2023–2024 Summary Report

Columbia Slope Water Quality Monitoring Project

Prepared for
City of Vancouver
Surface Water Management

Prepared by
Herrera Environmental Consultants, Inc.

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Prepared for
City of Vancouver
Surface Water Management
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July 16, 2024

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Executive Summary

In 2021, the Columbia Slope Water Quality Monitoring Project began to fill gaps in the existing water quality data for the Columbia Slope watershed, evaluate impacts to water quality in the Columbia River, and identify areas where stormwater treatment would be most effective in reducing pollutants from City outfalls to the Columbia River. The project is funded by grants from the United States Environmental Protection Agency (EPA) and includes monitoring of outfall basins in the Columbia Slope watershed (watershed) within City limits, data analysis and reporting activities. Monitoring of locations selected to characterize Washington Department of Transportation (WSDOT) highway runoff within the watershed were funded separately through WSDOT stormwater fees. This report describes the water quality monitoring and analysis conducted in accordance with procedures in the Quality Assurance Project Plan (QAPP) and associated addenda (Herrera 2021a, 2021b, 2022a, 2023).

Over the course of the project, 303 samples were collected at 21 stations during 18 storm events and 12 base flow events. The quality assurance review found that monitoring data met QAPP quality objectives, with some exceptions, resulting in values qualified as estimated. All data are valid and useable with the exception of *in situ* pH values for one monitoring event (see Appendix C).

Overall, most monitoring stations had good water quality; exceptions are discussed below and in the main text of the report. The following summary describes major spatial patterns, water quality criteria exceedances, and comparison to other studies.

Spatial patterns: A Kruskal-Wallis and Dunn test was performed to identify spatial patterns in water quality across the watershed by identifying statistically significant differences in select parameters at outfall and WSDOT monitoring stations. Key findings include the following:

- Nutrient (nitrogen and phosphorus) concentrations were generally greatest in large basins in the western portion of the project area (Basins E, F, J, and L), compared to similar basins in the eastern portion of the project area. This pattern is likely due to nutrient contamination in groundwater impacting these spring-fed drainage systems.
- During storm flow, concentrations of metals were significantly lower at monitoring stations with relatively high base flow discharge rates and higher at stations with small contributing areas or large proportions of highway or major arterial roadways.
- Polycyclic aromatic hydrocarbons (PAHs) were detected throughout the project area, usually at low concentrations. The greatest total PAH concentrations were observed at CSA1 and CSAA1. PAHs were detected fairly frequently at all WSDOT monitoring stations.

Water quality criteria comparison: Monitoring results generally indicate good water quality relative to applicable state criteria. Water quality criteria were occasionally exceeded for the following parameters, particularly during storm flow events:

- The majority of samples at all stations met the dissolved oxygen criterion of at least 10 milligrams per liter, with the exception of base flow median concentrations below the criterion at CSAA1 and CSL1.
- Most stations occasionally exceeded the turbidity project limit of 10 nephelometric turbidity units (typically during storm flow events), with the exceptions of CSF1 and CSJ1. Median turbidity was above the project limit at stations CSA1, CSAA1, CSE1, CSR1, and CSWSDOT1 during storm flow events.
- All stations exceeded EPA nutrient criteria during most events, with few exceptions.
- Acute metals criteria were occasionally exceeded during storm events, most frequently for zinc and copper (at various stations) and twice for lead (once each at CSWSDOT2 and CSWSDOT4). Chronic metals criteria were not exceeded during base flow events at any station.
- Base flow *Escherichia coli* (*E. coli*) bacteria results met the state water quality standard at all stations except CSR1 and CSL1 but exceeded the criteria during storm flow events at most stations.
- Several individual semivolatile organic compounds, including multiple PAHs and bis(2-ethylhexyl) phthalate (BEHP), exceeded applicable state water quality standards at several stations.
- The chronic freshwater aquatic life and human health criteria was exceeded for dieldrin in all 12 samples collected at CSWSDOT4, in 5 samples collected at CSE1, and in 1 sample collected at CSAA1. 4,4'-Dichlorodiphenyl-dichloroethylene (DDE) exceeded the chronic freshwater aquatic life criterion on at least one occasion at all WSDOT stations and at CSR1 and CSR2.

Comparison to other monitoring studies: Columbia Slope data for a subset of parameters were compared to other monitoring programs in the Pacific Northwest, including the Redmond Paired Watershed Study (Washington State Department of Ecology (Ecology) 2024), Toxics in Surface Runoff to Puget Sound (Herrera 2011), and the Western Washington National Pollutant Discharge Elimination System Phase I Stormwater Permit S8.D Data Characterization (S8.D Data; Ecology 2015a).

- Water quality in Columbia Slope open-channel creek outfall stations was generally comparable to other creeks, particularly for total suspended solids and total zinc. Nitrate+nitrite concentrations in these Columbia Slope stations were substantially higher than concentrations in four of five selected creeks in Redmond, Washington but were consistent with concentrations in the Toxics in Surface Runoff to Puget Sound monitoring program. Total PAHs were detected at slightly higher concentrations but less frequently in the Columbia Slope watershed than in selected creeks from other monitoring studies.
- Closed-channel monitoring stations in the Columbia Slope watershed were usually lower than or comparable to S8.D data, with the exception of higher maximum concentrations and greater frequency of BEHP detections. Columbia Slope residential and highway basins had greater median

total nitrogen concentrations than all basins from S8.D data, but the difference in concentrations between groupings were not substantial.

The following summarizes the conclusions and recommendations resulting from the evaluation of monitoring data and existing City watershed management activities.

Basin prioritization: The evaluation identified priority areas and basins that would benefit from water quality improvements or targeted monitoring. Water quality results, basin size, measured discharge rates relative to other stations, unique basin characteristics, and ecological value of the main drainage system, were key considerations for prioritization. The priority areas identified include all WSDOT drainage areas as well as Basins I-205, P, E, O, and R. Basins E, O, and R were selected due to potentially high ecological value where continued water quality protections, source control activities, and long-term monitoring should be prioritized to ensure these small Columbia River tributaries remain protected.

Stormwater retrofit and other management activities: The highest priority areas for stormwater retrofit include WSDOT drainage areas, Basin I-205, and Basin P. Concepts for projects within priority areas (as well as other basins) have already been developed under an Ecology-funded stormwater retrofit planning evaluation, and Herrera recommends prioritizing implementation of projects within these areas. Continued emphasis on identifying other suitable facilities for retrofit or locations for new facilities, particularly ones that treat highway or major arterial road runoff, is an important component of protecting water quality in the watershed. Given the relatively high pollutant concentrations observed at the highway monitoring stations, City partnerships with WSDOT and the use of WSDOT stormwater fees to improve or construct stormwater facilities are high priorities. In order to address high nutrient concentrations observed in Basins E and F, targeted efforts to decommission septic systems, treat stormwater prior to infiltration, and conduct public outreach on water quality protection practices are recommended.

Monitoring: Future targeted monitoring programs in the Columbia Slope watershed may be conducted with varying objectives, including outfall sampling in uncharacterized basins, source control effectiveness monitoring after implementation of stormwater best management practices or other management activities, or watershed-wide sampling for additional contaminants of concern. Uncharacterized basins that may be high priority for future monitoring include Basins B, D, and K. Ideally, effectiveness monitoring should be conducted at previously monitored stations so that baseline conditions are appropriately established. Depending on the target management activity or source control measure, one or multiple monitoring stations may be chosen for long-term monitoring of select parameters. Watershed-wide surveys for contaminants of emerging concern could be conducted at multiple stations over a short period of time. Target parameters may include priority toxics impacting the Columbia River (e.g., dioxins) or contaminants of emerging concern (e.g., 6PPD-quinone or per- and polyfluoroalkyl substances (PFAS)).

Data collection and analysis: The City's ability to accurately and efficiently tie changes in water quality to various watershed activities will be impacted by data quality, completeness, resolution, and format. This type of analysis is important to evaluate effectiveness and to inform future activities. Herrera recommends that the City continues to evaluate and improve upon its existing record keeping practices to ensure that data pertaining to management activities can be easily obtained and analyzed.

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1. Introduction

The United States Environmental Protection Agency (EPA) awarded the City of Vancouver (City) grants in 2020 and 2022, as part of the Columbia River Basin Restoration Funding Assistance Program, to help fund the Columbia Slope Water Quality Monitoring Project (the Project). In addition, Washington Department of Transportation (WSDOT) stormwater fees funded monitoring of locations selected to characterize highway runoff within the Columbia Slope watershed (watershed). Prior to the Project, water quality data for the watershed, which drains to the Columbia River, were not consistently collected. This resulted in a gap in the understanding of water quality within the watershed and its impacts to the Columbia River.

Key project objectives are to characterize current water quality of outfall basins, provide baseline data for future analyses, evaluate effectiveness of existing stormwater treatment, and demonstrate the benefit of expanding the City's long-term monitoring program. Another important objective is to identify and prioritize areas where stormwater treatment would be most effective in reducing pollutants from City outfalls to the Columbia River.

Monitoring and analysis were conducted in accordance with procedures in the Quality Assurance Project Plan (QAPP) and associated addenda (Herrera 2021a, 2021b, 2022a, 2023). The monitoring program occurred in two stages: the first round of monitoring occurred in water years (WY; the period from October 1 to September 30) 2021 and 2022, with results presented in the *2021–2022 Summary Report Columbia Slope Water Quality Monitoring Project* (Herrera 2022b). The second round of monitoring occurred in WY2023–2024. Where appropriate, monitoring procedures were consistent with those described in the Burnt Bridge Creek QAPP (Herrera 2019) to maintain consistency and comparability with other City monitoring efforts.

This report summarizes the monitoring and data quality review performed for the Project during the second round of monitoring. Results from both rounds of monitoring are presented to evaluate water quality in support of the City activities designed to improve water quality in the watershed. This report concludes with a prioritization of basins for stormwater treatment retrofit (based on an assessment of pollutants identified in each basin) and recommendations for future management activities and monitoring efforts.

1.1. Background

The Columbia Slope watershed encompasses approximately 25 square miles of central and southeast Vancouver, Washington, including hillsides between Vancouver Lake and Lacamas Creek (Figure 1). What is now referred to as the City of Vancouver is located within unceded territory of the indigenous Chinookan peoples who lived in the area from 4000 BCE or earlier until forced displacement by European colonizers in the 1800s. As long as indigenous peoples have inhabited the region, they have relied on the Columbia River's salmon runs for sustenance, a relationship that continues to this day. The Columbia River Basin Restoration Program aims to reduce toxic contaminant levels in the river to make fish safer to

eat, particularly for disproportionately affected indigenous peoples who consume more fish from the river than other demographics (EPA 2021).

The Columbia Slope watershed is part of the Columbia River Landscape Unit and is composed of riverine floodplain areas draining multiple hillside seeps and streams supplied by groundwater, surface water runoff, and infiltrated urban stormwater to the Columbia River. Approximately 10,411 acres (16.3 square miles) of the Columbia Slope watershed are within Vancouver city limits. Land use in the watershed is predominantly residential (approximately 86 percent) and commercial/industrial (approximately 13 percent). Impervious surfaces cover slightly more than half of the watershed. Most soils within the watershed are well-drained and derived from their parent geologic materials. This is particularly relevant because these soils control infiltration from the land surface to the shallow groundwater flow system. Infiltration is the basis for groundwater recharge and availability, and infiltration of untreated stormwater can carry pollutants from the land surface (or from shallow, constructed, infiltration facilities) to the water table.

A number of small ponds, marshes, and wetland areas in the watershed are sustained by groundwater spring flows. The U.S. Geological Survey estimated total discharge from the Columbia Slope springs at 25 cubic feet per second (cfs) in 1949 but noted that discharge declined to 14.5 cfs in 1988; this represents a 42 percent reduction between measurement events (McFarland and Morgan 1996). Two City water supply wells (WS-4 and Ellsworth WS) are located in the Columbia Slope watershed and provide approximately 7 percent of the City's annual groundwater withdrawal of 39.4 cfs (based on 2013 to 2017 data; Herrera and Pacific Groundwater Group [PGG] 2019). For some aquifers, there are also areas where pumping near the Columbia River could capture water from the river itself (although none of the City's wells have been identified as groundwater sourced from surface water features).

Stormwater runoff from urban areas typically carries pollutants that can be harmful to human health and aquatic life. The City is responsible for vital municipal infrastructure and urban services and is regulated under the National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Permit and the Safe Drinking Water Act. The City's Stormwater Management Program has evolved to include all NPDES permit requirements in addition to the tasks traditionally associated with operating a municipal stormwater utility. The City is committed to effectively managing stormwater and meeting the goals established by the Federal Clean Water Act and the Water Pollution Control Act to protect surface and groundwater. Other potential pollutant sources within City limits include infiltration facilities (e.g., dry wells and perforated drainage pipes), septic tanks, underground storage tanks, older sanitary sewer installations, contaminated sites, commercial/industrial sites that store and use hazardous materials, and former landfills.

The reach of the Columbia River bordering the Columbia Slope watershed is impaired by high water temperature and dioxin (a persistent organic pollutant), according to the EPA-approved Washington State 303(d) list (Ecology 2016). Additional listed parameters of concern include fecal coliform bacteria, bis(2-ethylhexyl) phthalate (BEHP), and arsenic. Dissolved oxygen and ammonia were determined to meet state standards. The Columbia Slope area has been designated as a Shoreline of Statewide Significance in Washington, with safeguards established in the City of Vancouver Shoreline Master Program. In 2010, the EPA published the Columbia River Basin Toxics Reduction Action Plan, with the goal to "reduce human and ecosystem exposure to toxics in the Columbia River Basin" (EPA 2010). In

2016, Congress amended the Clean Water Act to require EPA to establish a Columbia River Basin Restoration Program. As part of this effort, EPA also developed the Columbia River Basin Restoration Funding Assistance Program, through which this Project is funded. Previous monitoring for this project is summarized and analyzed in the 2021–2022 Summary Report (Herrera 2022b).

Under a separate effort, the City has recently completed a stormwater retrofit planning evaluation (Retrofit Study) for the Columbia Slope watershed funded by the Washington State Department of Ecology (Ecology). The Retrofit Study was designed to identify and prioritize projects that will provide stormwater runoff treatment and flow control. The phased project identified a number of potential projects based on desktop and field evaluations. Concept designs were created for 10 of the projects, including regional treatment facilities, green streets, a stormwater pond retrofit, and a filter vault retrofit. Concept designs are summarized in the *Conceptual Design Report* (Herrera 2024). Site-specific water quality data was considered for the stormwater pond retrofit and one of the regional treatment facilities, but limited water quality data was available for consideration with other potential retrofits because the two Columbia Slope watershed projects were conducted concurrently.

1.2. Objectives

The primary goals of the monitoring project described in this report are:

1. to collect credible water quality data, and
2. to provide data analysis in support of the City and state programs and activities designed to improve water quality and protect the environment throughout the Columbia Slope watershed.

Data collected during this monitoring project will allow the City to assess pollutant loading to the Columbia River and identify basins of priority for stormwater retrofits. To meet these primary goals, the following objectives have been defined for this project:

- Identify where stormwater pollutants are being carried to the Columbia River.
- Accurately characterize specific water quality parameters within the watershed.
- Provide high quality data for the City and other stakeholders.
- Determine whether trends or correlations are present in the water quality data.
- Prioritize basins where additional stormwater treatment or management activities could effectively remove pollutants that currently reach the Columbia River.
- Identify outfalls where stormwater treatment activities can be monitored for effectiveness over the long-term.
- Provide feedback for adaptive strategies in stormwater management programs.

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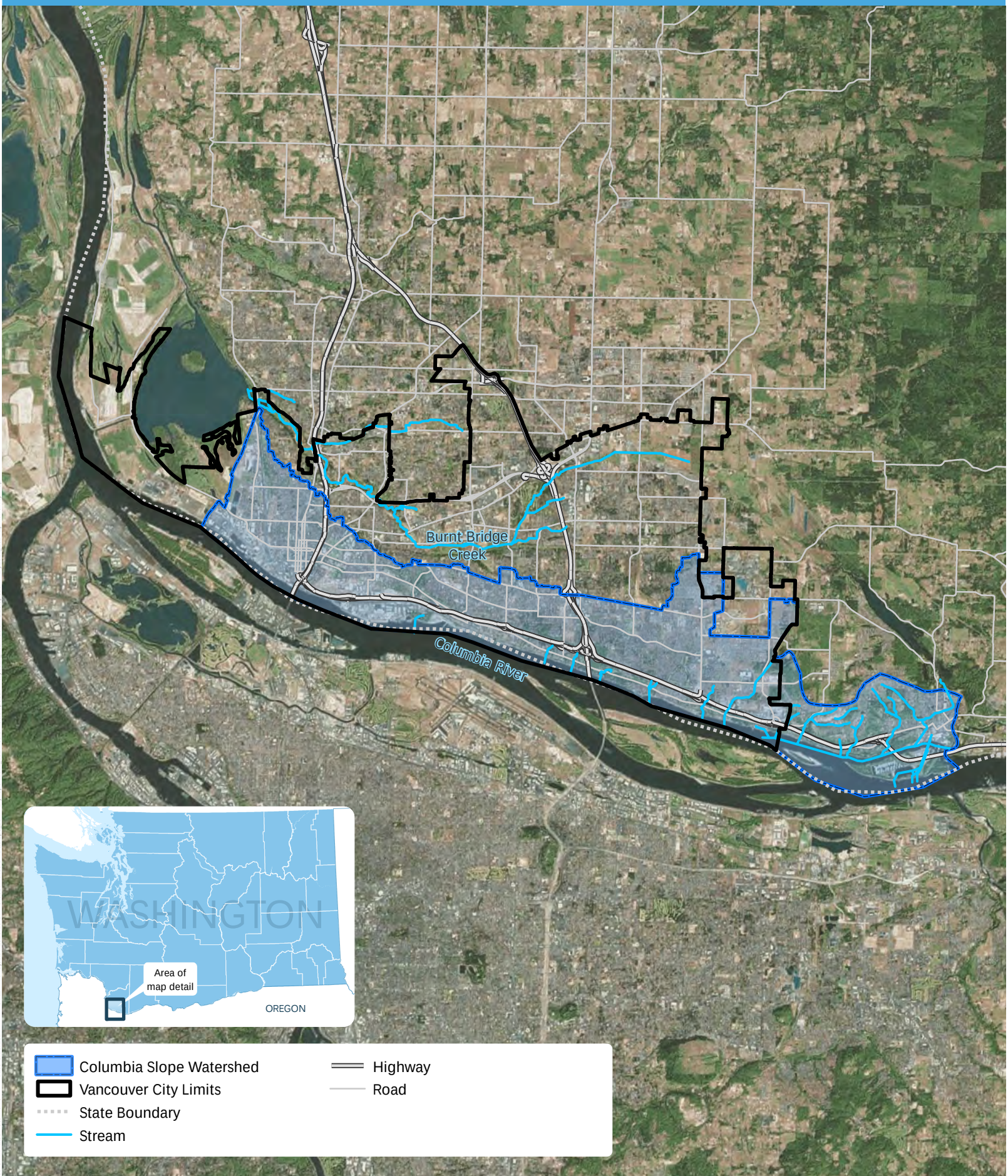
Figure 1.
Columbia Slope Watershed Vicinity Map.



Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Clark County, City of Vancouver, ESRI (Aerial 2021)

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Author: mmatsumoto-hervol

2. Monitoring Summary

This section describes field monitoring, laboratory analysis, and data management and analysis methods, in accordance with the QAPP (Herrera 2021a) and associated addenda (Herrera 2021b, 2022a, 2023).

2.1. Monitoring Stations

Water quality samples and field measurements were collected at 21 stations in the Columbia Slope watershed (Figure 2), including 16 City stations and 5 WSDOT stations that represent primarily highway runoff. Table 1 summarizes monitoring events at each station. The locations of these stations are described in the subsequent sections.

Monitoring stations were selected based on a preliminary desktop assessment and field feasibility investigation described in the QAPP (Herrera 2021a) and addenda (Herrera 2021b, 2022a, 2023). Larger basins with substantial base flow were prioritized to maximize the monitored portion of the watershed. Locations with safe public access and well-defined channels or pipe outfalls were selected to ensure that representative discharge measurements could be made. Beyond these metrics, basins representing a range of other characteristics were prioritized in basin outfall selection. These characteristics include land use, septic and drywell density, and stormwater treatment facility density. In addition, unique characteristics of interest, such as a fish hatchery discharging to the Basin J outfall, were considered. Site selection for the second round of monitoring prioritized filling gaps in spatial coverage and further exploring priority basins identified in the first round of monitoring.

Basin characteristics are summarized in Table 2. Further discussion of basin characteristics and their relationships to water quality within the watershed can be found in Section 4.2.2.2.

Table 1. Summary of Sampling at Each Monitoring Station.			
Station	**Monitoring Years**	**Storm Events**	**Base Flow Events**
WY2021–2022			
CSF1	2021–2022	6	6
CSJ1	2021–2022	6	6
CSR2	2021–2022	6	3
CSWSDOT2	2021–2022	6	0
CSWSDOT3	2021–2022	6	0
WY2022–2024			
CSE1	2021–2024	18	12
CSO1	2021–2024	18	12
CSP1	2021–2024	18	12
CSR1	2021–2024	18	12
CSWSDOT1	2021–2023	12	6
WY2023–2024			
CSA1	2023–2024	6	0
CSAA1	2022–2023	6	6
CSE2	2023–2024	6	0
CSE3	2023–2024	6	6
CSH1	2022–2024	12	6
CSL1	2022–2024	12	6
CSQ1	2022–2024	12	6
CSBMP1_IN	2022–2023	6	0
CSBMP1_OUT	2022–2023	6	0
CSWSDOT4	2022–2024	12	0
CSWSDOT5	2023	6	0

WY: Water year

2.1.1. Outfall Monitoring Stations

Monitoring stations that are located at or close to the basin outfall to the Columbia River were designated as "outfall" monitoring stations. They are grouped by primary channel characteristics, as described in Sections 2.1.1.1 and 2.1.1.2.

2.1.1.1. Open Channel Streams

Stream outfall monitoring stations are primarily conveyed through open channel streams in the lower portion of their respective basins. They are well-connected to the Columbia River through these natural open channels. These monitoring stations include the following:

- CSE1 is located in Basin E upstream of a culvert that crosses Southeast Evergreen Highway approximately 200 feet west of Southeast 94th Court.
- CSF1 is located in Basin F upstream of a culvert along Southeast Evergreen Highway approximately 250 feet east of Southeast 101st Avenue.
- CSH1 is located in Basin H upstream of a culvert along Southeast Evergreen Highway approximately 100 feet east of Southeast 112th Avenue.
- CSJ1 is located in Basin J downstream of a culvert along Southeast Evergreen Highway approximately 100 feet east of the Vancouver Trout Hatchery.
- CSL1 is located in Basin L upstream of a culvert along Southeast Evergreen Highway approximately 100 feet east of Southeast 144th Court.
- CSO1 is located in Basin O upstream of a culvert along Southeast Evergreen Highway approximately 150 feet east of Southeast 159th Court.
- CSQ1 is located in Basin Q upstream of a culvert at the north side of the intersection of Southeast 164th Avenue and Southeast Evergreen Highway.
- CSR1 is located in Basin R at an exposed artificial channel on an unnamed gravel road south of the railroad tracks adjacent to 17403 Southeast Evergreen Highway.

2.1.1.2. Closed Channel Pipes

Piped outfall monitoring stations are primarily conveyed through engineered closed channel pipes in the lower portion of their respective basins. These monitoring stations include the following:

- CSA1 is a pipe outfall in Basin A. CSA1 is located at the base of a walking path approximately 150 feet southwest of the Wintler Community Park parking lot.
- CSAA1 is a pipe outfall in Basin AA. CSAA1 is located on the beach of Wintler Community Park approximately 250 feet southeast of the parking lot.
- CSP1 is located in Basin P at the outfall to the Columbia River. CSP1 is accessible at the beach access approximately 50 feet south of the southern extent of Southeast 164th Avenue.
- CSWSDOT1 is located in the I-205 basin at the outfall to the Columbia River directly beneath the Glenn L. Jackson Memorial Bridge.

2.1.2. Upstream Monitoring Stations

2.1.2.1. Basin E

During the second round of monitoring, two upstream stations were selected for Basin E. These upstream stations were selected due to relatively high nutrient and organics concentrations observed at the Basin E outfall station (CSE1) during WY2021–2022 monitoring. These upstream stations represent two main branches in the basin, including stormwater runoff from Southeast Evergreen Highway and nearby residential roads (CSE2), and spring-fed water from residential areas north of SR-14 (CSE3). The Basin E upstream side channel monitoring station (CSE2) is a stormwater drainage ditch located immediately to the west of CSE1. The Basin E upstream monitoring station north of SR-14 (CSE3) is an improvised outfall from an exposed manhole structure located on the south side of the intersection of Southeast French Road and Southeast 95th Avenue.

2.1.2.2. Basin R

During WY2021–2022, upstream sampling was conducted in Basin R, which has one of the largest streams in the watershed (Fisher Creek). This upstream sampling was conducted to compare water quality between the primarily undeveloped upstream basin and the primarily residential lower basin. The Basin R upstream monitoring station (CSR2) is located at the upstream culvert on the east side of Southeast 192nd Avenue approximately 400 feet north of the intersection with Southeast 31st Street.

2.1.3. BMP Monitoring Stations

During the second round of monitoring, paired influent and effluent samples were collected from a stormwater pond in order to evaluate the effectiveness of this best management practice (BMP). This stormwater pond was selected because (1) it receives runoff from a large contributing area and (2) it drains to the Basin O outfall station (CSO1), which had moderately high metals concentrations relative to other outfall stations during the first round of monitoring. The stormwater pond is located between Southeast Cascade Park Drive and SR-14. The BMP influent and effluent monitoring stations are respectively located in the northwest corner of the stormwater pond (CSBMP1_IN) and along the south side of eastbound SR-14 Exit 8 approximately 300 feet north of Southeast 158th Court (CSBMP1_OUT).

2.1.4. Highway Stations

Five monitoring stations were selected to characterize the water quality contributions from WSDOT facilities. These monitoring stations included the I-205 outfall at the Columbia River (outfall monitoring station CSWSDOT1), pre-treatment runoff from SR-14, and post-treatment runoff from SR-14. Highway stations represent exclusively WSDOT runoff, with the exception of CSWSDOT3, which drains a small area of a City street. Highway monitoring stations include the following:

- CSWSDOT1, described in the outfall monitoring station section above, discharges I-205 and nearby residential runoff at the outfall beneath the Glenn L. Jackson Memorial Bridge.
- CSWSDOT2 discharges untreated SR-14 runoff in Basin Q at a daylighting stormwater pipe in between SR-14 and the eastbound offramp at Exit 8.
- CSWSDOT3 is located in Basin Q and discharges untreated SR-14 runoff from a pipe into a ditch in the southeast corner of the intersection of Southeast 164th Street and the eastbound SR-14 on- and off-ramps.
- CSWSDOT4 discharges untreated SR-14 runoff in Basin B at a stormwater outfall on the south side of SR-14 approximately 250 feet east of the intersection of Southeast Evergreen Highway and Southeast Chelsea Avenue.
- CSWSDOT5 discharges treated SR-14 runoff in Basin O at a stormwater outfall directly next to monitoring station CSBMP1_OUT.

Table 2. Columbia Slope Basin Characteristics.

Monitoring Station	Basin ID	Drainage Area (acres)	Impervious Area (%)	Residential (%)	Commercial and Industrial (%)	Agriculture (%)	Forest, Field, Other (%)	Septic Density (count/acre)	Swale Density (count/acre)	Stormwater Pond Density (count/10 acres)
CSA1	A	131	44	95	5	<1	0	0.3	0	0
CSAA1	AA	14.1	43	99	<1	0	0	0	0	0
CSE1	E	143	37	99	0	<1	1	0.5	0	0
CSE2	E	16.2	42	100	0	0	0	0	0	0
CSE3	E	53.1	42	98	0	<1	1	0.7	0	0
CSF1	F	161	35	82	3	1	13	0.2	0.006	0.06
CSH1	H	201	44	85	15	0	<1	0.1	0.1	0.2
CSJ1	J	86.8	29	72	7	3	18	0.1	0.01	0.11
CSL1	L	124	42	100	<1	0	0	0.05	0	0.08
CSO1	O	670	52	91	9	0	0	0.03	0.01	0.03
CSP1	P	523	61	79	21	0	<1	0.2	0.1	0
CSQ1	Q	762	54	84	13	3	<1	0.02	0.1	0.03
CSR1	R	1174	35	56	13	9	23	0.02	0.01	0.13
CSR2	R	622	28	42	10	11	37	0.01	0.006	0.02
CSBMP1_IN	O	612	53	92	8	0	0	0.01	0.02	0.02
CSBMP1_OUT	O	627	53	91	9	0	0	0.01	0.02	0.02
CSWSDOT1	I-205	457	51	73	25	<1	1	0.3	0.02	0
CSWSDOT2	Q	2.02	79	31	69	0	0	0	0	0
CSWSDOT3	Q	12.8	61	63	37	<1	0	0	0	0.78
CSWSDOT4	B	5.80	73	75	17	8	0	0	0	0
CSWSDOT5	O	8.43	56	89	11	0	0	0	0	1.2

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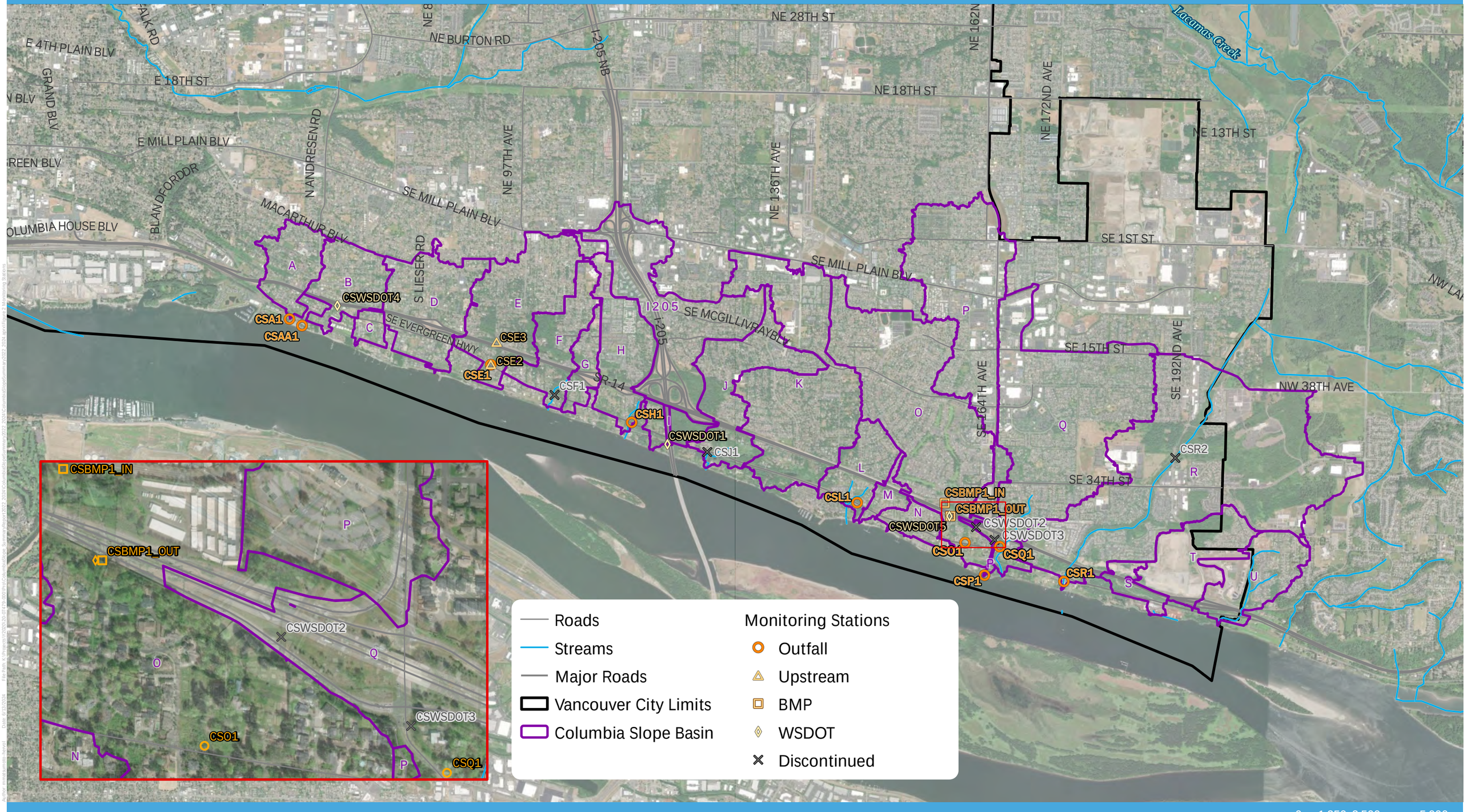
Figure 2.
Columbia Slope 2022-2024 Monitoring Stations.



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2.2. Monitoring Activities

As specified in the QAPP addenda (Herrera 2022b and 2023a), the second round of monitoring was conducted at 9 to 13 stations during 1 day for each of the 18 sampling events. The specific stations that were sampled varied depending on type of event and season. For one event, make-up samples were collected at CSWSDOT5 on a separate day. For another event, make-up samples were collected for CSWSDOT1 and CSWSDOT4 on a separate day. Sampling generally progressed from upstream to outfall stations and from east to west. The monitoring events are summarized in Table 3.

Storm flow monitoring occurred from October to March on days when at least 0.30 inch of rain was predicted to occur in daylight hours of the sampling date and at least 0.10 inch of rain occurred before sampling began.

Base flow sampling occurred according to schedule with the criterion for base flow conditions: less than 0.04 inch of rain in the previous 24 hours.

Rainfall data from the Post Office Rain Gage (Portland BES 2024) was checked before monitoring to ensure criteria were met.

Table 3. Sampling Events for the Columbia Slope Water Quality Monitoring Project.

Event ID	Sample Date	Sample Event Type	Sample Duplicate Station	Antecedent Dry Period (days)[a]	Storm Depth (inches)[b]
Round 1 Monitoring – WY2021–2022					
1	6/10/2021	Base	CSR1	3.7	0
2	7/15/2021	Base	CSJ1	31	0
3	8/26/2021	Base	CSF1	72	0
	10/26/2021			1.0	0.51
4	11/4/2021[c]	Storm	CSP1	2.1	0.51
5	11/22/2021	Base	CSE1	3.2	0
	12/9/2021			0.8	0.16[d]
6	12/15/2021[c]	Storm	CSO1	1.4	0.59
7	1/3/2022	Storm	CSWSDOT3	3.1	2.24
8	1/12/2022	Base	CSR2	1.1	0
9	1/20/2022	Storm	CSE1	1.0	0.79
10	2/17/2022	Base	CSWSDOT1	2.8	0
11	2/28/2022	Storm	CSWSDOT2	2.2	2.17
12	3/2/2022	Storm	CSWSDOT1	0.4	1.25

Table 3 (continued). Sampling Events for the Columbia Slope Water Quality Monitoring Project.

Event ID	Sample Date	Sample Event Type	Sample Duplicate Station	Antecedent Dry Period (days)[a]	Storm Depth (inches)[b]
Round 2 Monitoring – WY2023–2024					
1	12/27/2022	Storm	CSBMP1_IN & CSQ1	0.5	3.74
	1/12/2023			0.7	0.7
2	1/18/2023	Storm	CSP1	1.2	0.32
3	2/7/2023	Storm	CSBMP1_OUT	2.0	0.14[d]
4	3/13/2023	Storm	CSWSDOT5	2.0	1.65
5	3/24/2023	Storm	CSO1	0.5	0.47
	4/19/2023			0.3	0.09[e]
6	4/6/2023	Storm	CSWSDOT1	1.4	0.85
7	4/27/2023	Base	CSE1	3.6	0
8	5/18/2023	Base	CSE3	2.2	0
9	7/27/2023	Base	CSAA1	36	0
10	9/7/2023	Base	CSH1	6.2	0
11	10/18/2023	Base	CSL1	1.4	0.01
12	11/6/2023	Storm	CSO1	1.2	1.46
13	11/28/2023	Base	CSQ1	5.7	0
14	12/6/2023	Storm	CSR1	1.1	3.11
15	1/9/2024	Storm	CSE2	0.3	1.45
16	1/24/2024	Storm	CSA1	0.8	0.68
17	2/15/2024	Storm	CSL1	3.3	1.1
18	2/29/2024	Storm	CSH1	0.3	1.57

[a] Antecedent dry period was defined as the number of days with less than 0.04 inch of rain in a 6-hour period that preceded the event date (Portland BES 2024).

[b] Storm depth was determined as the total precipitation amount measured over the course of the targeted storm event (as defined by storm criteria) or base flow event (as determined by base flow sampling criteria) (Portland BES 2024).

[c] Makeup storm sampling day for CSWSDOT2 due to no flow at this site on the original event sampling day.

[d] The QAPP criteria for storm monitoring were not met because less than 0.1 inch of rain fell prior to monitoring.

[e] The CSWSDOT1 and CSWSDOT4 samples could not be collected with the rest of the monitoring stations on March 24, 2023. Make-up samples were collected on April 19, 2023, but did not meet the QAPP storm sampling criteria. These highway monitoring stations have a large impervious contributing area and therefore do not require significant precipitation to discharge.

2.3. Parameters of Concern

Samples collected for this monitoring program were analyzed for the following parameters, in accordance with the QAPP (Herrera 2021a) and addenda (Herrera 2021b, 2022b, 2023a). These parameters are consistent with those measured under similar City monitoring programs, with the exception that semivolatile organic compounds (SVOCs) and organochlorine pesticides (OC pesticides) were included to evaluate urban and highway runoff pollutant contribution during storm flow events.

- Water discharge
- Temperature
- pH
- Specific conductance
- Dissolved oxygen
- Turbidity
- Total suspended solids (TSS)
- Total phosphorus
- Total nitrogen
- Nitrate+nitrite nitrogen
- Hardness as CaCO3
- Chloride
- Total metals (copper, lead, zinc)
- SVOCs
- OC pesticides
- *Escherichia coli* (*E. coli*) bacteria

2.3.1. In Situ Measurements

2.3.1.1. Water Temperature

Water temperature is critical to the health and survival of fish and other aquatic species in many life stages, including embryonic development, juvenile growth, and adult migration. The relative species composition, metabolism, and reproductive effectiveness of cold-blooded aquatic species are also regulated by water temperature. An increase in water temperature accelerates the biodegradation of organic matter and increases the dissolved oxygen demand as well as decreasing the solubility of oxygen. The state water quality standards for temperature are based on a 7-day average daily maximum (7-DADMax). The maximum allowable 7-DADMax is 17.5 degrees Celsius (°C) in waters designated for salmon and trout spawning, noncore rearing, and migration. Temperature is category 5 listed (requiring an improvement project) due to state criteria exceedances, according to Washington State's 303(d) list of impaired waters (Ecology 2016).

2.3.1.2. Dissolved Oxygen

Dissolved oxygen is another important water quality parameter for salmonids and other aquatic organisms. Low dissolved oxygen levels can be harmful to larval life stages and respiration of juveniles

and adults, directly affecting the survival of aquatic organisms. Depletion of oxygen in water bodies can also lead to a shift in the composition of the aquatic community. Washington state surface water quality standards require that dissolved oxygen concentrations exceed 10.0 milligrams per liter (mg/L) in fresh waters designated for noncore salmonid rearing (WAC 173-201A). Dissolved oxygen naturally decreases as waters warm, because dissolved oxygen decreases with increasing temperature at 100 percent saturation. Higher nutrient concentrations are often found in warmer waters, so low dissolved oxygen is also associated with high nutrient concentrations.

2.3.1.3. Conductivity

Conductivity is a measure of the ability of water to conduct an electrical current, which is directly related to the content of dissolved ions in the water. Conductivity varies with temperature and is typically measured as specific conductance, which is normalized to a temperature of 25°C. Although there is no state surface water quality standard established for conductivity, this measurement is useful for identifying sources of dissolved solids (primarily salts) and for determining the relative flow contributions attributed to groundwater (since conductivity is typically higher in groundwater than in surface water).

2.3.2. Conventionals

2.3.2.1. Total Suspended Solids

TSS are the most widespread pollutants entering surface waters. Solids, especially the finer fractions, reduce light penetration in water. Solids can have a smothering effect on fish spawning and benthic biota. Suspended solids are also closely associated with other pollutants, such as nutrients, bacteria, metals, and organic compounds, which tend to adsorb to the solids' particles. Pollutants are transported in surface runoff to receiving waters if onsite controls are not implemented for solids removal, thus the presence of suspended solids is used to evaluate the overall pollutant loading within a basin. No state surface water quality standards have been established for total suspended solids.

2.3.2.2. Turbidity

Turbidity is a measure of water clarity that is determined by how the transmission of light is scattered as it passes through water. An increase in the amount of particulate matter in water reduces clarity (or transparency) by increasing the scattering of light. Measurements of turbidity are expressed in nephelometric turbidity units (NTU). Washington state surface water quality standards restrict turbidity increases to (1) a maximum of 5 NTU more than background when background turbidity is 50 NTU or less and (2) a maximum of 10 percent increase in turbidity when the background turbidity is greater than 50 NTU (WAC 173-201A). Typically, background turbidity is measured at an upstream location and turbidity criteria are applied to a downstream location.

2.3.2.3. Chloride

Chloride level is a measurement of dissolved chloride in association with sodium, potassium, calcium, and magnesium as salts. Chlorides are naturally present in surface and groundwater; these chlorides originate from natural sources like seawater intrusion in coastal areas and weathering of various rocks. However, chlorides are also present in a variety of products, such as water and wastewater treatment products (i.e.,

chlorine, iron chloride), roadway deicing salts (e.g., sodium chloride, magnesium chloride), and fertilizers (e.g., potassium chloride). Thus, anthropogenic sources of chloride may include runoff, landfill leachate, septic tank or industrial effluent, and irrigation drainage. Chloride can increase the corrosivity of water; as it reacts with the metal ions in pipes, this can increase the concentration of metals in drinking water or waterways. Measuring chloride in freshwater systems is thus an important indicator of impairment and is often used to specifically evaluate potential inputs from septic systems.

According to the World Health Organization (WHO 2003), chloride levels in unpolluted waterways are often below 10 mg/L and sometimes below 1 mg/L. There are no Washington state human health criteria for chloride. Healthy individuals can tolerate large quantities of chloride as long as it is accompanied by an intake of fresh water (WHO 2003). However, Washington state does maintain a criterion for aquatic life uses, which restricts chloride concentrations to less than 860 mg/L for acute exposure and 230 mg/L for chronic exposure (WAC 173-201A-240).

2.3.2.4. Hardness

Hardness is a measurement of the dissolved mineral content (primarily calcium and magnesium) of water. Hard water contains a high mineral content, and soft water contains a low mineral content. High hardness values can increase or decrease the toxicity of metals in runoff, depending on the aquatic species that are exposed. Hardness values are therefore used to calculate dissolved metals toxicity criteria. Natural sources of hardness include limestone (which introduces calcium into groundwater) and dolomite (which introduces magnesium). No state surface water quality standards have been established for hardness.

2.3.3. Nutrients and Bacteria

2.3.3.1. Nitrate+Nitrite

Washington State does not have a surface water quality standard for nitrate+nitrite nitrogen; however, it is a regulated parameter in the state groundwater standards (WAC 173-200-040) and the state drinking water standards (WAC 246-290-310) for the protection of human health. To prevent a potentially fatal blood disorder in infants called "blue baby syndrome" as well as other human health problems, both standards specify that nitrate+nitrite nitrogen concentrations shall not exceed 10 mg/L. Nitrate+nitrite nitrogen is also a concern in freshwaters because it may contribute to (1) an overabundant growth of algae and aquatic plants and (2) a decline in diversity of the biological community. The EPA recommends a nutrient criterion of 0.15 mg/L for nitrate nitrogen in rivers and streams in the Willamette Valley ecoregion.

Natural sources of nitrate include atmospheric deposition, wildlife waste, and decay of organic matter, while anthropogenic sources include fertilizers, domesticated animal waste (e.g., pets), septic systems, and combustion.

2.3.3.2. Total Nitrogen

Currently, Washington State has not established surface water quality criteria for total nitrogen. However, the EPA (2001) has recommended a nutrient criterion of 0.31 mg/L for total nitrogen in streams located in the Willamette Valley Ecoregion. Total nitrogen concentrations for each sample were calculated by using results from nitrate+nitrite and total Kjeldahl nitrogen analyses.

2.3.3.3. Total Phosphorus

Total phosphorus is a combination of inorganic and organic forms of phosphorus, which can come from natural sources or anthropogenic sources (e.g., wastewater treatment plants, septic system failures, animal manure storage, and fertilizer runoff). Phosphorus is a concern in fresh water because elevated levels can lead to accelerated plant growth, algal blooms, low dissolved oxygen, decreases in aquatic diversity, and eutrophication. Currently, Washington State does not have surface water quality standards for total phosphorus in rivers and streams. The EPA recommended a nutrient criterion of 0.040 mg/L for total phosphorus in streams located in the Willamette Valley ecoregion (EPA 2001).

2.3.4. E. coli Bacteria

In July 2018, Ecology proposed a transition from the use of fecal coliform to *E. coli* as the primary bacteria parameter for analysis of state recreational water quality criteria for freshwater bodies. The proposed change is due to the more robust correlation of gastrointestinal illness with these bacteria parameters and conformance with EPA recommendations (Finch 2018). In January 2019, Ecology adopted the following *E. coli* water quality standards that conform to the EPA's recommendations:

- There shall be no more than 32 illnesses per 1,000 primary contact recreators.
- The geometric mean shall not exceed 100 colony-forming units per 100 milliliters (CFU/100 mL), and 90th percentile shall not exceed 320 CFU/100 mL (Finch 2018; EPA 2012a; WAC 173-201A).

Note that *E. coli* results for this project were measured in most probable number per 100 milliliters (MPN/100 mL) and that these units are comparable to CFU/100 mL units used for Ecology's water quality standards.Washington State *E. coli* water quality criteria are based on a 90-day averaging period with at least three measurements per period. The frequency of sampling events over the course of the monitoring periods in this project, particularly during the dry season, did not meet the required sampling frequency to evaluate compliance with state water quality criteria; therefore, the sampling events do not necessarily indicate exceedance of these water quality criteria during part or all of the monitoring periods.

2.3.5. Metals

Copper, lead, and zinc are some of the most common heavy metals observed in urban streams. The total fractions of these heavy metals were included in both the storm and base flow monitoring program to evaluate acute and chronic aquatic toxicity within the project area. Potential sources of these heavy metals within the Columbia Slope watershed include vehicle components, petroleum-based fuels and oil, electronics waste, metal roofs, and naturally eroding soils. Washington state surface water quality

standards (WAC 173-201A) for these three heavy metals are based on the dissolved fraction and vary directly with hardness concentrations such that toxicity decreases with increasing hardness. Criteria values were calculated using the total fraction and hardness values reported at each station from each monitoring event. The water quality criteria are based on the dissolved fraction of metals, so comparing the total fraction to these criteria may show an inflated number of exceedances (since the total fraction is greater than the dissolved fraction).

2.3.6. Organics

SVOCs are common pollutants in urban and highway runoff. SVOCs consist of several subgroups, including polycyclic aromatic hydrocarbons (PAHs), phthalates, and chlorinated organics. These pollutants were included in the storm flow monitoring program to evaluate potential impacts to human health and freshwater aquatic life within the project area. The concentration of SVOCs in stormwater is typically related to the total suspended solids concentration, particularly silts and finer, as SVOCs can bind to this fine sediment. Potential sources of SVOCs within the Columbia Slope watershed include oil and grease, vehicle emissions, and petroleum hydrocarbons.

OC pesticides are common persistent pollutants in urban and residential runoff. While many of these pollutants have been banned from use in the United States, several are still in use or were used extensively prior to being banned. These pollutants were included in the storm flow monitoring program to evaluate potential impacts to human health and freshwater aquatic life within the project area. Potential sources of OC pesticides within the Columbia Slope watershed include residential and agricultural pesticide use and legacy contamination from prior widespread use.

Washington State surface water quality standards (WAC 173-201A) list criteria for several individual SVOCs and OC pesticides.

2.4. Data Collection Methods

In situ water quality measurements were made at each of the monitoring stations by submerging the probe of a calibrated water quality multimeter into the stream. Herrera's YSI Pro DSS water quality meter was used for 16 events, and a Hanna HI98194 and Aquaread AP-2000-D were each rented for one event. To ensure accuracy and minimize variability across multimeters, standardized field calibration procedures were followed (Herrera 2021a), including post-event calibration checks.

Upon arrival at a monitoring station, stream discharge measurements were made at select monitoring stations using a water current meter, field tape, and calibrated staff, according to the Herrera Standard Operating Procedures for Instantaneous Discharge Measurement in Streams and Pipes (QAPP Appendix A; Herrera 2021a). Where possible, discharge was measured at circular pipes. The water quality probe was then submerged in the stream and left to stabilize for several minutes. The probe was placed upstream of all instream activity. When the meter's readings were stabilized, measurements were recorded for each water quality parameter on standardized field forms. Field duplicate measurements were collected once during each sampling event by re-submerging the multimeter in the stream during the sampling event.

Field staff collected water samples by hand, using aseptic procedures after wading into the channel. The laboratories (ALS Environmental and BSK Analytical Laboratories) supplied precleaned bottles for all samples. The samples were collected after the *in situ* measurements were recorded, in order to ensure that both the *in situ* measurements and the water sampling would occur upstream of all monitoring activity disturbances in the channel. One field duplicate was collected from a different station during each sampling event by consecutively filling each pair of sample bottles and labeling the field duplicate sample bottles with a blind sample identification number.

The collected water samples were immediately stored in a cooler with ice at a temperature less than 6°C. *E. coli* samples were dropped off at the BSK Analytical Laboratories location in Vancouver, Washington, immediately after the conclusion of each sampling event. All other samples were picked up by the ALS Environmental laboratory courier the morning after the sampling event. Chain-of-custody forms were completed and included with each batch of samples sent to the laboratory.

Table 4 summarizes the field and laboratory parameters and methods. Sample preservation, maximum holding times, and analytical methods met federal requirements for the Clean Water Act (Federal Register 40 CFR Part 136; EPA 2012b) and recommendations by Standard Methods (APHA et al. 1998).

Table 4. Field and Laboratory Parameter Methods.

Parameter	Method Description	Method Number or Meter
Field Parameters		
Water Discharge	Circular conduit, velocity-depth transect	Swoffer Model 2100-13
Temperature	*In situ* field reading	YSI ProDSS
pH	*In situ* field reading	YSI ProDSS
Specific conductance	*In situ* field reading	YSI ProDSS
Dissolved oxygen	*In situ* field reading	YSI ProDSS
Laboratory Parameters		
Turbidity	Nephelometric	EPA 180.1
Total suspended solids	Weighed filter	SM 18 2540D
Total phosphorus	Persulfate digestion, ascorbic acid	EPA 365.3
Total nitrogen	Kjeldahl digestion, ammonia-selective electrode with known addition, adding to nitrate+nitrite	EPA 351.4; SM 4500-NH3 G LL
Nitrate+nitrite nitrogen	Automated cadmium reduction	EPA 353.2; SM 18 4500-NO3 F
Hardness as $CaCO_3$	Titrimetric	SM 2340C
Chloride	Ion chromatography	EPA 300.0
Total Cu, Pb, and Zn	Inductively coupled plasma mass spectrometry	EPA 200.8
SVOCs	Gas chromatography/mass spectrometry	EPA 8270D-LL
Organochlorine pesticides	Gas chromatography	EPA 8081B
E. coli bacteria	Quanti-Tray	SM 9223B Q-tray

SM = APHA Standard Methods (APHA et al. 1998) EPA = U.S. Environmental Protection Agency Method Code
Cu = copper Pb = lead Zn = zinc $CaCO_3$ = calcium carbonate
SVOCs = Semivolatile organic compounds

2.5. Data Analysis Methods

This section describes the methods used for computation of summary statistics, performing a Kruskal-Wallis test, comparison of results to the applicable water quality criteria, and comparison of results to similar monitoring studies. The *Results* section summarizes findings from these analyses.

Figures produced for conventionals, metals, nutrients, *E. coli* bacteria, *in situ* measurements, and select SVOCs and OC pesticides are listed below:

- Results plots: "Box and whisker" plots present spatial patterns among the sampling stations for storm and base flow. The figures are grouped together by station type: outfalls, upstream, and WSDOT stations. Where applicable, the figures include red horizontal lines representing water quality criteria and/or project action limits.
- Heat maps: These figures present results of the Kruskal-Wallis test and Dunn post-hoc test used to detect significant differences between sampling stations for base (top) and storm (bottom) flow. Heat maps were produced for each outfall station.
- BMP performance: Scatter and box plots present inflow versus outflow concentrations and percent reduction, respectively. A Wilcoxon rank test was used to evaluate statistically significant reductions.
- Comparison plots: "Box and whisker" plots, presenting Columbia Slope data alongside data from other monitoring studies for comparison.

To better evaluate and describe the concentrations and relative toxicities of certain PAHs and pesticides, individual parameters within each specified group were summed as follows:

- Carcinogenic PAHs: Per Ecology (WAC 173-340-708(8)(e)), the human health toxicity for carcinogenic PAHs (cPAHs) is evaluated using toxicity equivalency factors (TEFs) applied to certain parameters as estimates of toxicity relative to the reference PAH, benzo(a)pyrene (Ecology 2015b). Each applicable parameter was multiplied by its listed TEF value, the product of which is considered the toxic equivalent concentration (TEQ) for that cPAH. TEQs for individual cPAHs were then summed for each sample to obtain a total cPAH value (Ecology 2015b).
- Total DDx: Isomers dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyltrichloroethane (DDT) were summed using only detected values. For samples with no detected values, half of the maximum reporting limit in the specified group was used.

When the proportion of undetected values exceeded 50 percent in the data, half the reporting limit was used in calculations of summary statistics. This approach is consistent with data management practices used in other City monitoring programs and generally results in less bias than other estimation methods. When the proportion of undetected values was less than 50 percent (but greater than zero) in the data, the R statistical package NADA version 1.6-1.1 (Lee 2022) was used to estimate undetected values using the Regression on Order Statistics (RoS) method (Lee and Helsel 2005; Helsel and Cohn 1988). The RoS method has been shown to be one of the most accurate estimation techniques for left-censored analytical chemistry data. In few cases, where less than 50 percent of values were undetected and the reporting limit of undetected data exceeded the maximum detected value, RoS could not be used. For

these cases, a Monte Carlo imputation was used to estimate undetected values because it has similar accuracy to RoS and does not have the same limitation (Cameron 2019). Summary statistics using these values were then calculated and compiled for each of the monitoring parameters. Minimum and maximum values were reported using either the detected value or the reporting limit if not detected (Appendix A).

2.5.1. Computation of Summary Statistics

Herrera data analysts used R software packages to calculate the following summary statistics, which are presented in Appendix A, for the compiled data (R Core Team 2023):

- Minimum
- Mean
- Geometric mean (*E. coli* only)
- Median
- 25th percentile
- 75th percentile
- 90th percentile
- Maximum

2.5.2. Spatial Patterns

In addition to the tabular data summaries, graphical data summaries consisting of "box and whisker" plots were generated. These plots present the following information for each station:

- The minimum and maximum values as the lower and upper whiskers, respectively
- The median and mean as the black line and orange point inside the box, respectively
- The 25th and 75th percentiles of the data as the lower and upper boundaries of the box, respectively

For *E. coli*, the 90th percentile of the data is also shown on the plot as a black triangle, and the geometric mean (rather than the arithmetic mean) is presented as an orange diamond for comparison to water quality criteria. Box and whisker plots displaying storm and base flow data at each station were produced for comparison.

Spatial patterns in parameter concentrations for outfall stations were evaluated using the Kruskal-Wallis test, along with a pairwise comparison of sampled stations (the Dunn test). The Kruskal-Wallis test is a nonparametric analogue to a blocked analysis of variance test that was used to determine if there was a high probability (equal or greater to 95 percent confidence; $p \leq 0.05$) that individual concentrations in one or more outfall locations were significantly different (higher or lower) from the norm. The Kruskal-Wallis test was chosen because it does not assume (1) a distribution of the data, (2) that all stations have the same number of samples, or (3) that all stations were sampled on the same dates. If a significant difference was detected, the Dunn test was used as a post-hoc analysis in which each outfall station was compared to the other outfall stations. The Dunn test is a nonparametric pairwise comparison test to

determine which monitoring sites were significantly different from the others (Helsel et al 2020). The pairwise comparison results are presented as a heat map, where numbers indicate how frequently a particular station was significantly greater than or less than the other stations for a given parameter.

2.5.3. Comparison to Water Quality Criteria

In order to identify priority basins for long-term monitoring and stormwater retrofits within the Columbia Slope watershed, monitoring data were compared to project limits defined in the QAPP based on regulatory criteria from the following sources:

- Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A, updated December 2023)
- Ambient Water Quality Criteria Recommendations: Rivers and Streams in Nutrient Ecoregion I (EPA 2001)

Table 5 presents the surface water quality criteria and project limits, including acute criteria for storm flow event samples and chronic criteria for base flow event samples. Acute criteria are based on either a 1-hour average concentration not to be exceeded more than once every 3 years on average for metals or an instantaneous concentration not to be exceeded at any time for other parameters. Chronic criteria are based on a 4-day average concentration not to be exceeded more than once every 3 years. Metals criteria listed in Table 5 were calculated using a hardness concentration of 50 mg/L from the Washington State Department of Ecology (Ecology) Water Quality Calculator, but these criteria are calculated based on measured hardness for each sampled event. General criteria are also included (1) to protect salmonid spawning and rearing for temperature (based on a 7-day maximum), dissolved oxygen (based on a 1-day minimum), pH, and turbidity (based on a 5 NTU increase over a background) and (2) to protect water contact recreation for *E. coli* (based on single sample values).

Various criteria were applied to develop project limits in the QAPP for storm and base flow event samples (Herrera 2021a). In general, chronic water quality criteria were used for base flow limits and acute water quality criteria were used for storm flow limits. In cases where the analytical reporting limit was higher than the relevant water quality criterion, the reporting limit was used for the project limit. Parameters analyzed for this monitoring program that did not have established project limits in the QAPP, including TSS and several individual SVOCs, are omitted from Table 5. A comparison value of 100 mg/L was applied for TSS results, based on the Oregon Department of Environmental Quality (DEQ) 1200-z Industrial Stormwater General Permit benchmark for the Columbia River Mainstem (DEQ 2021).

If freshwater life criteria were unavailable, parameters were compared to the National Recommended Water Quality Criteria for protection of human health from consumption of water and organisms (EPA 2023). If the parameter reporting limit exceeded the human health criterion, then the reporting limit was used for the project limit.

Total phosphorus and total nitrogen criteria are based on reference conditions in Ecoregion I (Willamette Valley), determined by EPA (2001) using the 25th percentile of all data collected from 1990 to 2000 in the ecoregion. This source also includes a reference condition for turbidity at 4.25 NTU, which was rounded up to 5 NTU to represent background conditions.

Table 5. Water Quality Criteria and Project Action Limits Used for Comparison to Data Collected for the Columbia Slope Water Quality Monitoring Project.

Parameter	Surface Water Quality Criteria[a]			Project Action Limit	
	Aquatic Life–Freshwater		Protection of Human Health		
	Acute	Chronic		Storm Flow	Base Flow
Field Measurements					
Temperature	17.5°	17.5°C	–	17.5°C	17.5°C
pH	6.5–8.5 S.U.	6.5–8.5 S.U.	–	6.5–8.5 S.U.	6.5–8.5 S.U.
Dissolved oxygen	10 mg/L	10 mg/L	–	10 mg/L	10 mg/L
Conventionals, Metals, and Bacteria					
Turbidity	–	–	–	10 NTU	10 NTU
Nitrate+nitrite nitrogen	–	–	10 mg/L	10 mg/L	10 mg/L
Total nitrogen (TN)	–	–	–	0.31 mg/L	0.31 mg/L
Total phosphorus	–	–	–	0.047 mg/L	0.047 mg/L
Chloride	860 mg/L	230 mg/L	–	860 mg/L	230 mg/L
Copper (total)[b]	8.86 µg/L	6.28 µg/L	1300 µg/L	8.86 µg/L	6.28 µg/L
Lead (total)[b]	30.14 µg/L	1.174 µg/L	–	30.14 µg/L	1.174 µg/L
Zinc (total)[b]	63.61 µg/L	58.09 µg/L	1000 µg/L	63.61 µg/L	58.09 µg/L
E. coli bacteria	–	–	–	320 MPN/100 mL	320 MPN/100 mL
Polycyclic Aromatic Hydrocarbons (PAHs)[c]					
Acenaphthene	–	–	30 µg/L	30 µg/L	30 µg/L
Anthracene	–	–	100 µg/L	100 µg/L	100 µg/L
Benz(a)anthracene	–	–	0.00016 µg/L	0.2 µg/L	0.2 µg/L
Benzo(a)pyrene	–	–	0.000016 µg/L	0.2 µg/L	0.2 µg/L
Benzo(b)fluoranthene	–	–	0.00016 µg/L	0.2 µg/L	0.2 µg/L
Benzo(k)fluoranthene	–	–	0.0016 µg/L	0.2 µg/L	0.2 µg/L
Chrysene	–	–	0.016 µg/L	0.2 µg/L	0.2 µg/L
Dibenz(a,h)anthracene	–	–	0.000016 µg/L	0.2 µg/L	0.2 µg/L
Fluoranthene	–	–	6 µg/L	6 µg/L	6 µg/L
Fluorene	–	–	10 µg/L	10 µg/L	10 µg/L
Indeno(1,2,3-cd)pyrene	–	–	0.00016 µg/L	0.2 µg/L	0.2 µg/L
Pyrene	–	–	8 µg/L	8 µg/L	8 µg/L
Phthalates[c]					
Bis(2-ethylhexyl) Phthalate	–	–	0.045 µg/L	1 µg/L	1 µg/L
Butyl Benzyl Phthalate	–	–	0.013 µg/L	0.2 µg/L	0.2 µg/L
Diethyl Phthalate	–	–	200 µg/L	200 µg/L	200 µg/L
Dimethyl Phthalate	–	–	600 µg/L	600 µg/L	600 µg/L
Di-n-butyl Phthalate	–	–	8 µg/L	8 µg/L	8 µg/L

Table 5 (continued). Water Quality Criteria and Project Action Limits Used for Comparison to Data Collected for the Columbia Slope Water Quality Monitoring Project.

Parameter	Surface Water Quality Criteria[a]			Project Action Limit	
	Aquatic Life–Freshwater		Protection of Human Health		
	Acute	Chronic		Storm Flow	Base Flow
Chlorinated Organics[c]					
1,2-Dichlorobenzene	–	–	700 µg/L	700 µg/L	700 µg/L
1,3-Dichlorobenzene	–	–	2 µg/L	2 µg/L	2 µg/L
1,4-Dichlorobenzene	–	–	200 µg/L	200 µg/L	200 µg/L
2,4,6-Trichlorophenol	–	–	0.25 µg/L	0.5 µg/L	0.5 µg/L
2,4-Dichlorophenol	–	–	10 µg/L	10 µg/L	10 µg/L
2-Chloronaphthalene	–	–	100 µg/L	100 µg/L	100 µg/L
2-Chlorophenol	–	–	15 µg/L	15 µg/L	15 µg/L
3,3′-Dichlorobenzidine	–	–	0.0031 µg/L	2.0 µg/L	2.0 µg/L
4-Chloro-3-methylphenol	–	–	36 µg/L	36 µg/L	36 µg/L
Bis(2-chloroethyl) Ether	–	–	0.02 µg/L	0.2 µg/L	0.2 µg/L
Hexachlorobenzene	–	–	0.000005 µg/L	0.2 µg/L	0.2 µg/L
Hexachlorobutadiene	–	–	0.01 µg/L	0.2 µg/L	0.2 µg/L
Hexachlorocyclopenta-diene	–	–	1 µg/L	1 µg/L	1 µg/L
Hexachloroethane	–	–	0.02 µg/L	0.2 µg/L	0.2 µg/L
Pentachlorophenol[d]	9.07 µg/L	5.73 µg/L	0.002 µg/L	9.07 µg/L	5.73 µg/L
Other Semivolatile Organic Compounds (SVOCs)[c]					
1,2-Diphenylhydrazine	–	–	0.01 µg/L	0.2 µg/L	0.2 µg/L
2,4-Dimethylphenol	–	–	85 µg/L	85 µg/L	85 µg/L
2,4-Dinitrophenol	–	–	30 µg/L	30 µg/L	30 µg/L
2,4-Dinitrotoluene	–	–	0.039 µg/L	0.2 µg/L	0.2 µg/L
2-Methyl-4,6-dinitrophenol	–	–	3 µg/L	3 µg/L	3 µg/L
Isophorone	–	–	27 µg/L	27 µg/L	27 µg/L
Nitrobenzene	–	–	30 µg/L	30 µg/L	30 µg/L
N-Nitrosodi-n-propylamine	–	–	0.0044 µg/L	0.2 µg/L	0.2 µg/L
Phenol	–	–	9000 µg/L	9000 µg/L	9000 µg/L
Organochlorine Pesticides[c]					
2,4-DDD	1100 ng/L	1 ng/L	0.0079 ng/L	1100 ng/L	1 ng/L
2,4-DDE	1100 ng/L	1 ng/L	0.00088 ng/L	1100 ng/L	1 ng/L
2,4-DDT	1100 ng/L	1 ng/L	0.0012 ng/L	1100 ng/L	1 ng/L
4,4-DDD	1100 ng/L	1 ng/L	0.0079 ng/L	1100 ng/L	1 ng/L
4,4-DDE	1100 ng/L	1 ng/L	0.00088 ng/L	1100 ng/L	1 ng/L
4,4-DDT	1100 ng/L	1 ng/L	0.0012 ng/L	1100 ng/L	1 ng/L

Table 5 (continued). Water Quality Criteria and Project Action Limits Used for Comparison to Data Collected for the Columbia Slope Water Quality Monitoring Project.

Parameter	Surface Water Quality Criteria[a]			Project Action Limit	
	Aquatic Life–Freshwater		Protection of Human Health		
	Acute	Chronic		Storm Flow	Base Flow
Organochlorine Pesticides[c] (continued)					
Aldrin	2500 ng/L	1.9 ng/L	0.000041 ng/L	2500 ng/L	1.9 ng/L
alpha-BHC	–	–	0.048 ng/L	1 ng/L	1 ng/L
alpha-Chlordane[e]	2400 ng/L	43 ng/L	0.022 ng/L	2400 ng/L	43 ng/L
beta-BHC	–	–	1.3 ng/L	1.3 ng/L	1.3 ng/L
Chlordane	2400 ng/L	43 ng/L	0.022 ng/L	2400 ng/L	43 ng/L
Chlorpyrifos	83 ng/L	41 ng/L	–	83 ng/L	41 ng/L
Dieldrin	2500 ng/L	1.9 ng/L	0.00007 ng/L	2500 ng/L	1.9 ng/L
Endosulfan I[f]	220 ng/L	56 ng/L	–	220 ng/L	56 ng/L
Endosulfan II[f]	220 ng/L	56 ng/L	–	220 ng/L	56 ng/L
Endosulfan Sulfate	–	–	9000 ng/L	9000 ng/L	9000 ng/L
Endrin	180 ng/L	2.3 ng/L	2 ng/L	180 ng/L	2.3 ng/L
Endrin Aldehyde	–	–	34 ng/L	34 ng/L	34 ng/L
gamma-BHC (Lindane)	2000 ng/L	80 ng/L	430 ng/L	2000 ng/L	80 ng/L
gamma-Chlordane[c]	2400 ng/L	43 ng/L	0.022 ng/L	2400 ng/L	43 ng/L
Heptachlor	520 ng/L	3.8 ng/L	0.00034 ng/L	520 ng/L	3.8 ng/L
Heptachlor Epoxide	520 ng/L	3.8 ng/L	0.0024 ng/L	520 ng/L	3.8 ng/L
Hexachlorobenzene	–	–	0.005 ng/L	1 ng/L	1 ng/L
Hexachlorobutadiene	–	–	10 ng/L	10 ng/L	10 ng/L
Hexachloroethane	–	–	20 ng/L	20 ng/L	20 ng/L
Toxaphene	730 ng/L	0.2 ng/L	0.032 ng/L	730 ng/L	100 ng/L

°C degrees Celsius mg/L milligrams per liter NTU Nephelometric turbidity units µg/L micrograms per liter ng/L nanograms per liter MPN most probable number DDD Dichlorodiphenyldichloroethane DDE Dichlorodiphenyldichloroethylene, DDT Dichlorodiphenyltrichloroethane BHC Benzene Hexachloride

[a] Washington State human health criteria for the consumption of water and organisms, EPA-approved human health criteria under 40 CFR 131.45; National recommended water quality criteria for the protection of aquatic organisms and protection of human health based on consumption of organisms from Section 304 of the Clean Water Act; and Water Quality Standards for Surface Waters of the State of Washington, Chapter 173-201A WAC. Washington State Department of Ecology Water Quality Calculator with anticipated hardness concentration of 50 mg/L and pH of 7.

[b] Metals acute and chronic criteria are calculated separately for site and event using the measured hardness concentration. Values in the table were calculated using a hardness concentration of 50 mg/L.

[c] SVOCs and OC Pesticides are analyzed only during storm monitoring events.

[d] Pentachlorophenol criteria are calculated based on pH. Criteria in the table were calculated based on a pH of 7.0.

[e] Criteria for chlordane are used for cis-chlordane and gamma-chlordane.

[f] Criteria for endosulfan are used for endosulfan I and endosulfan II.

2.5.4. BMP Evaluation

The reduction of pollutants through CSBMP1 was evaluated using a linear regression and Wilcoxon paired test to determine significance. Results figures are located in Appendix B. The scatterplot displays influent (CSBMP1_IN) versus effluent (CSBMP1_OUT) concentrations. Points below or above the diagonal line indicate parameter reduction or export (increase in concentration) respectively. The boxplot summarizes percent reductions from each event and presents the median percent reduction. The Wilcoxon p-value is stated at the bottom. Statistical significance for this test was assessed at an alpha level of 0.05.

2.5.5. Comparison to Other Monitoring Studies

Columbia Slope monitoring data for select parameters were plotted alongside data from similar monitoring studies in different watersheds in Western Washington for comparison (Appendix B). Columbia Slope outfall monitoring stations located in open-channel creeks were compared to studies where samples were also collected in creeks. Monitoring stations conveyed through closed-channel pipe outfalls were compared to a study in which samples were collected from closed-channel systems. Table 6 summarizes groupings of stations and the studies used for comparison.

Table 6. Station Categories for Comparison to Other Studies.

Station Type	Stations	Land Use	Parameters	Comparison Studies
Open-channel Stream	CSE1, CSF1, CSH1, CSJ1, CSL1, CSO1, CSQ1, CSR1	Residential	Total zinc, TSS, total PAHs, BEHP, Nitrate+Nitrite, total Phosphorus	RPWS (Ecology 2024), Toxics in the Surface Runoff to Puget Sound (Herrera 2011)
Closed-channel Pipe	CSA1, CSAA1, CSP1, CSWSDOT1	Residential	Total zinc, TSS, total PAHs, BEHP, total phosphorus, total nitrogen	S8.D data (Ecology 2015a)
WSDOT Highway	CSWSDOT2, CSWSDOT3, CSWSDOT4, CSWSDOT5	Highway		

TSS = Total Suspended Solids PAHs = Polycyclic Aromatic Hydrocarbons BEHP = Bis(2-ethylhexyl) Phthalate
RPWS = Redmond Paired Watershed Study

2.5.5.1. Open-Channel Streams

Columbia Slope outfall monitoring stations located in open-channel streams include CSE1, CSF1, CSH1, CSJ1, CSL1, CSO1, CSQ1, and CSR1. The contributing basins to these outfalls were designated "residential" because all had more than 50 percent residential land use. Data from these monitoring stations were compared to data from residential basins in the following studies for both storm and base flow:

- Redmond Paired Watershed Study (RPWS; Ecology 2024) – An ongoing monitoring program in seven creeks in Redmond, Washington. Raw data used for comparison are from March 2016 through January 2023.
- Toxics in the Surface Runoff to Puget Sound (Herrera 2011) – Monitoring was conducted in 2009-2010 in creeks in the Puyallup and Snohomish watersheds to estimate toxic chemical loading to Puget Sound. Summary statistics from this study were used to create boxplots.

2.5.5.2. Closed-Channel Pipes

Columbia Slope monitoring stations located in closed-channel pipes include CSA1, CSAA1, CSP1, and all WSDOT stations. The contributing basins for CSA1, CSAA1, CSP1, and WSDOT1 were designated "residential" due to more than 70 percent residential land use. CSP1 and WSDOT1 include substantial commercial and industrial area (21 and 25 percent respectively). All WSDOT stations except WSDOT1 were designated "highway" due to more than 50 percent of land area being highways. Storm event data obtained at these stations were compared to data from low-density residential, high-density residential, and commercial land uses from stormwater runoff monitoring included in the Western Washington NPDES Phase I Stormwater Permit S8.D Data Characterization (S8.D data; Ecology 2015a).

3. Data Quality Review

A quality assurance review was performed for all field and laboratory data collected during the monitoring period, as specified in the QAPP (Herrera 2021a). Quality assurance review results for the WY2021 to WY2022 monitoring are presented in the 2021–2022 Summary Report (Herrera 2022a). The quality assurance review findings were presented in an interim update report for each sampling event. In general, the data quality for all parameters was considered acceptable based on holding time, reporting limit, method blank, control standard, laboratory duplicate, and field duplicate criteria specified in the QAPP. However, as summarized below, some quality control issues were identified in the data. Measurement quality objectives established in the QAPP, data quality criteria exceedances, and laboratory quality assurance review worksheets are presented in Appendix C. Data quality review findings are summarized below for field and laboratory data.

3.1. Field Data

The water quality meter was calibrated and then checked before and after each event, as documented in the calibration logs provided as an attachment to the Interim Reports. In general, *in situ* measurements met all data measurement quality objectives, with a few exceptions provided in Appendix C. Stream discharge was the only field measurement commonly flagged as estimated due to either excessive bank vegetation or low stream flow depth interfering with accurate velocity readings. In addition, one set of field pH measurements was flagged as rejected (R) due to meter malfunction. These measurements were replaced by laboratory pH measurements outside of holding time, which were qualified as estimated (J).

3.2. Laboratory Data

All scheduled samples were collected, the laboratory reported all parameters, and all laboratory methods were consistent with those specified in the QAPP (Herrera 2021a). Method blanks analyzed did not contain levels of target parameters above the reporting limit, with few exceptions. Laboratory matrix spike samples met control limits. All laboratory duplicate samples met the established control limits, with few exceptions for several OC pesticide confirmation samples. Field duplicate samples generally met the established control limits except for a number of sample results for parameters, including *E. coli*, turbidity, total suspended solids, and total nitrogen.

Exceptions to QAPP specified data quality criteria and resulting data qualifiers, if applicable, are detailed in the Data Quality Review memorandum (Appendix C) and are presented in the individual Interim Reports.

3.3. Data Quality Summary

In general, data quality criteria for the second round were met with relatively few exceptions. This is detailed in the individual Interim Reports and in the Data Quality Review memorandum (Appendix C).

In Table 7, the percentages of estimated (J flag) values for WY2021–WY2024 results are summarized by parameter (field duplicates are not included in the percentages). In addition to the reasons discussed in the prior subsections, some results (primarily total lead and multiple SVOCs and OC pesticides) were flagged as estimated due to detections below the laboratory's analytical reporting limit. SVOC and OC pesticide parameters are presented in Table 7 as total qualified percentage of all parameters within the respective groups.

Table 7. Percentages of WY2021–WY2024 Data Qualified as Estimated (J) Values.

Parameter	Base Flow % J	Storm Flow % J
Temperature	0	0
pH[a]	0	6
Dissolved Oxygen	0	0
Specific Conductance	0	5
Discharge	26	26
Turbidity	2	1
Total Suspended Solids	0	1
Nitrate+Nitrite Nitrogen	1	2
Total Nitrogen	5	8
Total Phosphorus	0	1
Hardness as CaCO3	1	2
Chloride	0	4
Total Copper	1	1
Total Lead	15	1
Total Zinc	16	6
E. coli Bacteria	3	2
Semivolatile Organic Compounds	3	23
Organochlorine Pesticides	0	24

[a] pH measurements from the water quality meter on 2/7/2023 were rejected due to field meter malfunction. Samples were analyzed for pH at the laboratory outside of holding time. The results were qualified as estimated for holding time exceedance.

4. Results

This section summarizes key results pertaining to water quality criteria, spatial patterns, comparison to other studies, and discussion of individual basin water quality.

4.1. Hydrology

4.1.1. Precipitation

Storm characteristics and monitoring events from the WY2023–WY2024 monitoring period are presented in Table 3. Portland Bureau of Environmental Services (BES) collected rainfall data in 1-hour intervals at the Post Office Rain Gage (Portland BES 2024), which is located approximately 1.5 miles south of station CSE1. During the 14-month project monitoring period from December 27, 2022, to February 29, 2024, the gage recorded 56.9 inches of rain, with a maximum daily precipitation value of 1.63 inches. There was no measurable precipitation recorded from June 20 to August 27, 2023.

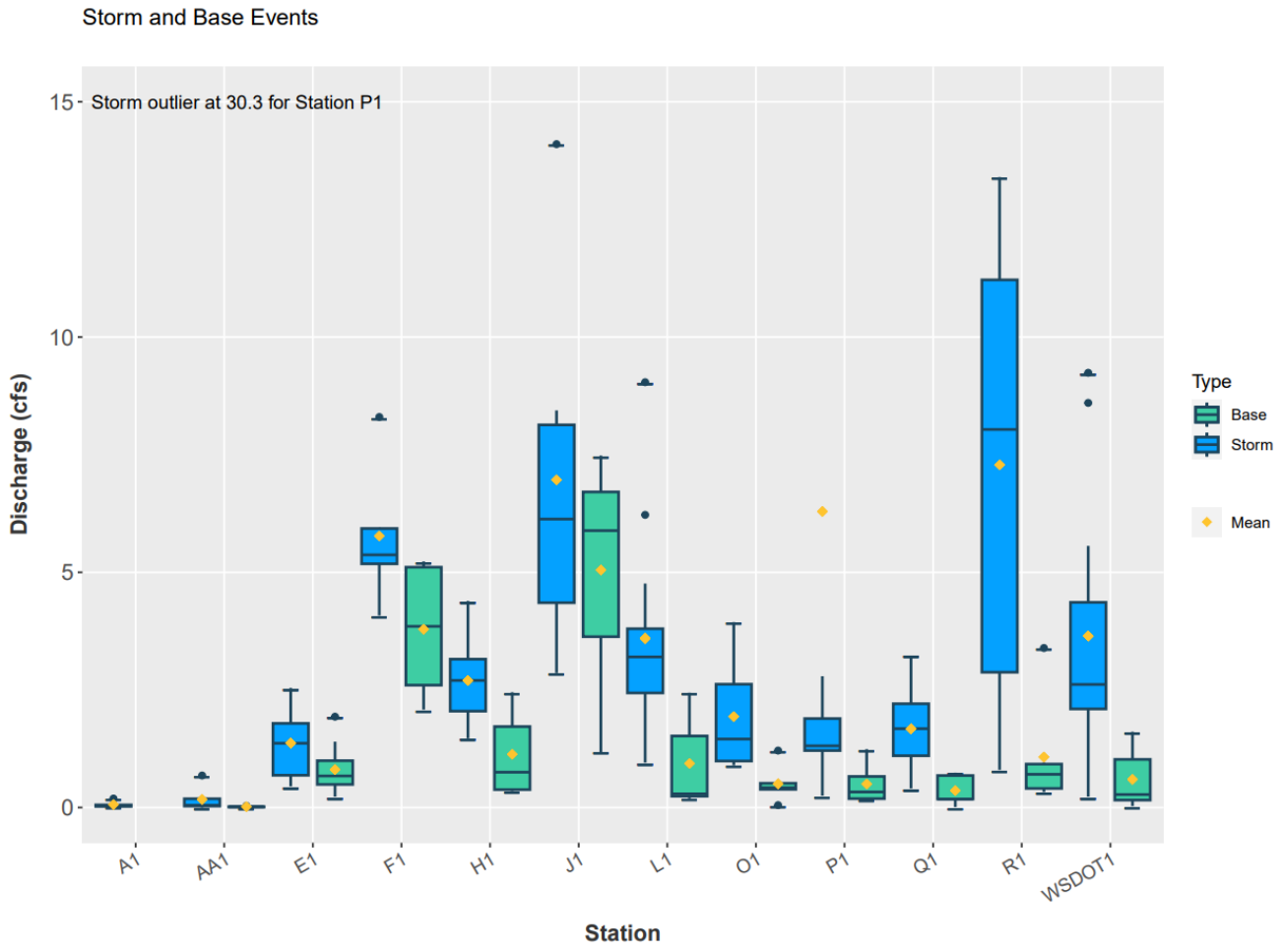
Individual event precipitation ranged from 0.09 to 3.74 inches during the WY2023–WY2024 monitoring period. Storm events sampled on February 7 and April 19, 2023, did not meet the QAPP goal of at least 0.3 inches of precipitation but were sampled when stormwater runoff was occurring and are considered valid storm events. All base flow sampling events were conducted with 0.01 inches or less of precipitation and antecedent dry periods ranging from 1.4 to 36 days.

4.1.2. Stream Discharge

Stream discharge measurements collected at outfall monitoring stations during both monitoring periods are summarized in Figure 3. Key observations for stream discharge include:

- Median discharge rates ranged from 0.01 cfs at station CSAA1 to 5.9 cfs at CSJ1 for base flow, and 0.04 cfs at CSA1 and CSWSDOT2 to 8.04 cfs at CSR1 for storm flow.
- Discharge during storm and base flow events tended to follow a similar spatial pattern, with higher median values at CSF1 and CSJ1; lower median values at CSA1 and CSAA1; and comparable ranges at all other stations. CSR1 was an exception to this pattern with greatest storm flow median discharge rate (8.0 cfs) but comparable base flow values to most other stations.
- For most stations, storm flow discharge was substantially greater (no overlapping interquartile ranges) than base flow. One exception was station CSJ1, which had similar median discharge measurements (6.1 and 5.9 cfs for storm and base flow, respectively), possibly due to flow controls employed by the Biddle Lake fish hatchery just upstream of this station.

Figure 3. Outfall Station Discharge Box Plots.



4.2. Water Quality

In order to assess water quality conditions across the Columbia Slope watershed, data from both monitoring periods spanning from WY2021 through WY2024, are summarized in tables and figures that follow. In this section, water quality results are compared to water quality criteria, spatial patterns among the basins are described, and Columbia Slope water quality is compared to water quality in other Western Washington watersheds. Select statistics and figures are presented in the text, while complete summary statistics are available in Appendix A and complete sets of figures are available in Appendix B.

4.2.1. Water Quality Comparison

4.2.1.1. Conventional and Metal Water Quality Exceedances

Water quality results were compared to project limits established in the QAPP and applicable water quality criteria. Additional water quality comparison values (e.g., Oregon's 1200-z TSS benchmark) are included where noted. The percentage of detected results that exceeded applicable criteria at each station for select inorganic parameters are presented in Table 8. Shading in Table 8 is based on the following percentages of samples exceeding the criterion or comparison value for a given parameter:

- Green: Less than 25 percent
- Yellow: 25 to 50 percent
- Red: Greater than or equal to 50 percent

Exceedances were usually rare, particularly at outfall monitoring stations, with some patterns differentiating storm and base flow results. TSS, water temperature, lead, and pH only exceeded applicable criteria at outfall monitoring stations (during base or storm flow events) on rare occasions (Table 8). Turbidity, copper, and zinc rarely exceeded criteria at any outfall monitoring station during base flow events but exceeded criteria relatively frequently during storm flow events. A full list of metals exceedances can be found in Appendix D. Dissolved oxygen was unique, with a moderate number of exceedances during storm flow events and frequent exceedances during base flow events. WSDOT monitoring stations were only sampled during storm flow events and frequently exceeded turbidity, copper, and zinc criteria.

Total phosphorus and total nitrogen criteria of 0.047 and 0.31 mg/L, respectively, are based on reference conditions in the Willamette Valley using the 25th percentile of all data collected from 1990 to 2000 in the ecoregion (EPA 2001). These criteria are extremely low, relative to typical urban stream concentrations, and represent recommended values rather than actual water quality criteria. Most samples at every monitoring station exceeded these recommended values. CSP1 was the only outfall monitoring station with nutrient concentrations below EPA recommended levels during any type of event.

Table 8. Water Quality Exceedances by Monitoring Station.

Station	n		TSS		Turbidity		Temperature		Copper		Lead		Zinc		DO		pH	
			100 mg/L		10 NTU		17.5°C		Variable[b]		Variable[b]		Variable[b]		>10 mg/L		6.5 to 8.5	
	S[a]	B[a]	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B
CSA1	6	0	-[c]	NS	100%	NS	-	NS	17%	NS	-	NS	50%	NS	-	NS	-	NS
CSAA1	6	6	-	-	83%	33%	-	17%	-	-	-	-	-	-	-	67%	-	-
CSE1	18	12	6%	-	56%	-	-	-	17%	-	-	-	-	-	-	17%	-	-
CSE2	6	0	-	NS	100%	NS	-	NS	17%	NS	-	NS	-	NS	17%	NS	-	NS
CSE3	6	6	-	-	17%	-	-	-	17%	-	-	-	17%	-	33%	50%	-	-
CSF1	6	6	-	-	-	-	-	-	-	-	-	-	-	-	-	17%	-	-
CSH1	12	6	-	-	25%	-	-	-	-	-	-	-	-	-	-	50%	-	-
CSJ1	6	6	-	-	-	-	-	-	-	-	-	-	-	-	17%	17%	-	-
CSL1	12	6	-	-	33%	-	-	-	-	-	-	-	25%	-	17%	67%	-	-
CSO1	18	12	-	-	22%	-	-	-	6%	-	-	-	28%	-	-	42%	-	-
CSP1	18	12	-	-	11%	-	-	-	22%	-	-	-	61%	-	6%	42%	-	-
CSQ1	12	6	-	-	42%	-	-	-	17%	-	-	-	33%	-	-	33%	-	-
CSR1	18	12	6%	-	50%	-	-	-	11%	-	-	-	-	-	-	25%	-	-
CSR2	6	3	-	-	33%	-	-	-	-	-	-	-	17%	-	33%	67%	67%	100%
CSBMP1_IN	6	0	-	NS	-	NS	-	NS	17%	NS	-	NS	100%	NS	-	NS	67%	NS
CSBMP1_OUT	6	0	-	NS	17%	NS	-	NS	-	NS	-	NS	33%	NS	33%	NS	-	NS
CSWSDOT1	12	6	-	-	50%	-	-	-	25%	-	-	-	25%	-	-	17%	-	-
CSWSDOT2	6	0	33%	NS	100%	NS	-	NS	100%	NS	17%	NS	100%	NS	17%	NS	33%	NS
CSWSDOT3	6	0	33%	NS	100%	NS	-	NS	100%	NS	-	NS	67%	NS	-	NS	33%	NS
CSWSDOT4	12	0	-	NS	50%	NS	-	NS	50%	NS	8%	NS	33%	NS	-	NS	8%	NS
CSWSDOT5	6	0	-	NS	83%	NS	-	NS	83%	NS	-	NS	67%	NS	33%	NS	-	NS

Green shading indicates samples exceeded criteria in less than 25 percent of samples.

Yellow shading indicates samples exceeded criteria in at least 25 percent of samples but less than 50 percent of samples.

Red shading indicates samples exceeded criteria in at least 50 percent of samples.

[a] "S" and "B" denote storm and base flow events, respectively.

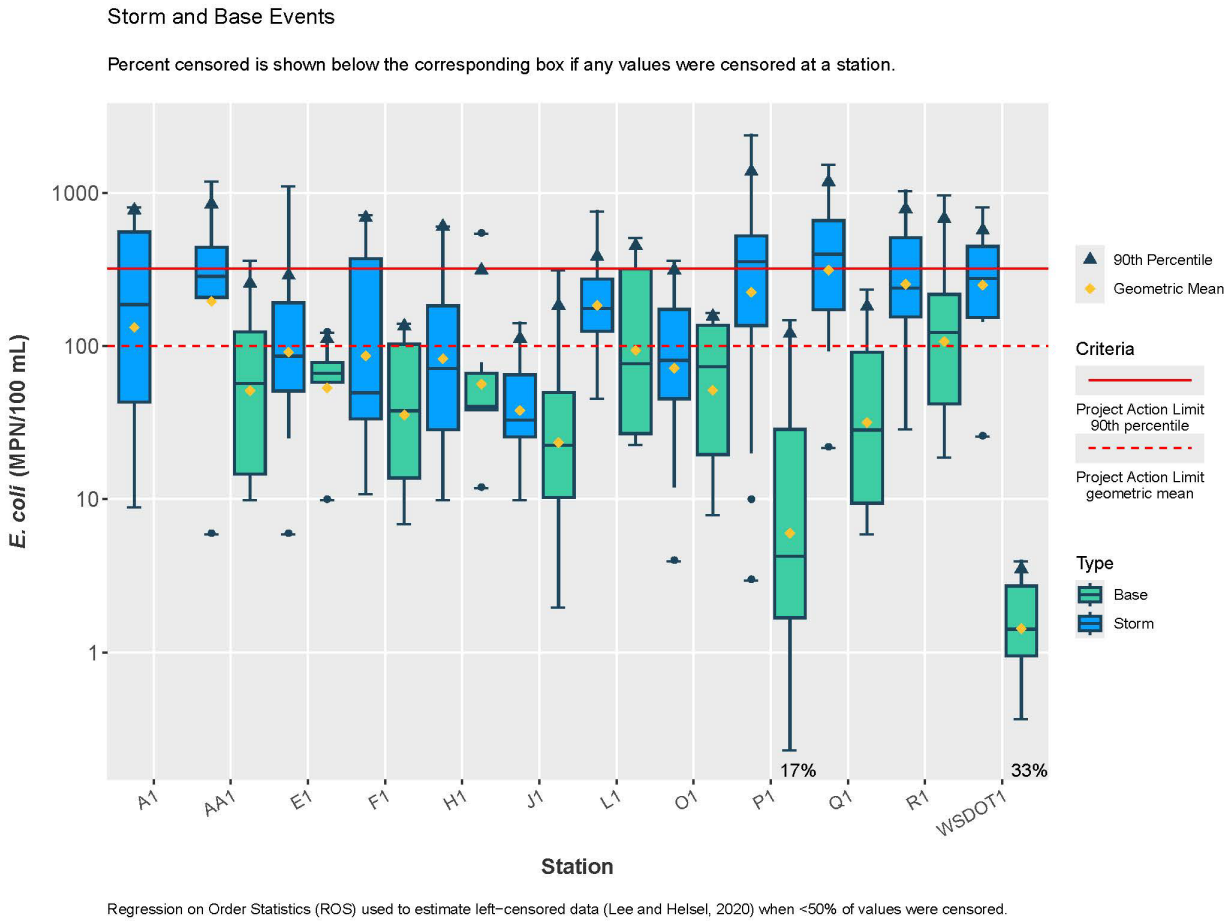
[b] Metals criteria were calculated for each sample collected using hardness values from the same monitoring event.

[c] "-" indicates no exceedances

DO: Dissolved oxygen mg/L: Milligrams per liter NS: Not sampled NTU: Nephelometric turbidity unit TSS: Total suspended solids

Geometric means and 90th percentile concentrations were calculated for *E. coli* results separately for base and storm flow events and compared to applicable water quality criteria for the geomean (100 CFU/100 mL) and 90th percentile (320 CFU/100 mL). During base flow sampling, all monitoring stations were below the applicable criteria except for CSL1 and CSR1 (Figure 4). During storm flow sampling, monitoring stations CSBMP1_OUT, CSE1, CSE2, CSJ1, CSO1, and CSWSDOT4 were all below the applicable criteria whereas all other monitoring stations exceeded at least one criterion. Washington State *E. coli* water quality criteria are based on a 90-day averaging period with at least three measurements per period. The frequency of sampling events over the course of the monitoring periods, particularly during the dry season, did not meet the required sampling frequency to evaluate compliance with state water quality criteria; therefore, these sampling events do not necessarily indicate exceedance of these water quality criteria during part or all of the monitoring periods.

Figure 4. Outfall Monitoring Station *E. Coli* Concentrations.



4.2.1.2. Organics Detections and Exceedances

Samples were analyzed for organic contaminants, including SVOCs and OC pesticides, during at least six storm flow events at each outfall, WSDOT, and upstream monitoring station. Samples were also analyzed for organics during two base flow events at monitoring stations CSAA1, CSE1, and CSE3. Multiple individual organics were detected across the project area at varying frequencies and locations and are summarized in Tables 9 and 10. A table detailing all SVOC and OC pesticide project limit exceedances is available in Appendix D. In general, SVOC and OC pesticide concentrations were not of concern throughout the project area; a few exceptions include the following:

- Organic contaminant concentrations exceeding water quality criteria at all WSDOT monitoring stations
- Frequent dieldrin detection and exceedances at CSWSDOT4 and CSE1
- Widespread low-level phthalate detections across the project area
- Infrequent detection of low-level OC pesticides across the project area

Table 9. Detected Organic Compounds During Base Flows Events.

Date	Parameter(s) Detected[a]	Stations
10/18/2023	Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Chrysene, Fluoranthene, Indeno(1,2,3-cd)pyrene	CSAA1
	Di-n-butyl Phthalate	CSAA1, CSE1, CSE3
	Diethyl Phthalate	CSE1
11/28/2023	Bis(2-ethylhexyl) Phthalate	CSE1, CSE3

[a] All parameters were detected below the reporting limit.

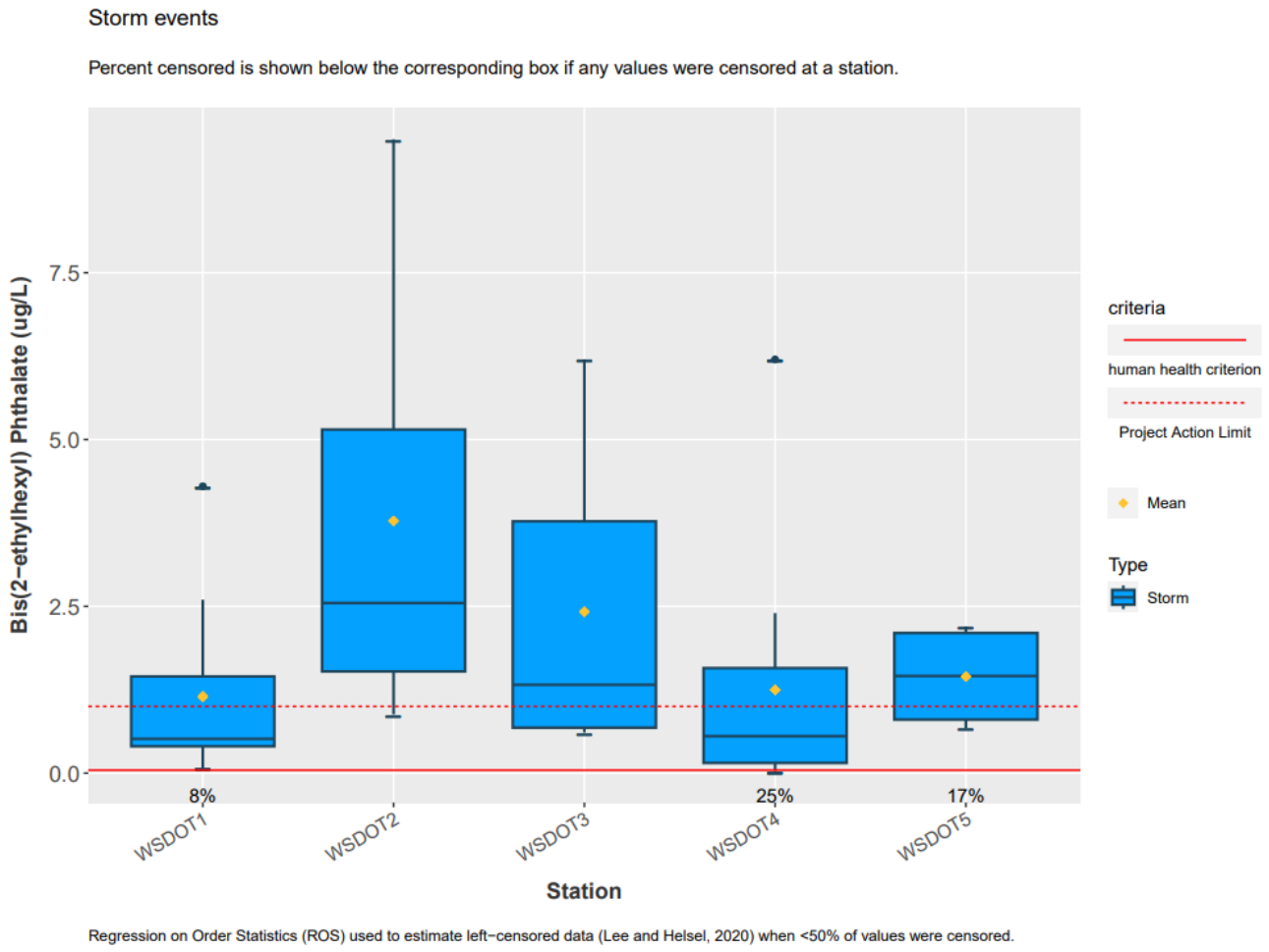
Several organic contaminants were frequently detected at concentrations above water quality criteria or project limits, including BEHP, dieldrin, and 4,4'-DDE (Table 10). Multiple other individual PAHs, phthalates, and OC pesticides were infrequently detected at concentrations exceeding water quality criteria or project limits. The laboratory reporting limits for several organic parameters were greater than relevant water quality criteria, so certain low-level exceedances may not have been detected due to analytical constraints in this study. Observations pertaining to total PAH concentrations or individual PAH detections and exceedances include the following:

- Individual PAHs were detected on at least one occasion at every monitoring station except for upstream station CSE3 and outfall stations CSF1, CSJ1, CSL1, and CSO1. Individual PAHs were detected in over half of the samples collected at CSA1, CSAA1, CSWSDOT1, CSWSDOT2, and CSWSDOT3 (Table 10).
- Total PAH concentrations were higher at WSDOT monitoring stations than most other stations, with medians ranging from 0.1 to 0.2 micrograms per liter (µg/L). However, total PAH concentrations were highest at outfall stations CSA1 and CSAA1, with medians ranging from 0.7 to 0.8 µg/L.
- Individual PAH exceedances, including benzo(b)fluoranthene and benz(a)anthracene, were usually observed at outfall monitoring station CSAA1.

Six individual phthalates, including BEHP, butyl benzyl phthalate, and di-n-butyl phthalate, were analyzed during this study. The following observations pertain to phthalate detections and exceedances:

- BEHP and di-n-butyl phthalate were detected on at least one occasion at every monitoring station. Di-n-butyl phthalate was the most widespread organic contaminant, with detections in every storm flow sample collected at CSAA1, CSF1, CSH1, CSL1, CSO1, CSP1, CSQ1, CSR1, CSR2, CSWSDOT1, and CSWSDOT5. These detections, however, were usually at low levels, with median concentrations at all stations ranging from 0.04 to 0.18 µg/L. These detections never exceeded the project action limit of 8 µg/L. BEHP detections were less frequent but greater in magnitude, with median concentrations ranging from 0.25 to 0.53 µg/L at outfall stations and from 0.56 to 2.6 µg/L at WSDOT stations.
- BEHP exceeded the project limit of 1 µg/L on one occasion at outfall monitoring stations CSAA1 (2 µg/L), CSH1 (21 µg/L), CSL1 (1.7 µg/L), and CSQ1 (2.4 µg/L) and on three occasions at CSWSDOT1 (2.5 to 4.3 µg/L). WSDOT monitoring stations exhibited higher BEHP concentrations, with exceedances at all stations and median concentrations above the project limit at CWSDOT2 (2.6 µg/L), CSWSDOT3 (1.3 µg/L), and CSWSDOT5 (1.5 µg/L) (Figure 5).
- Several low-level exceedances of the butyl benzyl phthalate project limit were detected at monitoring stations CSAA1, CSH1, CSWSDOT1, and CSWSDOT5.

Figure 5. WSDOT Station Bis(2-ethylhexyl) Phthalate Concentrations.



The suite of OC pesticides analyzed in this study includes six DDx isomers and 28 other OC pesticides, including aldrin, dieldrin, endrin, chlordane, benzene hexachlorides (BHC), mirex, toxaphene, and chlorpyrifos. Observations pertaining to OC pesticide detections and exceedances include the following:

- DDx isomers were detected on at least one occasion at all WSDOT stations and at CSE1, CSF1, CSJ1, CSO1, CSP1, CSR1, CSR2, and CSWSDOT1. These OC pesticides were detected most frequently at CSP1 (50 percent of samples) and CSWSDOT1 (42 percent of samples).
- 4,4′-DDE slightly exceeded the chronic freshwater aquatic life criterion of 1 nanogram per liter (ng/L) on at least one occasion at all WSDOT stations and at CSR1 and CSR2, with the maximum concentration of 2 ng/L detected at CSWSDOT3. 2,4′-DDD exceeded the chronic freshwater aquatic life criterion of 1 ng/L twice at CSWSDOT1 (1.1 and 1.9 ng/L) and once at CSP1 (1.6 ng/L). 4,4′-DDD and 4,4′-DDT exceeded the chronic freshwater aquatic life criterion of 1 ng/L once at CSWSDOT1 (1.5 and 2.5 ng/L, respectively).
- Dieldrin was infrequently detected at most monitoring stations but was detected in all 12 samples collected at CSWSDOT4, which represents untreated SR-14 runoff in Basin B (Table 10). The concentration of infrequent dieldrin detections in most samples were generally less than 3 ng/L but ranged from 4 to 12 ng/L, with a median of 6.9 ng/L, at CSWSDOT4. Dieldrin detections were less common but exceeded the chronic freshwater aquatic life criterion of 1.9 ng/L once at CSAA1 (2 ng/L), five times at CSE1 (2 to 2.8 ng/L), and 12 times at CSWSDOT4 (4 to 12 ng/L). These exceedances all occurred during storm flow monitoring events, which are generally more comparable to the acute criterion (which was not exceeded on any occasion). However, exceedances in every sample collected at CSWSDOT4 indicate that there may be a chronic source of dieldrin in the basin.
- Other OC pesticides, including chlorpyrifos, endrin, heptachlor, hexachlorobenzene, hexachlorobutadiene, and BHC, were detected less frequently throughout the project area. These detections were most common at WSDOT stations and outfall monitoring stations CSE1, CSF1, CSO1, CSP1, and CSWSDOT1.
- Other OC pesticides, including alpha-BHC, beta-BHC, heptachlor, and hexachlorobenzene, occasionally exceeded relevant criteria but did not exhibit any distinct patterns except that these infrequent exceedances were slightly more common at WSDOT monitoring stations.

Table 10. Select Organic Parameter Detections by Monitoring Station.

Station	n	Total PAHs	Phthalates		Other SVOCs		Organochlorine Pesticides						
			BEHP	Di-n-butyl Phthalate	Benzyl Alcohol	Phenol	DDx	Chlorpyrifos	Dieldrin	Endrin	Hexachloro-butadiene	Alpha-BHC	Delta-BHC
Base Flow Events													
CSAA1	2	50%	-	50%	-	-	-	-	-	-	-	-	-
CSE1	2	-	50%	50%	-	-	-	-	-	-	-	-	-
CSE3	2	-	50%	50%	-	-	-	-	-	-	-	-	-
Storm Flow Events													
CSA1	6	100%	50%	33%	17%	17%	-	33%	33%	-	-	-	-
CSAA1	6	100%	83%	100%	-	-	-	17%	17%	-	17%	-	-
CSE1	12	50%	25%	75%	42%	-	8%	25%	50%	8%	8%	25%	8%
CSE2	6	17%	17%	33%	-	-	-	-	-	-	-	-	-
CSE3	6	-	67%	67%	17%	-	-	-	-	-	17%	-	17%
CSF1	6	-	17%	100%	50%	-	17%	33%	17%	17%	17%	17%	17%
CSH1	6	17%	83%	100%	-	-	-	-	-	-	17%	-	-
CSJ1	6	-	17%	67%	-	-	33%	33%	17%	17%	17%	33%	33%
CSL1	6	-	83%	100%	-	17%	-	17%	-	-	17%	-	-
CSO1	6	-	50%	100%	100%	-	17%	33%	17%	17%	17%	33%	-
CSP1	6	17%	33%	100%	17%	-	50%	83%	17%	33%	-	17%	-
CSQ1	6	17%	83%	100%	-	17%	-	17%	-	-	17%	-	-
CSR1	6	17%	50%	100%	100%	-	17%	-	-	33%	17%	33%	33%
CSR2	6	17%	33%	100%	100%	-	33%	17%	17%	17%	17%	33%	17%
CSWSDOT1	12	58%	92%	100%	17%	25%	42%	50%	8%	8%	17%	17%	17%
CSWSDOT2	6	100%	100%	67%	67%	50%	33%	33%	-	-	-	17%	-
CSWSDOT3	6	83%	100%	67%	67%	50%	17%	50%	17%	-	17%	17%	33%
CSWSDOT4	12	33%	75%	50%	8%	42%	17%	8%	100%	-	8%	-	-
CSWSDOT5	6	50%	83%	100%	17%	67%	17%	17%	-	-	-	-	-

BEHP: Bis(2-ethylhexyl) phthalate

BHC: Benzene hexachloride

DDx: Sum of the individual detections of DDD (dichlorodiphenyldichloroethane), DDT (dichlorodiphenyltrichloroethane), and DDE (dichlorodiphenyldichloroethylene) isomers.

PAH: Polycyclic aromatic hydrocarbons

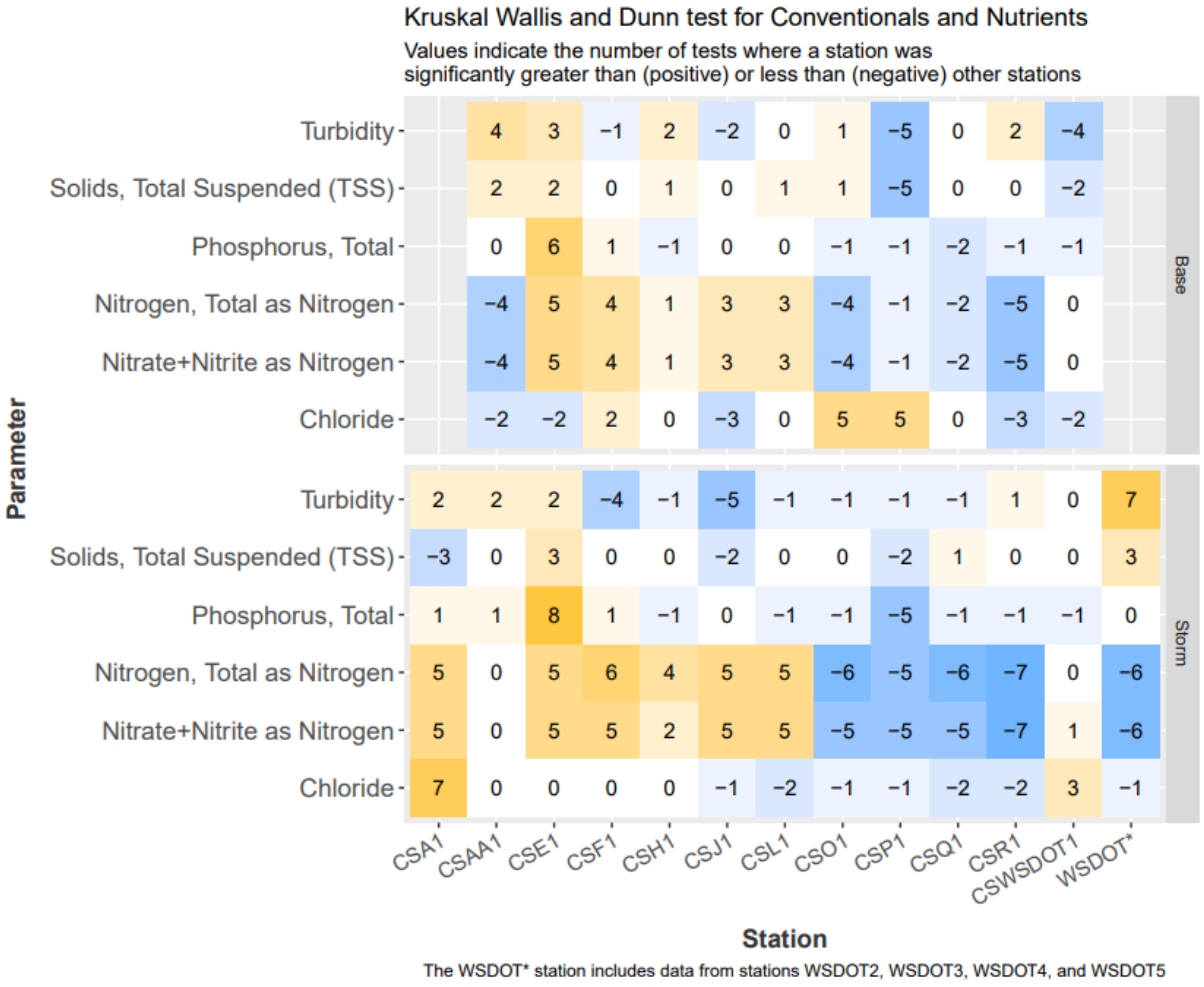
SVOC: Semivolatile organic compounds

4.2.2. Spatial Differences

4.2.2.1. Heatmaps

The Kruskal-Wallis heatmaps (Figures 6, 8, and 10) show statistically significant differences among outfall stations. Negative numbers and the color blue indicate significantly lower concentrations relative to other stations, while positive numbers and the color orange indicate significantly higher concentrations relative to other stations.

Figure 6. Kruskal-Wallis Heatmap for Conventionals and Nutrients.



Turbidity and TSS at outfall monitoring stations CSP1 and CSWSDOT1 were significantly lower than several other monitoring stations during base flow sampling events but exhibited more typical concentrations relative to other stations during storm flow sampling events (Figure 6). These two drainage systems are similar in that they are primarily conveyed by pipes and feature large arterial or highway components. During base flow, these systems are mainly fed through groundwater intrusion into the stormwater system, which likely contributes to the low turbidity. Outfall stations CSF1 and CSJ1 exhibited significantly lower turbidity than several other stations during storm flow events; both are larger open-channel streams. CSR1 represents a similar natural open-channel stream (Fisher Creek) but did not have a significantly lower turbidity like CSF1 and CSJ1.

Total phosphorus concentrations had minimal statistically significant differences between stations except for (1) CSE1, which was significantly greater than several stations during base and storm flow events and (2) CSP1, which was significantly lower than several stations during storm flow events only. Nitrogen concentrations, however, exhibited a clear pattern for both base and storm flow events, with significantly higher concentrations in outfall stations in the western portion of the project area and significantly lower concentrations in the eastern portion (except for CSAA1, which is located in the western portion of the project area). This pattern was more pronounced during storm flow events where stations CSA1, CSE1, CSF1, CSJ1, and CSL1 all had significantly greater concentrations than at least five other stations. Median total nitrogen concentrations were lower during storm flow at most outfall monitoring stations, indicating that groundwater may be the primary source of nitrogen in the project area (Figure 7). Chloride concentrations at CSO1 and CSP1 were significantly greater than at five other stations during base flow events but were not significantly different from most stations during storm flow events. Storm flow chloride concentrations were significantly higher at CSA1 than at several stations and had the highest median concentration among outfall stations.

Figure 7. Outfall Monitoring Station Total Nitrogen Concentrations.

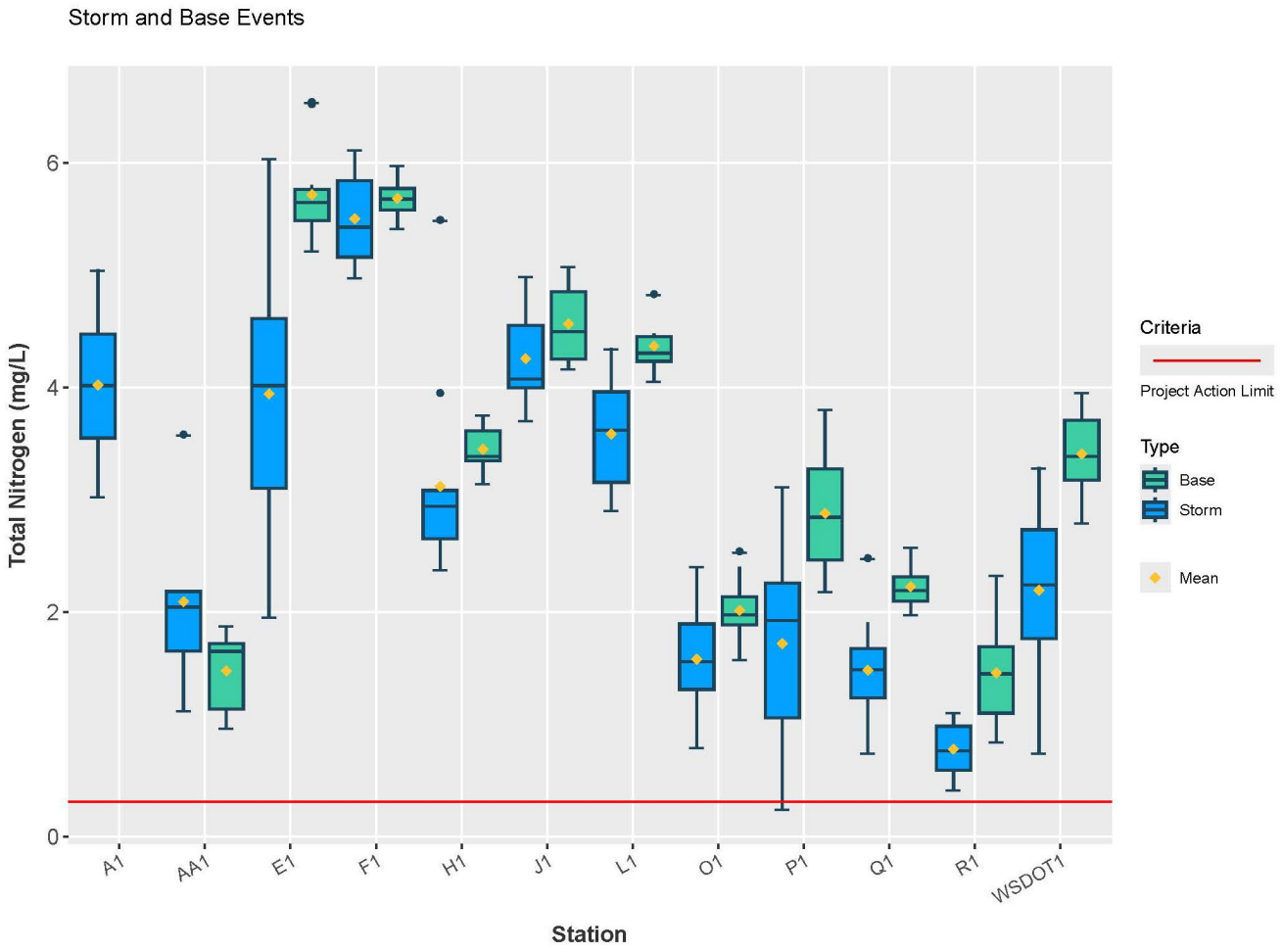
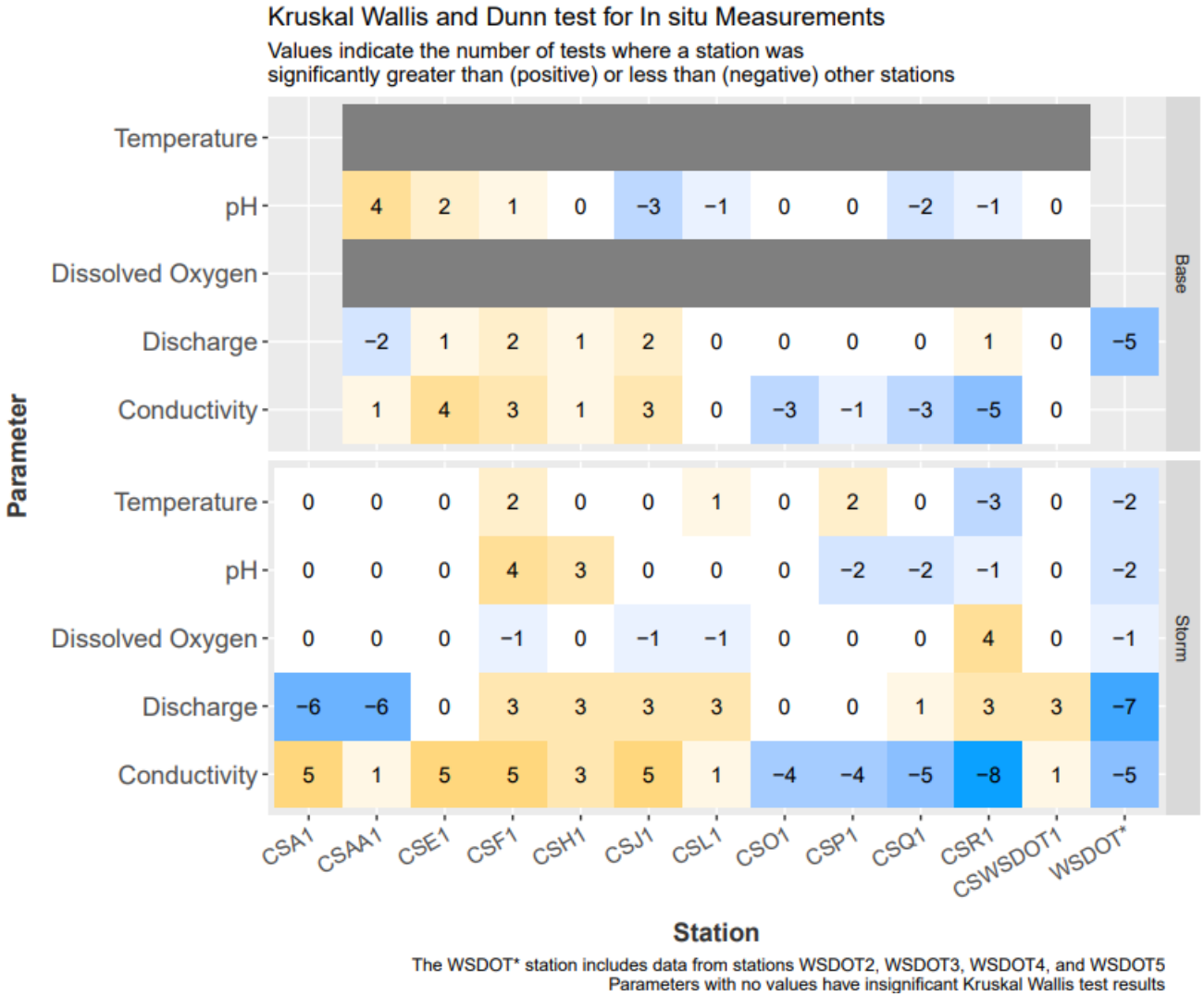


Figure 8. Kruskal-Wallis Heatmap for *In Situ* Measurements.



No significant differences were identified in base flow water temperature and dissolved oxygen as denoted by the gray rows in Figure 8. Storm flow water temperature and dissolved oxygen had minimal differences between stations with CSR1 exhibiting significantly lower water temperature and higher dissolved oxygen than several other stations. CSR1 was generally sampled in the morning, which may have resulted in colder air and water temperatures and higher dissolved oxygen concentrations.

Base flow pH measurements exhibited some significant differences with significantly higher readings at CSAA1 than at four other stations and significantly lower readings at CSJ1 than at three other stations. At most outfall stations, storm flow pH was substantially lower than base flow, with some exceptions. These exceptions include CSF1 and CSJ1, where base and storm flow pH were comparable (Figure 9). From base to storm flow, these stations plus CSH1 all saw their respective Kruskal-Wallis numbers increase by three. Conductivity followed a similar pattern in base and storm flow events, with generally higher Kruskal-Wallis numbers at outfall stations in the west and lower numbers in the east. Storm flow conductivity at CSR1 was significantly lower than at eight other stations and had the lowest median conductivity at 76.1 microsiemens per centimeter.

Discharge measurements followed a predictable pattern based on the relative sizes of the station's contributing areas. CSA1, CSAA1, and WSDOT stations exhibited significantly lower discharge than several other stations, particularly during storm flow events. During base flow events, monitoring stations CSF1 and CSJ1 were both significantly higher than two other stations and had the highest median discharge rates of 5.4 and 6.1 cfs, respectively. During storm flow, monitoring stations CSF1, CSH1, CSJ1, CSL1, CSR1, and CSWSDOT1 all had a positive Kruskal-Wallis number of three (Figure 8), with the highest median discharge at CSF1, CSJ1, and CSR1 (Figure 3).

Figure 9. Outfall Monitoring Station pH Measurements.

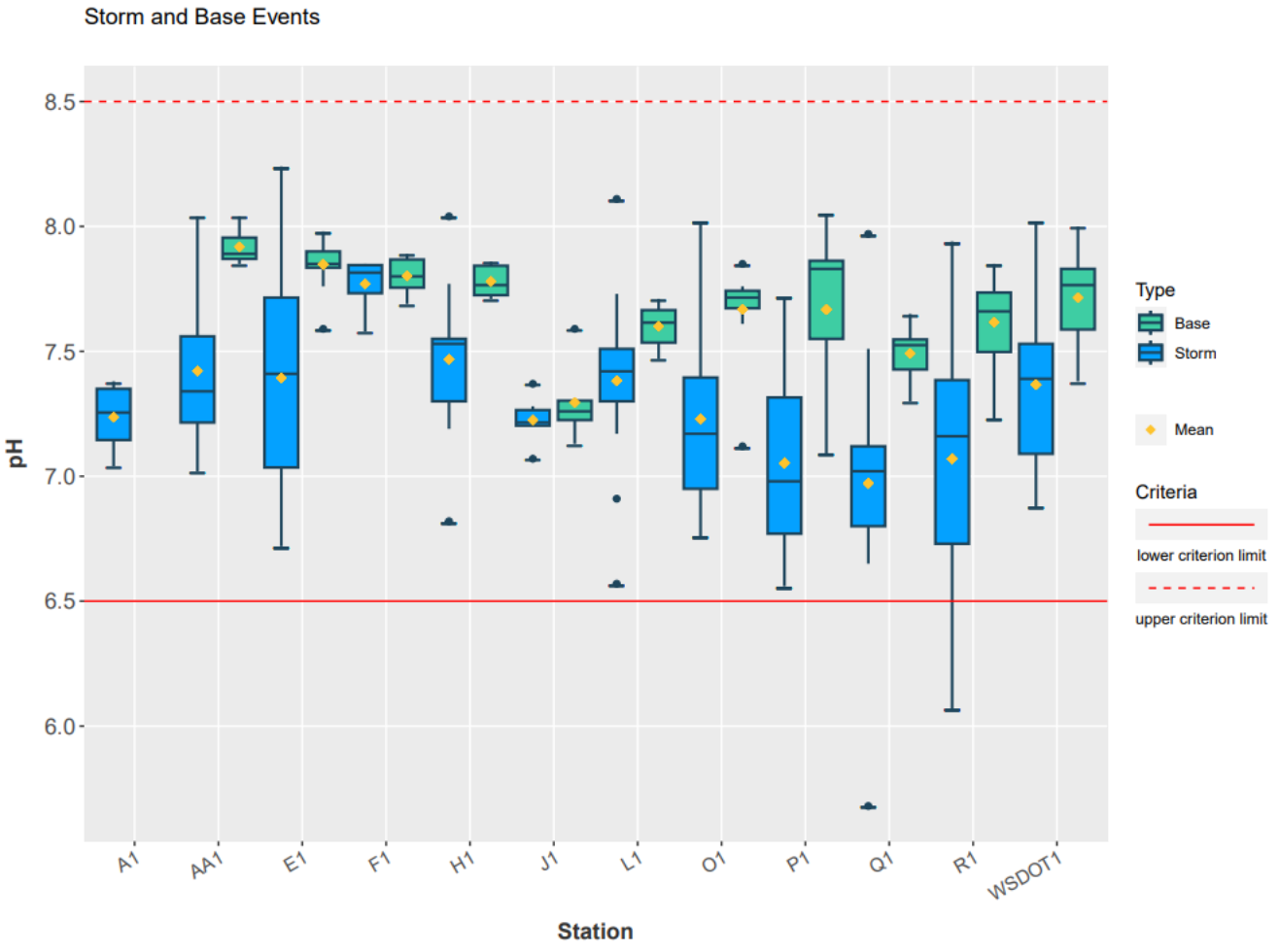
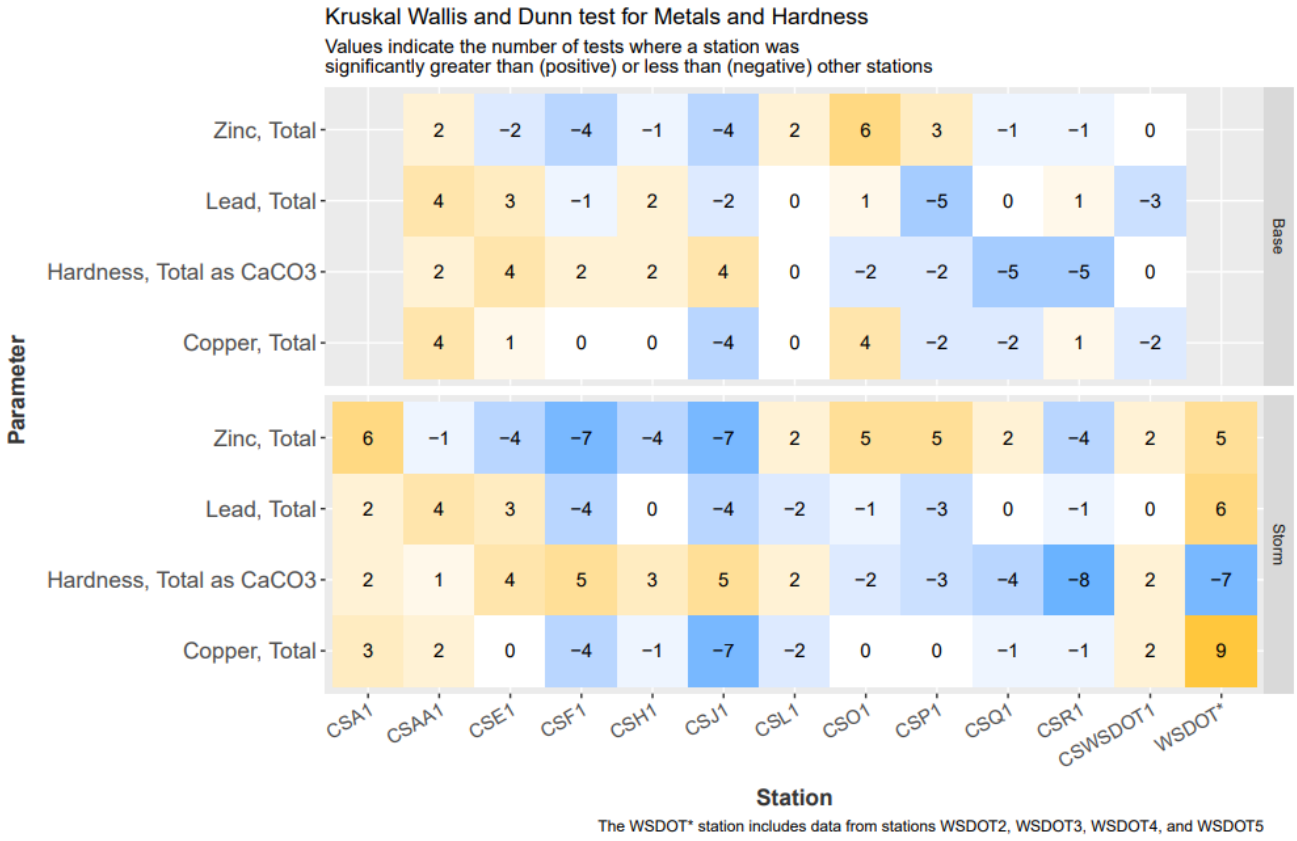


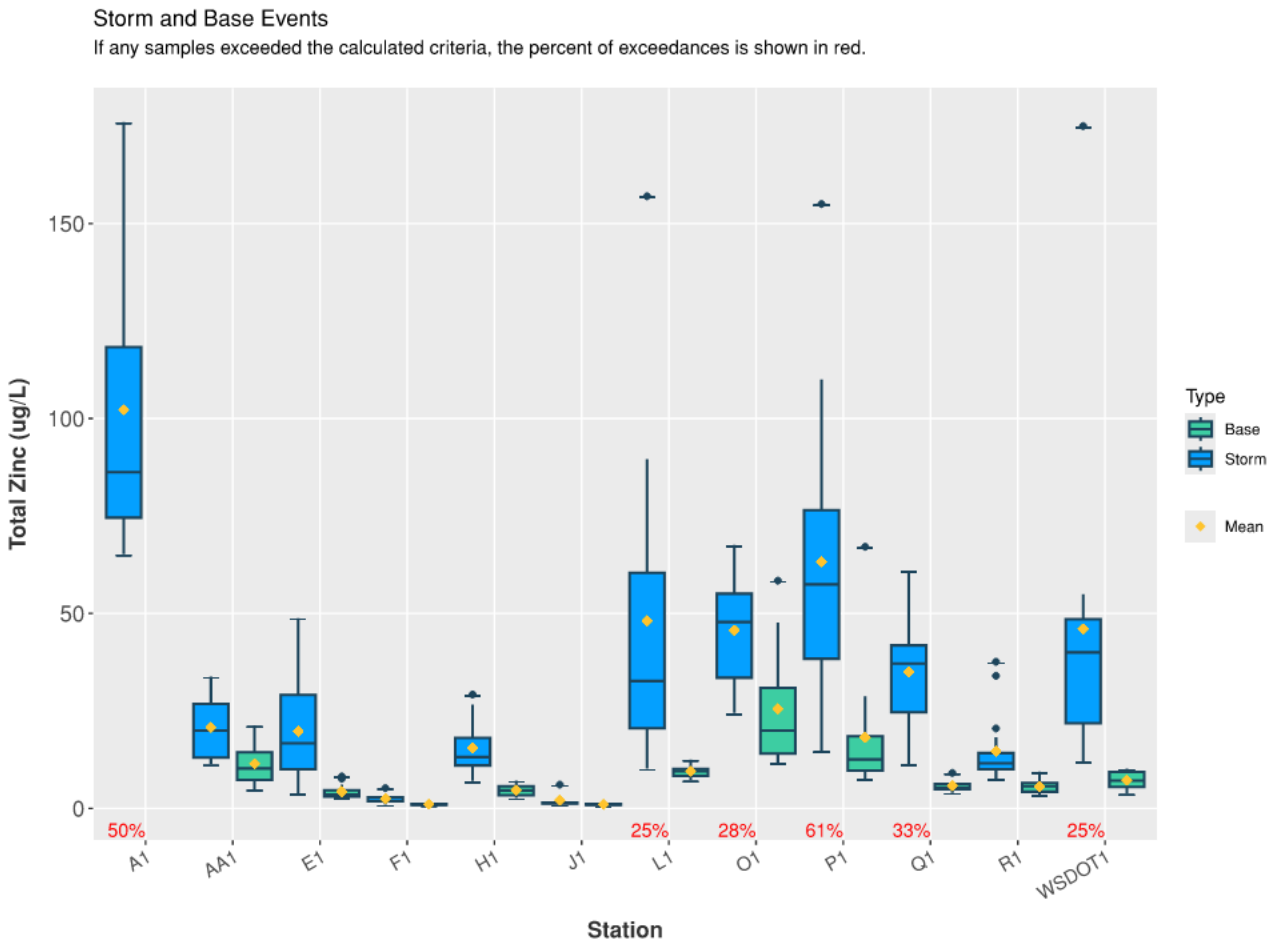
Figure 10. Kruskal-Wallis Heatmap for Metals and Hardness.



Hardness, which is used to calculate toxicity of metals, followed a similar pattern during storm and base flow events, with positive Kruskal-Wallis numbers in the western portion of the project area and negative Kruskal-Wallis numbers in the east and at WSDOT stations (Figure 10). This pattern was slightly more pronounced with larger Kruskal-Wallis numbers, which were both positive and negative, during storm flow events.

Outfall monitoring stations CSF1 and CSJ1 exhibited Kruskal-Wallis values of zero or lower for all metals during storm and base flow. WSDOT monitoring stations had significantly greater metals concentrations than other stations with Kruskal-Wallis values ranging from five for total zinc to nine for total copper. CSA1 had the highest storm flow median zinc concentration at 86.2 µg/L and was significantly higher than other stations. Base and storm flow total zinc and base flow total copper concentrations at CSO1 were significantly higher than several other stations with Kruskal-Wallis values ranging from four to six. Base and storm flow median total zinc concentrations (20 and 47.8 µg/L, respectively) at CSO1 were the highest and second highest, respectively, of any outfall monitoring station (Figure 11).

Figure 11. Outfall Monitoring Station Total Zinc Concentrations.



4.2.2.2. Basin Summaries

Basin A

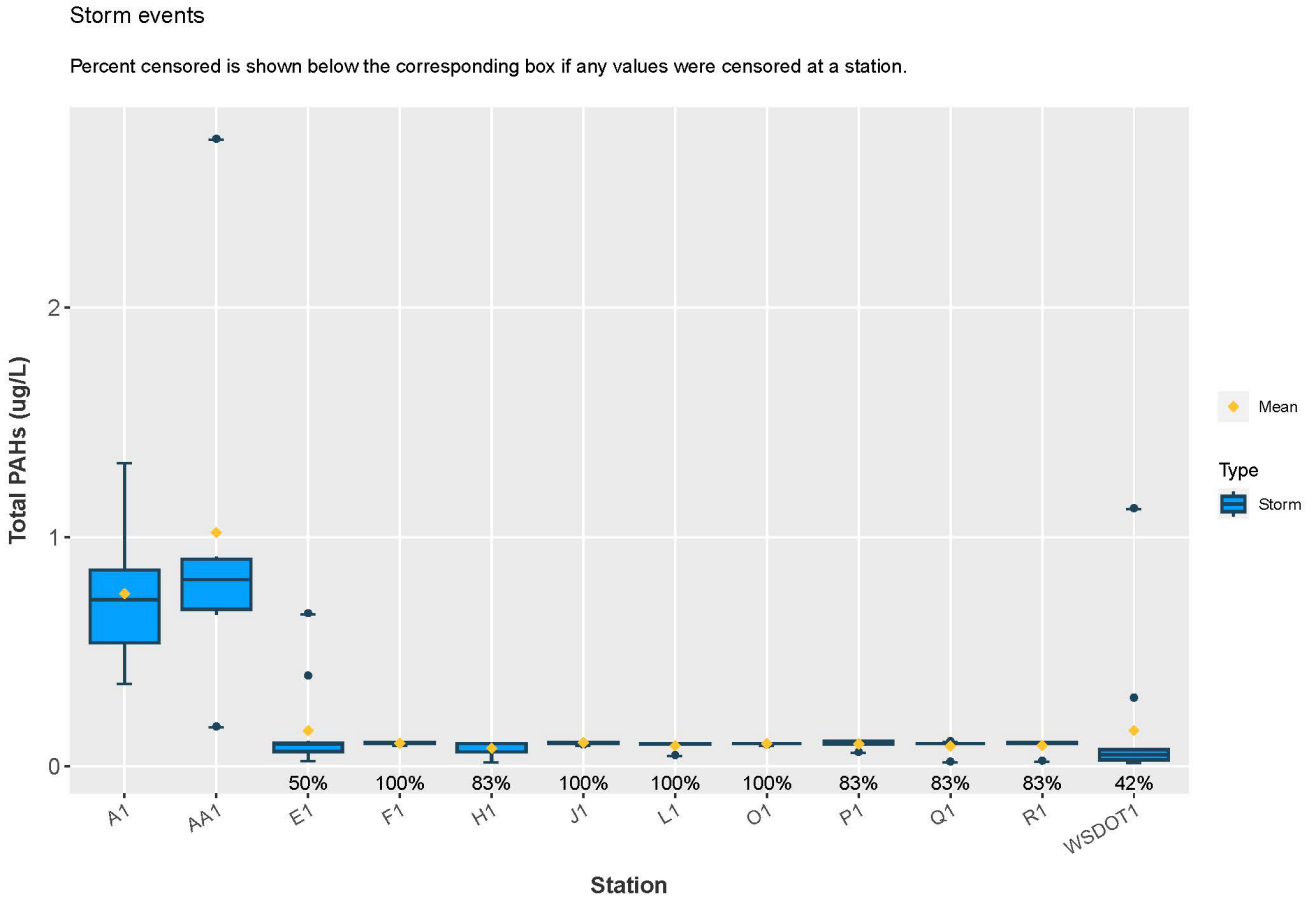
Outfall monitoring station CSA1 – 11/6/23

Monitoring station CSA1 is an outfall located in Wintler Park, just west of the parking lot, which discharges into a vegetated area prior to draining to the Columbia River. The contributing area to CSA1 is approximately 130 acres of primarily residential land use (95 percent), with a little less than half impervious area (44 percent). This area includes SR-14 and the railroad right-of-way. The upper portion of the basin is primarily managed by drywells, with stormwater pipes and channels conveying runoff from the middle and lower portions of the basin to the river. There is no mapped stormwater treatment infrastructure (such as swales, bioretention, ponds, filter vaults or water quality manholes). Septic systems are present north of SR-14 in the middle portion of the basin. There are no mapped springs. The Retrofit Study identified a potential project that would treat highway and residential areas in this basin.

Monitoring at this station was conducted during only six storm events. This station always met criteria for temperature, pH, and dissolved oxygen. Flow measurements during monitoring events were very low compared to most other monitoring stations. Likely related to the low flow rates, TSS tended to be low, with a maximum of 4.3 mg/L. However, the turbidity project limit of 10 NTU was exceeded in all samples at this station, with a median of 12.6 NTU. Median chloride concentration at CSA1 (16 mg/L) was the highest of all outfall stations and was significantly higher than at all outfall monitoring stations in the eastern portion of the project area. Total phosphorus, total nitrogen, and nitrate+nitrite nitrogen concentrations were elevated at this site, which is consistent with the spatial trend of elevated nutrients in western basins. Both the geometric mean and 90th percentile of *E. coli* concentrations at CSA1 exceeded criteria (Figure 4). Although CSA1 had the highest median zinc concentration of outfall stations at 86.2 µg/L (Figure 11), zinc only exceeded the acute criterion during three of six storm events (due to the high hardness at this station). Copper and lead concentrations were also elevated but were comparable to other stations with elevated metals. CSA1 did not have any lead criterion exceedances and had one acute copper criterion exceedance.

PAHs for every event were detected at this station, and it has the second highest median concentration of total PAHs (0.75 µg/L; Figure 12). The PAHs benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, and pyrene were detected in every sample, while anthracene benzo(k)fluoranthene, and indeno(1,2,3-cd) pyrene were detected in 50 percent or more of samples. The only PAH that exceeded criteria was benzo(b)fluoranthene. Other SVOCs and OC pesticides were not frequently detected at this station. Most were undetected, and the few that were detected were in less than 50 percent of samples. DDx isomers were undetected in all samples.

Figure 12. Outfall Monitoring Station Total Polycyclic Aromatic Hydrocarbons Concentrations.



Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

Half the reporting limit was used for censored data when >50% of values were censored.

Basin AA

Monitoring station CSAA1 is also located in Wintler Park southeast of the parking lot, at an outfall that discharges to the Columbia River. The approximately 14 acre contributing area draining to CSAA1 includes almost entirely residential land use (99 percent), city streets including Southeast Riverside Drive, and railroad right-of-way. The basin is unique because it is small relative to the other monitored basins, had relatively low flow measurements, has no mapped septic systems or drywells, and discharges to a high use recreational area. There are no mapped springs within the basin extents. A potential retrofit project has been identified at this location under the Retrofit Study.

Outfall monitoring station CSAA1

Monitoring occurred during six storm flow events and six base flow events at CSAA1. SVOC analysis was added for the two final base flow events, due to frequent detections during storm events (particularly of PAHs). Of any station, CSAA1 had the greatest storm event median for total PAHs (Figure 12). One phthalate (di-n-butyl phthalate) and eight PAHs were detected below the reporting limit during the October 2023 base flow event at CSAA1. Total PAH for this event was less than one half the station's total PAH storm event median (0.3 versus 0.8 µg/L, respectively). No PAHs were detected for the November 2023 base flow event. While sample size is limited for base flow for these parameters, the results indicate that stormwater is the primary source of SVOCs at this location. The relatively high concentrations at this site are likely influenced by direct inputs from Southeast Riverside Drive and the railroad tracks in a small basin with relatively little dilution from base flow.

Water quality criteria were never exceeded for pH or metals at this station. Most water quality criteria were met for storm events with the exception of *E. coli* (exceedance of 90th percentile threshold), turbidity, benz(a)anthracene, benzo(b)fluoranthene, chrysene, BEHP, and butyl benzyl phthalate. For base flow events, median dissolved oxygen fell below the 10 mg/L criteria on occasion, and there were occasional exceedances for temperature and turbidity. Total phosphorus was elevated at this site, which is consistent with the spatial pattern of elevated nutrients in western basins. However, unlike other western stations, CSAA1 had lower total nitrogen and nitrate+nitrite nitrogen than other outfall stations. This is likely due to the lack of mapped springs and nitrate-contaminated groundwater influence (Figure 7).

Basin E

Outfall monitoring station CSE1 is located along Southeast Evergreen Highway near the Jane Weber Evergreen Arboretum. The contributing area to CSE1 is approximately 143 acres of primarily residential land use (99 percent) with 37 percent impervious area. This area includes the SR-14 right-of-way. The upper portion of the basin is primarily managed by drywells, with stormwater pipes and channels conveying runoff from the middle and lower portions of the basin to the river. There is no mapped stormwater treatment infrastructure (such as swales, bioretention, ponds, filter vaults or water quality manholes). There is a high density of septic systems north of SR-14 in the upper portion of the basin. Several springs are located north of SR-14 in Basin E and neighboring Basin F.

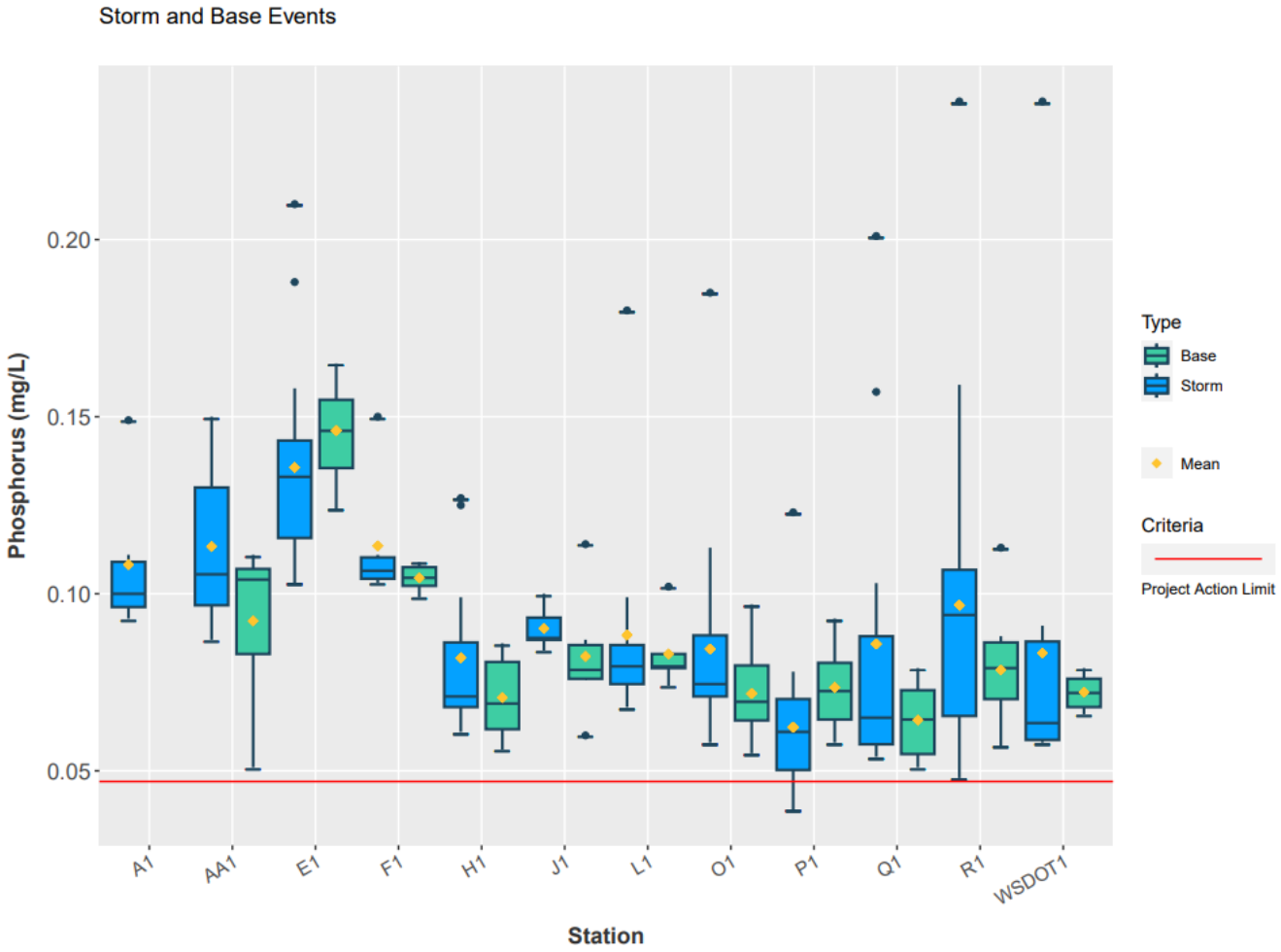
Monitoring stations CSE1 and CSE2 – 1/9/2024 (above).
Monitoring station CSE3 – 9/7/2023 (below).

Upstream monitoring station CSE2 is located immediately adjacent and to the west of CSE1 and has a completely residential 16-acre contributing area. Upstream monitoring station CSE3 is located north of SR-14 closer to the springs and has the highest density of septic systems of any station (0.7 per acre). Monitoring was conducted during 12 base flow and 18 storm flow events at CSE1, 6 storm flow events at CSE2, and 6 base flow and 6 storm flow events at CSE3. Flow at CSE1 during monitoring events was comparable to flow at most other outfall monitoring stations, with minimal flow only observed at CSE2 during storm flow events and relatively low flow at CSE3 during base and storm flow events.

All Basin E stations met criteria for temperature and pH. CSE1 met the dissolved oxygen criterion for all storm flow events, and CSE1 and CSE3 met the dissolved oxygen criterion for most base flow events. All Basin E stations met *E. coli* criteria for both storm and base flow, except for CSE3 during storm flow events. CSE1 and CSE2 median storm flow turbidity (11.4 and 14.9 NTU) exceeded the project limit, while CSE3 median storm flow turbidity (3.6 NTU) was below the project limit.

Total phosphorus and nitrogen were elevated at CSE1, relative to other outfalls, which is consistent with the spatial pattern of elevated nutrients in western basins (Figure 13). CSE1 had the highest median storm flow and base flow nitrogen (driven by nitrate+nitrite concentrations; Figure 7) and phosphorus of all outfall stations. CSE3 storm concentrations were comparable to CSE1, whereas CSE2 median storm flow total phosphorus was substantially lower than CSE1, with a median of 0.09 mg/L. Likely sources contributing to elevated nutrients are septic systems, lawn fertilizers, and domesticated animal waste.

Figure 13. Outfall Monitoring Station Total Phosphorus Concentrations.



CSE1 had lower zinc concentrations and higher lead concentrations than other outfall stations. Relatively high hardness at this station lowered its metals toxicity. CSE1 exceeded copper criteria for three of 18 storm events (17 percent). CSE2 and CSE3 each exceeded copper criteria once in six storm events (17 percent). The CSE2 copper exceedance coincided with a CSE1 exceedance, while the CSE3 copper exceedance did not coincide with exceedances at either of the other stations. CSE3 exceeded zinc criteria once. No CSE stations had any lead exceedances. CSE2 had highest median storm flow metals of CSE stations, particularly copper (4.85 µg/L) and lead (1.19 µg/L).

PAHs were detected at CSE1 for 6 of 12 storm events and at CSE2 for one of 6 storms. PAHs were not detected in any of the six storms at CSE3. DDx and cPAHs were undetected at CSE2 and CSE3, while both were detected at CSE1 in two of 12 storm events. There were no SVOC or OC pesticide exceedances, with the exception of one storm exceedance of n-nitrosodi-n-propylamine at CSE1. SVOCs were sampled at CSE1 and CSE3 for two base flow events. During one event, di-n-butyl-phthalate was detected at both stations, and diethyl phthalate was detected at CSE1. During the next base flow event, BEHP was detected at both stations. There were no base flow SVOC exceedances.

Basin F

Outfall monitoring station CSF1 – 12/9/2021

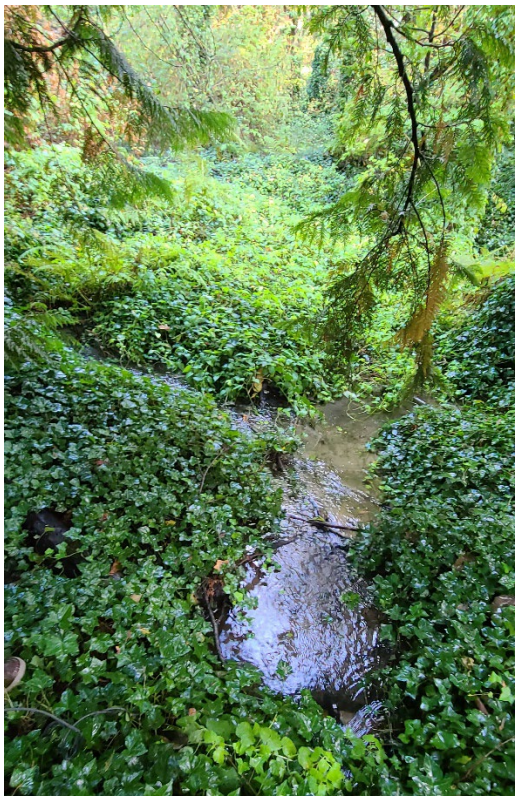
Monitoring station CSF1 is located along Southeast Evergreen Highway west of Southeast Ellsworth Road. The 161-acre contributing area to CSF1 is primarily residential (83 percent), with inputs from SR-14. It has a larger proportion of natural forested areas, relative to other basins (13 percent). Septic systems are common in the upper portion of the basin where stormwater is mainly controlled through drywells. Septic systems are also present in the lower portion of the basin south of SR-14. A spring located north of SR-14 likely contributes to the relatively high base flow discharge rates measured at this station (Figure 3). The spring located in Basin F was previously used as a source for drinking water in the City of Vancouver until it was abandoned due to elevated nitrate levels, which are still evident in water quality samples collected for this project (Figure 7). Monitoring station CSF1 was sampled during six storm and six base flow events during the first round of monitoring. CSF1 results were summarized in the *Columbia Slope 2021–2022 Summary Report* (Herrera 2022a). No new data were collected for this station in this monitoring round, so it will only be discussed in relation to other stations in this report.

CSF1 had slightly lower dissolved oxygen and higher pH than other stations during storm flow. There was generally higher nitrogen and slightly higher phosphorus at this station, relative to other outfall sites, which is consistent with the pattern of higher nutrients in western basins. CSF1 had the lowest median storm flow turbidity (1.1 NTU), and similarly low storm flow TSS (median 2.4 mg/L). CSF1 had the highest median base flow discharge of the outfall stations at 3.9 cfs (Figure 3). CSF1 had some of the lowest storm flow metals concentrations and relatively high hardness, which lowers metals toxicity. Base flow zinc and lead were also lower, while base flow copper was similar to other outfall stations. There were no metals exceedances at this station. PAHs were always undetected at this station, and DDx were detected in one of six storm events.

Basin H

Monitoring station CSH1 is located along Southeast Evergreen Highway near Southeast 112th Avenue. The 201-acre contributing area is majority residential (85 percent) except SR-14 and limited commercial (15 percent) in the upper basin. The basin has a low septic density (0.1 units per acre), with most septic systems concentrated near SR-14 in the lower basin. Several stormwater facilities that treat runoff from the upper and middle basin are located north of SR-14. One mapped spring is located directly upstream from CSH1. Several additional springs are located outside the perimeter of Basin H; this may contribute additional flow. Monitoring was conducted at CSH1 during 12 storm events and six base flow events.

There were no temperature or pH exceedances at this station. Median dissolved oxygen concentrations met the criterion for both storm and base flow; however, several individual base flow events fell below the criterion. *E. coli* concentrations were within the criterion during base flow events but exceeded during storm flow (Figure 4). Both storm and base flow median turbidity met the criteria; however, there were some exceedances during storm events. Storm and base flow nitrogen concentrations were higher, relative to other outfall stations, which is consistent with the pattern of elevated nitrogen in western basins (Figure 7). Notably, phosphorus concentrations did measure lower at this station (Figure 13). There were no metals exceedances at this station, but metals concentrations were generally lower (with the exception of base flow lead concentrations).



Outfall monitoring station CSH1 – 10/26/2022

There were minimal SVOC and OC pesticide detections at CSH1. DDx isomers were never detected, and PAHs were detected in just one of six storm events. Phthalates were frequently detected at this station. All phthalates were detected at least once, except di-n-octyl-phthalate. BEHP was detected in five out of six storm samples. All BEHP concentrations were below the project limit (1 µg/L), except one apparent outlier of 21 µg/L on December 27, 2022, which was the highest detection of BEHP at any station. Butyl benzyl phthalate was detected in three out of six storm events, with one slight exceedance (0.21 µg/L versus the project limit of 0.20 µg/L). Di-n-butyl-phthalate was detected at low levels in storm event, with no exceedances.

Basin J

Outfall monitoring station CSJ1 – 11/22/2022

Monitoring station CSJ1 is located along Southeast Evergreen Highway, at Love Creek, near the Vancouver Trout Hatchery at Columbia Springs. The 87-acre contributing area is majority residential (72 percent), with some natural forested areas in the lower and middle basin (18 percent). Few mapped septic systems are located in the basin, but they are mostly located in the lower basin south of SR-14. Drywells are installed in the upper basin to control stormwater runoff, but most runoff from the mid-basin appears to be conveyed through pipes to the outfall near CSJ1. A City detention pond located north of SR-14 in Basin J treats runoff from the upper and middle basin. The trout hatchery and CSJ1 are located next to several natural bodies of water, including West Biddle Lake and East Biddle Lake. Several water level controls including overflow spillways are located on the north side of Southeast Evergreen Highway; this likely contributes to the relatively small change in measured discharge between base and storm flow events at this station (Figure 3).

Monitoring station CSJ1 was sampled during six storm and six base flow events during the first round of monitoring. CSJ1 results were summarized in the *Columbia Slope 2021–2022 Summary Report* (Herrera 2022a). No new data were collected for this station during this monitoring round, so it will only be discussed in relation to other stations in this report.

CSJ1 had the lowest median dissolved oxygen of the outfall stations during storm flow events. The total nitrogen concentration at this station was significantly higher than at several other outfall stations, keeping with the pattern of higher nutrients in western basins (Figure 7). CSJ1 had the second lowest median storm flow turbidity (1.4 NTU) and the lowest storm and base flow chloride concentrations of the outfall stations. CSJ1 had second highest storm discharge and the highest base flow discharge of the outfall stations (Figure 3). No metals exceeded applicable criteria during any event at this station, PAHs were always undetected, and DDx isomers were detected in just two of six storm events.

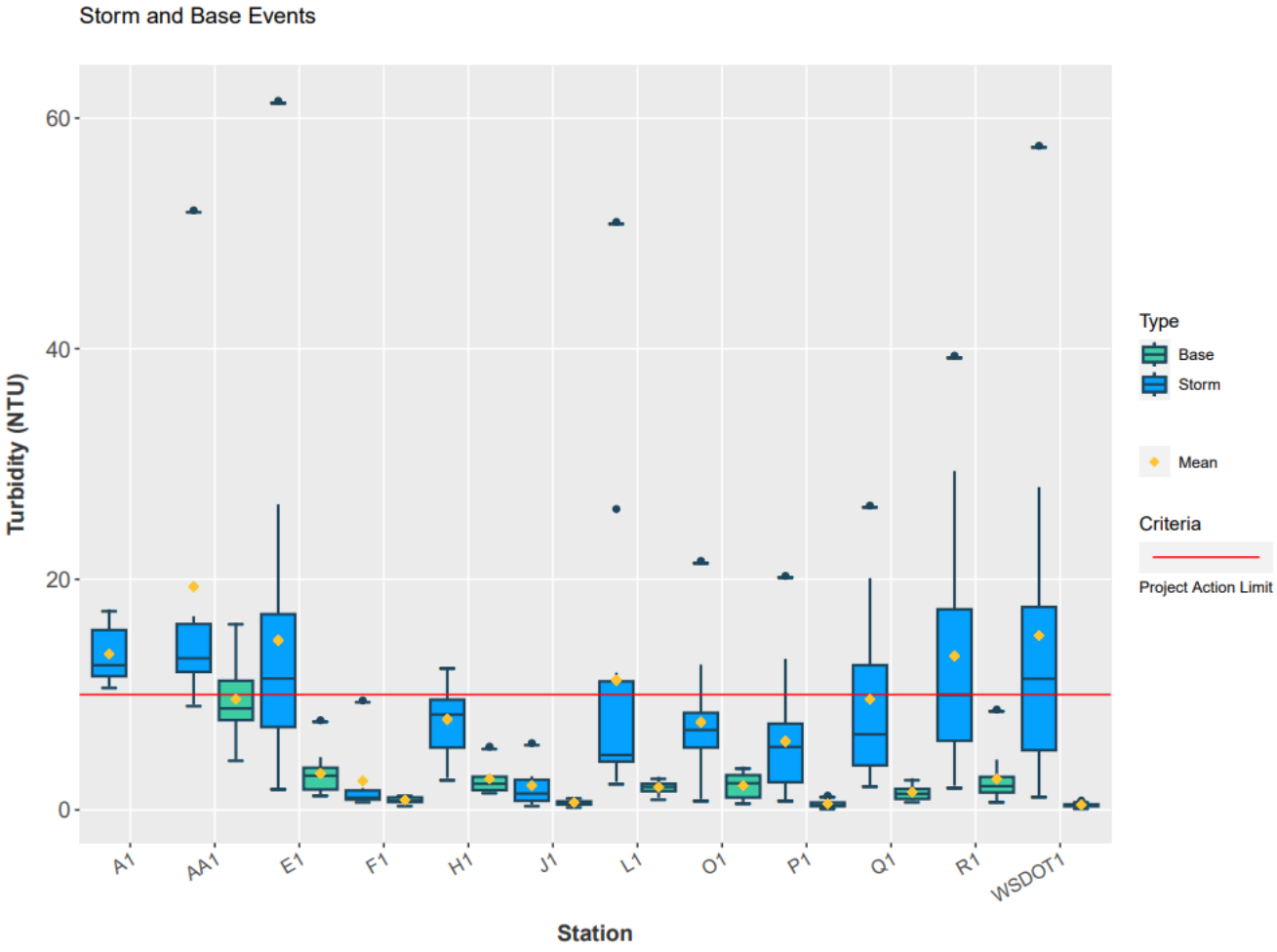
Basin L

Monitoring station CSL1 is located along Southeast Evergreen Highway near Southeast 144th Court. The 124-acre contributing area is entirely residential except for highway inputs from SR-14. The few mapped septic systems are primarily located around SR-14 in the middle basin. A private stormwater facility west of the monitoring station treats runoff from most of the residential development south of SR-14. The stormwater facility discharges to CSL1. Monitoring was conducted at CSL1 during 12 storm events and six base flow events.

Outfall monitoring station CSL1 – 1/9/2024

Temperature and pH at this station always met criteria. Median storm flow dissolved oxygen met the criterion, but concentrations were below the criterion for some events. Median base flow dissolved oxygen (9.7 mg/L) was slightly below the criterion and was the lowest of all outfall stations. There was higher nitrogen at this station, relative to eastern outfall stations, keeping with the pattern of higher nutrients in western basins. However, this station's storm flow phosphorus was slightly lower than that of other outfall stations. Median storm flow turbidity met the criterion (4.8 NTU) except for two outlier exceedances (Figure 14). Turbid water was observed in the side channel feeding CSL1 on April 6, 2023. It was identified as an illicit construction stormwater discharge and may have contributed to the storm flow turbidity exceedance of 51 NTU. Zinc exceeded the acute criterion in three of 12 storm events (25 percent), but lead and copper concentrations were below applicable water quality criteria during all sampling events.

Figure 14. Outfall Monitoring Station Turbidity.



SVOC and OC pesticide detections were minimal at this station. PAHs and DDx were always undetected. BEHP was detected in 83 percent of storm samples, but all concentrations except for one slight exceedance on December 27, 2022, were below the project limit (1 µg/L). Di-n-butyl-phthalate was detected at low levels in all six storm events, with no exceedances.

Basin O

The Basin O outfall monitoring station (CSO1) is located along Southeast Evergreen Highway west of Southeast 164th Avenue. The relatively large 670-acre contributing area is mostly residential (91 percent), with low septic density concentrated in the lower basin south of SR-14. Drywells are installed in portions of the upper basin to control runoff, but much of the upper basin is connected to the outfall through stormwater sewers. Located immediately north of SR-14, a combined residential area and golf course drains to biofiltration swales and a large detention pond that has been identified in the Retrofit Study as a feasible location for stormwater retrofit. Basin O BMP monitoring stations CSBMP1_IN and CSBMP1_OUT are located at one of the main influent pipes and at the effluent pipe of this detention pond, which receives drainage from over 600 acres of Basin O. WSDOT monitoring station CSWSDOT5 was located along the south side of SR-14 and discharges into the main Basin O drainage channel immediately downstream of CSBMP1_OUT.

Outfall monitoring station CSO1 – 10/18/2023

Outfall monitoring station CSO1 was sampled during 12 base flow and 18 storm flow events across both monitoring periods. BMP monitoring stations CSBMP1_IN and CSBMP1_OUT and WSDOT station CSWSDOT5 were all sampled during six storm flow events in the second round of monitoring.

CSO1 met criteria for temperature, pH, and storm flow dissolved oxygen. Median base flow dissolved oxygen met the criterion, but several individual events were below the criterion. Storm and base flow conductivity was lower than at other outfall sites. Median storm and base flow turbidity were below criterion; however, there were some storm event exceedances. CSO1 marks the transition from elevated nutrients in western basins to lower nutrients in eastern basins. Total nitrogen concentrations were significantly lower than at several western outfall stations. Base flow copper and zinc and storm flow zinc concentrations were significantly higher than at several other stations. Copper and zinc exceeded the acute criterion during one and five storm flow events, respectively. There were no lead exceedances. Copper and zinc concentrations at CSWSDOT5, which is located in Basin O upstream of CSO1, exceeded the acute criterion in 83 and 50 percent of the samples collected and may have contributed to metals exceedances at CSO1.

SVOC detections were rare at CSO1, with no detected PAHs, but several individual OC pesticides were infrequently detected; these included chlorpyrifos, endrin, and alpha-BHC. DDx isomers were detected in one of six samples but did not exceed the project limit.

BMP Evaluation

Statistically significant reductions in copper and zinc concentrations were observed from CSBMP1_IN to CSBMP1_OUT. Median total copper reduction was 44 percent, and median total zinc reduction was 32 percent. Reductions were also observed in *E. coli*, lead, TSS, and turbidity; however, these were not statistically significant. The geometric mean *E. coli* concentrations, for example, decreased from 164 MPN/100 mL at CSBMP1_IN to 64 MPN/100 mL at CSBMP1_OUT, with a median percent reduction of 36 percent.

BMP monitoring station CSBMP1_OUT – 2/7/2023

Figure 15. Basin O Stormwater BMP Total Copper Reductions.

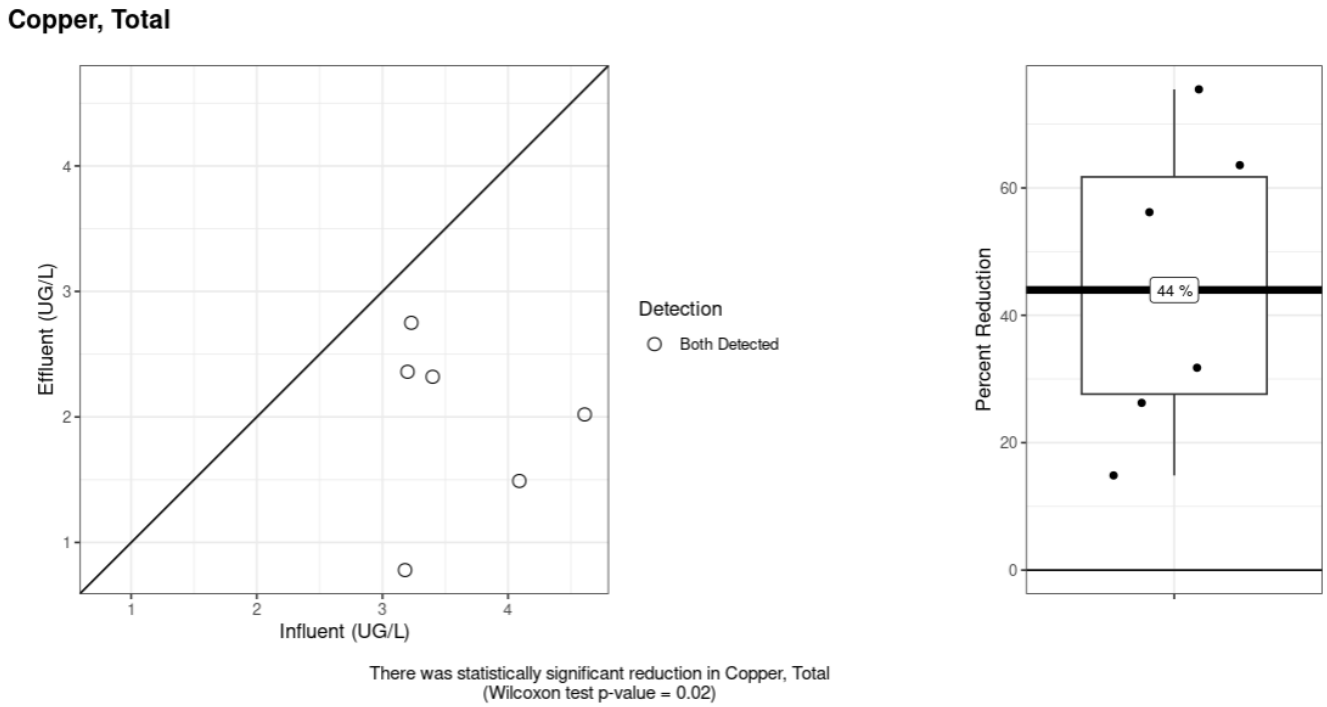
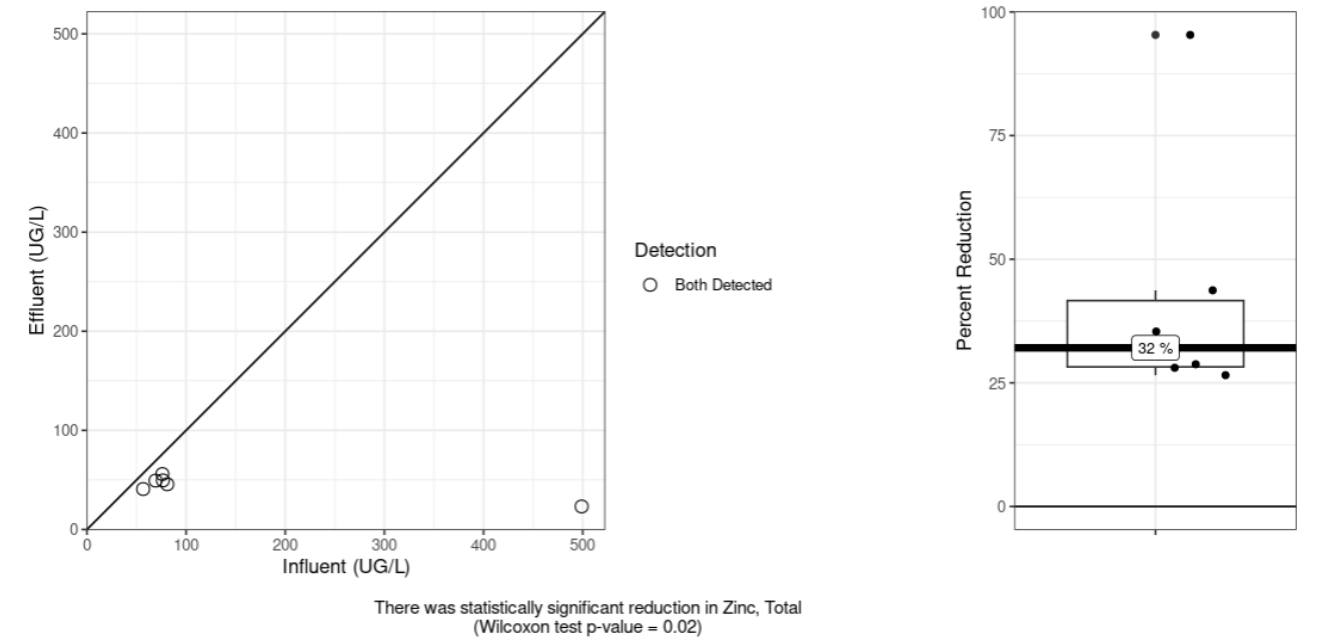


Figure 16. Basin O Stormwater BMP Total Zinc Reductions.



Basin P

Outfall monitoring station CSP1 – 12/27/2022

The Basin P outfall monitoring station CSP1 is located at the bottom of Southeast 164th Avenue, directly on the banks of the Columbia River. The large 523-acre contributing area is majority residential (79 percent), with a high commercial proportion (21 percent) and high impervious surface area (61 percent) relative to other outfall monitoring stations. Mapped septic systems are primarily located in the upper basin where stormwater runoff is mostly controlled through drywells. No mapped springs are located in Basin P, so base flow is likely driven by shallow groundwater intrusion into the stormwater system. Several stormwater treatment facilities are located in commercial and residential developments along Southeast 164th Avenue. Under a separate effort, two potential stormwater retrofit locations have been identified in this area. Outfall monitoring station CSP1 was sampled during 12 base flow and 18 storm flow events across both monitoring periods.

There were no temperature or pH criteria exceedances at this station. Median base and storm flow dissolved oxygen concentrations met the criteria, but concentrations during several individual events did not meet the criteria. Like most outfall monitoring stations, base flow *E. coli* concentrations met the applicable criterion, but storm flow concentrations exceeded the applicable criterion (Figure 4). All conventional parameter and nutrient concentrations were comparable to or slightly lower than other outfall stations, except for base flow chloride. Base flow chloride had the highest median (11.5 mg/L) of all outfall stations. CSP1 had the lowest median storm total phosphorus concentration (0.06 mg/L). Storm and base flow turbidity medians were both below the criterion, with a few exceedances during storm events (Figure 14). CSP1 had significantly higher zinc and lower lead concentrations than several other outfall monitoring stations in both base flow and storm events. CSP1 had four copper exceedances and 11 zinc exceedances across 18 storm events (22 and 61 percent, respectively), which is the highest percentage of metals exceedances at any of the outfall stations. There were no lead exceedances at this station.

SVOC detections at CSP1 were uncommon, beyond several phthalates that were detected in most or all stations. DDx isomers were detected during three of six storm events; although concentrations were relatively low (0.61 to 1.6 ng/L), this was the highest frequency of all outfall stations. Each total DDx detection was due to a single unique isomer, including 2,4′-DDD, 4,4′-DDD, or 4,4′-DDE, detected below the PAL of 1100 ng/L. Other individual OC pesticides were rarely detected, except for chlorpyrifos, which was detected below the PAL of 83 ng/L (at concentrations up to 5.6 ng/L) in five of six storm flow samples.

Basin Q

The Basin Q outfall monitoring station CSQ1 is located near the intersection of Southeast 164th Avenue and Southeast Evergreen Highway. The large 762-acre contributing area is majority residential (84 percent), with some commercial (13 percent) land use in the middle and upper basin. Few mapped septic systems are located in the basin, with most located in the upper basin or south of CSQ1. Stormwater runoff in the upper portion of the basin appears to be primarily controlled through drywells, particularly in commercial areas along Southeast 164th Avenue. WSDOT monitoring stations CSWSDOT2 and CSWSDOT3 convey treated and untreated SR-14 runoff to the main Basin Q drainage via a stormwater ditch directly upstream from CSQ1.

Outfall monitoring station CSQ1 – 10/26/2022

Monitoring at station CSQ1 was conducted during six base flow and 12 storm flow events. There were no temperature or pH criteria exceedances at this station. Base and storm flow median dissolved oxygen met the criterion but exceeded the criterion during some storm flow events. The base flow *E. coli* concentrations did not exceed the water quality criterion, but storm flow *E. coli* concentrations did. Storm flow *E. coli* concentrations had the highest median of all outfall monitoring stations (400 MPN/100mL). The significantly lower storm and base flow total nitrogen concentrations (relative to several other stations) fit the spatial pattern of lower nutrient concentrations in the eastern basins. Storm and base flow median turbidity were both below the criterion, with occasional exceedances during storm flow events. Total lead concentrations did not exceed the water quality criterion during any event at CSQ1. However, copper and zinc exceeded the applicable criteria during two and four storm flow events, respectively, out of 12 total storm flow events.

Despite relatively low discharge at CSQ1 and nearby WSDOT stations discharging into the main drainage, SVOC and OC pesticide detections were minimal at CSQ1. PAHs were detected in one of six storm events, while DDx isomers were never detected at this station. BEHP was detected in five out of six storm events. All BEHP concentrations were below the project limit, except one outlier of 2.4 µg/L on December 27, 2022. Some individual OC pesticides were detected occasionally but less frequently than at other outfall monitoring stations.

Basin R

Monitoring station CSR1 is located in an exposed rectangular box culvert directly upstream from the Fisher Creek outfall at the Columbia River. The 1,174-acre drainage area is the largest of any monitoring station and is comprised of a unique split of residential (56 percent), forest or fields (23 percent), commercial or industrial (13 percent), and agricultural (9 percent) land uses. Runoff from residential developments in the middle and upper basin is typically treated in stormwater facilities prior to discharging into Fisher Creek. Small sections of these developments in the middle basin have clusters of drywells, but the majority of the basin is connected to and conveyed by the creek. Septic systems are relatively sparse in the basin but are mostly located in the lower basin near the mapped springs. Forested and agricultural areas are primarily located in the upper basin near upstream monitoring station CSR2, which receives runoff from 662 acres of the basin (of which 11 percent is agricultural and 37 percent is forest or field). Upstream station CSR2 is located along Fisher Creek above SR-14 and includes a majority of the industrial and residential development in the basin.

Outfall monitoring station CSR1 – 1/20/2022

Fisher Creek is an important ecological resource; historically, it has been a salmonid rearing stream. Therefore, CSR1 was sampled during 12 base flow and 18 storm flow events across both rounds of monitoring. CSR2 was only sampled during the first phase of the project, for three base flow and six storm flow events.

CSR1 was within temperature and pH criteria during all events, exhibiting the lowest storm flow temperature of all outfall monitoring stations. Median base and storm flow dissolved oxygen concentrations met the criterion, with some exceptions during individual base flow events. CSR1 had the highest median storm flow dissolved oxygen (11.9 mg/L) and discharge (8.0 cfs) of the outfall stations (Figure 3). Median pH at CSR2 for both storm and base flow was below the 6.5 criterion. Low pH at upstream station CSR2, particularly during base flow events, was likely driven by unique biogeochemical processes related to the adjacent wetland area. Median storm flow dissolved oxygen at CSR2 met the criterion; however, one storm outlier was the lowest recorded dissolved oxygen concentration at any station, at 4.3 mg/L and 38.9 percent saturation. CSR1 exceeded *E. coli* criteria for both storm and base flow events, while CSR2 exceeded *E. coli* criteria only during storm events. CSR1 median storm flow turbidity was at the criterion (10 NTU), so half of storm events exceeded the criterion. CSR2 median storm turbidity met the criterion, with one low-level exceedance.

CSR1 had the lowest median base and storm flow hardness of all outfall stations, increasing metals toxicity at this station. Storm flow zinc concentrations at CSR1 were significantly lower than at four other outfall stations but did not exceed the applicable zinc criterion on any occasion. CSR1 had two copper exceedances out of 18 storm events (11 percent).

SVOC and OC pesticide detections were minimal at both Basin R stations. PAHs were detected during one of six storm events for both stations, while DDx isomers were detected at CSR1 during one storm event and at CSR2 during two of six storm events. BEHP was detected during three events at CSR1 and during two events at CSR2. BEHP concentrations did not exceed the project limit.

Basin I-205

The outfall monitoring station for Basin I-205, CSWSDOT1, is located on the banks of the river directly under the I-205 bridge. This mainly piped stormwater network conveys drainage from 457 acres of primarily residential (73 percent) and commercial or industrial (25 percent) area to the Columbia River. The basin is made up of a large portion of impervious area (51 percent), including highways I-205 and SR-14. Portions of the upper basin are located in residential neighborhoods, with a relatively high density of septic systems. There are no mapped springs in the basin, so base flow discharge is likely only driven by groundwater intrusion into the stormwater sewers. Storm flow discharge rates are notably higher due to the high proportion of impervious area in the basin (Figure 3). CSWSDOT1 was sampled during 12 storm flow events and six base flow events across both rounds of monitoring.

Outfall monitoring station CSWSDOT1 – 10/26/2021

There were no temperature or pH exceedances at this station during any sampling events. Storm flow dissolved oxygen concentrations always met the criterion, and only one base flow dissolved oxygen concentration was below the criterion. Storm flow *E. coli* exceeded the applicable criterion, but base flow *E. coli* was within the water quality criterion and had the lowest geometric mean of all outfall stations (1 MPN/100 mL).

CSWSDOT1 was a partial outlier to the spatial pattern of higher nutrient concentrations in western basins. Total phosphorus and nitrogen concentrations were generally comparable to most other outfall stations, except for nitrogen concentrations at CSE1 and CSF1. Base flow at CSWSDOT1 is likely sustained from shallow groundwater intrusion, which may come from a different water bearing unit than nearby nitrate-impacted springs. Median storm flow turbidity (11.4 NTU) exceeded the applicable criterion (Figure 14). CSWSDOT1 exceeded the acute copper and zinc criteria during three of 12 total storm flow events but was within the applicable lead criterion for all events. Base flow lead and copper concentrations were significantly lower at CSWSDOT1 than at three and two other outfall stations, respectively.

PAHs were detected at CSWSDOT1 in seven out of 12 storm events, while DDx isomers were detected in 8 of 12 storm events. CSWSDOT1 had the highest median BEHP (0.52 µg/L) and the most detections in 11 out of 12 storm events (92 percent). Three of 12 samples exceeded the BEHP project limit of 1 µg/L (Figure 5).

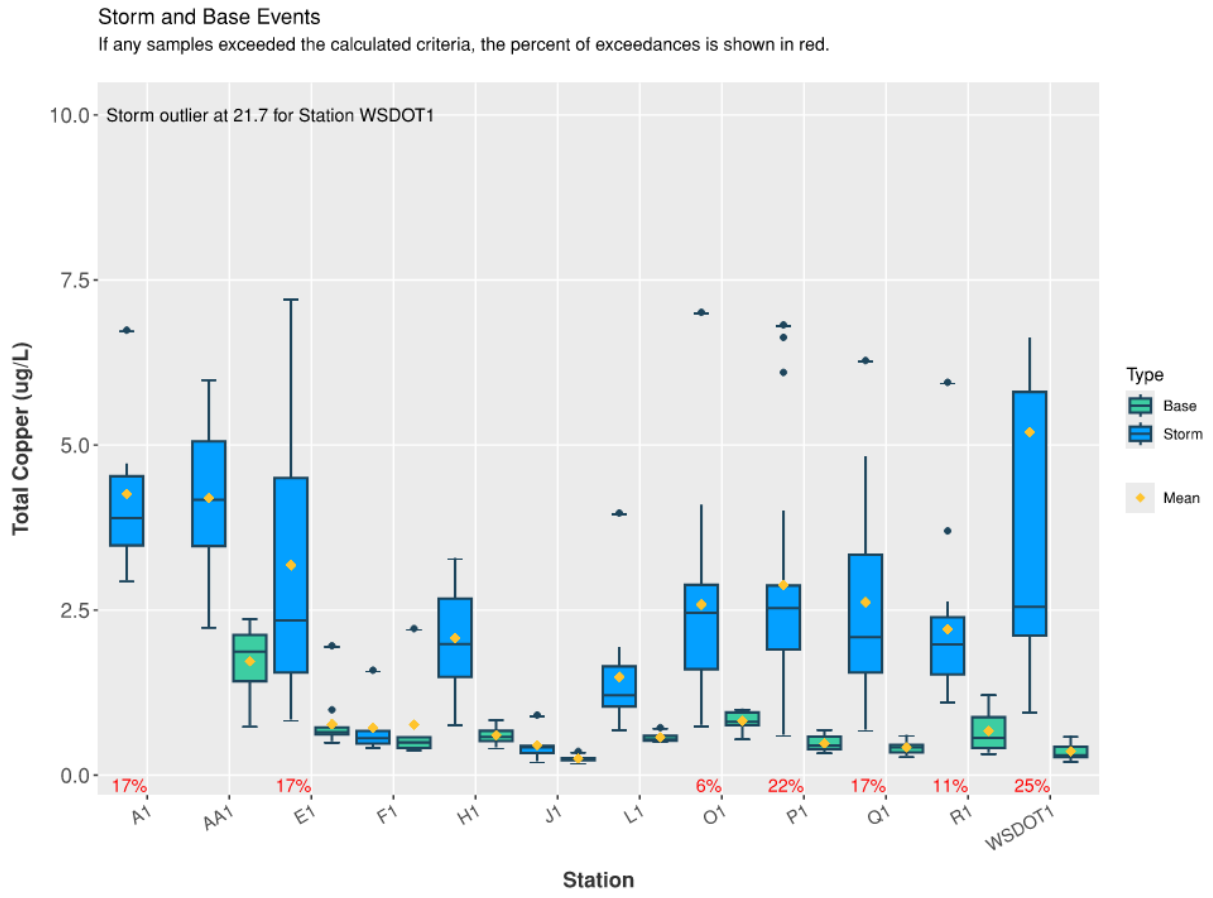
4.3. Discussion

4.3.1. Water Quality

4.3.1.1. Contaminant Pathways and Sources

Groundwater influences from mapped springs appeared to be primary drivers for base and storm flow parameter concentrations in the Columbia Slope watershed. CSF1 and CSJ1 are examples of stations with heavy influence from groundwater, and CSAA1 is an example of a station with little influence from groundwater. CSF1 and CSJ1 each have multiple mapped springs in the lower basins, with relatively high base flow discharge rates (medians of 3.9 and 5.9 cfs, respectively). *In situ* pH measurements (Figure 9) were generally lower during storm flow events, due to lower pH in rain, but this decrease in pH was much lower in stations CSF1 and CSJ1 (likely due to the larger proportion of groundwater during storm flow events). Copper and zinc, which are common urban stormwater contaminants, typically increased substantially during storm flow events (Figure 17); however, similar to pH, the change in copper and zinc was much lower from base flow concentrations at monitoring stations CSF1 and CSJ1. This is likely due to this larger proportion of groundwater. On the other hand, monitoring station CSAA1 saw larger increases in metals concentrations due to a larger proportion of stormwater runoff.

Figure 17. Outfall Monitoring Station Total Copper Concentrations.



In addition to the proportion of groundwater at each monitoring station, certain spatial differences discussed in the sections above are likely tied to groundwater quality. In the western portion of the project area, certain springs that have previously been used as a City drinking water source were identified to have elevated nitrate levels. The pattern of significantly higher nitrate+nitrite and total nitrogen concentrations during both base and storm flow in the western monitoring stations (Figure 7) is likely due to the groundwater influence on these stations (through springs). Monitoring station CSAA1 is an outlier to this pattern, as the westernmost monitoring station, but does not appear to be spring-fed and likely is not conveying the nitrate-impacted groundwater that the other stations are conveying.

Another primary driver of differences in storm flow water quality throughout the watershed is runoff from highways and major arterials. Small, primarily impervious WSDOT monitoring stations exhibited unique water quality characteristics, including significantly higher turbidity, TSS, and total metals concentrations, but significantly lower total nitrogen concentrations. Most monitoring stations included at least a small portion of highway or major arterial in the lower basin, so the actual impact on the outfall water quality may be more dependent on contributing area and flow proportions. Several organic contaminants, including OC pesticides and PAHs, appeared to be more common in WSDOT stations and at outfall monitoring stations CSA1 and CSAA1 (Figure 12). Petroleum products and vehicle emissions can be related to PAHs in urban stormwater runoff, which is likely the source of elevated concentrations at WSDOT stations and partly responsible for concentrations at CSA1. CSAA1, however, did not have a large proportion of highway contributing area but had a large proportion of railroad right-of-way. Petroleum-based lubricants, fuels, and railway tie coatings are likely sources of PAHs in this basin. OC pesticides were detected throughout the watershed, with slightly more frequent detections occurring at WSDOT stations. Beyond potential legacy dieldrin contamination at CSWSDOT4, the source for these scattered detections is unclear as most of these individual pesticides have been banned but persist in the environment.

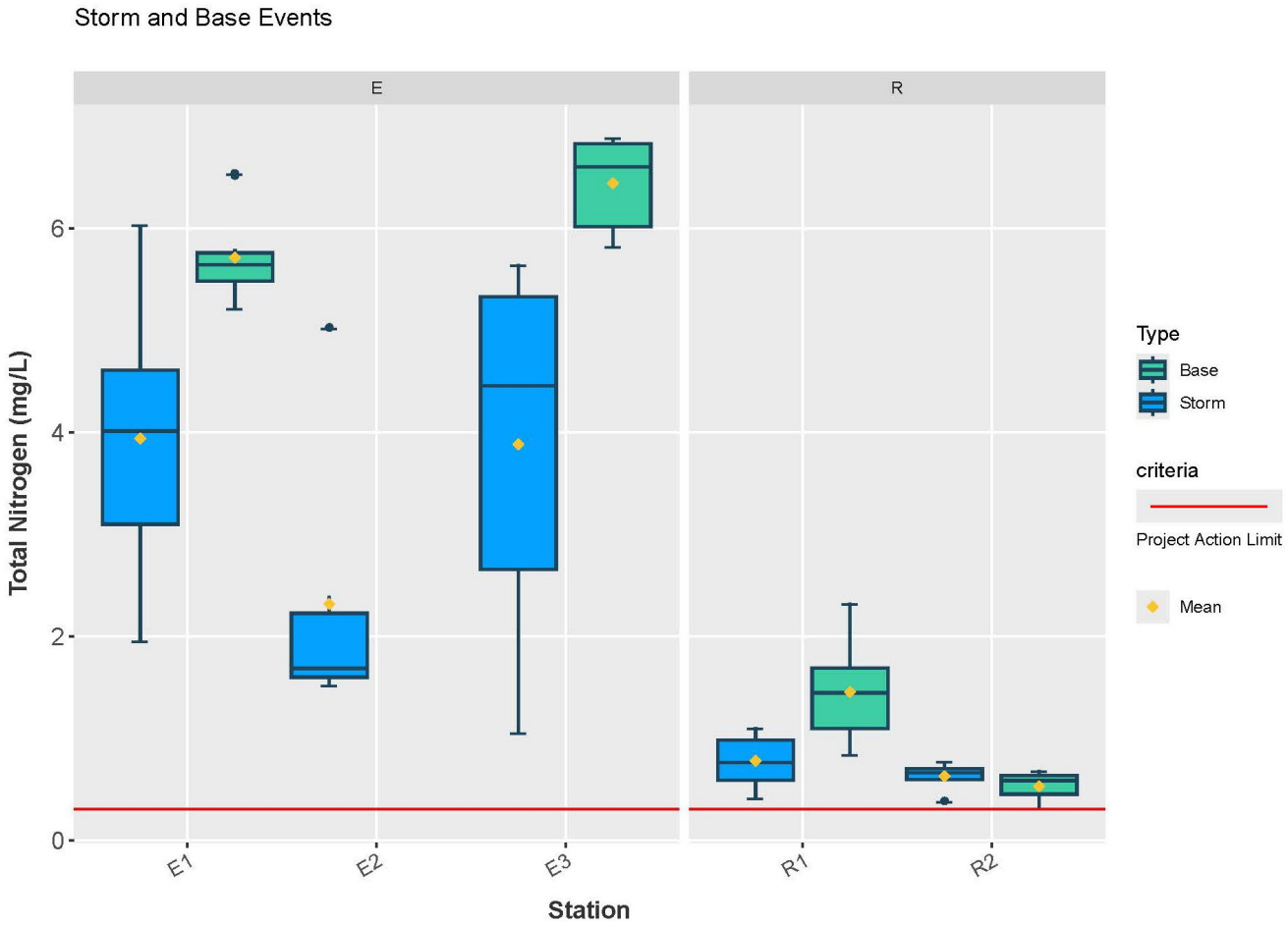
4.3.1.2. Upstream Source Tracking

Upstream stations were targeted for outfall station CSE1, due to relatively frequent detections of organic contaminants and elevated nutrient and bacteria levels during the first round of sampling. Frequent detection of organic contaminants persisted at CSE1 in the second round of monitoring, though at relatively low concentrations compared to other monitoring stations. Upstream stations CSE2 and CSE3 both had less frequent detections of individual organic parameters and, when detected, typically had lower concentrations than CSE1 (with some exceptions). Neither CSE2 or CSE3 received runoff from SR-14, which is likely a source of trace SVOCs and OC pesticides (as shown in WSDOT station results). While no discrete WSDOT runoff has been sampled in Basin E, it is likely that these frequent low-level detections are the result of highway runoff from SR-14.

Nutrient concentrations at CSE1 were consistently high during both monitoring periods, with base flow concentrations typically higher than storm flow concentrations. Monitoring station CSE3, which is located north of SR-14 and near mapped springs, exhibited similarly high base flow concentrations whereas median storm flow concentrations at CSE2 were lower than CSE1 and CSE3 (Figure 18). This supports the theory that, despite nutrients being common stormwater contaminants, stormwater within Basin E is actually diluting nutrient concentrations that are elevated due to groundwater nitrate and phosphorus contamination.

CSE3 *E. coli* concentrations were lower than those of CSE1 during base flow events, but otherwise all three stations exhibited comparable storm flow *E. coli* concentrations (Figure 4). This indicates that elevated bacteria concentrations may not be a result of a specific point source.

Figure 18. Upstream Monitoring Station Total Nitrogen Concentrations.



The series of monitoring stations CSBMP1_OUT, CSWSDOT5, and CSO1 were not originally selected to identify upstream sources; however, all of these stations are either located along the main channel of Basin O or discharge directly to that main channel. CSBMP1_OUT, which is directly upstream of CSWSDOT5, had median total copper and lead concentrations of 2.2 and 0.12 µg/L, respectively. These concentrations increased downstream at CSO1 to 2.5 and 0.27 µg/L. CSWSDOT5, which discharges between these two stations, had median total copper and lead concentrations of 12.9 and 1.46 µg/L. The CSWSDOT5 SR-14 outfall appears to have a measurable impact on metals concentrations in Basin O; however, other potential sources of copper and lead between CSBMP1_OUT and CSO1 could exist. Median total zinc concentration at CSWSDOT5 was similar to that of CSBMP1_OUT and did not appear to impact CSO1 concentrations.

Water quality at monitoring stations CSR1 and CSR2 is discussed in more detail in the 2021–2022 Summary Report (Herrera 2022). Additional monitoring was conducted at an upstream station in Fisher Creek (CSR2) during the first round of sampling, due to the importance of the basin as salmonid habitat.

Water quality at CSR2 was unique for many parameters. This is likely a result of the station's location, which drains a wetland. Biogeochemical processes in this wetland area differed from other stations and may have resulted in these unique characteristics, including low pH and dissolved oxygen, while not necessarily resulting from human impacts.

4.3.1.3. BMP Effectiveness

The stormwater pond located in Basin O (CSBMP1_IN and CSBMP1_OUT) appears to provide some reduction of total copper and total zinc concentrations (median of 44 and 32 percent, respectively), with statistically significant results for six paired stormwater grab samples. In addition, the concentrations of *E. coli*, lead, TSS, and turbidity saw relatively consistent reduction from the influent to effluent stations, but differences were not statistically significant. The stormwater pond appeared to also have a buffering effect on pH, with influent pH levels at CSBMP1_IN below the lower criterion of 6.5 on four occasions. However, the stormwater pond was within the pH criterion during all events at CSBMP1_OUT. Nutrients were greater at the effluent station for three and five of six events for nitrogen and phosphorus, respectively, indicating that the pond may be exporting nutrients, but the differences were not statistically significant. Additional grab sampling may be necessary to identify statistically significant differences, due to the relatively small dataset. Organic parameters, such as PAHs and pesticides, were not evaluated at this location. While the monitoring data indicates that the pond is providing some degree of treatment, the improvements identified for this pond under the Retrofit Study would reduce nutrient export and provide a higher level of treatment for parameters such as metals, *E. coli*, and TSS.

WSDOT owned stormwater detention ponds are located upstream of two of the five WSDOT stations. CSWSDOT3 (located in Basin Q) is located downstream of treatment but includes some untreated WSDOT runoff and a small area of Southeast 164th Avenue. The stormwater outfall CSWSDOT5 (located in Basin O) is located immediately downstream of a small WSDOT pond. The WSDOT boxplots generally do not show substantial water quality improvement at these locations, relative to the concentrations at untreated WSDOT stations CSWSDOT2 and CSWSDOT4, with the exception of temperature at CSWSDOT5. However, treatment effectiveness was not evaluated through paired influent and effluent sampling like CSBMP1_IN and CSBMP1_OUT. Therefore, additional effectiveness monitoring may be necessary to identify whether these BMPs are functioning as intended. The existing ponds could be evaluated to determine if these facilities could benefit from retrofit.

Beyond the paired BMP grab sampling conducted at CSBMP1_IN and CSMP1_OUT, no other specific BMPs were evaluated. Certain basins monitored for this project did have relatively high stormwater treatment pond or swale densities. Contributing areas for outfall monitoring stations CSH1, CSJ1, and CSR1 had stormwater pond densities of greater than 0.01 per acre, and outfall monitoring stations CSP1 and CSQ1 had stormwater swale densities of 0.1 per acre. Stormwater quality at these stations was impacted by a number of other variables, including proportion of groundwater, natural water features, and land use, so differences in water quality should not be presumed to be attributed to these stormwater BMPs. However, water quality in most of these basins, particularly CSJ1 and CSR1, was relatively good, with contaminant concentrations rarely elevated (compared to other outfall stations). Stormwater BMPs in some of these basins, such as CSH1, are mostly located in the upper basin where stormwater is typically controlled through drywells; therefore, stormwater quality improvements may not be reflected in the outfall storm flow event concentrations.

4.3.2. Comparison to Other studies

Monitoring data from the RPWS (Ecology 2024), Toxics in Surface Runoff to Puget Sound (Herrera 2011), and S8.D data (Ecology 2015a) were compiled for comparison with similar Columbia Slope station data, as described in Section 2.5.3. Because these projects were not intended as inter-watershed comparisons, only select parameters overlapped between the monitoring efforts. Comparison data are intended to provide points of reference for comparing water quality in the Columbia Slope watershed to that of other watersheds, but comparison data do not necessarily represent typical concentrations in Pacific Northwest urban runoff and streams. Full sets of comparison plots can be found in Appendix B.

Water quality in Columbia Slope open-channel creek outfall stations, including CSE1, CSF1, CSH1, CSJ1, CSL1, CSO1, CSQ1, and CSR1, were generally comparable to other creeks, particularly for TSS and total zinc (Figure 19). Nitrate+nitrite concentrations in these Columbia Slope stations were substantially higher than concentrations in four of five selected creeks in Redmond, Washington but were consistent with concentrations in the Toxics in Surface Runoff to Puget Sound study (Figure 20). Total PAHs were also detected at slightly higher concentrations than at selected creeks but were detected less frequently.

Figure 19. Columbia Slope Creek Total Zinc Comparison.

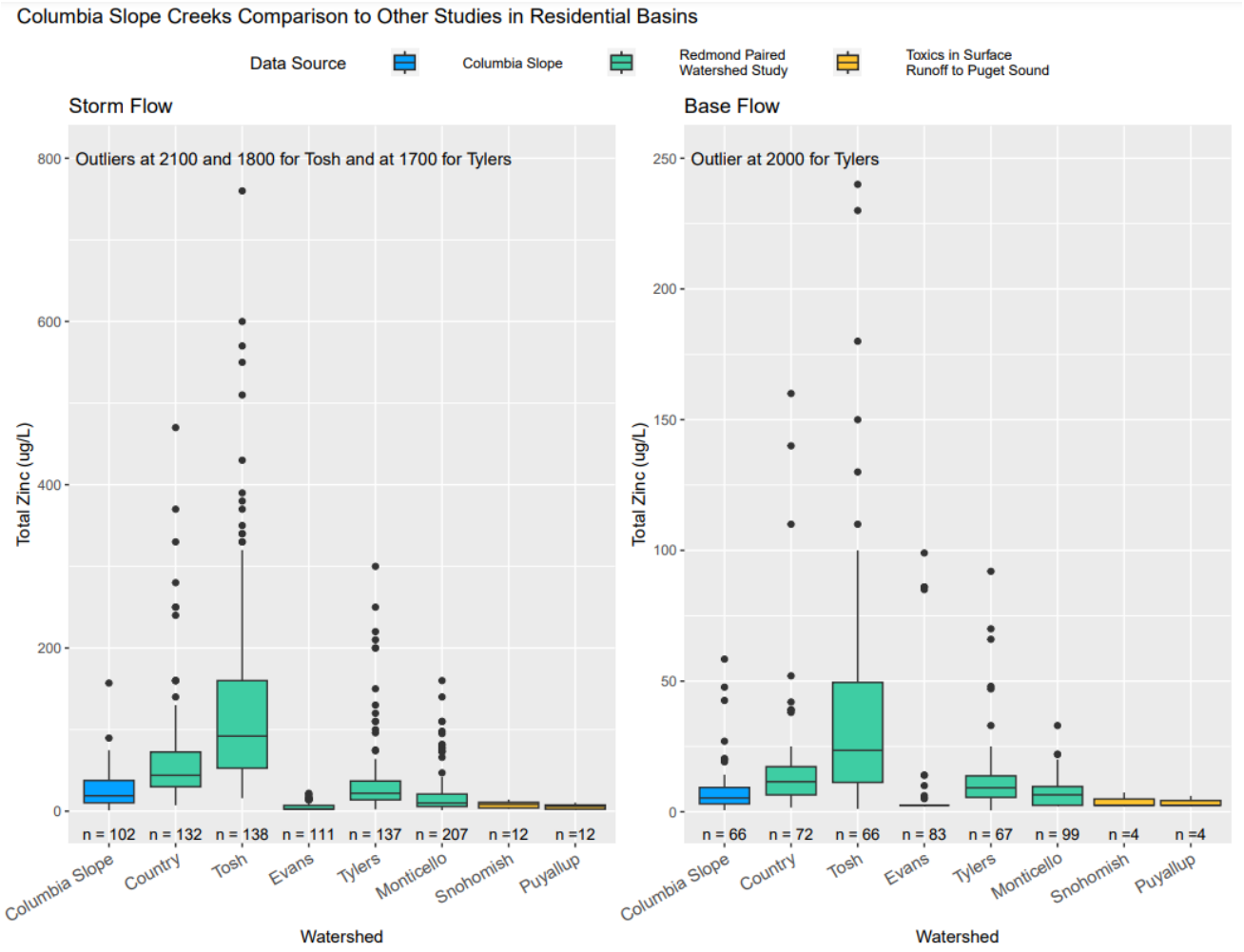
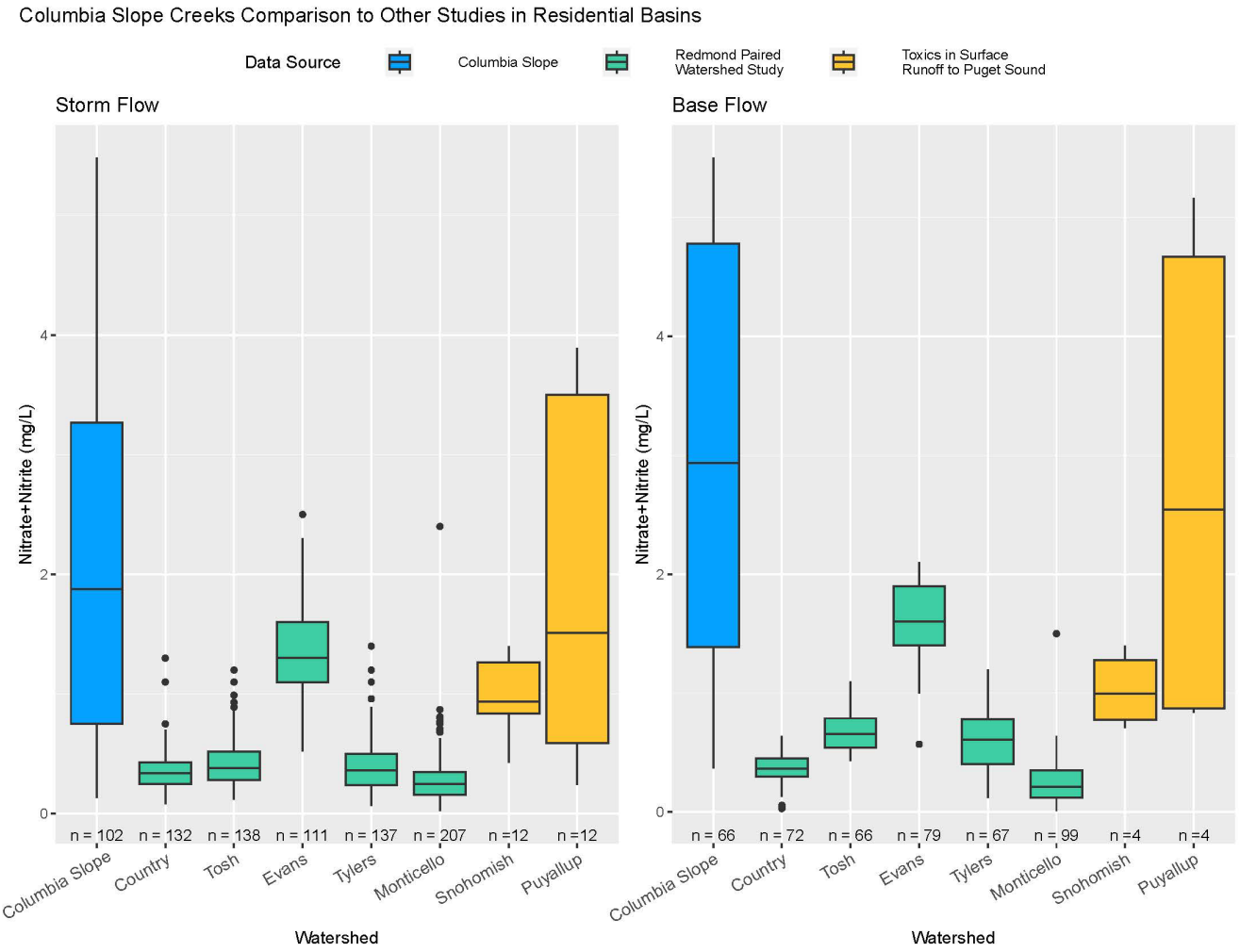


Figure 20. Columbia Slope Creek Nitrate+Nitrite Comparison.



Closed-channel monitoring stations in the Columbia Slope watershed were also generally lower than or comparable to S8.D data, with the following exceptions:

- Columbia Slope residential basins had a higher frequency of BEHP detections and higher maximum concentrations than S8.D data from residential basins (Figure 21).
- Columbia Slope residential and highway basins had higher median total nitrogen concentrations than all basins from S8.D data, but the difference in concentrations between groupings were not substantial (Figure 22).

Figure 21. Columbia Slope Closed Channel Pipe Bis(2-ethylhexyl) Phthalate Comparison.

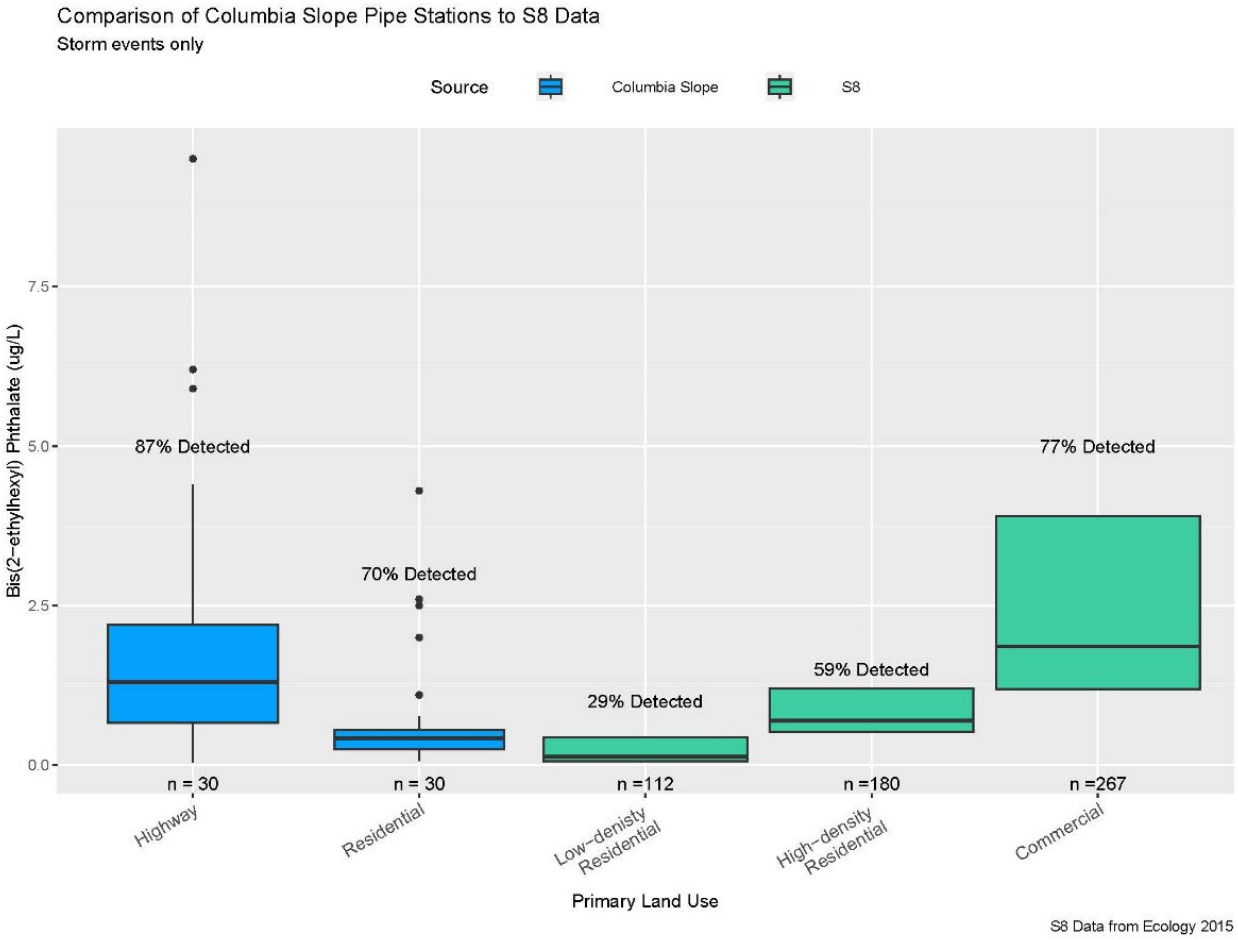
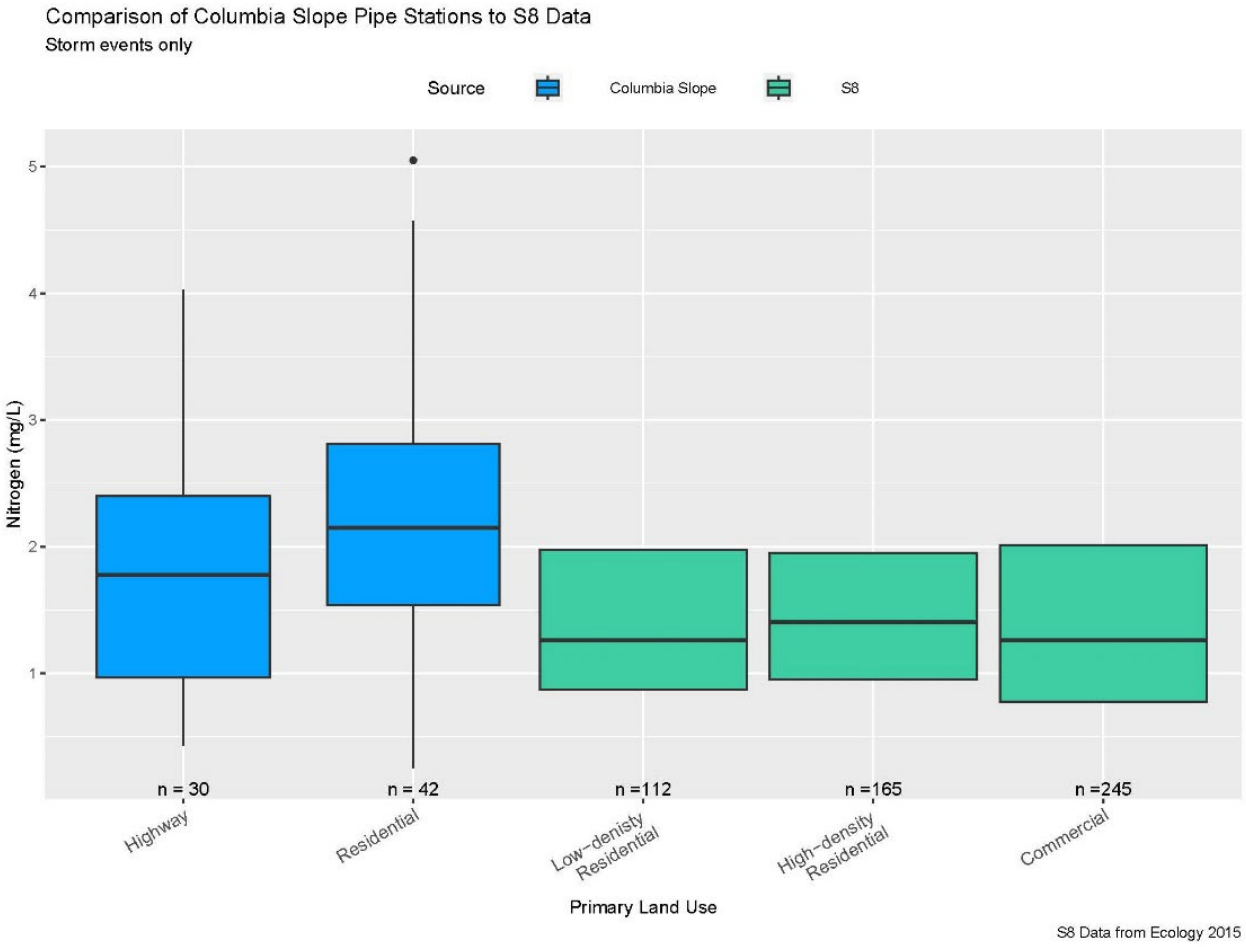


Figure 22. Columbia Slope Closed Channel Pipe Total Nitrogen Comparison.



5. Conclusions and Recommendations

The following sections present summaries of spatial patterns and water quality criteria comparison, basin prioritization, identified uncertainty and data gaps, and recommended future actions.

5.1. Water Quality

Monitoring results generally indicate good water quality relative to applicable state criteria. Water quality criteria were occasionally exceeded for the following parameters, particularly during storm flow events. Water quality standard exceedances during the monitoring period are summarized below:

- Temperature: The water temperature criterion (7-DADmax shall not exceed 17.5 degrees Celsius) could not be directly compared to the collected instantaneous water temperature measurements. However, all temperature measurements were below the 7-DADmax criterion except for one base flow event at CSAA1. CSAA1 is a small, mostly closed-channel piped system, with relatively low measured flow rates, which is not expected to provide significant aquatic life habitat.
- pH: The pH criterion (6.5 to 8.5) was met during all monitoring events at all outfall stations except for one storm flow event at CSQ1 and CSR1 where the lower criterion was exceeded. All base flow events at CSR2 and several storm flow events at CSWSDOT2, CSWSDOT3, CSWSDOT4, and CSR2 were also below the lower criterion.
- Dissolved Oxygen: The dissolved oxygen criterion (minimum value shall exceed 10.0 mg/L) was not met during at least one base flow event at all outfall monitoring stations. Median dissolved oxygen concentrations were above the criterion at all stations except for CSAA1, CSL1, CSE3, and CSR2 during base flow events. Base flow dissolved oxygen saturation was above 90 percent in all outfall stations, indicating that the infrequent low dissolved oxygen concentrations are of lesser concern with regard to inputs into the Columbia River where dissolved oxygen has been determined to meet state standards (Category 1 listing).
- Turbidity: The turbidity criterion was not met during at least one storm flow event at all stations except CSF1 and CSJ1 (Figure 14). The criterion was most frequently exceeded during storm flow events at CSA1 (100 percent), CSAA1 (83 percent), CSE2 (100 percent), and all WSDOT stations (50 to 100 percent). No base flow samples exceeded the applicable criterion except for CSAA1 on two occasions.
- Nutrients: Nutrient criteria for total nitrogen and total phosphorus recommended by EPA (2001) for streams in the Willamette Valley were not met for any base or storm flow sample at any outfall station except for storm flow at CSP1, which was below total phosphorus criterion during three storm flow events (Figure 13) and below total nitrogen criterion during one storm flow event. These high nutrient levels indicate potential impairment from eutrophication (nutrient enrichment) across the Columbia Slope watershed and appear to be driven in part from high nitrate+nitrite levels in groundwater.

- **Chloride:** No chloride concentrations exceeded acute or chronic criteria at any station, but spikes were observed at WSDOT stations and small outfall stations, including CSA1 and CSAA1, during cold winter storm events, likely driven by highway or residential community deicer application.
- **Metals:** The chronic criteria for copper, lead, and zinc were met during all base flow events at all stations. Acute metals criteria were exceeded (1) for copper during at least one storm flow event at all monitoring stations except CSAA1, CSF1, CSH1, CSJ1, CSL1, CSR2, and CSBMP1_OUT; (2) for lead during one storm flow event at CSWSDOT2 and CSWSDOT4; and (3) for zinc during at least one storm flow event at all monitoring stations except CSAA1, CSE1, CSE2, CSJ1, CSF1, CSH1, and CSR1. The number of noted metals exceedances may be an overestimate, because the samples were analyzed for the total fraction and compared to water quality criteria based on the dissolved fraction.
- ***E. coli*:** Base flow *E. coli* bacteria results met the state water quality standard for the geometric mean (shall not exceed 100 CFU/100 mL) and the 90th percentile (shall not exceed 320 CFU/100 mL) at all stations except CSR1 and CSL1. Storm flow bacteria results exceeded state water quality standards at all stations except for CSBMP1_OUT, CSE1, CSE2, CSJ1, CSO1, and CSWSDOT4. Bacteria is a category 2 listed (water of concern) parameter for the Columbia River.
- **SVOCs:** Several individual SVOCs, including multiple PAHs and BEHP, exceeded applicable state water quality standards at several stations. Most organics detections were at low concentrations below or near the laboratory's analytical reporting limit. Total PAHs and total cPAHs were greatest at outfall monitoring station CSAA1 but did not have established project limits for this study (Figure 12). Laboratory reporting limits are typically several orders of magnitude greater than the applicable criteria, so any detection above the reporting limit of most parameters typically constitutes an exceedance.
- **OC Pesticides:** OC pesticides were mostly undetected across the project area, except for several individual OC pesticides that infrequently exceeded applicable water quality standards, including 4,4'-DDE, dieldrin, alpha-BHC, beta-BHC, heptachlor, and hexachlorobenzene. These exceedances were generally infrequent and were most common at the WSDOT monitoring stations. Dieldrin exceeded the chronic freshwater aquatic life and human health criteria in all 12 samples collected at CSWSDOT4, in five samples collected at CSE1, and in one sample collected at CSAA1. 4,4'-DDE exceeded the chronic freshwater aquatic life criterion on at least one occasion at all WSDOT stations and at CSR1 and CSR2.

As noted above, water quality throughout the Columbia Slope watershed was generally good. However, some parameters were more likely than others to exceed water quality criteria and represent potential priority contaminants for future studies or management activities. During storm flow events, metals and OC pesticides are the highest priority contaminants, as they represent a risk to aquatic life and were occasionally detected at elevated levels across the project area. During base flow events, nutrients and *E. coli* are the highest priority contaminants. Nutrients were elevated in the base flow of spring-fed basins, particularly in the western portion of the project area, and can lead to eutrophication. *E. coli* was not of concern in most basins but was exceeded water quality criteria at CSL1 and CSR1.

5.2. Spatial Patterns

In order to identify spatial patterns in water quality across the watershed, a Kruskal-Wallis and Dunn test was performed to identify statistically significant differences in select parameters at outfall and WSDOT monitoring stations. General spatial patterns and differences in water quality are summarized below.

- Nutrients: Total nitrogen concentrations were generally greater in large basins in the western portion of the project area (including Basins E, F, J, and L) compared to similar basins in the eastern portion of the project area (Figure 7). These differences were statistically significant, with positive Kruskal-Wallis values for Basins E through L and negative values for Basins O through R during base and storm flow events. Historically, springs that the City used as drinking water sources near Basins E and F were abandoned due to nitrate contamination, which these results support. Total phosphorus concentrations displayed a similar but less stark pattern and had statistically significant higher concentrations at CSE1 than at several monitoring stations to the east during both base and storm flow events.
- Metals: Total copper, lead, and zinc were analyzed as part of this monitoring effort. While there were some spatial differences, base flow metals concentrations were generally low and did not exceed chronic water quality criteria. During storm flow, metals concentrations were significantly lower at monitoring stations with relatively high base flow discharge rates, such as CSF1, CSJ1, and CSR1. This indicates that stormwater runoff is being diluted by groundwater (Figures 11 and 17). Concentrations at stations with small contributing areas or large proportions of highway or major arterial roadways, such as WSDOT stations, CSA1, CSAA1, and CSP1, were typically significantly higher for certain metals.
- Organics: PAHs were detected throughout the project area, usually at low concentrations (Figure 12). Monitoring stations CSA1 and CSAA1 exhibited the highest total PAH concentrations, which may be due to the relatively large proportion of highway or railroad right-of-way in these basins. PAHs were also detected fairly frequently in all WSDOT monitoring stations but at lower concentrations than stations CSA1 and CSAA1. Phthalates, particularly BEHP and di-n-butyl phthalate, were detected at least once at every monitoring station. BEHP was more frequently detected at WSDOT stations and generally had higher concentrations that at outfall or upstream stations (Figure 5). Likewise, OC pesticides were infrequently detected across the project area but were most frequently detected at WSDOT stations. Dieldrin appeared to have a specific hot spot at CSWSDOT4 where it was detected in all samples and at greater concentrations than at any other station.

5.3. Basin Prioritization

The purpose of this basin prioritization is to identify monitoring stations or basins that would either (1) benefit from water quality improvements through future stormwater retrofits or (2) be good candidates for long-term monitoring to identify larger trends in water quality over time. The basins presented below were selected based on water quality results from this monitoring project, basin size, measured discharge rates relative to other stations, unique basin characteristics, and ecological value of the main drainage system. For example, while Basins A and AA would benefit from stormwater treatment due to elevated pollutant concentrations (including metals and total PAHs), these basins have relatively small contributing areas and discharge and are primarily conveyed through closed-channel stormwater sewer (as opposed to natural stream channels). Basins with substantial highway contribution are especially of interest due to the relatively high pollutant concentrations observed at WSDOT monitoring stations. The following basins and areas of particular interest would benefit from additional stormwater treatment or retrofit to reduce overall toxics loading to the Columbia River:

- WSDOT sites. Elevated concentrations of priority toxic contaminants (including metals, PAHs, and OC pesticides), TSS, and turbidity were consistently observed at WSDOT monitoring stations. Expanding treatment of highway runoff within the Columbia Slope watershed should be considered the highest priority in reducing toxic metals and organics loading to the Columbia River. The Retrofit Study evaluated multiple potential projects that would treat highway runoff and developed a concept design for a potential regional facility within Basin A (Table 11). This regional facility concept in Basin A was advanced above others within the Retrofit Study in part due to its potential for partnership between WSDOT and the City.
- Basin I-205: This basin encompasses a large area of I-205 and has relatively high impervious and industrial/commercial land cover (60 and 25 percent, respectively). The outfall monitoring station CSWSDOT1 frequently had high flow rates, elevated levels of metals, and organics detections. Future monitoring at CSWSDOT1 would be beneficial to understanding long-term changes in water quality from I-205 and potential impacts on toxics loading to the Columbia River. This basin, particularly the I-205 element, is also a high priority for metals and organic contaminant source control measures. The Retrofit Study identified two potential retrofit projects that would treat runoff from Southeast McGillivray Boulevard and residential roadways near Biddlewood park (Table 11).
- Basin P. This basin encompasses a large stretch of Southeast 164th Avenue, a major arterial road, and has a relatively high impervious and commercial land cover (21 percent). Similar to Basin I-205, the outfall monitoring station CSP1 had relatively high flow rates with elevated levels of certain contaminants. DDx isomers were detected at a slightly higher frequency (50 percent) at this station relative to other outfall monitoring stations. Storm flow zinc and *E. coli* concentrations were also relatively high and exceeded water quality criterion. Proactive stormwater management activities and effectiveness monitoring would be beneficial in this basin to reduce pollutant loading, particularly zinc and DDx isomers, to the Columbia River. Two potential retrofit projects that would treat stormwater from Southeast 164th Avenue (Table 11) were identified under the Retrofit Study.

Additional basins were identified not necessarily as priority sources to reduce toxics loading to the Columbia River, but as basins with potentially high ecological value where continued water quality protections or source control activities should be prioritized. Long-term monitoring may be conducted in these basins as nearby areas are developed, to ensure these small Columbia River tributaries remain protected. These basins include:

- **Basin E.** This basin encompasses a moderately small and almost entirely residential area with a high septic density and mapped springs in the upper basin. Nutrient concentrations at the outfall monitoring station CSE1 were consistently elevated, storm flow turbidity was typically higher than other similar stations, and OC pesticide detections were more frequent than most outfall monitoring stations. The main drainage channel in the lower basin is a natural open-channel stream that is relatively well-connected to the Columbia River. In addition to long-term monitoring, this basin would likely benefit from targeted efforts to decommission existing septic systems and connect to the sewer system.
- **Basin O.** This basin drains a relatively large, primarily residential area with unique characteristics, including a golf course and large stormwater treatment facilities—one of which has been identified as a potential stormwater retrofit site. Several individual OC pesticides were occasionally detected, and some copper and zinc storm concentrations exceeded applicable criteria at the outfall monitoring station CSO1. The main drainage channel in the lower basin is a natural open-channel stream that is relatively well-connected to the Columbia River.
- **Basin R:** The ecological and recreational value of the major stream, Fisher Creek, makes this basin a high priority. The majority of mapped stormwater treatment is relatively high up in the basin; the basin has 10 percent industrial/commercial land cover and over 30 percent impervious area. There is substantial highway area draining to this basin as well. Water quality was generally good in this basin, except for *E. coli*, which exceeded water quality criteria during base and storm flow events.

5.4. Next Steps

5.4.1. Uncertainty and Data Gaps

Limitations to current data and potential new areas to investigate are listed below:

- Water quality data has been collected over a limited period of time in the Columbia Slope watershed. Tracking trends in water quality over long periods of time, as the area is developed and management policies are implemented, is an important component in ensuring proactive environmental stewardship.
- The Columbia Slope monitoring project was developed in part to address the fundamental gap in water quality information in the Columbia Slope watershed. This data gap has been decreased over the course of this study, but multiple basins remain uncharacterized.
- Several parameters compared to water quality criteria were collected using methods that are not necessarily applicable to the relevant water quality criteria. The methods employed were selected to provide an efficient survey of water quality conditions across the basin, but additional investigation may be necessary to determine if water quality in certain areas is impacted. These parameters include the following:
    - Water temperature was collected as an instantaneous measurement, but the applicable water quality criteria is based on a seven-day average daily maximum.
    - E. coli was averaged over the entire project duration instead of 90-day averaging periods with minimum required number of samples per period.
    - Total metals were compared to calculated dissolved metals toxicity.
- The parameters analyzed were comparable to those monitored in other City water quality monitoring projects. These parameters cover most typical contaminants of concern in urban and highway stormwater runoff. However, several SVOCs and OC pesticides are difficult to detect at low levels, with laboratory reporting and detection limits up to several orders of magnitude greater than applicable water quality criteria. Additional stormwater contaminants of concern for the Columbia River (e.g., arsenic or dioxin) and emerging pollutants, including 6PPD-quinone (which is acutely toxic to coho salmon and prevalent in urban streams and stormwater (Tian et al, 2020)) have not been monitored in the watershed. This may represent a gap in water quality data.
- Relative flow contributions (through instantaneous flow measurements and contributing area data) were considered in the interpretation of water quality results and subsequent basin prioritization, but a quantitative pollutant loading analysis was not conducted.

5.4.2. Management Activities

The City employs a hands-on, multifaceted approach to surface water management, including (but not limited to) stormwater retrofit, stream restoration, planning activities, public education, outreach, partnerships with non-profit organizations, source control and illicit discharge detection and elimination. Water quality in the Columbia Slope basins monitored under this project is generally good, and

continued implementation of proactive surface water management programs by the City, particularly in areas of increased development, should remain a priority to protect surface water and groundwater quality in the watershed.

Efforts are currently underway to retrofit existing stormwater management facilities in the Columbia Slope watershed. The ten potential project concepts that have been developed under the Retrofit Study are presented in Table 11. If feasible, implementation of these planned retrofits, particularly in Basins P and I-205, should be prioritized. Continued emphasis on identifying other suitable facilities for retrofit or locations for new facilities, particularly ones that treat highway or major arterial road runoff, is another important component of protecting water quality in the watershed. City partnerships with WSDOT and use of WSDOT stormwater fees to improve or construct stormwater facilities are high priorities, given the relatively high pollutant concentrations observed at the highway monitoring stations.

Table 11. Stormwater Retrofit Concepts for the Columbia Slope Basin.

Concept Number	Potential Project Name	Description	Basin(s)	Treated Area (PGIS Acres)
C1	Regional Facility at C-TRAN Fisher Landing Transit Center	Regional treatment facility to treat SE 164th Ave	P	12.1
C2	Treatment Facilities at SE 164th Ave	Manufactured treatment facility to treat SE 164th Ave	P	3.4
C3	Green Street on MacArthur Blvd	Green street facilities to treat MacArthur Blvd	B, D	7.5
C4	Green Street on SE McGillivray Blvd	Green street facilities to treat McGillivray Blvd	I-205, J, K, O	13.9
C5	Regional Facility at Wy'East School Community Park	Regional treatment facility to treat SE 136th Ave, SE 7th Ave and residential area	K	12.4
C6	Regional Facility at State Route 14 and SE Riverside Drive	Regional treatment facility to treat highway and residential area	A	9.3
C7	Regional Facility at Wintler Community Park	Regional treatment facility to treat residential area	AA	3.9
C9	Regional Facility at Biddlewood Park	Regional treatment facility to treat a large residential area	I-205	20.0
C10	Green Street on SE Talton Ave	Green street facilities to treat SE Talton Ave	K, J	2.0
C12	Pond Retrofit at SE Cascade Park Dr	Retrofit existing pond to increase treatment of Cascade Park Drive, residential subdivision, and commercial areas including a golf course	O	53.0

Other existing City-wide management activities, including the Sewer Connection Incentive Program (SCIP), should be continued. Targeting septic systems within Basin E and Basin F to address elevated nutrient concentrations observed in these basins is recommended. Retrofit projects to treat stormwater prior to infiltration could be considered, as stormwater runoff north of SR-14 is primarily managed by drywells in these basins. Herrera recommends that the City continues public education efforts through

programs such as Urban Forestry to encourage responsible use of fertilizers and pesticides by residents and businesses.

Ecology is currently developing a Total Maximum Daily Load Advance Restoration Plan for the nearby urban stream Burnt Bridge Creek. This plan is intended to guide the City's voluntary implementation of BMPs to meet water quality standards. Where feasible and beneficial, the City should consider expanding elements of this program to priority areas in the Columbia Slope watershed.

5.4.3. Targeted Monitoring

Future targeted monitoring programs in the Columbia Slope watershed may be conducted with varying objectives, including outfall sampling in uncharacterized basins, source control effectiveness monitoring after implementation of stormwater BMPs or management activities, or watershed-wide sampling for additional contaminants of concern. While potential future project designs may be substantially different from this program, many results from this monitoring program will be relevant to future efforts as summarized below.

Uncharacterized basins that are a high priority for future monitoring are listed below. The Retrofit Study identified at least one project in each of these basins (Table 11). Future monitoring could be useful for establishing baseline conditions and evaluating BMP effectiveness:

- Basin B: High levels of the OC pesticide dieldrin were present in samples collected at CSWSDOT4, which is located in Basin B. Monitoring at the Basin B outfall and/or upstream of the highway would help determine whether this is localized or basin-wide contamination.
- Basin D: No samples have been collected to date in this mid-sized basin. Basin D features a relatively large number of mapped septic systems, a well-connected upper basin drainage system, and a relatively large proportion of SR-14 highway.
- Basin K: In the Columbia Slope watershed, Basin K is the largest basin in which no samples have been collected. Several mapped springs are located in the basin, and there is a unique wetland feature in the lower portion of the basin.

Ideally, effectiveness monitoring should be conducted at previously monitored stations where baseline conditions have been appropriately established. Depending on the target management activity or source control measure, one or multiple monitoring stations may be chosen for long-term monitoring of select parameters. For example, the City's SCIP is intended to make public sewer available to reduce reliance on private septic systems and potential septic system releases to groundwater. Long-term base flow monitoring for nutrients at CSE1 or CSE3 may be conducted to determine the effectiveness of a hypothetical SCIP project in Basin E, which has a high septic density.

Watershed-wide surveys of contaminants of emerging concern can be conducted at multiple stations over a short period of time. Priority basins described in Section 5.3 generally represent drainage systems that have higher ecological value or potential to impact water quality in the Columbia River and should be used as a starting point for developing an experimental design. Target parameters may include

priority toxics impacting the Columbia River (e.g., dioxins) or contaminants of emerging concern (e.g., 6PPD-q or PFAS).

5.4.4. Data Collection and Analysis

Future evaluations of BMP effectiveness to inform management activities will not only rely on a robust water quality dataset, but also on data pertaining to management activities. The City's ability to accurately and efficiently tie changes in water quality to various watershed activities will be greatly impacted by data quality, completeness, resolution, and format. Herrera recommends that the City continues to evaluate and improve upon its existing record keeping practices to ensure that data pertaining to management activities can be easily accessed and analyzed. If feasible, strategies such as automation and centralized databases could be useful, with upfront planning and built in flexibility within the database structure to ensure key information is collected. The City might also consider if involvement of developers and/or the public, through online forms or other data collection methods, could be added or improved upon to preserve City time and resources. While data collection and management can require significant resources and be challenging across multiple departments, even relatively small, targeted steps can make a significant impact. For example, including additional information during GIS database updates, such as timing of septic system decommission or treated contributing area for new stormwater facilities, would allow for more detailed and accurate analysis of effectiveness.

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Appendix A

Water Quality Summary Statistics

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Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Turbidity (NTU)										
CSAA1	Base	6	0	4.4	7.8	8.8	9.6	11.2	14.0	16.2
CSE1	Base	12	0	1.3	1.8	3.0	3.2	3.7	4.5	7.8
CSE3	Base	6	0	0.3	0.6	0.6	0.6	0.8	0.9	1.0
CSF1	Base	6	0	0.4	0.7	0.8	0.9	1.1	1.3	1.4
CSH1	Base	6	0	1.6	1.7	2.3	2.7	2.9	4.3	5.5
CSJ1	Base	6	0	0.4	0.5	0.6	0.7	0.7	0.9	1.1
CSL1	Base	6	0	1.1	1.6	2.0	2.0	2.3	2.6	2.9
CSO1	Base	12	0	0.7	1.1	2.3	2.1	3.0	3.3	3.8
CSP1	Base	12	0	0.2	0.3	0.4	0.5	0.6	1.1	1.2
CSQ1	Base	6	0	0.9	1.0	1.4	1.5	1.8	2.3	2.8
CSR1	Base	12	0	0.8	1.5	2.1	2.7	2.9	4.3	8.7
CSR2	Base	3	0	3.3	4.9	6.5	5.5	6.6	6.6	6.6
CSWSDOT1	Base	6	0	0.3	0.3	0.4	0.5	0.5	0.7	0.8
CSA1	Storm	6	0	10.7	11.6	12.6	13.5	15.6	16.9	17.4
CSAA1	Storm	6	0	9.2	12.0	13.2	19.4	16.1	34.4	52.0
CSBMP1_IN	Storm	6	0	3.5	4.2	4.9	5.1	5.9	6.6	7.0
CSBMP1_OUT	Storm	6	0	2.4	2.6	3.8	5.0	6.2	8.8	10.9
CSE1	Storm	18	0	1.9	7.2	11.4	14.7	17.0	23.0	61.5
CSE2	Storm	6	0	12.1	13.4	14.9	15.0	16.8	17.6	18.0
CSE3	Storm	6	0	1.9	2.7	3.6	5.3	6.9	10.1	12.5
CSF1	Storm	6	0	0.8	0.9	1.1	2.5	1.7	5.7	9.5
CSH1	Storm	12	0	2.8	5.4	8.3	7.9	9.6	11.7	12.4
CSJ1	Storm	6	0	0.5	0.8	1.4	2.1	2.6	4.4	5.8
CSL1	Storm	12	0	2.4	4.2	4.8	11.3	11.2	24.7	51.0
CSO1	Storm	18	0	1.0	5.4	6.9	7.6	8.4	12.5	21.6
CSP1	Storm	18	0	0.9	2.4	5.5	6.0	7.5	9.6	20.3
CSQ1	Storm	12	0	2.2	3.9	6.6	9.6	12.6	19.5	26.4
CSR1	Storm	18	0	2.1	6.0	10.0	13.4	17.4	27.4	39.4
CSR2	Storm	6	0	5.0	5.4	7.5	7.7	9.9	10.4	10.5
CSWSDOT1	Storm	12	0	1.2	5.2	11.4	15.1	17.6	27.1	57.6
CSWSDOT2	Storm	6	0	14.4	22.8	45.4	59.0	84.7	115	136
CSWSDOT3	Storm	6	0	17.5	19.7	42.8	60.7	104	122	125
CSWSDOT4	Storm	12	0	4.3	6.2	10.6	17.8	26.4	33.8	58.5
CSWSDOT5	Storm	6	0	4.0	19.6	41.0	38.8	60.2	64.3	68.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Total Suspended Solids (TSS) (mg/L)										
CSAA1	Base	6	0	5.5	9.2	15.7	13.5	17.0	18.4	19.7
CSE1	Base	12	0	2.4	6.2	8.6	9.7	10.8	14.9	25.8
CSE3	Base	6	50	0.5	0.5	1.4	3.4	4.8	8.2	10.8
CSF1	Base	6	17	0.6	1.8	2.4	3.0	2.9	5.6	8.2
CSH1	Base	6	0	2.6	4.3	6.6	8.3	12.5	14.9	15.8
CSJ1	Base	6	17	0.5	1.3	1.7	2.3	3.1	4.3	5.1
CSL1	Base	6	0	1.6	2.2	5.3	6.5	10.5	12.3	13.1
CSO1	Base	12	0	1.1	2.6	5.1	4.8	6.0	7.7	8.6
CSP1	Base	12	100	0.5	0.5	0.5	0.5	0.5	0.5	0.6
CSQ1	Base	6	17	0.2	1.2	2.5	5.1	7.5	12.2	15.6
CSR1	Base	12	8	1.0	1.8	2.6	2.9	2.8	4.1	7.6
CSR2	Base	3	0	1.2	1.2	1.3	1.6	1.9	2.2	2.4
CSWSDOT1	Base	6	67	0.5	0.5	0.5	1.6	0.9	3.9	6.8
CSA1	Storm	6	0	1.0	1.1	1.7	2.0	2.2	3.2	4.3
CSAA1	Storm	6	0	7.9	10.2	11.4	14.7	12.2	23.8	35.2
CSBMP1_IN	Storm	6	0	4.3	5.7	5.8	10.6	10.8	21.0	29.6
CSBMP1_OUT	Storm	6	0	1.8	2.5	4.7	5.0	7.5	8.4	8.7
CSE1	Storm	18	0	4.6	11.8	16.5	31.6	26.8	50.8	220
CSE2	Storm	6	0	7.3	8.8	12.7	12.4	14.1	17.2	19.9
CSE3	Storm	6	17	0.2	1.2	2.0	4.8	3.7	11.8	19.6
CSF1	Storm	6	0	2.0	2.2	2.4	5.2	2.6	11.2	19.8
CSH1	Storm	12	0	4.0	6.8	11.5	12.7	15.3	17.1	37.0
CSJ1	Storm	6	0	1.0	1.5	1.9	3.5	3.9	7.6	10.5
CSL1	Storm	12	0	2.1	4.5	7.6	8.3	9.5	15.5	19.4
CSO1	Storm	18	0	1.6	5.8	8.4	12.9	11.7	21.0	73.4
CSP1	Storm	18	6	0.3	1.8	3.2	6.7	5.4	15.0	43.2
CSQ1	Storm	12	0	2.7	6.9	9.6	26.2	40.3	71.5	87.1
CSR1	Storm	18	0	1.7	5.1	8.3	21.0	27.6	42.8	122
CSR2	Storm	6	0	1.5	2.7	2.9	3.7	4.7	6.2	7.0
CSWSDOT1	Storm	12	17	0.2	1.5	6.4	13.8	18.1	20.9	76.5
CSWSDOT2	Storm	6	0	11.5	23.1	45.2	157	135	411	661
CSWSDOT3	Storm	6	0	13.0	17.0	41.9	102	96.0	252	395
CSWSDOT4	Storm	12	25	0.1	0.9	5.1	12.8	13.3	26.9	76.6
CSWSDOT5	Storm	6	0	1.8	11.0	23.7	27.6	42.9	53.5	60.5

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Total Phosphorus (mg/L)										
CSAA1	Base	6	0	0.051	0.083	0.104	0.092	0.107	0.109	0.111
CSE1	Base	12	0	0.124	0.136	0.146	0.146	0.155	0.164	0.165
CSE3	Base	6	0	0.057	0.145	0.147	0.135	0.154	0.158	0.159
CSF1	Base	6	0	0.099	0.102	0.104	0.104	0.108	0.108	0.109
CSH1	Base	6	0	0.056	0.062	0.069	0.071	0.081	0.085	0.086
CSJ1	Base	6	0	0.060	0.076	0.078	0.082	0.086	0.100	0.114
CSL1	Base	6	0	0.074	0.079	0.080	0.083	0.083	0.093	0.102
CSO1	Base	12	0	0.055	0.064	0.070	0.072	0.080	0.085	0.097
CSP1	Base	12	0	0.058	0.064	0.072	0.074	0.080	0.092	0.093
CSQ1	Base	6	0	0.051	0.055	0.064	0.064	0.073	0.076	0.079
CSR1	Base	12	0	0.057	0.070	0.079	0.078	0.086	0.088	0.113
CSR2	Base	3	0	0.069	0.086	0.103	0.092	0.104	0.105	0.105
CSWSDOT1	Base	6	0	0.066	0.068	0.072	0.072	0.076	0.078	0.079
CSA1	Storm	6	0	0.093	0.096	0.100	0.108	0.109	0.130	0.149
CSAA1	Storm	6	0	0.087	0.097	0.106	0.113	0.130	0.144	0.150
CSBMP1_IN	Storm	6	0	0.043	0.048	0.052	0.058	0.065	0.077	0.086
CSBMP1_OUT	Storm	6	0	0.045	0.060	0.078	0.074	0.087	0.093	0.098
CSE1	Storm	18	0	0.103	0.116	0.133	0.136	0.143	0.167	0.210
CSE2	Storm	6	0	0.071	0.076	0.087	0.095	0.115	0.127	0.130
CSE3	Storm	6	0	0.081	0.100	0.117	0.113	0.130	0.131	0.132
CSF1	Storm	6	0	0.103	0.104	0.106	0.114	0.110	0.130	0.150
CSH1	Storm	12	0	0.061	0.068	0.071	0.082	0.086	0.122	0.127
CSJ1	Storm	6	0	0.084	0.087	0.088	0.090	0.093	0.098	0.100
CSL1	Storm	12	0	0.068	0.074	0.080	0.088	0.086	0.098	0.180
CSO1	Storm	18	0	0.058	0.071	0.074	0.084	0.088	0.108	0.185
CSP1	Storm	18	0	0.039	0.050	0.061	0.062	0.070	0.077	0.123
CSQ1	Storm	12	0	0.054	0.058	0.065	0.086	0.088	0.152	0.201
CSR1	Storm	18	0	0.048	0.066	0.094	0.097	0.107	0.134	0.239
CSR2	Storm	6	0	0.074	0.088	0.090	0.102	0.103	0.134	0.161
CSWSDOT1	Storm	12	0	0.058	0.059	0.064	0.083	0.086	0.091	0.239
CSWSDOT2	Storm	6	0	0.044	0.076	0.170	0.276	0.280	0.604	0.910
CSWSDOT3	Storm	6	0	0.062	0.084	0.154	0.192	0.236	0.348	0.455
CSWSDOT4	Storm	12	0	0.055	0.071	0.076	0.092	0.104	0.154	0.169
CSWSDOT5	Storm	6	0	0.026	0.044	0.074	0.072	0.102	0.109	0.113

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Total Nitrogen (mg/L)										
CSAA1	Base	6	0	0.97	1.14	1.65	1.48	1.72	1.80	1.88
CSE1	Base	12	0	5.22	5.48	5.64	5.72	5.76	6.45	6.54
CSE3	Base	6	0	5.83	6.02	6.61	6.44	6.83	6.86	6.89
CSF1	Base	6	0	5.42	5.58	5.68	5.68	5.77	5.88	5.98
CSH1	Base	6	0	3.15	3.35	3.38	3.45	3.61	3.72	3.76
CSJ1	Base	6	0	4.17	4.25	4.50	4.56	4.85	5.01	5.08
CSL1	Base	6	0	4.06	4.23	4.30	4.37	4.45	4.66	4.83
CSO1	Base	12	0	1.58	1.89	1.98	2.01	2.14	2.38	2.54
CSP1	Base	12	0	2.19	2.46	2.85	2.88	3.28	3.44	3.81
CSQ1	Base	6	0	1.98	2.10	2.19	2.23	2.31	2.46	2.58
CSR1	Base	12	0	0.85	1.10	1.45	1.46	1.69	2.01	2.33
CSR2	Base	3	0	0.32	0.46	0.59	0.53	0.64	0.67	0.69
CSWSDOT1	Base	6	0	2.80	3.17	3.38	3.41	3.71	3.86	3.96
CSA1	Storm	6	0	3.03	3.55	4.02	4.02	4.47	4.81	5.05
CSAA1	Storm	6	0	1.13	1.65	2.04	2.09	2.18	2.88	3.58
CSBMP1_IN	Storm	6	0	0.63	1.24	1.26	1.33	1.45	1.78	2.05
CSBMP1_OUT	Storm	6	0	0.93	1.11	1.61	1.65	2.08	2.34	2.58
CSE1	Storm	18	0	1.96	3.10	4.02	3.94	4.61	5.53	6.04
CSE2	Storm	6	0	1.53	1.60	1.69	2.32	2.23	3.71	5.03
CSE3	Storm	6	0	1.06	2.66	4.46	3.88	5.33	5.50	5.65
CSF1	Storm	6	0	4.98	5.16	5.42	5.50	5.84	6.03	6.12
CSH1	Storm	12	0	2.38	2.65	2.94	3.12	3.08	3.87	5.49
CSJ1	Storm	6	0	3.71	4.00	4.08	4.26	4.55	4.85	4.99
CSL1	Storm	12	0	2.91	3.15	3.62	3.58	3.96	4.04	4.35
CSO1	Storm	18	0	0.80	1.31	1.56	1.58	1.90	2.14	2.41
CSP1	Storm	18	0	0.25	1.06	1.93	1.72	2.26	2.53	3.12
CSQ1	Storm	12	0	0.75	1.24	1.49	1.48	1.68	1.90	2.48
CSR1	Storm	18	0	0.42	0.59	0.76	0.78	0.98	1.06	1.11
CSR2	Storm	6	0	0.39	0.60	0.66	0.63	0.71	0.74	0.78
CSWSDOT1	Storm	12	0	0.75	1.76	2.24	2.19	2.73	3.02	3.29
CSWSDOT2	Storm	6	0	0.47	0.67	0.92	1.06	1.47	1.72	1.80
CSWSDOT3	Storm	6	0	0.43	0.68	0.90	1.02	0.98	1.64	2.29
CSWSDOT4	Storm	12	0	1.37	2.22	2.48	2.54	2.78	3.11	4.03
CSWSDOT5	Storm	6	0	0.67	1.08	1.52	1.49	1.78	2.10	2.42

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Nitrate+Nitrite as Nitrogen (mg/L)										
CSAA1	Base	6	0	0.70	0.79	1.11	1.06	1.30	1.36	1.40
CSE1	Base	12	0	4.69	4.97	4.99	5.07	5.21	5.33	5.50
CSE3	Base	6	0	5.37	5.57	5.72	5.76	6.00	6.10	6.14
CSF1	Base	6	0	4.81	4.92	5.00	5.03	5.17	5.24	5.27
CSH1	Base	6	0	2.77	2.90	2.94	2.91	2.96	2.97	2.98
CSJ1	Base	6	0	3.30	3.70	3.75	3.69	3.77	3.83	3.88
CSL1	Base	6	0	3.60	3.62	3.70	3.70	3.79	3.80	3.81
CSO1	Base	12	0	0.94	1.19	1.55	1.51	1.74	1.94	2.30
CSP1	Base	12	0	2.05	2.15	2.29	2.39	2.63	2.78	2.83
CSQ1	Base	6	0	1.72	1.82	1.84	1.87	1.95	2.01	2.02
CSR1	Base	12	0	0.37	0.77	1.02	0.96	1.18	1.33	1.36
CSR2	Base	3	33	0.04	0.04	0.04	0.09	0.12	0.16	0.19
CSWSDOT1	Base	6	0	2.23	2.31	2.54	2.72	3.13	3.41	3.48
CSA1	Storm	6	0	2.61	2.92	3.31	3.41	3.91	4.19	4.31
CSAA1	Storm	6	0	0.76	0.94	1.25	1.49	1.63	2.39	3.08
CSBMP1_IN	Storm	6	0	0.43	0.68	0.84	0.91	1.07	1.33	1.55
CSBMP1_OUT	Storm	6	0	0.55	0.85	1.21	1.23	1.59	1.81	1.96
CSE1	Storm	18	0	1.18	2.57	3.36	3.30	4.08	4.58	5.03
CSE2	Storm	6	0	0.81	0.97	1.17	1.67	1.50	2.97	4.33
CSE3	Storm	6	0	0.38	2.01	3.83	3.27	4.81	4.96	5.05
CSF1	Storm	6	0	4.37	4.67	4.88	4.92	5.22	5.39	5.48
CSH1	Storm	12	0	1.84	2.01	2.32	2.34	2.52	2.80	3.13
CSJ1	Storm	6	0	3.35	3.43	3.64	3.62	3.80	3.87	3.89
CSL1	Storm	12	0	1.98	2.68	2.95	2.93	3.25	3.36	3.63
CSO1	Storm	18	0	0.42	0.75	1.08	1.08	1.26	1.67	1.99
CSP1	Storm	18	0	0.08	0.69	1.17	1.21	1.61	2.24	2.36
CSQ1	Storm	12	0	0.31	0.78	0.98	1.03	1.35	1.61	1.72
CSR1	Storm	18	0	0.13	0.20	0.27	0.28	0.33	0.38	0.62
CSR2	Storm	6	33	0.05	0.07	0.09	0.09	0.12	0.13	0.13
CSWSDOT1	Storm	12	0	0.43	1.25	1.82	1.70	2.23	2.62	2.78
CSWSDOT2	Storm	6	0	0.02	0.12	0.15	0.20	0.29	0.36	0.39
CSWSDOT3	Storm	6	0	0.08	0.14	0.18	0.23	0.29	0.39	0.47
CSWSDOT4	Storm	12	0	0.41	1.68	1.85	1.91	2.17	2.96	3.17
CSWSDOT5	Storm	6	0	0.27	0.32	0.41	0.42	0.53	0.57	0.59

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Total Kjeldahl Nitrogen (TKN) (mg/L)										
CSAA1	Base	6	0	0.24	0.28	0.37	0.42	0.47	0.62	0.76
CSE1	Base	12	0	0.24	0.42	0.66	0.65	0.76	1.01	1.26
CSE3	Base	6	0	0.26	0.52	0.62	0.68	0.74	1.04	1.32
CSF1	Base	6	0	0.36	0.46	0.61	0.65	0.86	0.94	0.98
CSH1	Base	6	0	0.38	0.40	0.48	0.54	0.66	0.75	0.78
CSJ1	Base	6	0	0.32	0.48	0.96	0.88	1.25	1.31	1.34
CSL1	Base	6	0	0.44	0.47	0.59	0.67	0.81	0.97	1.06
CSO1	Base	12	0	0.16	0.26	0.44	0.50	0.61	0.88	1.22
CSP1	Base	12	0	0.08	0.23	0.50	0.49	0.62	0.96	1.02
CSQ1	Base	6	0	0.24	0.28	0.35	0.36	0.38	0.47	0.56
CSR1	Base	12	0	0.20	0.34	0.39	0.50	0.62	0.95	1.00
CSR2	Base	3	0	0.28	0.39	0.50	0.46	0.55	0.58	0.60
CSWSDOT1	Base	6	0	0.42	0.50	0.62	0.69	0.87	0.99	1.04
CSA1	Storm	6	0	0.42	0.53	0.64	0.62	0.72	0.75	0.76
CSAA1	Storm	6	0	0.24	0.47	0.64	0.60	0.80	0.82	0.84
CSBMP1_IN	Storm	6	0	0.14	0.28	0.51	0.42	0.55	0.58	0.60
CSBMP1_OUT	Storm	6	0	0.14	0.22	0.46	0.42	0.60	0.66	0.70
CSE1	Storm	18	0	0.28	0.47	0.64	0.64	0.76	0.93	1.12
CSE2	Storm	6	0	0.40	0.54	0.68	0.65	0.78	0.83	0.86
CSE3	Storm	6	0	0.48	0.60	0.63	0.61	0.66	0.67	0.68
CSF1	Storm	6	0	0.32	0.37	0.60	0.58	0.77	0.80	0.82
CSH1	Storm	12	0	0.12	0.54	0.66	0.78	0.84	1.12	2.36
CSJ1	Storm	6	0	0.34	0.43	0.54	0.63	0.80	0.98	1.10
CSL1	Storm	12	0	0.20	0.46	0.71	0.66	0.86	0.98	0.98
CSO1	Storm	18	0	0.08	0.31	0.47	0.50	0.62	0.77	1.38
CSP1	Storm	18	6	0.04	0.32	0.52	0.51	0.66	0.80	1.38
CSQ1	Storm	12	8	0.26	0.38	0.44	0.47	0.54	0.67	0.76
CSR1	Storm	18	0	0.10	0.39	0.46	0.50	0.62	0.79	0.88
CSR2	Storm	6	0	0.28	0.54	0.58	0.56	0.62	0.71	0.78
CSWSDOT1	Storm	12	8	0.21	0.41	0.53	0.51	0.66	0.71	0.82
CSWSDOT2	Storm	6	0	0.30	0.51	0.67	0.87	1.16	1.54	1.78
CSWSDOT3	Storm	6	0	0.24	0.51	0.71	0.79	0.80	1.32	1.82
CSWSDOT4	Storm	12	0	0.08	0.43	0.61	0.63	0.81	0.95	1.34
CSWSDOT5	Storm	6	0	0.36	0.60	1.11	1.07	1.26	1.68	2.08

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Chloride (mg/L)										
CSAA1	Base	6	0	6.0	6.5	6.9	6.9	7.5	7.6	7.6
CSE1	Base	12	0	7.1	7.4	7.7	7.6	7.8	7.9	8.0
CSE3	Base	6	0	7.0	7.0	7.2	7.3	7.4	7.6	7.8
CSF1	Base	6	0	8.2	8.5	8.7	8.9	9.0	9.5	10.0
CSH1	Base	6	0	7.7	7.9	8.2	8.2	8.6	8.8	8.8
CSJ1	Base	6	0	5.3	5.4	5.9	5.8	6.2	6.3	6.3
CSL1	Base	6	0	6.7	6.8	7.6	7.6	8.3	8.5	8.6
CSO1	Base	12	0	9.1	9.6	10.1	10.2	10.8	11.2	12.2
CSP1	Base	12	0	7.4	9.6	11.5	11.9	13.6	15.2	19.9
CSQ1	Base	6	0	4.8	7.6	8.1	7.9	9.3	9.6	9.6
CSR1	Base	12	0	4.5	5.2	5.7	6.1	6.4	7.5	10.4
CSR2	Base	3	0	4.7	4.9	5.0	6.0	6.7	7.7	8.3
CSWSDOT1	Base	6	0	6.2	6.3	6.9	7.0	7.6	7.9	8.2
CSA1	Storm	6	0	10.5	11.9	16.0	15.3	18.5	19.3	19.7
CSAA1	Storm	6	0	3.9	9.9	11.3	10.8	13.1	14.6	15.6
CSBMP1_IN	Storm	6	0	2.0	2.8	4.0	3.8	4.6	5.2	5.8
CSBMP1_OUT	Storm	6	0	3.1	4.7	6.9	6.3	7.9	8.4	8.8
CSE1	Storm	18	0	4.5	6.9	7.8	7.7	8.3	10.4	11.5
CSE2	Storm	6	0	4.4	4.5	5.2	6.0	7.6	8.5	8.8
CSE3	Storm	6	0	3.3	5.8	6.8	6.6	7.8	8.5	9.0
CSF1	Storm	6	0	7.9	8.4	8.9	8.8	9.1	9.3	9.5
CSH1	Storm	12	0	5.4	8.0	8.4	8.7	9.9	11.1	12.0
CSJ1	Storm	6	0	5.2	5.6	5.8	6.6	6.0	8.6	11.1
CSL1	Storm	12	0	4.6	5.9	6.0	6.0	6.3	6.5	7.1
CSO1	Storm	18	0	2.5	6.2	7.0	7.2	9.0	9.8	10.9
CSP1	Storm	18	0	0.6	5.1	7.5	6.9	8.9	10.0	14.1
CSQ1	Storm	12	0	1.3	4.5	5.2	5.5	7.7	8.3	8.5
CSR1	Storm	18	0	2.8	5.0	6.4	7.0	8.1	10.2	17.5
CSR2	Storm	6	0	3.6	3.7	3.9	3.9	4.0	4.2	4.3
CSWSDOT1	Storm	12	0	6.5	8.9	10.1	12.2	11.1	15.8	35.8
CSWSDOT2	Storm	6	0	1.9	2.6	5.9	12.4	24.2	29.2	29.2
CSWSDOT3	Storm	6	0	4.0	5.5	7.4	12.9	9.0	26.8	44.2
CSWSDOT4	Storm	12	0	3.1	4.6	5.5	7.1	7.7	14.0	15.1
CSWSDOT5	Storm	6	0	7.9	9.5	9.9	10.7	11.4	13.6	15.2

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Escherichia coli (MPN/100 mL) [a]										
CSAA1	Base	6	0	10	19	58	51	129	256	365
CSE1	Base	12	0	10	58	66	53	78	111	124
CSE3	Base	6	17	0	2	4	3	7	19	31
CSF1	Base	6	0	7	15	40	36	109	135	142
CSH1	Base	6	0	12	38	40	56	69	313	548
CSJ1	Base	6	0	2	10	28	23	50	184	317
CSL1	Base	6	0	23	27	106	94	335	452	517
CSO1	Base	12	0	8	20	76	51	136	156	167
CSP1	Base	12	17	0	2	4	5	29	121	150
CSQ1	Base	6	0	6	11	29	32	102	182	238
CSR1	Base	12	0	19	42	124	107	219	680	980
CSR2	Base	3	0	7	16	26	17	28	28	29
CSWSDOT1	Base	6	33	0	1	2	1	3	4	4
CSA1	Storm	6	0	9	57	194	132	607	772	816
CSAA1	Storm	6	0	6	209	288	196	448	846	1203
CSBMP1_IN	Storm	6	0	80	108	170	164	179	348	517
CSBMP1_OUT	Storm	6	0	7	37	99	64	159	262	345
CSE1	Storm	18	0	6	52	86	91	192	289	1120
CSE2	Storm	6	0	7	30	78	57	148	213	260
CSE3	Storm	6	0	2	17	94	55	292	732	1120
CSF1	Storm	6	0	11	34	52	87	504	688	727
CSH1	Storm	12	0	10	28	74	83	227	603	613
CSJ1	Storm	6	0	10	26	33	38	69	112	144
CSL1	Storm	12	0	46	125	177	184	278	385	770
CSO1	Storm	18	0	4	45	82	72	174	313	365
CSP1	Storm	18	0	3	139	356	225	526	1381	2420
CSQ1	Storm	12	0	22	182	400	313	679	1181	1553
CSR1	Storm	18	0	29	156	240	253	510	784	1046
CSR2	Storm	6	0	12	161	164	149	202	597	980
CSWSDOT1	Storm	12	0	26	154	278	251	448	570	816
CSWSDOT2	Storm	6	0	35	84	174	206	782	1140	1300
CSWSDOT3	Storm	6	0	34	105	124	193	267	1692	3076
CSWSDOT4	Storm	12	8	2	23	82	45	128	181	649
CSWSDOT5	Storm	6	0	37	98	200	200	339	959	1553

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Temperature (degrees C)										
CSAA1	Base	6	0	9.8	14.1	15.8	15.1	17.2	17.6	17.8
CSE1	Base	12	0	9.8	11.4	13.0	12.7	14.0	14.4	14.6
CSE3	Base	6	0	11.8	12.8	13.6	13.4	14.3	14.6	14.7
CSF1	Base	6	0	11.1	11.8	12.6	12.8	13.6	14.6	15.4
CSH1	Base	6	0	8.2	12.6	13.6	13.3	15.4	15.9	16.2
CSJ1	Base	6	0	9.7	10.8	12.1	12.4	13.3	15.1	16.7
CSL1	Base	6	0	11.7	13.1	14.3	14.4	15.9	16.7	17.0
CSO1	Base	12	0	9.4	11.4	13.2	13.5	16.0	16.2	17.1
CSP1	Base	12	0	12.8	13.3	14.3	14.6	15.8	16.4	16.8
CSQ1	Base	6	0	12.1	12.3	13.1	13.4	14.2	14.9	15.4
CSR1	Base	12	0	7.7	9.5	13.4	12.5	15.3	15.5	16.1
CSR2	Base	3	0	4.3	5.4	6.5	5.8	6.6	6.6	6.6
CSWSDOT1	Base	6	0	11.3	11.8	12.6	12.8	13.6	14.4	15.0
CSA1	Storm	6	0	8.0	8.4	8.9	9.8	11.2	12.3	12.9
CSAA1	Storm	6	0	7.2	8.1	9.0	9.0	9.8	10.3	10.7
CSBMP1_IN	Storm	6	0	6.8	8.4	9.2	9.2	10.1	10.8	11.4
CSBMP1_OUT	Storm	6	0	8.0	8.8	9.3	9.5	10.4	10.8	11.0
CSE1	Storm	18	0	7.4	9.2	10.0	10.1	11.2	11.8	12.4
CSE2	Storm	6	0	7.7	8.0	8.6	9.6	10.9	12.4	13.2
CSE3	Storm	6	0	7.3	10.0	11.2	10.8	11.7	12.8	13.6
CSF1	Storm	6	0	10.5	11.4	11.9	11.7	12.2	12.3	12.5
CSH1	Storm	12	0	8.6	9.4	9.8	10.1	10.4	11.7	12.7
CSJ1	Storm	6	0	8.9	10.2	10.9	10.7	11.4	11.6	11.7
CSL1	Storm	12	0	9.6	10.3	10.8	11.0	11.3	12.2	13.8
CSO1	Storm	18	0	7.4	8.6	9.9	10.0	11.2	12.1	13.0
CSP1	Storm	18	0	8.4	9.4	10.8	11.1	12.4	14.0	15.0
CSQ1	Storm	12	0	7.6	8.6	9.8	9.8	10.7	11.4	12.9
CSR1	Storm	18	0	4.2	7.3	8.4	8.7	9.9	11.7	13.9
CSR2	Storm	6	0	3.4	6.3	7.8	7.4	8.6	9.9	10.9
CSWSDOT1	Storm	12	0	8.0	9.8	10.8	10.5	10.9	11.1	14.0
CSWSDOT2	Storm	6	0	3.8	7.6	9.5	9.1	10.8	12.4	13.6
CSWSDOT3	Storm	6	0	4.4	7.8	9.3	9.0	10.4	11.7	12.7
CSWSDOT4	Storm	12	0	6.4	9.0	9.2	9.7	10.2	12.0	13.4
CSWSDOT5	Storm	6	0	4.8	6.9	7.3	7.2	7.8	8.4	9.1

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
pH (-)										
CSAA1	Base	6	0	7.85	7.87	7.89	7.92	7.96	8.01	8.04
CSE1	Base	12	0	7.59	7.84	7.85	7.85	7.90	7.96	7.98
CSE3	Base	6	0	7.05	7.09	7.24	7.21	7.32	7.34	7.34
CSF1	Base	6	0	7.69	7.76	7.80	7.80	7.87	7.88	7.89
CSH1	Base	6	0	7.71	7.72	7.76	7.78	7.84	7.86	7.86
CSJ1	Base	6	0	7.13	7.22	7.26	7.30	7.30	7.45	7.59
CSL1	Base	6	0	7.47	7.54	7.62	7.60	7.66	7.70	7.71
CSO1	Base	12	0	7.12	7.67	7.72	7.67	7.74	7.76	7.85
CSP1	Base	12	0	7.09	7.55	7.83	7.67	7.86	7.89	8.05
CSQ1	Base	6	0	7.30	7.43	7.53	7.49	7.55	7.60	7.65
CSR1	Base	12	0	7.23	7.50	7.66	7.62	7.74	7.83	7.85
CSR2	Base	3	0	5.93	5.99	6.05	6.11	6.20	6.30	6.36
CSWSDOT1	Base	6	0	7.38	7.59	7.76	7.72	7.83	7.92	8.00
CSA1	Storm	6	0	7.04	7.14	7.26	7.24	7.35	7.38	7.38
CSAA1	Storm	6	0	7.02	7.19	7.41	7.44	7.60	7.84	8.04
CSBMP1_IN	Storm	6	0	6.28	6.39	6.46	6.72	6.89	7.36	7.69
CSBMP1_OUT	Storm	6	0	6.66	6.68	6.74	7.02	7.19	7.66	8.00
CSE1	Storm	18	0	6.72	7.10	7.43	7.42	7.73	7.83	8.24
CSE2	Storm	6	0	6.52	6.74	6.81	6.83	7.00	7.06	7.08
CSE3	Storm	6	0	6.55	6.62	6.70	6.74	6.78	6.93	7.07
CSF1	Storm	6	0	7.58	7.73	7.82	7.77	7.84	7.85	7.85
CSH1	Storm	12	0	7.19	7.32	7.53	7.52	7.60	7.77	8.04
CSJ1	Storm	6	0	7.07	7.20	7.22	7.22	7.26	7.32	7.37
CSL1	Storm	12	0	6.91	7.31	7.43	7.45	7.54	7.72	8.11
CSO1	Storm	18	0	6.76	7.00	7.18	7.25	7.43	7.67	8.02
CSP1	Storm	18	0	6.61	6.79	6.98	7.08	7.41	7.63	7.72
CSQ1	Storm	12	0	6.65	6.83	7.03	7.08	7.12	7.47	7.97
CSR1	Storm	18	0	6.52	6.77	7.16	7.13	7.39	7.57	7.94
CSR2	Storm	6	0	6.04	6.19	6.44	6.42	6.59	6.73	6.83
CSWSDOT1	Storm	12	0	6.98	7.16	7.39	7.41	7.54	7.90	8.02
CSWSDOT2	Storm	6	0	6.05	6.39	6.88	6.86	7.23	7.57	7.79
CSWSDOT3	Storm	6	0	6.39	6.57	6.92	6.94	7.32	7.46	7.48
CSWSDOT4	Storm	12	0	6.43	6.86	7.04	7.09	7.34	7.54	7.57
CSWSDOT5	Storm	6	0	6.73	6.90	7.14	7.15	7.42	7.51	7.57

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Conventionals, Nutrients, and Bacteria										
Dissolved Oxygen (mg/L)										
CSAA1	Base	6	0	9.47	9.63	9.72	10.01	10.14	10.76	11.24
CSE1	Base	12	0	9.78	10.10	10.28	10.43	10.87	11.04	11.12
CSE3	Base	6	0	9.60	9.84	9.97	9.96	10.12	10.20	10.26
CSF1	Base	6	0	9.66	10.14	10.37	10.35	10.67	10.78	10.85
CSH1	Base	6	0	9.43	9.65	10.11	10.15	10.25	10.87	11.49
CSJ1	Base	6	0	9.69	10.12	10.52	10.37	10.66	10.73	10.78
CSL1	Base	6	0	8.98	9.28	9.65	9.66	10.08	10.20	10.28
CSO1	Base	12	0	9.15	9.66	10.35	10.25	10.92	11.08	11.45
CSP1	Base	12	0	9.57	9.91	10.25	10.15	10.44	10.46	10.56
CSQ1	Base	6	0	9.70	9.95	10.25	10.18	10.41	10.48	10.54
CSR1	Base	12	0	9.54	10.02	10.36	10.66	11.55	11.97	11.99
CSR2	Base	3	0	8.51	8.61	8.70	9.23	9.60	10.13	10.49
CSWSDOT1	Base	6	0	9.92	10.14	10.57	10.51	10.89	10.98	11.01
CSA1	Storm	6	0	10.52	10.87	11.49	11.30	11.62	11.80	11.95
CSAA1	Storm	6	0	10.21	10.97	11.16	11.11	11.30	11.62	11.88
CSBMP1_IN	Storm	6	0	10.02	10.19	10.88	10.81	11.23	11.51	11.78
CSBMP1_OUT	Storm	6	0	9.56	10.09	10.53	10.57	10.98	11.43	11.75
CSE1	Storm	18	0	10.21	10.78	11.17	11.04	11.33	11.55	11.56
CSE2	Storm	6	0	9.95	10.56	11.29	11.03	11.44	11.65	11.82
CSE3	Storm	6	0	9.80	9.96	10.34	10.51	10.67	11.36	11.97
CSF1	Storm	6	0	10.41	10.49	10.66	10.63	10.76	10.82	10.85
CSH1	Storm	12	0	10.21	10.89	11.12	10.99	11.21	11.41	11.54
CSJ1	Storm	6	0	9.88	10.16	10.39	10.40	10.64	10.81	10.92
CSL1	Storm	12	0	9.44	10.23	10.71	10.60	11.05	11.19	11.28
CSO1	Storm	18	0	10.23	10.73	11.20	11.13	11.58	11.78	11.84
CSP1	Storm	18	0	9.94	10.55	10.97	10.95	11.47	11.61	11.71
CSQ1	Storm	12	0	10.23	10.89	11.26	11.16	11.47	11.81	11.89
CSR1	Storm	18	0	10.52	11.38	11.86	11.70	12.03	12.54	12.96
CSR2	Storm	6	0	4.30	9.11	10.30	9.36	10.51	11.24	11.95
CSWSDOT1	Storm	12	0	10.19	11.02	11.09	11.08	11.29	11.47	11.96
CSWSDOT2	Storm	6	0	9.54	10.51	10.85	11.13	12.07	12.55	12.69
CSWSDOT3	Storm	6	0	10.28	10.43	10.66	10.89	11.11	11.69	12.15
CSWSDOT4	Storm	12	0	10.21	10.80	11.09	11.05	11.24	11.44	12.41
CSWSDOT5	Storm	6	0	9.53	9.91	10.22	10.55	11.22	11.73	11.97

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Dissolved Oxygen Saturation (%)										
CSAA1	Base	6	0	96.8	99.0	99.3	99.2	99.8	100.6	101.2
CSE1	Base	12	0	95.7	97.9	98.5	98.2	98.7	99.1	100.8
CSE3	Base	6	0	93.8	94.9	95.6	95.6	96.3	97.0	97.5
CSF1	Base	6	0	96.1	96.7	97.3	97.8	98.7	99.8	100.7
CSH1	Base	6	0	96.0	96.0	96.3	96.6	97.3	97.6	97.6
CSJ1	Base	6	0	94.1	95.7	97.0	97.1	99.0	99.5	99.7
CSL1	Base	6	0	91.2	93.0	94.2	94.4	96.4	97.0	97.1
CSO1	Base	12	0	93.2	97.1	98.8	98.2	99.9	100.2	101.0
CSP1	Base	12	0	97.6	98.8	99.9	99.8	100.8	101.1	101.7
CSQ1	Base	6	0	97.0	97.1	97.2	97.4	97.9	98.2	98.2
CSR1	Base	12	0	97.0	99.0	99.4	99.7	101.0	101.2	101.5
CSR2	Base	3	0	65.4	68.2	71.1	74.0	78.2	82.5	85.4
CSWSDOT1	Base	6	0	97.1	98.5	99.6	99.3	100.2	100.7	101.2
CSA1	Storm	6	0	98.7	99.0	99.4	99.6	99.9	100.4	100.9
CSAA1	Storm	6	0	89.1	94.8	97.2	96.2	98.1	99.7	101.1
CSBMP1_IN	Storm	6	0	88.7	90.8	96.0	94.0	96.8	97.2	97.5
CSBMP1_OUT	Storm	6	0	85.9	90.2	90.8	92.8	97.3	99.6	99.8
CSE1	Storm	18	0	92.0	97.3	98.0	98.0	99.0	99.9	103.9
CSE2	Storm	6	0	94.8	95.3	96.6	96.5	96.8	98.0	99.2
CSE3	Storm	6	0	89.1	94.6	94.8	94.7	95.1	97.3	99.5
CSF1	Storm	6	0	96.6	97.4	98.0	98.0	98.4	99.0	99.5
CSH1	Storm	12	0	90.9	97.2	97.8	97.6	98.6	99.5	102.3
CSJ1	Storm	6	0	91.2	91.8	93.4	93.5	94.9	95.8	96.4
CSL1	Storm	12	0	89.5	92.9	96.7	96.1	98.2	100.6	103.1
CSO1	Storm	18	0	91.4	98.0	98.7	98.5	99.5	99.9	104.1
CSP1	Storm	18	0	91.5	99.0	99.6	99.3	100.4	100.8	103.0
CSQ1	Storm	12	0	90.7	97.8	98.6	98.2	99.7	100.2	101.5
CSR1	Storm	18	0	91.3	99.4	101.1	100.4	102.0	102.5	104.4
CSR2	Storm	6	0	38.9	74.6	88.0	77.3	88.7	89.2	89.8
CSWSDOT1	Storm	12	0	91.9	98.9	99.6	99.1	100.3	100.8	103.0
CSWSDOT2	Storm	6	0	91.9	93.3	96.5	96.1	96.9	99.7	102.3
CSWSDOT3	Storm	6	0	89.3	91.4	94.4	93.9	96.5	97.4	97.8
CSWSDOT4	Storm	12	0	90.2	95.6	97.2	97.0	98.3	100.5	101.1
CSWSDOT5	Storm	6	0	80.1	84.6	87.7	87.9	92.3	93.8	94.4

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Conventionals, Nutrients, and Bacteria										
Discharge (cfs)										
CSAA1	Base	5	0	0.01	0.01	0.01	0.02	0.02	0.03	0.035
CSE1	Base	11	0	0.23	0.49	0.67	0.81	1.00	1.40	1.93
CSE3	Base	5	0	0.06	0.09	0.14	0.13	0.17	0.17	0.17
CSF1	Base	6	0	2.08	2.60	3.85	3.79	5.11	5.18	5.23
CSH1	Base	5	0	0.35	0.38	0.75	1.13	1.72	2.16	2.45
CSJ1	Base	6	0	1.18	3.63	5.88	5.05	6.71	7.14	7.48
CSL1	Base	5	0	0.19	0.24	0.29	0.94	1.52	2.07	2.44
CSO1	Base	6	0	0.05	0.38	0.42	0.5	0.52	0.88	1.21
CSP1	Base	6	0	0.18	0.19	0.33	0.5	0.66	0.98	1.24
CSQ1	Base	5	0	0.01	0.18	0.18	0.36	0.68	0.72	0.74
CSR1	Base	6	0	0.33	0.41	0.70	1.07	0.92	2.17	3.39
CSR2	Base	6	0	0	0	0.10	0.86	0.66	2.48	4.15
CSWSDOT1	Base	6	0	0.03	0.16	0.28	0.60	1.02	1.43	1.61
CSWSDOT2	Base	6	0	0	0	0	0	0	0	0
CSWSDOT3	Base	6	0	0	0	0	0	0	0	0
CSA1	Storm	6	0	0.02	0.02	0.04	0.06	0.06	0.12	0.19
CSAA1	Storm	6	0	0	0.03	0.05	0.17	0.19	0.46	0.68
CSBMP1_IN	Storm	5	0	0.95	2.36	2.53	2.62	2.99	3.77	4.29
CSBMP1_OUT	Storm	5	0	1.30	1.30	1.86	2.20	2.30	3.45	4.22
CSE1	Storm	12	0	0.45	0.69	1.36	1.37	1.79	2.42	2.54
CSE2	Storm	6	0	0.07	0.08	0.16	0.24	0.30	0.48	0.63
CSE3	Storm	6	0	0.19	0.21	0.29	0.29	0.37	0.39	0.40
CSF1	Storm	5	0	4.08	5.18	5.37	5.77	5.93	7.35	8.30
CSH1	Storm	12	0	1.47	2.05	2.70	2.70	3.15	3.58	4.39
CSJ1	Storm	6	0	2.86	4.35	6.13	6.96	8.13	11.27	14.10
CSL1	Storm	12	0	0.95	2.44	3.20	3.59	3.80	6.07	9.04
CSO1	Storm	6	0	0.90	0.99	1.46	1.93	2.62	3.43	3.94
CSP1	Storm	6	0	0.25	1.24	1.60	6.29	2.56	16.55	30.30
CSQ1	Storm	11	0	0.40	1.10	1.68	1.67	2.20	2.36	3.23
CSR1	Storm	6	0	0.80	2.88	8.04	7.28	11.21	12.51	13.40
CSR2	Storm	6	0	1.44	2.27	3.64	3.47	4.19	5.07	5.94
CSWSDOT1	Storm	12	0	0.23	2.10	2.62	3.64	4.36	8.30	9.24
CSWSDOT2	Storm	6	0	0.01	0.01	0.04	0.09	0.12	0.22	0.32
CSWSDOT3	Storm	6	0	0	0.07	0.18	0.31	0.26	0.72	1.18
CSWSDOT4	Storm	12	0	0	0.02	0.09	0.14	0.17	0.41	0.43
CSWSDOT5	Storm	6	0	0.09	0.14	0.24	0.22	0.29	0.31	0.32

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Conventionals, Nutrients, and Bacteria										
Conductivity (uS/cm)										
CSAA1	Base	6	0	205.3	213.0	216.6	215.3	219.9	220.6	220.9
CSE1	Base	12	0	220.5	226.2	230.3	231.7	237.8	241.7	243.7
CSE3	Base	6	0	229.2	237.5	242.2	240.4	243.8	246.3	248.5
CSF1	Base	6	0	219.1	226.4	233.2	231.7	238.2	239.8	240.5
CSH1	Base	6	0	190.3	202.5	214.2	208.9	215.2	217.8	220.4
CSJ1	Base	6	0	215.9	221.4	228.5	229.4	238.8	241.4	242.3
CSL1	Base	6	0	182.5	187.2	192.4	192.2	198.1	200.2	200.6
CSO1	Base	12	0	166.9	177.7	183.0	181.3	185.3	190.9	192.0
CSP1	Base	12	0	176.9	188.1	190.9	191.0	194.5	197.9	200.3
CSQ1	Base	6	0	149.4	163.6	176.2	171.5	179.8	183.8	186.9
CSR1	Base	12	0	104.4	128.1	144.3	137.7	148.4	154.9	159.4
CSR2	Base	3	0	62.7	71.7	80.7	78.5	86.4	89.8	92.1
CSWSDOT1	Base	6	0	187.0	189.2	191.9	192.8	194.7	198.8	202.0
CSA1	Storm	6	0	159.2	188.3	194.1	197.1	213.5	223.7	228.7
CSAA1	Storm	6	0	92.7	142.6	167.3	161.3	175.5	201.8	228.0
CSBMP1_IN	Storm	6	0	49.1	59.8	72.4	87.7	118.9	137.7	142.3
CSBMP1_OUT	Storm	6	0	64.8	89.8	124.2	115.1	144.6	147.5	148.0
CSE1	Storm	18	0	105.4	144.3	160.6	171.1	199.4	221.3	252.0
CSE2	Storm	6	0	87.9	107.1	112.6	109.8	117.0	119.6	121.9
CSE3	Storm	6	0	62.3	113.8	183.2	162.5	219.3	223.6	224.6
CSF1	Storm	6	0	186.0	198.8	217.2	215.3	224.1	239.1	252.5
CSH1	Storm	12	0	122.0	149.4	158.7	160.7	168.3	185.3	219.0
CSJ1	Storm	6	0	194.0	199.0	212.0	214.2	220.8	235.9	248.8
CSL1	Storm	12	0	109.0	129.7	148.7	147.6	160.1	170.1	189.0
CSO1	Storm	18	0	58.7	85.0	112.8	114.4	140.4	159.7	178.0
CSP1	Storm	18	0	14.5	65.5	99.0	106.9	149.1	165.8	186.4
CSQ1	Storm	12	0	43.2	76.7	89.6	95.5	118.0	133.0	147.1
CSR1	Storm	18	0	52.0	67.7	76.1	82.1	93.6	113.7	118.1
CSR2	Storm	6	0	38.0	48.3	54.2	55.9	66.8	71.2	71.7
CSWSDOT1	Storm	12	0	82.6	111.3	144.6	146.5	177.1	191.2	222.2
CSWSDOT2	Storm	6	0	27.4	33.0	40.7	63.9	86.9	121.8	141.6
CSWSDOT3	Storm	6	0	50.3	55.5	69.6	88.2	102.8	143.7	175.1
CSWSDOT4	Storm	12	0	40.4	112.1	124.7	116.0	130.0	142.2	164.2
CSWSDOT5	Storm	6	0	58.0	89.2	111.2	113.6	126.5	159.2	188.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Metals and Hardness										
Total Zinc (ug/L)										
CSAA1	Base	6	0	4.9	7.3	10.2	11.4	14.4	18.4	21.2
CSE1	Base	12	0	2.8	3.0	3.5	4.3	4.7	7.4	8.2
CSE3	Base	6	0	1.1	1.3	1.6	4.5	1.9	10.7	19.4
CSF1	Base	6	0	0.9	0.9	0.9	1.0	1.1	1.3	1.4
CSH1	Base	6	0	2.7	3.4	4.6	4.7	5.7	6.4	7.1
CSJ1	Base	6	0	0.6	0.9	0.9	1.0	1.1	1.2	1.3
CSL1	Base	6	0	7.2	8.3	9.6	9.5	10.1	11.4	12.5
CSO1	Base	12	0	11.7	14.0	20.0	25.5	30.9	47.2	58.4
CSP1	Base	12	0	7.6	9.7	12.6	18.2	18.5	27.8	67.1
CSQ1	Base	6	0	4.0	5.0	5.2	5.8	6.2	7.8	9.1
CSR1	Base	12	0	3.4	4.2	5.7	5.6	6.6	7.2	9.4
CSR2	Base	3	0	4.4	4.6	4.8	5.1	5.5	5.9	6.2
CSWSDOT1	Base	6	0	3.8	5.5	7.1	7.2	9.4	9.9	10.2
CSA1	Storm	6	0	65.2	74.6	86.2	102	118	151	176
CSAA1	Storm	6	0	11.3	13.1	20.0	20.8	26.8	30.9	33.8
CSBMP1_IN	Storm	6	0	56.7	70.9	76.3	143	79.9	290	499
CSBMP1_OUT	Storm	6	0	23.2	42.0	47.5	44.0	49.5	52.7	55.9
CSE1	Storm	18	0	3.8	10.1	16.7	19.8	29.1	32.4	48.8
CSE2	Storm	6	0	10.3	24.4	25.0	23.4	25.9	27.8	29.5
CSE3	Storm	6	0	6.7	9.8	15.1	36.9	29.6	88.0	142
CSF1	Storm	6	0	1.0	1.8	1.9	2.5	2.9	4.2	5.2
CSH1	Storm	12	0	7.0	11.0	13.2	15.5	18.1	26.5	29.2
CSJ1	Storm	6	0	1.0	1.2	1.4	2.1	1.5	3.8	6.1
CSL1	Storm	12	0	10.2	20.6	32.6	48.1	60.4	88.1	157
CSO1	Storm	18	0	24.5	33.5	47.8	45.7	55.0	58.6	67.6
CSP1	Storm	18	0	14.7	38.4	57.5	63.3	76.5	106	155
CSQ1	Storm	12	0	11.3	24.7	37.1	35.0	41.8	52.9	61.0
CSR1	Storm	18	0	7.6	10.0	11.6	14.7	14.2	24.6	37.6
CSR2	Storm	6	0	4.0	4.3	5.0	37.0	7.2	102	196
CSWSDOT1	Storm	12	0	12.0	21.8	40.0	46.0	48.5	54.6	175
CSWSDOT2	Storm	6	0	39.7	59.5	124	144	156	266	374
CSWSDOT3	Storm	6	0	38.4	39.4	68.2	125	203	267	294
CSWSDOT4	Storm	12	0	8.5	12.6	29.6	36.9	57.0	71.0	102
CSWSDOT5	Storm	6	0	31.5	39.8	54.6	56.6	71.6	79.8	86.7

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Metals and Hardness										
Total Lead (ug/L)										
CSAA1	Base	6	0	0.28	0.63	0.80	0.78	1.04	1.08	1.09
CSE1	Base	12	0	0.09	0.17	0.22	0.23	0.25	0.36	0.43
CSE3	Base	6	17	0.01	0.01	0.01	0.02	0.03	0.03	0.04
CSF1	Base	6	0	0.04	0.06	0.07	0.07	0.07	0.09	0.11
CSH1	Base	6	0	0.06	0.12	0.18	0.21	0.24	0.37	0.48
CSJ1	Base	6	0	0.03	0.03	0.04	0.05	0.05	0.07	0.08
CSL1	Base	6	0	0.06	0.06	0.08	0.10	0.10	0.16	0.22
CSO1	Base	12	0	0.04	0.08	0.13	0.12	0.15	0.17	0.20
CSP1	Base	12	33	0.00	0.01	0.01	0.01	0.01	0.01	0.05
CSQ1	Base	6	0	0.03	0.03	0.09	0.13	0.20	0.27	0.31
CSR1	Base	12	0	0.03	0.09	0.10	0.11	0.11	0.13	0.31
CSR2	Base	3	0	0.11	0.13	0.15	0.14	0.16	0.16	0.17
CSWSDOT1	Base	6	17	0.01	0.01	0.02	0.02	0.02	0.02	0.03
CSA1	Storm	6	0	0.63	0.71	0.89	0.90	1.01	1.17	1.28
CSAA1	Storm	6	0	0.86	1.07	1.23	1.34	1.31	1.85	2.36
CSBMP1_IN	Storm	6	0	0.15	0.18	0.24	0.23	0.28	0.28	0.29
CSBMP1_OUT	Storm	6	0	0.05	0.07	0.12	0.14	0.18	0.25	0.31
CSE1	Storm	18	0	0.14	0.51	0.88	0.98	1.25	1.79	2.43
CSE2	Storm	6	0	0.75	1.05	1.19	1.17	1.36	1.45	1.50
CSE3	Storm	6	0	0.05	0.10	0.12	0.22	0.18	0.47	0.74
CSF1	Storm	6	0	0.04	0.05	0.07	0.15	0.12	0.34	0.54
CSH1	Storm	12	0	0.15	0.31	0.53	0.58	0.72	1.06	1.35
CSJ1	Storm	6	0	0.03	0.04	0.08	0.13	0.14	0.29	0.42
CSL1	Storm	12	0	0.07	0.17	0.23	0.34	0.30	0.51	1.43
CSO1	Storm	18	0	0.07	0.21	0.27	0.39	0.37	0.64	1.84
CSP1	Storm	18	0	0.02	0.07	0.18	0.30	0.26	0.78	1.41
CSQ1	Storm	12	0	0.12	0.22	0.32	0.74	1.02	1.80	2.60
CSR1	Storm	18	0	0.10	0.25	0.31	0.53	0.63	0.92	2.31
CSR2	Storm	6	0	0.16	0.18	0.21	0.22	0.26	0.28	0.30
CSWSDOT1	Storm	12	0	0.06	0.24	0.55	1.15	1.30	3.15	4.84
CSWSDOT2	Storm	6	0	0.68	1.28	2.54	5.36	5.18	12.66	19.50
CSWSDOT3	Storm	6	0	0.86	1.01	2.95	3.81	4.97	7.58	10.10
CSWSDOT4	Storm	12	0	0.25	0.43	0.73	1.20	1.40	1.95	5.27
CSWSDOT5	Storm	6	0	0.17	0.73	1.46	1.40	2.18	2.31	2.40

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Metals and Hardness										
Hardness as CaCO3 (mg/L)										
CSAA1	Base	6	0	74.4	81.8	83.0	84.0	87.1	91.0	94.0
CSE1	Base	12	0	77.6	82.6	85.0	86.3	90.5	93.8	96.0
CSE3	Base	6	0	79.2	85.9	87.0	87.3	89.3	92.4	94.9
CSF1	Base	6	0	84.8	85.4	86.0	86.0	86.0	87.0	88.0
CSH1	Base	6	0	68.4	80.2	85.7	83.0	88.0	89.9	91.4
CSJ1	Base	6	0	84.0	91.1	93.0	94.5	98.5	103.0	106.0
CSL1	Base	6	0	67.2	68.2	71.2	70.6	72.7	73.2	73.5
CSO1	Base	12	0	59.2	63.5	67.0	67.0	68.0	73.4	80.0
CSP1	Base	12	0	62.4	66.2	68.0	67.9	70.0	71.8	74.0
CSQ1	Base	6	0	50.0	55.5	57.8	58.0	59.7	64.0	67.6
CSR1	Base	12	0	36.0	41.5	48.0	49.3	54.2	64.9	66.0
CSR2	Base	3	0	16.0	24.6	33.2	29.1	35.6	37.0	38.0
CSWSDOT1	Base	6	0	54.0	71.7	73.0	73.3	74.0	84.0	94.0
CSA1	Storm	6	0	35.1	59.9	66.8	62.2	70.6	73.0	74.9
CSAA1	Storm	6	0	39.6	47.4	57.8	56.1	61.9	68.4	74.0
CSBMP1_IN	Storm	6	0	12.8	20.5	25.2	28.5	37.1	43.8	47.6
CSBMP1_OUT	Storm	6	0	20.0	27.9	47.4	41.4	52.8	55.6	57.6
CSE1	Storm	18	0	28.4	50.4	67.8	61.4	74.3	77.2	86.0
CSE2	Storm	6	0	33.1	36.0	39.5	45.4	48.5	62.6	73.9
CSE3	Storm	6	0	16.7	39.5	67.7	57.9	78.2	80.8	83.2
CSF1	Storm	6	0	76.0	84.5	86.0	85.3	89.0	90.0	90.0
CSH1	Storm	12	0	36.8	53.7	57.9	55.9	61.4	64.2	64.4
CSJ1	Storm	6	0	84.0	88.5	91.0	91.7	93.5	98.0	102.0
CSL1	Storm	12	0	37.2	49.5	54.8	52.2	55.9	57.6	59.3
CSO1	Storm	18	0	21.8	30.1	44.3	43.2	49.8	61.8	68.0
CSP1	Storm	18	0	8.0	23.7	38.5	39.0	53.8	62.3	74.0
CSQ1	Storm	12	0	18.0	25.3	31.8	32.4	37.6	42.0	49.3
CSR1	Storm	18	0	16.0	21.2	26.8	28.1	31.5	40.6	44.0
CSR2	Storm	6	0	20.0	22.0	23.0	23.2	24.9	25.6	26.0
CSWSDOT1	Storm	12	0	16.0	41.1	59.0	52.6	65.4	71.9	74.0
CSWSDOT2	Storm	6	0	10.0	17.5	22.0	23.8	24.0	36.0	48.0
CSWSDOT3	Storm	6	0	12.0	21.0	28.0	27.7	35.0	39.0	42.0
CSWSDOT4	Storm	12	0	6.4	34.0	37.2	36.1	43.0	47.4	48.7
CSWSDOT5	Storm	6	0	14.8	20.2	27.0	28.0	34.5	40.1	44.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Metals and Hardness										
Total Copper (ug/L)										
CSAA1	Base	6	0	0.75	1.42	1.87	1.73	2.12	2.26	2.38
CSE1	Base	12	0	0.51	0.62	0.65	0.77	0.72	0.96	1.96
CSE3	Base	6	0	0.27	0.32	0.36	0.35	0.39	0.41	0.43
CSF1	Base	6	0	0.39	0.41	0.50	0.76	0.57	1.40	2.22
CSH1	Base	6	0	0.42	0.52	0.58	0.60	0.67	0.77	0.85
CSJ1	Base	6	0	0.19	0.22	0.24	0.25	0.26	0.31	0.36
CSL1	Base	6	0	0.52	0.52	0.54	0.58	0.60	0.66	0.72
CSO1	Base	12	0	0.56	0.76	0.81	0.82	0.95	1.00	1.01
CSP1	Base	12	0	0.35	0.40	0.45	0.48	0.58	0.64	0.70
CSQ1	Base	6	0	0.29	0.34	0.42	0.42	0.46	0.54	0.61
CSR1	Base	12	0	0.34	0.41	0.56	0.67	0.88	1.05	1.23
CSR2	Base	3	0	1.09	1.18	1.27	1.32	1.44	1.53	1.60
CSWSDOT1	Base	6	0	0.22	0.28	0.30	0.36	0.43	0.54	0.60
CSA1	Storm	6	0	2.95	3.48	3.90	4.26	4.53	5.73	6.74
CSAA1	Storm	6	0	2.25	3.47	4.17	4.20	5.06	5.62	6.00
CSBMP1_IN	Storm	6	0	3.18	3.21	3.32	3.62	3.92	4.35	4.61
CSBMP1_OUT	Storm	6	0	0.78	1.62	2.17	1.95	2.35	2.56	2.75
CSE1	Storm	18	0	0.84	1.55	2.35	3.18	4.50	6.44	7.22
CSE2	Storm	6	0	2.52	4.34	4.85	4.74	5.24	5.98	6.65
CSE3	Storm	6	0	0.69	1.15	1.68	1.77	2.16	2.78	3.31
CSF1	Storm	6	0	0.43	0.48	0.56	0.72	0.67	1.15	1.59
CSH1	Storm	12	0	0.77	1.49	1.99	2.08	2.67	3.25	3.29
CSJ1	Storm	6	0	0.21	0.34	0.42	0.45	0.44	0.68	0.91
CSL1	Storm	12	0	0.70	1.04	1.21	1.49	1.65	1.93	3.97
CSO1	Storm	18	0	0.76	1.60	2.46	2.58	2.88	3.54	7.01
CSP1	Storm	18	0	0.61	1.91	2.53	2.88	2.87	6.26	6.82
CSQ1	Storm	12	0	0.69	1.55	2.09	2.62	3.34	4.72	6.28
CSR1	Storm	18	0	1.12	1.53	1.98	2.21	2.39	2.95	5.95
CSR2	Storm	6	0	1.44	1.56	1.75	2.27	2.68	3.56	4.18
CSWSDOT1	Storm	12	0	0.96	2.13	3.58	5.20	6.40	6.62	21.70
CSWSDOT2	Storm	6	0	8.00	12.12	20.85	27.75	30.85	52.95	73.40
CSWSDOT3	Storm	6	0	6.57	8.18	13.91	21.53	32.12	43.40	50.30
CSWSDOT4	Storm	12	0	1.44	2.41	5.79	6.89	11.43	12.61	17.50
CSWSDOT5	Storm	6	0	6.36	9.41	12.90	13.10	17.77	18.60	18.80

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
2-Methylnaphthalene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	92	0.068	0.095	0.100	0.098	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Acenaphthene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	92	0.064	0.095	0.100	0.097	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Acenaphthylene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	83	0.057	0.101	0.105	0.096	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.028	0.100	0.100	0.125	0.106	0.110	0.500
CSWSDOT2	Storm	6	83	0.055	0.100	0.105	0.402	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Anthracene (ug/L)										
CSAA1	Base	2	50	0.025	0.043	0.060	0.060	0.078	0.088	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	50	0.035	0.081	0.100	0.085	0.100	0.100	0.100
CSAA1	Storm	6	17	0.029	0.037	0.047	0.074	0.076	0.142	0.200
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Benz(a)anthracene (ug/L)										
CSAA1	Base	2	50	0.031	0.047	0.063	0.063	0.079	0.089	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	0	0.036	0.050	0.067	0.070	0.080	0.101	0.120
CSAA1	Storm	6	0	0.027	0.049	0.102	0.126	0.158	0.240	0.320
CSE1	Storm	12	92	0.026	0.095	0.100	0.094	0.100	0.104	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.047	0.100	0.100	0.127	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Benzo(a)pyrene (ug/L)										
CSAA1	Base	2	50	0.05	0.06	0.07	0.07	0.08	0.09	0.10
CSE1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSA1	Storm	6	0	0.04	0.05	0.07	0.07	0.07	0.11	0.14
CSAA1	Storm	6	17	0.04	0.05	0.09	0.10	0.13	0.17	0.20
CSE1	Storm	12	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSE2	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSF1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSH1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.11
CSJ1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSL1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSO1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSP1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSQ1	Storm	6	100	0.06	0.10	0.10	0.09	0.10	0.11	0.11
CSR1	Storm	6	100	0.10	0.11	0.11	0.10	0.11	0.11	0.11
CSR2	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSWSDOT1	Storm	12	92	0.05	0.10	0.10	0.13	0.11	0.11	0.50
CSWSDOT2	Storm	6	100	0.10	0.10	0.11	0.41	0.78	1.02	1.05
CSWSDOT3	Storm	6	100	0.10	0.10	0.10	0.32	0.39	0.77	1.05
CSWSDOT4	Storm	12	100	0.06	0.10	0.10	0.25	0.10	0.11	1.95
CSWSDOT5	Storm	6	100	0.10	0.10	0.10	0.17	0.11	0.31	0.50

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Benzo(b)fluoranthene (ug/L)										
CSAA1	Base	2	50	0.054	0.064	0.075	0.075	0.085	0.091	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	0	0.074	0.101	0.145	0.147	0.180	0.215	0.240
CSAA1	Storm	6	0	0.041	0.081	0.167	0.188	0.248	0.340	0.430
CSE1	Storm	12	92	0.060	0.095	0.100	0.097	0.100	0.104	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.047	0.100	0.100	0.130	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	92	0.055	0.099	0.100	0.260	0.105	0.208	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Benzo(g,h,i)perylene (ug/L)										
CSAA1	Base	2	50	0.038	0.052	0.067	0.067	0.081	0.089	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	67	0.019	0.100	0.100	0.090	0.100	0.110	0.120
CSAA1	Storm	6	50	0.028	0.054	0.079	0.073	0.100	0.100	0.100
CSE1	Storm	12	92	0.070	0.095	0.100	0.098	0.100	0.104	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.043	0.100	0.100	0.126	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	83	0.100	0.100	0.100	0.167	0.100	0.300	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Benzo(k)fluoranthene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	17	0.017	0.028	0.041	0.039	0.047	0.056	0.065
CSAA1	Storm	6	17	0.026	0.033	0.036	0.073	0.092	0.155	0.200
CSE1	Storm	12	92	0.051	0.095	0.100	0.096	0.100	0.104	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.031	0.100	0.100	0.125	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	92	0.047	0.095	0.100	0.246	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Chrysene (ug/L)										
CSAA1	Base	2	50	0.042	0.055	0.069	0.069	0.082	0.090	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	0	0.057	0.073	0.115	0.106	0.135	0.145	0.150
CSAA1	Storm	6	0	0.032	0.072	0.076	0.112	0.086	0.210	0.330
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	83	0.052	0.100	0.105	0.402	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Dibenz(a,h)anthracene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	83	0.019	0.060	0.098	0.077	0.100	0.100	0.100
CSE1	Storm	12	92	0.050	0.095	0.100	0.096	0.100	0.104	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Fluoranthene (ug/L)										
CSAA1	Base	2	50	0.046	0.058	0.071	0.071	0.083	0.090	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	0	0.069	0.082	0.125	0.115	0.140	0.150	0.160
CSAA1	Storm	6	0	0.043	0.087	0.110	0.182	0.165	0.375	0.570
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	83	0.021	0.063	0.100	0.079	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	83	0.021	0.100	0.100	0.089	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	75	0.021	0.100	0.100	0.134	0.110	0.218	0.500
CSWSDOT2	Storm	6	17	0.031	0.065	0.079	0.138	0.200	0.290	0.340
CSWSDOT3	Storm	6	50	0.023	0.074	0.102	0.254	0.161	0.615	1.050
CSWSDOT4	Storm	12	67	0.022	0.073	0.100	0.236	0.100	0.104	1.950
CSWSDOT5	Storm	6	67	0.076	0.098	0.100	0.162	0.100	0.300	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Fluorene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	92	0.029	0.095	0.100	0.095	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Indeno(1,2,3-cd)pyrene (ug/L)										
CSAA1	Base	2	50	0.039	0.053	0.067	0.067	0.081	0.089	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	33	0.020	0.034	0.057	0.061	0.071	0.102	0.130
CSAA1	Storm	6	17	0.035	0.055	0.075	0.097	0.133	0.175	0.200
CSE1	Storm	12	92	0.062	0.095	0.100	0.097	0.100	0.104	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.046	0.100	0.100	0.126	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	92	0.055	0.098	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	50	0.027	0.065	0.095	0.113	0.100	0.109	0.480
CSE2	Storm	6	83	0.042	0.095	0.095	0.088	0.099	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.047	0.100	0.100	0.127	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Phenanthrene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	83	0.025	0.096	0.100	0.087	0.100	0.100	0.100
CSAA1	Storm	6	50	0.027	0.058	0.097	0.078	0.100	0.100	0.100
CSE1	Storm	12	92	0.027	0.095	0.100	0.094	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	83	0.024	0.096	0.105	0.092	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	83	0.047	0.100	0.100	0.104	0.110	0.110	0.170
CSWSDOT2	Storm	6	83	0.038	0.100	0.105	0.400	0.778	1.020	1.050
CSWSDOT3	Storm	6	83	0.047	0.100	0.102	0.314	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	67	0.040	0.060	0.100	0.148	0.100	0.300	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Polycyclic Aromatic Hydrocarbons (PAHs)										
Pyrene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	0	0.060	0.070	0.097	0.092	0.107	0.120	0.130
CSAA1	Storm	6	0	0.031	0.072	0.087	0.144	0.137	0.295	0.440
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	83	0.039	0.096	0.105	0.094	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	83	0.025	0.101	0.105	0.091	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	42	0.019	0.030	0.039	0.067	0.061	0.123	0.290
CSWSDOT2	Storm	6	0	0.035	0.040	0.052	0.171	0.246	0.425	0.540
CSWSDOT3	Storm	6	50	0.033	0.100	0.125	0.196	0.270	0.395	0.480
CSWSDOT4	Storm	12	67	0.026	0.061	0.100	0.235	0.100	0.104	1.950
CSWSDOT5	Storm	6	50	0.021	0.100	0.105	0.158	0.118	0.310	0.500
Total PAHs (ug/L)										
CSAA1	Base	2	50	0.095	0.152	0.210	0.210	0.268	0.302	0.325
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	0	0.364	0.538	0.726	0.753	0.856	1.110	1.327
CSAA1	Storm	6	0	0.174	0.685	0.814	1.020	0.903	1.820	2.736
CSE1	Storm	12	50	0.027	0.065	0.098	0.155	0.102	0.367	0.668
CSE2	Storm	6	83	0.042	0.095	0.095	0.088	0.099	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	83	0.021	0.063	0.100	0.079	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	83	0.063	0.096	0.105	0.098	0.110	0.110	0.110
CSQ1	Storm	6	83	0.021	0.100	0.100	0.089	0.100	0.105	0.110
CSR1	Storm	6	83	0.025	0.101	0.105	0.091	0.105	0.105	0.105
CSR2	Storm	6	83	0.057	0.101	0.105	0.096	0.105	0.105	0.105
CSWSDOT1	Storm	12	42	0.019	0.029	0.051	0.156	0.073	0.277	1.126
CSWSDOT2	Storm	6	0	0.035	0.088	0.198	0.323	0.482	0.715	0.880
CSWSDOT3	Storm	6	17	0.023	0.037	0.115	0.143	0.242	0.286	0.310
CSWSDOT4	Storm	12	67	0.048	0.100	0.100	0.281	0.116	0.411	1.950
CSWSDOT5	Storm	6	50	0.021	0.100	0.163	0.218	0.329	0.432	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Polycyclic Aromatic Hydrocarbons (PAHs)										
Total cPAHs (ug/L)										
CSAA1	Base	2	50	0.095	0.125	0.156	0.156	0.186	0.204	0.216
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	0	0.230	0.360	0.478	0.483	0.530	0.694	0.845
CSAA1	Storm	6	0	0.100	0.344	0.523	0.600	0.644	1.070	1.489
CSE1	Storm	12	92	0.095	0.099	0.100	0.112	0.101	0.110	0.249
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	92	0.047	0.100	0.100	0.154	0.110	0.344	0.500
CSWSDOT2	Storm	6	83	0.052	0.100	0.105	0.402	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	92	0.055	0.099	0.100	0.273	0.105	0.340	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Phtalates										
Bis(2-ethylhexyl) Phthalate (ug/L)										
CSAA1	Base	2	100	0.47	0.47	0.47	0.47	0.47	0.47	0.47
CSE1	Base	2	50	0.13	0.22	0.32	0.32	0.41	0.46	0.50
CSE3	Base	2	50	0.13	0.22	0.32	0.32	0.41	0.46	0.50
CSA1	Storm	6	50	0.14	0.25	0.44	0.37	0.49	0.49	0.50
CSAA1	Storm	6	17	0.22	0.25	0.28	0.55	0.29	1.15	2.00
CSE1	Storm	12	75	0.13	0.46	0.50	0.43	0.50	0.50	0.55
CSE2	Storm	6	83	0.15	0.47	0.49	0.43	0.50	0.50	0.50
CSE3	Storm	6	33	0.05	0.09	0.15	0.16	0.17	0.26	0.35
CSF1	Storm	6	83	0.37	0.48	0.50	0.48	0.50	0.53	0.55
CSH1	Storm	6	17	0.19	0.26	0.29	3.74	0.38	10.70	21.00
CSJ1	Storm	6	83	0.31	0.48	0.50	0.46	0.50	0.50	0.50
CSL1	Storm	6	17	0.14	0.23	0.25	0.47	0.26	0.98	1.70
CSO1	Storm	6	50	0.28	0.31	0.41	0.40	0.50	0.50	0.50
CSP1	Storm	6	67	0.40	0.48	0.53	0.51	0.55	0.56	0.56
CSQ1	Storm	6	17	0.15	0.25	0.27	0.61	0.35	1.38	2.40
CSR1	Storm	6	50	0.15	0.30	0.40	0.38	0.50	0.53	0.55
CSR2	Storm	6	67	0.29	0.36	0.50	0.43	0.50	0.50	0.50
CSWSDOT1	Storm	12	8	0.20	0.41	0.52	1.17	1.45	2.59	4.30
CSWSDOT2	Storm	6	0	0.88	1.52	2.55	3.78	5.15	7.70	9.50
CSWSDOT3	Storm	6	0	0.61	0.68	1.32	2.42	3.78	5.30	6.20
CSWSDOT4	Storm	12	25	0.03	0.15	0.56	1.25	1.58	2.34	6.20
CSWSDOT5	Storm	6	17	0.67	0.80	1.46	1.45	2.10	2.15	2.20
Butyl Benzyl Phthalate (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	67	0.048	0.100	0.100	0.133	0.190	0.225	0.230
CSE1	Storm	12	83	0.030	0.095	0.100	0.092	0.100	0.104	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	67	0.030	0.085	0.098	0.085	0.100	0.102	0.105
CSH1	Storm	6	50	0.027	0.100	0.100	0.123	0.175	0.205	0.210
CSJ1	Storm	6	83	0.042	0.098	0.105	0.093	0.105	0.105	0.105
CSL1	Storm	6	83	0.049	0.096	0.100	0.107	0.100	0.150	0.200
CSO1	Storm	6	33	0.021	0.024	0.032	0.083	0.151	0.195	0.200
CSP1	Storm	6	67	0.025	0.062	0.102	0.084	0.110	0.110	0.110
CSQ1	Storm	6	83	0.055	0.100	0.100	0.111	0.108	0.155	0.200
CSR1	Storm	6	67	0.024	0.054	0.102	0.080	0.105	0.105	0.105
CSR2	Storm	6	83	0.038	0.100	0.102	0.092	0.105	0.105	0.105
CSWSDOT1	Storm	12	50	0.039	0.096	0.105	0.151	0.180	0.219	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	83	0.054	0.100	0.102	0.315	0.386	0.765	1.050
CSWSDOT4	Storm	12	92	0.055	0.100	0.100	0.259	0.105	0.190	1.950
CSWSDOT5	Storm	6	83	0.100	0.100	0.100	0.190	0.205	0.370	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Phtalates										
Di-n-butyl Phthalate (ug/L)										
CSAA1	Base	2	50	0.036	0.051	0.066	0.066	0.080	0.089	0.095
CSE1	Base	2	50	0.044	0.058	0.072	0.072	0.086	0.094	0.100
CSE3	Base	2	50	0.052	0.064	0.076	0.076	0.088	0.095	0.100
CSA1	Storm	6	67	0.042	0.074	0.098	0.084	0.100	0.100	0.100
CSAA1	Storm	6	0	0.032	0.125	0.145	0.132	0.165	0.175	0.180
CSE1	Storm	12	25	0.021	0.029	0.043	0.042	0.056	0.062	0.066
CSE2	Storm	6	67	0.033	0.055	0.095	0.077	0.099	0.100	0.100
CSE3	Storm	6	33	0.016	0.024	0.038	0.041	0.055	0.066	0.073
CSF1	Storm	6	0	0.024	0.026	0.044	0.048	0.065	0.076	0.085
CSH1	Storm	6	0	0.028	0.122	0.135	0.148	0.170	0.235	0.290
CSJ1	Storm	6	33	0.035	0.045	0.056	0.102	0.172	0.210	0.210
CSL1	Storm	6	0	0.033	0.112	0.130	0.122	0.155	0.165	0.170
CSO1	Storm	6	0	0.031	0.044	0.051	0.053	0.065	0.071	0.074
CSP1	Storm	6	0	0.024	0.036	0.045	0.041	0.048	0.051	0.052
CSQ1	Storm	6	0	0.040	0.122	0.135	0.128	0.155	0.170	0.180
CSR1	Storm	6	0	0.033	0.043	0.056	0.051	0.059	0.061	0.062
CSR2	Storm	6	0	0.033	0.035	0.047	0.050	0.065	0.068	0.069
CSWSDOT1	Storm	12	0	0.040	0.053	0.125	0.146	0.190	0.190	0.510
CSWSDOT2	Storm	6	33	0.064	0.105	0.145	0.759	1.540	2.050	2.100
CSWSDOT3	Storm	6	33	0.047	0.067	0.077	0.554	0.739	1.530	2.100
CSWSDOT4	Storm	12	50	0.045	0.099	0.100	0.271	0.155	0.215	1.950
CSWSDOT5	Storm	6	0	0.038	0.150	0.175	0.241	0.222	0.455	0.680
Di-n-octyl Phthalate (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.191	0.195	0.172	0.199	0.202	0.205
CSE1	Storm	12	92	0.095	0.099	0.100	0.108	0.101	0.110	0.190
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.196	0.202	0.178	0.205	0.208	0.210
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.191	0.195	0.172	0.195	0.200	0.205
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.195	0.198	0.178	0.204	0.210	0.215
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.105	0.208	0.208	0.220	1.000
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.100	0.100	0.447	0.199	0.210	3.900
CSWSDOT5	Storm	6	100	0.100	0.196	0.202	0.319	0.212	0.608	1.000

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Phtalates										
Diethyl Phthalate (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	50	0.023	0.042	0.062	0.062	0.081	0.092	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	83	0.041	0.096	0.100	0.089	0.100	0.100	0.100
CSAA1	Storm	6	50	0.028	0.033	0.047	0.059	0.087	0.100	0.100
CSE1	Storm	12	75	0.019	0.081	0.100	0.083	0.100	0.104	0.105
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	83	0.044	0.096	0.100	0.090	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	67	0.028	0.051	0.077	0.073	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	83	0.023	0.061	0.098	0.078	0.100	0.100	0.100
CSO1	Storm	6	83	0.022	0.096	0.100	0.086	0.100	0.100	0.100
CSP1	Storm	6	50	0.019	0.026	0.068	0.066	0.108	0.110	0.110
CSQ1	Storm	6	50	0.029	0.031	0.067	0.067	0.100	0.105	0.110
CSR1	Storm	6	67	0.016	0.039	0.102	0.075	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	42	0.027	0.036	0.076	0.179	0.202	0.219	1.000
CSWSDOT2	Storm	6	50	0.044	0.075	0.095	0.392	0.775	1.020	1.050
CSWSDOT3	Storm	6	50	0.042	0.059	0.102	0.254	0.161	0.615	1.050
CSWSDOT4	Storm	12	58	0.020	0.064	0.098	0.233	0.100	0.100	1.950
CSWSDOT5	Storm	6	33	0.039	0.067	0.119	0.256	0.185	0.600	1.000
Dimethyl Phthalate (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	83	0.095	0.100	0.100	0.119	0.100	0.160	0.220
CSAA1	Storm	6	67	0.047	0.096	0.100	0.149	0.100	0.275	0.450
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	83	0.095	0.096	0.100	0.113	0.100	0.145	0.190
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	83	0.050	0.100	0.100	0.238	0.104	0.538	0.970
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	83	0.055	0.100	0.100	0.104	0.108	0.135	0.160
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	75	0.031	0.074	0.100	0.119	0.106	0.110	0.500
CSWSDOT2	Storm	6	83	0.031	0.100	0.105	0.398	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	50	0.022	0.096	0.100	0.581	0.215	1.810	3.700
CSWSDOT5	Storm	6	50	0.030	0.081	0.105	0.159	0.132	0.320	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Chlorinated Organics										
1,2,4-Trichlorobenzene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
1,2-Dichlorobenzene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
1,3-Dichlorobenzene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
1,4-Dichlorobenzene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
2,4,5-Trichlorophenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	100	0.120	0.249	0.255	0.333	0.266	0.279	1.300
CSWSDOT2	Storm	6	100	0.245	0.251	0.262	1.030	1.980	2.580	2.600
CSWSDOT3	Storm	6	100	0.255	0.255	0.258	0.804	0.965	1.900	2.600
CSWSDOT4	Storm	12	100	0.135	0.245	0.248	0.627	0.252	0.260	4.900
CSWSDOT5	Storm	6	100	0.245	0.251	0.255	0.429	0.266	0.785	1.300
2,4,6-Trichlorophenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	100	0.120	0.249	0.255	0.333	0.266	0.279	1.300
CSWSDOT2	Storm	6	100	0.245	0.251	0.262	1.030	1.980	2.580	2.600
CSWSDOT3	Storm	6	100	0.255	0.255	0.258	0.804	0.965	1.900	2.600
CSWSDOT4	Storm	12	100	0.135	0.245	0.248	0.627	0.252	0.260	4.900
CSWSDOT5	Storm	6	100	0.245	0.251	0.255	0.429	0.266	0.785	1.300

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
2,4-Dichlorophenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	100	0.120	0.249	0.255	0.333	0.266	0.279	1.300
CSWSDOT2	Storm	6	100	0.245	0.251	0.262	1.030	1.980	2.580	2.600
CSWSDOT3	Storm	6	100	0.255	0.255	0.258	0.804	0.965	1.900	2.600
CSWSDOT4	Storm	12	100	0.135	0.245	0.248	0.627	0.252	0.260	4.900
CSWSDOT5	Storm	6	100	0.245	0.251	0.255	0.429	0.266	0.785	1.300
2-Chloronaphthalene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
2-Chlorophenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	100	0.120	0.249	0.255	0.333	0.266	0.279	1.300
CSWSDOT2	Storm	6	100	0.245	0.251	0.262	1.030	1.980	2.580	2.600
CSWSDOT3	Storm	6	100	0.255	0.255	0.258	0.804	0.965	1.900	2.600
CSWSDOT4	Storm	12	100	0.135	0.245	0.248	0.627	0.252	0.260	4.900
CSWSDOT5	Storm	6	100	0.245	0.251	0.255	0.429	0.266	0.785	1.300
3,3'-Dichlorobenzidine (ug/L)										
CSAA1	Base	2	100	0.95	0.95	0.95	0.95	0.95	0.95	0.95
CSE1	Base	2	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CSE3	Base	2	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CSA1	Storm	6	100	0.95	0.96	1.00	0.98	1.00	1.00	1.00
CSAA1	Storm	6	100	0.48	0.96	1.00	0.91	1.00	1.00	1.00
CSE1	Storm	12	100	0.95	0.99	1.00	1.00	1.01	1.05	1.10
CSE2	Storm	6	100	0.95	0.95	0.98	0.98	1.00	1.00	1.00
CSE3	Storm	6	100	0.95	0.96	1.00	0.98	1.00	1.00	1.00
CSF1	Storm	6	100	0.95	1.00	1.00	1.01	1.04	1.05	1.05
CSH1	Storm	6	100	0.50	1.00	1.00	0.93	1.00	1.02	1.05
CSJ1	Storm	6	100	0.95	1.01	1.05	1.02	1.05	1.05	1.05
CSL1	Storm	6	100	0.49	0.96	1.00	0.91	1.00	1.00	1.00
CSO1	Storm	6	100	0.95	1.00	1.00	0.99	1.00	1.00	1.00
CSP1	Storm	6	100	0.95	1.00	1.05	1.04	1.10	1.10	1.10
CSQ1	Storm	6	100	0.55	1.00	1.00	0.94	1.00	1.05	1.10
CSR1	Storm	6	100	1.00	1.05	1.05	1.04	1.05	1.05	1.05
CSR2	Storm	6	100	1.00	1.01	1.05	1.03	1.05	1.05	1.05
CSWSDOT1	Storm	12	100	0.47	1.00	1.00	1.31	1.06	1.10	5.00
CSWSDOT2	Storm	6	100	1.00	1.00	1.05	4.10	7.78	10.20	10.50
CSWSDOT3	Storm	6	100	1.00	1.00	1.02	3.22	3.86	7.65	10.50
CSWSDOT4	Storm	12	100	0.55	0.99	1.00	2.50	1.01	1.05	19.50
CSWSDOT5	Storm	6	100	1.00	1.00	1.00	1.68	1.08	3.05	5.00

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
4-Chloro-3-methylphenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	100	0.120	0.249	0.255	0.333	0.266	0.279	1.300
CSWSDOT2	Storm	6	100	0.245	0.251	0.262	1.030	1.980	2.580	2.600
CSWSDOT3	Storm	6	100	0.255	0.255	0.258	0.804	0.965	1.900	2.600
CSWSDOT4	Storm	12	100	0.135	0.245	0.248	0.627	0.252	0.260	4.900
CSWSDOT5	Storm	6	100	0.245	0.251	0.255	0.429	0.266	0.785	1.300
4-Chloroaniline (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
4-Chlorophenyl Phenyl Ether (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Bis(1-chloroisopropyl) Ether (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
Bis(2-chloroethoxy)methane (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Bis(2-chloroethyl) Ether (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
Hexachlorobenzene-CO (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
Hexachlorobutadiene-CO (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
Hexachlorocyclopentadiene (ug/L)										
CSAA1	Base	2	100	0.47	0.47	0.47	0.47	0.47	0.47	0.47
CSE1	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSE3	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSA1	Storm	6	100	0.48	0.48	0.49	0.49	0.50	0.50	0.50
CSAA1	Storm	6	100	0.24	0.48	0.49	0.45	0.50	0.50	0.50
CSE1	Storm	12	100	0.47	0.49	0.50	0.50	0.50	0.55	0.55
CSE2	Storm	6	100	0.47	0.47	0.49	0.49	0.50	0.50	0.50
CSE3	Storm	6	100	0.48	0.49	0.50	0.49	0.50	0.50	0.50
CSF1	Storm	6	100	0.48	0.49	0.50	0.50	0.50	0.53	0.55
CSH1	Storm	6	100	0.26	0.49	0.50	0.47	0.50	0.53	0.55
CSJ1	Storm	6	100	0.47	0.50	0.50	0.50	0.50	0.53	0.55
CSL1	Storm	6	100	0.25	0.48	0.49	0.45	0.49	0.50	0.50
CSO1	Storm	6	100	0.47	0.49	0.50	0.49	0.50	0.50	0.50
CSP1	Storm	6	100	0.47	0.50	0.53	0.52	0.55	0.55	0.55
CSQ1	Storm	6	100	0.27	0.49	0.50	0.47	0.50	0.53	0.55
CSR1	Storm	6	100	0.50	0.50	0.50	0.51	0.50	0.53	0.55
CSR2	Storm	6	100	0.50	0.50	0.50	0.51	0.50	0.53	0.55
CSWSDOT1	Storm	12	100	0.24	0.50	0.50	0.66	0.55	0.55	2.55
CSWSDOT2	Storm	6	100	0.49	0.50	0.53	2.01	3.89	5.00	5.00
CSWSDOT3	Storm	6	100	0.50	0.50	0.50	1.57	1.92	3.70	5.00
CSWSDOT4	Storm	12	100	0.27	0.49	0.49	1.27	0.50	0.50	10.00
CSWSDOT5	Storm	6	100	0.49	0.50	0.50	0.85	0.54	1.55	2.55
Hexachloroethane-CO (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Chlorinated Organics										
Pentachlorophenol (PCP) (ug/L)										
CSAA1	Base	2	100	0.47	0.47	0.47	0.47	0.47	0.47	0.47
CSE1	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSE3	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSA1	Storm	6	100	0.48	0.48	0.49	0.49	0.50	0.50	0.50
CSAA1	Storm	6	100	0.24	0.48	0.49	0.45	0.50	0.50	0.50
CSE1	Storm	12	100	0.47	0.49	0.50	0.54	0.51	0.55	1.00
CSE2	Storm	6	100	0.47	0.47	0.49	0.49	0.50	0.50	0.50
CSE3	Storm	6	100	0.48	0.49	0.50	0.49	0.50	0.50	0.50
CSF1	Storm	6	100	0.48	0.50	0.50	0.59	0.54	0.78	1.00
CSH1	Storm	6	100	0.26	0.49	0.50	0.47	0.50	0.53	0.55
CSJ1	Storm	6	100	0.47	0.50	0.50	0.59	0.54	0.78	1.00
CSL1	Storm	6	100	0.25	0.48	0.49	0.45	0.49	0.50	0.50
CSO1	Storm	6	100	0.47	0.49	0.50	0.58	0.50	0.75	1.00
CSP1	Storm	6	100	0.47	0.51	0.55	0.60	0.55	0.78	1.00
CSQ1	Storm	6	100	0.27	0.49	0.50	0.47	0.50	0.53	0.55
CSR1	Storm	6	100	0.50	0.50	0.50	0.59	0.54	0.78	1.00
CSR2	Storm	6	100	0.50	0.50	0.50	0.59	0.54	0.78	1.00
CSWSDOT1	Storm	12	100	0.24	0.50	0.50	0.70	0.55	0.96	2.55
CSWSDOT2	Storm	6	100	0.49	0.51	0.78	2.09	4.00	5.00	5.00
CSWSDOT3	Storm	6	100	0.50	0.50	0.75	1.65	2.05	3.70	5.00
CSWSDOT4	Storm	12	92	0.36	0.49	0.49	1.27	0.50	0.50	10.00
CSWSDOT5	Storm	6	100	0.49	0.50	0.50	0.85	0.54	1.55	2.55

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
1,2-Diphenylhydrazine (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
2,4-Dimethylphenol (ug/L)										
CSAA1	Base	2	100	1.9	1.9	1.9	1.9	1.9	1.9	1.9
CSE1	Base	2	100	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CSE3	Base	2	100	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CSA1	Storm	6	100	1.9	1.9	2.0	2.0	2.0	2.0	2.0
CSAA1	Storm	6	83	1.9	2.0	2.0	2.0	2.0	2.1	2.2
CSE1	Storm	12	100	1.9	2.0	2.0	2.0	2.1	2.1	2.2
CSE2	Storm	6	100	1.9	1.9	2.0	2.0	2.0	2.0	2.0
CSE3	Storm	6	100	1.9	1.9	2.0	2.0	2.0	2.0	2.0
CSF1	Storm	6	100	1.9	2.0	2.0	2.0	2.1	2.1	2.2
CSH1	Storm	6	100	1.1	2.0	2.0	1.9	2.1	2.1	2.1
CSJ1	Storm	6	100	1.9	2.1	2.1	2.1	2.1	2.1	2.2
CSL1	Storm	6	100	1.1	1.9	2.0	1.8	2.0	2.0	2.1
CSO1	Storm	6	100	1.9	2.0	2.0	2.0	2.0	2.1	2.1
CSP1	Storm	6	100	1.9	2.1	2.1	2.1	2.2	2.2	2.2
CSQ1	Storm	6	100	1.1	2.0	2.0	1.9	2.0	2.1	2.2
CSR1	Storm	6	100	2.0	2.1	2.1	2.1	2.1	2.1	2.1
CSR2	Storm	6	100	2.1	2.1	2.1	2.1	2.1	2.1	2.2
CSWSDOT1	Storm	12	100	1.1	2.0	2.1	2.6	2.1	2.2	10.0
CSWSDOT2	Storm	6	100	2.0	2.0	2.1	8.3	15.9	20.8	21.0
CSWSDOT3	Storm	6	100	2.1	2.1	2.1	6.5	7.7	15.2	21.0
CSWSDOT4	Storm	12	100	1.1	2.0	2.0	5.0	2.0	2.1	39.0
CSWSDOT5	Storm	6	100	2.0	2.0	2.1	3.4	2.1	6.1	10.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
2,4-Dinitrophenol (ug/L)										
CSAA1	Base	2	100	1.9	1.9	1.9	1.9	1.9	1.9	1.9
CSE1	Base	2	100	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CSE3	Base	2	100	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CSA1	Storm	6	100	1.9	1.9	2.0	2.0	2.0	2.0	2.0
CSAA1	Storm	6	100	1.0	1.9	2.0	1.8	2.0	2.0	2.1
CSE1	Storm	12	100	1.9	2.0	2.0	2.0	2.1	2.1	2.2
CSE2	Storm	6	100	1.9	1.9	2.0	2.0	2.0	2.0	2.0
CSE3	Storm	6	100	1.9	1.9	2.0	2.0	2.0	2.0	2.0
CSF1	Storm	6	100	1.9	2.0	2.0	2.0	2.1	2.1	2.2
CSH1	Storm	6	100	1.1	2.0	2.0	1.9	2.1	2.1	2.1
CSJ1	Storm	6	100	1.9	2.1	2.1	2.1	2.1	2.1	2.2
CSL1	Storm	6	100	1.0	1.9	2.0	1.8	2.0	2.0	2.1
CSO1	Storm	6	100	1.9	2.0	2.0	2.0	2.0	2.1	2.1
CSP1	Storm	6	100	1.9	2.1	2.1	2.1	2.2	2.2	2.2
CSQ1	Storm	6	100	1.1	2.0	2.0	1.9	2.0	2.1	2.2
CSR1	Storm	6	100	2.0	2.1	2.1	2.1	2.1	2.1	2.1
CSR2	Storm	6	100	2.1	2.1	2.1	2.1	2.1	2.1	2.2
CSWSDOT1	Storm	12	100	1.0	2.0	2.1	2.6	2.1	2.2	10.0
CSWSDOT2	Storm	6	100	2.0	2.0	2.1	8.3	15.9	20.8	21.0
CSWSDOT3	Storm	6	100	2.1	2.1	2.1	6.5	7.7	15.2	21.0
CSWSDOT4	Storm	12	100	1.1	2.0	2.0	5.0	2.0	2.1	39.0
CSWSDOT5	Storm	6	100	2.0	2.0	2.1	3.4	2.1	6.1	10.0
2,4-Dinitrotoluene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.191	0.195	0.172	0.199	0.202	0.205
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.196	0.202	0.178	0.205	0.208	0.210
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.191	0.195	0.172	0.195	0.200	0.205
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.195	0.198	0.178	0.204	0.210	0.215
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.105	0.208	0.208	0.220	1.000
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.100	0.100	0.447	0.199	0.210	3.900
CSWSDOT5	Storm	6	100	0.100	0.196	0.202	0.319	0.212	0.608	1.000

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
2,6-Dinitrotoluene (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.191	0.195	0.172	0.199	0.202	0.205
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.196	0.202	0.178	0.205	0.208	0.210
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.191	0.195	0.172	0.195	0.200	0.205
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.195	0.198	0.178	0.204	0.210	0.215
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.105	0.208	0.208	0.220	1.000
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.100	0.100	0.447	0.199	0.210	3.900
CSWSDOT5	Storm	6	100	0.100	0.196	0.202	0.319	0.212	0.608	1.000
2-Methylphenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	92	0.120	0.249	0.252	0.332	0.262	0.279	1.300
CSWSDOT2	Storm	6	50	0.150	0.214	0.288	1.010	1.990	2.580	2.600
CSWSDOT3	Storm	6	100	0.255	0.255	0.258	0.804	0.965	1.900	2.600
CSWSDOT4	Storm	12	75	0.135	0.244	0.245	0.630	0.252	0.341	4.900
CSWSDOT5	Storm	6	67	0.140	0.226	0.248	0.402	0.254	0.778	1.300

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
2-Nitroaniline (ug/L)										
CSAA1	Base	2	100	0.095	0.119	0.142	0.142	0.166	0.180	0.190
CSE1	Base	2	100	0.100	0.125	0.150	0.150	0.175	0.190	0.200
CSE3	Base	2	100	0.100	0.125	0.150	0.150	0.175	0.190	0.200
CSA1	Storm	6	100	0.095	0.100	0.100	0.114	0.100	0.145	0.190
CSAA1	Storm	6	100	0.048	0.191	0.195	0.172	0.199	0.202	0.205
CSE1	Storm	12	100	0.095	0.100	0.100	0.108	0.105	0.110	0.190
CSE2	Storm	6	100	0.095	0.096	0.100	0.113	0.100	0.145	0.190
CSE3	Storm	6	100	0.095	0.100	0.100	0.114	0.100	0.145	0.190
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.196	0.202	0.178	0.205	0.208	0.210
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.191	0.195	0.172	0.195	0.200	0.205
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.195	0.198	0.178	0.204	0.210	0.215
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.105	0.208	0.208	0.220	1.000
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.100	0.145	0.455	0.199	0.210	3.900
CSWSDOT5	Storm	6	100	0.100	0.196	0.202	0.319	0.212	0.608	1.000
2-Nitrophenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	100	0.120	0.249	0.255	0.333	0.266	0.279	1.300
CSWSDOT2	Storm	6	100	0.245	0.251	0.262	1.030	1.980	2.580	2.600
CSWSDOT3	Storm	6	100	0.255	0.255	0.258	0.804	0.965	1.900	2.600
CSWSDOT4	Storm	12	100	0.135	0.245	0.248	0.627	0.252	0.260	4.900
CSWSDOT5	Storm	6	100	0.245	0.251	0.255	0.429	0.266	0.785	1.300

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
3-Nitroaniline (ug/L)										
CSAA1	Base	2	100	0.47	0.47	0.47	0.47	0.47	0.47	0.47
CSE1	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSE3	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSA1	Storm	6	100	0.48	0.48	0.49	0.49	0.50	0.50	0.50
CSAA1	Storm	6	100	0.24	0.48	0.49	0.45	0.50	0.50	0.50
CSE1	Storm	12	100	0.47	0.49	0.50	0.50	0.50	0.55	0.55
CSE2	Storm	6	100	0.47	0.47	0.49	0.49	0.50	0.50	0.50
CSE3	Storm	6	100	0.48	0.49	0.50	0.49	0.50	0.50	0.50
CSF1	Storm	6	100	0.48	0.49	0.50	0.50	0.50	0.53	0.55
CSH1	Storm	6	100	0.26	0.49	0.50	0.47	0.50	0.53	0.55
CSJ1	Storm	6	100	0.47	0.50	0.50	0.50	0.50	0.53	0.55
CSL1	Storm	6	100	0.25	0.48	0.49	0.45	0.49	0.50	0.50
CSO1	Storm	6	100	0.47	0.49	0.50	0.49	0.50	0.50	0.50
CSP1	Storm	6	100	0.47	0.50	0.53	0.52	0.55	0.55	0.55
CSQ1	Storm	6	100	0.27	0.49	0.50	0.47	0.50	0.53	0.55
CSR1	Storm	6	100	0.50	0.50	0.50	0.51	0.50	0.53	0.55
CSR2	Storm	6	100	0.50	0.50	0.50	0.51	0.50	0.53	0.55
CSWSDOT1	Storm	12	100	0.24	0.50	0.50	0.66	0.55	0.55	2.55
CSWSDOT2	Storm	6	100	0.49	0.50	0.53	2.01	3.89	5.00	5.00
CSWSDOT3	Storm	6	100	0.50	0.50	0.50	1.57	1.92	3.70	5.00
CSWSDOT4	Storm	12	100	0.27	0.49	0.49	1.27	0.50	0.50	10.00
CSWSDOT5	Storm	6	100	0.49	0.50	0.50	0.85	0.54	1.55	2.55
4,6-Dinitro-2-methylphenol (ug/L)										
CSAA1	Base	2	100	0.95	0.95	0.95	0.95	0.95	0.95	0.95
CSE1	Base	2	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CSE3	Base	2	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CSA1	Storm	6	100	0.95	0.96	1.00	0.98	1.00	1.00	1.00
CSAA1	Storm	6	100	0.48	0.96	1.00	0.91	1.00	1.00	1.00
CSE1	Storm	12	100	0.95	0.99	1.00	1.00	1.01	1.05	1.10
CSE2	Storm	6	100	0.95	0.95	0.98	0.98	1.00	1.00	1.00
CSE3	Storm	6	100	0.95	0.96	1.00	0.98	1.00	1.00	1.00
CSF1	Storm	6	100	0.95	1.00	1.00	1.01	1.04	1.05	1.05
CSH1	Storm	6	100	0.50	1.00	1.00	0.93	1.00	1.02	1.05
CSJ1	Storm	6	100	0.95	1.01	1.05	1.02	1.05	1.05	1.05
CSL1	Storm	6	100	0.49	0.96	1.00	0.91	1.00	1.00	1.00
CSO1	Storm	6	100	0.95	1.00	1.00	0.99	1.00	1.00	1.00
CSP1	Storm	6	100	0.95	1.00	1.05	1.04	1.10	1.10	1.10
CSQ1	Storm	6	100	0.55	1.00	1.00	0.94	1.00	1.05	1.10
CSR1	Storm	6	100	1.00	1.05	1.05	1.04	1.05	1.05	1.05
CSR2	Storm	6	100	1.00	1.01	1.05	1.03	1.05	1.05	1.05
CSWSDOT1	Storm	12	100	0.47	1.00	1.00	1.31	1.06	1.10	5.00
CSWSDOT2	Storm	6	100	1.00	1.00	1.05	4.10	7.78	10.20	10.50
CSWSDOT3	Storm	6	100	1.00	1.00	1.02	3.22	3.86	7.65	10.50
CSWSDOT4	Storm	12	100	0.55	0.99	1.00	2.50	1.01	1.05	19.50
CSWSDOT5	Storm	6	100	1.00	1.00	1.00	1.68	1.08	3.05	5.00

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
4-Bromophenyl Phenyl Ether (ug/L)										
CSAA1	Base	2	100	0.095	0.095	0.095	0.095	0.095	0.095	0.095
CSE1	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSE3	Base	2	100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
CSA1	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSAA1	Storm	6	100	0.048	0.096	0.100	0.091	0.100	0.100	0.100
CSE1	Storm	12	100	0.095	0.099	0.100	0.100	0.101	0.105	0.110
CSE2	Storm	6	100	0.095	0.095	0.098	0.098	0.100	0.100	0.100
CSE3	Storm	6	100	0.095	0.096	0.100	0.098	0.100	0.100	0.100
CSF1	Storm	6	100	0.095	0.100	0.100	0.101	0.104	0.105	0.105
CSH1	Storm	6	100	0.050	0.100	0.100	0.093	0.100	0.102	0.105
CSJ1	Storm	6	100	0.095	0.101	0.105	0.102	0.105	0.105	0.105
CSL1	Storm	6	100	0.049	0.096	0.100	0.091	0.100	0.100	0.100
CSO1	Storm	6	100	0.095	0.100	0.100	0.099	0.100	0.100	0.100
CSP1	Storm	6	100	0.095	0.100	0.105	0.104	0.110	0.110	0.110
CSQ1	Storm	6	100	0.055	0.100	0.100	0.094	0.100	0.105	0.110
CSR1	Storm	6	100	0.100	0.105	0.105	0.104	0.105	0.105	0.105
CSR2	Storm	6	100	0.100	0.101	0.105	0.103	0.105	0.105	0.105
CSWSDOT1	Storm	12	100	0.047	0.100	0.100	0.131	0.106	0.110	0.500
CSWSDOT2	Storm	6	100	0.100	0.100	0.105	0.410	0.778	1.020	1.050
CSWSDOT3	Storm	6	100	0.100	0.100	0.102	0.322	0.386	0.765	1.050
CSWSDOT4	Storm	12	100	0.055	0.099	0.100	0.250	0.101	0.105	1.950
CSWSDOT5	Storm	6	100	0.100	0.100	0.100	0.168	0.108	0.305	0.500
4-Methylphenol (ug/L)										
CSAA1	Base	2	100	0.235	0.235	0.235	0.235	0.235	0.235	0.235
CSE1	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSE3	Base	2	100	0.250	0.250	0.250	0.250	0.250	0.250	0.250
CSA1	Storm	6	100	0.240	0.241	0.248	0.246	0.250	0.250	0.250
CSAA1	Storm	6	100	0.120	0.241	0.245	0.226	0.249	0.252	0.255
CSE1	Storm	12	100	0.235	0.248	0.250	0.252	0.256	0.264	0.270
CSE2	Storm	6	100	0.235	0.236	0.245	0.243	0.250	0.250	0.250
CSE3	Storm	6	100	0.240	0.242	0.250	0.247	0.250	0.250	0.250
CSF1	Storm	6	100	0.240	0.246	0.252	0.252	0.259	0.262	0.265
CSH1	Storm	6	100	0.130	0.246	0.252	0.233	0.255	0.260	0.265
CSJ1	Storm	6	100	0.235	0.256	0.260	0.256	0.260	0.262	0.265
CSL1	Storm	6	100	0.125	0.238	0.245	0.225	0.245	0.250	0.255
CSO1	Storm	6	100	0.235	0.245	0.250	0.248	0.255	0.255	0.255
CSP1	Storm	6	100	0.235	0.255	0.262	0.259	0.270	0.270	0.270
CSQ1	Storm	6	100	0.135	0.245	0.248	0.233	0.254	0.262	0.270
CSR1	Storm	6	100	0.250	0.260	0.260	0.259	0.260	0.262	0.265
CSR2	Storm	6	100	0.255	0.256	0.260	0.259	0.260	0.262	0.265
CSWSDOT1	Storm	12	92	0.120	0.245	0.252	0.324	0.262	0.279	1.300
CSWSDOT2	Storm	6	67	0.250	0.264	0.305	1.040	1.990	2.580	2.600
CSWSDOT3	Storm	6	83	0.140	0.255	0.255	0.784	0.964	1.900	2.600
CSWSDOT4	Storm	12	92	0.135	0.245	0.250	0.647	0.260	0.458	4.900
CSWSDOT5	Storm	6	83	0.180	0.246	0.252	0.417	0.266	0.785	1.300

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
4-Nitroaniline (ug/L)										
CSAA1	Base	2	100	0.47	0.47	0.47	0.47	0.47	0.47	0.47
CSE1	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSE3	Base	2	100	0.50	0.50	0.50	0.50	0.50	0.50	0.50
CSA1	Storm	6	100	0.48	0.48	0.49	0.49	0.50	0.50	0.50
CSAA1	Storm	6	100	0.24	0.48	0.49	0.45	0.50	0.50	0.50
CSE1	Storm	12	100	0.47	0.49	0.50	0.50	0.50	0.55	0.55
CSE2	Storm	6	100	0.47	0.47	0.49	0.49	0.50	0.50	0.50
CSE3	Storm	6	100	0.48	0.49	0.50	0.49	0.50	0.50	0.50
CSF1	Storm	6	100	0.48	0.49	0.50	0.50	0.50	0.53	0.55
CSH1	Storm	6	100	0.26	0.49	0.50	0.47	0.50	0.53	0.55
CSJ1	Storm	6	100	0.47	0.50	0.50	0.50	0.50	0.53	0.55
CSL1	Storm	6	100	0.25	0.48	0.49	0.45	0.49	0.50	0.50
CSO1	Storm	6	100	0.47	0.49	0.50	0.49	0.50	0.50	0.50
CSP1	Storm	6	100	0.47	0.50	0.53	0.52	0.55	0.55	0.55
CSQ1	Storm	6	100	0.27	0.49	0.50	0.47	0.50	0.53	0.55
CSR1	Storm	6	100	0.50	0.50	0.50	0.51	0.50	0.53	0.55
CSR2	Storm	6	100	0.50	0.50	0.50	0.51	0.50	0.53	0.55
CSWSDOT1	Storm	12	100	0.24	0.50	0.50	0.66	0.55	0.55	2.55
CSWSDOT2	Storm	6	100	0.49	0.50	0.53	2.01	3.89	5.00	5.00
CSWSDOT3	Storm	6	100	0.50	0.50	0.50	1.57	1.92	3.70	5.00
CSWSDOT4	Storm	12	100	0.27	0.49	0.49	1.27	0.50	0.50	10.00
CSWSDOT5	Storm	6	100	0.49	0.50	0.50	0.85	0.54	1.55	2.55
4-Nitrophenol (ug/L)										
CSAA1	Base	2	100	0.95	0.95	0.95	0.95	0.95	0.95	0.95
CSE1	Base	2	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CSE3	Base	2	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CSA1	Storm	6	100	0.95	0.96	1.00	0.98	1.00	1.00	1.00
CSAA1	Storm	6	100	0.48	0.96	1.00	0.91	1.00	1.00	1.00
CSE1	Storm	12	100	0.95	0.99	1.00	1.00	1.01	1.05	1.10
CSE2	Storm	6	100	0.95	0.95	0.98	0.98	1.00	1.00	1.00
CSE3	Storm	6	100	0.95	0.96	1.00	0.98	1.00	1.00	1.00
CSF1	Storm	6	100	0.95	1.00	1.00	1.01	1.04	1.05	1.05
CSH1	Storm	6	100	0.50	1.00	1.00	0.93	1.00	1.02	1.05
CSJ1	Storm	6	100	0.95	1.01	1.05	1.02	1.05	1.05	1.05
CSL1	Storm	6	100	0.49	0.96	1.00	0.91	1.00	1.00	1.00
CSO1	Storm	6	83	0.32	0.96	1.00	0.88	1.00	1.00	1.00
CSP1	Storm	6	100	0.95	1.00	1.05	1.04	1.10	1.10	1.10
CSQ1	Storm	6	100	0.55	1.00	1.00	0.94	1.00	1.05	1.10
CSR1	Storm	6	100	1.00	1.05	1.05	1.04	1.05	1.05	1.05
CSR2	Storm	6	100	1.00	1.01	1.05	1.03	1.05	1.05	1.05
CSWSDOT1	Storm	12	100	0.47	1.00	1.00	1.31	1.06	1.10	5.00
CSWSDOT2	Storm	6	100	1.00	1.00	1.05	4.10	7.78	10.20	10.50
CSWSDOT3	Storm	6	100	1.00	1.00	1.02	3.22	3.86	7.65	10.50
CSWSDOT4	Storm	12	100	0.55	0.99	1.00	2.50	1.01	1.05	19.50
CSWSDOT5	Storm	6	83	1.00	1.00	1.05	1.73	1.25	3.15	5.00

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
Benzoic Acid (ug/L)										
CSAA1	Base	2	100	2.4	2.4	2.4	2.4	2.4	2.4	2.4
CSE1	Base	2	100	2.5	2.5	2.5	2.5	2.5	2.5	2.5
CSE3	Base	2	100	2.5	2.5	2.5	2.5	2.5	2.5	2.5
CSA1	Storm	6	83	1.3	2.4	2.5	2.3	2.5	2.5	2.5
CSAA1	Storm	6	83	1.2	2.4	2.4	2.3	2.5	2.5	2.6
CSE1	Storm	12	100	2.4	2.5	2.5	2.5	2.6	2.6	2.7
CSE2	Storm	6	100	2.4	2.4	2.5	2.4	2.5	2.5	2.5
CSE3	Storm	6	83	1.1	2.4	2.5	2.2	2.5	2.5	2.5
CSF1	Storm	6	100	2.4	2.5	2.5	2.5	2.6	2.6	2.7
CSH1	Storm	6	67	1.3	2.5	2.5	2.4	2.6	2.7	2.8
CSJ1	Storm	6	100	2.4	2.6	2.6	2.6	2.6	2.6	2.7
CSL1	Storm	6	83	1.3	2.3	2.5	2.2	2.5	2.5	2.6
CSO1	Storm	6	100	2.4	2.5	2.5	2.5	2.6	2.6	2.6
CSP1	Storm	6	100	2.4	2.6	2.6	2.6	2.7	2.7	2.7
CSQ1	Storm	6	83	1.4	2.4	2.5	2.3	2.5	2.6	2.7
CSR1	Storm	6	100	2.5	2.6	2.6	2.6	2.6	2.6	2.7
CSR2	Storm	6	100	2.6	2.6	2.6	2.6	2.6	2.6	2.7
CSWSDOT1	Storm	12	83	1.2	2.4	2.5	3.2	2.6	2.8	13.0
CSWSDOT2	Storm	6	50	1.1	1.3	2.0	9.6	19.8	25.8	26.0
CSWSDOT3	Storm	6	100	2.6	2.6	2.6	8.0	9.7	19.0	26.0
CSWSDOT4	Storm	12	75	1.4	2.5	2.5	7.4	2.5	15.6	49.0
CSWSDOT5	Storm	6	33	1.6	2.3	2.8	6.8	4.6	15.6	26.0
Benzyl Alcohol (ug/L)										
CSAA1	Base	2	100	0.24	0.24	0.24	0.24	0.24	0.24	0.24
CSE1	Base	2	100	0.25	0.25	0.25	0.25	0.25	0.25	0.25
CSE3	Base	2	100	0.25	0.25	0.25	0.25	0.25	0.25	0.25
CSA1	Storm	6	83	0.10	0.24	0.25	0.22	0.25	0.25	0.25
CSAA1	Storm	6	100	0.12	0.24	0.25	0.23	0.25	0.25	0.26
CSE1	Storm	12	58	0.07	0.15	0.25	0.21	0.25	0.26	0.28
CSE2	Storm	6	100	0.24	0.24	0.25	0.24	0.25	0.25	0.25
CSE3	Storm	6	83	0.12	0.24	0.25	0.23	0.25	0.25	0.25
CSF1	Storm	6	50	0.08	0.23	0.24	0.22	0.24	0.26	0.27
CSH1	Storm	6	100	0.13	0.25	0.25	0.23	0.26	0.26	0.27
CSJ1	Storm	6	100	0.24	0.26	0.26	0.26	0.26	0.26	0.27
CSL1	Storm	6	100	0.13	0.24	0.25	0.23	0.25	0.25	0.26
CSO1	Storm	6	0	0.16	0.17	0.21	0.25	0.30	0.39	0.46
CSP1	Storm	6	83	0.10	0.26	0.26	0.24	0.27	0.27	0.27
CSQ1	Storm	6	100	0.14	0.25	0.25	0.23	0.25	0.26	0.27
CSR1	Storm	6	0	0.13	0.17	0.22	0.21	0.24	0.28	0.31
CSR2	Storm	6	0	0.15	0.17	0.21	0.70	0.28	1.74	3.20
CSWSDOT1	Storm	12	83	0.09	0.25	0.26	0.33	0.27	0.33	1.30
CSWSDOT2	Storm	6	33	0.11	0.58	2.35	2.55	4.58	5.15	5.20
CSWSDOT3	Storm	6	33	0.23	0.31	0.81	1.43	1.25	3.25	5.20
CSWSDOT4	Storm	12	92	0.14	0.25	0.25	0.67	0.26	0.69	4.90
CSWSDOT5	Storm	6	83	0.25	0.25	0.26	0.43	0.28	0.79	1.30

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
Carbazole (ug/L)										
CSAA1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSA1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSAA1	Storm	6	33	0.02	0.02	0.03	0.07	0.08	0.15	0.20
CSE1	Storm	12	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSE2	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSF1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSH1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.11
CSJ1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSL1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSO1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSP1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSQ1	Storm	6	100	0.06	0.10	0.10	0.09	0.10	0.11	0.11
CSR1	Storm	6	100	0.10	0.11	0.11	0.10	0.11	0.11	0.11
CSR2	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSWSDOT1	Storm	12	100	0.05	0.10	0.10	0.13	0.11	0.11	0.50
CSWSDOT2	Storm	6	100	0.10	0.10	0.11	0.41	0.78	1.02	1.05
CSWSDOT3	Storm	6	100	0.10	0.10	0.10	0.32	0.39	0.77	1.05
CSWSDOT4	Storm	12	92	0.07	0.10	0.10	0.25	0.10	0.11	1.95
CSWSDOT5	Storm	6	100	0.10	0.10	0.10	0.17	0.11	0.31	0.50
Dibenzofuran (ug/L)										
CSAA1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSA1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSAA1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSE1	Storm	12	92	0.03	0.10	0.10	0.09	0.10	0.11	0.11
CSE2	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSF1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSH1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.11
CSJ1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSL1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSO1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSP1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSQ1	Storm	6	100	0.06	0.10	0.10	0.09	0.10	0.11	0.11
CSR1	Storm	6	100	0.10	0.11	0.11	0.10	0.11	0.11	0.11
CSR2	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSWSDOT1	Storm	12	100	0.05	0.10	0.10	0.13	0.11	0.11	0.50
CSWSDOT2	Storm	6	100	0.10	0.10	0.11	0.41	0.78	1.02	1.05
CSWSDOT3	Storm	6	100	0.10	0.10	0.10	0.32	0.39	0.77	1.05
CSWSDOT4	Storm	12	100	0.06	0.10	0.10	0.25	0.10	0.11	1.95
CSWSDOT5	Storm	6	100	0.10	0.10	0.10	0.17	0.11	0.31	0.50

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
Isophorone (ug/L)										
CSAA1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSA1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSAA1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSE1	Storm	12	92	0.04	0.10	0.10	0.10	0.10	0.11	0.11
CSE2	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSF1	Storm	6	83	0.02	0.10	0.10	0.09	0.10	0.11	0.11
CSH1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.11
CSJ1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSL1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSO1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSP1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSQ1	Storm	6	100	0.06	0.10	0.10	0.09	0.10	0.11	0.11
CSR1	Storm	6	83	0.04	0.10	0.11	0.09	0.11	0.11	0.11
CSR2	Storm	6	83	0.07	0.10	0.10	0.10	0.11	0.11	0.11
CSWSDOT1	Storm	12	92	0.05	0.10	0.10	0.13	0.11	0.11	0.50
CSWSDOT2	Storm	6	100	0.10	0.10	0.11	0.41	0.78	1.02	1.05
CSWSDOT3	Storm	6	100	0.10	0.10	0.10	0.32	0.39	0.77	1.05
CSWSDOT4	Storm	12	100	0.06	0.10	0.10	0.25	0.10	0.11	1.95
CSWSDOT5	Storm	6	100	0.10	0.10	0.10	0.17	0.11	0.31	0.50
N-Nitrosodi-n-propylamine (ug/L)										
CSAA1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSA1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSAA1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSE1	Storm	12	92	0.10	0.10	0.10	0.11	0.10	0.11	0.25
CSE2	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSF1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSH1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.11
CSJ1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSL1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSO1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSP1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSQ1	Storm	6	100	0.06	0.10	0.10	0.09	0.10	0.11	0.11
CSR1	Storm	6	100	0.10	0.11	0.11	0.10	0.11	0.11	0.11
CSR2	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSWSDOT1	Storm	12	100	0.05	0.10	0.10	0.13	0.11	0.11	0.50
CSWSDOT2	Storm	6	67	0.10	0.33	1.02	4.69	5.44	13.00	19.00
CSWSDOT3	Storm	6	100	0.10	0.10	0.10	0.32	0.39	0.77	1.05
CSWSDOT4	Storm	12	100	0.06	0.10	0.10	0.25	0.10	0.11	1.95
CSWSDOT5	Storm	6	100	0.10	0.10	0.10	0.17	0.11	0.31	0.50

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
N-Nitrosodiphenylamine (ug/L)										
CSAA1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSA1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSAA1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSE1	Storm	12	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSE2	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSF1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSH1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.11
CSJ1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSL1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSO1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSP1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSQ1	Storm	6	100	0.06	0.10	0.10	0.09	0.10	0.11	0.11
CSR1	Storm	6	100	0.10	0.11	0.11	0.10	0.11	0.11	0.11
CSR2	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSWSDOT1	Storm	12	100	0.05	0.10	0.10	0.13	0.11	0.11	0.50
CSWSDOT2	Storm	6	100	0.10	0.10	0.11	0.41	0.78	1.02	1.05
CSWSDOT3	Storm	6	100	0.10	0.10	0.10	0.32	0.39	0.77	1.05
CSWSDOT4	Storm	12	100	0.06	0.10	0.10	0.25	0.10	0.11	1.95
CSWSDOT5	Storm	6	83	0.10	0.10	0.10	0.17	0.11	0.31	0.50
Nitrobenzene (ug/L)										
CSAA1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE1	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Base	2	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSA1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSAA1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSE1	Storm	12	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSE2	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSE3	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSF1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.11	0.11
CSH1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.11
CSJ1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSL1	Storm	6	100	0.05	0.10	0.10	0.09	0.10	0.10	0.10
CSO1	Storm	6	100	0.10	0.10	0.10	0.10	0.10	0.10	0.10
CSP1	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSQ1	Storm	6	100	0.06	0.10	0.10	0.09	0.10	0.11	0.11
CSR1	Storm	6	100	0.10	0.11	0.11	0.10	0.11	0.11	0.11
CSR2	Storm	6	100	0.10	0.10	0.11	0.10	0.11	0.11	0.11
CSWSDOT1	Storm	12	100	0.05	0.10	0.10	0.13	0.11	0.11	0.50
CSWSDOT2	Storm	6	100	0.10	0.10	0.11	0.41	0.78	1.02	1.05
CSWSDOT3	Storm	6	100	0.10	0.10	0.10	0.32	0.39	0.77	1.05
CSWSDOT4	Storm	12	100	0.06	0.10	0.10	0.25	0.10	0.11	1.95
CSWSDOT5	Storm	6	100	0.10	0.10	0.10	0.17	0.11	0.31	0.50

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Other Semivolatile Organic Compounds (SVOCs)										
Phenol (ug/L)										
CSAA1	Base	2	100	0.24	0.24	0.24	0.24	0.24	0.24	0.24
CSE1	Base	2	100	0.25	0.25	0.25	0.25	0.25	0.25	0.25
CSE3	Base	2	100	0.25	0.25	0.25	0.25	0.25	0.25	0.25
CSA1	Storm	6	83	0.07	0.24	0.25	0.22	0.25	0.25	0.25
CSAA1	Storm	6	100	0.12	0.24	0.25	0.23	0.25	0.25	0.26
CSE1	Storm	12	100	0.24	0.25	0.25	0.25	0.26	0.26	0.27
CSE2	Storm	6	100	0.24	0.24	0.25	0.24	0.25	0.25	0.25
CSE3	Storm	6	100	0.24	0.24	0.25	0.25	0.25	0.25	0.25
CSF1	Storm	6	100	0.24	0.25	0.25	0.25	0.26	0.26	0.27
CSH1	Storm	6	100	0.13	0.25	0.25	0.23	0.26	0.26	0.27
CSJ1	Storm	6	100	0.24	0.26	0.26	0.26	0.26	0.26	0.27
CSL1	Storm	6	83	0.13	0.20	0.25	0.22	0.25	0.25	0.26
CSO1	Storm	6	100	0.24	0.25	0.25	0.25	0.26	0.26	0.26
CSP1	Storm	6	100	0.24	0.26	0.26	0.26	0.27	0.27	0.27
CSQ1	Storm	6	83	0.14	0.20	0.25	0.22	0.25	0.26	0.27
CSR1	Storm	6	100	0.25	0.26	0.26	0.26	0.26	0.26	0.27
CSR2	Storm	6	100	0.26	0.26	0.26	0.26	0.26	0.26	0.27
CSWSDOT1	Storm	12	75	0.07	0.24	0.25	0.39	0.27	1.02	1.30
CSWSDOT2	Storm	6	50	0.11	0.28	0.44	1.06	2.04	2.58	2.60
CSWSDOT3	Storm	6	50	0.07	0.15	0.26	0.83	1.34	2.15	2.60
CSWSDOT4	Storm	12	58	0.14	0.25	0.25	0.75	0.60	1.05	4.90
CSWSDOT5	Storm	6	33	0.18	0.36	0.47	0.79	0.62	1.63	2.60

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Organochlorine Pesticides										
2,4'-DDD (ng/L)										
CSAA1	Base	2	100	1.50	1.69	1.88	1.88	2.06	2.17	2.25
CSE1	Base	2	100	1.50	1.69	1.88	1.88	2.06	2.17	2.25
CSE3	Base	2	100	0.75	0.94	1.12	1.12	1.31	1.42	1.50
CSA1	Storm	6	100	0.75	0.75	1.12	1.38	2.06	2.25	2.25
CSAA1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSE1	Storm	12	100	0.75	0.75	1.12	1.44	1.69	2.25	3.75
CSE2	Storm	6	100	0.75	0.94	1.88	1.62	2.25	2.25	2.25
CSE3	Storm	6	100	0.75	0.75	1.12	1.38	2.06	2.25	2.25
CSF1	Storm	6	100	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CSH1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSJ1	Storm	6	83	0.74	0.75	0.75	0.75	0.75	0.75	0.75
CSL1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSO1	Storm	6	100	0.75	0.75	0.75	0.94	0.75	1.32	1.90
CSP1	Storm	6	83	0.75	0.75	0.75	0.89	0.75	1.18	1.60
CSQ1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSR1	Storm	6	100	0.75	0.75	0.75	0.88	0.75	1.12	1.50
CSR2	Storm	6	100	0.75	0.75	0.75	0.88	0.75	1.12	1.50
CSWSDOT1	Storm	12	83	0.75	0.75	1.30	1.19	1.50	1.50	1.90
CSWSDOT2	Storm	6	83	0.75	0.76	6.14	8.05	14.10	17.20	19.50
CSWSDOT3	Storm	6	100	0.75	0.75	1.00	3.33	1.44	8.25	15.00
CSWSDOT4	Storm	12	100	0.75	0.75	1.50	1.44	1.69	2.25	2.25
CSWSDOT5	Storm	6	100	0.75	1.50	1.50	1.38	1.50	1.50	1.50
2,4'-DDE (ng/L)										
CSAA1	Base	2	100	1.50	1.69	1.88	1.88	2.06	2.17	2.25
CSE1	Base	2	100	1.50	1.69	1.88	1.88	2.06	2.17	2.25
CSE3	Base	2	100	0.75	0.94	1.12	1.12	1.31	1.42	1.50
CSA1	Storm	6	100	0.75	0.75	1.12	1.38	2.06	2.25	2.25
CSAA1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSE1	Storm	12	100	0.75	0.75	1.12	1.44	1.69	2.25	3.75
CSE2	Storm	6	100	0.75	0.94	1.88	1.62	2.25	2.25	2.25
CSE3	Storm	6	100	0.75	0.75	1.12	1.38	2.06	2.25	2.25
CSF1	Storm	6	100	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CSH1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSJ1	Storm	6	100	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CSL1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSO1	Storm	6	100	0.75	0.75	0.75	1.05	1.24	1.65	1.90
CSP1	Storm	6	100	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CSQ1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSR1	Storm	6	100	0.75	0.75	0.75	0.88	0.75	1.12	1.50
CSR2	Storm	6	100	0.75	0.75	0.75	0.88	0.75	1.12	1.50
CSWSDOT1	Storm	12	100	0.75	0.75	1.12	1.19	1.50	1.50	2.25
CSWSDOT2	Storm	6	100	0.75	0.85	2.45	5.48	9.56	13.20	15.00
CSWSDOT3	Storm	6	100	0.75	0.75	0.75	3.25	1.31	8.25	15.00
CSWSDOT4	Storm	12	100	0.75	0.75	1.50	1.44	1.69	2.25	2.25
CSWSDOT5	Storm	6	100	0.75	1.50	1.50	1.38	1.50	1.50	1.50

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
2,4'-DDT (ng/L)										
CSAA1	Base	2	100	1.50	1.69	1.88	1.88	2.06	2.17	2.25
CSE1	Base	2	100	1.50	1.69	1.88	1.88	2.06	2.17	2.25
CSE3	Base	2	100	0.75	0.94	1.12	1.12	1.31	1.42	1.50
CSA1	Storm	6	100	0.75	0.75	1.12	1.38	2.06	2.25	2.25
CSAA1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSE1	Storm	12	100	0.75	0.75	1.50	2.21	2.25	3.60	10.00
CSE2	Storm	6	100	0.75	0.94	1.88	1.62	2.25	2.25	2.25
CSE3	Storm	6	100	0.75	0.75	1.12	1.38	2.06	2.25	2.25
CSF1	Storm	6	100	0.75	0.75	0.75	0.75	0.75	0.75	0.75
CSH1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSJ1	Storm	6	100	0.75	0.75	0.75	1.06	0.75	1.68	2.60
CSL1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSO1	Storm	6	100	0.75	0.75	0.75	1.00	0.75	1.50	2.25
CSP1	Storm	6	100	0.75	0.75	0.75	1.27	0.75	2.33	3.90
CSQ1	Storm	6	100	1.50	1.50	1.50	1.62	1.50	1.88	2.25
CSR1	Storm	6	100	0.75	0.75	0.83	0.98	1.01	1.38	1.70
CSR2	Storm	6	100	0.75	0.75	0.75	0.88	0.75	1.12	1.50
CSWSDOT1	Storm	12	100	0.75	0.75	1.50	1.27	1.50	1.68	2.25
CSWSDOT2	Storm	6	100	0.75	0.75	2.25	5.42	9.56	13.20	15.00
CSWSDOT3	Storm	6	100	0.75	0.75	1.12	3.39	1.58	8.30	15.00
CSWSDOT4	Storm	12	100	0.75	0.75	1.50	1.44	1.69	2.25	2.25
CSWSDOT5	Storm	6	100	0.75	1.50	1.50	1.38	1.50	1.50	1.50
4,4'-DDD (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSE1	Storm	12	100	1.0	1.0	1.5	1.9	2.3	3.0	5.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	83	0.6	1.0	1.0	0.9	1.0	1.0	1.0
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	83	1.0	1.0	1.0	1.3	1.0	1.8	2.5
CSP1	Storm	6	83	0.6	1.0	1.0	0.9	1.0	1.0	1.0
CSQ1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSR1	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSR2	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSWSDOT1	Storm	12	92	1.0	1.0	1.8	1.6	2.0	2.0	3.0
CSWSDOT2	Storm	6	100	1.0	1.0	3.0	7.2	12.5	17.5	20.0
CSWSDOT3	Storm	6	100	1.0	1.0	1.4	4.5	1.9	11.0	20.0
CSWSDOT4	Storm	12	100	1.0	1.0	2.0	1.9	2.3	3.0	3.0
CSWSDOT5	Storm	6	100	1.0	2.0	2.0	1.8	2.0	2.0	2.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
4,4'-DDE (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	92	0.5	0.5	0.9	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.6	0.6
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.6	0.7
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.5	0.5	0.5	0.7	0.7	1.0	1.3
CSP1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.6	0.7
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	83	0.5	0.5	0.5	0.8	0.9	1.4	1.7
CSR2	Storm	6	67	0.5	0.5	0.6	0.7	0.9	1.1	1.1
CSWSDOT1	Storm	12	75	0.5	0.5	1.0	1.0	1.1	1.8	1.8
CSWSDOT2	Storm	6	83	0.5	0.8	2.2	3.8	6.3	8.8	10.0
CSWSDOT3	Storm	6	83	0.5	0.5	0.8	2.4	1.8	6.0	10.0
CSWSDOT4	Storm	12	83	0.5	0.5	1.0	1.0	1.5	1.5	1.5
CSWSDOT5	Storm	6	83	0.5	1.0	1.0	1.0	1.0	1.4	1.7
4,4'-DDT (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSE1	Storm	12	100	1.0	1.0	1.5	1.9	2.3	3.0	5.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	100	1.0	1.0	1.0	1.3	1.0	1.8	2.5
CSP1	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.7	2.4
CSQ1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSR1	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSR2	Storm	6	100	1.0	1.0	1.0	1.4	1.8	2.1	2.3
CSWSDOT1	Storm	12	92	1.0	1.0	2.0	2.0	2.4	3.0	4.6
CSWSDOT2	Storm	6	100	1.1	1.9	9.1	11.9	18.8	25.2	30.5
CSWSDOT3	Storm	6	100	1.0	1.1	1.7	4.8	2.9	11.6	20.0
CSWSDOT4	Storm	12	100	1.0	1.0	2.0	1.9	2.3	3.0	3.0
CSWSDOT5	Storm	6	100	1.0	2.0	2.0	1.8	2.0	2.0	2.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Organochlorine Pesticides										
Aldrin (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSE1	Storm	12	92	1.0	1.0	1.6	1.9	2.3	3.0	5.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	83	0.8	1.0	1.0	1.0	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	83	0.9	1.0	1.0	1.0	1.0	1.0	1.0
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	100	1.0	1.0	1.0	1.3	1.0	1.8	2.5
CSP1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSQ1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSR1	Storm	6	83	1.0	1.0	1.0	1.2	1.2	1.7	2.0
CSR2	Storm	6	83	0.9	1.0	1.0	1.2	1.0	1.5	2.0
CSWSDOT1	Storm	12	92	1.0	1.0	2.0	1.7	2.0	2.4	3.0
CSWSDOT2	Storm	6	100	1.0	1.0	3.0	7.2	12.5	17.5	20.0
CSWSDOT3	Storm	6	100	1.0	1.0	1.0	4.3	1.8	11.0	20.0
CSWSDOT4	Storm	12	100	1.0	1.0	2.0	1.9	2.3	3.0	3.0
CSWSDOT5	Storm	6	100	1.0	2.0	2.0	1.8	2.0	2.0	2.0
Chlordane (ng/L)										
CSAA1	Base	2	100	20	23	25	25	28	29	30
CSE1	Base	2	100	20	23	25	25	28	29	30
CSE3	Base	2	100	10	13	15	15	18	19	20
CSA1	Storm	6	100	10	10	15	18	28	30	30
CSAA1	Storm	6	100	20	20	20	22	20	25	30
CSE1	Storm	12	100	10	10	15	19	23	30	50
CSE2	Storm	6	100	10	13	25	22	30	30	30
CSE3	Storm	6	100	10	10	15	18	28	30	30
CSF1	Storm	6	100	10	10	10	10	10	10	10
CSH1	Storm	6	100	20	20	20	22	20	25	30
CSJ1	Storm	6	100	10	10	10	10	10	10	10
CSL1	Storm	6	100	20	20	20	22	20	25	30
CSO1	Storm	6	100	10	10	10	13	10	18	25
CSP1	Storm	6	100	10	10	10	10	10	10	10
CSQ1	Storm	6	100	20	20	20	22	20	25	30
CSR1	Storm	6	100	10	10	10	12	10	15	20
CSR2	Storm	6	100	10	10	10	12	10	15	20
CSWSDOT1	Storm	12	100	10	10	20	18	20	29	33
CSWSDOT2	Storm	6	100	10	10	80	155	188	375	550
CSWSDOT3	Storm	6	100	10	10	10	43	18	110	200
CSWSDOT4	Storm	12	100	10	10	20	19	23	30	30
CSWSDOT5	Storm	6	100	10	20	20	18	20	20	20

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Chlorpyrifos (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	67	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	83	0.8	1.0	1.0	1.0	1.0	1.3	1.5
CSE1	Storm	12	75	0.5	0.5	1.0	1.2	1.5	2.2	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	67	0.5	0.6	0.8	0.9	1.1	1.4	1.5
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	67	0.5	0.5	0.6	1.0	0.9	1.8	2.7
CSL1	Storm	6	83	0.8	1.0	1.0	1.0	1.0	1.3	1.5
CSO1	Storm	6	67	0.5	0.5	0.8	1.1	1.2	2.1	3.0
CSP1	Storm	6	17	0.5	0.7	1.5	2.2	3.3	4.7	5.6
CSQ1	Storm	6	83	1.0	1.0	1.0	1.2	1.4	1.7	1.9
CSR1	Storm	6	100	0.5	0.5	0.5	0.8	0.5	1.4	2.3
CSR2	Storm	6	83	0.5	0.5	0.5	0.7	0.5	1.1	1.7
CSWSDOT1	Storm	12	50	0.5	0.8	1.0	1.5	1.6	3.4	4.7
CSWSDOT2	Storm	6	67	0.8	1.2	3.2	4.0	6.8	8.1	8.5
CSWSDOT3	Storm	6	50	0.6	1.0	1.6	3.2	2.2	7.2	12.0
CSWSDOT4	Storm	12	92	0.5	0.9	1.0	1.1	1.5	1.5	2.5
CSWSDOT5	Storm	6	83	0.5	1.0	1.0	1.1	1.3	1.6	1.8
Dieldrin (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	67	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSAA1	Storm	6	83	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSE1	Storm	12	50	0.5	1.3	1.8	1.8	2.5	2.6	2.8
CSE2	Storm	5	100	0.5	1.0	1.5	1.2	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.6	0.5	0.7	0.8
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.6	0.7
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.5	0.5	0.5	0.7	0.6	1.0	1.3
CSP1	Storm	6	83	0.5	0.5	0.5	0.6	0.6	0.8	1.0
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.7	0.9	1.0
CSR2	Storm	6	83	0.5	0.5	0.5	0.7	0.9	1.0	1.0
CSWSDOT1	Storm	12	92	0.5	0.5	1.0	0.9	1.0	1.5	1.9
CSWSDOT2	Storm	6	100	0.5	0.6	1.8	3.7	6.3	8.8	10.0
CSWSDOT3	Storm	6	83	0.5	0.6	0.9	2.4	1.4	5.8	10.0
CSWSDOT4	Storm	12	0	4.0	4.7	6.9	7.3	9.5	10.9	12.0
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Endosulfan I (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	83	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.7	0.8
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.5	0.6
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	83	0.5	0.5	1.0	0.9	1.0	1.3	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.8	2.6	2.4	6.4	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
Endosulfan II (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.6
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.1
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.6	0.7	0.8	1.1	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.7	0.9
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.8	1.0	1.2	1.8	2.3
CSR2	Storm	6	100	0.5	0.5	0.5	0.7	0.9	1.0	1.1
CSWSDOT1	Storm	12	92	0.5	0.5	1.0	1.1	1.1	1.5	3.3
CSWSDOT2	Storm	6	100	0.5	1.3	2.0	3.9	6.3	8.8	10.0
CSWSDOT3	Storm	6	83	0.5	1.0	1.2	3.0	1.8	7.0	12.0
CSWSDOT4	Storm	12	92	0.5	0.5	1.0	1.0	1.2	1.5	1.5
CSWSDOT5	Storm	6	83	0.5	0.8	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Endosulfan Sulfate (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	92	0.5	0.5	1.0	1.1	1.5	2.1	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.7	0.8	1.1	1.3
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	83	0.5	0.5	0.5	0.8	0.8	1.5	2.2
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.5	0.5	0.9	1.0	1.3	1.5	1.6
CSP1	Storm	6	100	0.5	0.5	0.6	2.5	1.0	6.3	11.5
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.9	0.9	1.8	2.5
CSWSDOT1	Storm	12	83	0.5	0.5	1.0	1.1	1.0	1.5	4.1
CSWSDOT2	Storm	6	83	0.5	1.0	2.7	4.1	6.3	9.3	11.0
CSWSDOT3	Storm	6	83	0.5	0.5	0.8	3.6	1.0	9.5	18.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
Endrin (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	92	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.5	0.6
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	67	0.5	0.5	0.6	0.7	0.9	0.9	1.0
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	67	0.5	0.5	0.6	0.8	0.9	1.3	1.6
CSR2	Storm	6	83	0.5	0.5	0.5	0.7	0.9	1.1	1.1
CSWSDOT1	Storm	12	92	0.5	0.5	1.0	0.9	1.0	1.3	1.5
CSWSDOT2	Storm	6	100	0.5	0.7	1.8	3.7	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.8	2.3	1.2	5.6	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Endrin Aldehyde (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	92	0.5	0.5	1.0	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.5	0.5	0.6	0.8
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.5	0.5	0.6	1.1	1.1	2.2	3.2
CSP1	Storm	6	100	0.5	0.5	0.5	0.6	0.6	0.7	0.7
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.8	0.9	1.5	2.1
CSR2	Storm	6	100	0.5	0.5	0.8	1.1	1.0	2.1	3.3
CSWSDOT1	Storm	12	92	0.5	0.9	1.0	1.1	1.1	1.5	2.4
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.7	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	92	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
Endrin Ketone (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSE1	Storm	12	100	1.0	1.0	1.5	1.9	2.3	3.0	5.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	83	0.8	1.0	1.0	1.2	1.0	1.8	2.5
CSP1	Storm	6	83	1.0	1.0	1.1	1.6	2.2	2.9	3.2
CSQ1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSR1	Storm	6	83	1.0	1.0	1.5	2.4	2.4	4.8	7.0
CSR2	Storm	6	100	1.0	1.0	1.2	1.4	1.9	2.1	2.2
CSWSDOT1	Storm	12	92	1.0	1.0	2.0	1.7	2.0	2.1	3.0
CSWSDOT2	Storm	6	100	1.0	1.2	3.4	7.3	12.5	17.5	20.0
CSWSDOT3	Storm	6	83	1.0	1.0	1.0	7.7	1.8	21.0	40.0
CSWSDOT4	Storm	12	100	1.0	1.0	2.0	1.9	2.3	3.0	3.0
CSWSDOT5	Storm	6	100	1.0	2.0	2.0	1.8	2.0	2.0	2.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	**Event Type**	**n**	**% U**	**Minimum**	**25th percentile**	**Median**	**Mean[a]**	**75th percentile**	**90th percentile**	**Maximum**
Organochlorine Pesticides										
Heptachlor (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	67	1.5	2.0	2.0	2.2	2.0	2.8	3.5
CSE1	Storm	12	100	1.0	1.0	1.5	1.9	2.3	3.0	5.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	83	1.0	1.0	1.0	1.3	1.2	1.9	2.5
CSP1	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.6	2.1
CSQ1	Storm	6	83	2.0	2.0	2.0	3.3	2.8	5.8	8.6
CSR1	Storm	6	67	1.0	1.0	1.2	1.5	1.8	2.4	2.7
CSR2	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSWSDOT1	Storm	12	92	1.0	1.0	2.0	1.7	2.0	2.7	3.0
CSWSDOT2	Storm	6	83	1.0	2.7	4.4	7.9	12.5	17.5	20.0
CSWSDOT3	Storm	6	83	1.0	1.0	1.6	5.0	4.3	12.5	20.0
CSWSDOT4	Storm	12	92	1.0	1.0	2.0	1.9	2.3	3.0	3.1
CSWSDOT5	Storm	6	67	1.0	2.0	2.0	4.0	5.8	8.6	10.0
Heptachlor Epoxide (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	67	0.3	0.5	0.7	0.9	1.1	1.5	2.5
CSE2	Storm	6	50	0.5	0.7	1.0	1.0	1.4	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	83	0.3	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.7	0.9
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	92	0.5	0.5	0.8	0.8	1.0	1.0	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	83	0.5	0.5	0.8	2.3	1.0	5.5	10.0
CSWSDOT4	Storm	12	92	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Hexachlorobenzene-OP (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	83	0.5	0.6	0.9	1.0	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	100	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	83	0.5	0.5	0.5	0.8	0.9	1.5	2.0
CSR2	Storm	6	83	0.5	0.5	0.5	0.6	0.8	0.9	1.0
CSWSDOT1	Storm	12	100	0.5	0.5	0.8	0.8	1.0	1.0	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	83	0.5	0.5	0.8	2.6	2.5	6.5	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
Hexachlorobutadiene-OP (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	83	1.0	1.0	1.0	1.7	1.4	3.2	4.9
CSE1	Storm	12	92	0.3	0.5	0.8	0.9	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	83	0.4	0.5	0.5	0.8	1.3	1.5	1.5
CSF1	Storm	6	83	0.2	0.5	0.5	0.4	0.5	0.5	0.5
CSH1	Storm	6	83	1.0	1.0	1.0	1.4	1.4	2.3	3.1
CSJ1	Storm	6	83	0.2	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	83	1.0	1.0	1.0	1.4	1.4	2.2	2.9
CSO1	Storm	6	83	0.2	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSQ1	Storm	6	83	1.0	1.0	1.0	1.4	1.4	2.3	3.0
CSR1	Storm	6	83	0.2	0.5	0.5	0.5	0.5	0.8	1.0
CSR2	Storm	6	83	0.4	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	83	0.2	0.5	0.8	1.0	1.0	1.5	3.3
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	83	0.5	0.5	0.6	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	92	0.5	0.5	1.0	1.1	1.5	1.5	3.2
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Hexachloroethane-OP (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	83	1.0	1.0	1.0	1.1	1.2	1.4	1.5
CSE1	Storm	12	100	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSH1	Storm	6	83	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	83	1.0	1.0	1.0	1.1	1.2	1.4	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSQ1	Storm	6	83	1.0	1.0	1.0	1.1	1.2	1.4	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	92	0.5	0.5	0.8	0.8	1.0	1.5	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.5	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	92	0.5	0.5	1.0	1.0	1.3	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
Isodrin (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	100	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.6	0.6
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	100	0.5	0.5	0.8	0.8	1.0	1.0	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.7	3.7	6.4	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.5	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Methoxychlor (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.1	2.5	2.4	2.5	2.8	3.0
CSE1	Storm	12	100	1.0	1.0	1.5	1.9	2.3	3.0	5.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	83	1.0	1.0	1.0	1.2	1.0	1.7	2.3
CSH1	Storm	6	100	2.0	2.1	2.5	2.4	2.5	2.8	3.0
CSJ1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSL1	Storm	6	100	2.0	2.1	2.5	2.4	2.5	2.8	3.0
CSO1	Storm	6	83	1.0	1.0	1.0	1.6	2.1	2.8	3.0
CSP1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSQ1	Storm	6	100	2.0	2.1	2.5	2.4	2.5	2.8	3.0
CSR1	Storm	6	100	1.0	1.0	1.0	1.7	1.8	3.0	4.0
CSR2	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSWSDOT1	Storm	12	92	1.0	1.0	2.0	1.9	2.5	3.0	4.0
CSWSDOT2	Storm	6	100	1.0	1.0	3.0	7.2	12.5	17.5	20.0
CSWSDOT3	Storm	6	100	1.0	1.0	1.5	5.4	6.1	13.8	20.0
CSWSDOT4	Storm	12	92	1.0	1.2	2.0	2.6	3.0	3.9	8.3
CSWSDOT5	Storm	6	100	1.0	2.0	2.3	2.1	2.5	2.5	2.5
Mirex (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	100	0.5	0.5	1.0	1.2	1.5	2.4	3.0
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	1.0	0.5	1.9	3.3
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	1.1	0.5	2.3	4.1
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.6	0.8
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	1.1	0.9	2.3	3.5
CSR2	Storm	6	100	0.5	0.5	0.5	0.8	0.9	1.3	1.7
CSWSDOT1	Storm	12	100	0.5	0.5	0.9	0.8	1.0	1.0	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.8	2.3	1.0	5.5	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Oxychlordane (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	100	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.4	0.5	0.5	0.7	0.7	1.0	1.3
CSP1	Storm	6	67	0.5	0.5	0.5	0.6	0.7	0.9	0.9
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	100	0.5	0.5	0.8	0.8	1.0	1.0	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.5	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
Toxaphene (ng/L)										
CSAA1	Base	2	100	100	112	125	125	138	145	150
CSE1	Base	2	100	100	112	125	125	138	145	150
CSE3	Base	2	100	50	63	75	75	88	95	100
CSA1	Storm	6	100	50	50	75	92	138	150	150
CSAA1	Storm	6	100	100	100	100	108	100	125	150
CSE1	Storm	12	100	50	50	75	96	112	150	250
CSE2	Storm	6	100	50	63	125	108	150	150	150
CSE3	Storm	6	100	50	50	75	92	138	150	150
CSF1	Storm	6	100	50	50	50	50	50	50	50
CSH1	Storm	6	100	100	100	100	108	100	125	150
CSJ1	Storm	6	100	50	50	50	50	50	50	50
CSL1	Storm	6	100	100	100	100	108	100	125	150
CSO1	Storm	6	100	50	50	50	63	50	88	125
CSP1	Storm	6	100	50	50	50	67	50	100	150
CSQ1	Storm	6	100	100	100	100	108	100	125	150
CSR1	Storm	6	100	50	50	50	58	50	75	100
CSR2	Storm	6	100	50	50	50	58	50	75	100
CSWSDOT1	Storm	12	100	50	50	98	83	100	100	150
CSWSDOT2	Storm	6	100	50	50	300	408	700	875	1000
CSWSDOT3	Storm	6	100	50	50	50	217	88	550	1000
CSWSDOT4	Storm	12	100	50	50	100	96	112	150	150
CSWSDOT5	Storm	6	100	50	100	100	92	100	100	100

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
alpha-BHC (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	75	0.3	0.5	0.9	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.6	0.5	0.8	1.1
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	67	0.3	0.5	0.5	0.6	0.5	0.8	1.1
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	67	0.3	0.5	0.5	0.7	1.0	1.2	1.3
CSP1	Storm	6	83	0.5	0.5	0.5	0.6	0.5	0.7	0.9
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	67	0.4	0.5	0.5	0.6	0.9	1.0	1.0
CSR2	Storm	6	67	0.4	0.5	0.5	0.6	0.7	0.9	1.0
CSWSDOT1	Storm	12	83	0.5	0.5	1.0	0.9	1.0	1.5	2.2
CSWSDOT2	Storm	6	83	0.3	0.5	1.5	3.5	6.3	8.8	10.0
CSWSDOT3	Storm	6	83	0.5	0.5	0.6	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
alpha-Chlordane (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	83	0.4	0.5	0.9	1.0	1.1	1.5	2.5
CSE2	Storm	6	83	0.5	0.8	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.4	0.5	0.5	0.5	0.5	0.5	0.5
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	83	0.4	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.4	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	92	0.5	0.5	1.0	0.9	1.0	1.2	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.7	2.2	1.0	5.5	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
beta-BHC (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	83	0.3	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	92	0.5	0.5	0.9	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.6	0.6	0.8	0.9
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.6	0.6
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	83	0.5	0.5	0.6	1.2	0.7	2.5	4.2
CSP1	Storm	6	100	0.5	0.5	0.5	1.0	1.6	2.1	2.3
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	83	0.5	0.5	0.6	0.8	0.9	1.4	1.7
CSR2	Storm	6	100	0.5	0.6	0.9	1.2	1.3	2.3	3.2
CSWSDOT1	Storm	12	92	0.5	0.7	1.0	0.9	1.0	1.3	1.5
CSWSDOT2	Storm	6	100	0.5	1.2	2.9	4.6	8.3	10.2	10.5
CSWSDOT3	Storm	6	83	0.5	0.6	2.6	4.5	8.6	10.5	11.0
CSWSDOT4	Storm	12	92	0.5	0.5	1.0	0.9	1.2	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.1	1.1
cis-Nonachlor (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	100	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	83	0.5	0.5	0.5	0.9	0.5	1.7	2.8
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	83	0.5	0.5	0.5	0.6	0.7	0.9	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	100	0.5	0.5	0.9	0.9	1.0	1.5	1.8
CSWSDOT2	Storm	6	83	0.5	1.8	6.7	5.8	9.4	10.2	10.5
CSWSDOT3	Storm	6	100	0.5	0.5	0.8	2.3	1.4	5.8	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
delta-BHC (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	92	0.5	0.5	1.0	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	83	0.5	0.5	0.6	0.9	1.3	1.5	1.5
CSF1	Storm	6	83	0.5	0.5	0.5	0.6	0.5	0.7	0.8
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	67	0.5	0.5	0.5	0.5	0.5	0.6	0.7
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	0.9	0.5	1.6	2.6
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	67	0.5	0.5	0.5	0.6	0.7	0.9	1.0
CSR2	Storm	6	83	0.5	0.5	0.5	0.7	0.8	0.9	1.0
CSWSDOT1	Storm	12	83	0.4	0.5	1.0	0.9	1.0	1.5	2.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	67	0.5	0.5	0.5	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	100	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0
gamma-BHC (Lindane) (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSE1	Storm	12	100	1.0	1.0	1.5	1.9	2.3	3.0	5.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	100	1.0	1.0	1.0	1.3	1.0	1.8	2.5
CSP1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSQ1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSR1	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSR2	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSWSDOT1	Storm	12	92	0.8	1.0	1.5	1.6	2.0	2.0	3.0
CSWSDOT2	Storm	6	83	0.7	1.0	3.0	7.1	12.5	17.5	20.0
CSWSDOT3	Storm	6	100	1.0	1.0	1.0	4.3	1.8	11.0	20.0
CSWSDOT4	Storm	12	100	1.0	1.0	2.0	1.9	2.3	3.0	3.0
CSWSDOT5	Storm	6	100	1.0	2.0	2.0	1.8	2.0	2.0	2.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
trans-Chlordane (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSE1	Storm	12	100	1.0	1.0	1.5	1.9	2.3	3.0	5.0
CSE2	Storm	6	83	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	100	1.0	1.0	1.0	1.3	1.0	1.9	2.9
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	100	1.0	1.0	1.0	1.3	1.0	1.8	2.5
CSP1	Storm	6	100	1.0	1.0	1.0	1.0	1.0	1.0	1.0
CSQ1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSR1	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSR2	Storm	6	100	1.0	1.0	1.0	1.2	1.0	1.5	2.0
CSWSDOT1	Storm	12	92	1.0	1.0	1.9	1.6	2.0	2.0	3.0
CSWSDOT2	Storm	6	100	1.0	1.0	3.0	7.2	12.5	17.5	20.0
CSWSDOT3	Storm	6	100	1.0	1.0	1.0	4.3	1.8	11.0	20.0
CSWSDOT4	Storm	12	100	1.0	1.0	2.0	1.9	2.3	3.0	3.0
CSWSDOT5	Storm	6	100	1.0	2.0	2.0	1.8	2.0	2.0	2.0
trans-Nonachlor (ng/L)										
CSAA1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE1	Base	2	100	1.0	1.1	1.3	1.3	1.4	1.5	1.5
CSE3	Base	2	100	0.5	0.6	0.8	0.8	0.9	1.0	1.0
CSA1	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSAA1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSE1	Storm	12	100	0.5	0.5	0.8	1.0	1.1	1.5	2.5
CSE2	Storm	6	100	0.5	0.6	1.3	1.1	1.5	1.5	1.5
CSE3	Storm	6	100	0.5	0.5	0.8	0.9	1.4	1.5	1.5
CSF1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSH1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSJ1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSL1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSO1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.9	1.3
CSP1	Storm	6	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CSQ1	Storm	6	100	1.0	1.0	1.0	1.1	1.0	1.3	1.5
CSR1	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSR2	Storm	6	100	0.5	0.5	0.5	0.6	0.5	0.8	1.0
CSWSDOT1	Storm	12	100	0.5	0.5	0.8	0.8	1.0	1.0	1.5
CSWSDOT2	Storm	6	100	0.5	0.5	1.5	3.6	6.3	8.8	10.0
CSWSDOT3	Storm	6	100	0.5	0.5	0.5	2.2	0.9	5.5	10.0
CSWSDOT4	Storm	12	92	0.5	0.5	1.0	1.0	1.1	1.5	1.5
CSWSDOT5	Storm	6	100	0.5	1.0	1.0	0.9	1.0	1.0	1.0

Table A-1. Summary Statistics for Columbia Slope Water Quality Monitoring Project 2021-2024										
Station	Event Type	n	% U	Minimum	25th percentile	Median	Mean[a]	75th percentile	90th percentile	Maximum
Organochlorine Pesticides										
Total DDx (ng/L)										
CSAA1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE1	Base	2	100	2.0	2.3	2.5	2.5	2.8	2.9	3.0
CSE3	Base	2	100	1.0	1.3	1.5	1.5	1.8	1.9	2.0
CSA1	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSAA1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSE1	Storm	12	92	0.8	1.0	2.0	2.7	3.0	4.8	10.0
CSE2	Storm	6	100	1.0	1.3	2.5	2.2	3.0	3.0	3.0
CSE3	Storm	6	100	1.0	1.0	1.5	1.8	2.8	3.0	3.0
CSF1	Storm	6	83	0.6	1.0	1.0	0.9	1.0	1.0	1.0
CSH1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSJ1	Storm	6	67	0.7	1.0	1.0	1.0	1.0	1.1	1.2
CSL1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSO1	Storm	6	83	1.0	1.0	1.2	1.4	1.7	2.1	2.5
CSP1	Storm	6	50	0.6	0.8	1.0	1.2	1.5	2.0	2.4
CSQ1	Storm	6	100	2.0	2.0	2.0	2.2	2.0	2.5	3.0
CSR1	Storm	6	83	1.0	1.0	1.0	1.3	1.5	1.9	2.0
CSR2	Storm	6	67	0.6	1.0	1.1	1.3	1.8	2.1	2.3
CSWSDOT1	Storm	12	58	1.0	1.1	1.9	2.0	2.0	2.4	5.8
CSWSDOT2	Storm	6	67	0.8	1.2	8.4	11.5	18.8	25.2	30.5
CSWSDOT3	Storm	6	83	1.0	1.2	1.9	4.6	2.0	11.0	20.0
CSWSDOT4	Storm	12	83	1.0	1.0	1.8	1.8	2.3	3.0	3.0
CSWSDOT5	Storm	6	83	1.0	1.8	2.0	1.8	2.0	2.0	2.0

[a] Geometric mean is reported for E. coli

BHC: Benzene hexachloride

cfs: Cubic feet per second

DDD: Dichlorodiphenyldichloroethane

DDE: Dichlorodiphenyldichloroethylene

DDT: Dichlorodiphenyltrichloroethane

mg/L: Milligrams per liter

MPN/100 mL: Most probable number per 100 milliliters

ng/L: Nanograms per liter

NTU: Nephelometric turbidity unit

U: Undetected

ug/L: Micrograms per liter

uS/cm: Microsiemens per centimeter

Appendix B

Water Quality Figures

CITY OF Vancouver WASHINGTON

HERRERA Science + Planning + Design

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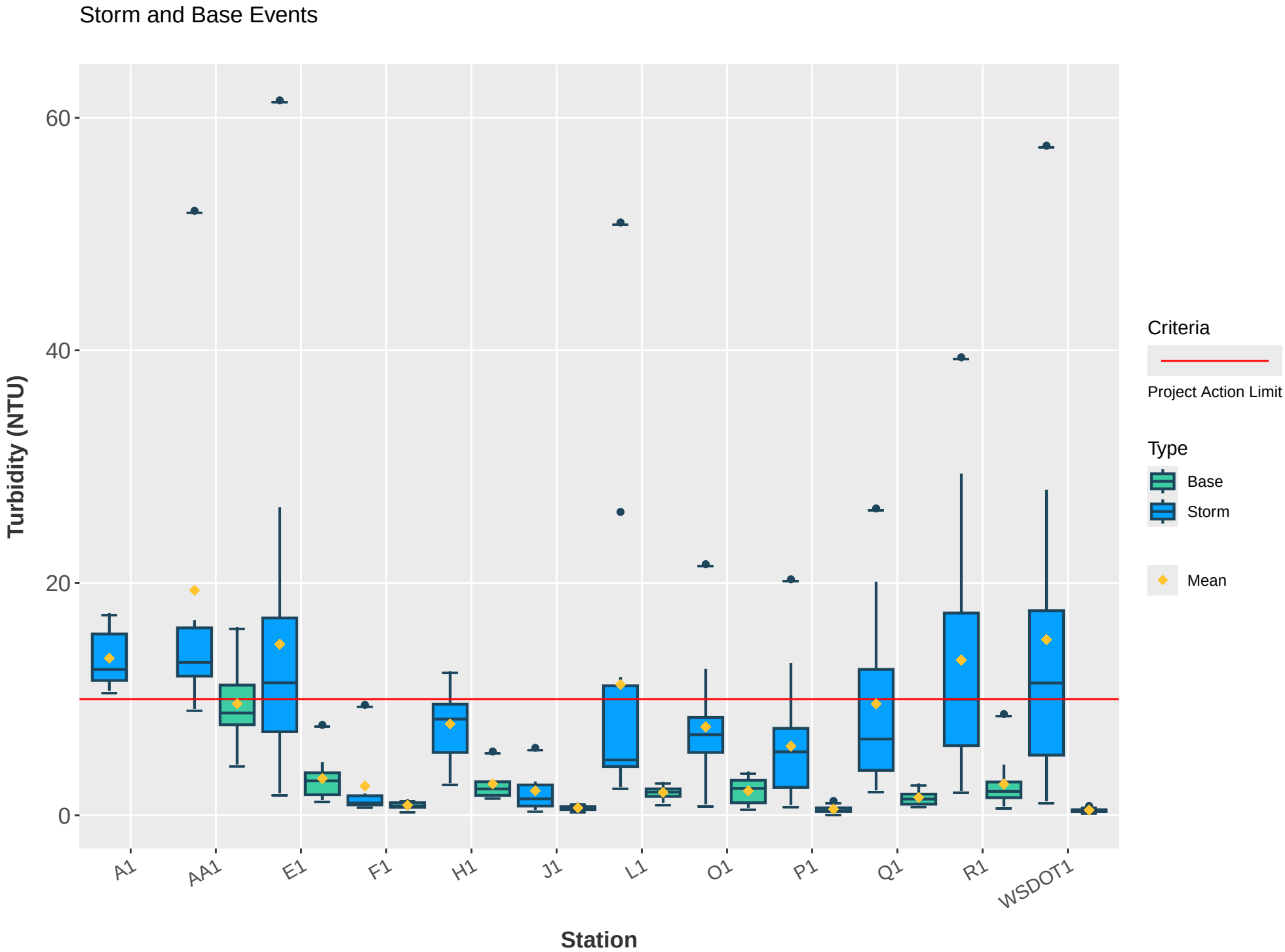
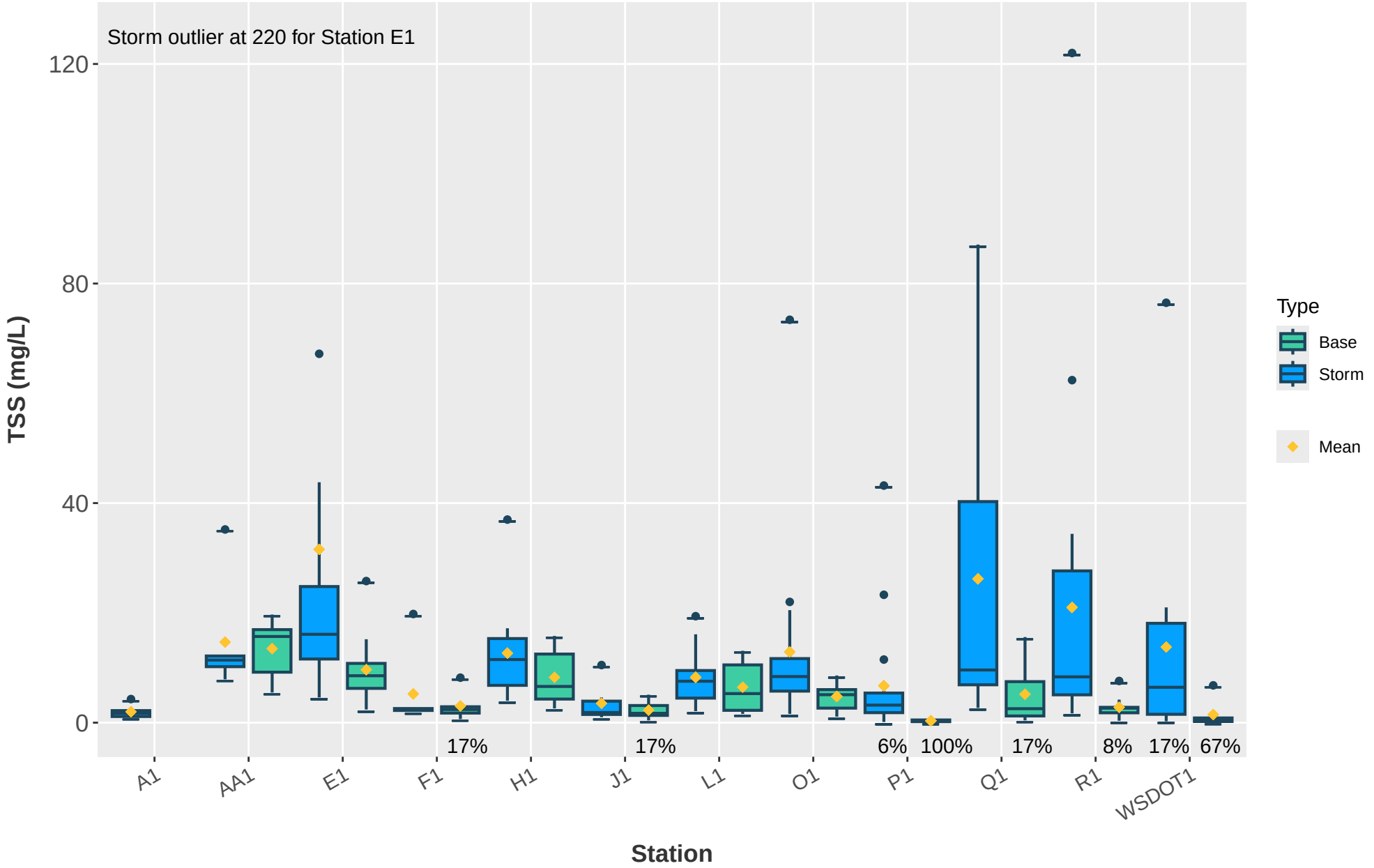
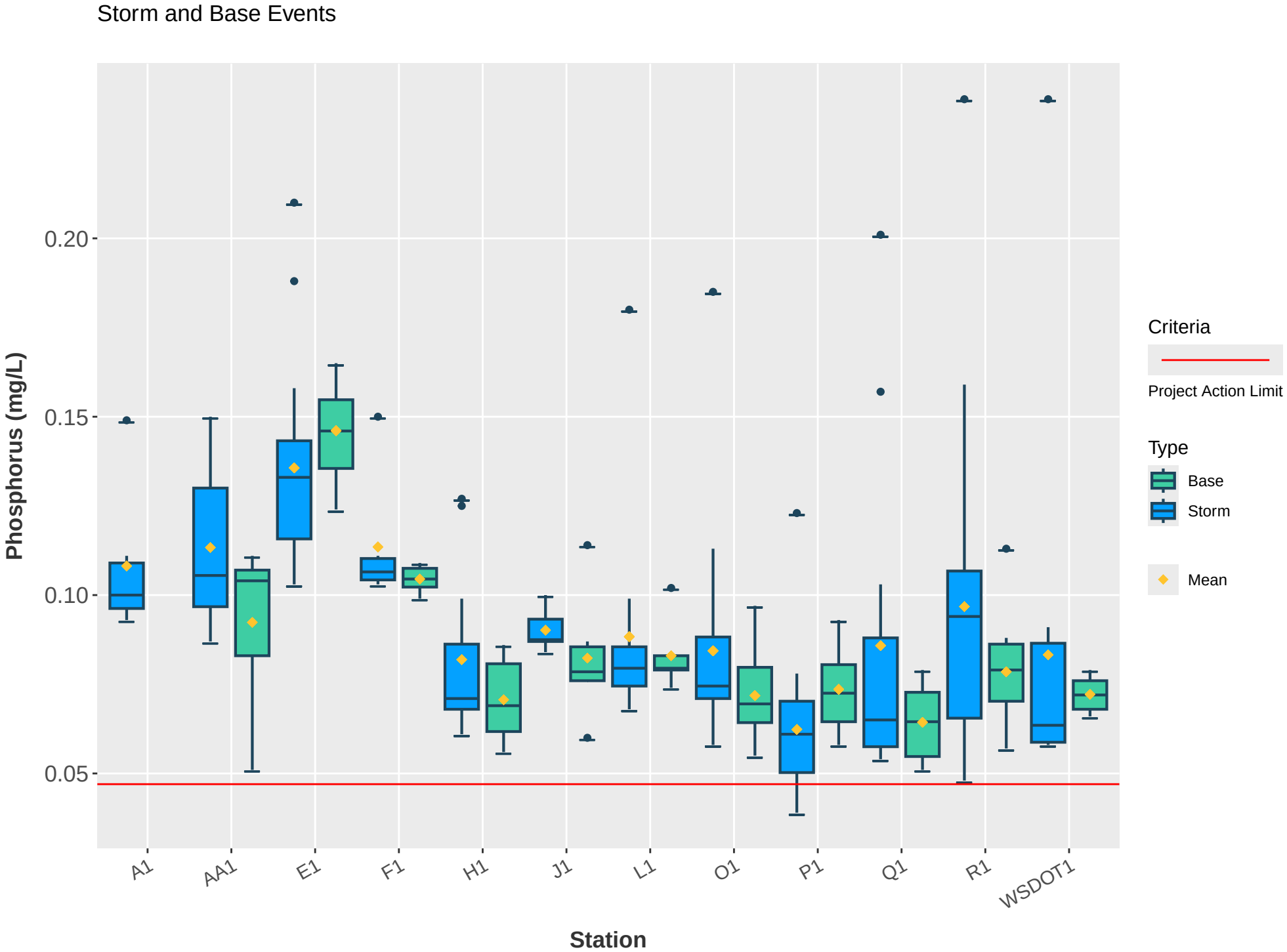

Storm and Base Events
Turbidity (NTU)
60
40
20
0
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Criteria
Project Action Limit
Type
Base
Storm
Mean

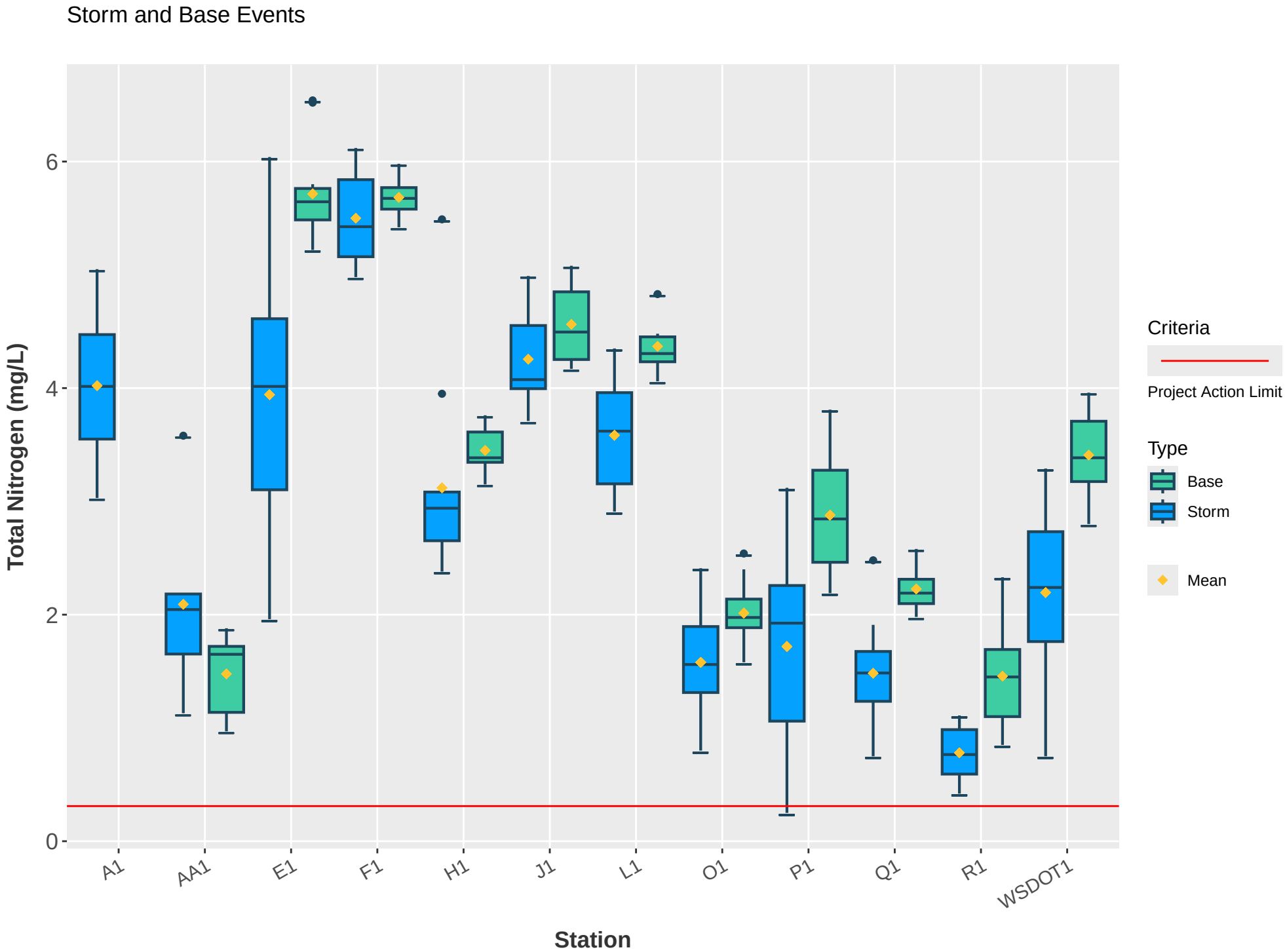
Storm and Base Events

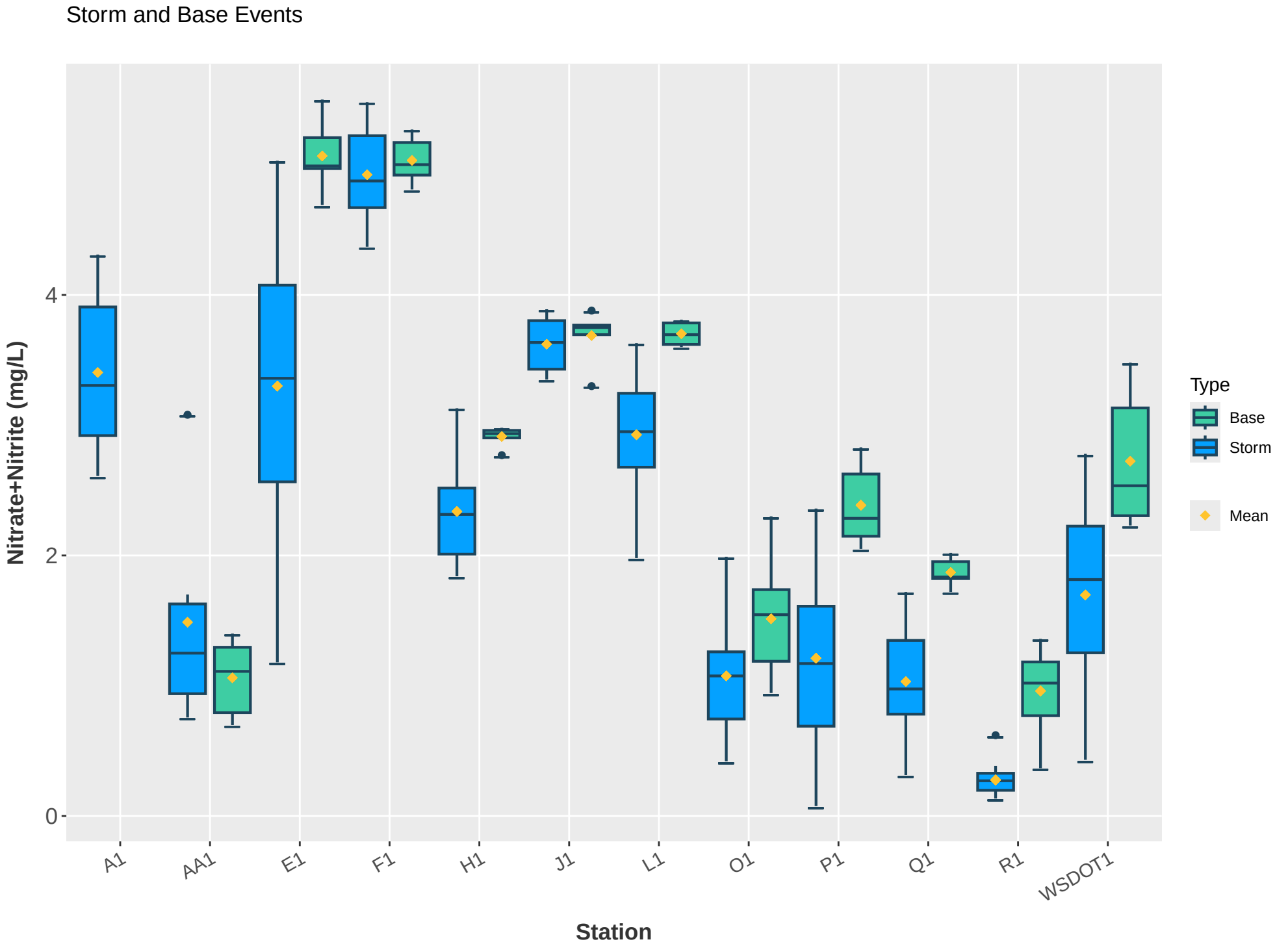
Percent censored is shown below the corresponding box if any values were censored at a station.



Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

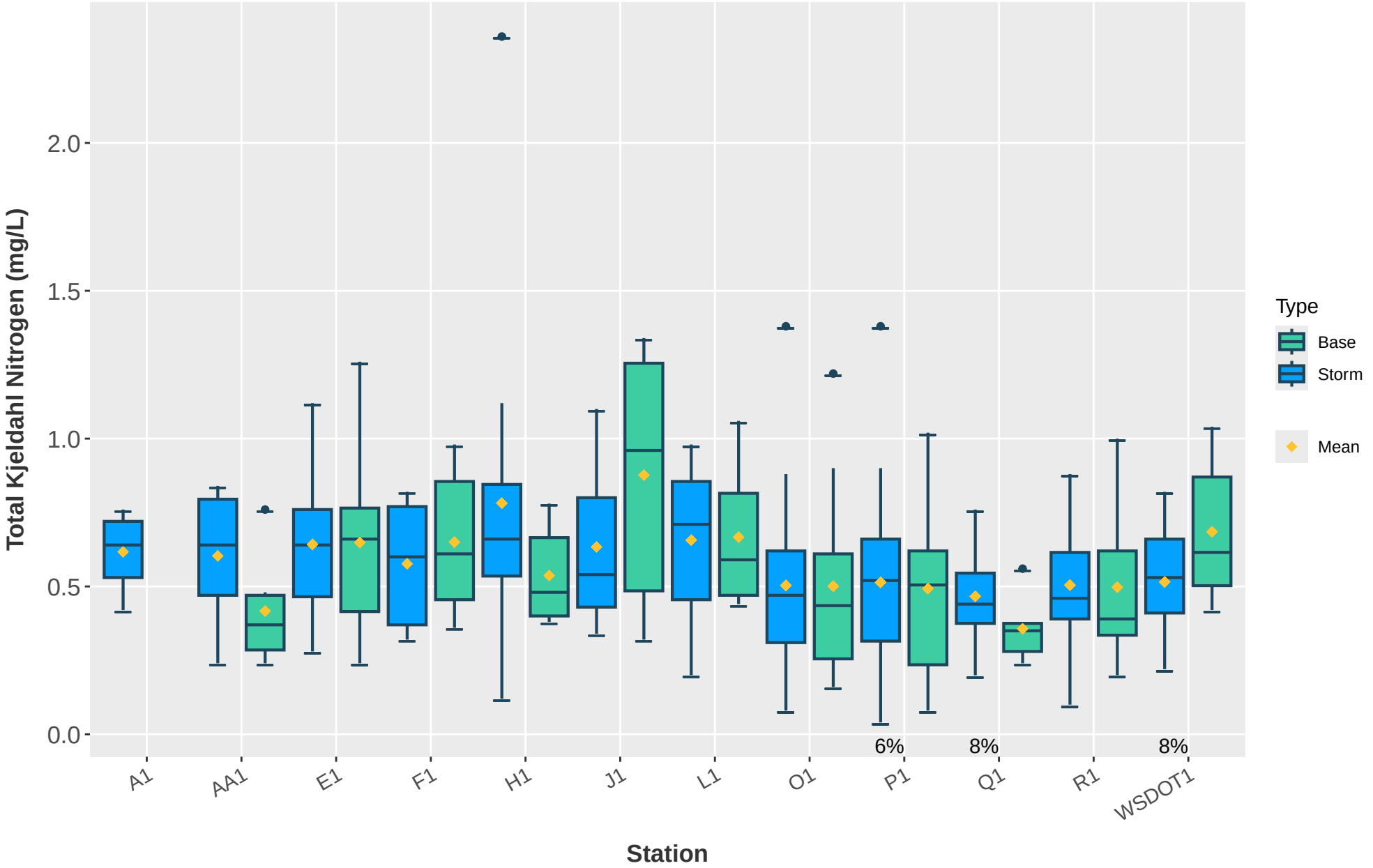

Storm and Base Events
Phosphorus (mg/L)
0.20
0.15
0.10
0.05
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Criteria
Project Action Limit
Type
Base
Storm
Mean


Storm and Base Events
Total Nitrogen (mg/L)
0
2
4
6
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Criteria
Project Action Limit
Type
Base
Storm
Mean

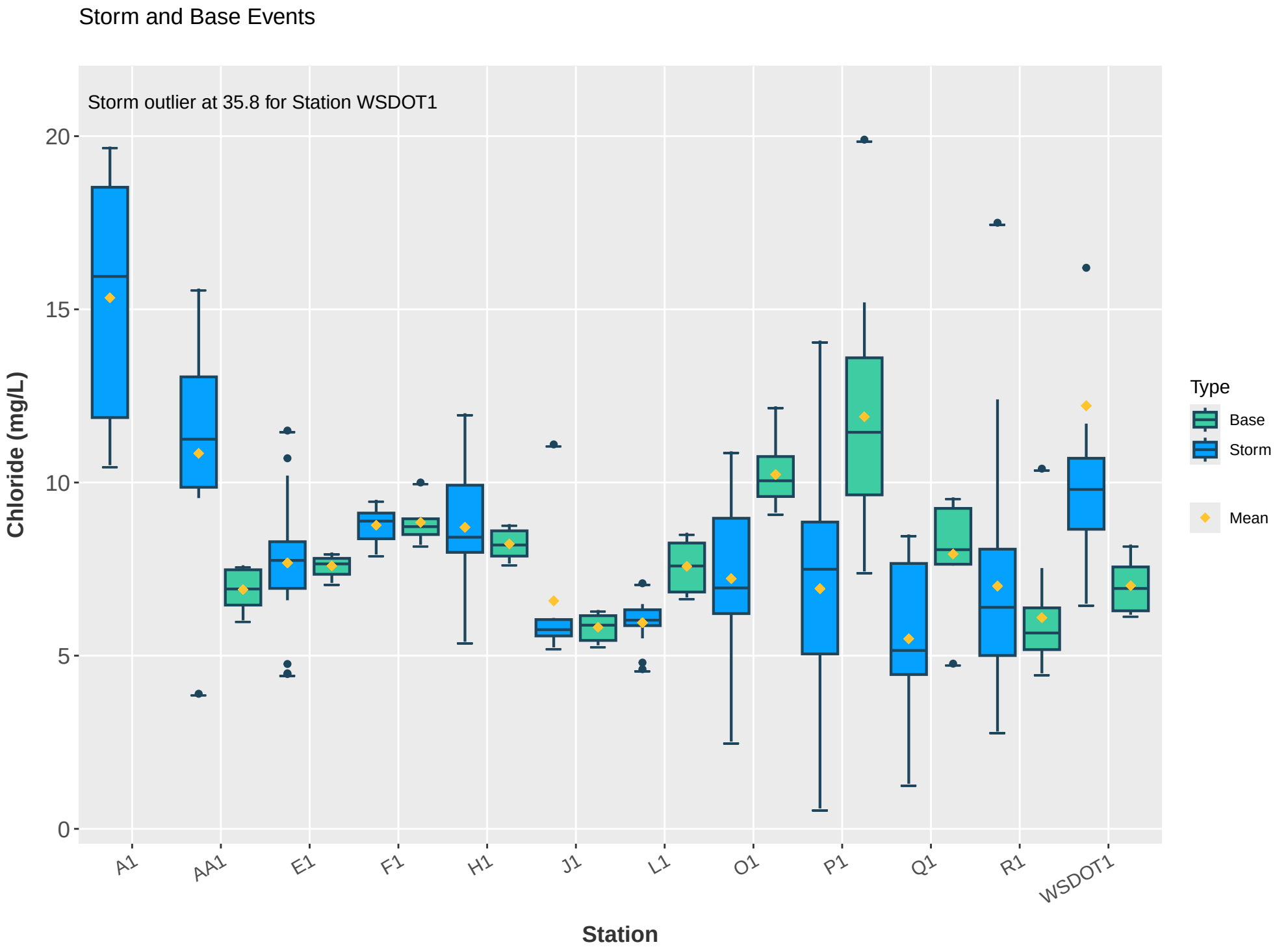

Storm and Base Events
Nitrate+Nitrite (mg/L)
0
2
4
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Type
Base
Storm
Mean

Storm and Base Events

Percent censored is shown below the corresponding box if any values were censored at a station.

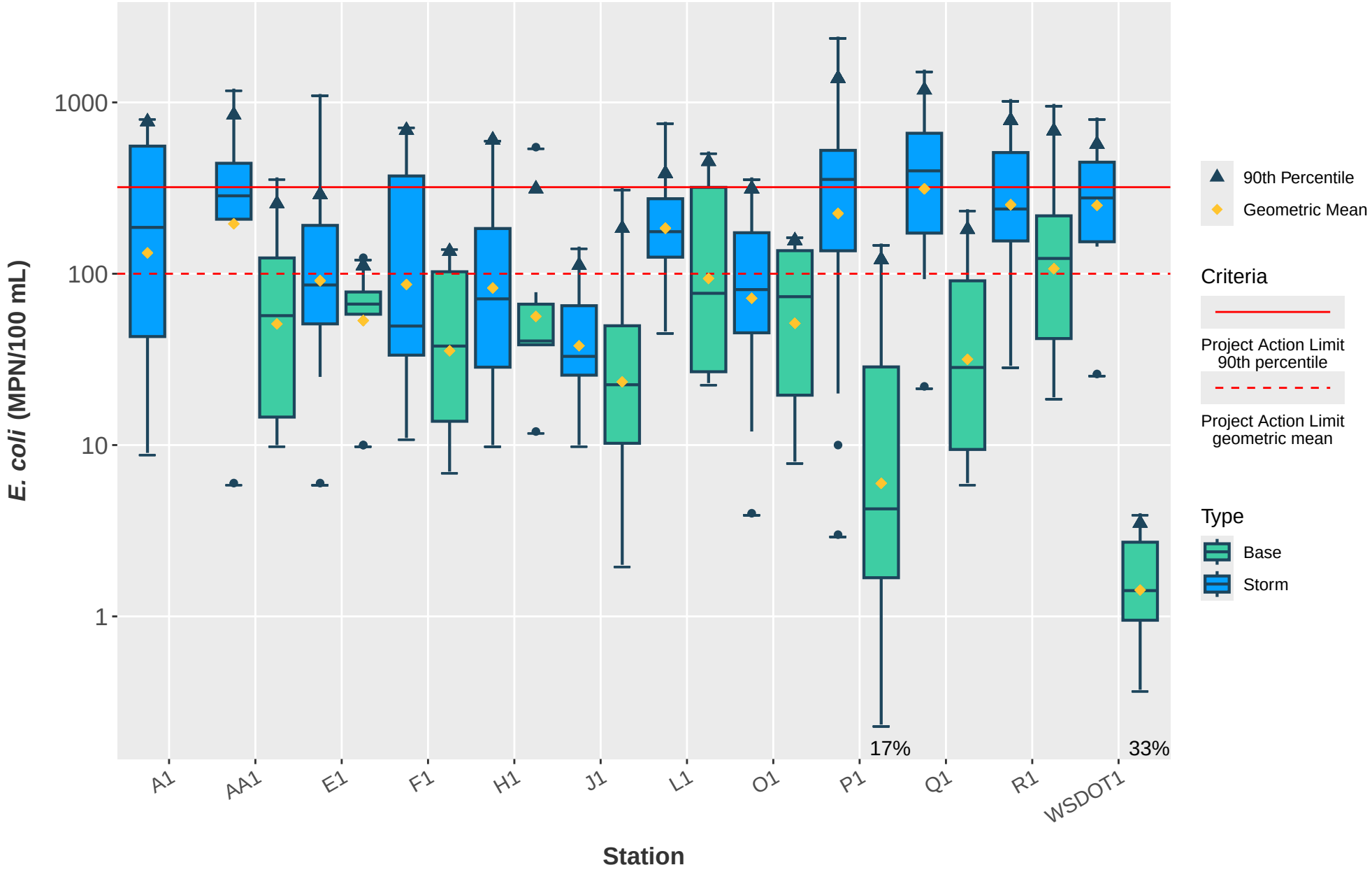


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

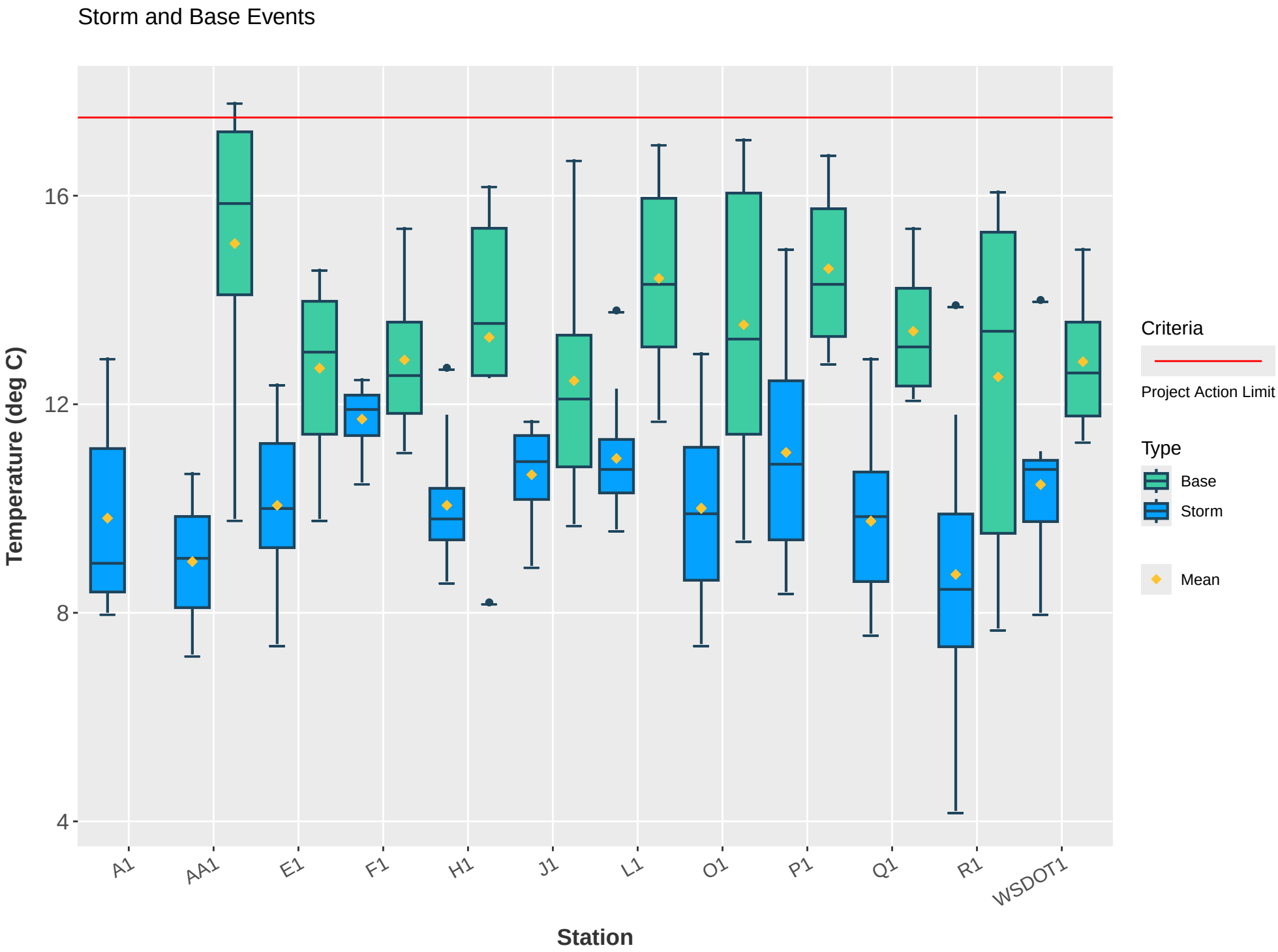

Storm and Base Events
Storm outlier at 35.8 for Station WSDOT1
Chloride (mg/L)
20
15
10
5
0
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Type
Base
Storm
Mean

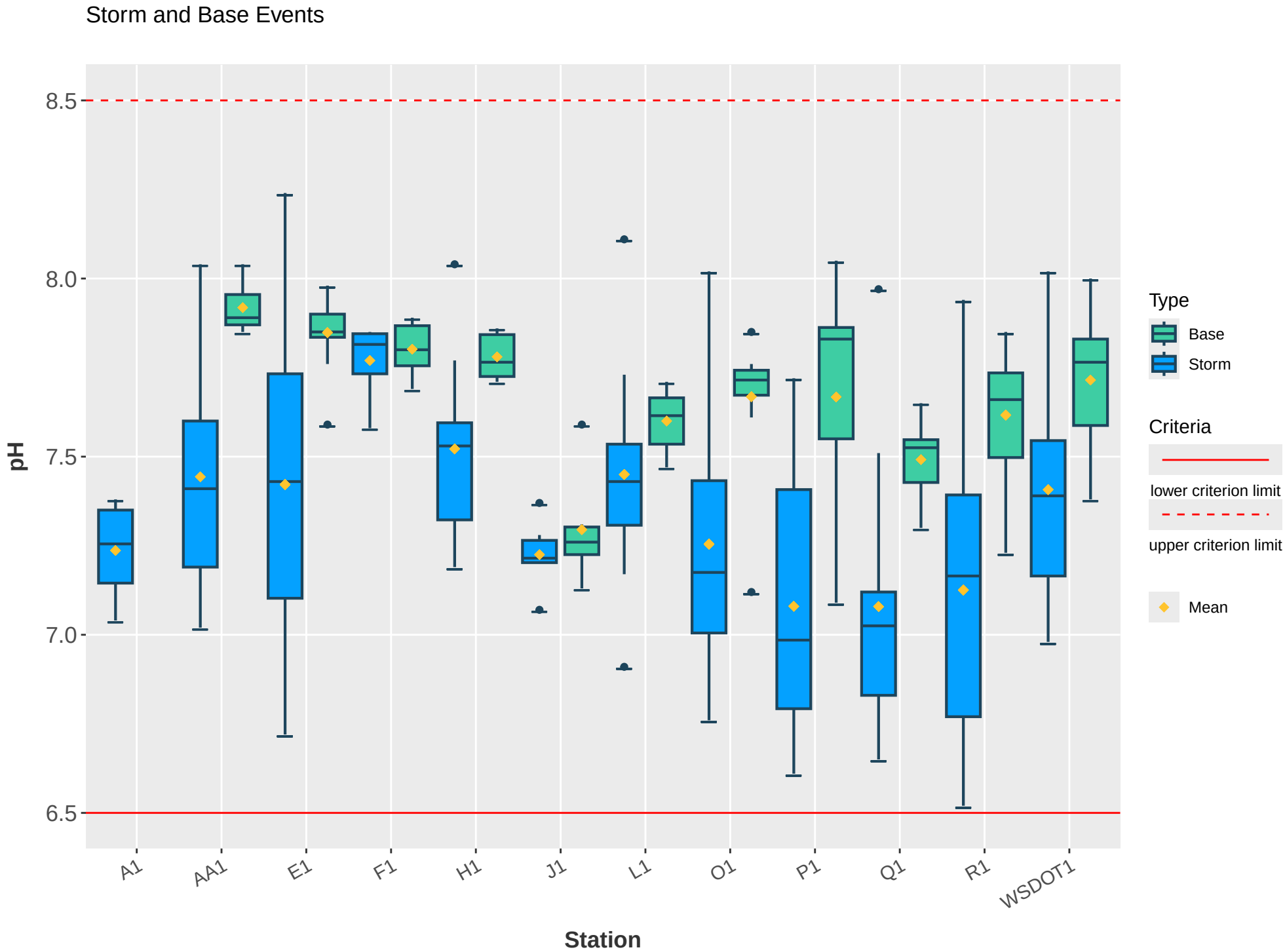
Storm and Base Events

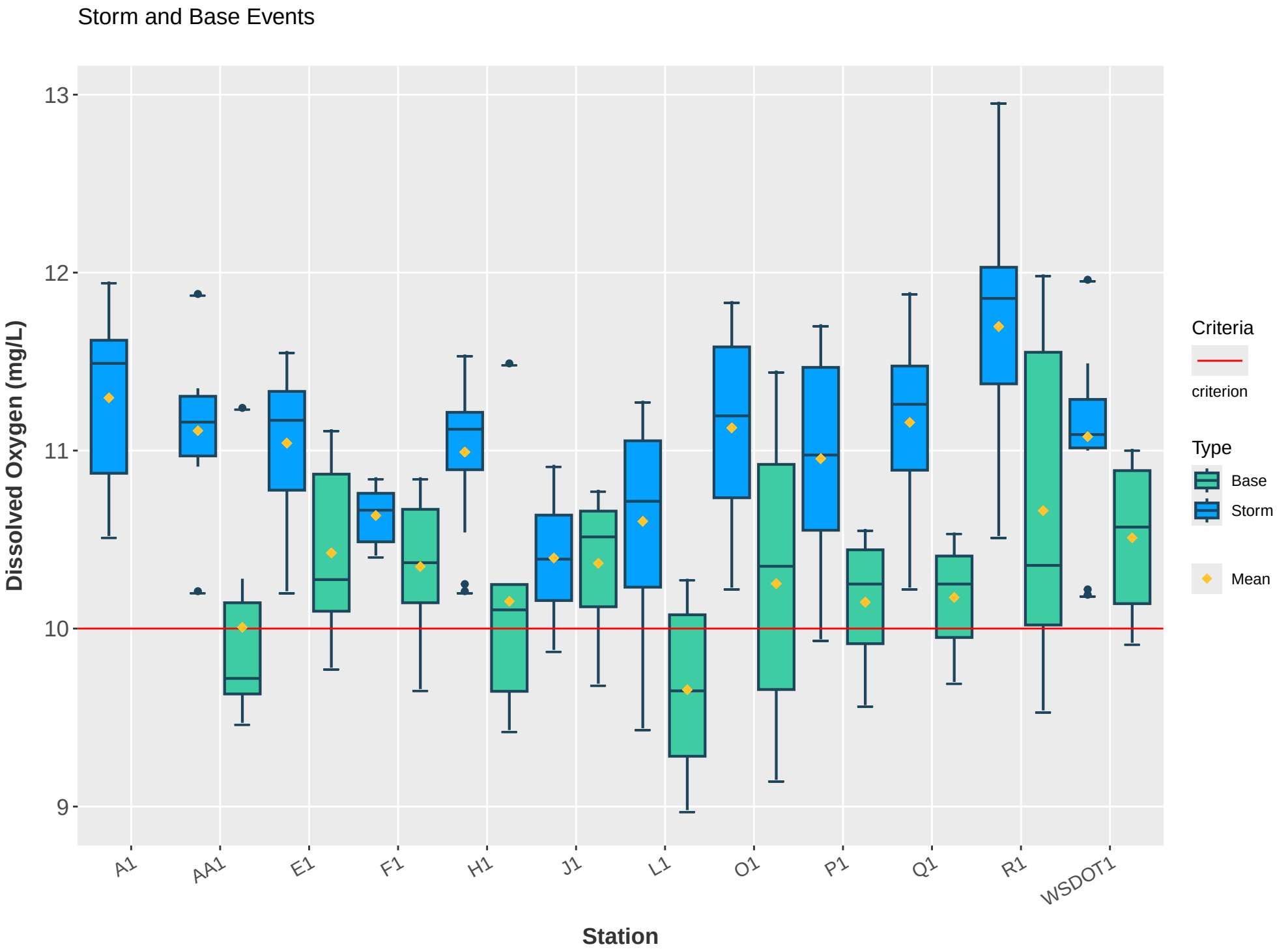
Percent censored is shown below the corresponding box if any values were censored at a station.

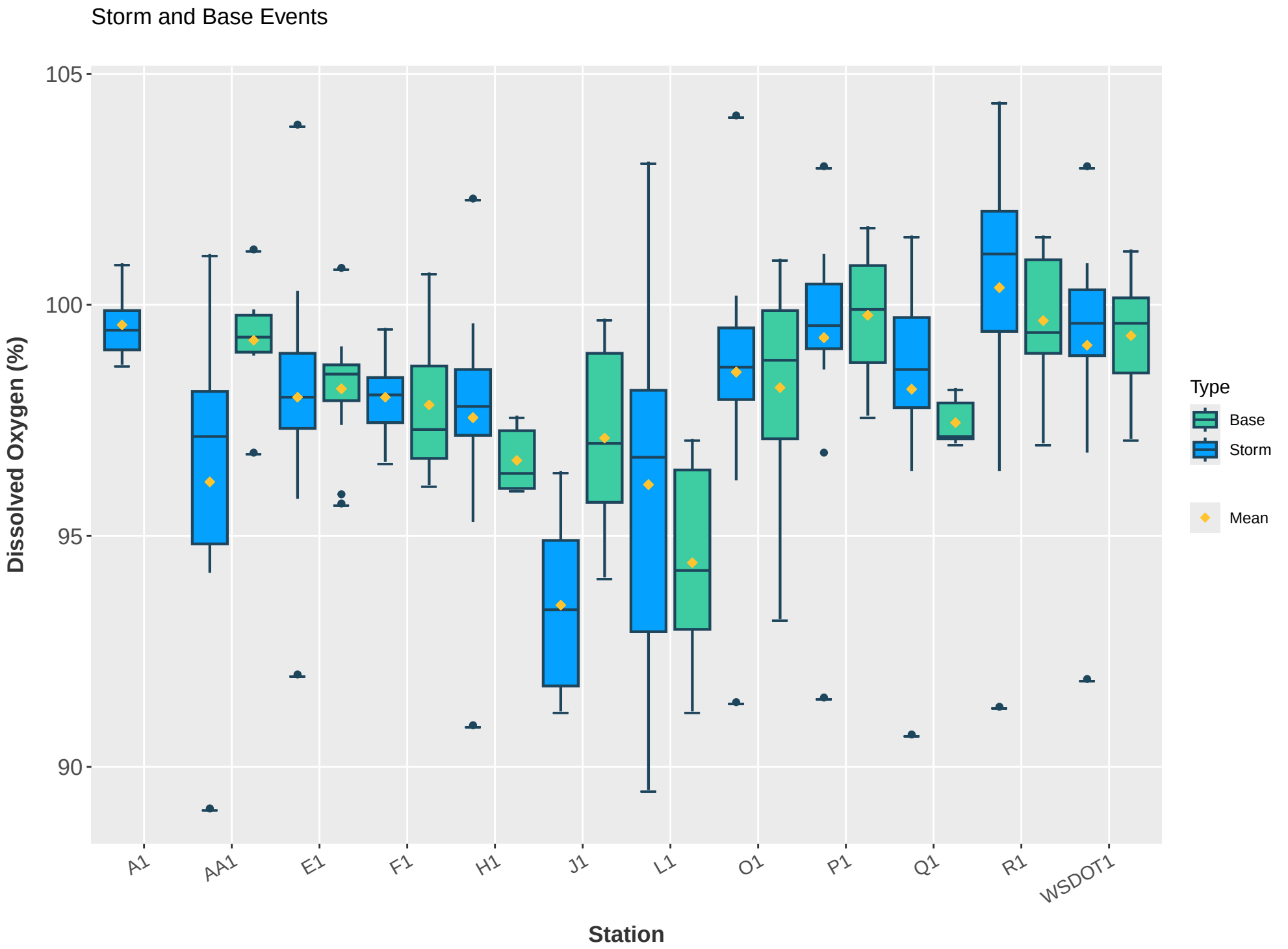


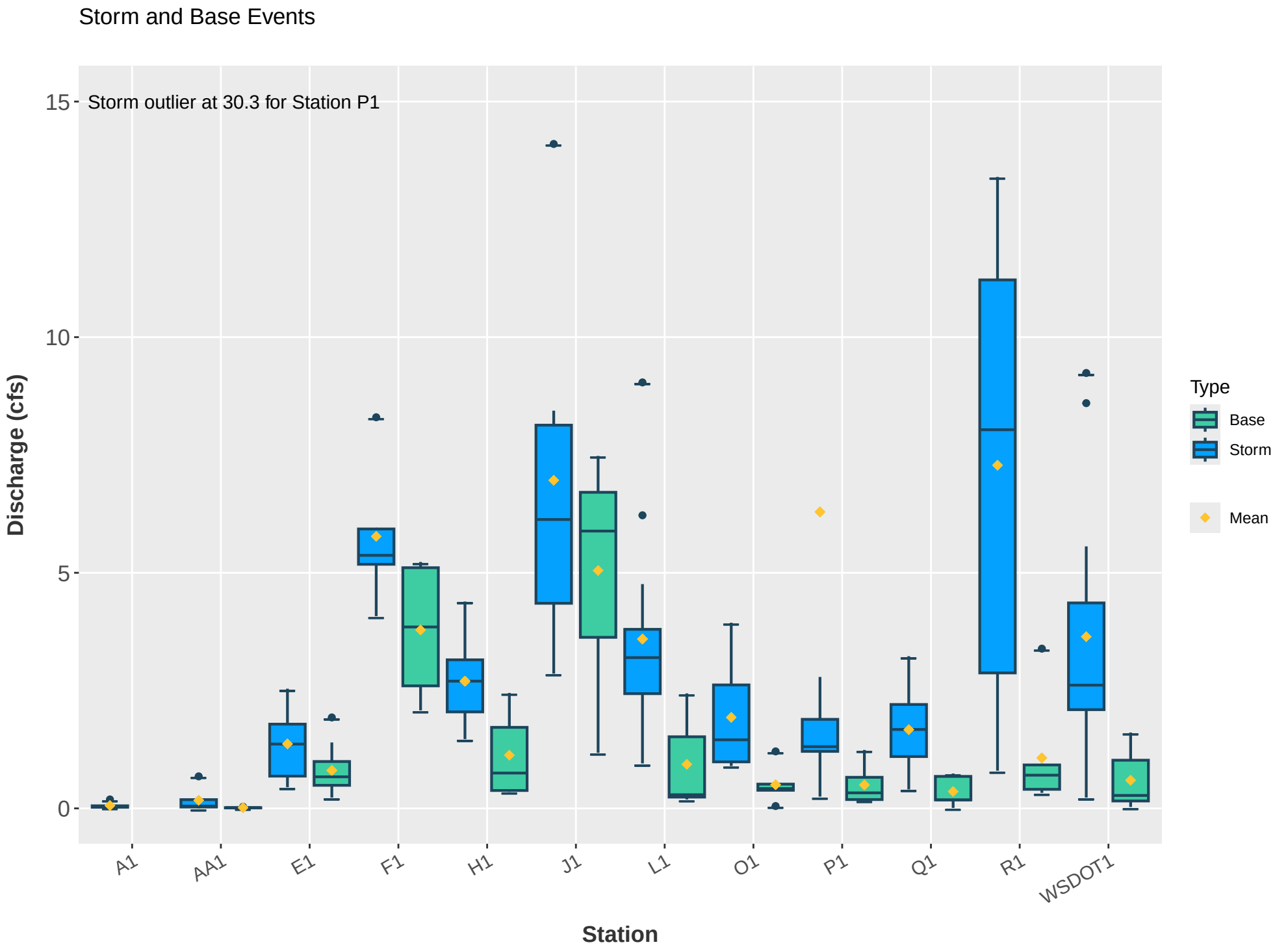
Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

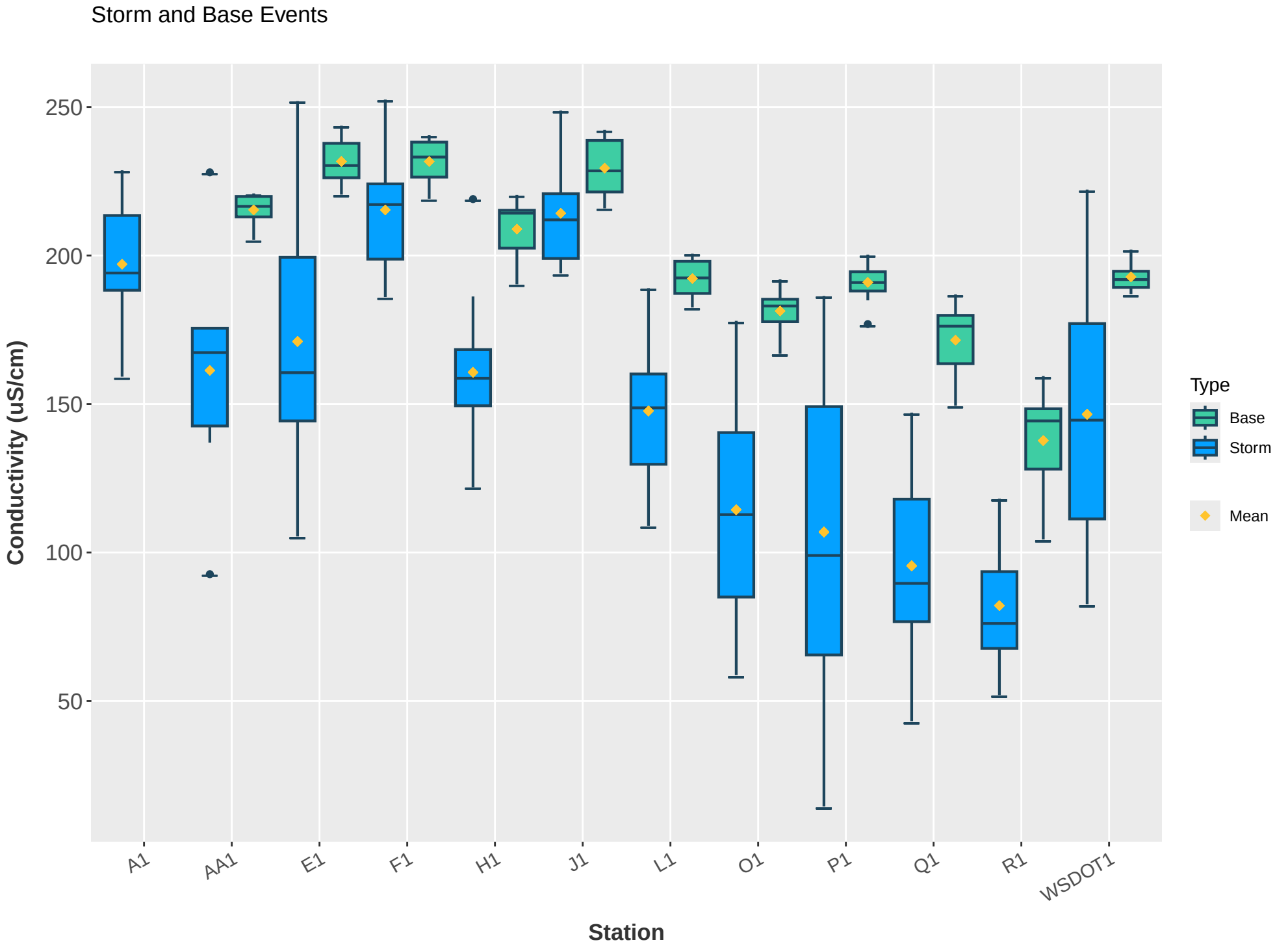

Storm and Base Events
Temperature (deg C)
16
12
8
4
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Criteria
Project Action Limit
Type
Base
Storm
Mean


Storm and Base Events
8.5
8.0
7.5
7.0
6.5
pH
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Type
Base
Storm
Criteria
lower criterion limit
upper criterion limit
Mean


Storm and Base Events
Dissolved Oxygen (mg/L)
13
12
11
10
9
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Criteria
criterion
Type
Base
Storm
Mean

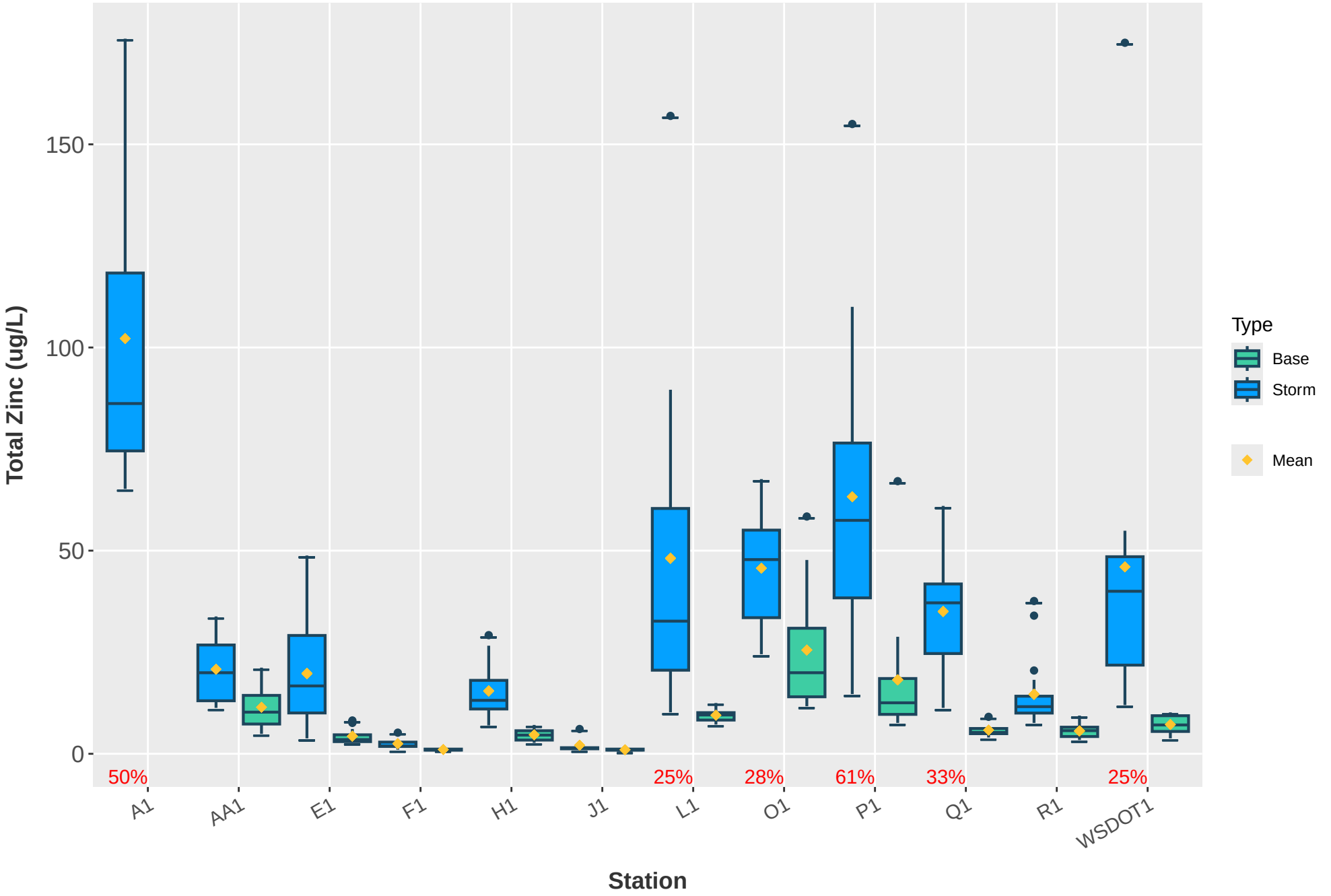

Storm and Base Events
Dissolved Oxygen (%)
105
100
95
90
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Type
Base
Storm
Mean


Storm and Base Events
Storm outlier at 30.3 for Station P1
15
10
5
0
Discharge (cfs)
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Type
Base
Storm
Mean


Storm and Base Events
Conductivity (uS/cm)
250
200
150
100
50
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Type
Base
Storm
Mean

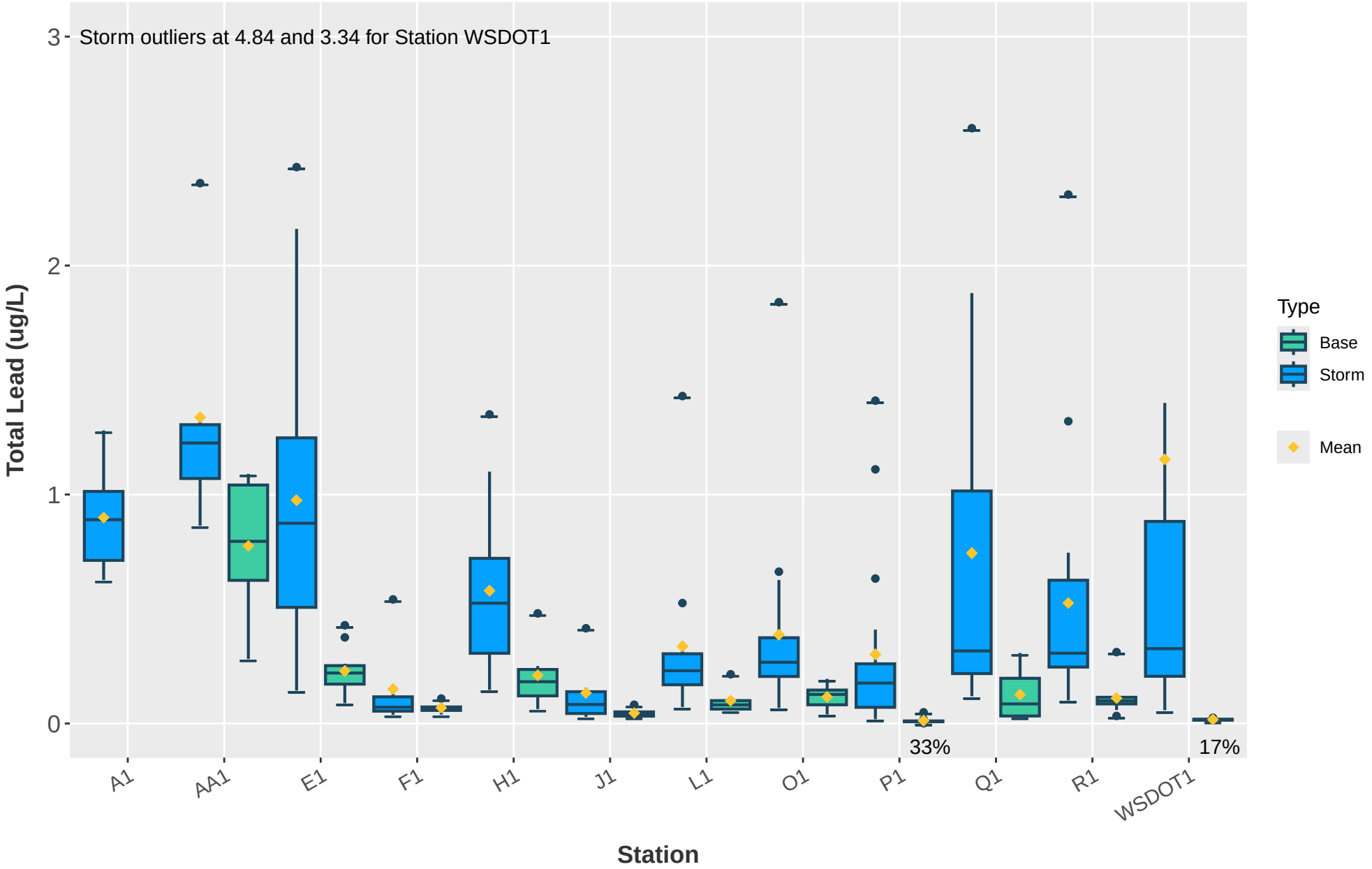
Storm and Base Events

If any samples exceeded the calculated criteria, the percent of exceedances is shown in red.

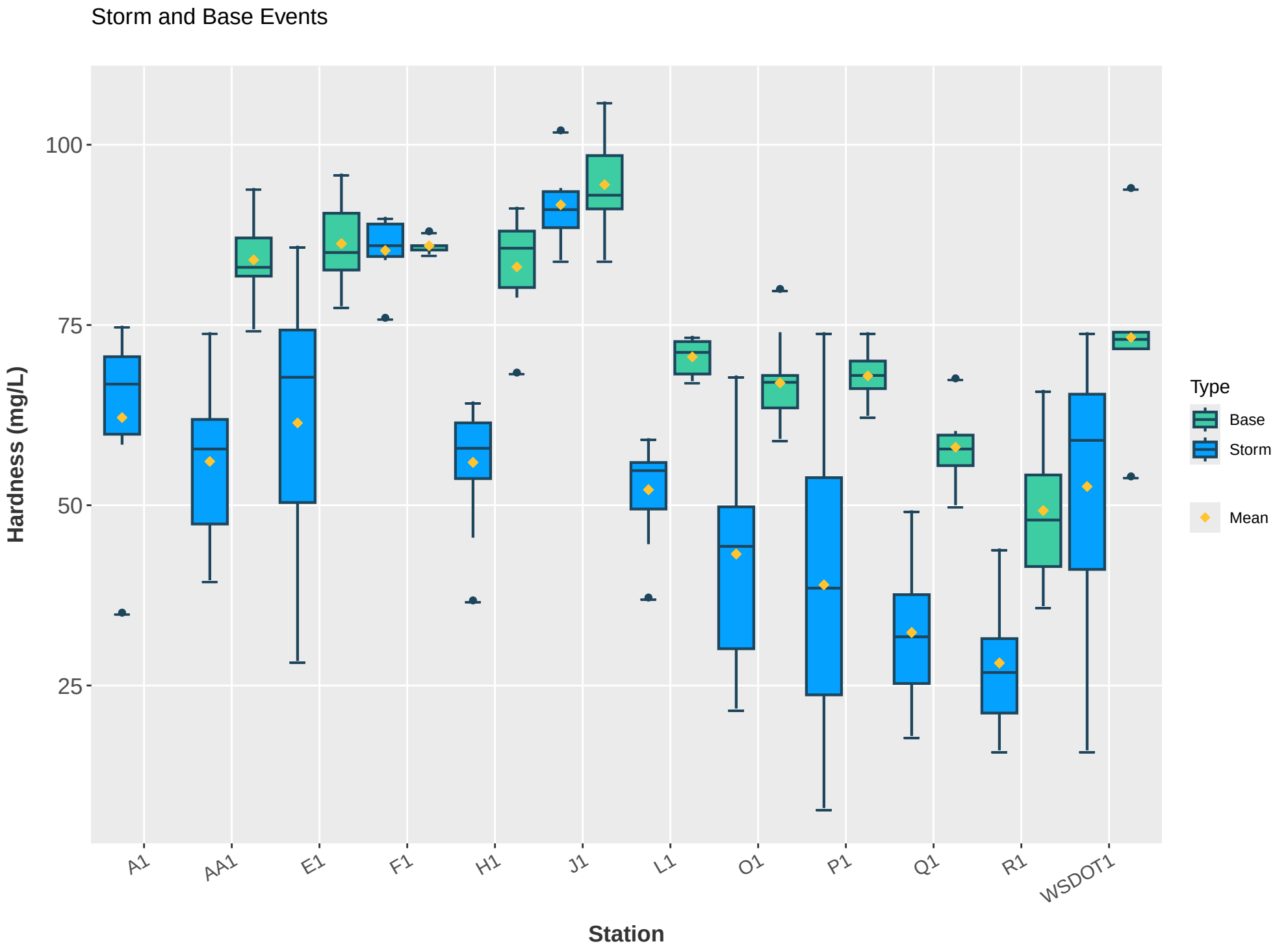


Storm and Base Events

Percent censored is shown below the corresponding box if any values were censored at a station.

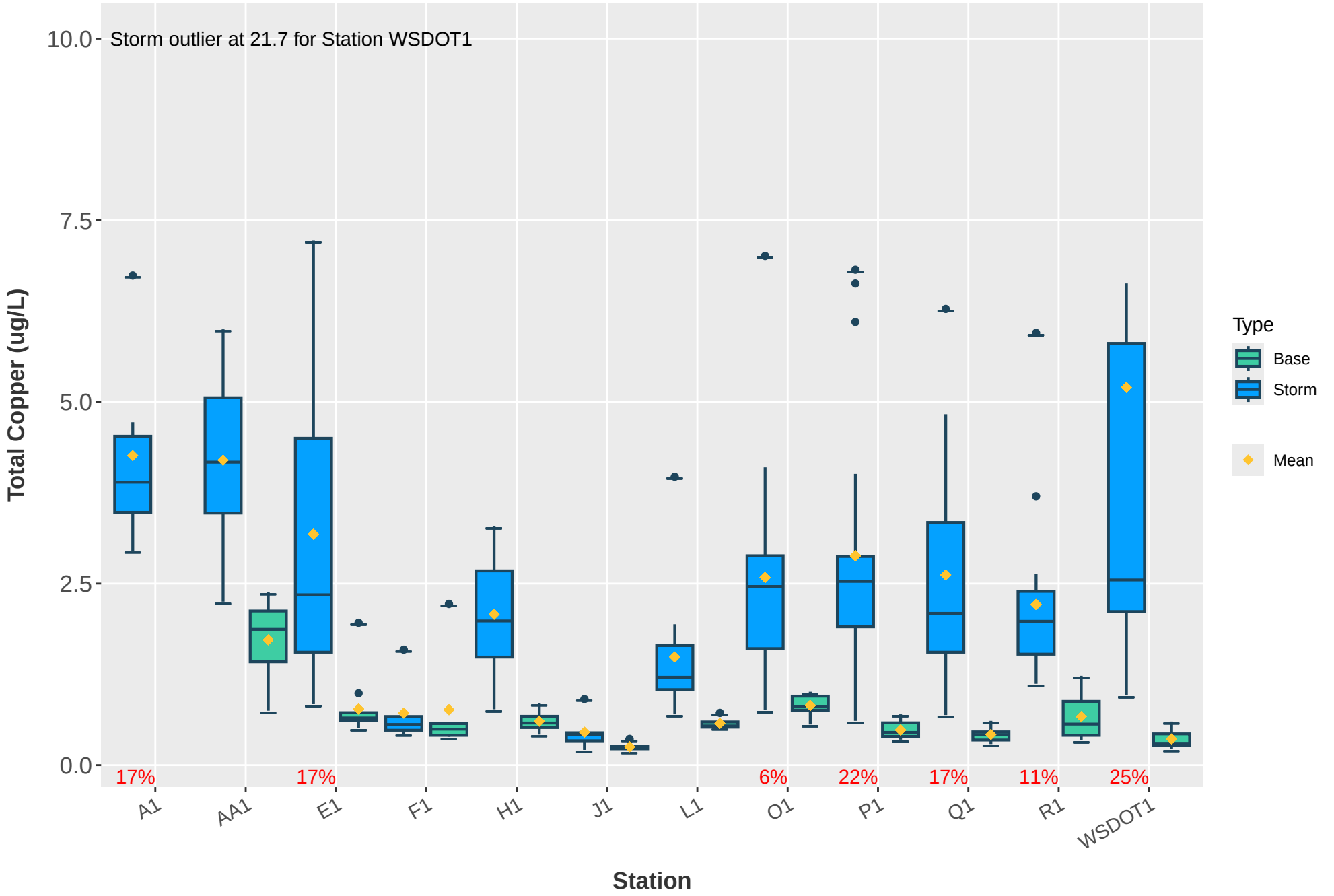


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.


Storm and Base Events
Hardness (mg/L)
100
75
50
25
A1
AA1
E1
F1
H1
J1
L1
O1
P1
Q1
R1
WSDOT1
Station
Type
Base
Storm
Mean

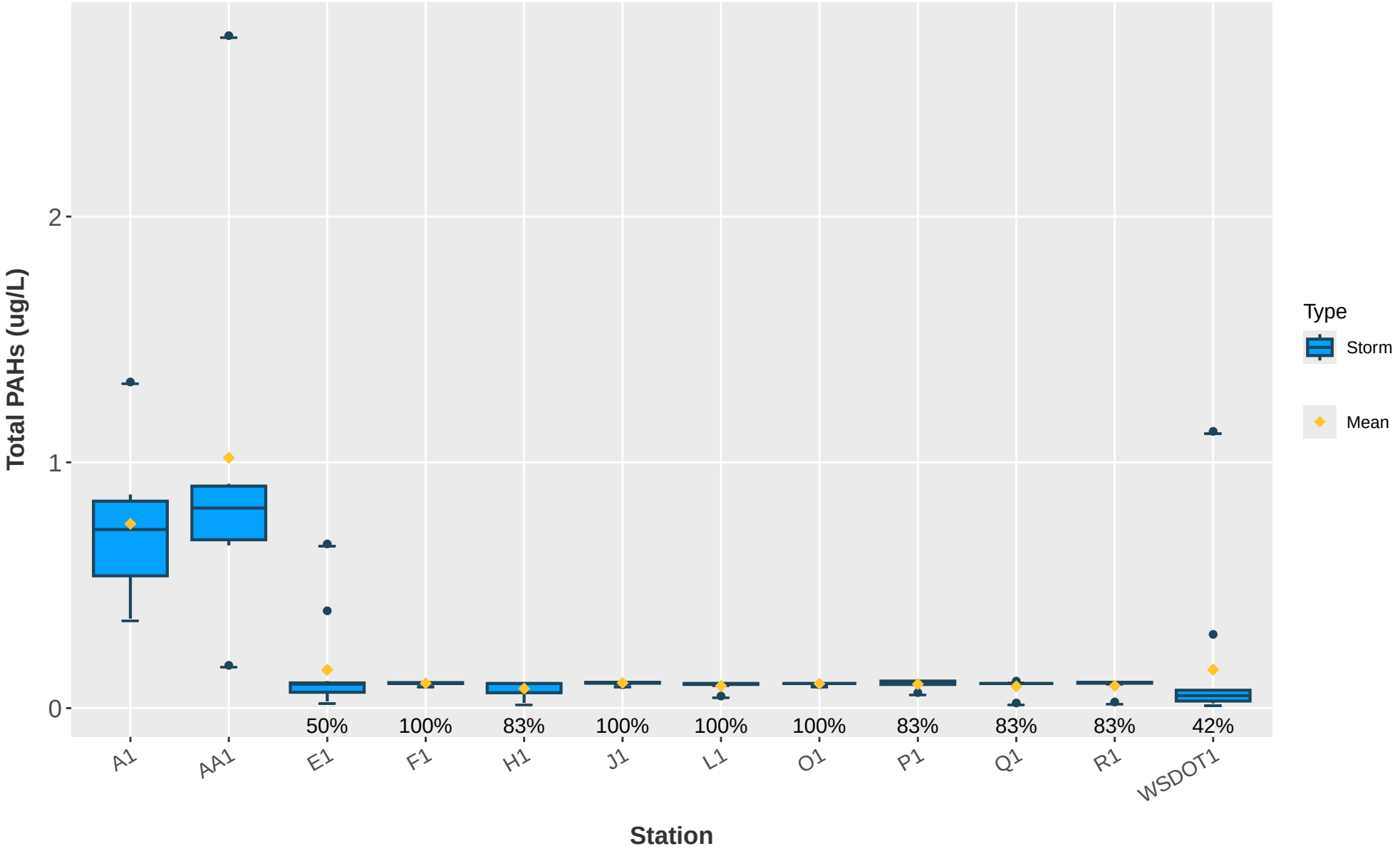
Storm and Base Events

If any samples exceeded the calculated criteria, the percent of exceedances is shown in red.



Storm events

Percent censored is shown below the corresponding box if any values were censored at a station.

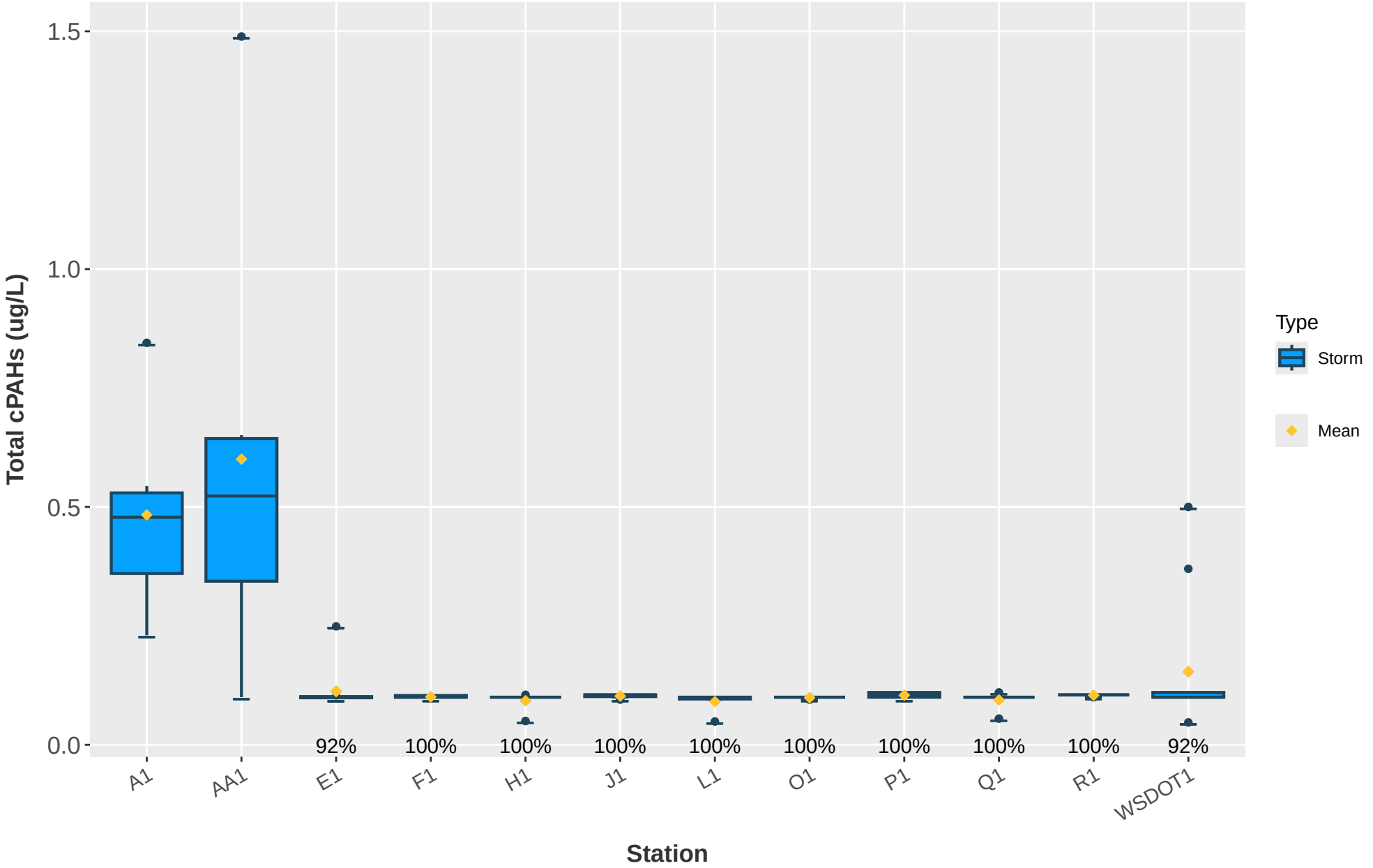


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

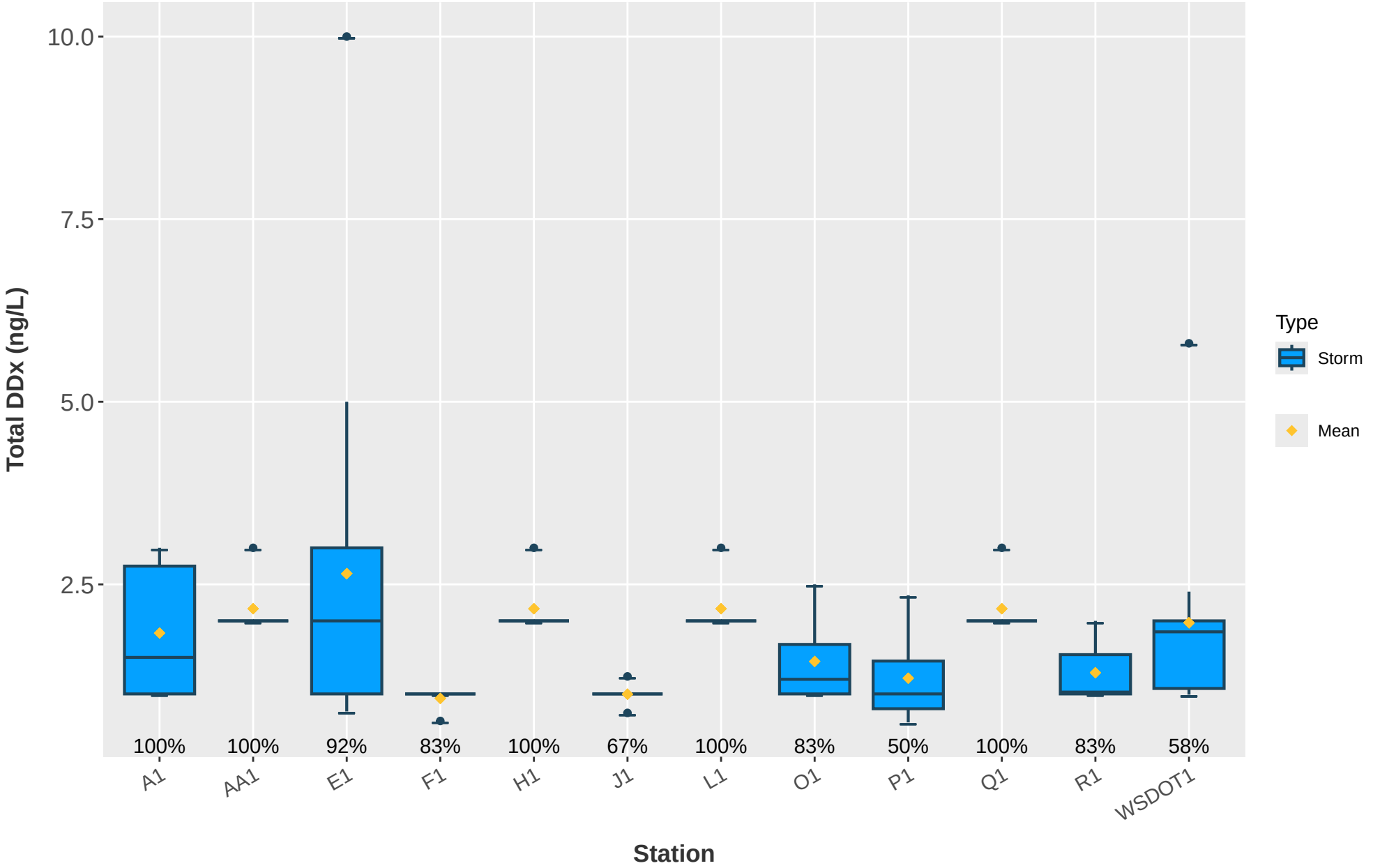
Percent censored is shown below the corresponding box if any values were censored at a station.



Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

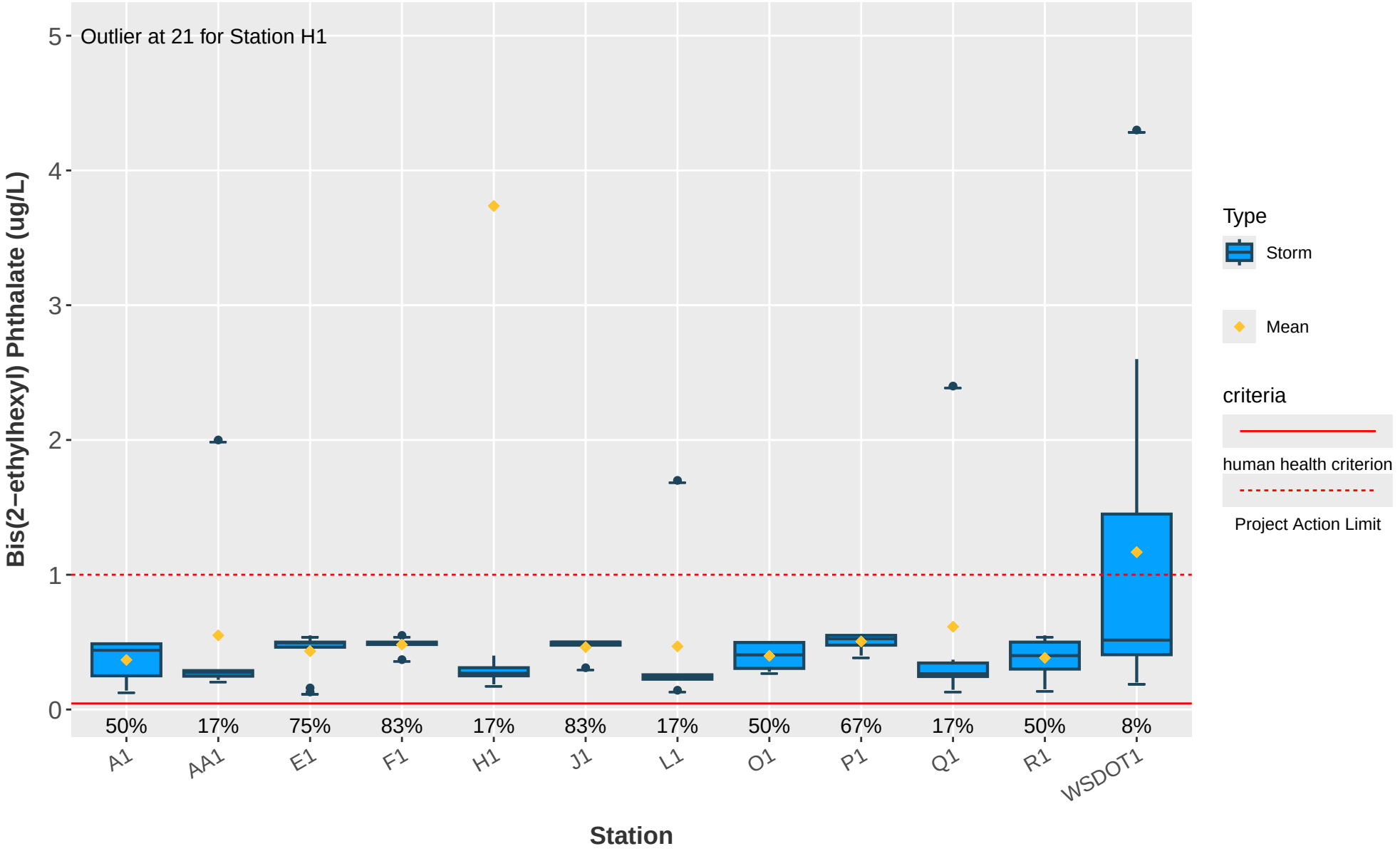
Percent censored is shown below the corresponding box if any values were censored at a station.



Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

Percent censored is shown below the corresponding box if any values were censored at a station.

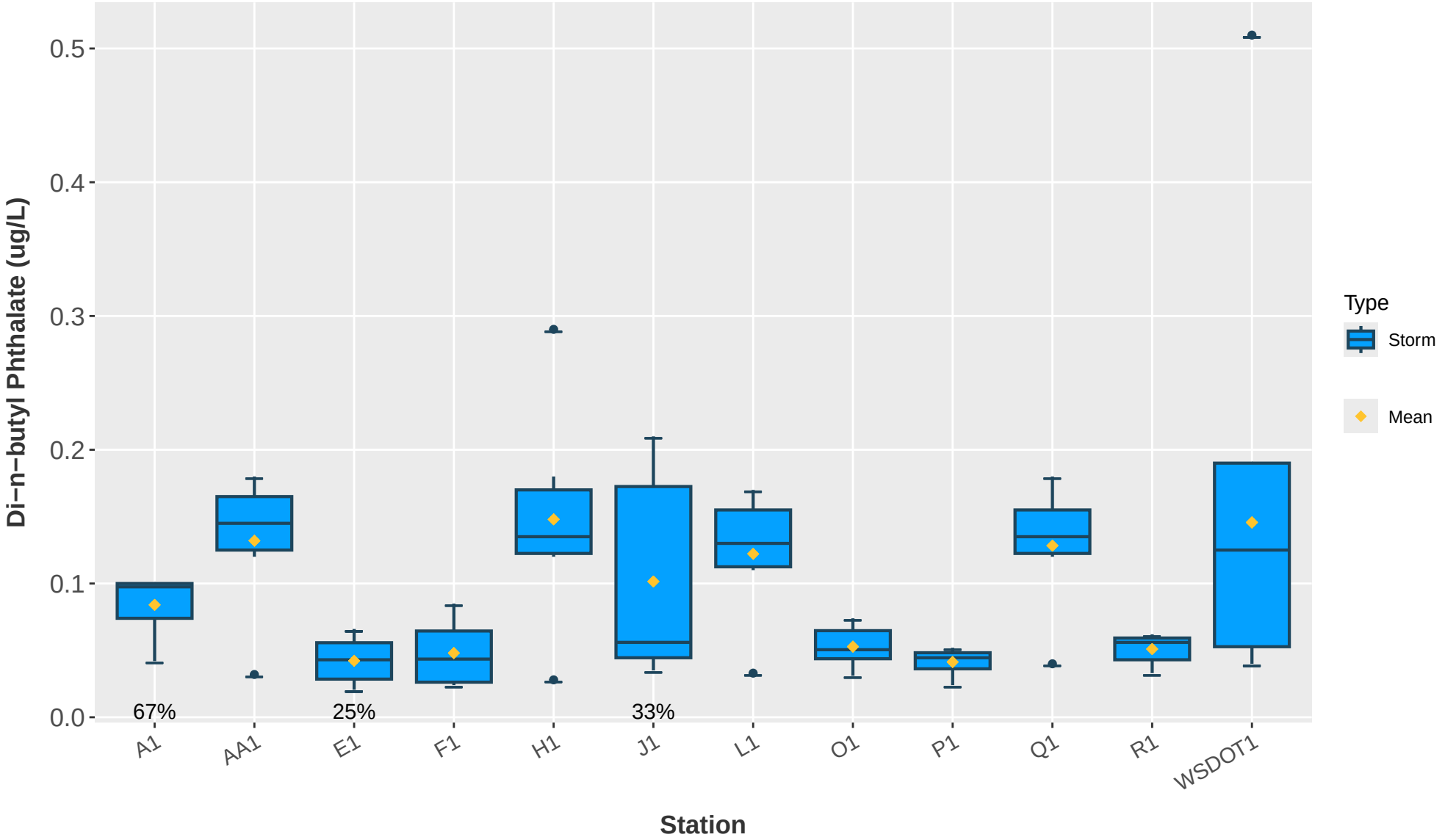


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

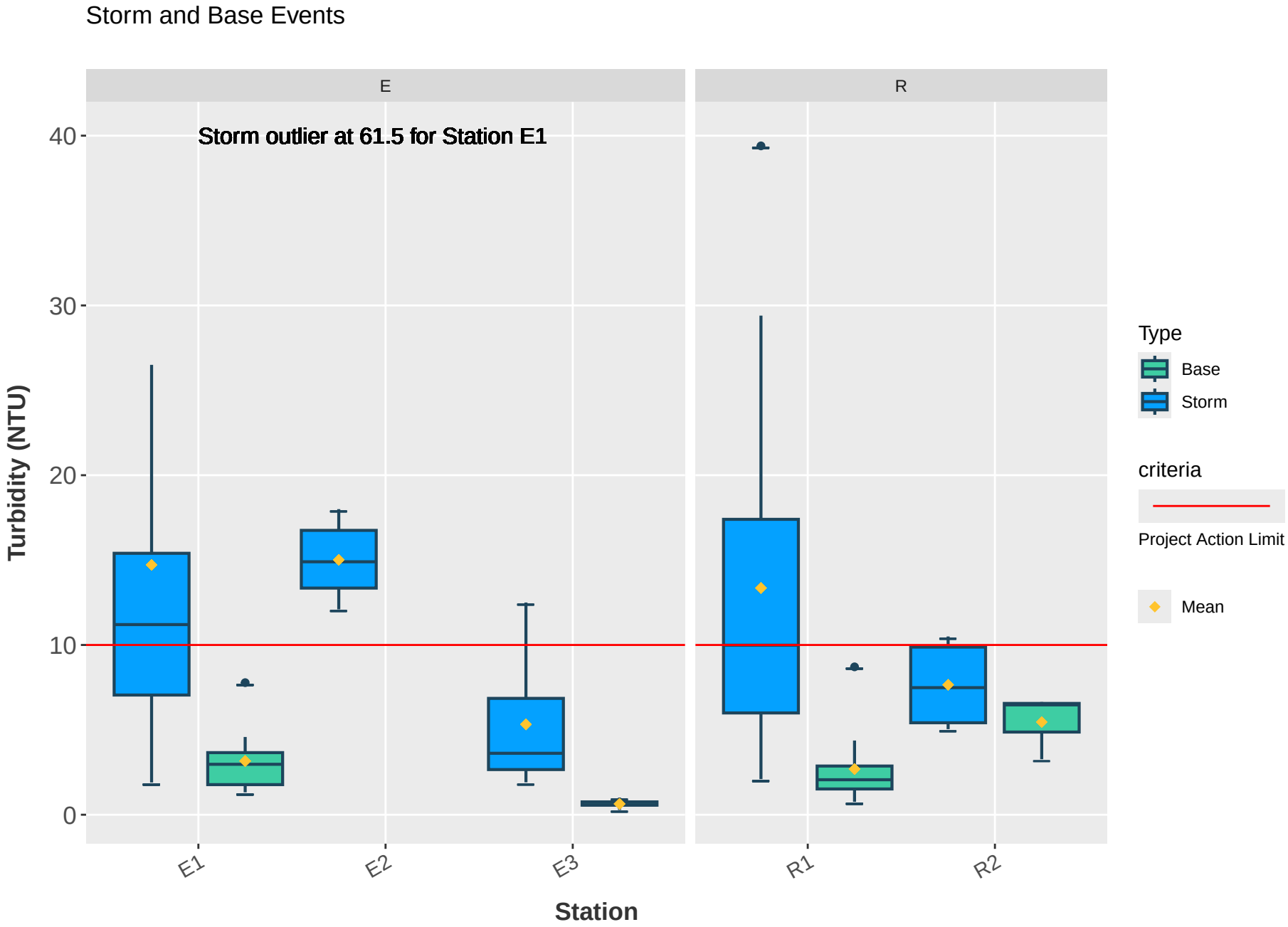
Percent censored is shown below the corresponding box if any values were censored at a station.



Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

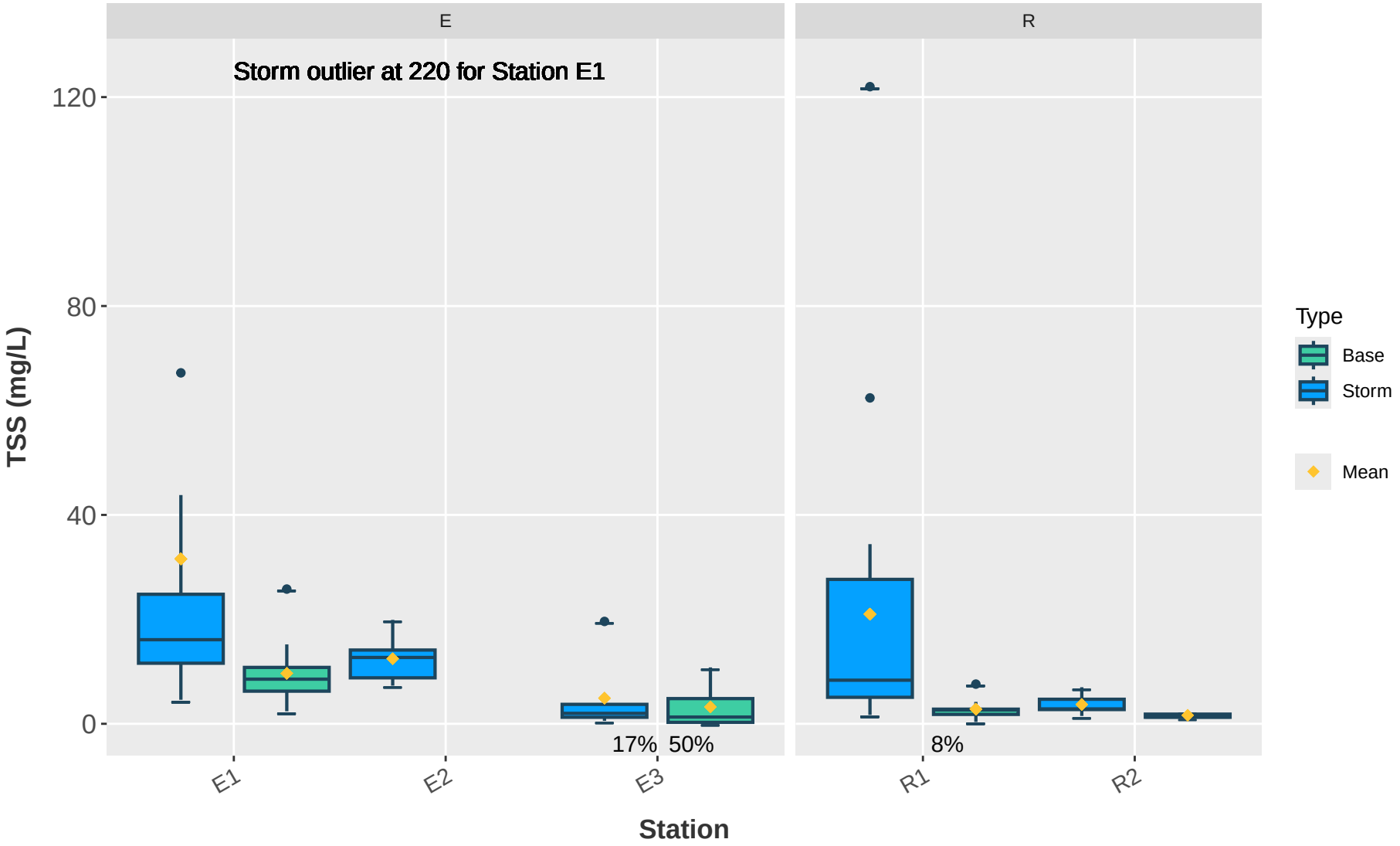
Monte Carlo imputation used to estimate left−censored data when <50% of values were censored and max censored RL > max detected value

Half the reporting limit was used for censored data when >50% of values were censored.

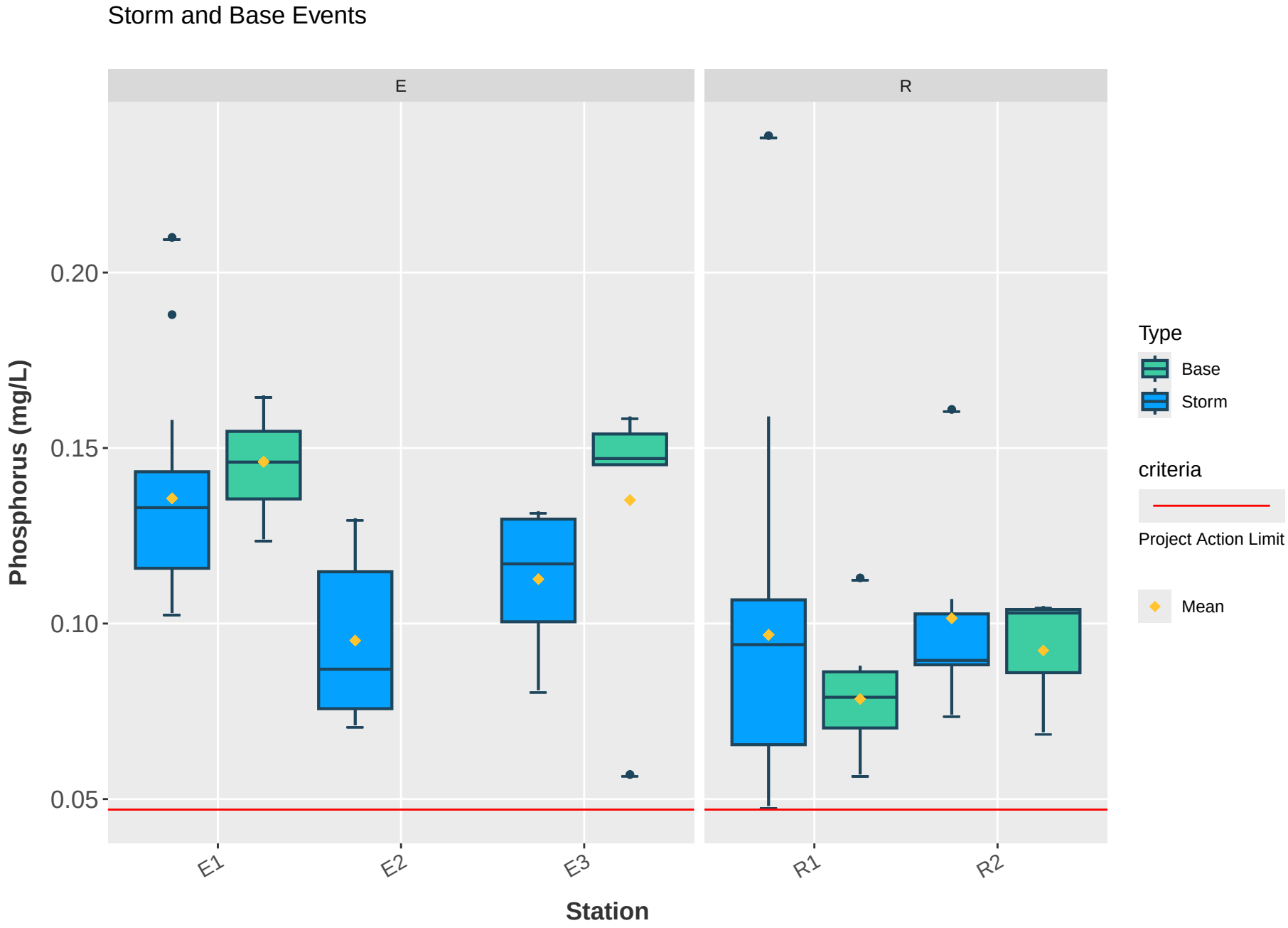

Storm and Base Events
E
R
Storm outlier at 61.5 for Station E1
40
30
20
10
0
Turbidity (NTU)
E1
E2
E3
R1
R2
Station
Type
Base
Storm
criteria
Project Action Limit
Mean

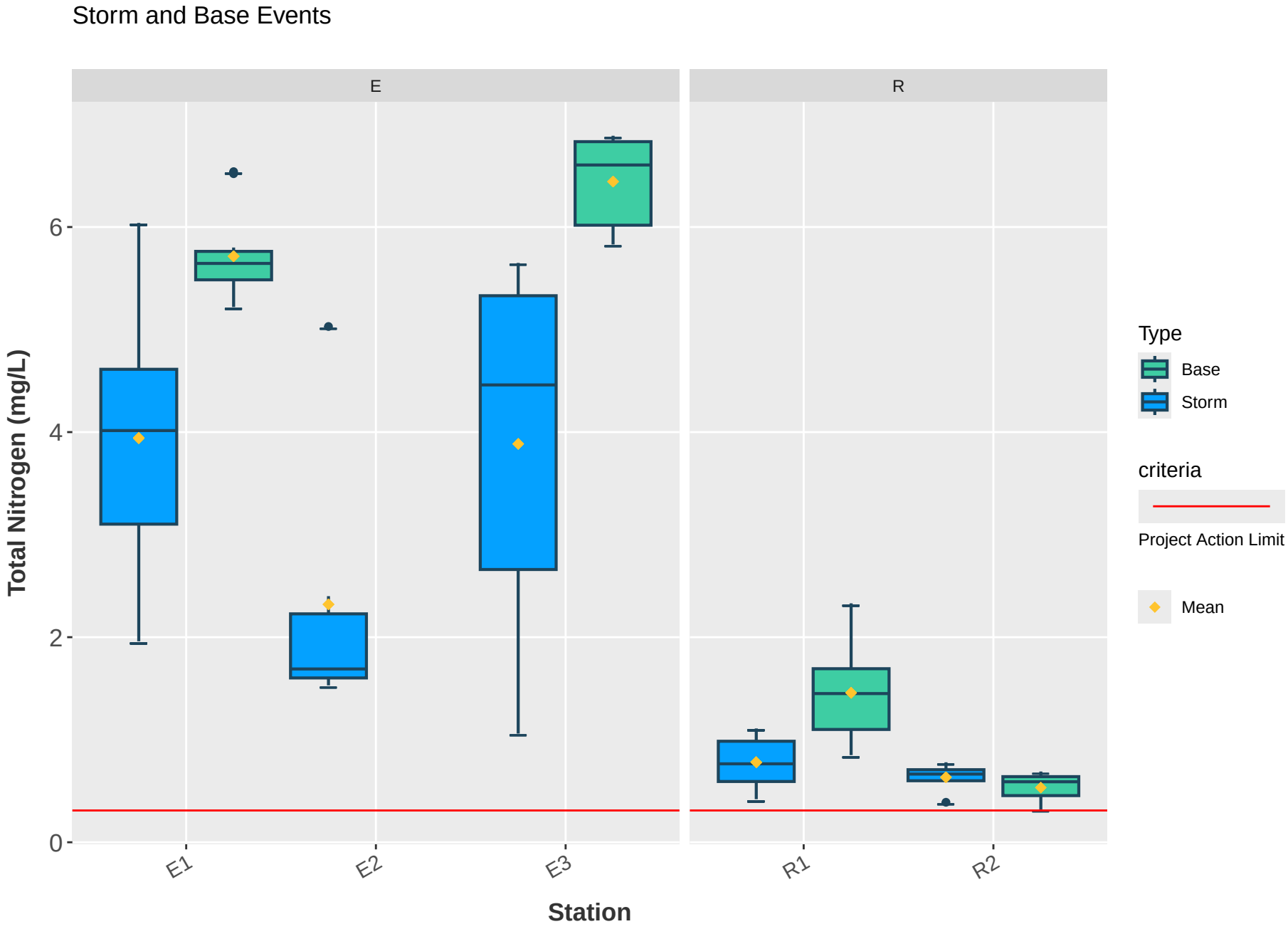
Storm and Base Events

Percent censored is shown below the corresponding box if any values were censored at a station.



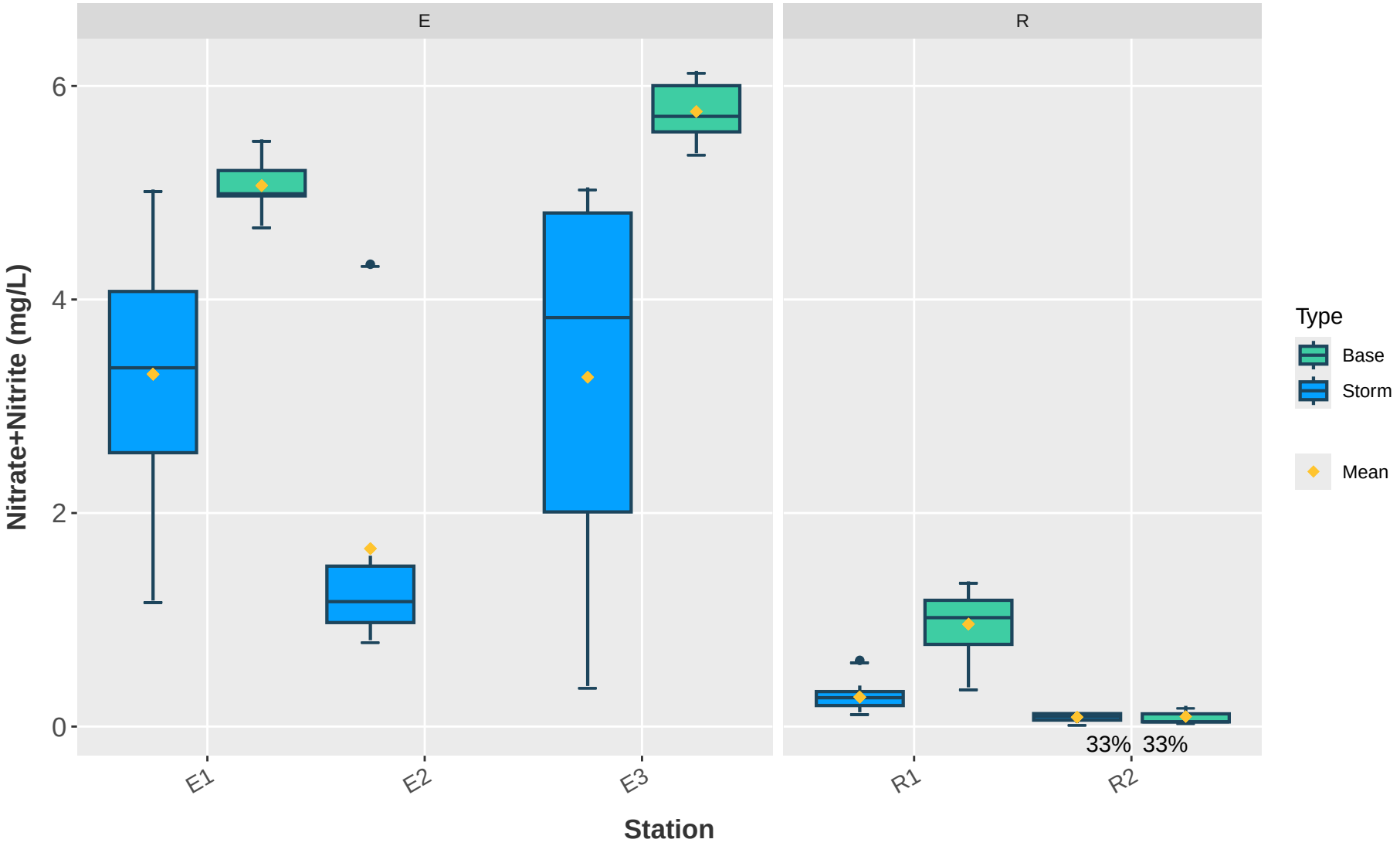
Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.


Storm and Base Events
E
R
Phosphorus (mg/L)
0.20
0.15
0.10
0.05
E1
E2
E3
R1
R2
Station
Type
Base
Storm
criteria
Project Action Limit
Mean

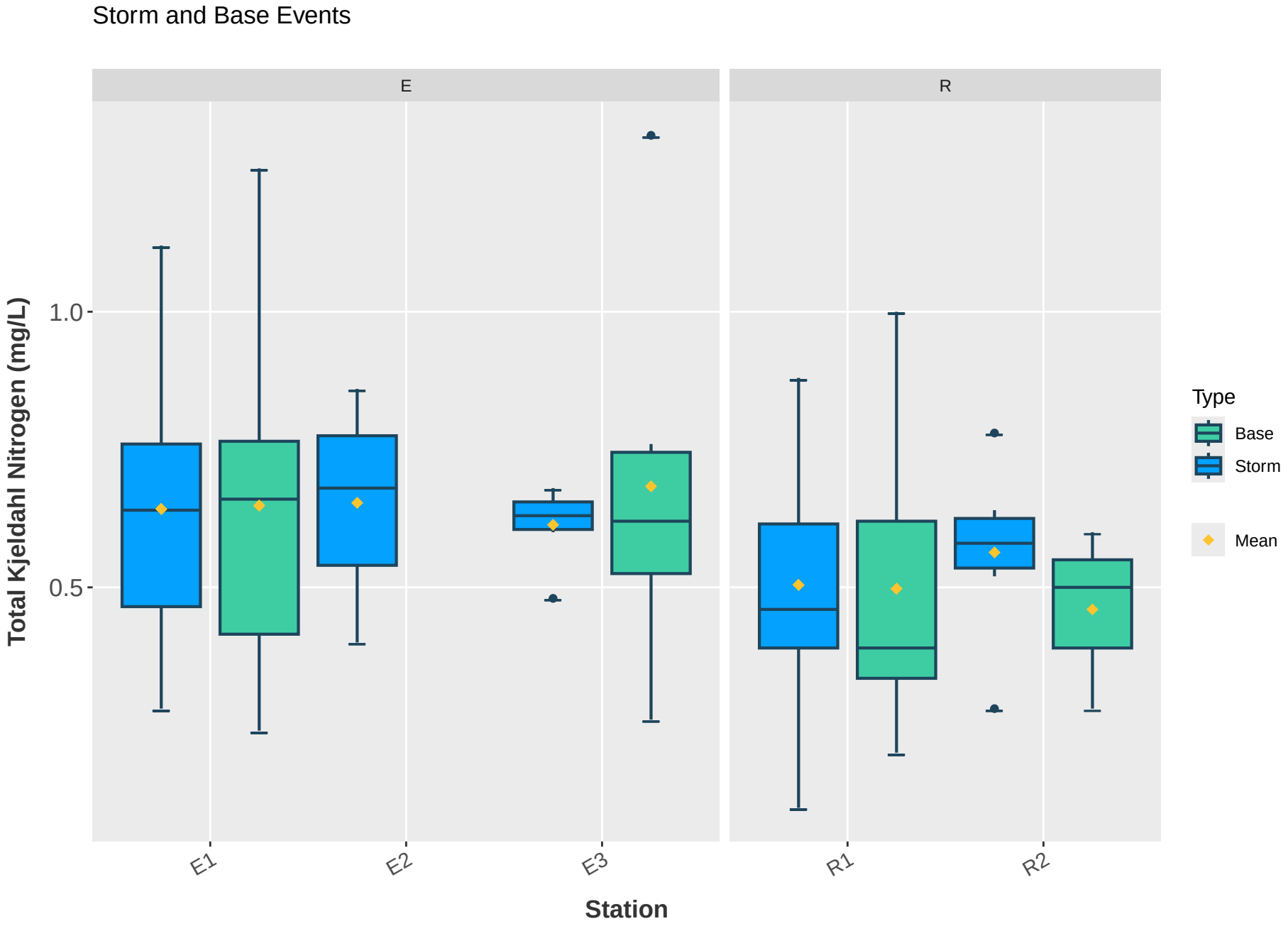

Storm and Base Events
E
R
Total Nitrogen (mg/L)
0
2
4
6
E1
E2
E3
R1
R2
Station
Type
Base
Storm
criteria
Project Action Limit
Mean

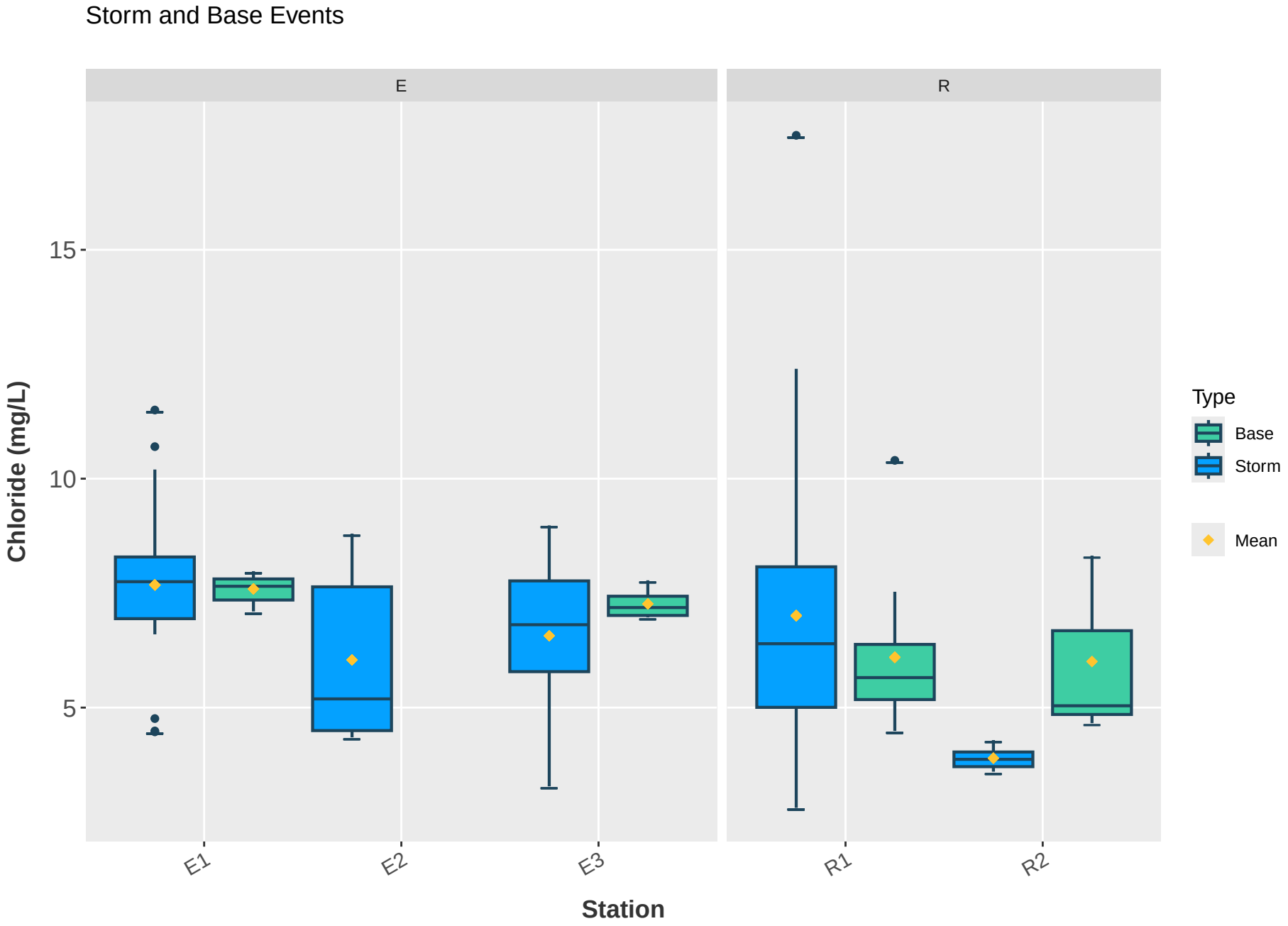
Storm and Base Events

Percent censored is shown below the corresponding box if any values were censored at a station.



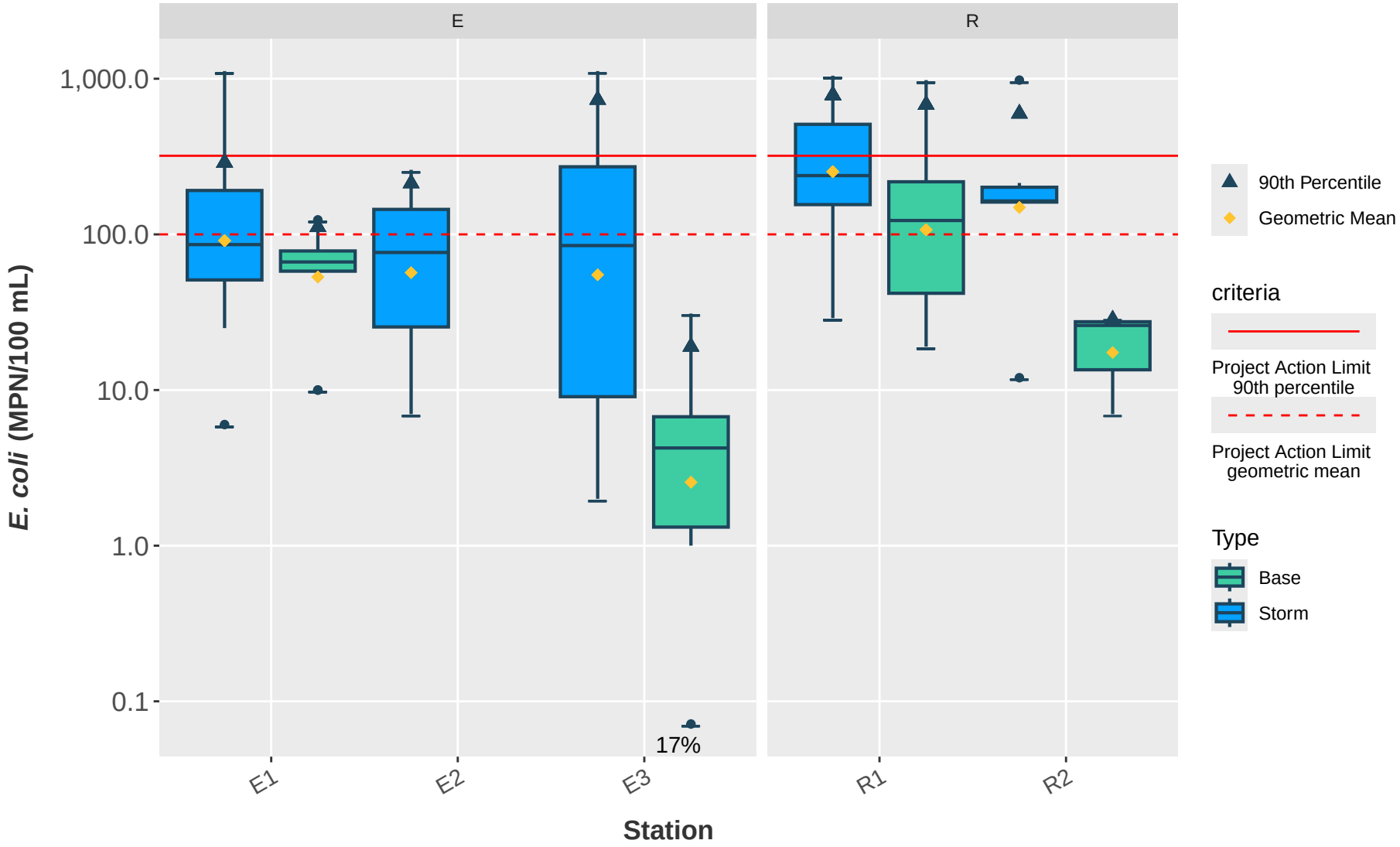
Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.


Storm and Base Events
E
R
Total Kjeldahl Nitrogen (mg/L)
1.0
0.5
E1
E2
E3
R1
R2
Station
Type
Base
Storm
Mean

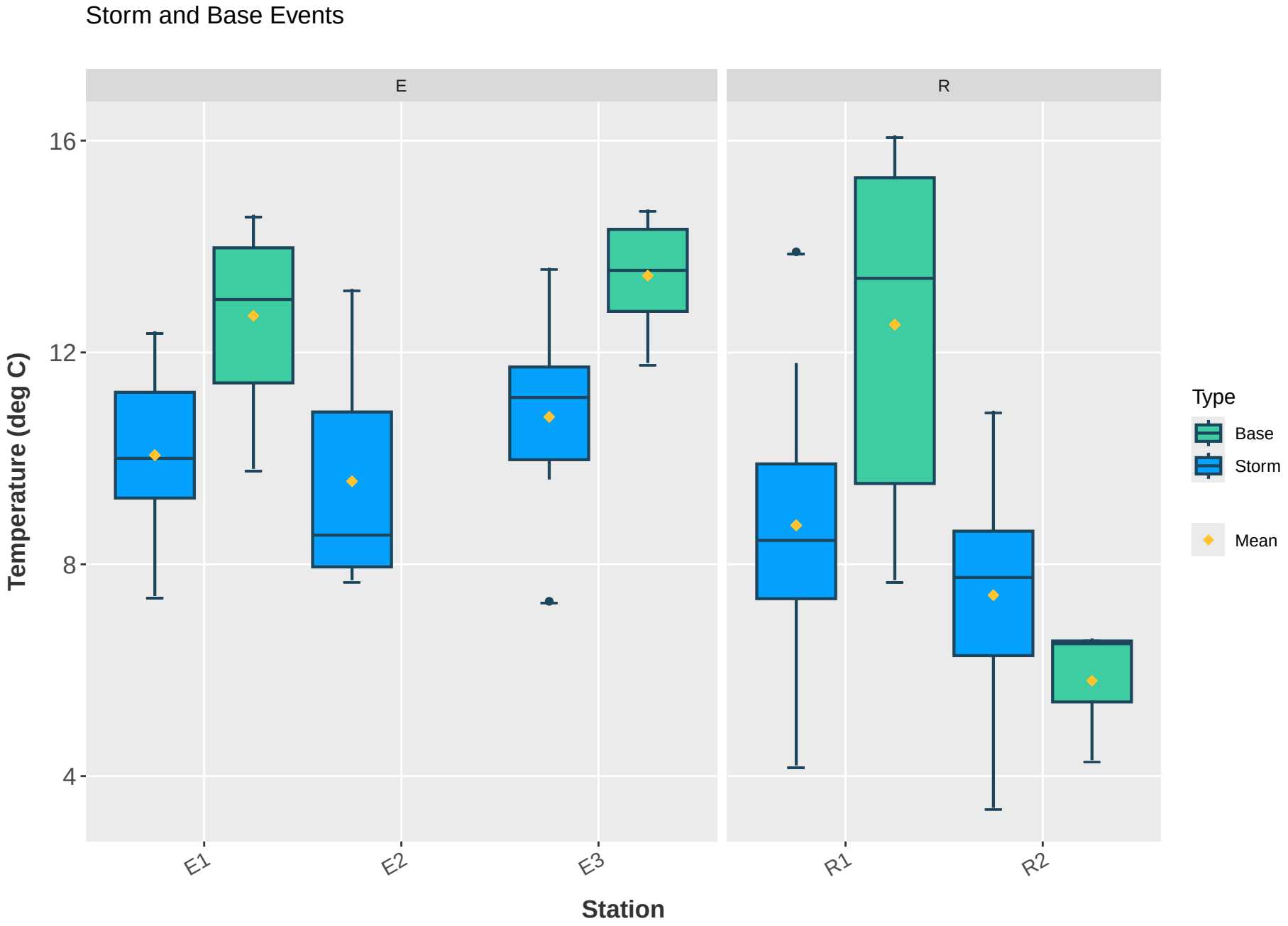

Storm and Base Events
E
R
15
10
5
Chloride (mg/L)
E1
E2
E3
R1
R2
Station
Type
Base
Storm
Mean

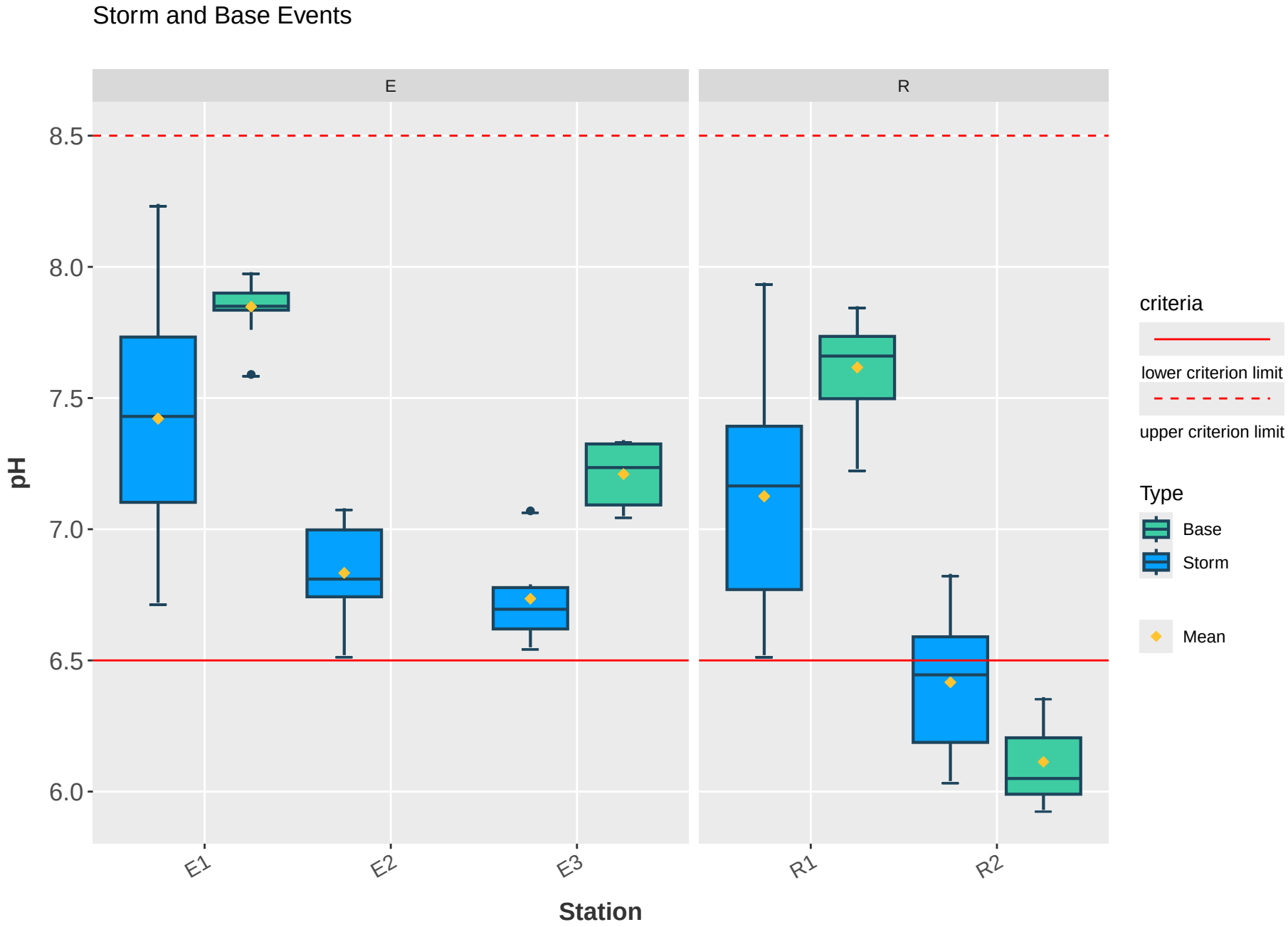
Storm and Base Events

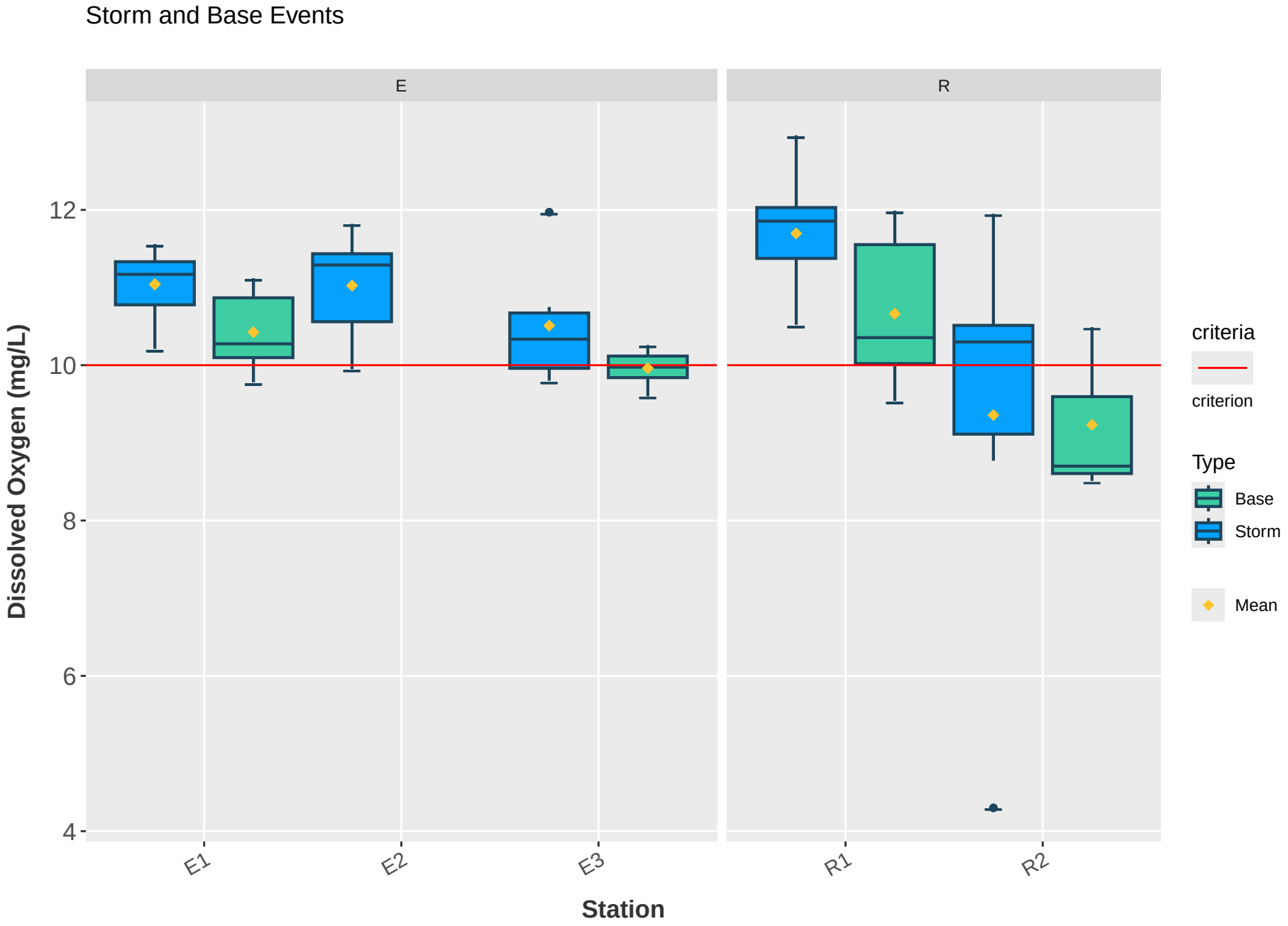
Percent censored is shown below the corresponding box if any values were censored at a station.

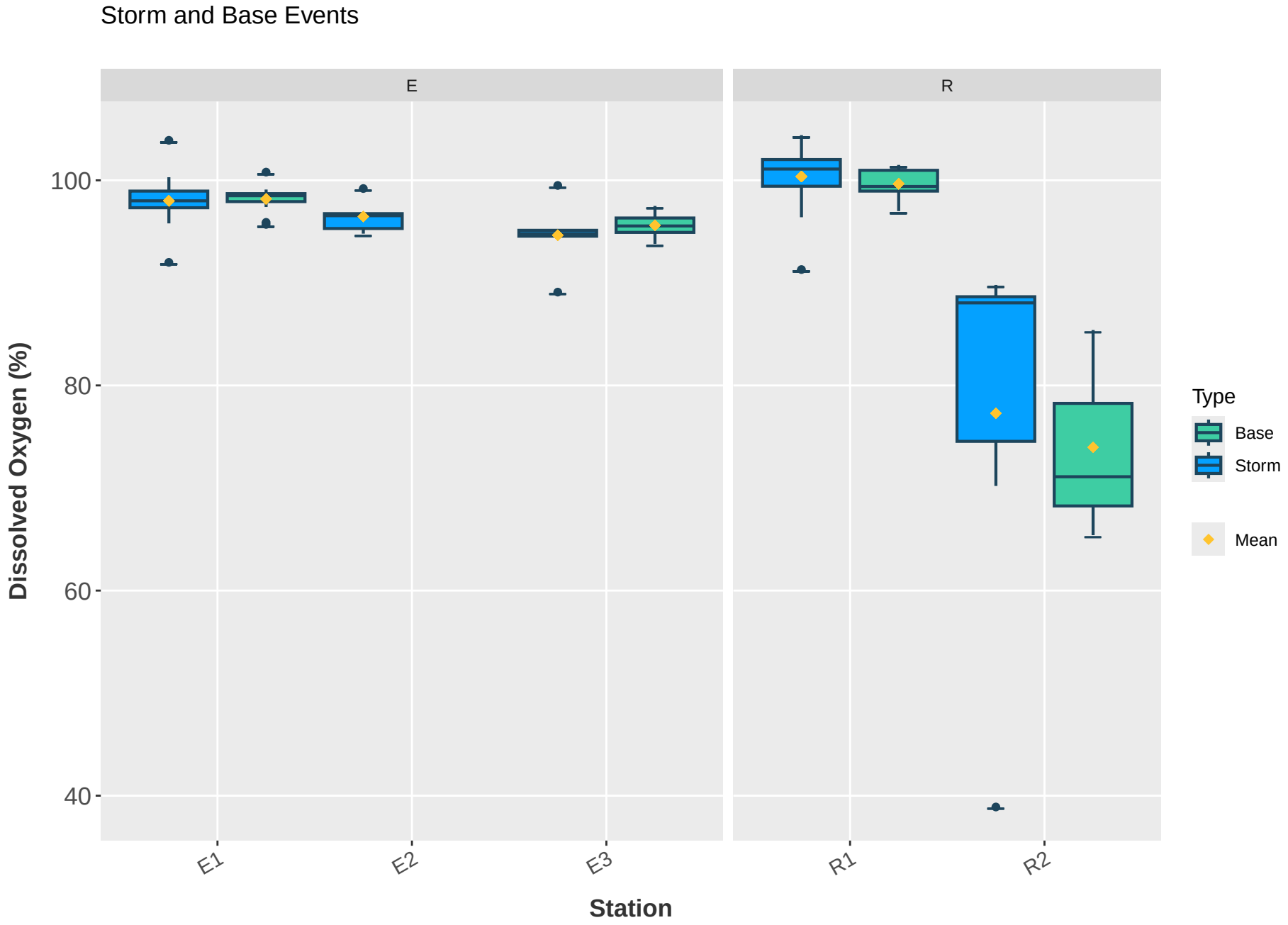


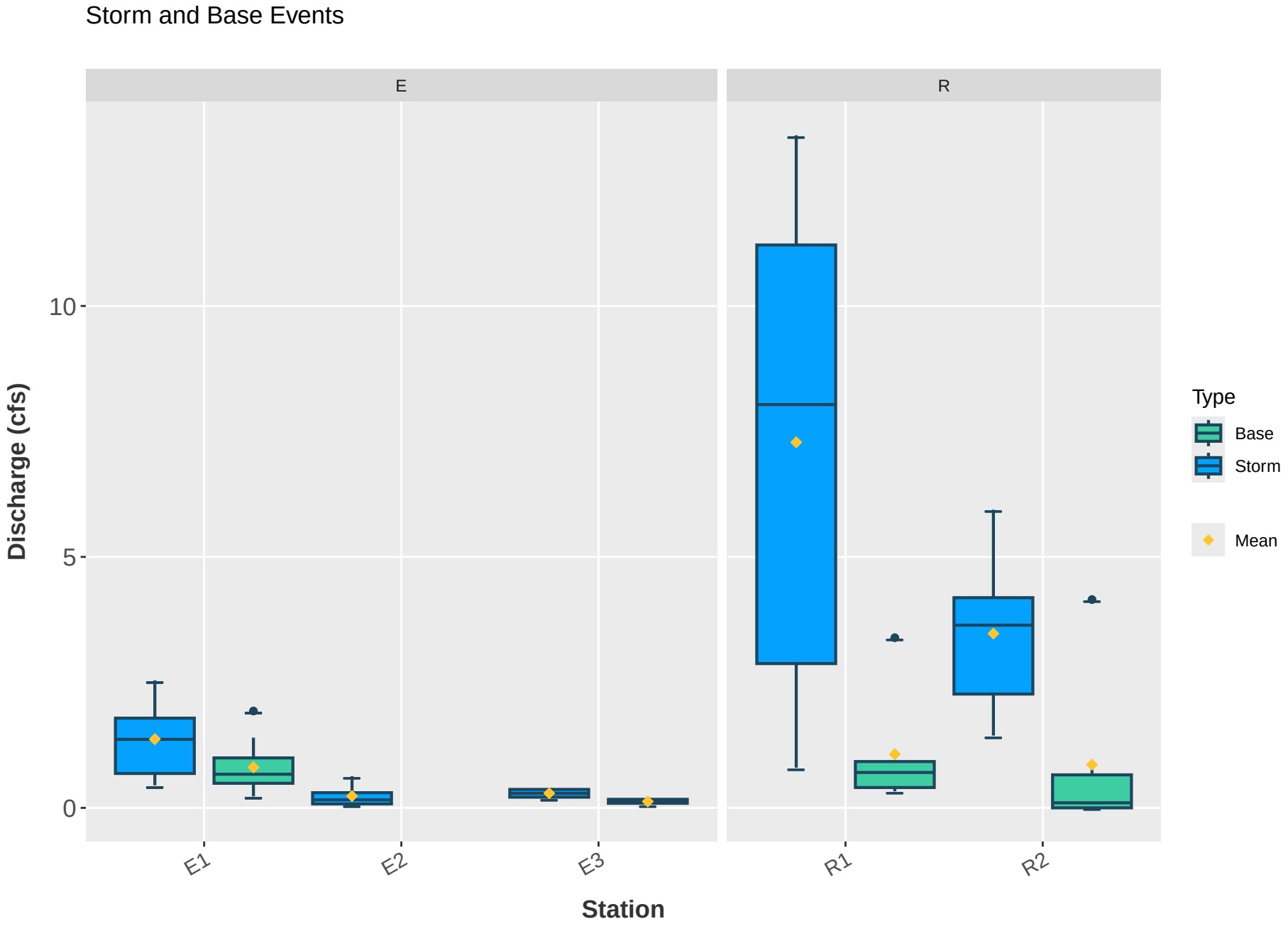
Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

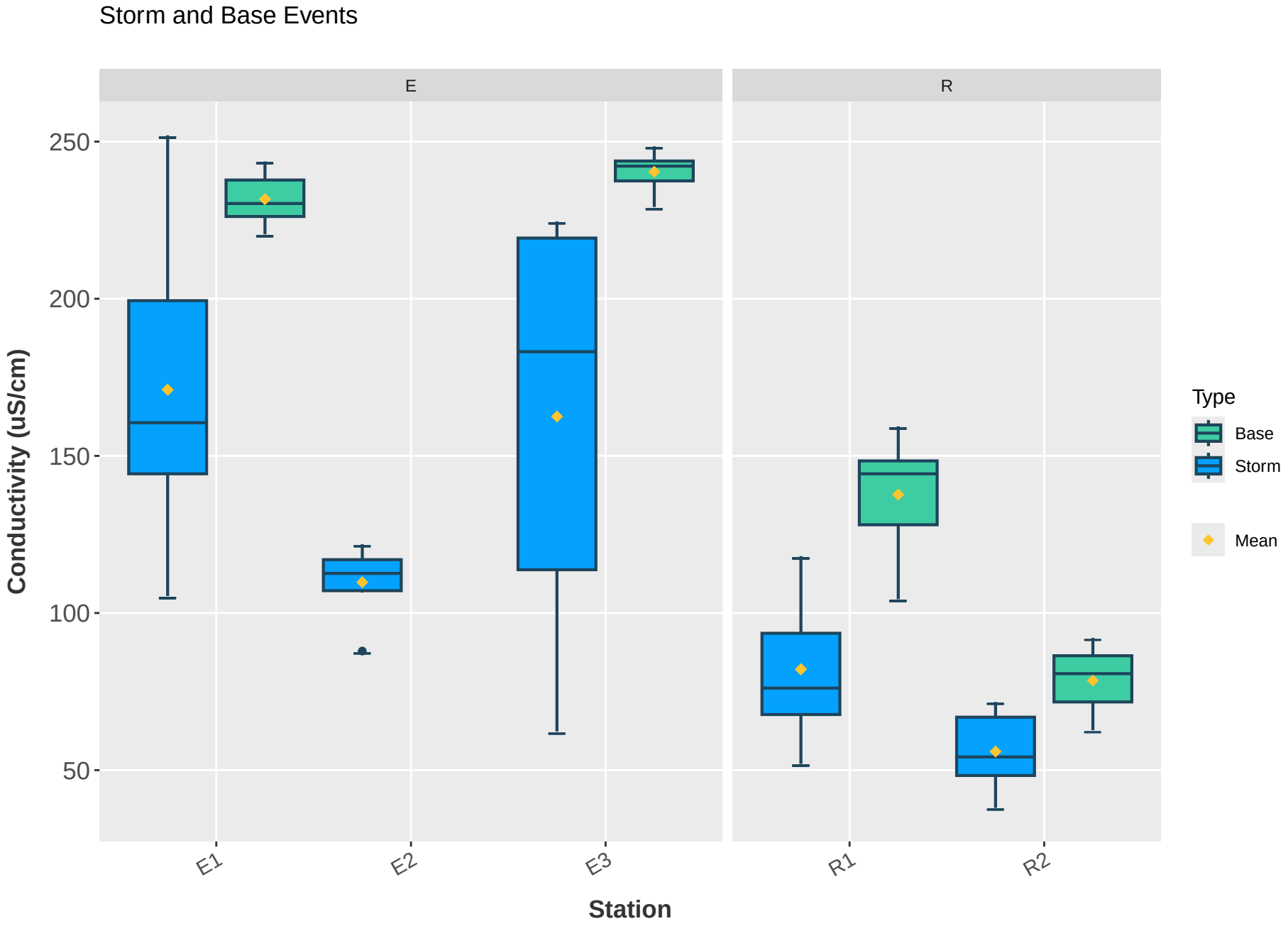

Storm and Base Events
E
R
16
12
8
4
Temperature (deg C)
E1
E2
E3
R1
R2
Station
Type
Base
Storm
Mean


Storm and Base Events
E
R
8.5
8.0
7.5
7.0
6.5
6.0
pH
E1
E2
E3
R1
R2
Station
criteria
lower criterion limit
upper criterion limit
Type
Base
Storm
Mean


Storm and Base Events
E
R
Dissolved Oxygen (mg/L)
12
10
8
6
4
E1
E2
E3
R1
R2
Station
criteria
criterion
Type
Base
Storm
Mean

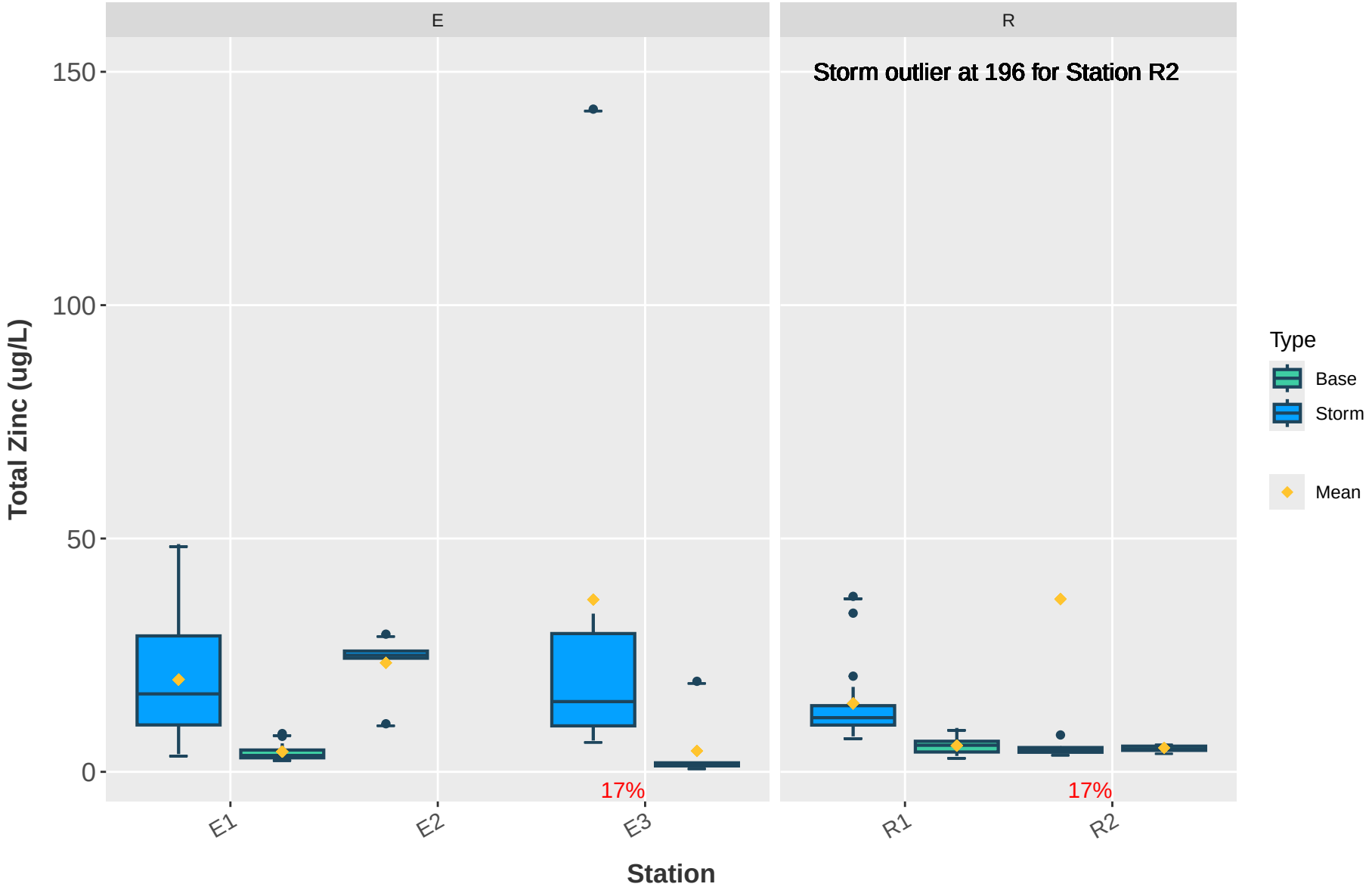

Storm and Base Events
E
R
100
80
60
40
Dissolved Oxygen (%)
E1
E2
E3
R1
R2
Station
Type
Base
Storm
Mean


Storm and Base Events
E
R
10
5
0
Discharge (cfs)
E1
E2
E3
R1
R2
Station
Type
Base
Storm
Mean


Storm and Base Events
E
R
250
200
150
100
50
Conductivity (uS/cm)
E1
E2
E3
R1
R2
Station
Type
Base
Storm
Mean

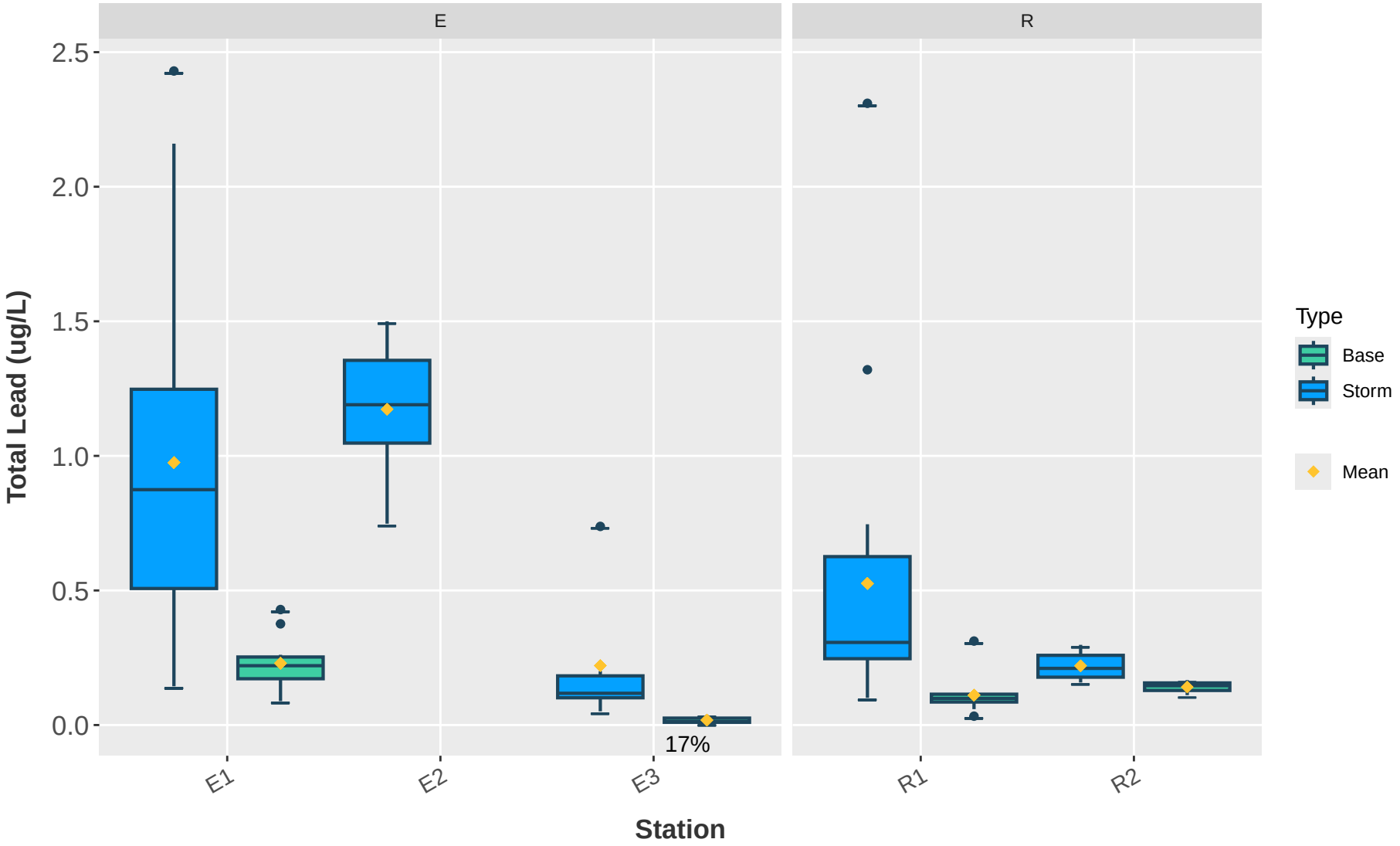
Storm and Base Events

If any samples exceeded the calculated criteria, the percent of exceedances is shown in red.

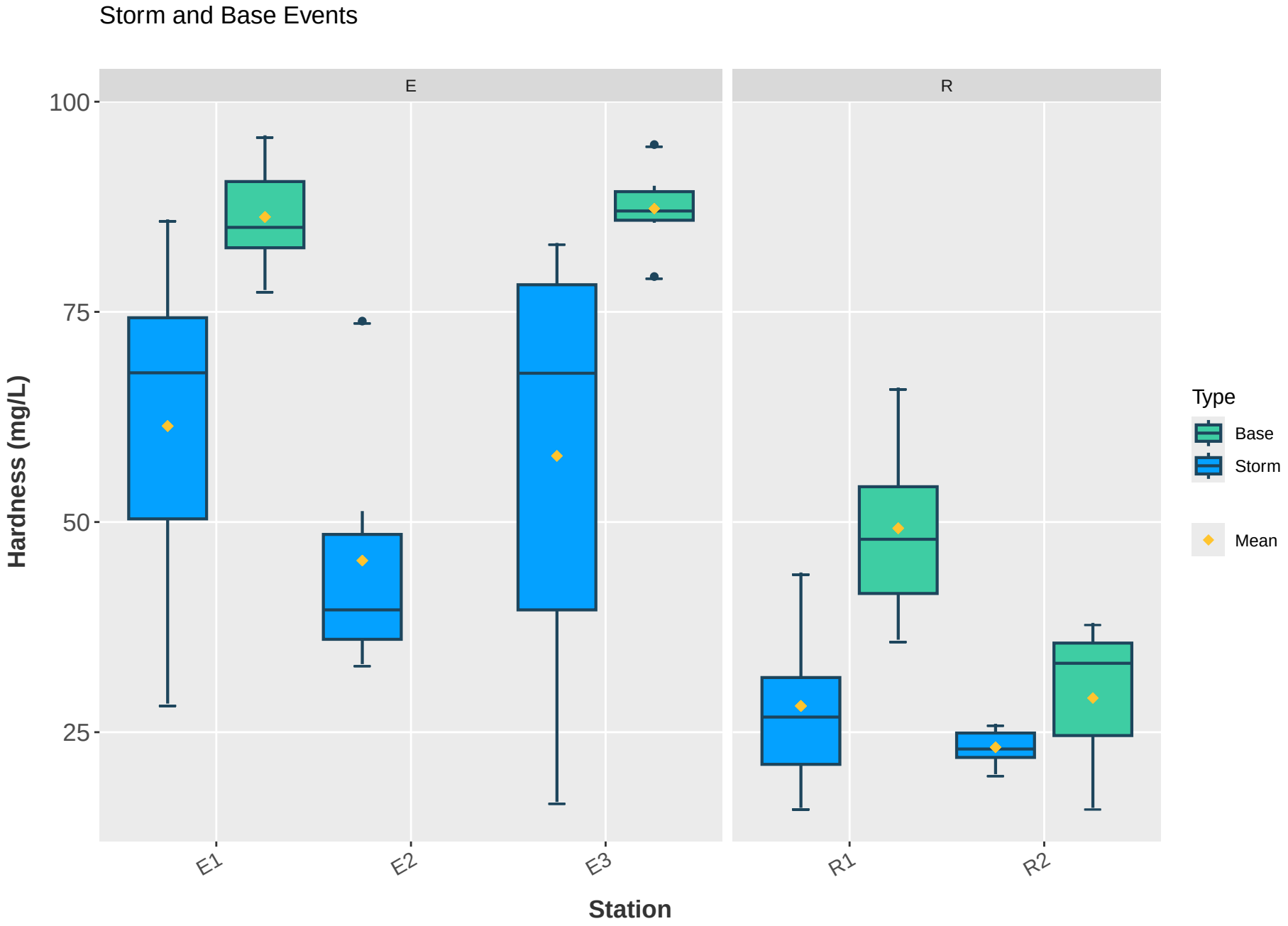


Storm and Base Events

Percent censored is shown below the corresponding box if any values were censored at a station.

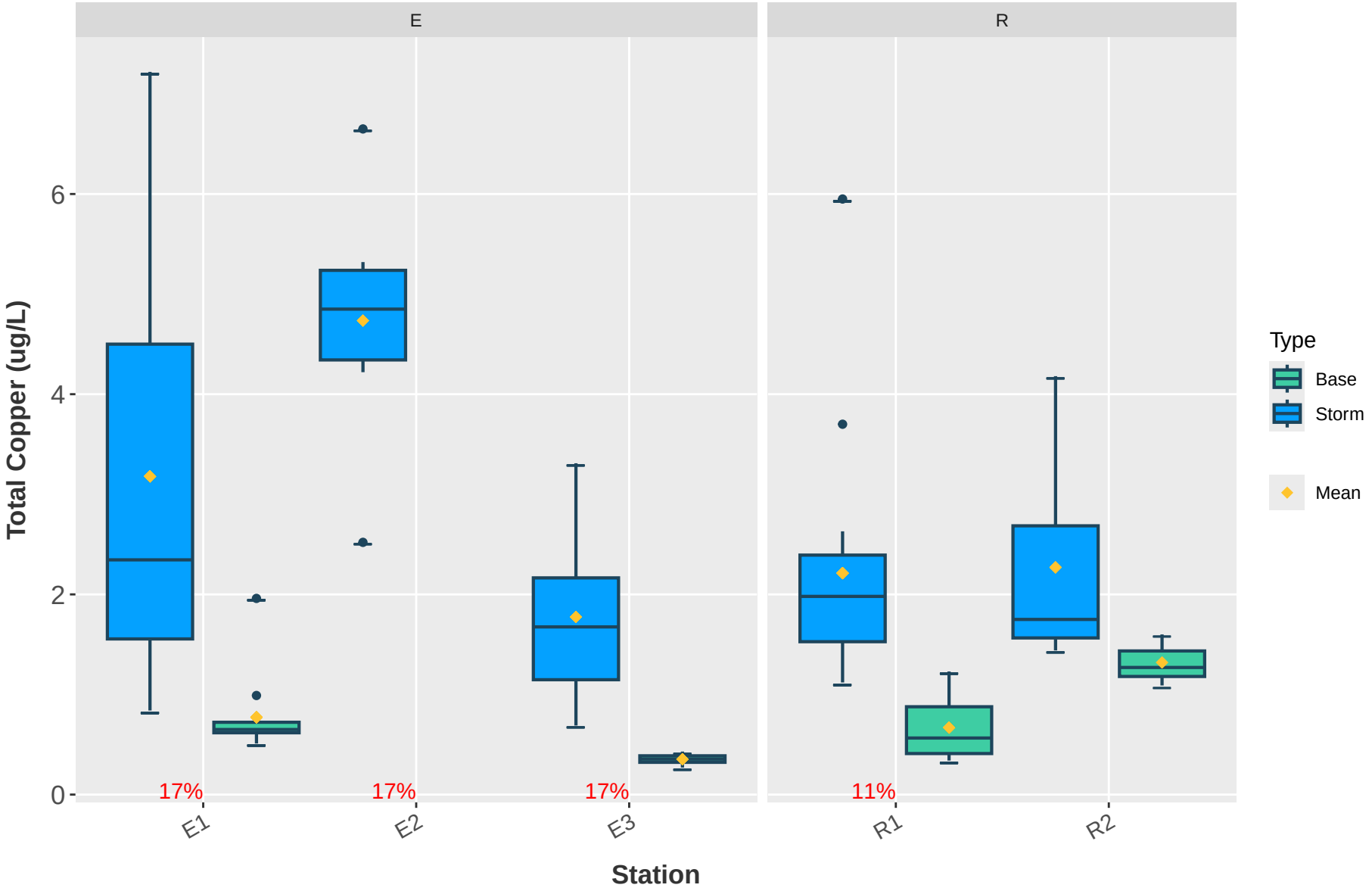


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.


Storm and Base Events
E
R
100
75
50
25
Hardness (mg/L)
E1
E2
E3
R1
R2
Station
Type
Base
Storm
Mean

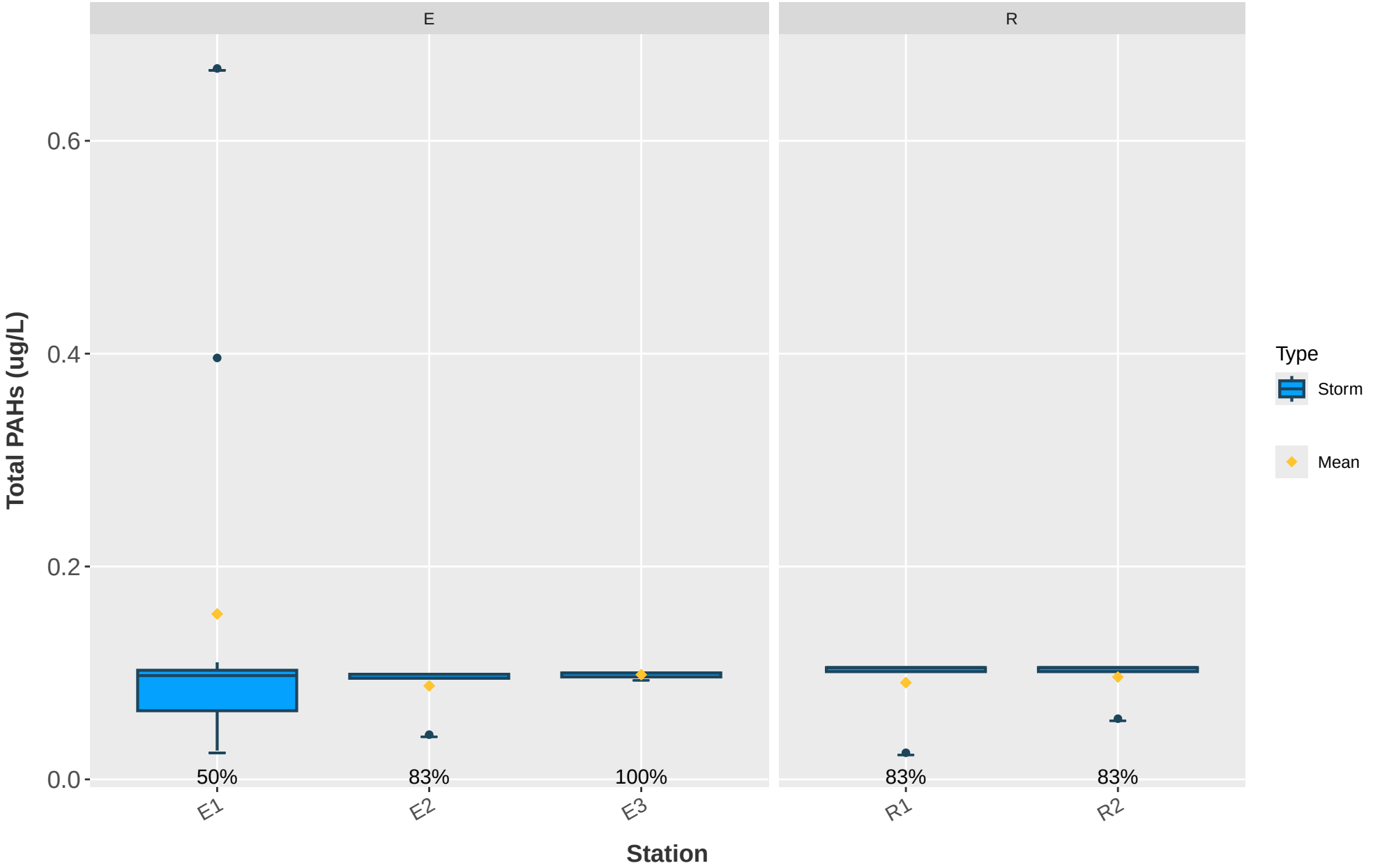
Storm and Base Events

If any samples exceeded the calculated criteria, the percent of exceedances is shown in red.



Storm events

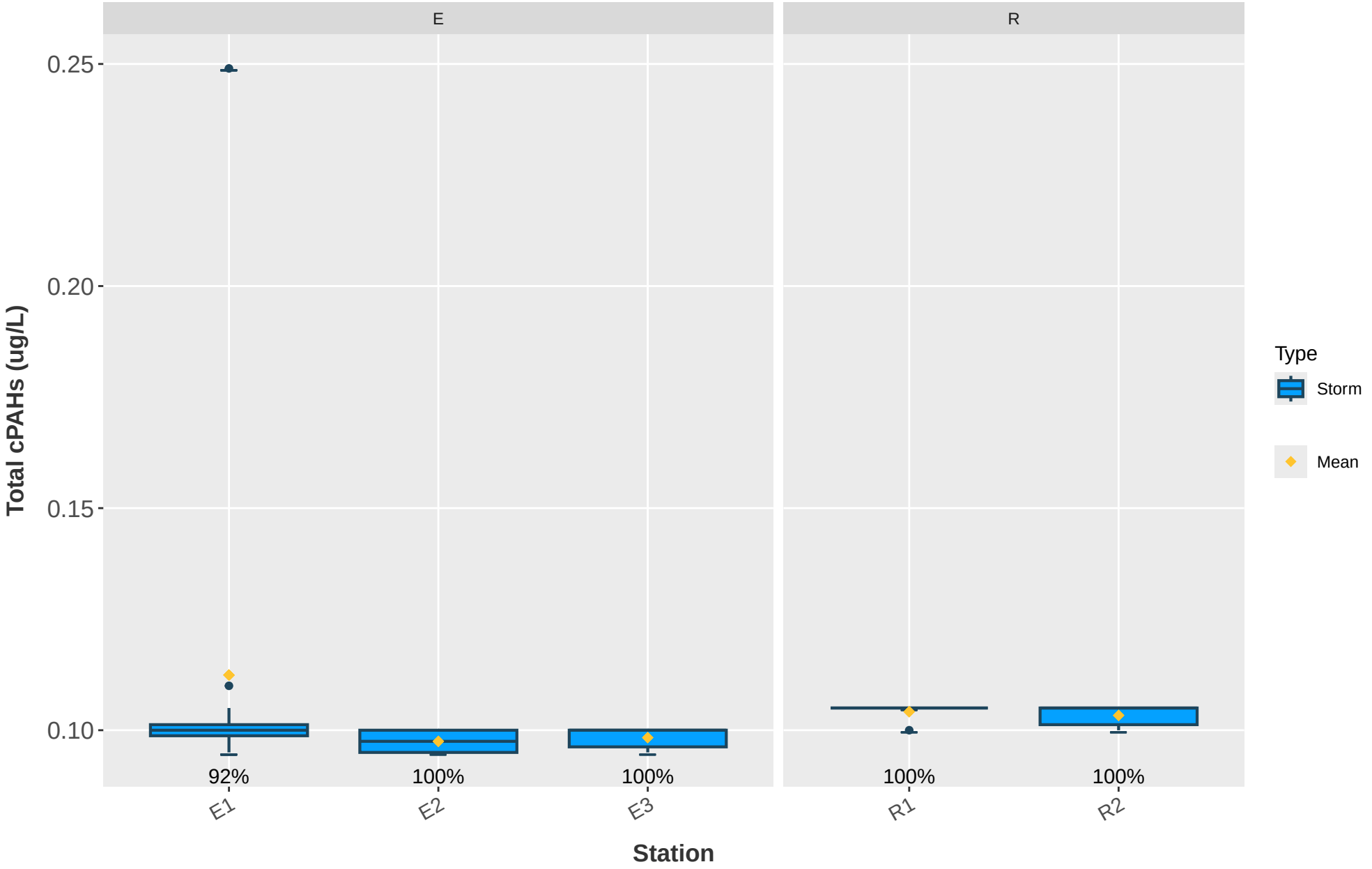
Percent censored is shown below the corresponding box if any values were censored at a station.



Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

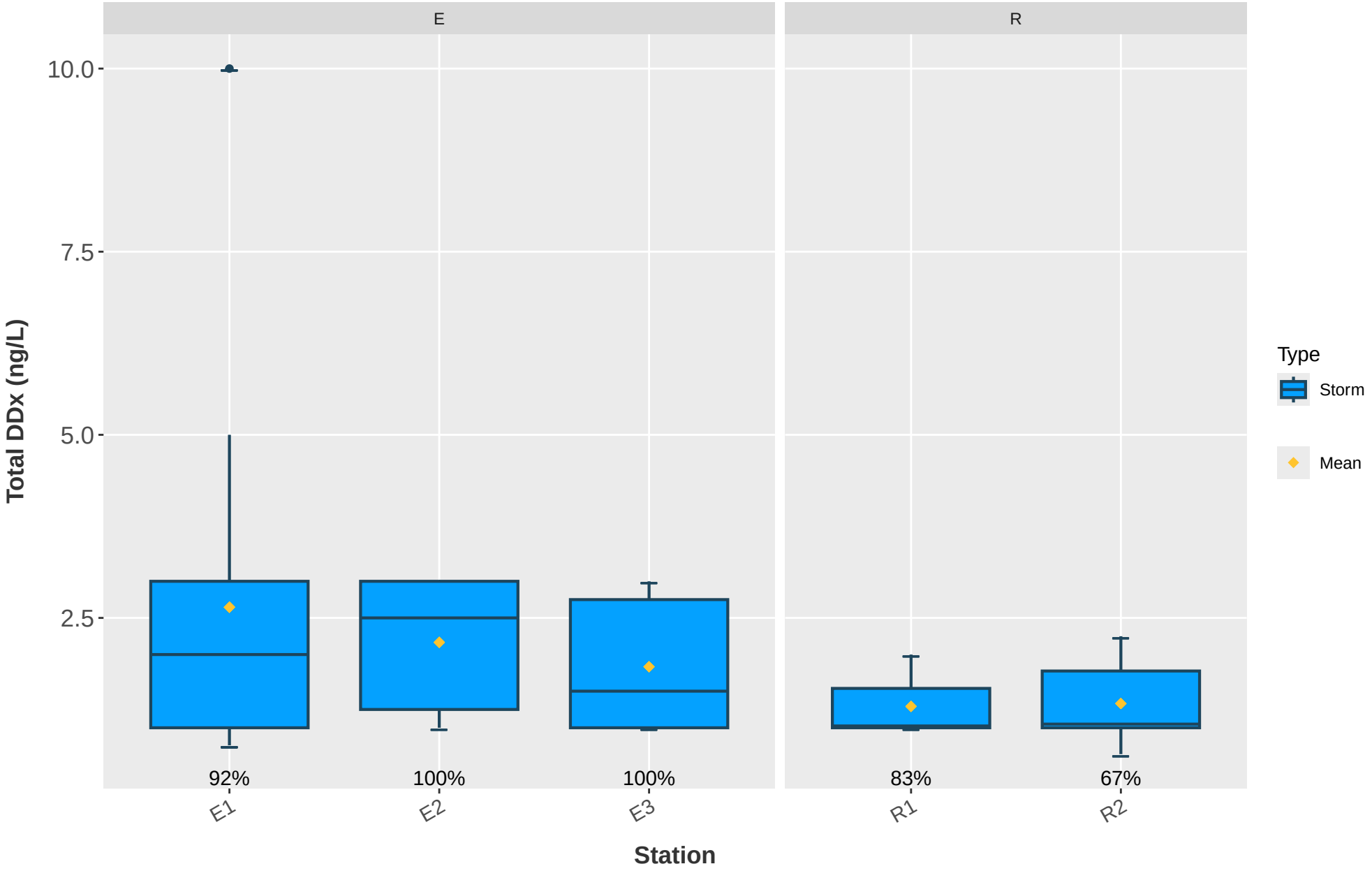
Percent censored is shown below the corresponding box if any values were censored at a station.



Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

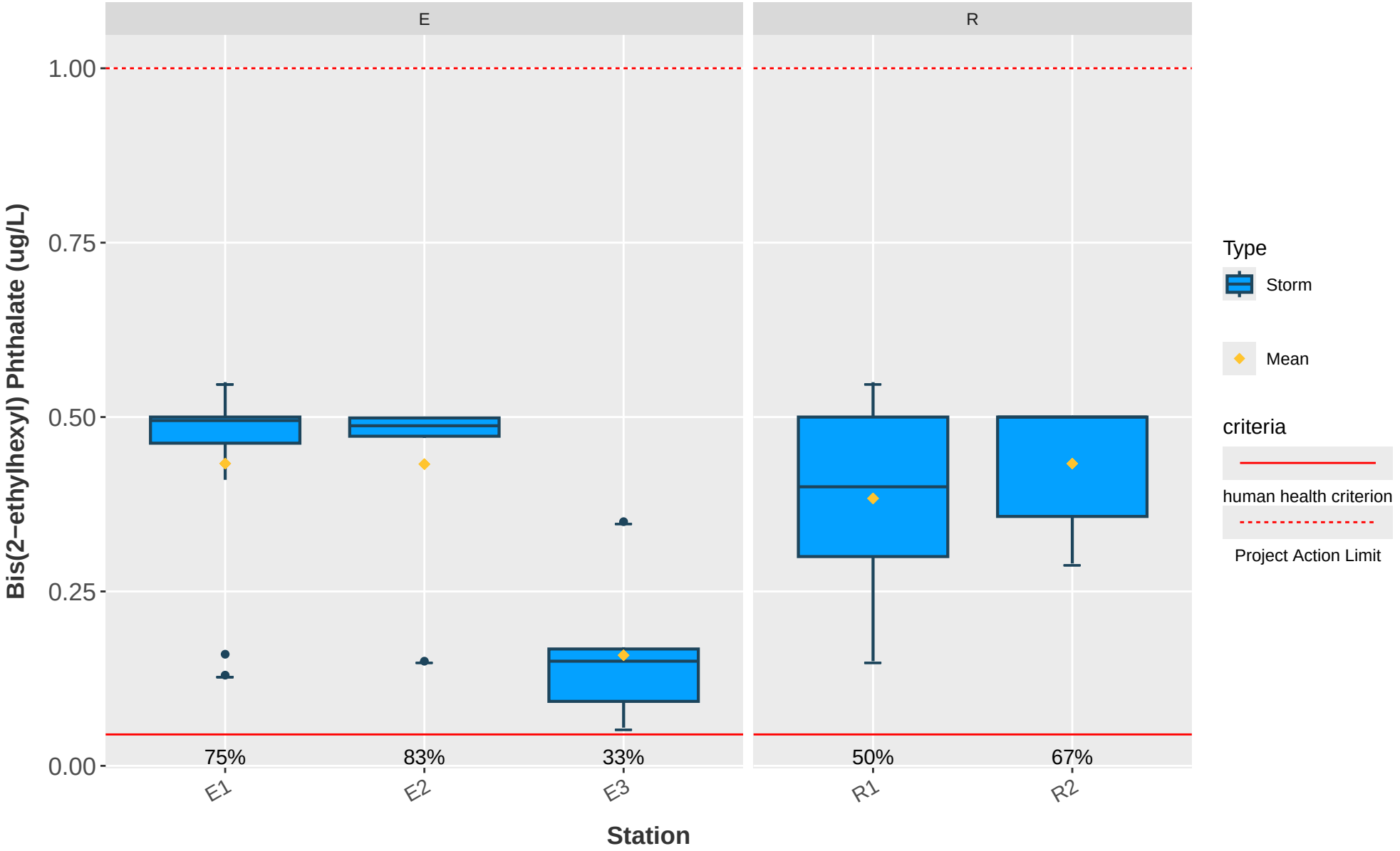
Percent censored is shown below the corresponding box if any values were censored at a station.



Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

Percent censored is shown below the corresponding box if any values were censored at a station.

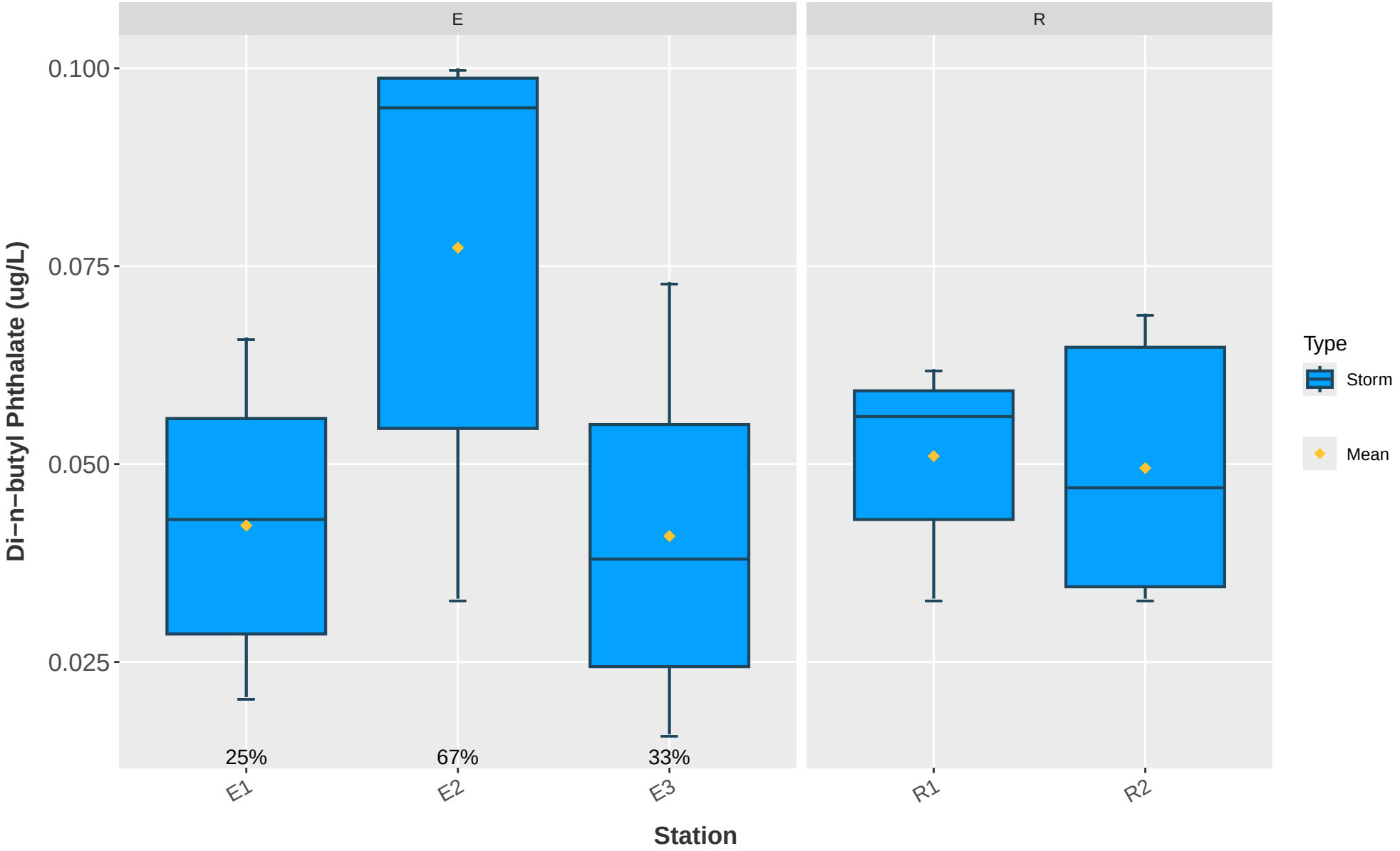


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

Half the reporting limit was used for censored data when >50% of values were censored.

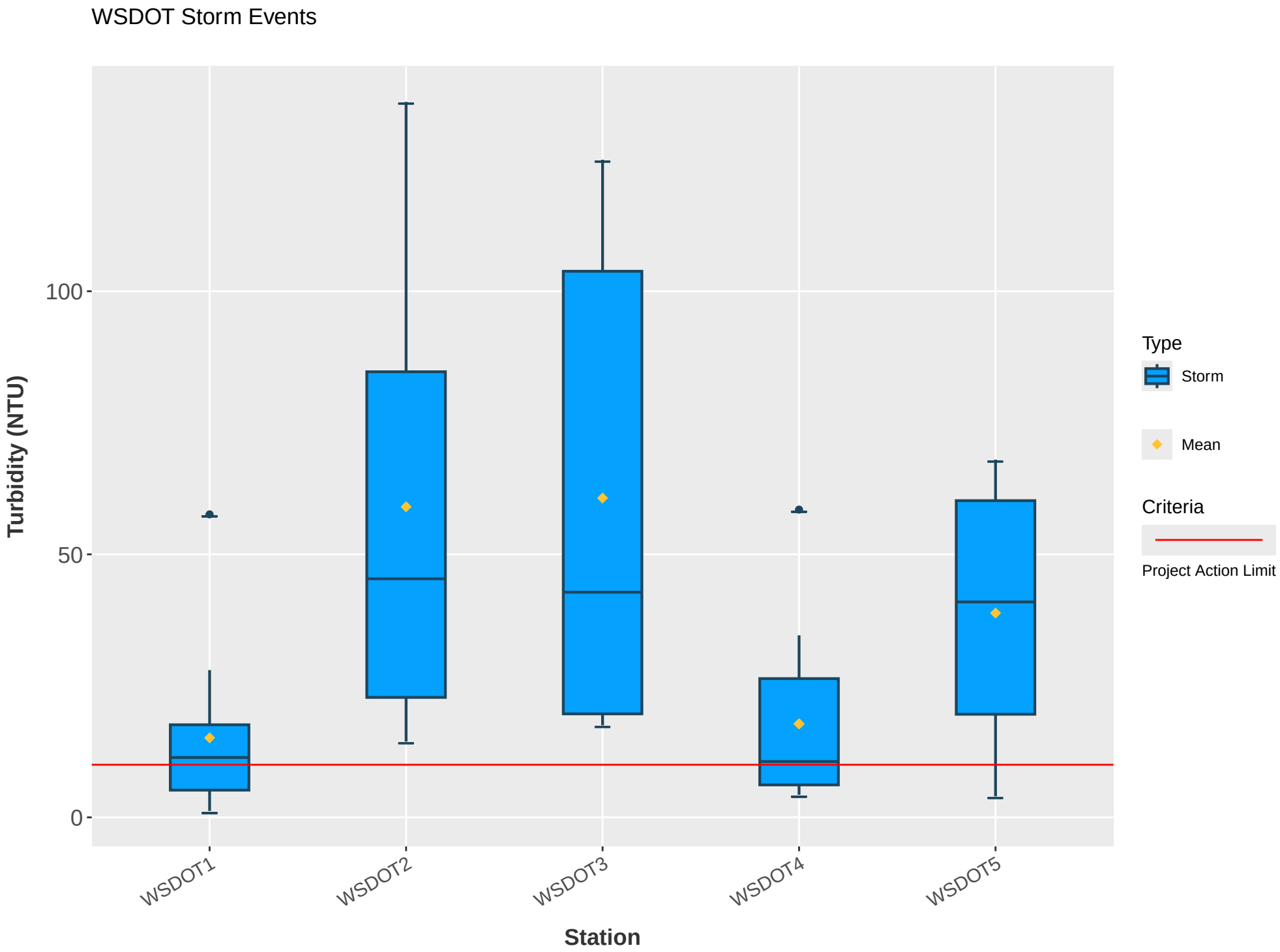
Storm events

Percent censored is shown below the corresponding box if any values were censored at a station.



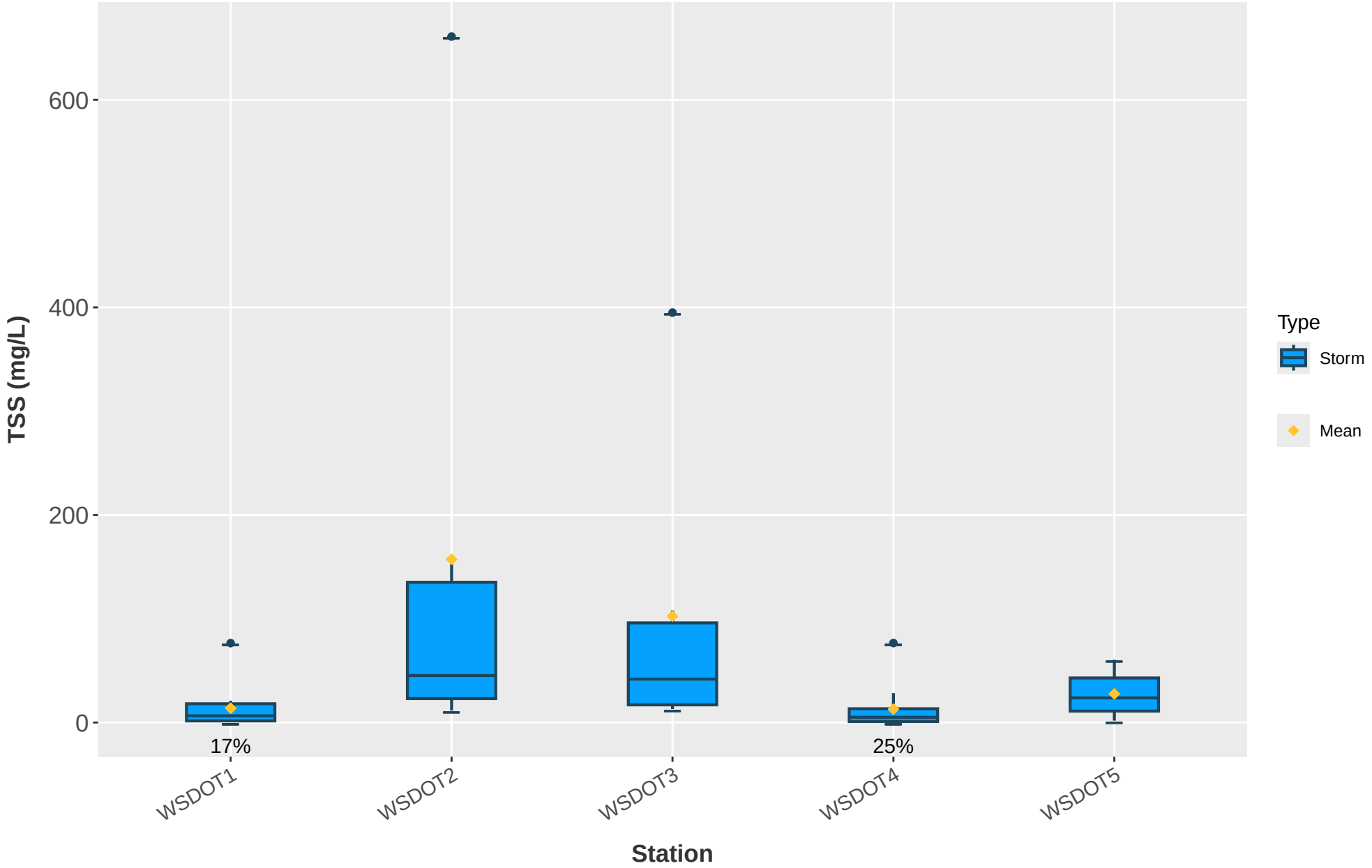
Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

Half the reporting limit was used for censored data when >50% of values were censored.

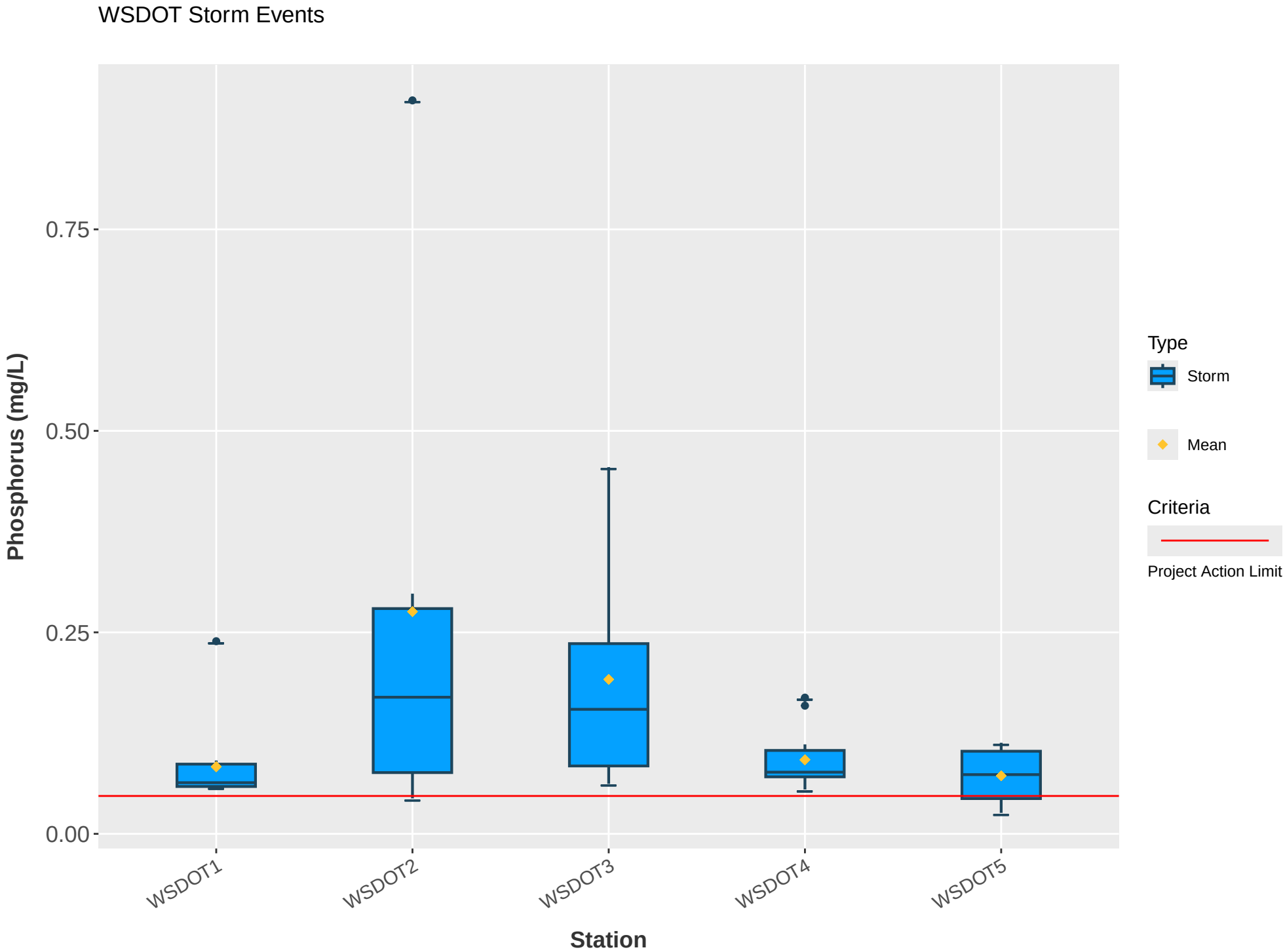

WSDOT Storm Events
Turbidity (NTU)
100
50
0
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean
Criteria
Project Action Limit

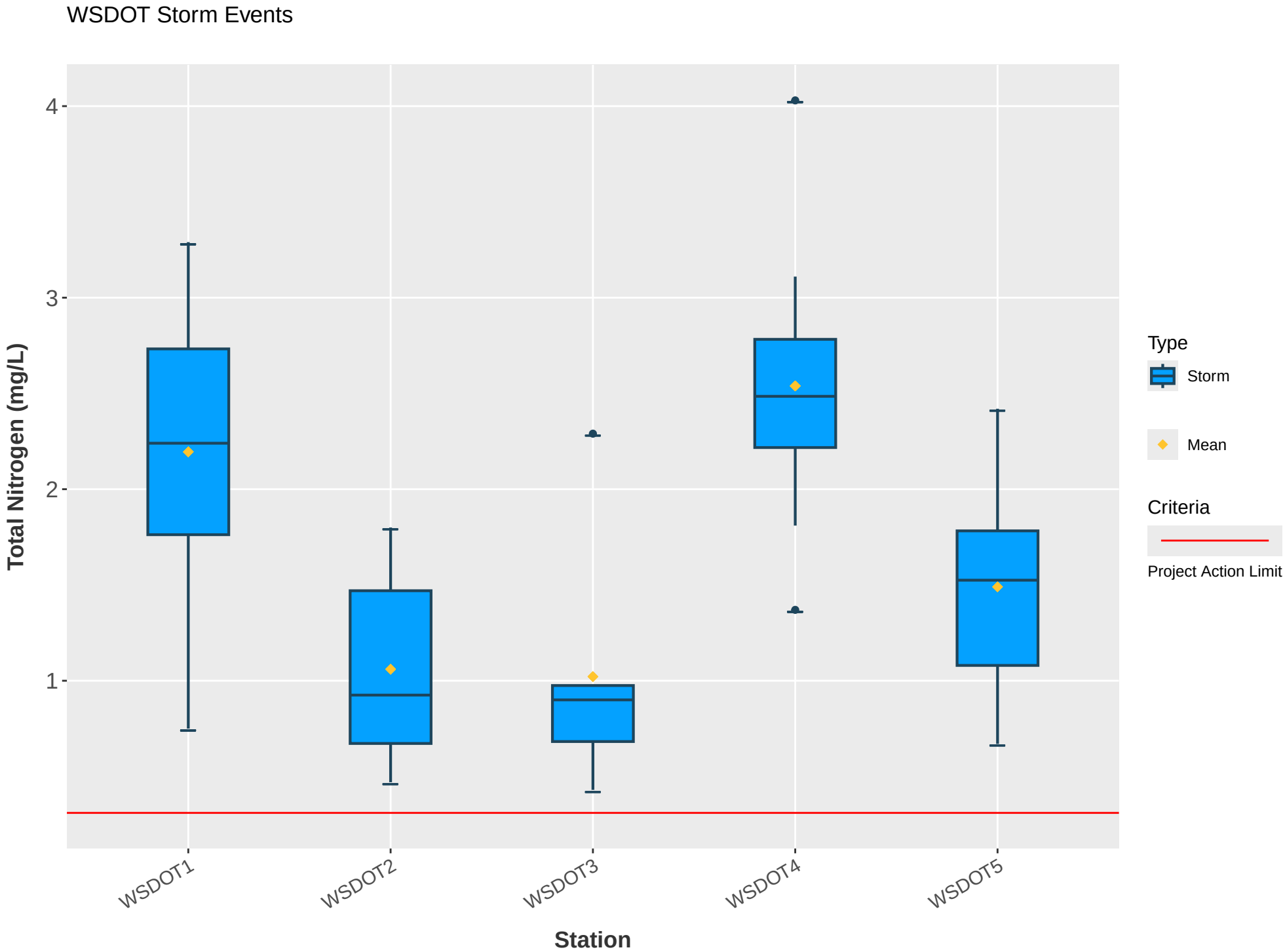
WSDOT Storm Events

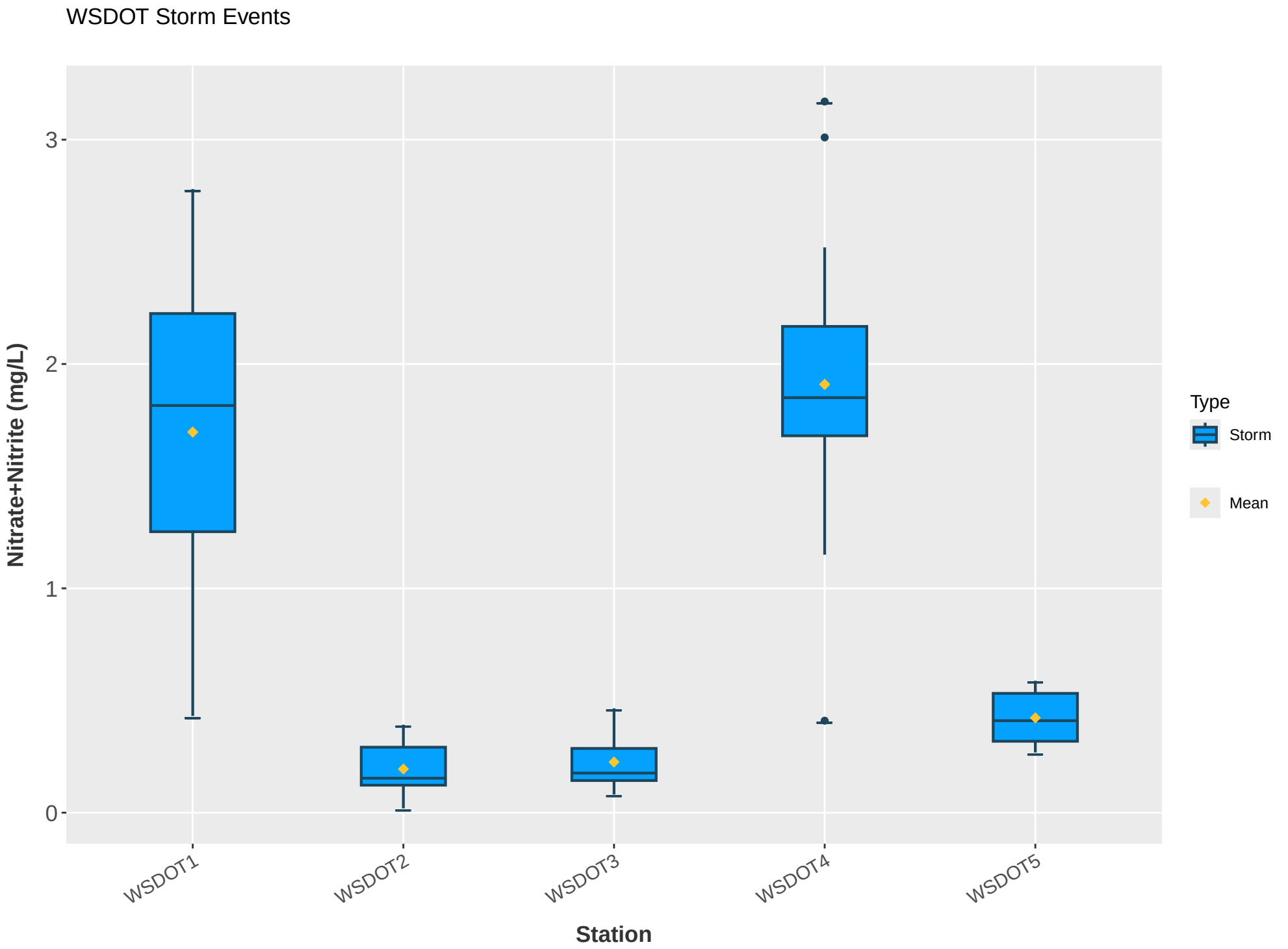
Percent censored is shown below the corresponding box if any values were censored at a station.



Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

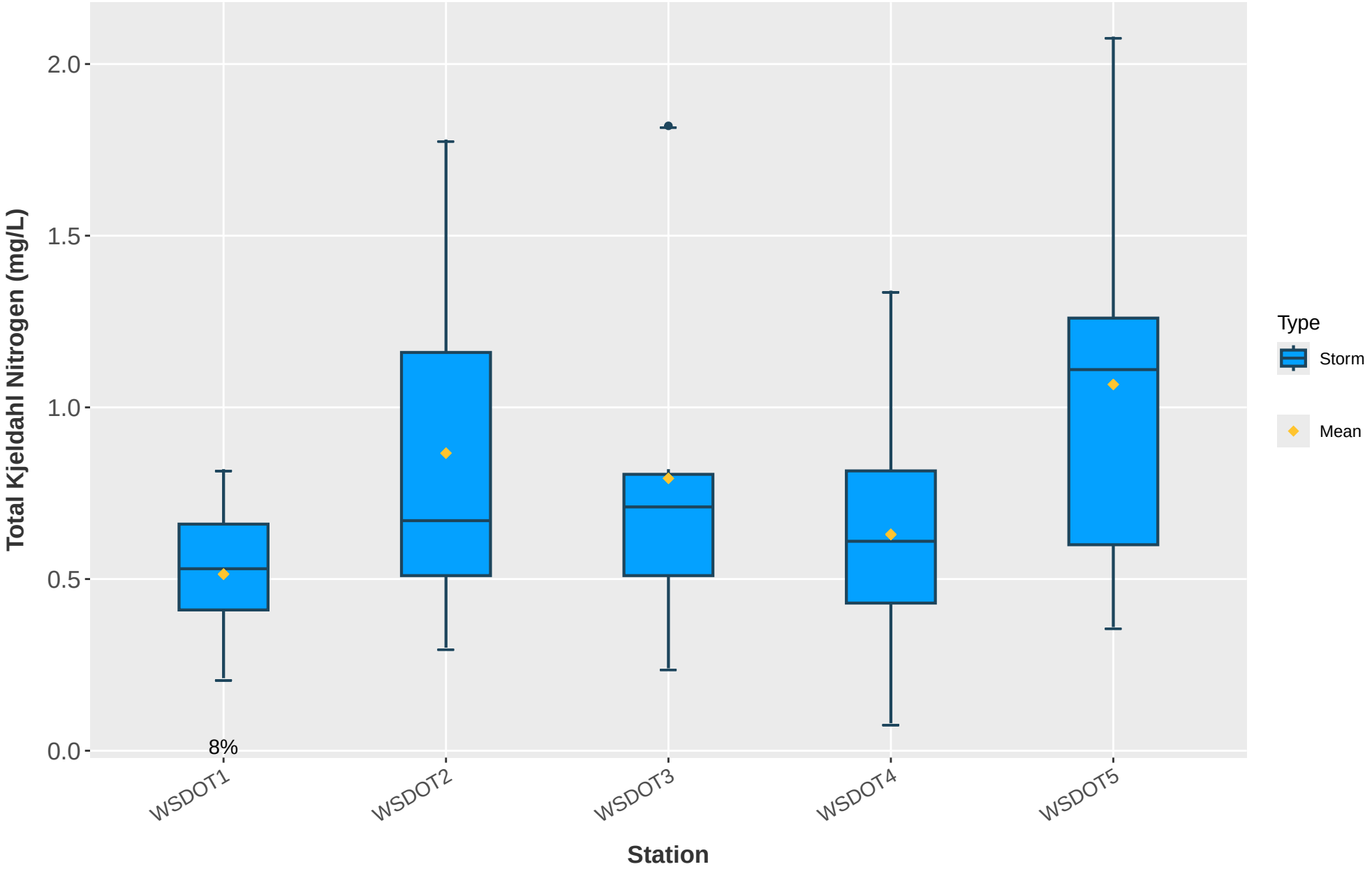

WSDOT Storm Events
Phosphorus (mg/L)
0.75
0.50
0.25
0.00
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean
Criteria
Project Action Limit


WSDOT Storm Events
Total Nitrogen (mg/L)
4
3
2
1
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean
Criteria
Project Action Limit

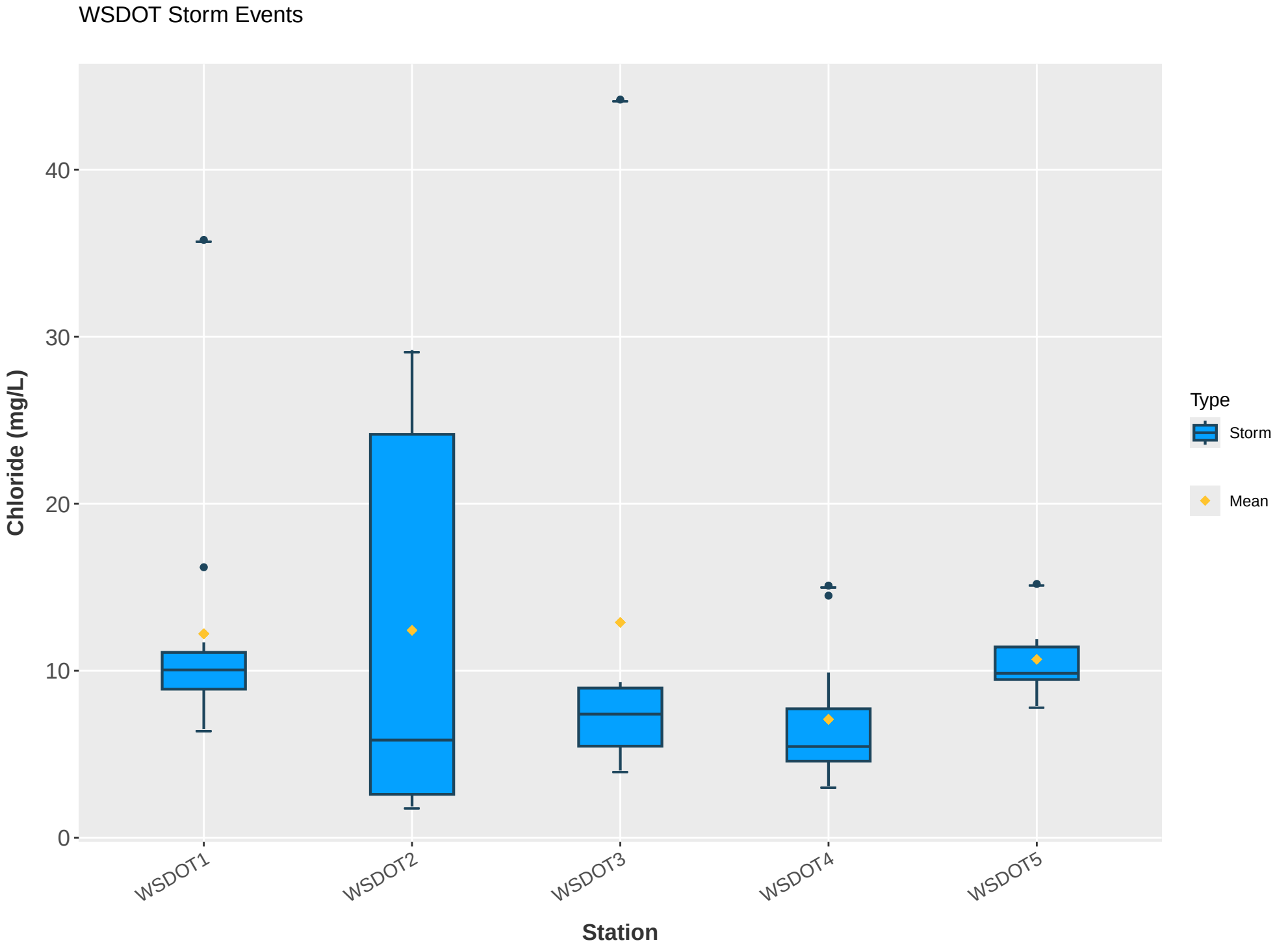

WSDOT Storm Events
Nitrate+Nitrite (mg/L)
3
2
1
0
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean

WSDOT Storm Events

Percent censored is shown below the corresponding box if any values were censored at a station.

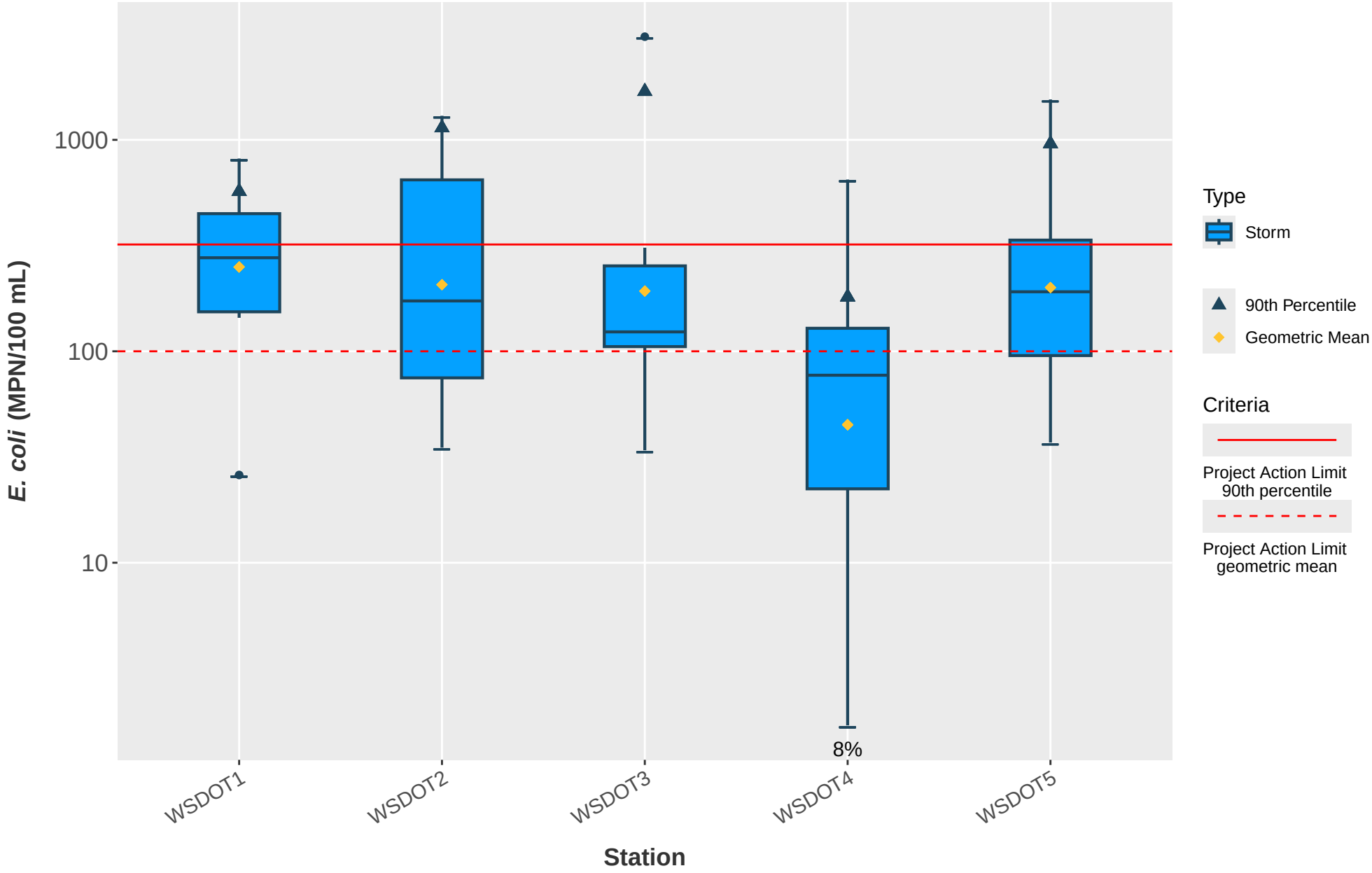


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

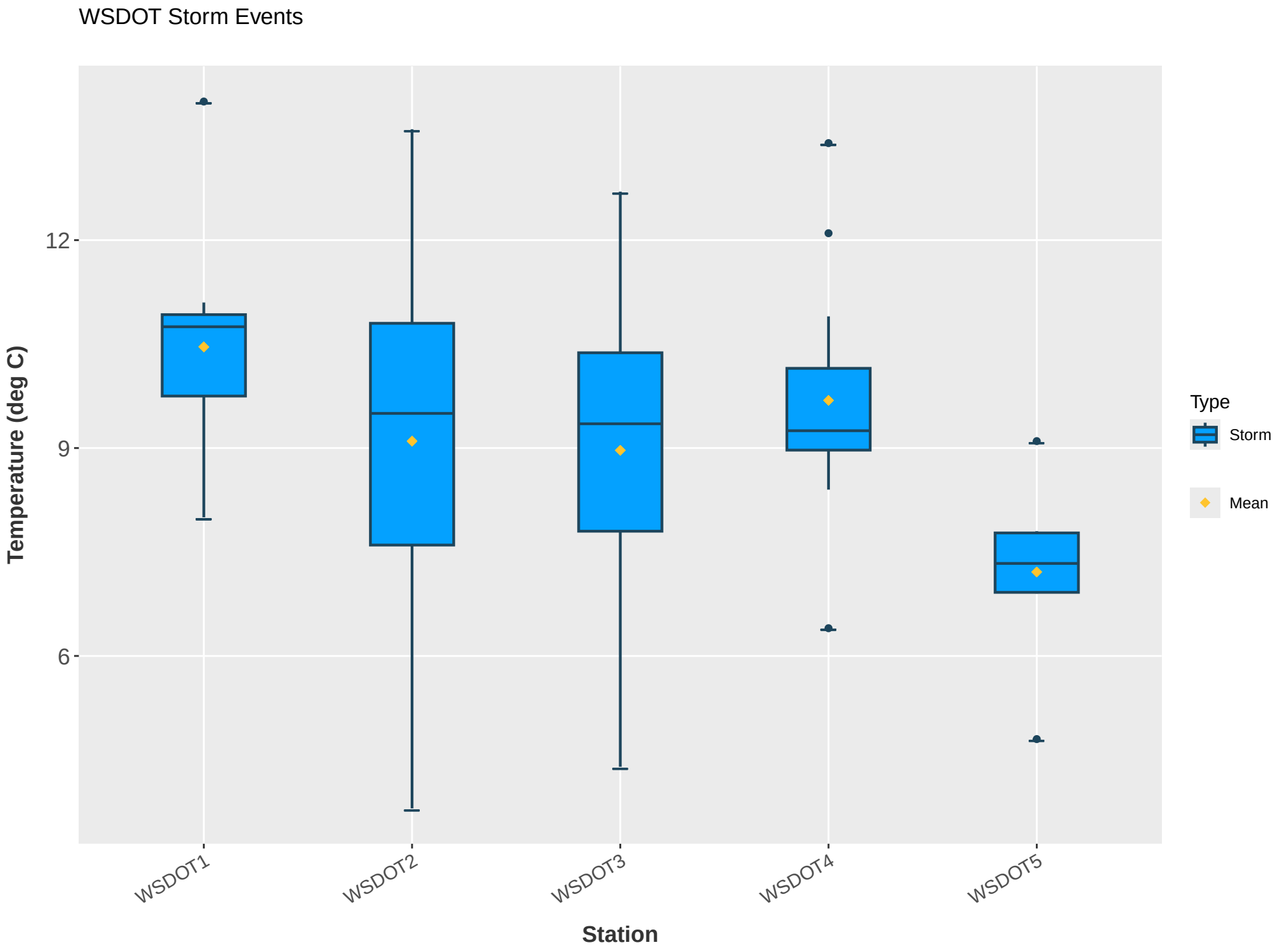

WSDOT Storm Events
Chloride (mg/L)
0
10
20
30
40
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean

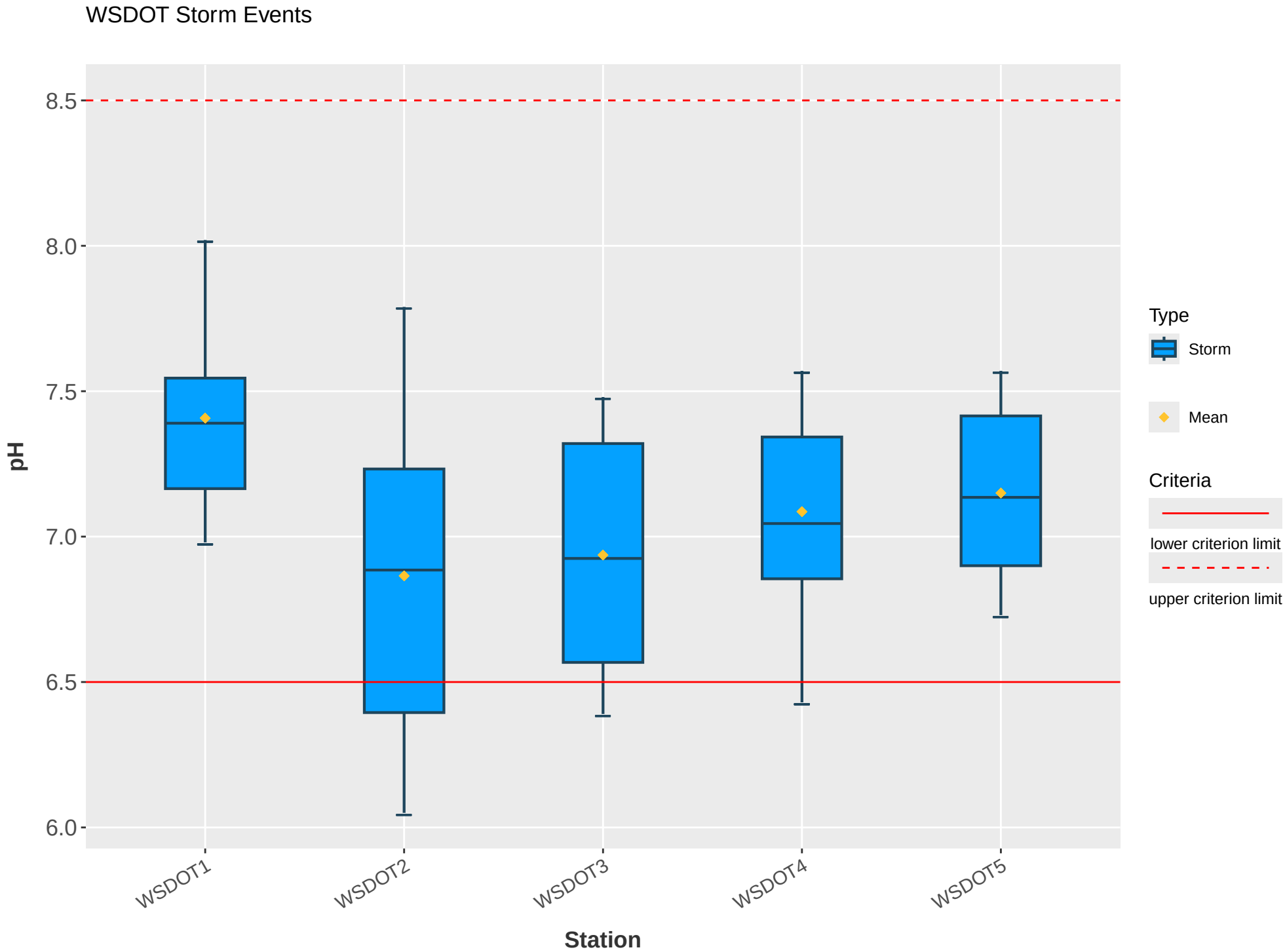
WSDOT Storm Events

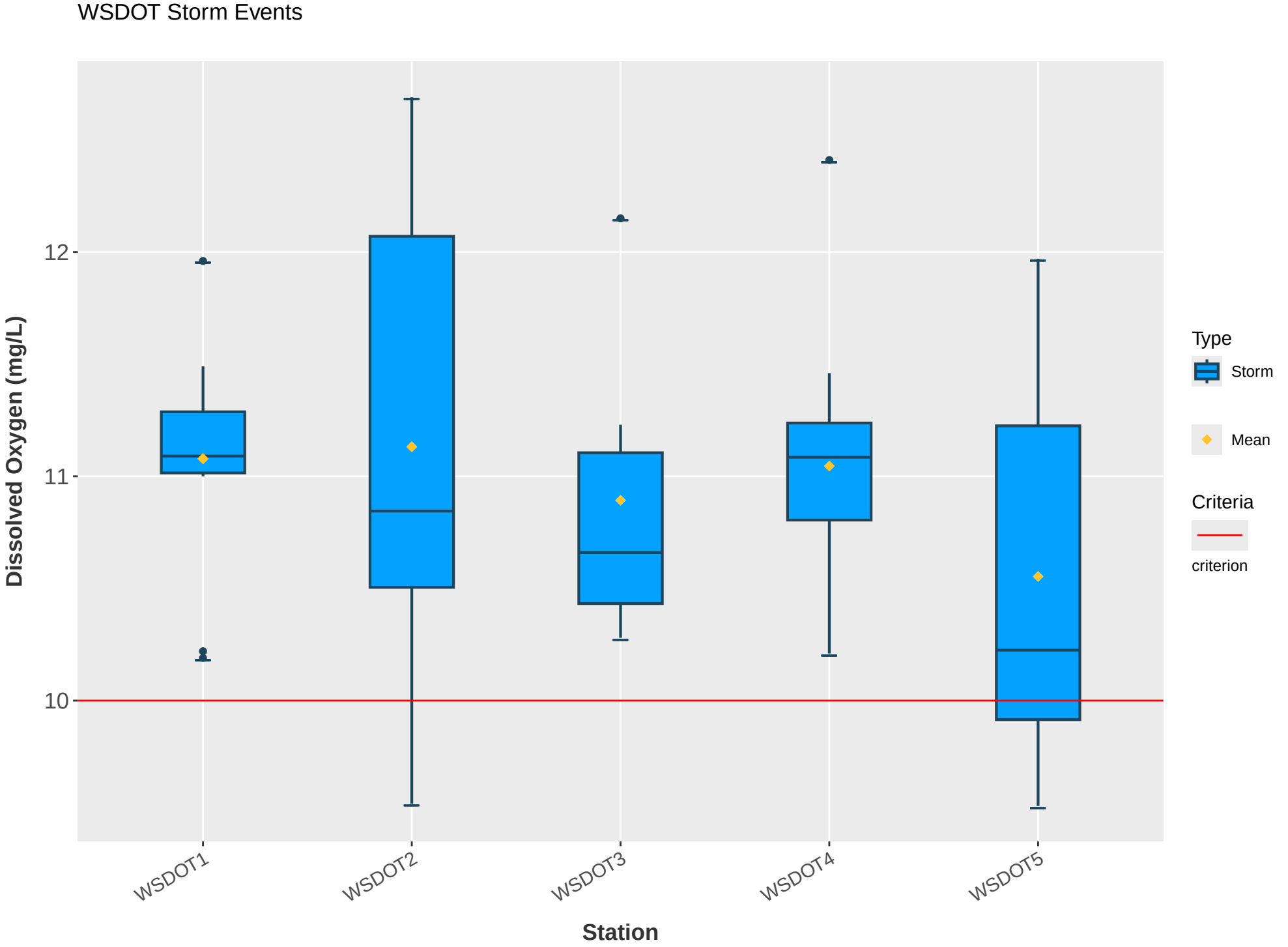
Percent censored is shown below the corresponding box if any values were censored at a station.

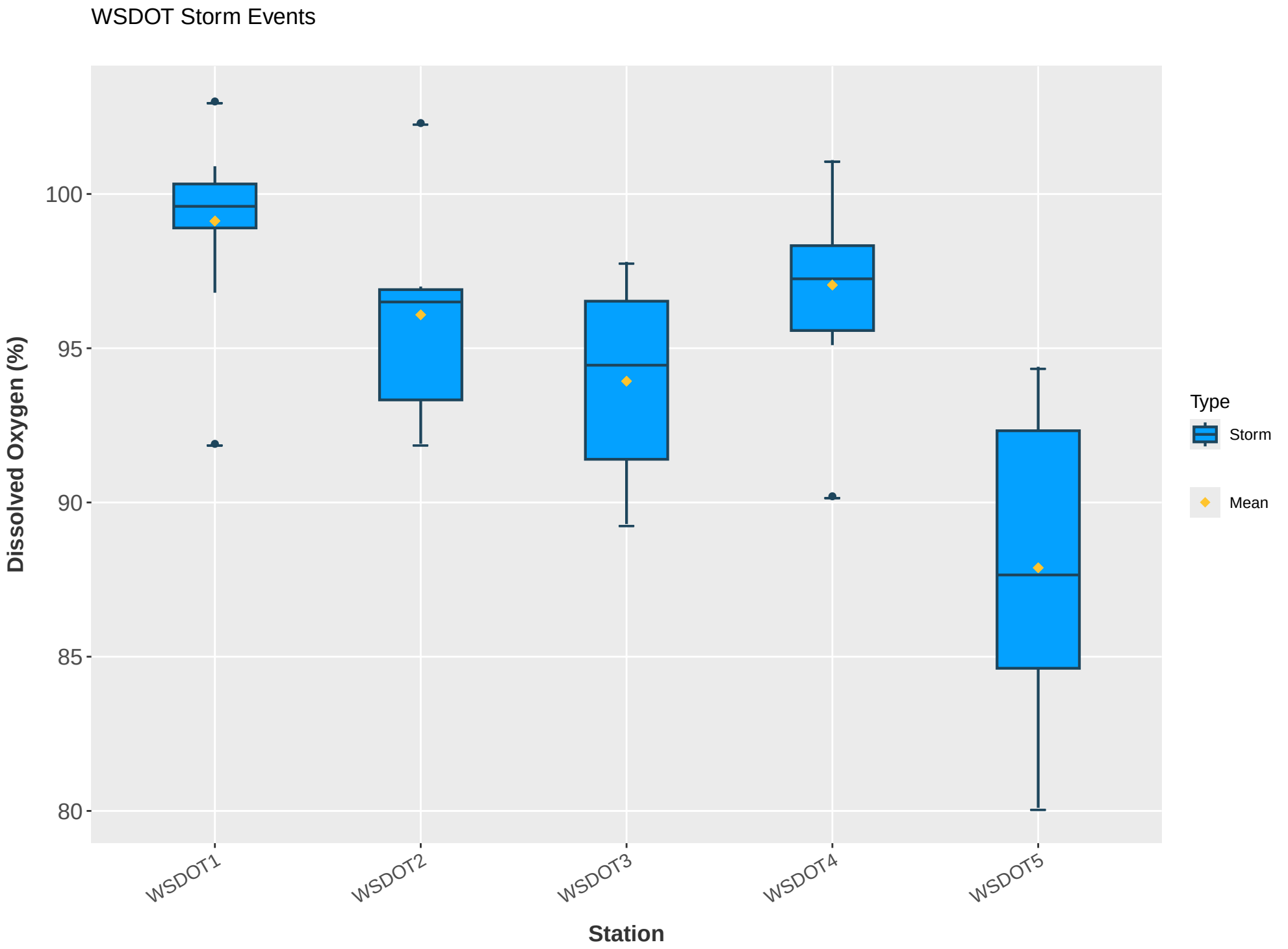


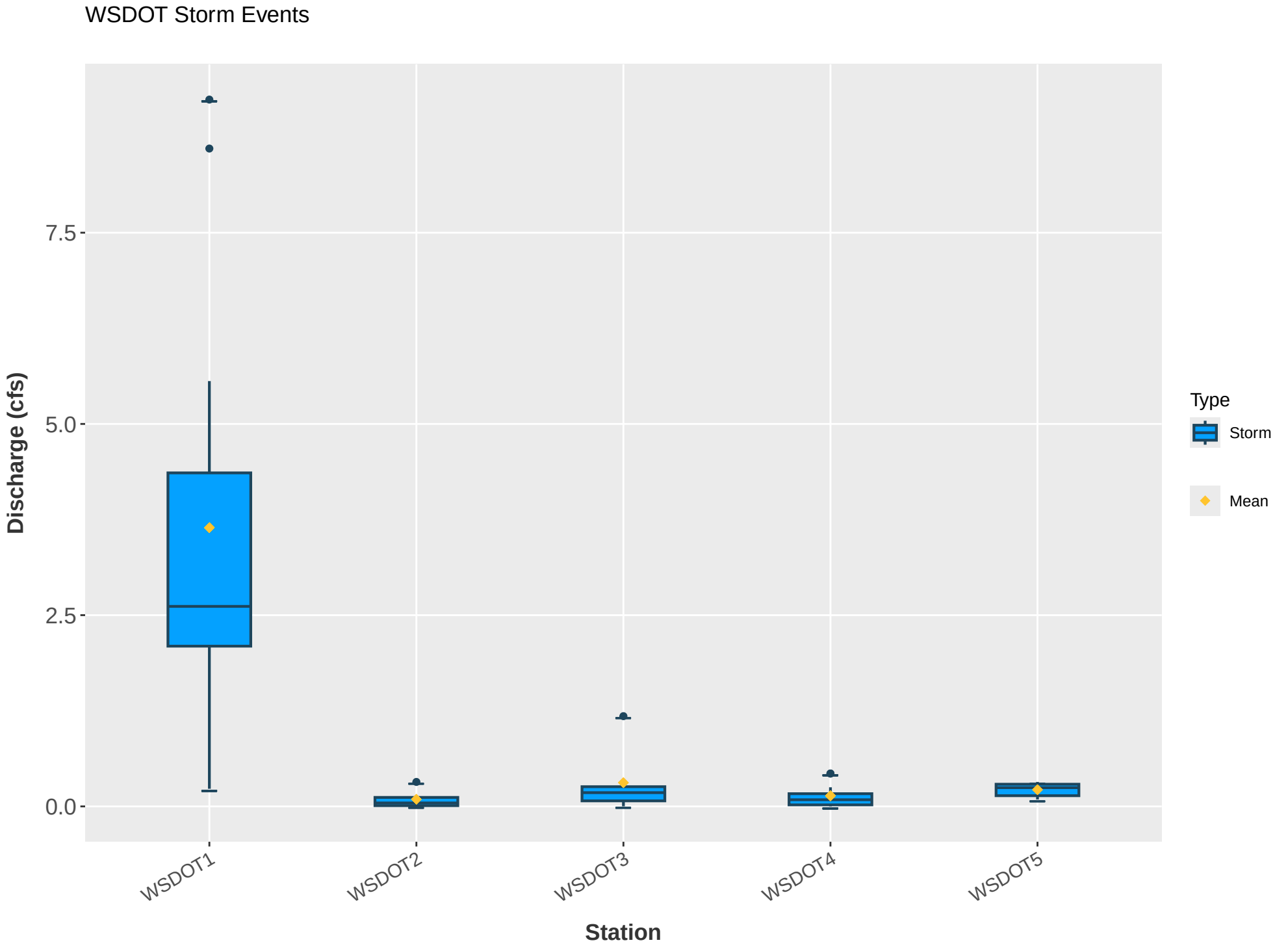
Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

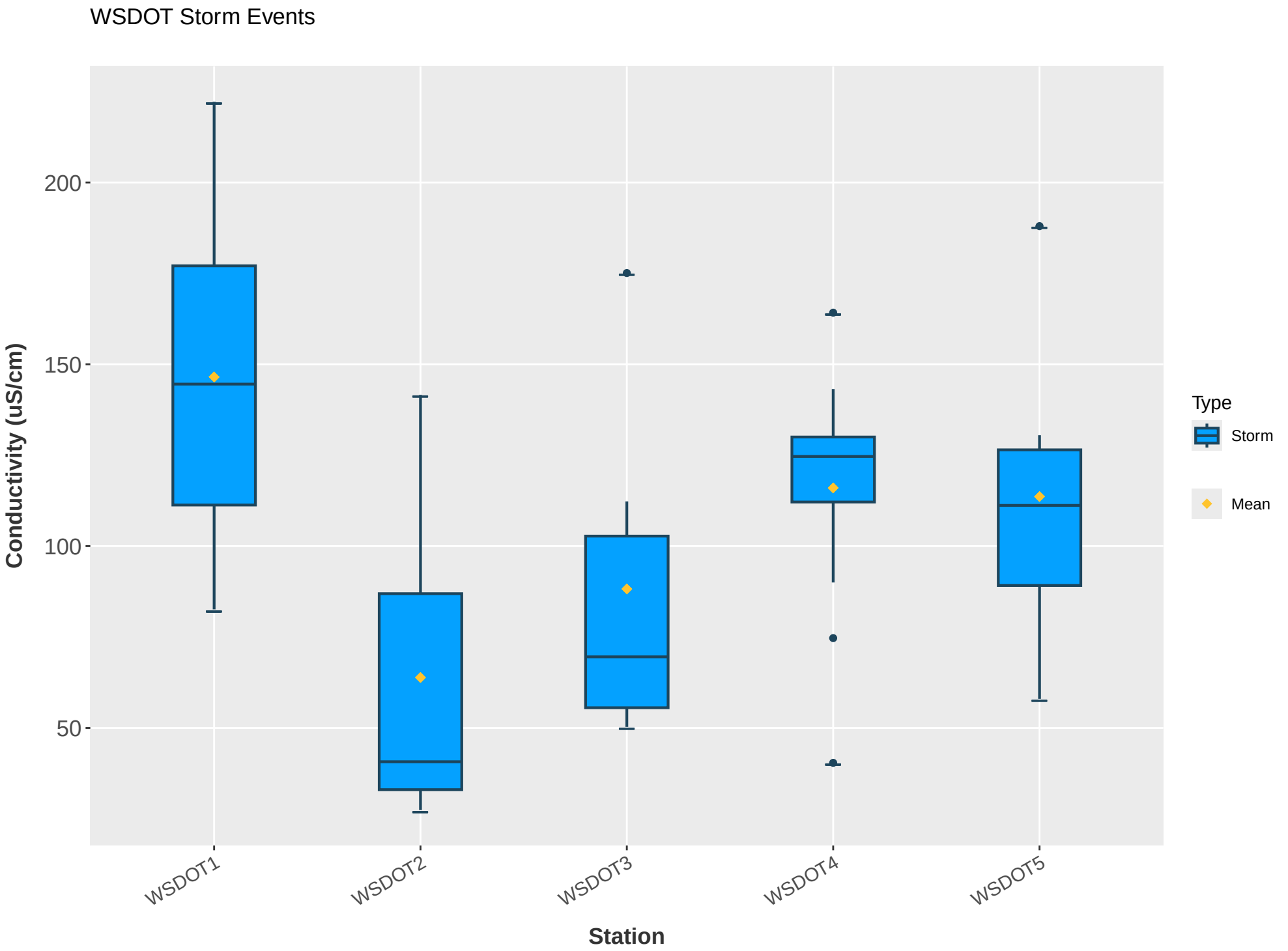

WSDOT Storm Events
Temperature (deg C)
12
9
6
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean


WSDOT Storm Events
8.5
8.0
7.5
7.0
6.5
6.0
pH
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean
Criteria
lower criterion limit
upper criterion limit


WSDOT Storm Events
Dissolved Oxygen (mg/L)
12
11
10
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean
Criteria
criterion

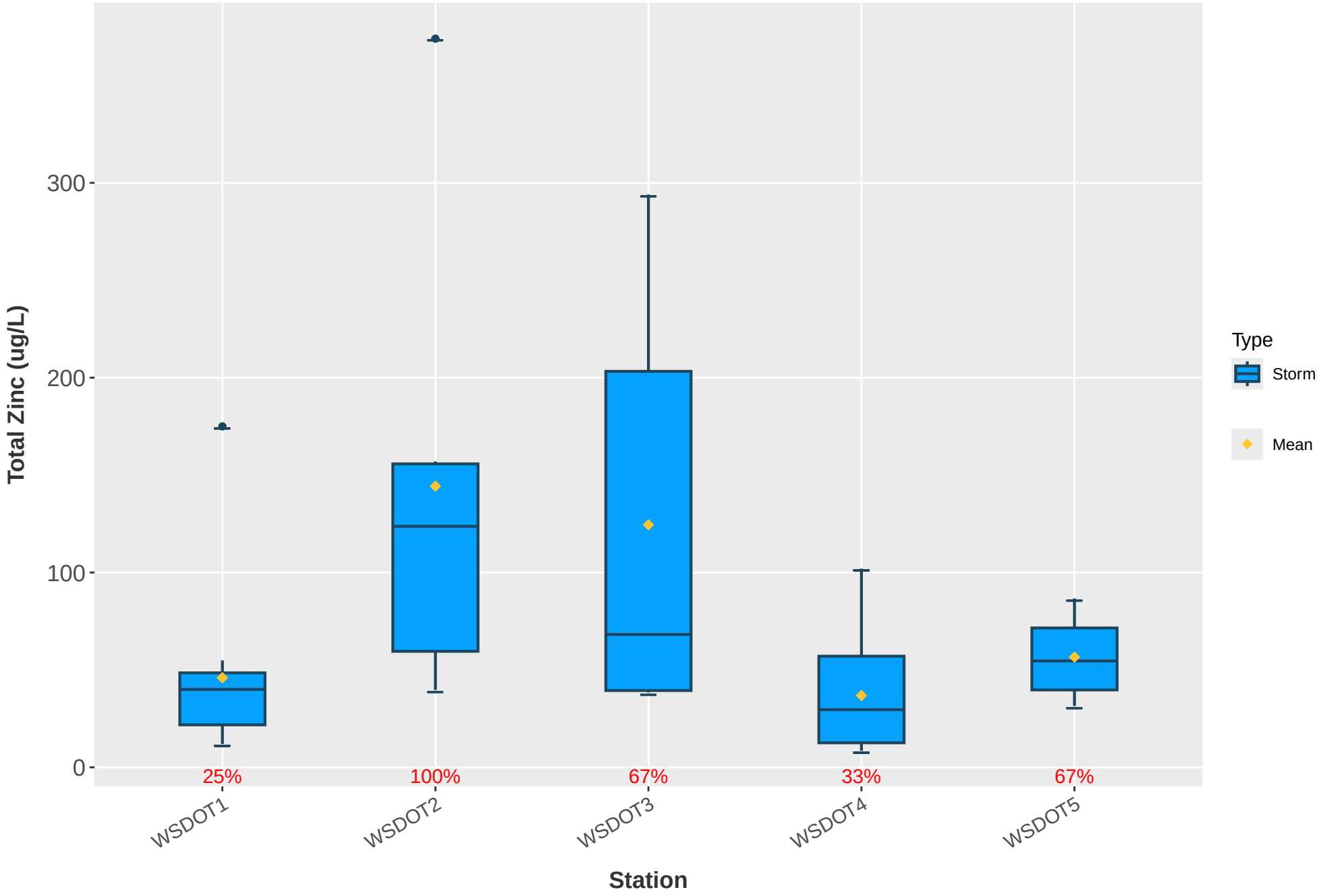

WSDOT Storm Events
Dissolved Oxygen (%)
100
95
90
85
80
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean


WSDOT Storm Events
Discharge (cfs)
7.5
5.0
2.5
0.0
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean


WSDOT Storm Events
Conductivity (uS/cm)
200
150
100
50
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean

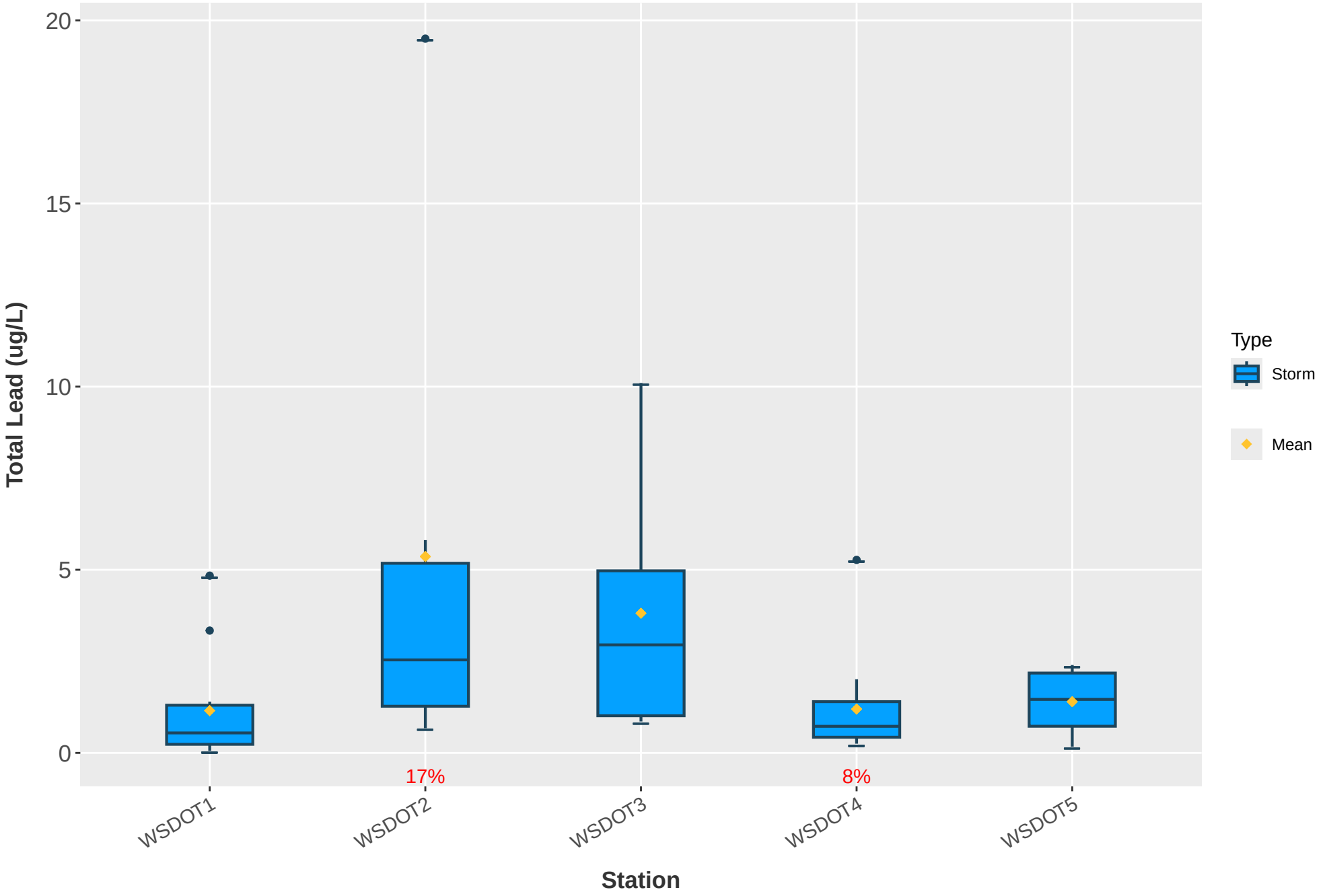
WSDOT Storm Events

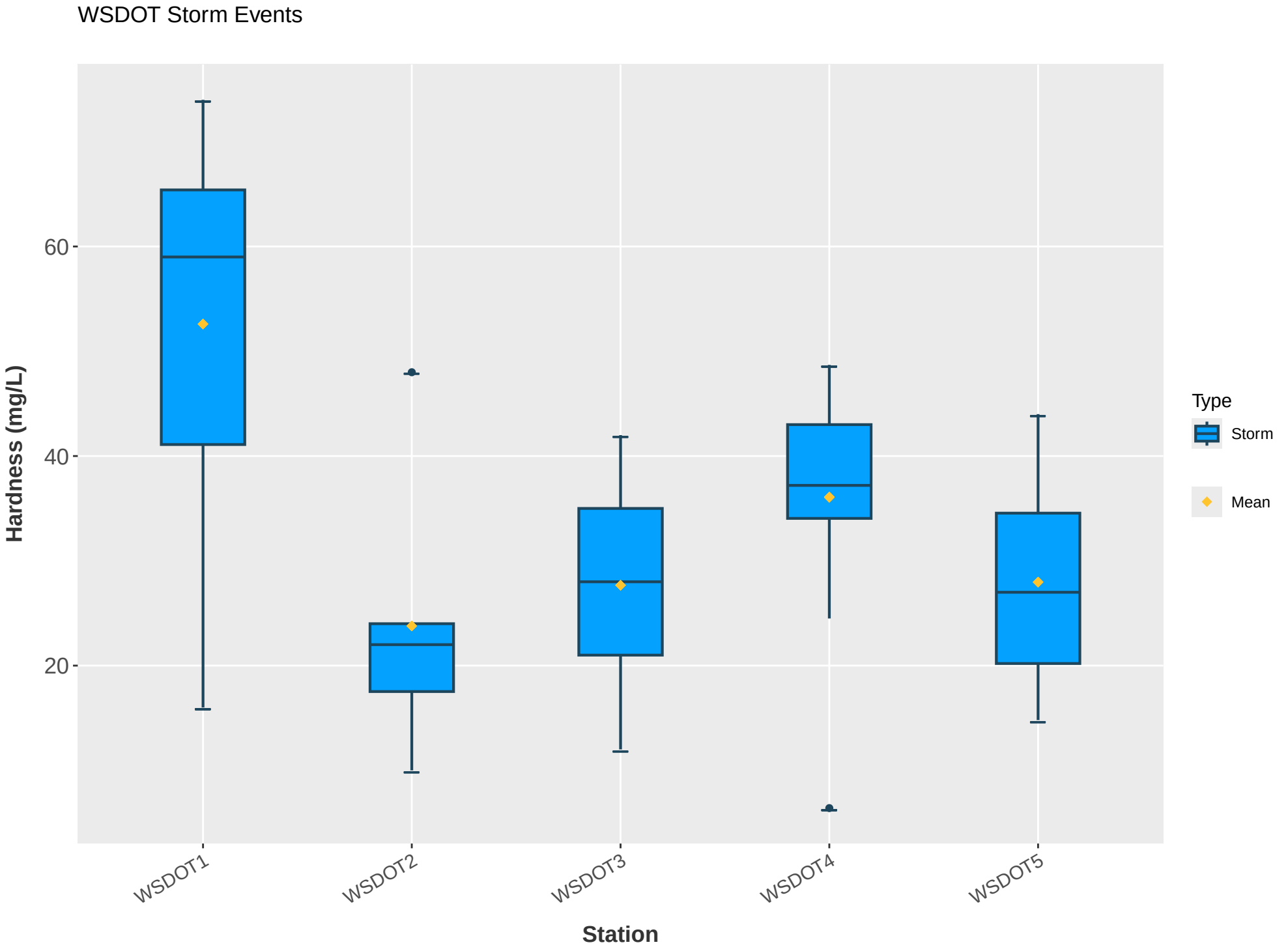
If any samples exceeded the calculated criteria, the percent of exceedances is shown in red.



WSDOT Storm Events

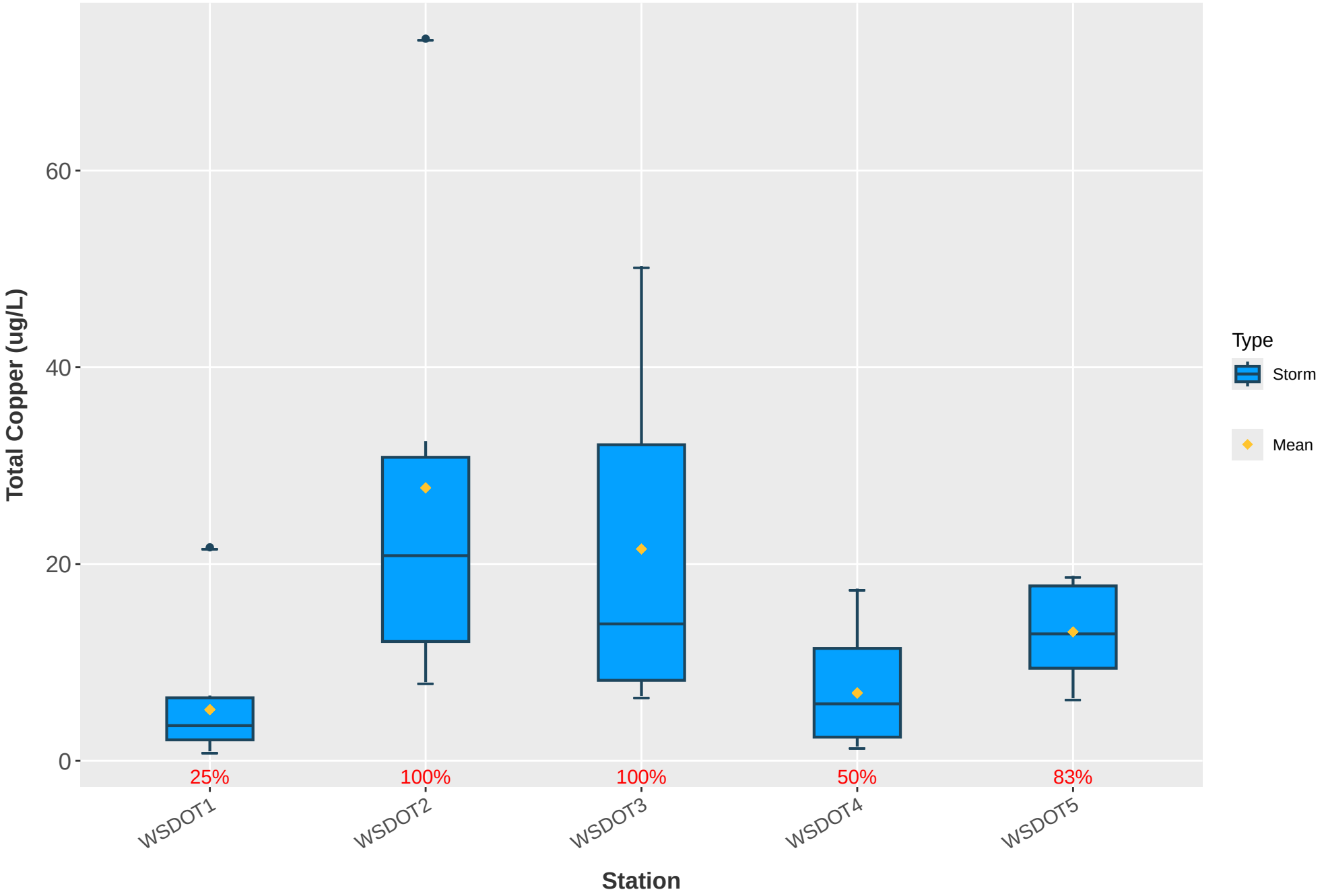
If any samples exceeded the calculated criteria, the percent of exceedances is shown in red.




WSDOT Storm Events
Hardness (mg/L)
60
40
20
WSDOT1
WSDOT2
WSDOT3
WSDOT4
WSDOT5
Station
Type
Storm
Mean

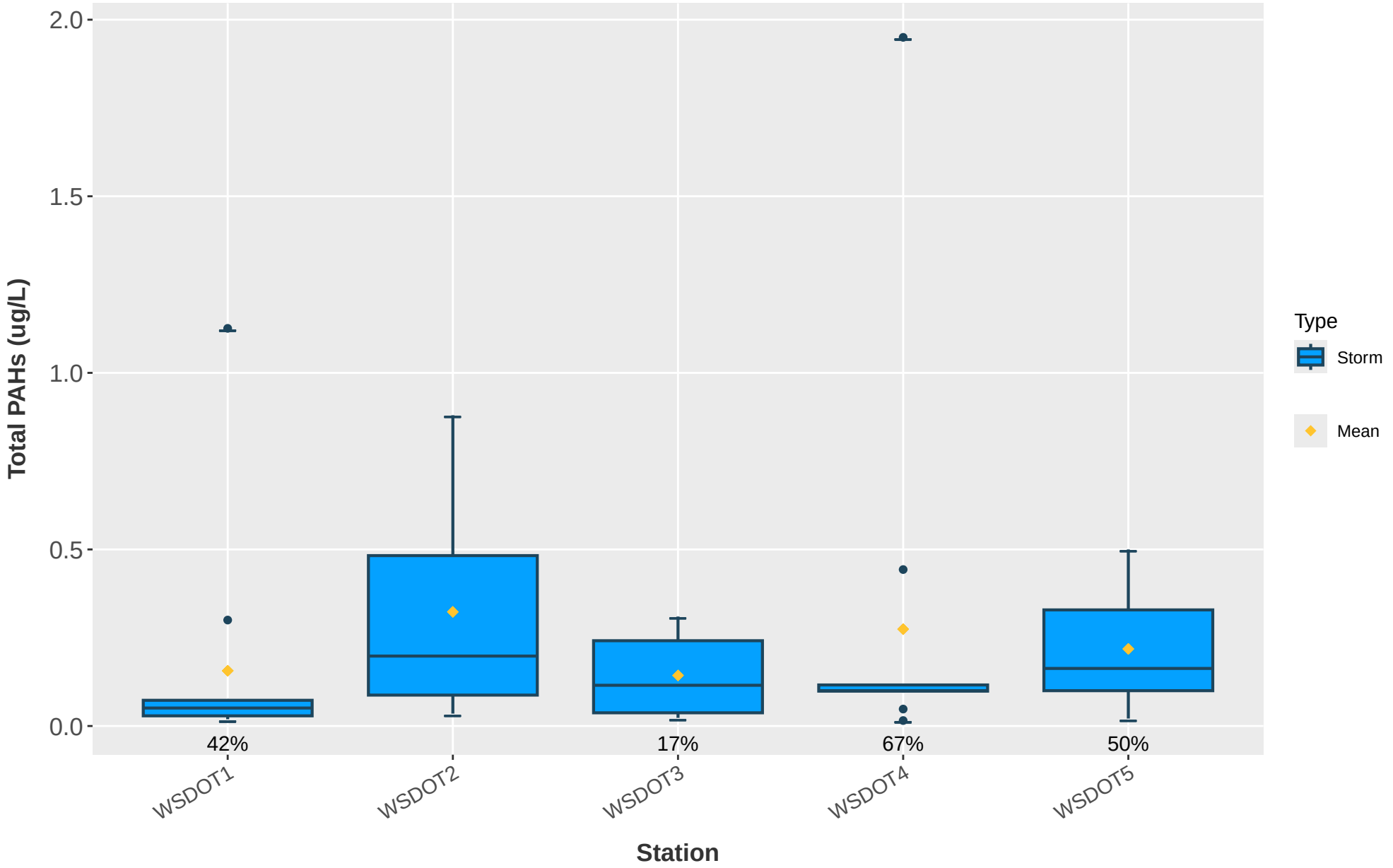
WSDOT Storm Events

If any samples exceeded the calculated criteria, the percent of exceedances is shown in red.



Storm events

Percent censored is shown below the corresponding box if any values were censored at a station.

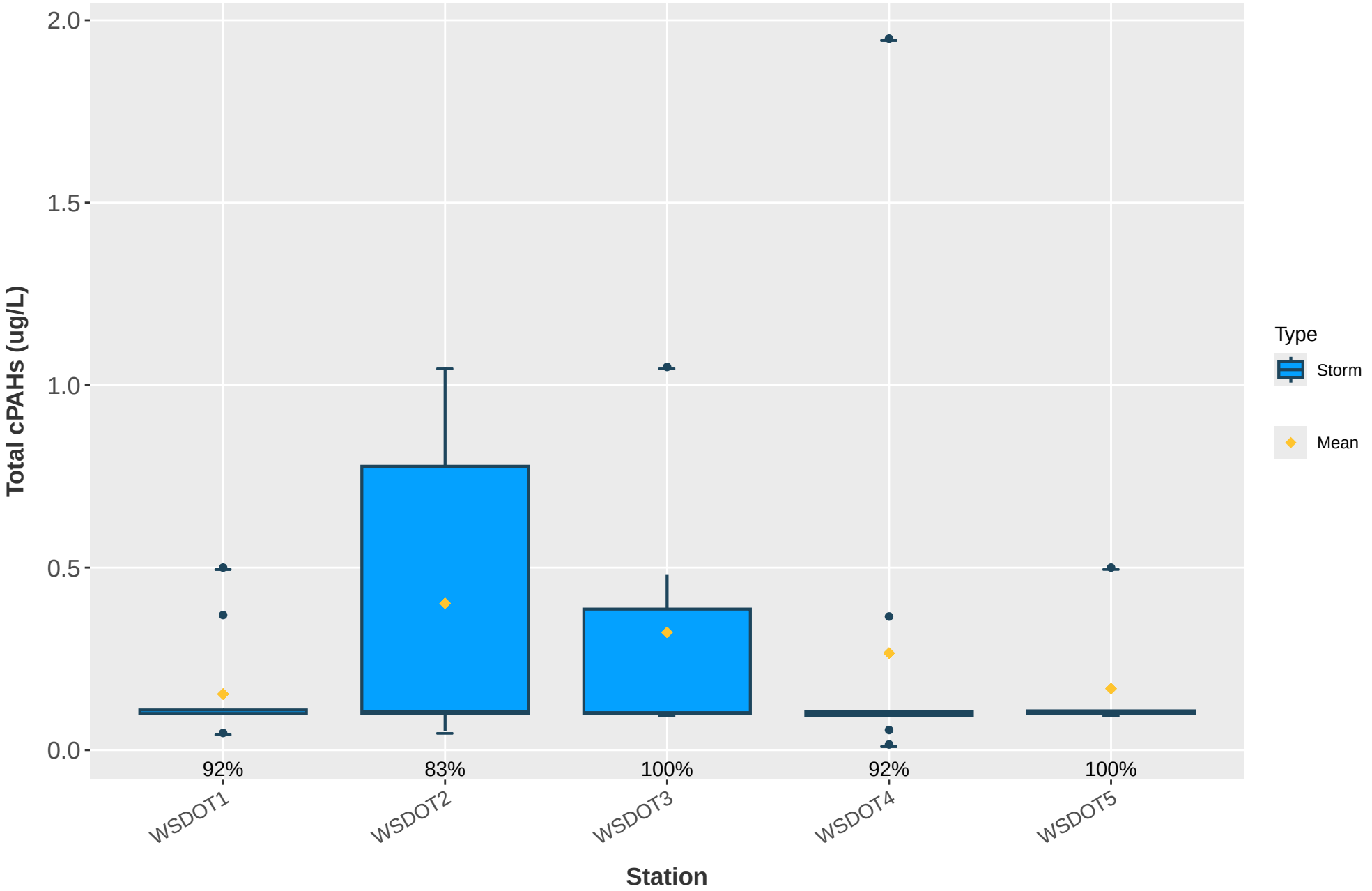


Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

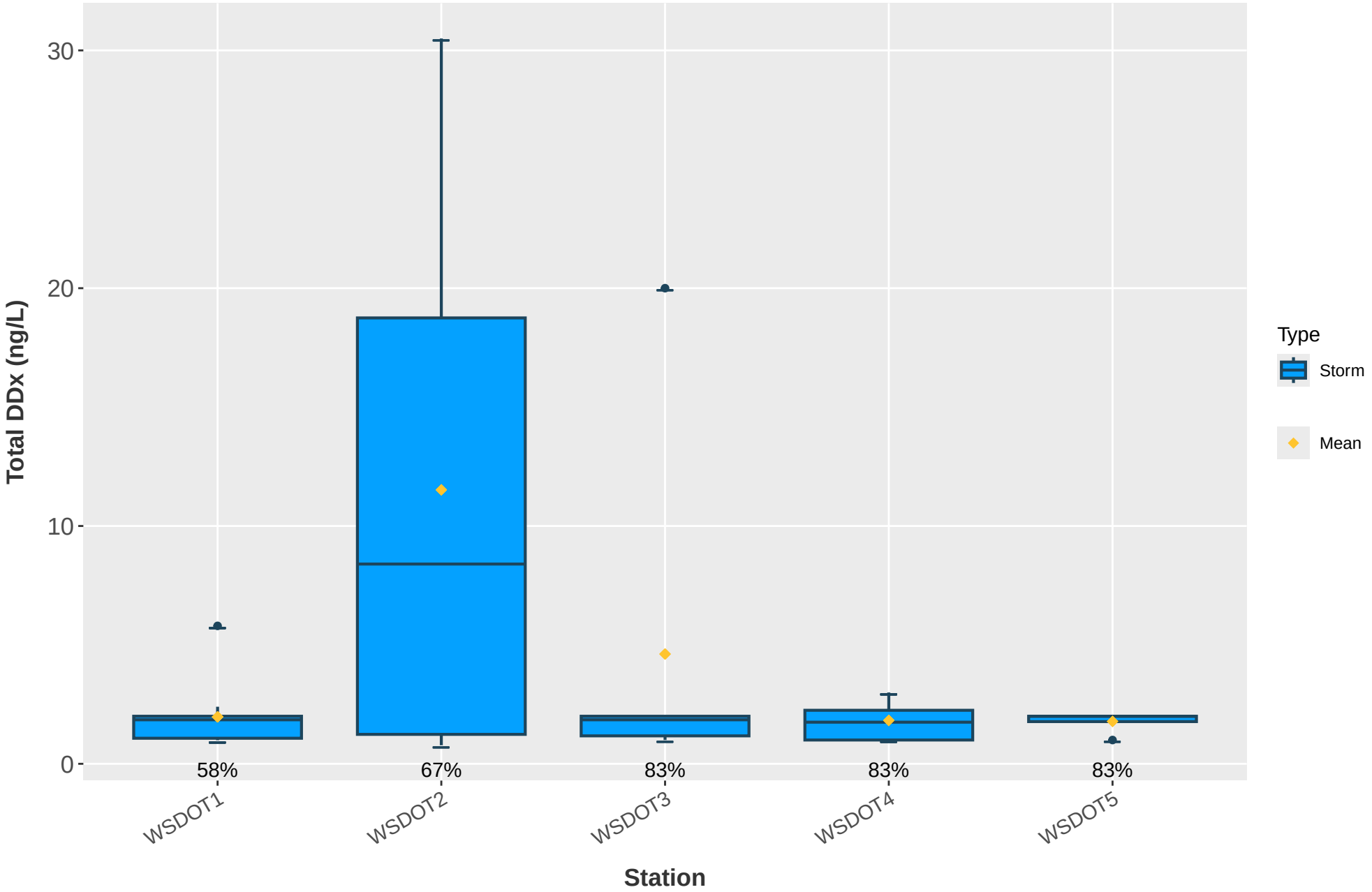
Percent censored is shown below the corresponding box if any values were censored at a station.



Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

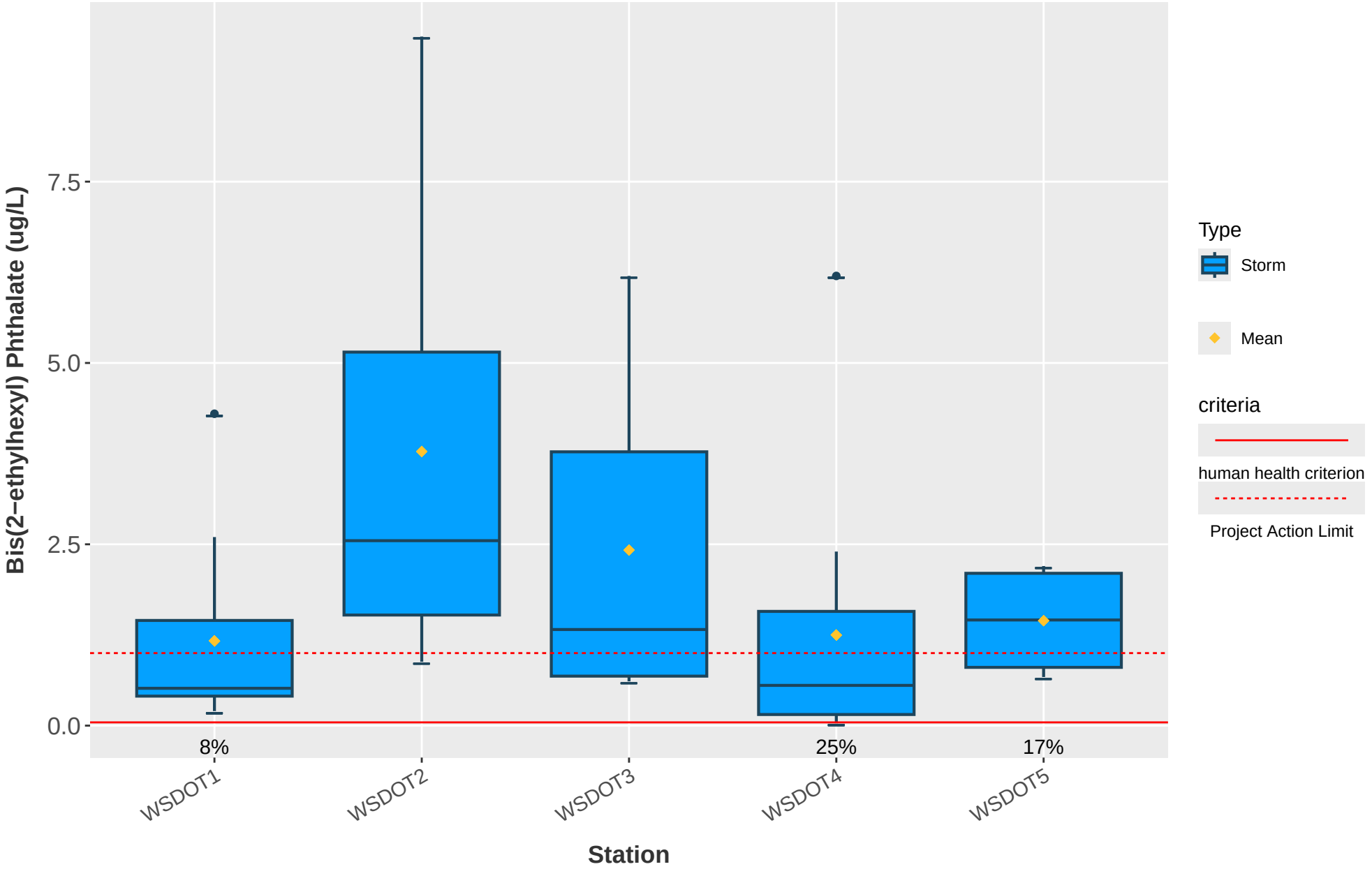
Percent censored is shown below the corresponding box if any values were censored at a station.



Half the reporting limit was used for censored data when >50% of values were censored.

Storm events

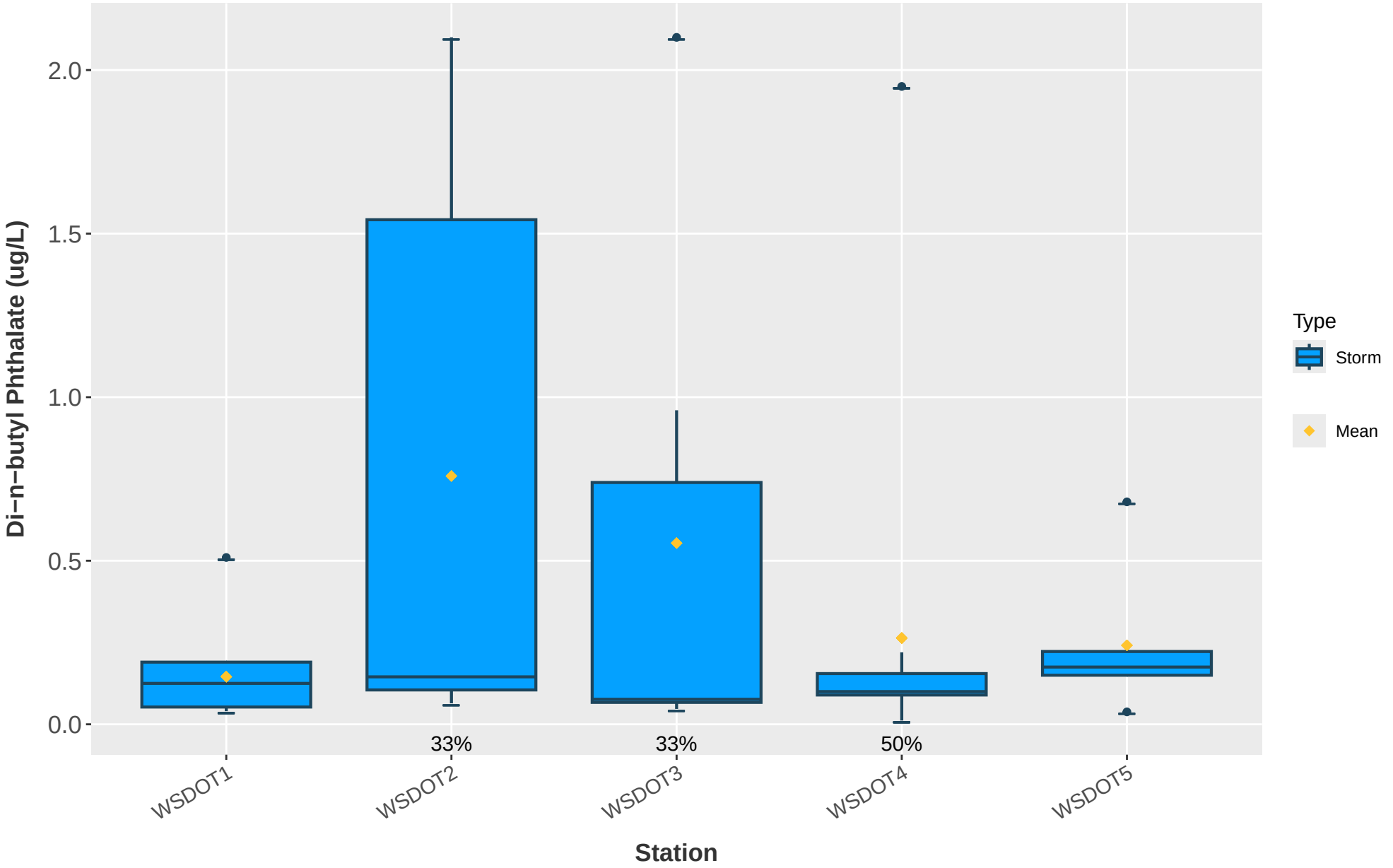
Percent censored is shown below the corresponding box if any values were censored at a station.



Regression on Order Statistics (ROS) used to estimate left−censored data (Lee and Helsel, 2020) when <50% of values were censored.

Storm events

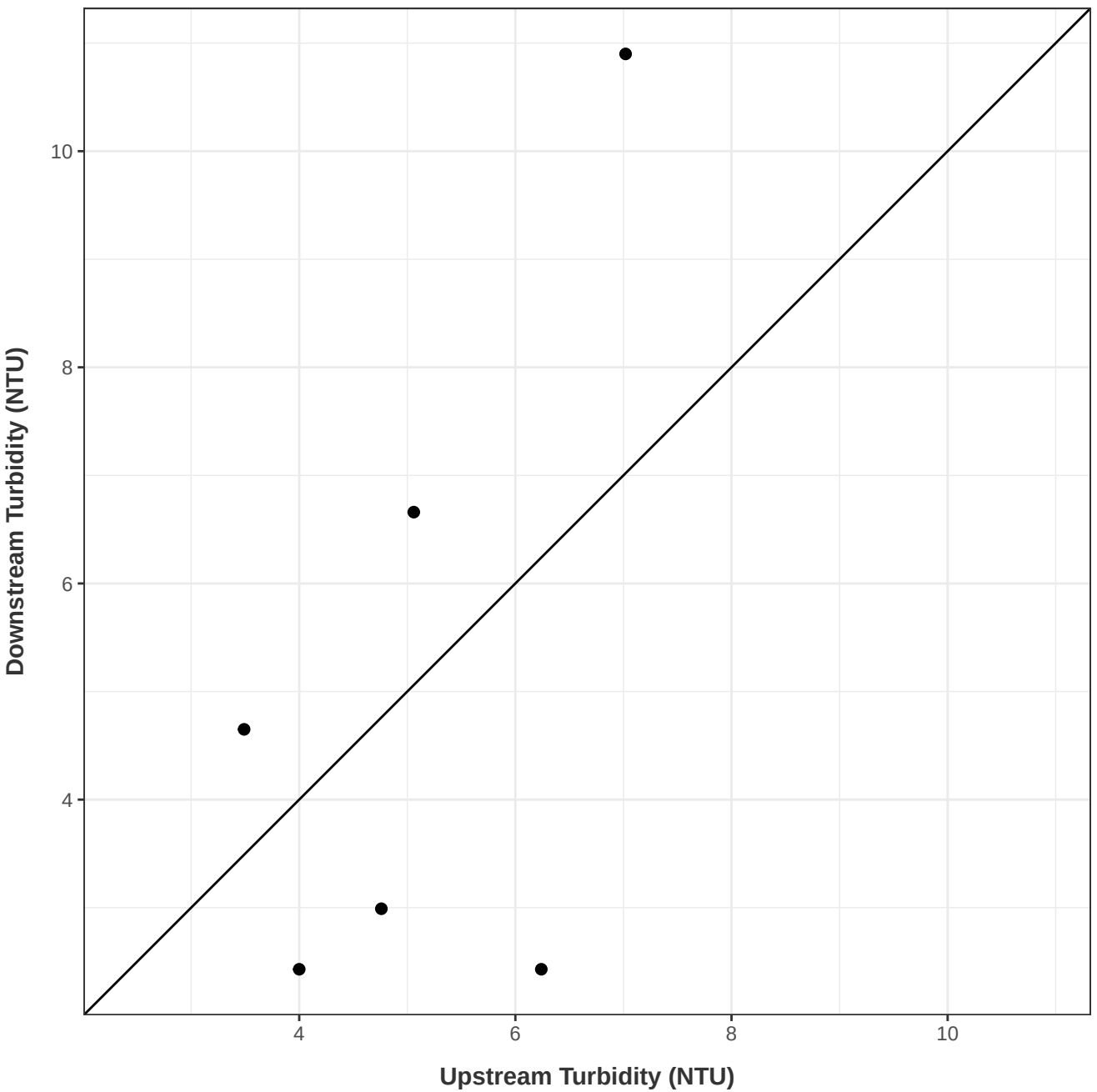
Percent censored is shown below the corresponding box if any values were censored at a station.

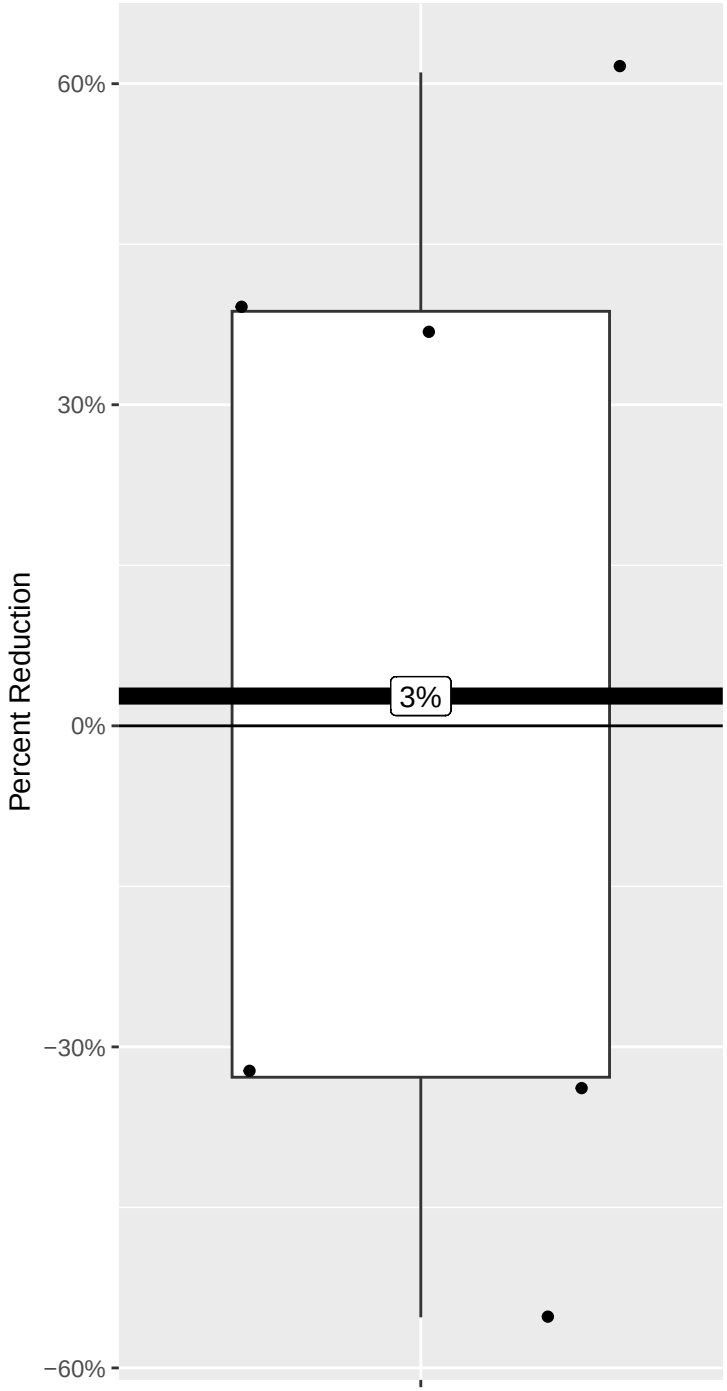


Monte Carlo imputation used to estimate left−censored data when <50% of values were censored and max censored RL > max detected value

Half the reporting limit was used for censored data when >50% of values were censored.

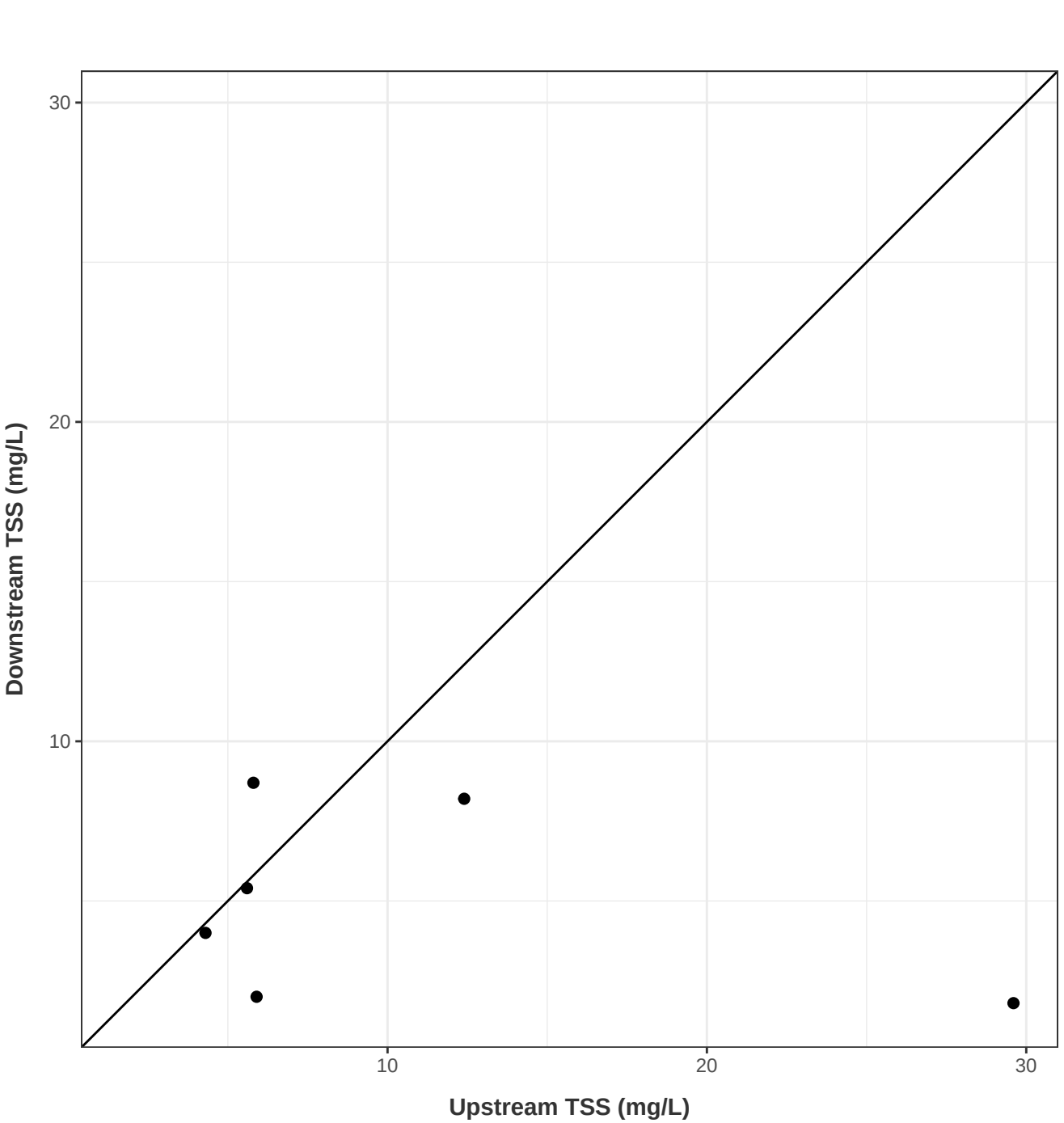
CSBMP1 Reduction of Turbidity (NTU)





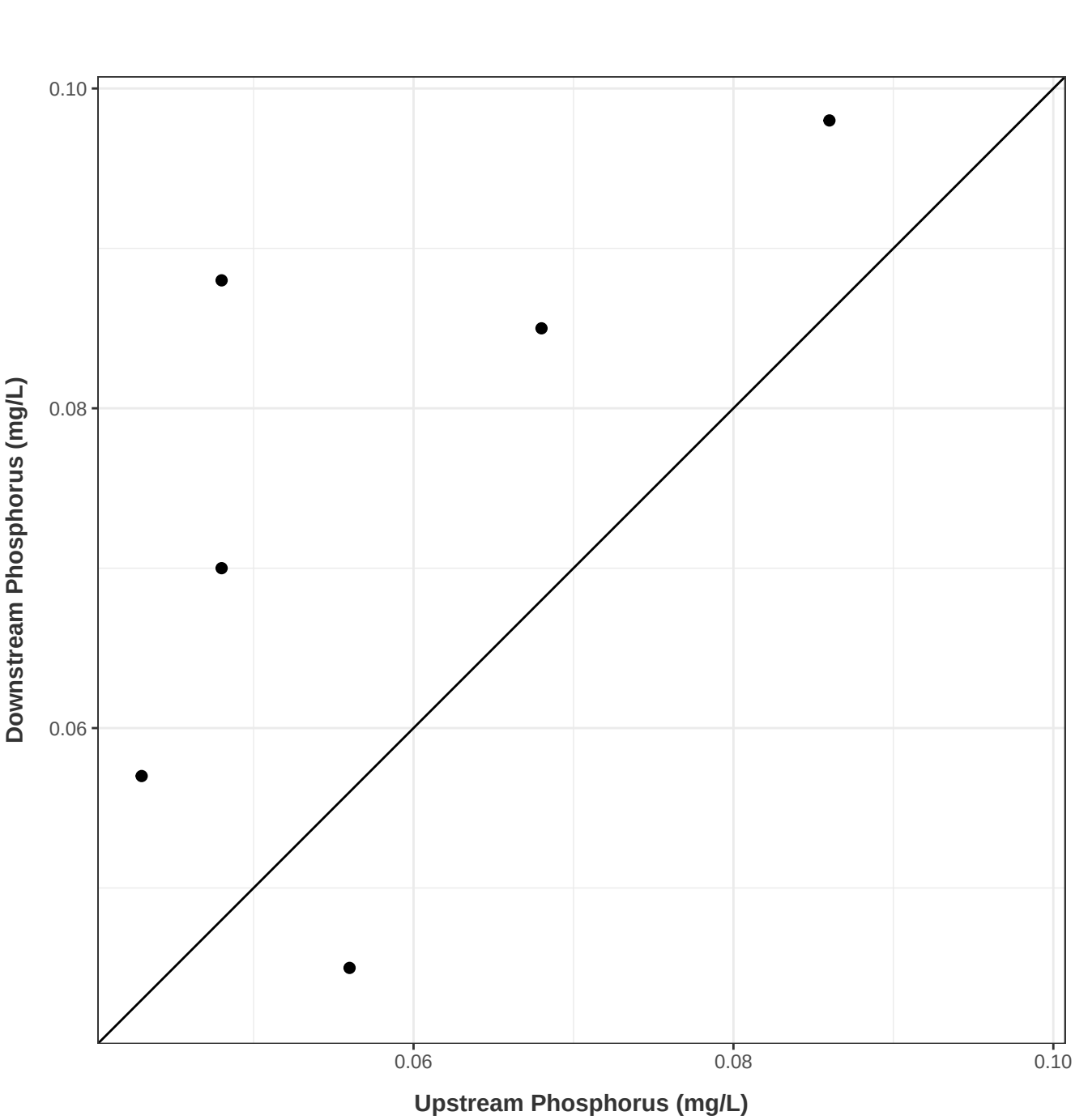
Wilcoxon test p−value = 0.5

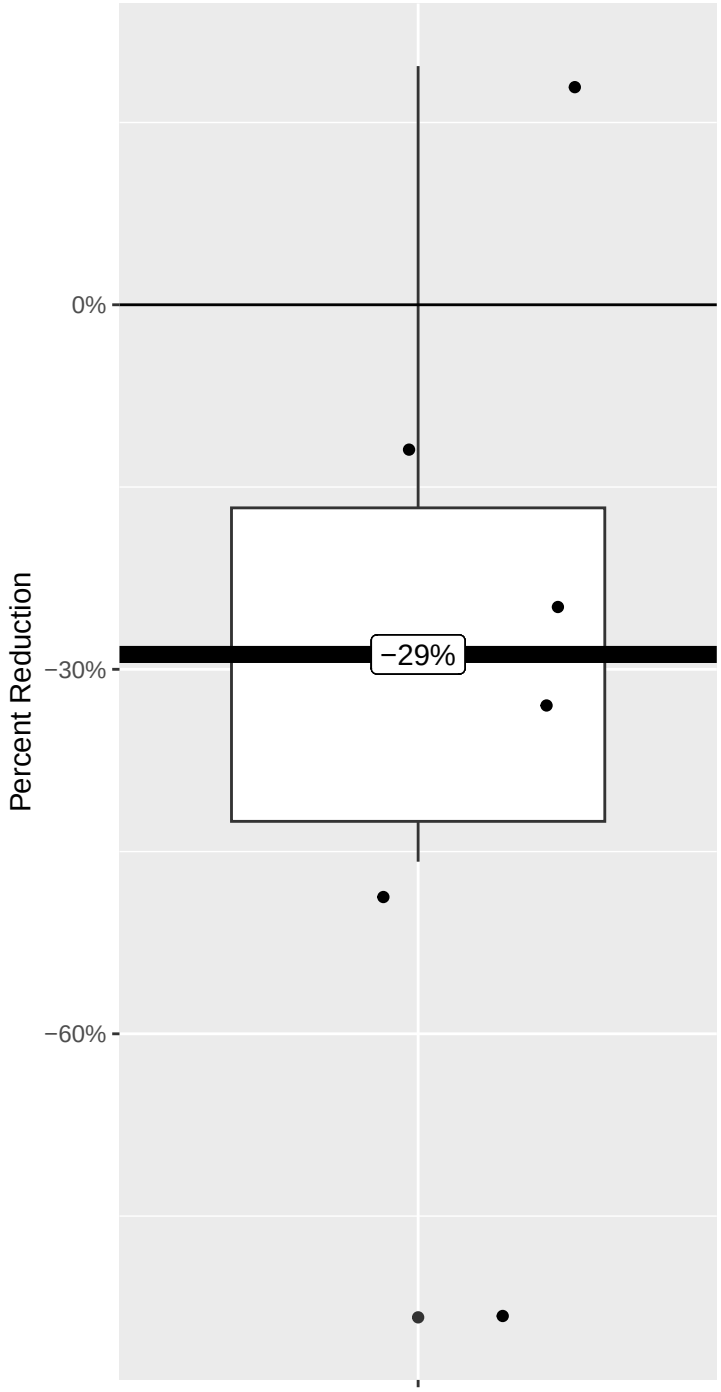
CSBMP1 Reduction of TSS (mg/L)



Wilcoxon test p−value = 0.08

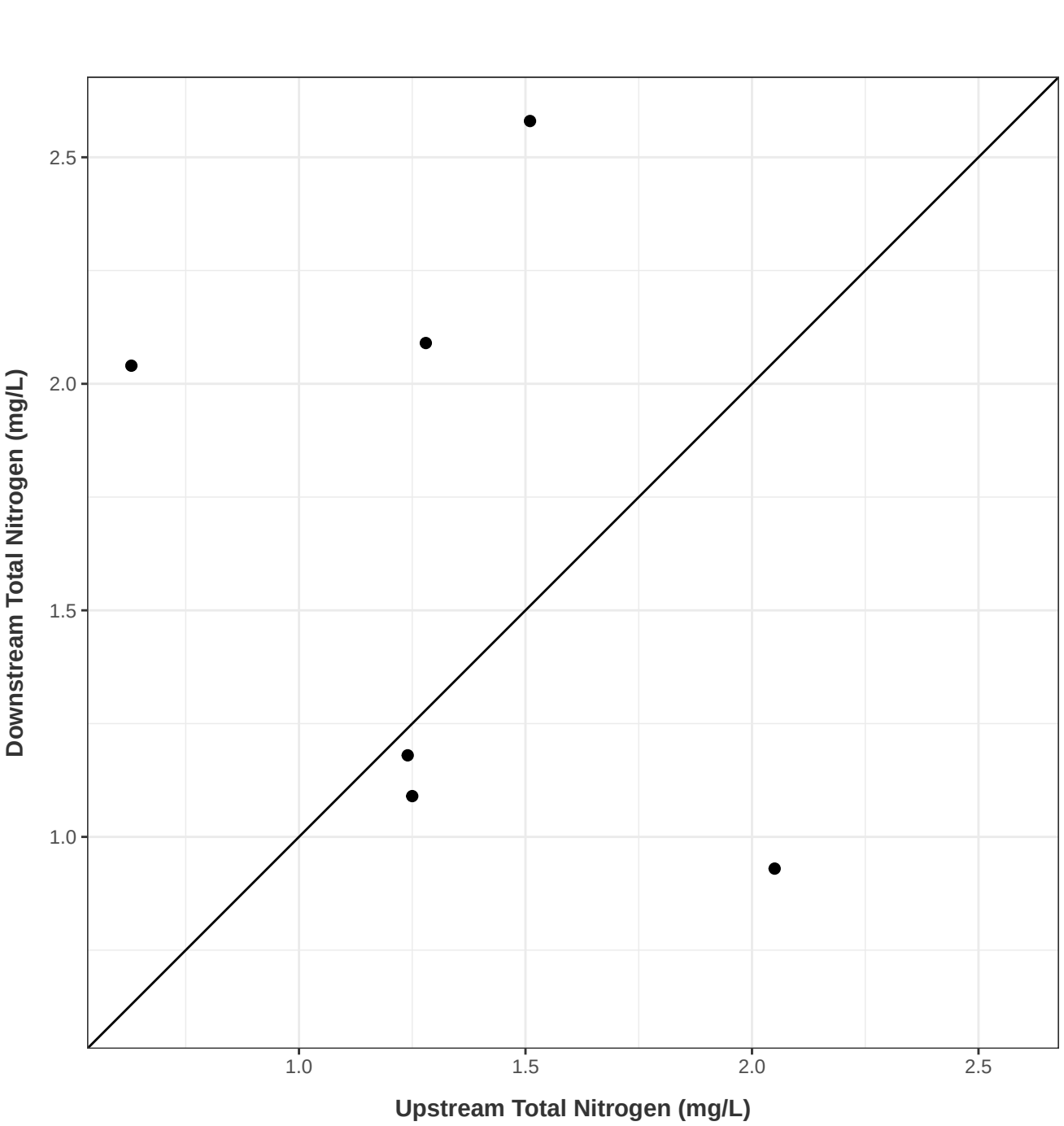
CSBMP1 Reduction of Phosphorus (mg/L)

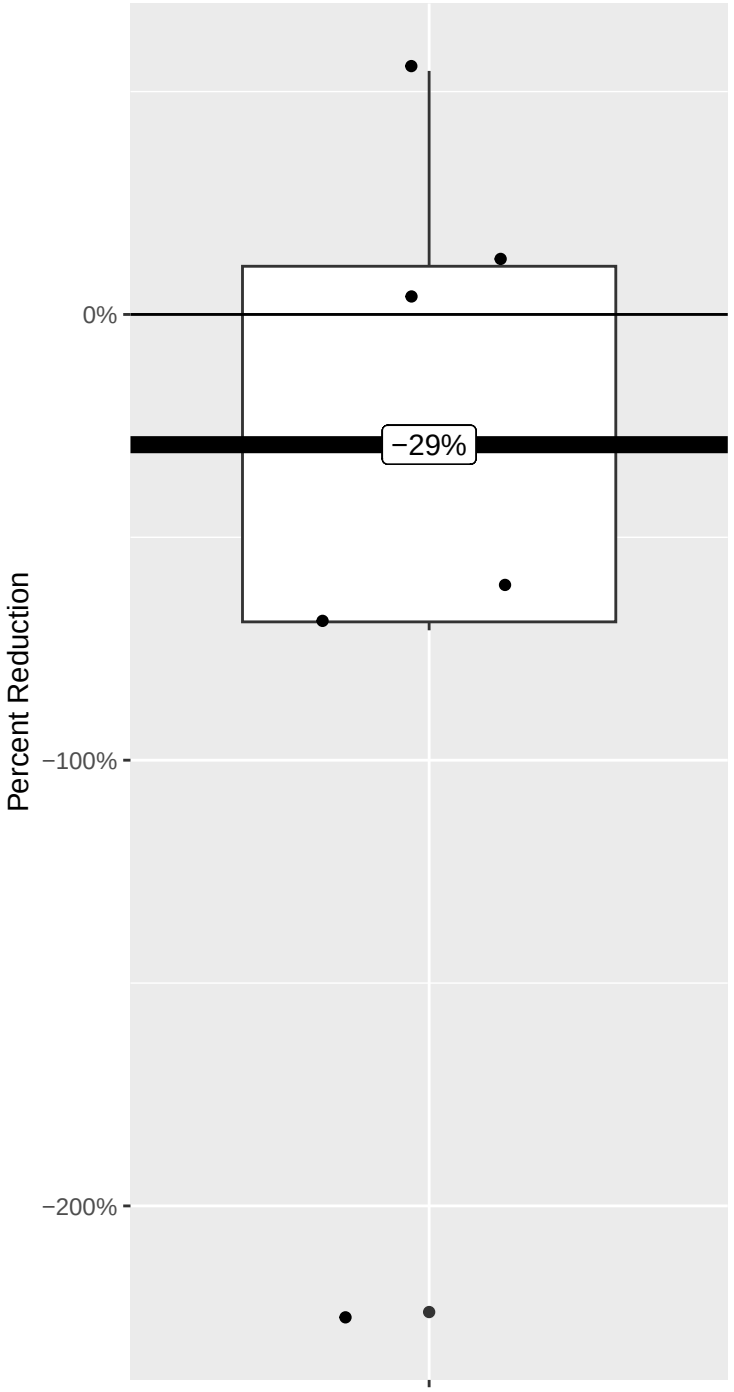




Wilcoxon test p−value = 0.98

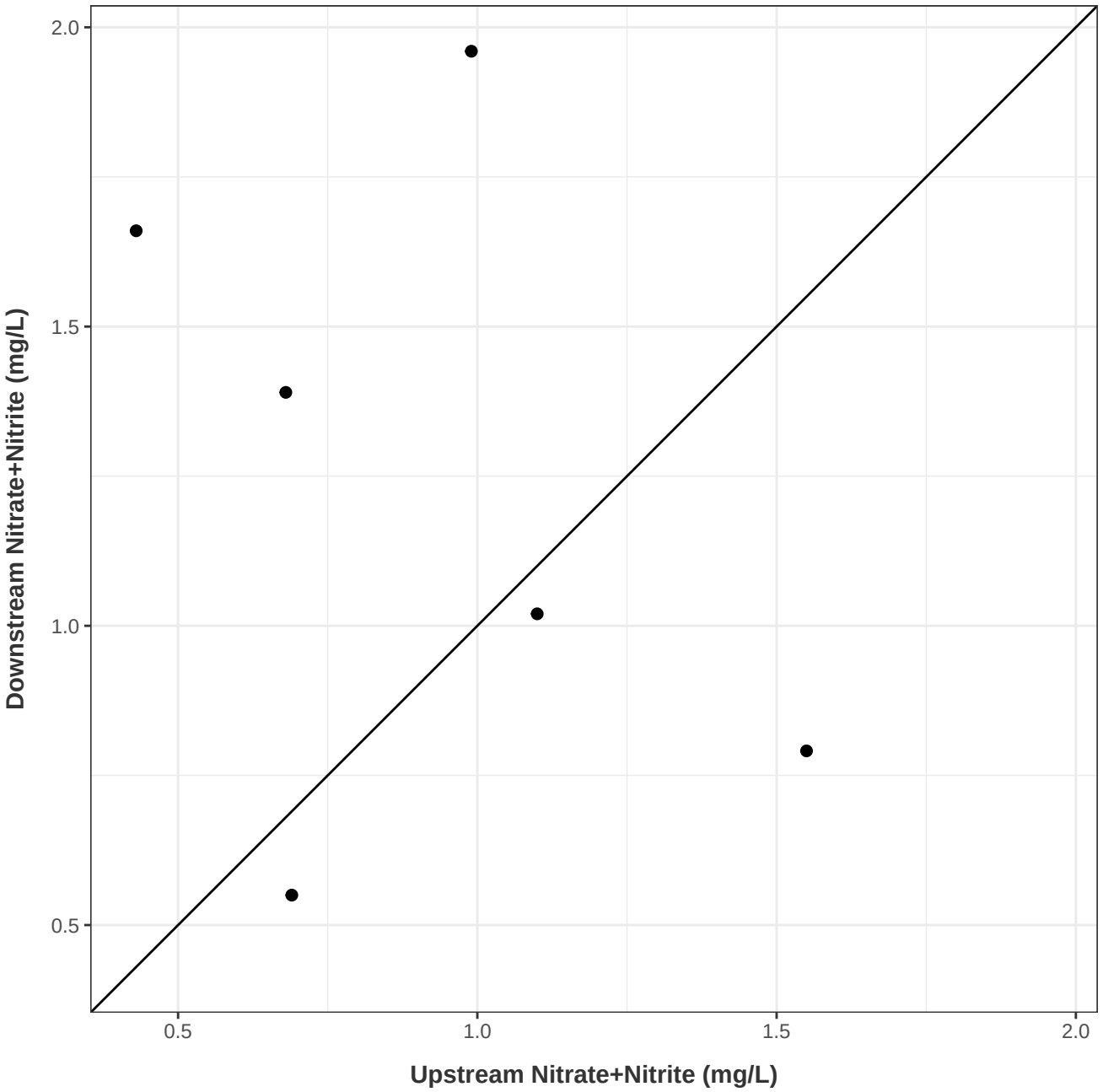
CSBMP1 Reduction of Total Nitrogen (mg/L)

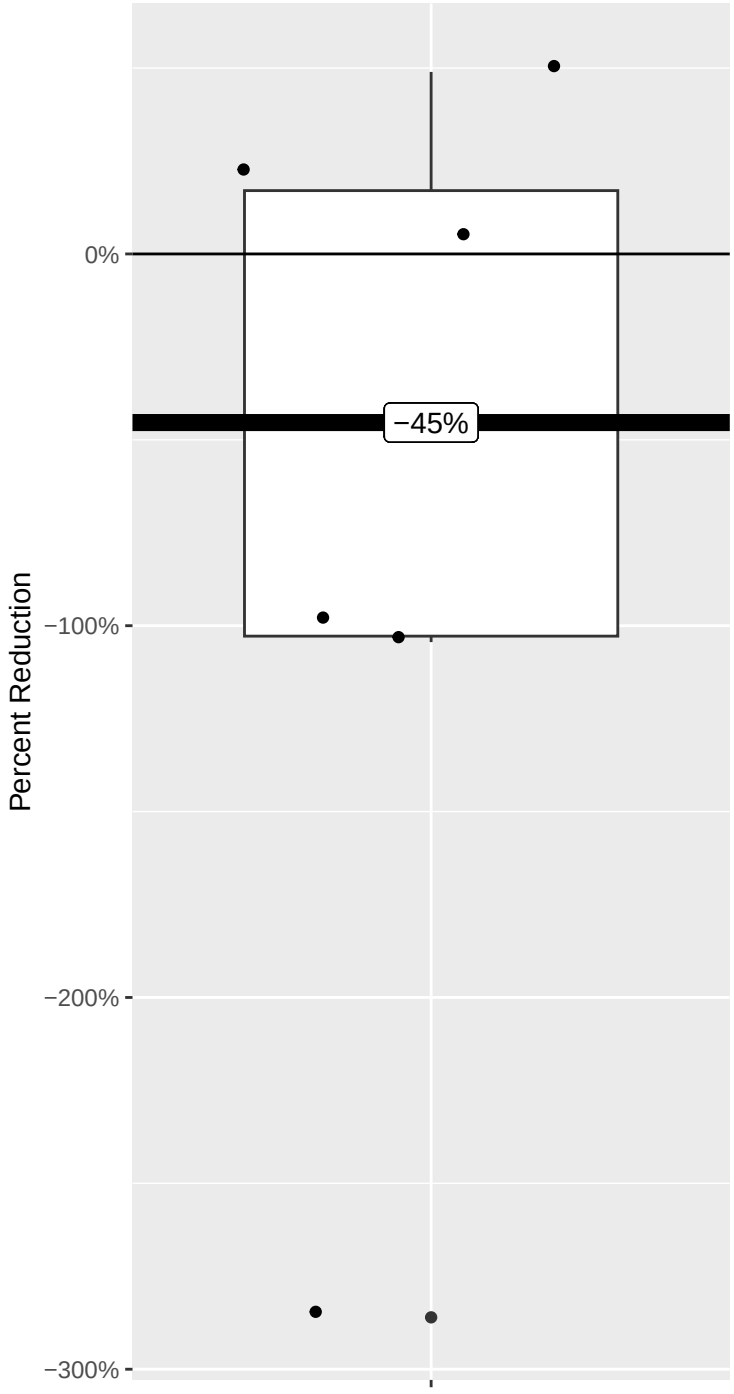




Wilcoxon test p−value = 0.72

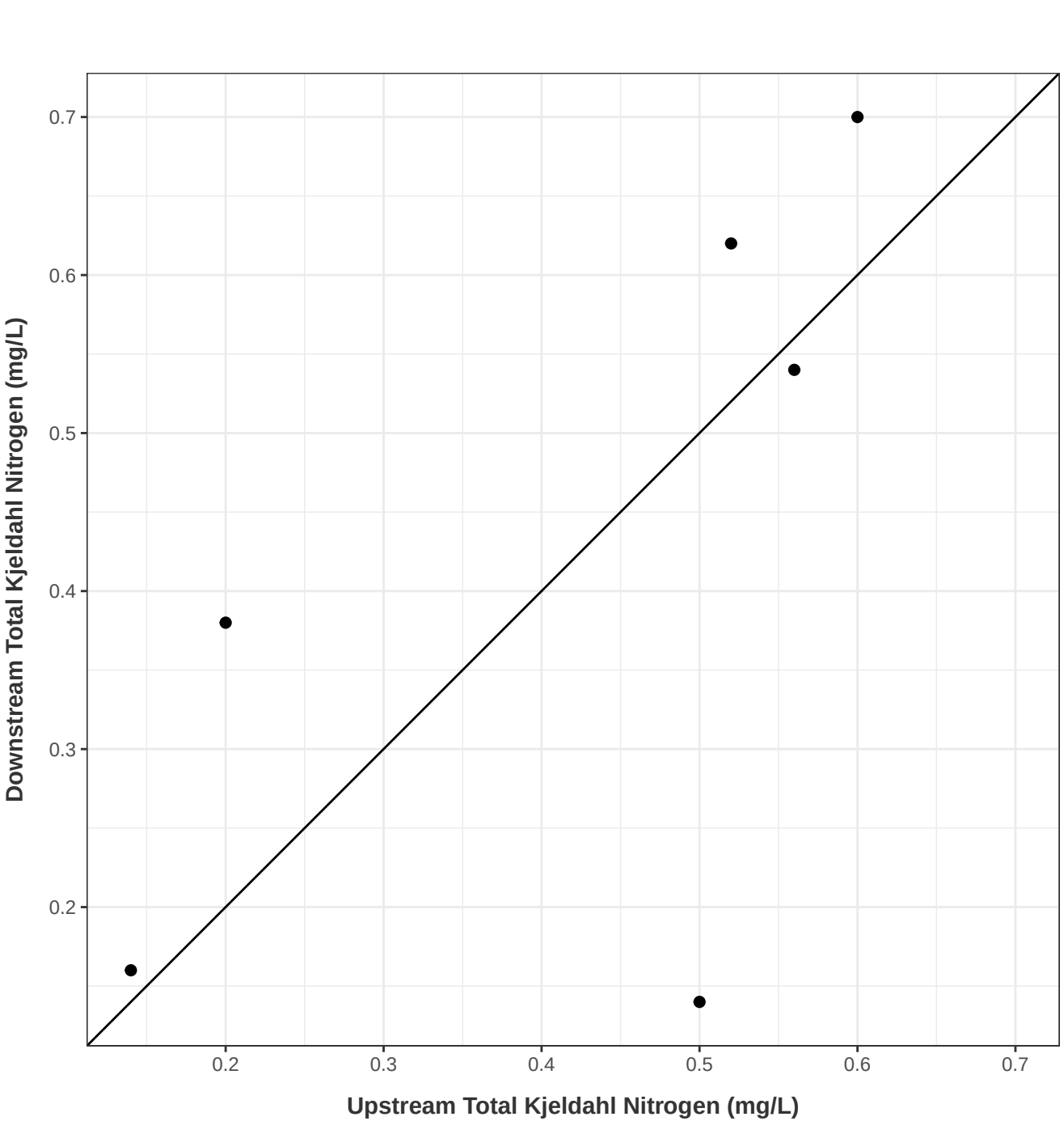
CSBMP1 Reduction of Nitrate+Nitrite (mg/L)

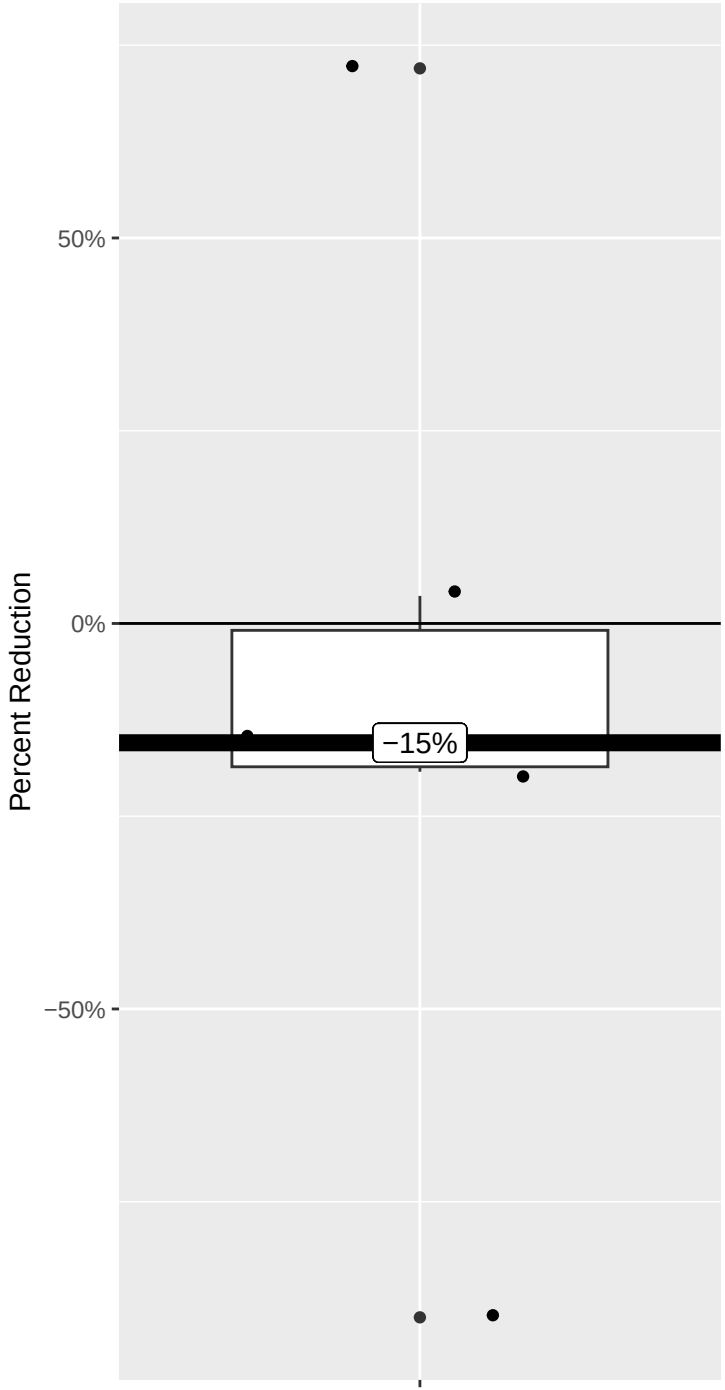




Wilcoxon test p−value = 0.78

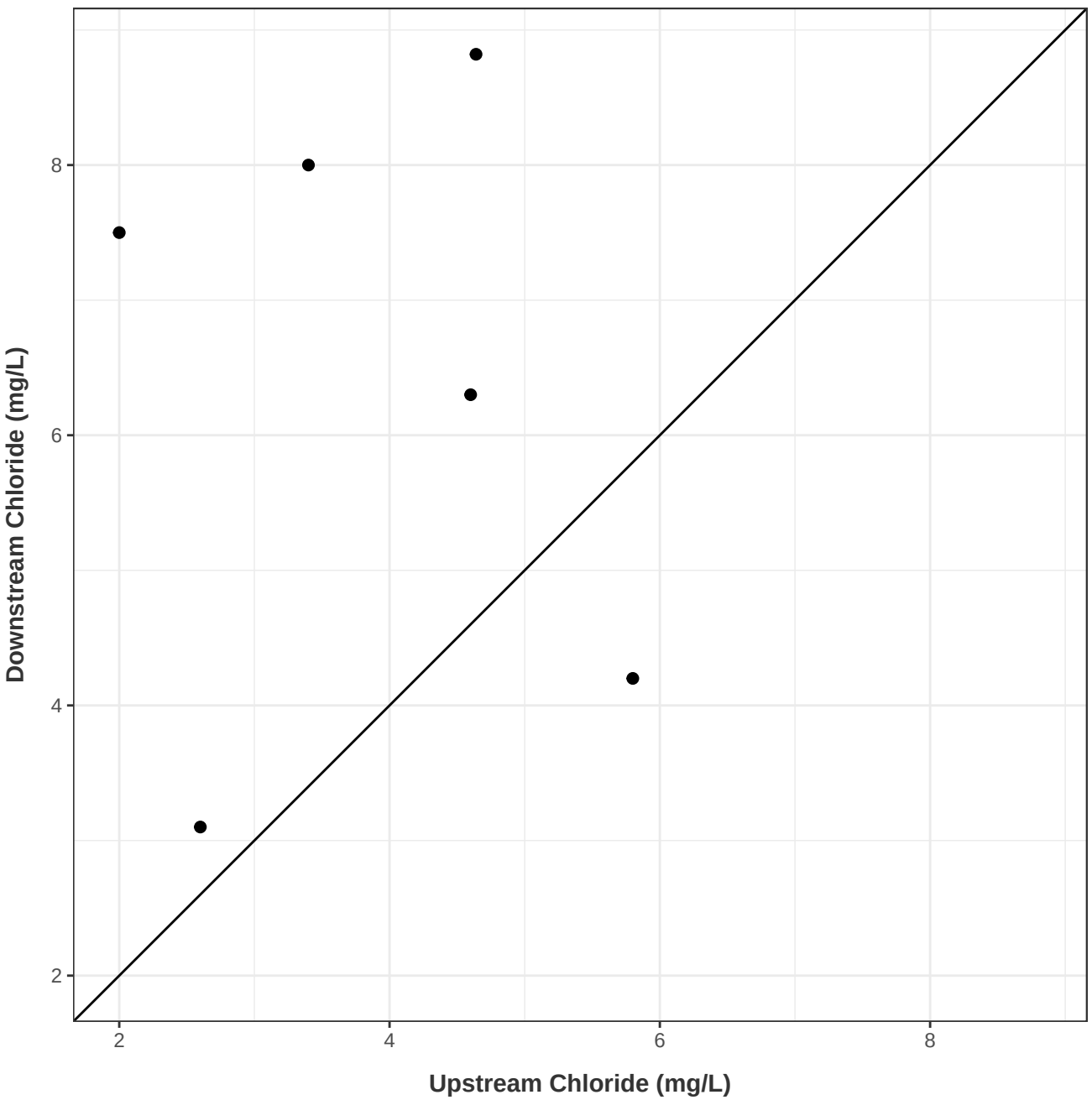
CSBMP1 Reduction of Total Kjeldahl Nitrogen (mg/L)

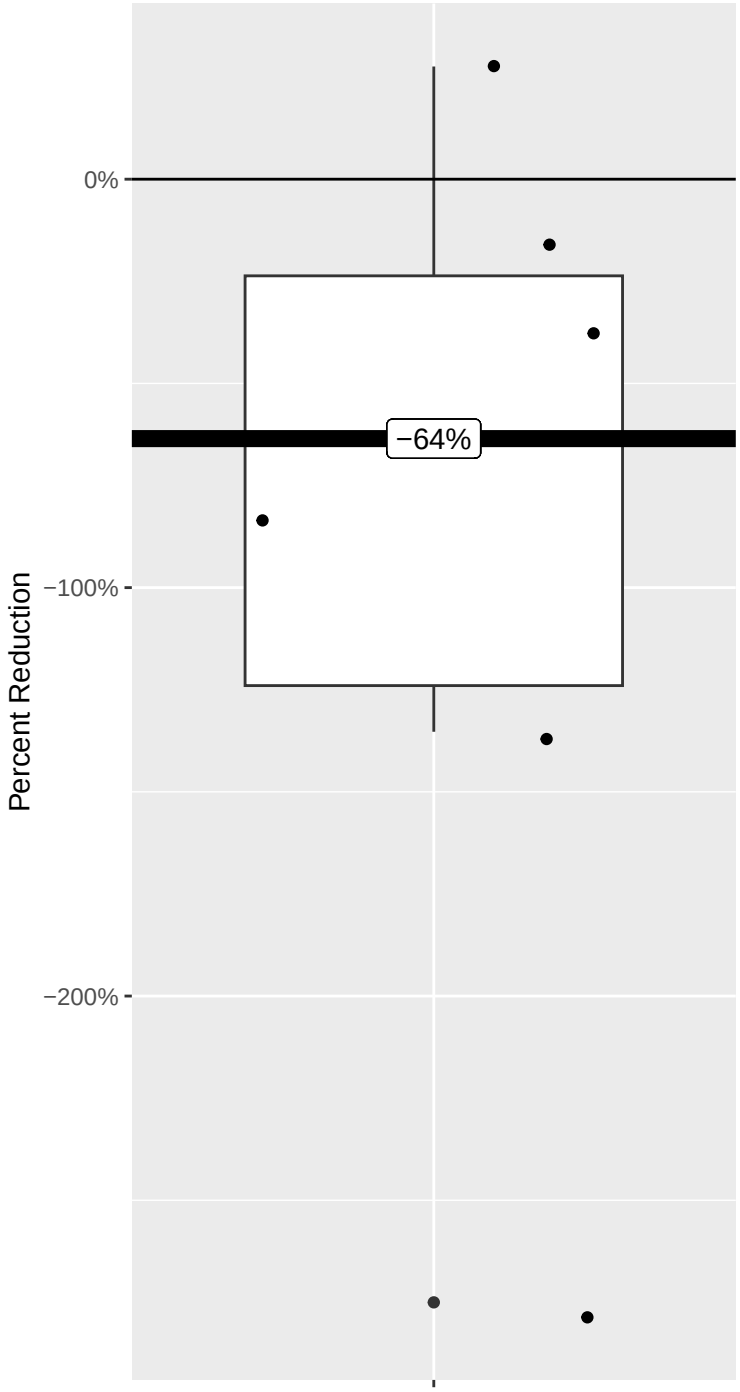




Wilcoxon test p−value = 0.74

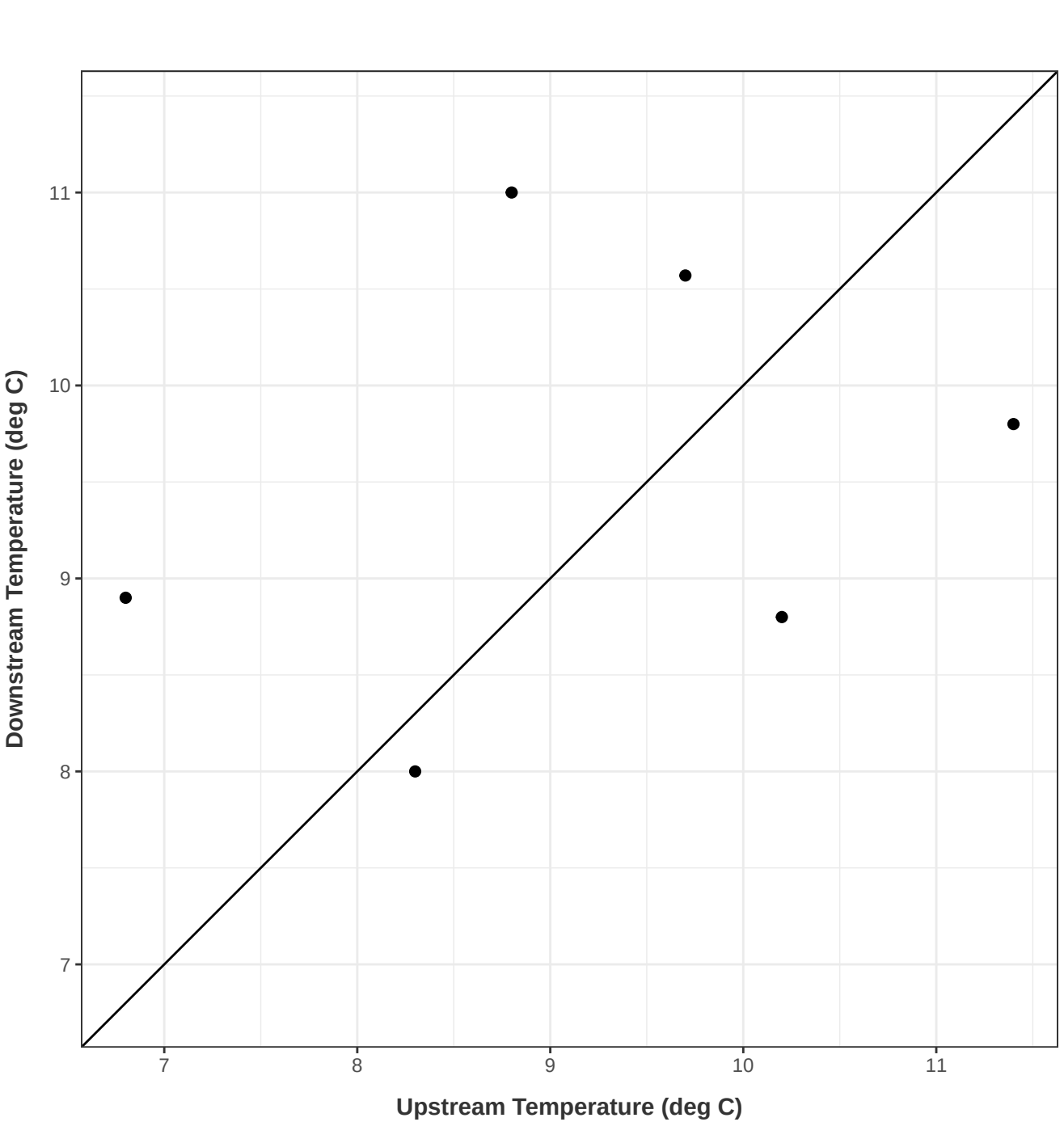
CSBMP1 Reduction of Chloride (mg/L)

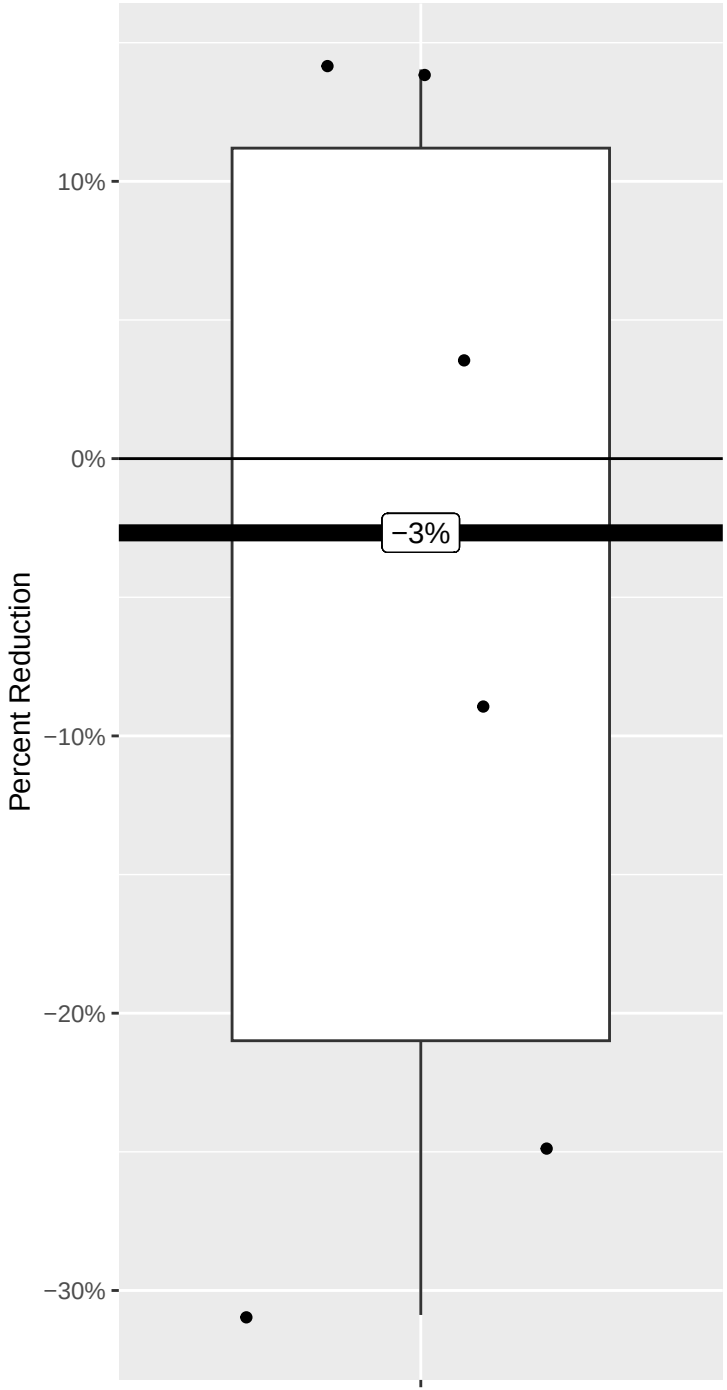




Wilcoxon test p−value = 0.97

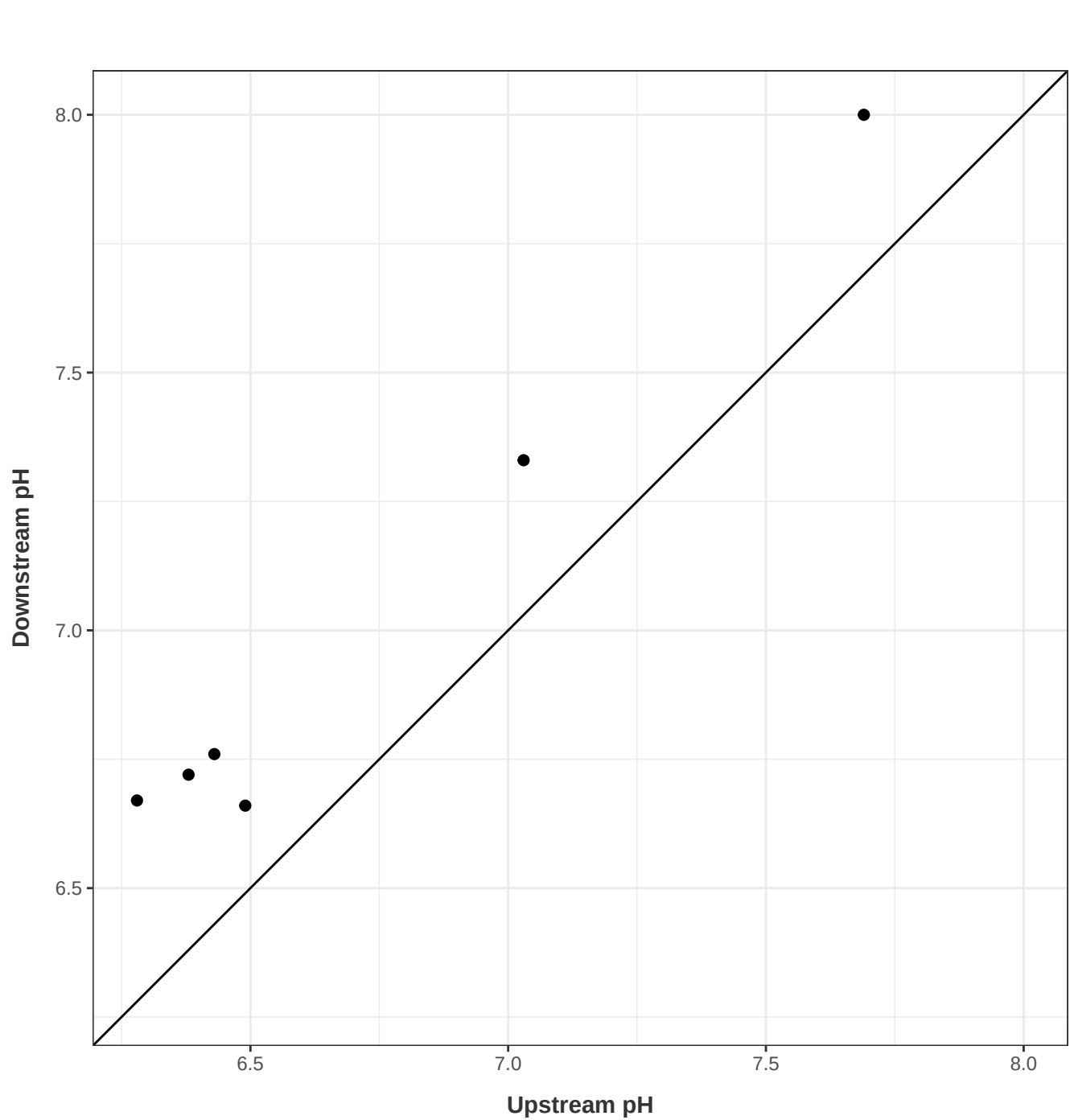
CSBMP1 Reduction of Temperature (deg C)

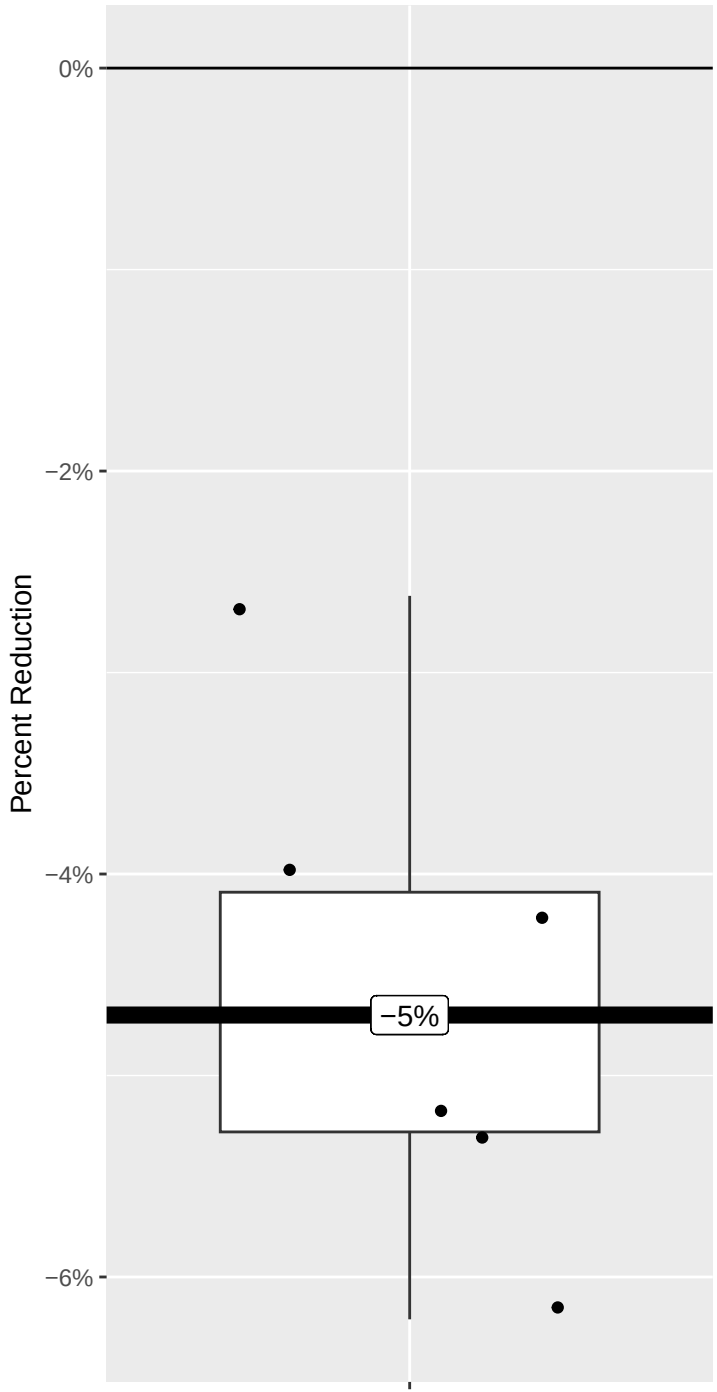




Wilcoxon test p−value = 0.72

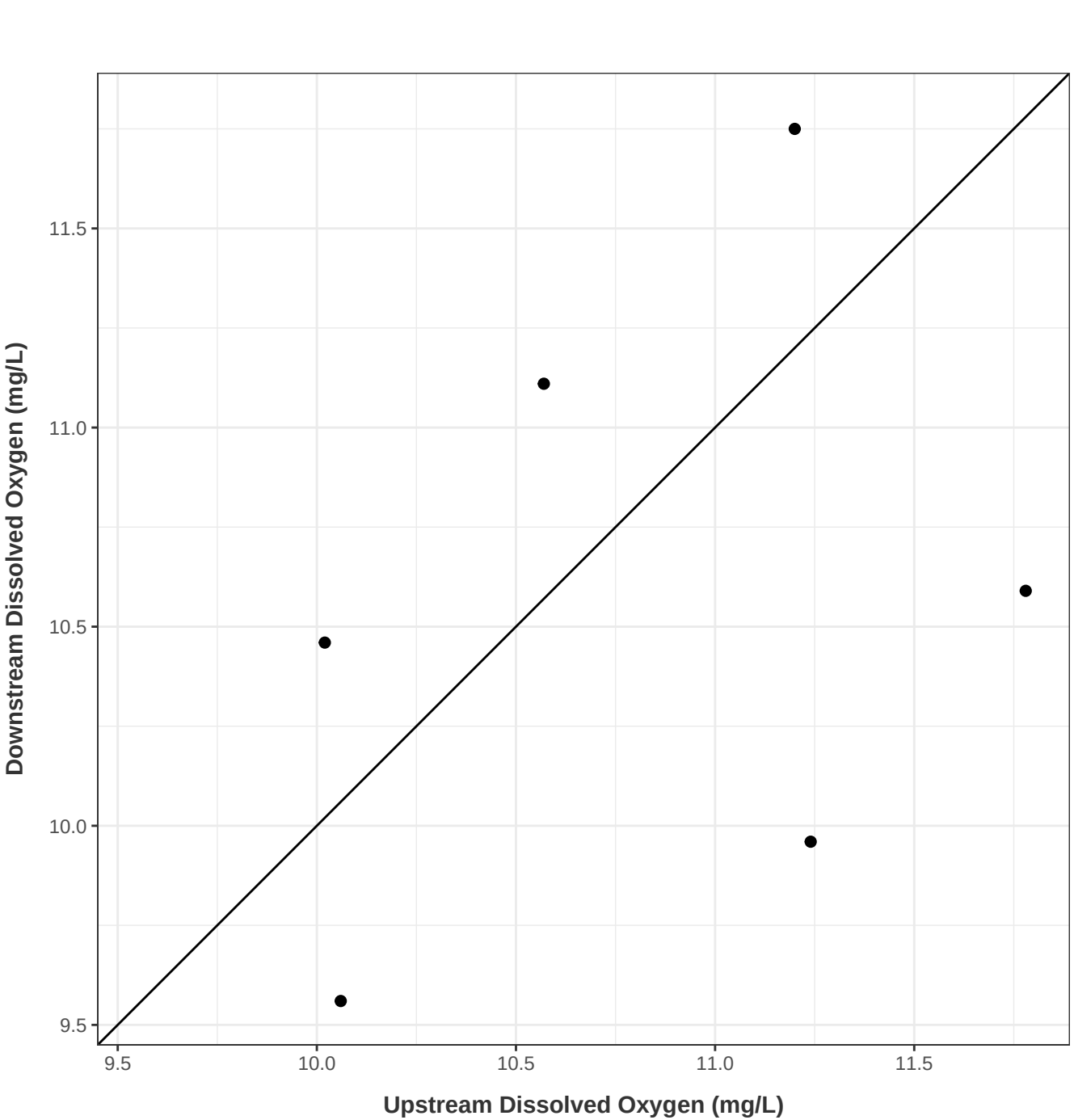
CSBMP1 Reduction of pH

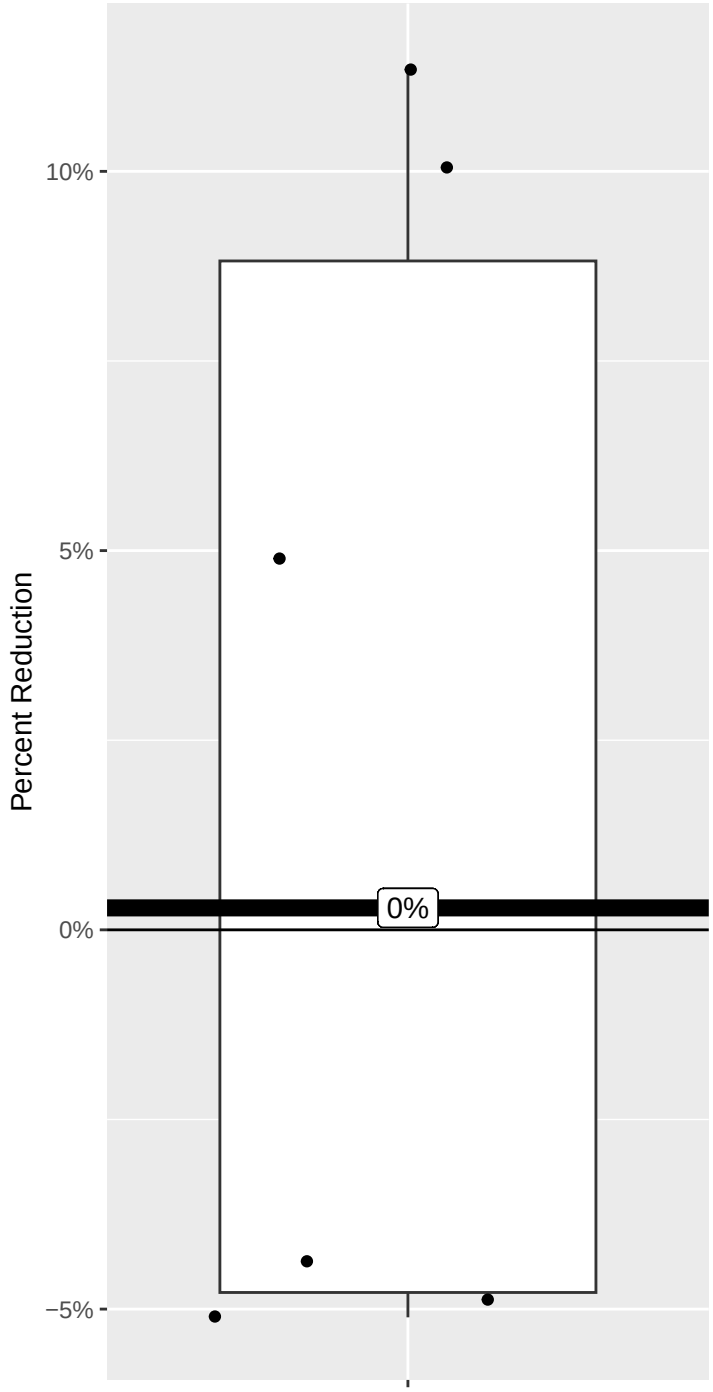




Wilcoxon test p−value = 1

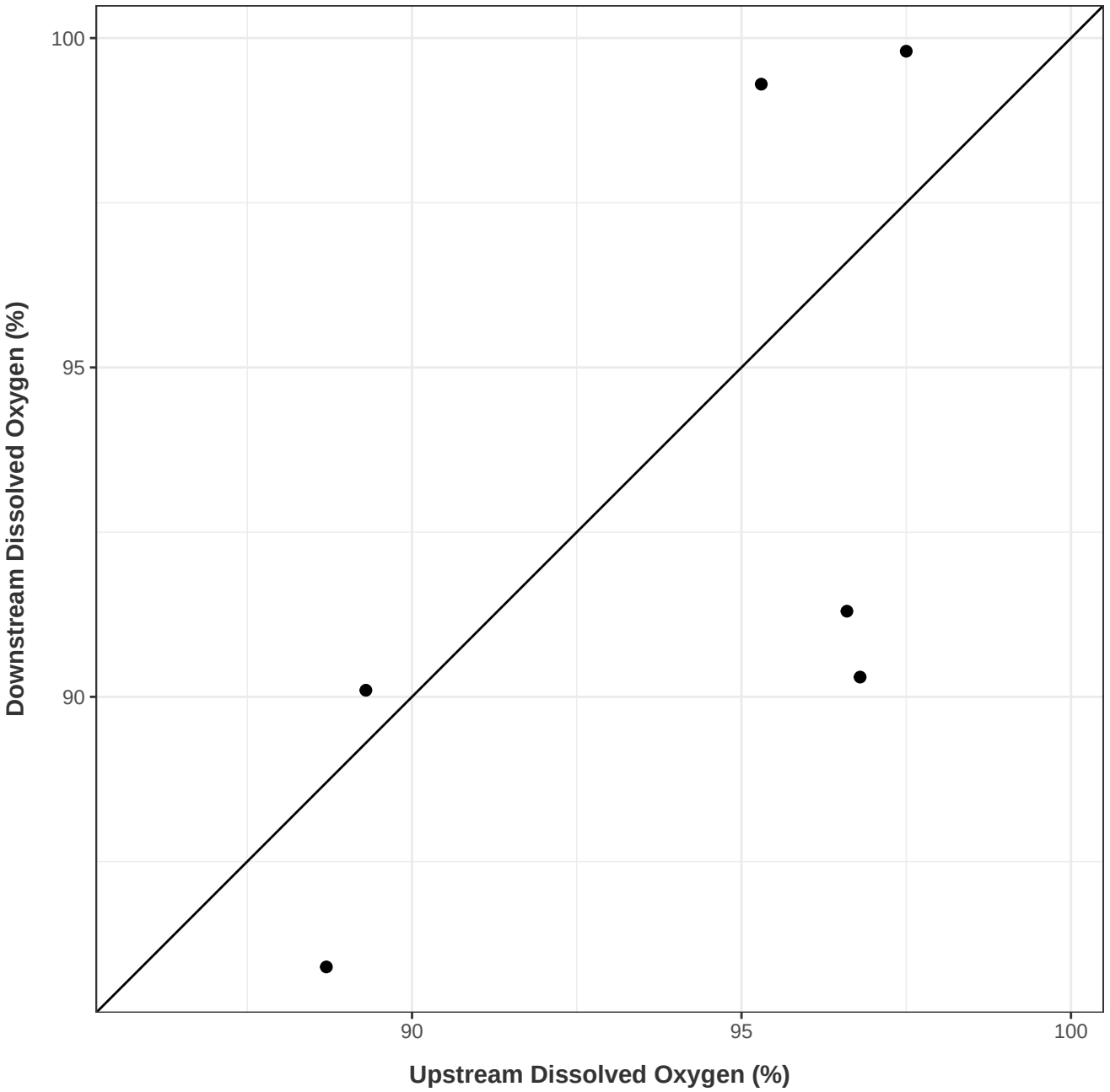
CSBMP1 Reduction of Dissolved Oxygen (mg/L)

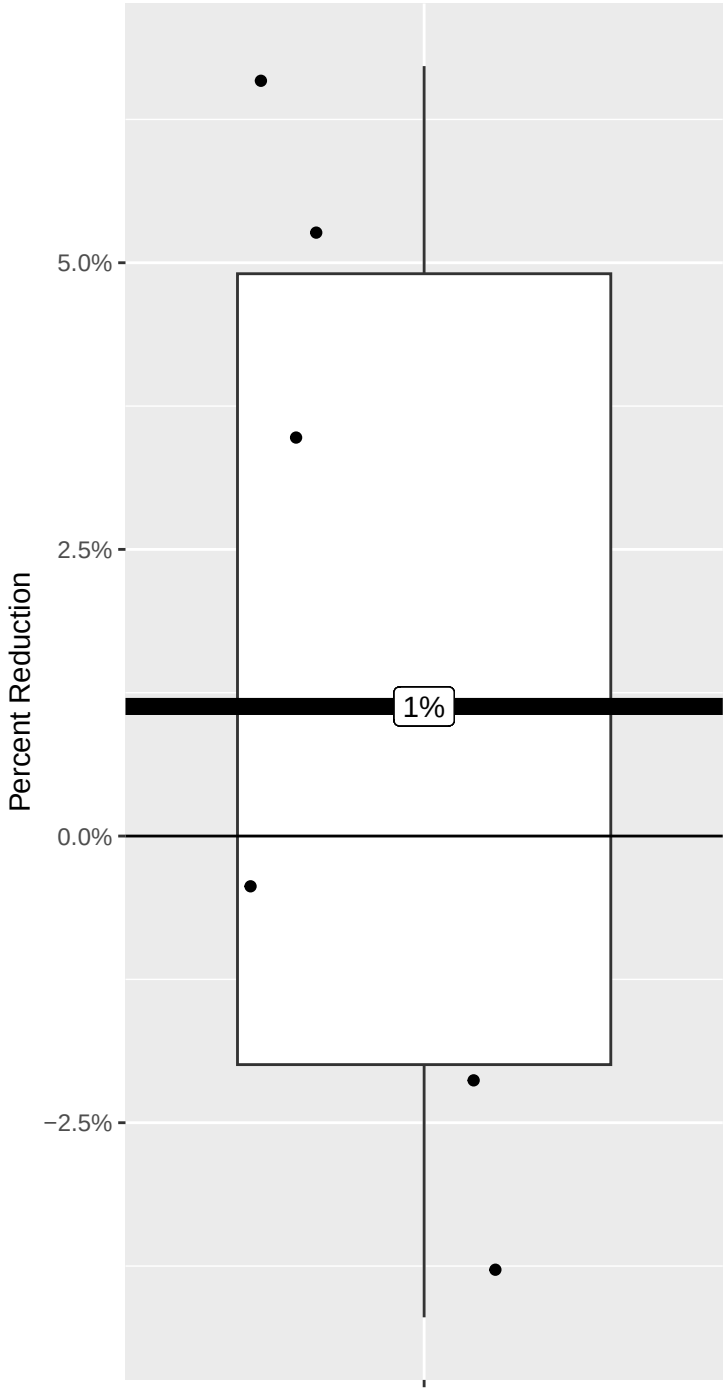




Wilcoxon test p−value = 0.34

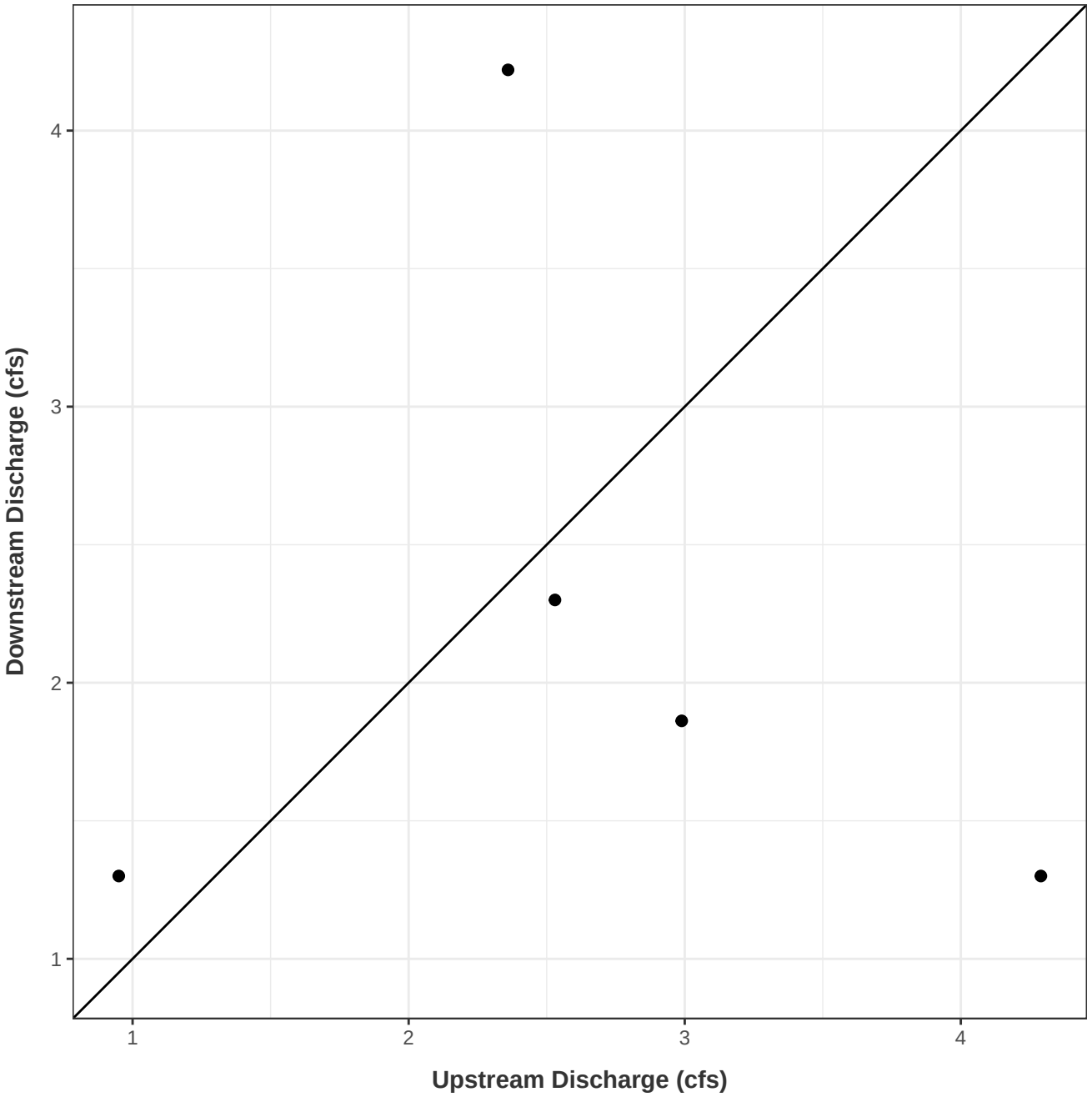
CSBMP1 Reduction of Dissolved Oxygen (%)

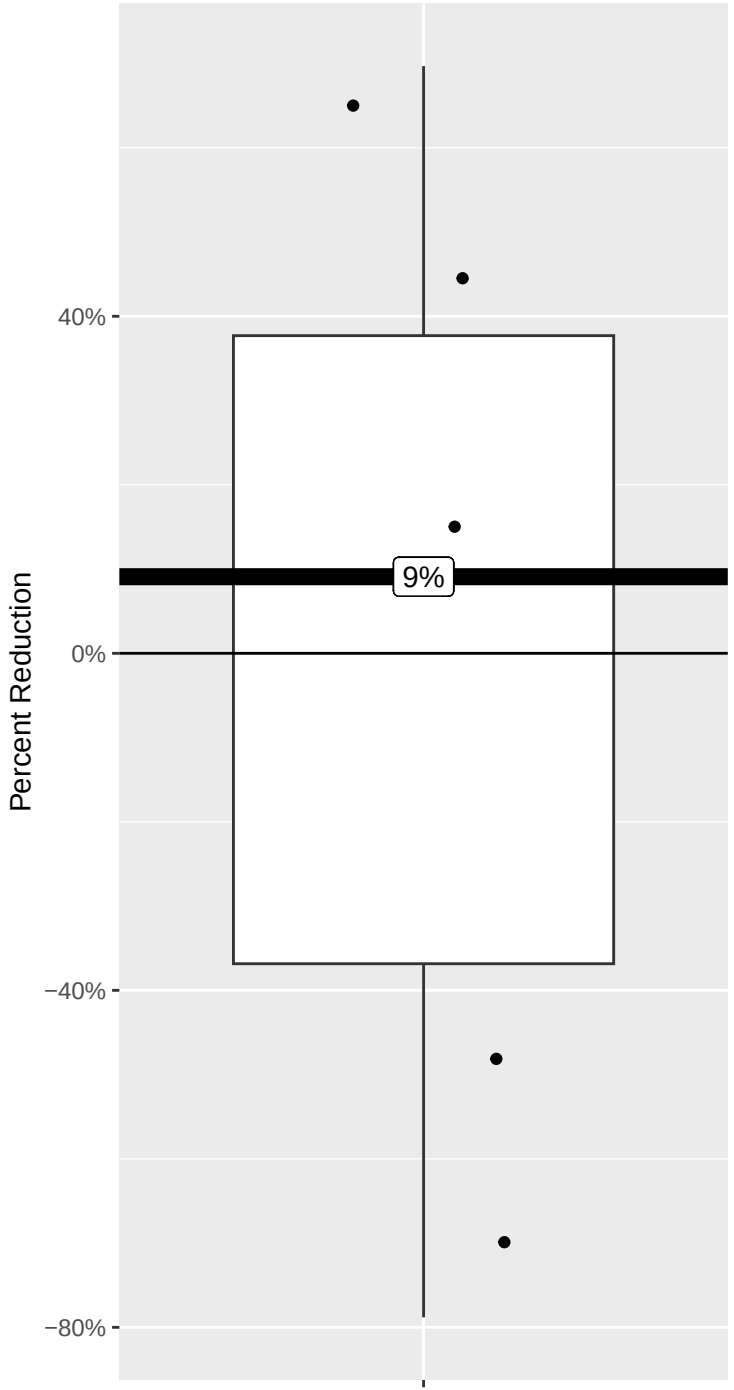




Wilcoxon test p−value = 0.28

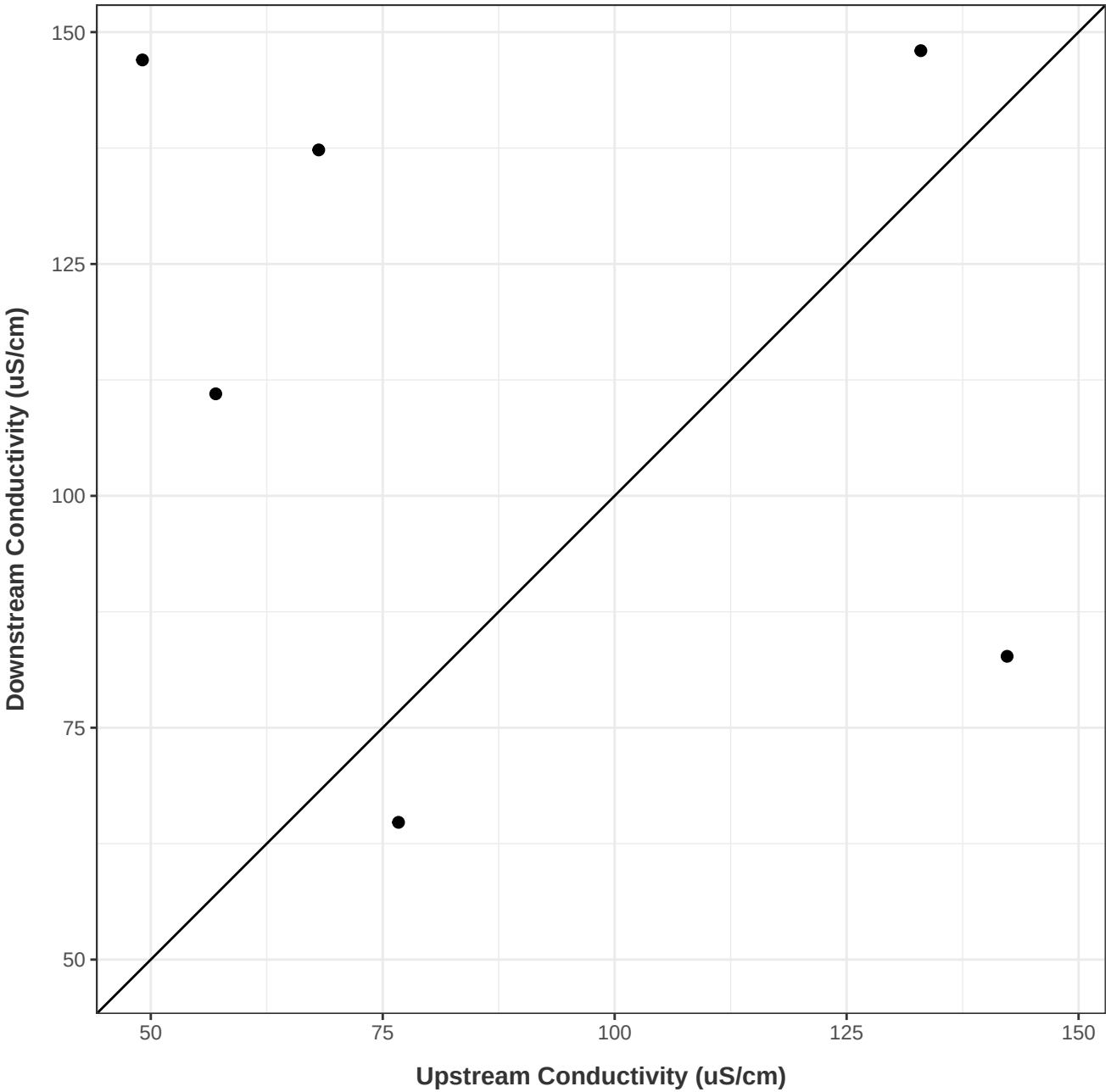
CSBMP1 Reduction of Discharge (cfs)

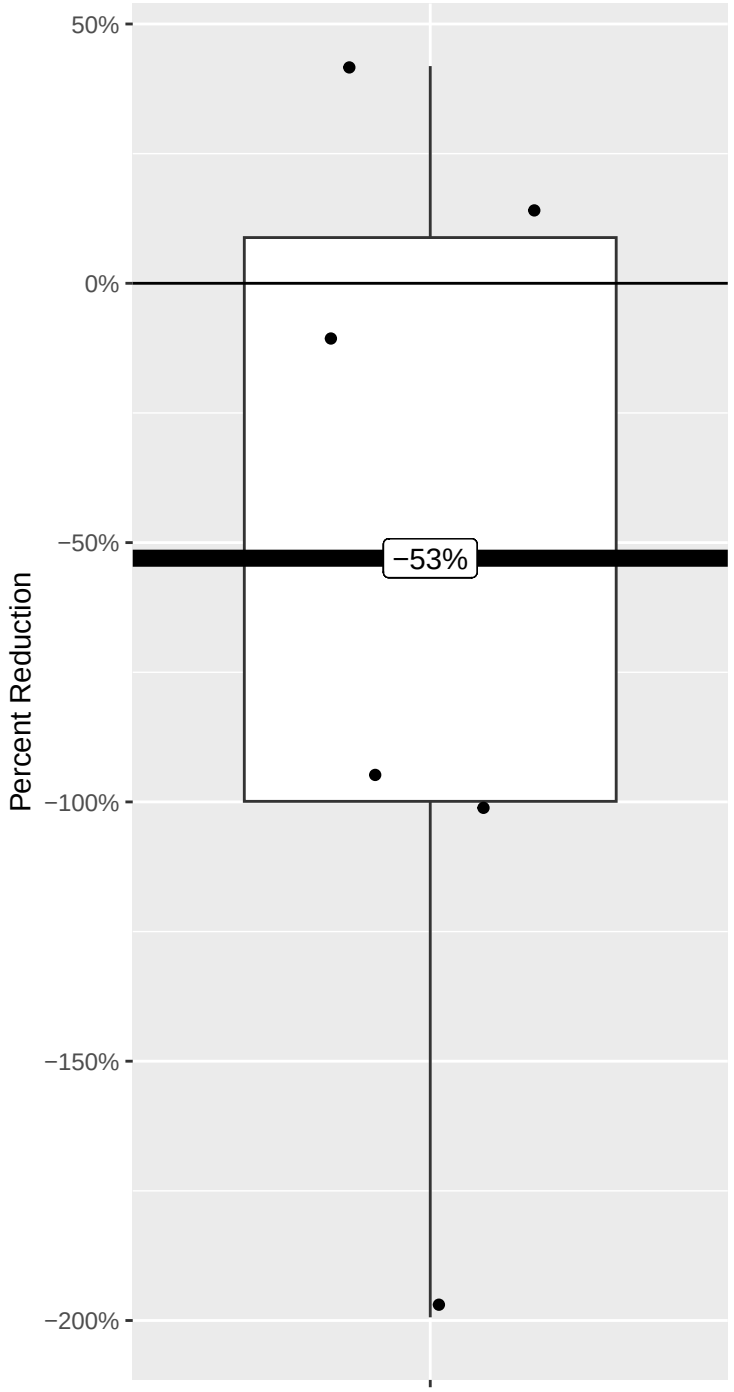




Wilcoxon test p−value = 0.41

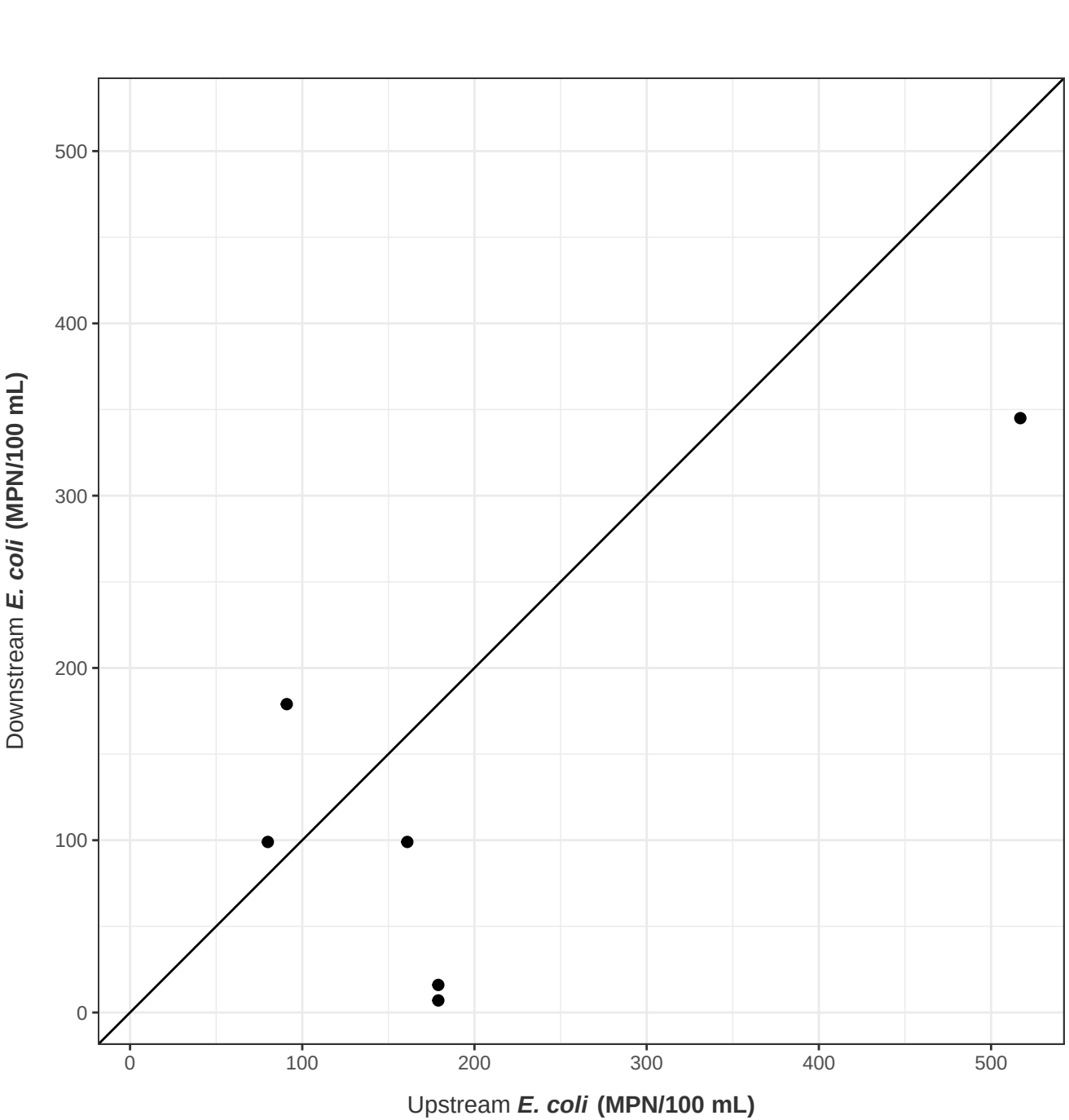
CSBMP1 Reduction of Conductivity (uS/cm)

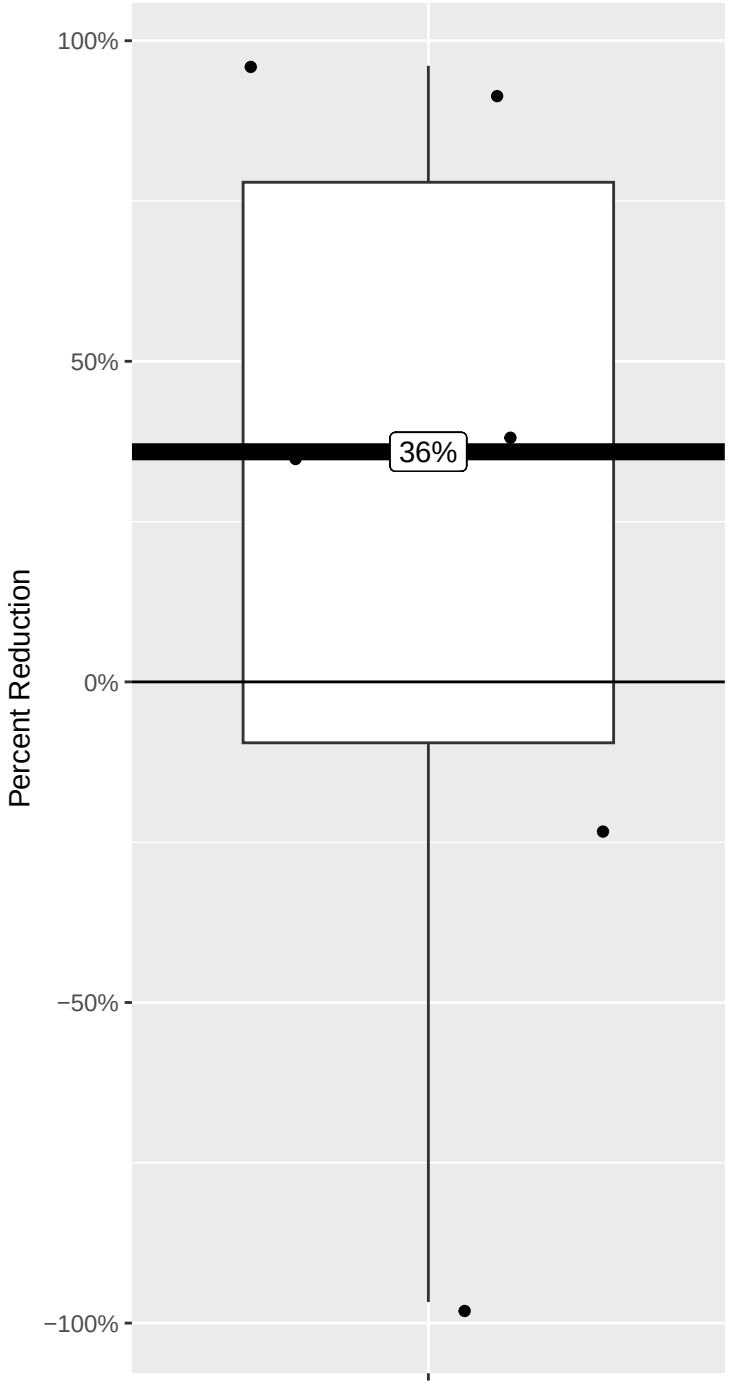




Wilcoxon test p−value = 0.89

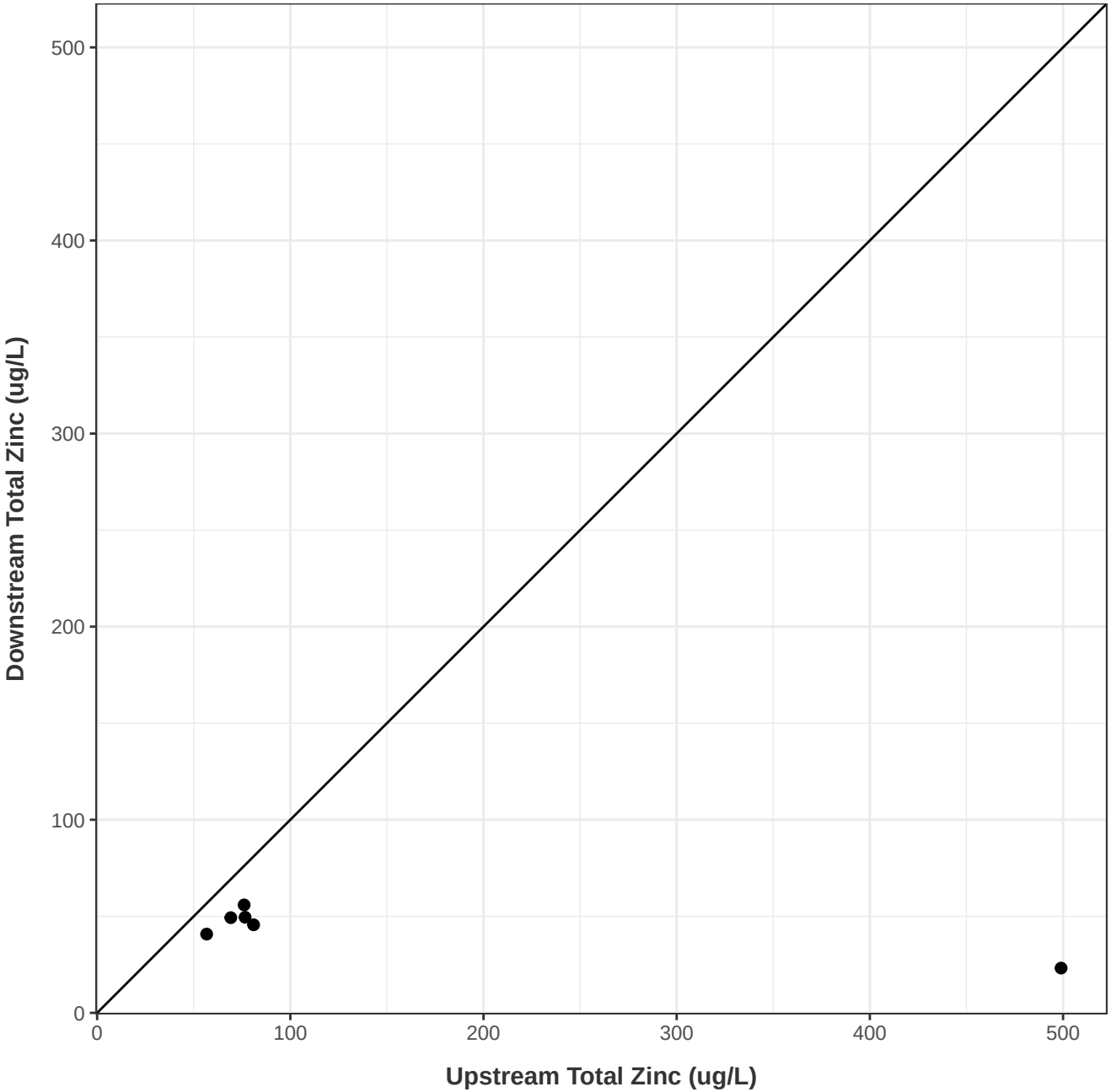
CSBMP1 Reduction of E. coli

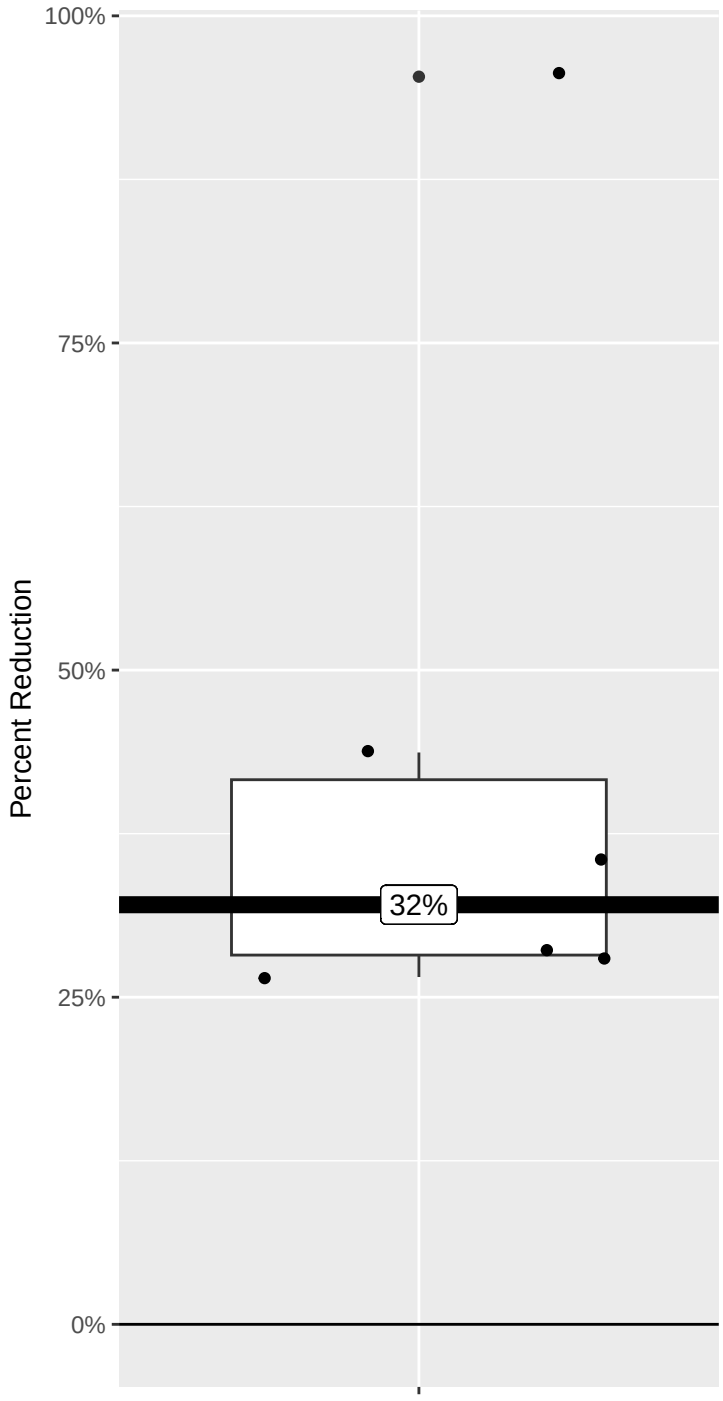




Wilcoxon test p−value = 0.1

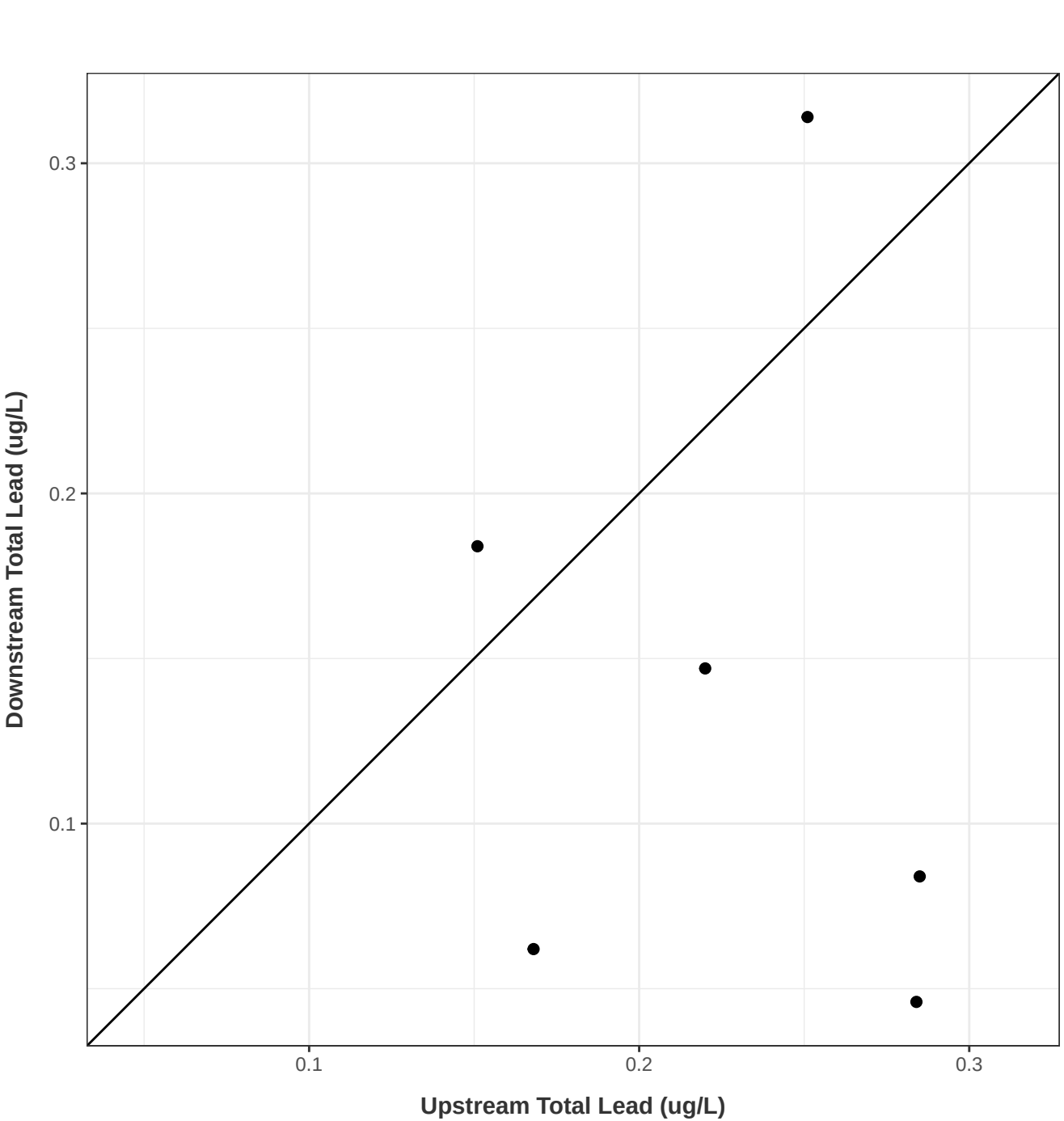
CSBMP1 Reduction of Total Zinc (ug/L)

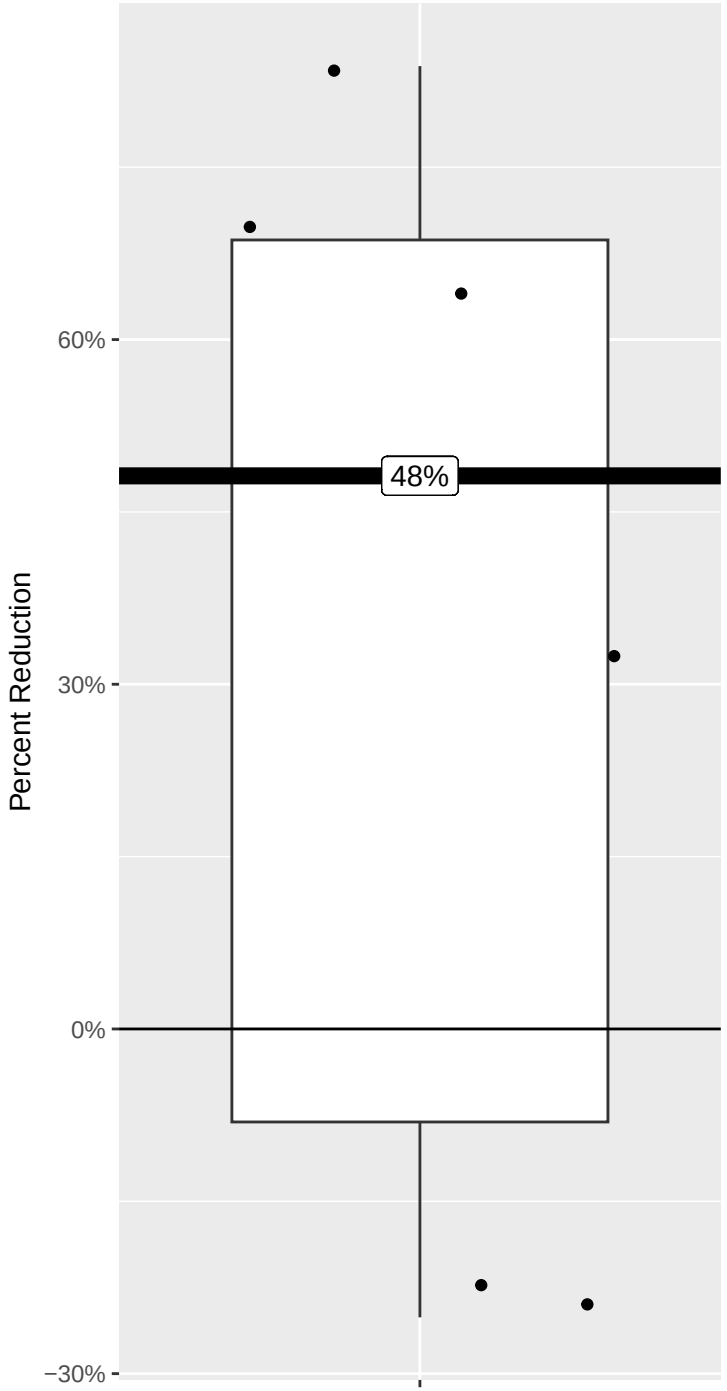




Wilcoxon test p−value = 0.02

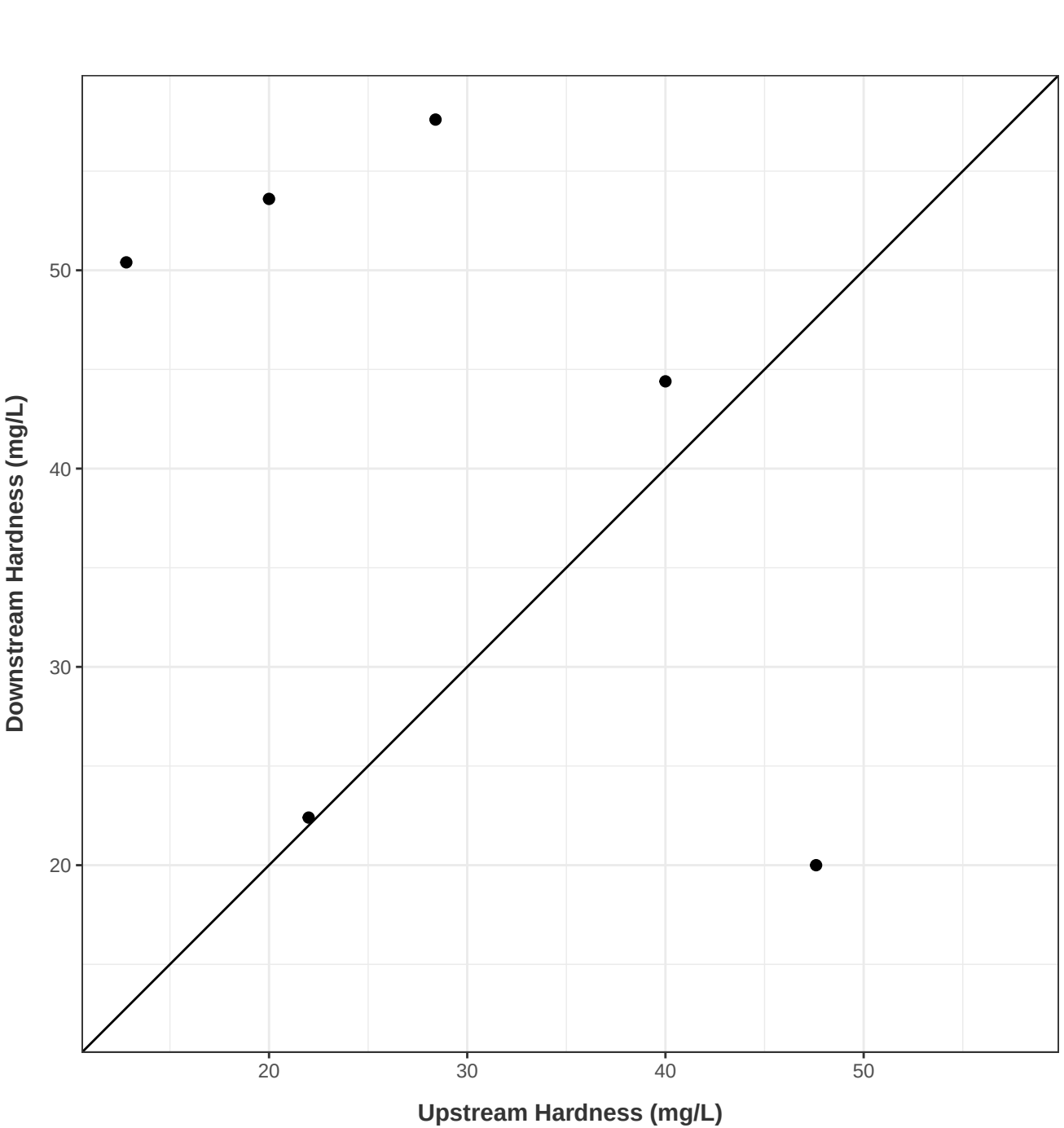
CSBMP1 Reduction of Total Lead (ug/L)

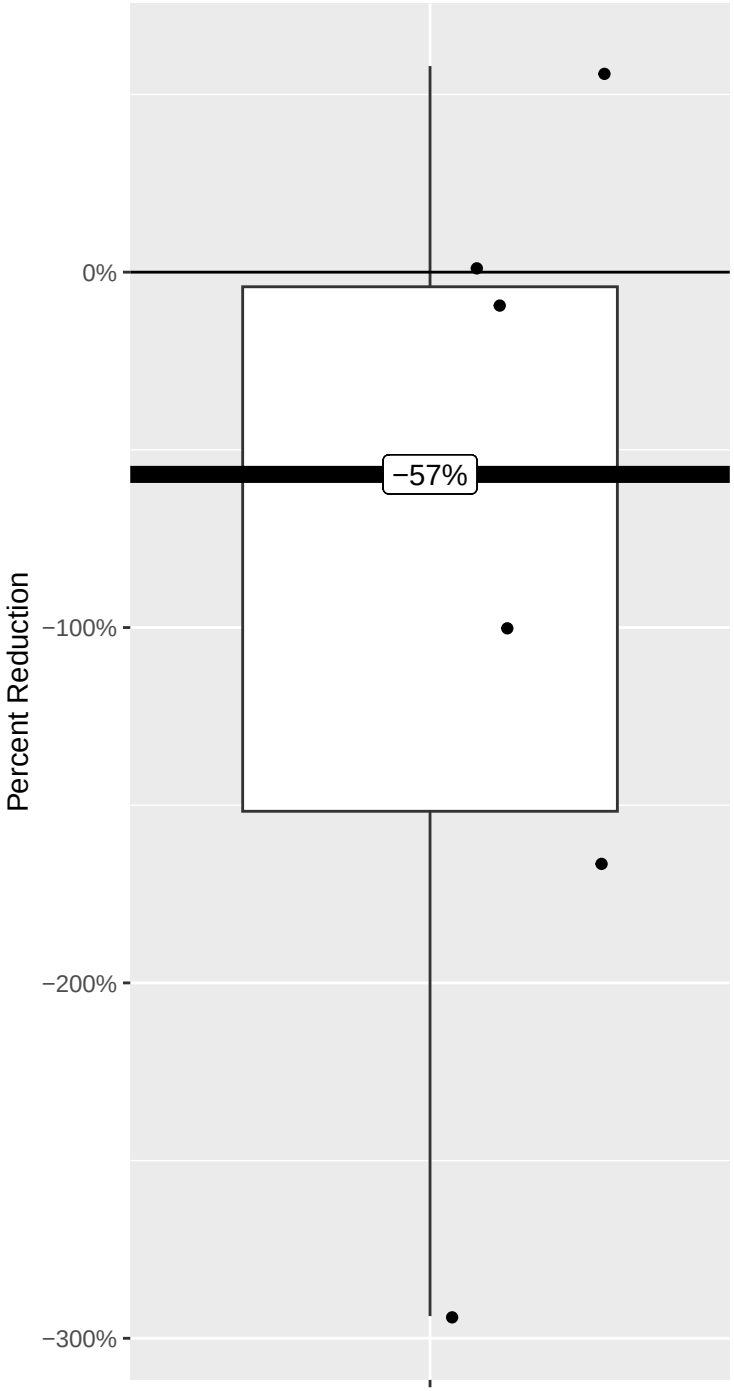




Wilcoxon test p−value = 0.08

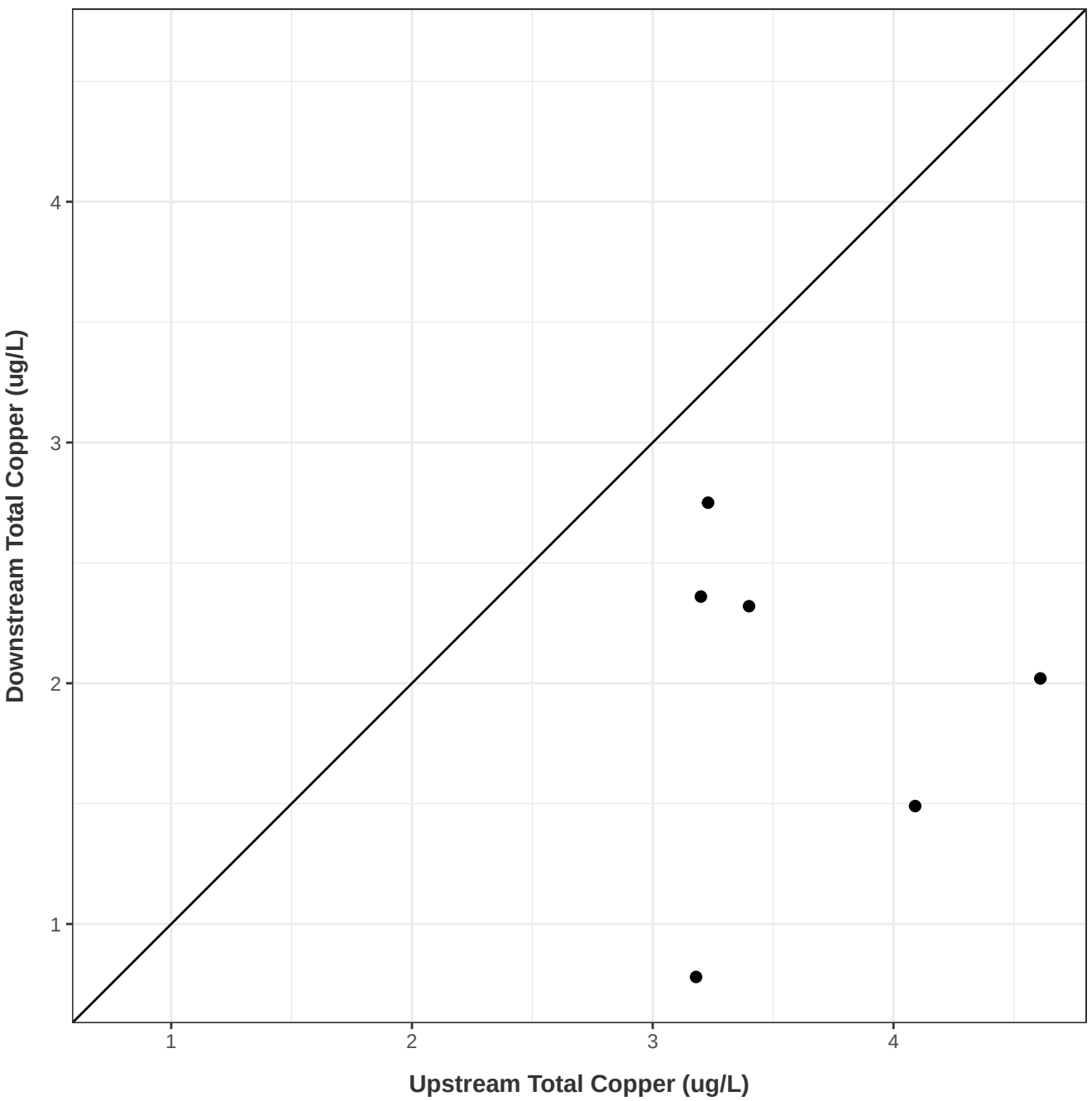
CSBMP1 Reduction of Hardness (mg/L)

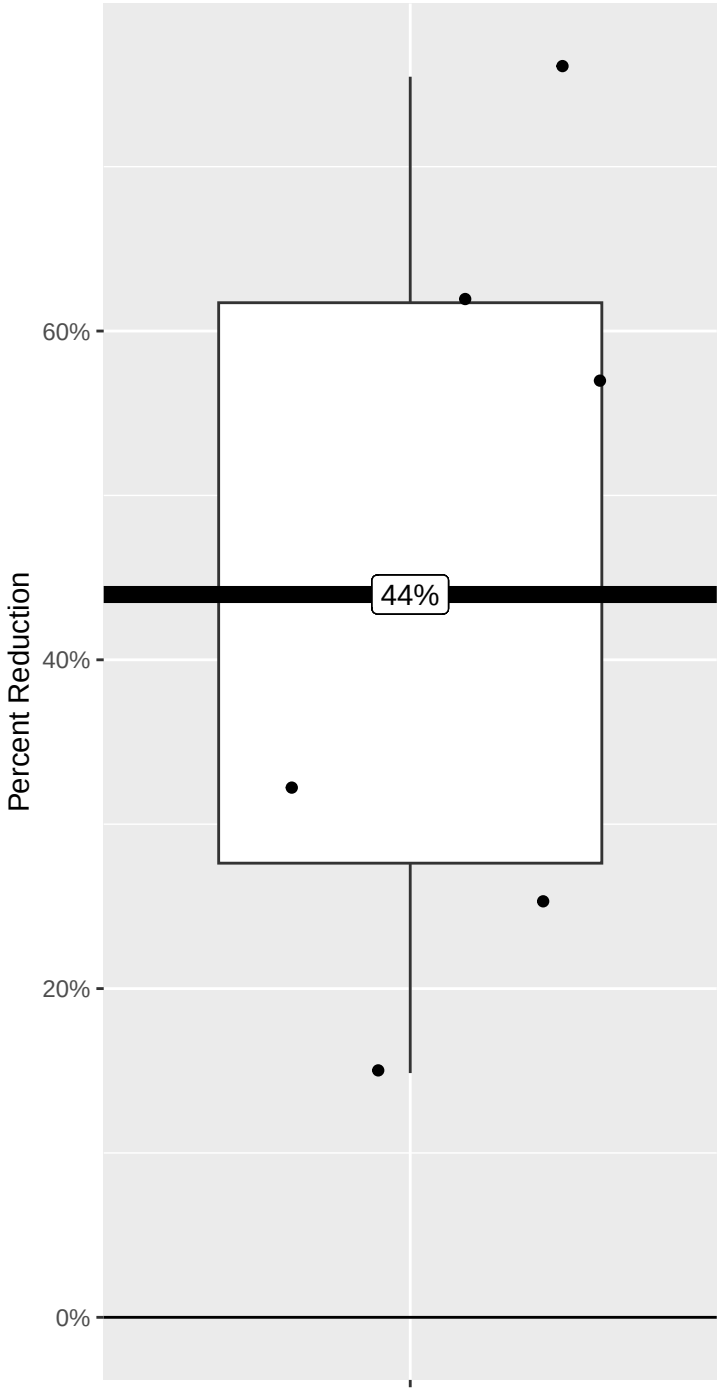




Wilcoxon test p−value = 0.95

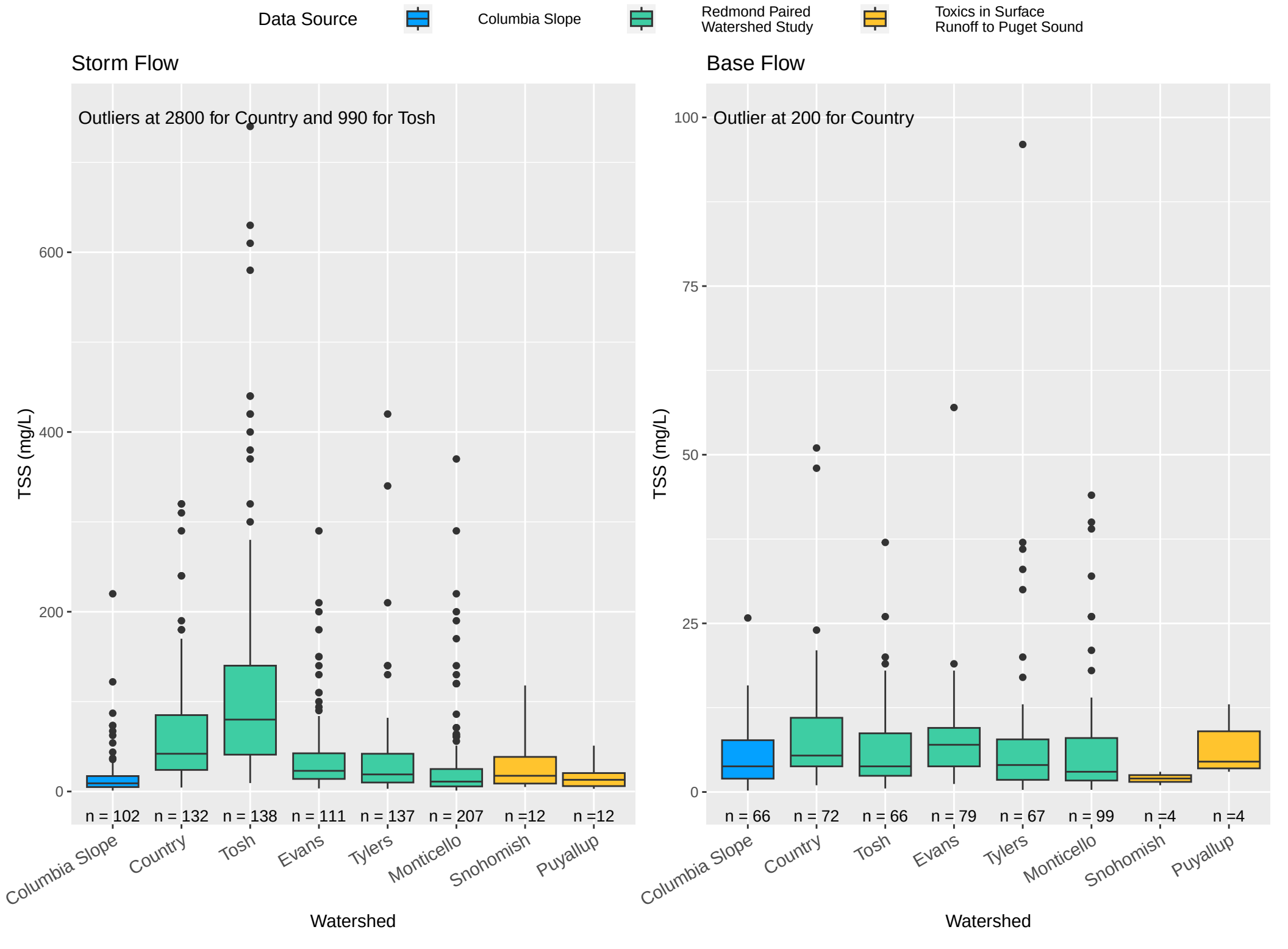
CSBMP1 Reduction of Total Copper (ug/L)



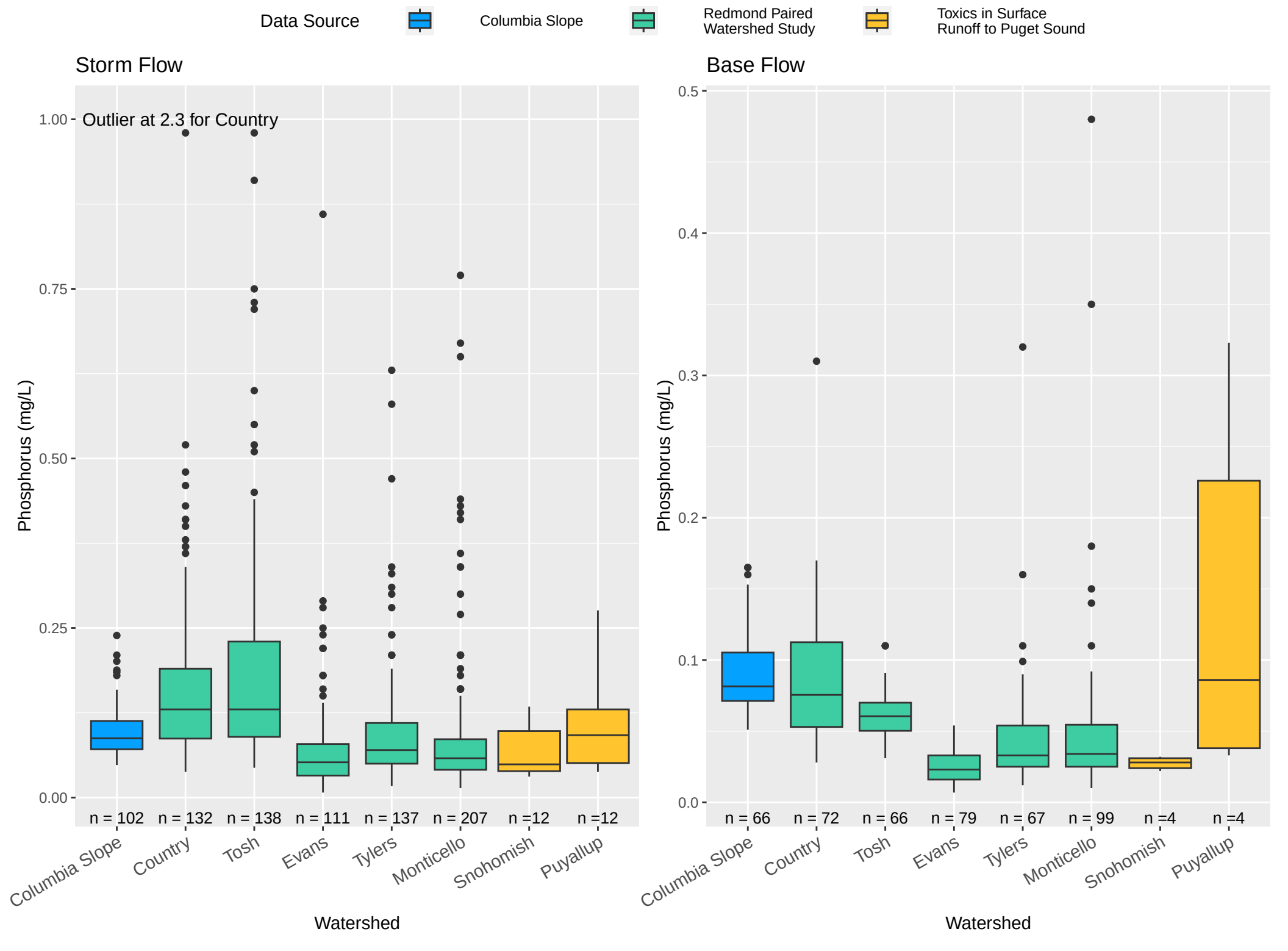


Wilcoxon test p−value = 0.02

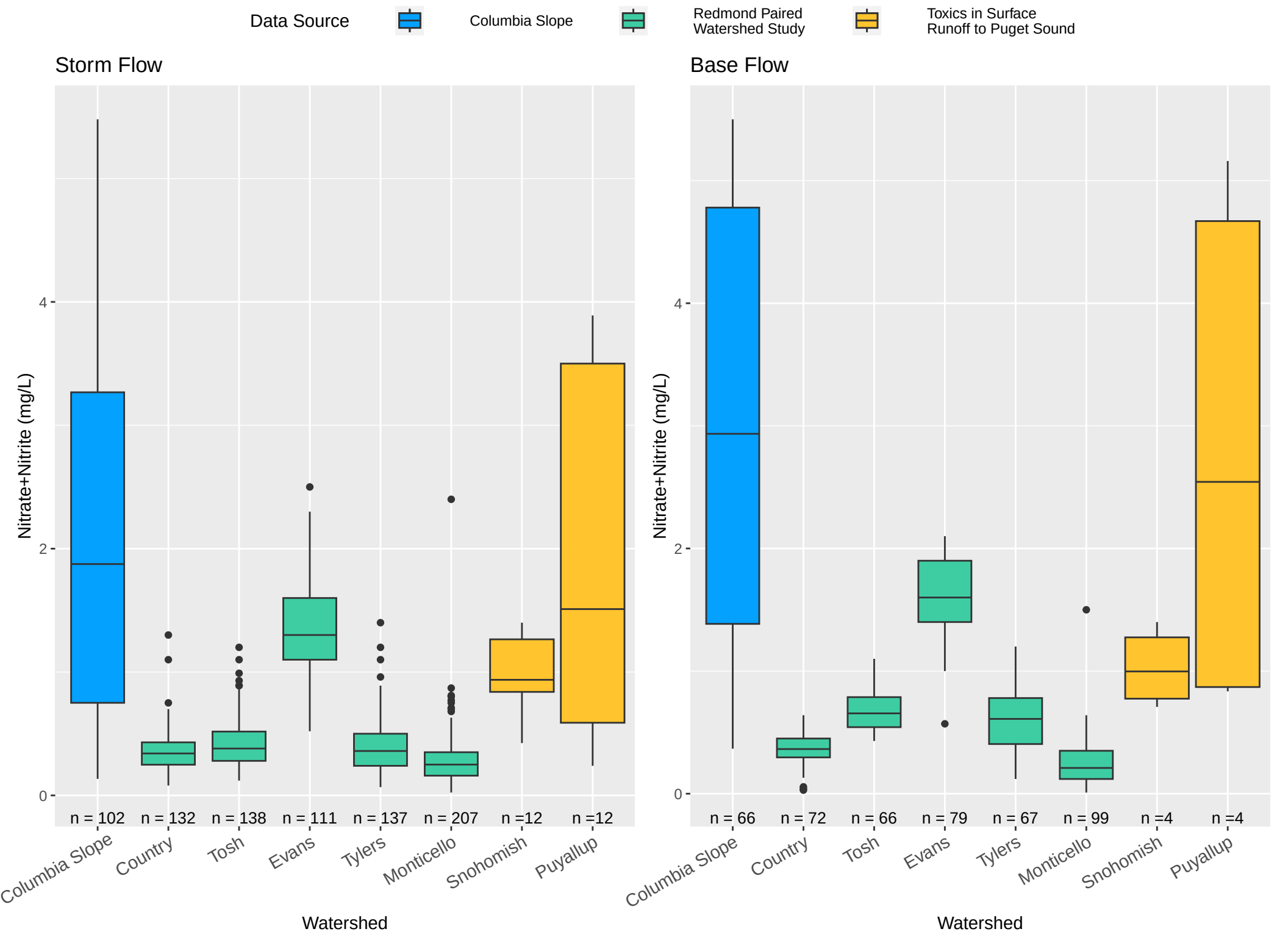
Columbia Slope Creeks Comparison to Other Studies in Residential Basins



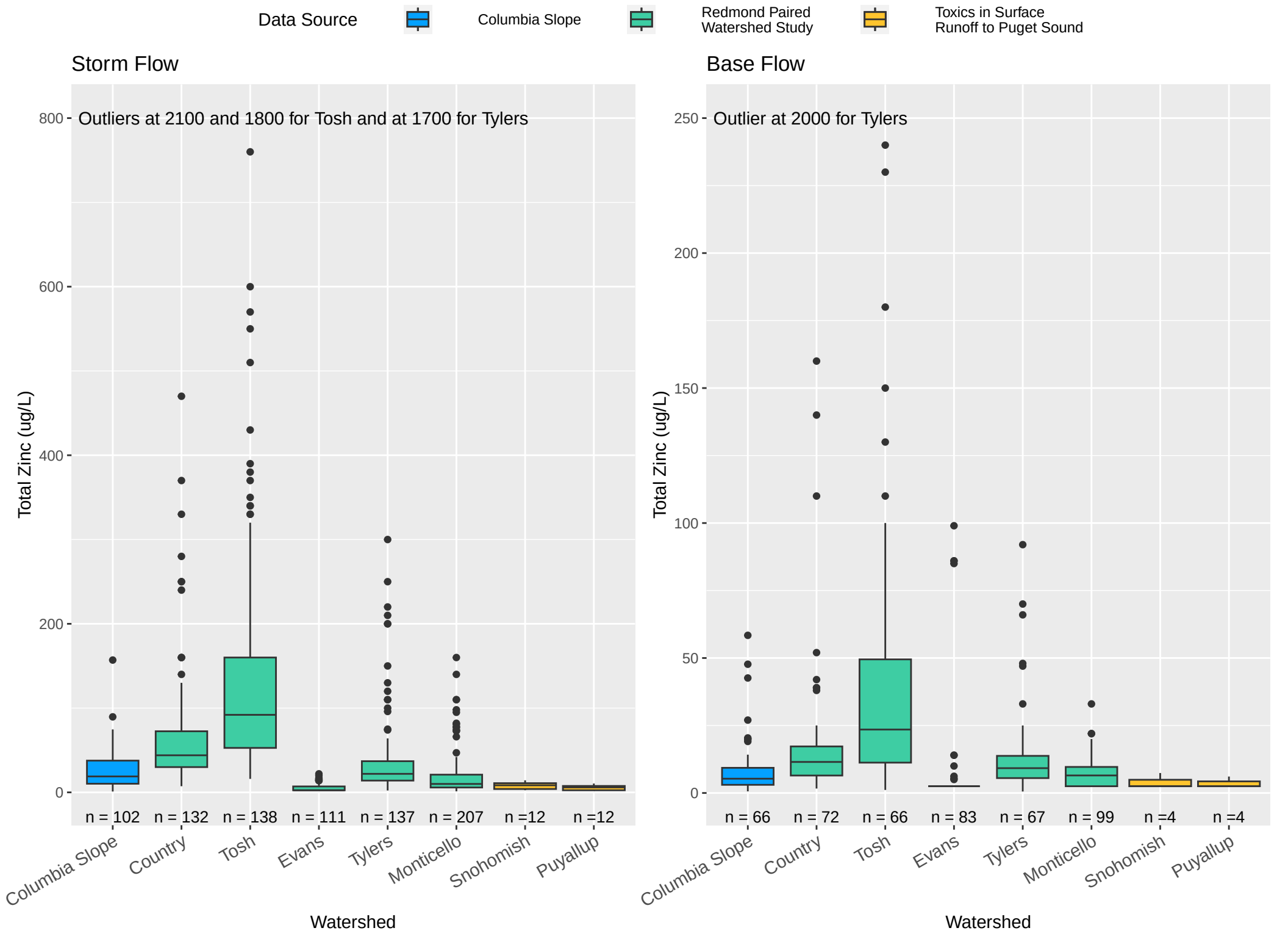
Columbia Slope Creeks Comparison to Other Studies in Residential Basins



Columbia Slope Creeks Comparison to Other Studies in Residential Basins

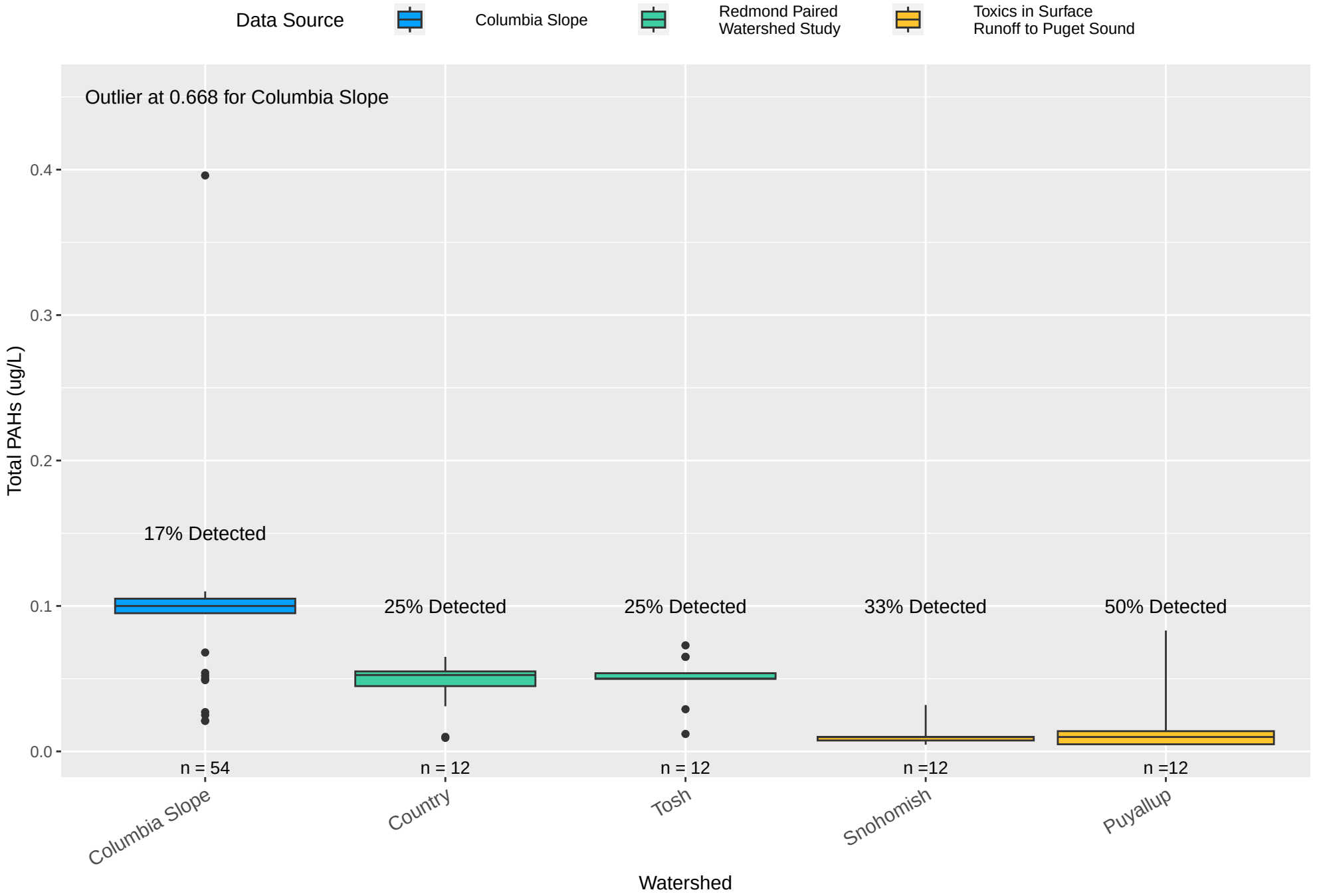


Columbia Slope Creeks Comparison to Other Studies in Residential Basins



Columbia Slope Creeks Comparison to Other Studies in Residential Basins

Only storm flow results are presented due to insufficient number of base flow samples



Columbia Slope Creeks Comparison to Other Studies in Residential Basins

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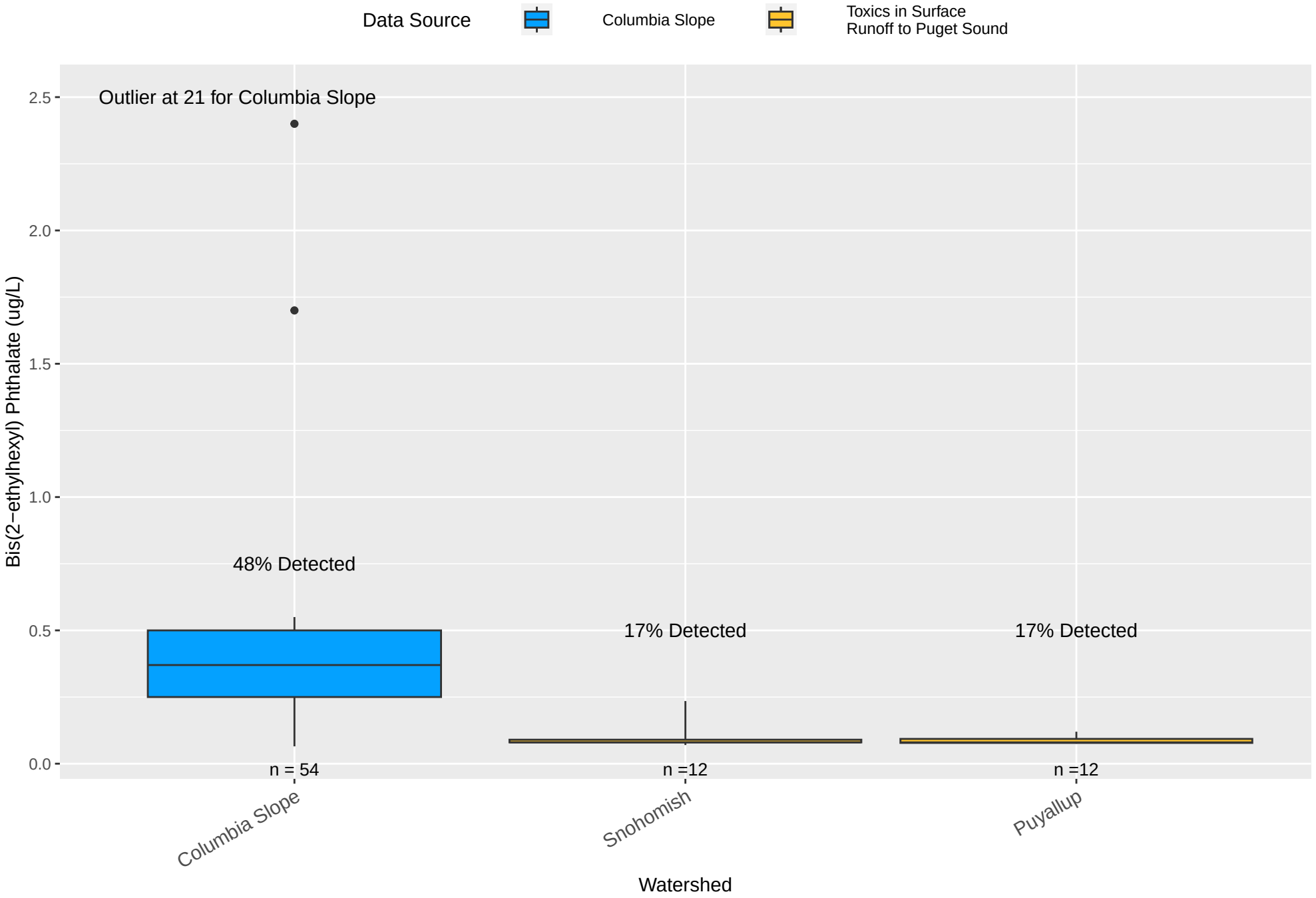
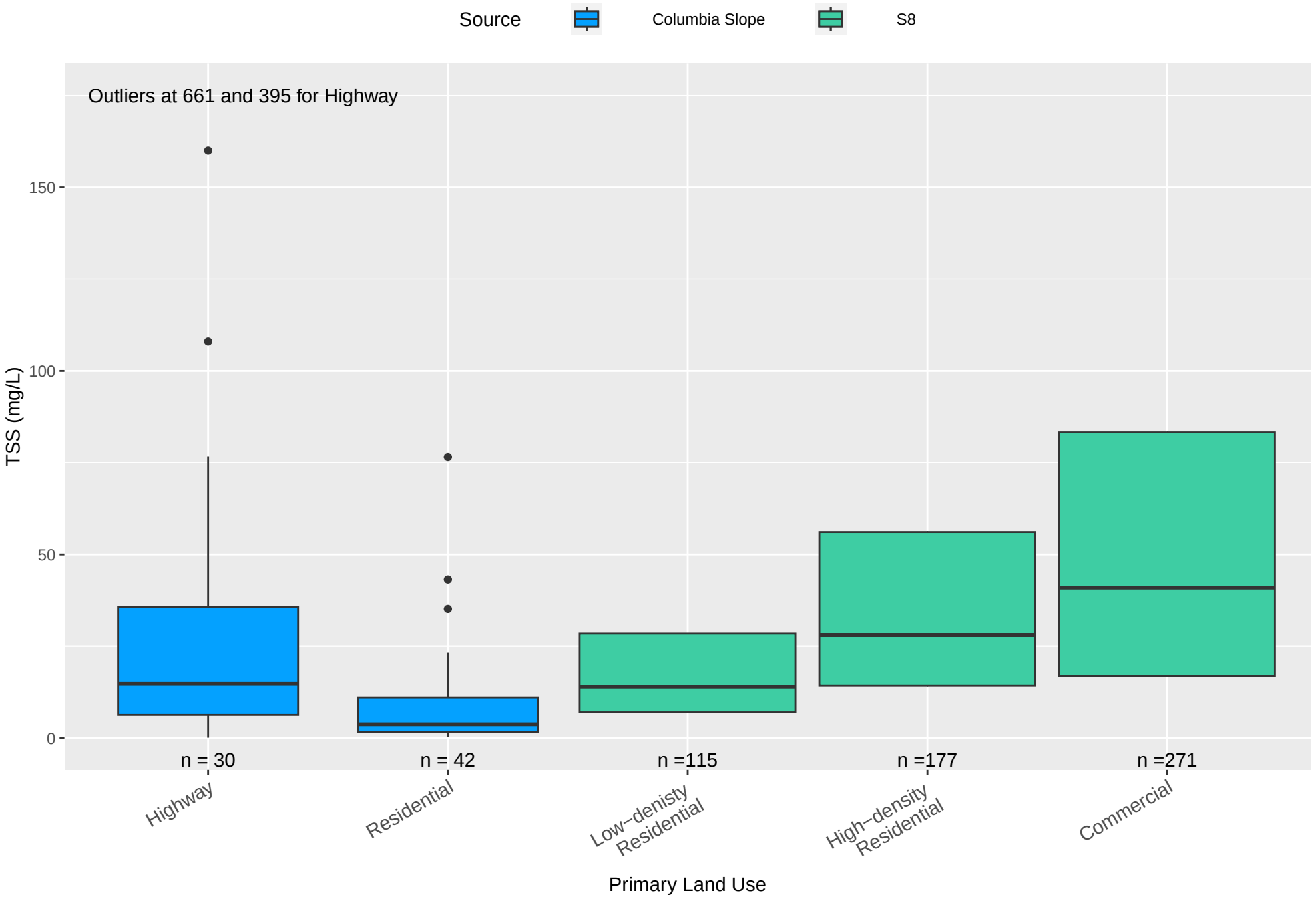


Comparison of Columbia Slope Pipe Stations to S8 Data

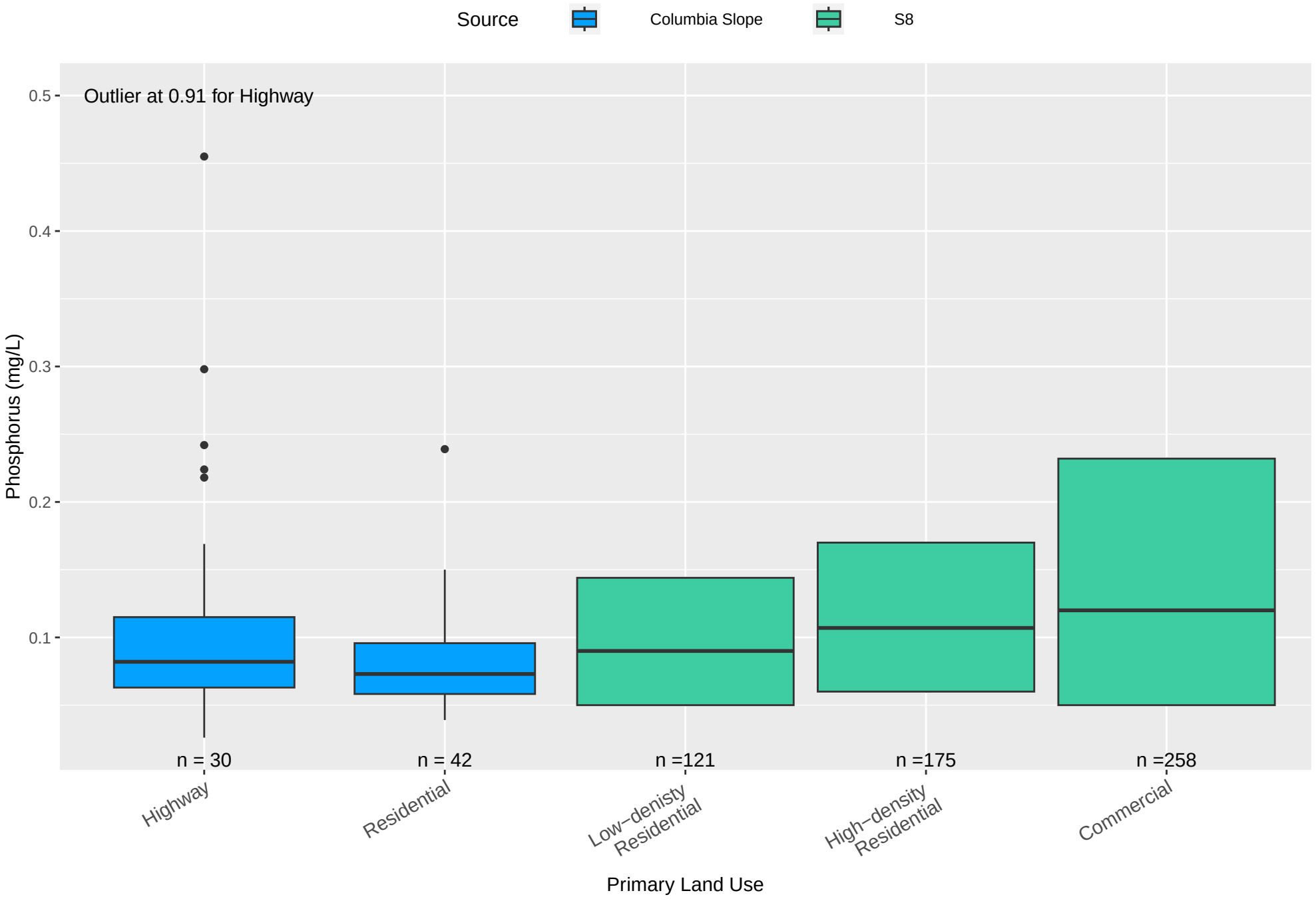
Storm events only



S8 Data from Ecology 2015

Comparison of Columbia Slope Pipe Stations to S8 Data

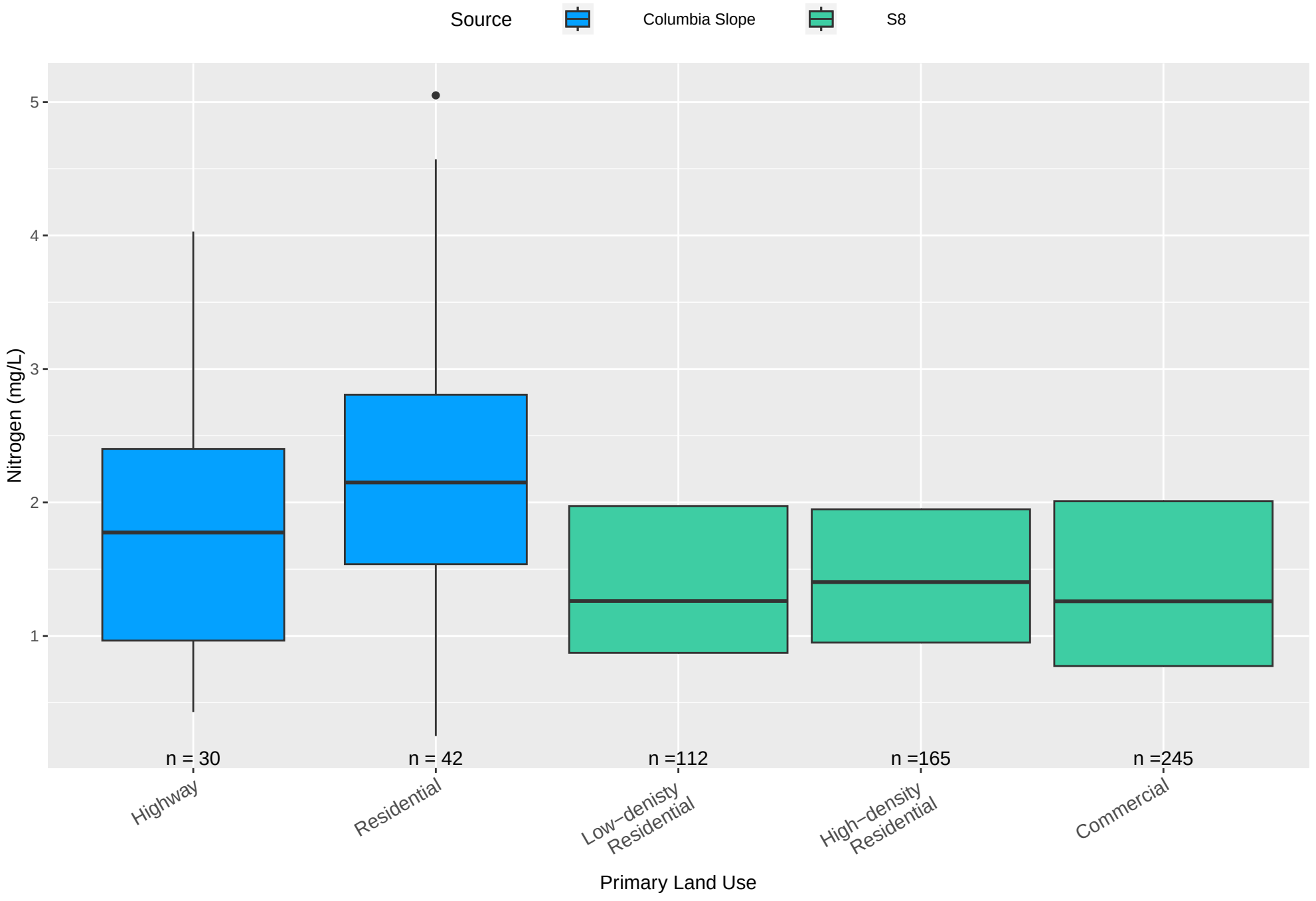
Storm events only



S8 Data from Ecology 2015

Comparison of Columbia Slope Pipe Stations to S8 Data

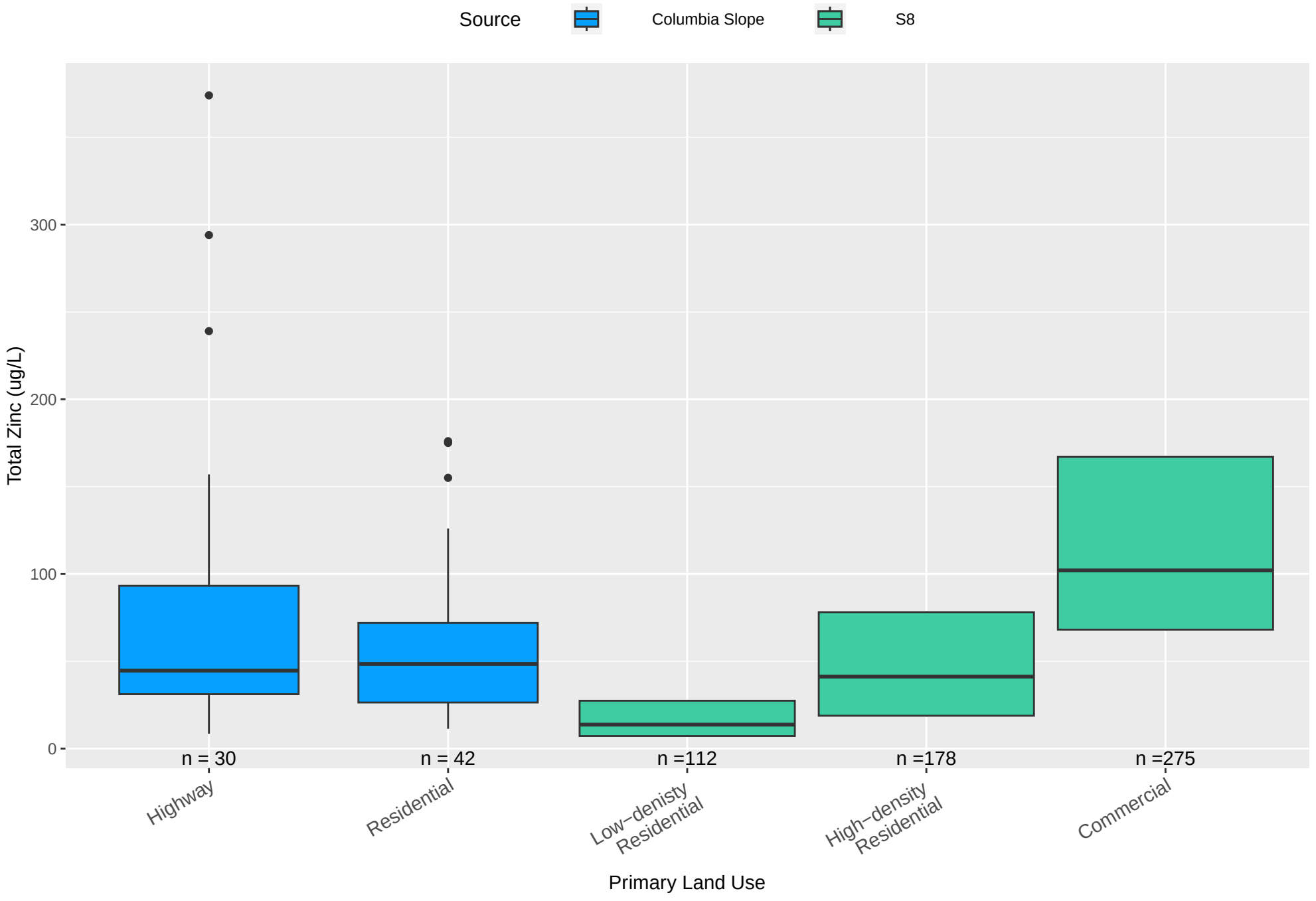
Storm events only



S8 Data from Ecology 2015

Comparison of Columbia Slope Pipe Stations to S8 Data

Storm events only



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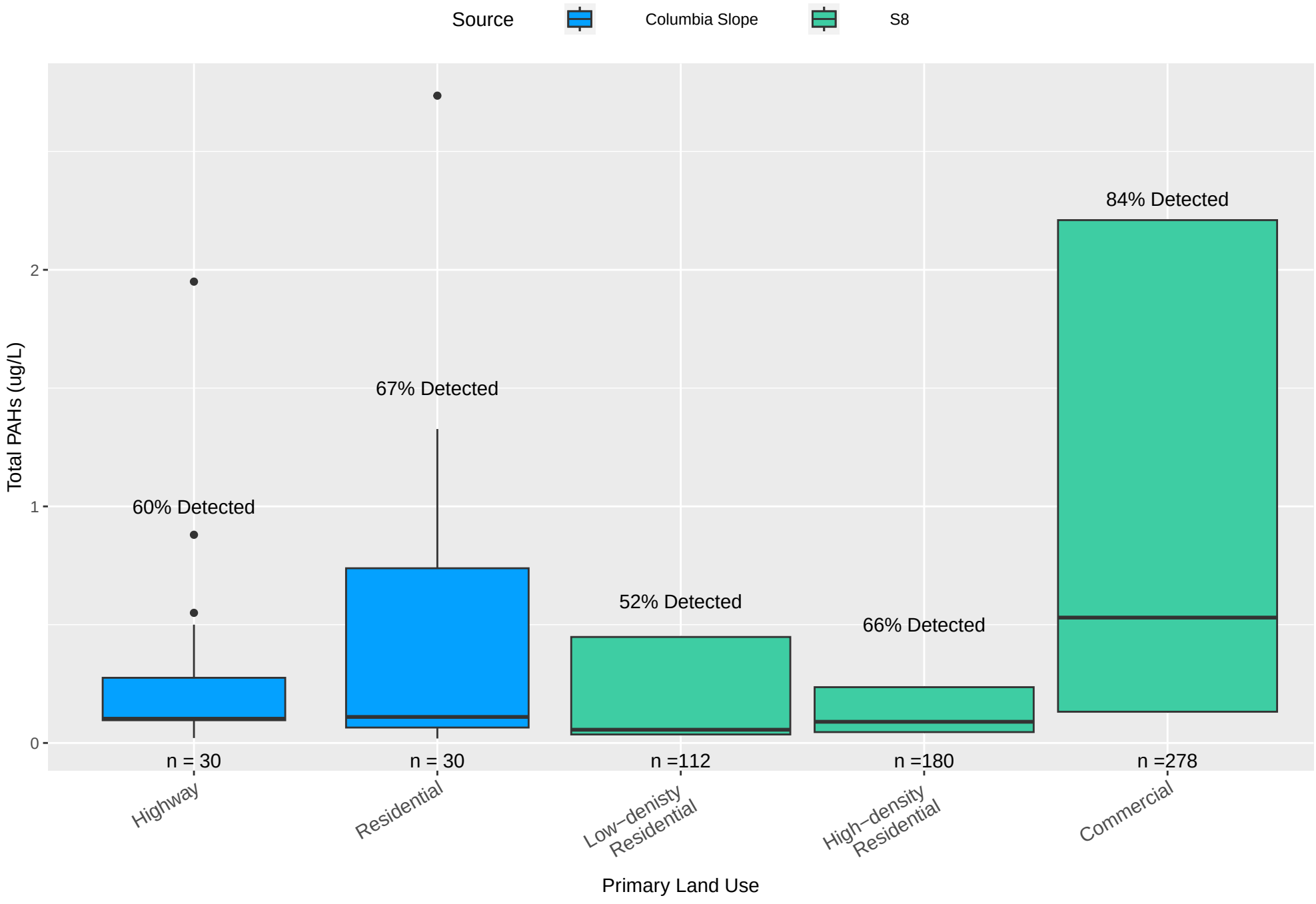

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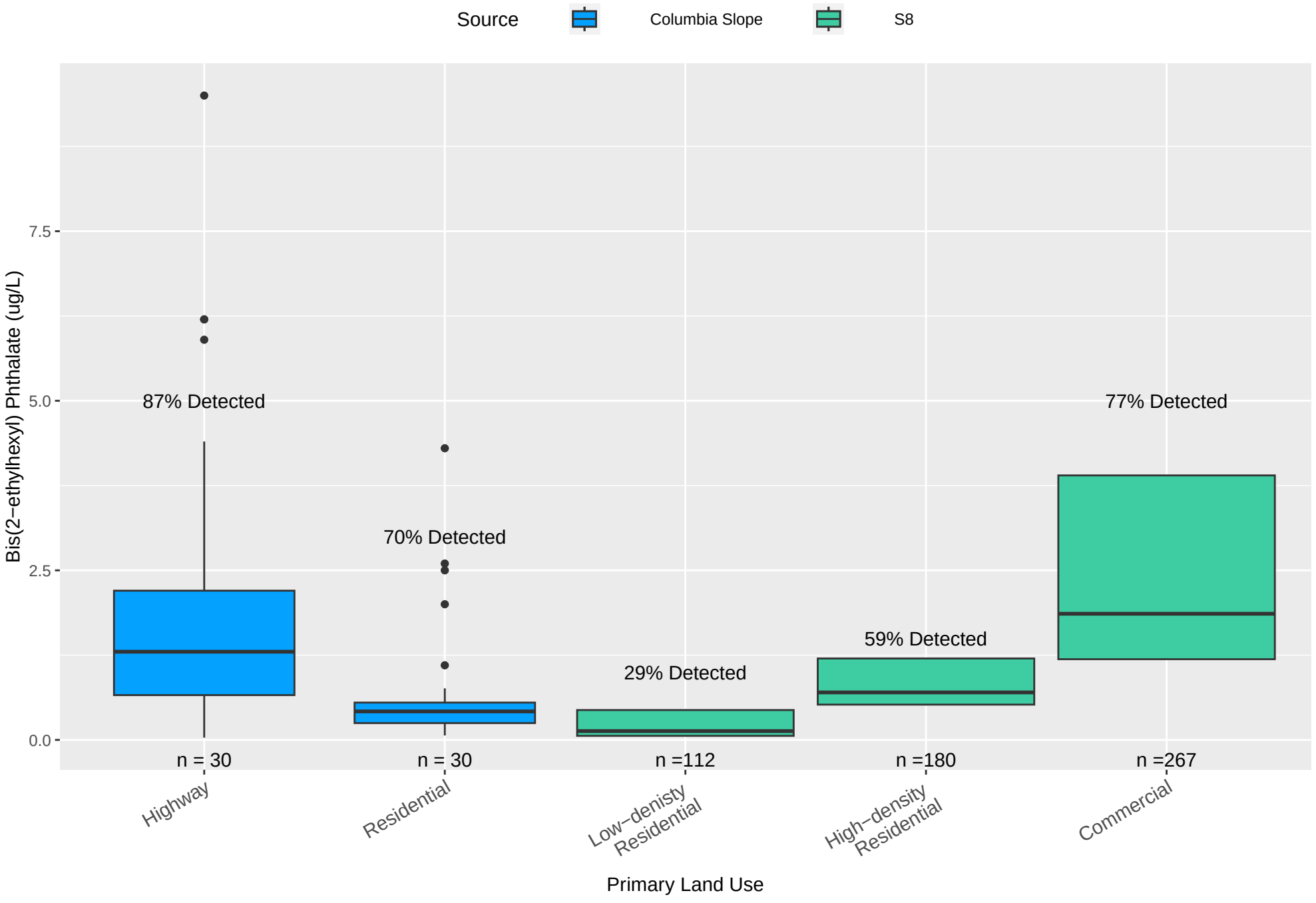

S8 Data from Ecology 2015

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Appendix C

Data Quality Review

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Appendix C: Data Quality Review

Contents

Tables

Introduction

The quality assurance review findings for monitoring data collected in water years (WY) 2023 through 2024 are summarized below. All data are valid and useable, with some values qualified as estimated. While the review resulted in rejection of *in situ* pH measurements for one monitoring event (see *Water Quality In Situ Measurement* and *Holding Times* sections below), useable pH data was obtained through laboratory measurements.

Field Data

Water Quality *In Situ* Measurements

The water quality meter was calibrated before each event, and a calibration check was conducted at the end of the event. All meter calibration checks in WY2023 through WY2024 were within 5 percent of the calibration standard.

In situ pH measurements collected on February 7, 2023, fluctuated substantially between sites and were outside of typical ranges for all monitoring stations. These results were flagged as rejected (R), and additional volume was submitted to the laboratory for pH measurement outside of holding time. These laboratory pH measurements were flagged as estimates (J) and reported instead of the rejected field measurements.

Discharge Measurements

Stream discharge measurements were calculated from field velocity and depth transects or with a calibrated bucket and timer. The following measurements were qualified as estimated (J):

- Two stream discharge *in situ* measurements from December 27, 2022, and January 12, 2023, were flagged due to environmental hazards (excessive large boulders, debris, high winds, overhead hazards, and upstream encampments). Equipment error and visually estimated velocity also interfered with accurate measurements.
- Four stream discharge *in situ* measurements from January 18, 2023, were flagged due to meter malfunctions, low flow depth, and irregular stream transect shape interfering with accurate velocity readings.
- One stream discharge *in situ* measurement from February 7, 2023, was flagged based on excessive large boulders, debris, ponding interference, and upstream encampments interfering with accurate velocity measurements.
- One stream discharge *in situ* measurement from March 13, 2023, was flagged due to velocity higher than appropriate for the bucket-timer method causing stormwater to partly splash out of the bucket.

- Four stream discharge *in situ* measurements from February 7, 2023, were flagged due to estimated velocity.
- One stream discharge *in situ* measurement from the March 24 and April 19 sampling events was flagged based on excessive large boulders, debris, and ponding interfering with accurate velocity measurements. Encampments around the upstream culvert made measurement at a different location infeasible.
- One stream discharge *in situ* measurement from April 6, 2023, was flagged due to large boulders, debris, and ponding interfering with accurate velocity measurements.
- Two stream discharge *in situ* measurement from April 27, 2023, were flagged based on low flow depths interfering with accurate velocity readings.
- Two stream discharge *in situ* measurements from May 18, 2023, were flagged based on low flow depths interfering with accurate velocity readings.
- Four stream discharge *in situ* measurement from July 27, 2023, were flagged based on low flow depths interfering with accurate velocity readings, the bucket splashing during measurement, and excessive bank vegetation interfering with accurate velocity readings.
- Four stream discharge *in situ* measurements from September 7, 2023, were flagged based on low flow and excessive bank vegetation interfering with accurate velocity readings.
- Four discharge results from October 18, 2023, were flagged based on estimated depth or velocity measurements due to low flow conditions.
- Three stream discharge *in situ* measurements from November 6, 2023, were flagged based on estimated depths or velocity.
- Two stream discharge *in situ* measurements from November 28, 2023, were flagged based on estimated depth or velocity measurements due to low flow depth.
- Four stream discharge *in situ* measurements from December 6, 2023, were flagged based on estimated depth or velocity measurements due to low flow depths.
- Three stream discharge measurements from January 24, 2024, were flagged based on estimated depth and velocity readings.
- Five stream discharge *in situ* measurements from February 15, 2024, were flagged based on excessive bank vegetation interfering with accurate velocity readings and estimated depth readings.
- One stream discharge *in situ* measurement from February 29, 2024, was flagged based on vegetation interfering with accurate velocity readings.

Laboratory Data

Measurement quality objectives are presented in Table A-1.

Table C-1. Summary of Measurement Quality Objectives and Required Reporting Limits of Field and Laboratory Parameters.

Parameter	Lab Duplicates (RPD[a])	Field Duplicates (RPD[a])	Control Sample (percent recovery)	Matrix Spike (percent recovery)	Reporting Limit
Field Measurements					
Temperature	NA	5	NA	NA	+0.2°C
pH	NA	5	NA	NA	+0.1 std. units
Dissolved Oxygen	NA	5	NA	NA	+0.2 mg/L
Specific Conductivity	NA	5	NA	NA	+2 µS/cm
Conventionals, Metals, and Bacteria					
Turbidity	<20	<20	90–110	NA	0.2 NTU
Total suspended solids	<20	<20	85–115	NA	1 mg/L
Nitrate+nitrite nitrogen	<20	<20	90–110	90–110	0.05 mg/L
Total nitrogen	<20	<20	70–130	70–130	0.2 mg/L
Total phosphorus	<20	<20	85–115	85–115	0.02 mg/L
Hardness as $CaCO_3$	<20	<20	90–120	90–120	2 mg/L
Chloride	<20	<20	90–110	90–110	0.1 mg/L
Total copper	<20	<20	85–115	85–115	0.1 µg/L
Total lead	<20	<20	85-115	NA	0.02 µg/L
Total zinc	<20	<20	85–115	NA	2 µg/L
E. coli bacteria	<35	<35	NA	NA	2 MPN/100 mL
Polycyclic Aromatic Hydrocarbons (PAHs)					
2-Methylnaphthalene	<30	<35	28–97	28–97	0.2 µg/L
Acenaphthene	<30	<35	49–102	49–102	0.2 µg/L
Acenaphthylene	<30	<35	49–104	49–104	0.2 µg/L
Anthracene	<30	<35	58–108	58–108	0.2 µg/L
Benzo(a)anthracene	<30	<35	66–106	66–106	0.2 µg/L
Benzo(a)pyrene	<30	<35	63–117	63–117	0.2 µg/L
Benzo(b)fluoranthene	<30	<35	61–113	61–113	0.2 µg/L
Benzo(g,h,i)perylene	<30	<35	58–116	58–116	0.2 µg/L
Benzo(k)fluoranthene	<30	<35	59–107	59–107	0.2 µg/L
Chrysene	<30	<35	64–108	64–108	0.2 µg/L
Dibenz(a,h)anthracene	<30	<35	62–115	62–115	0.2 µg/L
Fluoranthene	<30	<35	55–122	55–122	0.2 µg/L
Fluorene	<30	<35	54–105	54–105	0.2 µg/L
Indeno(1,2,3-cd)pyrene	<30	<35	57–121	57–121	0.2 µg/L
Naphthalene	<30	<35	40–95	40–95	0.2 µg/L
Phenanthrene	<30	<35	58–107	58–107	0.2 µg/L
Pyrene	<30	<35	59–115	59–115	0.2 µg/L

Table A-1 (continued). Summary of Measurement Quality Objectives and Required Reporting Limits of Field and Laboratory Parameters.					
Parameter	**Lab Duplicates (RPD[a])**	**Field Duplicates (RPD[a])**	**Control Sample (percent recovery)**	**Matrix Spike (percent recovery)**	**Reporting Limit**
Phthalates					
Bis(2-ethylhexyl) Phthalate	<30	<35	42–147	42–147	1 µg/L
Butyl Benzyl Phthalate	<30	<35	59–119	59–119	0.2 µg/L
Diethyl Phthalate	<30	<35	58–114	58–114	0.2 µg/L
Dimethyl Phthalate	<30	<35	58–109	58–109	0.2 µg/L
Di-n-butyl Phthalate	<30	<35	61–121	61–121	0.2 µg/L
Di-n-octyl Phthalate	<30	<35	50–125	50–125	0.2 µg/L
Chlorinated Organics					
1,2,4-Trichlorobenzene	<30	<35	27–88	27–88	0.2 µg/L
1,2-Dichlorobenzene	<30	<35	26–86	26–86	0.2 µg/L
1,3-Dichlorobenzene	<30	<35	22–82	22–82	0.2 µg/L
1,4-Dichlorobenzene	<30	<35	24–82	24–82	0.2 µg/L
2,2'-Oxybis(1-chloropropane)	<30	<35	34–114	34–114	0.2 µg/L
2,4,5-Trichlorophenol	<30	<35	51–116	51–116	0.5 µg/L
2,4,6-Trichlorophenol	<30	<35	51–114	51–114	0.5 µg/L
2,4-Dichlorophenol	<30	<35	50–115	50–115	0.5 µg/L
2-Chloronaphthalene	<30	<35	43–99	43–99	0.2 µg/L
2-Chlorophenol	<30	<35	48–112	48–112	0.5 µg/L
3,3'-Dichlorobenzidine	<30	<35	10–131	10–131	2.0 µg/L
4-Chloro-3-methylphenol	<30	<35	45–120	45–120	0.5 µg/L
4-Chloroaniline	<30	<35	10–129	10–129	0.2 µg/L
4-Chlorophenyl Phenyl Ether	<30	<35	48–108	48–108	0.2 µg/L
Bis(2-chloroethoxy)methane	<30	<35	46–112	46–112	0.2 µg/L
Bis(2-chloroethyl) Ether	<30	<35	42–111	42–111	0.2 µg/L
Hexachlorobenzene	<30	<35	50–112	50–112	0.2 µg/L
Hexachlorobutadiene	<30	<35	10–83	10–83	0.2 µg/L
Hexachlorocyclopentadiene	<30	<35	10–51	10–51	1.0 µg/L
Hexachloroethane	<30	<35	10–85	10–85	0.2 µg/L
Pentachlorophenol	<30	<35	27–112	27–112	1.0 µg/L
Other Semivolatile Organic compounds (SVOCs)					
1,2-Diphenylhydrazine	<30	<35	41–121	41–121	0.2 µg/L
2,4-Dimethylphenol	<30	<35	10–152	10–152	4.0 µg/L
2,4-Dinitrophenol	<30	<35	24–125	24–125	4.0 µg/L
2,4-Dinitrotoluene	<30	<35	56–120	56–120	0.2 µg/L

Table A-1 (continued). Summary of Measurement Quality Objectives and Required Reporting Limits of Field and Laboratory Parameters.

Parameter	Lab Duplicates (RPD[a])	Field Duplicates (RPD[a])	Control Sample (percent recovery)	Matrix Spike (percent recovery)	Reporting Limit
Other Semivolatile Organic compounds (SVOCs) (continued)					
2,6-Dinitrotoluene	<30	<35	54–115	54–115	0.2 µg/L
2-Methyl-4,6-dinitrophenol	<30	<35	26–136	26–136	2.0 µg/L
2-Methylphenol	<30	<35	45–114	45–114	0.5 µg/L
2-Nitroaniline	<30	<35	52–121	52–121	0.2 µg/L
2-Nitrophenol	<30	<35	48–116	48–116	0.5 µg/L
3-Nitroaniline	<30	<35	48–116	48–116	1.0 µg/L
4-Bromophenyl Phenyl Ether	<30	<35	50–112	50–112	0.2 µg/L
4-Methylphenol	<30	<35	44–120	44–120	0.5 µg/L
4-Nitroaniline	<30	<35	50–118	50–118	1.0 µg/L
4-Nitrophenol	<30	<35	30–149	30–149	2.0 µg/L
Azobenzene	<30	<35	41–121	41–121	0.2 µg/L
Benzoic Acid	<30	<35	10–86	10–86	5.0 µg/L
Benzyl Alcohol	<30	<35	38–124	38–124	0.5 µg/L
Carbazole	<30	<35	57–112	57–112	0.2 µg/L
Dibenzofuran	<30	<35	51–102	51–102	0.2 µg/L
Isophorone	<30	<35	47–113	47–113	0.2 µg/L
Nitrobenzene	<30	<35	43–120	43–120	0.2 µg/L
N-Nitrosodi-n-propylamine	<30	<35	42–118	42–118	0.2 µg/L
N-Nitrosodiphenylamine	<30	<35	54–115	54–115	0.2 µg/L
Phenol	<30	<35	45–112	45–112	0.5 µg/L
Organochlorine Pesticides					
2,4-Dichlorodiphenyl-dichloroethane (DDD)	<30	<35	28–173	28–173	1 ng/L
2,4-Dichlorodiphenyl-dichloroethylene (DDE)	<30	<35	37–182	37–182	1 ng/L
2,4-Dichlorodiphenyl-trichloroethane (DDT)	<30	<35	29–179	29–179	1 ng/L
4,4-DDD	<30	<35	73–173	73–173	1 ng/L
4,4-DDE	<30	<35	70–169	70–169	1 ng/L
4,4-DDT	<30	<35	72–174	72–174	1 ng/L
Aldrin	<30	<35	54–163	54–163	1 ng/L
alpha-Benzene hexachloride (BHC)	<30	<35	71–165	71–165	1 ng/L
alpha-Chlordane	<30	<35	62–173	62–173	1 ng/L

Table A-1 (continued). Summary of Measurement Quality Objectives and Required Reporting Limits of Field and Laboratory Parameters.					
Parameter	**Lab Duplicates (RPD[a])**	**Field Duplicates (RPD[a])**	**Control Sample (percent recovery)**	**Matrix Spike (percent recovery)**	**Reporting Limit**
Organochlorine Pesticides (continued)					
beta-BHC	<30	<35	58–159	58–159	1 ng/L
Chlordane	<30	<35	27–172	27–172	20 ng/L
Chlorpyrifos	<30	<35	70–153	70–153	1 ng/L
cis-Nonachlor	<30	<35	62–142	62–142	1 ng/L
delta-BHC	<30	<35	65–162	65–162	1 ng/L
Dieldrin	<30	<35	60–166	60–166	1 ng/L
Endosulfan I	<30	<35	36–172	36–172	1 ng/L
Endosulfan II	<30	<35	33–184	33–184	1 ng/L
Endosulfan Sulfate	<30	<35	58–161	58–161	1 ng/L
Endrin	<30	<35	66–178	66–178	1 ng/L
Endrin Aldehyde	<30	<35	45–171	45–171	1 ng/L
Endrin Ketone	<30	<35	51–165	51–165	1 ng/L
gamma-BHC (Lindane)	<30	<35	67–172	67–172	1 ng/L
gamma-Chlordane	<30	<35	67–168	67–168	1 ng/L
Heptachlor	<30	<35	61–178	61–178	1 ng/L
Heptachlor Epoxide	<30	<35	59–163	59–163	1 ng/L
Hexachlorobenzene	<30	<35	52–132	52–132	1 ng/L
Hexachlorobutadiene	<30	<35	34–139	34–139	1 ng/L
Hexachloroethane	<30	<35	31–134	31–134	1 ng/L
Isodrin	<30	<35	65–155	65–155	1 ng/L
Methoxychlor	<30	<35	65–183	65–183	2 ng/L
Mirex	<30	<35	54–134	54–134	1 ng/L
Oxychlordane	<30	<35	54–134	54–134	1 ng/L
Toxaphene	<30	<35	66–154	66–154	100 ng/L
trans-Nonachlor	<30	<35	63–144	63–144	1 ng/L

MPN = most probable number
µS/cm = microsiemens per centimeter
mg/L = milligrams per liter
µg/L = micrograms per liter
NA = not applicable
NTU = nephelometric turbidity unit

[a] RPD = Relative percent difference, or within two reporting limits if a value is less than five times the reporting limit

Completeness

As noted in the *Data Collection Methods* section of the main report, all scheduled samples were collected, and the laboratory reported all parameters for all samples.

Methodology

The laboratories met all analytical method requirements specified in the QAPP (Herrera 2019a[1]). The following result was flagged as an estimate (J) due to method limitations:

- One *Escherichia coli* (*E. coli*) result from February 29, 2024, was flagged based on the result exceeding the upper quantitation limit of 2,419.6 MPN/100 mL.
- Hexachlorobenzene and pyrene via EPA 8270D and 2,4′-DDD, 4,4′-DDD, 4,4′-DDT, hexachlorobenzene, hexachlorobutadiene, and hexachloroethane via EPA 8081B results for all monitoring stations from February 29, 2024, were flagged qualified as estimated (J) based on lapse in ORELAP accreditation for the analytes by ALS Kelso at the time of analysis.

Holding Times

All holding times specified in the QAPP were met with the following exceptions:

- Six organochlorine pesticide results from December 27, 2022, and January 12, 2023, were flagged based on the extraction holding time (45 days versus the objective of ≤14 days). Initial sample extraction was performed within the recommended holding time but, due to emulsions affecting the extracts, were re-extracted past the recommended holding time.
- All organochlorine pesticide results via EPA 8081B for all samples from January 18, 2023, were flagged based on the extraction holding time (30 to 70 days versus the objective of ≤7 days).
- One total Kjeldahl nitrogen result from March 24 and April 19, 2023, was flagged based on the analytical holding time (61 days versus the objective of 28 days). The sample was originally analyzed within holding time but was reanalyzed due to an anomalously high result (the original result was reported as 1,050 mg/L, and the reanalyzed result was reported as 0.54 mg/L). Results from the reanalysis are reported.
- One dieldrin result from November 6, 2023, was flagged based on holding time exceedance (45 days versus the objective of 40 days).
- All semivolatile organic compound results via EPA method 8270D at one station from January 9, 2024, were flagged due to the extraction holding time (9 days versus the objective of ≤7 days).
- All organochlorine pesticides via EPA 8081B from February 29, 2024, were flagged based on the extraction holding time (22 days versus the objective of ≤7 days). The sample was initially extracted within holding time but had to be reanalyzed due to laboratory QA issues.

[1] Citations refer to the *References* section of the main report.

- As noted in the Field data section above, *in situ* pH measurements collected on February 7, 2023 were rejected (R) and additional volume was submitted to the laboratory for pH measurement outside of holding time. These laboratory pH measurements were flagged as estimates (J) and reported instead of the rejected field measurements.

All results with holding time exceedances were flagged as estimated (J flag) unless otherwise noted.

Blanks

The following samples were qualified as estimated (J) due to detections in the method blanks.

- Five bis(2-ethylhexyl) phthalate results from December 27, 2022, and January 12, 2023, were flagged based on concentrations within five times of the de facto reporting limit. A de facto reporting limit of 1.7 µg/L was adopted (versus the laboratory reporting limit of 0.5 µg/L) due to a detection in the method blank at this higher concentration.
- Six hexachlorobutadiene results from January 18, 2023, were flagged based on sample results within five times the de facto reporting limit. The analyte was detected above the reporting limit in the associated method blank (2.4 ng/L).
- Five bis(2-ethylheyxl) phthalate results from February 7, 2023, were flagged as undetected (U) based on sample results below the de facto reporting limit and two results from the same date were flagged as estimated (J) based on sample results within five times the de facto reporting limit. The analyte was detected above the reporting limit in the associated method blank (1.1 µg/L).
- Four butyl benzyl phthalate results from February 7, 2023, were flagged based on sample results within five times the de facto reporting limit. The analyte was detected above the reporting limit in the associated method blank (0.21 µg/L).

Laboratory Control Standards

The following samples were qualified as estimated (J) due to laboratory control sample (LCS) percent recovery or LCS and LCS duplicate relative percent difference (RPD).

- Six 2,4-dimethylphenol and 2,4-dinitrophenol results from December 27, 2022, and January 12, 2023, were estimated due to low LCS percent recovery and, for 2,4-dinitrophenol, exceedance of the lower continuing calibration verification criterion indicating potential low bias.
- All 3,3'-dichlorobenzidine and 2,4-dinitrophenol results from December 27, 2022, and January 12, 2023, were flagged due to exceedance of the lower continuing calibration verification criteria and low LCS percent recovery indicating potential low bias.
- All chlorpyrifos and mirex results for one station from December 27, 2022, and January 12, 2023, were qualified as estimated (J) due to low LCS percent recovery and high LCS duplicate relative percent difference (69 and 70 percent versus the objective of ≤30).
- 3,3'-Dichlorobenzidine results for all samples from January 18, 2023, were flagged based on LCS percent recovery (0 percent versus the objective of 10 to 131 percent).

- Six delta-BHC, toxaphene, and chlordane results from January 18, 2023, were flagged based on high LCS and duplicate LCS relative percent difference (61, 84, and 85 percent, respectively, versus the objective of ≤30 percent).
- 3,3'-Dichlorobenzidine results for all samples from February 7, 2023, were flagged based on low LCS and LCS duplicate percent recoveries (0 percent versus the objective of 10 to 131 percent) indicating potential low bias.
- All benzoic acid and 2,4-dinitrophenol results via EPA method 8081B from February 15, 2024, were flagged due to the LCS recovery exceeding the lower control criteria indicating potential low bias.
- Two 4-chloroanaline results via EPA 8270D from March 24 and April 19, 2023, were flagged based on the LCS and LCS duplicate RPD (126 percent versus the objective of ≤30 percent).
- Hexachlorobutadiene and hexachloroethane results via EPA 8081B from March 24 and April 19, 2023, were flagged based on the LCS and LCS duplicate recoveries (6 to 14 percent versus the lower control criterion of 16 percent) and the LCS and LCS duplicate RPD (38 to 46 percent versus the objective of ≤30 percent).
- Results for bis(2-ethylhexyl) phthalate via EPA 8270D from April 6, 2023, was flagged based on LCS recovery (191 percent versus the objective of 42 to 147 percent) and the LCS and LCS duplicate RPD (43 percent versus the objective of ≤30 percent).
- All 2,4'-DDx isomers via EPA method 8081B from January 24, 2024, were qualified as estimated non-detects (UJ) due to the LCS recovery exceeding the lower control criteria indicating potential low bias.

Laboratory Calibration Verification

The following samples were qualified as estimated (J) due to laboratory analytical equipment calibration or performance results.

- All 3,3'-dichlorobenzidine and 2,4-dinitrophenol results from December 27, 2022, and January 12, 2023, were flagged due to exceedance of the lower continuing calibration verification criteria (CCV) and low LCS percent recovery indicating potential low bias.
- Benzoic acid, bis(2-chloroethoxy)methane, 4,6-dinitro-2-methylphenol, 2,4-dinitrophenol,isophrone, 4-methylphenol, 4-nitrophenol, 2,2'-oxybis(1-chloropropane), and pentachlorophenol results for all samples from January 18, 2023, were flagged due to exceeding the CCV lower control criterion indicating potential low bias.
- Pyrene results for all samples from February 7, 2023, were flagged due to exceeding the CCV lower control criterion indicating potential low bias.
- All OC pesticide results via EPA 8081B from except chlordane and toxaphene from March 24 and April 19, 2023, were flagged based on internal standard recovery of 1-bromo-2-nitrobenzene outside instrument calibration criteria.

Matrix Spikes

All matrix spike samples met the established control limits (see Table A-1).

Laboratory Duplicates

All laboratory duplicate samples met the established control limits specified in the QAPP, with the following exceptions flagged as estimated (J):

- The RPD values for 4-chloroaniline for the laboratory duplicate collected on February 7, 2023 (103 percent) exceeded the 30 percent criterion.
- The RPD values for hexachlorobutadiene for the laboratory duplicate collected on February 7, 2023 (84 percent) exceeded the 30 percent criterion.

Field Duplicates

One field duplicate sample was collected during each sampling event, as specified in the QAPP. Results were flagged as estimate (J) due to field duplicate criteria exceedance most frequently for bacteria. The following results were flagged as estimated due to field duplicate RPD or difference exceedances greater than those specified in the QAPP:

- Two specific conductance *in situ* measurements from January 18, 2023, were flagged based on the field duplicate RPD (13 percent versus the objective of ≤5 percent).
- One total nitrogen result from May 18, 2023, and the associated duplicate were flagged based on the field duplicate difference (0.44 mg/L versus the objective of 0.4 mg/L) for total Kjeldahl nitrogen (used to calculate total nitrogen).
- One *E. coli* result from July 27, 2023, was flagged based on the field duplicate RPD (59 percent versus the objective of ≤35 percent).
- One TSS result from September 7, 2023, was flagged based on the field duplicate RPD (30 percent versus the objective of 20 percent).
- One *E. coli* result from September 7, 2023, was flagged based on the field duplicate RPD (49 percent versus the objective of ≤35 percent).
- One turbidity result from November 28, 2023, and the associated duplicate were flagged based on the field duplicate difference (0.45 NTU versus the objective of 0.4 NTU).

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Appendix D

Metals and Organics Exceedance Tables

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Table D-1. Metals Water Quality Criteria Exceedances.							
Station	Date	Type	Parameter	Result (µg/L)	Hardness (mg/L)	Criteria Type	Criteria Value (µg/L)
CSA1	11/6/2023	Storm	Copper	6.74	35.1	Acute	6.35
CSBMP1_IN	1/18/2023	Storm	Copper	4.09	12.8	Acute	2.45
CSE1	12/27/2022	Storm	Copper	6.43	28.4	Acute	5.20
CSE1	11/6/2023	Storm	Copper	7.22	38.8	Acute	6.97
CSE1	12/6/2023	Storm	Copper	6.47	34.6	Acute	6.26
CSE2	12/6/2023	Storm	Copper	6.65	33.1	Acute	6.00
CSE3	1/9/2024	Storm	Copper	3.31	16.7	Acute	3.15
CSO1	2/28/2022	Storm	Copper	7.01	30.0	Acute	5.47
CSP1	2/28/2022	Storm	Copper	6.63	8.0	Acute	1.58
CSP1	12/27/2022	Storm	Copper	6.82	13.2	Acute	2.53
CSP1	1/18/2023	Storm	Copper	2.81	14.4	Acute	2.74
CSP1	4/6/2023	Storm	Copper	6.10	26.4	Acute	4.85
CSQ1	1/18/2023	Storm	Copper	6.28	18.0	Acute	3.38
CSQ1	12/6/2023	Storm	Copper	4.83	25.3	Acute	4.66
CSR1	2/28/2022	Storm	Copper	5.95	30.0	Acute	5.47
CSR1	12/6/2023	Storm	Copper	3.70	17.1	Acute	3.22
CSWSDOT1	12/9/2021	Storm	Copper	21.7	58.0	Acute	10.19
CSWSDOT1	12/27/2022	Storm	Copper	6.63	16.0	Acute	3.03
CSWSDOT1	3/13/2023	Storm	Copper	6.53	31.6	Acute	5.75
CSWSDOT2	11/4/2021	Storm	Copper	25.9	20.0	Acute	3.74
CSWSDOT2	12/15/2021	Storm	Copper	15.8	48.0	Acute	8.52
CSWSDOT2	1/3/2022	Storm	Copper	8.00	10.0	Acute	1.94
CSWSDOT2	1/20/2022	Storm	Copper	32.5	24.0	Acute	4.44
CSWSDOT2	2/28/2022	Storm	Copper	73.4	16.7	Acute	3.15
CSWSDOT2	3/2/2022	Storm	Copper	10.9	24.0	Acute	4.44
CSWSDOT3	10/26/2021	Storm	Copper	36.5	36.0	Acute	6.50
CSWSDOT3	12/9/2021	Storm	Copper	7.96	42.0	Acute	7.51
CSWSDOT3	1/3/2022	Storm	Copper	6.57	32.0	Acute	5.82
CSWSDOT3	1/20/2022	Storm	Copper	50.3	24.0	Acute	4.44
CSWSDOT3	2/28/2022	Storm	Copper	19.0	20.0	Acute	3.74
CSWSDOT3	3/2/2022	Storm	Copper	8.83	12.0	Acute	2.31
CSWSDOT4	12/27/2022	Storm	Copper	6.35	31.2	Acute	5.68
CSWSDOT4	2/7/2023	Storm	Copper	11.8	36.0	Acute	6.50
CSWSDOT4	3/13/2023	Storm	Copper	17.5	6.4	Acute	1.28

CSWSDOT4	4/6/2023	Storm	Copper	11.3	36.0	Acute	6.50
CSWSDOT4	11/6/2023	Storm	Copper	12.7	24.5	Acute	4.52
CSWSDOT4	12/6/2023	Storm	Copper	6.33	35.0	Acute	6.33
CSWSDOT5	1/18/2023	Storm	Copper	15.9	29.6	Acute	5.40
CSWSDOT5	2/7/2023	Storm	Copper	18.4	18.8	Acute	3.52
CSWSDOT5	3/13/2023	Storm	Copper	9.24	24.4	Acute	4.50
CSWSDOT5	3/24/2023	Storm	Copper	18.8	14.8	Acute	2.81
CSWSDOT5	4/6/2023	Storm	Copper	9.91	44.0	Acute	7.85
CSWSDOT2	2/28/2022	Storm	Lead	19.5	16.7	Acute	8.80
CSWSDOT4	3/13/2023	Storm	Lead	5.27	6.4	Acute	2.94
CSA1	11/6/2023	Storm	Zinc	176	35.1	Acute	47.14
CSA1	1/9/2024	Storm	Zinc	126	64.2	Acute	78.62
CSA1	2/15/2024	Storm	Zinc	95.3	69.4	Acute	83.98
CSBMP1_IN	12/27/2022	Storm	Zinc	81.0	47.6	Acute	61.02
CSBMP1_IN	1/18/2023	Storm	Zinc	76.6	12.8	Acute	20.05
CSBMP1_IN	2/7/2023	Storm	Zinc	499	28.4	Acute	39.39
CSBMP1_IN	3/13/2023	Storm	Zinc	56.7	22.0	Acute	31.73
CSBMP1_IN	3/24/2023	Storm	Zinc	69.2	20.0	Acute	29.27
CSBMP1_IN	4/6/2023	Storm	Zinc	76.1	40.0	Acute	52.65
CSBMP1_OUT	12/27/2022	Storm	Zinc	45.6	20.0	Acute	29.27
CSBMP1_OUT	3/13/2023	Storm	Zinc	40.8	22.4	Acute	32.22
CSE3	1/9/2024	Storm	Zinc	142	16.7	Acute	25.12
CSL1	2/7/2023	Storm	Zinc	89.6	54.4	Acute	68.32
CSL1	12/6/2023	Storm	Zinc	74.7	46.7	Acute	60.04
CSL1	2/15/2024	Storm	Zinc	157	44.6	Acute	57.74
CSO1	2/28/2022	Storm	Zinc	67.6	30.0	Acute	41.26
CSO1	12/27/2022	Storm	Zinc	54.0	30.4	Acute	41.73
CSO1	3/13/2023	Storm	Zinc	43.3	23.2	Acute	33.19
CSO1	11/6/2023	Storm	Zinc	57.9	29.4	Acute	40.56
CSO1	12/6/2023	Storm	Zinc	55.4	21.8	Acute	31.48
CSP1	10/26/2021	Storm	Zinc	100	60.0	Acute	74.24
CSP1	2/28/2022	Storm	Zinc	56.5	8.0	Acute	13.46
CSP1	12/27/2022	Storm	Zinc	79.8	13.2	Acute	20.58
CSP1	1/18/2023	Storm	Zinc	65.6	14.4	Acute	22.16
CSP1	2/7/2023	Storm	Zinc	155	22.8	Acute	32.70
CSP1	3/13/2023	Storm	Zinc	58.4	35.6	Acute	47.70
CSP1	3/24/2023	Storm	Zinc	62.0	28.4	Acute	39.39

CSP1	4/6/2023	Storm	Zinc	66.5	26.4	Acute	37.03
CSP1	11/6/2023	Storm	Zinc	110	55.1	Acute	69.07
CSP1	12/6/2023	Storm	Zinc	104	19.5	Acute	28.65
CSP1	1/9/2024	Storm	Zinc	49.5	28.0	Acute	38.92
CSQ1	1/18/2023	Storm	Zinc	61.0	18.0	Acute	26.77
CSQ1	3/13/2023	Storm	Zinc	41.1	23.2	Acute	33.19
CSQ1	3/24/2023	Storm	Zinc	41.7	25.2	Acute	35.60
CSQ1	12/6/2023	Storm	Zinc	54.1	25.3	Acute	35.72
CSR2	12/9/2021	Storm	Zinc	196	24.0	Acute	34.16
CSWSDOT1	12/9/2021	Storm	Zinc	175	58.0	Acute	72.14
CSWSDOT1	12/27/2022	Storm	Zinc	51.8	16.0	Acute	24.22
CSWSDOT1	3/13/2023	Storm	Zinc	54.9	31.6	Acute	43.12
CSWSDOT2	11/4/2021	Storm	Zinc	95.4	20.0	Acute	29.27
CSWSDOT2	12/15/2021	Storm	Zinc	152	48.0	Acute	61.45
CSWSDOT2	1/3/2022	Storm	Zinc	39.7	10.0	Acute	16.27
CSWSDOT2	1/20/2022	Storm	Zinc	157	24.0	Acute	34.16
CSWSDOT2	2/28/2022	Storm	Zinc	374	16.7	Acute	25.12
CSWSDOT2	3/2/2022	Storm	Zinc	47.6	24.0	Acute	34.16
CSWSDOT3	10/26/2021	Storm	Zinc	239	36.0	Acute	48.16
CSWSDOT3	1/20/2022	Storm	Zinc	294	24.0	Acute	34.16
CSWSDOT3	2/28/2022	Storm	Zinc	96.0	20.0	Acute	29.27
CSWSDOT3	3/2/2022	Storm	Zinc	40.4	12.0	Acute	18.98
CSWSDOT4	2/7/2023	Storm	Zinc	66.5	36.0	Acute	48.16
CSWSDOT4	3/13/2023	Storm	Zinc	102	6.4	Acute	11.15
CSWSDOT4	4/6/2023	Storm	Zinc	53.9	36.0	Acute	48.16
CSWSDOT4	11/6/2023	Storm	Zinc	71.5	24.5	Acute	34.76
CSWSDOT5	1/18/2023	Storm	Zinc	67.5	29.6	Acute	40.80
CSWSDOT5	2/7/2023	Storm	Zinc	86.7	18.8	Acute	27.77
CSWSDOT5	3/13/2023	Storm	Zinc	39.1	24.4	Acute	34.64
CSWSDOT5	3/24/2023	Storm	Zinc	72.9	14.8	Acute	22.68

mg/L: Milligrams per liter
ug/L: Micrograms per liter

Table D-2. Organics Criteria Exceedances.						
Station	**Date**	**Type**	**Parameter**	**Result**	**Unit**	**PAL**
CSAA1	3/13/2023	Storm	Benz(a)anthracene	0.32	ug/L	0.2
CSA1	11/6/2023	Storm	Benzo(b)fluoranthene	0.24	ug/L	0.2
CSAA1	3/13/2023	Storm	Benzo(b)fluoranthene	0.43	ug/L	0.2
CSAA1	3/24/2023	Storm	Benzo(b)fluoranthene	0.24	ug/L	0.2
CSAA1	4/6/2023	Storm	Benzo(b)fluoranthene	0.25	ug/L	0.2
CSWSDOT4	4/6/2023	Storm	Benzo(b)fluoranthene	0.22	ug/L	0.2
CSAA1	12/27/2022	Storm	Bis(2-ethylhexyl) Phthalate	2	ug/L	1
CSH1	12/27/2022	Storm	Bis(2-ethylhexyl) Phthalate	21	ug/L	1
CSL1	12/27/2022	Storm	Bis(2-ethylhexyl) Phthalate	1.7	ug/L	1
CSQ1	12/27/2022	Storm	Bis(2-ethylhexyl) Phthalate	2.4	ug/L	1
CSWSDOT1	12/9/2021	Storm	Bis(2-ethylhexyl) Phthalate	4.3	ug/L	1
CSWSDOT1	12/27/2022	Storm	Bis(2-ethylhexyl) Phthalate	2.6	ug/L	1
CSWSDOT1	3/13/2023	Storm	Bis(2-ethylhexyl) Phthalate	2.5	ug/L	1
CSWSDOT1	4/6/2023	Storm	Bis(2-ethylhexyl) Phthalate	1.1	ug/L	1
CSWSDOT2	11/4/2021	Storm	Bis(2-ethylhexyl) Phthalate	2.9	ug/L	1
CSWSDOT2	12/15/2021	Storm	Bis(2-ethylhexyl) Phthalate	2.2	ug/L	1
CSWSDOT2	1/3/2022	Storm	Bis(2-ethylhexyl) Phthalate	1.3	ug/L	1
CSWSDOT2	1/20/2022	Storm	Bis(2-ethylhexyl) Phthalate	5.9	ug/L	1
CSWSDOT2	2/28/2022	Storm	Bis(2-ethylhexyl) Phthalate	9.5	ug/L	1
CSWSDOT3	10/26/2021	Storm	Bis(2-ethylhexyl) Phthalate	6.2	ug/L	1
CSWSDOT3	1/20/2022	Storm	Bis(2-ethylhexyl) Phthalate	4.4	ug/L	1
CSWSDOT3	2/28/2022	Storm	Bis(2-ethylhexyl) Phthalate	1.9	ug/L	1
CSWSDOT4	12/27/2022	Storm	Bis(2-ethylhexyl) Phthalate	2.4	ug/L	1
CSWSDOT4	2/7/2023	Storm	Bis(2-ethylhexyl) Phthalate	1.5	ug/L	1
CSWSDOT4	3/13/2023	Storm	Bis(2-ethylhexyl) Phthalate	6.2	ug/L	1
CSWSDOT4	4/6/2023	Storm	Bis(2-ethylhexyl) Phthalate	1.8	ug/L	1
CSWSDOT4	11/6/2023	Storm	Bis(2-ethylhexyl) Phthalate	1.3	ug/L	1
CSWSDOT5	1/18/2023	Storm	Bis(2-ethylhexyl) Phthalate	2.1	ug/L	1
CSWSDOT5	2/7/2023	Storm	Bis(2-ethylhexyl) Phthalate	2.1	ug/L	1
CSWSDOT5	3/24/2023	Storm	Bis(2-ethylhexyl) Phthalate	2.2	ug/L	1
CSAA1	1/18/2023	Storm	Butyl Benzyl Phthalate	0.23	ug/L	0.2
CSAA1	2/7/2023	Storm	Butyl Benzyl Phthalate	0.22	ug/L	0.2
CSH1	2/7/2023	Storm	Butyl Benzyl Phthalate	0.21	ug/L	0.2
CSWSDOT1	1/18/2023	Storm	Butyl Benzyl Phthalate	0.22	ug/L	0.2
CSWSDOT1	2/7/2023	Storm	Butyl Benzyl Phthalate	0.21	ug/L	0.2
CSWSDOT5	2/7/2023	Storm	Butyl Benzyl Phthalate	0.24	ug/L	0.2
CSAA1	3/13/2023	Storm	Chrysene	0.33	ug/L	0.2
CSR1	10/26/2021	Storm	Hexachlorobenzene-OP	2	ng/L	1
CSWSDOT3	12/9/2021	Storm	Hexachlorobenzene-OP	3	ng/L	1
CSE1	12/9/2021	Storm	N-Nitrosodi-n-propylamine	0.25	ug/L	0.2
CSWSDOT2	11/4/2021	Storm	N-Nitrosodi-n-propylamine	19	ug/L	0.2
CSWSDOT2	12/15/2021	Storm	N-Nitrosodi-n-propylamine	6.9	ug/L	0.2

CSF1	1/20/2022	Storm	alpha-BHC	1.1	ng/L	1
CSJ1	1/20/2022	Storm	alpha-BHC	1.1	ng/L	1
CSO1	1/20/2022	Storm	alpha-BHC	1.1	ng/L	1
CSWSDOT1	1/20/2022	Storm	alpha-BHC	2.2	ng/L	1
CSR1	10/26/2021	Storm	beta-BHC	1.7	ng/L	1.3
CSWSDOT3	10/26/2021	Storm	beta-BHC	11	ng/L	1.3

BHC: Benzene hexachloride
ng/L: Nanograms per liter
PAL: Project action limit
ug/L: Micrograms per liter