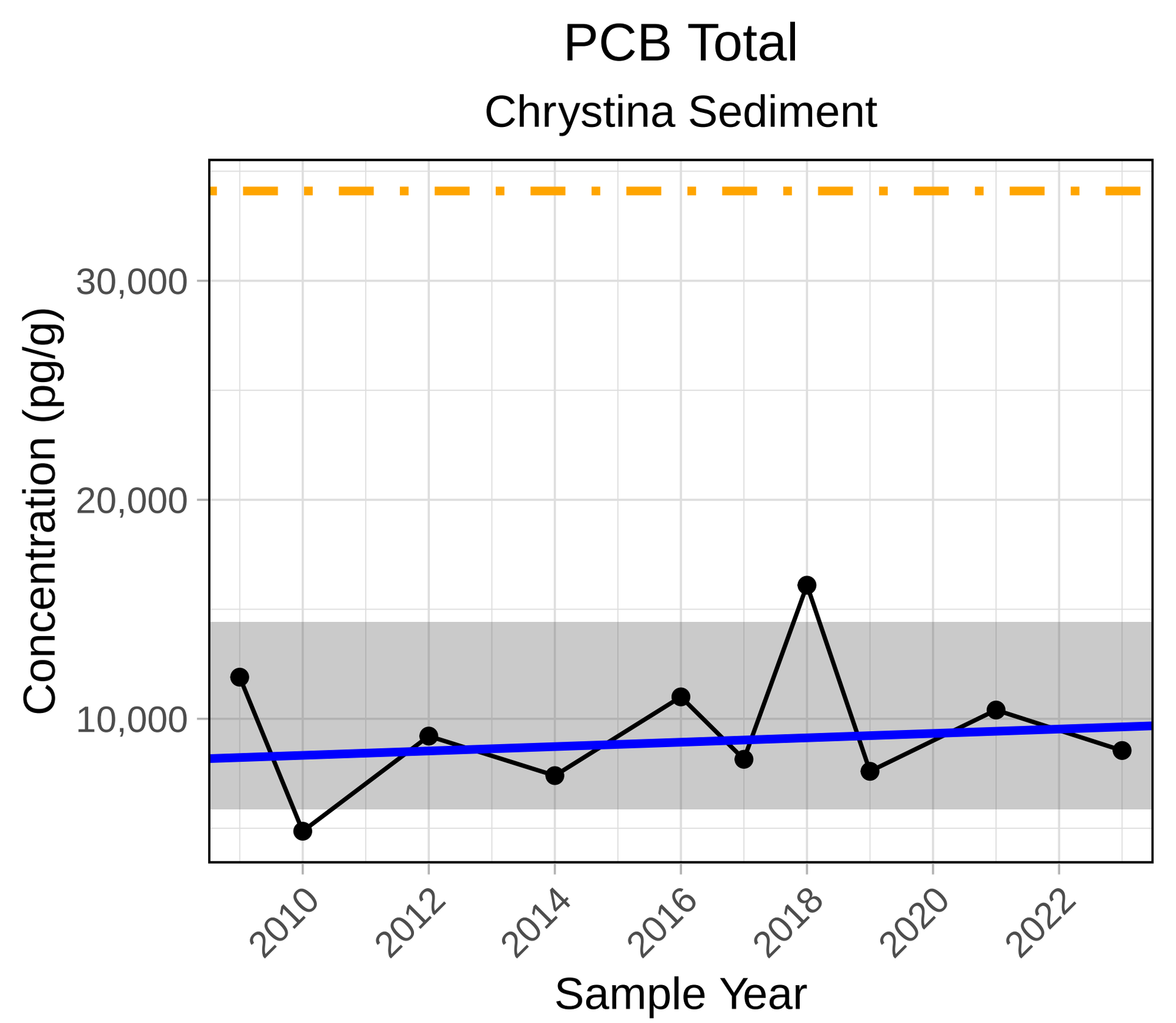

PCB 205
Chrystina Sediment
Concentration (pg/g)
10.0
7.5
5.0
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.414


PCB 206
Chrystina Sediment
Concentration (pg/g)
60
50
40
30
20
2007
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.466

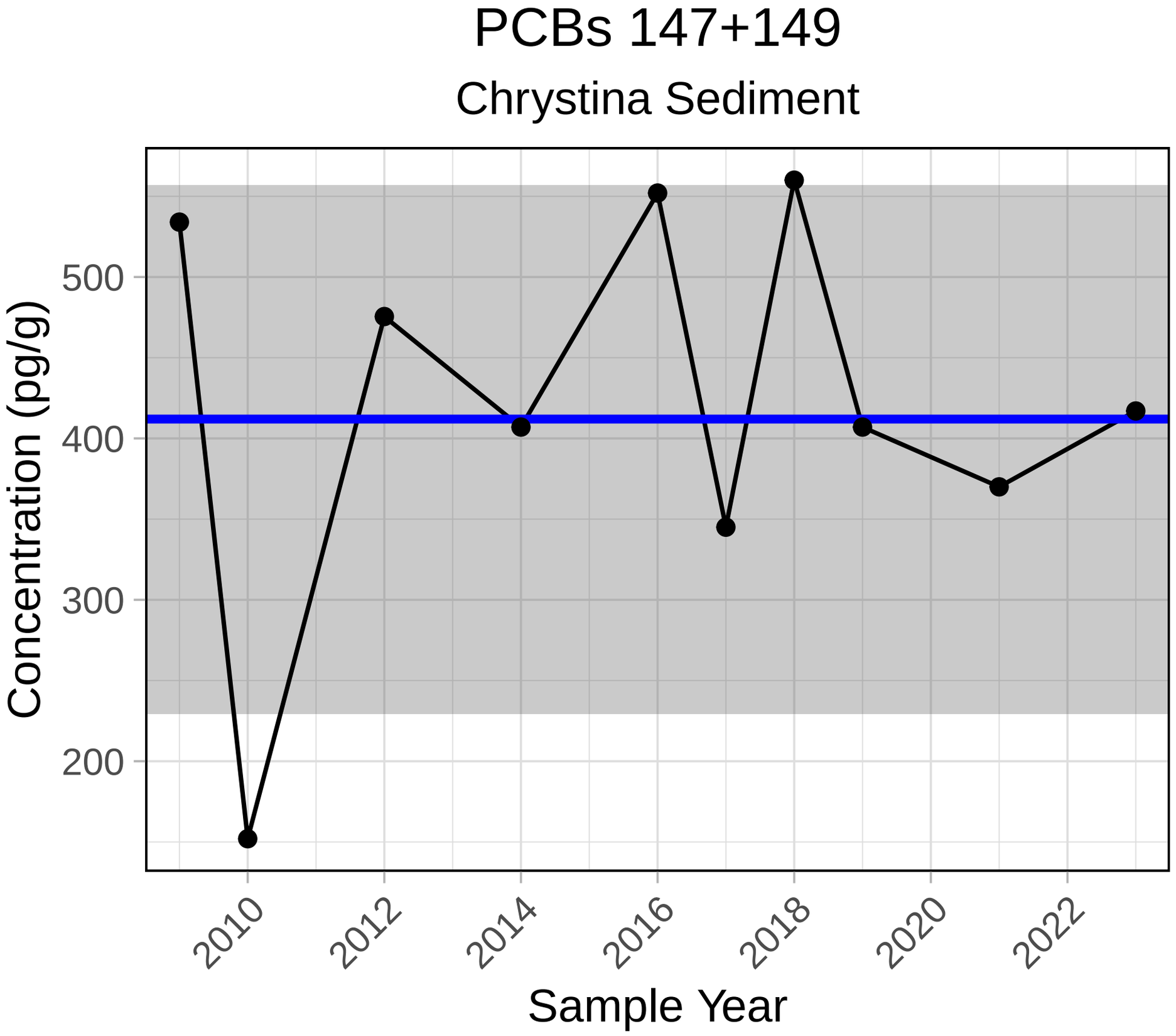

PCB 207
Chrystina Sediment
Concentration (pg/g)
7
6
5
4
3
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.337

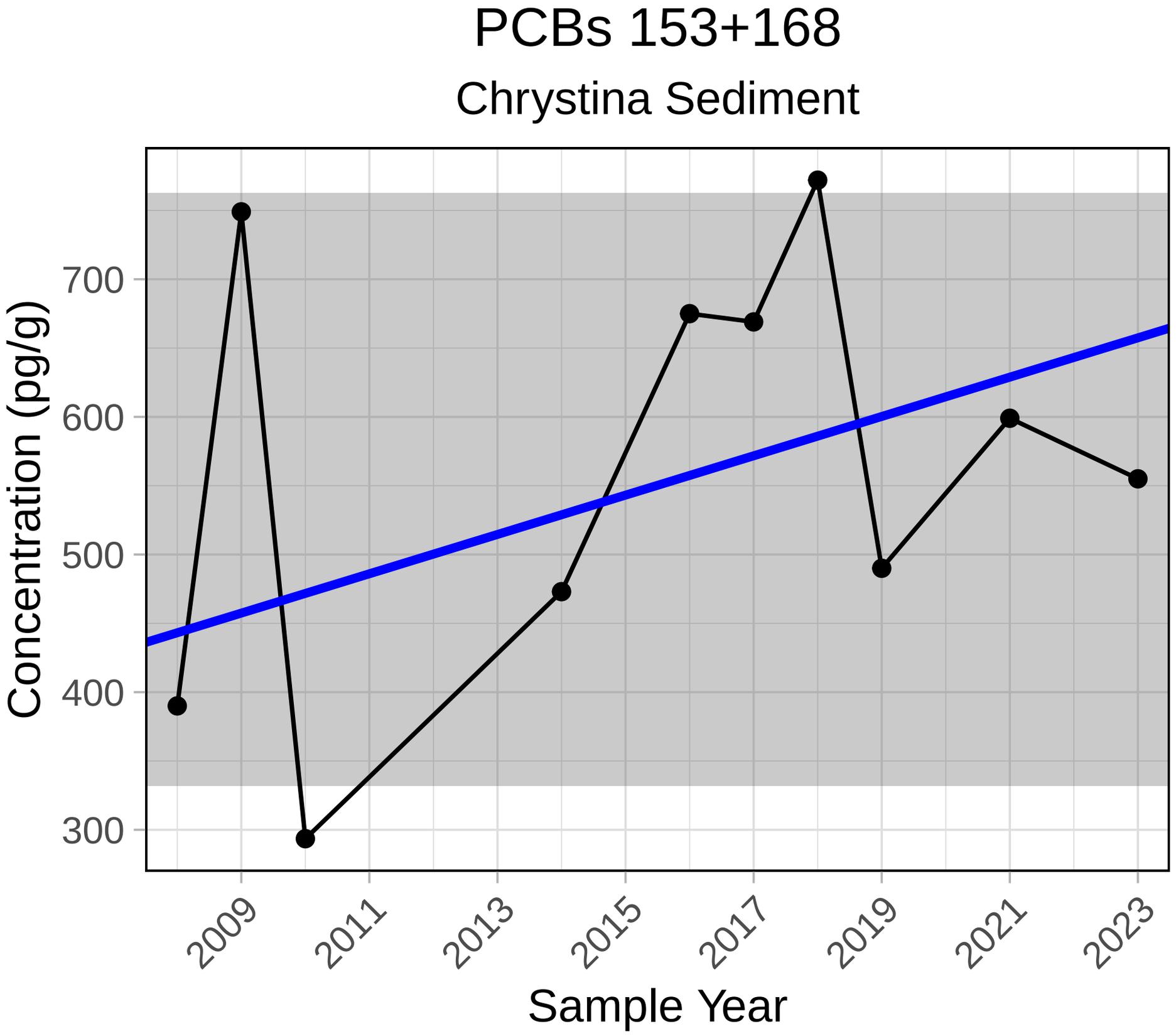

PCB 208
Chrystina Sediment
Concentration (pg/g)
9
8
7
6
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.084

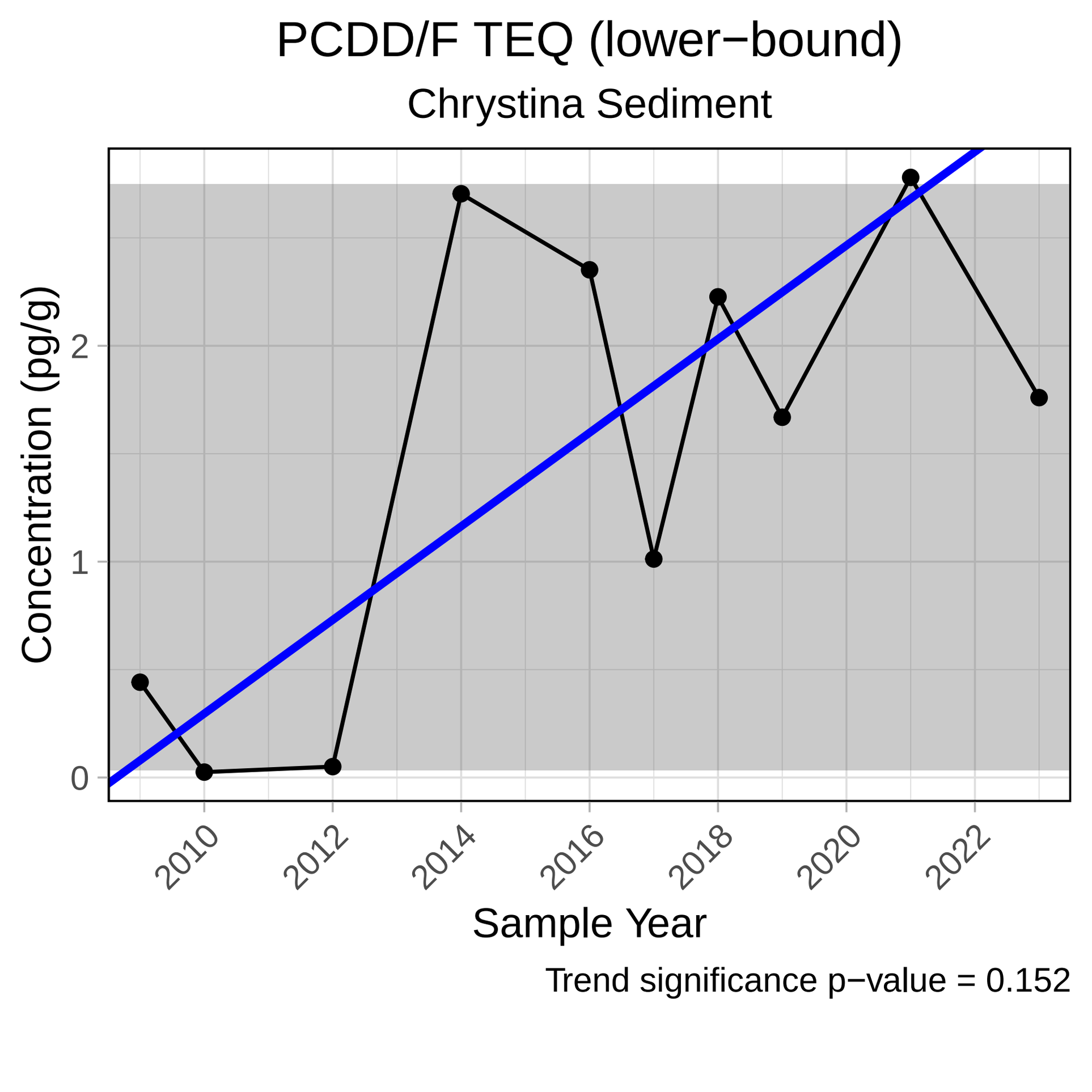

PCB 209
Chrystina Sediment
Concentration (pg/g)
18
15
12
9
6
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.65

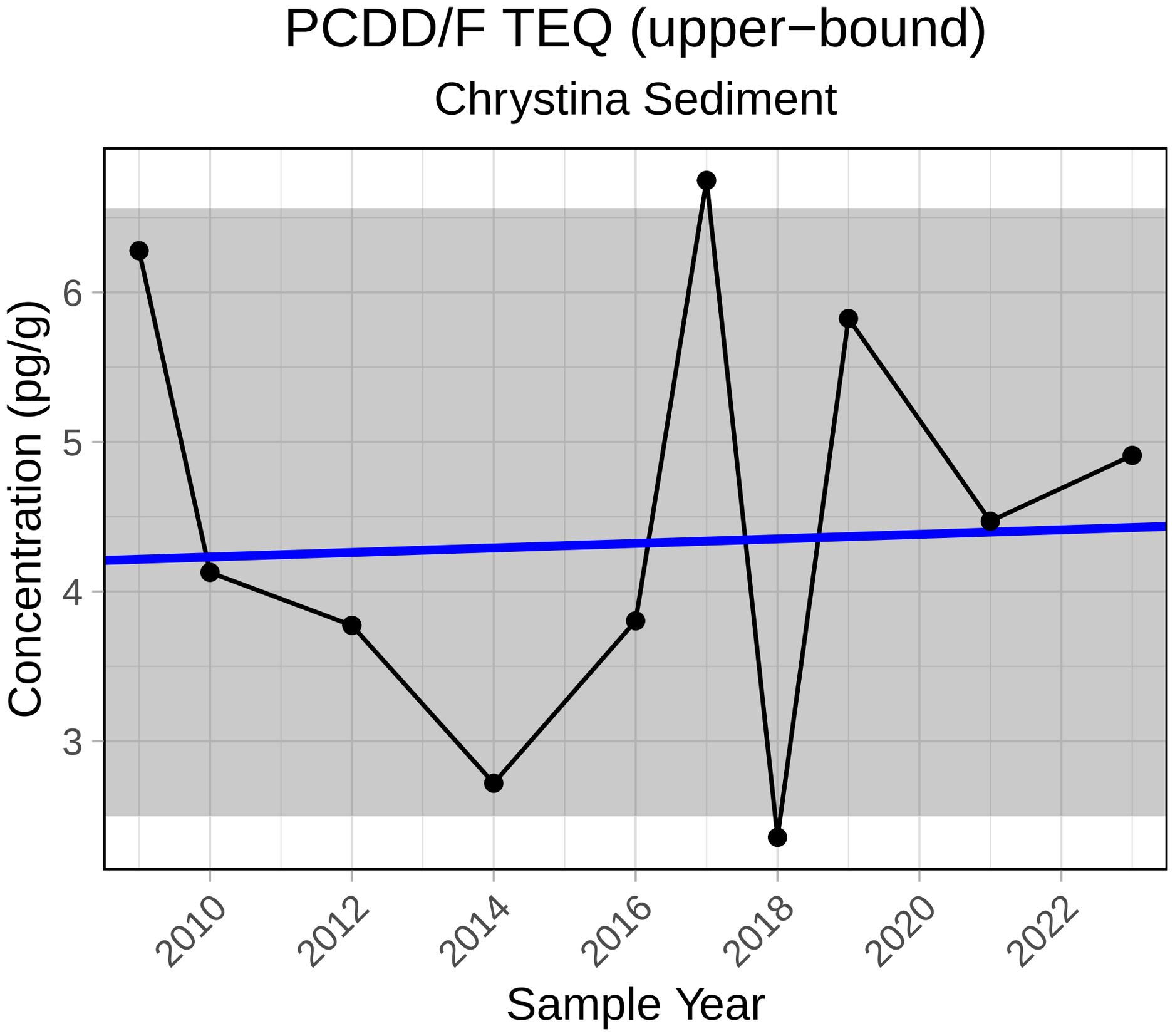


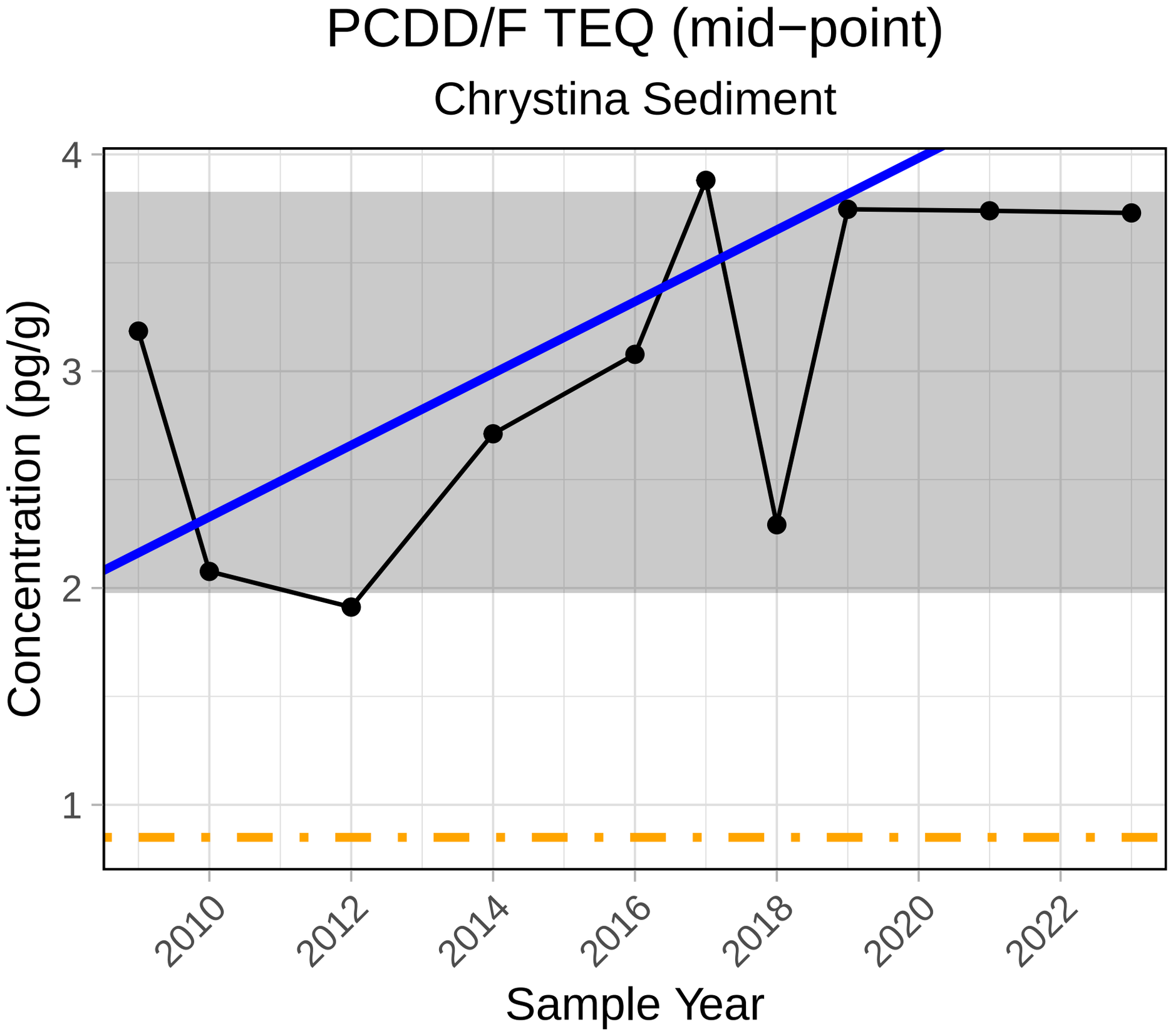
Trend significance p−value = 0.858
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)


PCBs 147+149
Chrystina Sediment
Concentration (pg/g)
500
400
300
200
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

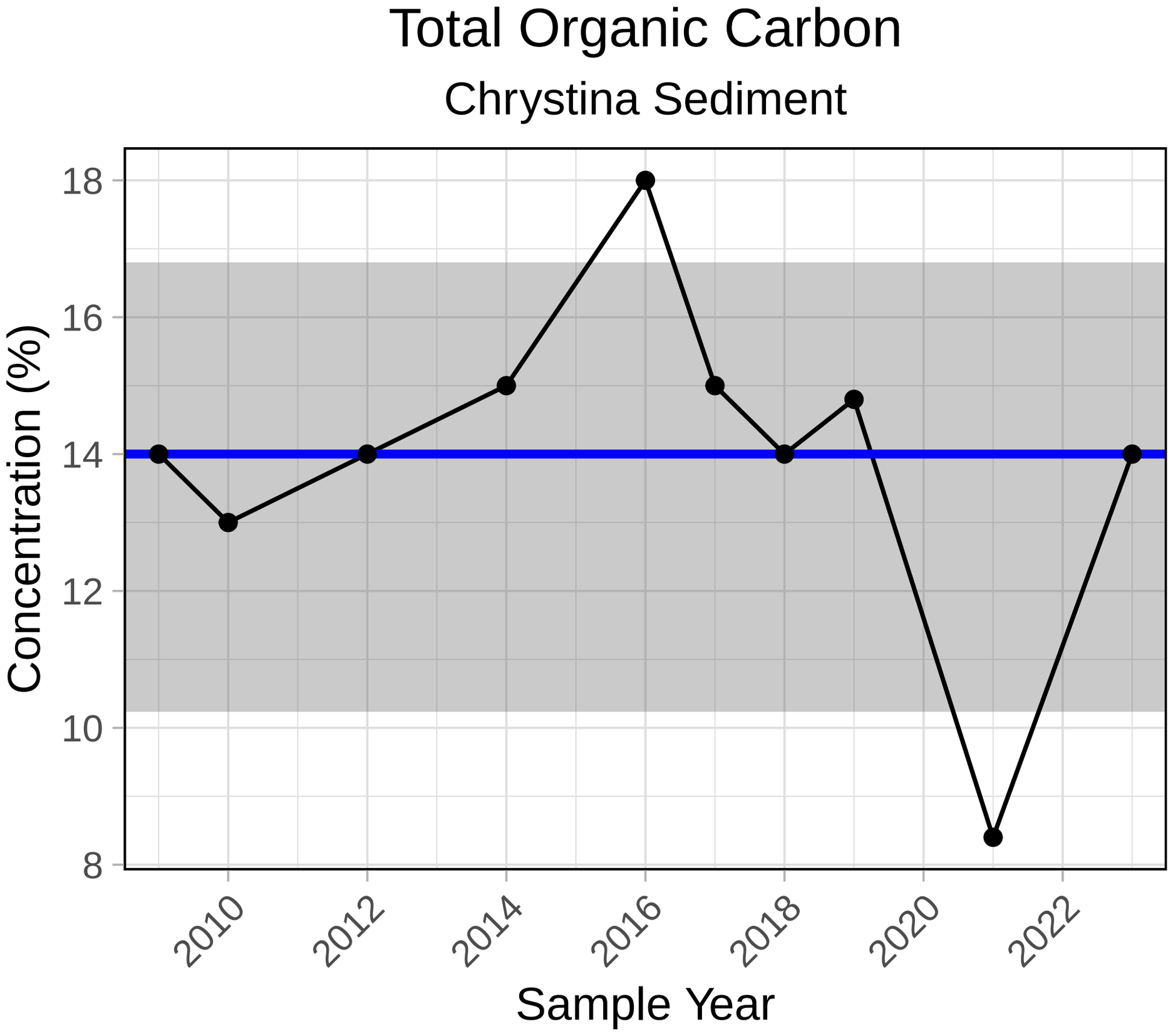

PCBs 153+168
Chrystina Sediment
Concentration (pg/g)
700
600
500
400
300
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.592

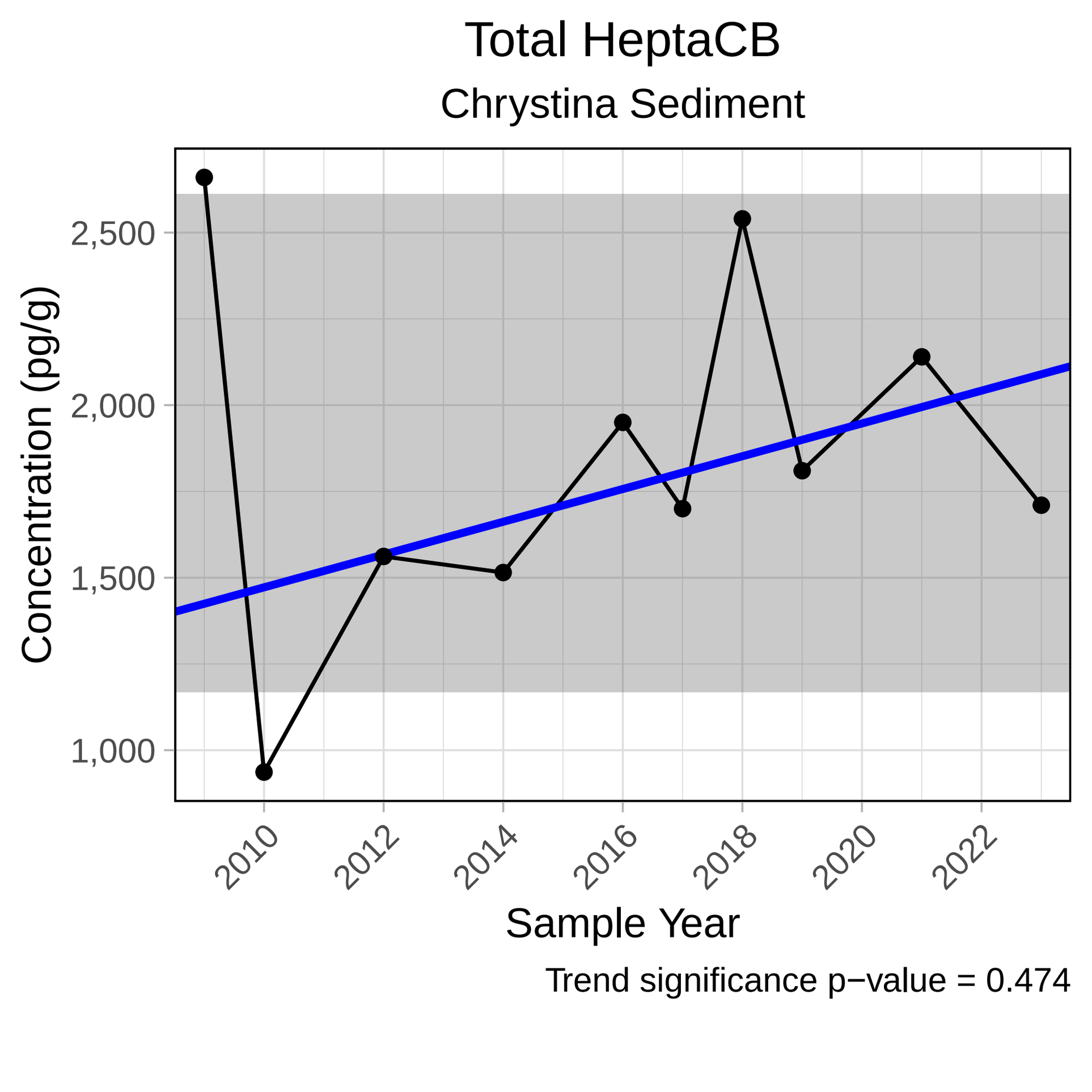

PCDD/F TEQ (lower−bound)
Chrystina Sediment
Concentration (pg/g)
0
1
2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

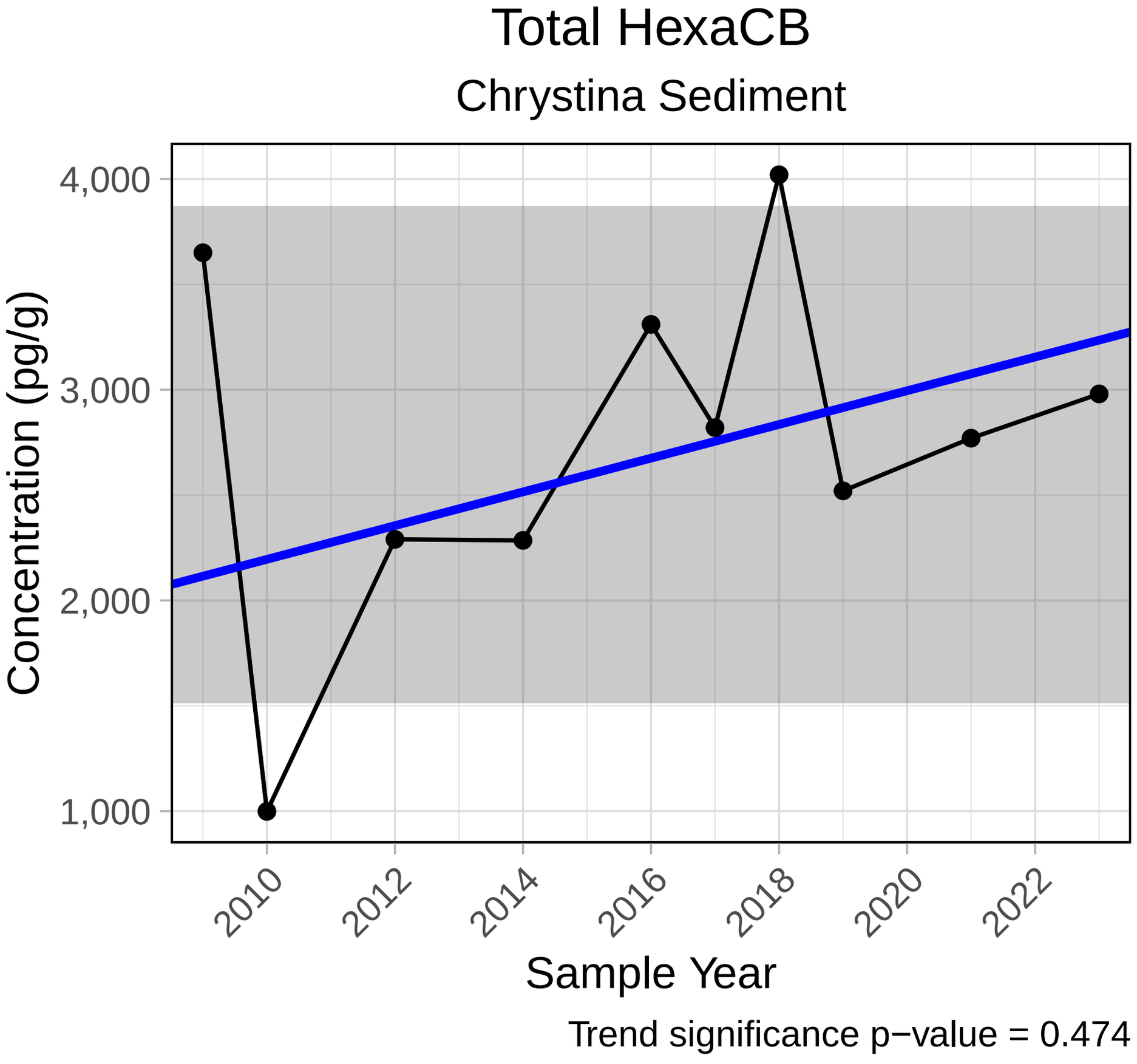

PCDD/F TEQ (upper−bound)
Chrystina Sediment
Concentration (pg/g)
6
5
4
3
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

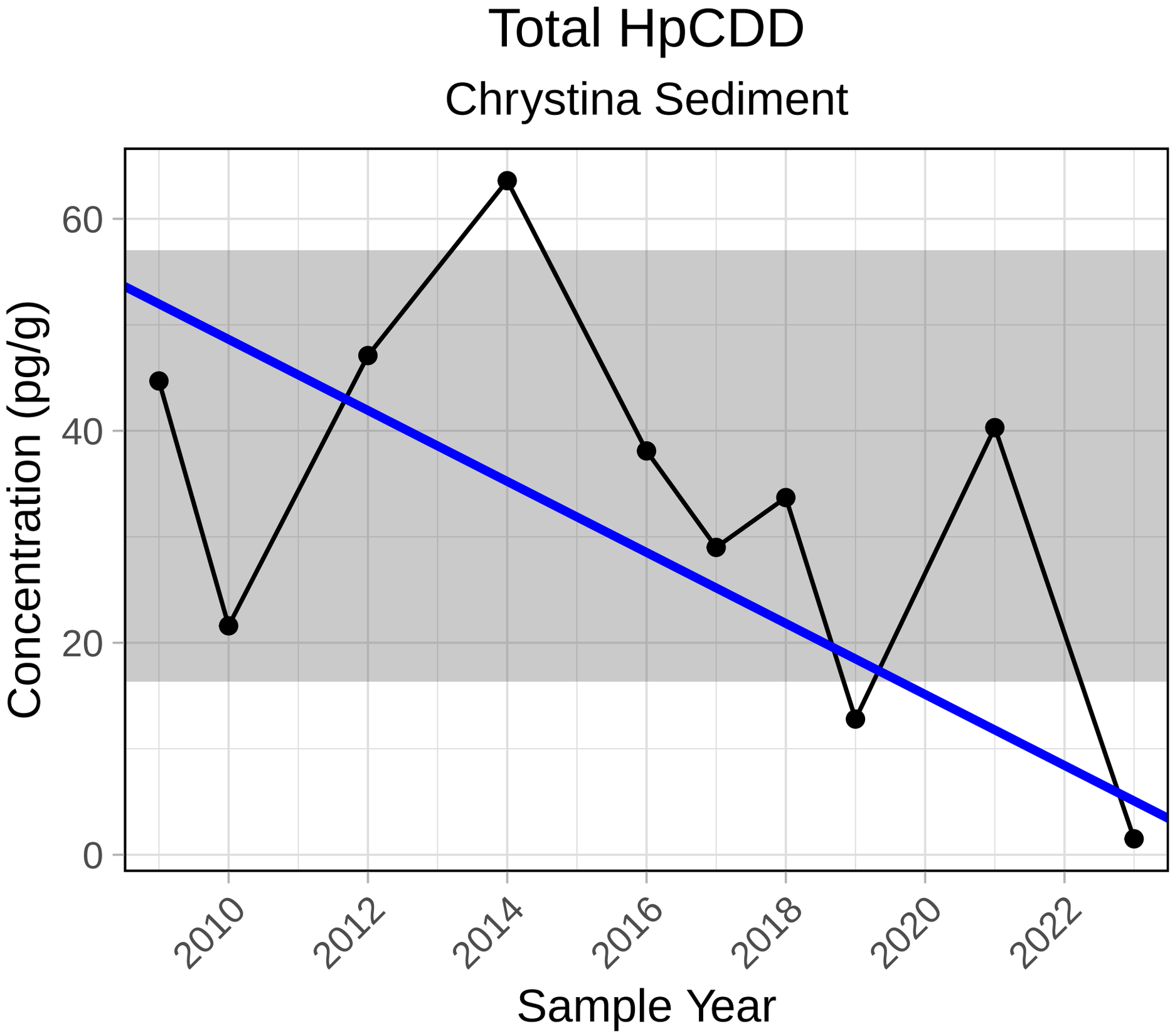


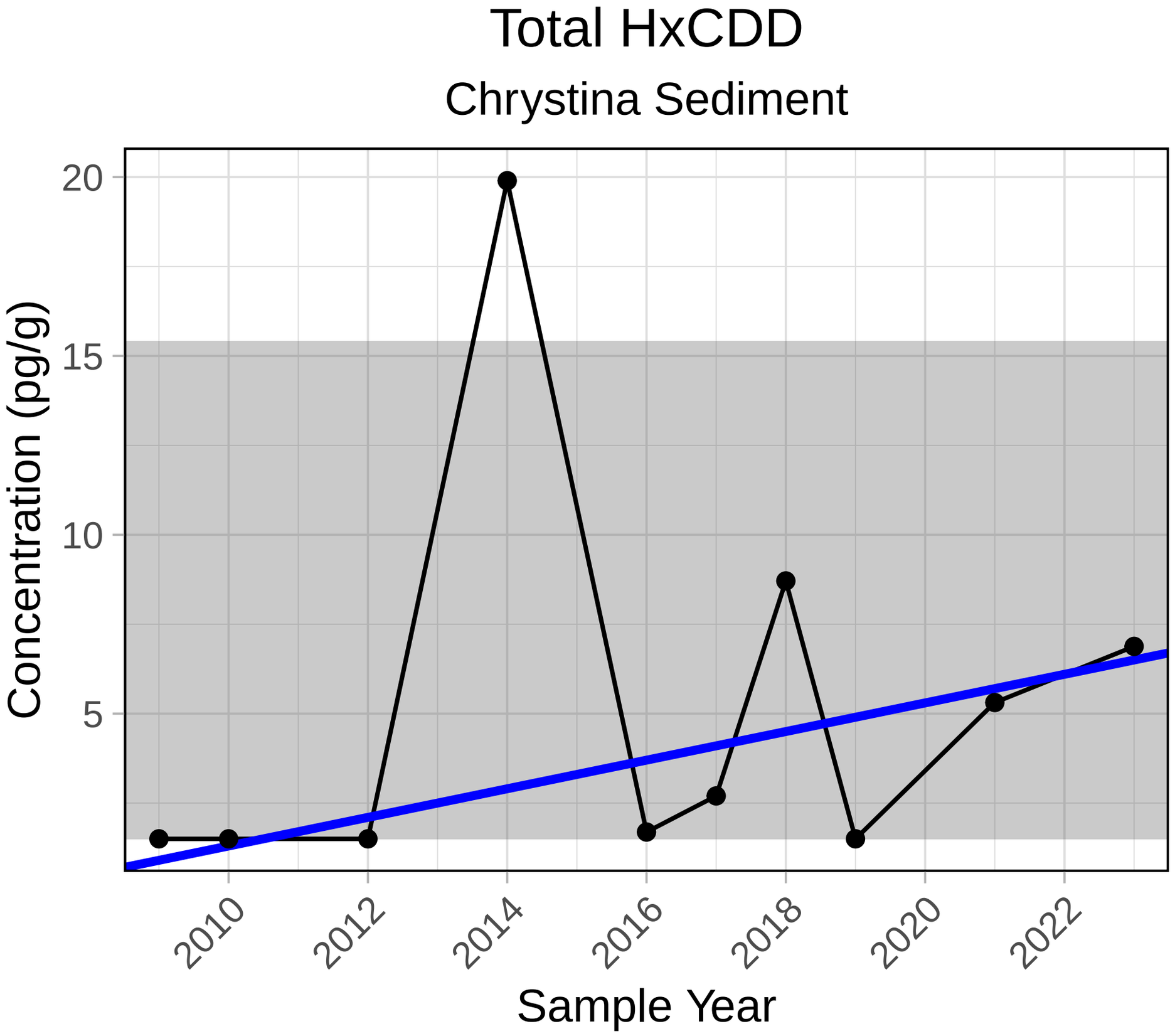
Trend significance p−value = 0.21
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)


Total Organic Carbon
Chrystina Sediment
Concentration (%)
18
16
14
12
10
8
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.926


Total HeptaCB
Chrystina Sediment
Concentration (pg/g)
2,500
2,000
1,500
1,000
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

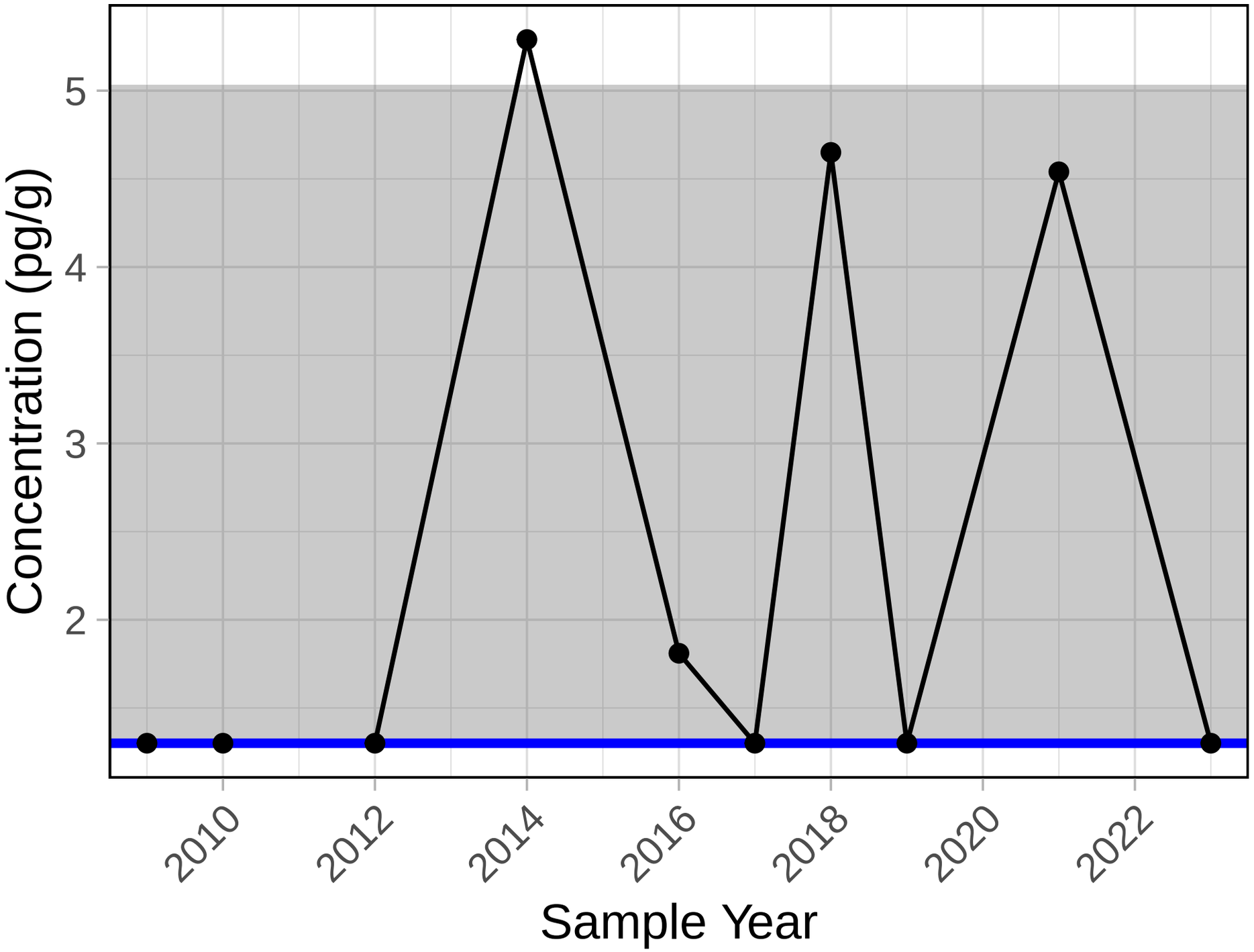

Total HexaCB
Chrystina Sediment
4,000
3,000
2,000
1,000
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474


Total HpCDD
Chrystina Sediment
Concentration (pg/g)
60
40
20
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

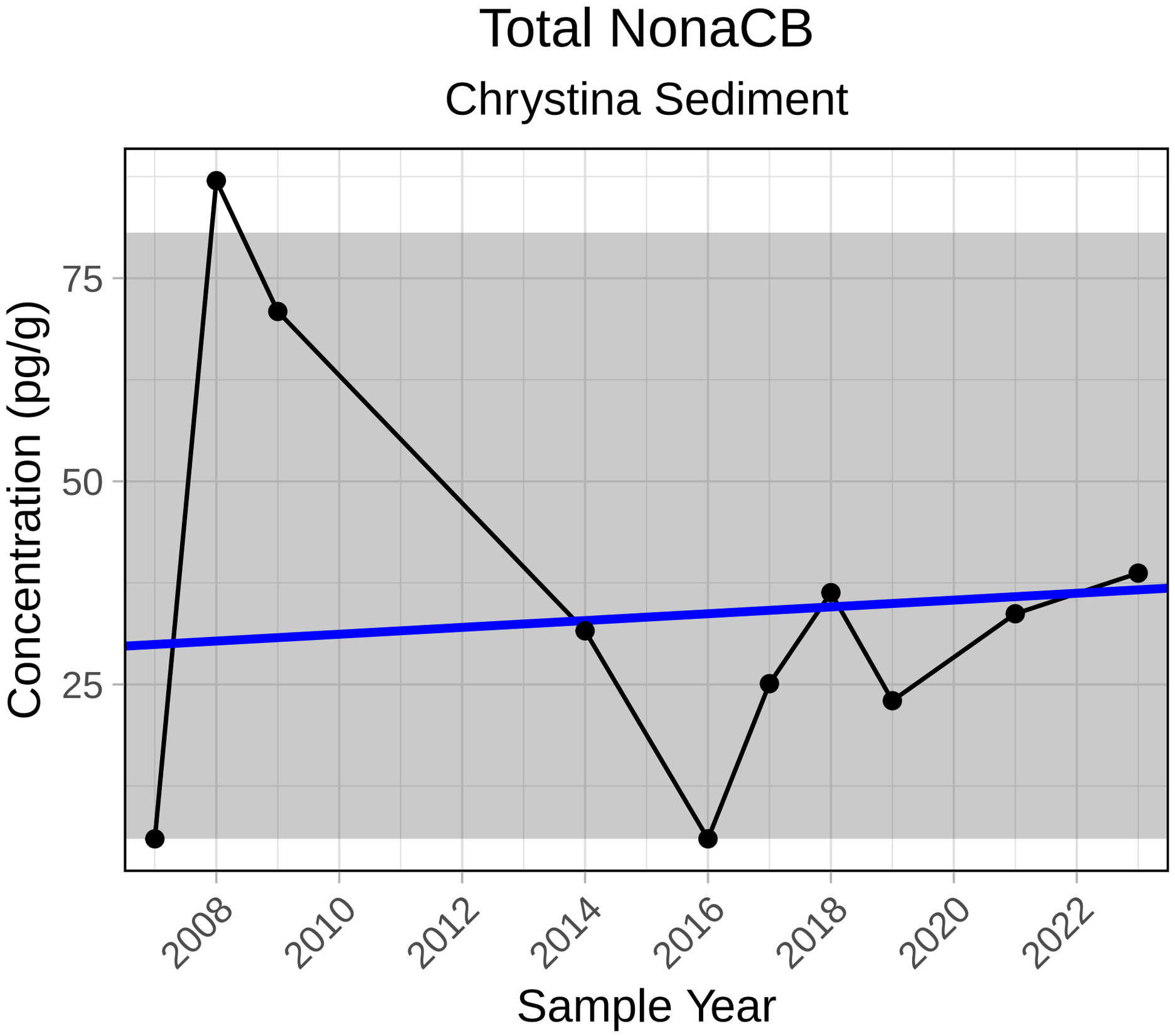

Total HxCDD
Chrystina Sediment
Concentration (pg/g)
20
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.138

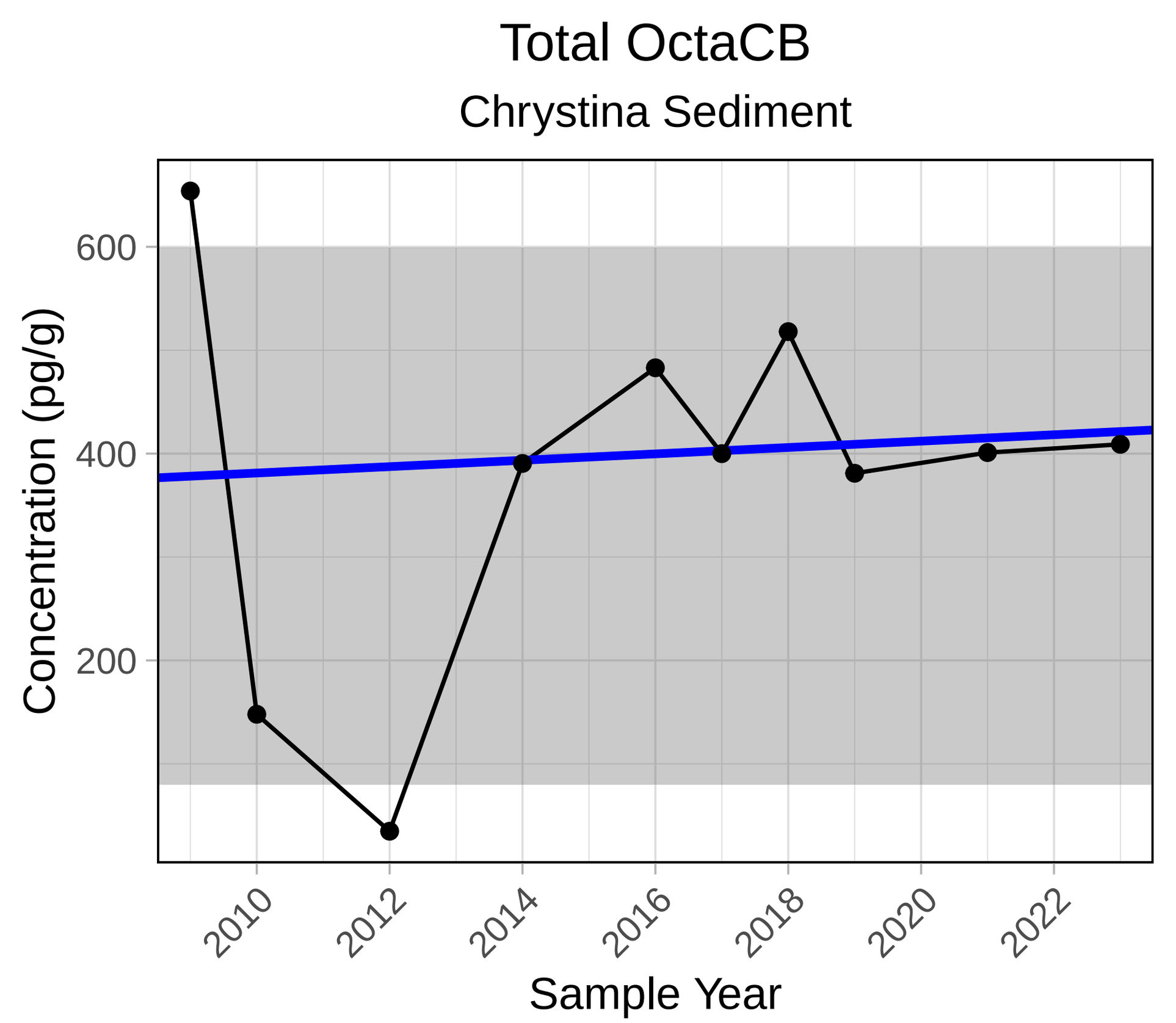
Total HxCDF

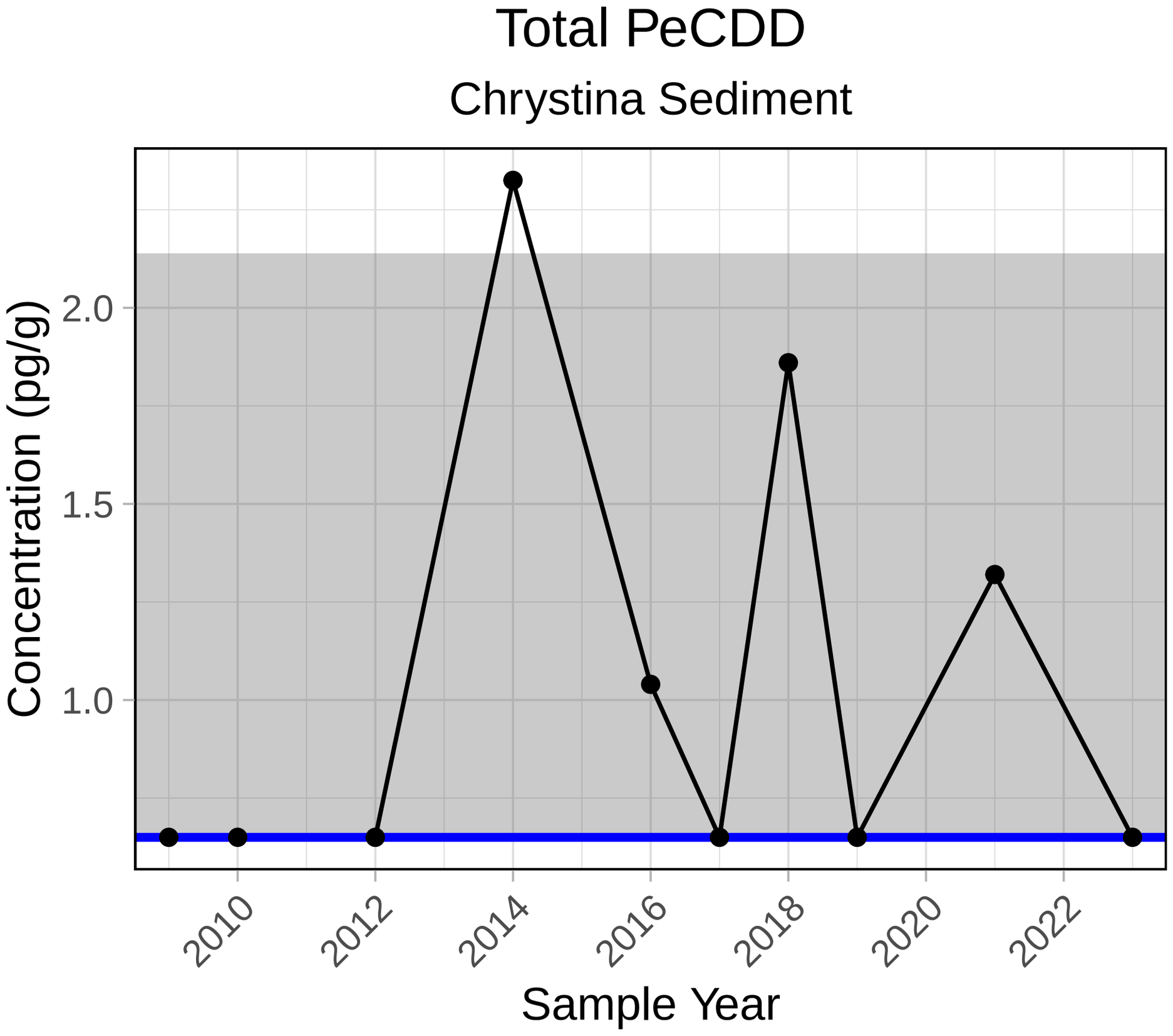
Chrystina Sediment

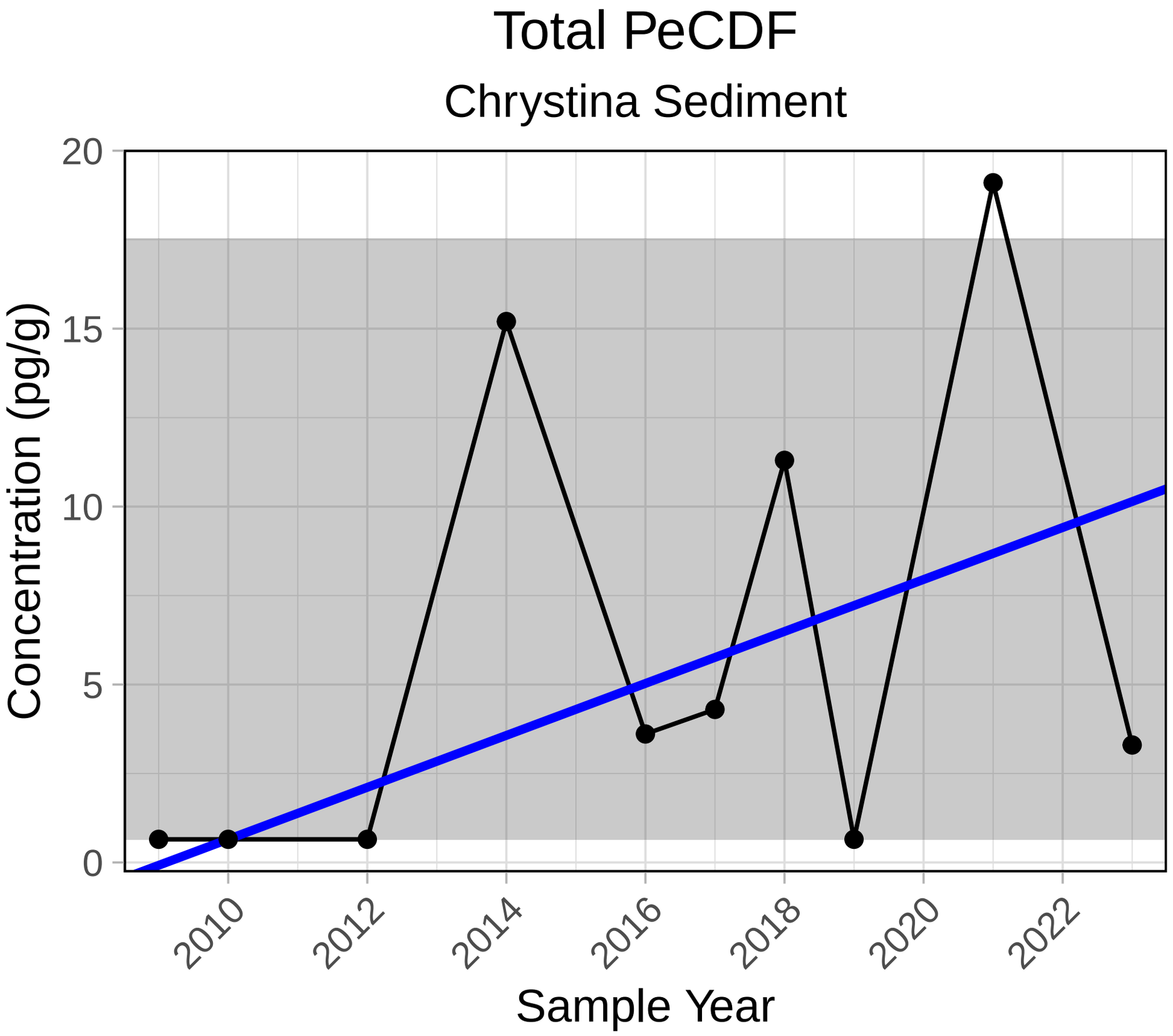


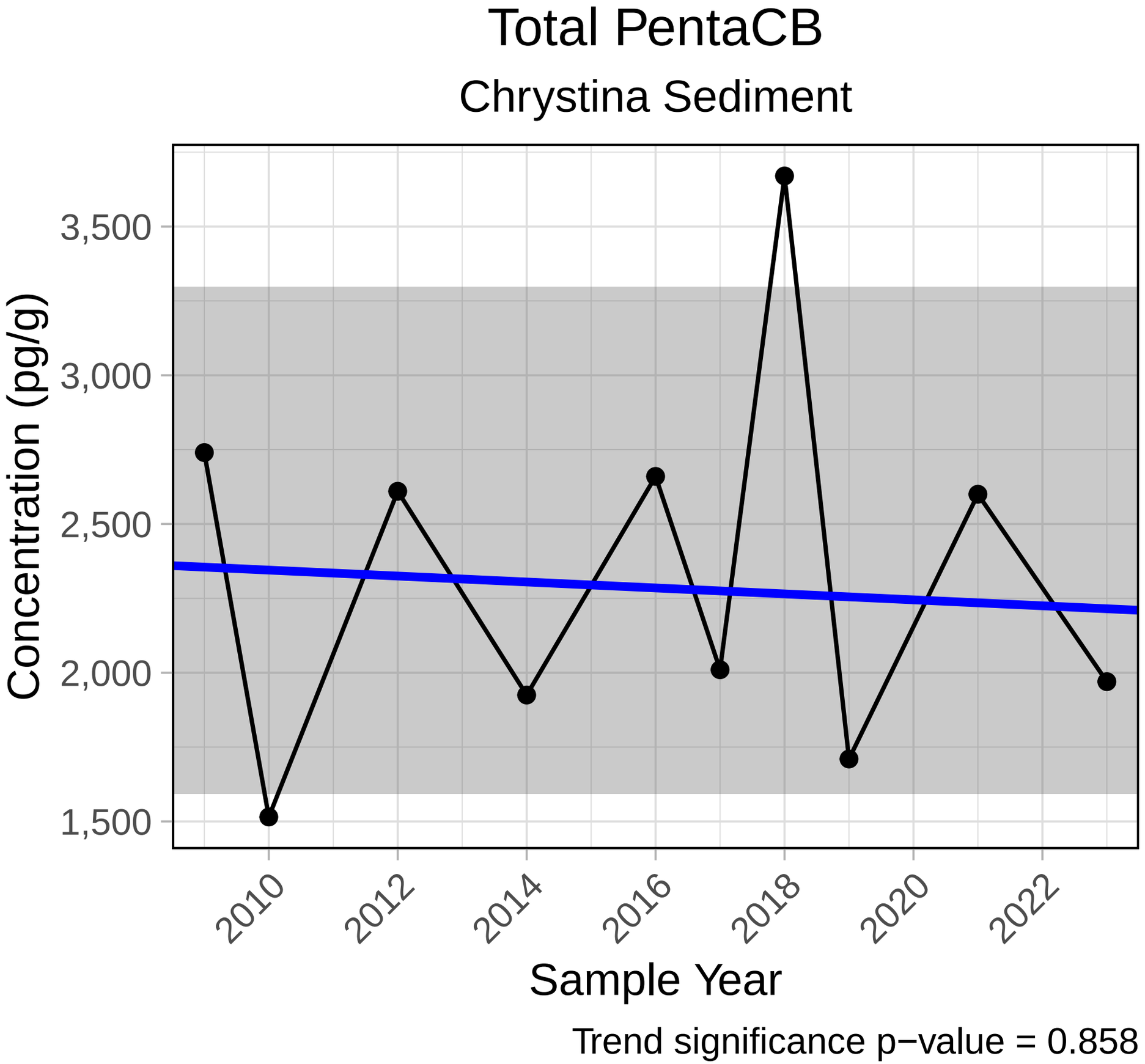
Trend significance p−value = 0.76

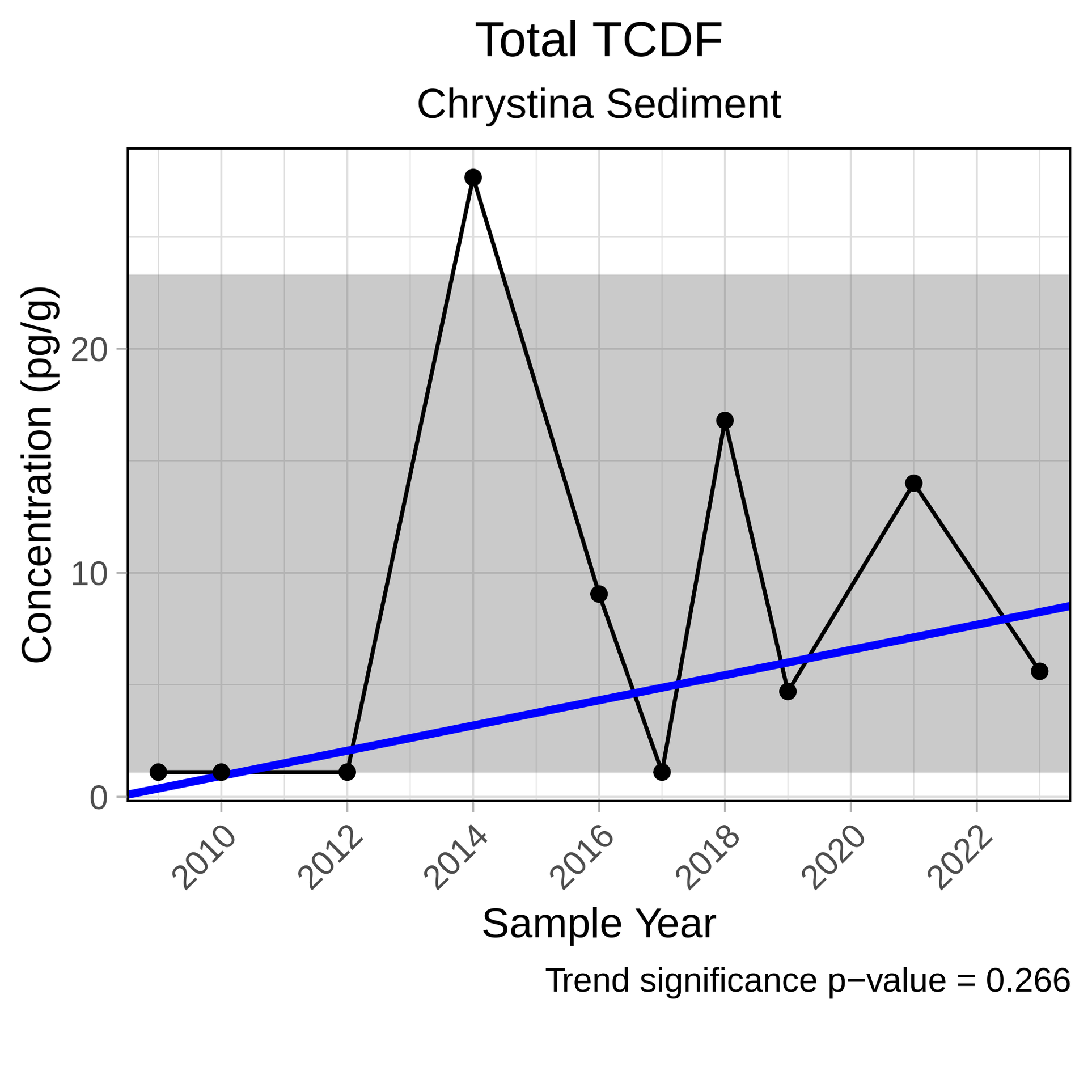

Total NonaCB
Chrystina Sediment
Concentration (pg/g)
75
50
25
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

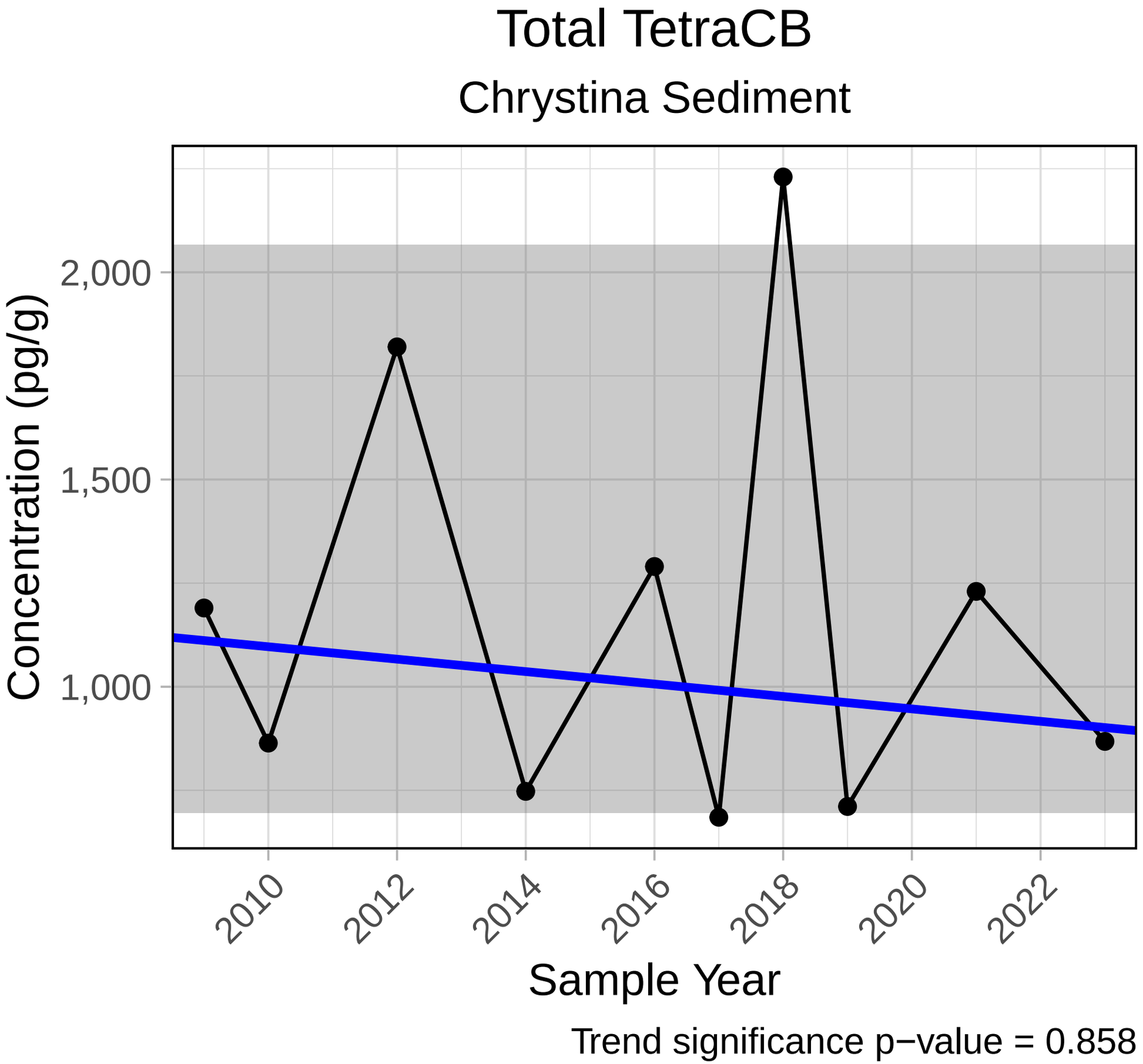

Total OctaCB
Chrystina Sediment
600
400
200
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

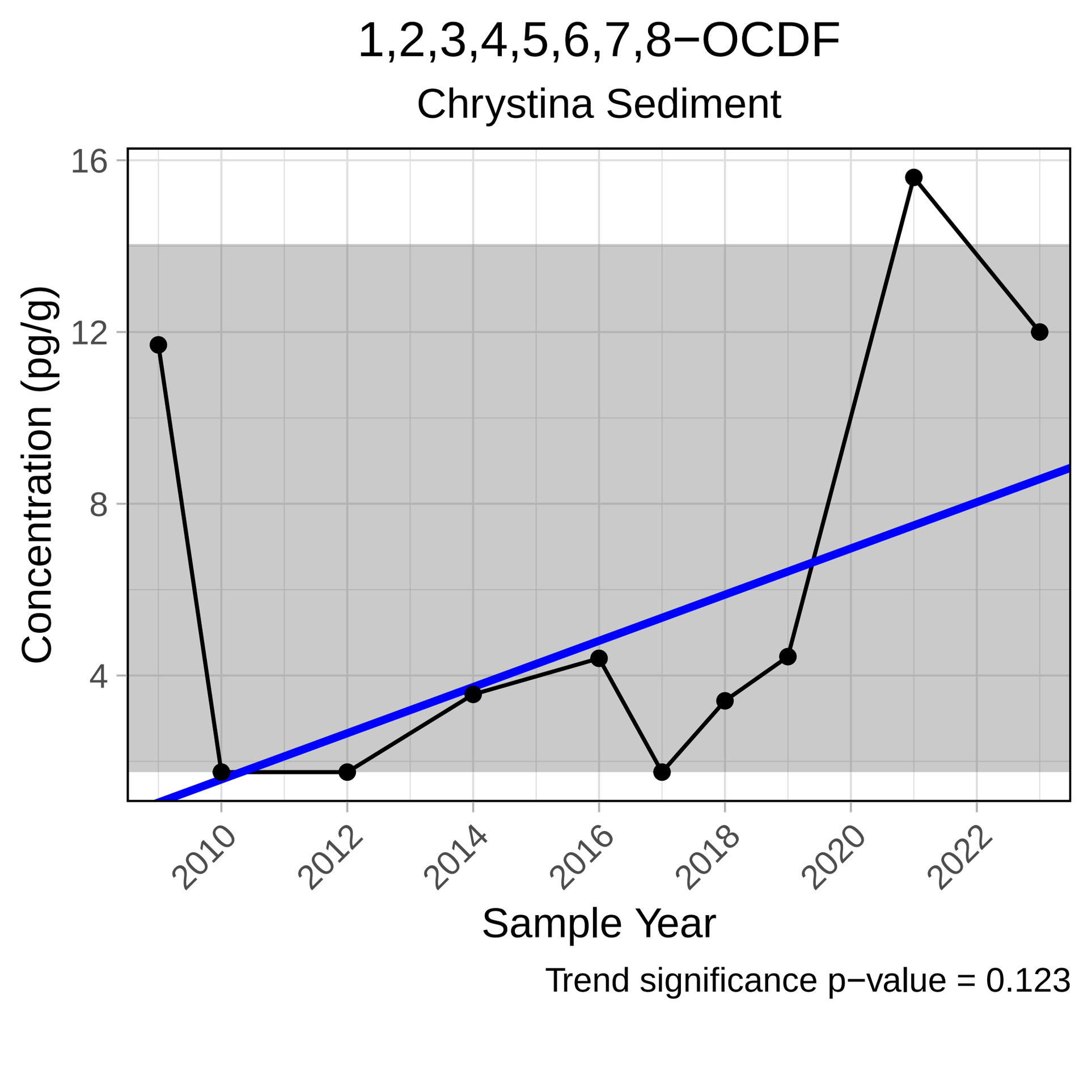

Total PeCDD
Chrystina Sediment
Concentration (pg/g)
2.0
1.5
1.0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.76

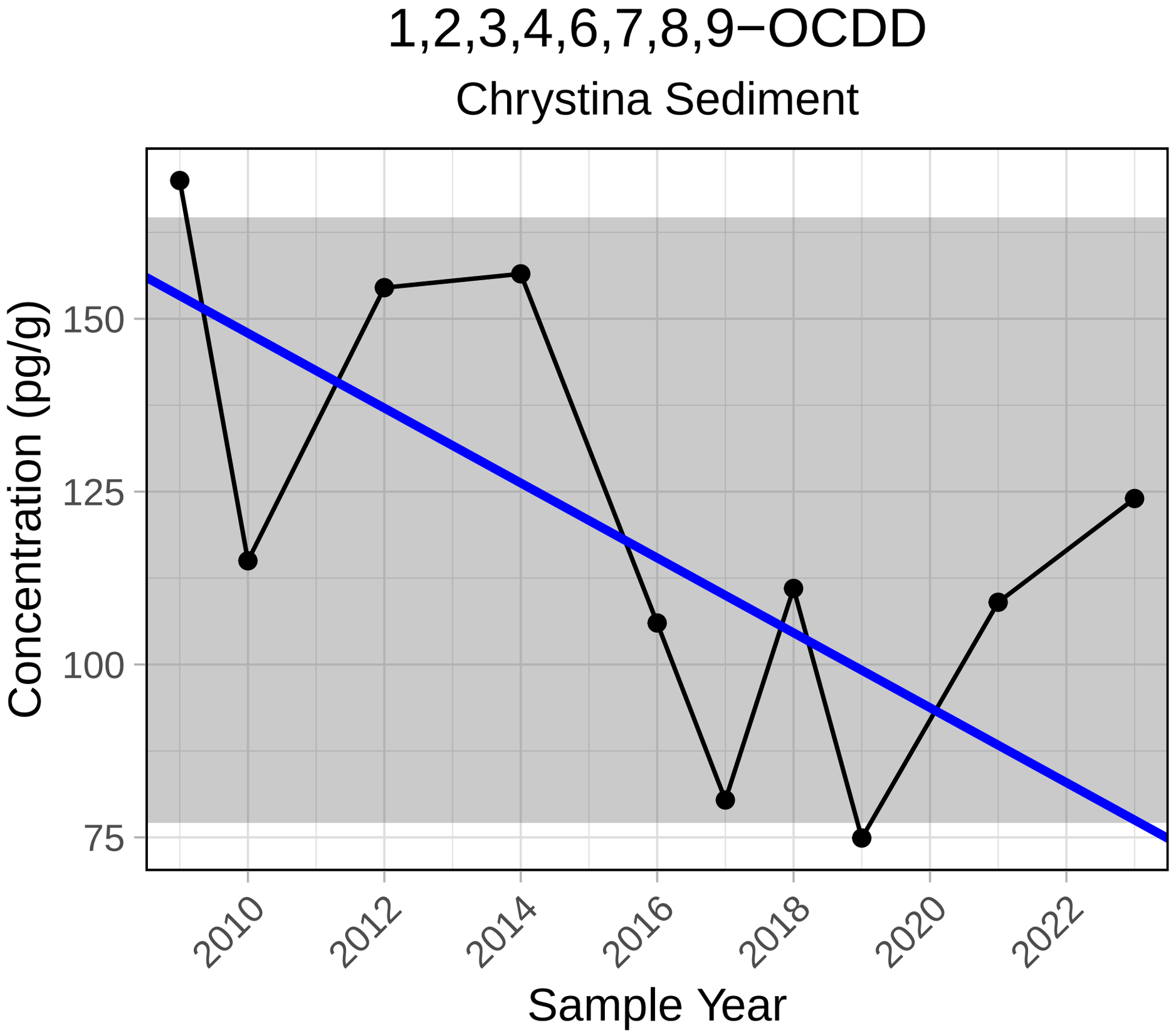

Total PeCDF
Chrystina Sediment
Concentration (pg/g)
20
15
10
5
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.194


Total PentaCB
Chrystina Sediment
Concentration (pg/g)
3,500
3,000
2,500
2,000
1,500
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

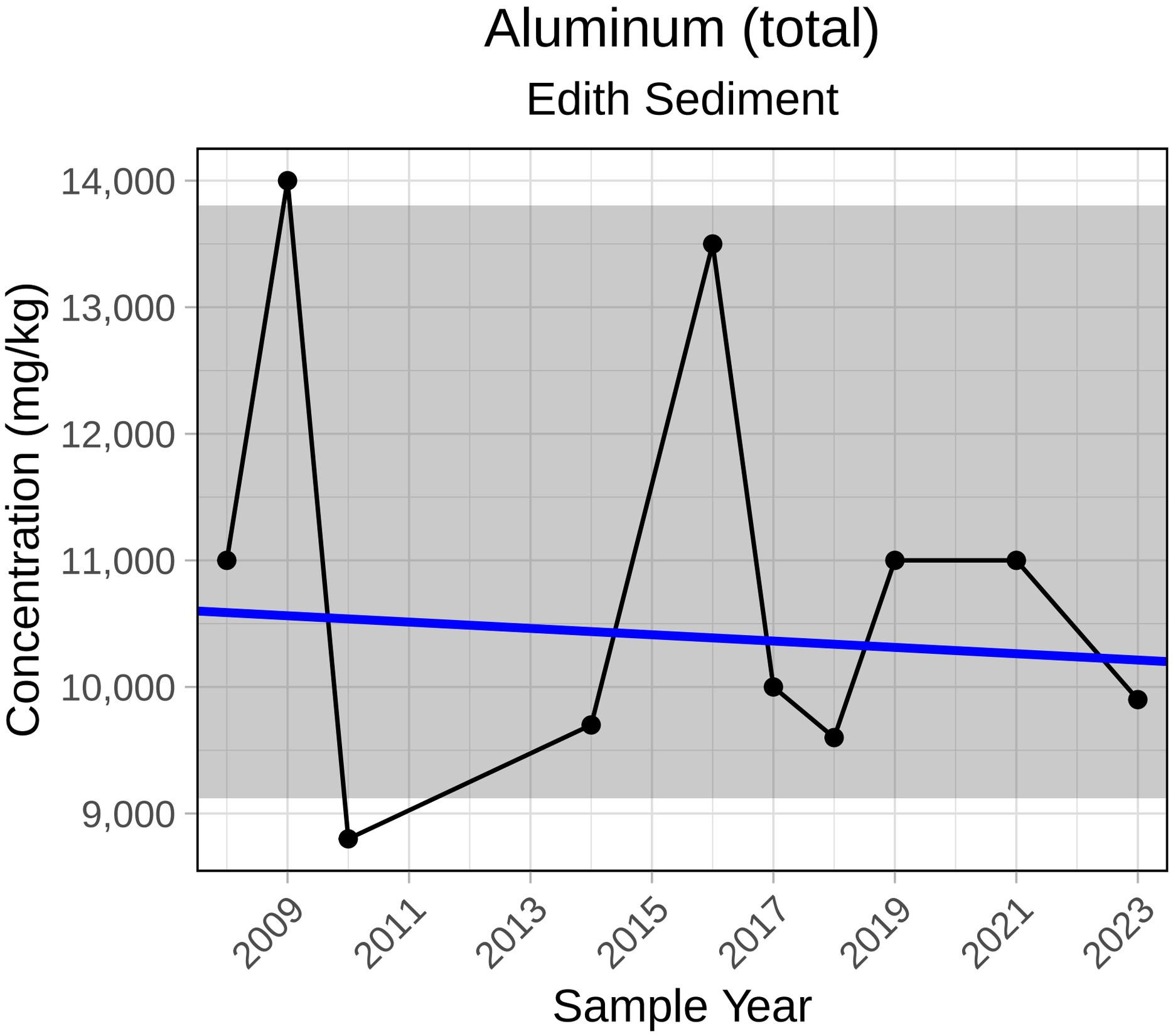

Total TCDF
Chrystina Sediment
Concentration (pg/g)
0
10
20
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.266

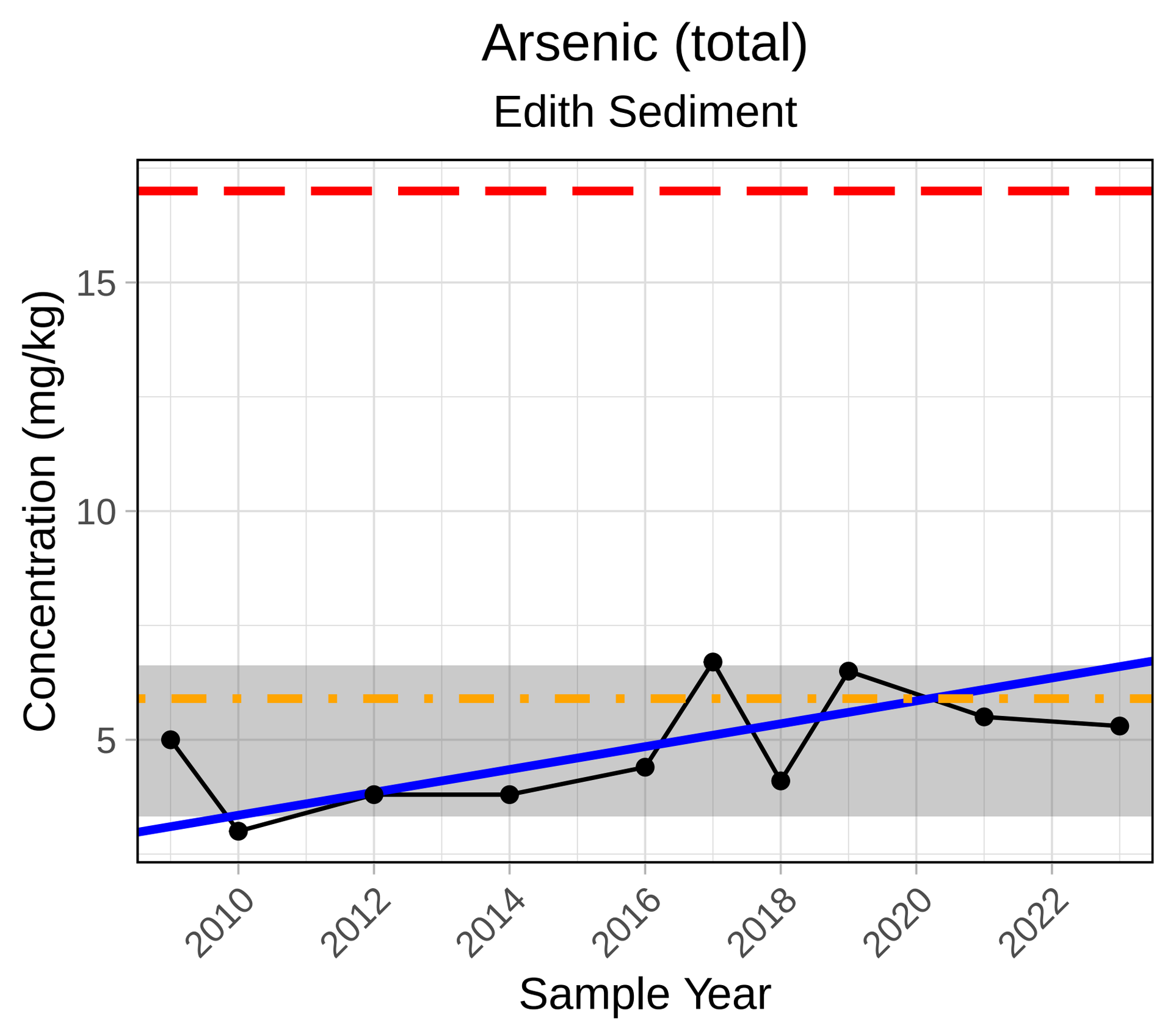

Total TetraCB
Chrystina Sediment
Concentration (pg/g)
2,000
1,500
1,000
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

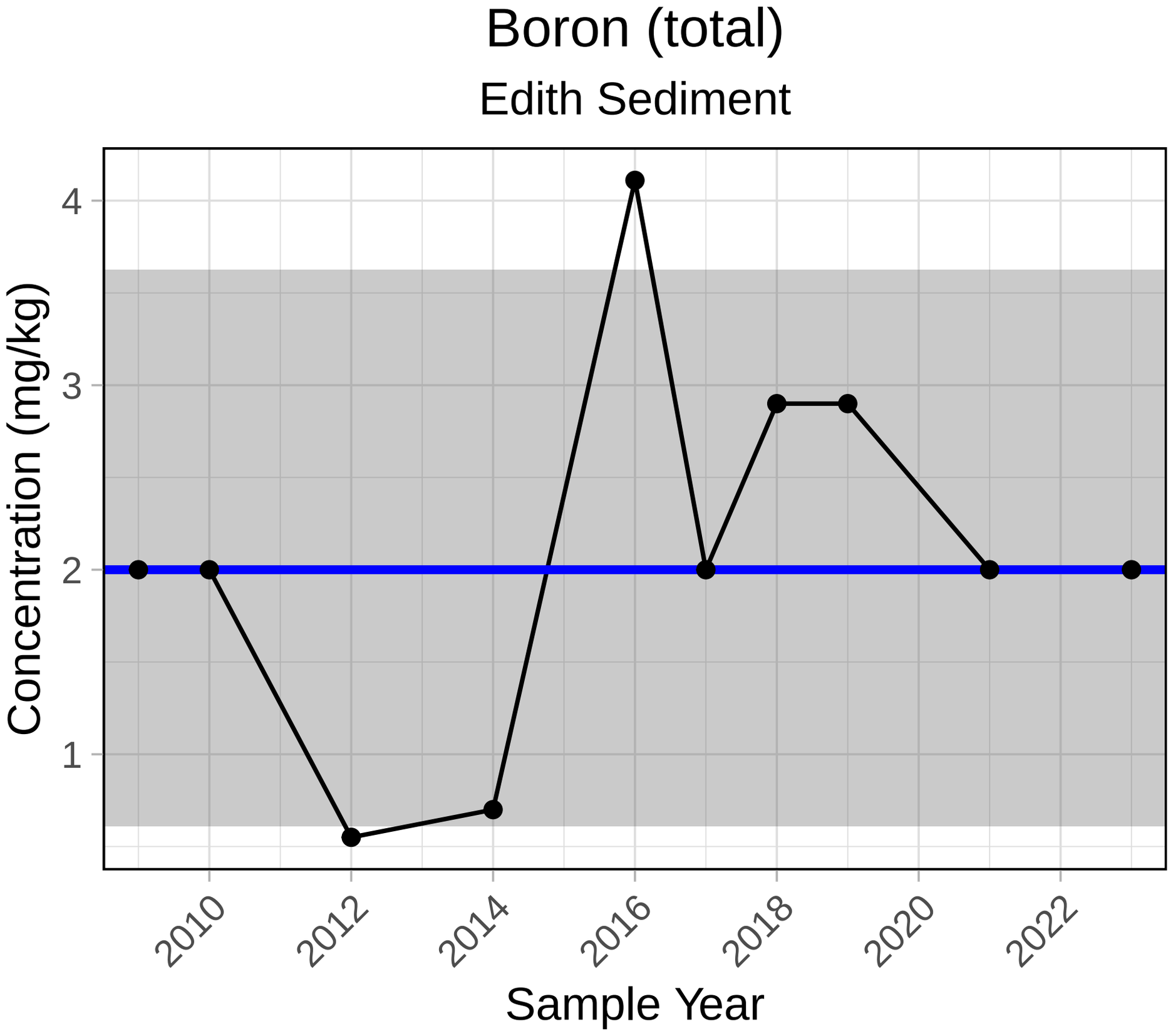

1,2,3,4,5,6,7,8−OCDF
Chrystina Sediment
16
12
8
4
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.123

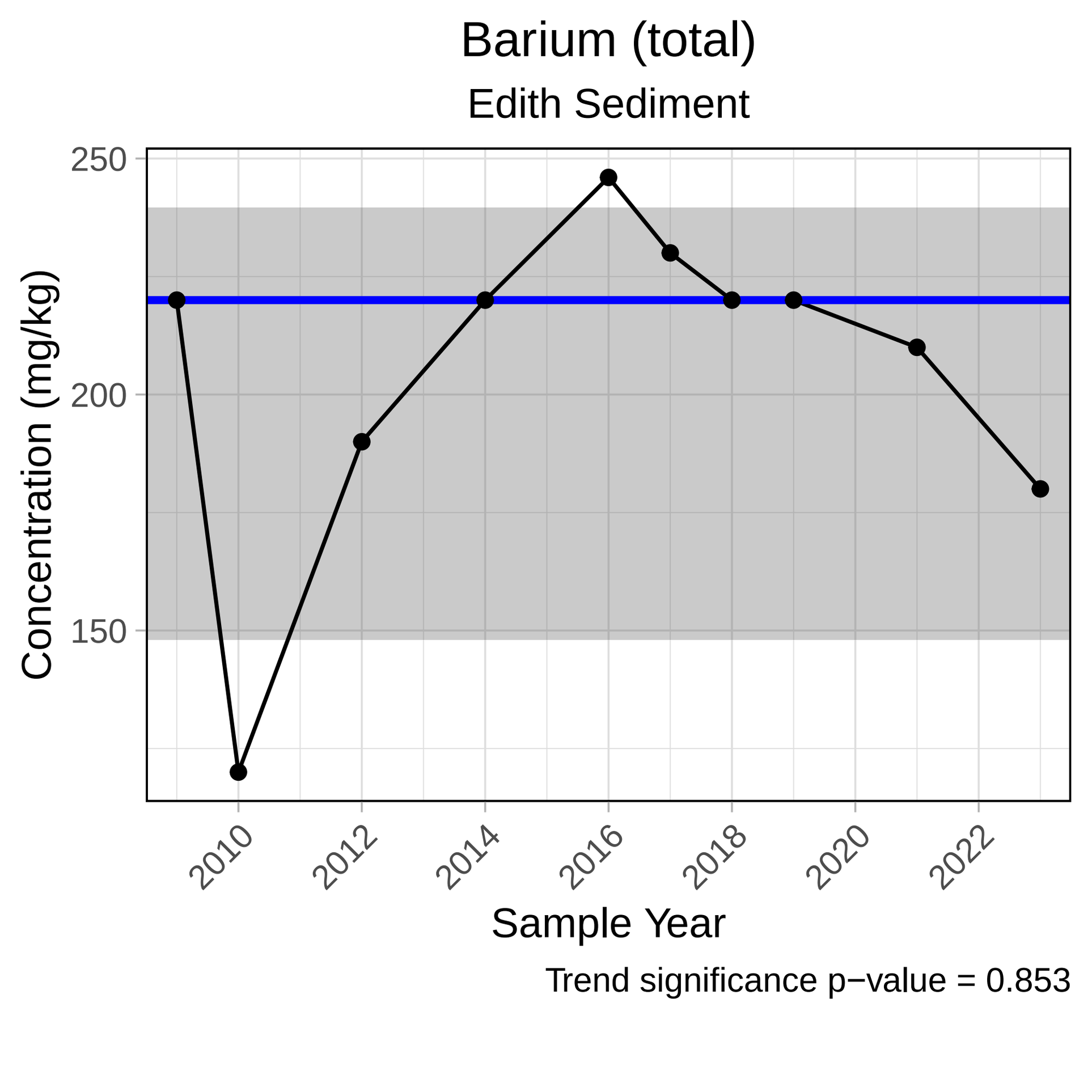


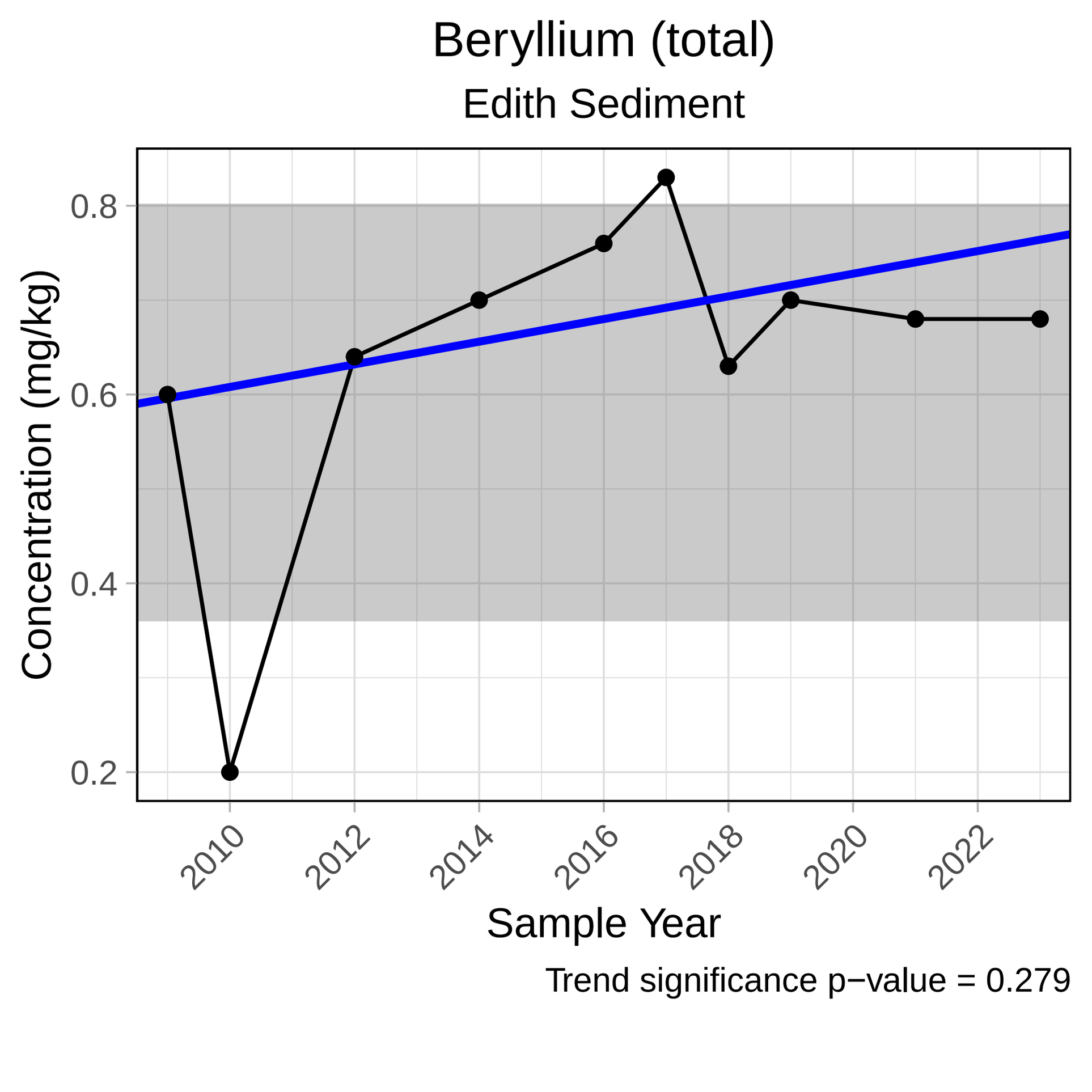
Trend significance p−value = 0.152

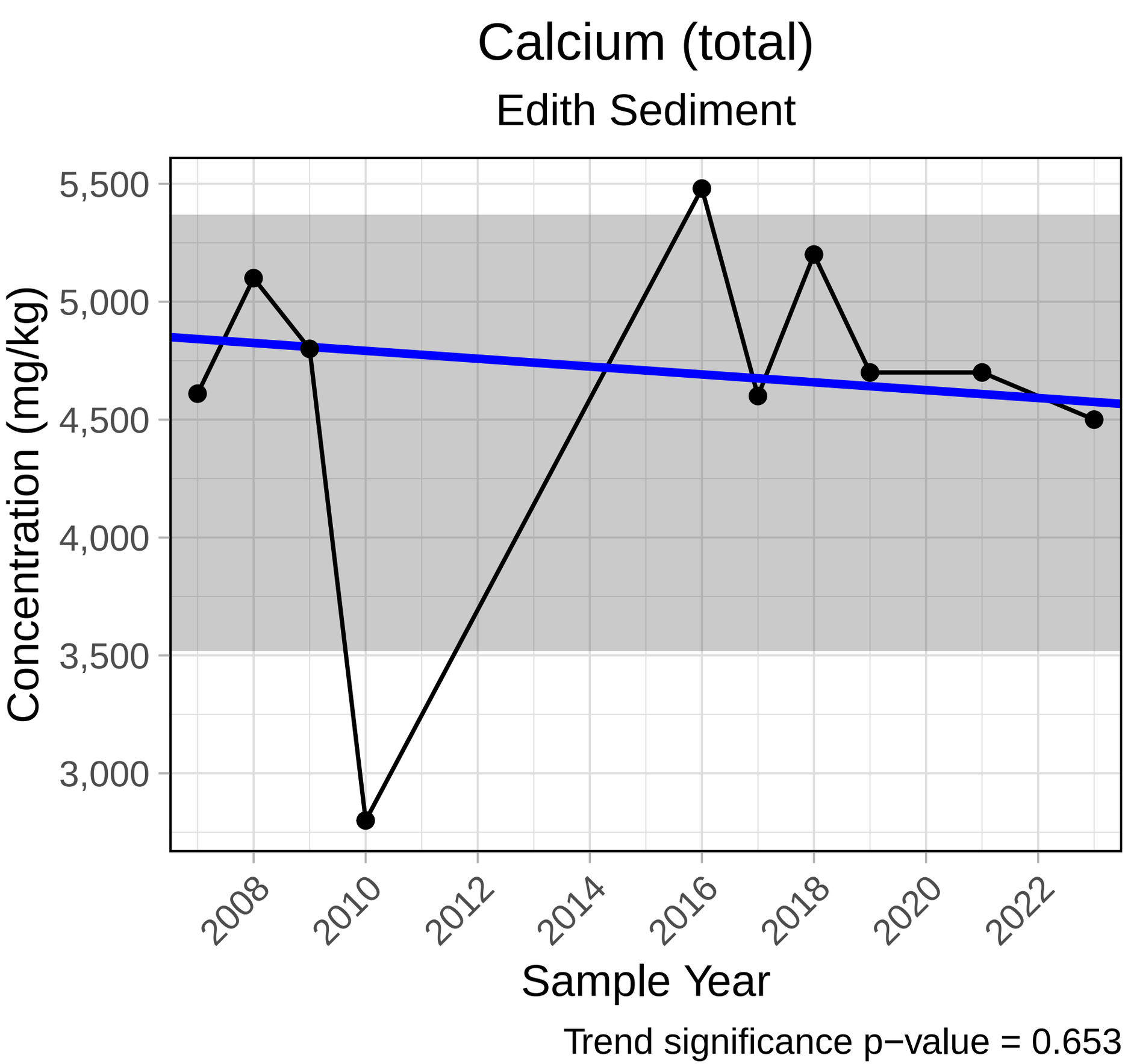

Aluminum (total)
Edith Sediment
Concentration (mg/kg)
14,000
13,000
12,000
11,000
10,000
9,000
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.785

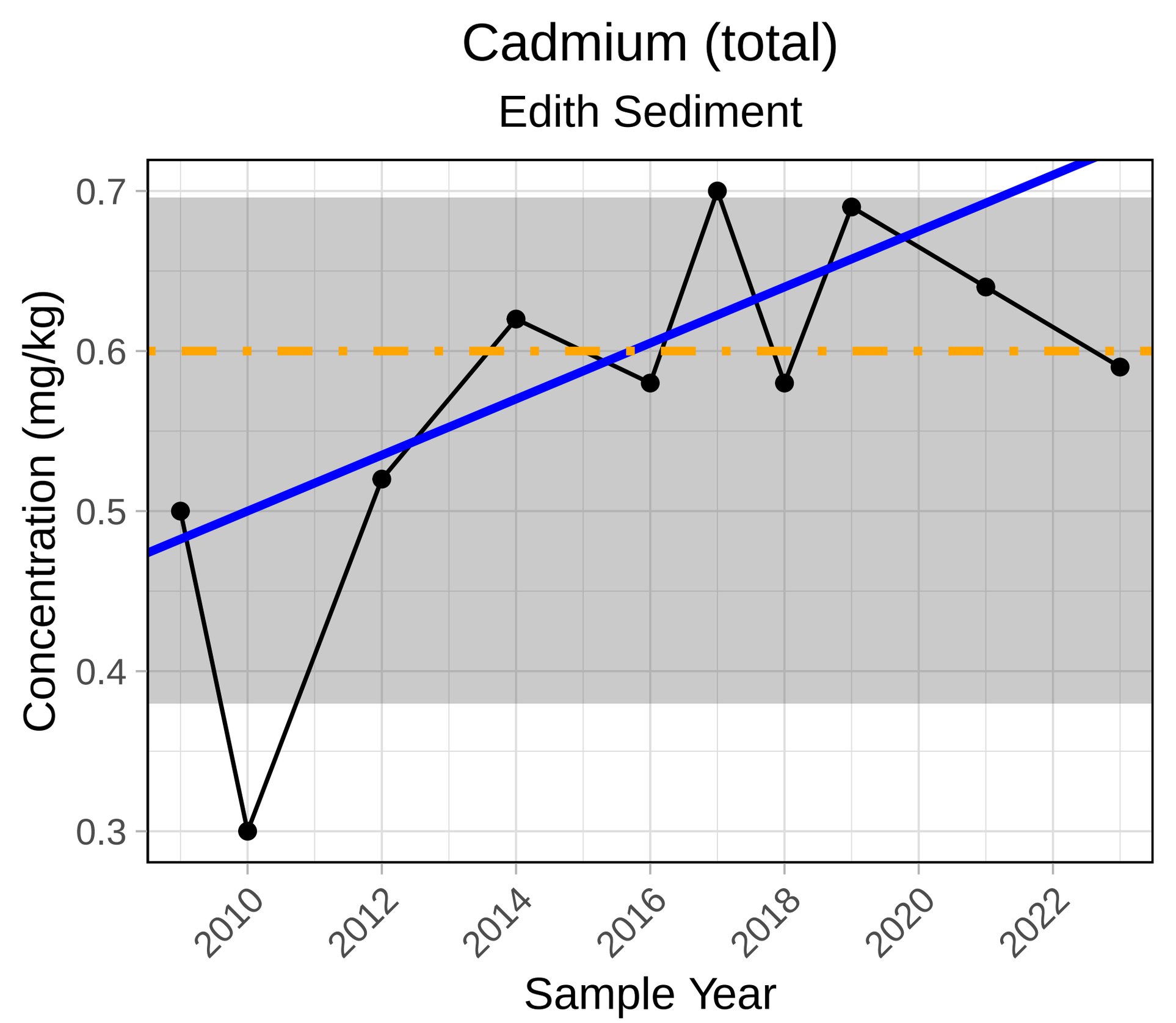

Arsenic (total)
Edith Sediment
Concentration (mg/kg)
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.127
ISQG level = 5.9 mg/kg (maximum)
PEL level = 17 mg/kg (maximum)


Boron (total)
Edith Sediment
Concentration (mg/kg)
4
3
2
1
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.499

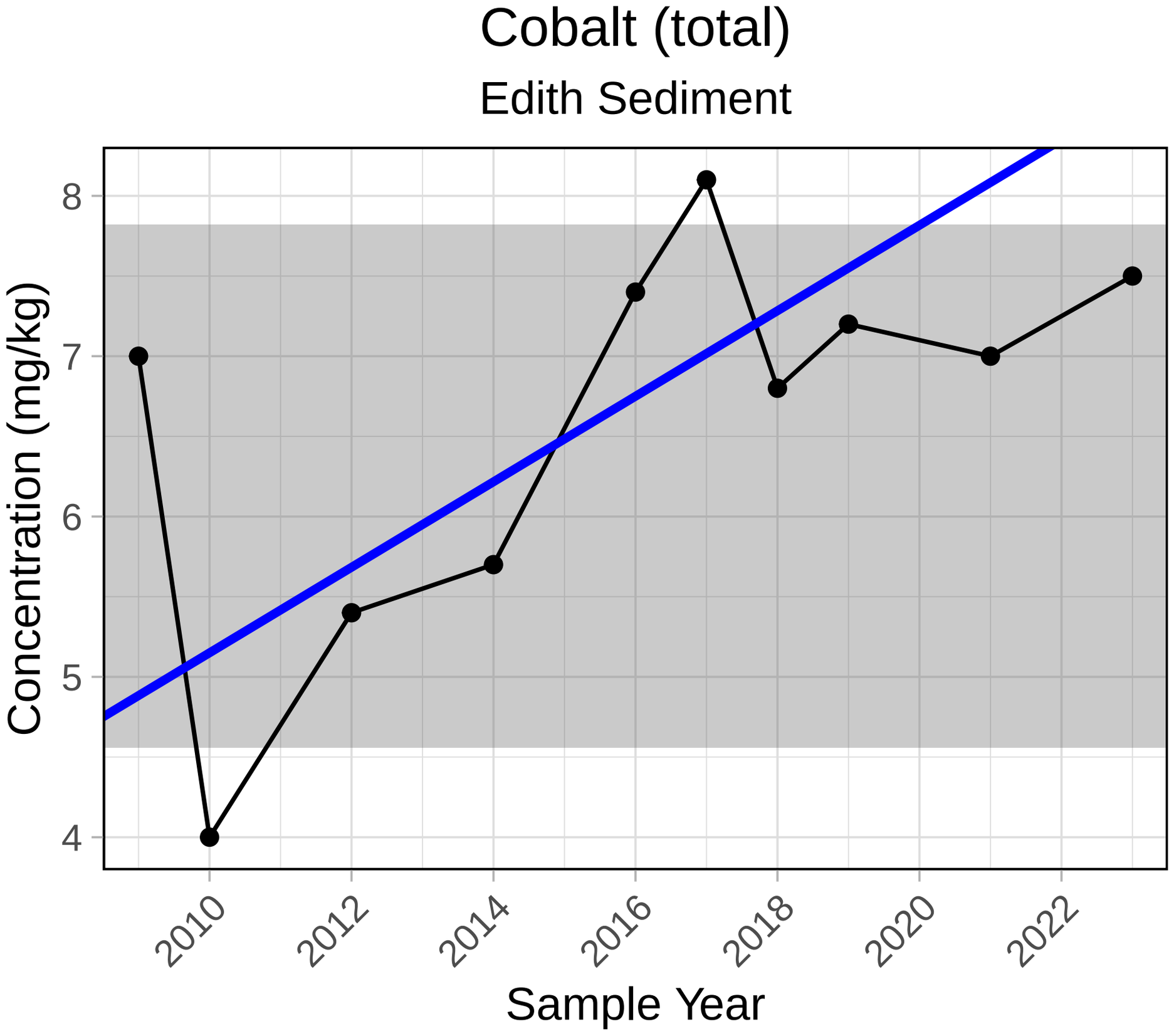

Barium (total)
Edith Sediment
250
200
150
Concentration (mg/kg)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.853


Beryllium (total)
Edith Sediment
Concentration (mg/kg)
0.8
0.6
0.4
0.2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.279


Calcium (total)
Edith Sediment
5,500
5,000
4,500
4,000
3,500
3,000
Concentration (mg/kg)
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.653

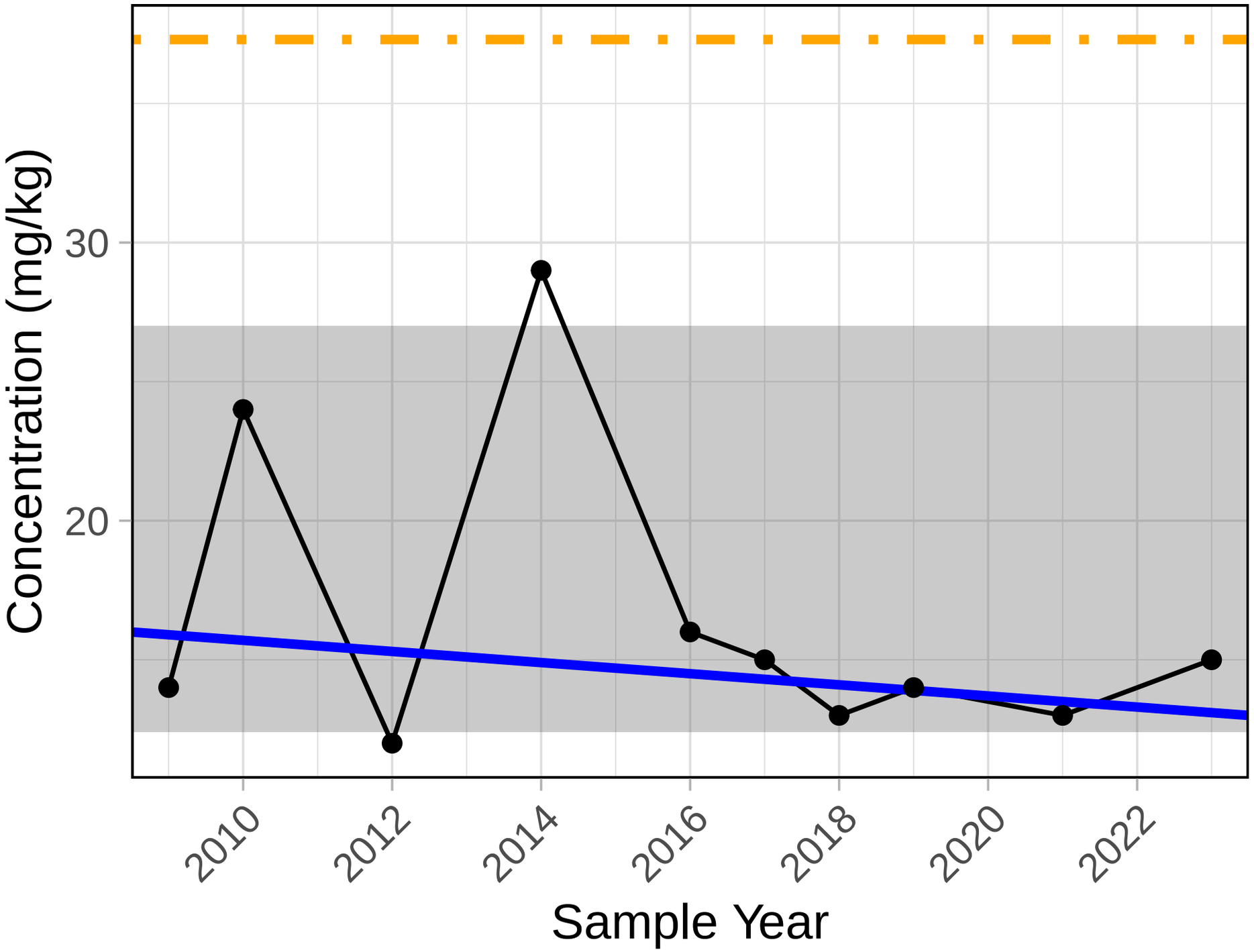


Trend significance p−value = 0.059
ISQG level = 0.6 mg/kg (maximum)
PEL level = 3.5 mg/kg (maximum)

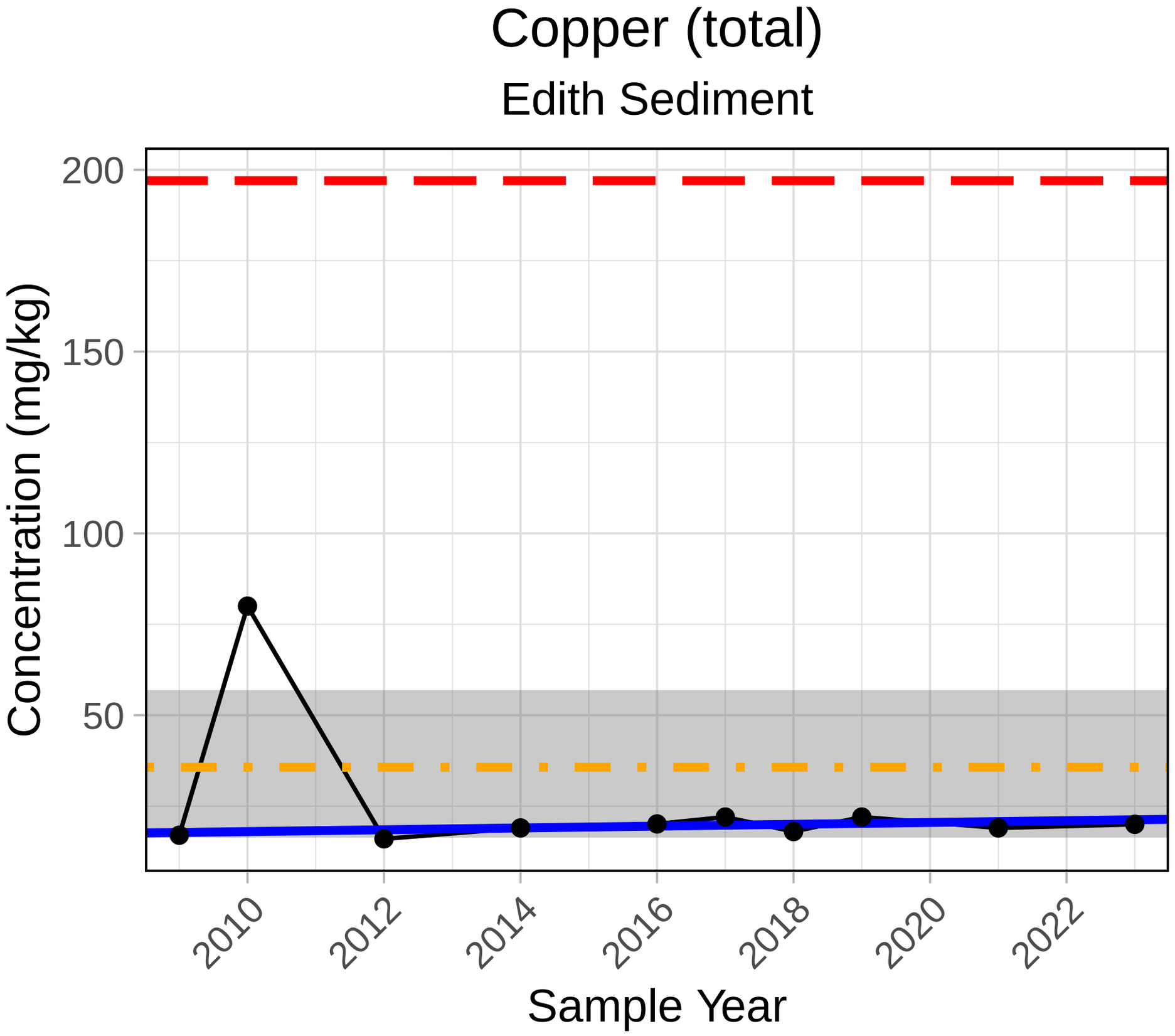

Cobalt (total)
Edith Sediment
Concentration (mg/kg)
8
7
6
5
4
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.088

Chromium (total)

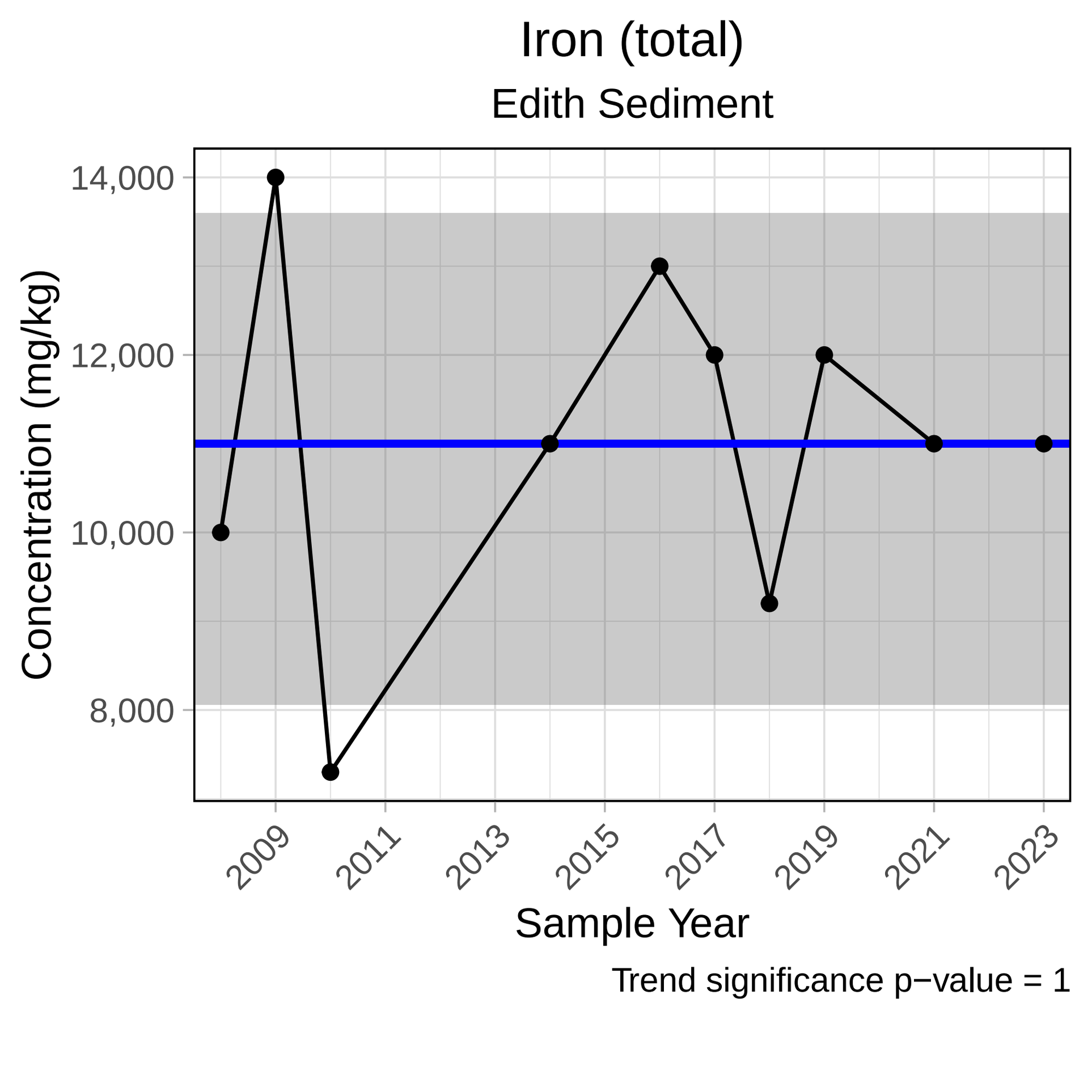
Edith Sediment



Trend significance p−value = 0.526
ISQG level = 37.3 mg/kg (maximum)
PEL level = 90 mg/kg (maximum)

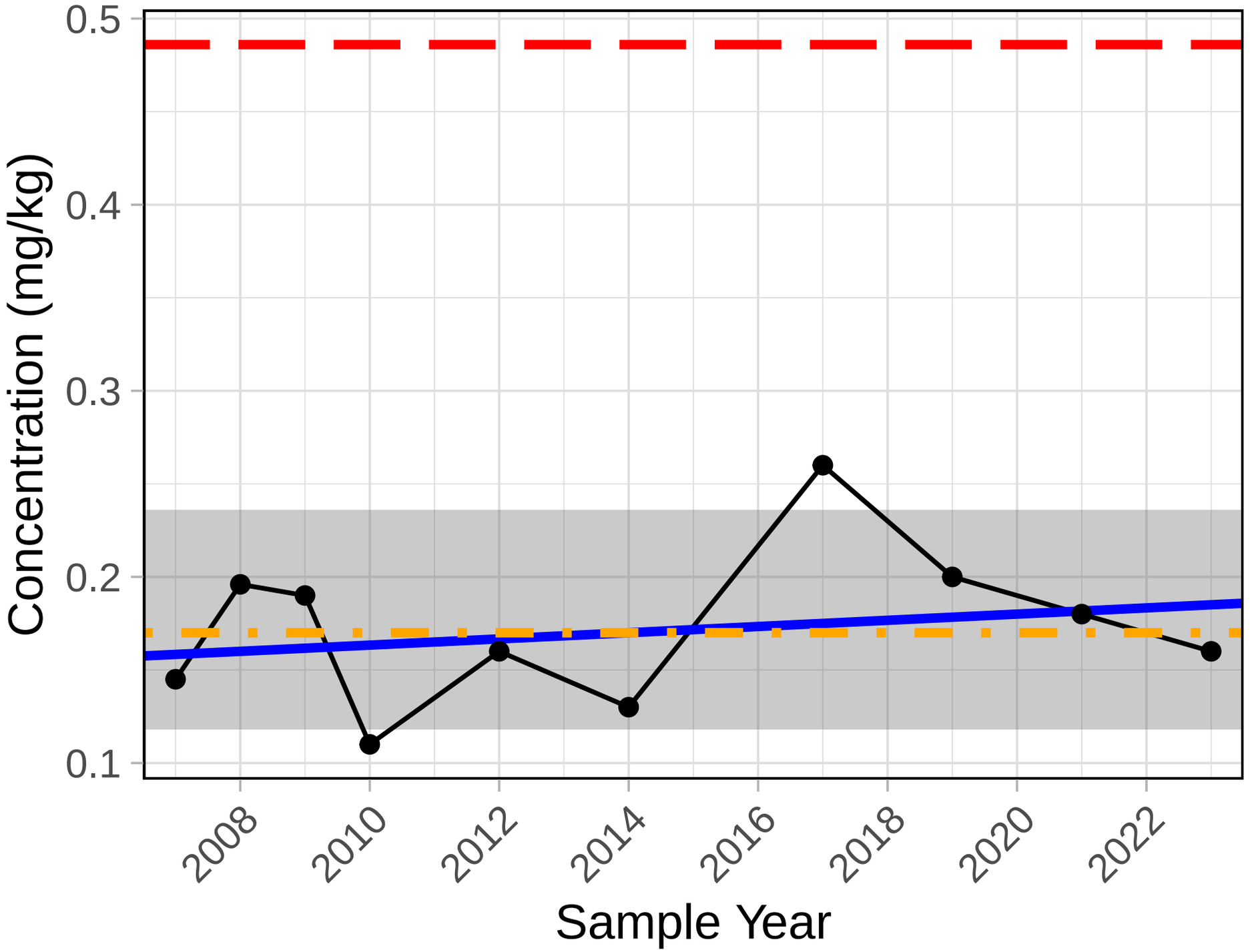


Trend significance p−value = 0.589
ISQG level = 35.7 mg/kg (maximum)
PEL level = 197 mg/kg (maximum)

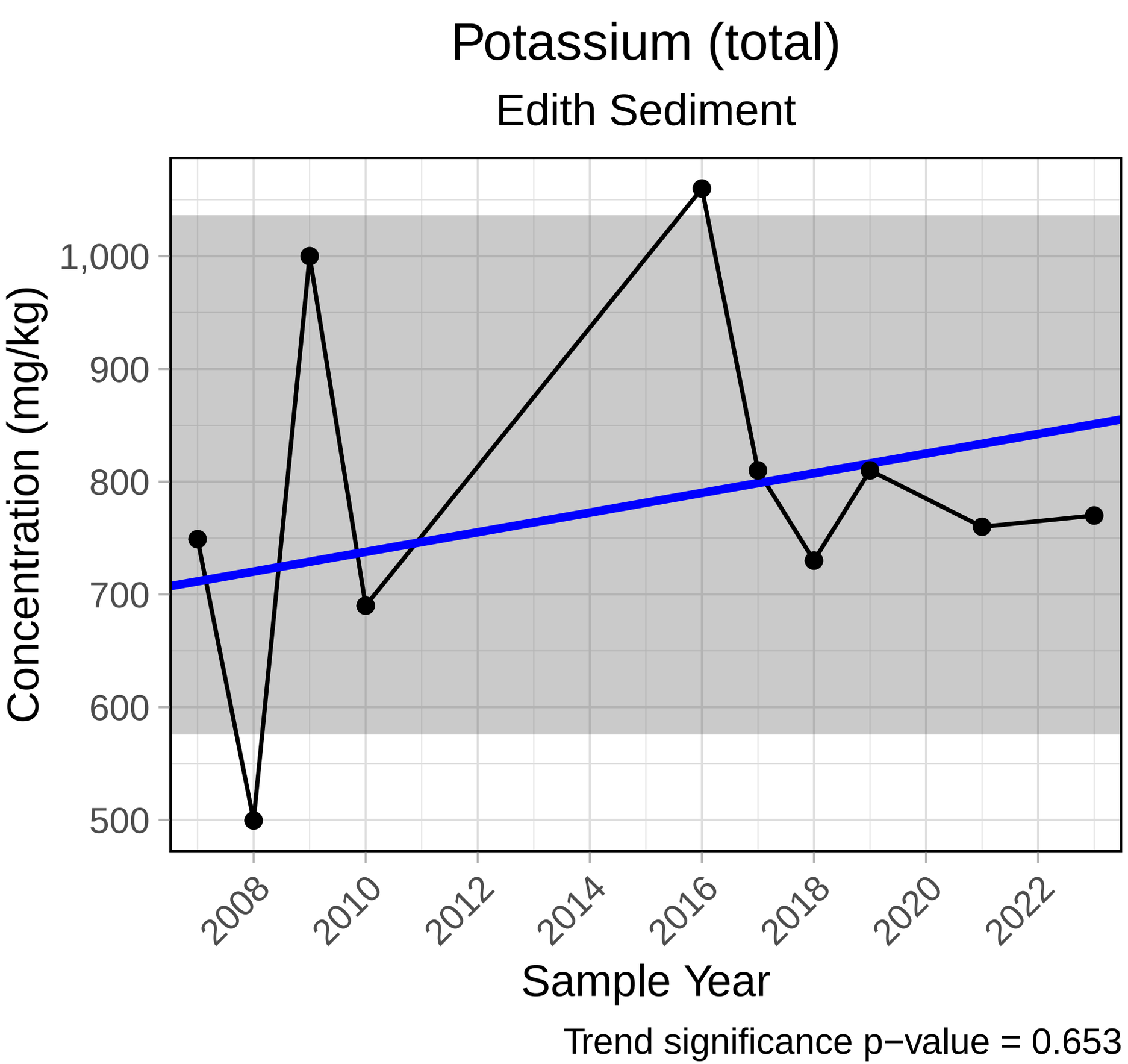

Iron (total)
Edith Sediment
14,000
12,000
10,000
8,000
Concentration (mg/kg)
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

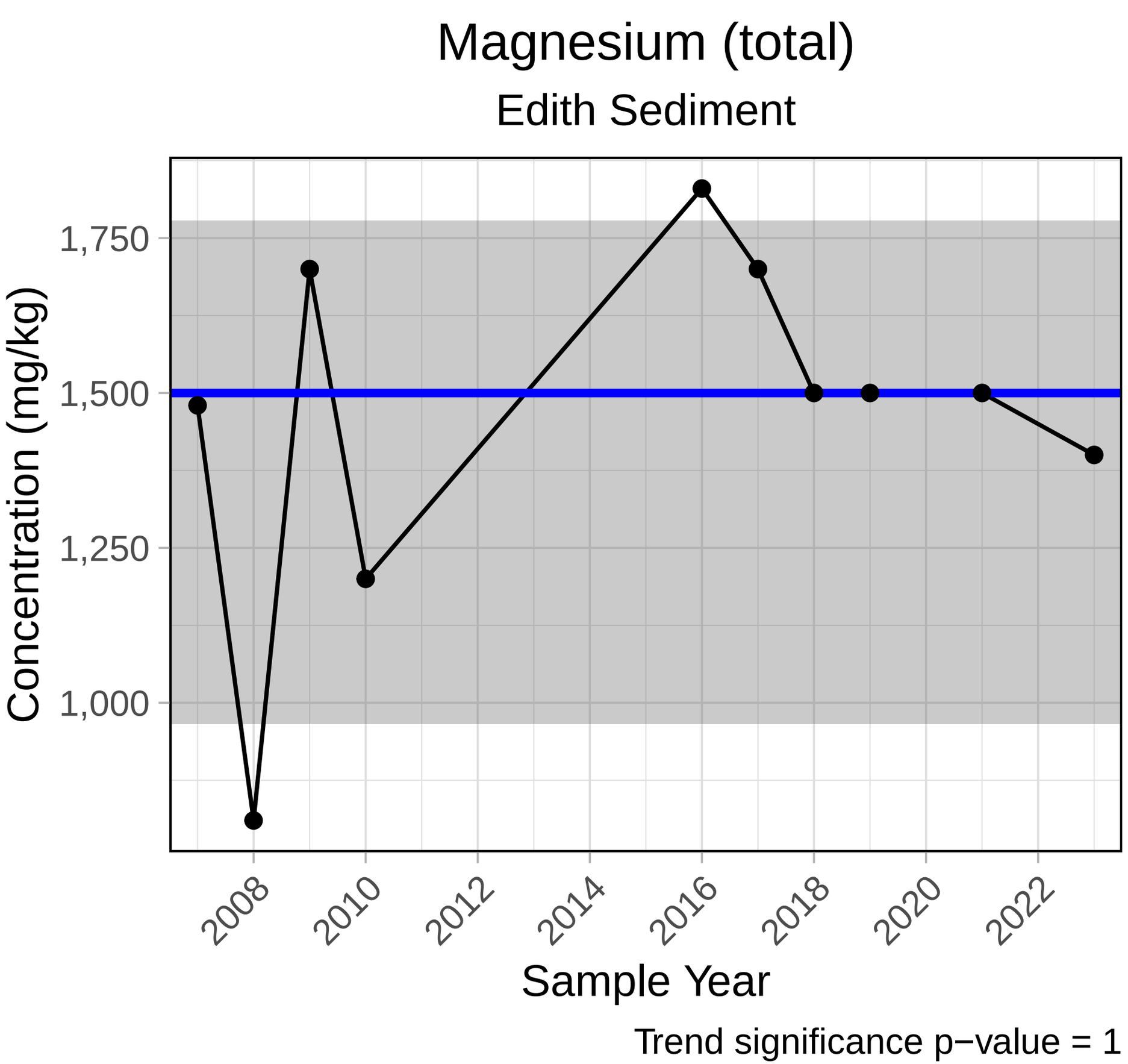
Mercury (total)

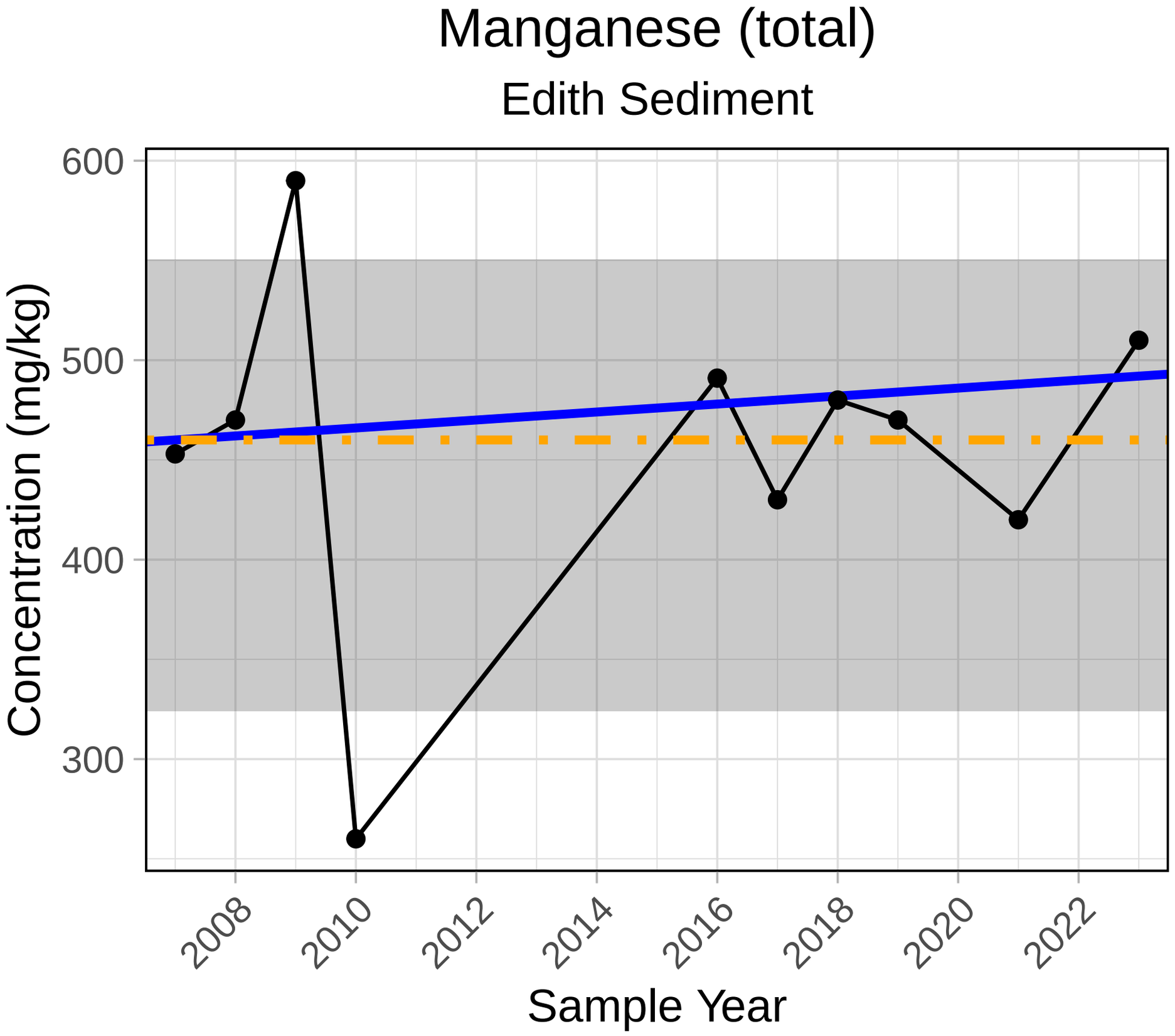
Edith Sediment

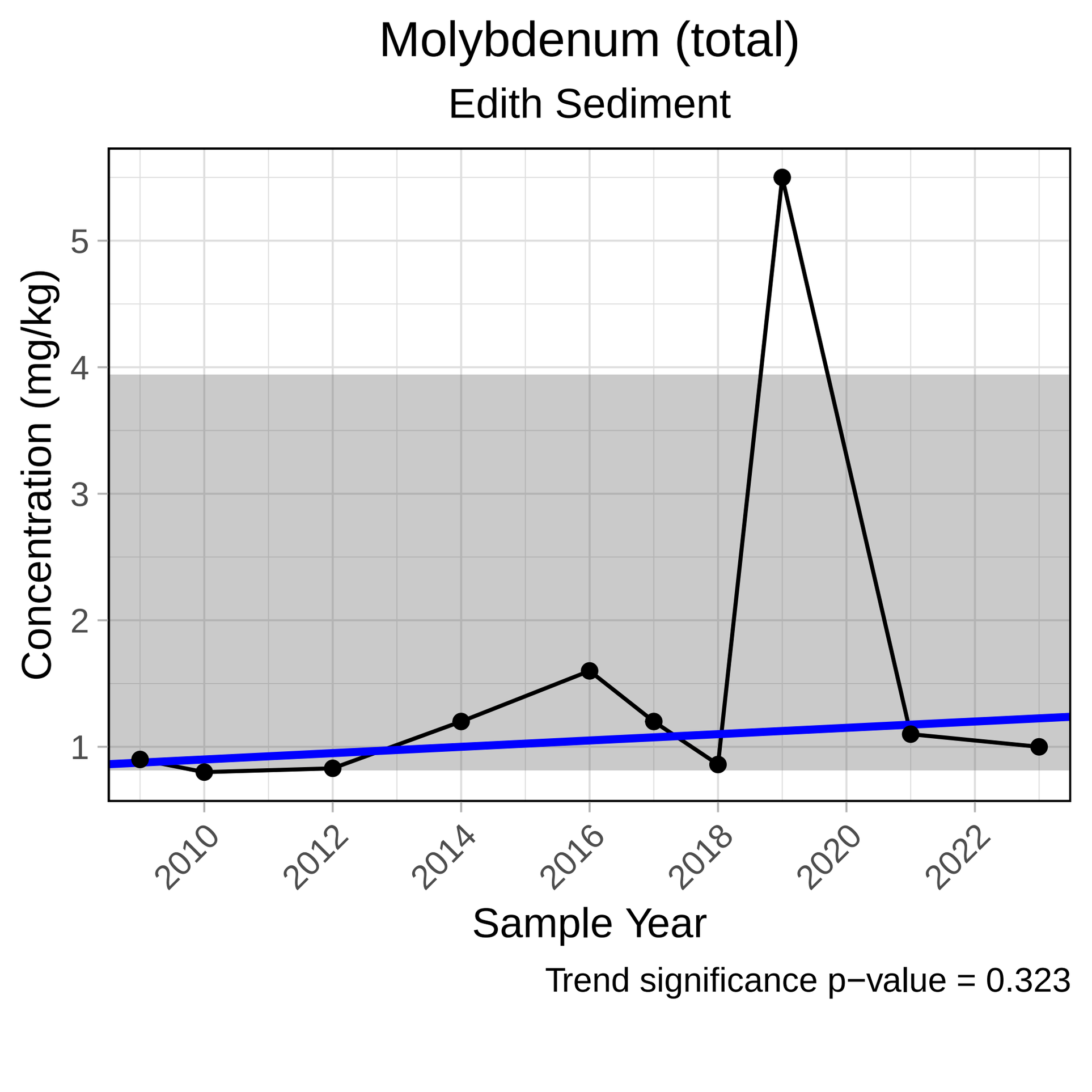


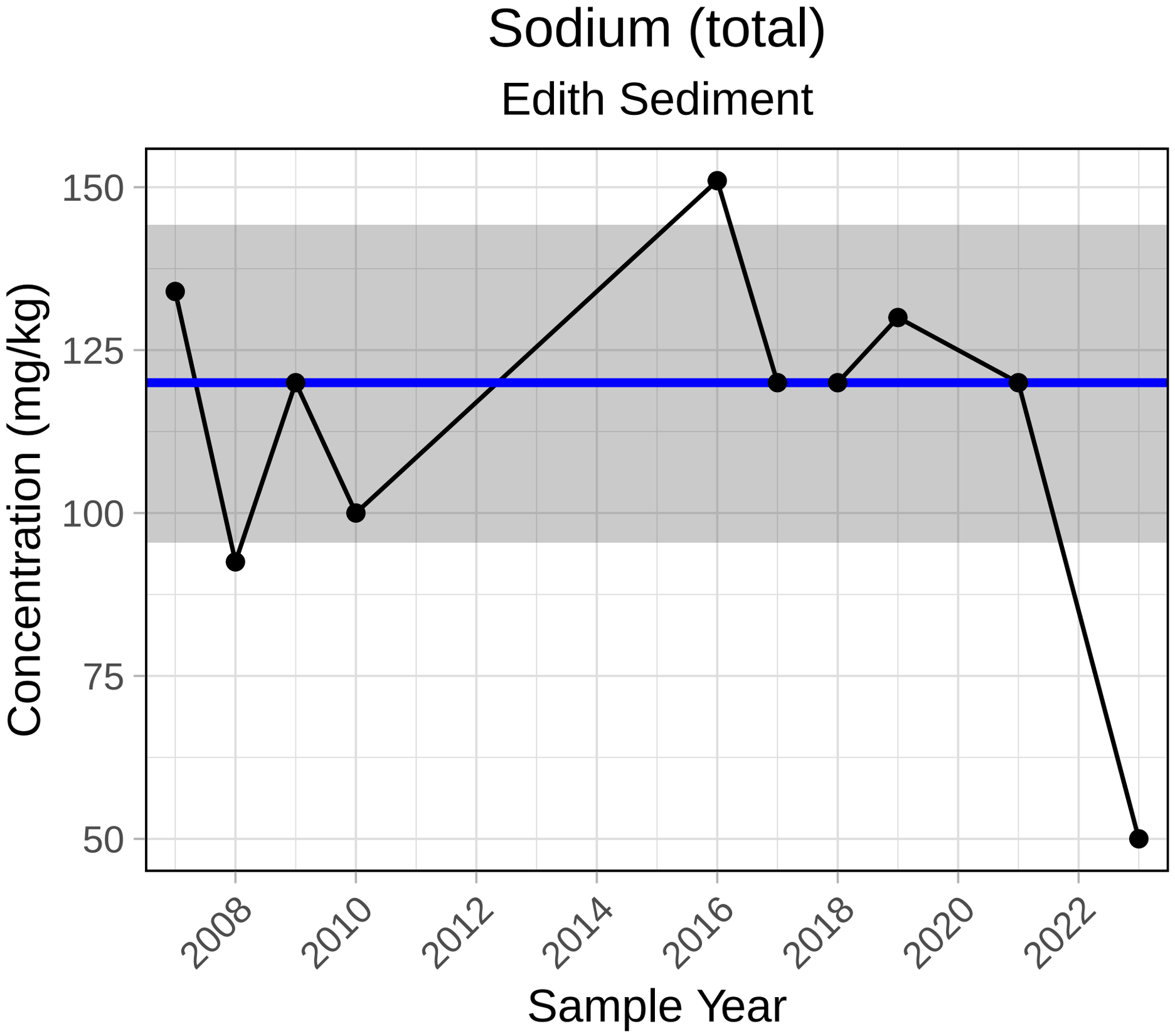
Trend significance p−value = 0.788
ISQG level = 0.17 mg/kg (maximum)
PEL level = 0.486 mg/kg (maximum)

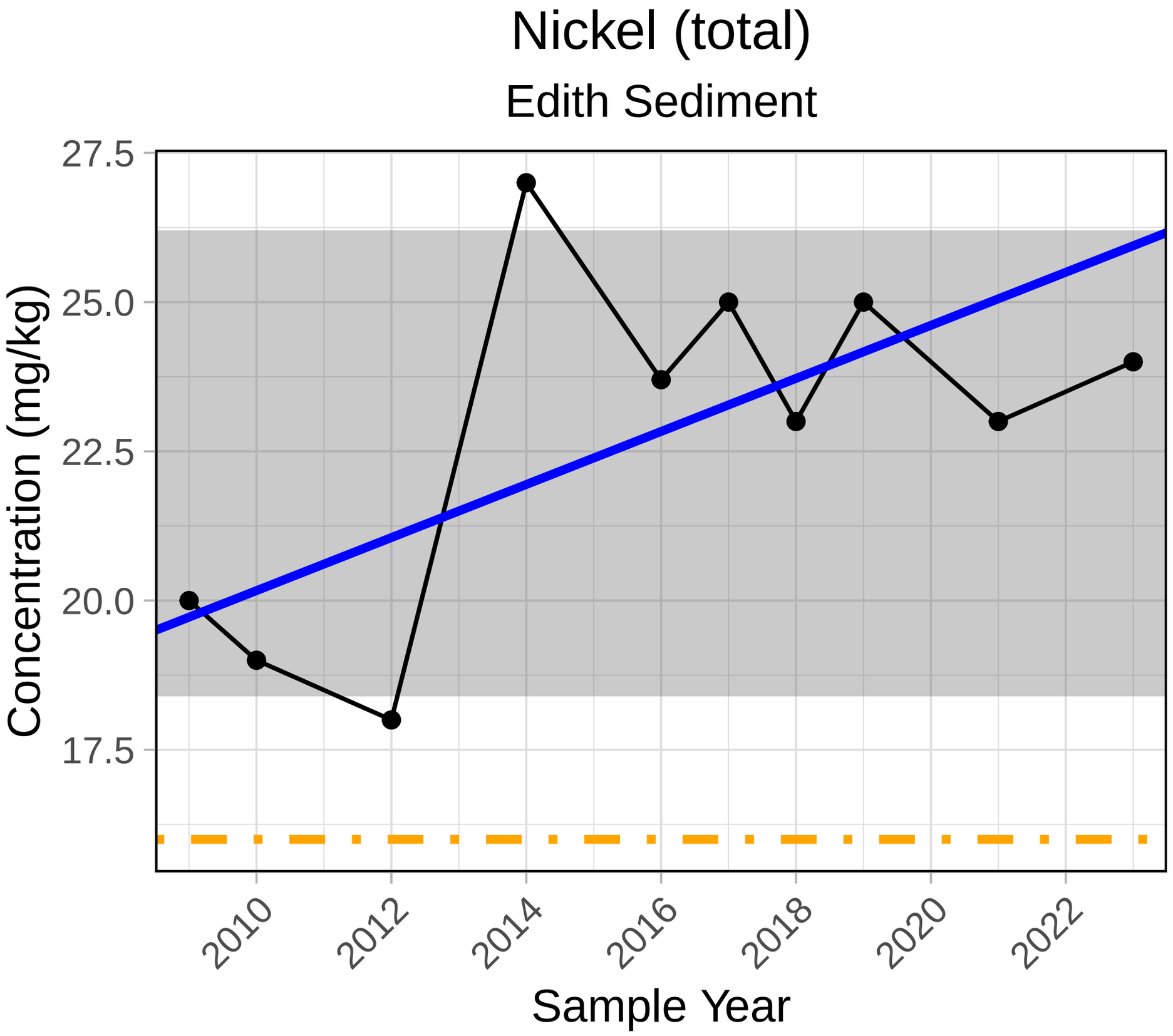

Potassium (total)
Edith Sediment
Concentration (mg/kg)
1,000
900
800
700
600
500
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.653

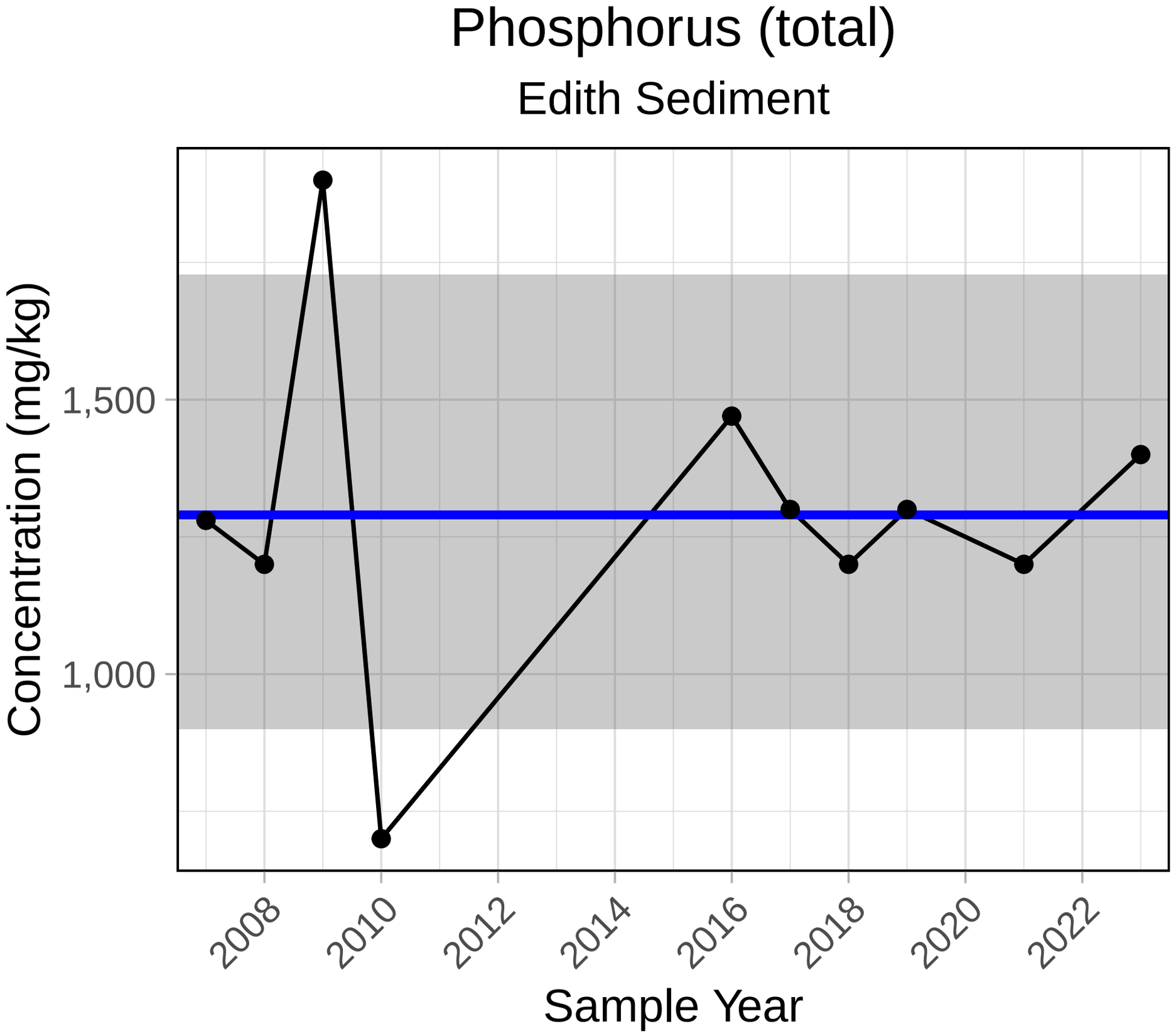

Magnesium (total)
Edith Sediment
Concentration (mg/kg)
1,750
1,500
1,250
1,000
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

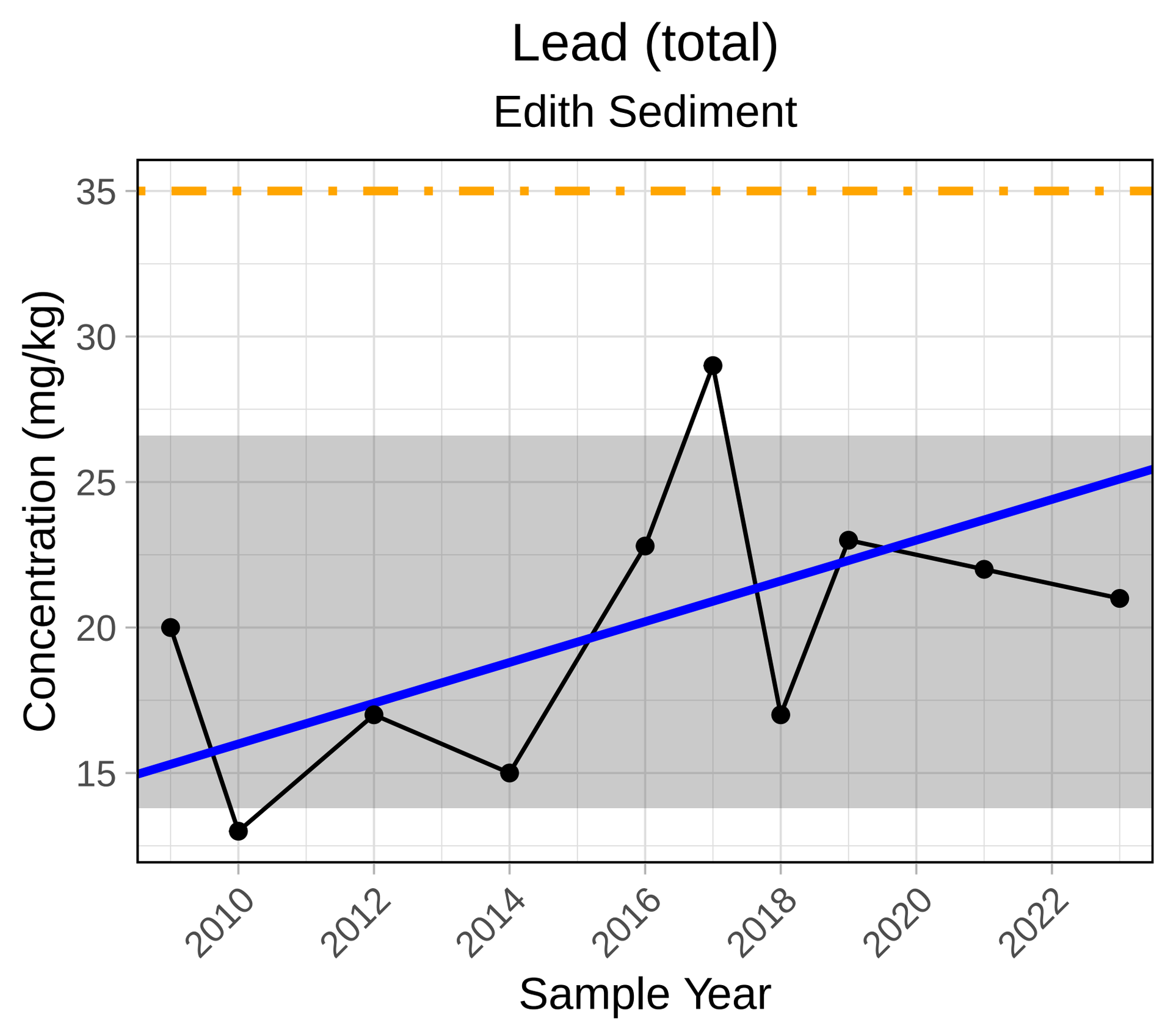

Manganese (total)
Edith Sediment
600
500
400
300
Concentration (mg/kg)
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928
ISQG level = 460 mg/kg (maximum)


Molybdenum (total)
Edith Sediment
Concentration (mg/kg)
5
4
3
2
1
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.323

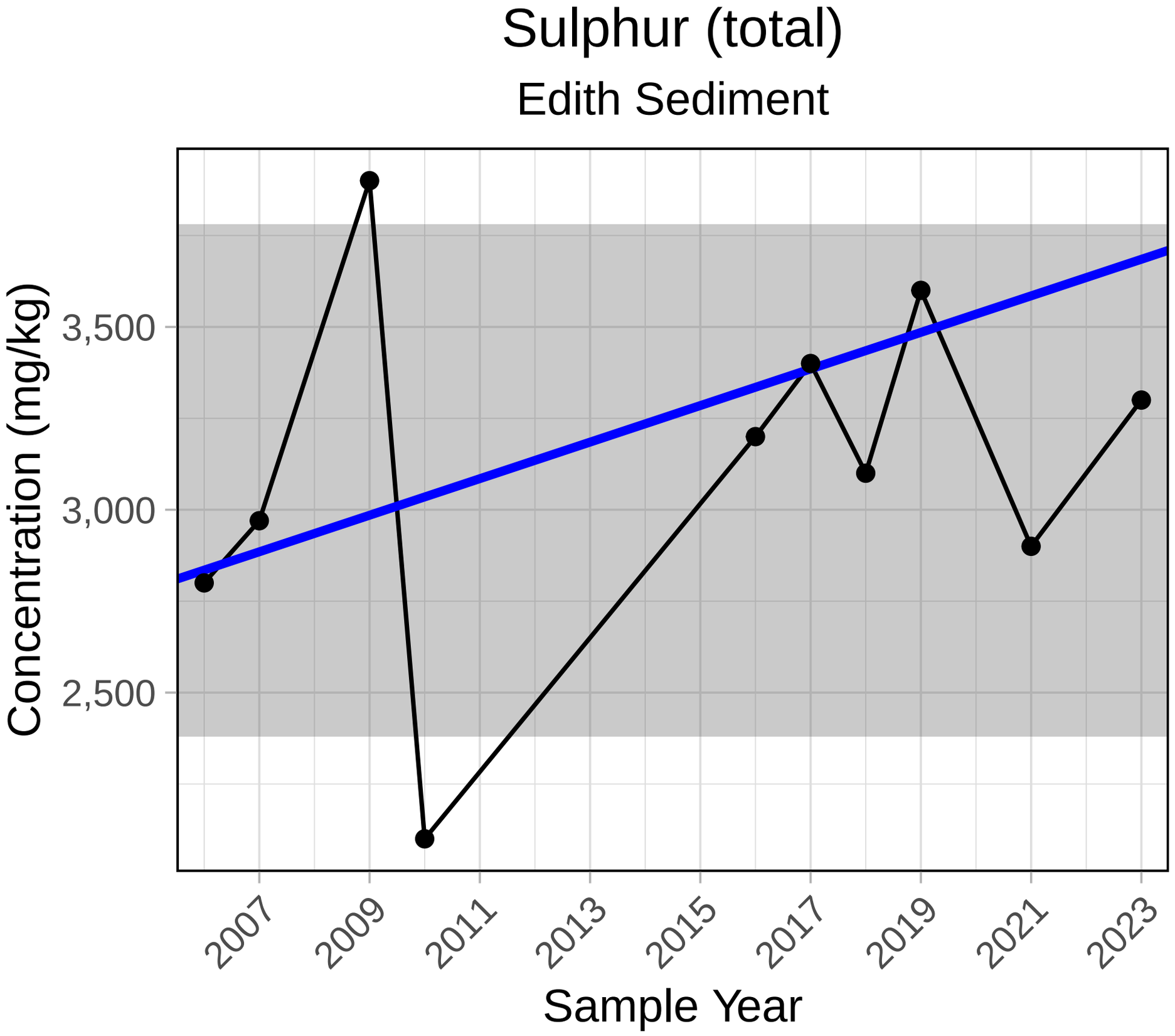

Sodium (total)
Edith Sediment
Concentration (mg/kg)
150
125
100
75
50
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.711

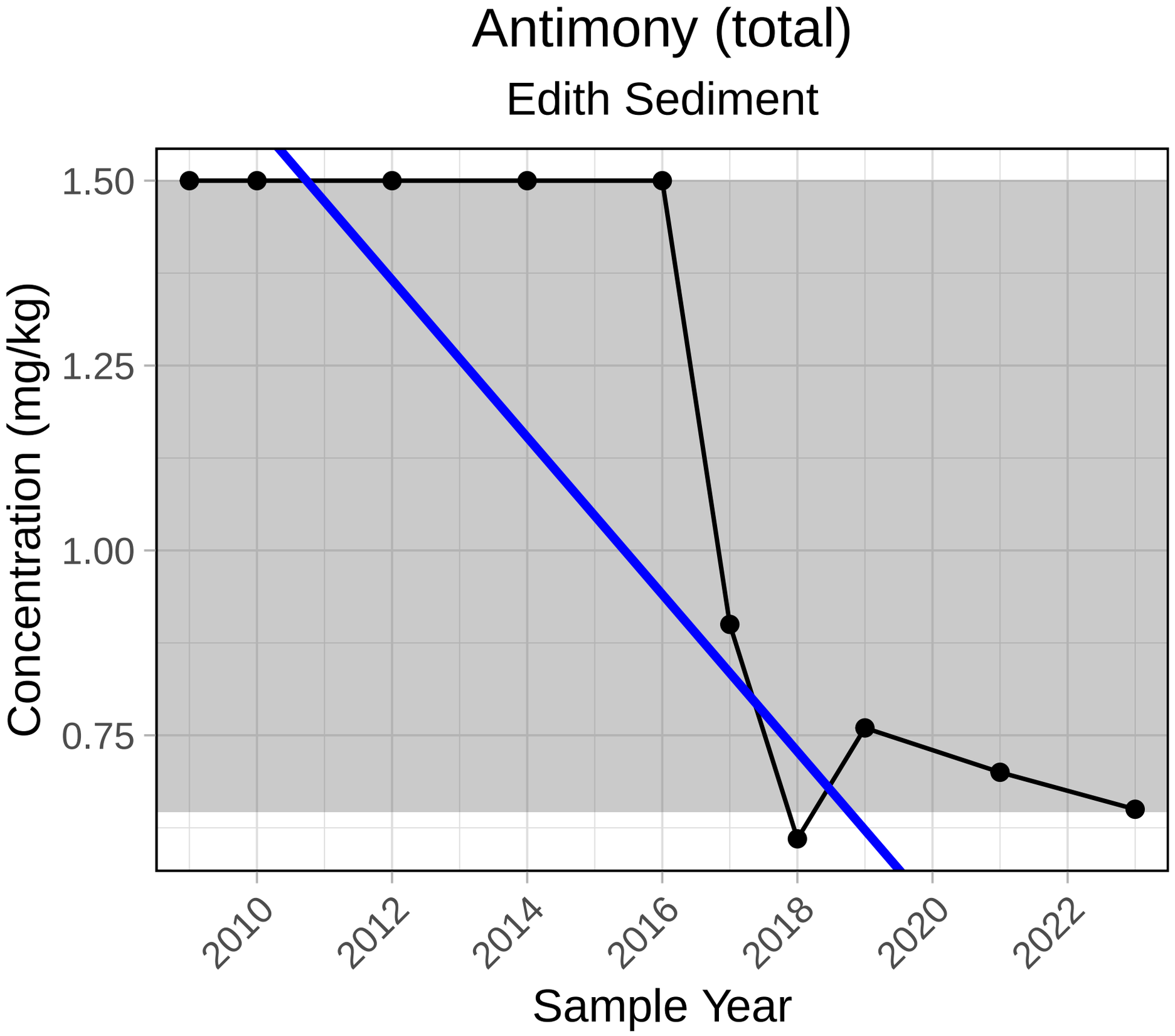

Nickel (total)
Edith Sediment
27.5
25.0
22.5
20.0
17.5
Concentration (mg/kg)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.367
ISQG level = 16 mg/kg (maximum)


Phosphorus (total)
Edith Sediment
Concentration (mg/kg)
1,500
1,000
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1



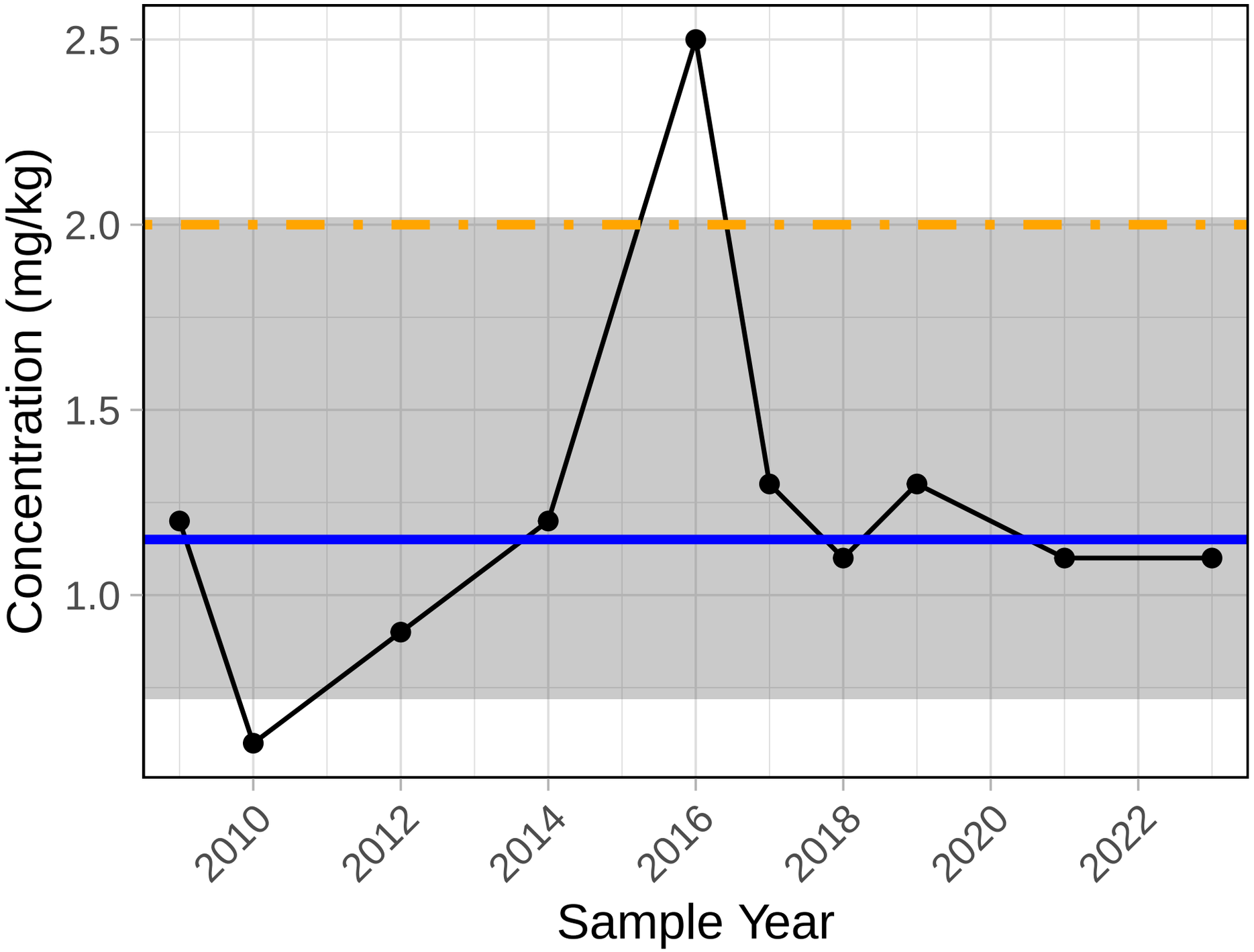
Trend significance p−value = 0.243
ISQG level = 35 mg/kg (maximum)
PEL level = 91.3 mg/kg (maximum)


Sulphur (total)
Edith Sediment
Concentration (mg/kg)
3,500
3,000
2,500
2007
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.474

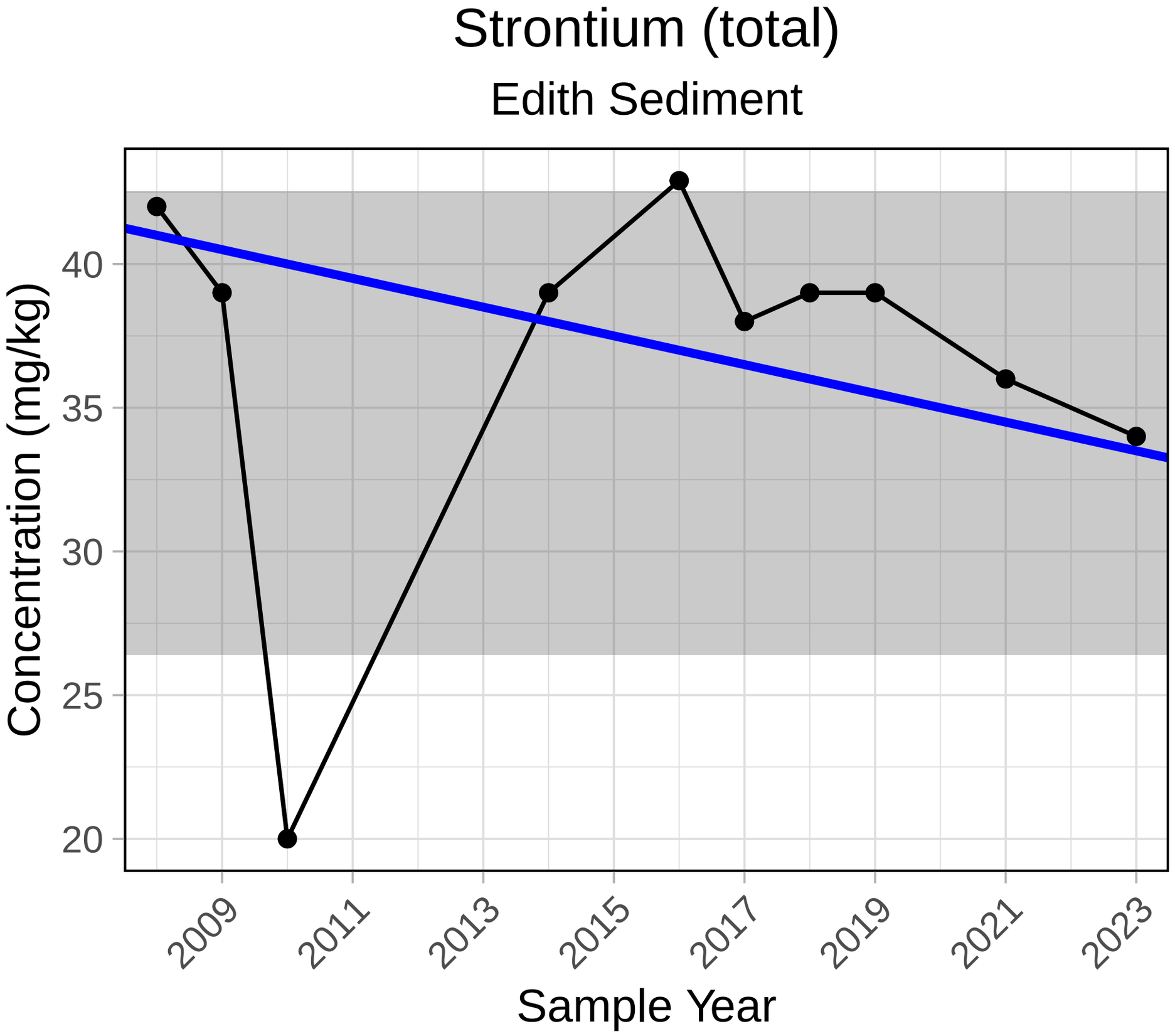

Antimony (total)
Edith Sediment
1.50
1.25
1.00
0.75
Concentration (mg/kg)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.007

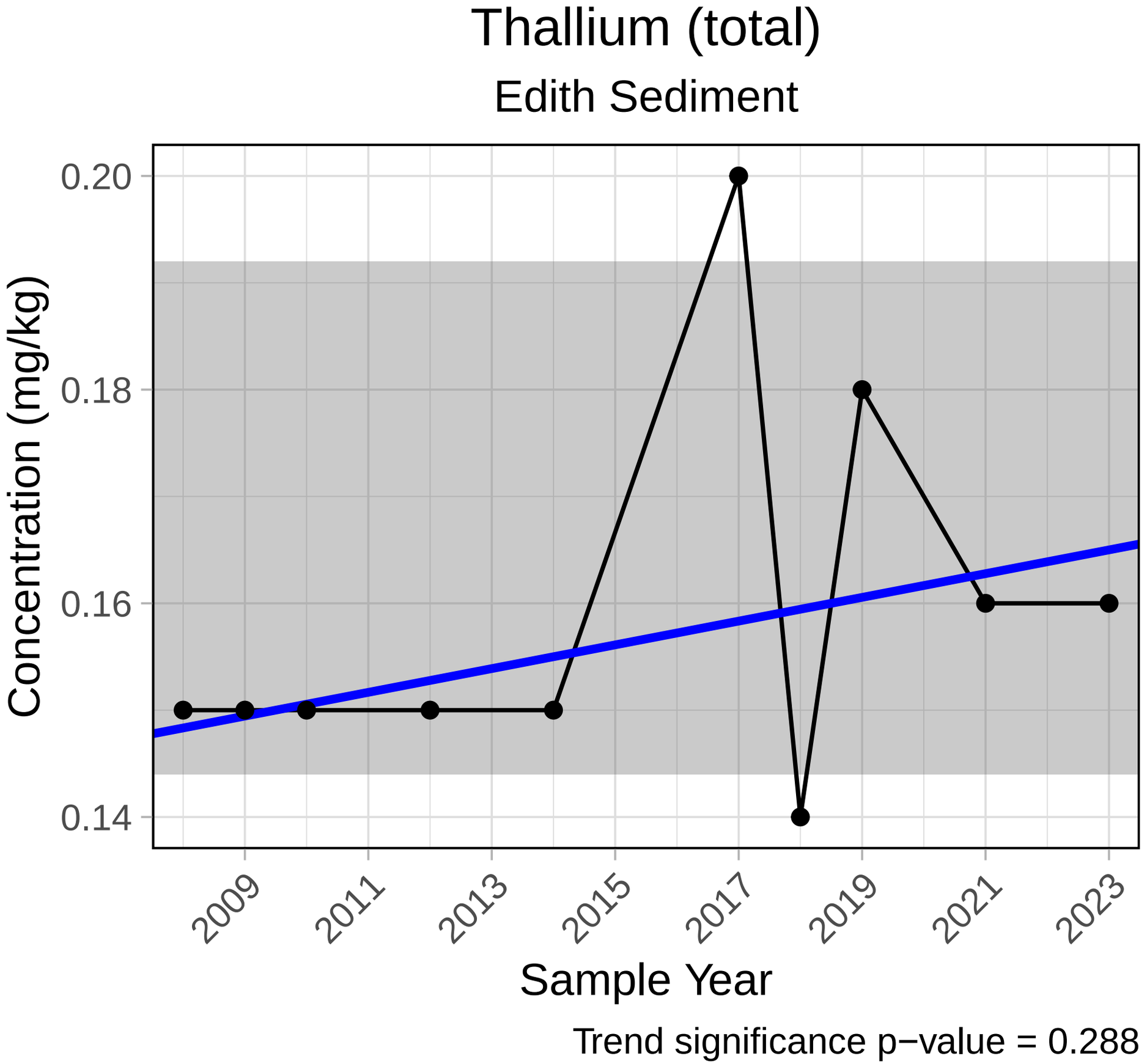
Selenium (total)

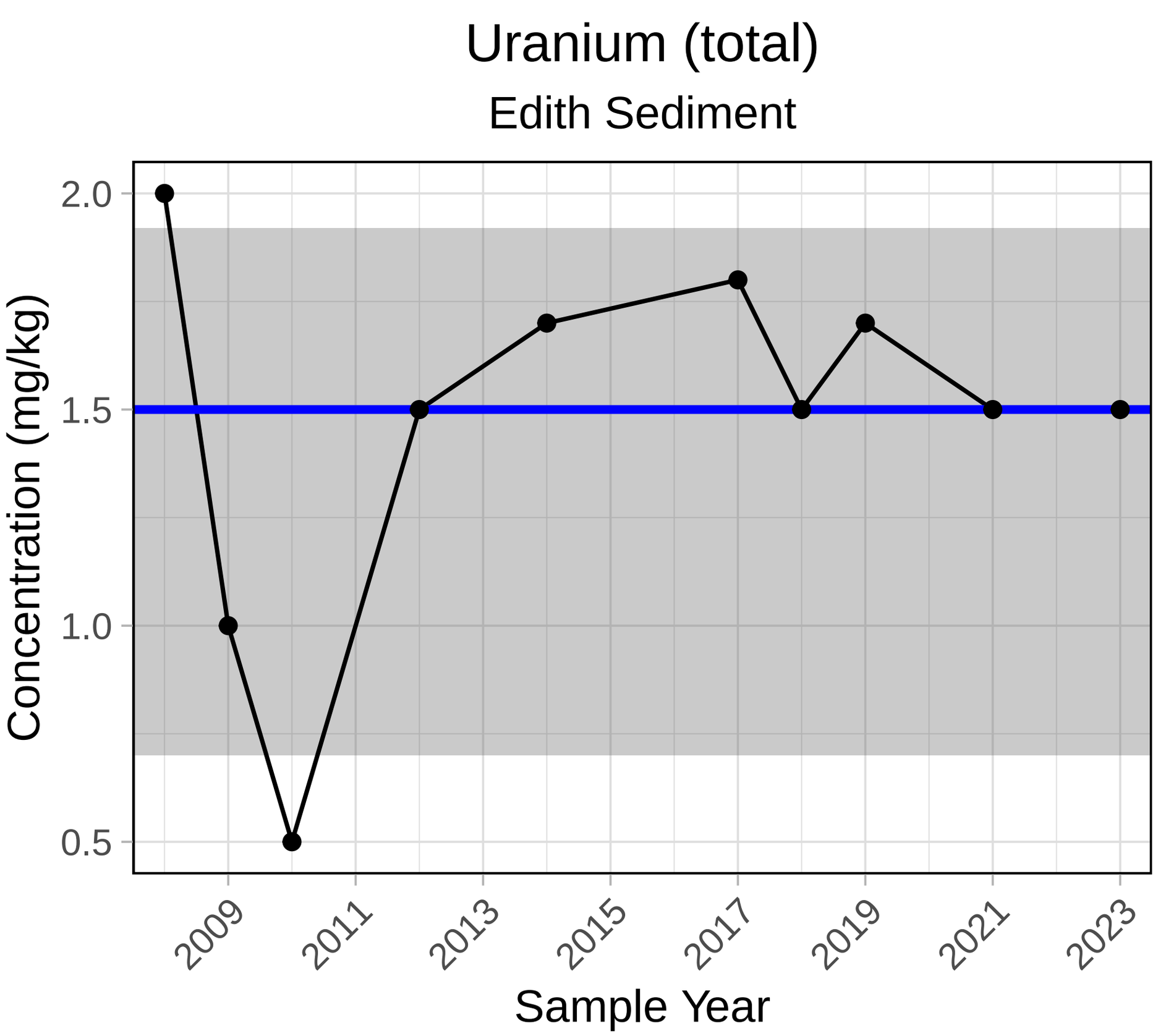
Edith Sediment

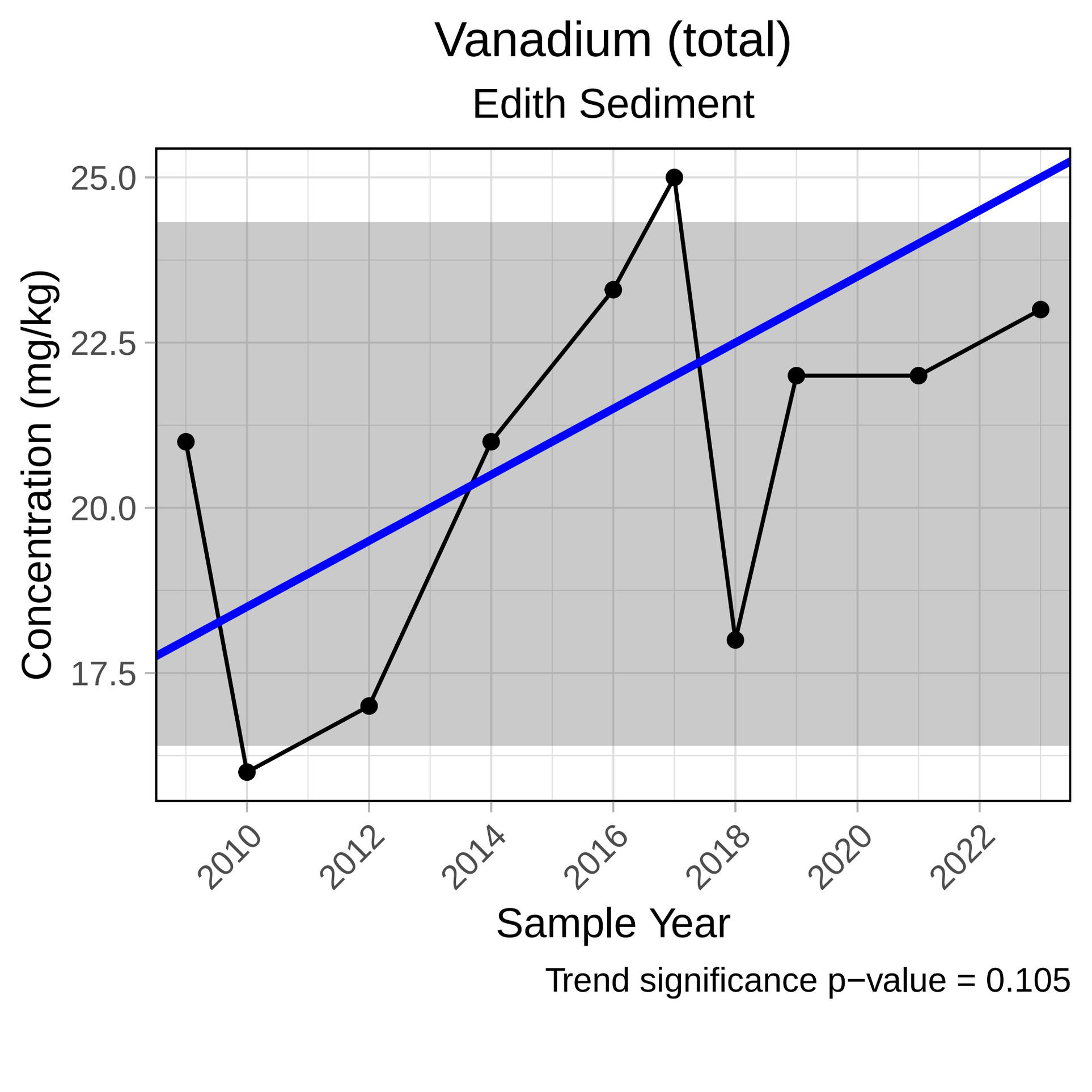


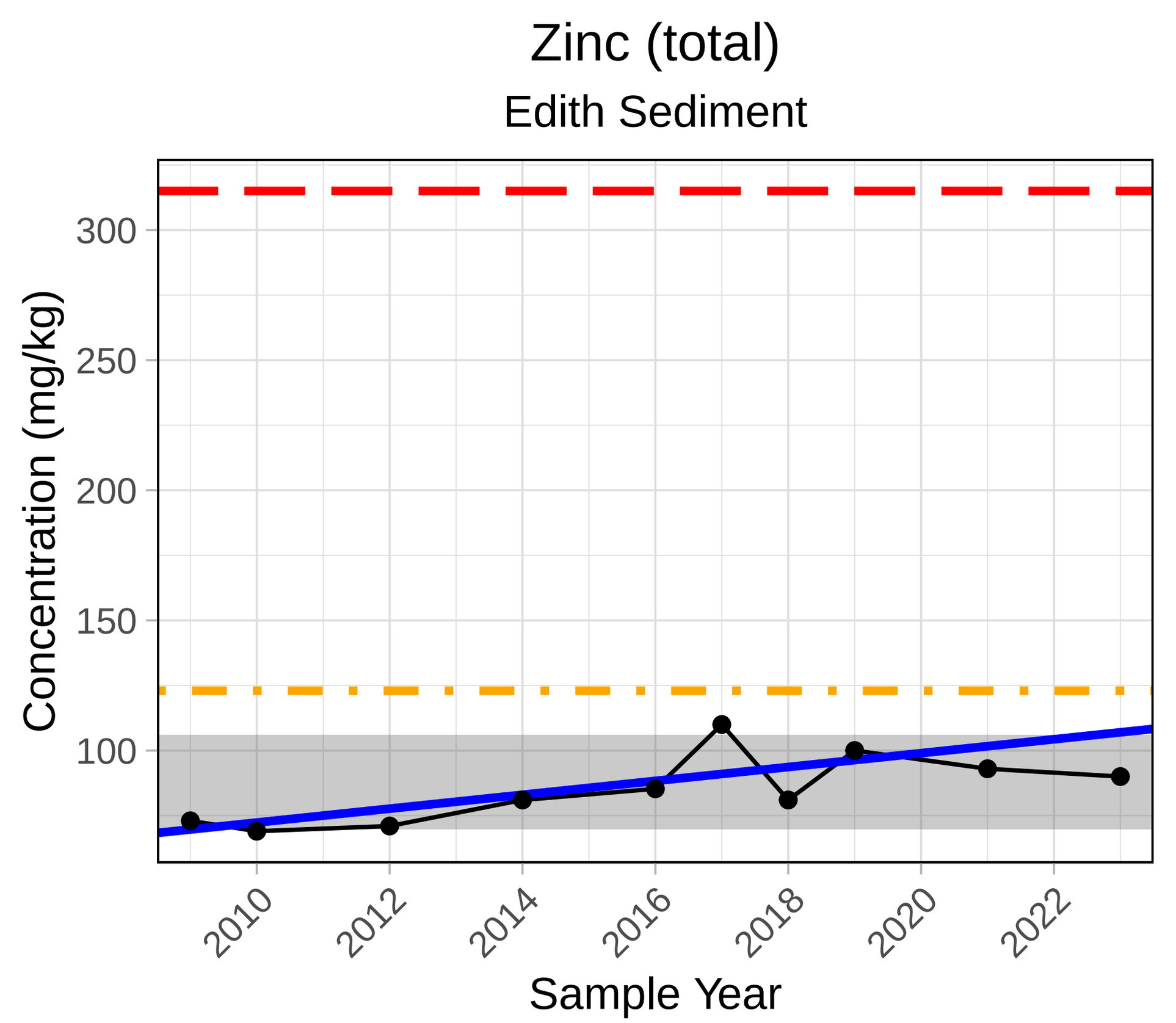
Trend significance p−value = 0.784
ISQG level = 2 mg/kg (maximum)


Strontium (total)
Edith Sediment
Concentration (mg/kg)
40
35
30
25
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.194

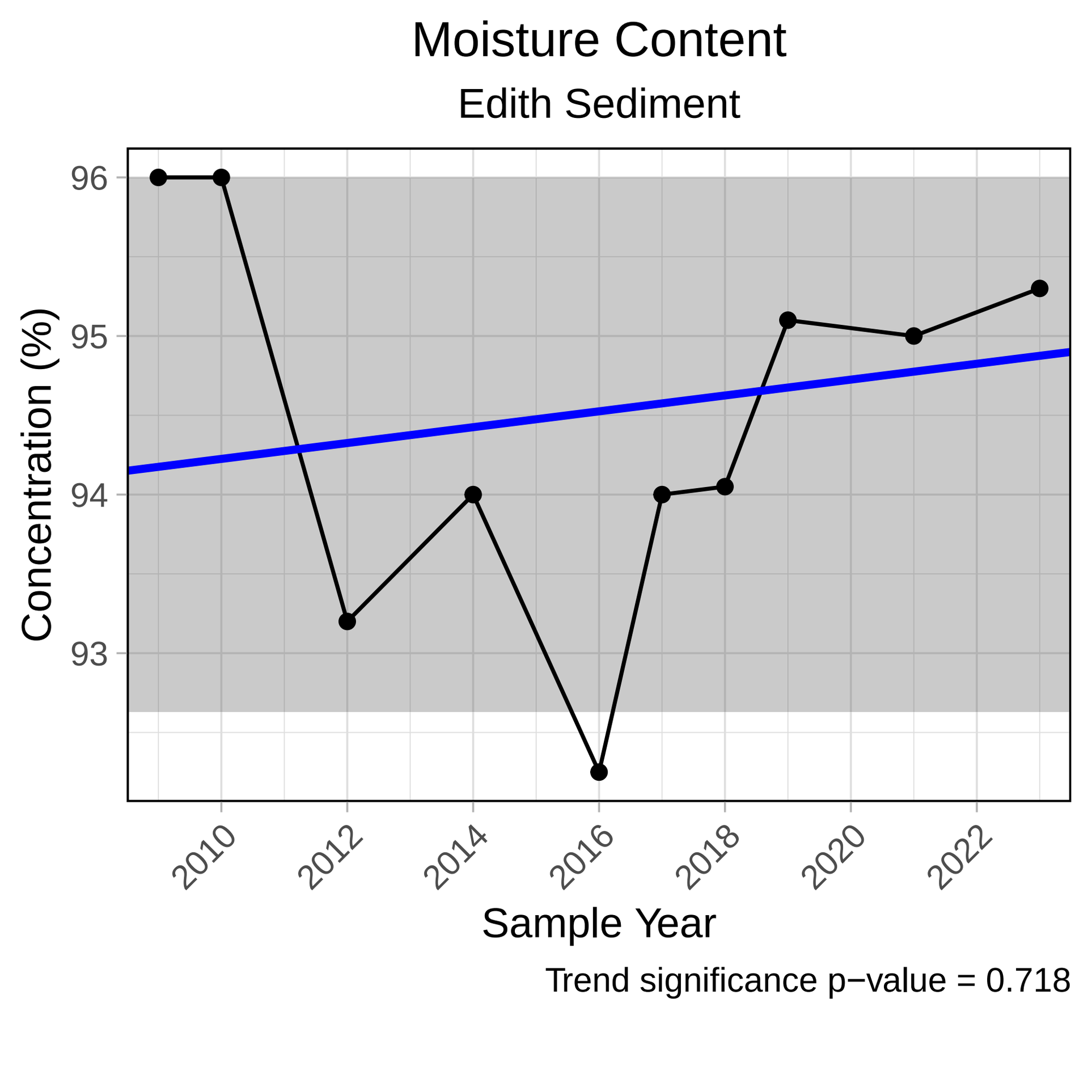

Thallium (total)
Edith Sediment
Concentration (mg/kg)
0.20
0.18
0.16
0.14
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.288

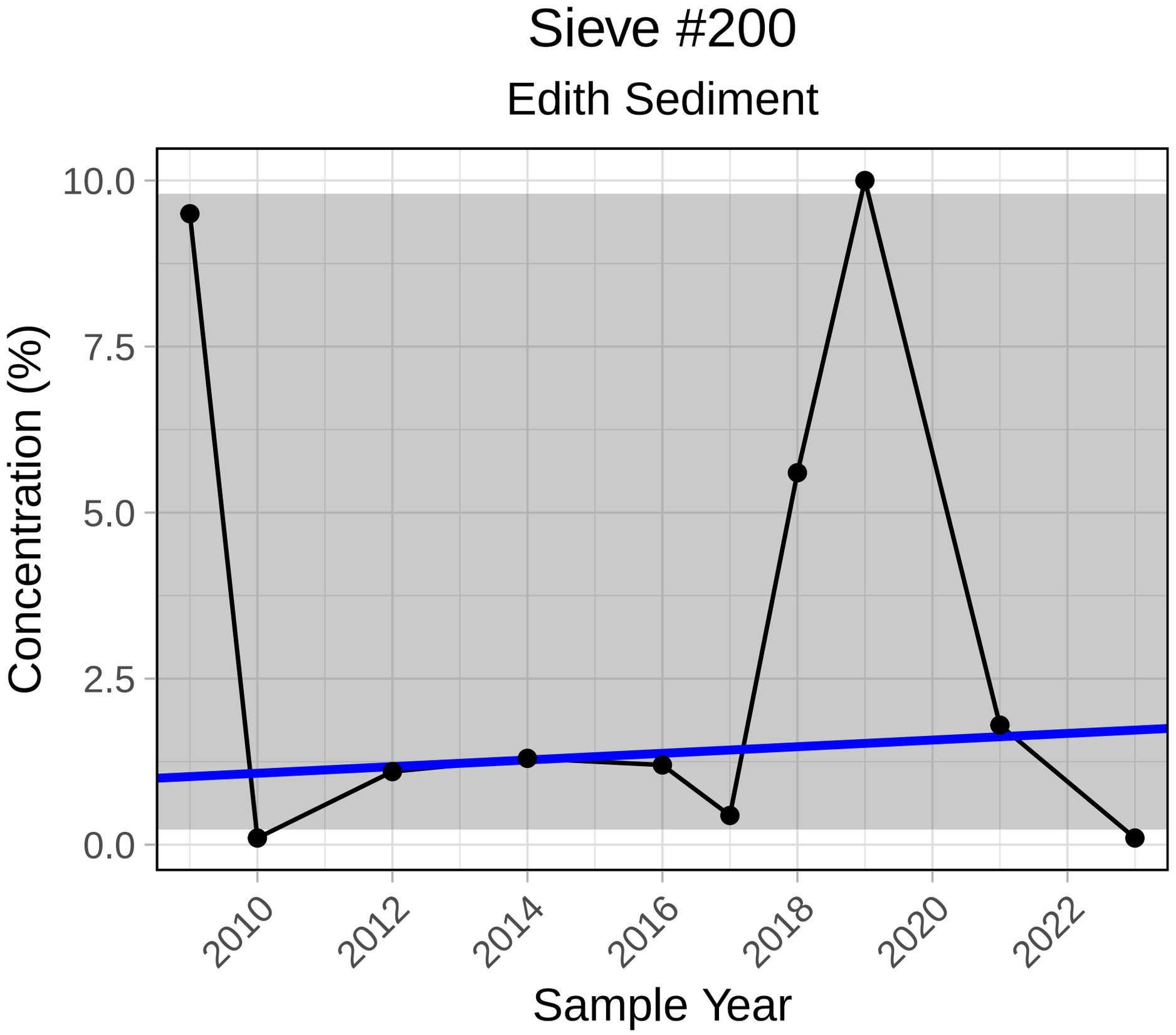

Uranium (total)
Edith Sediment
Concentration (mg/kg)
2.0
1.5
1.0
0.5
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

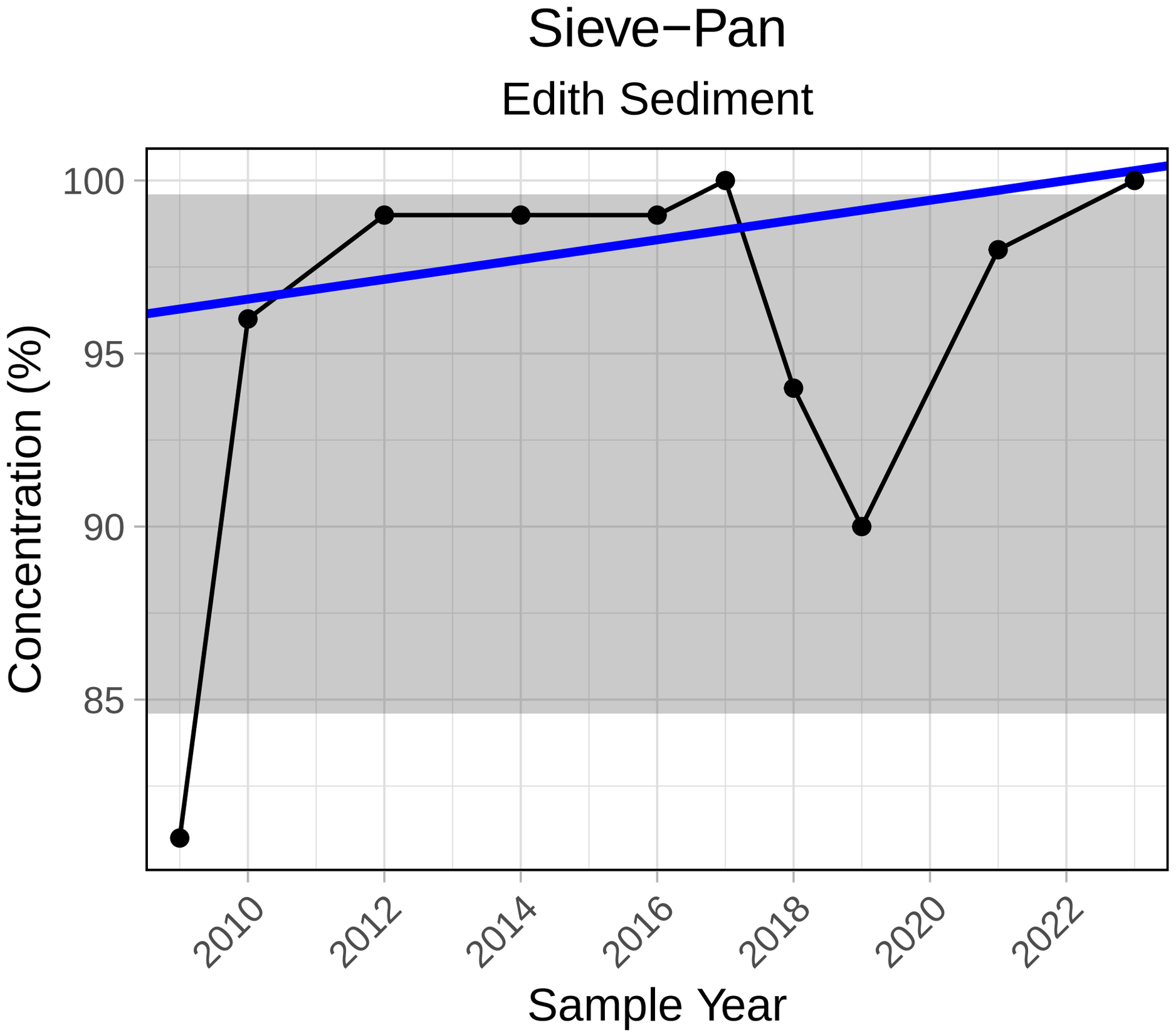

Vanadium (total)
Edith Sediment
Concentration (mg/kg)
25.0
22.5
20.0
17.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.105

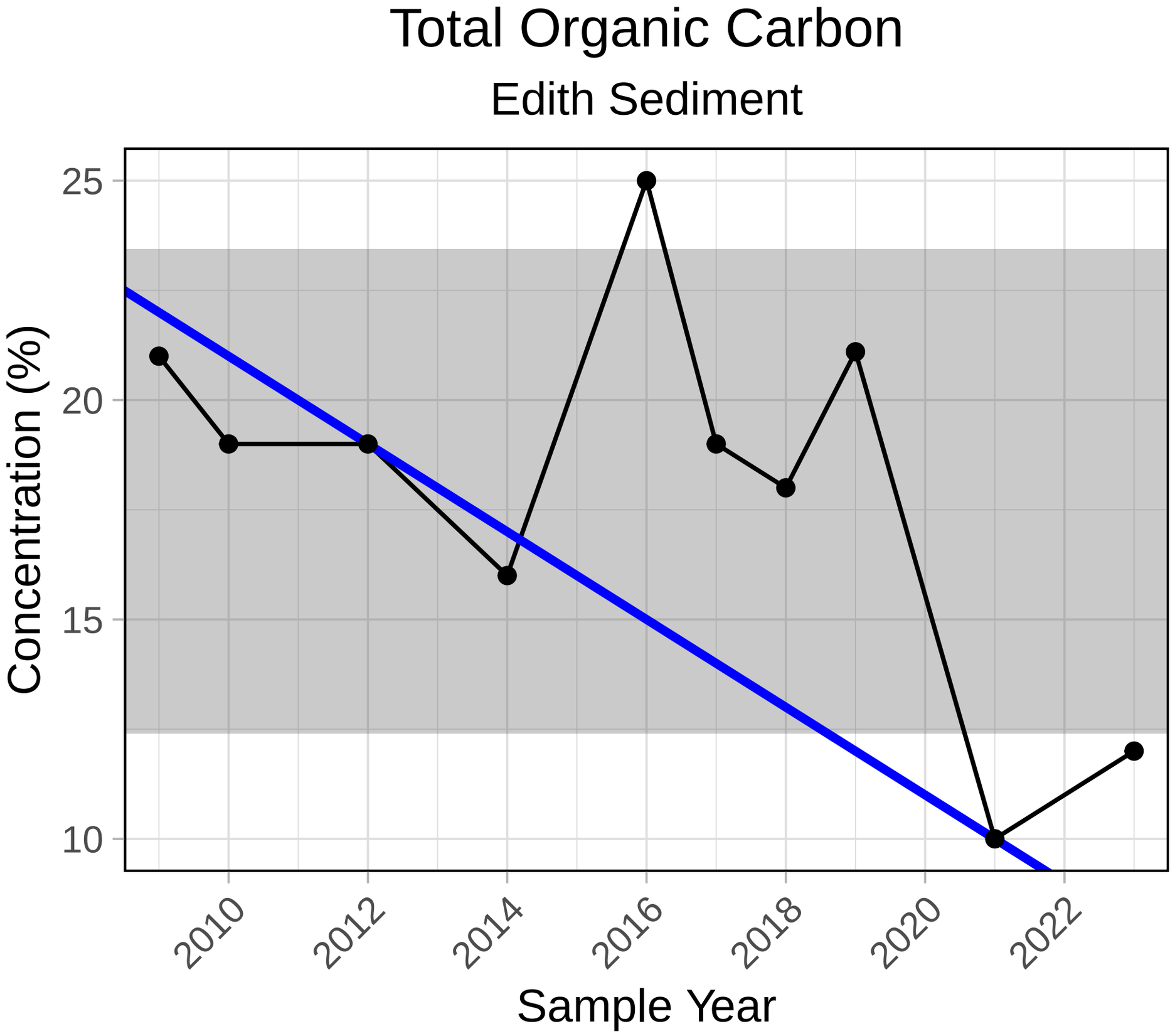


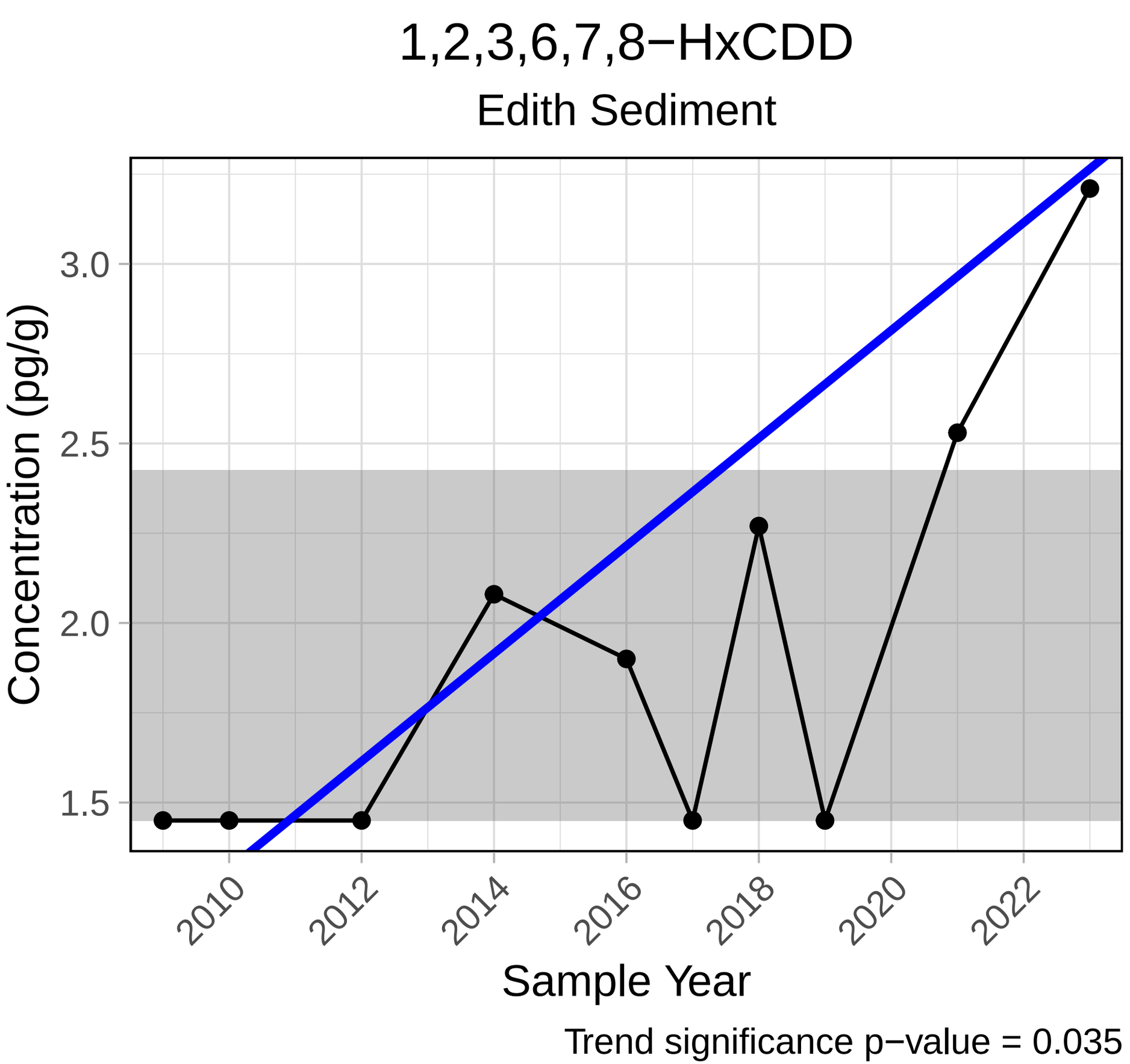
Trend significance p−value = 0.039
ISQG level = 123 mg/kg (maximum)
PEL level = 315 mg/kg (maximum)

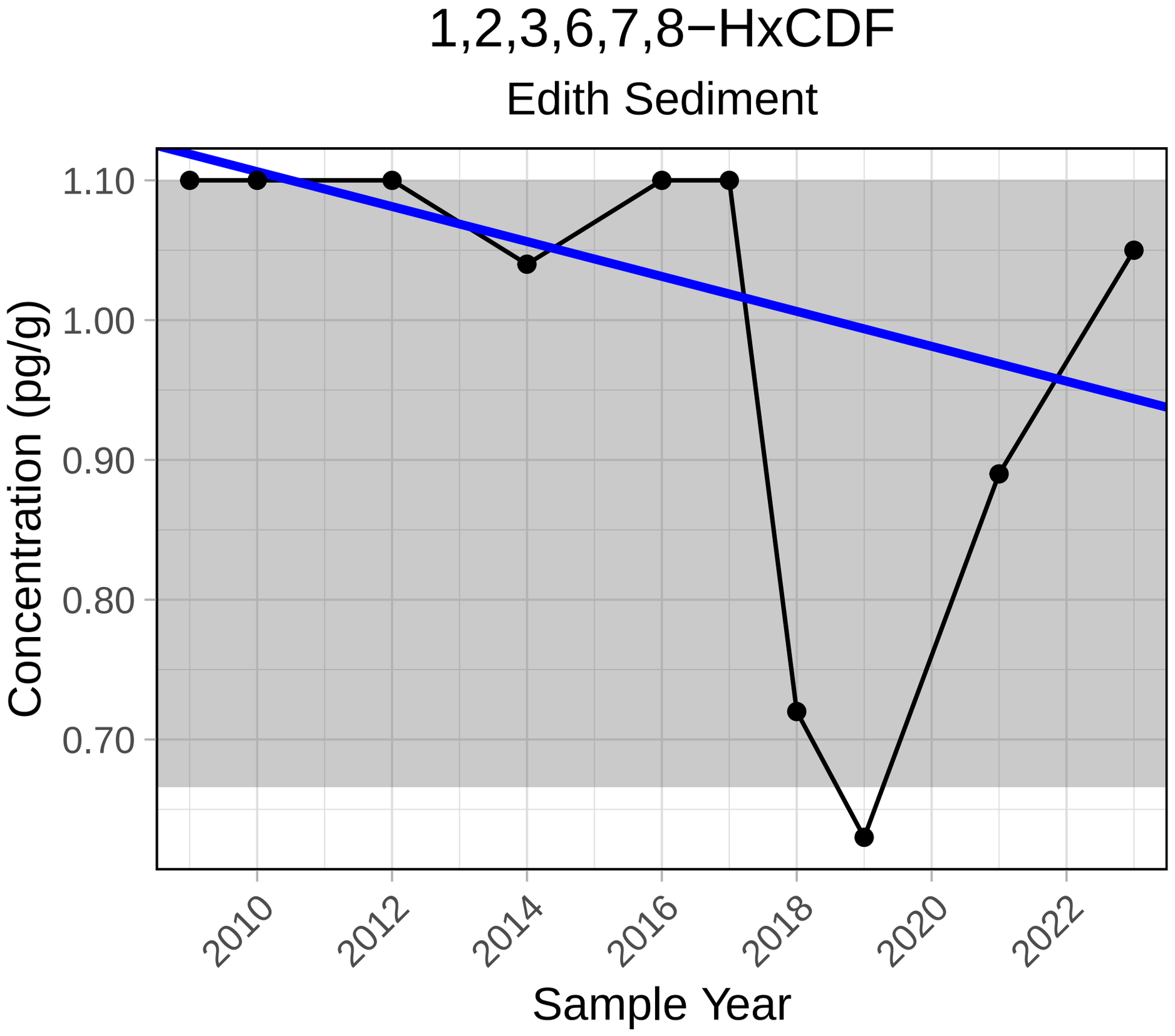

Moisture Content
Edith Sediment
96
95
94
93
Concentration (%)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.718

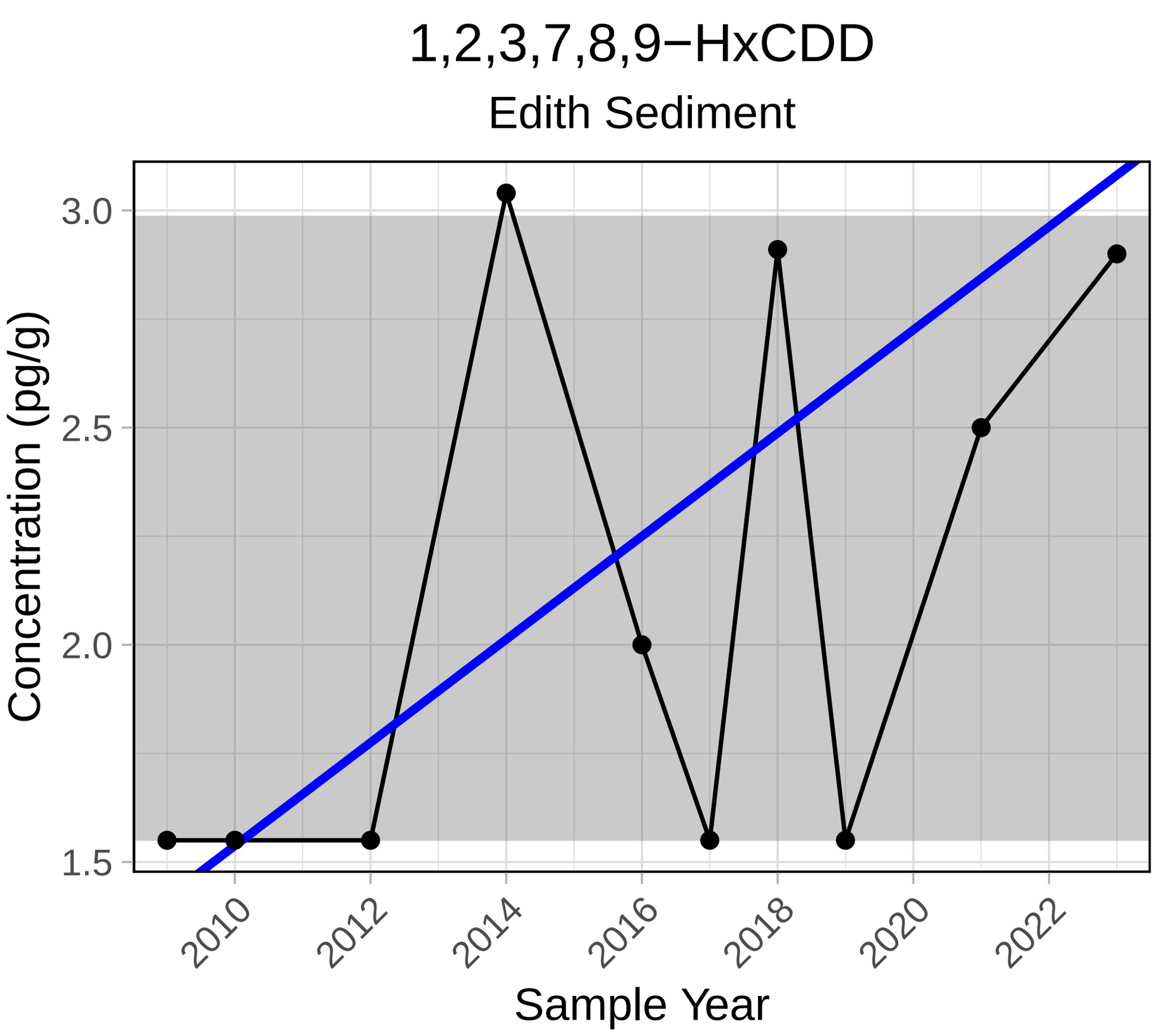

Sieve #200
Edith Sediment
10.0
7.5
5.0
2.5
0.0
Concentration (%)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

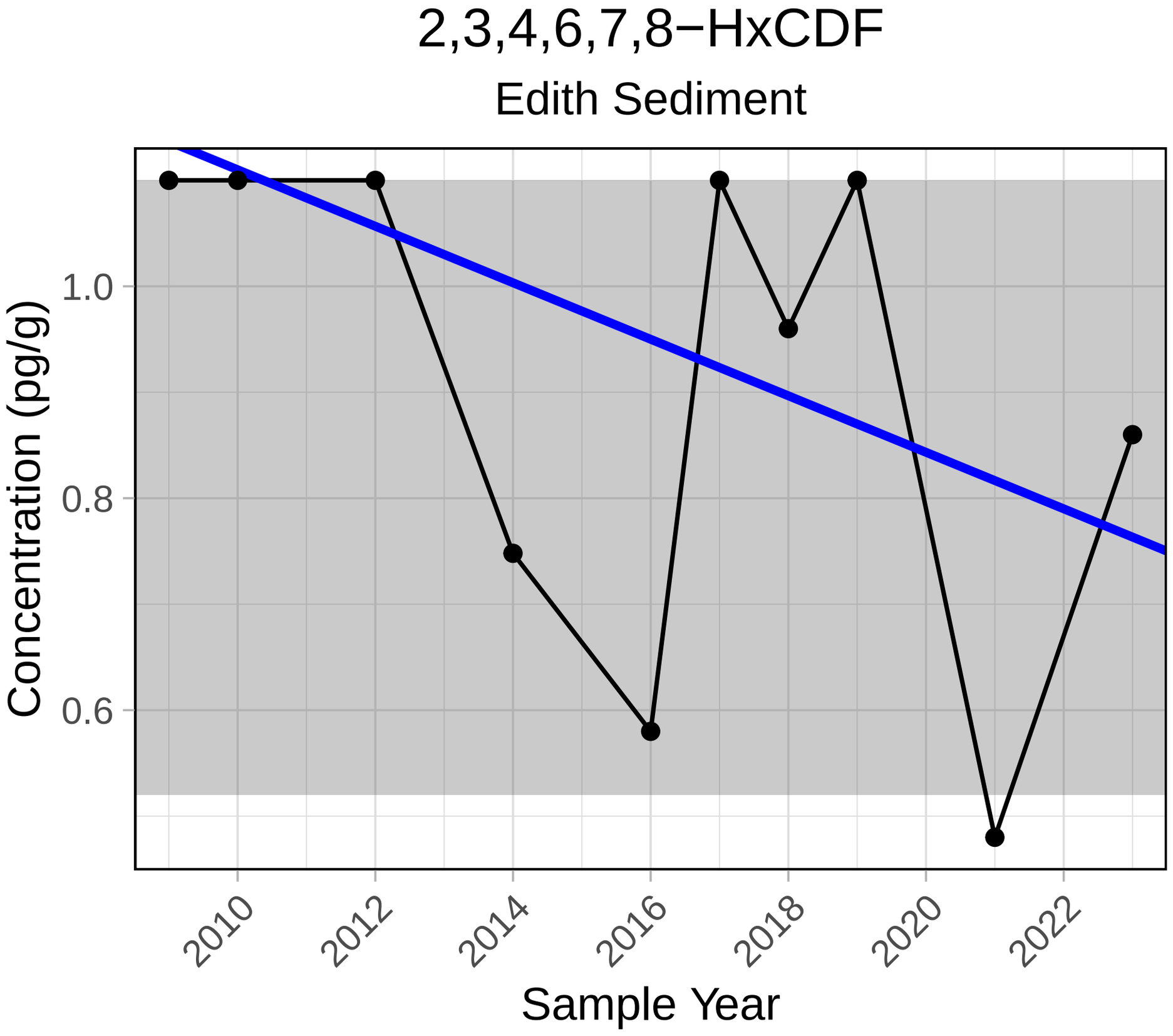

Sieve−Pan
Edith Sediment
100
95
90
85
Concentration (%)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.362


Total Organic Carbon
Edith Sediment
Concentration (%)
25
20
15
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.173

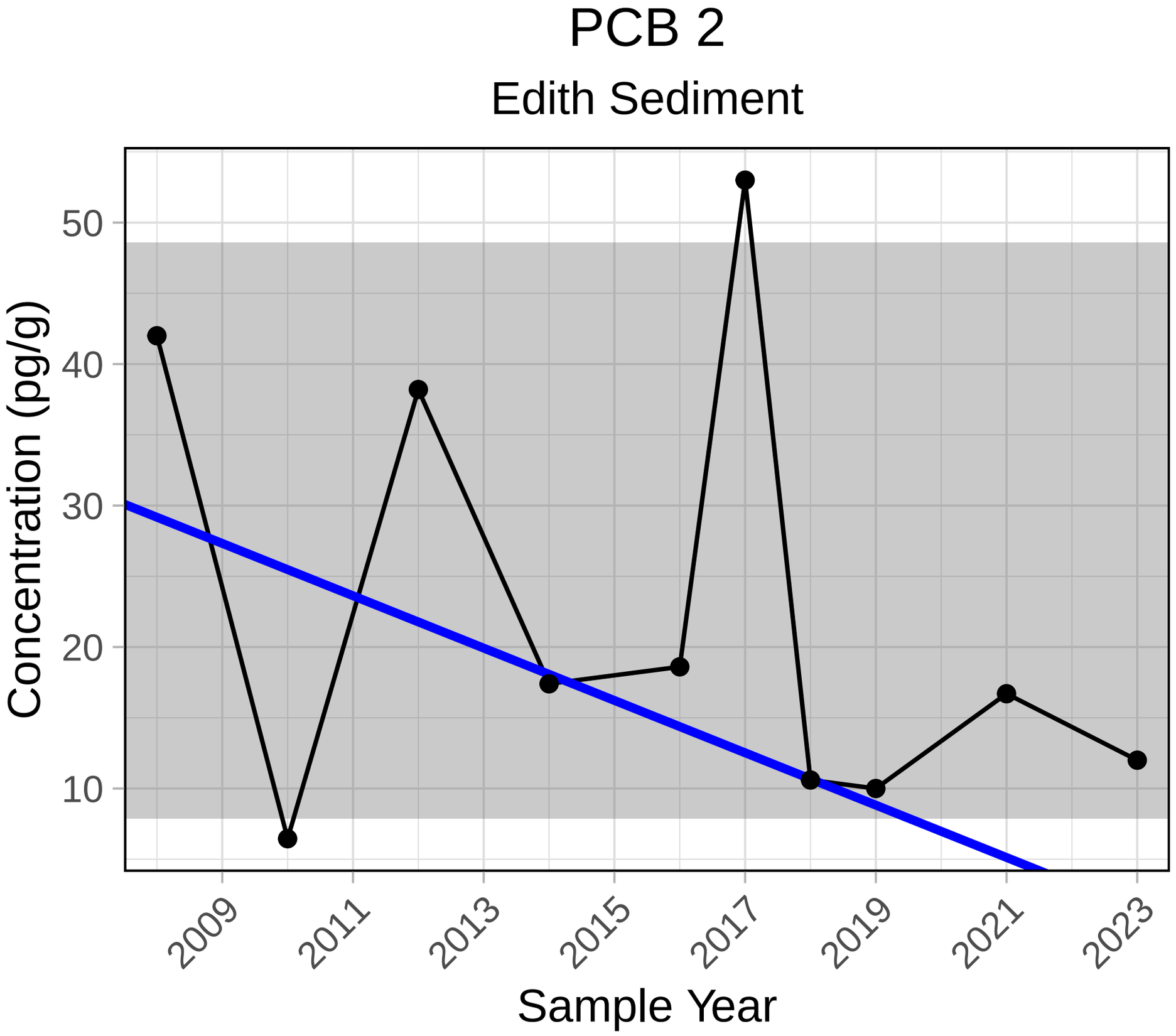

1,2,3,6,7,8−HxCDD
Edith Sediment
Concentration (pg/g)
3.0
2.5
2.0
1.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.035

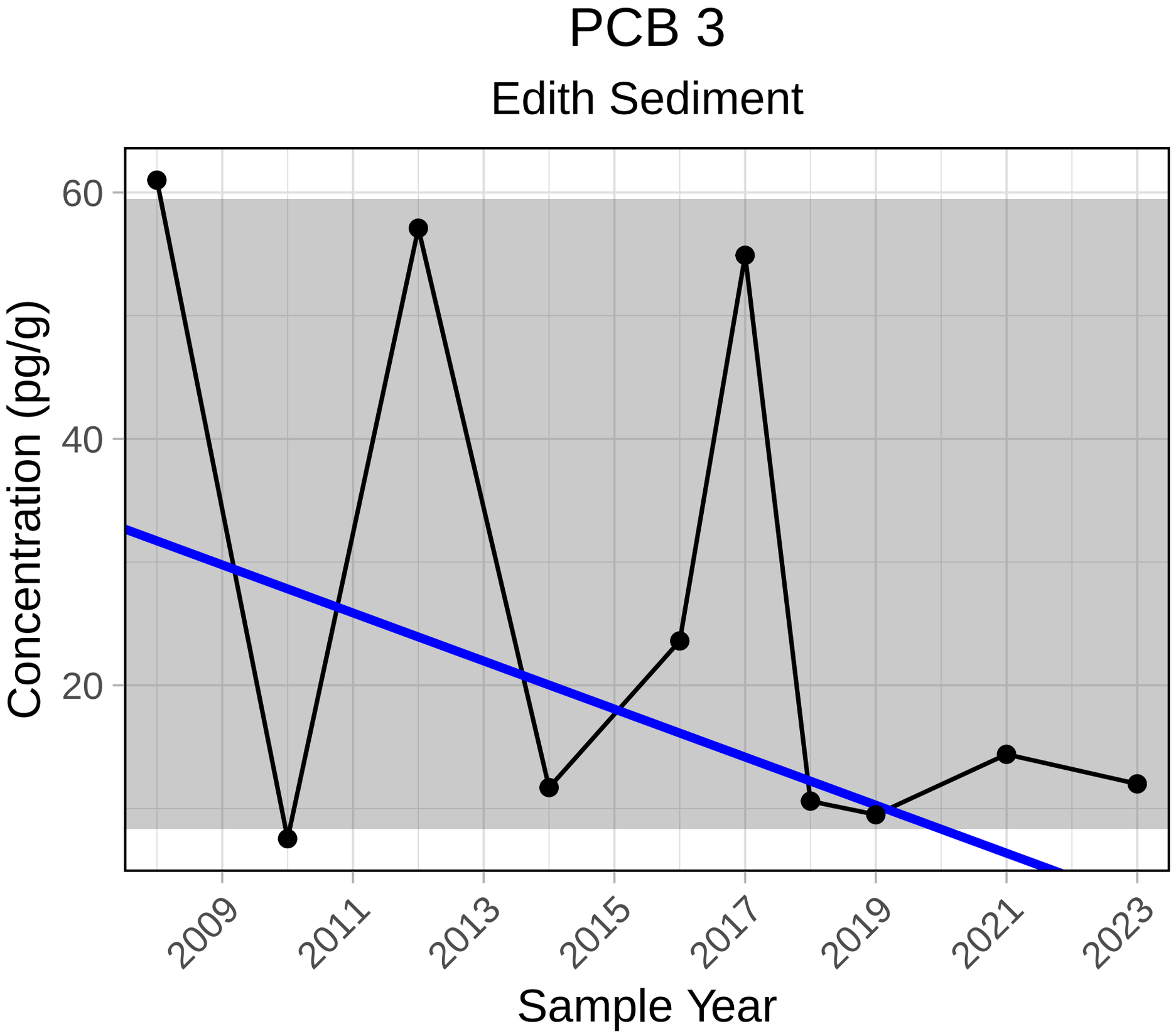

1,2,3,6,7,8−HxCDF
Edith Sediment
Concentration (pg/g)
1.10
1.00
0.90
0.80
0.70
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.084

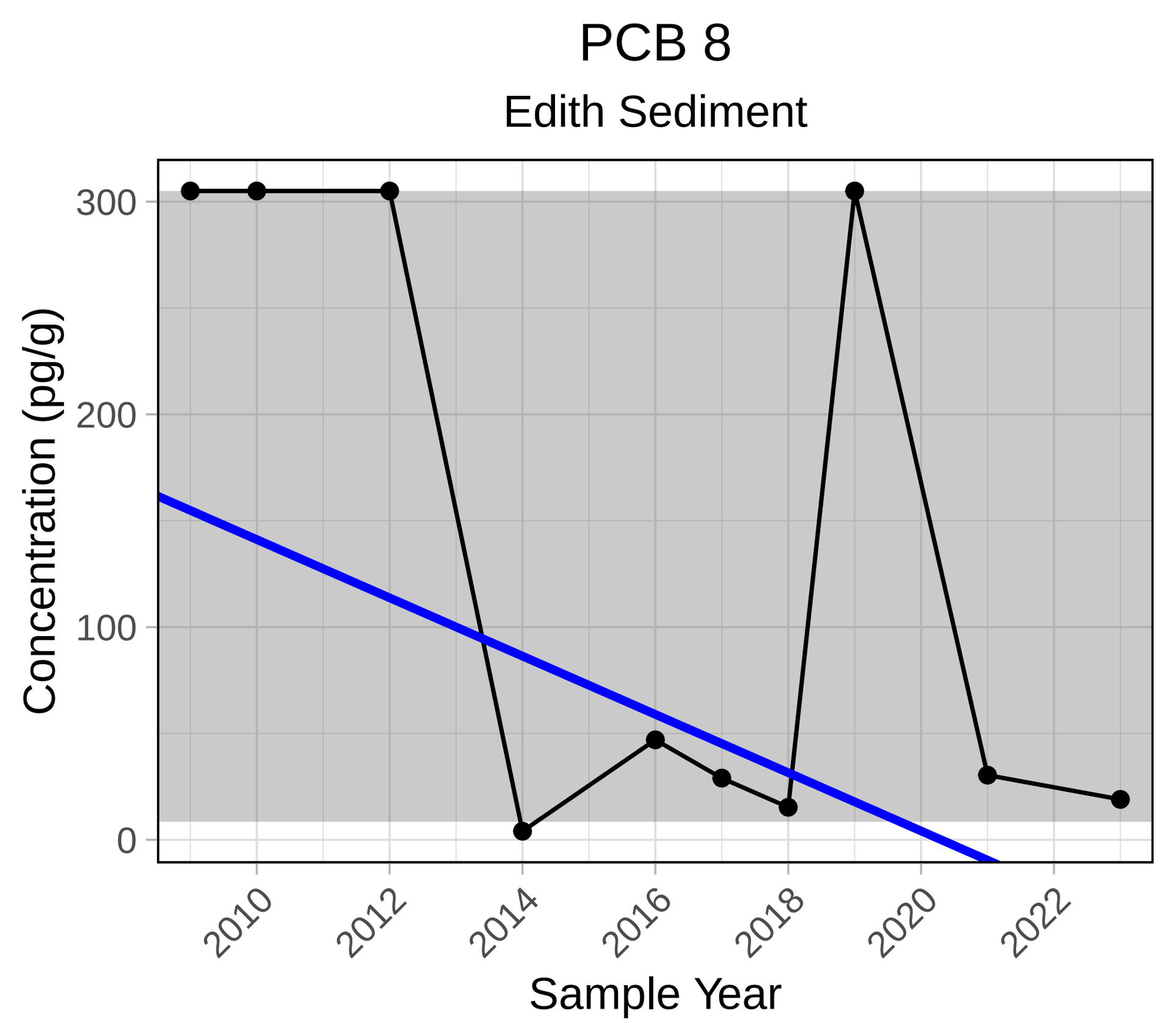

1,2,3,7,8,9−HxCDD
Edith Sediment
Concentration (pg/g)
3.0
2.5
2.0
1.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.249

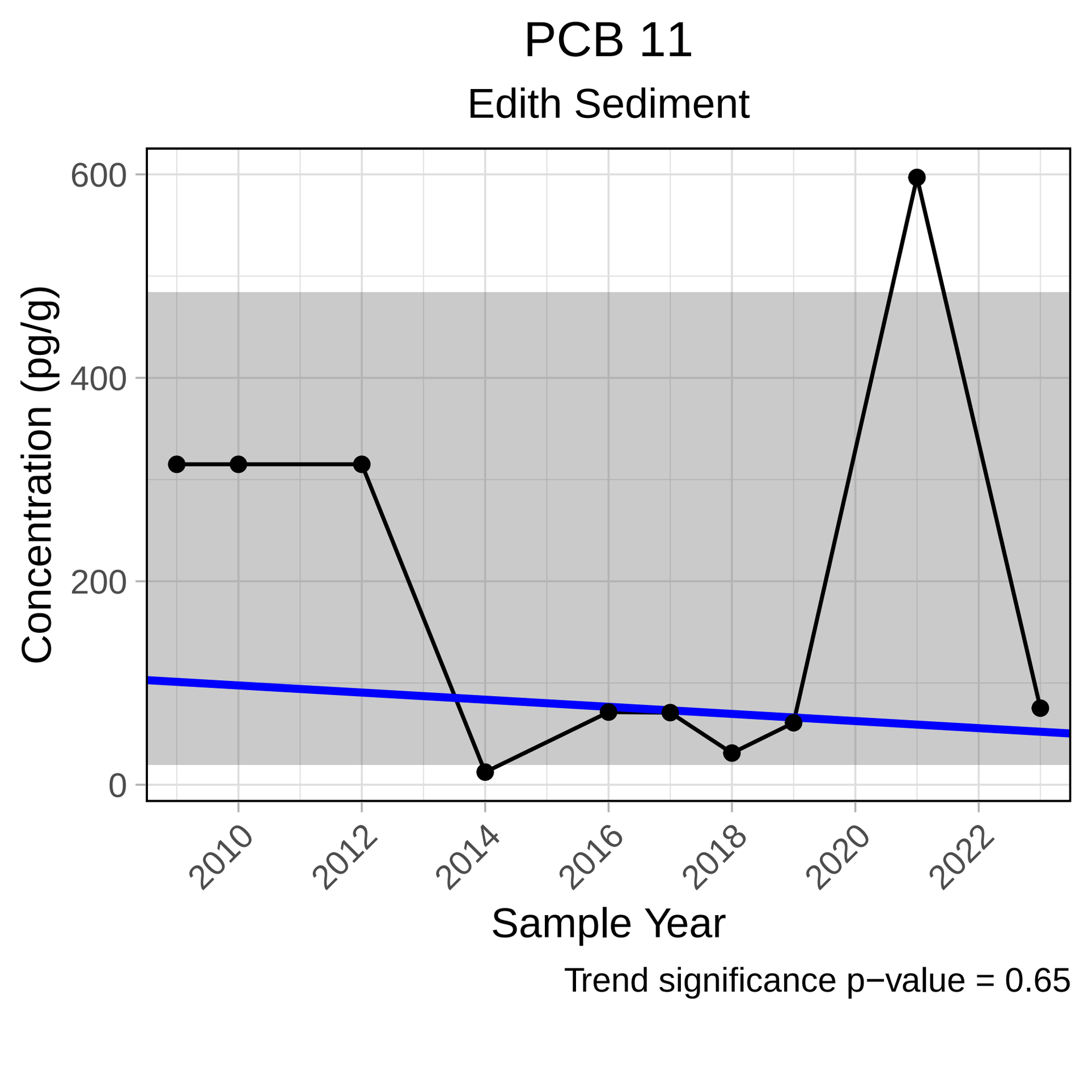

2,3,4,6,7,8−HxCDF
Edith Sediment
Concentration (pg/g)
1.0
0.8
0.6
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.179

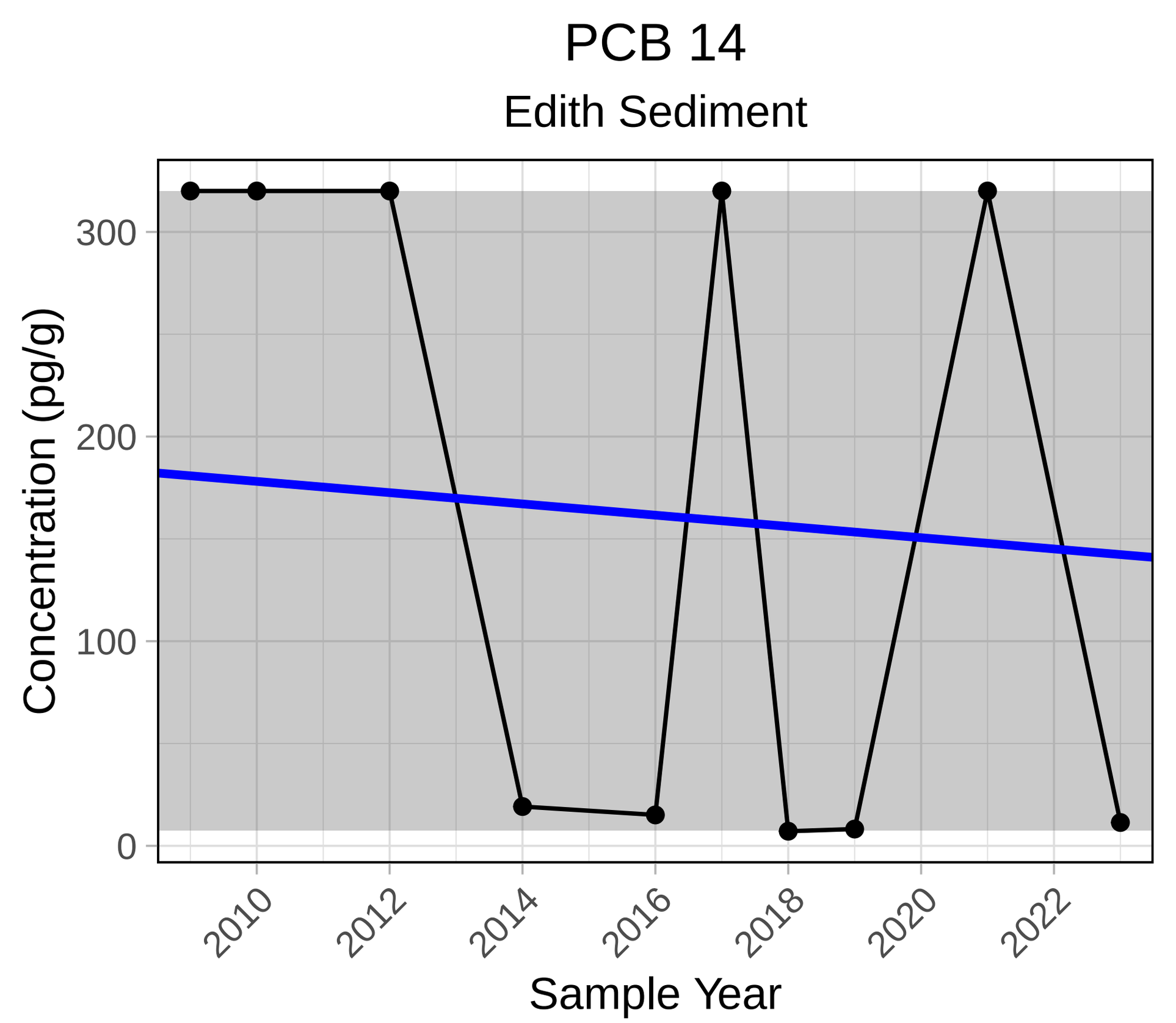
PCB 1
Edith Sediment
Concentration (pg/g)
30
20
10
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.564

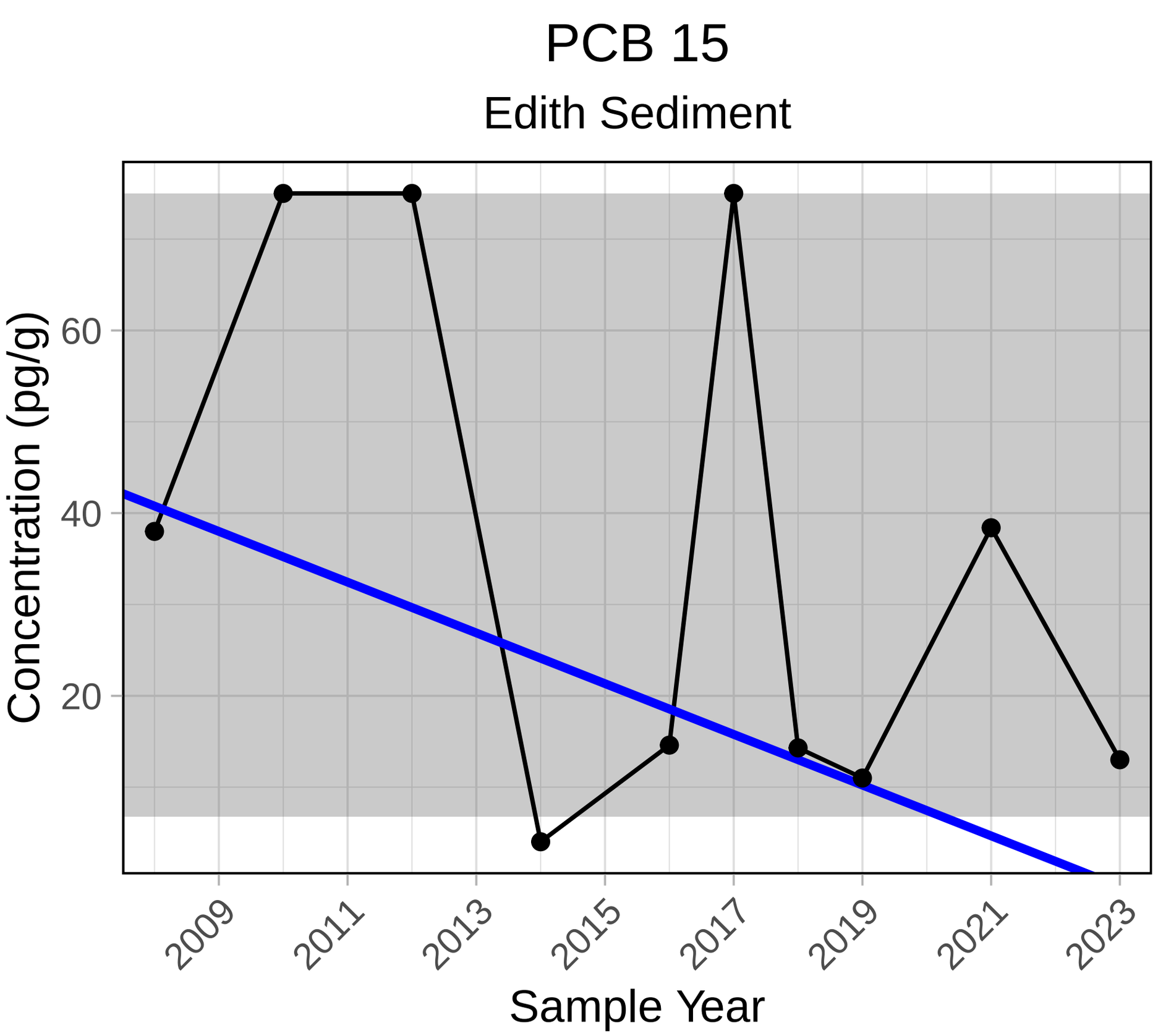

PCB 2
Edith Sediment
Concentration (pg/g)
50
40
30
20
10
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.371

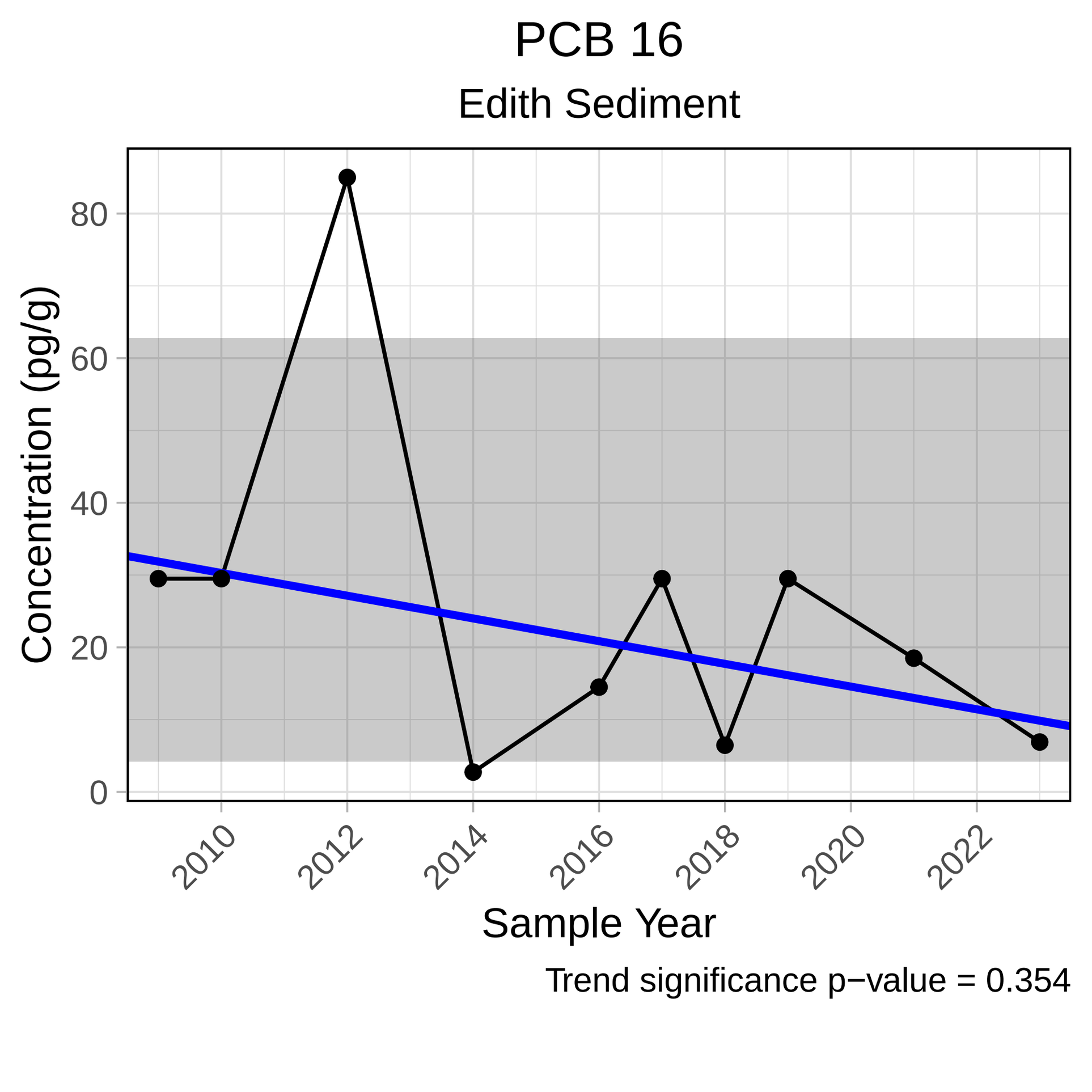

PCB 3
Edith Sediment
Concentration (pg/g)
60
40
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.371

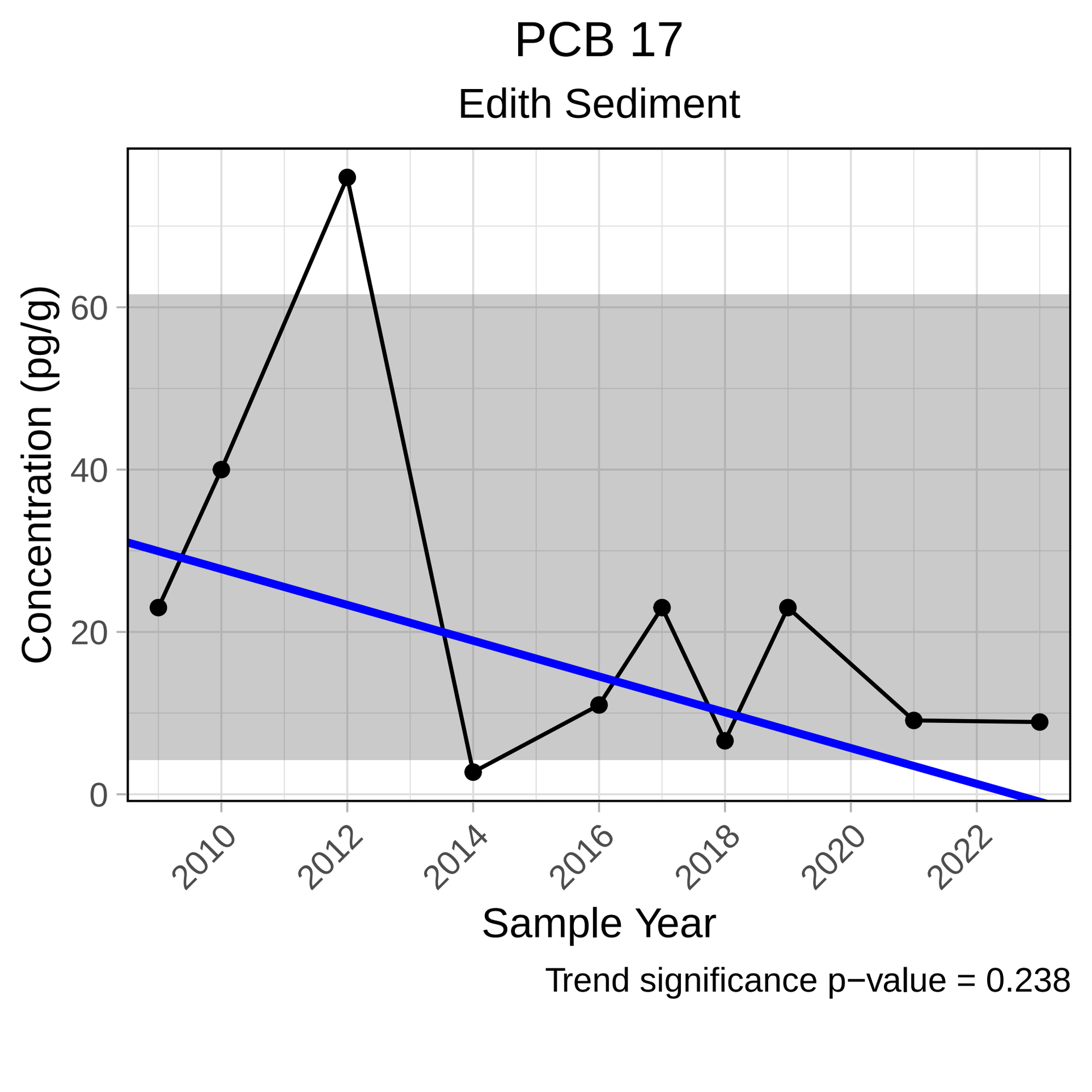

PCB 8
Edith Sediment
Concentration (pg/g)
300
200
100
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.194


PCB 11
Edith Sediment
600
400
200
0
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.65

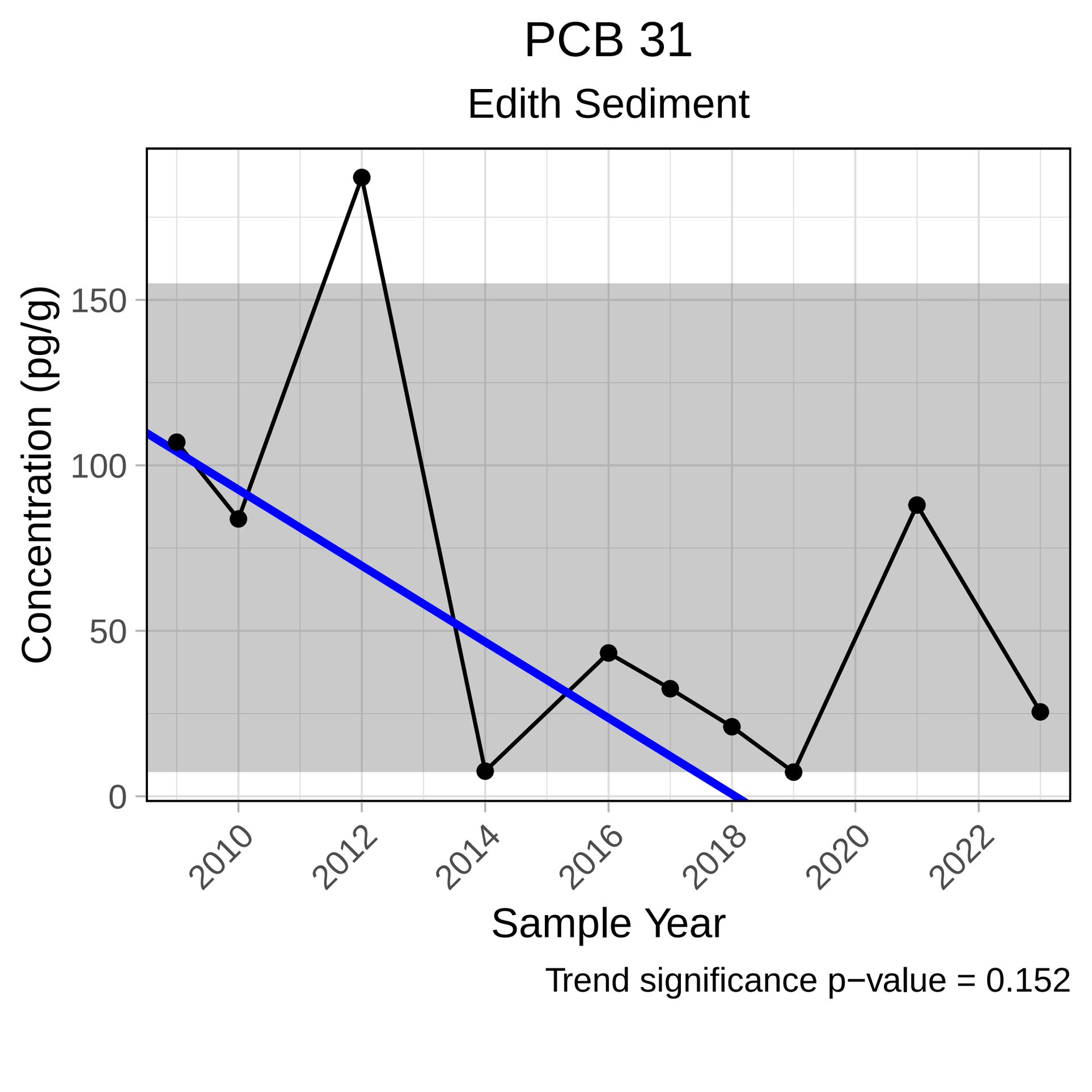

PCB 14
Edith Sediment
Concentration (pg/g)
300
200
100
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.124

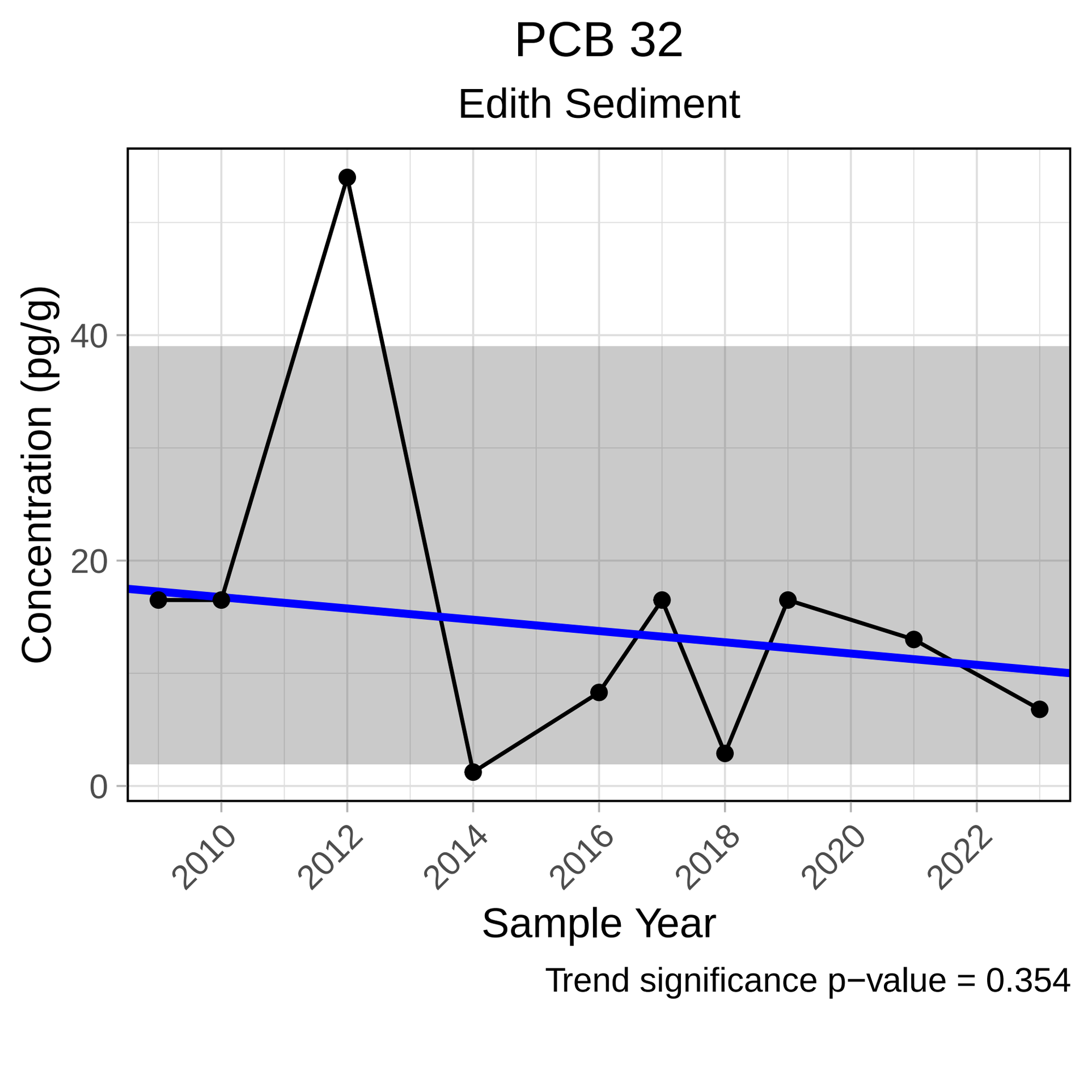

PCB 15
Edith Sediment
Concentration (pg/g)
60
40
20
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.318

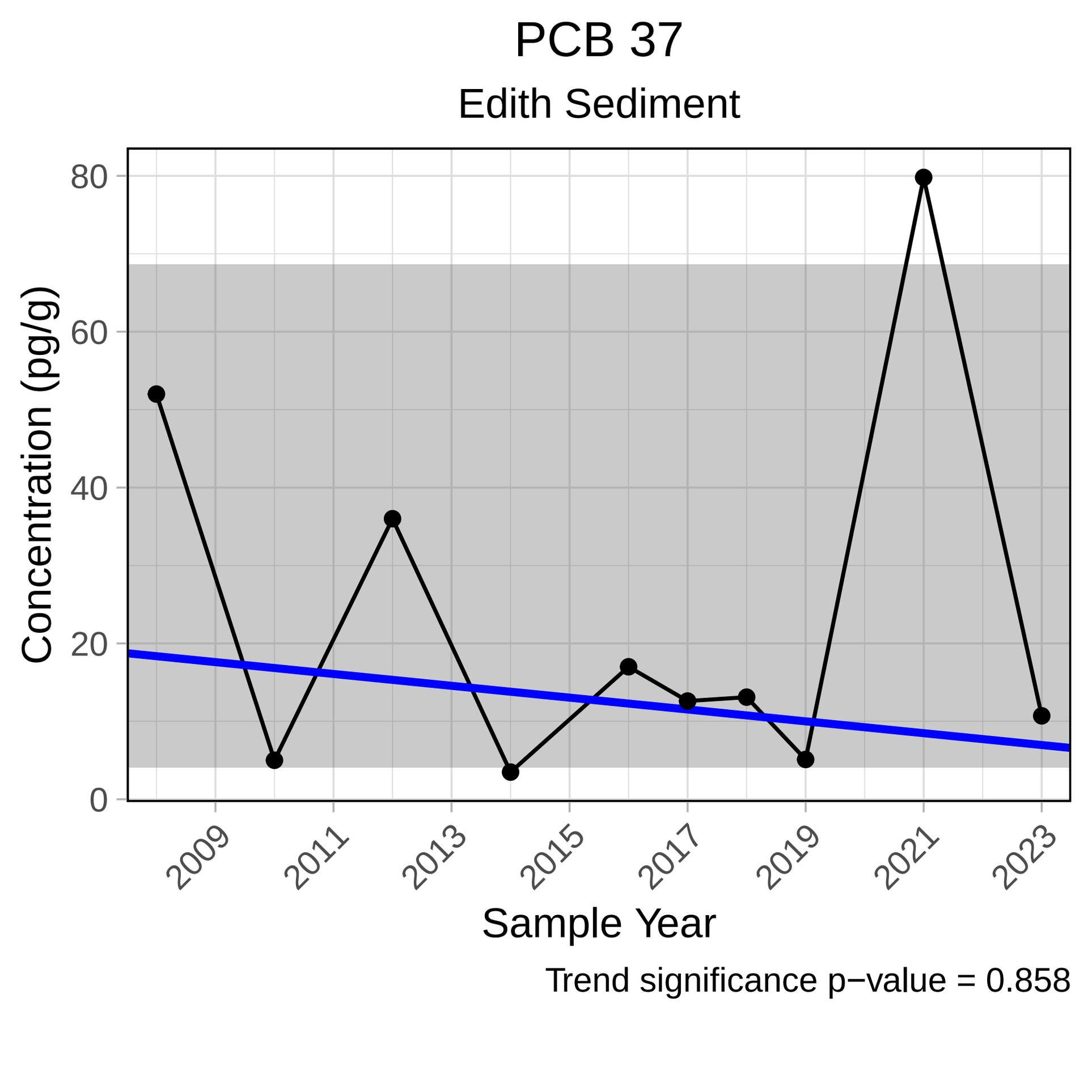

PCB 16
Edith Sediment
Concentration (pg/g)
0
20
40
60
80
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.354

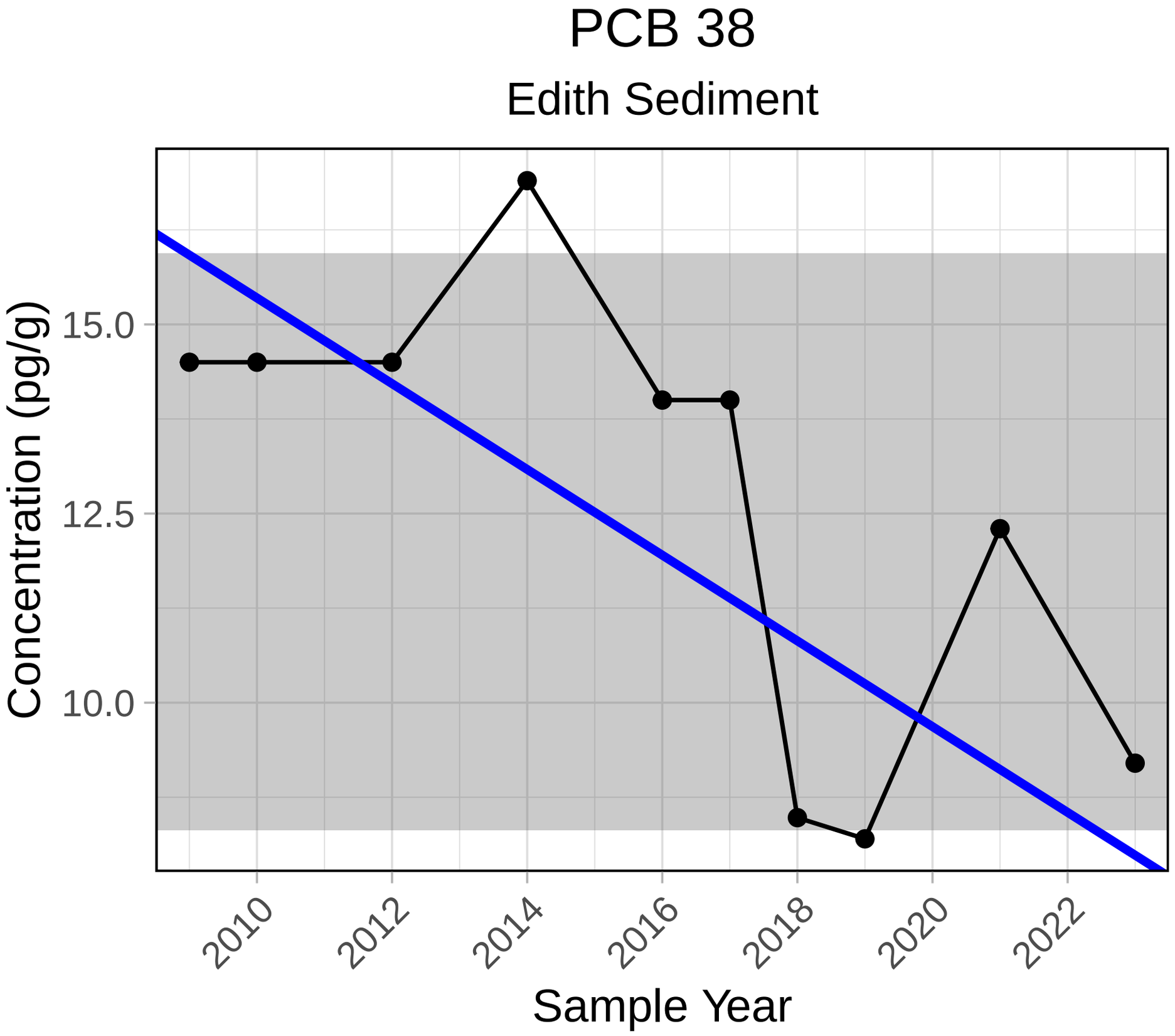

PCB 17
Edith Sediment
Concentration (pg/g)
0
20
40
60
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.238

PCB 22
Edith Sediment
Concentration (pg/g)
60
40
20
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

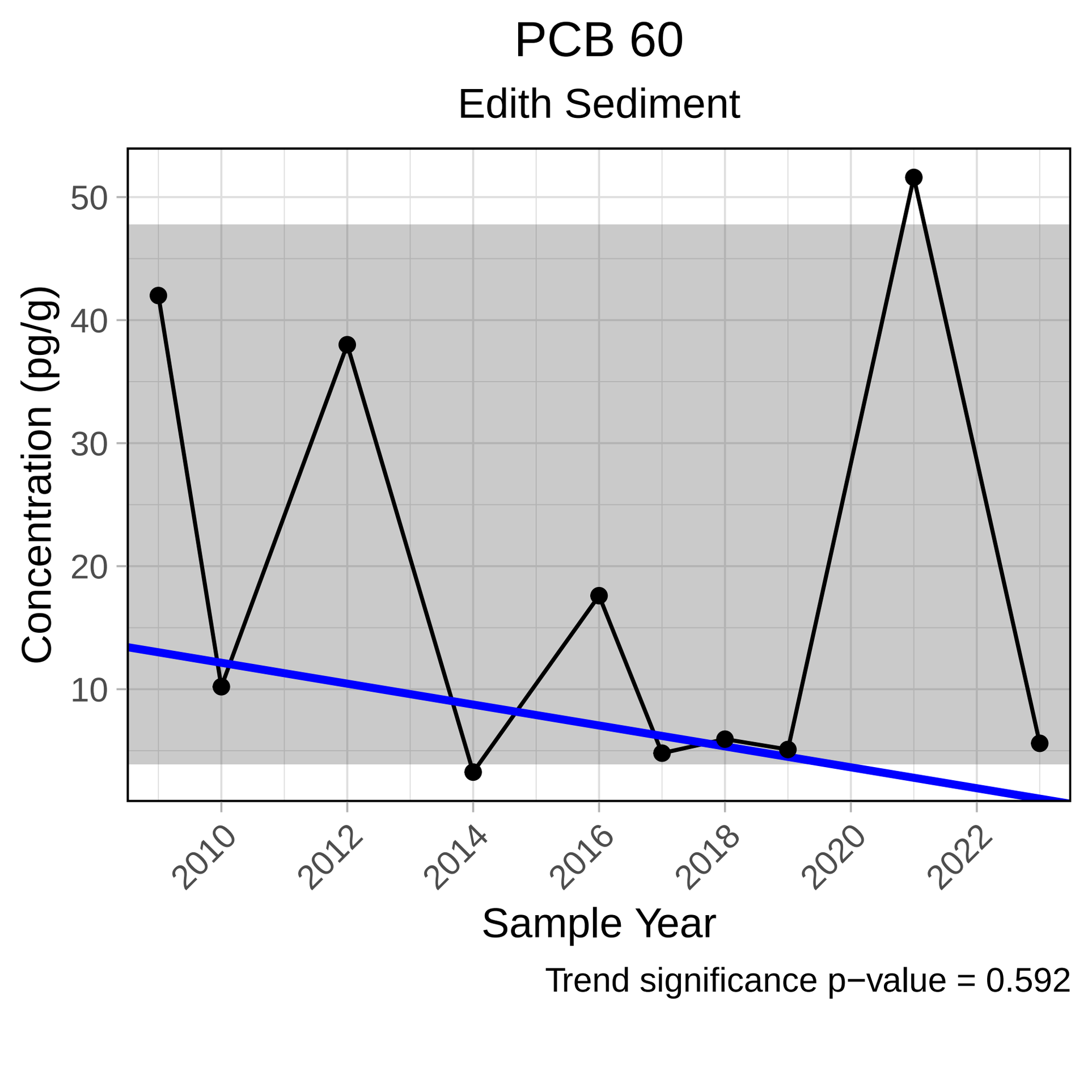

PCB 31
Edith Sediment
Concentration (pg/g)
150
100
50
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

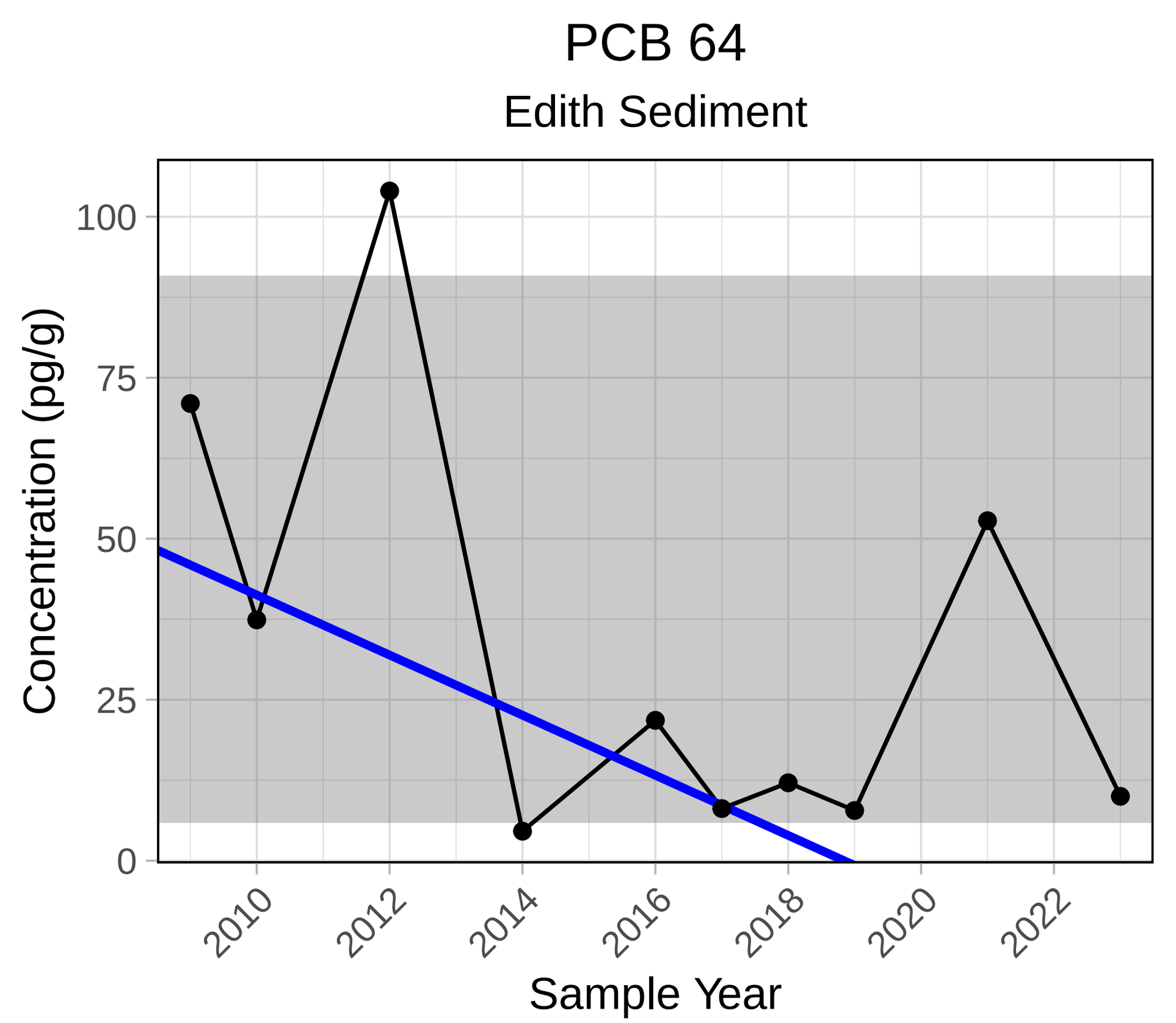

PCB 32
Edith Sediment
Concentration (pg/g)
0
20
40
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.354

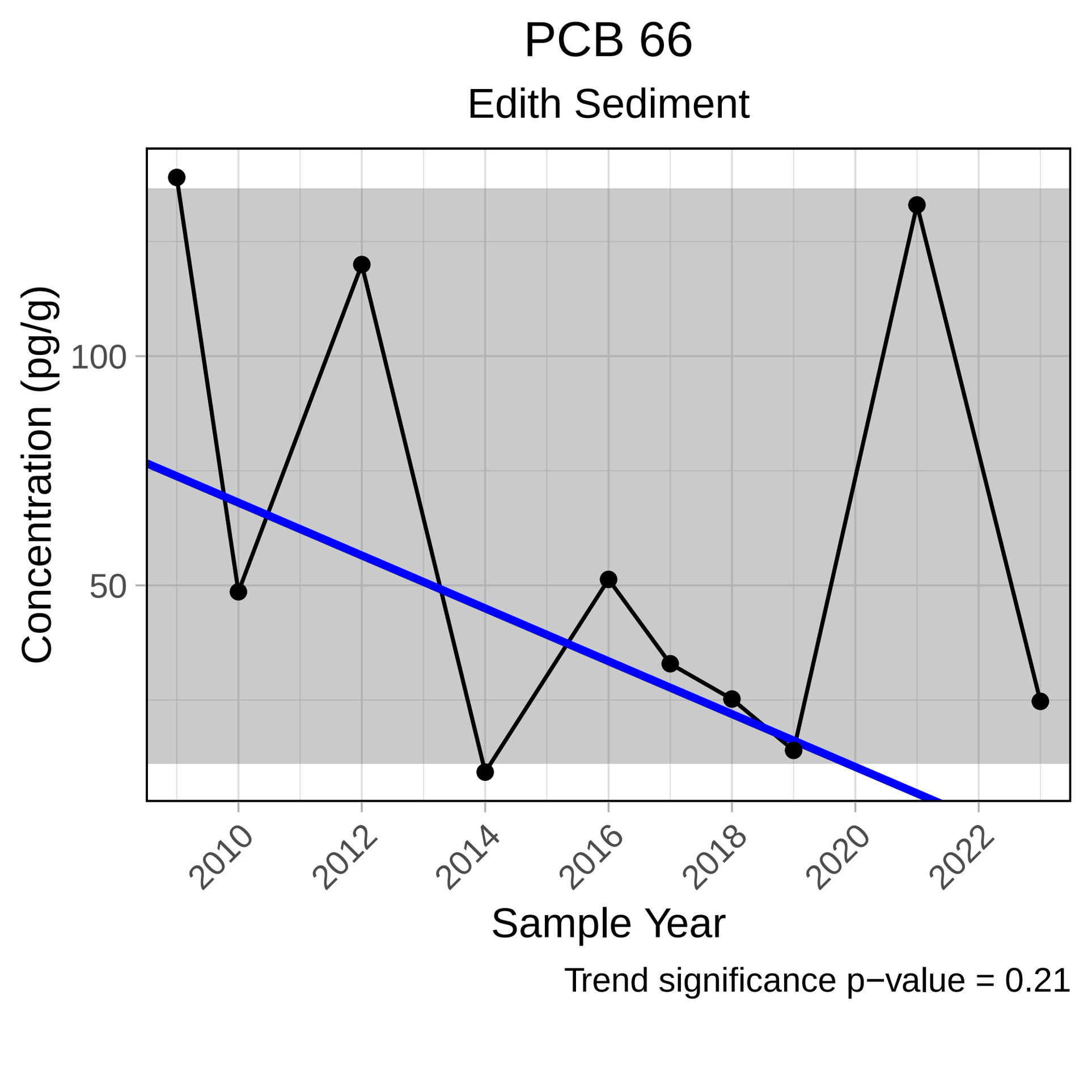

PCB 37
Edith Sediment
Concentration (pg/g)
0
20
40
60
80
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.858

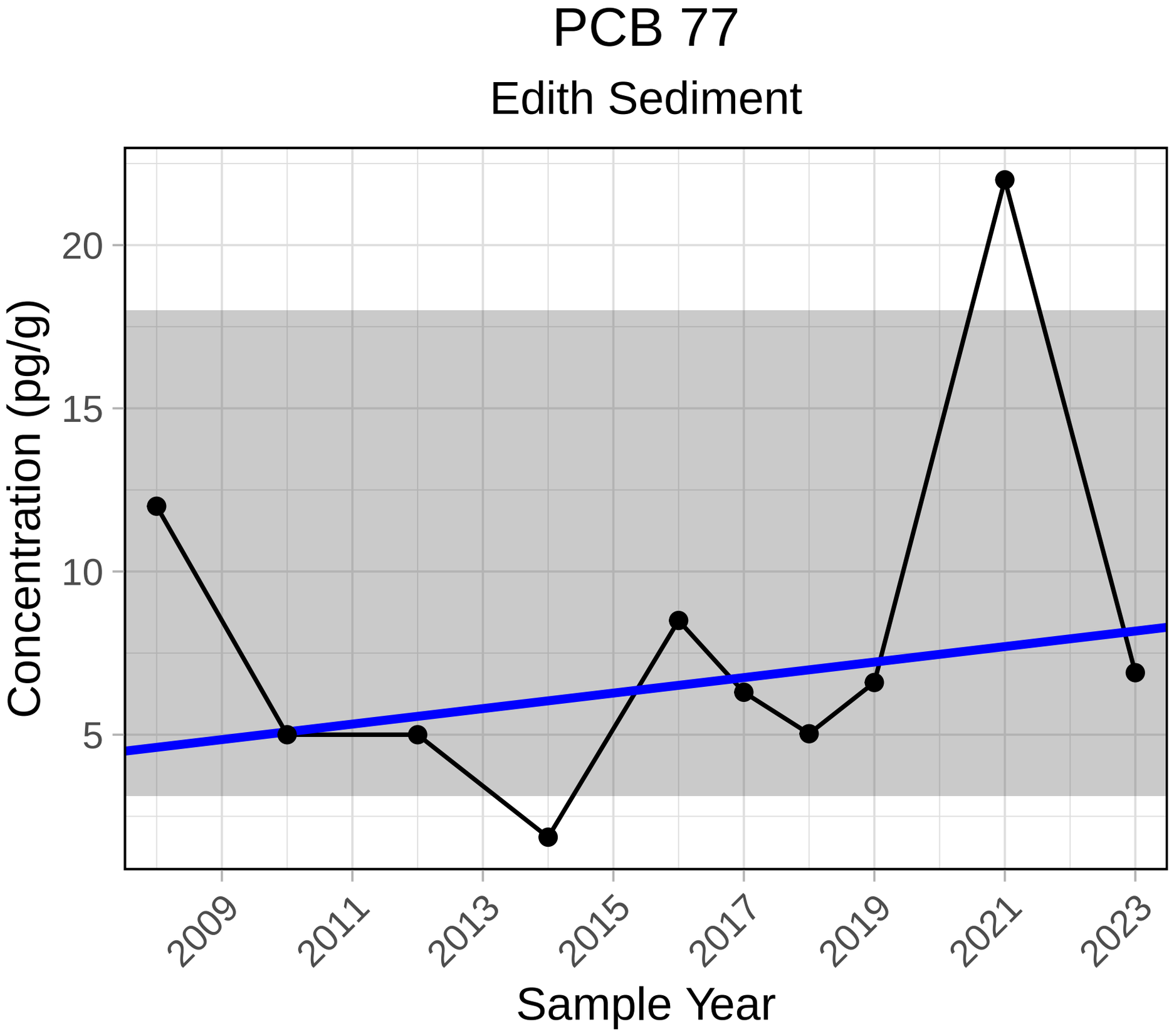

PCB 38
Edith Sediment
Concentration (pg/g)
15.0
12.5
10.0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.018

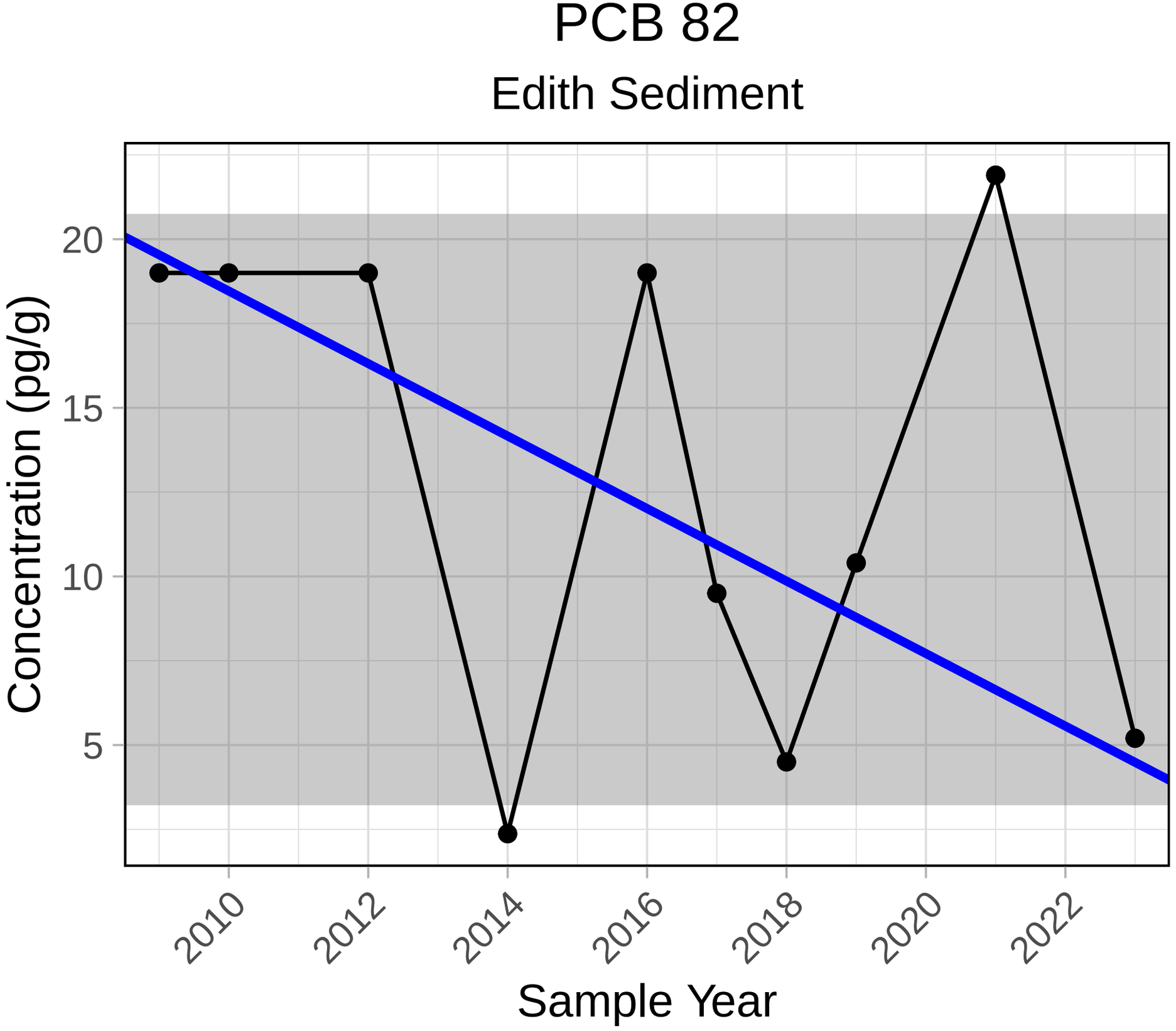
PCB 56
Edith Sediment
Concentration (pg/g)
60
40
20
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.53

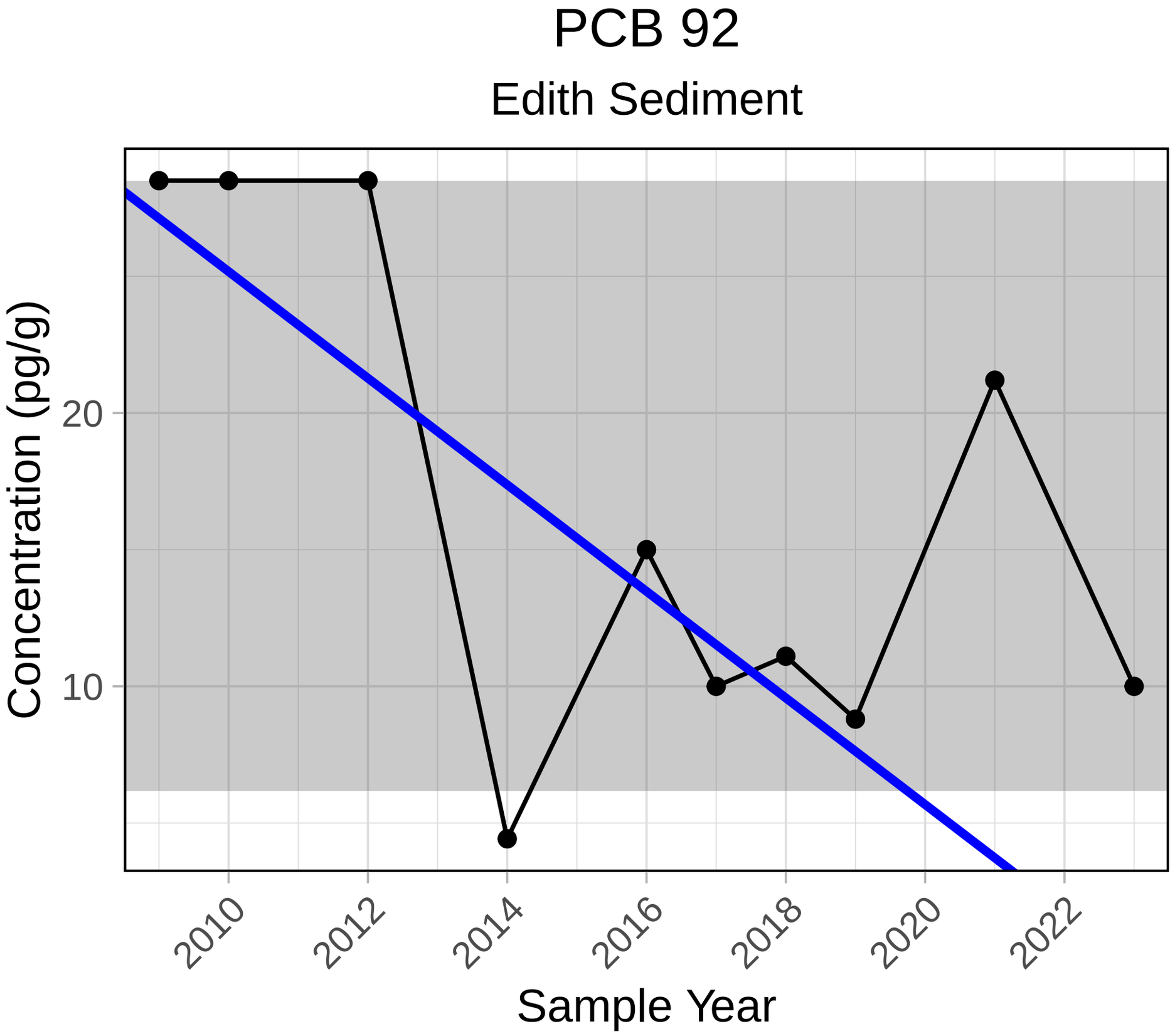

PCB 60
Edith Sediment
Concentration (pg/g)
50
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

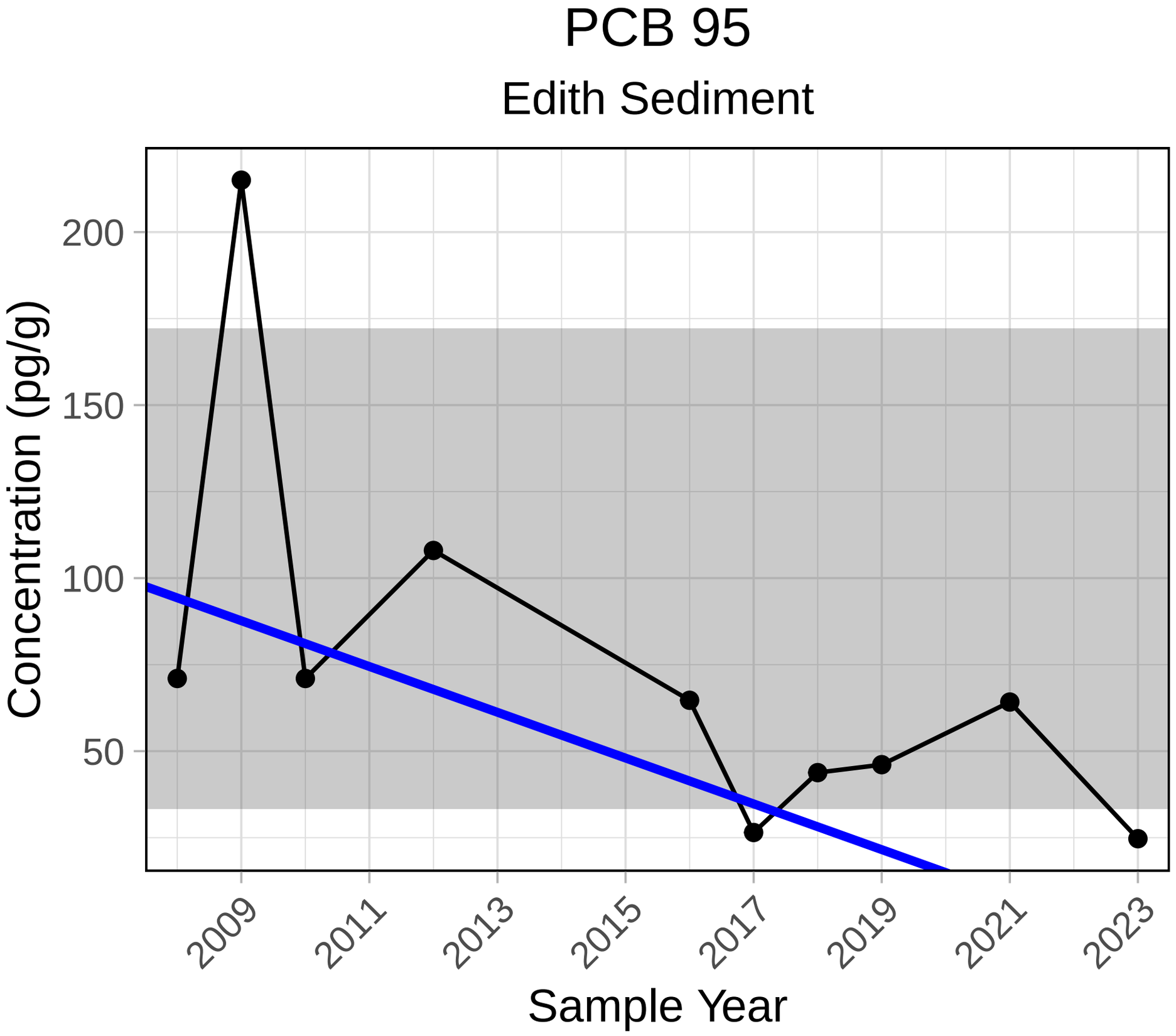

PCB 64
Edith Sediment
Concentration (pg/g)
100
75
50
25
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

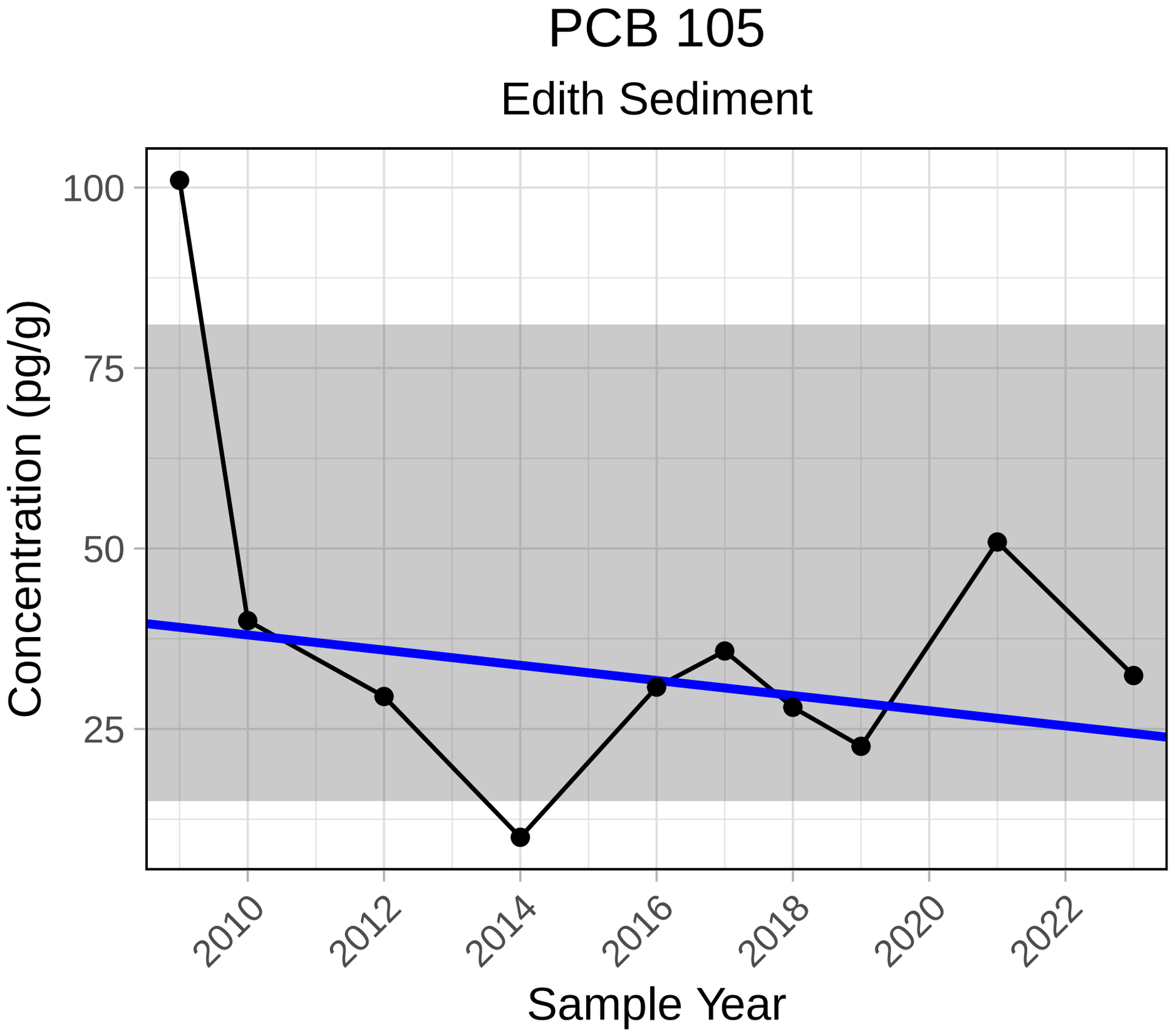

PCB 66
Edith Sediment
Concentration (pg/g)
100
50
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21

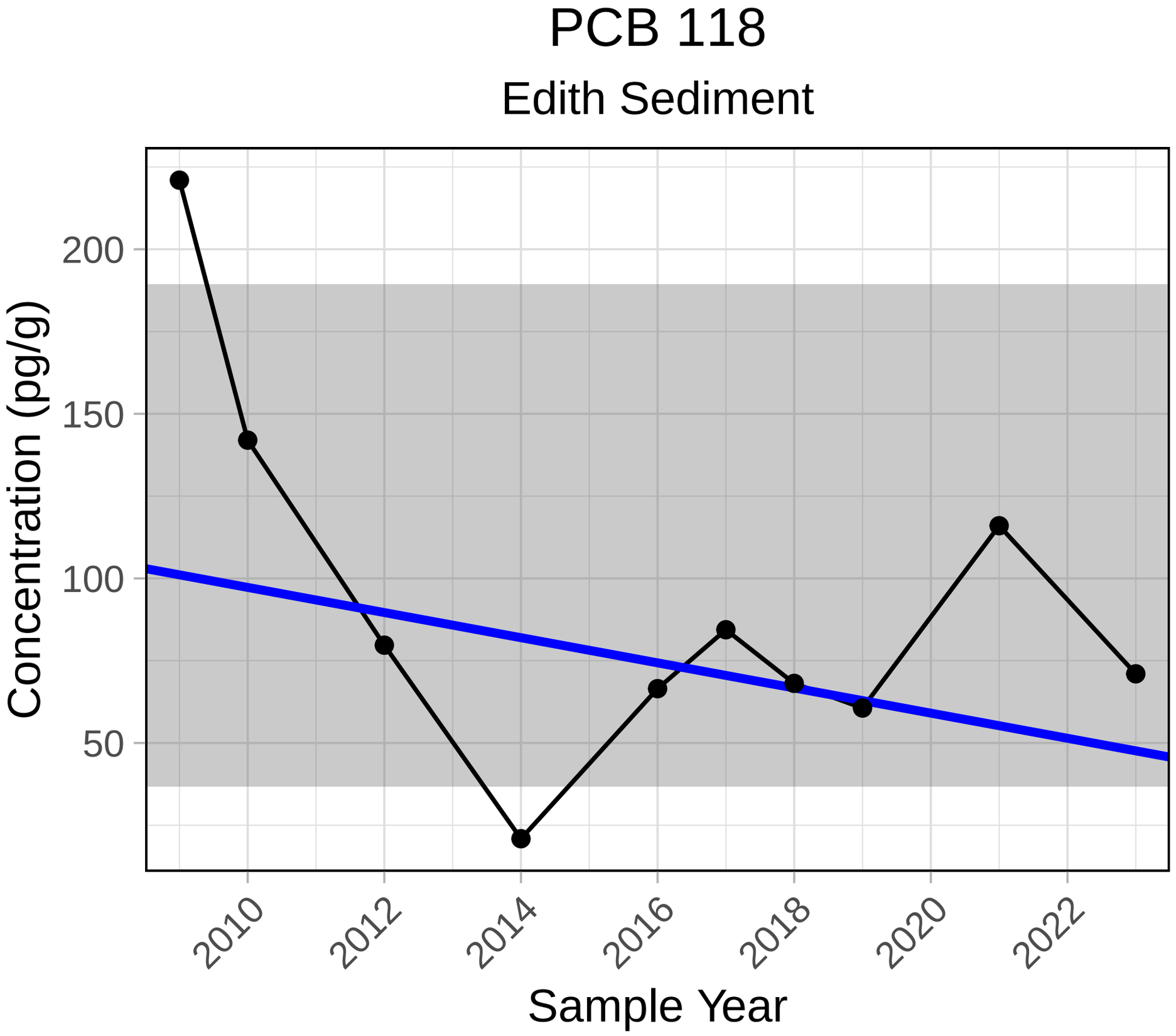

PCB 77
Edith Sediment
Concentration (pg/g)
20
15
10
5
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323

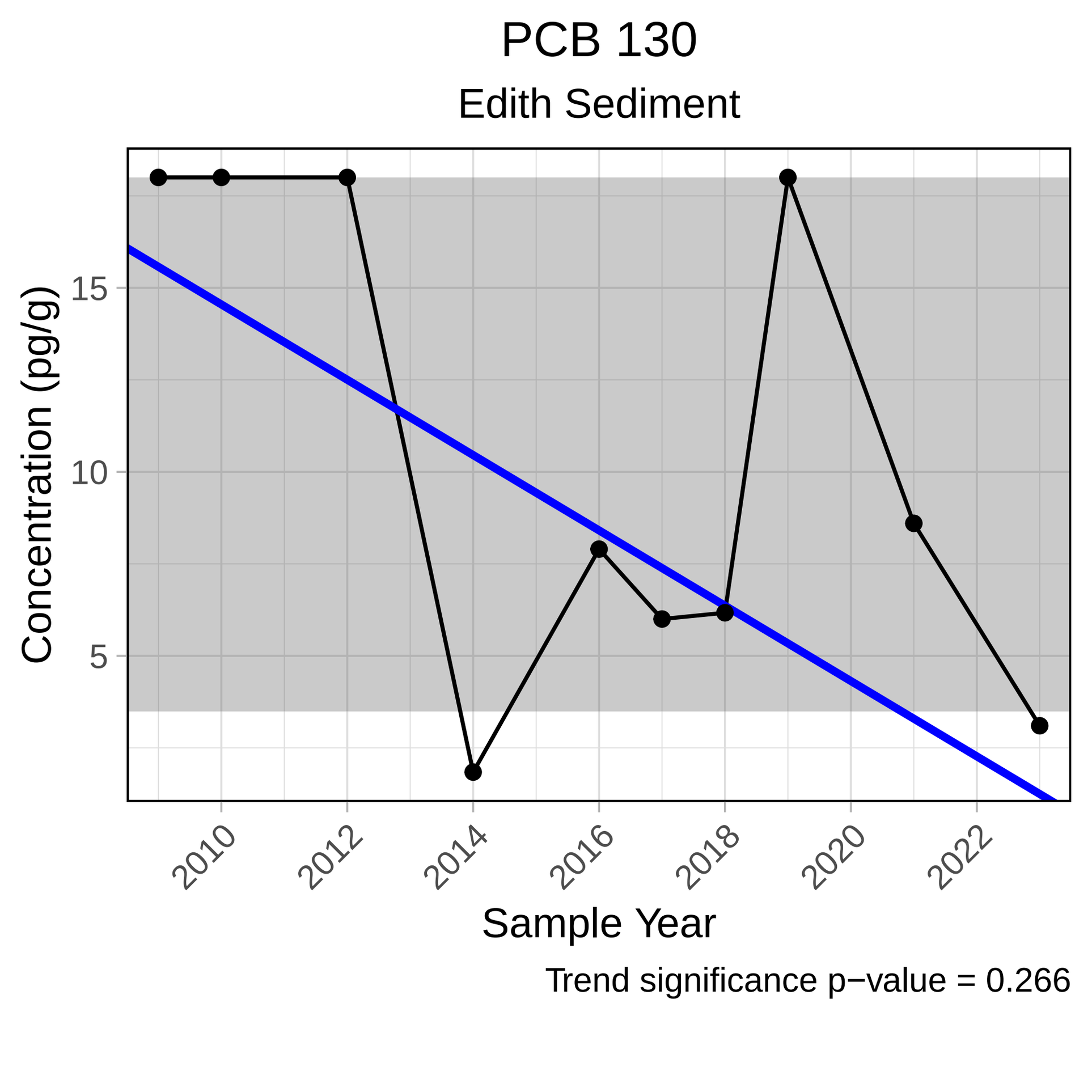

PCB 82
Edith Sediment
Concentration (pg/g)
20
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.578

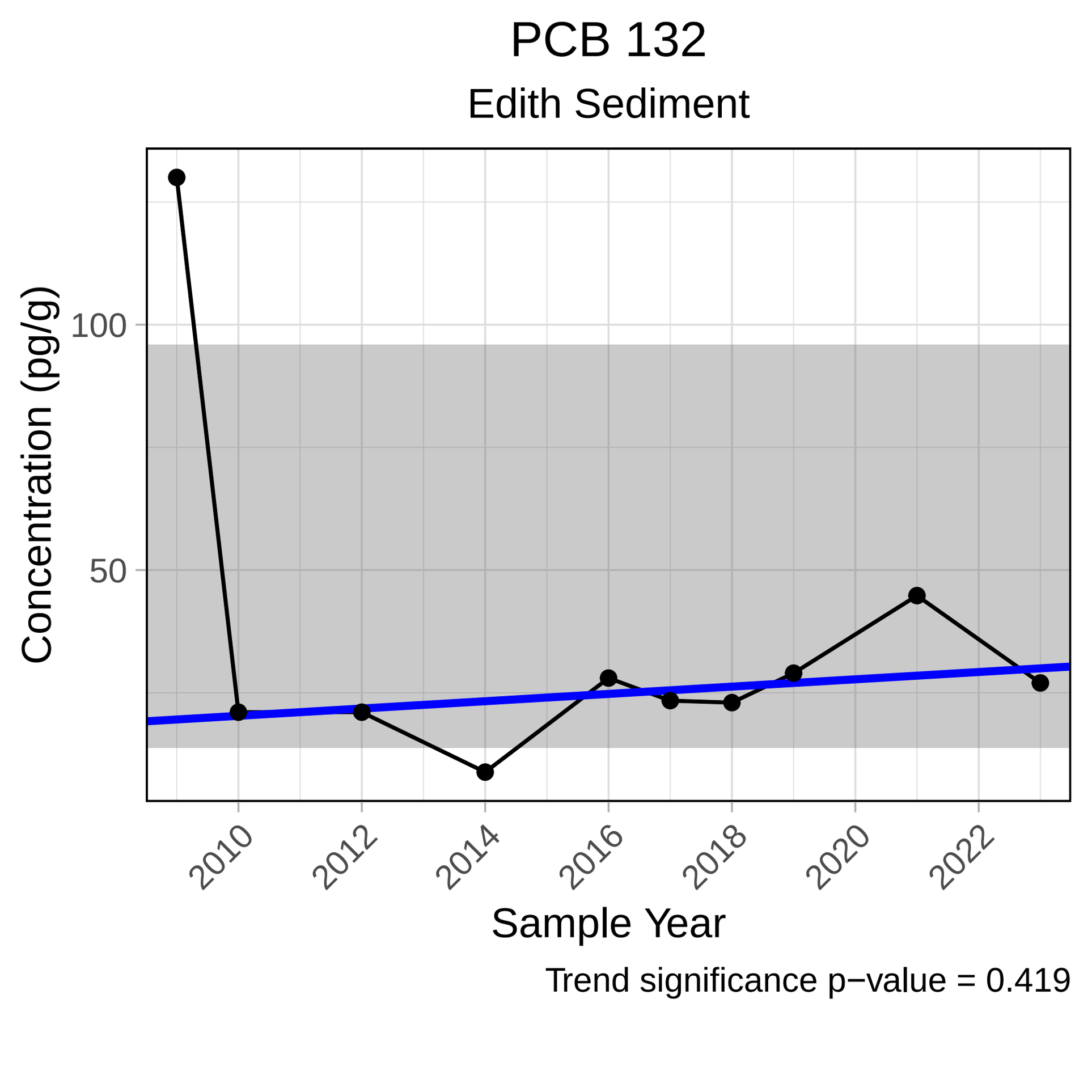

PCB 92
Edith Sediment
Concentration (pg/g)
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.145

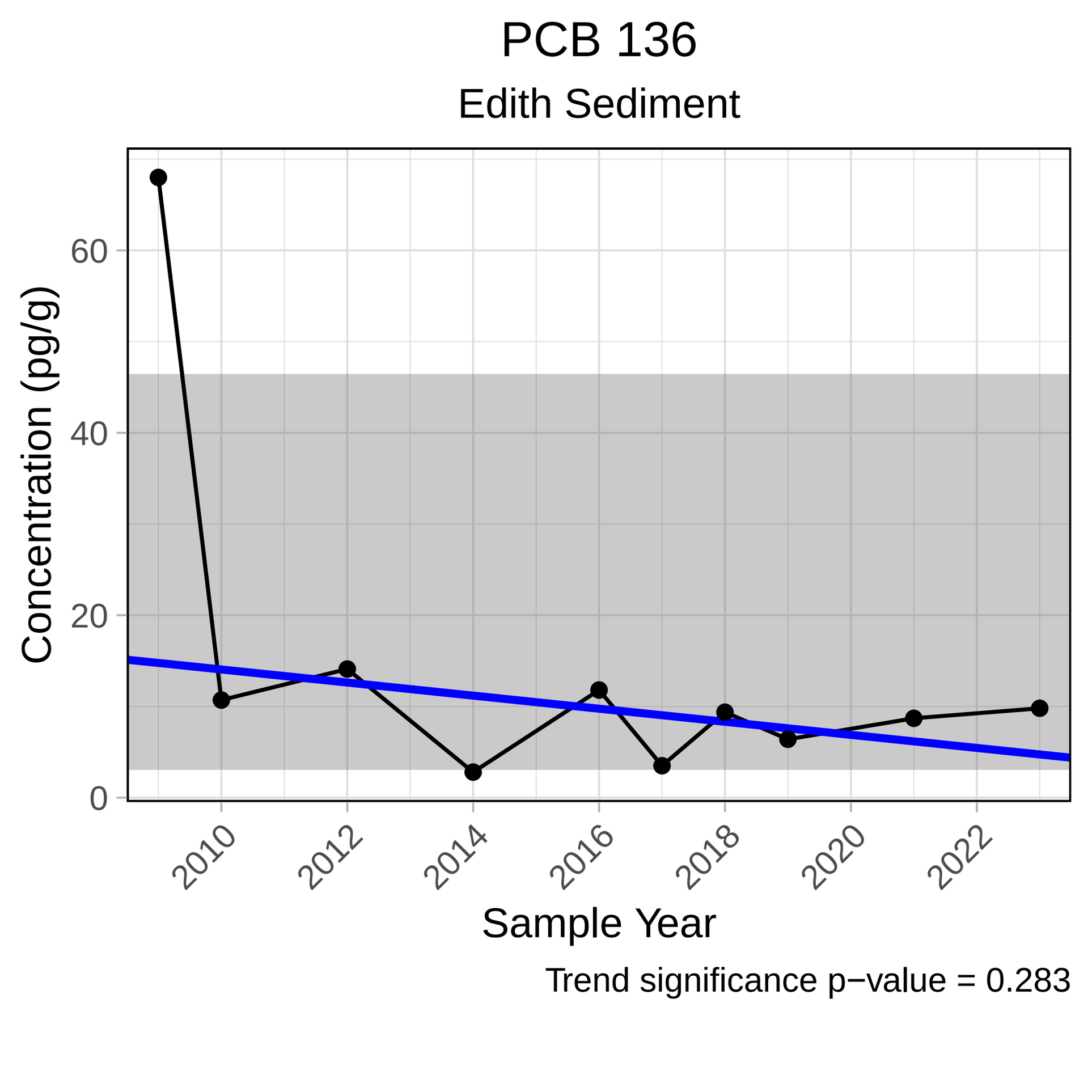

PCB 95
Edith Sediment
Concentration (pg/g)
200
150
100
50
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.025

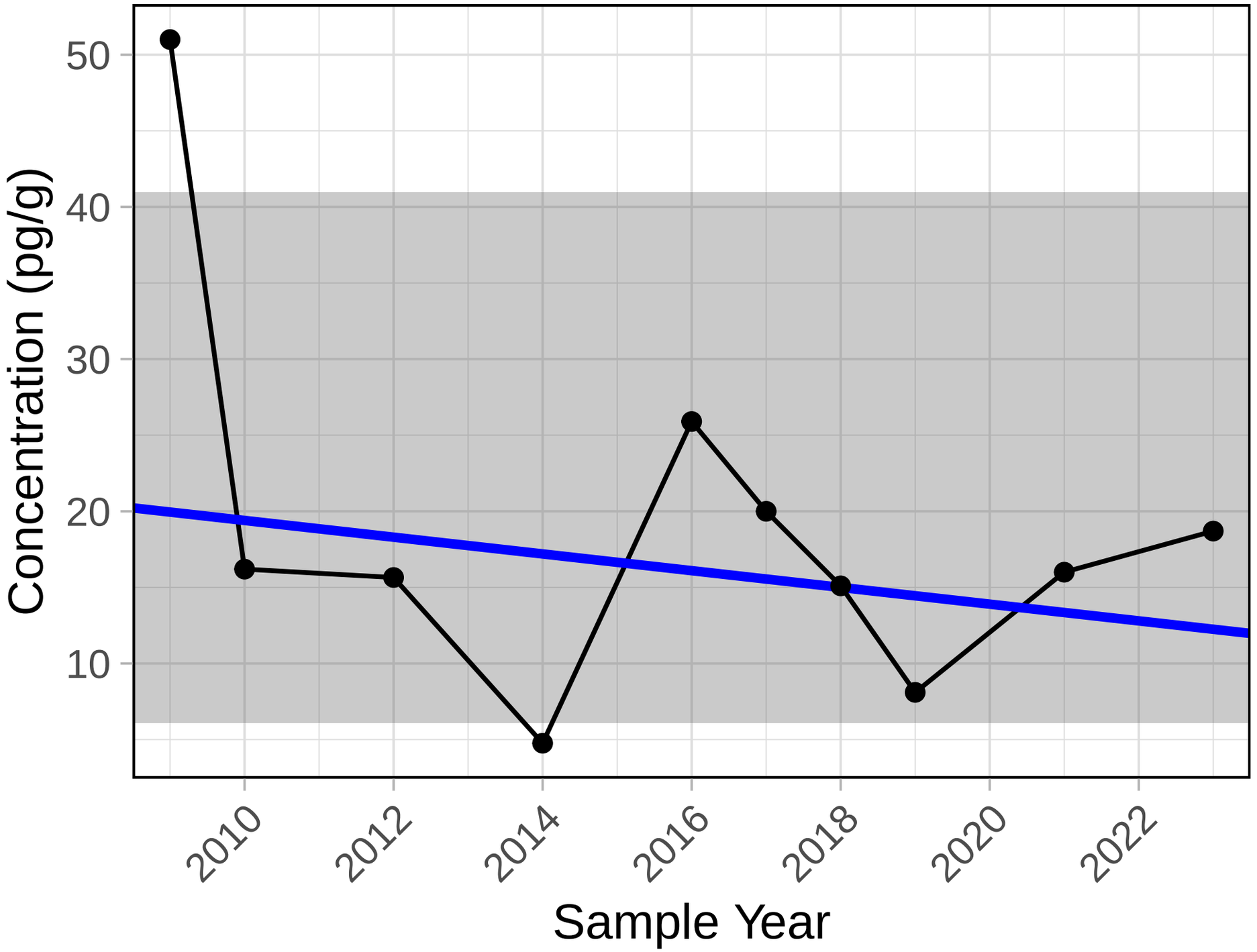

PCB 105
Edith Sediment
Concentration (pg/g)
100
75
50
25
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

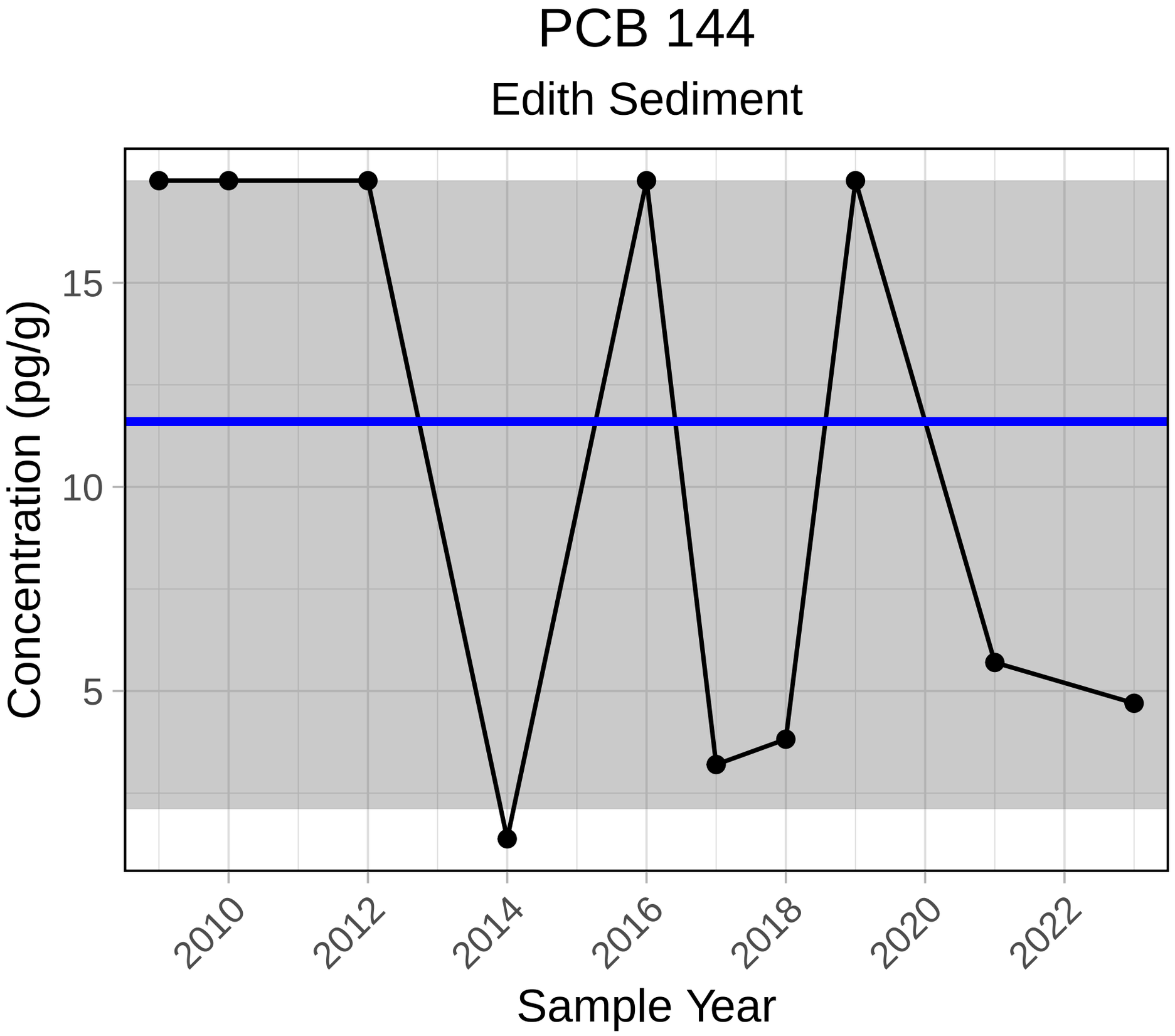

PCB 118
Edith Sediment
Concentration (pg/g)
200
150
100
50
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

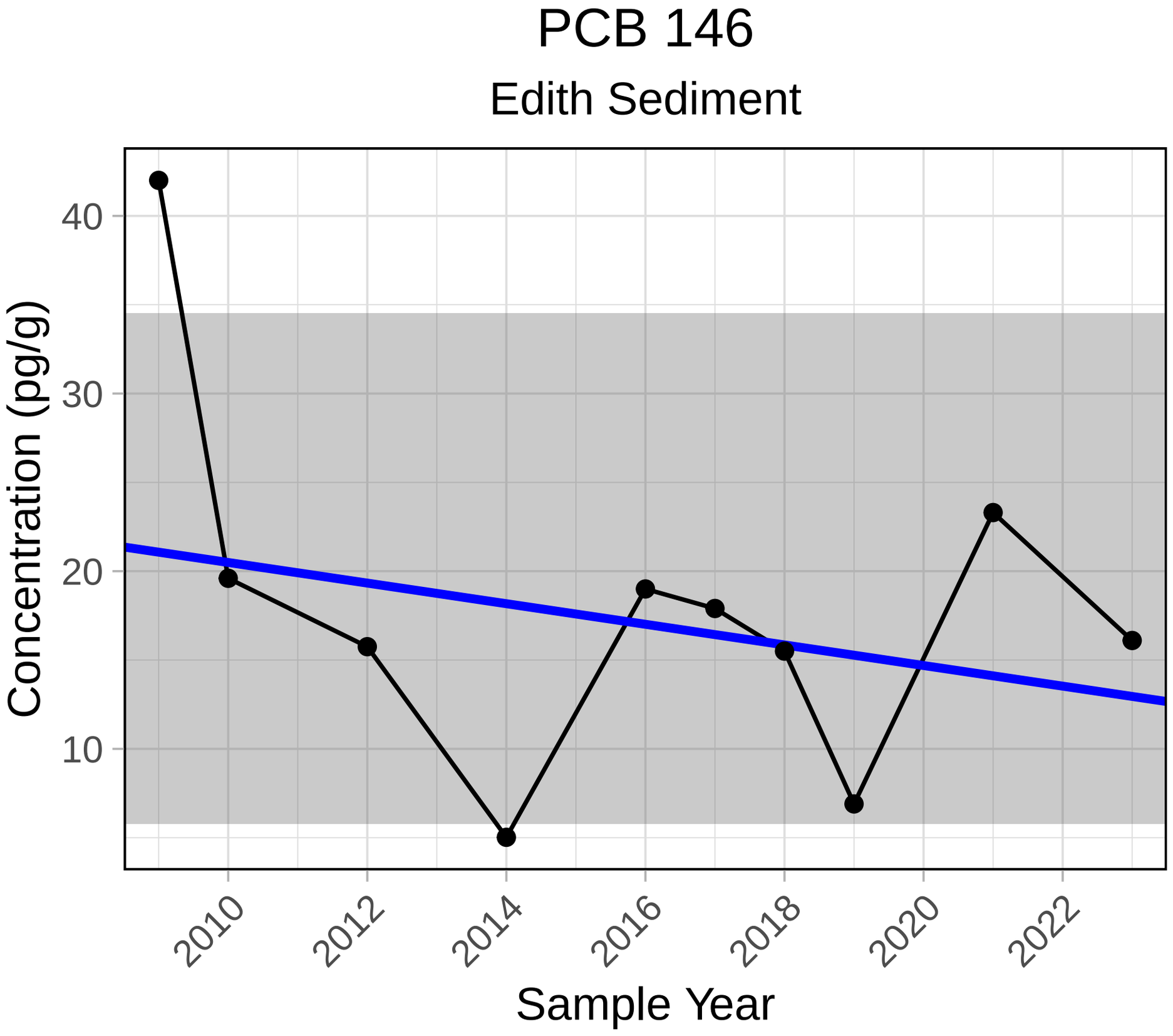

PCB 130
Edith Sediment
Concentration (pg/g)
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.266

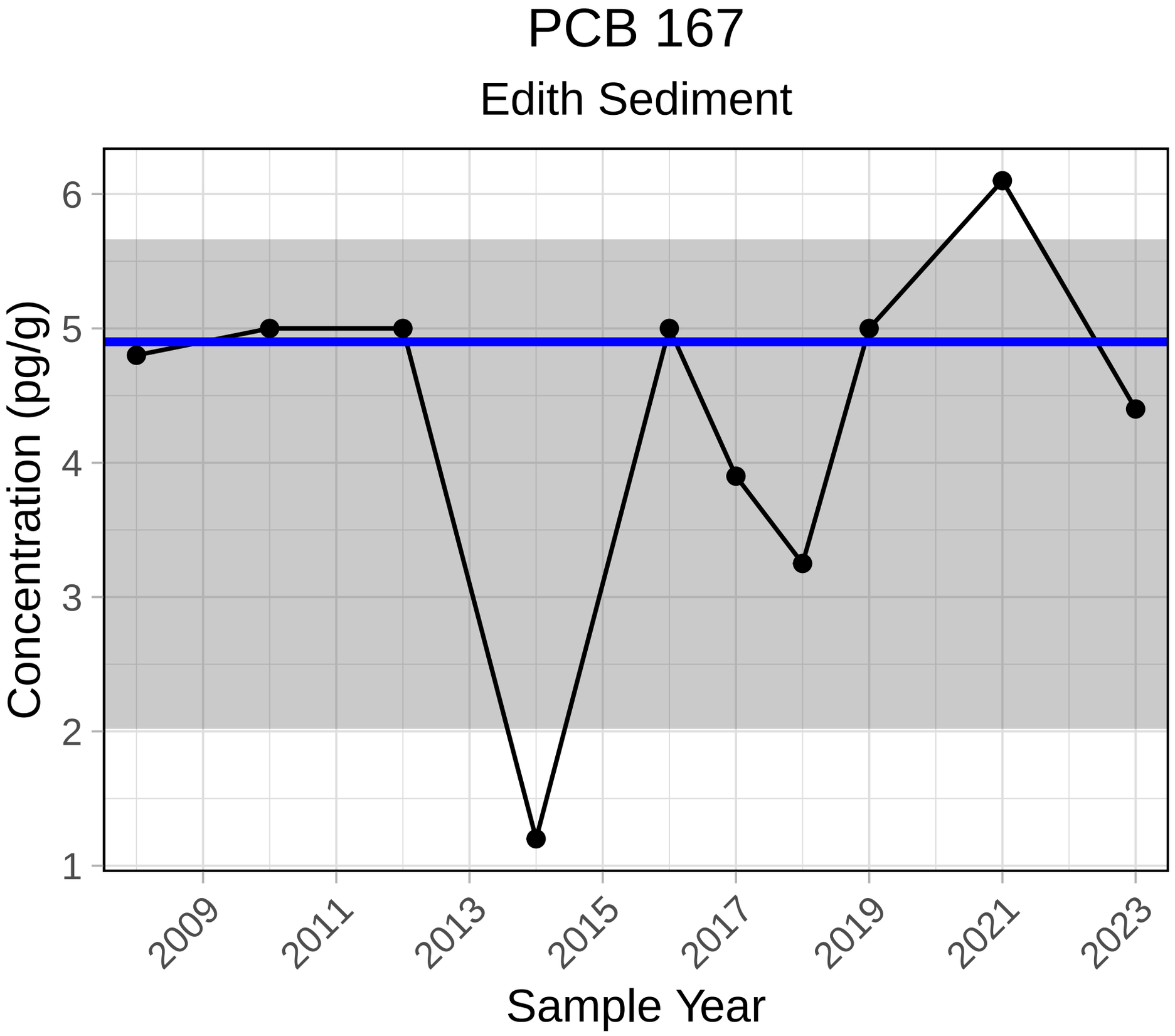

PCB 132
Edith Sediment
Concentration (pg/g)
100
50
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.419

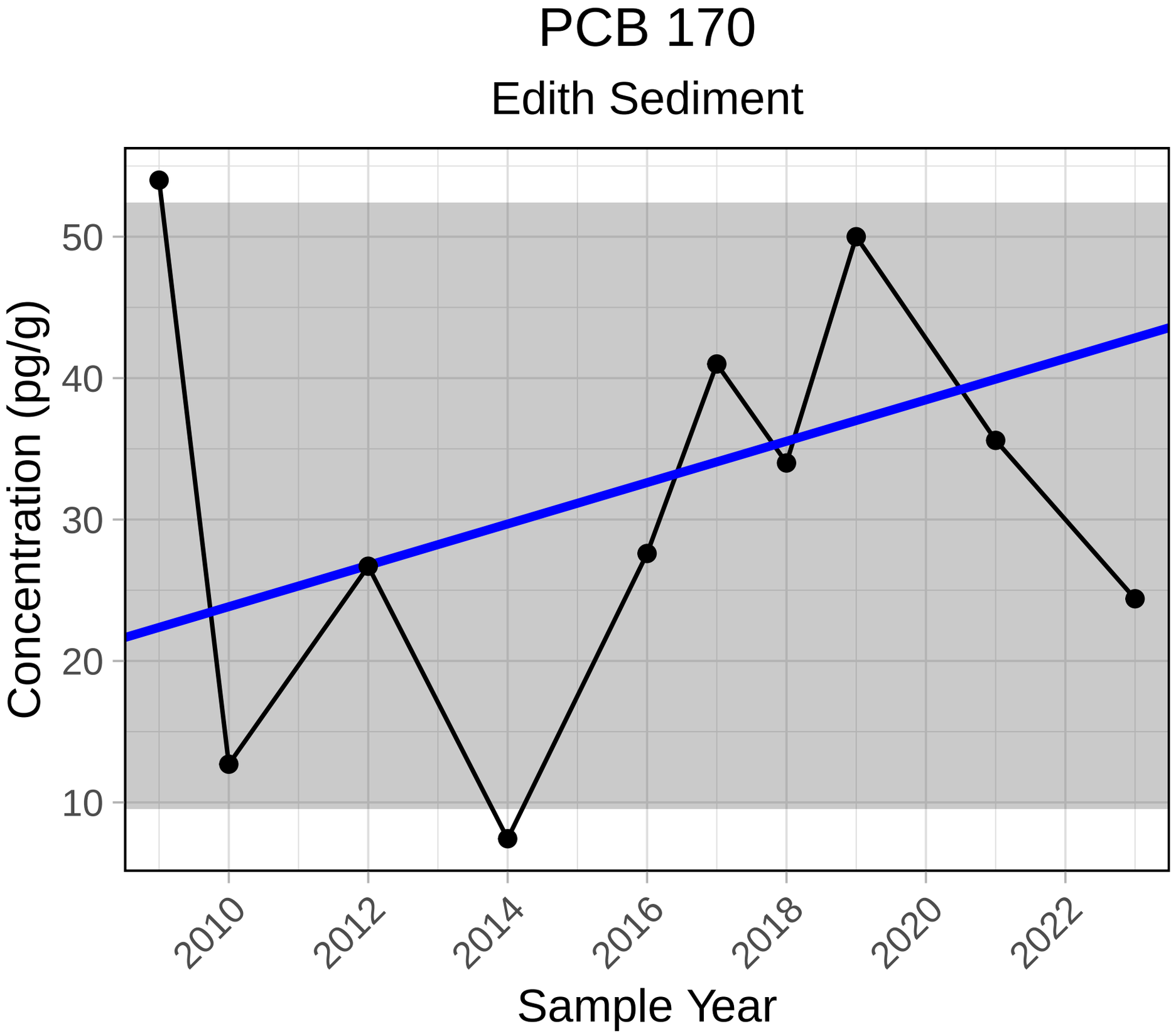

PCB 136
Edith Sediment
Concentration (pg/g)
0
20
40
60
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283


PCB 141
Edith Sediment
Concentration (pg/g)
50
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

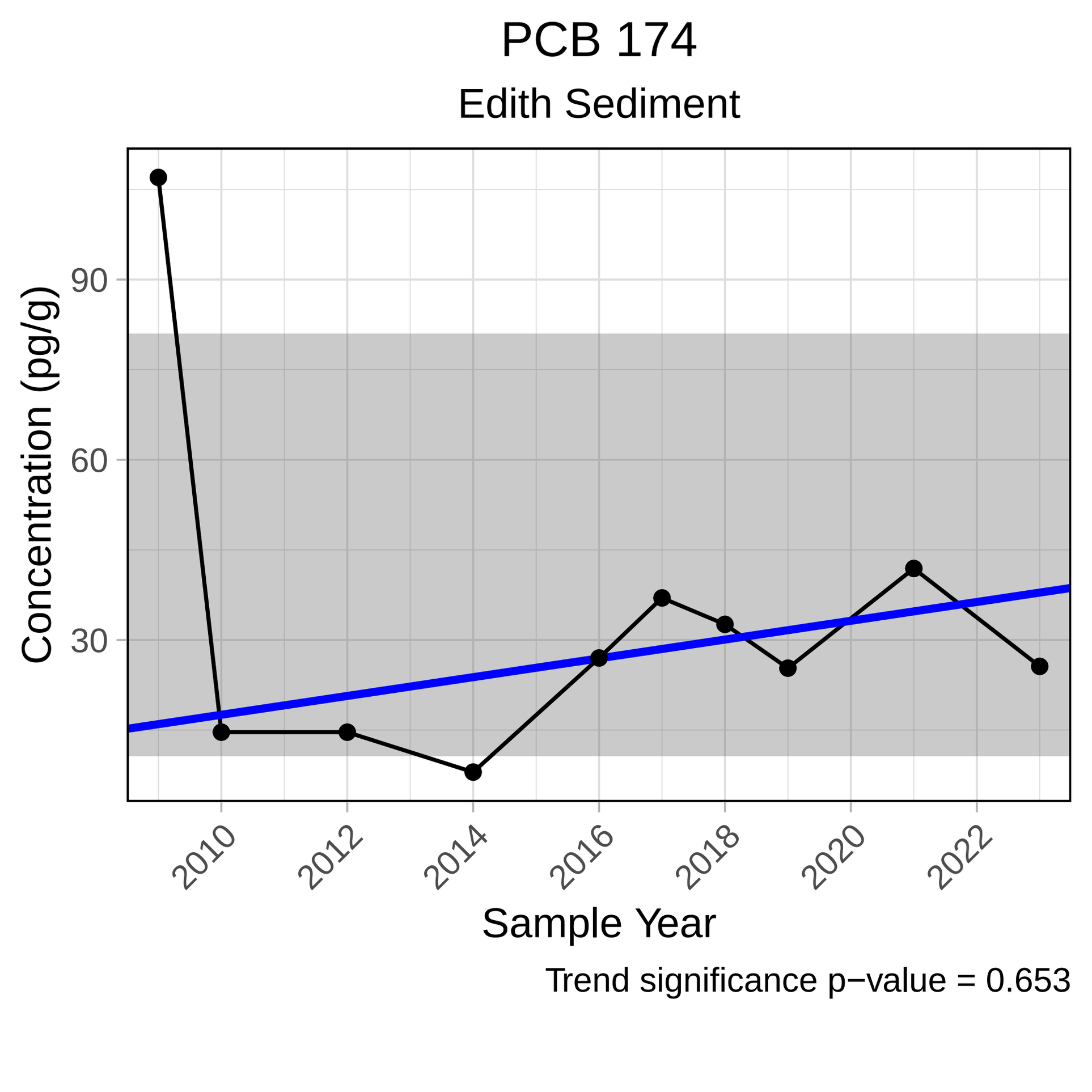

PCB 144
Edith Sediment
Concentration (pg/g)
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.442

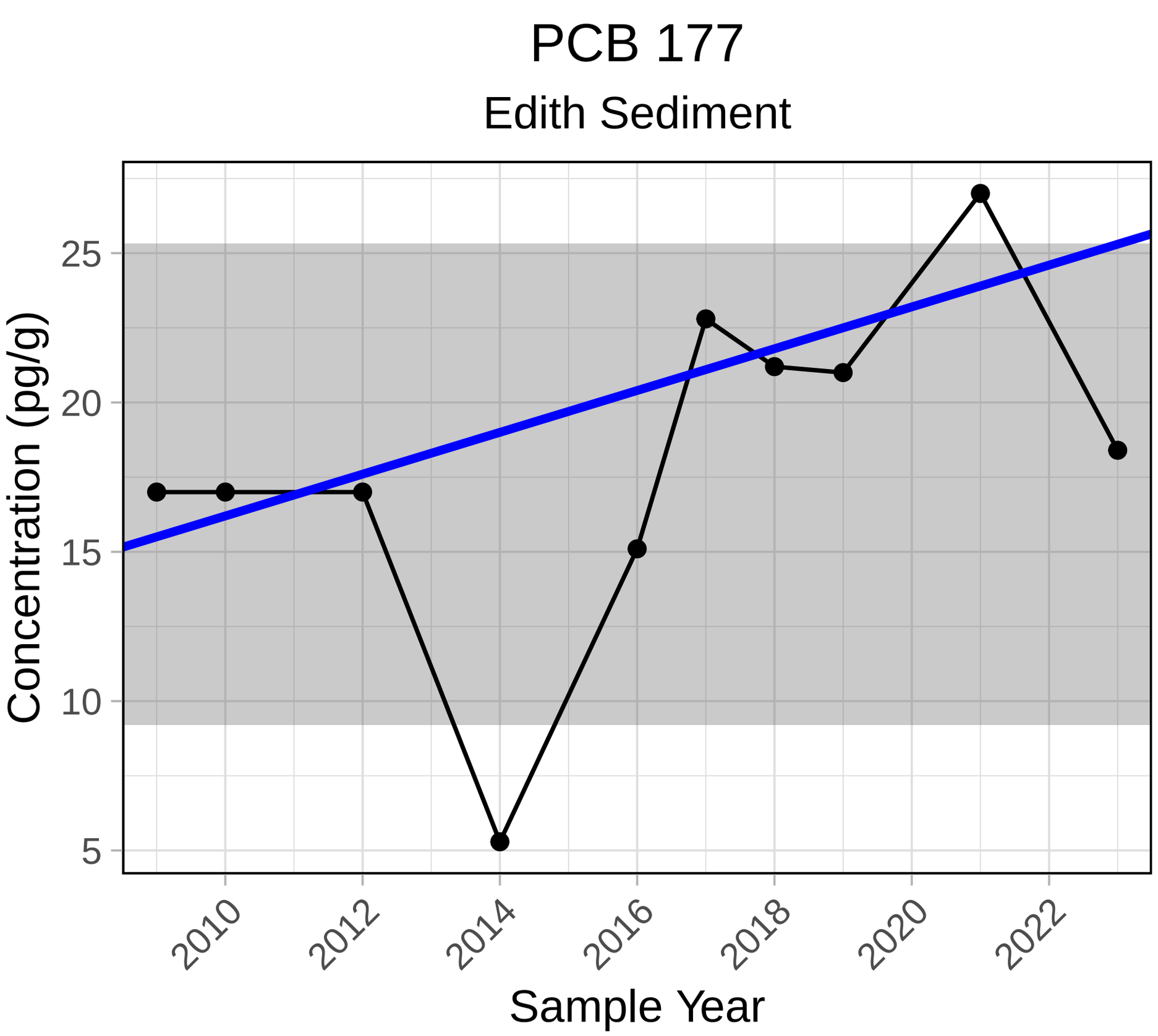

PCB 146
Edith Sediment
Concentration (pg/g)
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371


PCB 167
Edith Sediment
Concentration (pg/g)
6
5
4
3
2
1
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.853

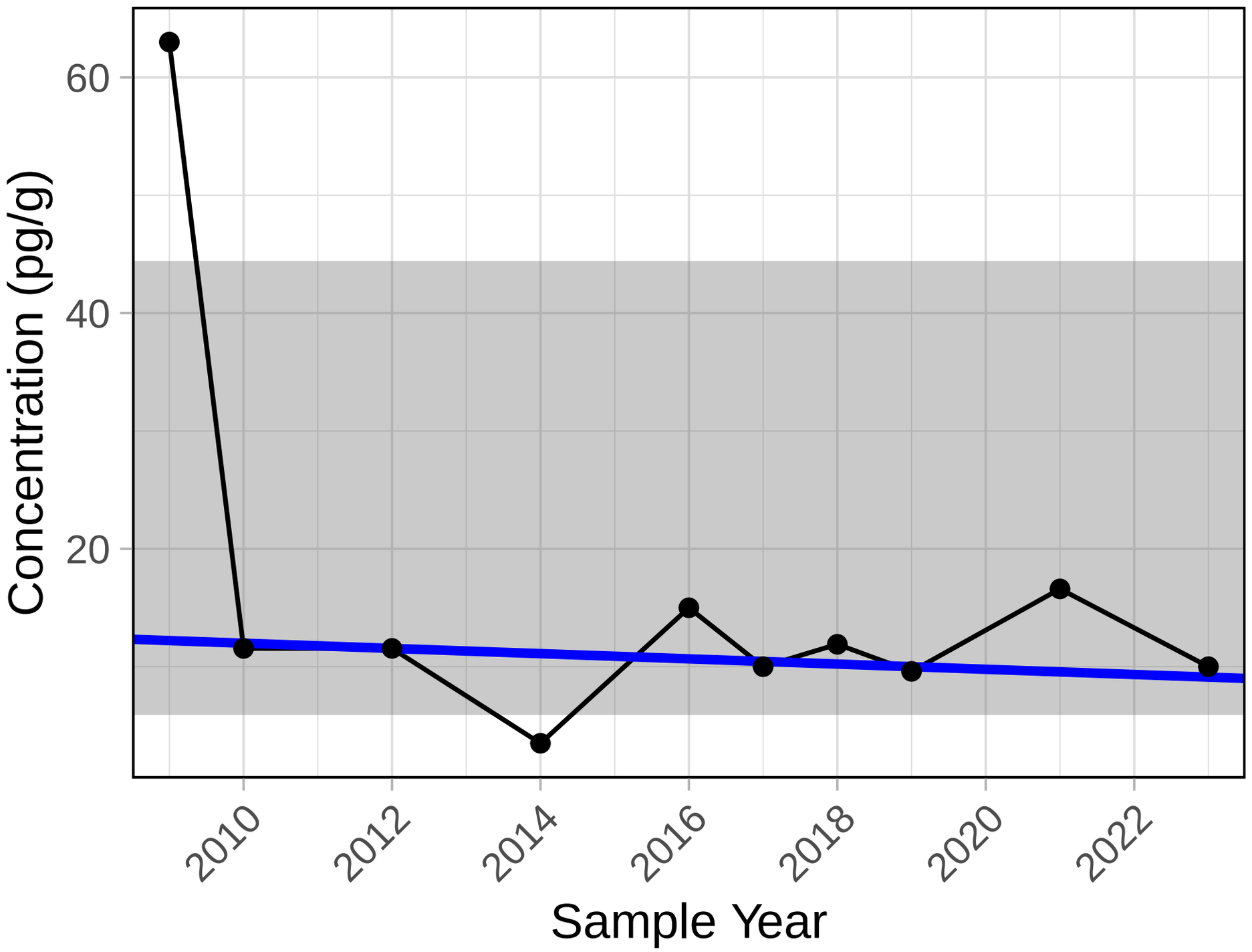

PCB 170
Edith Sediment
Concentration (pg/g)
50
40
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

PCB 172
Edith Sediment
15
10
5
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.711

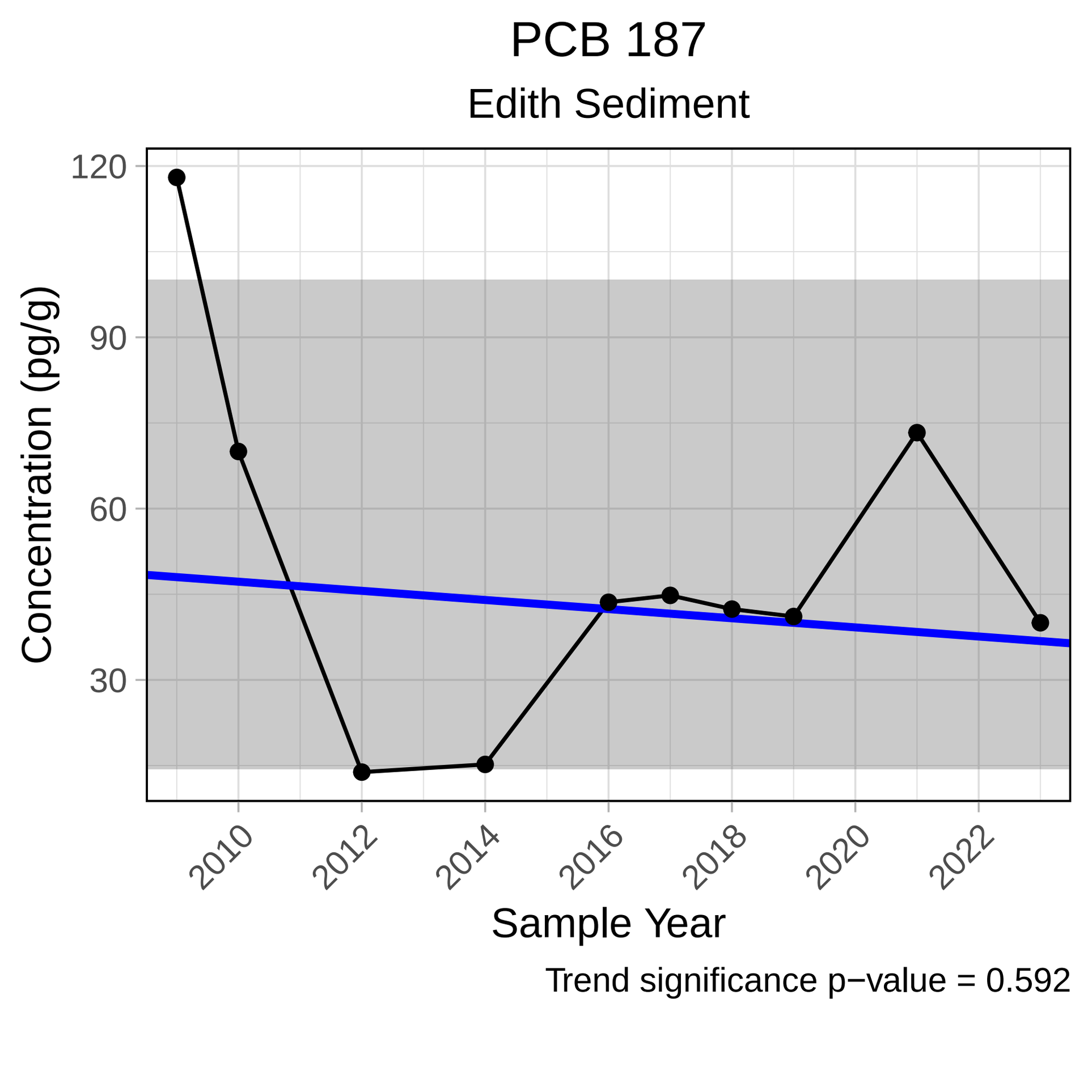

PCB 174
Edith Sediment
Concentration (pg/g)
90
60
30
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.653

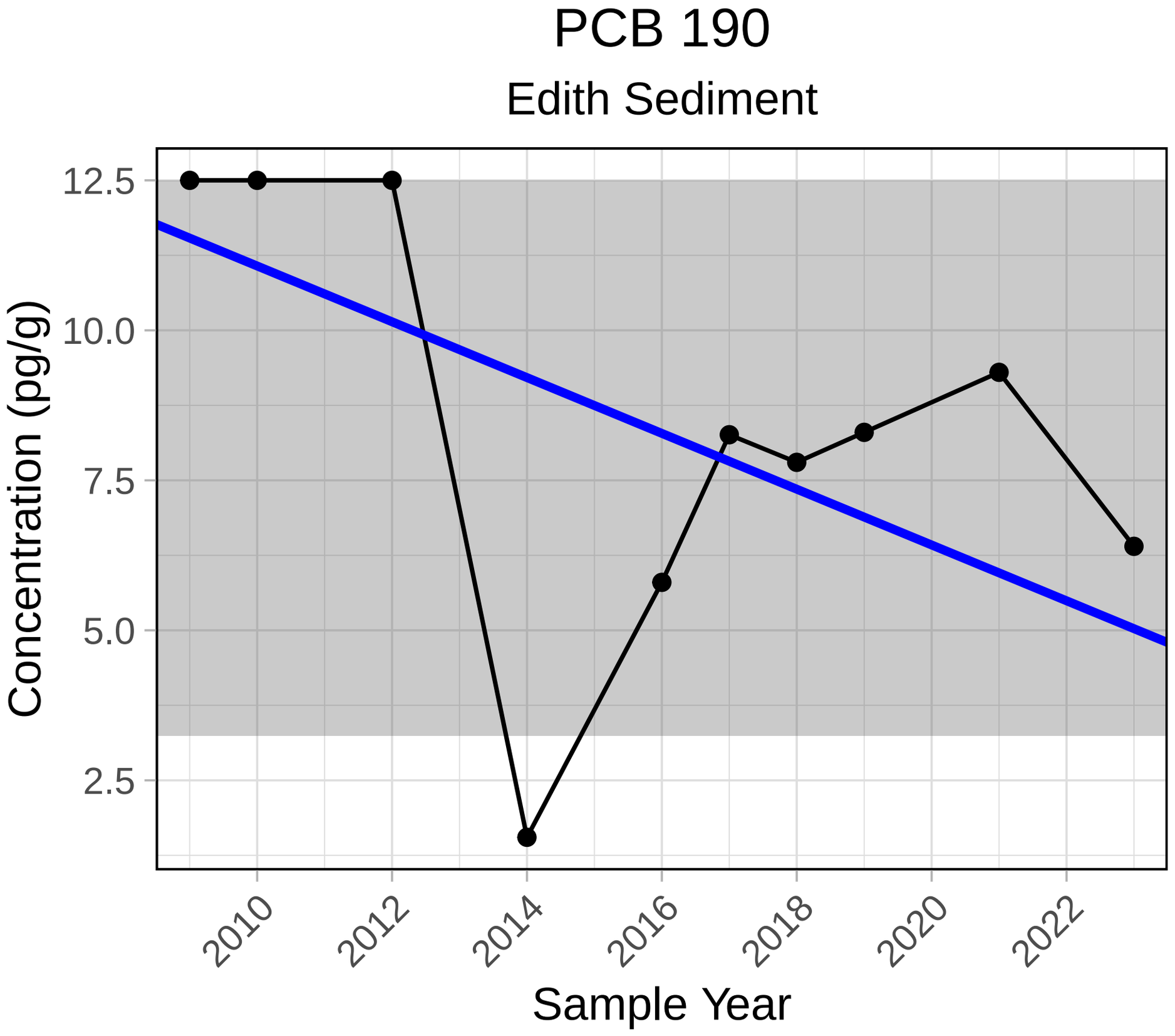

PCB 177
Edith Sediment
Concentration (pg/g)
25
20
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.173

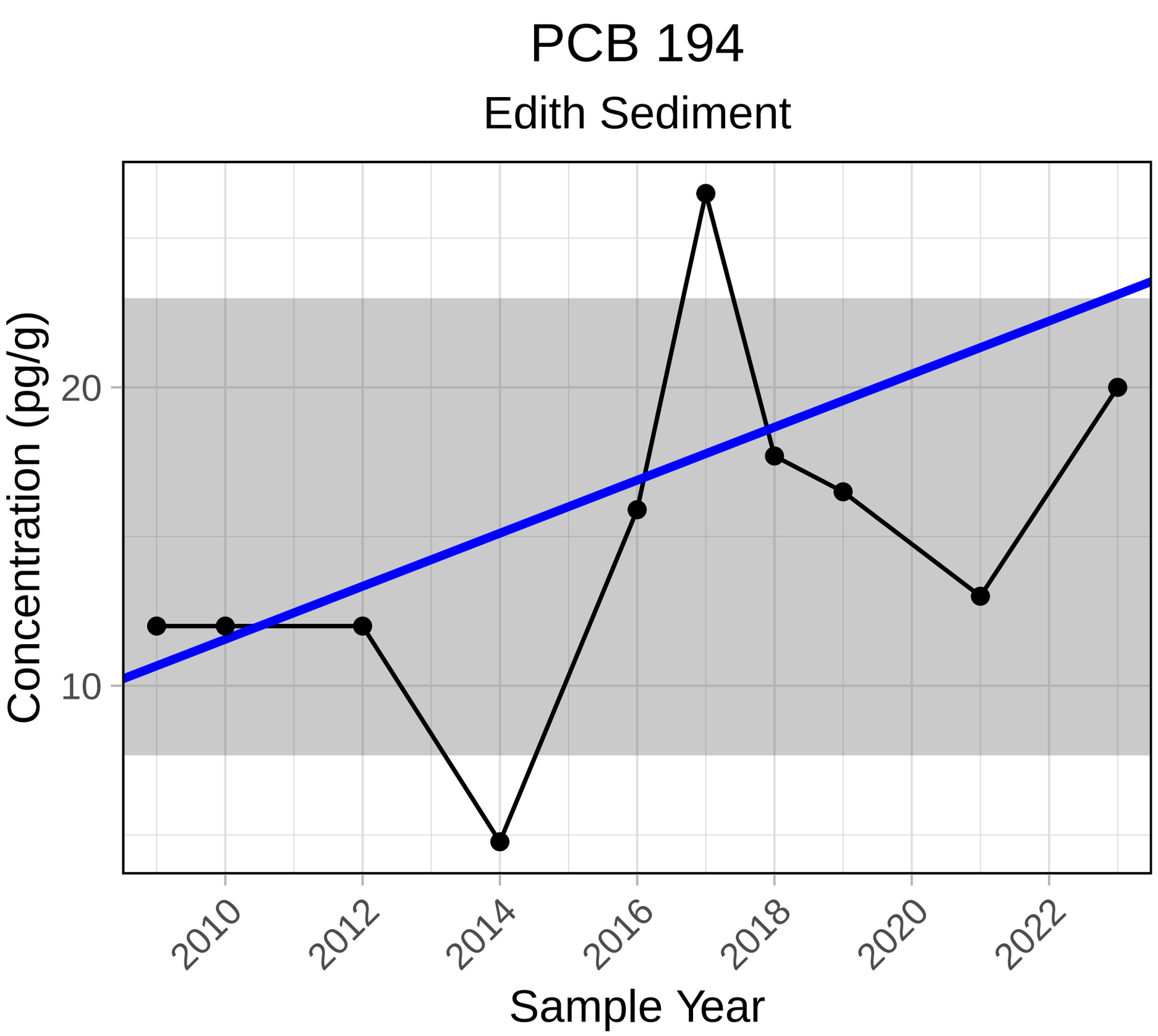
PCB 178
Edith Sediment
Concentration (pg/g)
10
5
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.458

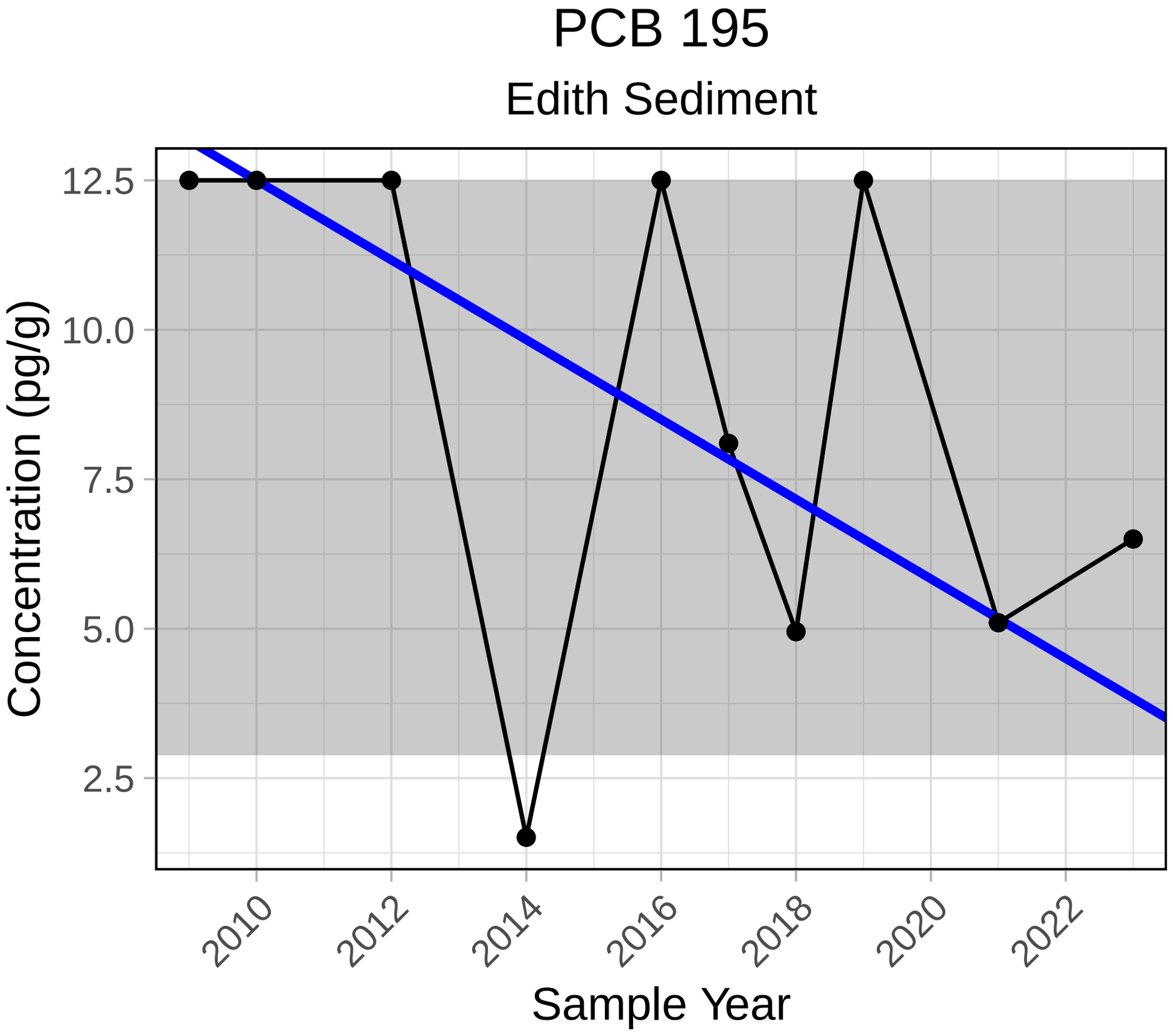

PCB 179
Edith Sediment
Concentration (pg/g)
60
40
20
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.589

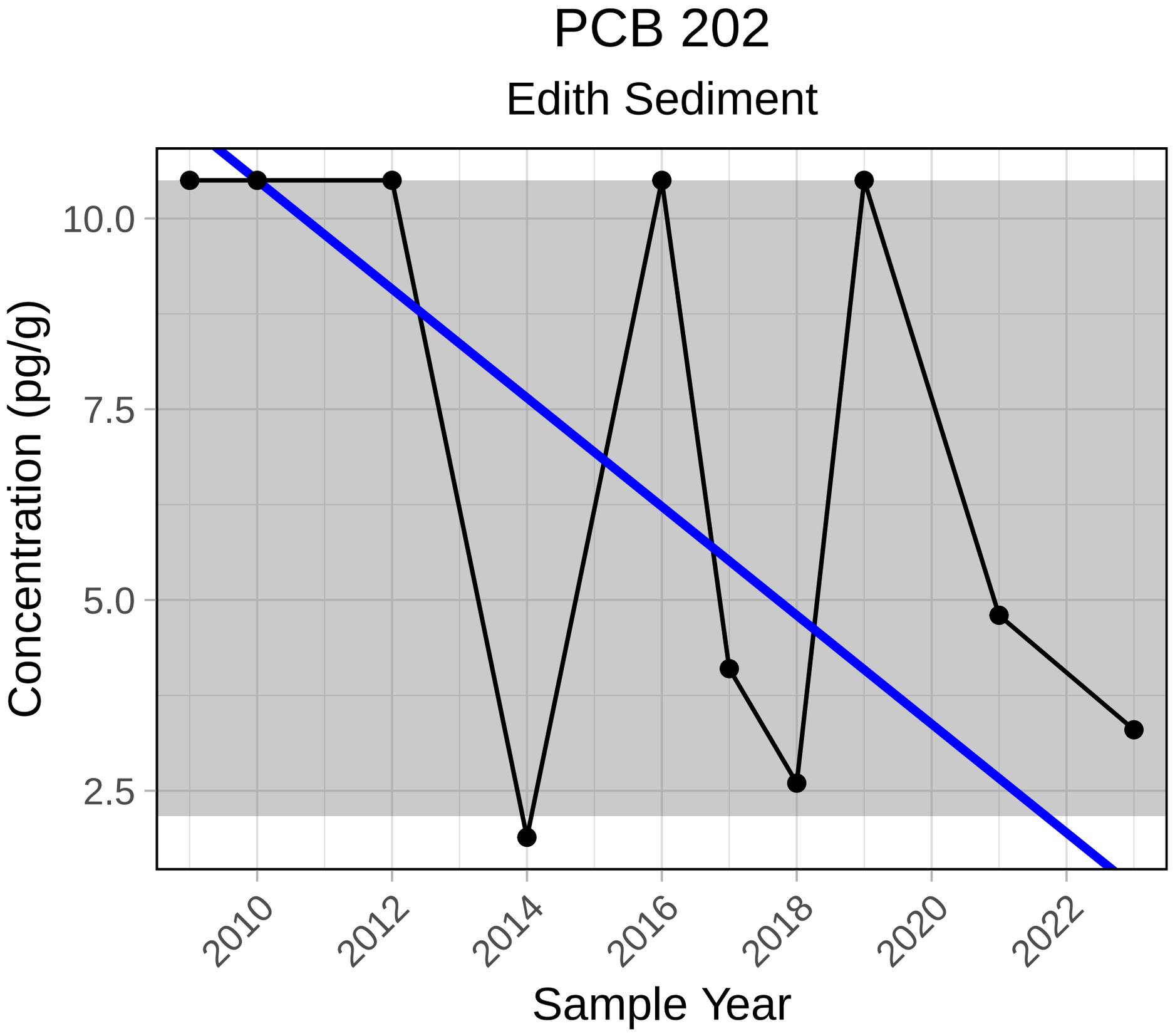
PCB 183
Edith Sediment
60
50
40
30
20
Concentration (pg/g)
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.318

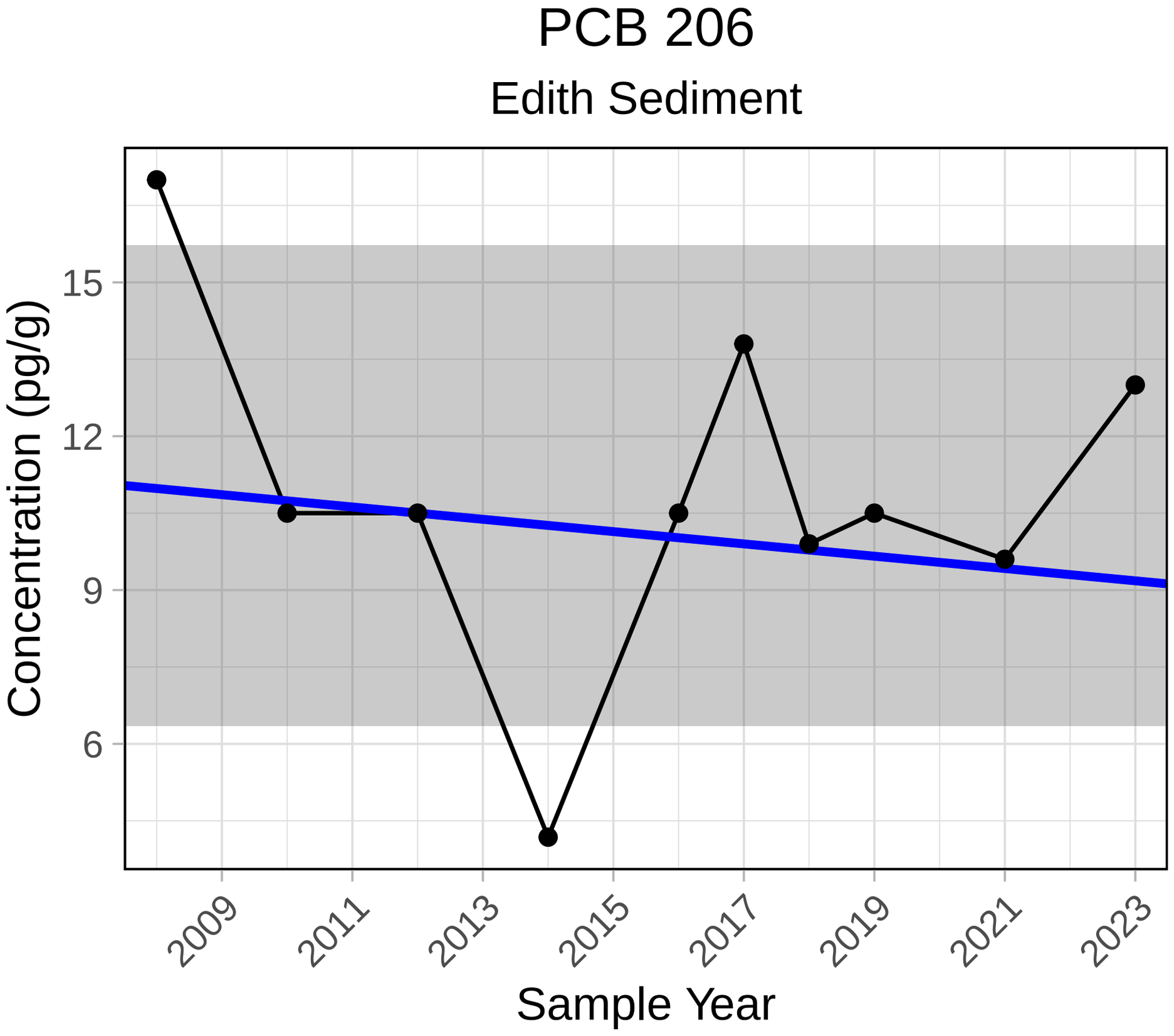

PCB 187
Edith Sediment
120
90
60
30
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592


PCB 190
Edith Sediment
Concentration (pg/g)
12.5
10.0
7.5
5.0
2.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.414

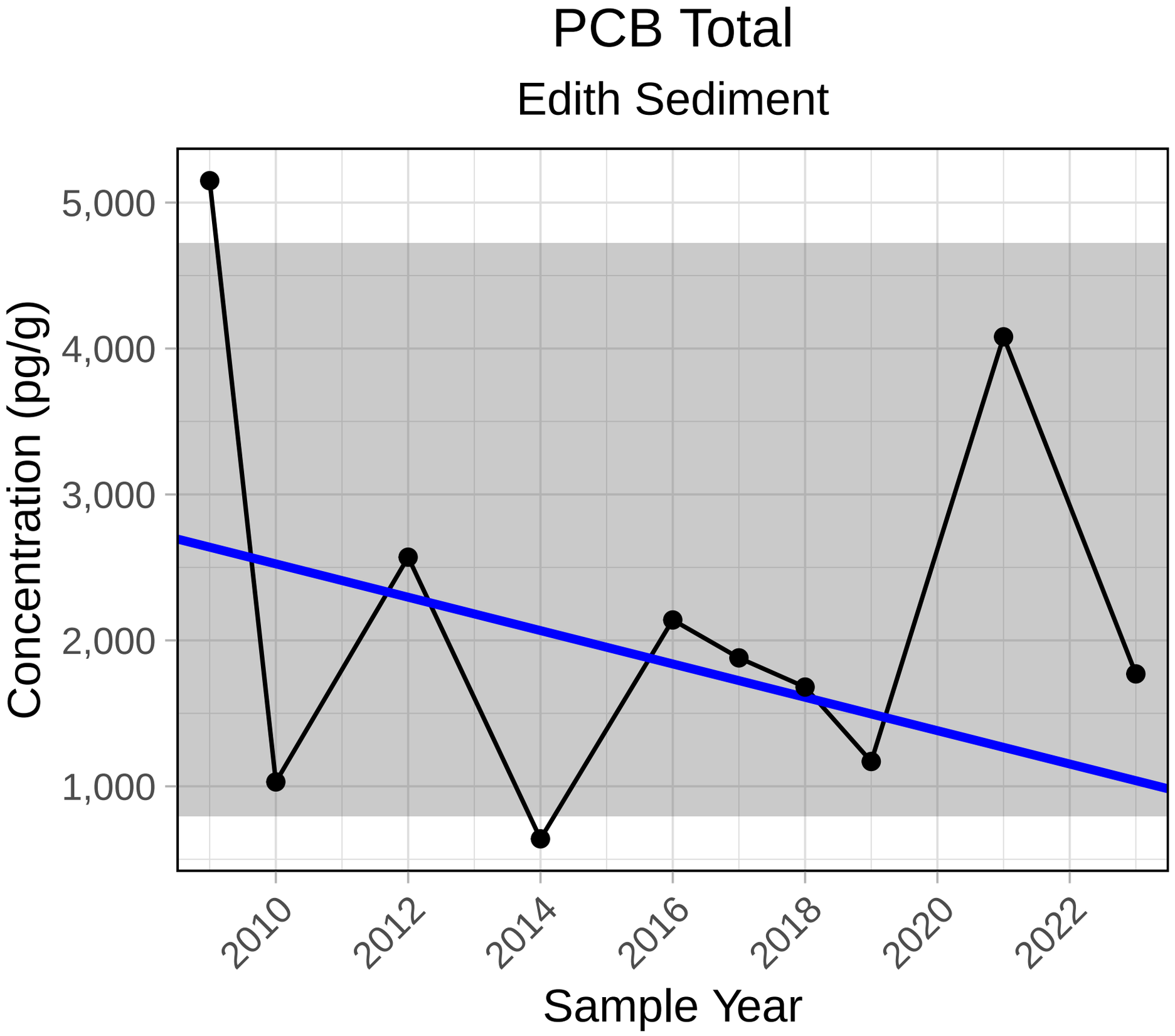

PCB 194
Edith Sediment
Concentration (pg/g)
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.085


PCB 195
Edith Sediment
Concentration (pg/g)
12.5
10.0
7.5
5.0
2.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.249

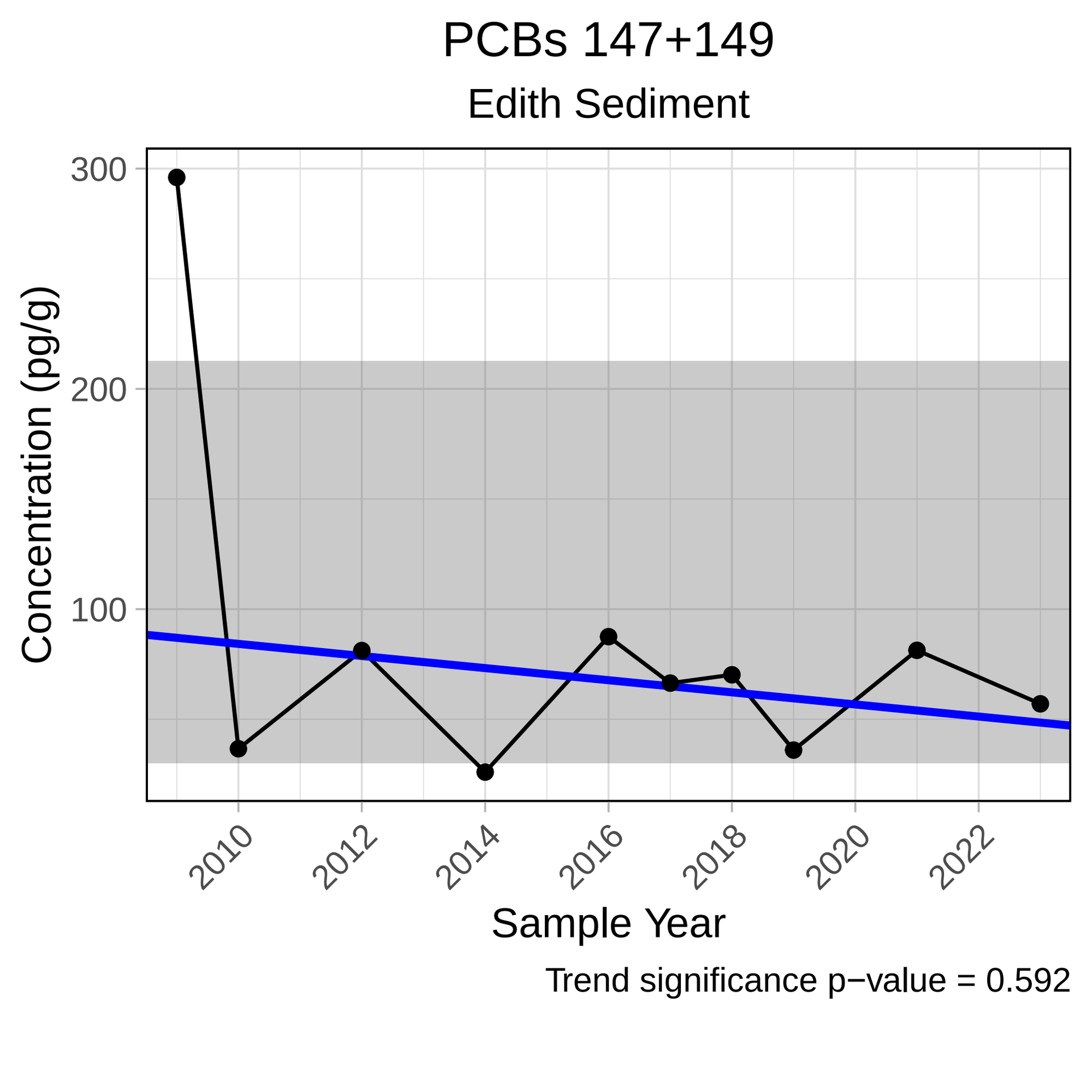

PCB 202
Edith Sediment
Concentration (pg/g)
10.0
7.5
5.0
2.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.249

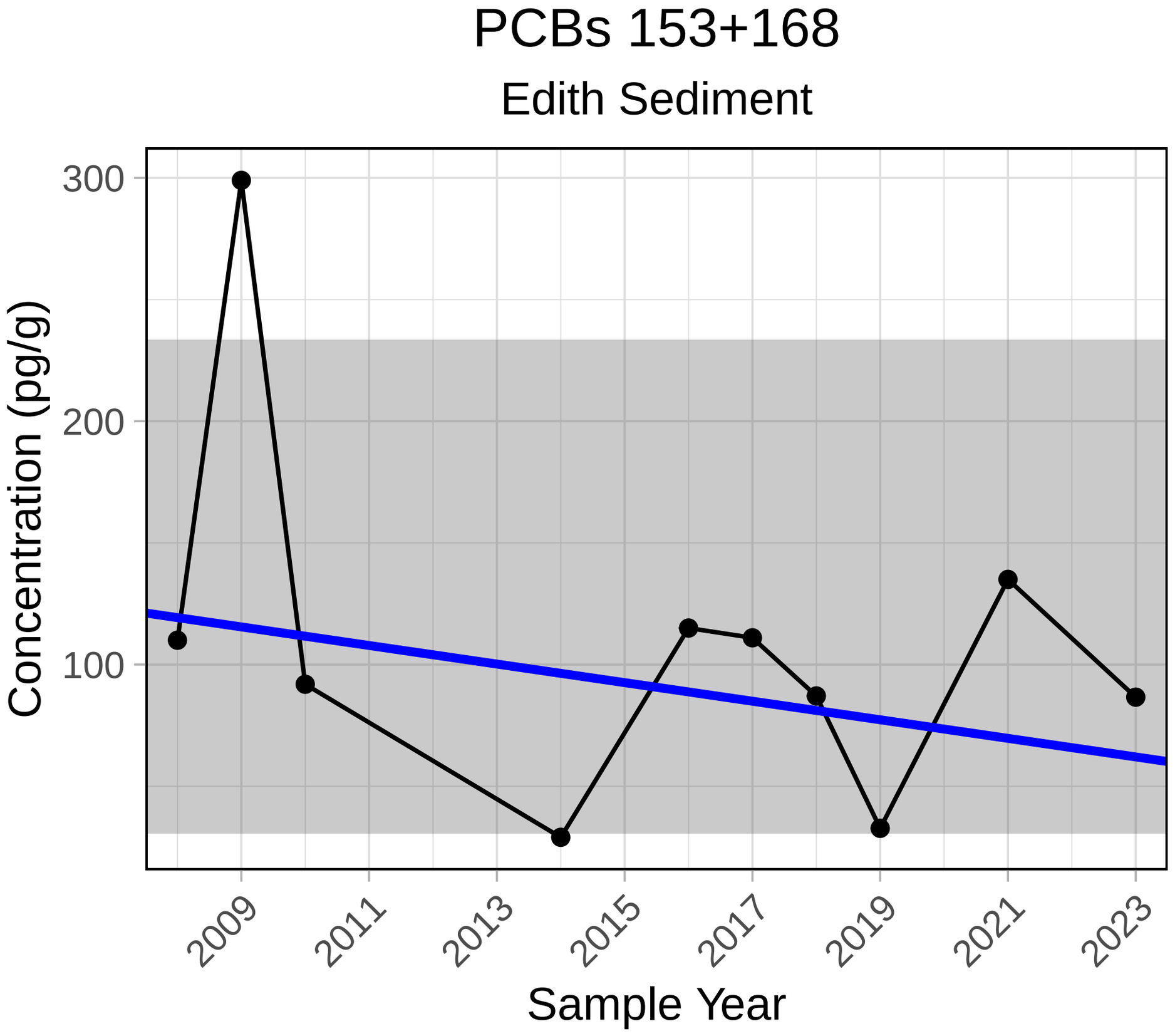

PCB 206
Edith Sediment
Concentration (pg/g)
15
12
9
6
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.578

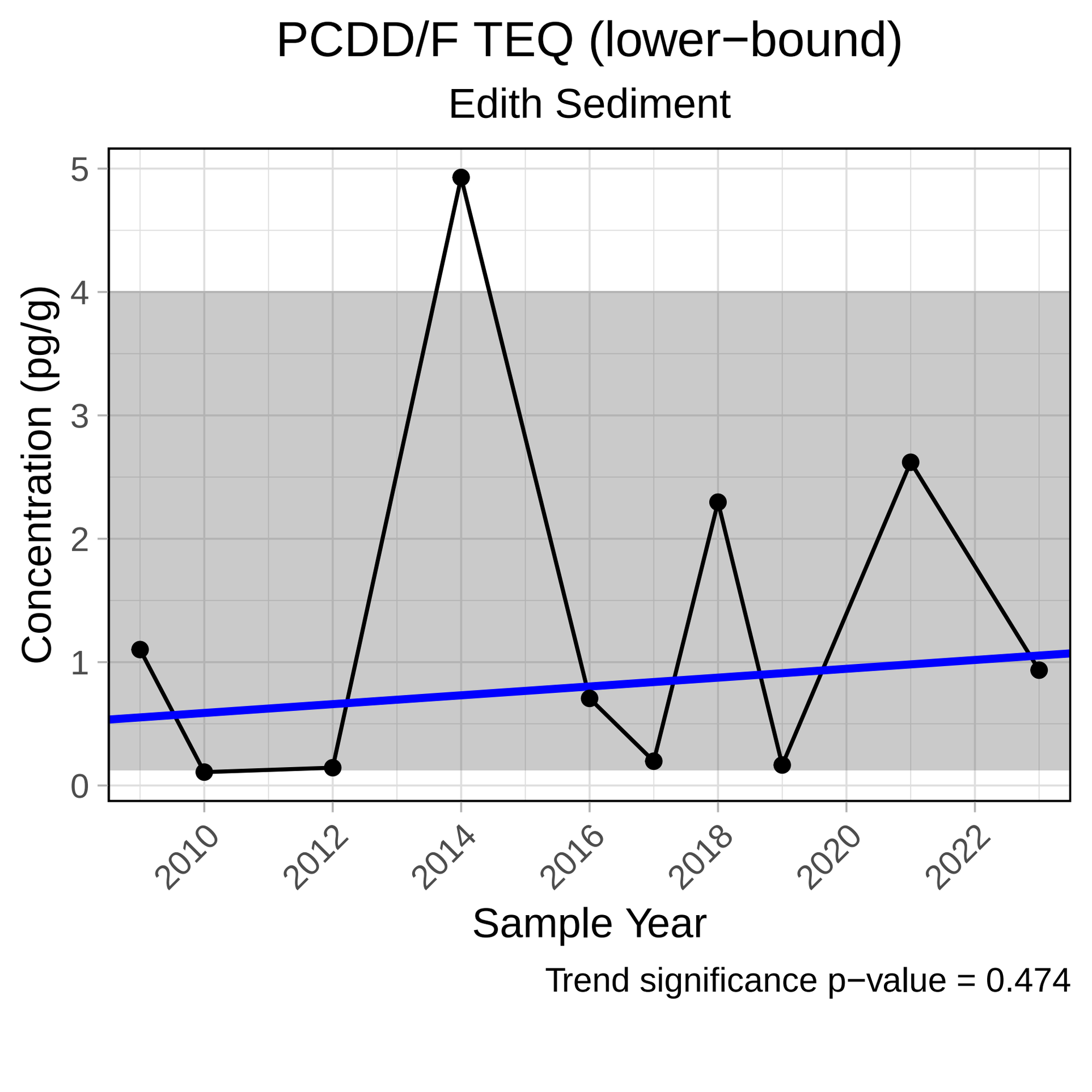
PCB 209
Edith Sediment
Concentration (pg/g)
15
12
9
6
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

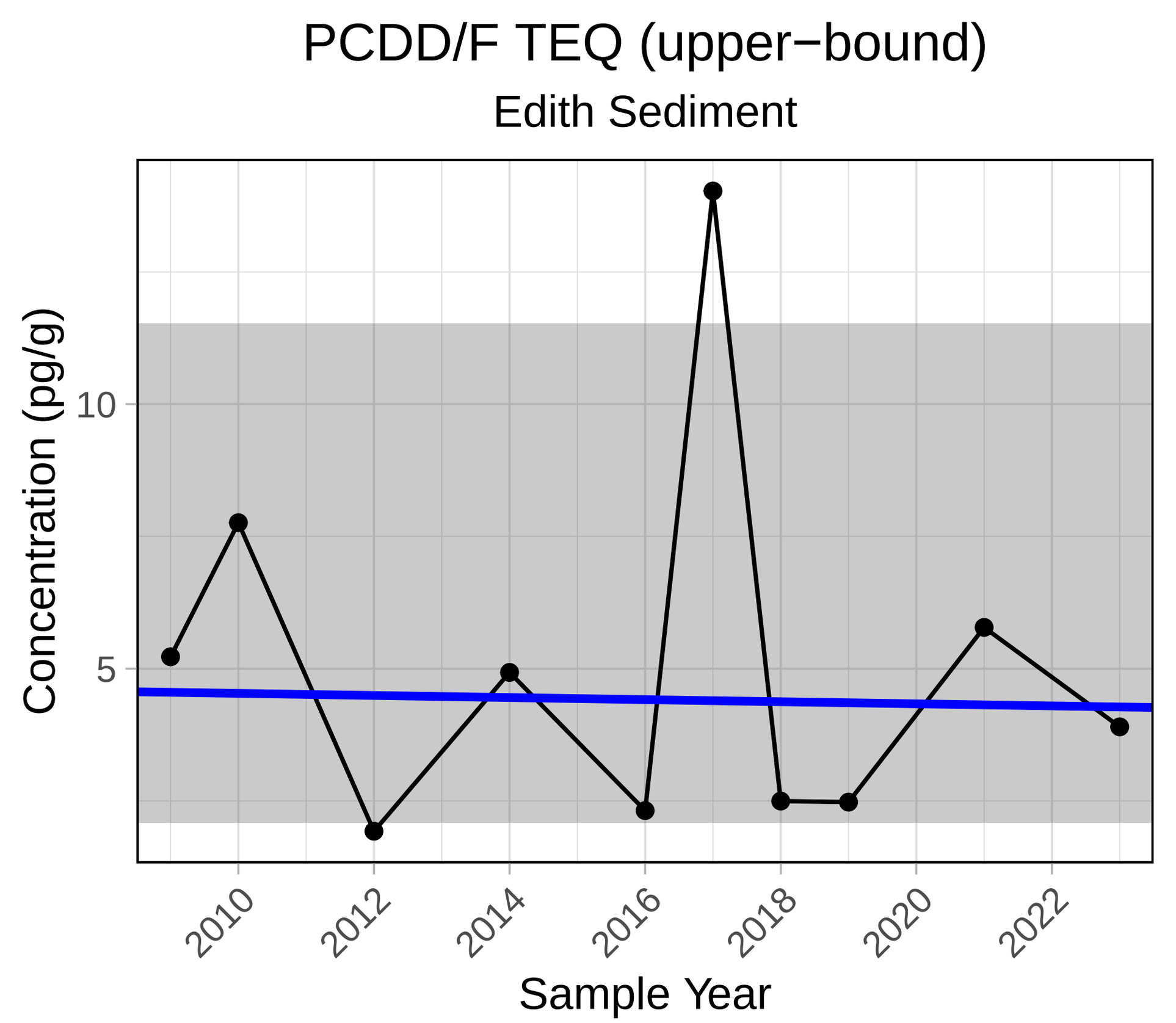


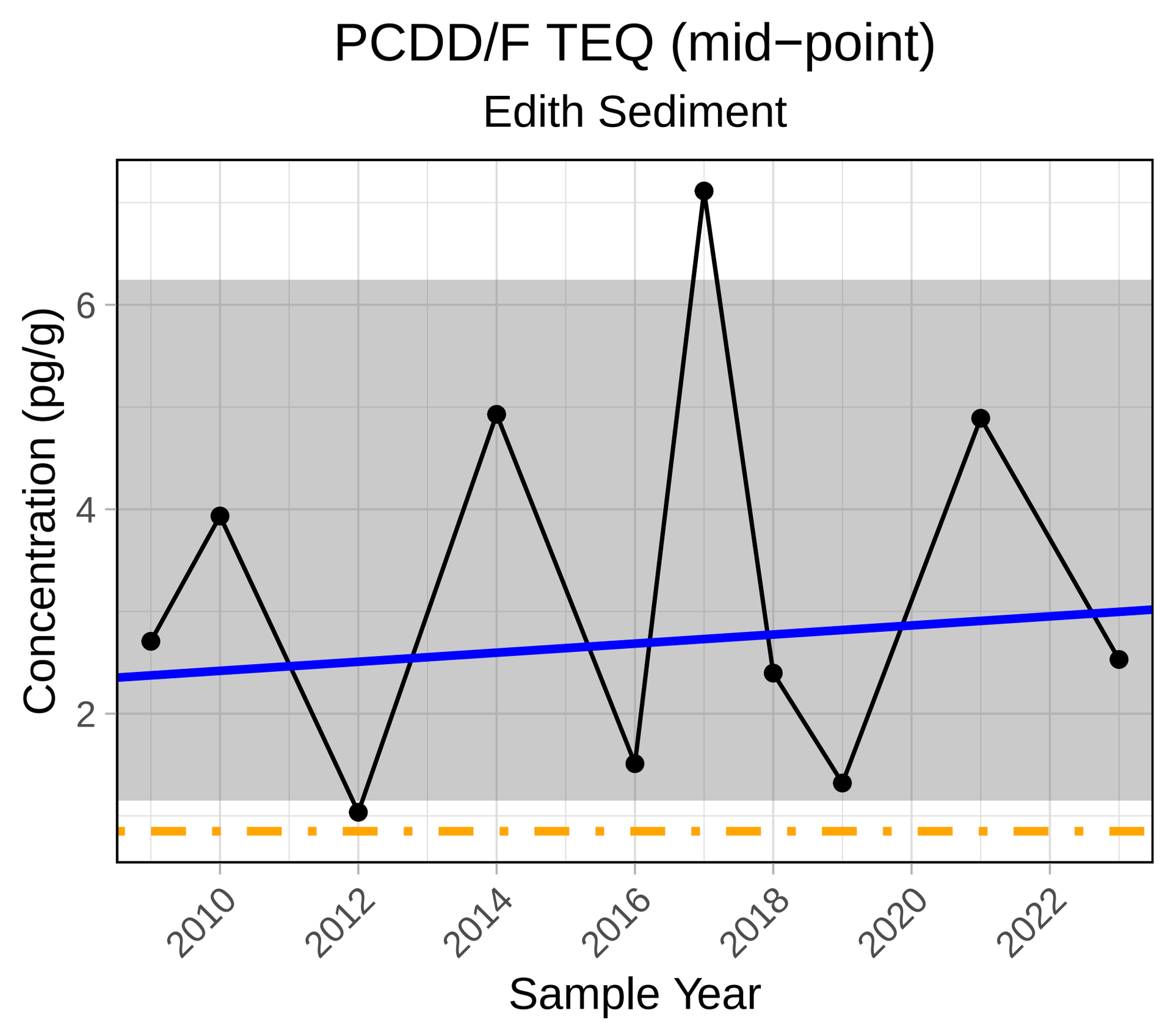
Trend significance p−value = 0.721
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)


PCBs 147+149
Edith Sediment
300
200
100
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

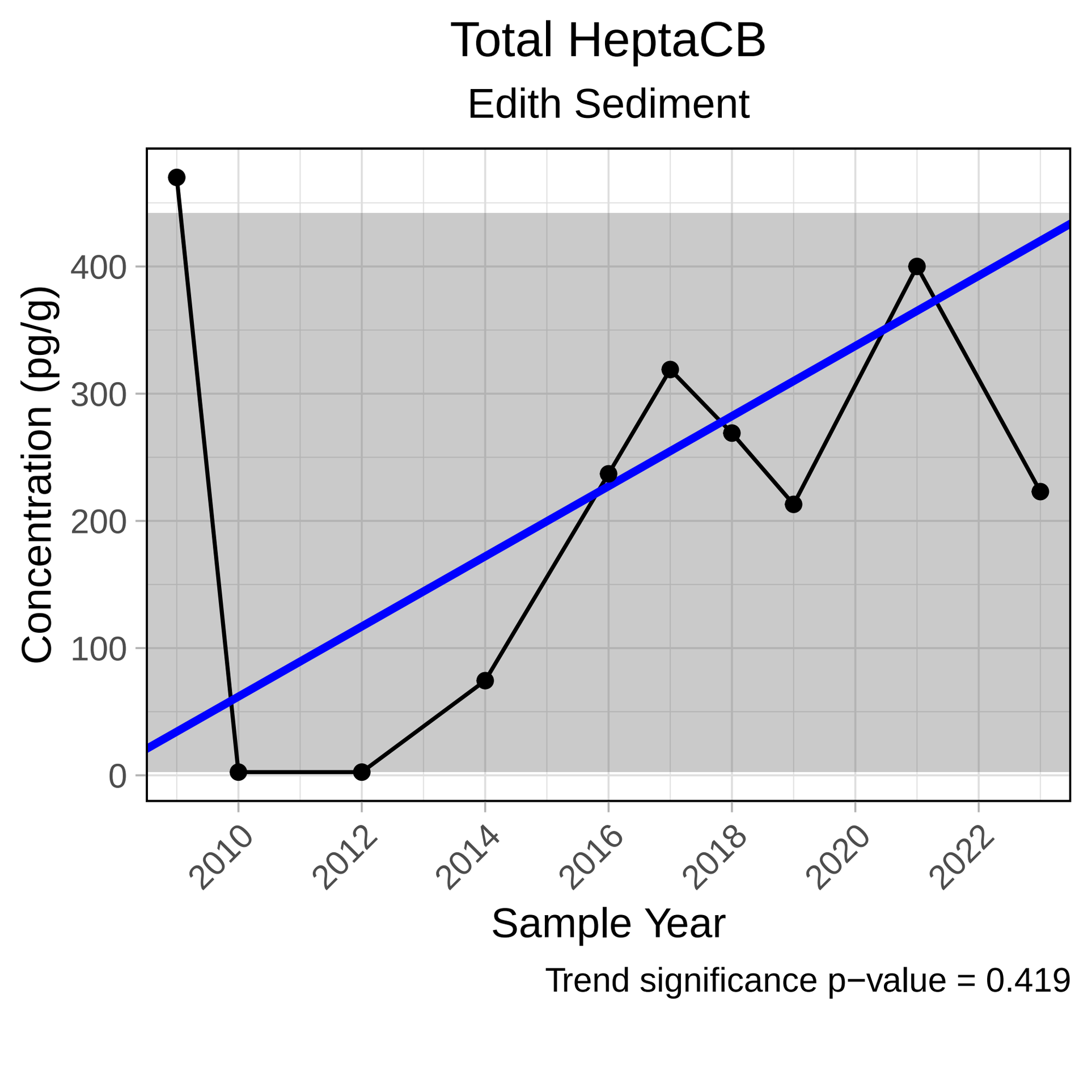

PCBs 153+168
Edith Sediment
300
200
100
Concentration (pg/g)
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.474

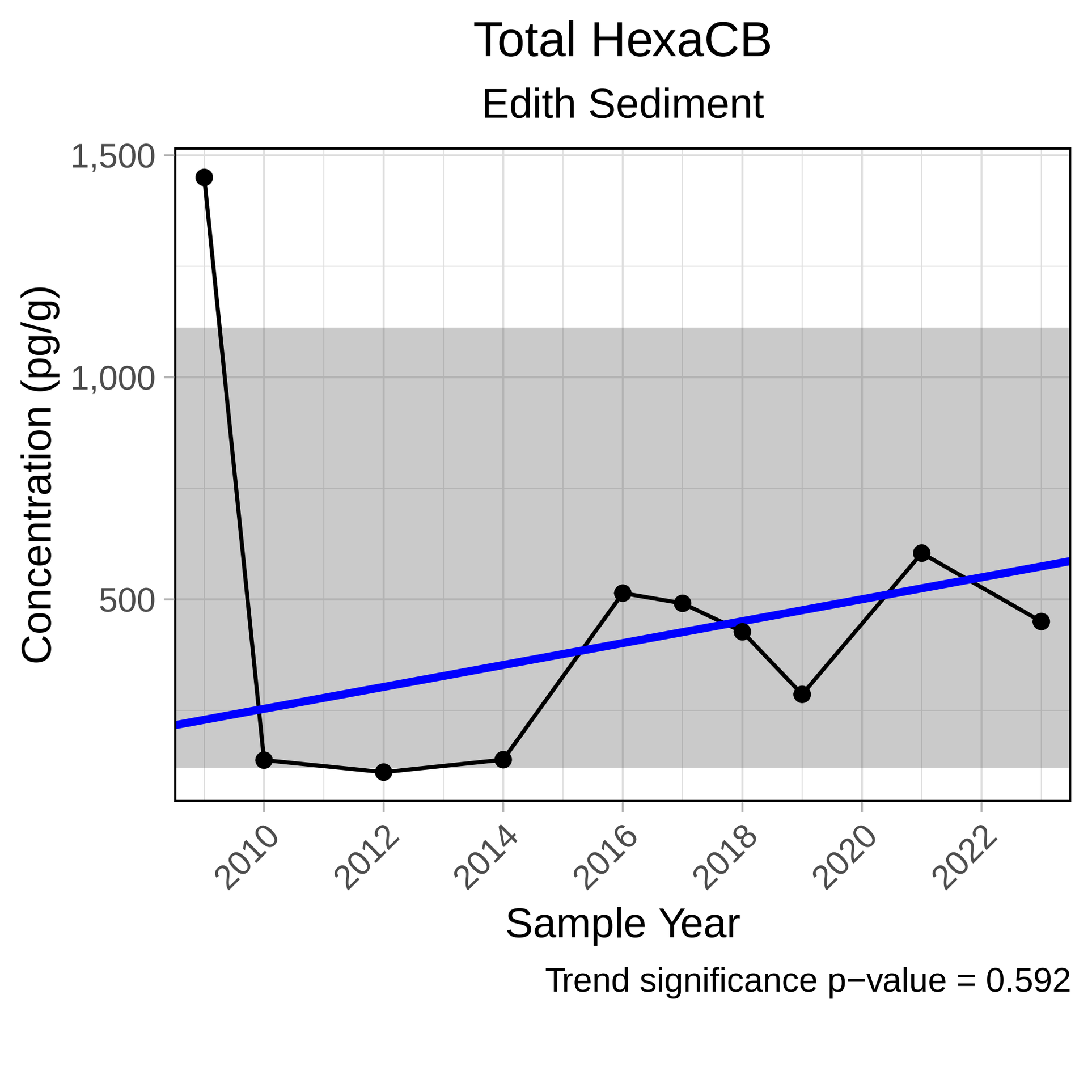

PCDD/F TEQ (lower−bound)
Edith Sediment
Concentration (pg/g)
0
1
2
3
4
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

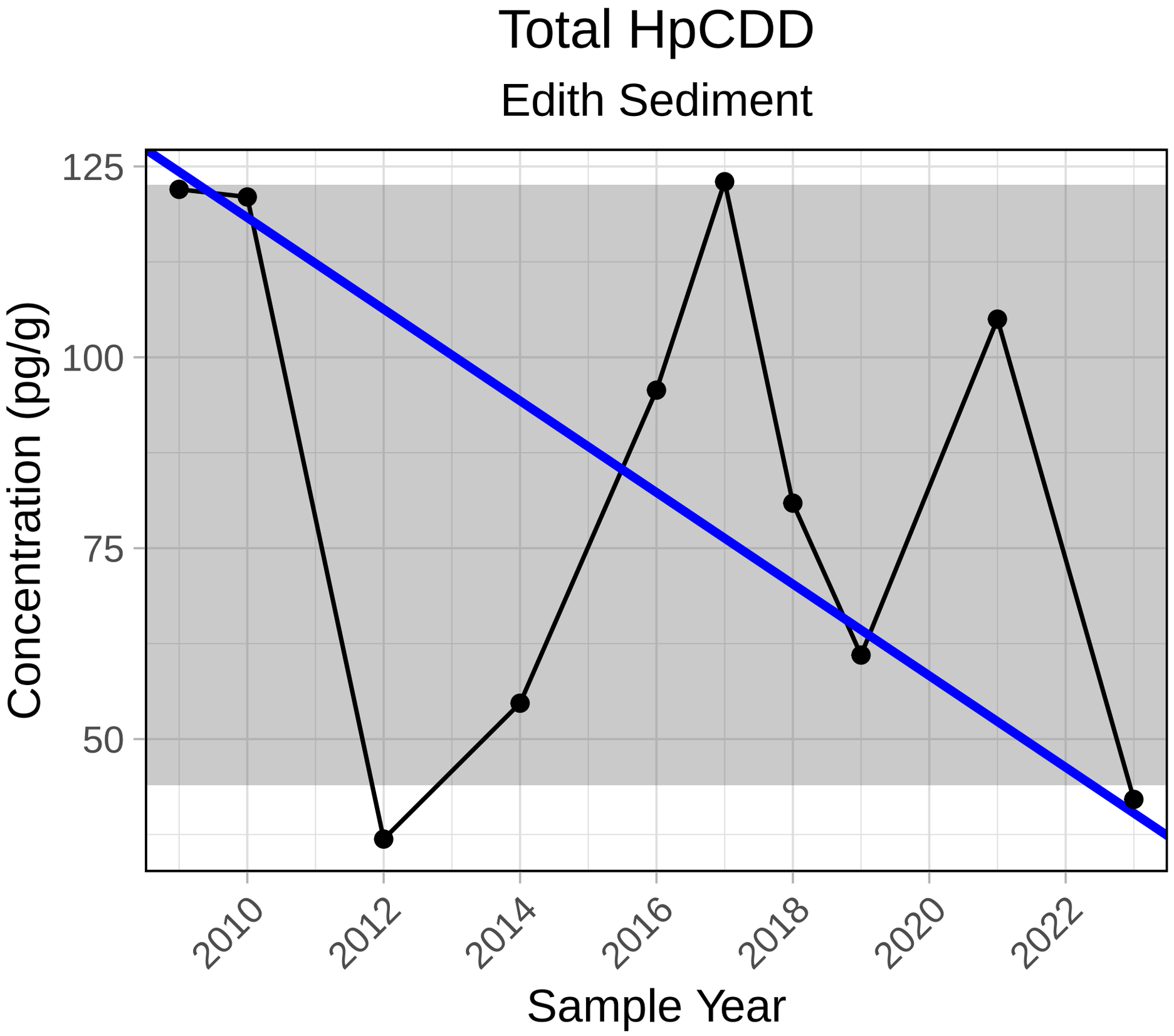

PCDD/F TEQ (upper−bound)
Edith Sediment
Concentration (pg/g)
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

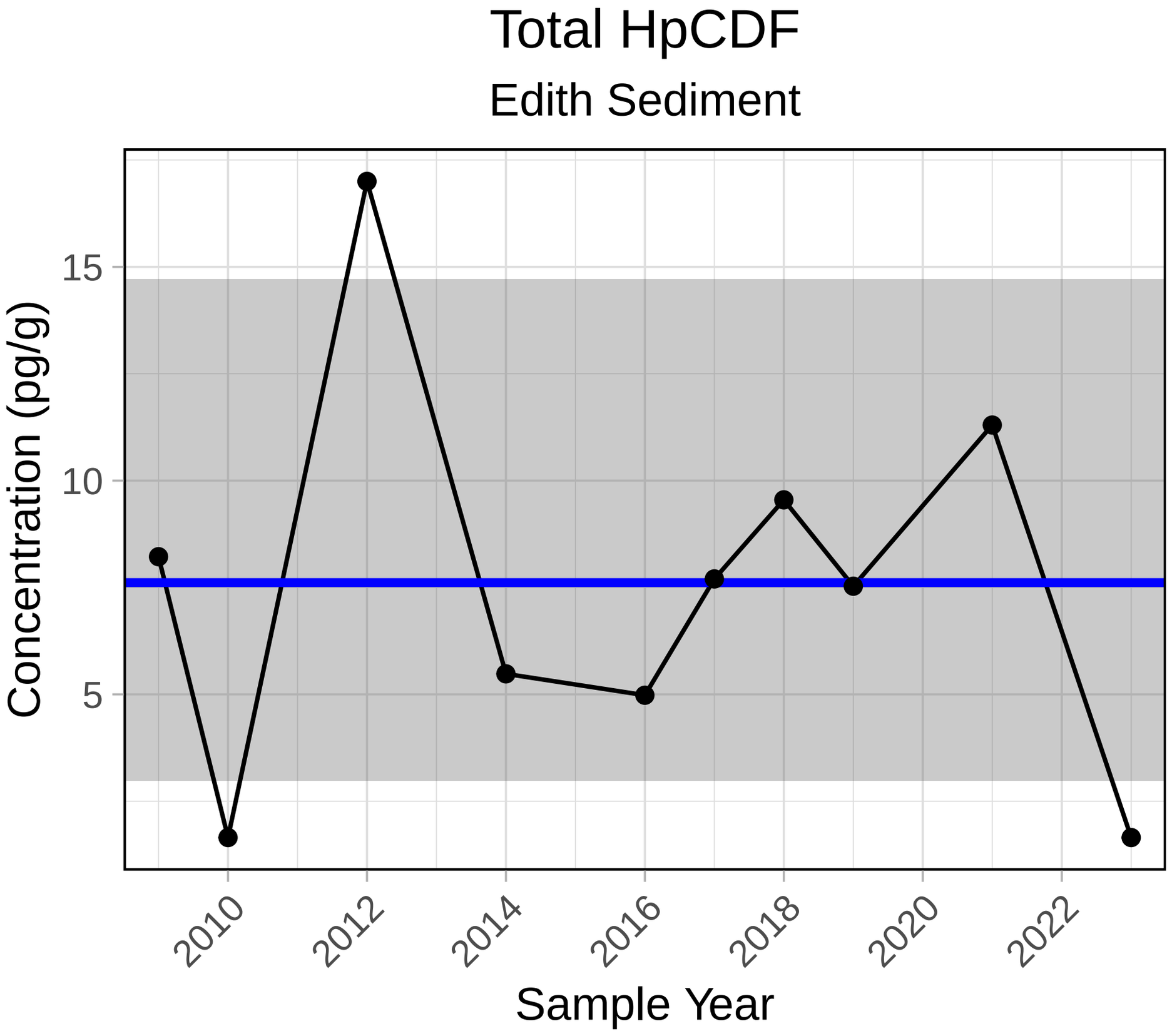


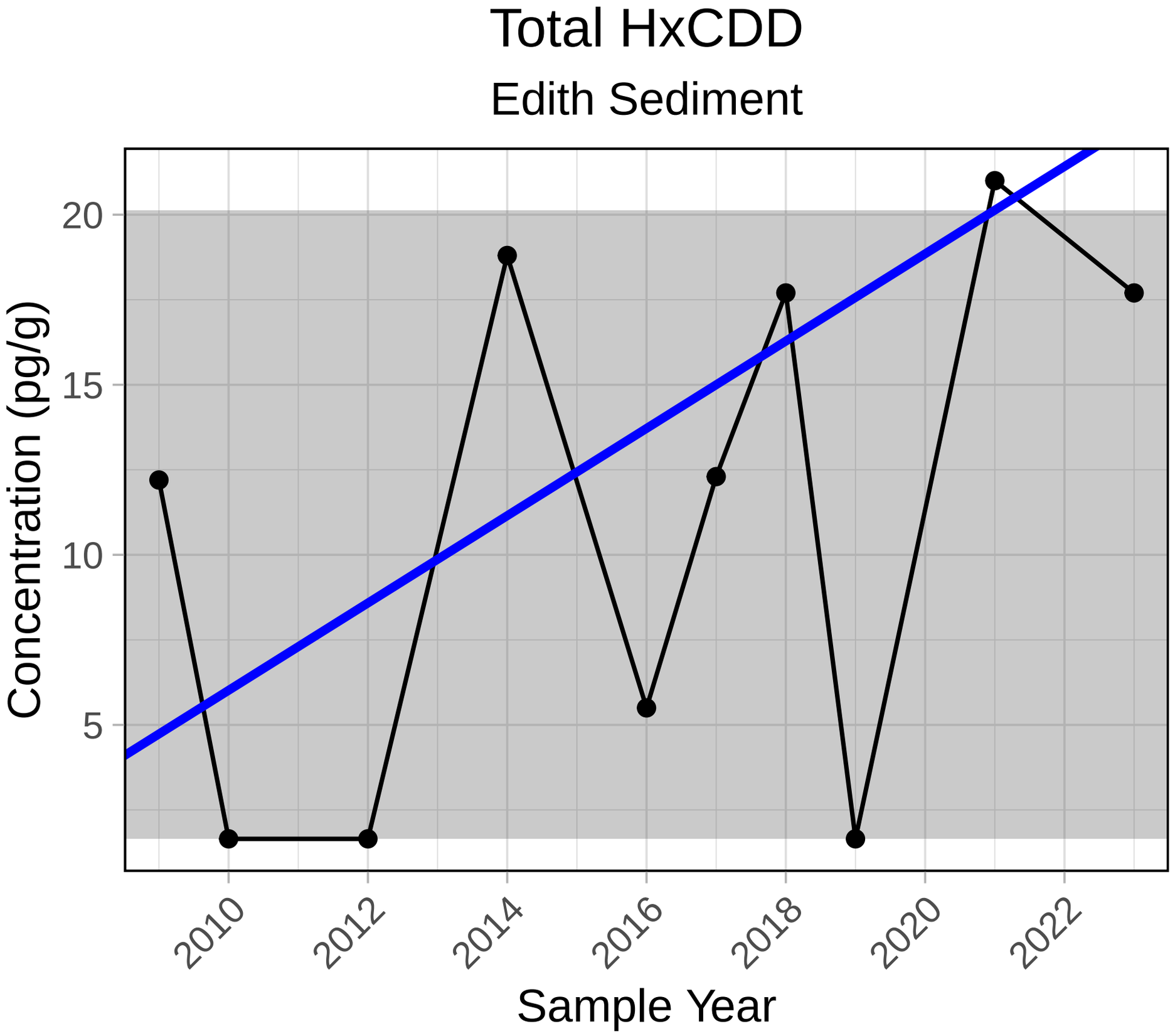
Trend significance p−value = 1
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)

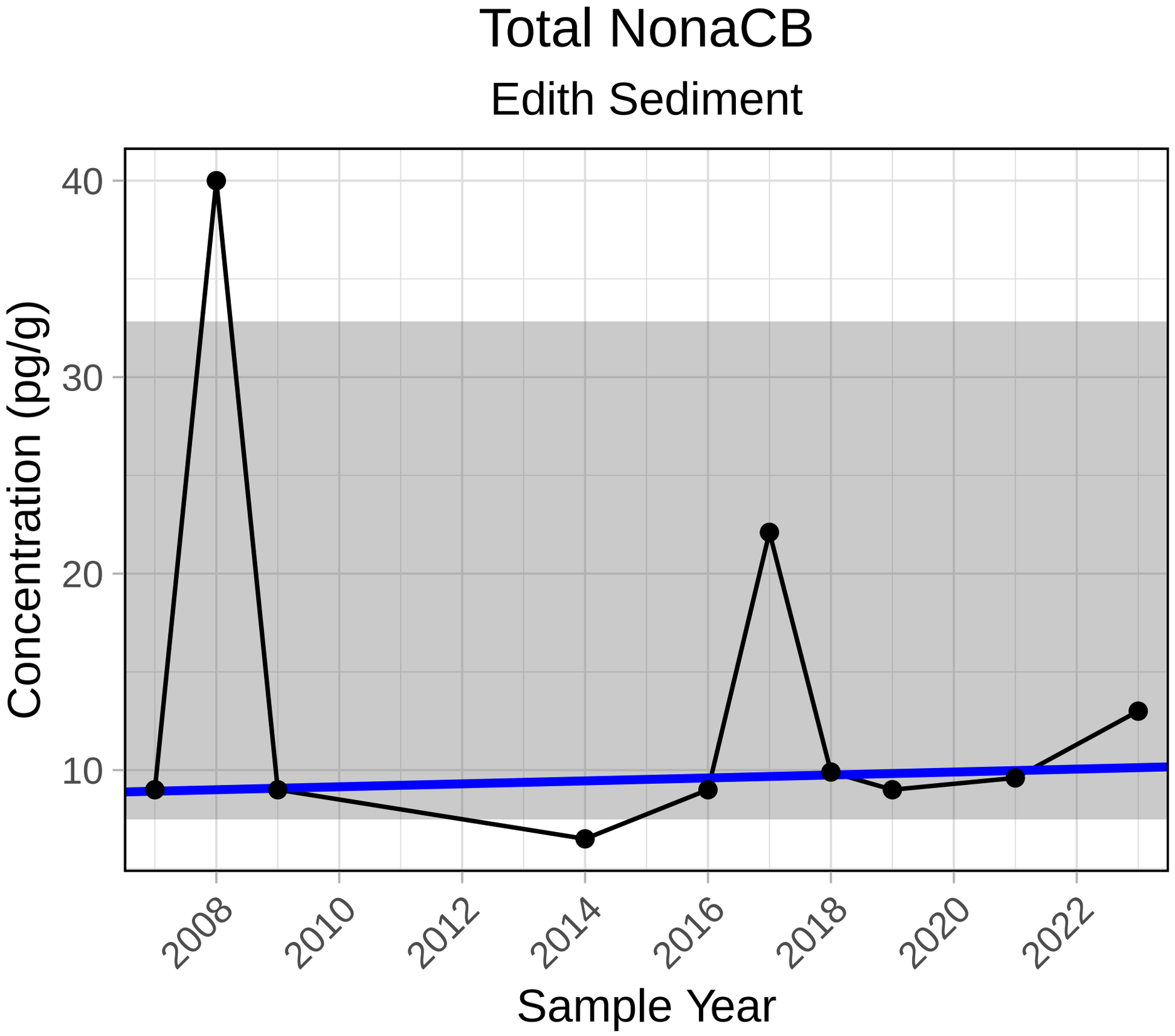

Total HeptaCB
Edith Sediment
Concentration (pg/g)
400
300
200
100
0
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.419

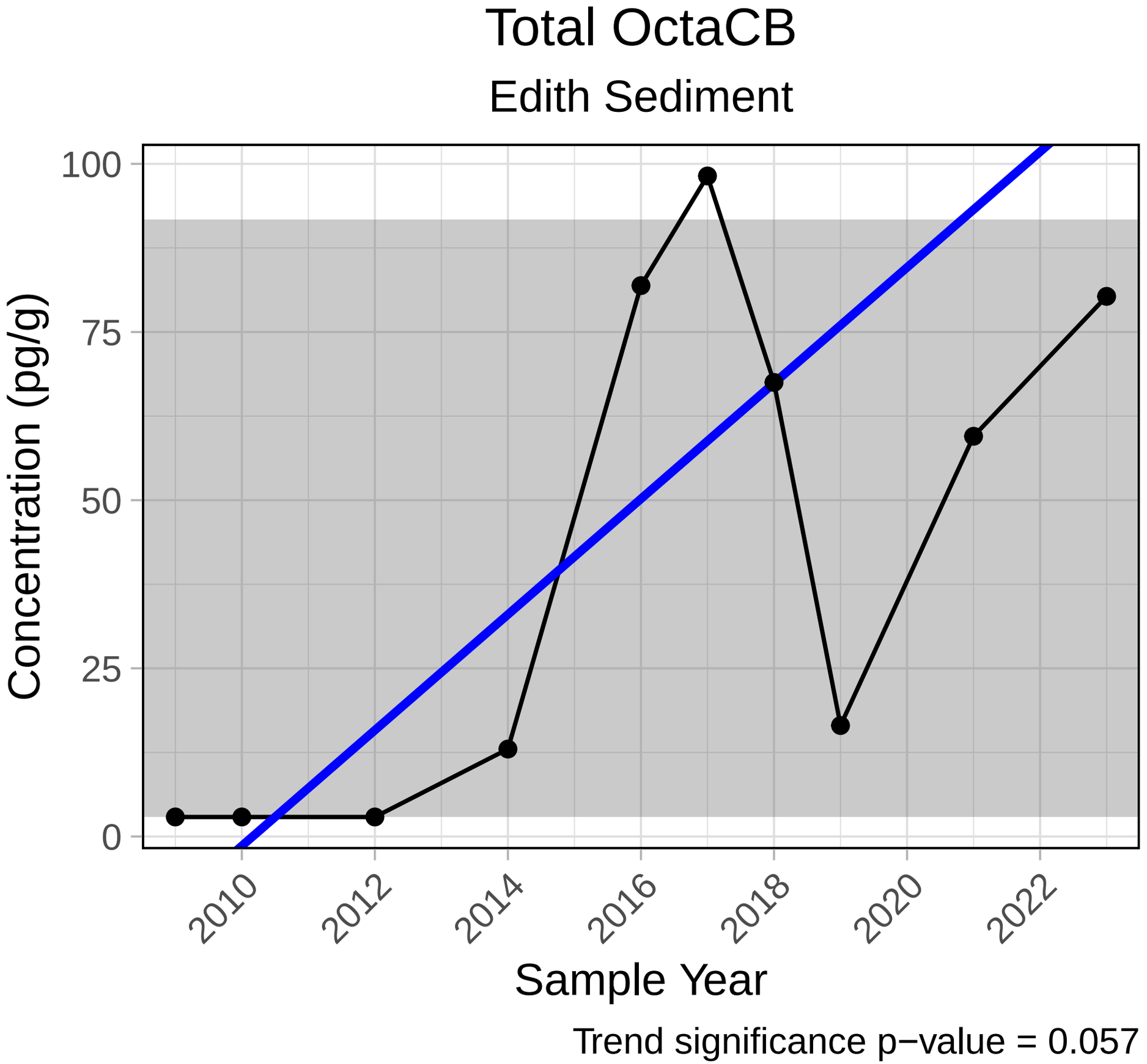

Total HexaCB
Edith Sediment
1,500
1,000
500
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592


Total HpCDD
Edith Sediment
125
100
75
50
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

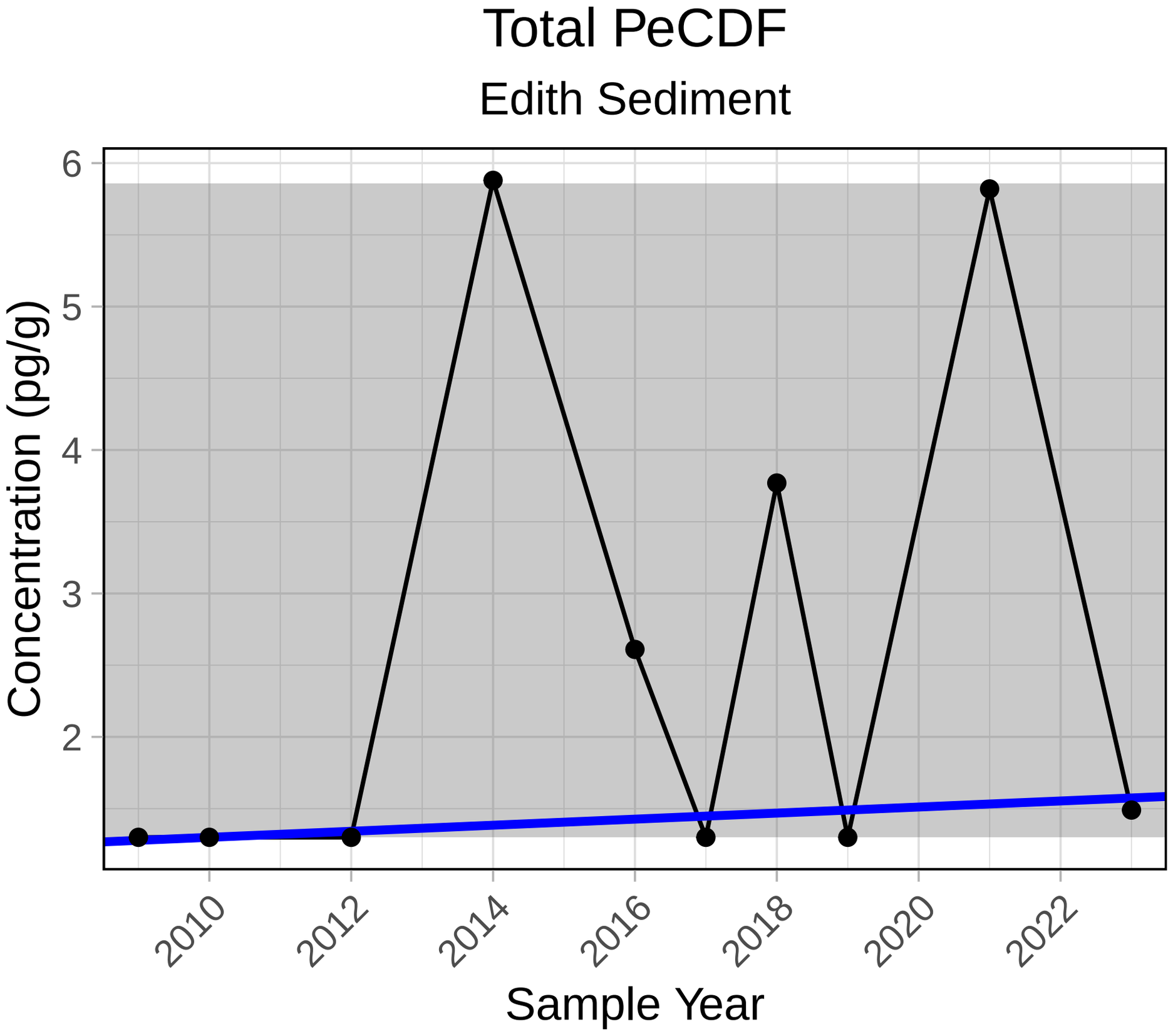

Total HpCDF
Edith Sediment
Concentration (pg/g)
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

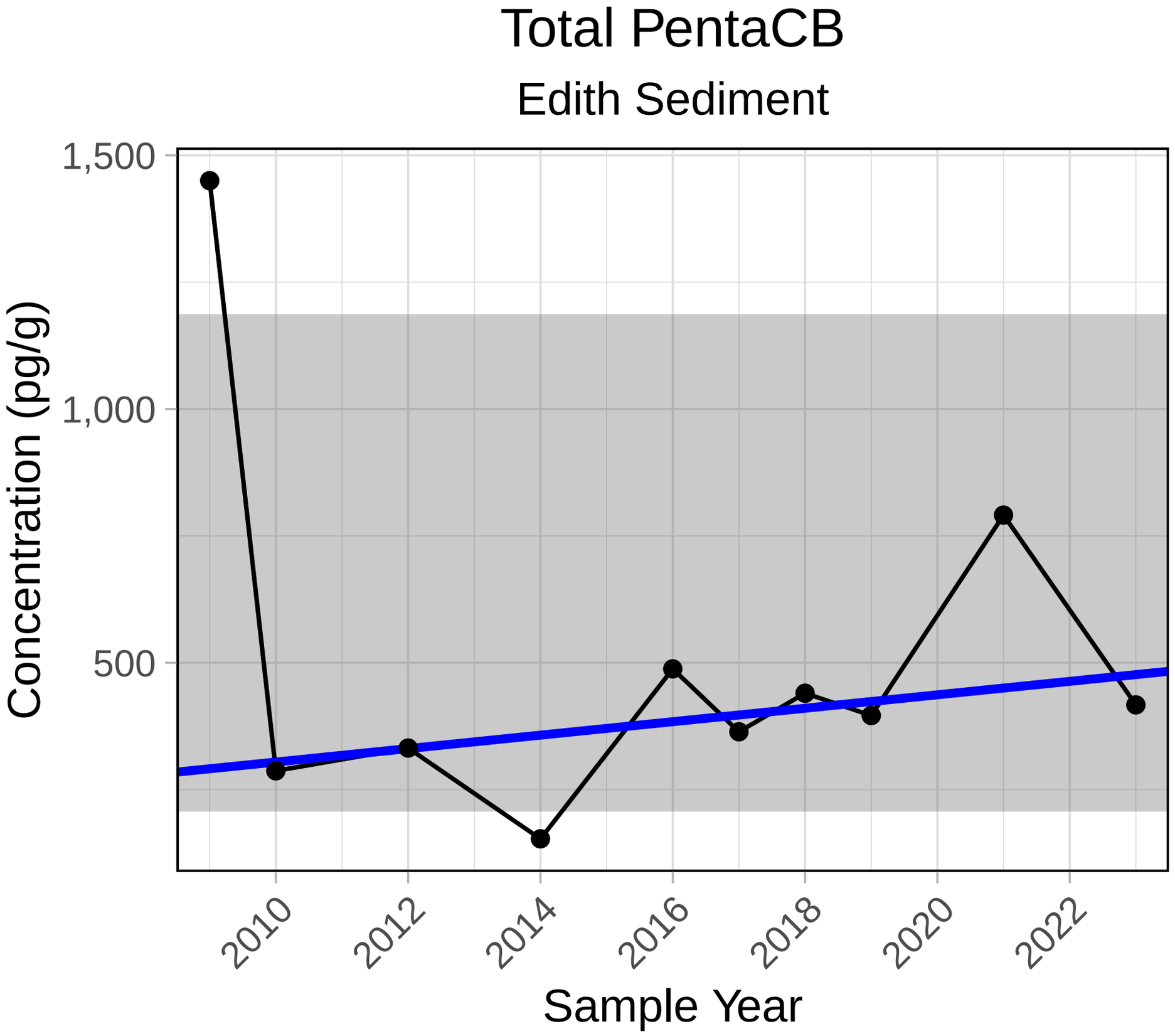

Total HxCDD
Edith Sediment
Concentration (pg/g)
20
15
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.202

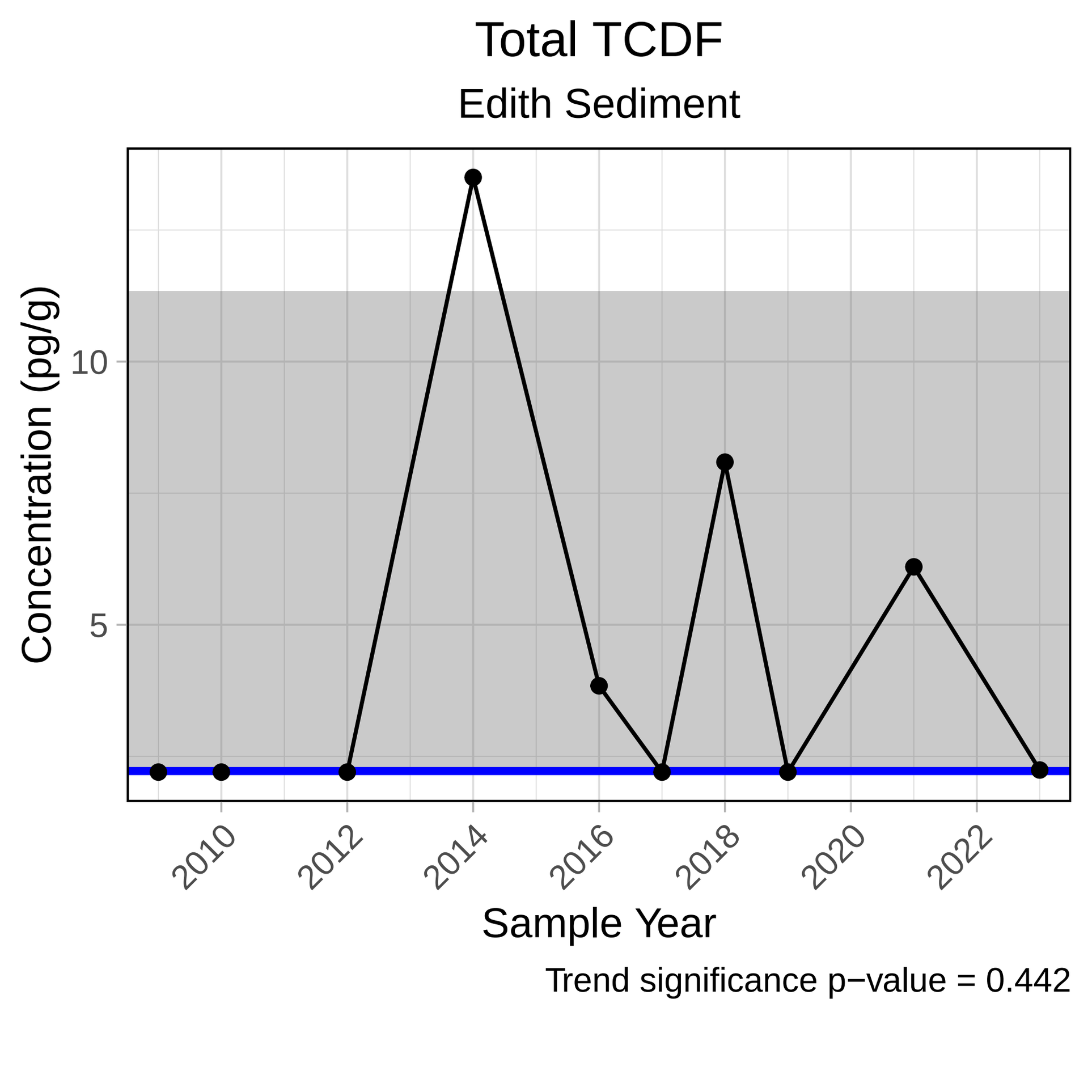

Total NonaCB
Edith Sediment
Concentration (pg/g)
40
30
20
10
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.578

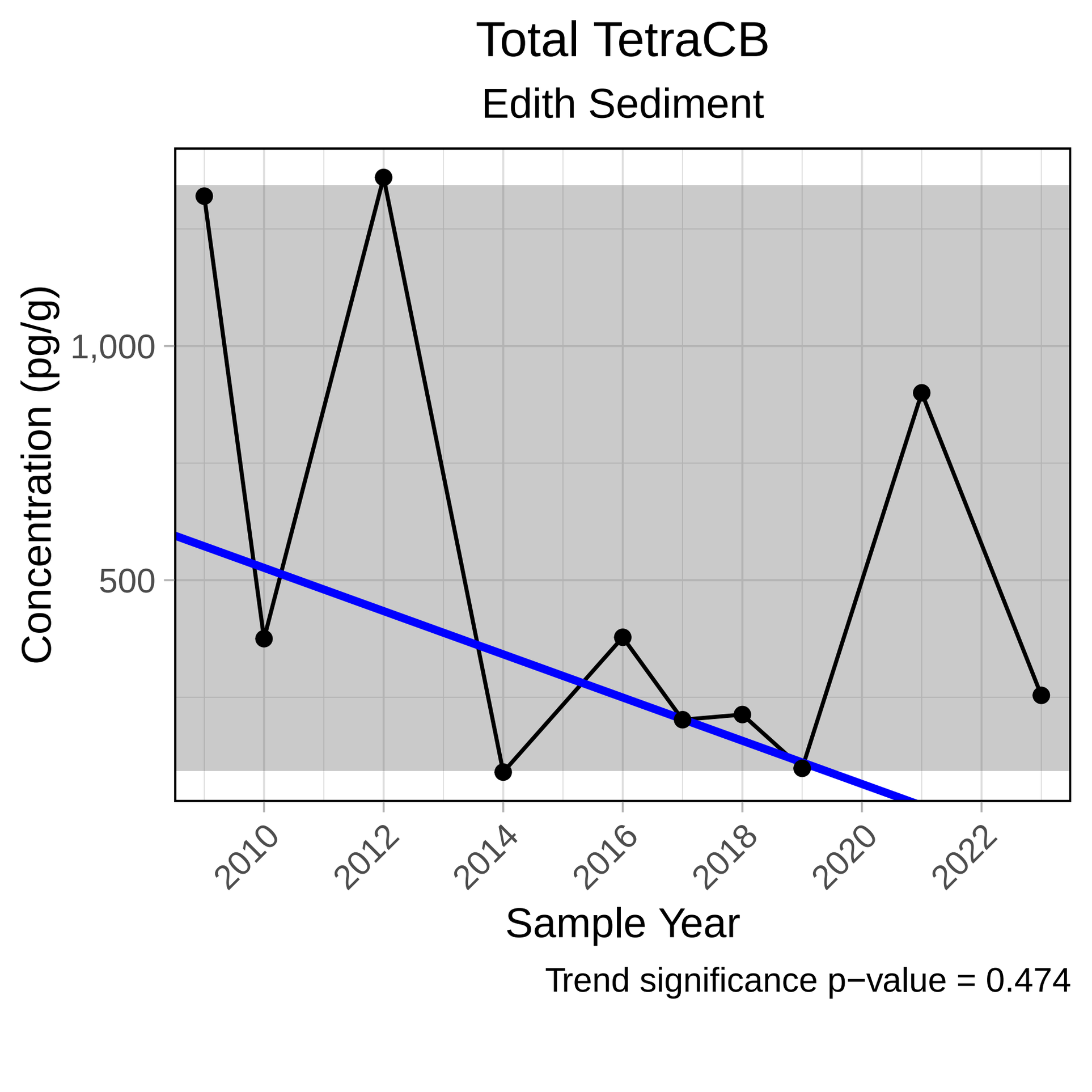

Total OctaCB
Edith Sediment
100
75
50
25
0
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.057

Total PeCDD
Edith Sediment
Concentration (pg/g)
4
3
2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.179

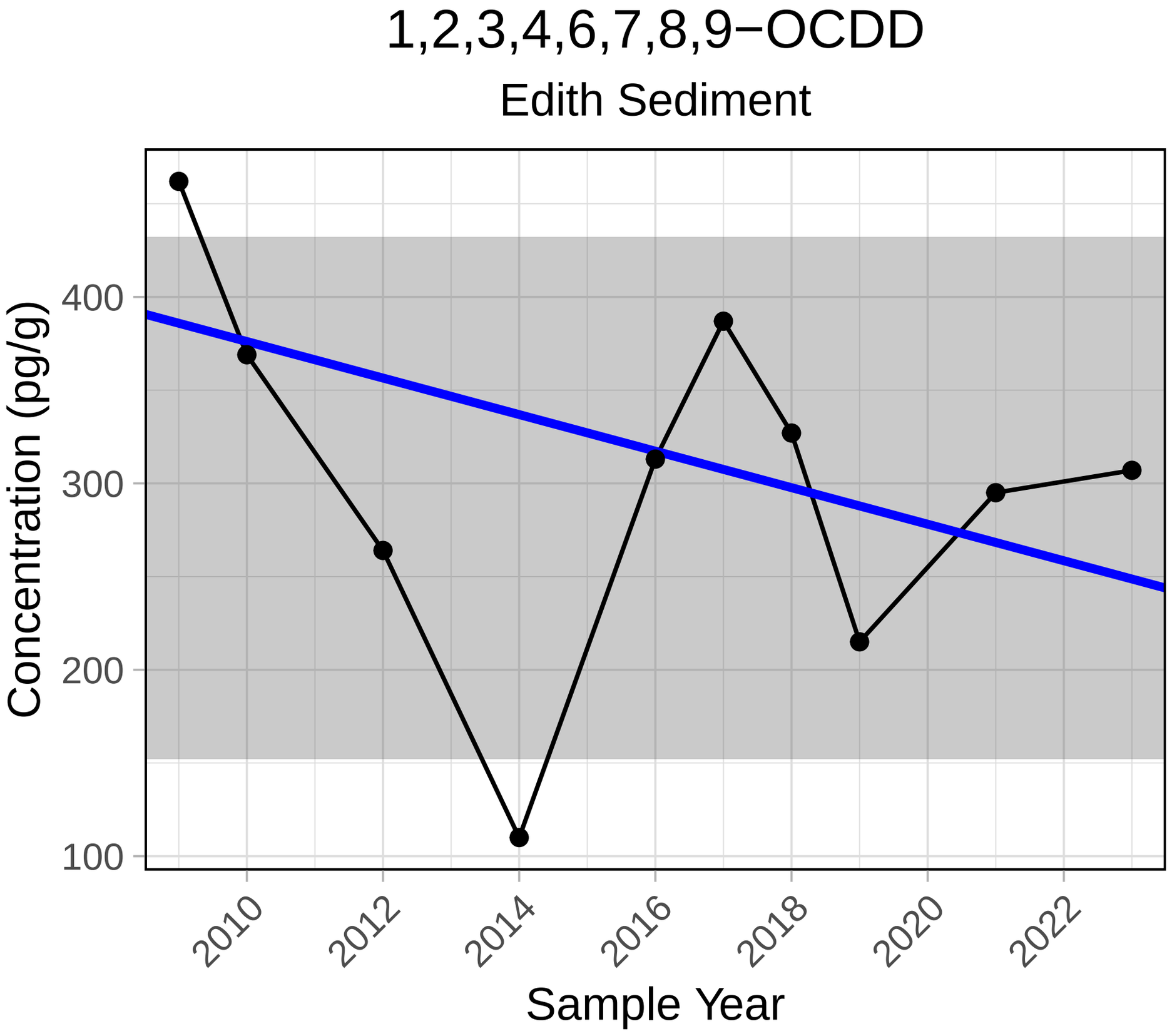

Total PeCDF
Edith Sediment
Concentration (pg/g)
6
5
4
3
2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.337


Total PentaCB
Edith Sediment
1,500
1,000
500
Concentration (pg/g)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474


Total TCDF
Edith Sediment
Concentration (pg/g)
10
5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.442

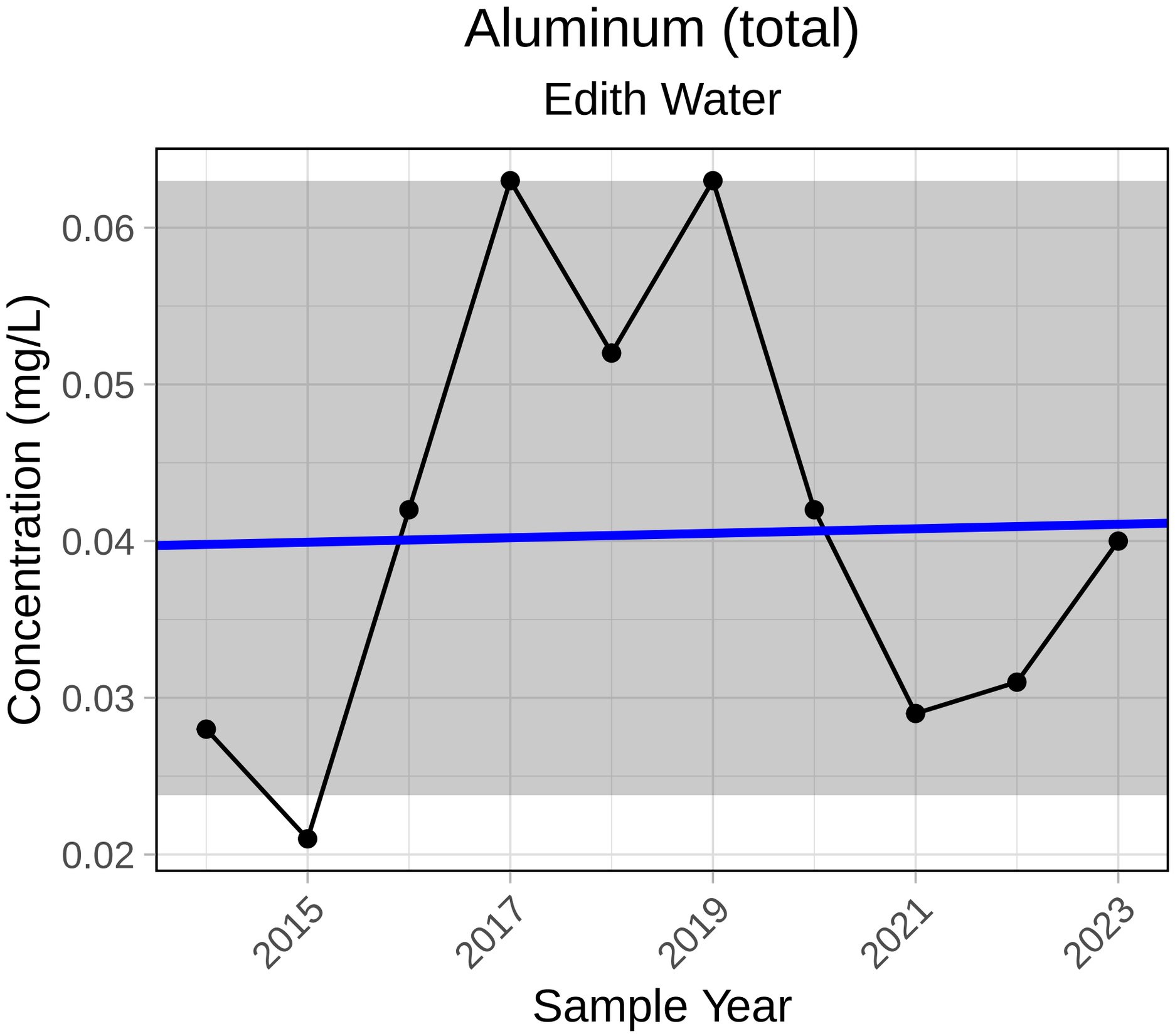

Total TetraCB
Edith Sediment
Concentration (pg/g)
1,000
500
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

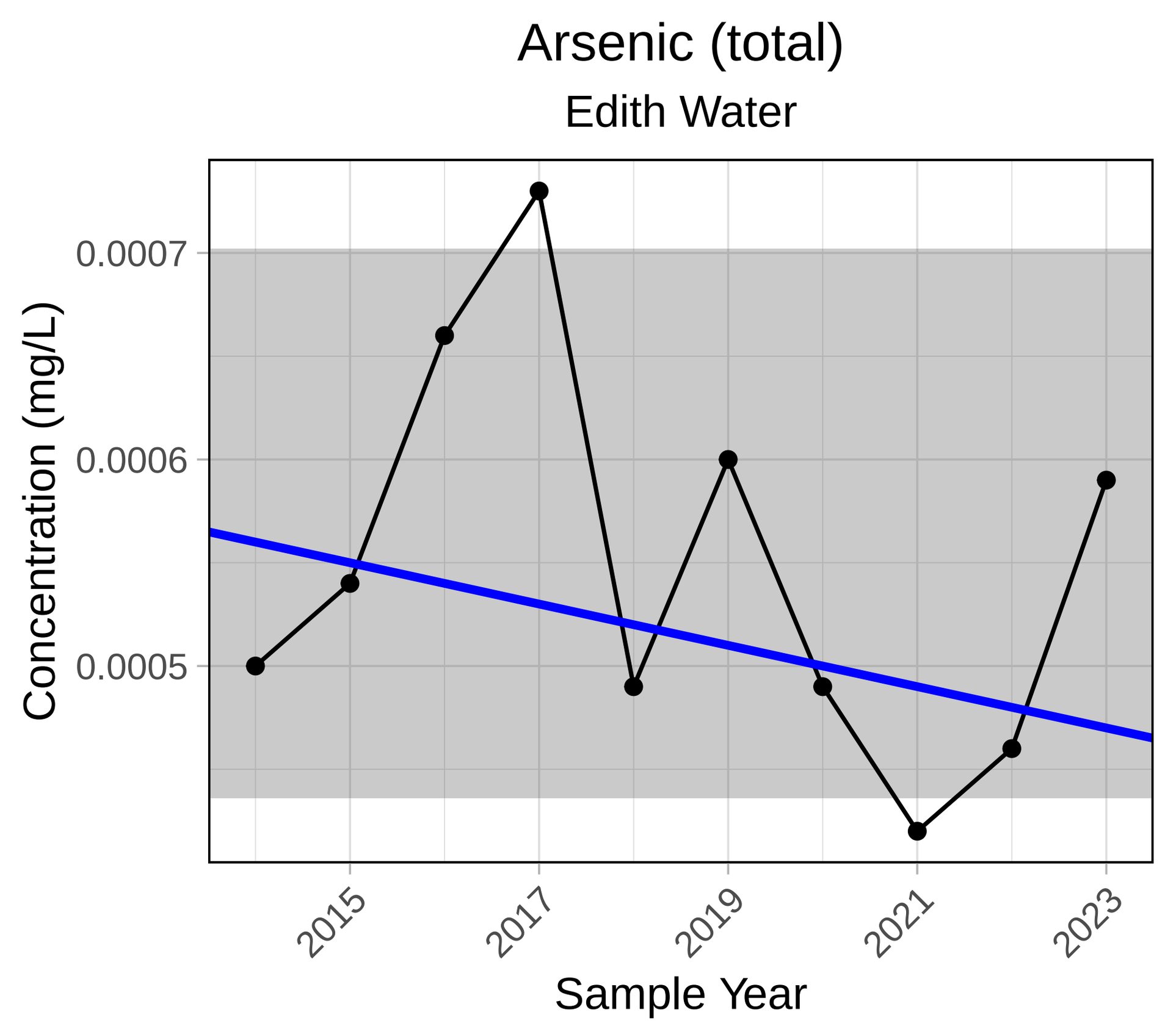
1,2,3,4,5,6,7,8−OCDF
Edith Sediment
Concentration (pg/g)
30
20
10
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.178

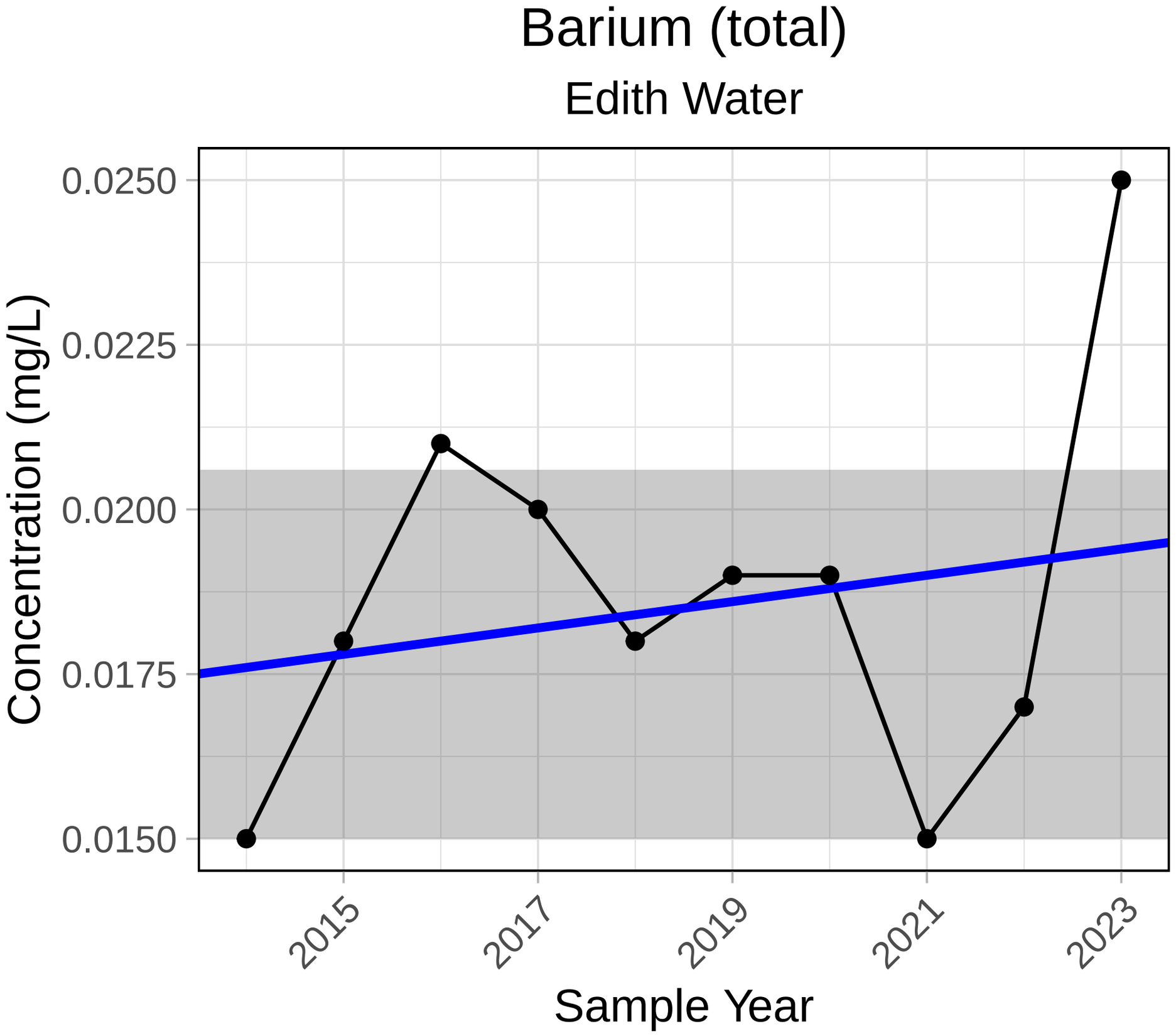

1,2,3,4,6,7,8,9−OCDD
Edith Sediment
Concentration (pg/g)
400
300
200
100
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

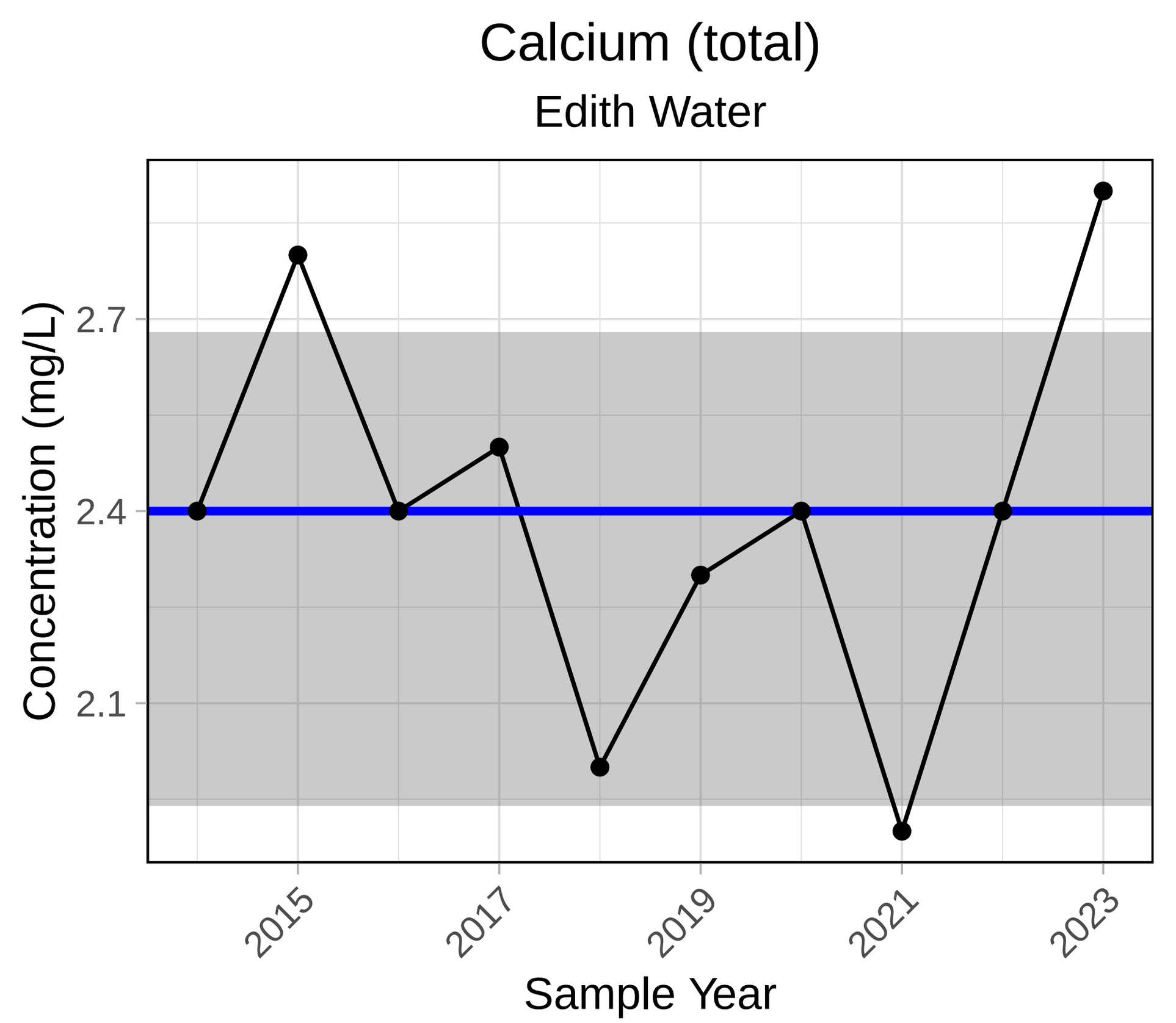
1,2,3,4,6,7,8−HpCDD
Edith Sediment
Concentration (pg/g)
70
60
50
40
30
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21

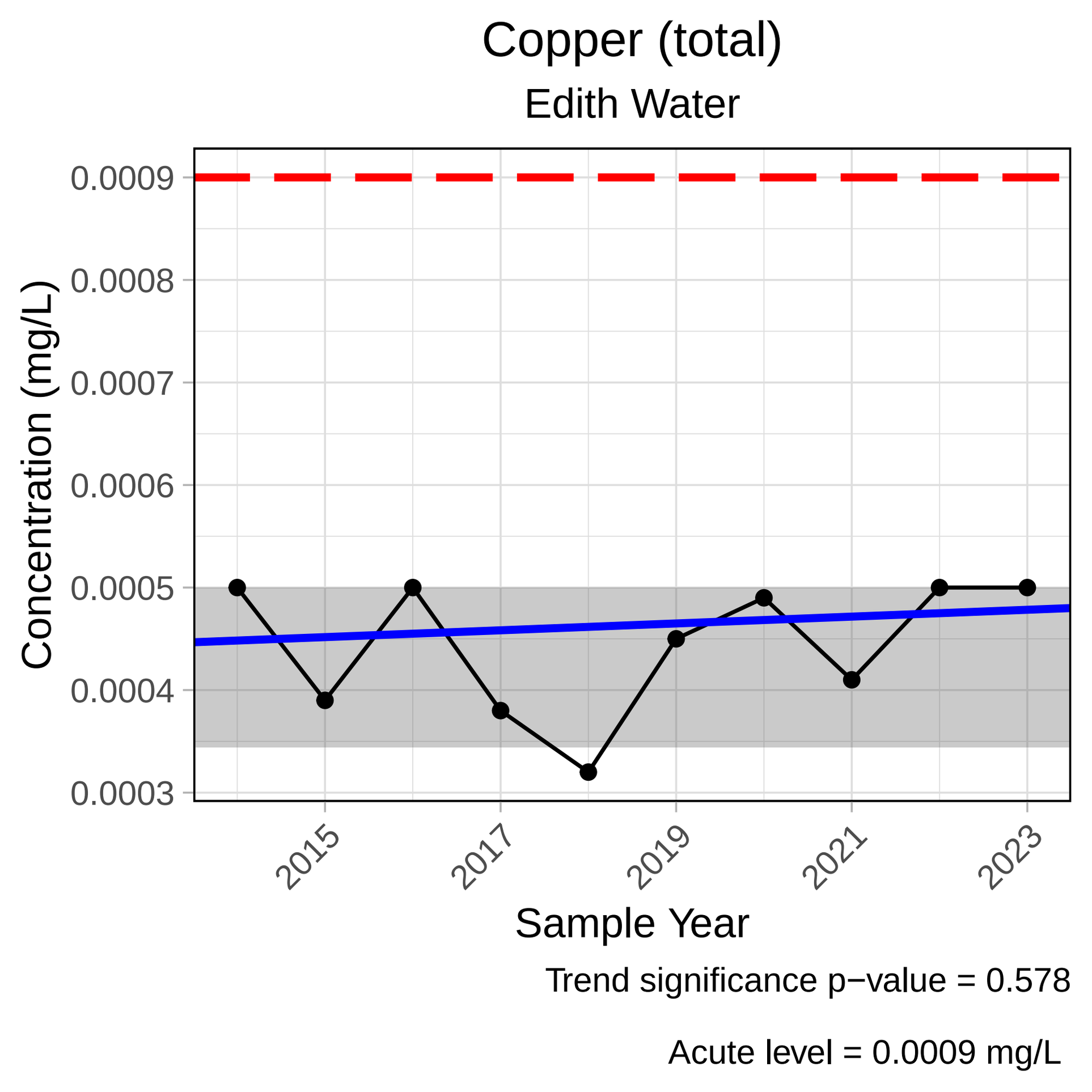
1,2,3,4,6,7,8−HpCDF
Edith Sediment
Concentration (pg/g)
9
6
3
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

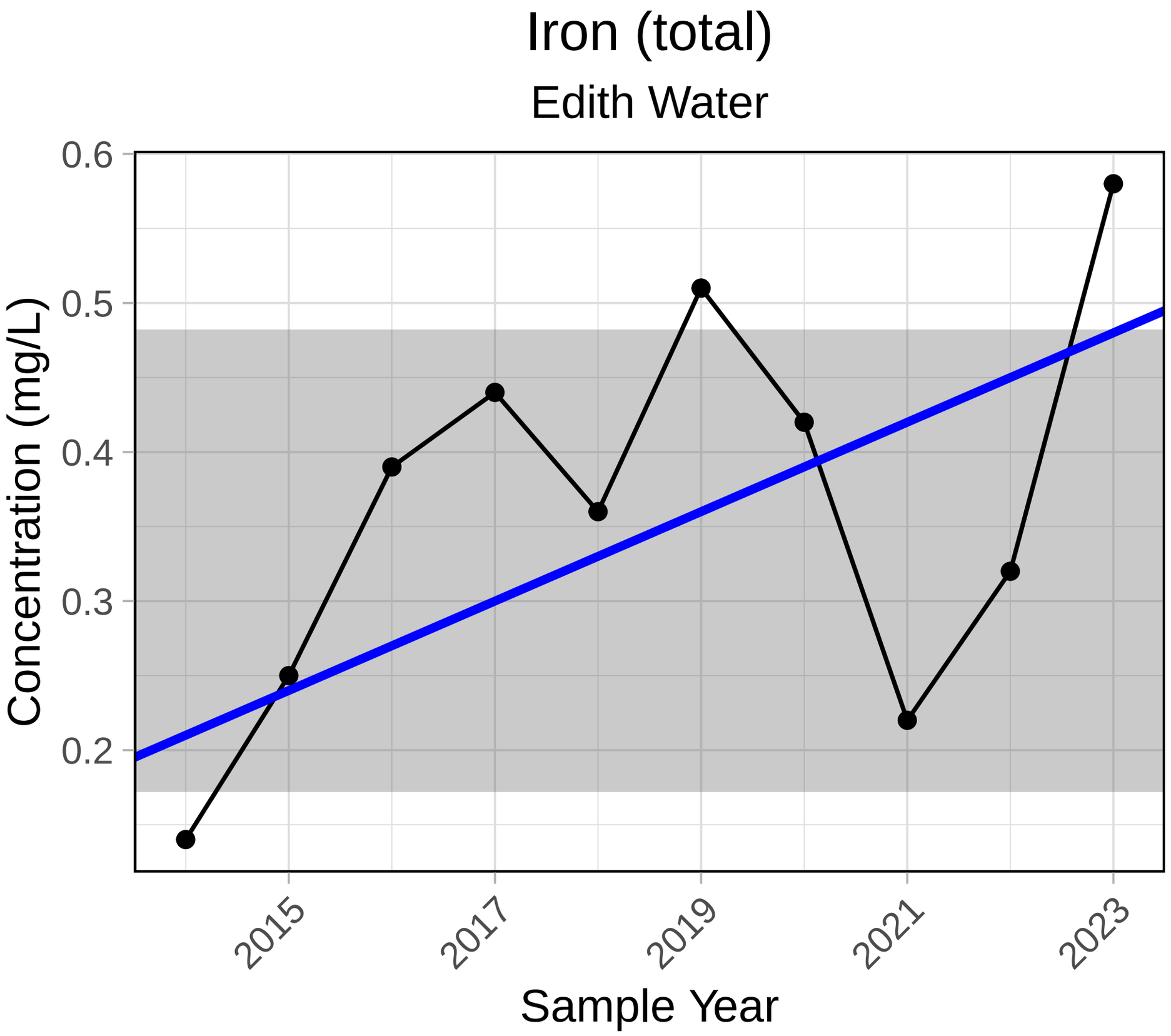

Aluminum (total)
Edith Water
Concentration (mg/L)
0.06
0.05
0.04
0.03
0.02
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.857


Arsenic (total)
Edith Water
Concentration (mg/L)
0.0007
0.0006
0.0005
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323
Chronic level = 0.005 mg/L (maximum)


Barium (total)
Edith Water
Concentration (mg/L)
0.0250
0.0225
0.0200
0.0175
0.0150
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.786

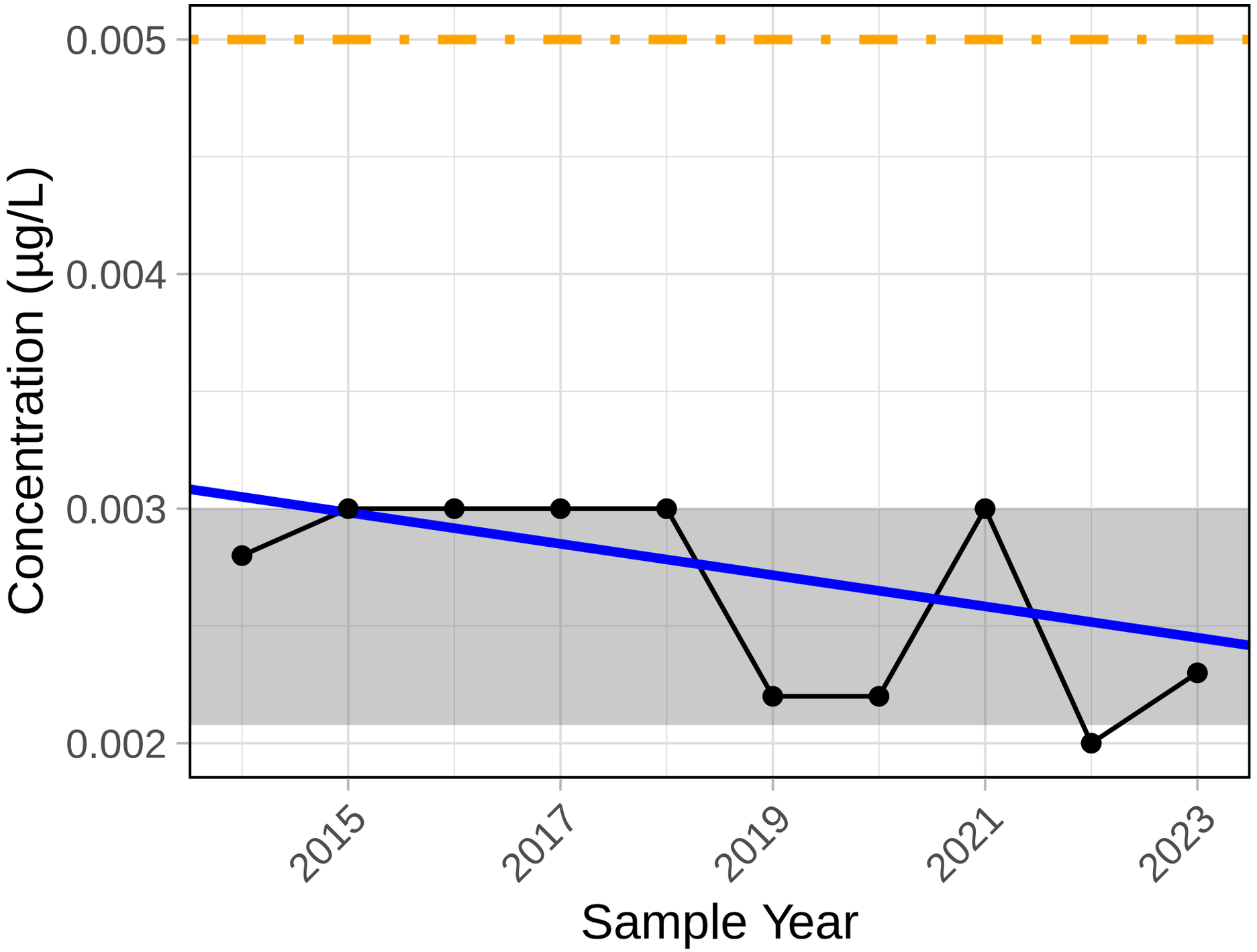

Calcium (total)
Edith Water
Concentration (mg/L)
2.7
2.4
2.1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.853


Copper (total)
Edith Water
Concentration (mg/L)
0.0009
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.578
Acute level = 0.0009 mg/L

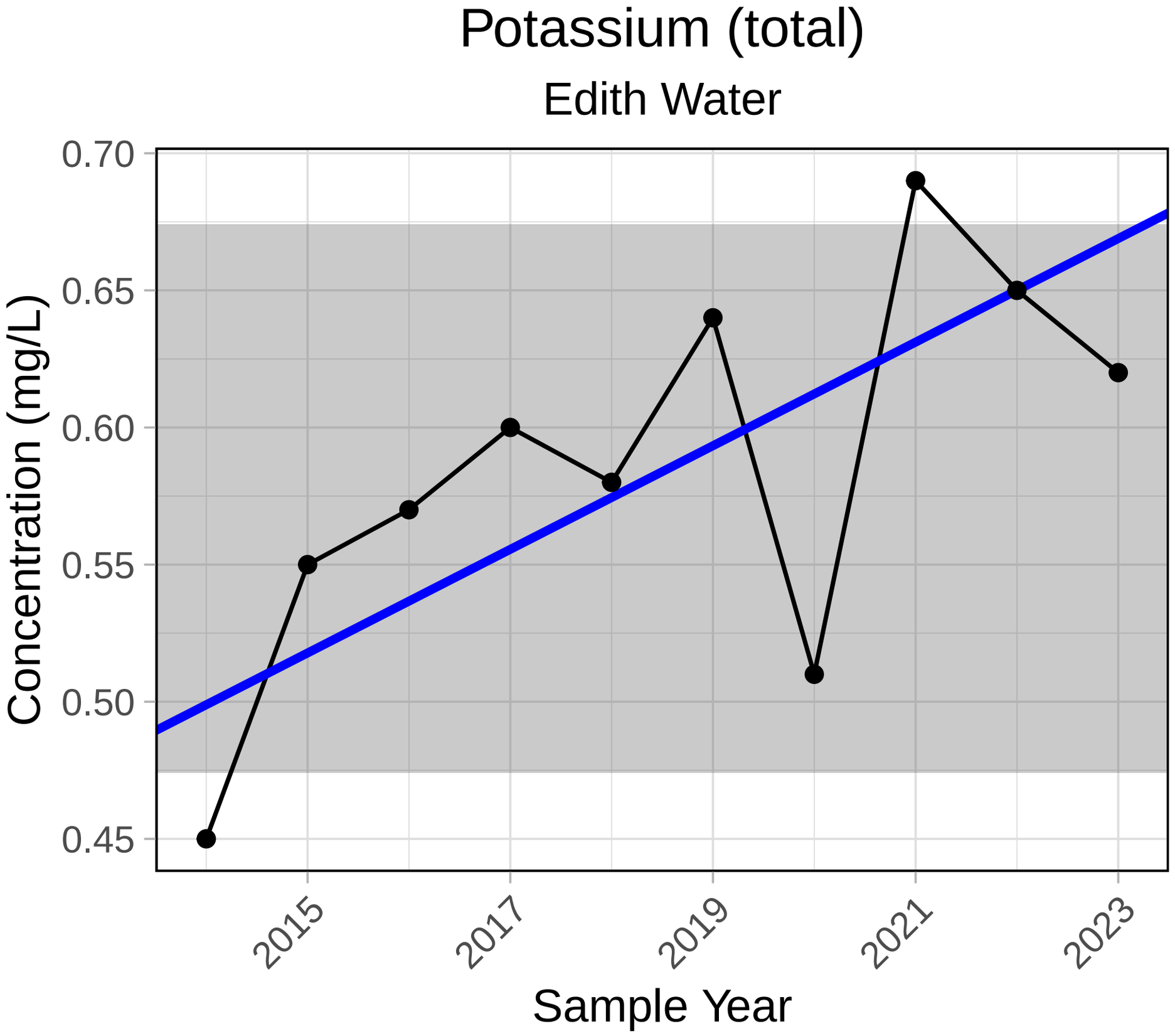

Iron (total)
Edith Water
0.6
0.5
0.4
0.3
0.2
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.21

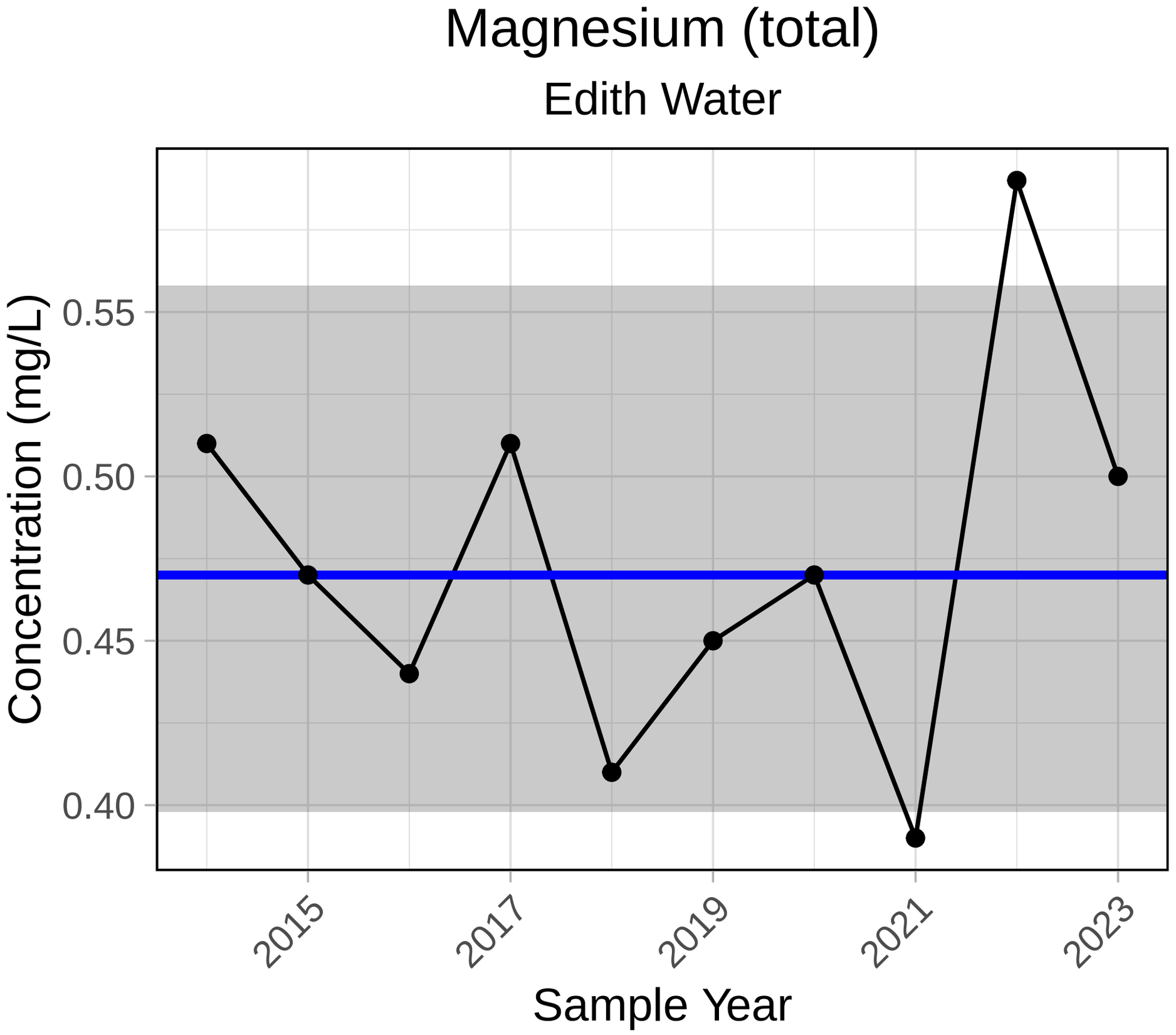
Mercury (total)

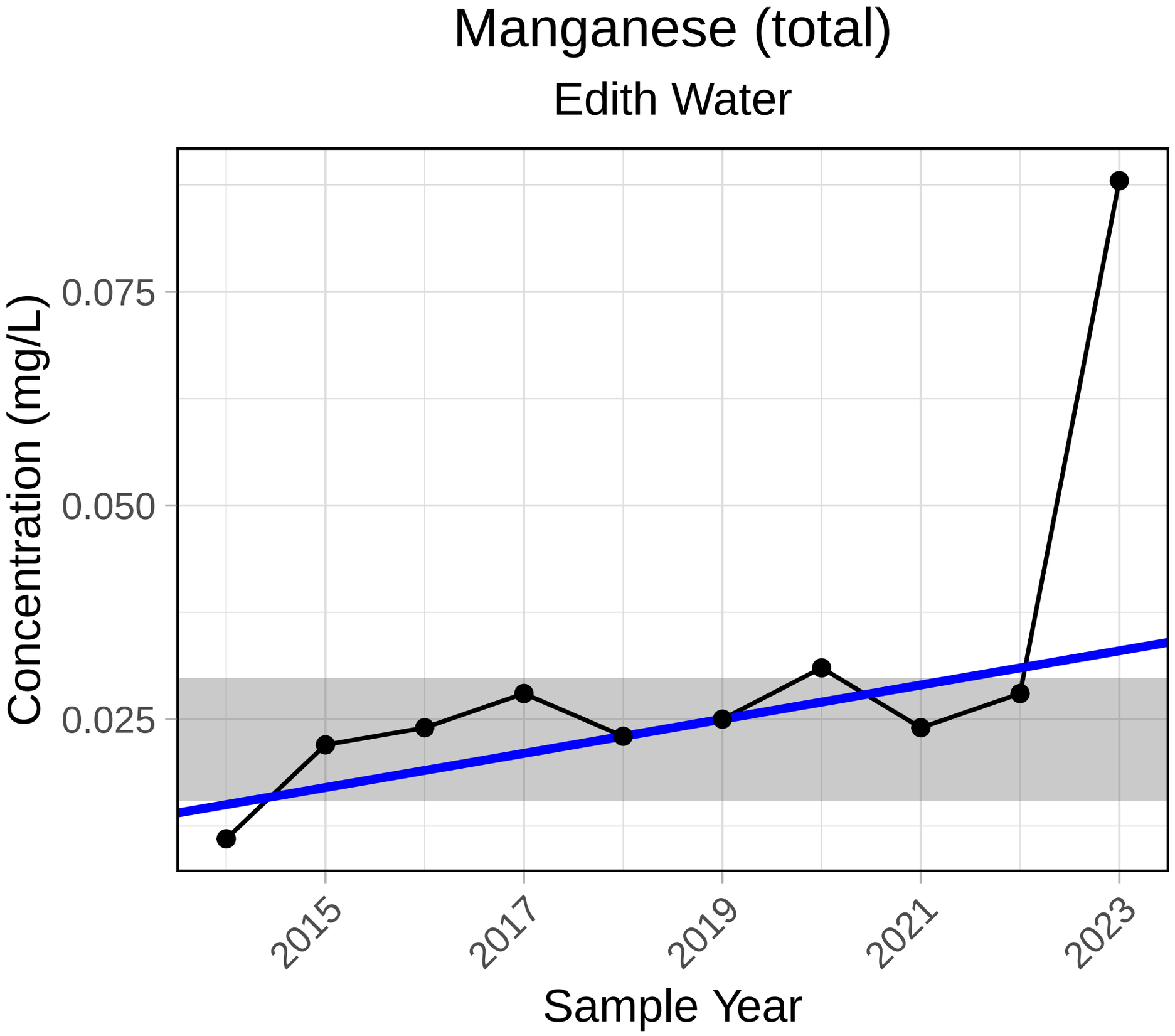
Edith Water

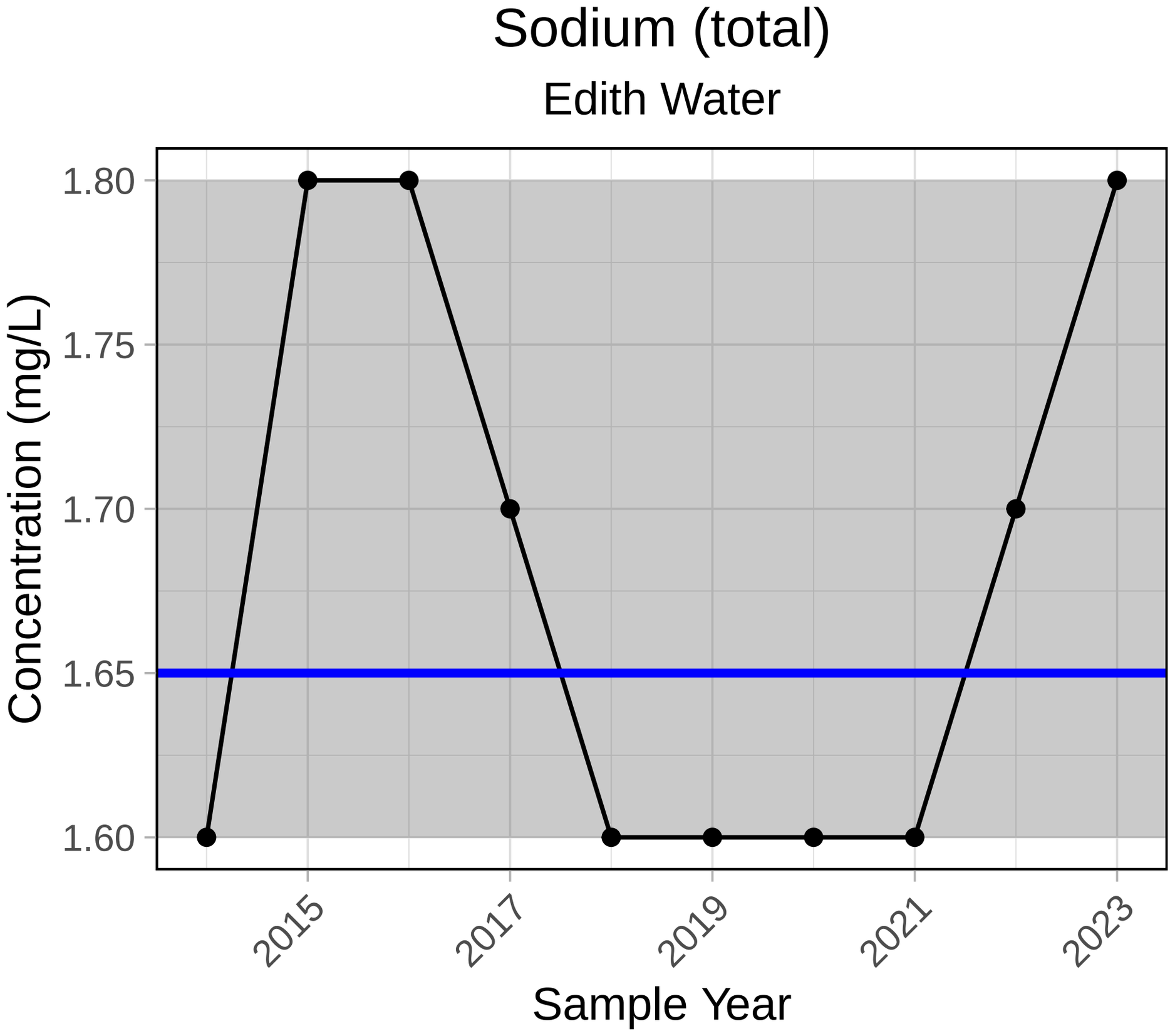


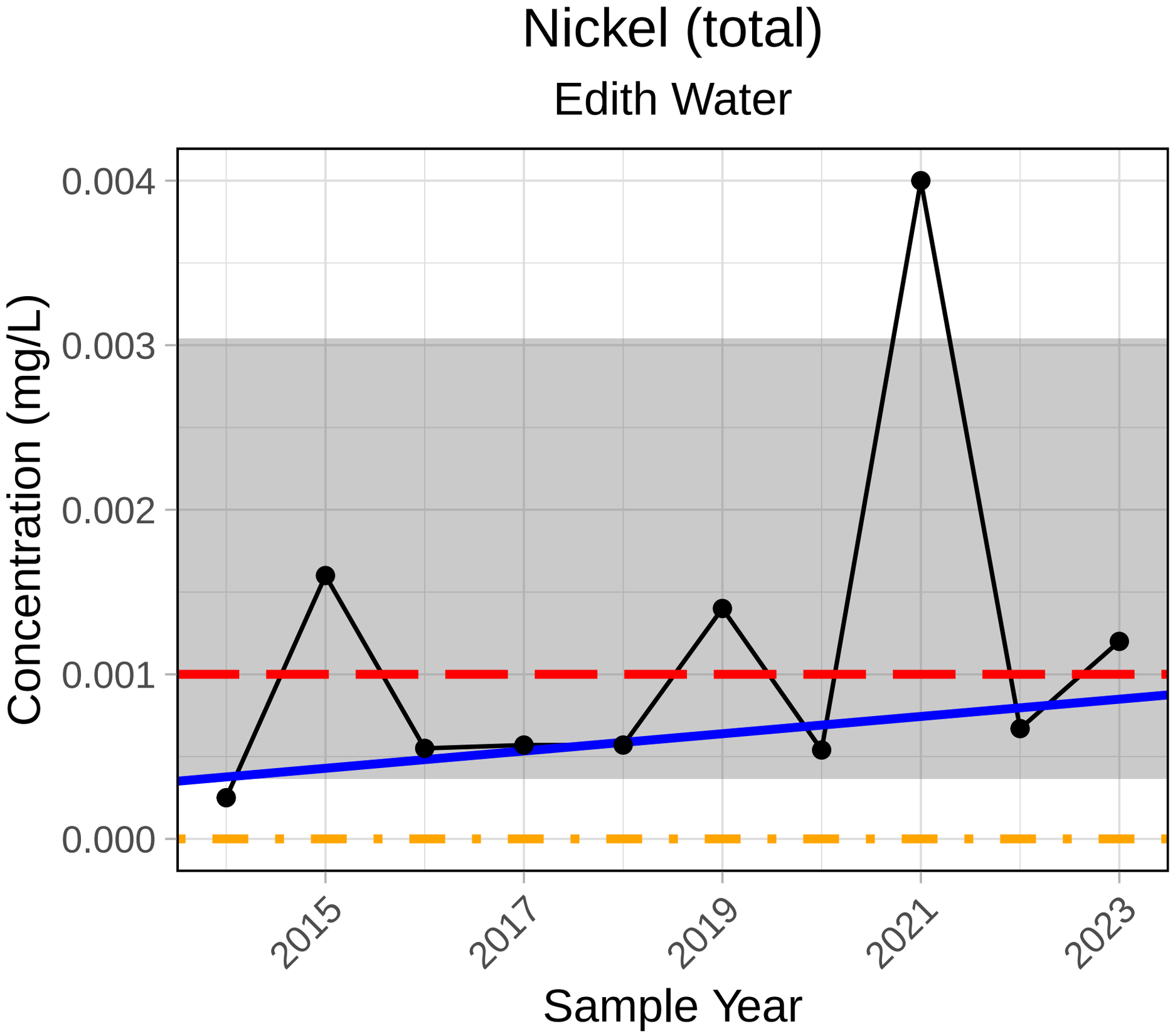
Trend significance p−value = 0.21
Chronic level = 0.005 µg/L (maximum)
Acute level = 0.013 µg/L (maximum)


Potassium (total)
Edith Water
0.70
0.65
0.60
0.55
0.50
0.45
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.032

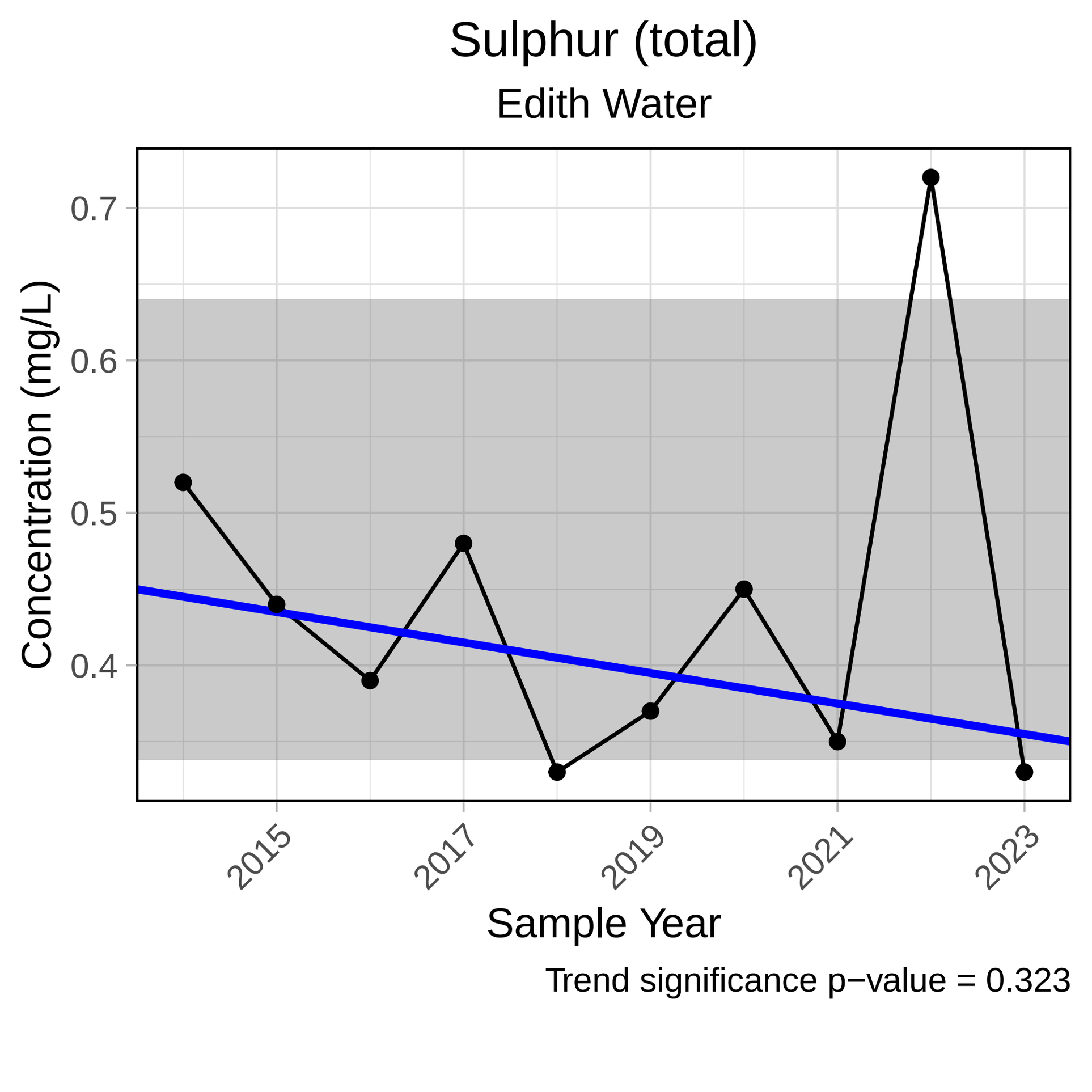

Magnesium (total)
Edith Water
Concentration (mg/L)
0.55
0.50
0.45
0.40
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

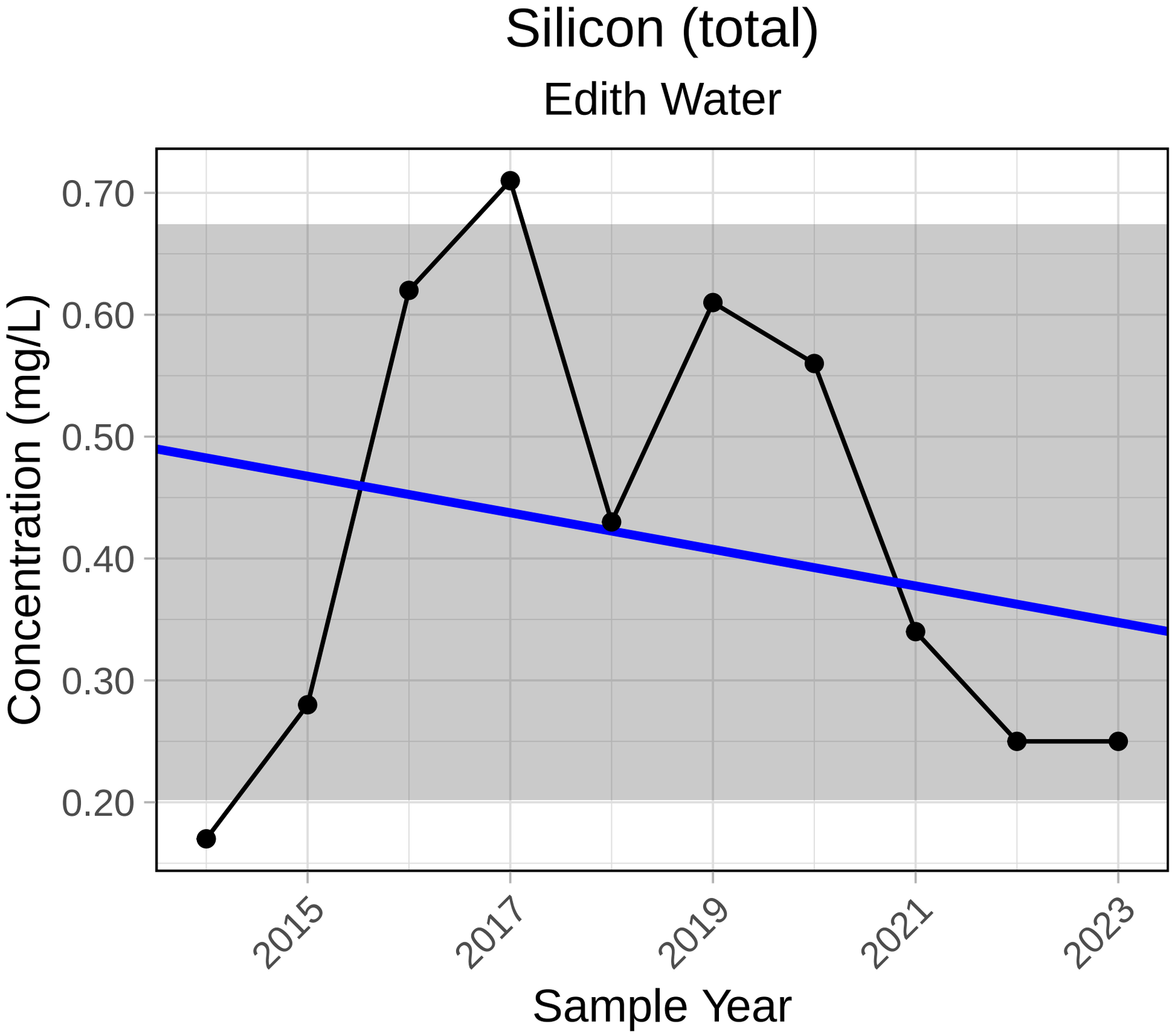

Manganese (total)
Edith Water
Concentration (mg/L)
0.075
0.050
0.025
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.012

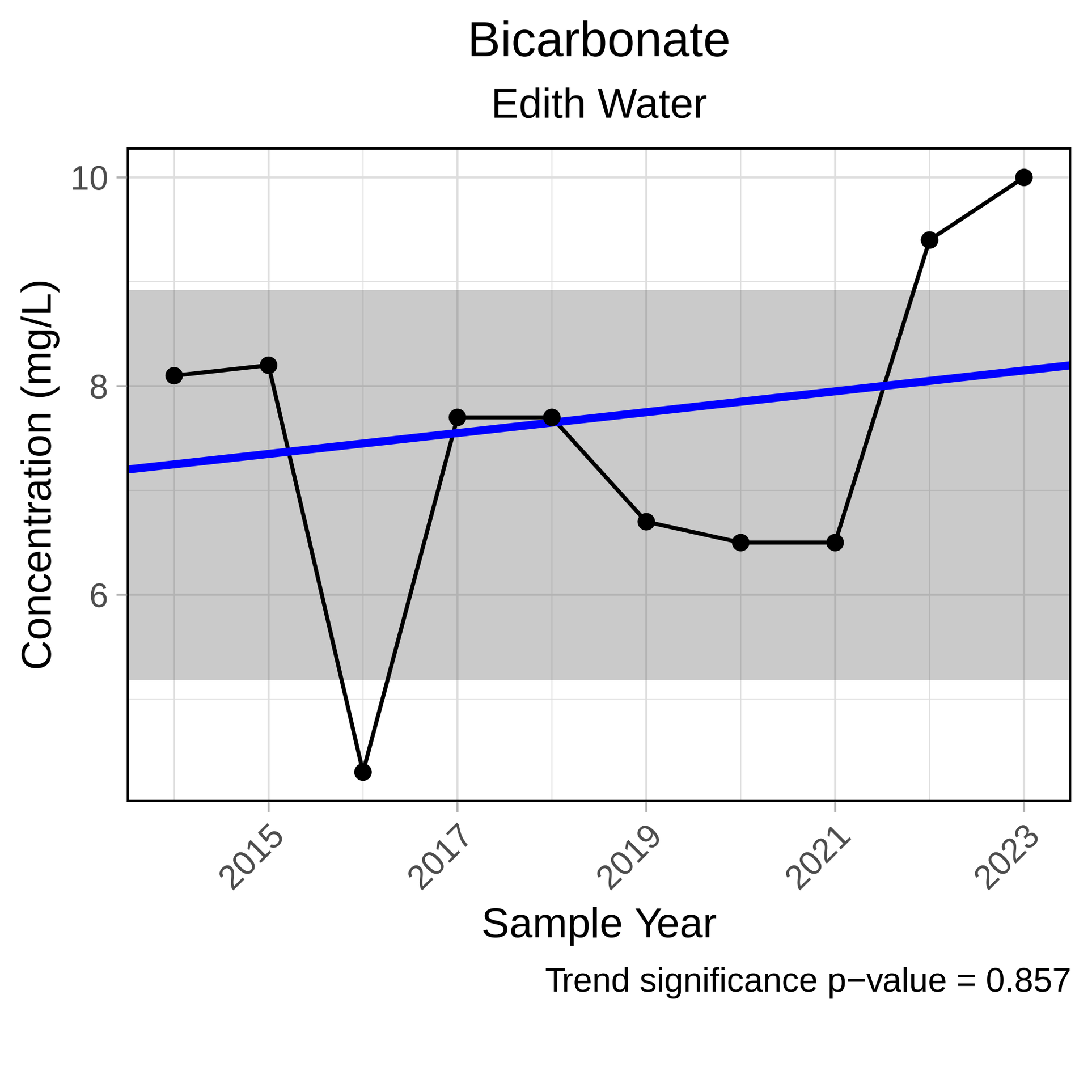

Sodium (total)
Edith Water
1.80
1.75
1.70
1.65
1.60
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

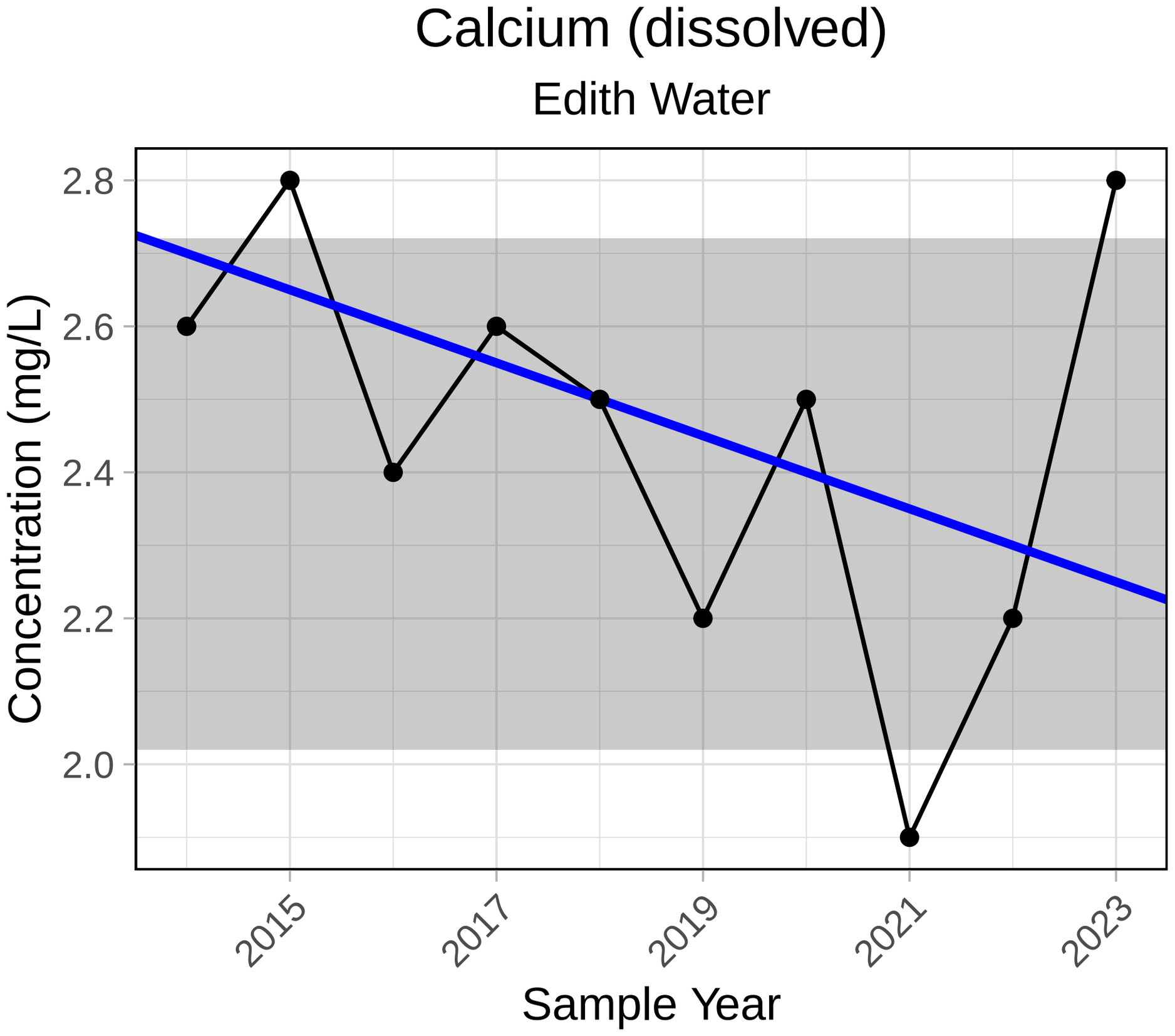


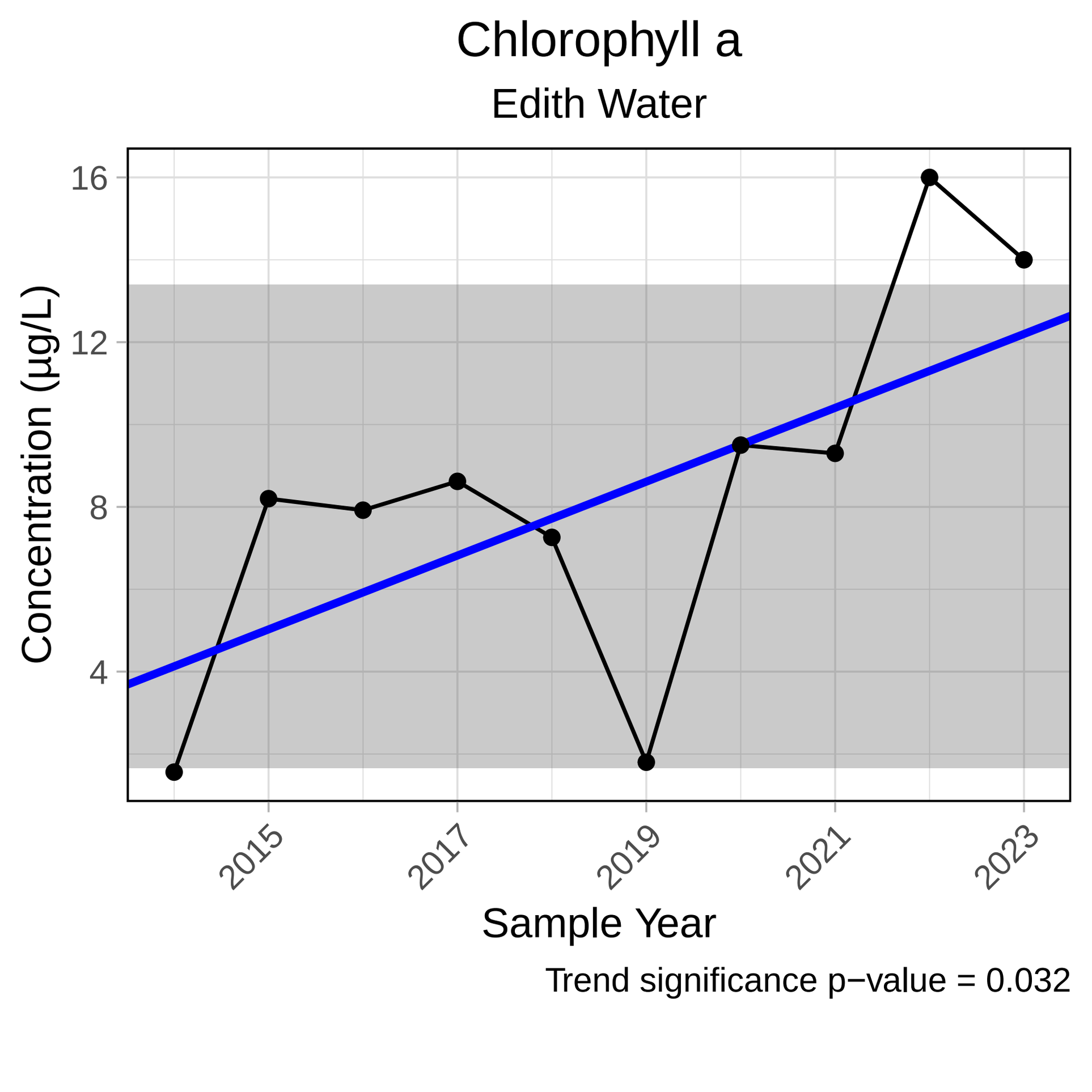
Trend significance p−value = 0.243
Chronic level = 0 mg/L
Acute level = 0.001 mg/L


Sulphur (total)
Edith Water
Concentration (mg/L)
0.7
0.6
0.5
0.4
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323


Silicon (total)
Edith Water
Concentration (mg/L)
0.70
0.60
0.50
0.40
0.30
0.20
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.53

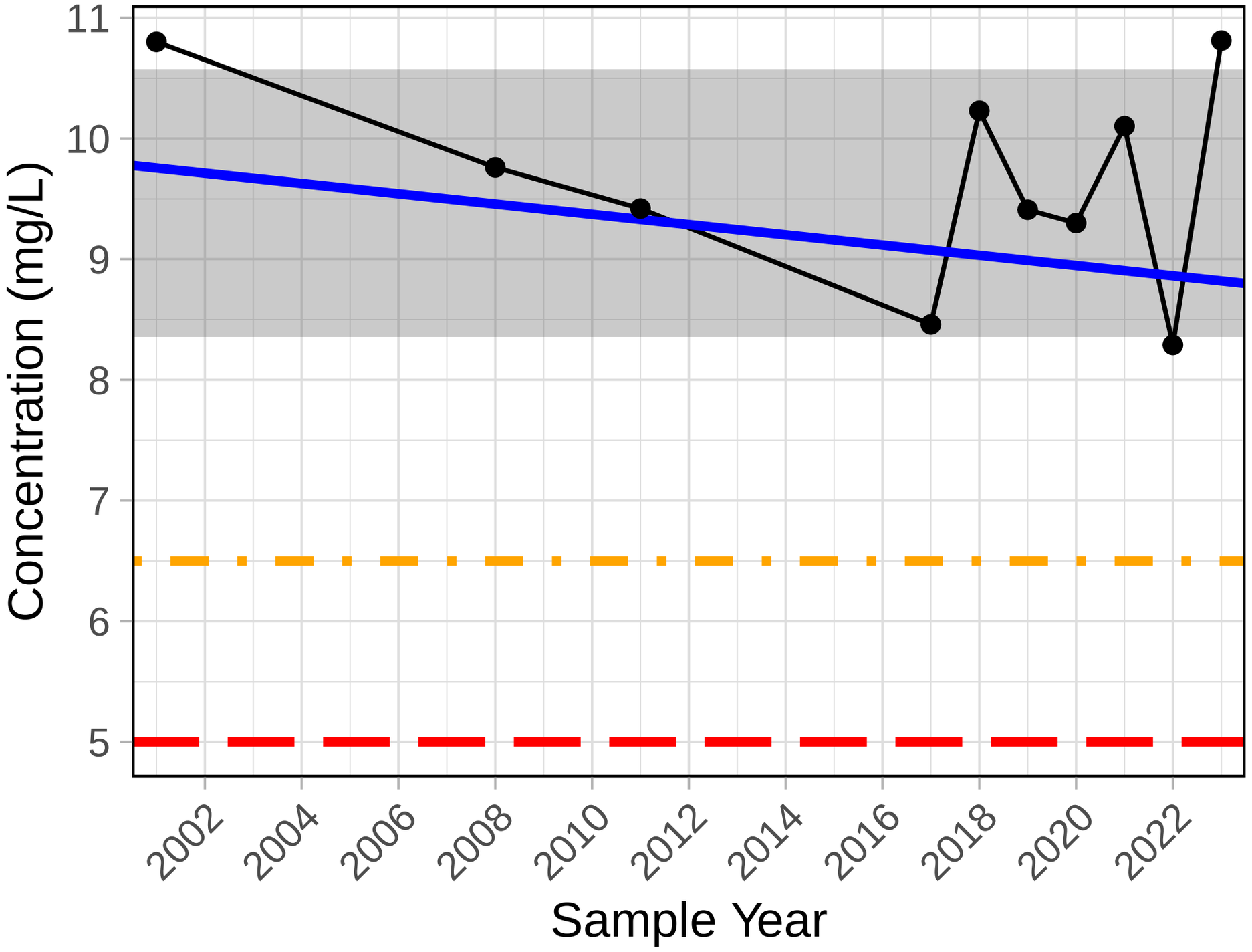

Bicarbonate
Edith Water
10
8
6
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.857


Calcium (dissolved)
Edith Water
Concentration (mg/L)
2.8
2.6
2.4
2.2
2.0
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.275

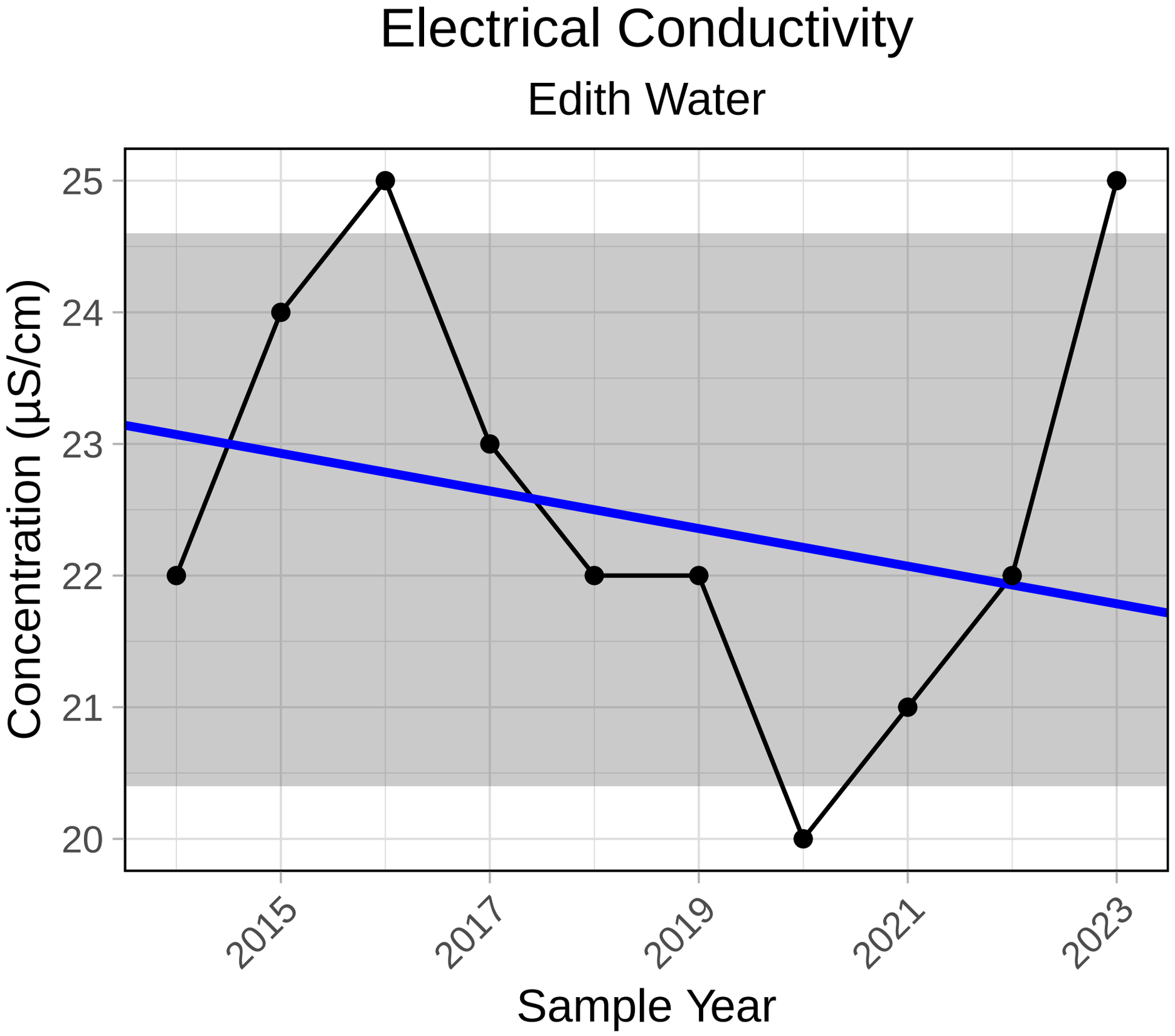

Chlorophyll a
Edith Water
16
12
8
4
Concentration (µg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.032

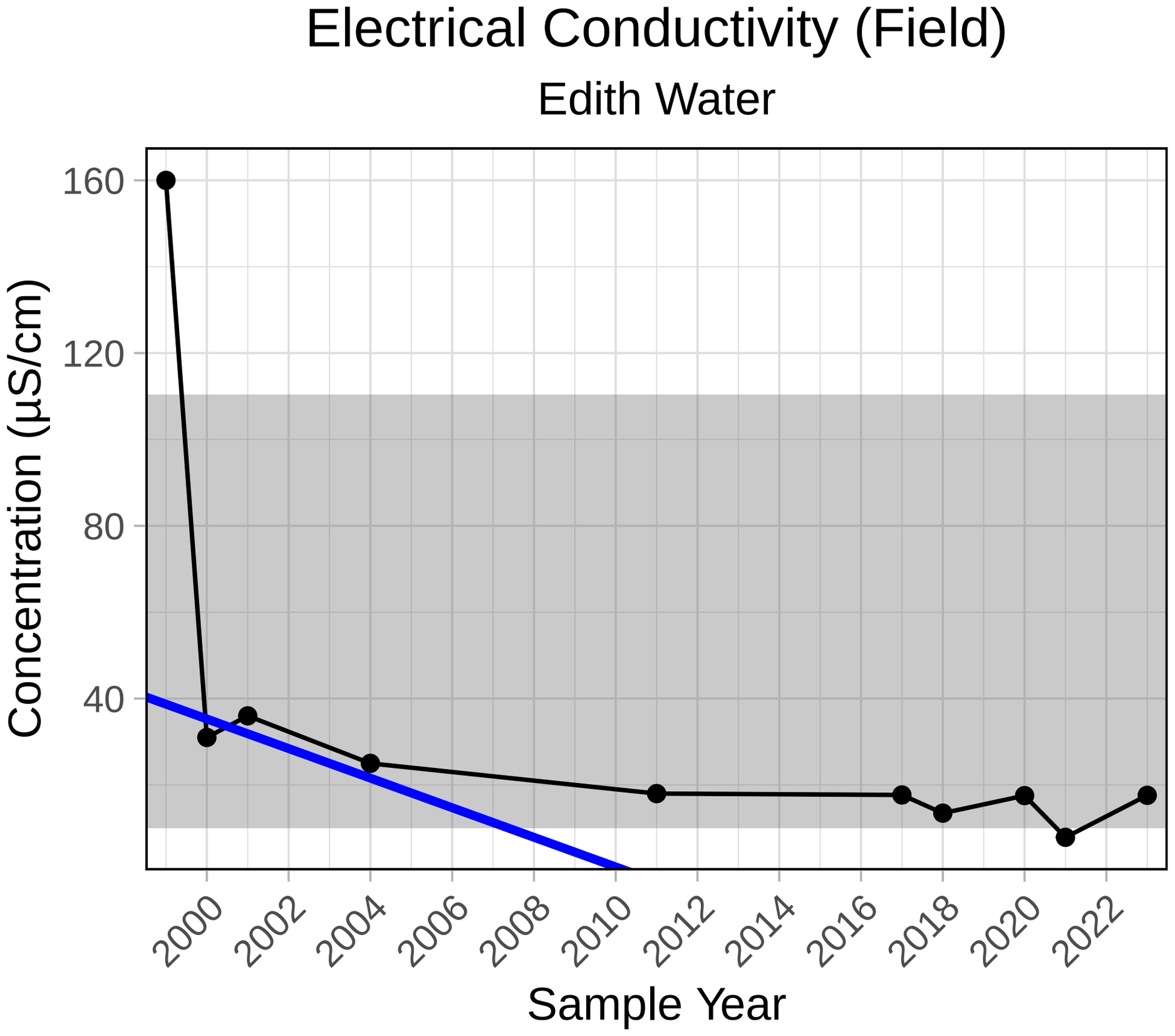
Dissolved Oxygen

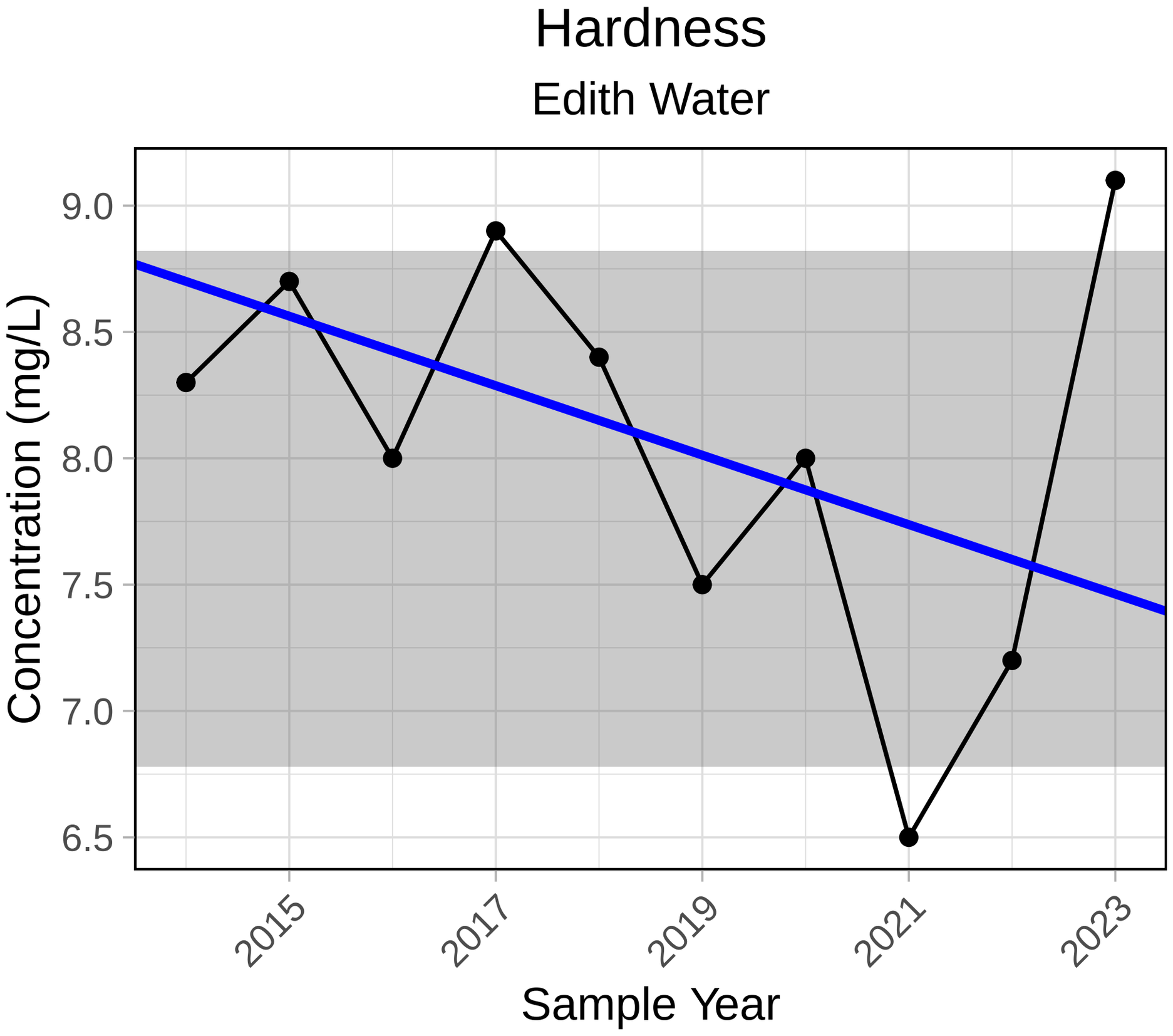
Edith Water

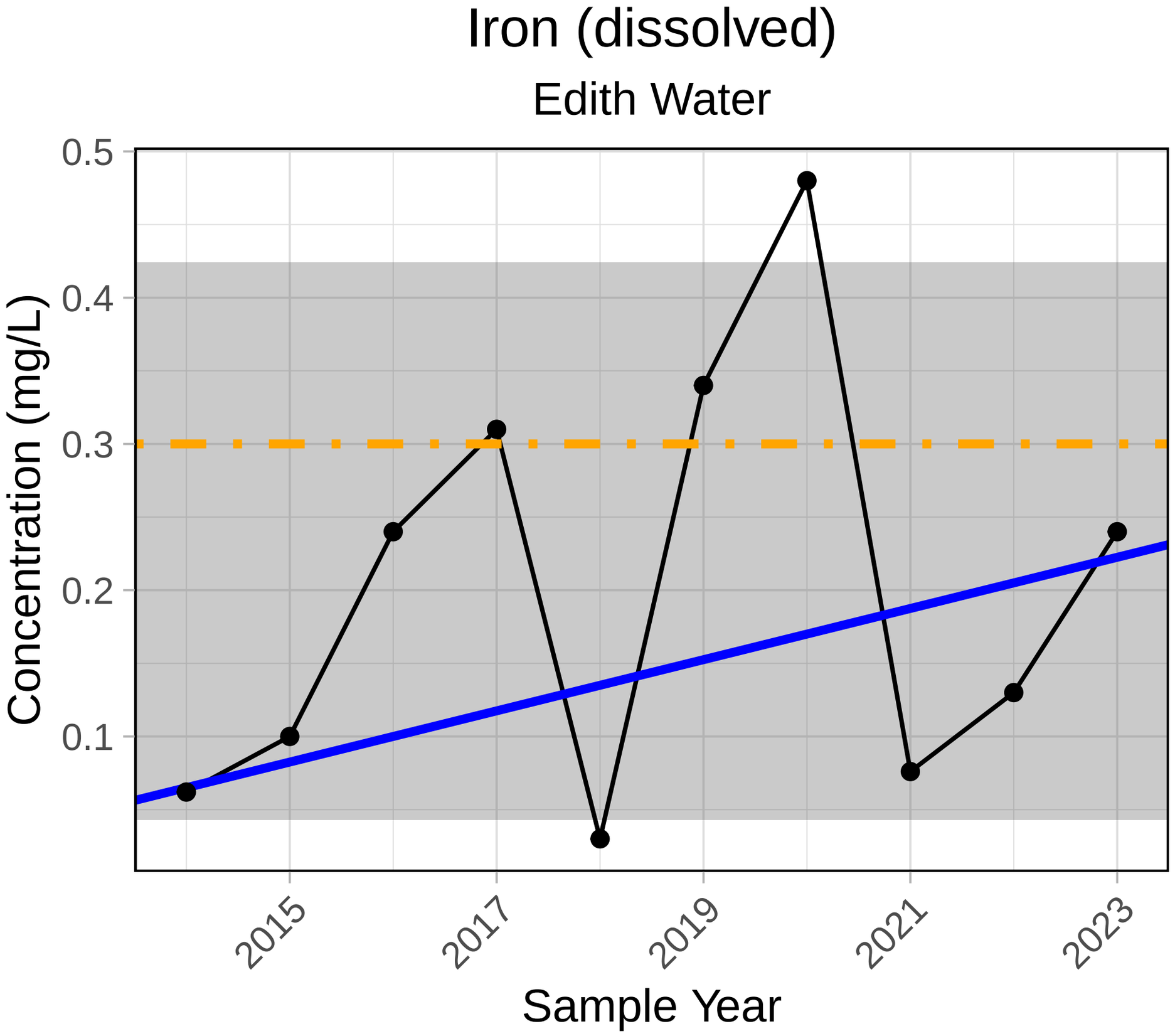


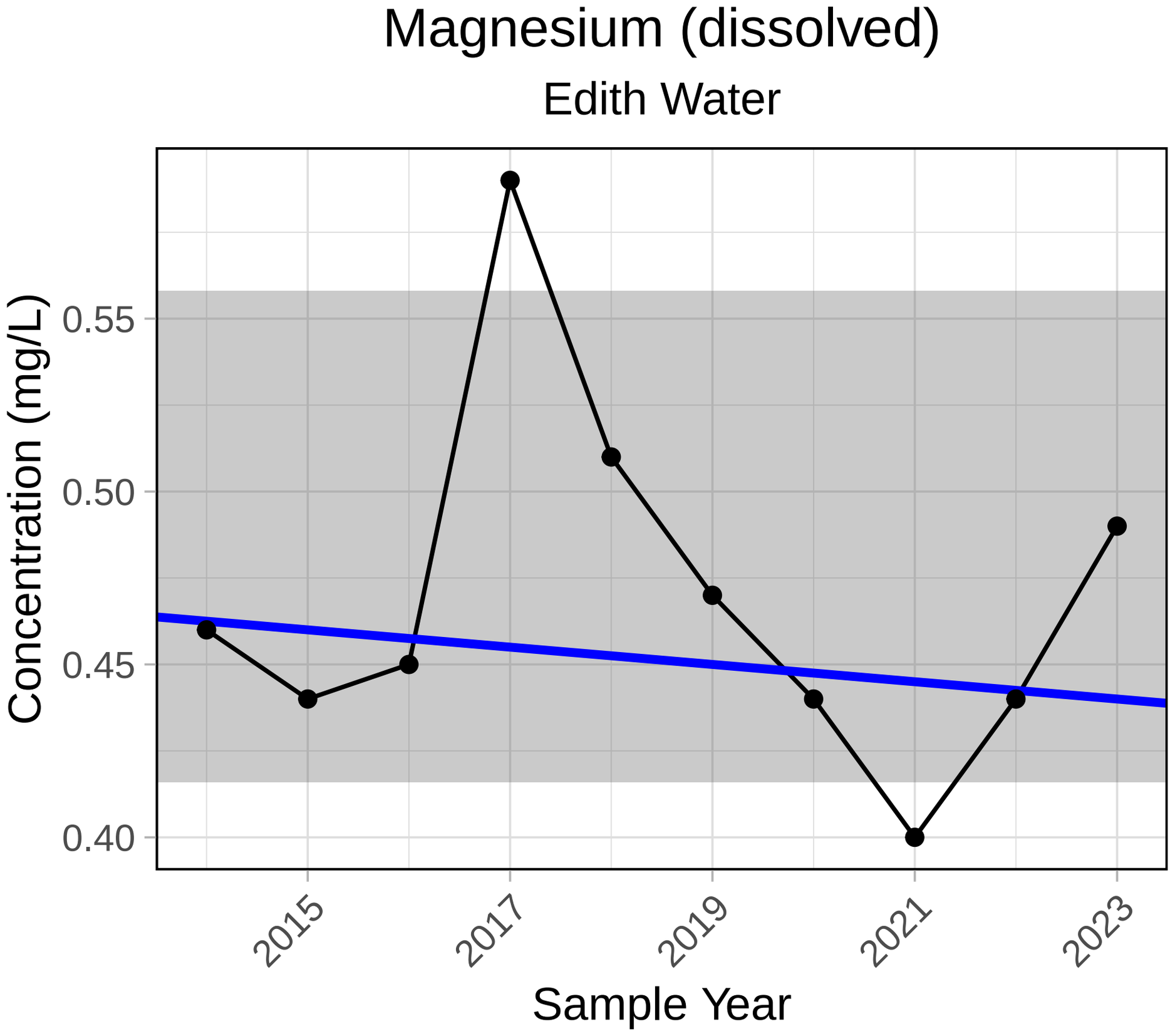
Trend significance p−value = 0.592
Chronic level = 6.5 mg/L (minimum)
Acute level = 5 mg/L (minimum)

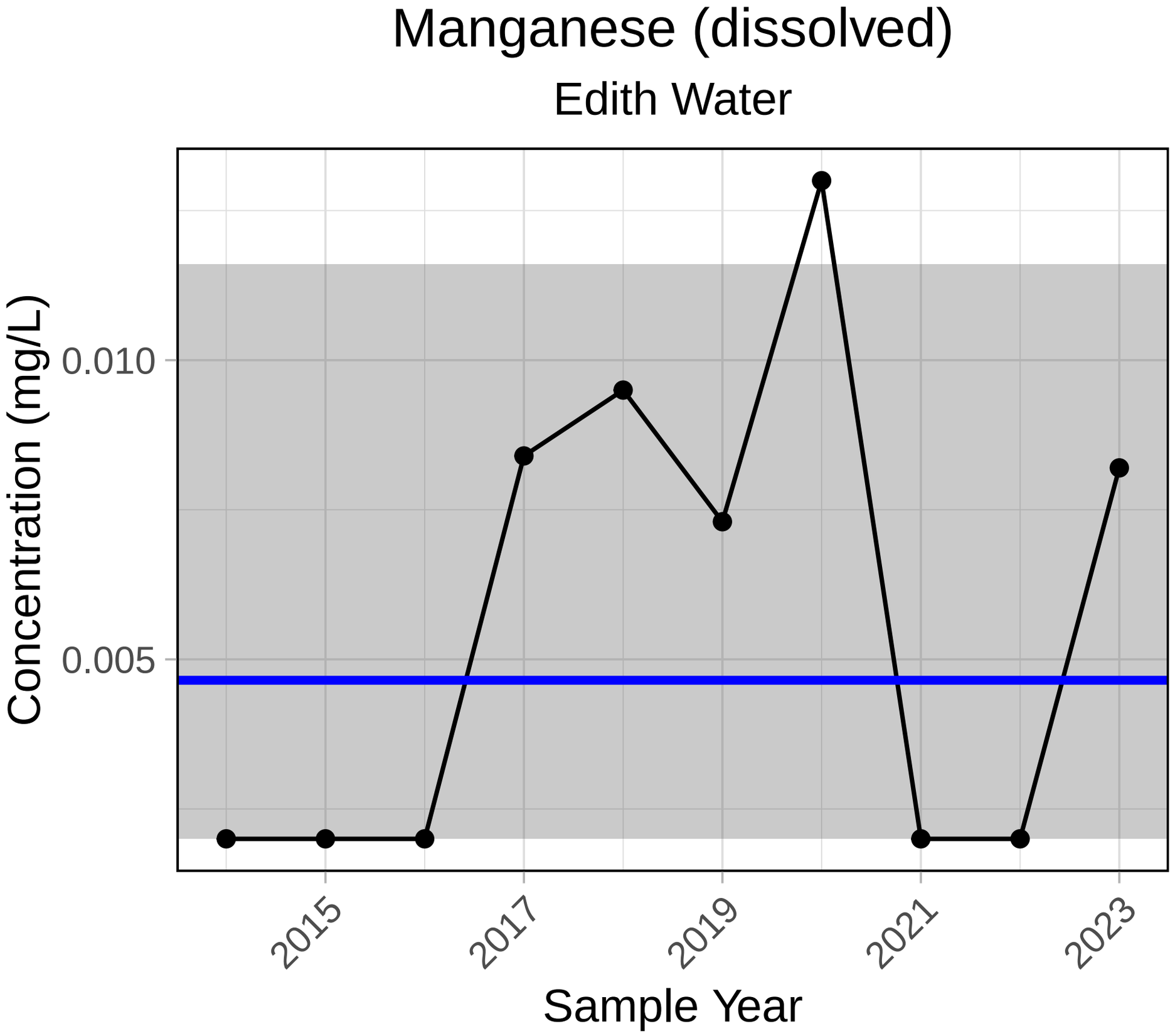

Electrical Conductivity
Edith Water
Concentration (µS/cm)
25
24
23
22
21
20
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.515


Electrical Conductivity (Field)
Edith Water
160
120
80
40
Concentration (µS/cm)
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.002


Hardness
Edith Water
Concentration (mg/L)
9.0
8.5
8.0
7.5
7.0
6.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.419

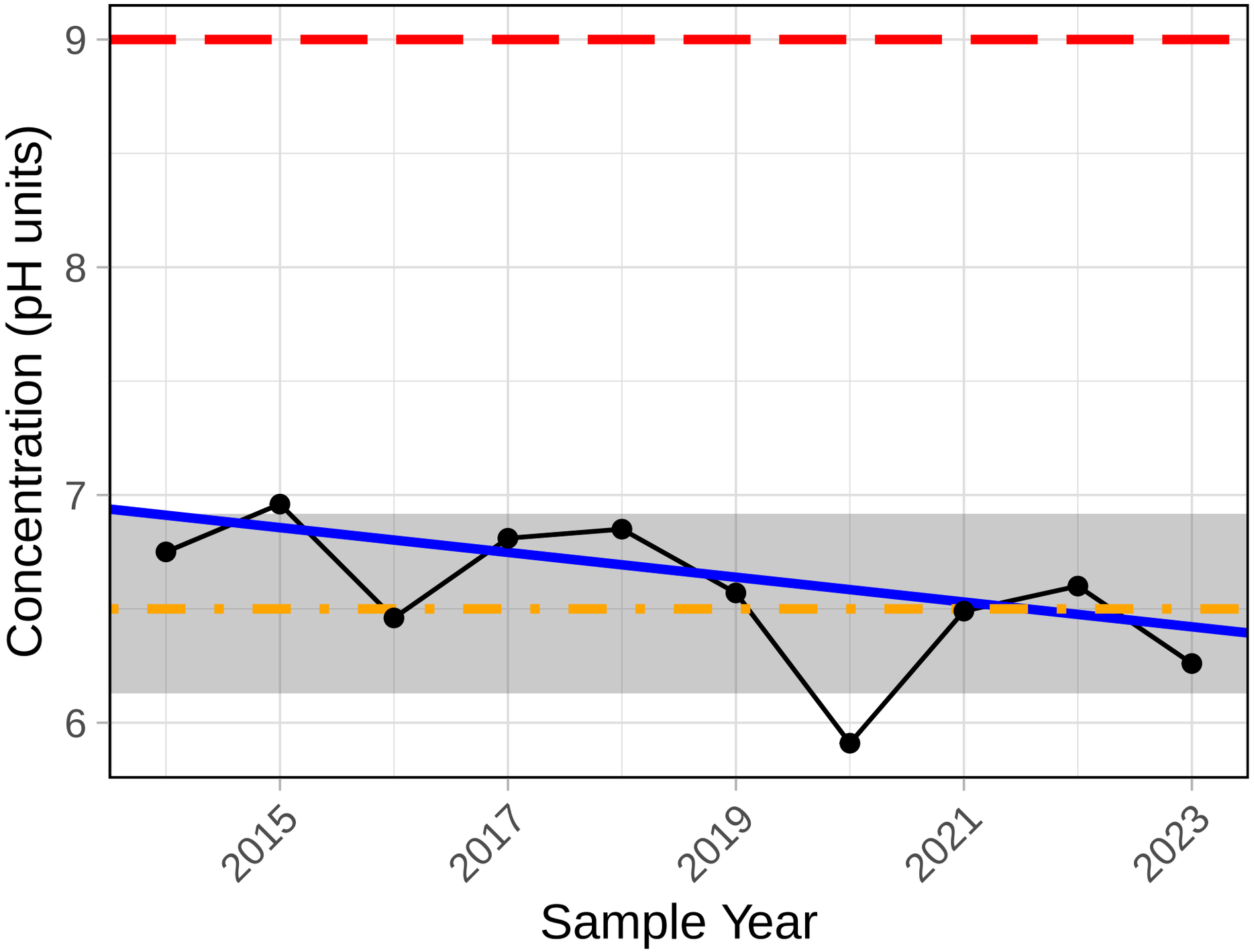

Iron (dissolved)
Edith Water
0.5
0.4
0.3
0.2
0.1
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323
Chronic level = 0.3 mg/L (maximum)


Magnesium (dissolved)
Edith Water
Concentration (mg/L)
0.55
0.50
0.45
0.40
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.65


Manganese (dissolved)
Edith Water
Concentration (mg/L)
0.010
0.005
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.442

pH

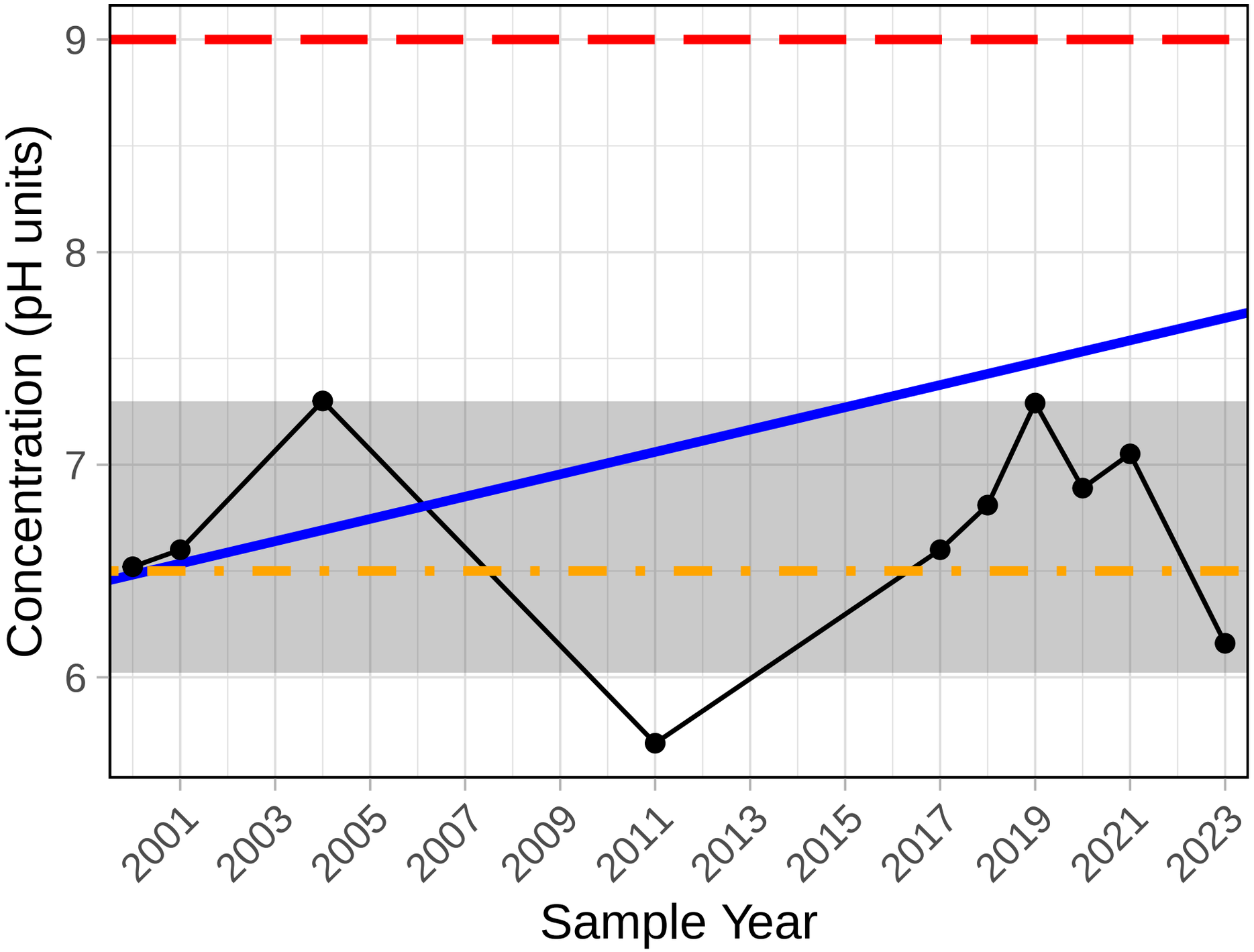
Edith Water



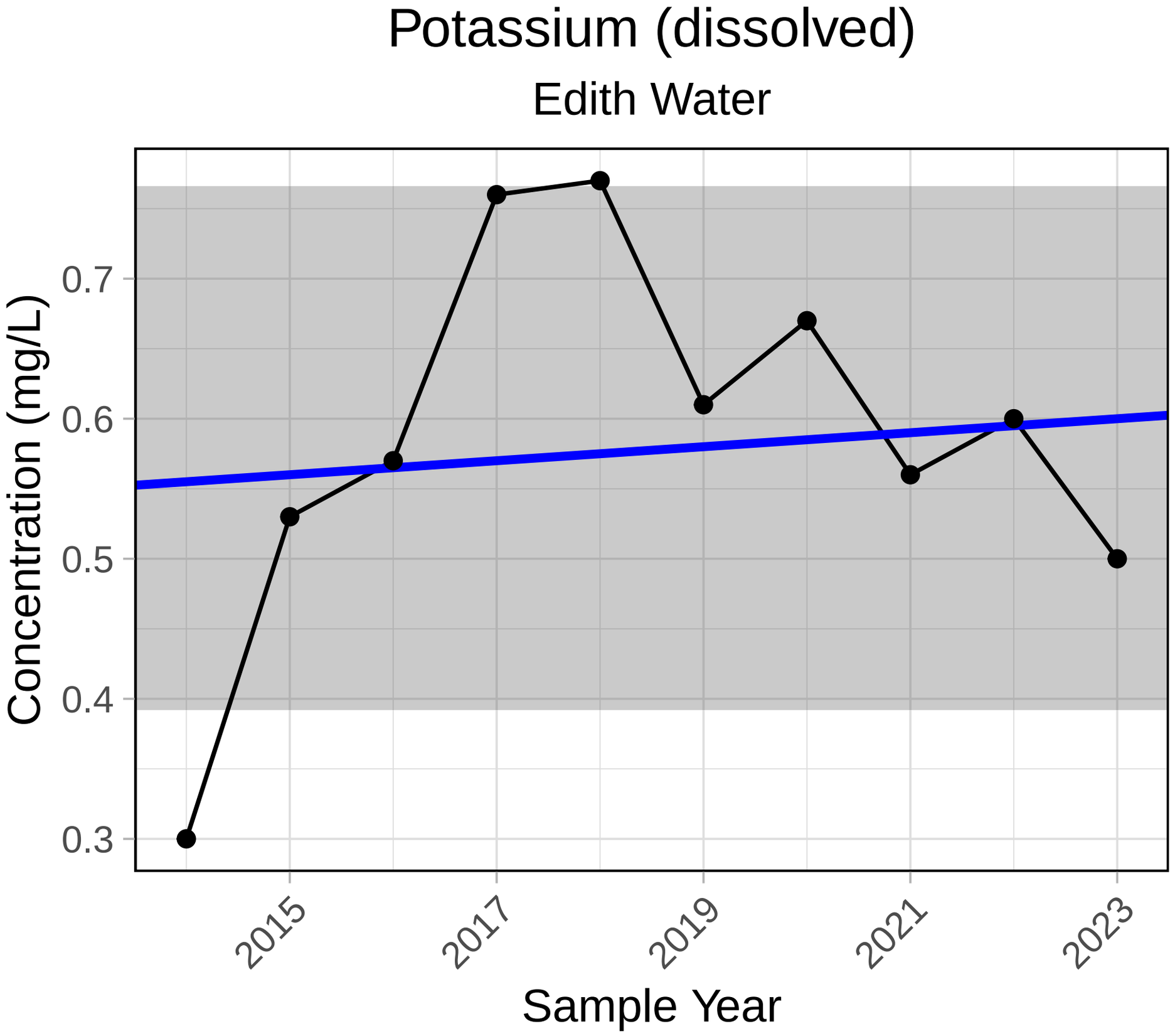
Trend significance p−value = 0.152
Lower limit = 6.5 pH units (minimum)
Upper limit = 9 pH units (maximum)

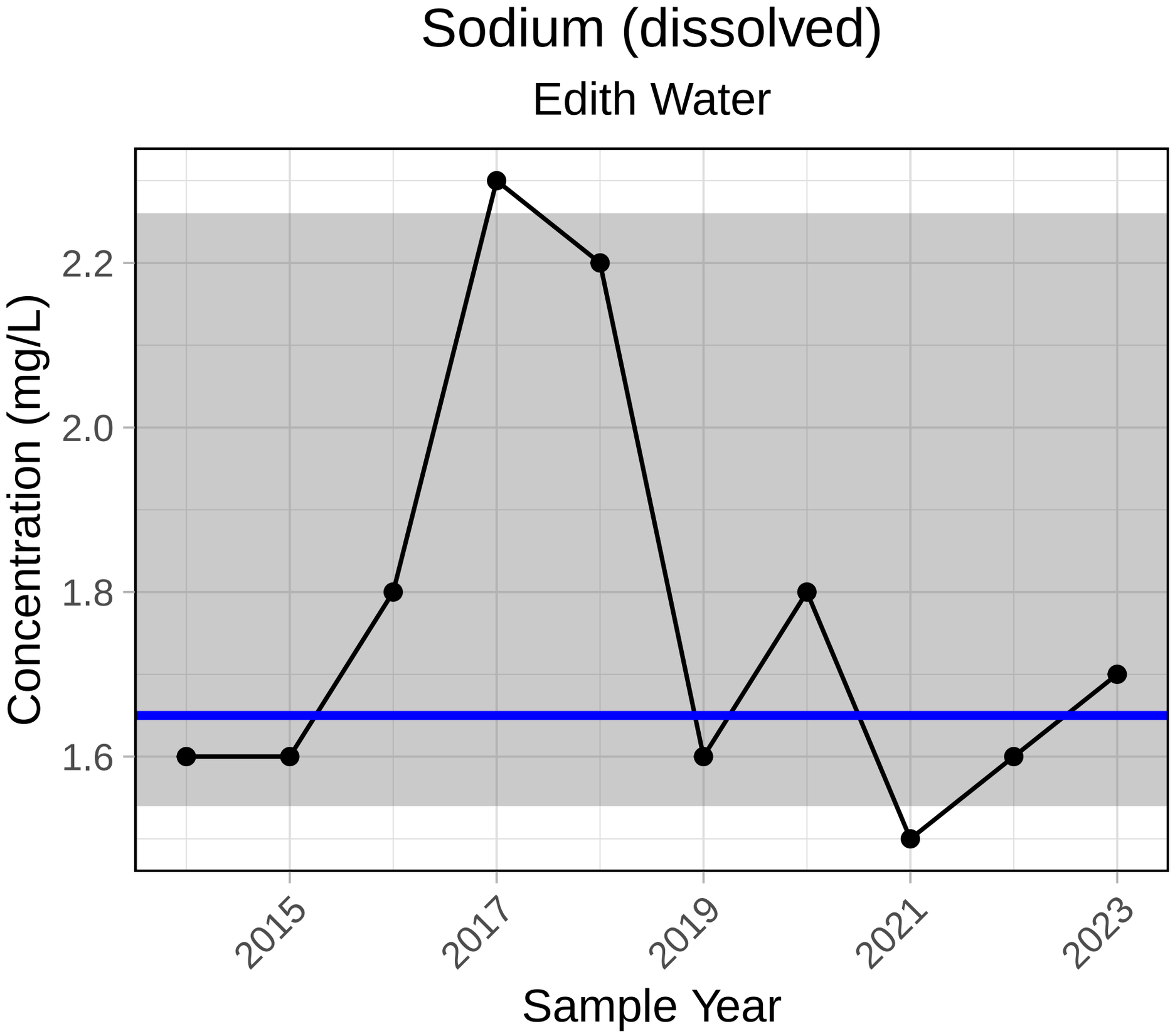
pH (Field)

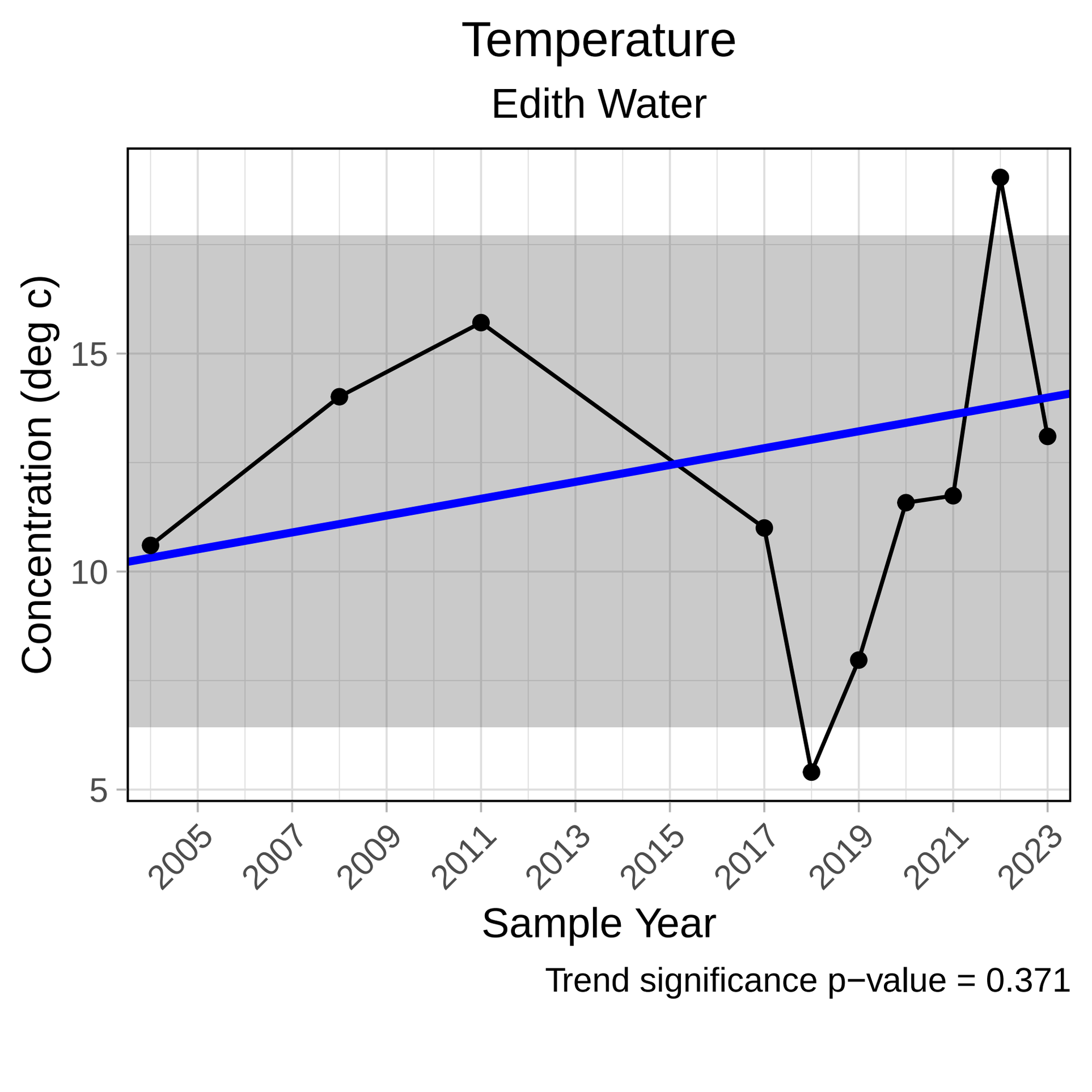
Edith Water

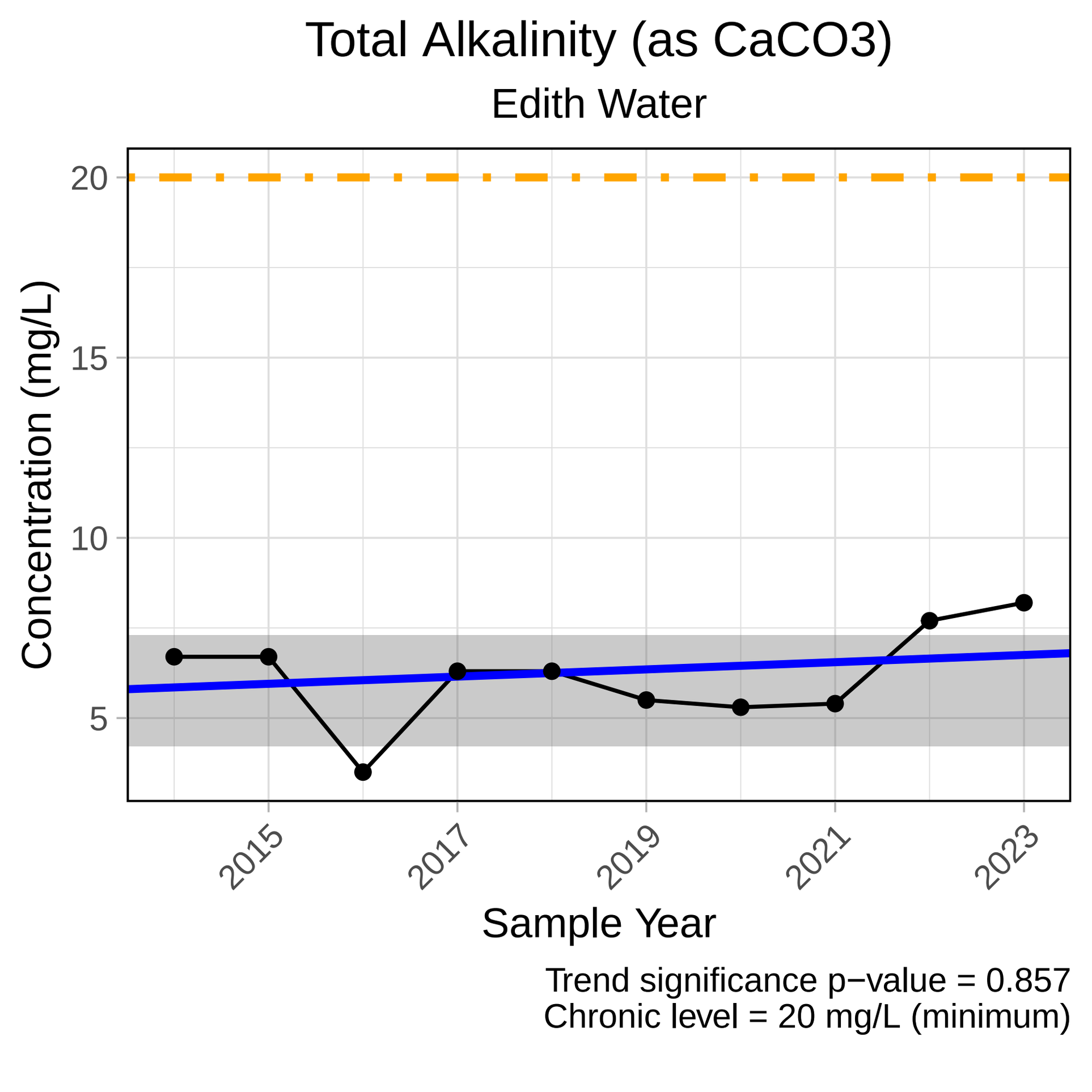


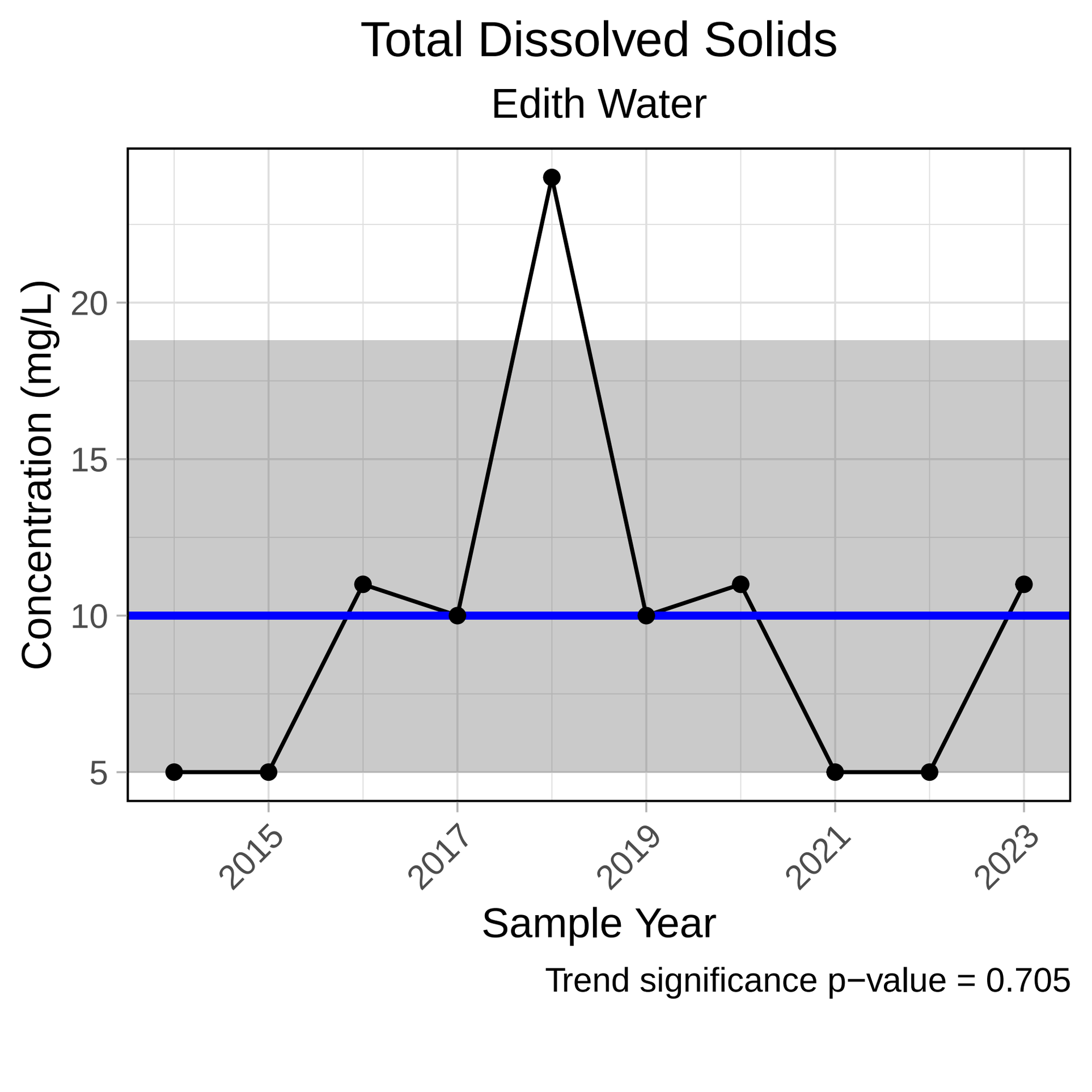
Trend significance p−value = 0.53
Lower limit = 6.5 pH units (minimum)
Upper limit = 9 pH units (maximum)

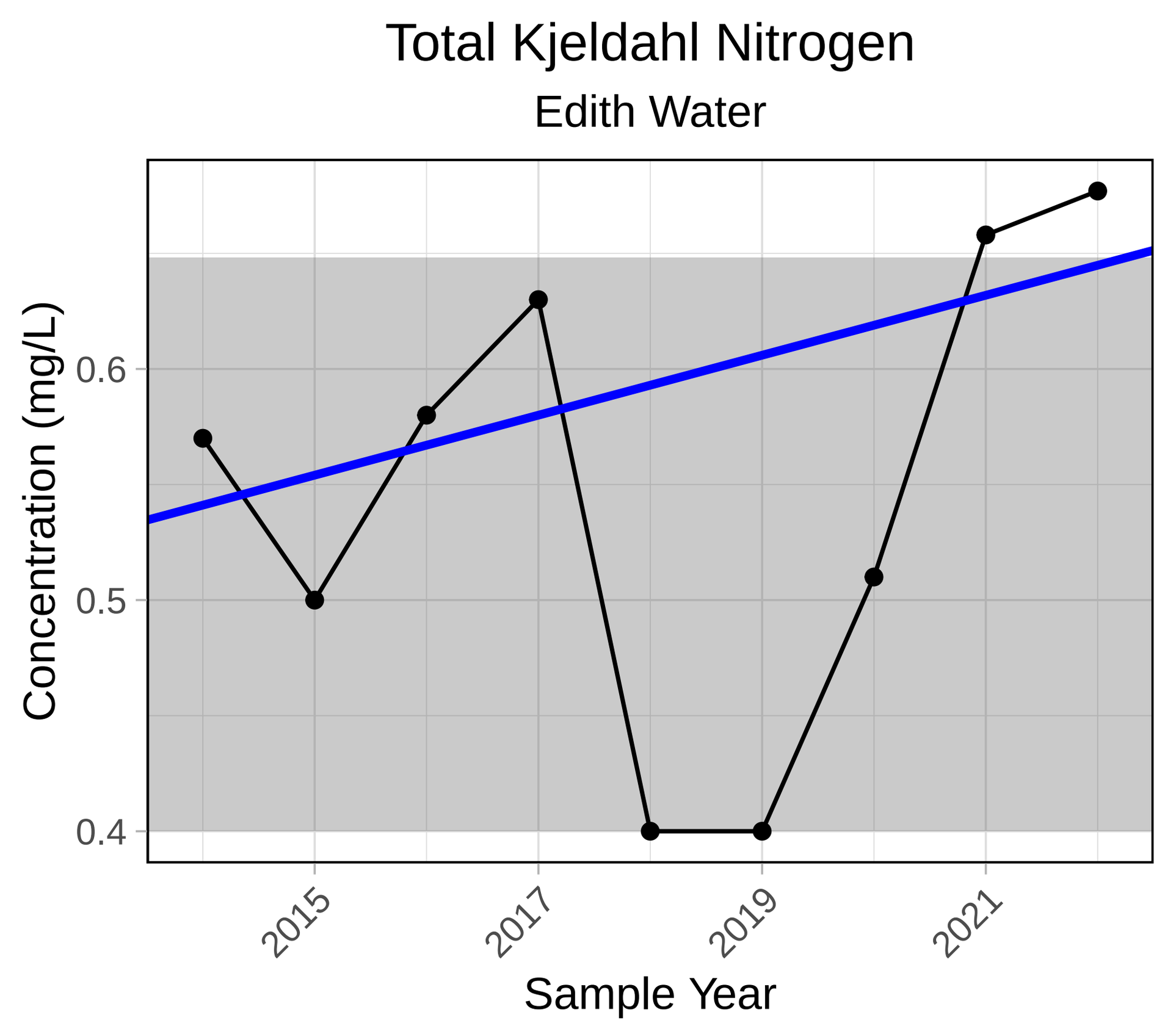

Potassium (dissolved)
Edith Water
Concentration (mg/L)
0.7
0.6
0.5
0.4
0.3
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.858

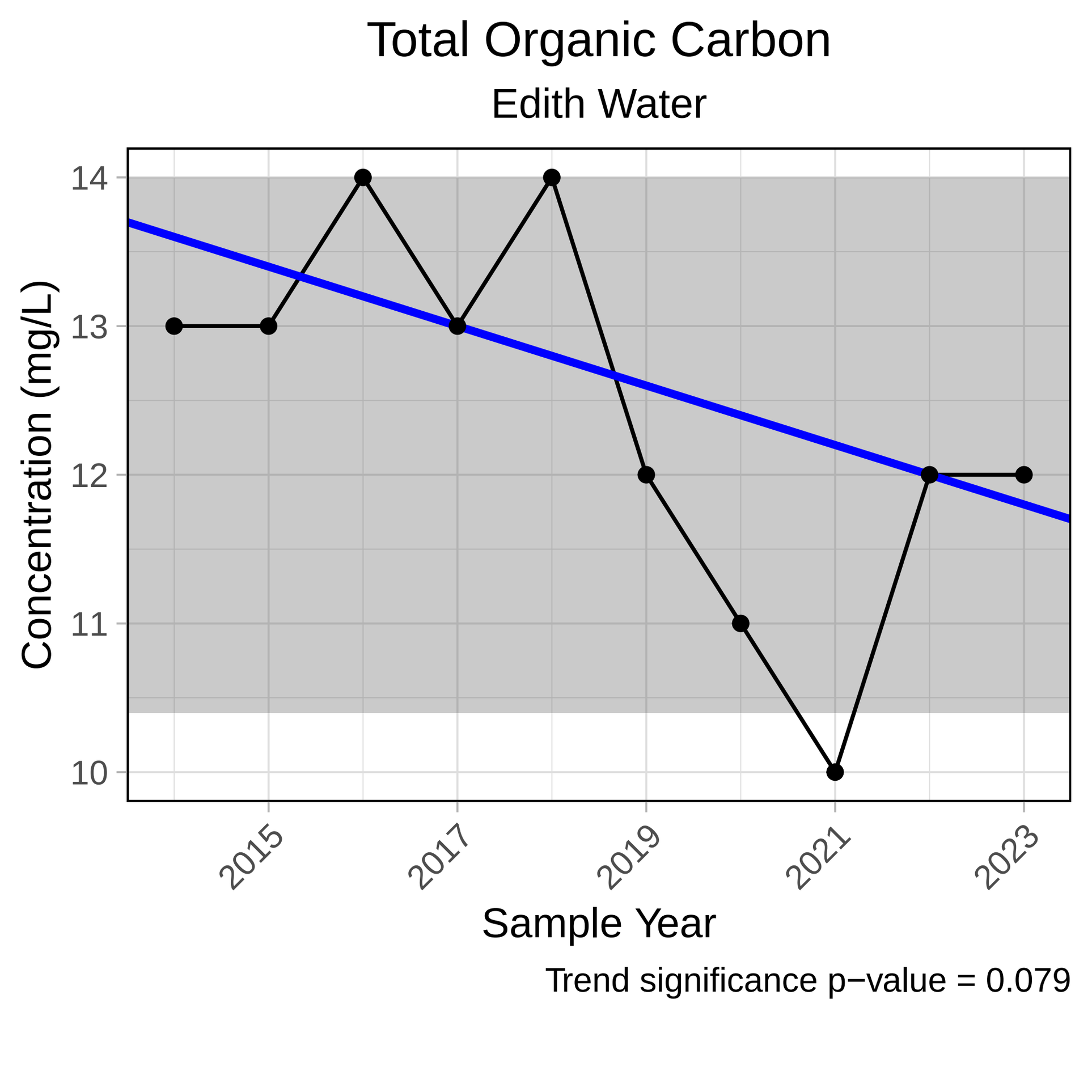

Sodium (dissolved)
Edith Water
Concentration (mg/L)
2.2
2.0
1.8
1.6
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.78

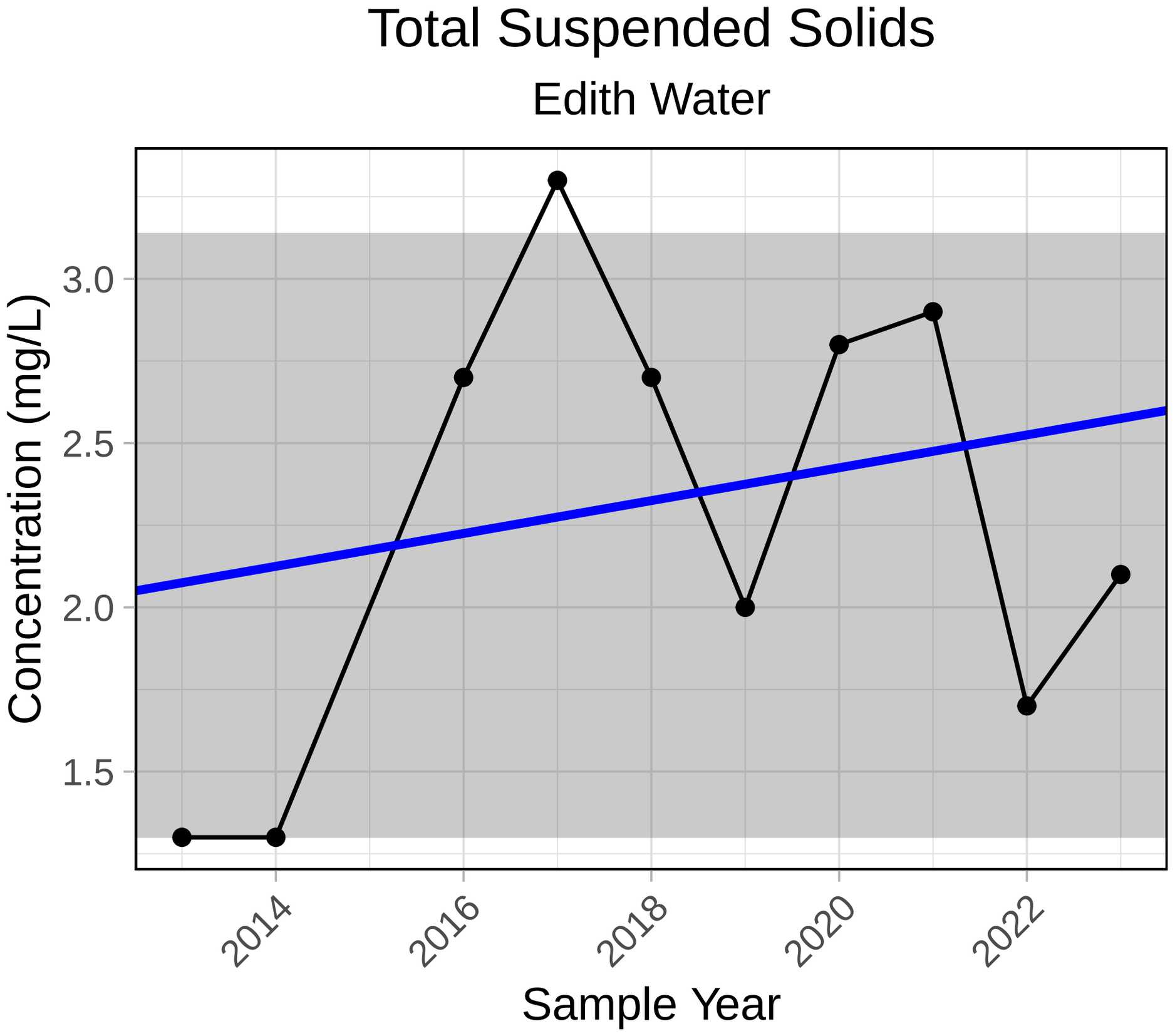

Temperature
Edith Water
Concentration (deg c)
15
10
5
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.371

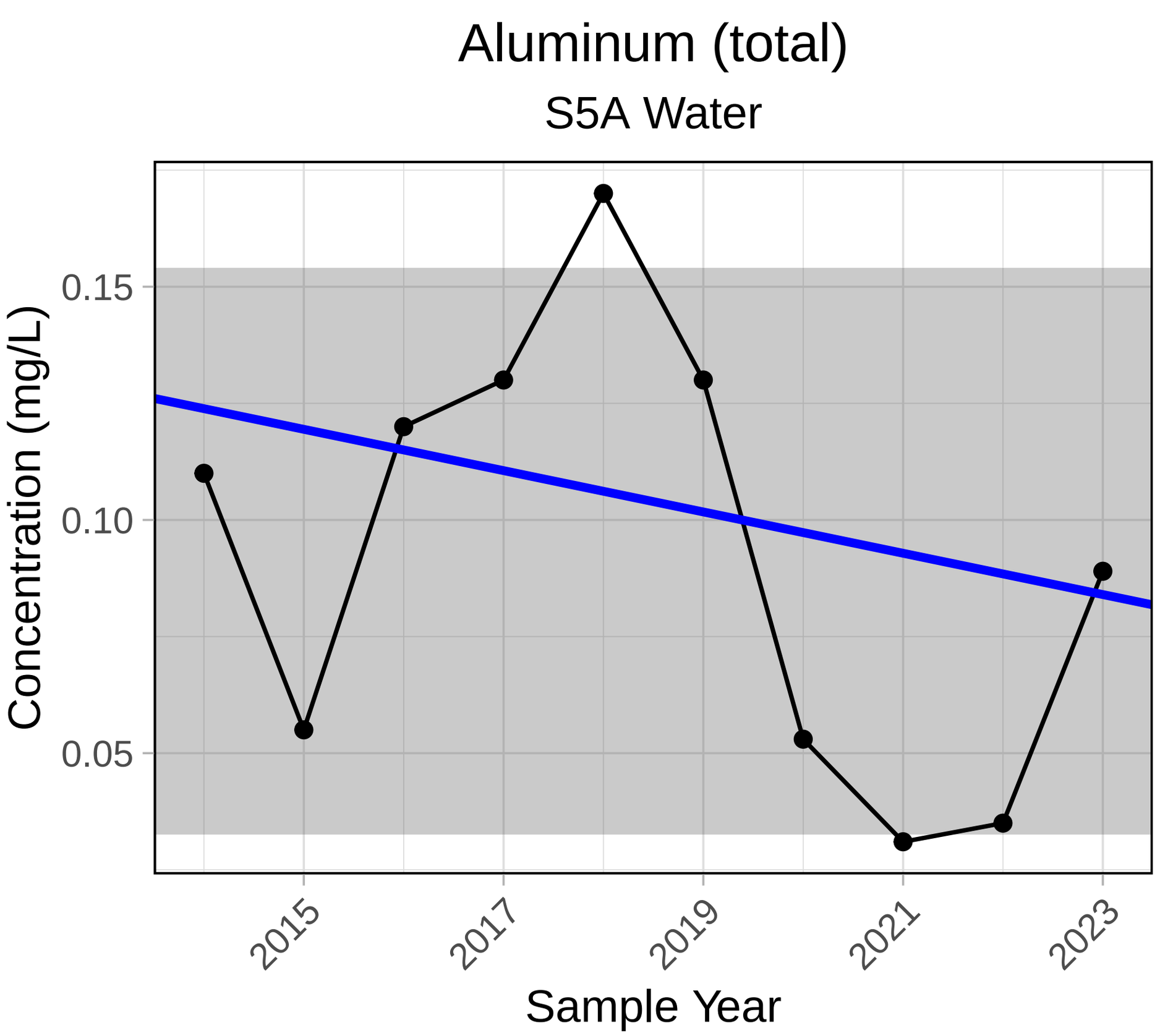

Total Alkalinity (as CaCO3)
Edith Water
Concentration (mg/L)
20
15
10
5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.857
Chronic level = 20 mg/L (minimum)

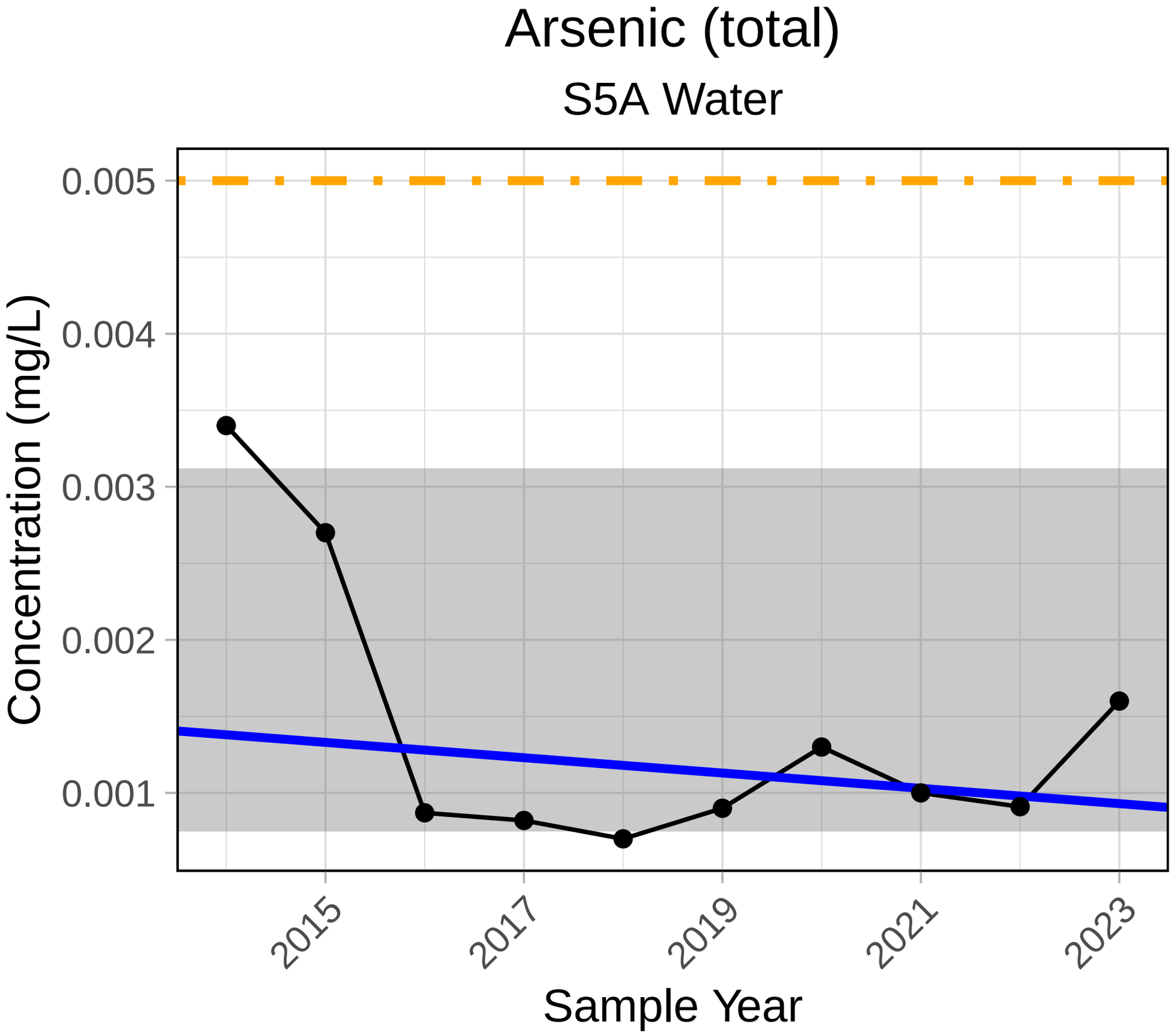

Total Dissolved Solids
Edith Water
Concentration (mg/L)
20
15
10
5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.705

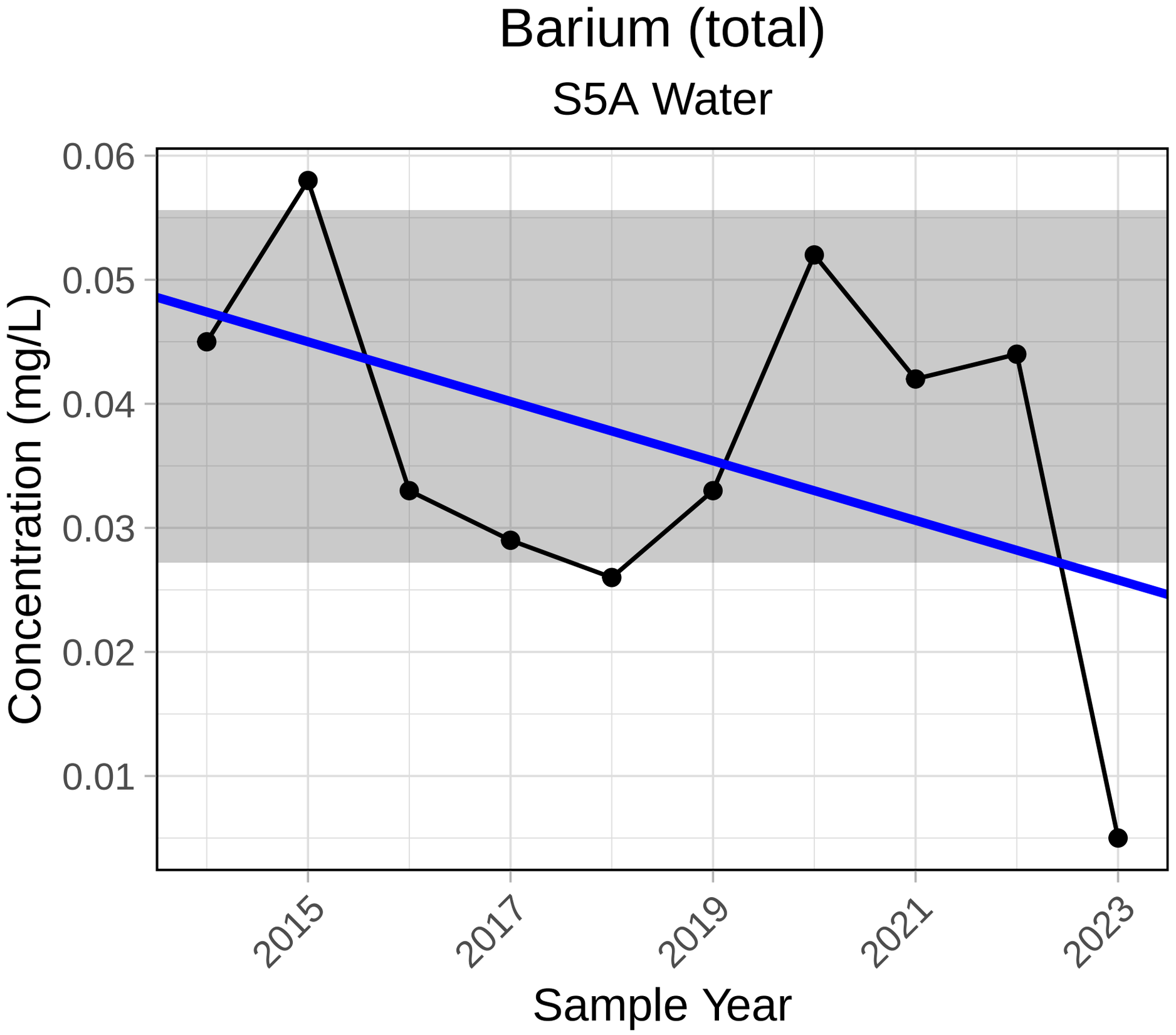

Total Kjeldahl Nitrogen
Edith Water
Concentration (mg/L)
0.6
0.5
0.4
2015
2017
2019
2021
Sample Year
Trend significance p−value = 0.295

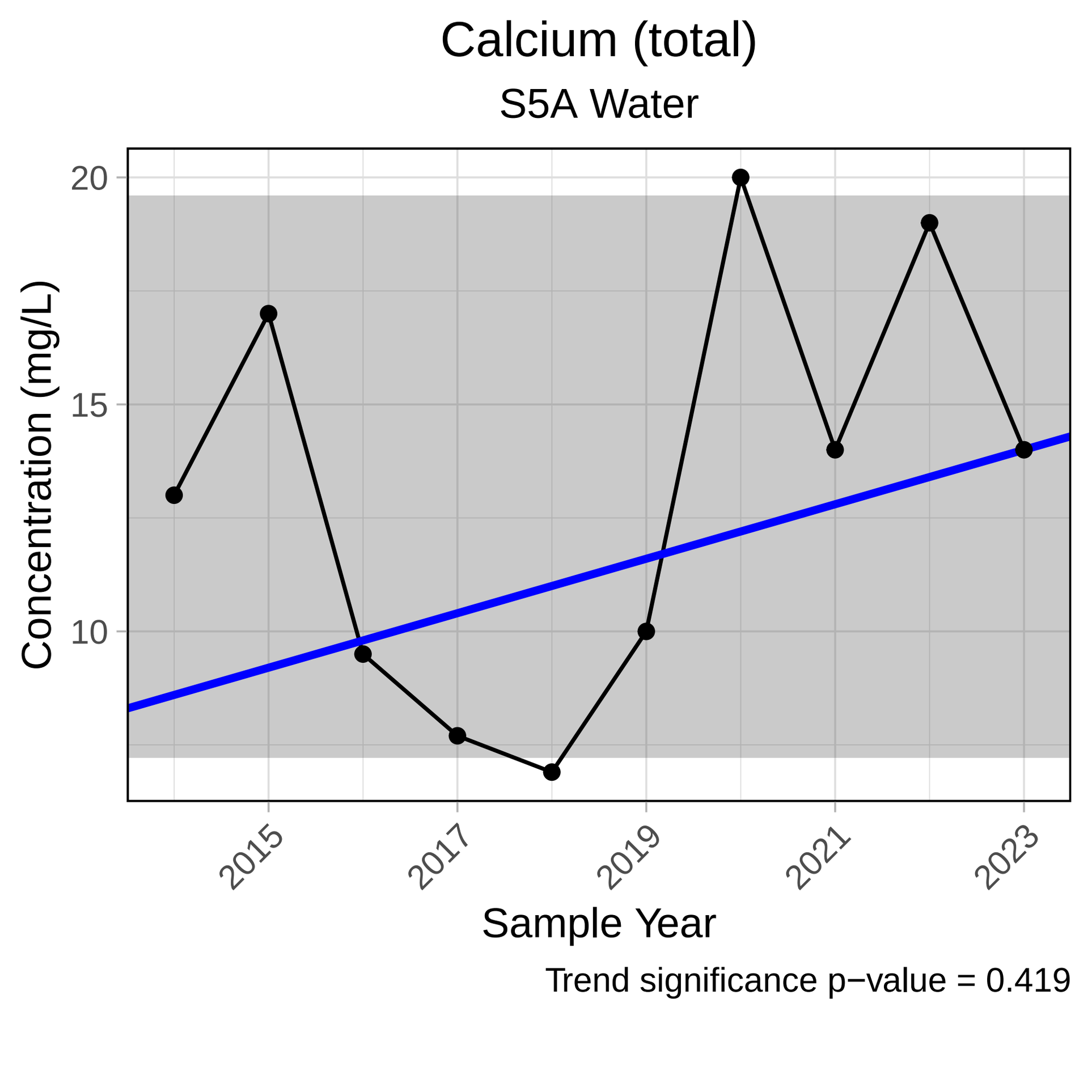

Total Organic Carbon
Edith Water
Concentration (mg/L)
14
13
12
11
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.079

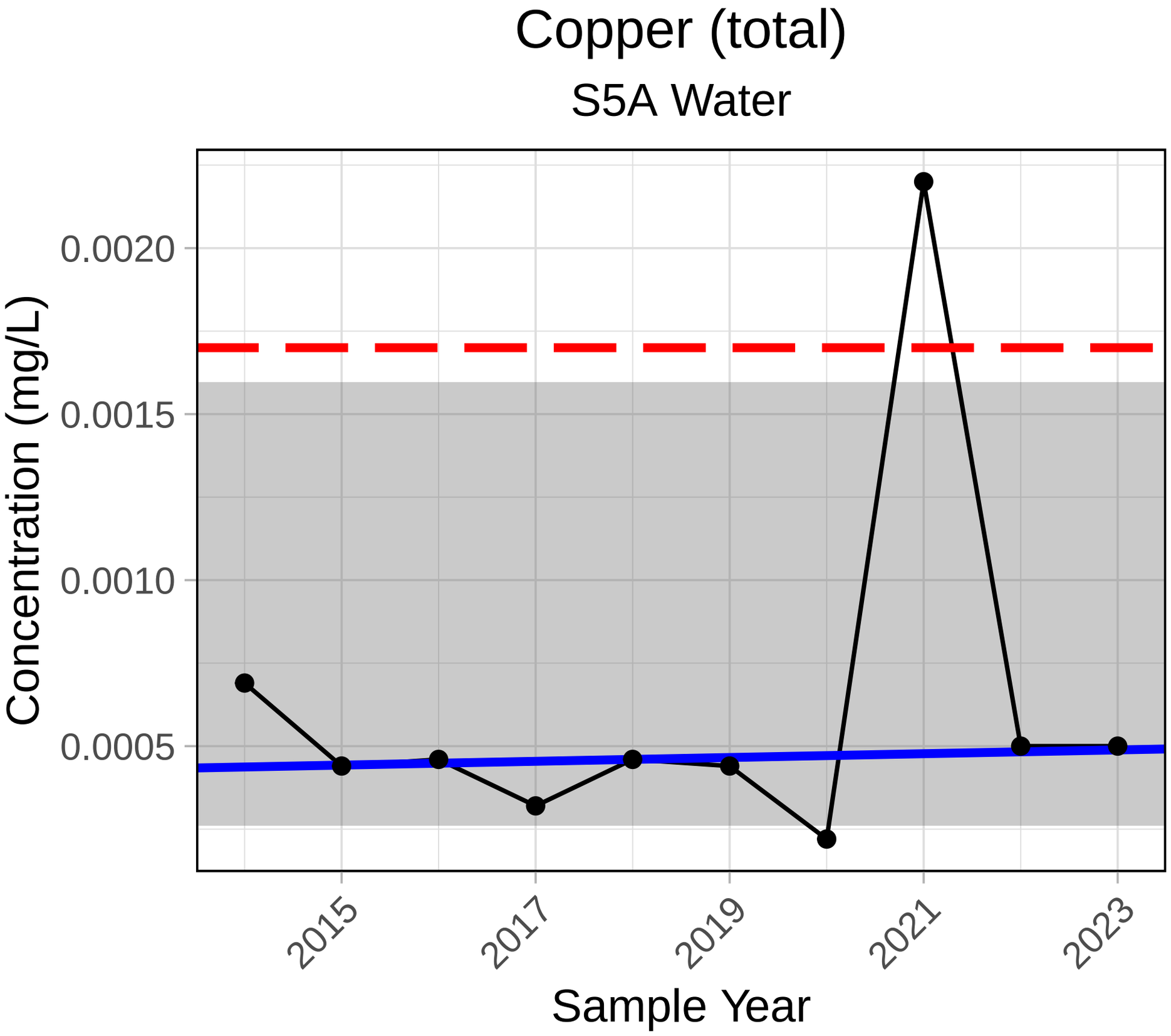

Total Suspended Solids
Edith Water
Concentration (mg/L)
3.0
2.5
2.0
1.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.471


Aluminum (total)
S5A Water
Concentration (mg/L)
0.15
0.10
0.05
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.419


Arsenic (total)
S5A Water
0.005
0.004
0.003
0.002
0.001
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1
Chronic level = 0.005 mg/L (maximum)

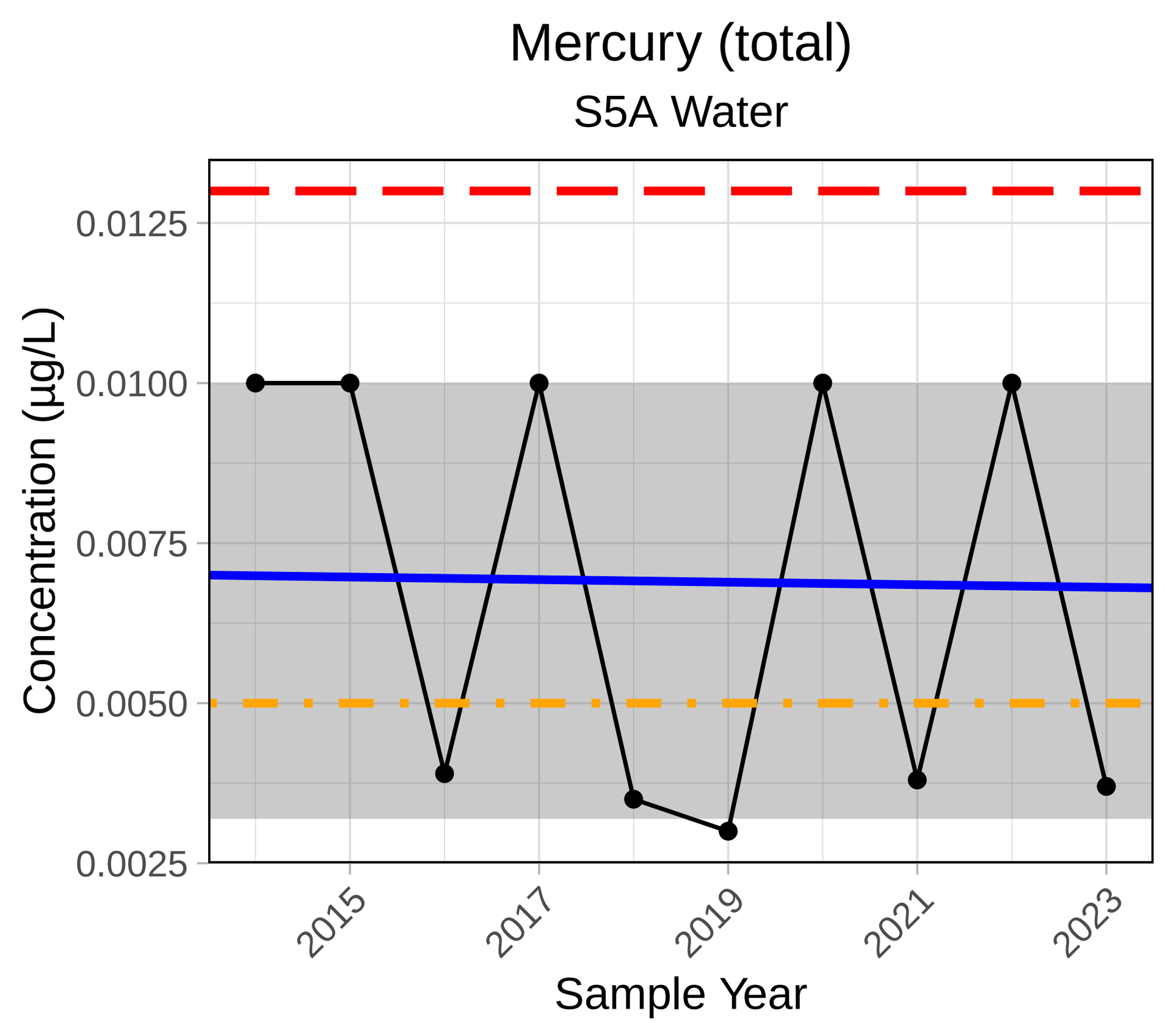

Barium (total)
S5A Water
0.06
0.05
0.04
0.03
0.02
0.01
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.419


Calcium (total)
S5A Water
20
15
10
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.419

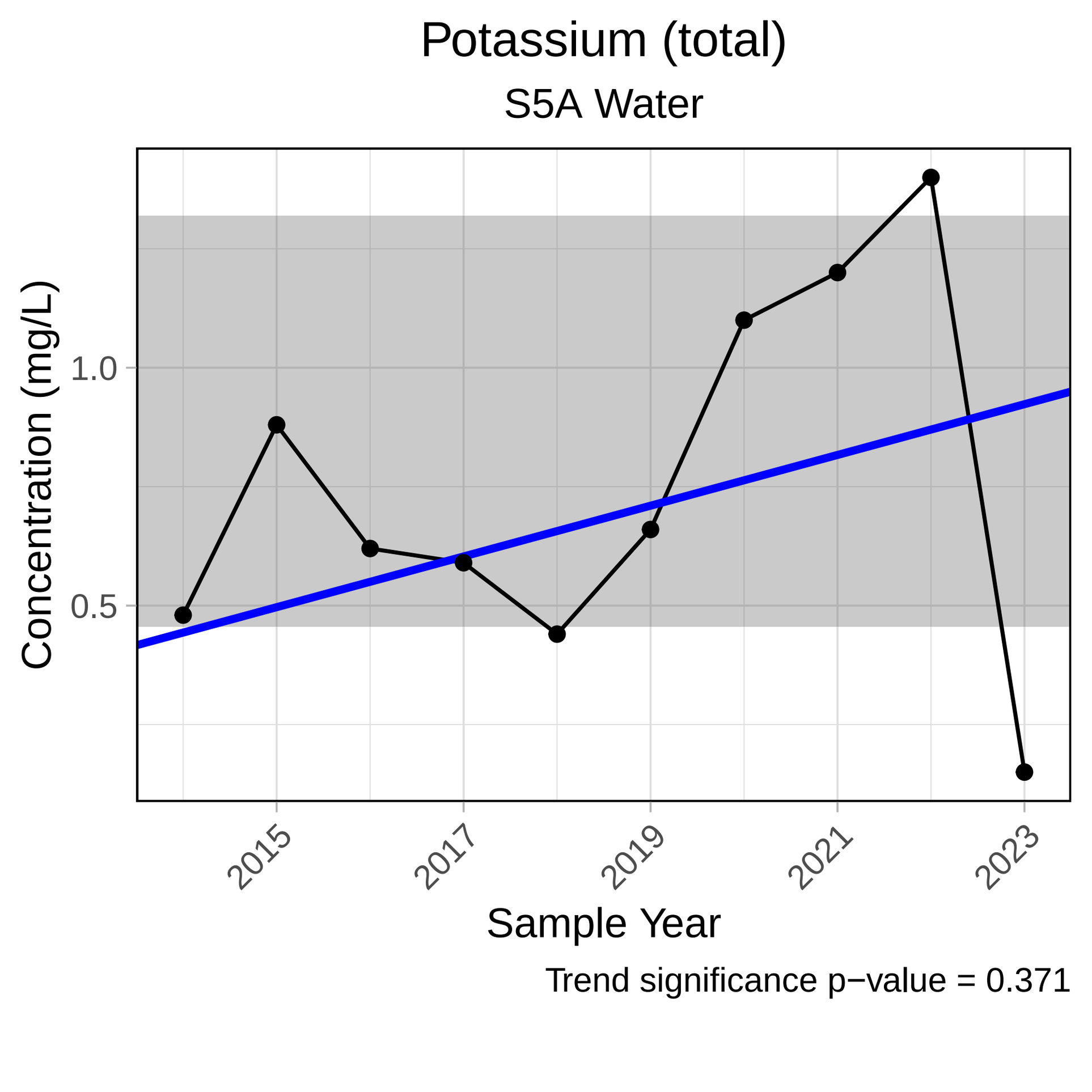


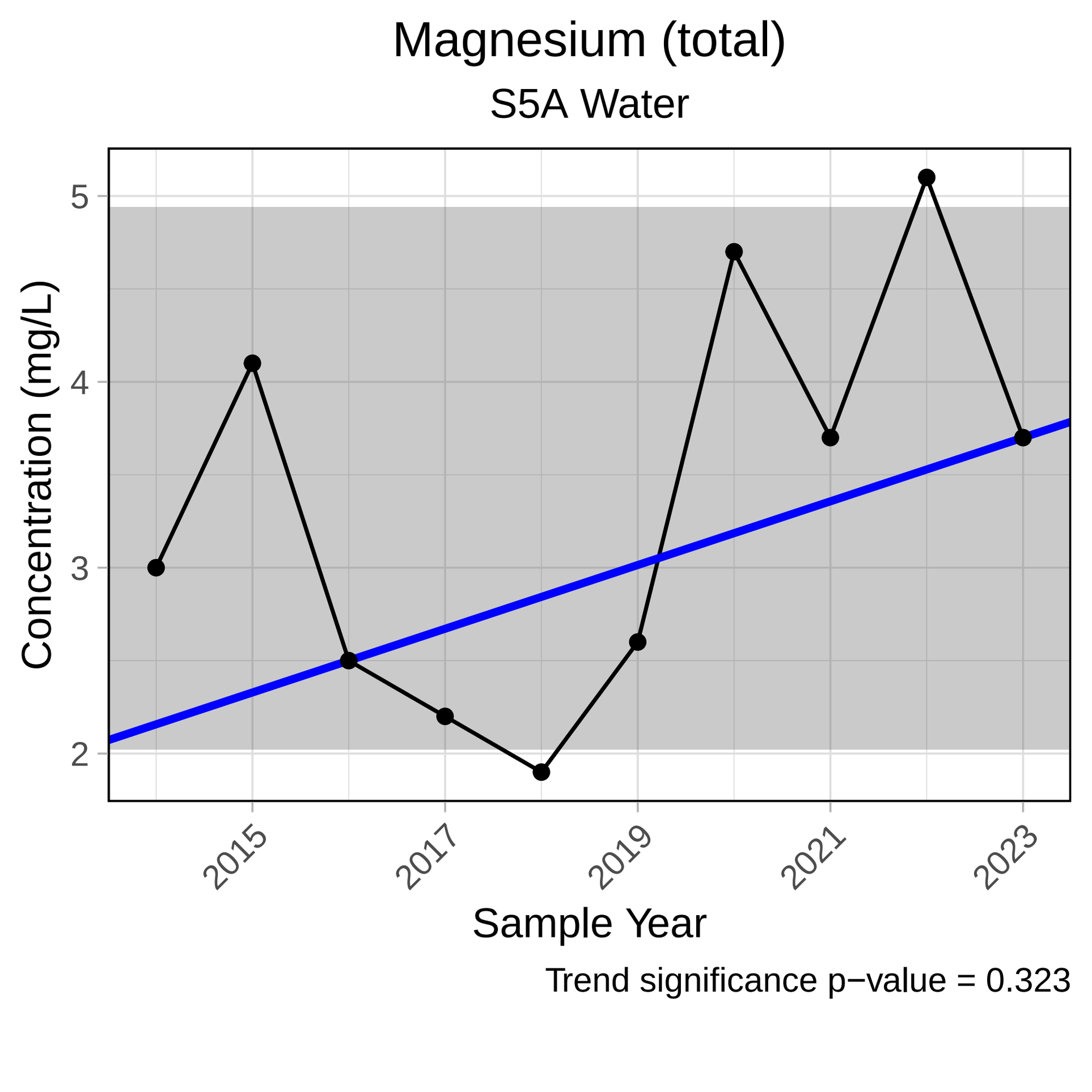
Trend significance p−value = 0.786
Chronic level = 0.007 mg/L
Acute level = 0.0017 mg/L

Iron (total)
S5A Water
Concentration (mg/L)
5
4
3
2
1
0
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.721

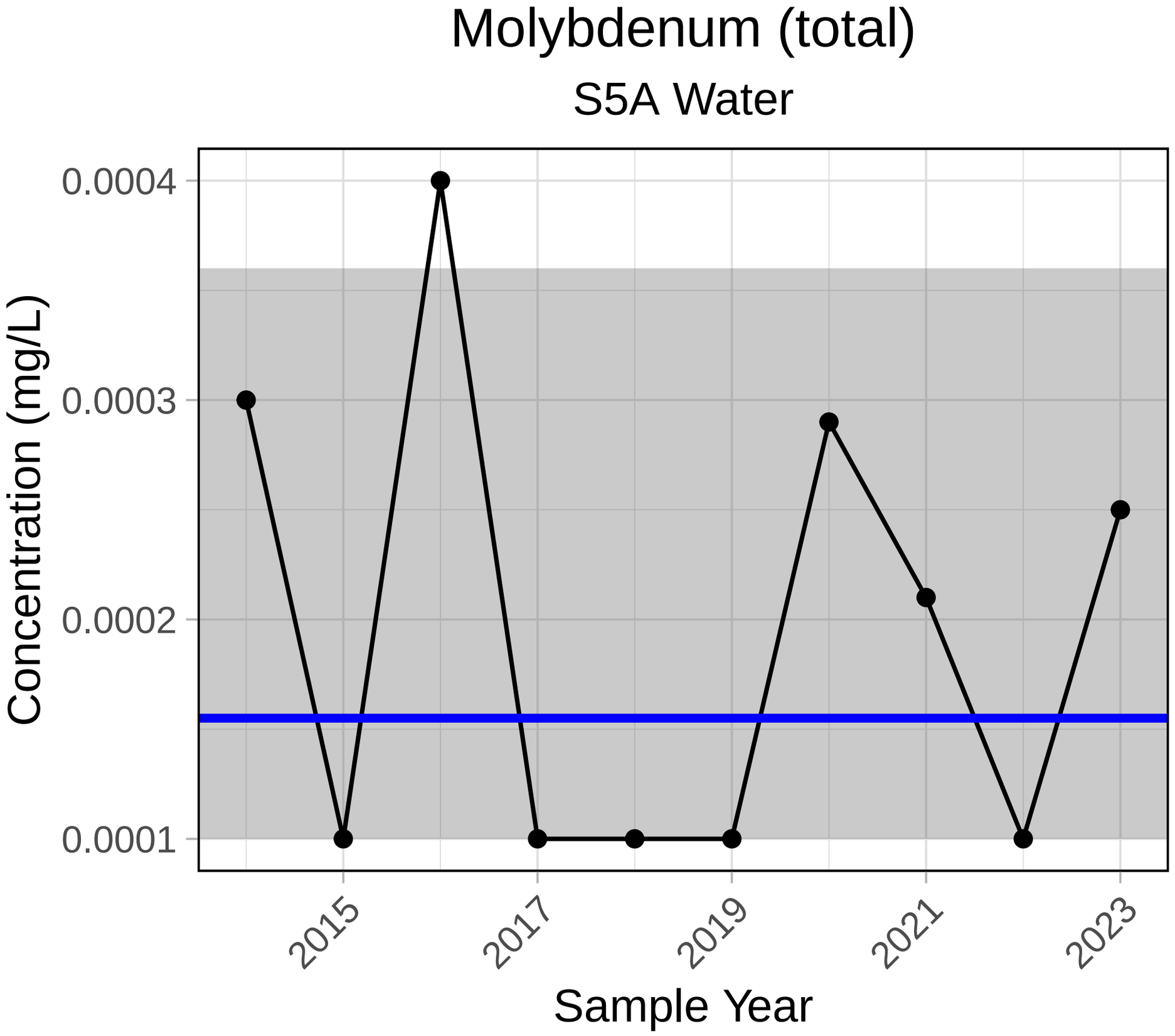


Trend significance p−value = 0.337
Chronic level = 0.005 µg/L (maximum)
Acute level = 0.013 µg/L (maximum)

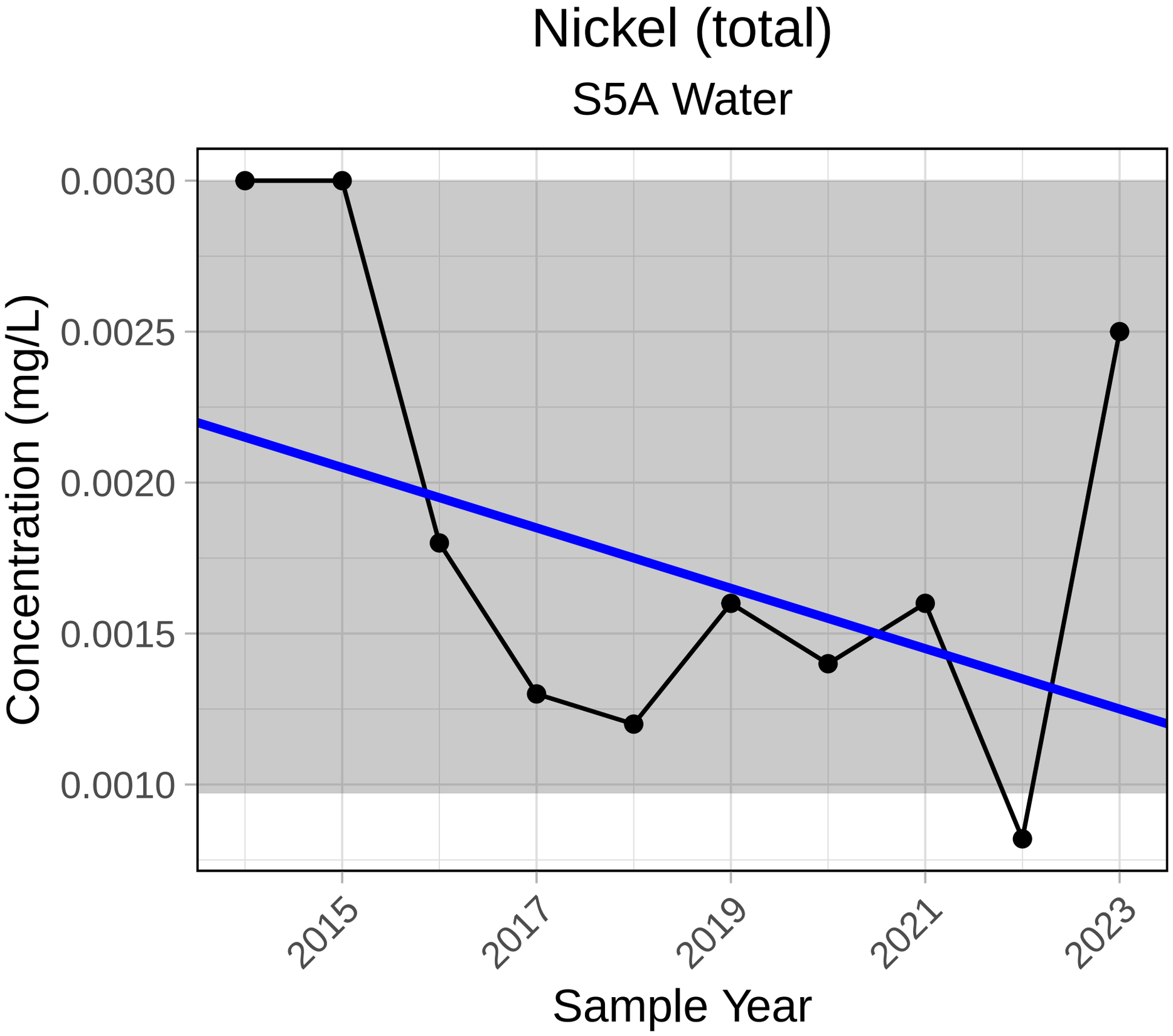

Potassium (total)
S5A Water
Concentration (mg/L)
1.0
0.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.371

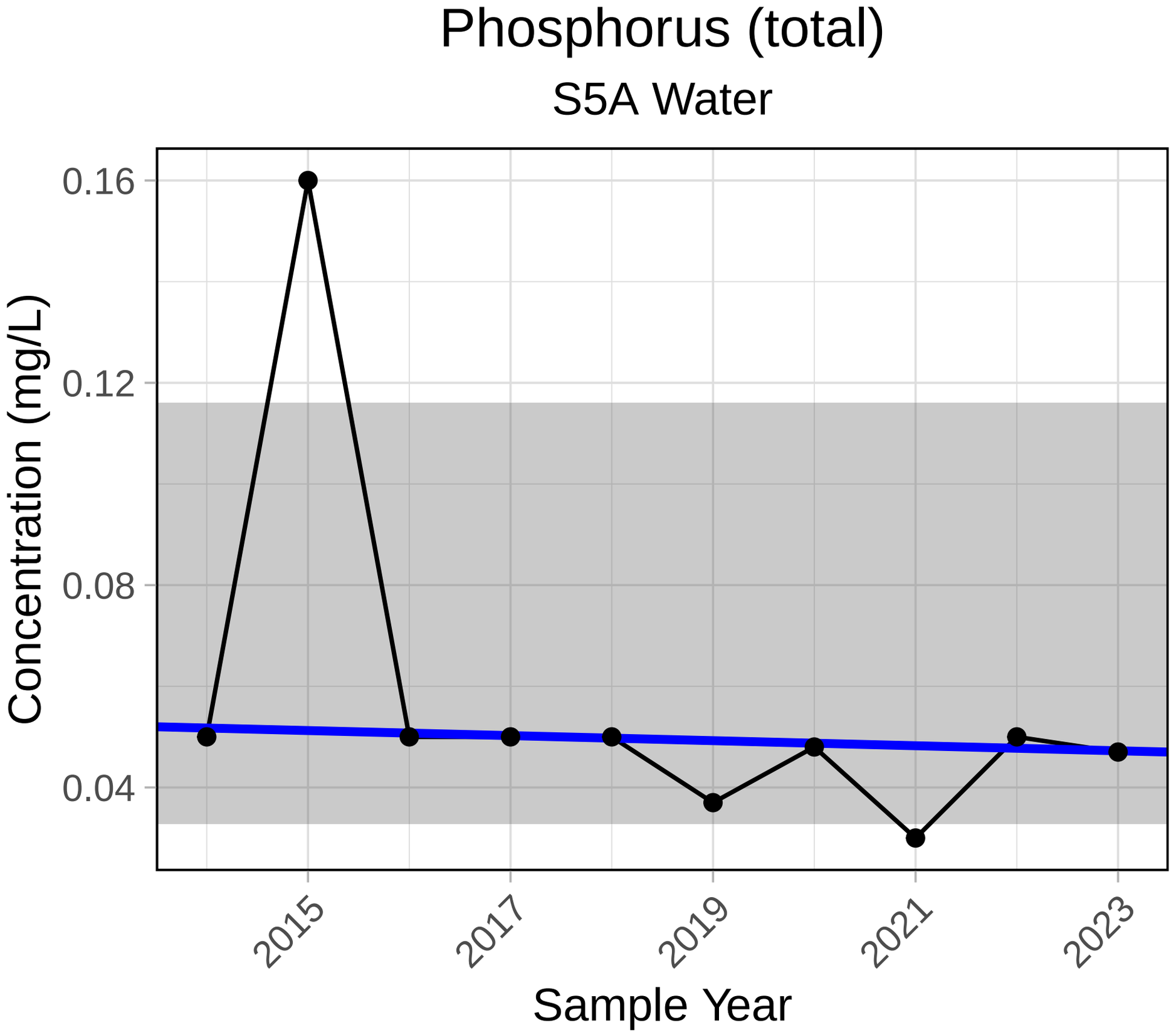

Magnesium (total)
S5A Water
Concentration (mg/L)
5
4
3
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323

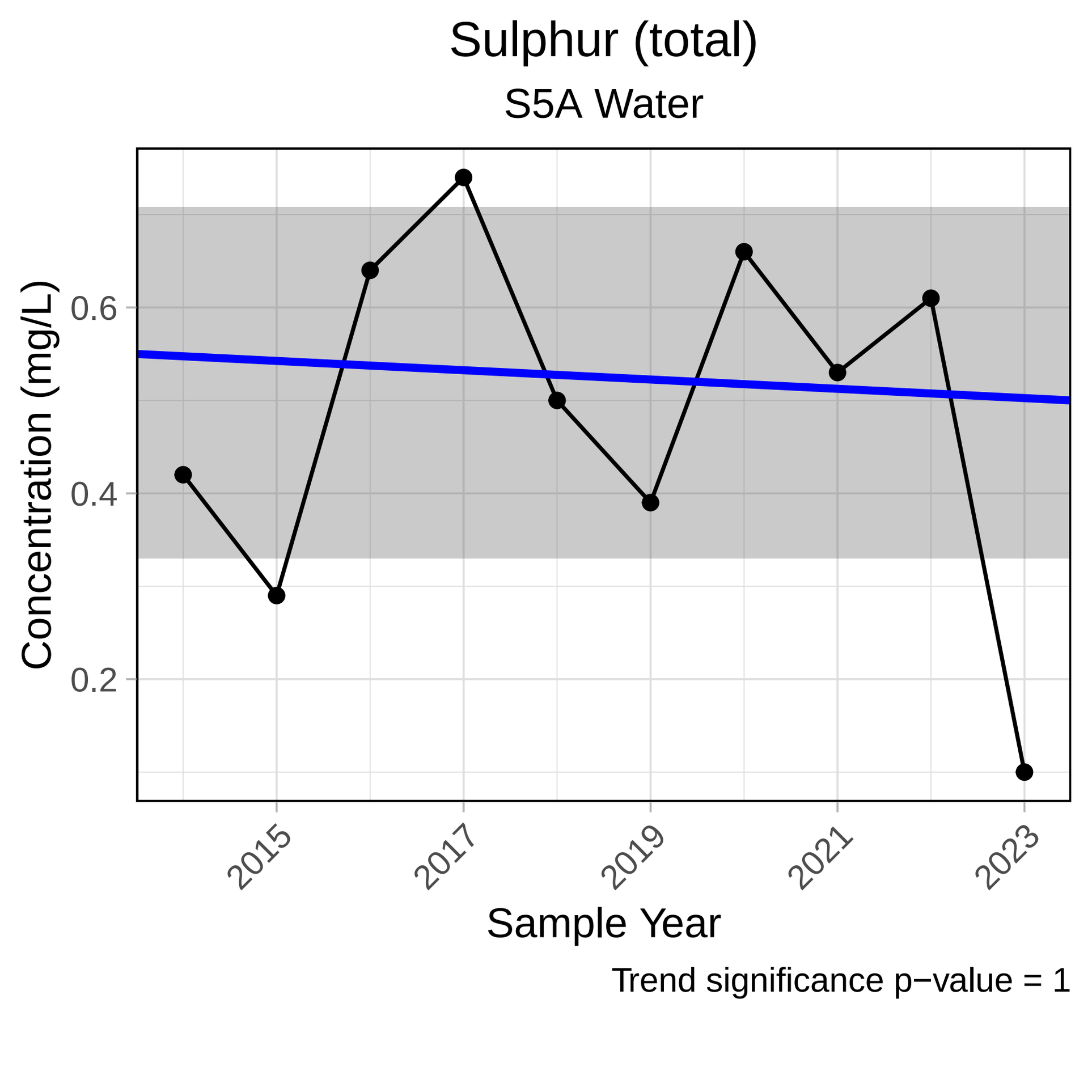
Manganese (total)
S5A Water
Concentration (mg/L)
0.6
0.4
0.2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.858

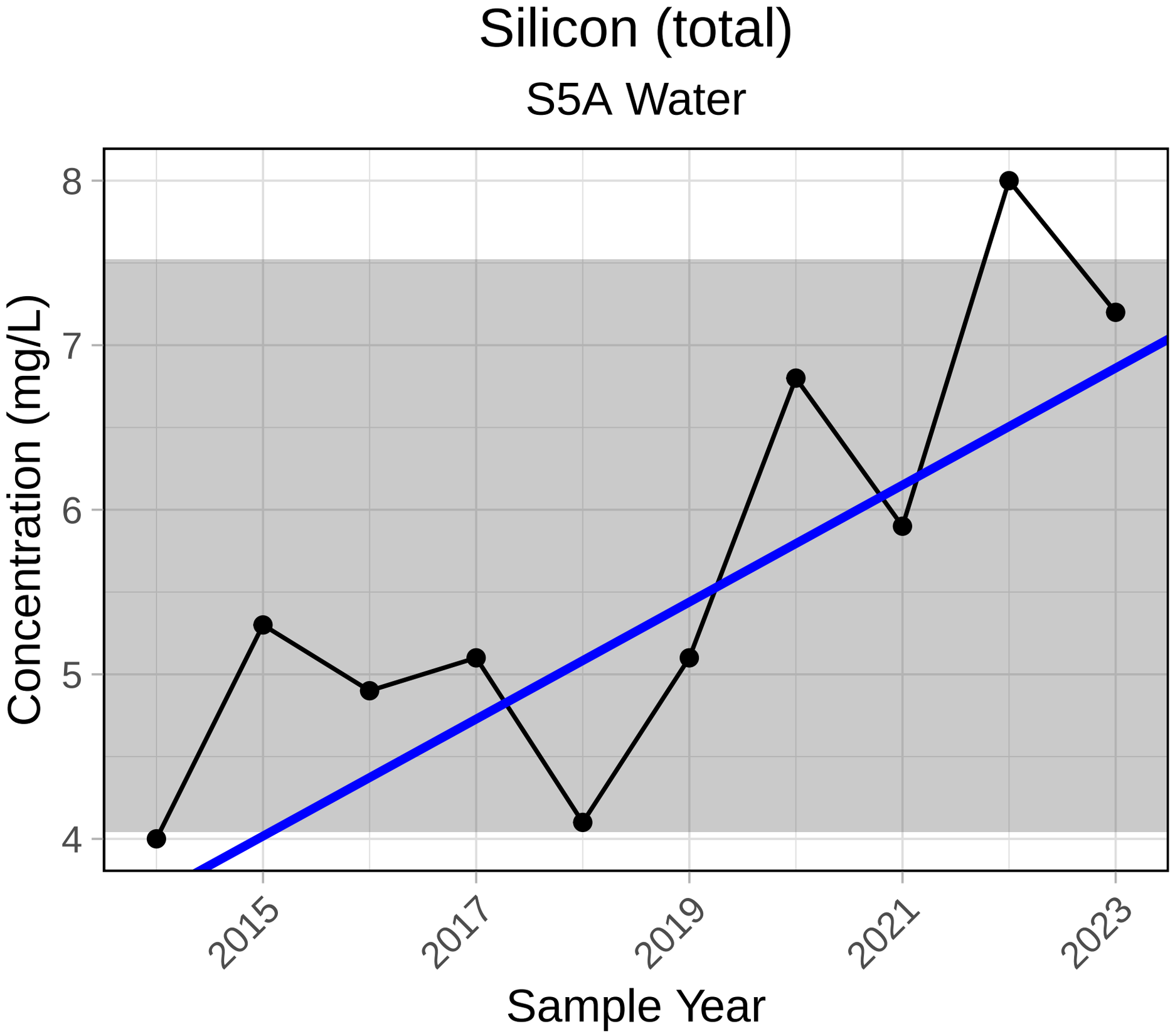

Molybdenum (total)
S5A Water
0.0004
0.0003
0.0002
0.0001
Concentration (mg/L)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.848
Chronic level = 0.073 mg/L (maximum)

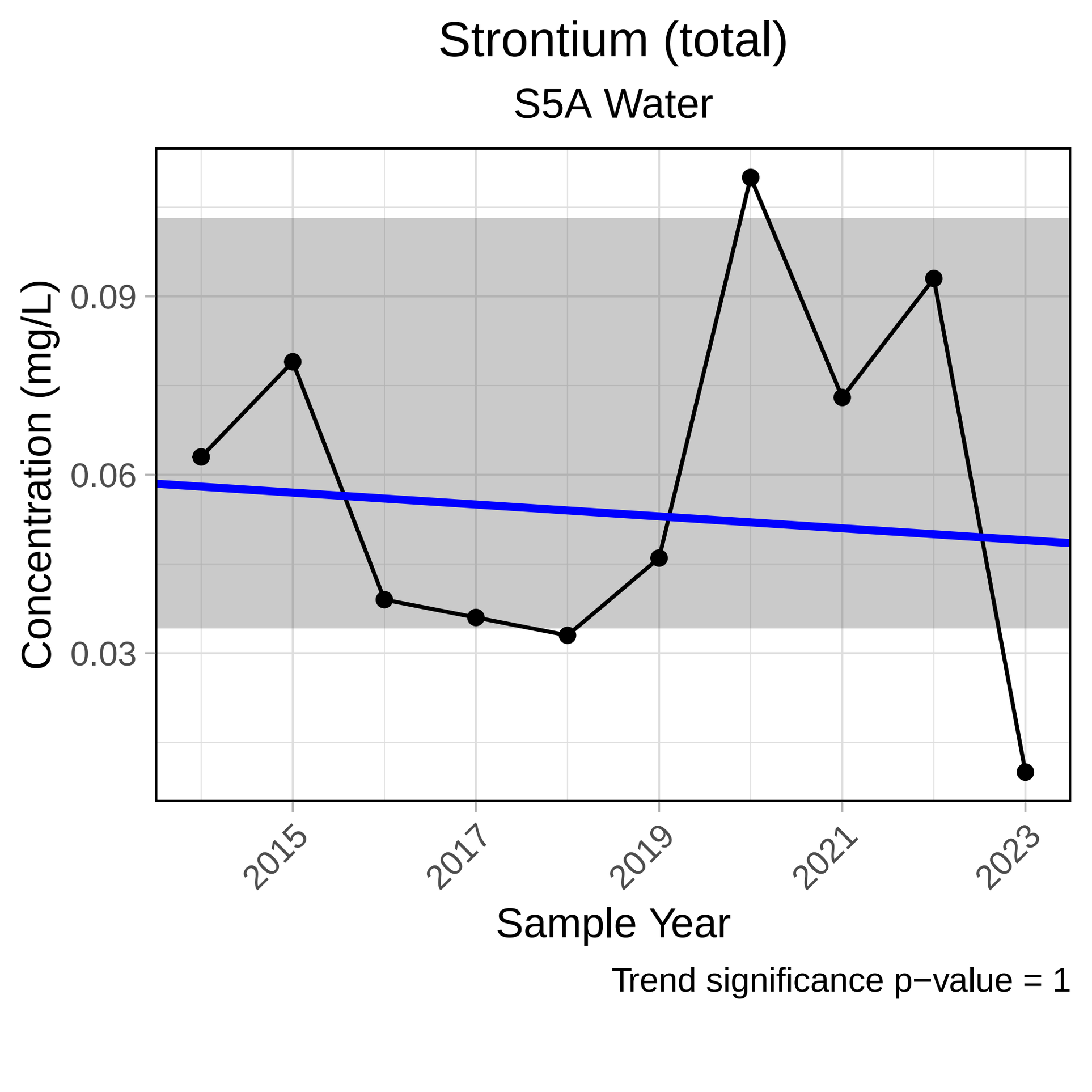
Sodium (total)
S5A Water
Concentration (mg/L)
7
6
5
4
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.127

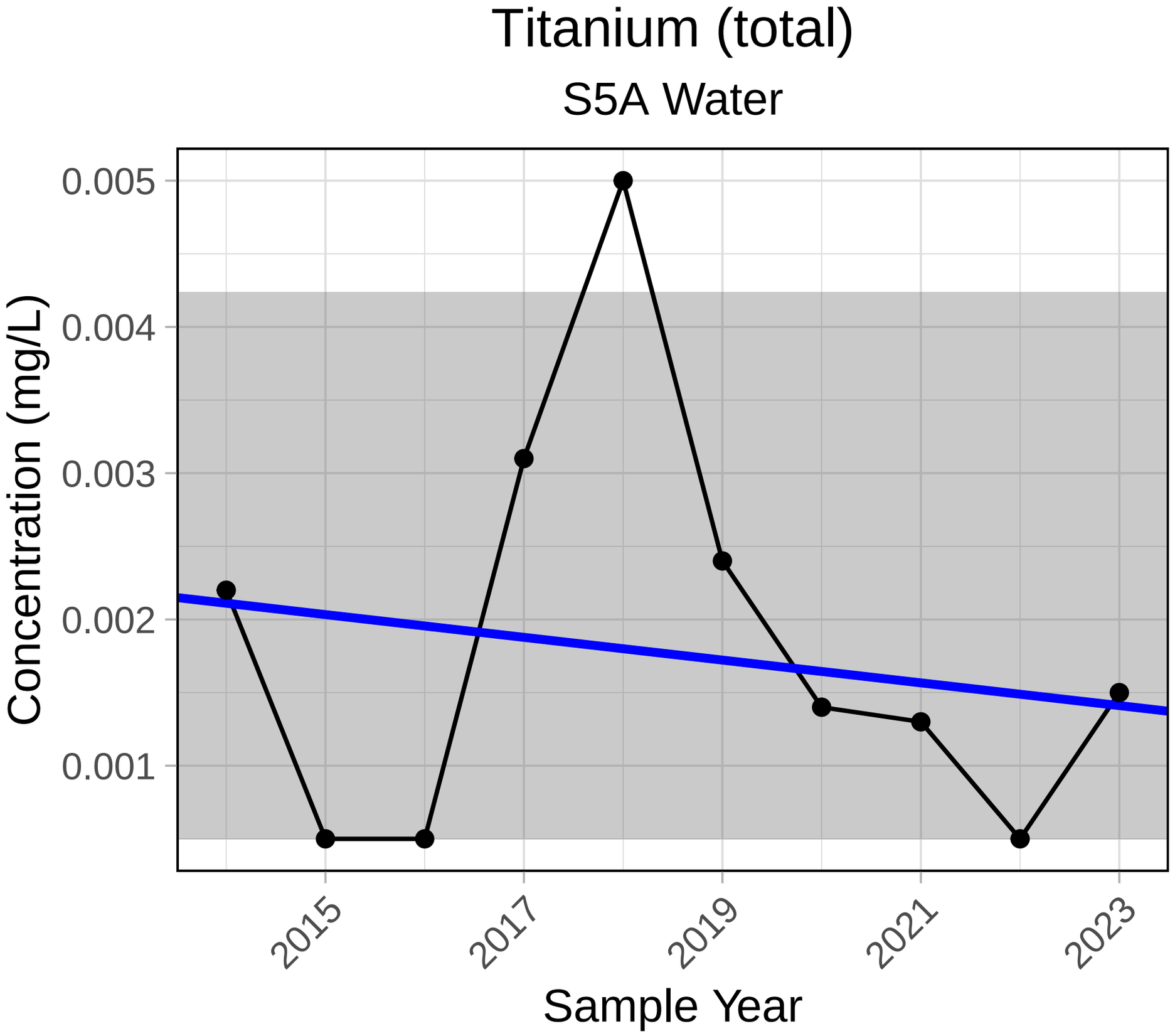

Nickel (total)
S5A Water
Concentration (mg/L)
0.0030
0.0025
0.0020
0.0015
0.0010
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.207


Phosphorus (total)
S5A Water
Concentration (mg/L)
0.16
0.12
0.08
0.04
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.055


Sulphur (total)
S5A Water
Concentration (mg/L)
0.6
0.4
0.2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

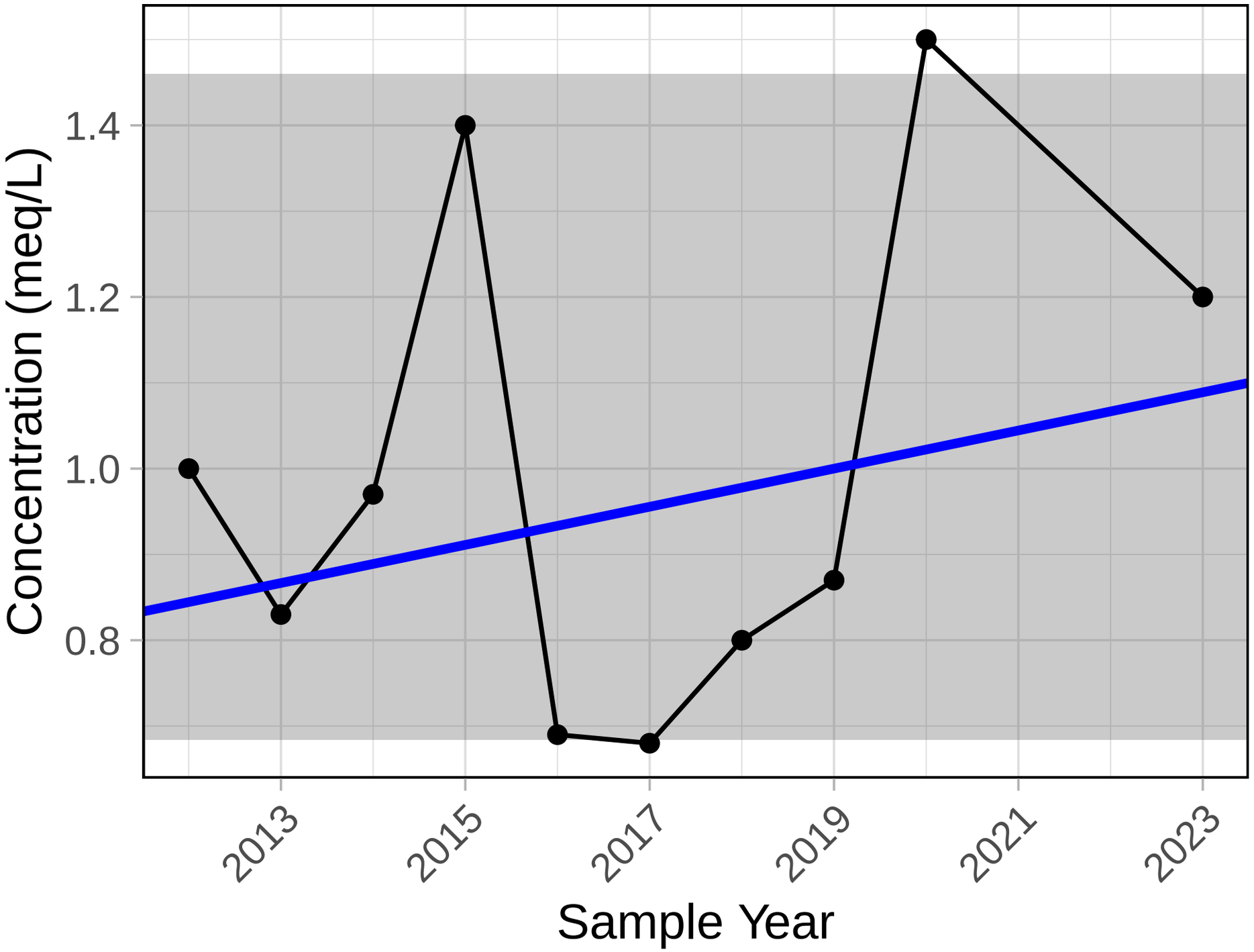

Silicon (total)
S5A Water
Concentration (mg/L)
8
7
6
5
4
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.015


Strontium (total)
S5A Water
Concentration (mg/L)
0.09
0.06
0.03
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1

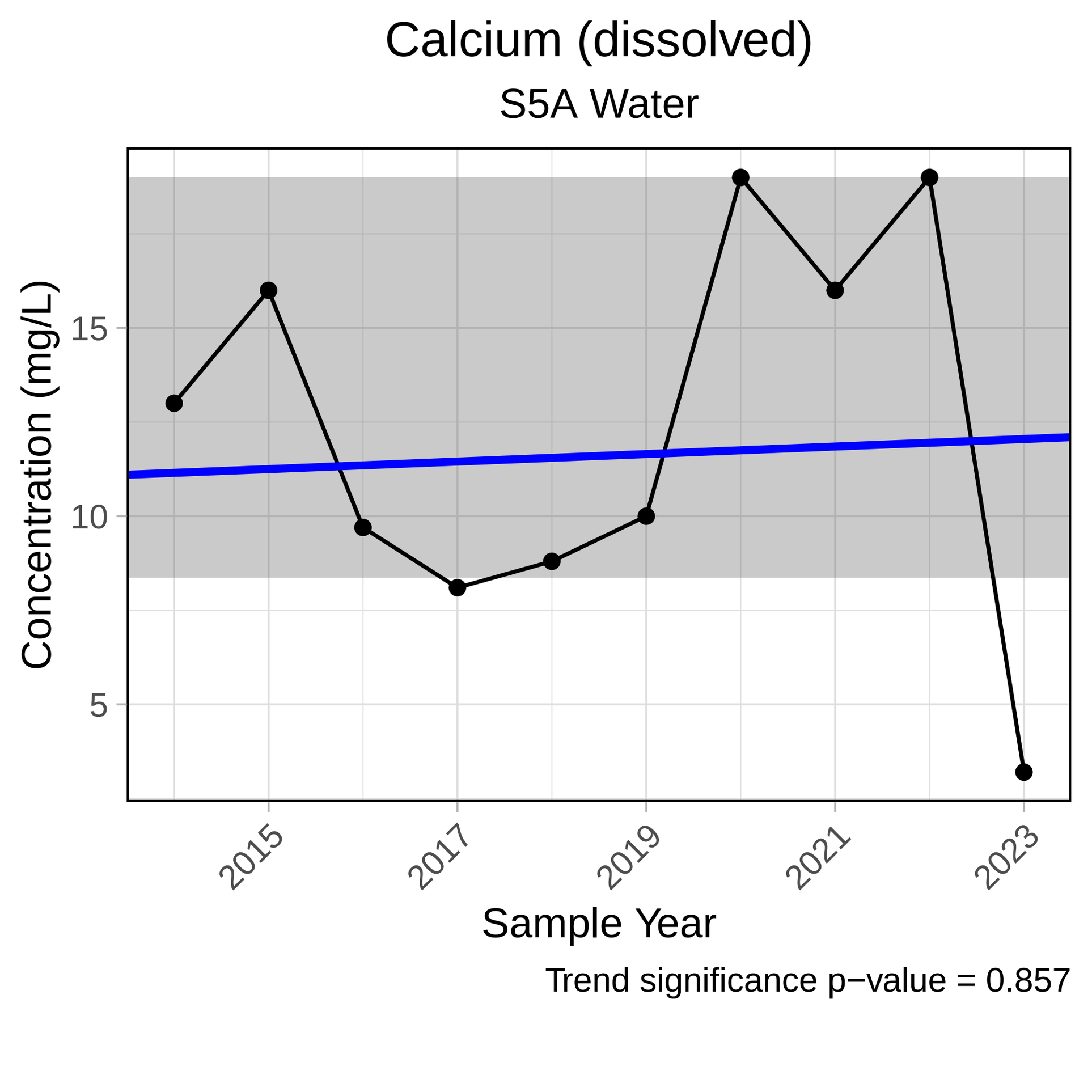

Titanium (total)
S5A Water
Concentration (mg/L)
0.005
0.004
0.003
0.002
0.001
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.785

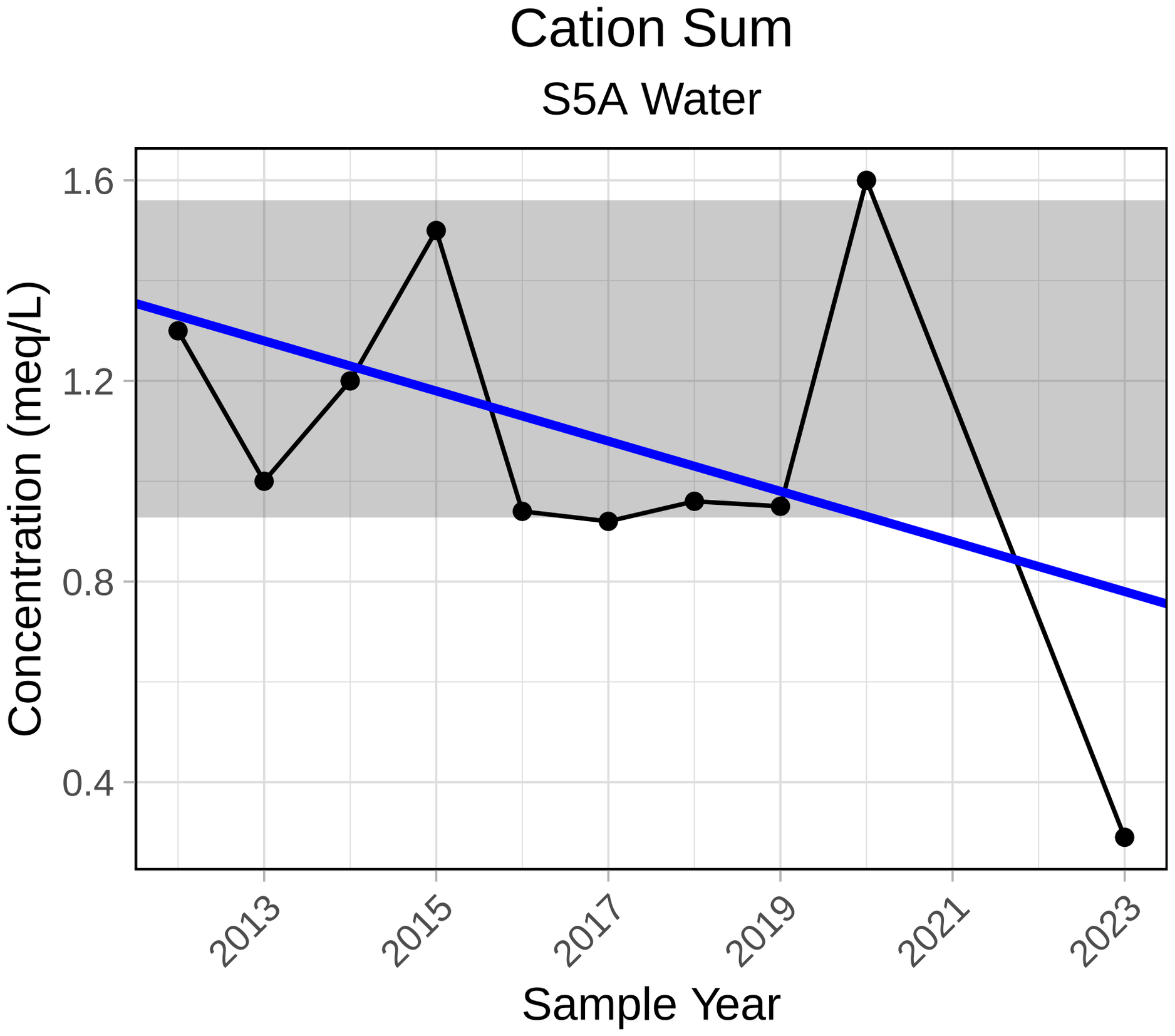
Anion Sum

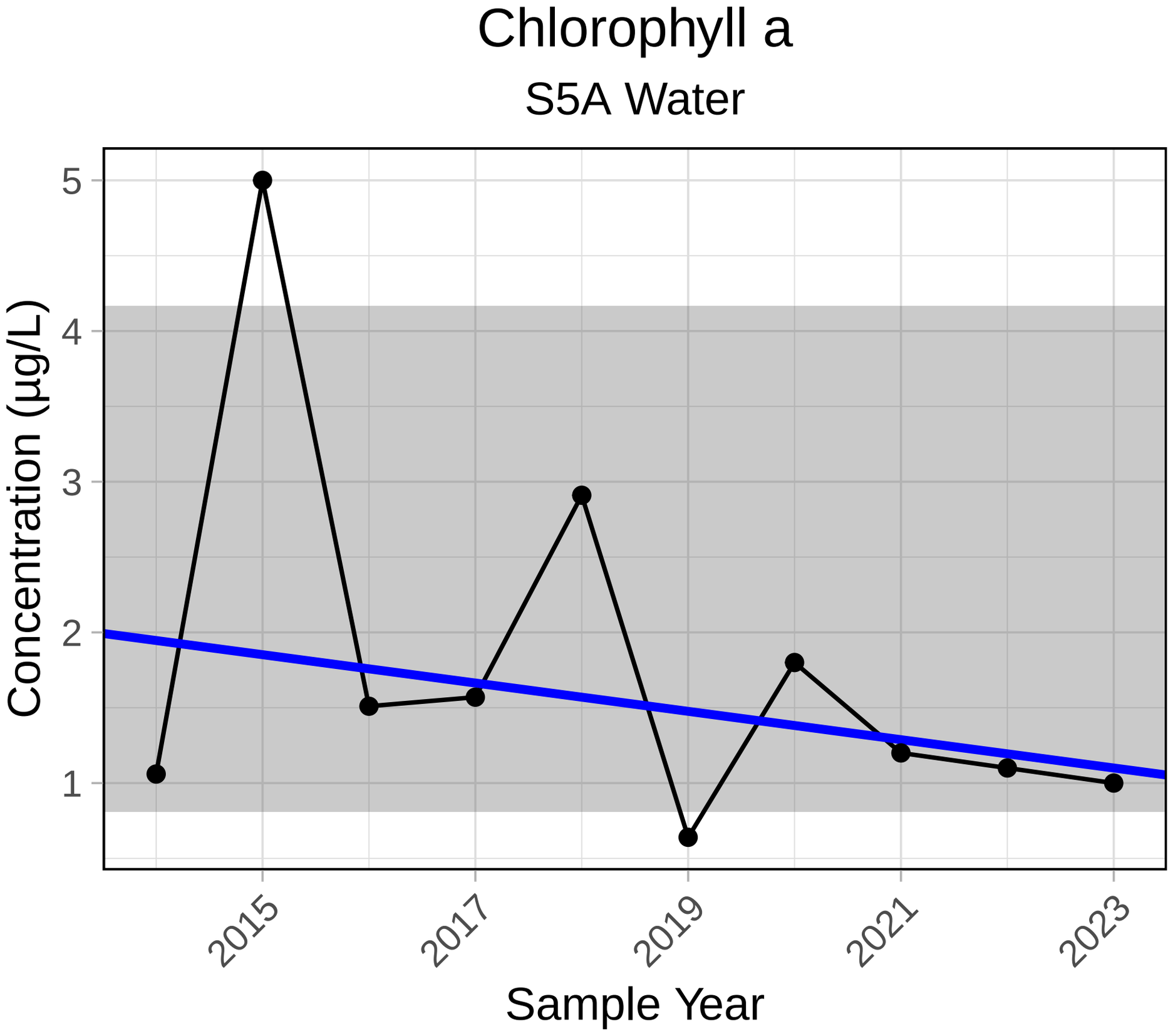
S5A Water

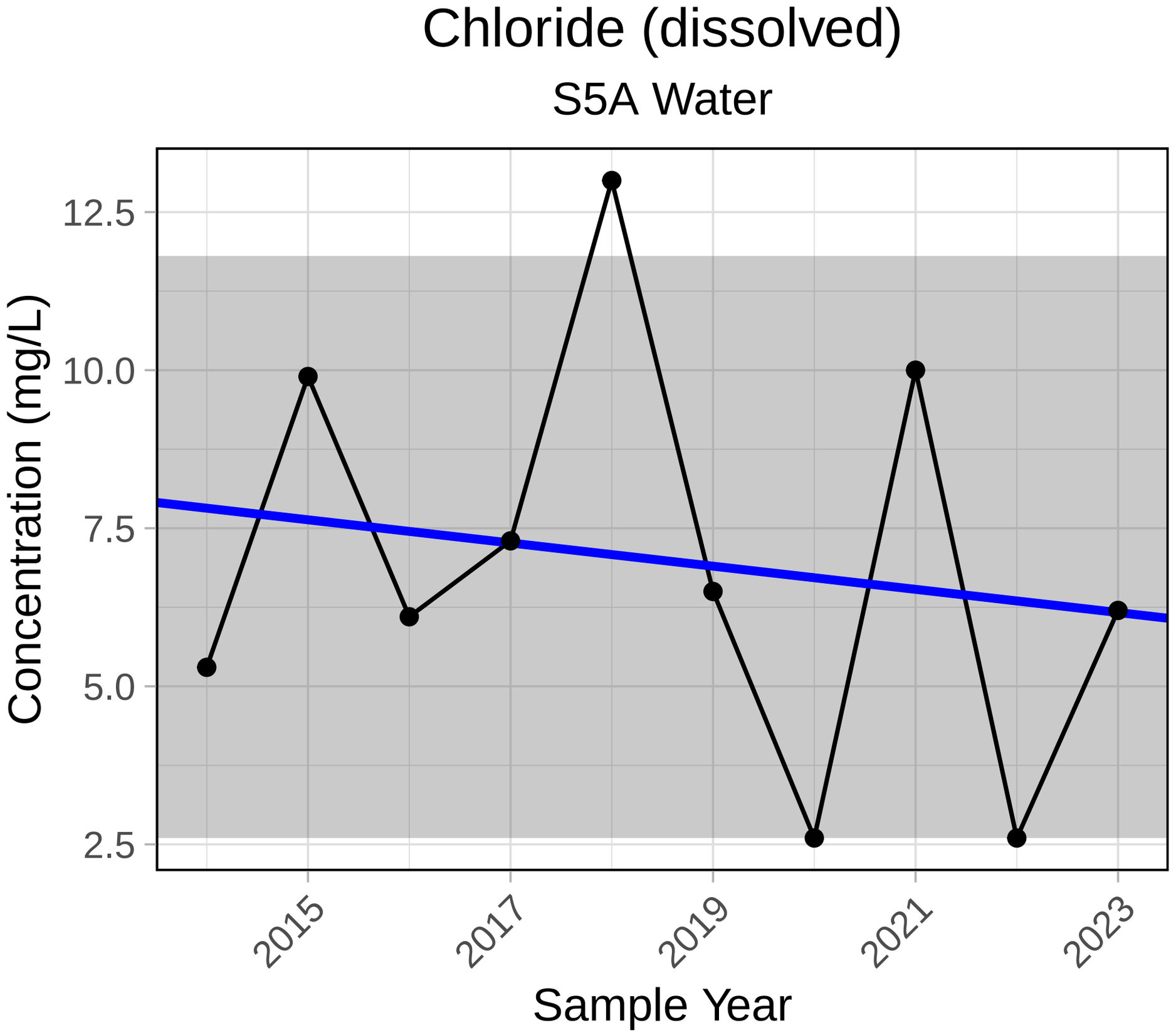


Trend significance p−value = 0.721


Calcium (dissolved)
S5A Water
Concentration (mg/L)
15
10
5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.857


Cation Sum
S5A Water
Concentration (meq/L)
1.6
1.2
0.8
0.4
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.283

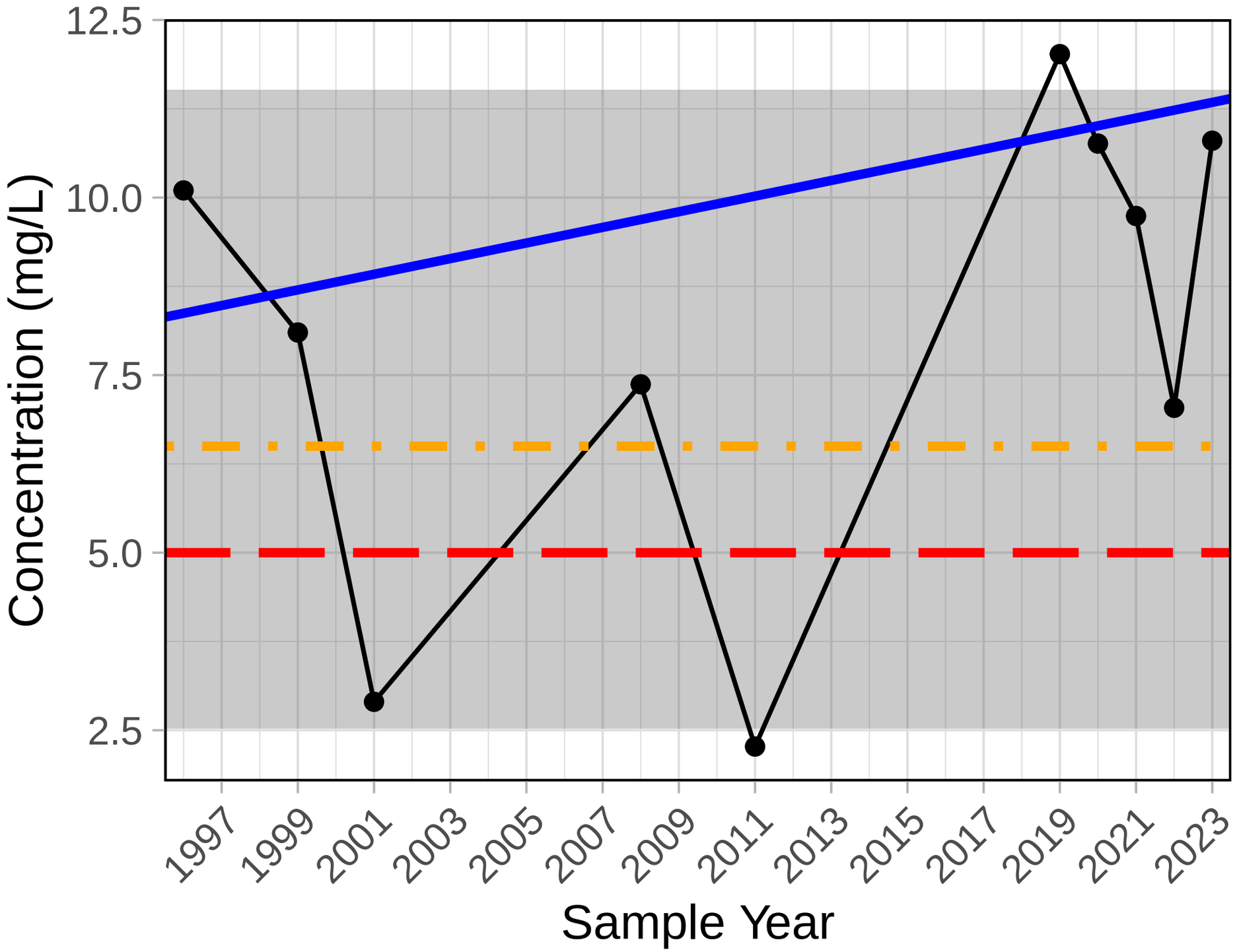

Chlorophyll a
S5A Water
Concentration (µg/L)
5
4
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.283



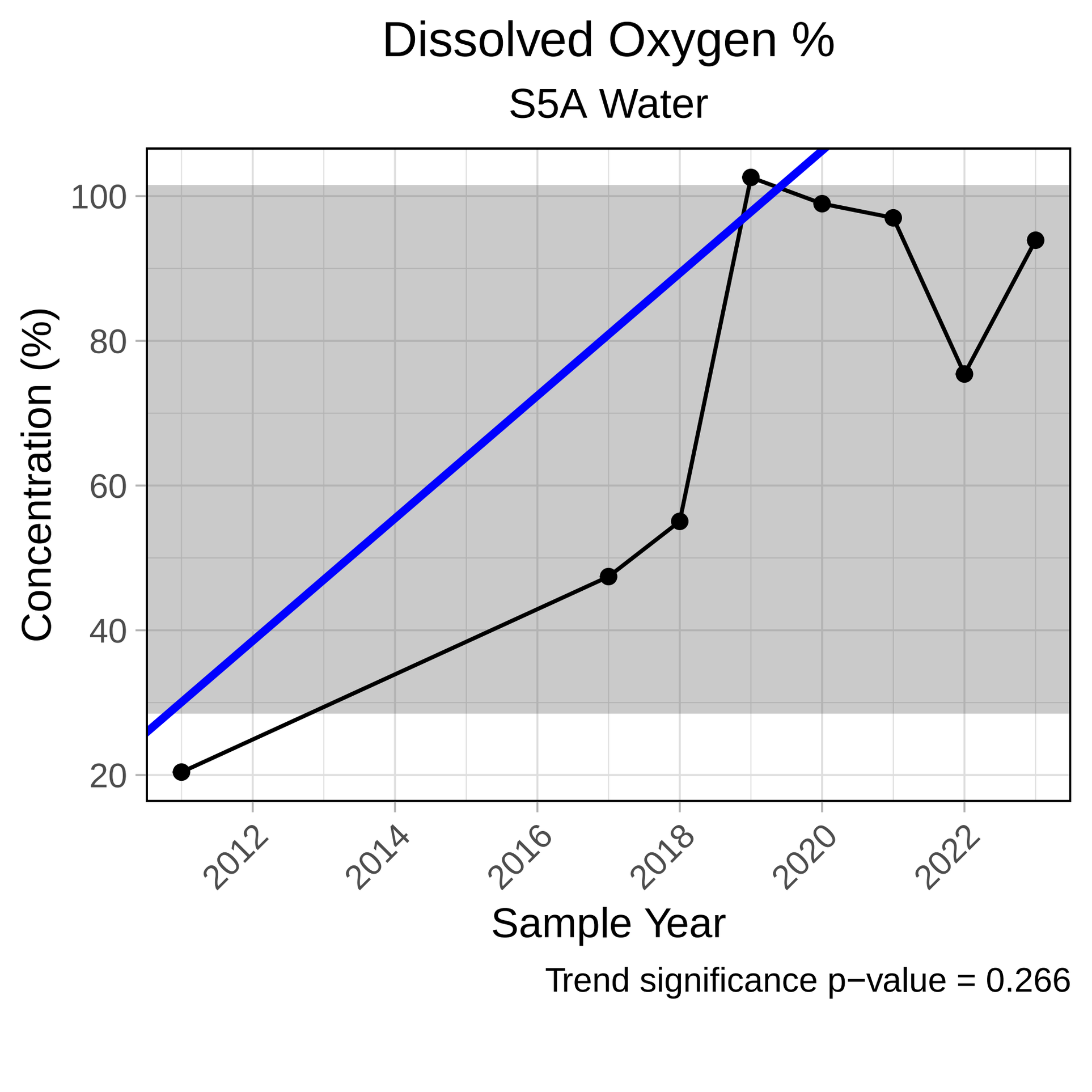
Trend significance p−value = 0.788
Chronic level = 120 mg/L (maximum)
Acute level = 640 mg/L (maximum)

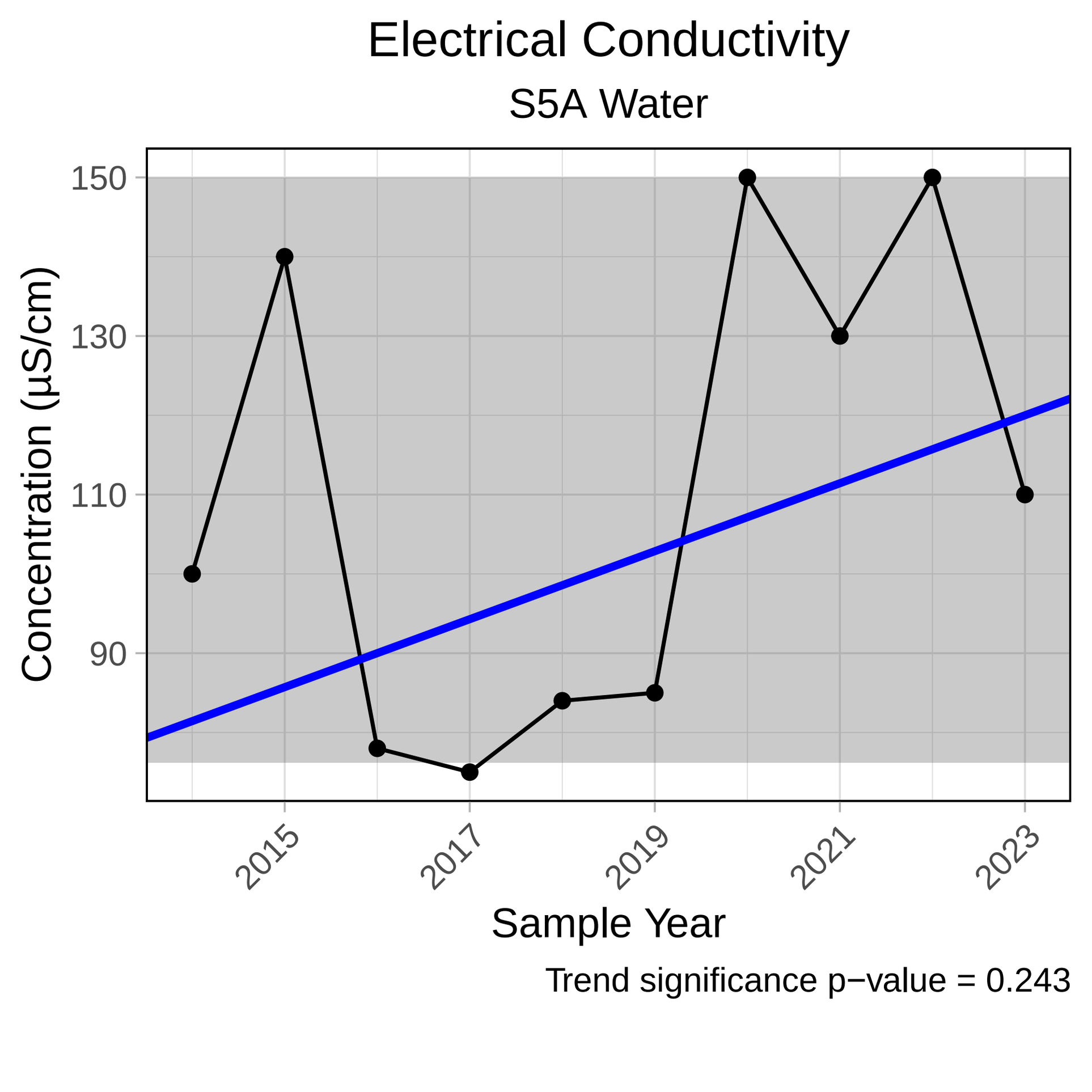
Dissolved Oxygen

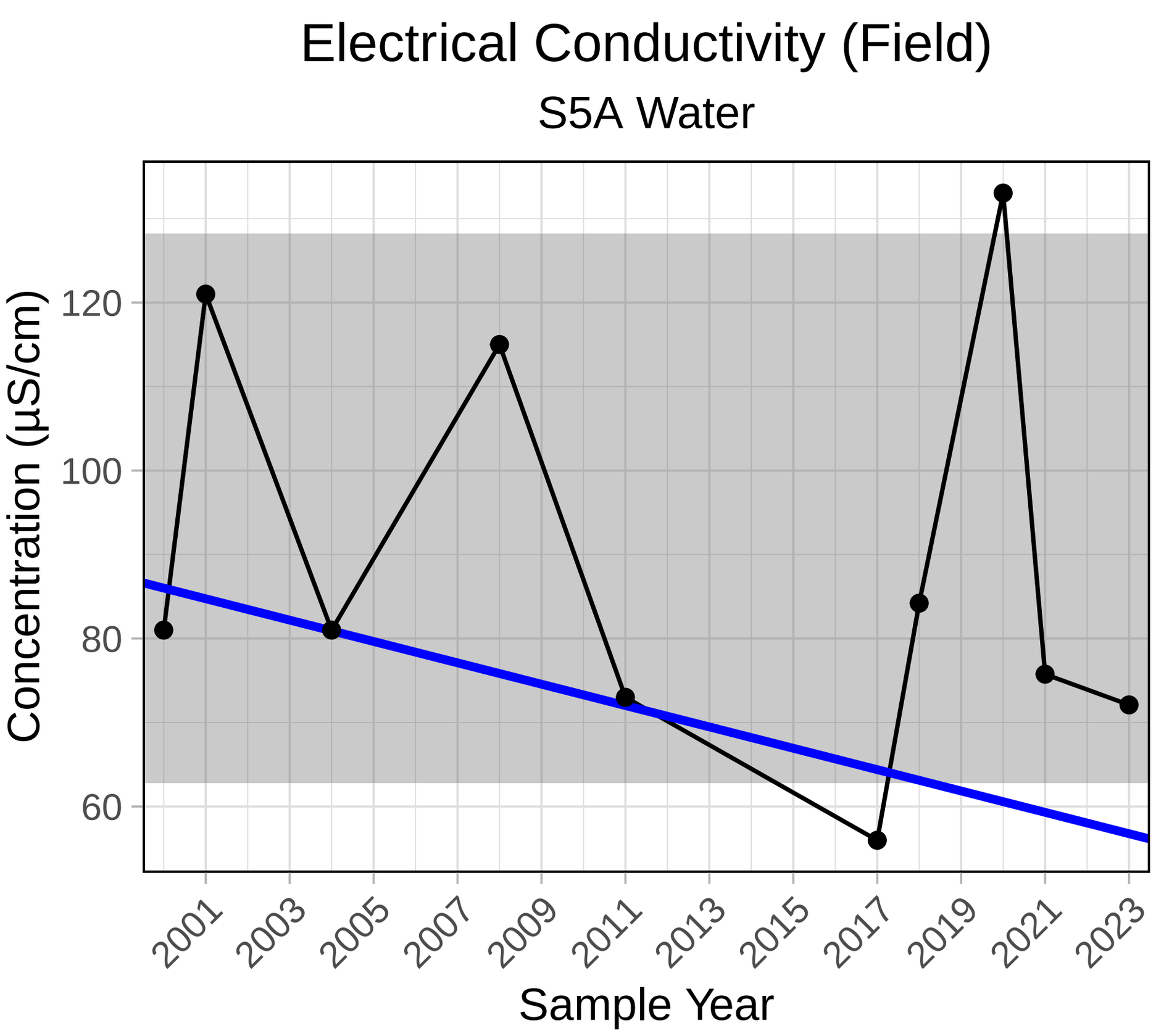
S5A Water

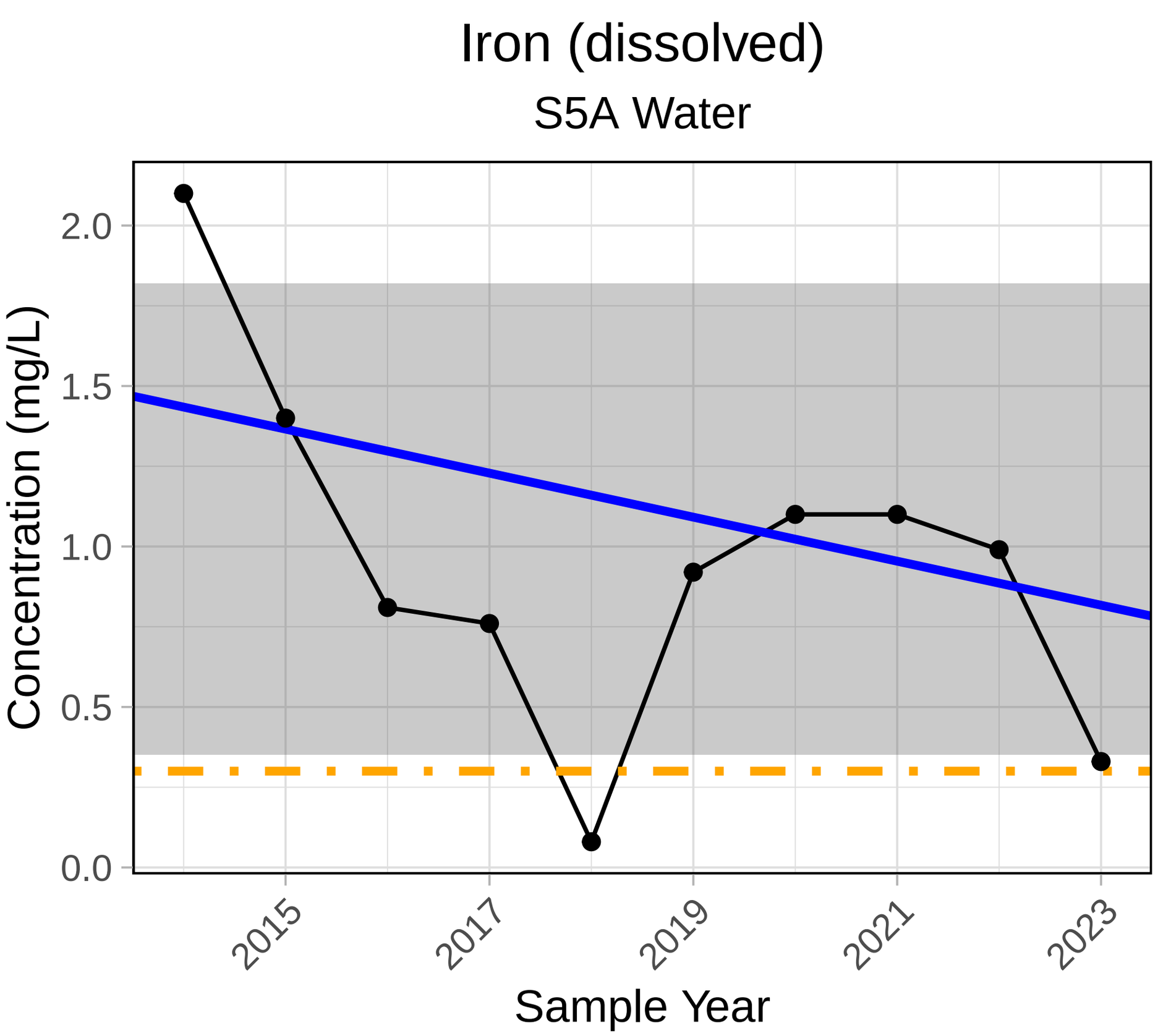


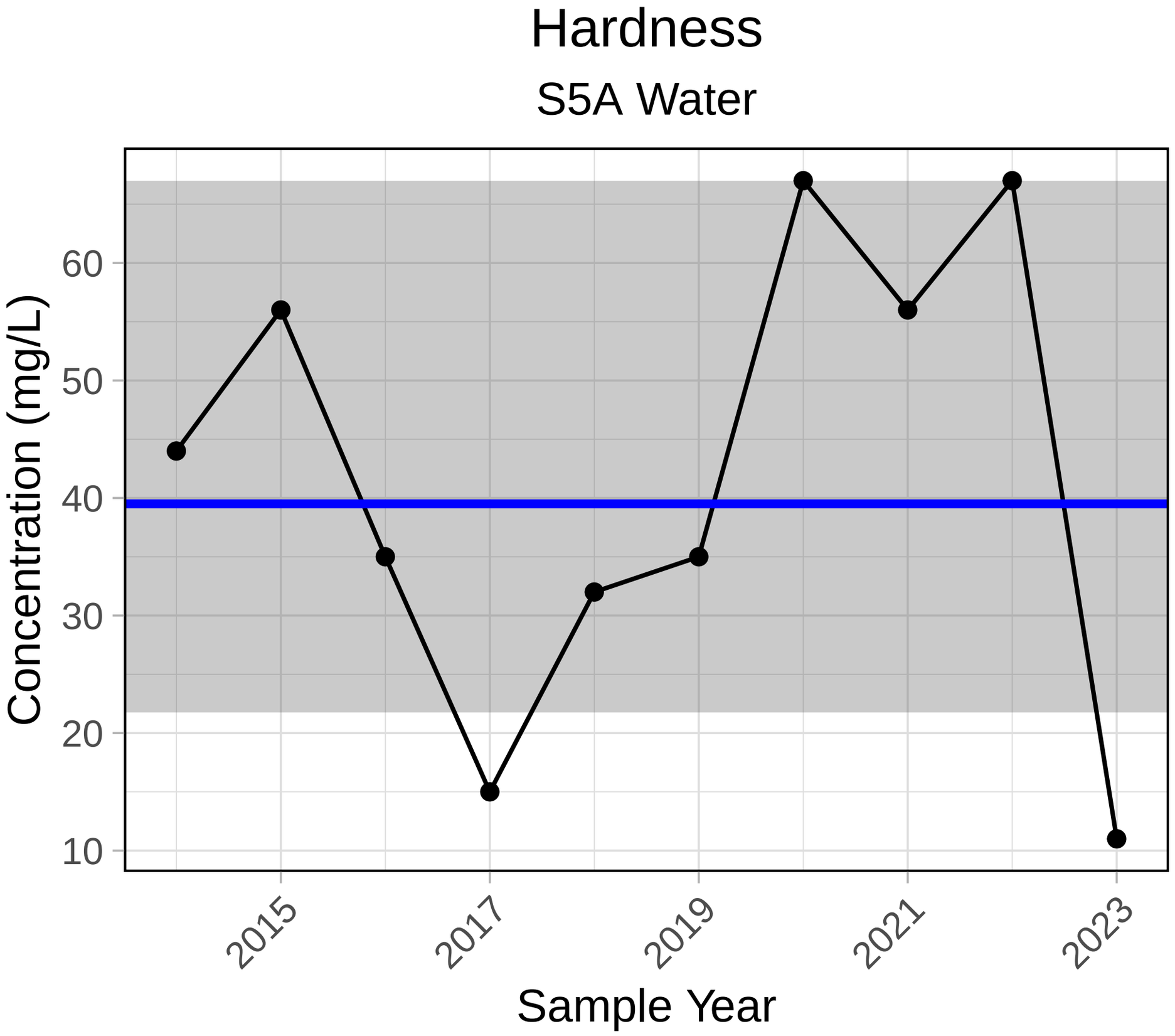
Trend significance p−value = 0.721
Chronic level = 6.5 mg/L (minimum)
Acute level = 5 mg/L (minimum)


Dissolved Oxygen %
S5A Water
Concentration (%)
100
80
60
40
20
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.266


Electrical Conductivity
S5A Water
150
130
110
90
Concentration (µS/cm)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.243

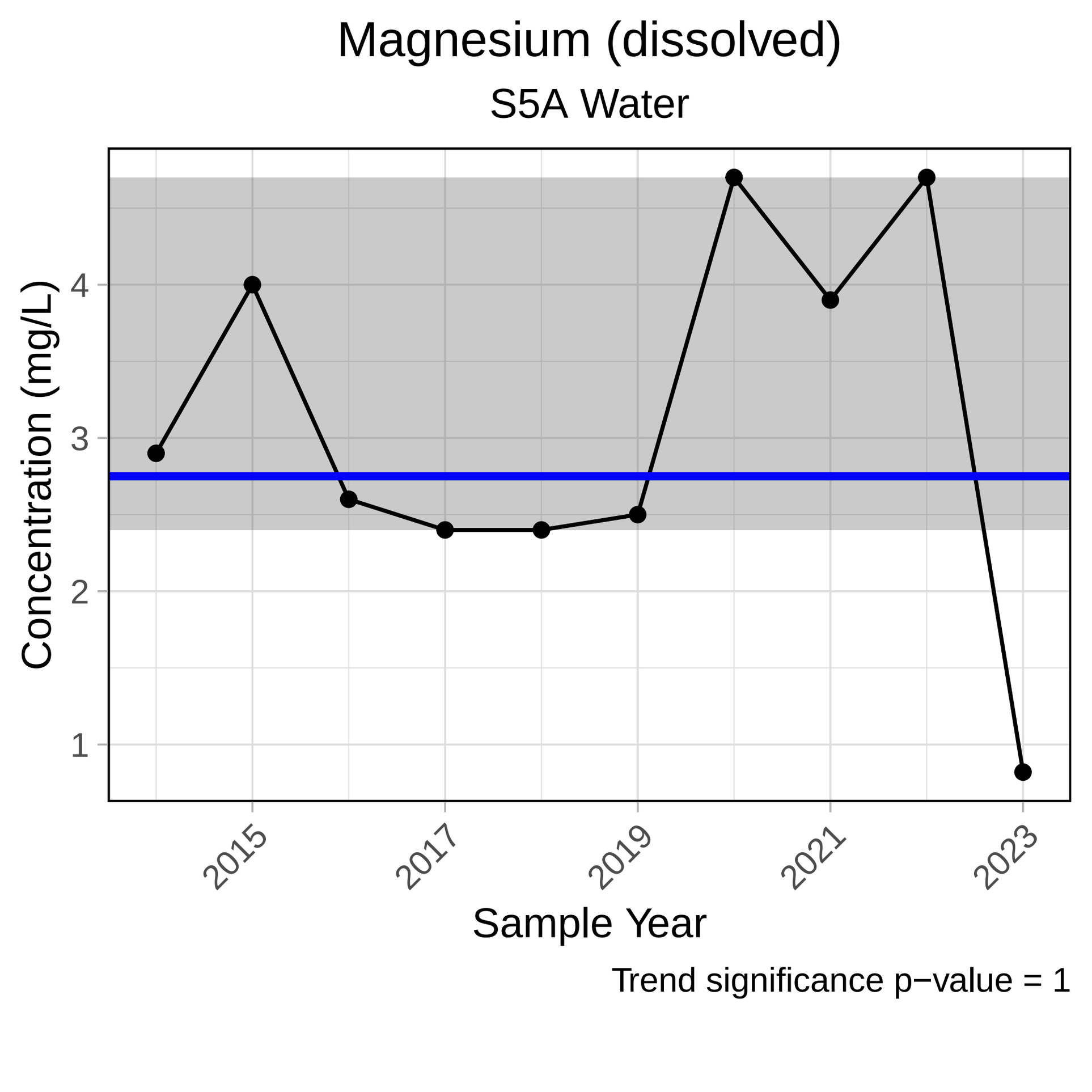

Electrical Conductivity (Field)
S5A Water
Concentration (µS/cm)
120
100
80
60
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.419

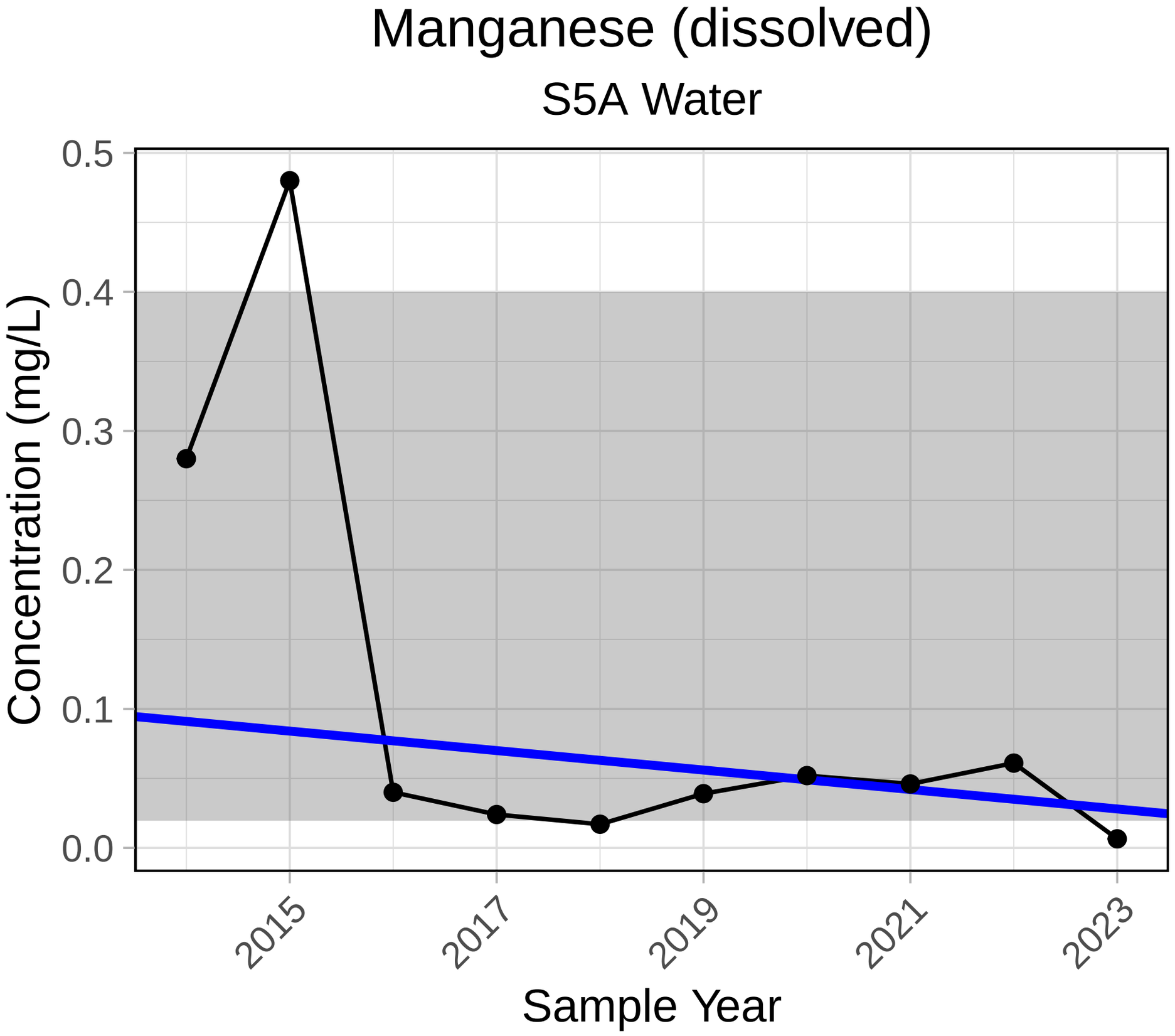

Iron (dissolved)
S5A Water
Concentration (mg/L)
2.0
1.5
1.0
0.5
0.0
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323
Chronic level = 0.3 mg/L (maximum)

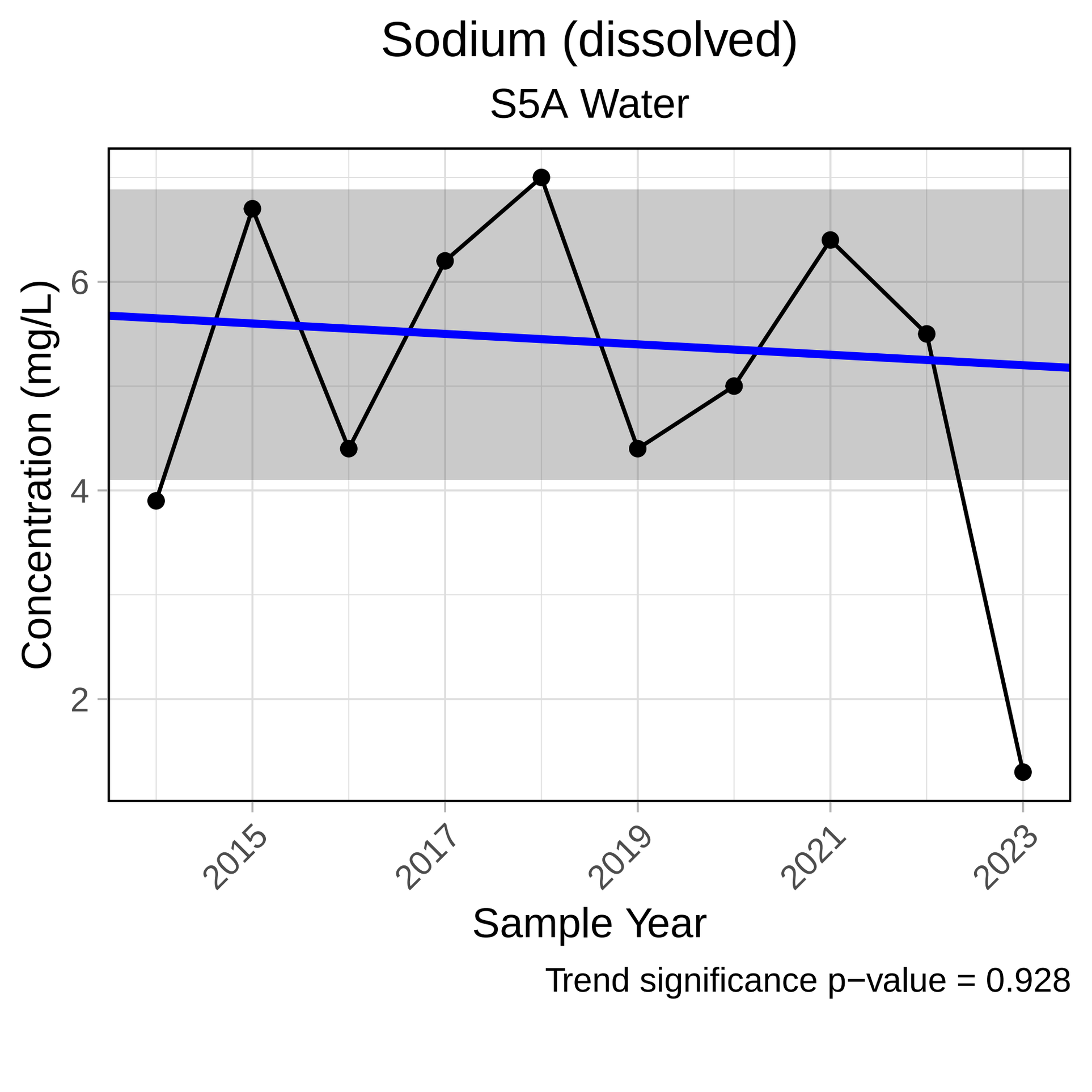

Hardness
S5A Water
Concentration (mg/L)
60
50
40
30
20
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.928

Bicarbonate
S5A Water
Concentration (mg/L)
80
60
40
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.371

Potassium (dissolved)
S5A Water
Concentration (mg/L)
1.0
0.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.243

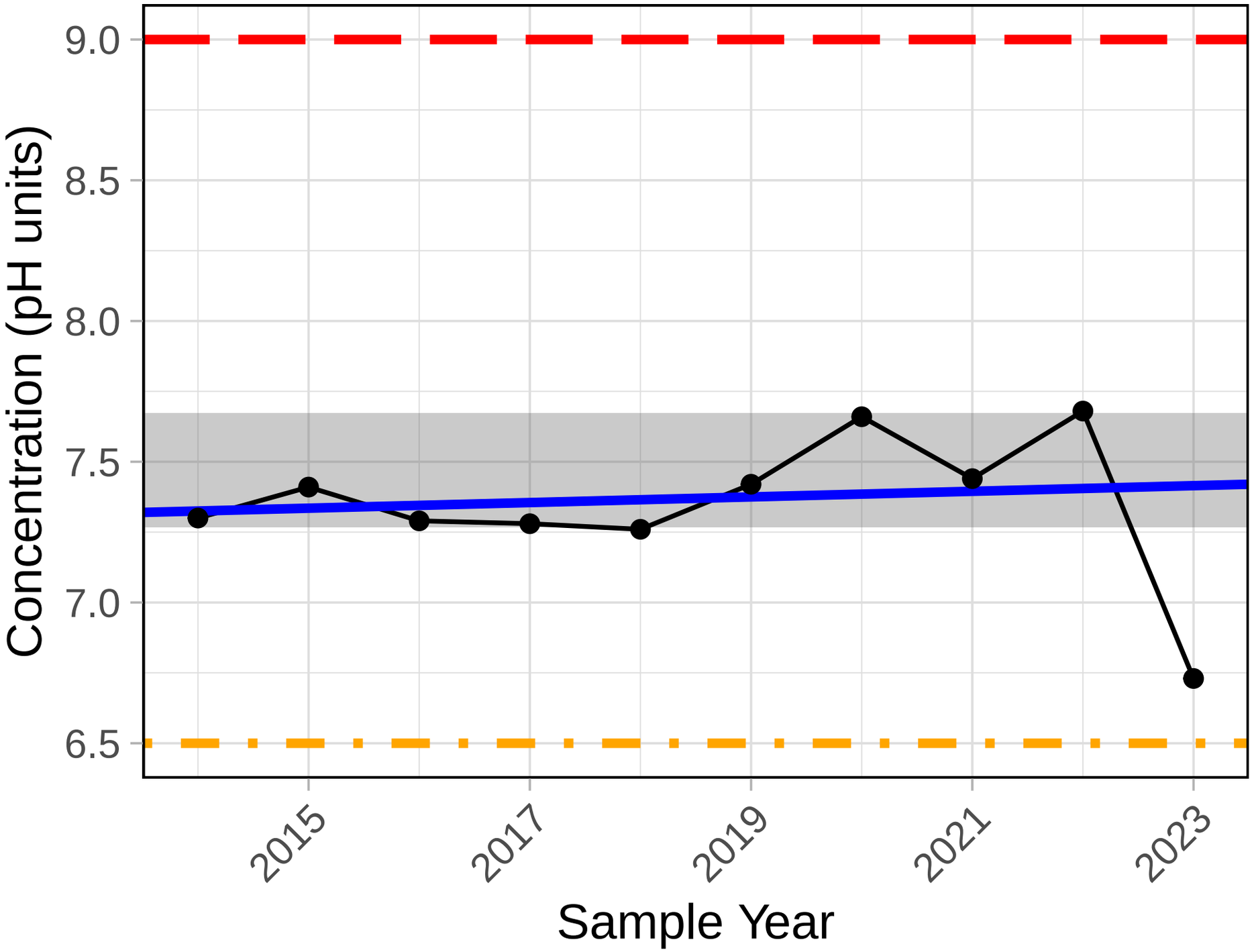

Magnesium (dissolved)
S5A Water
Concentration (mg/L)
4
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 1


Manganese (dissolved)
S5A Water
Concentration (mg/L)
0.5
0.4
0.3
0.2
0.1
0.0
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.371


Sodium (dissolved)
S5A Water
Concentration (mg/L)
6
4
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.928

pH

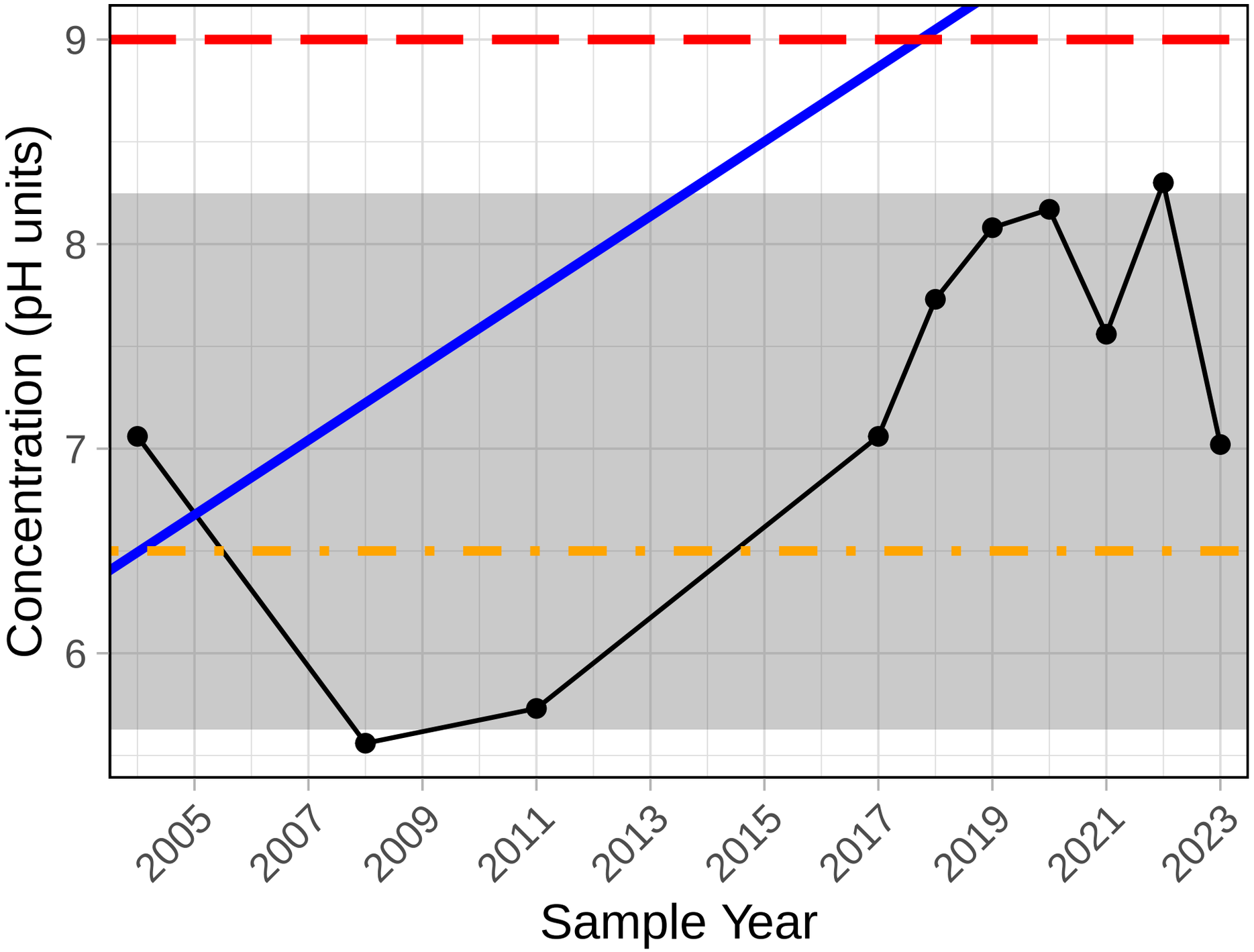
S5A Water



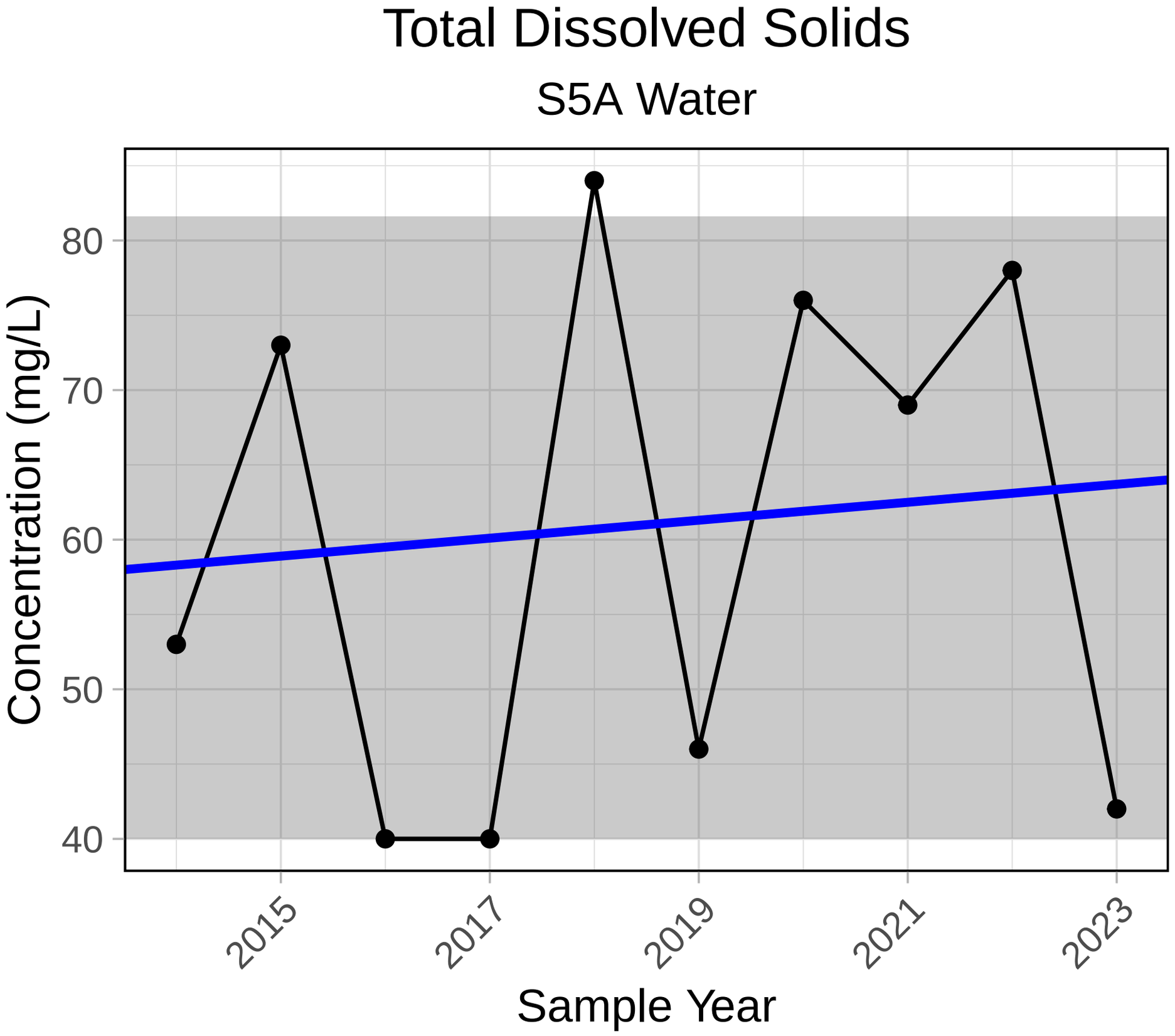
Trend significance p−value = 0.592
Lower limit = 6.5 pH units (minimum)
Upper limit = 9 pH units (maximum)

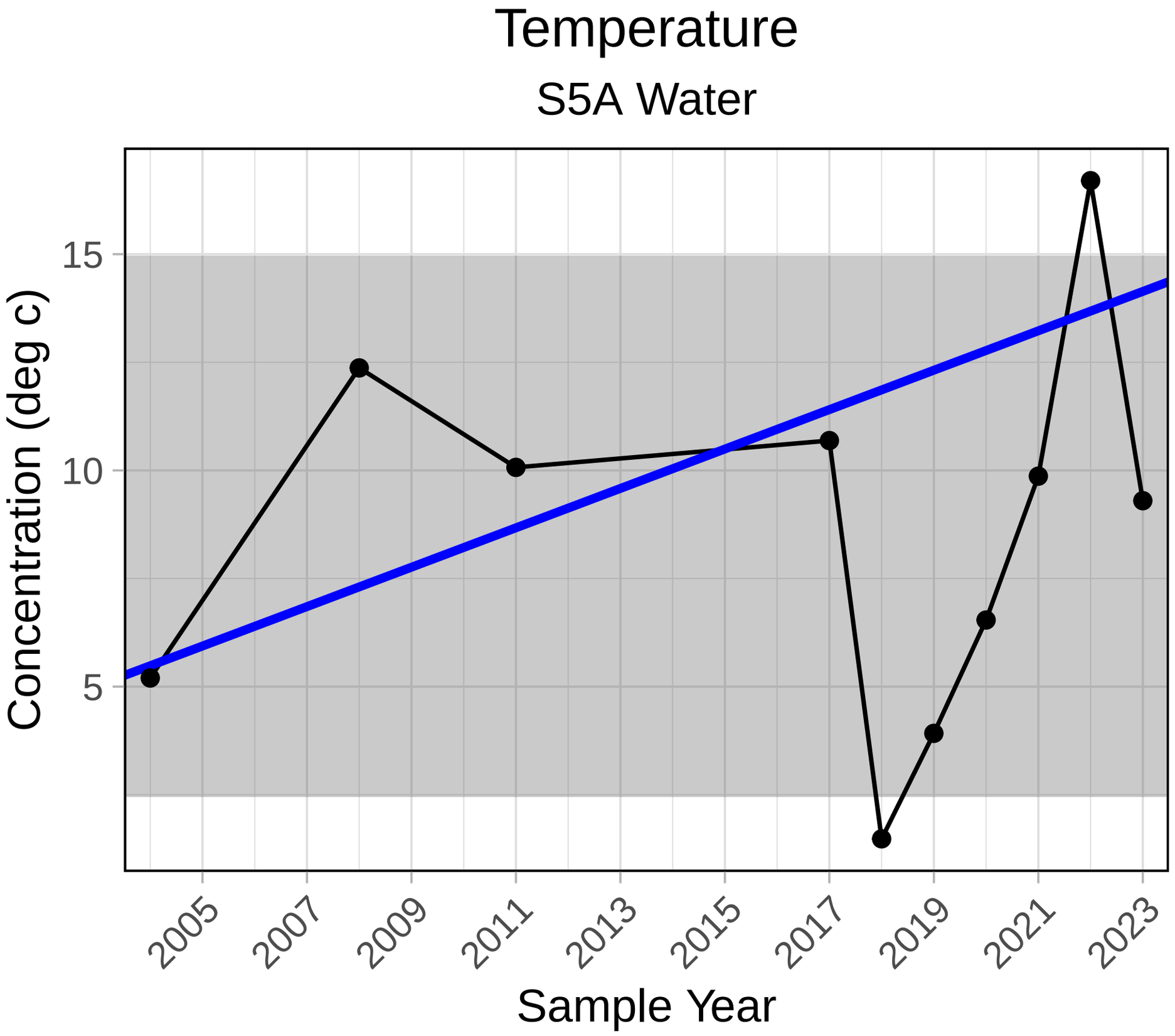
pH (Field)

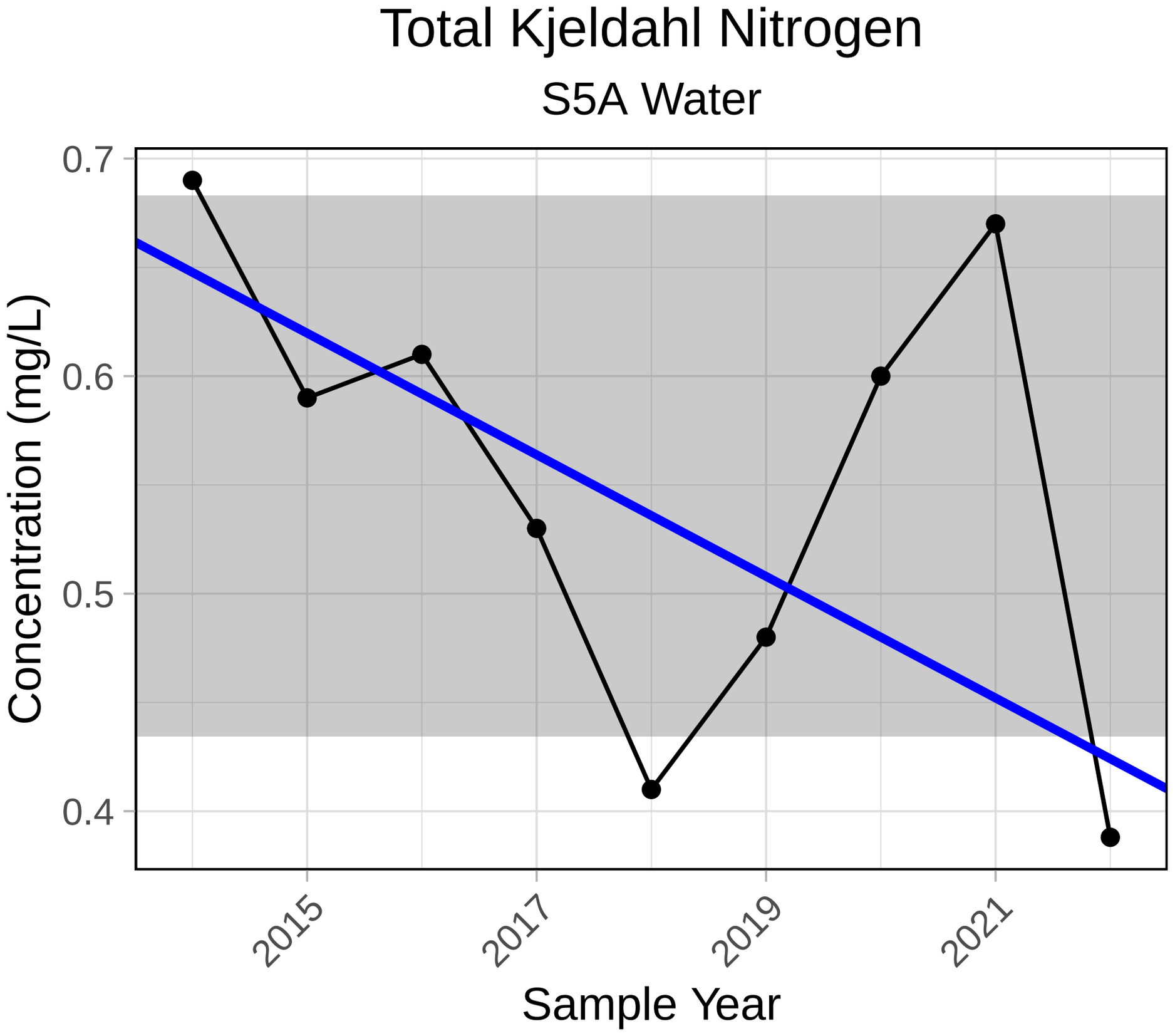
S5A Water

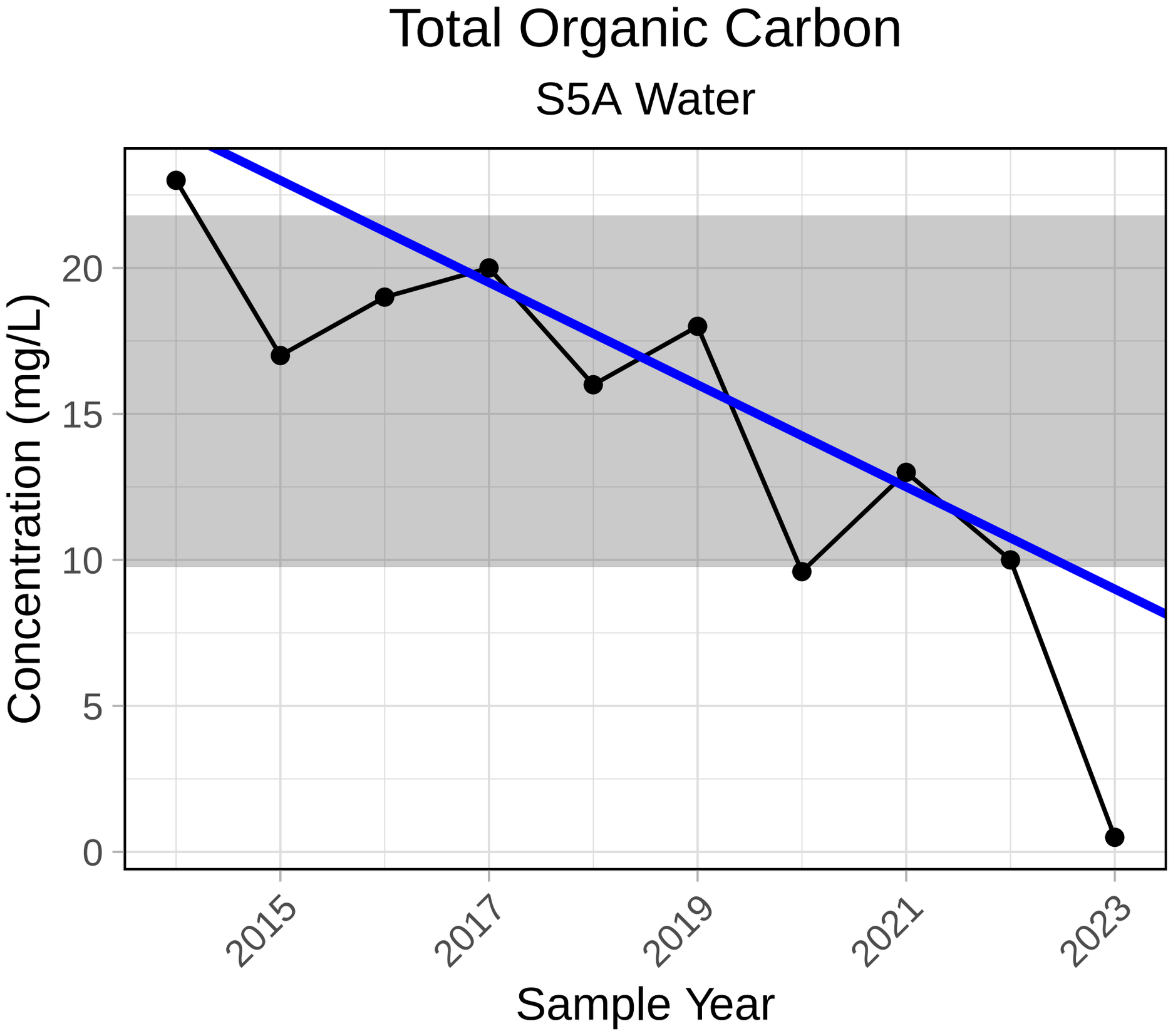


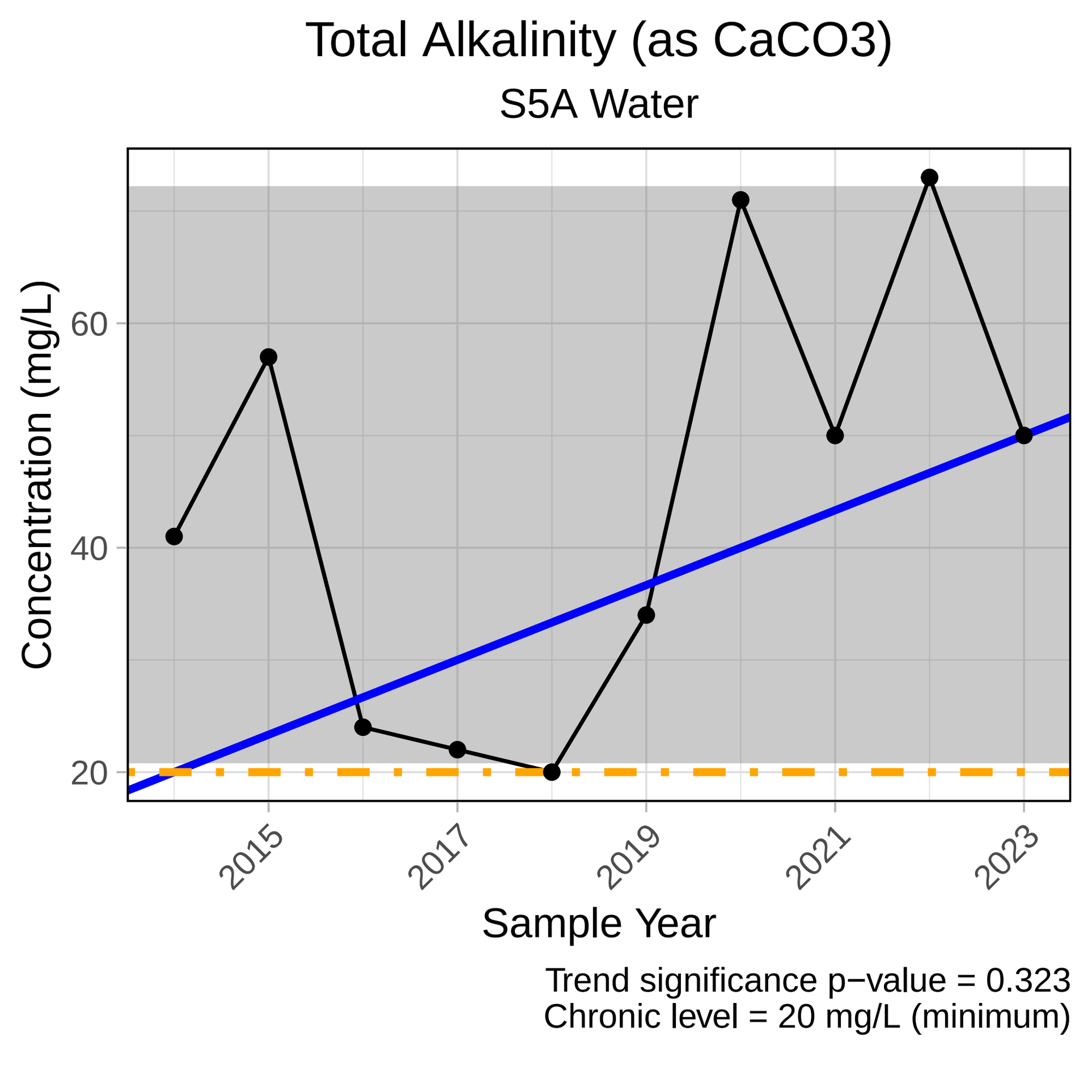
Trend significance p−value = 0.088
Lower limit = 6.5 pH units (minimum)
Upper limit = 9 pH units (maximum)

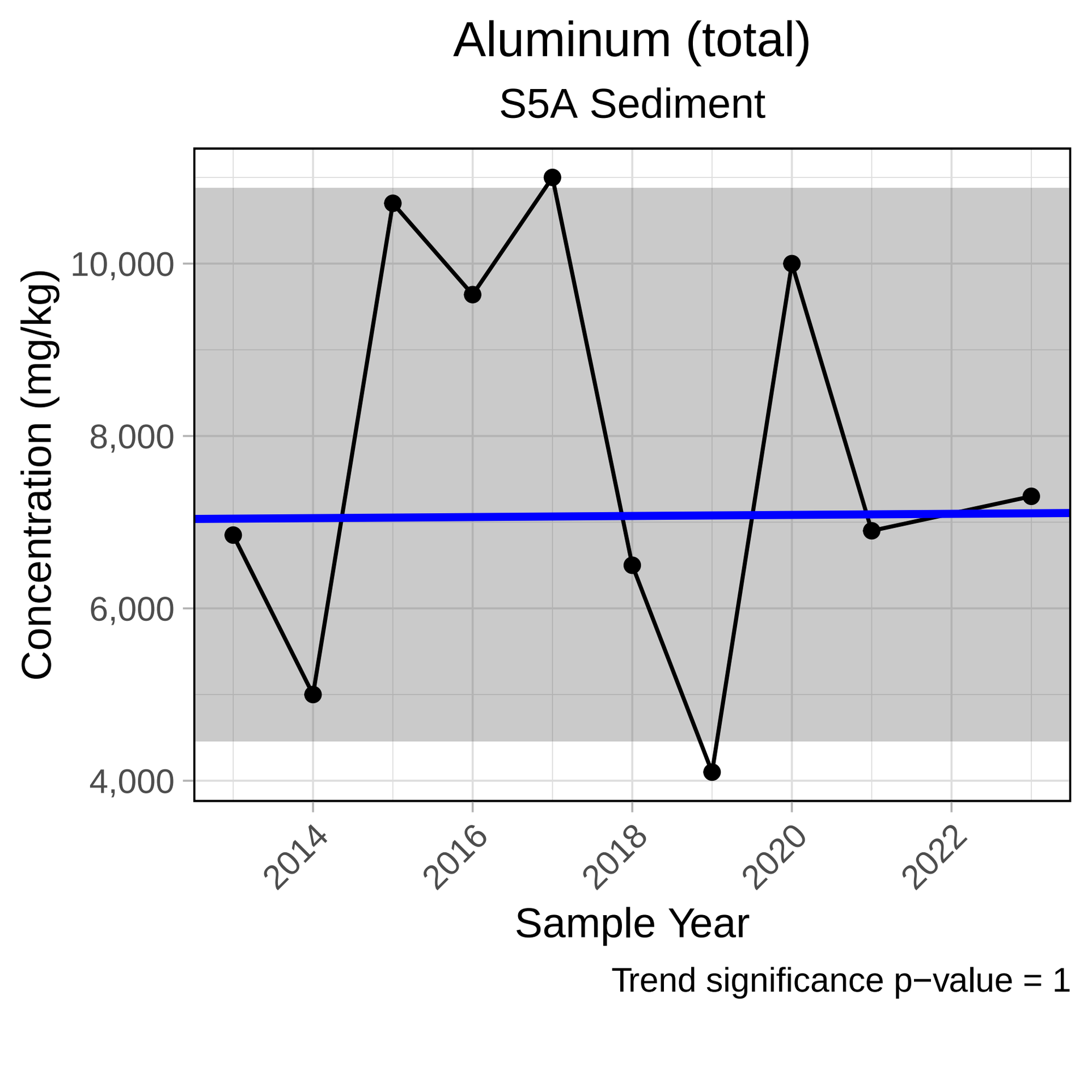

Total Dissolved Solids
S5A Water
Concentration (mg/L)
80
70
60
50
40
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.653

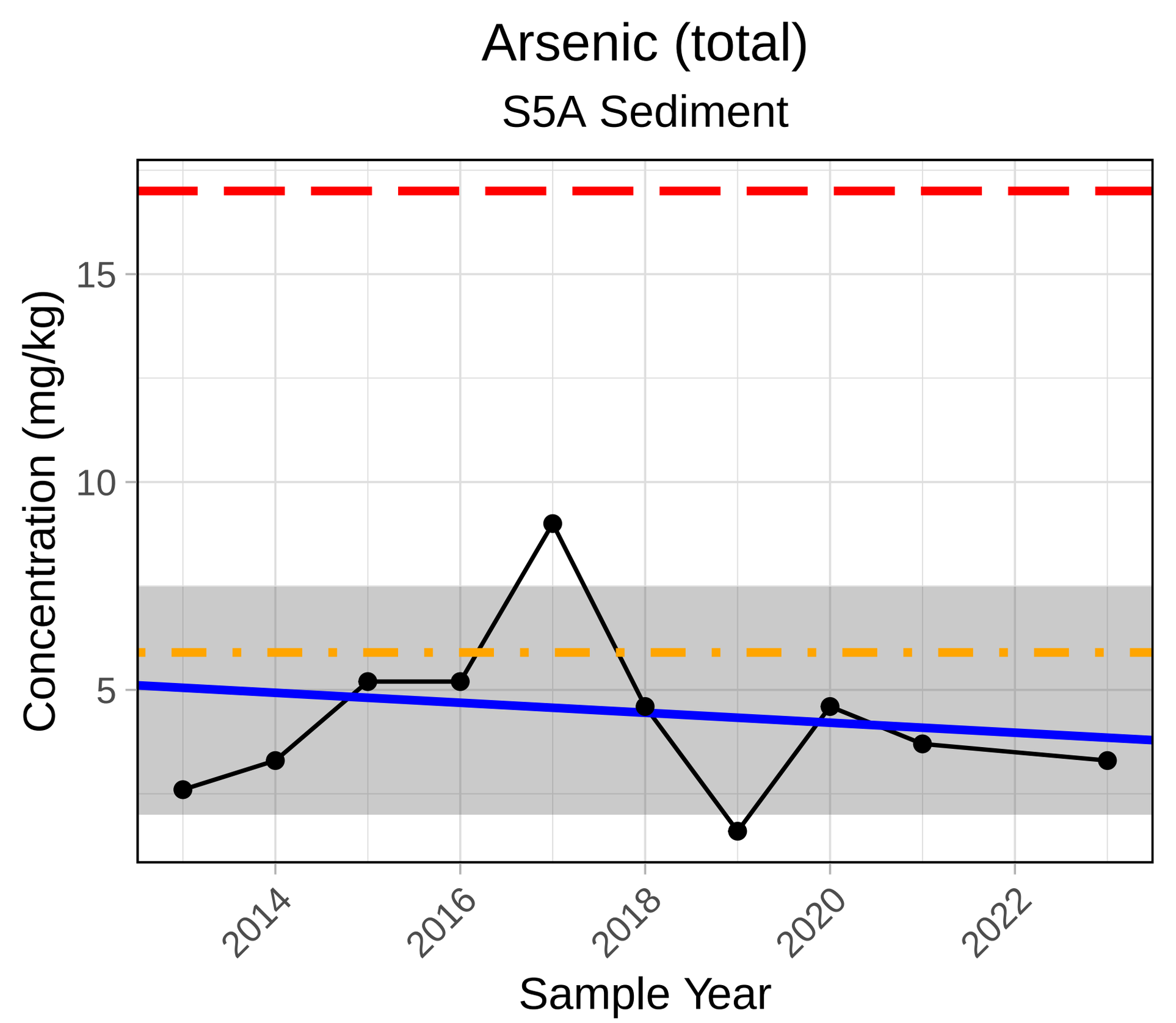

Temperature
S5A Water
Concentration (deg c)
15
10
5
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.858


Total Kjeldahl Nitrogen
S5A Water
0.7
0.6
0.5
0.4
Concentration (mg/L)
2015
2017
2019
2021
Sample Year
Trend significance p−value = 0.251


Total Organic Carbon
S5A Water
Concentration (mg/L)
0
5
10
15
20
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.007

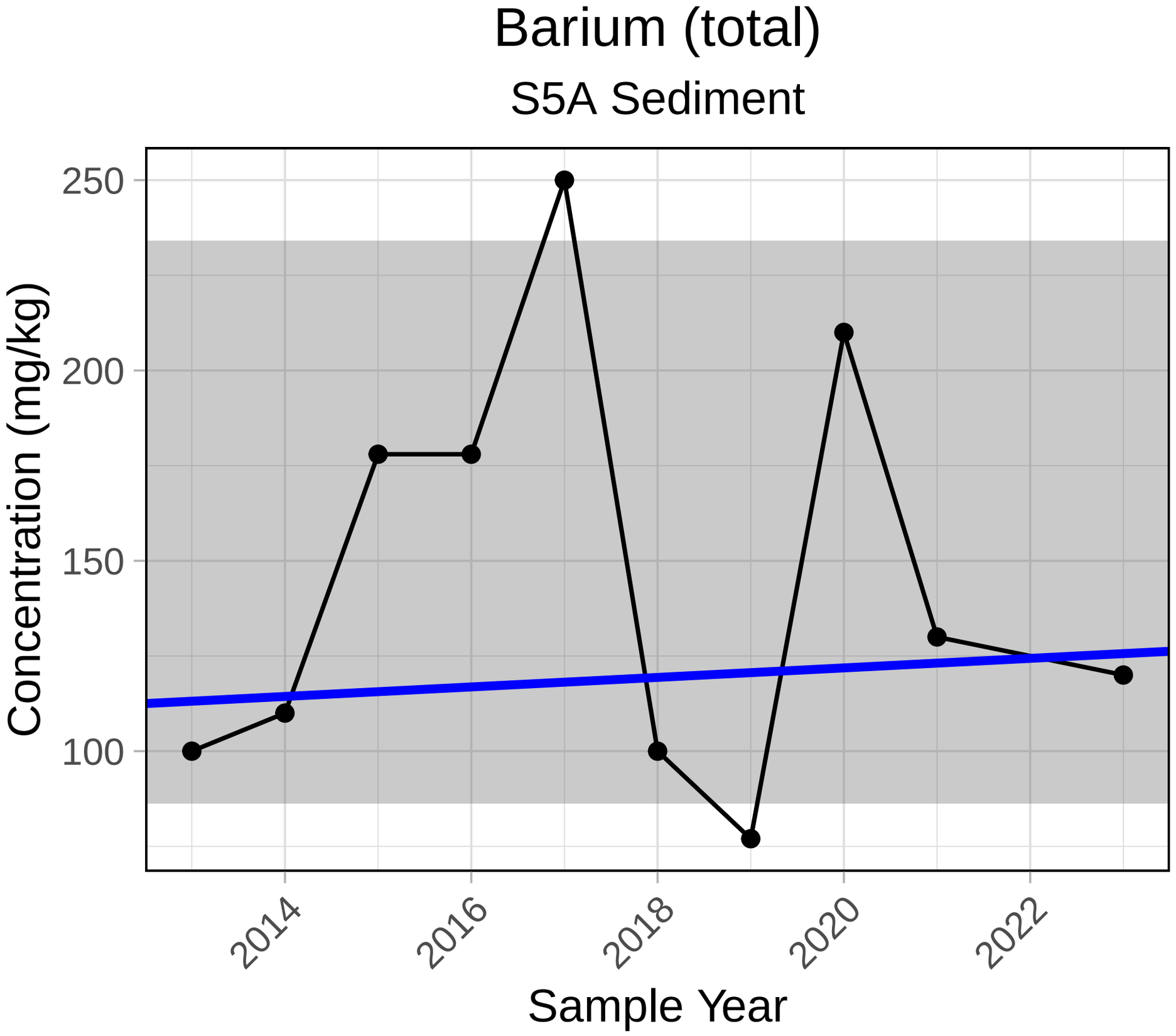

Total Alkalinity (as CaCO3)
S5A Water
Concentration (mg/L)
60
40
20
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323
Chronic level = 20 mg/L (minimum)

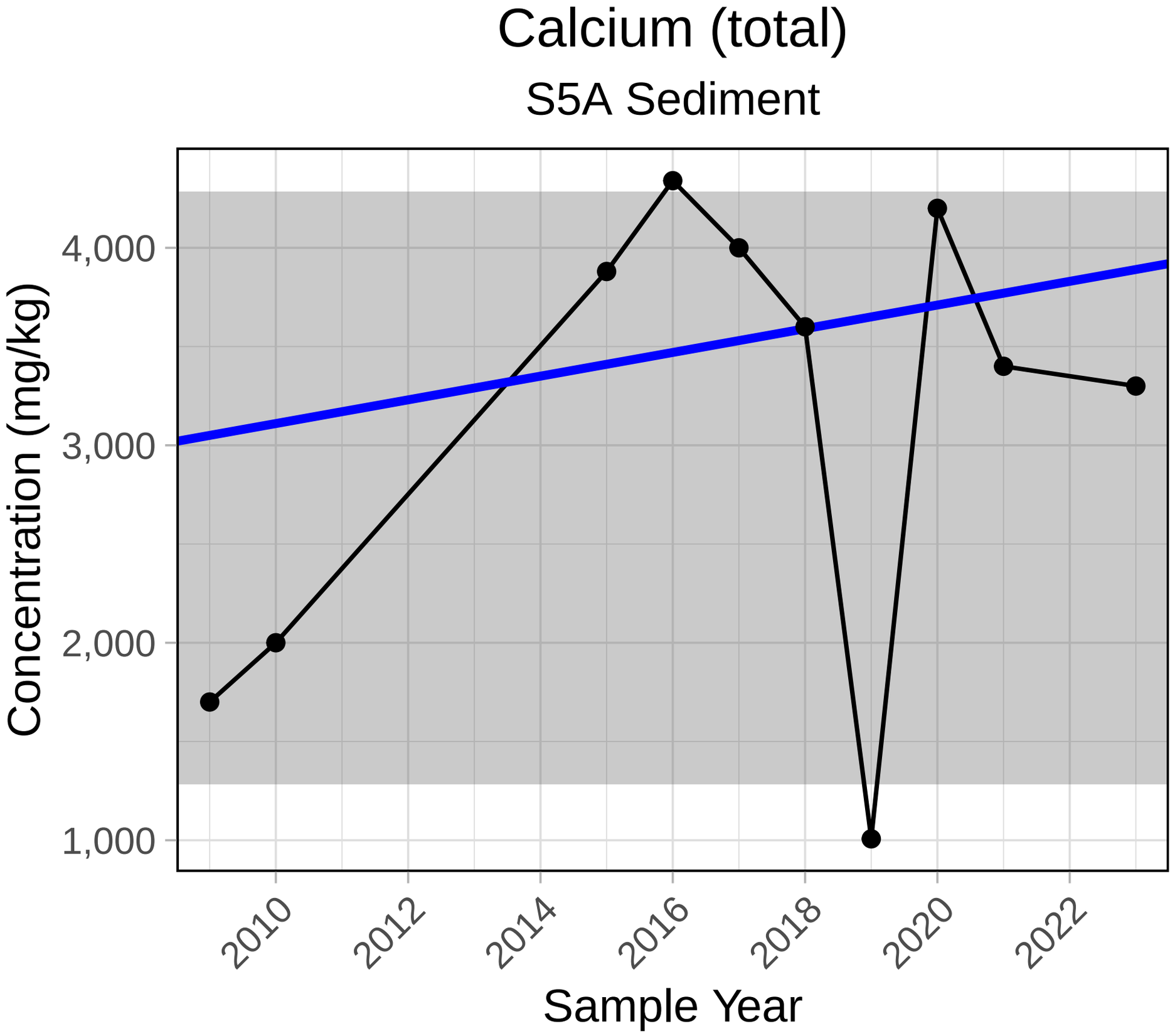

Aluminum (total)
S5A Sediment
Concentration (mg/kg)
10,000
8,000
6,000
4,000
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

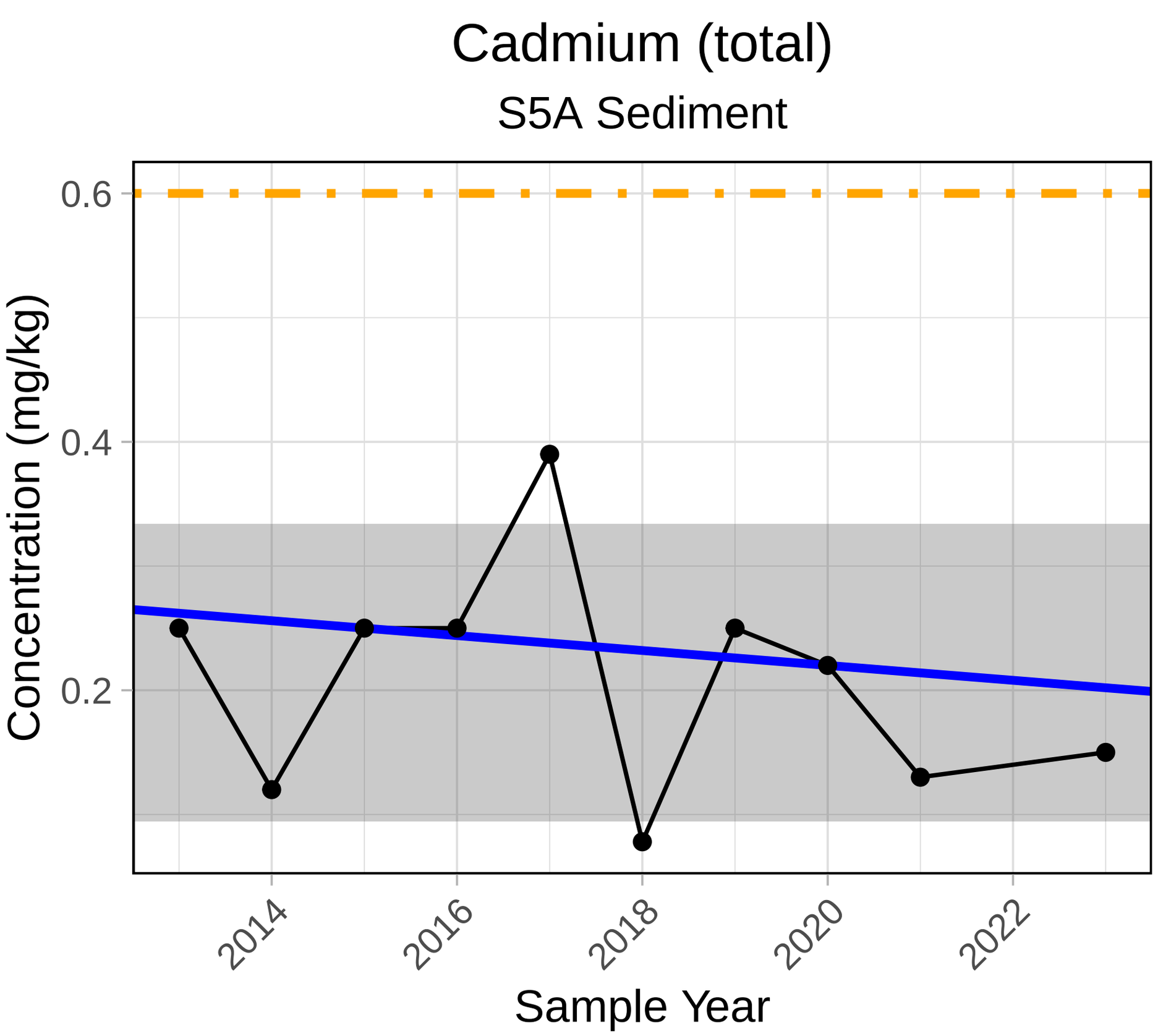


Trend significance p−value = 0.786
ISQG level = 5.9 mg/kg (maximum)
PEL level = 17 mg/kg (maximum)

Boron (total)
S5A Sediment
Concentration (mg/kg)
0
1
2
3
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.564

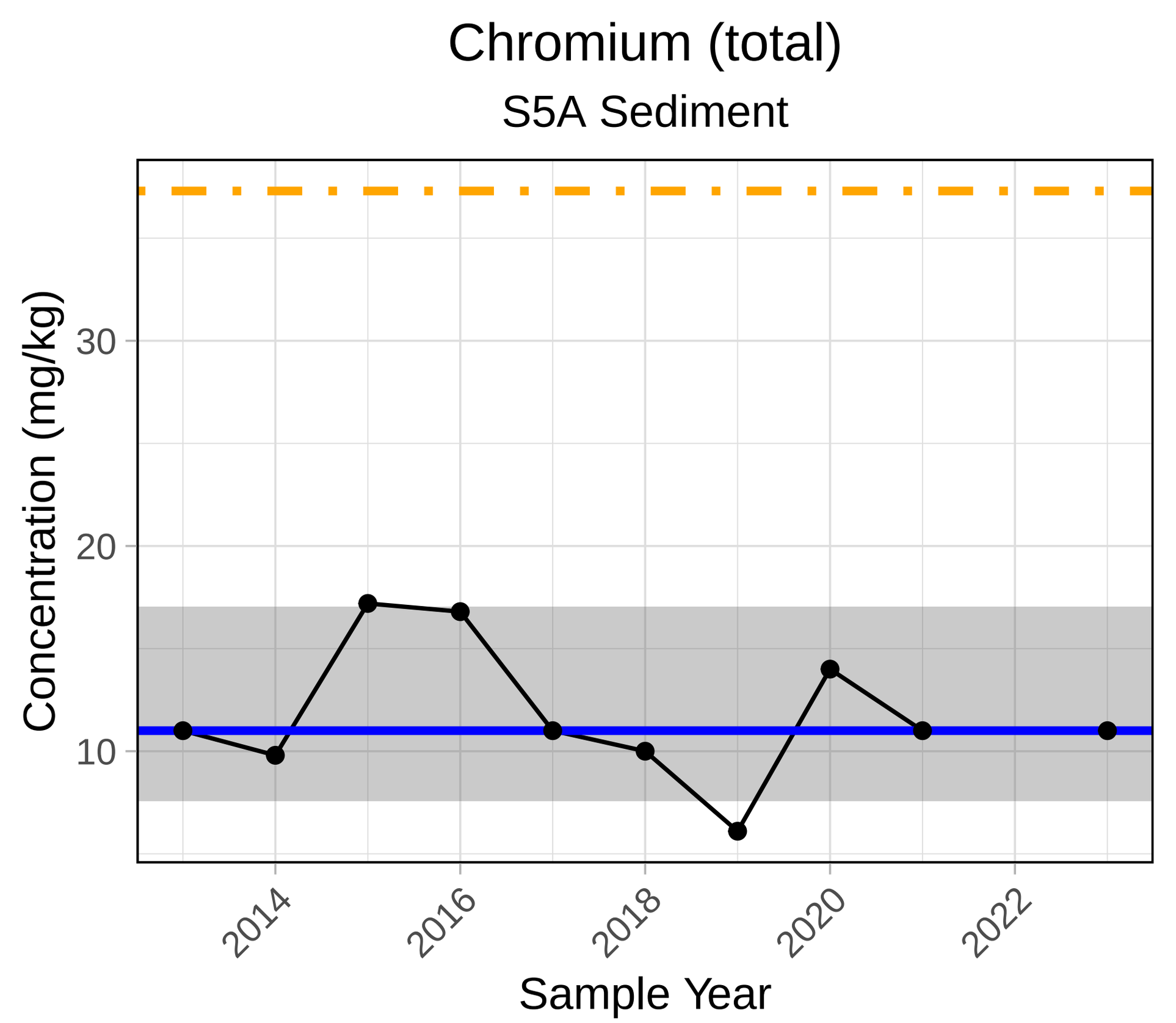

Barium (total)
S5A Sediment
Concentration (mg/kg)
250
200
150
100
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.857


Calcium (total)
S5A Sediment
Concentration (mg/kg)
4,000
3,000
2,000
1,000
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1



Trend significance p−value = 0.458
ISQG level = 0.6 mg/kg (maximum)
PEL level = 3.5 mg/kg (maximum)

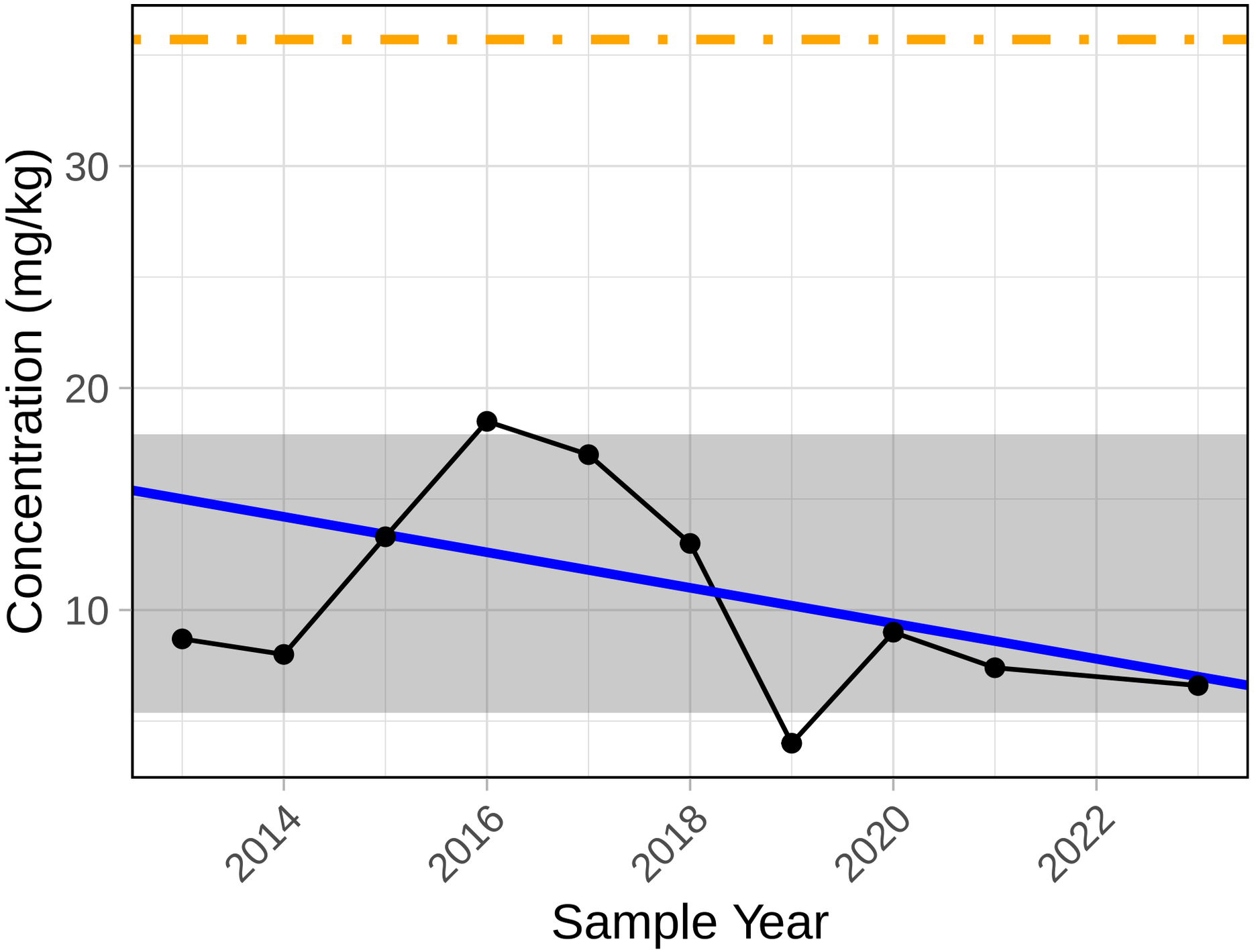
Cobalt (total)
S5A Sediment
Concentration (mg/kg)
10
8
6
4
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.419



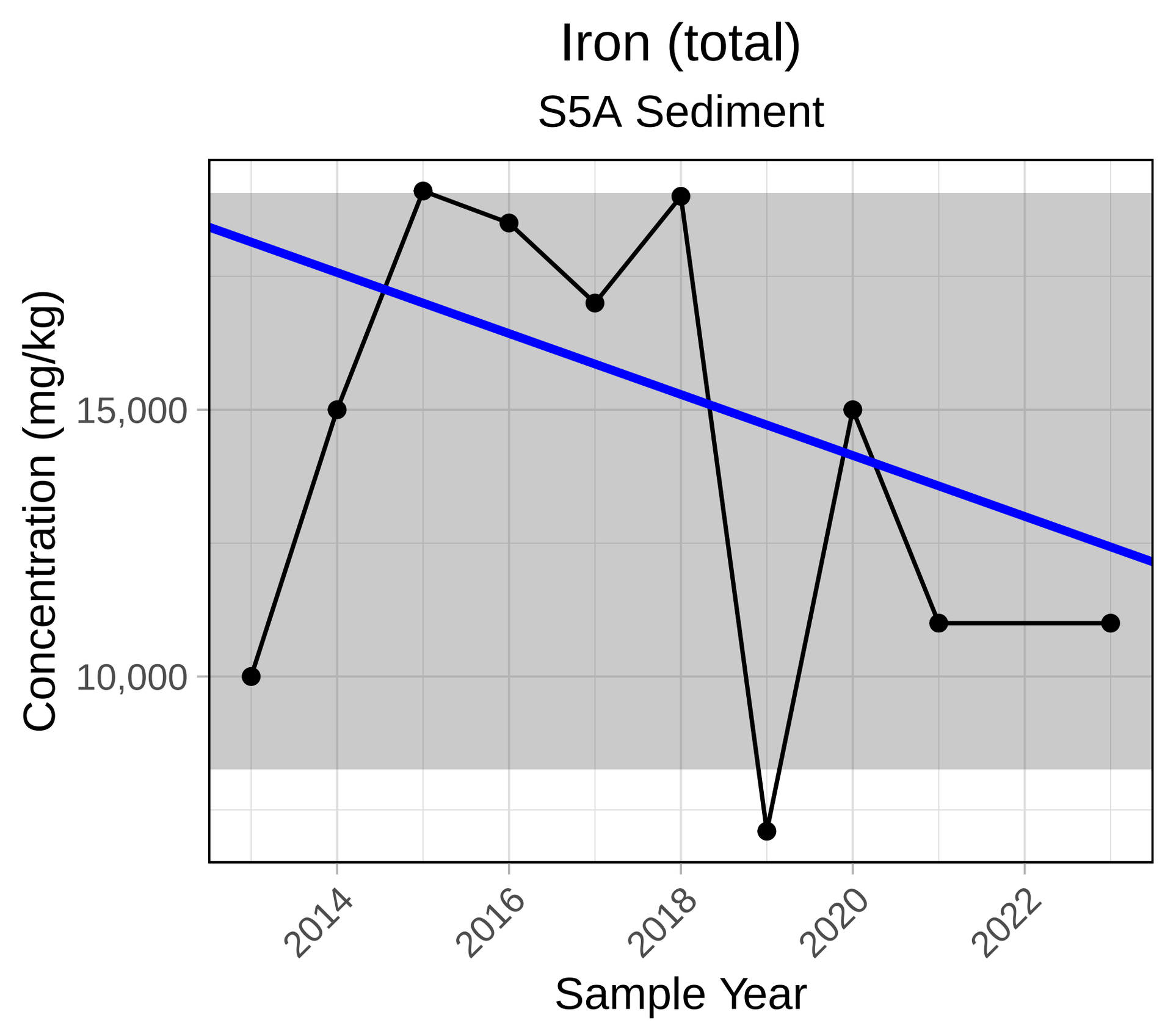
Trend significance p−value = 0.711
ISQG level = 37.3 mg/kg (maximum)
PEL level = 90 mg/kg (maximum)

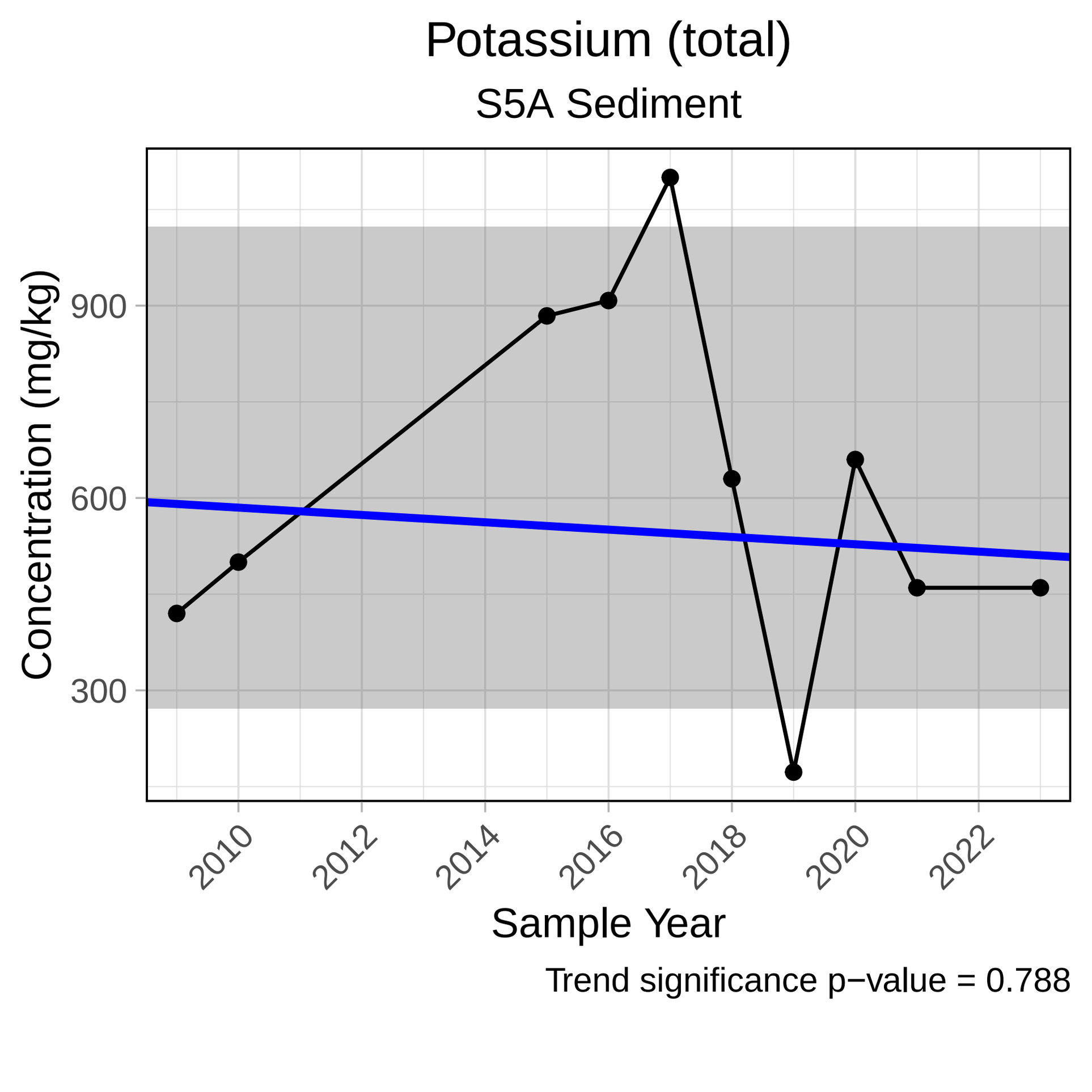
Copper (total)

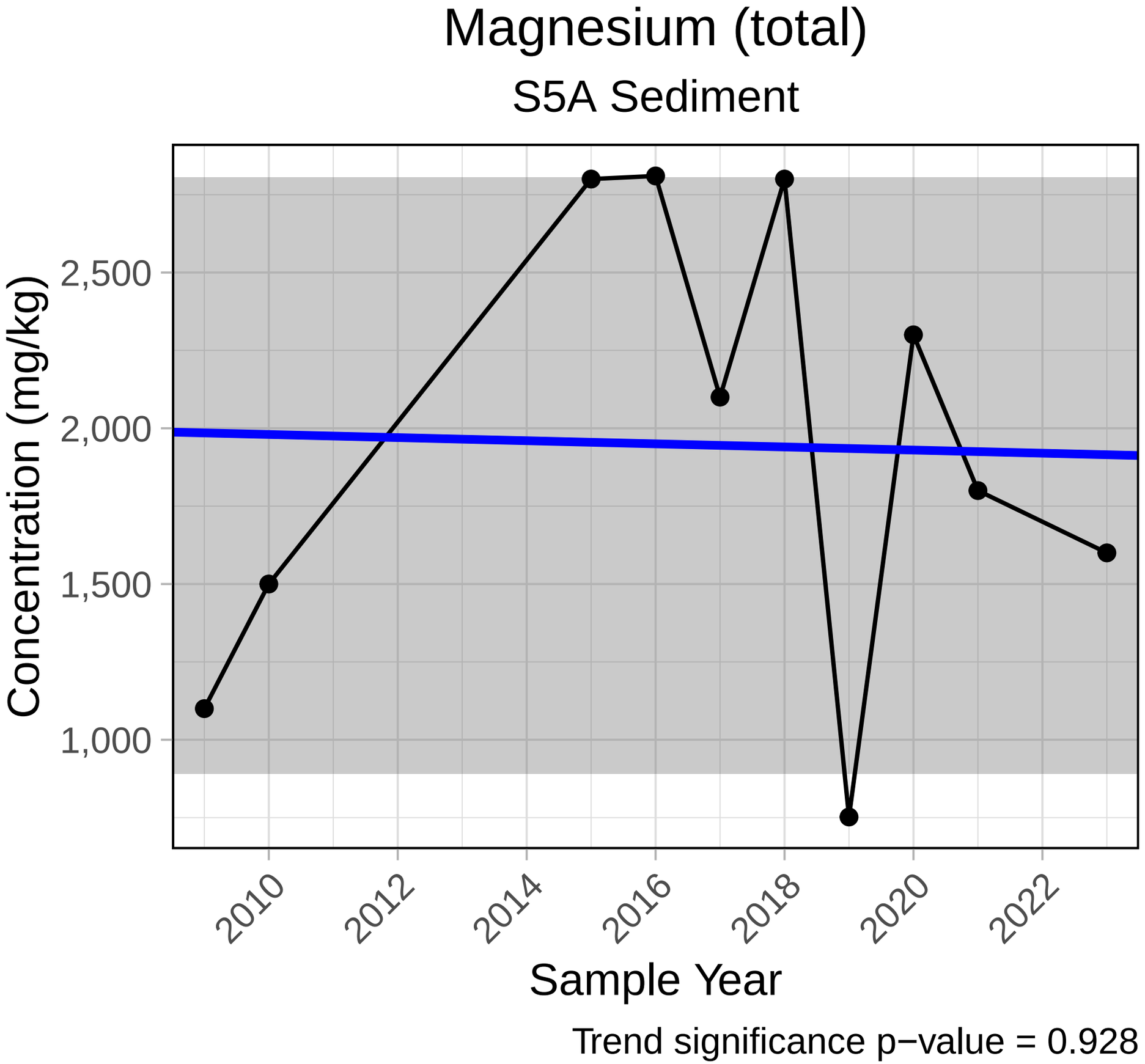
S5A Sediment

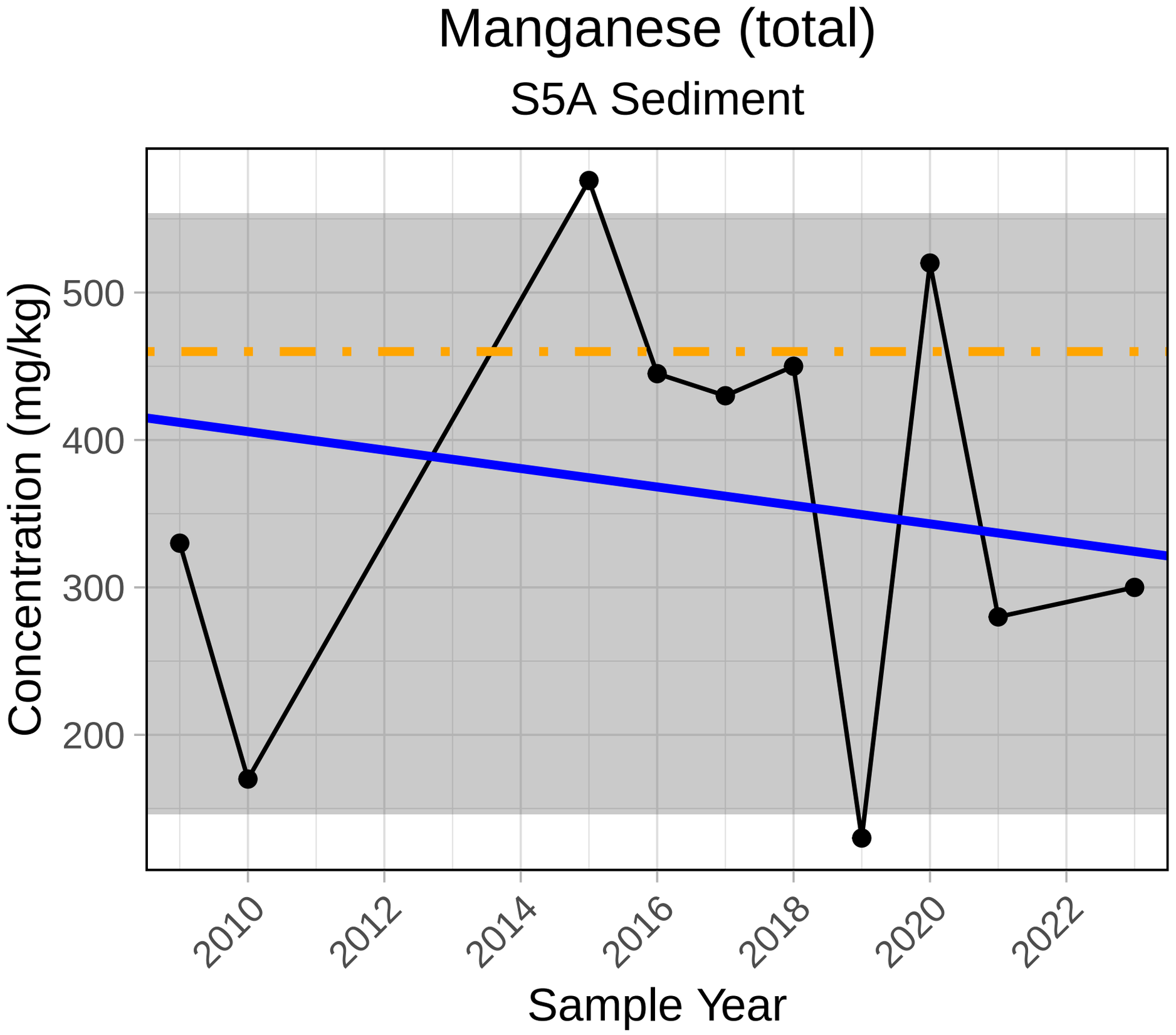


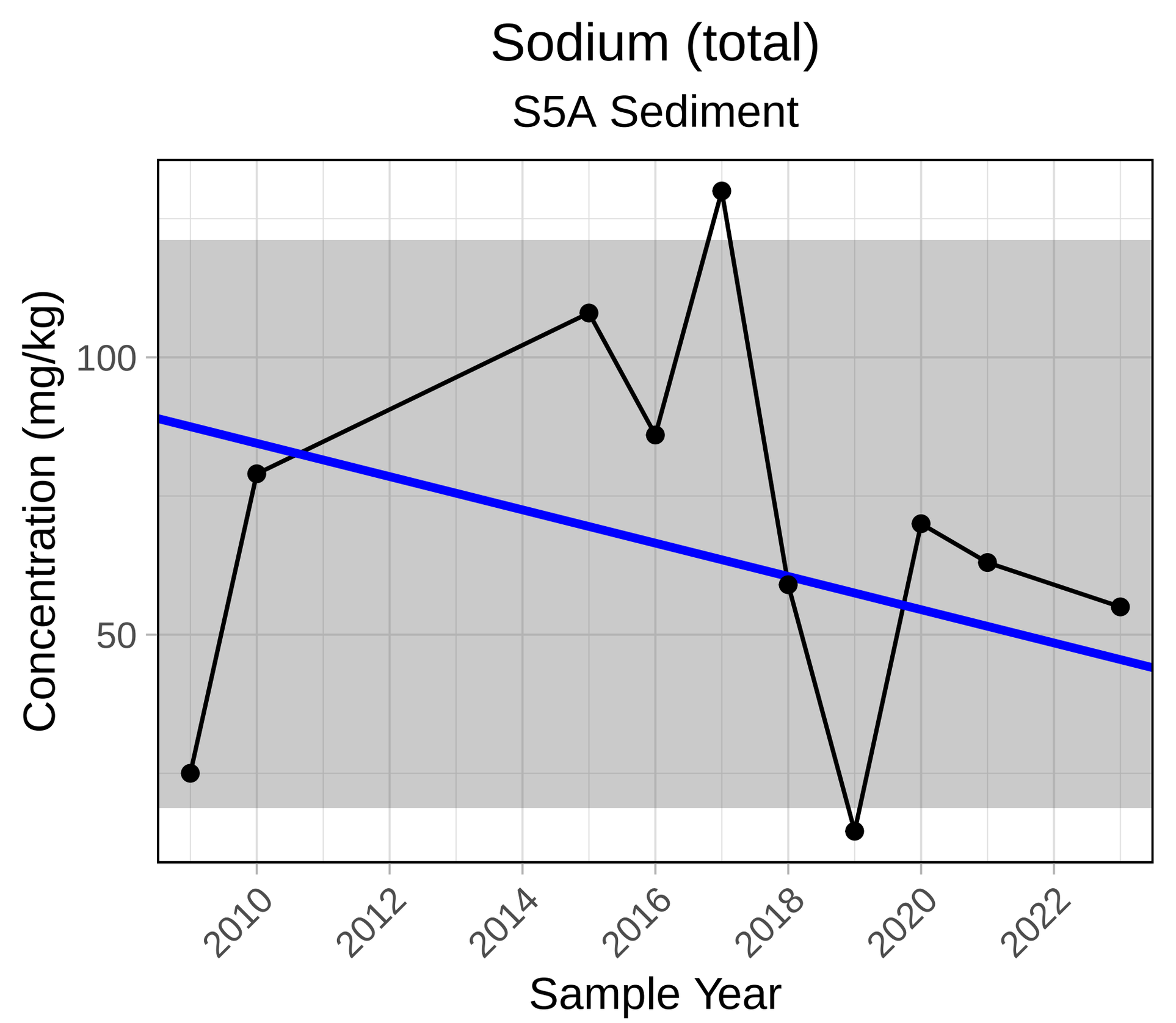
Trend significance p−value = 0.21
ISQG level = 35.7 mg/kg (maximum)
PEL level = 197 mg/kg (maximum)

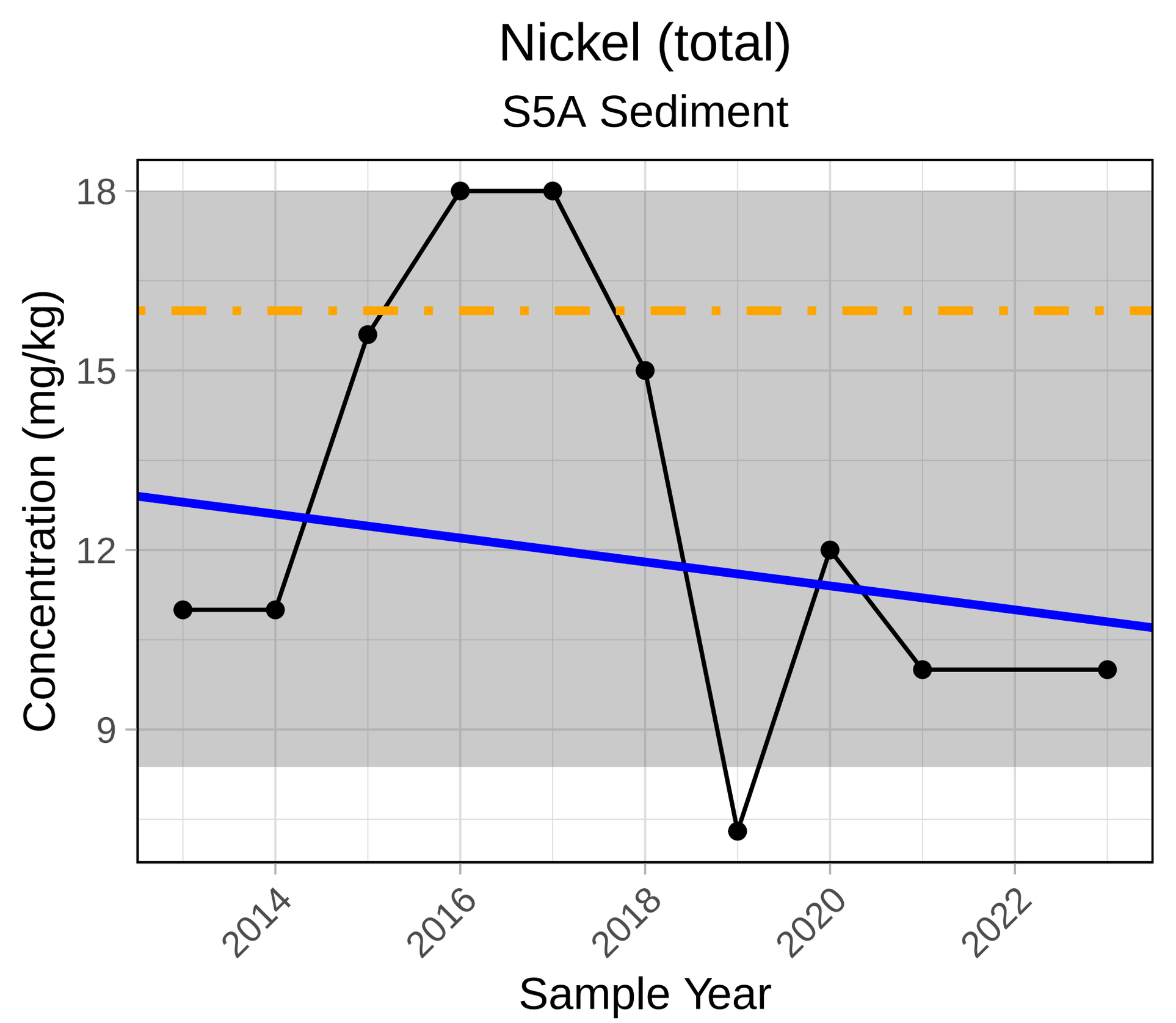

Iron (total)
S5A Sediment
Concentration (mg/kg)
15,000
10,000
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.471


Potassium (total)
S5A Sediment
Concentration (mg/kg)
900
600
300
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.788


Magnesium (total)
S5A Sediment
Concentration (mg/kg)
2,500
2,000
1,500
1,000
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

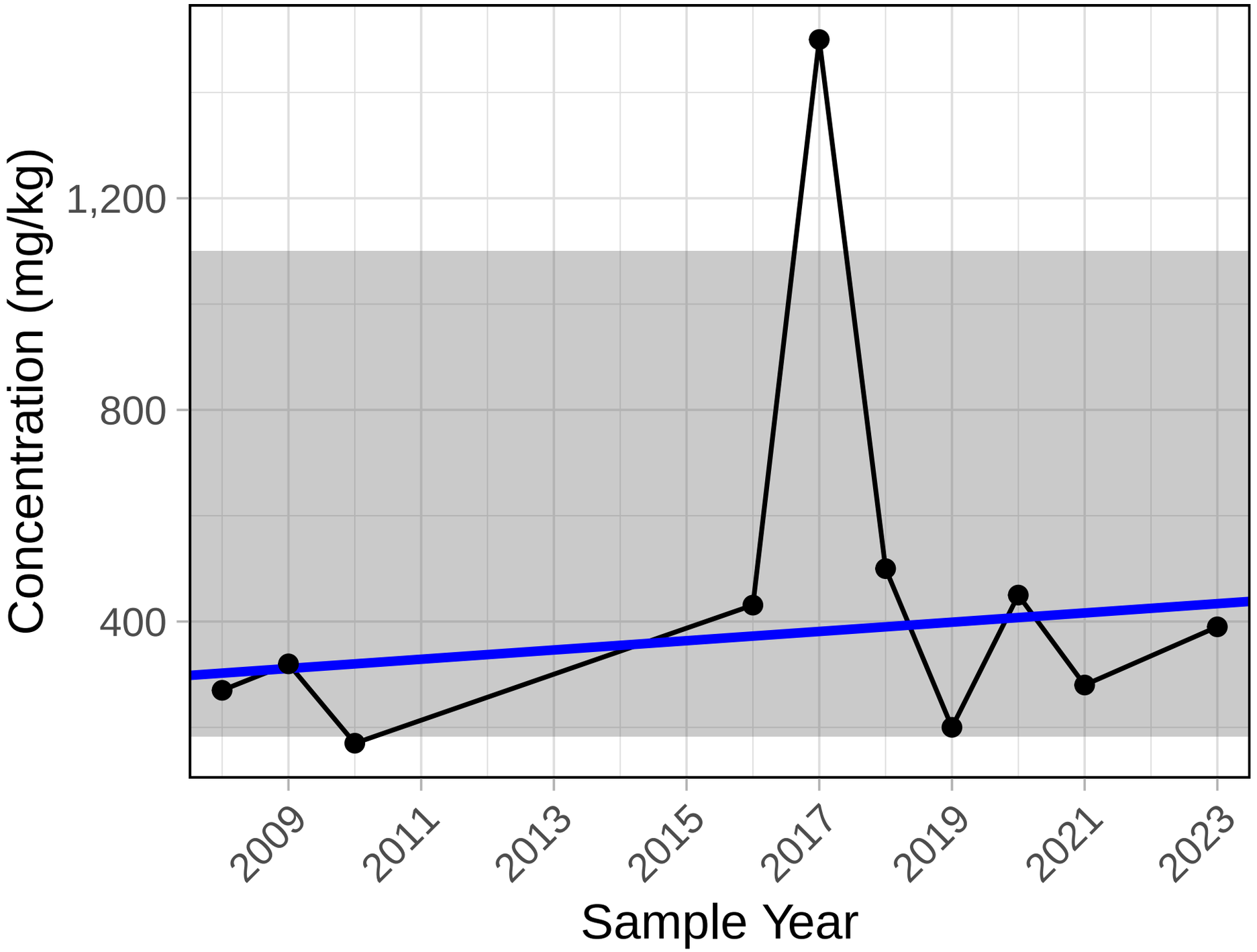

Manganese (total)
S5A Sediment
Concentration (mg/kg)
500
400
300
200
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858
ISQG level = 460 mg/kg (maximum)


Sodium (total)
S5A Sediment
Concentration (mg/kg)
100
50
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474


Nickel (total)
S5A Sediment
Concentration (mg/kg)
18
15
12
9
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.319
ISQG level = 16 mg/kg (maximum)

Phosphorus (total)

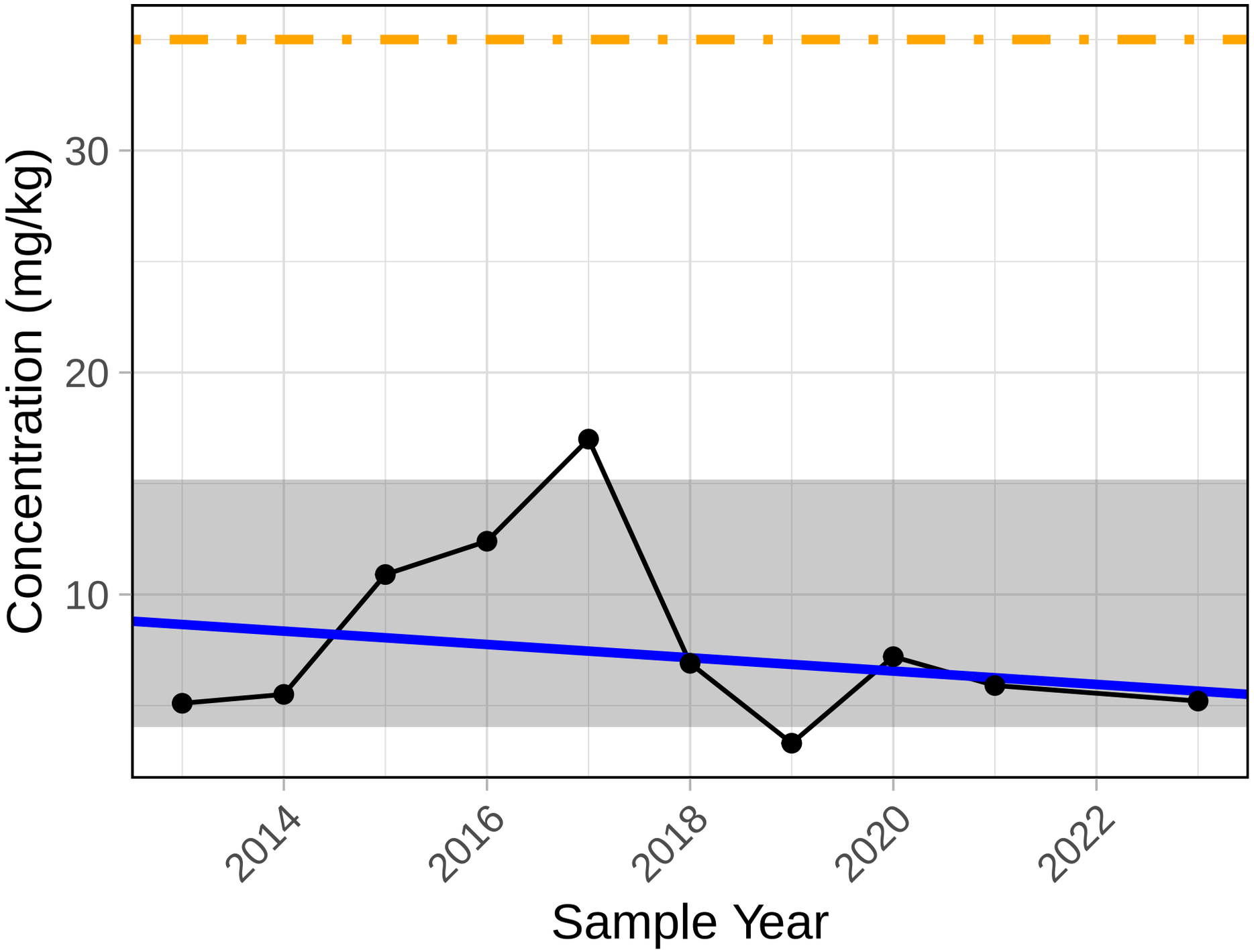
S5A Sediment



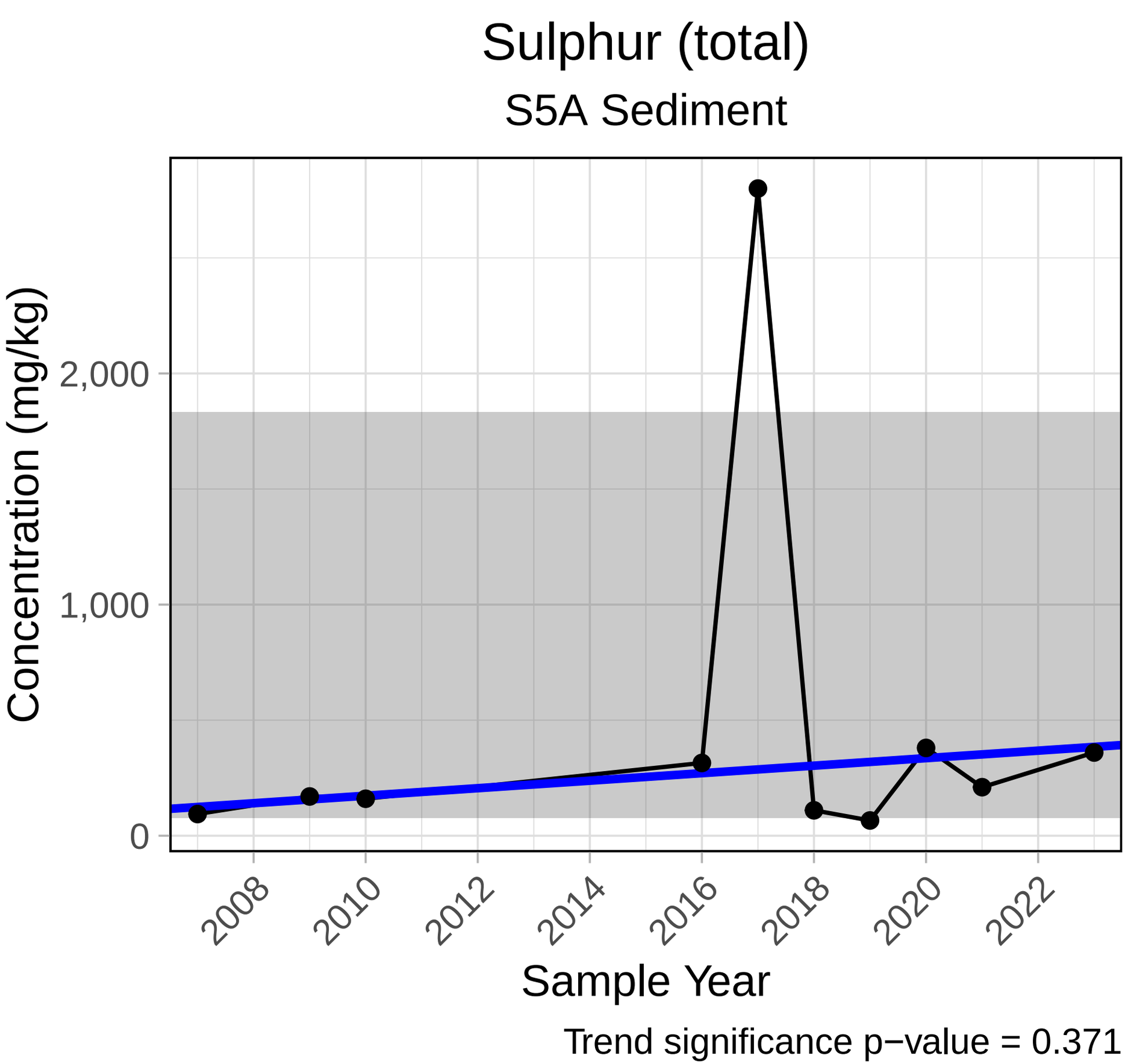
Trend significance p−value = 0.592

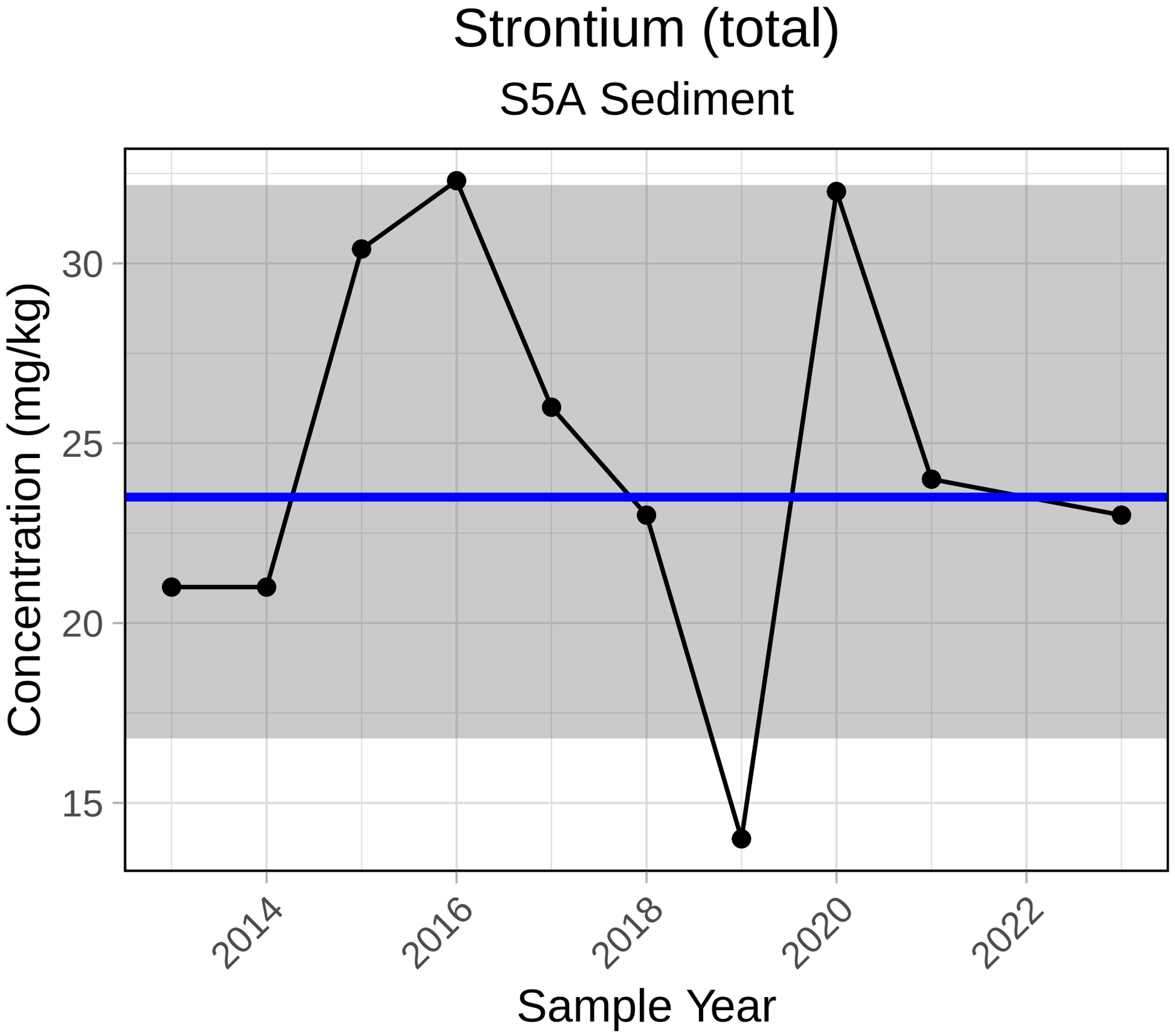
Lead (total)

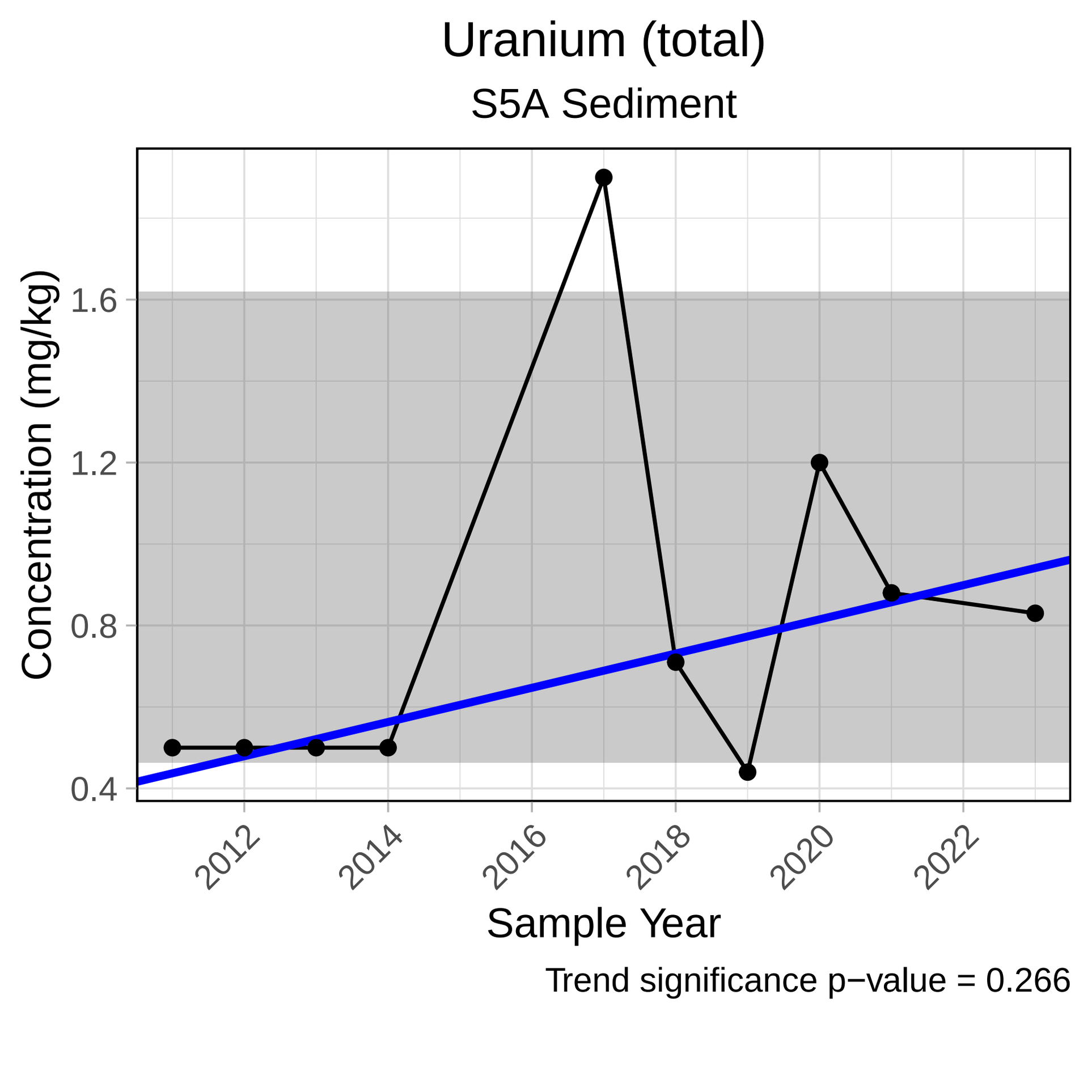
S5A Sediment

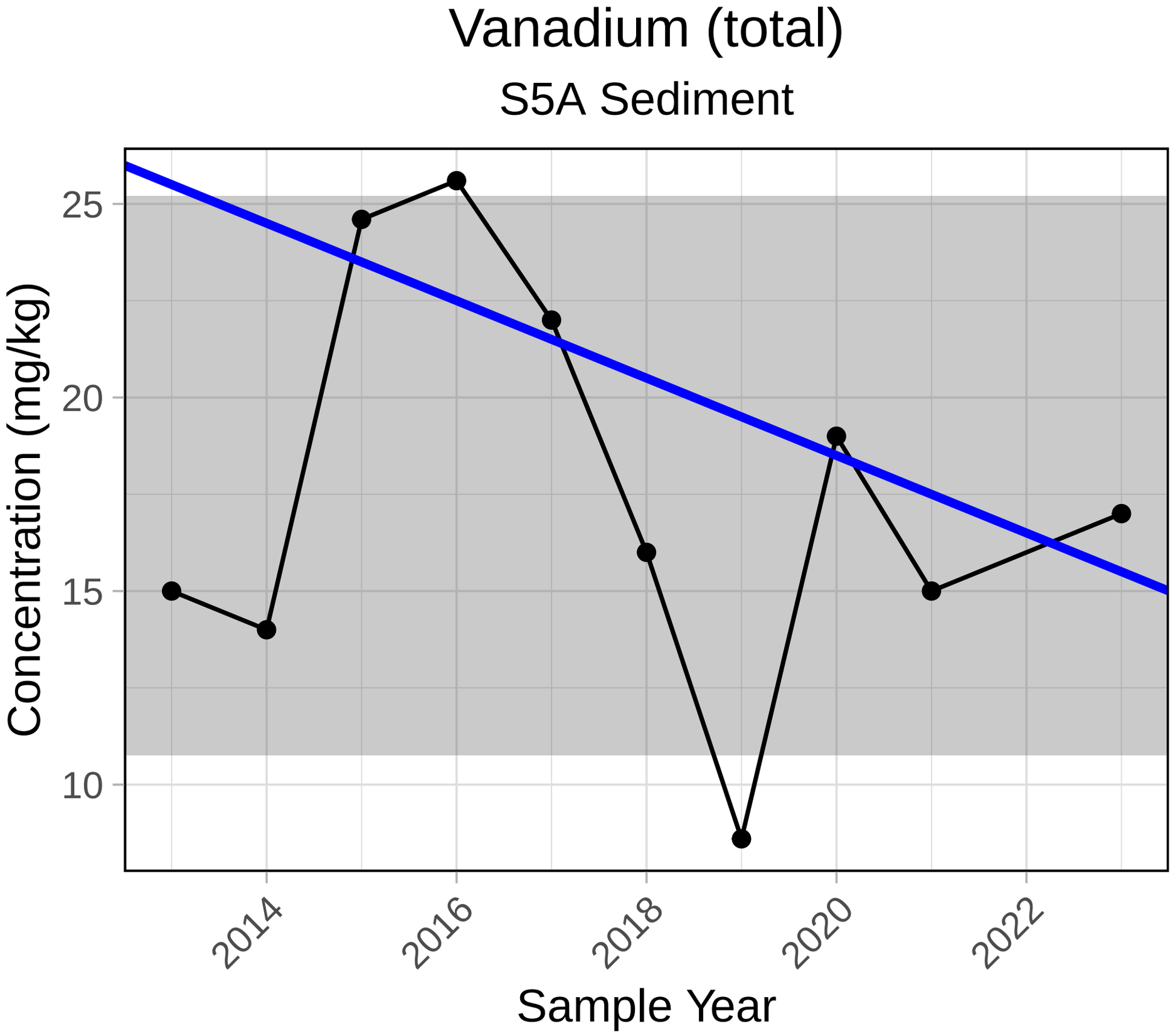


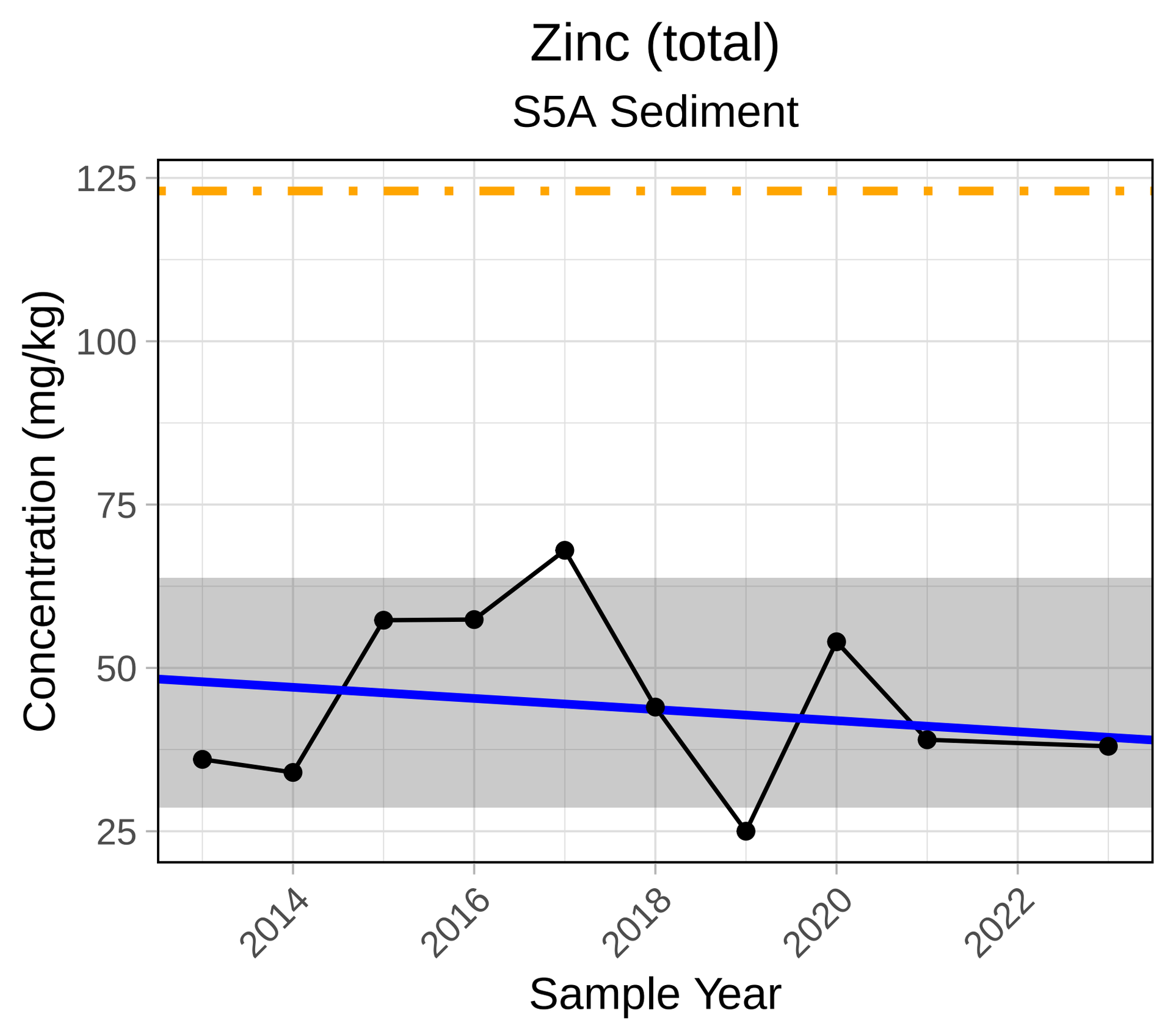
Trend significance p−value = 0.858
ISQG level = 35 mg/kg (maximum)
PEL level = 91.3 mg/kg (maximum)


Sulphur (total)
S5A Sediment
Concentration (mg/kg)
2,000
1,000
0
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

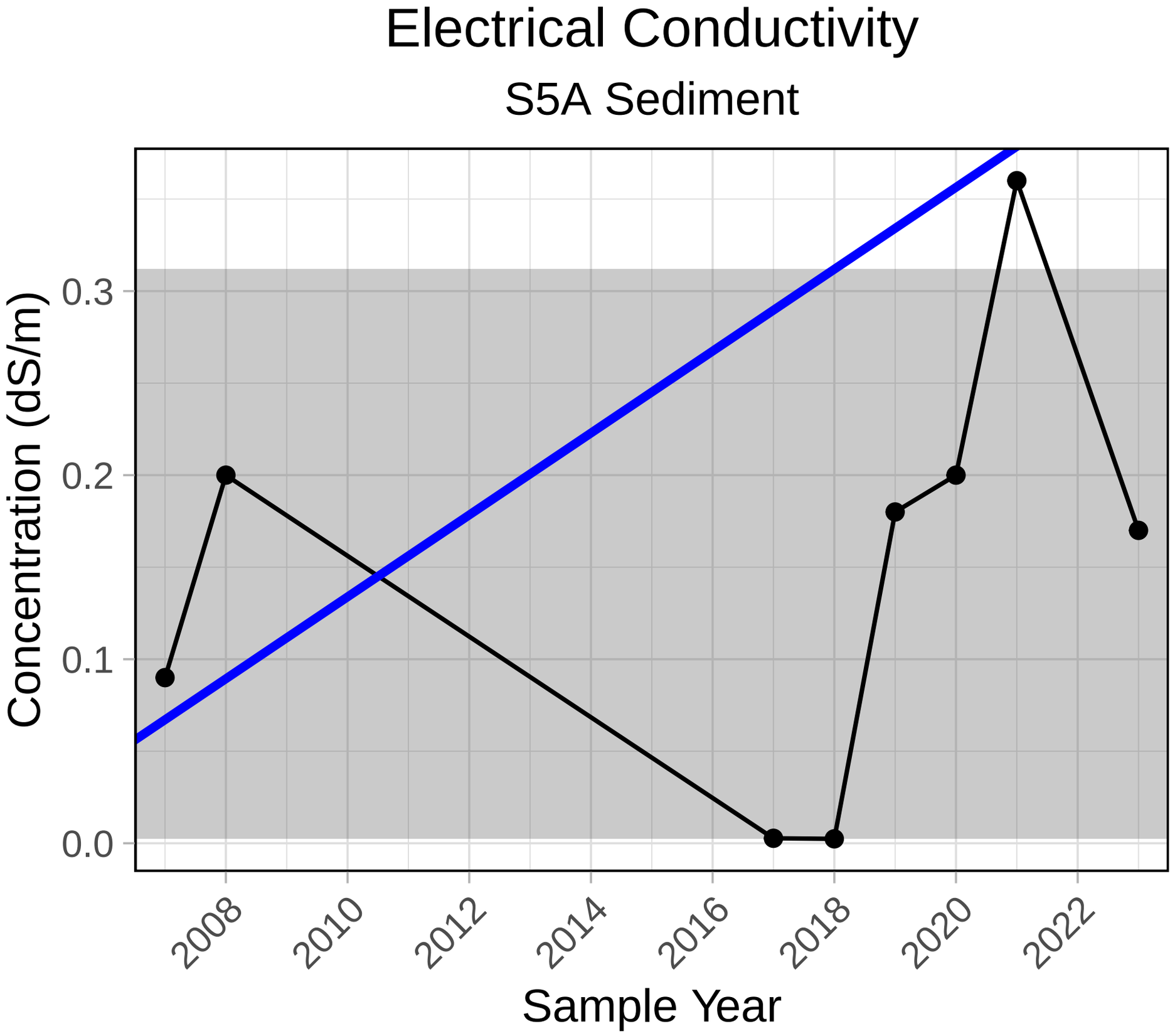

Strontium (total)
S5A Sediment
Concentration (mg/kg)
30
25
20
15
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

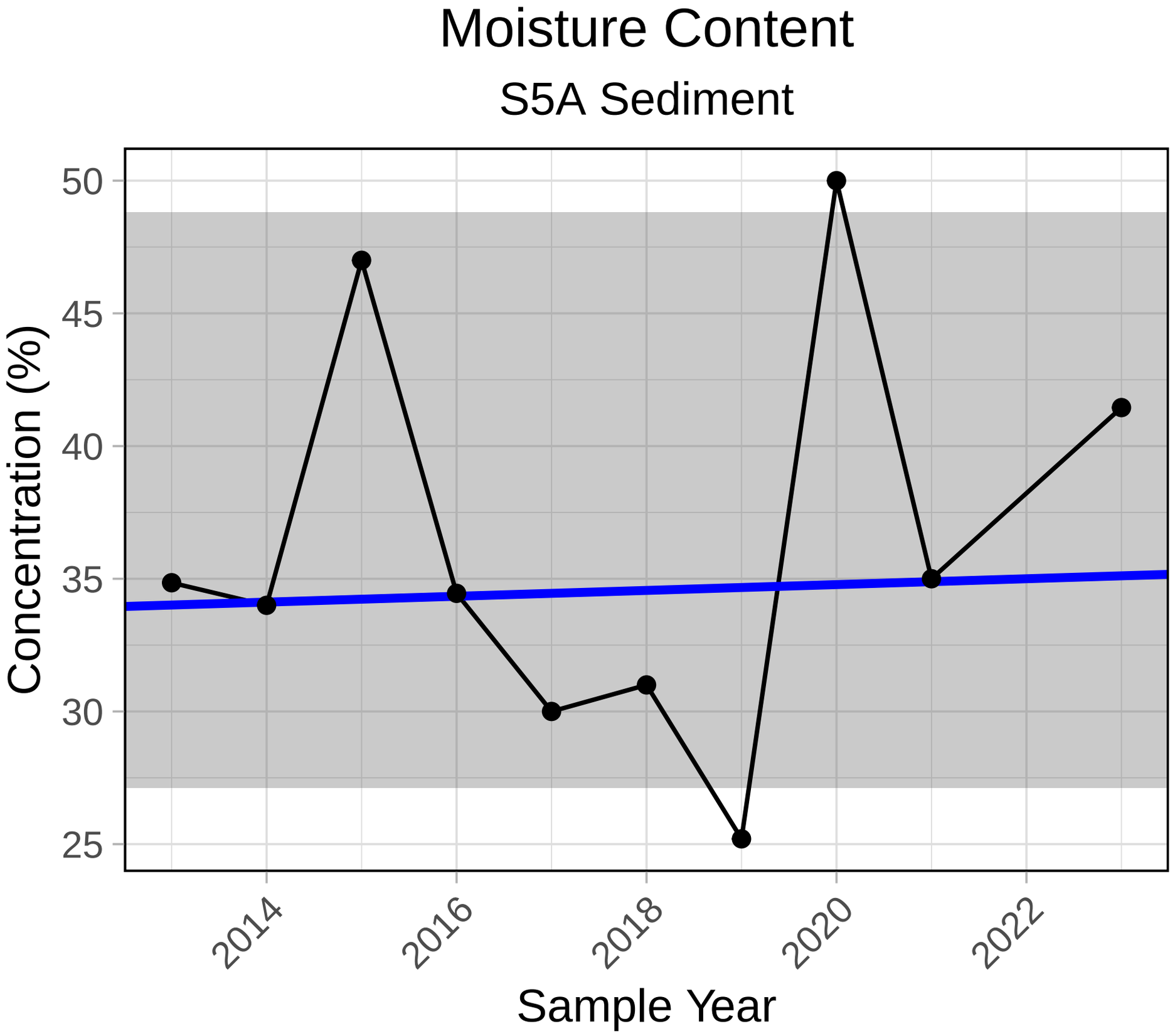

Uranium (total)
S5A Sediment
Concentration (mg/kg)
1.6
1.2
0.8
0.4
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.266

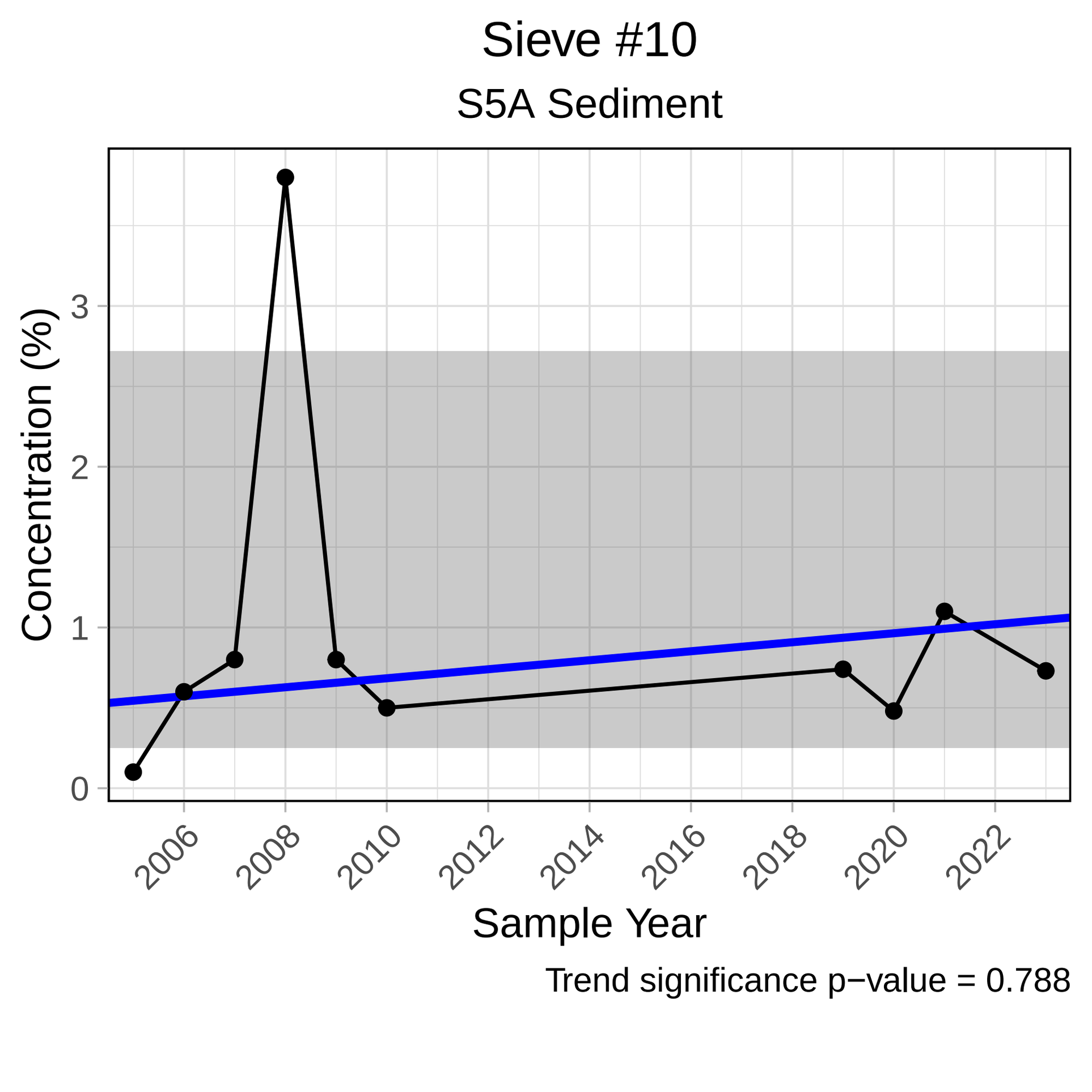

Vanadium (total)
S5A Sediment
Concentration (mg/kg)
25
20
15
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.788



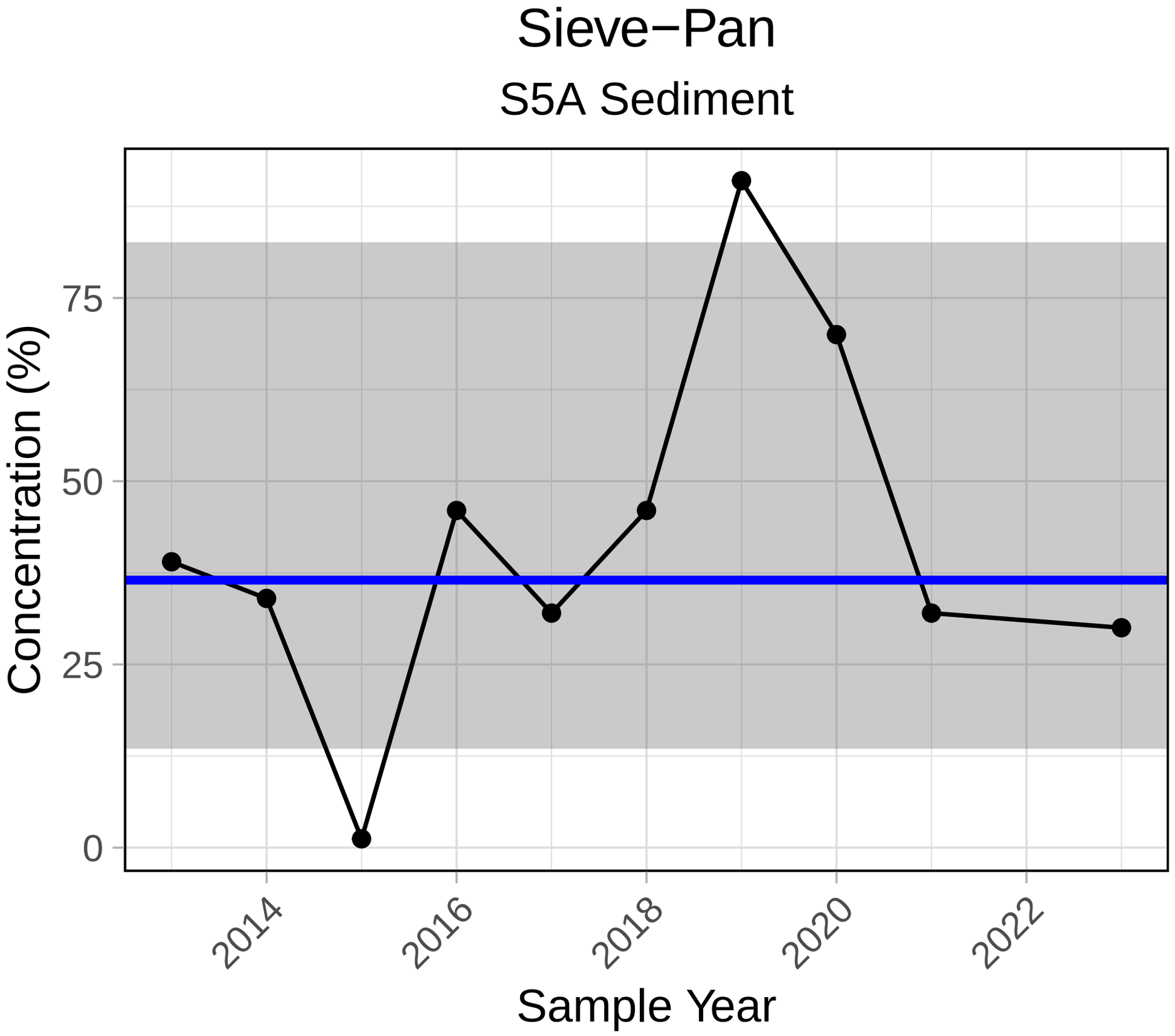
Trend significance p−value = 0.858
ISQG level = 123 mg/kg (maximum)
PEL level = 315 mg/kg (maximum)

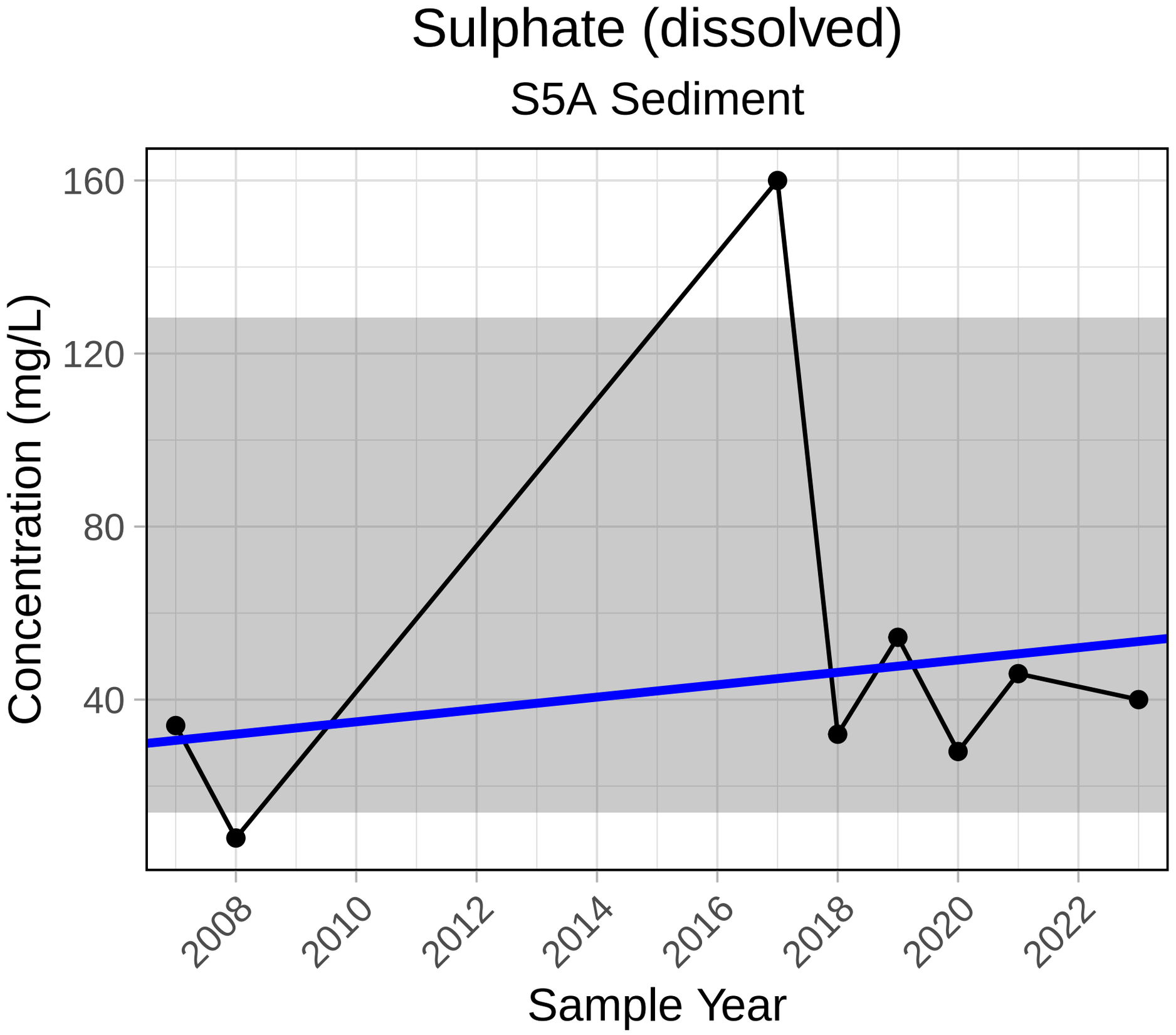

Electrical Conductivity
S5A Sediment
Concentration (dS/m)
0.3
0.2
0.1
0.0
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.454

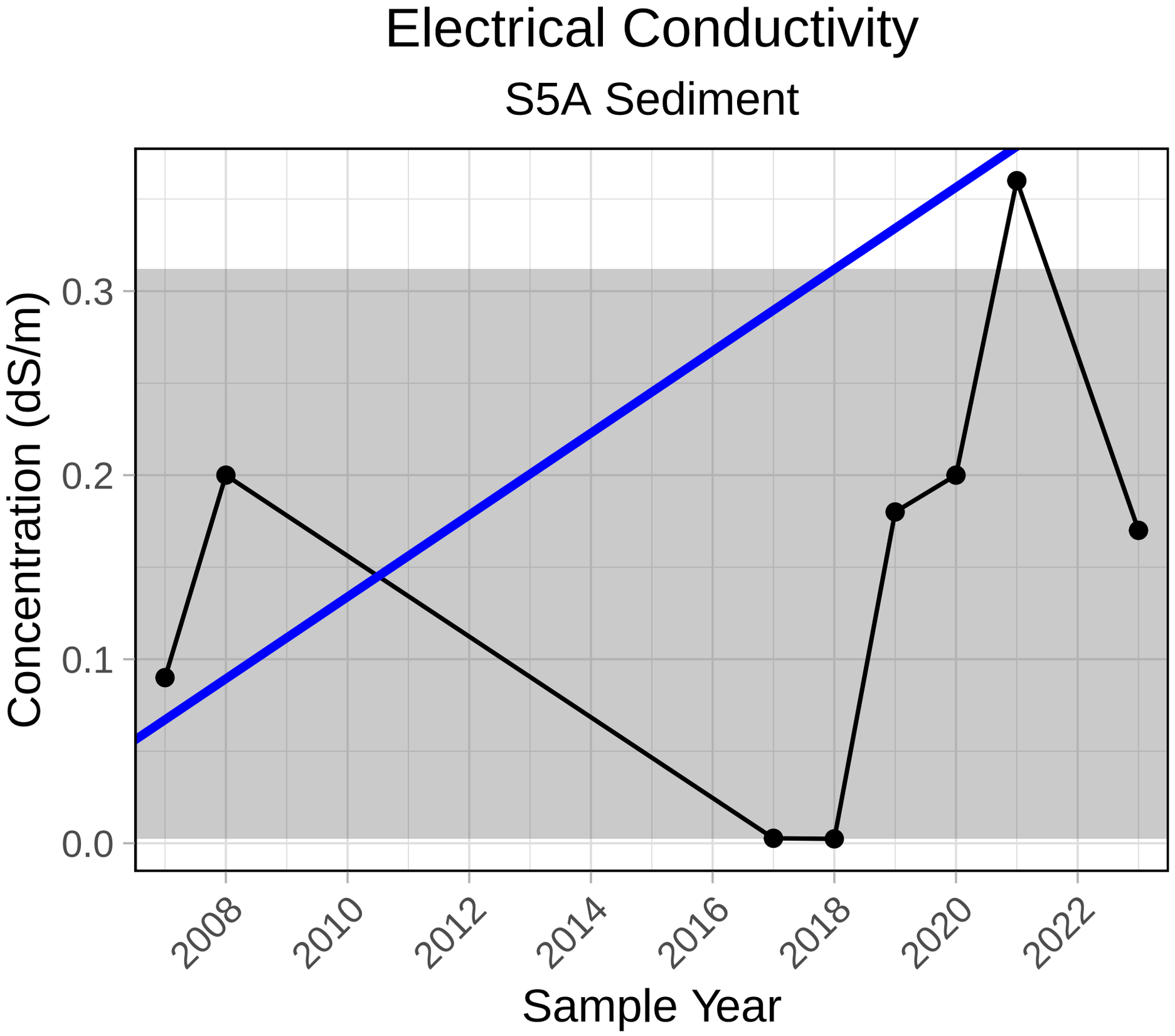

Moisture Content
S5A Sediment
Concentration (%)
50
45
40
35
30
25
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

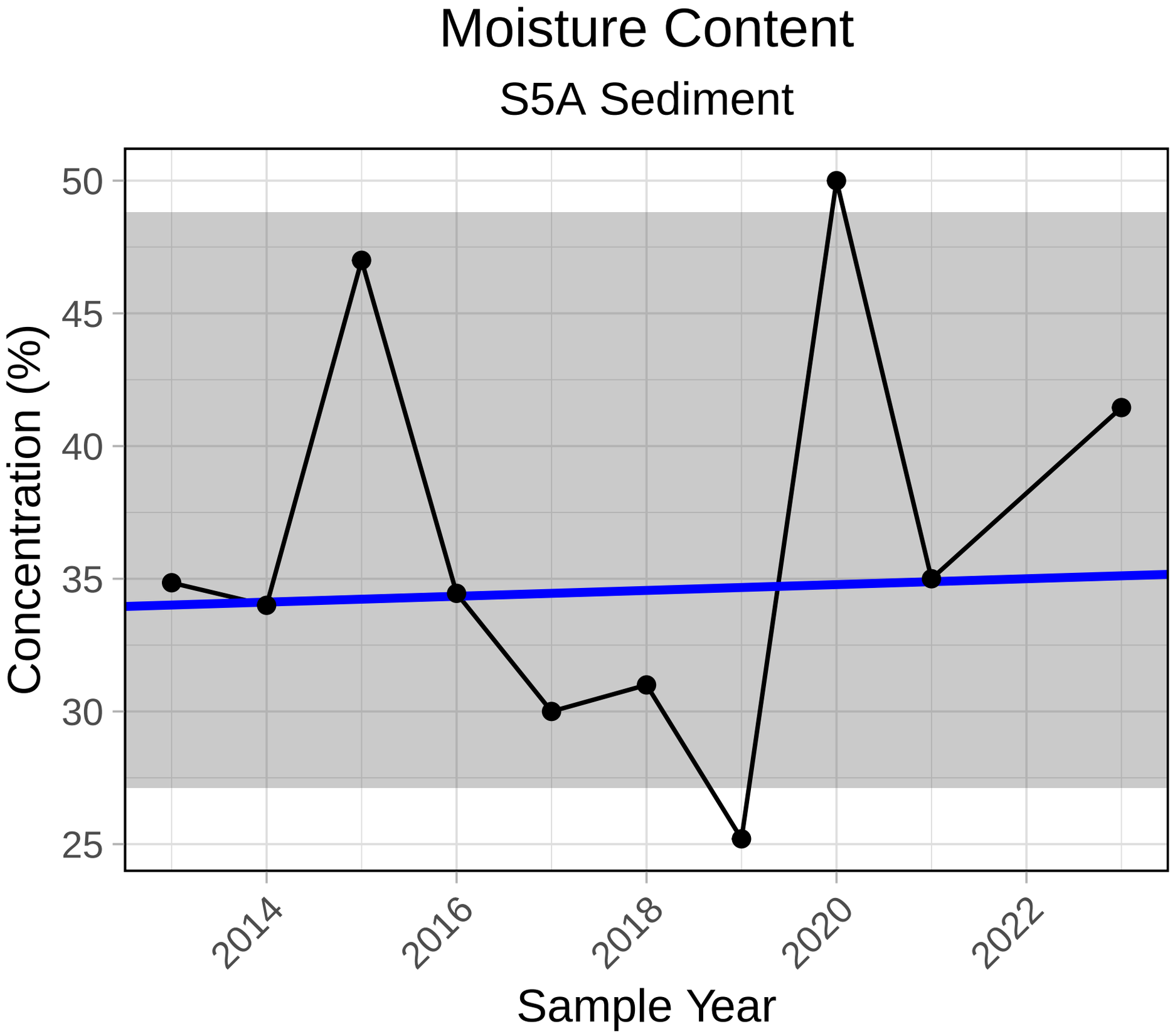

Sieve #10
S5A Sediment
Concentration (%)
0
1
2
3
2006
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.788

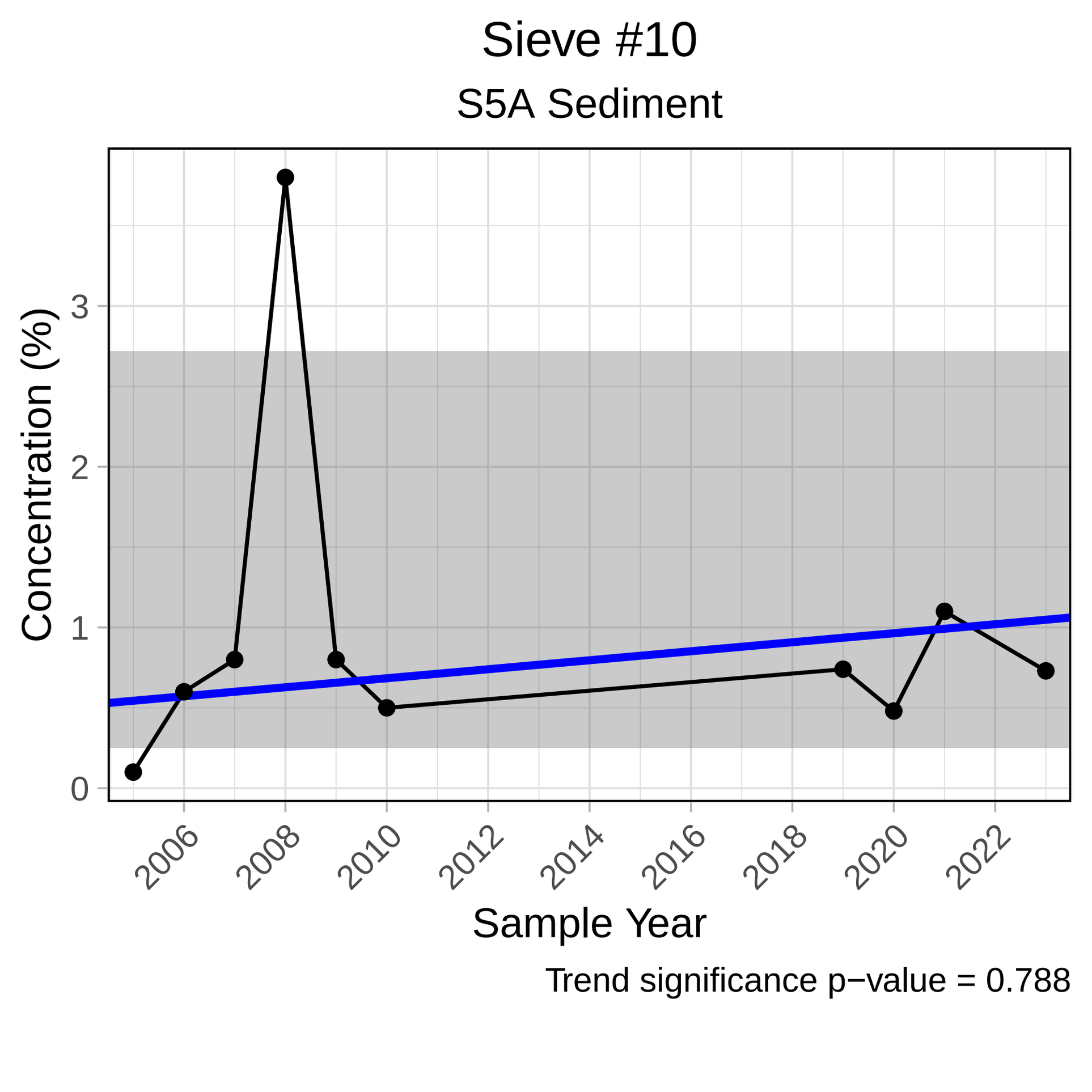
Sieve #200
S5A Sediment
100
75
50
25
Concentration (%)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1


Sieve−Pan
S5A Sediment
Concentration (%)
75
50
25
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

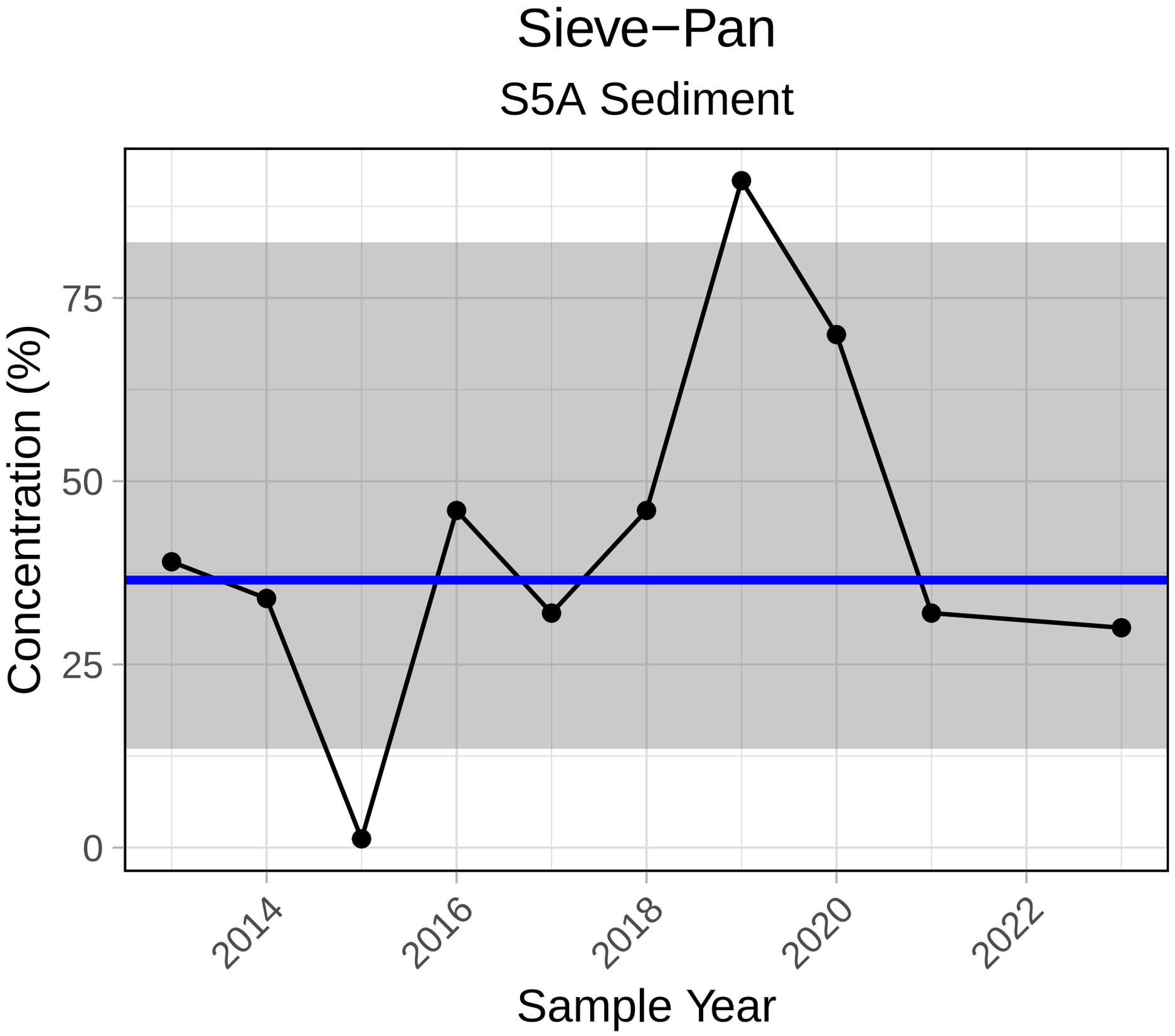

Sulphate (dissolved)
S5A Sediment
Concentration (mg/L)
160
120
80
40
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.902

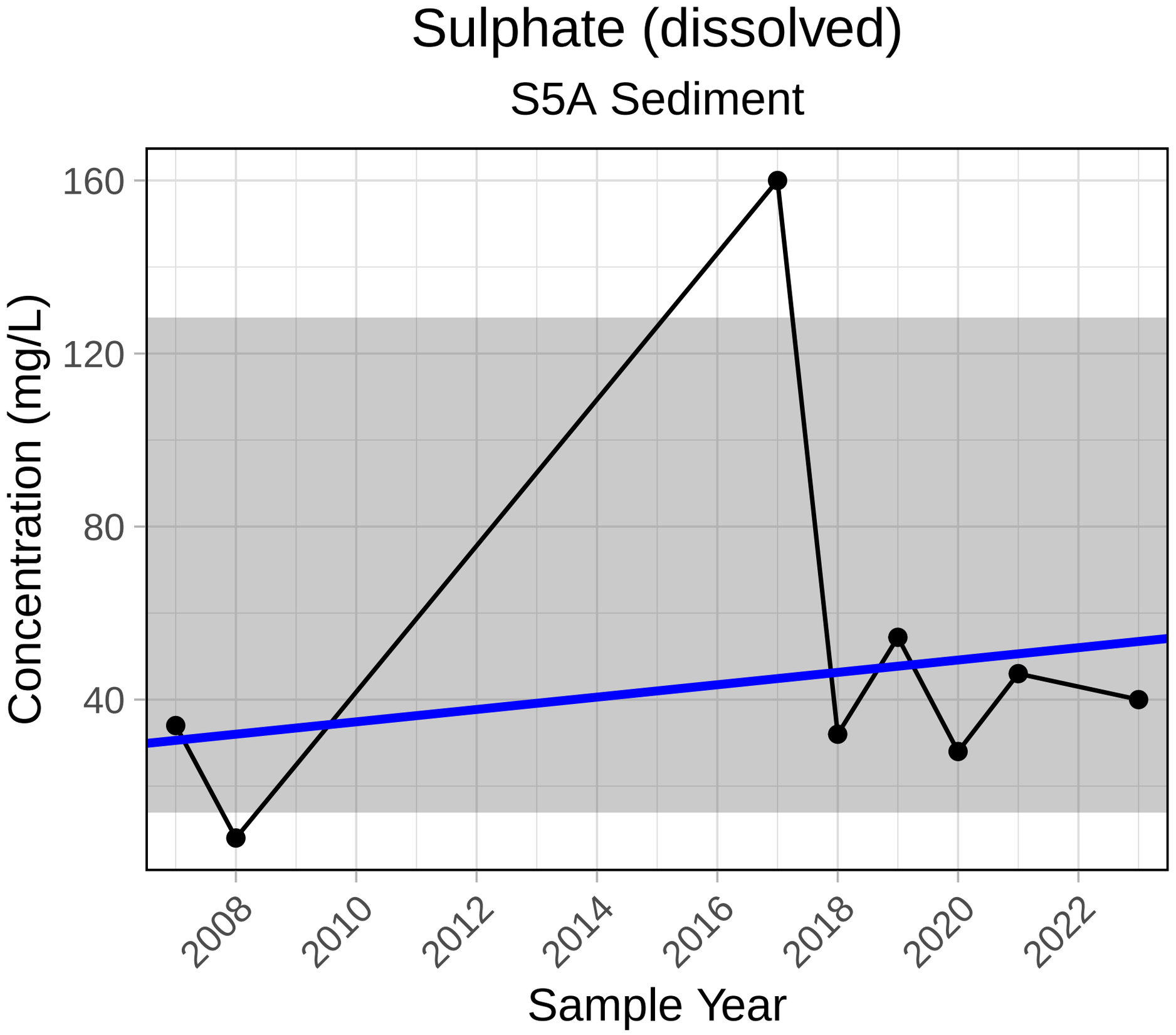

Electrical Conductivity
S5A Sediment
Concentration (dS/m)
0.3
0.2
0.1
0.0
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.454

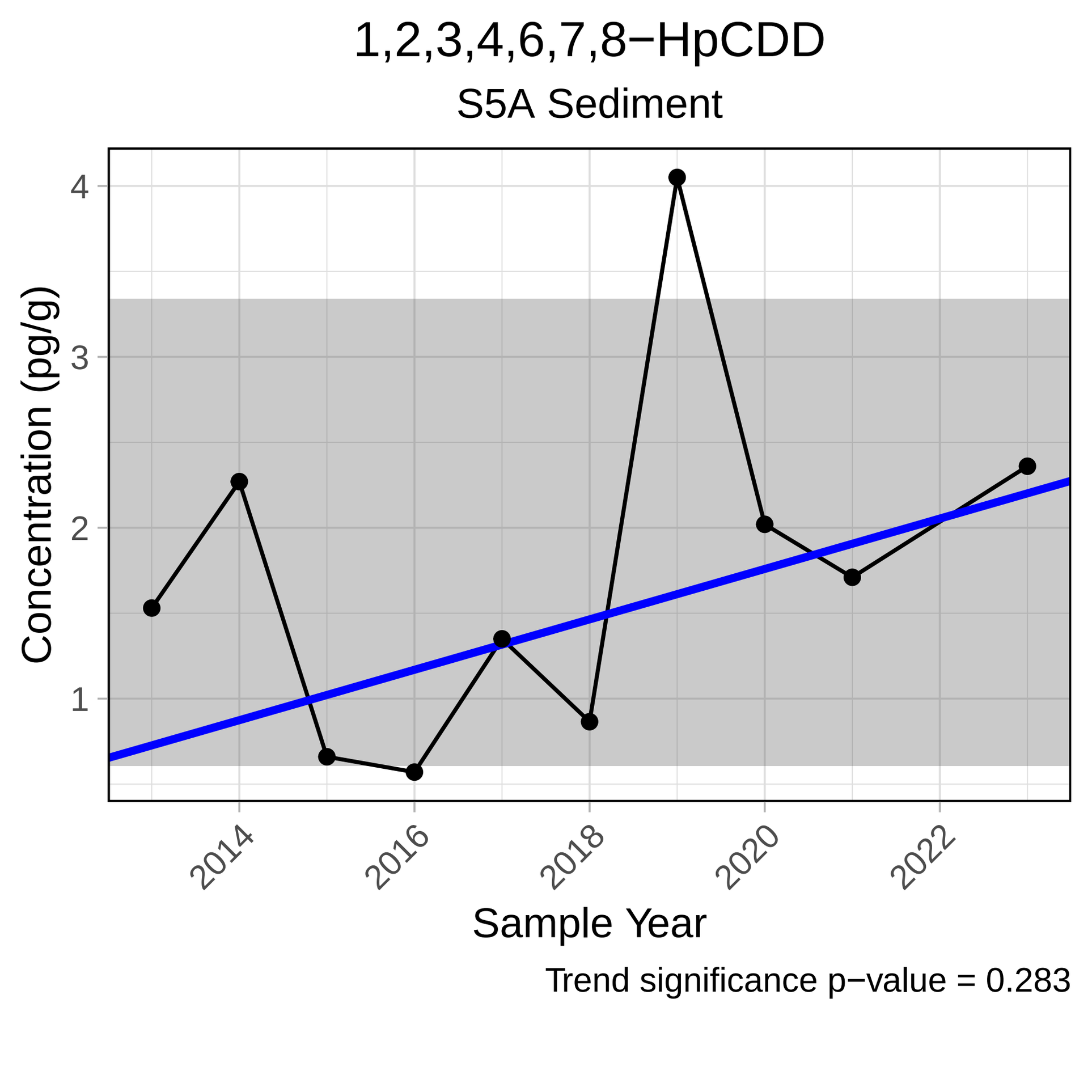

Moisture Content
S5A Sediment
Concentration (%)
50
45
40
35
30
25
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

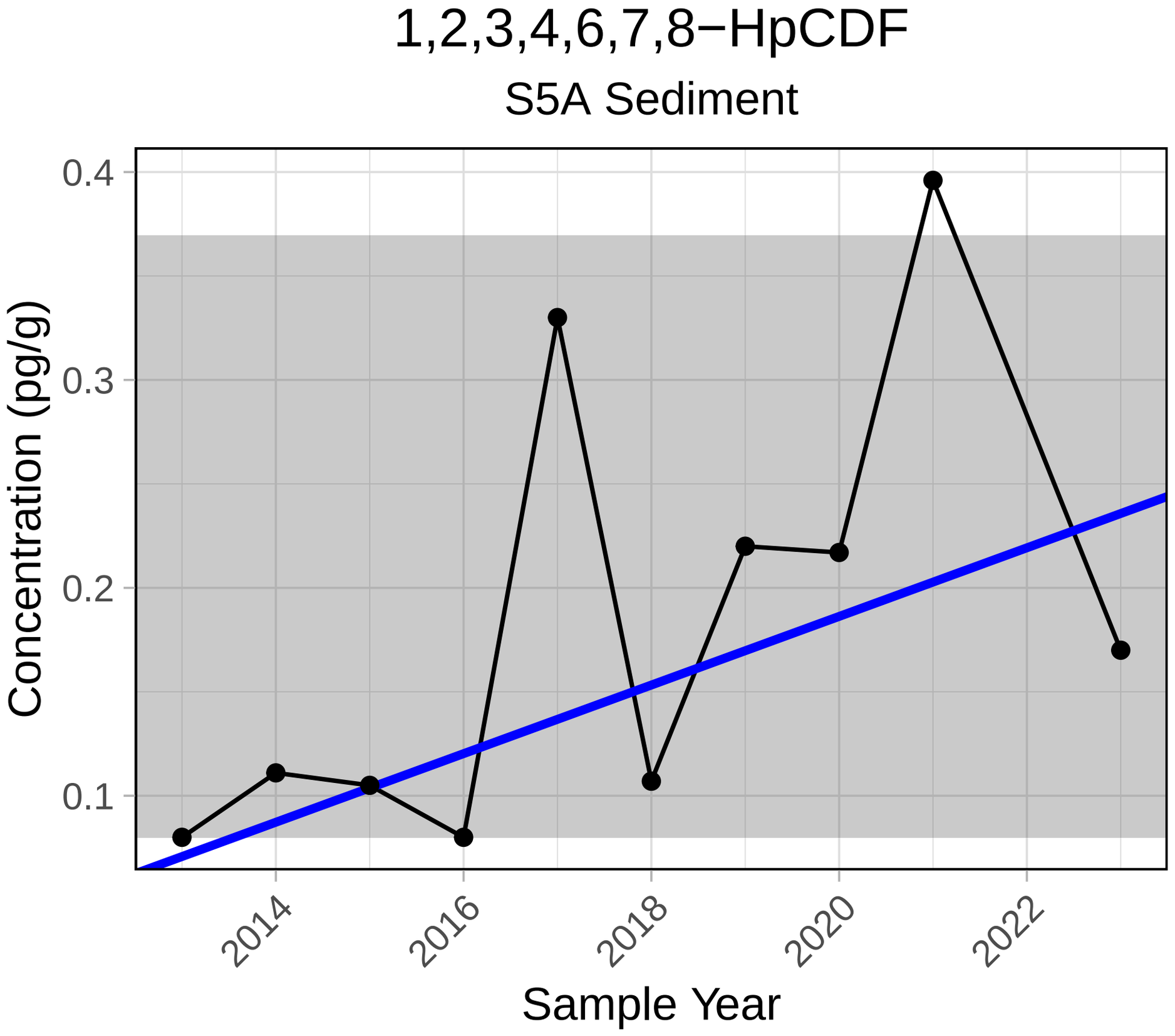

Sieve #10
S5A Sediment
Concentration (%)
0
1
2
3
2006
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.788

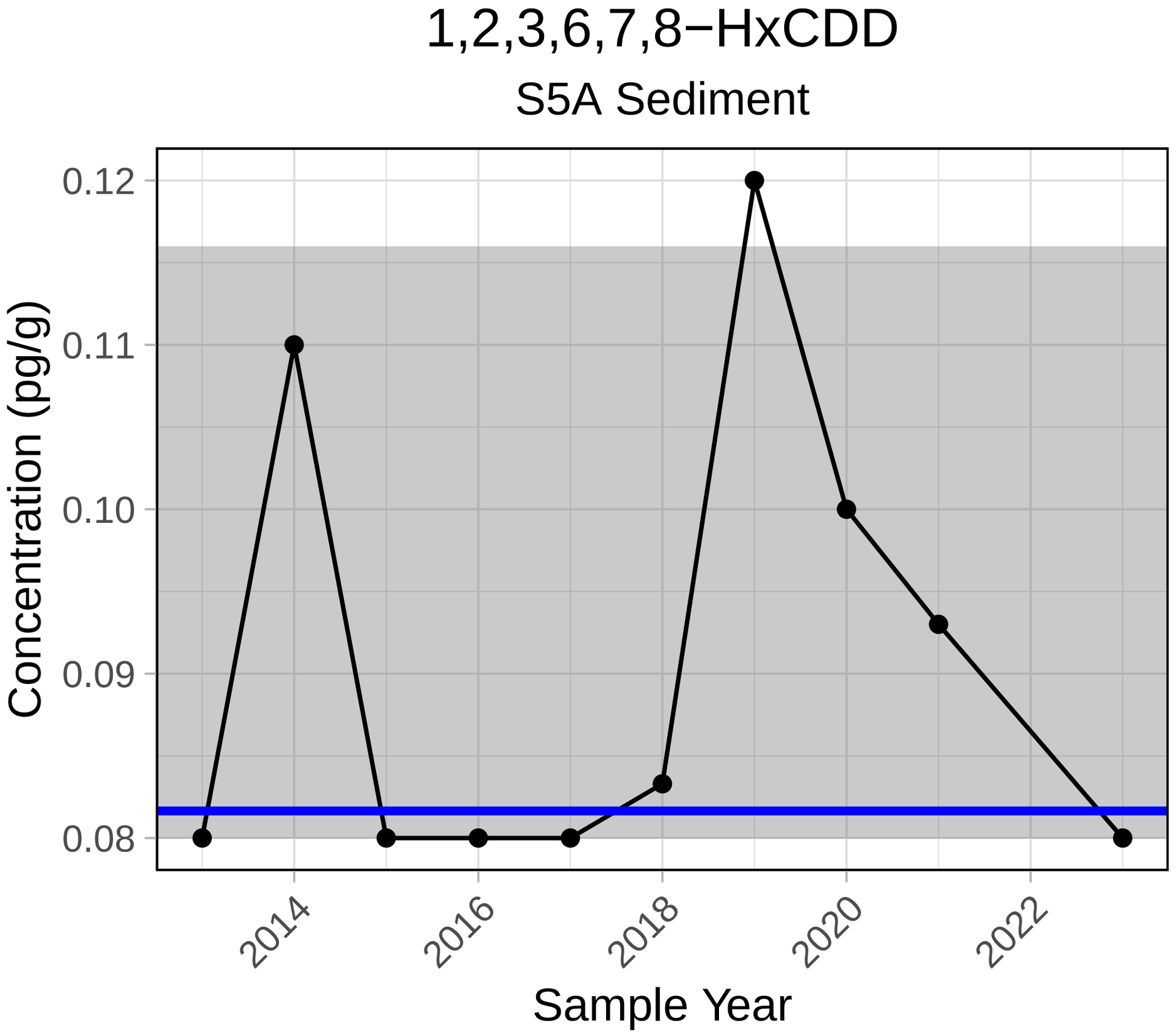
Sieve #200
S5A Sediment
100
75
50
25
Concentration (%)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

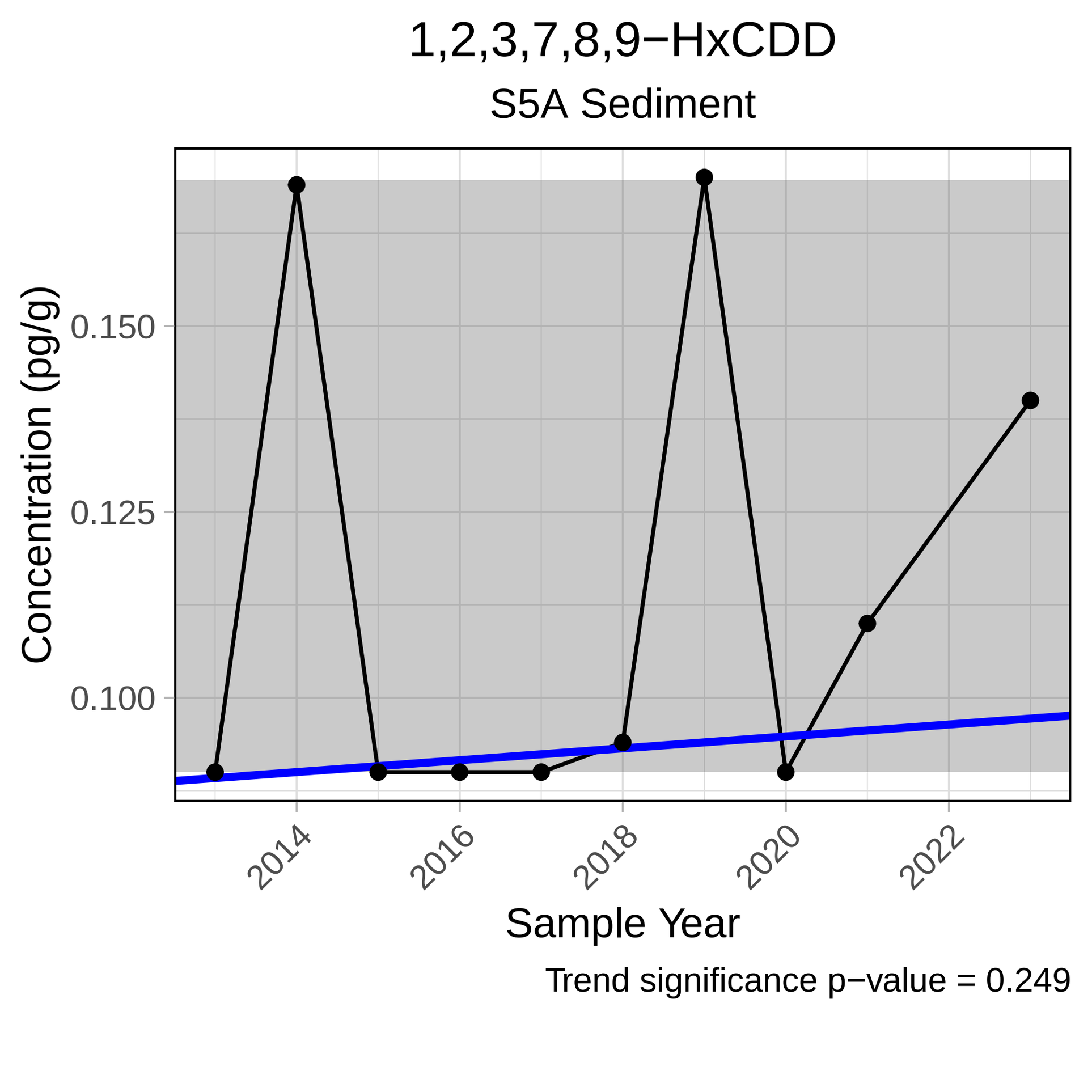

Sieve−Pan
S5A Sediment
Concentration (%)
75
50
25
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

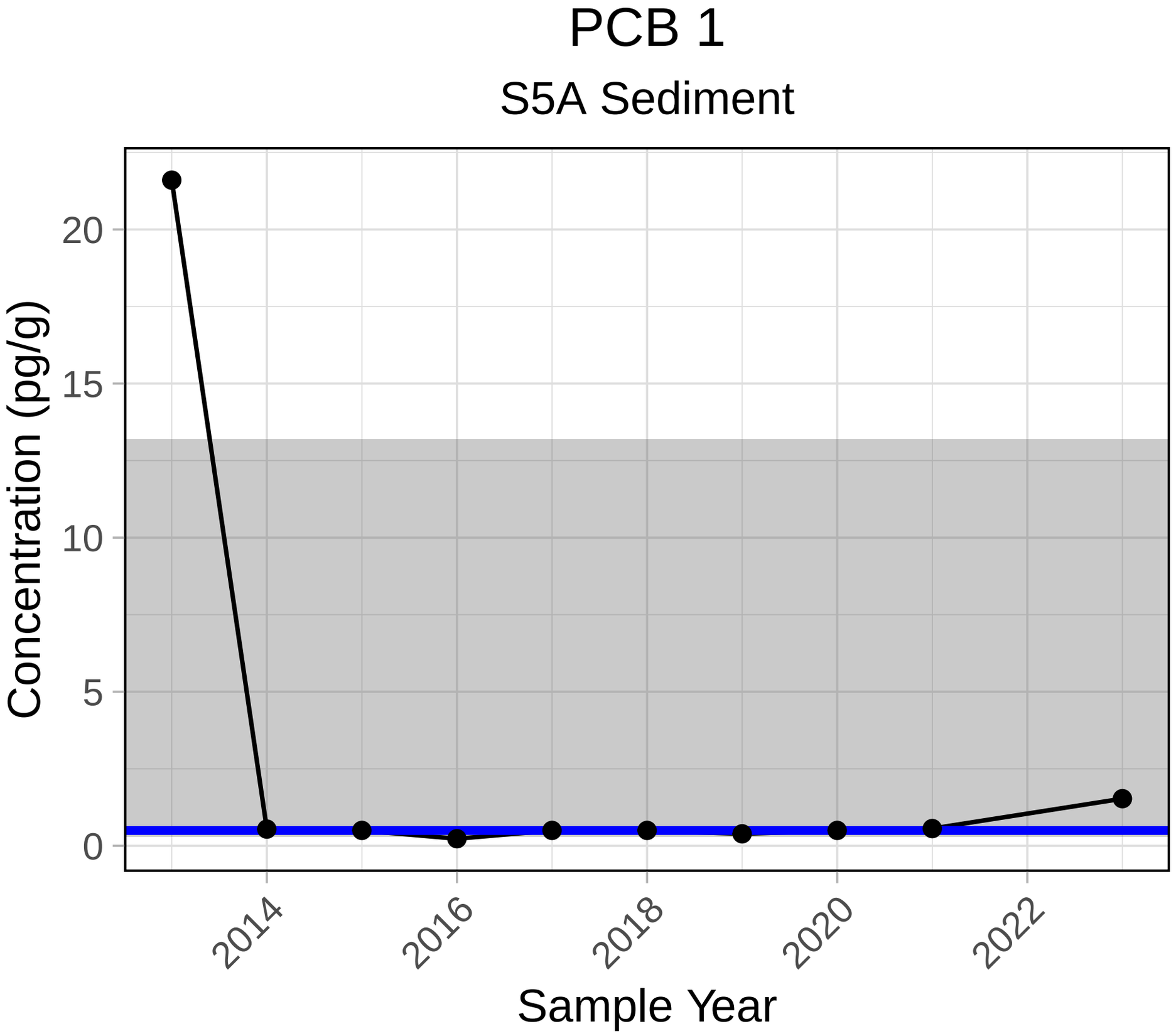

Sulphate (dissolved)
S5A Sediment
Concentration (mg/L)
160
120
80
40
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.902

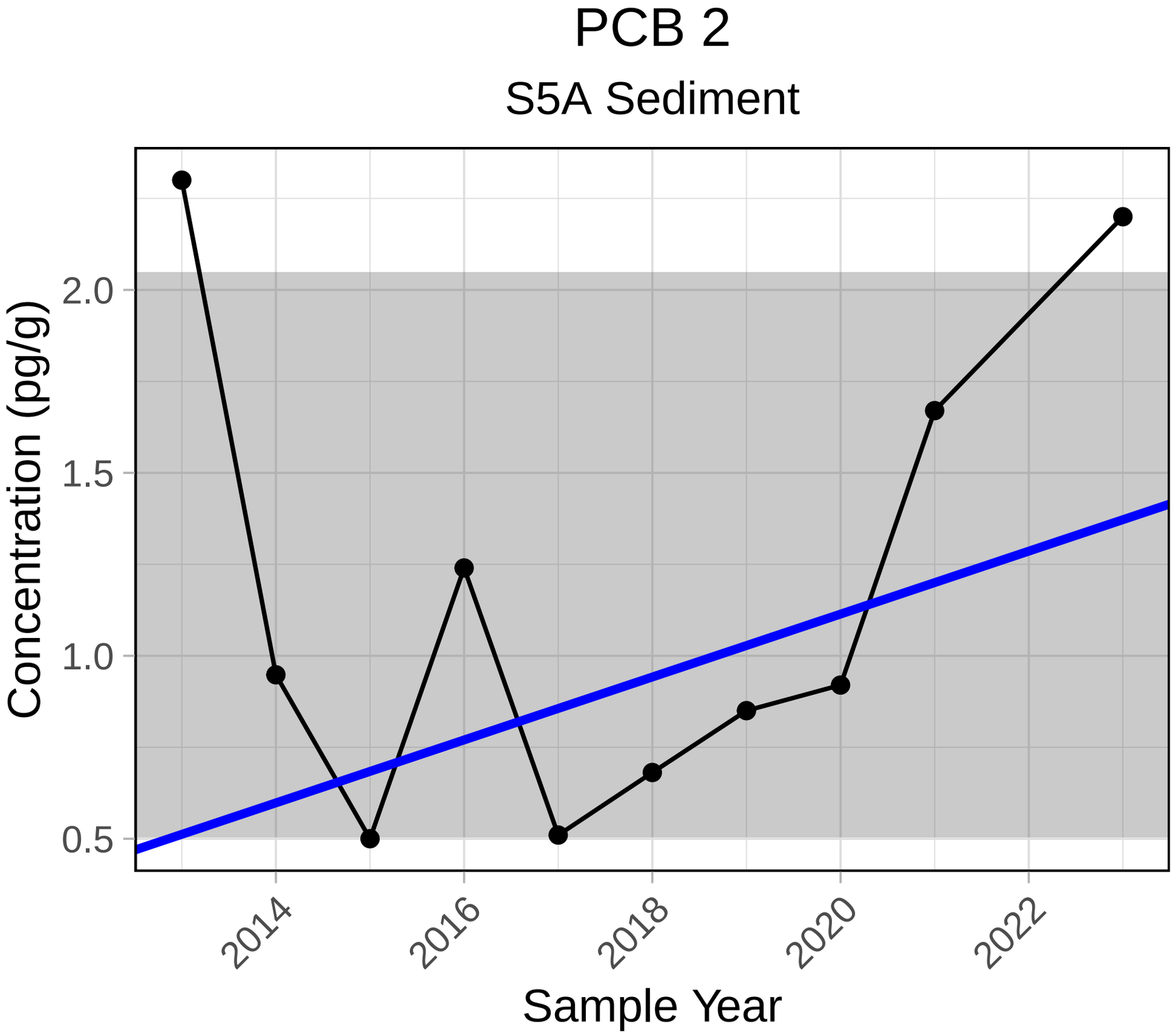

1,2,3,4,6,7,8−HpCDD
S5A Sediment
Concentration (pg/g)
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283


1,2,3,4,6,7,8−HpCDF
S5A Sediment
Concentration (pg/g)
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.088


1,2,3,6,7,8−HxCDD
S5A Sediment
Concentration (pg/g)
0.12
0.11
0.10
0.09
0.08
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.564

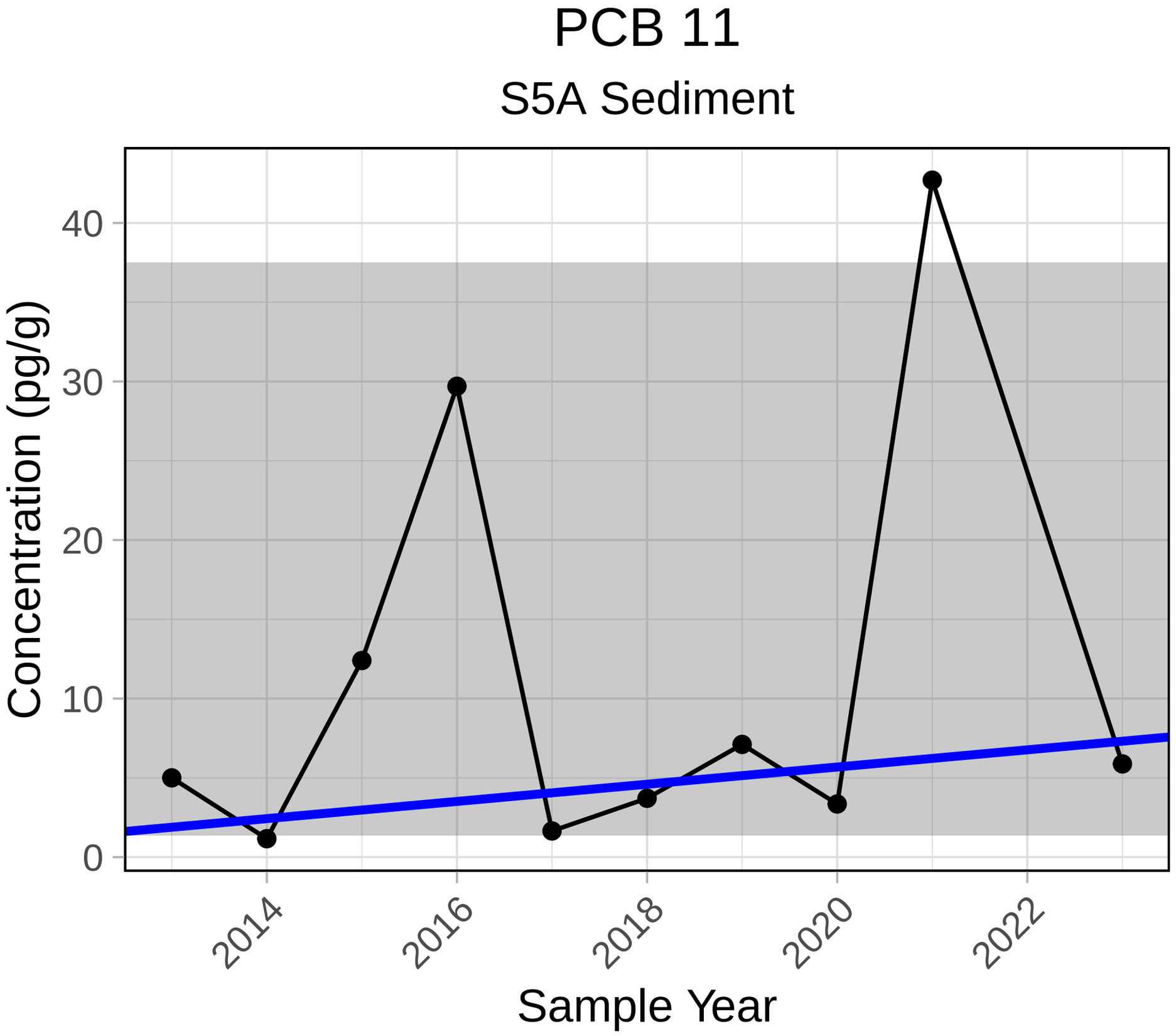

1,2,3,7,8,9−HxCDD
S5A Sediment
Concentration (pg/g)
0.150
0.125
0.100
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.249


PCB 1
S5A Sediment
Concentration (pg/g)
20
15
10
5
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1


PCB 2
S5A Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

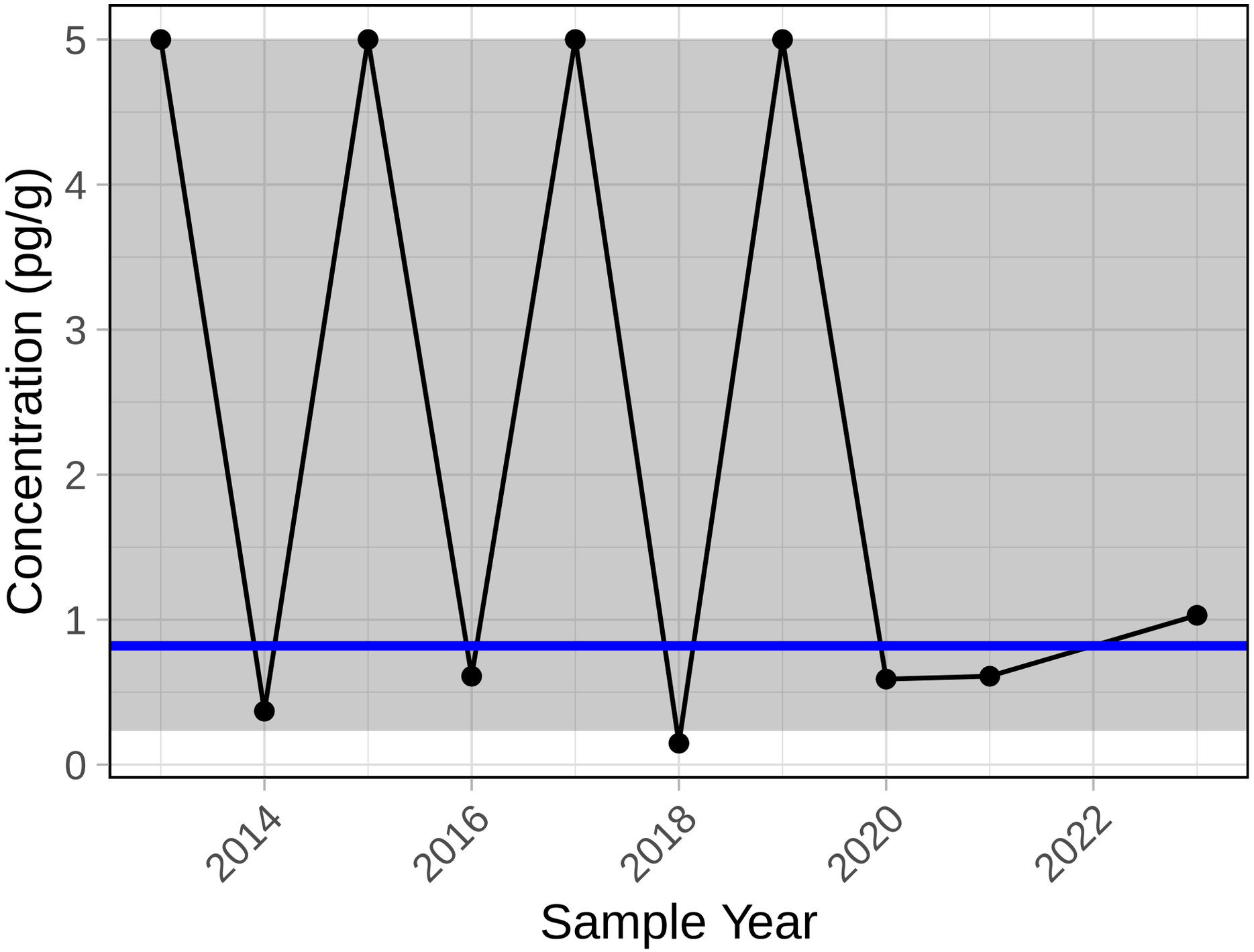
PCB 3
S5A Sediment
Concentration (pg/g)
8
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

PCB 8
S5A Sediment
Concentration (pg/g)
5
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1


PCB 11
S5A Sediment
Concentration (pg/g)
0
10
20
30
40
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

PCB 14

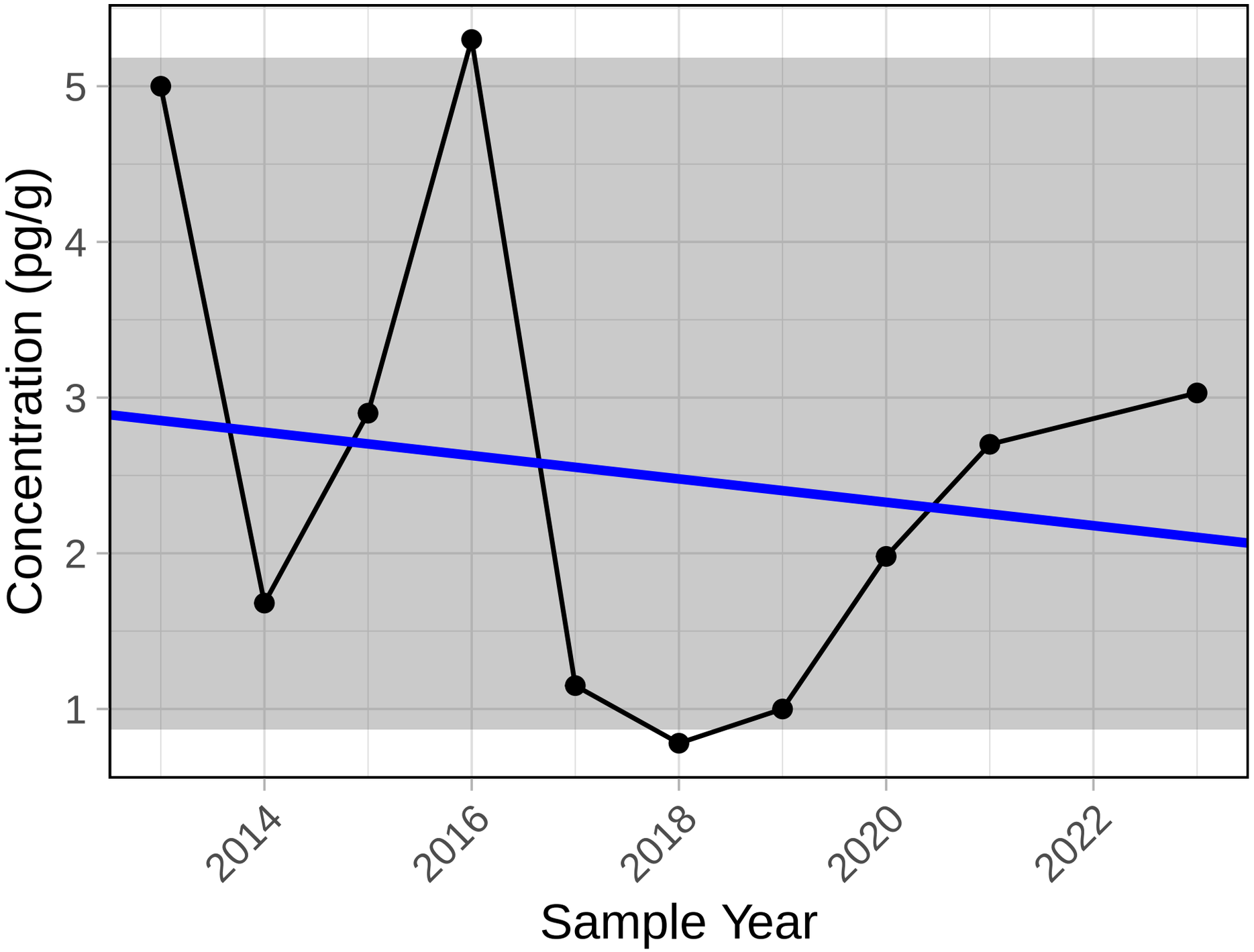
S5A Sediment



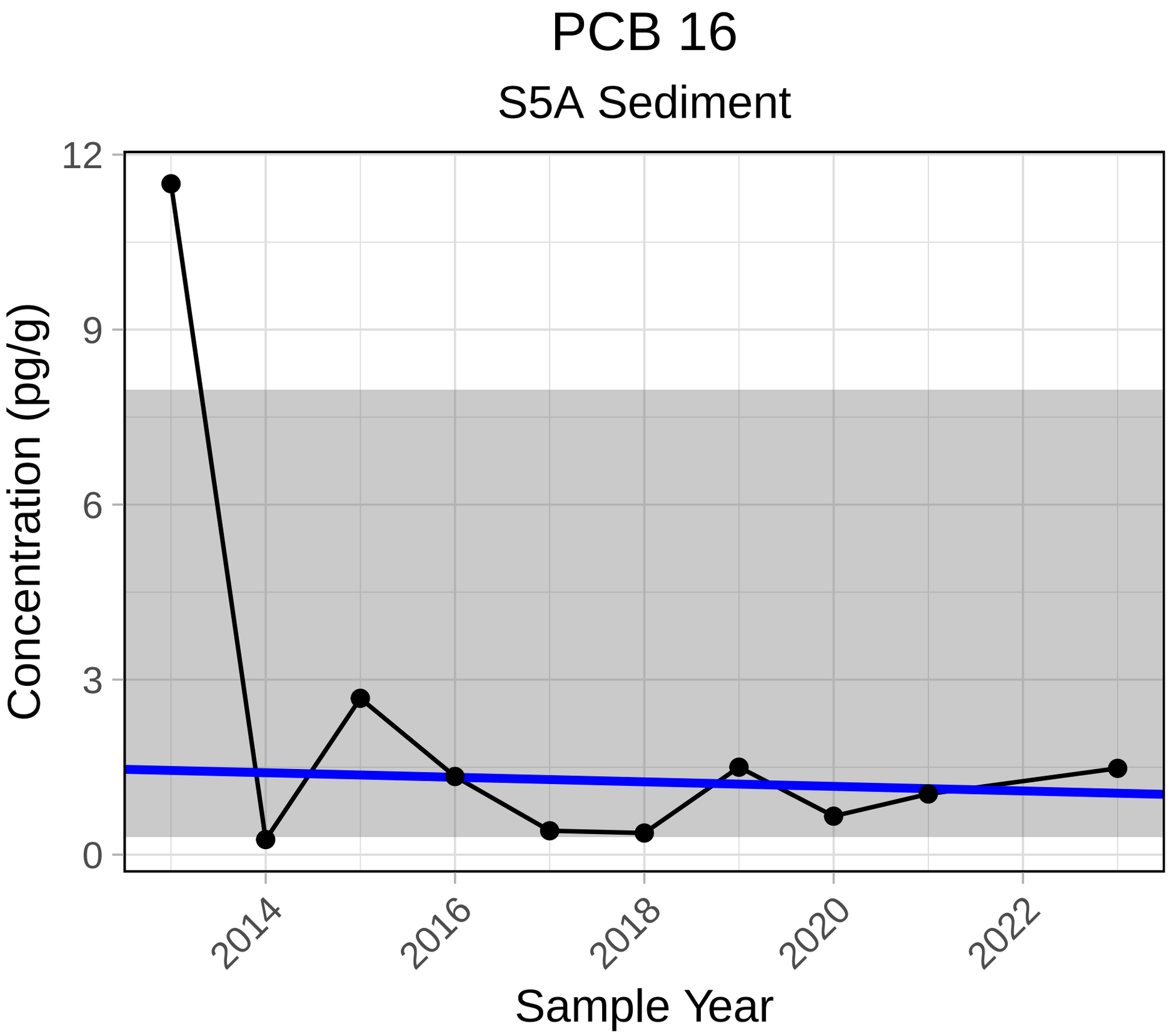
Trend significance p−value = 0.78

PCB 15

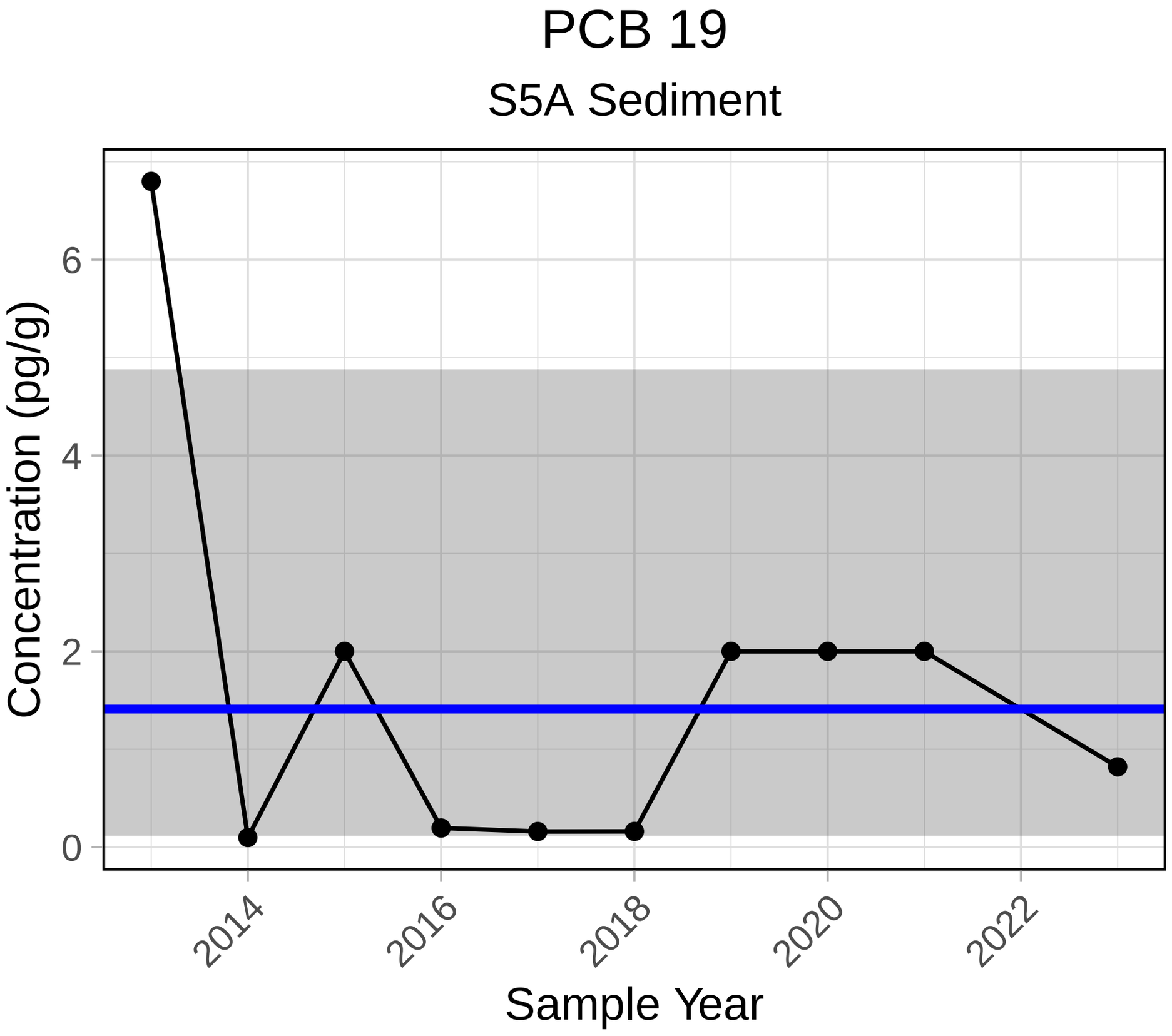
S5A Sediment

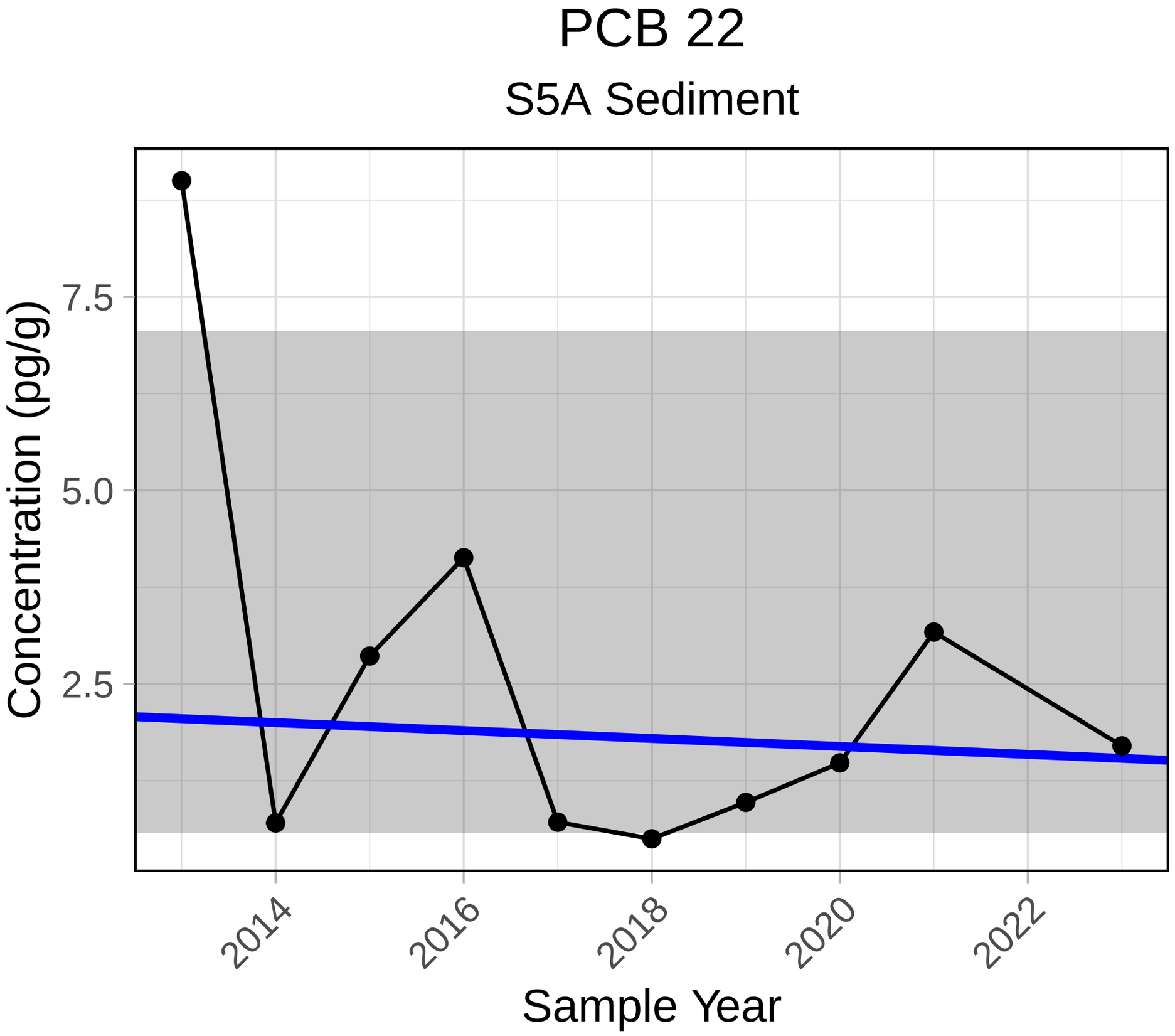


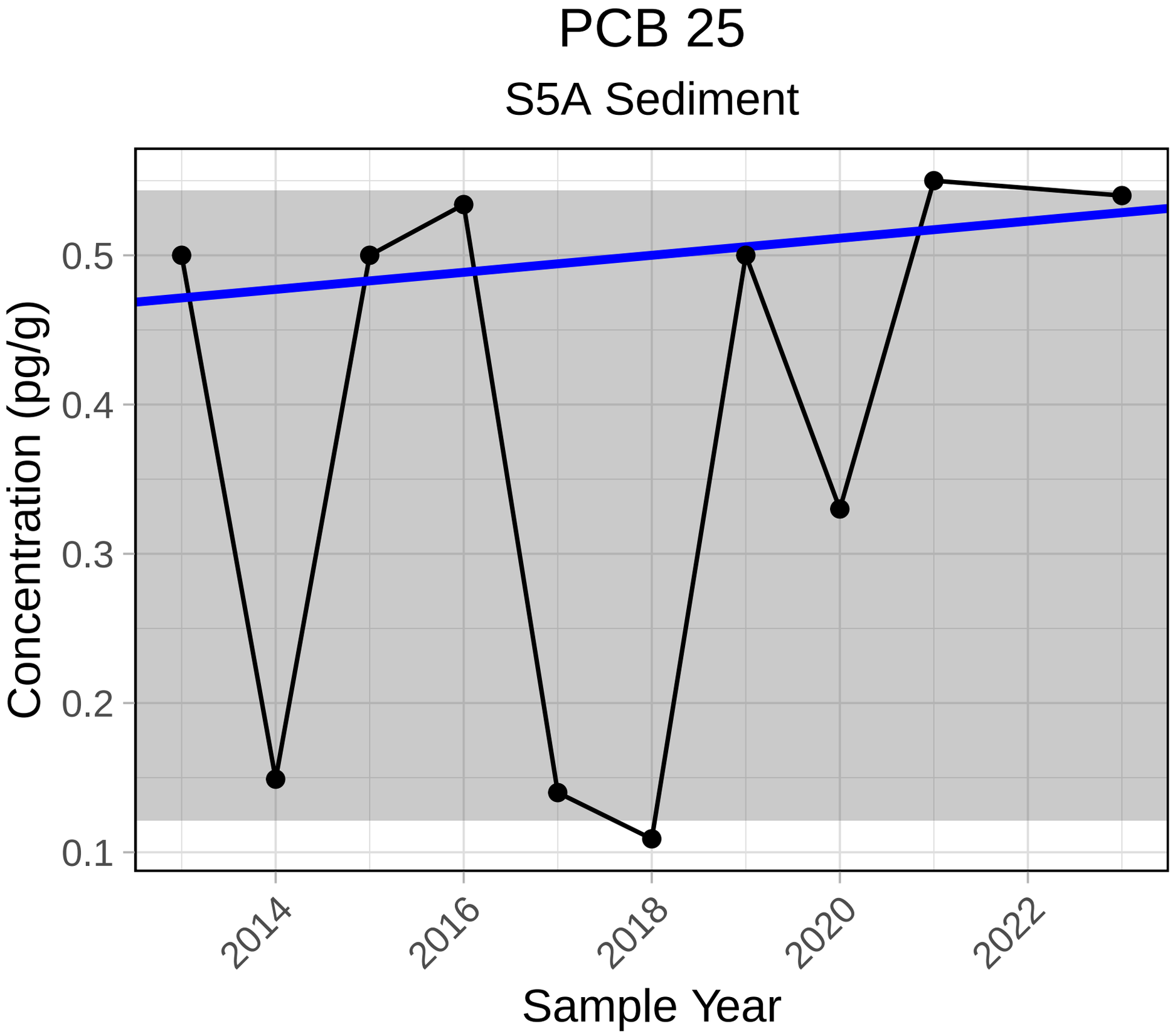
Trend significance p−value = 0.858

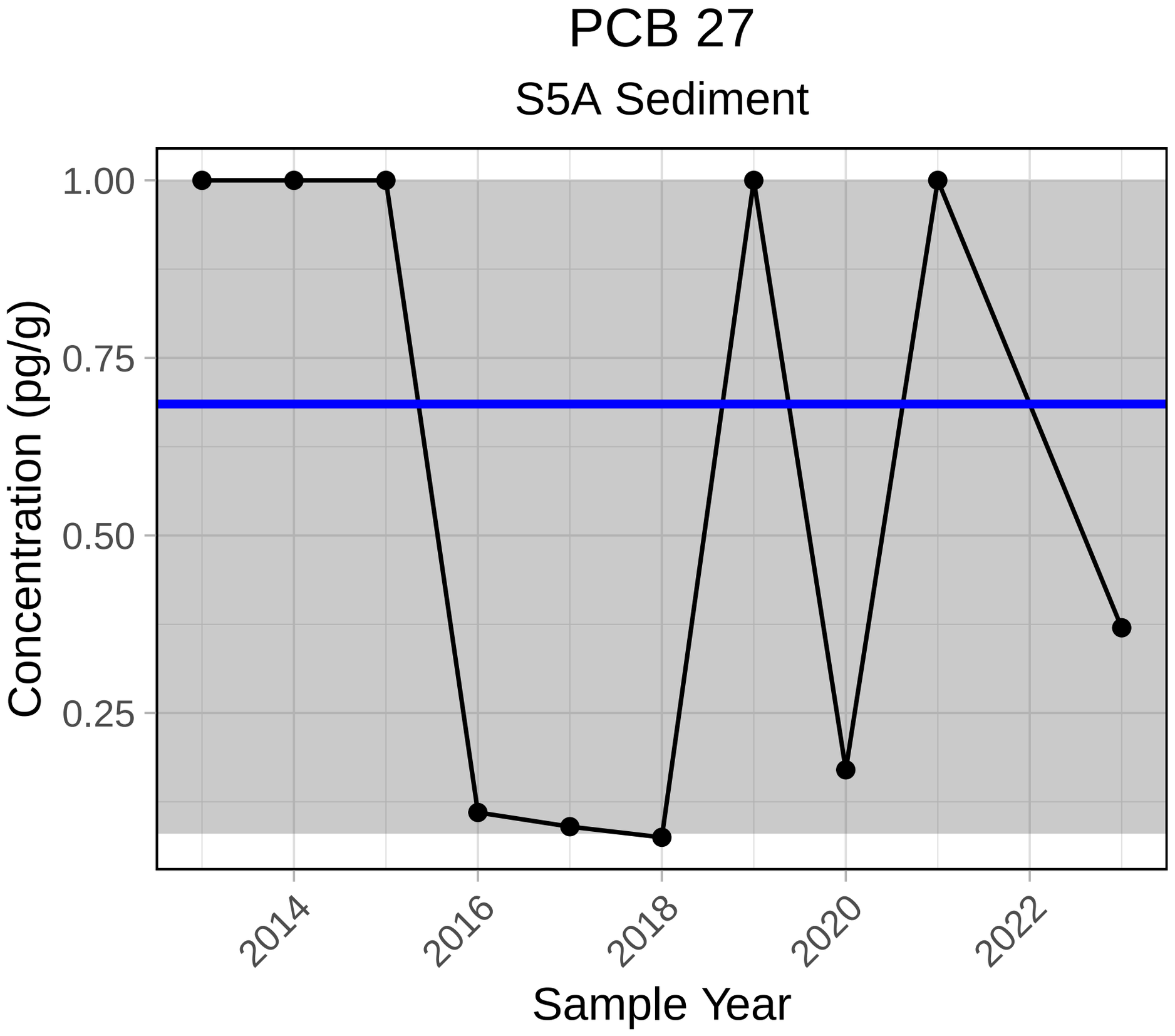

PCB 16
S5A Sediment
Concentration (pg/g)
12
9
6
3
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

PCB 17
S5A Sediment
Concentration (pg/g)
10
5
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858


PCB 19
S5A Sediment
Concentration (pg/g)
0
2
4
6
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.853

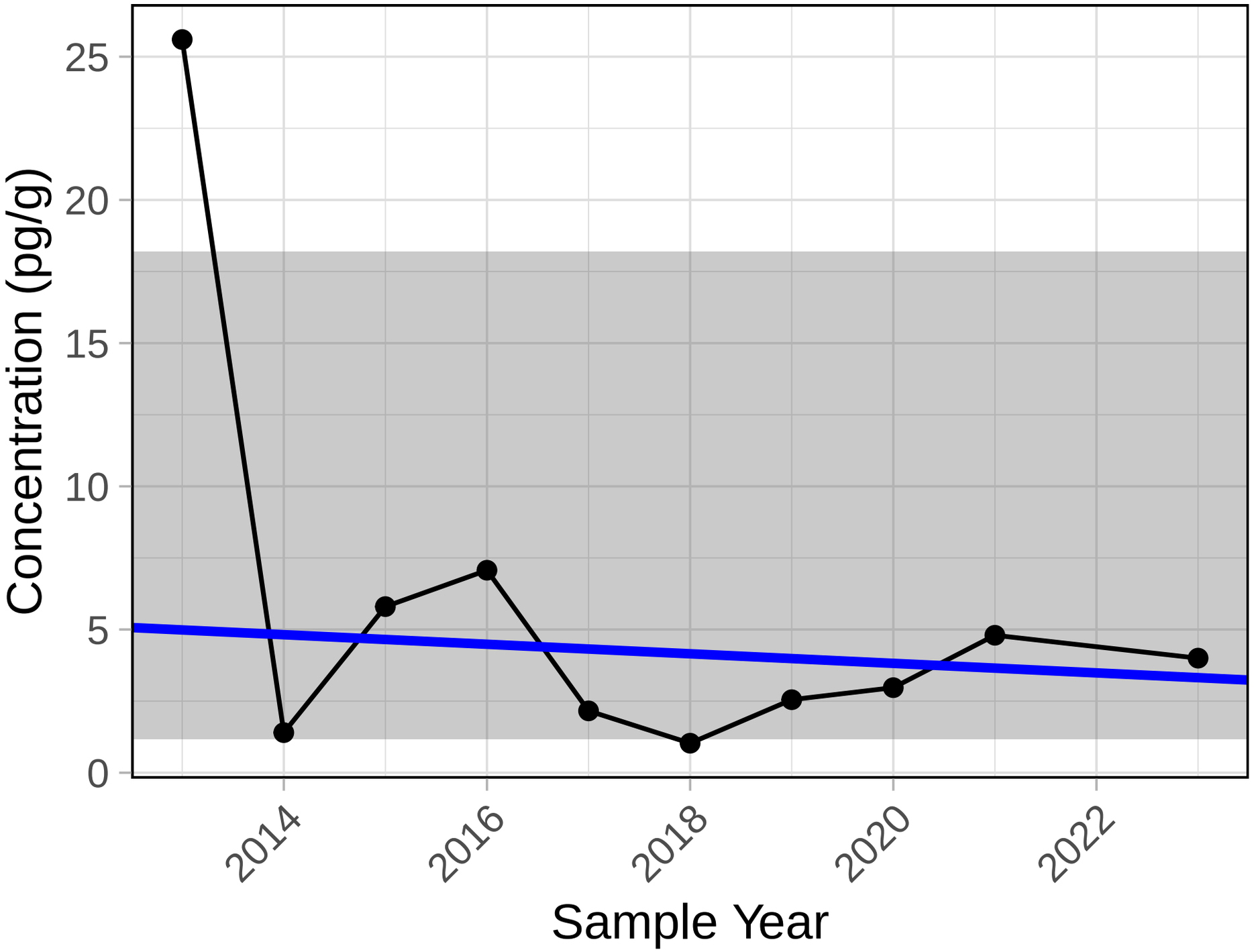

PCB 22
S5A Sediment
Concentration (pg/g)
7.5
5.0
2.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1


PCB 25
S5A Sediment
Concentration (pg/g)
0.5
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.414

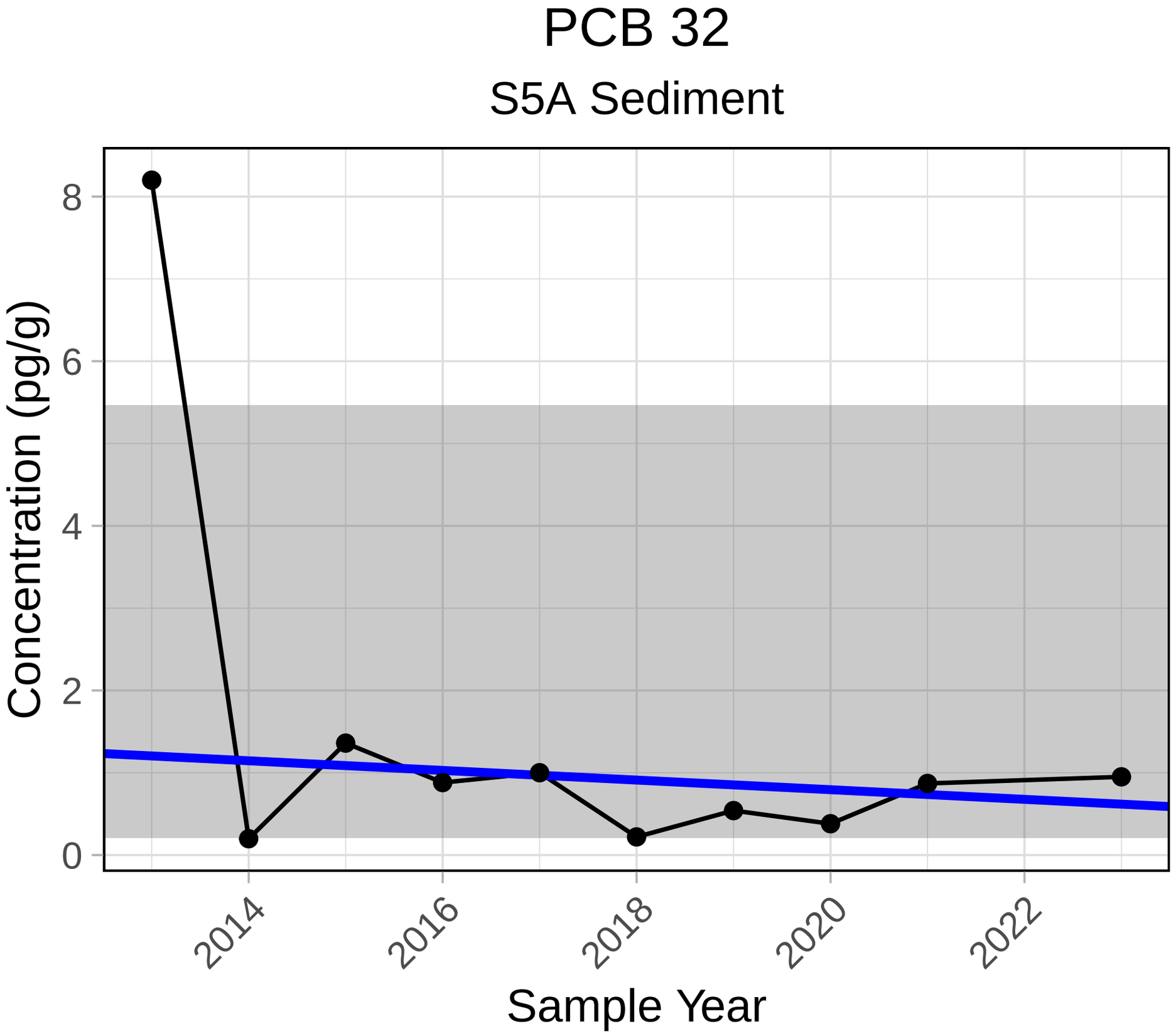

PCB 27
S5A Sediment
1.00
0.75
0.50
0.25
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.564

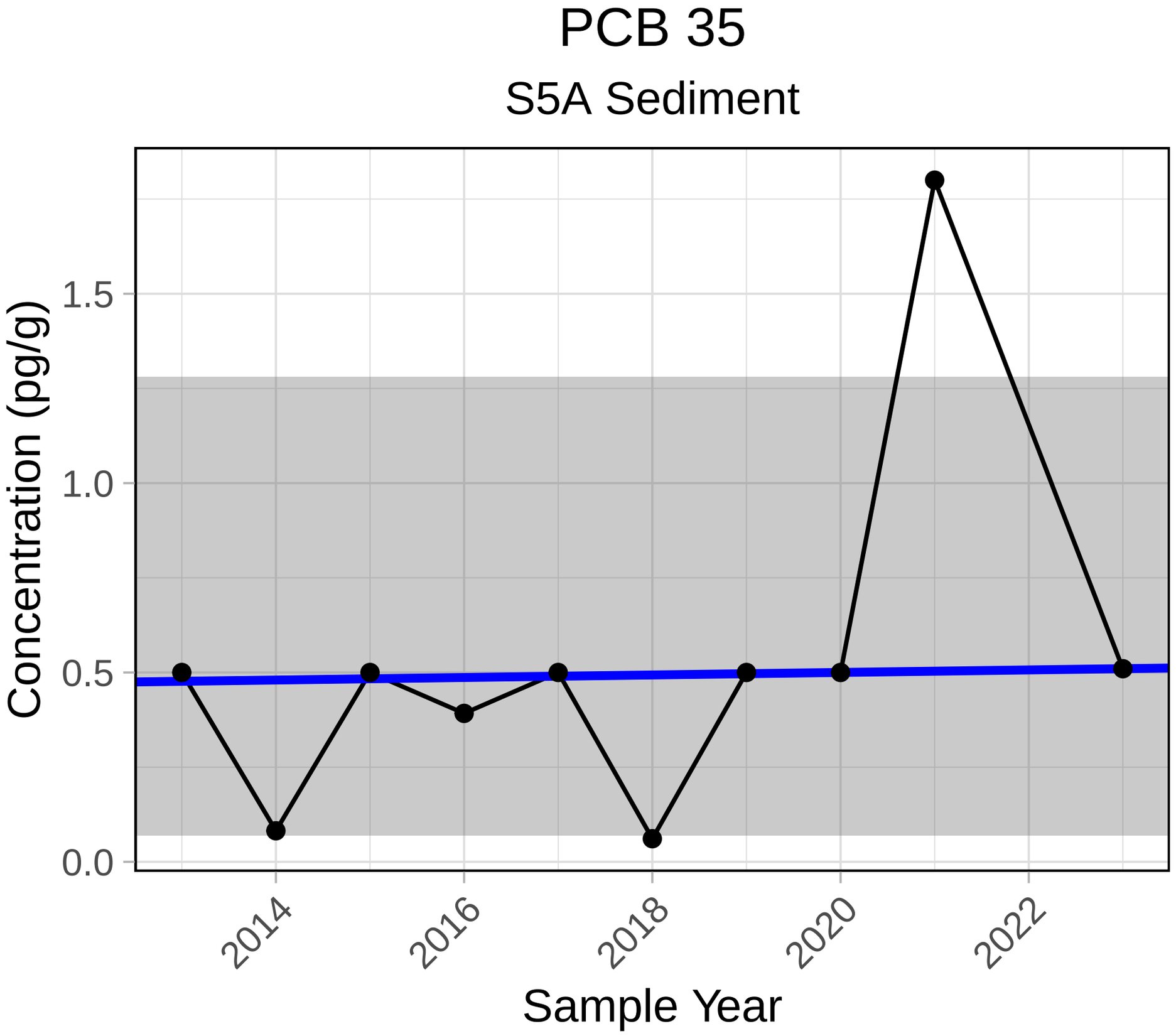
PCB 31

S5A Sediment



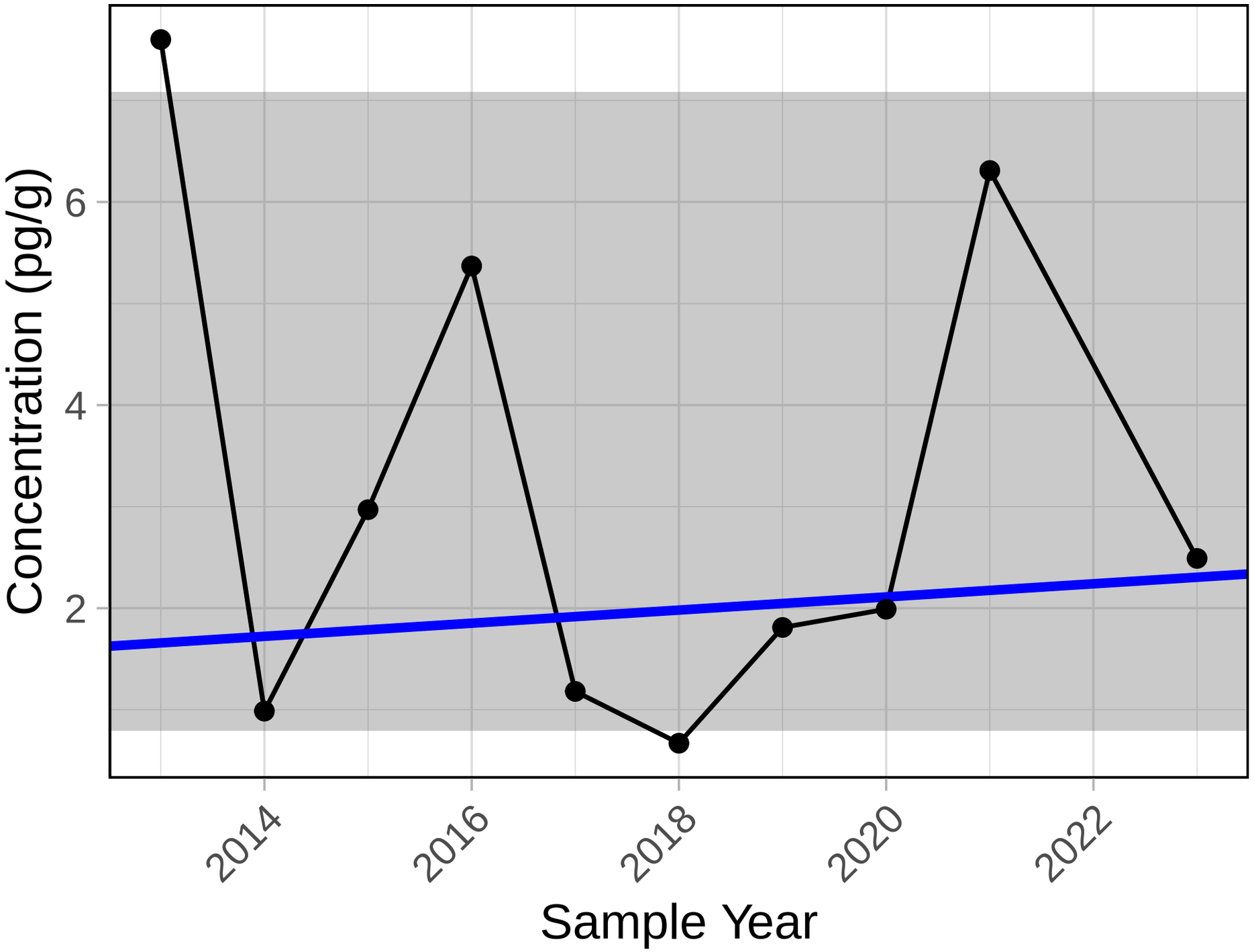
Trend significance p−value = 0.858


PCB 32
S5A Sediment
Concentration (pg/g)
0
2
4
6
8
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592


PCB 35
S5A Sediment
Concentration (pg/g)
1.5
1.0
0.5
0.0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.124

PCB 37

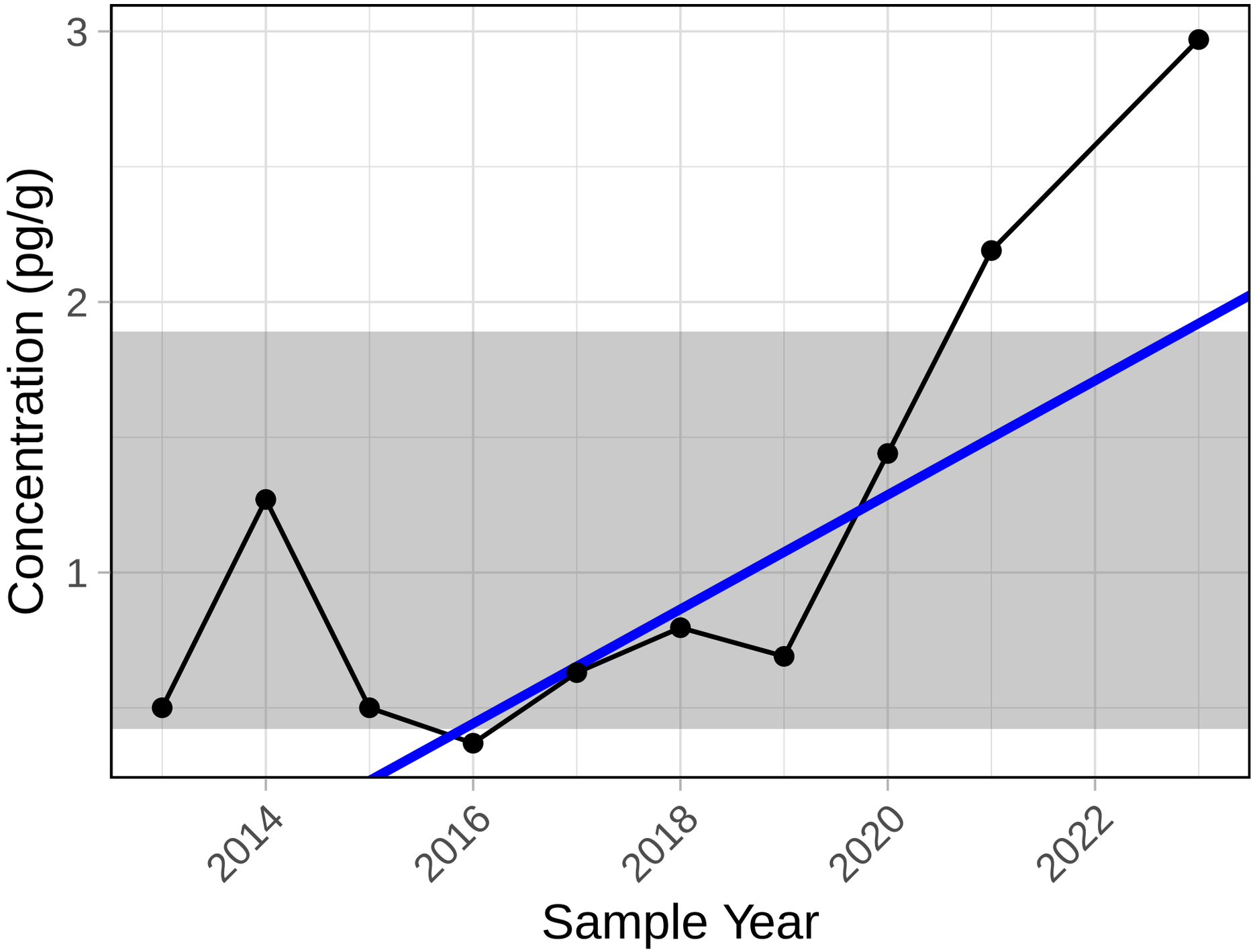
S5A Sediment



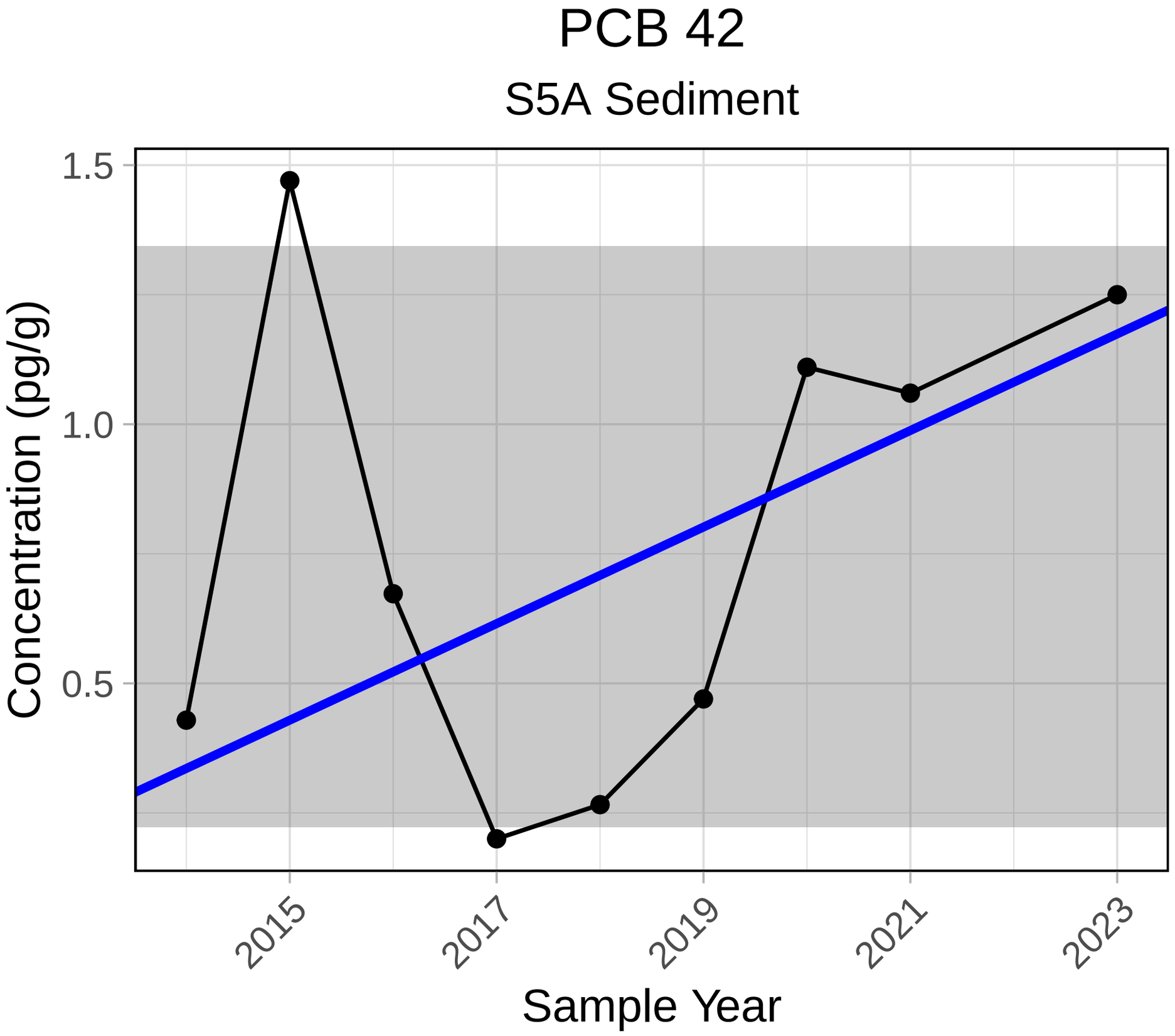
Trend significance p−value = 1

PCB 38

S5A Sediment

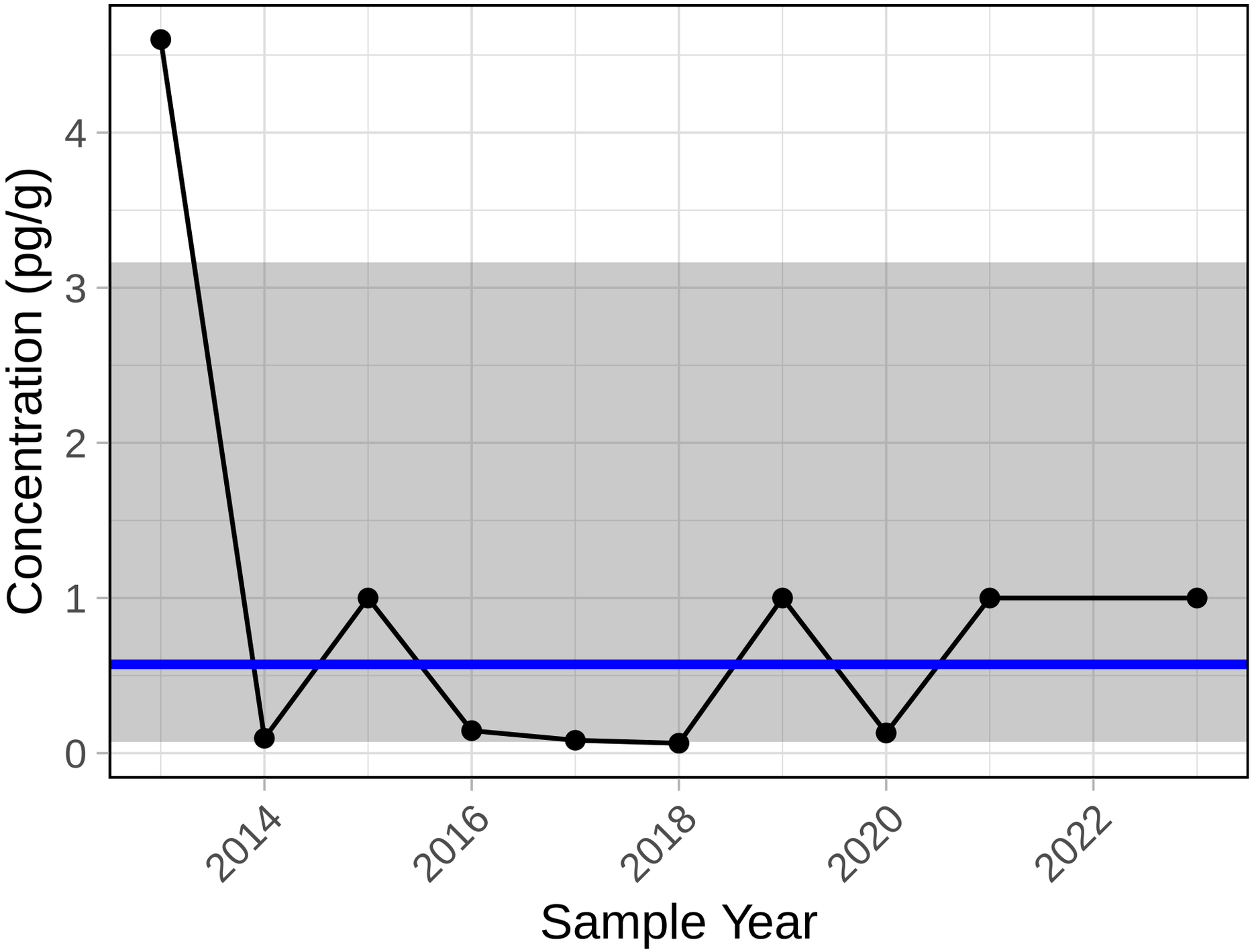


Trend significance p−value = 0.015

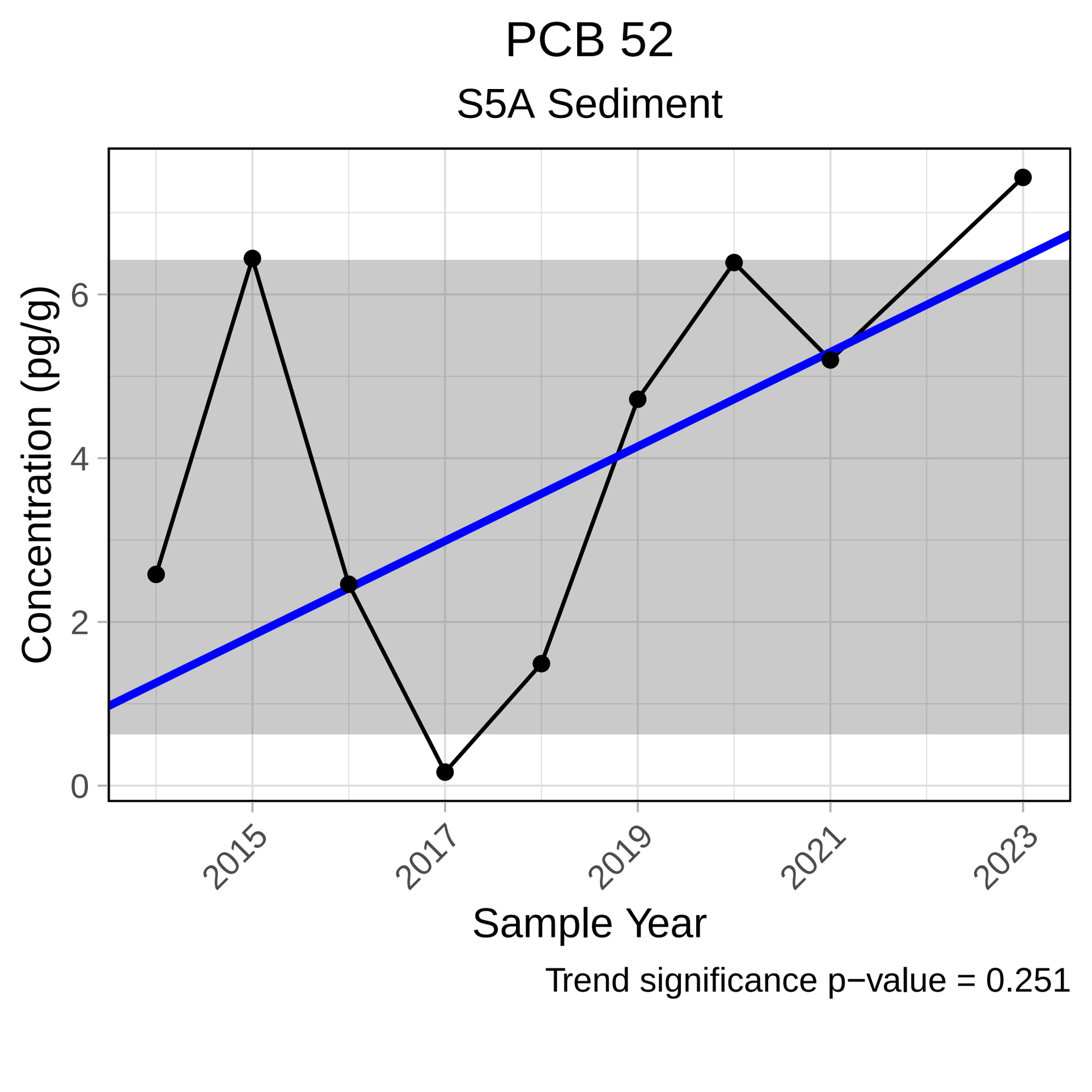

PCB 42
S5A Sediment
1.5
1.0
0.5
Concentration (pg/g)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.348

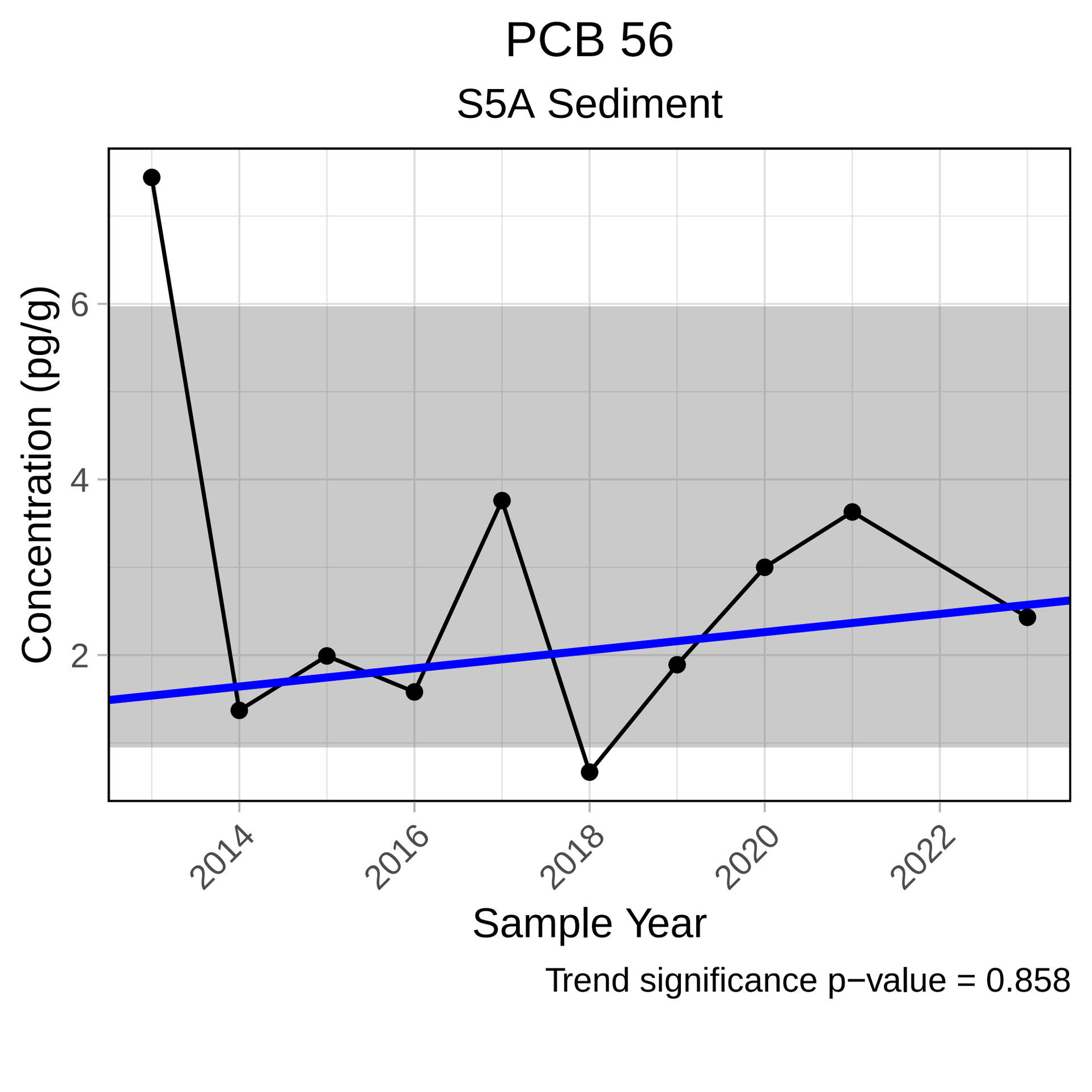
PCB 46

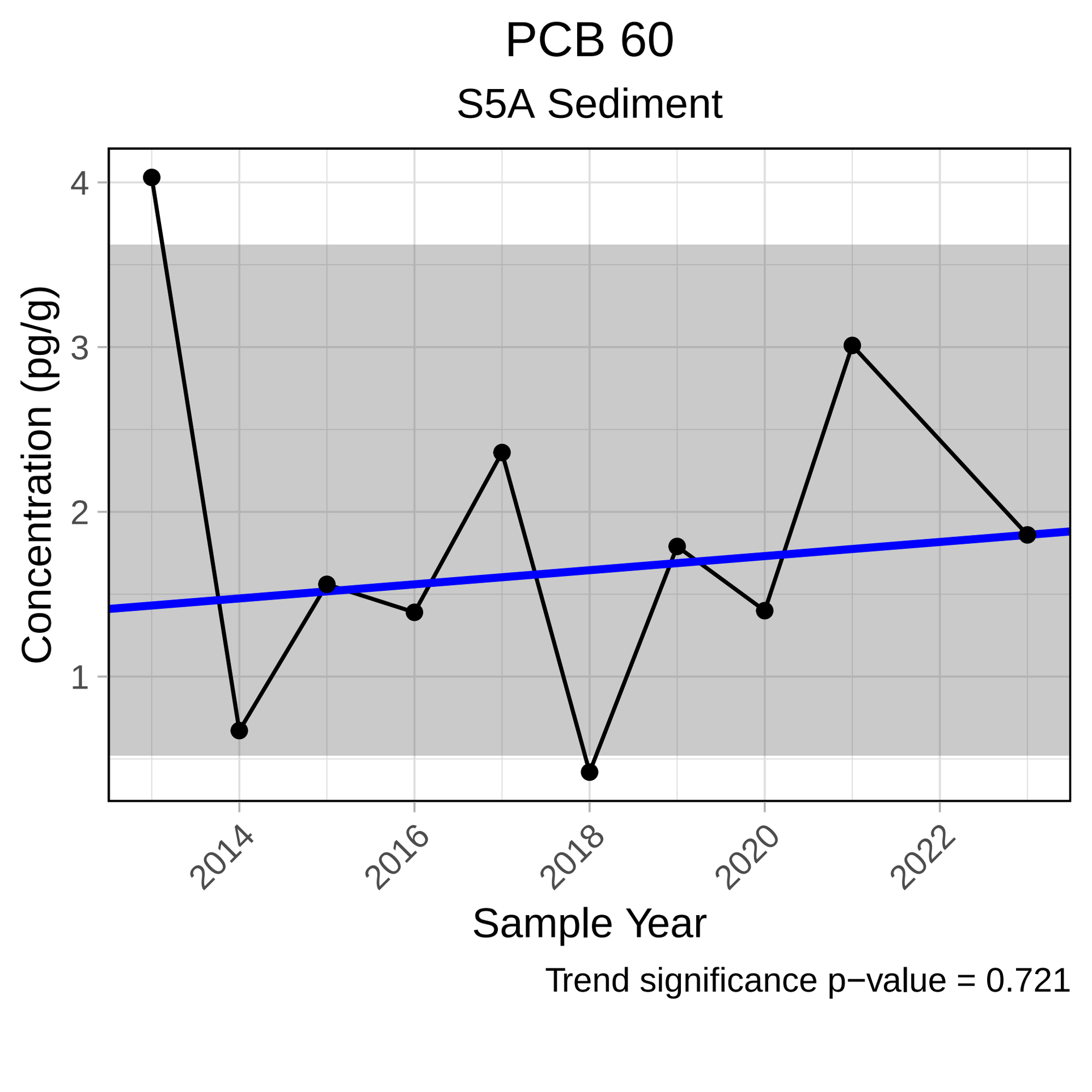
S5A Sediment



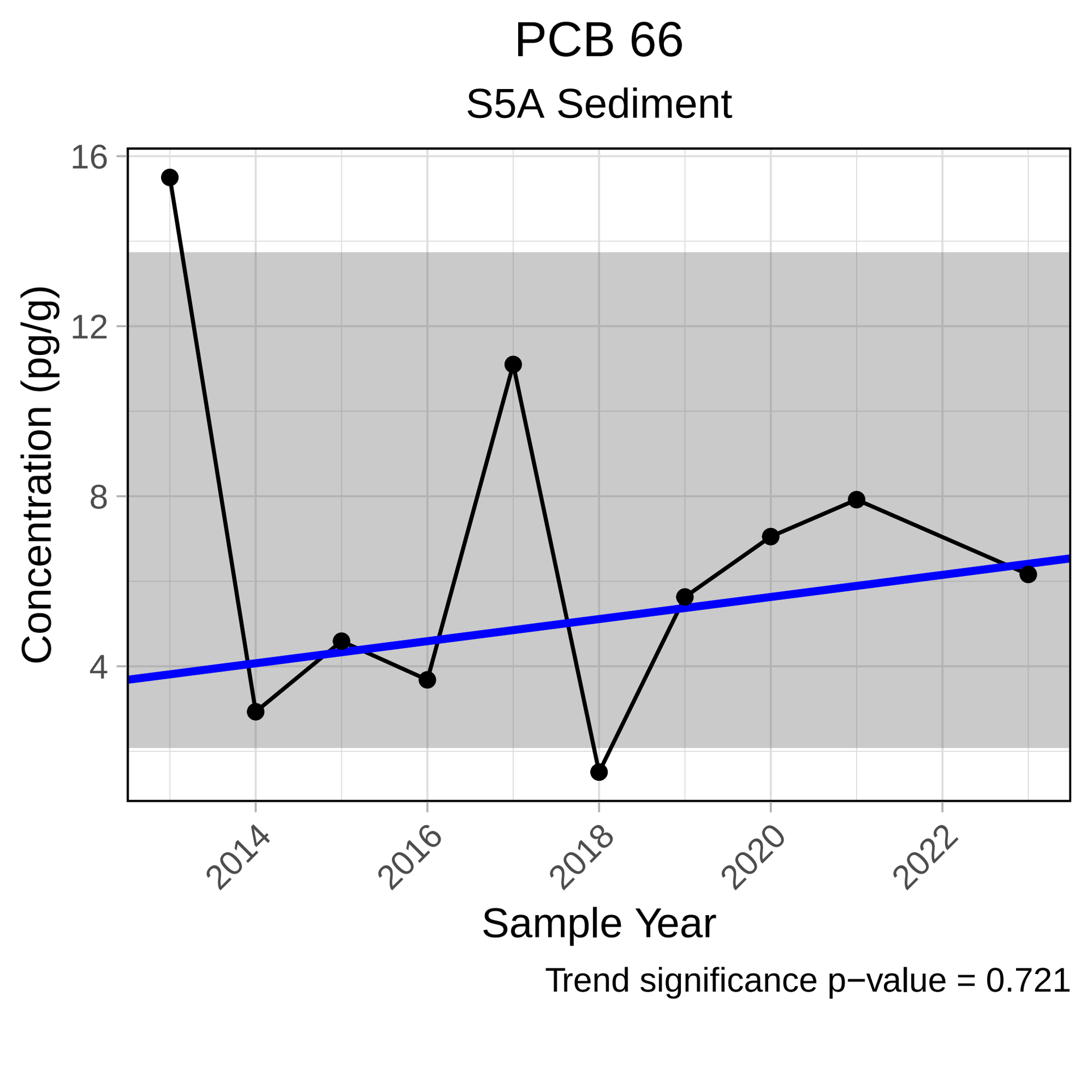
Trend significance p−value = 1

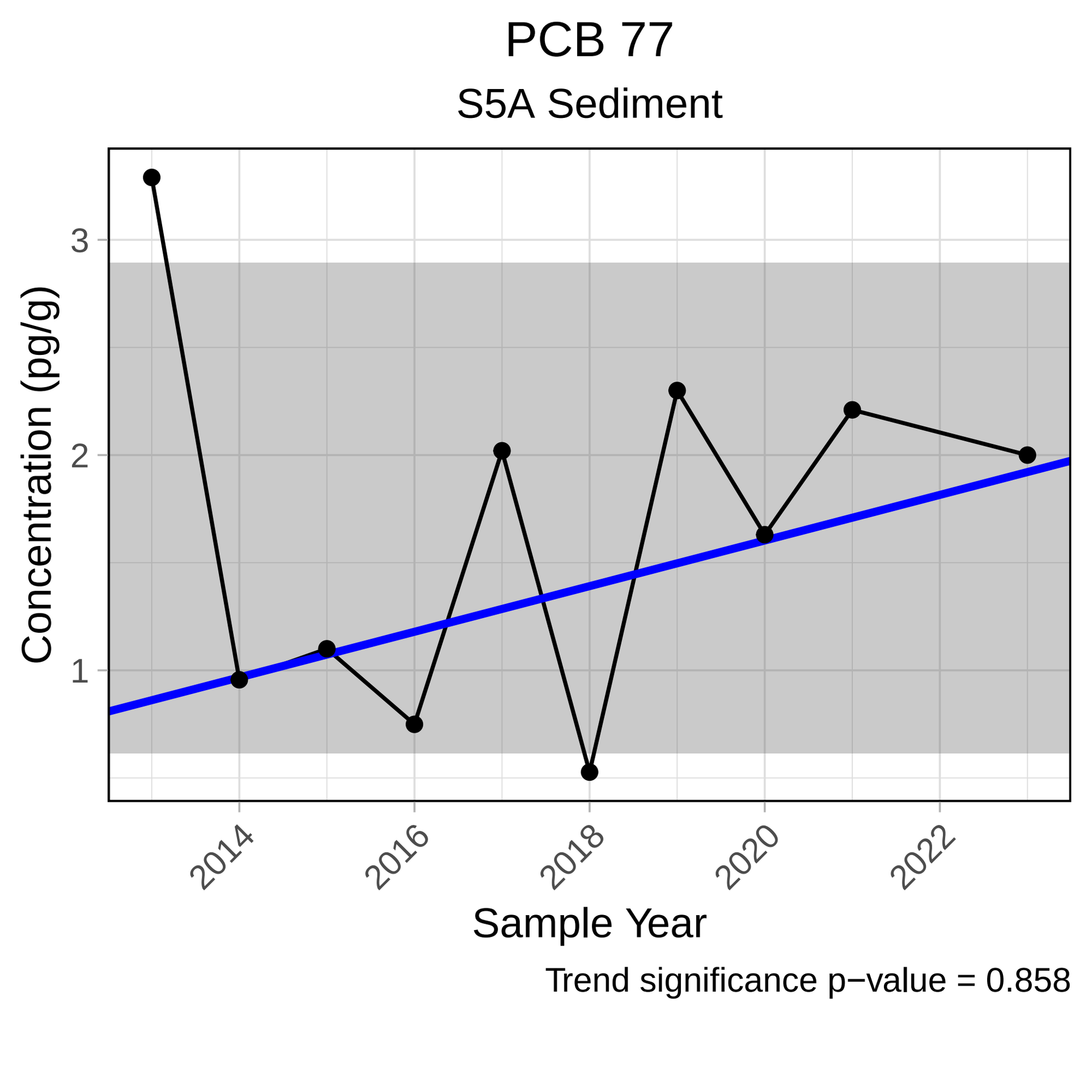

PCB 52
S5A Sediment
Concentration (pg/g)
0
2
4
6
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

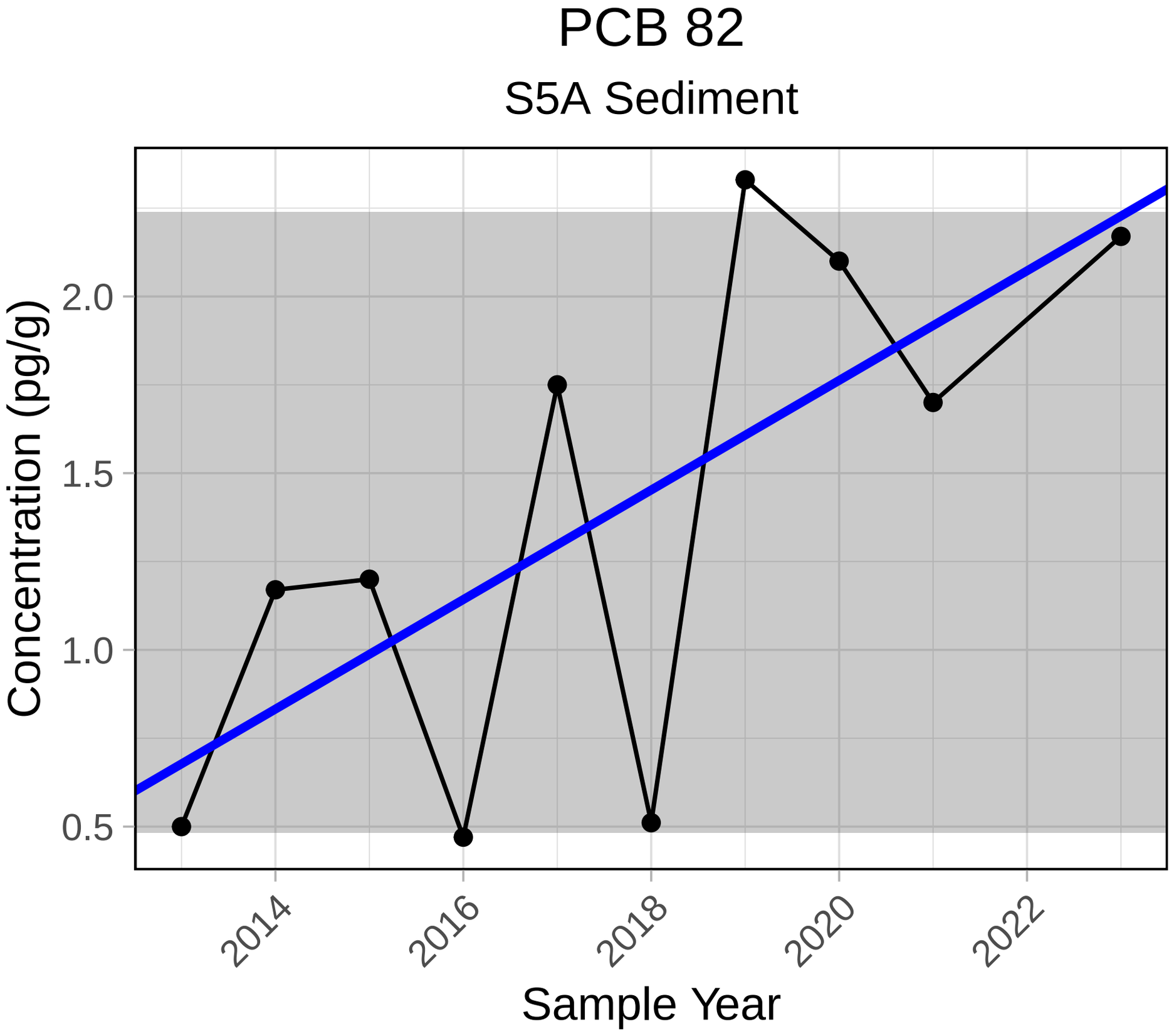

PCB 56
S5A Sediment
Concentration (pg/g)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

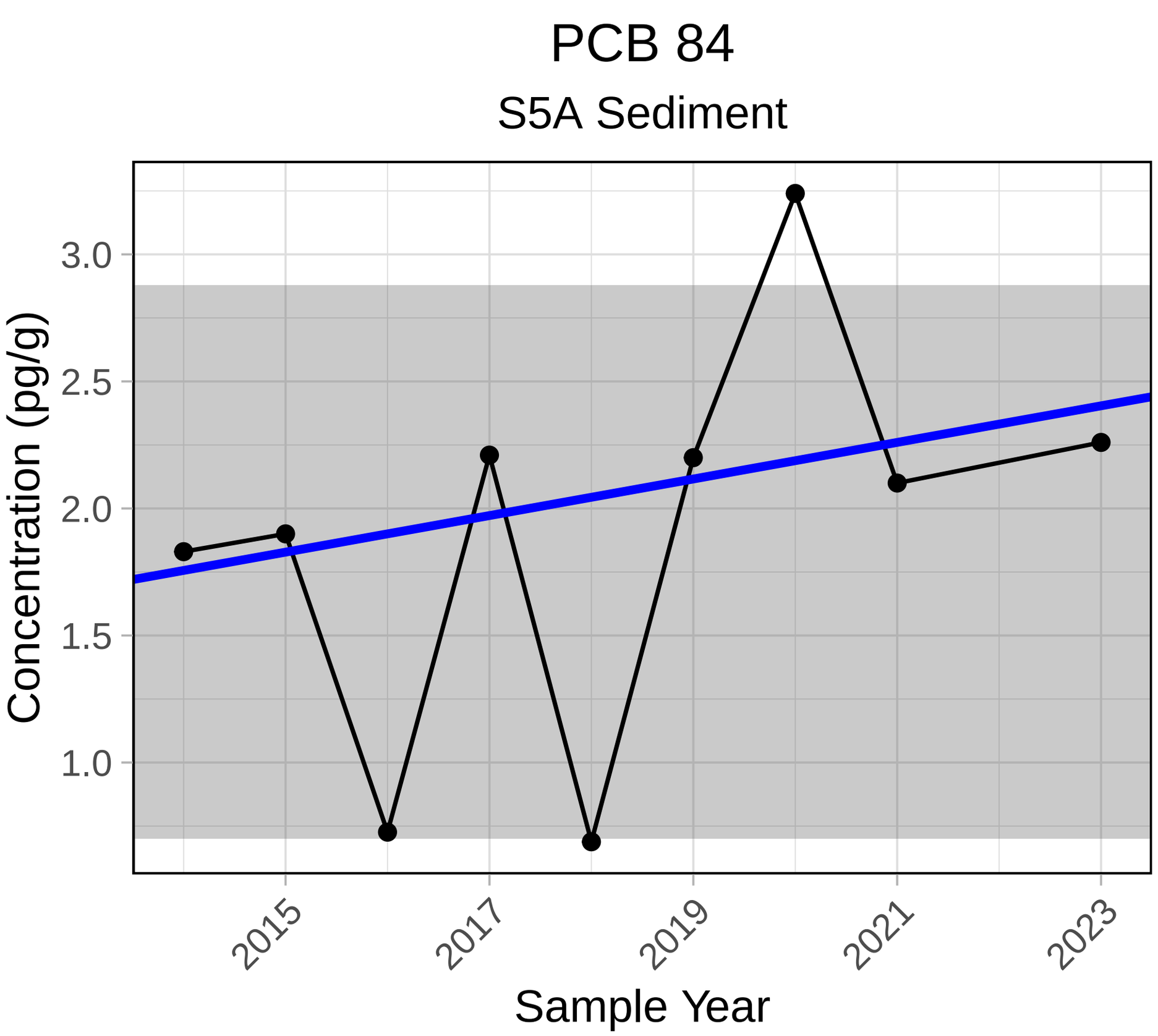

PCB 60
S5A Sediment
Concentration (pg/g)
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

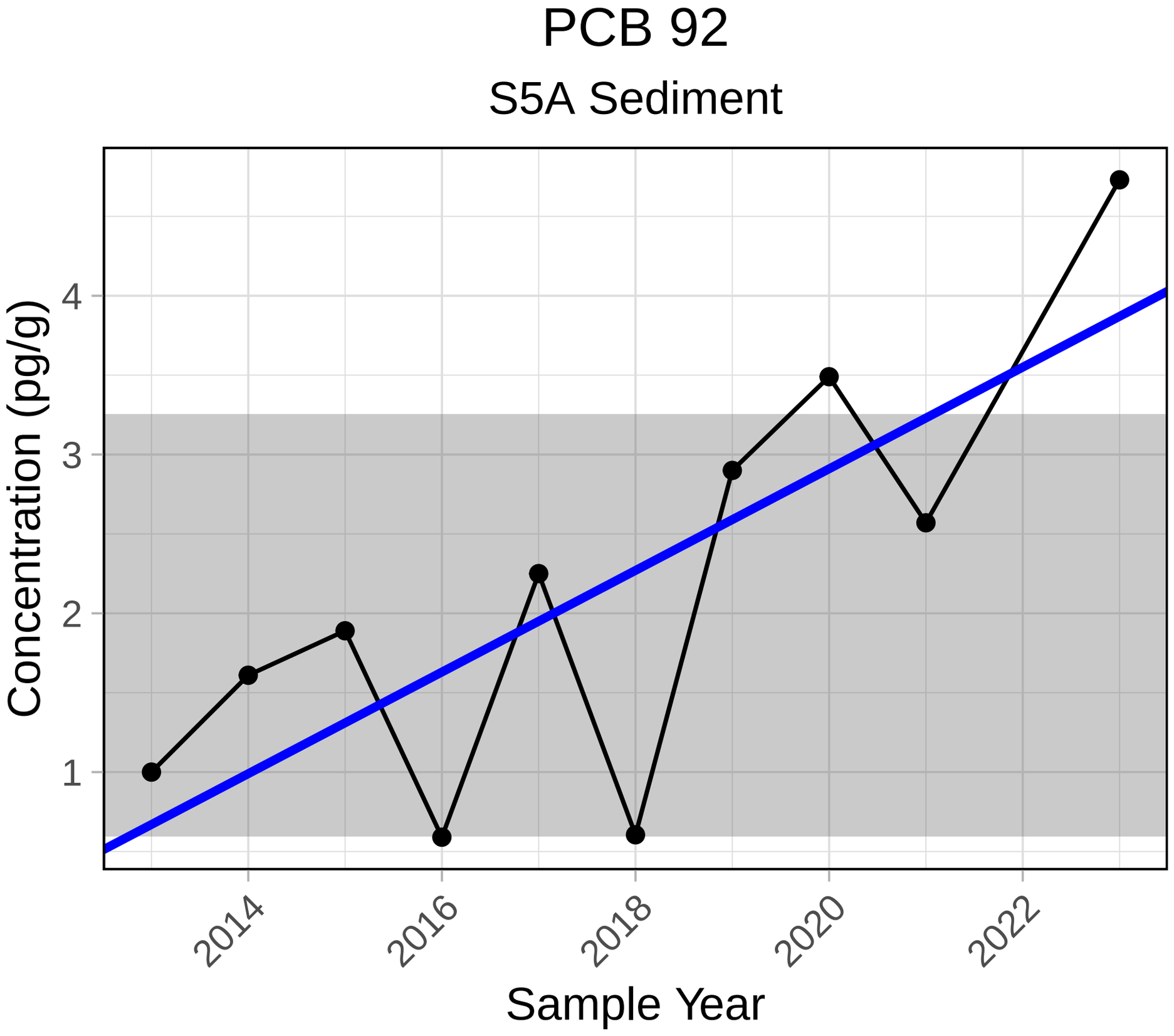
PCB 64
S5A Sediment
Concentration (pg/g)
15
10
5
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

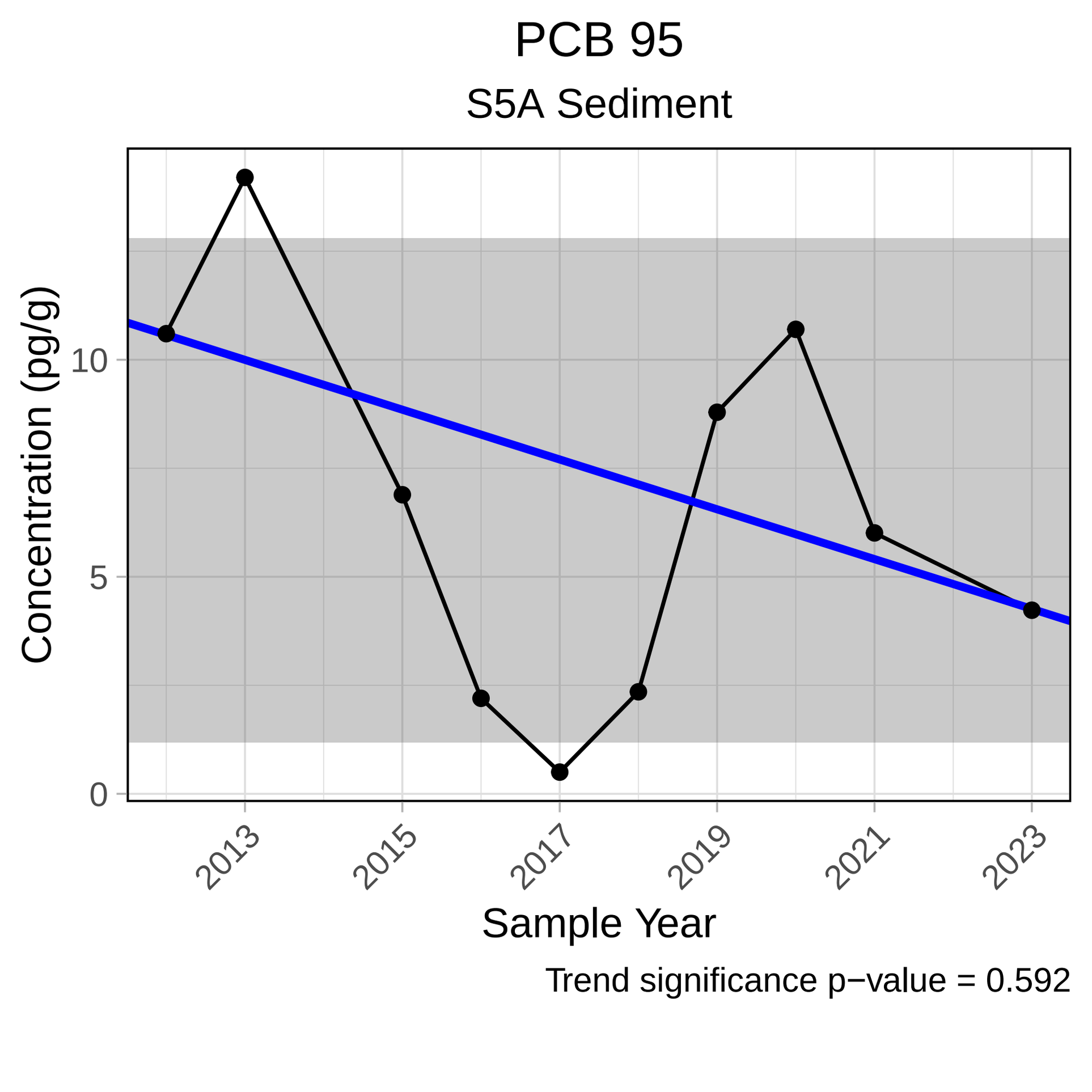

PCB 66
S5A Sediment
16
12
8
4
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

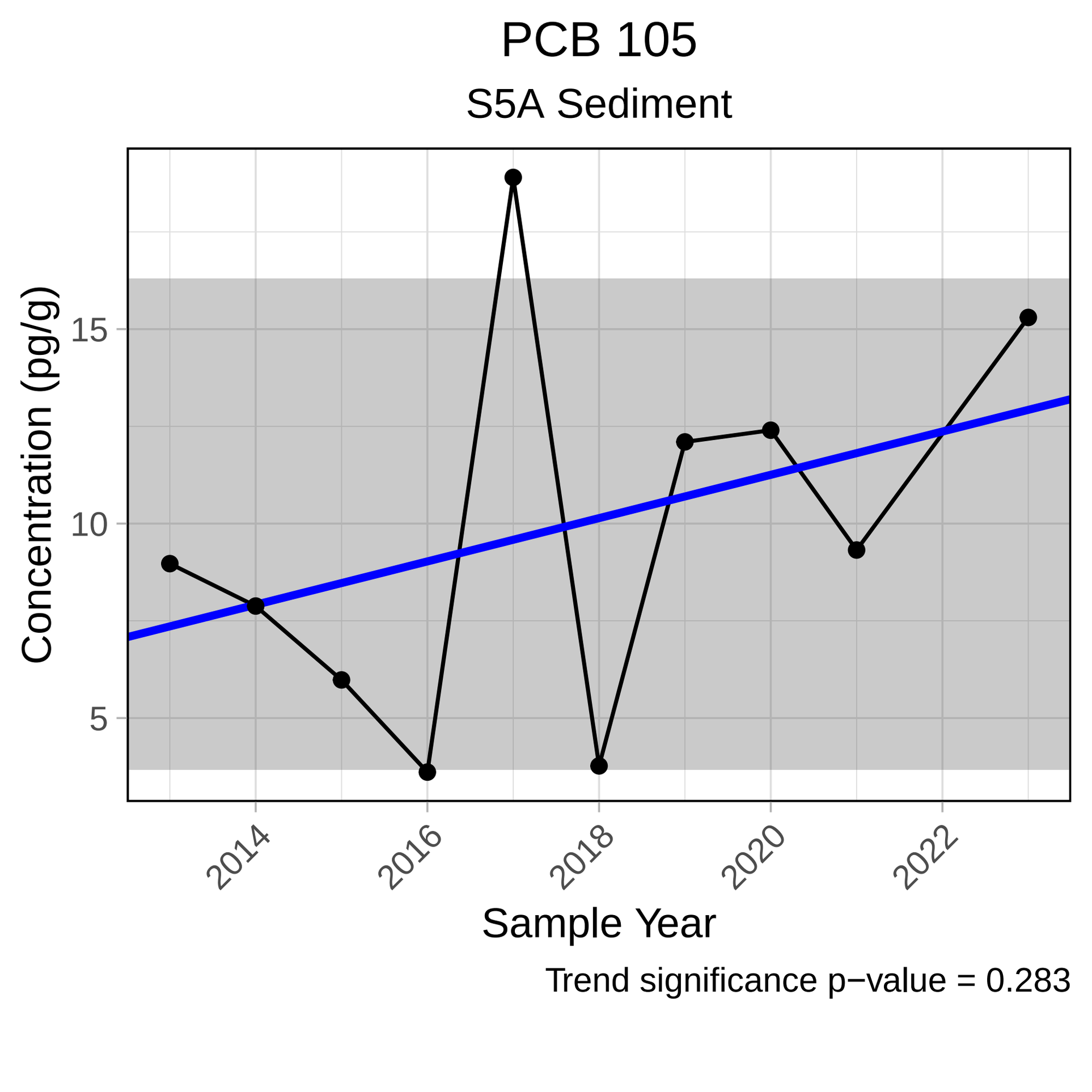

PCB 77
S5A Sediment
Concentration (pg/g)
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

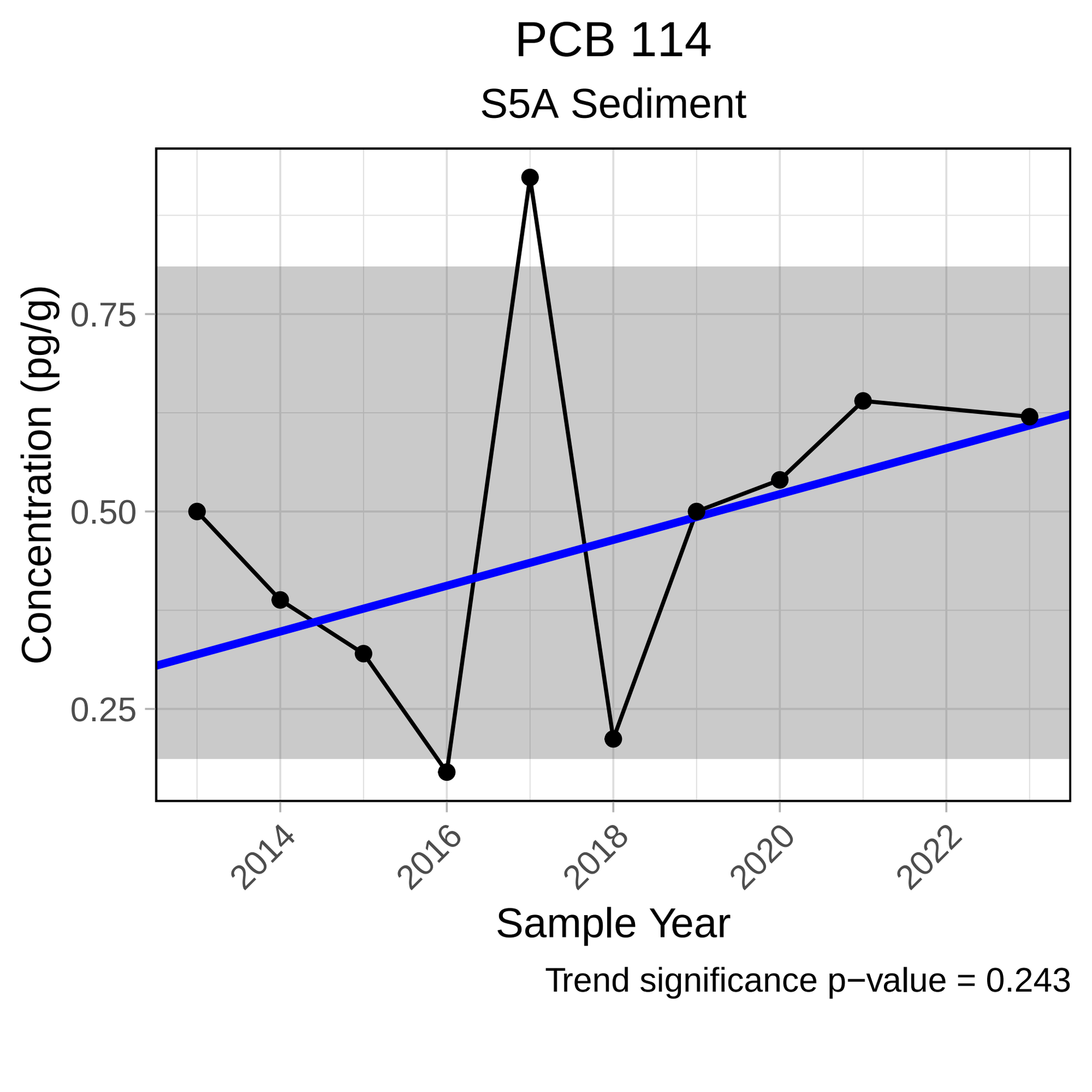

PCB 82
S5A Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.049

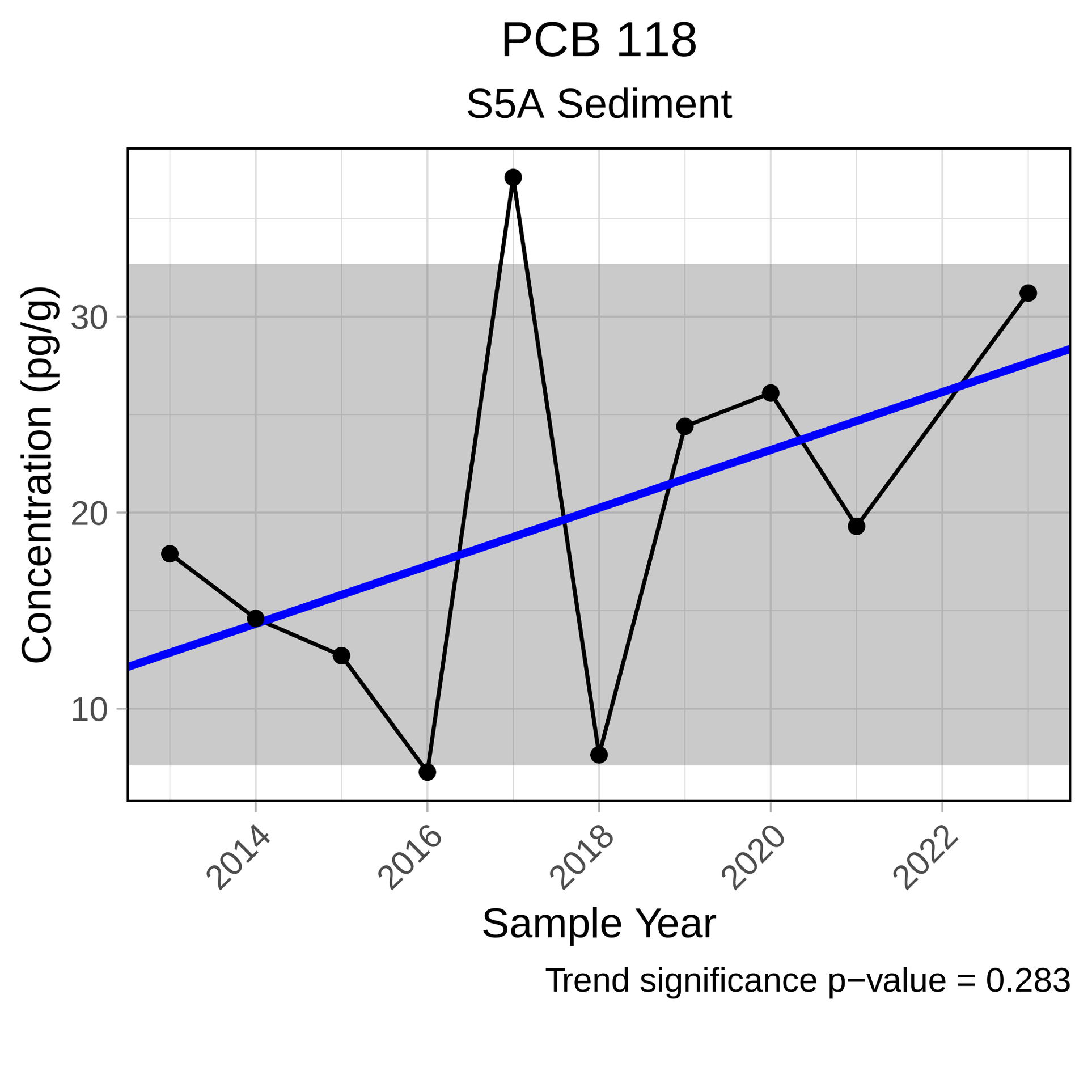

PCB 84
S5A Sediment
Concentration (pg/g)
3.0
2.5
2.0
1.5
1.0
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.175

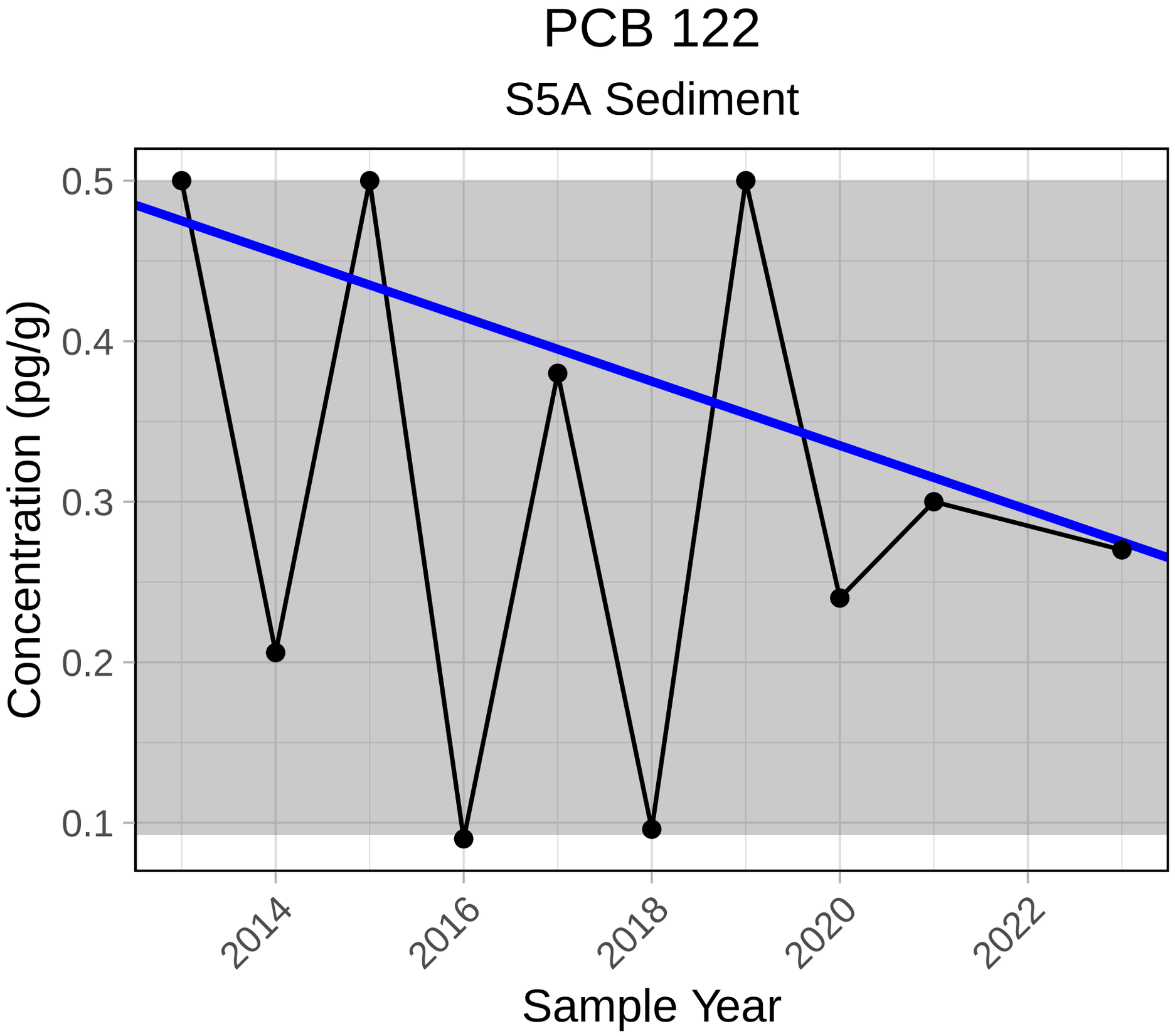

PCB 92
S5A Sediment
Concentration (pg/g)
1
2
3
4
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.02

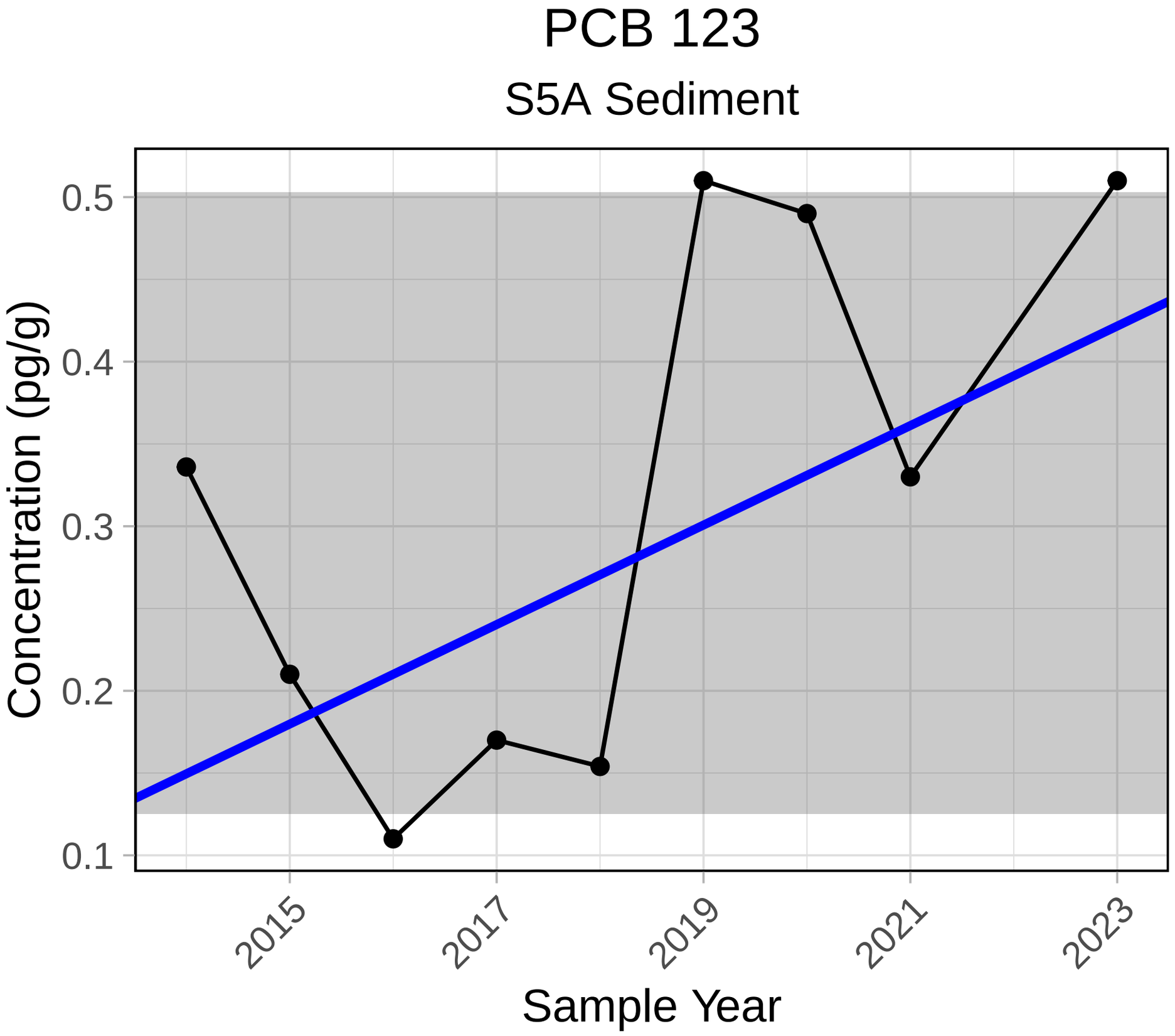

PCB 95
S5A Sediment
Concentration (pg/g)
10
5
0
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.592

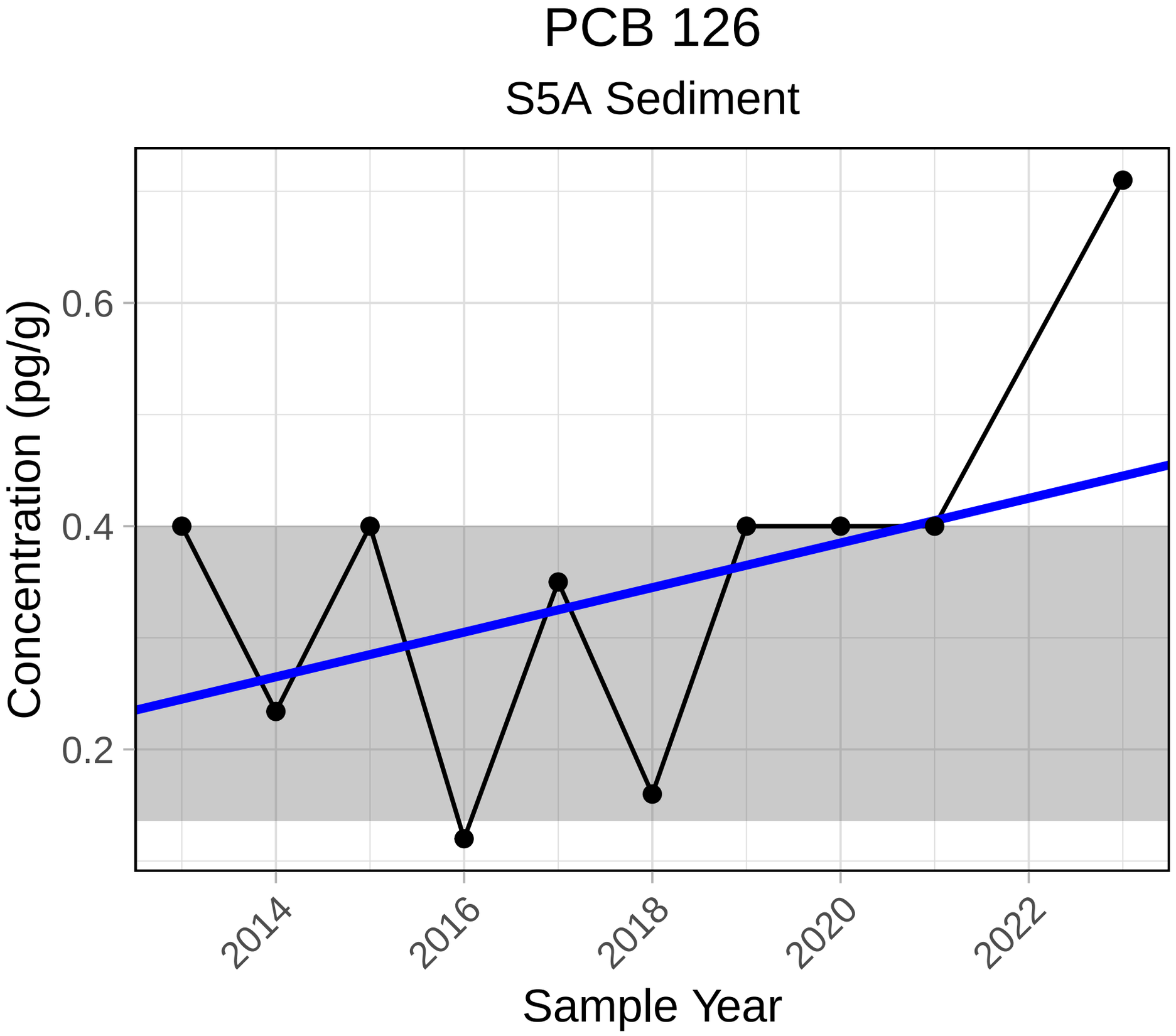

PCB 105
S5A Sediment
Concentration (pg/g)
15
10
5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

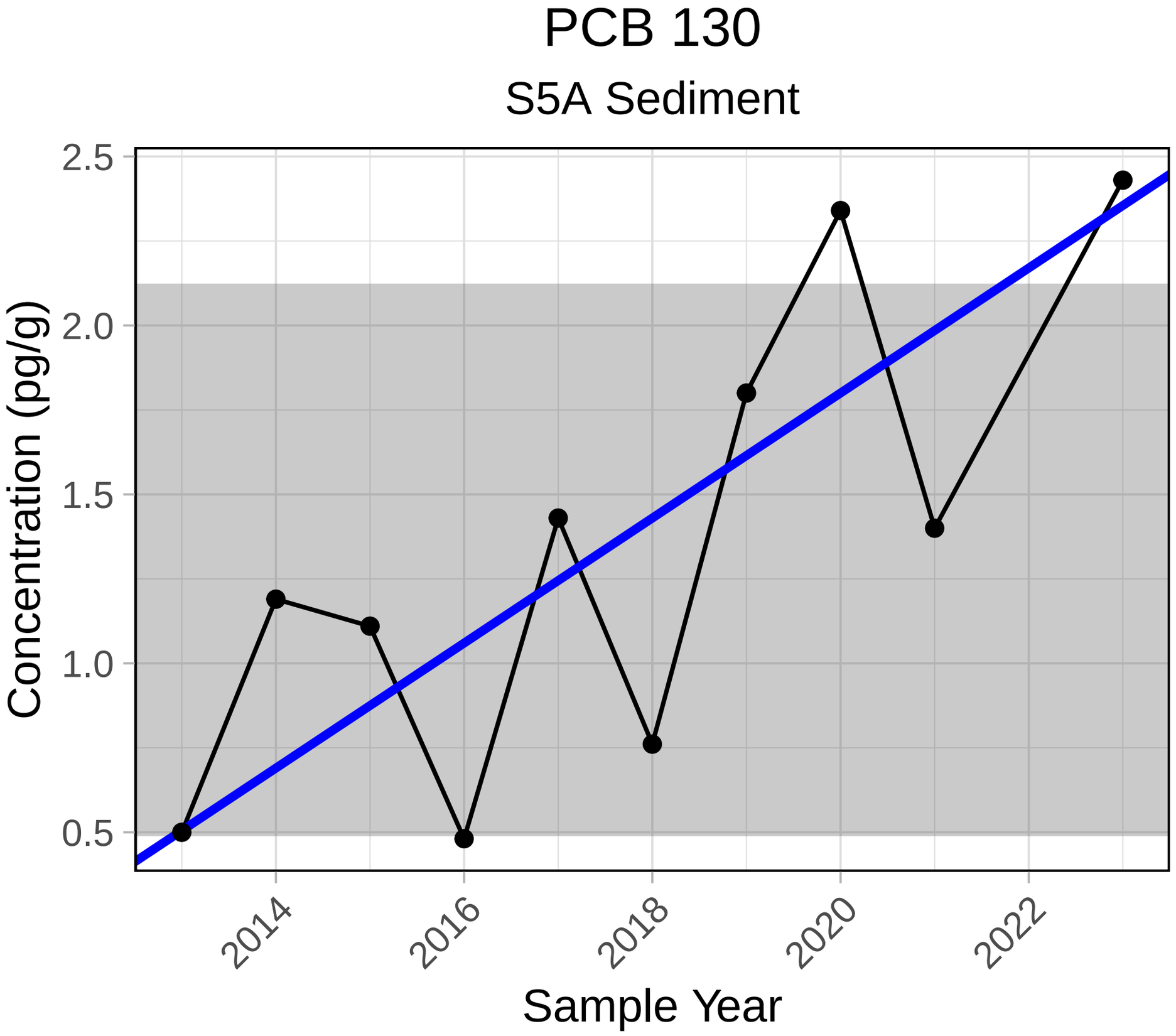

PCB 114
S5A Sediment
Concentration (pg/g)
0.75
0.50
0.25
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.243

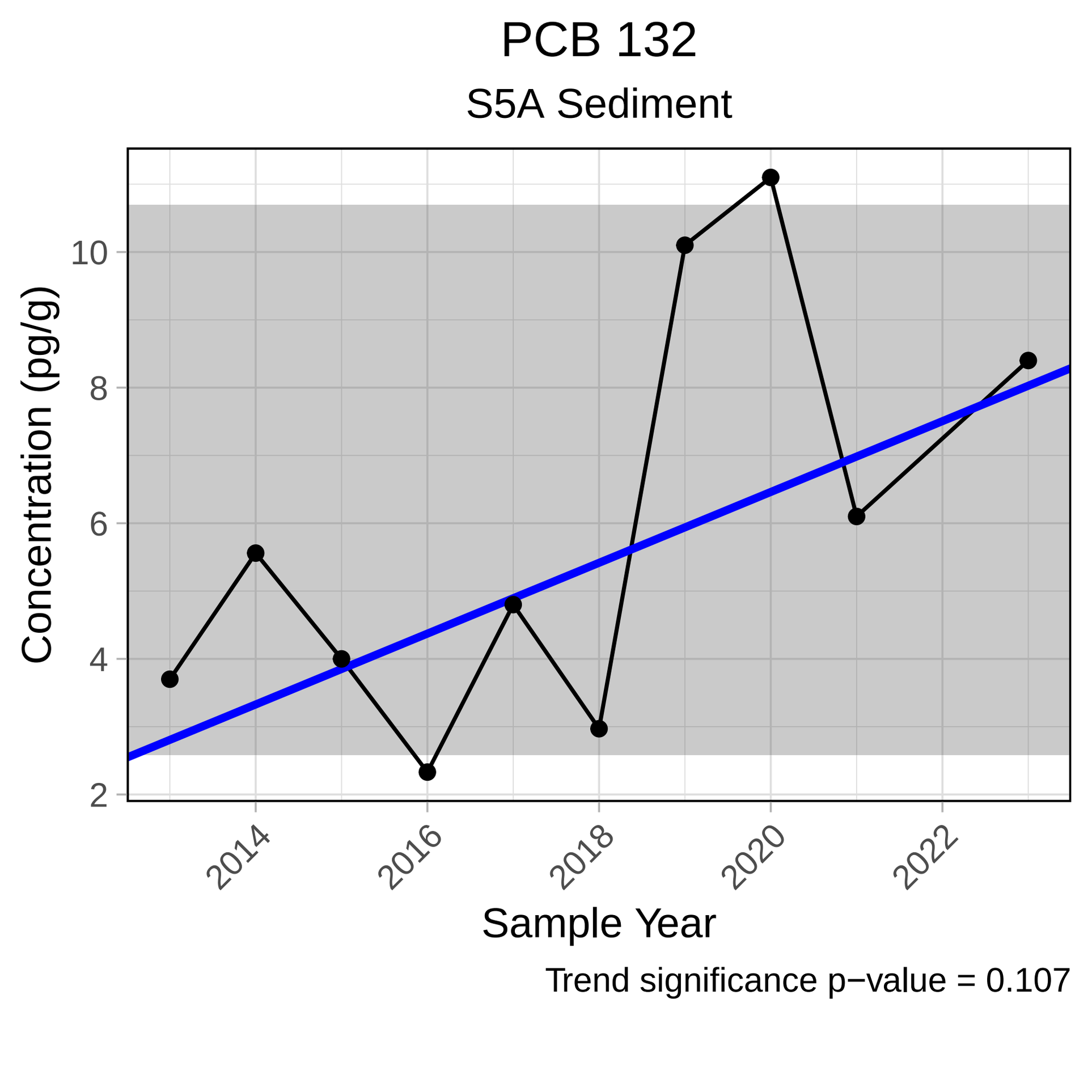

PCB 118
S5A Sediment
Concentration (pg/g)
30
20
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

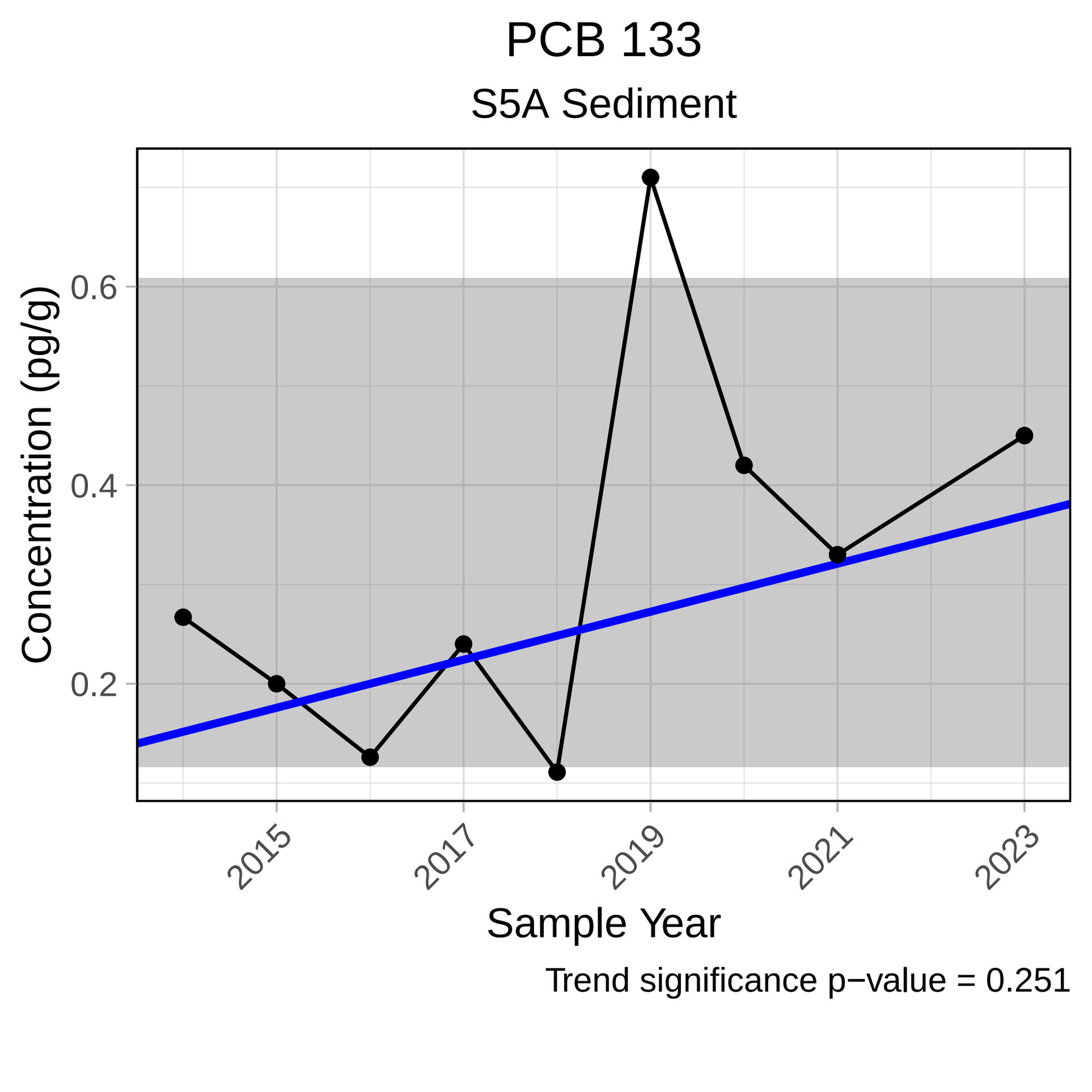

PCB 122
S5A Sediment
Concentration (pg/g)
0.5
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.785

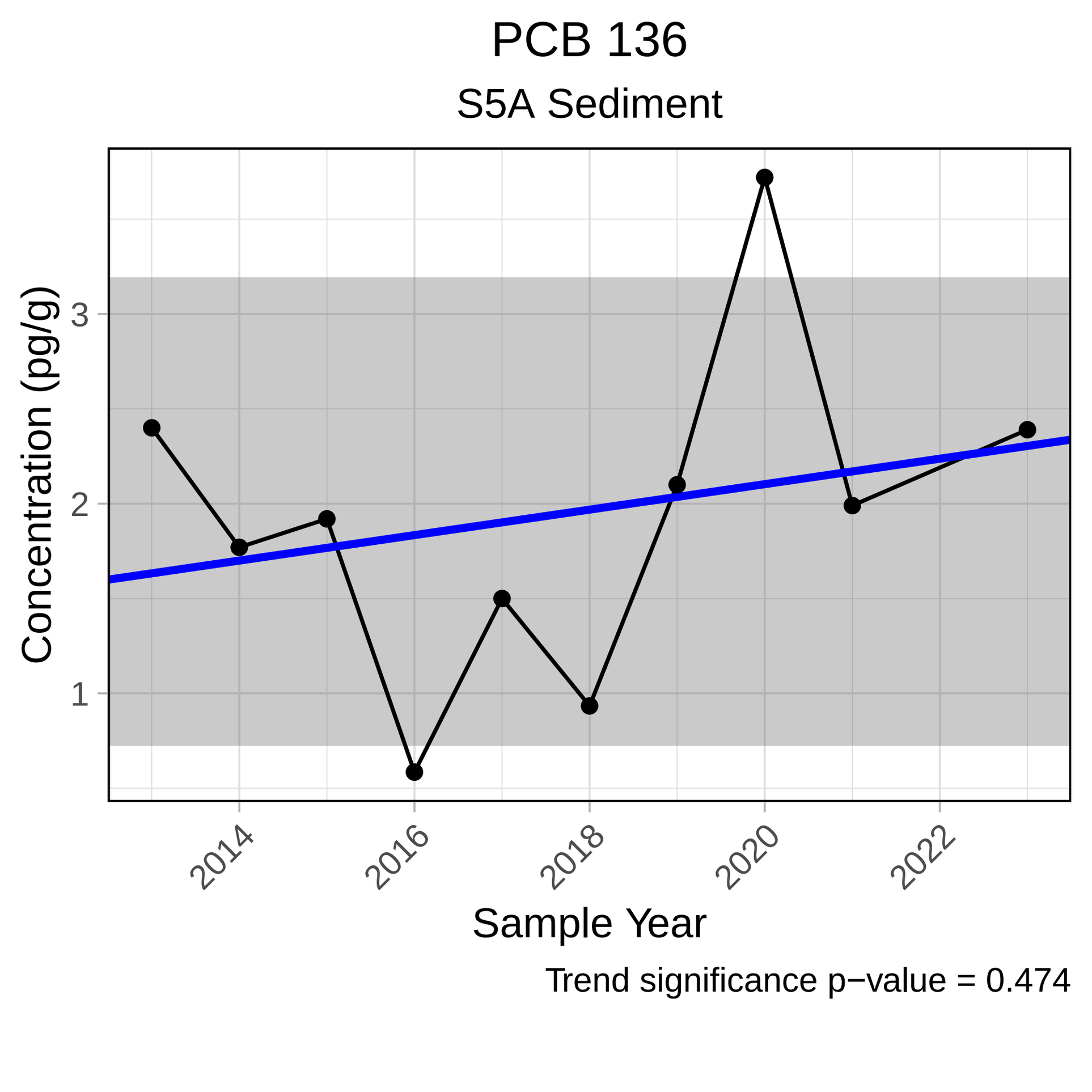

PCB 123
S5A Sediment
Concentration (pg/g)
0.5
0.4
0.3
0.2
0.1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.295

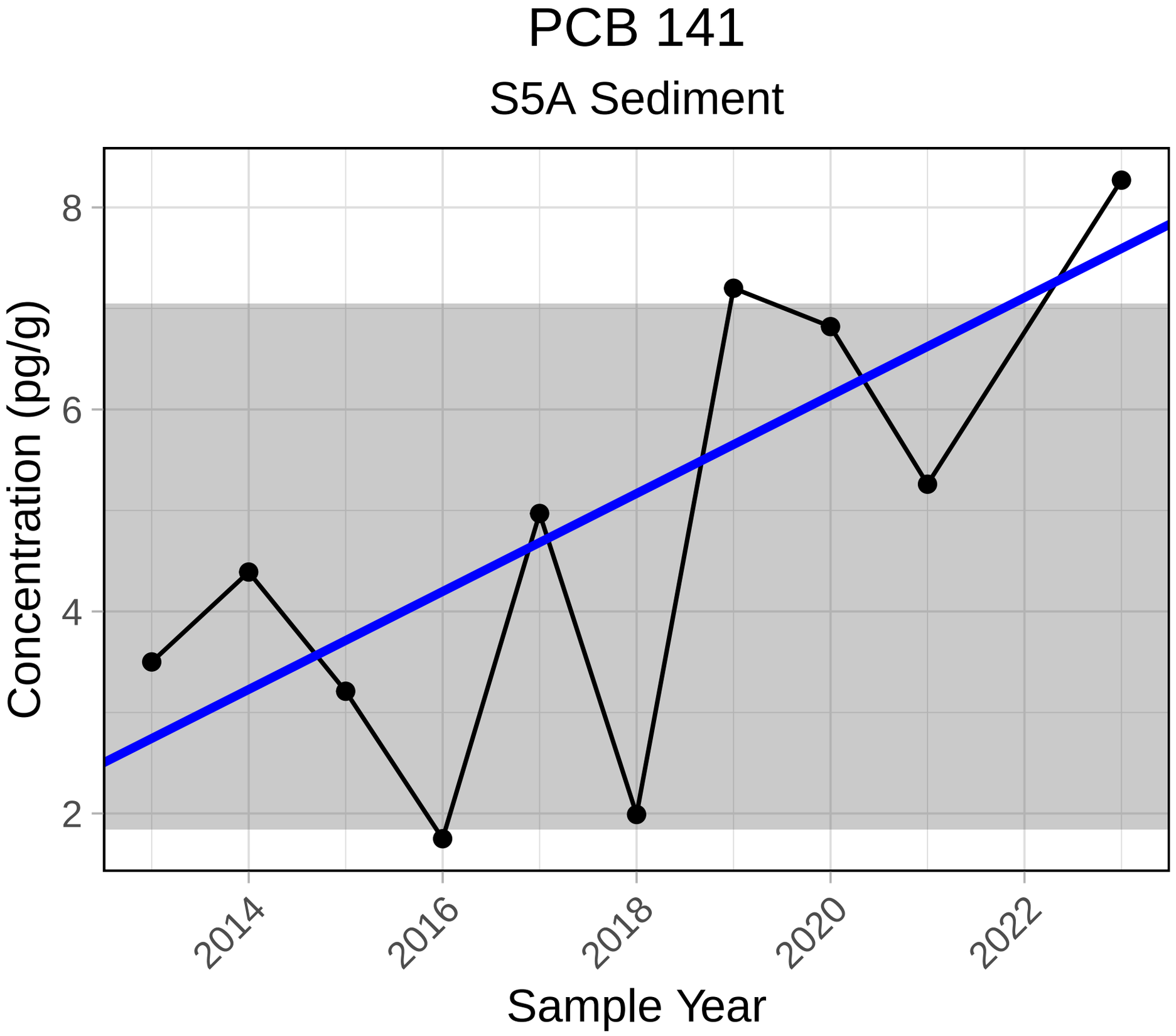

PCB 126
S5A Sediment
Concentration (pg/g)
0.6
0.4
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.179


PCB 130
S5A Sediment
Concentration (pg/g)
2.5
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.032


PCB 132
S5A Sediment
Concentration (pg/g)
10
8
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107

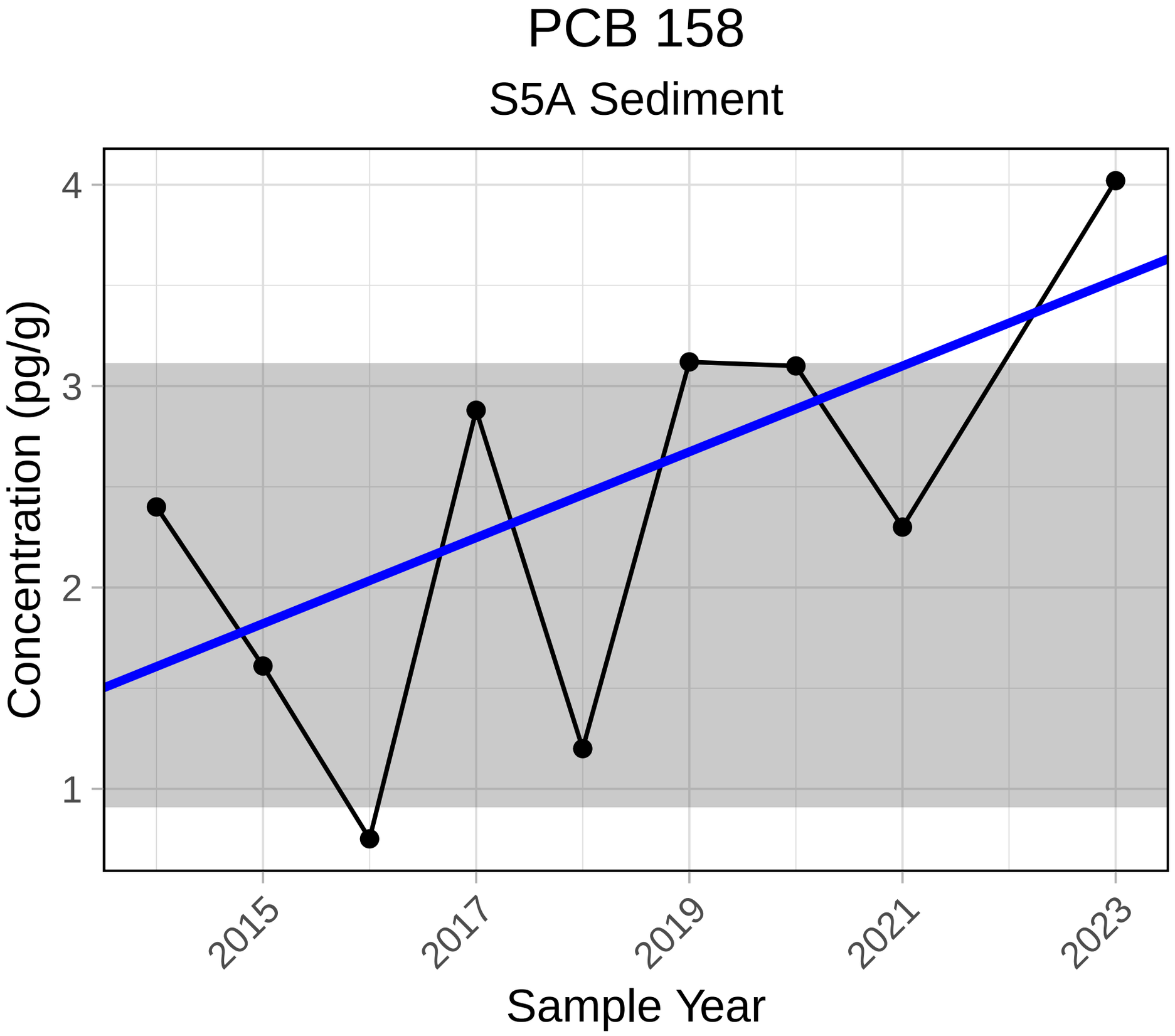

PCB 133
S5A Sediment
Concentration (pg/g)
0.6
0.4
0.2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

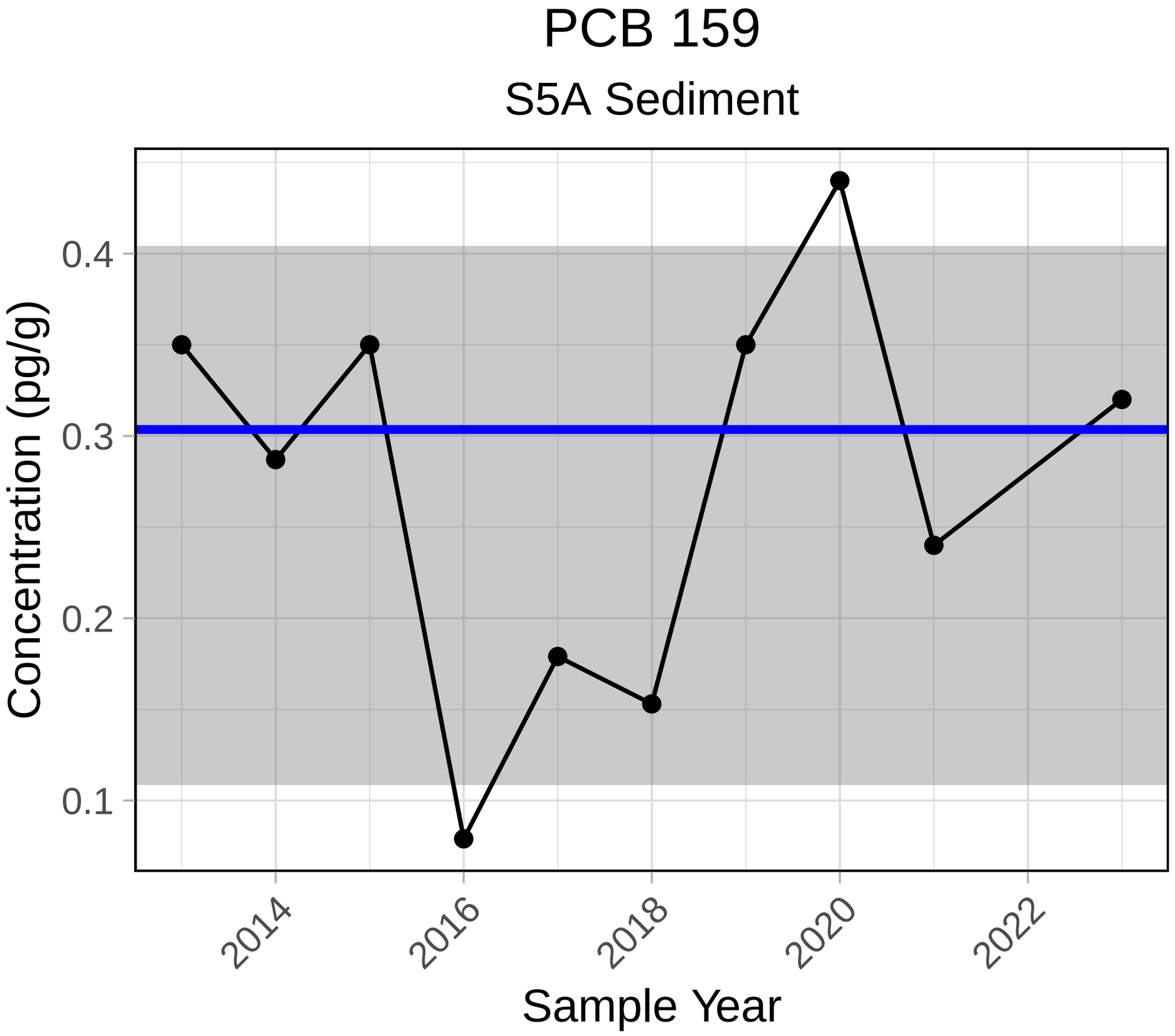

PCB 136
S5A Sediment
Concentration (pg/g)
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

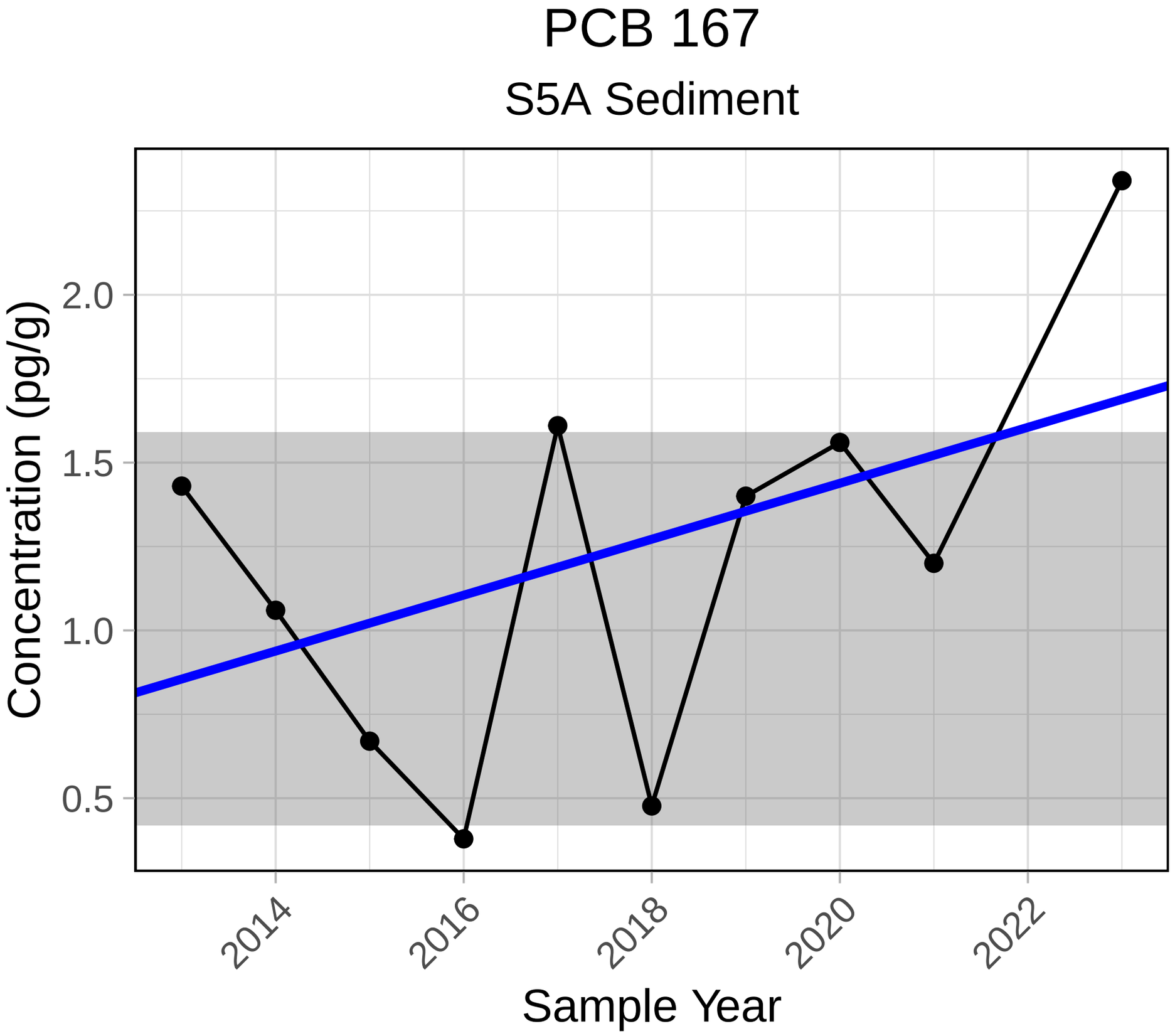

PCB 141
S5A Sediment
Concentration (pg/g)
8
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.074

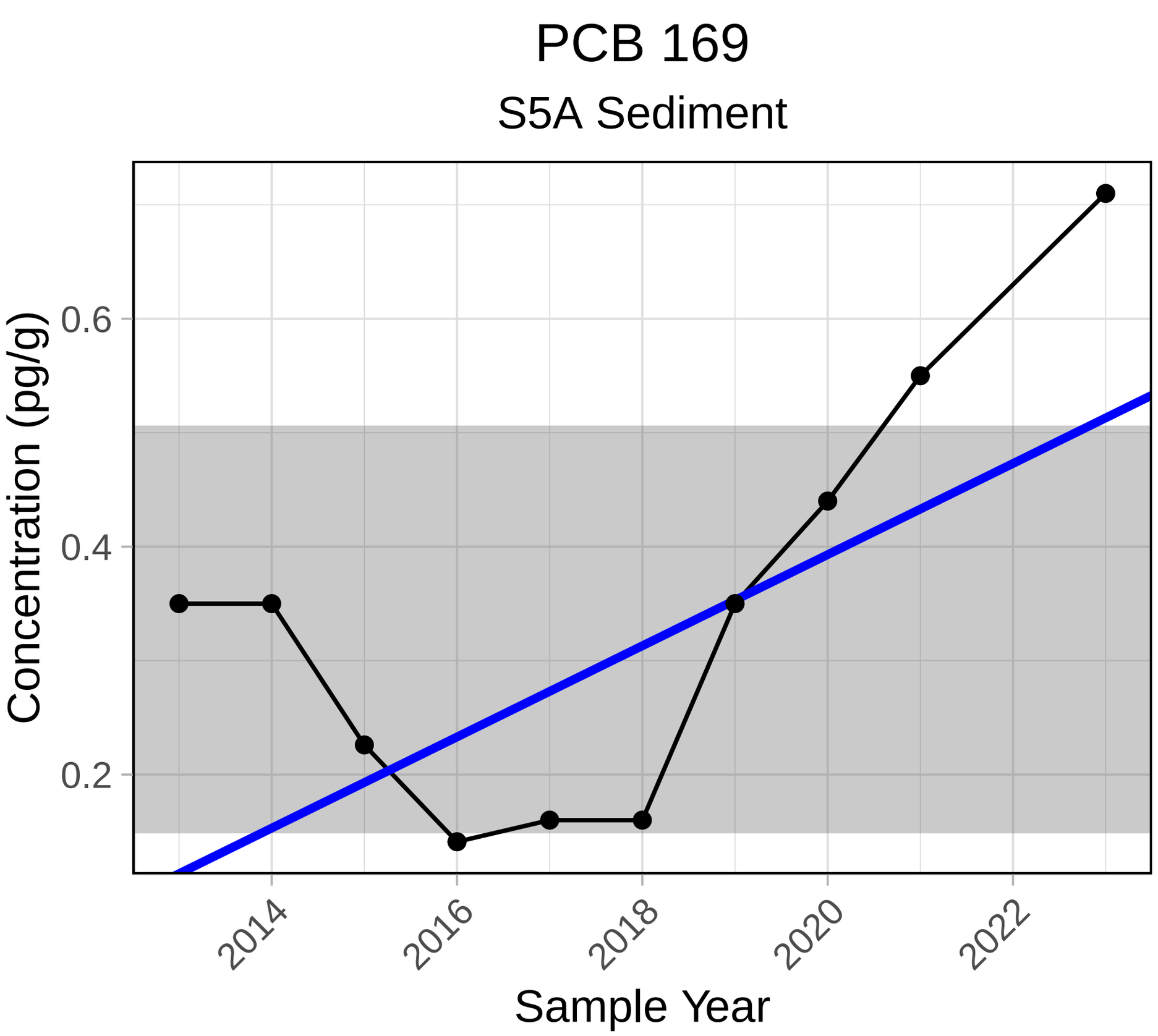
PCB 144
S5A Sediment
Concentration (pg/g)
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107

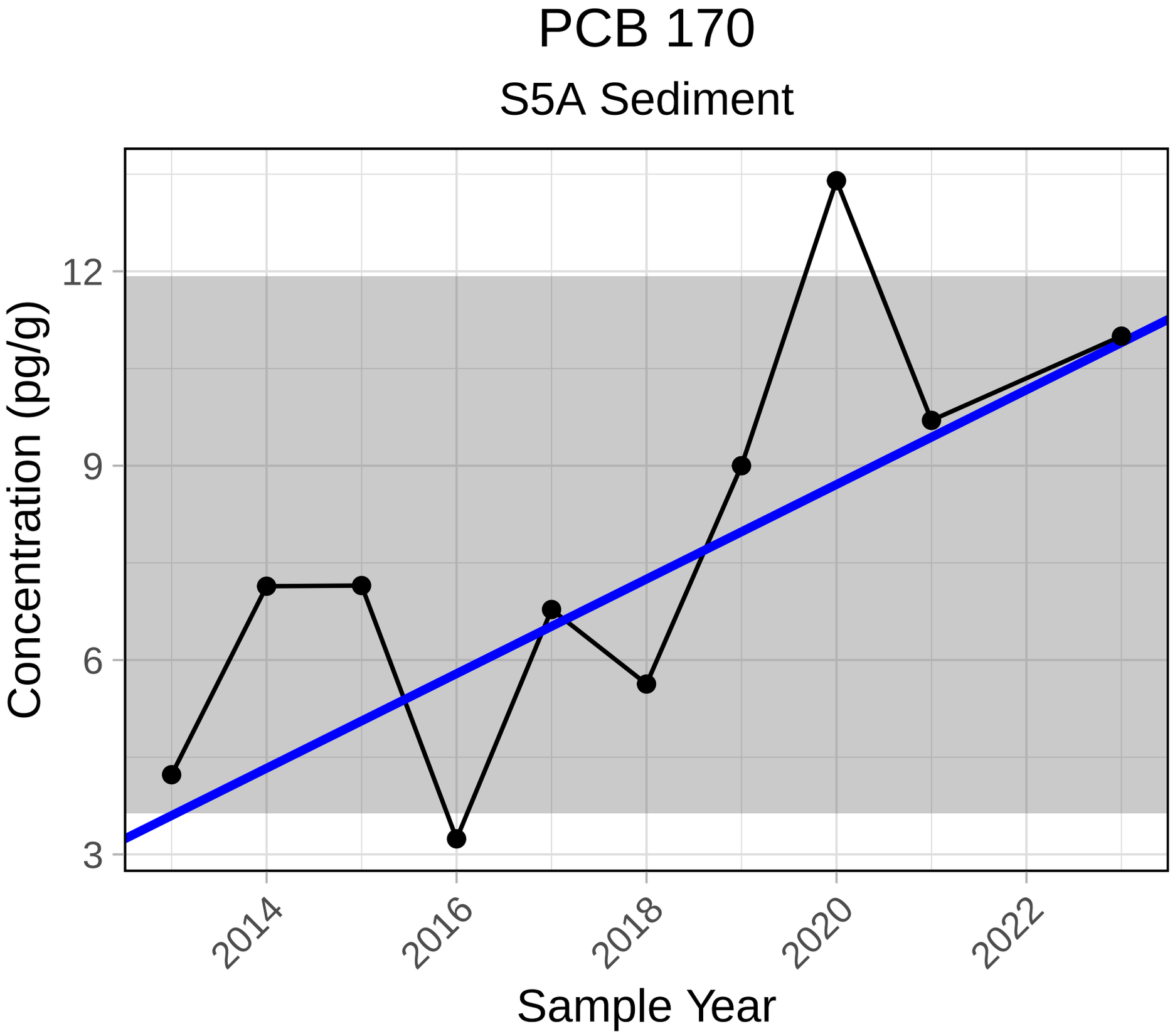
PCB 146
S5A Sediment
Concentration (pg/g)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21

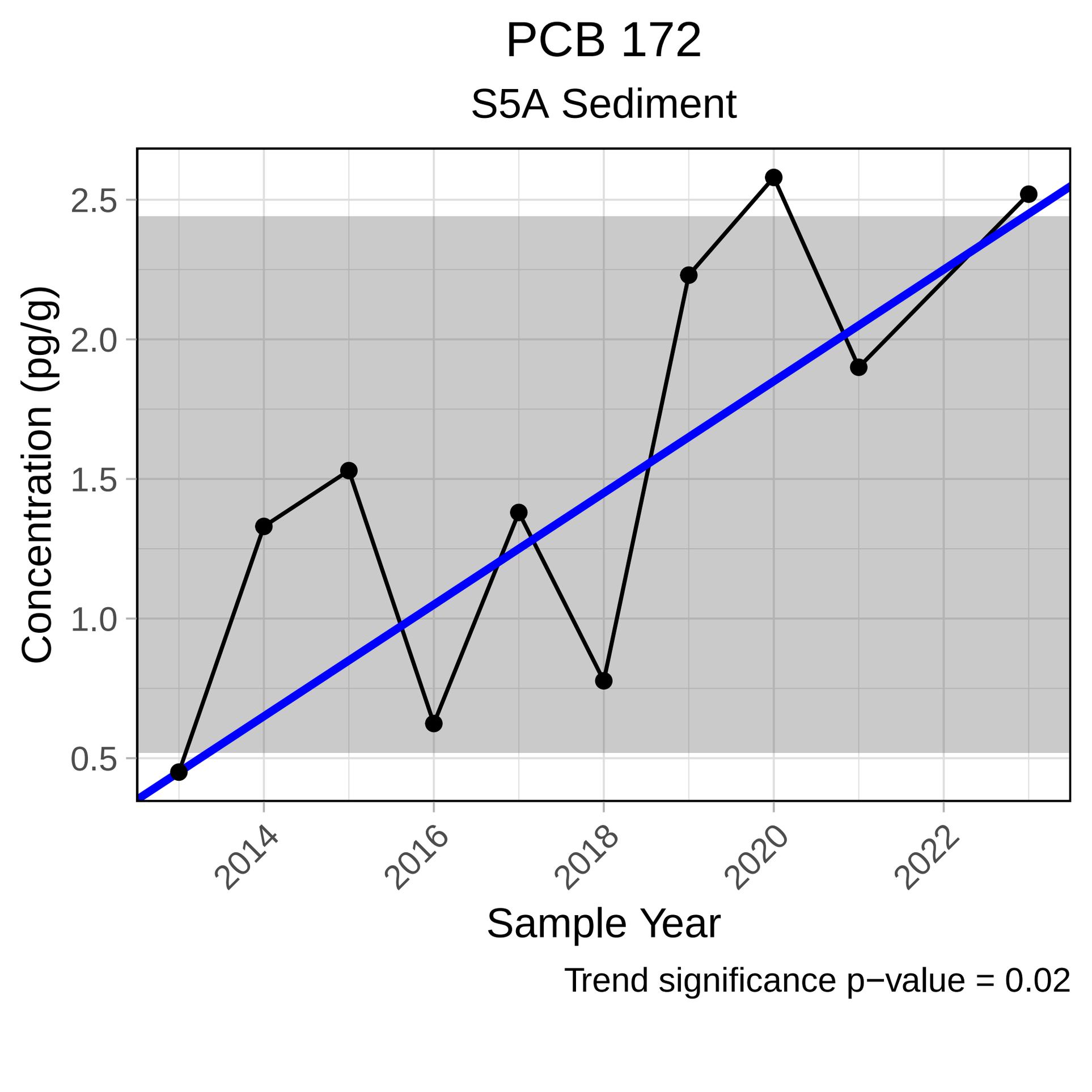

PCB 158
S5A Sediment
Concentration (pg/g)
4
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.175


PCB 159
S5A Sediment
Concentration (pg/g)
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

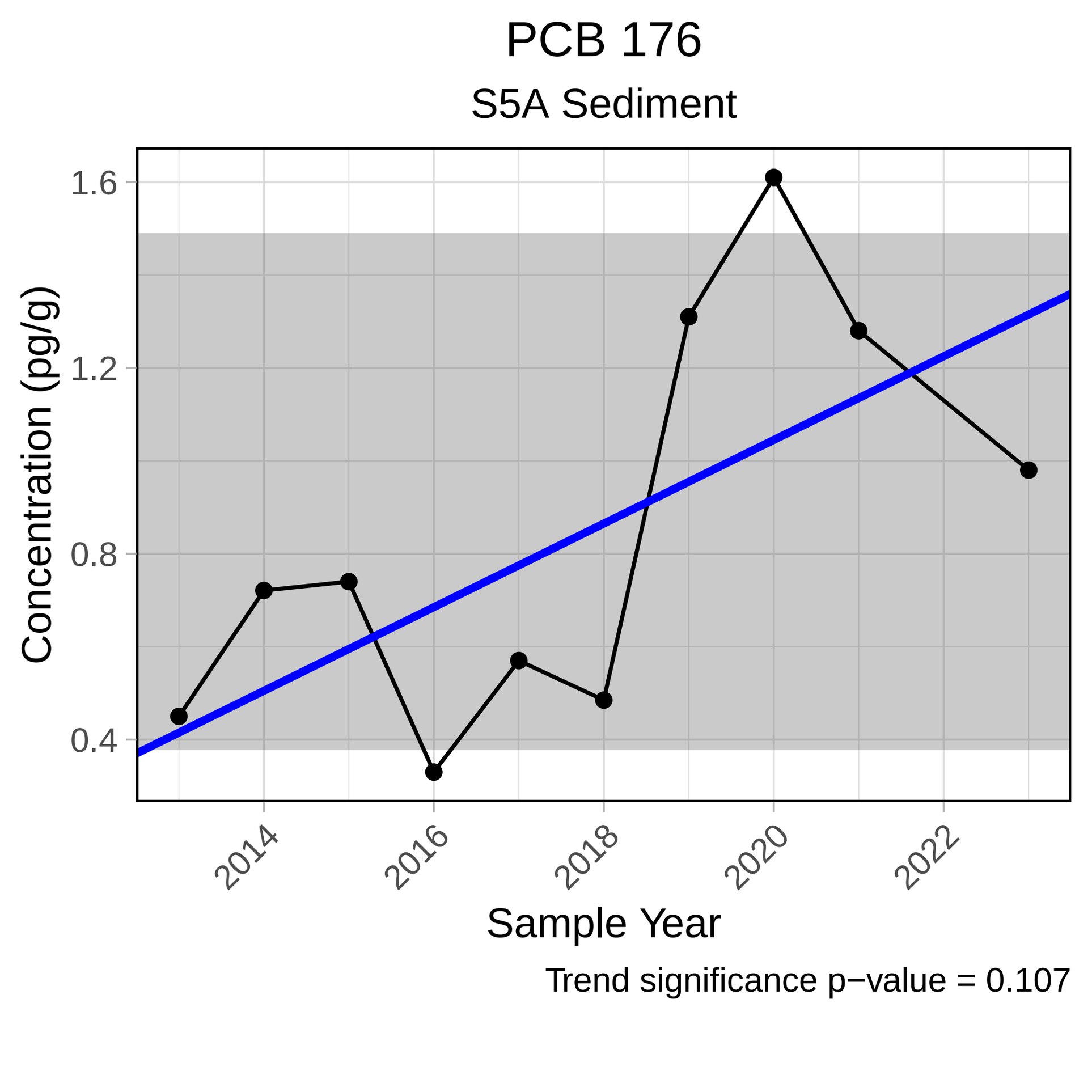

PCB 167
S5A Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

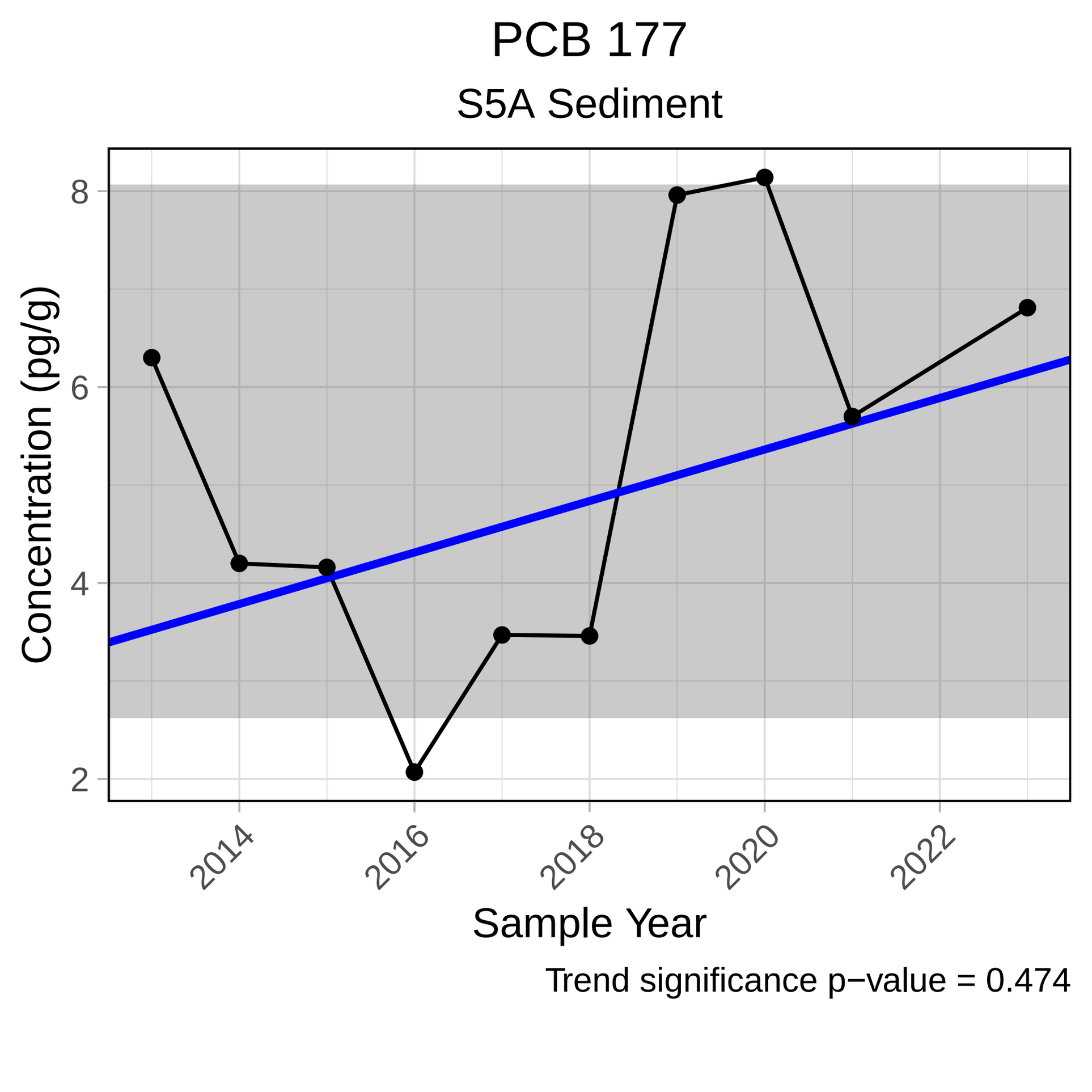

PCB 169
S5A Sediment
Concentration (pg/g)
0.6
0.4
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.101


PCB 170
S5A Sediment
Concentration (pg/g)
12
9
6
3
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.032


PCB 172
S5A Sediment
Concentration (pg/g)
2.5
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.02

PCB 174
S5A Sediment
Concentration (pg/g)
12
9
6
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

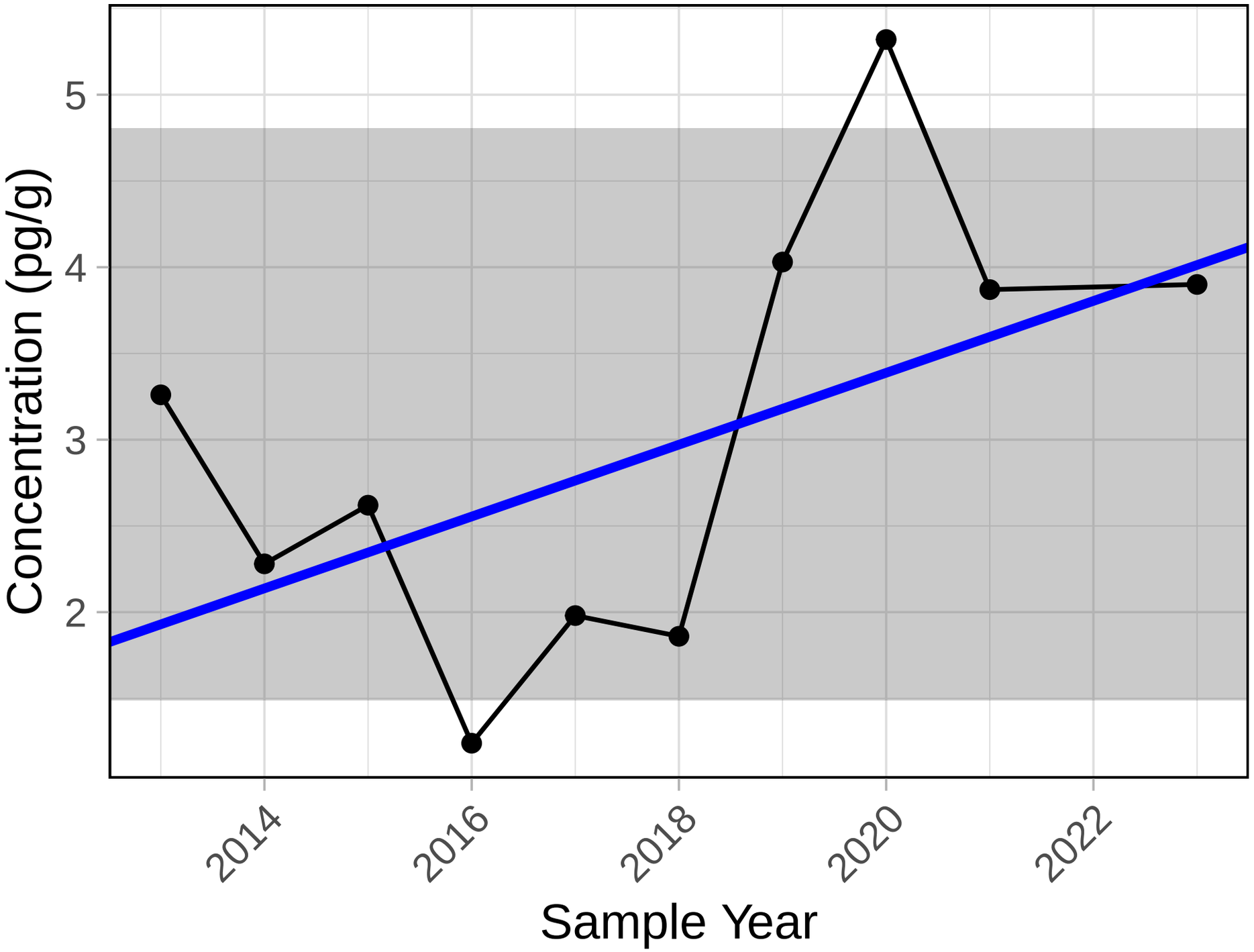

PCB 176
S5A Sediment
1.6
1.2
0.8
0.4
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107


PCB 177
S5A Sediment
Concentration (pg/g)
8
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

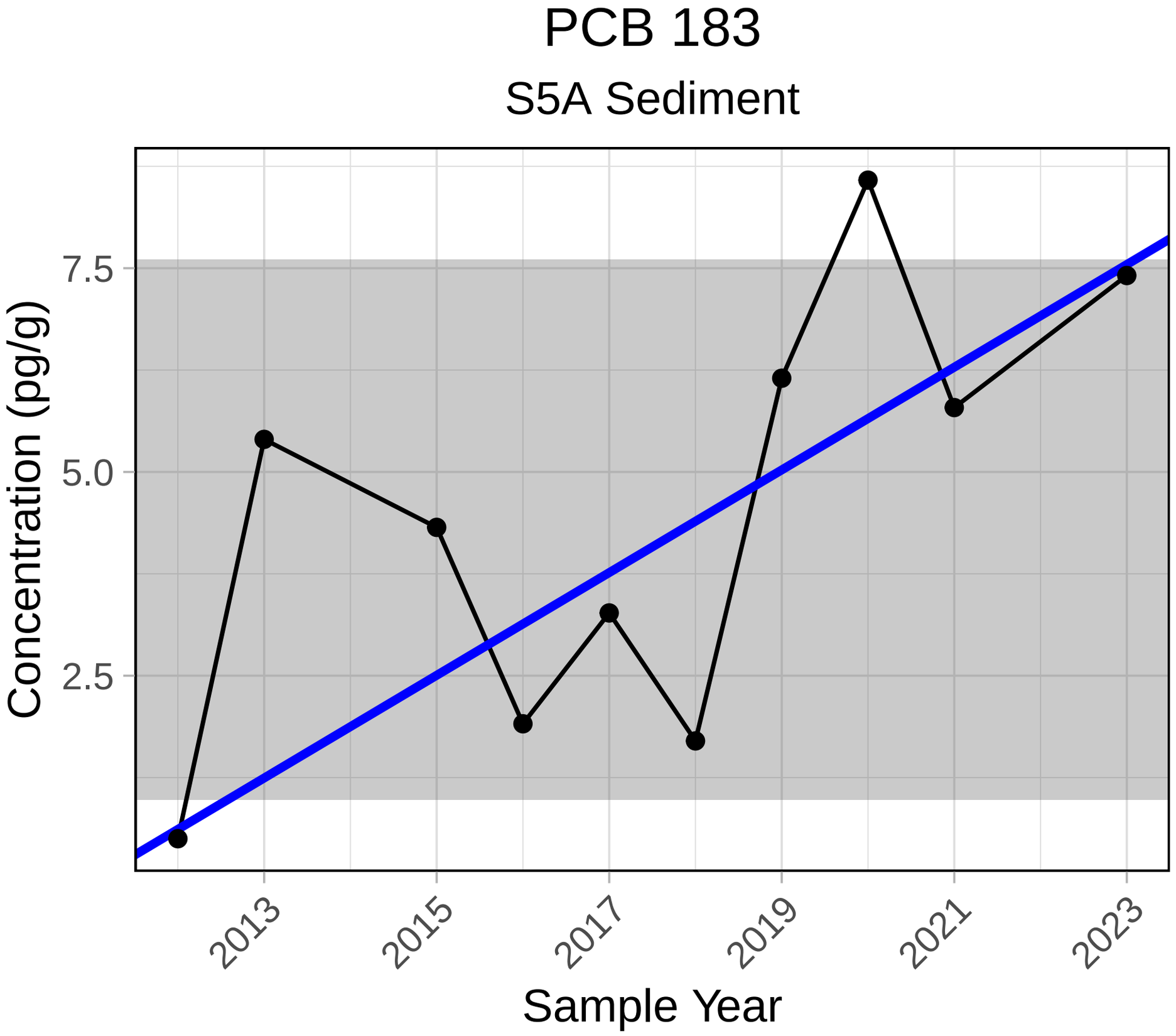
PCB 178
S5A Sediment
Concentration (pg/g)
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.02

PCB 179

S5A Sediment

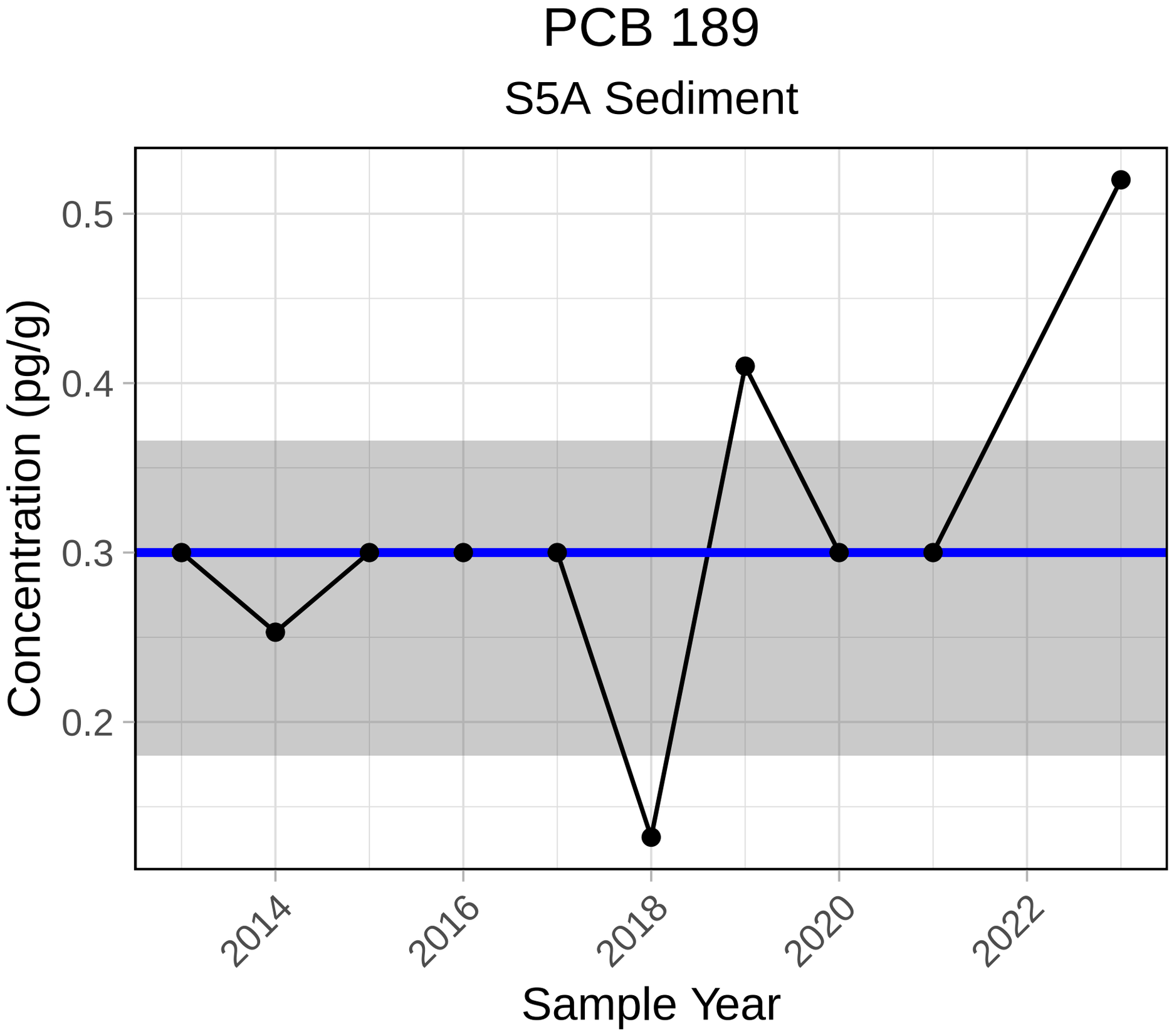


Trend significance p−value = 0.283


PCB 183
S5A Sediment
Concentration (pg/g)
7.5
5.0
2.5
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.074

PCB 185
S5A Sediment
Concentration (pg/g)
1.5
1.0
0.5
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.323

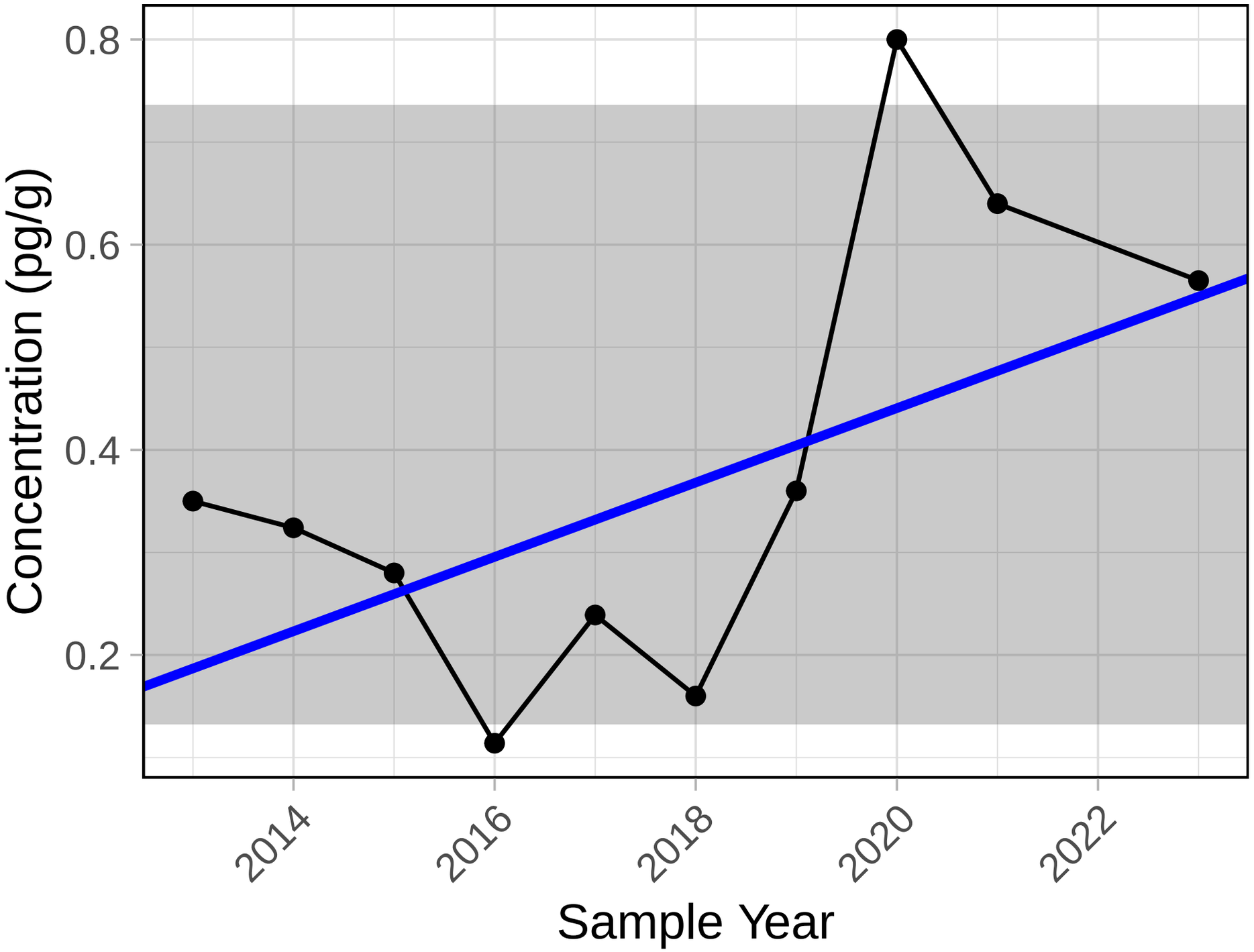
PCB 187
S5A Sediment
18
15
12
9
6
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21


PCB 189
S5A Sediment
Concentration (pg/g)
0.5
0.4
0.3
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.186

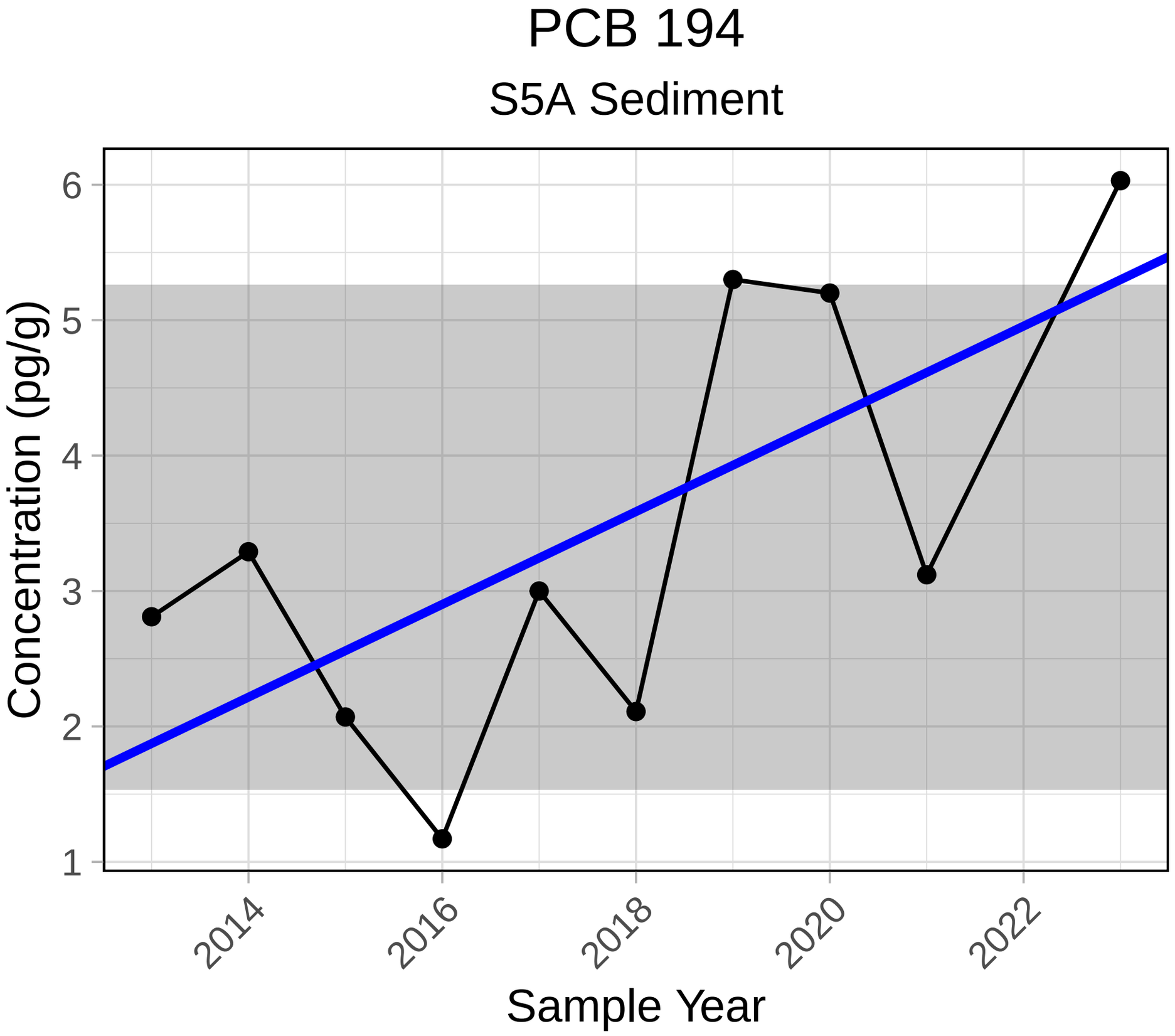
PCB 190
S5A Sediment
Concentration (pg/g)
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.02

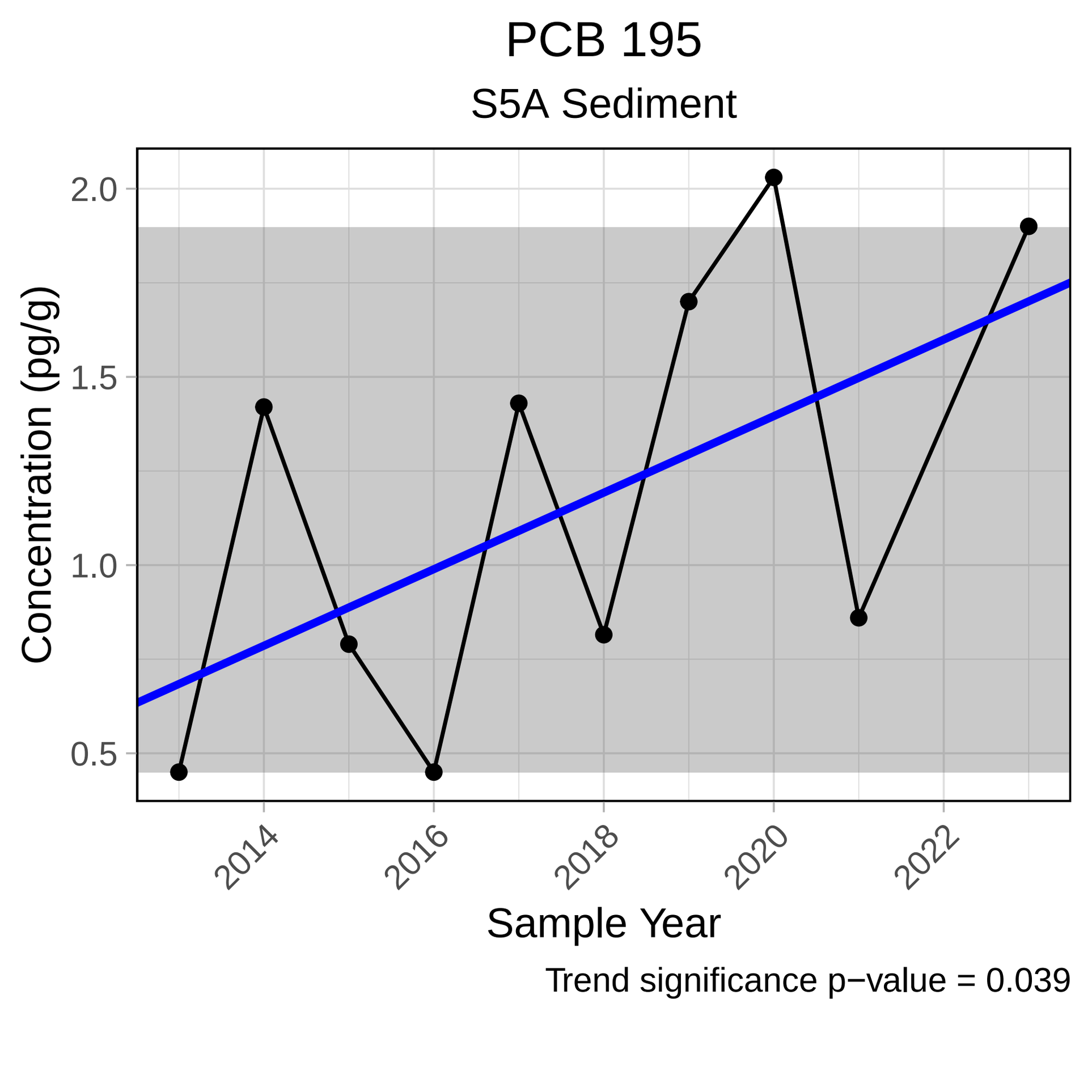
PCB 191

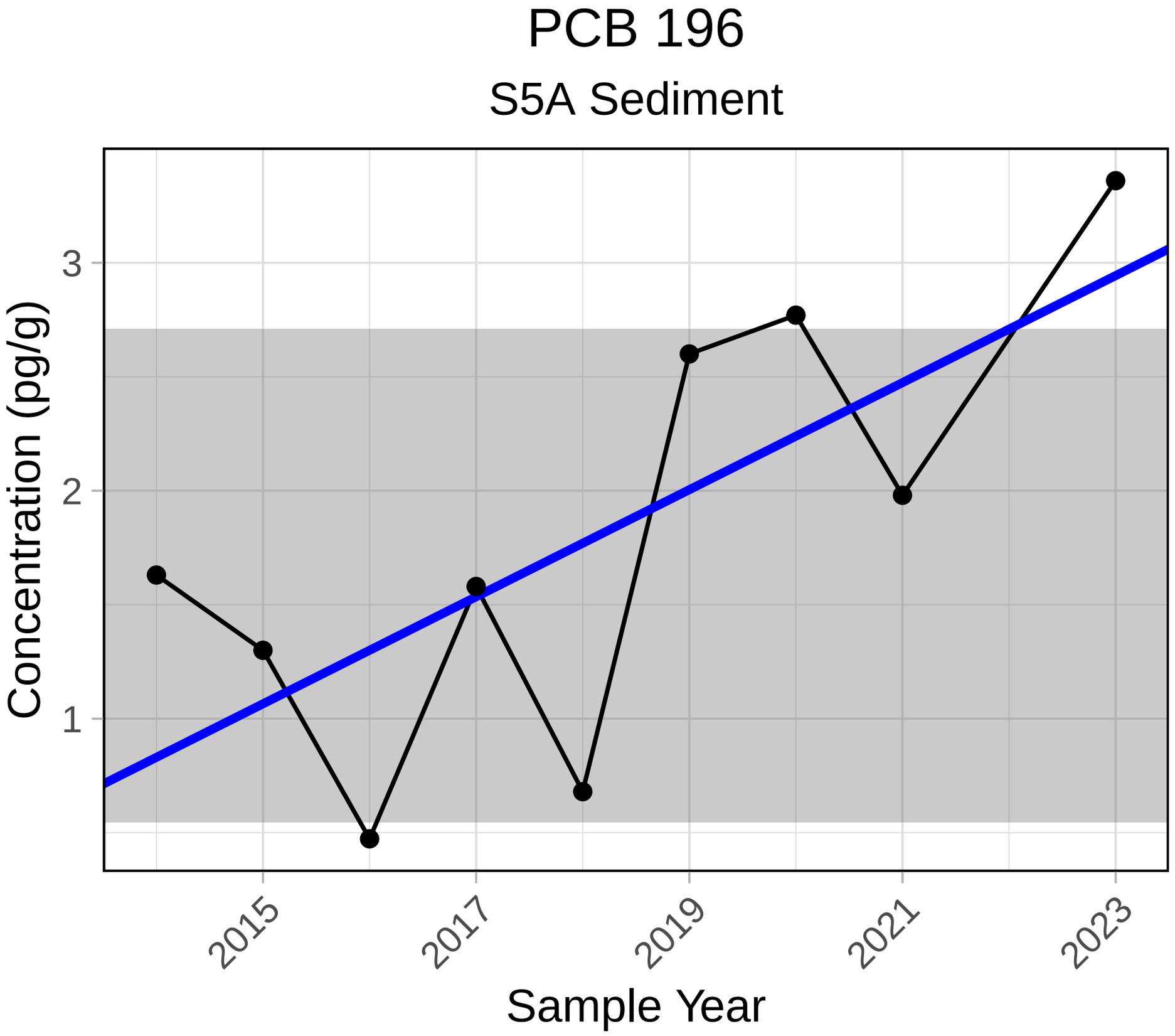
S5A Sediment

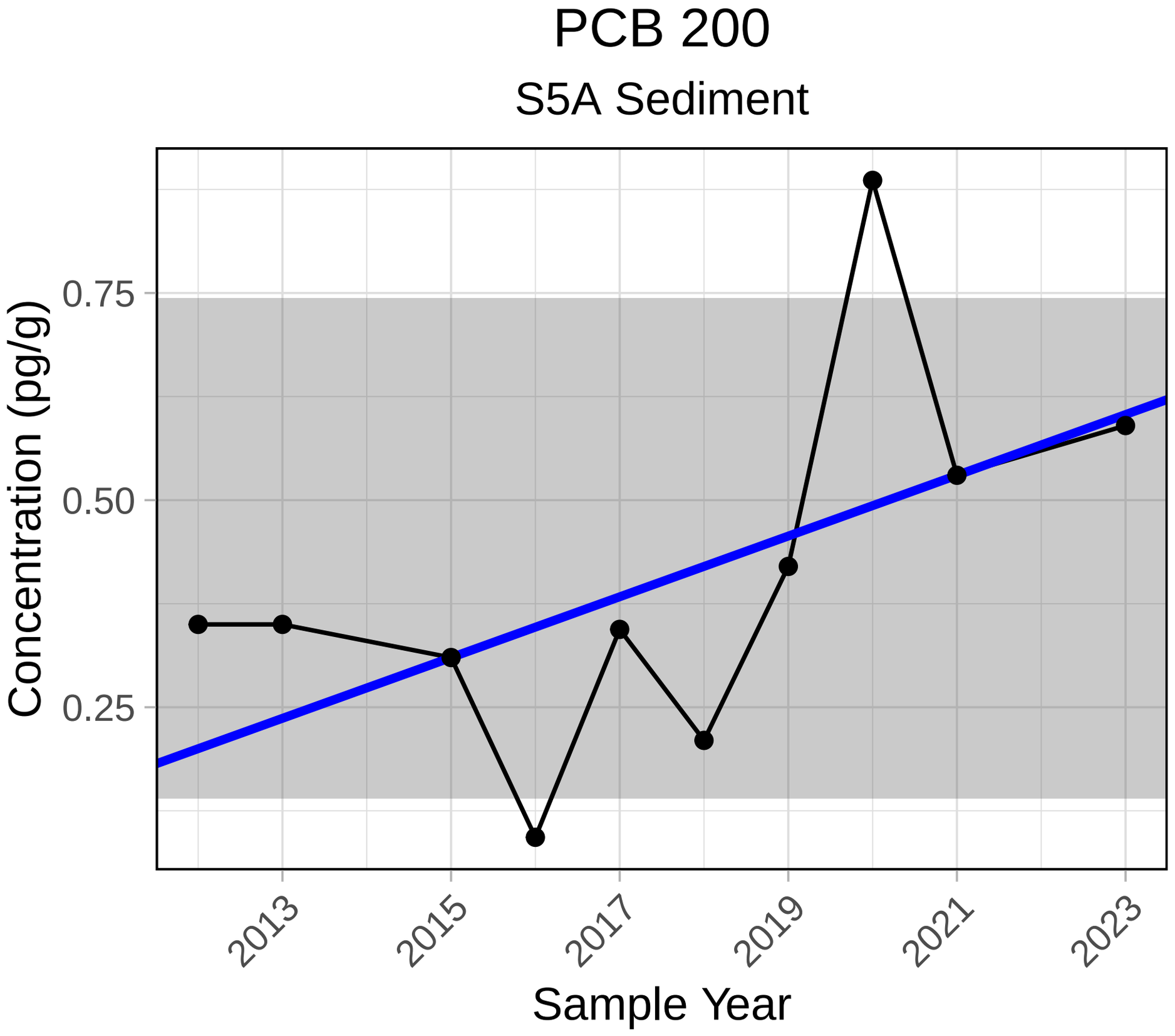


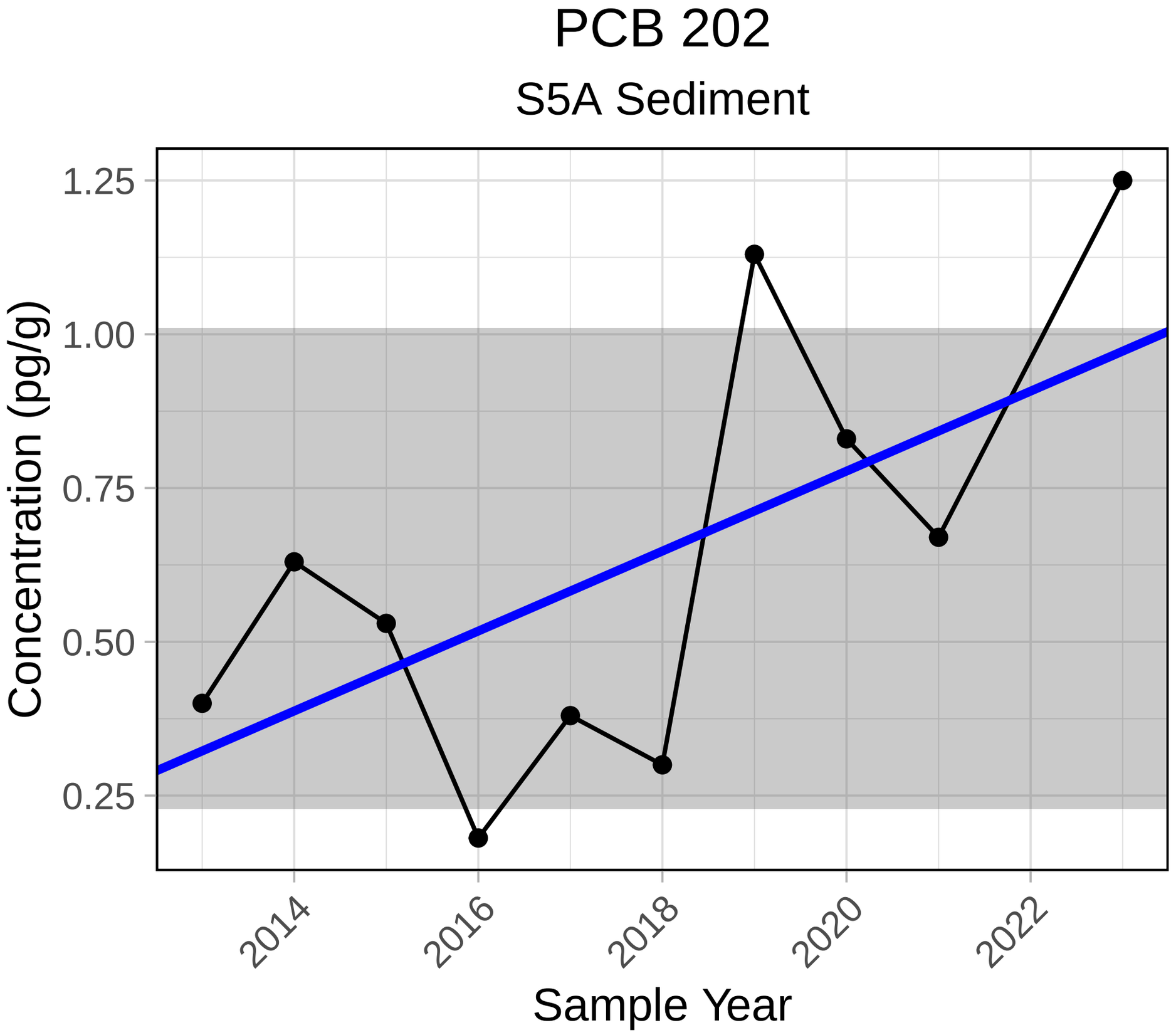
Trend significance p−value = 0.283


PCB 194
S5A Sediment
Concentration (pg/g)
6
5
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107

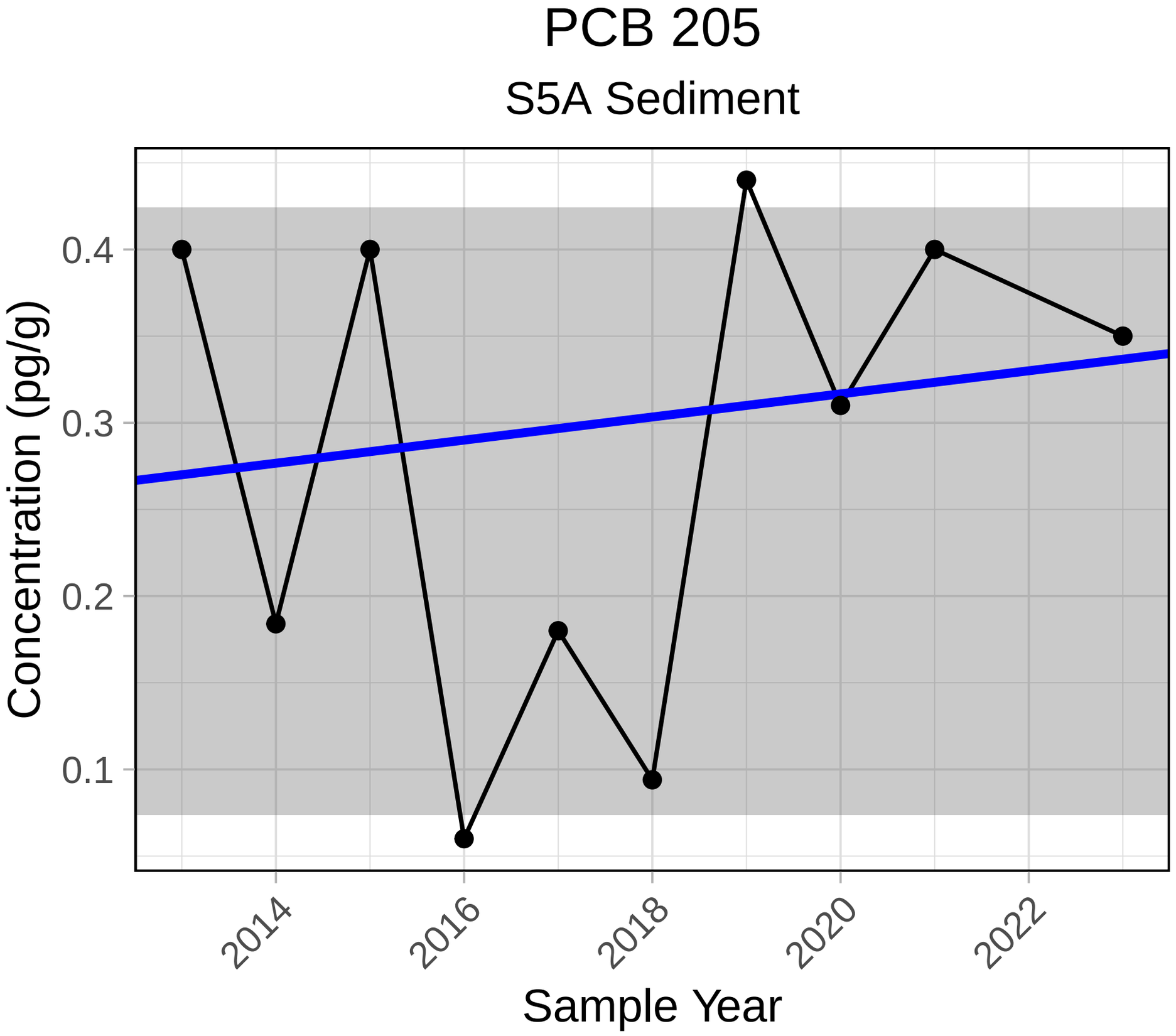

PCB 195
S5A Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.039

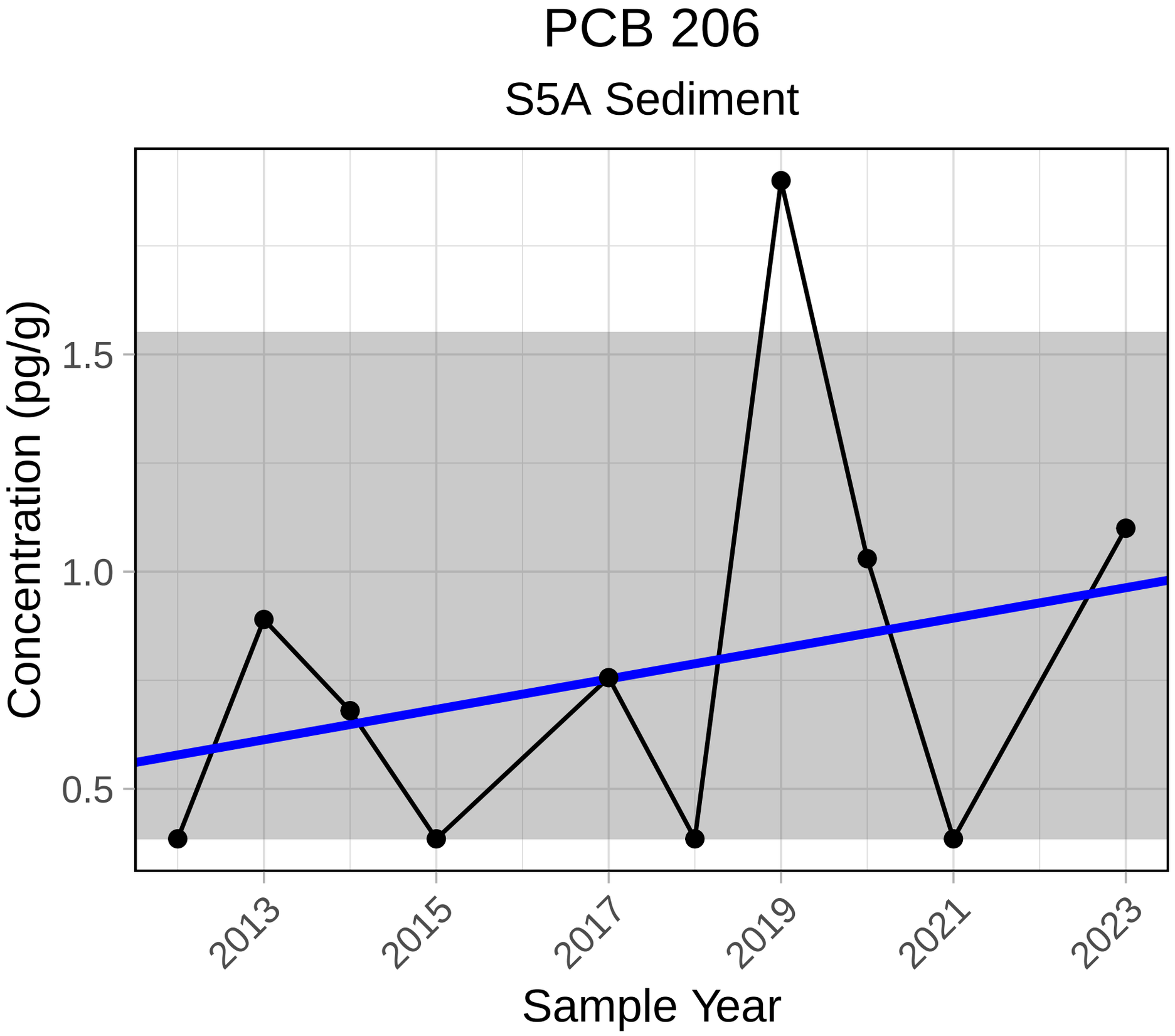

PCB 196
S5A Sediment
Concentration (pg/g)
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.076

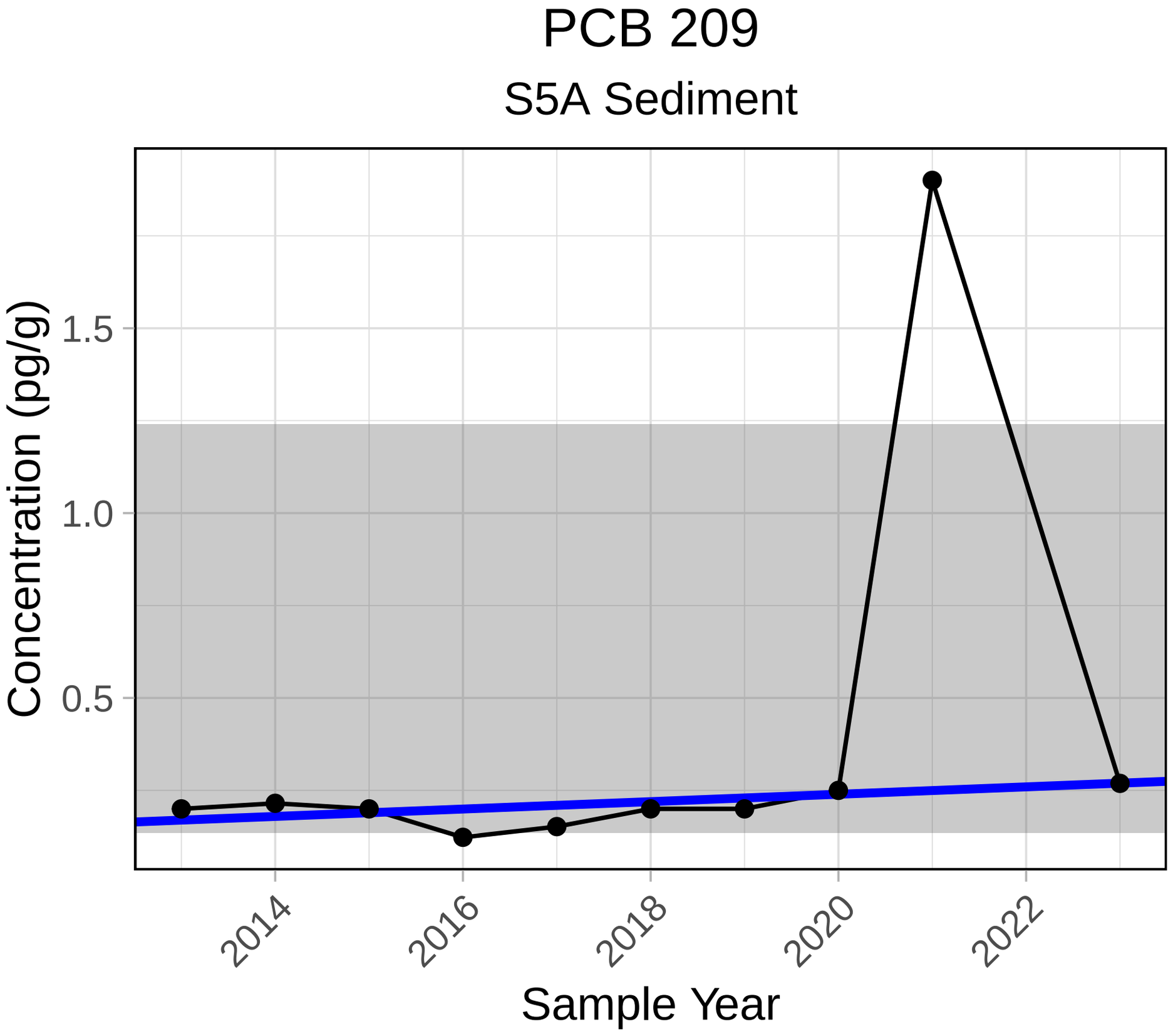

PCB 200
S5A Sediment
Concentration (pg/g)
0.75
0.50
0.25
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.127

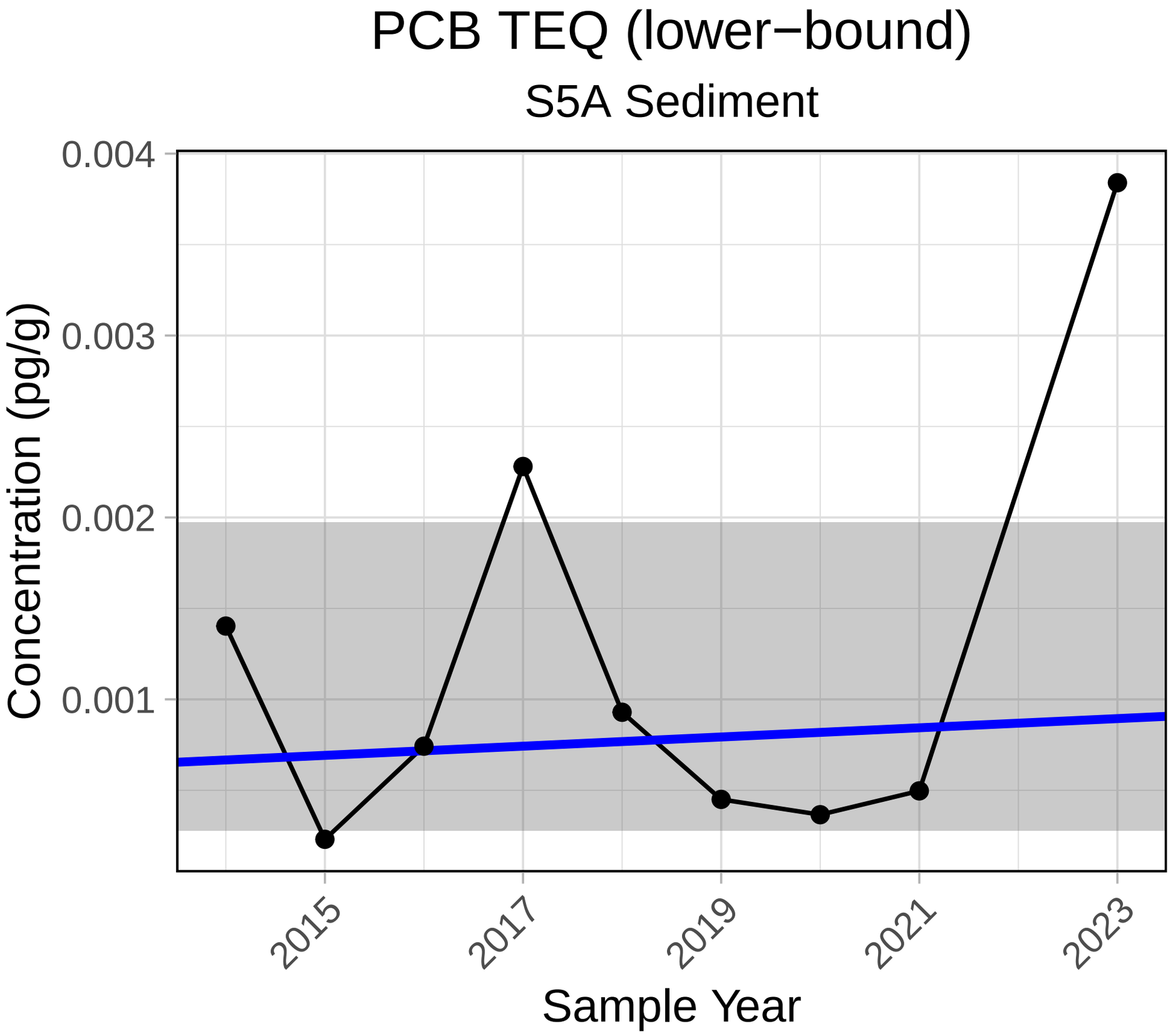

PCB 202
S5A Sediment
1.25
1.00
0.75
0.50
0.25
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

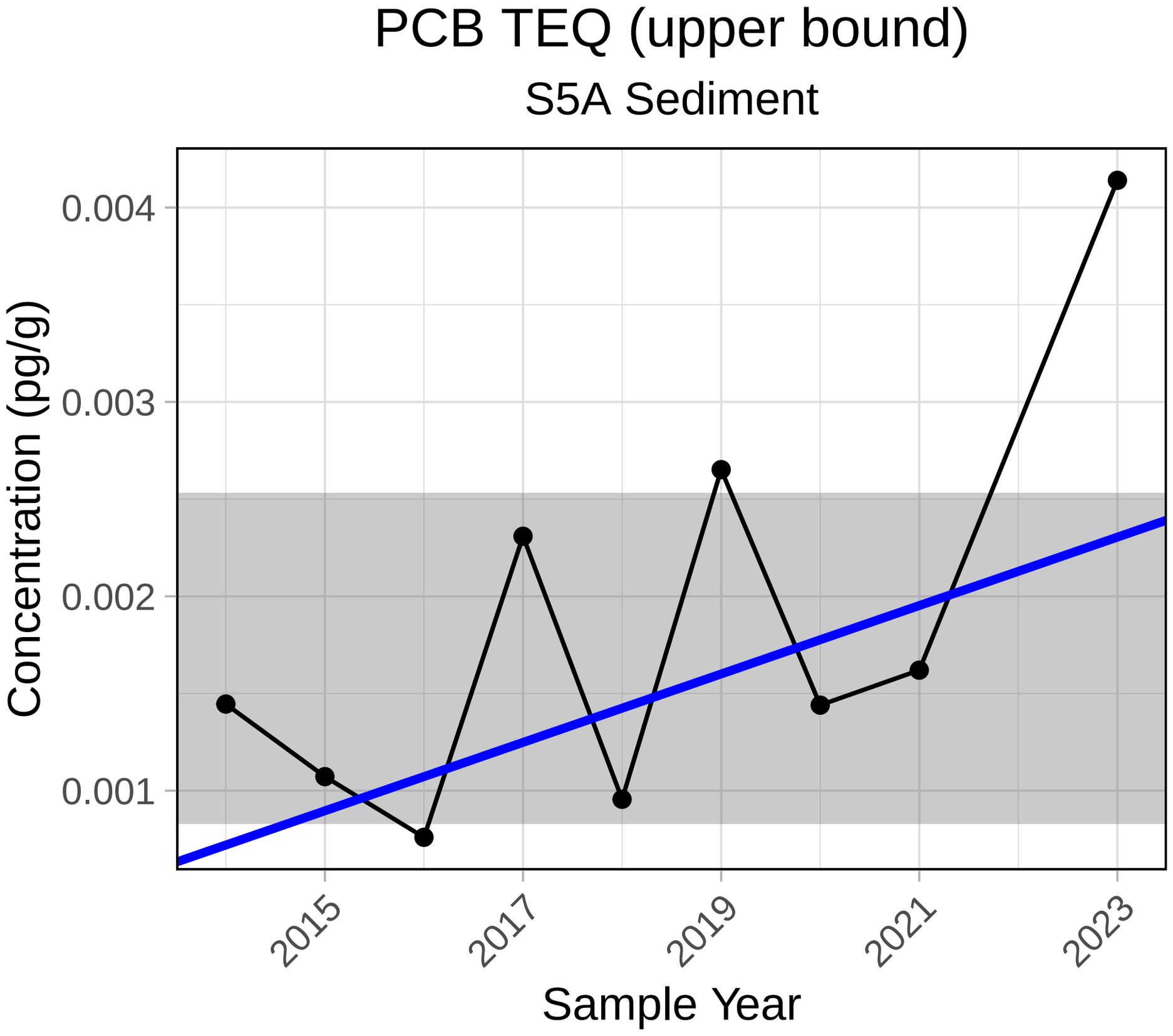
PCB 203
S5A Sediment
Concentration (pg/g)
4
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.175

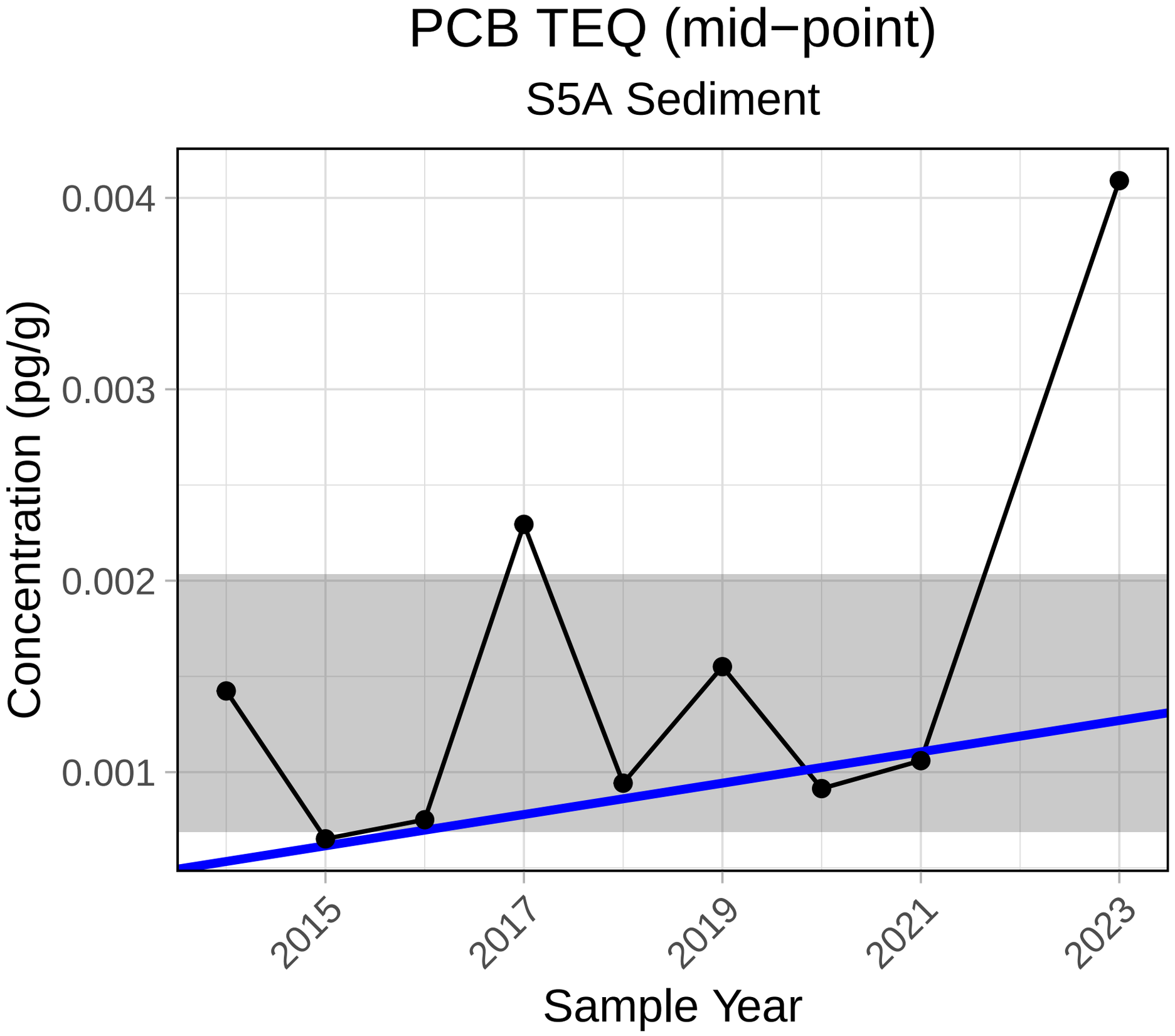

PCB 205
S5A Sediment
Concentration (pg/g)
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.785

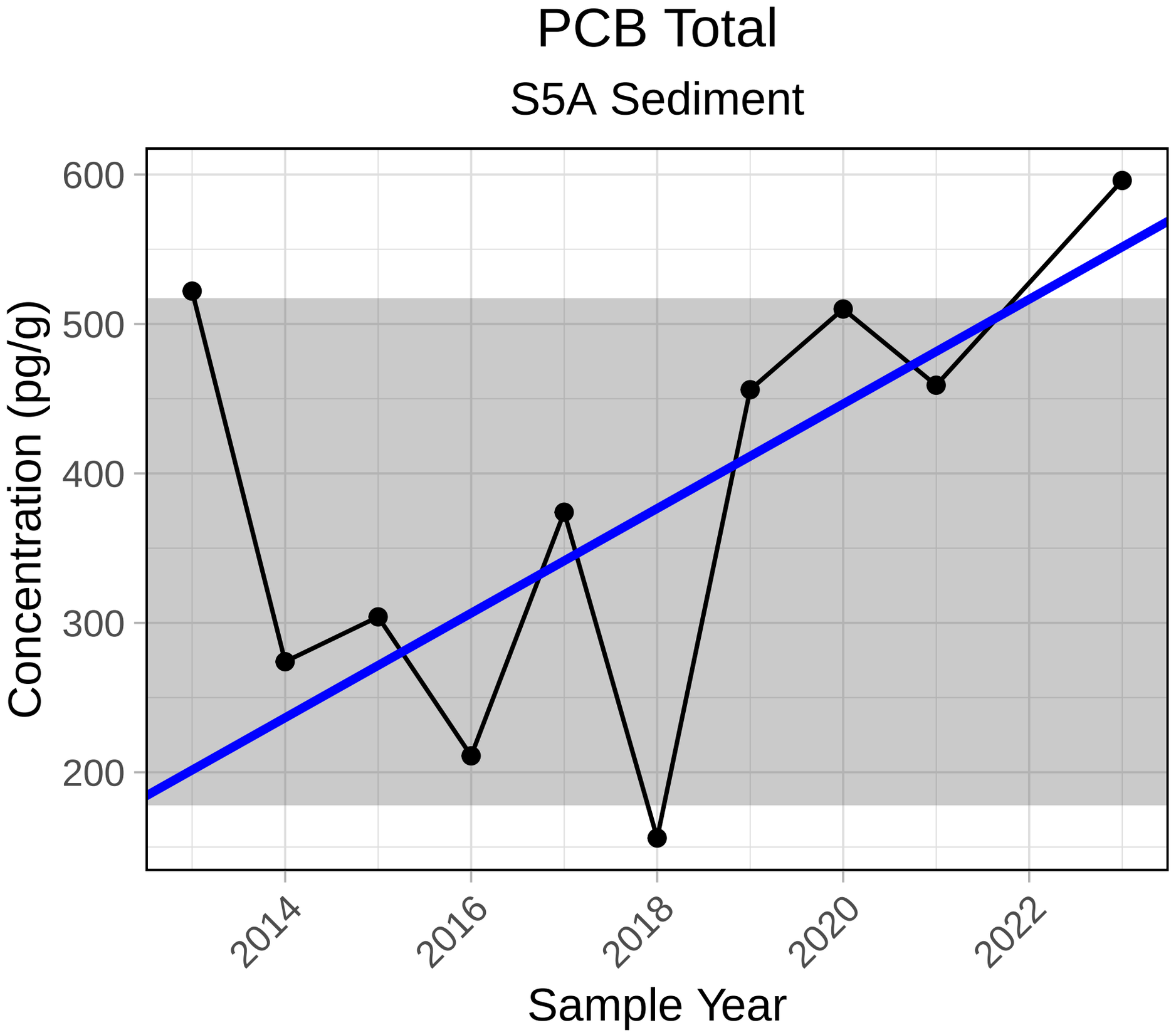

PCB 206
S5A Sediment
Concentration (pg/g)
1.5
1.0
0.5
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.354


PCB 209
S5A Sediment
Concentration (pg/g)
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.095


PCB TEQ (lower−bound)
S5A Sediment
0.004
0.003
0.002
0.001
Concentration (pg/g)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.917

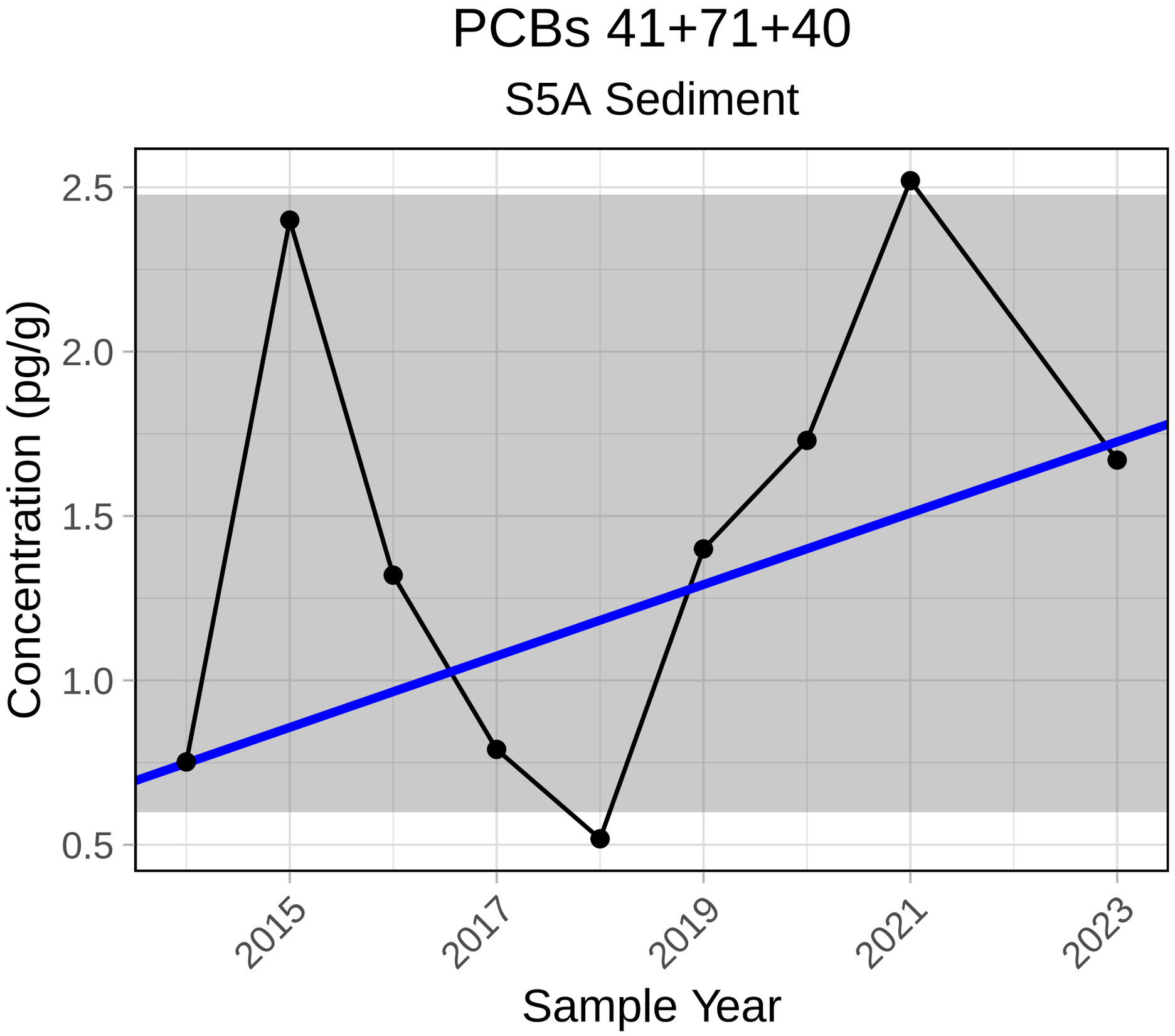

PCB TEQ (upper bound)
S5A Sediment
Concentration (pg/g)
0.004
0.003
0.002
0.001
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.175

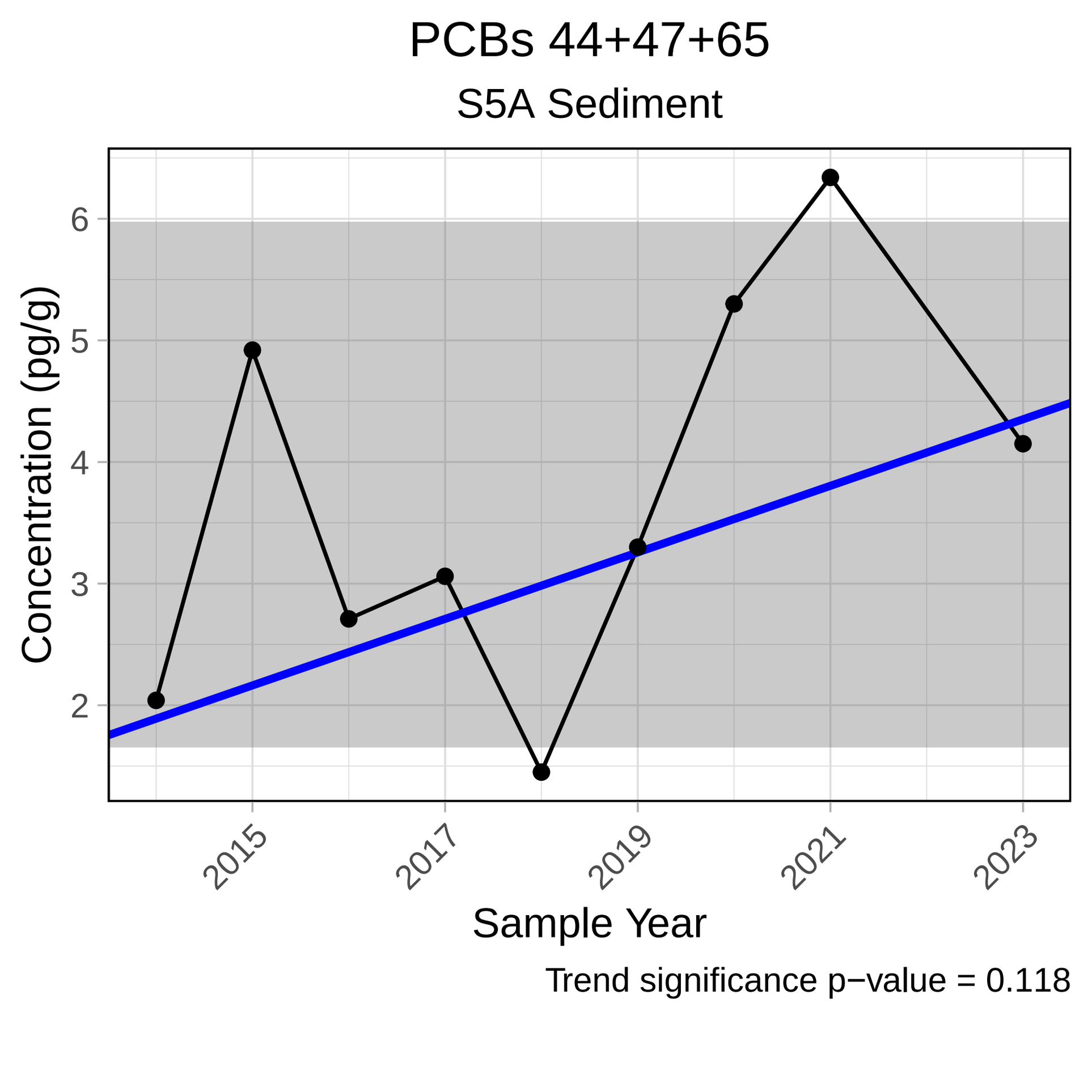

PCB TEQ (mid−point)
S5A Sediment
0.004
0.003
0.002
0.001
Concentration (pg/g)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

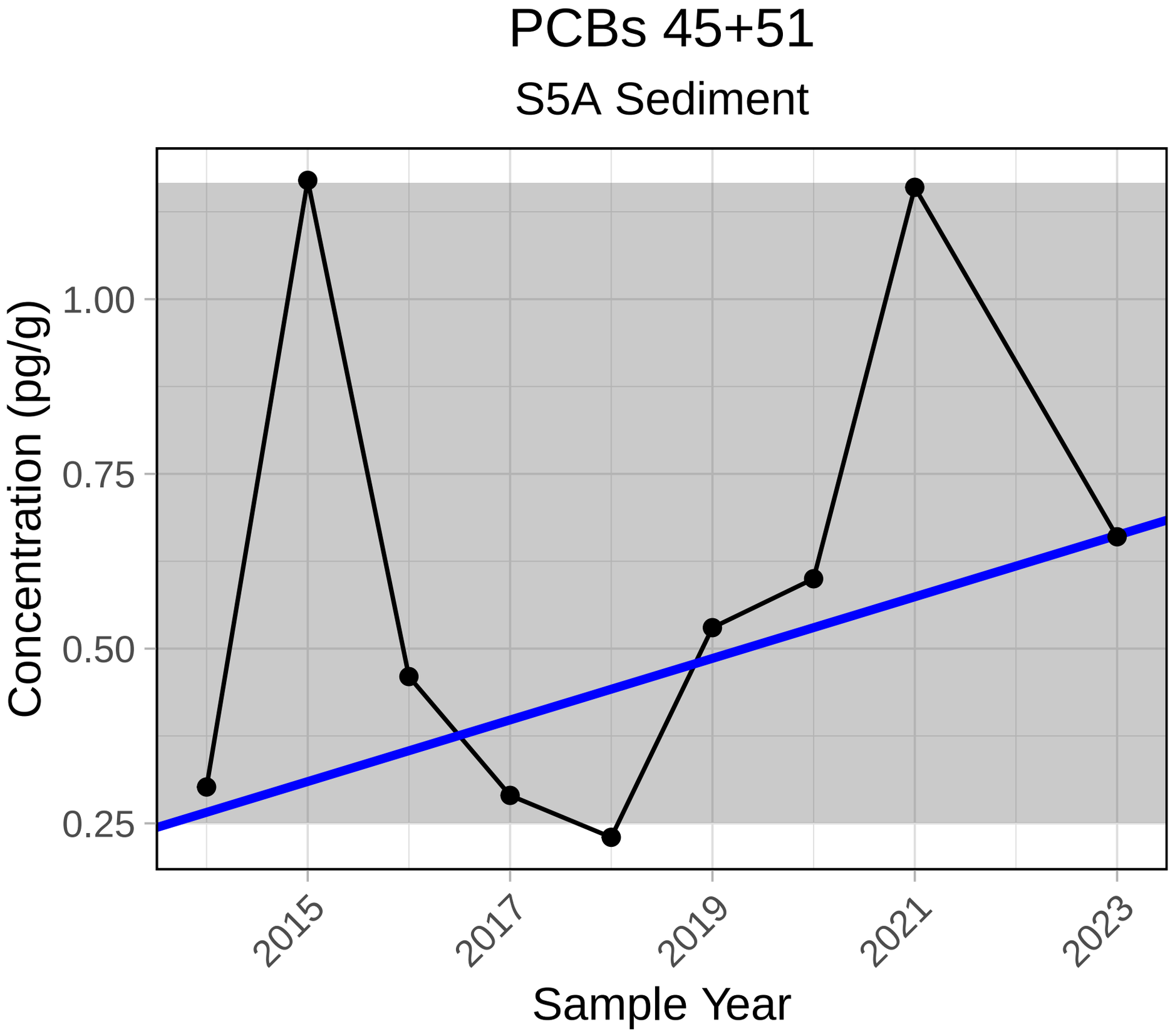


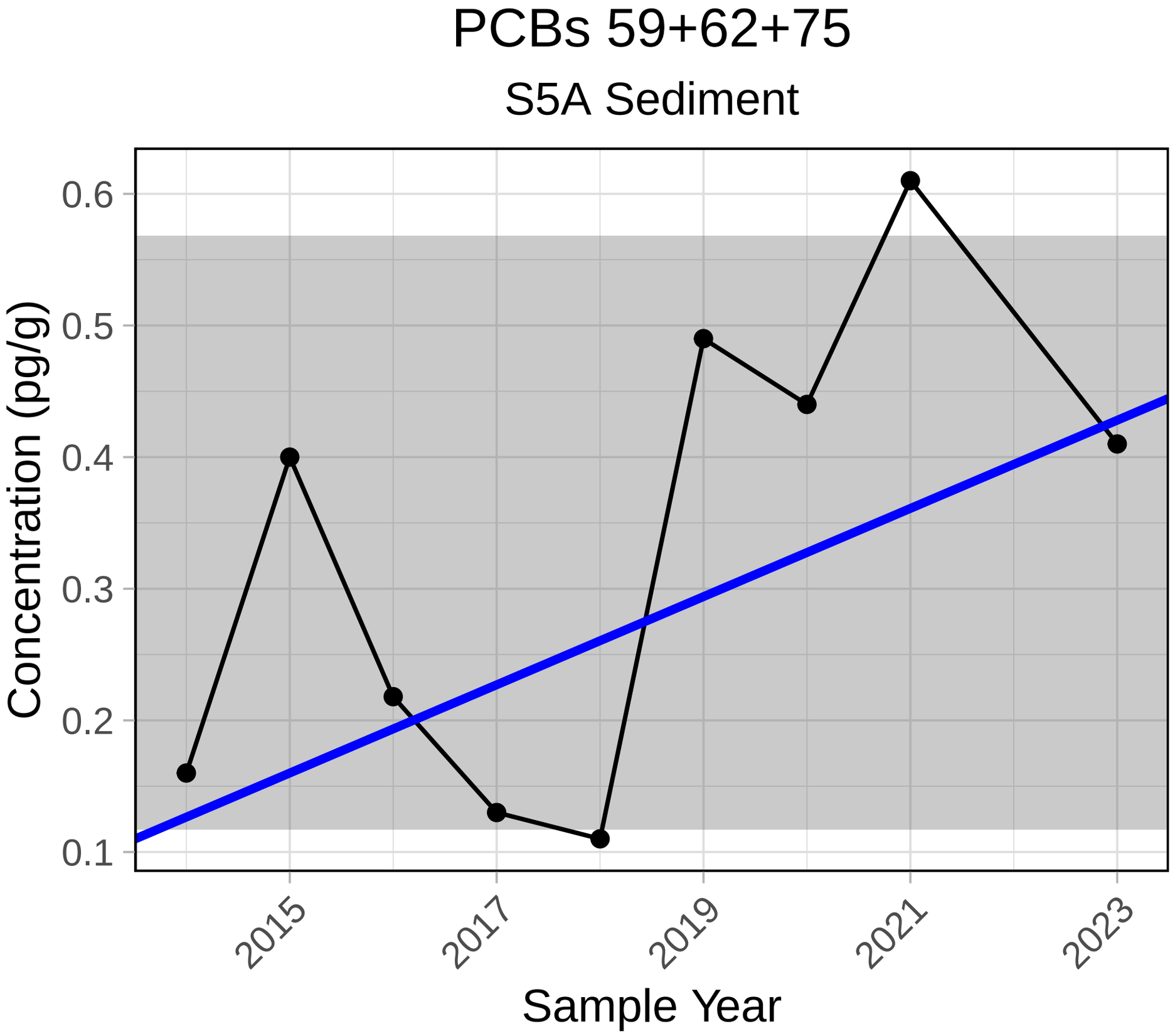
Trend significance p−value = 0.21
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)

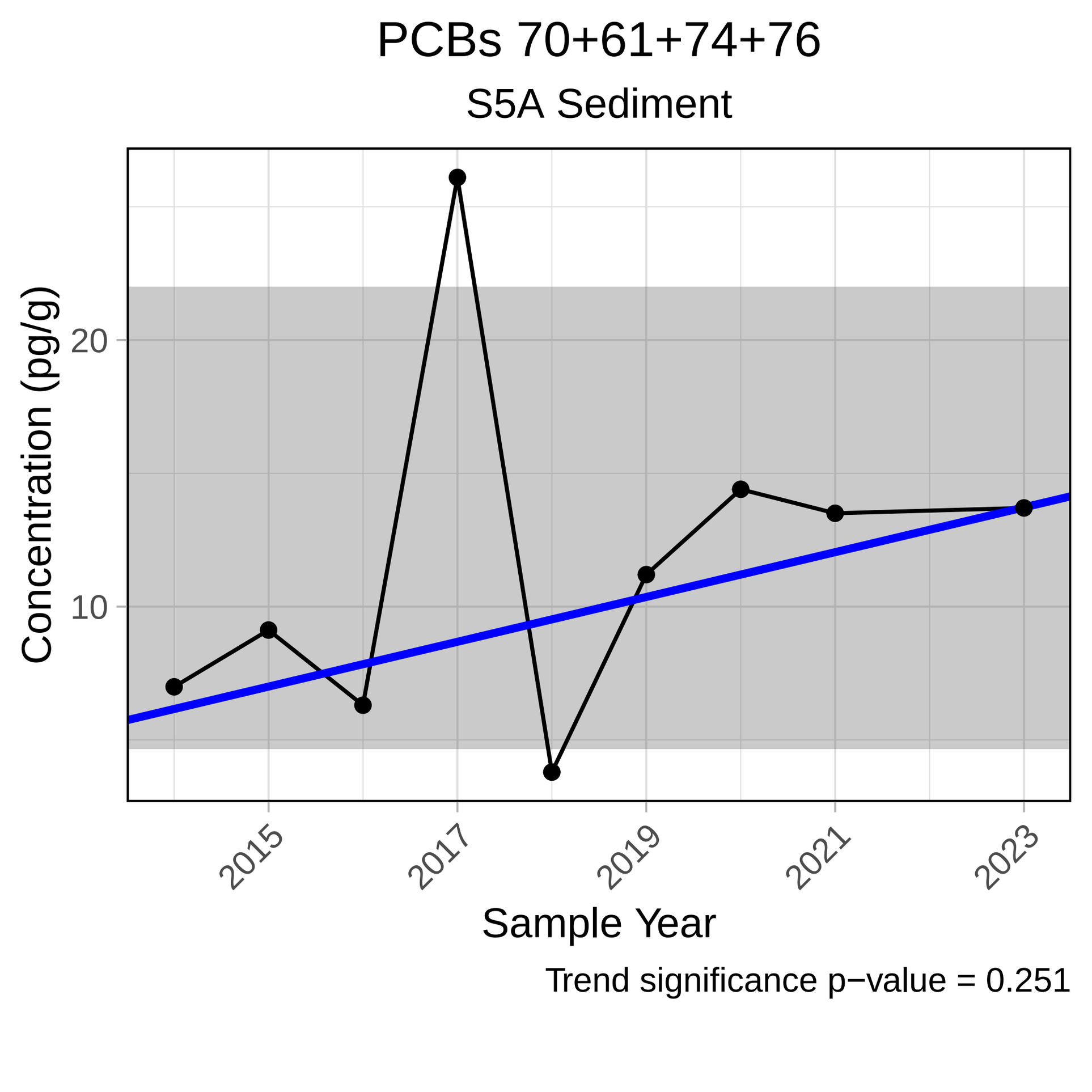
PCBs 21+33
S5A Sediment
Concentration (pg/g)
5
4
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.529


PCBs 41+71+40
S5A Sediment
Concentration (pg/g)
2.5
2.0
1.5
1.0
0.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

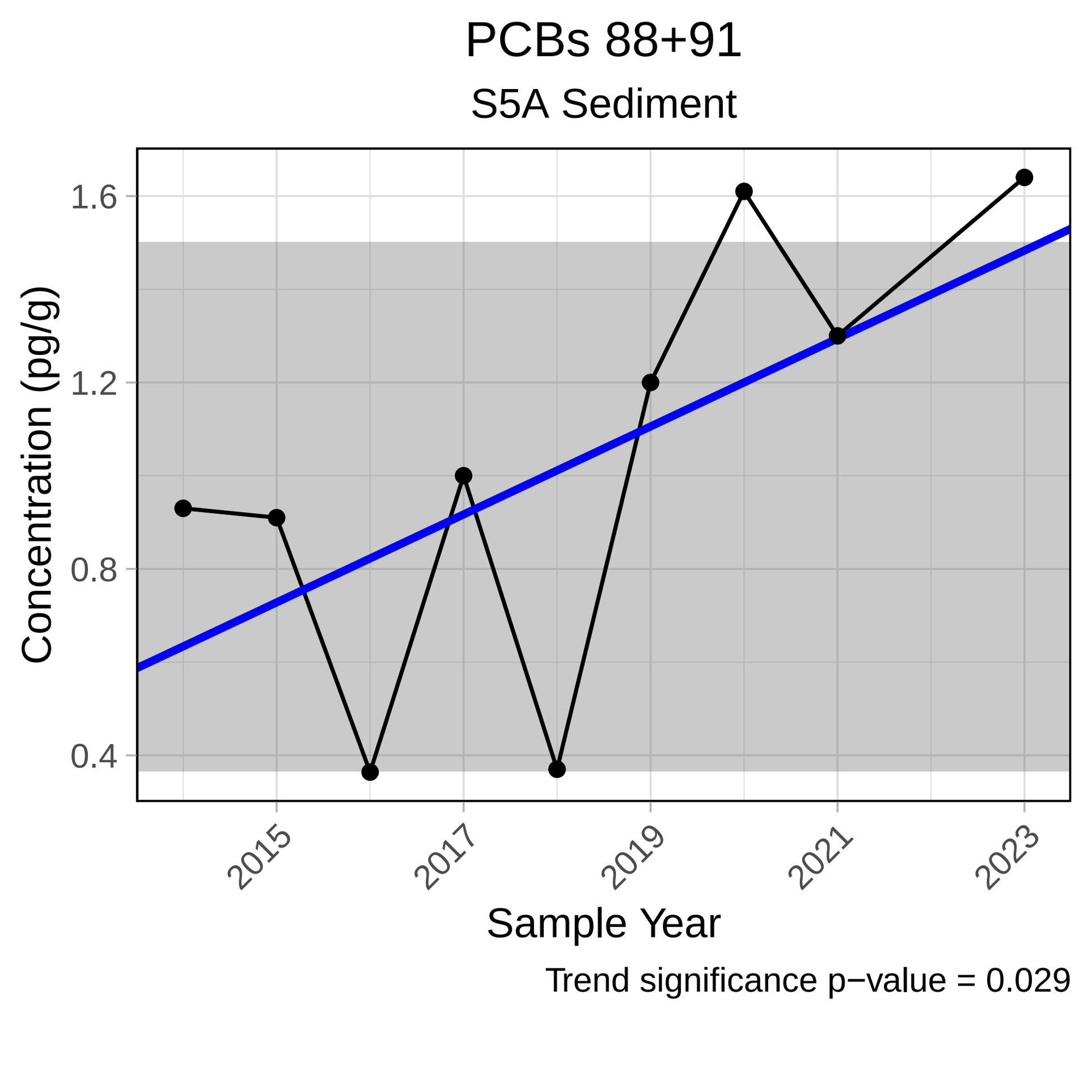

PCBs 44+47+65
S5A Sediment
Concentration (pg/g)
6
5
4
3
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.118

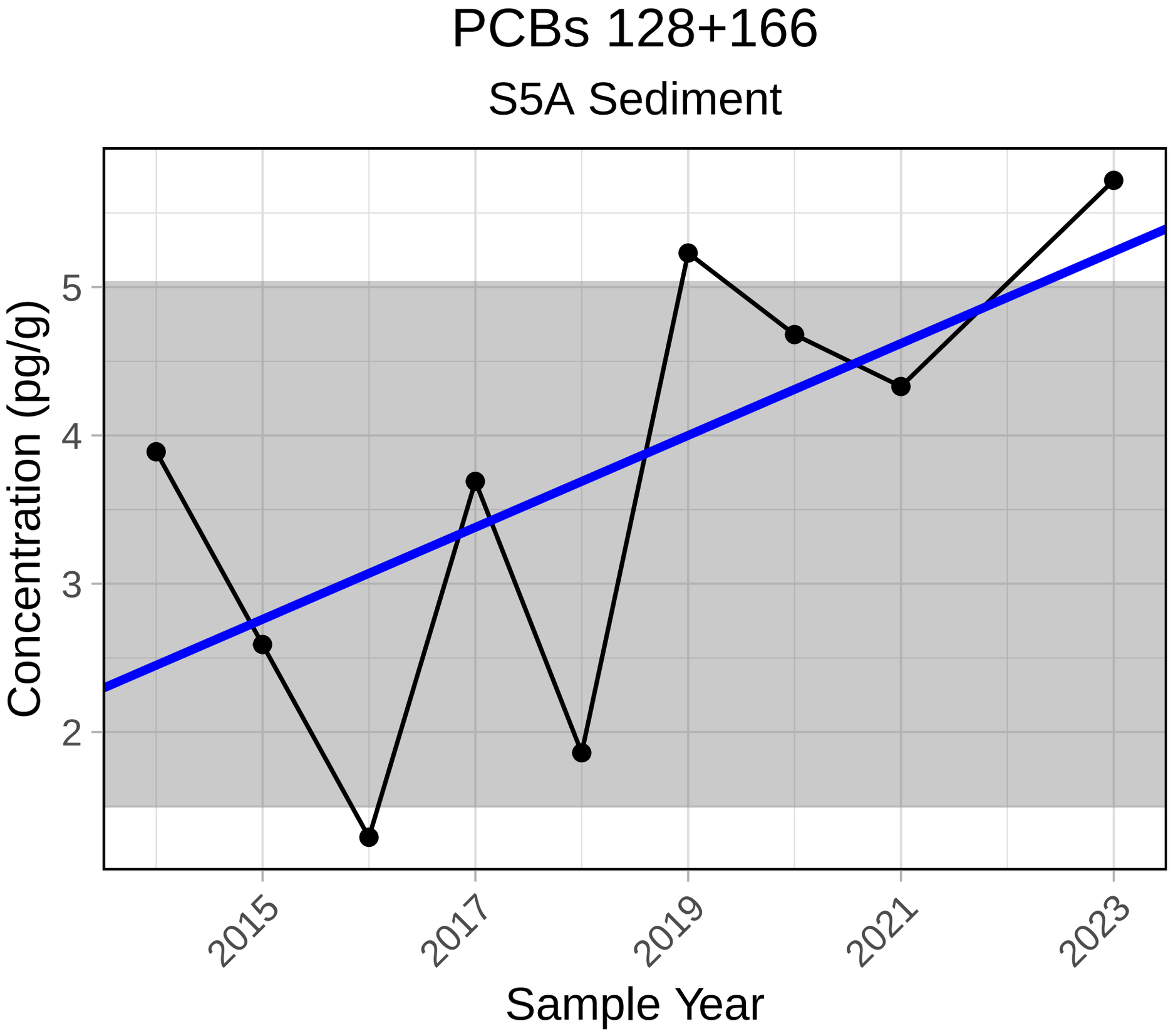

PCBs 45+51
S5A Sediment
Concentration (pg/g)
1.00
0.75
0.50
0.25
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.348

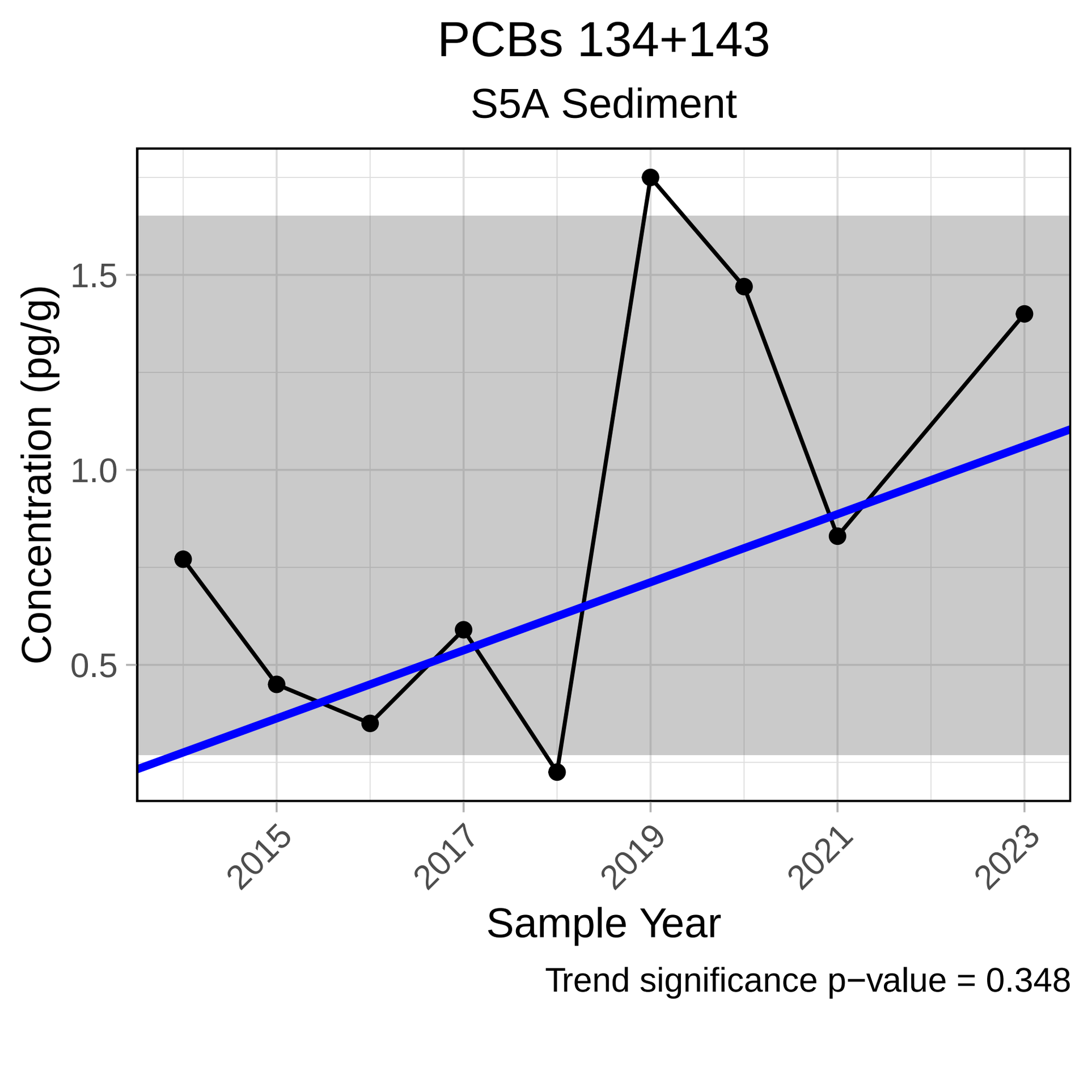

PCBs 59+62+75
S5A Sediment
Concentration (pg/g)
0.6
0.5
0.4
0.3
0.2
0.1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

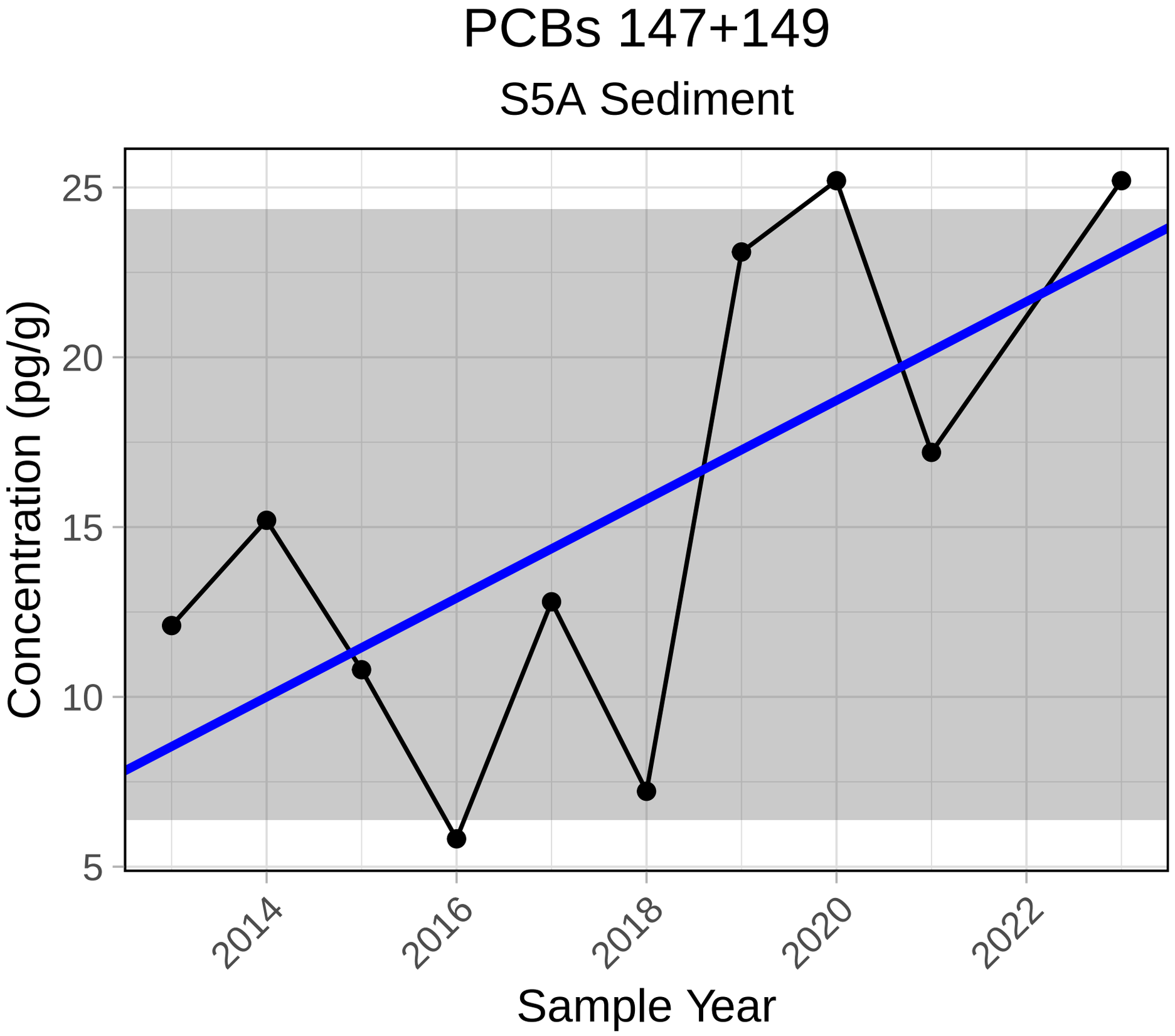

PCBs 70+61+74+76
S5A Sediment
Concentration (pg/g)
20
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

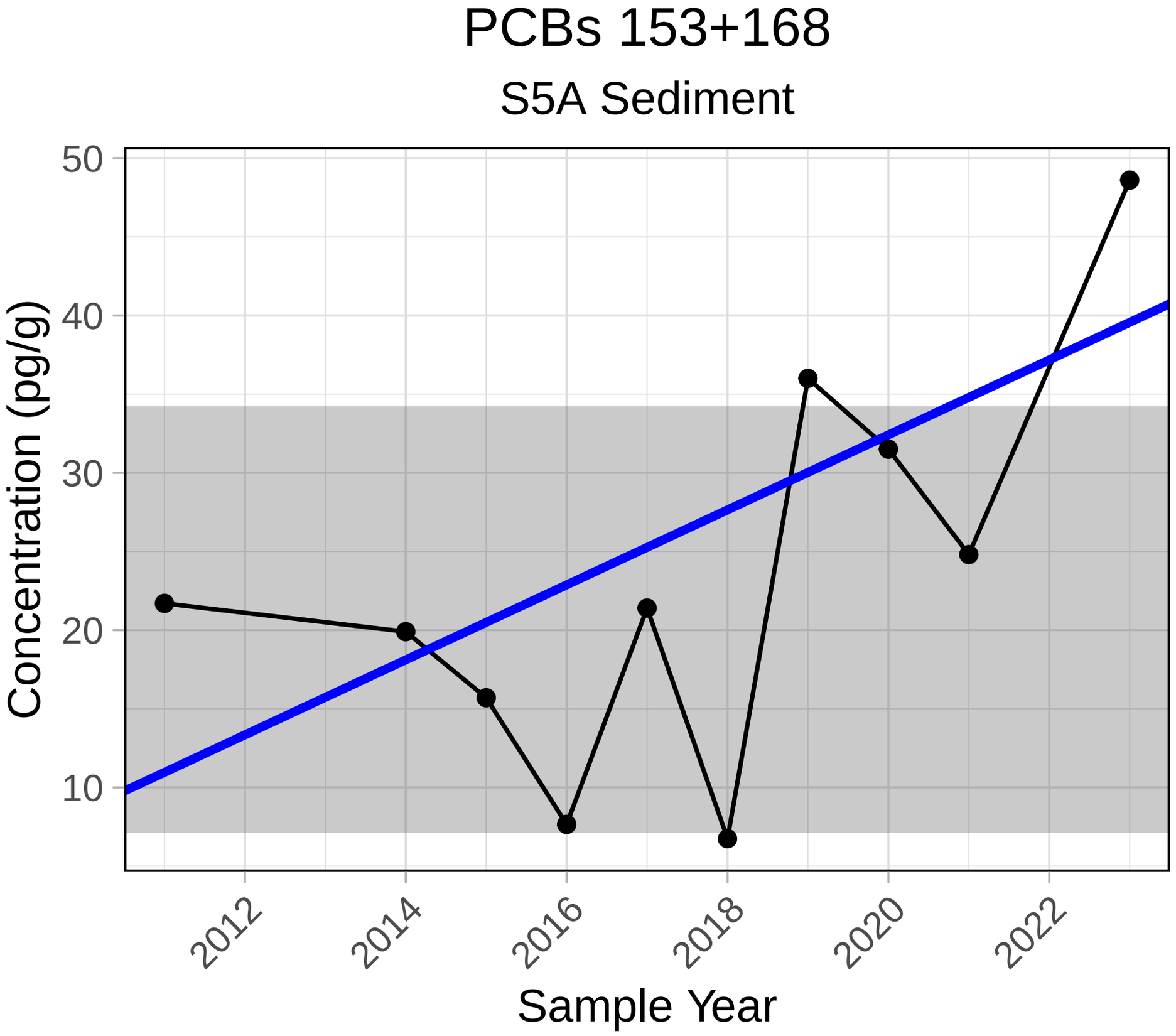
PCBs 83+99
S5A Sediment
Concentration (pg/g)
10
5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.076

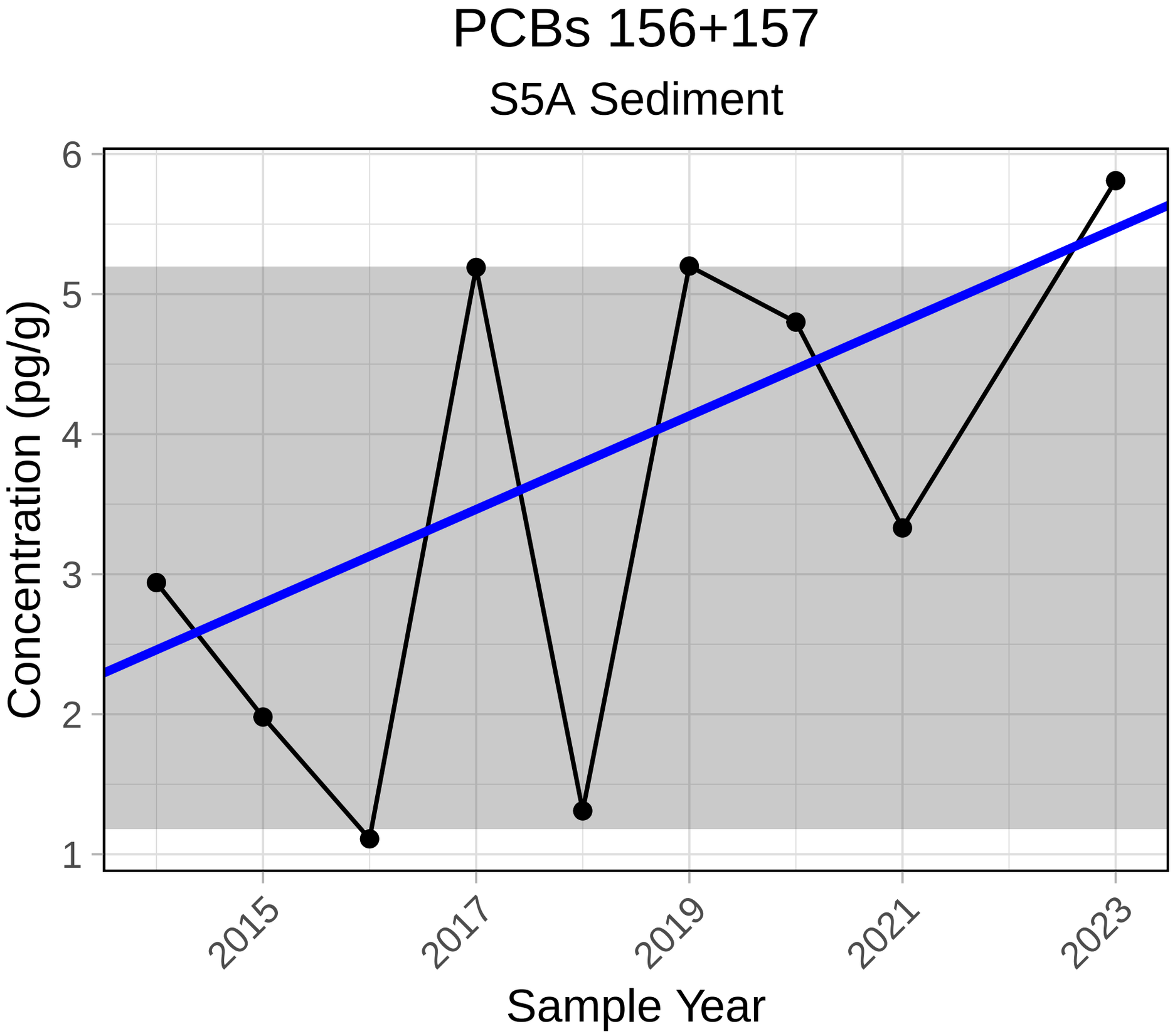

PCBs 88+91
S5A Sediment
Concentration (pg/g)
1.6
1.2
0.8
0.4
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.029


PCBs 128+166
S5A Sediment
Concentration (pg/g)
5
4
3
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.118

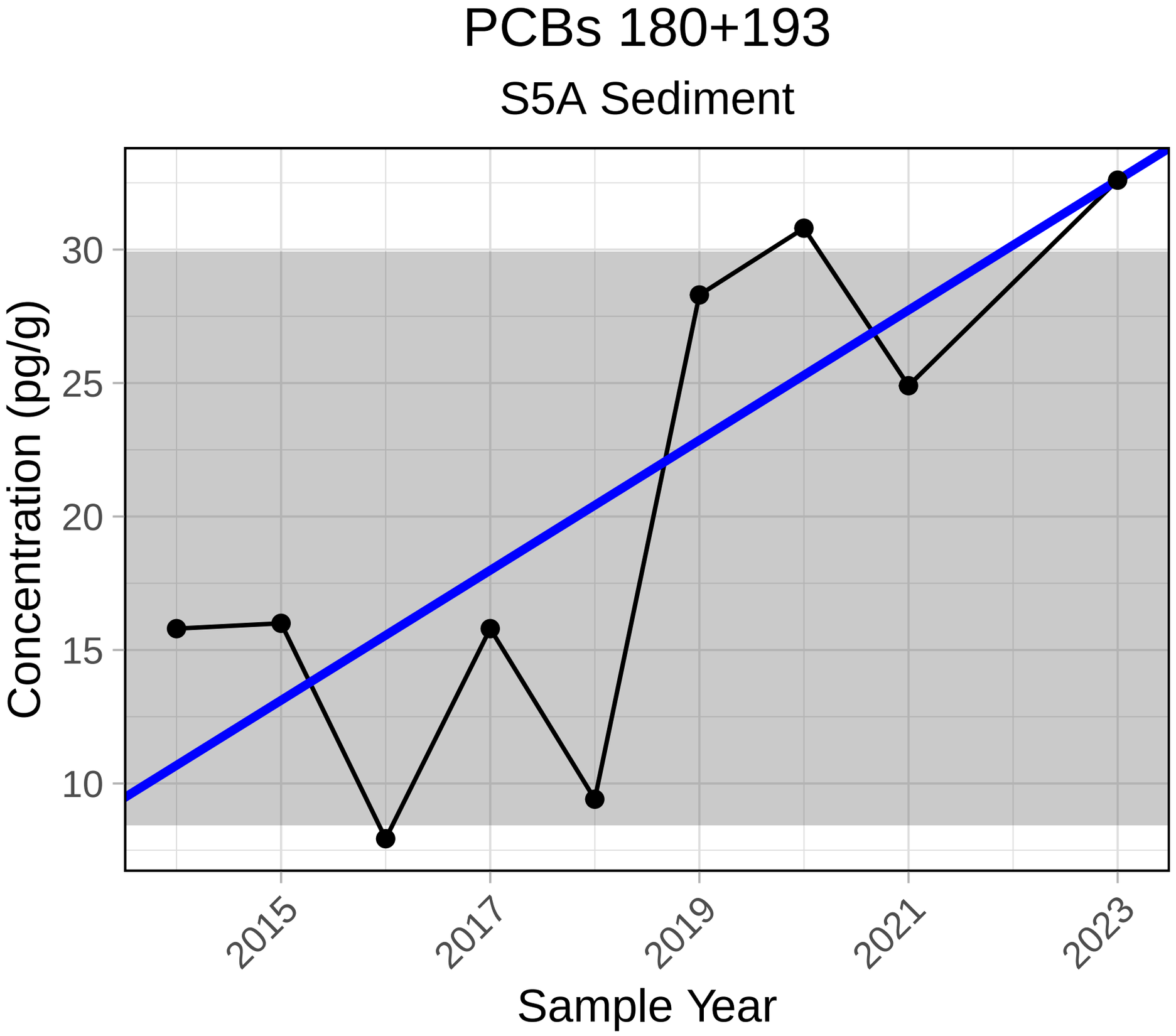

PCBs 134+143
S5A Sediment
Concentration (pg/g)
1.5
1.0
0.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.348

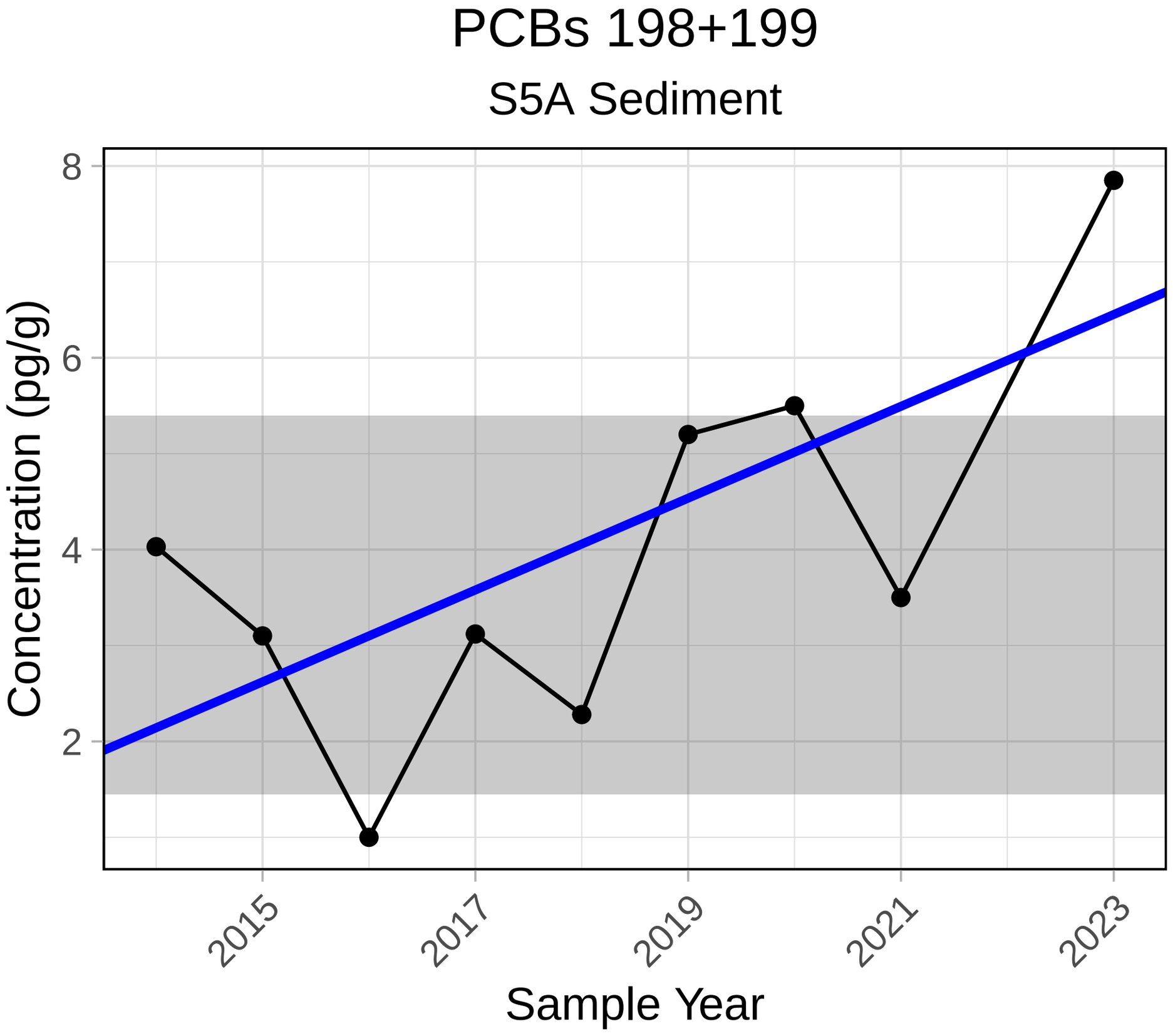

PCBs 147+149
S5A Sediment
Concentration (pg/g)
25
20
15
10
5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.088

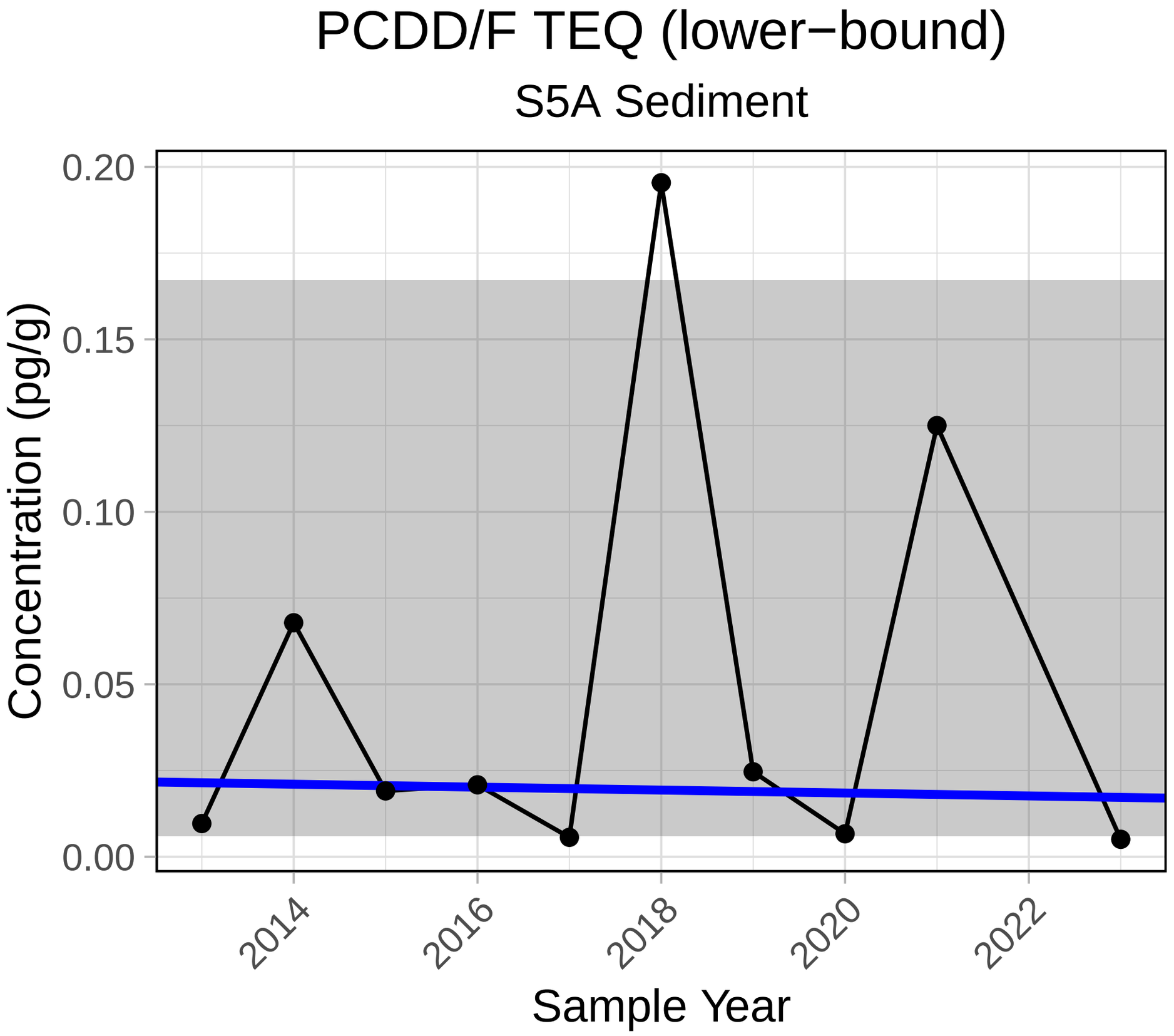

PCBs 153+168
S5A Sediment
Concentration (pg/g)
50
40
30
20
10
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21

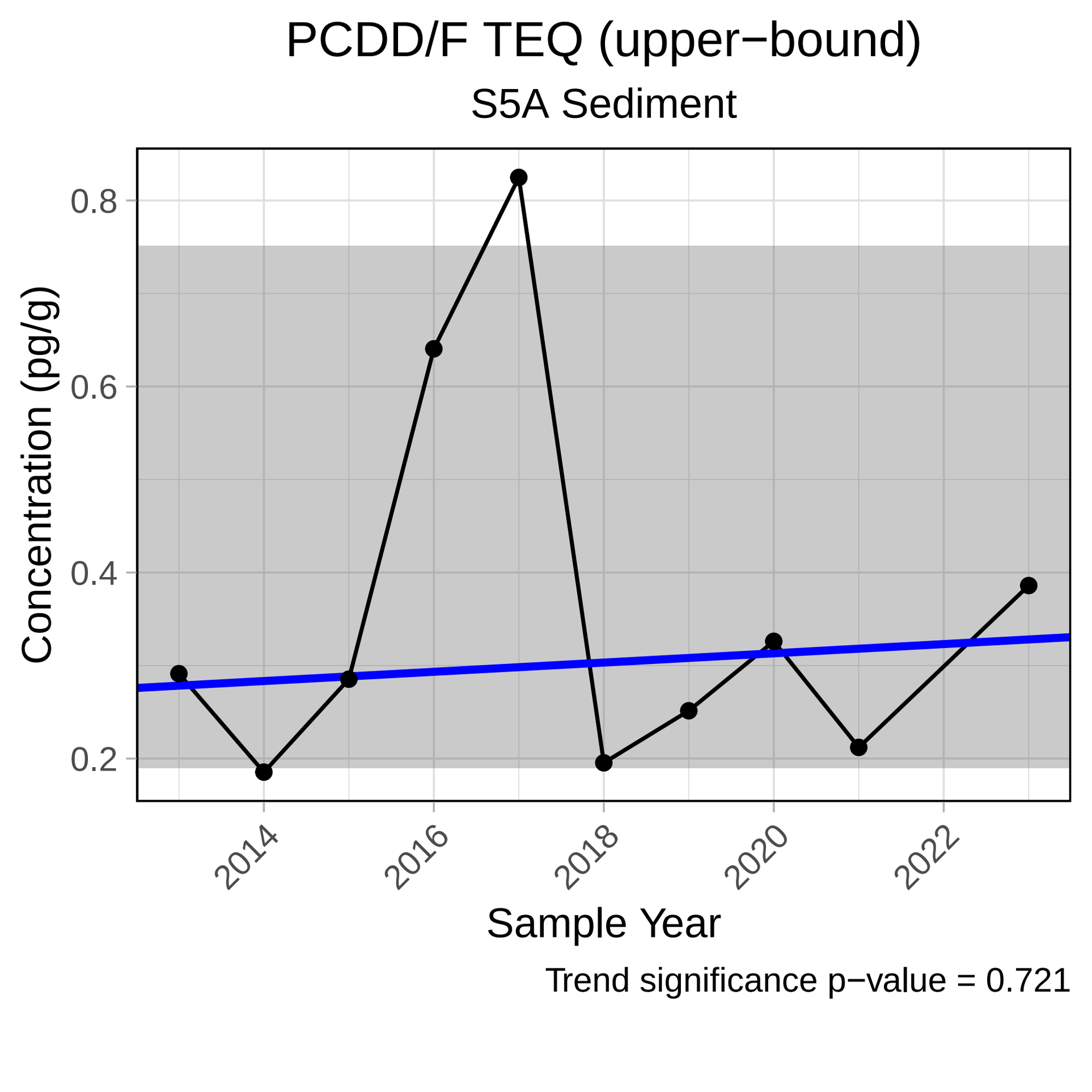

PCBs 156+157
S5A Sediment
Concentration (pg/g)
6
5
4
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.175

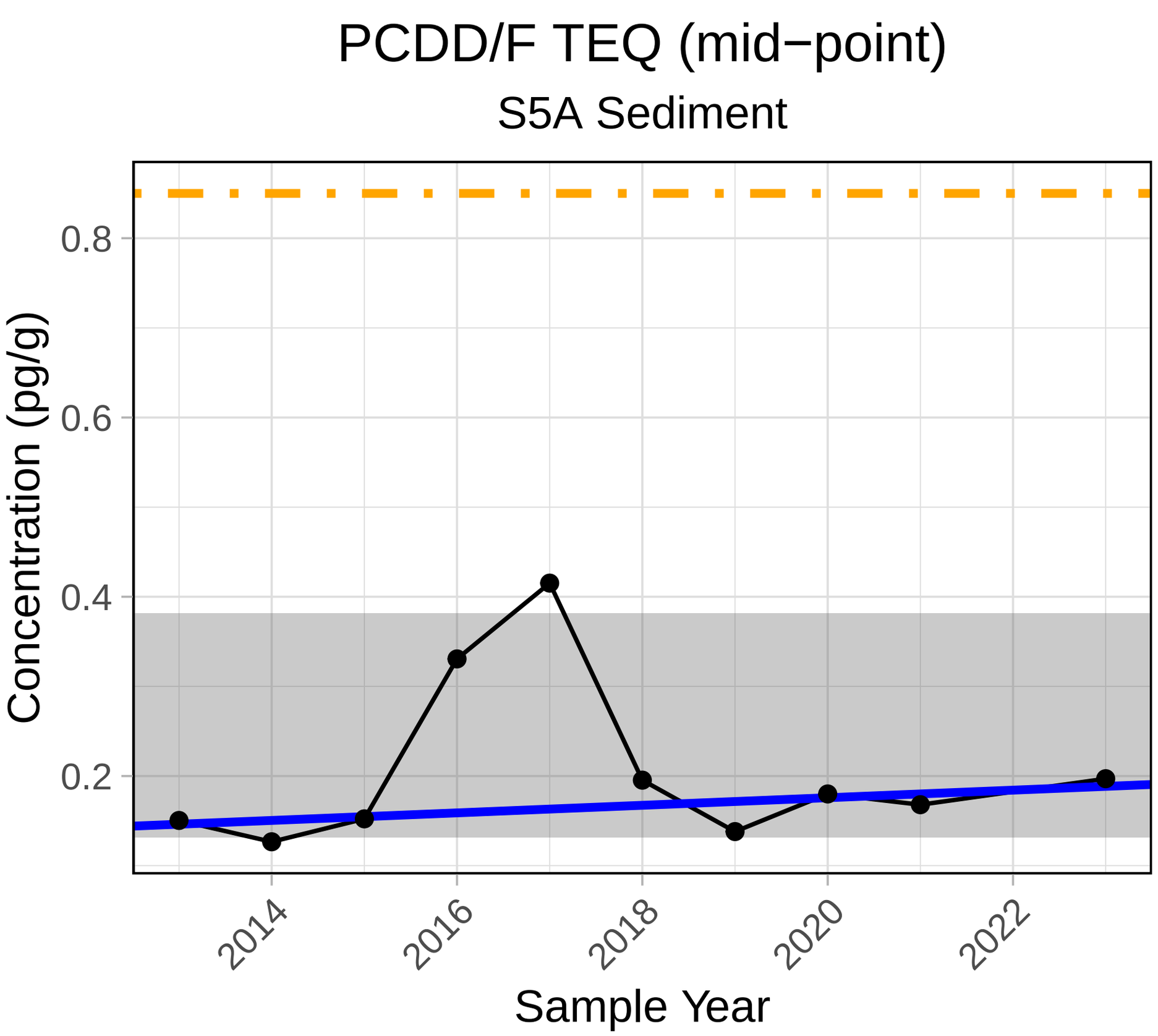
PCBs 171+173
S5A Sediment
Concentration (pg/g)
4
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.118


PCBs 180+193
S5A Sediment
Concentration (pg/g)
30
25
20
15
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.059

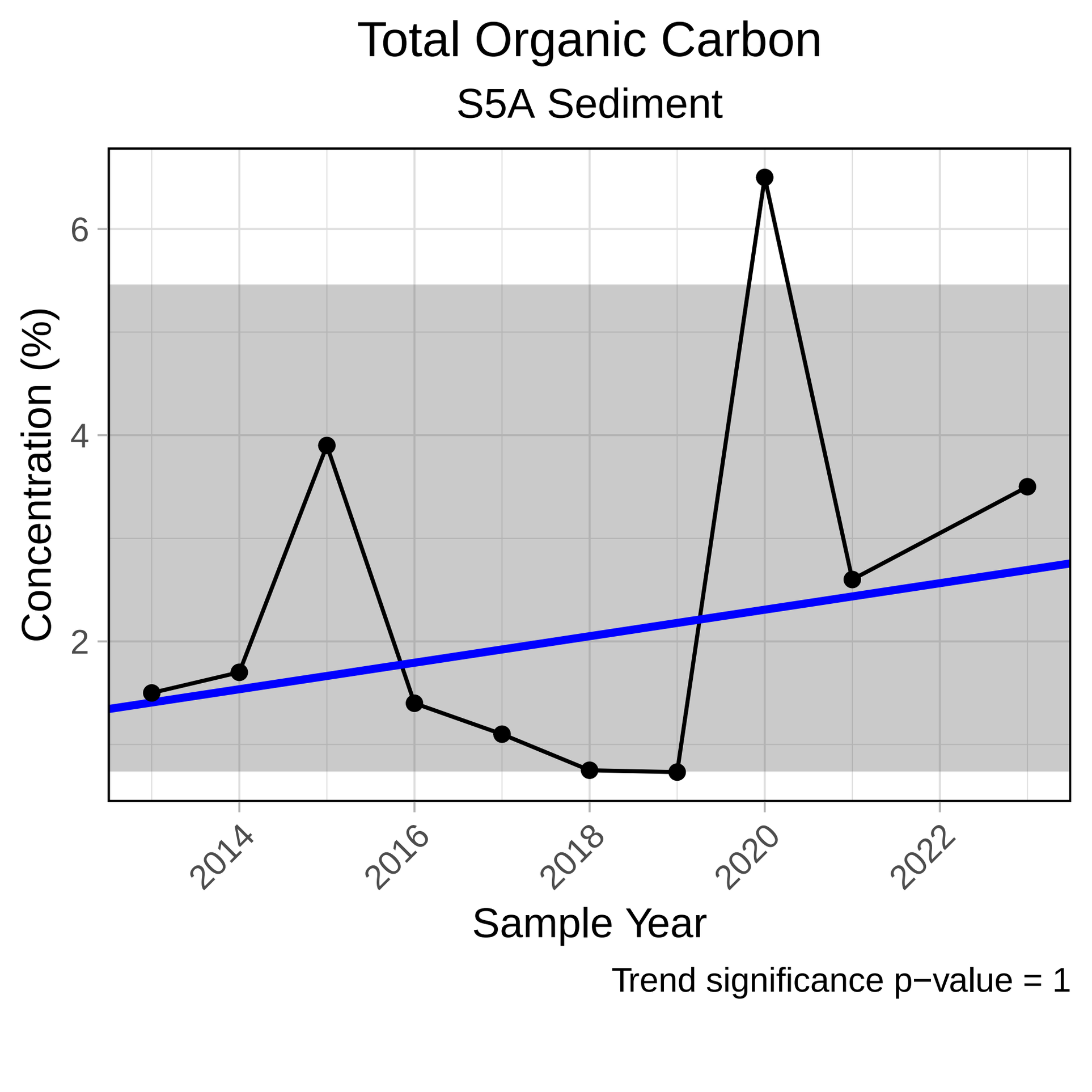

PCBs 198+199
S5A Sediment
Concentration (pg/g)
8
6
4
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.118


PCDD/F TEQ (lower−bound)
S5A Sediment
Concentration (pg/g)
0.20
0.15
0.10
0.05
0.00
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

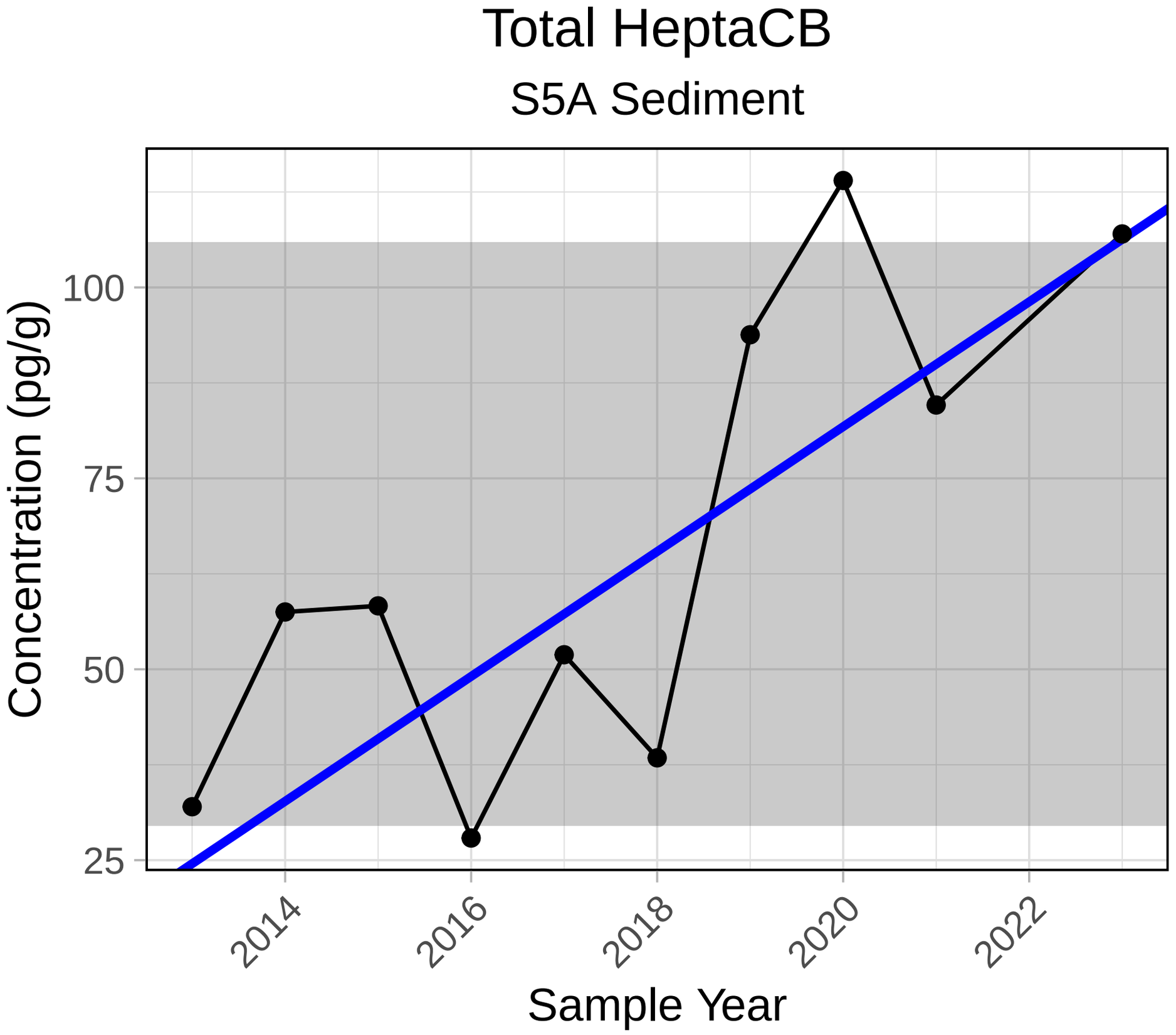

PCDD/F TEQ (upper−bound)
S5A Sediment
Concentration (pg/g)
0.8
0.6
0.4
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

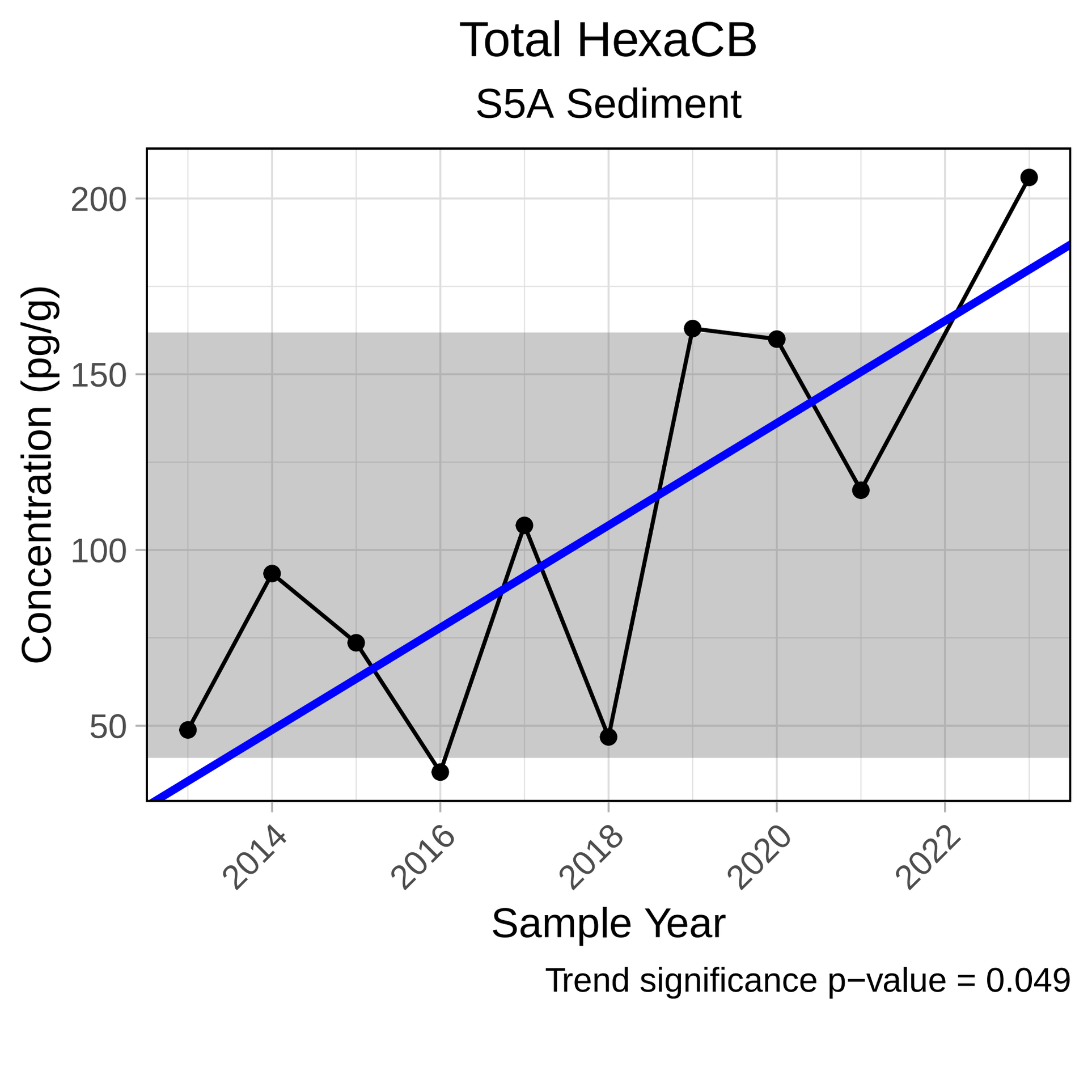


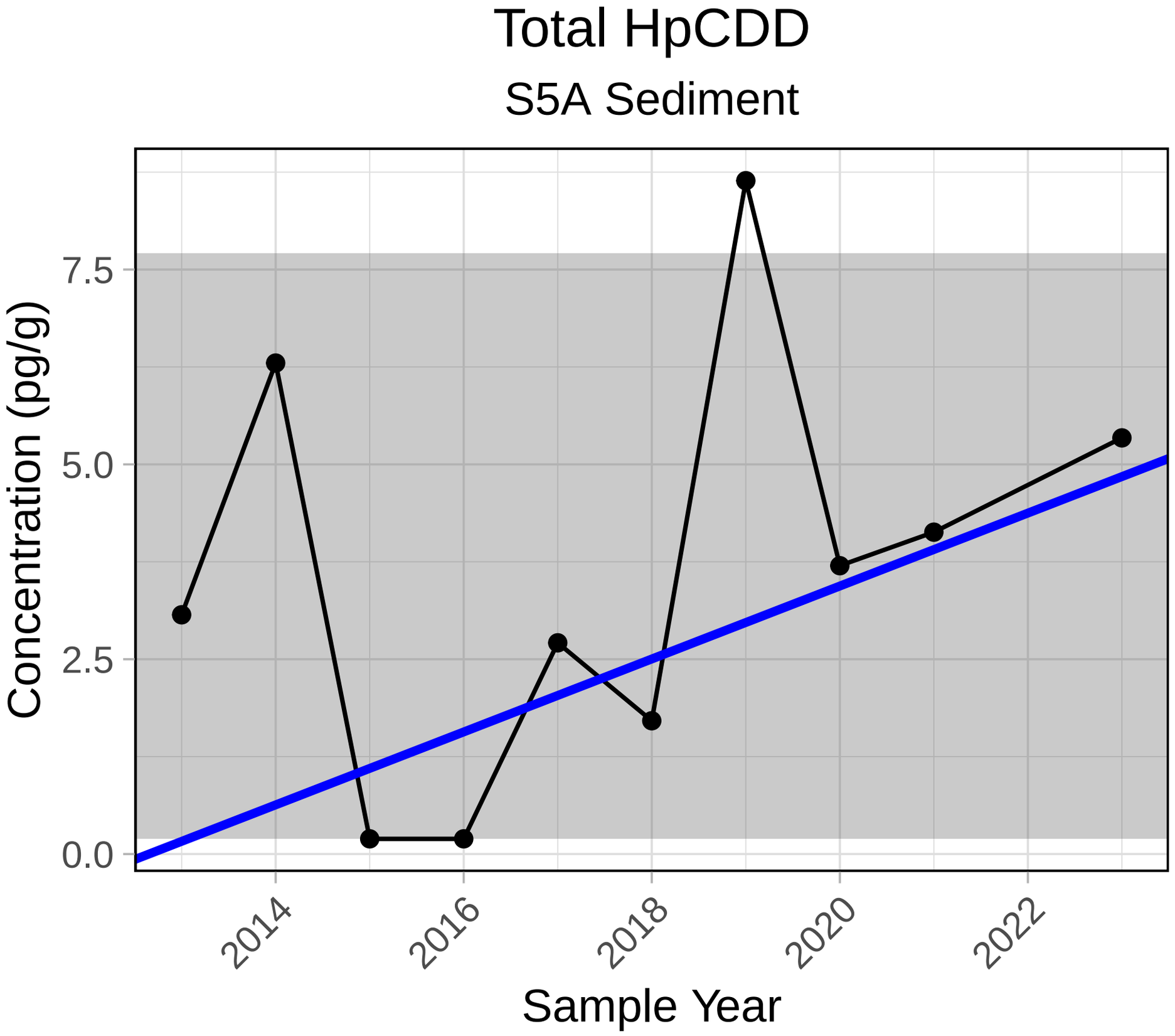
Trend significance p−value = 0.371
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)

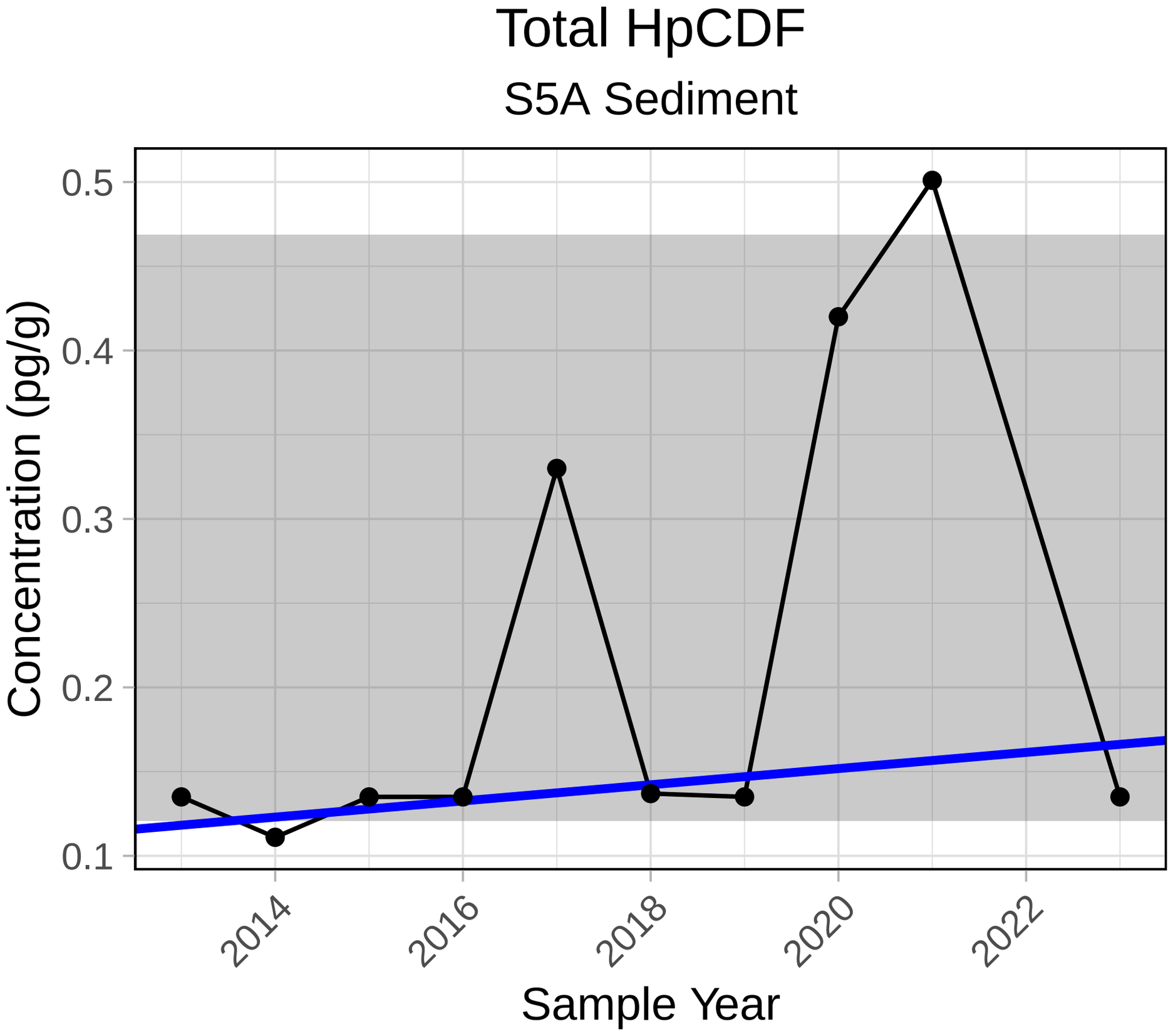

Total Organic Carbon
S5A Sediment
Concentration (%)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

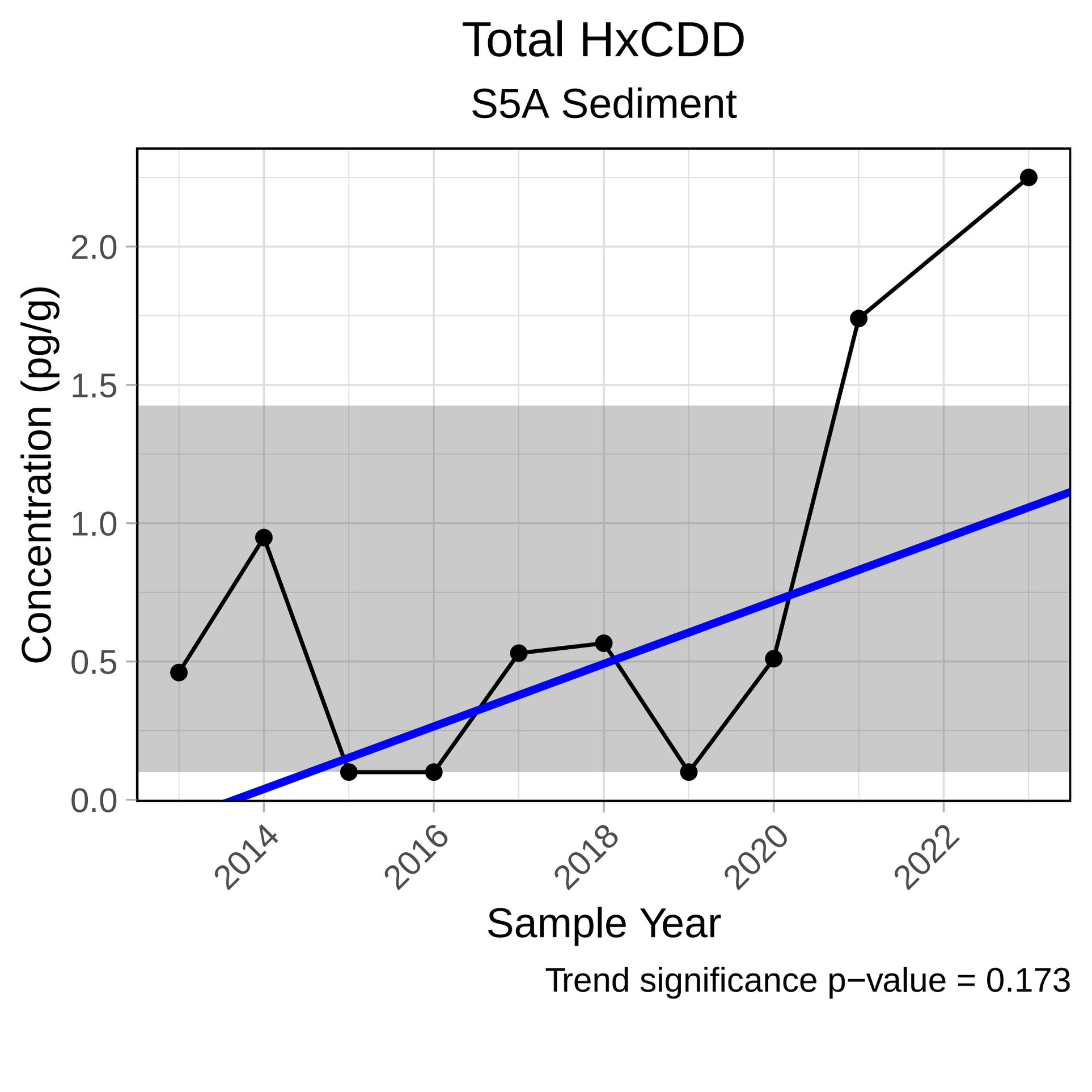
Total DiCB
S5A Sediment
Concentration (pg/g)
50
40
30
20
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.118

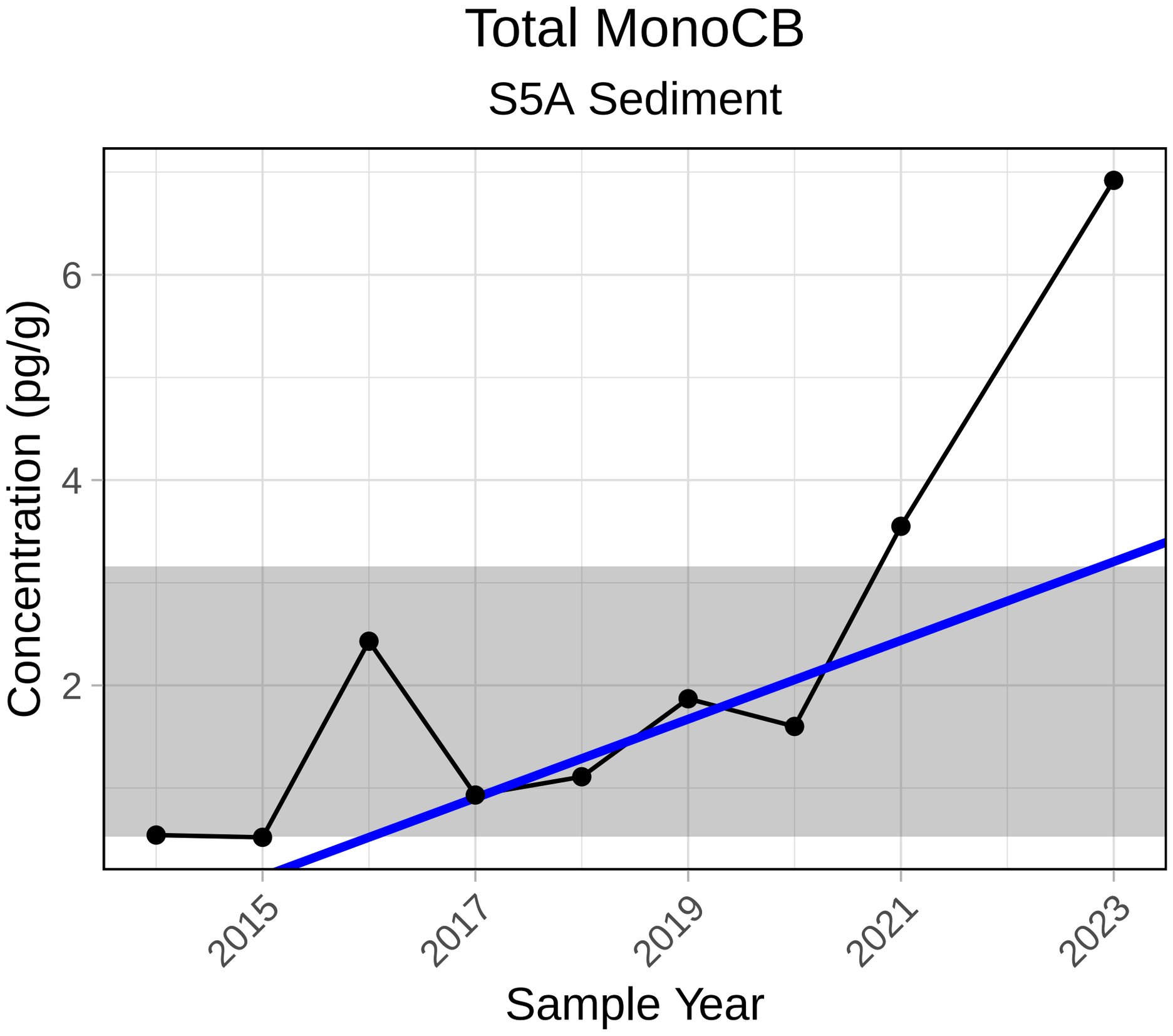

Total HeptaCB
S5A Sediment
Concentration (pg/g)
100
75
50
25
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.049

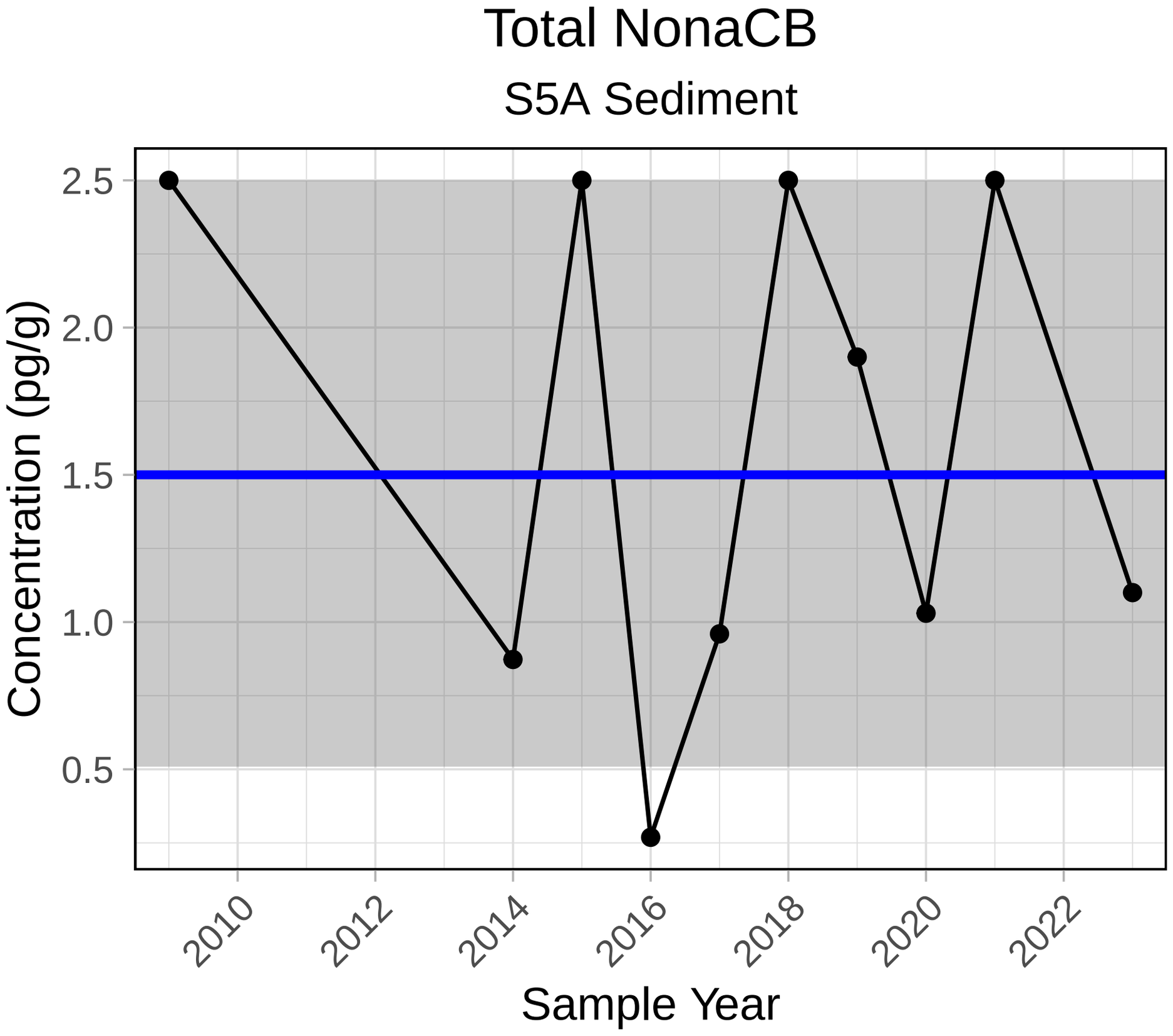

Total HexaCB
S5A Sediment
Concentration (pg/g)
200
150
100
50
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.049

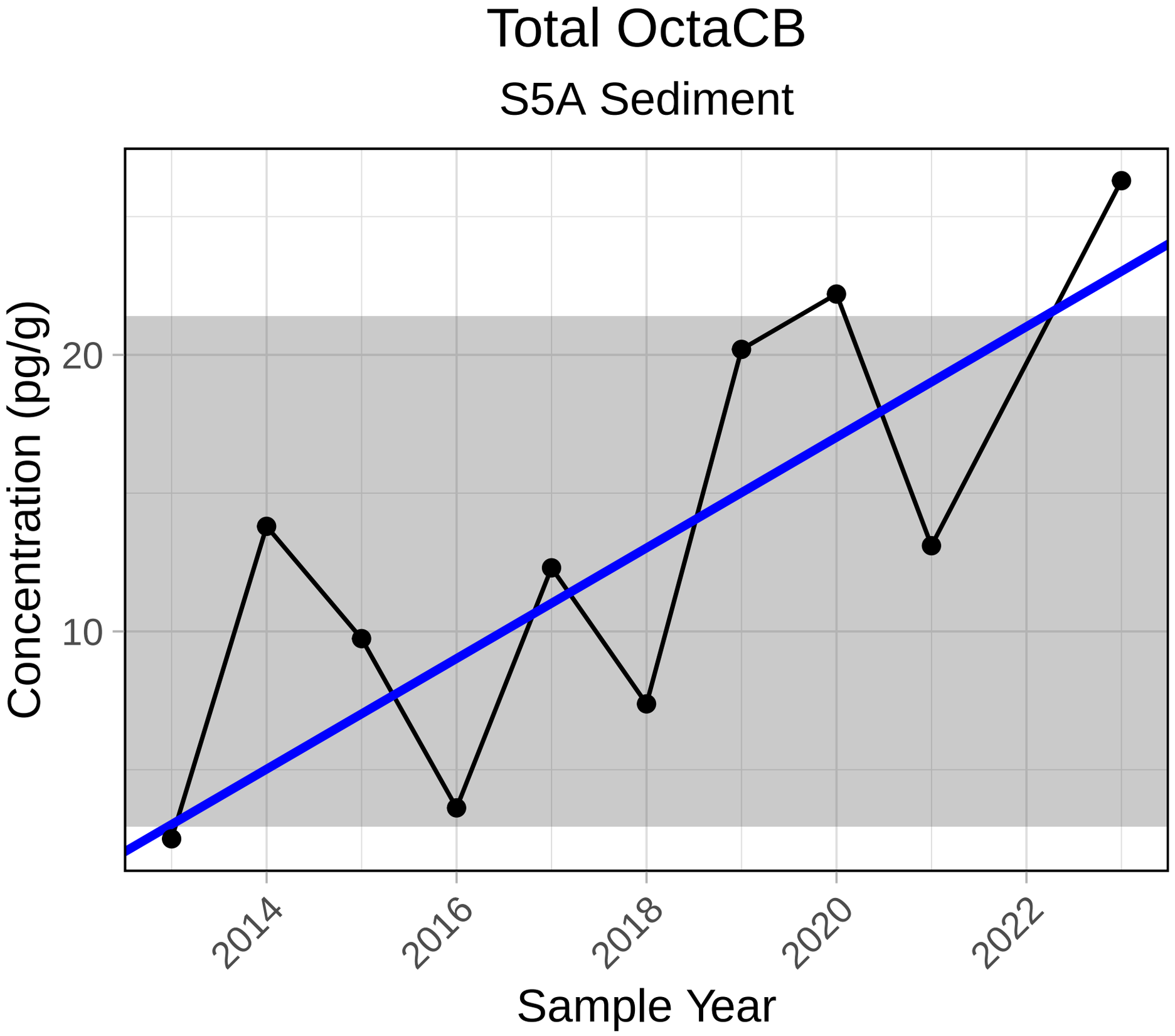

Total HpCDD
S5A Sediment
Concentration (pg/g)
7.5
5.0
2.5
0.0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.243

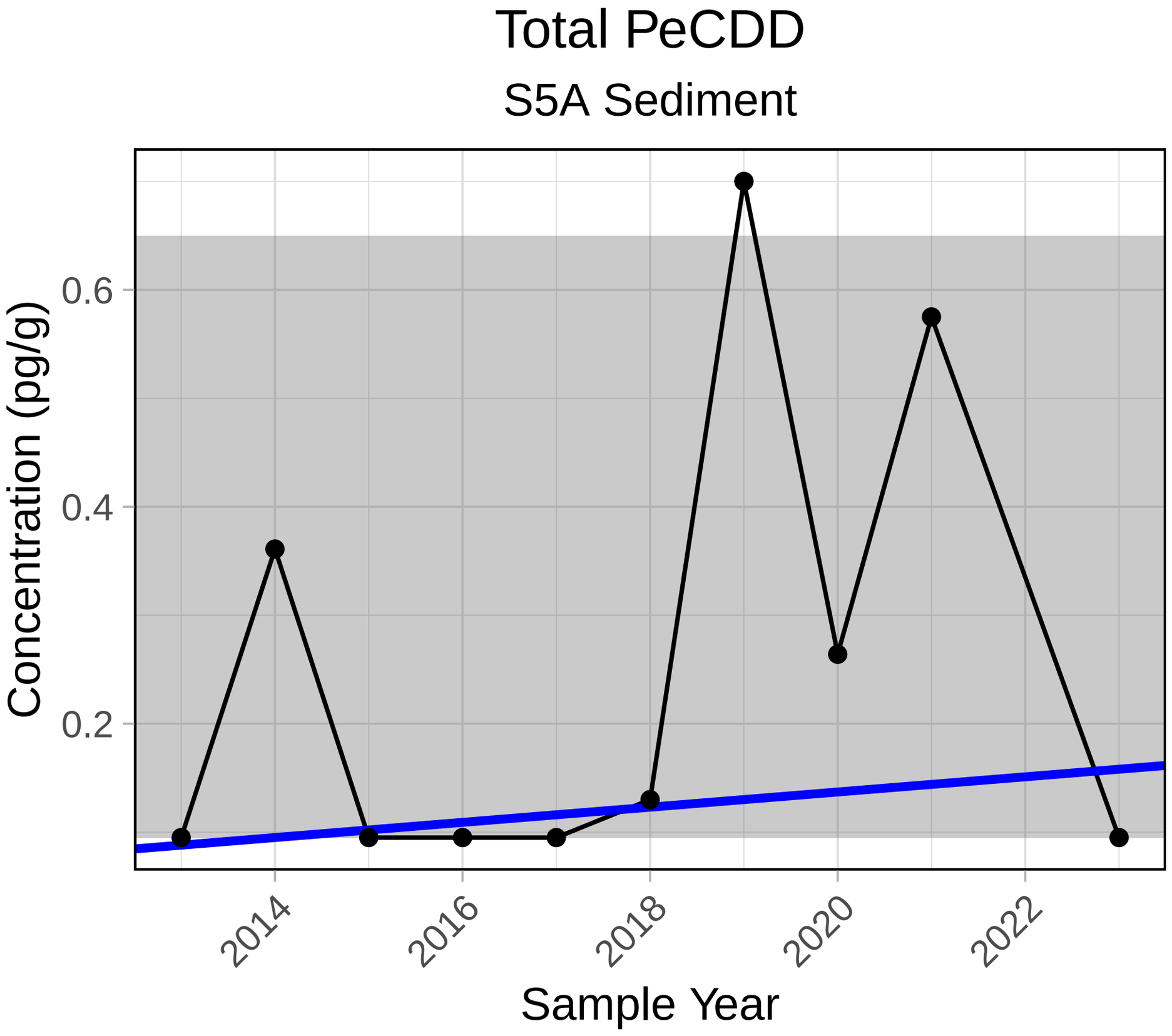

Total HpCDF
S5A Sediment
Concentration (pg/g)
0.5
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.084

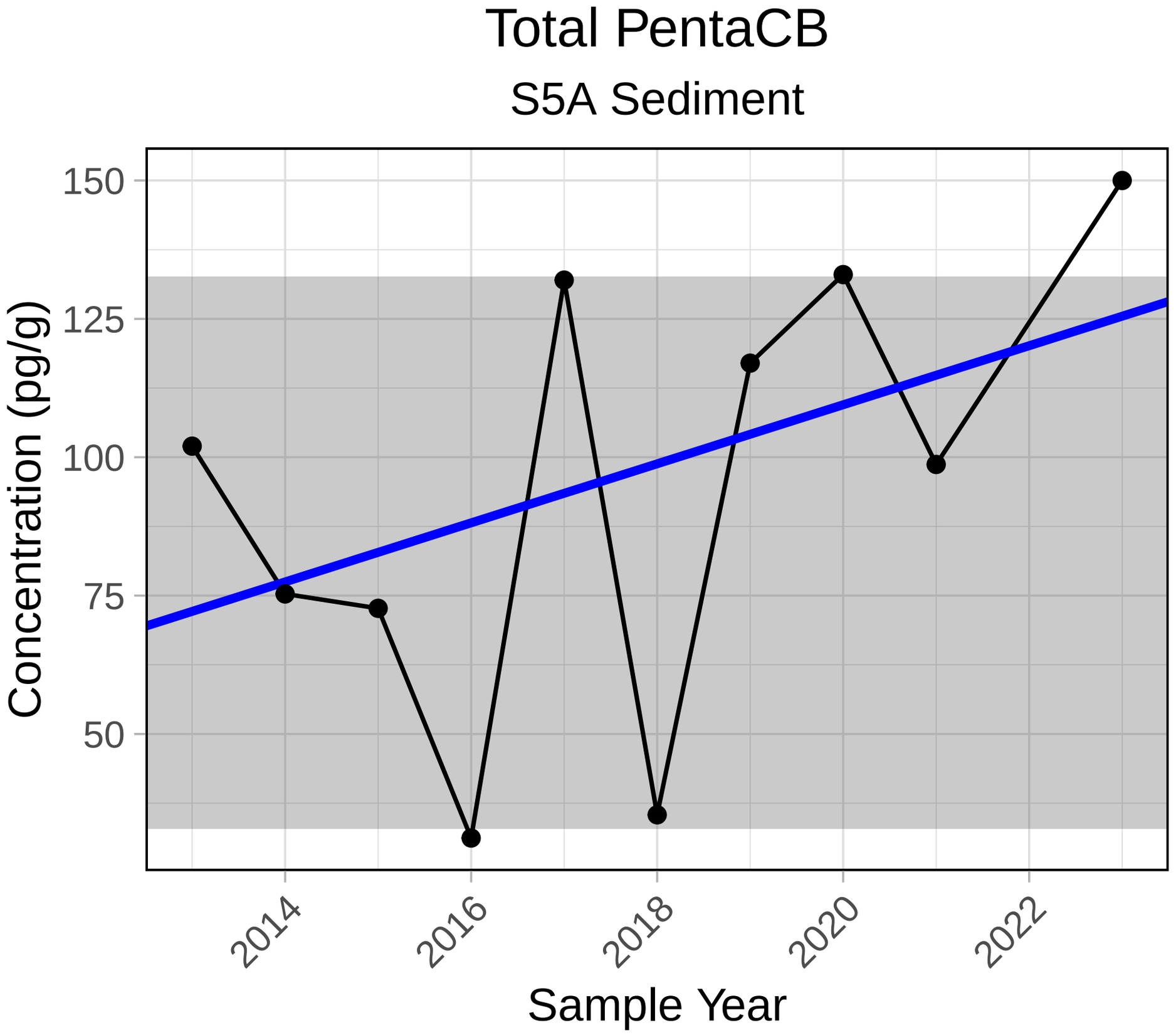

Total HxCDD
S5A Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
0.0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.173

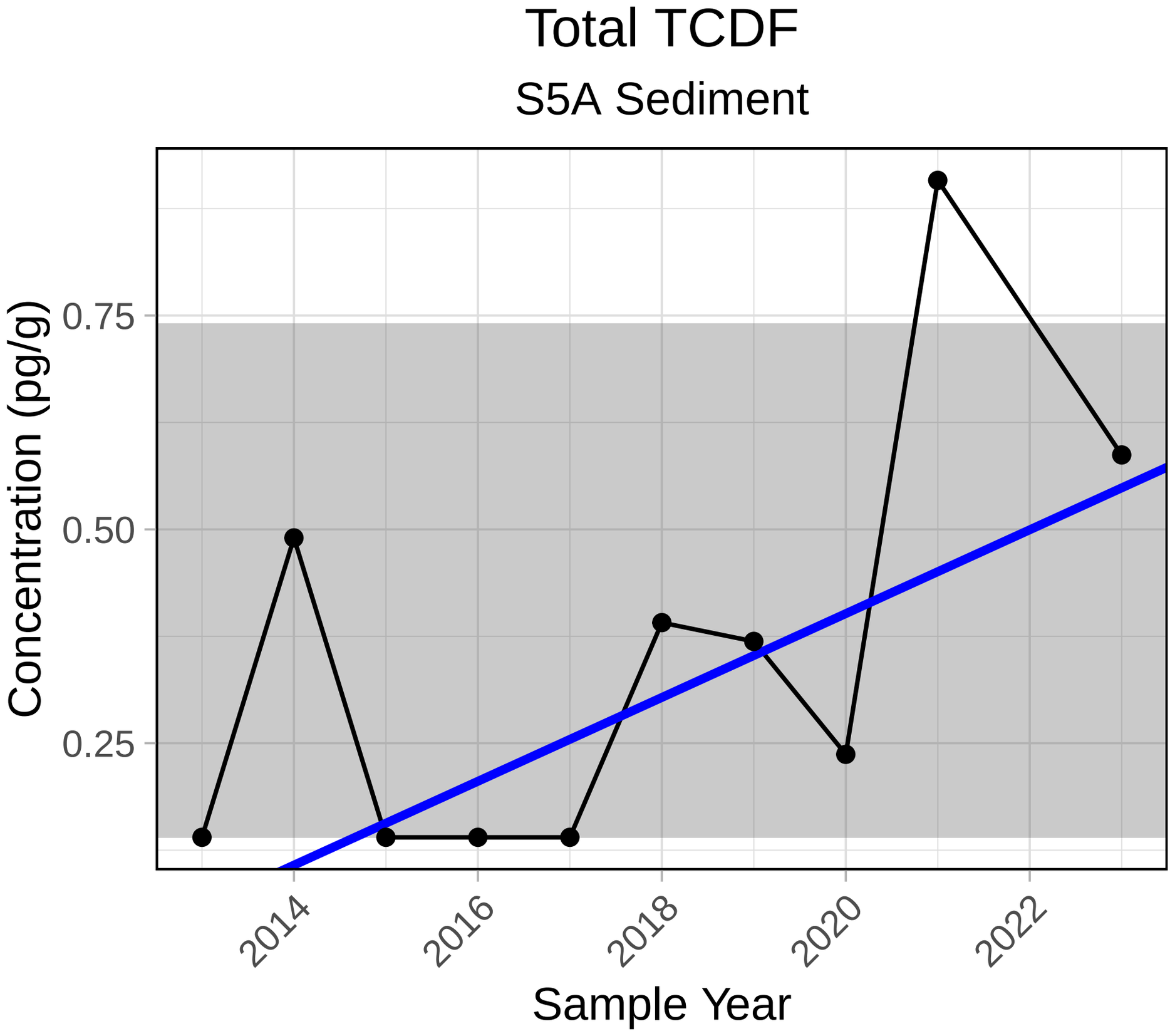

Total MonoCB
S5A Sediment
Concentration (pg/g)
6
4
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.016

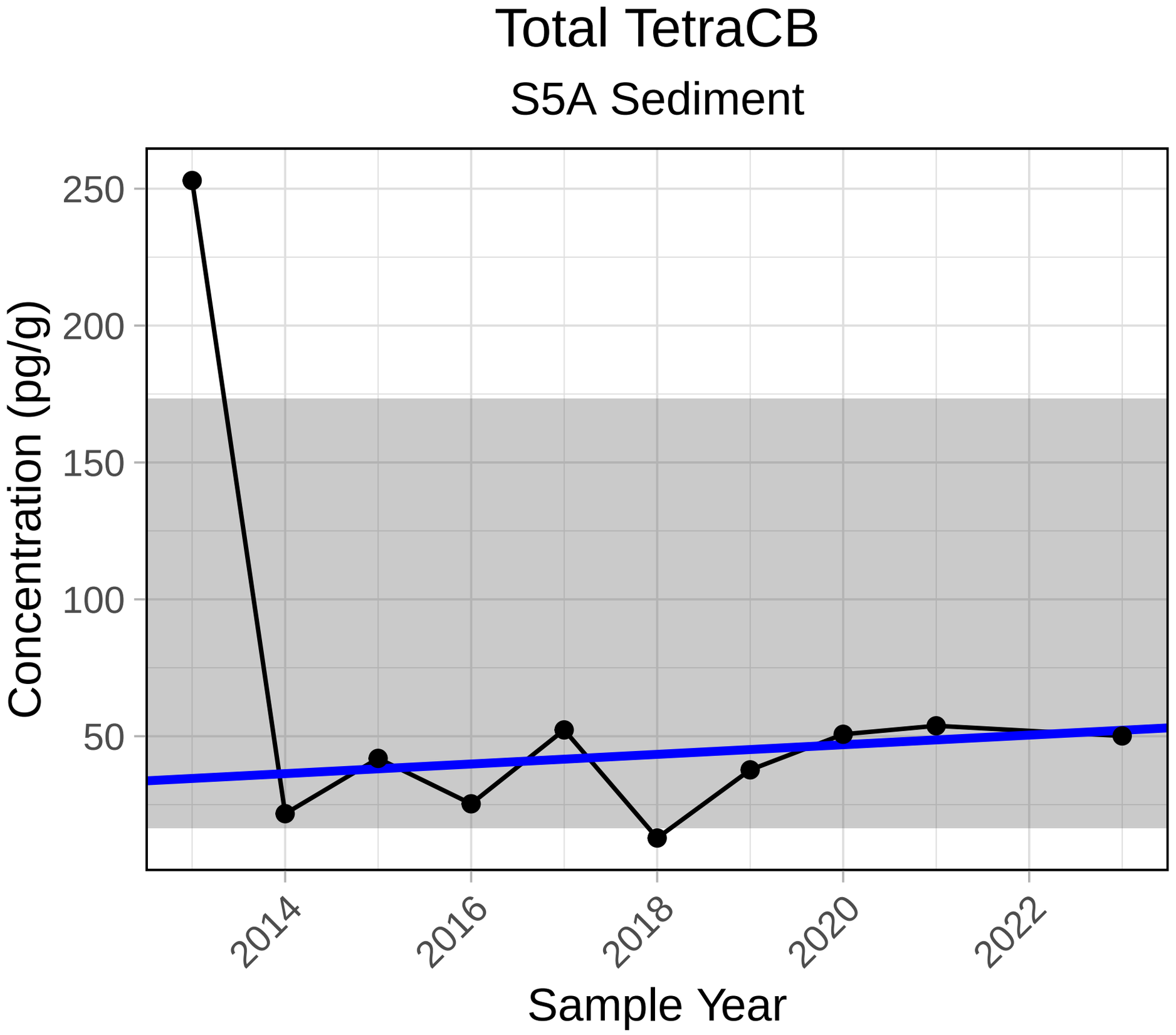

Total NonaCB
S5A Sediment
Concentration (pg/g)
2.5
2.0
1.5
1.0
0.5
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.853

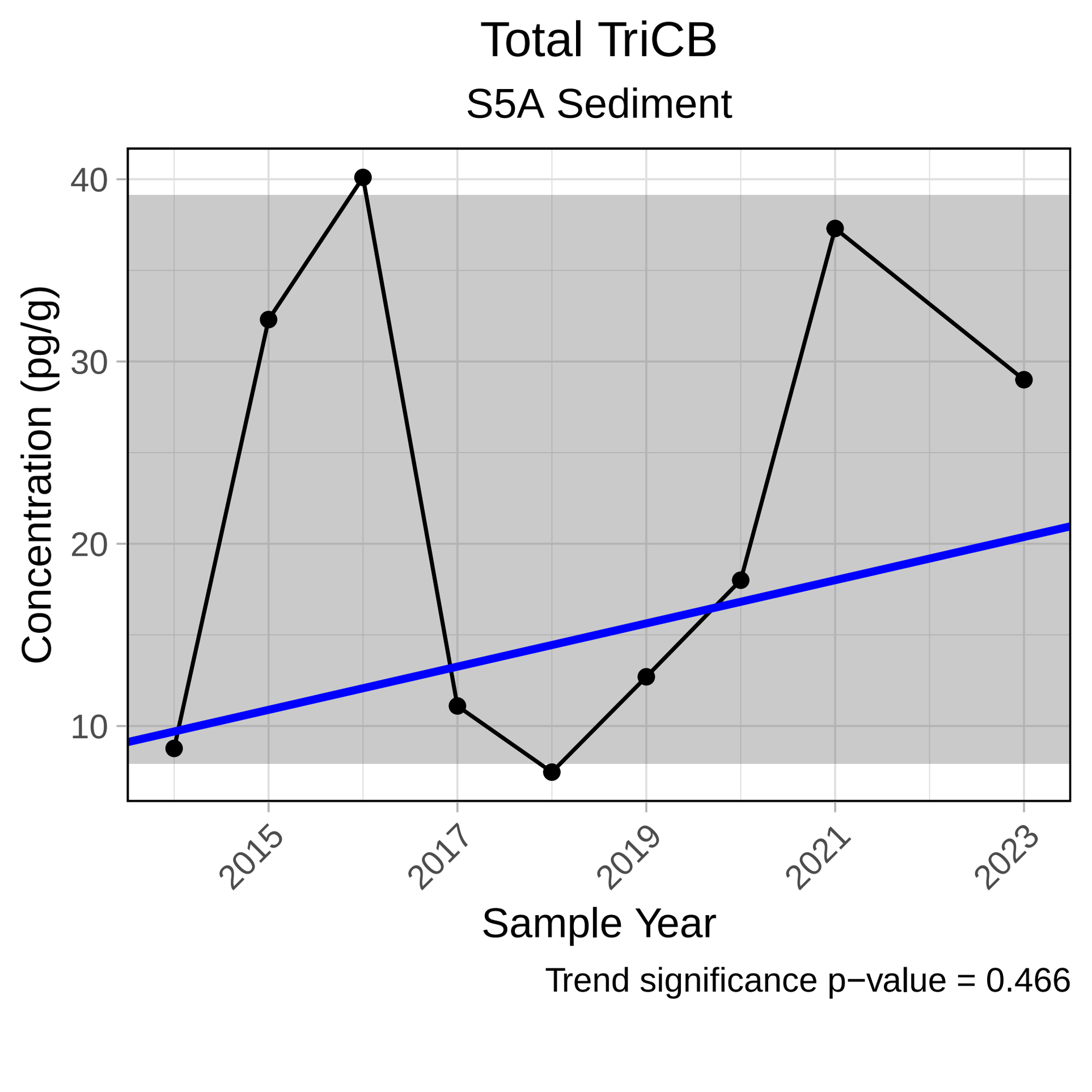

Total OctaCB
S5A Sediment
Concentration (pg/g)
20
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.032


Total PeCDD
S5A Sediment
Concentration (pg/g)
0.6
0.4
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.337

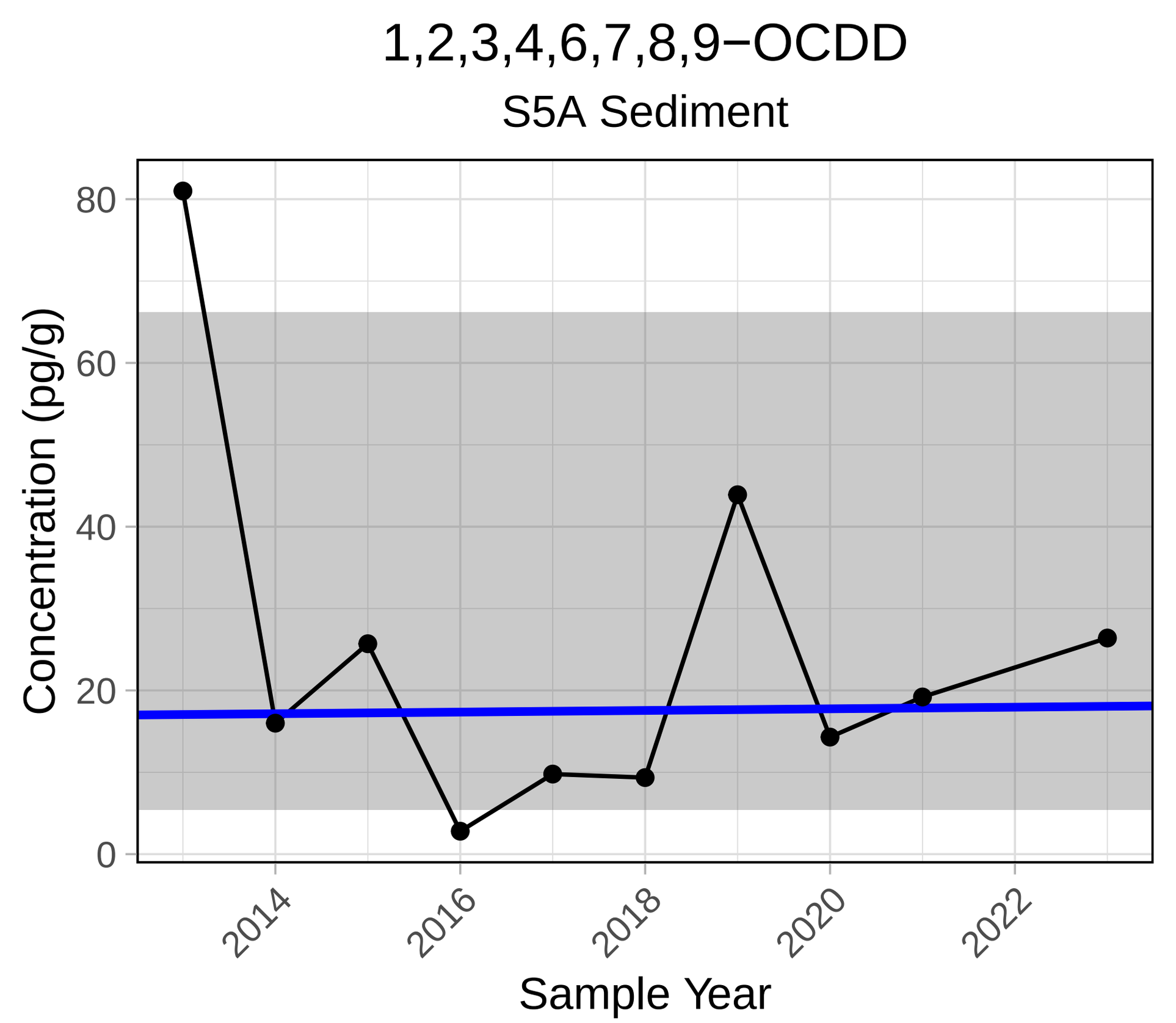

Total PentaCB
S5A Sediment
Concentration (pg/g)
150
125
100
75
50
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21


Total TCDF
S5A Sediment
Concentration (pg/g)
0.75
0.50
0.25
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.095

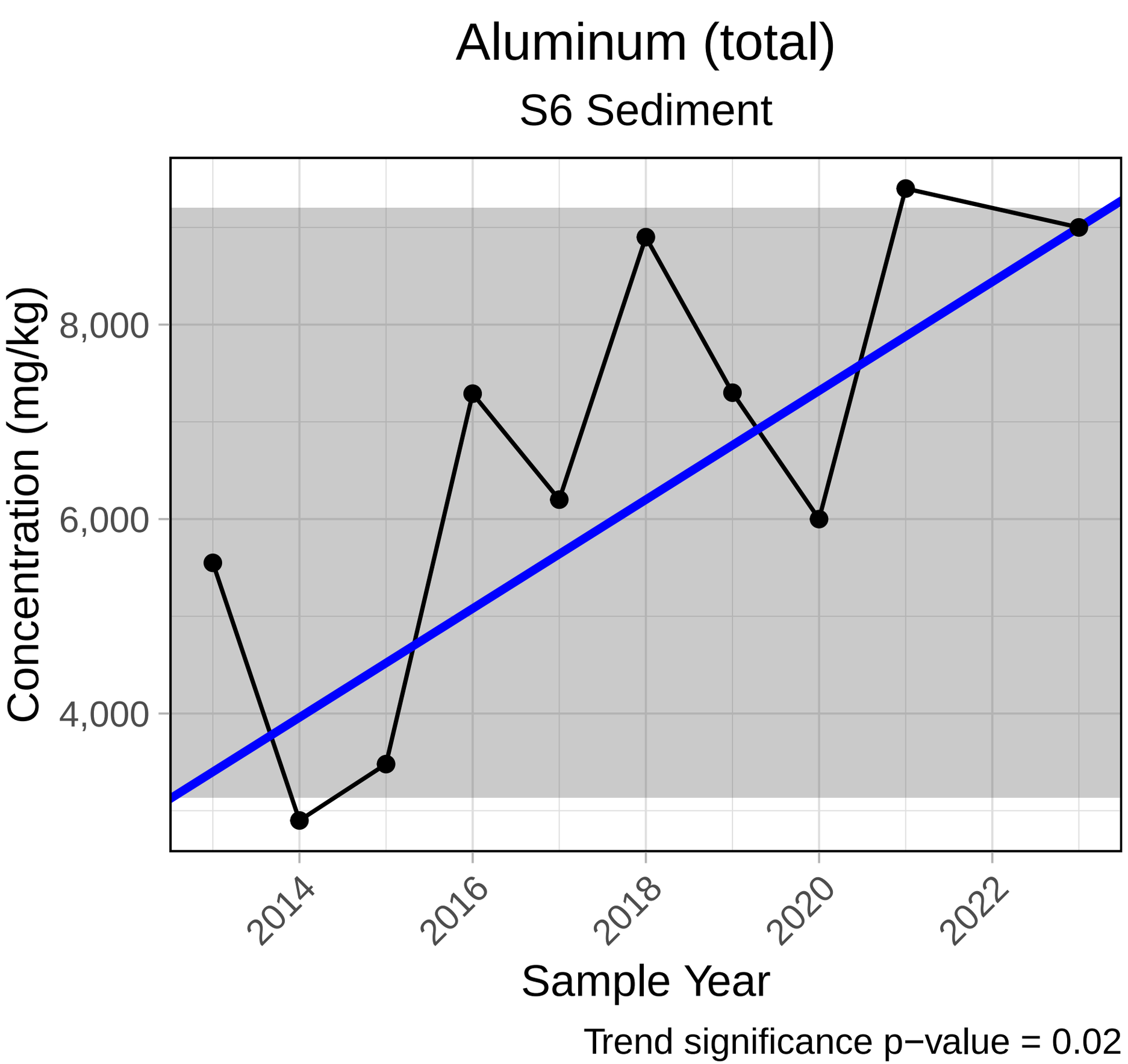

Total TetraCB
S5A Sediment
Concentration (pg/g)
250
200
150
100
50
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

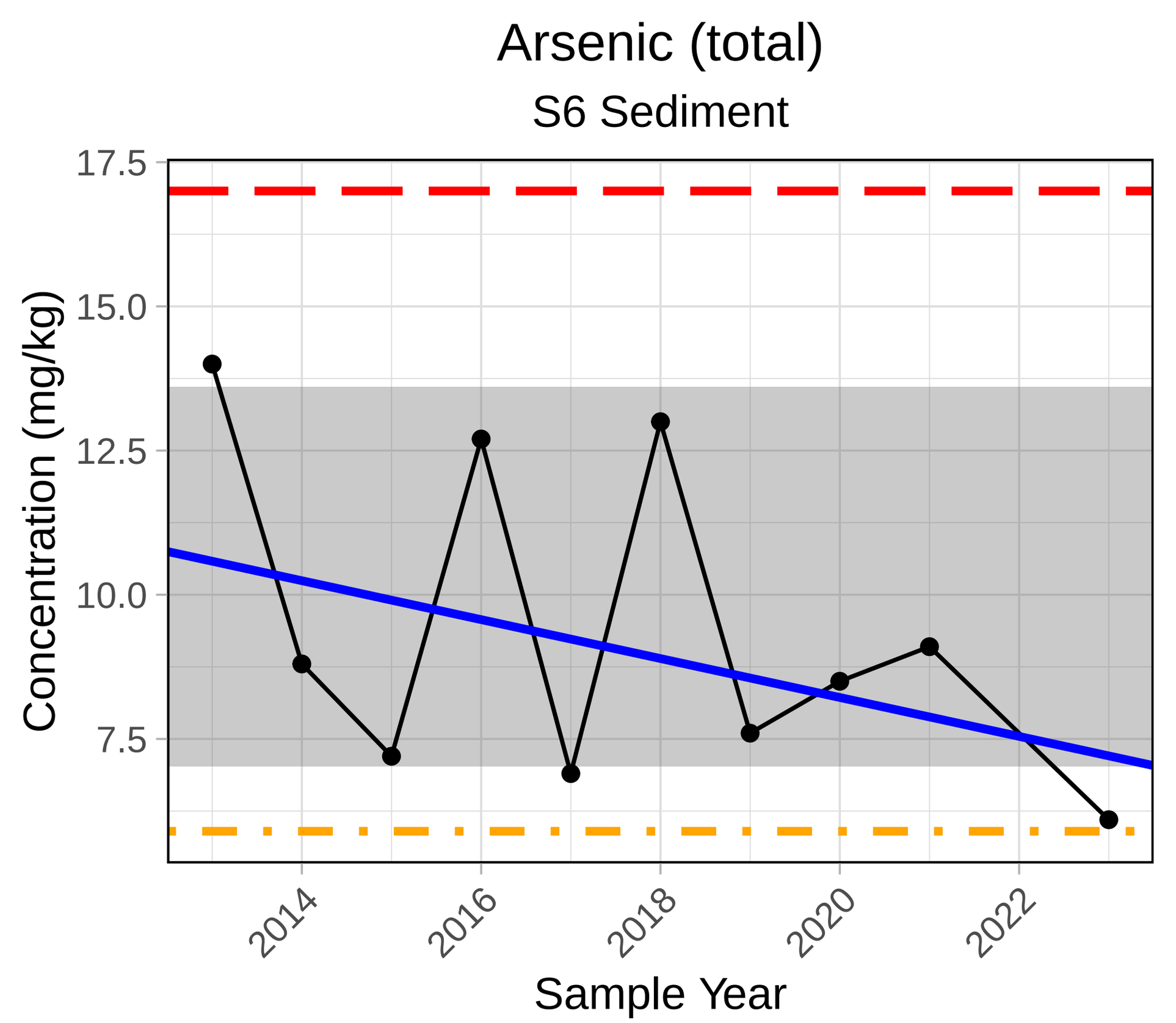

Total TriCB
S5A Sediment
Concentration (pg/g)
40
30
20
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.466

1,2,3,4,5,6,7,8−OCDF
S5A Sediment
Concentration (pg/g)
1.6
1.2
0.8
0.4
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.138

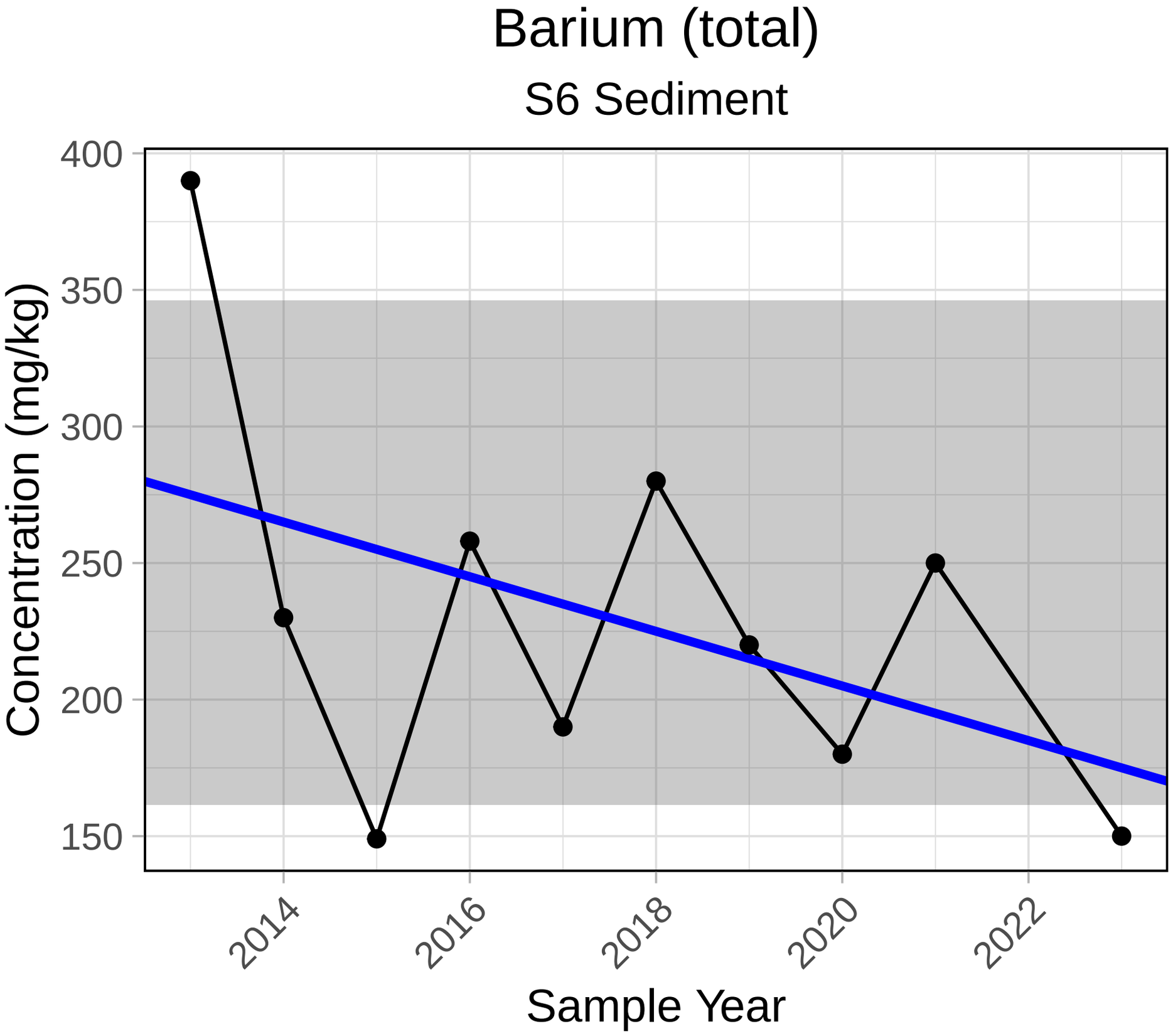


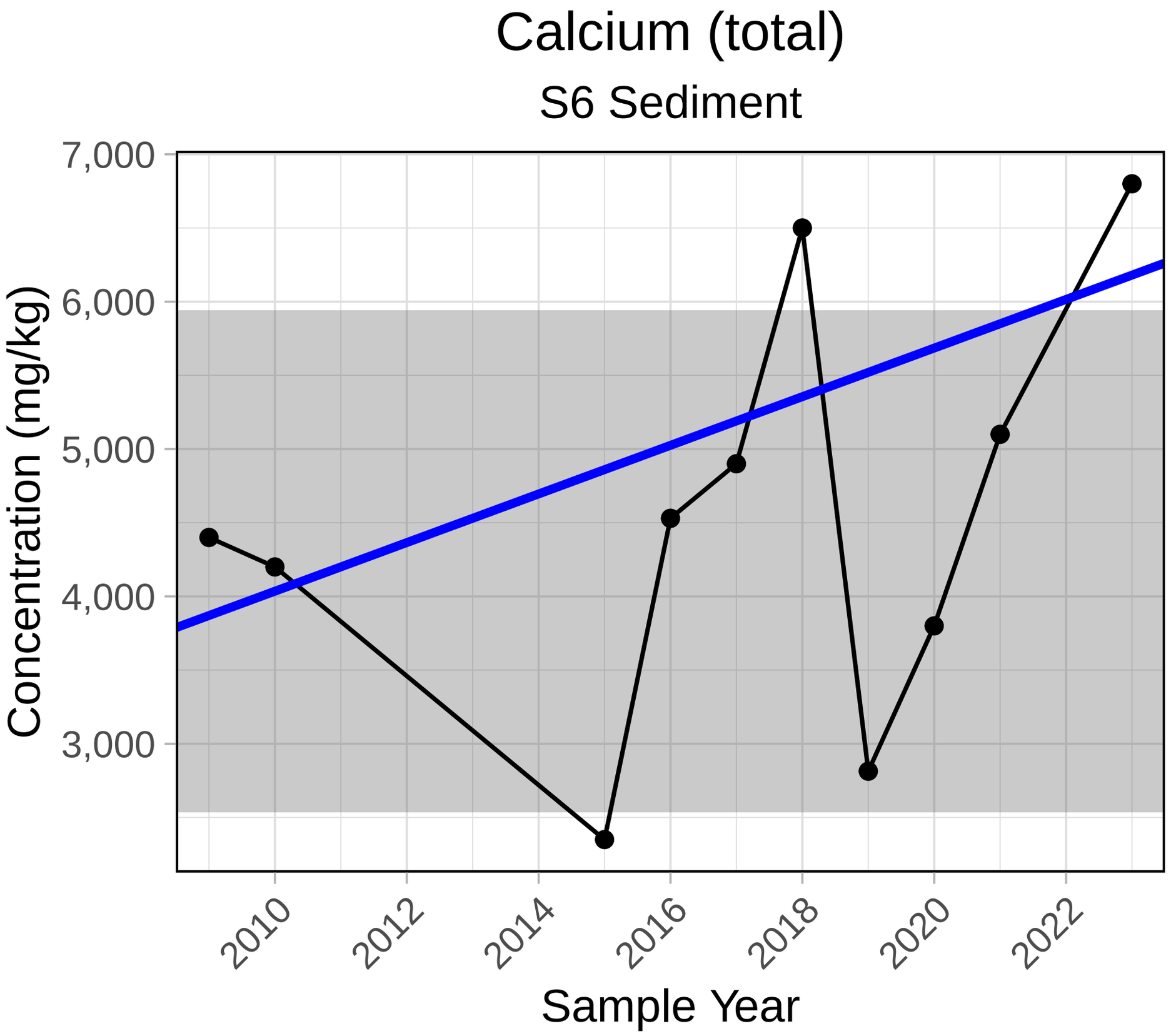
Trend significance p−value = 1

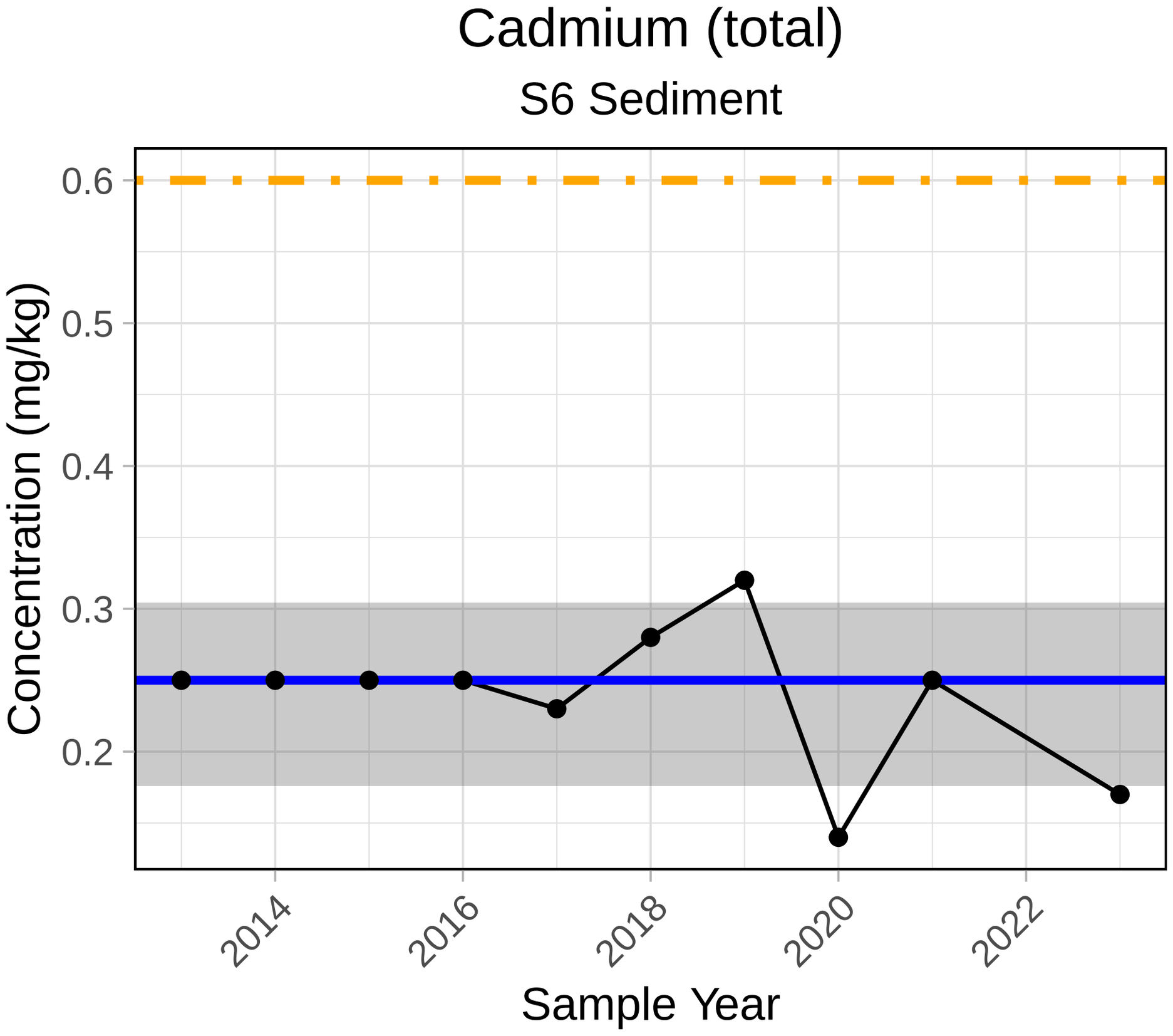

Aluminum (total)
S6 Sediment
Concentration (mg/kg)
8,000
6,000
4,000
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.02

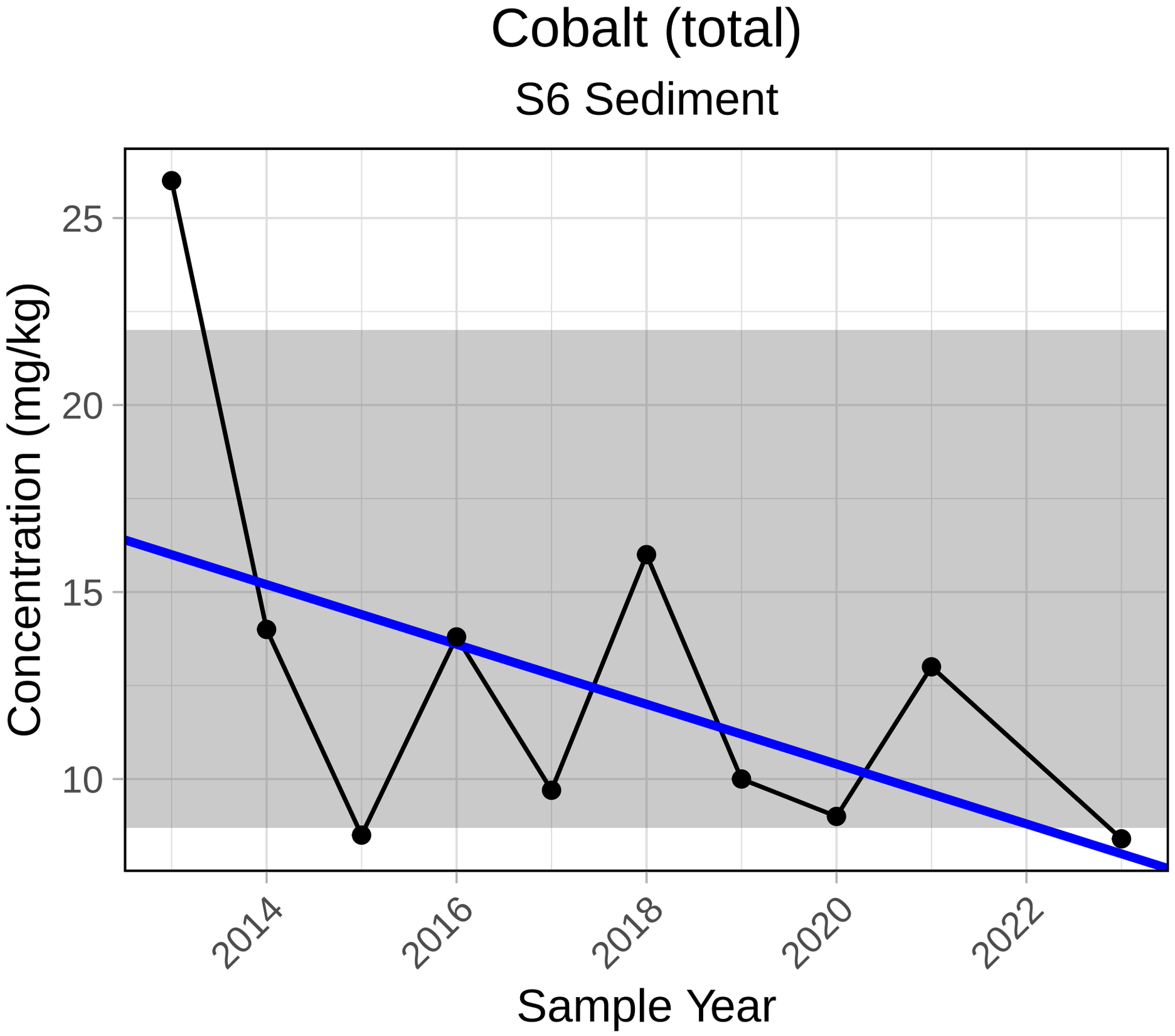


Trend significance p−value = 0.283
ISQG level = 5.9 mg/kg (maximum)
PEL level = 17 mg/kg (maximum)


Barium (total)
S6 Sediment
400
350
300
250
200
150
Concentration (mg/kg)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

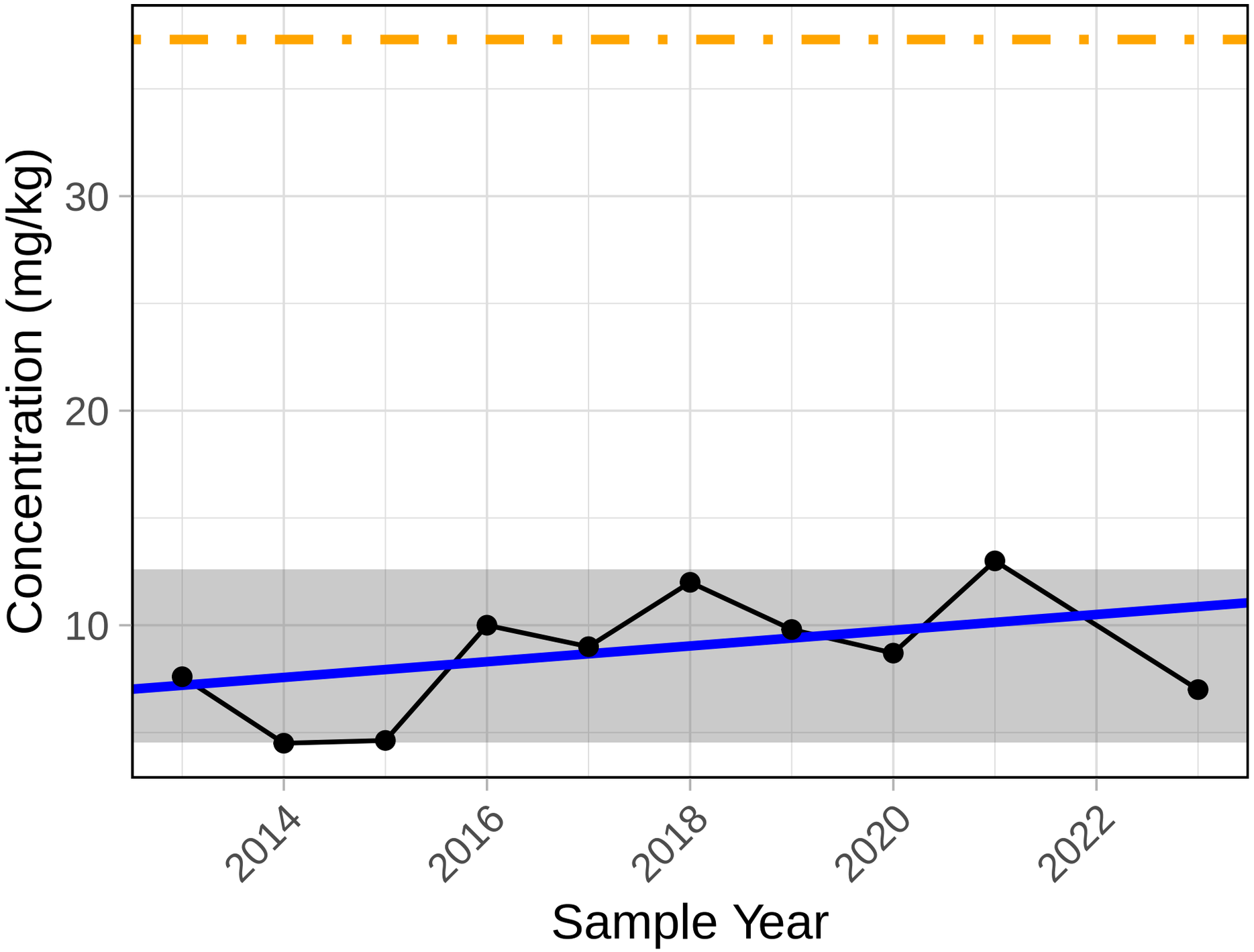

Calcium (total)
S6 Sediment
7,000
6,000
5,000
4,000
3,000
Concentration (mg/kg)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152


Cadmium (total)
S6 Sediment
Concentration (mg/kg)
0.6
0.5
0.4
0.3
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.564
ISQG level = 0.6 mg/kg (maximum)
PEL level = 3.5 mg/kg (maximum)

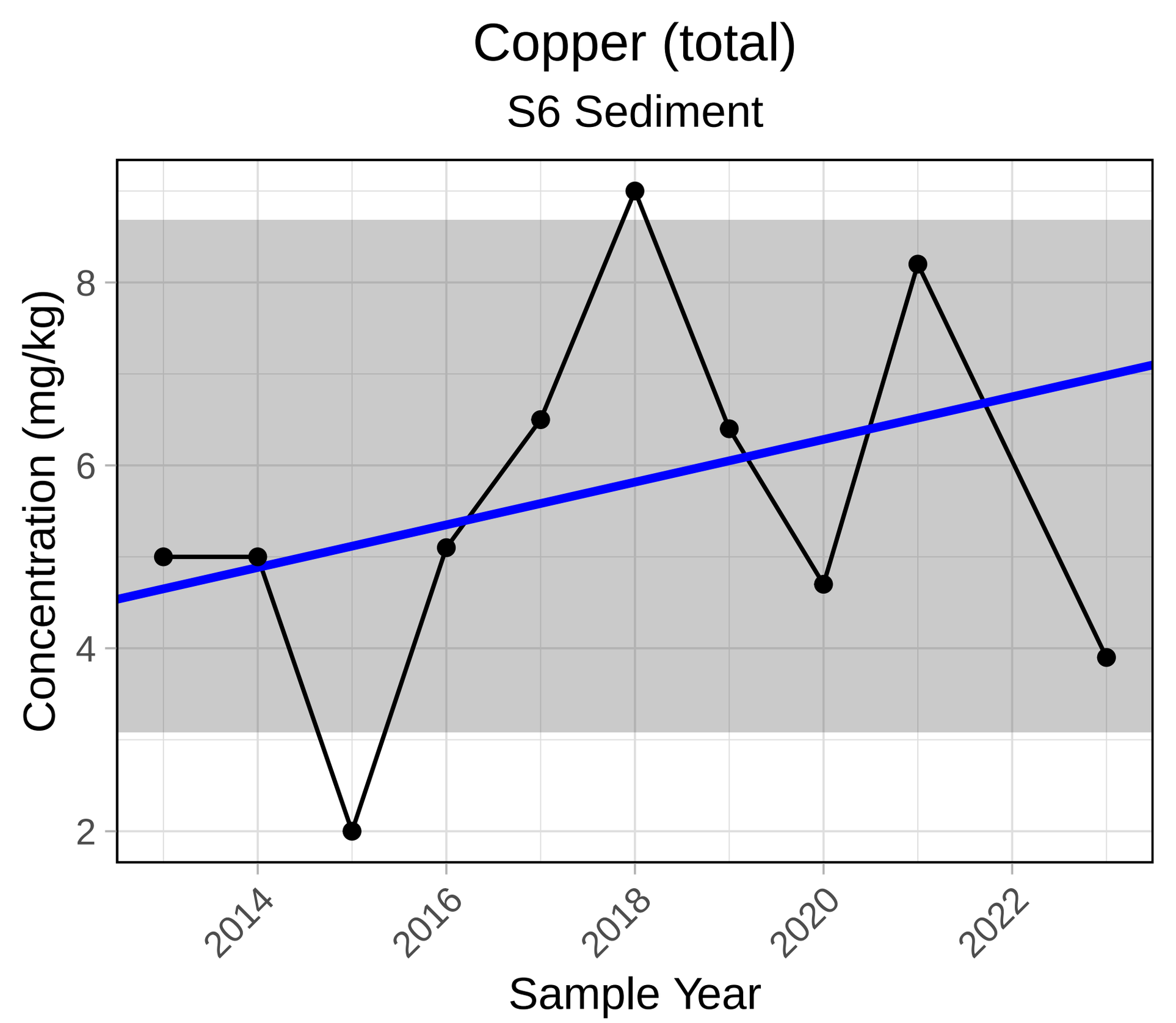

Cobalt (total)
S6 Sediment
Concentration (mg/kg)
25
20
15
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107

Chromium (total)

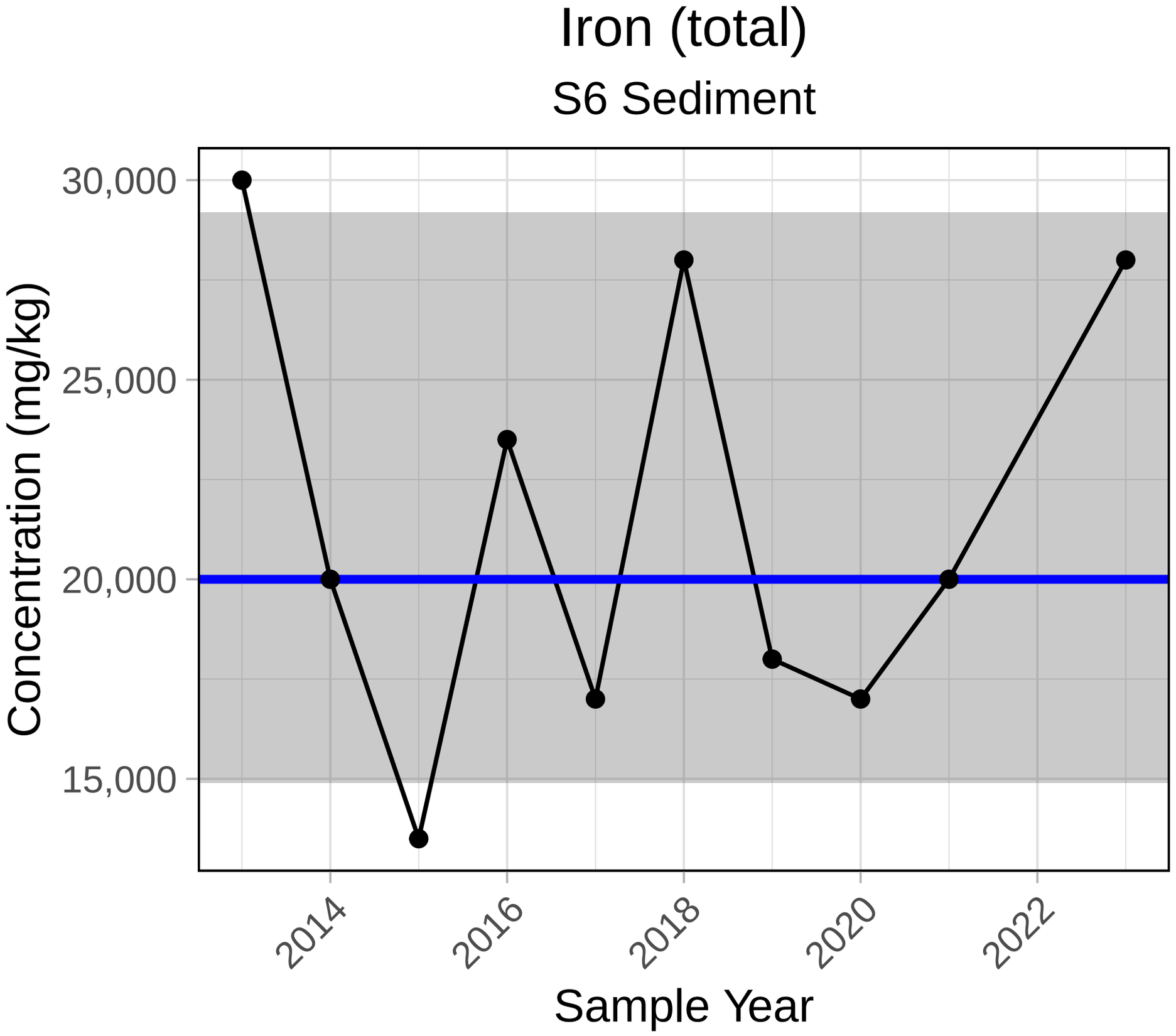
S6 Sediment

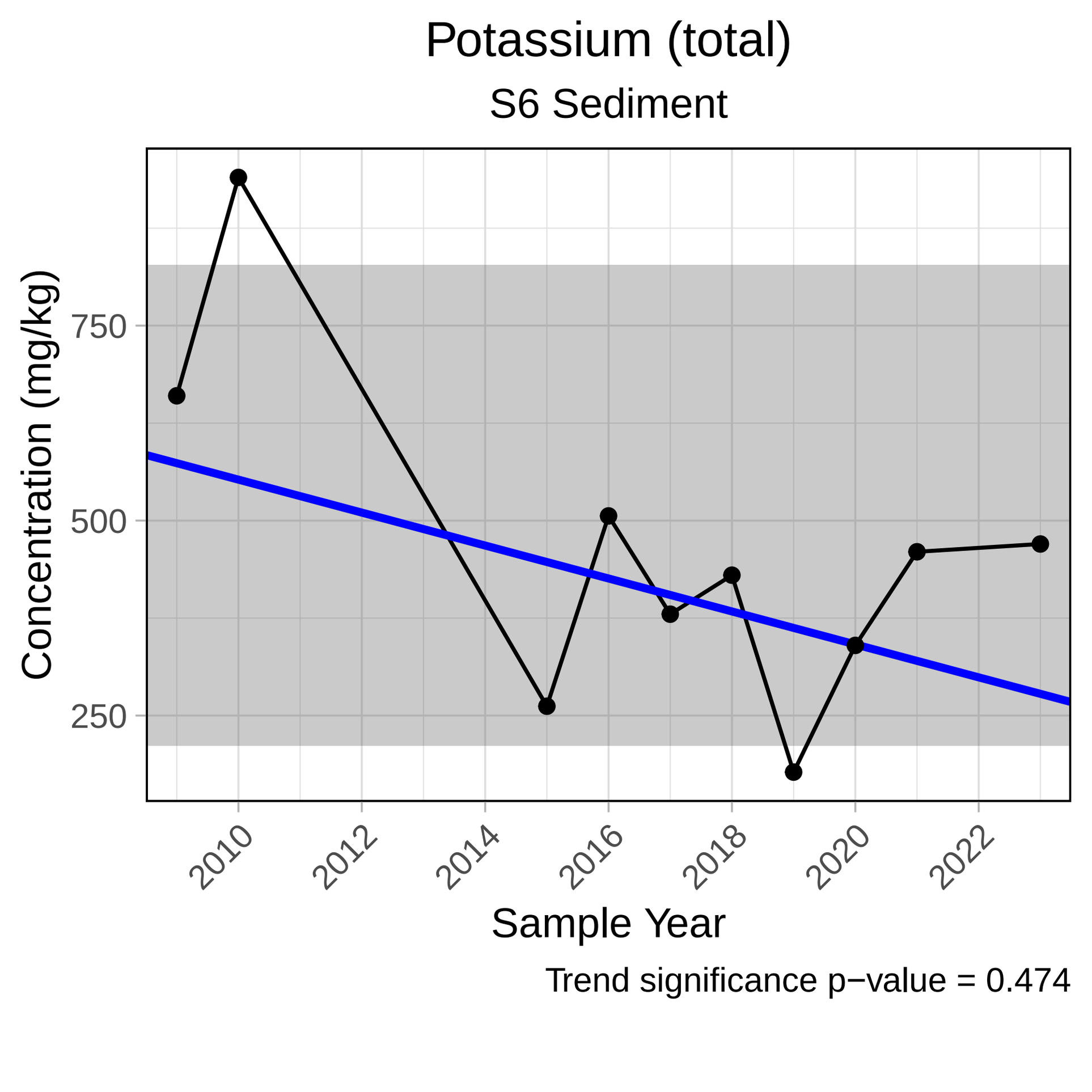


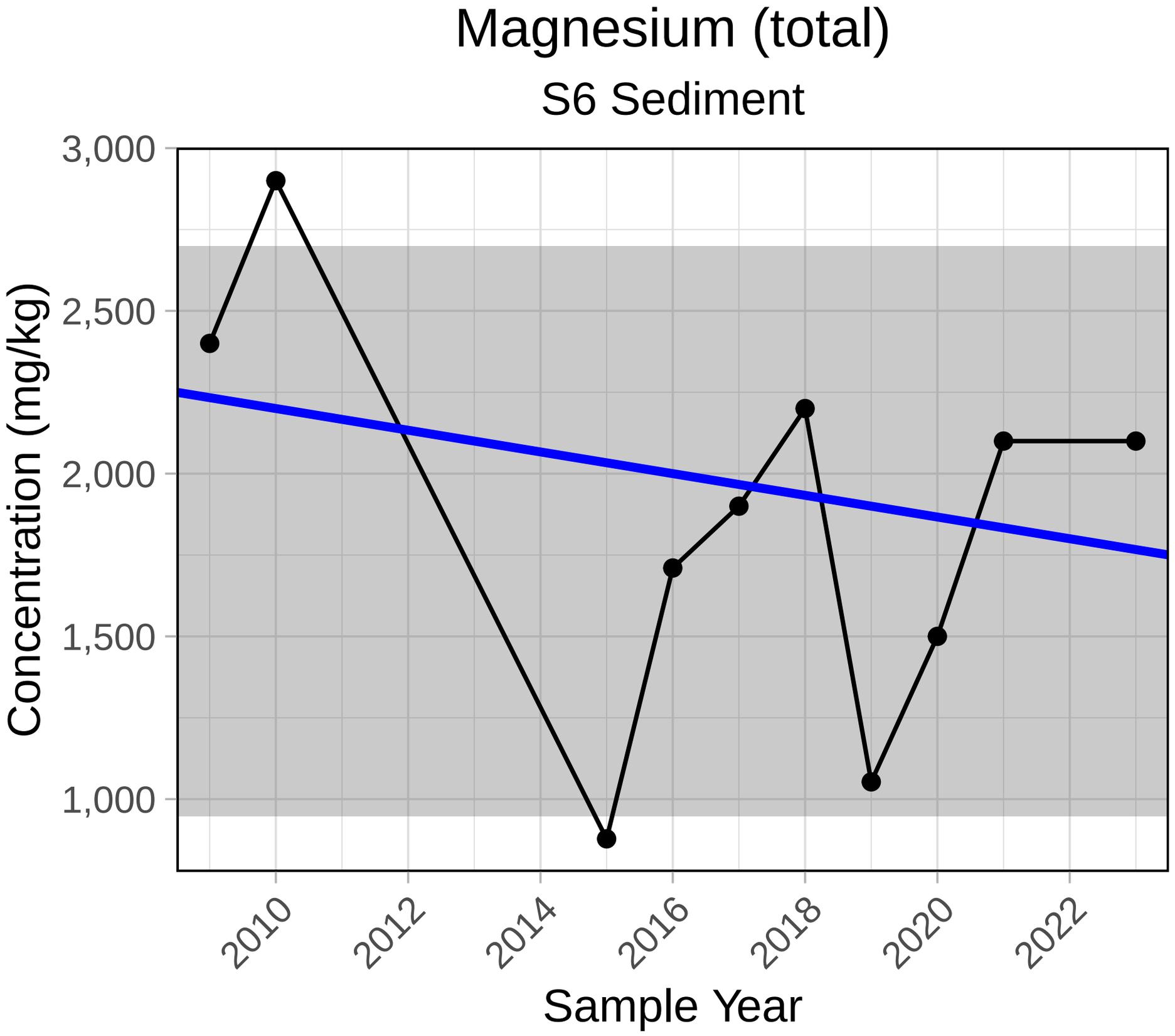
Trend significance p−value = 0.283
ISQG level = 37.3 mg/kg (maximum)
PEL level = 90 mg/kg (maximum)

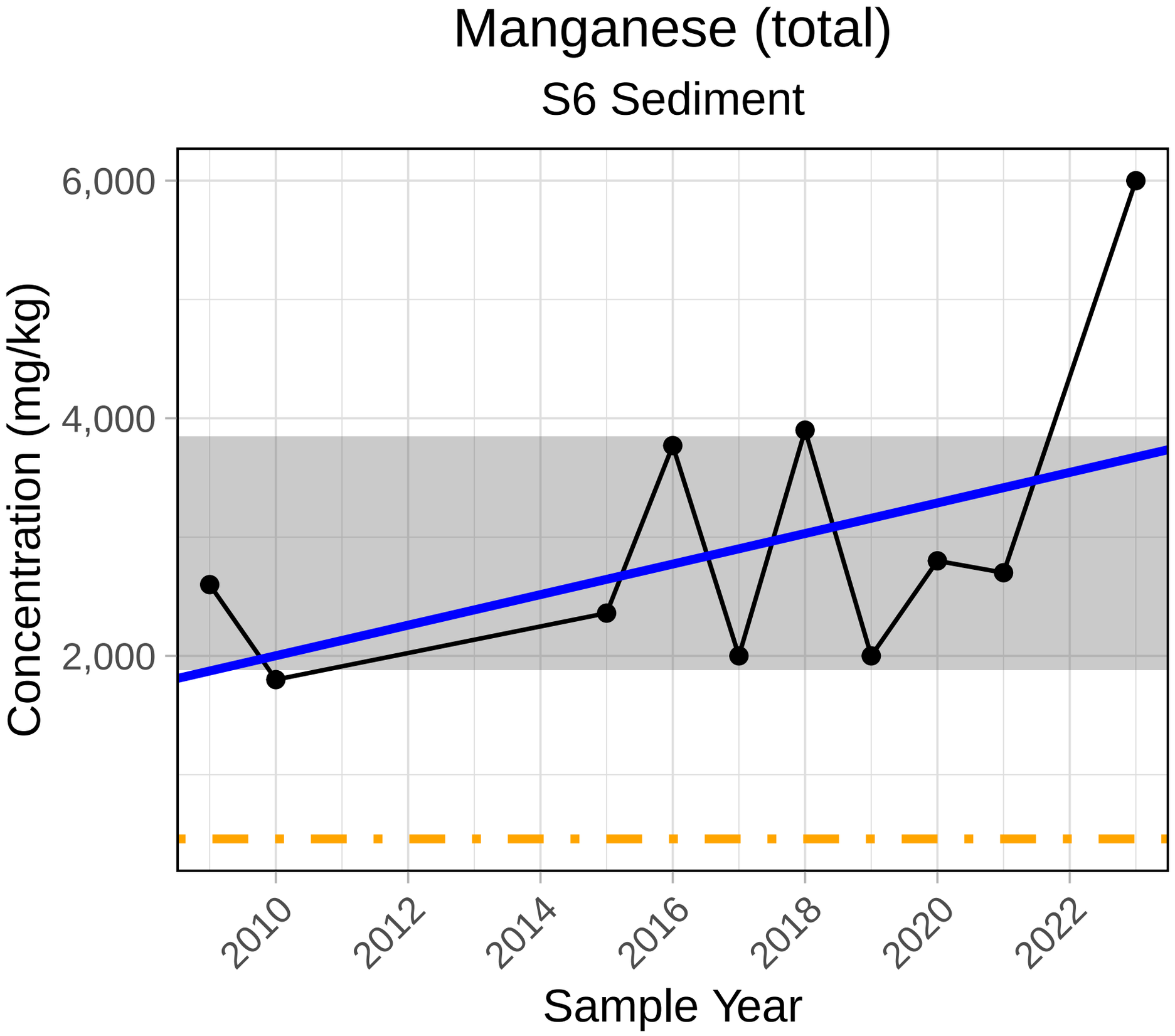


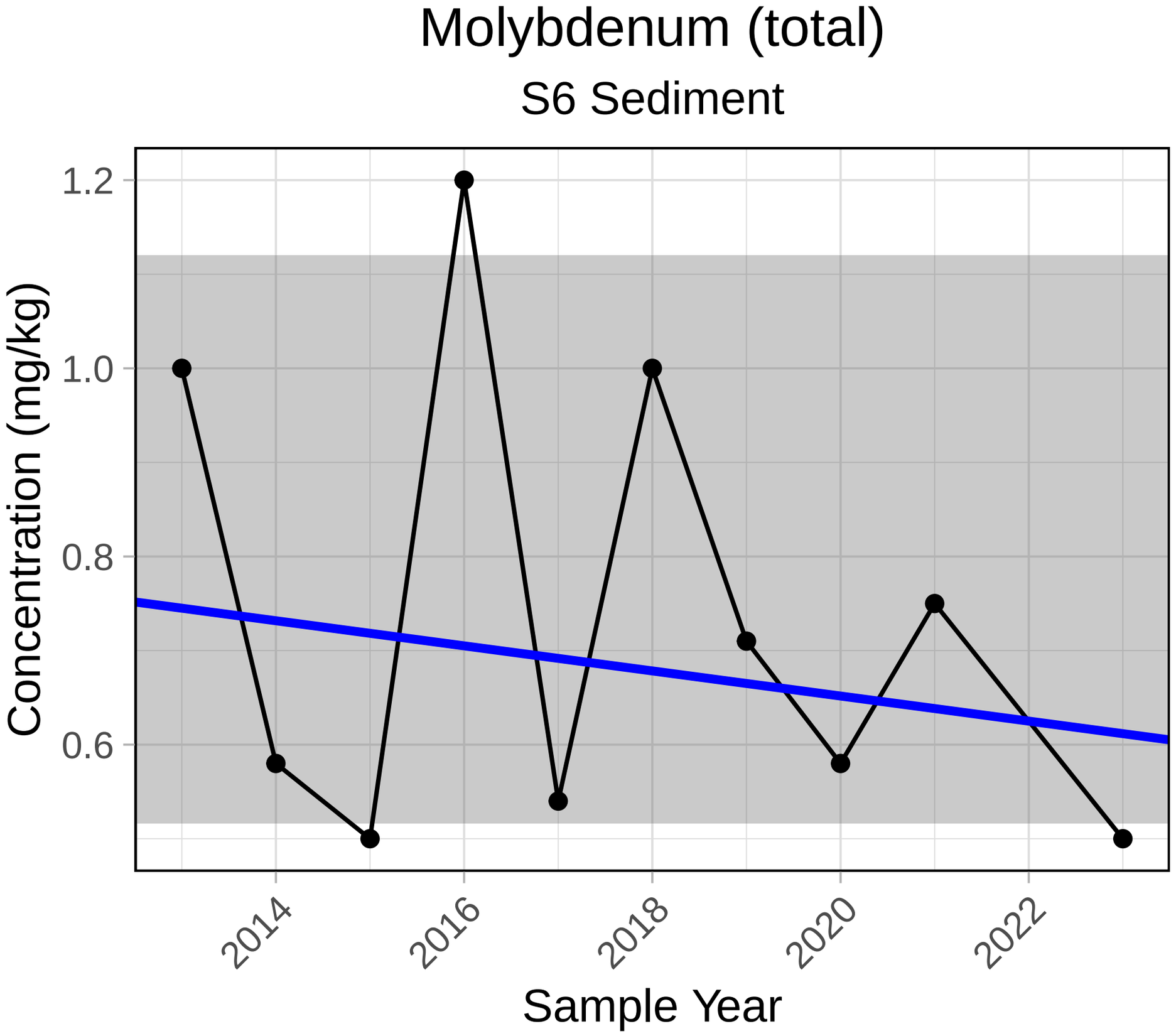
Trend significance p−value = 0.653
ISQG level = 35.7 mg/kg (maximum)
PEL level = 197 mg/kg (maximum)

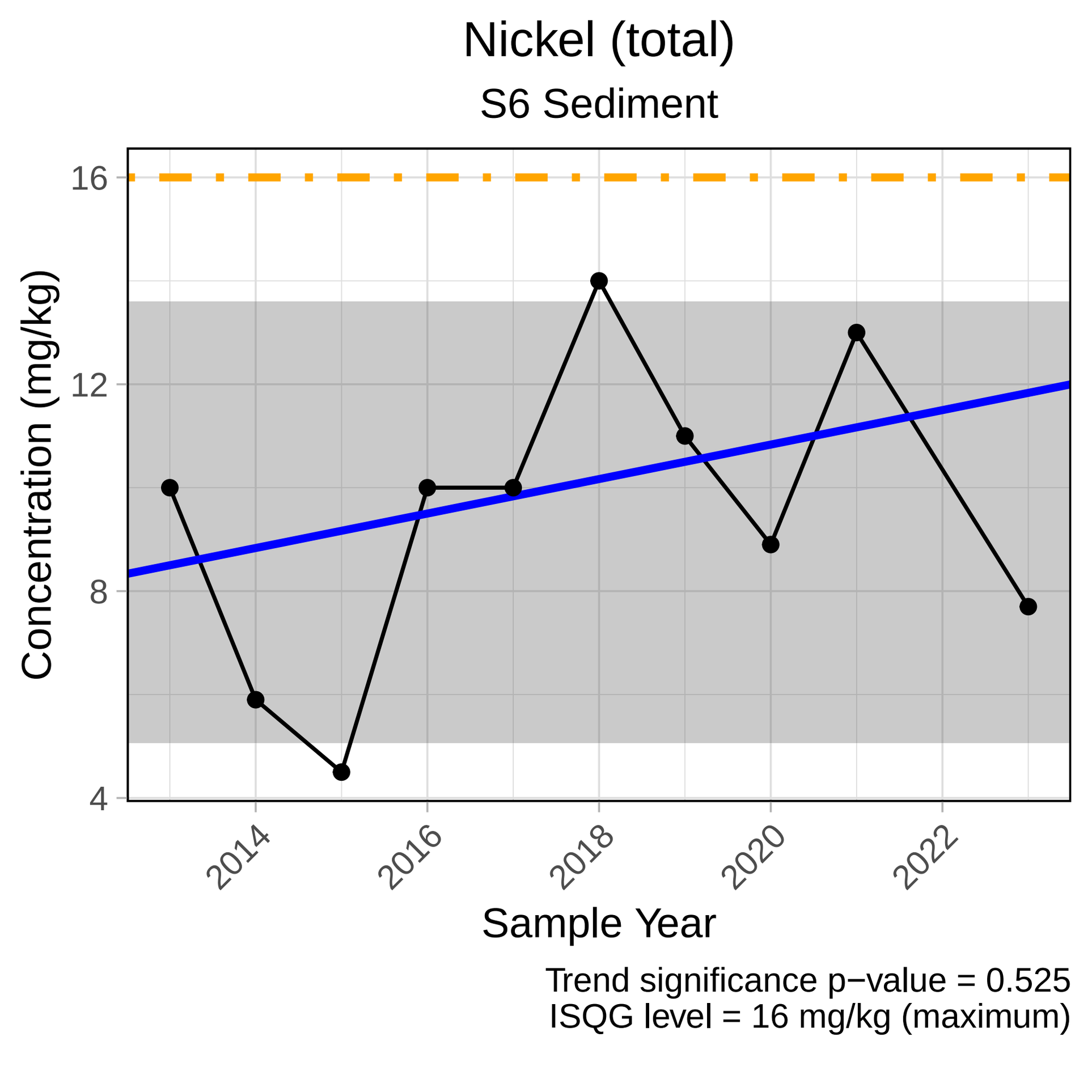

Iron (total)
S6 Sediment
30,000
25,000
20,000
15,000
Concentration (mg/kg)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

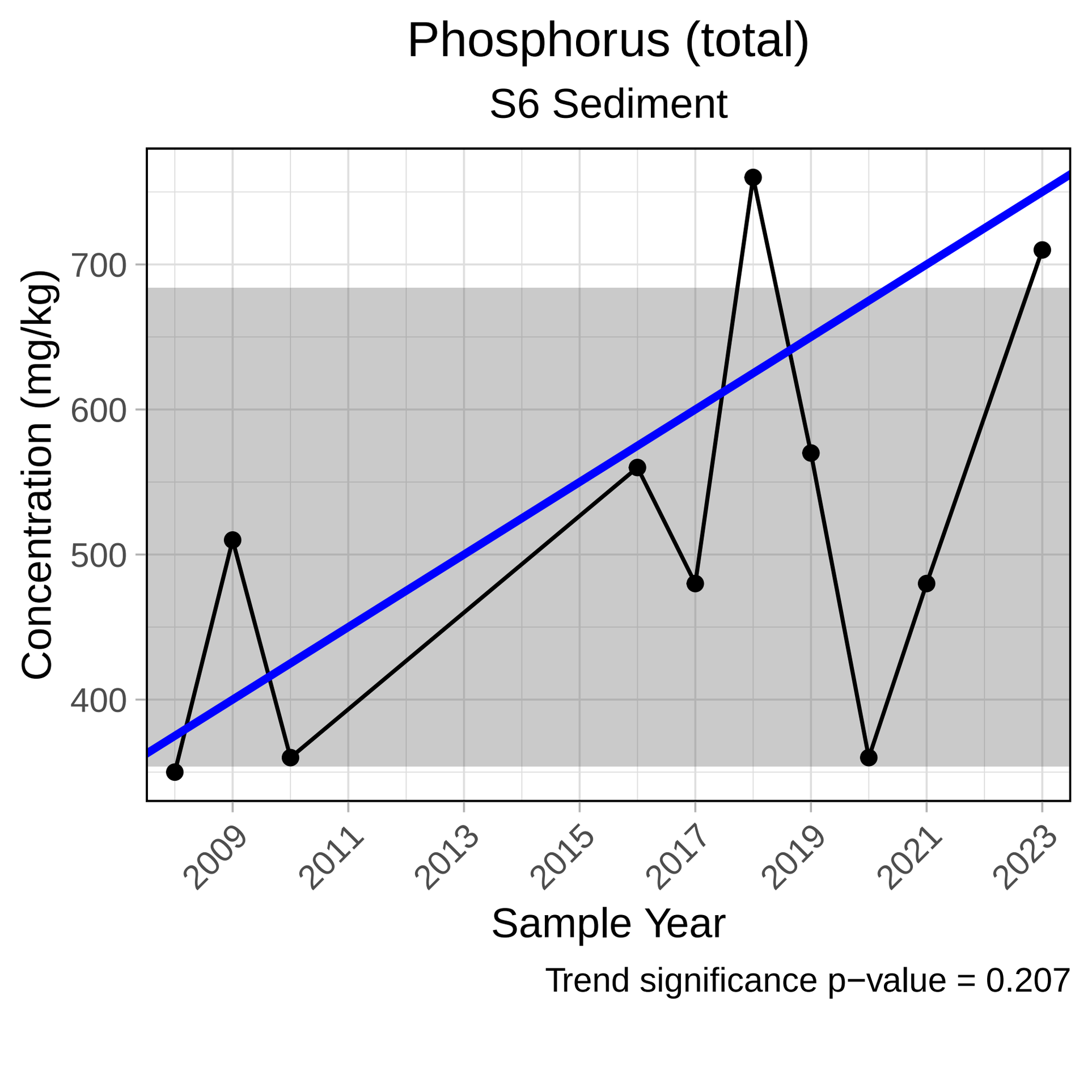

Potassium (total)
S6 Sediment
Concentration (mg/kg)
750
500
250
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

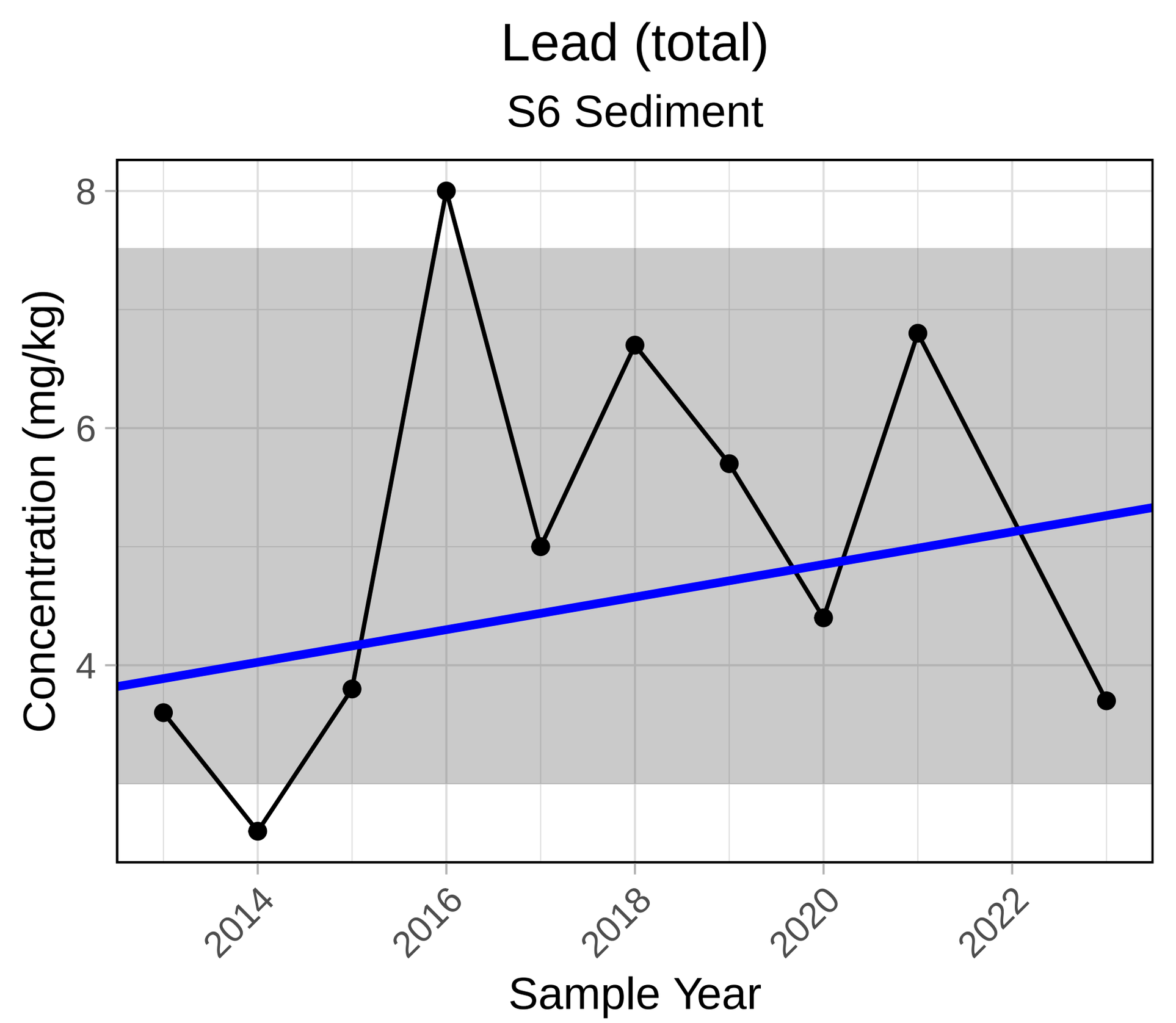

Magnesium (total)
S6 Sediment
3,000
2,500
2,000
1,500
1,000
Concentration (mg/kg)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.788


Manganese (total)
S6 Sediment
6,000
4,000
2,000
Concentration (mg/kg)
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.178
ISQG level = 460 mg/kg (maximum)

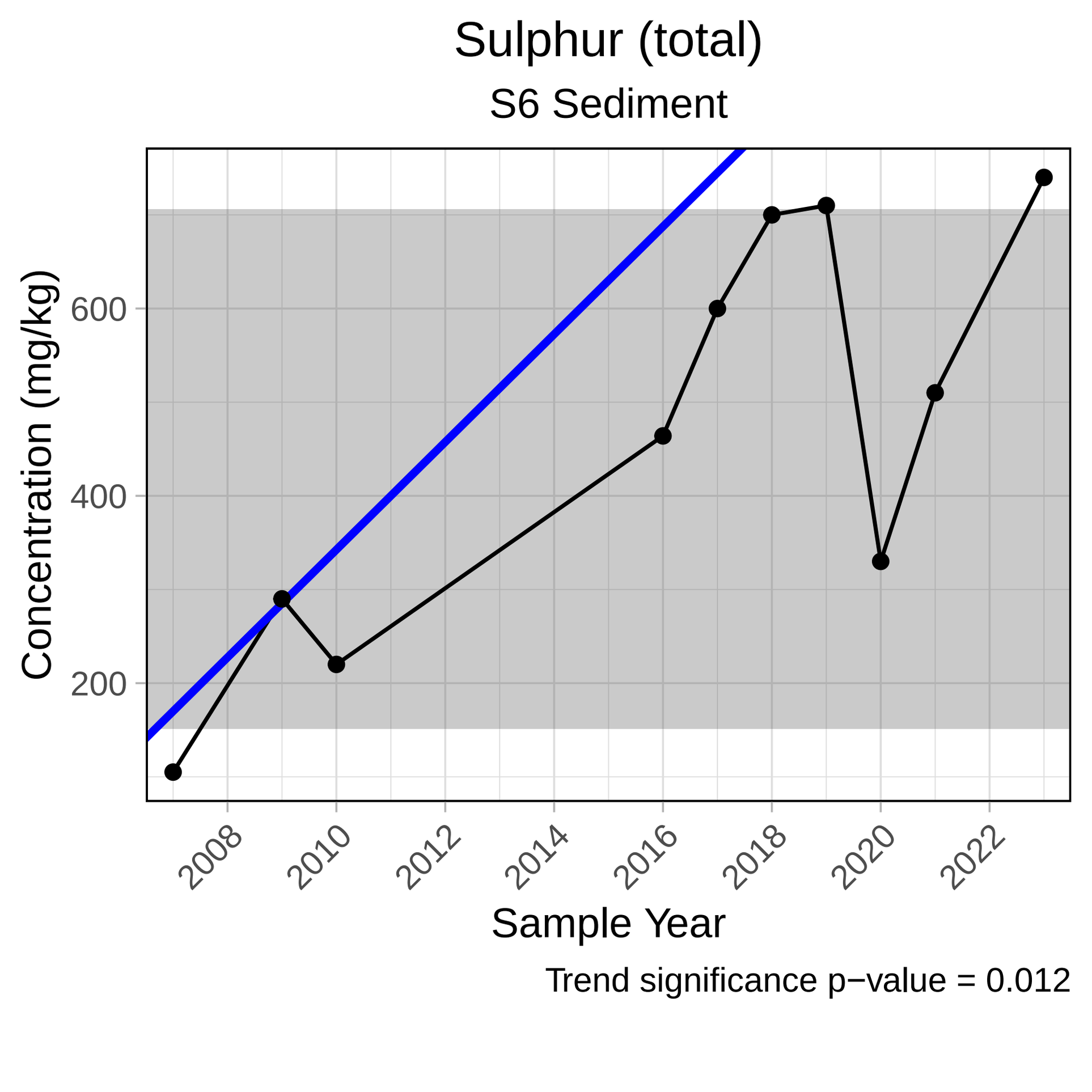

Molybdenum (total)
S6 Sediment
Concentration (mg/kg)
1.2
1.0
0.8
0.6
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.526

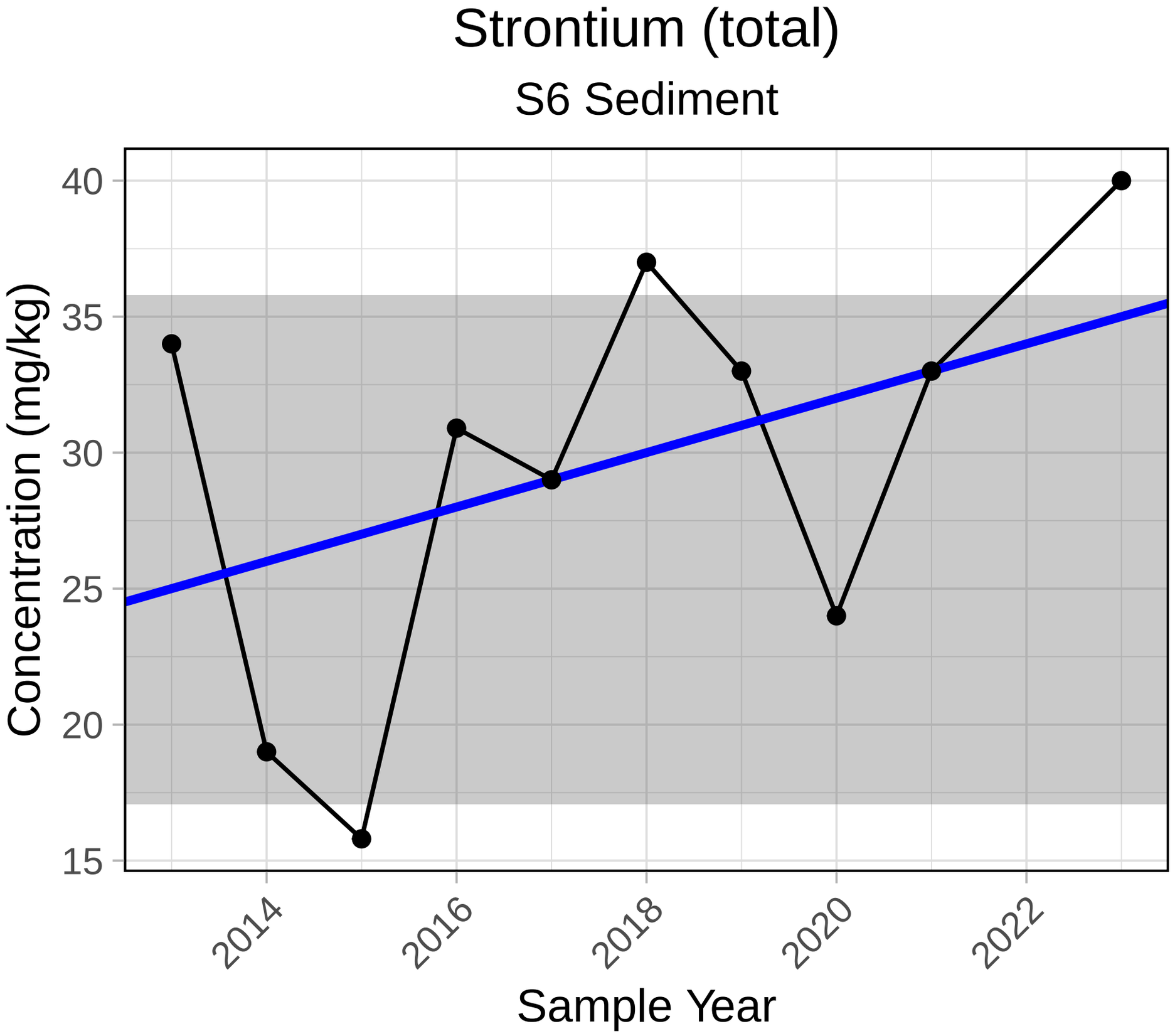

Nickel (total)
S6 Sediment
16
12
8
4
Concentration (mg/kg)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.525
ISQG level = 16 mg/kg (maximum)

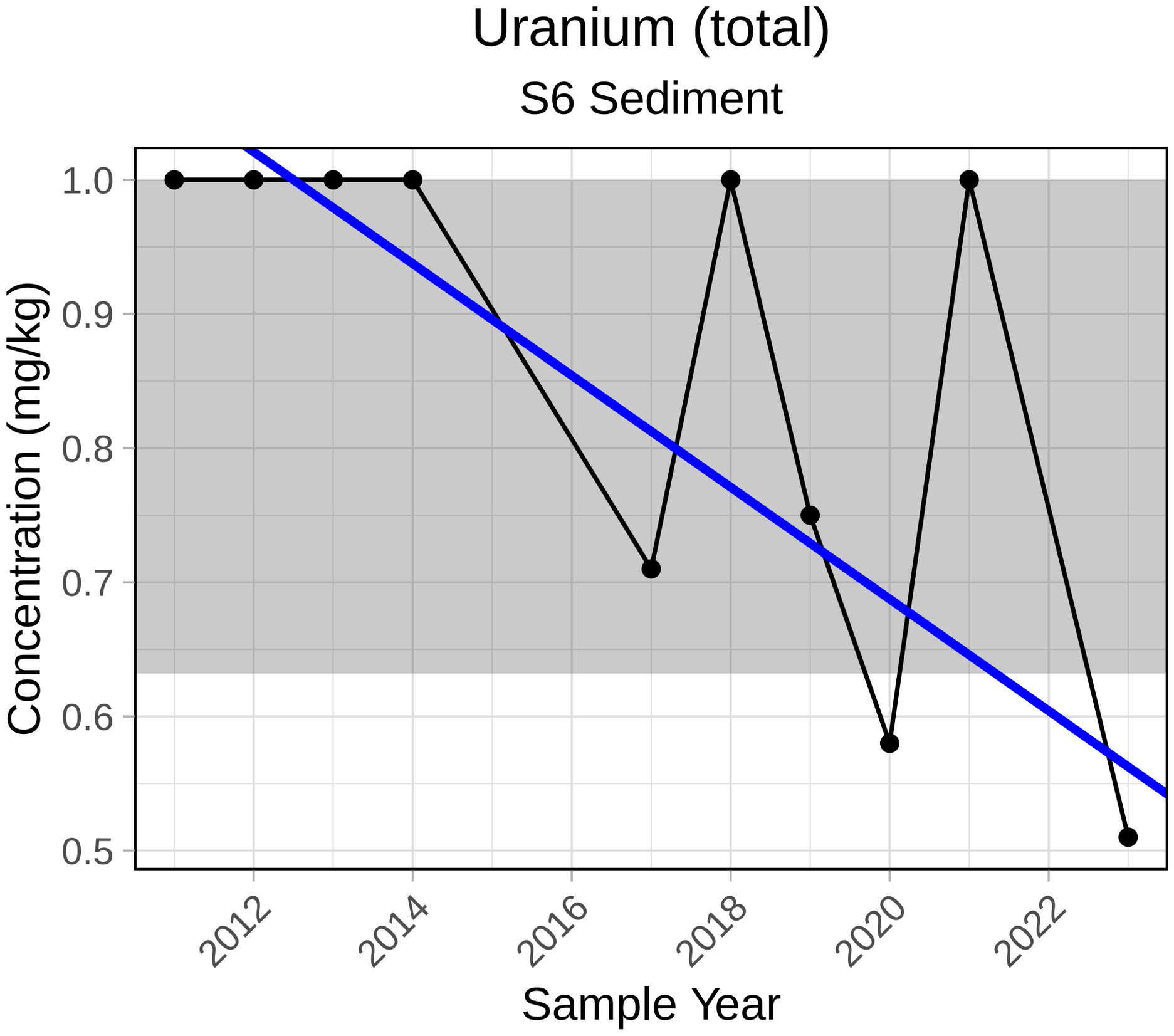

Phosphorus (total)
S6 Sediment
Concentration (mg/kg)
700
600
500
400
2009
2011
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.207

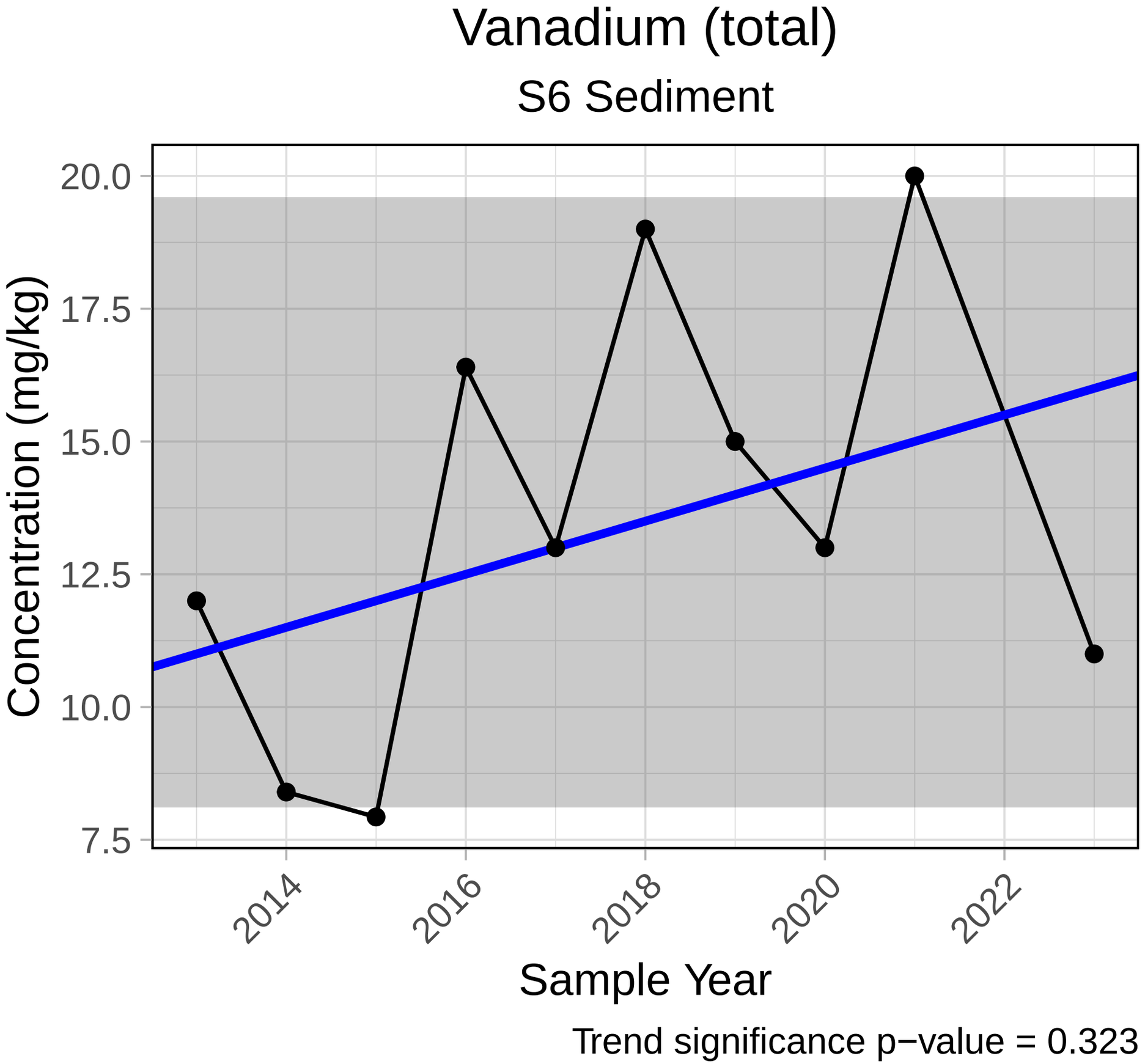


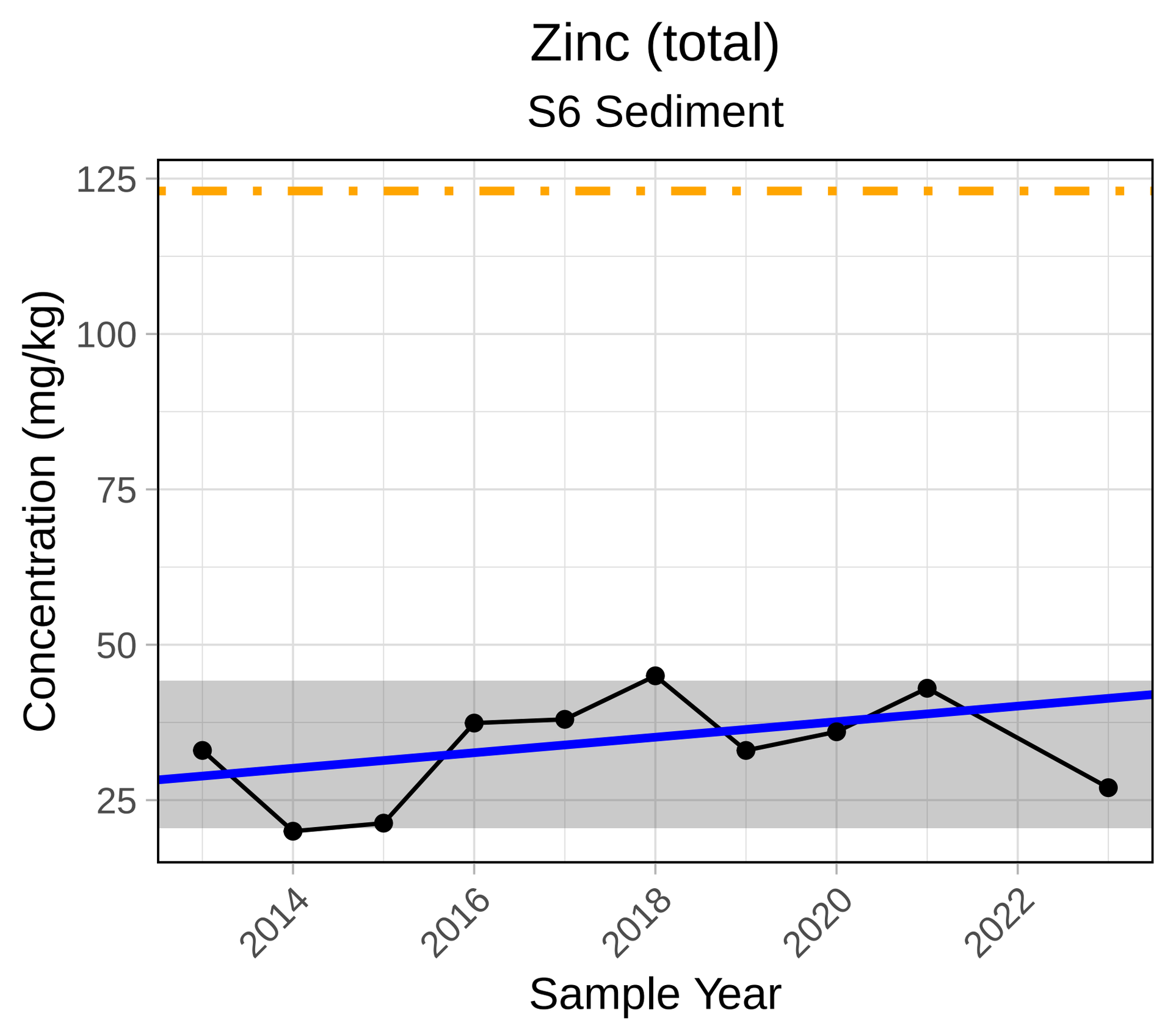
Trend significance p−value = 0.371
ISQG level = 35 mg/kg (maximum)
PEL level = 91.3 mg/kg (maximum)


Sulphur (total)
S6 Sediment
Concentration (mg/kg)
600
400
200
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.012

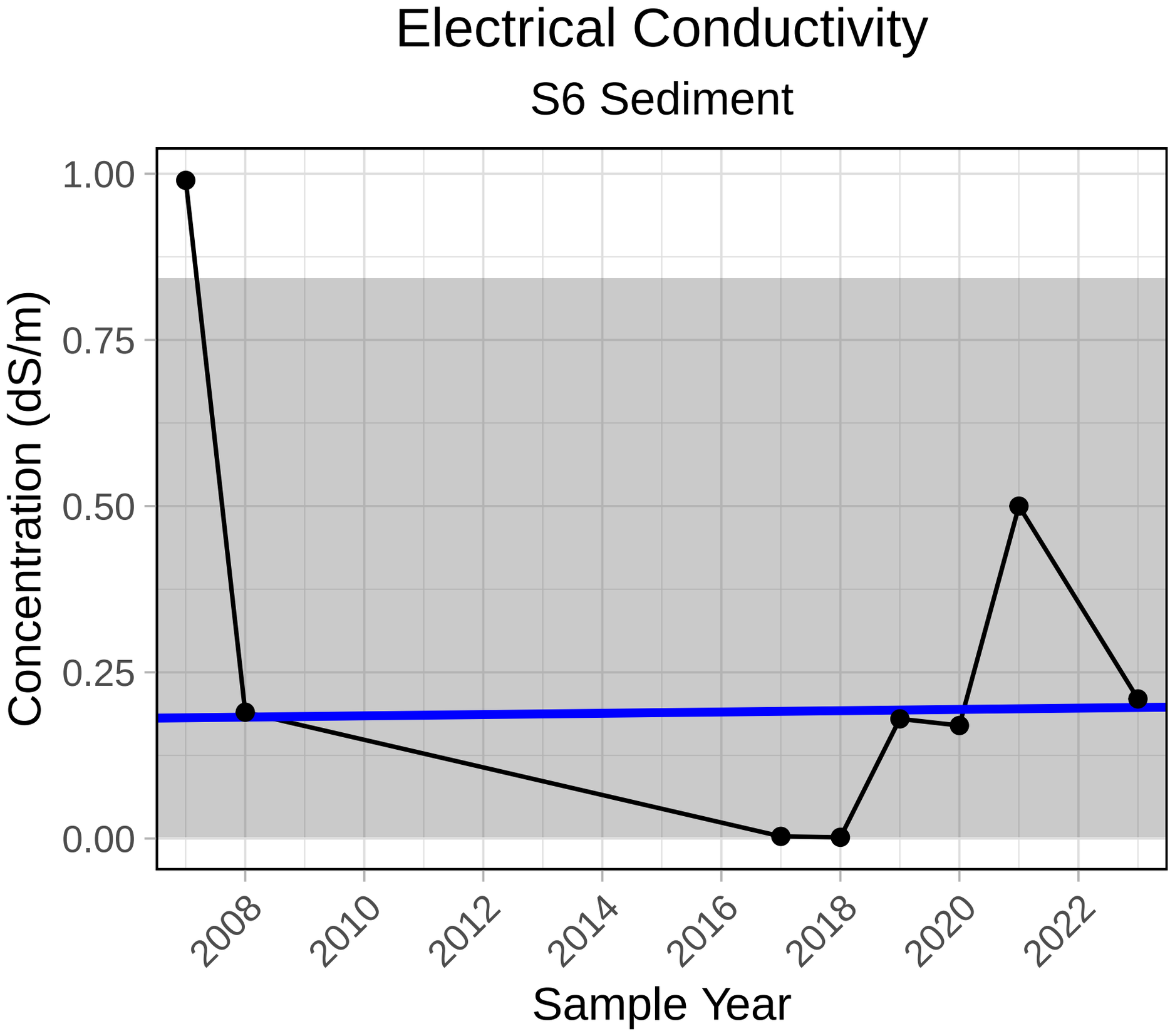

Strontium (total)
S6 Sediment
Concentration (mg/kg)
40
35
30
25
20
15
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.243

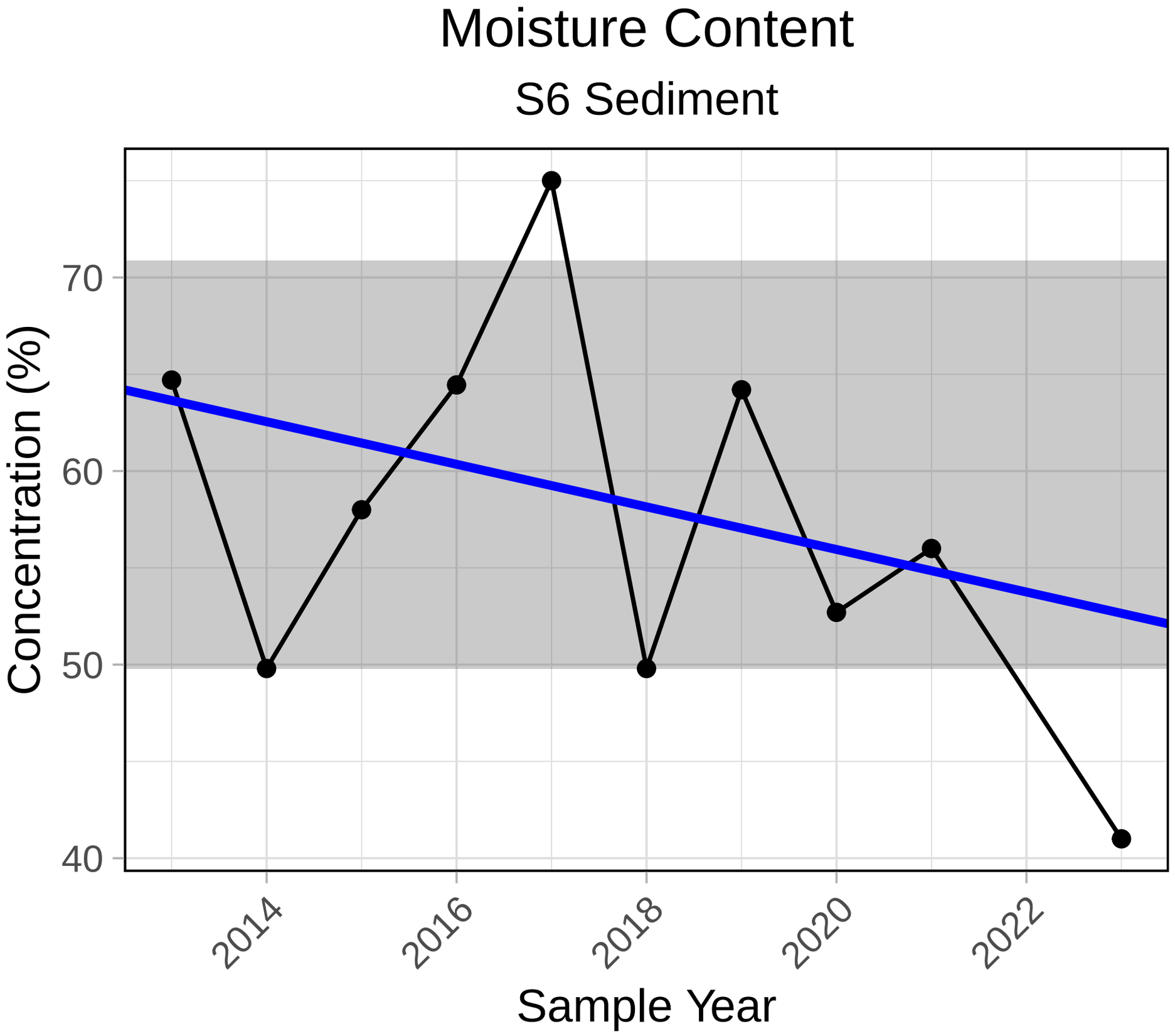

Uranium (total)
S6 Sediment
Concentration (mg/kg)
1.0
0.9
0.8
0.7
0.6
0.5
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.053


Vanadium (total)
S6 Sediment
Concentration (mg/kg)
20.0
17.5
15.0
12.5
10.0
7.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.323

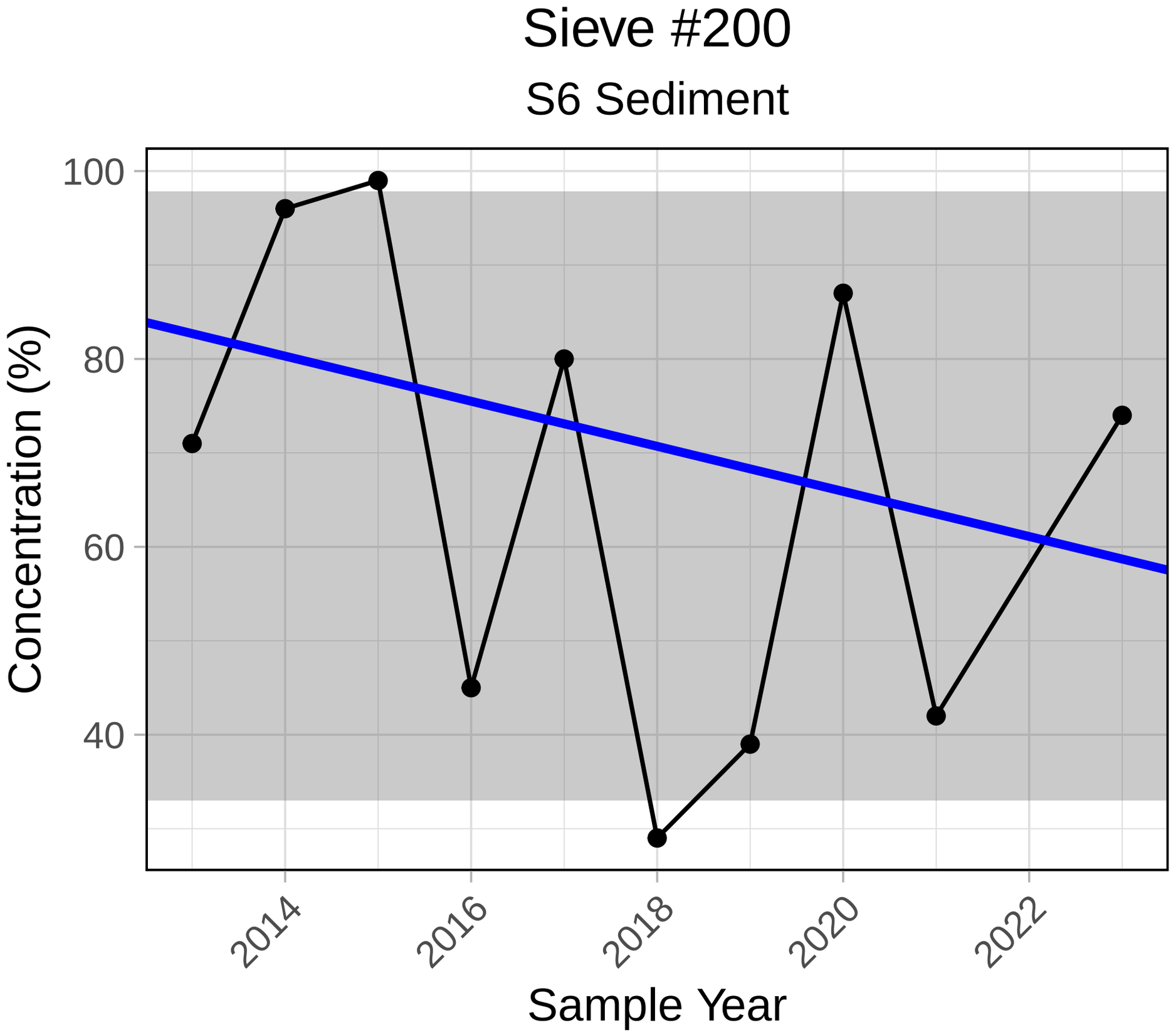


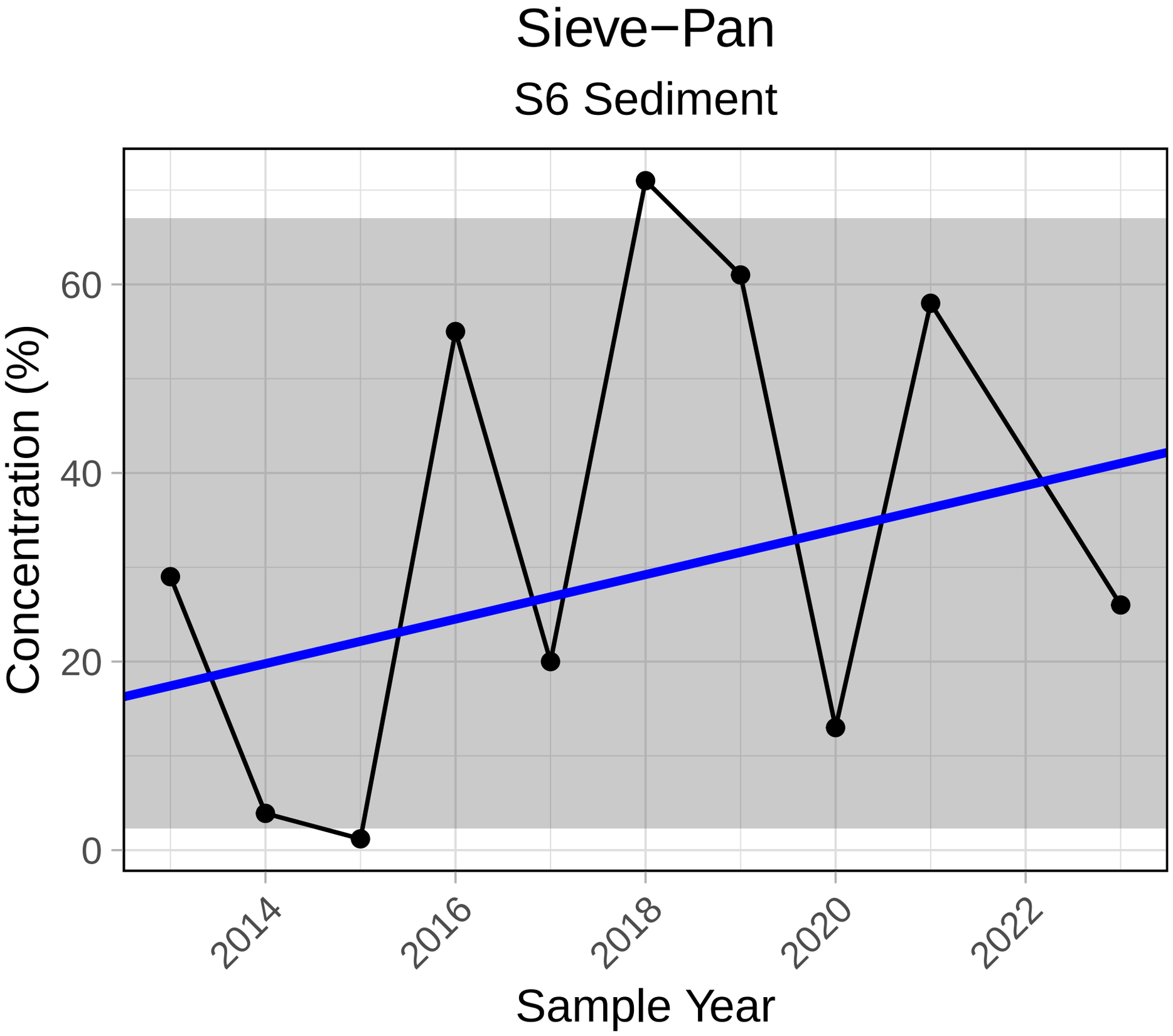
Trend significance p−value = 0.323
ISQG level = 123 mg/kg (maximum)
PEL level = 315 mg/kg (maximum)

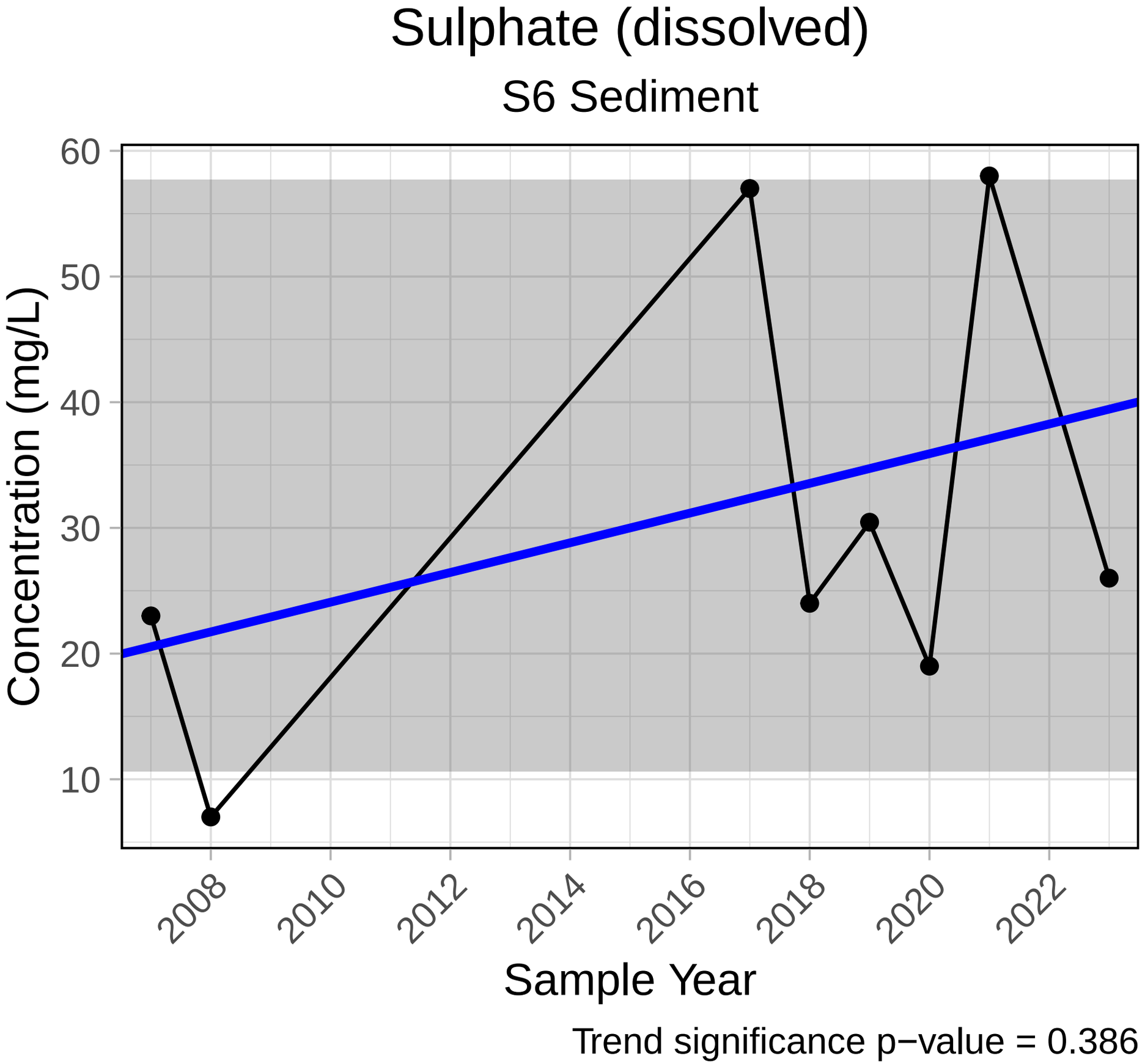

Electrical Conductivity
S6 Sediment
Concentration (dS/m)
1.00
0.75
0.50
0.25
0.00
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

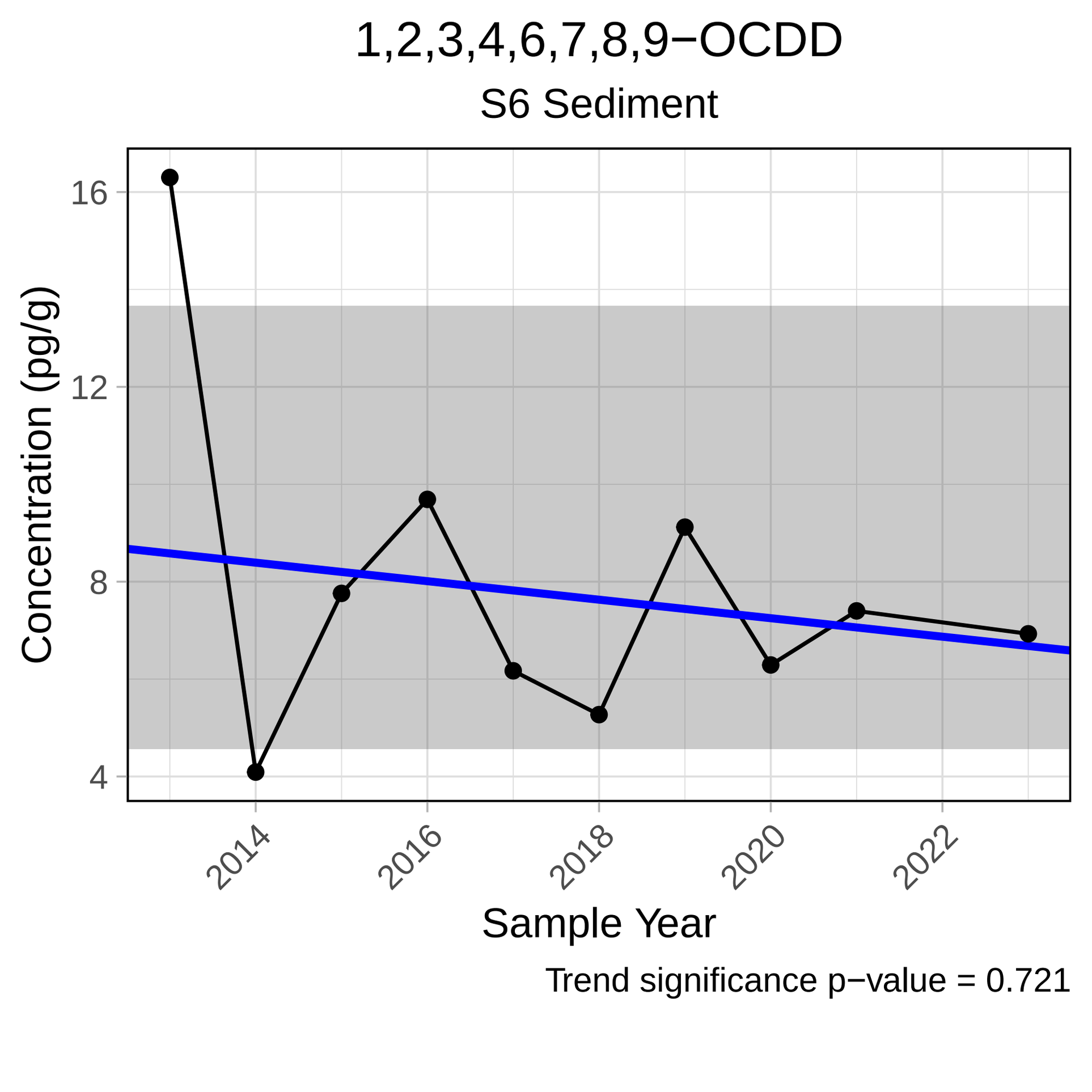

Moisture Content
S6 Sediment
Concentration (%)
70
60
50
40
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.243

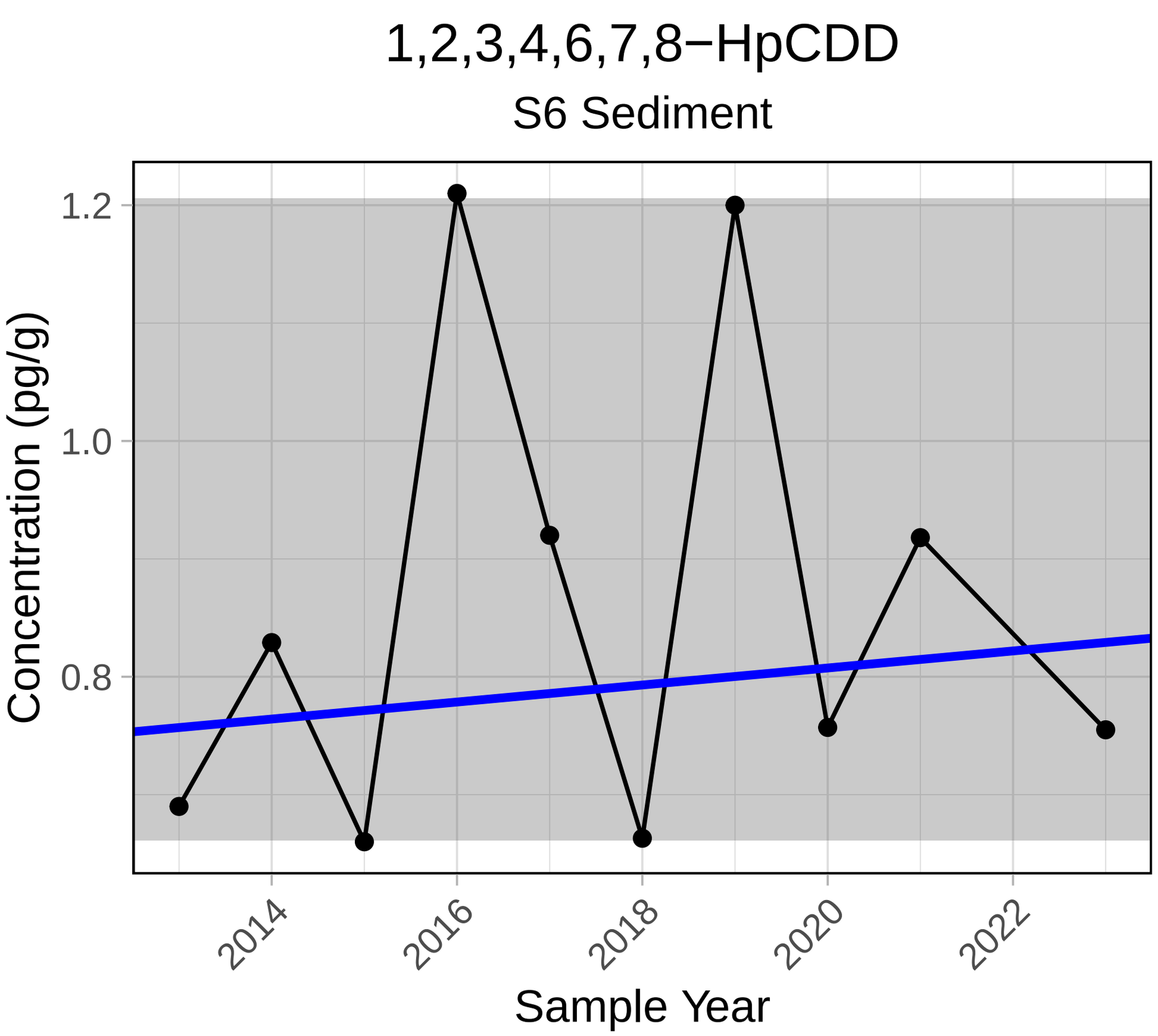
Sieve #10
S6 Sediment
Concentration (%)
0
2
4
6
8
2006
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.039

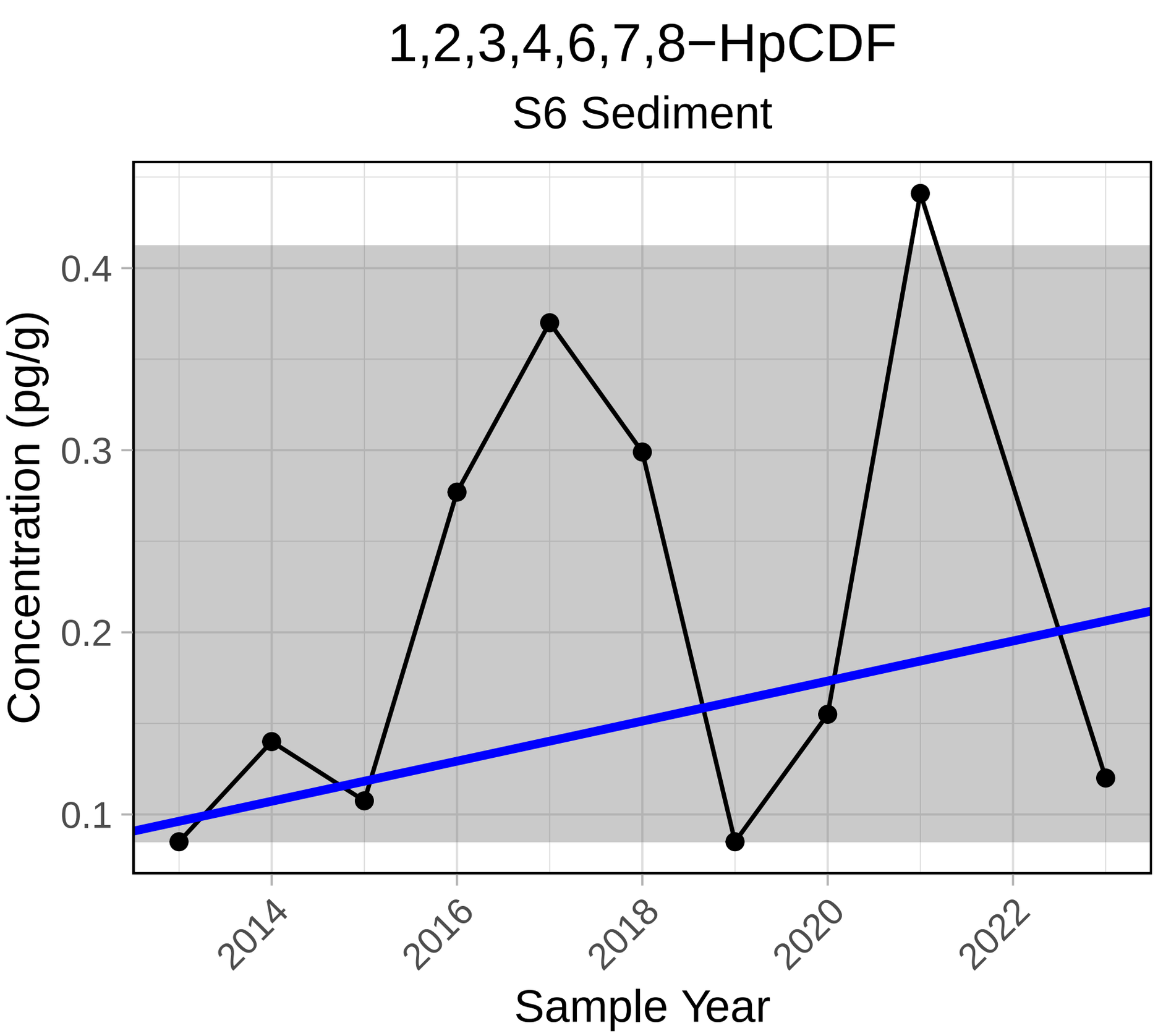

Sieve #200
S6 Sediment
100
80
60
40
Concentration (%)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

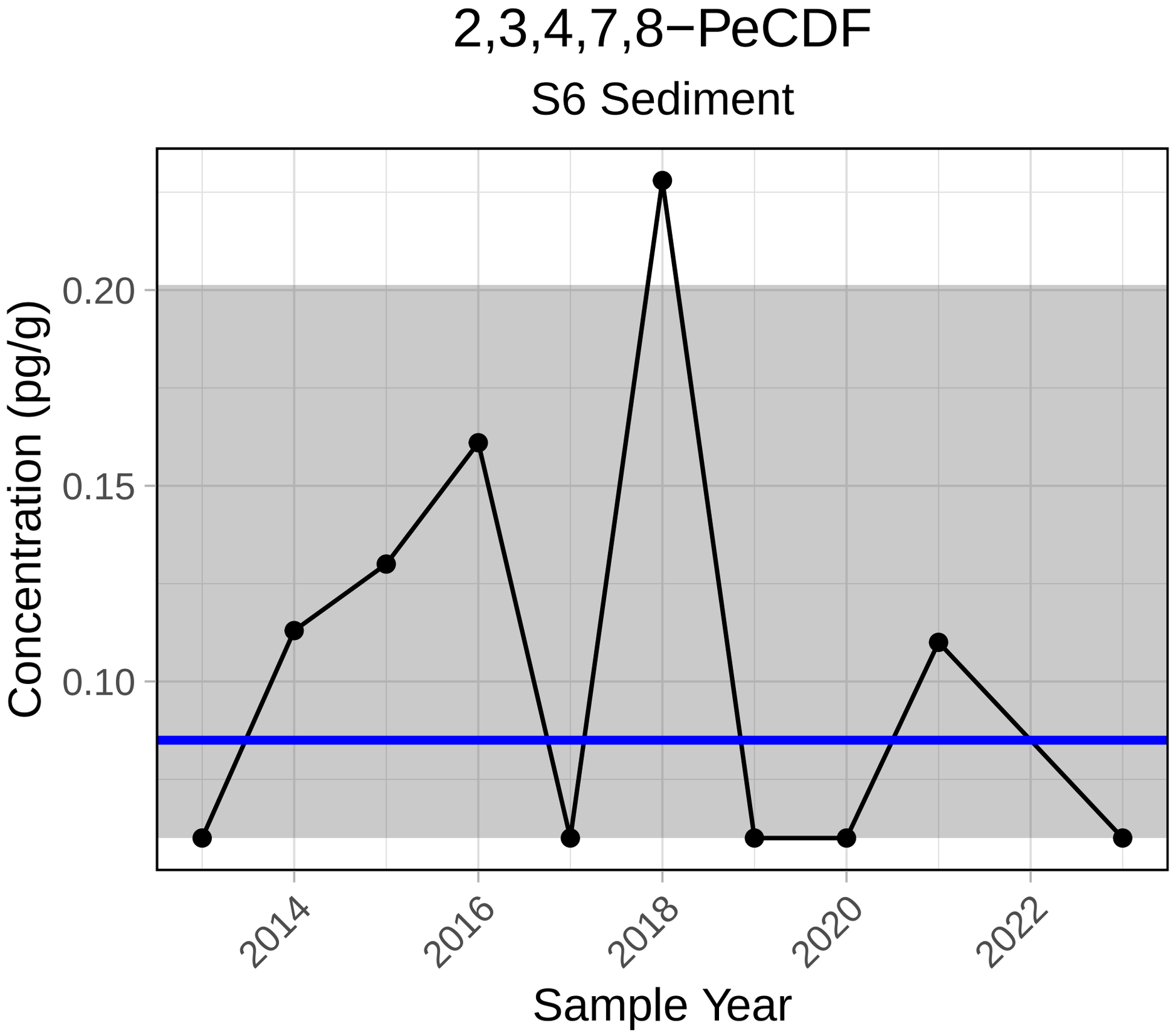

Sieve−Pan
S6 Sediment
Concentration (%)
0
20
40
60
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

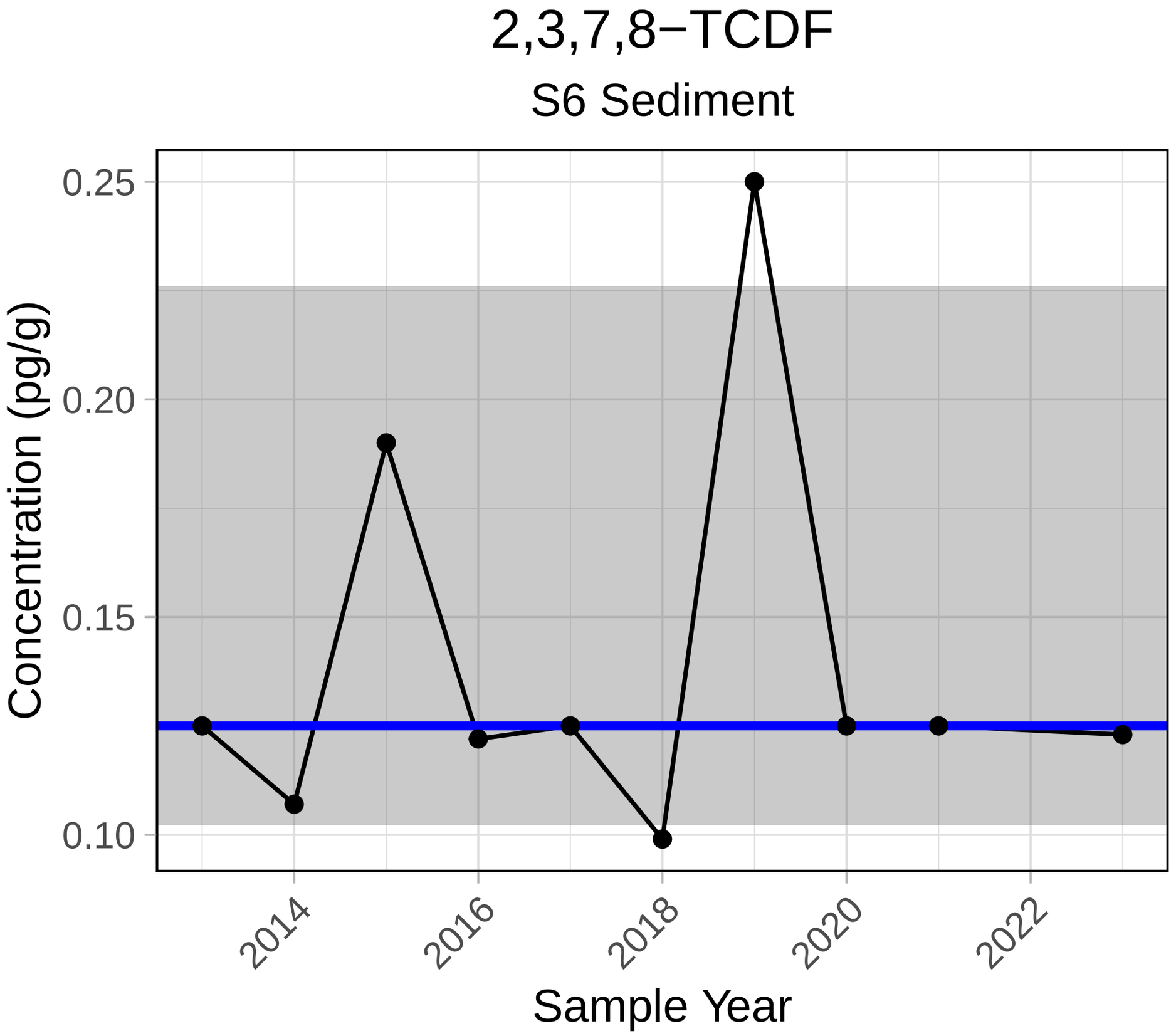

Sulphate (dissolved)
S6 Sediment
Concentration (mg/L)
60
50
40
30
20
10
2008
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.386

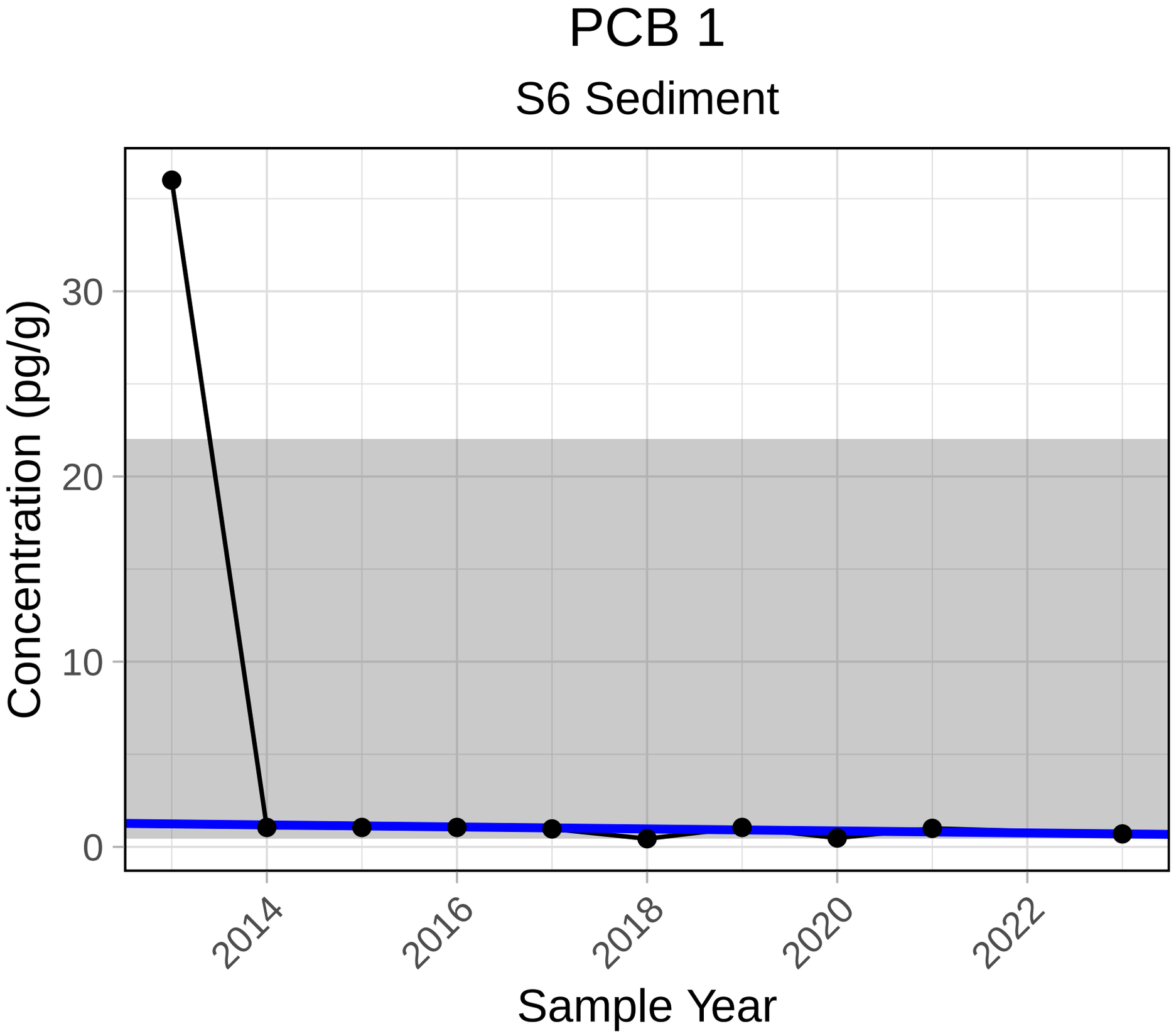

1,2,3,4,6,7,8,9−OCDD
S6 Sediment
Concentration (pg/g)
16
12
8
4
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

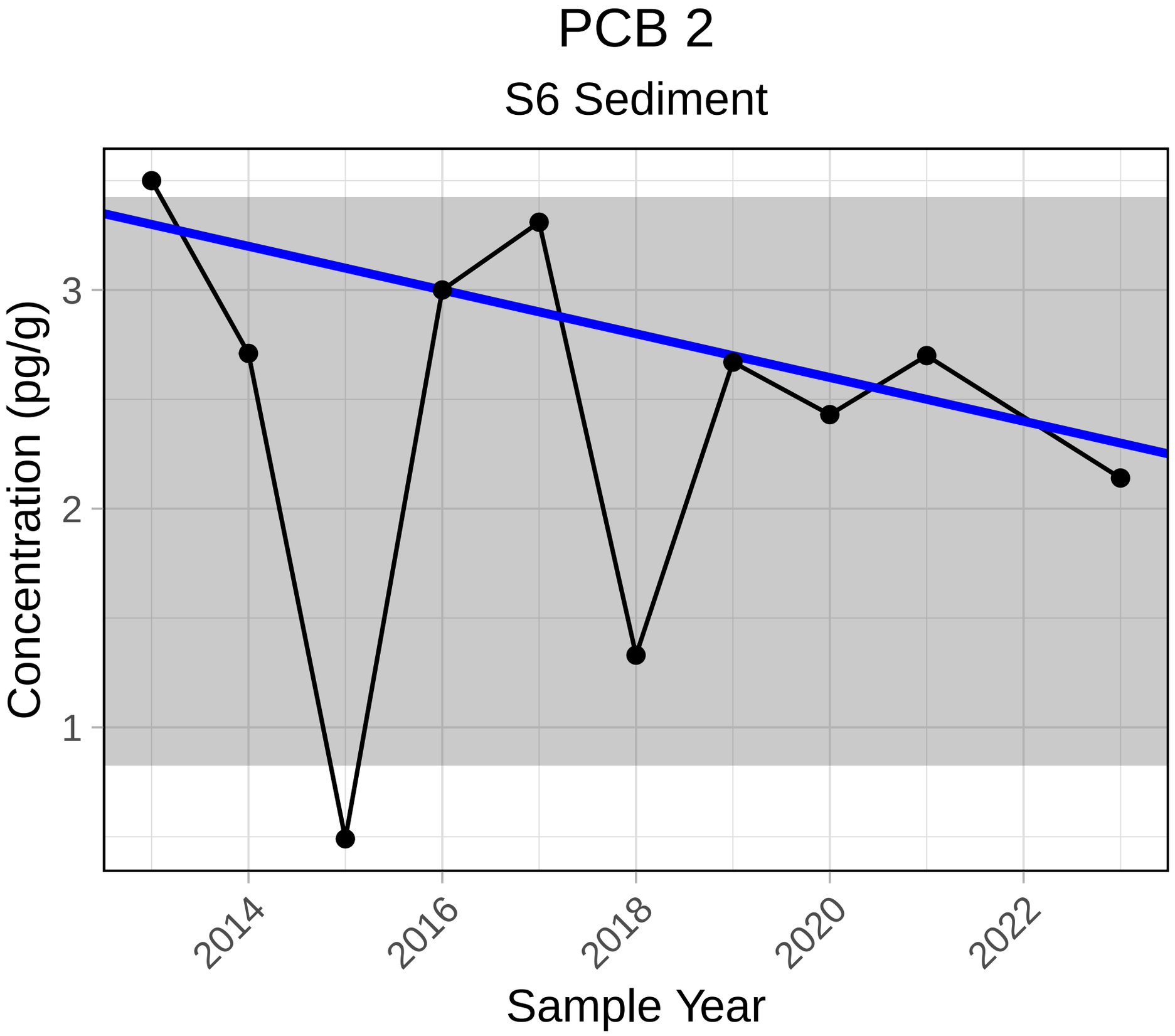

1,2,3,4,6,7,8−HpCDD
S6 Sediment
Concentration (pg/g)
1.2
1.0
0.8
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

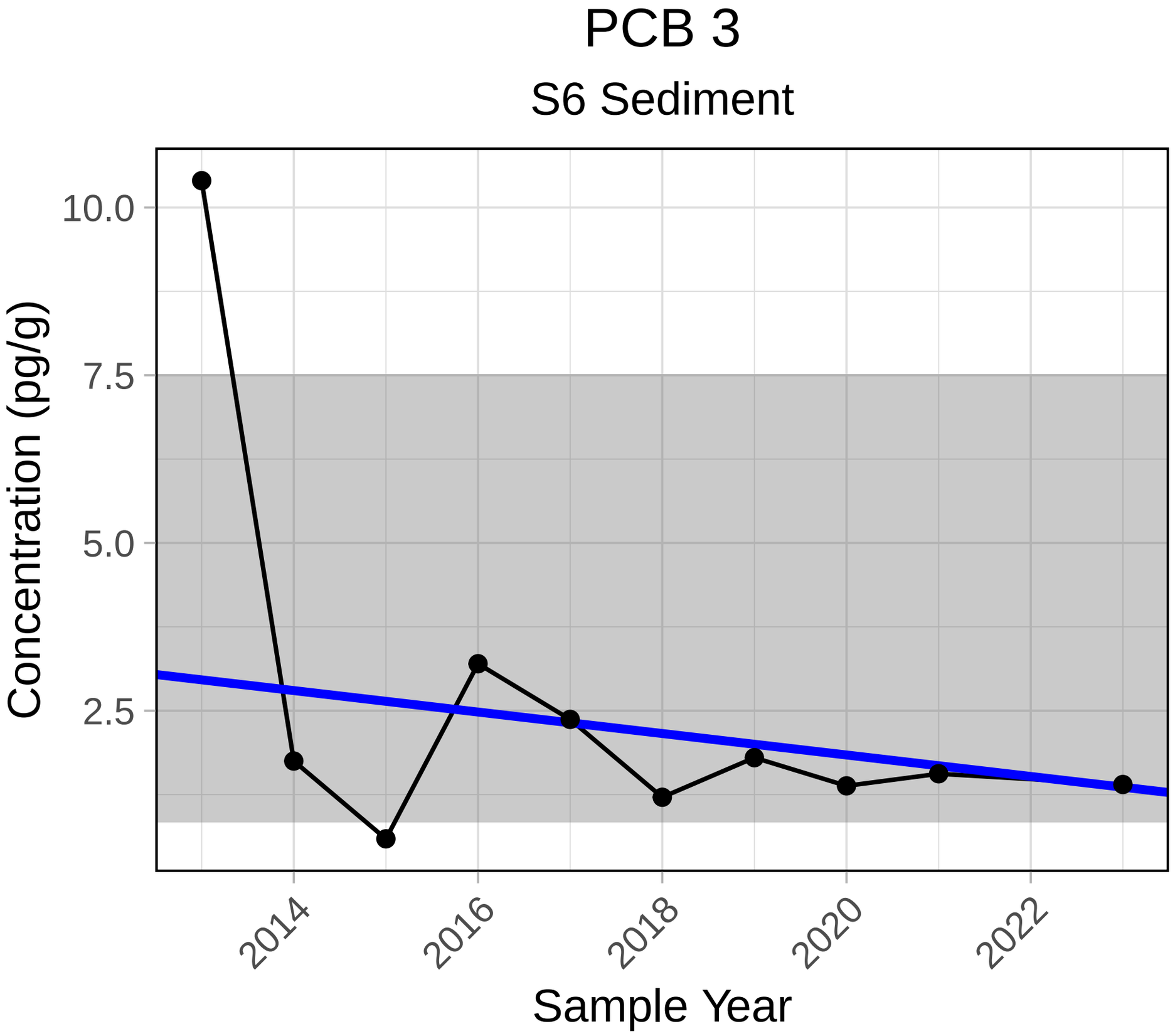

1,2,3,4,6,7,8−HpCDF
S6 Sediment
Concentration (pg/g)
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.323

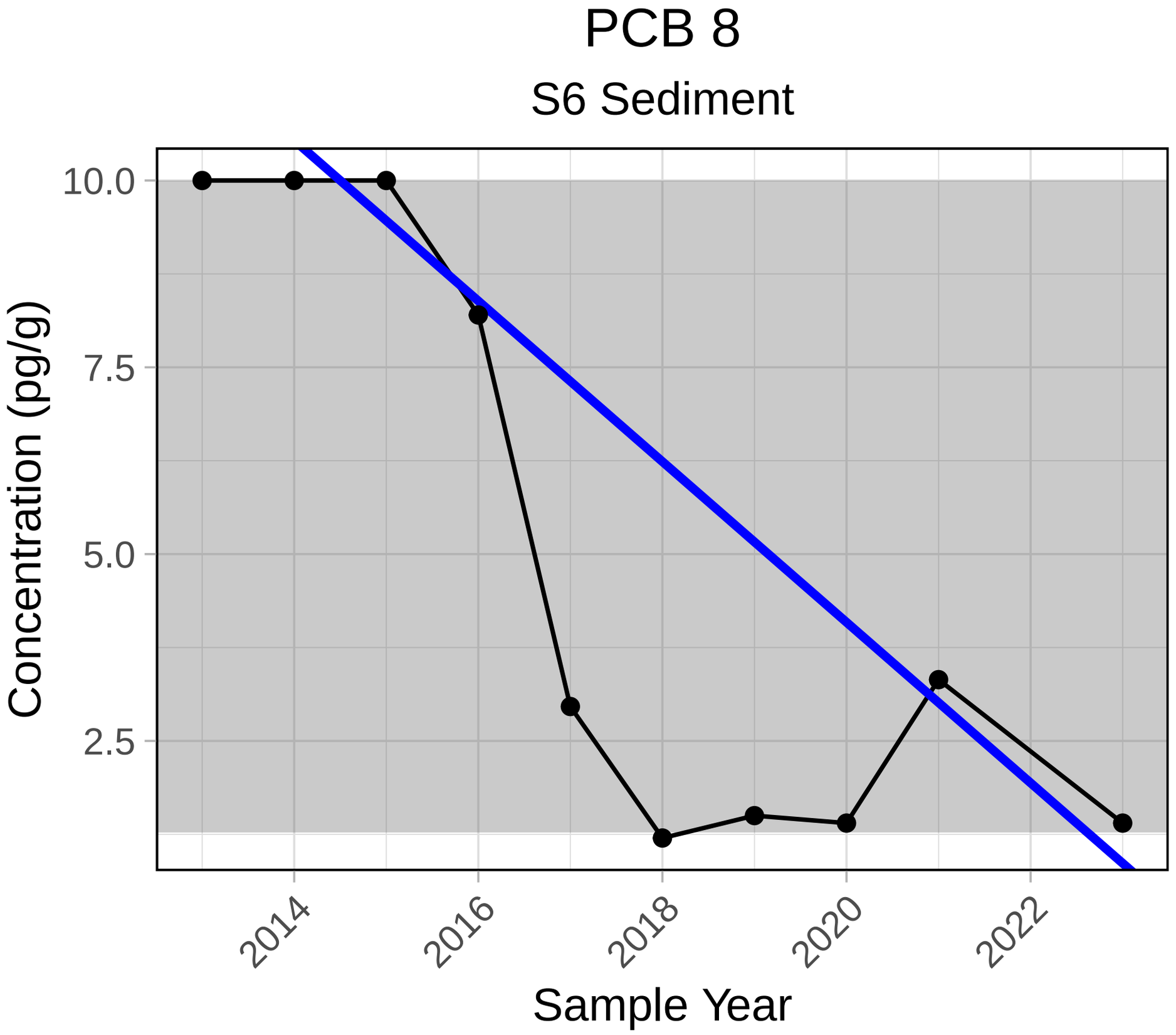

2,3,4,7,8−PeCDF
S6 Sediment
Concentration (pg/g)
0.20
0.15
0.10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.701


2,3,7,8−TCDF
S6 Sediment
Concentration (pg/g)
0.25
0.20
0.15
0.10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1


PCB 1
S6 Sediment
Concentration (pg/g)
30
20
10
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.041

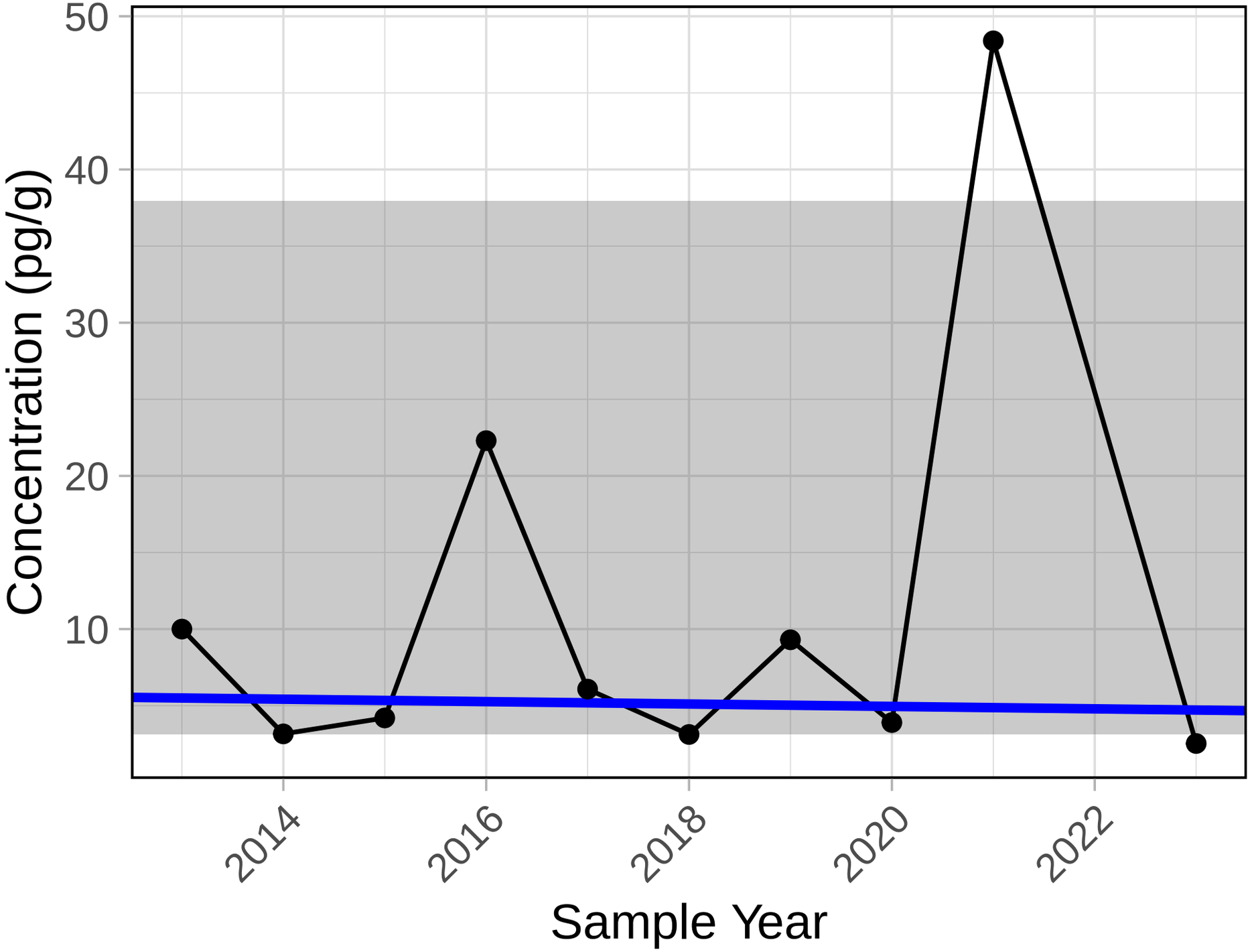

PCB 2
S6 Sediment
Concentration (pg/g)
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283


PCB 3
S6 Sediment
10.0
7.5
5.0
2.5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

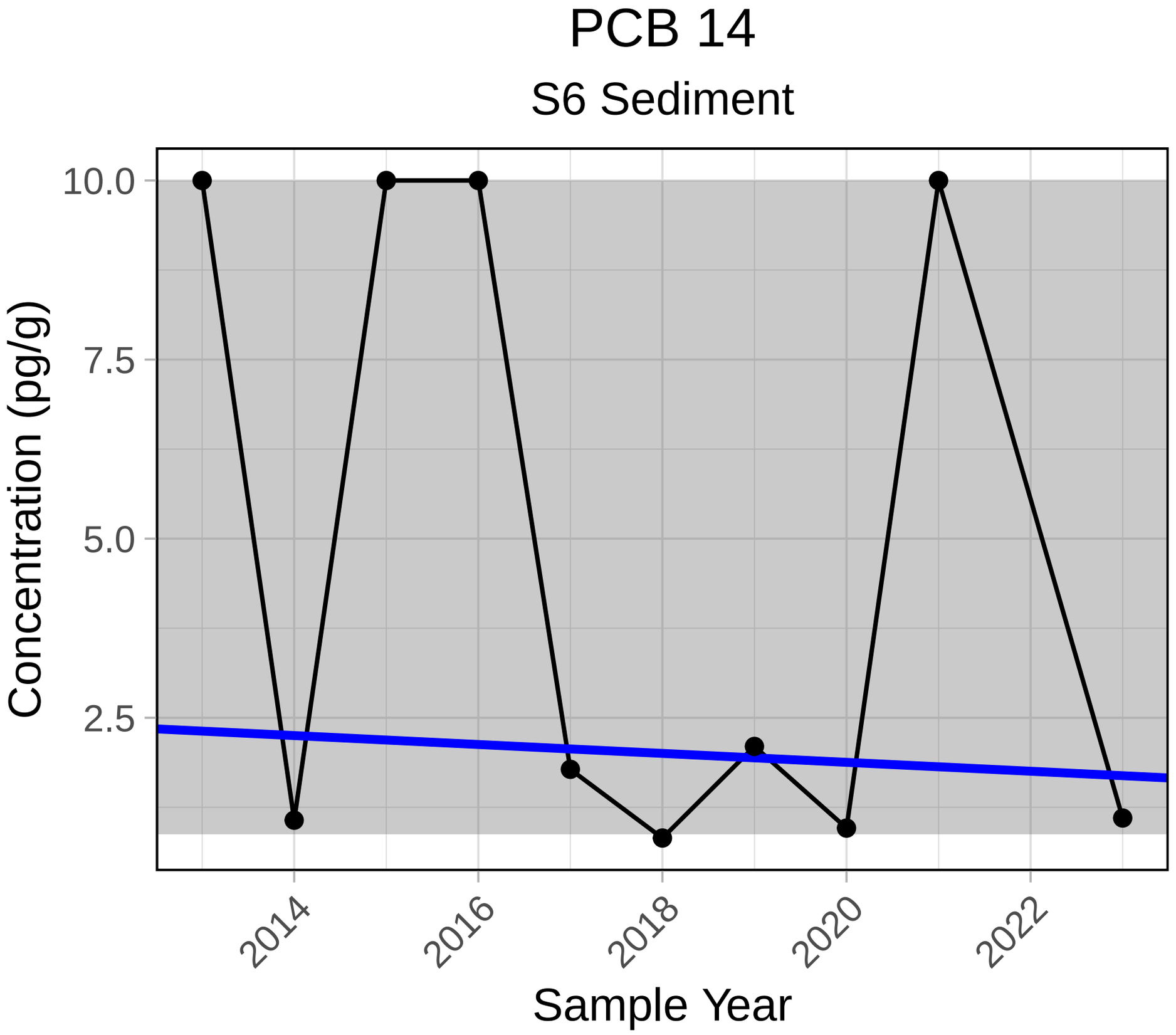

PCB 8
S6 Sediment
10.0
7.5
5.0
2.5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.018

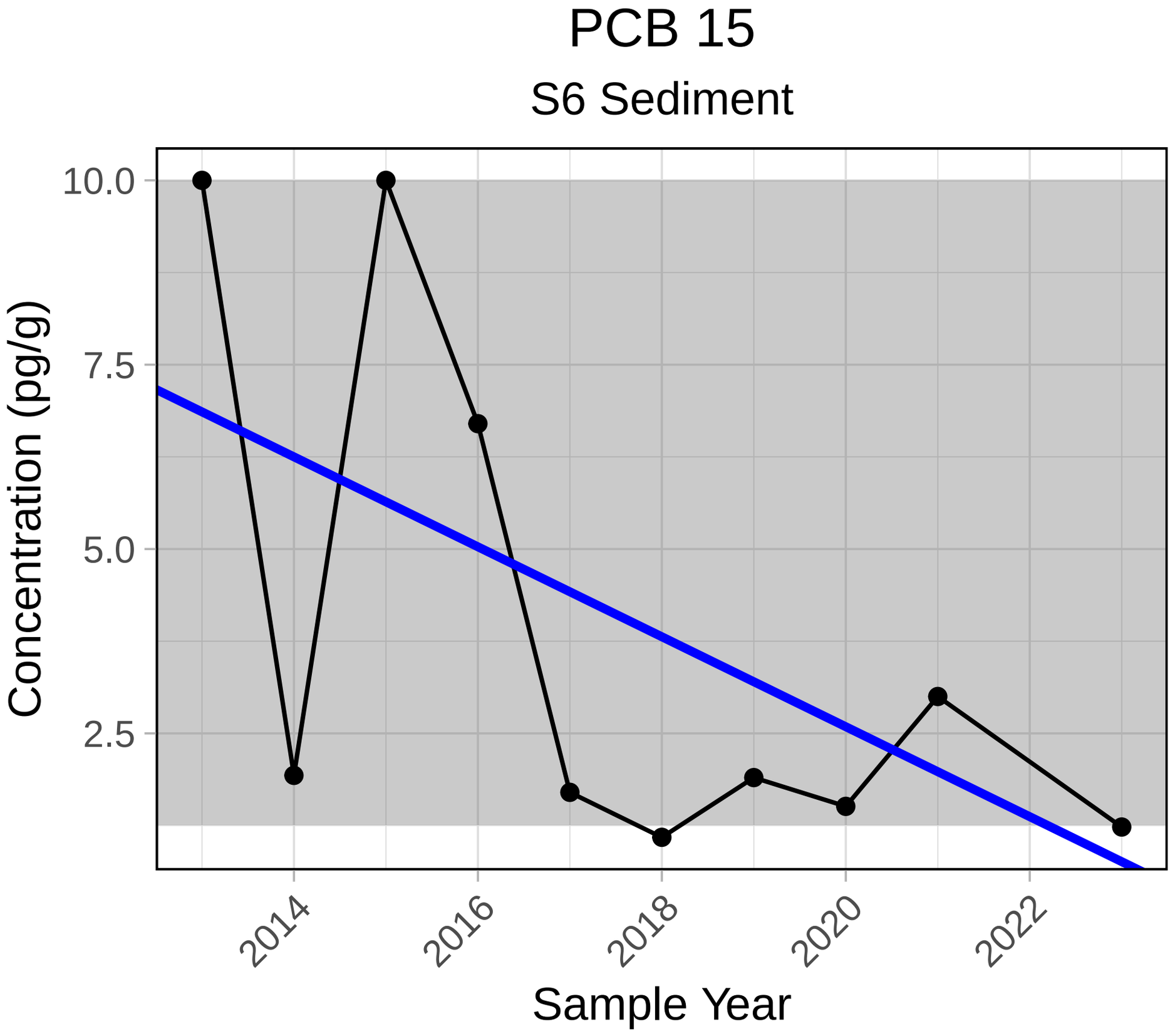
PCB 11

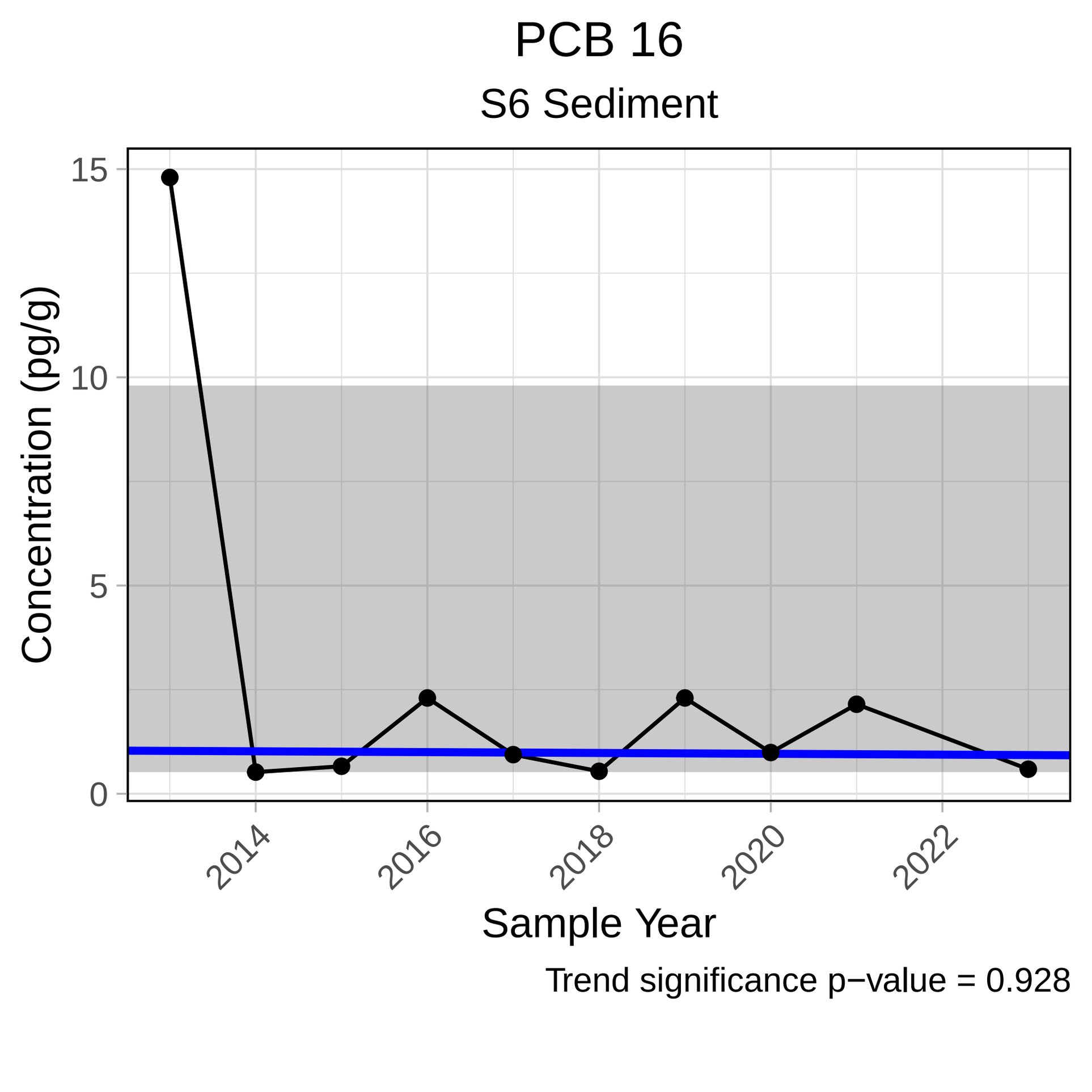
S6 Sediment

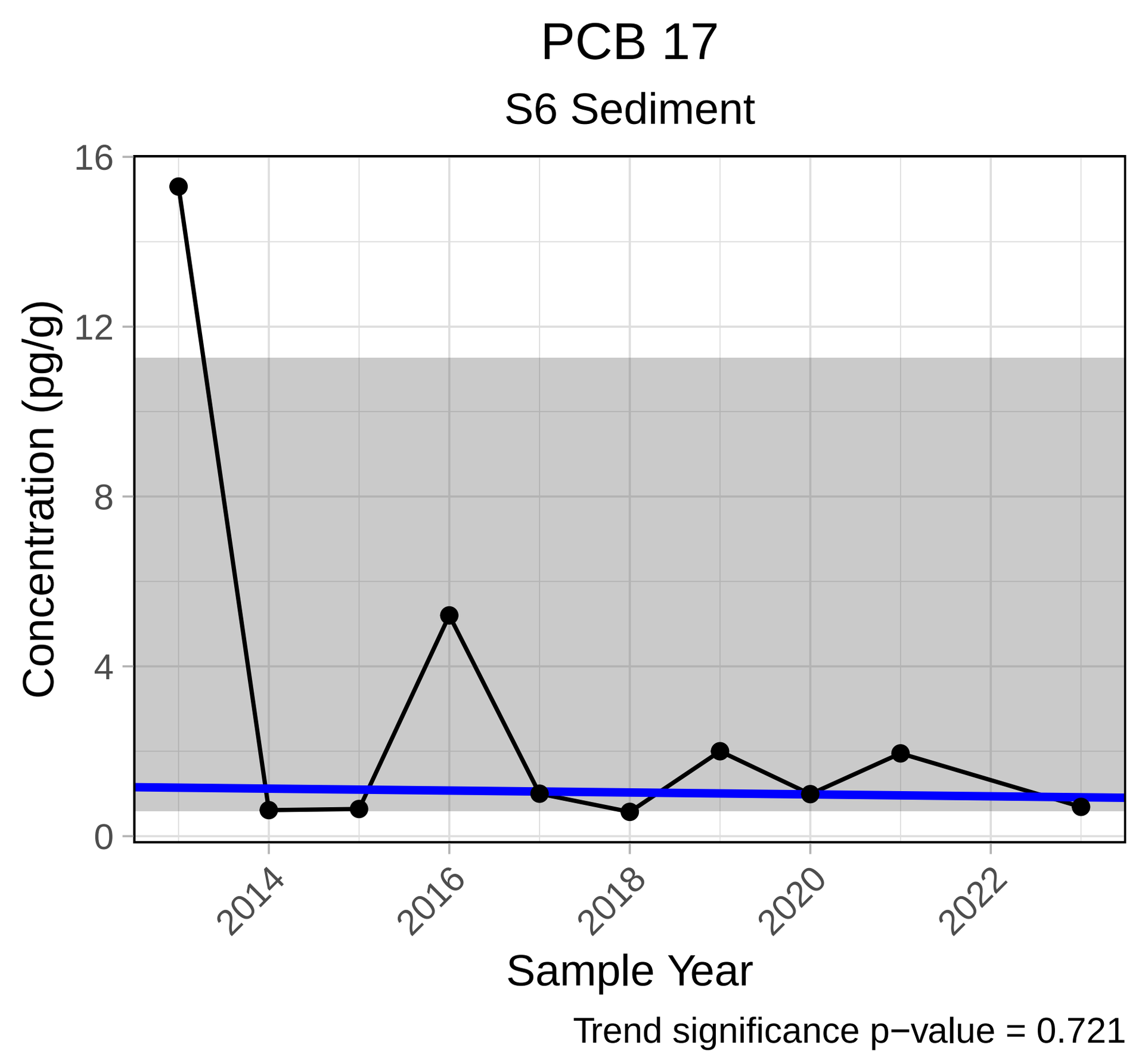


Trend significance p−value = 0.721


PCB 14
S6 Sediment
10.0
7.5
5.0
2.5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.458

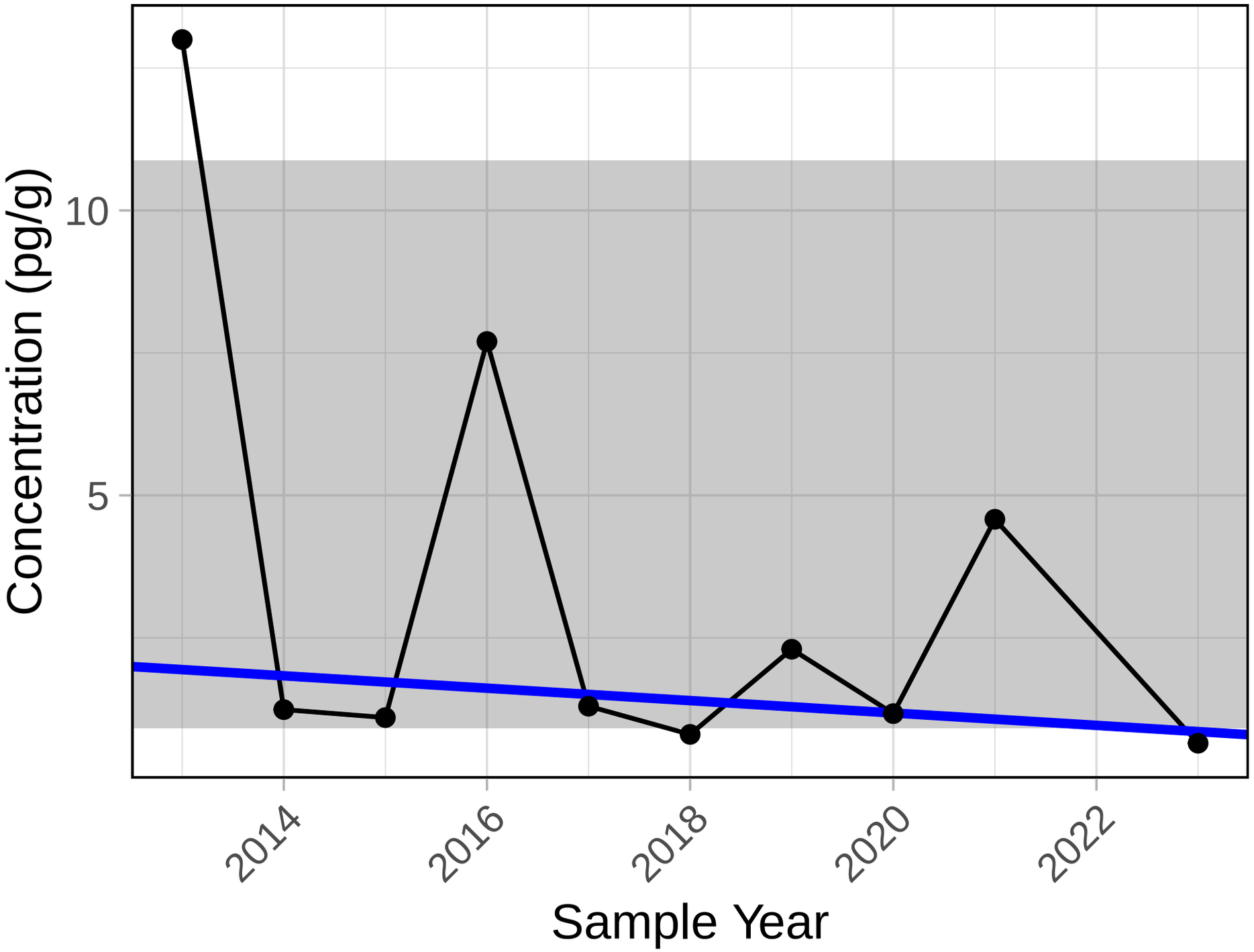

PCB 15
S6 Sediment
10.0
7.5
5.0
2.5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.059


PCB 16
S6 Sediment
15
10
5
0
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

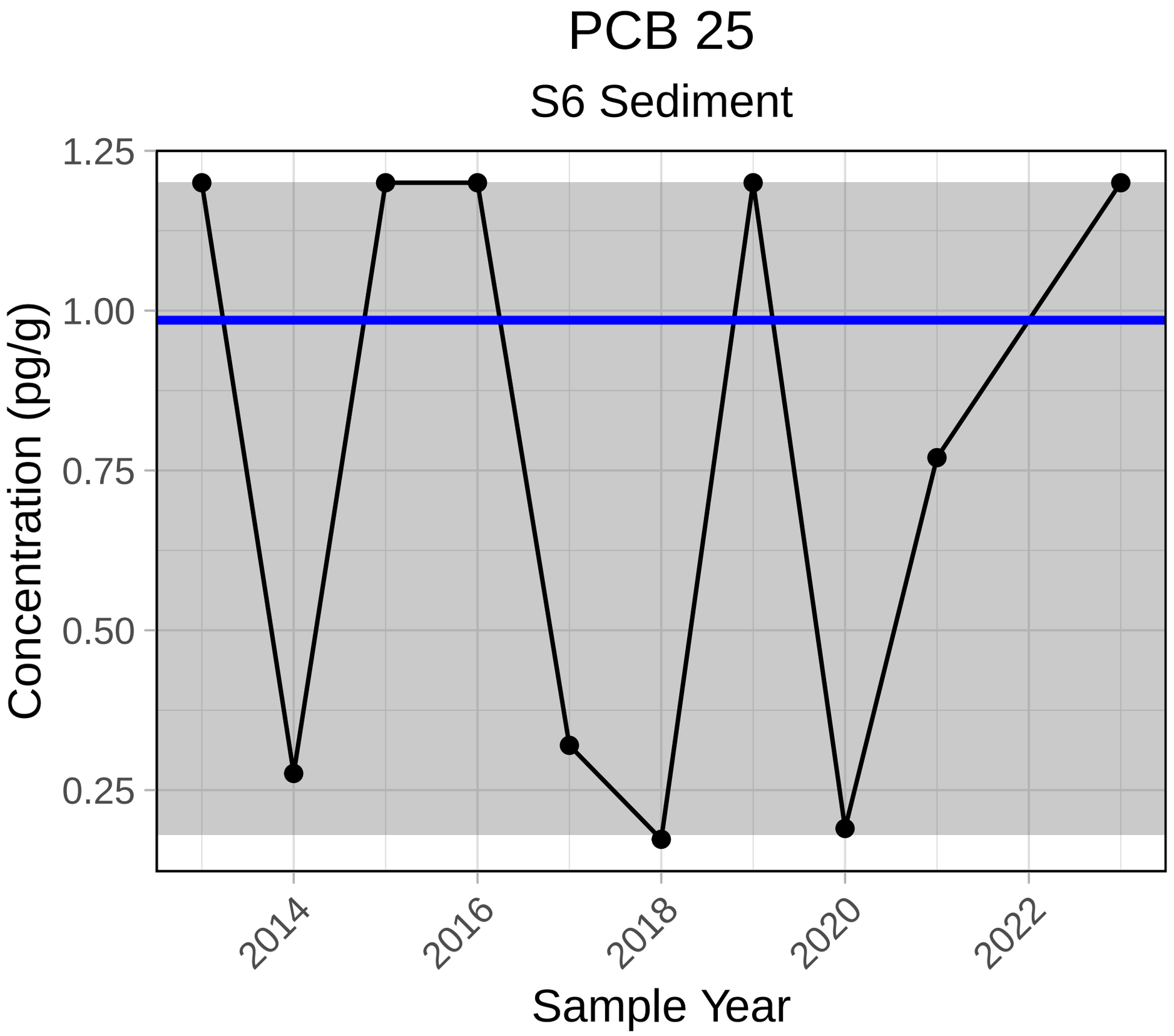

PCB 17
S6 Sediment
16
12
8
4
0
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

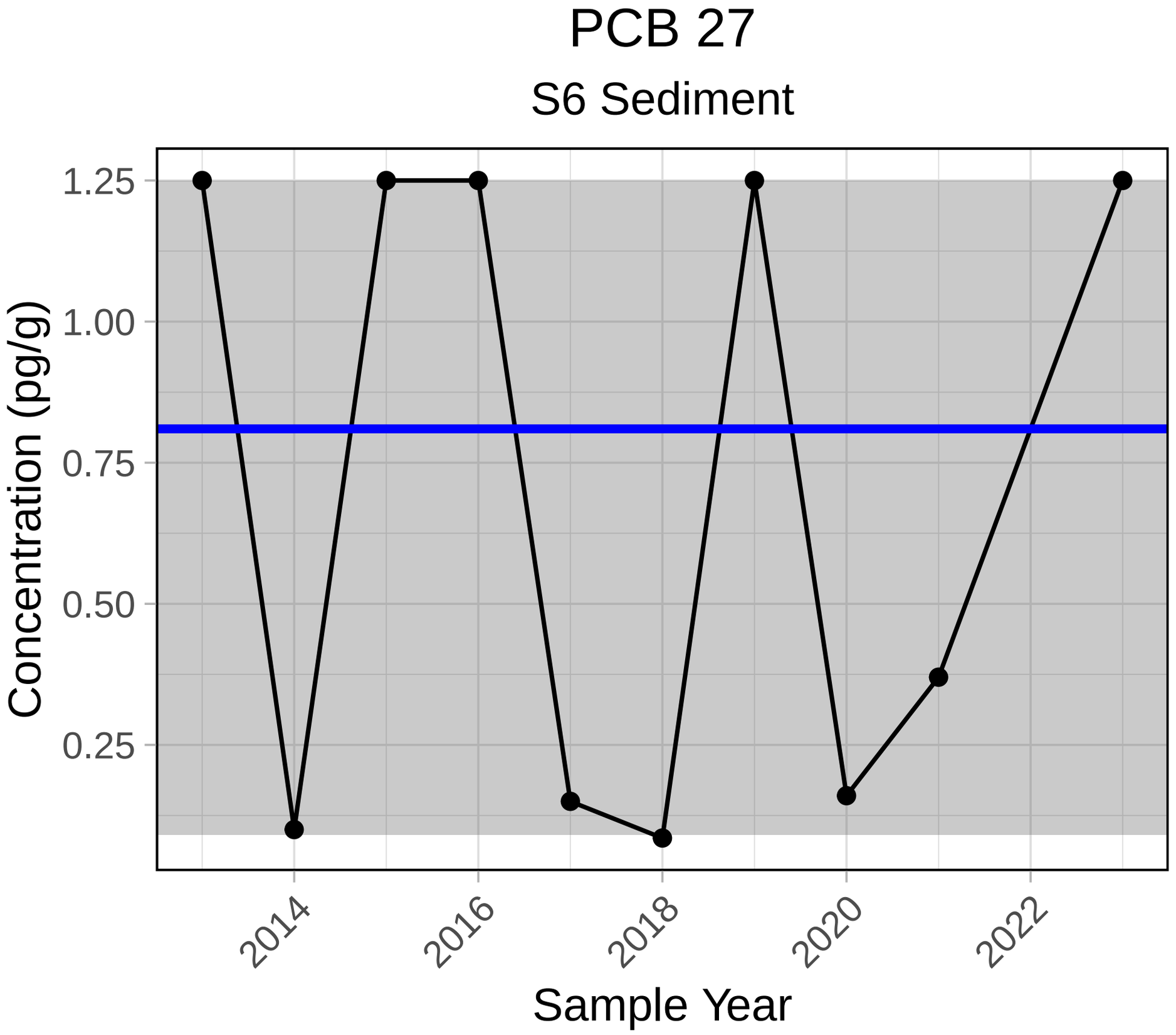
PCB 22

S6 Sediment



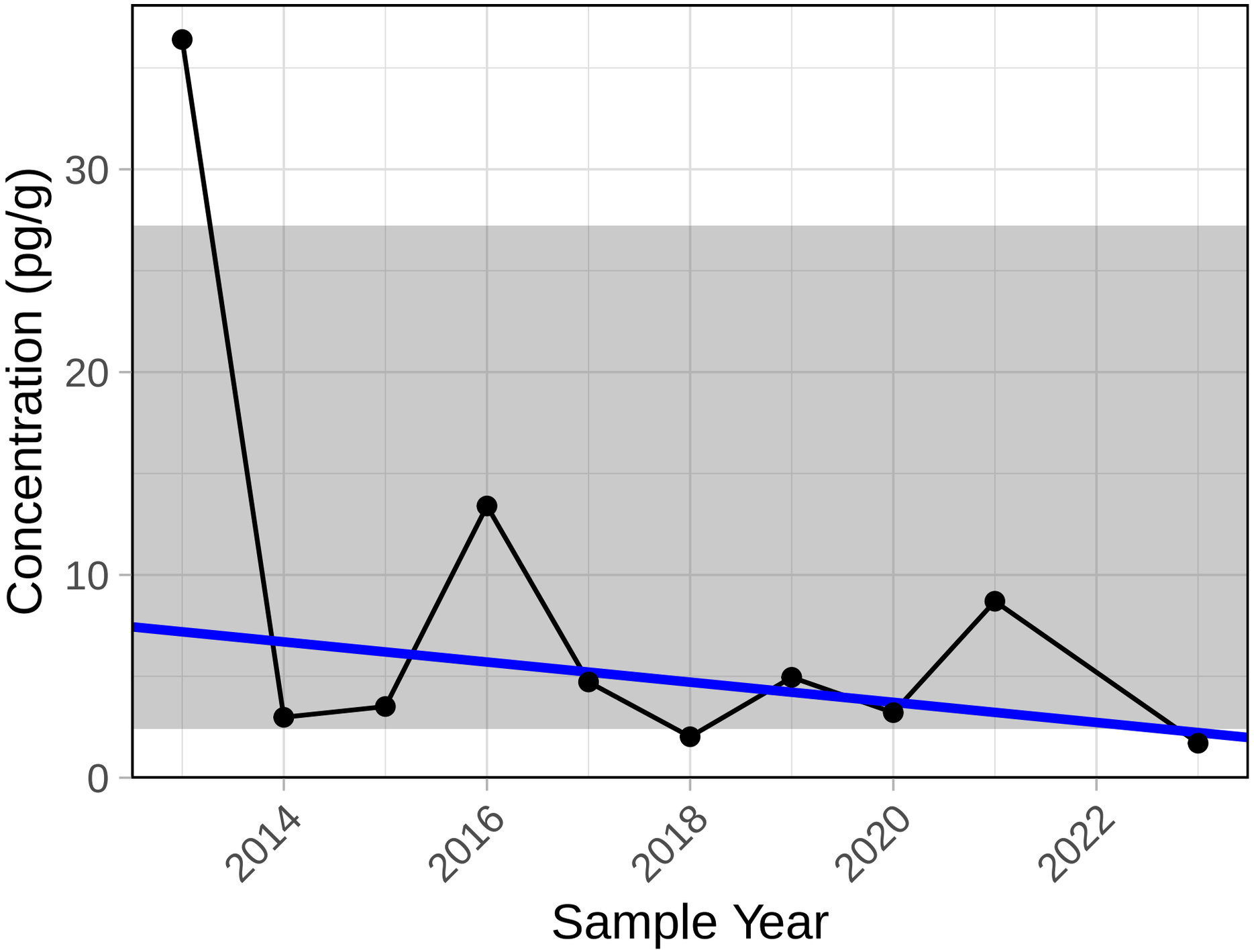
Trend significance p−value = 0.283


PCB 25
S6 Sediment
1.25
1.00
0.75
0.50
0.25
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.848

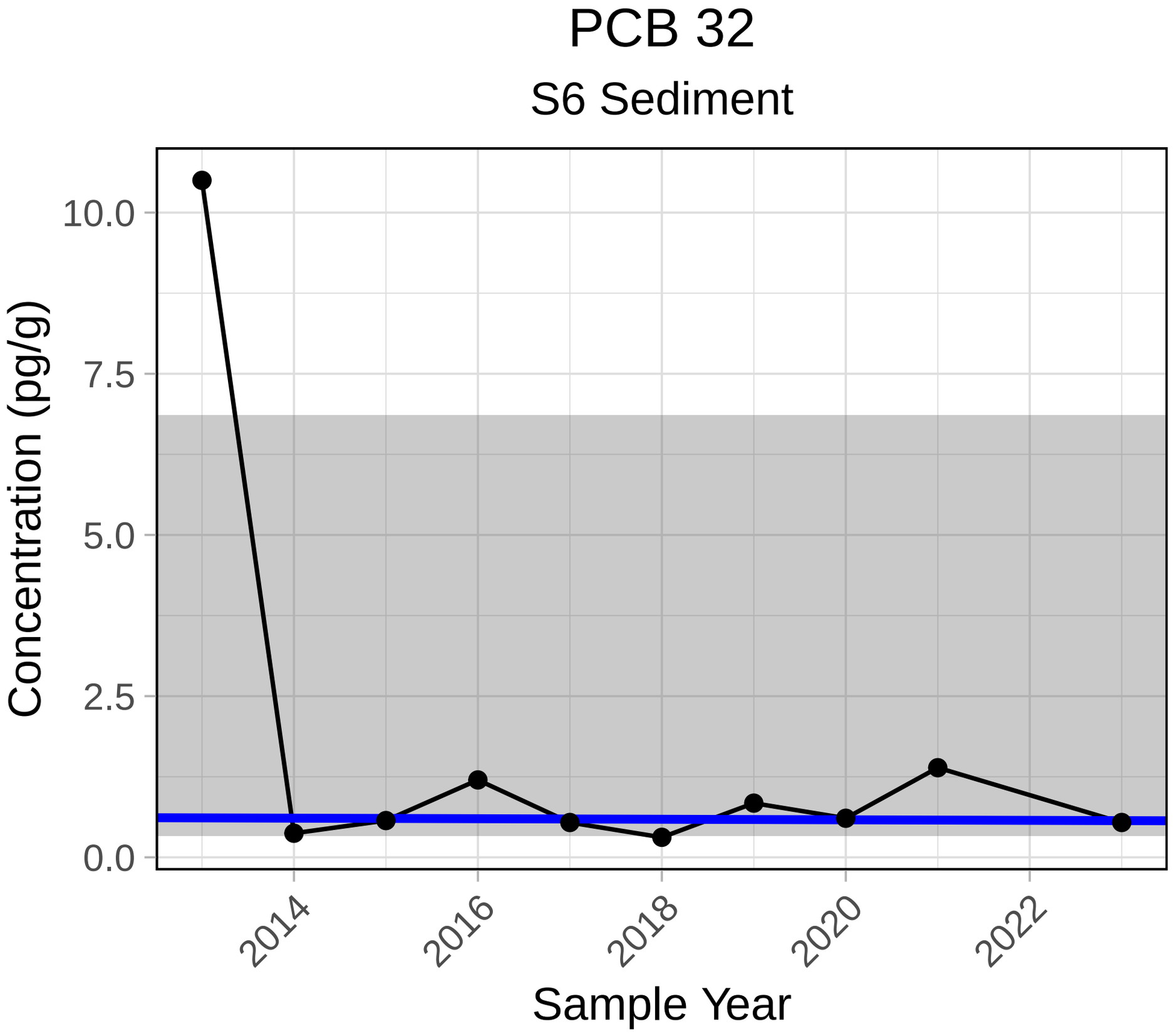

PCB 27
S6 Sediment
1.25
1.00
0.75
0.50
0.25
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

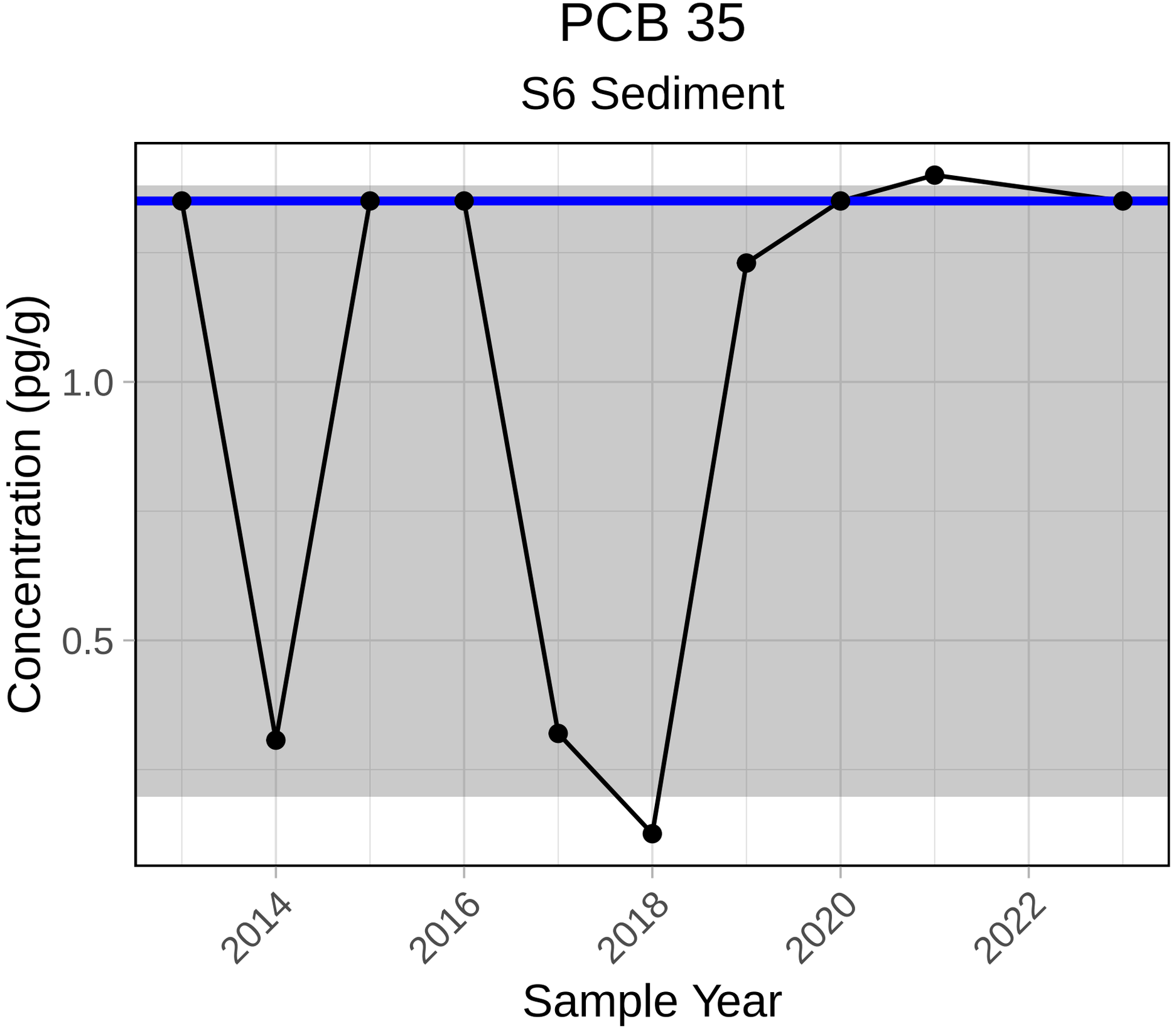
PCB 31

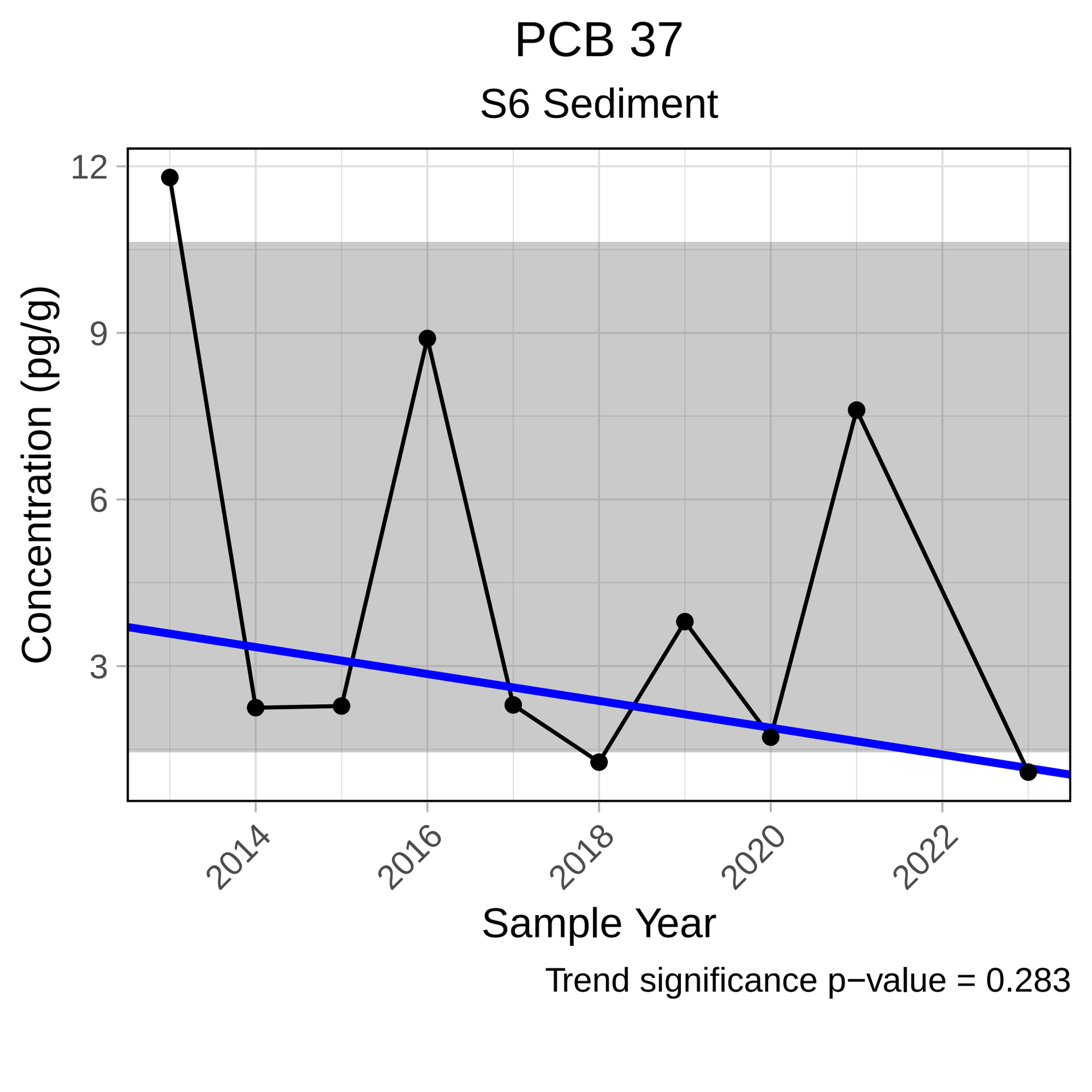
S6 Sediment



Trend significance p−value = 0.371

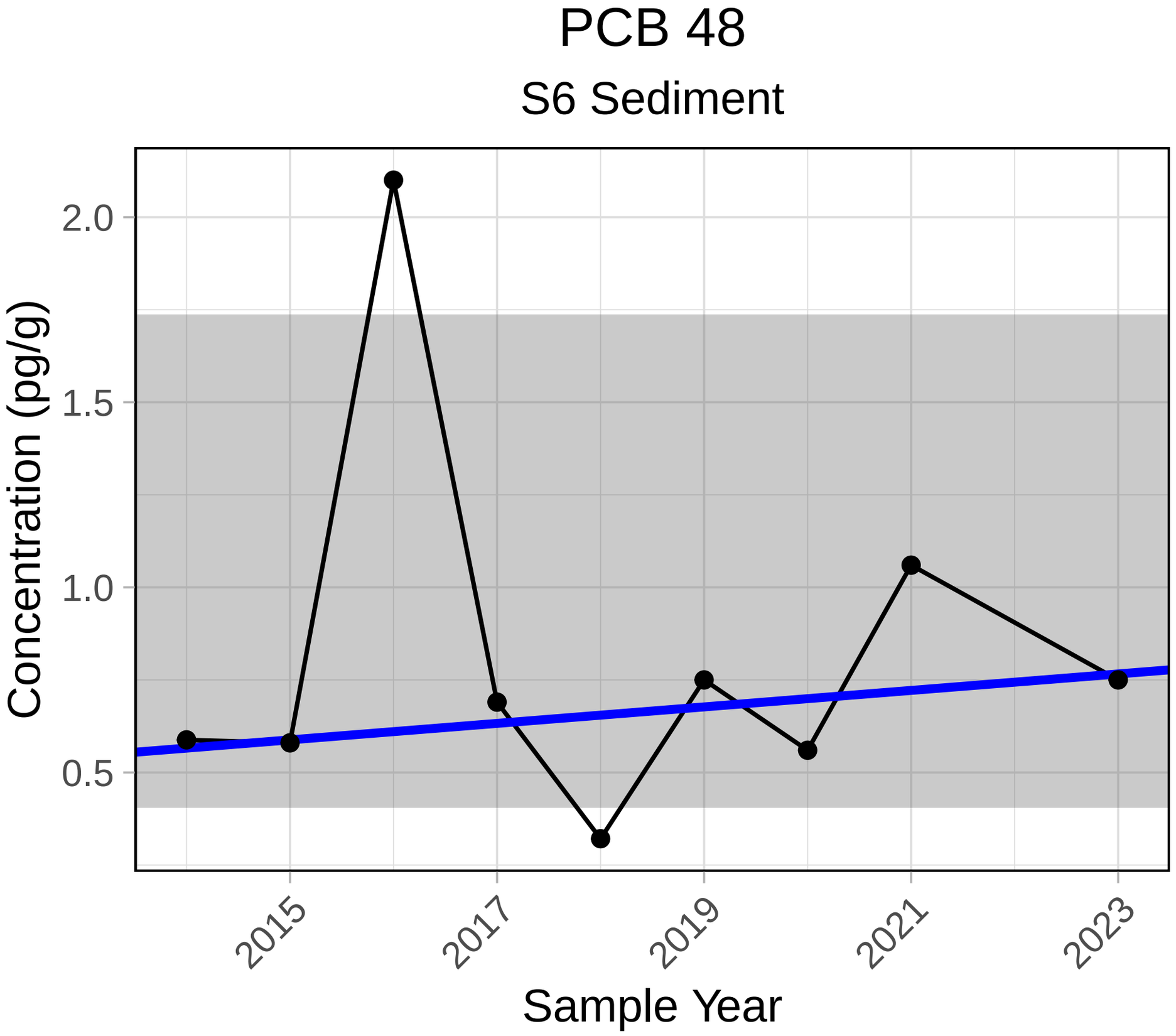

PCB 32
S6 Sediment
Concentration (pg/g)
10.0
7.5
5.0
2.5
0.0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

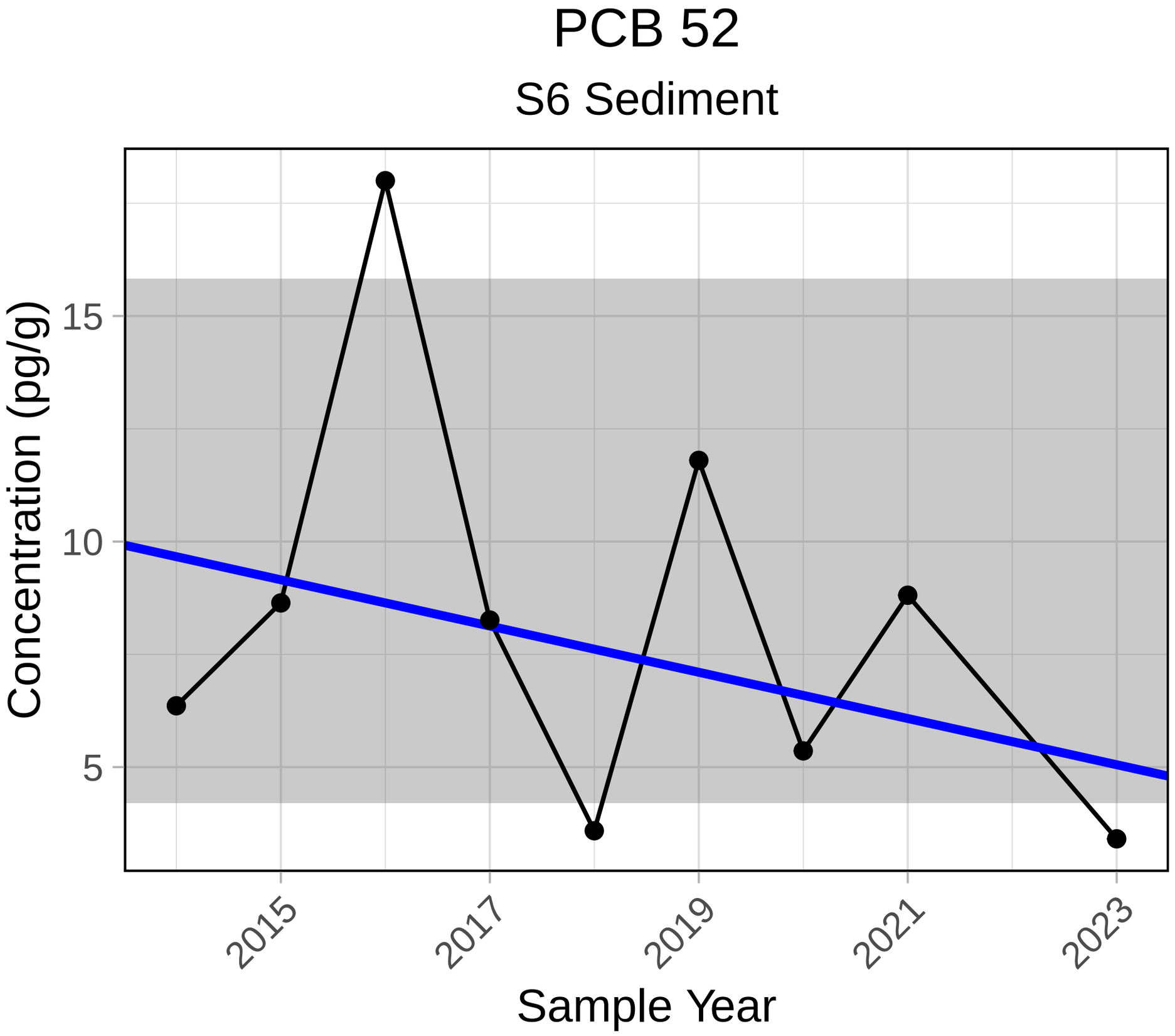

PCB 35
S6 Sediment
Concentration (pg/g)
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.442


PCB 37
S6 Sediment
12
9
6
3
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

PCB 38
S6 Sediment
Concentration (pg/g)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.243

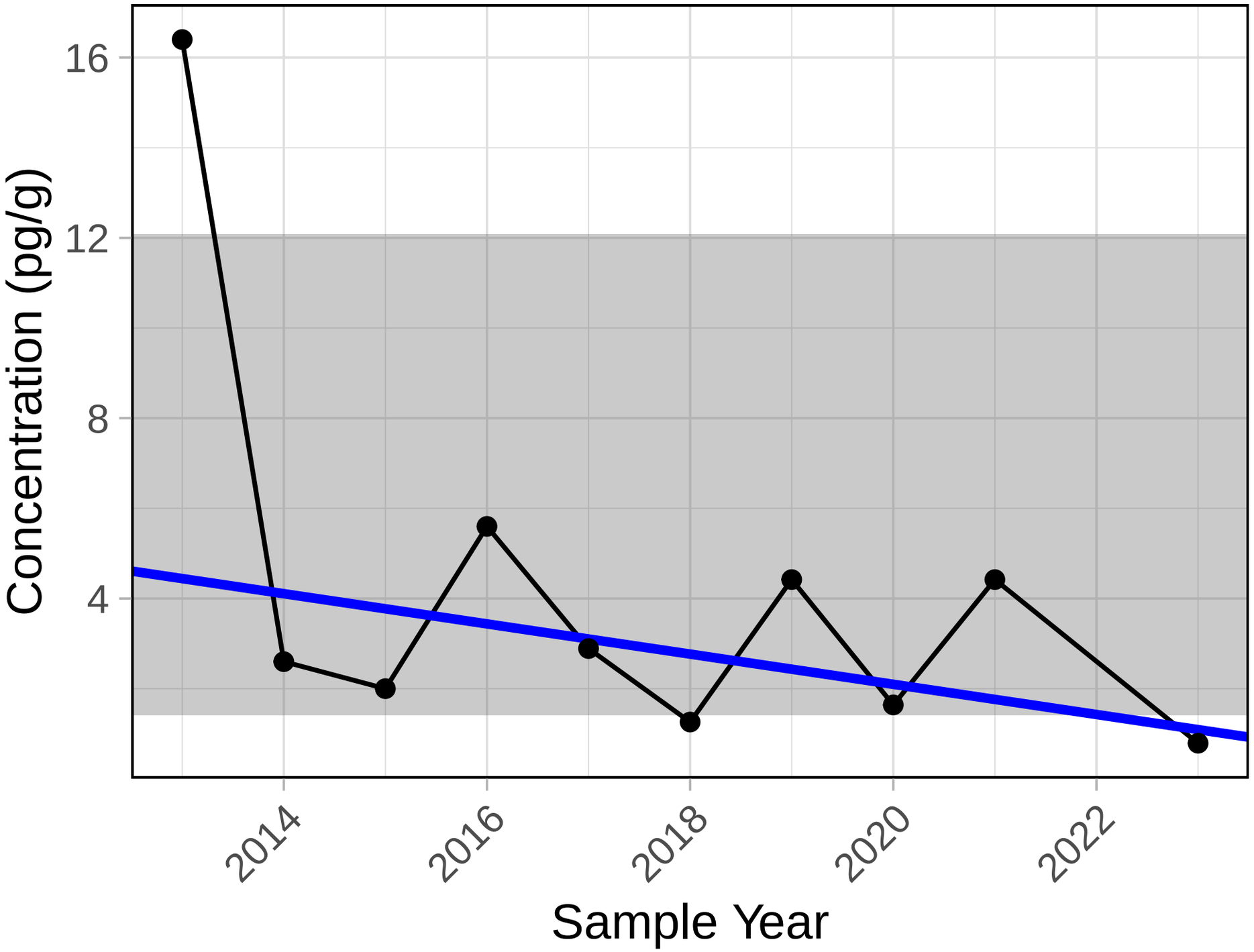
PCB 42
S6 Sediment
Concentration (pg/g)
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.917


PCB 48
S6 Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.675

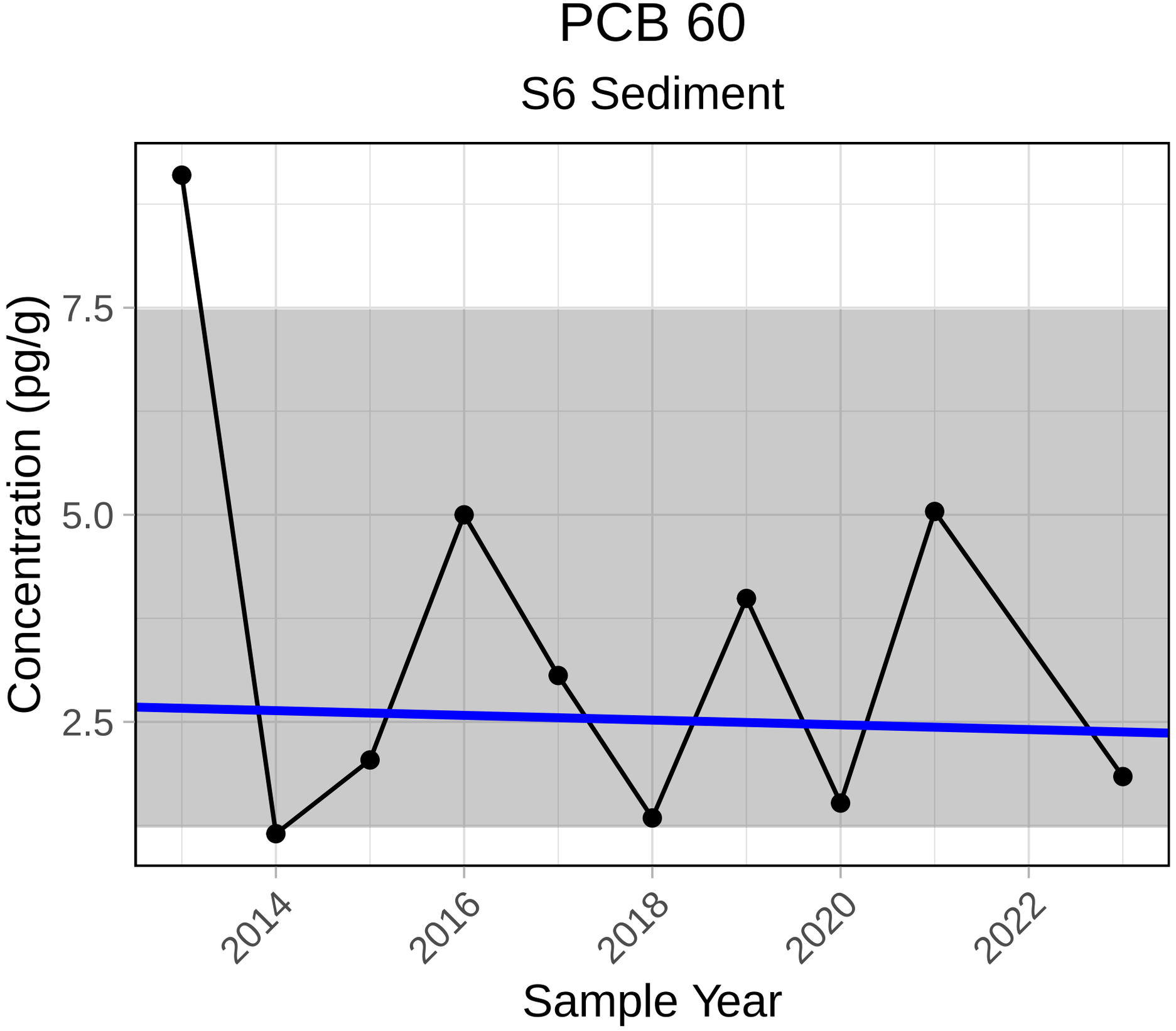

PCB 52
S6 Sediment
Concentration (pg/g)
15
10
5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.466

PCB 56

S6 Sediment

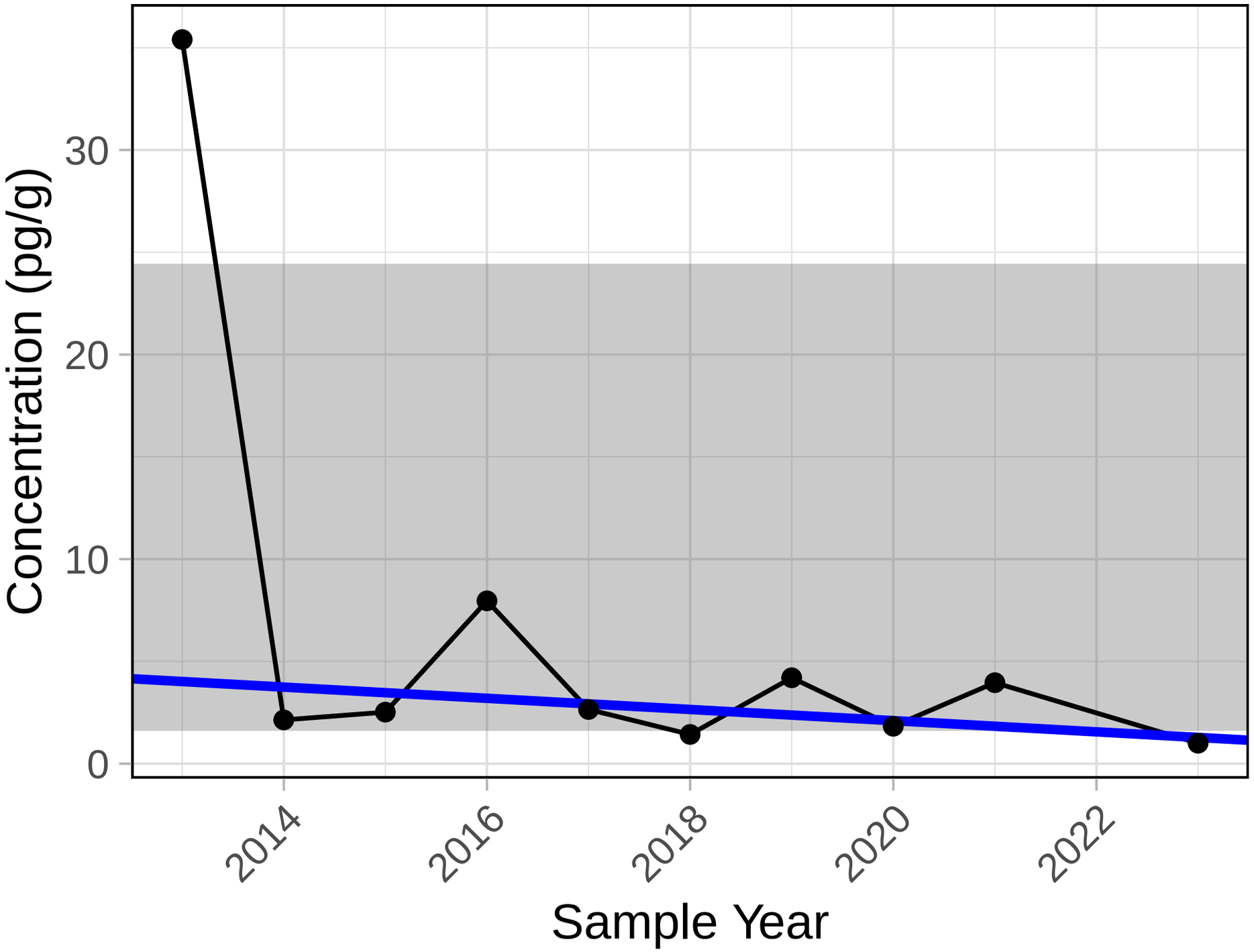


Trend significance p−value = 0.178


PCB 60
S6 Sediment
Concentration (pg/g)
7.5
5.0
2.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

PCB 64

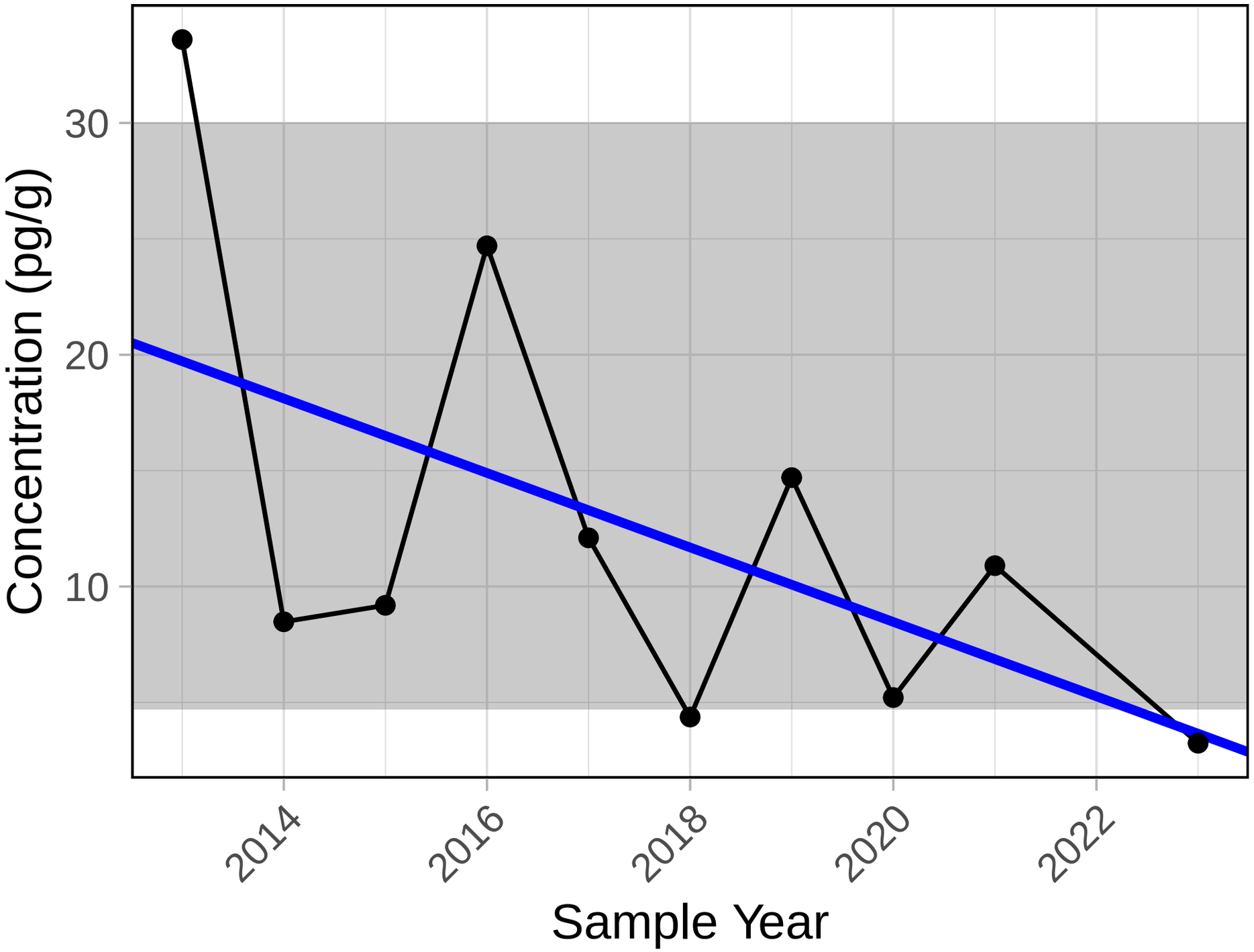
S6 Sediment



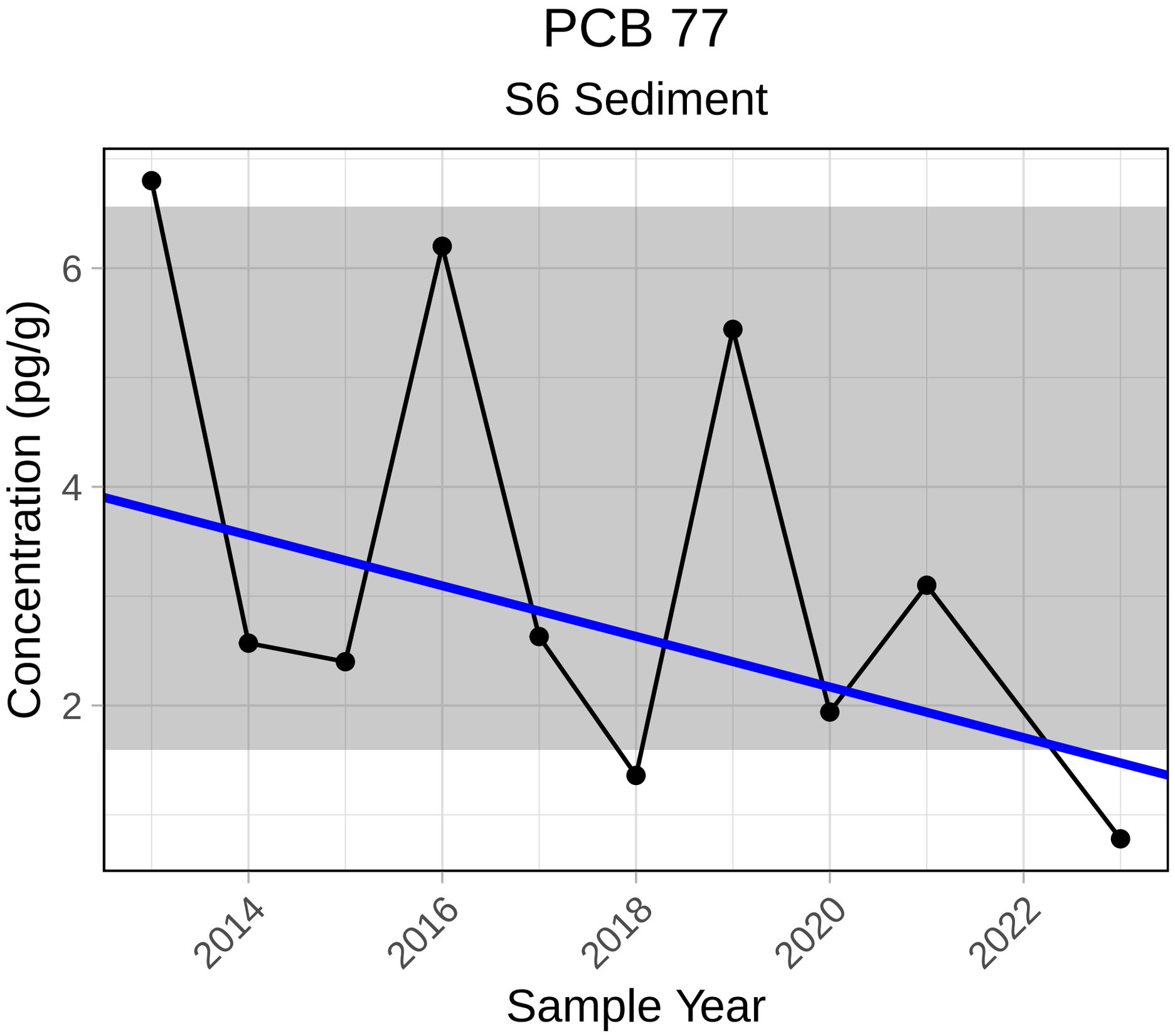
Trend significance p−value = 0.21

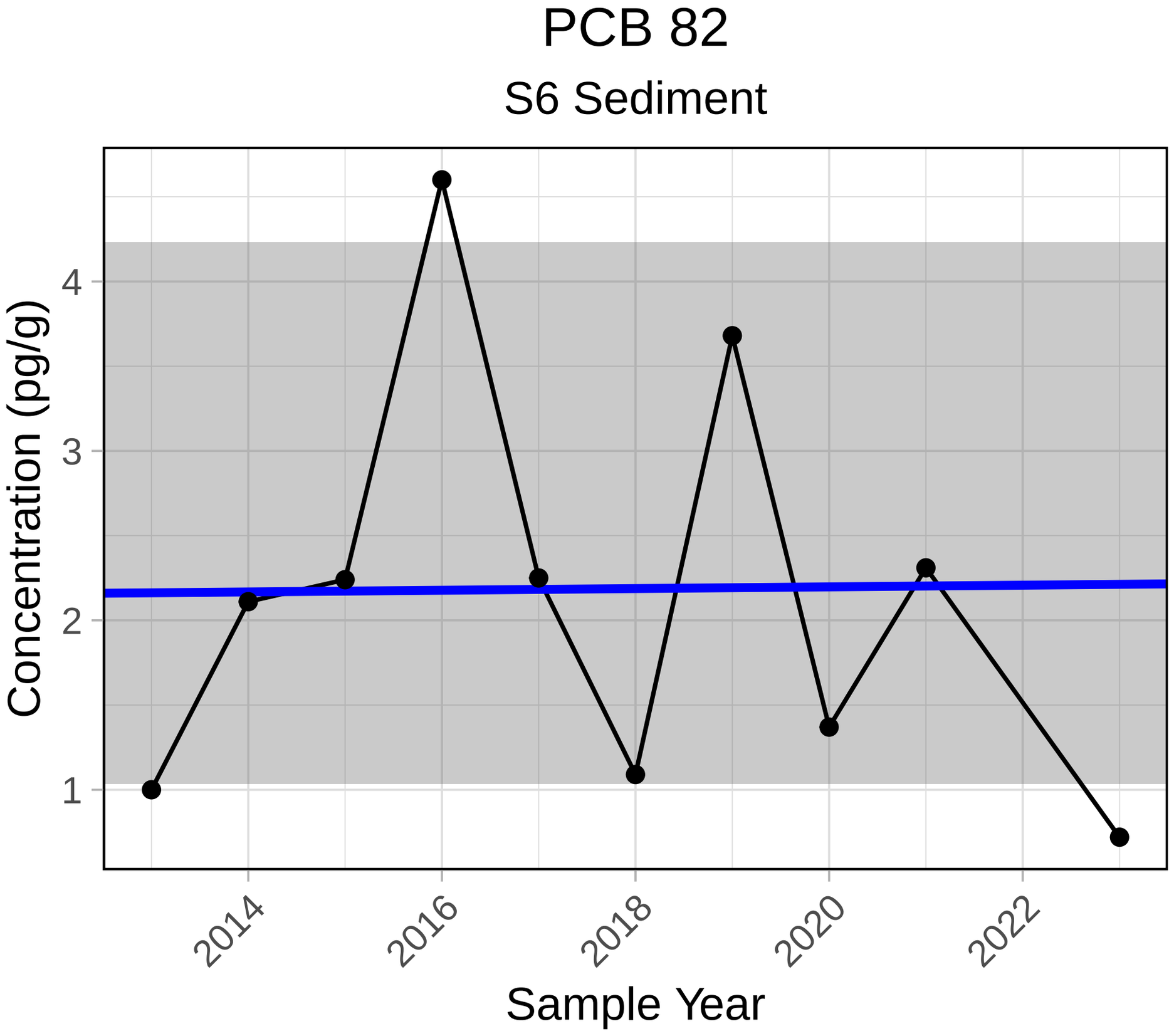
PCB 66

S6 Sediment

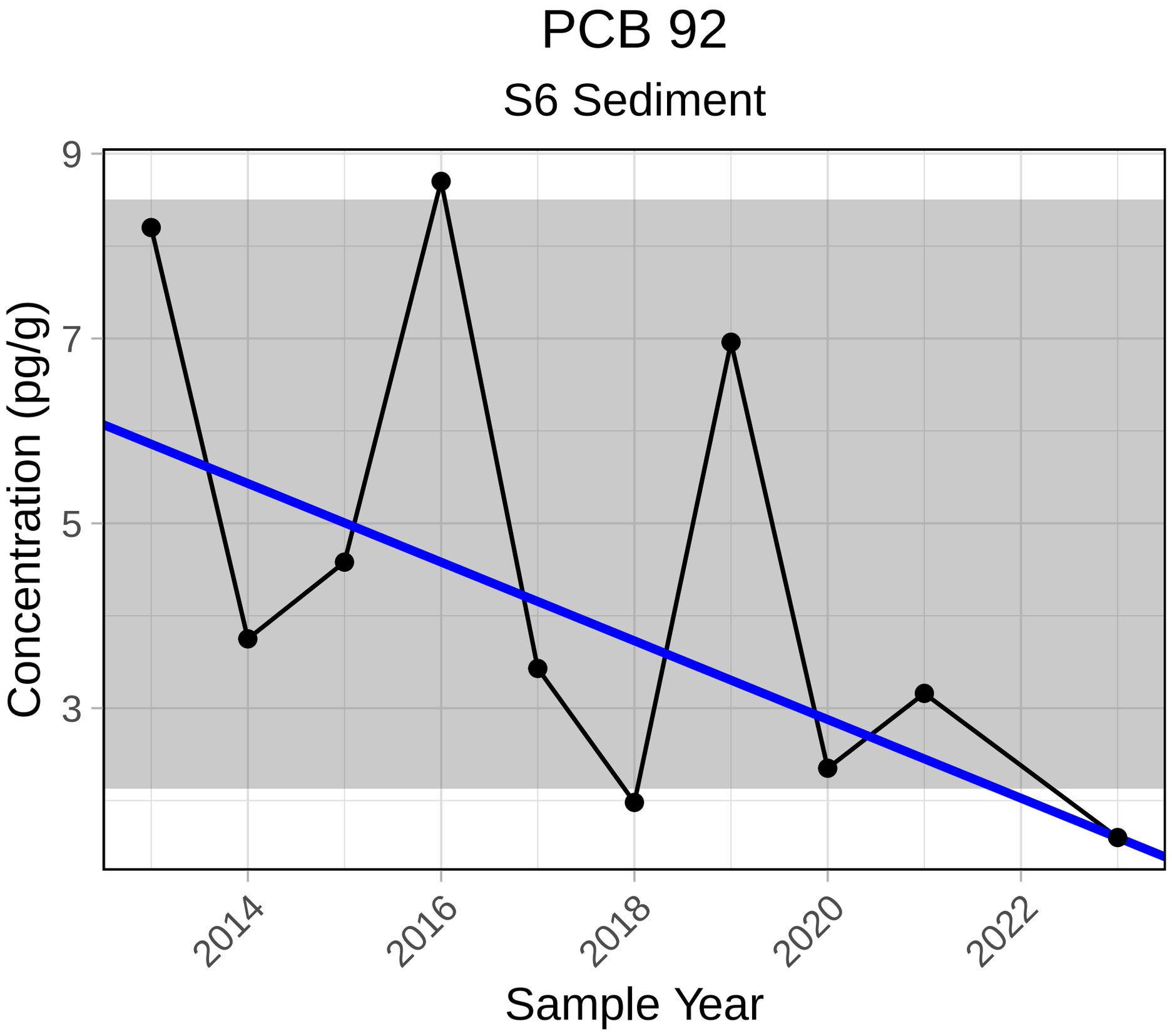


Trend significance p−value = 0.152


PCB 77
S6 Sediment
Concentration (pg/g)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

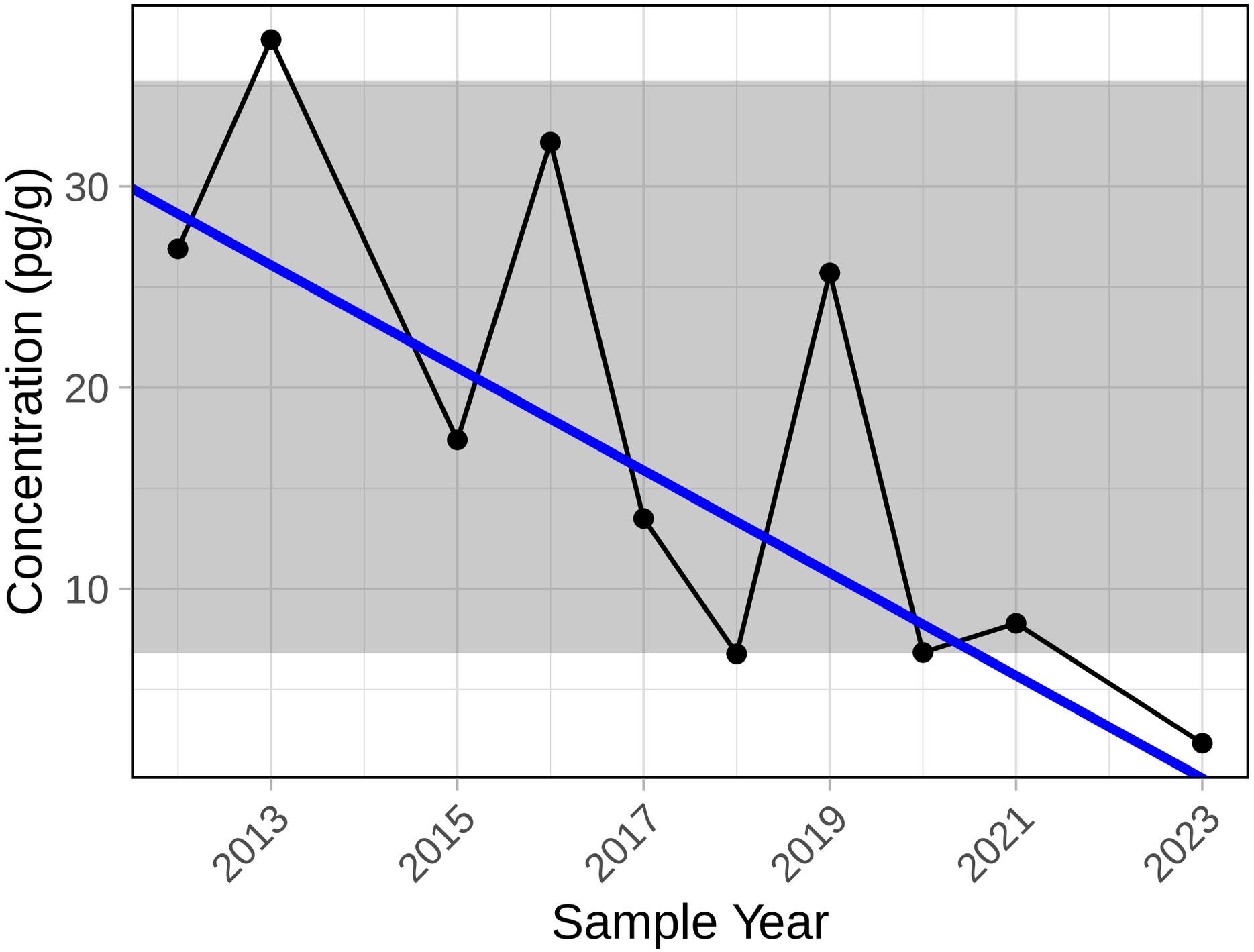

PCB 82
S6 Sediment
Concentration (pg/g)
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

PCB 84
S6 Sediment
Concentration (pg/g)
7.5
5.0
2.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.118

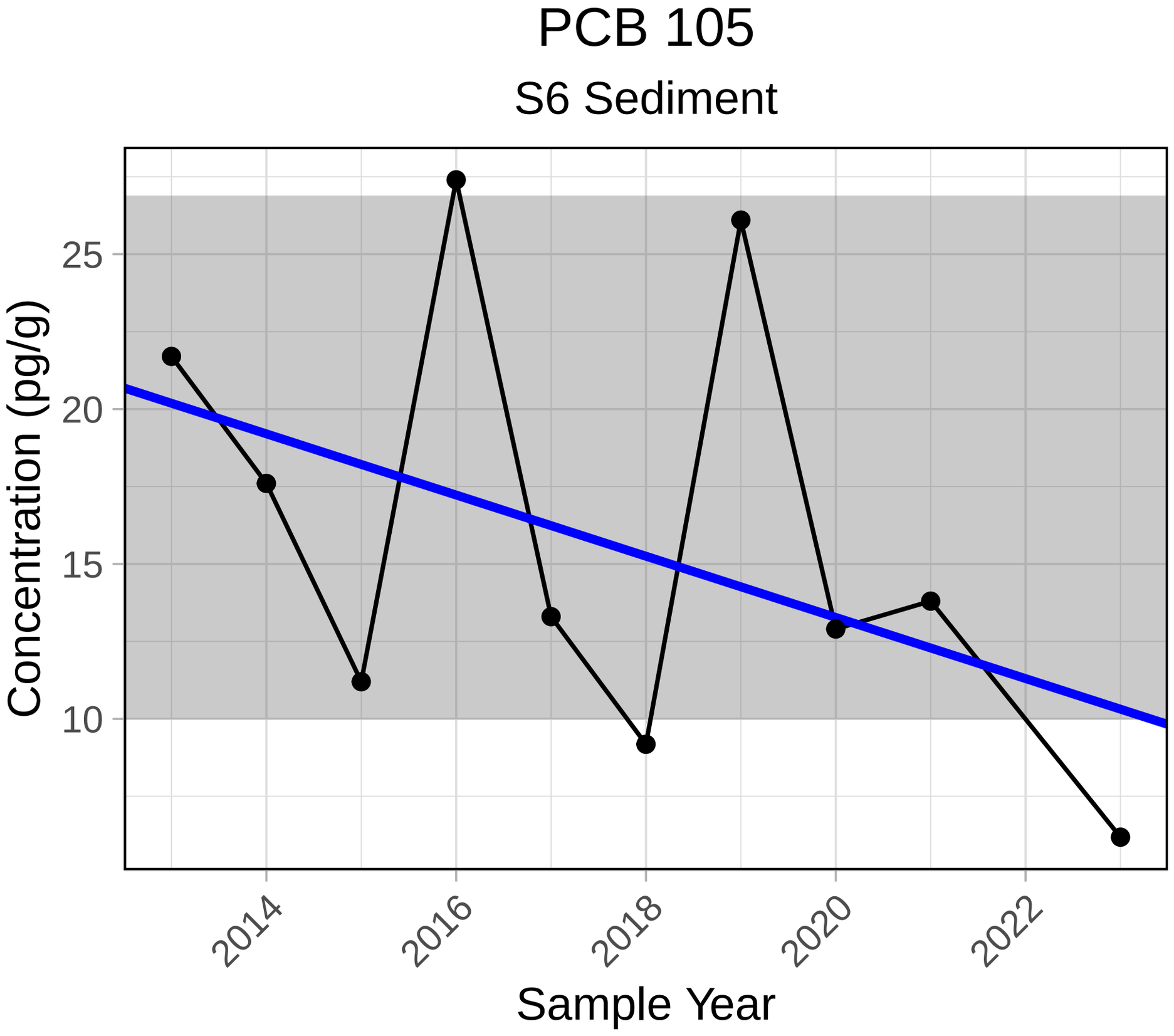

PCB 92
S6 Sediment
9
7
5
3
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.049

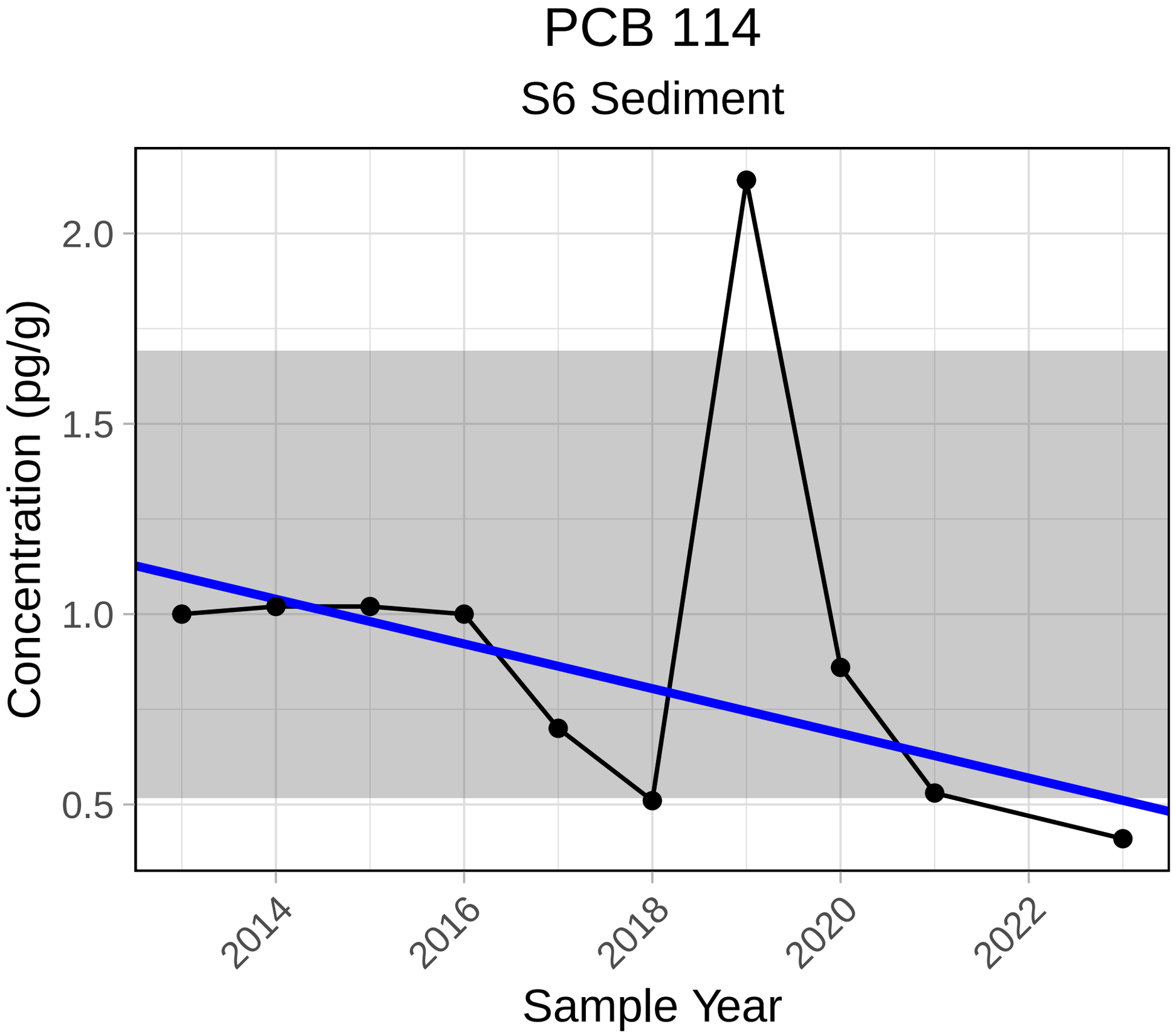
PCB 95

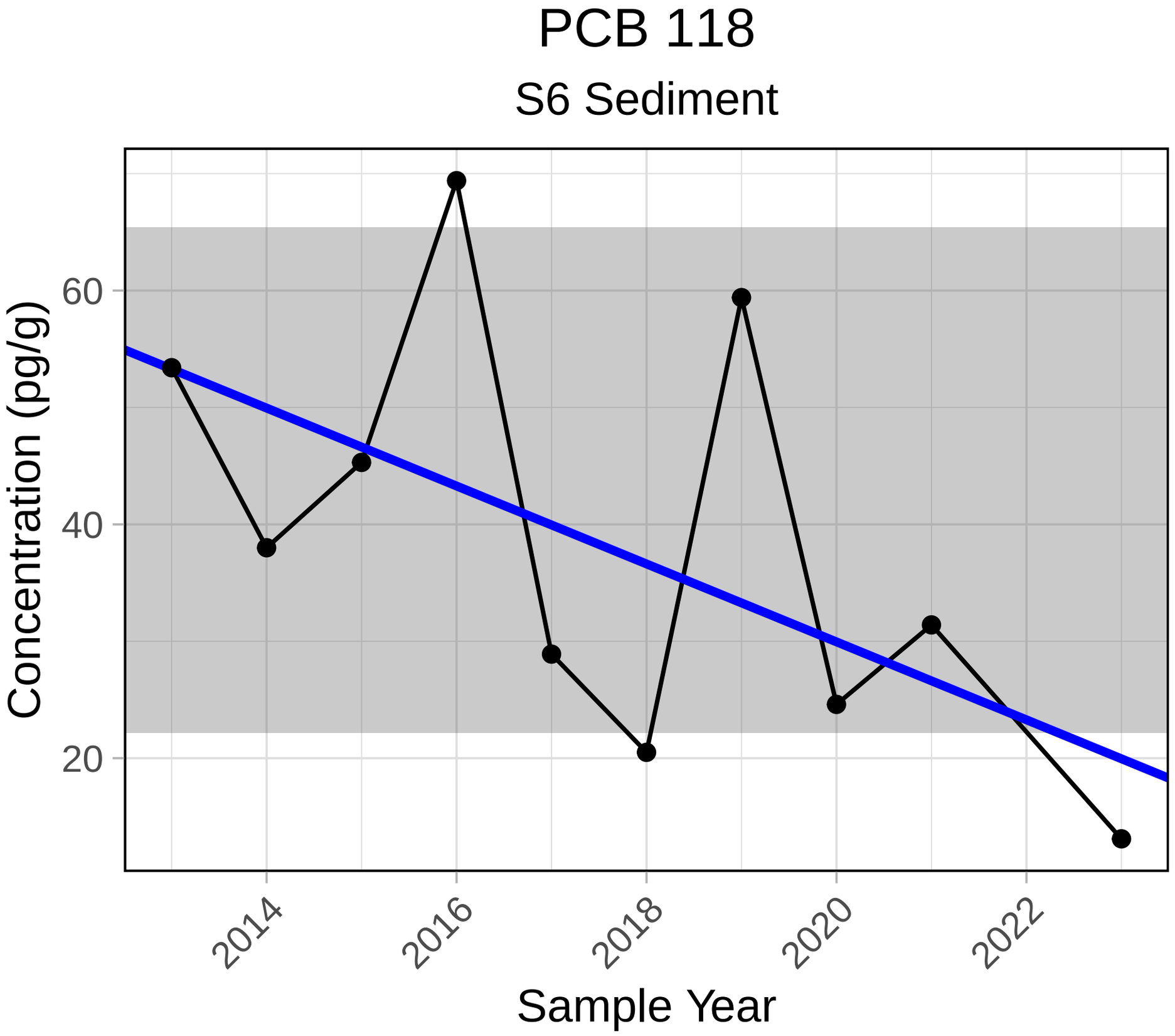
S6 Sediment

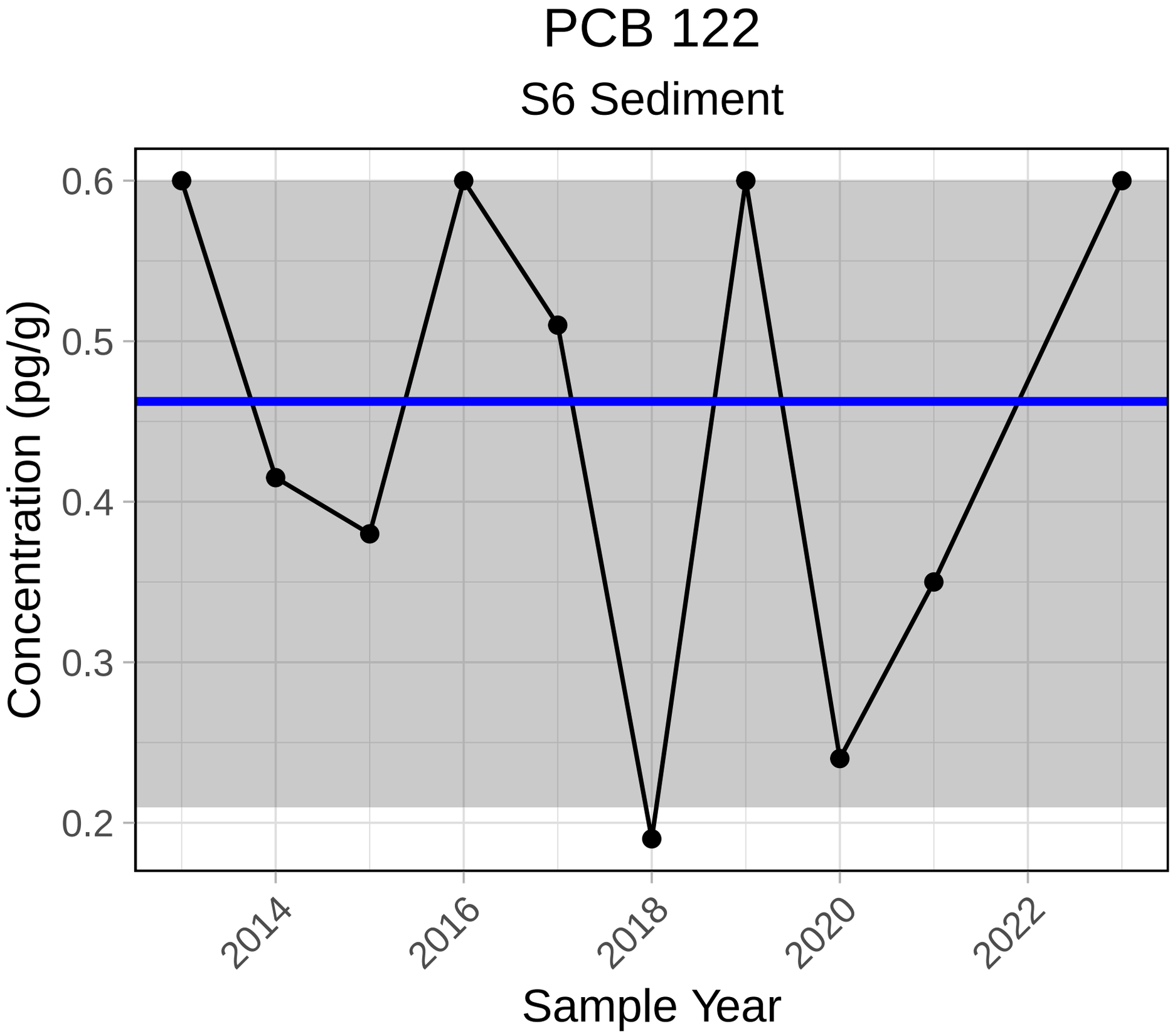


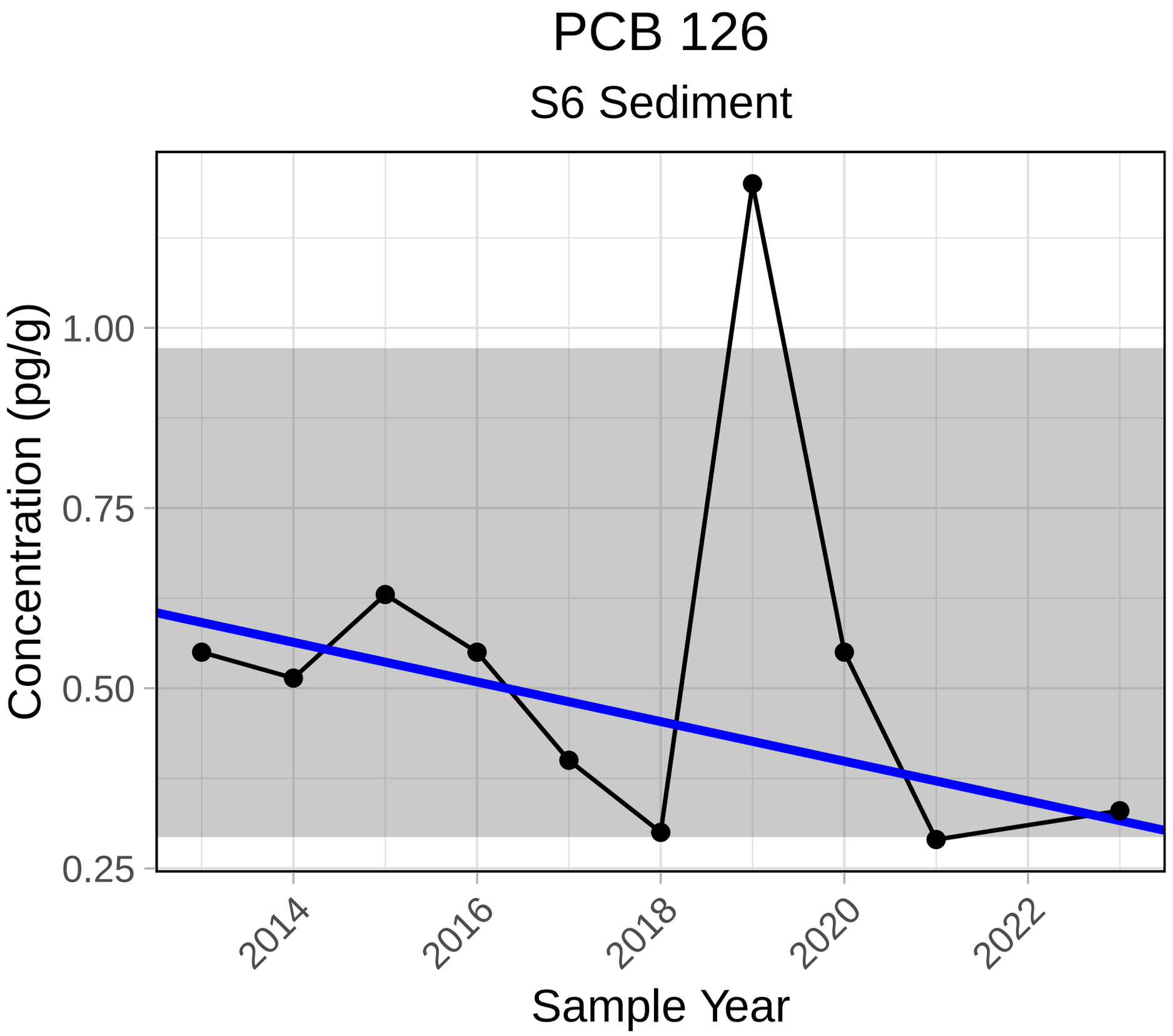
Trend significance p−value = 0.02

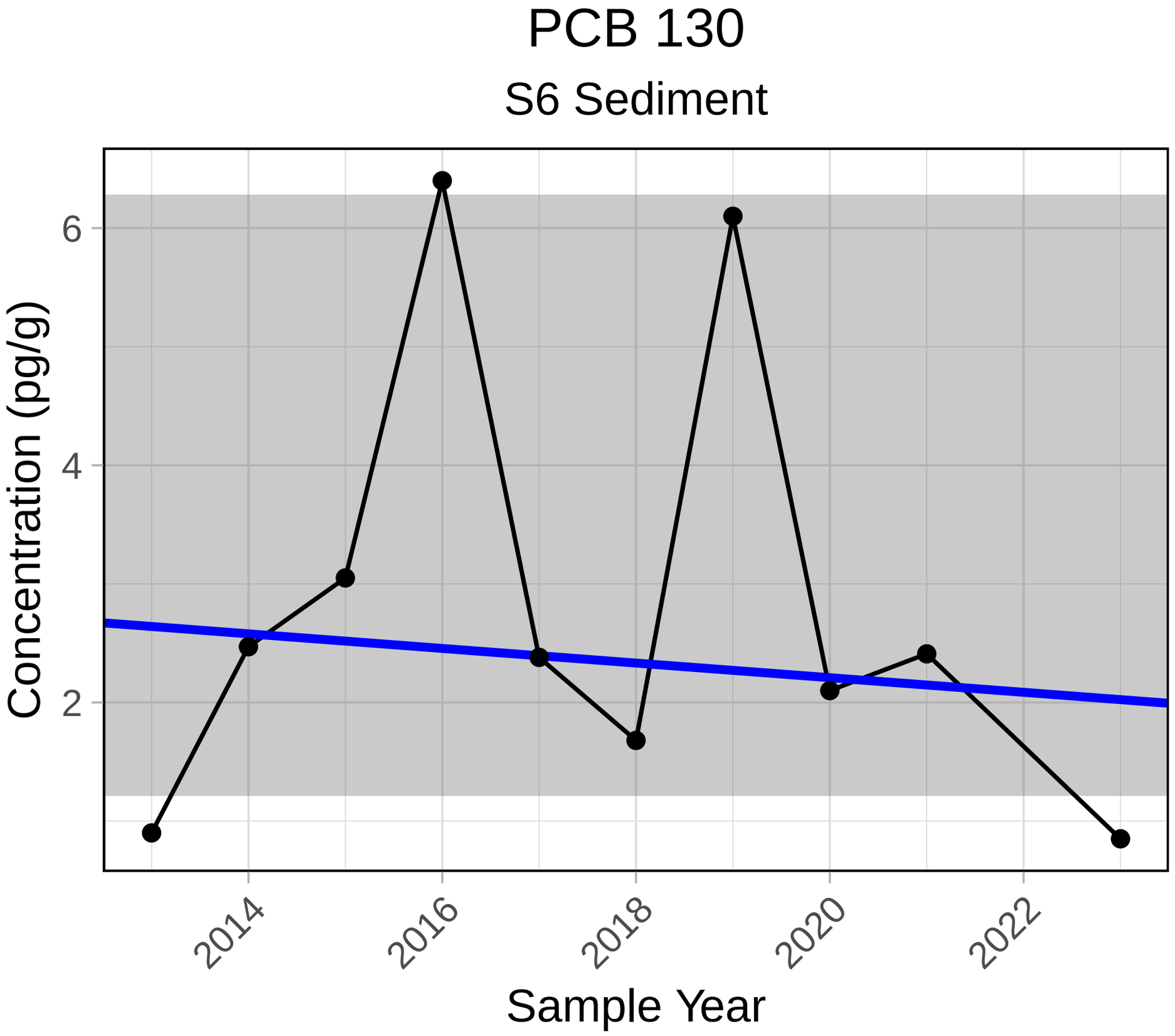

PCB 105
S6 Sediment
Concentration (pg/g)
25
20
15
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21

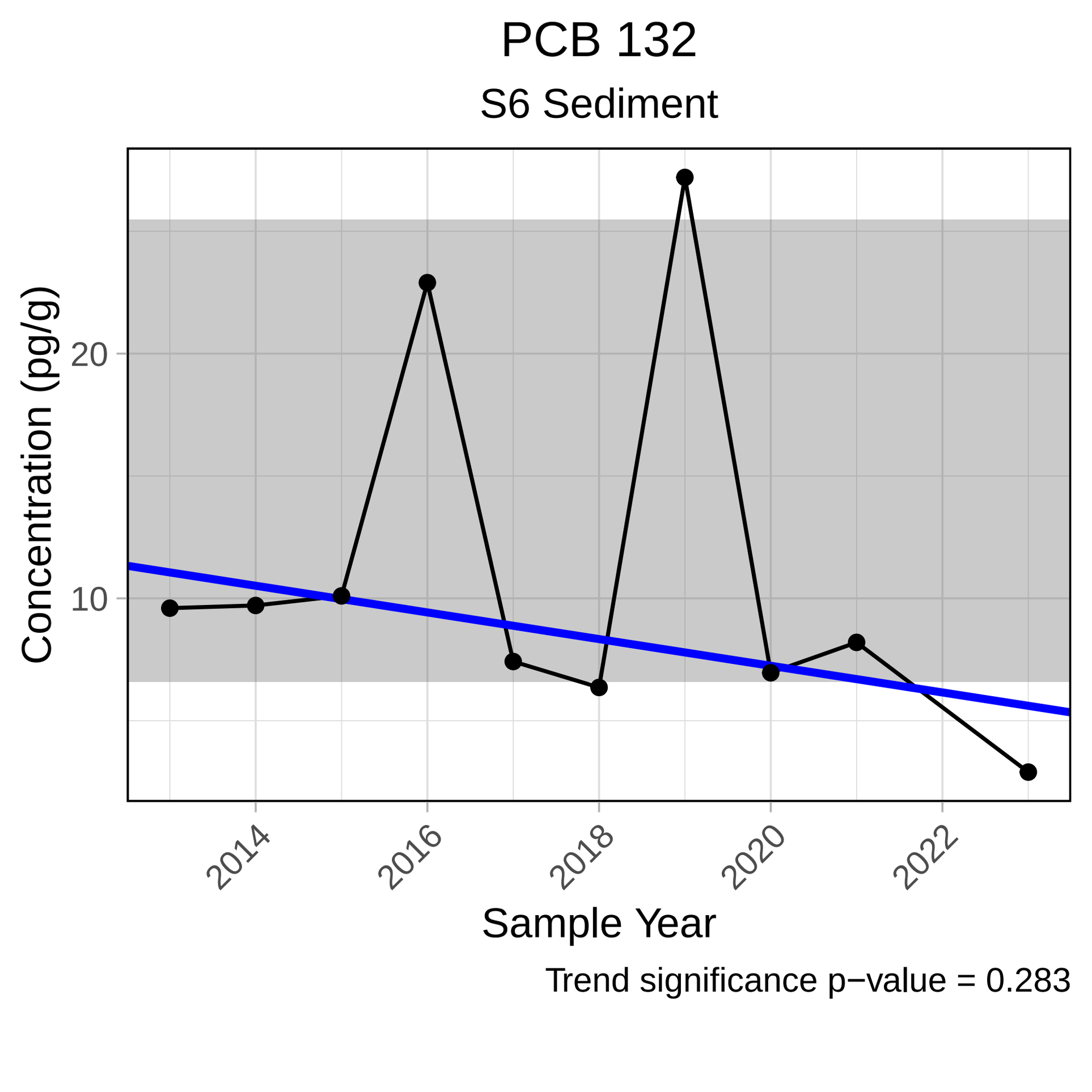

PCB 114
S6 Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.071

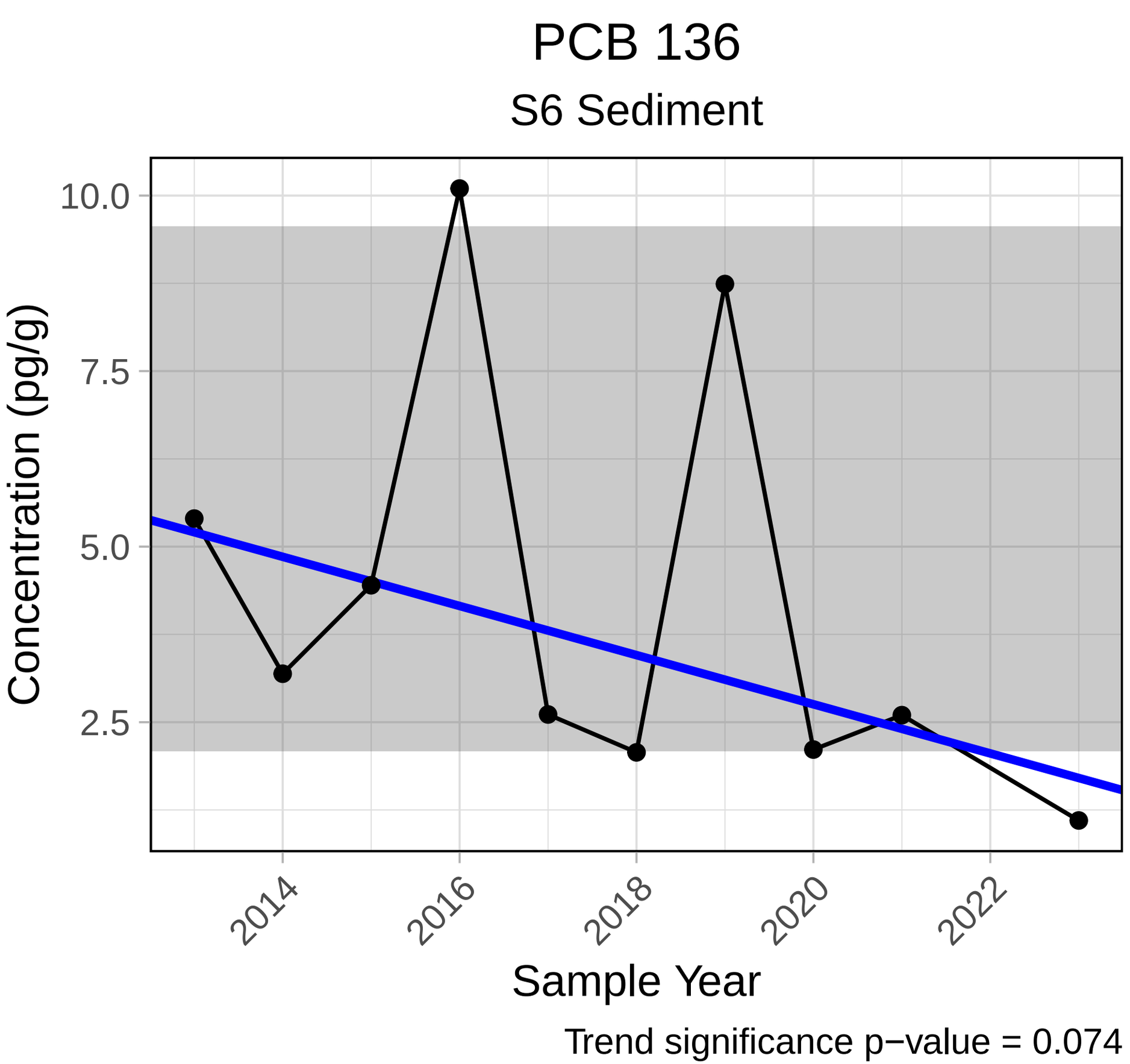

PCB 118
S6 Sediment
Concentration (pg/g)
60
40
20
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107

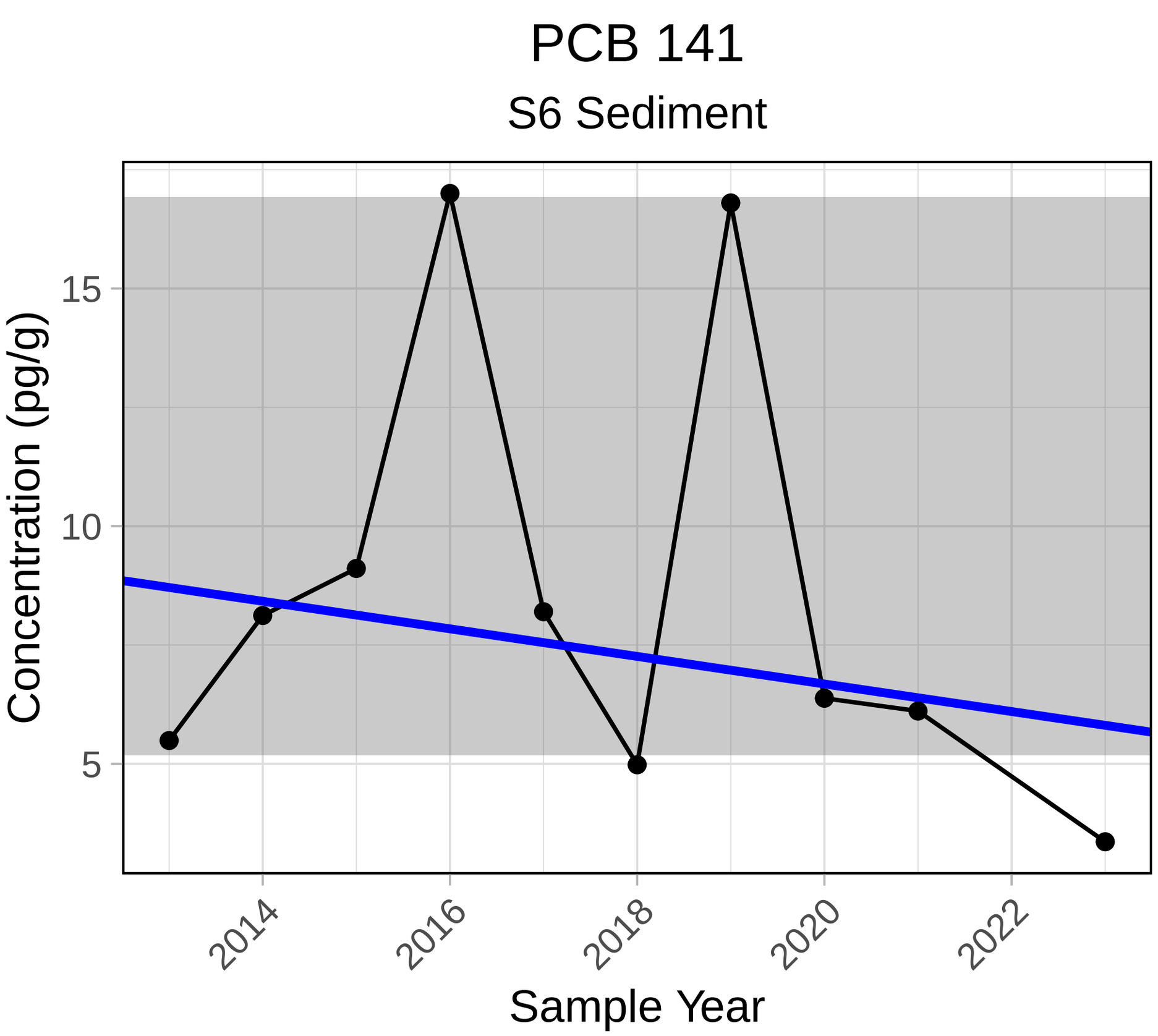

PCB 122
S6 Sediment
Concentration (pg/g)
0.6
0.5
0.4
0.3
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.711

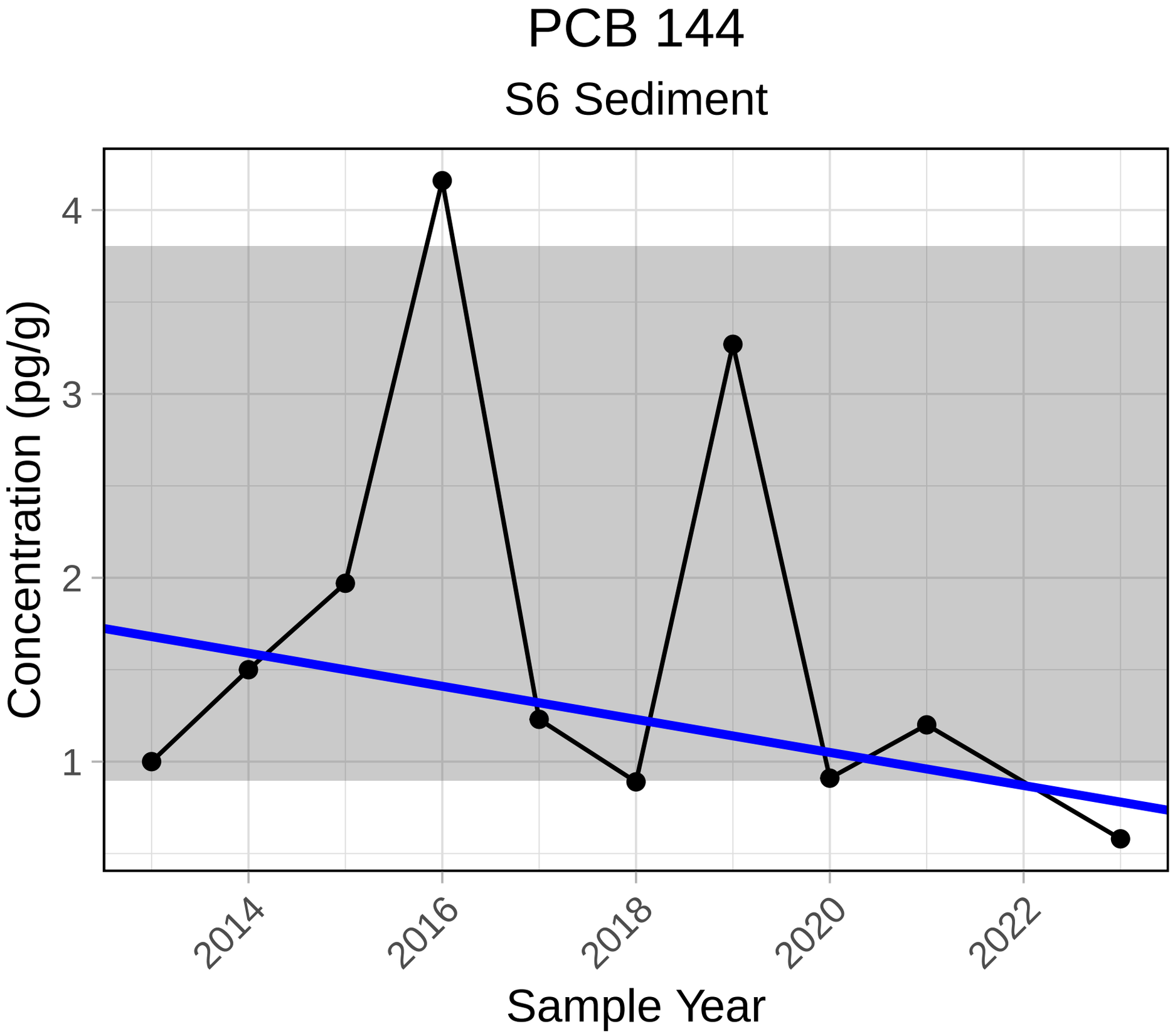

PCB 126
S6 Sediment
Concentration (pg/g)
1.00
0.75
0.50
0.25
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.238

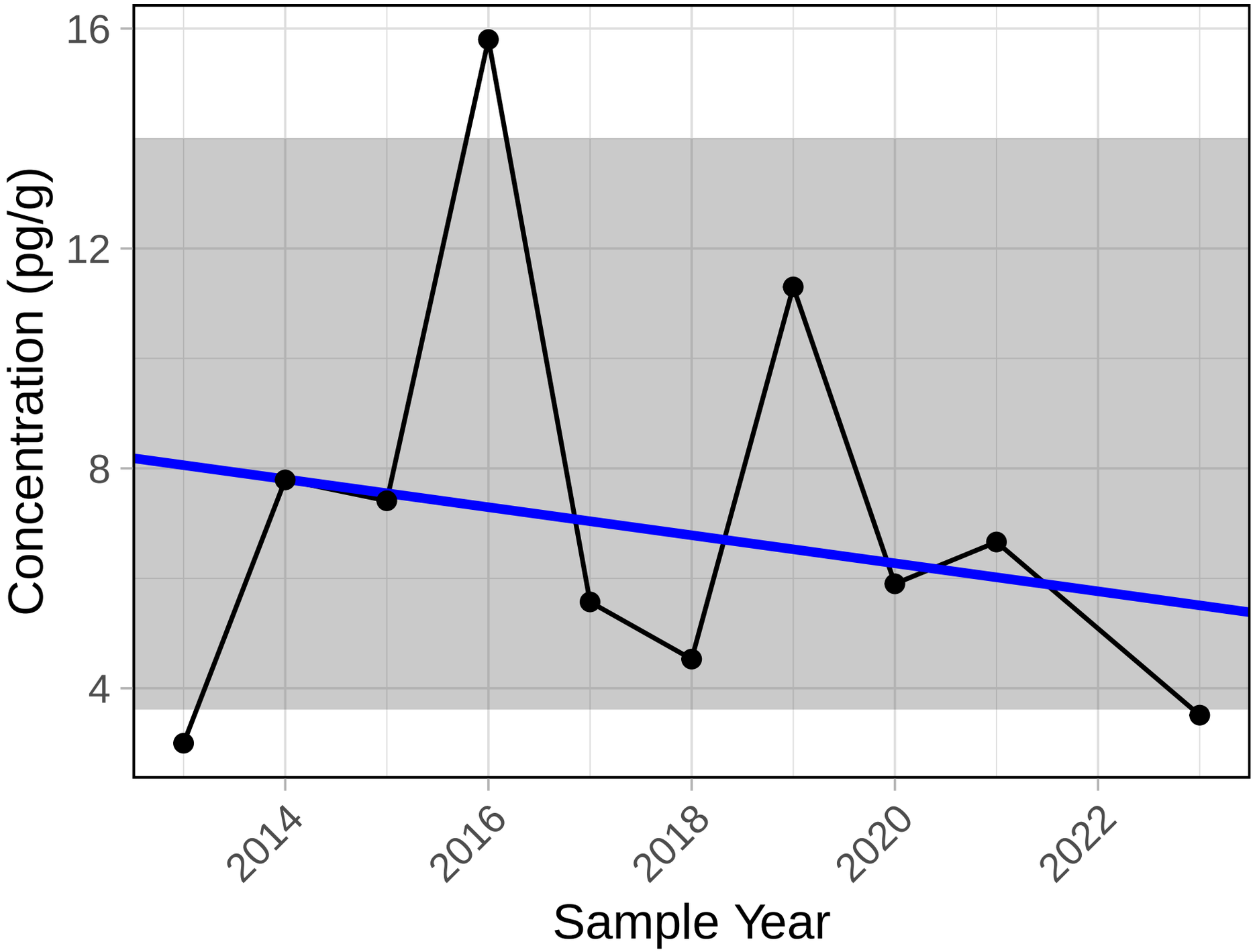

PCB 130
S6 Sediment
Concentration (pg/g)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

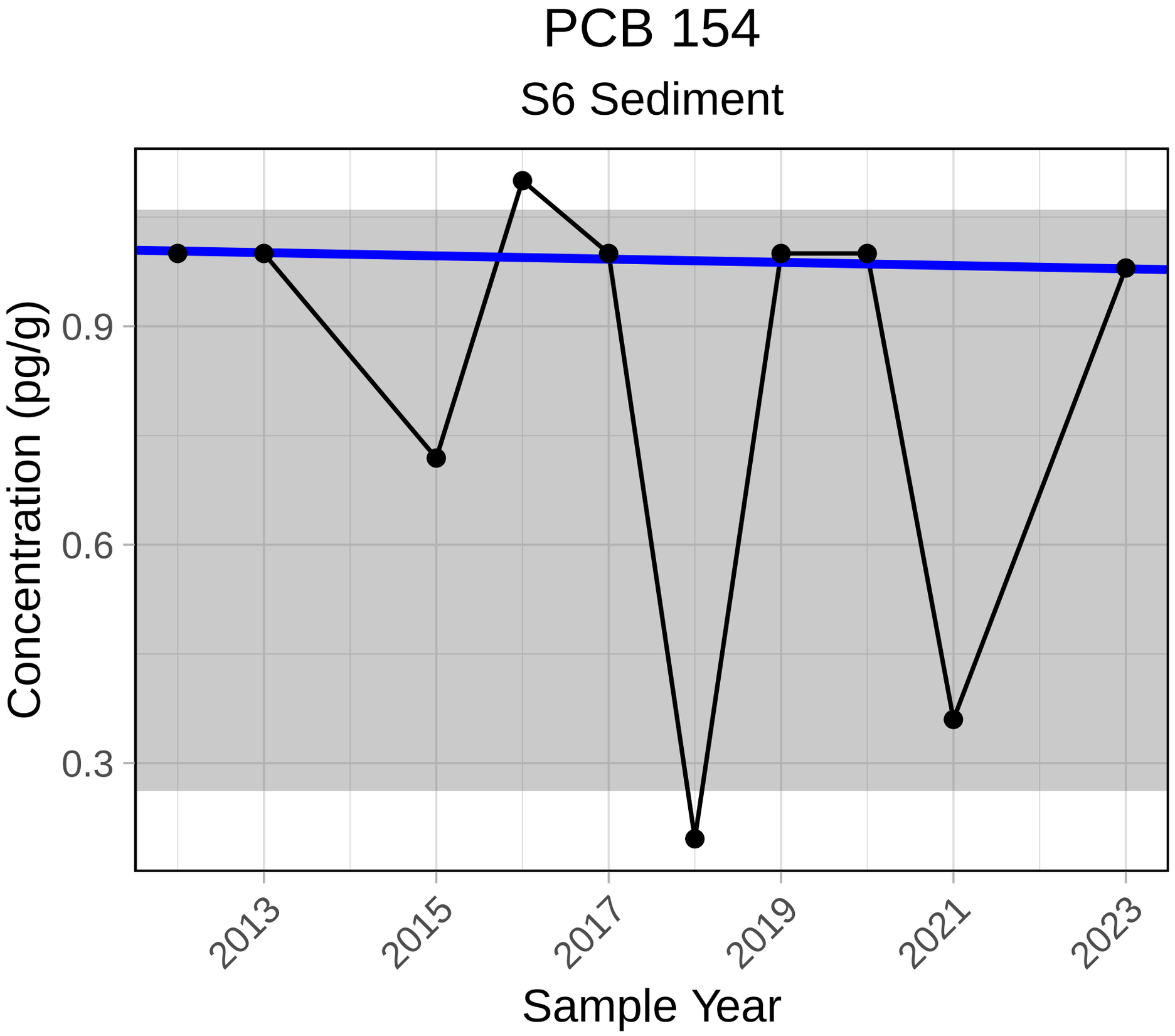

PCB 132
S6 Sediment
Concentration (pg/g)
20
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

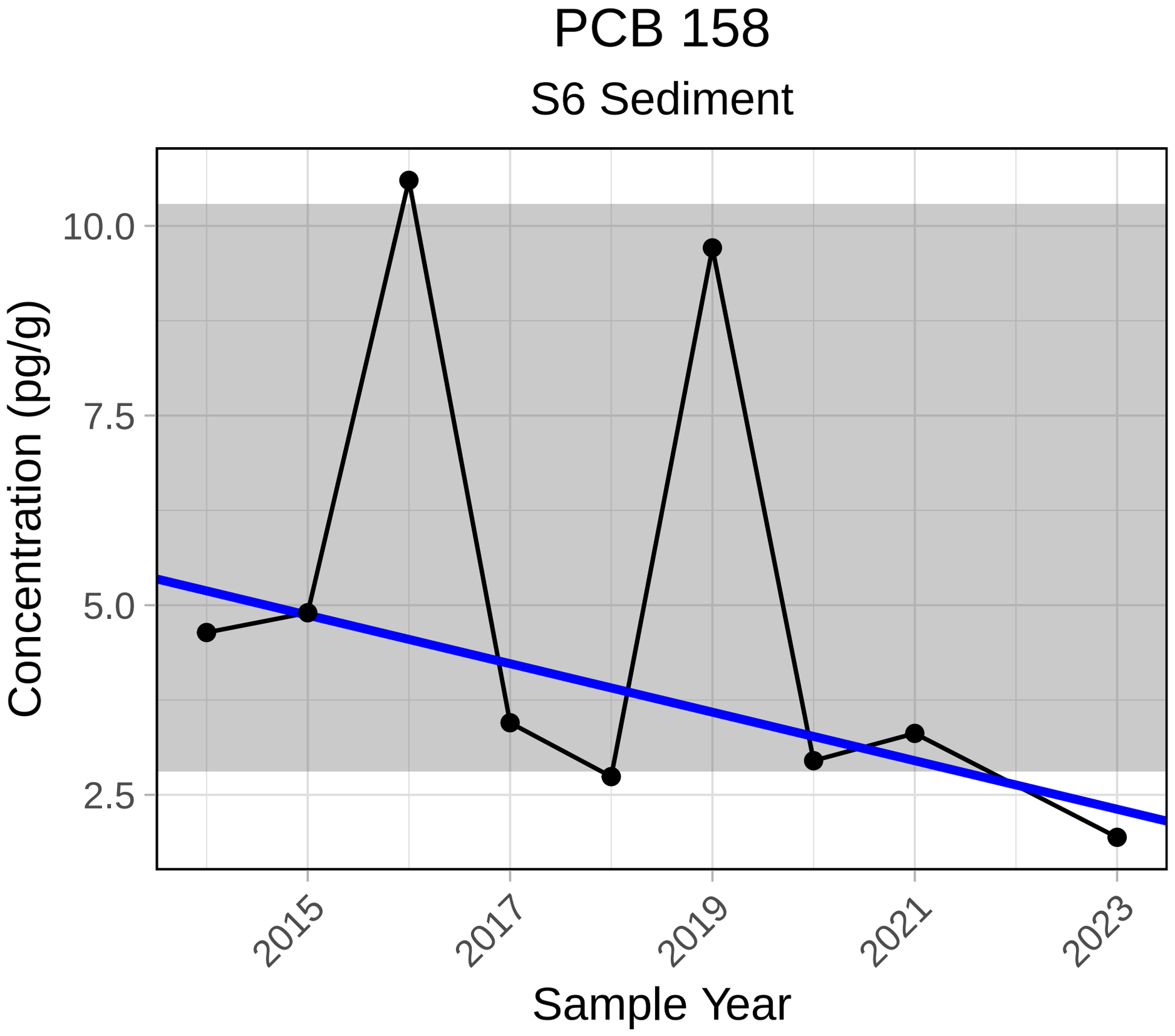

PCB 136
S6 Sediment
10.0
7.5
5.0
2.5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.074

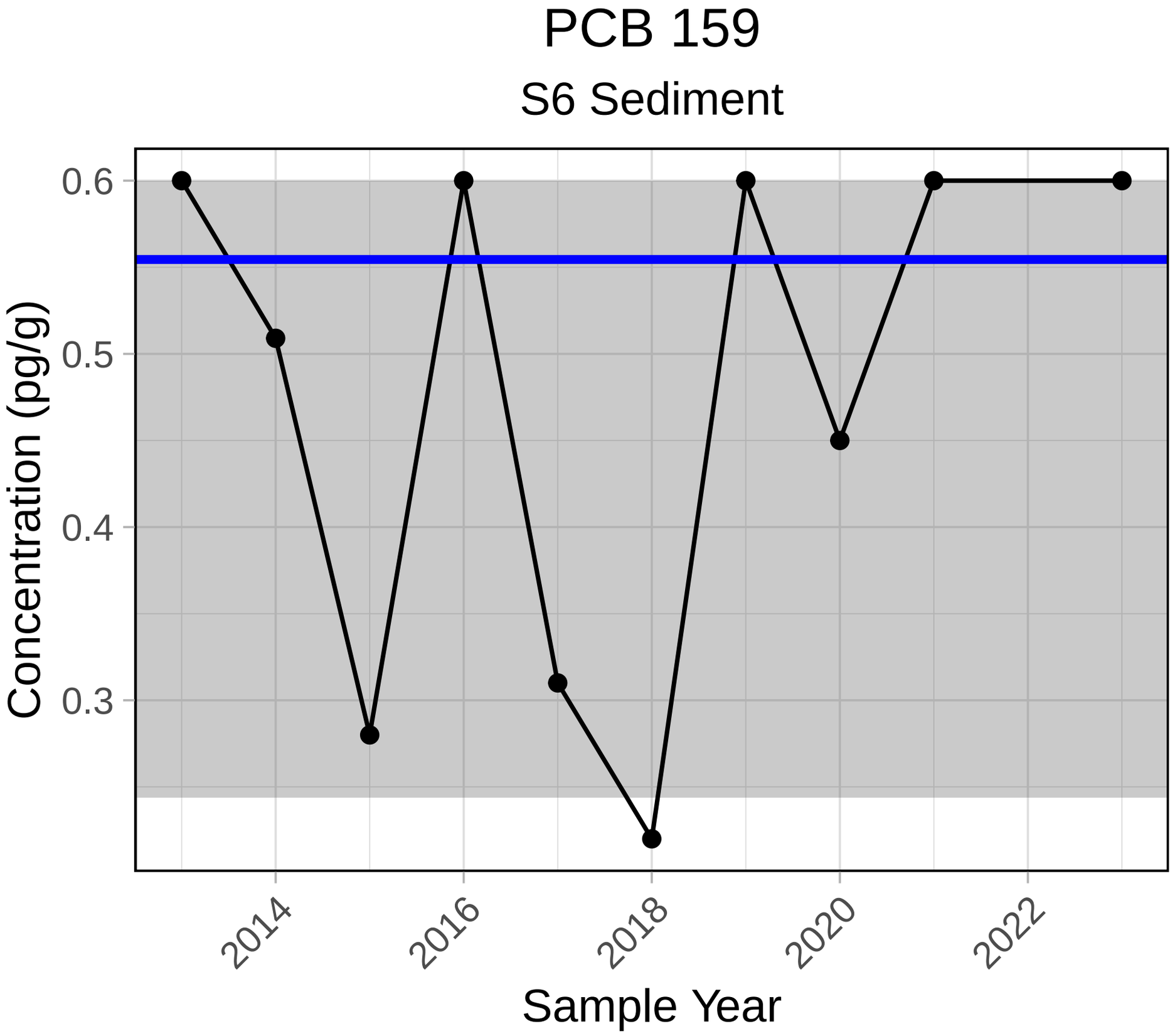

PCB 141
S6 Sediment
Concentration (pg/g)
15
10
5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

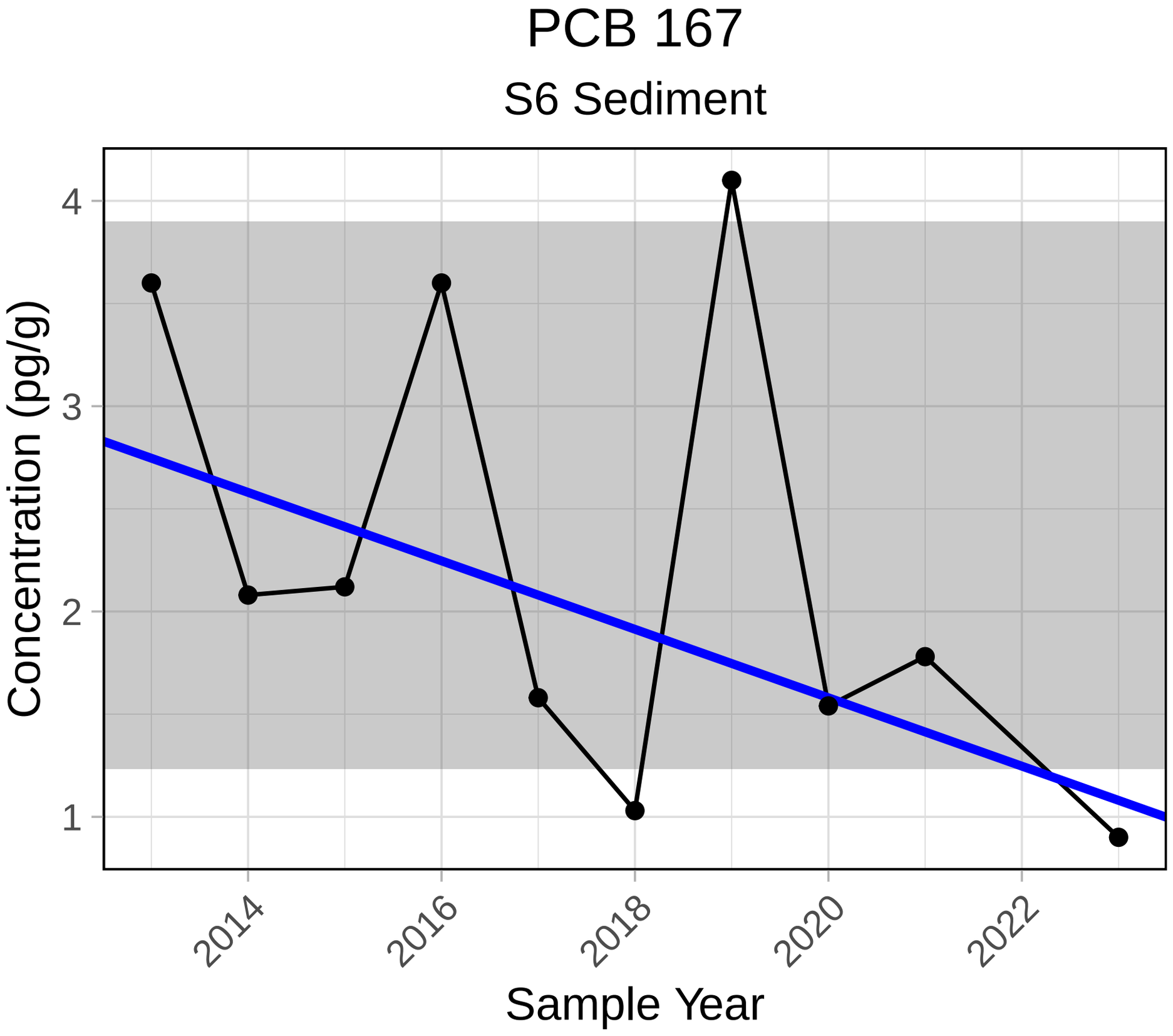

PCB 144
S6 Sediment
Concentration (pg/g)
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

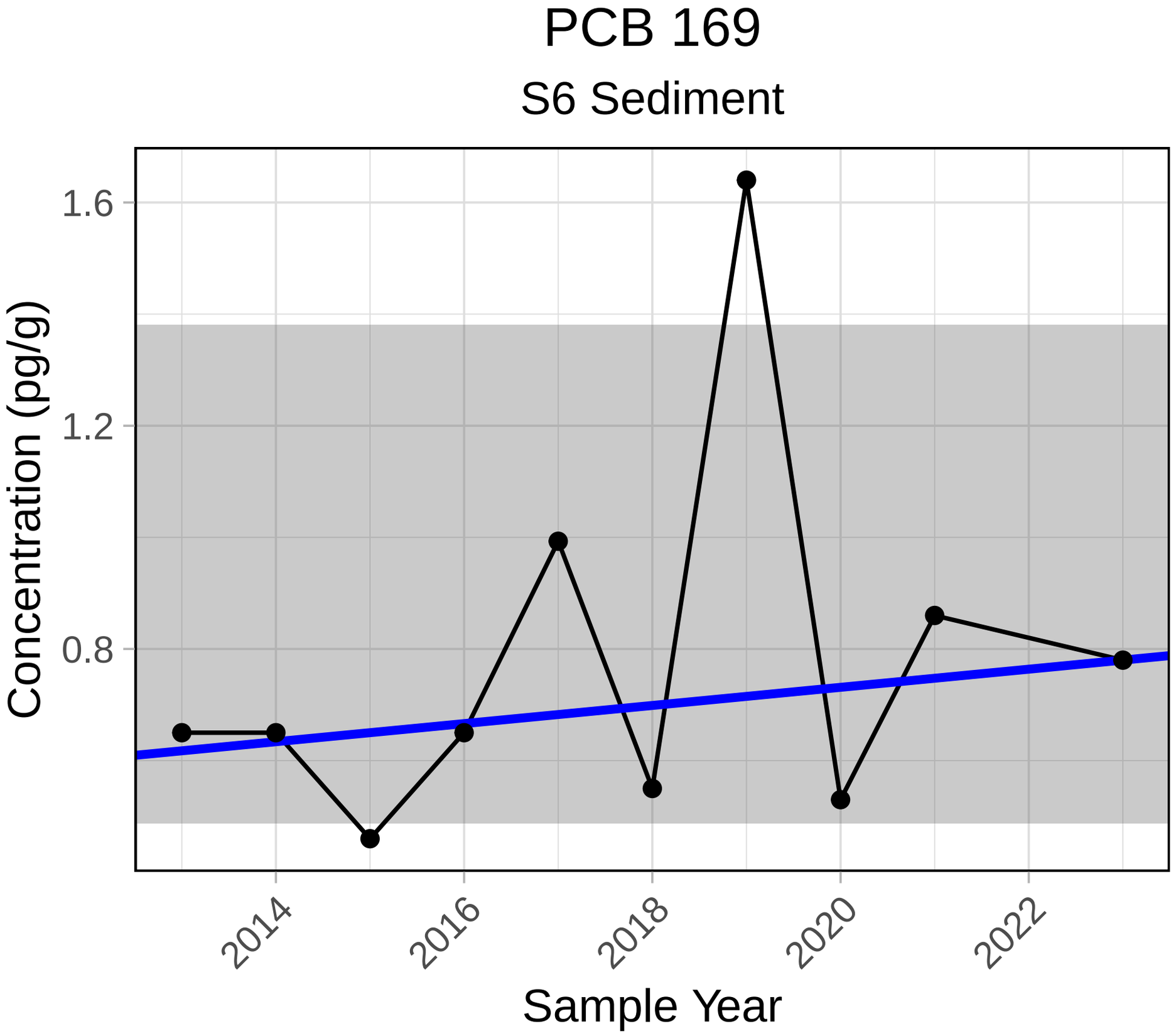

PCB 146
S6 Sediment
16
12
8
4
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.721

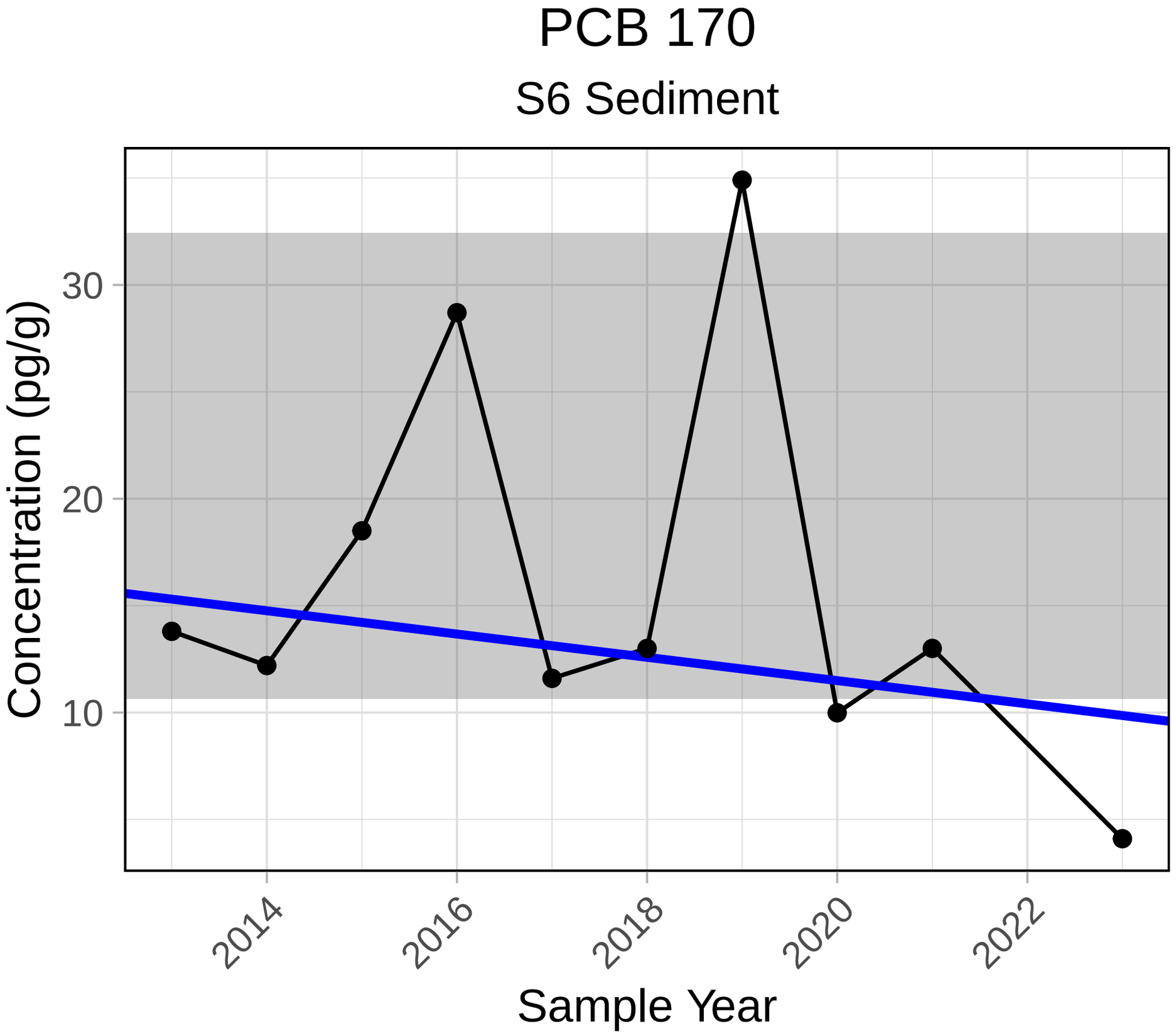

PCB 154
S6 Sediment
Concentration (pg/g)
0.9
0.6
0.3
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.337

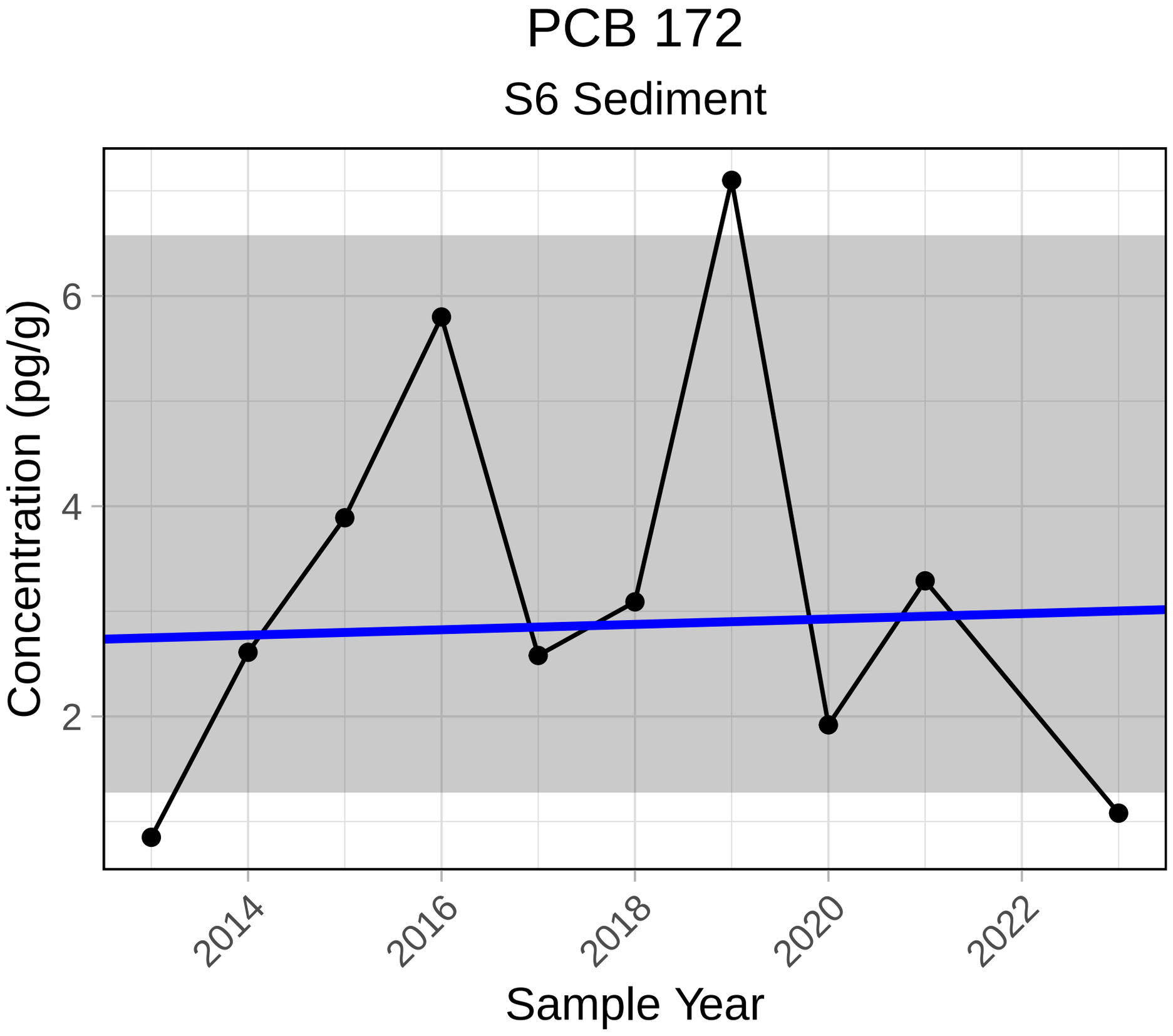

PCB 158
S6 Sediment
Concentration (pg/g)
10.0
7.5
5.0
2.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.118

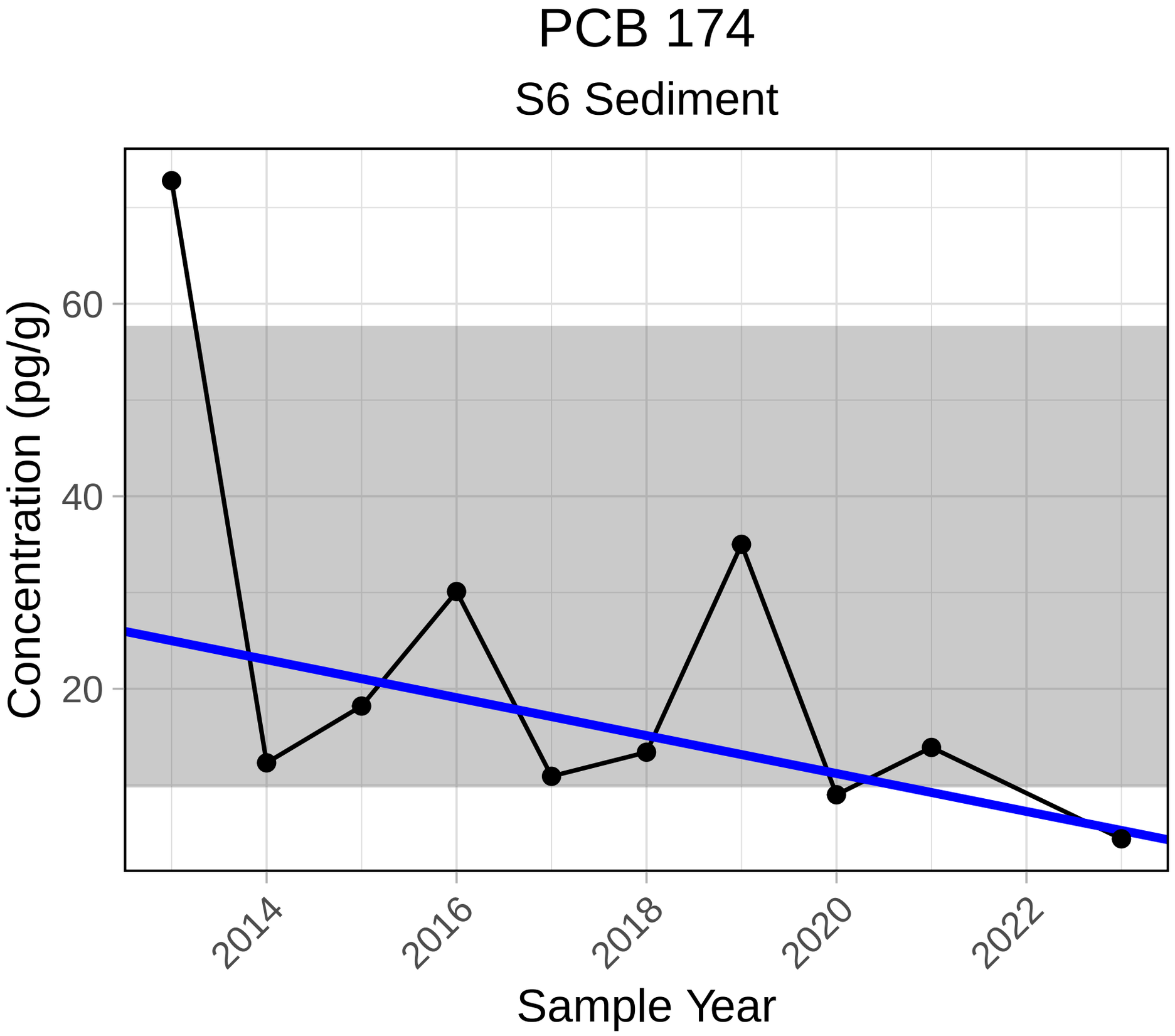

PCB 159
S6 Sediment
Concentration (pg/g)
0.6
0.5
0.4
0.3
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.701

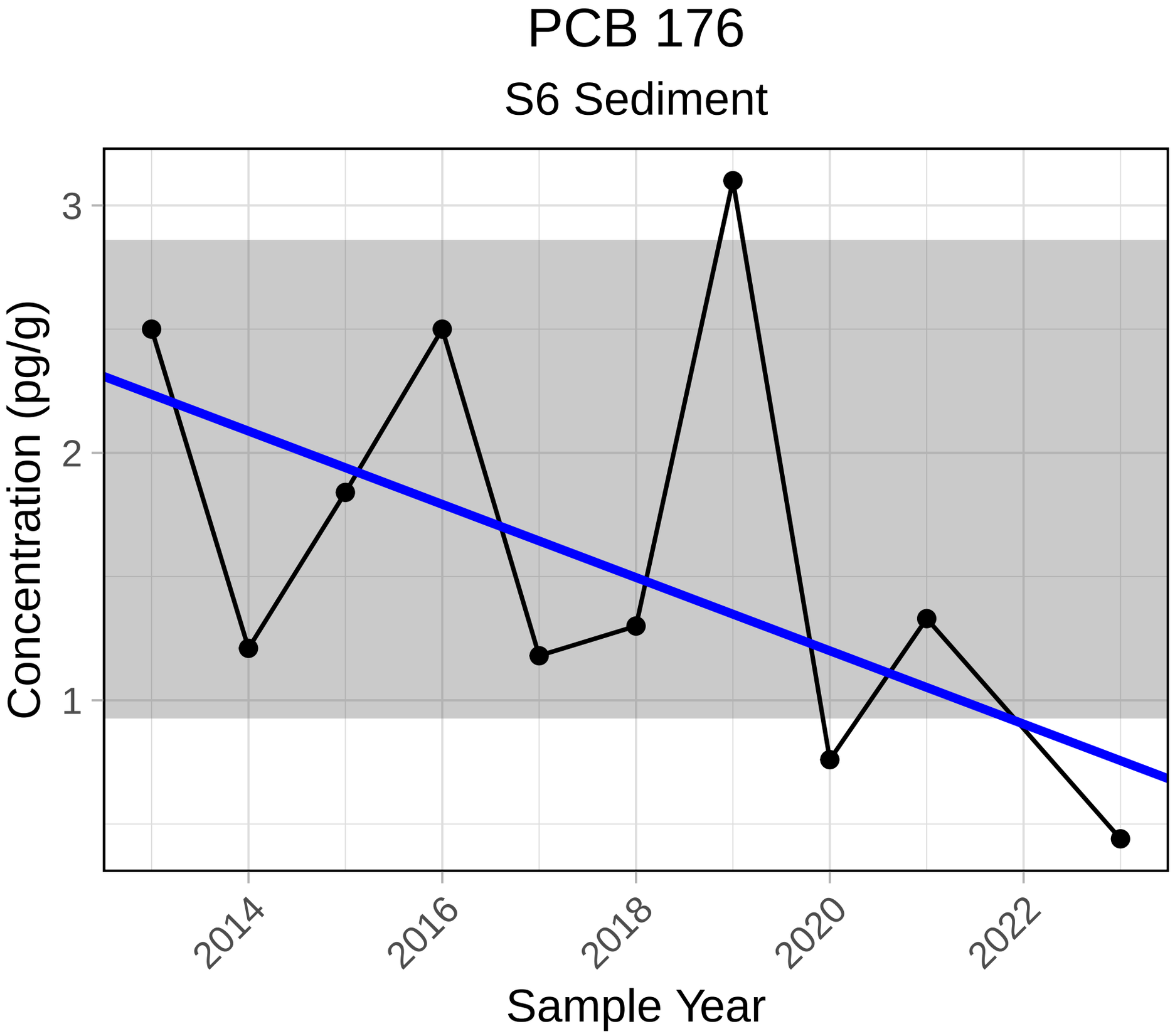

PCB 167
S6 Sediment
Concentration (pg/g)
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.127

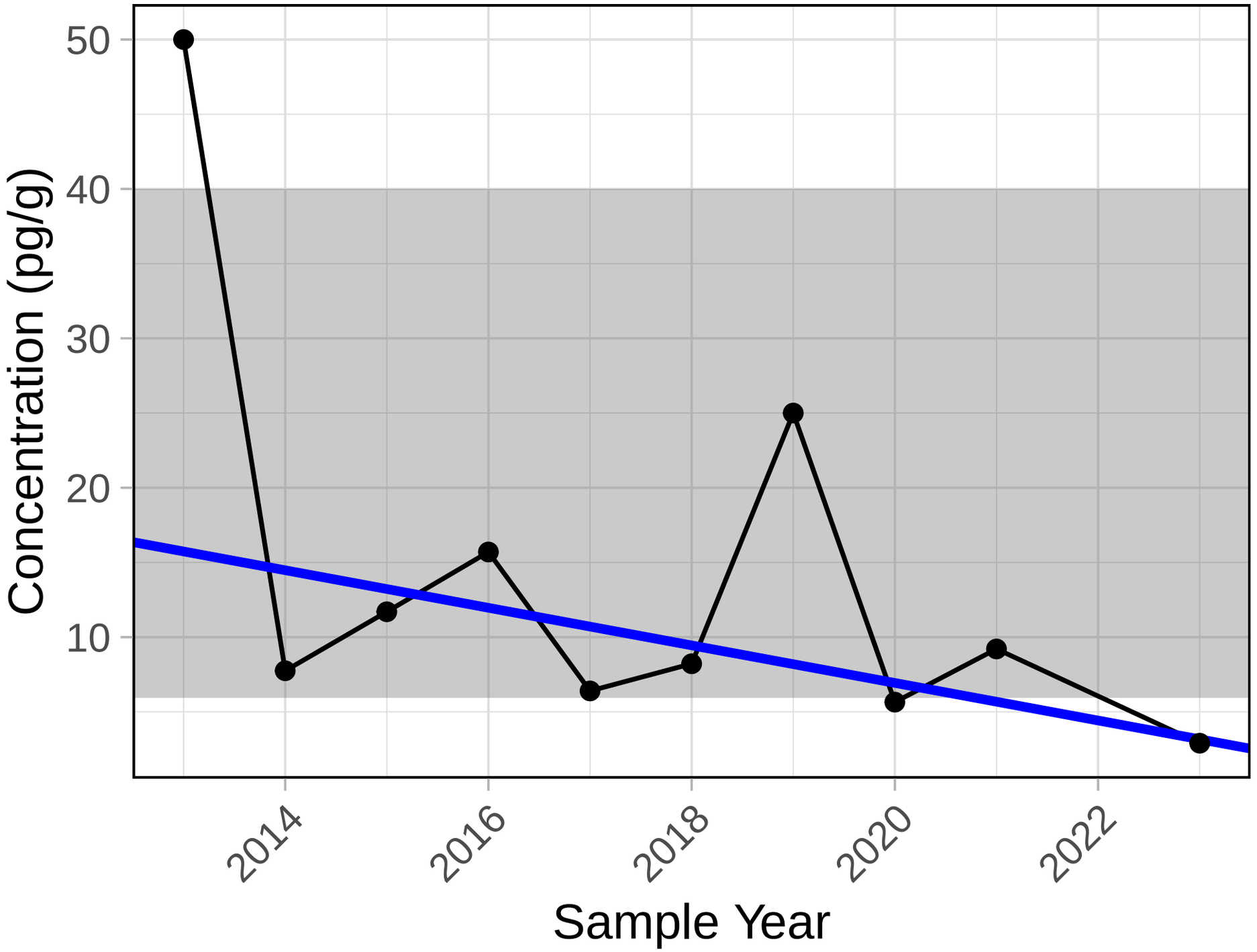

PCB 169
S6 Sediment
Concentration (pg/g)
1.6
1.2
0.8
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.525

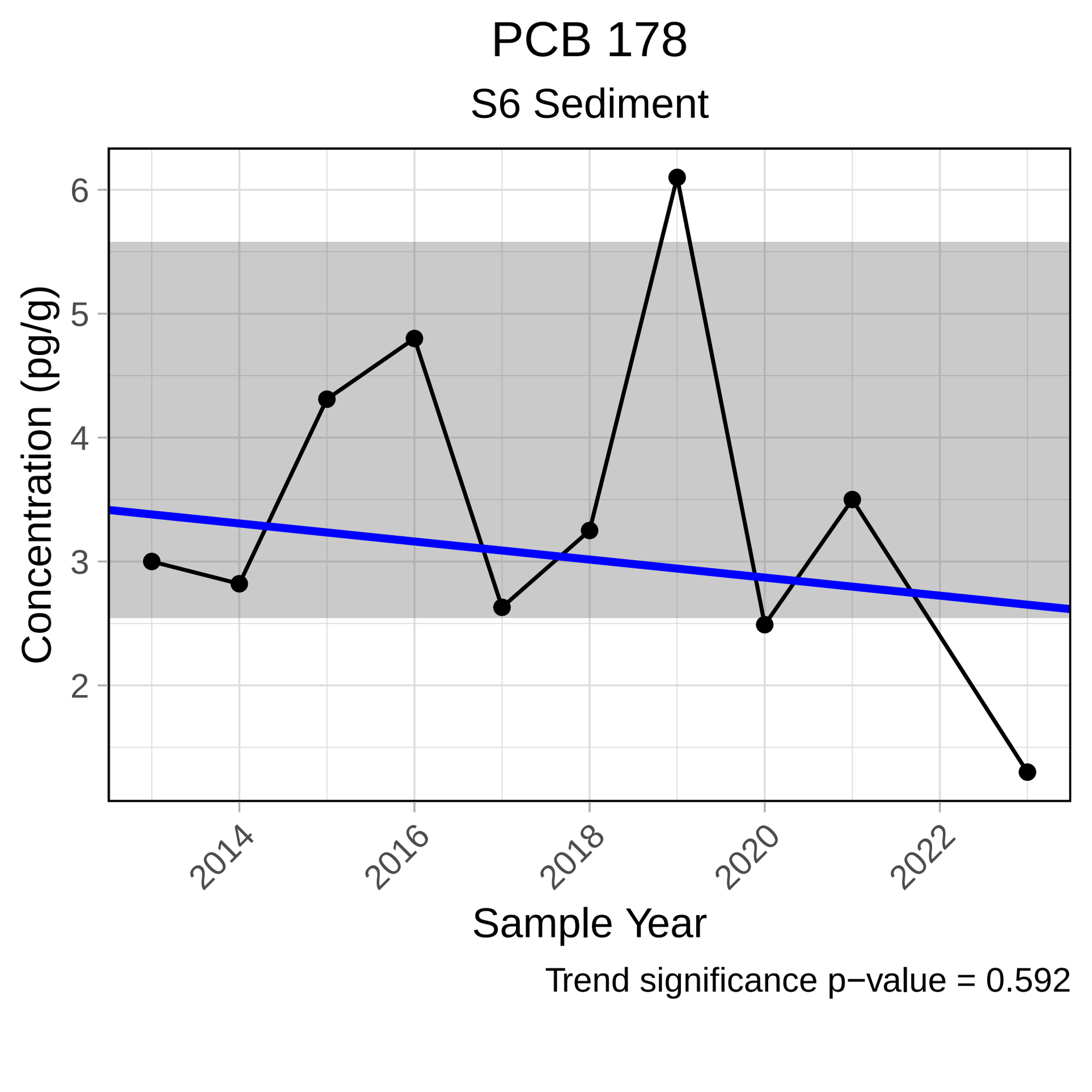

PCB 170
S6 Sediment
Concentration (pg/g)
30
20
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.323

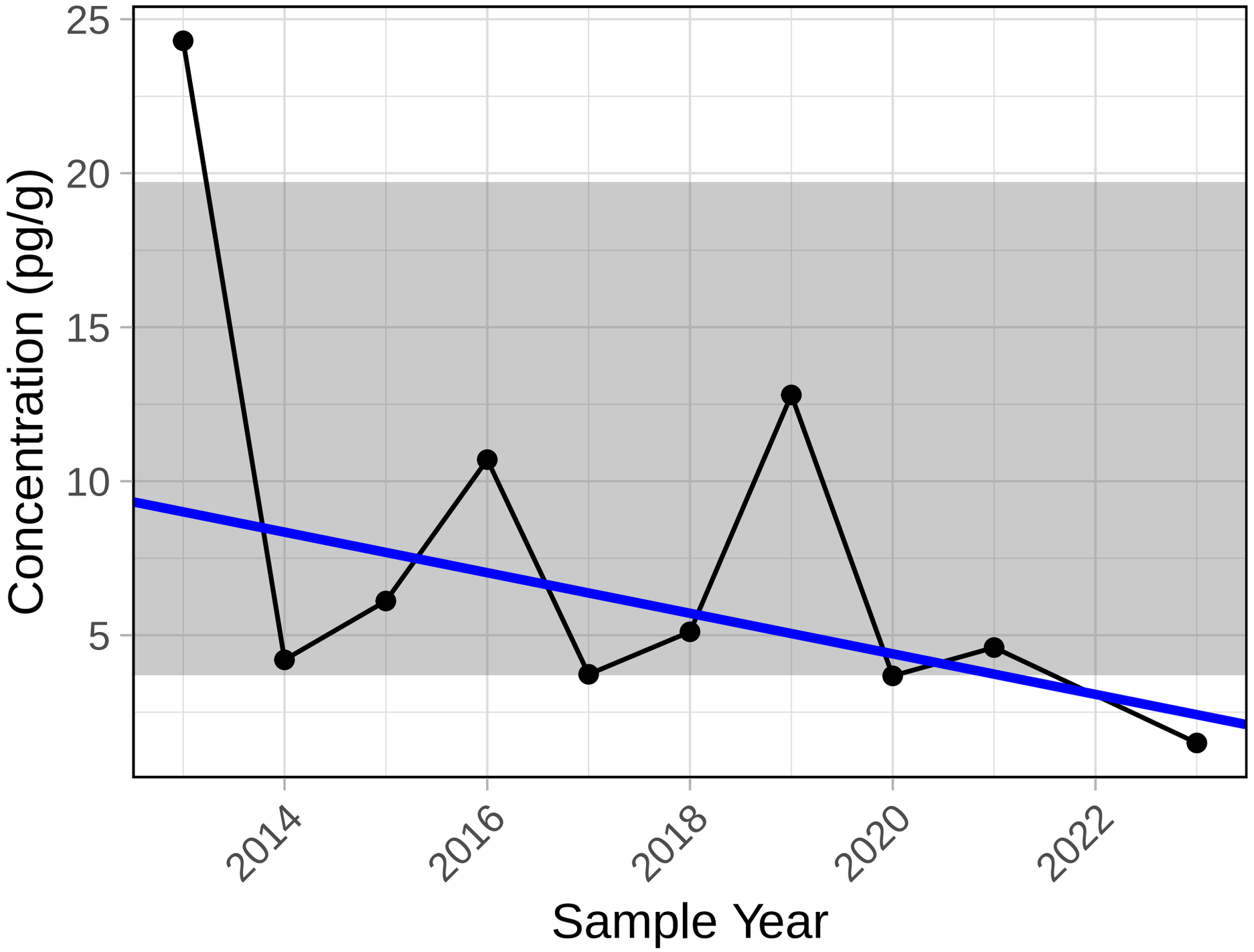

PCB 172
S6 Sediment
Concentration (pg/g)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

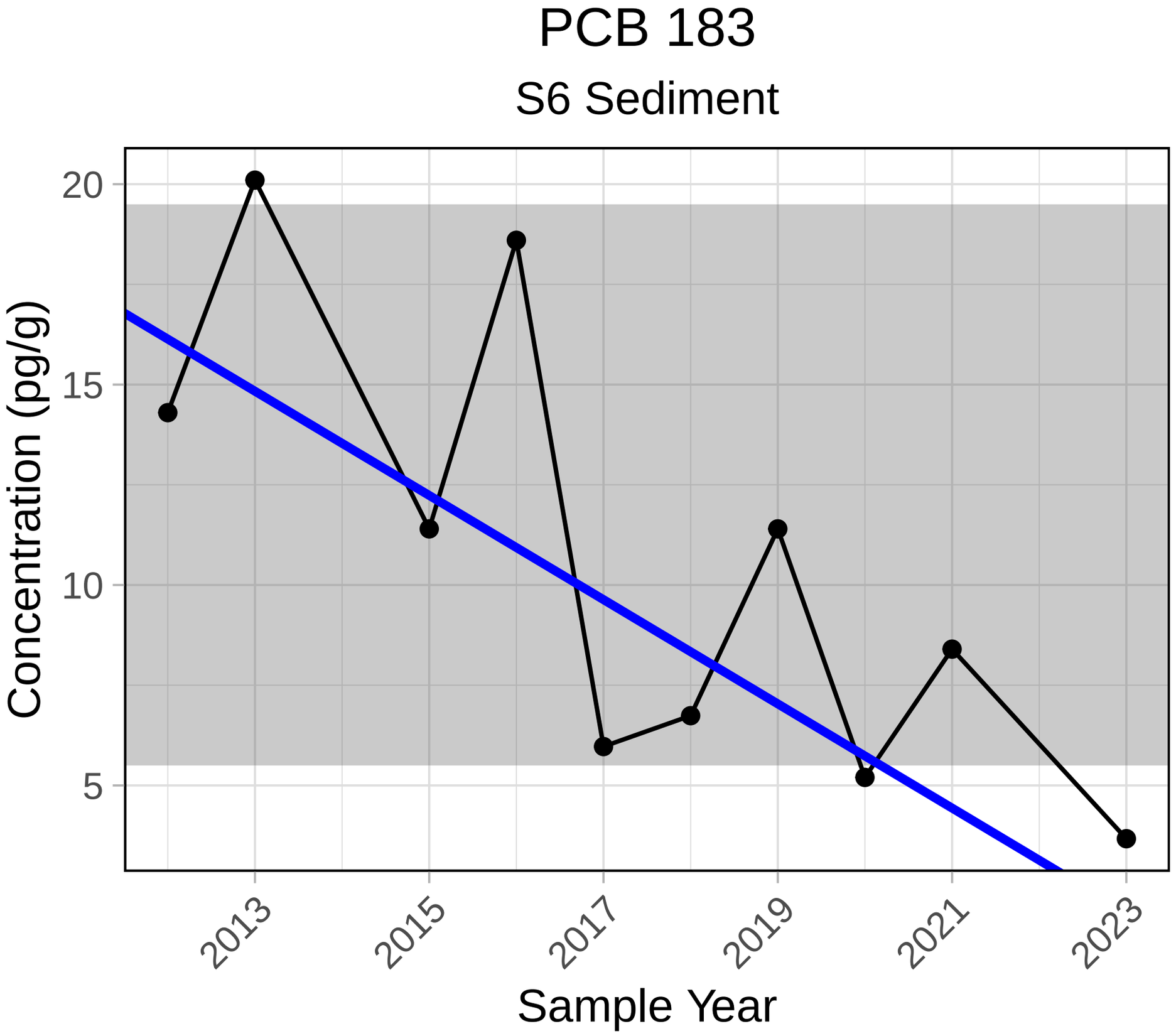

PCB 174
S6 Sediment
Concentration (pg/g)
60
40
20
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152


PCB 176
S6 Sediment
Concentration (pg/g)
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.243


PCB 177
S6 Sediment
Concentration (pg/g)
50
40
30
20
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

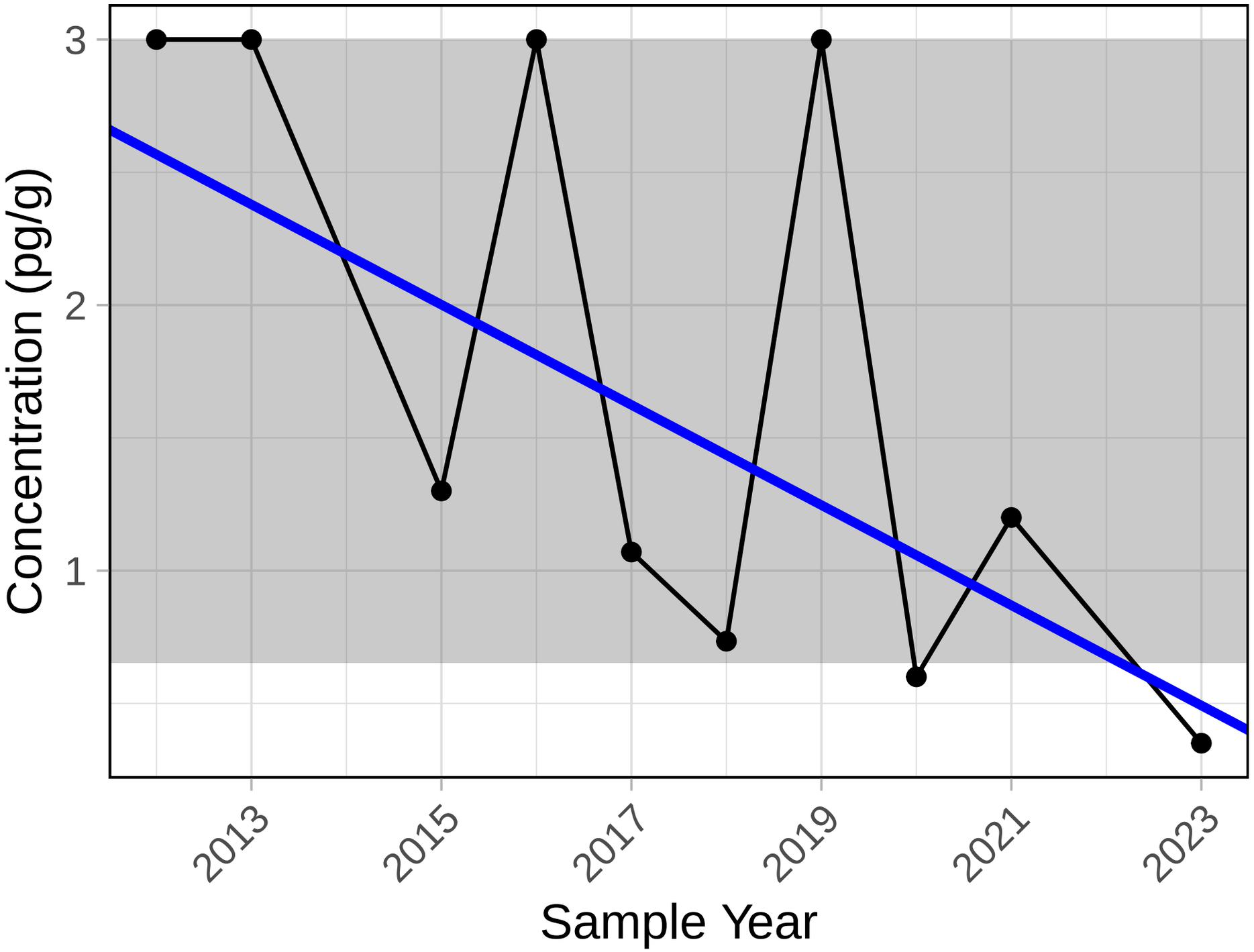

PCB 178
S6 Sediment
Concentration (pg/g)
6
5
4
3
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592


PCB 179
S6 Sediment
25
20
15
10
5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107

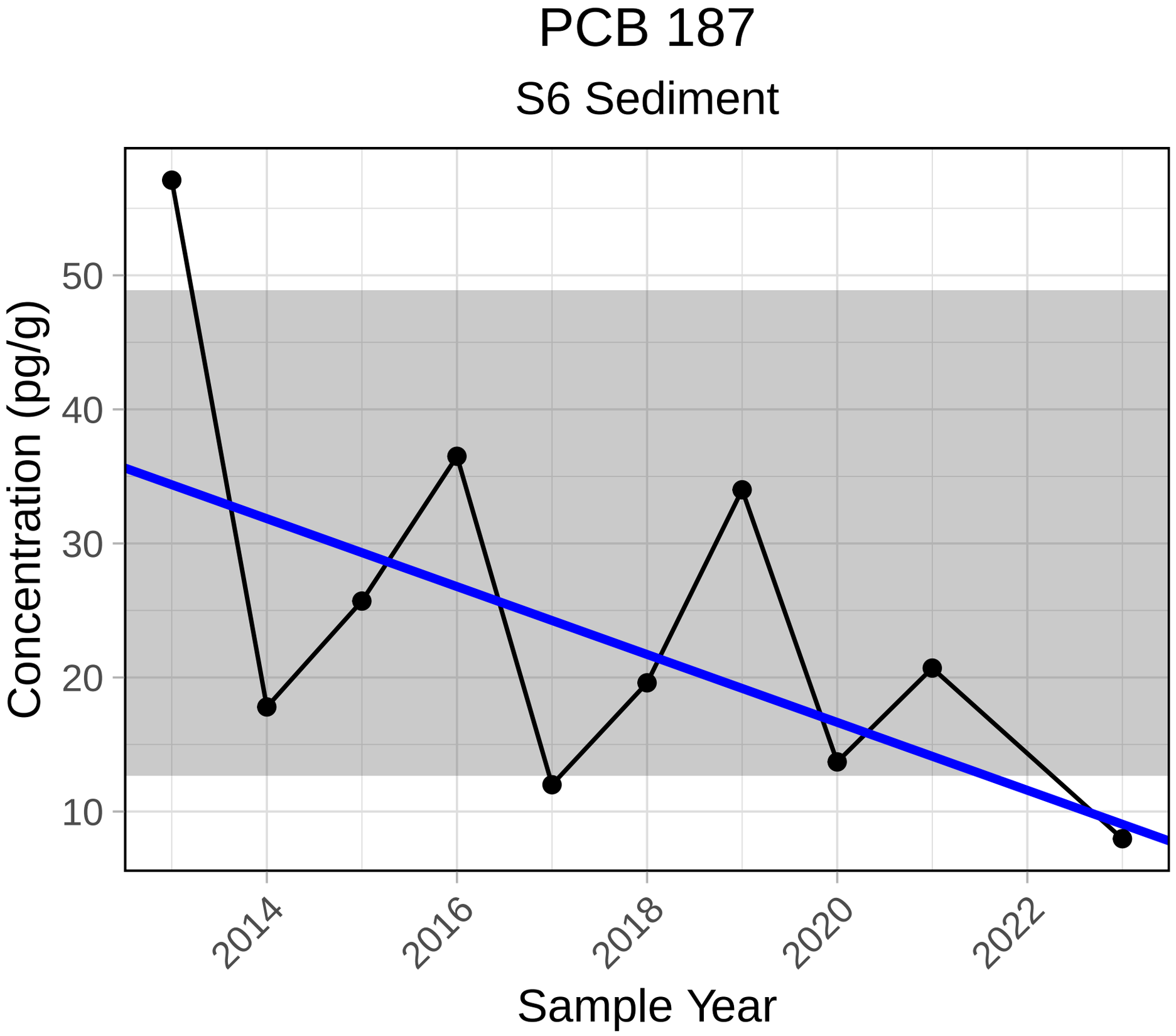

PCB 183
S6 Sediment
Concentration (pg/g)
20
15
10
5
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.025

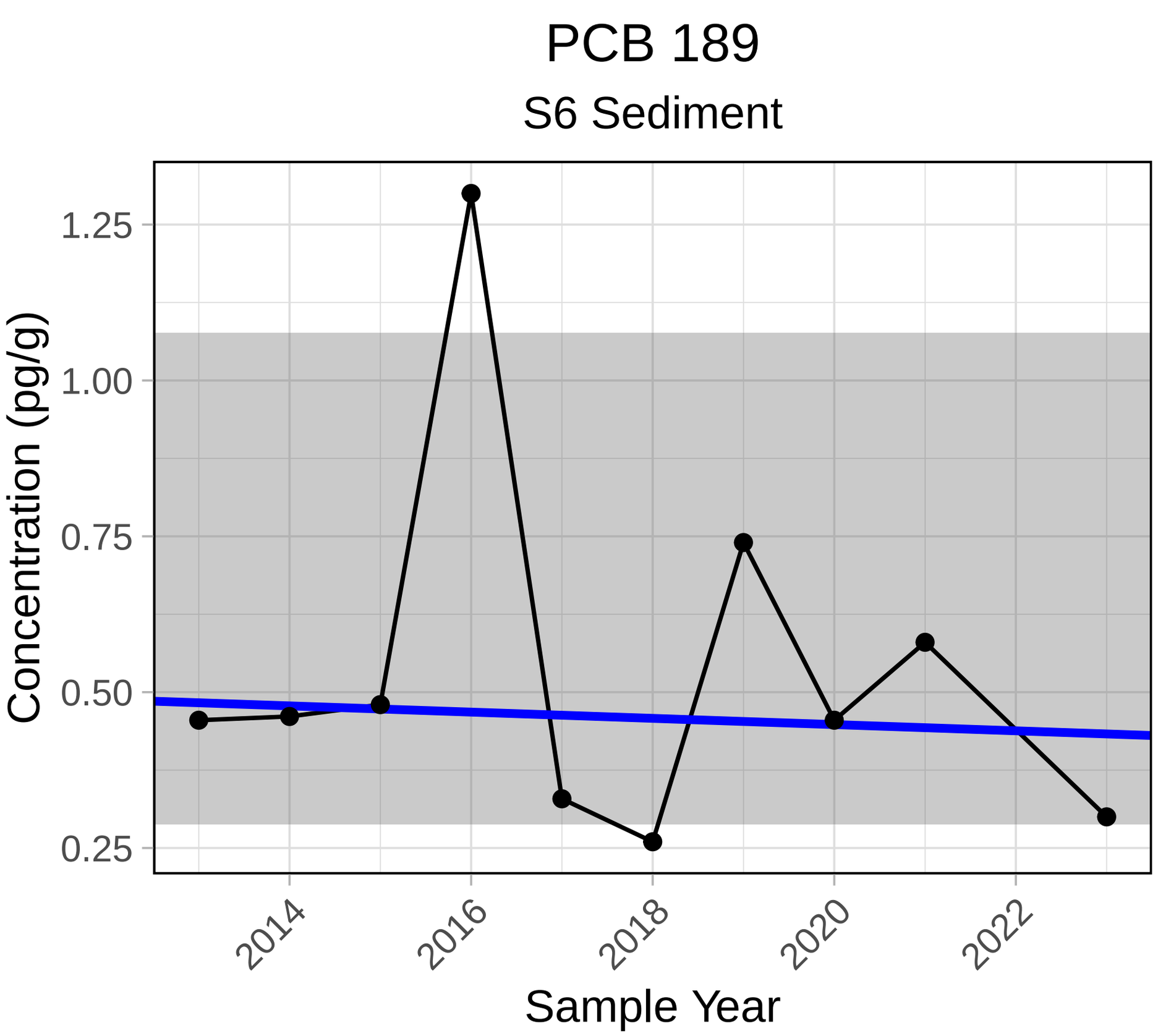
PCB 185

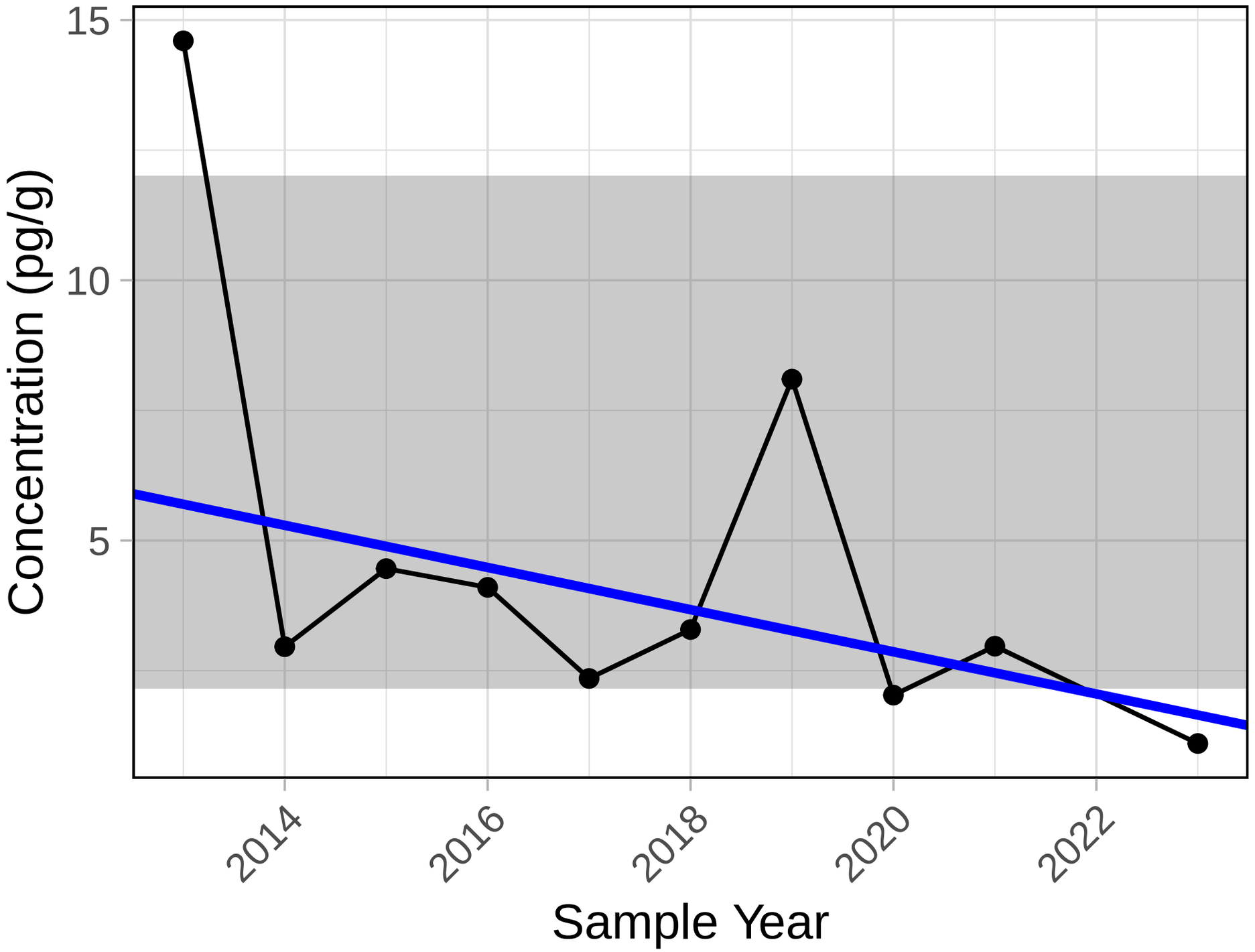
S6 Sediment

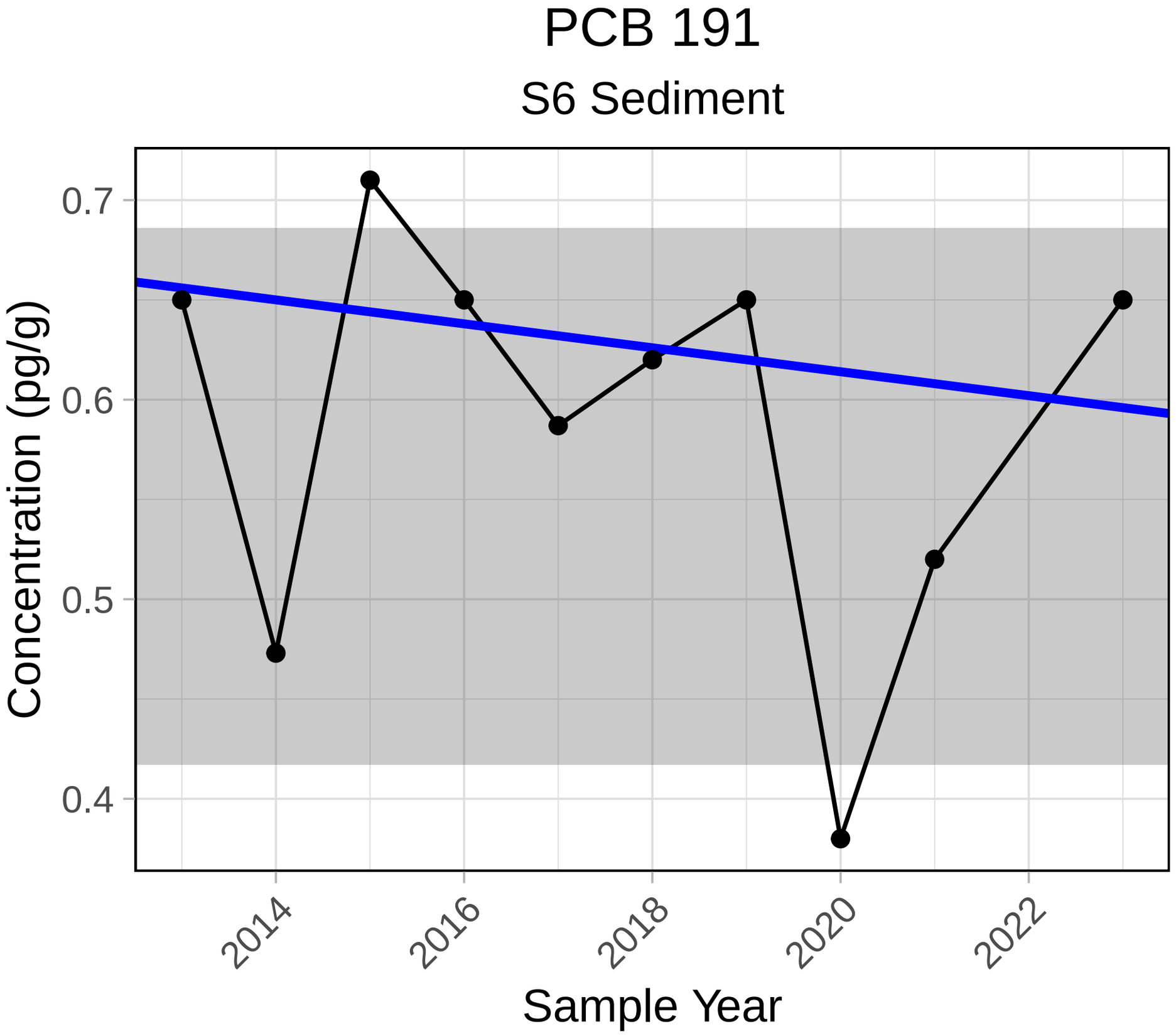


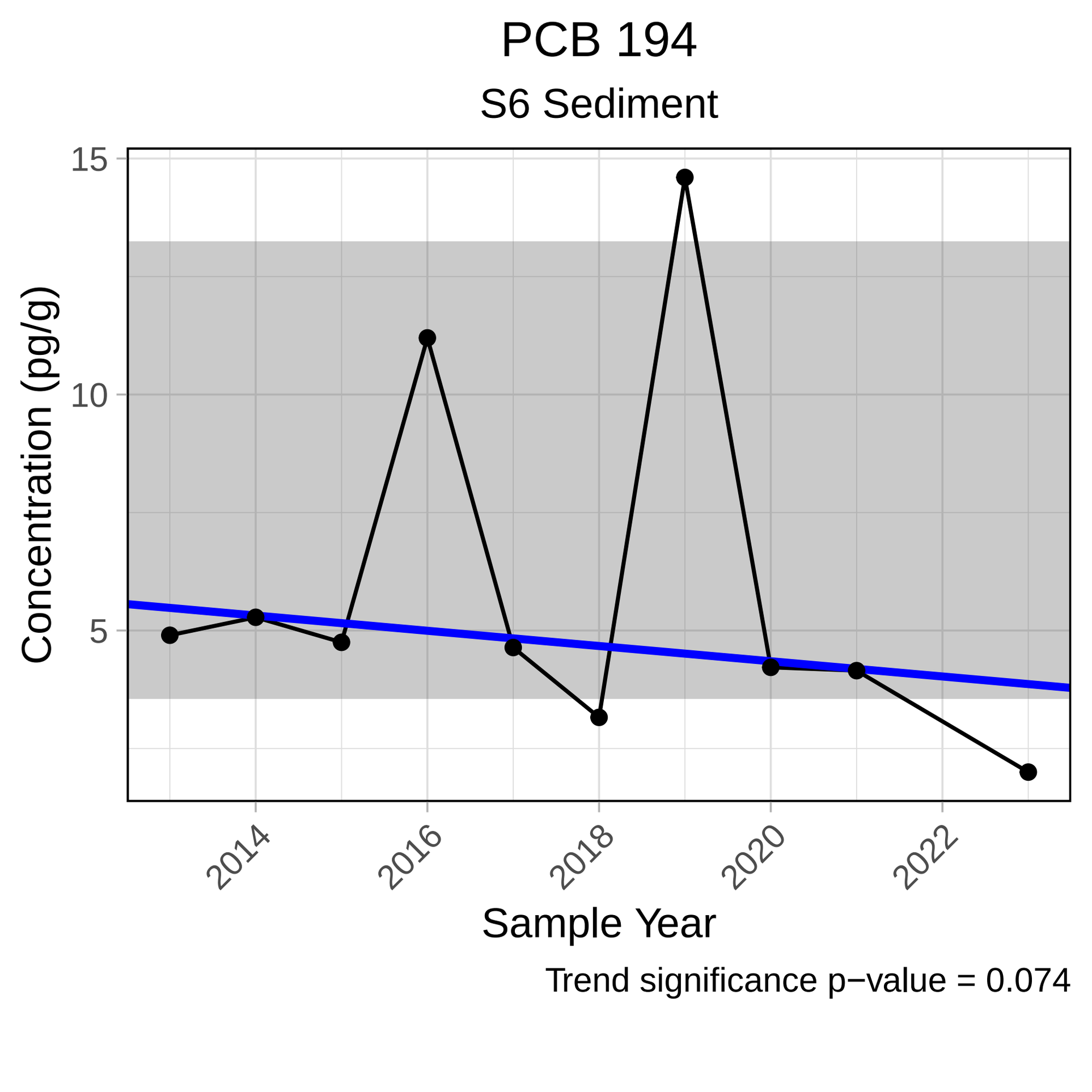
Trend significance p−value = 0.026

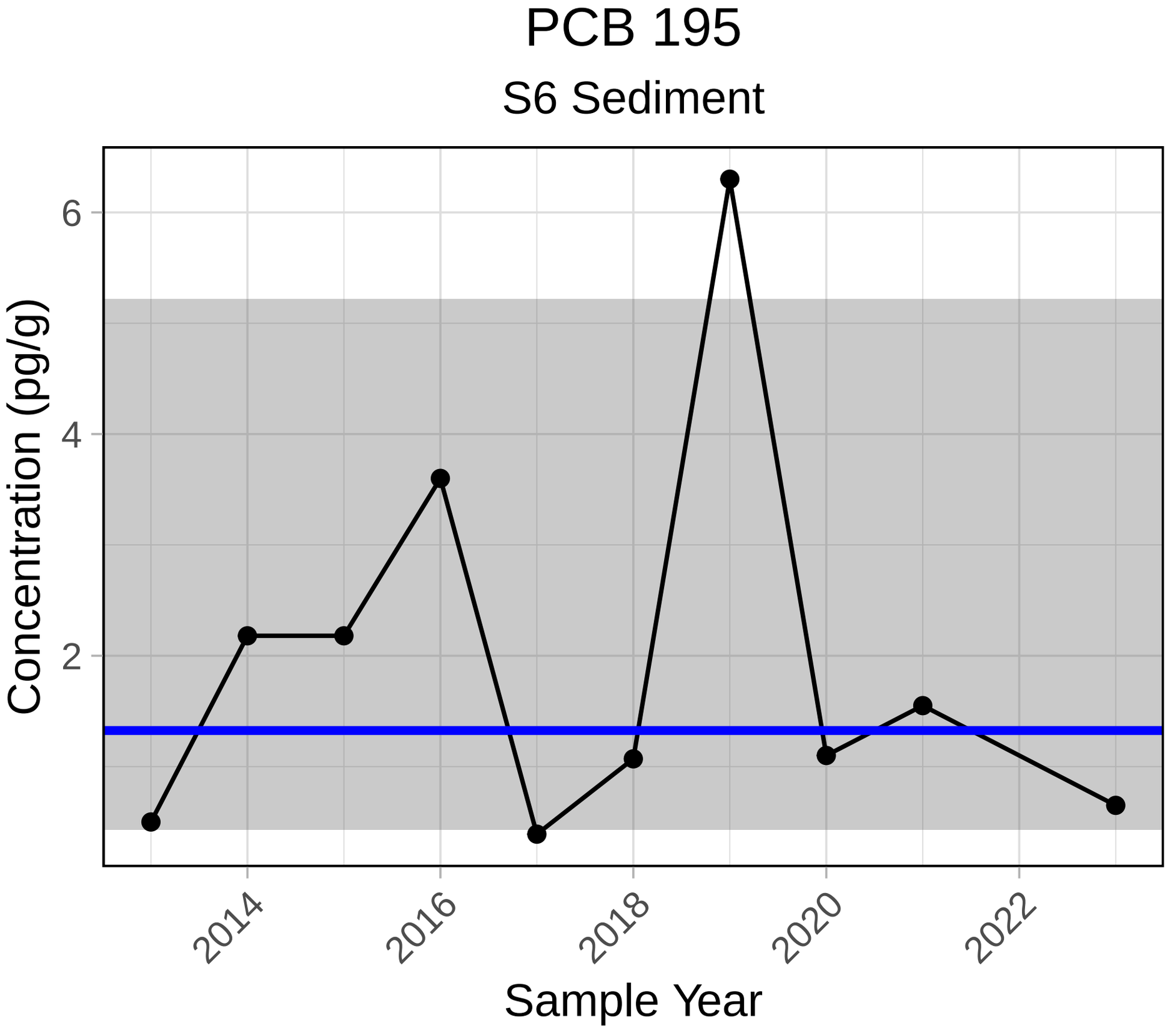

PCB 187
S6 Sediment
Concentration (pg/g)
50
40
30
20
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152


PCB 189
S6 Sediment
1.25
1.00
0.75
0.50
0.25
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.788


PCB 190
S6 Sediment
15
10
5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.074

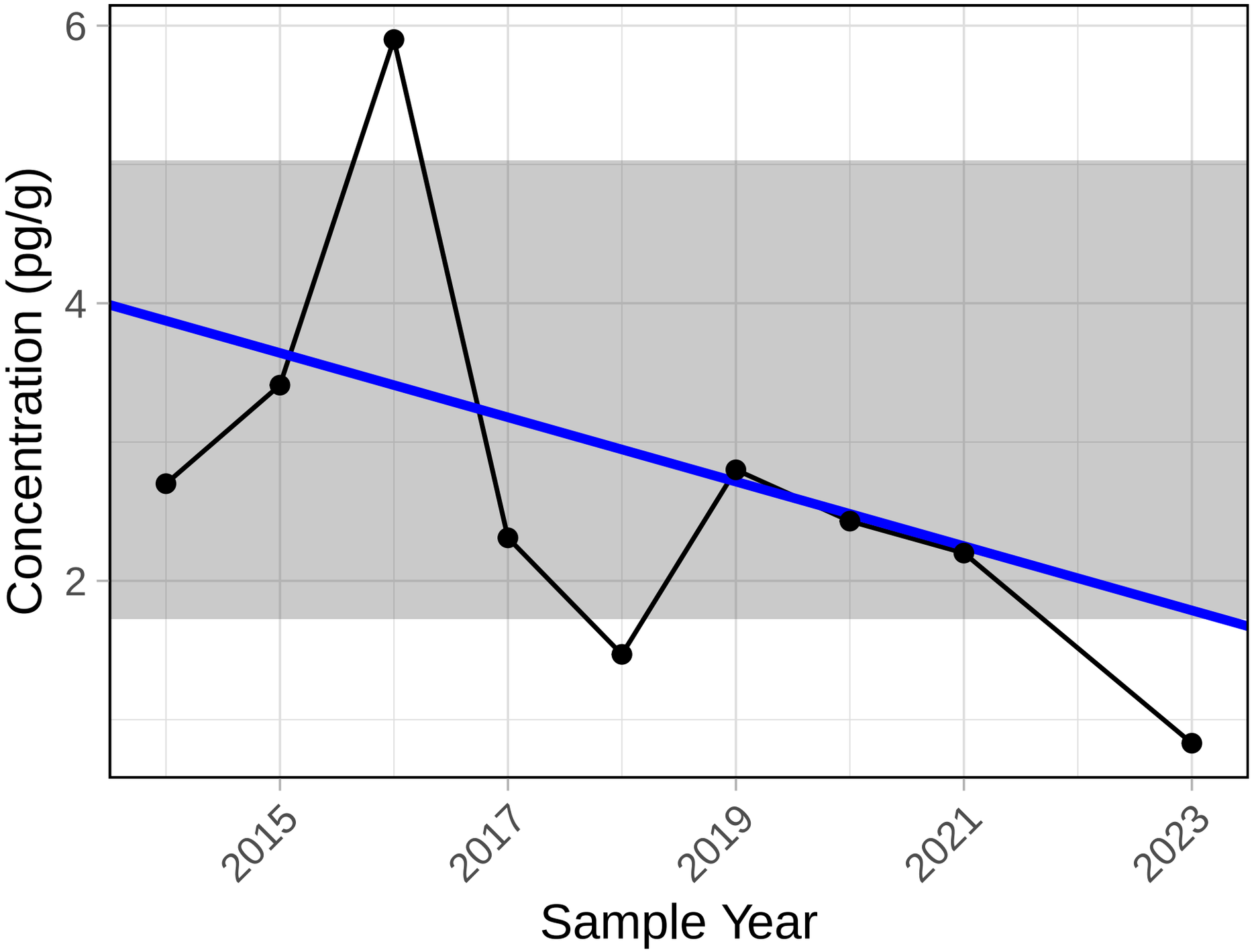

PCB 191
S6 Sediment
0.7
0.6
0.5
0.4
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.578


PCB 194
S6 Sediment
15
10
5
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.074

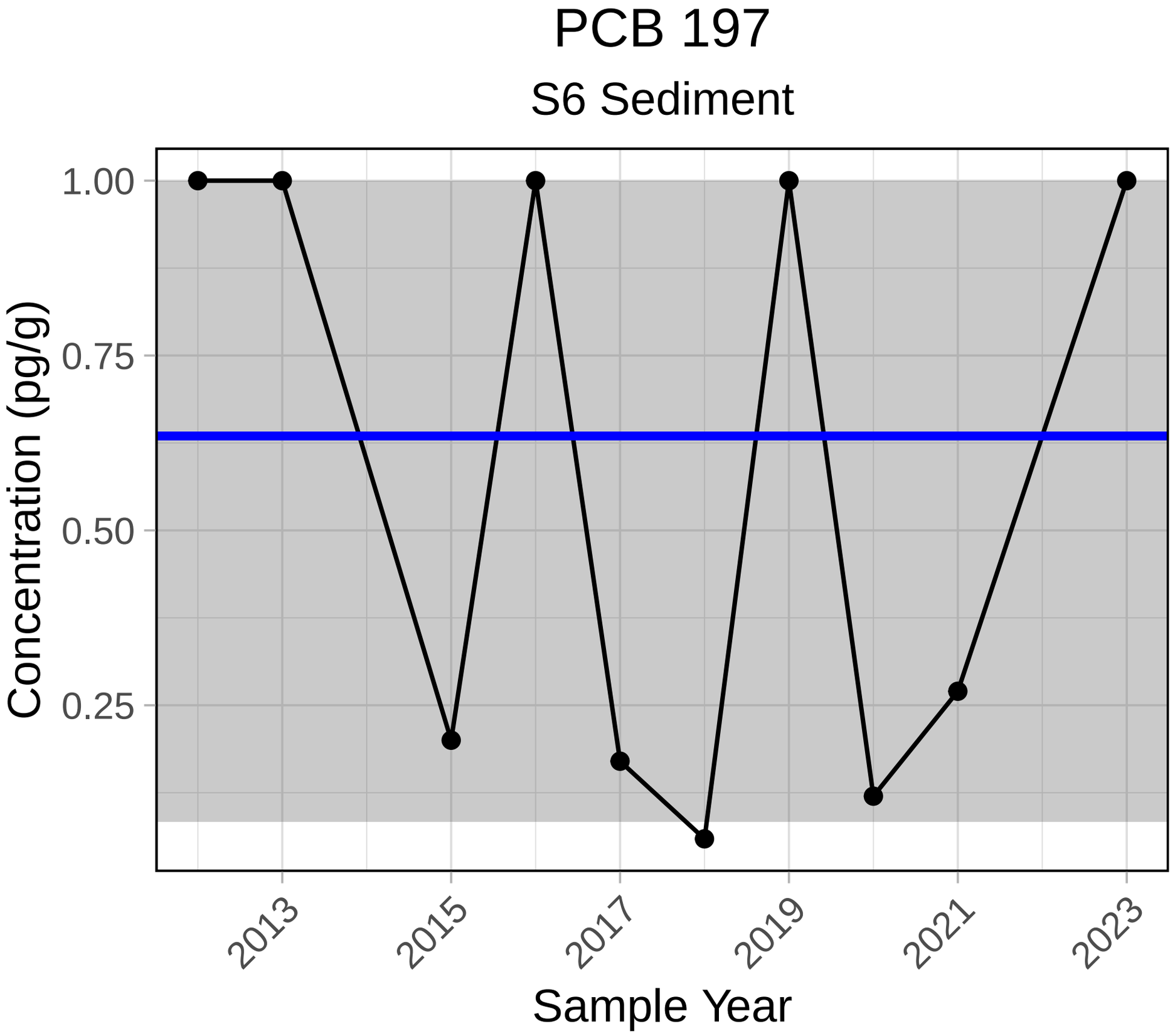

PCB 195
S6 Sediment
Concentration (pg/g)
6
4
2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

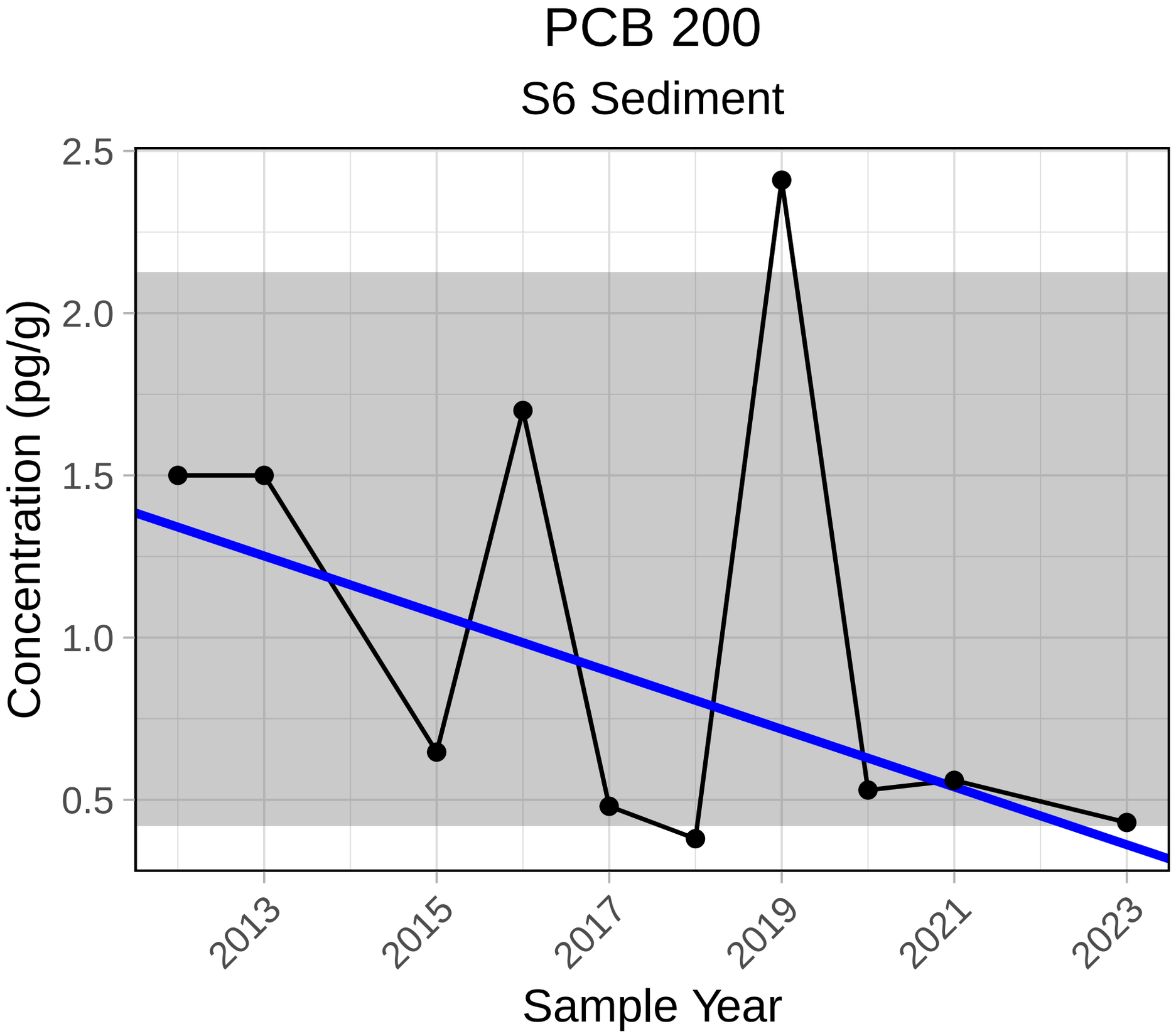
PCB 196

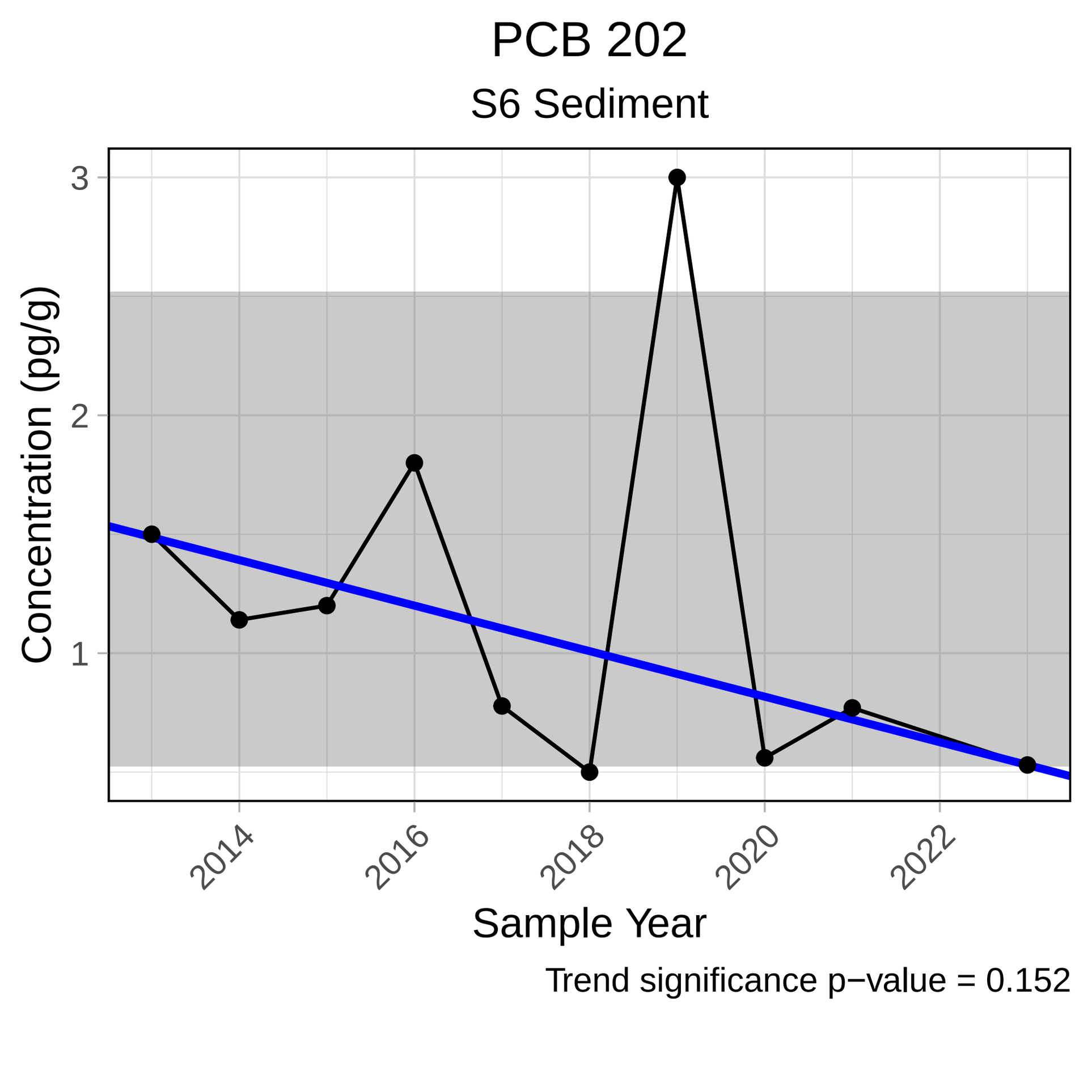
S6 Sediment

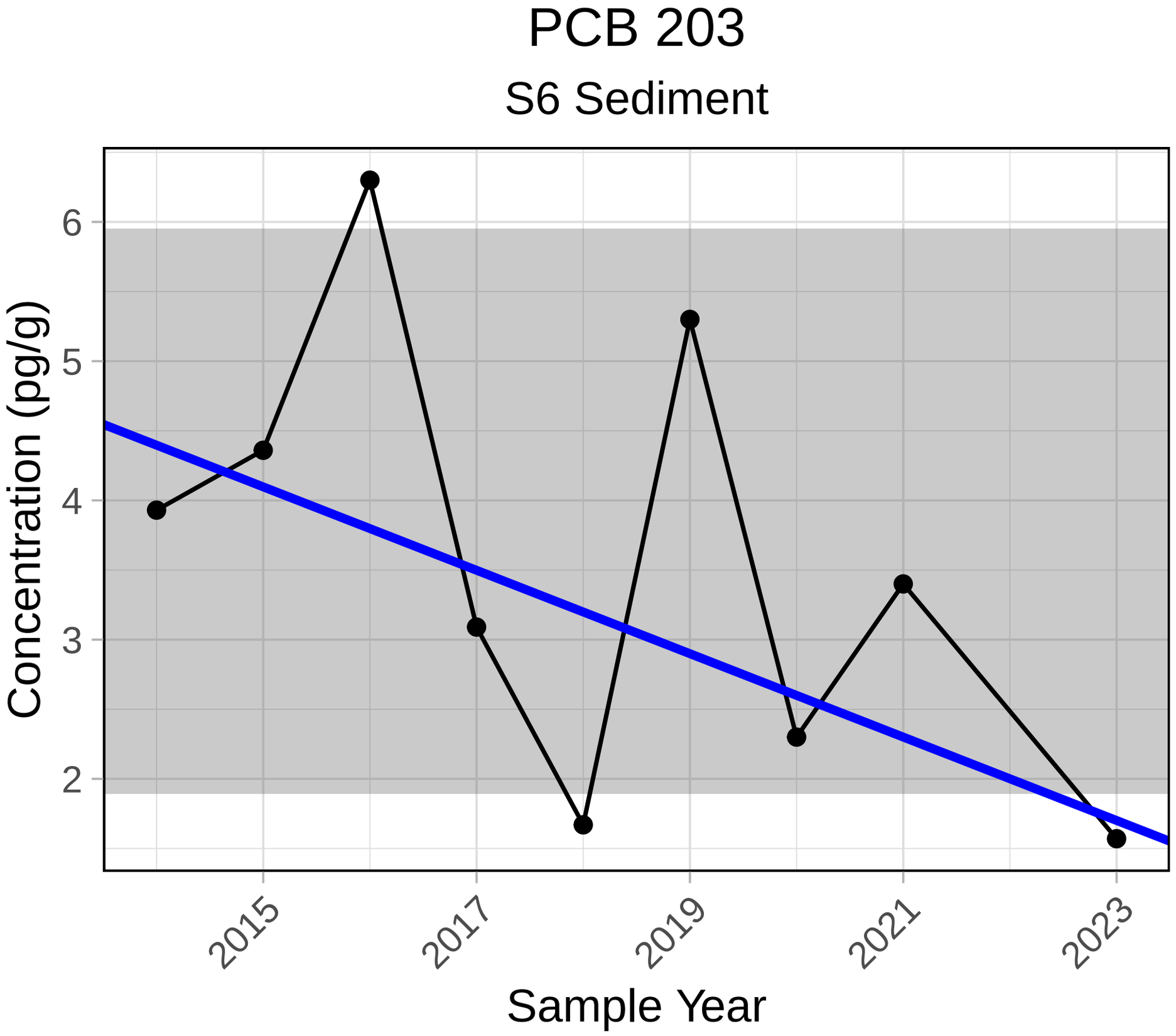


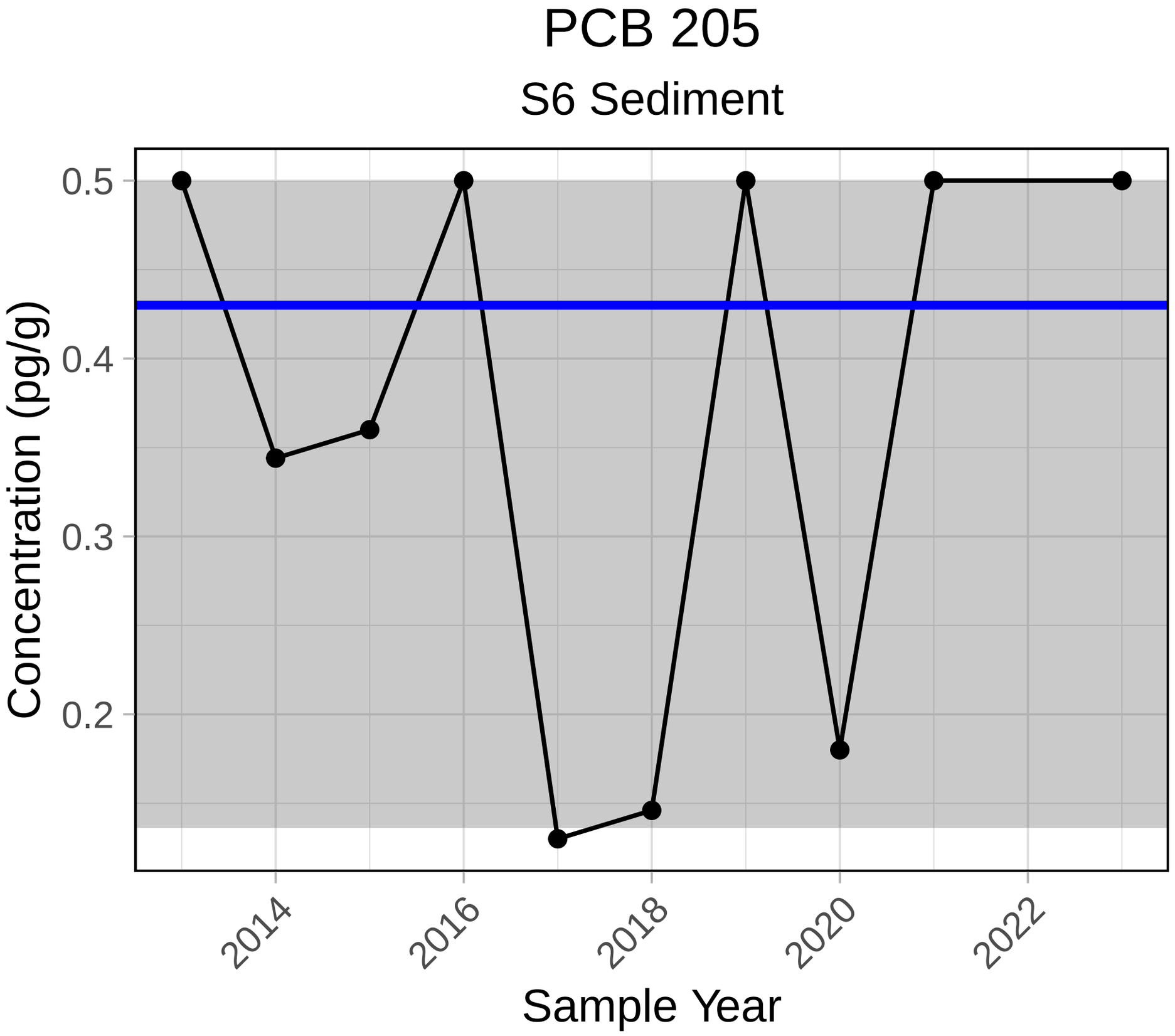
Trend significance p−value = 0.076

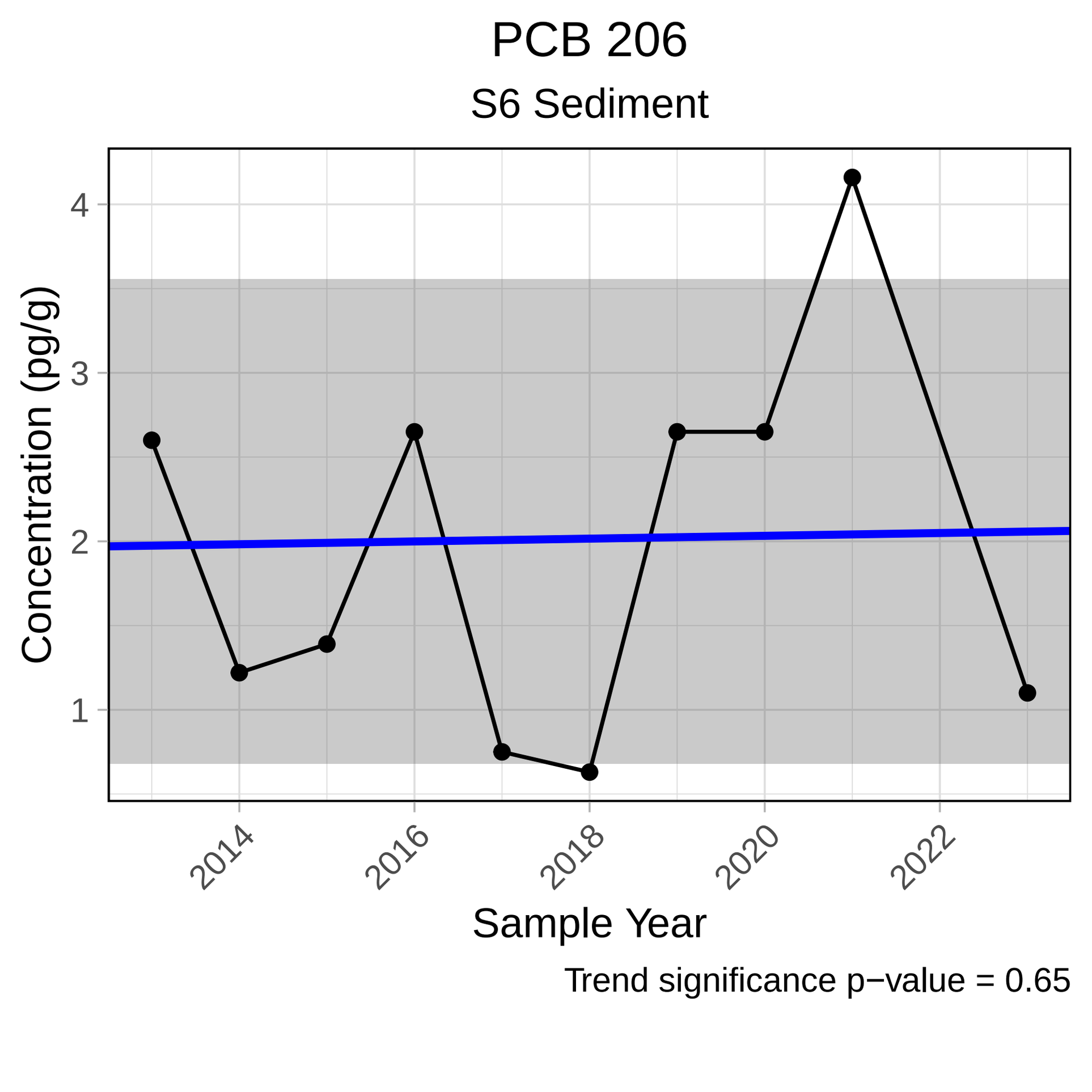

PCB 197
S6 Sediment
1.00
0.75
0.50
0.25
Concentration (pg/g)
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.564

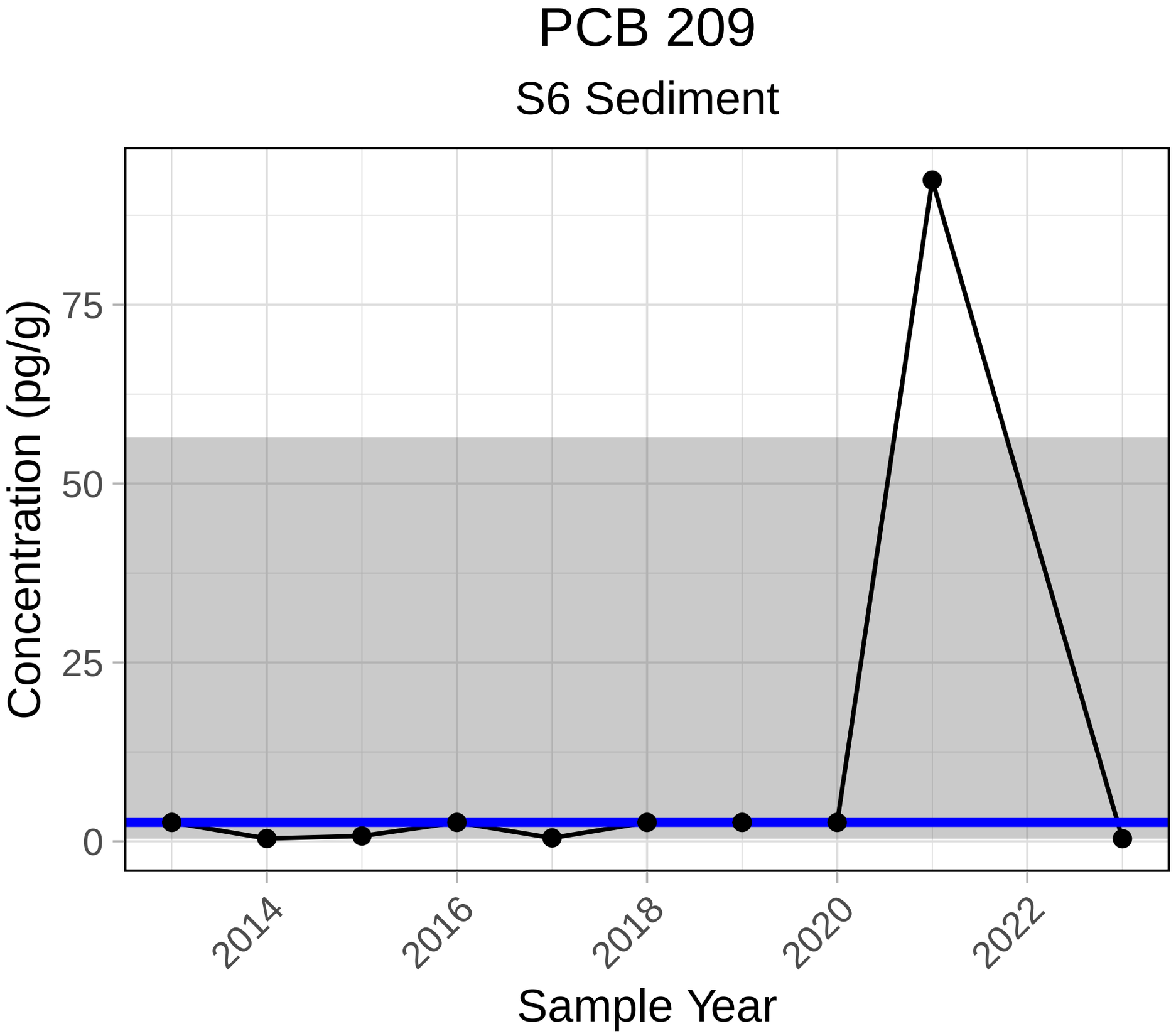

PCB 200
S6 Sediment
Concentration (pg/g)
2.5
2.0
1.5
1.0
0.5
2013
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.243

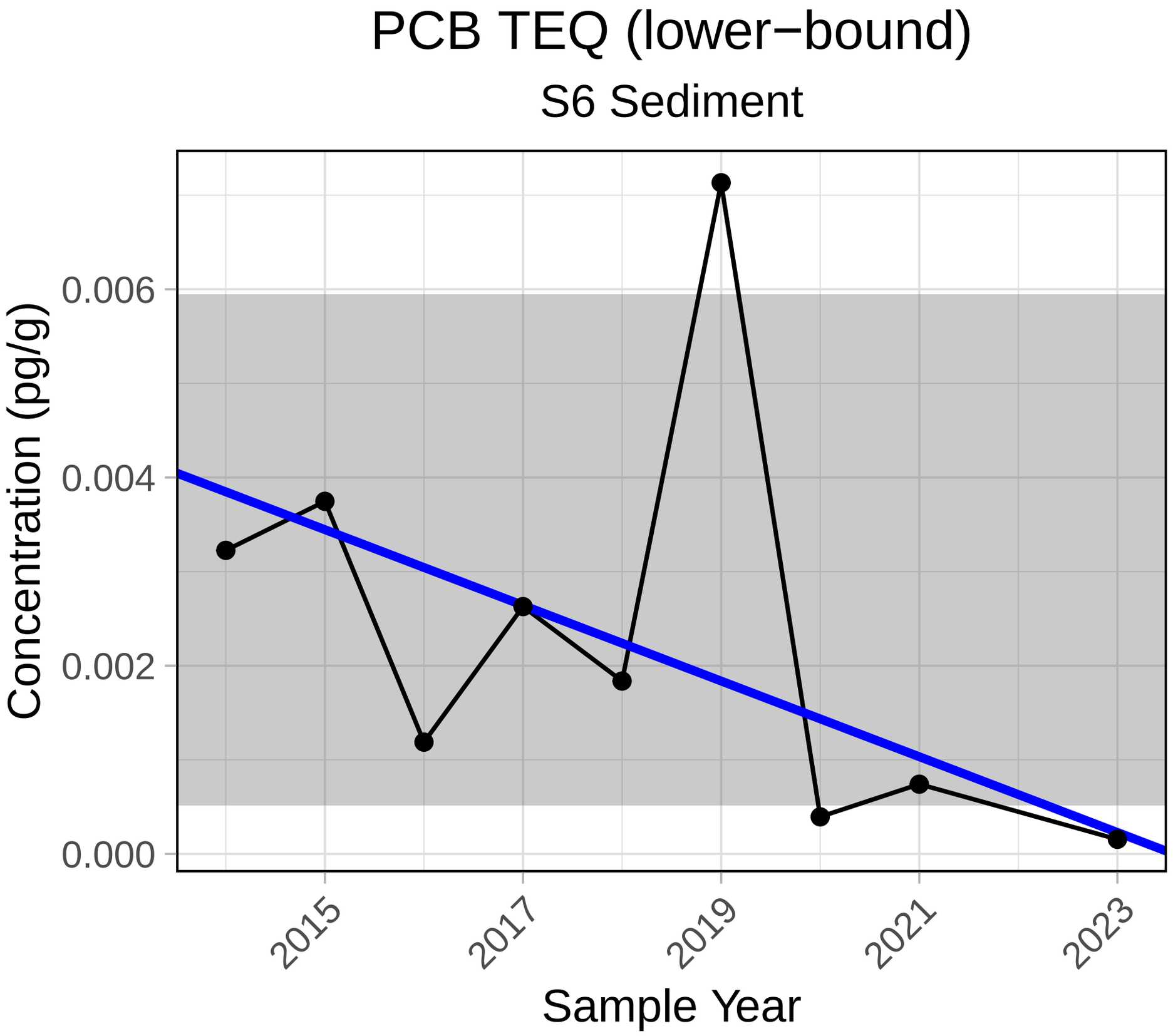

PCB 202
S6 Sediment
Concentration (pg/g)
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.152

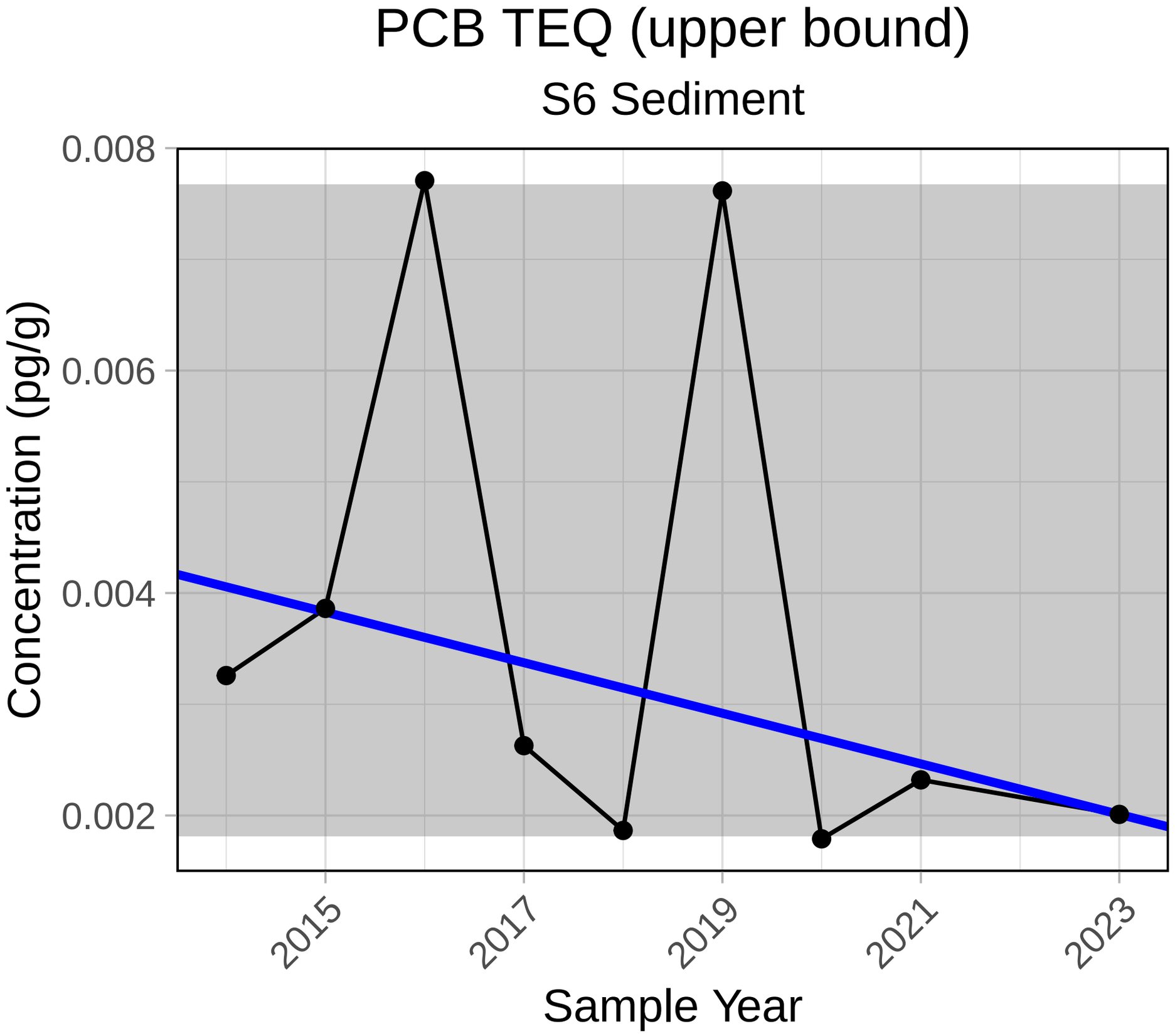

PCB 203
S6 Sediment
Concentration (pg/g)
6
5
4
3
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.175

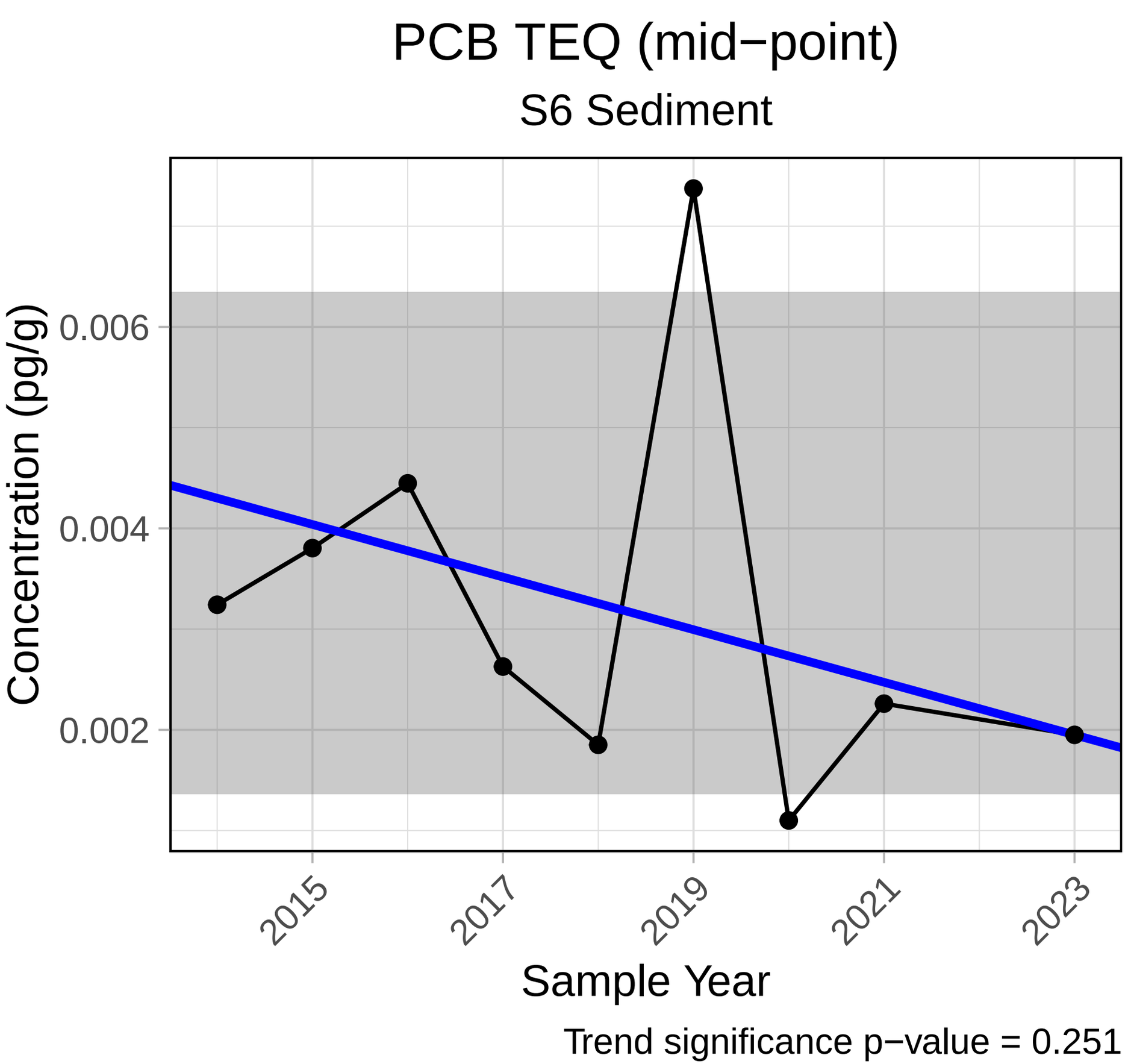

PCB 205
S6 Sediment
Concentration (pg/g)
0.5
0.4
0.3
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.701

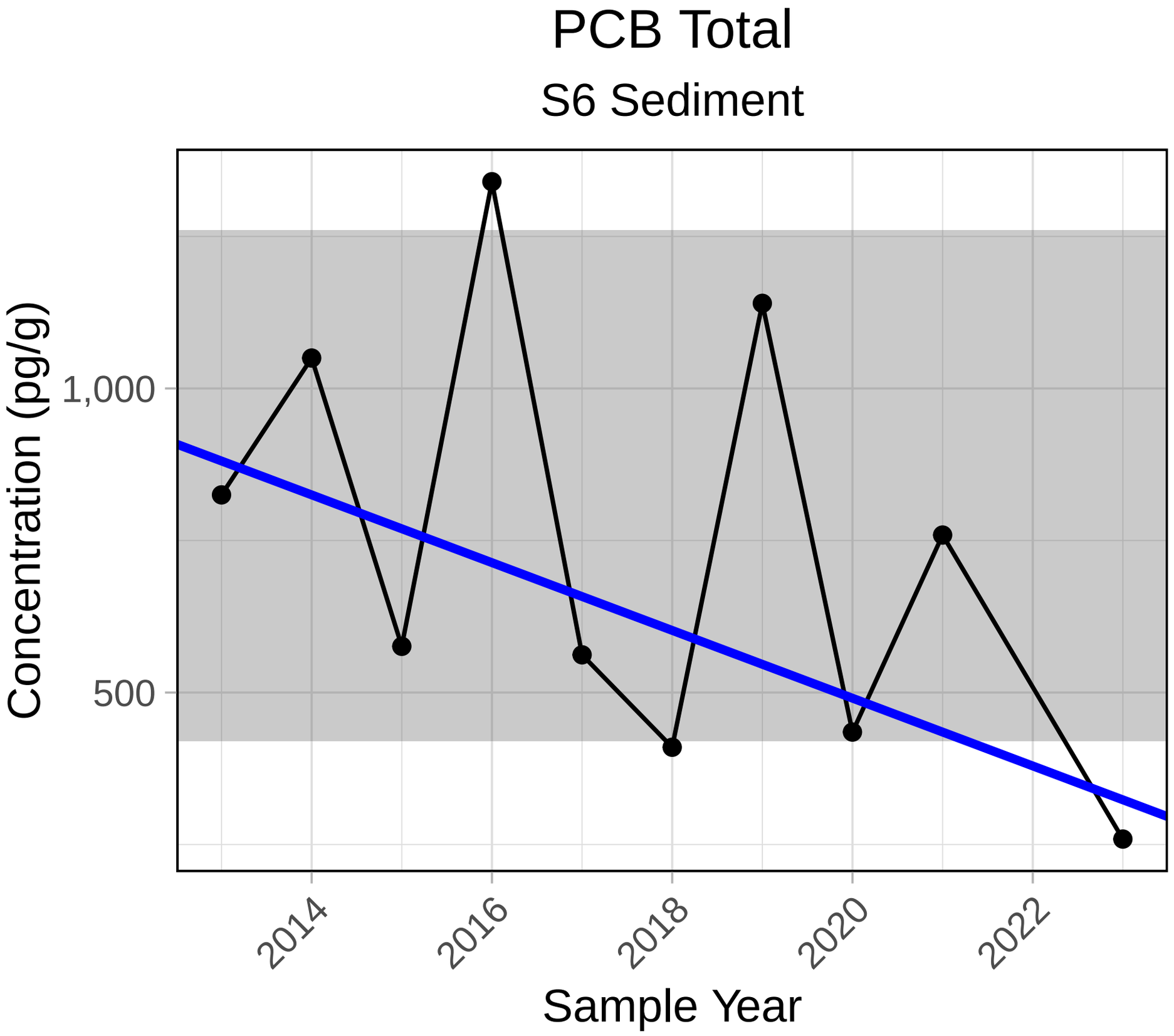

PCB 206
S6 Sediment
Concentration (pg/g)
4
3
2
1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.65


PCB 209
S6 Sediment
Concentration (pg/g)
75
50
25
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.564


PCB TEQ (lower−bound)
S6 Sediment
Concentration (pg/g)
0.006
0.004
0.002
0.000
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.076

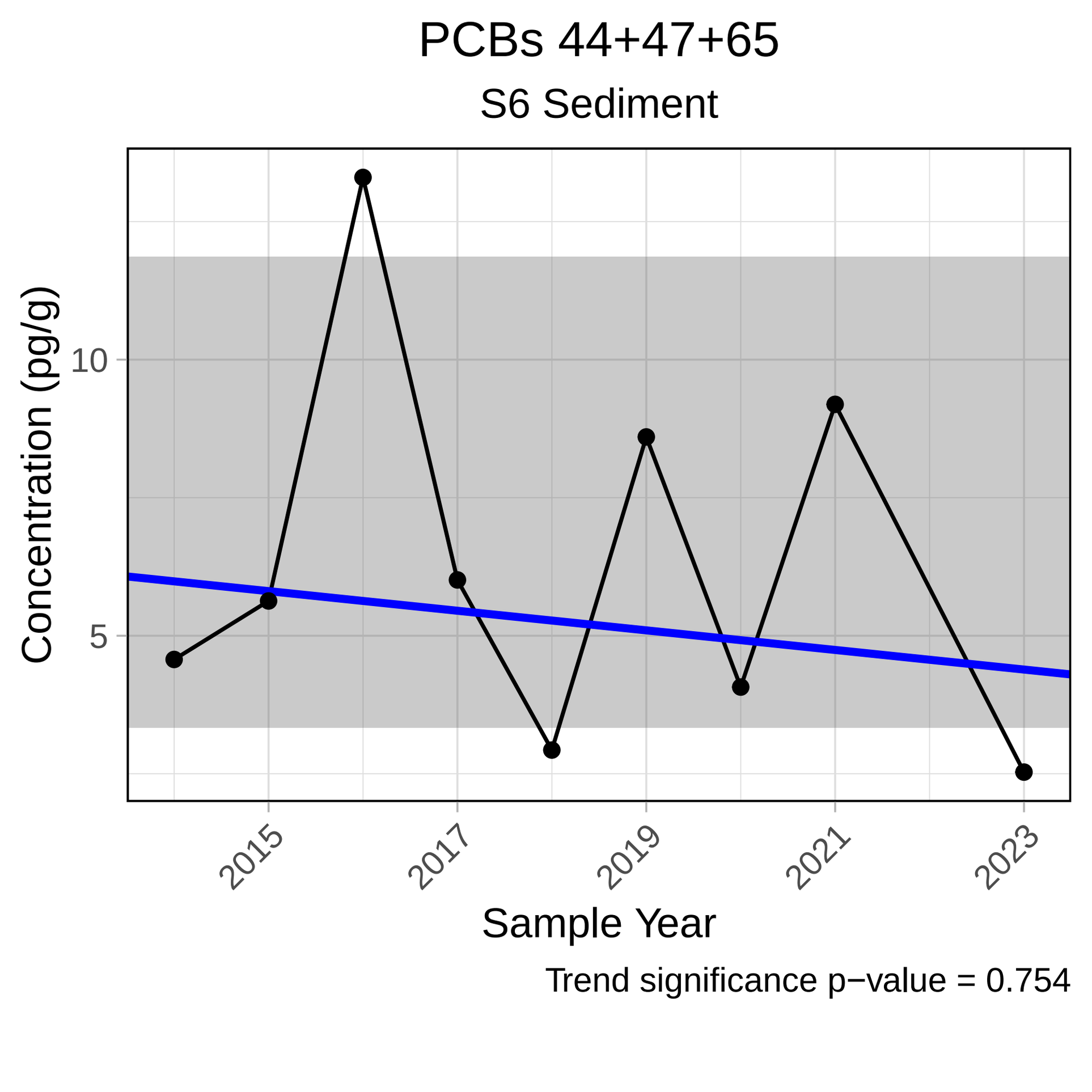

PCB TEQ (upper bound)
S6 Sediment
0.008
0.006
0.004
0.002
Concentration (pg/g)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.175

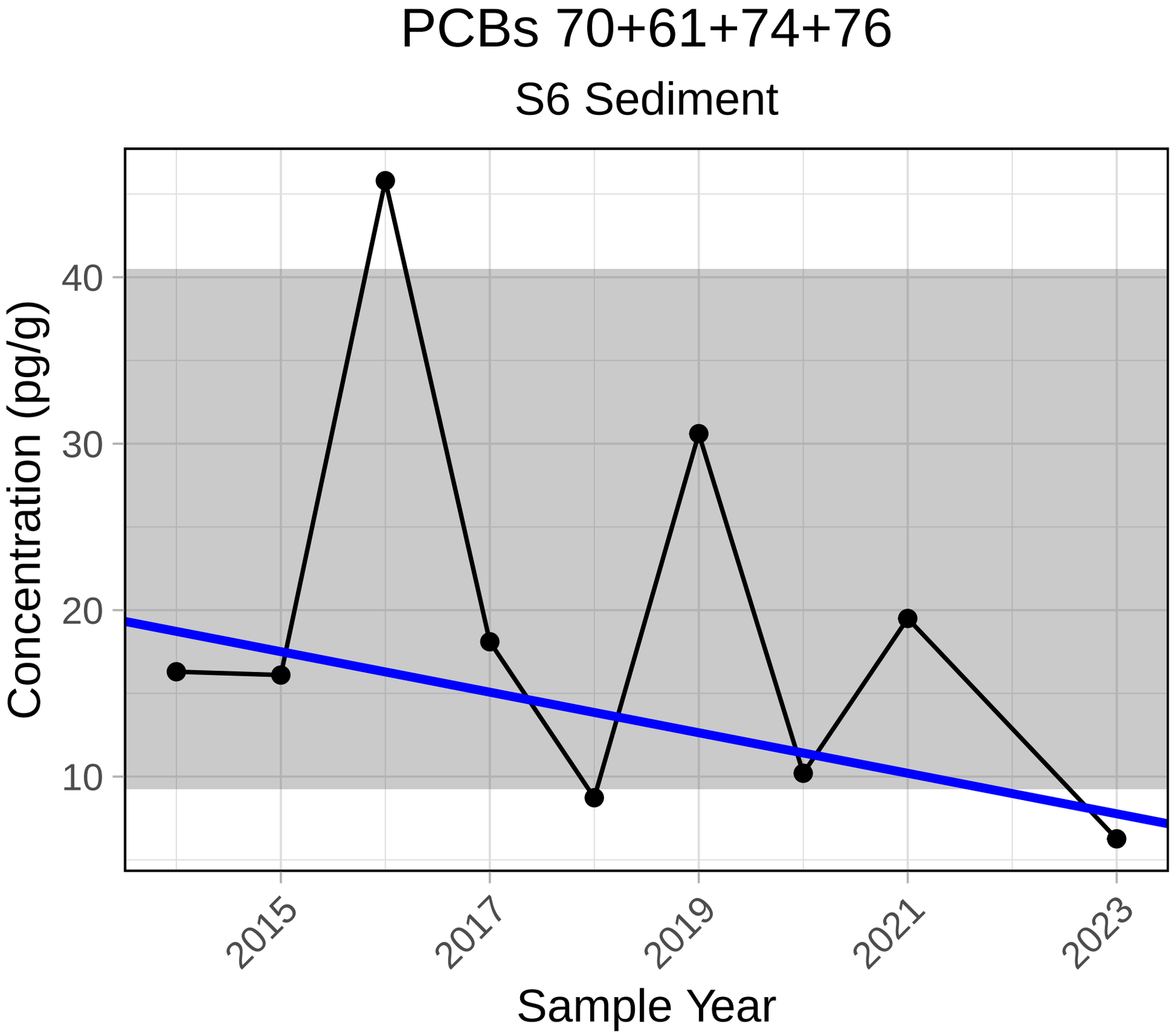

PCB TEQ (mid−point)
S6 Sediment
Concentration (pg/g)
0.006
0.004
0.002
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

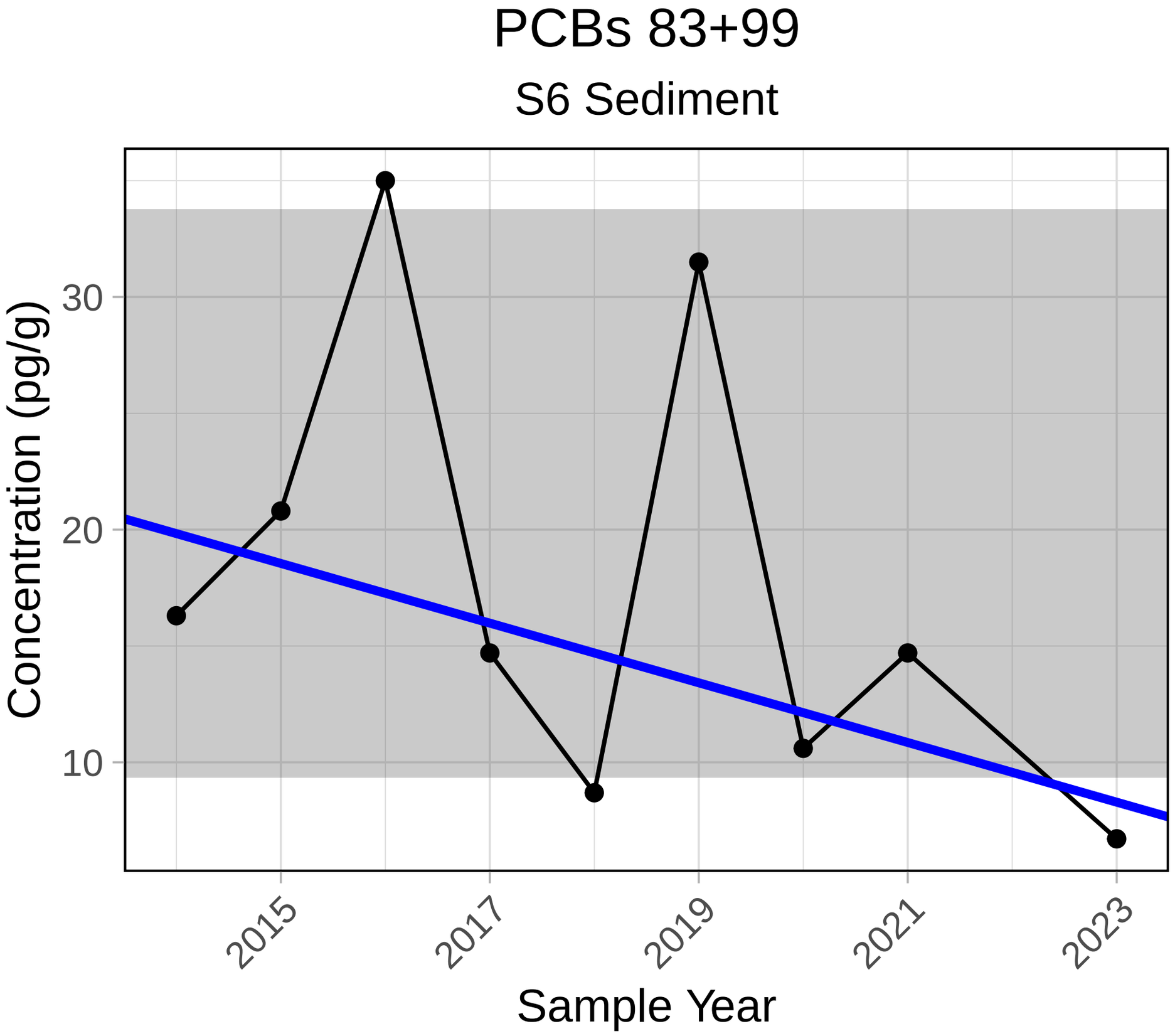


Trend significance p−value = 0.152
ISQG level = 34100 pg/g (maximum)
PEL level = 277000 pg/g (maximum)

PCBs 41+71+40
S6 Sediment
Concentration (pg/g)
6
4
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.402

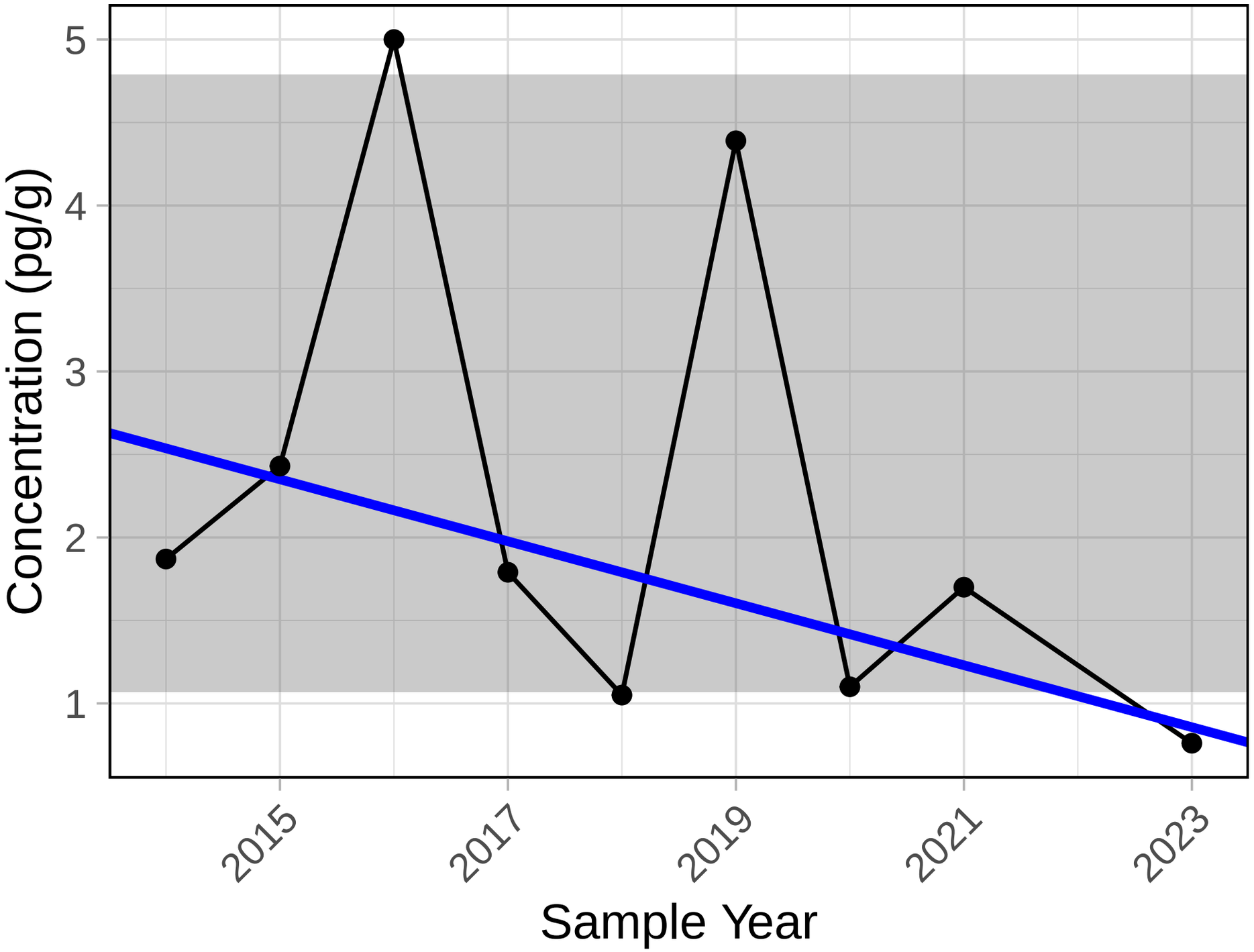

PCBs 44+47+65
S6 Sediment
Concentration (pg/g)
10
5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.754


PCBs 70+61+74+76
S6 Sediment
Concentration (pg/g)
40
30
20
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.466

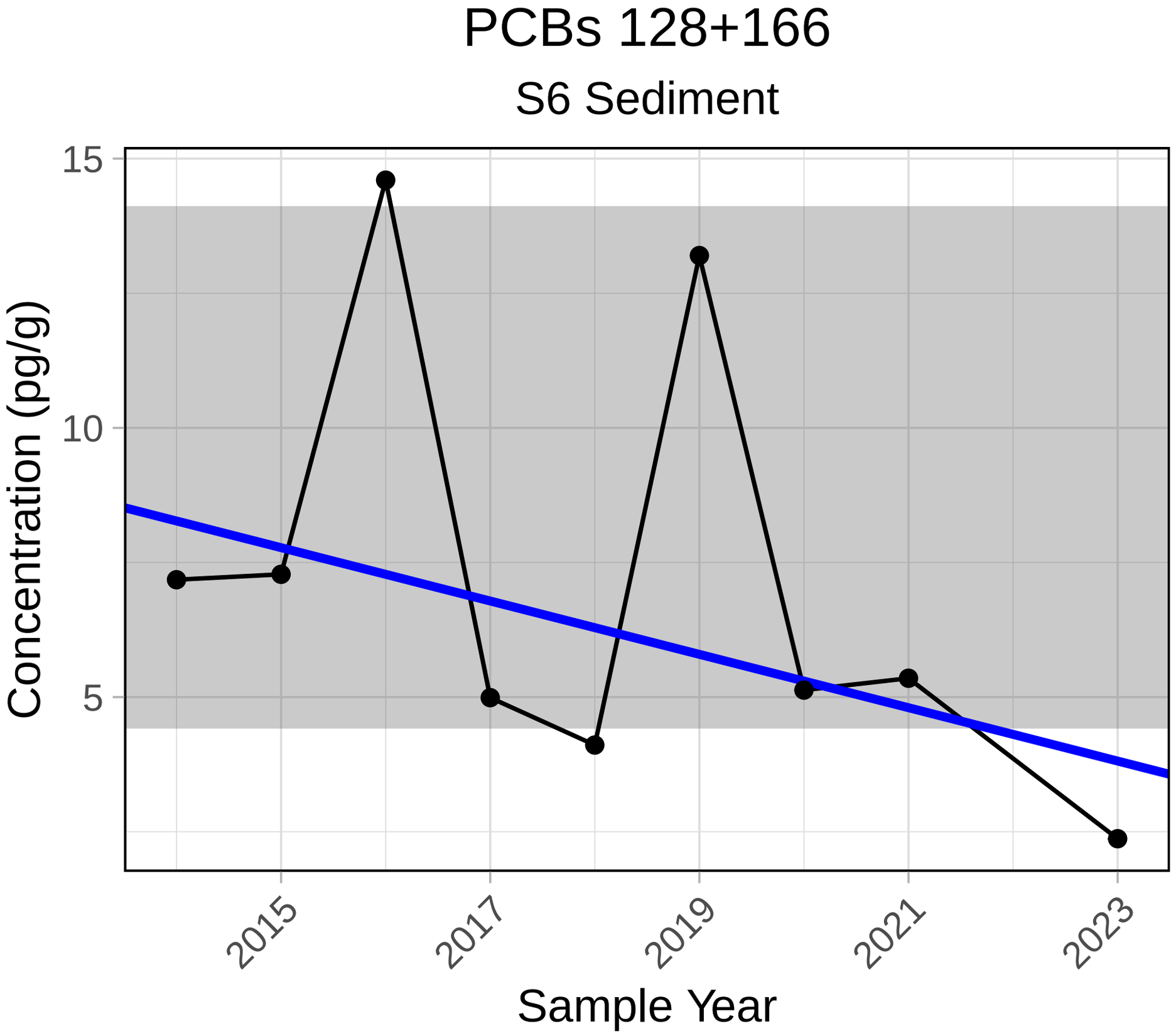

PCBs 83+99
S6 Sediment
Concentration (pg/g)
30
20
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.142

PCBs 88+91

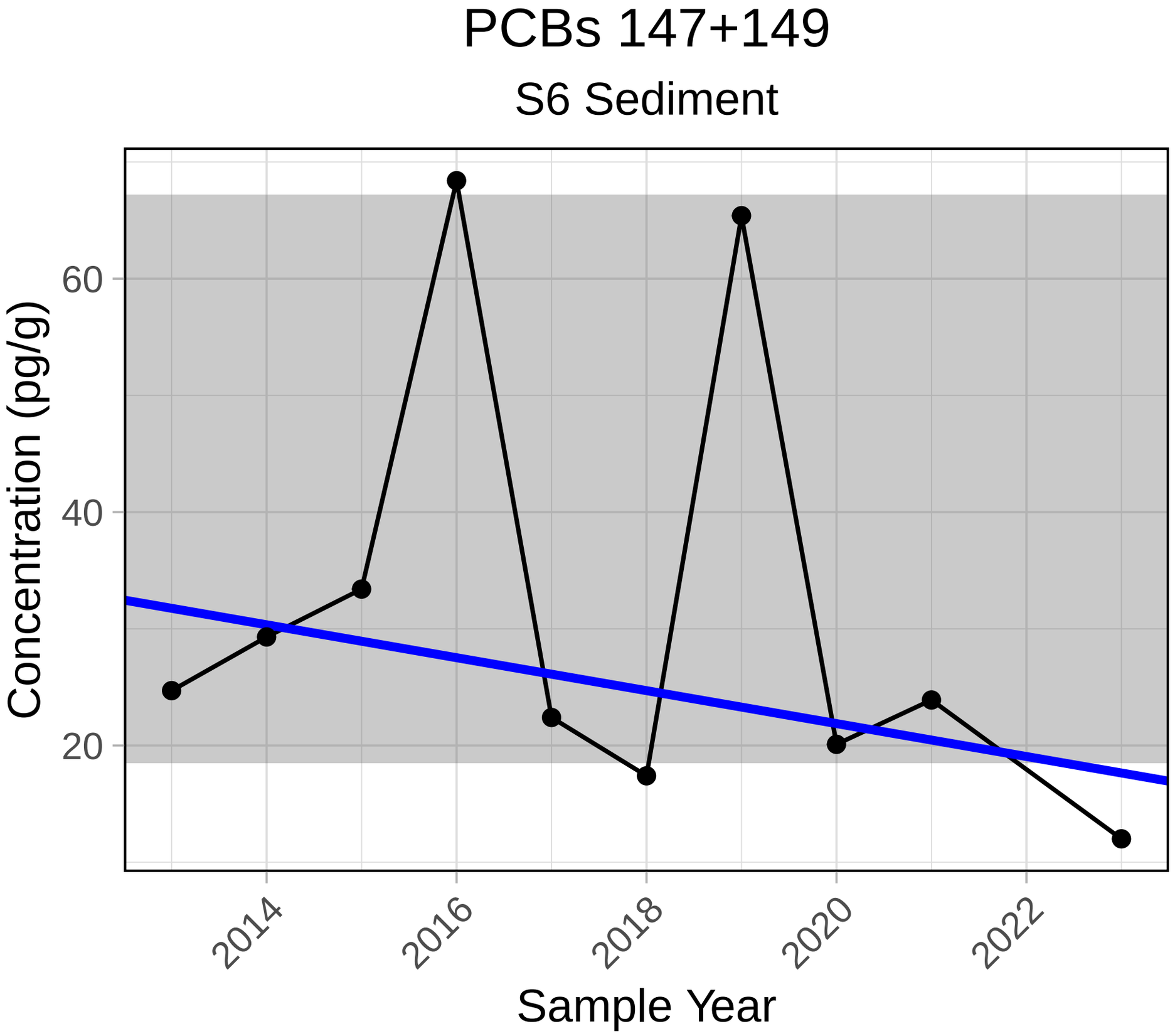
S6 Sediment

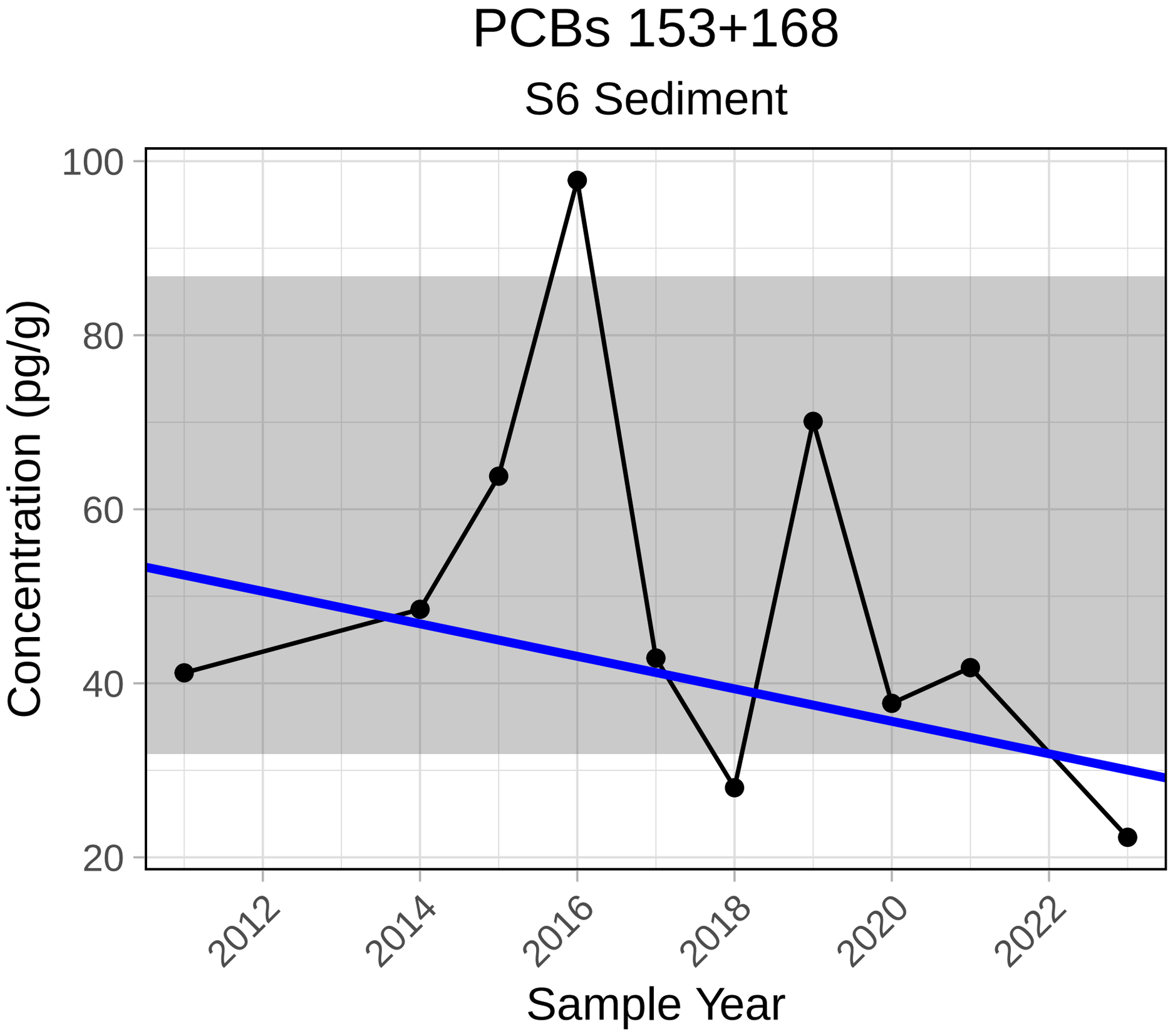


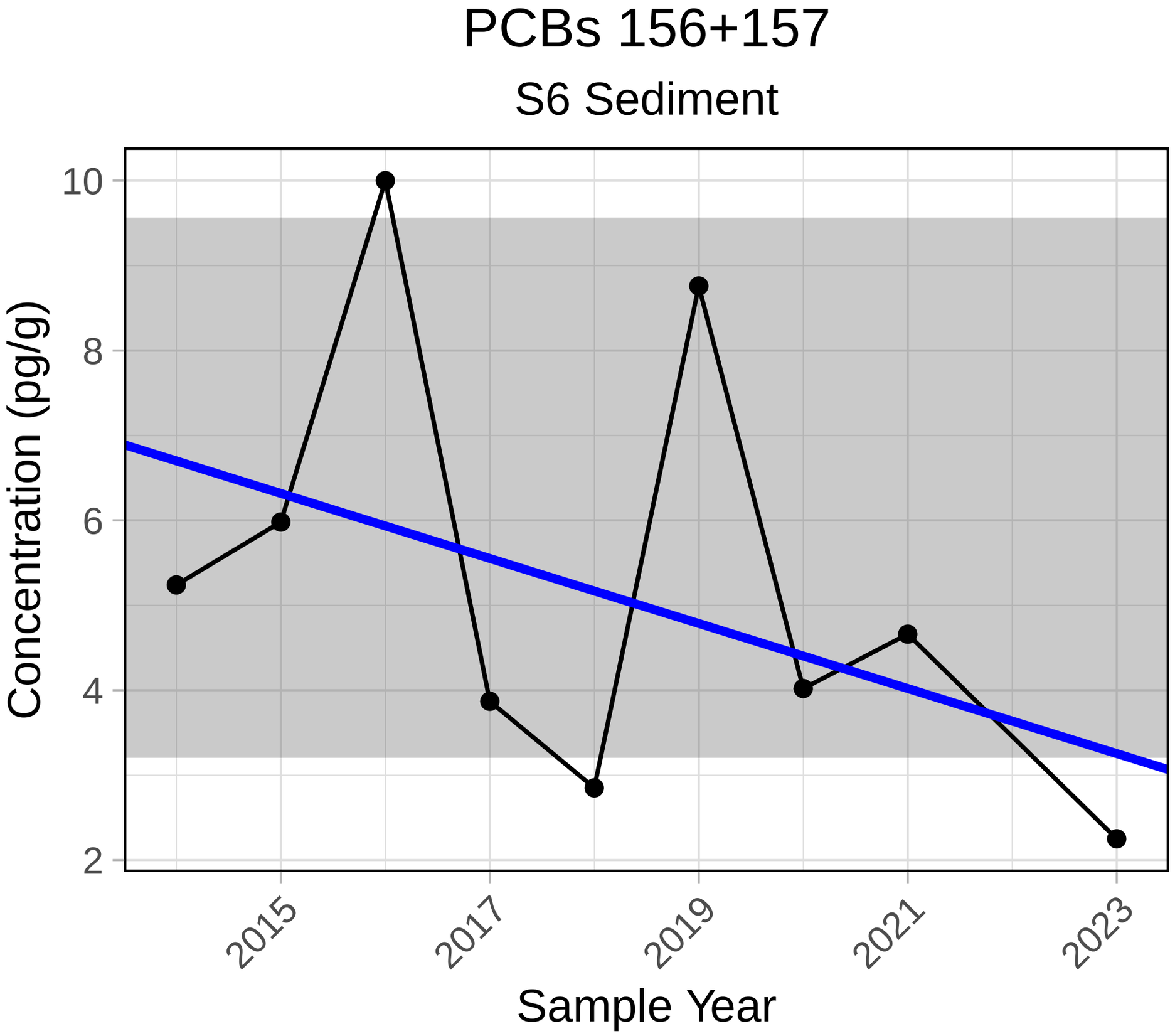
Trend significance p−value = 0.118

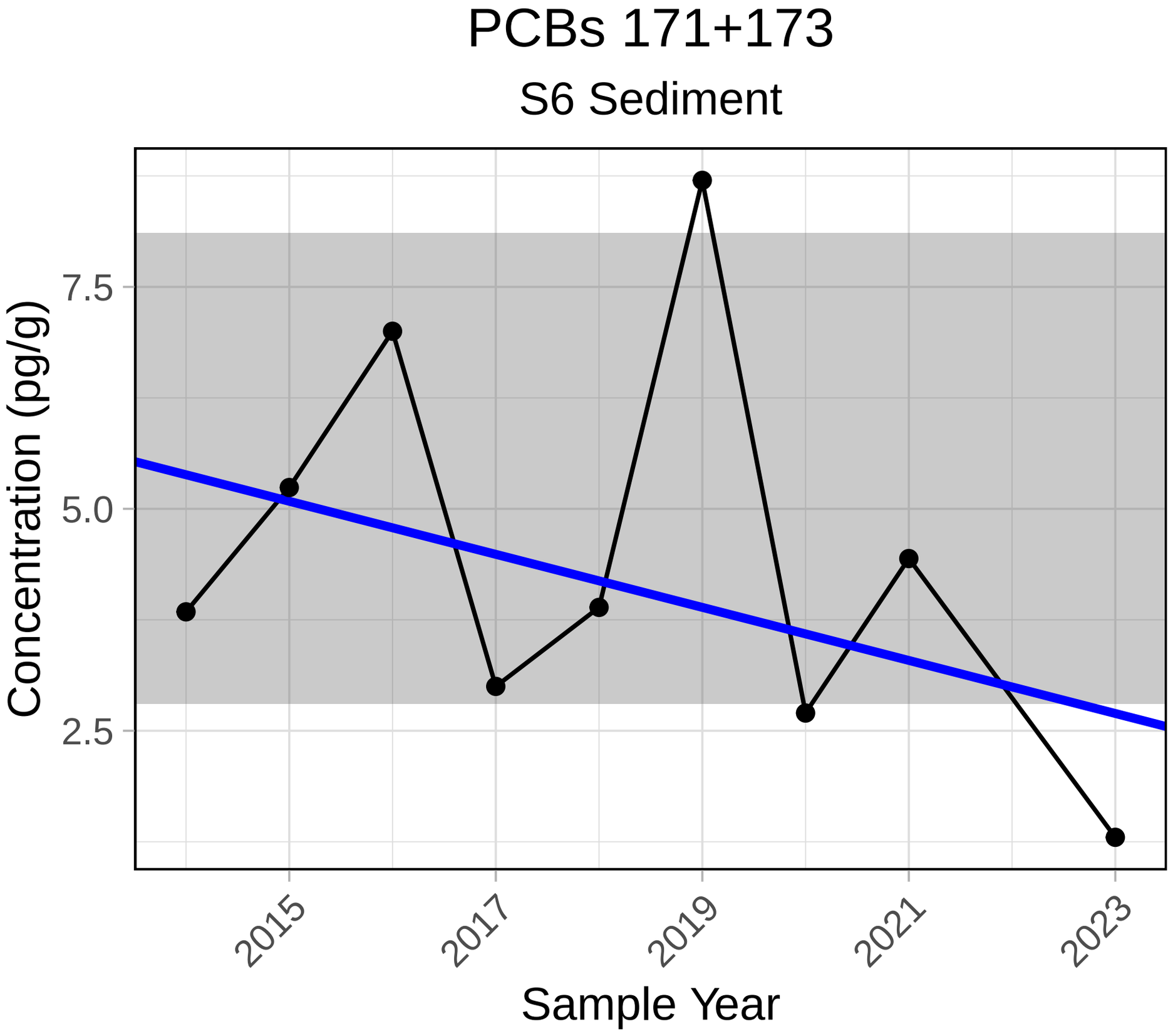

PCBs 128+166
S6 Sediment
15
10
5
Concentration (pg/g)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

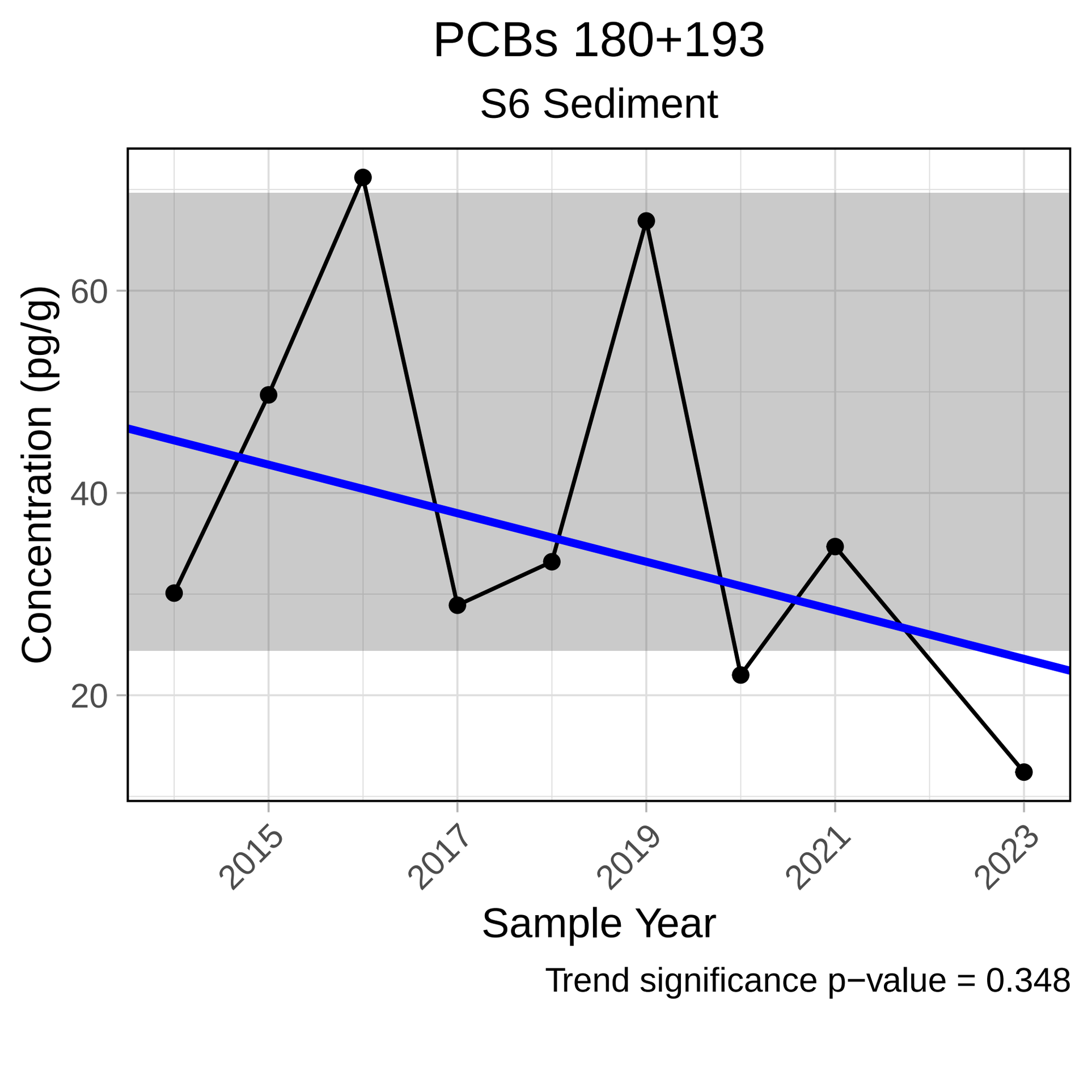
PCBs 134+143
S6 Sediment
Concentration (pg/g)
3
2
1
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.348

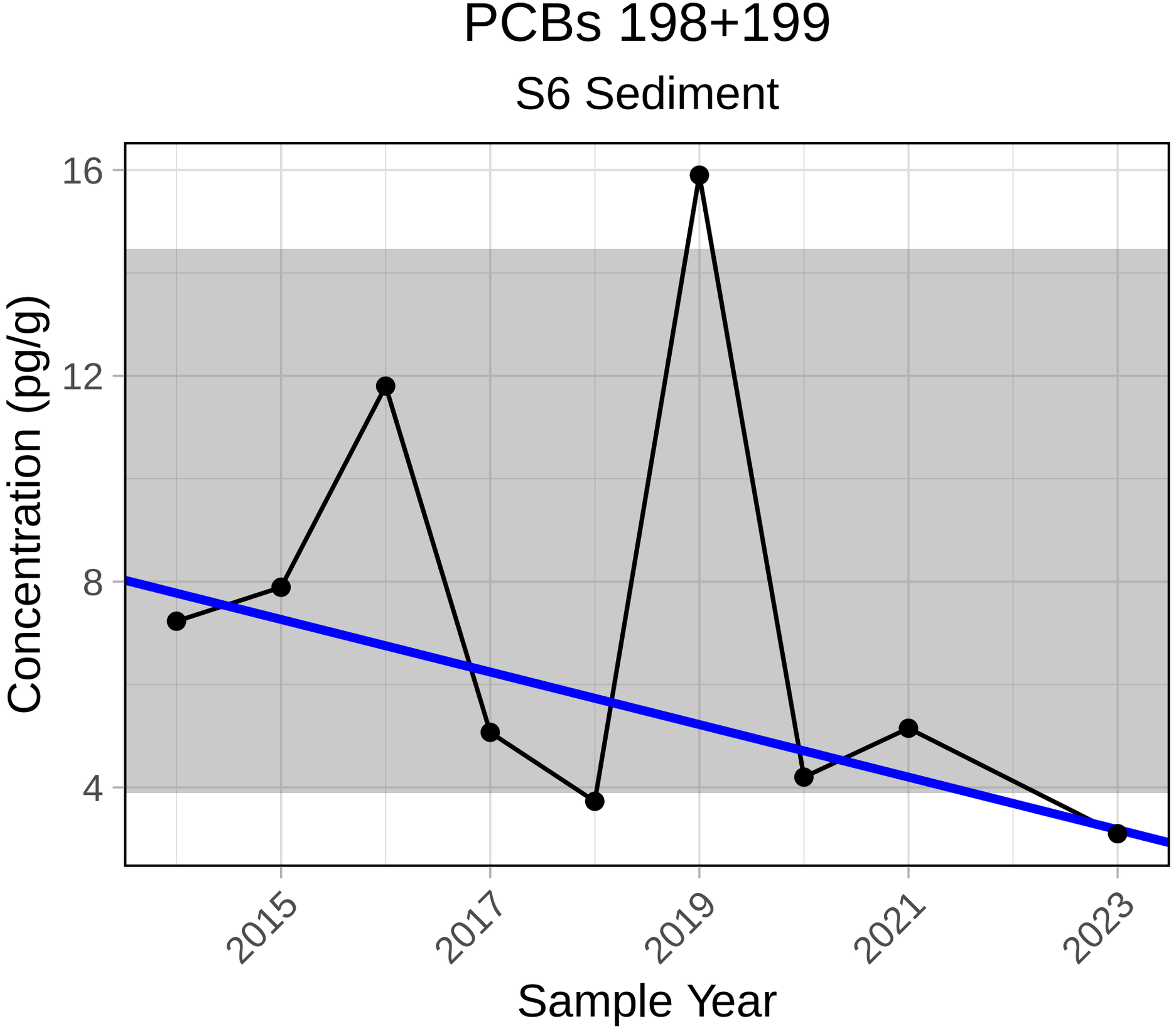

PCBs 147+149
S6 Sediment
Concentration (pg/g)
60
40
20
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21

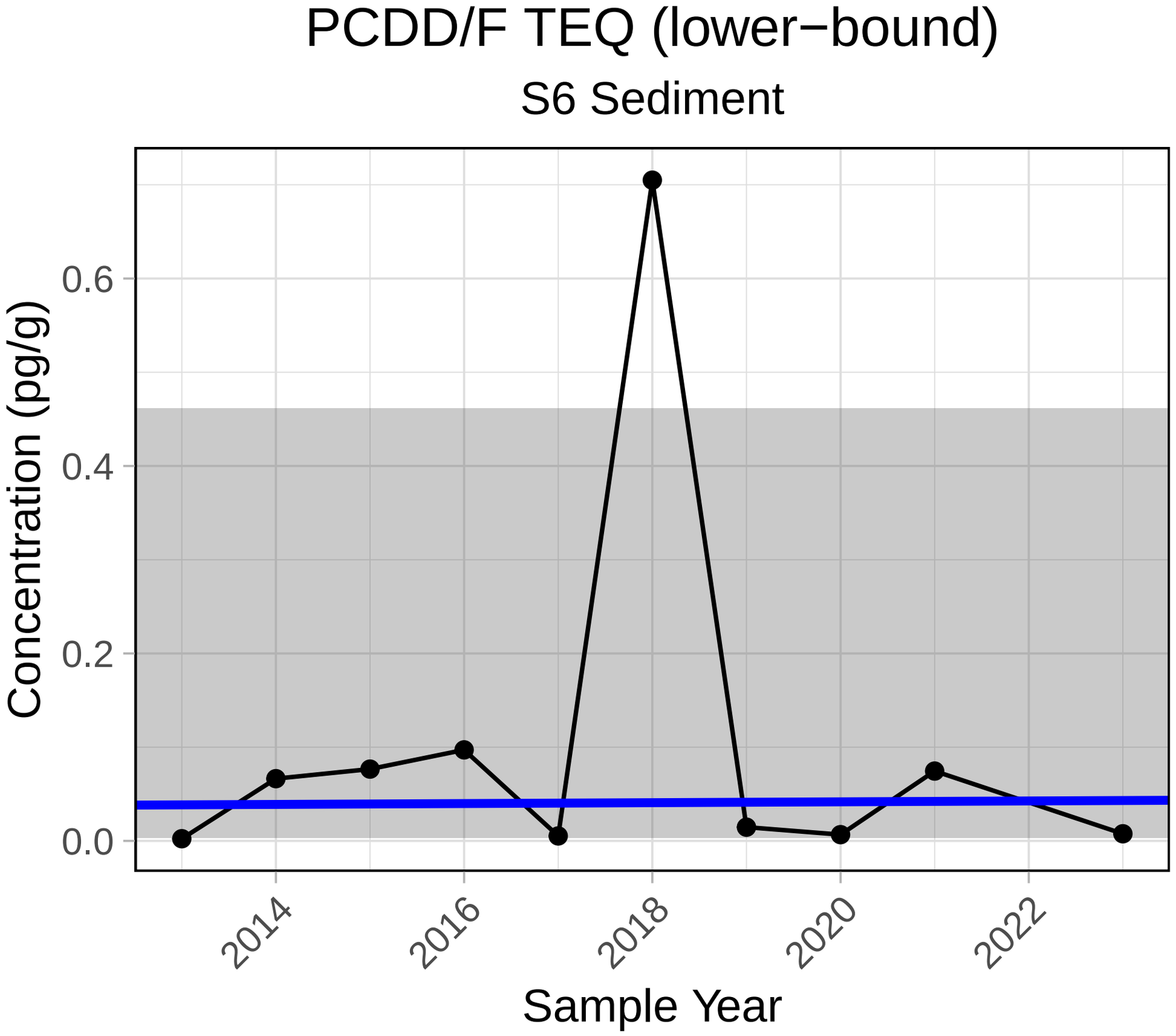

PCBs 153+168
S6 Sediment
Concentration (pg/g)
100
80
60
40
20
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.283

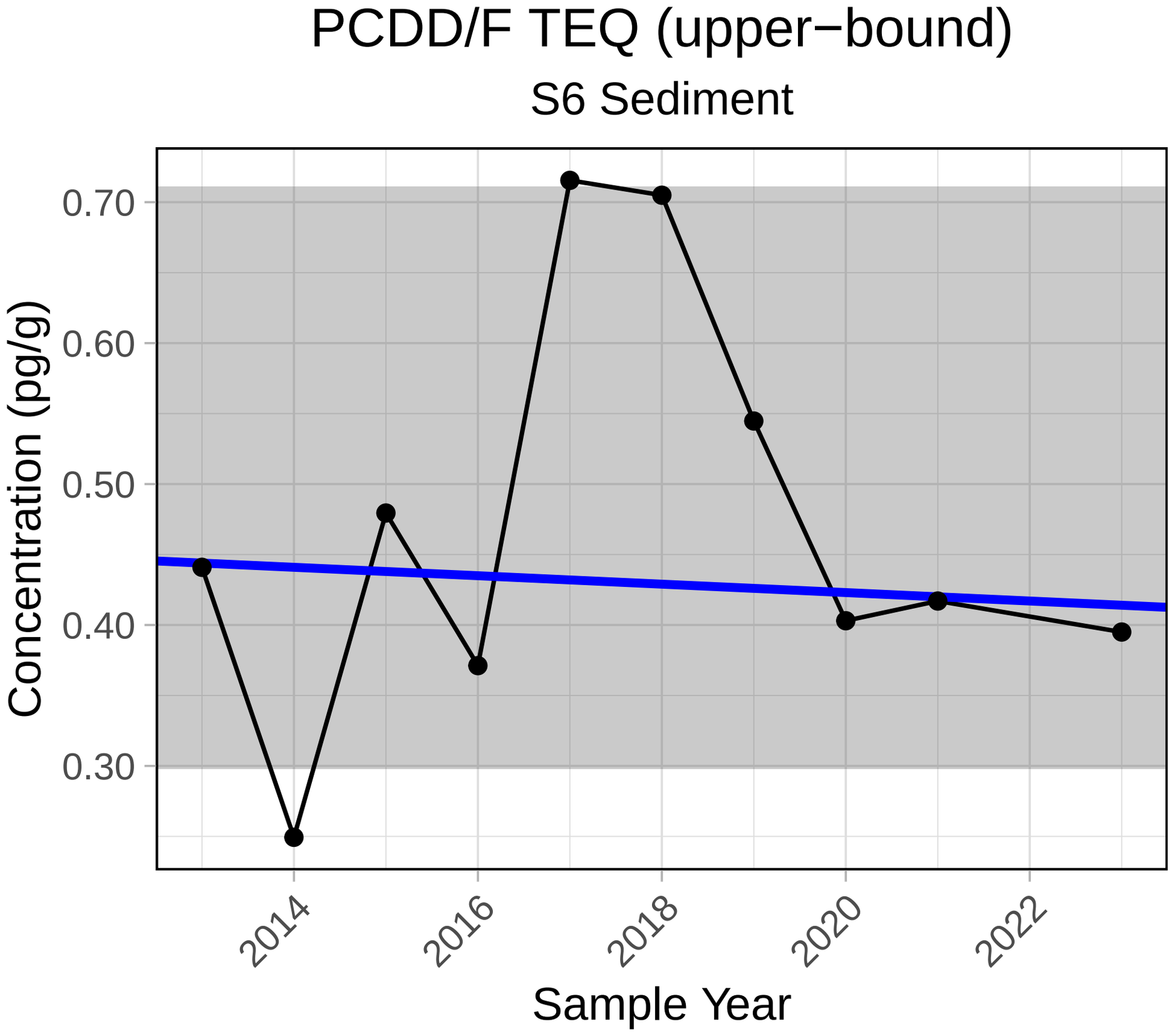

PCBs 156+157
S6 Sediment
Concentration (pg/g)
10
8
6
4
2
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

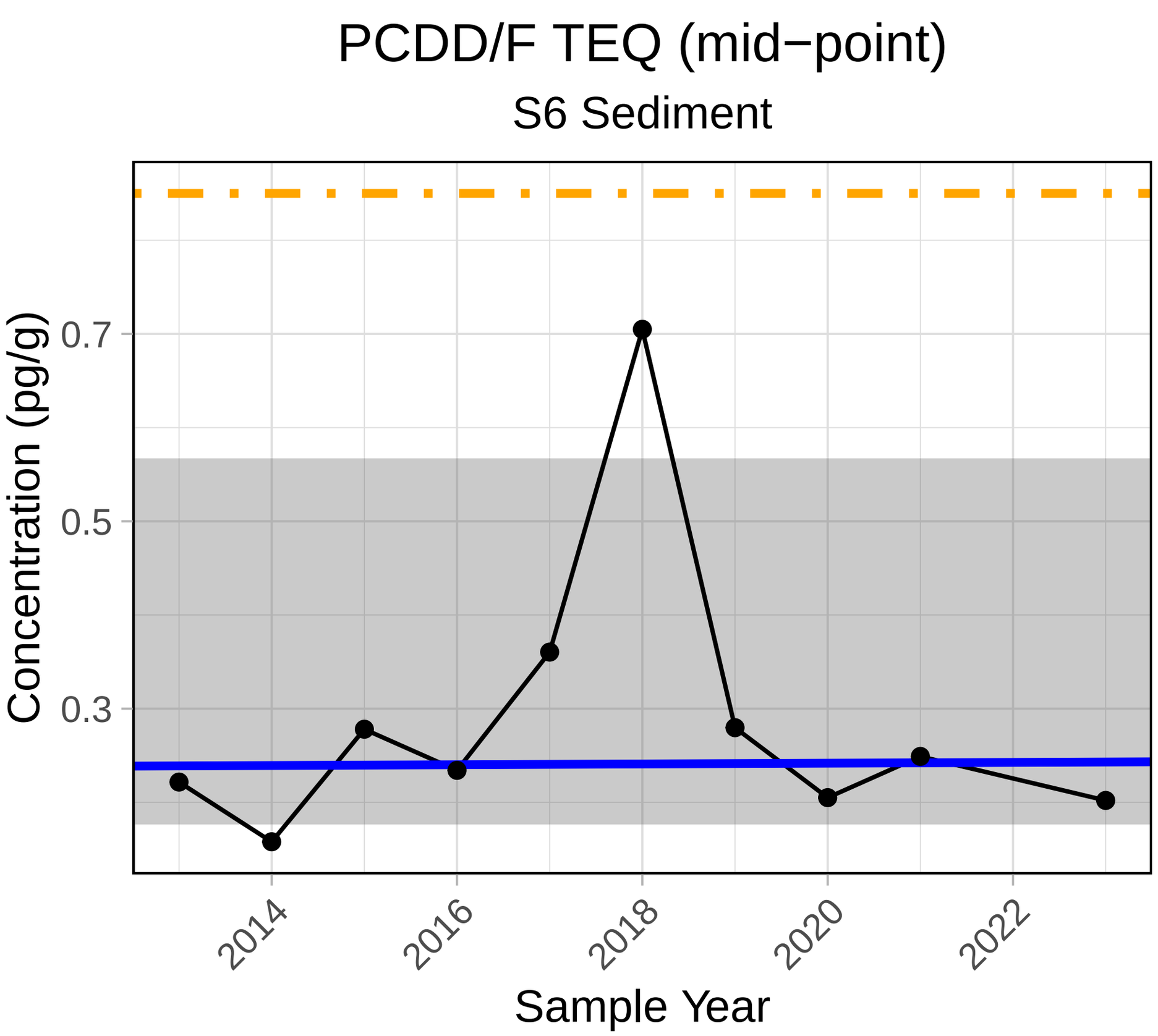

PCBs 171+173
S6 Sediment
Concentration (pg/g)
7.5
5.0
2.5
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.466


PCBs 180+193
S6 Sediment
Concentration (pg/g)
60
40
20
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.348

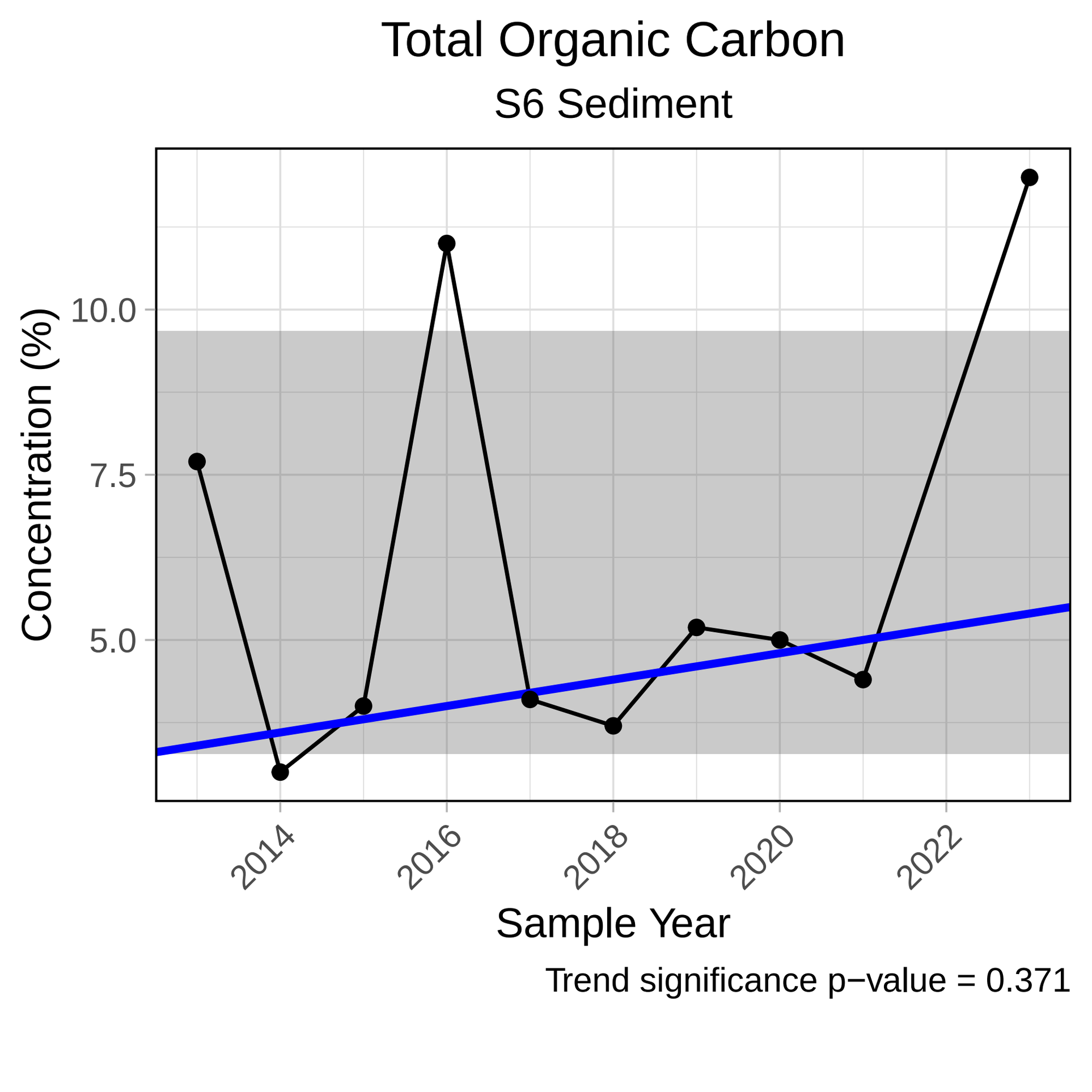

PCBs 198+199
S6 Sediment
16
12
8
4
Concentration (pg/g)
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.251

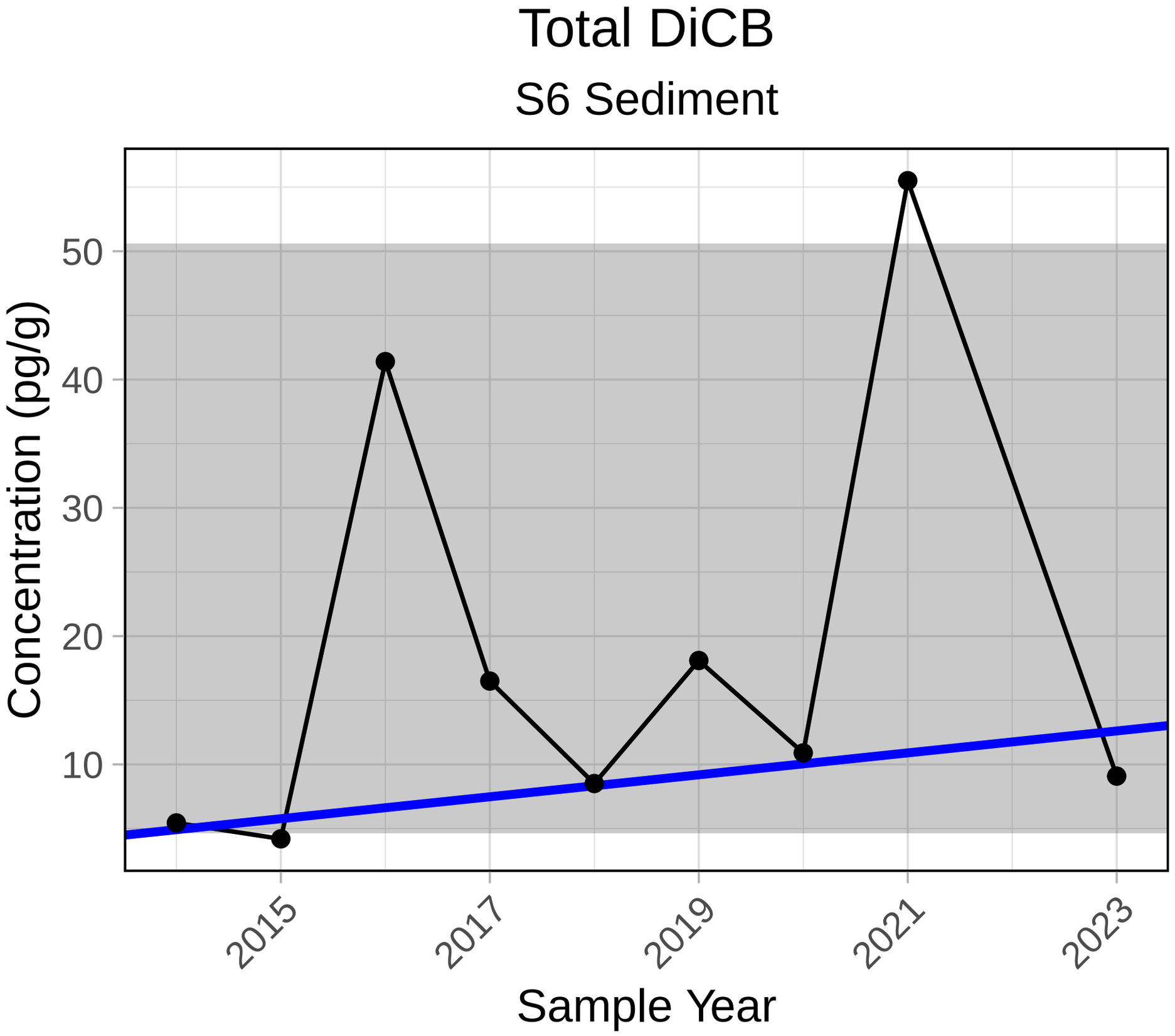

PCDD/F TEQ (lower−bound)
S6 Sediment
Concentration (pg/g)
0.6
0.4
0.2
0.0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858

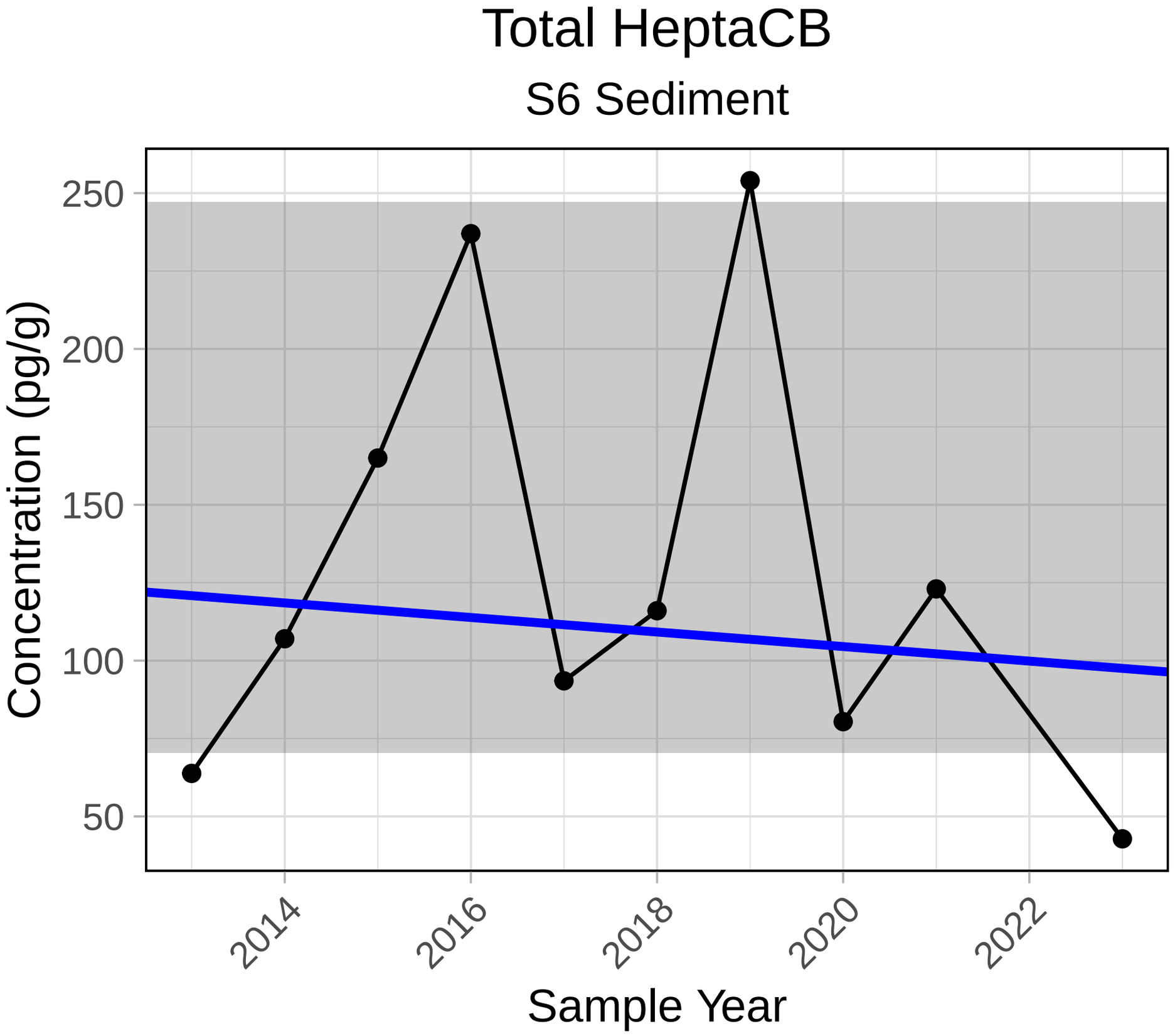

PCDD/F TEQ (upper−bound)
S6 Sediment
Concentration (pg/g)
0.70
0.60
0.50
0.40
0.30
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

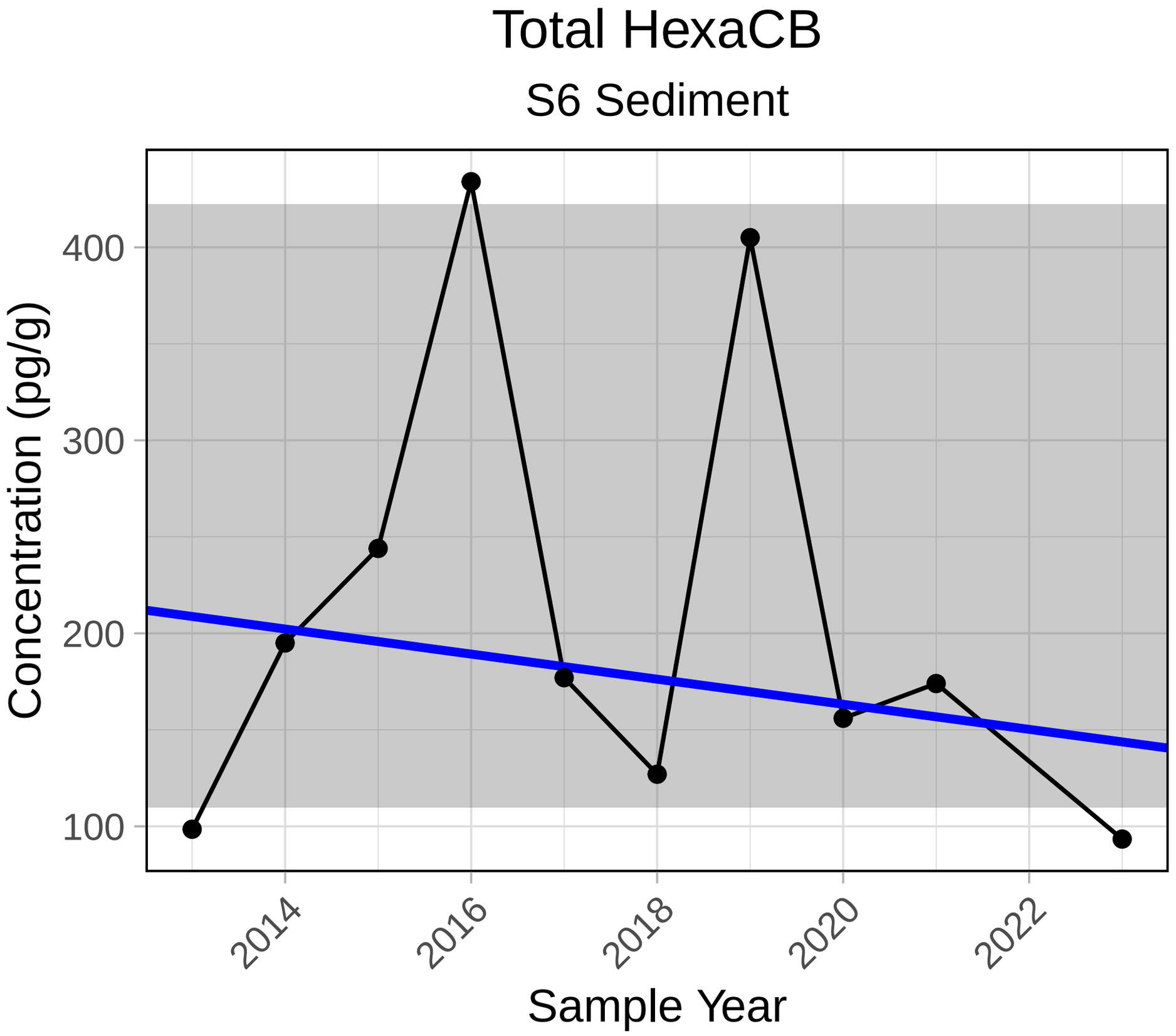


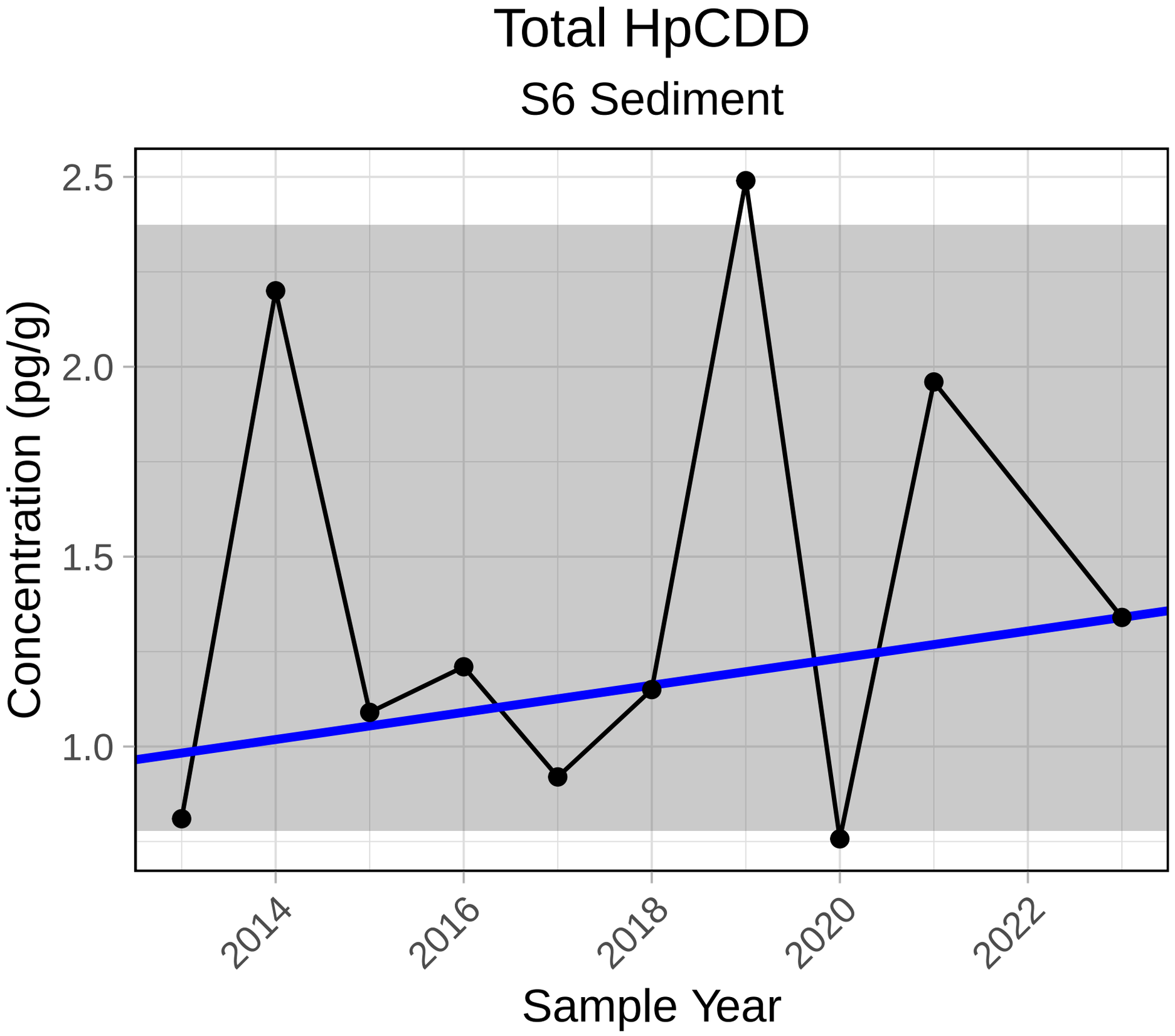
Trend significance p−value = 1
ISQG level = 0.85 pg/g (maximum)
PEL level = 21.5 pg/g (maximum)

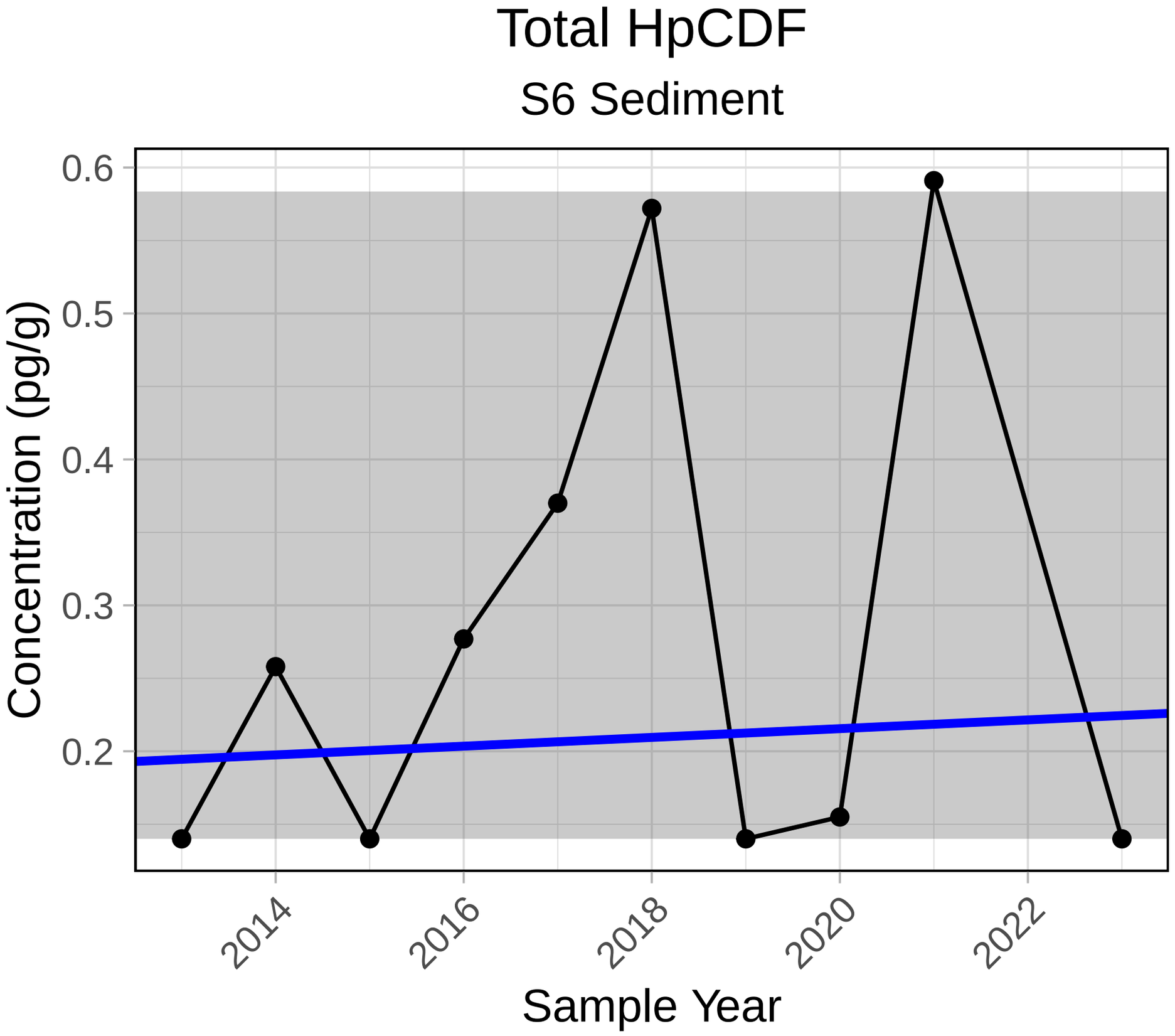

Total Organic Carbon
S6 Sediment
Concentration (%)
10.0
7.5
5.0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.371

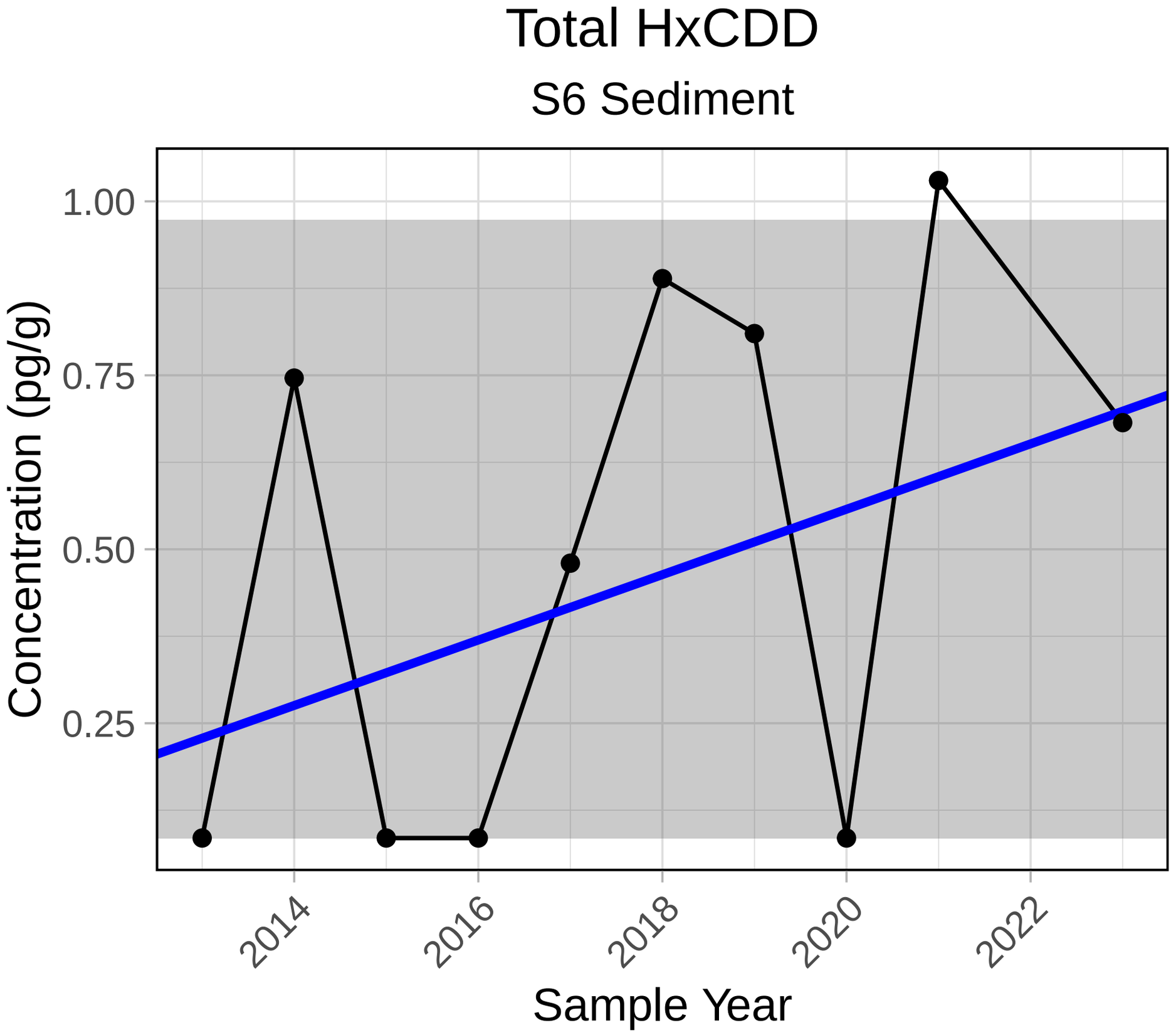

Total DiCB
S6 Sediment
Concentration (pg/g)
50
40
30
20
10
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.348

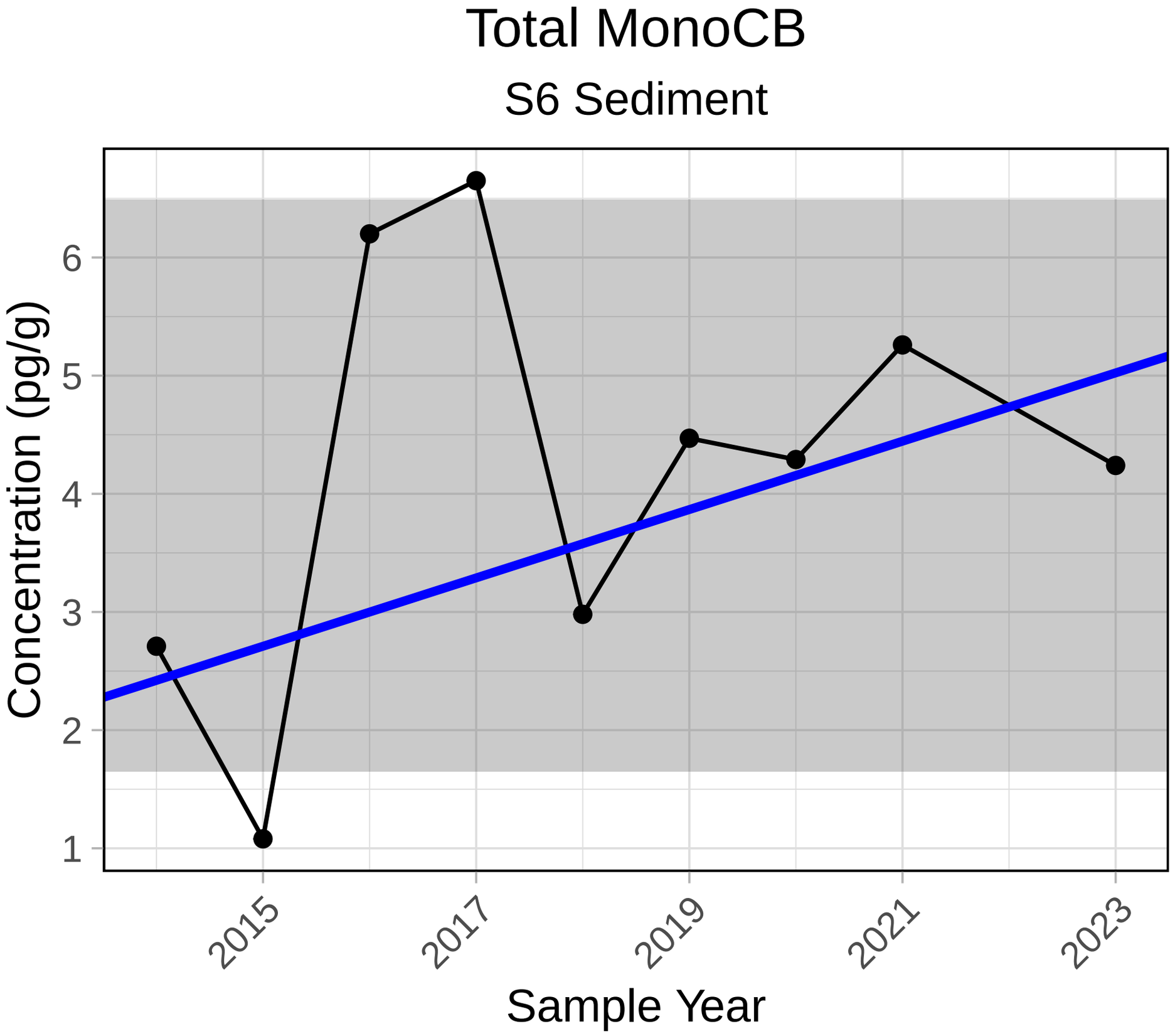

Total HeptaCB
S6 Sediment
250
200
150
100
50
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 1

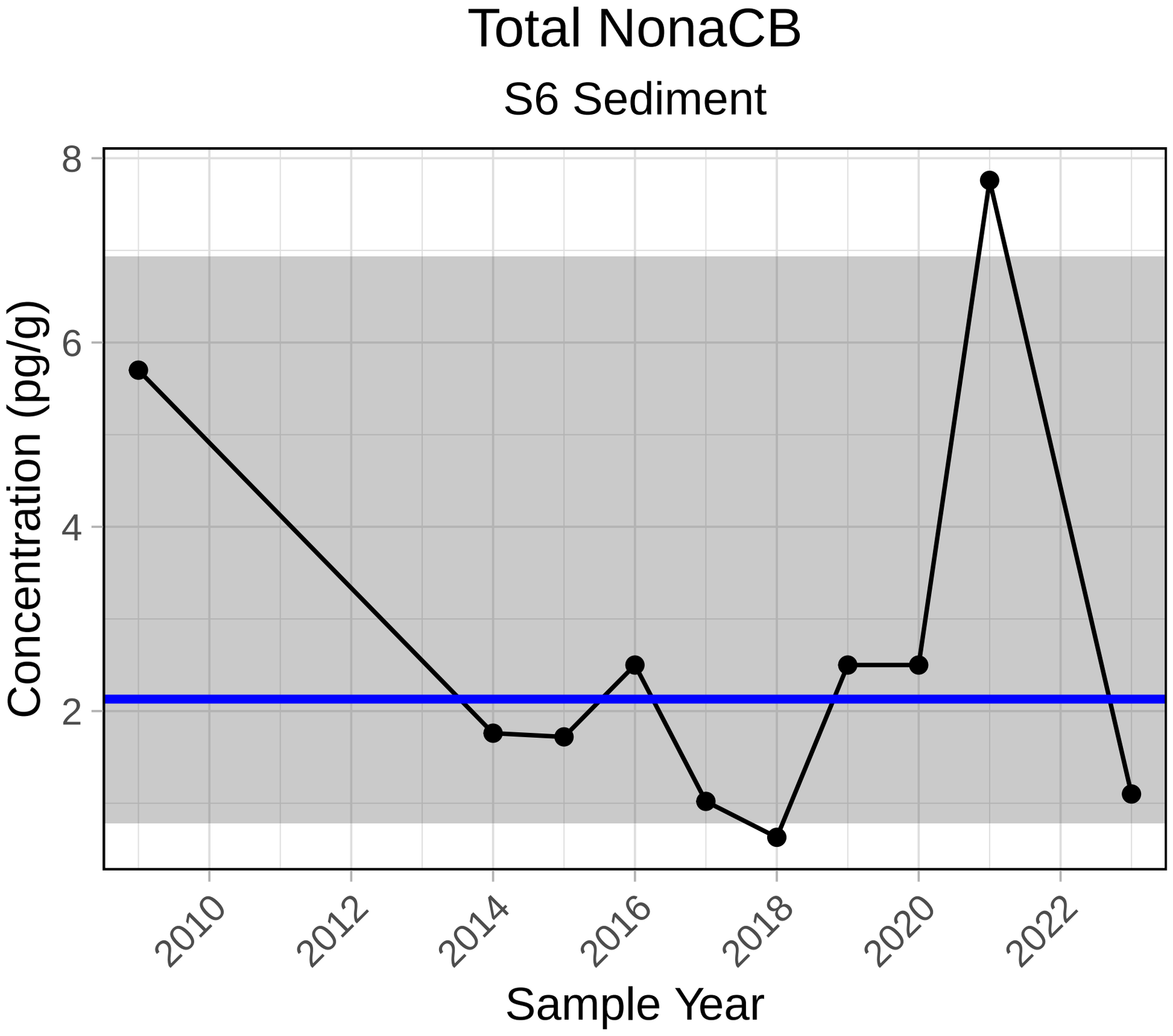

Total HexaCB
S6 Sediment
Concentration (pg/g)
400
300
200
100
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.474

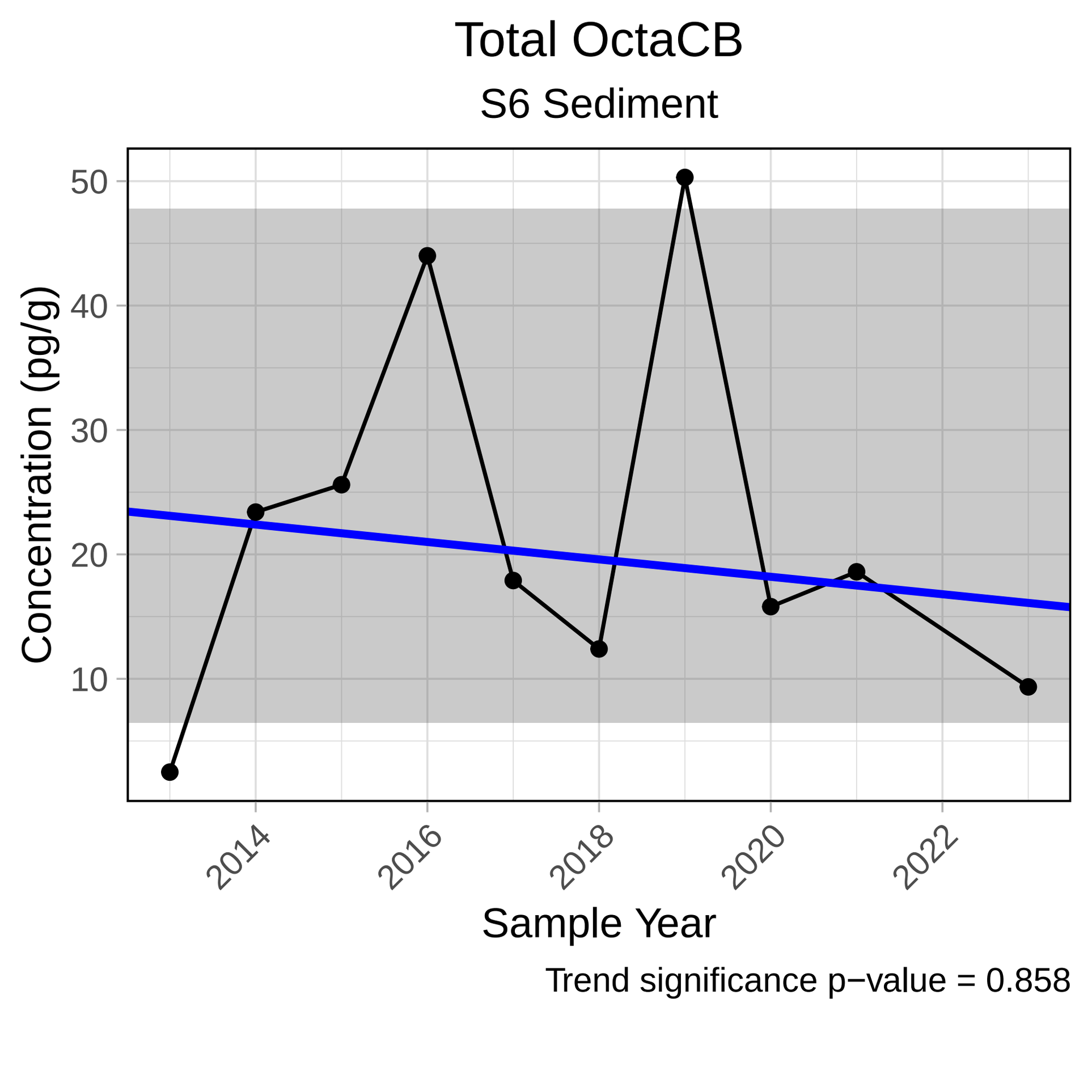

Total HpCDD
S6 Sediment
Concentration (pg/g)
2.5
2.0
1.5
1.0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.592

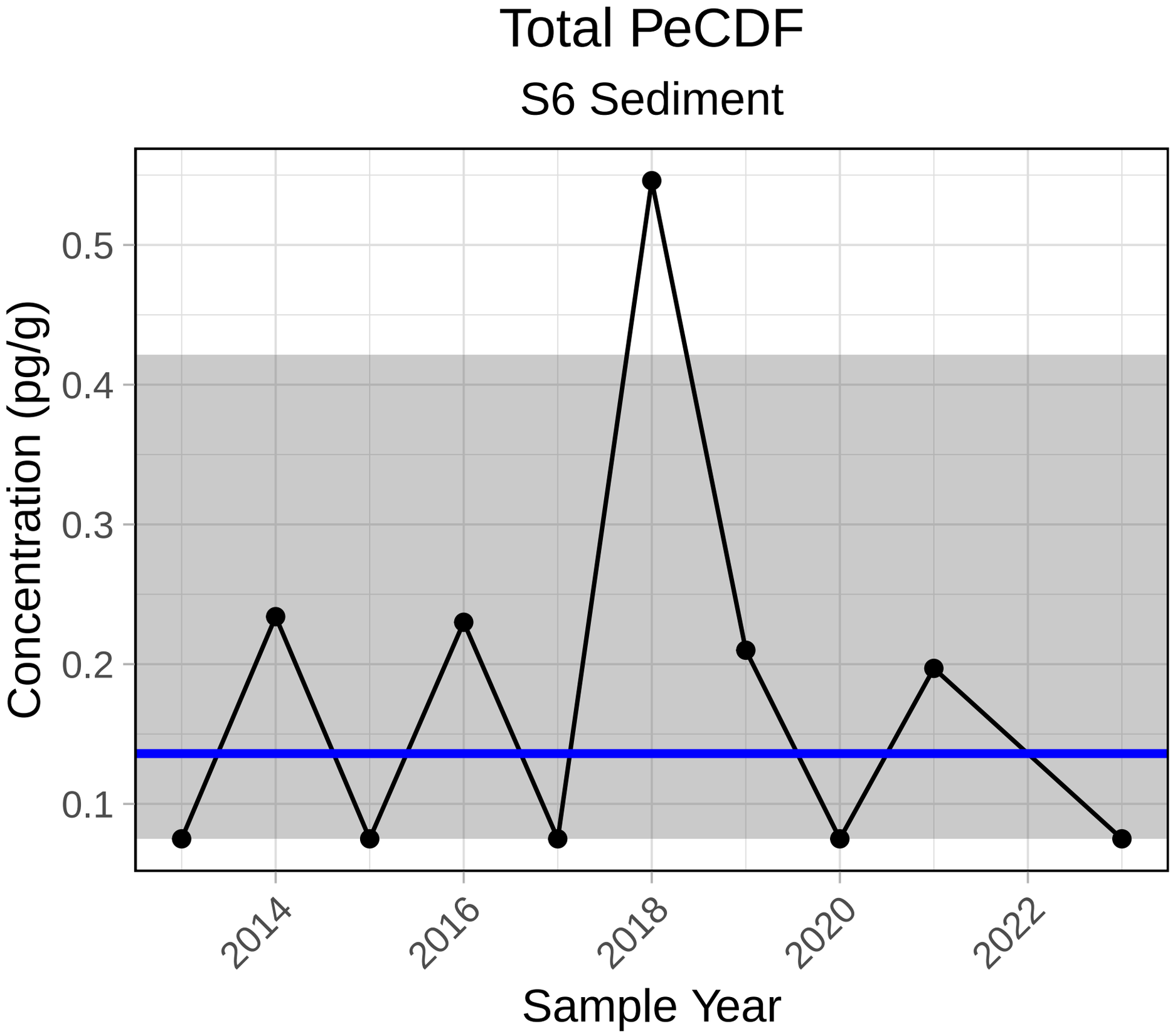

Total HpCDF
S6 Sediment
Concentration (pg/g)
0.6
0.5
0.4
0.3
0.2
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.458

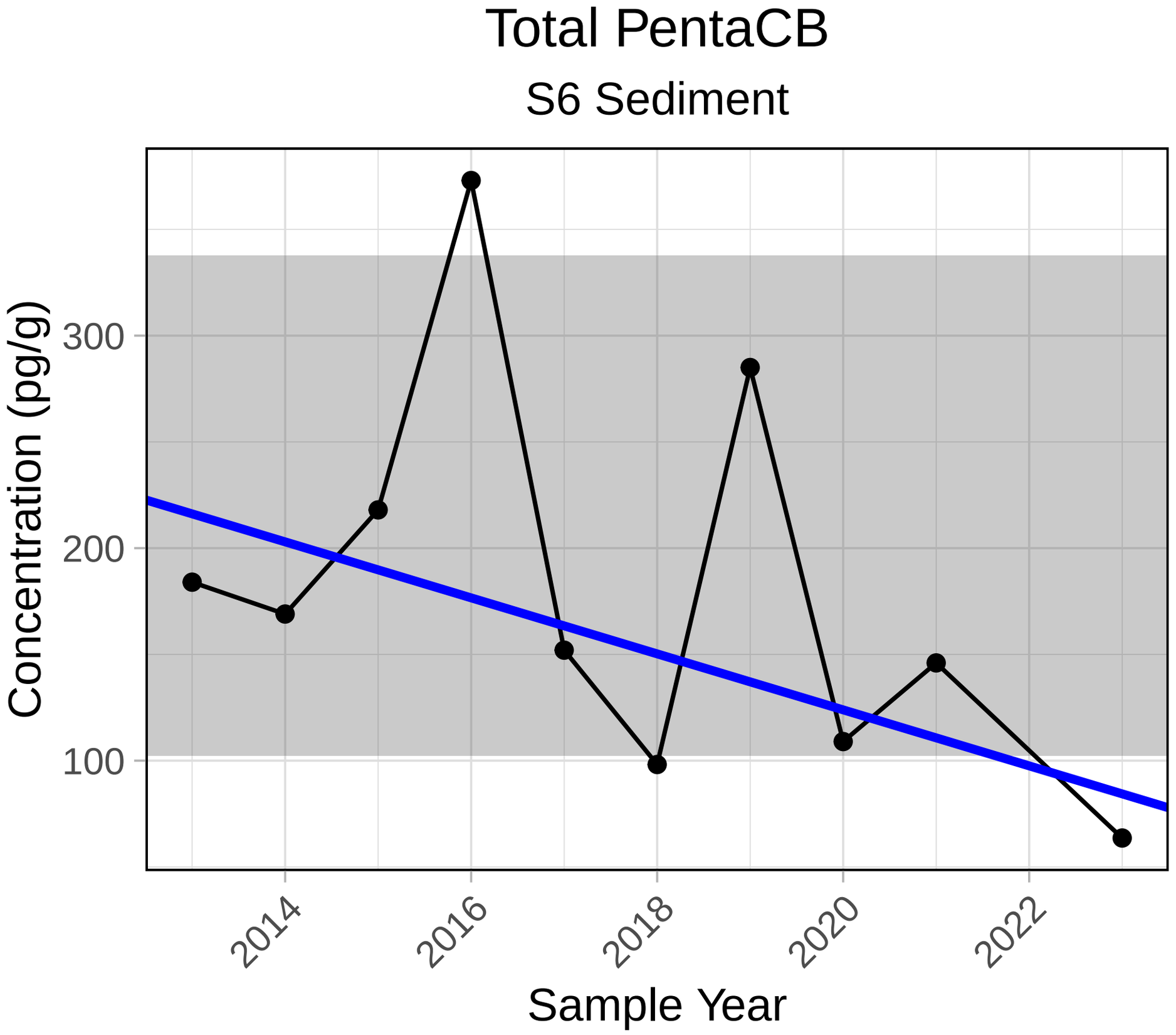

Total HxCDD
S6 Sediment
1.00
0.75
0.50
0.25
Concentration (pg/g)
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.194

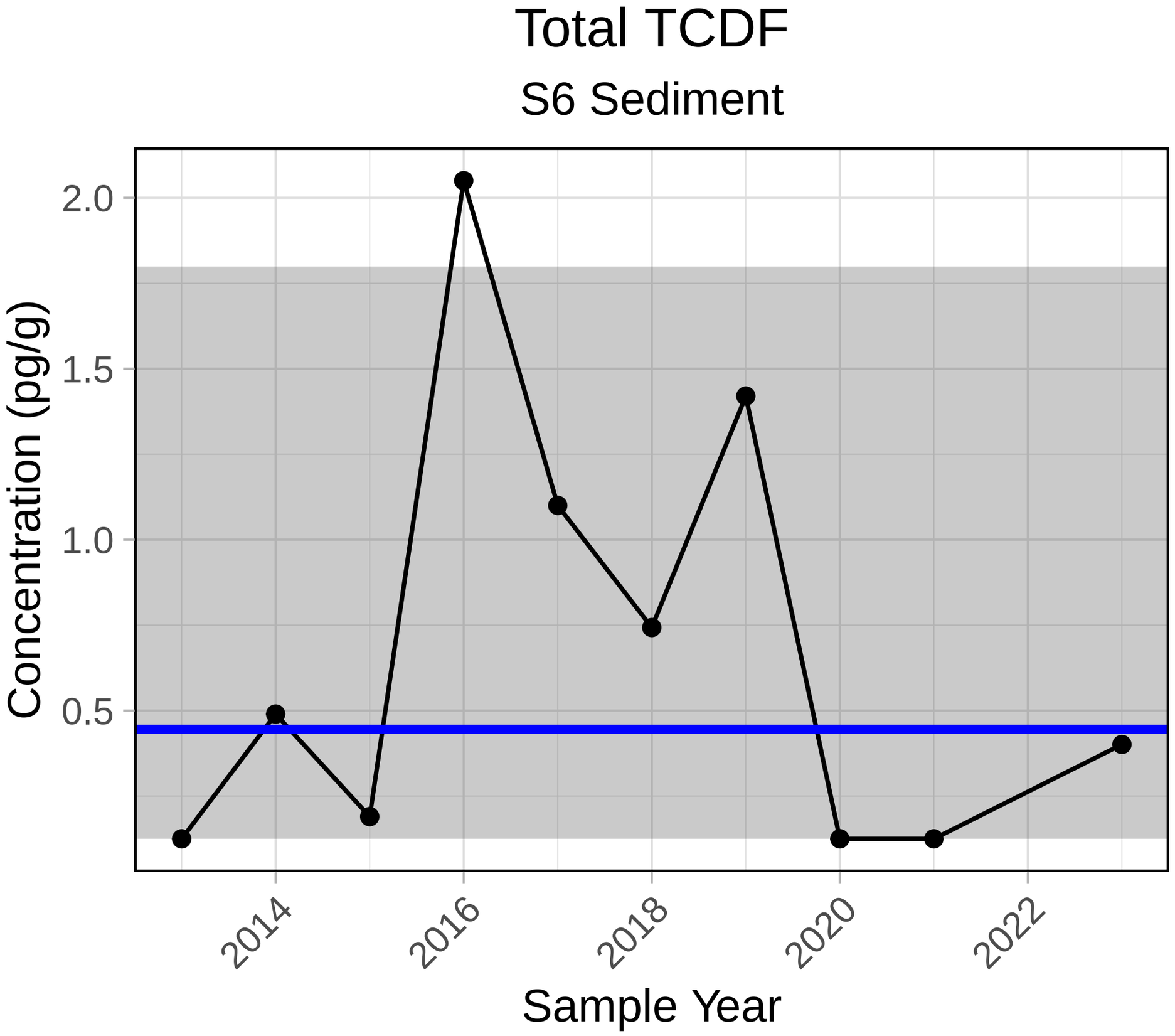

Total MonoCB
S6 Sediment
Concentration (pg/g)
1
2
3
4
5
6
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.602


Total NonaCB
S6 Sediment
Concentration (pg/g)
8
6
4
2
2010
2012
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

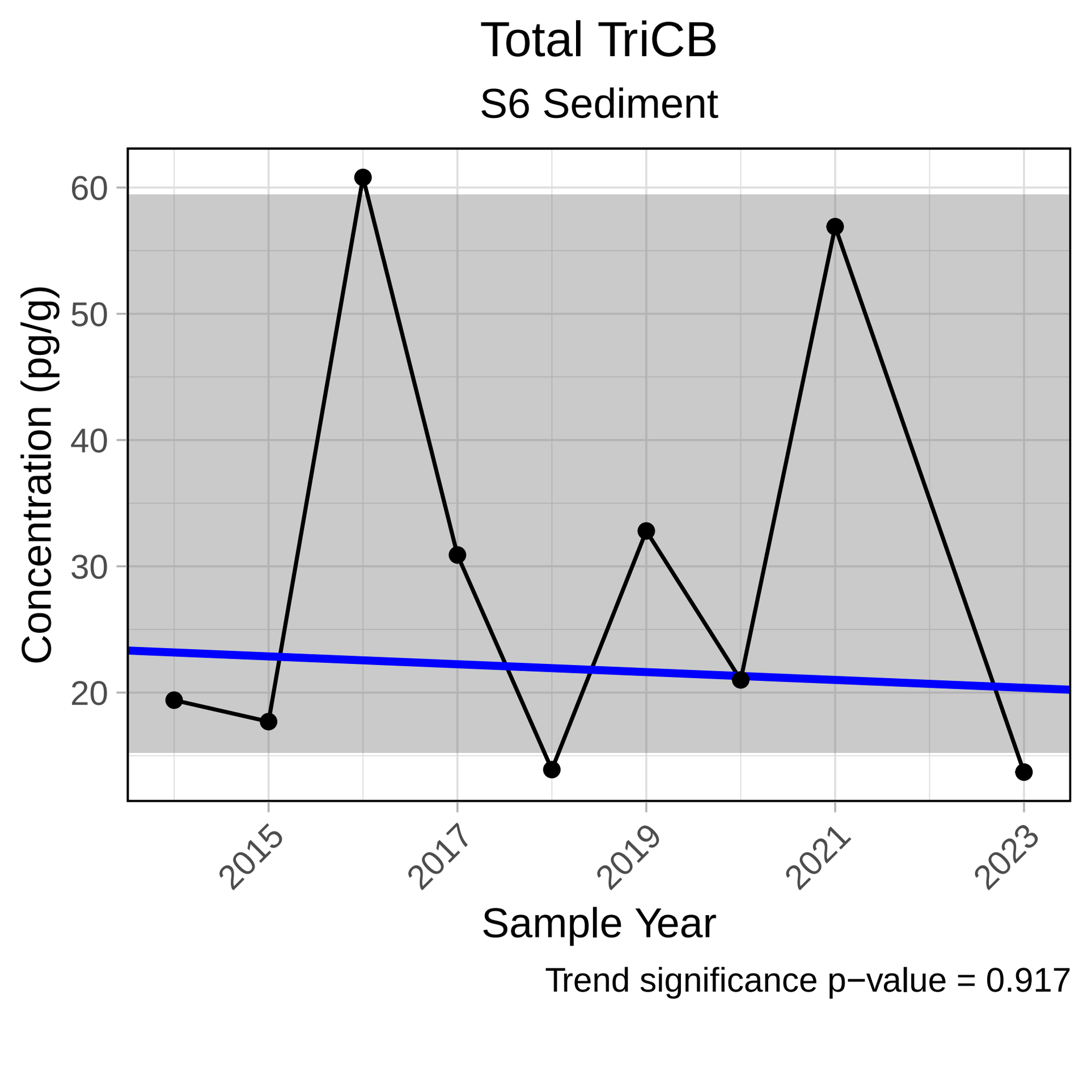

Total OctaCB
S6 Sediment
Concentration (pg/g)
50
40
30
20
10
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.858


Total PeCDF
S6 Sediment
Concentration (pg/g)
0.5
0.4
0.3
0.2
0.1
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.701


Total PentaCB
S6 Sediment
Concentration (pg/g)
300
200
100
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.107


Total TCDF
S6 Sediment
Concentration (pg/g)
2.0
1.5
1.0
0.5
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.928

Total TetraCB
S6 Sediment
Concentration (pg/g)
400
300
200
100
0
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.21


Total TriCB
S6 Sediment
Concentration (pg/g)
60
50
40
30
20
2015
2017
2019
2021
2023
Sample Year
Trend significance p−value = 0.917

1,2,3,4,5,6,7,8−OCDF
S6 Sediment
Concentration (pg/g)
1.6
1.2
0.8
0.4
2014
2016
2018
2020
2022
Sample Year
Trend significance p−value = 0.074

Appendix 4: Laboratory Analytical Reports

CPP ENVIRONMENTAL
ATTN: Theo Charette
154-150 Chippewa Road
Sherwood Park AB T8A 6A2

Date Received: 22-SEP-23
Report Date: 31-OCT-23 15:21 (MT)
Version: FINAL

Client Phone: 780-570-5818

Certificate of Analysis

Lab Work Order #: L2752797

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 20-963521
Legal Site Desc:

Megha Walia
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-1 S5A							
Sampled By: CLIENT on 18-SEP-23 @ 18:00							
Matrix: Soil							
Miscellaneous Parameters							
% Moisture	43.9		0.10	%	19-OCT-23	23-OCT-23	R5969857
All PCB congeners by GC/HRMS							
PCB 1	1.53	[J]	0.23	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 2	2.20	[J]	0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 3	3.19	[J]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 4	<0.94	[U]	0.94	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 10	<0.32	[U]	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 9	<0.33	[U]	0.33	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 7	<0.32	[U]	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 6	2.00	[J]	0.33	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 5	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 8	5.20	R	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 14	1.03	[J]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 11	5.88	[B]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 13/12	2.40	J,R	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 15	3.03	[J]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 19	0.82	M,J	0.37	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 30/18	2.70	J,R	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 17	1.59	J,B	0.23	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 27	0.37	M,J	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 24	<0.19	[U]	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 16	1.48	[J]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 32	0.95	[J]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 34	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 23	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 29/26	1.38	[J]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 25	0.54	[J]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 31	4.00	J,R	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 28/20	5.54		0.26	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 21/33	2.00	J,R	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 22	1.70	J,R	0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 36	<0.24	[U]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 39	<0.26	[U]	0.26	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 38	2.97	[J]	0.26	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 35	0.51	[J]	0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 37	2.49	[J]	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 54	<0.15	[U]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 50/53	0.71	M,J,R	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 45/51	0.66	J,R	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 46	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 52	7.43		0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 73	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 43	<0.29	[U]	0.29	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 69/49	3.37	J,B	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 48	0.91	[J]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 44/47/65	4.15	[J]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 59/62/75	0.41	M,J	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 42	1.25	[J]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 41/71/40	1.67	[J]	0.23	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 64	1.98	[J]	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 72	0.27	M,J,R	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-1 S5A							
Sampled By: CLIENT on 18-SEP-23 @ 18:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 68	0.26	M,J,R	0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 57	<0.20	[U]	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 58	0.29	M,J,R	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 67	<0.17	M,J,R	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 63	0.33	M,J	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 61/70/74/76	13.7		0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 66	6.16		0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 55	<0.20	[U]	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 56	2.43	[J]	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 60	1.86	[J]	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 80	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 79	0.26	M,J,R	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 78	<0.21	[U]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 81	<0.17	M,U	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 77	2.00	J,R	0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 104	<0.081	[U]	0.081	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 96	<0.092	[U]	0.092	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 103	<0.21	[U]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 94	<0.22	[U]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 95	4.23	[J]	0.10	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 100/93/102/98	0.61	M,J	0.29	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 88/91	1.64	[J]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 84	2.26	[J]	0.23	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 89	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 121	<0.15	[U]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 92	4.73		0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 113/90/101	24.7		0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 83/99	14.0	M	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 112	<0.15	M,U	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 109/119/86/97/125/87	11.9	M	0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 117/116/85/110/115	30.5	M	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 82	2.17	[J]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 111	<0.15	[U]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 120	0.27	M,J,R	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 108/124	1.38	[J]	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 107	2.47	M,J	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 123	0.51	M,J,R	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 106	<0.14	[U]	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 118	31.2		0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 122	0.27	J,R	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 114	0.62	J,R	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 105	15.3		0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 127	0.18	M,J	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 126	0.71	[J]	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 155	<0.053	[U]	0.053	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 152	<0.091	[U]	0.091	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 150	<0.084	[U]	0.084	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 136	2.39	[J]	0.092	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 145	<0.086	[U]	0.086	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 148	<0.12	[U]	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 151/135	11.1	M	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-1 S5A							
Sampled By: CLIENT on 18-SEP-23 @ 18:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 154	1.10	M,J	0.082	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 144	1.79	[J]	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 147/149	25.2		0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 134/143	1.40	J,R	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 139/140	0.49	[J]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 131	0.34	J,R	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 142	<0.21	[U]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 132	8.40		0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 133	0.45	J,R	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 165	<0.14	[U]	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 146	7.10		0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 161	<0.13	[U]	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 168/153	48.6		0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 141	8.27		0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 130	2.43	[J]	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 137/164	4.60	M	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 138/163/129	62.8	M	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 160	0.410	M,J	0.084	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 158	4.02	[J]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 128/166	5.72	M	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 159	0.32	M,J,R	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 162	0.21	M,J,R	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 167	2.34	[J]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 156/157	5.81	[J]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 169	0.71	M,J	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 188	<0.060	M,U	0.060	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 179	3.90	[J]	0.072	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 184	<0.069	[U]	0.069	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 176	0.980	J,R	0.074	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 186	<0.074	[U]	0.074	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 178	3.26	[J]	0.10	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 175	0.510	J,R	0.098	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 187	17.4		0.090	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 182	<0.090	[U]	0.090	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 183	7.41		0.089	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 185	1.71	[J]	0.10	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 174	11.3		0.093	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 177	6.81		0.099	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 181	<0.098	[U]	0.098	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 171/173	3.96	[J]	0.69	pg/g	19-OCT-23	27-OCT-23	R5970024
PCB 172	2.52	[J]	0.094	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 192	<0.080	[U]	0.080	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 180/193	32.6		0.078	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 191	0.565	[J]	0.071	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 170	11.0		0.098	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 190	2.52	[J]	0.063	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 189	0.52	M,J,R	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 202	1.25	[J]	0.065	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 201	0.650	J,R	0.066	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 204	<0.066	[U]	0.066	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 197	0.160	M,J,R	0.069	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-1 S5A							
Sampled By: CLIENT on 18-SEP-23 @ 18:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 200	0.590	J,R	0.070	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 198/199	7.85		0.098	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 196	3.36	[J]	0.091	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 203	4.17	[J]	0.092	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 195	1.90	[J]	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 194	6.03		0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 205	0.35	[J]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 208	<0.62	[U]	0.62	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 207	<0.41	[U]	0.41	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 206	1.10	M,J,R	0.44	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 209	0.269	[J]	0.065	pg/g	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 1	26.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 3	38.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 4	27.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 15	52.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 19	31.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 37	56.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 54	30.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 81	66.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 77	64.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 104	50.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 123	68.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 118	68.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 114	61.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 105	58.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 126	68.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 155	70.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 167	68.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 156/157	57.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 169	70.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 188	68.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 189	67.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 202	63.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 205	72.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 208	28.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 206	68.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 209	77.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 28	53.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 111	79.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 178	70.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Total MonoCB	6.92	[J]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
Total DiCB	19.5	[J]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
Total TriCB	29.0	[J]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
Total TetraCB	50.1	[J]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PentaCB	150	[J]	0.081	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HexaCB	206	[J]	0.053	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HeptaCB	107	[J]	0.060	pg/g	19-OCT-23	24-OCT-23	R5970024
Total OctaCB	26.3	[J]	0.065	pg/g	19-OCT-23	24-OCT-23	R5970024
Total NonaCB	1.10	[J]	0.41	pg/g	19-OCT-23	24-OCT-23	R5970024
DecaCB	0.269	[J]	0.065	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PCB	596	[J]	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-1 S5A							
Sampled By: CLIENT on 18-SEP-23 @ 18:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
Lower Bound PCB TEQ (WHO 2005)	0.0937			pg/g	19-OCT-23	24-OCT-23	R5970024
Mid Point PCB TEQ (WHO 2005)	0.0940			pg/g	19-OCT-23	24-OCT-23	R5970024
Upper Bound PCB TEQ (WHO 2005)	0.0940			pg/g	19-OCT-23	24-OCT-23	R5970024
Dioxins and Furans HR 1613B							
2,3,7,8-TCDD	<0.12	[U]	0.12	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDD	<0.12	M,U	0.12	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDD	<0.11	[U]	0.11	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDD	<0.12	M,U	0.12	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDD	0.14	M,J,R	0.11	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDD	2.36	[J]	0.13	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDD	26.4		0.23	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,7,8-TCDF	<0.078	M,U	0.078	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDF	<0.098	[U]	0.098	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,7,8-PeCDF	<0.093	[U]	0.093	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDF	<0.062	M,U	0.062	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDF	<0.061	M,U	0.061	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,6,7,8-HxCDF	<0.058	[U]	0.058	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDF	<0.074	[U]	0.074	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDF	0.170	J,R	0.058	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8,9-HpCDF	<0.074	[U]	0.074	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDF	0.52	M,J	0.15	pg/g	19-OCT-23	25-OCT-23	R5970024
Total-TCDD	0.30		0.12	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDD # Homologues	2				19-OCT-23	25-OCT-23	R5970024
Total-PeCDD	<0.12	[U]	0.12	pg/g	19-OCT-23	25-OCT-23	R5970024
Total PeCDD # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HxCDD	2.25		0.12	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDD # Homologues	3				19-OCT-23	25-OCT-23	R5970024
Total-HpCDD	5.34		0.13	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDD # Homologues	2				19-OCT-23	25-OCT-23	R5970024
Total-TCDF	0.587		0.078	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDF # Homologues	1				19-OCT-23	25-OCT-23	R5970024
Total-PeCDF	<0.098	[U]	0.098	pg/g	19-OCT-23	25-OCT-23	R5970024
Total PeCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HxCDF	<0.074	[U]	0.074	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HpCDF	<0.074	[U]	0.074	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDD	56.0		25-164	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDD	67.0		25-181	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	62.0		32-141	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	55.0		28-130	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	65.0		23-140	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-OCDD	53.0		17-157	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDF	66.0		24-169	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDF	76.0		24-185	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,7,8-PeCDF	74.0		21-178	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	75.0		26-152	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	71.0		26-123	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	78.0		29-147	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	77.0		28-136	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	68.0		28-143	%	19-OCT-23	25-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-1 S5A							
Sampled By: CLIENT on 18-SEP-23 @ 18:00							
Matrix: Soil							
Dioxins and Furans HR 1613B							
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	69.0		26-138	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	64.0		35-197	%	19-OCT-23	25-OCT-23	R5970024
Lower Bound PCDD/F TEQ (WHO 2005)	0.0317		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Mid Point PCDD/F TEQ (WHO 2005)	0.211		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Upper Bound PCDD/F TEQ (WHO 2005)	0.375		0	pg/g	19-OCT-23	25-OCT-23	R5970024
L2752797-2 CHRYSTINA L							
Sampled By: CLIENT on 19-SEP-23 @ 11:30							
Matrix: Soil							
Miscellaneous Parameters							
% Moisture	95.1		0.10	%	19-OCT-23	23-OCT-23	R5969857
All PCB congeners by GC/HRMS							
PCB 1	6.7	M,J	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 2	8.1	[J]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 3	7.0	M,J	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 4	14.0	M,J,R	4.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 10	<2.3	[U]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 9	<2.3	[U]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 7	<2.3	[U]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 6	10.1	M,J	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 5	<2.2	[U]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 8	44.7	M,J	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 14	4.9	M,J	3.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 11	39.0	J,B	3.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 13/12	8.8	M,J,R	3.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 15	36.2	[J]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 19	5.6	M,J,R	3.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 30/18	39.5	[J]	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 17	17.0	J,R	3.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 27	<2.3	M,U	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 24	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 16	14.0	J,R	3.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 32	10.8	[J]	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 34	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 23	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 29/26	13.3	[J]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 25	6.1	[J]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 31	62.8		2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 28/20	86.1		2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 21/33	46.0	[J]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 22	30.7	[J]	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 36	<2.2	[U]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 39	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 38	5.3	J,R	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 35	<2.6	[U]	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 37	47.6	[J]	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 54	<1.3	[U]	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 50/53	9.0	J,R	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 45/51	10.7	[J]	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 46	4.0	M,J,R	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 52	126		2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 73	<1.4	[U]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-2 CHRYSTINA L							
Sampled By: CLIENT on 19-SEP-23 @ 11:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 43	<2.5	M,U	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 69/49	47.5	[J]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 48	17.0	J,R	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 44/47/65	74.8		1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 59/62/75	9.5	[J]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 42	21.5	[J]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 41/71/40	35.8	[J]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 64	38.1	[J]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 72	2.8	M,J,R	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 68	2.8	[J]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 57	<2.4	[U]	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 58	5.8	[J]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 67	2.4	M,J,R	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 63	5.5	[J]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 61/70/74/76	243		2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 66	121		2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 55	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 56	44.5	[J]	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 60	18.0	J,R	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 80	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 79	2.4	M,J,R	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 78	<2.6	[U]	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 81	<2.2	[U]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 77	26.0	J,R	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 104	<1.0	[U]	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 96	1.7	M,J	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 103	3.8	[J]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 94	<1.7	M,U	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 95	88.6		0.80	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 100/93/102/98	9.0	M,J,R	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 88/91	28.6	[J]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 84	43.6	[J]	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 89	3.5	M,J,R	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 121	<1.1	[U]	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 92	63.6		1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 113/90/101	335		1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 83/99	192		1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 112	<1.1	[U]	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 109/119/86/97/125/87	91.0	M,R	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 117/116/85/110/115	423	M	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 82	33.0	M,J	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 111	<1.1	[U]	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 120	3.4	M,J	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 108/124	13.0	J,R	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 107	28.0	M,J,R	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 123	4.7	M,J,R	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 106	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 118	398		1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 122	5.1	J,R	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 114	8.9	J,R	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 105	186		2.0	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-2 CHRYSTINA L							
Sampled By: CLIENT on 19-SEP-23 @ 11:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 127	<1.8	[U]	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 126	5.5	J,R	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 155	<0.63	[U]	0.63	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 152	<0.95	M,U	0.95	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 150	<0.88	M,U	0.88	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 136	56.0	R	0.96	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 145	<0.90	[U]	0.90	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 148	<1.2	[U]	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 151/135	212	M	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 154	31.3	M,J	0.85	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 144	33.8	[J]	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 147/149	417		1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 134/143	23.5	[J]	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 139/140	9.8	[J]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 131	4.6	J,R	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 142	<2.2	[U]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 132	156		2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 133	10.6	[J]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 165	<1.5	[U]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 146	97.7		1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 161	<1.4	[U]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 168/153	555		1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 141	110		1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 130	39.5	[J]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 137/164	70.0	M	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 138/163/129	893		2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 160	<0.90	[U]	0.90	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 158	60.0		1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 128/166	79.7		1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 159	5.4	J,R	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 162	2.5	M,J,R	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 167	30.0	[J]	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 156/157	78.8	[J]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 169	2.6	M,J,R	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 188	<0.82	[U]	0.82	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 179	79.4		0.95	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 184	<0.92	[U]	0.92	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 176	23.0	J,R	0.97	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 186	<0.98	[U]	0.98	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 178	44.9	[J]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 175	10.9	[J]	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 187	272	M	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 182	1.6	M,J,R	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 183	120		1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 185	21.6	[J]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 174	200		1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 177	120		1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 181	<1.3	[U]	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 171/173	55.0	R	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 172	39.9	[J]	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 192	<1.1	[U]	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-2 CHRYSTINA L							
Sampled By: CLIENT on 19-SEP-23 @ 11:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 180/193	460		1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 191	8.85	[J]	0.94	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 170	205		1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 190	40.0	[J]	0.84	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 189	7.4	J,R	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 202	17.8	[J]	0.56	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 201	13.0	J,R	0.57	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 204	<0.57	[U]	0.57	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 197	3.57	[J]	0.60	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 200	11.8	[J]	0.61	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 198/199	114		0.86	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 196	48.4	[J]	0.80	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 203	63.4		0.80	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 195	38.7	[J]	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 194	93.0		1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 205	5.7	J,R	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 208	4.9	J,R	3.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 207	3.7	J,R	3.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 206	30.1	[J]	5.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 209	8.3	M,J	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 1	34.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 3	42.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 4	41.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 15	50.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 19	49.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 37	56.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 54	43.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 81	68.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 77	64.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 104	61.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 123	71.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 118	72.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 114	67.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 105	65.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 126	67.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 155	60.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 167	65.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 156/157	61.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 169	66.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 188	62.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 189	63.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 202	60.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 205	65.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 208	54.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 206	60.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 209	44.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 28	57.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 111	71.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 178	65.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Total MonoCB	21.8	[J]	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
Total DiCB	158	[J]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-2 CHRYSTINA L							
Sampled By: CLIENT on 19-SEP-23 @ 11:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
Total TriCB	385	[J]	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
Total TetraCB	868	[J]	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PentaCB	1970	[J]	0.80	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HexaCB	2980	[J]	0.63	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HeptaCB	1710	[J]	0.82	pg/g	19-OCT-23	24-OCT-23	R5970024
Total OctaCB	409	[J]	0.56	pg/g	19-OCT-23	24-OCT-23	R5970024
Total NonaCB	38.7	[J]	3.2	pg/g	19-OCT-23	24-OCT-23	R5970024
DecaCB	8.3	[J]	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PCB	8550	[J]	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
Lower Bound PCB TEQ (WHO 2005)	0.0208			pg/g	19-OCT-23	24-OCT-23	R5970024
Mid Point PCB TEQ (WHO 2005)	0.652			pg/g	19-OCT-23	24-OCT-23	R5970024
Upper Bound PCB TEQ (WHO 2005)	0.653			pg/g	19-OCT-23	24-OCT-23	R5970024
Dioxins and Furans HR 1613B							
2,3,7,8-TCDD	<0.99	M,U	0.99	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDD	<1.3	[U]	1.3	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDD	0.90	M,J,R	0.86	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDD	1.20	J,R	0.91	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDD	2.51	M,J	0.87	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDD	18.0	J,R	1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDD	124		1.8	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,7,8-TCDF	5.6	M,J	1.2	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDF	1.2	M,J,R	1.0	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,7,8-PeCDF	2.89	M,J	0.96	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDF	0.68	M,J,R	0.52	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDF	0.60	M,J,R	0.54	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,6,7,8-HxCDF	0.71	M,J,R	0.51	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDF	<0.68	[U]	0.68	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDF	4.40	M,J,R	0.54	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8,9-HpCDF	<0.73	M,U	0.73	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDF	12.0	[J]	1.6	pg/g	19-OCT-23	25-OCT-23	R5970024
Total-TCDD	<0.99	[U]	0.99	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDD # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-PeCDD	<1.3	[U]	1.3	pg/g	19-OCT-23	25-OCT-23	R5970024
Total PeCDD # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HxCDD	6.88		0.91	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDD # Homologues	2				19-OCT-23	25-OCT-23	R5970024
Total-HpCDD	<1.1	[U]	1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDD # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-TCDF	5.6		1.2	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDF # Homologues	1				19-OCT-23	25-OCT-23	R5970024
Total-PeCDF	3.3		1.0	pg/g	19-OCT-23	25-OCT-23	R5970024
Total PeCDF # Homologues	2				19-OCT-23	25-OCT-23	R5970024
Total-HxCDF	<0.68	[U]	0.68	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HpCDF	<0.73	[U]	0.73	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDD	56.0		25-164	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDD	61.0		25-181	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	66.0		32-141	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	59.0		28-130	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	71.0		23-140	%	19-OCT-23	25-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-2 CHRYSTINA L							
Sampled By: CLIENT on 19-SEP-23 @ 11:30							
Matrix: Soil							
Dioxins and Furans HR 1613B							
Surrogate: 13C12-OCDD	58.0		17-157	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDF	63.0		24-169	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDF	72.0		24-185	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,7,8-PeCDF	68.0		21-178	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	78.0		26-152	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	72.0		26-123	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	81.0		29-147	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	77.0		28-136	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	69.0		28-143	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	72.0		26-138	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	60.0		35-197	%	19-OCT-23	25-OCT-23	R5970024
Lower Bound PCDD/F TEQ (WHO 2005)	1.71		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Mid Point PCDD/F TEQ (WHO 2005)	3.57		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Upper Bound PCDD/F TEQ (WHO 2005)	4.75		0	pg/g	19-OCT-23	25-OCT-23	R5970024
L2752797-3 EDITH L							
Sampled By: CLIENT on 19-SEP-23 @ 18:30							
Matrix: Soil							
Miscellaneous Parameters							
% Moisture	95.6		0.10	%	19-OCT-23	23-OCT-23	R5969857
All PCB congeners by GC/HRMS							
PCB 1	6.6	M,J,R	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 2	12.0	M,J,R	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 3	12.0	J,R	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 4	<5.8	[U]	5.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 10	<2.7	[U]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 9	<2.8	[U]	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 7	<2.7	[U]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 6	<2.8	[U]	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 5	<2.7	[U]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 8	19.0	J,R	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 14	11.4	[J]	3.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 11	75.3		3.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 13/12	11.0	M,J,R	3.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 15	13.0	J,R	3.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 19	<3.5	[U]	3.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 30/18	17.0	J,R	2.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 17	8.9	J,R	3.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 27	<2.6	[U]	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 24	<2.8	[U]	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 16	6.9	[J]	4.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 32	6.8	M,J,R	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 34	<2.9	[U]	2.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 23	<2.9	[U]	2.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 29/26	5.5	J,R	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 25	3.9	M,J	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 31	25.5	[J]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 28/20	40.2	[J]	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 21/33	12.0	J,R	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 22	12.0	[J]	3.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 36	<2.6	[U]	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 39	<2.9	[U]	2.9	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-3 EDITH L							
Sampled By: CLIENT on 19-SEP-23 @ 18:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 38	9.2	J,R	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 35	<3.0	[U]	3.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 37	10.7	[J]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 54	<1.5	[U]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 50/53	2.5	M,J,R	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 45/51	4.3	M,J,R	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 46	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 52	53.5	[J]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 73	<1.5	[U]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 43	<2.7	[U]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 69/49	20.8	[J]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 48	5.4	J,R	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 44/47/65	33.7	[J]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 59/62/75	2.5	M,J,R	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 42	8.0	[J]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 41/71/40	11.5	M,J	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 64	10.0	J,R	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 72	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 68	<1.8	M,U	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 57	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 58	2.6	M,J	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 67	<1.7	[U]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 63	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 61/70/74/76	52.9	[J]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 66	24.7	[J]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 55	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 56	9.6	J,R	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 60	5.6	J,R	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 80	<1.7	[U]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 79	<1.7	[U]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 78	<2.1	[U]	2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 81	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 77	6.9	[J]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 104	<1.4	[U]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 96	<1.8	[U]	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 103	<2.3	[U]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 94	<2.4	[U]	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 95	24.7	[J]	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 100/93/102/98	<3.1	[U]	3.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 88/91	7.2	M,J	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 84	11.6	[J]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 89	<2.9	[U]	2.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 121	<1.6	[U]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 92	10.0	J,R	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 113/90/101	70.9		2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 83/99	44.9	[J]	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 112	<1.6	[U]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 109/119/86/97/125/87	35.0	M,J,R	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 117/116/85/110/115	96.8	M	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 82	5.2	M,J,R	2.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 111	<1.6	[U]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-3 EDITH L							
Sampled By: CLIENT on 19-SEP-23 @ 18:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 120	<1.5	[U]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 108/124	2.3	M,J,R	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 107	5.2	M,J	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 123	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 106	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 118	71.0		1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 122	<2.4	[U]	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 114	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 105	32.4	[J]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 127	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 126	<1.8	[U]	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 155	<0.63	[U]	0.63	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 152	<0.95	[U]	0.95	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 150	<0.88	[U]	0.88	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 136	9.80	[J]	0.95	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 145	<0.90	[U]	0.90	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 148	<1.2	[U]	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 151/135	30.8	M,J	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 154	4.60	M,J,R	0.85	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 144	4.7	J,R	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 147/149	57.0	R	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 134/143	4.1	M,J,R	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 139/140	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 131	<2.4	[U]	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 142	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 132	27.0	J,R	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 133	<2.2	[U]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 165	<1.6	[U]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 146	16.1	[J]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 161	<1.5	[U]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 168/153	86.6		1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 141	18.7	[J]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 130	3.1	M,J,R	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 137/164	10.6	M,J	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 138/163/129	138		2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 160	<1.0	[U]	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 158	7.3	[J]	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 128/166	13.9	M,J	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 159	<1.4	[U]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 162	<1.5	[U]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 167	4.4	M,J,R	1.3	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 156/157	13.0	J,R	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 169	<1.4	[U]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 188	<1.7	[U]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 179	10.0	J,R	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 184	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 176	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 186	<2.0	[U]	2.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 178	7.5	[J]	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 175	<2.7	[U]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 187	40.0	J,R	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-3 EDITH L							
Sampled By: CLIENT on 19-SEP-23 @ 18:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 182	<2.5	[U]	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 183	14.0	M,J,R	2.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 185	<2.8	[U]	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 174	25.6	M,J	2.5	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 177	18.4	[J]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 181	<2.7	[U]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 171/173	8.1	[J]	2.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 172	8.6	M,J,R	2.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 192	<2.2	[U]	2.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 180/193	57.7		2.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 191	<1.9	[U]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 170	24.4	[J]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 190	6.4	[J]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 189	2.5	M,J	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 202	3.30	M,J,R	0.80	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 201	2.30	M,J,R	0.81	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 204	<0.81	[U]	0.81	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 197	<0.85	[U]	0.85	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 200	3.40	J,R	0.87	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 198/199	18.0	J,R	1.2	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 196	11.0	J,R	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 203	15.8	[J]	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 195	6.5	[J]	1.9	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 194	20.0	J,R	1.8	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 205	<1.6	[U]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 208	<4.1	[U]	4.1	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 207	<4.4	[U]	4.4	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 206	13.0	M,J,R	7.0	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 209	9.0	J,R	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 1	28.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 3	35.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 4	35.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 15	41.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 19	43.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 37	50.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 54	41.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 81	58.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 77	57.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 104	51.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 123	57.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 118	62.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 114	55.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 105	57.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 126	61.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 155	51.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 167	55.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 156/157	53.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 169	58.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 188	52.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 189	53.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 202	50.0		10-145	%	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-3 EDITH L							
Sampled By: CLIENT on 19-SEP-23 @ 18:30							
Matrix: Soil							
All PCB congeners by GC/HRMS							
Surrogate: 13C12 PCB 205	54.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 208	47.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 206	49.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 209	44.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 28	47.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 111	56.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 178	53.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Total MonoCB	30.6	[J]	1.7	pg/g	19-OCT-23	24-OCT-23	R5970024
Total DiCB	130	[J]	2.7	pg/g	19-OCT-23	24-OCT-23	R5970024
Total TriCB	159	[J]	2.3	pg/g	19-OCT-23	24-OCT-23	R5970024
Total TetraCB	254	[J]	1.5	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PentaCB	417	[J]	1.1	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HexaCB	450	[J]	0.63	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HeptaCB	223	[J]	1.4	pg/g	19-OCT-23	24-OCT-23	R5970024
Total OctaCB	80.3	[J]	0.80	pg/g	19-OCT-23	24-OCT-23	R5970024
Total NonaCB	13.0	[J]	4.1	pg/g	19-OCT-23	24-OCT-23	R5970024
DecaCB	9.0	[J]	1.6	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PCB	1770	[J]	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
Lower Bound PCB TEQ (WHO 2005)	0.00387			pg/g	19-OCT-23	24-OCT-23	R5970024
Mid Point PCB TEQ (WHO 2005)	0.116			pg/g	19-OCT-23	24-OCT-23	R5970024
Upper Bound PCB TEQ (WHO 2005)	0.227			pg/g	19-OCT-23	24-OCT-23	R5970024
Dioxins and Furans HR 1613B							
2,3,7,8-TCDD	<1.1	[U]	1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDD	<1.1	[U]	1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDD	1.43	M,J	0.86	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDD	3.21	[J]	0.93	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDD	2.90	J,R	0.88	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDD	42.0	J,R	1.7	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDD	307		2.1	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,7,8-TCDF	1.01	M,J	0.95	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDF	<0.66	[U]	0.66	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,7,8-PeCDF	<0.64	M,U	0.64	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDF	<0.73	[U]	0.73	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDF	1.05	M,J	0.73	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,6,7,8-HxCDF	0.86	M,J,R	0.73	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDF	<1.1	[U]	1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDF	6.50	J,R	0.77	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8,9-HpCDF	<1.0	[U]	1.0	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDF	20.1	[J]	1.9	pg/g	19-OCT-23	25-OCT-23	R5970024
Total-TCDD	1.7		1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDD # Homologues	1				19-OCT-23	25-OCT-23	R5970024
Total-PeCDD	1.6		1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
Total PeCDD # Homologues	1				19-OCT-23	25-OCT-23	R5970024
Total-HxCDD	17.7		0.93	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDD # Homologues	4				19-OCT-23	25-OCT-23	R5970024
Total-HpCDD	42.1		1.7	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDD # Homologues	1				19-OCT-23	25-OCT-23	R5970024
Total-TCDF	2.78		0.95	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDF # Homologues	3				19-OCT-23	25-OCT-23	R5970024
Total-PeCDF	1.38		0.66	pg/g	19-OCT-23	25-OCT-23	R5970024
Total PeCDF # Homologues	1				19-OCT-23	25-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-3 EDITH L							
Sampled By: CLIENT on 19-SEP-23 @ 18:30							
Matrix: Soil							
Dioxins and Furans HR 1613B							
Total-HxCDF	<1.1	[U]	1.1	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HpCDF	<1.0	[U]	1.0	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDD	65.0		25-164	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDD	67.0		25-181	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	80.0		32-141	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	69.0		28-130	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	82.0		23-140	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-OCDD	66.0		17-157	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDF	75.0		24-169	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDF	79.0		24-185	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,7,8-PeCDF	76.0		21-178	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	98.0		26-152	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	85.0		26-123	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	93.0		29-147	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	82.0		28-136	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	81.0		28-143	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	83.0		26-138	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	68.0		35-197	%	19-OCT-23	25-OCT-23	R5970024
Lower Bound PCDD/F TEQ (WHO 2005)	0.768		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Mid Point PCDD/F TEQ (WHO 2005)	2.93		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Upper Bound PCDD/F TEQ (WHO 2005)	4.23		0	pg/g	19-OCT-23	25-OCT-23	R5970024
L2752797-4 S6							
Sampled By: CLIENT on 20-SEP-23 @ 10:00							
Matrix: Soil							
Miscellaneous Parameters							
% Moisture	55.3		0.10	%	19-OCT-23	23-OCT-23	R5969857
All PCB congeners by GC/HRMS							
PCB 1	0.70	M,J	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 2	2.14	[J]	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 3	1.40	J,R	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 4	<0.74	[U]	0.74	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 10	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 9	<0.32	[U]	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 7	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 6	<0.32	[U]	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 5	<0.30	[U]	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 8	1.40	J,R	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 14	1.10	M,J,R	0.48	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 11	2.53	J,B	0.49	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 13/12	2.83	[J]	0.47	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 15	1.23	[J]	0.36	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 19	<0.40	[U]	0.40	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 30/18	1.20	J,R	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 17	0.69	M,J,B	0.34	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 27	<0.26	[U]	0.26	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 24	<0.28	[U]	0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 16	0.59	M,J,R	0.40	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 32	0.54	M,J	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 34	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-4 S6							
Sampled By: CLIENT on 20-SEP-23 @ 10:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 23	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 29/26	0.29	M,J	0.29	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 25	<0.29	[U]	0.29	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 31	1.70	[J]	0.29	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 28/20	2.63	[J]	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 21/33	0.53	J,B	0.29	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 22	0.65	J,R	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 36	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 39	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 38	3.76	[J]	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 35	<0.32	[U]	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 37	1.09	[J]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 54	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 50/53	<0.45	[U]	0.45	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 45/51	<0.45	[U]	0.45	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 46	<0.50	[U]	0.50	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 52	3.41	[J]	0.45	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 73	<0.30	[U]	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 43	<0.54	[U]	0.54	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 69/49	1.54	J,B	0.35	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 48	<0.42	[U]	0.42	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 44/47/65	2.53	[J]	0.39	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 59/62/75	<0.32	[U]	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 42	<0.47	[U]	0.47	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 41/71/40	<0.43	[U]	0.43	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 64	1.00	M,J,R	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 72	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 68	<0.26	[U]	0.26	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 57	<0.28	[U]	0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 58	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 67	<0.24	[U]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 63	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 61/70/74/76	6.26		0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 66	3.24	[J]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 55	<0.29	[U]	0.29	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 56	0.79	[J]	0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 60	1.84	[J]	0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 80	<0.24	[U]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 79	<0.25	[U]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 78	<0.30	[U]	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 81	<0.25	[U]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 77	0.78	J,R	0.26	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 104	<0.098	[U]	0.098	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 96	<0.12	[U]	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 103	<0.24	[U]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 94	<0.25	[U]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 95	2.33	[J]	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 100/93/102/98	<0.32	[U]	0.32	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 88/91	0.76	J,R	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 84	0.97	[J]	0.26	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 89	<0.30	[U]	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-4 S6							
Sampled By: CLIENT on 20-SEP-23 @ 10:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 121	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 92	1.60	J,R	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 113/90/101	10.6		0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 83/99	6.71		0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 112	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 109/119/86/97/125/87	5.56	M,J	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 117/116/85/110/115	12.1	M	0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 82	0.72	J,R	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 111	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 120	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 108/124	0.59	J,R	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 107	1.16	M,J	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 123	0.44	M,J,R	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 106	<0.22	[U]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 118	13.1		0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 122	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 114	0.41	M,J	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 105	6.18		0.23	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 127	<0.21	[U]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 126	0.33	J,R	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 155	<0.15	[U]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 152	<0.24	[U]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 150	<0.22	[U]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 136	1.10	[J]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 145	<0.22	[U]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 148	<0.31	[U]	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 151/135	5.04	M,J	0.34	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 154	0.98	M,J,R	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 144	0.58	J,R	0.31	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 147/149	12.0		0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 134/143	0.59	[J]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 139/140	<0.22	M,U	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 131	<0.27	[U]	0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 142	<0.28	[U]	0.28	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 132	2.90	J,R	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 133	0.38	M,J,R	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 165	<0.18	[U]	0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 146	3.51	[J]	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 161	<0.17	[U]	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 168/153	22.3		0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 141	3.36	[J]	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 130	0.85	[J]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 137/164	2.00	M,J,R	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 138/163/129	29.6		0.27	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 160	<0.11	[U]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 158	1.94	[J]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 128/166	2.37	M,J	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 159	<0.15	[U]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 162	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 167	0.90	[J]	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 156/157	2.25	[J]	0.25	pg/g	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-4 S6							
Sampled By: CLIENT on 20-SEP-23 @ 10:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
PCB 169	0.78	[J]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 188	<0.14	[U]	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 179	1.50	J,R	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 184	<0.15	[U]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 176	0.44	J,R	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 186	<0.16	[U]	0.16	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 178	1.30	J,R	0.23	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 175	<0.21	[U]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 187	7.97		0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 182	<0.20	[U]	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 183	3.67	[J]	0.19	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 185	0.35	M,J,R	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 174	4.40	M,J	0.20	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 177	2.90	J,R	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 181	<0.21	[U]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 171/173	1.30	J,R	0.22	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 172	1.08	[J]	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 192	<0.18	[U]	0.18	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 180/193	12.4		0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 191	<0.15	[U]	0.15	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 170	4.10	J,R	0.21	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 190	1.10	J,R	0.14	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 189	0.30	[J]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 202	0.530	J,R	0.087	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 201	0.240	M,J,R	0.088	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 204	<0.088	[U]	0.088	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 197	<0.092	[U]	0.092	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 200	0.430	M,J,R	0.094	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 198/199	3.10	J,R	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 196	0.83	[J]	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 203	1.57	[J]	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 195	0.65	J,R	0.13	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 194	2.00	J,R	0.12	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 205	<0.11	[U]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 208	<0.93	[U]	0.93	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 207	<0.61	[U]	0.61	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 206	1.10	M,J	0.61	pg/g	19-OCT-23	24-OCT-23	R5970024
PCB 209	0.373	M,J	0.093	pg/g	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 1	23.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 3	30.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 4	29.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 15	39.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 19	34.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 37	48.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 54	29.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 81	55.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 77	54.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 104	49.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 123	59.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 118	61.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 114	55.0		10-145	%	19-OCT-23	24-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-4 S6							
Sampled By: CLIENT on 20-SEP-23 @ 10:00							
Matrix: Soil							
All PCB congeners by GC/HRMS							
Surrogate: 13C12 PCB 105	53.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 126	60.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 155	54.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 167	55.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 156/157	50.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 169	56.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 188	53.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 189	56.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 202	53.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 205	57.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 208	25.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 206	53.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 209	54.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 28	46.0		5-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 111	62.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Surrogate: 13C12 PCB 178	59.0		10-145	%	19-OCT-23	24-OCT-23	R5970024
Total MonoCB	4.24	[J]	0.17	pg/g	19-OCT-23	24-OCT-23	R5970024
Total DiCB	9.09	[J]	0.30	pg/g	19-OCT-23	24-OCT-23	R5970024
Total TriCB	13.7	[J]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
Total TetraCB	21.4	[J]	0.24	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PentaCB	63.6	[J]	0.098	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HexaCB	93.4	[J]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
Total HeptaCB	42.8	[J]	0.11	pg/g	19-OCT-23	24-OCT-23	R5970024
Total OctaCB	9.35	[J]	0.087	pg/g	19-OCT-23	24-OCT-23	R5970024
Total NonaCB	1.10	[J]	0.61	pg/g	19-OCT-23	24-OCT-23	R5970024
DecaCB	0.373	[J]	0.093	pg/g	19-OCT-23	24-OCT-23	R5970024
Total PCB	259	[J]	1.0	pg/g	19-OCT-23	24-OCT-23	R5970024
Lower Bound PCB TEQ (WHO 2005)	0.0242			pg/g	19-OCT-23	24-OCT-23	R5970024
Mid Point PCB TEQ (WHO 2005)	0.0573			pg/g	19-OCT-23	24-OCT-23	R5970024
Upper Bound PCB TEQ (WHO 2005)	0.0574			pg/g	19-OCT-23	24-OCT-23	R5970024
Dioxins and Furans HR 1613B							
2,3,7,8-TCDD	<0.14	[U]	0.14	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDD	<0.14	[U]	0.14	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDD	<0.090	[U]	0.090	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDD	<0.097	[U]	0.097	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDD	0.120	M,J,R	0.092	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDD	0.755	[J]	0.076	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDD	6.93	[J]	0.21	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,7,8-TCDF	0.123	M,J	0.098	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8-PeCDF	<0.060	[U]	0.060	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,7,8-PeCDF	<0.058	[U]	0.058	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8-HxCDF	<0.061	[U]	0.061	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,6,7,8-HxCDF	<0.062	M,U	0.062	pg/g	19-OCT-23	25-OCT-23	R5970024
2,3,4,6,7,8-HxCDF	<0.059	[U]	0.059	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,7,8,9-HxCDF	<0.076	[U]	0.076	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,6,7,8-HpCDF	0.120	J,R	0.073	pg/g	19-OCT-23	25-OCT-23	R5970024
1,2,3,4,7,8,9-HpCDF	<0.084	[U]	0.084	pg/g	19-OCT-23	25-OCT-23	R5970024
OCDF	0.56	M,J,R	0.15	pg/g	19-OCT-23	25-OCT-23	R5970024
Total-TCDD	<0.14	[U]	0.14	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDD # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-PeCDD	<0.14	[U]	0.14	pg/g	19-OCT-23	25-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2752797-4 S6							
Sampled By: CLIENT on 20-SEP-23 @ 10:00							
Matrix: Soil							
Dioxins and Furans HR 1613B							
Total PeCDD # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HxCDD	0.682		0.097	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDD # Homologues	1				19-OCT-23	25-OCT-23	R5970024
Total-HpCDD	1.34		0.076	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDD # Homologues	2				19-OCT-23	25-OCT-23	R5970024
Total-TCDF	0.401		0.098	pg/g	19-OCT-23	25-OCT-23	R5970024
Total TCDF # Homologues	2				19-OCT-23	25-OCT-23	R5970024
Total-PeCDF	<0.060	[U]	0.060	pg/g	19-OCT-23	25-OCT-23	R5970024
Total PeCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HxCDF	<0.076	[U]	0.076	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HxCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Total-HpCDF	<0.084	[U]	0.084	pg/g	19-OCT-23	25-OCT-23	R5970024
Total HpCDF # Homologues	0				19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDD	69.0		25-164	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDD	77.0		25-181	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDD	77.0		32-141	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDD	69.0		28-130	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD	89.0		23-140	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-OCDD	75.0		17-157	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,7,8-TCDF	77.0		24-169	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8-PeCDF	91.0		24-185	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,7,8-PeCDF	86.0		21-178	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8-HxCDF	94.0		26-152	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,6,7,8-HxCDF	86.0		26-123	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-2,3,4,6,7,8-HxCDF	97.0		29-147	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,7,8,9-HxCDF	93.0		28-136	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF	84.0		28-143	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF	95.0		26-138	%	19-OCT-23	25-OCT-23	R5970024
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)	79.0		35-197	%	19-OCT-23	25-OCT-23	R5970024
Lower Bound PCDD/F TEQ (WHO 2005)	0.0219		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Mid Point PCDD/F TEQ (WHO 2005)	0.208		0	pg/g	19-OCT-23	25-OCT-23	R5970024
Upper Bound PCDD/F TEQ (WHO 2005)	0.380		0	pg/g	19-OCT-23	25-OCT-23	R5970024

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J,B	The analyte was detected below the calibrated range but above the EDL, and was detected in the Method Blank at >10% of the sample concentration.
J,G	QC result did not meet ALS DQO. Refer to narrative comments for further information. Duplicate expressed in terms of absolute difference.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M	A peak has been manually integrated.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,B	A peak has been manually integrated. Target analyte was detected below the calibrated range but above the EDL. Compound was detected in the method blank at >10% of the sample concentration.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,R	A peak has been manually integrated, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
R	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
[B]	The analyte was detected in the Method Blank at >10% of the sample concentration.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DX-1613B-HRMS-BU	Soil	Dioxins and Furans HR 1613B	USEPA 1613B
Samples are extracted by Soxhlet. The extracts are prepared using column chromatography, reduced in volume and analyzed by isotope-dilution GC/HRMS			
MOISTURE-BU	Soil	% Moisture	CCME PHC in Soil - Tier 1 (mod)
This method is used to determine the percent moisture in a sample. Samples are homogenized, moisture is removed by heating at 105°C until constant mass is achieved. The residues are measured gravimetrically and the difference in weight between the wet sample and the dried sample is used to determine the moisture content. This percent moisture can be used, in conjunction with analytical results, to report data on a dry weight basis.			
PCB-1668C-O2-HRMS-BU	Solid	All PCB congeners by GC/HRMS	USEPA 1668C
Samples are extracted by Soxhlet and the targets are isolated via multiple cleanup steps then analyzed by gas chromatography/high-resolution mass spectrometry using an SPB-Octyl column by isotope dilution			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
BU	ALS ENVIRONMENTAL - BURLINGTON, ONTARIO, CANADA

Chain of Custody Numbers:

20-963521

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: CPP ENVIRONMENTAL
154-150 Chippewa Road
Sherwood Park AB T8A 6A2
Contact: Theo Charette

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DX-1613B-HRMS-BU	**Soil**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
2,3,7,8-TCDD		<0.12	<0.14	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,7,8-PeCDD		<0.12	<0.15	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,4,7,8-HxCDD		<0.11	<0.12	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,6,7,8-HxCDD		<0.12	0.16	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,7,8,9-HxCDD		0.14	0.23		pg/g	49	50	25-OCT-23
1,2,3,4,6,7,8-HpCDD		2.36	2.73		pg/g	15	50	25-OCT-23
OCDD		26.4	32.5		pg/g	21	50	25-OCT-23
2,3,7,8-TCDF		<0.078	<0.096	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,7,8-PeCDF		<0.098	<0.081	RPD-NA	pg/g	N/A	50	25-OCT-23
2,3,4,7,8-PeCDF		<0.093	<0.073	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,4,7,8-HxCDF		<0.062	<0.068	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,6,7,8-HxCDF		<0.061	<0.066	RPD-NA	pg/g	N/A	50	25-OCT-23
2,3,4,6,7,8-HxCDF		<0.058	<0.064	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,7,8,9-HxCDF		<0.074	<0.087	RPD-NA	pg/g	N/A	50	25-OCT-23
1,2,3,4,6,7,8-HpCDF		0.170	0.240		pg/g	34	50	25-OCT-23
1,2,3,4,7,8,9-HpCDF		<0.074	<0.11	RPD-NA	pg/g	N/A	50	25-OCT-23
OCDF		0.52	0.42		pg/g	22	50	25-OCT-23
Total-TCDD		0.30	0.37		pg/g	22	50	25-OCT-23
Total-PeCDD		<0.12	<0.15	RPD-NA	pg/g	N/A	50	25-OCT-23
Total-HxCDD		2.25	1.63		pg/g	32	50	25-OCT-23
Total-HpCDD		5.34	5.60		pg/g	4.8	50	25-OCT-23
Total-TCDF		0.587	0.829		pg/g	34	50	25-OCT-23
Total-PeCDF		<0.098	<0.081	RPD-NA	pg/g	N/A	50	25-OCT-23
Total-HxCDF		<0.074	<0.087	RPD-NA	pg/g	N/A	50	25-OCT-23
Total-HpCDF		<0.074	<0.11	RPD-NA	pg/g	N/A	50	25-OCT-23
WG3787033-2 LCS								
2,3,7,8-TCDD			97.0		%		67-158	25-OCT-23
1,2,3,7,8-PeCDD			108.0		%		70-142	25-OCT-23
1,2,3,4,7,8-HxCDD			107.0		%		70-164	25-OCT-23
1,2,3,6,7,8-HxCDD			107.0		%		76-134	25-OCT-23
1,2,3,7,8,9-HxCDD			114.0		%		64-162	25-OCT-23
1,2,3,4,6,7,8-HpCDD			87.0		%		70-140	25-OCT-23
OCDD			95.0		%		78-144	25-OCT-23
2,3,7,8-TCDF			101.0		%		75-158	25-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DX-1613B-HRMS-BU	**Soil**							
Batch R5970024								
WG3787033-2 LCS								
1,2,3,7,8-PeCDF			98.0		%		80-134	25-OCT-23
2,3,4,7,8-PeCDF			92.0		%		68-160	25-OCT-23
1,2,3,4,7,8-HxCDF			102.0		%		72-134	25-OCT-23
1,2,3,6,7,8-HxCDF			105.0		%		84-130	25-OCT-23
2,3,4,6,7,8-HxCDF			92.0		%		70-156	25-OCT-23
1,2,3,7,8,9-HxCDF			103.0		%		78-130	25-OCT-23
1,2,3,4,6,7,8-HpCDF			99.0		%		82-122	25-OCT-23
1,2,3,4,7,8,9-HpCDF			92.0		%		78-138	25-OCT-23
OCDF			108.0		%		63-170	25-OCT-23
WG3787033-1 MB								
2,3,7,8-TCDD			<0.27	[U]	pg/g		2	25-OCT-23
1,2,3,7,8-PeCDD			<0.20	[U]	pg/g		10	25-OCT-23
1,2,3,4,7,8-HxCDD			<0.17	[U]	pg/g		10	25-OCT-23
1,2,3,6,7,8-HxCDD			<0.17	[U]	pg/g		10	25-OCT-23
1,2,3,7,8,9-HxCDD			0.20	M,J,R	pg/g		10	25-OCT-23
1,2,3,4,6,7,8-HpCDD			<0.17	[U]	pg/g		10	25-OCT-23
OCDD			1.10	J,R	pg/g		20	25-OCT-23
2,3,7,8-TCDF			<0.15	[U]	pg/g		2	25-OCT-23
1,2,3,7,8-PeCDF			<0.15	[U]	pg/g		10	25-OCT-23
2,3,4,7,8-PeCDF			<0.11	M,U	pg/g		10	25-OCT-23
1,2,3,4,7,8-HxCDF			<0.13	[U]	pg/g		10	25-OCT-23
1,2,3,6,7,8-HxCDF			<0.13	[U]	pg/g		10	25-OCT-23
2,3,4,6,7,8-HxCDF			0.12	M,J	pg/g		10	25-OCT-23
1,2,3,7,8,9-HxCDF			<0.15	[U]	pg/g		10	25-OCT-23
1,2,3,4,6,7,8-HpCDF			0.17	M,J,R	pg/g		10	25-OCT-23
1,2,3,4,7,8,9-HpCDF			<0.15	[U]	pg/g		10	25-OCT-23
OCDF			0.52	M,J,R	pg/g		20	25-OCT-23
Total-TCDD			<0.27	[U]	pg/g		0.27	25-OCT-23
Total-PeCDD			<0.20	[U]	pg/g		0.2	25-OCT-23
Total-HxCDD			0.19	A	pg/g		0.17	25-OCT-23
Total-HpCDD			<0.17	[U]	pg/g		0.17	25-OCT-23
Total-TCDF			<0.15	[U]	pg/g		0.15	25-OCT-23
Total-PeCDF			<0.15	[U]	pg/g		0.15	25-OCT-23
Total-HxCDF			<0.15	[U]	pg/g		0.15	25-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DX-1613B-HRMS-BU	**Soil**							
Batch R5970024								
WG3787033-1 MB								
Total-HpCDF			<0.15	[U]	pg/g		0.15	25-OCT-23
Surrogate: 13C12-2,3,7,8-TCDD			54.0		%		25-164	25-OCT-23
Surrogate: 13C12-1,2,3,7,8-PeCDD			76.0		%		25-181	25-OCT-23
Surrogate: 13C12-1,2,3,4,7,8-HxCDD			72.0		%		32-141	25-OCT-23
Surrogate: 13C12-1,2,3,6,7,8-HxCDD			64.0		%		28-130	25-OCT-23
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDD			88.0		%		23-140	25-OCT-23
Surrogate: 13C12-OCDD			73.0		%		17-157	25-OCT-23
Surrogate: 13C12-2,3,7,8-TCDF			65.0		%		24-169	25-OCT-23
Surrogate: 13C12-1,2,3,7,8-PeCDF			82.0		%		24-185	25-OCT-23
Surrogate: 13C12-2,3,4,7,8-PeCDF			91.0		%		21-178	25-OCT-23
Surrogate: 13C12-1,2,3,4,7,8-HxCDF			85.0		%		26-152	25-OCT-23
Surrogate: 13C12-1,2,3,6,7,8-HxCDF			82.0		%		26-123	25-OCT-23
Surrogate: 13C12-2,3,4,6,7,8-HxCDF			91.0		%		29-147	25-OCT-23
Surrogate: 13C12-1,2,3,7,8,9-HxCDF			91.0		%		28-136	25-OCT-23
Surrogate: 13C12-1,2,3,4,6,7,8-HpCDF			82.0		%		28-143	25-OCT-23
Surrogate: 13C12-1,2,3,4,7,8,9-HpCDF			90.0		%		26-138	25-OCT-23
Surrogate: 37Cl4-2,3,7,8-TCDD (Cleanup)			61.0		%		35-197	25-OCT-23
COMMENTS: There were low levels of select targets in the blank that were within the reference method control limits.								
MOISTURE-BU	**Soil**							
Batch R5969857								
WG3787034-3 DUP		**L2752797-1**						
% Moisture		43.9	43.3		%	1.4	20	23-OCT-23
WG3787034-2 LCS								
% Moisture			104.7		%		90-110	23-OCT-23
WG3787034-1 MB								
% Moisture			<0.10		%		0.3	23-OCT-23
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
PCB 1		1.53	1.50		pg/g	2.0	50	24-OCT-23
PCB 2		2.20	2.32		pg/g	5.3	50	24-OCT-23
PCB 3		3.19	2.32		pg/g	32	50	24-OCT-23
PCB 4		<0.94	<0.85	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 10		<0.32	<0.31	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 9		<0.33	<0.31	RPD-NA	pg/g	N/A	50	24-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
PCB 7		<0.32	<0.30	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 6		2.00	<0.31	G	pg/g	N/A	50	24-OCT-23
PCB 5		<0.31	<0.30	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 8		5.20	2.73	G	pg/g	62	50	24-OCT-23
PCB 14		1.03	1.12		pg/g	8.4	50	24-OCT-23
PCB 11		5.88	5.61		pg/g	4.7	50	24-OCT-23
PCB 13/12		2.40	1.95		pg/g	21	50	24-OCT-23
PCB 15		3.03	1.30	G	pg/g	80	50	24-OCT-23
PCB 19		0.82	<0.48	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 30/18		2.70	1.80		pg/g	40	50	24-OCT-23
PCB 17		1.59	0.87	J	pg/g	0.72	0.84	24-OCT-23
PCB 27		0.37	<0.32	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 24		<0.19	<0.34	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 16		1.48	0.83	J	pg/g	0.65	0.98	24-OCT-23
PCB 32		0.95	0.78		pg/g	19	50	24-OCT-23
PCB 34		<0.27	<0.37	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 23		<0.27	<0.37	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 29/26		1.38	0.52	J,G	pg/g	0.86	0.68	24-OCT-23
PCB 25		0.54	<0.34	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 31		4.00	2.50		pg/g	46	50	24-OCT-23
PCB 28/20		5.54	3.78		pg/g	38	50	24-OCT-23
PCB 21/33		2.00	1.27		pg/g	45	50	24-OCT-23
PCB 22		1.70	1.10		pg/g	43	50	24-OCT-23
PCB 36		<0.24	<0.32	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 39		<0.26	<0.36	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 38		2.97	3.22		pg/g	8.1	50	24-OCT-23
PCB 35		0.51	<0.38	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 37		2.49	1.60		pg/g	44	50	24-OCT-23
PCB 54		<0.15	<0.19	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 50/53		0.71	0.51		pg/g	33	50	24-OCT-23
PCB 45/51		0.66	0.42		pg/g	44	50	24-OCT-23
PCB 46		<0.27	<0.31	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 52		7.43	6.35		pg/g	16	50	24-OCT-23

COMMENTS: Sample and Duplicate do not meet replication criteria for some targets.

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
PCB 73		<0.16	<0.19	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 43		<0.29	<0.34	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 69/49		3.37	2.40		pg/g	34	50	24-OCT-23
PCB 48		0.91	0.63		pg/g	36	50	24-OCT-23
PCB 44/47/65		4.15	4.40		pg/g	5.8	50	24-OCT-23
PCB 59/62/75		0.41	0.46		pg/g	11	50	24-OCT-23
PCB 42		1.25	<0.30	G	pg/g	N/A	50	24-OCT-23
PCB 41/71/40		1.67	1.60		pg/g	4.3	50	24-OCT-23
PCB 64		1.98	2.05		pg/g	3.5	50	24-OCT-23
PCB 72		0.27	<0.28	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 68		0.26	<0.27	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 57		<0.20	<0.29	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 58		0.29	0.32		pg/g	9.8	50	24-OCT-23
PCB 67		<0.17	<0.25	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 63		0.33	<0.28	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 61/70/74/76		13.7	11.9		pg/g	14	50	24-OCT-23
PCB 66		6.16	5.52		pg/g	11	50	24-OCT-23
PCB 55		<0.20	<0.30	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 56		2.43	1.91		pg/g	24	50	24-OCT-23
PCB 60		1.86	1.90		pg/g	2.1	50	24-OCT-23
PCB 80		<0.16	<0.24	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 79		0.26	<0.26	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 78		<0.21	<0.31	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 81		<0.17	<0.25	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 77		2.00	2.17		pg/g	8.2	50	24-OCT-23
PCB 104		<0.081	<0.11	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 96		<0.092	<0.13	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 103		<0.21	<0.22	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 94		<0.22	<0.23	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 95		4.23	4.51		pg/g	6.4	50	24-OCT-23
PCB 100/93/102/98		0.61	<0.30	G	pg/g	N/A	50	24-OCT-23
PCB 88/91		1.64	1.10		pg/g	39	50	24-OCT-23
PCB 84		2.26	2.22		pg/g	1.8	50	24-OCT-23

COMMENTS: Sample and Duplicate do not meet replication criteria for some targets.

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
PCB 89		<0.27	<0.28	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 121		<0.15	<0.15	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 92		4.73	3.80		pg/g	22	50	24-OCT-23
PCB 113/90/101		24.7	22.5		pg/g	9.3	50	24-OCT-23
PCB 83/99		14.0	13.6		pg/g	2.9	50	24-OCT-23
PCB 112		<0.15	<0.16	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 109/119/86/97/125/87		11.9	12.5		pg/g	4.9	50	24-OCT-23
PCB 117/116/85/110/115		30.5	29.6		pg/g	3.0	50	24-OCT-23
PCB 82		2.17	2.10		pg/g	3.3	50	24-OCT-23
PCB 111		<0.15	<0.15	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 120		0.27	0.24		pg/g	12	50	24-OCT-23
PCB 108/124		1.38	0.88		pg/g	44	50	24-OCT-23
PCB 107		2.47	1.90		pg/g	26	50	24-OCT-23
PCB 123		0.51	0.47		pg/g	8.2	50	24-OCT-23
PCB 106		<0.14	<0.20	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 118		31.2	31.0		pg/g	0.6	50	24-OCT-23
PCB 122		0.27	0.28		pg/g	3.6	50	24-OCT-23
PCB 114		0.62	0.62		pg/g	0.0	50	24-OCT-23
PCB 105		15.3	15.5		pg/g	1.3	50	24-OCT-23
PCB 127		0.18	<0.18	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 126		0.71	0.49		pg/g	36	50	24-OCT-23
PCB 155		<0.053	<0.054	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 152		<0.091	0.139	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 150		<0.084	<0.081	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 136		2.39	2.62		pg/g	9.2	50	24-OCT-23
PCB 145		<0.086	<0.083	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 148		<0.12	<0.11	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 151/135		11.1	11.7		pg/g	5.3	50	24-OCT-23
PCB 154		1.10	1.30		pg/g	17	50	24-OCT-23
PCB 144		1.79	1.92		pg/g	7.0	50	24-OCT-23
PCB 147/149		25.2	24.1		pg/g	4.5	50	24-OCT-23
PCB 134/143		1.40	1.25		pg/g	11	50	24-OCT-23
PCB 139/140		0.49	0.45		pg/g	9.3	50	24-OCT-23

COMMENTS: Sample and Duplicate do not meet replication criteria for some targets.

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
PCB 131		0.34	<0.42	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 142		<0.21	<0.44	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 132		8.40	8.19		pg/g	2.5	50	24-OCT-23
PCB 133		0.45	<0.40	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 165		<0.14	<0.29	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 146		7.10	7.02		pg/g	1.1	50	24-OCT-23
PCB 161		<0.13	<0.27	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 168/153		48.6	45.9		pg/g	5.7	50	24-OCT-23
PCB 141		8.27	8.06		pg/g	2.6	50	24-OCT-23
PCB 130		2.43	2.44		pg/g	0.4	50	24-OCT-23
PCB 137/164		4.60	4.47		pg/g	2.9	50	24-OCT-23
PCB 138/163/129		62.8	63.3		pg/g	0.8	50	24-OCT-23
PCB 160		0.410	0.24	J	pg/g	0.17	0.36	24-OCT-23
PCB 158		4.02	3.89		pg/g	3.3	50	24-OCT-23
PCB 128/166		5.72	7.16		pg/g	22	50	24-OCT-23
PCB 159		0.32	0.64	J	pg/g	0.32	0.48	24-OCT-23
PCB 162		0.21	<0.26	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 167		2.34	2.20		pg/g	6.2	50	24-OCT-23
PCB 156/157		5.81	6.46		pg/g	11	50	24-OCT-23
PCB 169		0.71	0.62		pg/g	14	50	24-OCT-23
PCB 188		<0.060	<0.077	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 179		3.90	4.05		pg/g	3.8	50	24-OCT-23
PCB 184		<0.069	<0.088	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 176		0.980	0.950		pg/g	3.1	50	24-OCT-23
PCB 186		<0.074	<0.094	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 178		3.26	3.45		pg/g	5.7	50	24-OCT-23
PCB 175		0.510	0.44		pg/g	15	50	24-OCT-23
PCB 187		17.4	18.3		pg/g	5.0	50	24-OCT-23
PCB 182		<0.090	<0.11	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 183		7.41	7.71		pg/g	4.0	50	24-OCT-23
PCB 185		1.71	1.23		pg/g	33	50	24-OCT-23
PCB 174		11.3	11.4		pg/g	0.9	50	24-OCT-23
PCB 177		6.81	7.54		pg/g	10	50	24-OCT-23

COMMENTS: Sample and Duplicate do not meet replication criteria for some targets.

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
PCB 181		<0.098	<0.12	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 171/173		3.96	2.75	G	pg/g	N/A	50	24-OCT-23
PCB 172		2.52	2.73		pg/g	8.0	50	24-OCT-23
PCB 192		<0.080	<0.10	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 180/193		32.6	33.2		pg/g	1.8	50	24-OCT-23
PCB 191		0.565	0.510		pg/g	10	50	24-OCT-23
PCB 170		11.0	11.8		pg/g	7.0	50	24-OCT-23
PCB 190		2.52	2.70		pg/g	6.9	50	24-OCT-23
PCB 189		0.52	0.55		pg/g	5.1	50	24-OCT-23
PCB 202		1.25	1.27		pg/g	1.6	50	24-OCT-23
PCB 201		0.650	0.934		pg/g	36	50	24-OCT-23
PCB 204		<0.066	<0.081	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 197		0.160	0.296	J	pg/g	0.136	0.17	24-OCT-23
PCB 200		0.590	0.690		pg/g	16	50	24-OCT-23
PCB 198/199		7.85	7.98		pg/g	1.6	50	24-OCT-23
PCB 196		3.36	3.00		pg/g	11	50	24-OCT-23
PCB 203		4.17	4.64		pg/g	11	50	24-OCT-23
PCB 195		1.90	2.26		pg/g	17	50	24-OCT-23
PCB 194		6.03	6.97		pg/g	14	50	24-OCT-23
PCB 205		0.35	0.40		pg/g	11	50	24-OCT-23
PCB 208		<0.62	<0.97	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 207		<0.41	<0.62	RPD-NA	pg/g	N/A	50	24-OCT-23
PCB 206		1.10	1.70		pg/g	43	50	24-OCT-23
PCB 209		0.269	0.429		pg/g	46	50	24-OCT-23
Total MonoCB		6.92	6.14		pg/g	12	50	24-OCT-23
Total DiCB		19.5	12.7		pg/g	42	50	24-OCT-23
Total TriCB		29.0	18.3		pg/g	45	50	24-OCT-23
Total TetraCB		50.1	42.5		pg/g	16	50	24-OCT-23
Total PentaCB		150	143		pg/g	4.8	50	24-OCT-23
Total HexaCB		206	204		pg/g	1.0	50	24-OCT-23
Total HeptaCB		107	109		pg/g	1.9	50	24-OCT-23
Total OctaCB		26.3	28.4		pg/g	7.7	50	24-OCT-23
Total NonaCB		1.10	1.70		pg/g	43	50	24-OCT-23

COMMENTS: Sample and Duplicate do not meet replication criteria for some targets.

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-4 DUP		**L2752797-1**						
DecaCB		0.269	0.429		pg/g	46	50	24-OCT-23
Total PCB		596	567		pg/g	5.0	50	24-OCT-23
COMMENTS: Sample and Duplicate do not meet replication criteria for some targets.								
WG3787033-2 LCS								
PCB 1			108.0		%		60-135	24-OCT-23
PCB 3			94.0		%		60-135	24-OCT-23
PCB 4			96.0		%		60-135	24-OCT-23
PCB 15			101.0		%		60-135	24-OCT-23
PCB 19			97.0		%		60-135	24-OCT-23
PCB 37			104.0		%		60-135	24-OCT-23
PCB 54			101.0		%		60-135	24-OCT-23
PCB 81			93.0		%		60-135	24-OCT-23
PCB 77			90.0		%		60-135	24-OCT-23
PCB 104			89.0		%		60-135	24-OCT-23
PCB 123			91.0		%		60-135	24-OCT-23
PCB 118			97.0		%		60-135	24-OCT-23
PCB 114			105.0		%		60-135	24-OCT-23
PCB 105			94.0		%		60-135	24-OCT-23
PCB 126			93.0		%		60-135	24-OCT-23
PCB 155			94.0		%		60-135	24-OCT-23
PCB 167			91.0		%		60-135	24-OCT-23
PCB 156/157			93.0		%		60-135	24-OCT-23
PCB 169			96.0		%		60-135	24-OCT-23
PCB 188			89.0		%		60-135	24-OCT-23
PCB 189			98.0		%		60-135	24-OCT-23
PCB 202			104.0		%		60-135	24-OCT-23
PCB 205			91.0		%		60-135	24-OCT-23
PCB 208			93.0		%		60-135	24-OCT-23
PCB 206			95.0		%		60-135	24-OCT-23
PCB 209			107.0		%		60-135	24-OCT-23
WG3787033-1 MB								
PCB 1			<0.30	[U]	pg/g		7.463	24-OCT-23
PCB 2			<0.28	[U]	pg/g		7.463	24-OCT-23
PCB 3			<0.27	[U]	pg/g		7.463	24-OCT-23
PCB 4			<1.4	[U]	pg/g		7.463	24-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-1 MB								
PCB 10			<0.60	[U]	pg/g		7.463	24-OCT-23
PCB 9			<0.61	[U]	pg/g		7.463	24-OCT-23
PCB 7			<0.60	[U]	pg/g		7.463	24-OCT-23
PCB 6			<0.62	[U]	pg/g		7.463	24-OCT-23
PCB 5			<0.58	[U]	pg/g		7.463	24-OCT-23
PCB 8			1.20	J,R	pg/g		7.463	24-OCT-23
PCB 14			<0.72	[U]	pg/g		7.463	24-OCT-23
PCB 11			5.99	[J]	pg/g		7.463	24-OCT-23
PCB 13/12			<0.71	[U]	pg/g		7.463	24-OCT-23
PCB 15			<0.55	[U]	pg/g		7.463	24-OCT-23
PCB 19			<0.77	[U]	pg/g		7.463	24-OCT-23
PCB 30/18			0.82	J,R	pg/g		7.463	24-OCT-23
PCB 17			0.84	M,J	pg/g		7.463	24-OCT-23
PCB 27			<0.41	[U]	pg/g		7.463	24-OCT-23
PCB 24			<0.44	[U]	pg/g		7.463	24-OCT-23
PCB 16			<0.62	[U]	pg/g		7.463	24-OCT-23
PCB 32			0.45	M,J,R	pg/g		7.463	24-OCT-23
PCB 34			<0.58	[U]	pg/g		7.463	24-OCT-23
PCB 23			<0.58	[U]	pg/g		7.463	24-OCT-23
PCB 29/26			<0.54	[U]	pg/g		7.463	24-OCT-23
PCB 25			<0.53	[U]	pg/g		7.463	24-OCT-23
PCB 31			1.10	J,R	pg/g		7.463	24-OCT-23
PCB 28/20			1.20	J,R	pg/g		7.463	24-OCT-23
PCB 21/33			0.92	[J]	pg/g		7.463	24-OCT-23
PCB 22			<0.60	[U]	pg/g		7.463	24-OCT-23
PCB 36			<0.51	[U]	pg/g		7.463	24-OCT-23
PCB 39			<0.57	[U]	pg/g		7.463	24-OCT-23
PCB 38			<0.56	[U]	pg/g		7.463	24-OCT-23
PCB 35			<0.60	[U]	pg/g		7.463	24-OCT-23
PCB 37			<0.45	[U]	pg/g		7.463	24-OCT-23
PCB 54			<0.38	[U]	pg/g		7.463	24-OCT-23
PCB 50/53			<0.45	[U]	pg/g		7.463	24-OCT-23
PCB 45/51			<0.46	M,U	pg/g		7.463	24-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-1 MB								
PCB 46			<0.51	[U]	pg/g		7.463	24-OCT-23
PCB 52			1.10	J,R	pg/g		7.463	24-OCT-23
PCB 73			<0.30	[U]	pg/g		7.463	24-OCT-23
PCB 43			<0.55	[U]	pg/g		7.463	24-OCT-23
PCB 69/49			0.65	M,J	pg/g		7.463	24-OCT-23
PCB 48			<0.43	[U]	pg/g		7.463	24-OCT-23
PCB 44/47/65			1.40	M,J,R	pg/g		7.463	24-OCT-23
PCB 59/62/75			<0.33	[U]	pg/g		7.463	24-OCT-23
PCB 42			<0.48	M,U	pg/g		7.463	24-OCT-23
PCB 41/71/40			<0.44	[U]	pg/g		7.463	24-OCT-23
PCB 64			<0.32	[U]	pg/g		7.463	24-OCT-23
PCB 72			<0.34	[U]	pg/g		7.463	24-OCT-23
PCB 68			<0.33	[U]	pg/g		7.463	24-OCT-23
PCB 57			<0.36	[U]	pg/g		7.463	24-OCT-23
PCB 58			<0.35	[U]	pg/g		7.463	24-OCT-23
PCB 67			<0.31	[U]	pg/g		7.463	24-OCT-23
PCB 63			<0.35	[U]	pg/g		7.463	24-OCT-23
PCB 61/70/74/76			<0.35	[U]	pg/g		7.463	24-OCT-23
PCB 66			<0.34	[U]	pg/g		7.463	24-OCT-23
PCB 55			<0.37	[U]	pg/g		7.463	24-OCT-23
PCB 56			<0.36	[U]	pg/g		7.463	24-OCT-23
PCB 60			<0.36	[U]	pg/g		7.463	24-OCT-23
PCB 80			<0.30	[U]	pg/g		7.463	24-OCT-23
PCB 79			<0.31	[U]	pg/g		7.463	24-OCT-23
PCB 78			<0.38	[U]	pg/g		7.463	24-OCT-23
PCB 81			<0.31	[U]	pg/g		7.463	24-OCT-23
PCB 77			<0.32	[U]	pg/g		7.463	24-OCT-23
PCB 104			<0.24	[U]	pg/g		7.463	24-OCT-23
PCB 96			<0.30	[U]	pg/g		7.463	24-OCT-23
PCB 103			<0.36	[U]	pg/g		7.463	24-OCT-23
PCB 94			<0.37	[U]	pg/g		7.463	24-OCT-23
PCB 95			<0.17	M,U	pg/g		7.463	24-OCT-23
PCB 100/93/102/98			<0.49	[U]	pg/g		7.463	24-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-1 MB								
PCB 88/91			<0.37	[U]	pg/g		7.463	24-OCT-23
PCB 84			<0.38	[U]	pg/g		7.463	24-OCT-23
PCB 89			<0.45	[U]	pg/g		7.463	24-OCT-23
PCB 121			<0.25	[U]	pg/g		7.463	24-OCT-23
PCB 92			<0.40	[U]	pg/g		7.463	24-OCT-23
PCB 113/90/101			0.36	M,J,R	pg/g		7.463	24-OCT-23
PCB 83/99			<0.37	[U]	pg/g		7.463	24-OCT-23
PCB 112			<0.25	[U]	pg/g		7.463	24-OCT-23
PCB 109/119/86/97/125/87			<0.30	[U]	pg/g		7.463	24-OCT-23
PCB 117/116/85/110/115			0.30	M,J,R	pg/g		7.463	24-OCT-23
PCB 82			<0.45	[U]	pg/g		7.463	24-OCT-23
PCB 111			<0.24	[U]	pg/g		7.463	24-OCT-23
PCB 120			<0.23	[U]	pg/g		7.463	24-OCT-23
PCB 108/124			<0.32	[U]	pg/g		7.463	24-OCT-23
PCB 107			<0.30	[U]	pg/g		7.463	24-OCT-23
PCB 123			<0.32	[U]	pg/g		7.463	24-OCT-23
PCB 106			<0.34	[U]	pg/g		7.463	24-OCT-23
PCB 118			0.39	M,J	pg/g		7.463	24-OCT-23
PCB 122			<0.41	[U]	pg/g		7.463	24-OCT-23
PCB 114			<0.34	[U]	pg/g		7.463	24-OCT-23
PCB 105			<0.35	[U]	pg/g		7.463	24-OCT-23
PCB 127			<0.32	[U]	pg/g		7.463	24-OCT-23
PCB 126			<0.33	[U]	pg/g		7.463	24-OCT-23
PCB 155			<0.12	[U]	pg/g		7.463	24-OCT-23
PCB 152			<0.17	[U]	pg/g		7.463	24-OCT-23
PCB 150			<0.16	[U]	pg/g		7.463	24-OCT-23
PCB 136			<0.17	[U]	pg/g		7.463	24-OCT-23
PCB 145			<0.16	[U]	pg/g		7.463	24-OCT-23
PCB 148			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 151/135			<0.24	[U]	pg/g		7.463	24-OCT-23
PCB 154			<0.15	[U]	pg/g		7.463	24-OCT-23
PCB 144			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 147/149			<0.32	M,U	pg/g		7.463	24-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-1 MB								
PCB 134/143			<0.39	[U]	pg/g		7.463	24-OCT-23
PCB 139/140			<0.32	[U]	pg/g		7.463	24-OCT-23
PCB 131			<0.39	[U]	pg/g		7.463	24-OCT-23
PCB 142			<0.40	[U]	pg/g		7.463	24-OCT-23
PCB 132			<0.37	[U]	pg/g		7.463	24-OCT-23
PCB 133			<0.37	[U]	pg/g		7.463	24-OCT-23
PCB 165			<0.27	[U]	pg/g		7.463	24-OCT-23
PCB 146			<0.29	[U]	pg/g		7.463	24-OCT-23
PCB 161			<0.25	[U]	pg/g		7.463	24-OCT-23
PCB 168/153			<0.26	[U]	pg/g		7.463	24-OCT-23
PCB 141			<0.32	[U]	pg/g		7.463	24-OCT-23
PCB 130			<0.37	[U]	pg/g		7.463	24-OCT-23
PCB 137/164			<0.28	[U]	pg/g		7.463	24-OCT-23
PCB 138/163/129			<0.40	[U]	pg/g		7.463	24-OCT-23
PCB 160			<0.17	[U]	pg/g		7.463	24-OCT-23
PCB 158			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 128/166			<0.28	[U]	pg/g		7.463	24-OCT-23
PCB 159			<0.23	[U]	pg/g		7.463	24-OCT-23
PCB 162			<0.24	[U]	pg/g		7.463	24-OCT-23
PCB 167			<0.21	[U]	pg/g		7.463	24-OCT-23
PCB 156/157			<0.38	[U]	pg/g		14.925	24-OCT-23
PCB 169			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 188			<0.15	[U]	pg/g		7.463	24-OCT-23
PCB 179			<0.16	[U]	pg/g		7.463	24-OCT-23
PCB 184			<0.15	[U]	pg/g		7.463	24-OCT-23
PCB 176			<0.16	[U]	pg/g		7.463	24-OCT-23
PCB 186			<0.16	[U]	pg/g		7.463	24-OCT-23
PCB 178			<0.23	[U]	pg/g		7.463	24-OCT-23
PCB 175			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 187			<0.20	[U]	pg/g		7.463	24-OCT-23
PCB 182			<0.20	[U]	pg/g		7.463	24-OCT-23
PCB 183			<0.20	[U]	pg/g		7.463	24-OCT-23
PCB 185			<0.23	[U]	pg/g		7.463	24-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-1 MB								
PCB 174			<0.20	[U]	pg/g		7.463	24-OCT-23
PCB 177			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 181			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 171/173			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 172			<0.21	[U]	pg/g		7.463	24-OCT-23
PCB 192			<0.18	[U]	pg/g		7.463	24-OCT-23
PCB 180/193			<0.17	[U]	pg/g		7.463	24-OCT-23
PCB 191			<0.16	[U]	pg/g		7.463	24-OCT-23
PCB 170			<0.22	[U]	pg/g		7.463	24-OCT-23
PCB 190			<0.14	[U]	pg/g		7.463	24-OCT-23
PCB 189			<0.17	[U]	pg/g		7.463	24-OCT-23
PCB 202			<0.15	[U]	pg/g		7.463	24-OCT-23
PCB 201			<0.14	[U]	pg/g		7.463	24-OCT-23
PCB 204			<0.14	[U]	pg/g		7.463	24-OCT-23
PCB 197			<0.15	[U]	pg/g		7.463	24-OCT-23
PCB 200			<0.15	[U]	pg/g		7.463	24-OCT-23
PCB 198/199			<0.21	[U]	pg/g		7.463	24-OCT-23
PCB 196			<0.20	[U]	pg/g		7.463	24-OCT-23
PCB 203			<0.20	[U]	pg/g		7.463	24-OCT-23
PCB 195			<0.18	[U]	pg/g		7.463	24-OCT-23
PCB 194			0.36	M,J,R	pg/g		7.463	24-OCT-23
PCB 205			<0.15	[U]	pg/g		7.463	24-OCT-23
PCB 208			<0.62	[U]	pg/g		7.463	24-OCT-23
PCB 207			<0.67	[U]	pg/g		7.463	24-OCT-23
PCB 206			<1.1	[U]	pg/g		7.463	24-OCT-23
PCB 209			<0.20	[U]	pg/g		7.463	24-OCT-23
Surrogate: 13C12 PCB 1			23.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 3			28.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 4			23.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 15			31.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 19			24.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 37			36.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 54			21.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 81			44.0		%		10-145	24-OCT-23

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-1668C-O2-HRMS-BU	**Solid**							
Batch R5970024								
WG3787033-1 MB								
Surrogate: 13C12 PCB 77			42.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 104			40.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 123			50.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 118			48.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 114			45.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 105			44.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 126			49.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 155			45.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 167			52.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 156/157			45.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 169			54.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 188			46.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 189			54.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 202			47.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 205			52.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 208			48.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 206			48.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 209			41.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 28			35.0		%		5-145	24-OCT-23
Surrogate: 13C12 PCB 111			51.0		%		10-145	24-OCT-23
Surrogate: 13C12 PCB 178			50.0		%		10-145	24-OCT-23
Total MonoCB			<0.27	[U]	pg/g		29.851	24-OCT-23
Total DiCB			7.19	[J]	pg/g		59.701	24-OCT-23
Total TriCB			5.33	[J]	pg/g		59.701	24-OCT-23
Total TetraCB			3.15	[J]	pg/g		119.403	24-OCT-23
Total PentaCB			1.05	[J]	pg/g		119.403	24-OCT-23
Total HexaCB			<0.12	[U]	pg/g		119.403	24-OCT-23
Total HeptaCB			<0.14	[U]	pg/g		59.701	24-OCT-23
Total OctaCB			0.36	[J]	pg/g		59.701	24-OCT-23
Total NonaCB			<0.62	[U]	pg/g		29.851	24-OCT-23
DecaCB			<0.20	[U]	pg/g		29.851	24-OCT-23
Total PCB			17.1	[J]	pg/g		238.806	24-OCT-23

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
A	Method Blank exceeds ALS DQO. Refer to narrative comments for further information.
G	QC result did not meet ALS DQO. Refer to narrative comments for further information.
J	Duplicate results and limits are expressed in terms of absolute difference.
J,G	QC result did not meet ALS DQO. Refer to narrative comments for further information. Duplicate expressed in terms of absolute difference.
J,R	The analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,J	A peak has been manually integrated, and the analyte was detected below the calibrated range but above the EDL.
M,J,R	A peak has been manually integrated, the analyte was detected below the calibrated range but above the EDL, and the ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
M,U	A peak has been manually integrated, and the analyte was not detected above the EDL.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
[J]	The analyte was detected below the calibrated range but above the EDL.
[U]	The analyte was not detected above the EDL.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 963521

Canada Toll Free: 1 800 668 9878

Page of

www.alsglobal.com

Report To	Contact and company name below will appear on the final report	Reports / Recipients	Turnaround Tim
Company:	CPP Environmental	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	☑ Routine [R] If received by 3pm M-I
Contact:	Theo Charette	Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A	☐ 4 day [P4] If received by 3pm M-F
Phone:	780 - 570 - 5818	☐ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] If received by 3pm M-I
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] If received by 3pm M-I
Street:	154-150 Chippewa Rd	Email 1 or Fax theo.charette@cppenv.c	☐ 1 day [E] If received by 3pm M-F
City/Province:	Sherwood Park	Email 2 info@cppenv.ca	☐ Same day [E2] If received by 10am may apply to rush requests on weeke
Postal Code:		Email 3	Date and Time Required for all
Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Recipients	For all tests
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Company:		Email 1 or Fax	
Contact:		Email 2	

L2752797-COFC

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #	Q86576	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):	E02308678	ALS Contact:	Sampler:

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Indicate Filtered: Dioxins/Furans	DC/PCB	General + BTEX	TOC	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRI	SUSPECTED HAZARD (see notes)
	SSA	18-Sept-23	1800	Soil	4	✓	✓	✓				
	~~Bore A~~	~~18-Sep-23~~		Soil	4							
	Chrystina L	19 Sep 23	1130	Soil	4	✓	✓	✓				
	Edith L	19 Sep 23	1830	Soil	4	✓	✓	✓				
	SC	20 Sep 23	1000	Soil	4	✓	✓	✓				

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	See quote for analyses
Are samples for human consumption/ use? ☐ YES ☑ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
6 6							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
				Sep 20 23	3:26			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Your Project #: SUEZ
Your C.O.C. #: 1/1

Attention: Théo Charette

CPP ENVIRONMENTAL
154-150 CHIPPEWA ROAD
SHERWOOD PARK, AB
CANADA T8A 6A2

Report Date: 2023/12/30
Report #: R3446758
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C375503
Received: 2023/09/20, 16:13

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cation/EC Ratio (1)	3	N/A	2023/10/06		Auto Calc
Cation/EC Ratio (1)	1	N/A	2023/10/17		Auto Calc
Cation/EC Ratio (1)	1	N/A	2023/10/20		Auto Calc
Chloride (Soluble) (1)	3	2023/10/05	2023/10/06	AB SOP-00033 / AB SOP-00020	SM 24-4500-Cl-E m
Chloride (Soluble) (1)	1	2023/10/16	2023/10/17	AB SOP-00033 / AB SOP-00020	SM 24-4500-Cl-E m
Chloride (Soluble) (1)	1	2023/10/19	2023/10/19	AB SOP-00033 / AB SOP-00020	SM 24-4500-Cl-E m
Hexavalent Chromium (1, 2)	4	2023/12/27	2023/12/27	AB SOP-00063	SM 24 3500-Cr B m
Conductivity @25C (Soluble) (1)	3	2023/10/06	2023/10/06	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble) (1)	1	2023/10/16	2023/10/17	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Conductivity @25C (Soluble) (1)	1	2023/10/19	2023/10/20	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
Elements by ICP -Soils (1)	3	2023/10/06	2023/10/09	AB SOP-00001 / AB SOP-00042	EPA 6010d R5 m
Elements by ICP -Soils (1)	2	2023/10/17	2023/10/18	AB SOP-00001 / AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS - Soils (1)	4	2023/12/28	2023/12/29	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Sum of Cations, Anions (1)	3	N/A	2023/10/06		Auto Calc
Sum of Cations, Anions (1)	1	N/A	2023/10/17		Auto Calc
Sum of Cations, Anions (1)	1	N/A	2023/10/20		Auto Calc
Moisture (1)	5	N/A	2023/10/11	AB SOP-00002	CCME PHC-CWS m
pH @25C (1:2 Calcium Chloride Extract) (1)	3	2023/10/06	2023/10/06	AB SOP-00033 / AB SOP-00006	SM 24 4500 H+B m
pH @25C (1:2 Calcium Chloride Extract) (1)	1	2023/10/17	2023/10/17	AB SOP-00033 / AB SOP-00006	SM 24 4500 H+B m
pH @25C (1:2 Calcium Chloride Extract) (1)	1	2023/10/20	2023/10/20	AB SOP-00033 / AB SOP-00006	SM 24 4500 H+B m
Particle Size by Sieve (75 micron) (1)	5	N/A	2023/10/13		Auto Calc

Your Project #: SUEZ
Your C.O.C. #: 1/1

Attention: Théo Charette

CPP ENVIRONMENTAL
154-150 CHIPPEWA ROAD
SHERWOOD PARK, AB
CANADA T8A 6A2

Report Date: 2023/12/30
Report #: R3446758
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C375503
Received: 2023/09/20, 16:13

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Particle Size by Sieve (1)	5	N/A	2023/10/13	AB SOP-00022	ASTM D6913-17 m
Sodium Adsorption Ratio (1)	3	N/A	2023/10/06		Auto Calc
Sodium Adsorption Ratio (1)	1	N/A	2023/10/17		Auto Calc
Sodium Adsorption Ratio (1)	1	N/A	2023/10/20		Auto Calc
Soluble Ions (1)	3	2023/10/05	2023/10/06	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Ions (1)	1	2023/10/16	2023/10/17	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Ions (1)	1	2023/10/19	2023/10/19	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Paste (1)	3	2023/10/05	2023/10/05	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Paste (1)	1	2023/10/16	2023/10/16	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Paste (1)	1	2023/10/19	2023/10/19	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Boron Calculation (1)	4	N/A	2023/12/28		Auto Calc
Soluble Ions Calculation (1)	3	N/A	2023/10/05		Auto Calc
Soluble Ions Calculation (1)	2	N/A	2023/10/11		Auto Calc
Total Organic Carbon LECO Method (1)	5	N/A	2023/10/18	CAL SOP-00243	LECO 203-821-498 m
Total Carbon, Nitrogen & Sulphur in Soil (1)	5	N/A	2023/10/17	CAL SOP-00243	LECO 203-821-498 m
Theoretical Gypsum Requirement (1, 3)	3	N/A	2023/10/06		Auto Calc
Theoretical Gypsum Requirement (1, 3)	1	N/A	2023/10/17		Auto Calc
Theoretical Gypsum Requirement (1, 3)	1	N/A	2023/10/20		Auto Calc

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report.

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

Your Project #: SUEZ
Your C.O.C. #: 1/1

Attention: Théo Charette

CPP ENVIRONMENTAL
154-150 CHIPPEWA ROAD
SHERWOOD PARK, AB
CANADA T8A 6A2

Report Date: 2023/12/30
Report #: R3446758
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C375503
Received: 2023/09/20, 16:13

Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8
(2) Some soil samples may react with the Cr(VI) spike reducing it to Cr(III). These samples are highly unlikely to contain native hexavalent chromium. Thus a failed spike recovery does not invalidate a negative result on the native sample.
(3) TGR calculation is based on a theoretical SAR of 4. Salt Contamination and Assessment and remediation guideline 2001 recommended SAR is ranging 4-8. TGR is reported in tonnes/ha.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bureauveritas.com
Phone# (780) 577-7100

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

PARTICLE SIZE BY SIEVE (75 UM)

Bureau Veritas ID		BZT150	BZT151	BZT152	BZT153	BZT154		
Sampling Date		2023/09/18 17:30	2023/09/18 17:30	2023/09/19 11:30	2023/09/19 18:30	2023/09/20 10:00		
COC Number		1/1	1/1	1/1	1/1	1/1		
	UNITS	**S5A**	**BEAR R**	**CHRYSTINA L**	**EDITH L**	**S6**	**RDL**	**QC Batch**
Physical Properties								
Grain Size	N/A	COARSE	COARSE	FINE	FINE	COARSE	N/A	B121100
Sieve - #10 (>2.00mm)	%	0.73	0.68	<0.20	<0.20	2.3	0.20	B147952
Sieve - #200 (>0.075mm)	%	70	55	0.82	<0.20	74	0.20	B147952
Sieve - Pan	%	30	45	99	100	26	0.20	B147952

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

AT1 REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		BZT150		BZT152		BZT153		BZT154		
Sampling Date		2023/09/18 17:30		2023/09/19 11:30		2023/09/19 18:30		2023/09/20 10:00		
COC Number		1/1		1/1		1/1		1/1		
	UNITS	S5A	RDL	CHRYSTINA L	RDL	EDITH L	RDL	S6	RDL	QC Batch
Calculated Parameters										
Calculated Boron (B)	mg/kg	<0.060	0.060	0.37	0.15	<0.13	0.13	<0.12	0.12	B242829
Elements										
Hex. Chromium (Cr 6+)	mg/kg	<0.080	0.080	<1.3 (1)	1.3	<1.5 (1)	1.5	<0.080	0.080	B243461
Total Antimony (Sb)	mg/kg	<1.0	1.0	<0.50	0.50	0.65	0.50	<1.0	1.0	B244527
Total Arsenic (As)	mg/kg	3.3	2.0	7.8	1.0	5.3	1.0	6.1	2.0	B244527
Total Barium (Ba)	mg/kg	120	2.0	200	1.0	180	1.0	150	2.0	B244527
Total Beryllium (Be)	mg/kg	<0.80	0.80	0.86	0.40	0.68	0.40	<0.80	0.80	B244527
Total Cadmium (Cd)	mg/kg	0.15	0.10	0.38	0.050	0.59	0.050	0.17	0.10	B244527
Total Chromium (Cr)	mg/kg	11	2.0	13	1.0	15	1.0	7.0	2.0	B244527
Total Cobalt (Co)	mg/kg	5.3	1.0	7.1	0.50	7.5	0.50	8.4	1.0	B244527
Total Copper (Cu)	mg/kg	6.6	2.0	18	1.0	20	1.0	3.9	2.0	B244527
Total Lead (Pb)	mg/kg	5.2	1.0	16	0.50	21	0.50	3.7	1.0	B244527
Total Mercury (Hg)	mg/kg	<0.10 (2)	0.10	0.11 (2)	0.050	0.16 (2)	0.050	<0.10 (2)	0.10	B244527
Total Molybdenum (Mo)	mg/kg	<0.80	0.80	0.97	0.40	1.0	0.40	<0.80	0.80	B244527
Total Nickel (Ni)	mg/kg	10	2.0	19	1.0	24	1.0	7.7	2.0	B244527
Total Selenium (Se)	mg/kg	<1.0	1.0	0.67	0.50	1.1	0.50	<1.0	1.0	B244527
Total Silver (Ag)	mg/kg	<0.40	0.40	<0.20	0.20	<0.20	0.20	<0.40	0.40	B244527
Total Thallium (Tl)	mg/kg	<0.20	0.20	0.19	0.10	0.16	0.10	<0.20	0.20	B244527
Total Tin (Sn)	mg/kg	<2.0	2.0	1.2	1.0	2.0	1.0	<2.0	2.0	B244527
Total Uranium (U)	mg/kg	0.83	0.40	1.8	0.20	1.5	0.20	0.51	0.40	B244527
Total Vanadium (V)	mg/kg	17	2.0	23	1.0	23	1.0	11	2.0	B244527
Total Zinc (Zn)	mg/kg	38	20	70	10	90	10	27	20	B244527

RDL = Reportable Detection Limit
(1) Detection limits raised due to high moisture content, samples contain => 50% moisture.
(2) Sample analyzed past method specified hold time

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

SOIL SALINITY 4 (SOIL)

Bureau Veritas ID		BZT150		BZT151			BZT152		
Sampling Date		2023/09/18 17:30		2023/09/18 17:30			2023/09/19 11:30		
COC Number		1/1		1/1			1/1		
	UNITS	S5A	RDL	BEAR R	RDL	QC Batch	CHRYSTINA L	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	0.83	N/A	0.86	N/A	B121099	2.1	N/A	B121099
Cation Sum	meq/L	1.4	N/A	1.5	N/A	B121099	3.7	N/A	B121099
Cation/EC Ratio	N/A	8.3	0.10	8.5	0.10	B121096	6.4	0.10	B121096
Calculated Calcium (Ca)	mg/kg	3.0	0.90	2.9	0.92	B121102	59	2.3	B121102
Calculated Magnesium (Mg)	mg/kg	0.70	0.60	0.66	0.62	B121102	12	1.5	B121102
Calculated Sodium (Na)	mg/kg	13	1.5	15	1.5	B121102	26	3.8	B121102
Calculated Potassium (K)	mg/kg	1.6	0.78	1.7	0.80	B121102	23	2.0	B121102
Calculated Chloride (Cl)	mg/kg	<6.0	6.0	<6.2	6.2	B121102	<15	15	B121102
Calculated Sulphate (SO4)	mg/kg	24	3.0	25	3.1	B121102	160	7.6	B121102
Soluble Parameters									
Soluble Boron (B)	mg/L	<0.10	0.10	<0.10	0.10	B142745	0.24	0.10	B156712
Soluble Chloride (Cl)	mg/L	<10	10	<10	10	B142653	<10	10	B156738
Soluble Conductivity	dS/m	0.17	0.020	0.17	0.020	B142760	0.58	0.020	B156792
Soluble (CaCl2) pH	pH	5.25	N/A	5.15	N/A	B141294	5.12	N/A	B155423
Sodium Adsorption Ratio	N/A	2.4	0.10	2.7	0.10	B121101	0.64	0.10	B121101
Soluble Calcium (Ca)	mg/L	5.1	1.5	4.6	1.5	B142745	39	1.5	B156712
Soluble Magnesium (Mg)	mg/L	1.2	1.0	1.1	1.0	B142745	8.1	1.0	B156712
Soluble Sodium (Na)	mg/L	23	2.5	24	2.5	B142745	17	2.5	B156712
Soluble Potassium (K)	mg/L	2.7	1.3	2.8	1.3	B142745	15	1.3	B156712
Saturation %	%	60	N/A	62	N/A	B141286	150	N/A	B155420
Soluble Sulphate (SO4)	mg/L	40	5.0	41	5.0	B142745	100	5.0	B156712
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	<0.20	0.20	B121103	<0.20	0.20	B121103

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

SOIL SALINITY 4 (SOIL)

Bureau Veritas ID		BZT153			BZT154		
Sampling Date		2023/09/19 18:30			2023/09/20 10:00		
COC Number		1/1			1/1		
	UNITS	EDITH L	RDL	QC Batch	S6	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	3.6	N/A	B121099	0.53	N/A	B121099
Cation Sum	meq/L	4.2	N/A	B121099	2.3	N/A	B121099
Cation/EC Ratio	N/A	5.7	0.10	B121096	11	0.10	B121096
Calculated Calcium (Ca)	mg/kg	43	1.9	B121102	33	1.7	B121102
Calculated Magnesium (Mg)	mg/kg	9.2	1.3	B121102	6.8	1.2	B121102
Calculated Sodium (Na)	mg/kg	34	3.2	B121102	9.7	2.9	B121102
Calculated Potassium (K)	mg/kg	38	1.7	B121102	2.0	1.5	B121102
Calculated Chloride (Cl)	mg/kg	56	13	B121102	<12	12	B121102
Calculated Sulphate (SO4)	mg/kg	150	6.4	B121102	30	5.8	B121102
Soluble Parameters							
Soluble Boron (B)	mg/L	<0.10	0.10	B161713	<0.10	0.10	B142745
Soluble Chloride (Cl)	mg/L	43	10	B161683	<10	10	B142653
Soluble Conductivity	dS/m	0.74	0.020	B163295	0.21	0.020	B142760
Soluble (CaCl2) pH	pH	5.20	N/A	B154255	6.01	N/A	B141294
Sodium Adsorption Ratio	N/A	1.1	0.10	B121101	0.37	0.10	B121101
Soluble Calcium (Ca)	mg/L	34	1.5	B161713	28	1.5	B142745
Soluble Magnesium (Mg)	mg/L	7.1	1.0	B161713	5.8	1.0	B142745
Soluble Sodium (Na)	mg/L	27	2.5	B161713	8.3	2.5	B142745
Soluble Potassium (K)	mg/L	30	1.3	B161713	1.7	1.3	B142745
Saturation %	%	130	N/A	B160960	120	N/A	B141286
Soluble Sulphate (SO4)	mg/L	110	5.0	B161713	26	5.0	B142745
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	B121103	<0.20	0.20	B121103

RDL = Reportable Detection Limit
N/A = Not Applicable

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BZT150	BZT151	BZT152	BZT153	BZT154		
Sampling Date		2023/09/18 17:30	2023/09/18 17:30	2023/09/19 11:30	2023/09/19 18:30	2023/09/20 10:00		
COC Number		1/1	1/1	1/1	1/1	1/1		
	UNITS	S5A	BEAR R	CHRYSTINA L	EDITH L	S6	RDL	QC Batch
Physical Properties								
Moisture	%	39	42	94	95	41	0.30	B146981
RDL = Reportable Detection Limit								

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		BZT150	BZT151			BZT152	BZT153			BZT154		
Sampling Date		2023/09/18 17:30	2023/09/18 17:30			2023/09/19 11:30	2023/09/19 18:30			2023/09/20 10:00		
COC Number		1/1	1/1			1/1	1/1			1/1		
	UNITS	S5A	BEAR R	RDL	QC Batch	CHRYSTINA L	EDITH L	RDL	QC Batch	S6	RDL	QC Batch
Elements												
Total Aluminum (Al)	mg/kg	7300	7400	10	B142610	14000	9900	20	B156336	9000	10	B142610
Total Boron (B)	mg/kg	2.6	3.7	2.0	B142610	4.2	<4.0	4.0	B156336	<2.0	2.0	B142610
Total Calcium (Ca)	mg/kg	3300	3100	50	B142610	4800	4500	100	B156336	6800	50	B142610
Total Iron (Fe)	mg/kg	11000	11000	10	B142610	17000	11000	20	B156336	28000	10	B142610
Total Lithium (Li)	mg/kg	<10	<10	10	B142610	<20	<20	20	B156336	<10	10	B142610
Total Magnesium (Mg)	mg/kg	1600	1600	20	B142610	2300	1400	40	B156336	2100	20	B142610
Total Manganese (Mn)	mg/kg	300	320	10	B142610	450	510	20	B156336	6000	10	B142610
Total Phosphorus (P)	mg/kg	390	410	20	B142610	1500	1400	40	B156336	710	20	B142610
Total Potassium (K)	mg/kg	460	480	25	B142610	1000	770	50	B156336	470	25	B142610
Total Sodium (Na)	mg/kg	55	53	50	B142610	<100	<100	100	B156336	<50	50	B142610
Total Strontium (Sr)	mg/kg	23	23	10	B142610	28	34	20	B156336	40	10	B142610
Total Sulphur (S)	mg/kg	360	370	20	B142610	2500	3300	40	B156336	740	20	B142610

RDL = Reportable Detection Limit

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

MISCELLANEOUS (SOIL)

Bureau Veritas ID		BZT150	BZT151	BZT152	BZT153	BZT154		
Sampling Date		2023/09/18 17:30	2023/09/18 17:30	2023/09/19 11:30	2023/09/19 18:30	2023/09/20 10:00		
COC Number		1/1	1/1	1/1	1/1	1/1		
	UNITS	**S5A**	**BEAR R**	**CHRYSTINA L**	**EDITH L**	**S6**	**RDL**	**QC Batch**
Misc. Inorganics								
Total Organic Carbon (C)	%	3.5	3.7	14	22	12	0.050	B156830
Total Carbon	%	4.8	4.7	12 (1)	24	13	0.05	B154365
Total Sulphur (S)	%	<0.06	<0.06	<0.06	0.30	0.19	0.06	B154365

RDL = Reportable Detection Limit
(1) TC< TOC: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.0°C
Package 2	6.3°C

Version #2: Report reissued to include results for AT1 regulated metals on samples S5A/ BZT150, Chrystina L./ BZT152, Edith L./ BZT153, S6/ BZT154 as per client request received 2023/12/22.

Sample BZT150 [S5A] : Sample was analyzed past method specified hold time for Hexavalent Chromium. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample BZT152 [CHRYSTINA L] : Sample was analyzed past method specified hold time for Hexavalent Chromium. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample BZT153 [EDITH L] : Sample was analyzed past method specified hold time for Hexavalent Chromium. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample BZT154 [S6] : Sample was analyzed past method specified hold time for Hexavalent Chromium. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

AT1 REGULATED METALS - SOILS (SOIL) Comments

Sample BZT150 [S5A] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.
Sample BZT154 [S6] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL) Comments

Sample BZT152 [CHRYSTINA L] Elements by ICP -Soils: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
Sample BZT153 [EDITH L] Elements by ICP -Soils: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B141286	KVA	QC Standard	Saturation %	2023/10/05		98	%	75 - 125
B141286	KVA	RPD	Saturation %	2023/10/05	8.9		%	12
B141294	HAP	QC Standard	Soluble (CaCl2) pH	2023/10/06		97	%	97 - 103
B141294	HAP	Spiked Blank	Soluble (CaCl2) pH	2023/10/06		100	%	97 - 103
B141294	HAP	RPD	Soluble (CaCl2) pH	2023/10/06	0.14		%	N/A
B142610	MPU	Matrix Spike	Total Aluminum (Al)	2023/10/09		NC	%	75 - 125
			Total Boron (B)	2023/10/09		69 (1)	%	75 - 125
			Total Calcium (Ca)	2023/10/09		NC	%	75 - 125
			Total Iron (Fe)	2023/10/09		NC	%	75 - 125
			Total Lithium (Li)	2023/10/09		87	%	75 - 125
			Total Magnesium (Mg)	2023/10/09		NC	%	75 - 125
			Total Manganese (Mn)	2023/10/09		NC	%	75 - 125
			Total Phosphorus (P)	2023/10/09		81	%	75 - 125
			Total Potassium (K)	2023/10/09		92	%	75 - 125
			Total Sodium (Na)	2023/10/09		76	%	75 - 125
			Total Strontium (Sr)	2023/10/09		69 (1)	%	75 - 125
			Total Sulphur (S)	2023/10/09		NC	%	75 - 125
B142610	MPU	QC Standard	Total Aluminum (Al)	2023/10/09		89	%	74 - 126
			Total Boron (B)	2023/10/09		74	%	70 - 130
			Total Calcium (Ca)	2023/10/09		93	%	85 - 115
			Total Iron (Fe)	2023/10/09		99	%	78 - 122
			Total Magnesium (Mg)	2023/10/09		99	%	74 - 126
			Total Manganese (Mn)	2023/10/09		101	%	76 - 124
			Total Phosphorus (P)	2023/10/09		100	%	82 - 118
			Total Potassium (K)	2023/10/09		80	%	55 - 145
			Total Sodium (Na)	2023/10/09		86	%	61 - 138
			Total Strontium (Sr)	2023/10/09		86	%	75 - 123
			Total Sulphur (S)	2023/10/09		92	%	72 - 128
B142610	MPU	Spiked Blank	Total Aluminum (Al)	2023/10/09		97	%	80 - 120
			Total Boron (B)	2023/10/09		98	%	80 - 120
			Total Calcium (Ca)	2023/10/09		96	%	80 - 120
			Total Iron (Fe)	2023/10/09		110	%	80 - 120
			Total Lithium (Li)	2023/10/09		98	%	80 - 120
			Total Magnesium (Mg)	2023/10/09		98	%	80 - 120
			Total Manganese (Mn)	2023/10/09		104	%	80 - 120
			Total Phosphorus (P)	2023/10/09		106	%	80 - 120
			Total Potassium (K)	2023/10/09		97	%	80 - 120
			Total Sodium (Na)	2023/10/09		99	%	80 - 120
			Total Strontium (Sr)	2023/10/09		93	%	80 - 120
			Total Sulphur (S)	2023/10/09		98	%	80 - 120
B142610	MPU	Method Blank	Total Aluminum (Al)	2023/10/09	<10		mg/kg	
			Total Boron (B)	2023/10/09	<2.0		mg/kg	
			Total Calcium (Ca)	2023/10/09	<50		mg/kg	
			Total Iron (Fe)	2023/10/09	10, RDL=10 (2)		mg/kg	
			Total Lithium (Li)	2023/10/09	<10		mg/kg	
			Total Magnesium (Mg)	2023/10/09	<20		mg/kg	
			Total Manganese (Mn)	2023/10/09	<10		mg/kg	
			Total Phosphorus (P)	2023/10/09	<20		mg/kg	
			Total Potassium (K)	2023/10/09	<25		mg/kg	
			Total Sodium (Na)	2023/10/09	<50		mg/kg	
			Total Strontium (Sr)	2023/10/09	<10		mg/kg	
			Total Sulphur (S)	2023/10/09	<20		mg/kg	
B142610	MPU	RPD	Total Aluminum (Al)	2023/10/09	9.2		%	35
			Total Boron (B)	2023/10/09	22		%	30

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Calcium (Ca)	2023/10/09	2.8		%	30
			Total Iron (Fe)	2023/10/09	8.2		%	30
			Total Lithium (Li)	2023/10/09	16		%	30
			Total Magnesium (Mg)	2023/10/09	1.2		%	30
			Total Manganese (Mn)	2023/10/09	1.2		%	30
			Total Phosphorus (P)	2023/10/09	3.1		%	30
			Total Potassium (K)	2023/10/09	13		%	35
			Total Sodium (Na)	2023/10/09	0.47		%	35
			Total Strontium (Sr)	2023/10/09	0.59		%	35
			Total Sulphur (S)	2023/10/09	45 (1)		%	30
B142653	TOR	Matrix Spike	Soluble Chloride (Cl)	2023/10/06		98	%	75 - 125
B142653	TOR	QC Standard	Soluble Chloride (Cl)	2023/10/06		97	%	75 - 125
B142653	TOR	Spiked Blank	Soluble Chloride (Cl)	2023/10/06		100	%	80 - 120
B142653	TOR	Method Blank	Soluble Chloride (Cl)	2023/10/06	<10		mg/L	
B142653	TOR	RPD	Soluble Chloride (Cl)	2023/10/06	NC		%	30
B142745	PL	Matrix Spike	Soluble Boron (B)	2023/10/06		97	%	75 - 125
			Soluble Calcium (Ca)	2023/10/06		100	%	75 - 125
			Soluble Magnesium (Mg)	2023/10/06		101	%	75 - 125
			Soluble Sodium (Na)	2023/10/06		101	%	75 - 125
			Soluble Potassium (K)	2023/10/06		102	%	75 - 125
B142745	PL	QC Standard	Soluble Calcium (Ca)	2023/10/06		89	%	75 - 125
			Soluble Magnesium (Mg)	2023/10/06		94	%	75 - 125
			Soluble Sodium (Na)	2023/10/06		101	%	75 - 125
			Soluble Potassium (K)	2023/10/06		100	%	75 - 125
			Soluble Sulphate (SO4)	2023/10/06		84	%	75 - 125
B142745	PL	Spiked Blank	Soluble Boron (B)	2023/10/06		97	%	80 - 120
			Soluble Calcium (Ca)	2023/10/06		101	%	80 - 120
			Soluble Magnesium (Mg)	2023/10/06		101	%	80 - 120
			Soluble Sodium (Na)	2023/10/06		102	%	80 - 120
			Soluble Potassium (K)	2023/10/06		102	%	80 - 120
B142745	PL	Method Blank	Soluble Boron (B)	2023/10/06	<0.10		mg/L	
			Soluble Calcium (Ca)	2023/10/06	<1.5		mg/L	
			Soluble Magnesium (Mg)	2023/10/06	<1.0		mg/L	
			Soluble Sodium (Na)	2023/10/06	<2.5		mg/L	
			Soluble Potassium (K)	2023/10/06	<1.3		mg/L	
			Soluble Sulphate (SO4)	2023/10/06	<5.0		mg/L	
B142745	PL	RPD	Soluble Boron (B)	2023/10/06	NC		%	30
			Soluble Calcium (Ca)	2023/10/06	2.6		%	30
			Soluble Magnesium (Mg)	2023/10/06	4.4		%	30
			Soluble Sodium (Na)	2023/10/06	2.2		%	30
			Soluble Potassium (K)	2023/10/06	3.2		%	30
			Soluble Sulphate (SO4)	2023/10/06	1.1		%	30
B142760	ZI	QC Standard	Soluble Conductivity	2023/10/06		102	%	75 - 125
B142760	ZI	Spiked Blank	Soluble Conductivity	2023/10/06		101	%	90 - 110
B142760	ZI	Method Blank	Soluble Conductivity	2023/10/06	<0.020		dS/m	
B142760	ZI	RPD	Soluble Conductivity	2023/10/06	1.3		%	20
B146981	BAS	Method Blank	Moisture	2023/10/11	<0.30		%	
B146981	BAS	RPD	Moisture	2023/10/11	1.3		%	20
B147952	VSO	QC Standard	Sieve - #200 (>0.075mm)	2023/10/13		104	%	75 - 125
			Sieve - Pan	2023/10/13		98	%	75 - 125
B147952	VSO	RPD	Sieve - #10 (>2.00mm)	2023/10/13	16		%	30
			Sieve - #200 (>0.075mm)	2023/10/13	1.1		%	30
			Sieve - Pan	2023/10/13	0.95		%	30
B154255	HAP	QC Standard	Soluble (CaCl2) pH	2023/10/20		97	%	97 - 103
B154255	HAP	Spiked Blank	Soluble (CaCl2) pH	2023/10/20		101	%	97 - 103

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B154255	HAP	RPD	Soluble (CaCl2) pH	2023/10/20	0.024		%	N/A
B154365	PL	QC Standard	Total Carbon	2023/10/17		99	%	75 - 125
			Total Sulphur (S)	2023/10/17		96	%	75 - 125
B154365	PL	Spiked Blank	Total Carbon	2023/10/17		101	%	80 - 120
			Total Sulphur (S)	2023/10/17		101	%	80 - 120
B154365	PL	Method Blank	Total Carbon	2023/10/17	<0.05		%	
			Total Sulphur (S)	2023/10/17	<0.06		%	
B154365	PL	RPD	Total Carbon	2023/10/17	0.96		%	30
			Total Sulphur (S)	2023/10/17	21		%	30
B155420	DPL	QC Standard	Saturation %	2023/10/16		99	%	75 - 125
B155420	DPL	RPD	Saturation %	2023/10/16	1.3		%	12
B155423	HAP	QC Standard	Soluble (CaCl2) pH	2023/10/17		98	%	97 - 103
B155423	HAP	Spiked Blank	Soluble (CaCl2) pH	2023/10/17		101	%	97 - 103
B155423	HAP	RPD	Soluble (CaCl2) pH	2023/10/17	1.9		%	N/A
B156336	VSC	Matrix Spike	Total Aluminum (Al)	2023/10/17		NC	%	75 - 125
			Total Boron (B)	2023/10/17		98	%	75 - 125
			Total Calcium (Ca)	2023/10/17		109	%	75 - 125
			Total Iron (Fe)	2023/10/17		NC	%	75 - 125
			Total Lithium (Li)	2023/10/17		95	%	75 - 125
			Total Magnesium (Mg)	2023/10/17		118	%	75 - 125
			Total Manganese (Mn)	2023/10/17		NC	%	75 - 125
			Total Phosphorus (P)	2023/10/17		105	%	75 - 125
			Total Potassium (K)	2023/10/17		104	%	75 - 125
			Total Sodium (Na)	2023/10/17		101	%	75 - 125
			Total Strontium (Sr)	2023/10/17		93	%	75 - 125
			Total Sulphur (S)	2023/10/17		91	%	75 - 125
B156336	VSC	QC Standard	Total Aluminum (Al)	2023/10/18		104	%	74 - 126
			Total Boron (B)	2023/10/18		98	%	70 - 130
			Total Calcium (Ca)	2023/10/18		110	%	85 - 115
			Total Iron (Fe)	2023/10/18		113	%	78 - 122
			Total Magnesium (Mg)	2023/10/18		118	%	74 - 126
			Total Manganese (Mn)	2023/10/18		109	%	76 - 124
			Total Phosphorus (P)	2023/10/18		109	%	82 - 118
			Total Potassium (K)	2023/10/18		95	%	55 - 145
			Total Sodium (Na)	2023/10/18		110	%	61 - 138
			Total Strontium (Sr)	2023/10/18		98	%	75 - 123
			Total Sulphur (S)	2023/10/18		95	%	72 - 128
B156336	VSC	Spiked Blank	Total Aluminum (Al)	2023/10/17		95	%	80 - 120
			Total Boron (B)	2023/10/17		117	%	80 - 120
			Total Calcium (Ca)	2023/10/17		107	%	80 - 120
			Total Iron (Fe)	2023/10/17		116	%	80 - 120
			Total Lithium (Li)	2023/10/17		111	%	80 - 120
			Total Magnesium (Mg)	2023/10/17		110	%	80 - 120
			Total Manganese (Mn)	2023/10/17		107	%	80 - 120
			Total Phosphorus (P)	2023/10/17		111	%	80 - 120
			Total Potassium (K)	2023/10/17		106	%	80 - 120
			Total Sodium (Na)	2023/10/17		111	%	80 - 120
			Total Strontium (Sr)	2023/10/17		97	%	80 - 120
			Total Sulphur (S)	2023/10/17		99	%	80 - 120
B156336	VSC	Method Blank	Total Aluminum (Al)	2023/10/18	<10		mg/kg	
			Total Boron (B)	2023/10/18	<2.0		mg/kg	
			Total Calcium (Ca)	2023/10/18	<50		mg/kg	
			Total Iron (Fe)	2023/10/18	10, RDL=10 (2)		mg/kg	
			Total Lithium (Li)	2023/10/18	<10		mg/kg	

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Magnesium (Mg)	2023/10/18	<20		mg/kg	
			Total Manganese (Mn)	2023/10/18	<10		mg/kg	
			Total Phosphorus (P)	2023/10/18	<20		mg/kg	
			Total Potassium (K)	2023/10/18	<25		mg/kg	
			Total Sodium (Na)	2023/10/18	<50		mg/kg	
			Total Strontium (Sr)	2023/10/18	<10		mg/kg	
			Total Sulphur (S)	2023/10/18	<20		mg/kg	
B156336	VSC	RPD	Total Aluminum (Al)	2023/10/18	3.6		%	35
			Total Boron (B)	2023/10/18	NC		%	30
			Total Calcium (Ca)	2023/10/18	6.9		%	30
			Total Iron (Fe)	2023/10/18	3.4		%	30
			Total Lithium (Li)	2023/10/18	NC		%	30
			Total Magnesium (Mg)	2023/10/18	1.3		%	30
			Total Manganese (Mn)	2023/10/18	3.1		%	30
			Total Phosphorus (P)	2023/10/18	10		%	30
			Total Potassium (K)	2023/10/18	4.3		%	35
			Total Sodium (Na)	2023/10/18	3.8		%	35
			Total Strontium (Sr)	2023/10/18	NC		%	35
			Total Sulphur (S)	2023/10/18	19		%	30
B156712	EBO	Matrix Spike	Soluble Boron (B)	2023/10/17		98	%	75 - 125
			Soluble Calcium (Ca)	2023/10/17		104	%	75 - 125
			Soluble Magnesium (Mg)	2023/10/17		103	%	75 - 125
			Soluble Sodium (Na)	2023/10/17		99	%	75 - 125
			Soluble Potassium (K)	2023/10/17		98	%	75 - 125
B156712	EBO	QC Standard	Soluble Calcium (Ca)	2023/10/17		93	%	75 - 125
			Soluble Magnesium (Mg)	2023/10/17		94	%	75 - 125
			Soluble Sodium (Na)	2023/10/17		100	%	75 - 125
			Soluble Potassium (K)	2023/10/17		116	%	75 - 125
			Soluble Sulphate (SO4)	2023/10/17		91	%	75 - 125
B156712	EBO	Spiked Blank	Soluble Boron (B)	2023/10/17		98	%	80 - 120
			Soluble Calcium (Ca)	2023/10/17		105	%	80 - 120
			Soluble Magnesium (Mg)	2023/10/17		103	%	80 - 120
			Soluble Sodium (Na)	2023/10/17		99	%	80 - 120
			Soluble Potassium (K)	2023/10/17		97	%	80 - 120
B156712	EBO	Method Blank	Soluble Boron (B)	2023/10/17	<0.10		mg/L	
			Soluble Calcium (Ca)	2023/10/17	<1.5		mg/L	
			Soluble Magnesium (Mg)	2023/10/17	<1.0		mg/L	
			Soluble Sodium (Na)	2023/10/17	<2.5		mg/L	
			Soluble Potassium (K)	2023/10/17	<1.3		mg/L	
			Soluble Sulphate (SO4)	2023/10/17	<5.0		mg/L	
B156712	EBO	RPD	Soluble Calcium (Ca)	2023/10/17	1.0		%	30
			Soluble Magnesium (Mg)	2023/10/17	0.013		%	30
			Soluble Sodium (Na)	2023/10/17	0.62		%	30
			Soluble Potassium (K)	2023/10/17	0.82		%	30
			Soluble Sulphate (SO4)	2023/10/17	0.88		%	30
B156738	ZI	Matrix Spike	Soluble Chloride (Cl)	2023/10/17		99	%	75 - 125
B156738	ZI	QC Standard	Soluble Chloride (Cl)	2023/10/17		93	%	75 - 125
B156738	ZI	Spiked Blank	Soluble Chloride (Cl)	2023/10/17		103	%	80 - 120
B156738	ZI	Method Blank	Soluble Chloride (Cl)	2023/10/17	<10		mg/L	
B156738	ZI	RPD	Soluble Chloride (Cl)	2023/10/17	2.0		%	30
B156792	EBO	QC Standard	Soluble Conductivity	2023/10/17		99	%	75 - 125
B156792	EBO	Spiked Blank	Soluble Conductivity	2023/10/17		99	%	90 - 110
B156792	EBO	Method Blank	Soluble Conductivity	2023/10/17	<0.020		dS/m	
B156792	EBO	RPD	Soluble Conductivity	2023/10/17	0.36		%	20
B156830	PL	QC Standard	Total Organic Carbon (C)	2023/10/18		92	%	75 - 125

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B156830	PL	Spiked Blank	Total Organic Carbon (C)	2023/10/18		102	%	80 - 120
B156830	PL	Method Blank	Total Organic Carbon (C)	2023/10/18	<0.050		%	
B156830	PL	RPD	Total Organic Carbon (C)	2023/10/18	3.4		%	35
B160960	DPL	QC Standard	Saturation %	2023/10/19		104	%	75 - 125
B160960	DPL	RPD	Saturation %	2023/10/19	9.0		%	12
B161683	CTU	Matrix Spike	Soluble Chloride (Cl)	2023/10/19		103	%	75 - 125
B161683	CTU	QC Standard	Soluble Chloride (Cl)	2023/10/19		87	%	75 - 125
B161683	CTU	Spiked Blank	Soluble Chloride (Cl)	2023/10/19		103	%	80 - 120
B161683	CTU	Method Blank	Soluble Chloride (Cl)	2023/10/19	<10		mg/L	
B161683	CTU	RPD	Soluble Chloride (Cl)	2023/10/19	NC		%	30
B161713	VSC	Matrix Spike	Soluble Boron (B)	2023/10/19		95	%	75 - 125
			Soluble Calcium (Ca)	2023/10/19		97	%	75 - 125
			Soluble Magnesium (Mg)	2023/10/19		106	%	75 - 125
			Soluble Sodium (Na)	2023/10/19		89	%	75 - 125
			Soluble Potassium (K)	2023/10/19		95	%	75 - 125
B161713	VSC	QC Standard	Soluble Calcium (Ca)	2023/10/19		85	%	75 - 125
			Soluble Magnesium (Mg)	2023/10/19		103	%	75 - 125
			Soluble Sodium (Na)	2023/10/19		92	%	75 - 125
			Soluble Potassium (K)	2023/10/19		117	%	75 - 125
			Soluble Sulphate (SO4)	2023/10/19		80	%	75 - 125
B161713	VSC	Spiked Blank	Soluble Boron (B)	2023/10/19		94	%	80 - 120
			Soluble Calcium (Ca)	2023/10/19		96	%	80 - 120
			Soluble Magnesium (Mg)	2023/10/19		106	%	80 - 120
			Soluble Sodium (Na)	2023/10/19		90	%	80 - 120
			Soluble Potassium (K)	2023/10/19		95	%	80 - 120
B161713	VSC	Method Blank	Soluble Boron (B)	2023/10/19	<0.10		mg/L	
			Soluble Calcium (Ca)	2023/10/19	<1.5		mg/L	
			Soluble Magnesium (Mg)	2023/10/19	<1.0		mg/L	
			Soluble Sodium (Na)	2023/10/19	<2.5		mg/L	
			Soluble Potassium (K)	2023/10/19	<1.3		mg/L	
			Soluble Sulphate (SO4)	2023/10/19	<5.0		mg/L	
B161713	VSC	RPD	Soluble Calcium (Ca)	2023/10/19	12		%	30
			Soluble Magnesium (Mg)	2023/10/19	18		%	30
			Soluble Sodium (Na)	2023/10/19	9.0		%	30
			Soluble Potassium (K)	2023/10/19	14		%	30
			Soluble Sulphate (SO4)	2023/10/19	9.8		%	30
B163295	ZI	QC Standard	Soluble Conductivity	2023/10/20		90	%	75 - 125
B163295	ZI	Spiked Blank	Soluble Conductivity	2023/10/20		100	%	90 - 110
B163295	ZI	Method Blank	Soluble Conductivity	2023/10/20	<0.020		dS/m	
B163295	ZI	RPD	Soluble Conductivity	2023/10/20	18		%	20
B243461	TOR	Matrix Spike	Hex. Chromium (Cr 6+)	2023/12/27		89	%	75 - 125
B243461	TOR	Spiked Blank	Hex. Chromium (Cr 6+)	2023/12/27		103	%	80 - 120
B243461	TOR	Method Blank	Hex. Chromium (Cr 6+)	2023/12/27	<0.080		mg/kg	
B243461	TOR	RPD	Hex. Chromium (Cr 6+)	2023/12/27	NC		%	35
B244527	KH2	Matrix Spike	Total Antimony (Sb)	2023/12/29		113	%	75 - 125
			Total Arsenic (As)	2023/12/29		115	%	75 - 125
			Total Barium (Ba)	2023/12/29		NC	%	75 - 125
			Total Beryllium (Be)	2023/12/29		104	%	75 - 125
			Total Cadmium (Cd)	2023/12/29		111	%	75 - 125
			Total Chromium (Cr)	2023/12/29		141 (1)	%	75 - 125
			Total Cobalt (Co)	2023/12/29		117	%	75 - 125
			Total Copper (Cu)	2023/12/29		113	%	75 - 125
			Total Lead (Pb)	2023/12/29		109	%	75 - 125
			Total Mercury (Hg)	2023/12/29		108	%	75 - 125
			Total Molybdenum (Mo)	2023/12/29		121	%	75 - 125

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Nickel (Ni)	2023/12/29		118	%	75 - 125
			Total Selenium (Se)	2023/12/29		110	%	75 - 125
			Total Silver (Ag)	2023/12/29		111	%	75 - 125
			Total Thallium (Tl)	2023/12/29		107	%	75 - 125
			Total Tin (Sn)	2023/12/29		115	%	75 - 125
			Total Uranium (U)	2023/12/29		106	%	75 - 125
			Total Vanadium (V)	2023/12/29		165 (1)	%	75 - 125
			Total Zinc (Zn)	2023/12/29		NC	%	75 - 125
B244527	KH2	QC Standard	Total Antimony (Sb)	2023/12/29		118	%	14 - 183
			Total Arsenic (As)	2023/12/29		117	%	53 - 147
			Total Barium (Ba)	2023/12/29		103	%	80 - 119
			Total Cadmium (Cd)	2023/12/29		93	%	71 - 129
			Total Chromium (Cr)	2023/12/29		104	%	59 - 141
			Total Cobalt (Co)	2023/12/29		104	%	58 - 142
			Total Copper (Cu)	2023/12/29		108	%	83 - 117
			Total Lead (Pb)	2023/12/29		113	%	79 - 121
			Total Molybdenum (Mo)	2023/12/29		106	%	67 - 134
			Total Nickel (Ni)	2023/12/29		111	%	78 - 122
			Total Silver (Ag)	2023/12/29		88	%	46 - 154
			Total Tin (Sn)	2023/12/29		94	%	67 - 133
			Total Uranium (U)	2023/12/29		89	%	77 - 123
			Total Vanadium (V)	2023/12/29		109	%	79 - 121
			Total Zinc (Zn)	2023/12/29		103	%	79 - 122
B244527	KH2	Spiked Blank	Total Antimony (Sb)	2023/12/29		90	%	80 - 120
			Total Arsenic (As)	2023/12/29		86	%	80 - 120
			Total Barium (Ba)	2023/12/29		83	%	80 - 120
			Total Beryllium (Be)	2023/12/29		83	%	80 - 120
			Total Cadmium (Cd)	2023/12/29		81	%	80 - 120
			Total Chromium (Cr)	2023/12/29		88	%	80 - 120
			Total Cobalt (Co)	2023/12/29		88	%	80 - 120
			Total Copper (Cu)	2023/12/29		88	%	80 - 120
			Total Lead (Pb)	2023/12/29		84	%	80 - 120
			Total Mercury (Hg)	2023/12/29		86	%	80 - 120
			Total Molybdenum (Mo)	2023/12/29		85	%	80 - 120
			Total Nickel (Ni)	2023/12/29		87	%	80 - 120
			Total Selenium (Se)	2023/12/29		87	%	80 - 120
			Total Silver (Ag)	2023/12/29		84	%	80 - 120
			Total Thallium (Tl)	2023/12/29		84	%	80 - 120
			Total Tin (Sn)	2023/12/29		83	%	80 - 120
			Total Uranium (U)	2023/12/29		82	%	80 - 120
			Total Vanadium (V)	2023/12/29		88	%	80 - 120
			Total Zinc (Zn)	2023/12/29		84	%	80 - 120
B244527	KH2	Method Blank	Total Antimony (Sb)	2023/12/29	<0.50		mg/kg	
			Total Arsenic (As)	2023/12/29	<1.0		mg/kg	
			Total Barium (Ba)	2023/12/29	<1.0		mg/kg	
			Total Beryllium (Be)	2023/12/29	<0.40		mg/kg	
			Total Cadmium (Cd)	2023/12/29	<0.050		mg/kg	
			Total Chromium (Cr)	2023/12/29	<1.0		mg/kg	
			Total Cobalt (Co)	2023/12/29	<0.50		mg/kg	
			Total Copper (Cu)	2023/12/29	<1.0		mg/kg	
			Total Lead (Pb)	2023/12/29	<0.50		mg/kg	
			Total Mercury (Hg)	2023/12/29	<0.050		mg/kg	
			Total Molybdenum (Mo)	2023/12/29	<0.40		mg/kg	
			Total Nickel (Ni)	2023/12/29	<1.0		mg/kg	
			Total Selenium (Se)	2023/12/29	<0.50		mg/kg	

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Silver (Ag)	2023/12/29	<0.20		mg/kg	
			Total Thallium (Tl)	2023/12/29	<0.10		mg/kg	
			Total Tin (Sn)	2023/12/29	<1.0		mg/kg	
			Total Uranium (U)	2023/12/29	<0.20		mg/kg	
			Total Vanadium (V)	2023/12/29	<1.0		mg/kg	
			Total Zinc (Zn)	2023/12/29	<10		mg/kg	
B244527	KH2	RPD	Total Antimony (Sb)	2023/12/29	NC		%	30
			Total Arsenic (As)	2023/12/29	0.76		%	30
			Total Barium (Ba)	2023/12/29	2.5		%	35
			Total Beryllium (Be)	2023/12/29	1.1		%	30
			Total Cadmium (Cd)	2023/12/29	3.8		%	30
			Total Chromium (Cr)	2023/12/29	1.1		%	30
			Total Cobalt (Co)	2023/12/29	1.3		%	30
			Total Copper (Cu)	2023/12/29	0.97		%	30
			Total Lead (Pb)	2023/12/29	0.66		%	35
			Total Mercury (Hg)	2023/12/29	NC		%	35
			Total Molybdenum (Mo)	2023/12/29	5.2		%	35
			Total Nickel (Ni)	2023/12/29	0.11		%	30
			Total Selenium (Se)	2023/12/29	NC		%	30
			Total Silver (Ag)	2023/12/29	NC		%	35
			Total Thallium (Tl)	2023/12/29	4.0		%	30
			Total Tin (Sn)	2023/12/29	NC		%	35
			Total Uranium (U)	2023/12/29	1.2		%	30
			Total Vanadium (V)	2023/12/29	1.9		%	30
			Total Zinc (Zn)	2023/12/29	1.4		%	30

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

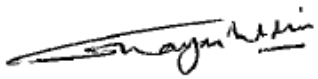
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(2) Method blank above criteria. Data inspected. All data < RDL or greater than 10x Method Blank.

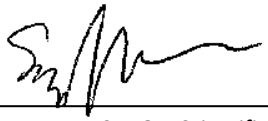
Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



Sandy Yuan, M.Sc., QP, Scientific Specialist

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Edmonton: 4326 76 Avenue NW T6B 2H8 Telephone (780)577-7100 Fax (780)450-4187

453(2)

www.BVNA.com

Choose Location:
- ☐ Calgary, AB: 4000 19th St. NE, T2E 6P8 Toll Free (800) 386-7247
- ☑ Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 2

Invoice Information	Invoice to (requires report) ☐	Report Information (if differs from invoice)		Project Information		LAB USE ONLY - PLACE STICKER HERE
Company:	CPP Environmental	Company:		Quotation #:	C10874	
Contact Name:	Theo Charette	Contact Name:		P.O. #/ AFE#:		
Street Address:	154-150 Chippewa R	Street Address:		Project #:	SUEZ	
City:	Sherwood Park Prov: AB Postal Code:	City: Prov: Postal Code:		Site #:		
Phone:	780-570-[illegible]5818	Phone:		Site Location:		Rush Confirmation #:
Email:	theo.charette@cppenv.ca	Email:		Site Location Province:	AB	
Copies:	info@cppenv.ca	Copies:		Sampled By:	TC/MK	

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba ☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT): ☐ 5 to 7 Day ☑ 10 Day

Rush Turnaround Time (TAT) Surcharges apply: ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

Comments

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 ~~VOCs~~ Organic carbon	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity 4	14 Sieve (75 micron)	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 CoS	18 Moisture	19 TOC	20 TCARDS	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	55A	23	09	18	17	30	Soil					✓				✓				✓	✓			✓	✓	✓	✓	3		See quote for analyses
2	Bear R	23	09	18	17	30	"					✓				✓				✓	✓			✓	✓	✓	✓	3		
3	Chrystina L	23	09	19	11	30	"					✓				✓				✓	✓			✓	✓	✓	✓	3		
4	Edith L	23	09	19	19	30	"					✓				✓				✓	✓			✓	✓	✓	✓	3		
5	56	23	09	20	10	00	"					✓				✓				✓	✓			✓	✓	✓	✓	3		
6																													
7																													
8																													
9																													
10																													
11																													
12																													

mcal-09-1808

4/4

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C				LAB USE ONLY	Yes	No	°C				LAB USE ONLY	Yes	No	°C				Temperature reading by:
Seal present		✓					Seal present		✓					Seal present			See ACTR				
Seal intact		✓					Seal intact		✓					Seal intact							
Cooling media present	✓			8	8	8	Cooling media present	✓			6	7	6	Cooling media present				1	2	3	DWS
				1	2	3					1	2	3								

	Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1	Theo Charette	23	09	20	16	00	1 DejiWu D	2023	09	20	16	13	
2							2 ATRAUER Lill	2023	09	21	06	30	

344

www.BVNA.com

Choose Location:
- ☐ Calgary, AB: 4000 19th St. NE, T2E 6P8 Toll Free (800) 386-7247
- ☒ Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
- ☐ Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

Invoice Information	Invoice to (requires report) ☐	Report Information (if differs from invoice)		Project Information	
Company:	CPP Environmental	Company:	CPP Environmental	Quotation #:	CL0874
Contact Name:	Theo Charette	Contact Name:	Serena Farrugia	P.O. #/ AFE#:	
Street Address:	154 - 150 Chippewa Rd	Street Address:		Project #:	SUE2
City:	Sherwood Park Prov: AB Postal Code:	City:	Prov: Postal Code:	Site #:	
Phone:	780-570-5818	Phone:		Site Location:	
Email:	theo.charette@cppenv.ca	Email:		Site Location Province:	AB
Copies:	info@cppenv.ca	Copies:	serena@cppenv.ca	Sampled By:	TC/MK

LAB USE ONLY - PLACE STICKER HERE

Rush Confirmation #:

Regulatory Criteria

☐ AT1 ☐ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba ☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)

☐ 5 to 7 Day ☒ 10 Day

Rush Turnaround Time (TAT) Surcharges apply

☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity 4	14 Sieve (75 micron)	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17	18	19	20	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	S5A	23	09	18	18	00	Soil									✓												1		Add to job #C375503
2	Chrystina L.	23	09	19	11	30	Soil									✓												1		
3	Edith L.	23	09	19	18	30	Soil									✓												1		
4	S6	23	09	20	10	00	Soil									✓												1		
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C				Temperature reading by:
Seal present		✓					
Seal intact		✓					
Cooling media present		✓					
				1	2	3	
				6	8	8	

LAB USE ONLY	Yes	No	°C			
Seal present						
Seal intact						
Cooling media present				1	2	3

LAB USE ONLY	Yes	No	°C			
Seal present						
Seal intact						
Cooling media present				1	2	3

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1 Serena F. Serena Farrugia	23	12	22	09	34	1 [signature] ANNMARIE PLEET	2023	12	22	09	32	
2						2						