Renew Harbor Island

Background Statistical Certification Report

For Compliance with CCR Rule and the Michigan Part 115 Solid Waste Management Rules
Former J.B. Sims Generation Station

City of Grand Haven
December 11, 2023

City of Grand Haven

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Table of Abbreviations and Acronyms

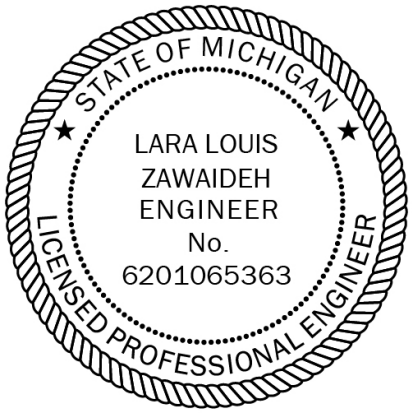
Abbreviation	Definition
BDL	below detection limits
BTV	background threshold value
CCR	Coal Combustion Residuals
COI	constituent of interest
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EPA	Environmental Protection Agency
GPS	groundwater protection standard
MDL	method detection limit
ND	non-detects
SOP	Standard Operating Procedure
SSI	statistically significant increase
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UPL	upper prediction limit
UTL	upper tolerance limit

Certification

Background Water Quality Statistical Certification for Compliance with the Coal Combustion Residuals Rule and Part 115 Solid Waste Management Rules

I hereby certify to the best of my knowledge that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR management area.

I am duly licensed Professional Engineer under the laws of the State of Michigan.



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1.0 Introduction

The U.S. Environmental Protection Agency's (EPA's) final Coal Combustion Residuals (CCR) Rule establishes a comprehensive set of requirements for the management and disposal of CCR (or coal ash) in landfills and surface impoundments by electric utilities. The former JB Sims Generating Station (facility or Site) was a coal-fired power generation facility formerly operated by Grand Haven Board of Light and Power (GHBLP) on Harbor Island (**Figure 1**). The facility is located at 1231 North 3rd Street, on Harbor Island, in Grand Haven, Michigan. The former coal-fired power generation facility ceased operations in February 2020. Coal Combustion Residuals (CCR) generated at the former generating station are stored in two CCR units: (1) the inactive Units 1/2 Impoundment and (2) the former Unit 3A/B Impoundments (**Figure 2**). The two CCR impoundments are subject to the CCR Rule. Part §257.93 of the Rule requires that a certification be obtained from a professional engineer describing the statistical method selected to evaluate the groundwater monitoring data at the facility.

The State of Michigan has legislation requiring that CCR impoundments be permitted under Part 115 Solid Waste Management. The two CCR impoundments are regulated under Part 115. Pursuant to Part 115, R 299.4907(7), background groundwater quality must be established following the statistical procedure in R 299.4908. Therefore, this Background Water Quality Statistical Certification describes the statistical methods selected to evaluate the groundwater monitoring data at Harbor Island in compliance with both the federal CCR Rule and the Michigan Part 115 regulations.

The objective of this report is to document the selection of the statistical method for each Appendix III and IV constituent of interest (COI) for each CCR unit. At this Site, groundwater monitoring has been conducted to collect eight rounds of background sampling as specified under CCR Rule Part §257.94. The water quality data collected from the monitoring wells located upgradient of the CCR units has been compiled and statistically analyzed to develop the original background threshold values (BTVs) for the impoundments. The statistical method chosen to represent background water quality is the upper prediction limit (UPL) and is one of the methods described in the CCR Rule Part §257.93 (f)(3) and Part 115 R 299.4908. This background water quality report documents the background sample events and describes the statistics performed to develop the BTVs.

2.0 Facility Description

The former CCR Unit 3A/B Impoundments were engineered, clay-lined, above-ground units built over a field of ash from Boiler Units 1 & 2. Although the former coal-fired power generation facility ceased operations in February 2020, the Site continued to use the Unit 3A/B Impoundments to clean out the hoppers, vessels, etc. prior to demolition of the buildings. In July 2020, following the clean out procedures, the Site ceased accepting CCR materials in the Unit 3A/B Impoundments. The majority of CCR materials were removed from the Unit 3A/B Impoundments in December 2020.

The inactive CCR Units 1/2 Impoundment was a depression in the ground where sluiced ash was disposed. The inactive Units 1/2 Impoundment ceased receiving CCR materials in 2012. The monitoring network at Units 1/2 Impoundment consisted of 1 background monitoring well (MW-07), 4 downgradient detection monitoring wells (MW-01R, MW-05, MW-06, MW-08), and an additional 5 assessment monitoring wells (MW-02, MW-03, MW-04, MW-09, and MW-10). Based on information provided to HDR, it appears that Grand Haven Board of Light and Power (GHBLP), United States Environmental Protection Agency (EPA), and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) discussed the boundary for the inactive Units 1/2 Impoundment on January 14, 2021. During that discussion, a boundary of the inactive Units 1/2 Impoundment was agreed upon that includes an area of sluiced ash disposal further to the east than the original boundary (**Figure 2**). It was also agreed between the parties that the former northern outlet channel from the Units 1/2 Impoundment would be evaluated for potential inclusion in the revised boundary (**Figure 2**). A final determination regarding the revised boundary has yet to be reached as of October 2023.

2.1 Hydrogeology

The regional general direction of groundwater flow across the Harbor Island is west to southwest towards Lake Michigan (Western Michigan University, 1981). The Grand River is located on the northern and western side of the Site, and the South Channel is located on the south side of Harbor Island. Internal to the Island there are several influences to the groundwater flow and direction. Specifically,

- Various fill materials
- Surface water features, such as the inactive Units 1/2 impoundment and wetlands
- Former coal yard area which may have lower infiltration rates due to compaction from heavy equipment and stockpiling.

These features influence the groundwater flow and direction in an inward and outward direction and are very localized. As a result, a traditional upgradient/downgradient monitoring well approach to the CCR units is not appropriate.

Groundwater contour maps, contained in **Appendix A**, from January, April, and August 2023, respectively, showing groundwater flow beneath Unit 3A/B is consistently west toward the Grand River. Groundwater flow beneath Units 1/2 is seasonably and spatially variable; flow is generally north toward the North Channel (**Figure 2**), east toward the internal wetland, and potentially south near MW-05. The presence of the wetland east of the Units 1/2 appears to provide a hydraulic sink between the CCR impoundments and the wells situated to the east (PZ-23 through PZ-26, MW-27, MW-33, and MW-34).

2.2 Monitoring Well Network

The certified monitoring system for the CCR impoundments includes the following wells, shown on (**Figure 2**):

- Background Monitoring Wells (Units 1/2 & Unit 3A/B) – MW-27, MW-33, MW-34,

- Downgradient Compliance Wells (Units 1/2) - MW-06, MW-08, MW-18, MW-19, MW-20, MW-30, and MW-31,
- Downgradient Compliance Wells Unit (3A/B) - MW-02, MW-03, MW-04, MW-11, and MW-12,
- Water Level Only: MW-05, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-21, PZ-22, PZ-23, PZ-24, PZ-25, PZ-26, PZ-28, PZ-29, MW-35, MW-36, MW-37, MW-38, MW-39, and MW-40.

2.2.1 Additional Wells

The certified groundwater monitoring system includes the additional wells MW-07, MW-09, MW-10, and MW-32 that have been part of the monitoring network at the Island for the last several years (Figure 2). These wells will not be used to determine if there is a Statistically Significant Increase (SSI) or an Statistically Significant Level (SSL) over Groundwater Protection Standards (GPS) at the Site; however, the continued water quality data set over time will help evaluate groundwater flow and transport at the Island should the CCR units move into Assessment Monitoring and/or Assessment of Corrective Measures status in the future. Prior data collected from these wells potentially may be useful to both CCR units or to further understand the Site as they are considered nature and extent wells (**Figure 2**).

Well MW-01R location has a higher groundwater elevation than Unit 3A/B between October and December 2021 and, therefore, may be unlikely to reflect potential groundwater impacts from this Unit. This well is therefore not part of the official point of compliance network of wells. However, due to the limited Site-wide groundwater flow data timeline, this well will be monitored in case the flow directions shift and it becomes downgradient of either CCR unit and to improve Site-wide understanding. Because data from this well potentially could be useful to both CCR units, or to better understand the Site, it is considered a nature and extent well (**Figure 2**).

Monitoring wells MW-35, MW-36, MW-37, MW-38, MW-39, and MW-40 are not included as compliance monitoring wells for either CCR unit. However, they are monitored for water levels during groundwater monitoring events to provide additional data for groundwater contouring.

Figure 1. Vicinity Map for Site

Figure 2. CCR Unit and Monitoring Well Location Map

3.0 Monitoring Methods

3.1 Monitoring Frequency

The eight rounds of background groundwater sampling events that are required in the CCR rule began on November 28, 2022 and ended August 8, 2023. As part of each sampling event, samples were collected from the background, Units 1/2 Impoundment compliance, and Unit 3A/B Impoundments compliance, and the additional wells noted in Section 2.2. Sampling events were conducted on the following dates:

- ✓ November 28, 2022 - December 2, 2022
- ✓ January 3 - 5, 2023
- ✓ February 7- 8, 2023
- ✓ March 13 - 14, 2023
- ✓ April 18 - 19, 2023
- ✓ May 22 - 23, 2023
- ✓ June 27 - 28, 2023
- ✓ August 7 - 8, 2023

3.2 Water Levels and Sample Collection

Water levels were recorded for each of the monitoring wells when groundwater quality samples were collected. Groundwater sample collection is conducted following the protocols outlined in the 2022 Harbor Island Work Plan for CCR Compliance (HDR, 2022). Water samples were delivered under Chain of Custody to Trace Analytical Laboratory, in Muskegon, Michigan.

3.3 Analytical Testing

Groundwater samples were analyzed for the parameters shown in **Table 1**. The table includes the parameters for compliance with CCR Rule Part §257 (Appendix III & Appendix IV), detection monitoring and assessment monitoring constituents listed in Michigan Part 115 sections 324.11511a(3) and 11519b(2), and Total Suspended Solids (TSS). In addition to the parameters listed in Error! Reference source not found., samples were analyzed for general water quality parameters including alkalinity, magnesium, potassium, and sodium.

Table 1. Constituents of Interest

Appendix III Constituents	Appendix IV Constituents		Michigan Part 115 Constituents	Additional Parameters
Boron	Antimony	Lead	Copper	Total Suspended Solids (TSS)
Calcium	Arsenic	Lithium	Iron	
Chloride	Barium	Mercury	Nickel	
Fluoride	Beryllium	Molybdenum	Silver	
pH	Cadmium	Selenium	Vanadium	
Sulfate	Chromium	Thallium	Zinc	
Total Dissolved Solids (TDS)	Cobalt	Radium-226 and -228 combined		
	Fluoride			

4.0 Data Validation and Data Management

Data validation and data management tasks were performed per the 2022 Harbor Island Work Plan for CCR Compliance (HDR, 2022). Data validation was conducted to eliminate data that did not meet validation criteria and to designate a data qualifier for any data quality limitation discovered.

5.0 Water Levels and Flow Direction

Water levels were measured in the monitoring wells during each sample event. The potentiometric water contours for January, April, and August 2023 are displayed in **Appendix A.** These contour maps illustrate that the groundwater wells chosen for development of background threshold values (BTV) for the Site are located in an area that would not be impacted by the CCR units. Groundwater flow in the area east of the internal wetland is consistent with regional groundwater flow and the flow of the Grand River toward the west. Groundwater contour maps from January, April, and August 2023, respectively, show groundwater flow beneath Unit 3A/B Impoundments is consistently west toward the Grand River. Groundwater flow beneath Units 1/2 Impoundment is seasonably and spatially variable; flow is generally northward toward the North Channel (**Figure 2**), east from the ponds of Units 1/2 Impoundment toward the wetland, and potentially south near MW-05. The presence of the wetland east of the Units 1/2 Impoundment appears to provide a hydraulic sink between the CCR impoundments and the wells situated to the east (PZ-23 through PZ-26, MW-27, MW-33, and MW-34).

6.0 Evaluation of Background Water Quality Data

The purpose of the statistical analysis is to develop BTVs for each constituent. Prior to estimating the BTVs, a preliminary data analysis using statistical methods such as sample means, medians and standard deviations, tests for sample distributions, statistical outliers, autocorrelation, seasonality, spatial variability, and trends over time are conducted to confirm if all observed concentrations are representative of field conditions. Federal Rule statistical output tables are located in **Appendix B** with supporting charts in **Appendix C**. State Rule statistical output tables are located in **Appendix D** with charts in **Appendix E**.

6.1 Constituents

The statistical analyses detailed in the below sections pertain to samples collected and pooled from background monitoring wells MW-27, MW-33, and MW-34 between November 30, 2022, and August 7, 2023. Pooled data from these wells represents background field conditions for the aquifer. When pooled for statistical analysis of monitored constituents, the number of samples ranges from 22 to 24. Appendix III Appendix IV, and Part 115 constituents were utilized for the statistical analysis. Reporting units, number of observations, number of non-detects (NDs), and percentage of NDs below detection limits (BDL) for each constituent are listed in Error! Reference source not found..

Table 2. Monitored Constituents				
Constituent	**Unit**	**n**	**No. BDLs**	**% BDL**
Appendix III				
Boron	mg/L	24	0	0%
Calcium	mg/L	24	0	0%
Chloride	mg/L	24	0	0%
Fluoride	mg/L	24	0	0%
pH, Field	su	24	0	0%
Sulfate	mg/L	24	4	17%
Total Dissolved Solids	mg/L	24	0	0%
Appendix IV				
Antimony	mg/L	24	3	13%
Arsenic	mg/L	24	0	0%
Barium	mg/L	24	0	0%
Beryllium	mg/L	24	23	96%
Cadmium	mg/L	24	19	79%
Chromium	mg/L	24	1	4%
Cobalt	mg/L	24	1	4%
Fluoride	mg/L	24	0	0%
Lead	mg/L	23	14	61%
Lithium	mg/L	24	1	4%
Mercury	mg/L	24	24	100%
Molybdenum	mg/L	24	10	42%
Selenium	mg/L	24	6	25%
Thallium	mg/L	22	22	100%
Radium-226/228	pCi/L	24	6	25%
Part 115				
Copper	mg/L	24	4	17%
Iron	mg/L	24	0	0%
Nickel	mg/L	24	2	8%
Silver	mg/L	24	23	96%
Vanadium	mg/L	24	18	75%
Zinc	mg/L	24	6	25%

6.2 Outliers

Outliers are values that are not representative of the population from which they are sampled. The data sets were screened for outliers using Dixon's test or Rosner's test; Dixon's test is used for sample sizes smaller than 25 and Rosner's test is used for sample sizes 25 and above. Both tests are conducted with NDs excluded and using a significance level of 1 percent.

Quality control conducted on the sampling protocols and laboratory results did not indicate reasons for the noted concentration of the outliers on the dates they were sampled. No unusual weather patterns, anthropogenic activity or high turbidity events, or high dilution protocols during laboratory testing occurred which could explain the higher concentrations.

In the analysis of the monitoring wells, one Appendix III, one Appendix IV, and one Part 115 constituent had outliers. Of the 24 samples for pH (field), one (1) outlier with a value of 7.66 su was identified on January 5th, 2023, from MW-33 and was included in the analysis. One lead outlier was identified at MW-34 with a value of 0.0069 mg/L on December 1, 2022 and was excluded from the analysis. For Part 115 constituents, zinc had an outlier on December 1, 2022, from MW-34 and was included in the analysis. Plots for each data set containing an outlier are included in Figure 3 to Figure 5 below.

As the sample sizes per well are small (approximately 22 to 24), from a statistical perspective, the variability in the concentrations of these constituents will change as additional samples are obtained, approaching the true underlying variability of concentrations in groundwater in the vicinity of the background wells. Therefore, the pH and zinc outliers were retained in the dataset. The exception is the lead outlier. The lead outlier concentration was dropped due to the concentration being more than three times the value of the other observed concentrations. As a result, the lead outlier observation was filtered from subsequent analysis of background field conditions. The distributions for constituents flagged in the outlier tests will continue to be monitored as sampling events are added to the background. The outliers identified are included in the subsequent analysis, as future observations may reveal that they fit the underlying distribution well.

Table 3. Outliers at the 1% Significance Level

Constituent	Unit	n	No. NDs	% NDs	Date	Value
Appendix III						
pH (field)	su	24	0	0%	1/5/2023	7.66
Appendix IV						
Lead	mg/L	24	14	58%	12/1/2022	0.0069
Part 115						
Zinc	mg/L	24	8	25%	12/1/2022	0.031

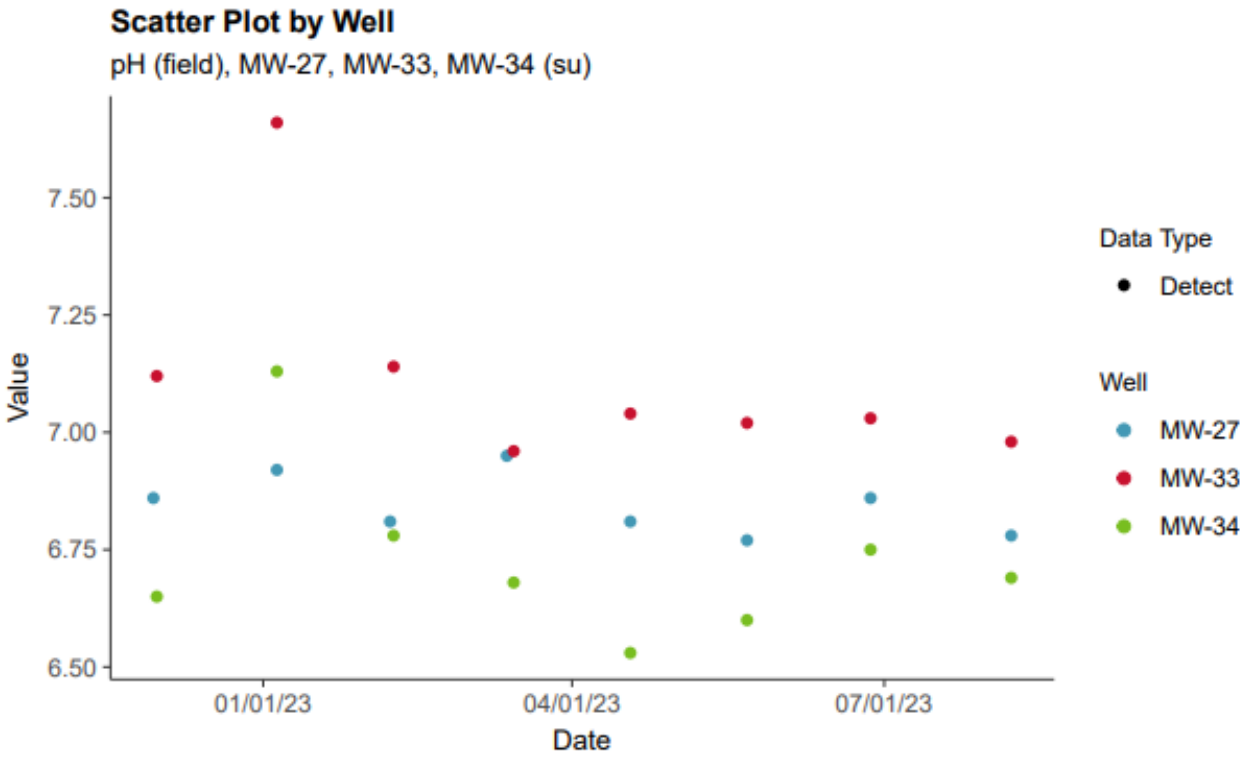


Figure 3. Scatter Plot by Well, pH (Field)

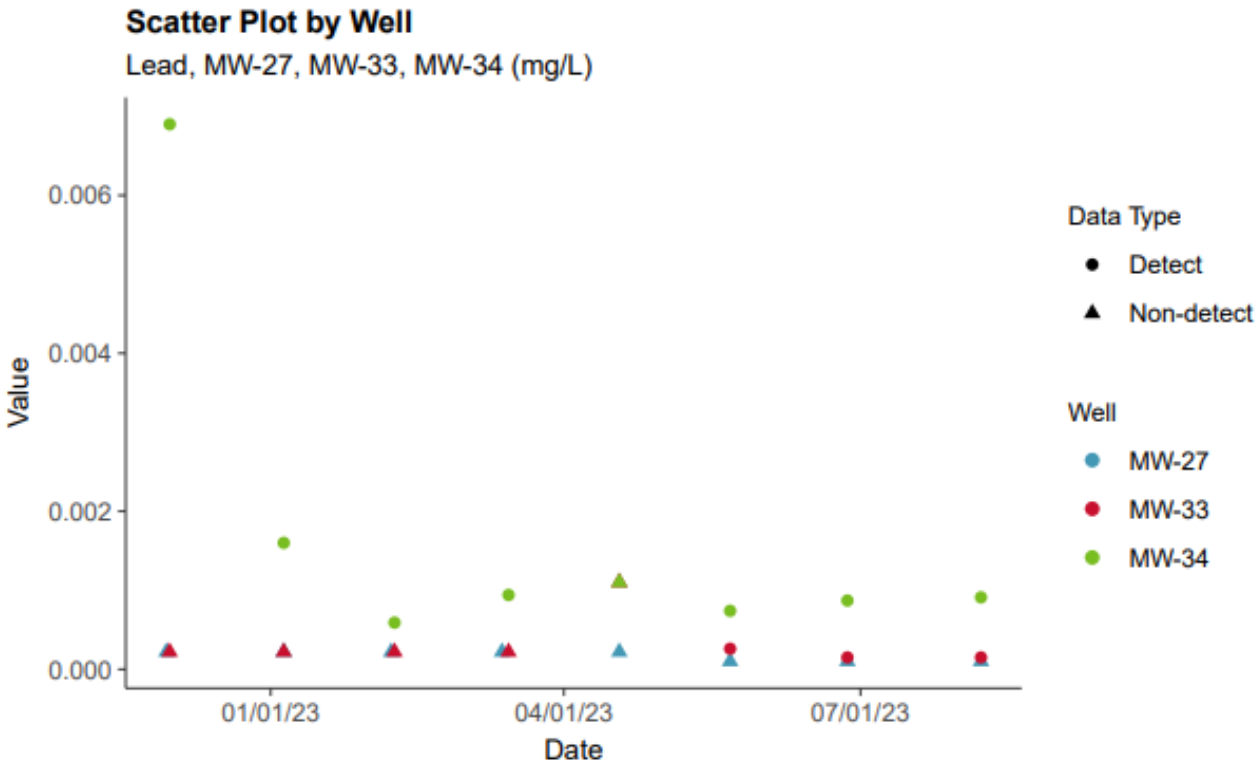


Figure 4. Scatter Plot by Well, Lead

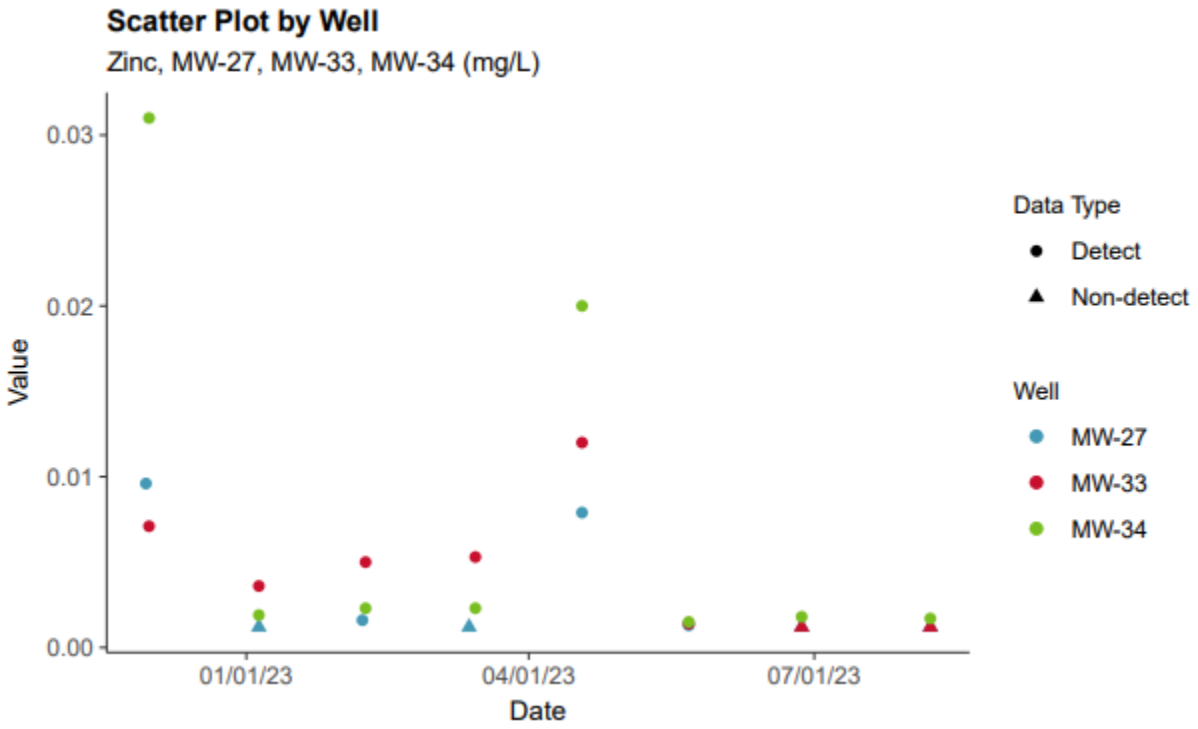


Figure 5 . Scatter Plot by Well, Zinc

In addition to the statistical outliers described above, two non-detect thallium samples were omitted from the analysis. The two non-detects were diluted observations, and as a result had elevated MDLs. As thallium is 100% non-detects, the elevated maximum MDL is chosen as the background threshold for Double Quantification Rule testing. To avoid increasing the background threshold based on unrepresentative MDLs, the thallium samples at MW-33 and MW-34 on April 18, 2023 were both excluded from consideration.

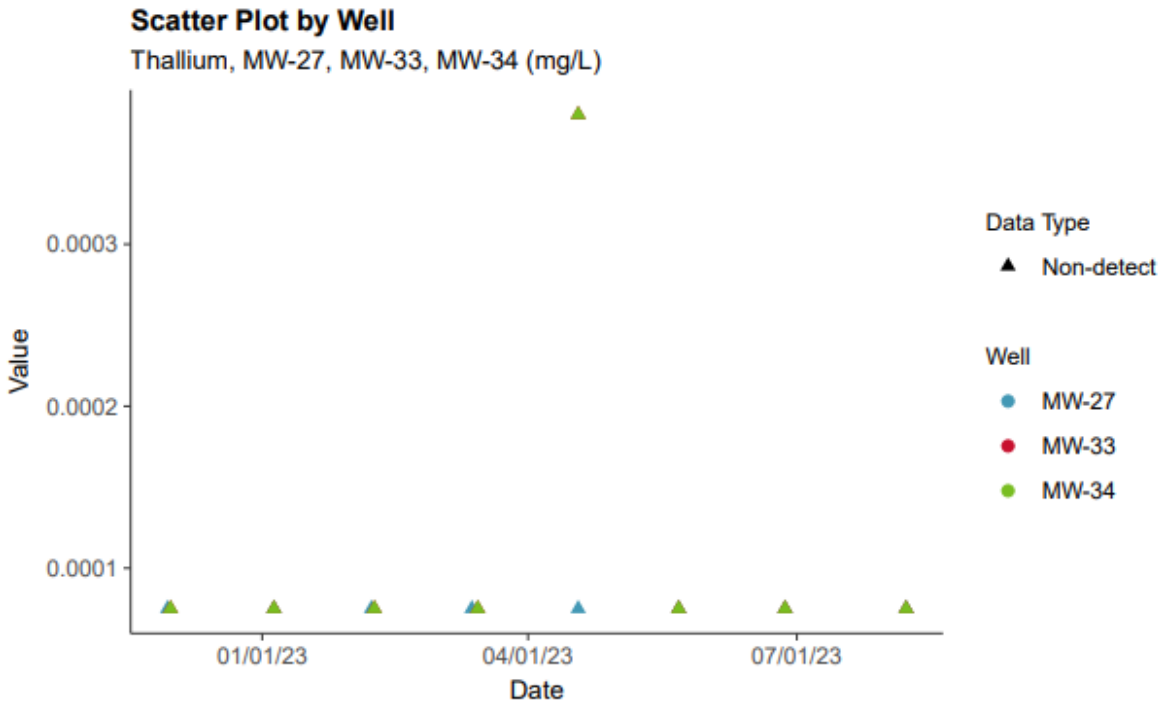


Figure 6 . Scatter Plot by Well, Thallium

6.3 Distributions

Groundwater data were fit to known distribution models using goodness-of-fit (GOF) tests. GOF tests were not conducted on data sets with less than four detected values due to insufficient data. For purposes of estimating background concentration levels, nonparametric methods will be used on data sets with less than four detected values or more than 50 percent non-detects.

Appendix III constituents, boron, sulfate, and chloride (as Cl) will be analyzed using nonparametric methods. Sulfate was initially flagged as following a gamma distribution; however, the application of either the Kaplan-Meier (KM) or Robust Regression on Order Statistics (ROS) methods to estimate BTVs produced incongruous results. This was due to small sample size with respect for the ROS estimator and to having only having one level of non-detects with respect to the KM estimator.[1]

Calcium, fluoride, pH (field), and total dissolved solids are best described with a normal distribution. Appendix IV constituents chromium (total), cobalt, fluoride, and radium 226 and 228 are best described with a normal distribution. All other Appendix IV constituents will be analyzed with nonparametric methods, except for molybdenum, which is analyzed with a gamma distribution. For Part 115 constituents, all constituents use nonparametric methods except for zinc, which assumes a lognormal distribution.

[1] ITRCWEB, See parts 5.7.6 and 5.7.7. 5.7 Non-detects (itrcweb.org)

6.4 Spatial Variability

An assumption when deriving background groundwater quality is that concentrations of constituents measured at the background wells over time when pooled represent an estimate of overall well field conditions for those constituents. This assumption implies the variability of the concentrations per well is comparable and the values are independent of each other. A means to test this assumption is to study the spatial variability of the observations across the wells.

Spatial variability exists when the distribution or pattern of concentrations changes between well locations, either from natural or anthropogenic factors. To evaluate the potential for spatial variability in background wells, time series plots of concentrations were used for each constituent at each well (**Appendix B - Background Wells MW-27, MW-33, and MW-34, Scatter Plots**). Visual cues from the observed variability of concentrations across the wells per constituent were corroborated using the parametric ANOVA test and non-parametric ANOVA Kruskal-Wallis test where appropriate that tested if differences in mean or median concentrations among the three wells were statistically significant.

Spatial variability was present in the detected data for 17 of the 22 CCR Rule constituents and 20 of the 28 State Program constituents at the 1% level of significance based on differences in means or medians. The remaining constituents did not have evidence of spatial variability solely based on the statistical tests or had over half the observations as non-detects.

Error! Reference source not found. demonstrates an example of a constituent with 100% detected data, boron, that exhibited spatial variability across the wells. While statistically different well averages for most of the constituents were flagged using either parametric or nonparametric ANOVA tests at the 1% level of significance, the sample concentrations are approximately within an order of magnitude of each other and reflect the natural variability of the concentrations for the constituents of interest across the background field area (see **Appendix B - Background Wells MW-27,-33 and MW-34, Scatter Plots**). Spatial variability among the three wells can be monitored as new data are collected. While the current sample size of eight per well meets the recommended minimum sample size to test for statistical differences in averages, the power to detect true spatial variability will increase as future samples are observed.[2]

6.5 Seasonal Variability

Temporal variability in groundwater samples can be due to seasonal effects (i.e., seasonality) or temporal effects (i.e., autocorrelation or trends). 40 CFR §257.93(g)(6) and Michigan

[2] USEPA. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance. Office of Resource Conservation and Recovery, Program Implementation and Information Division, USEPA, EPA 530/R-09-007, 2009, pp 5-3-5-4.

Administrative Code R 299.4908(2)(f) require that, if necessary, the statistical method must include procedures to control or correct for seasonal as well as temporal correlation in the data.

Groundwater data may exhibit predictable recurring increases and decreases in concentrations, termed seasonality. Constituents are analyzed for seasonality using the Kruskal-Wallis, ANOVA, and log-transformed ANOVA tests.

The data contain 8 winter samples, 9 spring samples, 6 summer samples, and 1 fall sample. The sample sizes per season at the combined wells do not allow for accurate statistical analysis of seasonality; a minimum of eight samples per sampled season is recommended to test for seasonal differences, but at least twenty samples per season are recommended to de-seasonalize the data. Constituents will be analyzed for seasonality as additional sampling is conducted to determine if samples are affected by seasonality.

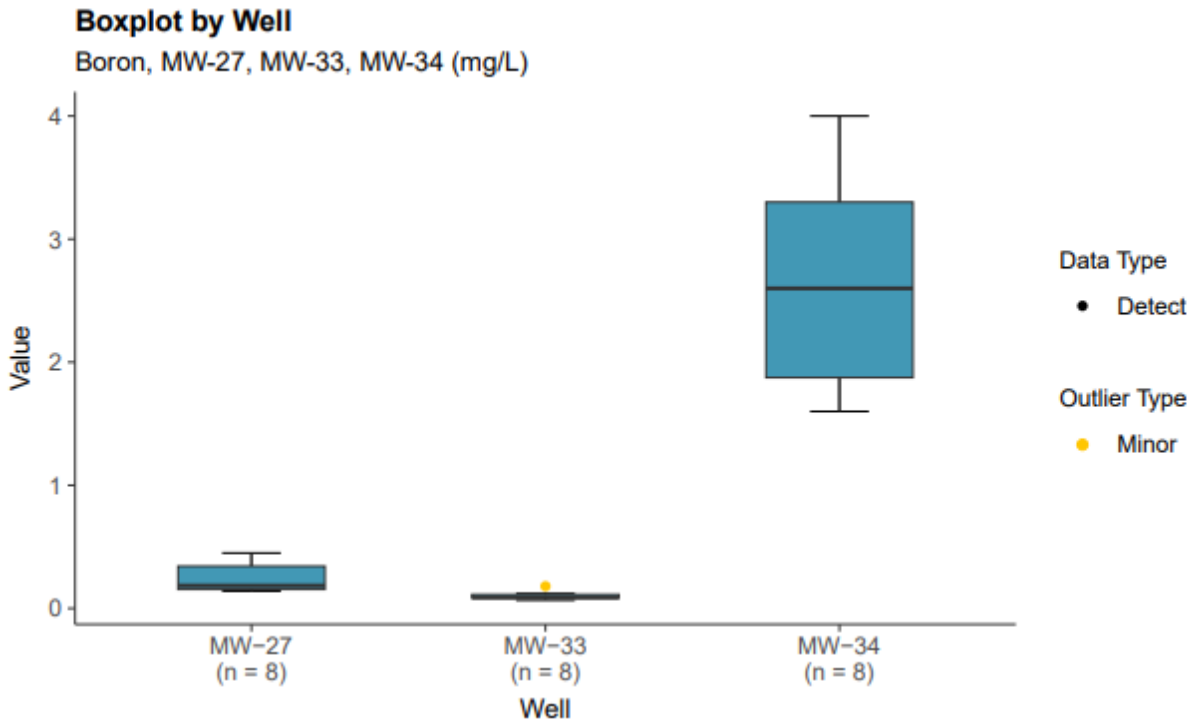


Figure 7. Boxplot by Well, Boron

6.6 Autocorrelation

Autocorrelation occurs when values of a single variable data set are correlated over successive (i.e., lagged) time intervals. A minimum of at least fifty sampling events is recommended for autocorrelation tests to perform well using conventional estimators when assessing a test statistic's probability value. Constituents will be analyzed for autocorrelation as additional sampling is conducted.

6.7 Trends

A key assumption for hypothesis testing is that sample data are stationary through time, free of trends. Constituents that follow a parametric distribution and do not demonstrate seasonality were analyzed for trends within the data set using a lognormal Maximum Likelihood Estimate (MLE) regression. The Mann-Kendall test and Theil-Sen slope was used to analyze linear trends for constituents that could not be fit to any of the three tested distributions. The Mann-Kendall test is suitable for data sets with no seasonality and only one unique detection limit such as a method detection limit (MDL).

Results for both parametric and nonparametric trend tests are reported in Error! Reference source not found.. Constituents with 50% or more non-detects are not tested for trends given limited information in the datasets. For those datasets with less than 50% non-detects and are best described using nonparametric distribution assumptions, only those datasets with one unique MDL value are tested using the Mann-Kendall test given the test's assumptions. For parametric tests, the "Slope" column contains the MLE slope on a log-linear scale with respect to time (measured in days), and the "*p*-value" column contains the *p*-value associated with that slope. For nonparametric tests, the "Slope" column contains the Theil-Sen slope estimator, and the "*p*-value" column contains the *p*-value from the Mann-Kendall test. The "Trend" column indicates upward or downward trends when the *p*-value is below 1%. At the 1% significance level, no upward trends were identified for the constituents of interest.

Table 4. Trend Tests at the 1% Significance Level

Constituent	Unit	n	No. BDL	% BDL	Method	Slope	p-value	Trend
Appendix III								
Boron	mg/L	24	0	0%	MK	-0.0000049	1.000	↔
Calcium	mg/L	24	0	0%	Lognormal MLE	0.0144	0.071	↔
Chloride (as Cl)	mg/L	24	0	0%	MK	-0.0981	0.033	↔
Fluoride	mg/L	24	0	0%	Lognormal MLE	0.000304	0.585	↔
pH (field)	su	24	0	0%	Lognormal MLE	-0.000123	0.118	↔
Sulfate	mg/L	24	4	17%	MK	-0.0931	0.006	↓
Total Dissolved Solids	mg/L	24	0	0%	Lognormal MLE	-0.000610	0.107	↔
Appendix IV								
Antimony	mg/L	24	3	3%	MK	-0.00000016	0.634	↔
Arsenic	mg/L	24	0	0%	MK	0.00000152	0.147	↔
Barium	mg/L	24	0	0%	MK	0	0.980	↔
Chromium, Total	mg/L	24	1	4%	Lognormal MLE	0.00235	0.394	↔

Cobalt	mg/L	24	1	4%	Lognormal MLE	0.0000429	0.977	↔
Fluoride	mg/L	24	0	0%	Lognormal MLE	0.000304	0.585	↔
Lithium	mg/L	24	1	4%	MK	0.00000730	0.549	↔
Molybdenum	mg/L	24	10	42%	Lognormal MLE	-0.00578	0.139	↔
Radium 226 and 228	pCi/L	24	6	25%	Lognormal MLE	0.00239	0.044	↔
Part 115								
Iron	mg/L	24	0	0%	MK	0.0114	0.653	↔
Zinc	mg/L	24	6	25%	Lognormal MLE	-0.00823	0.004	↓

6.8 Summary of Statistical Analysis

Error! Reference source not found. contains key summaries of the outlier tests, distribution tests, and trend tests for each constituent. A "✓" symbol denotes that the constituent was flagged by the indicated test. Additional sampling is necessary to determine the validity of outlier samples, distributional assumptions, and stationarity assumptions.

Table 5. Summary of Statistical Analysis

Constituent	Outliers	Nonparametric	Trend
Appendix III			
Boron		✓	
Calcium			
Chloride		✓	
Fluoride			
pH, Field	✓		
Sulfate		✓	✓
Total Dissolved Solids			
Appendix IV			
Antimony		✓	
Arsenic		✓	
Barium		✓	
Beryllium			
Cadmium			
Chromium			
Cobalt			
Fluoride			
Lead	✓		
Lithium		✓	
Mercury			
Molybdenum			
Selenium		✓	
Thallium			
Radium-226/228			

Table 5. Summary of Statistical Analysis			
Constituent	**Outliers**	**Nonparametric**	**Trend**
Part 115			
Copper			
Iron		✓	
Nickel		✓	
Silver			
Vanadium			
Zinc	✓		✓

6.9 Detection Monitoring Background Threshold Values

BTVs were estimated to represent background concentration levels for future use in evaluating whether downgradient samples exhibit statistically significant increases (SSIs) during detection monitoring. The BTVs are the upper prediction limits (UPLs) of the background data, which are one of the statistical methods specified under 40 C.F.R. § 257.93(f)(3) for evaluating groundwater monitoring data. The number of verification samples and the significance levels associated with each UPL are chosen such that the Site-wide false positive rate over comparisons is no more than 10 percent and such that the power of each test exceeds the EPA Reference Power Curve (ERPC) at either 3 standard deviations above background, 4 standard deviations above background, or both.

Note that for pH, both the UPL and the lower prediction limit (LPL) are of interest as pH values above the UPL or below the LPL at the downgradient wells can be considered statistically significant.

For constituents that do not have the detected values, the maximum MDL is chosen as the BTV and the double quantification rule (DQR) is used to evaluate whether there is an SSI; that is, an SSI is registered for a downgradient well-constituent pair if there are two consecutive detections above the BTV. These constituents are excluded from the determination of target false positive rates.

The Units 1/2 Impoundments and the Unit 3 A/B Impoundment at the Site have a different number of downgradient wells (8 at Unit 3A/B and 9 at Units 1/2), and the number of downgradient wells can influence the specification of UPLs; therefore different UPLs were generated for the different units. Similarly, the number of parameters can influence the specification of UPLs; therefore, different UPLs were generated for the different monitoring programs (State and Federal). **Table 6** and **Table 7** contain the estimated UPLs for Appendix III and Part 115 constituents for Units 1/2 and Unit 3A/B, respectively. These UPLs are used during detection monitoring of the CCR Rule's implementation.

6.9.1 Federal CCR Rule

The number of retests and the rank of the order statistic for nonparametric UPLs are chosen such that the significance level does not exceed the per-constituent false positive rate of 0.0149, and such that the test power exceeds the EPA Reference Power Curve (ERPC) at either 3 standard deviations (SDs) above background, 4 SDs above background, or both. The maximum

per-constituent false positive rate is computed based on a site-wide false positive rate of 10% subdivided across 7 constituents.

For parametric (normal, lognormal, or gamma) UPLs, the number of retests and the value of the K factor are chosen such that the significance level does not exceed the per-test false positive rate of 0.00167 for 9 downgradient wells (or 0.00188 for 8 downgradient wells), and such that the test power exceeds the ERPC at either 3 SDs above background, 4 SDs above background, or both.

6.9.2 Part 115 Rule

The number of retests and the rank of the order statistic for nonparametric UPLs are chosen such that the significance level does not exceed the per-constituent false positive rate of 0.0131, and such that the test power exceeds the EPA Reference Power Curve (ERPC) at either 3 standard deviations (SDs) above background, 4 SDs above background, or both. The maximum per-constituent false positive rate is computed based on a site-wide false positive rate of 10% subdivided across 8 constituents.

For parametric (normal, lognormal, or gamma) UPLs, the number of retests and the value of the K factor are chosen such that the significance level does not exceed the per-test false positive rate of 0.00164 for 9 downgradient wells (or 0.00188 for 8 downgradient wells), and such that the test power exceeds the ERPC at either 3 SDs above background, 4 SDs above background, or both.

Table 6 and Table 7 contains the estimated UPLs for constituents for Units 1/2 Impoundments and Unit 3A/B Impoundments, respectively. These UPLs are used during Detection Monitoring

in accordance with Michigan Part 115 at 324.11511a(3).

Table 6. Background Threshold Values for Detection Monitoring (Units 1/2)

Constituent	Unit	n	No. BDL	% BDL	Recommended distribution	No. of verification samples	Federal Program UPL	State Program UPL
Appendix III								
Boron	mg/L	24	0	0%	Nonparametric	2	4.00	4.00
Calcium	mg/L	24	0	0%	Normal	1	247	248
Chloride	mg/L	24	0	0%	Nonparametric	2	120	120
Fluoride	mg/L	24	0	0%	Normal	1	0.440	0.441
pH, Field, LPL	su	24	0	0%	Normal	1	6.00	5.96
pH, Field, UPL	su	24	0	0%	Normal	1	7.80	7.83
Sulfate (as SO4)	mg/L	24	4	17%	Nonparametric	2	100	100
Total Dissolved Solids	mg/L	24	0	0%	Normal	1	937	941

Table 6. Background Threshold Values for Detection Monitoring (Units 1/2)								
Constituent	**Unit**	**n**	**No. BDL**	**% BDL**	**Recommended distribution**	**No. of verification samples**	**Federal Program UPL**	**State Program UPL**
Part 115								
Iron	mg/L	24	0	0%	Nonparametric	2	N/A	83.0

Table 7. Background Threshold Values for Detection Monitoring (Unit 3A/B)								
Constituent	**Unit**	**n**	**No. BDL**	**% BDL**	**Recommended distribution**	**No. of verification samples**	**Federal Program UPL**	**State Program UPL**
Appendix III								
Boron	mg/L	24	0	0%	Nonparametric	2	4.00	4.00
Calcium	mg/L	24	0	0%	Normal	1	248	247
Chloride	mg/L	24	0	0%	Nonparametric	2	120	120
Fluoride	mg/L	24	0	0%	Normal	1	0.441	0.439
pH, Field, LPL	su	24	0	0%	Normal	1	5.96	5.97
pH, Field, UPL	su	24	0	0%	Normal	1	7.83	7.82
Sulfate (as SO4)	mg/L	24	4	17%	Nonparametric	2	100	100
Total Dissolved Solids	mg/L	24	0	0%	Normal	1	941	938
Part 115								
Iron	mg/L	24	0	0%	Nonparametric	2	N/A	83.0

6.10 Assessment Monitoring Background Threshold Values

6.10.1 Federal CCR Rule Program

Table 8 and Table 9 contain the estimated UPLs for Appendix III, Appendix IV, and Part 115 constituents. These UPLs are the background threshold values during assessment monitoring. As with UPLs for detection monitoring, two sets of UPLs are produced (one for 9 downgradient wells at Units 1/2 and one for 8 downgradient wells at Unit 3A/B).

The number of retests and the rank of the order statistic for nonparametric UPLs are chosen such that the significance level does not exceed the per-constituent false positive rate of 0.00553, and such that the test power exceeds the EPA Reference Power Curve (ERPC) at either 3 standard deviations (SDs) above background, 4 SDs above background, or both. The

maximum per-constituent false positive rate is computed based on a Site-wide false positive rate of 10% subdivided across 19 constituents.

For parametric (normal, lognormal, or gamma) UPLs, the number of retests and the value of the K factor are chosen such that the significance level does not exceed the per-test false positive rate of 0.000620, and such that the test power exceeds the ERPC at either 3 SDs above background, 4 SDs above background, or both. The maximum per-test false positive rate is computed based on a Site-wide false positive rate of 10% subdivided across 25 constituents and 3 downgradient wells.

6.10.2 Michigan Part 115 Rule

The number of retests and the rank of the order statistic for nonparametric UPLs are chosen such that the significance level does not exceed the per-constituent false positive rate of 0.00421, and such that the test power exceeds the EPA Reference Power Curve (ERPC) at either 3 standard deviations (SDs) above background, 4 SDs above background, or both. The maximum per-constituent false positive rate is computed based on a Site-wide false positive rate of 10% subdivided across 25 constituents.

For parametric (normal, lognormal, or gamma) UPLs, the number of retests and the value of the K factor are chosen such that the significance level does not exceed the per-test false positive rate of 0.00053 at Unit 3A/B or 0.0047 at Units 1/2, and such that the test power exceeds the ERPC at either 3 SDs above background, 4 SDs above background, or both. The maximum per-test false positive rate is computed based on a site-wide false positive rate of 10% subdivided across 25 constituents and 8 or 9 downgradient wells (at Unit 3A/B and Units 1/2 respectively). These UPLs are used during assessment monitoring in accordance with Michigan Part 115 at 324.11519b(2).

Table 8. Background Threshold Values for Assessment Monitoring (Units 1/2)

Constituent	Units	n	NDs	% NDs	Recommended Distribution	No. of Verification Samples	Federal Program UPL	State Program UPL
Appendix III								
Boron	mg/L	24	0	0%	Nonparametric	3	3.60	4.00
Calcium	mg/L	24	0	0%	Normal	1	256	258
Chloride	mg/L	24	0	0%	Nonparametric	3	110	120
Fluoride	mg/L	24	0	0%	Normal	1	0.460	0.464
pH, Field, LPL	su	24	0	0%	Normal	1	5.88	5.85
pH, Field, UPL	su	24	0	0%	Normal	1	7.91	7.94
Sulfate (as SO4)	mg/L	24	4	17%	Nonparametric	3	65.0	100
Total Dissolved Solids	mg/L	24	0	0%	Normal	1	969	977
Appendix IV								
Antimony	mg/L	24	3	13%	Nonparametric	3	0.000980	0.00120
Arsenic	mg/L	24	0	0%	Nonparametric	3	0.00380	0.00400
Barium	mg/L	24	0	0%	Nonparametric	3	0.540	0.580

Table 8. Background Threshold Values for Assessment Monitoring (Units 1/2)								
Constituent	**Units**	**n**	**NDs**	**% NDs**	**Recommended Distribution**	**No. of Verification Samples**	**Federal Program UPL**	**State Program UPL**
Beryllium	mg/L	24	23	96%	Nonparametric	3	0.0000590	0.0000590
Cadmium	mg/L	24	19	79%	Nonparametric	3	0.000150	0.000150
Chromium	mg/L	24	1	4%	Normal	1	0.0434	0.0443
Cobalt	mg/L	24	1	4%	Normal	1	0.00221	0.00225
Fluoride	mg/L	24	0	0%	Normal	1	0.458	0.464
Lead	mg/L	23	14	61%	Nonparametric	3	0.00110	0.00160
Lithium	mg/L	24	1	4%	Nonparametric	3	0.0880	0.100
Mercury	mg/L	24	24	100%	Nonparametric	3	0.000160*	0.00016*
Molybdenum	mg/L	24	10	42%	Gamma	1	0.011	0.0114
Selenium	mg/L	24	6	25%	Nonparametric	3	0.000890	0.00089
Thallium	mg/L	22	22	100%	Nonparametric	3	0.0000750*	0.0000750*
Radium-226/228	pCi/L	24	6	25%	Normal	1	2.6	2.6
Part 115								
Copper	mg/L	24	4	17%	Nonparametric	3	N/A	0.0200
Iron	mg/L	24	0	0%	Nonparametric	3	N/A	83.0
Nickel	mg/L	24	2	8%	Nonparametric	3	N/A	0.0230
Silver	mg/L	24	23	96%	Nonparametric	3	N/A	0.000110
Vanadium	mg/L	24	18	75%	Nonparametric	3	N/A	0.000930
Zinc	mg/L	24	6	25%	Lognormal	1	N/A	0.0517

*Constituent is 100% non-detects. Double Quantification Rule (DQR) is recommended for determining if an exceedance has occurred.

Table 9. Background Threshold Values for Assessment Monitoring (Unit 3A/B)								
Constituent	**Units**	**n**	**NDs**	**% NDs**	**Recommended Distribution**	**No. of Verification Samples**	**Federal Program UPL**	**State Program UPL**
Appendix III								
Boron	mg/L	24	0	0%	Nonparametric	2	4.00	3.60
Calcium	mg/L	24	0	0%	Normal	1	255	257
Chloride	mg/L	24	0	0%	Nonparametric	2	120	110
Fluoride	mg/L	24	0	0%	Normal	1	0.456	0.461
pH, Field, LPL	su	24	0	0%	Normal	1	5.89	5.68
pH, Field, UPL	su	24	0	0%	Normal	1	7.90	7.93
Sulfate (as SO4)	mg/L	24	4	17%	Nonparametric	2	100	65.0
Total Dissolved Solids	mg/L	24	0	0%	Normal	1	965	974
Appendix IV								
Antimony	mg/L	24	3	13%	Nonparametric	2	0.00120	0.000980
Arsenic	mg/L	24	0	0%	Nonparametric	2	0.0040	0.00380
Barium	mg/L	24	0	0%	Nonparametric	2	0.580	0.540
Beryllium	mg/L	24	23	96%	Nonparametric	2	0.0000590	0.0000590
Cadmium	mg/L	24	19	79%	Nonparametric	2	0.000150	0.000150
Chromium	mg/L	24	1	4%	Normal	1	0.0430	0.0439
Cobalt	mg/L	24	1	4%	Normal	1	0.00220	0.00224
Fluoride	mg/L	24	0	0%	Normal	1	0.456	0.461
Lead	mg/L	23	14	61%	Nonparametric	3	0.00160	0.00160
Lithium	mg/L	24	1	4%	Nonparametric	2	0.0880	0.0880

Table 9. Background Threshold Values for Assessment Monitoring (Unit 3A/B)								
Constituent	**Units**	**n**	**NDs**	**% NDs**	**Recommended Distribution**	**No. of Verification Samples**	**Federal Program UPL**	**State Program UPL**
Mercury	mg/L	24	24	100%	Nonparametric	2	0.000160*	0.000160*
Molybdenum	mg/L	24	10	42%	Gamma	1	0.0110	0.0111
Selenium	mg/L	24	6	25%	Nonparametric	2	0.000890	0.00089
Thallium	mg/L	22	22	100%	Nonparametric	3	0.0000750*	0.000075*
Radium-226/228	pCi/L	24	6	25%	Normal	1	2.58	2.62
Part 115								
Copper	mg/L	24	4	17%	Nonparametric	3	N/A	0.0160
Iron	mg/L	24	0	0%	Nonparametric	3	N/A	78.0
Nickel	mg/L	24	2	8%	Nonparametric	3	N/A	0.0200
Silver	mg/L	24	23	96%	Nonparametric	3	N/A	0.000110
Vanadium	mg/L	24	18	75%	Nonparametric	3	N/A	0.000930
Zinc	mg/L	24	6	25%	Lognormal	1	N/A	0.0497

*Constituent is 100% non-detects. Double Quantification Rule (DQR) is recommended for determining if an exceedance has occurred.

6.11 Groundwater Protection Standard Development for Assessment Monitoring

The Unified Guidance has recommended that the upper tolerance limit (UTL) be used as a fixed value similar to a groundwater protection standard for constituents for which MCLs have not been established (USEPA, 2009). The upper tolerance limits (UTLs) represent background water quality concentration for development of GPS values for use in assessment monitoring. Under the assessment monitoring program in Michigan Part 115 at 324.11519b(2), the UTLs are used as the background values to develop GPS values. Tolerance intervals represent a range where a proportion of the population is expected at a given confidence level. For the purpose of this certification plan, a 95% confidence level was assumed.

The UTL values are not dependent on the number of downgradient wells being compared to the background or the number of parameters tested (like for the UPL); therefore the same UTL values are appropriate for both Units 1/2 and Unit 3A/B and the values are contained in **Table 10**.

The UTLs are estimated using a coverage proportion of 95% and a confidence level of 95%. However, nonparametric rank-based UTLs are unable to achieve both 95% coverage and 95% confidence when the sample size is below 60. In this case, nonparametric UTLs are chosen to maximize coverage while maintaining a 95% confidence level, as recommended by the Unified Guidance.

Table 10. Upper Tolerance Limits with 95% Coverage and 95% Confidence						
Constituent	**Unit**	**n**	**No. BDL**	**% BDL**	**Recommended distribution**	**State and Federal Program UTL**
Appendix III						
Boron	mg/L	24	0	0%	Nonparametric	4.00
Calcium	mg/L	24	0	0%	Normal	251
Chloride	mg/L	24	0	0%	Nonparametric	120
Fluoride	mg/L	24	0	0%	Normal	0.446
pH (field)	su	24	0	0%	Normal	7.44
Sulfate (as SO4)	mg/L	24	4	17%	Nonparametric	100
Total Dissolved Solids	mg/L	24	0	0%	Nonparametric	949
Appendix IV						
Antimony	mg/L	24	3	13%	Nonparametric	0.00120
Arsenic	mg/L	24	0	0%	Nonparametric	0.00400
Barium	mg/L	24	0	0%	Nonparametric	0.580
Beryllium	mg/L	24	23	96%	Nonparametric	0.00000590
Cadmium	mg/L	24	19	79%	Nonparametric	0.000150
Chromium	mg/L	24	1	4%	Normal	0.0417
Cobalt	mg/L	24	1	4%	Normal	0.00214
Fluoride	mg/L	24	0	0%	Normal	0.446
Lead	mg/L	23	14	61%	Nonparametric	0.00160
Lithium	mg/L	24	0	4%	Nonparametric	0.100
Mercury	mg/L	24	24	100%	Nonparametric	0.000160*
Molybdenum	mg/L	24	10	42%	Gamma	0.00929
Selenium	mg/L	24	6	25%	Nonparametric	0.000890
Thallium	mg/L	22	22	100%	Nonparametric	0.0000750*
Radium-226/228	pCi/L	24	6	25%	Normal	2.58
Part 115						
Copper	mg/L	24	4	17%	Nonparametric	0.0200
Iron	mg/L	24	0	0%	Nonparametric	83.0
Nickel	mg/L	24	2	8%	Nonparametric	0.0230
Silver	mg/L	24	23	96%	Nonparametric	0.000110
Vanadium	mg/L	24	18	75%	Nonparametric	0.00930
Zinc	mg/L	24	6	25%	Lognormal	0.0380

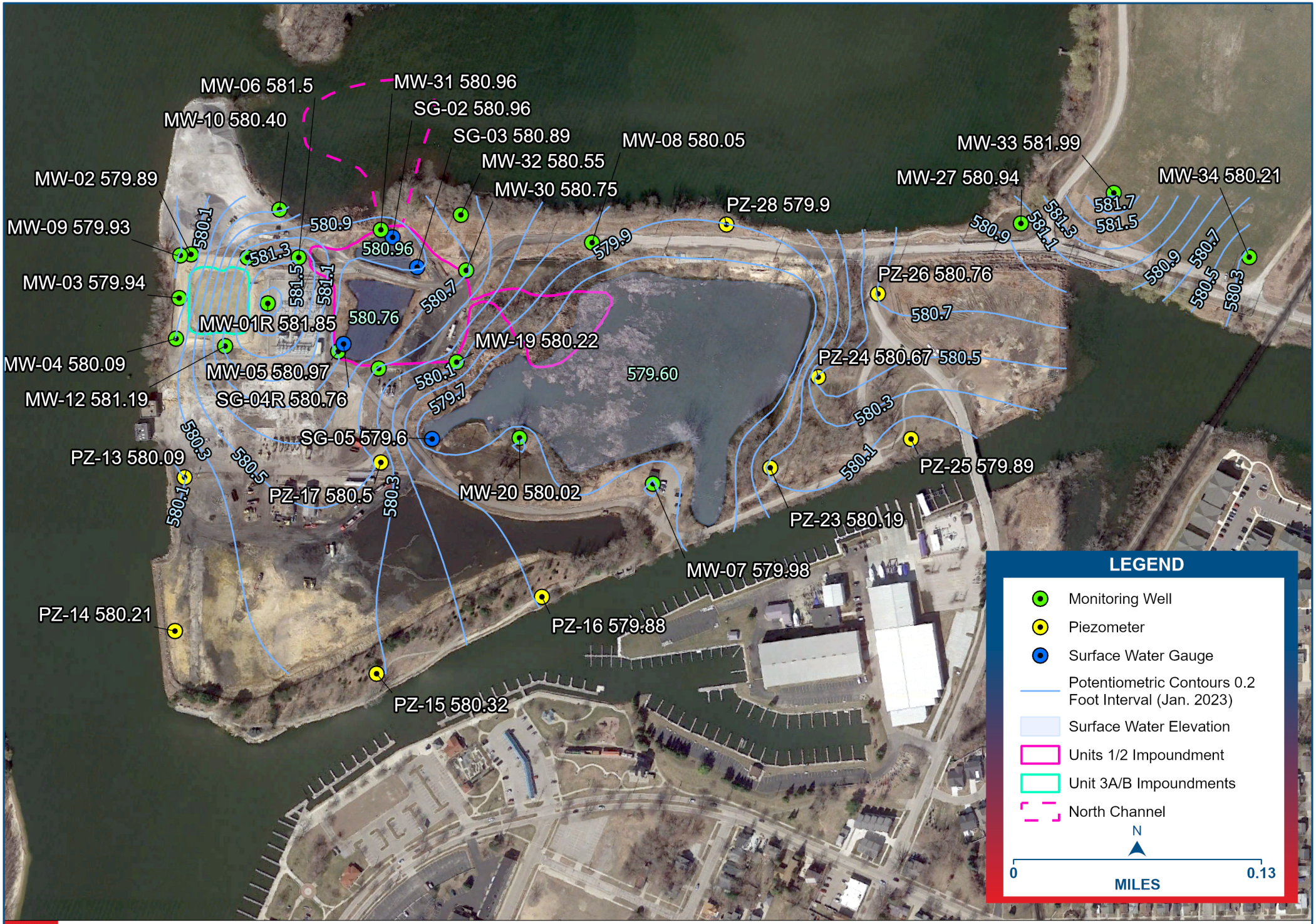
7.0 References

U.S. Environmental Protection Agency (USEPA), 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities: Unified Guidance. Office of Resource Conservation and Recovery, Program Implementation and Information Division, USEPA, EPA 530/R-09-007, 2009.

HDR, 2022. 2022 Harbor Island Work Plan for CCR Compliance. April 14, 2022. Revised June 23, 2022.

Appendix A

Potentiometric Contour Maps



Renew Harbor Island

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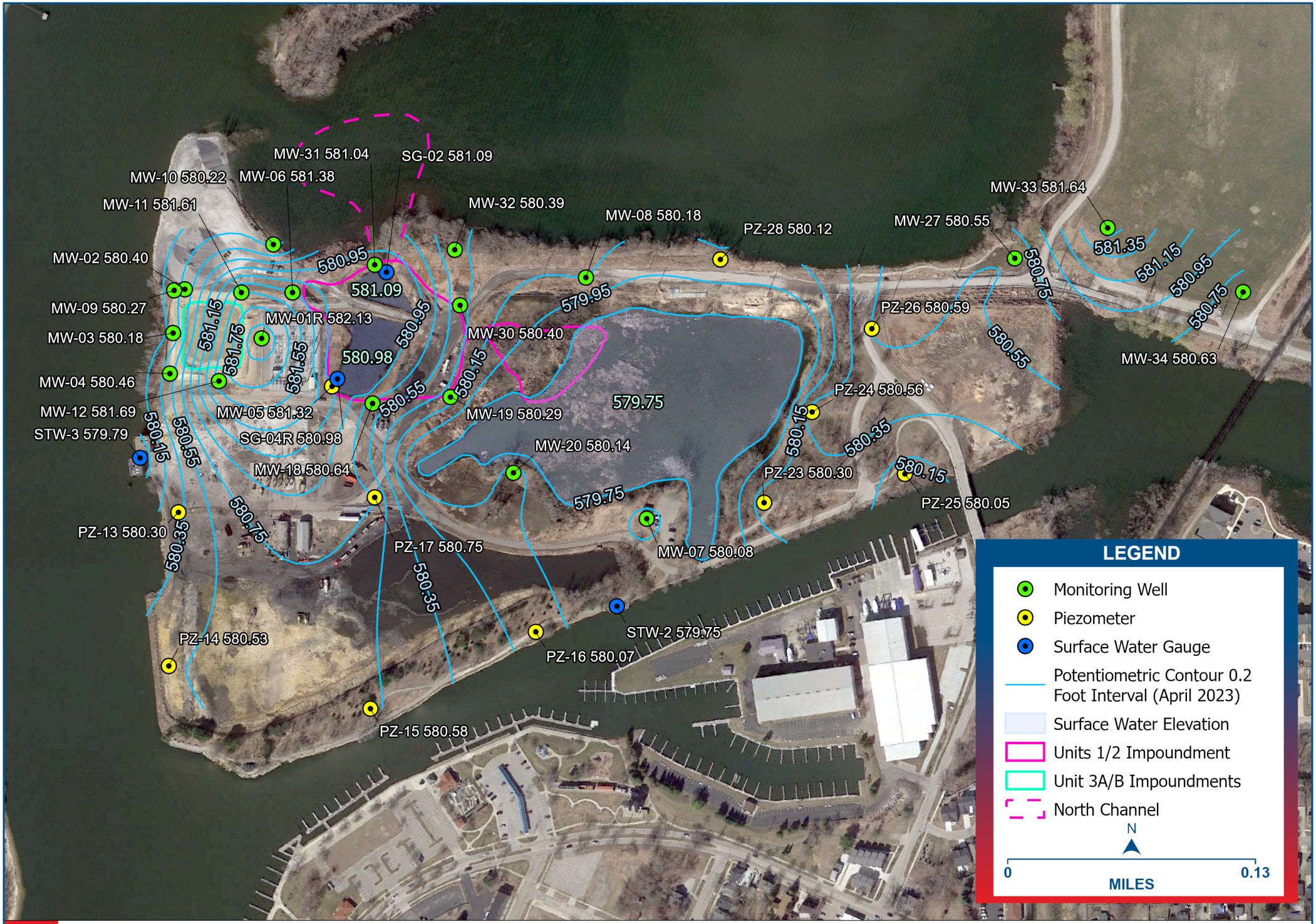
FORMER J.B. SIMS GENERATING STATION

CITY OF GRAND HAVEN



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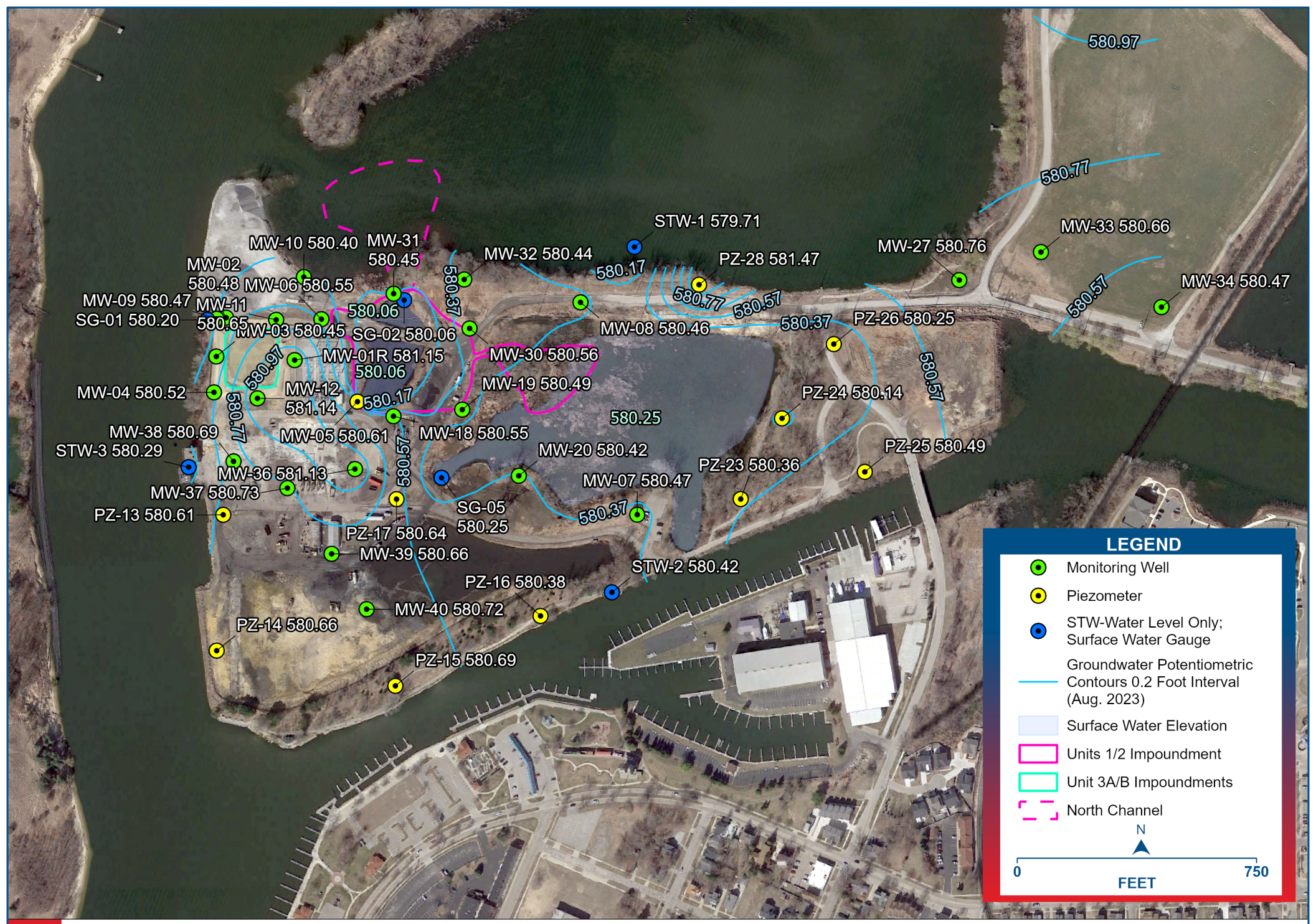

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Appendix B

Federal Rule Statistical Analysis Tables

Table 1: Summary Statistics, Non-Detects Included

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Date Range	Distributions Fit[a]	Recommended Distribution	Mean	Median	Minimum	Maximum	SD	CV	MAD/0.675	Skewness	Kurtosis
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Gamma	47.5	21.5	1.00	170	55.6	1.17	21.5	1.33	0.320
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	1.01	0.190	0.0670	4.00	1.30	1.29	0.169	1.20	0.00497
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	180	180	100	220	30.7	0.171	37.0	-0.714	0.394
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	46.5	35.5	17.0	120	30.3	0.650	20.7	1.23	0.574
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	6.90	6.86	6.53	7.66	0.235	0.0341	0.207	1.36	3.69
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Nonparametric	19.8	2.75	0.410	100	28	1.41	3.47	1.45	1.39
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	699	705	460	920	108	0.155	126	-0.168	-0.380
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000325	0.000150	0.0000600	0.00120	0.000351	1.08	0.0000748	1.42	0.548
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.00155	0.00110	0.000690	0.00400	0.00101	0.650	0.000400	1.44	0.845
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.246	0.165	0.0730	0.580	0.190	0.770	0.123	0.785	-1.19
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	2022-11-30 to 2023-08-07		Nonparametric	0.0000696	0.0000520	0.0000520	0.000260	0.0000587	0.842	0	3.22	9.11
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.0000719	0.0000750	0.0000320	0.000160	0.0000426	0.592	0.0000607	0.992	0.0359
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Normal	Normal	0.0152	0.0129	0.000880	0.0340	0.0116	0.759	0.0151	0.215	-1.60
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.000952	0.000825	0.000240	0.00200	0.000515	0.541	0.000600	0.547	-0.971
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	23	14	61%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.000465	0.000220	0.000100	0.00160	0.000424	0.912	0.000104	1.25	0.642
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.0269	0.00870	0.00410	0.100	0.0323	1.20	0.00526	1.27	-0.00151
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	24	24	100%	2022-11-30 to 2023-08-07		Nonparametric	0.000160	0.000160	0.000160	0.000160	0	0	0	NA	NA
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Gamma	0.00177	0.000620	0.000250	0.00790	0.00204	1.15	0.000511	1.74	2.63
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	1.24	1.15	0.587	2.79	0.541	0.438	0.483	1.20	1.36
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000391	0.000280	0.000160	0.00110	0.000279	0.713	0.0000889	1.82	2.15
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	22	22	100%	2022-11-30 to 2023-08-07		Nonparametric	0.0000750	0.0000750	0.0000750	0.0000750	0	0	0	NA	NA

[a] Non-detects are excluded from goodness-of-fit tests.

Table 2: Summary Statistics, Non-Detects Excluded

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Date Range	Distributions Fit	Recommended Distribution	Mean	Median	Minimum	Maximum	SD	CV	MAD/0.675	Skewness	Kurtosis
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Gamma	47.5	21.5	1.00	170	55.6	1.17	21.5	1.33	0.320
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	1.01	0.190	0.0670	4.00	1.30	1.29	0.169	1.20	0.00497
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	180	180	100	220	30.7	0.171	37.0	-0.714	0.394
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	46.5	35.5	17.0	120	30.3	0.650	20.7	1.23	0.574
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	6.90	6.86	6.53	7.66	0.235	0.0341	0.207	1.36	3.69
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Nonparametric	23.7	5.55	0.560	100	29.2	1.23	7.39	1.20	0.680
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	699	705	460	920	108	0.155	126	-0.168	-0.380
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000357	0.000160	0.0000600	0.00120	0.000365	1.02	0.0000963	1.22	-0.0406
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.00155	0.00110	0.000690	0.00400	0.00101	0.650	0.000400	1.44	0.845
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.246	0.165	0.0730	0.580	0.190	0.770	0.123	0.785	-1.19
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	2022-11-30 to 2023-08-07		Nonparametric	0.0000590	0.0000590	0.0000590	0.0000590	NA	NA	0	NA	NA
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.0000950	0.000100	0.0000360	0.000150	0.0000517	0.544	0.0000741	-0.136	-2.76
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Normal	Normal	0.0159	0.0160	0.00210	0.0340	0.0114	0.718	0.0163	0.155	-1.62
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.000972	0.000830	0.000240	0.00200	0.000517	0.533	0.000622	0.475	-1.03
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	23	14	61%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.000690	0.000740	0.000150	0.00160	0.000468	0.678	0.000296	0.612	0.440
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.0276	0.00860	0.00410	0.100	0.0328	1.19	0.00519	1.20	-0.186
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Gamma	0.00267	0.00220	0.000300	0.00790	0.00229	0.857	0.00224	1.03	0.576
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	1.40	1.26	0.823	2.79	0.531	0.380	0.570	1.06	1.19
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000350	0.000290	0.000160	0.000890	0.000193	0.552	0.0000815	1.98	3.44

Table 3: Goodness-of-Fit Tests, Non-Detects Excluded

								Normal				Lognormal				Gamma						
								S-W		Lilliefors		S-W		Lilliefors		K-S		A-D				
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Log-SD (NDs excl.)	ProUCL Distributions Fit	Recommended Distribution
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	0.751	0.000	0.268	0.000	0.960	0.442	0.089	0.890	0.168	>= 0.10	0.619	>= 0.10	1.373	Gamma; Lognormal	Gamma
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	0.733	0.000	0.333	0.000	0.853	0.003	0.214	0.006	0.256	< 0.01	1.872	< 0.01	1.456	Nonparametric	Nonparametric
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	0.941	0.167	0.130	0.363	0.894	0.016	0.163	0.097	0.154	>= 0.10	0.567	>= 0.10	0.189	Gamma; Lognormal; Normal	Normal
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	0.828	0.001	0.199	0.015	0.914	0.042	0.191	0.024	0.204	0.01 <= p < 0.05	0.997	0.01 <= p < 0.05	0.592	Nonparametric	Nonparametric
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	0.914	0.043	0.167	0.083	0.942	0.180	0.123	0.460	0.137	>= 0.10	0.566	>= 0.10	0.226	Gamma; Lognormal; Normal	Normal
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	0.907	0.030	0.108	0.658	0.921	0.063	0.104	0.716	0.104	>= 0.10	0.442	>= 0.10	0.033	Gamma; Lognormal; Normal	Normal
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	0.789	0.001	0.268	0.001	0.902	0.044	0.181	0.085	0.195	0.05 <= p < 0.10	0.953	0.01 <= p < 0.05	1.766	Gamma; Lognormal	Nonparametric
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	0.962	0.470	0.139	0.270	0.947	0.228	0.154	0.150	0.153	>= 0.10	0.535	>= 0.10	0.161	Gamma; Lognormal; Normal	Normal
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	0.744	0.000	0.302	0.000	0.885	0.018	0.189	0.048	0.233	< 0.01	1.545	< 0.01	0.949	Nonparametric	Nonparametric
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	0.764	0.000	0.235	0.001	0.880	0.008	0.197	0.017	0.210	< 0.01	1.523	< 0.01	0.546	Nonparametric	Nonparametric
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	0.782	0.000	0.240	0.001	0.863	0.004	0.188	0.027	0.194	0.01 <= p < 0.05	1.491	< 0.01	0.770	Nonparametric	Nonparametric
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA		Nonparametric
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	0.895	0.383	0.213	0.639	0.885	0.331	0.222	0.576	0.230	>= 0.10	0.390	>= 0.10	0.639	Gamma; Lognormal; Normal	Nonparametric
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	0.878	0.009	0.178	0.057	0.867	0.006	0.197	0.021	0.190	0.01 <= p < 0.05	1.094	< 0.01	0.980	Normal	Normal
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	0.928	0.098	0.173	0.072	0.956	0.396	0.168	0.093	0.164	>= 0.10	0.426	>= 0.10	0.580	Gamma; Lognormal; Normal	Normal
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	0.914	0.043	0.167	0.083	0.942	0.180	0.123	0.460	0.137	>= 0.10	0.566	>= 0.10	0.226	Gamma; Lognormal; Normal	Normal
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	23	14	61%	0.914	0.342	0.185	0.498	0.876	0.142	0.221	0.235	0.188	>= 0.10	0.471	>= 0.10	0.859	Gamma; Lognormal; Normal	Nonparametric
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	0.709	0.000	0.335	0.000	0.821	0.001	0.254	0.000	0.296	< 0.01	2.278	< 0.01	1.143	Nonparametric	Nonparametric
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	24	24	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA		Nonparametric
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	0.895	0.094	0.150	0.531	0.941	0.426	0.156	0.475	0.153	>= 0.10	0.283	>= 0.10	1.049	Gamma; Lognormal; Normal	Gamma
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	0.899	0.056	0.155	0.306	0.942	0.308	0.115	0.769	0.112	>= 0.10	0.397	>= 0.10	0.360	Gamma; Lognormal; Normal	Normal
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	0.736	0.000	0.298	0.000	0.892	0.042	0.209	0.036	0.243	< 0.01	1.189	< 0.01	0.439	Nonparametric	Nonparametric
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	22	22	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA		Nonparametric

Note: p-values above 0.05 suggest a fit to the tested distribution; a distribution passes its GOF test when at least one of the two p-values is above 0.05.

Table 4: Autocorrelation Tests, Non-Detects Excluded

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Autocorrelation	Box-Ljung p-value	Sig.
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	-0.325	0.091	
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	-0.365	0.057	
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	-0.130	0.499	
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	-0.178	0.354	
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	-0.273	0.155	
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	-0.027	0.887	
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	0.077	0.710	
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	-0.026	0.892	
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	-0.056	0.784	
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	-0.285	0.138	
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	-0.389	0.043	*
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	NA	NA	
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	0.480	0.156	
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	-0.341	0.081	
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	-0.493	0.012	*
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	-0.273	0.155	
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	23	14	61%	-0.334	0.240	
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	-0.307	0.117	
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	0.199	0.408	
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	-0.029	0.896	
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	-0.155	0.477	

*** p < 0.001, ** p < 0.01, * p < 0.05

Table 5: Outlier Counts by Date

Date	Count
2023-01-05	1

Table 6: Outliers Identified at the 1% Significance Level, Non-Detects Excluded

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	No. Detects	Date	Dilution	Value
4_120	MW-33	Appendix III	pH (field)	su	24	0	0%	24	2023-01-05	NA	7.66

Table 7: Seasonality Tests

						Full								Without Non-Detects							
						Sample Size					p-Value			Sample Size					p-Value		
ID	Well	Constituent Type	Constituent	Unit	% NDs	Winter	Spring	Summer	Fall	Total	Kruskal-Wallis	ANOVA	Log ANOVA	Winter	Spring	Summer	Fall	Total	Kruskal-Wallis	ANOVA	Log ANOVA
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	0%	8	9	6	1	24	0.708	0.895	0.784	8	9	6	1	24	0.708	0.895	0.784
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	0%	8	9	6	1	24	0.579	0.730	0.853	8	9	6	1	24	0.579	0.730	0.853
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	0%	8	9	6	1	24	0.540	0.496	0.465	8	9	6	1	24	0.540	0.496	0.465
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	0%	8	9	6	1	24	0.151	0.039 *	0.125	8	9	6	1	24	0.151	0.039 *	0.125
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	0%	8	9	6	1	24	0.364	0.424	0.403	8	9	6	1	24	0.364	0.424	0.403
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	0%	8	9	6	1	24	0.447	0.305	0.311	8	9	6	1	24	0.447	0.305	0.311
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	17%	8	9	6	1	24	0.119	0.043 *	0.107	7	8	4	1	20	0.104	0.047 *	0.117
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	0%	8	9	6	1	24	0.063	0.019 *	0.031 *	8	9	6	1	24	0.063	0.019 *	0.031 *
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	12%	8	9	6	1	24	0.925	0.465	0.646	8	8	4	1	21	0.894	0.612	0.812
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	0%	8	9	6	1	24	0.397	0.803	0.710	8	9	6	1	24	0.397	0.803	0.710
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	0%	8	9	6	1	24	0.499	0.770	0.715	8	9	6	1	24	0.499	0.770	0.715
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	96%	8	9	6	1	24	0.141	0.321	0.299	0	1	0	0	1	NA	NA	NA
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	79%	8	9	6	1	24	0.250	0.380	0.237	4	1	0	0	5	0.157	0.290	0.360
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	4%	8	9	6	1	24	0.252	0.378	0.444	8	8	6	1	23	0.282	0.456	0.560
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	4%	8	9	6	1	24	0.969	0.913	0.978	8	8	6	1	23	0.908	0.858	0.969
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	0%	8	9	6	1	24	0.364	0.424	0.403	8	9	6	1	24	0.364	0.424	0.403
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	61%	7	9	6	1	23	0.395	0.848	0.721	2	3	4	0	9	0.552	0.411	0.474
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	4%	8	9	6	1	24	0.633	0.633	0.775	8	9	5	1	23	0.672	0.521	0.706
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	100%	8	9	6	1	24	NA	0.000 ***	0.000 ***	NA	NA	NA	NA	NA	NA	NA	NA
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	42%	8	9	6	1	24	0.020 *	0.186	0.018 *	5	6	3	0	14	0.077	0.152	0.036 *
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	25%	8	9	6	1	24	0.250	0.418	0.314	5	6	6	1	18	0.206	0.538	0.348
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	25%	8	9	6	1	24	0.757	0.589	0.613	6	5	6	1	18	0.208	0.086	0.088
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	100%	8	7	6	1	22	NA	0.000 ***	0.000 ***	NA	NA	NA	NA	NA	NA	NA	NA

*** p < 0.001, ** p < 0.01, * p < 0.05

Table 8: Spatial Variability Tests

						Full									Without Non-Detects									
						Sample Size			p-Value						Sample Size			p-Value						
ID	Well	Constituent Type	Constituent	Unit	% NDs	MW-27	MW-33	MW-34	Total	Kruskal-Wallis		ANOVA		Log ANOVA		MW-27	MW-33	MW-34	Total	Kruskal-Wallis		ANOVA		Log ANOVA	
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	0%	8	8	8	24	0.001	**	0.001	**	0.004	**	8	8	8	24	0.001	**	0.001	**	0.004	**
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	0%	8	8	8	24	0.001	**	0.000	***	0.000	***	8	8	8	24	0.001	**	0.000	***	0.000	***
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	0%	8	8	8	24	0.001	***	0.000	***	0.000	***	8	8	8	24	0.001	***	0.000	***	0.000	***
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	0%	8	8	8	24	0.001	***	0.001	***	0.000	***	8	8	8	24	0.001	***	0.001	***	0.000	***
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	17%	8	8	8	24	0.003	**	0.027	*	0.001	***	8	8	4	20	0.068		0.133		0.047	*
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	0%	8	8	8	24	0.007	**	0.013	*	0.016	*	8	8	8	24	0.007	**	0.013	*	0.016	*
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	12%	8	8	8	24	0.003	**	0.006	**	0.001	**	5	8	8	21	0.013	*	0.021	*	0.007	**
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	96%	8	8	8	24	0.351		0.602		0.587		0	0	1	1	NA		NA		NA	
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	79%	8	8	8	24	0.020	*	0.022	*	0.014	*	0	4	1	5	0.157		0.246		0.170	
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	4%	8	8	8	24	0.002	**	0.000	***	0.000	***	8	8	7	23	0.000	***	0.000	***	0.000	***
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	4%	8	8	8	24	0.033	*	0.009	**	0.009	**	8	8	7	23	0.010	*	0.002	**	0.002	**
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	0%	8	8	8	24	0.001	***	0.000	***	0.000	***	8	8	8	24	0.001	***	0.000	***	0.000	***
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	61%	8	8	7	23	0.001	**	0.000	***	0.000	***	0	3	6	9	0.020	*	0.009	**	0.000	***
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	4%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	7	8	23	0.000	***	0.000	***	0.000	***
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	100%	8	8	8	24	NA		0.385		0.385		NA	NA	NA	NA	NA		NA		NA	
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	42%	8	8	8	24	0.011	*	0.036	*	0.005	**	1	8	5	14	0.261		0.583		0.276	
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	25%	8	8	8	24	0.007	**	0.005	**	0.004	**	5	5	8	18	0.048	*	0.074		0.054	
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	25%	8	8	8	24	0.000	***	0.023	*	0.002	**	4	7	7	18	0.002	**	0.011	*	0.001	**
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	100%	8	7	7	22	NA		0.438		0.438		NA	NA	NA	NA	NA		NA		NA	

*** p < 0.001, ** p < 0.01, * p < 0.05

Table 9: Trend Tests: Lognormal MLE and MK

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Type	Method	Slope	p-value	Trend
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	Parametric	Lognormal MLE	0.00285	0.395	↔
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	Nonparametric	MK	-0.00000485	1.000	↔
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	Parametric	Lognormal MLE	-0.000793	0.071	↔
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	Nonparametric	MK	-0.0981	0.033	↔
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	Parametric	Lognormal MLE	0.000304	0.585	↔
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	Parametric	Lognormal MLE	-0.000123	0.118	↔
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	Nonparametric	MK	-0.0931	0.006	↓
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	Parametric	Lognormal MLE	-0.000610	0.107	↔
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	Nonparametric	MK	-0.000000159	0.634	↔
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	Nonparametric	MK	0.00000152	0.147	↔
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	Nonparametric	MK	0	0.980	↔
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	Parametric	Lognormal MLE	0.00235	0.394	↔
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	Parametric	Lognormal MLE	0.0000429	0.977	↔
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	Parametric	Lognormal MLE	0.000304	0.585	↔
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	Nonparametric	MK	0.00000730	0.549	↔
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	Parametric	Lognormal MLE	-0.00578	0.139	↔
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	Parametric	Lognormal MLE	0.00239	0.044	↔

Table 10: Trend Tests: Piecewise Linear-Linear

								Line 1			Line 2					
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Slope	p-Value	Trend	Slope	p-Value	Trend	Break 1	R-Squared	Overall Trend
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	-0.577	0.672	↔	0.185	0.421	↔	2023-01-05	0.050	↔
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	-0.00553	0.591	↔	0.00779	0.420	↔	2023-03-28	0.053	↔
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	-0.251	0.279	↔	0.0276	0.897	↔	2023-04-17	0.165	↔
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	-0.280	0.090	↔	0.236	0.462	↔	2023-04-22	0.163	↔
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	-0.0500	0.540	↔	0.000312	0.139	↔	2022-12-02	0.184	↔
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	0.0250	0.930	↔	-0.00138	0.067	↔	2022-12-08	0.159	↔
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	-0.00845	0.988	↔	-0.230	0.028	↔	2023-02-06	0.304	↔
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	-1.40	0.068	↔	0.906	0.195	↔	2023-04-17	0.306	↔
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	0.000000841	0.750	↔	-0.00000380	0.134	↔	2023-04-17	0.145	↔
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	-0.0000221	0.986	↔	0.00000434	0.187	↔	2023-01-04	0.097	↔
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	-0.000903	0.549	↔	0.00119	0.400	↔	2023-04-17	0.054	↔
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	0.000000629	0.041	↔	-0.000000758	0.203	↔	2023-04-18	0.252	↔
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	0.000000441	0.166	↔	-0.000000272	0.353	↔	2023-04-17	0.198	↔
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	-0.0000394	0.516	↔	0.000141	0.253	↔	2023-04-18	0.174	↔
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	0.00000146	0.726	↔	-0.000000299	0.939	↔	2023-03-15	0.009	↔
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	-0.0500	0.540	↔	0.000312	0.139	↔	2022-12-02	0.184	↔
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	23	14	61%	0.0000102	0.987	↔	-0.000000914	0.512	↔	2023-01-04	0.055	↔
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	-0.000213	0.404	↔	0.000198	0.406	↔	2023-03-15	0.077	↔
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	0.0000107	0.310	↔	-0.0000285	0.180	↔	2023-04-18	0.218	↔

(Table continues on next page)

Table 10: Trend Tests: Piecewise Linear-Linear *(continued)*

								Line 1			Line 2					
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Slope	p-Value	Trend	Slope	p-Value	Trend	Break 1	R-Squared	Overall Trend
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	-0.00945	0.988	↔	0.00340	0.049	↔	2023-01-04	0.180	↔
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	0.000000831	0.584	↔	-0.00000273	0.371	↔	2023-04-18	0.111	↔

Table 11: Trend Tests: Piecewise Linear-Linear-Linear

								Line 1			Line 2			Line 3						
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Slope	p-Value	Trend	Slope	p-Value	Trend	Slope	p-Value	Trend	Break 1	Break 2	R-Squared	Overall Trend
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	0.0250	0.928	↔	-0.00545	0.055	↔	0.000393	0.803	↔	2022-12-17	2023-03-19	0.302	↔
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	0.0687	0.823	↔	-0.521	0.399	↔	0.00376	0.989	↔	2023-02-22	2023-05-08	0.344	↔
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	-0.00000300	0.477	↔	0.0000986	0.651	↔	-0.00000506	0.053	↔	2023-03-12	2023-03-18	0.224	↔
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	-0.0000114	0.371	↔	0.000305	0.642	↔	-0.00000226	0.762	↔	2023-03-12	2023-03-17	0.148	↔
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	-0.000104	0.967	↔	-0.00249	0.985	↔	0.00149	0.318	↔	2023-03-02	2023-04-17	0.066	↔
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	-0.000000538	0.672	↔	0.00000128	0.060	↔	-0.000000942	0.118	↔	2023-01-25	2023-04-18	0.335	↔
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	-0.00000414	0.995	↔	0.00000115	0.713	↔	-0.00000200	0.864	↔	2022-12-26	2023-06-18	0.011	↔
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	-0.0137	0.983	↔	0.00611	0.044	↔	-0.00256	0.812	↔	2023-01-04	2023-05-22	0.246	↔
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	-0.00000432	0.519	↔	0.00000383	0.574	↔	-0.00000358	0.088	↔	2023-01-26	2023-04-17	0.188	↔

Appendix C

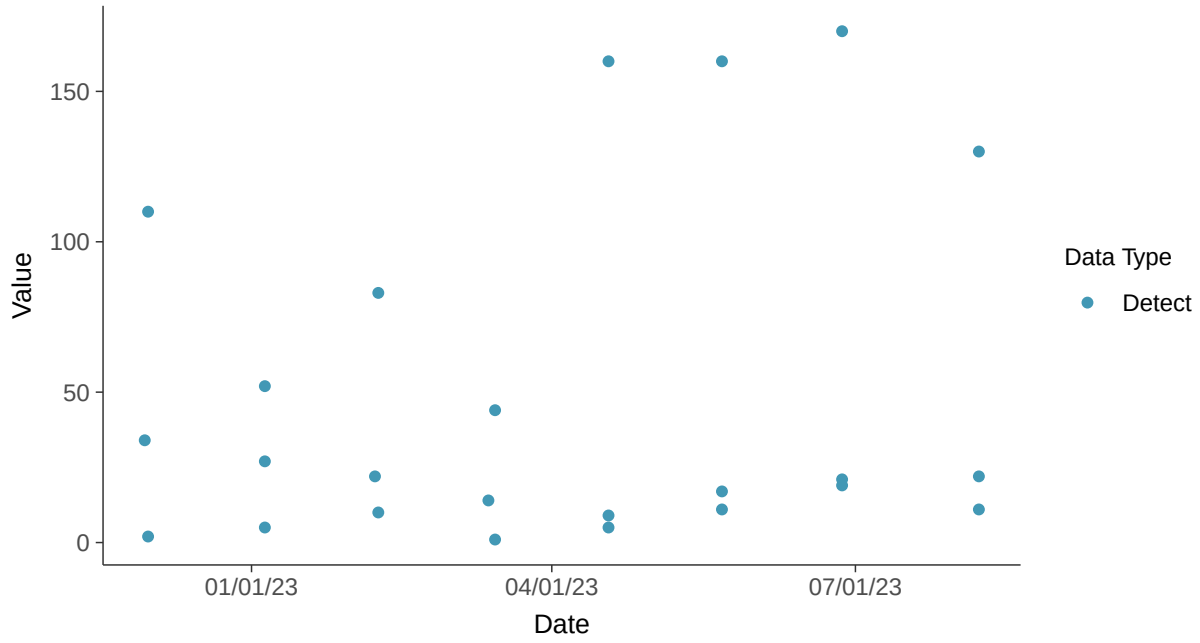
Federal Rule Statistical Analysis Plots

Additional Parameters: Total Suspended Solids, MW-27, MW-33, MW-34

ID: 3_127

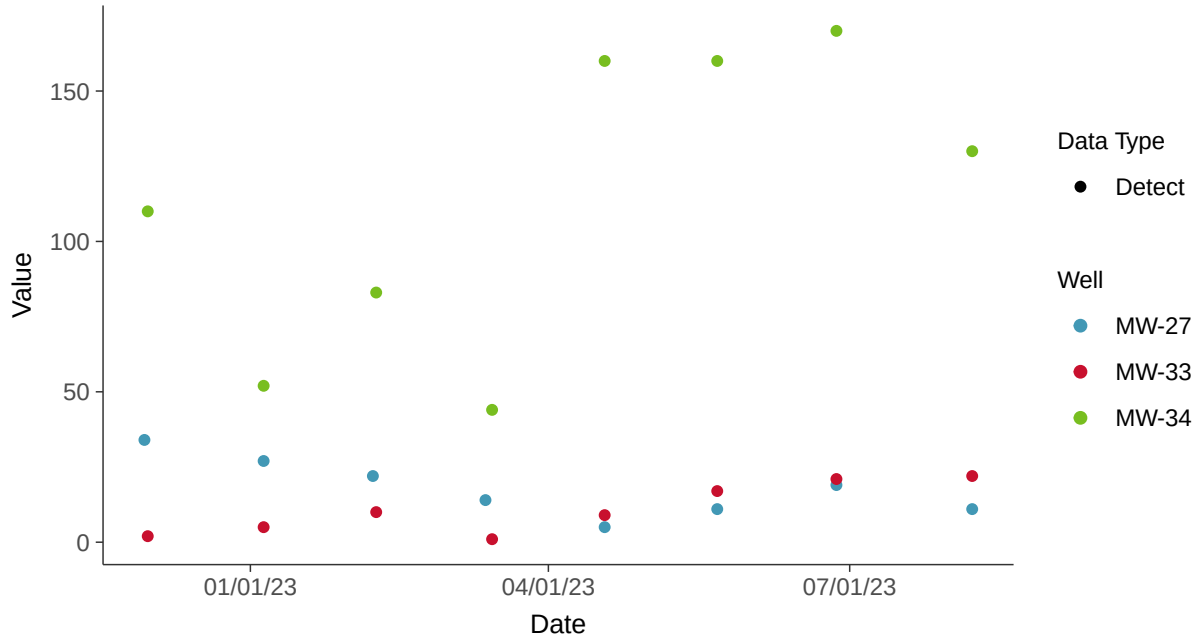
Scatter Plot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



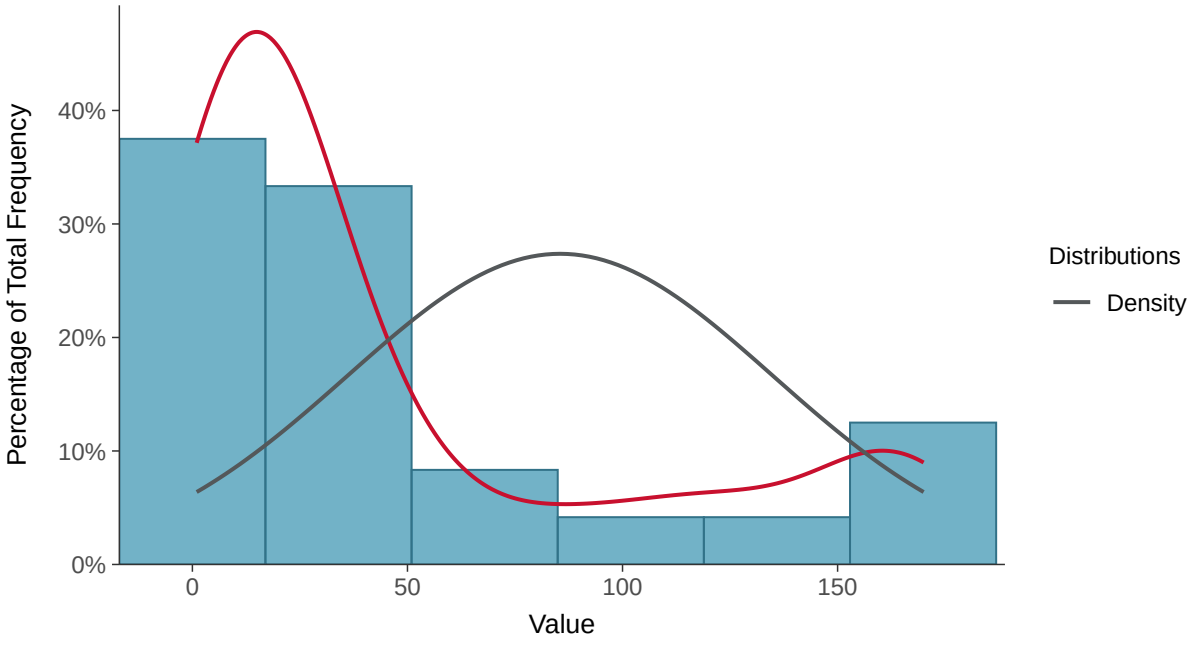
Scatter Plot by Well

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



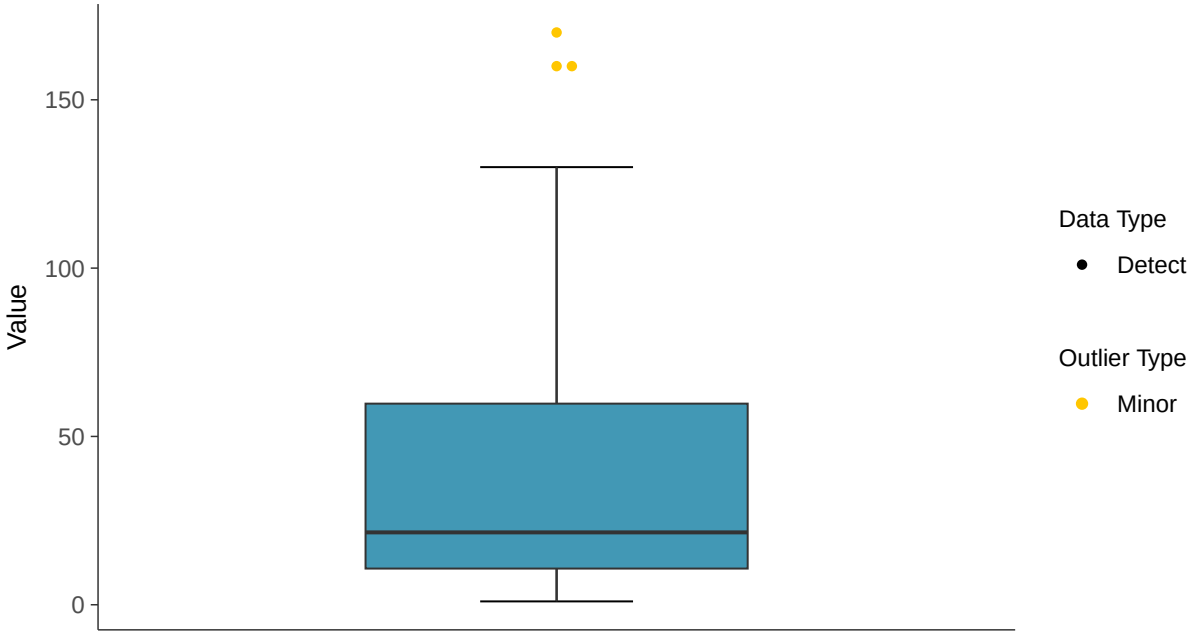
Histogram

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



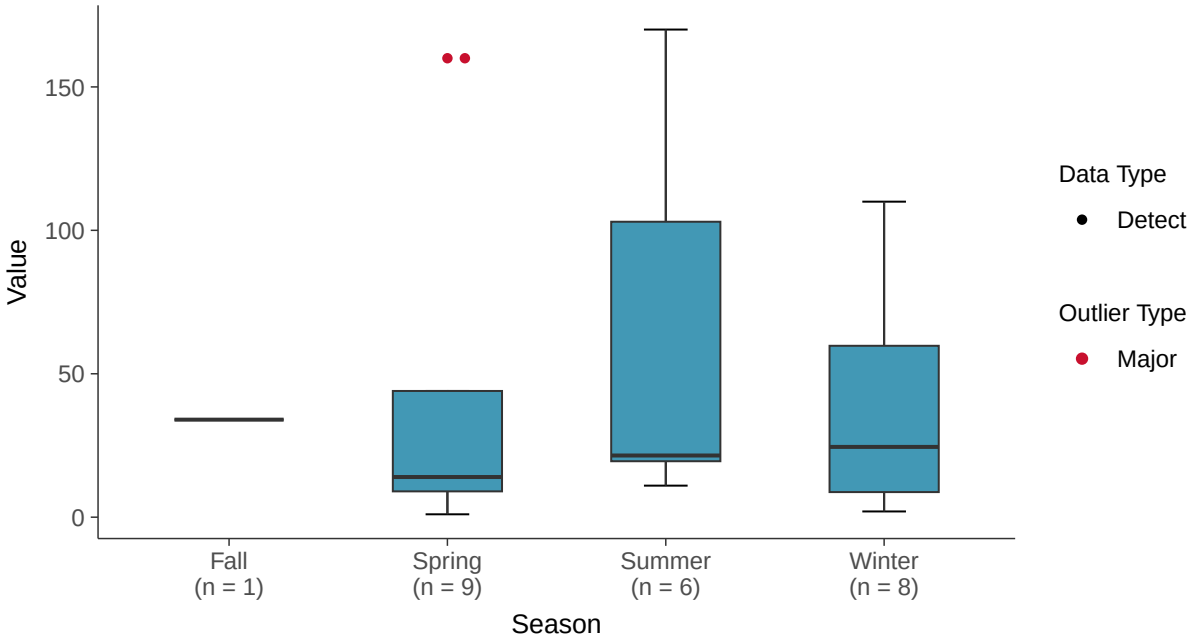
Boxplot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



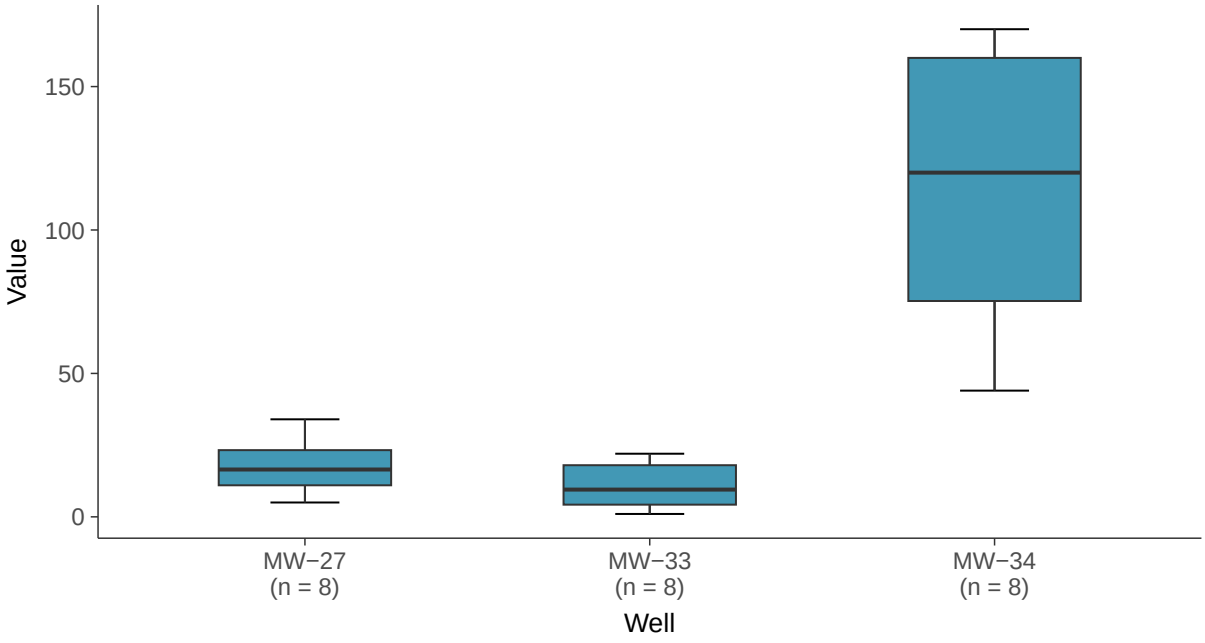
Boxplot by Season

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



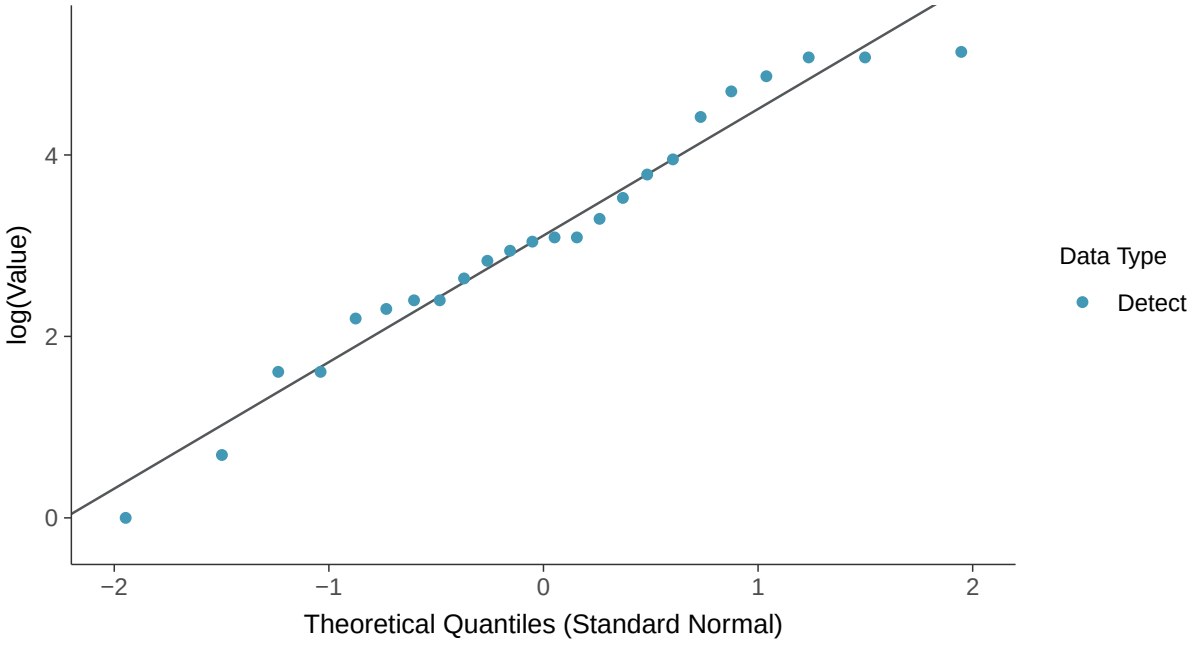
Boxplot by Well

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



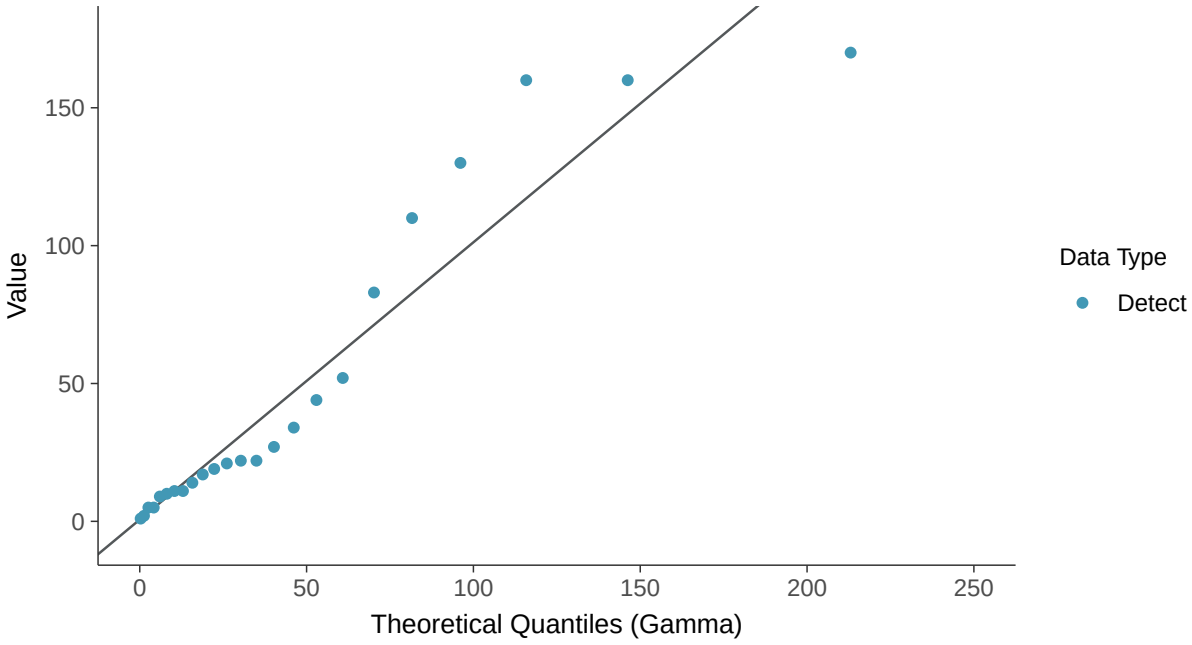
Lognormal Q-Q plot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



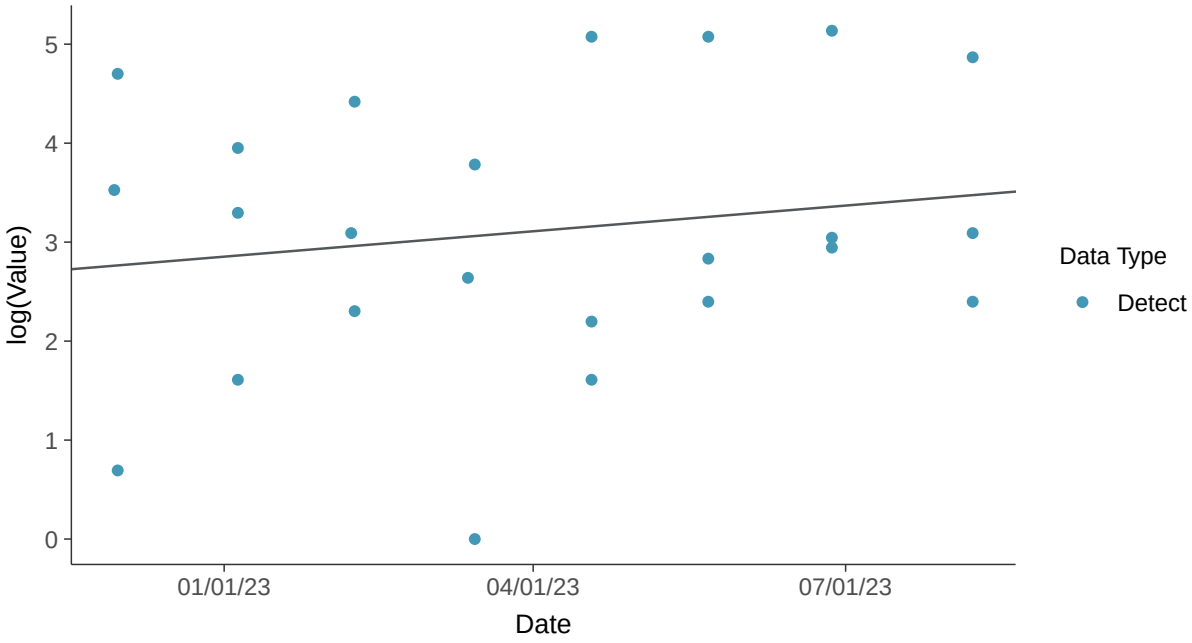
Gamma Q-Q plot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



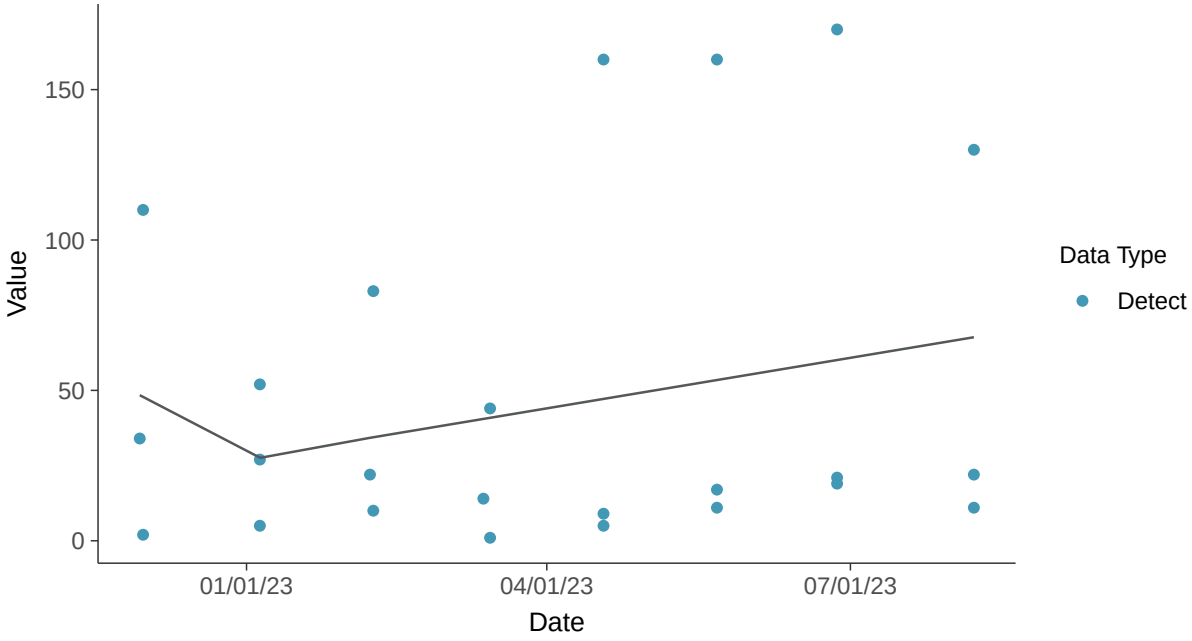
Trend Regression: Lognormal MLE

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)

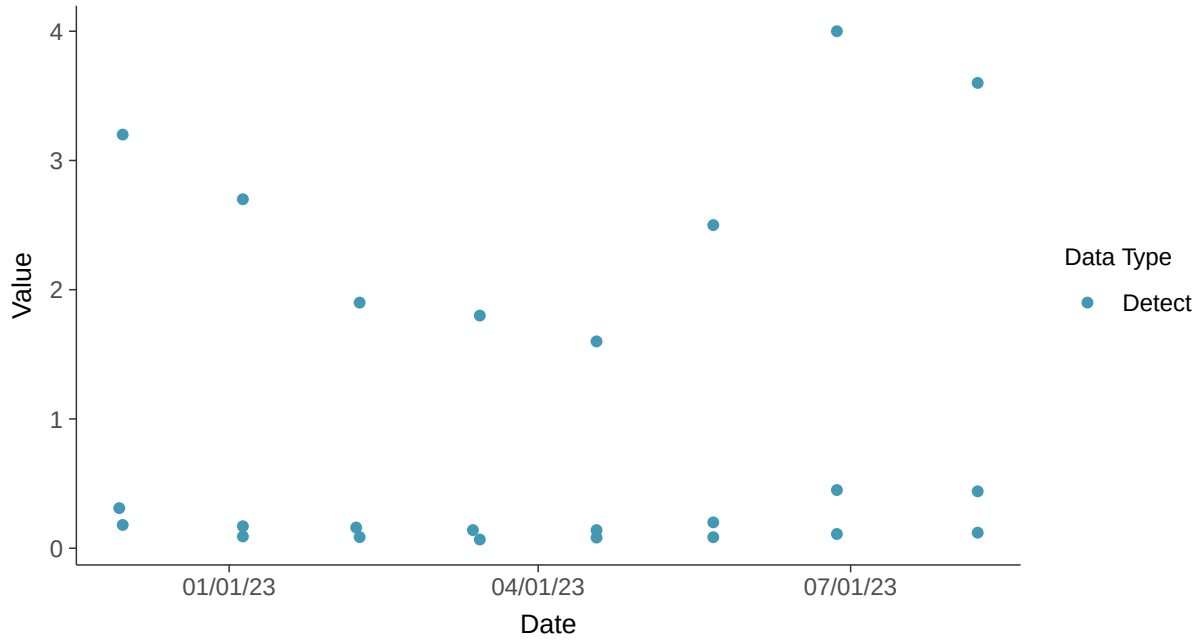


Appendix III: Boron, MW-27, MW-33, MW-34

ID: 4_105

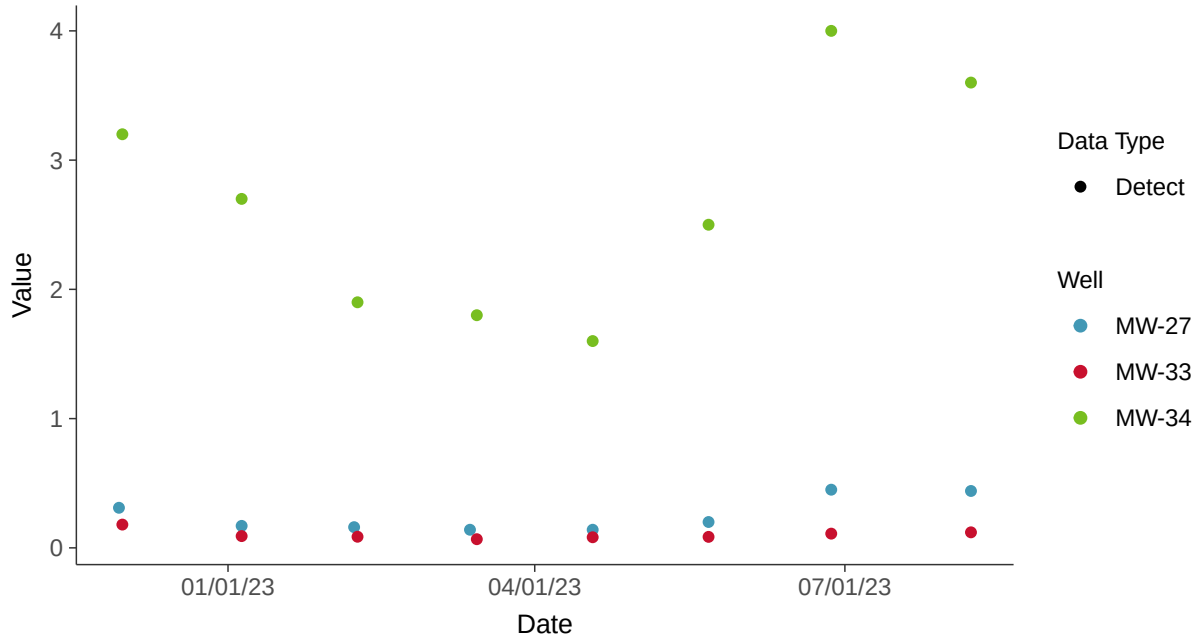
Scatter Plot

Boron, MW-27, MW-33, MW-34 (mg/L)



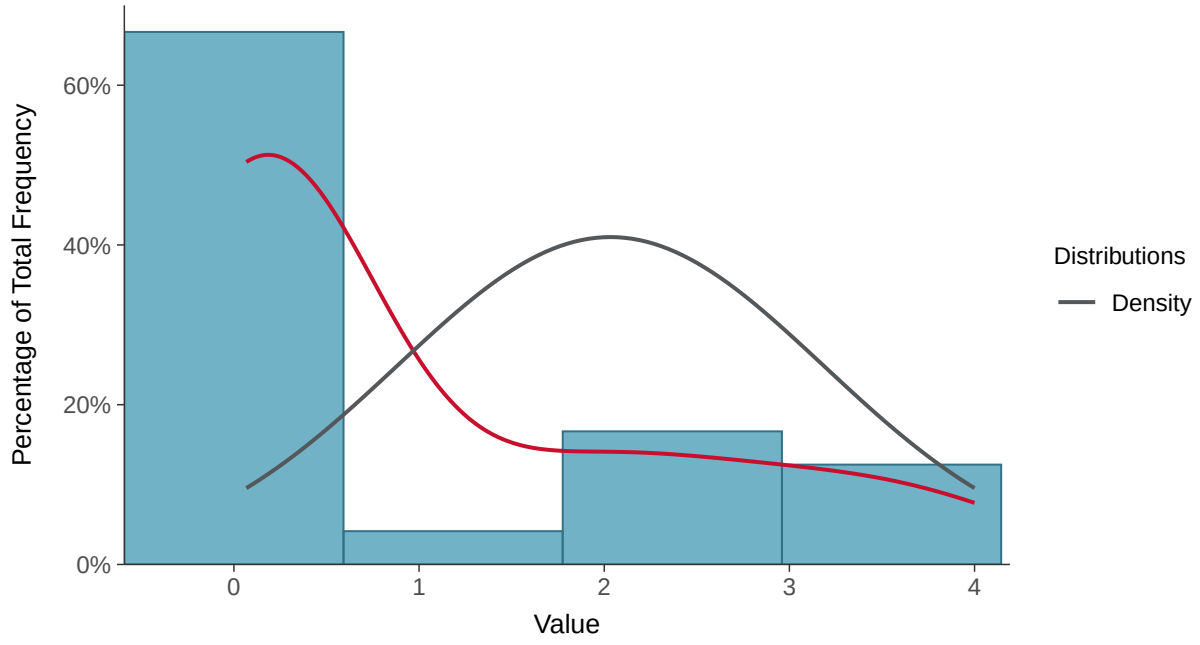
Scatter Plot by Well

Boron, MW-27, MW-33, MW-34 (mg/L)



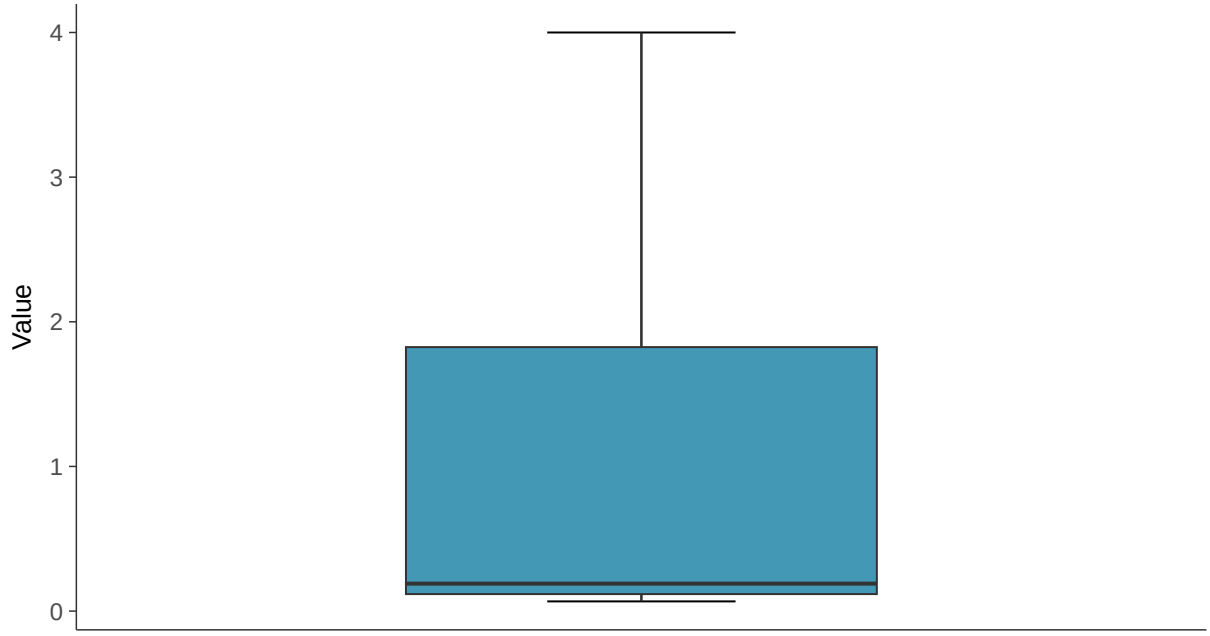
Histogram

Boron, MW-27, MW-33, MW-34 (mg/L)



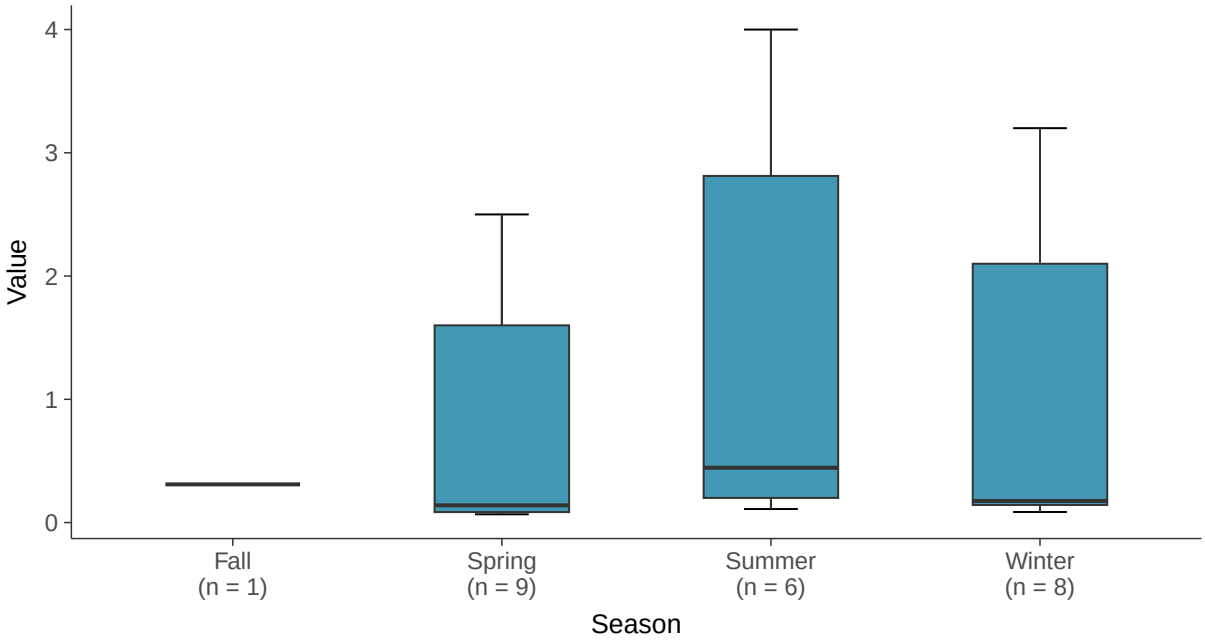
Boxplot

Boron, MW-27, MW-33, MW-34 (mg/L)



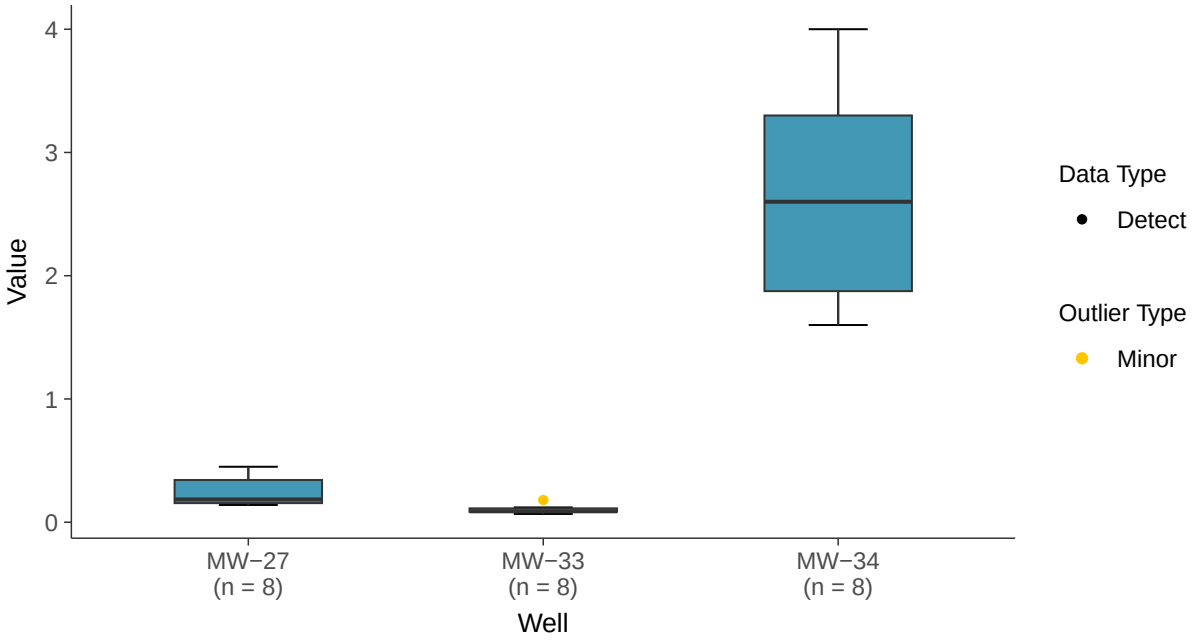
Boxplot by Season

Boron, MW-27, MW-33, MW-34 (mg/L)



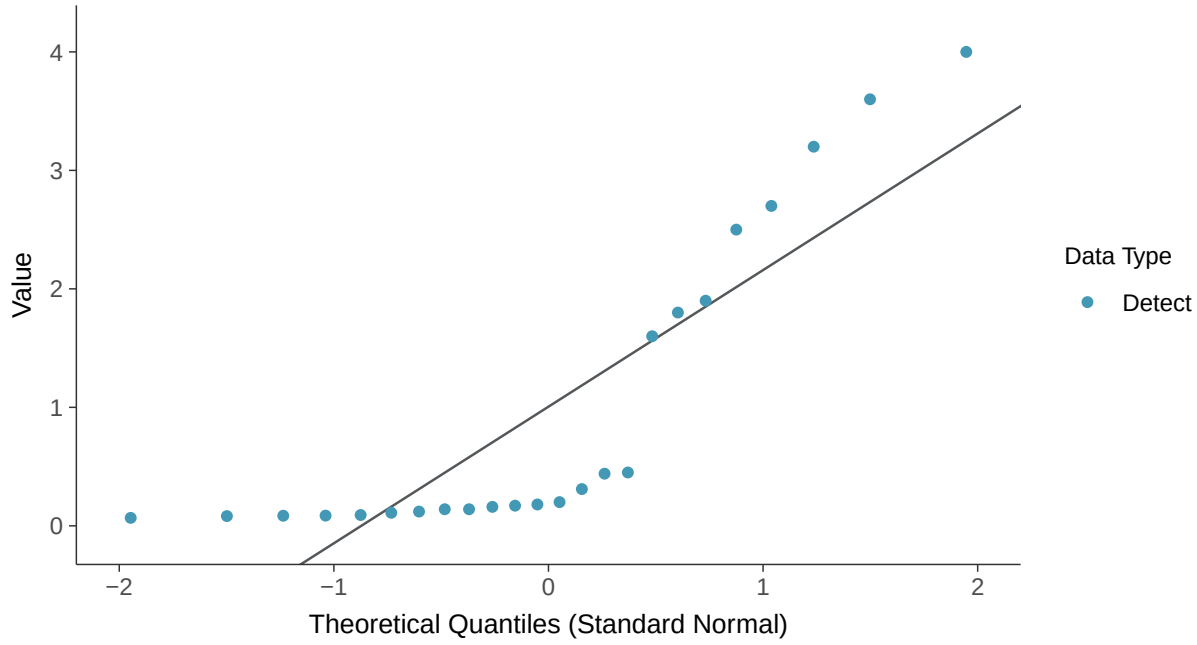
Boxplot by Well

Boron, MW-27, MW-33, MW-34 (mg/L)



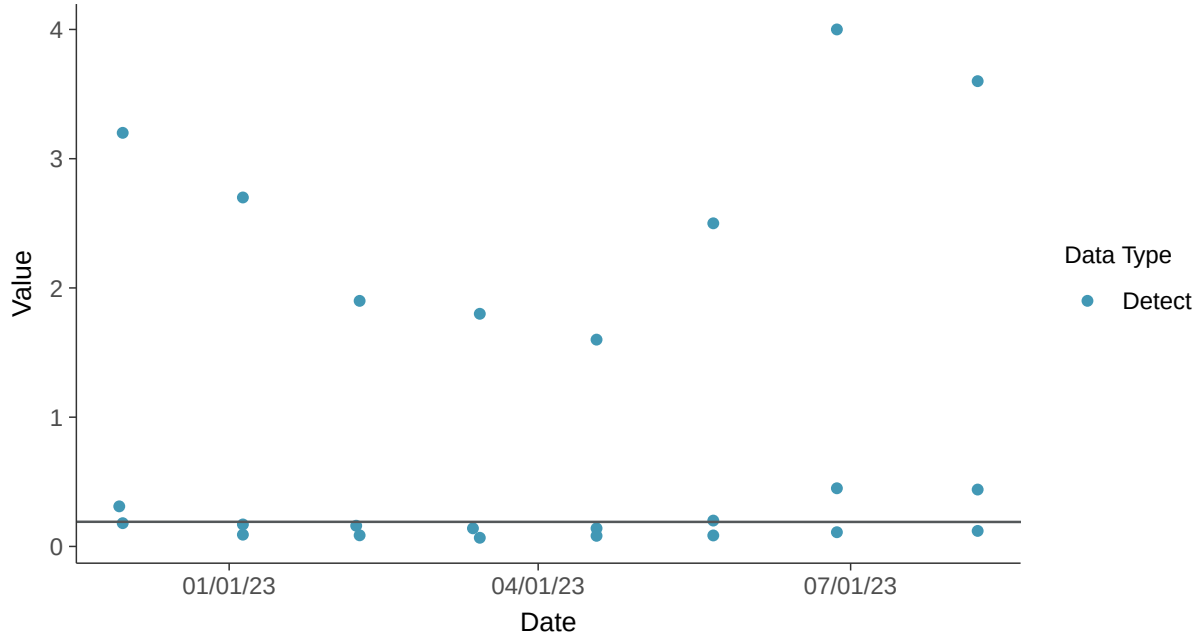
Normal Q-Q plot

Boron, MW-27, MW-33, MW-34 (mg/L)



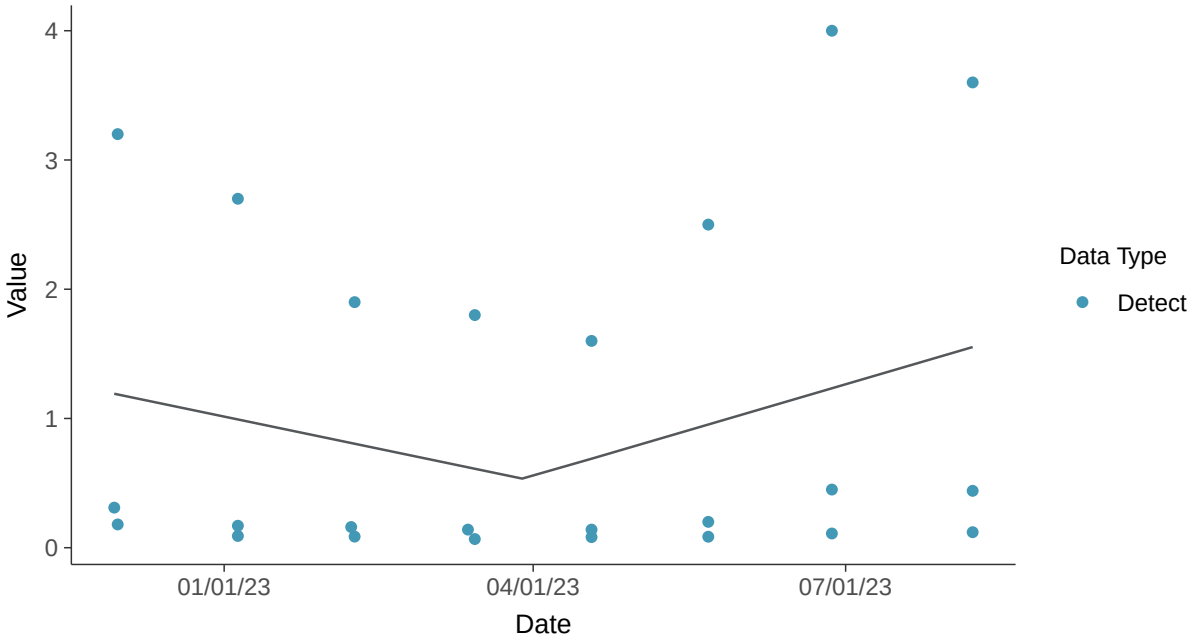
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Boron, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Boron, MW-27, MW-33, MW-34 (mg/L)

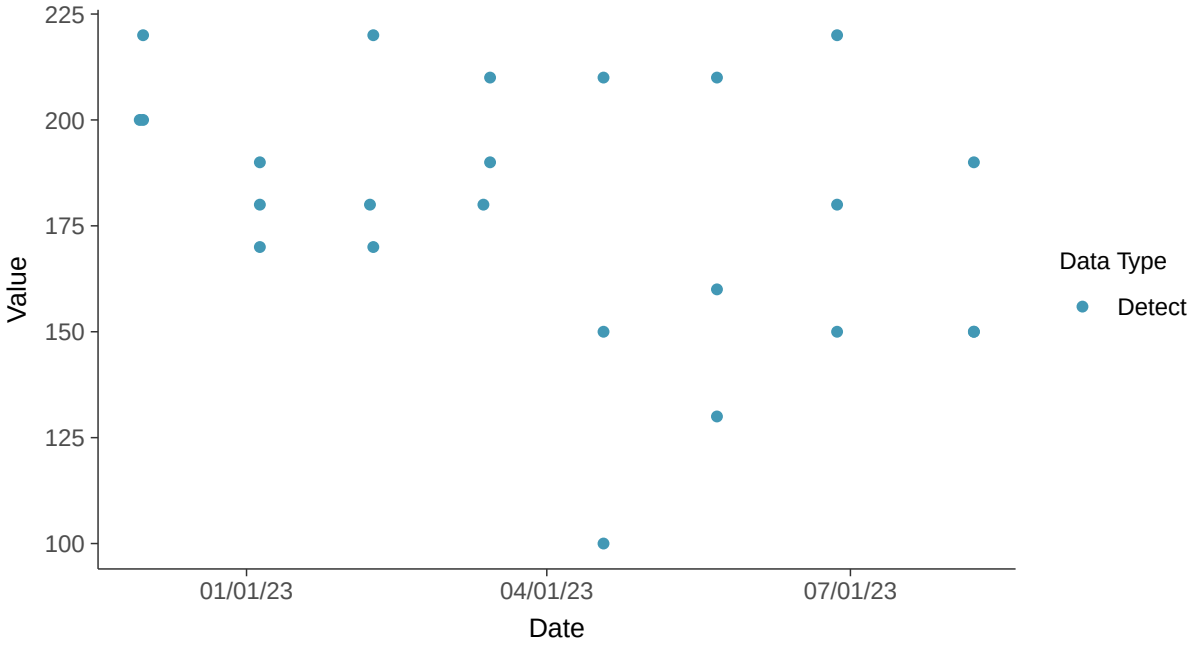


Appendix III: Calcium, MW-27, MW-33, MW-34

ID: 4_107

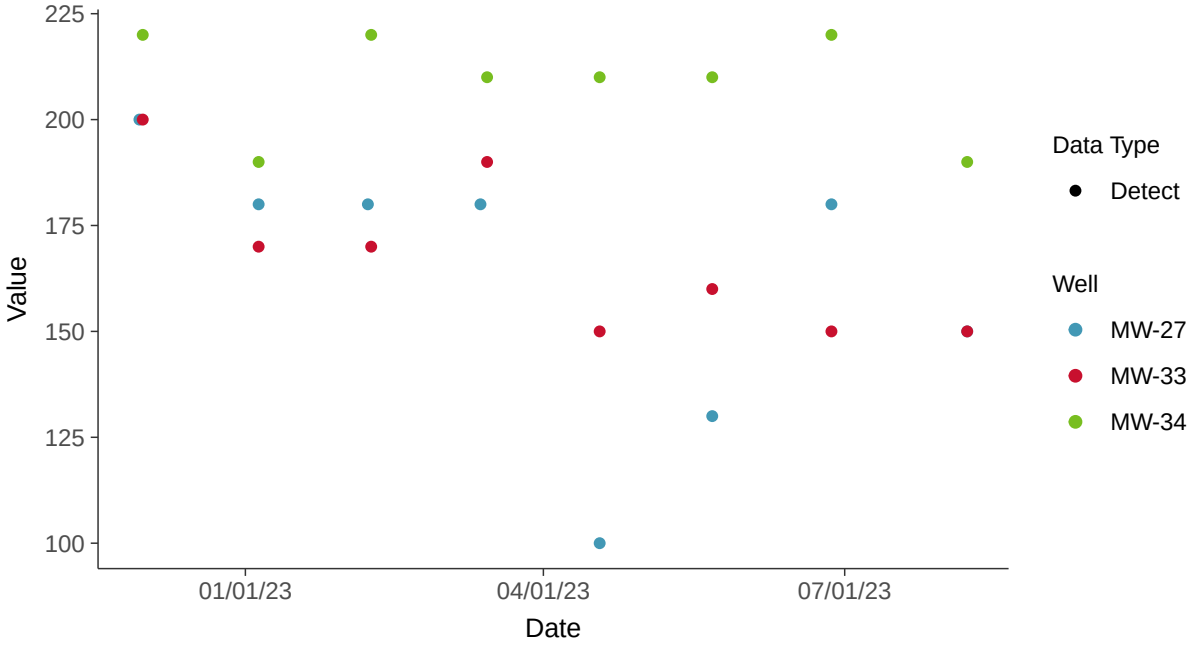
Scatter Plot

Calcium, MW-27, MW-33, MW-34 (mg/L)



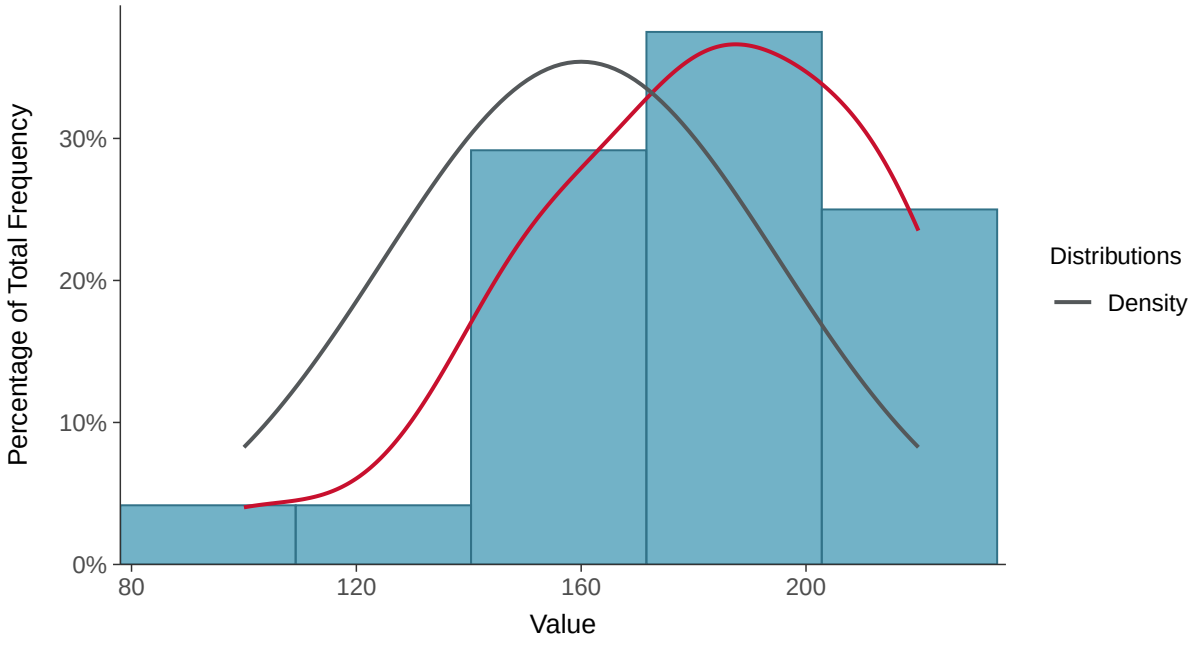
Scatter Plot by Well

Calcium, MW-27, MW-33, MW-34 (mg/L)



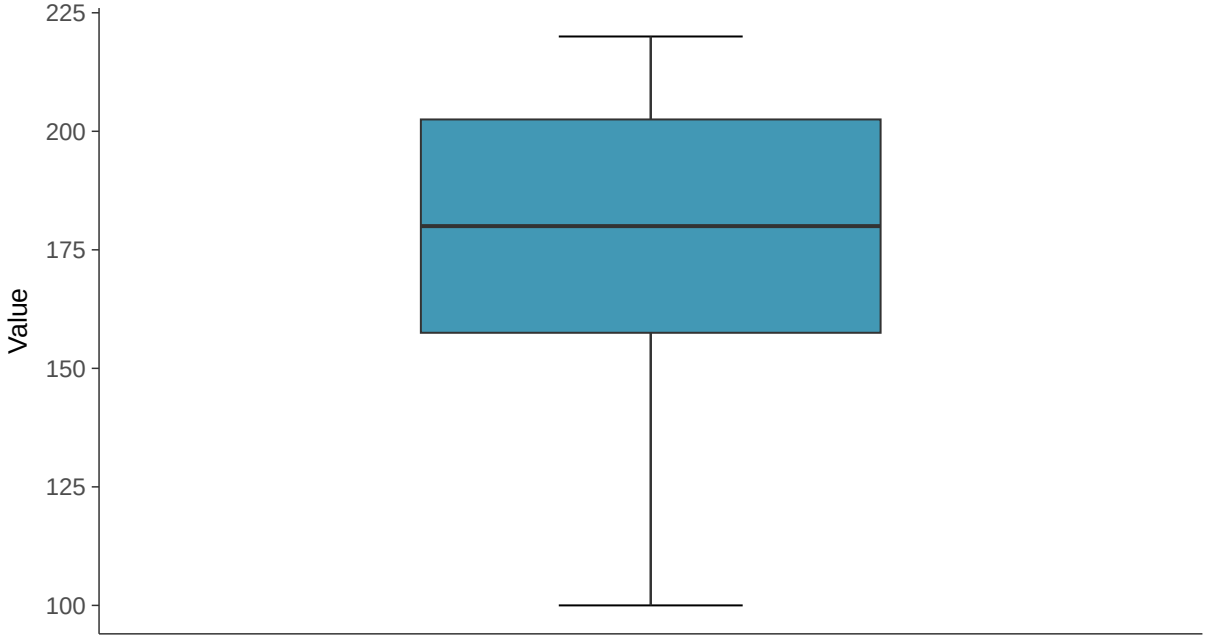
Histogram

Calcium, MW-27, MW-33, MW-34 (mg/L)



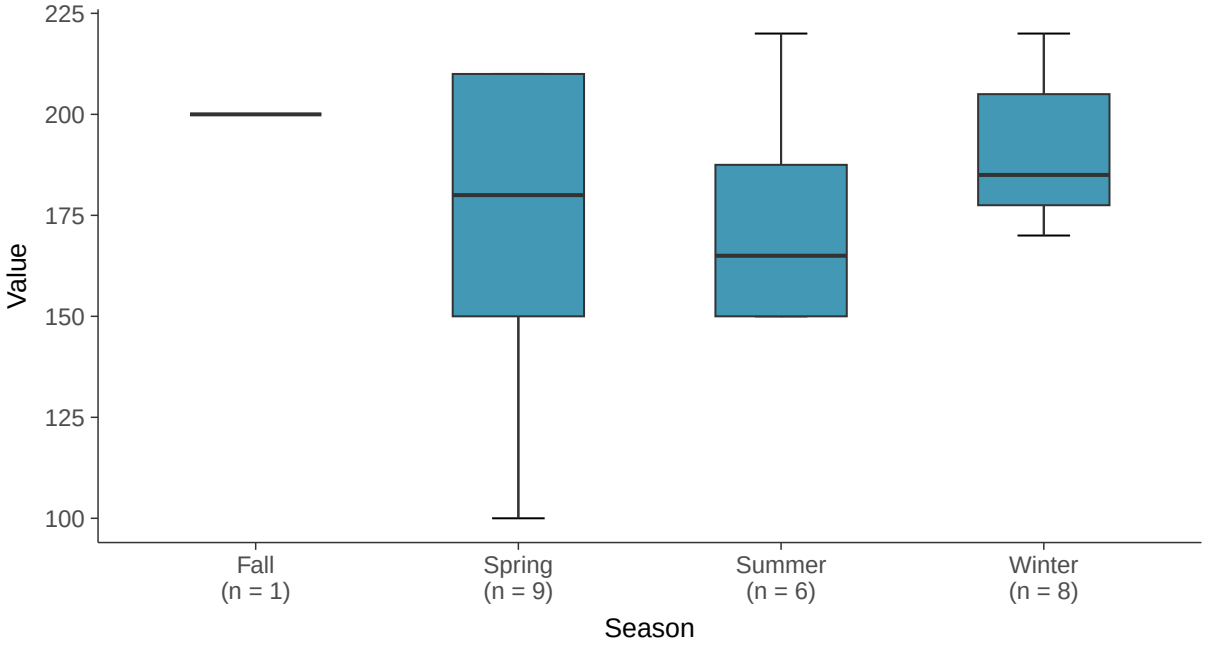
Boxplot

Calcium, MW-27, MW-33, MW-34 (mg/L)



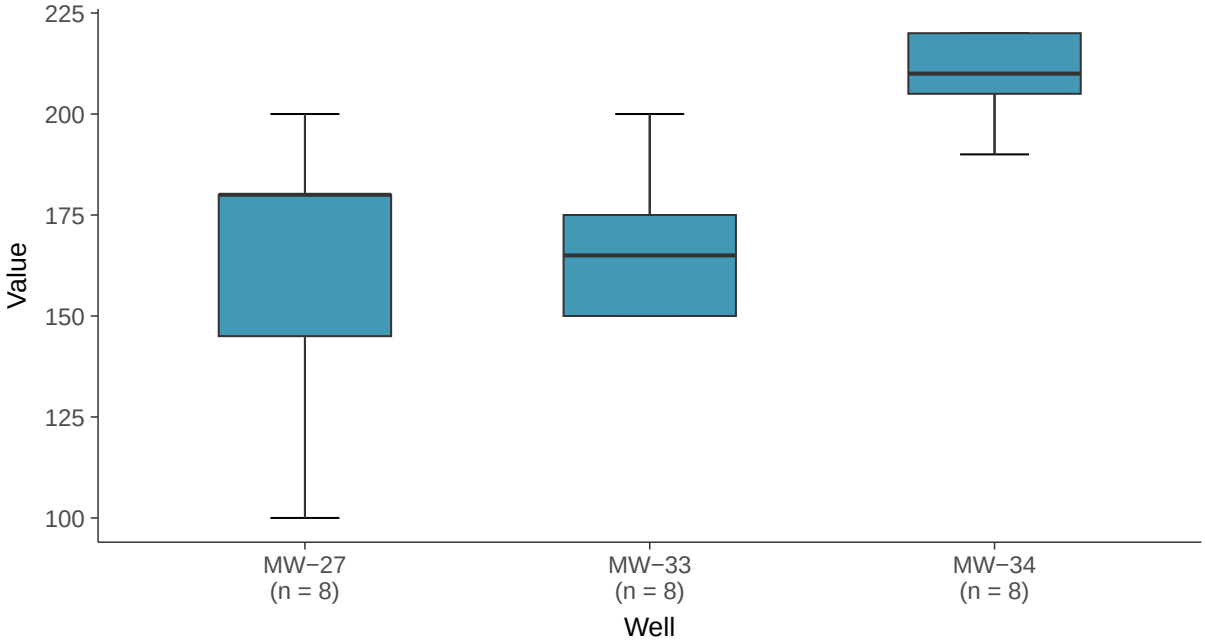
Boxplot by Season

Calcium, MW-27, MW-33, MW-34 (mg/L)



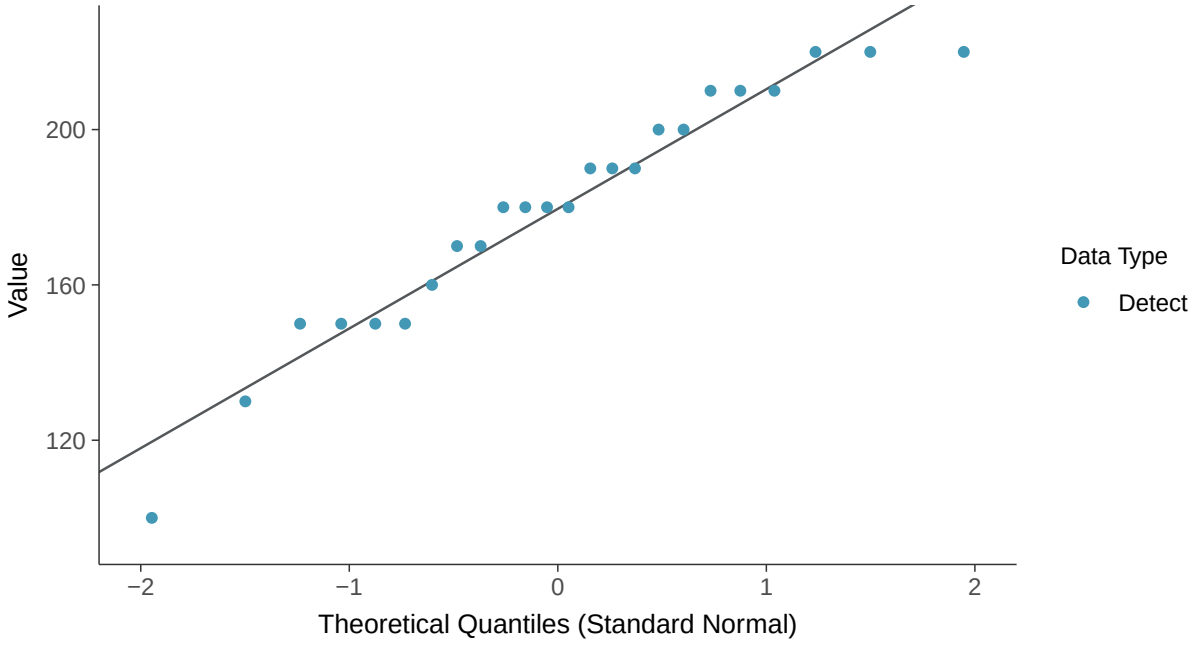
Boxplot by Well

Calcium, MW-27, MW-33, MW-34 (mg/L)



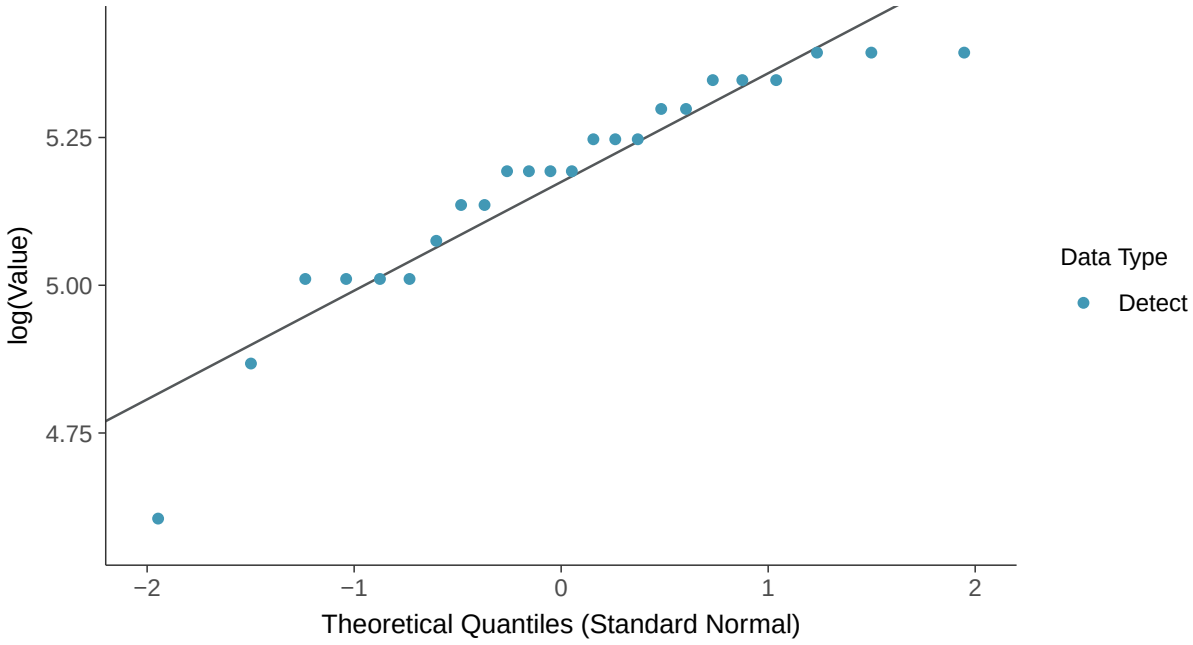
Normal Q-Q plot

Calcium, MW-27, MW-33, MW-34 (mg/L)



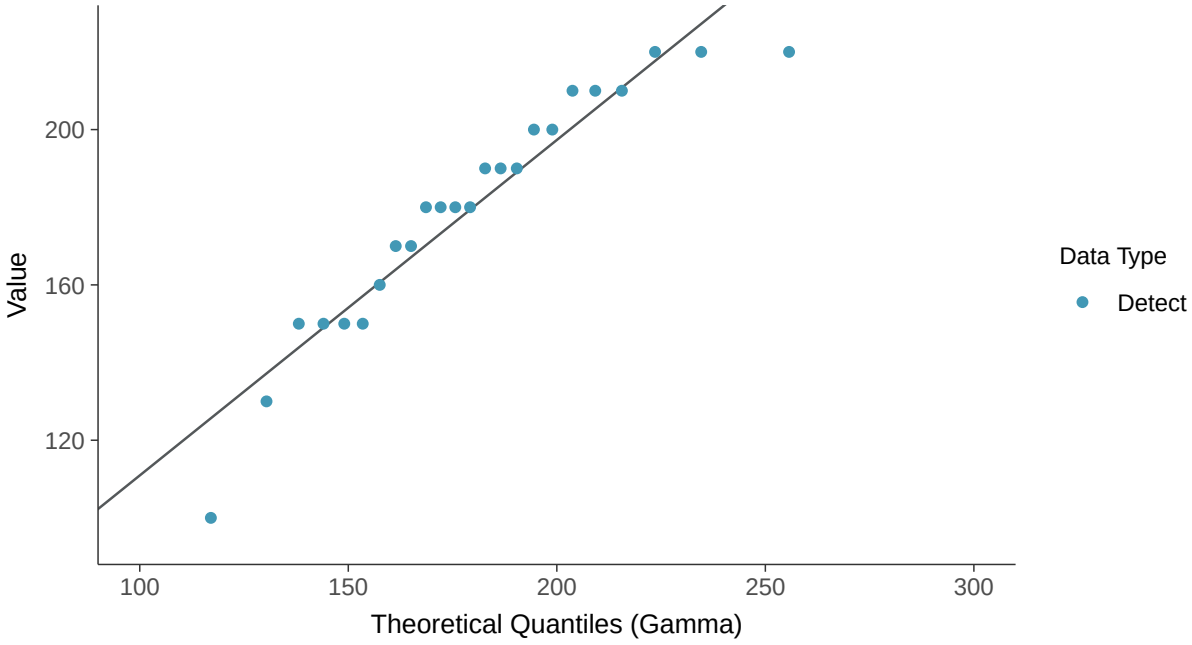
Lognormal Q-Q plot

Calcium, MW-27, MW-33, MW-34 (mg/L)



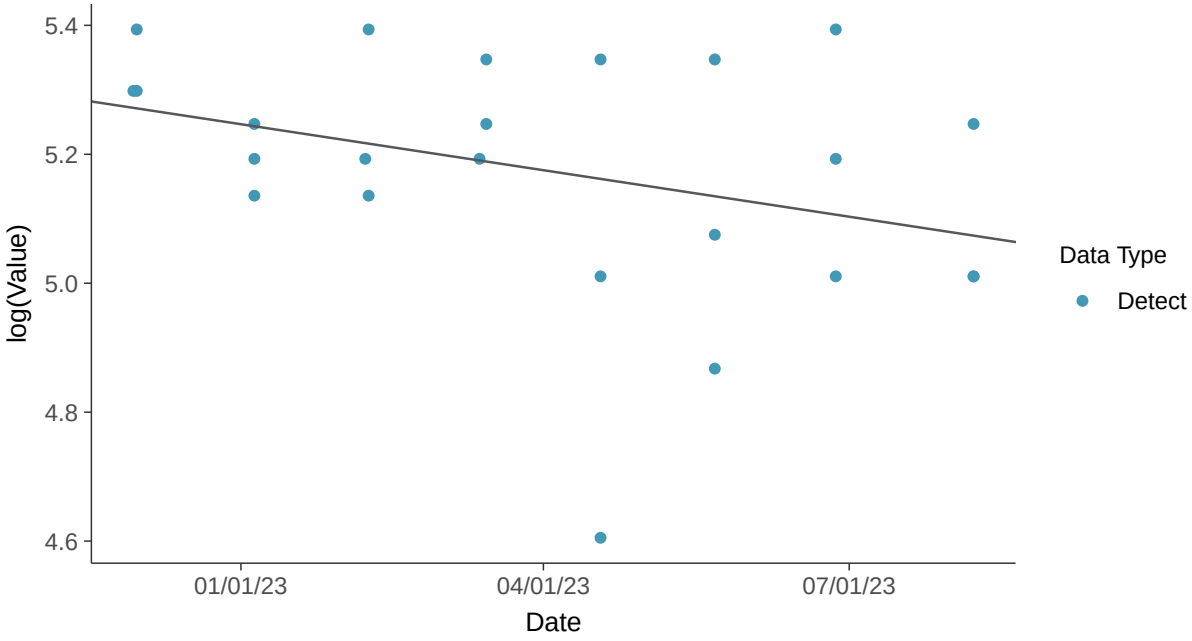
Gamma Q-Q plot

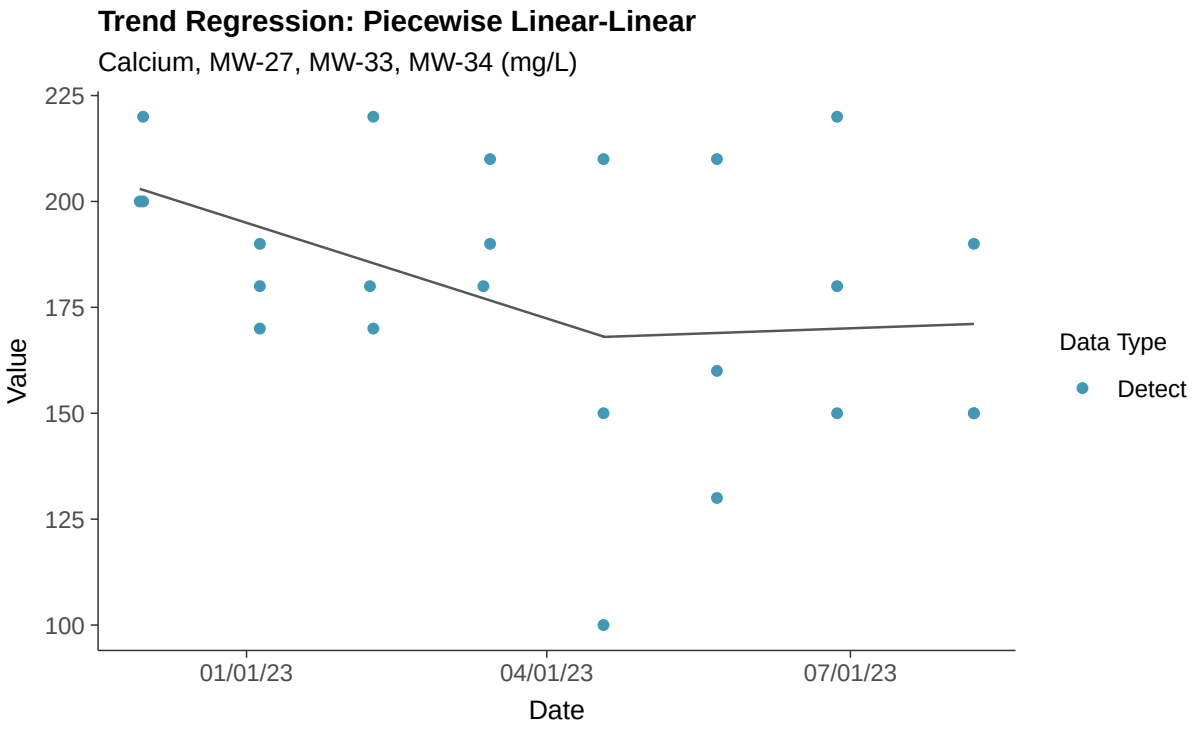
Calcium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Lognormal MLE

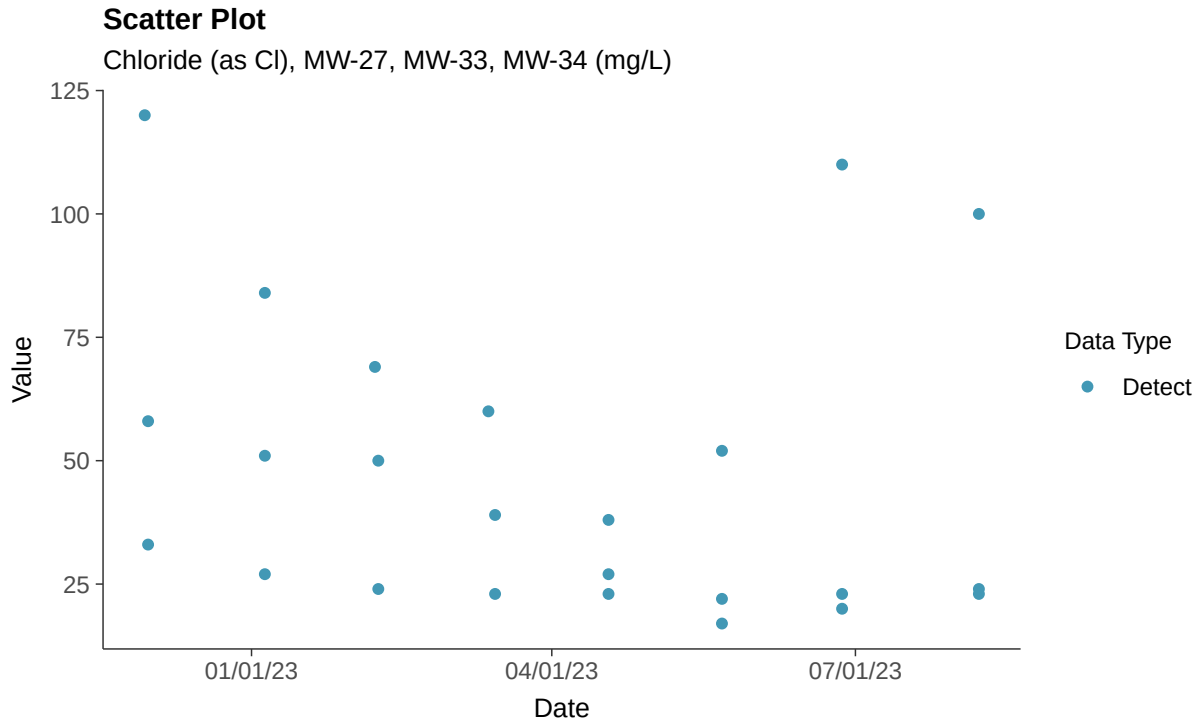
Calcium, MW-27, MW-33, MW-34 (mg/L)

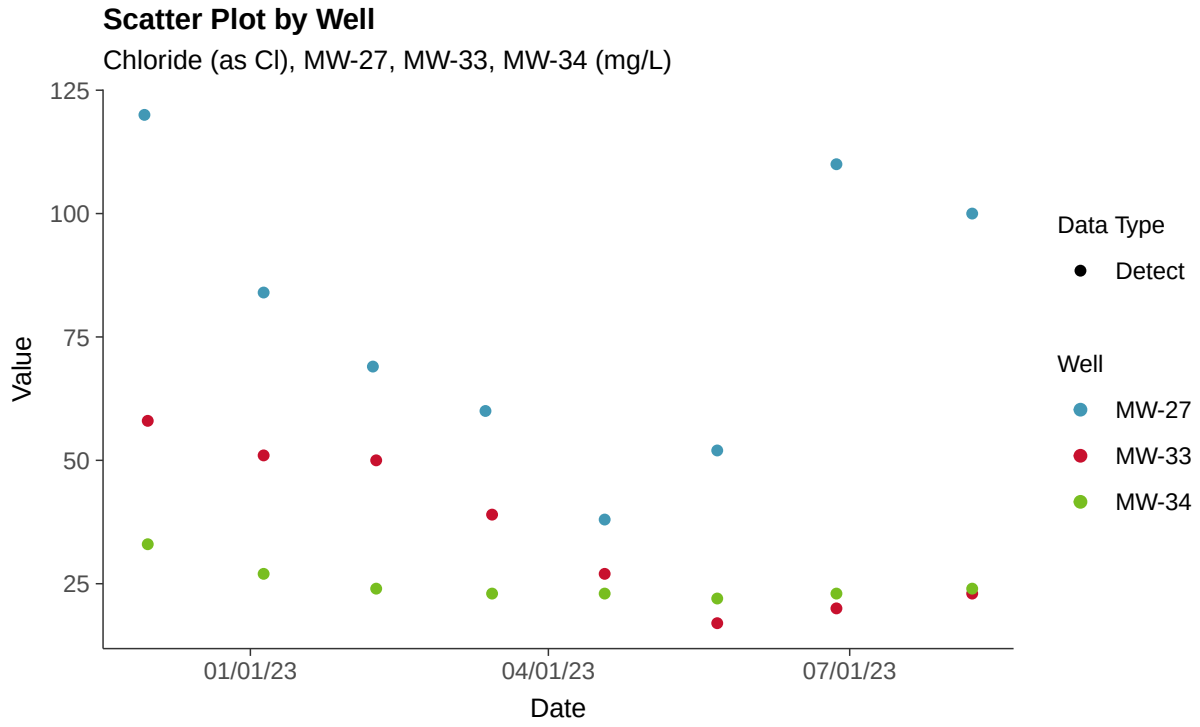



Trend Regression: Piecewise Linear-Linear
Calcium, MW-27, MW-33, MW-34 (mg/L)
225
200
175
150
125
100
Value
01/01/23
04/01/23
07/01/23
Date
Data Type
Detect

Appendix III: Chloride (as Cl), MW-27, MW-33, MW-34

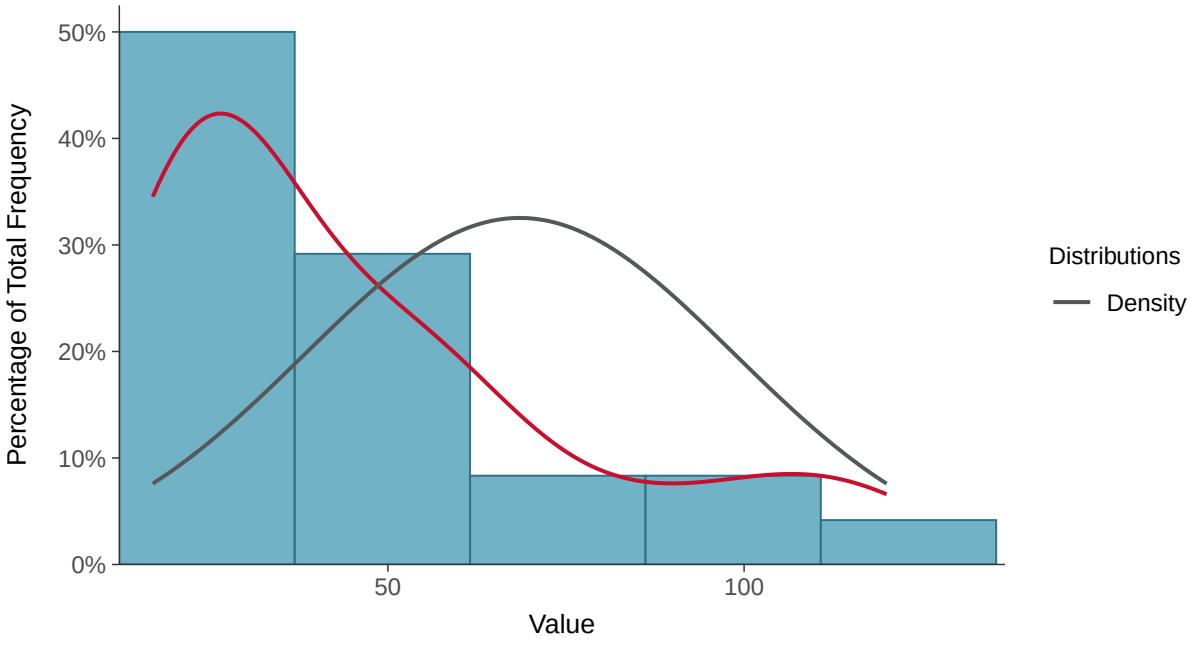
ID: 4_108





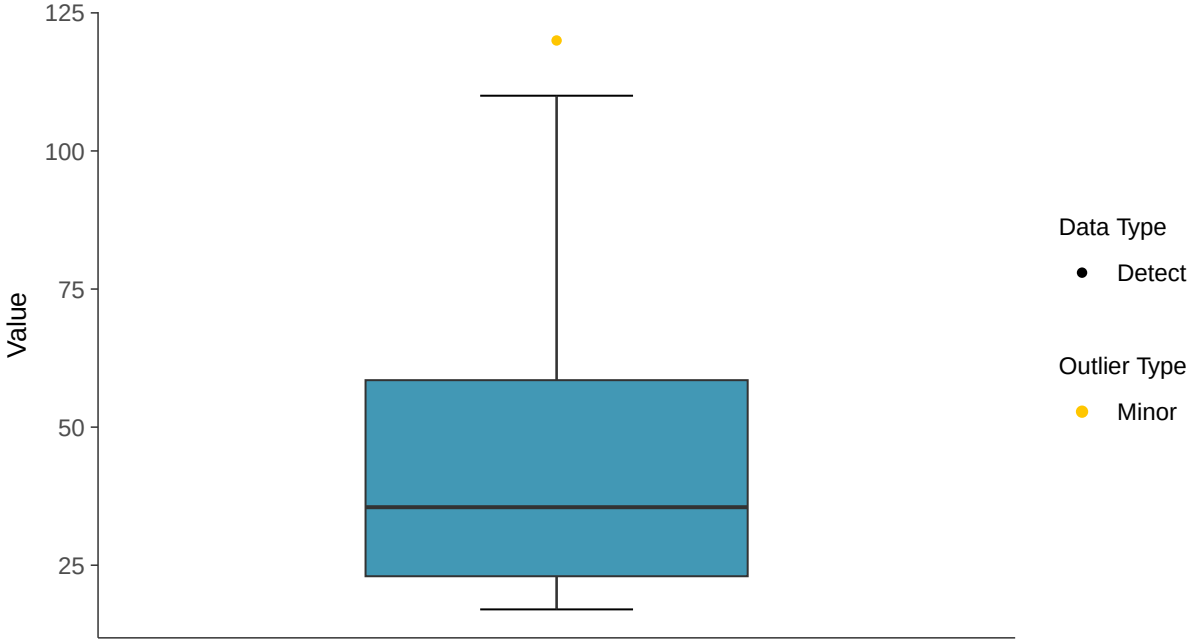
Histogram

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



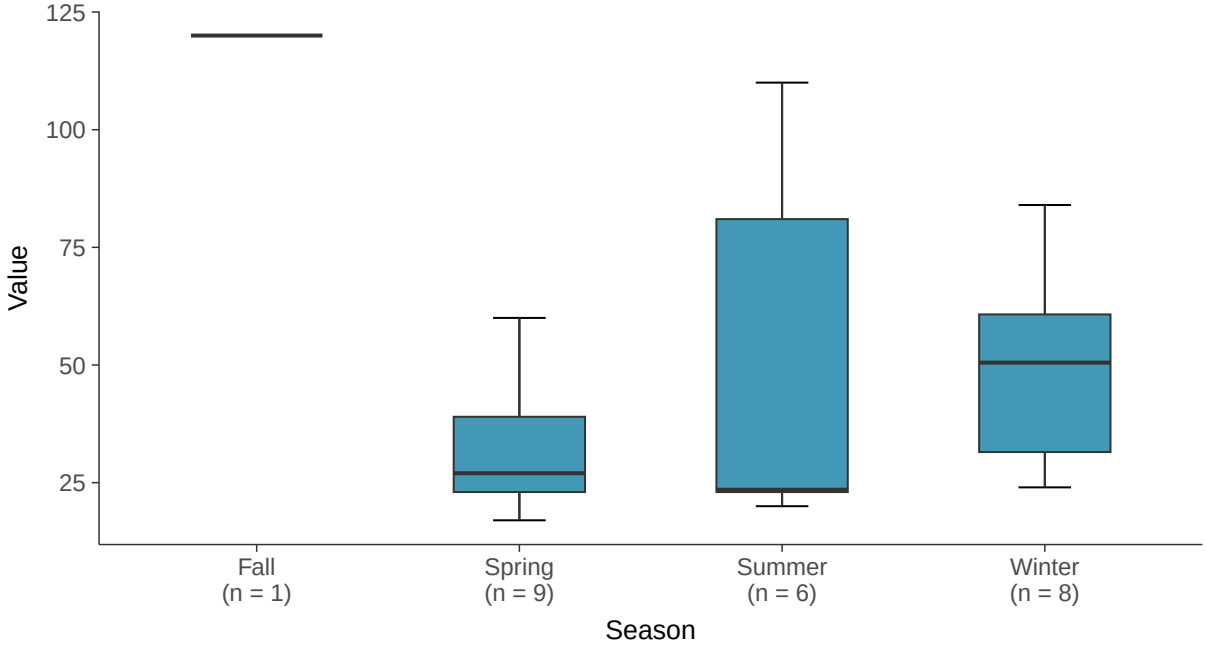
Boxplot

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



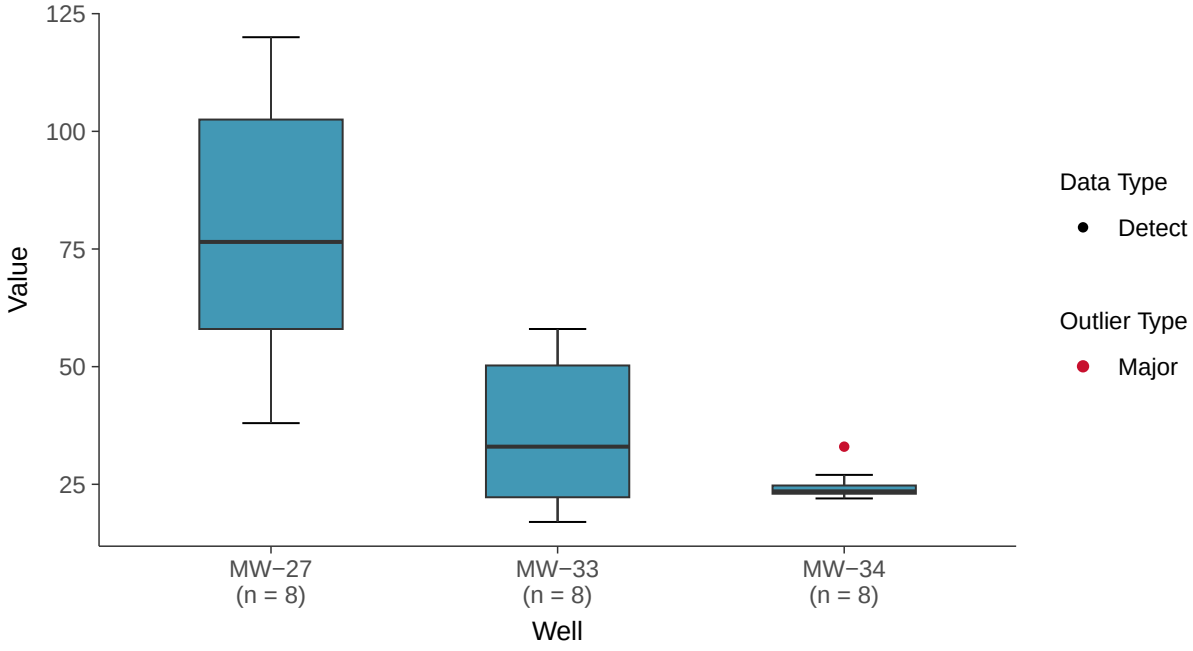
Boxplot by Season

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



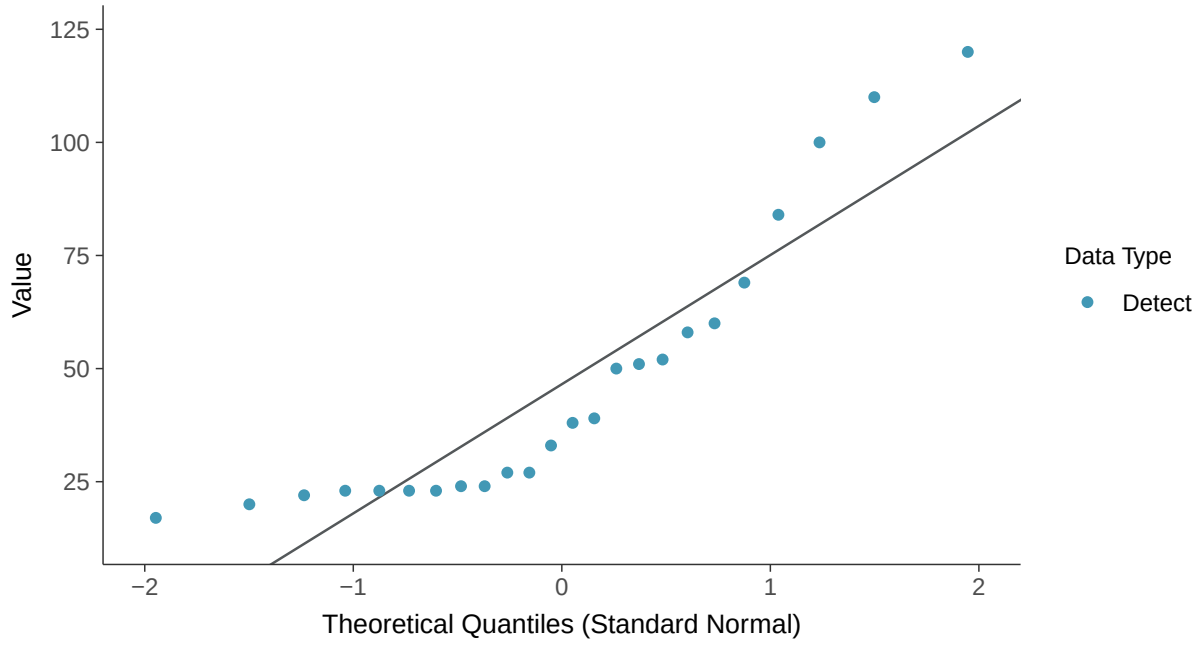
Boxplot by Well

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



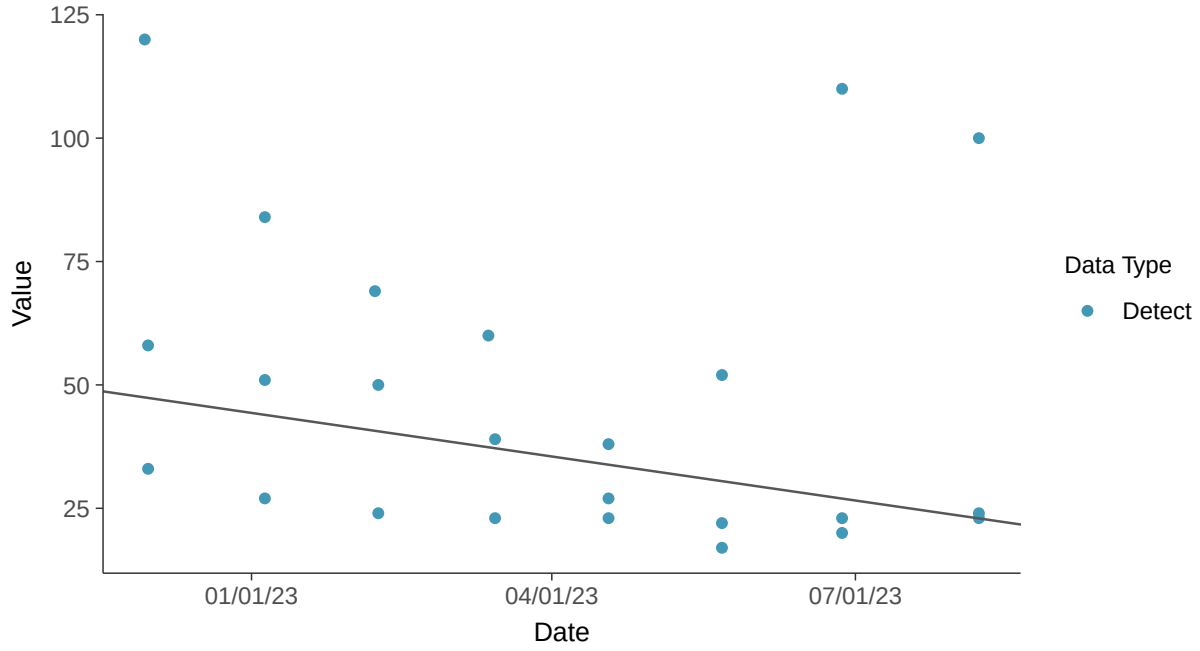
Normal Q-Q plot

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



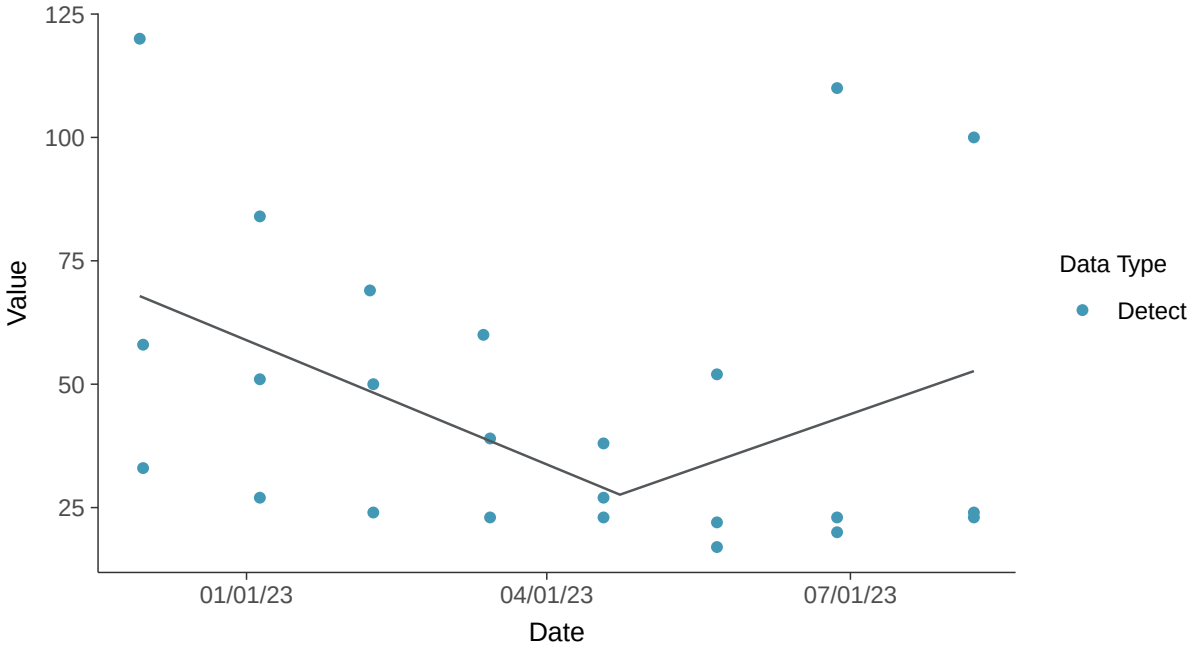
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



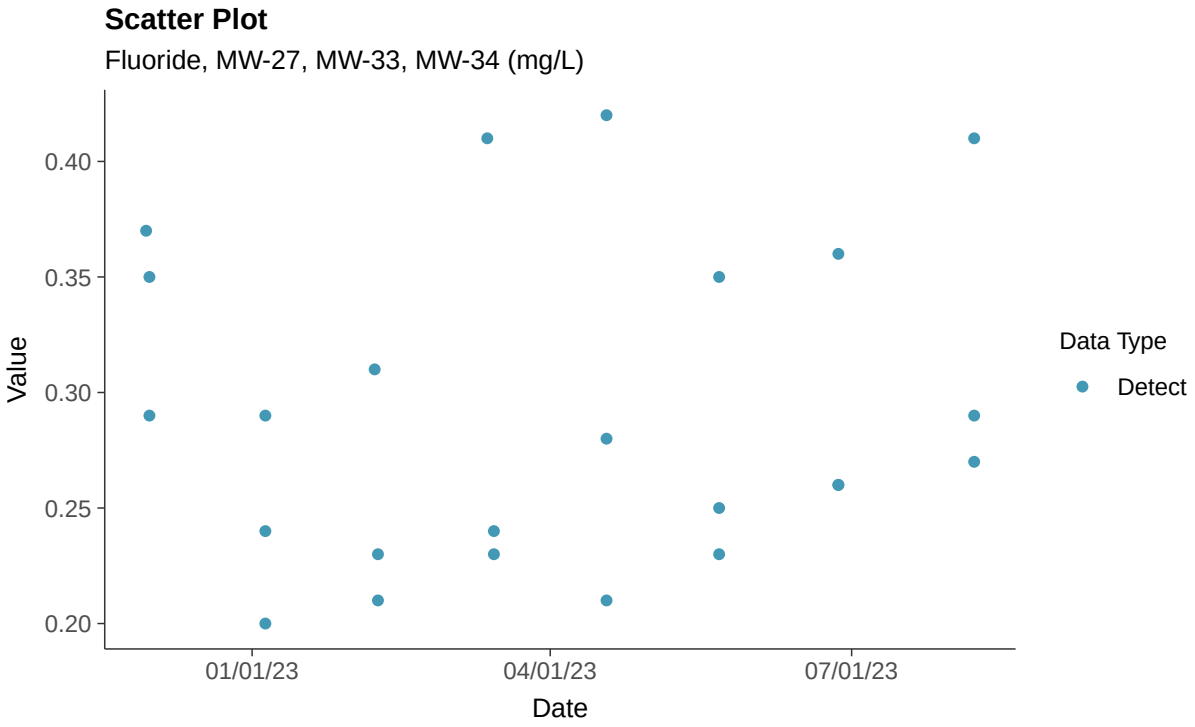
Trend Regression: Piecewise Linear-Linear

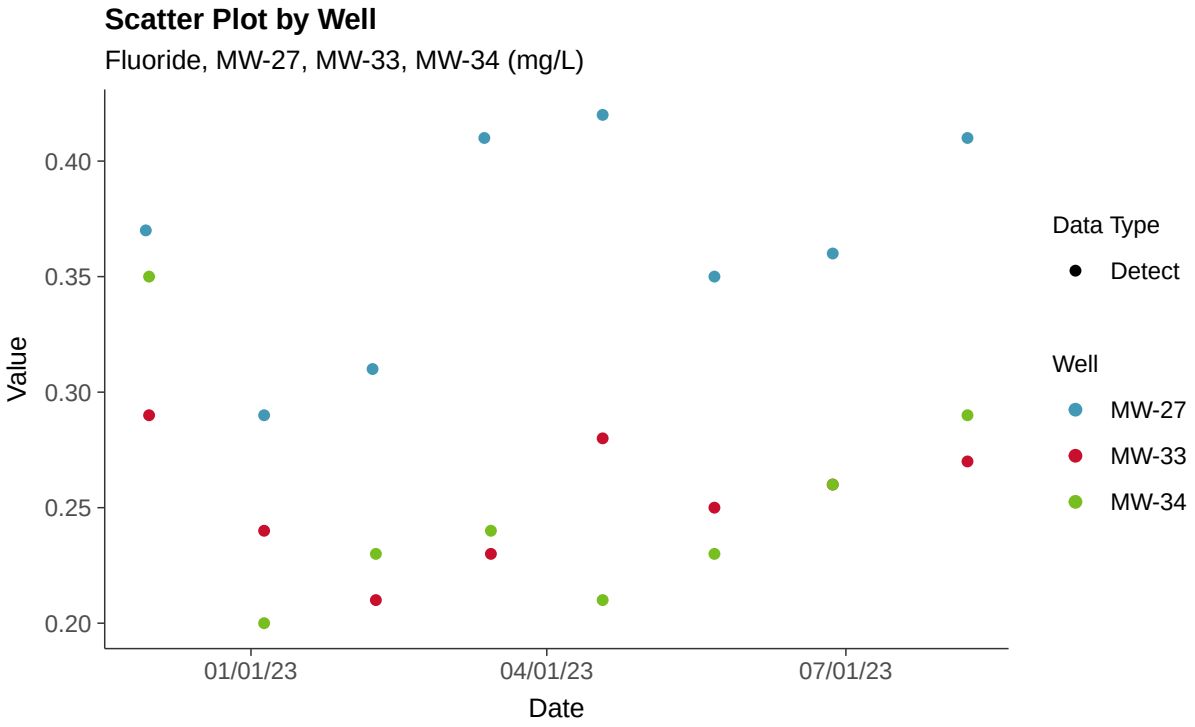
Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



Appendix III: Fluoride, MW-27, MW-33, MW-34

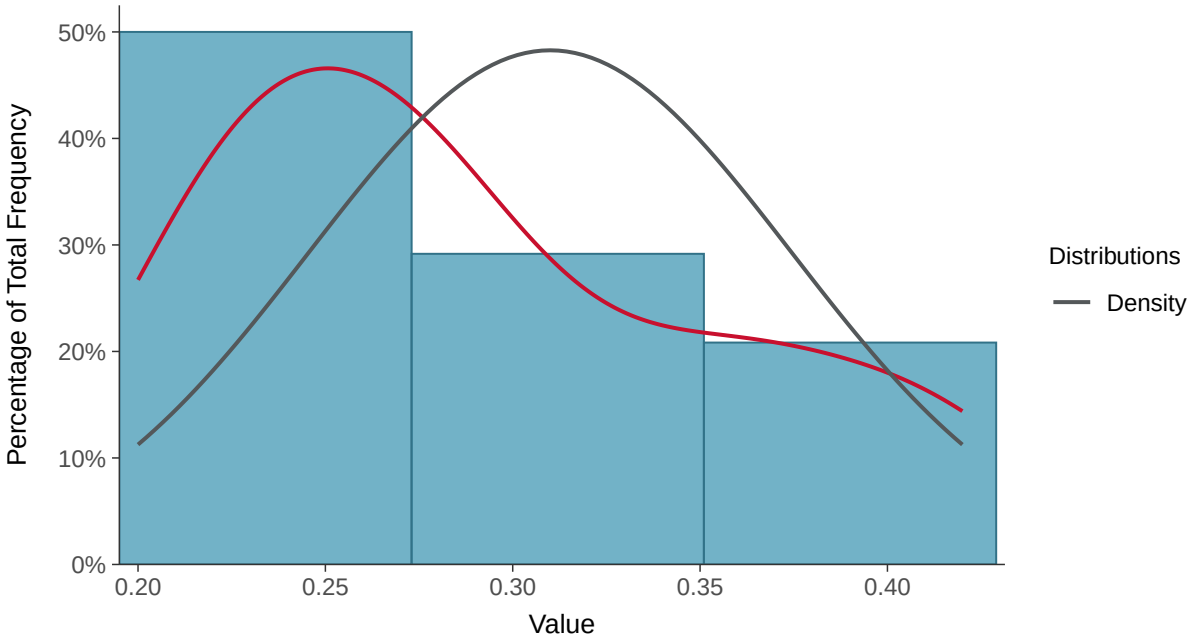
ID: 4_112





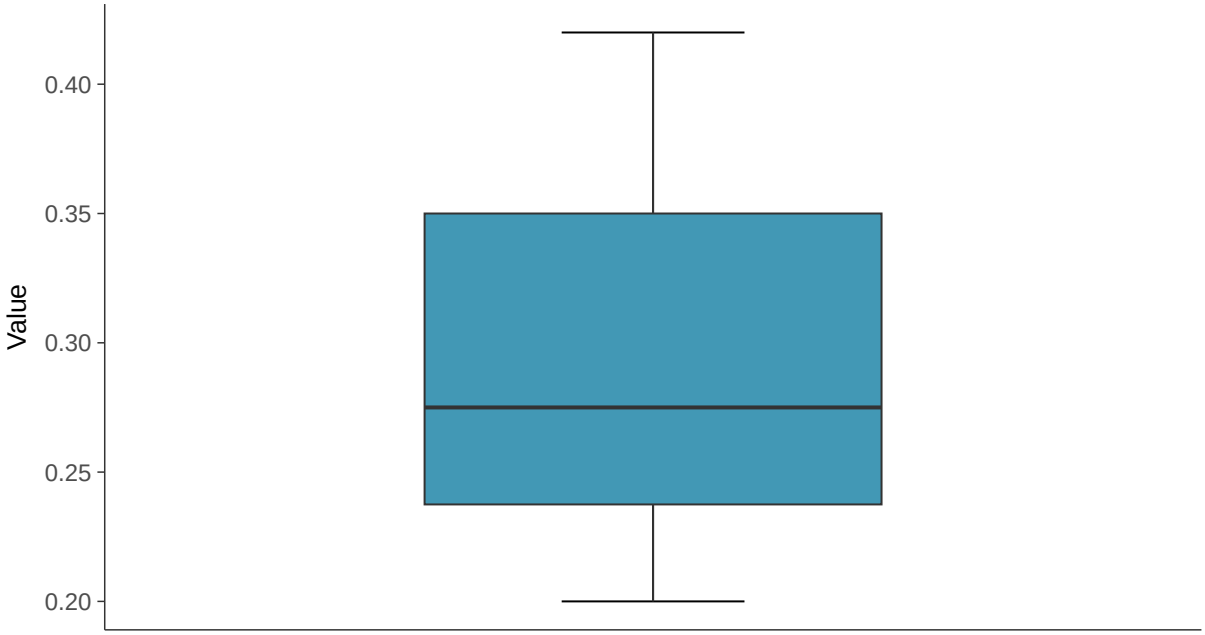
Histogram

Fluoride, MW-27, MW-33, MW-34 (mg/L)



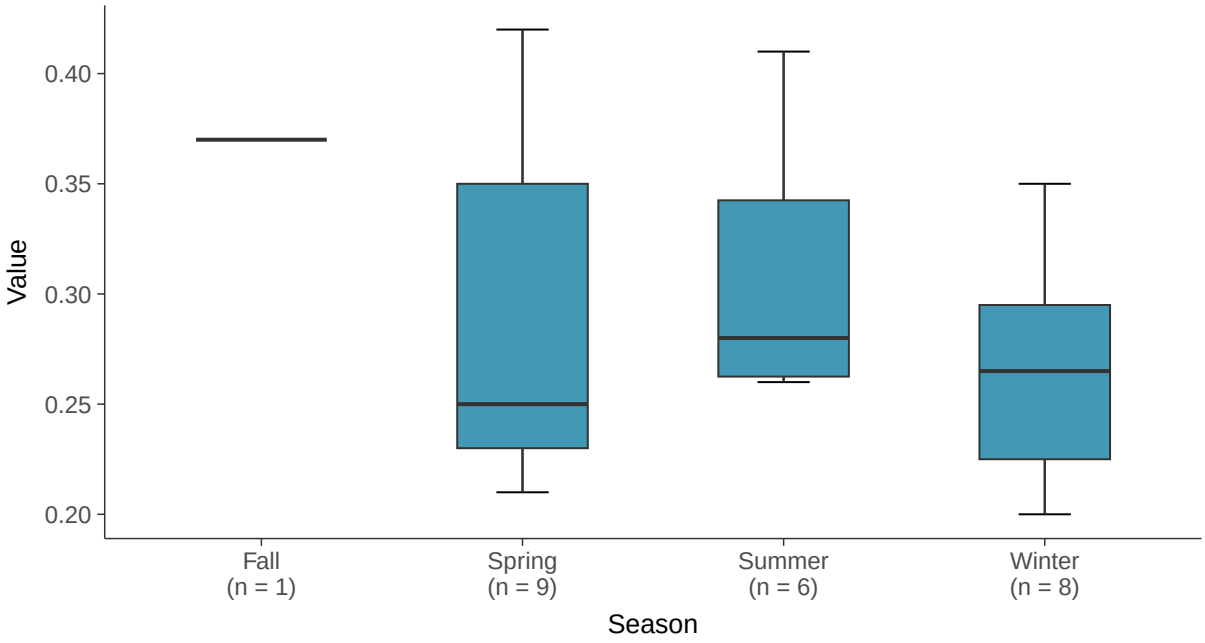
Boxplot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



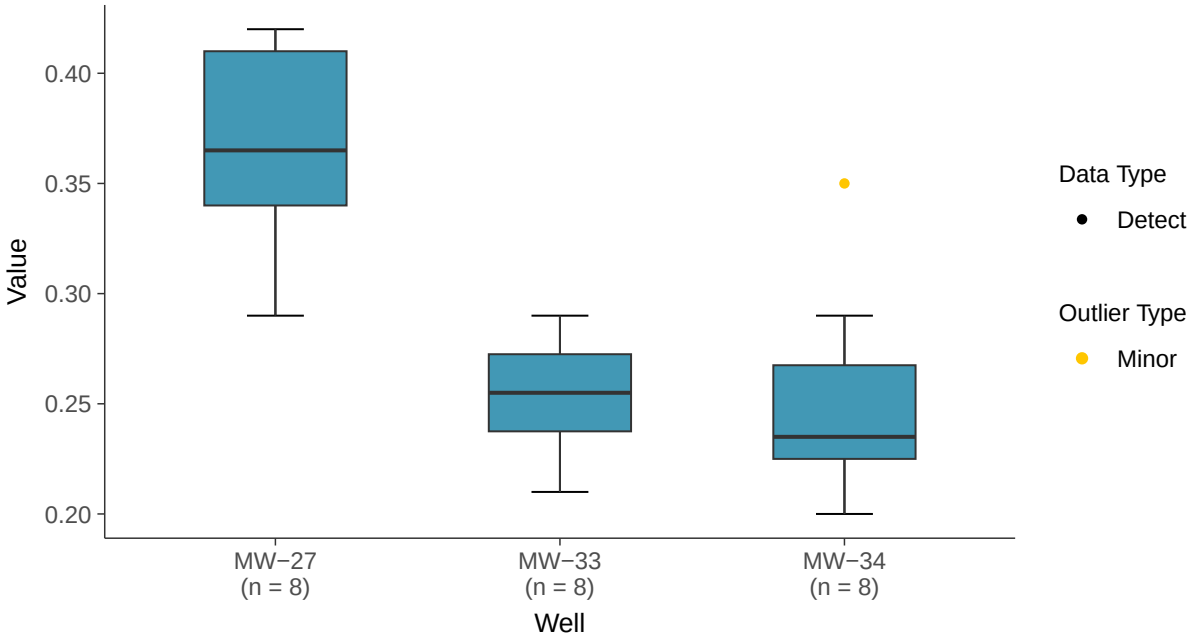
Boxplot by Season

Fluoride, MW-27, MW-33, MW-34 (mg/L)



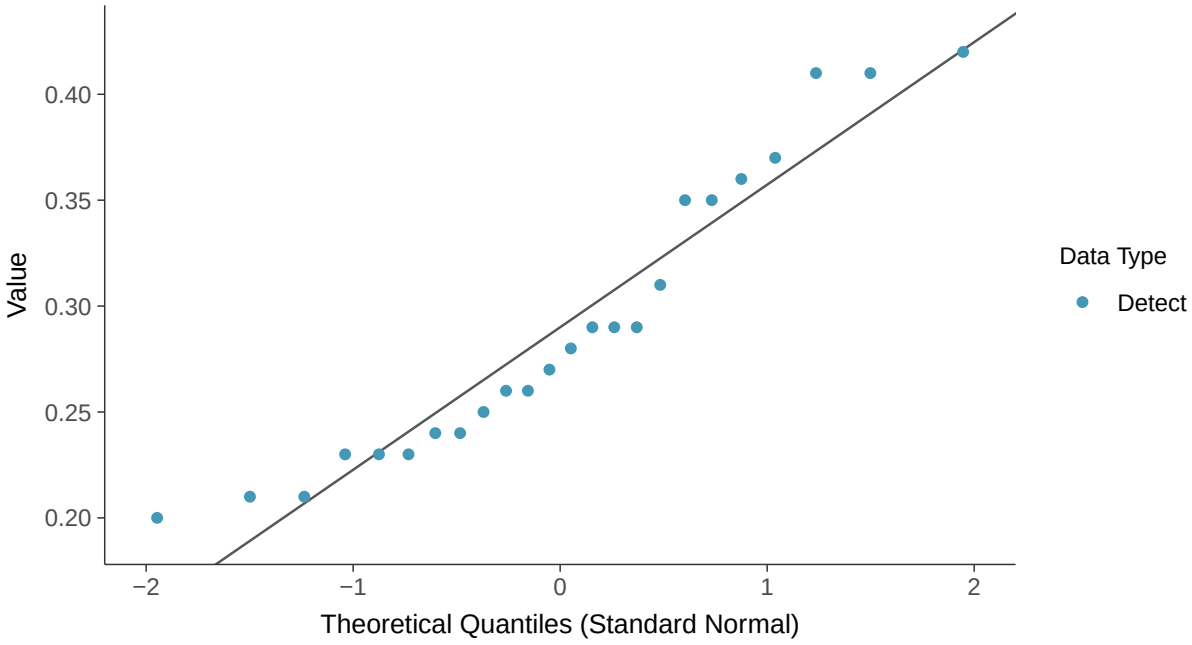
Boxplot by Well

Fluoride, MW-27, MW-33, MW-34 (mg/L)



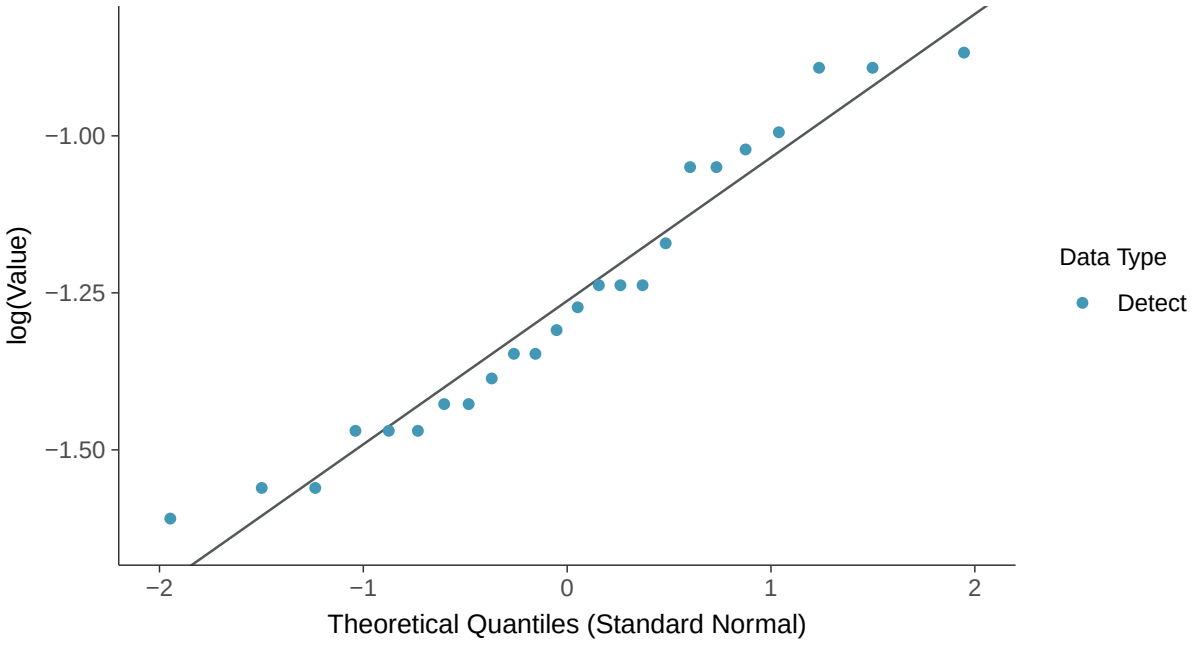
Normal Q-Q plot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



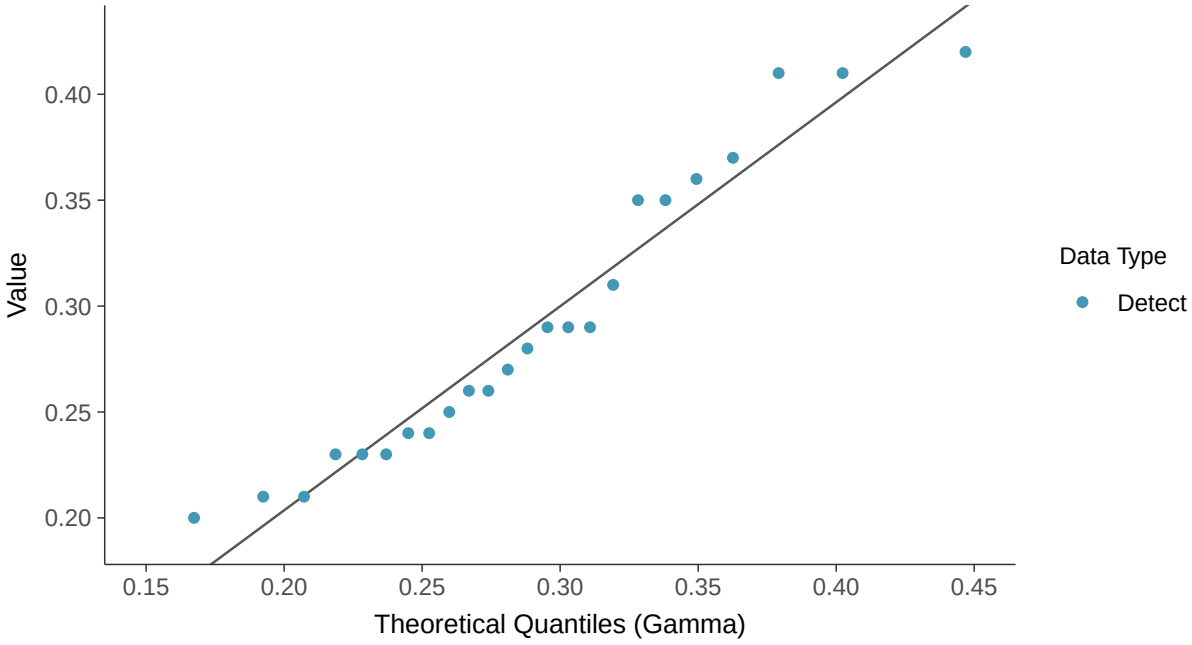
Lognormal Q-Q plot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



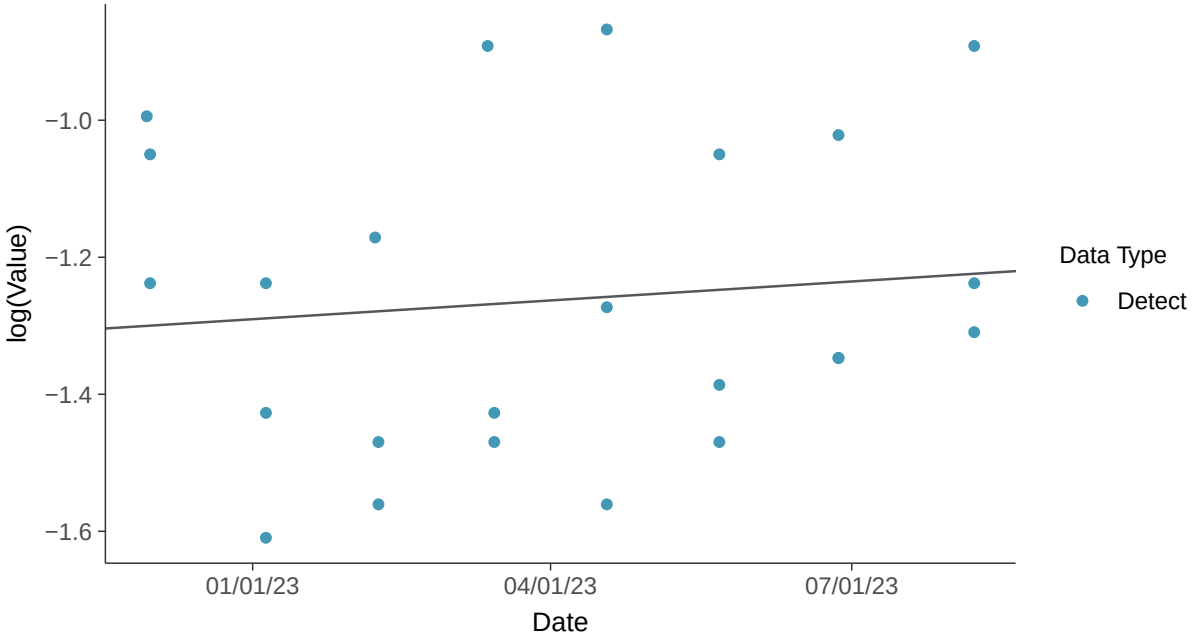
Gamma Q-Q plot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



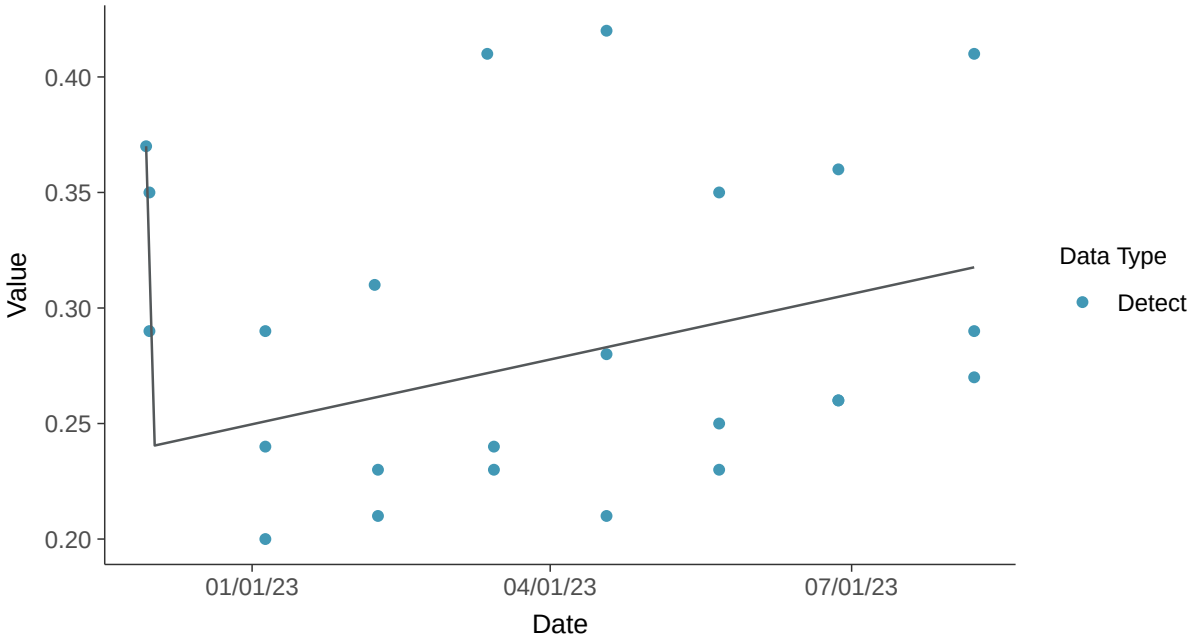
Trend Regression: Lognormal MLE

Fluoride, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Fluoride, MW-27, MW-33, MW-34 (mg/L)

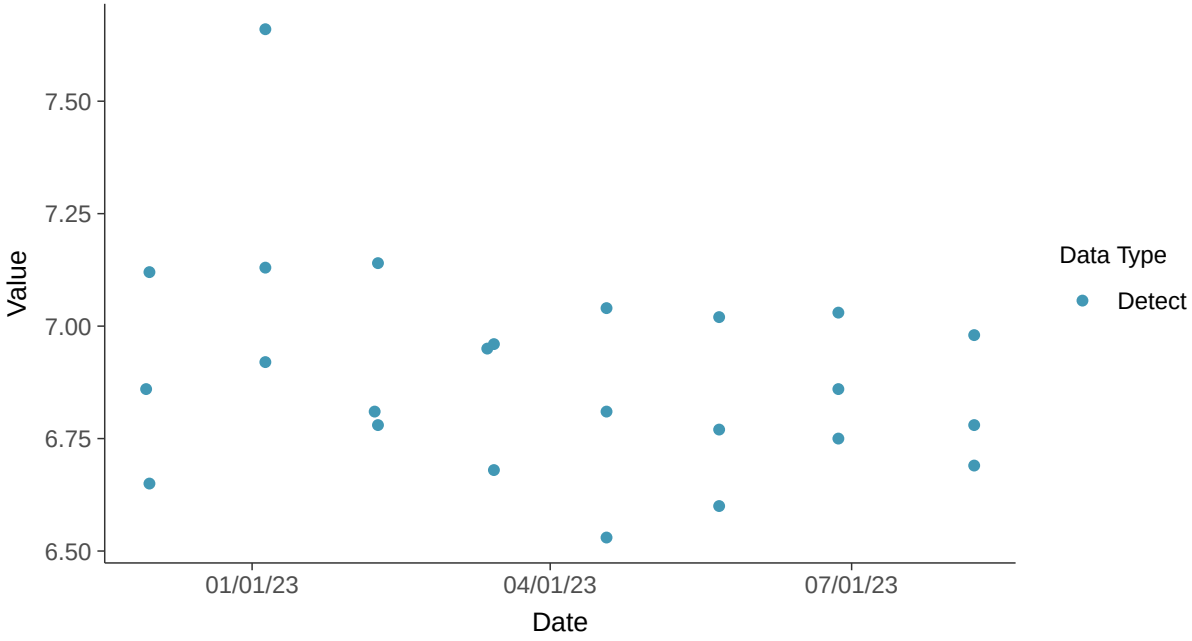


Appendix III: pH (field), MW-27, MW-33, MW-34

ID: 4_120

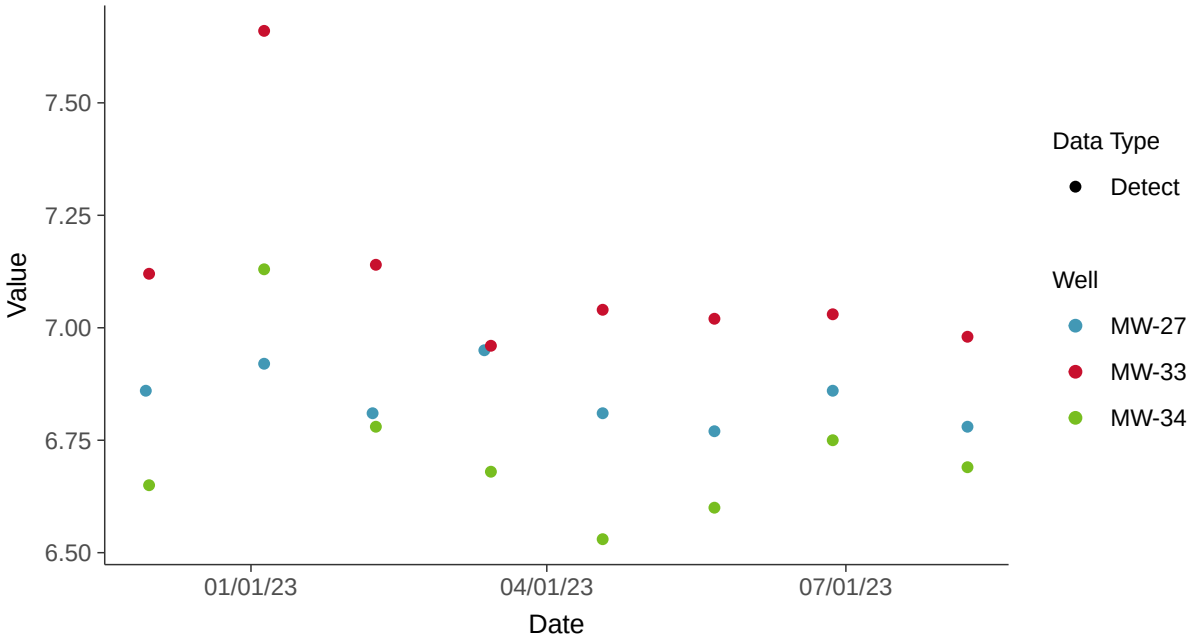
Scatter Plot

pH (field), MW-27, MW-33, MW-34 (su)



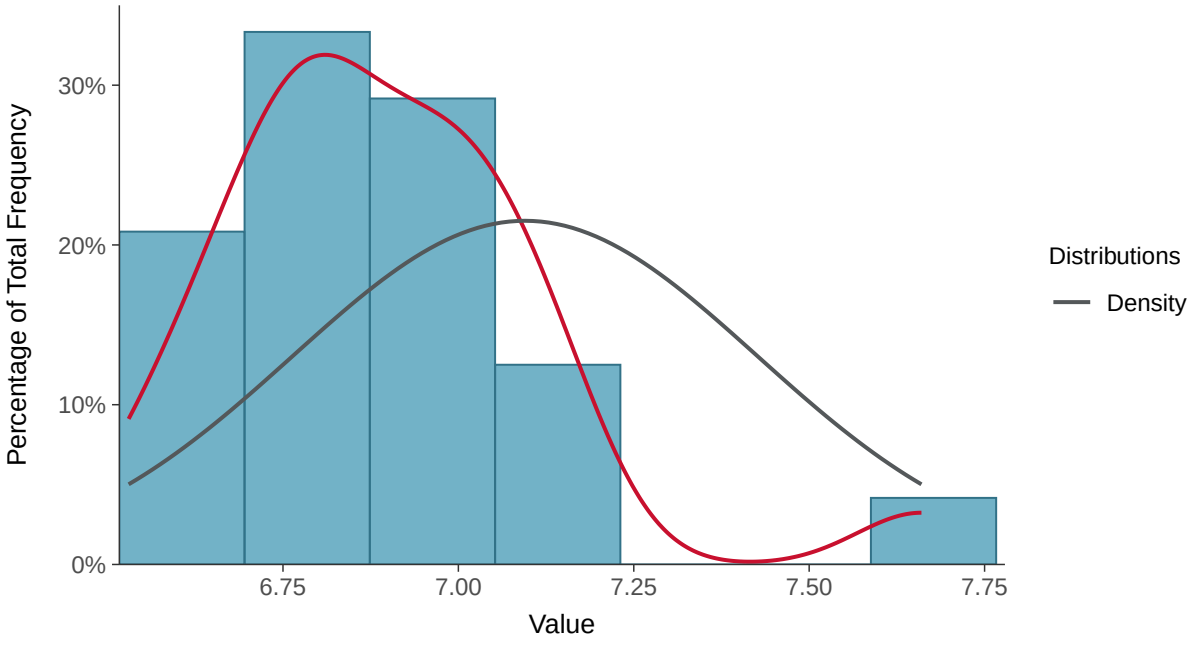
Scatter Plot by Well

pH (field), MW-27, MW-33, MW-34 (su)



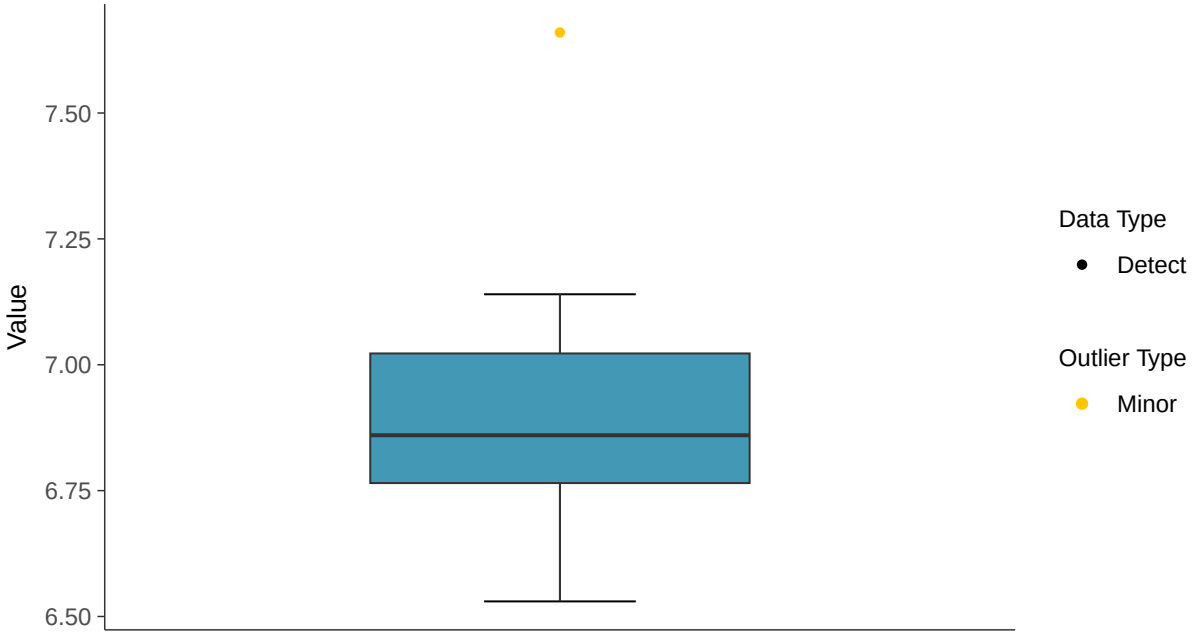
Histogram

pH (field), MW-27, MW-33, MW-34 (su)



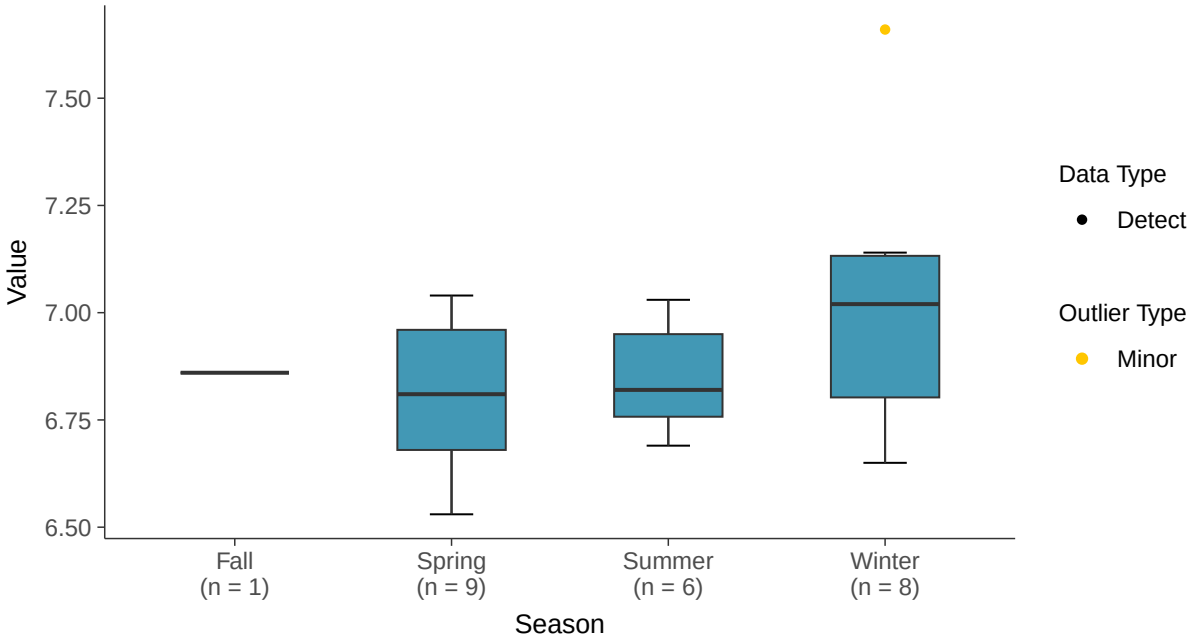
Boxplot

pH (field), MW-27, MW-33, MW-34 (su)



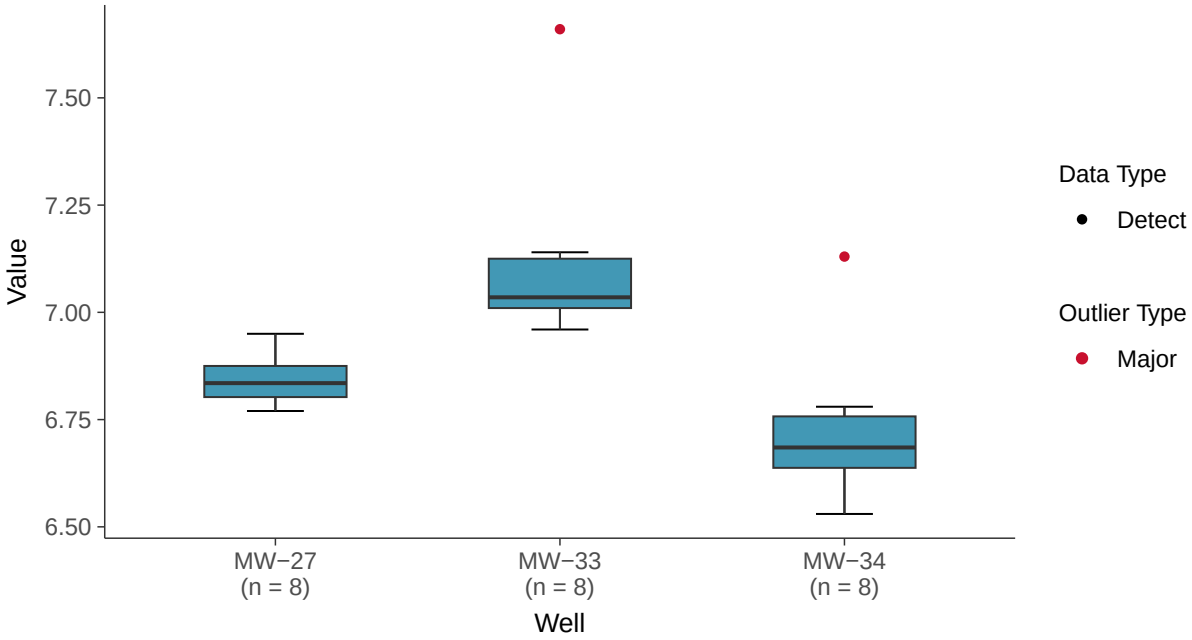
Boxplot by Season

pH (field), MW-27, MW-33, MW-34 (su)



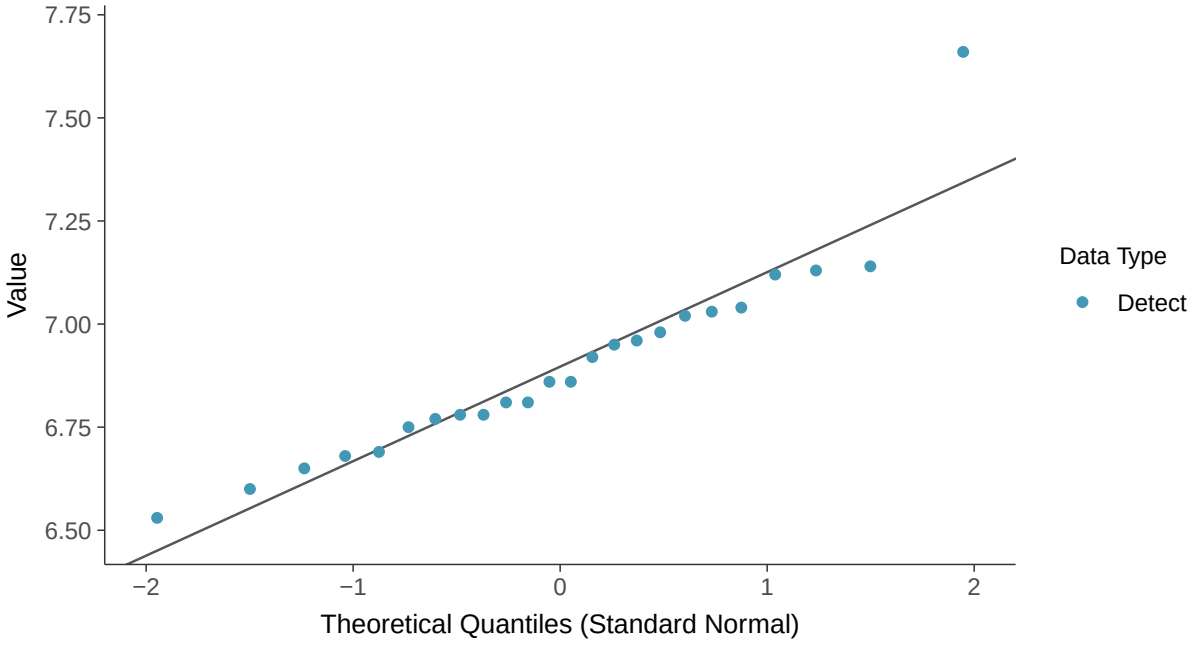
Boxplot by Well

pH (field), MW-27, MW-33, MW-34 (su)



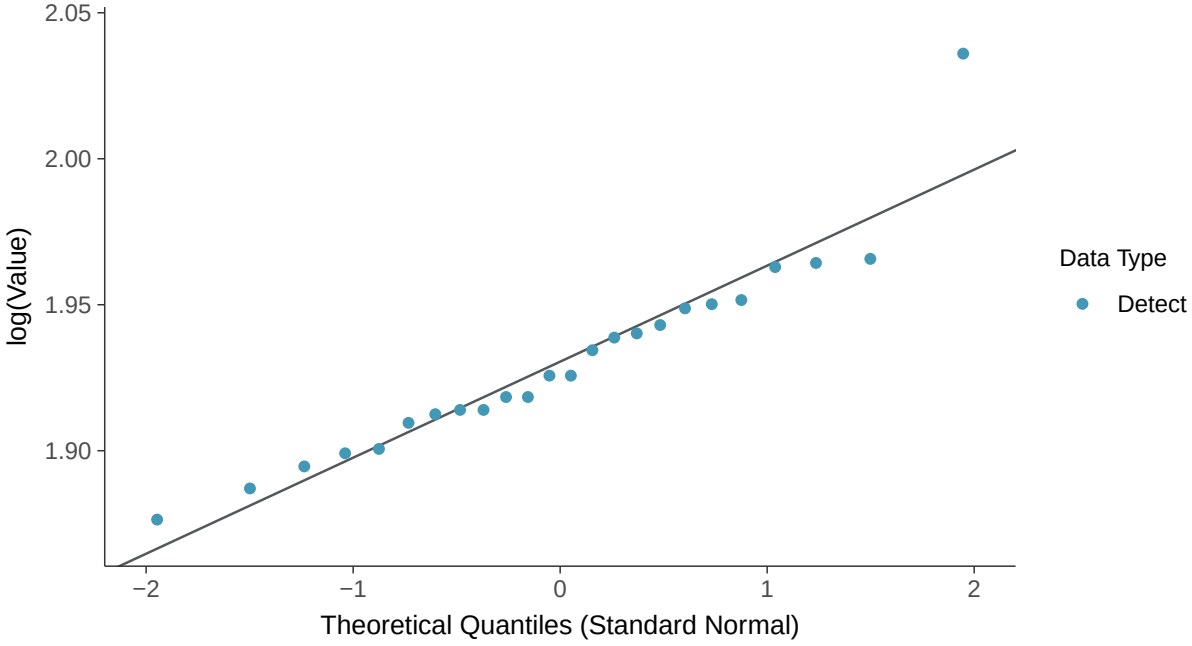
Normal Q-Q plot

pH (field), MW-27, MW-33, MW-34 (su)



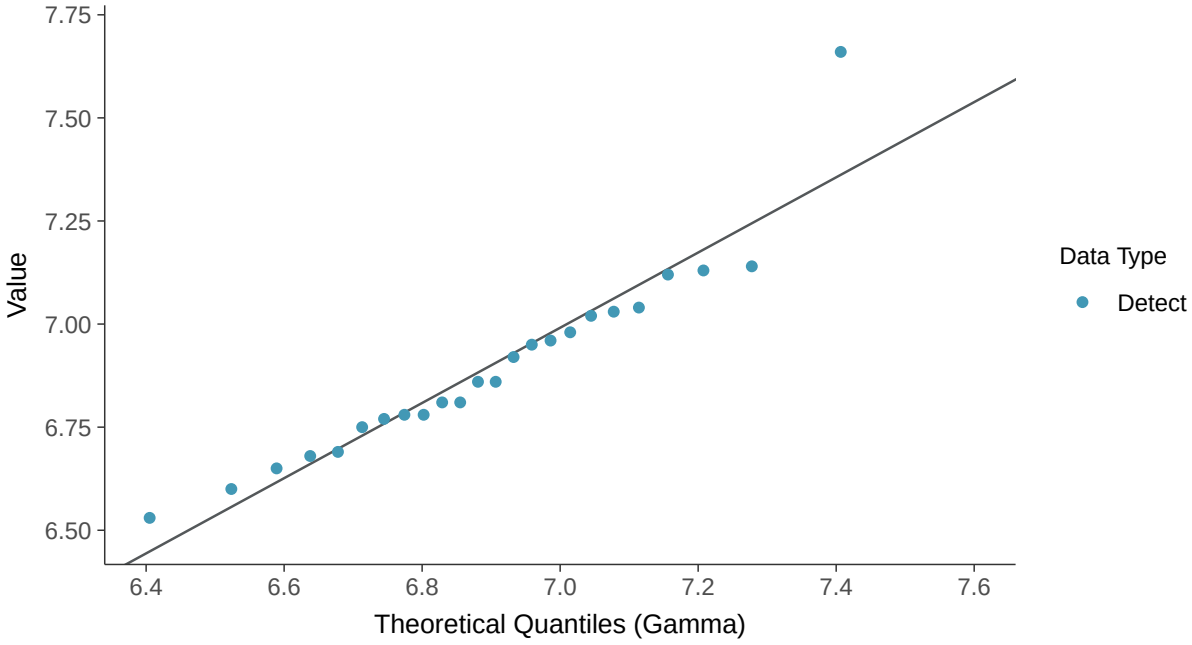
Lognormal Q-Q plot

pH (field), MW-27, MW-33, MW-34 (su)



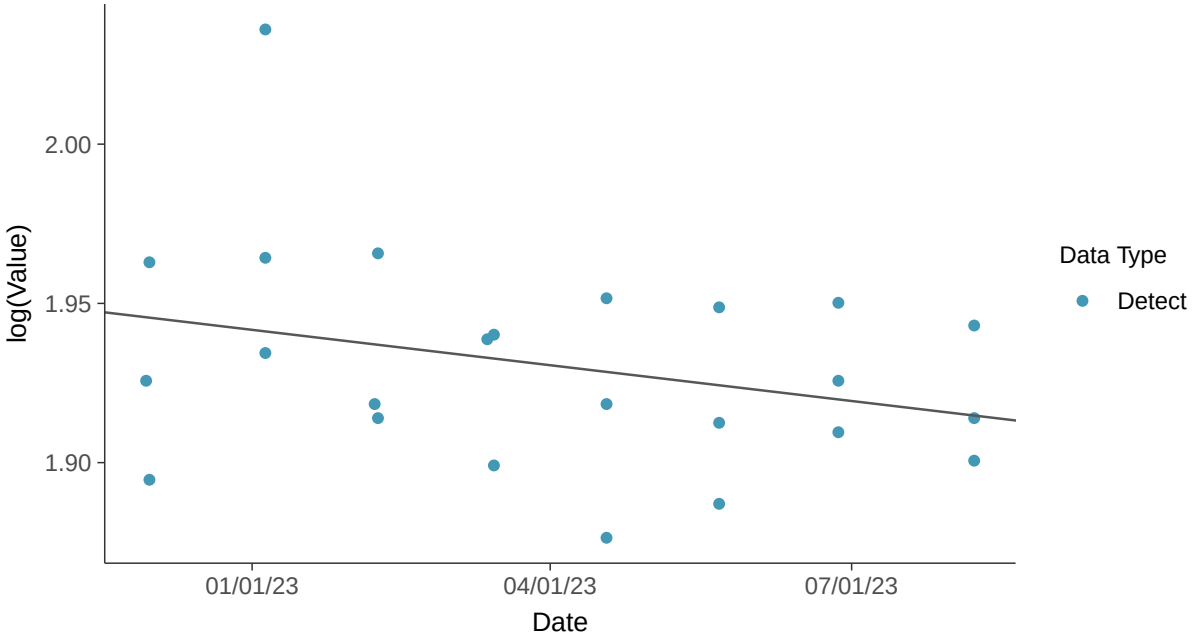
Gamma Q-Q plot

pH (field), MW-27, MW-33, MW-34 (su)



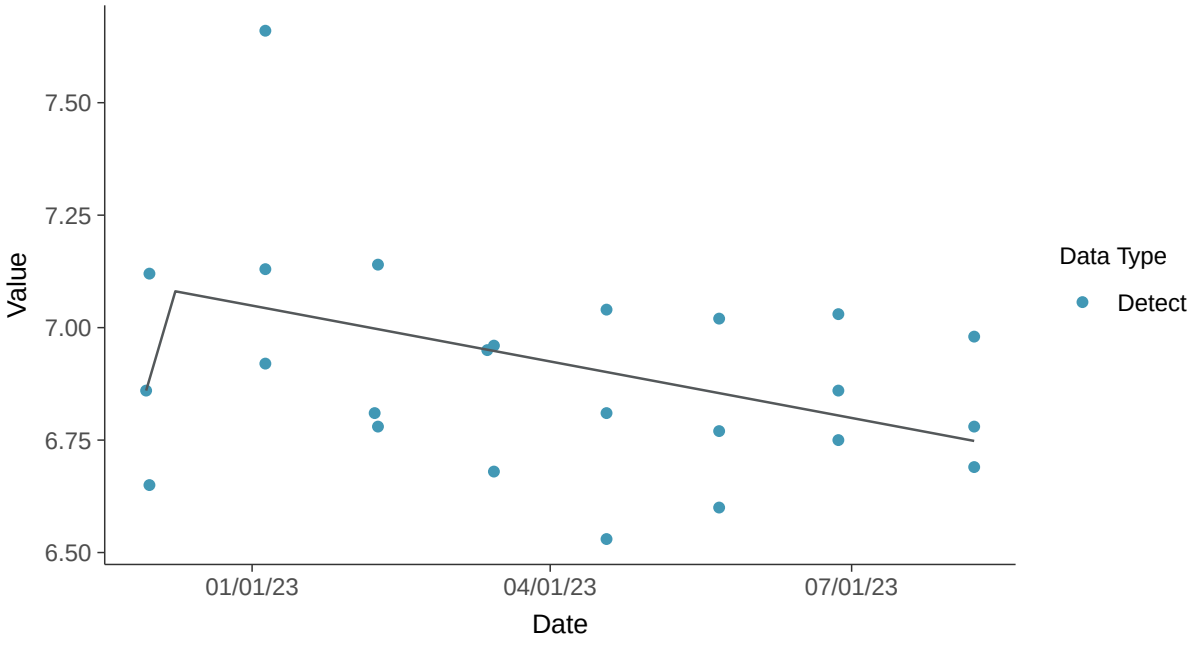
Trend Regression: Lognormal MLE

pH (field), MW-27, MW-33, MW-34 (su)



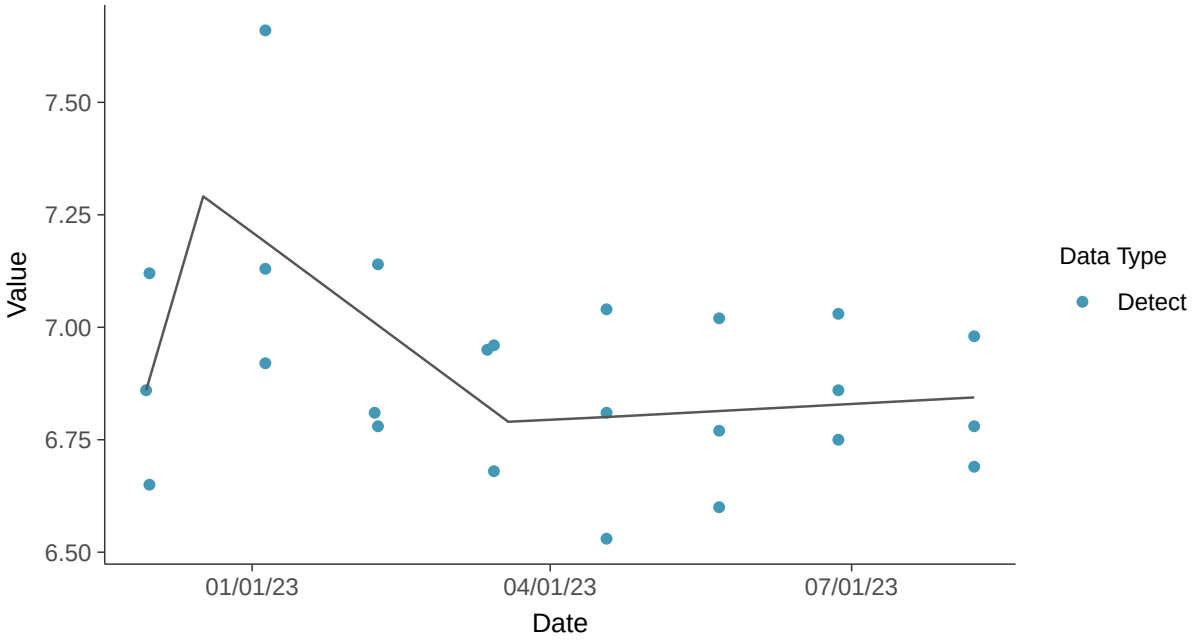
Trend Regression: Piecewise Linear-Linear

pH (field), MW-27, MW-33, MW-34 (su)



Trend Regression: Piecewise Linear-Linear-Linear

pH (field), MW-27, MW-33, MW-34 (su)

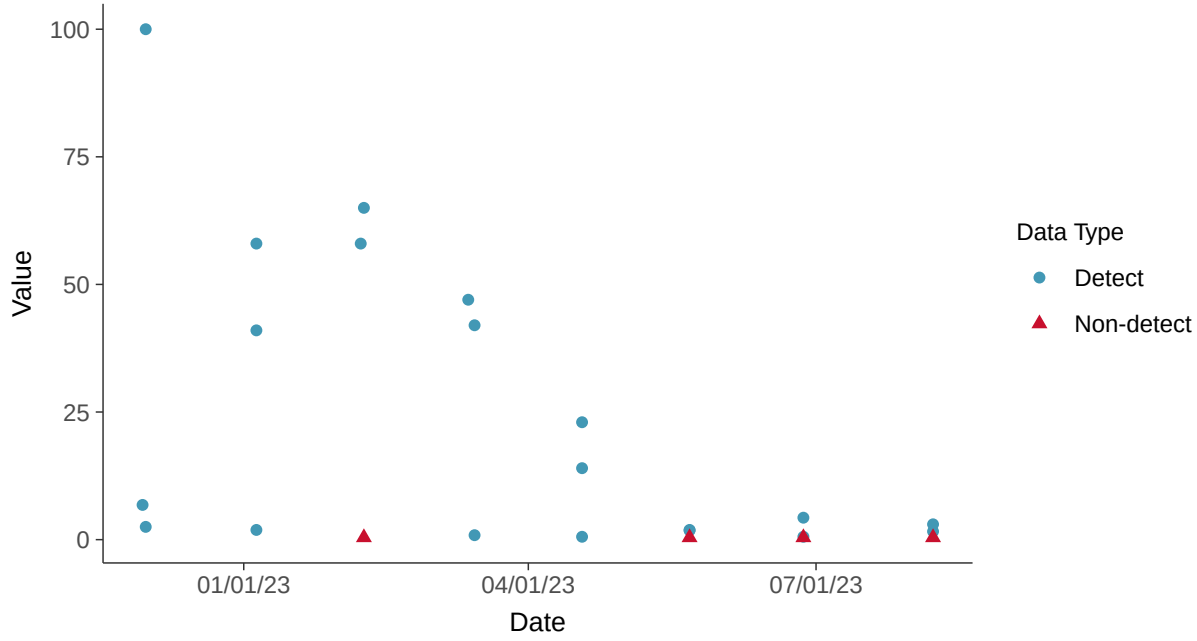


Appendix III: Sulfate (as SO4), MW-27, MW-33, MW-34

ID: 4_124

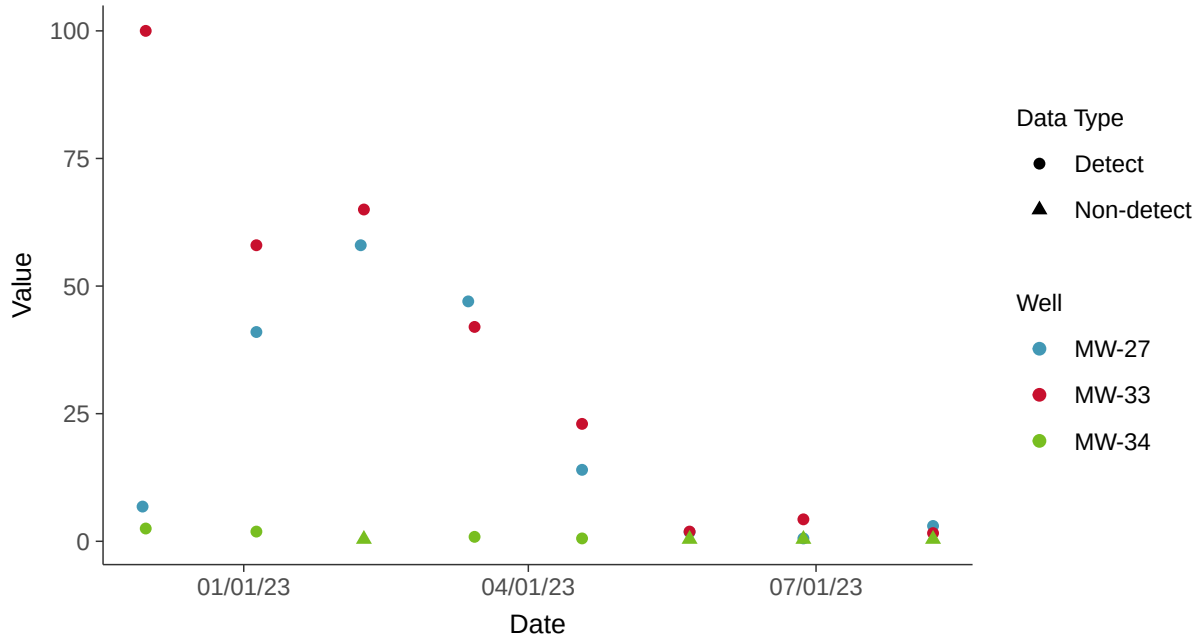
Scatter Plot

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



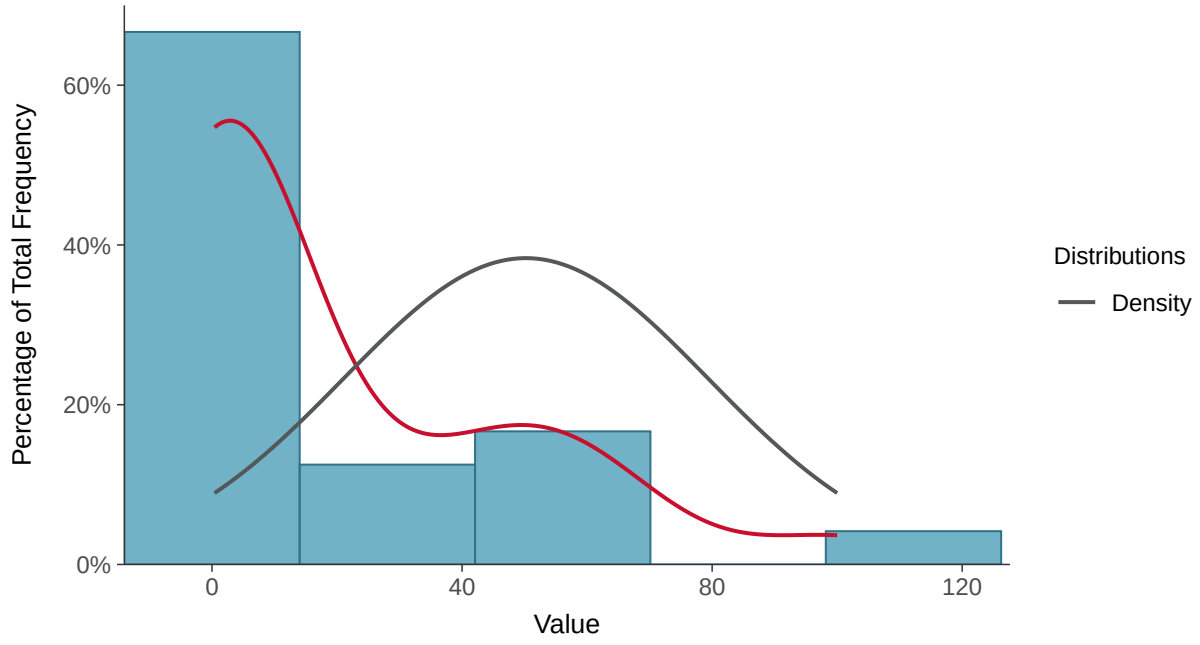
Scatter Plot by Well

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



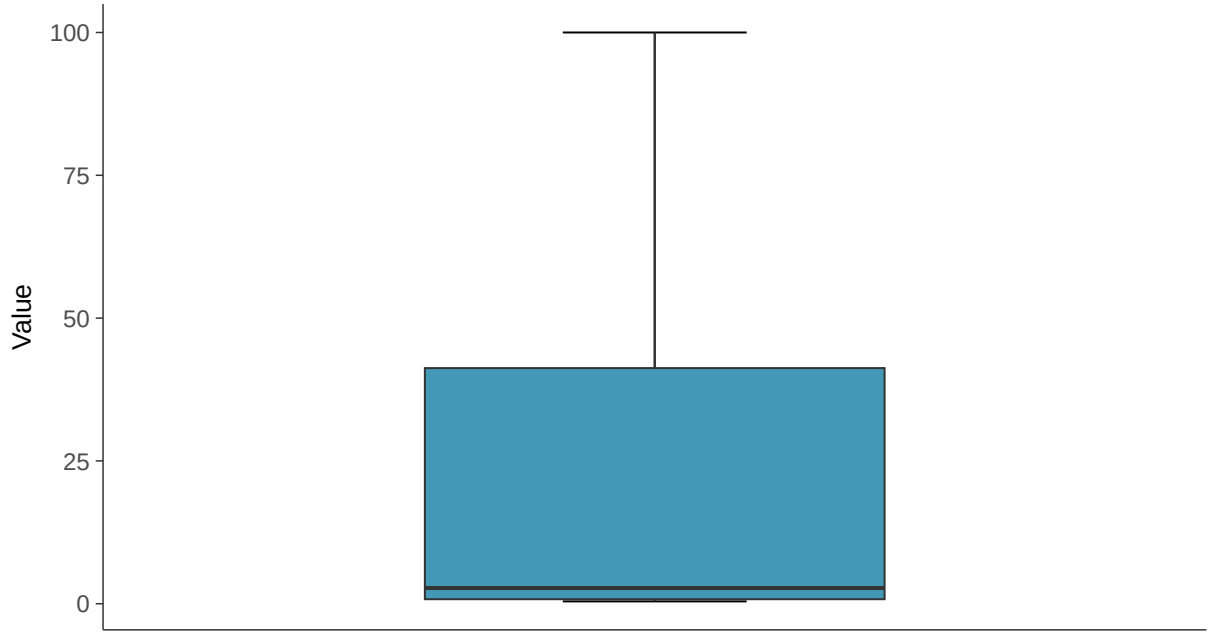
Histogram

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



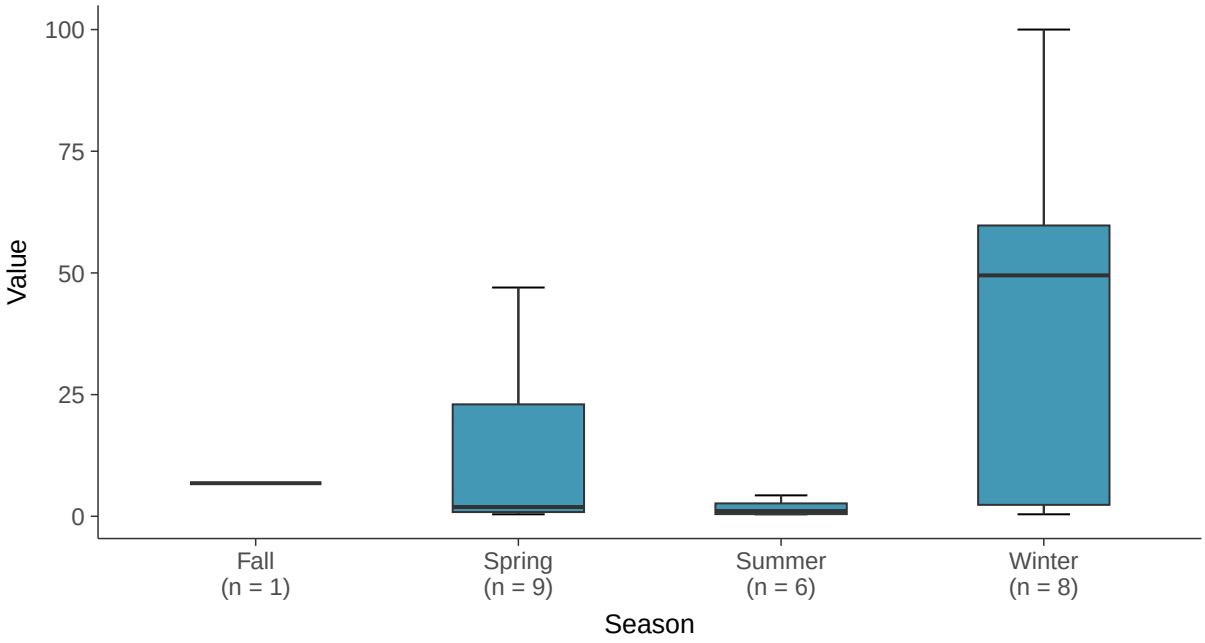
Boxplot

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



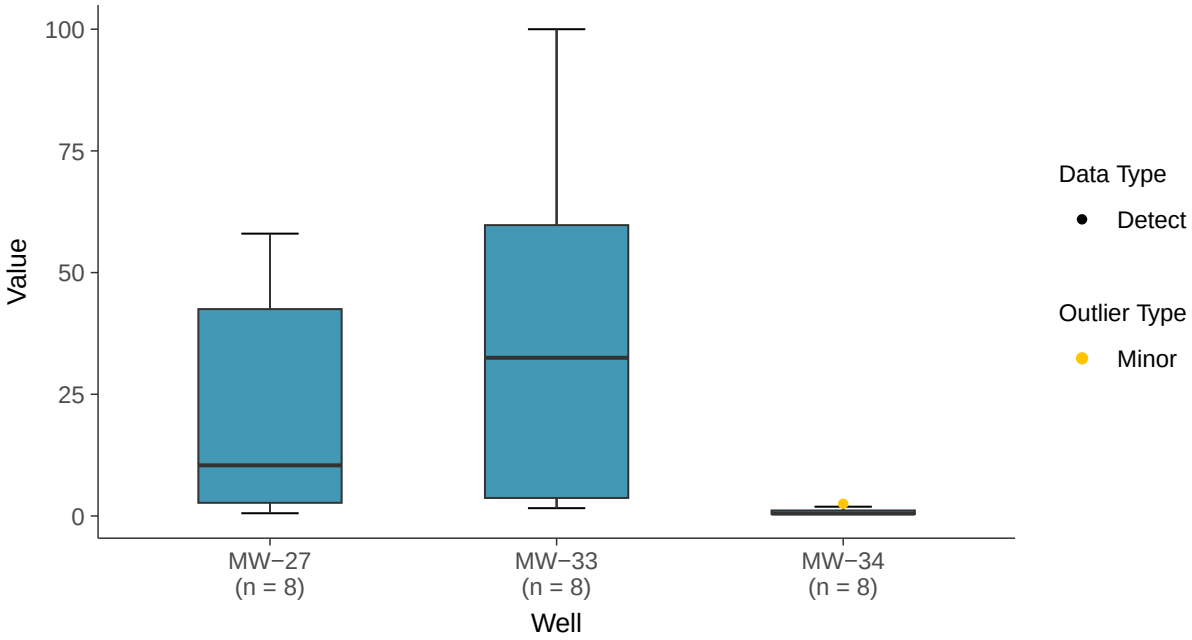
Boxplot by Season

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



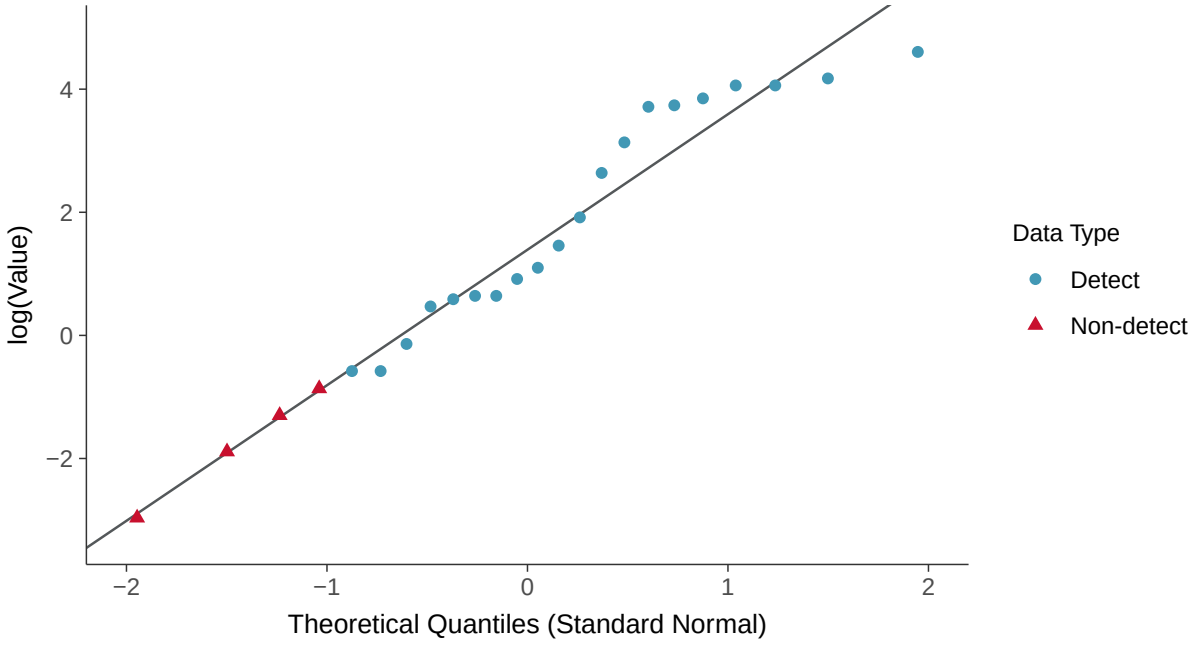
Boxplot by Well

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



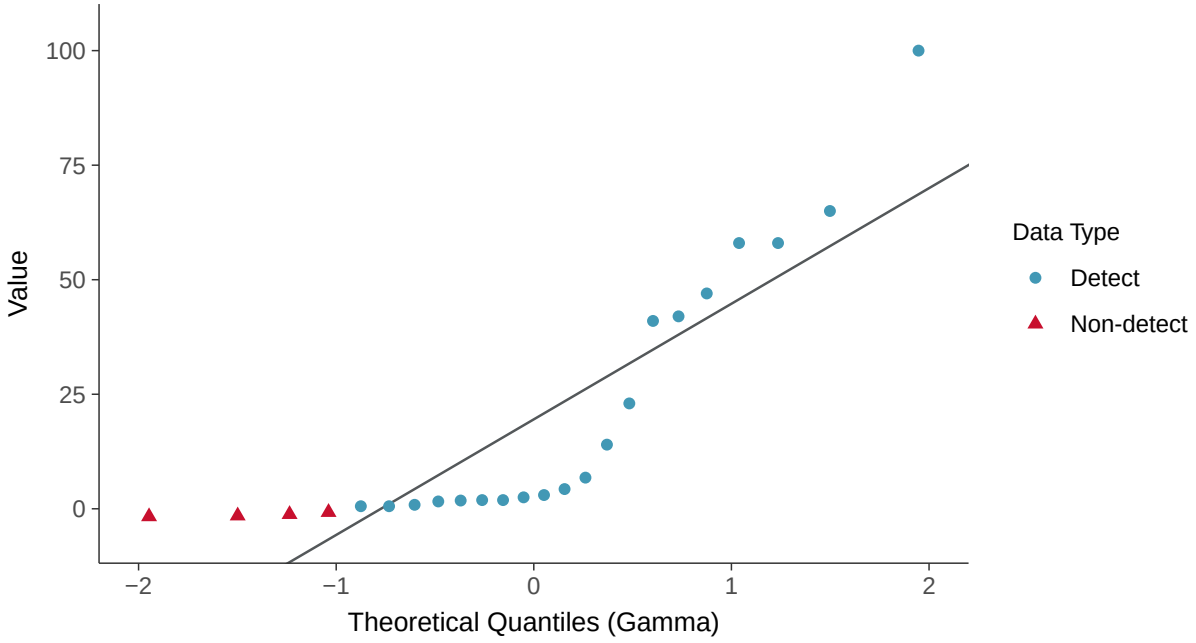
Lognormal Q-Q plot using ROS Imputed Estimates

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



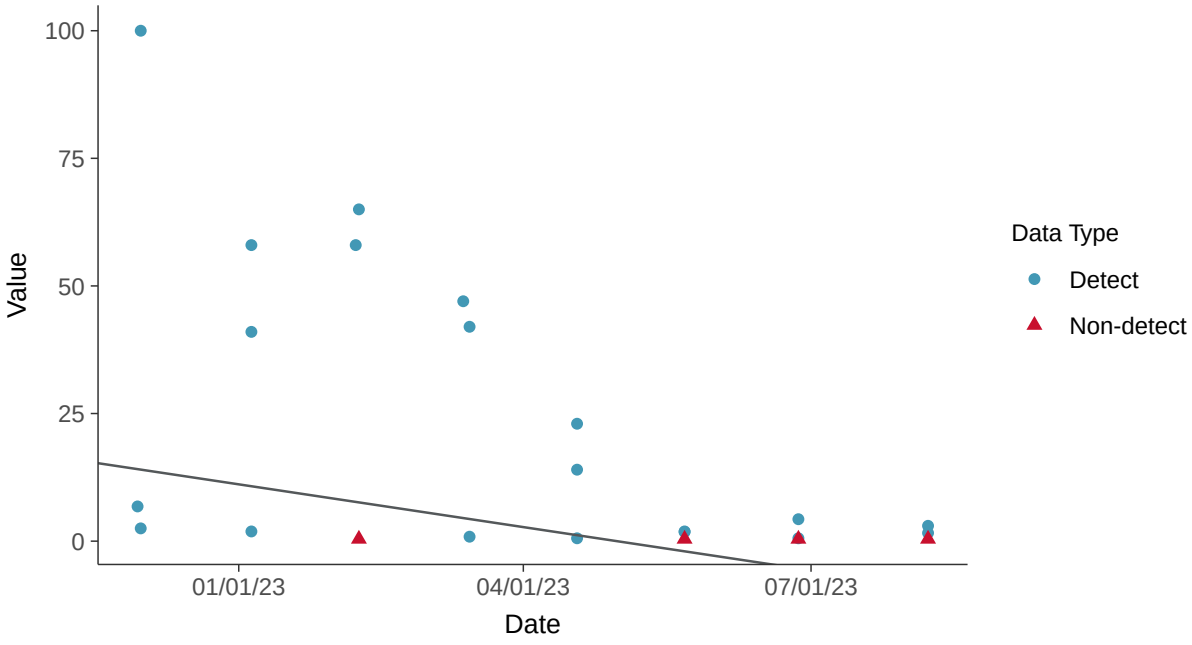
Gamma Q-Q plot using ROS Imputed Estimates

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



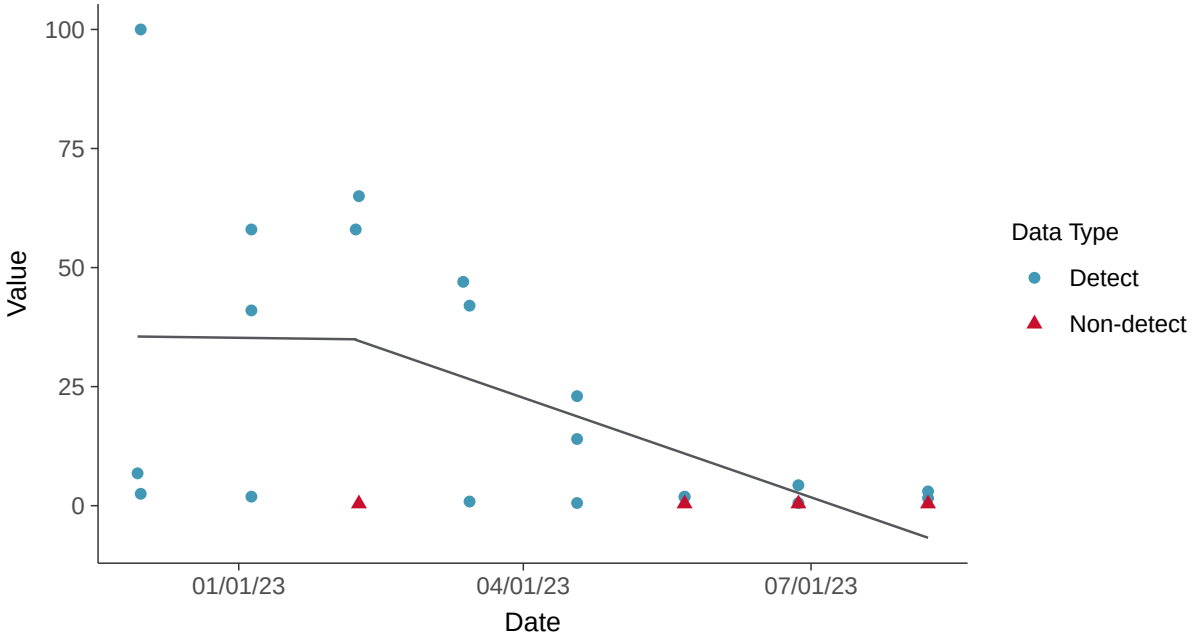
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



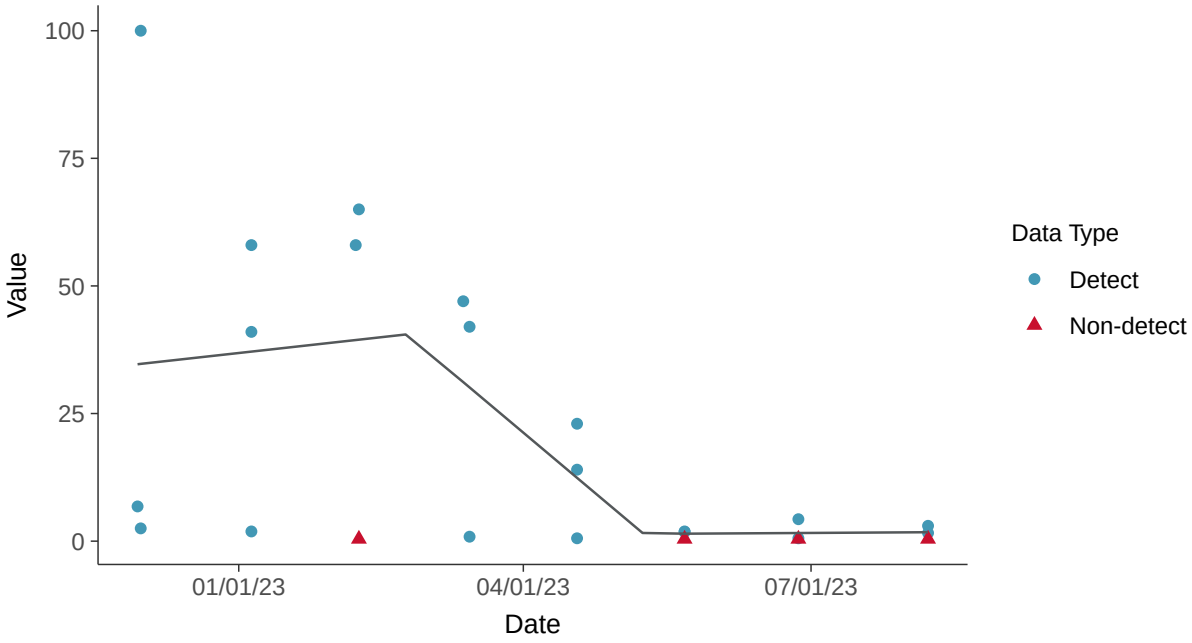
Trend Regression: Piecewise Linear-Linear

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)

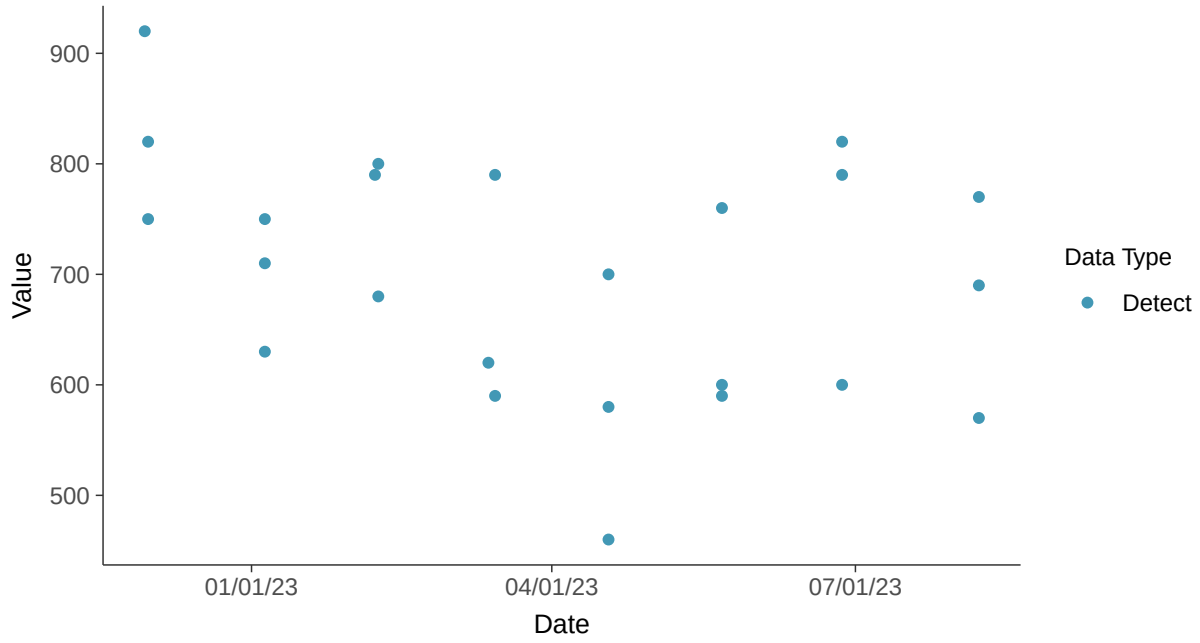


Appendix III: Total Dissolved Solids, MW-27, MW-33, MW-34

ID: 4_126

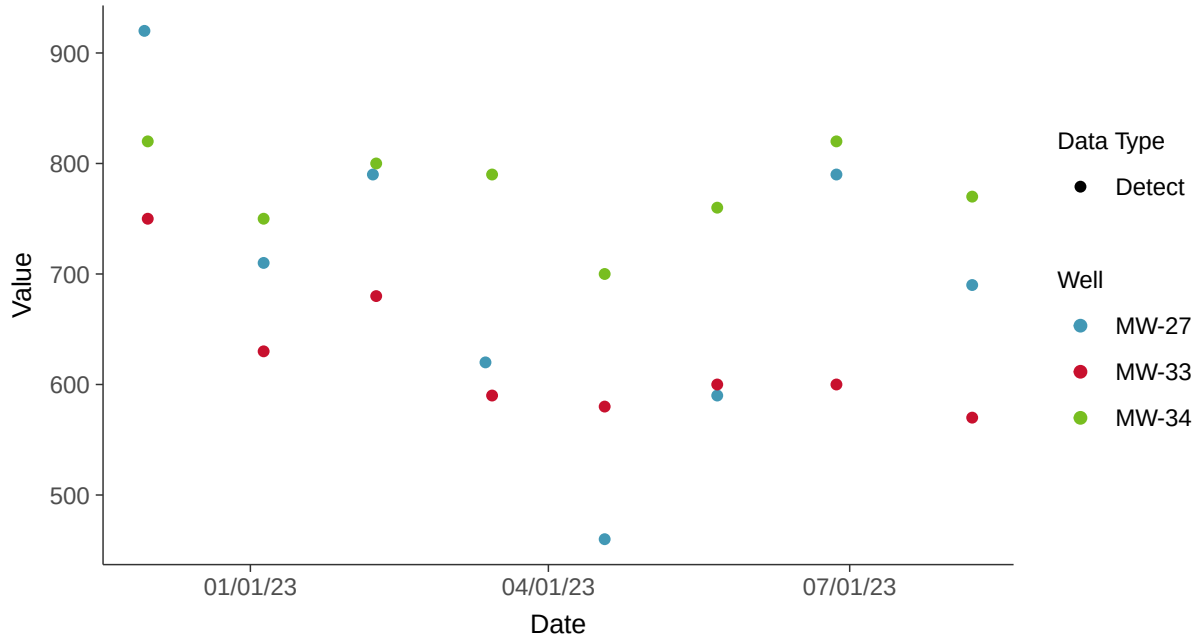
Scatter Plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



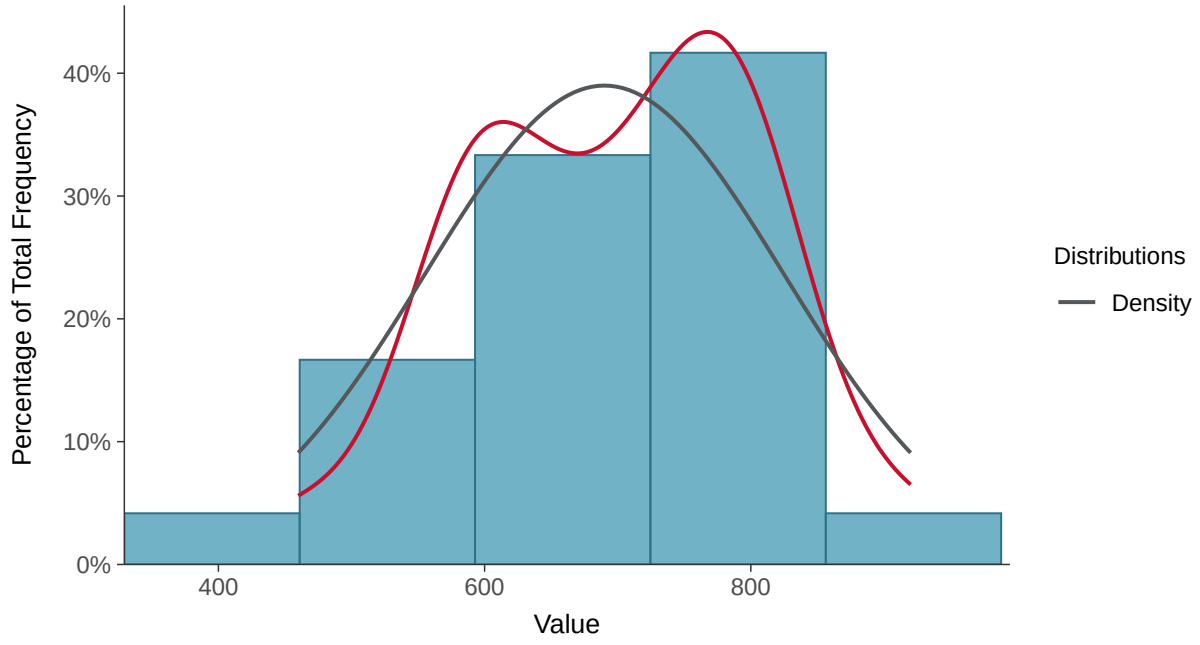
Scatter Plot by Well

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



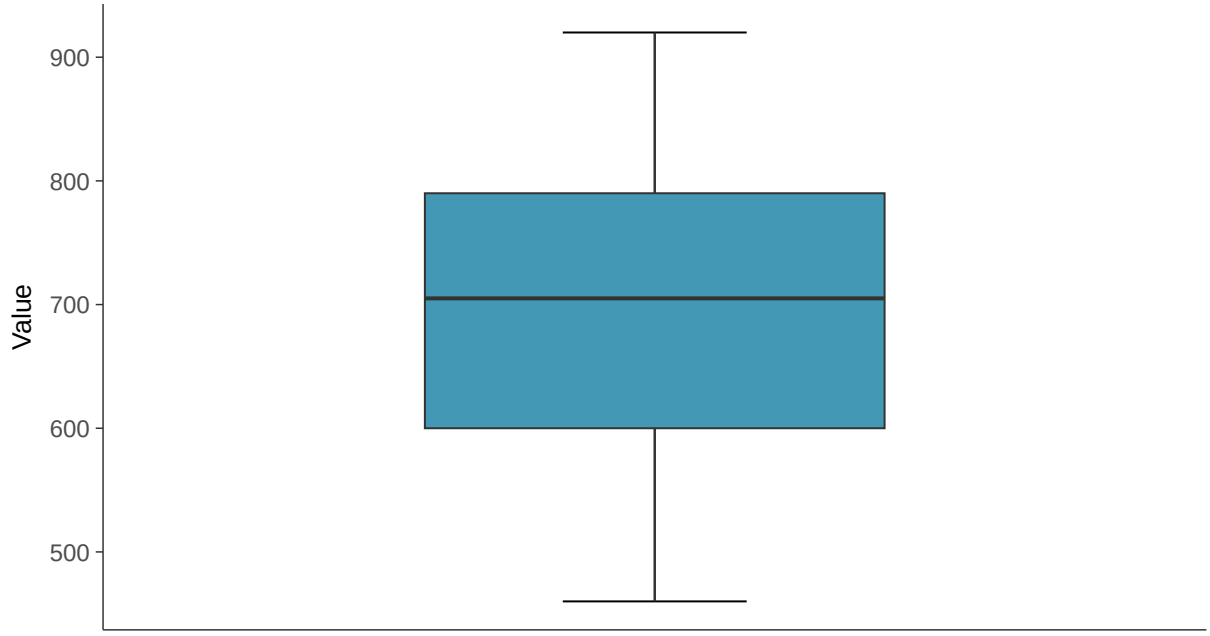
Histogram

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



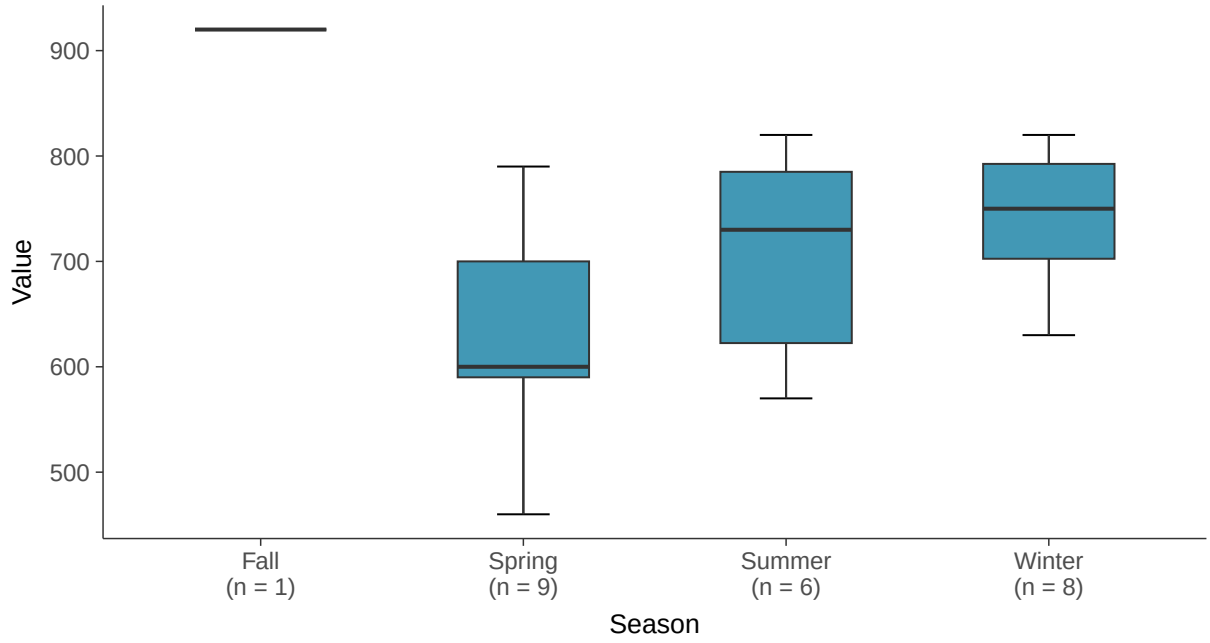
Boxplot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



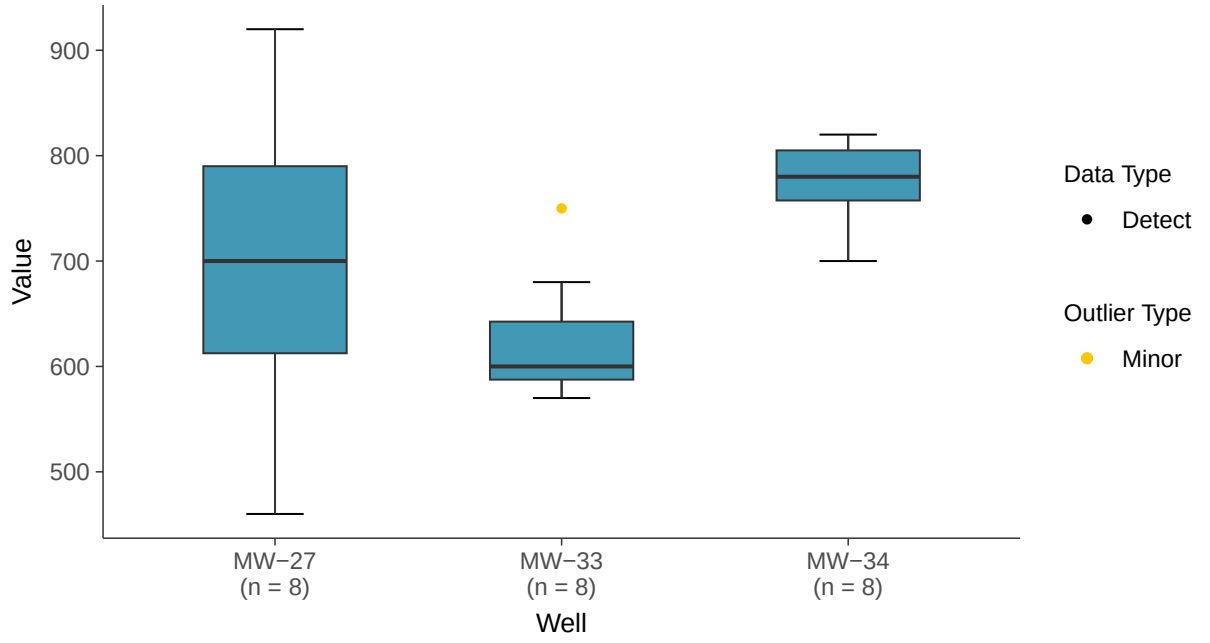
Boxplot by Season

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



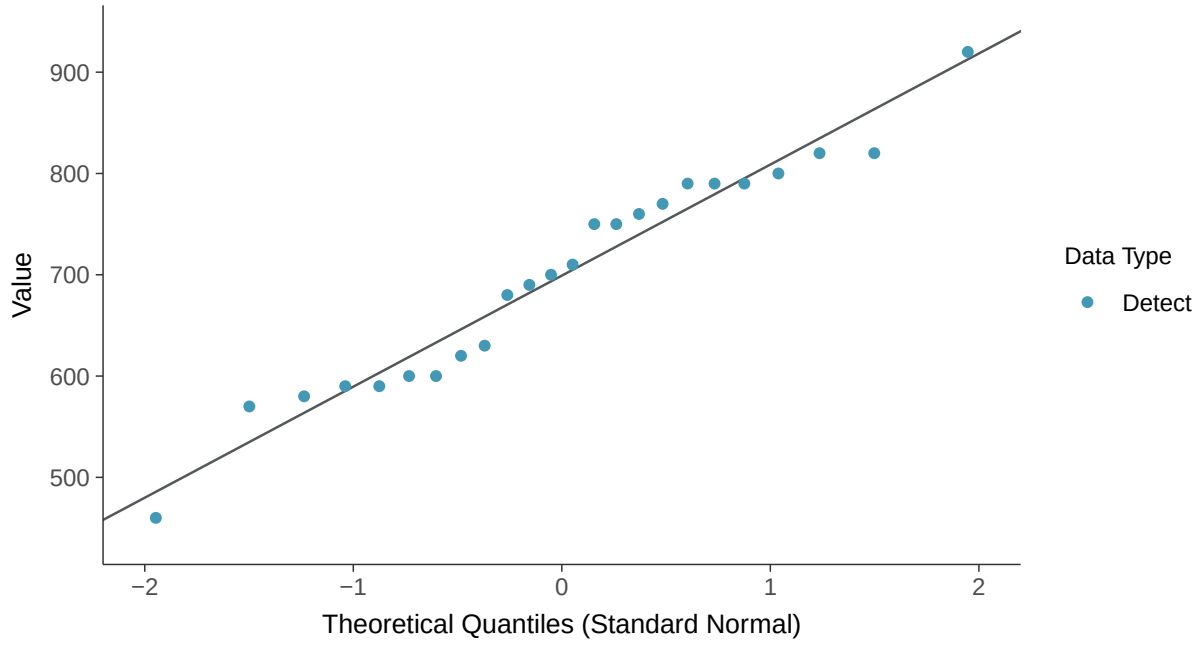
Boxplot by Well

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



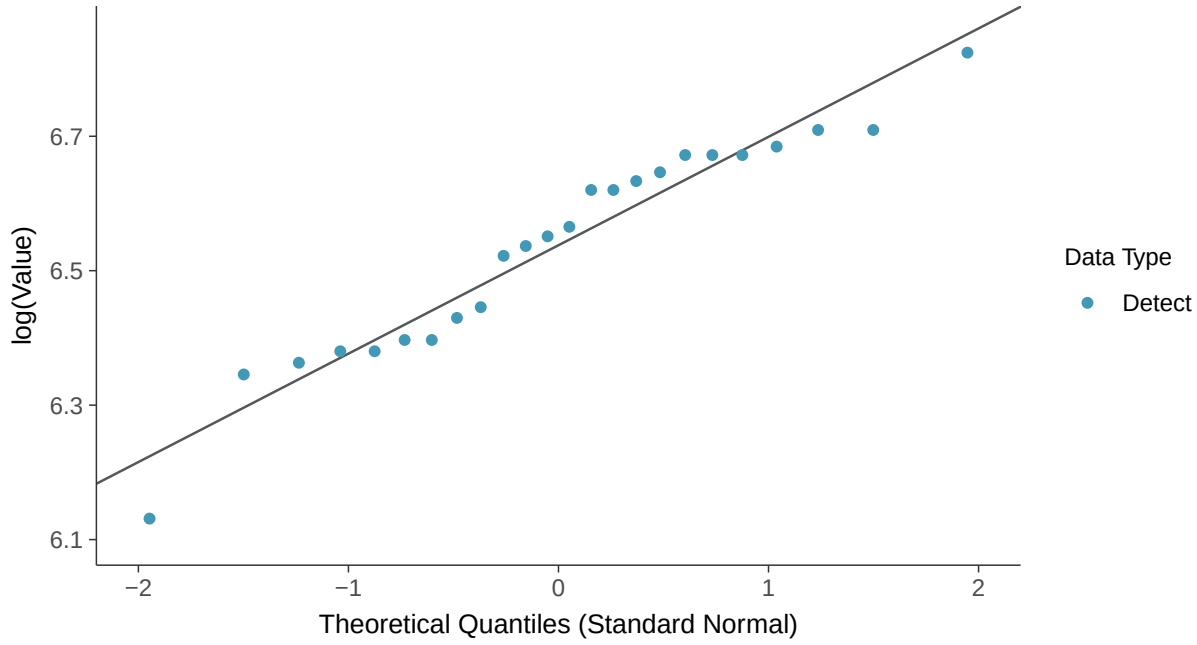
Normal Q-Q plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



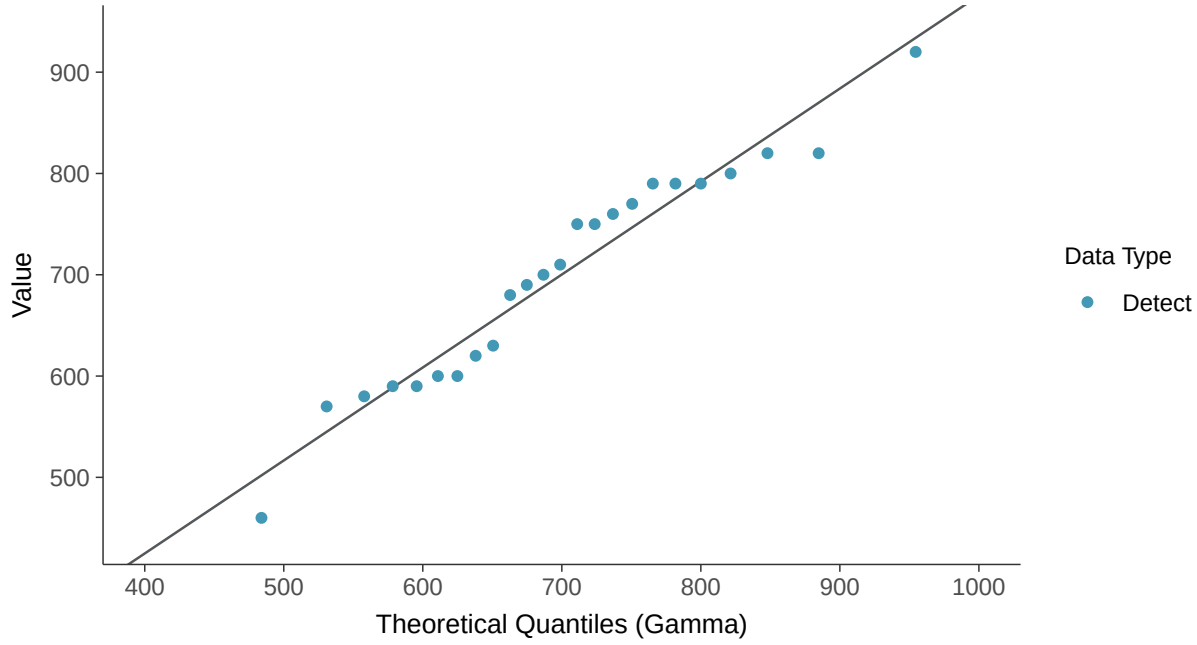
Lognormal Q-Q plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



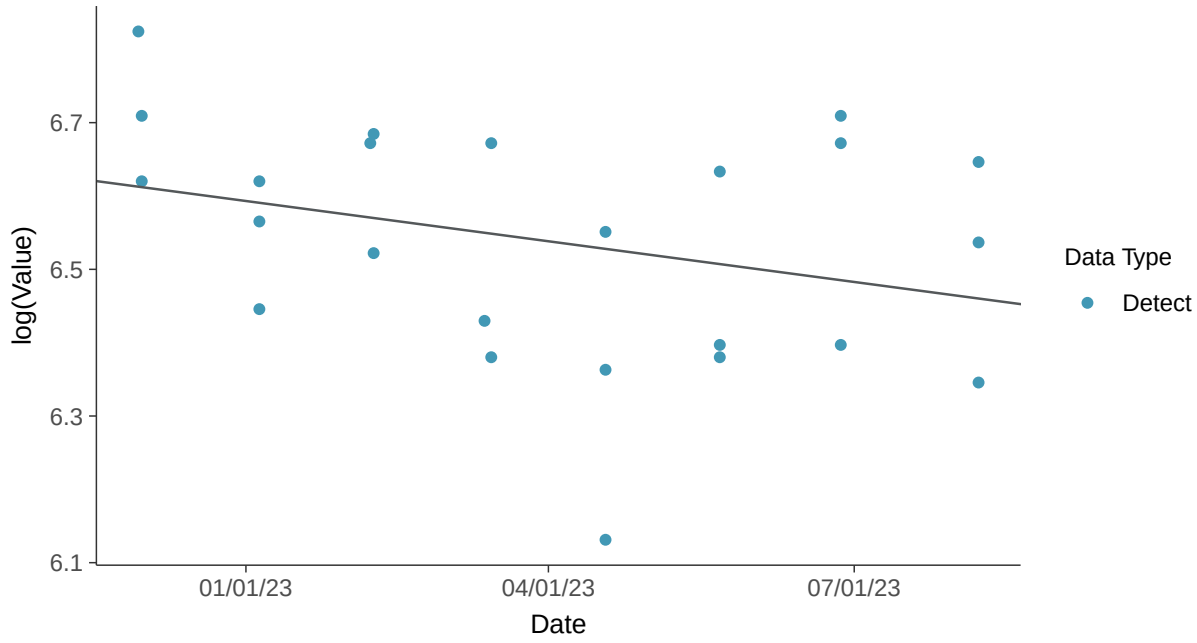
Gamma Q-Q plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



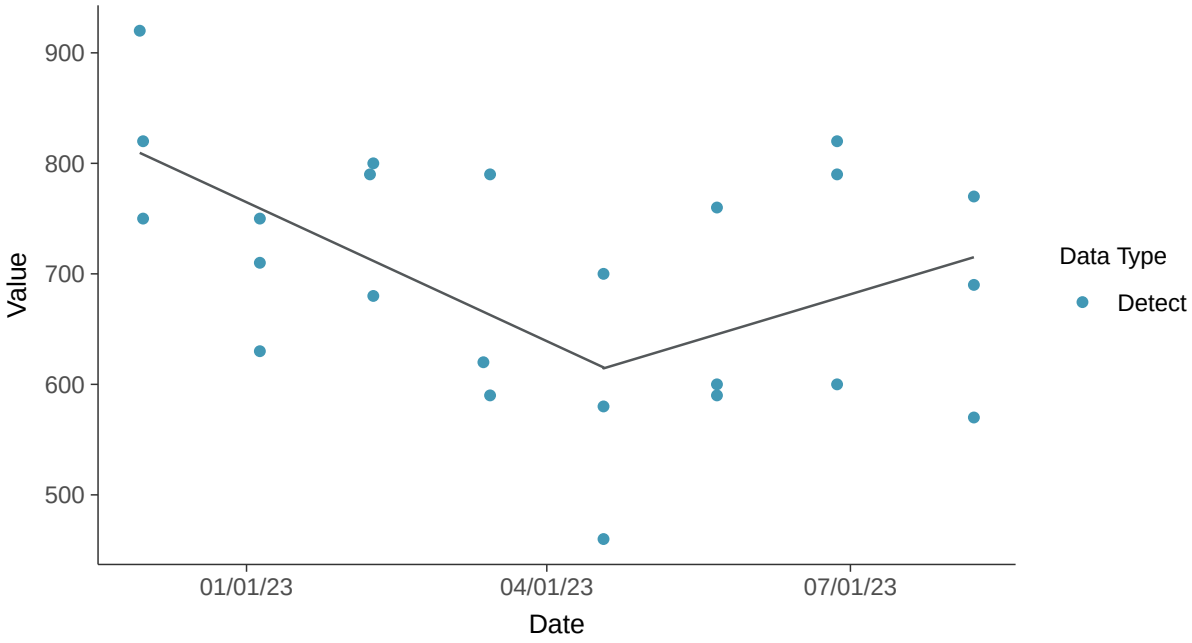
Trend Regression: Lognormal MLE

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



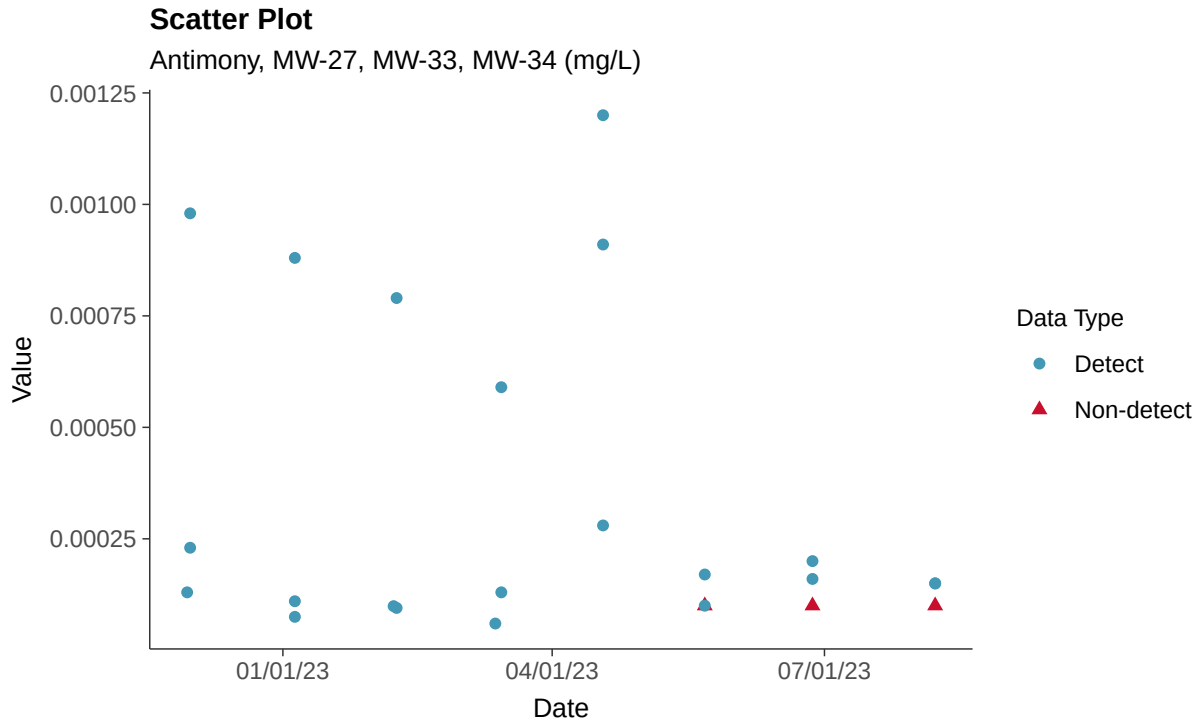
Trend Regression: Piecewise Linear-Linear

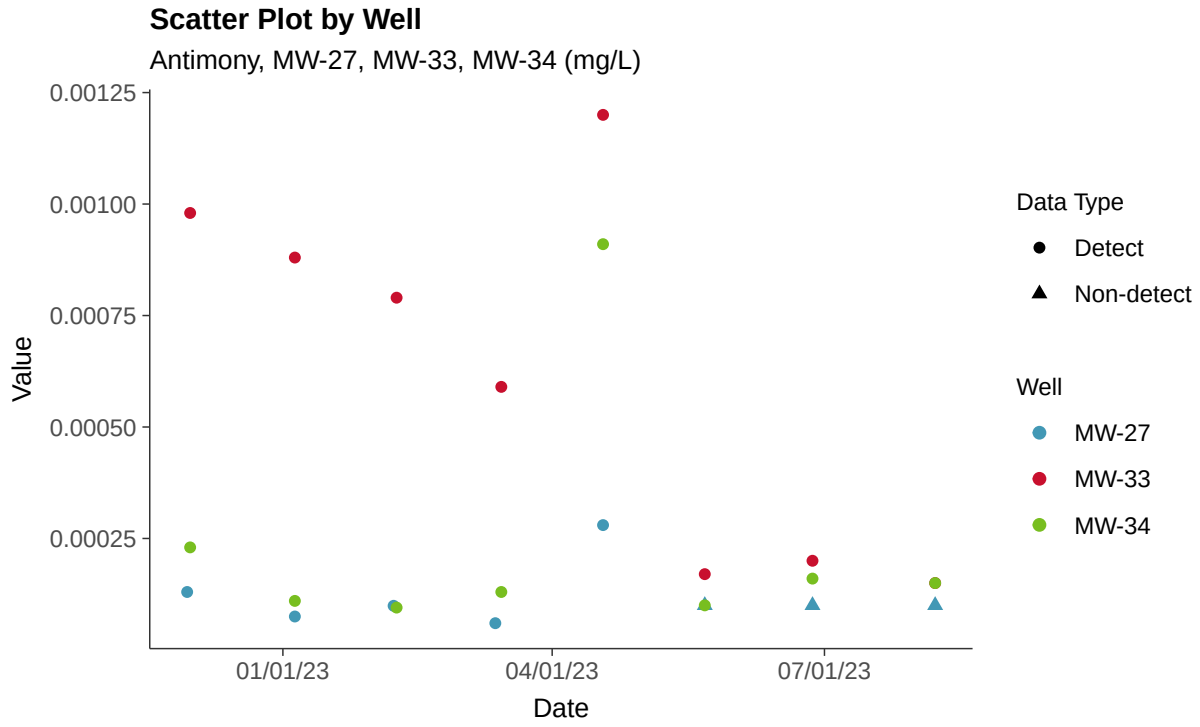
Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Antimony, MW-27, MW-33, MW-34

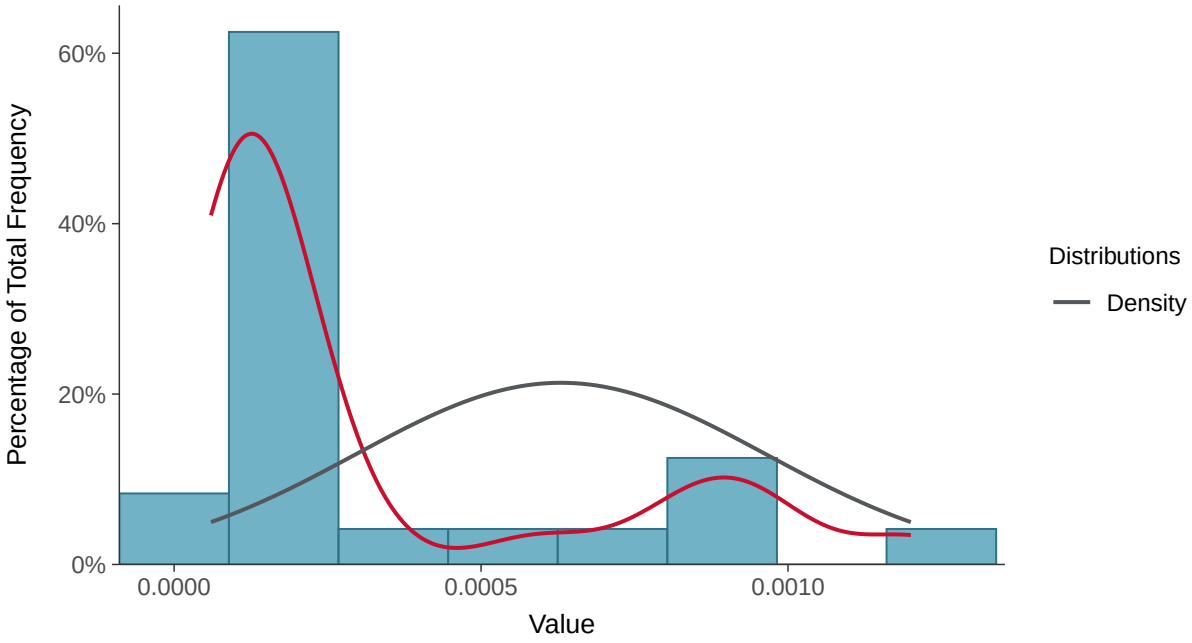
ID: 5_101





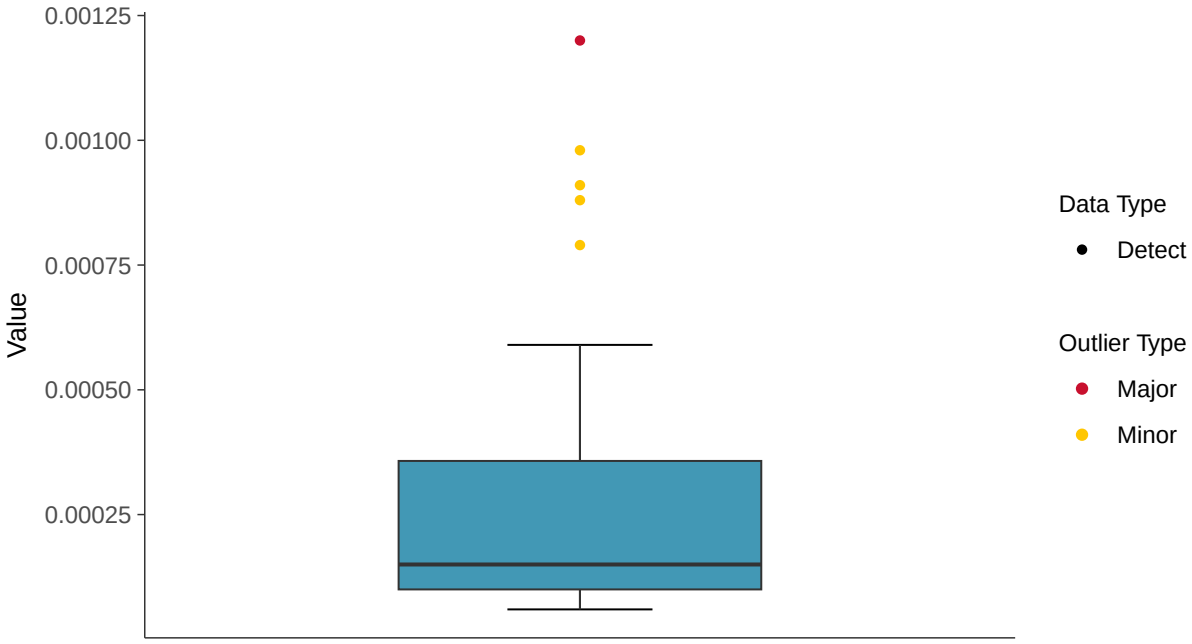
Histogram

Antimony, MW-27, MW-33, MW-34 (mg/L)



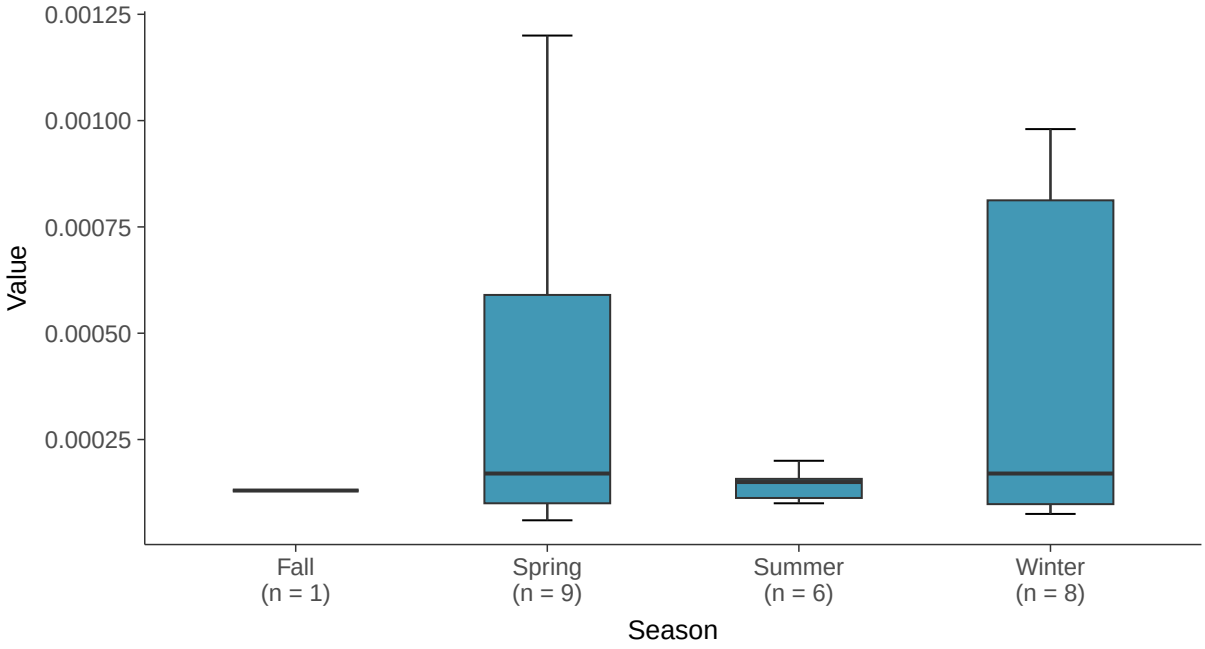
Boxplot

Antimony, MW-27, MW-33, MW-34 (mg/L)



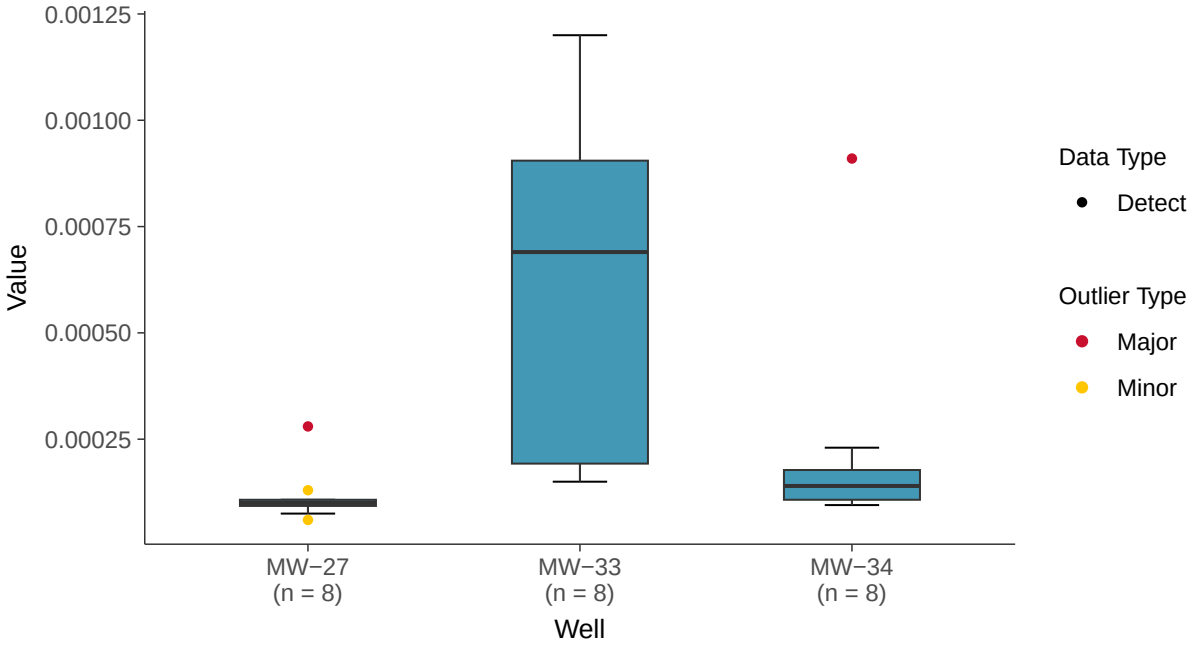
Boxplot by Season

Antimony, MW-27, MW-33, MW-34 (mg/L)



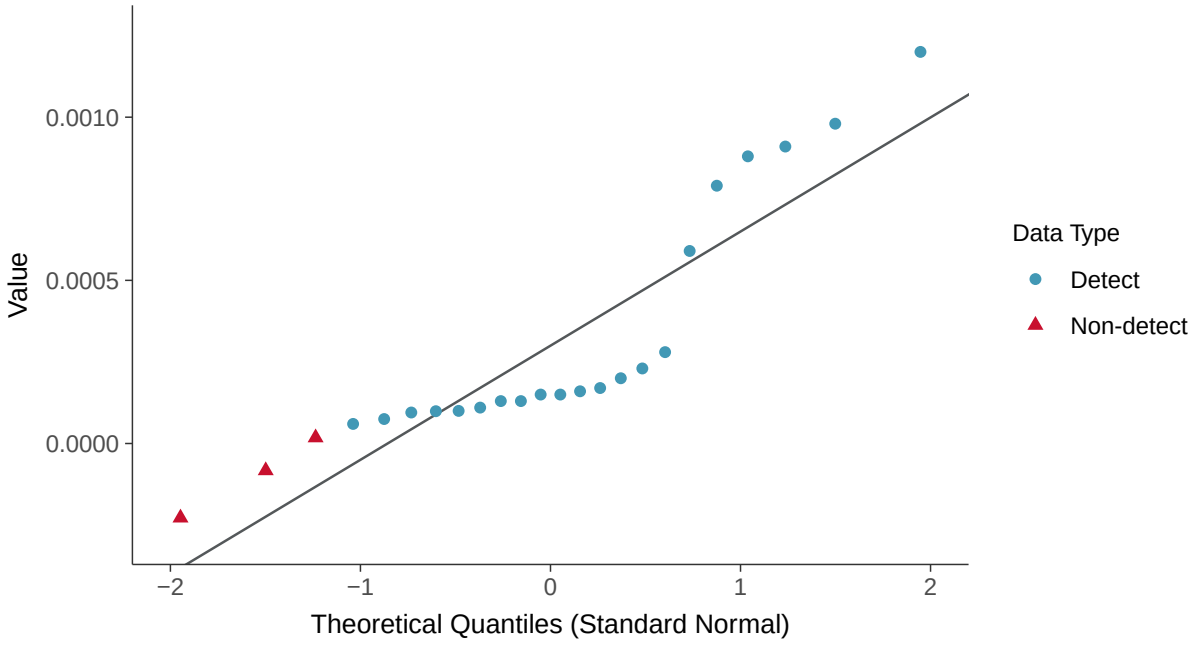
Boxplot by Well

Antimony, MW-27, MW-33, MW-34 (mg/L)



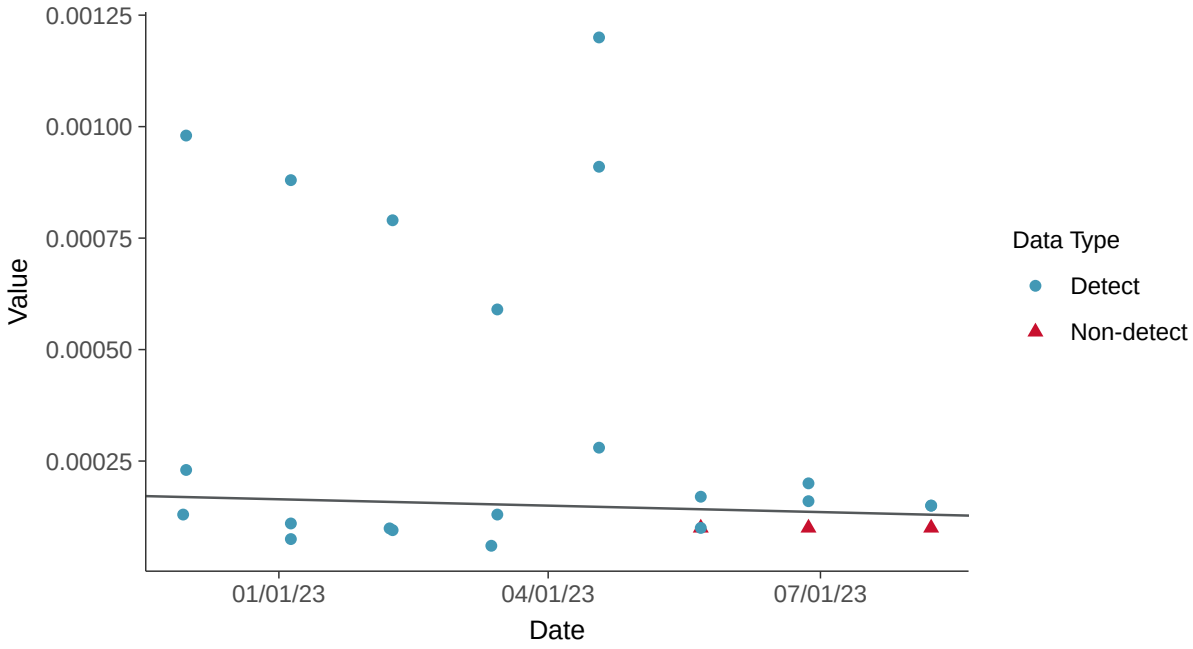
Normal Q-Q plot using ROS Imputed Estimates

Antimony, MW-27, MW-33, MW-34 (mg/L)



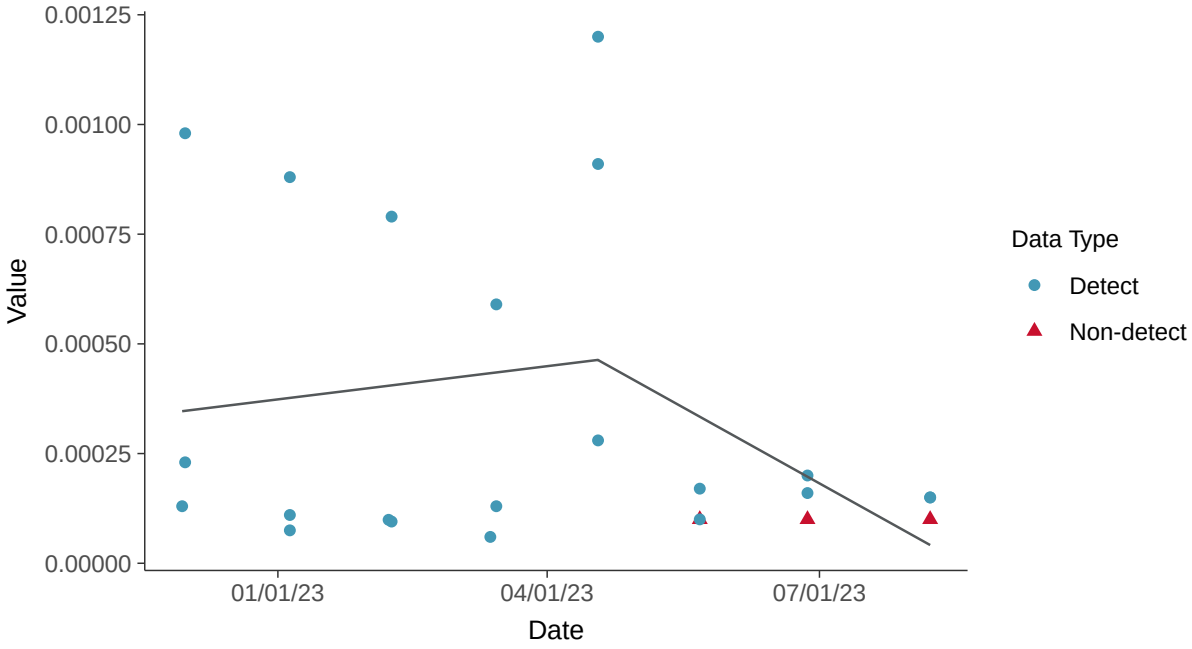
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Antimony, MW-27, MW-33, MW-34 (mg/L)



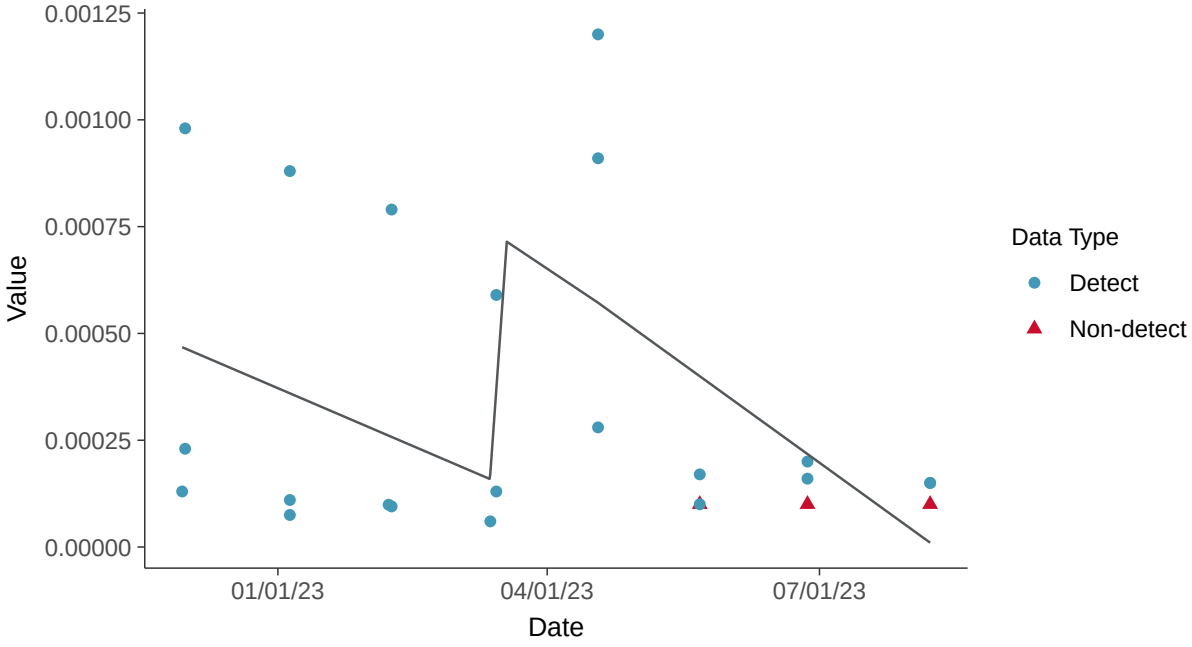
Trend Regression: Piecewise Linear-Linear

Antimony, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Antimony, MW-27, MW-33, MW-34 (mg/L)

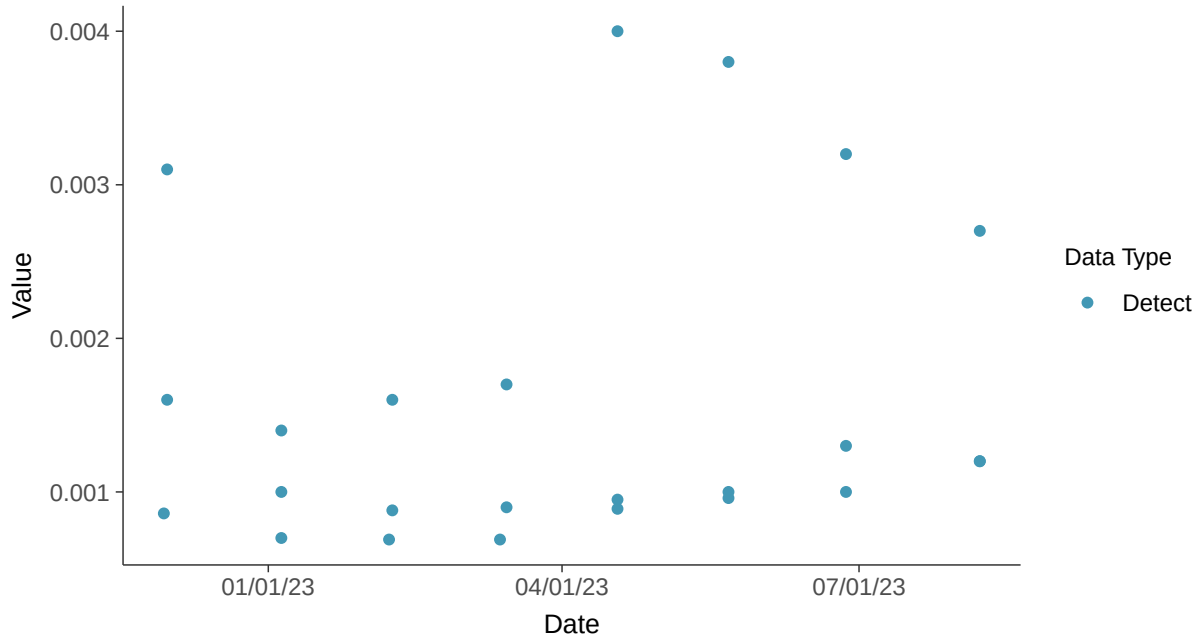


Appendix IV: Arsenic, MW-27, MW-33, MW-34

ID: 5_102

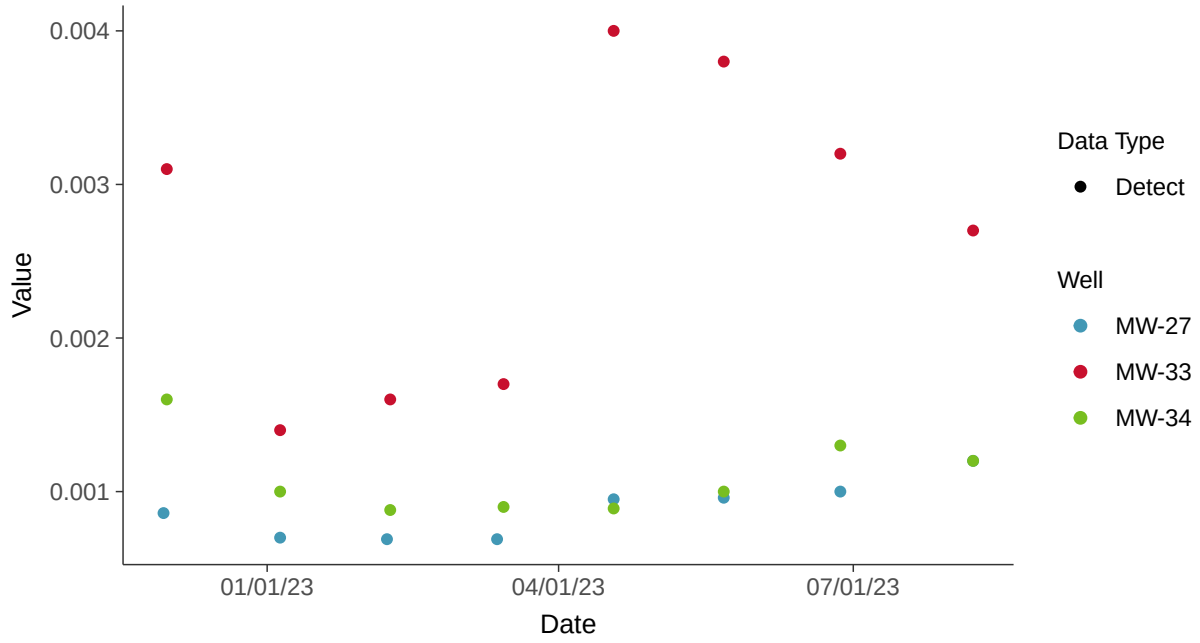
Scatter Plot

Arsenic, MW-27, MW-33, MW-34 (mg/L)



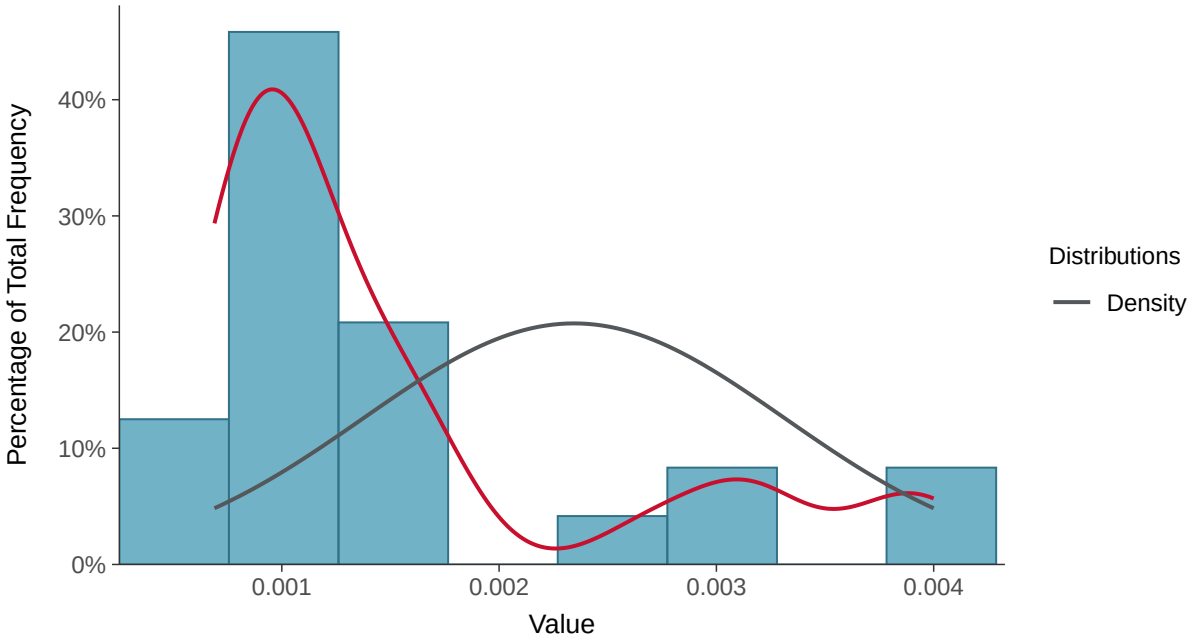
Scatter Plot by Well

Arsenic, MW-27, MW-33, MW-34 (mg/L)



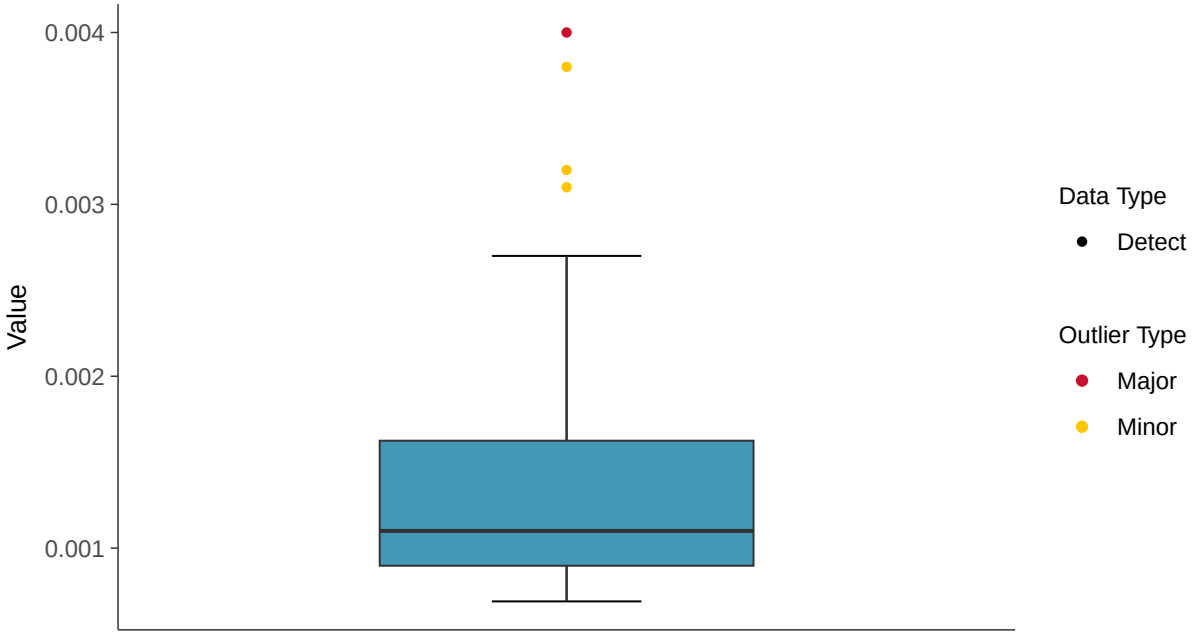
Histogram

Arsenic, MW-27, MW-33, MW-34 (mg/L)



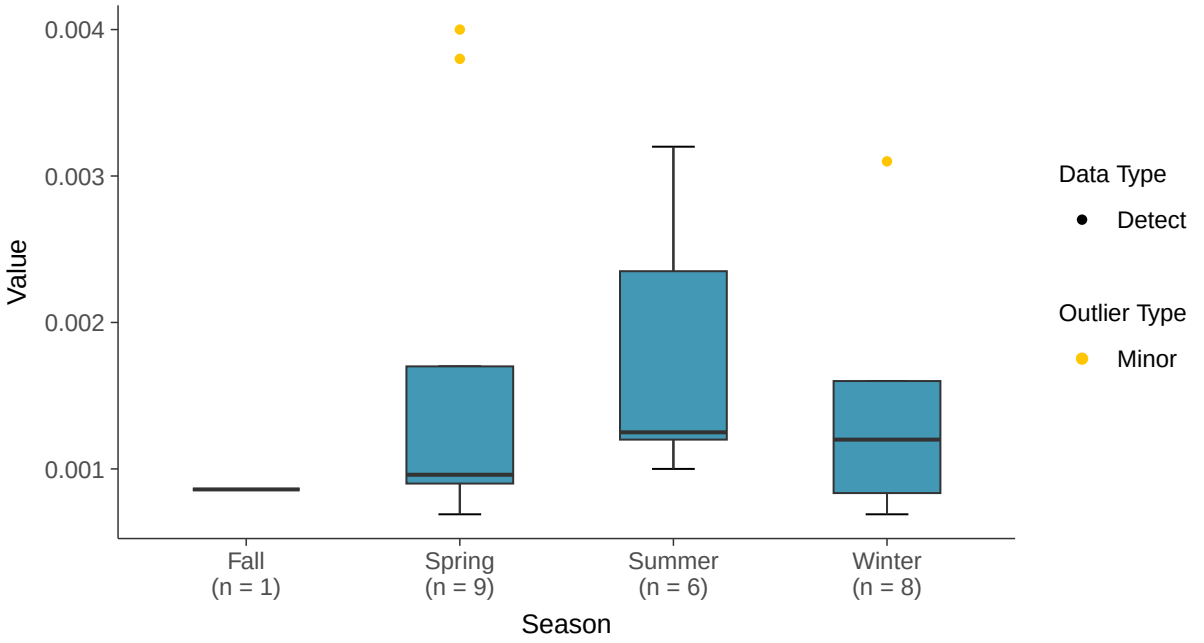
Boxplot

Arsenic, MW-27, MW-33, MW-34 (mg/L)



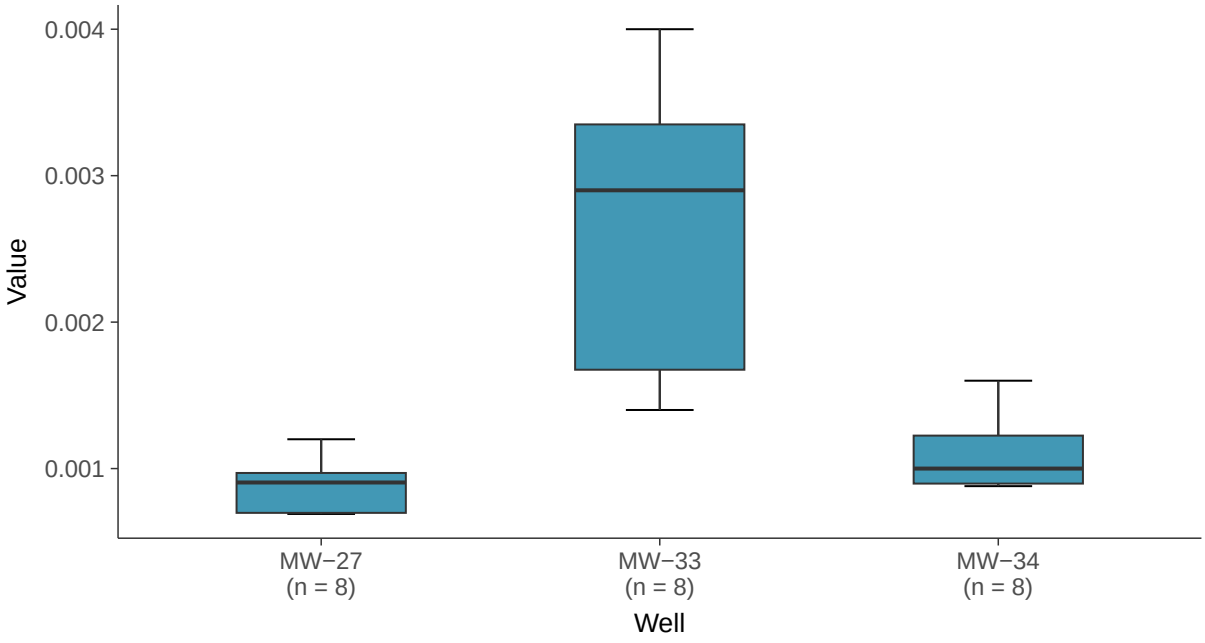
Boxplot by Season

Arsenic, MW-27, MW-33, MW-34 (mg/L)



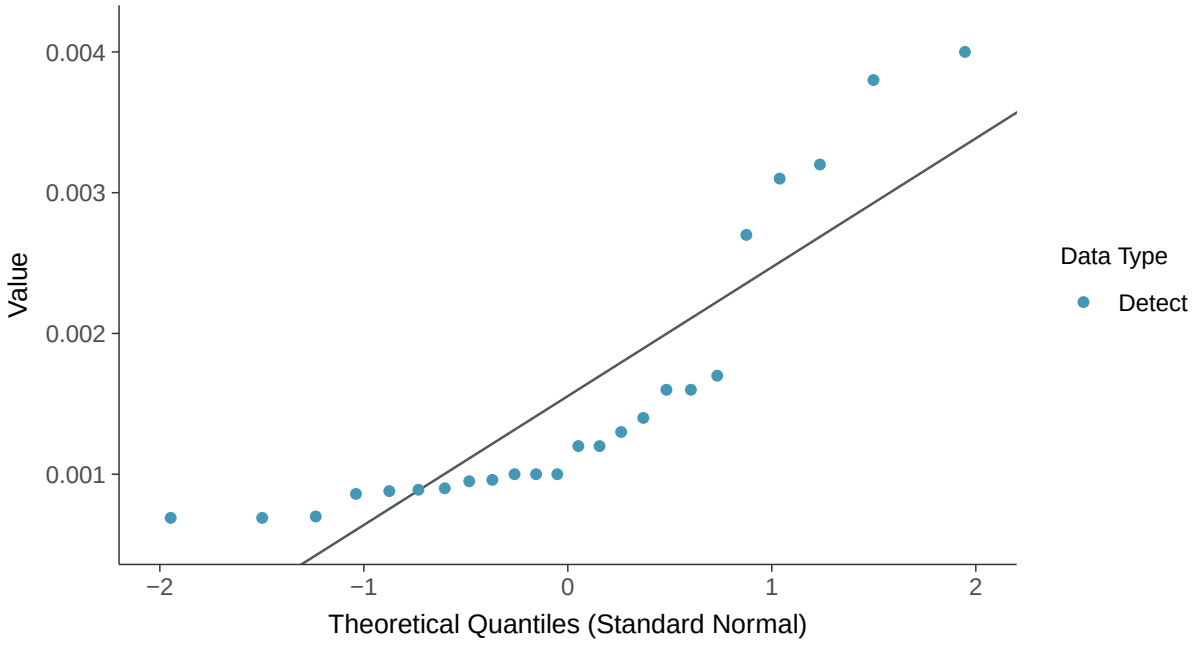
Boxplot by Well

Arsenic, MW-27, MW-33, MW-34 (mg/L)



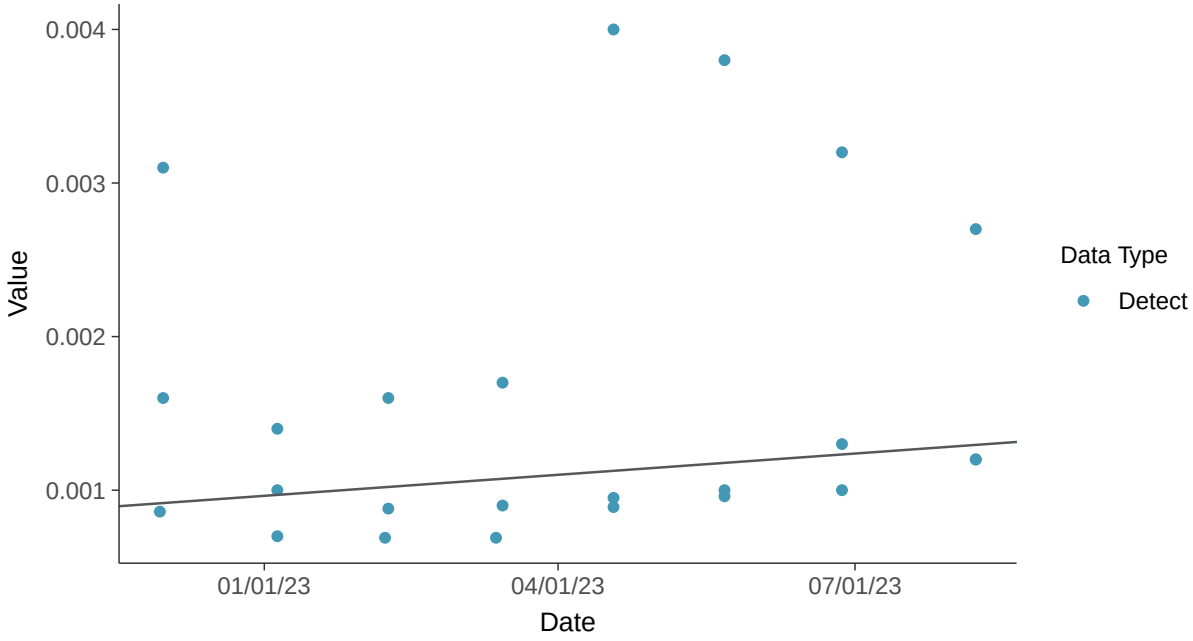
Normal Q-Q plot

Arsenic, MW-27, MW-33, MW-34 (mg/L)



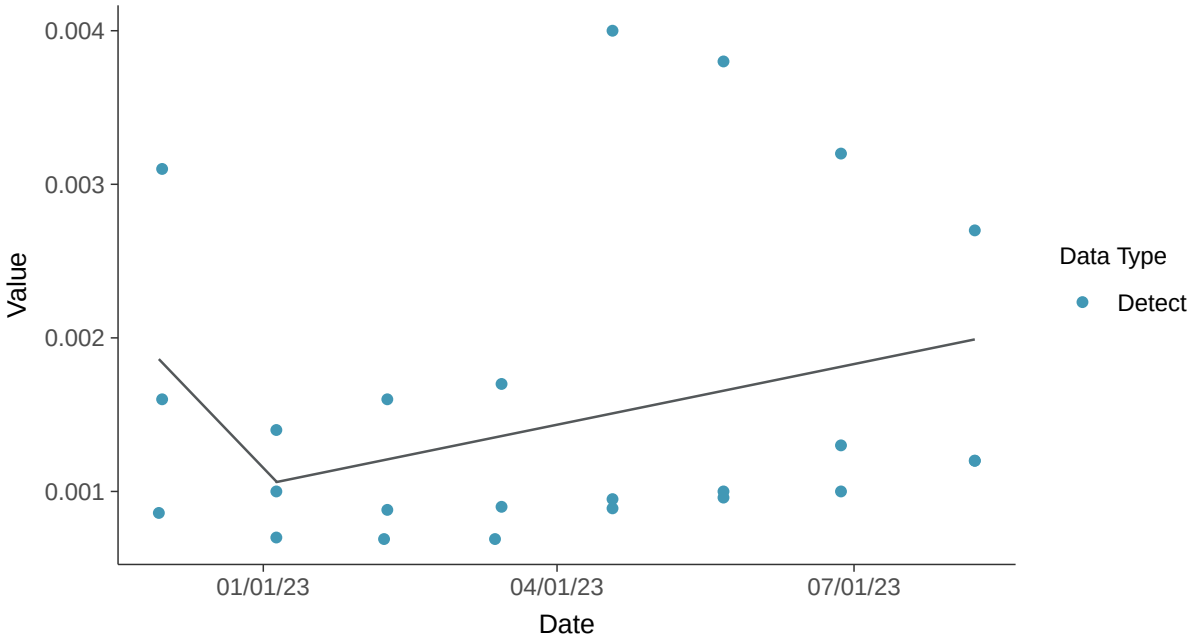
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Arsenic, MW-27, MW-33, MW-34 (mg/L)



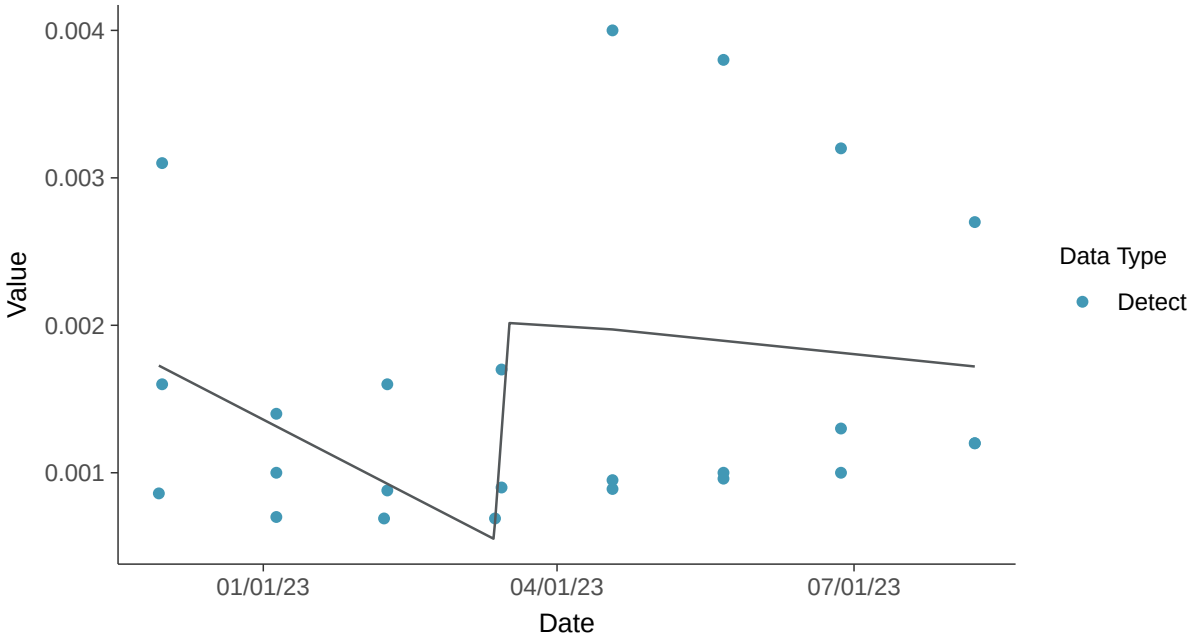
Trend Regression: Piecewise Linear-Linear

Arsenic, MW-27, MW-33, MW-34 (mg/L)



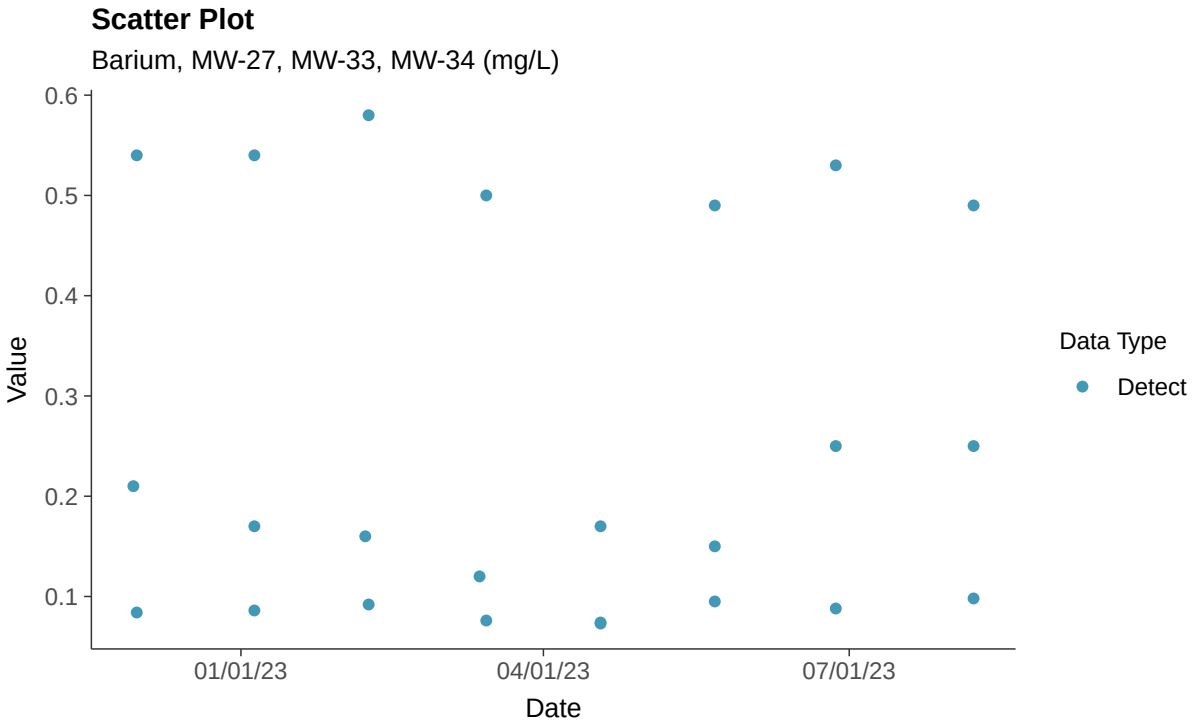
Trend Regression: Piecewise Linear-Linear-Linear

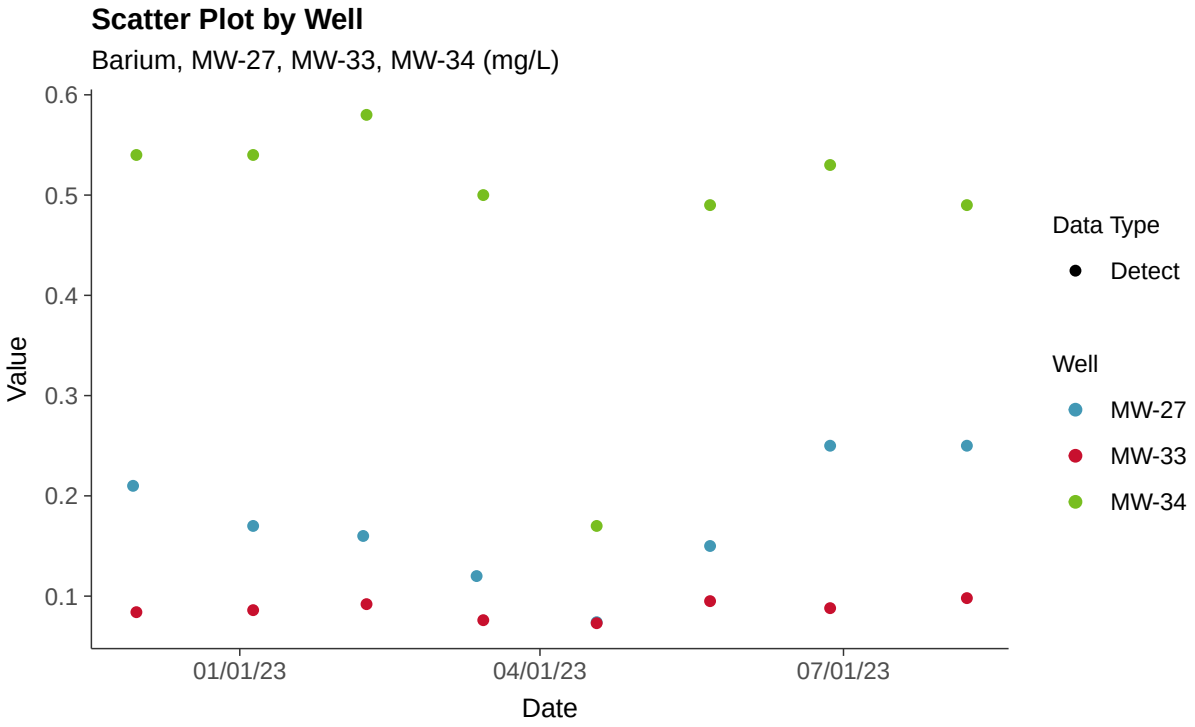
Arsenic, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Barium, MW-27, MW-33, MW-34

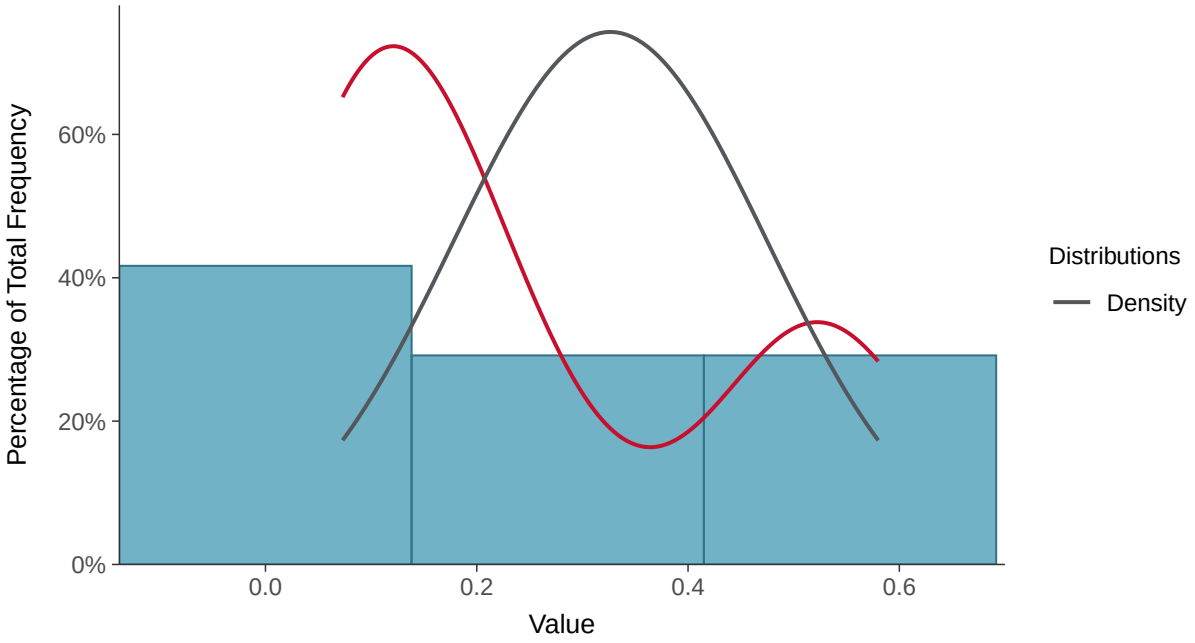
ID: 5_103





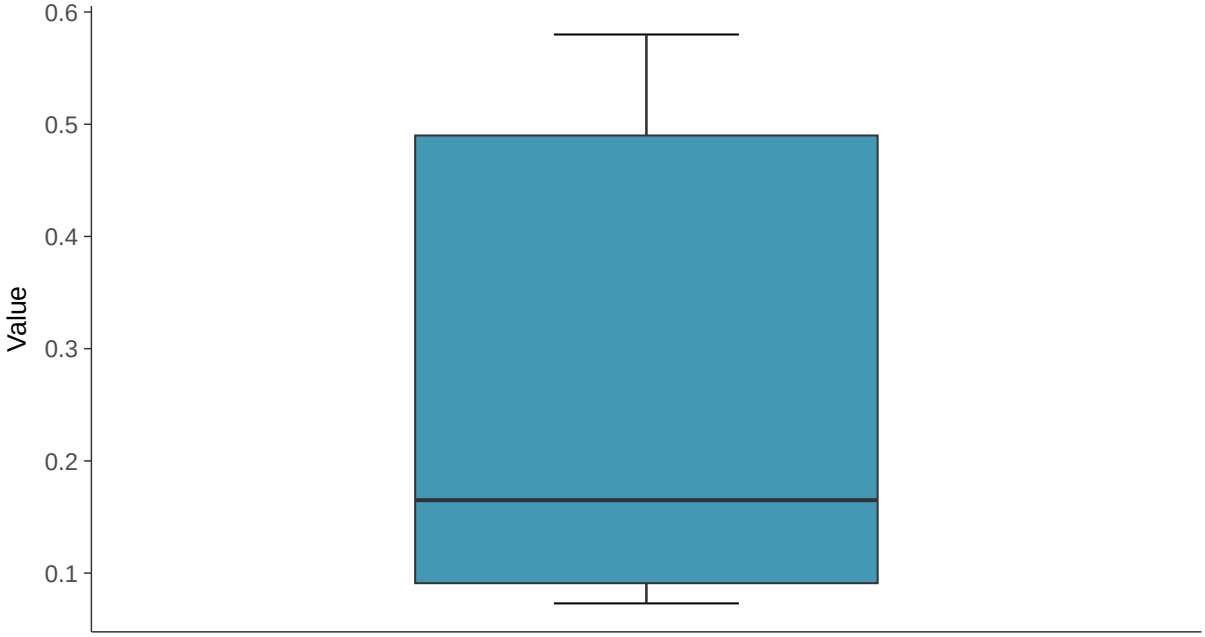
Histogram

Barium, MW-27, MW-33, MW-34 (mg/L)



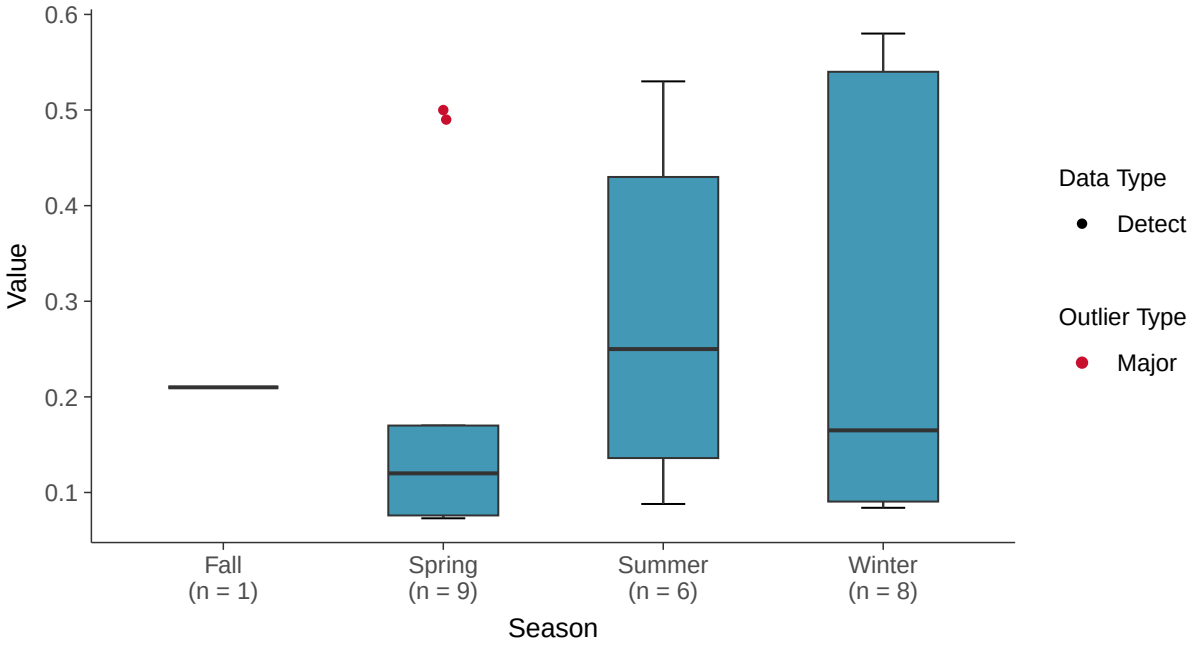
Boxplot

Barium, MW-27, MW-33, MW-34 (mg/L)



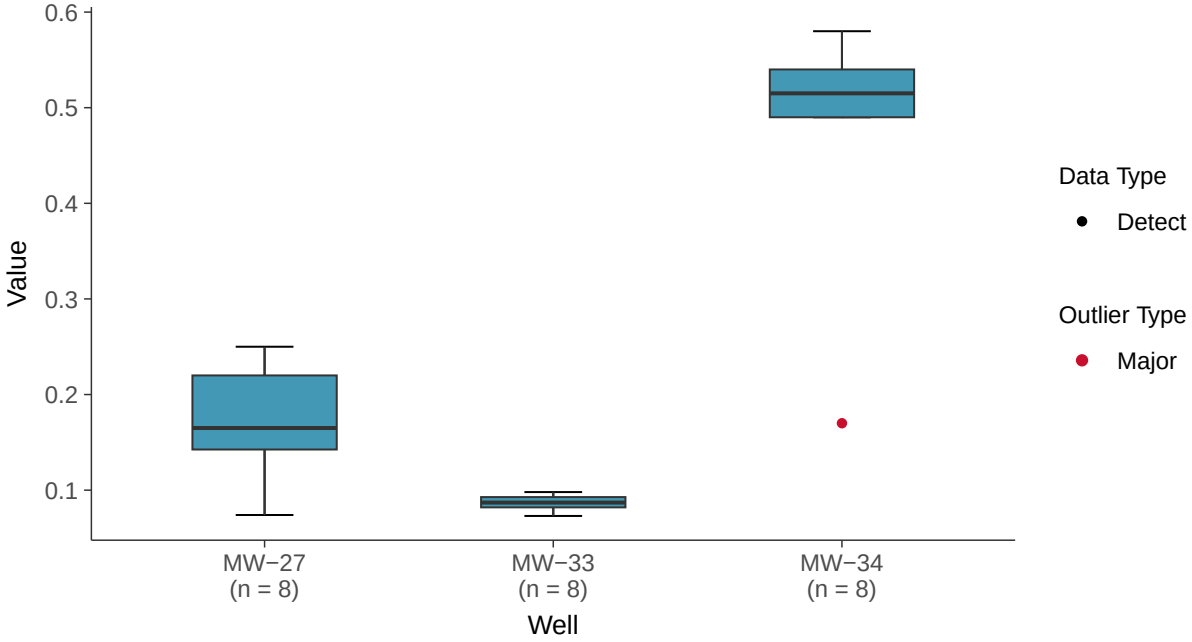
Boxplot by Season

Barium, MW-27, MW-33, MW-34 (mg/L)



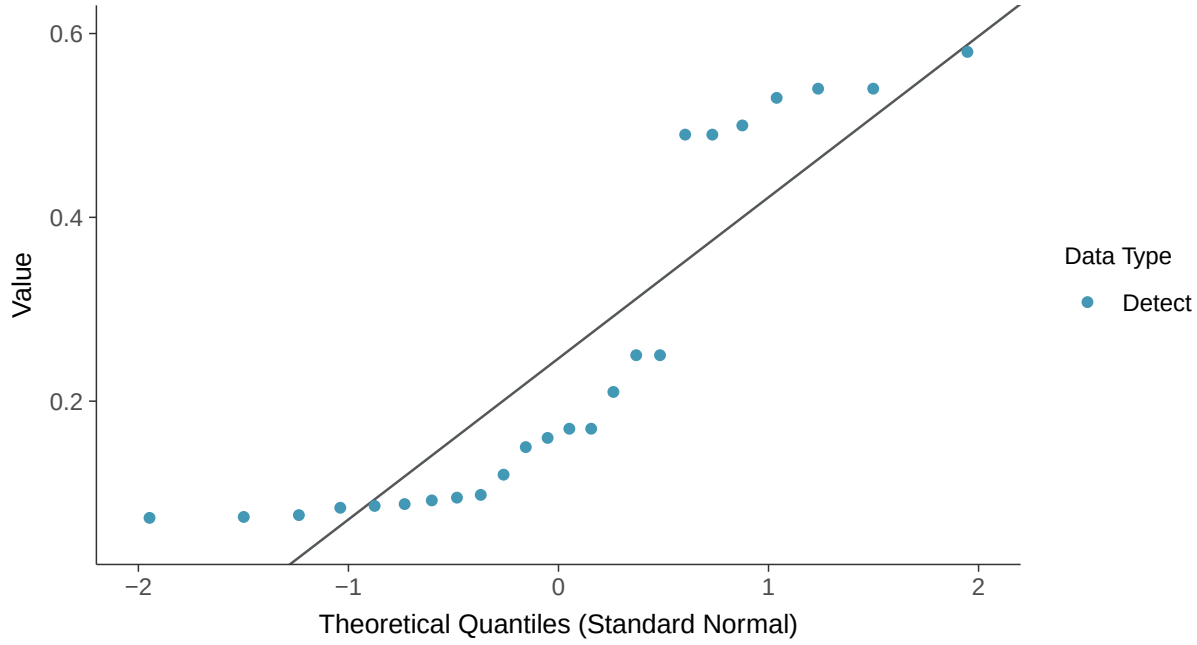
Boxplot by Well

Barium, MW-27, MW-33, MW-34 (mg/L)



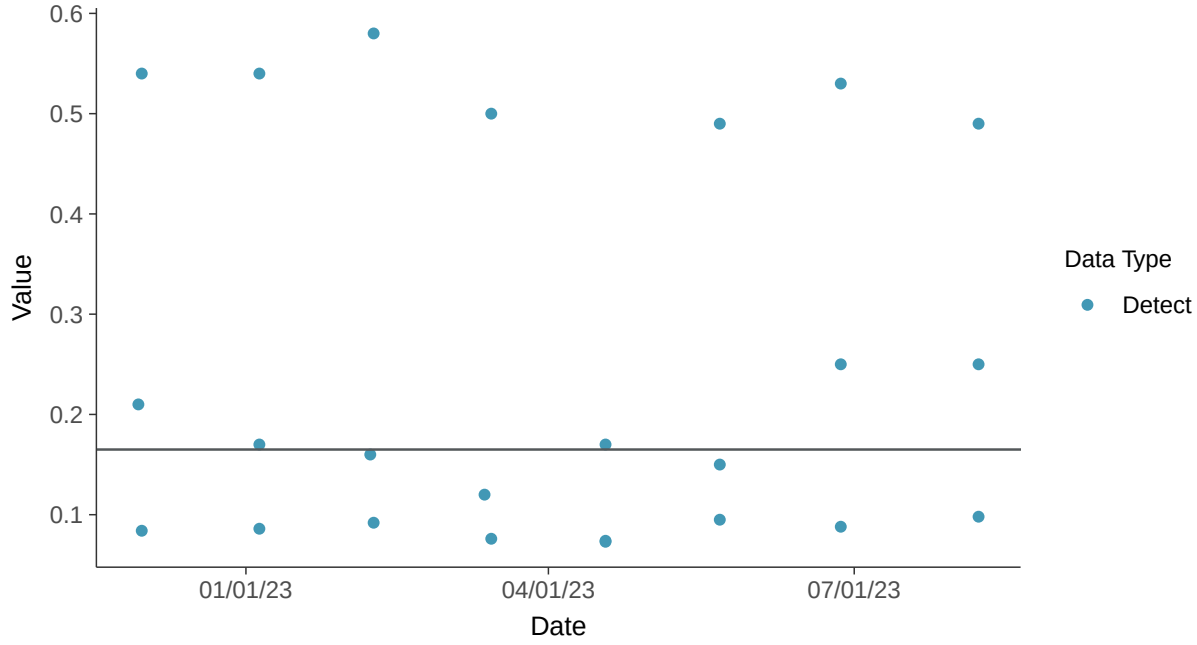
Normal Q-Q plot

Barium, MW-27, MW-33, MW-34 (mg/L)



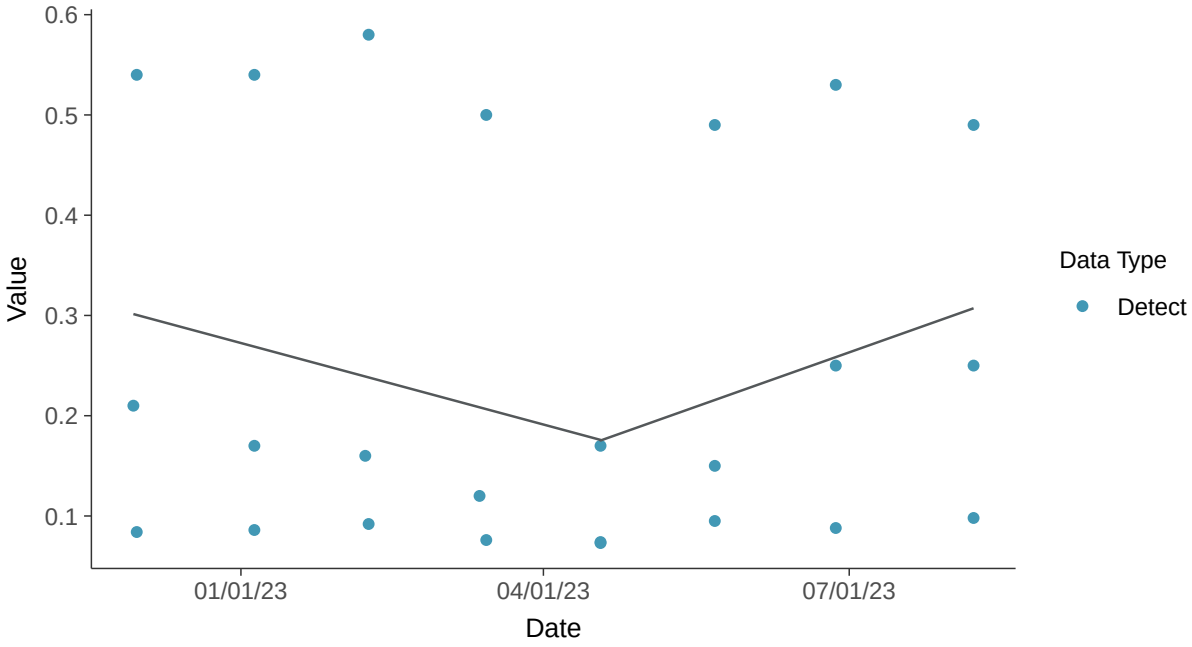
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Barium, MW-27, MW-33, MW-34 (mg/L)



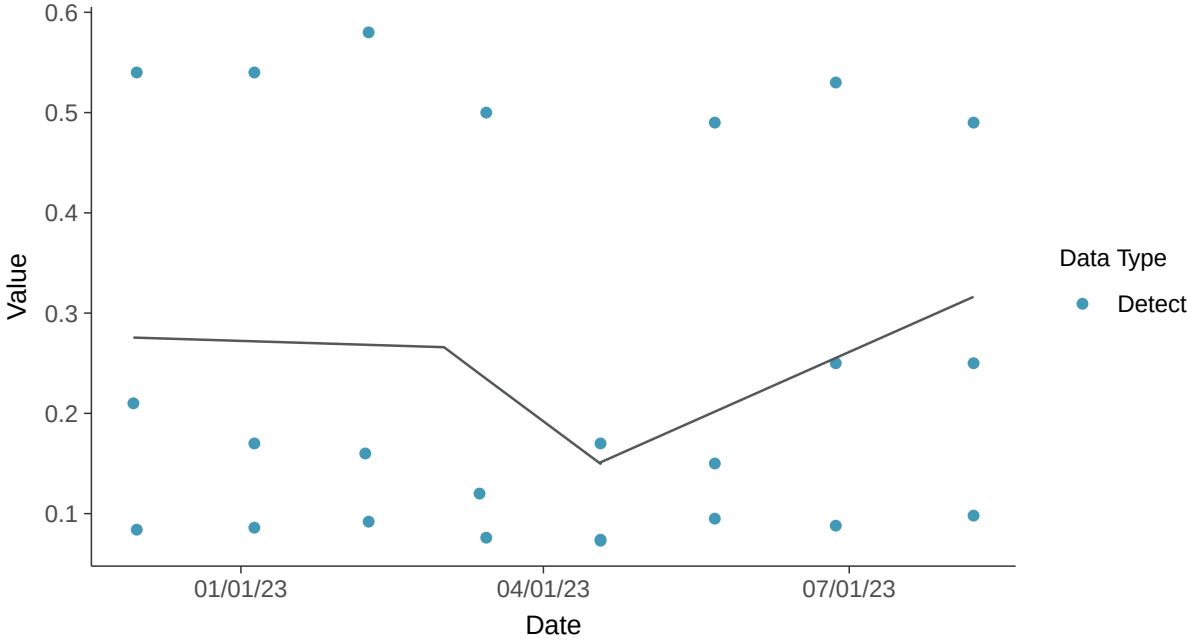
Trend Regression: Piecewise Linear-Linear

Barium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Barium, MW-27, MW-33, MW-34 (mg/L)

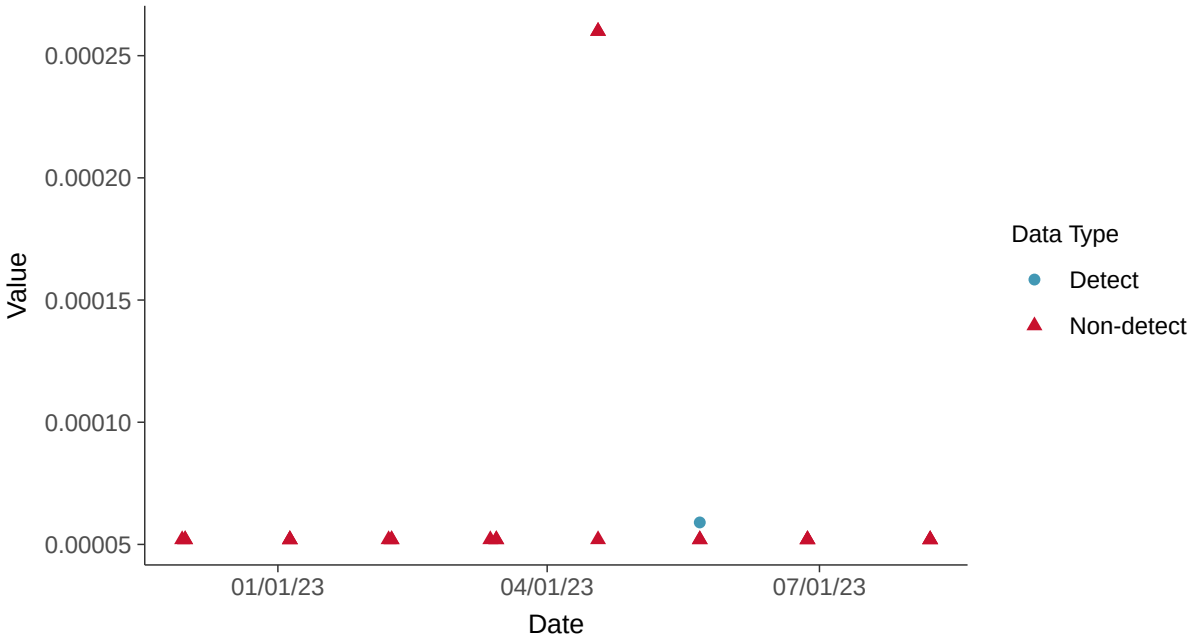


Appendix IV: Beryllium, MW-27, MW-33, MW-34

ID: 5_104

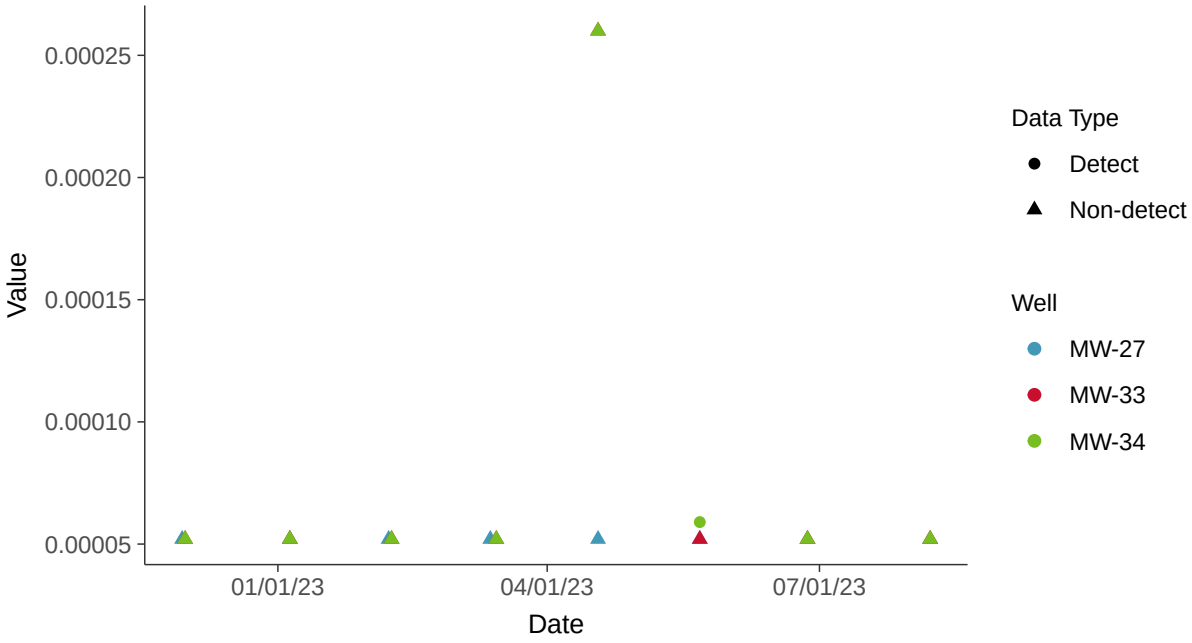
Scatter Plot

Beryllium, MW-27, MW-33, MW-34 (mg/L)



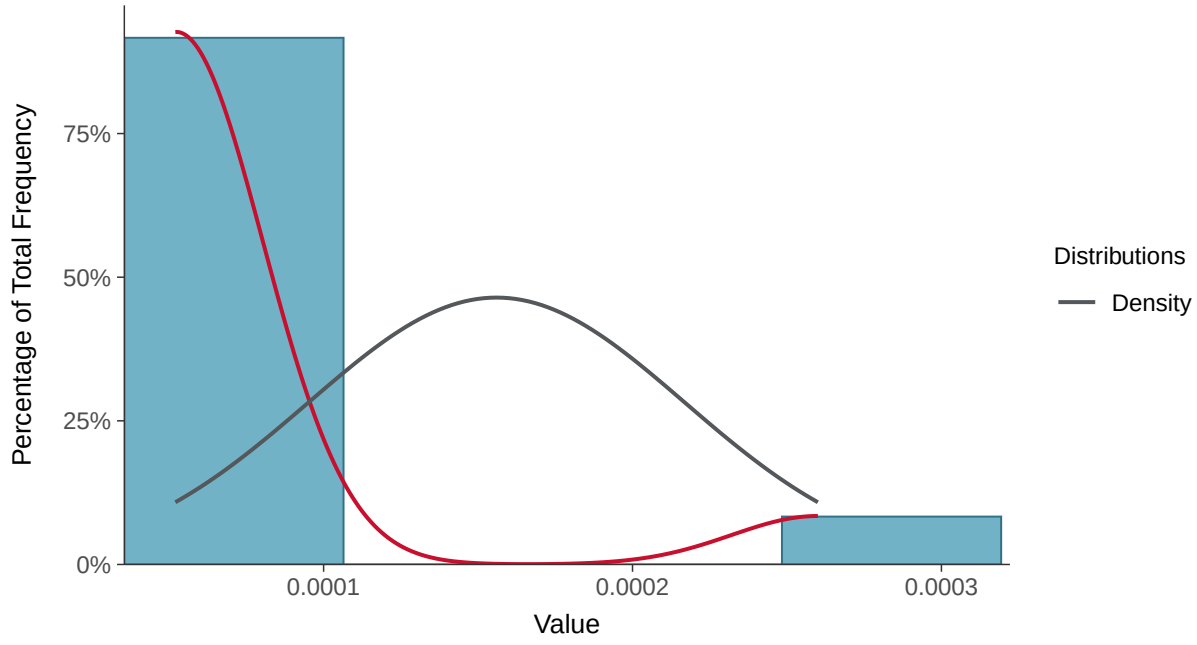
Scatter Plot by Well

Beryllium, MW-27, MW-33, MW-34 (mg/L)



Histogram

Beryllium, MW-27, MW-33, MW-34 (mg/L)

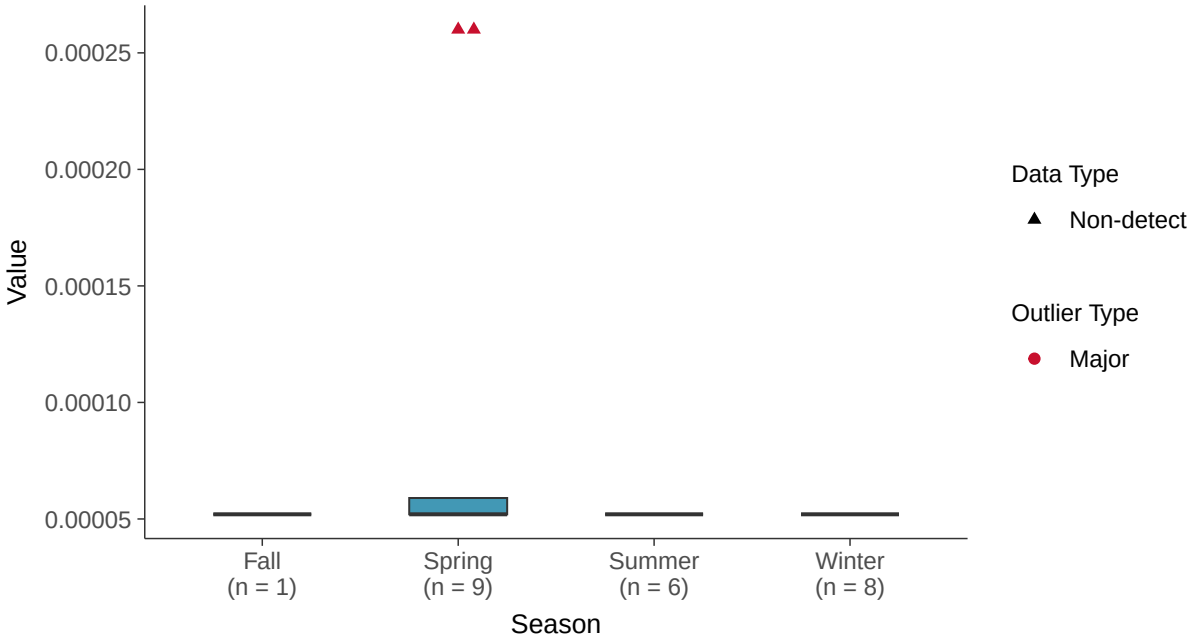


Boxplot

Beryllium, MW-27, MW-33, MW-34 (mg/L)

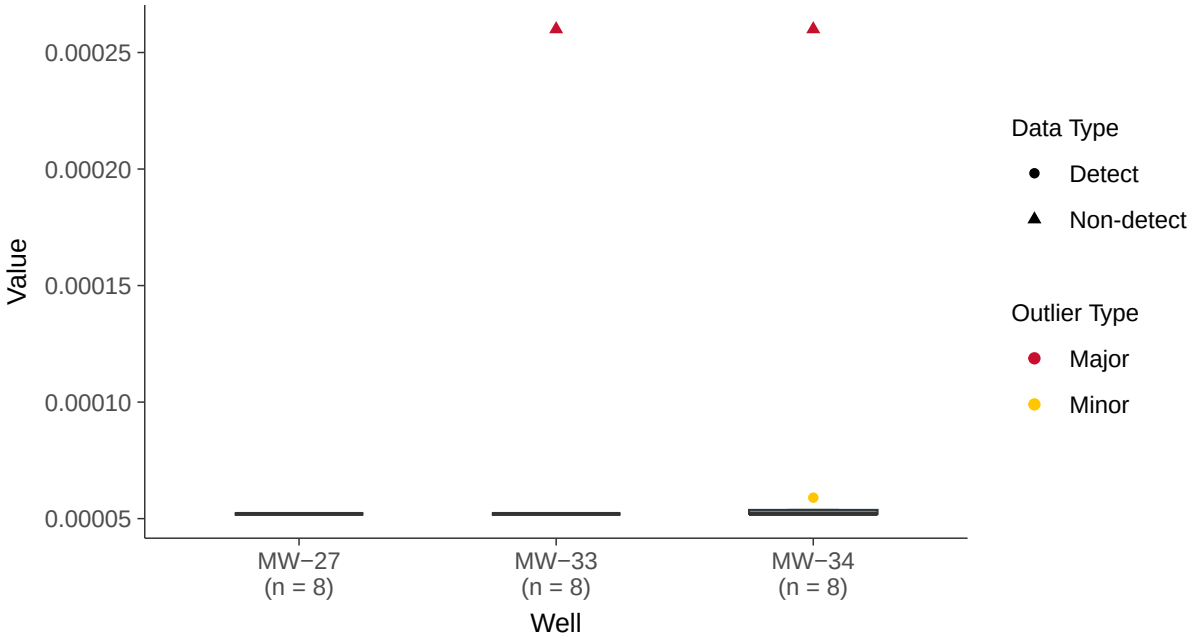
Boxplot by Season

Beryllium, MW-27, MW-33, MW-34 (mg/L)



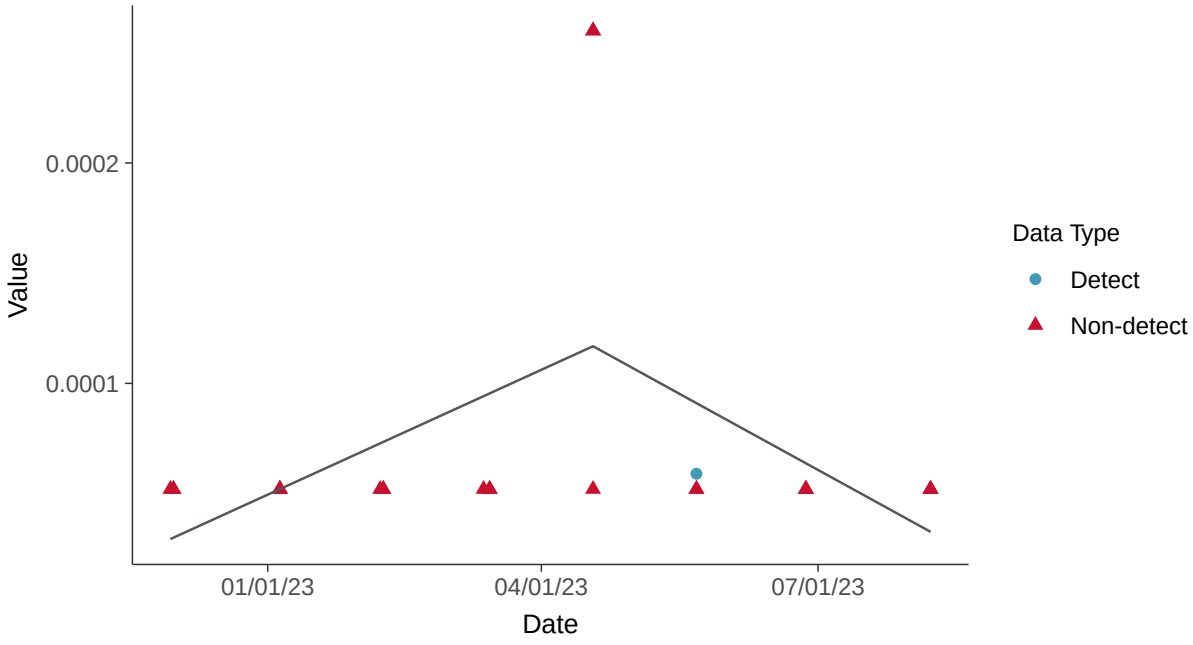
Boxplot by Well

Beryllium, MW-27, MW-33, MW-34 (mg/L)



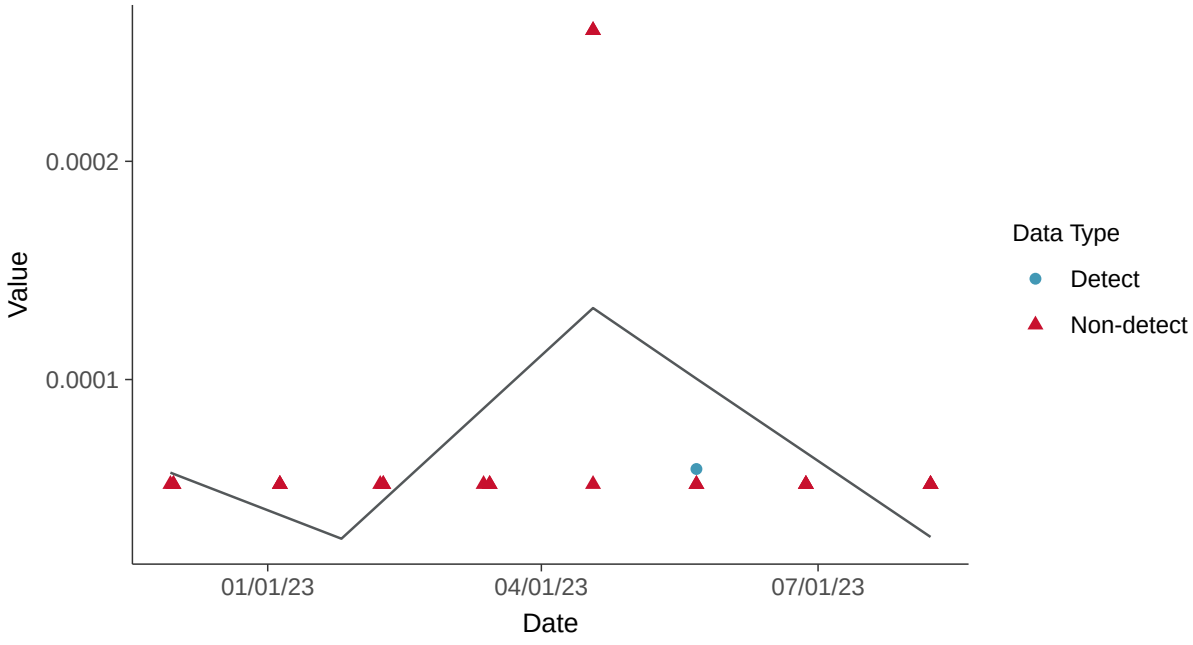
Trend Regression: Piecewise Linear-Linear

Beryllium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Beryllium, MW-27, MW-33, MW-34 (mg/L)

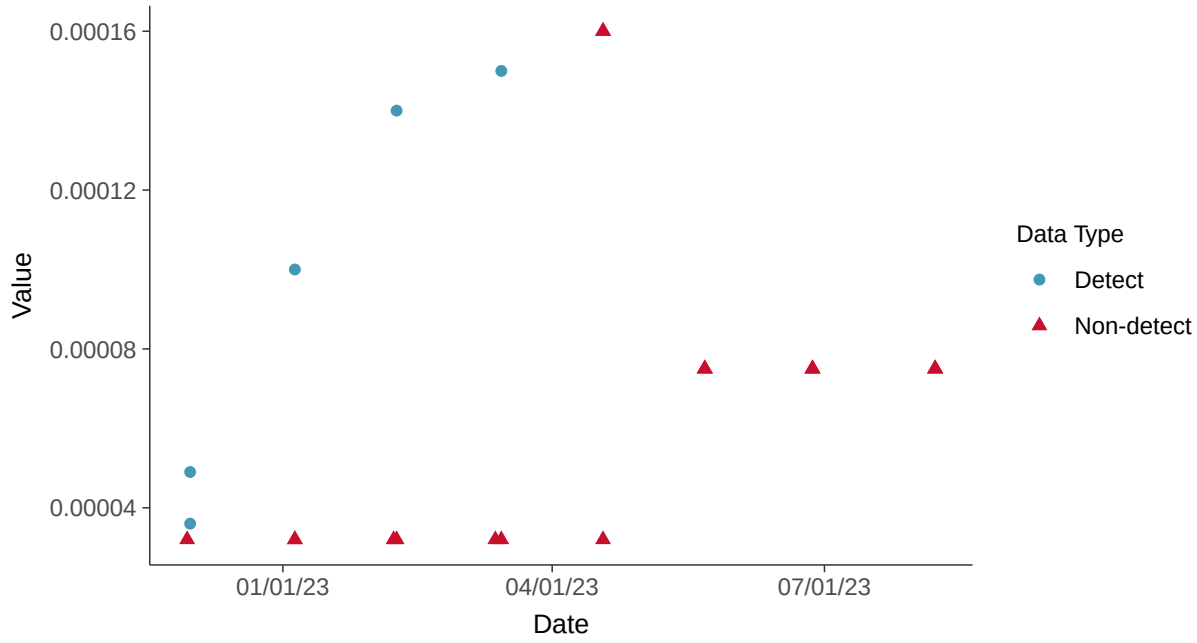


Appendix IV: Cadmium, MW-27, MW-33, MW-34

ID: 5_106

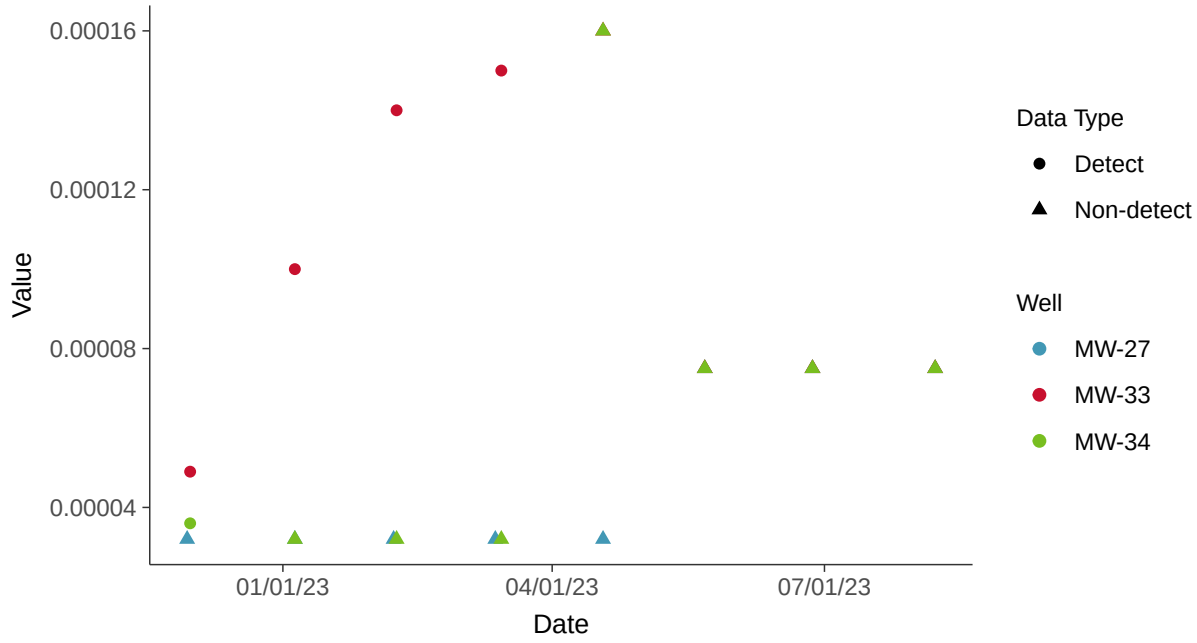
Scatter Plot

Cadmium, MW-27, MW-33, MW-34 (mg/L)



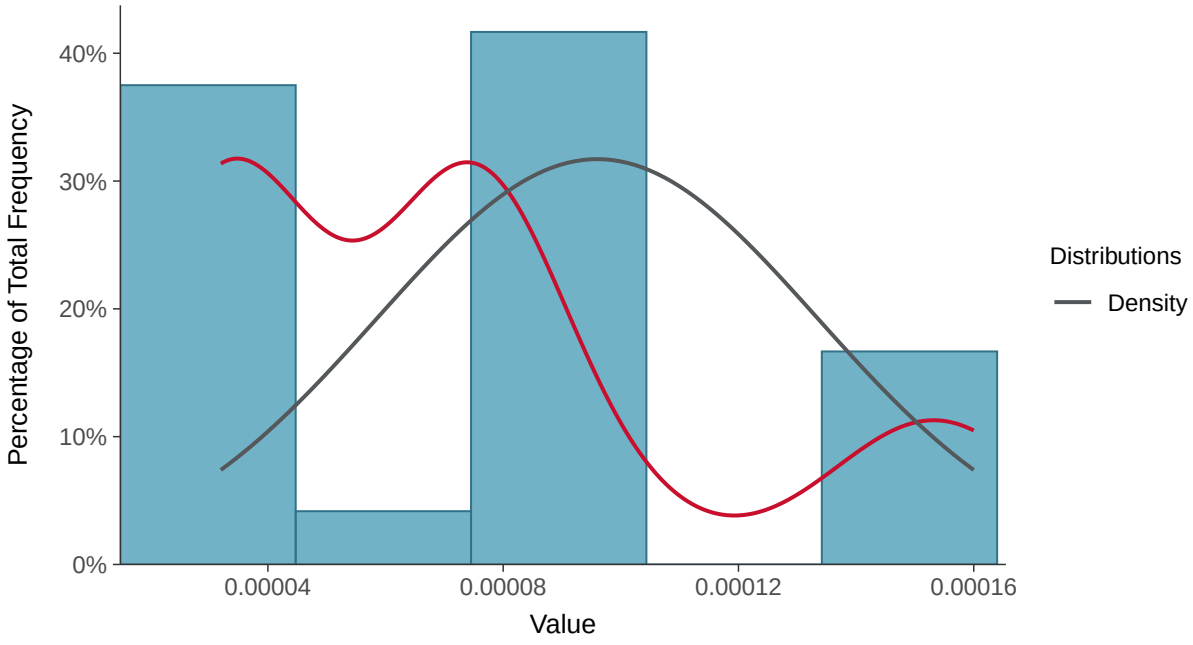
Scatter Plot by Well

Cadmium, MW-27, MW-33, MW-34 (mg/L)



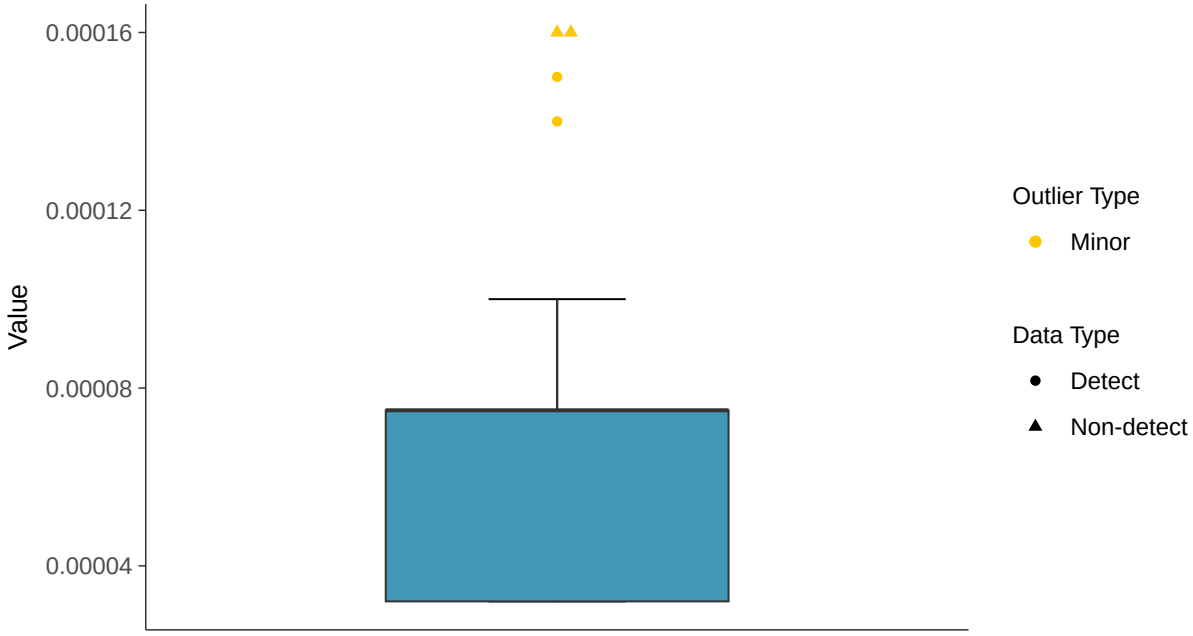
Histogram

Cadmium, MW-27, MW-33, MW-34 (mg/L)



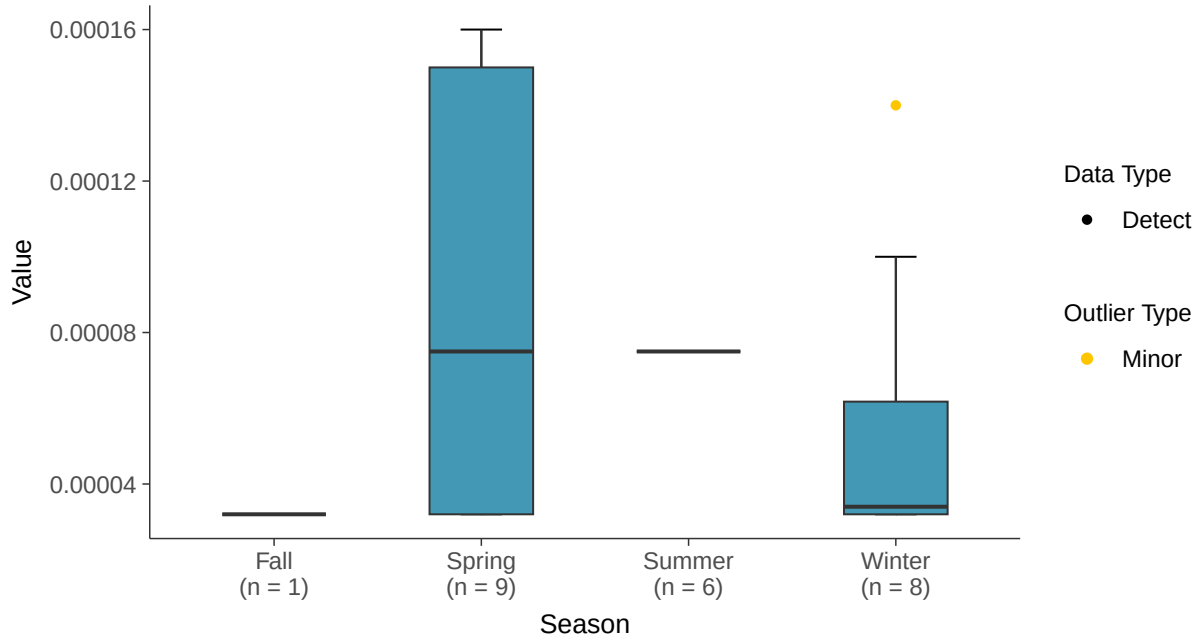
Boxplot

Cadmium, MW-27, MW-33, MW-34 (mg/L)



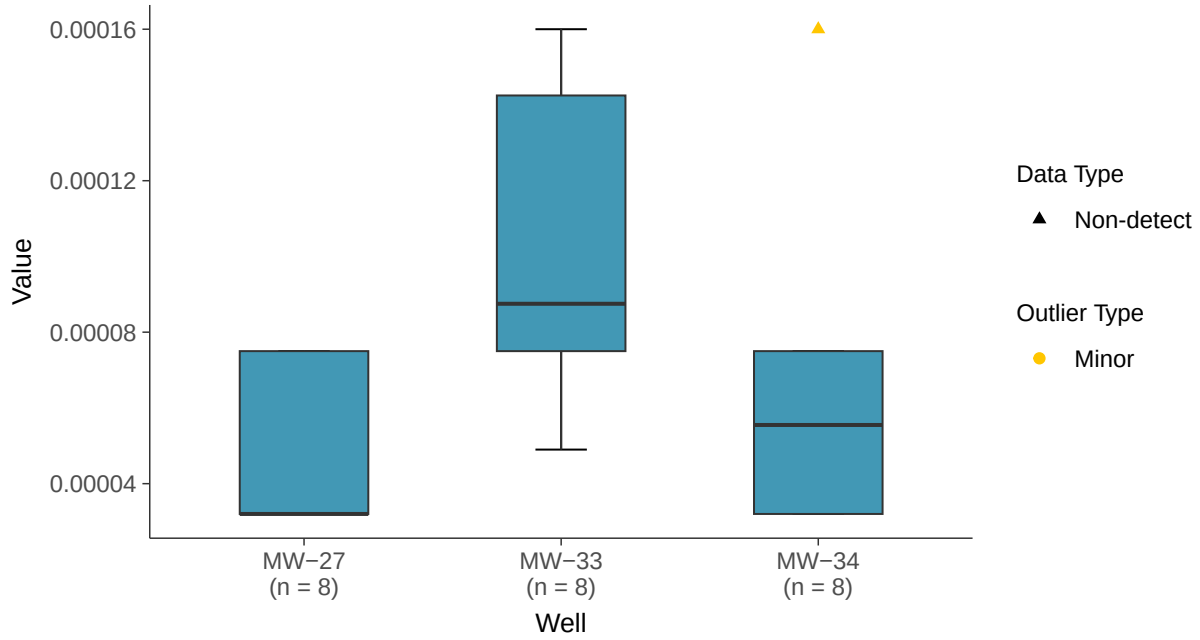
Boxplot by Season

Cadmium, MW-27, MW-33, MW-34 (mg/L)



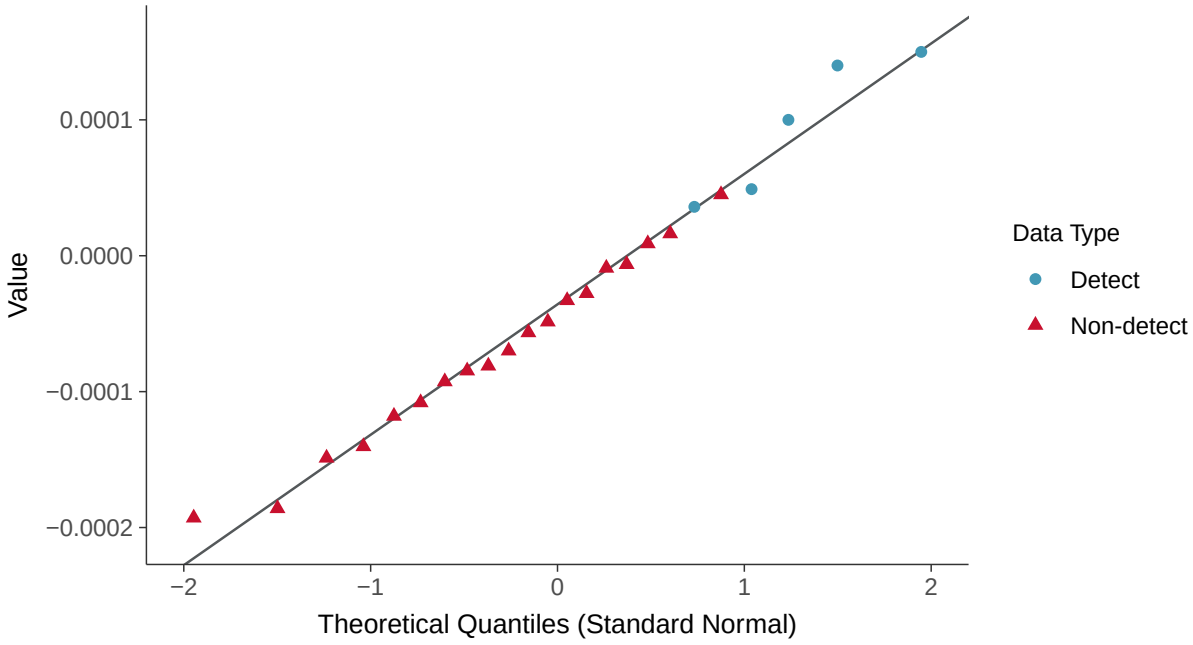
Boxplot by Well

Cadmium, MW-27, MW-33, MW-34 (mg/L)



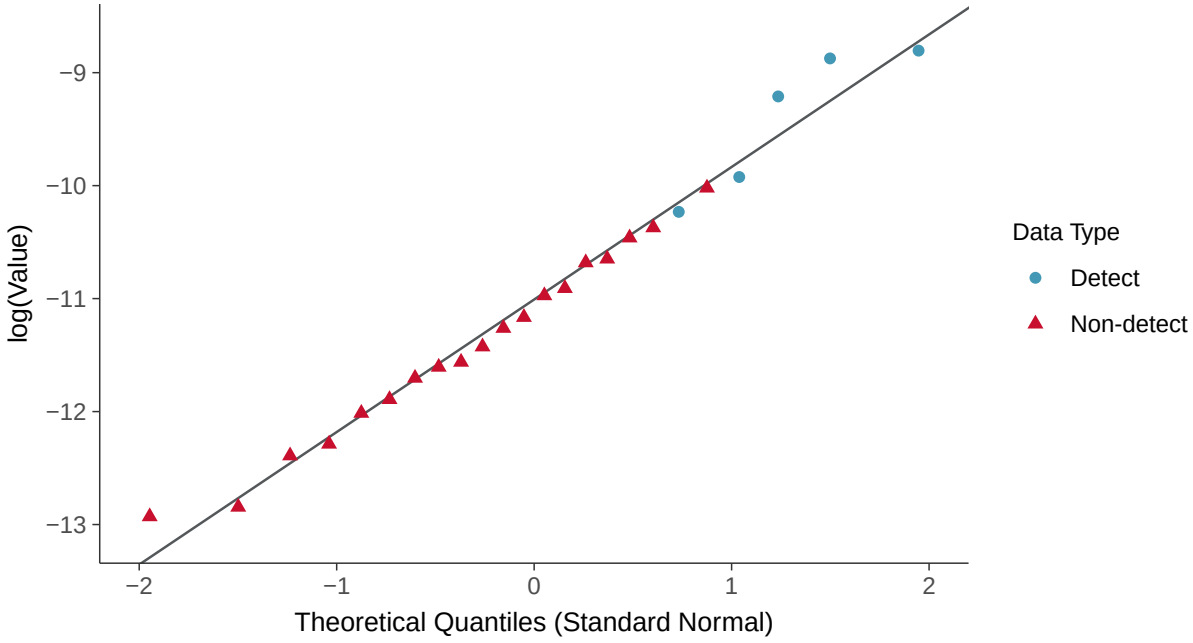
Normal Q-Q plot using ROS Imputed Estimates

Cadmium, MW-27, MW-33, MW-34 (mg/L)



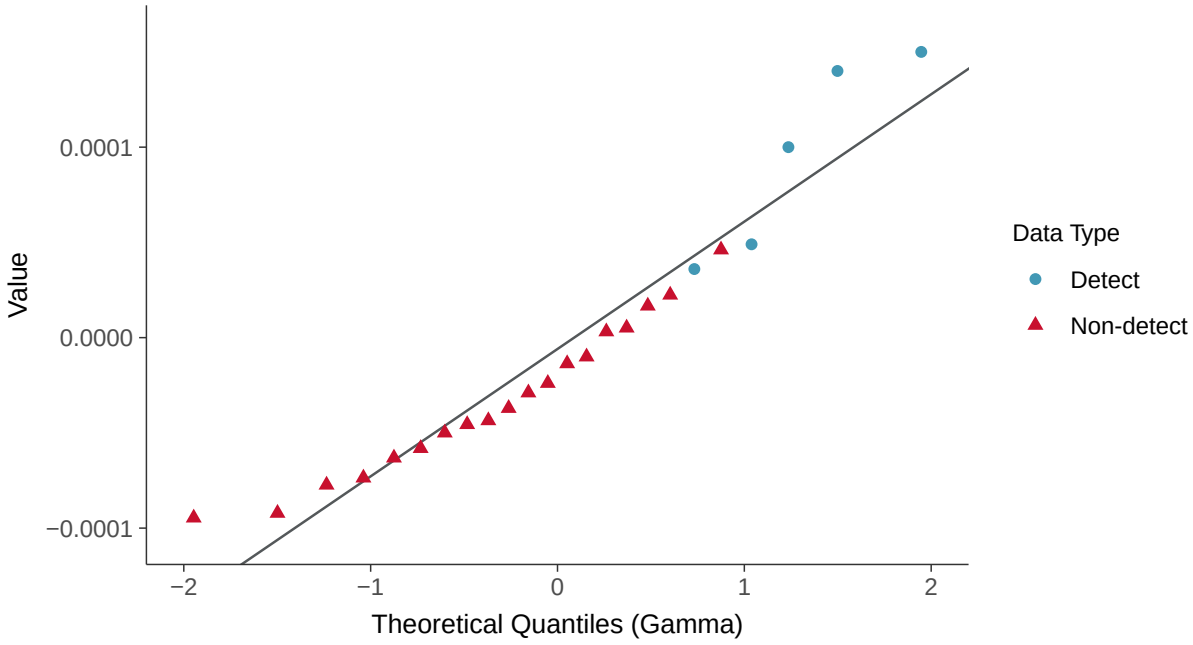
Lognormal Q-Q plot using ROS Imputed Estimates

Cadmium, MW-27, MW-33, MW-34 (mg/L)



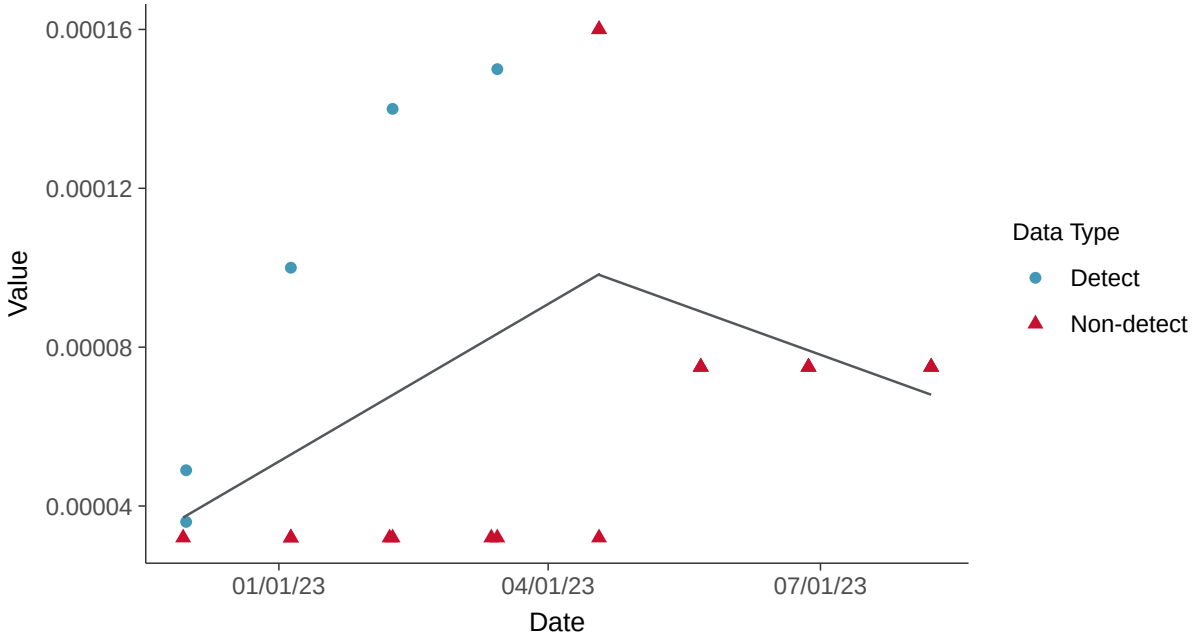
Gamma Q-Q plot using ROS Imputed Estimates

Cadmium, MW-27, MW-33, MW-34 (mg/L)



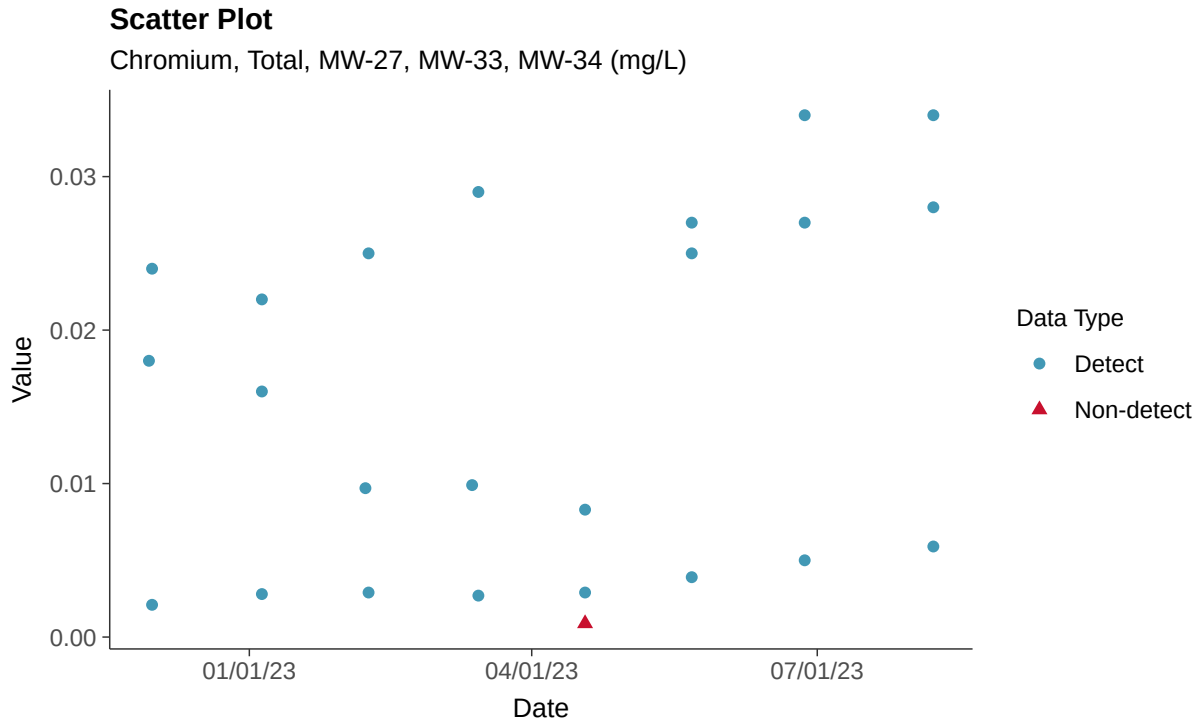
Trend Regression: Piecewise Linear-Linear

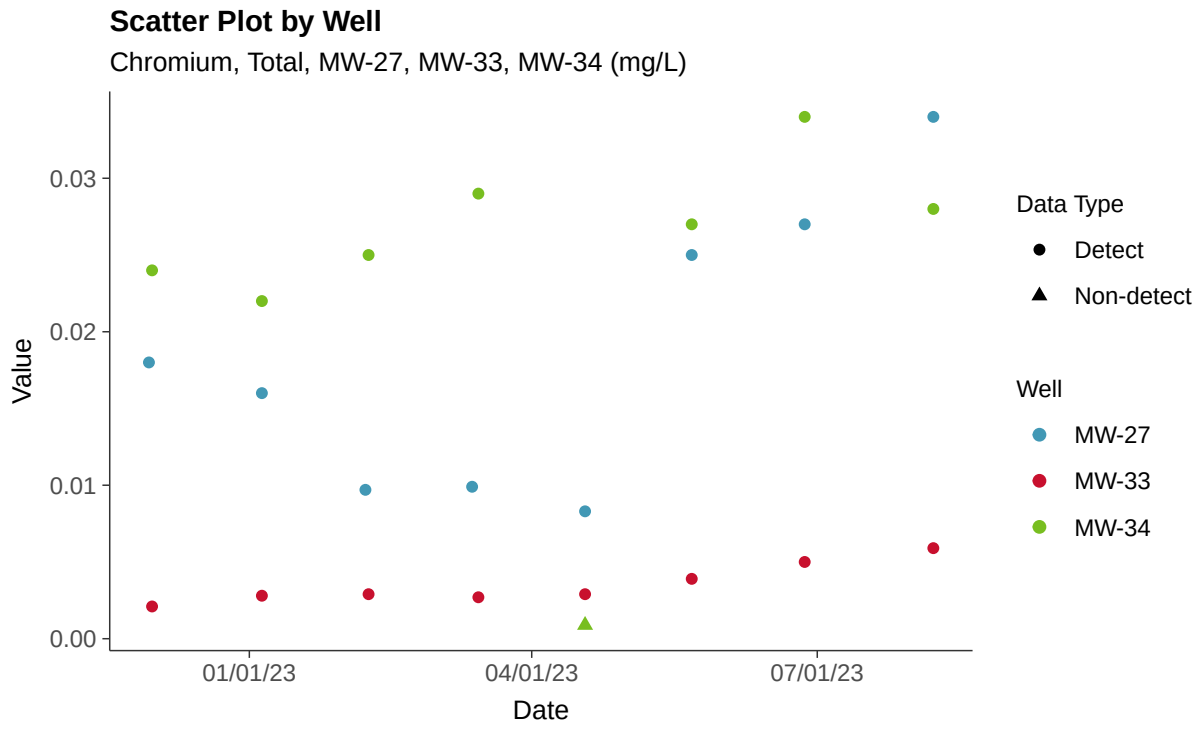
Cadmium, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Chromium, Total, MW-27, MW-33, MW-34

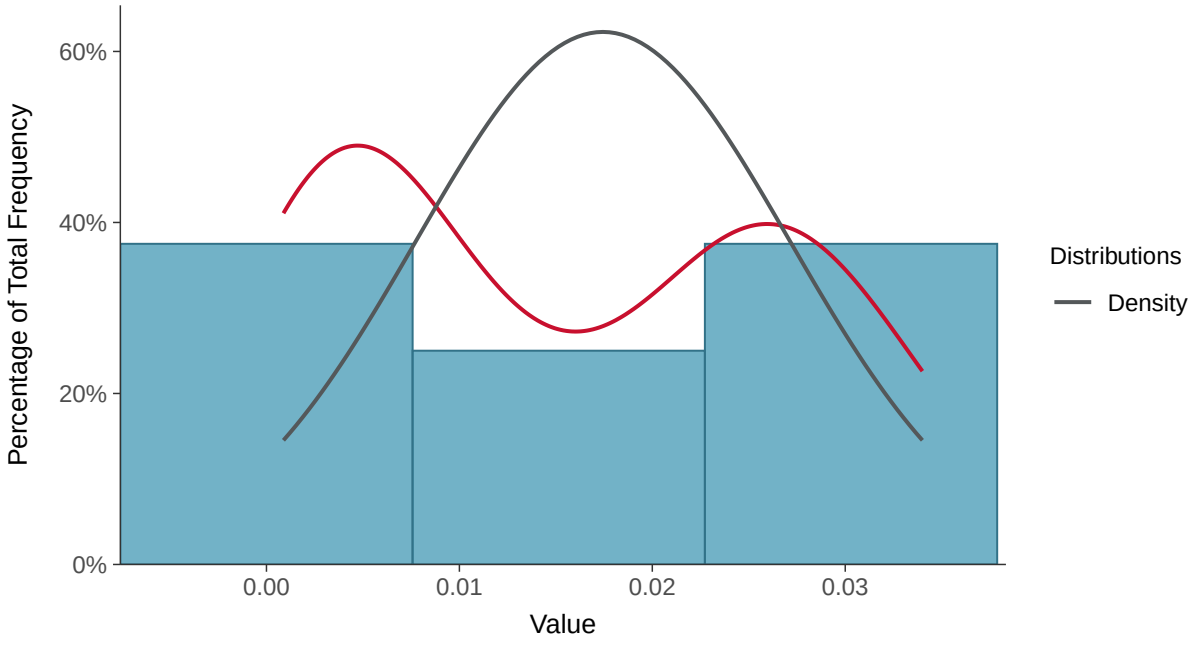
ID: 5_109





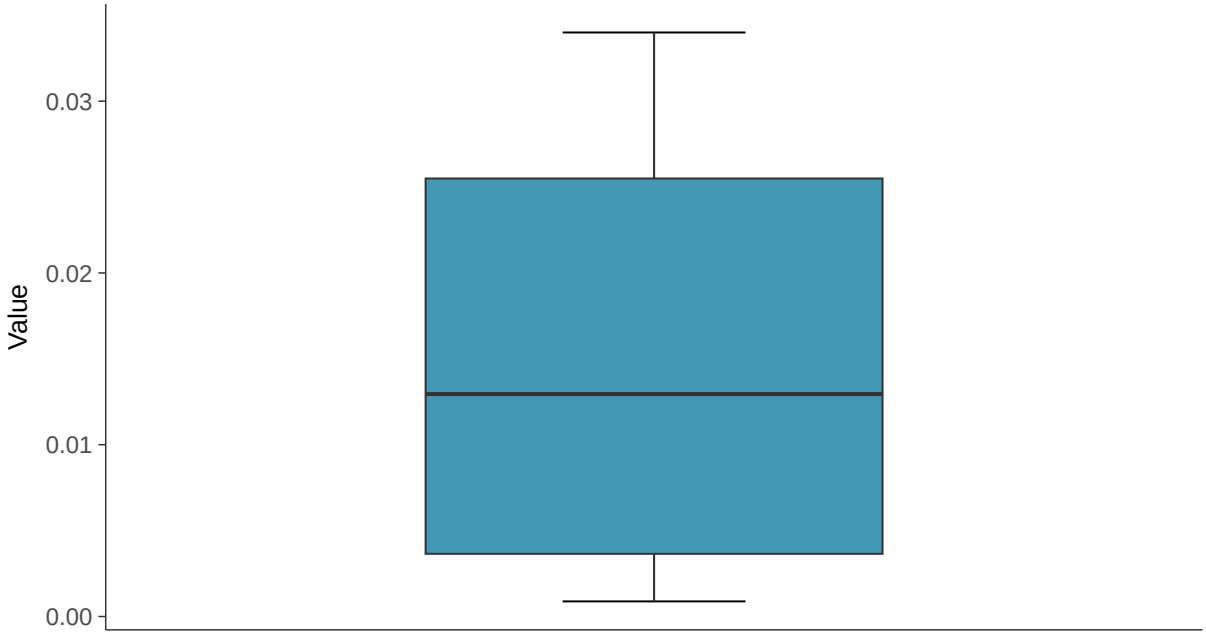
Histogram

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



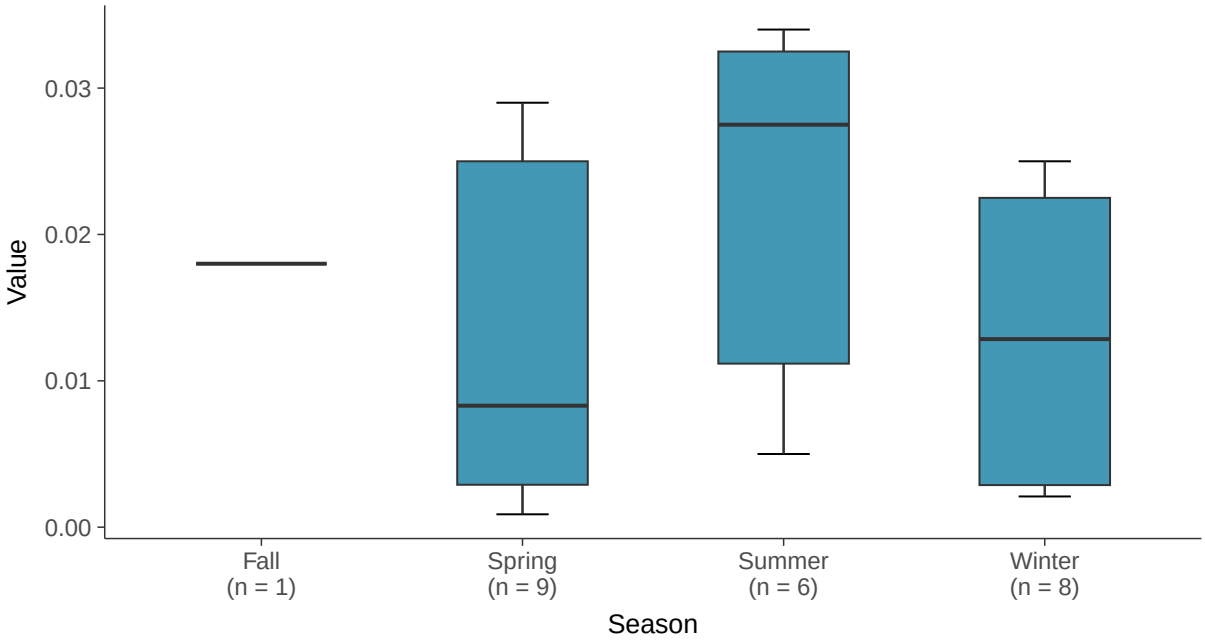
Boxplot

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



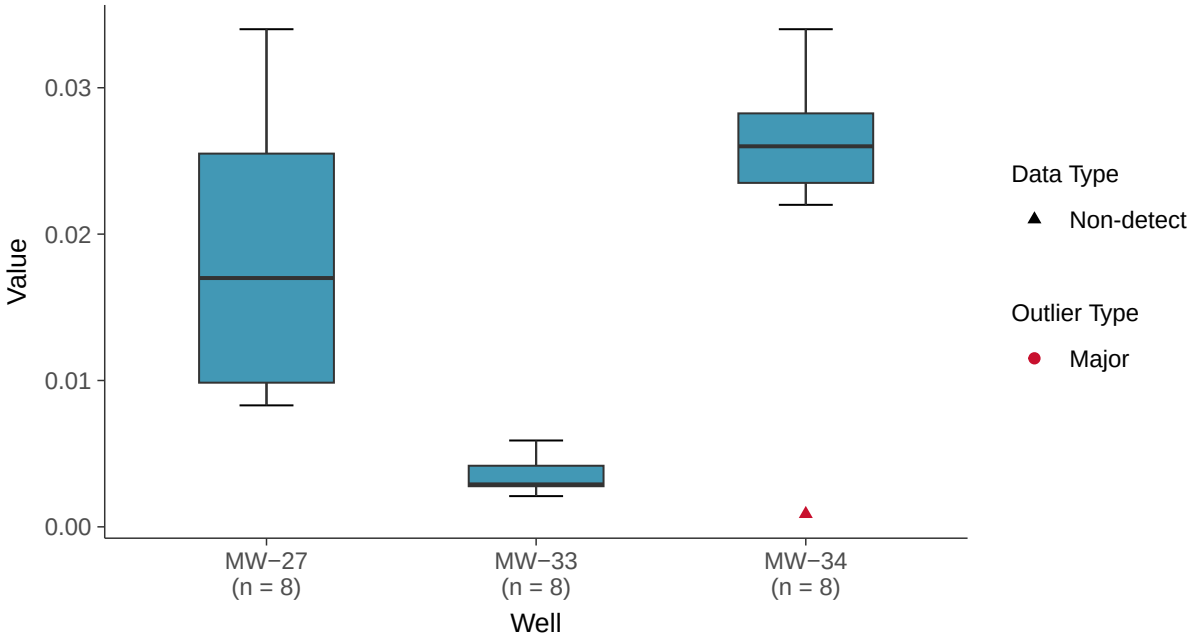
Boxplot by Season

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



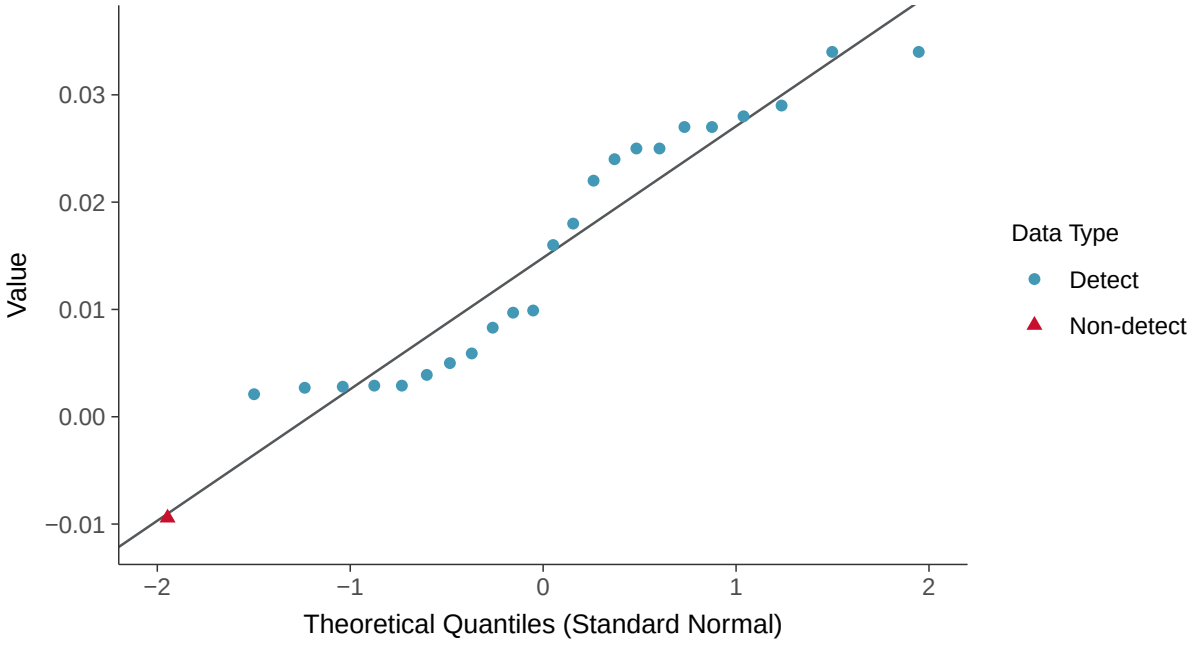
Boxplot by Well

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



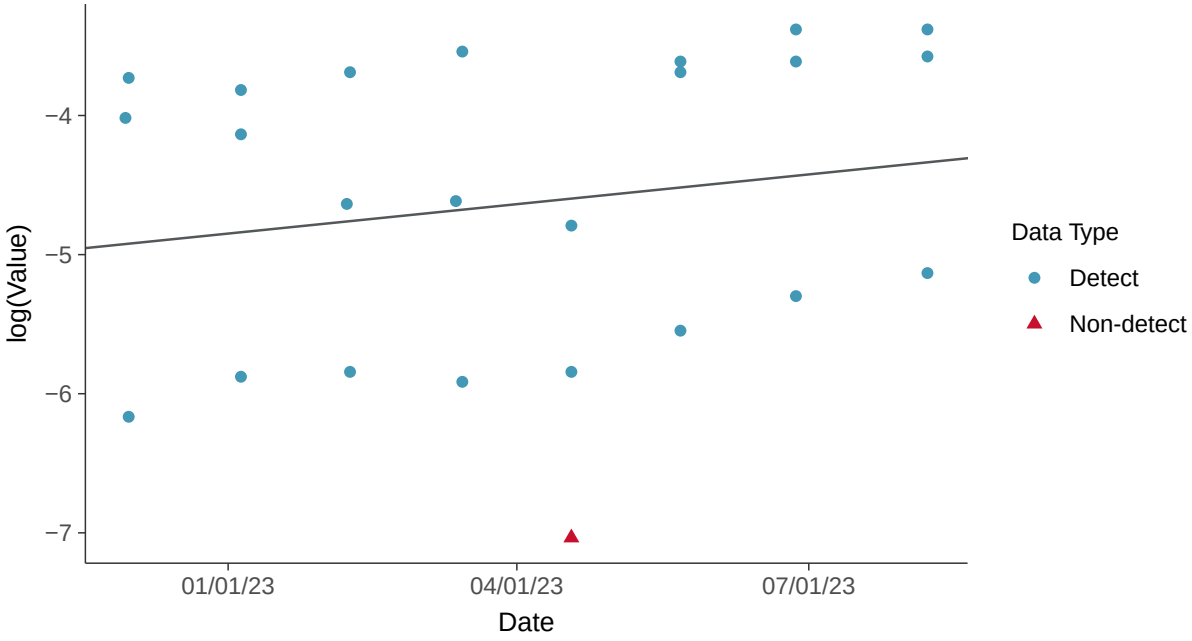
Normal Q-Q plot using ROS Imputed Estimates

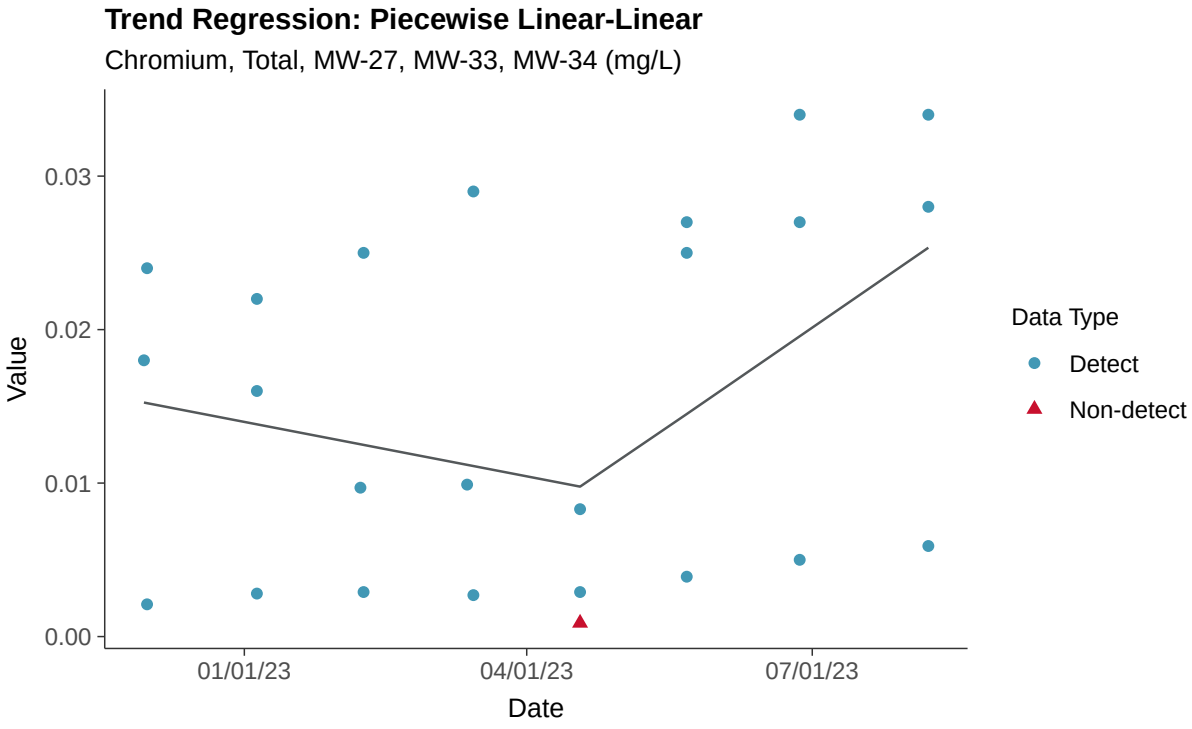
Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Lognormal MLE

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



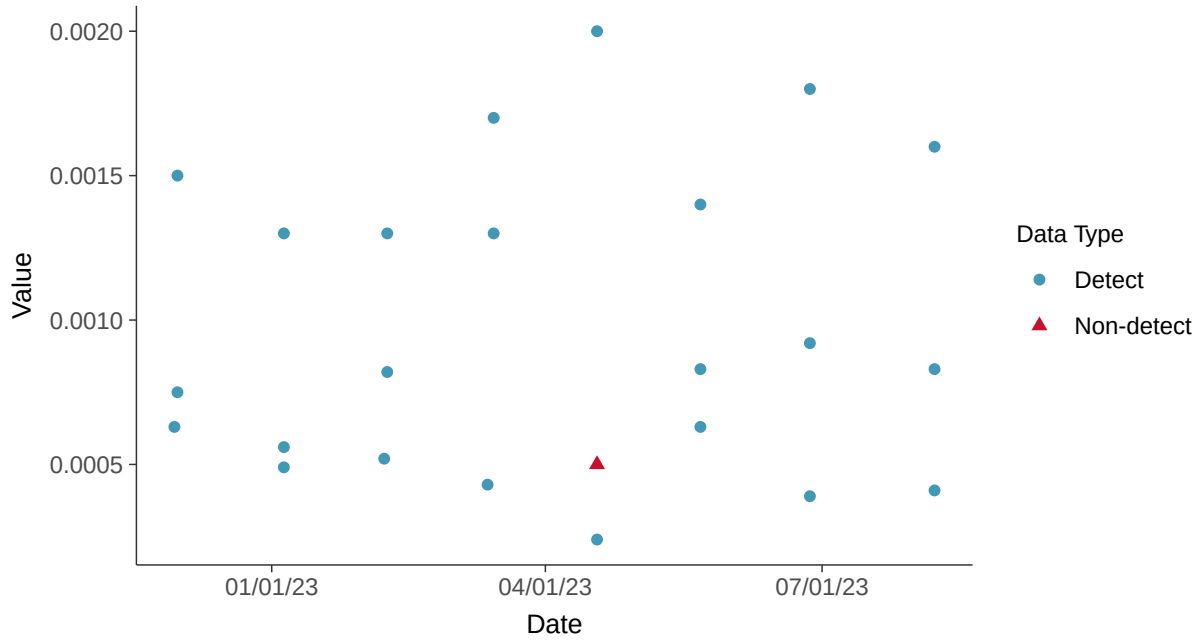

Trend Regression: Piecewise Linear-Linear
Chromium, Total, MW-27, MW-33, MW-34 (mg/L)
Value
0.03
0.02
0.01
0.00
01/01/23
04/01/23
07/01/23
Date
Data Type
Detect
Non-detect

Appendix IV: Cobalt, MW-27, MW-33, MW-34

ID: 5_110

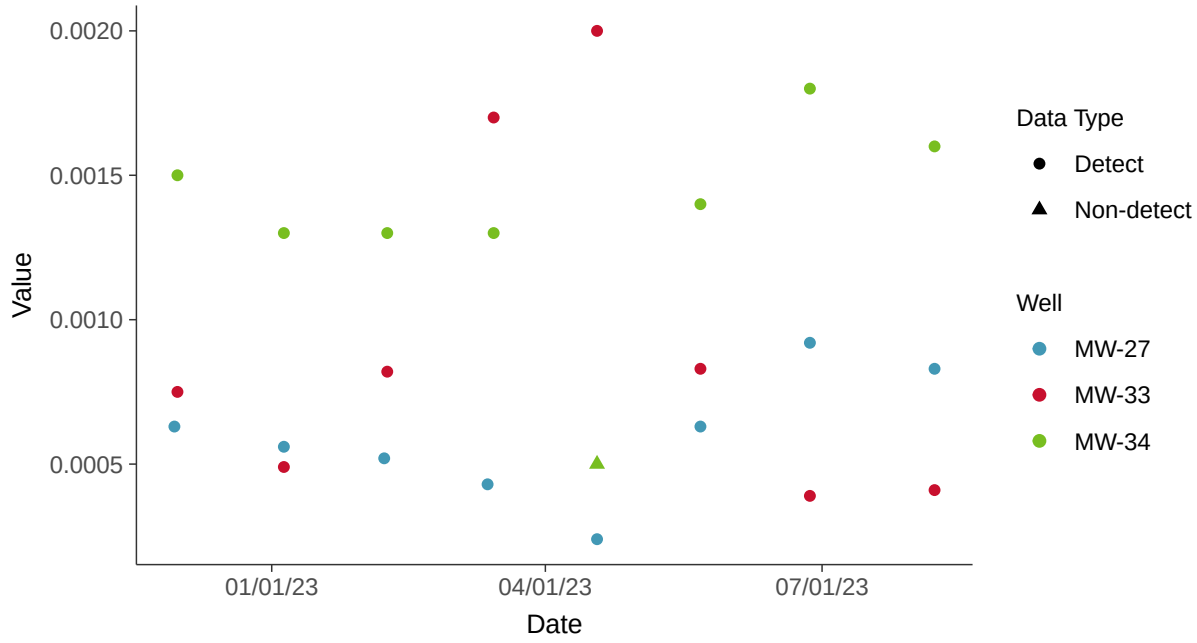
Scatter Plot

Cobalt, MW-27, MW-33, MW-34 (mg/L)



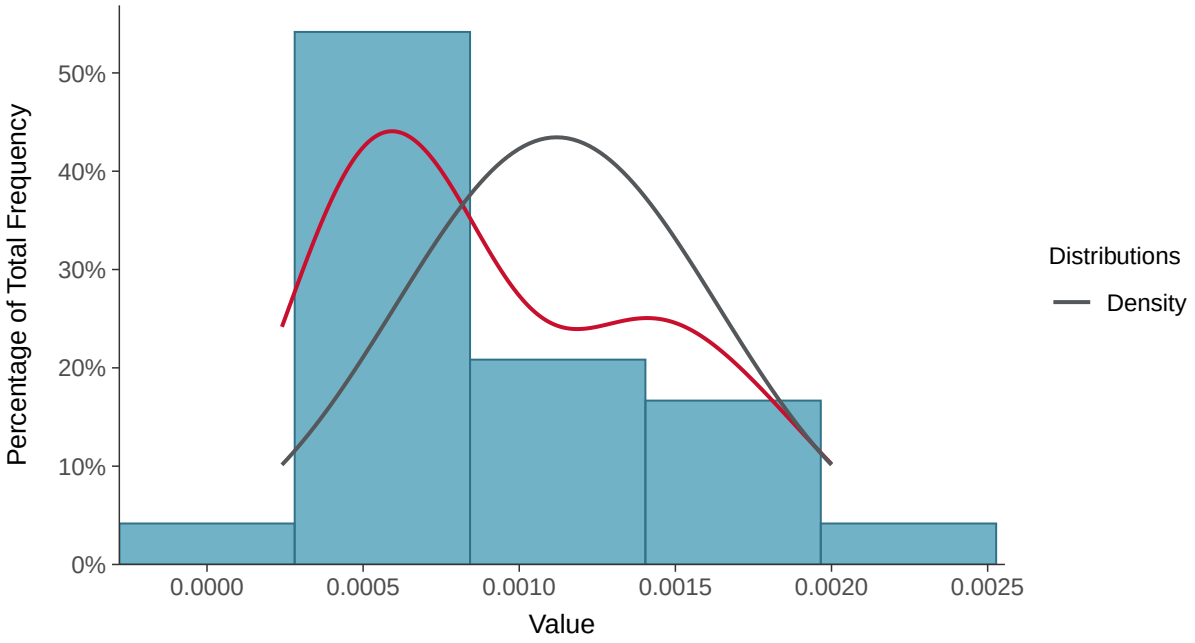
Scatter Plot by Well

Cobalt, MW-27, MW-33, MW-34 (mg/L)



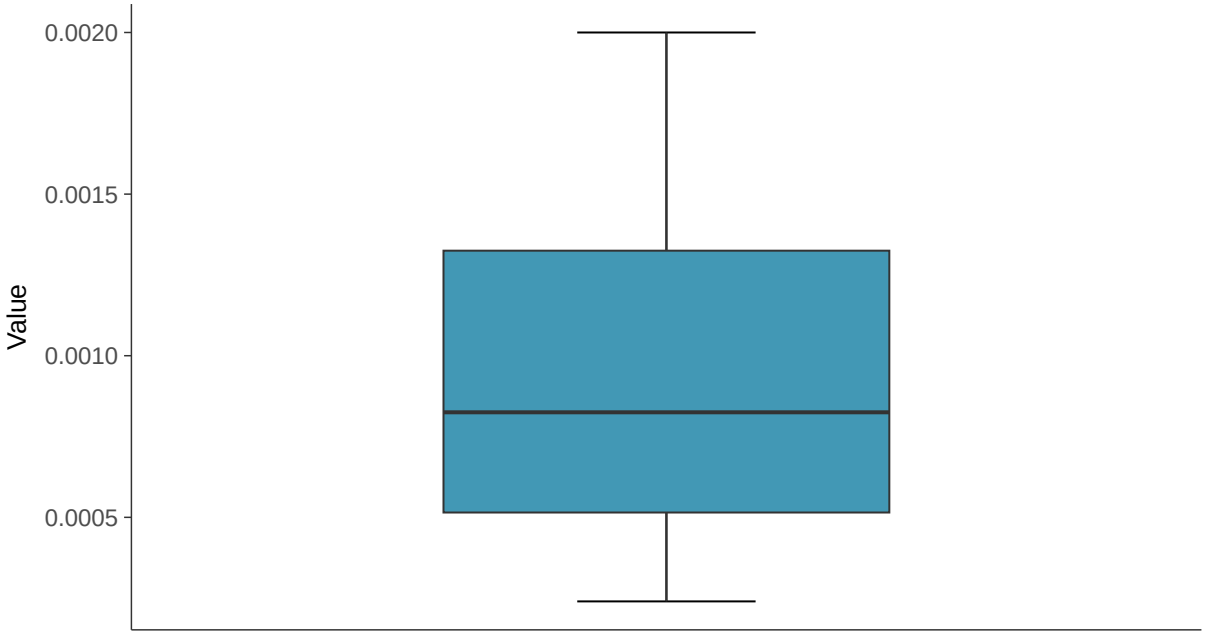
Histogram

Cobalt, MW-27, MW-33, MW-34 (mg/L)



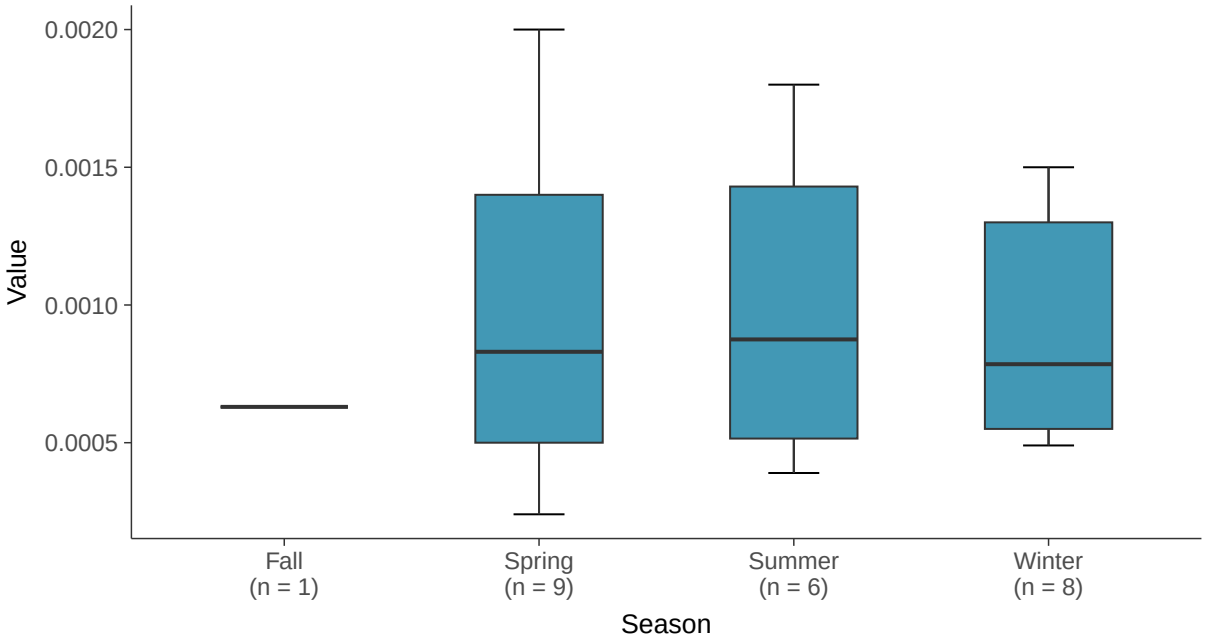
Boxplot

Cobalt, MW-27, MW-33, MW-34 (mg/L)



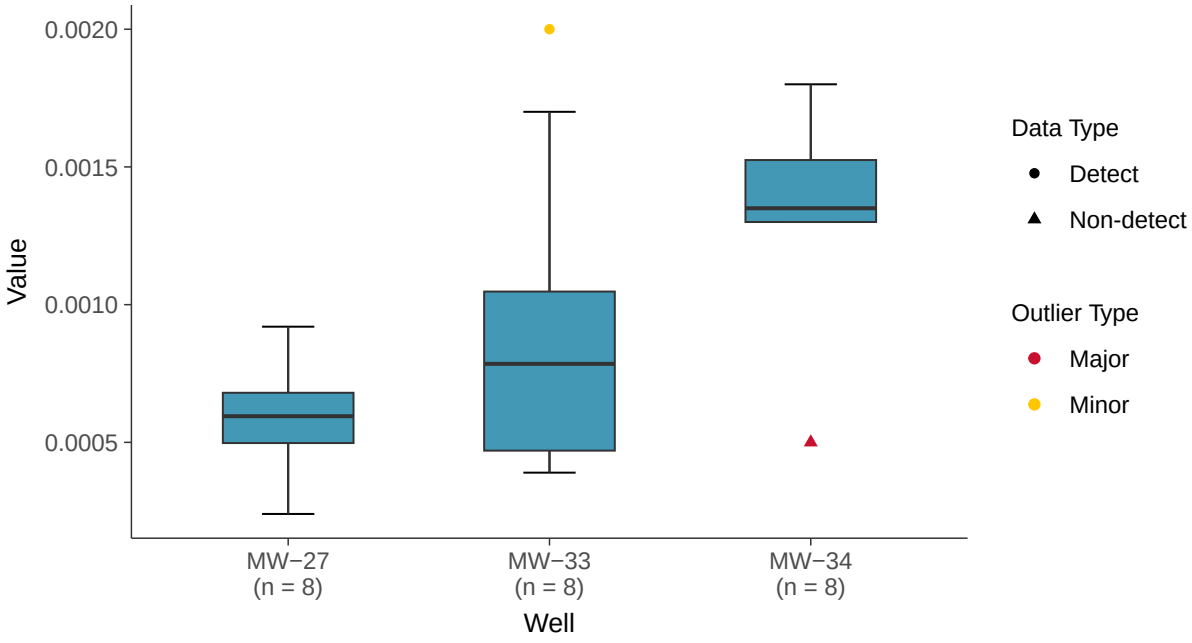
Boxplot by Season

Cobalt, MW-27, MW-33, MW-34 (mg/L)



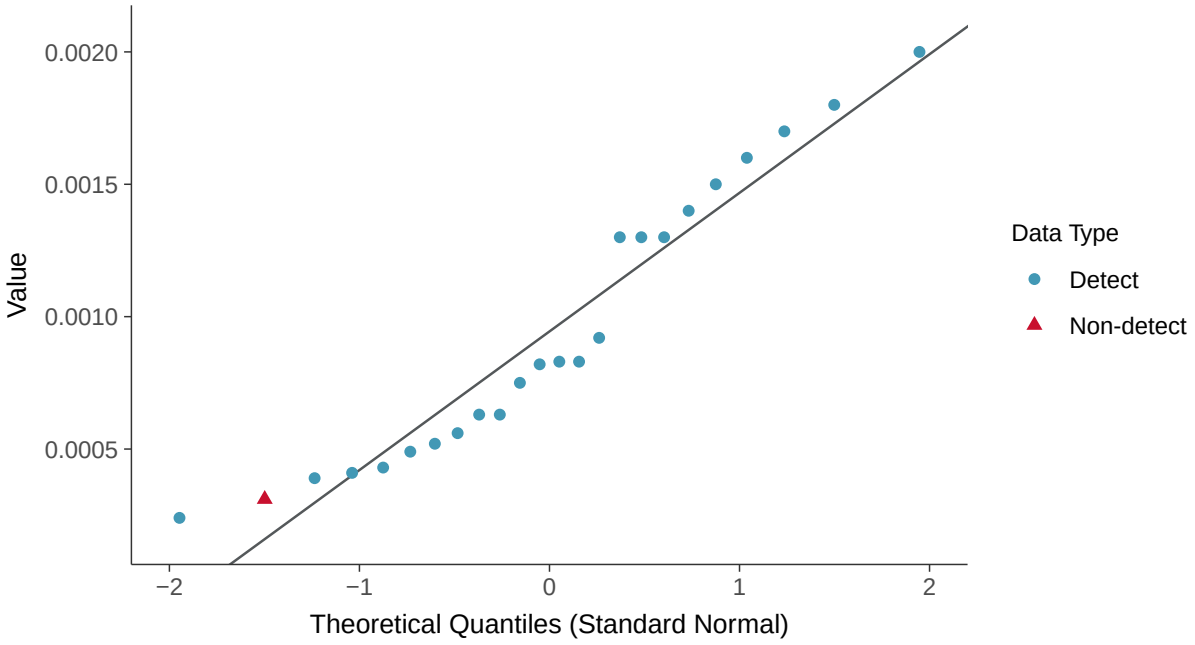
Boxplot by Well

Cobalt, MW-27, MW-33, MW-34 (mg/L)



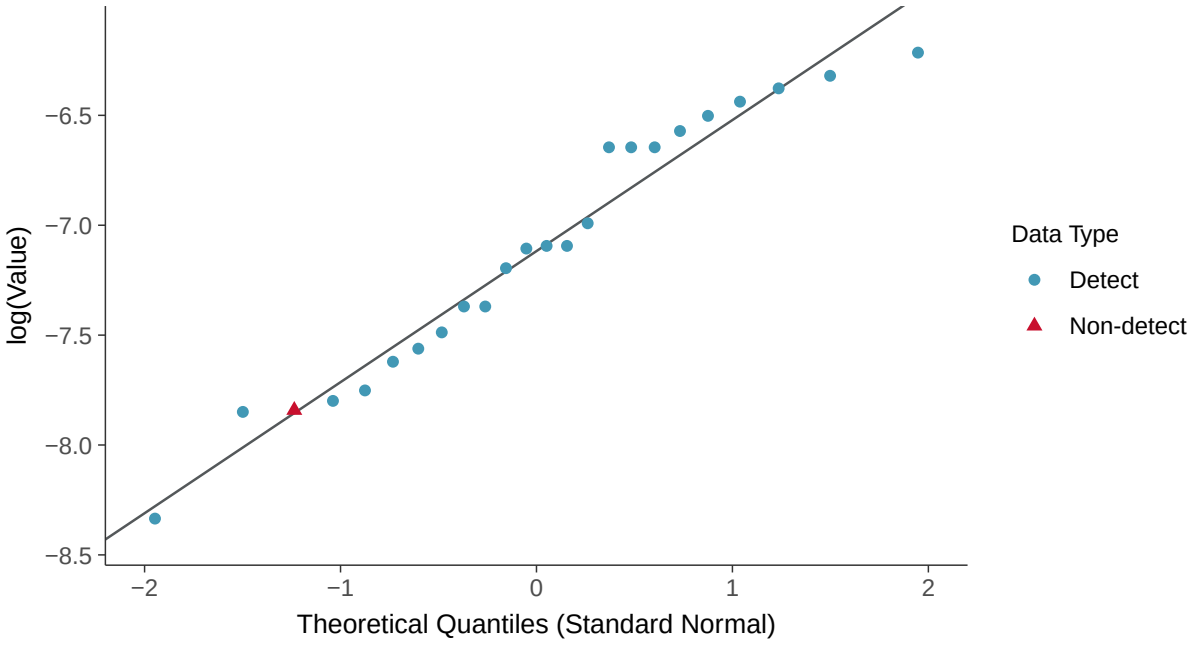
Normal Q-Q plot using ROS Imputed Estimates

Cobalt, MW-27, MW-33, MW-34 (mg/L)



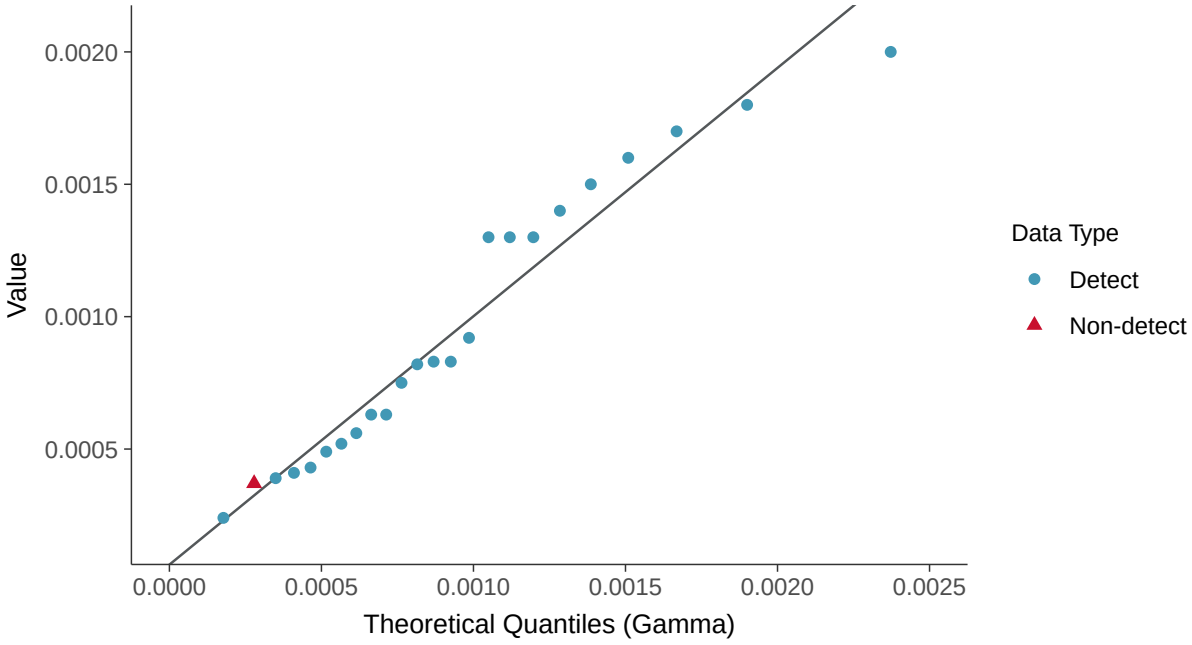
Lognormal Q-Q plot using ROS Imputed Estimates

Cobalt, MW-27, MW-33, MW-34 (mg/L)



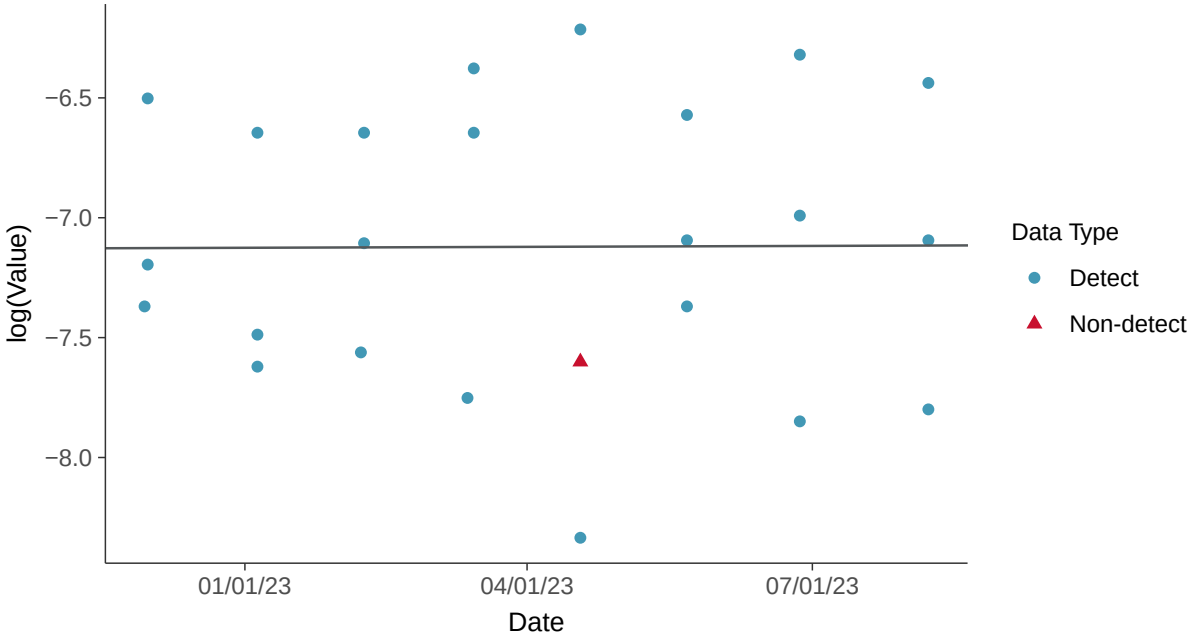
Gamma Q-Q plot using ROS Imputed Estimates

Cobalt, MW-27, MW-33, MW-34 (mg/L)



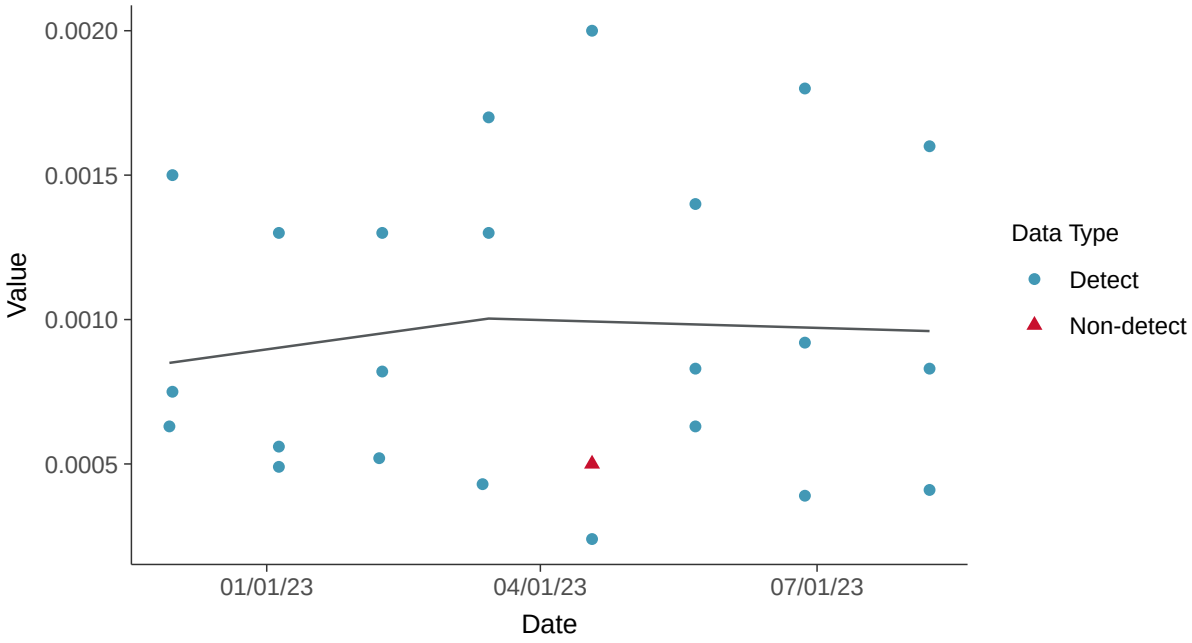
Trend Regression: Lognormal MLE

Cobalt, MW-27, MW-33, MW-34 (mg/L)



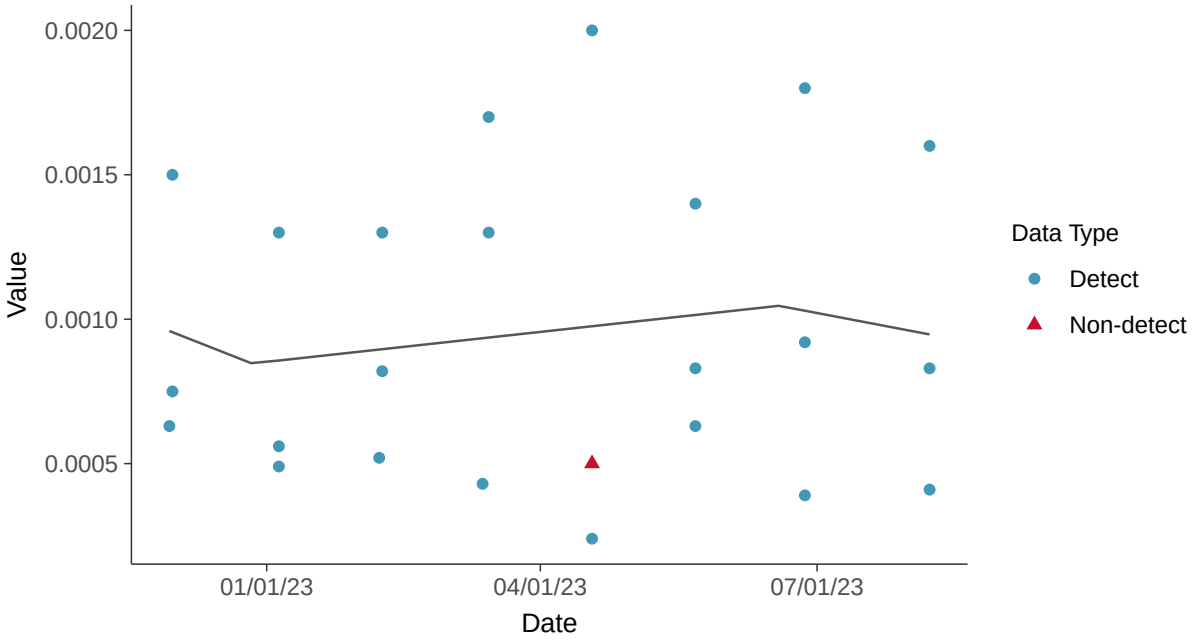
Trend Regression: Piecewise Linear-Linear

Cobalt, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Cobalt, MW-27, MW-33, MW-34 (mg/L)

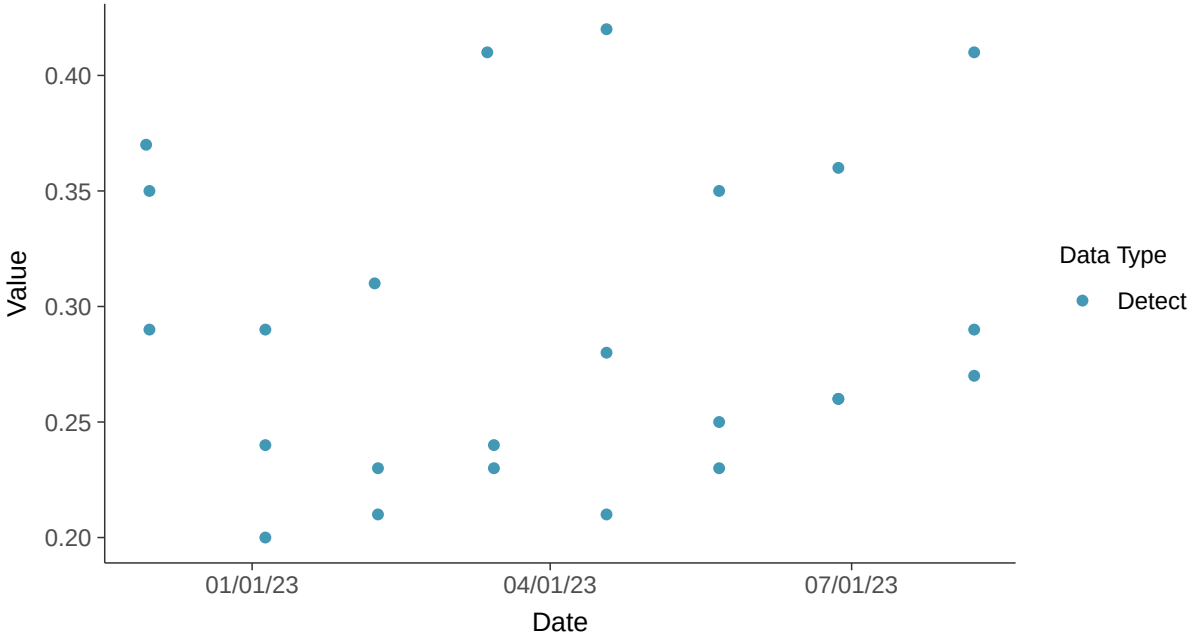


Appendix IV: Fluoride (App IV), MW-27, MW-33, MW-34

ID: 5_113

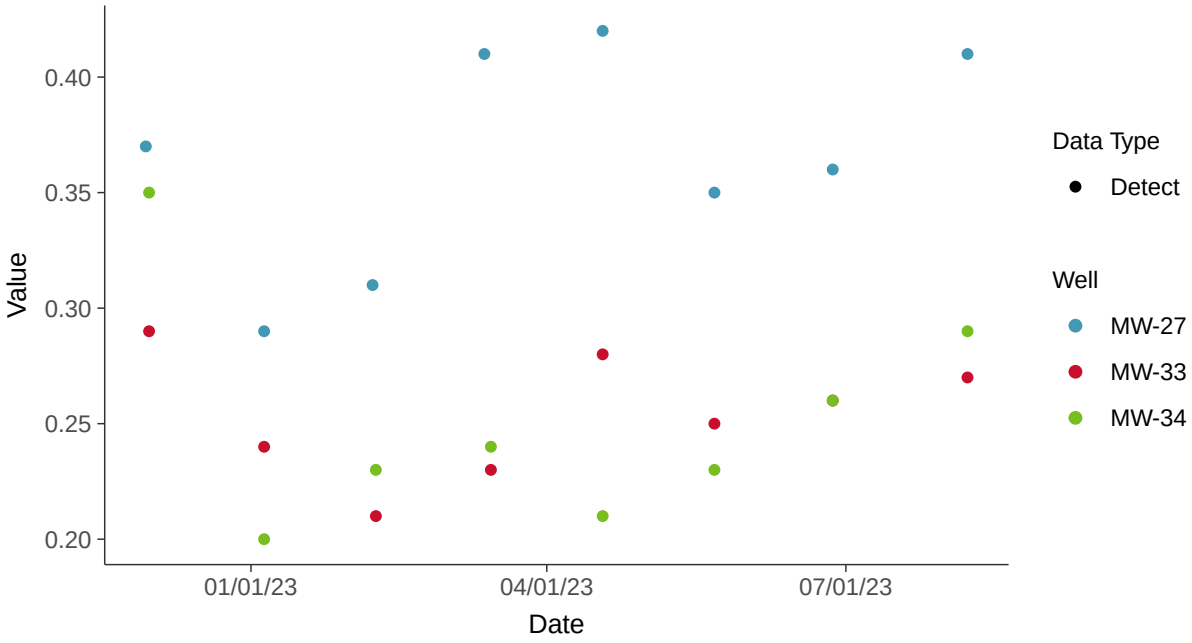
Scatter Plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



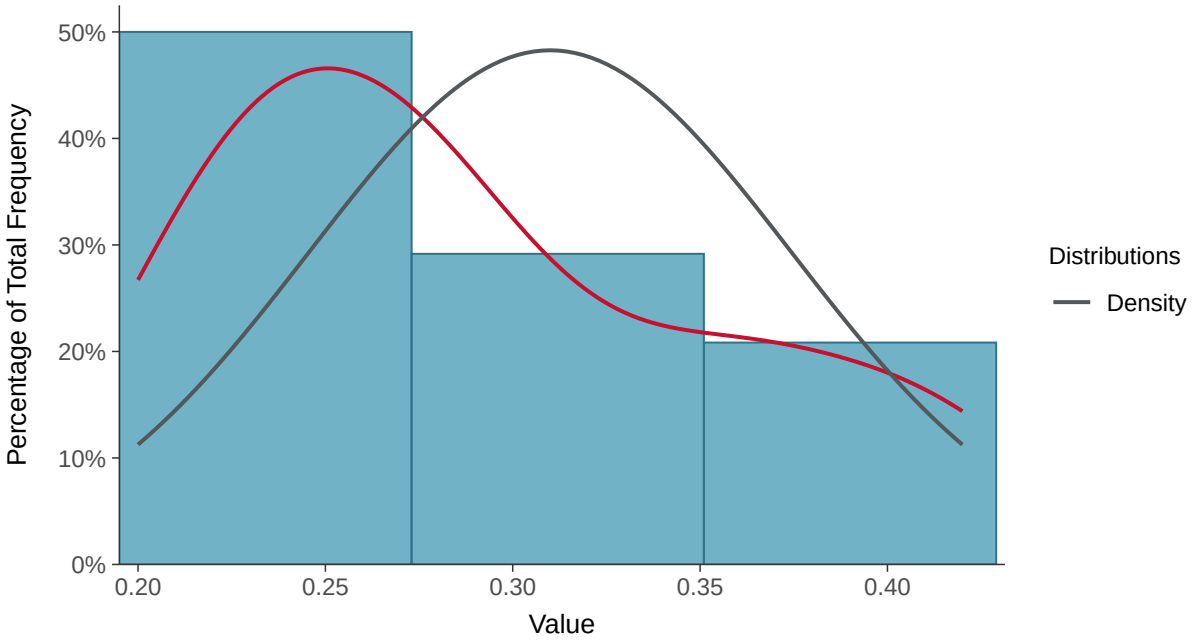
Scatter Plot by Well

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



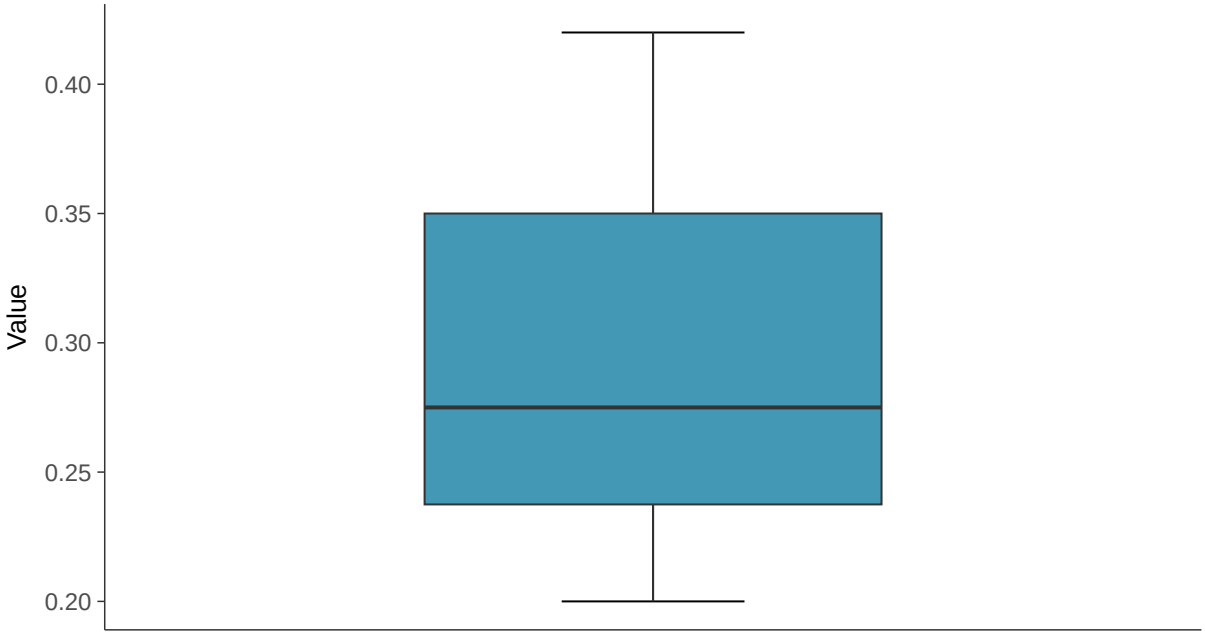
Histogram

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



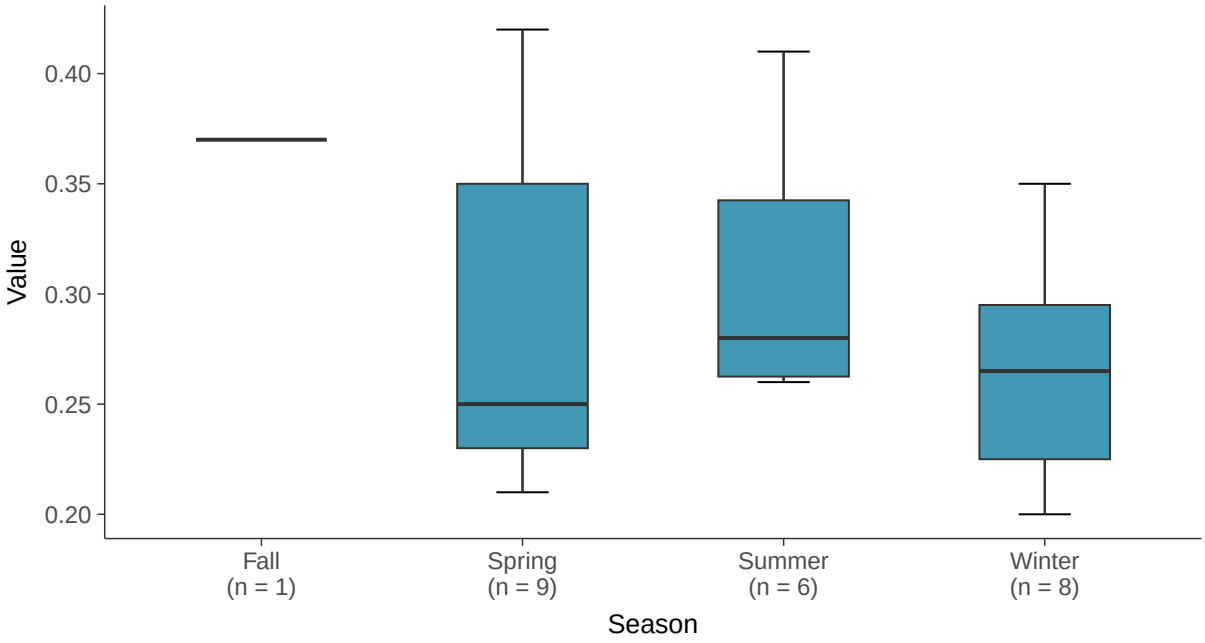
Boxplot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



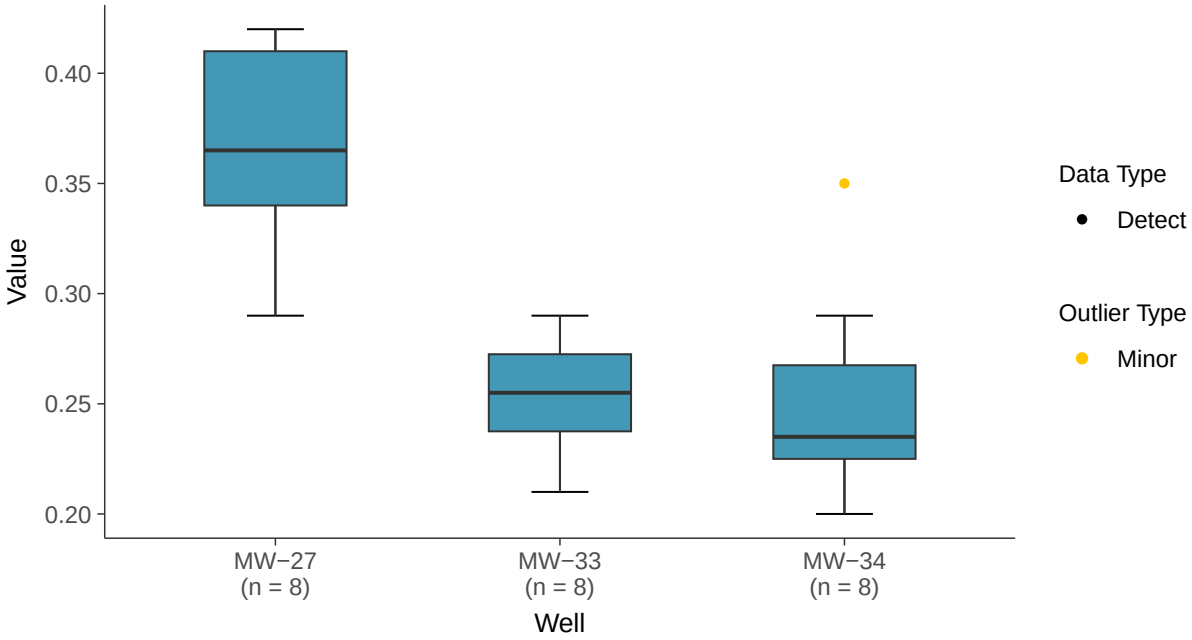
Boxplot by Season

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



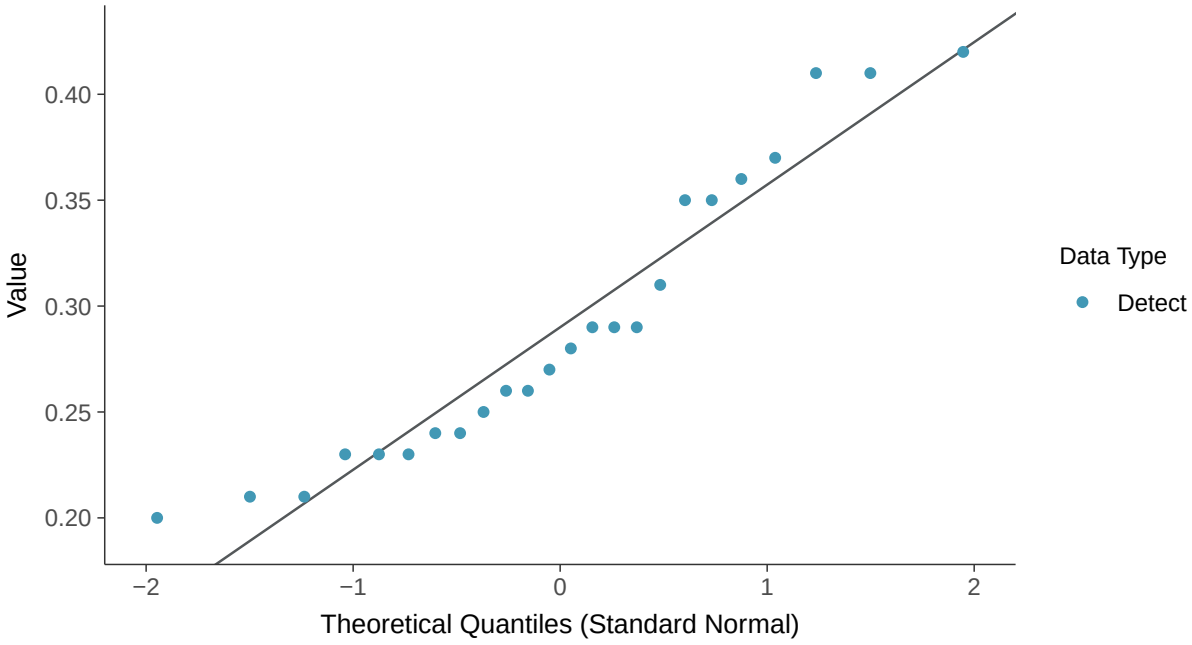
Boxplot by Well

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



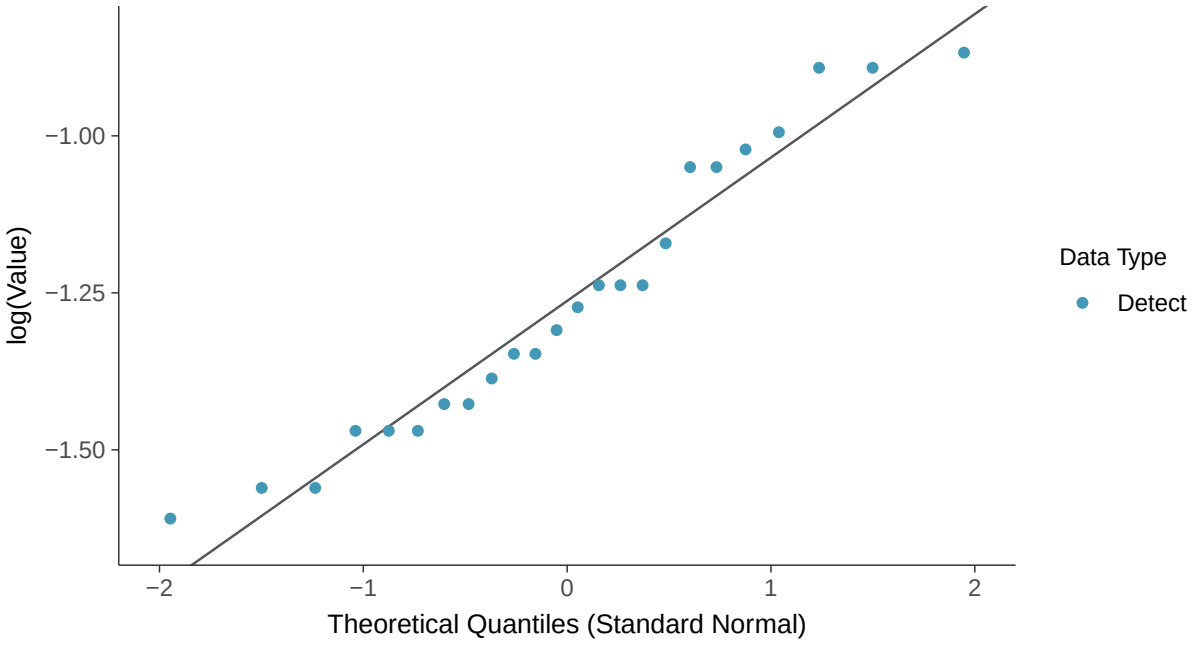
Normal Q-Q plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



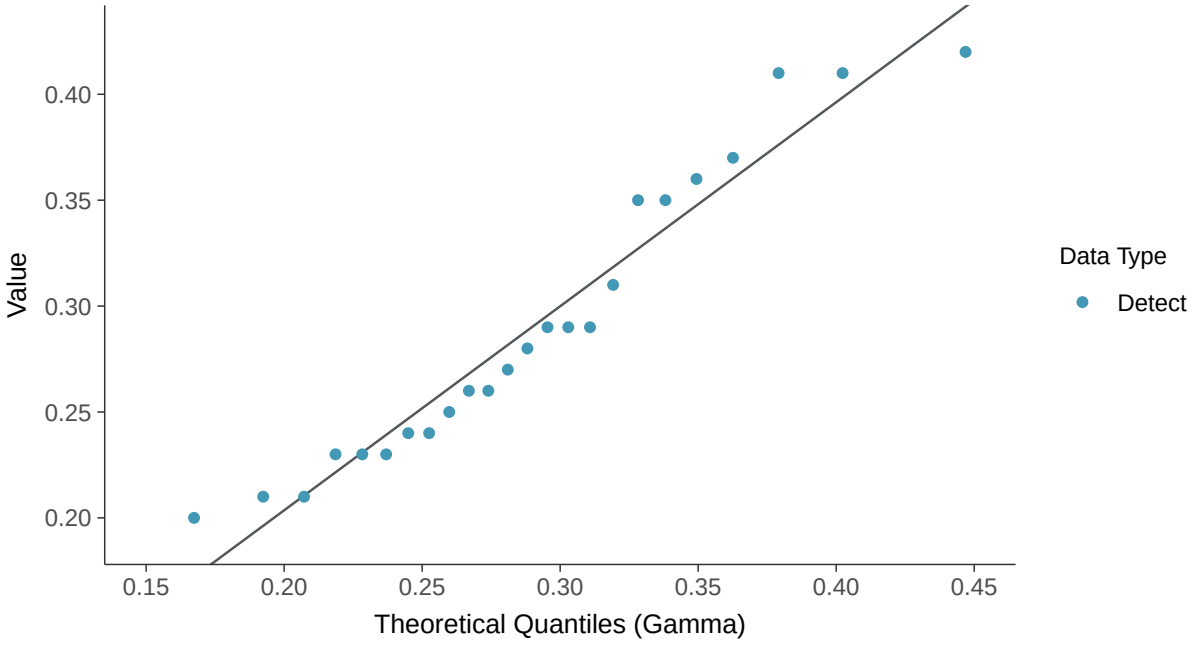
Lognormal Q-Q plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



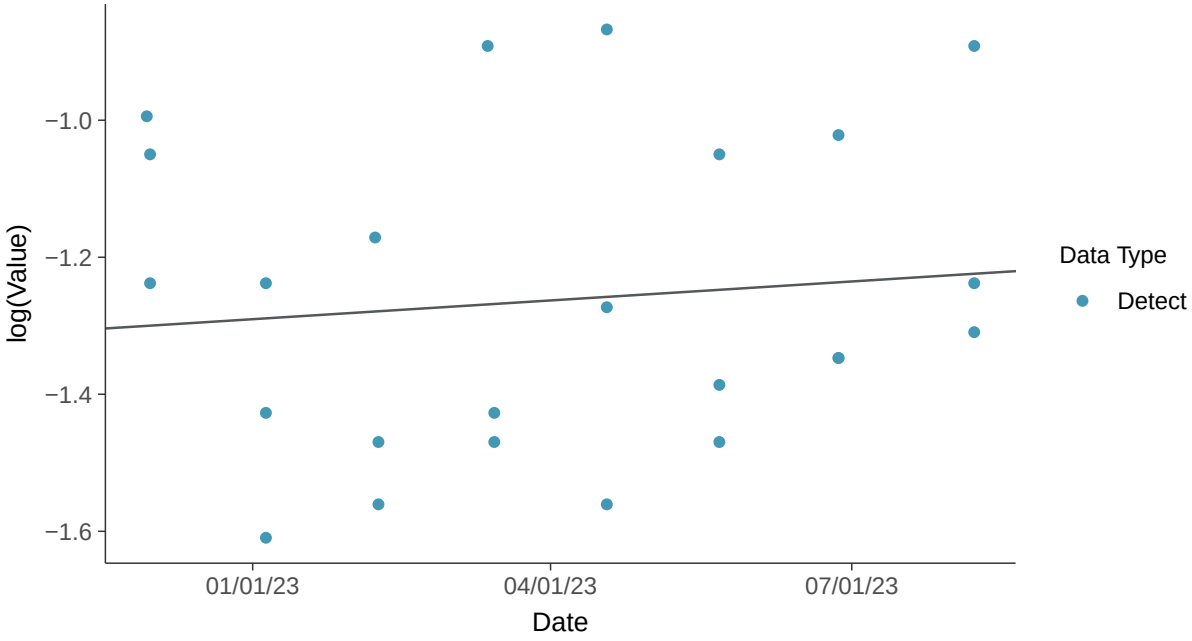
Gamma Q-Q plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



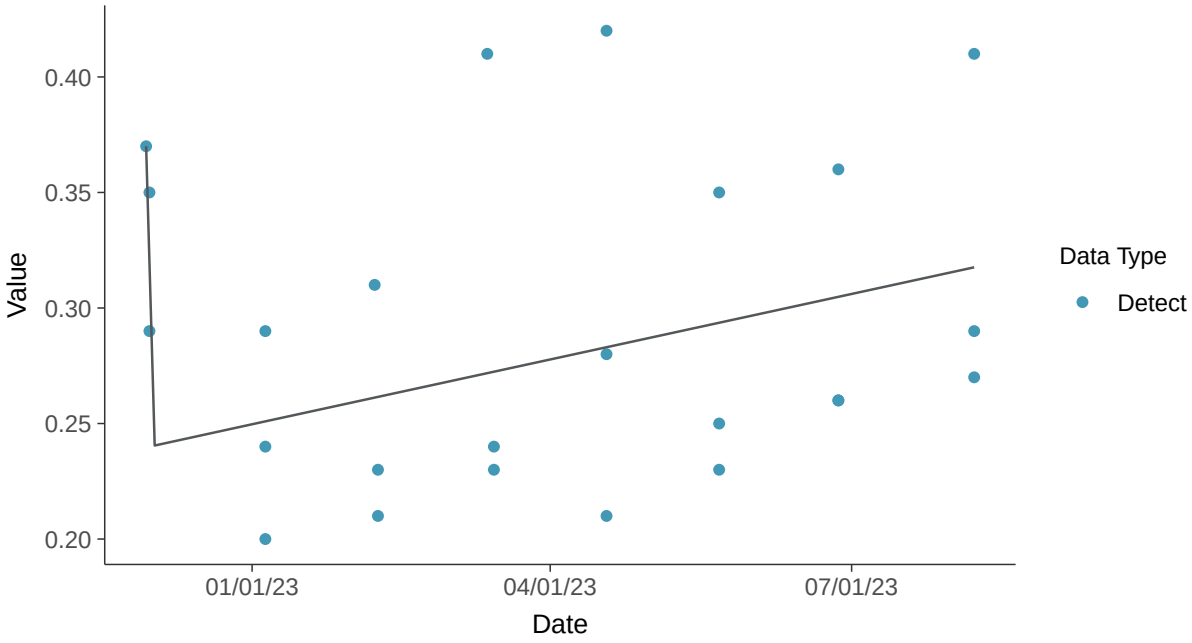
Trend Regression: Lognormal MLE

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)

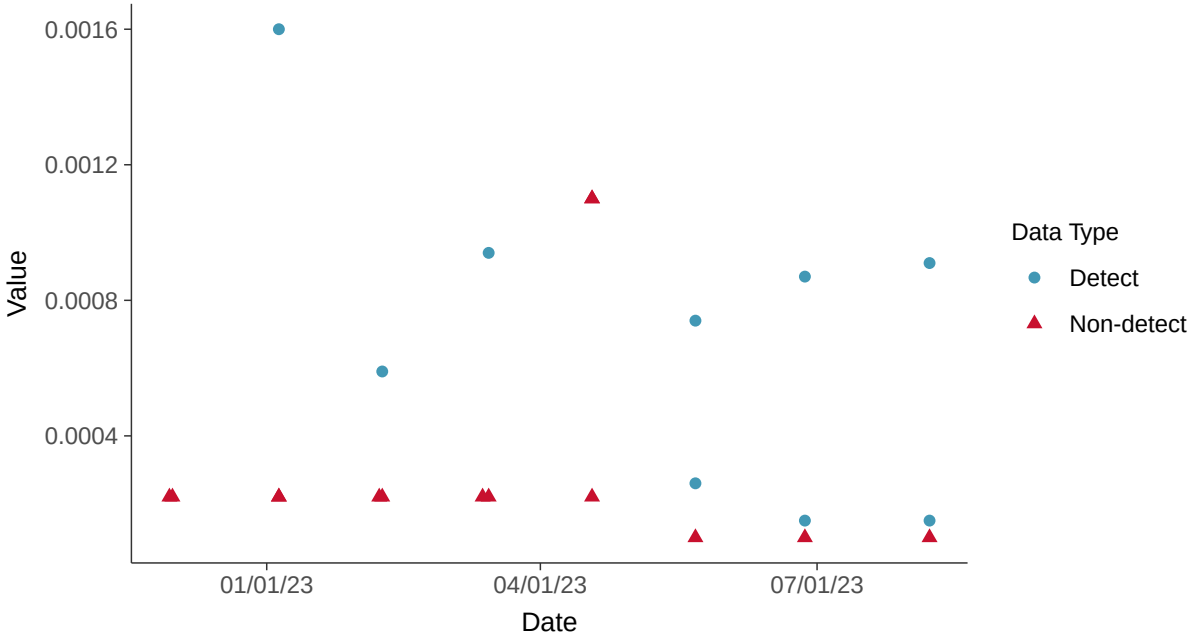


Appendix IV: Lead, MW-27, MW-33, MW-34

ID: 5_115

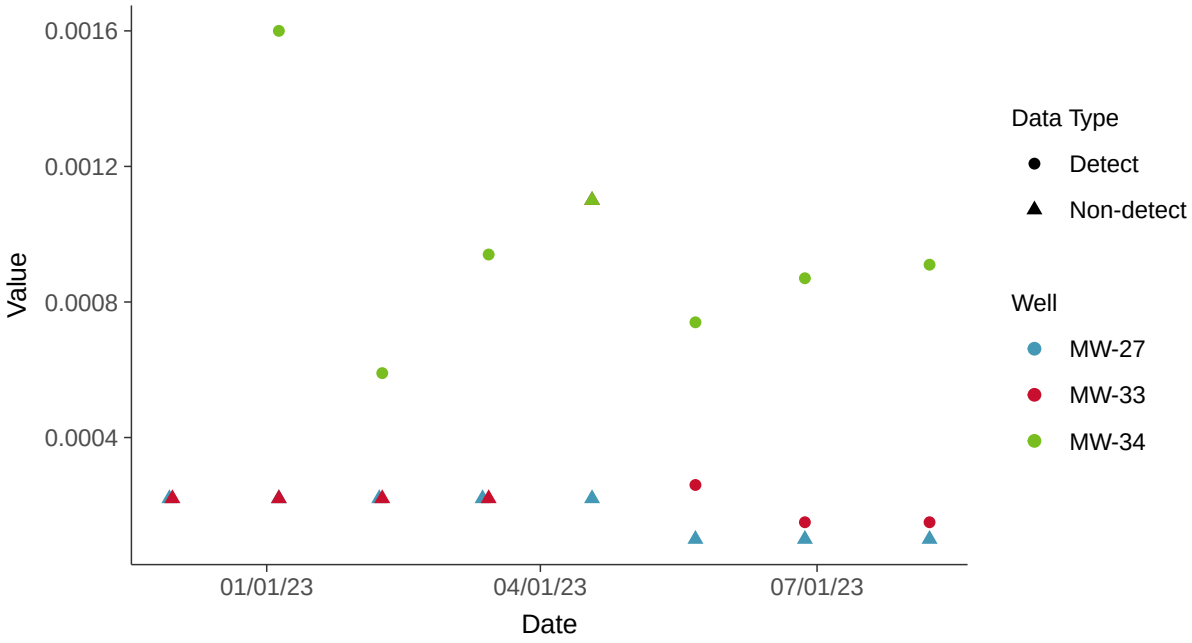
Scatter Plot

Lead, MW-27, MW-33, MW-34 (mg/L)



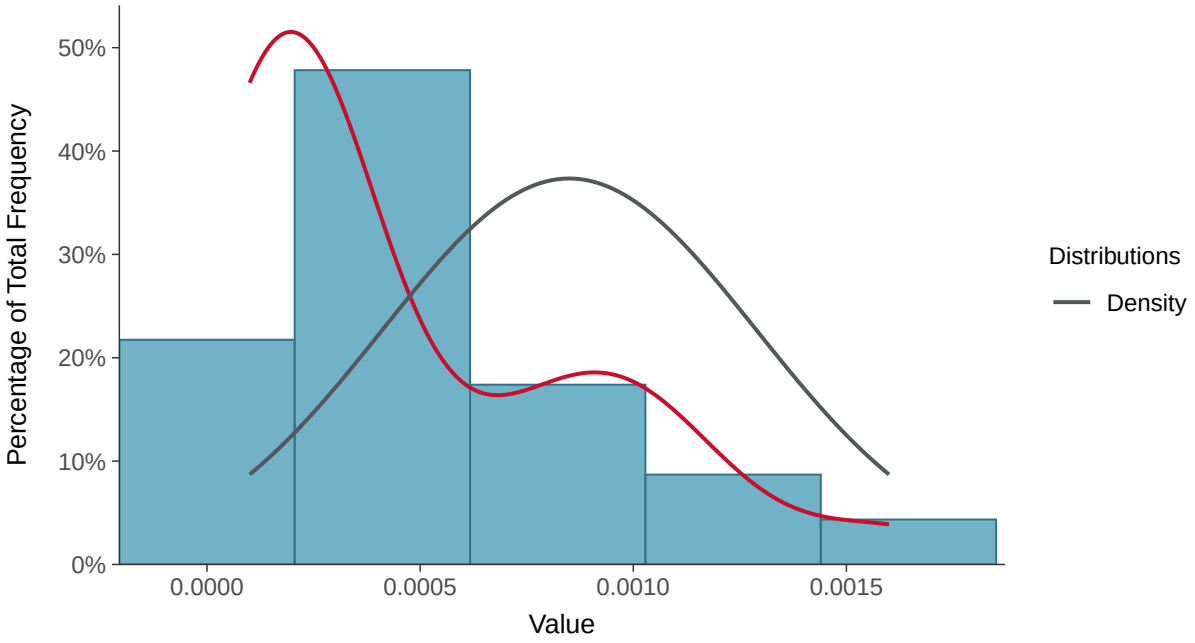
Scatter Plot by Well

Lead, MW-27, MW-33, MW-34 (mg/L)



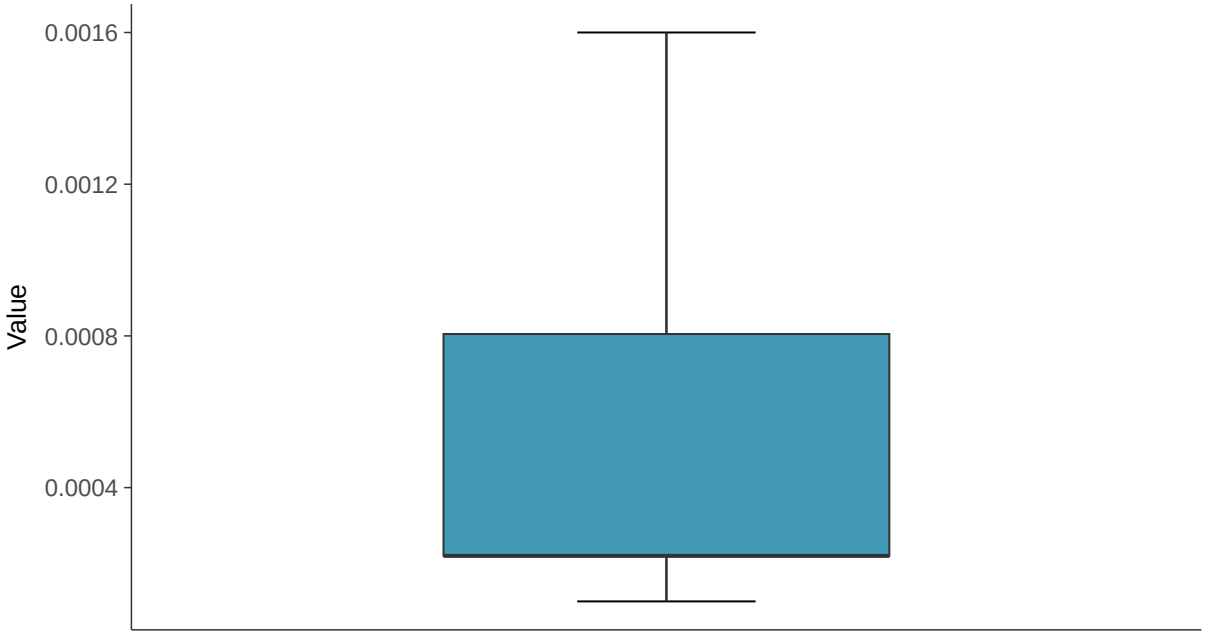
Histogram

Lead, MW-27, MW-33, MW-34 (mg/L)



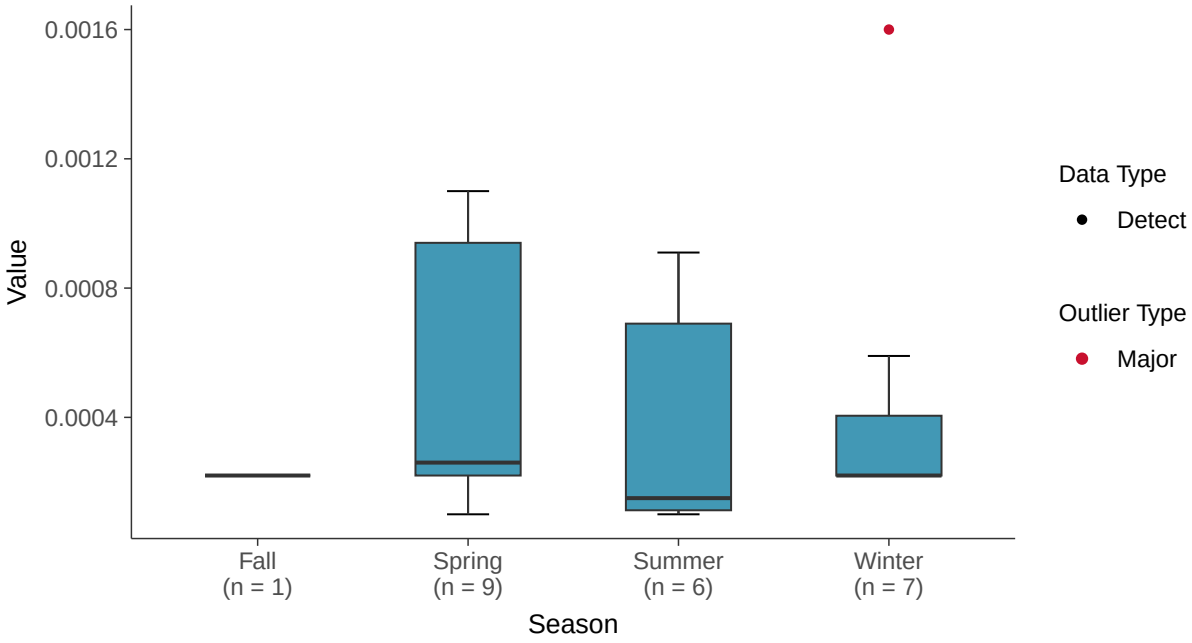
Boxplot

Lead, MW-27, MW-33, MW-34 (mg/L)



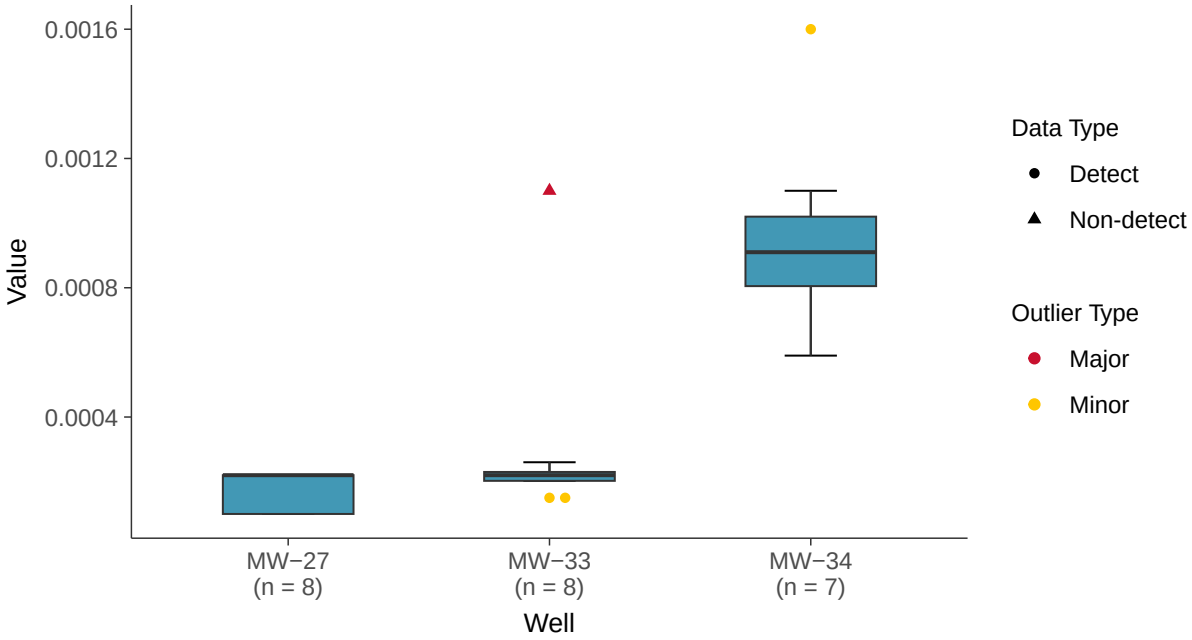
Boxplot by Season

Lead, MW-27, MW-33, MW-34 (mg/L)



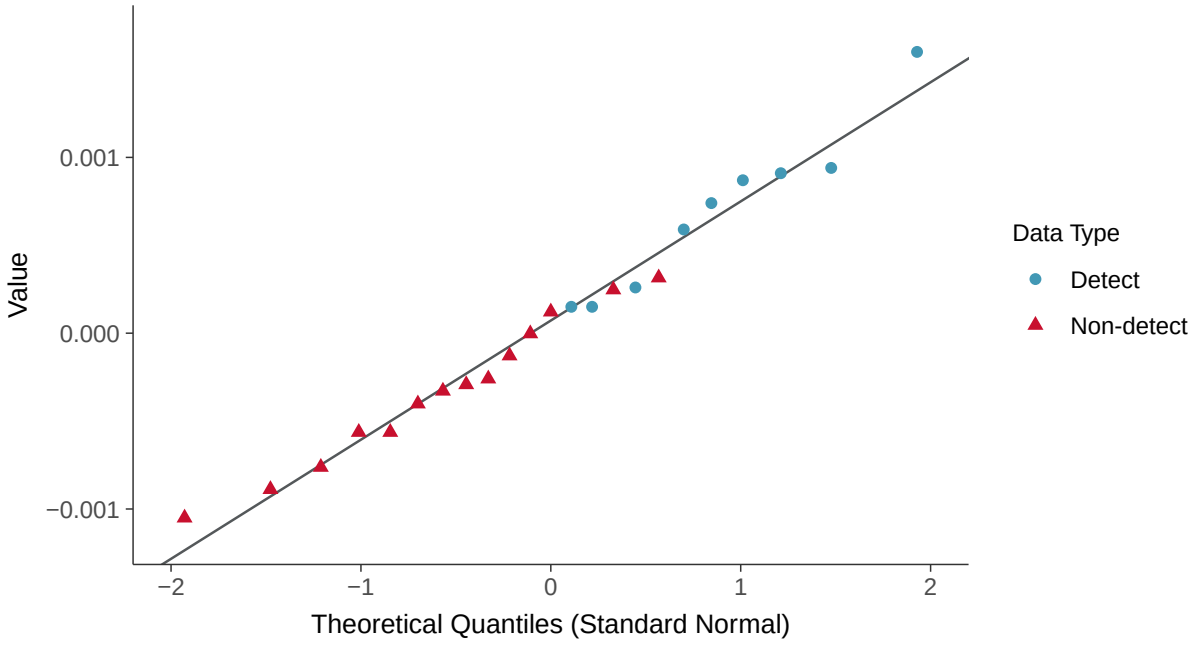
Boxplot by Well

Lead, MW-27, MW-33, MW-34 (mg/L)



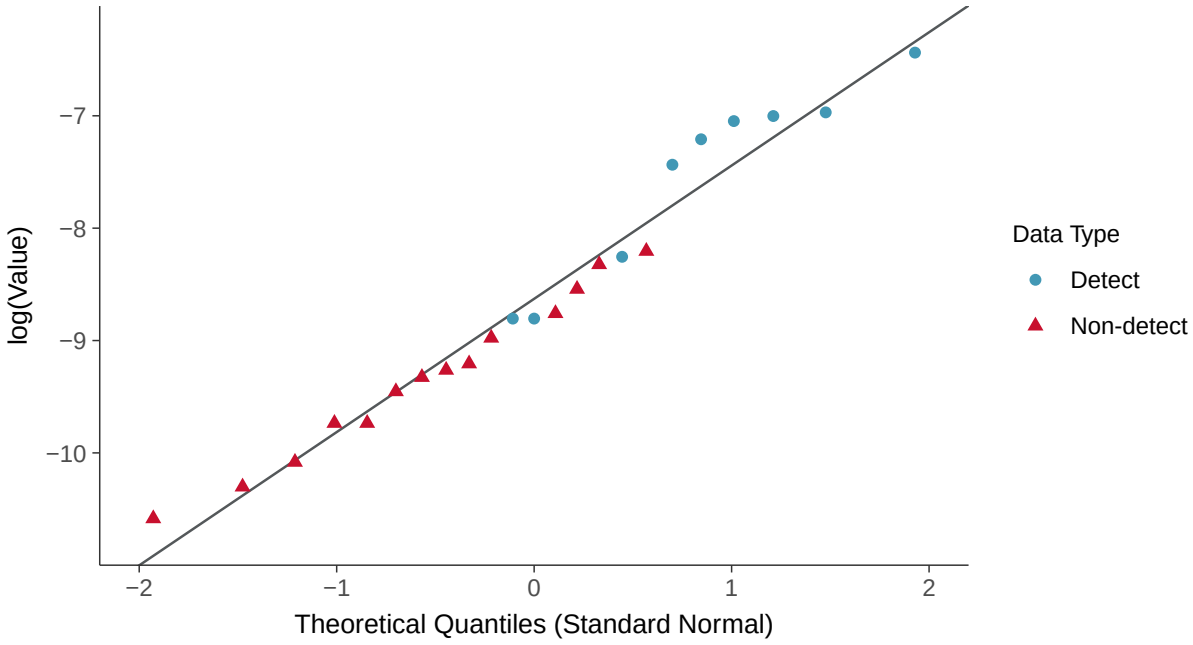
Normal Q-Q plot using ROS Imputed Estimates

Lead, MW-27, MW-33, MW-34 (mg/L)



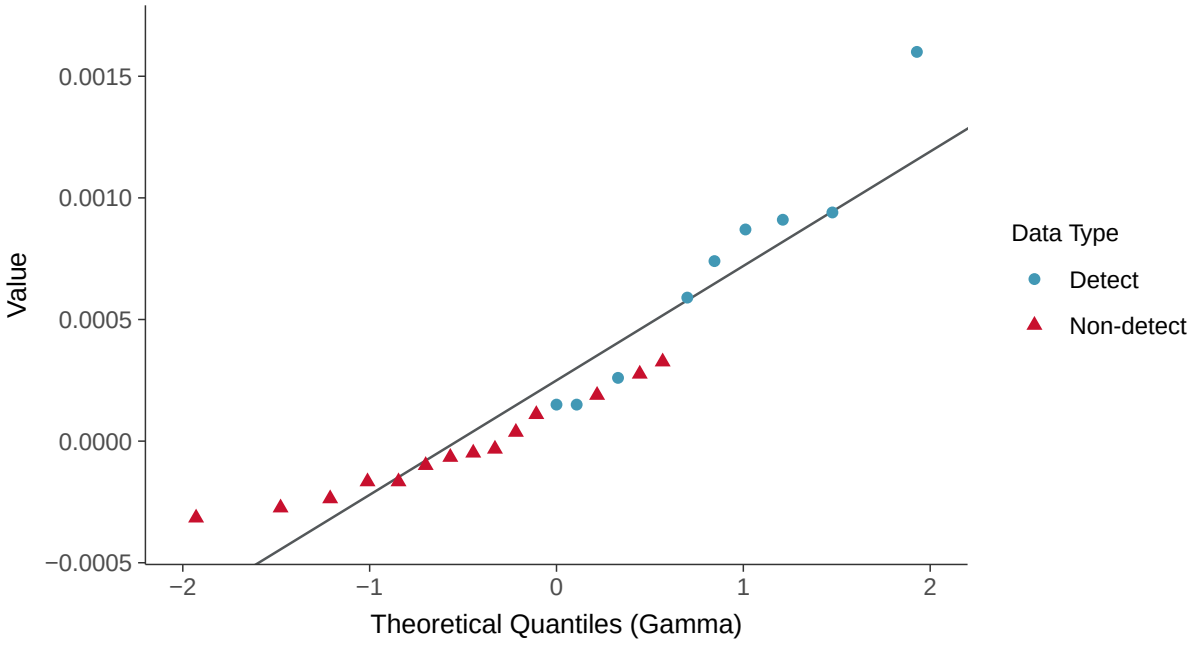
Lognormal Q-Q plot using ROS Imputed Estimates

Lead, MW-27, MW-33, MW-34 (mg/L)



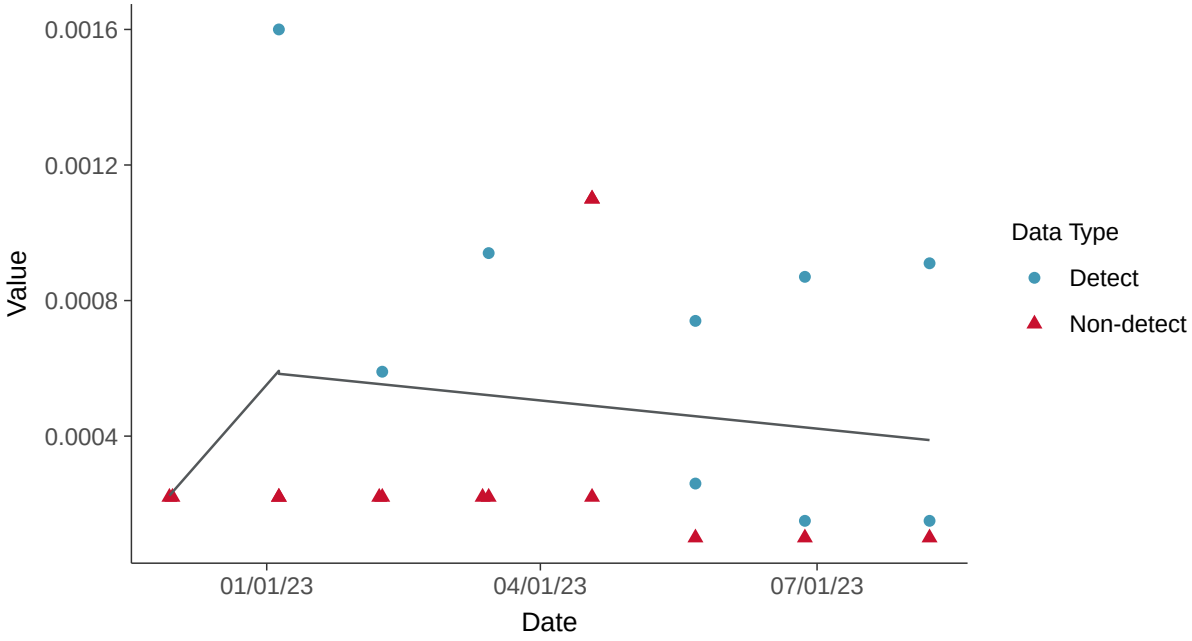
Gamma Q-Q plot using ROS Imputed Estimates

Lead, MW-27, MW-33, MW-34 (mg/L)



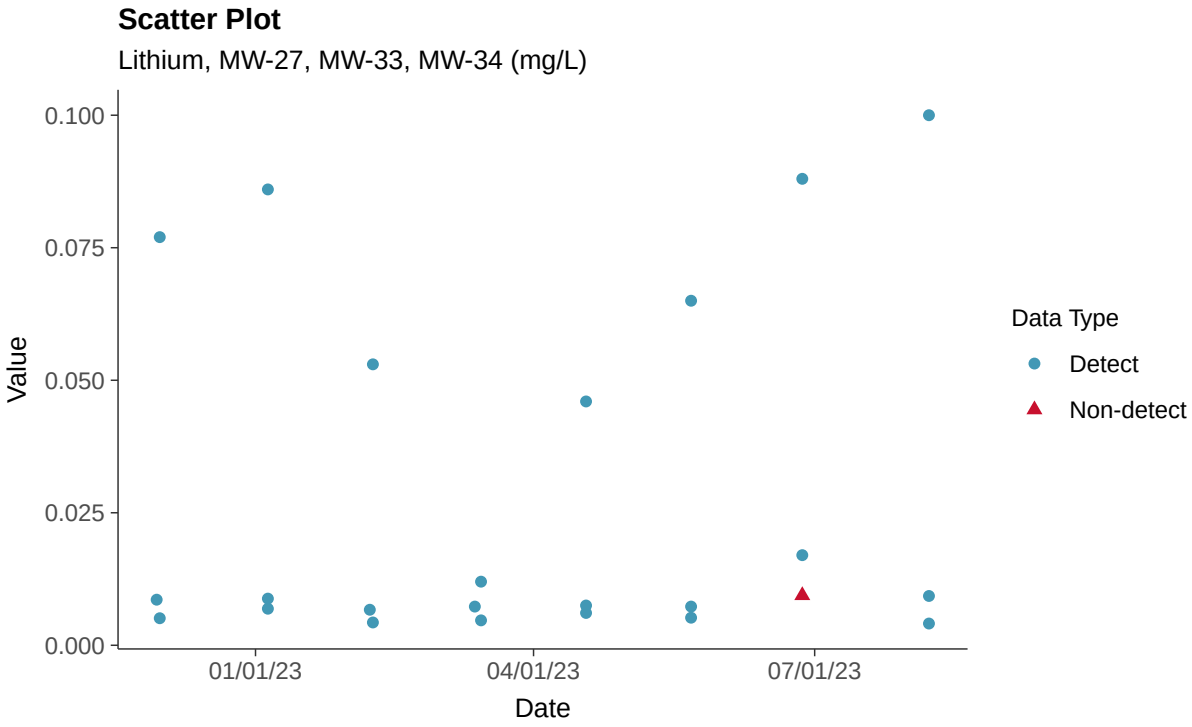
Trend Regression: Piecewise Linear-Linear

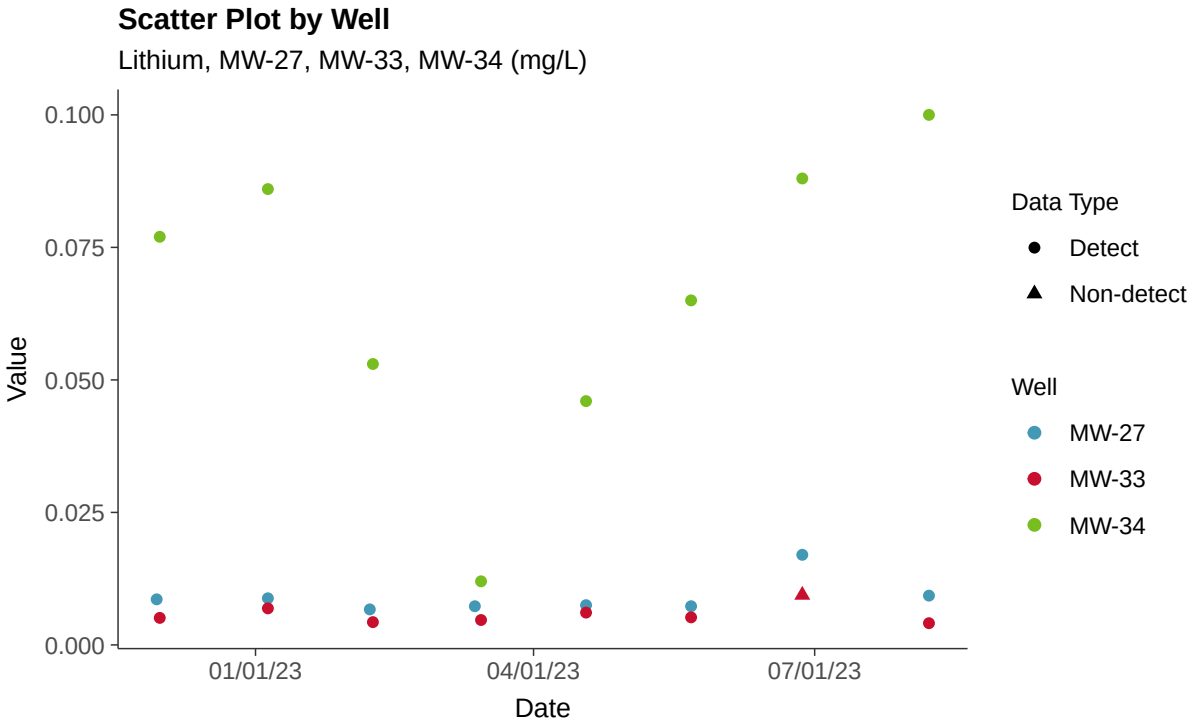
Lead, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Lithium, MW-27, MW-33, MW-34

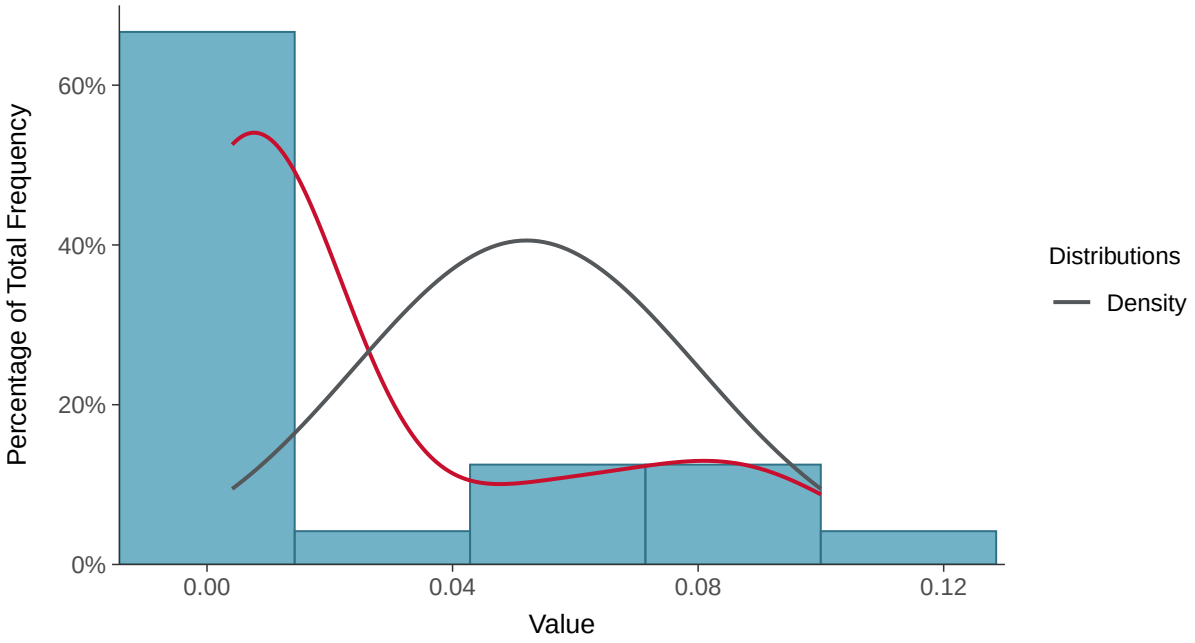
ID: 5_116





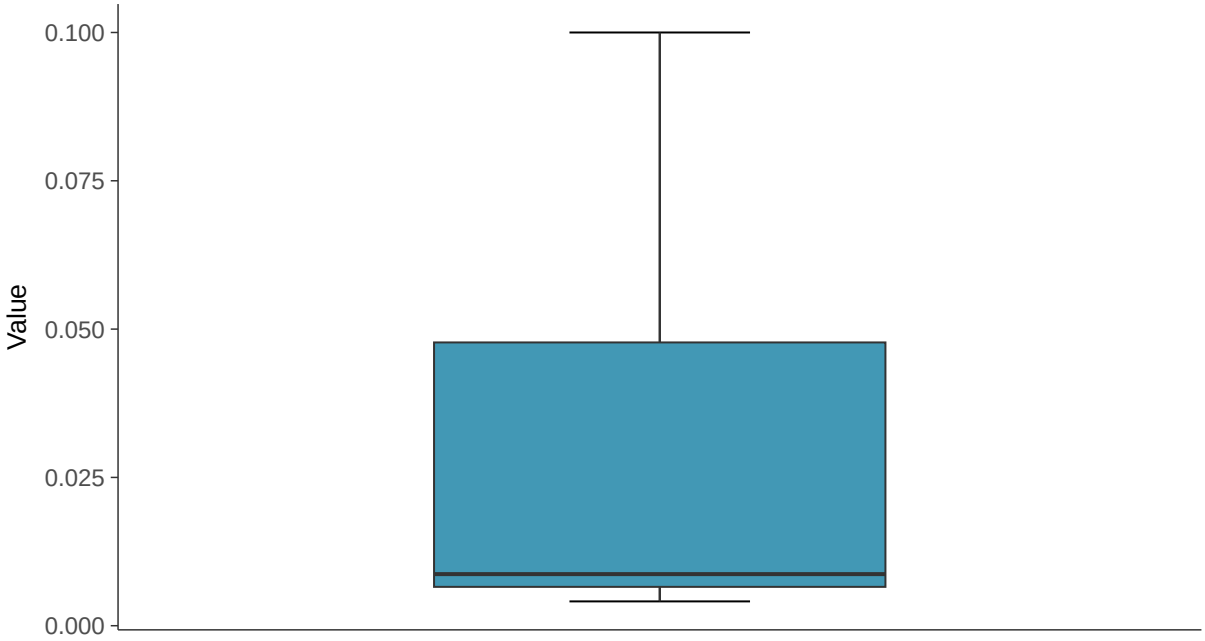
Histogram

Lithium, MW-27, MW-33, MW-34 (mg/L)



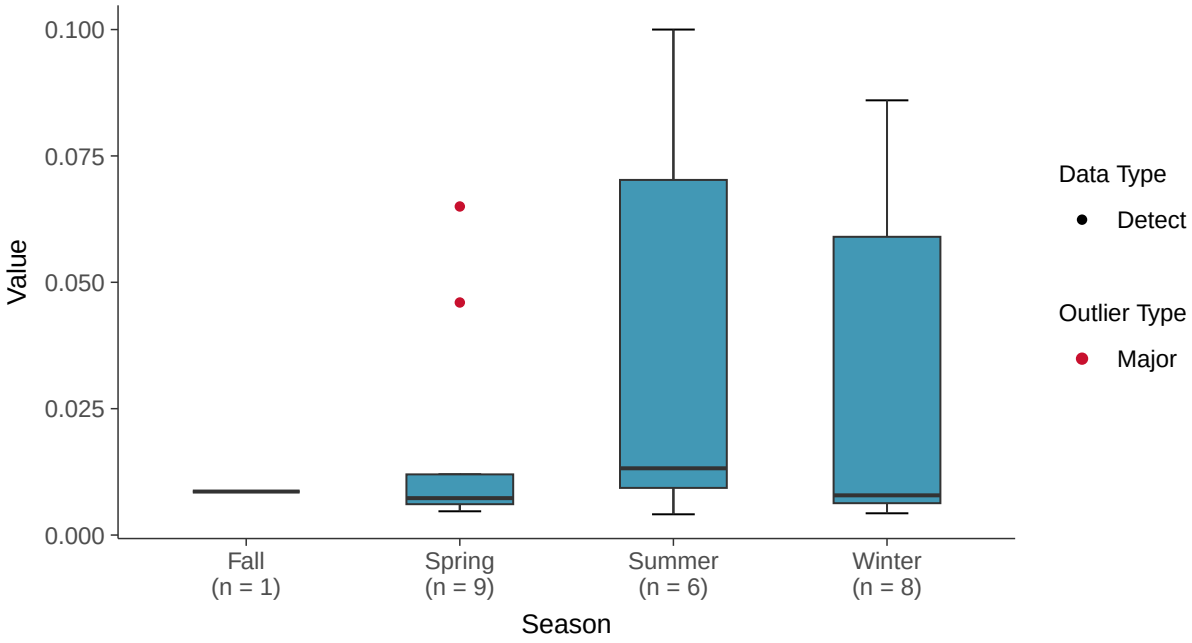
Boxplot

Lithium, MW-27, MW-33, MW-34 (mg/L)



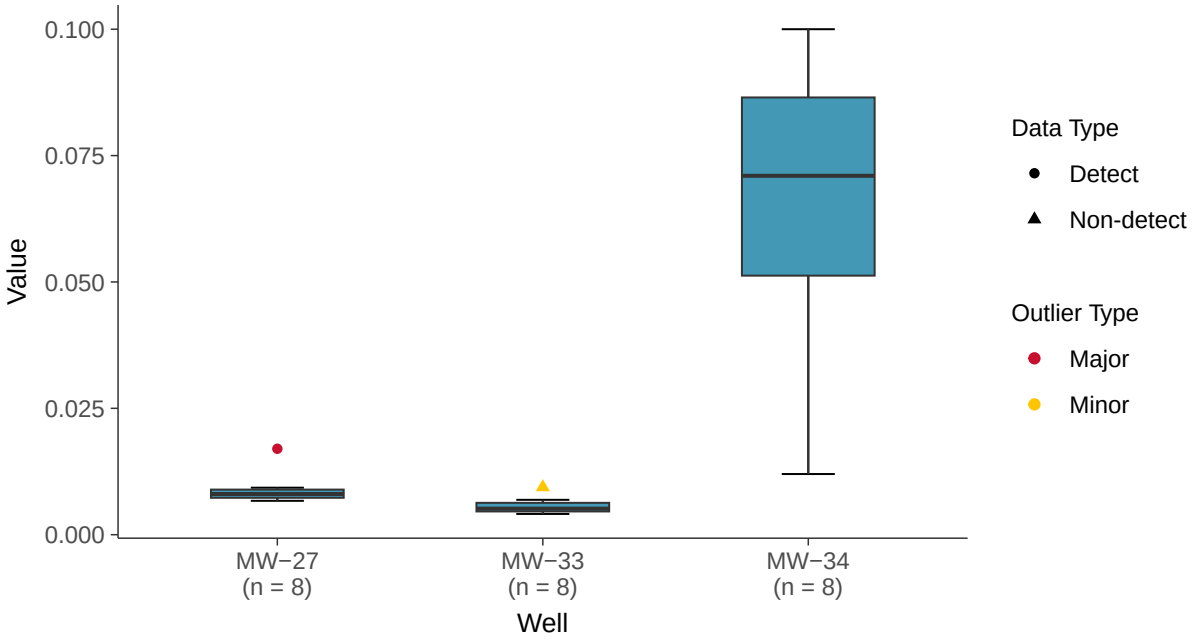
Boxplot by Season

Lithium, MW-27, MW-33, MW-34 (mg/L)



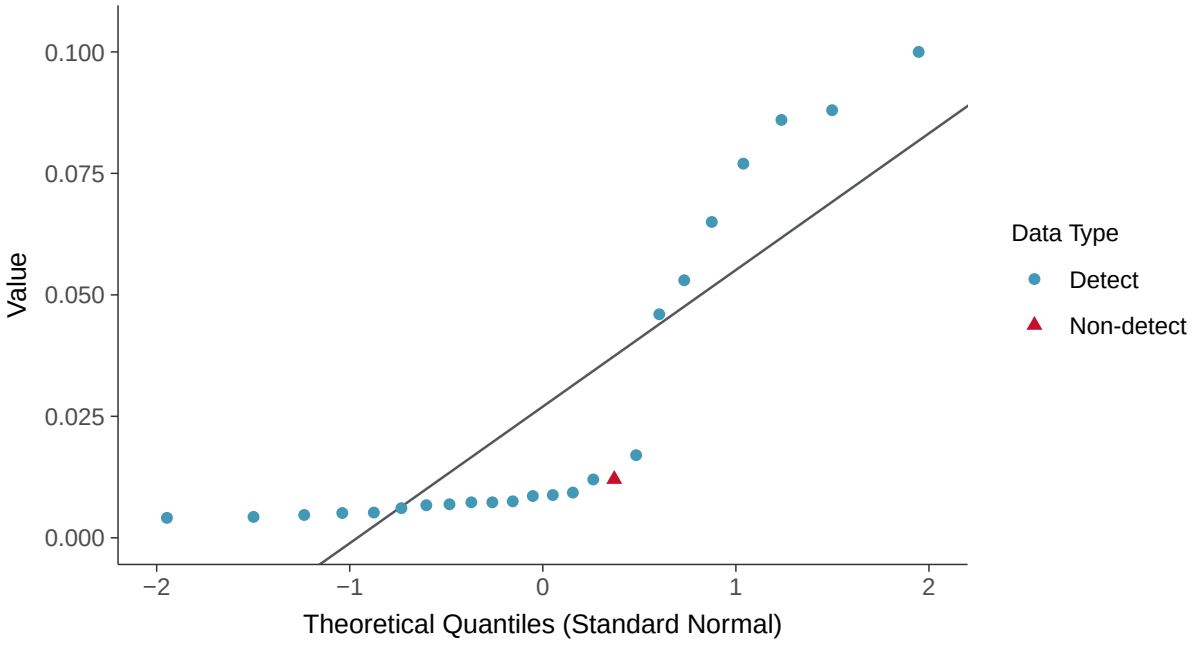
Boxplot by Well

Lithium, MW-27, MW-33, MW-34 (mg/L)



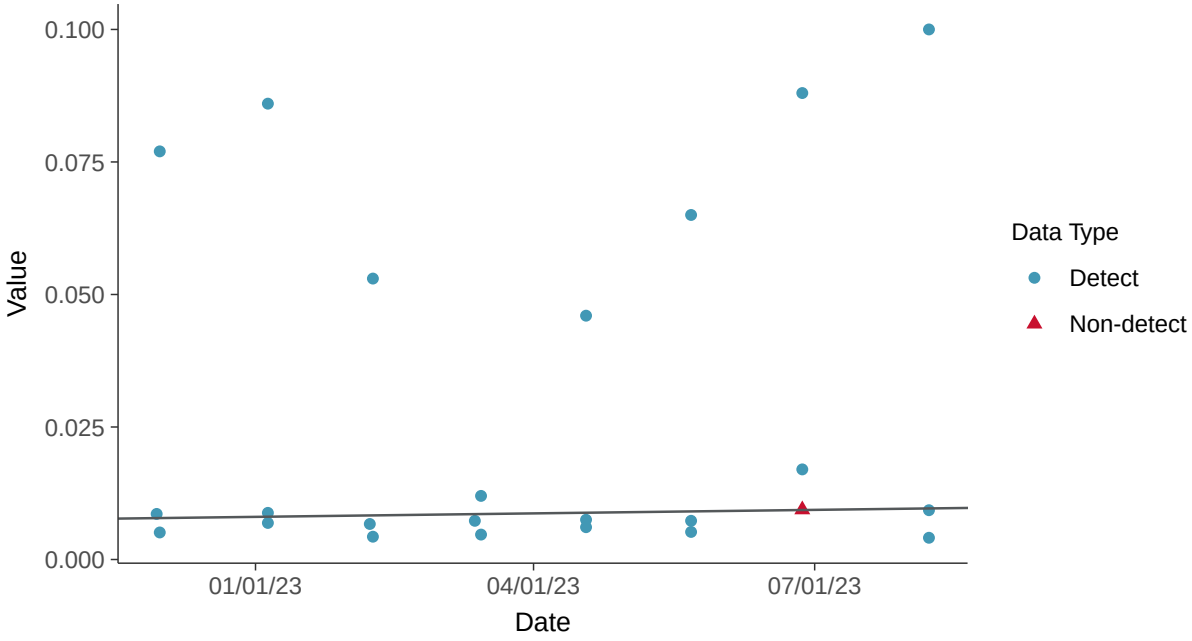
Normal Q-Q plot using ROS Imputed Estimates

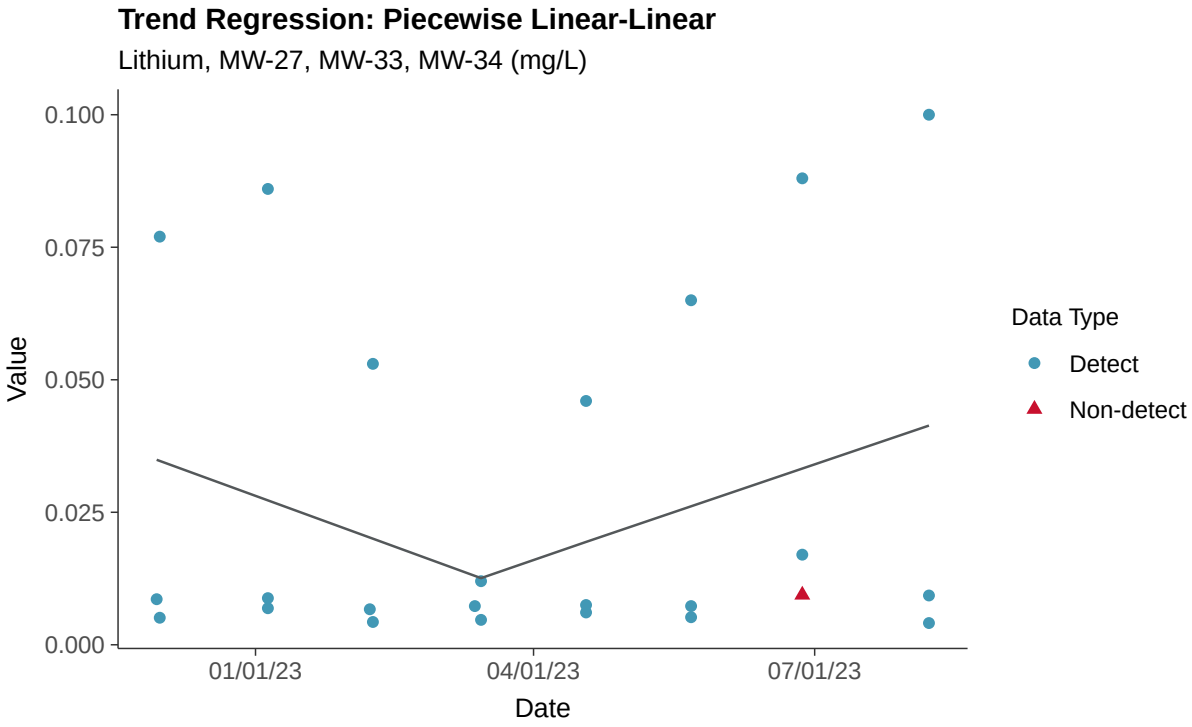
Lithium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Mann-Kendall/Theil-Sen Estimate

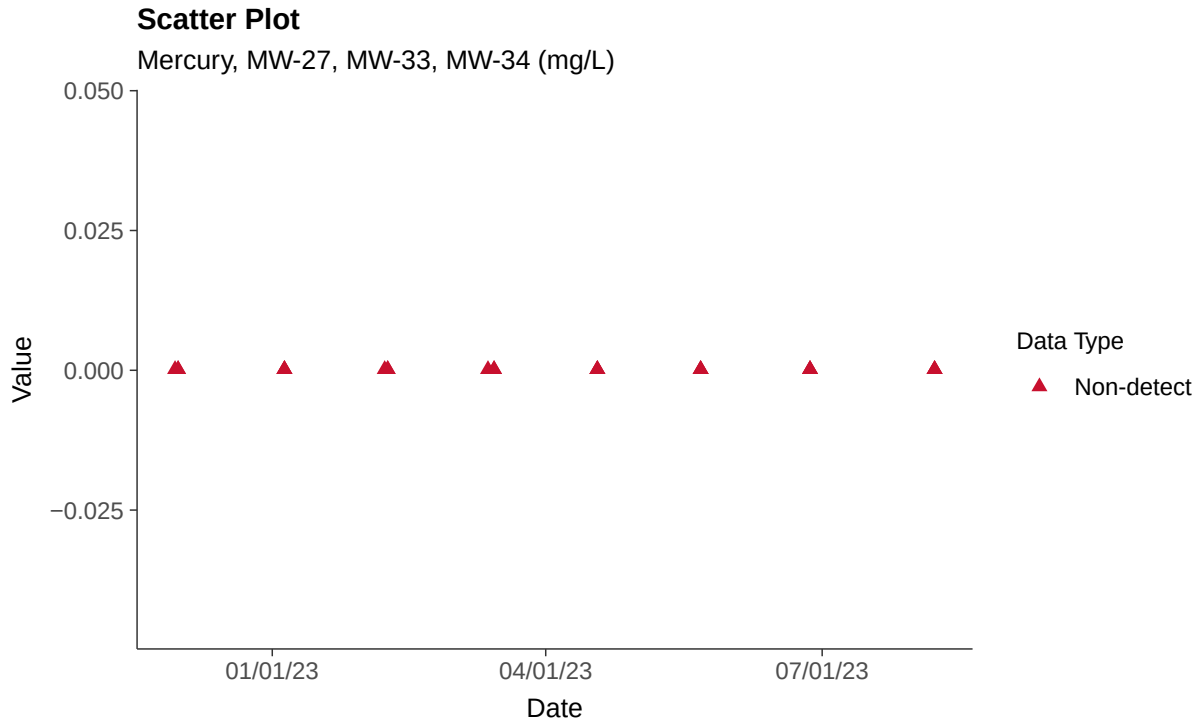
Lithium, MW-27, MW-33, MW-34 (mg/L)

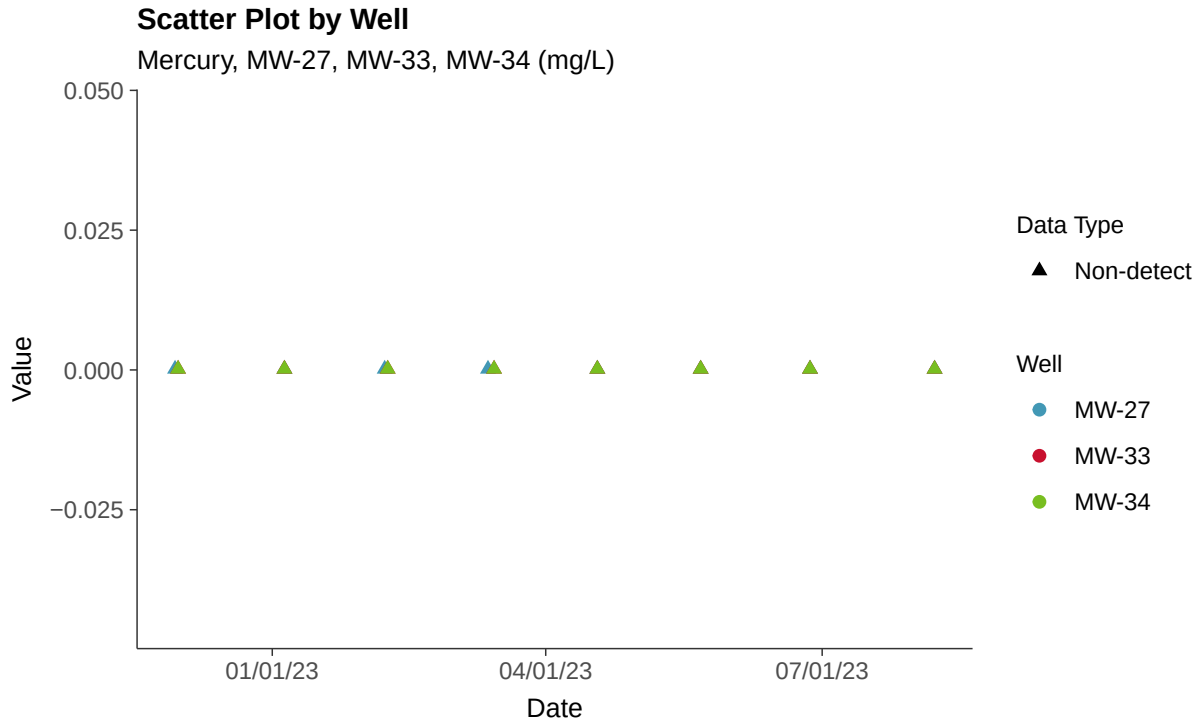



Trend Regression: Piecewise Linear-Linear
Lithium, MW-27, MW-33, MW-34 (mg/L)
Value
0.100
0.075
0.050
0.025
0.000
01/01/23
04/01/23
07/01/23
Date
Data Type
Detect
Non-detect

Appendix IV: Mercury, MW-27, MW-33, MW-34

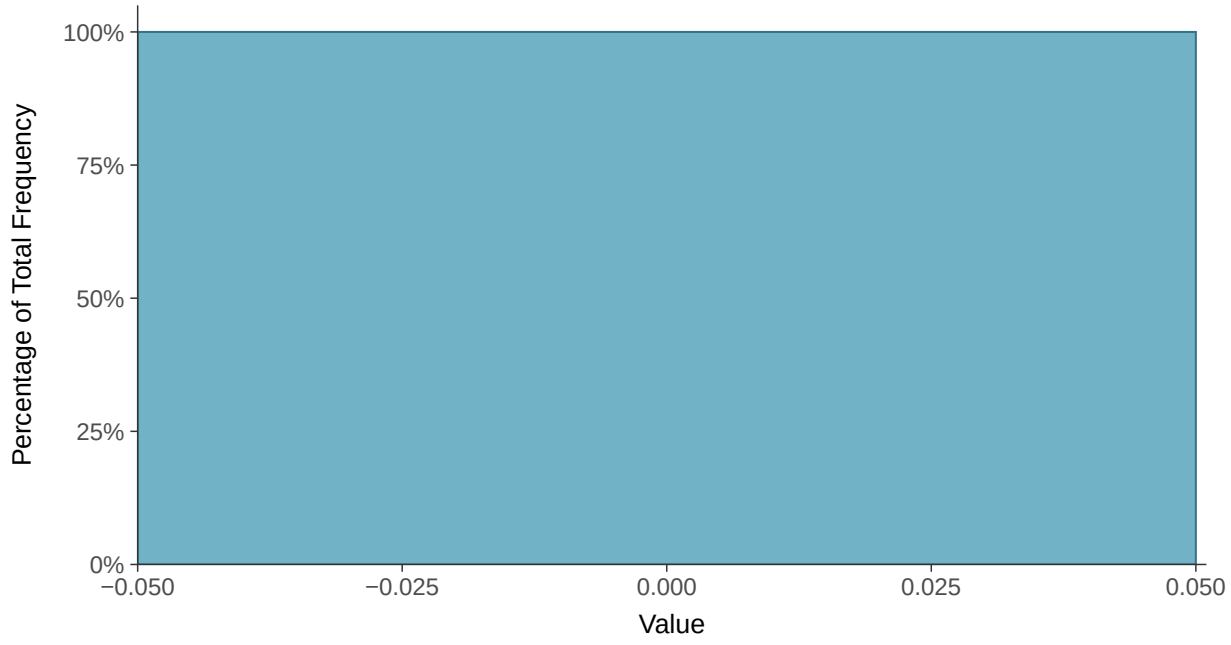
ID: 5_117





Histogram

Mercury, MW-27, MW-33, MW-34 (mg/L)

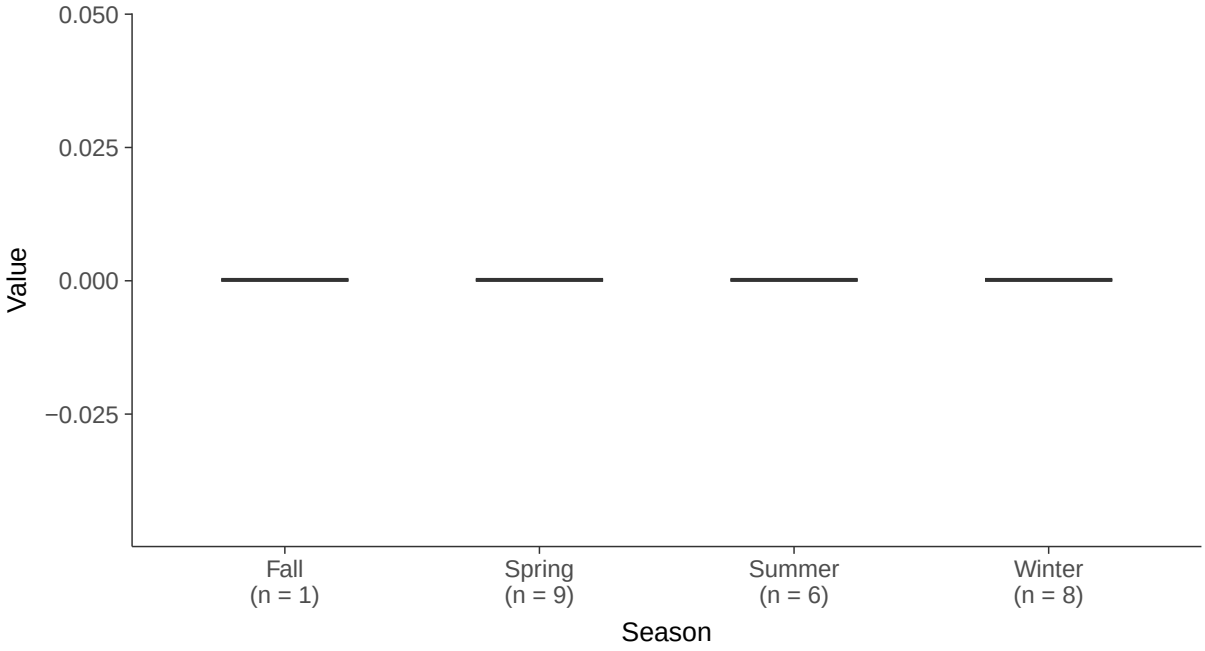


Boxplot

Mercury, MW-27, MW-33, MW-34 (mg/L)

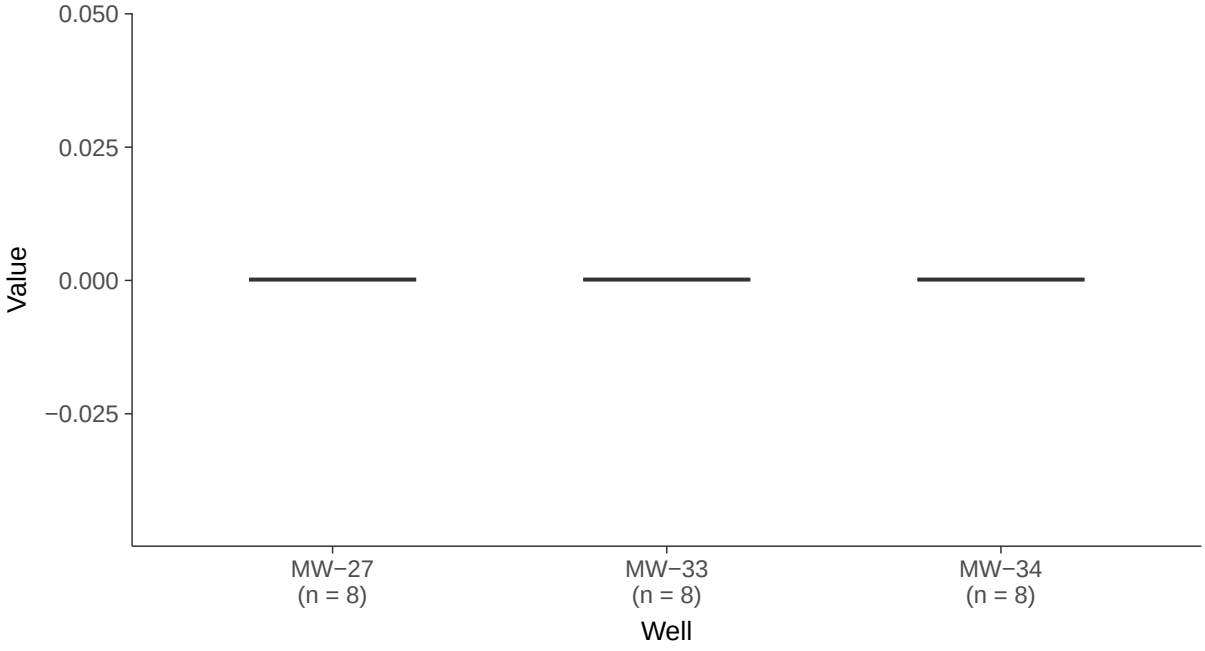
Boxplot by Season

Mercury, MW-27, MW-33, MW-34 (mg/L)



Boxplot by Well

Mercury, MW-27, MW-33, MW-34 (mg/L)

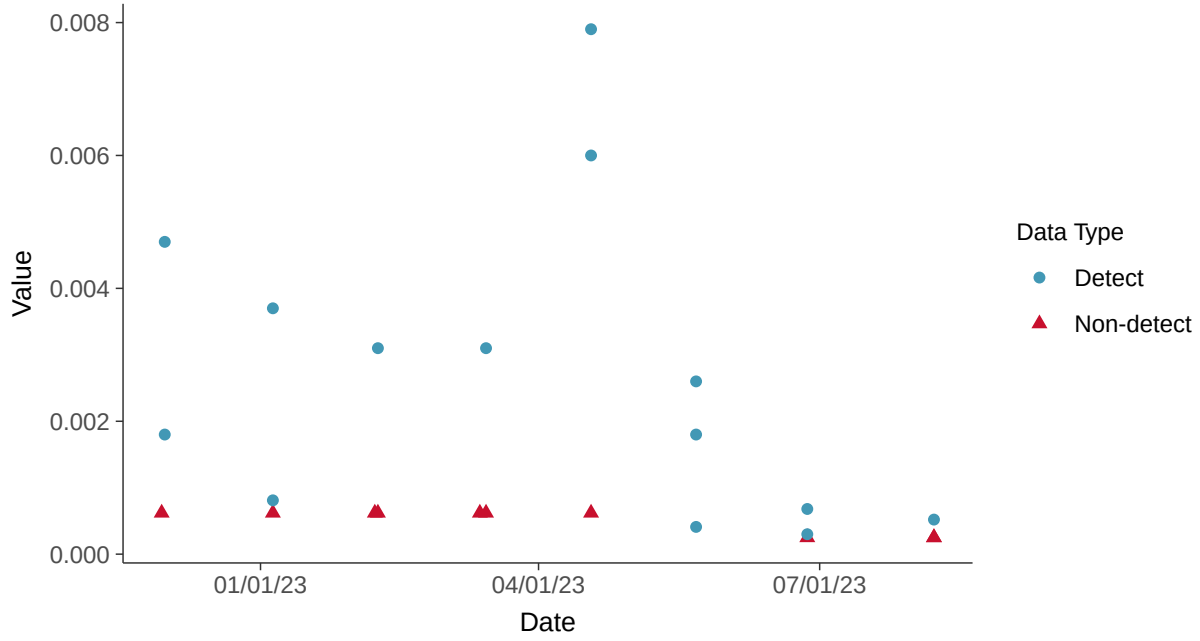


Appendix IV: Molybdenum, MW-27, MW-33, MW-34

ID: 5_118

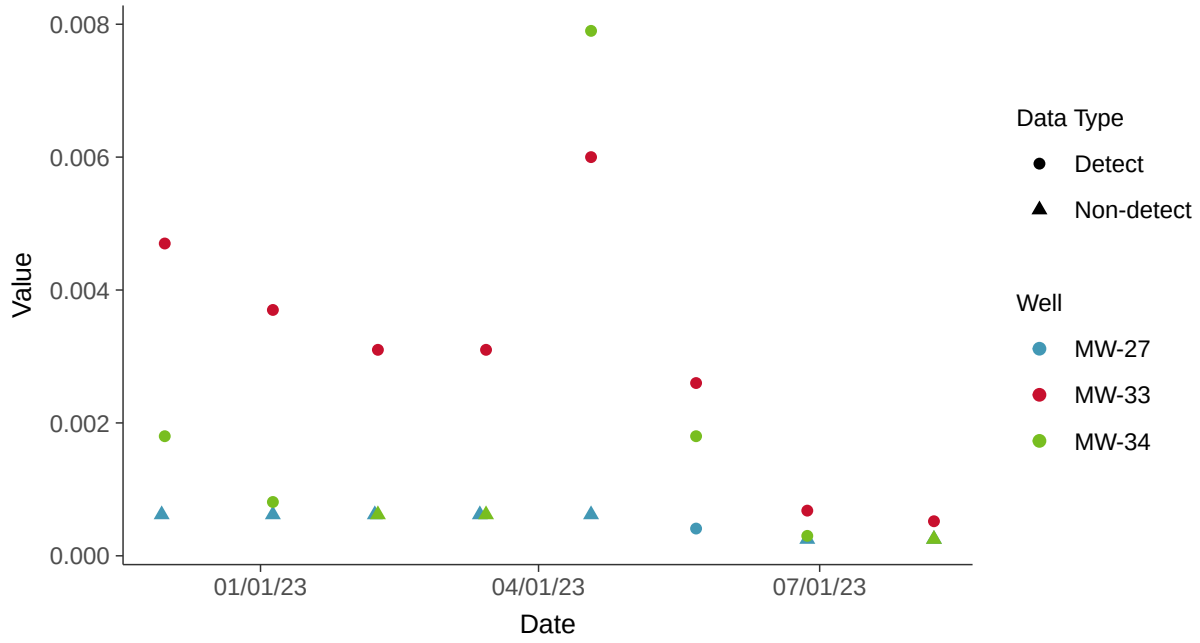
Scatter Plot

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



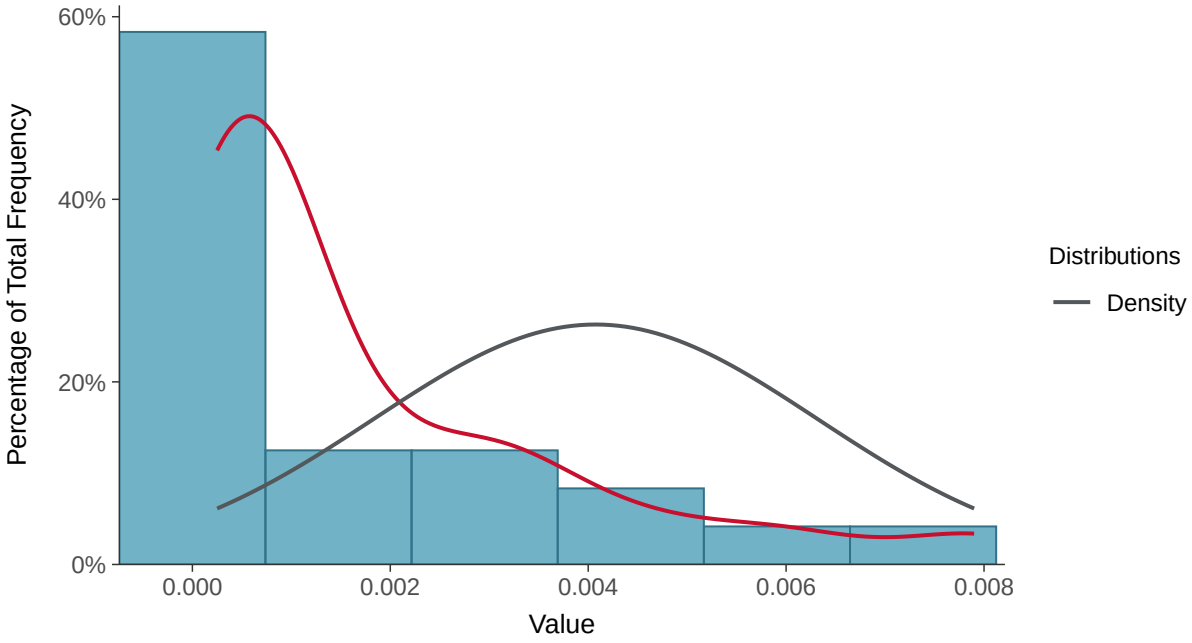
Scatter Plot by Well

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



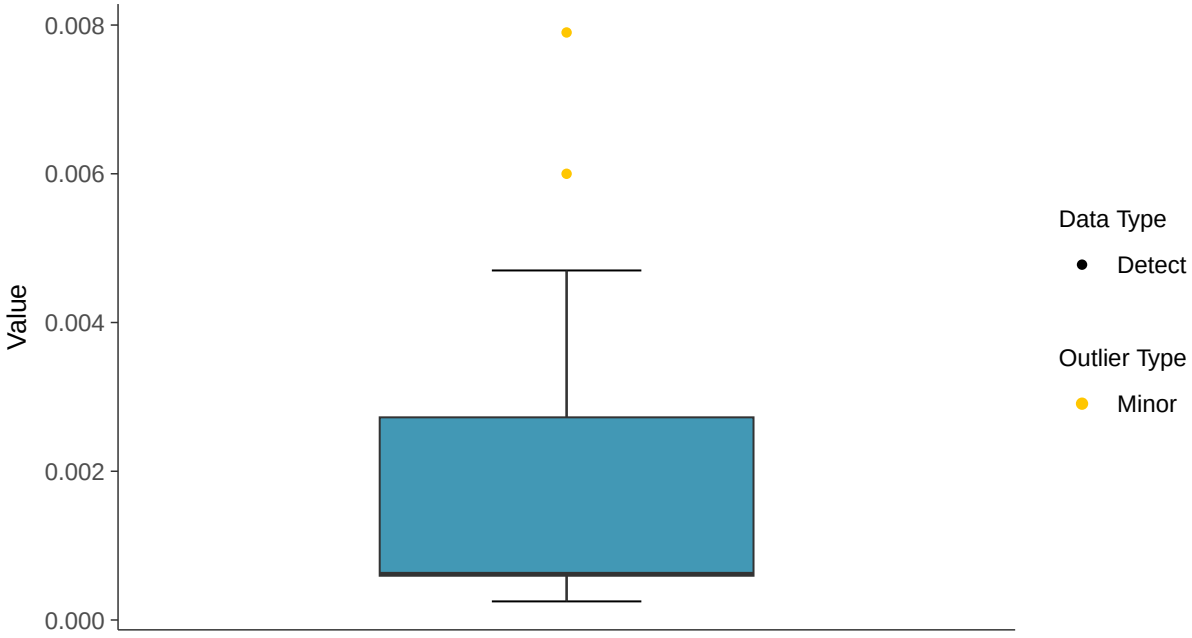
Histogram

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



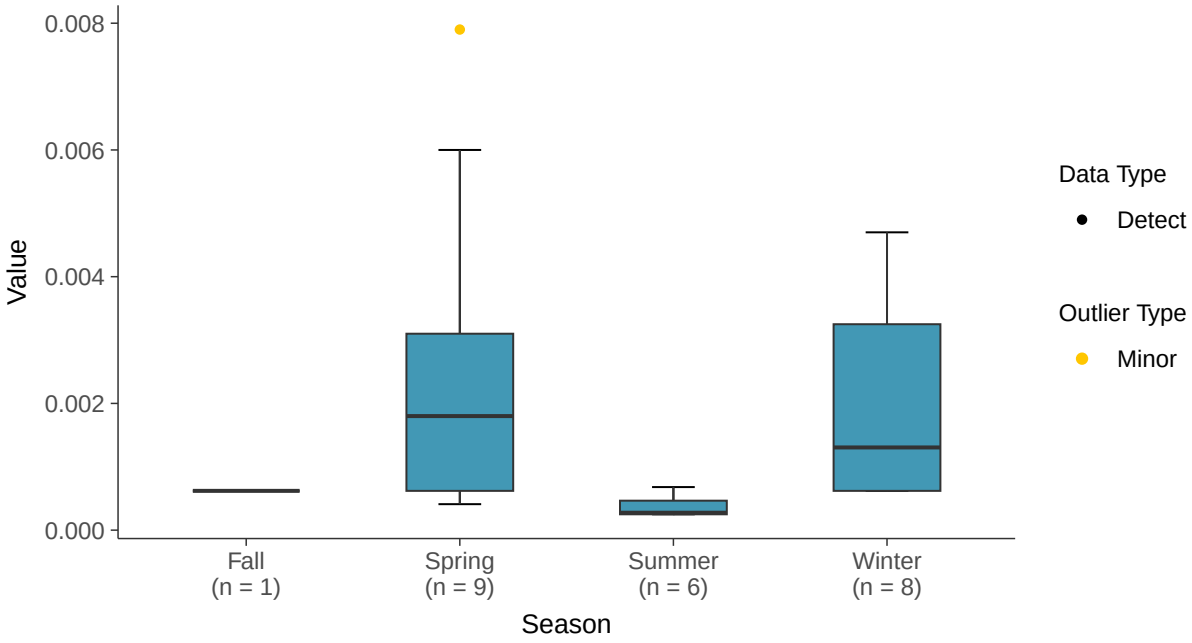
Boxplot

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



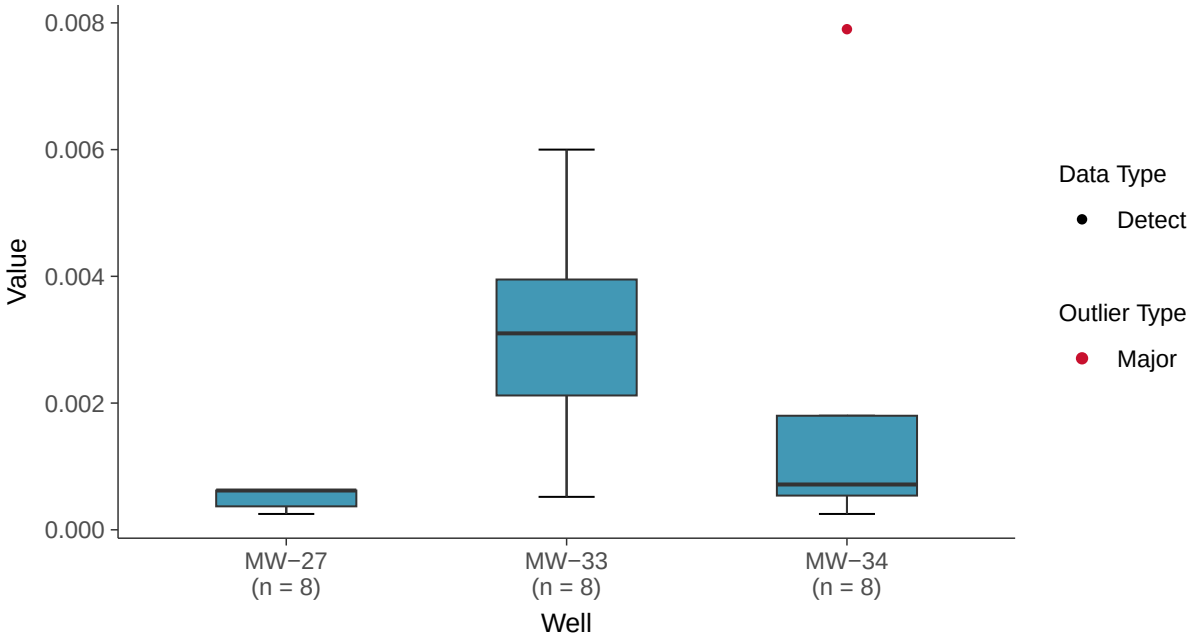
Boxplot by Season

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



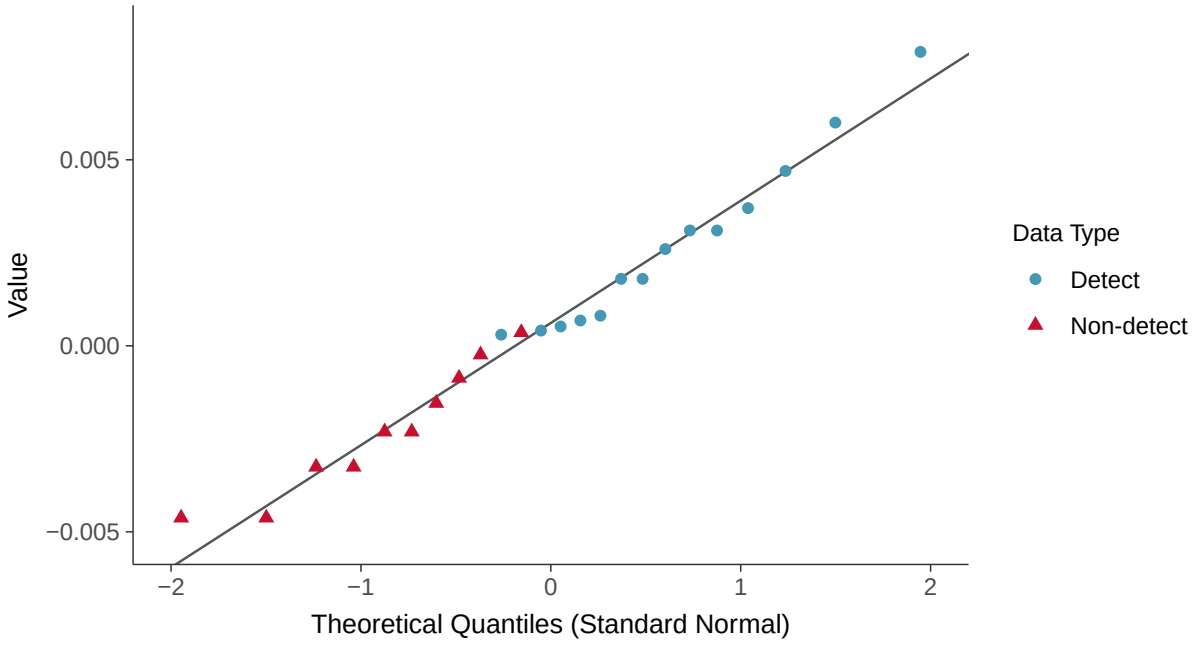
Boxplot by Well

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



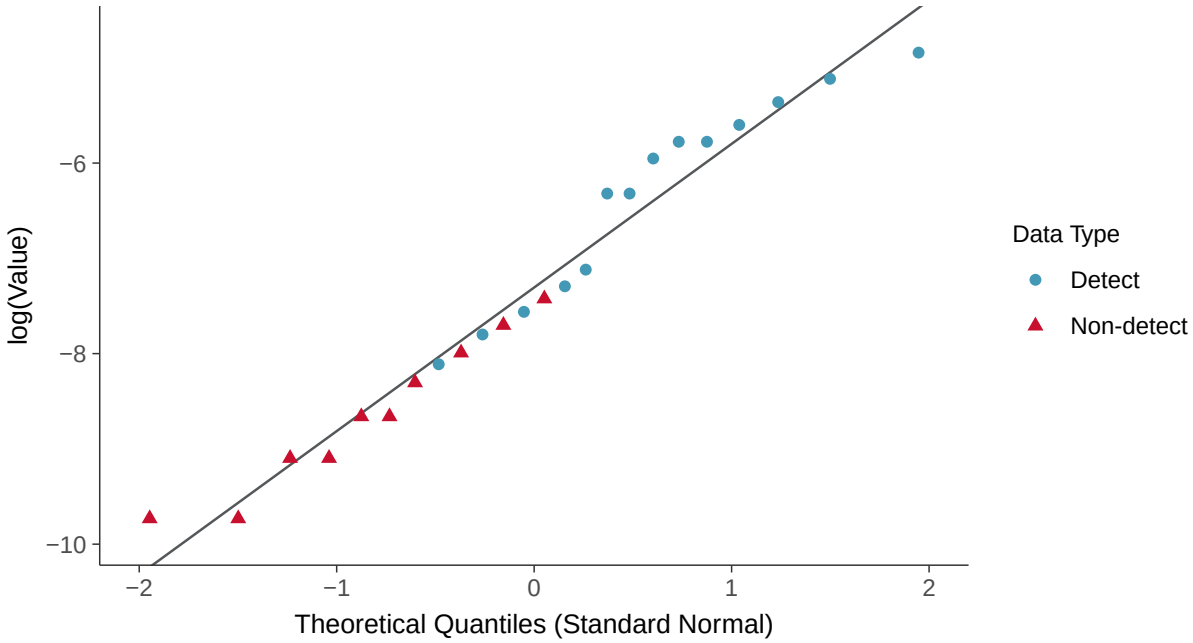
Normal Q-Q plot using ROS Imputed Estimates

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



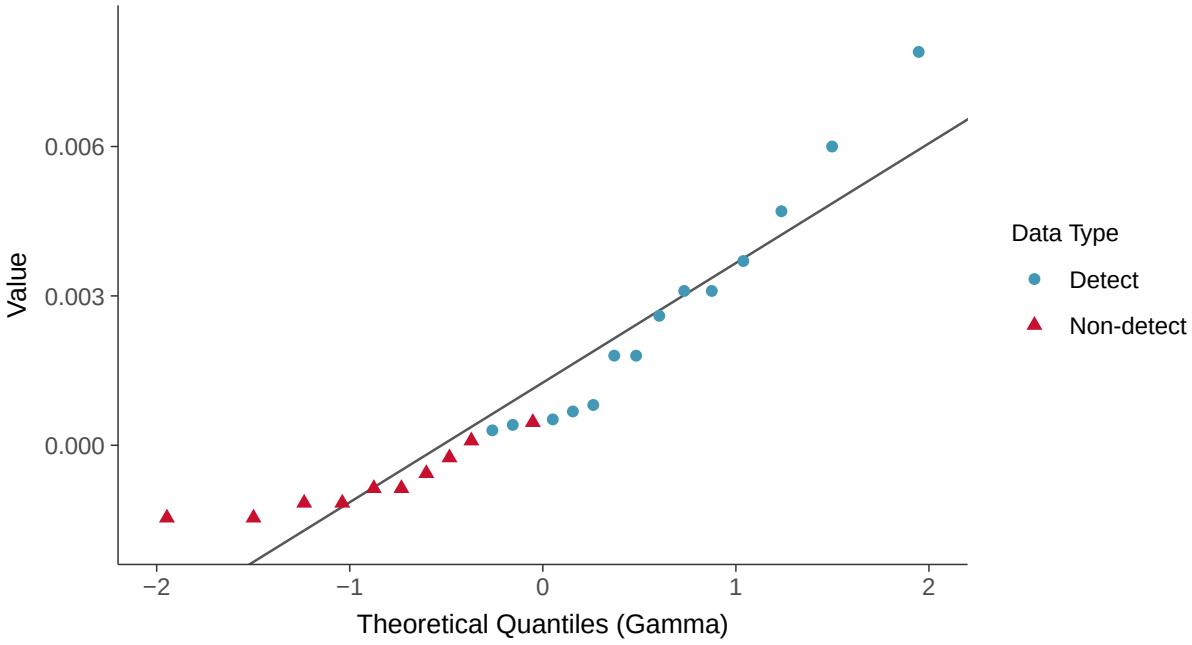
Lognormal Q-Q plot using ROS Imputed Estimates

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



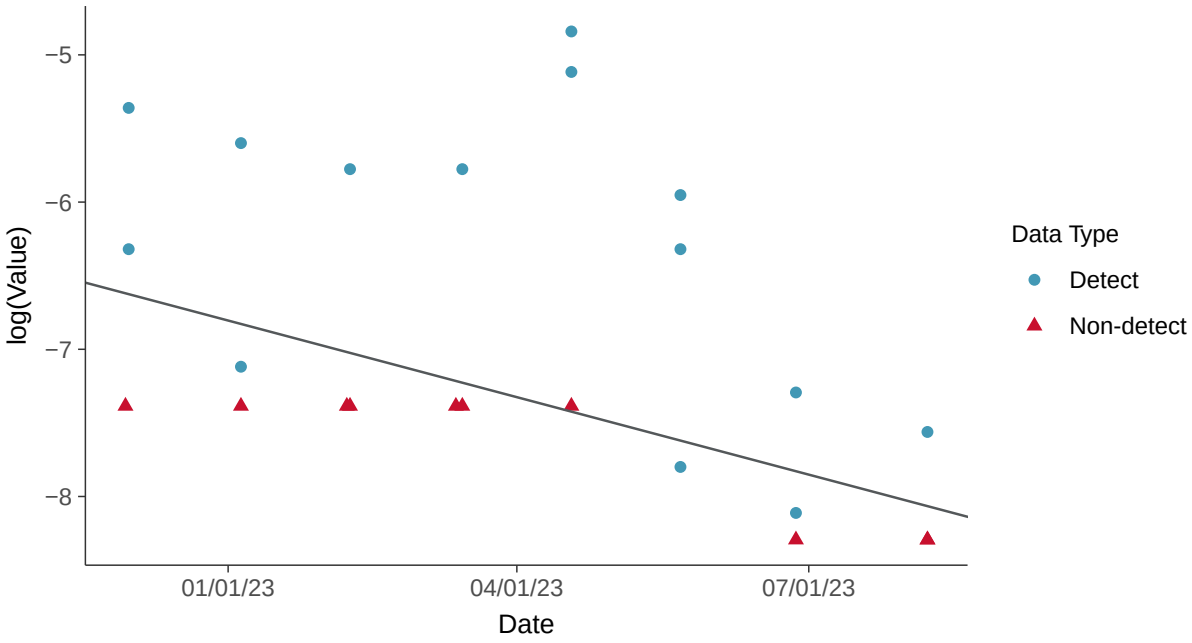
Gamma Q-Q plot using ROS Imputed Estimates

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



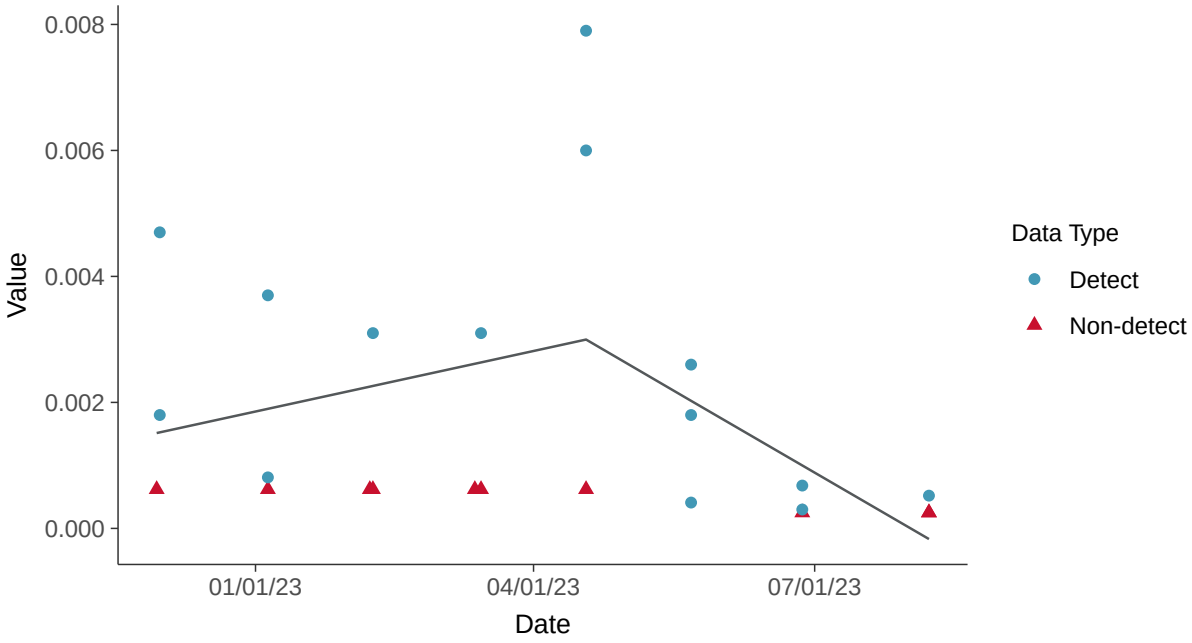
Trend Regression: Lognormal MLE

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Molybdenum, MW-27, MW-33, MW-34 (mg/L)

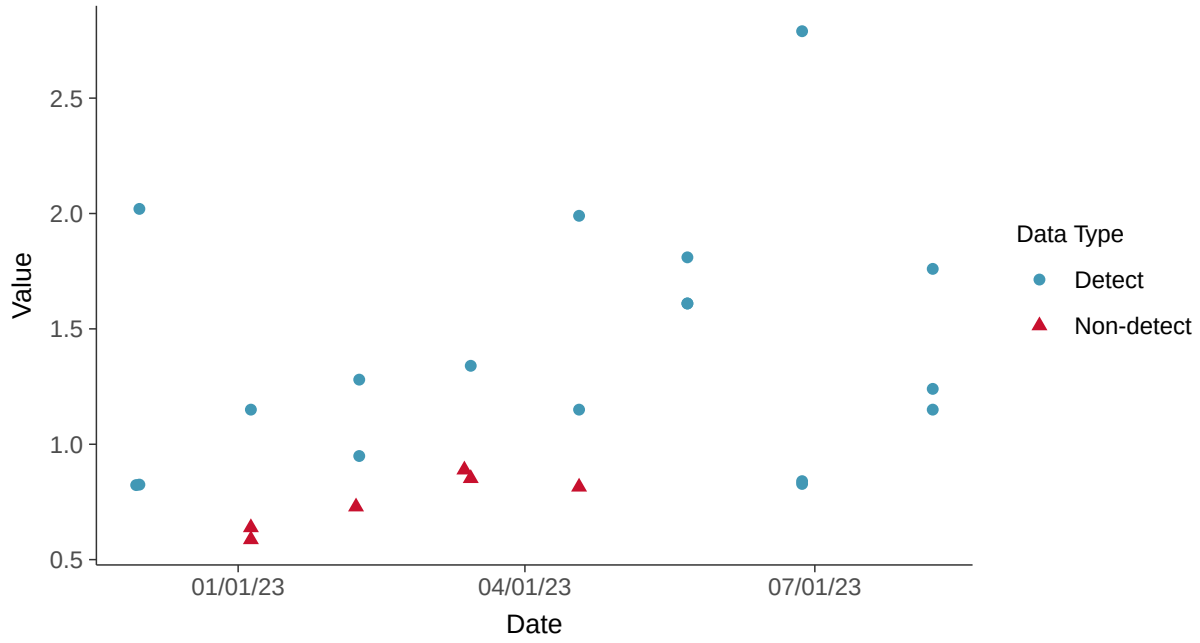


Appendix IV: Radium 226 and 228, MW-27, MW-33, MW-34

ID: 5_121

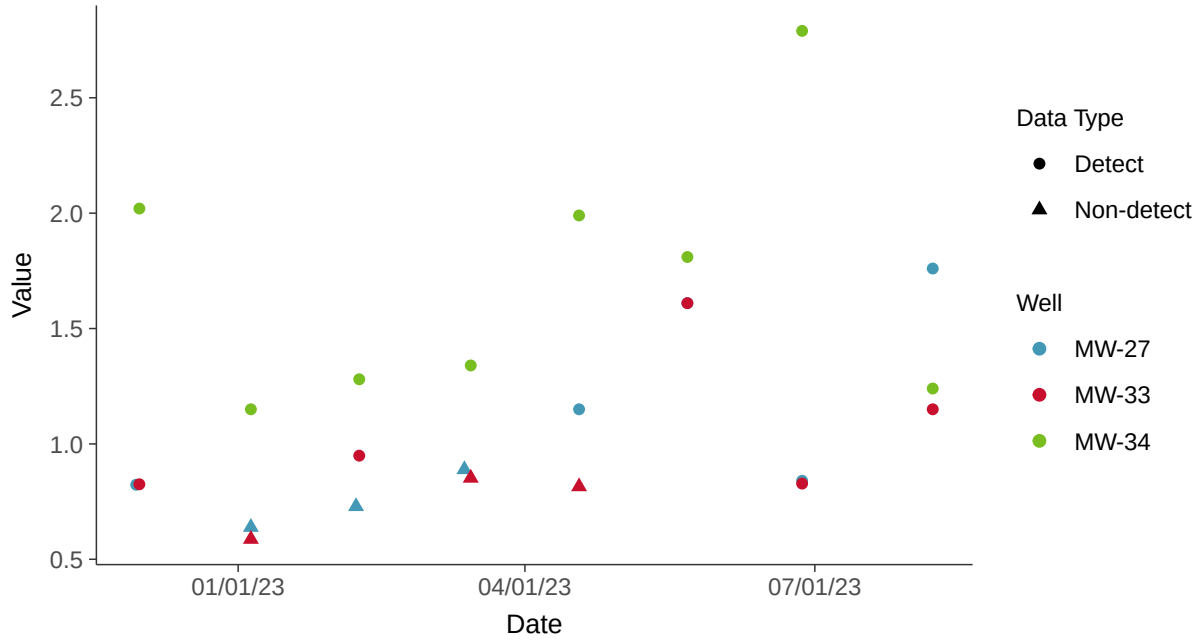
Scatter Plot

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



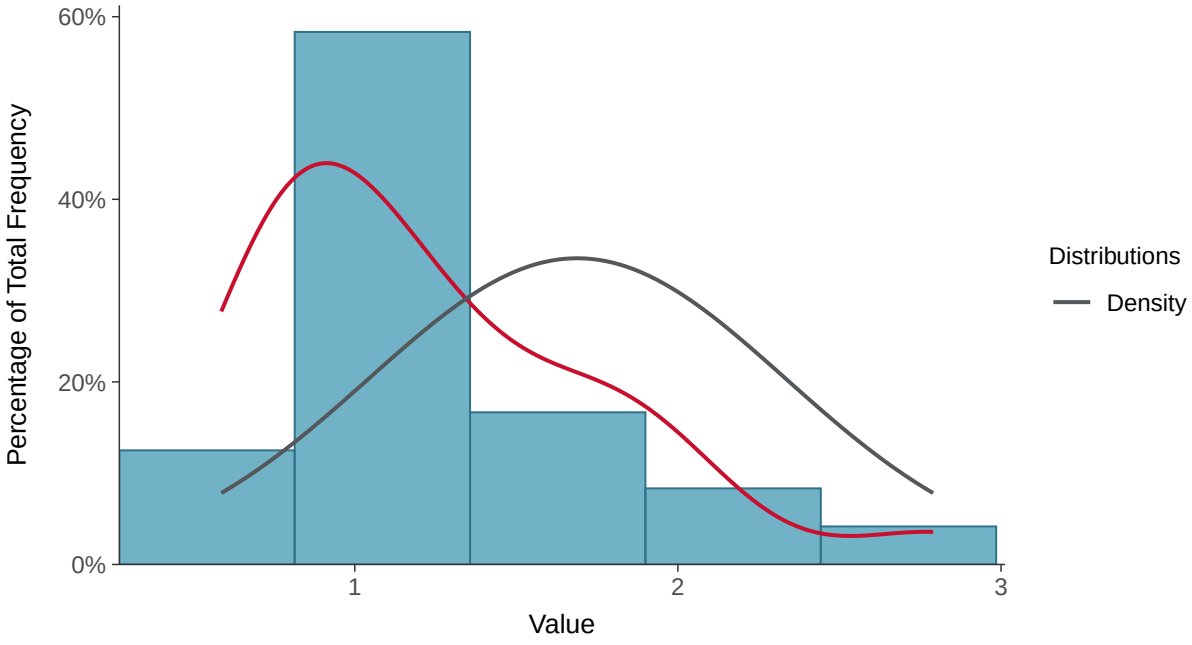
Scatter Plot by Well

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



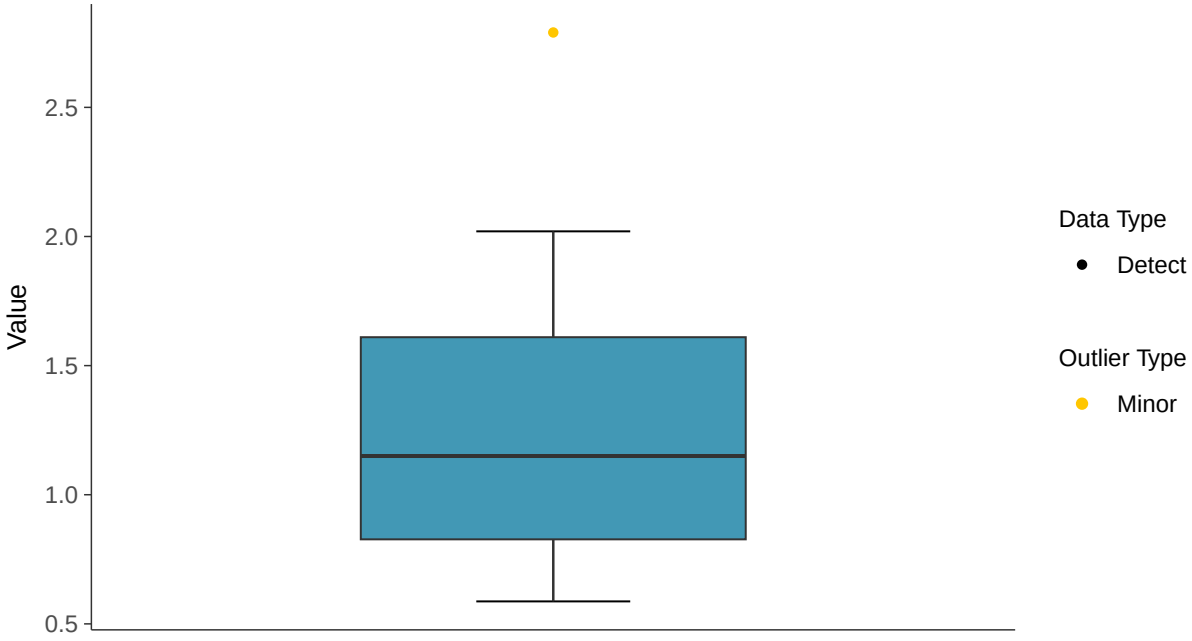
Histogram

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



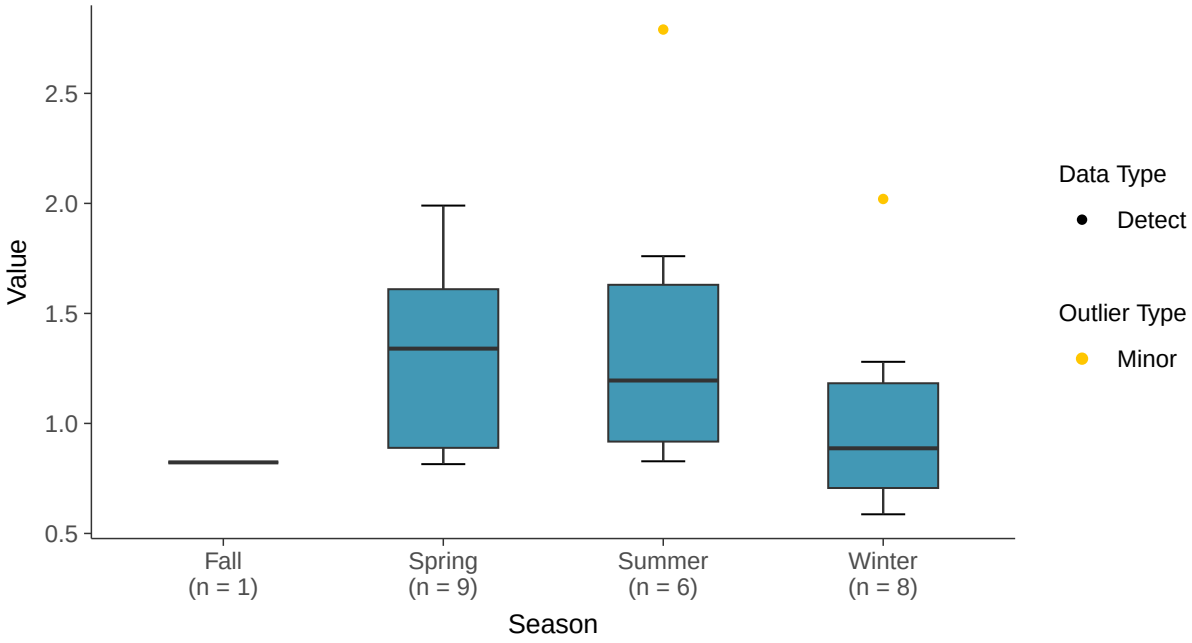
Boxplot

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



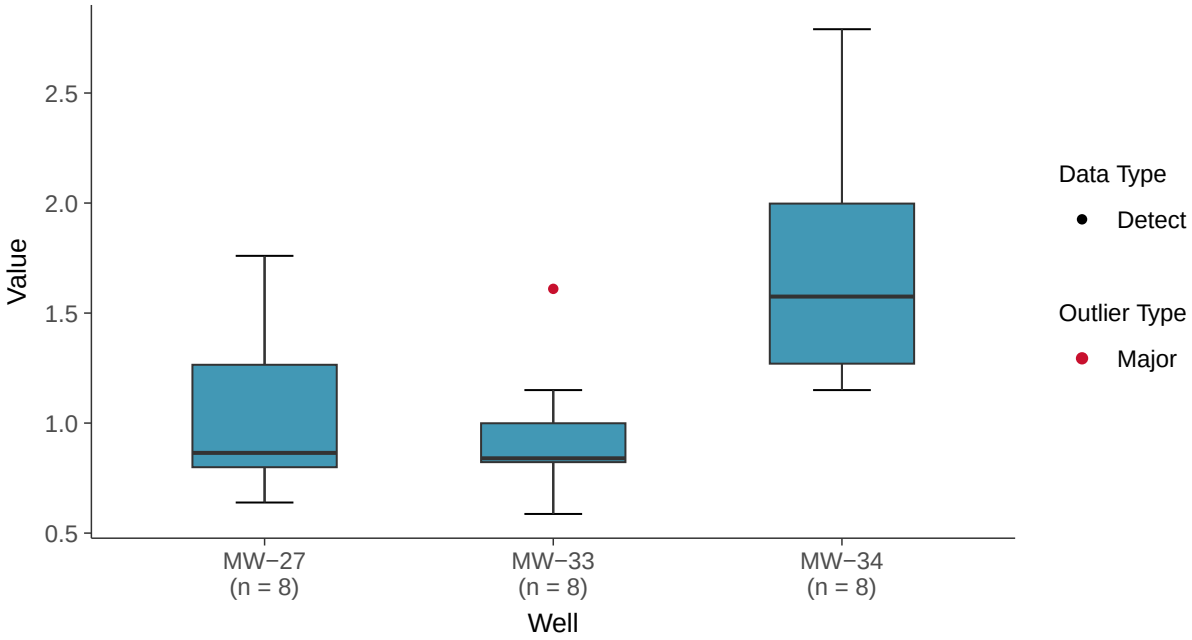
Boxplot by Season

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



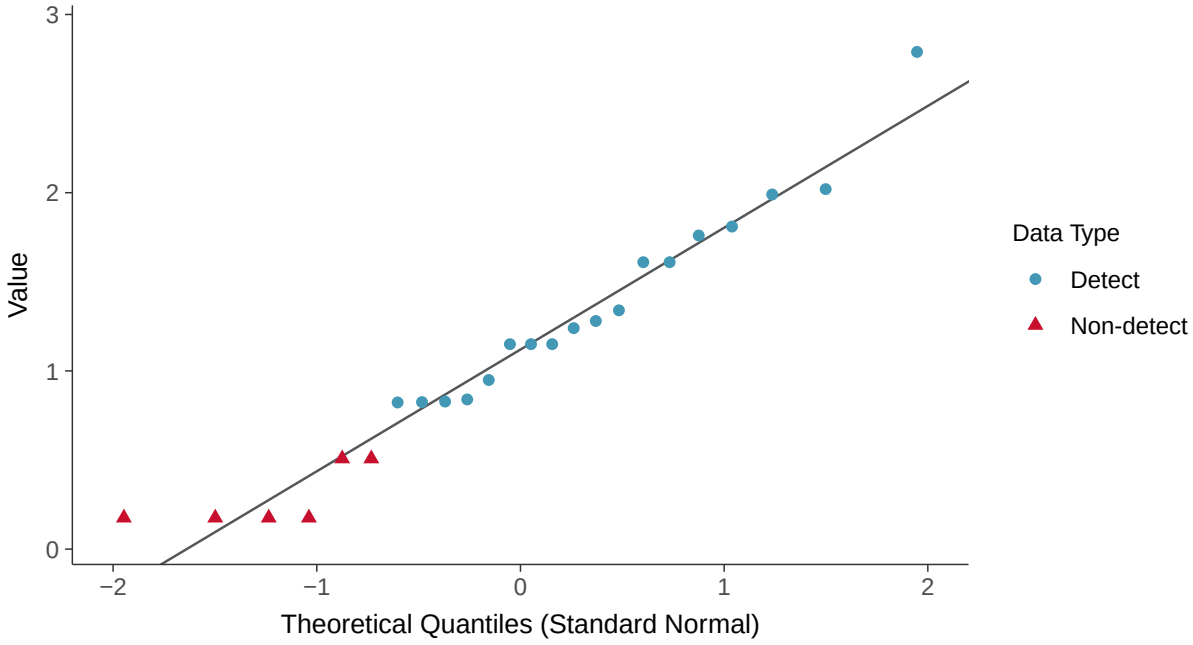
Boxplot by Well

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



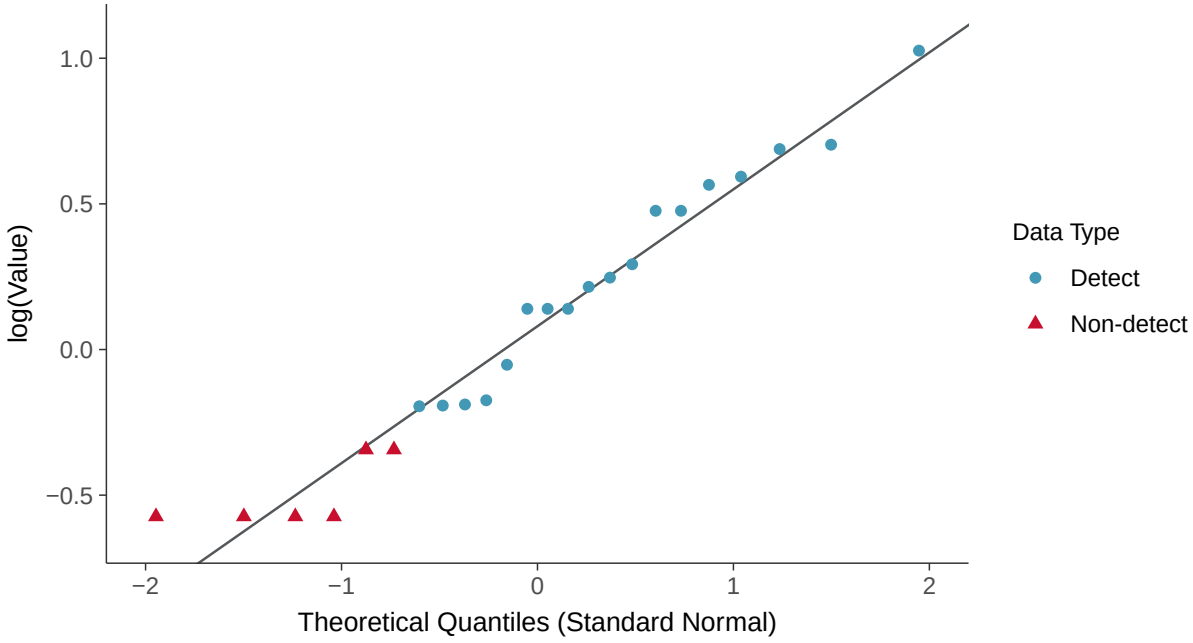
Normal Q-Q plot using ROS Imputed Estimates

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



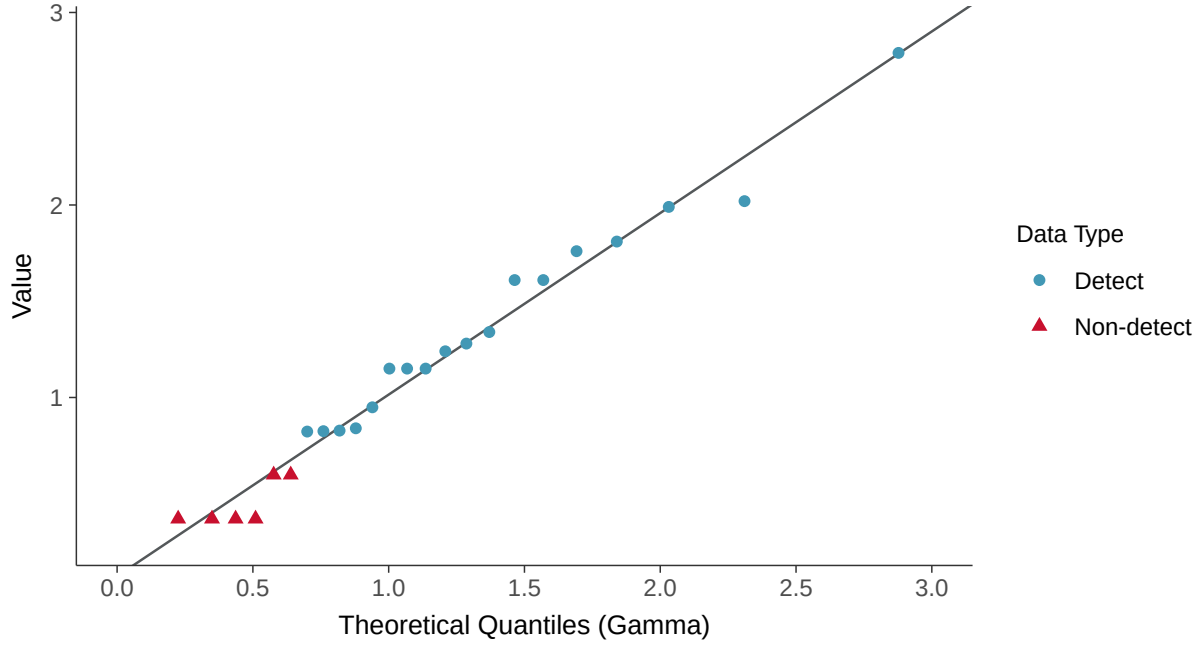
Lognormal Q-Q plot using ROS Imputed Estimates

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



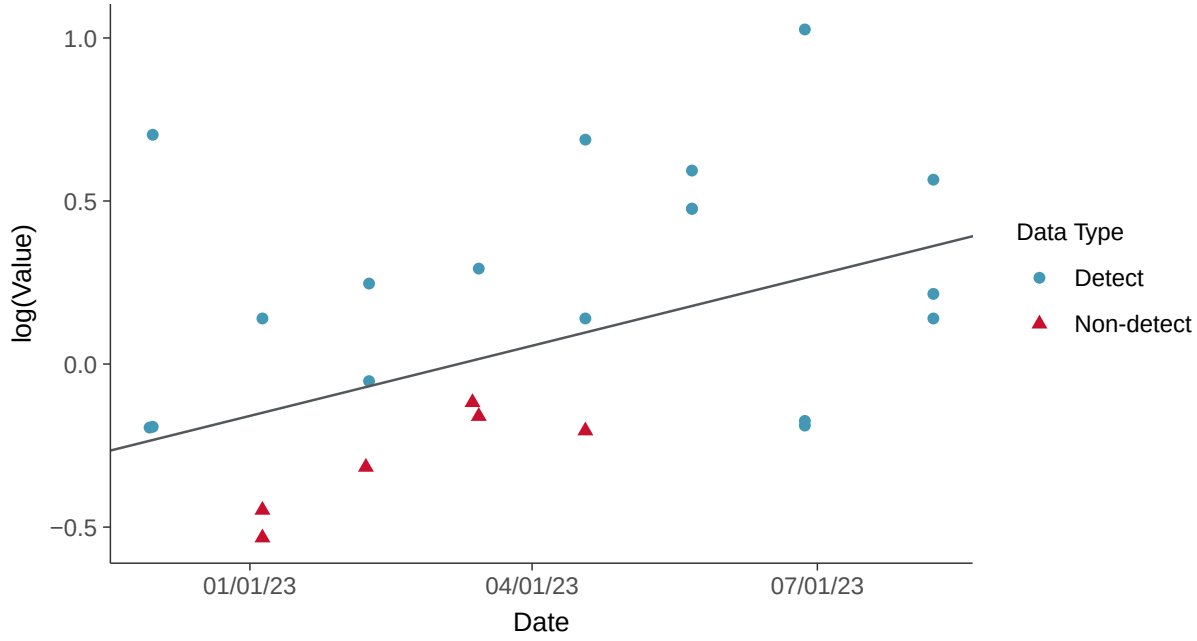
Gamma Q-Q plot using ROS Imputed Estimates

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



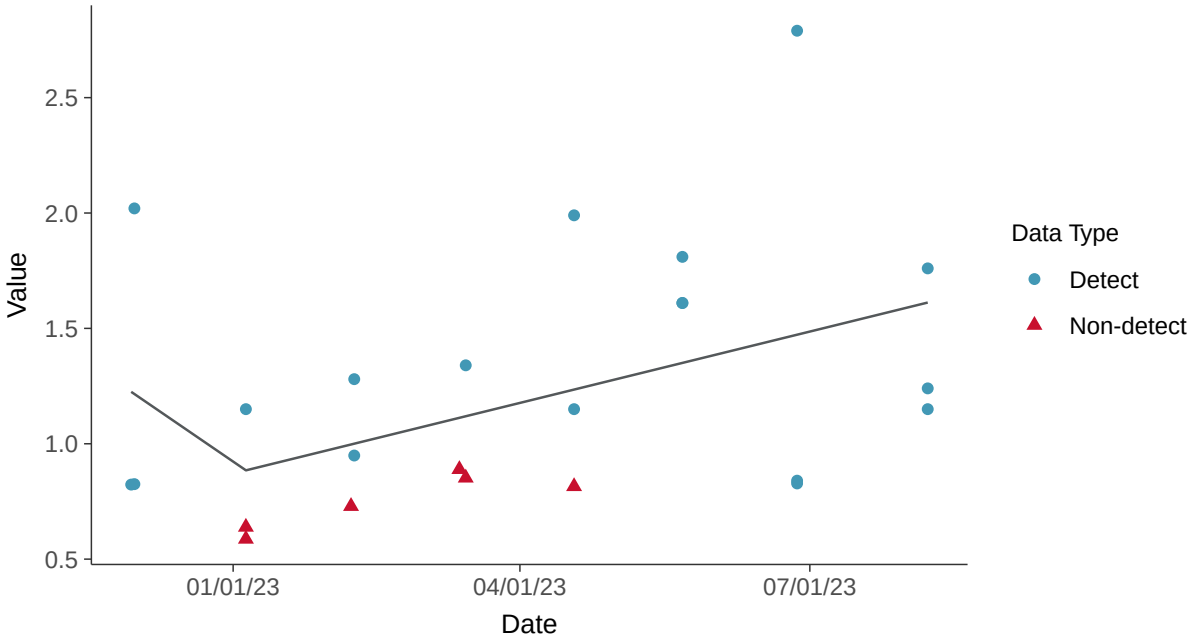
Trend Regression: Lognormal MLE

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



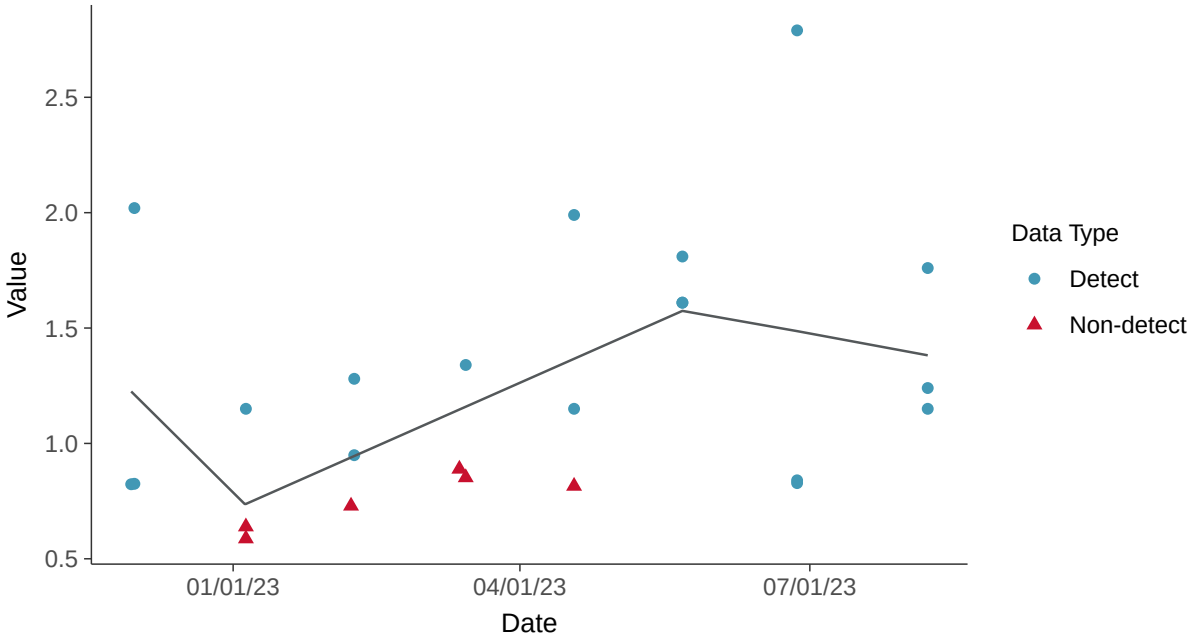
Trend Regression: Piecewise Linear-Linear

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



Trend Regression: Piecewise Linear-Linear-Linear

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)

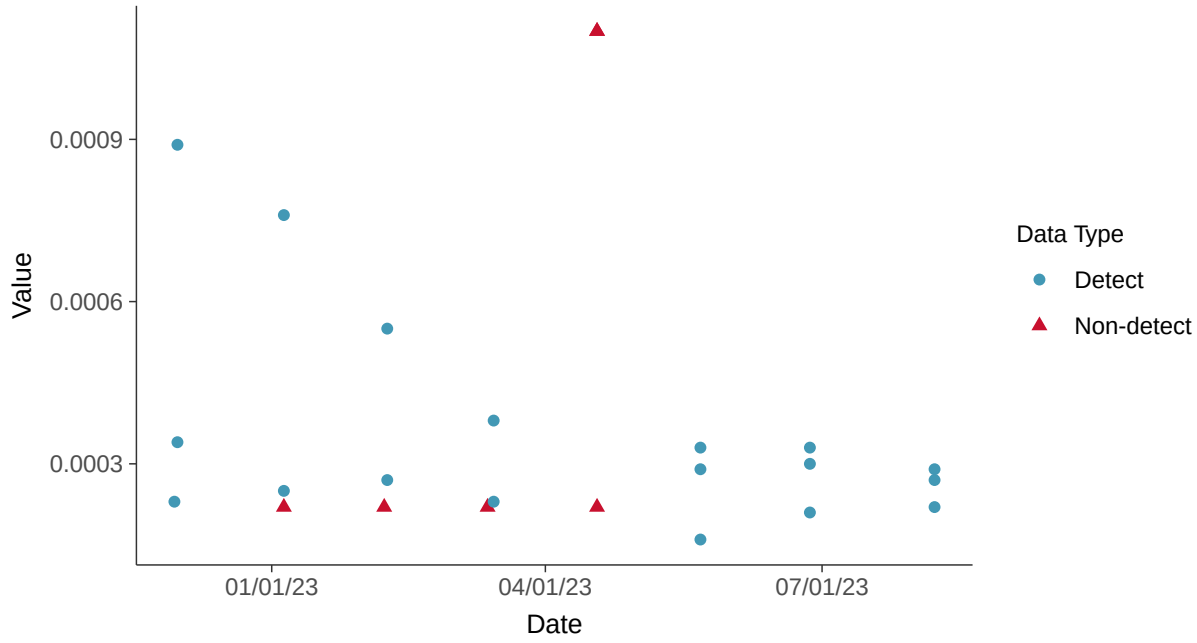


Appendix IV: Selenium, MW-27, MW-33, MW-34

ID: 5_122

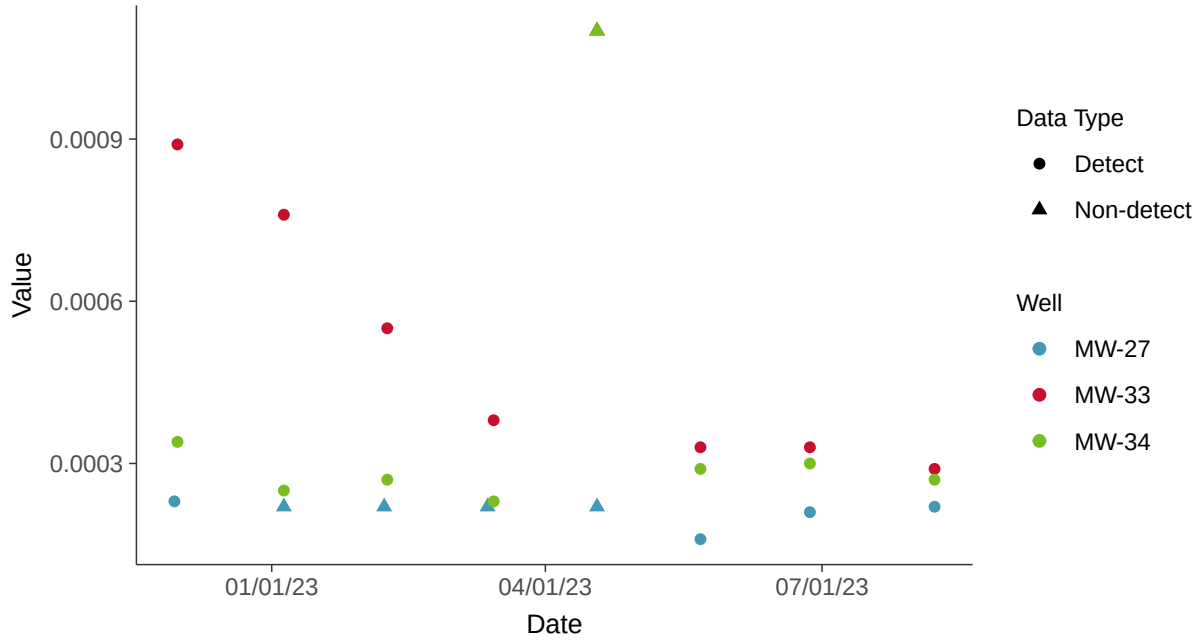
Scatter Plot

Selenium, MW-27, MW-33, MW-34 (mg/L)



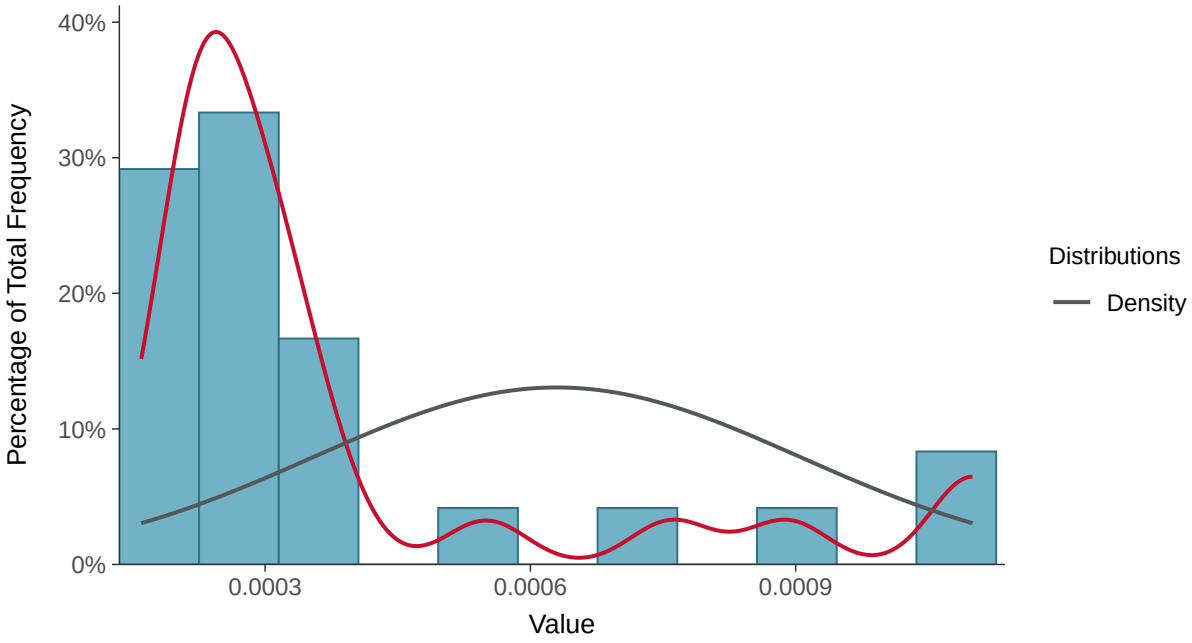
Scatter Plot by Well

Selenium, MW-27, MW-33, MW-34 (mg/L)



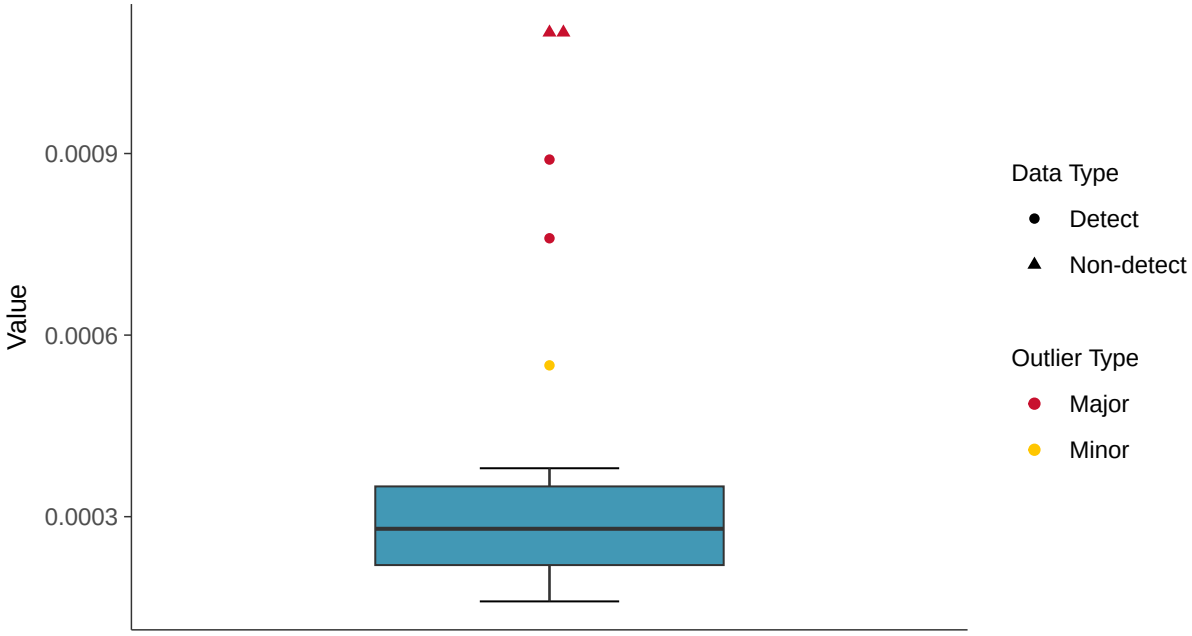
Histogram

Selenium, MW-27, MW-33, MW-34 (mg/L)



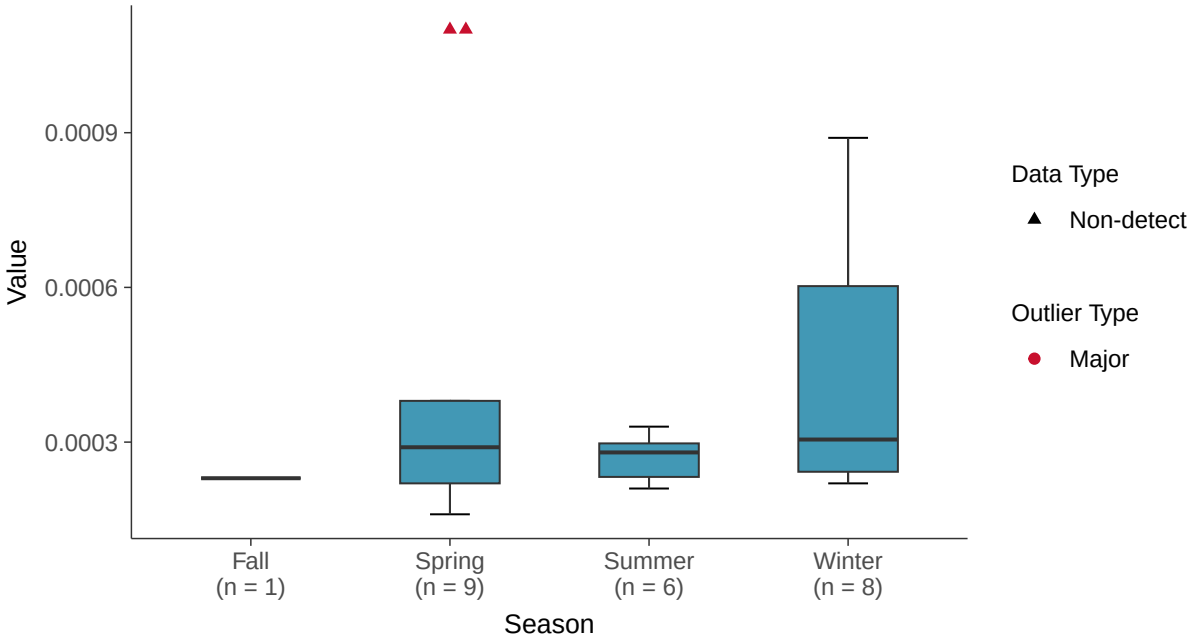
Boxplot

Selenium, MW-27, MW-33, MW-34 (mg/L)



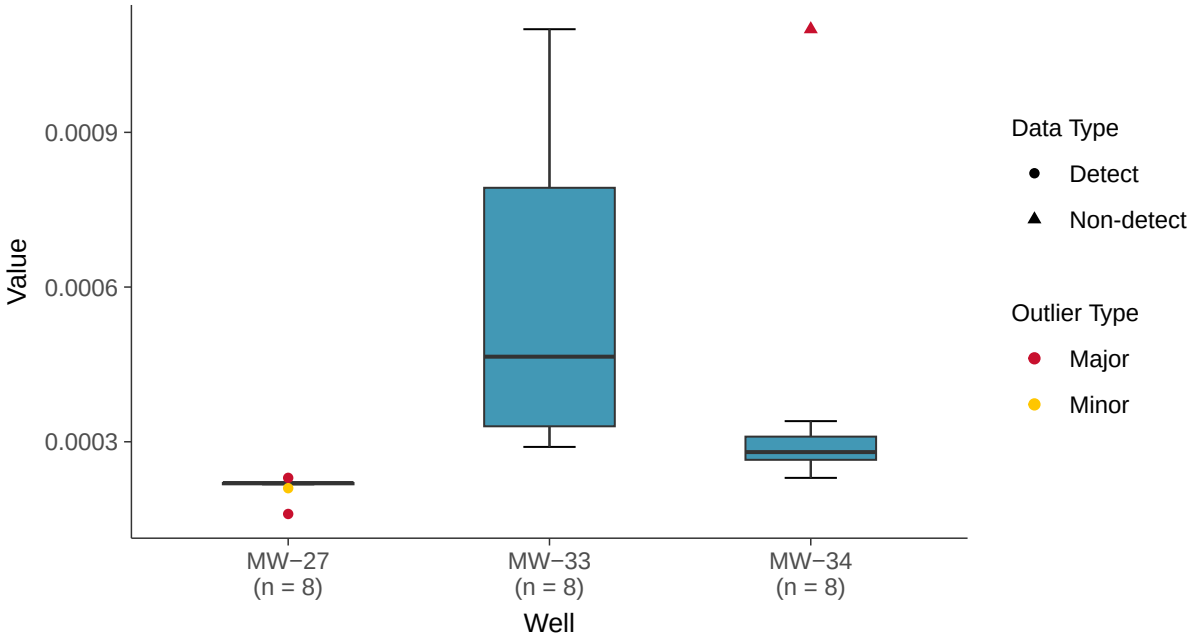
Boxplot by Season

Selenium, MW-27, MW-33, MW-34 (mg/L)



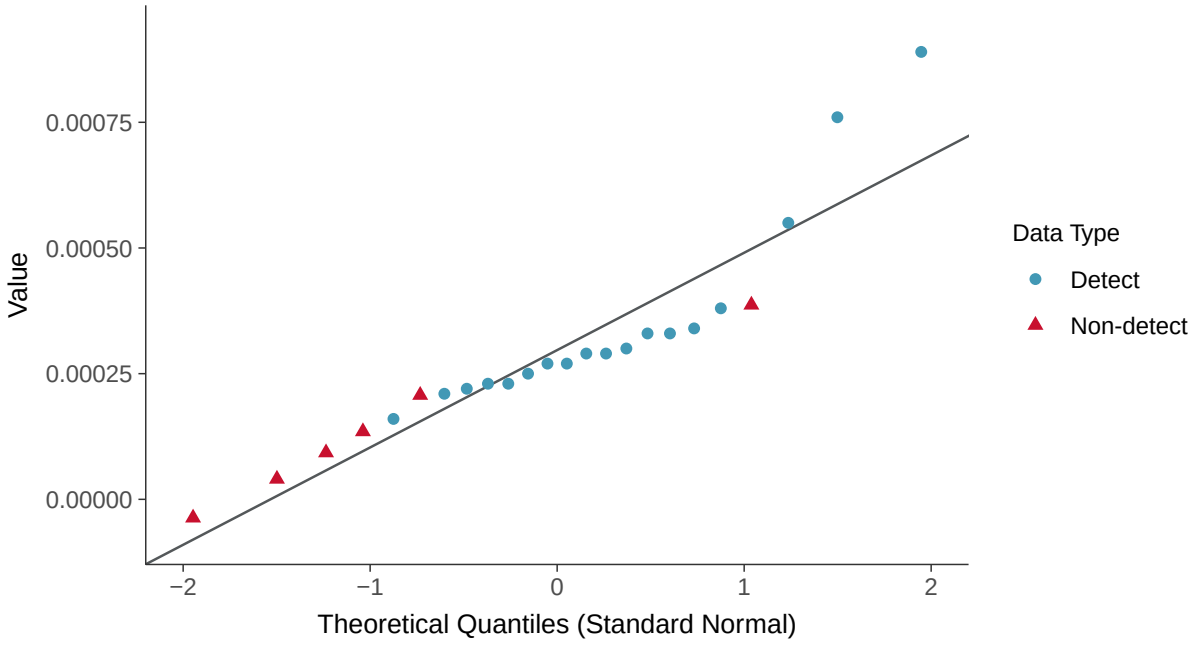
Boxplot by Well

Selenium, MW-27, MW-33, MW-34 (mg/L)



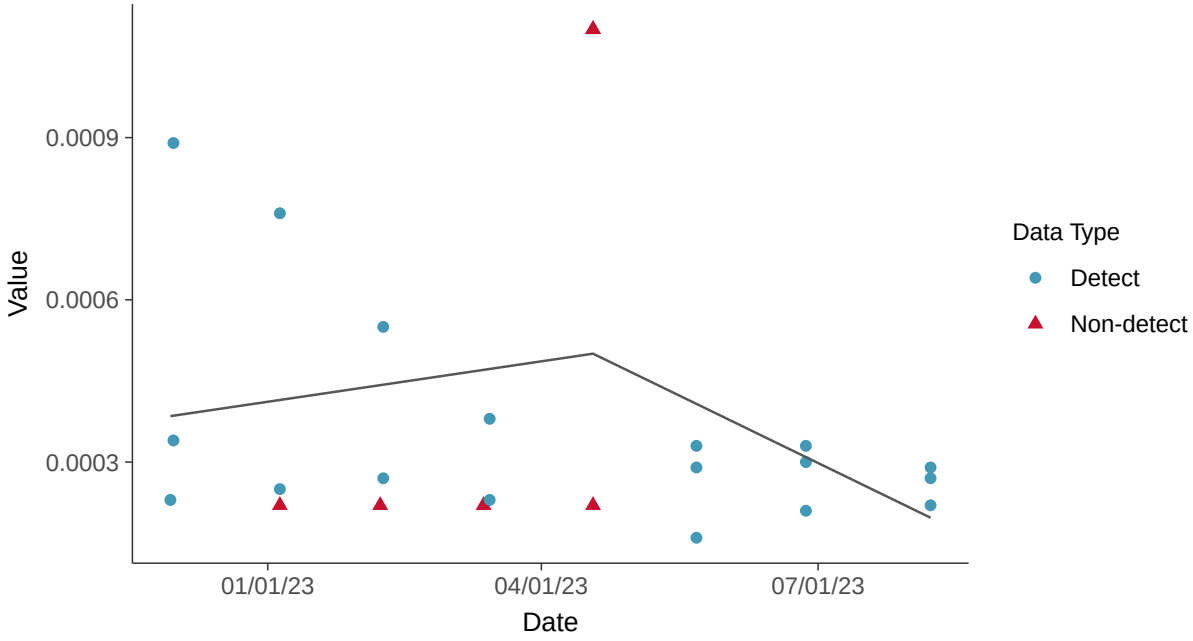
Normal Q-Q plot using ROS Imputed Estimates

Selenium, MW-27, MW-33, MW-34 (mg/L)



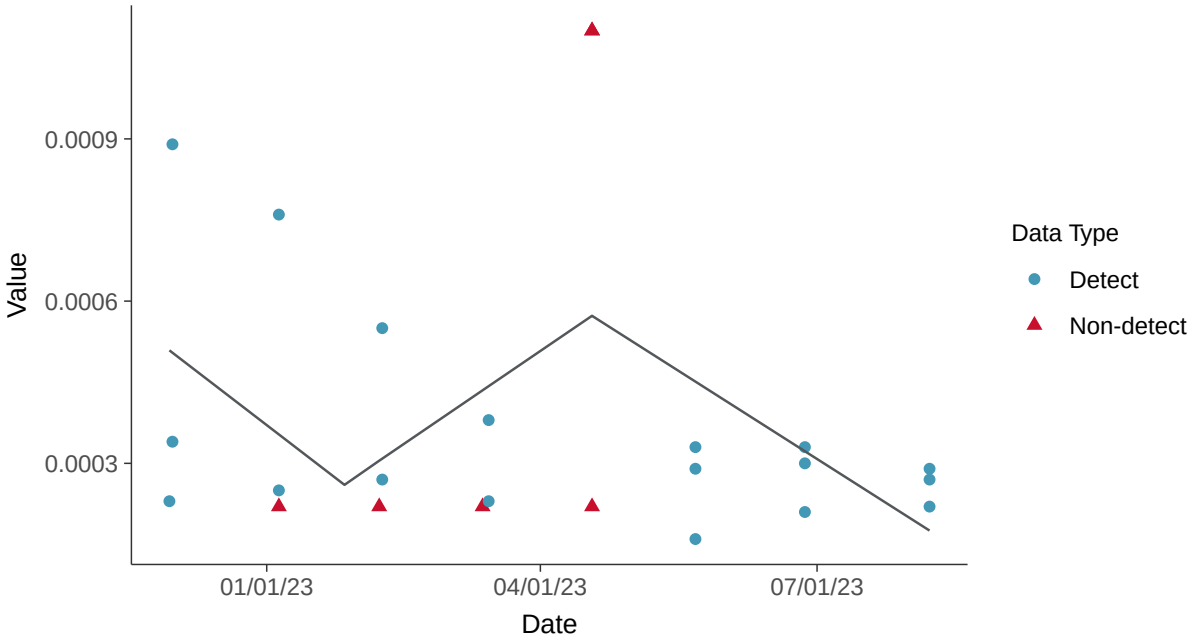
Trend Regression: Piecewise Linear-Linear

Selenium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Selenium, MW-27, MW-33, MW-34 (mg/L)

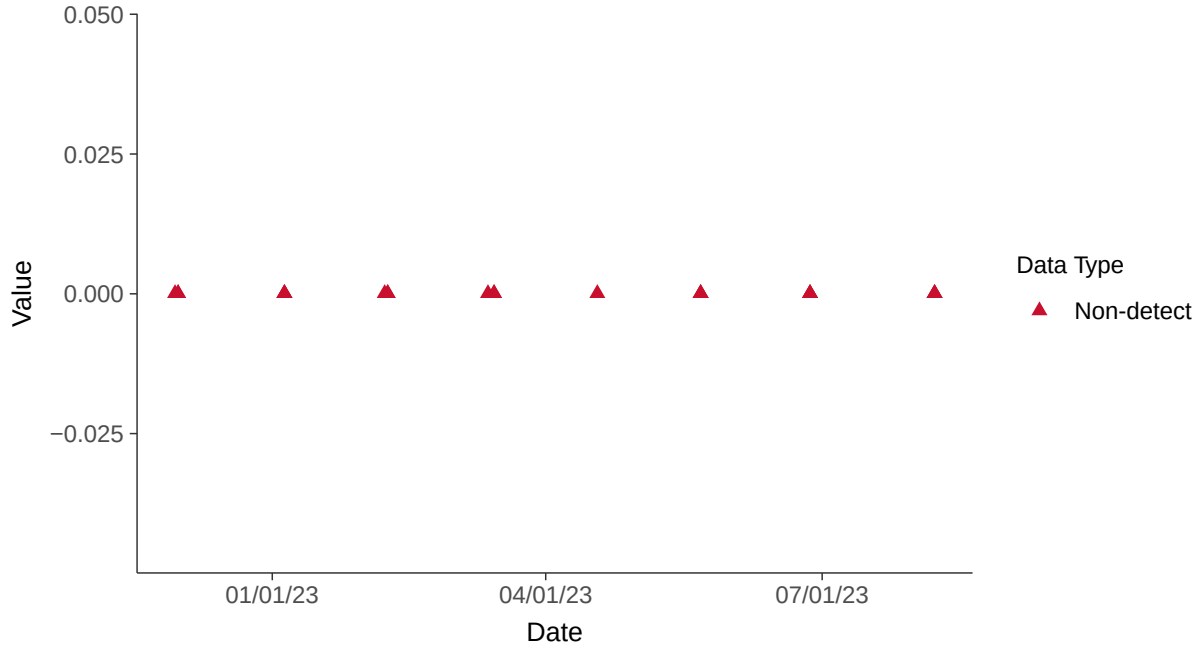


Appendix IV: Thallium, MW-27, MW-33, MW-34

ID: 5_125

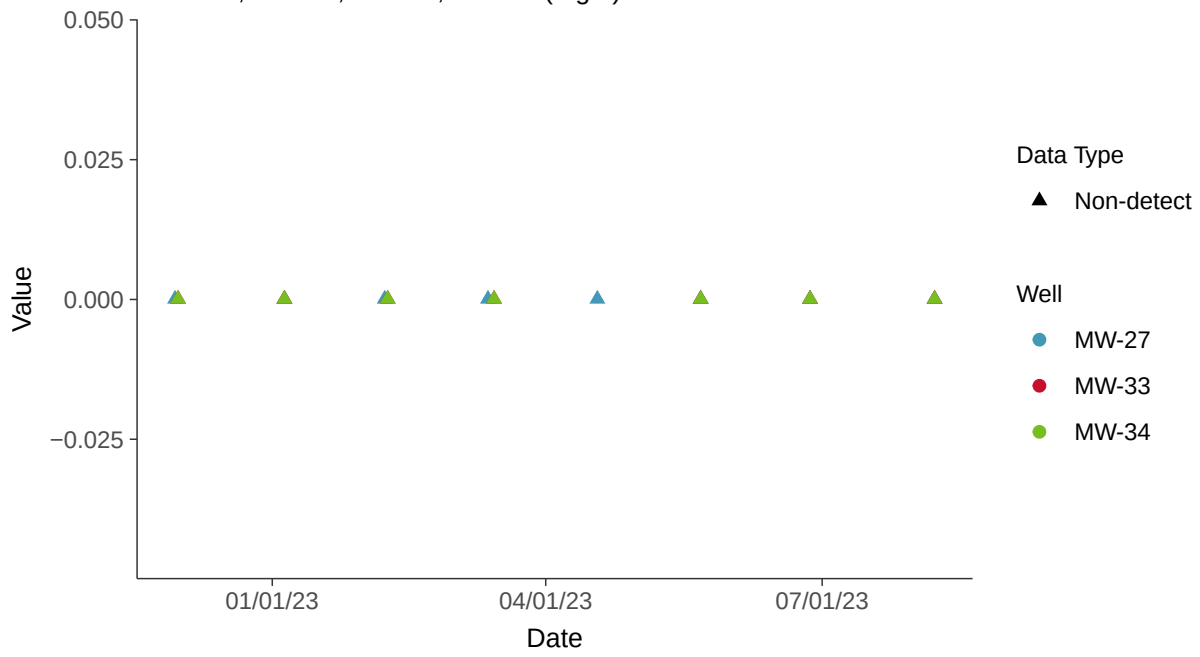
Scatter Plot

Thallium, MW-27, MW-33, MW-34 (mg/L)



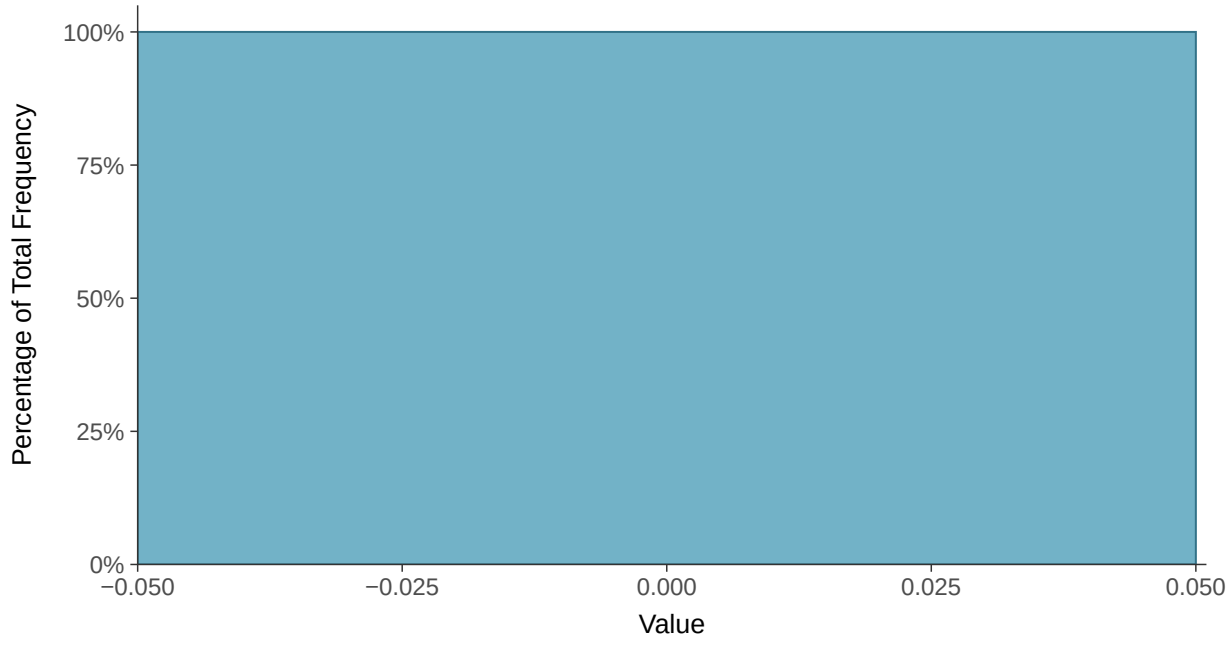
Scatter Plot by Well

Thallium, MW-27, MW-33, MW-34 (mg/L)



Histogram

Thallium, MW-27, MW-33, MW-34 (mg/L)

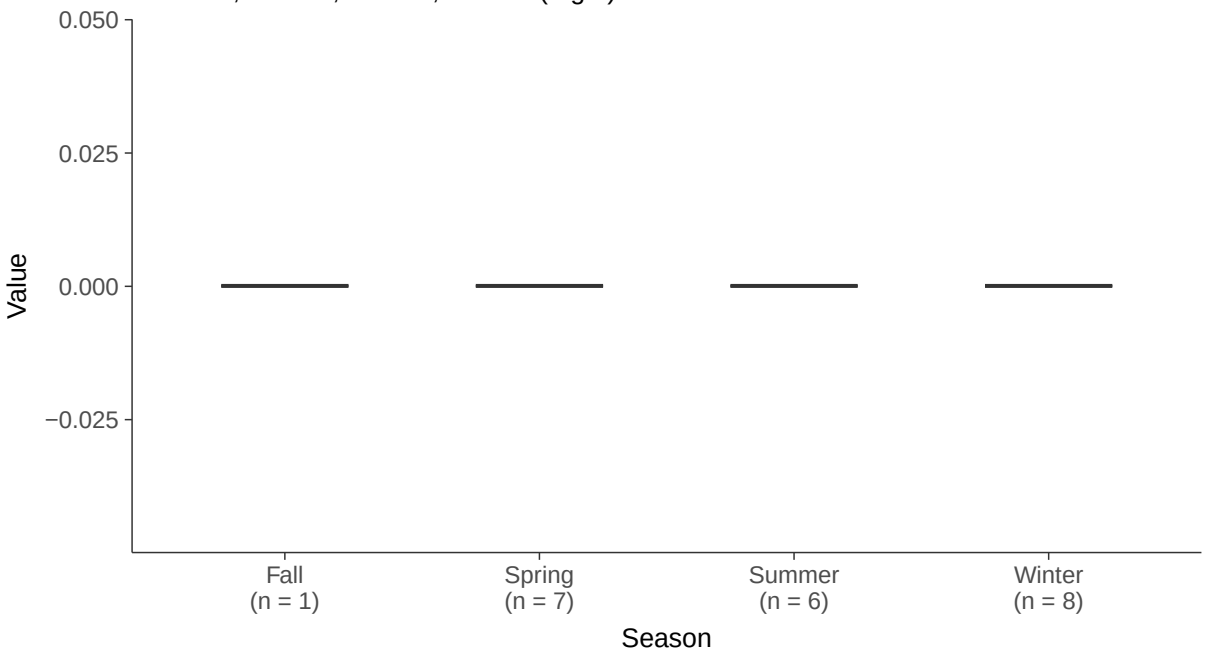


Boxplot

Thallium, MW-27, MW-33, MW-34 (mg/L)

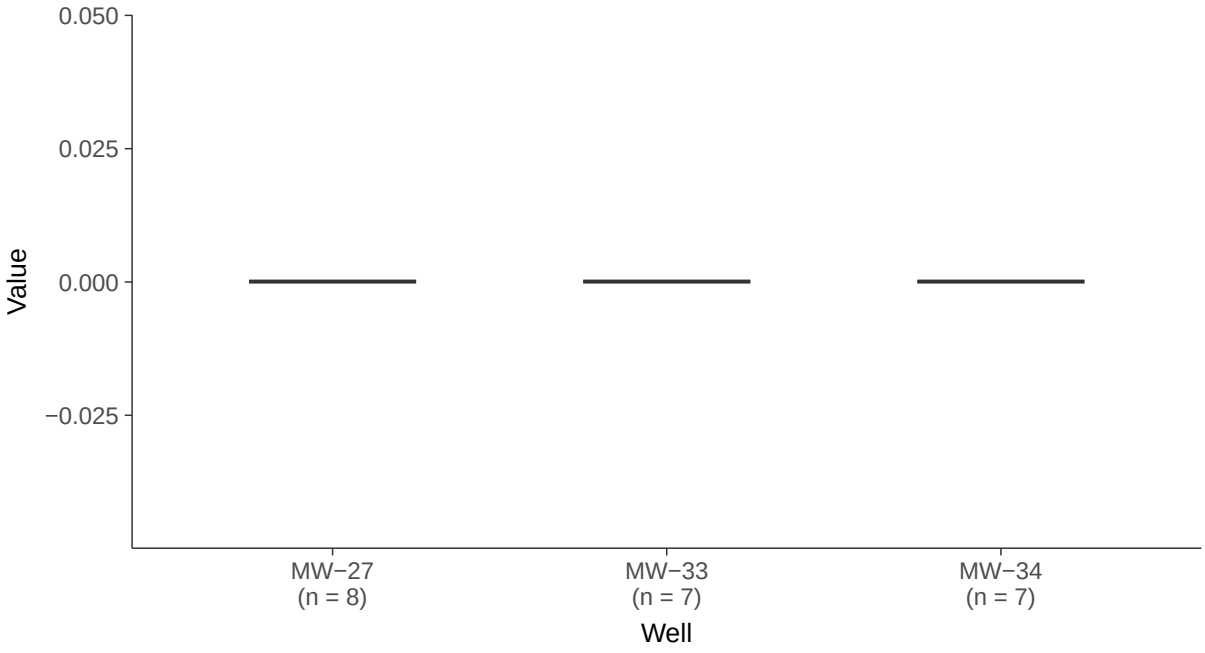
Boxplot by Season

Thallium, MW-27, MW-33, MW-34 (mg/L)



Boxplot by Well

Thallium, MW-27, MW-33, MW-34 (mg/L)



Appendix D

State Rule Statistical Analysis Tables

Table 1: Summary Statistics, Non-Detects Included

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Date Range	Distributions Fit[a]	Recommended Distribution	Mean	Median	Minimum	Maximum	SD	CV	MAD/0.675	Skewness	Kurtosis
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Gamma	47.5	21.5	1.00	170	55.6	1.17	21.5	1.33	0.320
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	1.01	0.190	0.0670	4.00	1.30	1.29	0.169	1.20	0.00497
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	180	180	100	220	30.7	0.171	37.0	-0.714	0.394
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	46.5	35.5	17.0	120	30.3	0.650	20.7	1.23	0.574
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	6.90	6.86	6.53	7.66	0.235	0.0341	0.207	1.36	3.69
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Nonparametric	19.8	2.75	0.410	100	28	1.41	3.47	1.45	1.39
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	699	705	460	920	108	0.155	126	-0.168	-0.380
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000325	0.000150	0.0000600	0.00120	0.000351	1.08	0.0000748	1.42	0.548
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.00155	0.00110	0.000690	0.00400	0.00101	0.650	0.000400	1.44	0.845
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.246	0.165	0.0730	0.580	0.190	0.770	0.123	0.785	-1.19
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	2022-11-30 to 2023-08-07		Nonparametric	0.0000696	0.0000520	0.0000520	0.000260	0.0000587	0.842	0	3.22	9.11
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.0000719	0.0000750	0.0000320	0.000160	0.0000426	0.592	0.0000607	0.992	0.0359
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Normal	Normal	0.0152	0.0129	0.000880	0.0340	0.0116	0.759	0.0151	0.215	-1.60
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.000952	0.000825	0.000240	0.00200	0.000515	0.541	0.000600	0.547	-0.971
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	24	14	58%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Nonparametric	0.000733	0.000220	0.000100	0.00690	0.00138	1.88	0.000141	4.23	19.3
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.0269	0.00870	0.00410	0.100	0.0323	1.20	0.00526	1.27	-0.00151
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	24	24	100%	2022-11-30 to 2023-08-07		Nonparametric	0.000160	0.000160	0.000160	0.000160	0	0	0	NA	NA
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Gamma	0.00177	0.000620	0.000250	0.00790	0.00204	1.15	0.000511	1.74	2.63
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	1.24	1.15	0.587	2.79	0.541	0.438	0.483	1.20	1.36
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000391	0.000280	0.000160	0.00110	0.000279	0.713	0.0000889	1.82	2.15
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	24	24	100%	2022-11-30 to 2023-08-07		Nonparametric	0.000100	0.0000750	0.0000750	0.000380	0.0000861	0.858	0	3.22	9.12
6_111	MW-27, MW-33, MW-34	Part 115	Copper	mg/L	24	4	17%	2022-11-30 to 2023-08-07	Lognormal	Nonparametric	0.00371	0.000770	0.000200	0.0200	0.00584	1.57	0.000830	1.84	2.35
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	29.5	9.05	1.20	83.0	32.9	1.11	7.93	0.761	-1.47
6_119	MW-27, MW-33, MW-34	Part 115	Nickel	mg/L	24	2	8%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.00594	0.00160	0.000650	0.0230	0.00754	1.27	0.00124	1.24	-0.102
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	24	23	96%	2022-11-30 to 2023-08-07		Nonparametric	0.0000692	0.0000500	0.0000500	0.000250	0.0000570	0.824	0	3.01	8.02
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	24	18	75%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.000860	0.000620	0.000620	0.00310	0.000694	0.807	0	3.15	8.81
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	24	6	25%	2022-11-30 to 2023-08-07	Lognormal	Lognormal	0.00519	0.00185	0.00120	0.0310	0.00712	1.37	0.000963	2.64	7.47

[a] Non-detects are excluded from goodness-of-fit tests.

Table 2: Summary Statistics, Non-Detects Excluded

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Date Range	Distributions Fit	Recommended Distribution	Mean	Median	Minimum	Maximum	SD	CV	MAD/0.675	Skewness	Kurtosis
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Gamma	47.5	21.5	1.00	170	55.6	1.17	21.5	1.33	0.320
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	1.01	0.190	0.0670	4.00	1.30	1.29	0.169	1.20	0.00497
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	180	180	100	220	30.7	0.171	37.0	-0.714	0.394
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	46.5	35.5	17.0	120	30.3	0.650	20.7	1.23	0.574
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	6.90	6.86	6.53	7.66	0.235	0.0341	0.207	1.36	3.69
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Nonparametric	23.7	5.55	0.560	100	29.2	1.23	7.39	1.20	0.680
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	699	705	460	920	108	0.155	126	-0.168	-0.380
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000357	0.000160	0.0000600	0.00120	0.000365	1.02	0.0000963	1.22	-0.0406
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.00155	0.00110	0.000690	0.00400	0.00101	0.650	0.000400	1.44	0.845
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.246	0.165	0.0730	0.580	0.190	0.770	0.123	0.785	-1.19
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	2022-11-30 to 2023-08-07		Nonparametric	0.0000590	0.0000590	0.0000590	0.0000590	NA	NA	0	NA	NA
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.0000950	0.000100	0.0000360	0.000150	0.0000517	0.544	0.0000741	-0.136	-2.76
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Normal	Normal	0.0159	0.0160	0.00210	0.0340	0.0114	0.718	0.0163	0.155	-1.62
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.000972	0.000830	0.000240	0.00200	0.000517	0.533	0.000622	0.475	-1.03
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	0.290	0.275	0.200	0.420	0.0676	0.233	0.0667	0.639	-0.751
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	24	14	58%	2022-11-30 to 2023-08-07	Gamma; Lognormal	Nonparametric	0.00131	0.000805	0.000150	0.00690	0.00201	1.54	0.000563	2.89	8.71
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.0276	0.00860	0.00410	0.100	0.0328	1.19	0.00519	1.20	-0.186
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Gamma	0.00267	0.00220	0.000300	0.00790	0.00229	0.857	0.00224	1.03	0.576
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Normal	1.40	1.26	0.823	2.79	0.531	0.380	0.570	1.06	1.19
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.000350	0.000290	0.000160	0.000890	0.000193	0.552	0.0000815	1.98	3.44
6_111	MW-27, MW-33, MW-34	Part 115	Copper	mg/L	24	4	17%	2022-11-30 to 2023-08-07	Lognormal	Nonparametric	0.00437	0.000945	0.000220	0.0200	0.00620	1.42	0.00101	1.57	1.32
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	24	0	0%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	29.5	9.05	1.20	83.0	32.9	1.11	7.93	0.761	-1.47
6_119	MW-27, MW-33, MW-34	Part 115	Nickel	mg/L	24	2	8%	2022-11-30 to 2023-08-07	Nonparametric	Nonparametric	0.00630	0.00160	0.000670	0.0230	0.00777	1.23	0.00123	1.11	-0.454
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	24	23	96%	2022-11-30 to 2023-08-07		Nonparametric	0.000110	0.000110	0.000110	0.000110	NA	NA	0	NA	NA
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	24	18	75%	2022-11-30 to 2023-08-07	Gamma; Lognormal; Normal	Nonparametric	0.000755	0.000740	0.000650	0.000930	0.000112	0.148	0.000126	0.665	-0.766
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	24	6	25%	2022-11-30 to 2023-08-07	Lognormal	Lognormal	0.00652	0.00295	0.00130	0.0310	0.00782	1.20	0.00237	2.25	5.30

Table 3: Goodness-of-Fit Tests, Non-Detects Excluded

								Normal				Lognormal				Gamma						
								S-W		Lilliefors		S-W		Lilliefors		K-S		A-D				
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Stat.	p-Value	Log-SD (NDs excl.)	ProUCL Distributions Fit	Recommended Distribution
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	0.751	0.000	0.268	0.000	0.960	0.442	0.089	0.890	0.168	>= 0.10	0.619	>= 0.10	1.373	Gamma; Lognormal	Gamma
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	0.733	0.000	0.333	0.000	0.853	0.003	0.214	0.006	0.256	< 0.01	1.872	< 0.01	1.456	Nonparametric	Nonparametric
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	0.941	0.167	0.130	0.363	0.894	0.016	0.163	0.097	0.154	>= 0.10	0.567	>= 0.10	0.189	Gamma; Lognormal; Normal	Normal
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	0.828	0.001	0.199	0.015	0.914	0.042	0.191	0.024	0.204	0.01 <= p < 0.05	0.997	0.01 <= p < 0.05	0.592	Nonparametric	Nonparametric
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	0.914	0.043	0.167	0.083	0.942	0.180	0.123	0.460	0.137	>= 0.10	0.566	>= 0.10	0.226	Gamma; Lognormal; Normal	Normal
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	0.907	0.030	0.108	0.658	0.921	0.063	0.104	0.716	0.104	>= 0.10	0.442	>= 0.10	0.033	Gamma; Lognormal; Normal	Normal
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	0.789	0.001	0.268	0.001	0.902	0.044	0.181	0.085	0.195	0.05 <= p < 0.10	0.953	0.01 <= p < 0.05	1.766	Gamma; Lognormal	Nonparametric
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	0.962	0.470	0.139	0.270	0.947	0.228	0.154	0.150	0.153	>= 0.10	0.535	>= 0.10	0.161	Gamma; Lognormal; Normal	Normal
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	0.744	0.000	0.302	0.000	0.885	0.018	0.189	0.048	0.233	< 0.01	1.545	< 0.01	0.949	Nonparametric	Nonparametric
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	0.764	0.000	0.235	0.001	0.880	0.008	0.197	0.017	0.210	< 0.01	1.523	< 0.01	0.546	Nonparametric	Nonparametric
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	0.782	0.000	0.240	0.001	0.863	0.004	0.188	0.027	0.194	0.01 <= p < 0.05	1.491	< 0.01	0.770	Nonparametric	Nonparametric
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA		Nonparametric
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	0.895	0.383	0.213	0.639	0.885	0.331	0.222	0.576	0.230	>= 0.10	0.390	>= 0.10	0.639	Gamma; Lognormal; Normal	Nonparametric
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	0.878	0.009	0.178	0.057	0.867	0.006	0.197	0.021	0.190	0.01 <= p < 0.05	1.094	< 0.01	0.980	Normal	Normal
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	0.928	0.098	0.173	0.072	0.956	0.396	0.168	0.093	0.164	>= 0.10	0.426	>= 0.10	0.580	Gamma; Lognormal; Normal	Normal
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	0.914	0.043	0.167	0.083	0.942	0.180	0.123	0.460	0.137	>= 0.10	0.566	>= 0.10	0.226	Gamma; Lognormal; Normal	Normal
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	24	14	58%	0.565	0.000	0.373	0.000	0.923	0.383	0.189	0.398	0.273	0.05 <= p < 0.10	0.684	0.05 <= p < 0.10	1.149	Gamma; Lognormal	Nonparametric
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	0.709	0.000	0.335	0.000	0.821	0.001	0.254	0.000	0.296	< 0.01	2.278	< 0.01	1.143	Nonparametric	Nonparametric
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	24	24	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA		Nonparametric
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	0.895	0.094	0.150	0.531	0.941	0.426	0.156	0.475	0.153	>= 0.10	0.283	>= 0.10	1.049	Gamma; Lognormal; Normal	Gamma
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	0.899	0.056	0.155	0.306	0.942	0.308	0.115	0.769	0.112	>= 0.10	0.397	>= 0.10	0.360	Gamma; Lognormal; Normal	Normal
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	0.736	0.000	0.298	0.000	0.892	0.042	0.209	0.036	0.243	< 0.01	1.189	< 0.01	0.439	Nonparametric	Nonparametric
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	24	24	100%	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA		Nonparametric
6_111	MW-27, MW-33, MW-34	Part 115	Copper	mg/L	24	4	17%	0.704	0.000	0.317	0.000	0.899	0.039	0.159	0.204	0.213	0.01 <= p < 0.05	1.180	< 0.01	1.551	Lognormal	Nonparametric
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	24	0	0%	0.703	0.000	0.359	0.000	0.876	0.007	0.209	0.008	0.260	< 0.01	1.978	< 0.01	1.339	Nonparametric	Nonparametric
6_119	MW-27, MW-33, MW-34	Part 115	Nickel	mg/L	24	2	8%	0.719	0.000	0.346	0.000	0.827	0.001	0.237	0.002	0.297	< 0.01	2.023	< 0.01	1.304	Nonparametric	Nonparametric
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	24	23	96%	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA		NA		Nonparametric
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	24	18	75%	0.898	0.360	0.220	0.484	0.902	0.386	0.212	0.539	0.233	>= 0.10	0.372	>= 0.10	0.145	Gamma; Lognormal; Normal	Nonparametric
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	24	6	25%	0.697	0.000	0.252	0.004	0.904	0.067	0.208	0.039	0.228	0.01 <= p < 0.05	0.948	0.01 <= p < 0.05	0.982	Lognormal	Lognormal

Note: p-values above 0.05 suggest a fit to the tested distribution; a distribution passes its GOF test when at least one of the two p-values is above 0.05.

Table 4: Autocorrelation Tests, Non-Detects Excluded

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Autocorrelation	Box-Ljung p-value	Sig.
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	-0.325	0.091	
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	-0.365	0.057	
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	-0.130	0.499	
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	-0.178	0.354	
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	-0.273	0.155	
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	-0.027	0.887	
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	0.077	0.710	
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	-0.026	0.892	
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	-0.056	0.784	
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	-0.285	0.138	
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	-0.389	0.043	*
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	NA	NA	
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	0.480	0.156	
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	-0.341	0.081	
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	-0.493	0.012	*
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	-0.273	0.155	
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	24	14	58%	0.132	0.630	
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	-0.307	0.117	
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	0.199	0.408	
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	-0.029	0.896	
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	-0.155	0.477	
6_111	MW-27, MW-33, MW-34	Part 115	Copper	mg/L	24	4	17%	-0.116	0.577	
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	24	0	0%	-0.476	0.013	*
6_119	MW-27, MW-33, MW-34	Part 115	Nickel	mg/L	24	2	8%	-0.482	0.016	*
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	24	23	96%	NA	NA	
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	24	18	75%	-0.194	0.548	
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	24	6	25%	0.105	0.630	

*** p < 0.001, ** p < 0.01, * p < 0.05

Table 5: Outlier Counts by Date

Date	Count
2022-12-01	2
2023-01-05	1

Table 6: Outliers Identified at the 1% Significance Level, Non-Detects Excluded

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	No. Detects	Date	Dilution	Value
4_120	MW-33	Appendix III	pH (field)	su	24	0	0%	24	2023-01-05	NA	7.66
5_115	MW-34	Appendix IV	Lead	mg/L	24	14	58%	10	2022-12-01	1	0.00690
6_130	MW-34	Part 115	Zinc	mg/L	24	6	25%	18	2022-12-01	1	0.0310

Table 7: Seasonality Tests

						Full								Without Non-Detects							
						Sample Size					p-Value			Sample Size					p-Value		
ID	Well	Constituent Type	Constituent	Unit	% NDs	Winter	Spring	Summer	Fall	Total	Kruskal-Wallis	ANOVA	Log ANOVA	Winter	Spring	Summer	Fall	Total	Kruskal-Wallis	ANOVA	Log ANOVA
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	0%	8	9	6	1	24	0.708	0.895	0.784	8	9	6	1	24	0.708	NA 0.895	0.784
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	0%	8	9	6	1	24	0.579	0.730	0.853	8	9	6	1	24	0.579	NA 0.730	0.853
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	0%	8	9	6	1	24	0.540	0.496	0.465	8	9	6	1	24	0.540	NA 0.496	0.465
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	0%	8	9	6	1	24	0.151	0.039 *	0.125	8	9	6	1	24	0.151	NA 0.039 *	0.125
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	0%	8	9	6	1	24	0.364	0.424	0.403	8	9	6	1	24	0.364	NA 0.424	0.403
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	0%	8	9	6	1	24	0.447	0.305	0.311	8	9	6	1	24	0.447	NA 0.305	0.311
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	17%	8	9	6	1	24	0.119	0.043 *	0.107	7	8	4	1	20	0.104	NA 0.047 *	0.117
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	0%	8	9	6	1	24	0.063	0.019 *	0.031 *	8	9	6	1	24	0.063	NA 0.019 *	0.031 *
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	12%	8	9	6	1	24	0.925	0.465	0.646	8	8	4	1	21	0.894	NA 0.612	0.812
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	0%	8	9	6	1	24	0.397	0.803	0.710	8	9	6	1	24	0.397	NA 0.803	0.710
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	0%	8	9	6	1	24	0.499	0.770	0.715	8	9	6	1	24	0.499	NA 0.770	0.715
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	96%	8	9	6	1	24	0.141	0.321	0.299	0	1	0	0	1	NA	NA NA	NA
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	79%	8	9	6	1	24	0.250	0.380	0.237	4	1	0	0	5	0.157	NA 0.290	0.360
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	4%	8	9	6	1	24	0.252	0.378	0.444	8	8	6	1	23	0.282	NA 0.456	0.560
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	4%	8	9	6	1	24	0.969	0.913	0.978	8	8	6	1	23	0.908	NA 0.858	0.969
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	0%	8	9	6	1	24	0.364	0.424	0.403	8	9	6	1	24	0.364	NA 0.424	0.403
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	58%	8	9	6	1	24	0.351	0.615	0.619	3	3	4	0	10	0.280	NA 0.224	0.171
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	4%	8	9	6	1	24	0.633	0.633	0.775	8	9	5	1	23	0.672	NA 0.521	0.706
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	100%	8	9	6	1	24	NA	0.000 ***	0.000 ***	NA	NA	NA	NA	NA	NA	NA NA	NA
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	42%	8	9	6	1	24	0.020 *	0.186	0.018 *	5	6	3	0	14	0.077	NA 0.152	0.036 *
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	25%	8	9	6	1	24	0.250	0.418	0.314	5	6	6	1	18	0.206	NA 0.538	0.348
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	25%	8	9	6	1	24	0.757	0.589	0.613	6	5	6	1	18	0.208	NA 0.086	0.088
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	100%	8	9	6	1	24	0.323	0.339	0.339	NA	NA	NA	NA	NA	NA	NA NA	NA
6_111	MW-27, MW-33, MW-34	Part 115	Copper	mg/L	17%	8	9	6	1	24	0.318	0.376	0.221	7	7	5	1	20	0.187	NA 0.359	0.161
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	0%	8	9	6	1	24	0.894	0.967	0.974	8	9	6	1	24	0.894	NA 0.967	0.974
6_119	MW-27, MW-33, MW-34	Part 115	Nickel	mg/L	8%	8	9	6	1	24	0.631	0.625	0.715	8	7	6	1	22	0.535	NA 0.532	0.660
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	96%	8	9	6	1	24	0.141	0.214	0.171	0	1	0	0	1	NA	NA NA	NA
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	75%	8	9	6	1	24	0.026 *	0.401	0.431	0	1	5	0	6	0.235	NA 0.358	0.339
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	25%	8	9	6	1	24	0.059	0.493	0.121	7	8	2	1	18	0.505	NA 0.829	0.561

*** p < 0.001, ** p < 0.01, * p < 0.05

Table 8: Spatial Variability Tests

						Full									Without Non-Detects									
						Sample Size			p-Value						Sample Size			p-Value						
ID	Well	Constituent Type	Constituent	Unit	% NDs	MW-27	MW-33	MW-34	Total	Kruskal-Wallis		ANOVA		Log ANOVA		MW-27	MW-33	MW-34	Total	Kruskal-Wallis		ANOVA		Log ANOVA	
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	0%	8	8	8	24	0.001	**	0.001	**	0.004	**	8	8	8	24	0.001	**	0.001	**	0.004	**
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	0%	8	8	8	24	0.001	**	0.000	***	0.000	***	8	8	8	24	0.001	**	0.000	***	0.000	***
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	0%	8	8	8	24	0.001	***	0.000	***	0.000	***	8	8	8	24	0.001	***	0.000	***	0.000	***
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	0%	8	8	8	24	0.001	***	0.001	***	0.000	***	8	8	8	24	0.001	***	0.001	***	0.000	***
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	17%	8	8	8	24	0.003	**	0.027	*	0.001	***	8	8	4	20	0.068		0.133		0.047	*
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	0%	8	8	8	24	0.007	**	0.013	*	0.016	*	8	8	8	24	0.007	**	0.013	*	0.016	*
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	12%	8	8	8	24	0.003	**	0.006	**	0.001	**	5	8	8	21	0.013	*	0.021	*	0.007	**
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	96%	8	8	8	24	0.351		0.602		0.587		0	0	1	1	NA		NA		NA	
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	79%	8	8	8	24	0.020	*	0.022	*	0.014	*	0	4	1	5	0.157		0.246		0.170	
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	4%	8	8	8	24	0.002	**	0.000	***	0.000	***	8	8	7	23	0.000	***	0.000	***	0.000	***
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	4%	8	8	8	24	0.033	*	0.009	**	0.009	**	8	8	7	23	0.010	*	0.002	**	0.002	**
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	0%	8	8	8	24	0.001	***	0.000	***	0.000	***	8	8	8	24	0.001	***	0.000	***	0.000	***
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	58%	8	8	8	24	0.001	***	0.041	*	0.000	***	0	3	7	10	0.016	*	0.271		0.006	**
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	4%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	7	8	23	0.000	***	0.000	***	0.000	***
5_117	MW-27, MW-33, MW-34	Appendix IV	Mercury	mg/L	100%	8	8	8	24	NA		0.385		0.385		NA	NA	NA	NA	NA		NA		NA	
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	42%	8	8	8	24	0.011	*	0.036	*	0.005	**	1	8	5	14	0.261		0.583		0.276	
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	25%	8	8	8	24	0.007	**	0.005	**	0.004	**	5	5	8	18	0.048	*	0.074		0.054	
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	25%	8	8	8	24	0.000	***	0.023	*	0.002	**	4	7	7	18	0.002	**	0.011	*	0.001	**
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	100%	8	8	8	24	0.593		0.614		0.614		NA	NA	NA	NA	NA		NA		NA	
6_111	MW-27, MW-33, MW-34	Part 115	Copper	mg/L	17%	8	8	8	24	0.001	***	0.004	**	0.000	***	5	8	7	20	0.005	**	0.021	*	0.003	**
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	0%	8	8	8	24	0.000	***	0.000	***	0.000	***	8	8	8	24	0.000	***	0.000	***	0.000	***
6_119	MW-27, MW-33, MW-34	Part 115	Nickel	mg/L	8%	8	8	8	24	0.000	***	0.000	***	0.000	***	7	8	7	22	0.000	***	0.000	***	0.000	***
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	96%	8	8	8	24	0.351		0.511		0.452		0	1	0	1	NA		NA		NA	
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	75%	8	8	8	24	0.908		0.697		0.779		2	2	2	6	0.165		0.138		0.144	
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	25%	8	8	8	24	0.198		0.426		0.492		4	6	8	18	0.792		0.832		0.865	

*** p < 0.001, ** p < 0.01, * p < 0.05

Table 9: Trend Tests: Lognormal MLE and MK

ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Type	Method	Slope	p-value	Trend
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	Parametric	Lognormal MLE	0.00285	0.395	↔
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	Nonparametric	MK	-0.00000485	1.000	↔
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	Parametric	Lognormal MLE	-0.000793	0.071	↔
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	Nonparametric	MK	-0.0981	0.033	↔
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	Parametric	Lognormal MLE	0.000304	0.585	↔
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	Parametric	Lognormal MLE	-0.000123	0.118	↔
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	Nonparametric	MK	-0.0931	0.006	↓
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	Parametric	Lognormal MLE	-0.000610	0.107	↔
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	Nonparametric	MK	-0.000000159	0.634	↔
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	Nonparametric	MK	0.00000152	0.147	↔
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	Nonparametric	MK	0	0.980	↔
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	Parametric	Lognormal MLE	0.00235	0.394	↔
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	Parametric	Lognormal MLE	0.0000429	0.977	↔
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	Parametric	Lognormal MLE	0.000304	0.585	↔
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	Nonparametric	MK	0.00000730	0.549	↔
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	Parametric	Lognormal MLE	-0.00578	0.139	↔
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	Parametric	Lognormal MLE	0.00239	0.044	↔
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	24	0	0%	Nonparametric	MK	0.0114	0.653	↔
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	24	6	25%	Parametric	Lognormal MLE	-0.00823	0.004	↓

Table 10: Trend Tests: Piecewise Linear-Linear

								Line 1			Line 2					
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Slope	p-Value	Trend	Slope	p-Value	Trend	Break 1	R-Squared	Overall Trend
3_127	MW-27, MW-33, MW-34	Additional Parameters	Total Suspended Solids	mg/L	24	0	0%	-0.577	0.672	↔	0.185	0.421	↔	2023-01-05	0.050	↔
4_105	MW-27, MW-33, MW-34	Appendix III	Boron	mg/L	24	0	0%	-0.00553	0.591	↔	0.00779	0.420	↔	2023-03-28	0.053	↔
4_107	MW-27, MW-33, MW-34	Appendix III	Calcium	mg/L	24	0	0%	-0.251	0.279	↔	0.0276	0.897	↔	2023-04-17	0.165	↔
4_108	MW-27, MW-33, MW-34	Appendix III	Chloride (as Cl)	mg/L	24	0	0%	-0.280	0.090	↔	0.236	0.462	↔	2023-04-22	0.163	↔
4_112	MW-27, MW-33, MW-34	Appendix III	Fluoride	mg/L	24	0	0%	-0.0500	0.540	↔	0.000312	0.139	↔	2022-12-02	0.184	↔
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	0.0250	0.930	↔	-0.00138	0.067	↔	2022-12-08	0.159	↔
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	-0.00845	0.988	↔	-0.230	0.028	↔	2023-02-06	0.304	↔
4_126	MW-27, MW-33, MW-34	Appendix III	Total Dissolved Solids	mg/L	24	0	0%	-1.40	0.068	↔	0.906	0.195	↔	2023-04-17	0.306	↔
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	0.000000841	0.750	↔	-0.00000380	0.134	↔	2023-04-17	0.145	↔
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	-0.0000221	0.986	↔	0.00000434	0.187	↔	2023-01-04	0.097	↔
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	-0.000903	0.549	↔	0.00119	0.400	↔	2023-04-17	0.054	↔
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	0.000000629	0.041	↔	-0.000000758	0.203	↔	2023-04-18	0.252	↔
5_106	MW-27, MW-33, MW-34	Appendix IV	Cadmium	mg/L	24	19	79%	0.000000441	0.166	↔	-0.000000272	0.353	↔	2023-04-17	0.198	↔
5_109	MW-27, MW-33, MW-34	Appendix IV	Chromium, Total	mg/L	24	1	4%	-0.0000394	0.516	↔	0.000141	0.253	↔	2023-04-18	0.174	↔
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	0.00000146	0.726	↔	-0.000000299	0.939	↔	2023-03-15	0.009	↔
5_113	MW-27, MW-33, MW-34	Appendix IV	Fluoride (App IV)	mg/L	24	0	0%	-0.0500	0.540	↔	0.000312	0.139	↔	2022-12-02	0.184	↔
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	24	14	58%	-0.0000488	0.119	↔	-0.000000388	0.939	↔	2023-01-09	0.229	↔

(Table continues on next page)

Table 10: Trend Tests: Piecewise Linear-Linear *(continued)*

								Line 1			Line 2					
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Slope	p-Value	Trend	Slope	p-Value	Trend	Break 1	R-Squared	Overall Trend
5_116	MW-27, MW-33, MW-34	Appendix IV	Lithium	mg/L	24	1	4%	-0.000213	0.404	↔	0.000198	0.406	↔	2023-03-15	0.077	↔
5_118	MW-27, MW-33, MW-34	Appendix IV	Molybdenum	mg/L	24	10	42%	0.0000107	0.310	↔	-0.0000285	0.180	↔	2023-04-18	0.218	↔
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	-0.00945	0.988	↔	0.00340	0.049	↔	2023-01-04	0.180	↔
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	0.000000831	0.584	↔	-0.00000273	0.371	↔	2023-04-18	0.111	↔
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	24	24	100%	0.000000914	0.043	↔	-0.00000111	0.207	↔	2023-04-18	0.247	↔
6_111	MW-27, MW-33, MW-34	Part 115	Copper	mg/L	24	4	17%	0.0000257	0.547	↔	-0.0000565	0.164	↔	2023-03-15	0.199	↔
6_114	MW-27, MW-33, MW-34	Part 115	Iron	mg/L	24	0	0%	19.3	0.658	↔	-0.0162	0.882	↔	2022-12-01	0.013	↔
6_119	MW-27, MW-33, MW-34	Part 115	Nickel	mg/L	24	2	8%	0.00000898	0.831	↔	-0.0000513	0.544	↔	2023-04-18	0.060	↔
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	24	23	96%	0.000000640	0.030	↔	-0.000000799	0.160	↔	2023-04-18	0.285	↔
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	24	18	75%	0.00000732	0.048	↔	-0.00000751	0.295	↔	2023-04-18	0.219	↔
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	24	6	25%	-0.000321	0.967	↔	-0.00000784	0.687	↔	2023-01-04	0.339	↔

Table 11: Trend Tests: Piecewise Linear-Linear-Linear

								Line 1			Line 2			Line 3						
ID	Well	Constituent Type	Constituent	Unit	n	No. NDs	% NDs	Slope	p-Value	Trend	Slope	p-Value	Trend	Slope	p-Value	Trend	Break 1	Break 2	R-Squared	Overall Trend
4_120	MW-27, MW-33, MW-34	Appendix III	pH (field)	su	24	0	0%	0.0250	0.928	↔	-0.00545	0.055	↔	0.000393	0.803	↔	2022-12-17	2023-03-19	0.302	↔
4_124	MW-27, MW-33, MW-34	Appendix III	Sulfate (as SO4)	mg/L	24	4	17%	0.0687	0.823	↔	-0.521	0.399	↔	0.00376	0.989	↔	2023-02-22	2023-05-08	0.344	↔
5_101	MW-27, MW-33, MW-34	Appendix IV	Antimony	mg/L	24	3	12%	-0.00000300	0.477	↔	0.0000986	0.651	↔	-0.00000506	0.053	↔	2023-03-12	2023-03-18	0.224	↔
5_102	MW-27, MW-33, MW-34	Appendix IV	Arsenic	mg/L	24	0	0%	-0.0000114	0.371	↔	0.000305	0.642	↔	-0.00000226	0.762	↔	2023-03-12	2023-03-17	0.148	↔
5_103	MW-27, MW-33, MW-34	Appendix IV	Barium	mg/L	24	0	0%	-0.000104	0.967	↔	-0.00249	0.985	↔	0.00149	0.318	↔	2023-03-02	2023-04-17	0.066	↔
5_104	MW-27, MW-33, MW-34	Appendix IV	Beryllium	mg/L	24	23	96%	-0.000000538	0.672	↔	0.00000128	0.060	↔	-0.000000942	0.118	↔	2023-01-25	2023-04-18	0.335	↔
5_110	MW-27, MW-33, MW-34	Appendix IV	Cobalt	mg/L	24	1	4%	-0.00000414	0.995	↔	0.00000115	0.713	↔	-0.00000200	0.864	↔	2022-12-26	2023-06-18	0.011	↔
5_115	MW-27, MW-33, MW-34	Appendix IV	Lead	mg/L	24	14	58%	-0.0000487	0.139	↔	0.00000475	0.884	↔	-0.00000320	0.741	↔	2023-01-15	2023-04-17	0.235	↔
5_121	MW-27, MW-33, MW-34	Appendix IV	Radium 226 and 228	pCi/L	24	6	25%	-0.0137	0.983	↔	0.00611	0.044	↔	-0.00256	0.812	↔	2023-01-04	2023-05-22	0.246	↔
5_122	MW-27, MW-33, MW-34	Appendix IV	Selenium	mg/L	24	6	25%	-0.00000432	0.519	↔	0.00000383	0.574	↔	-0.00000358	0.088	↔	2023-01-26	2023-04-17	0.188	↔
5_125	MW-27, MW-33, MW-34	Appendix IV	Thallium	mg/L	24	24	100%	-0.000000781	0.677	↔	0.00000185	0.064	↔	-0.00000137	0.122	↔	2023-01-25	2023-04-18	0.329	↔
6_123	MW-27, MW-33, MW-34	Part 115	Silver	mg/L	24	23	96%	-0.00000000000710	1.000	↔	0.0000150	0.633	↔	-0.00000105	0.008	↓	2023-03-12	2023-03-20	0.387	↔
6_129	MW-27, MW-33, MW-34	Part 115	Vanadium	mg/L	24	18	75%	-0.00000312	0.838	↔	0.0000162	0.049	↔	-0.00000989	0.170	↔	2023-02-06	2023-04-18	0.308	↔
6_130	MW-27, MW-33, MW-34	Part 115	Zinc	mg/L	24	6	25%	-0.000188	0.018	↔	0.00130	0.733	↔	-0.0000941	0.041	↔	2023-03-08	2023-03-21	0.421	↔

Appendix E

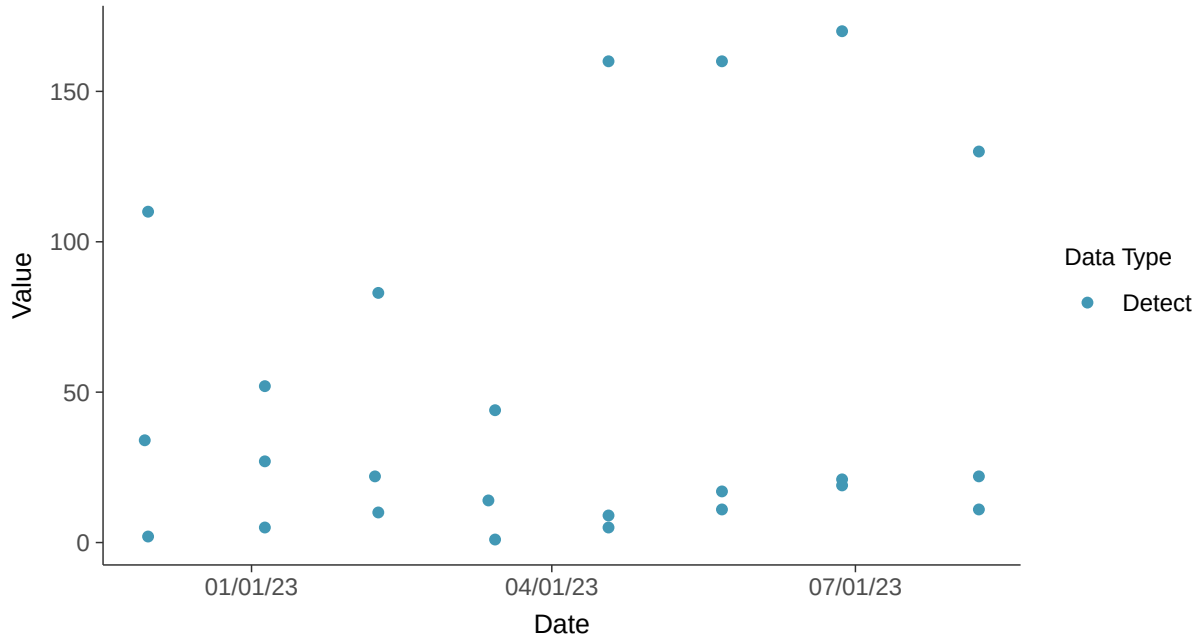
State Rule Statistical Analysis Plots

Additional Parameters: Total Suspended Solids, MW-27, MW-33, MW-34

ID: 3_127

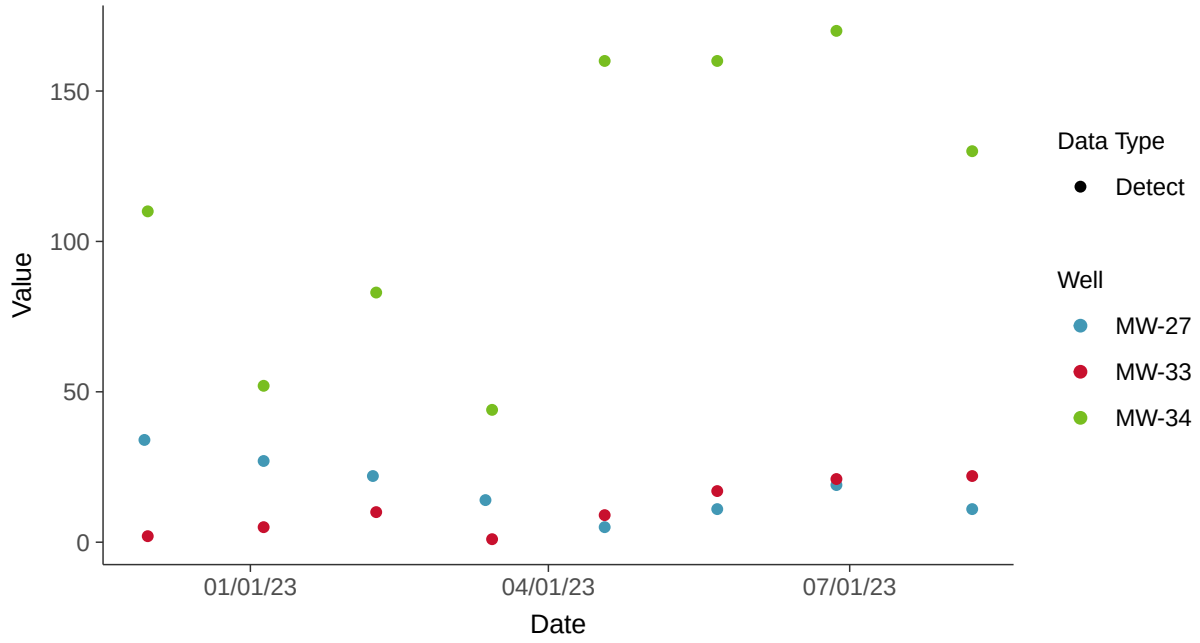
Scatter Plot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



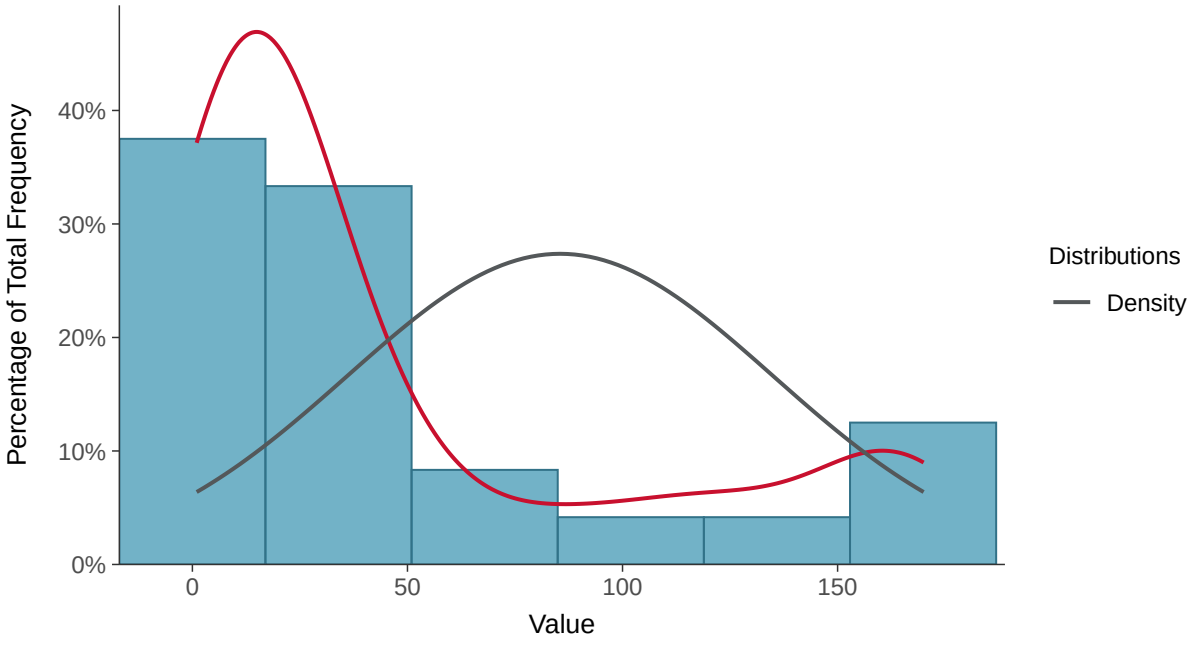
Scatter Plot by Well

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



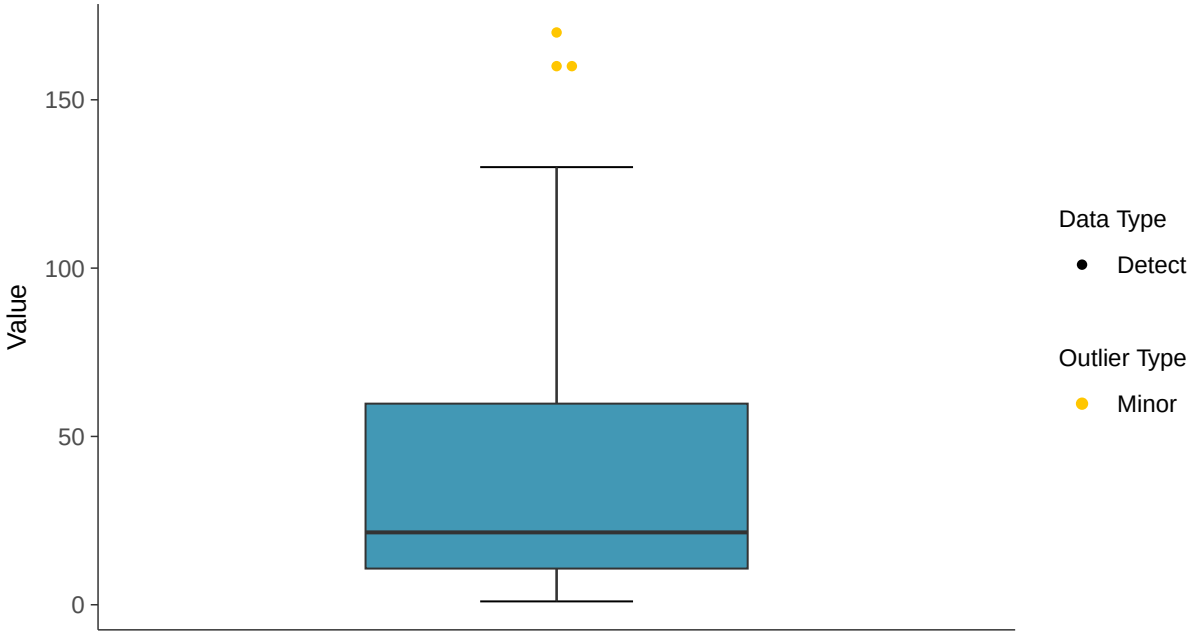
Histogram

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



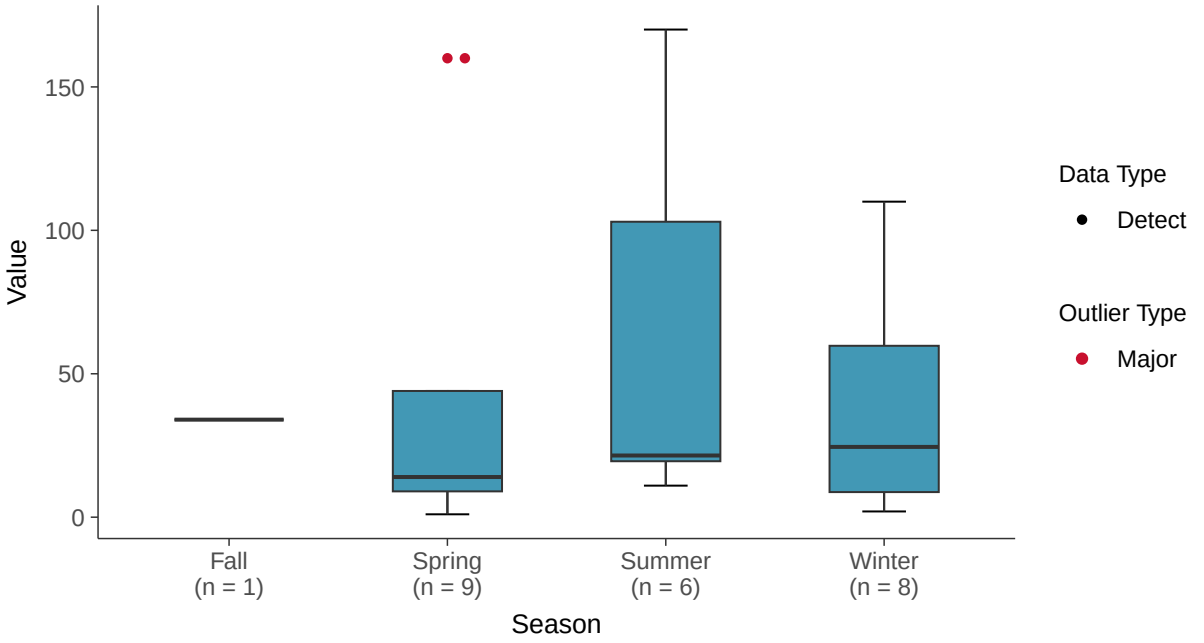
Boxplot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



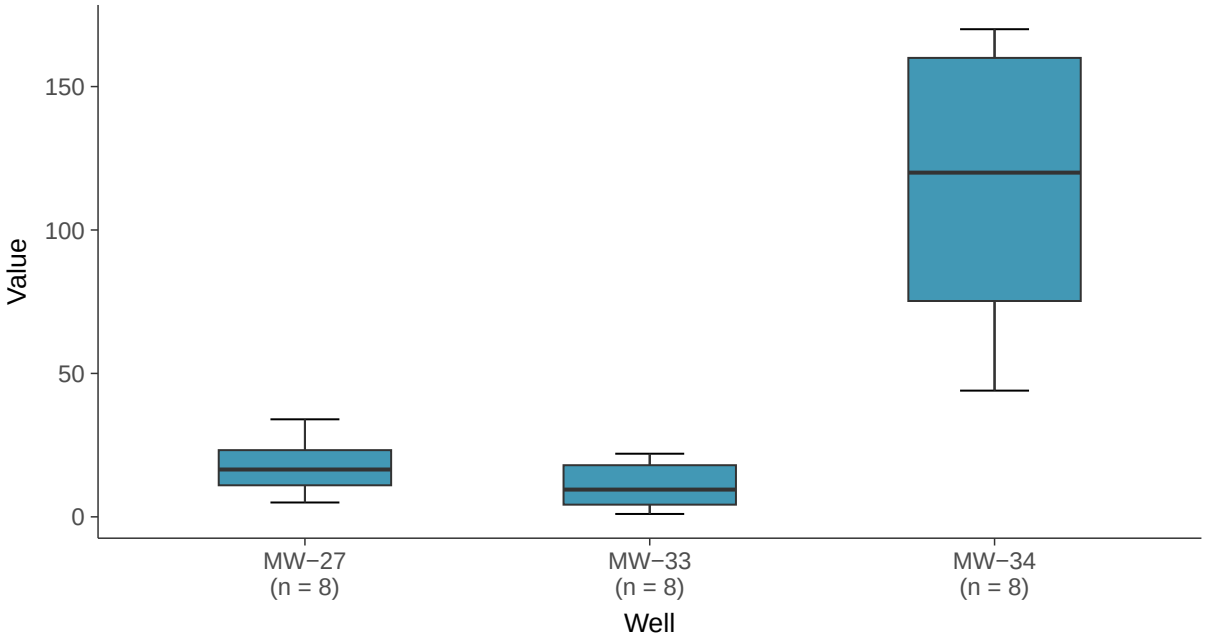
Boxplot by Season

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



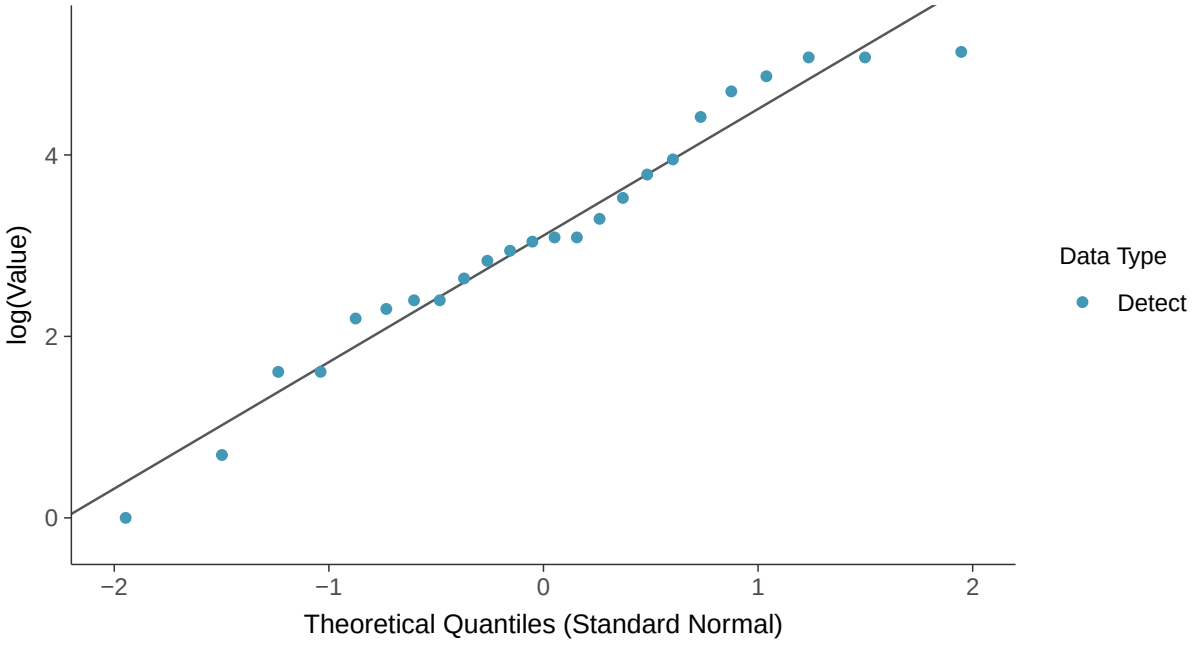
Boxplot by Well

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



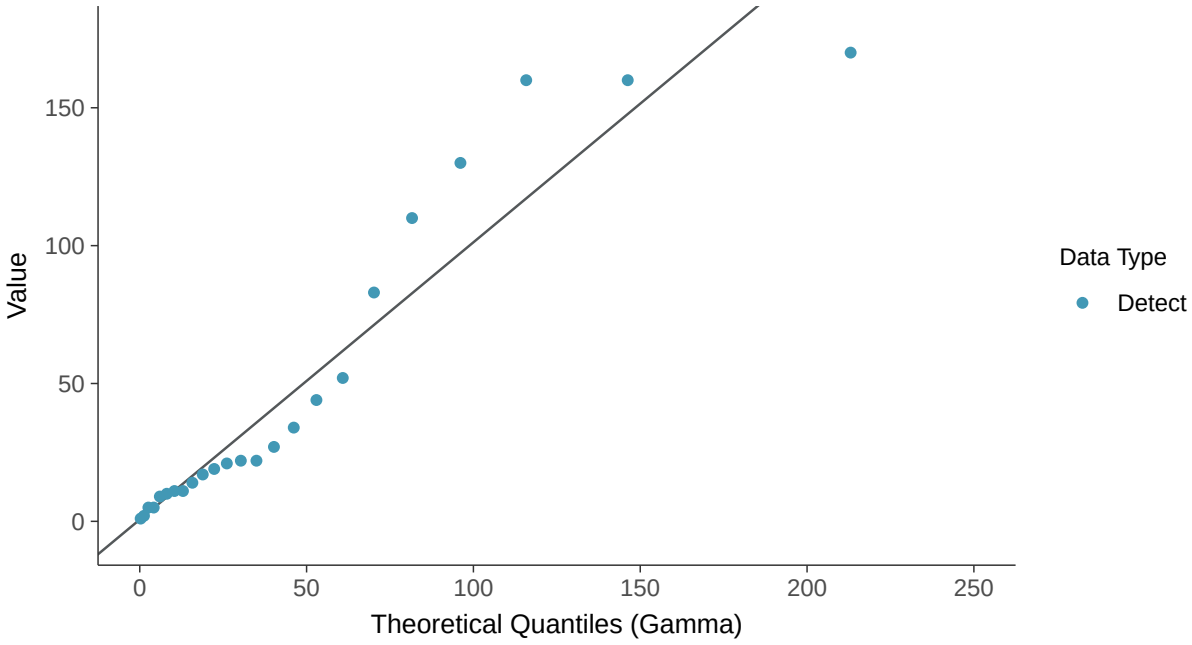
Lognormal Q-Q plot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



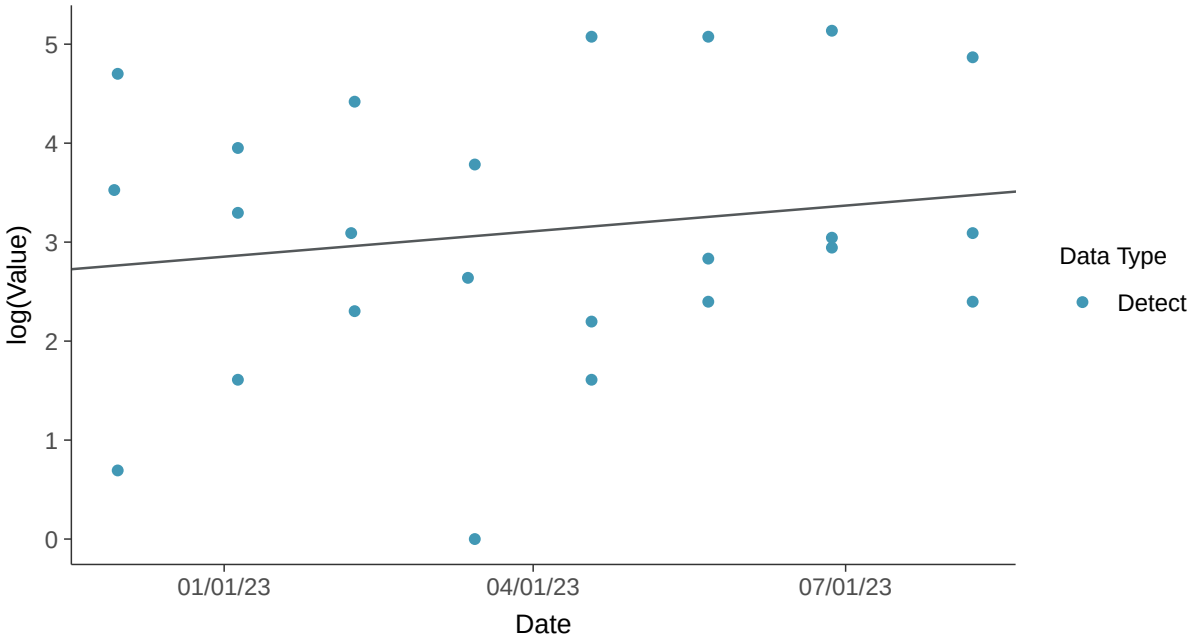
Gamma Q-Q plot

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



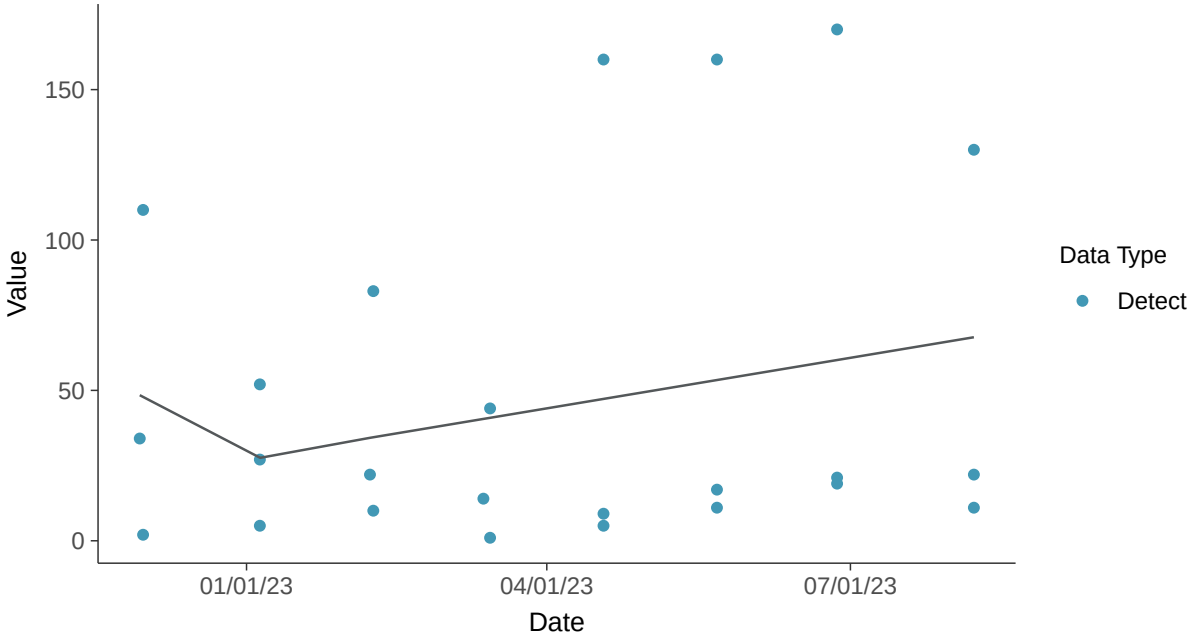
Trend Regression: Lognormal MLE

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Total Suspended Solids, MW-27, MW-33, MW-34 (mg/L)

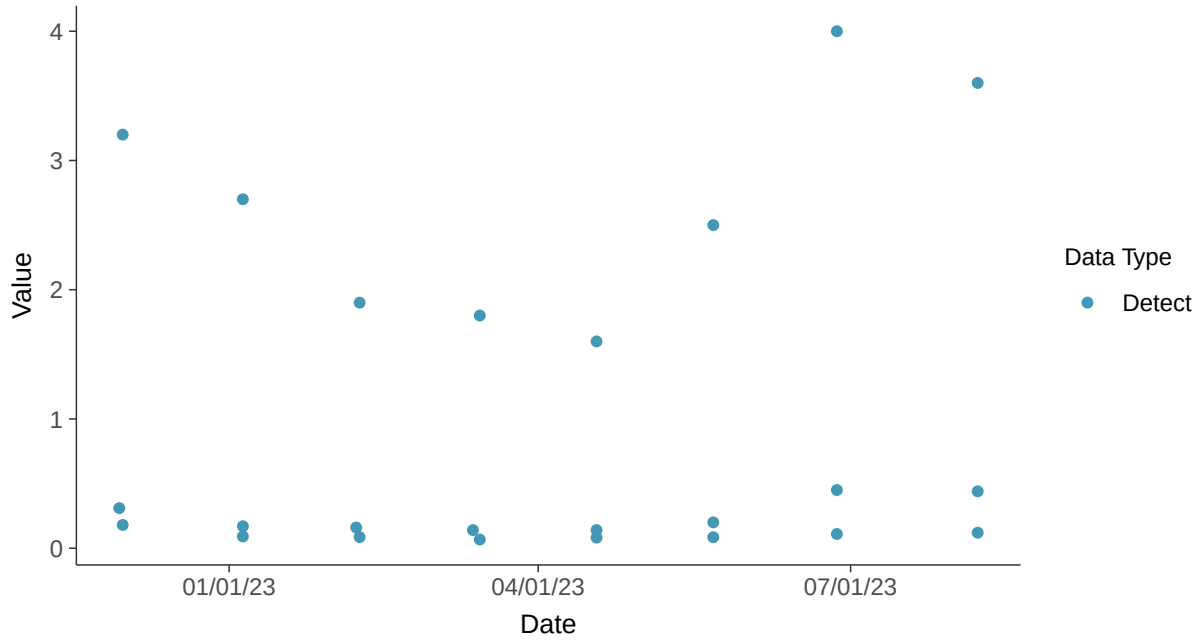


Appendix III: Boron, MW-27, MW-33, MW-34

ID: 4_105

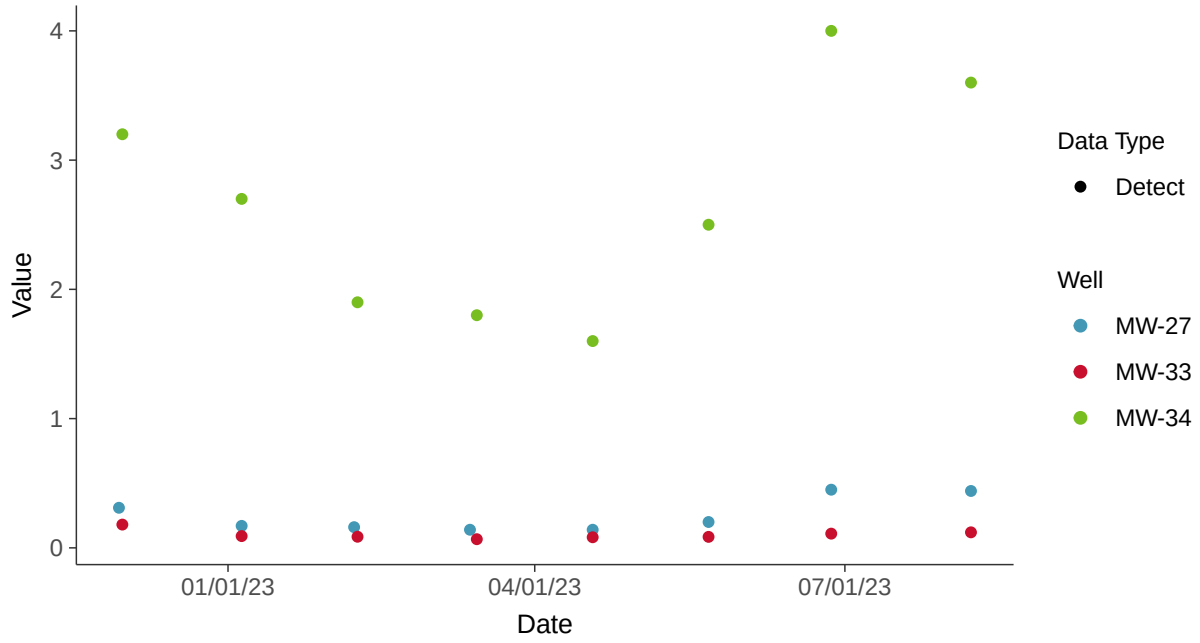
Scatter Plot

Boron, MW-27, MW-33, MW-34 (mg/L)



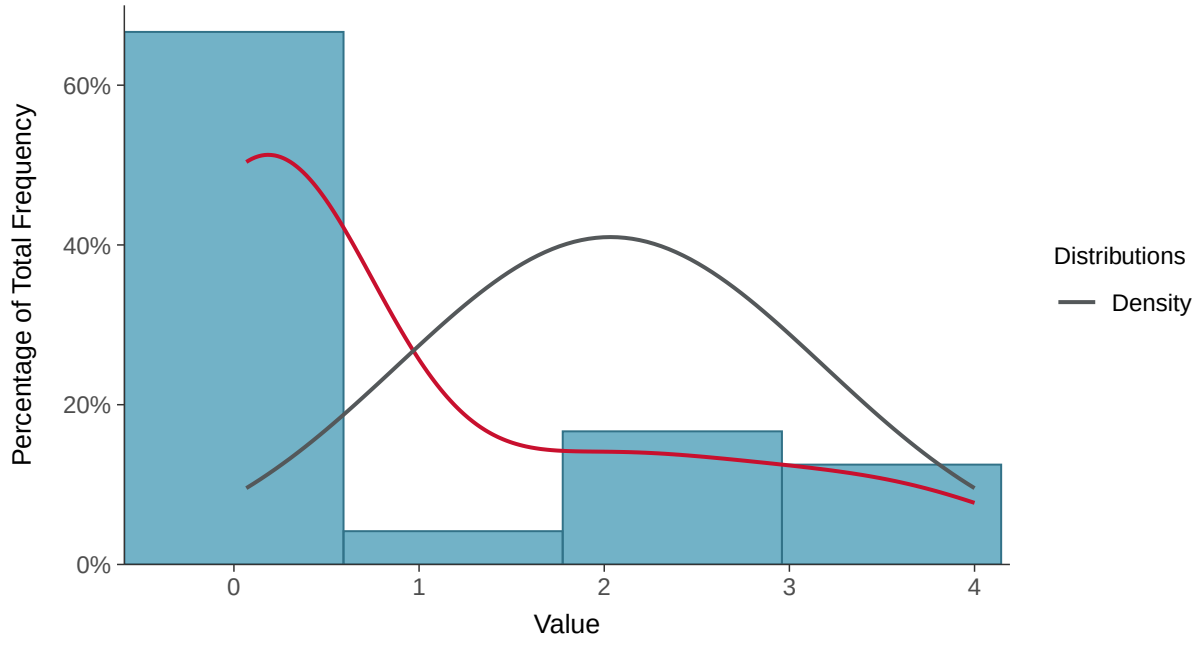
Scatter Plot by Well

Boron, MW-27, MW-33, MW-34 (mg/L)



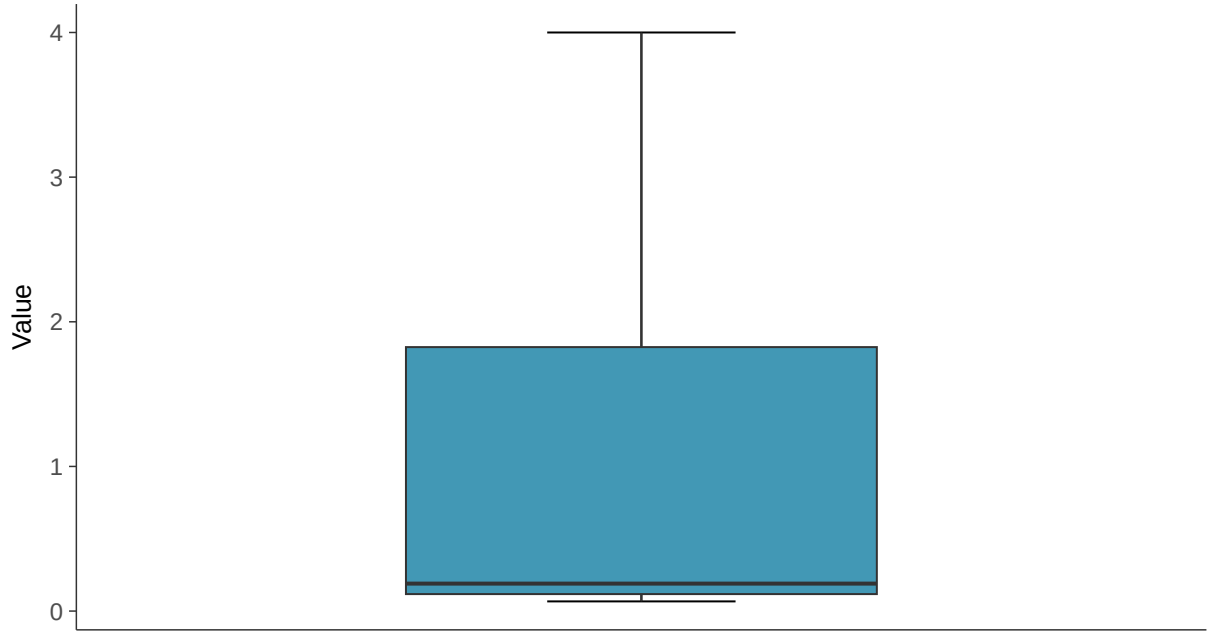
Histogram

Boron, MW-27, MW-33, MW-34 (mg/L)



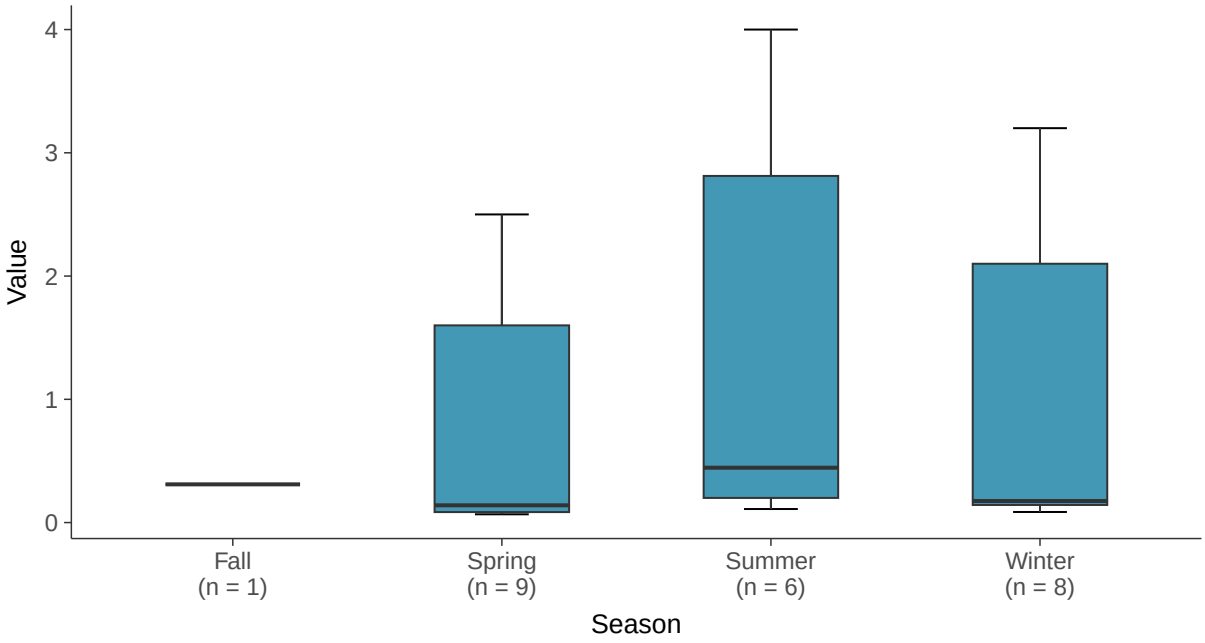
Boxplot

Boron, MW-27, MW-33, MW-34 (mg/L)



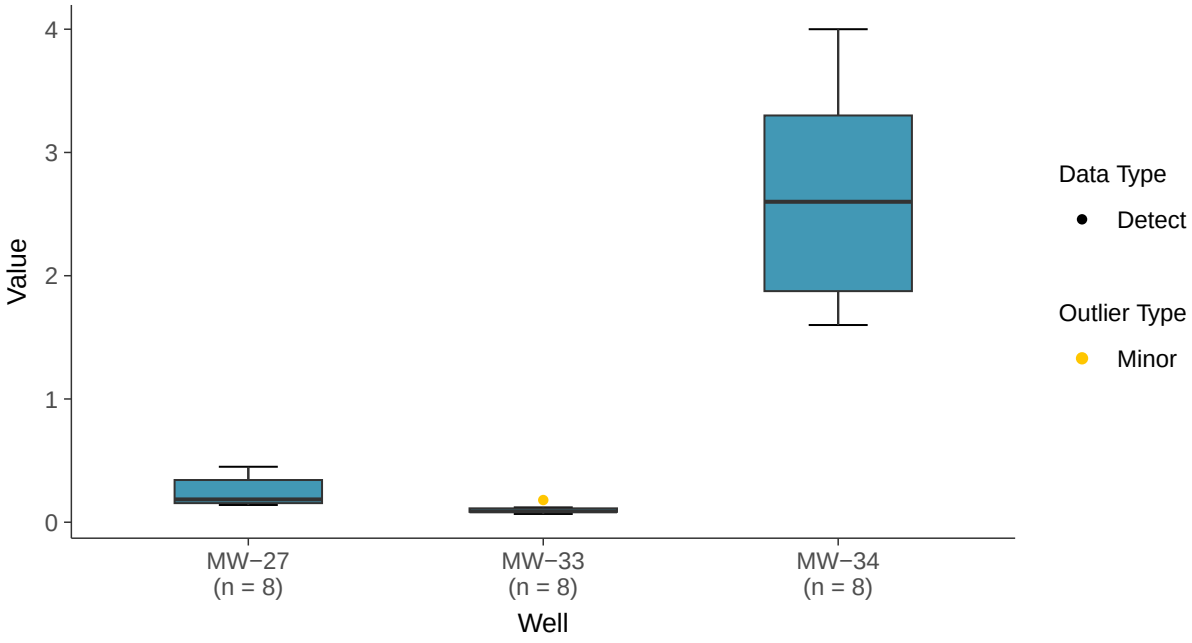
Boxplot by Season

Boron, MW-27, MW-33, MW-34 (mg/L)



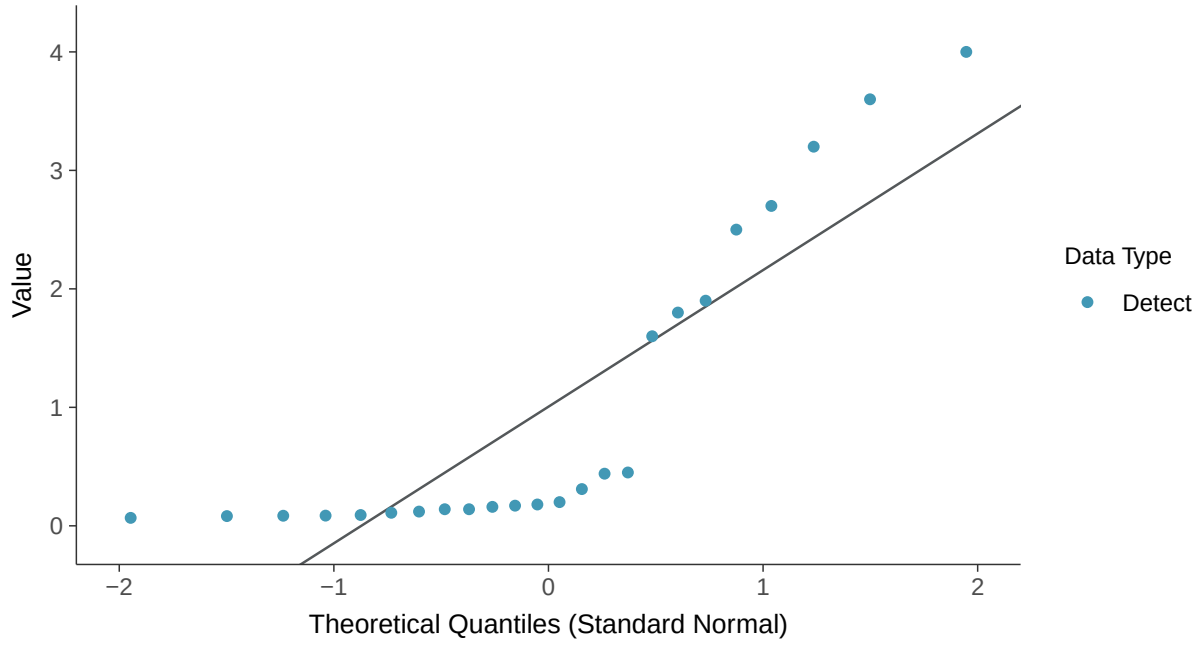
Boxplot by Well

Boron, MW-27, MW-33, MW-34 (mg/L)



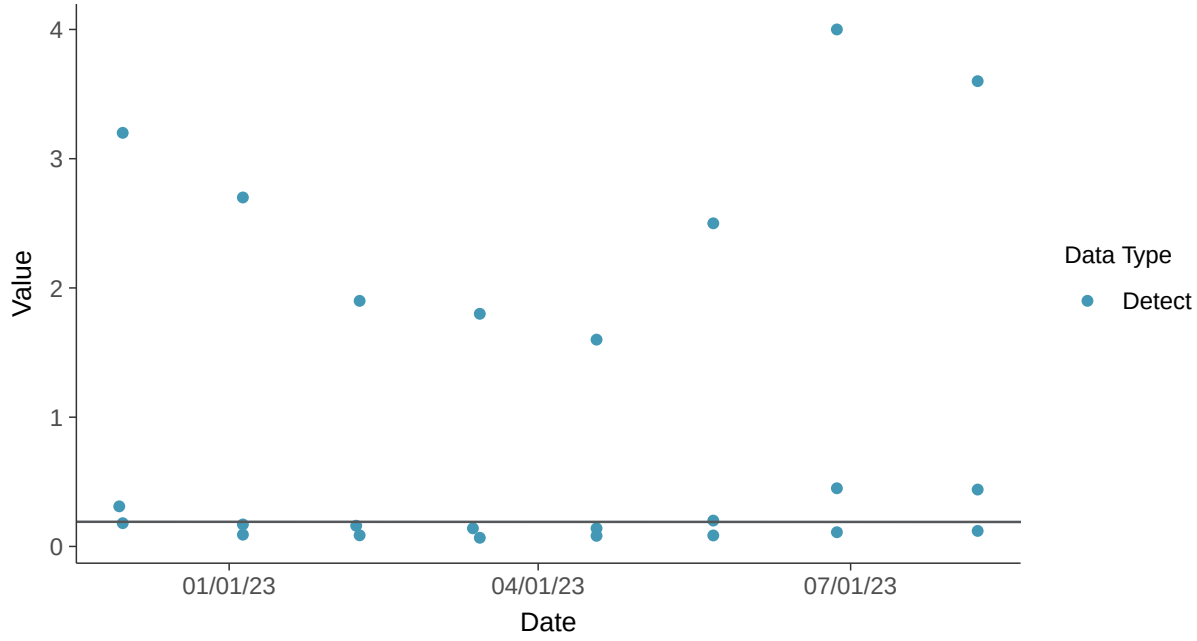
Normal Q-Q plot

Boron, MW-27, MW-33, MW-34 (mg/L)



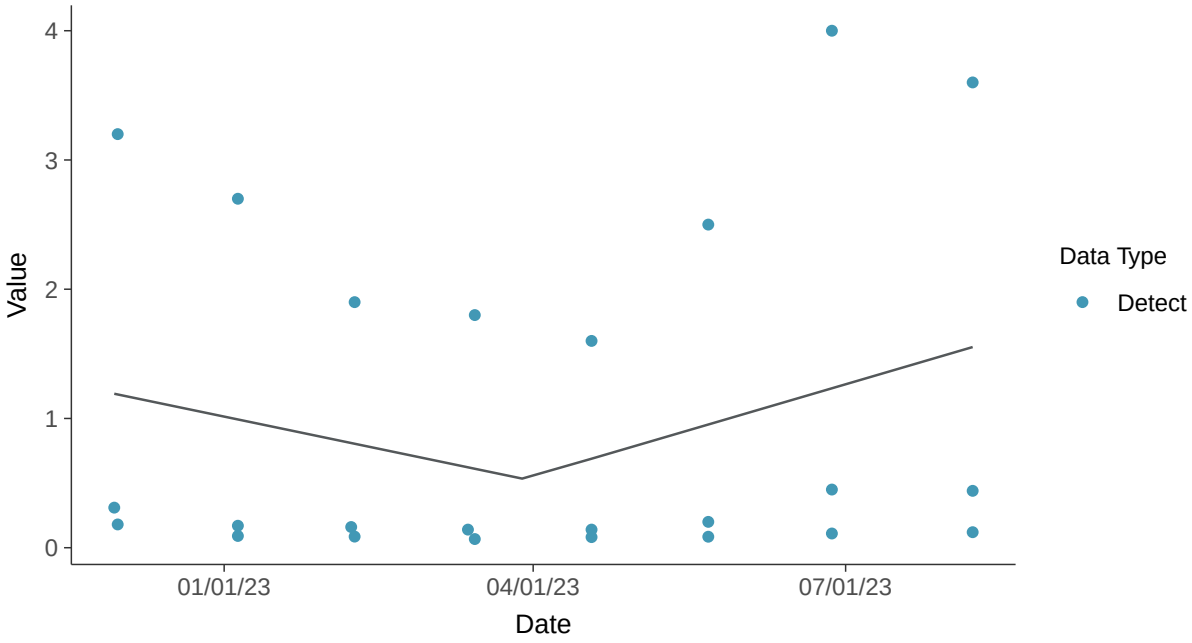
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Boron, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Boron, MW-27, MW-33, MW-34 (mg/L)

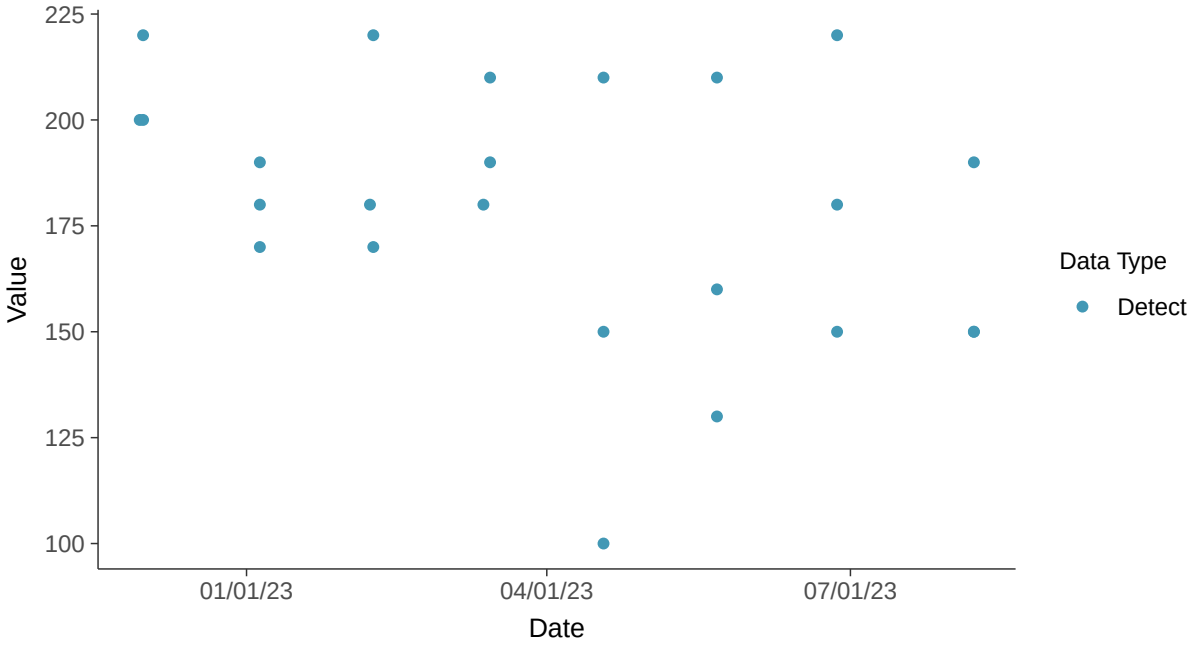


Appendix III: Calcium, MW-27, MW-33, MW-34

ID: 4_107

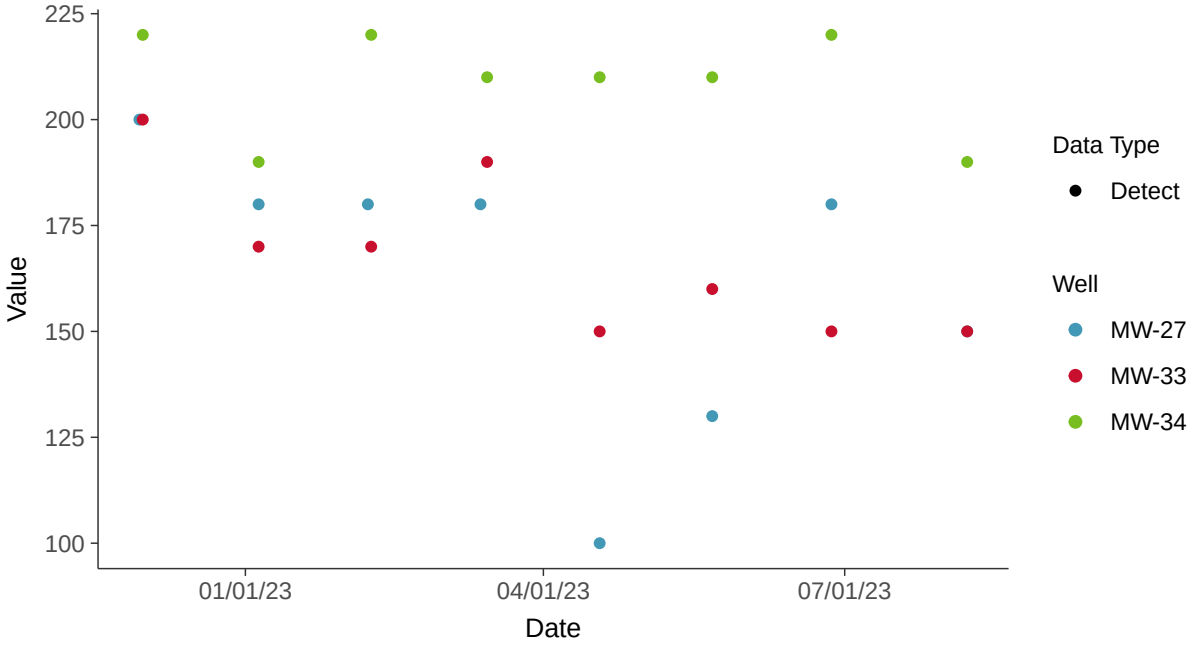
Scatter Plot

Calcium, MW-27, MW-33, MW-34 (mg/L)



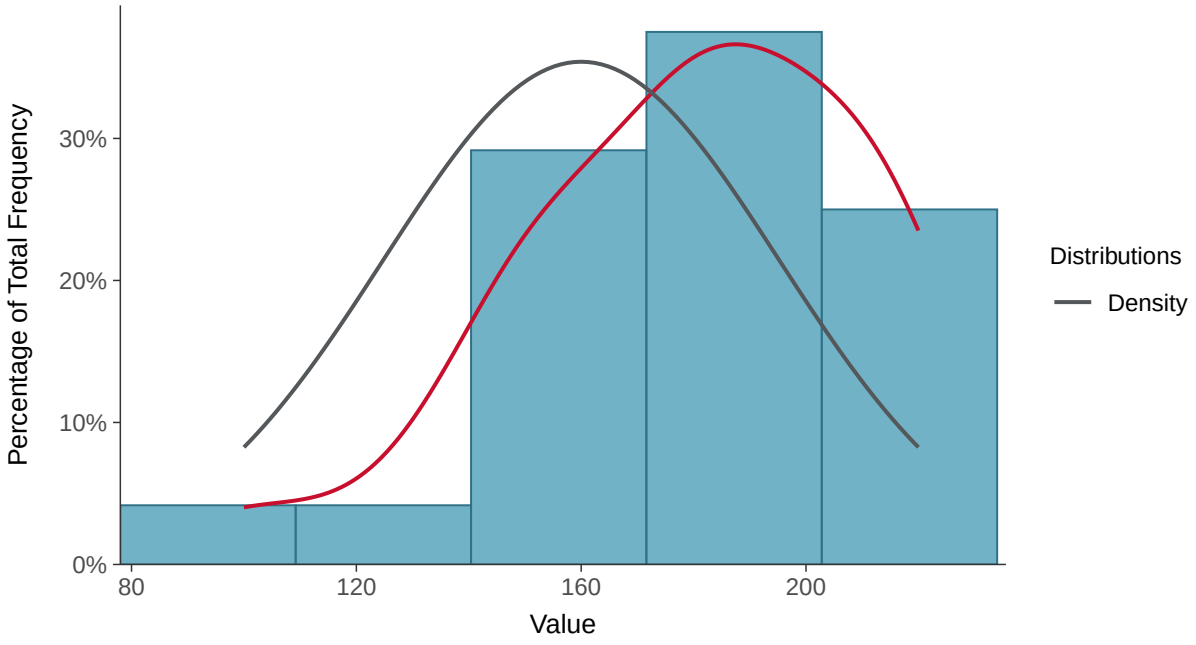
Scatter Plot by Well

Calcium, MW-27, MW-33, MW-34 (mg/L)



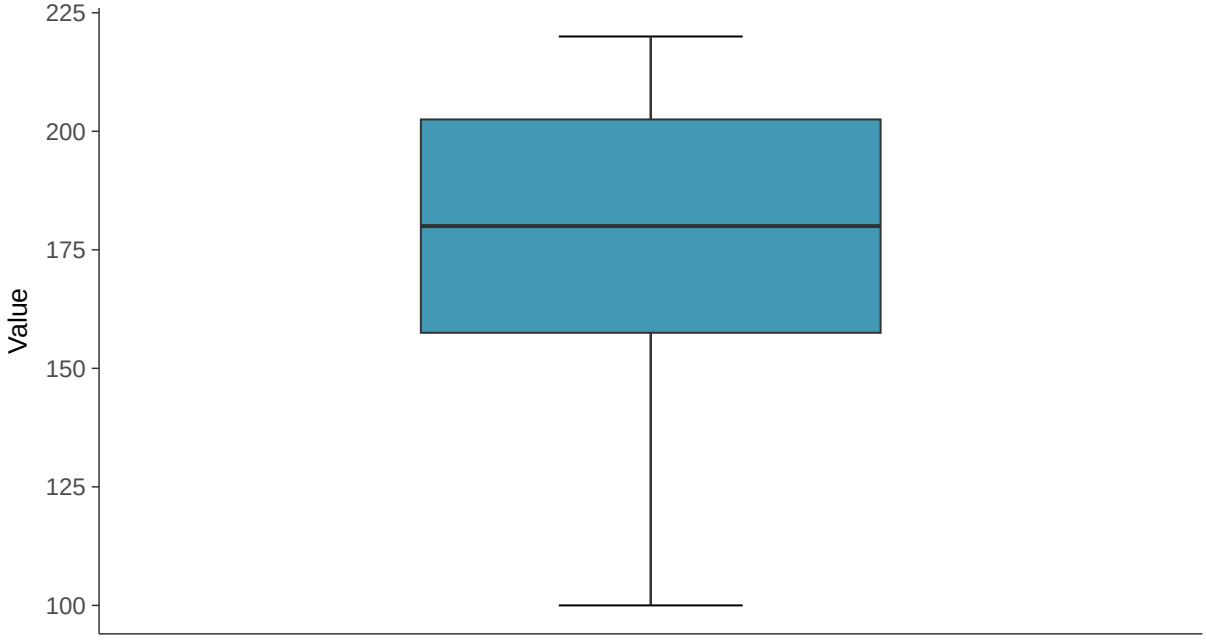
Histogram

Calcium, MW-27, MW-33, MW-34 (mg/L)



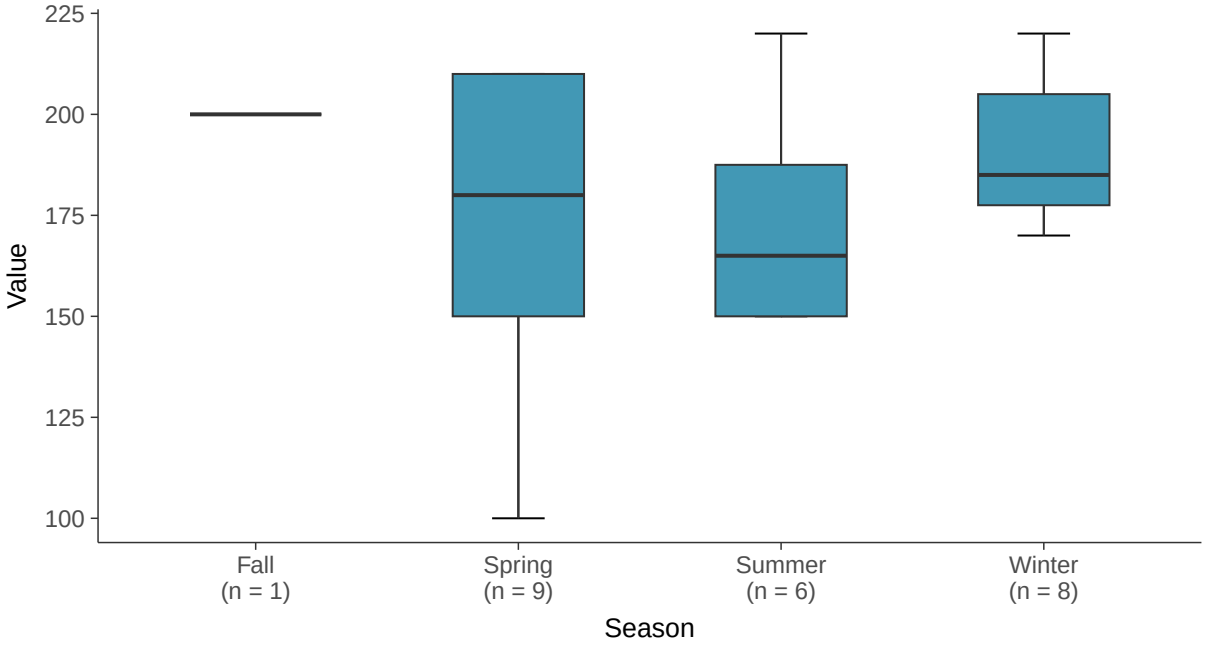
Boxplot

Calcium, MW-27, MW-33, MW-34 (mg/L)



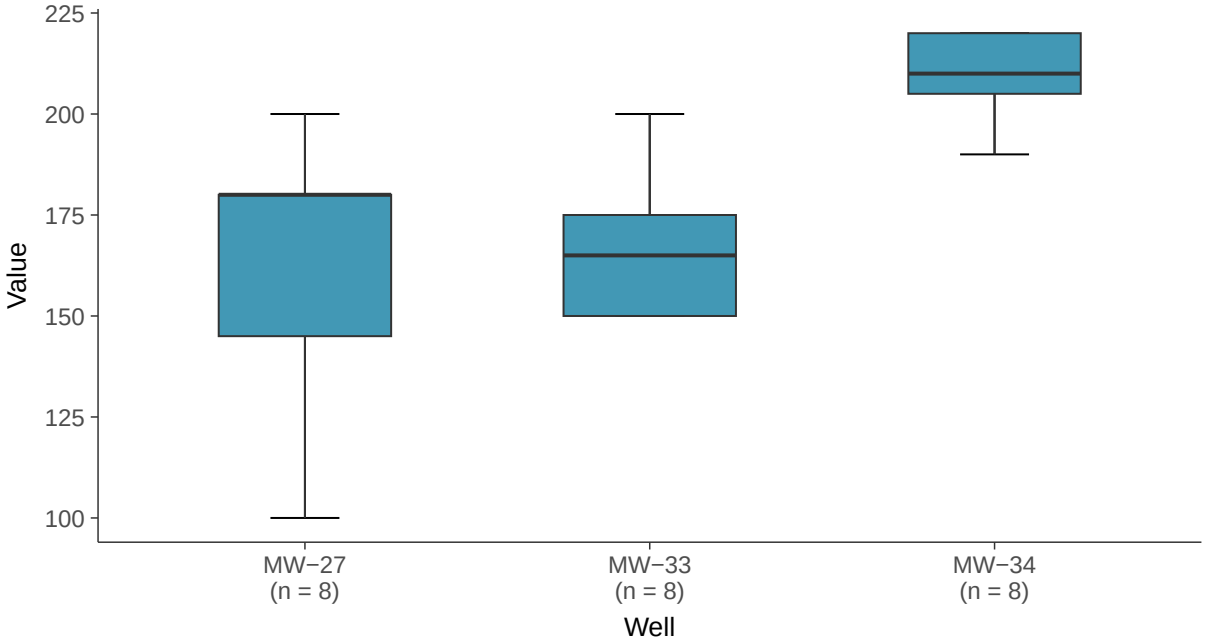
Boxplot by Season

Calcium, MW-27, MW-33, MW-34 (mg/L)



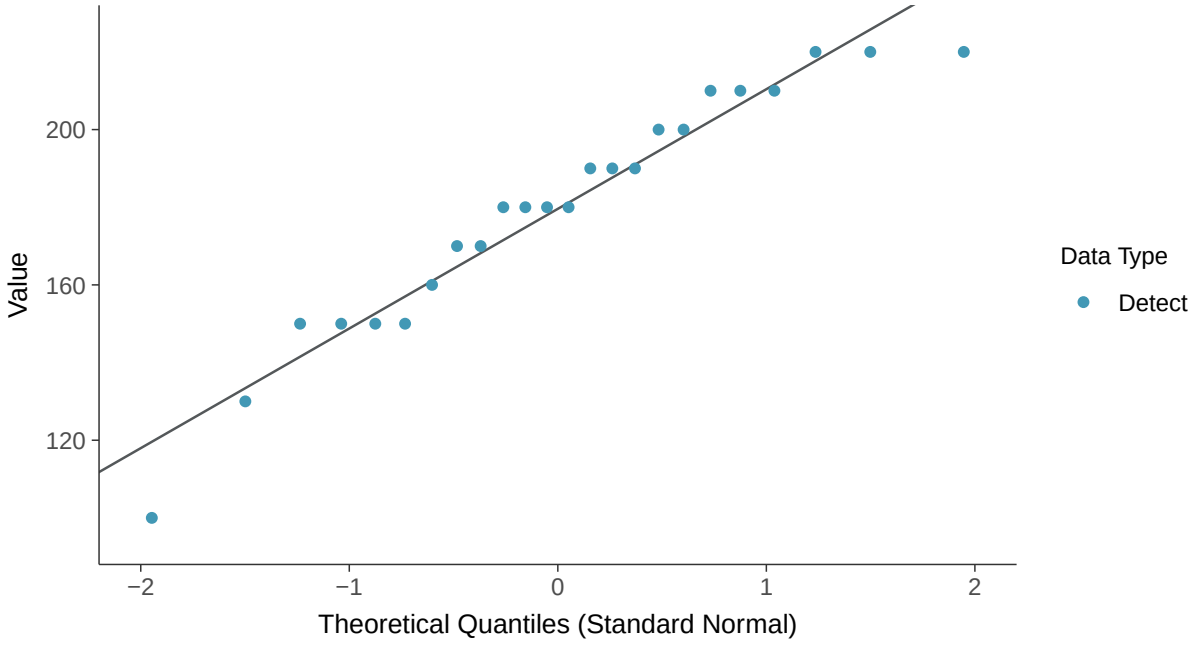
Boxplot by Well

Calcium, MW-27, MW-33, MW-34 (mg/L)



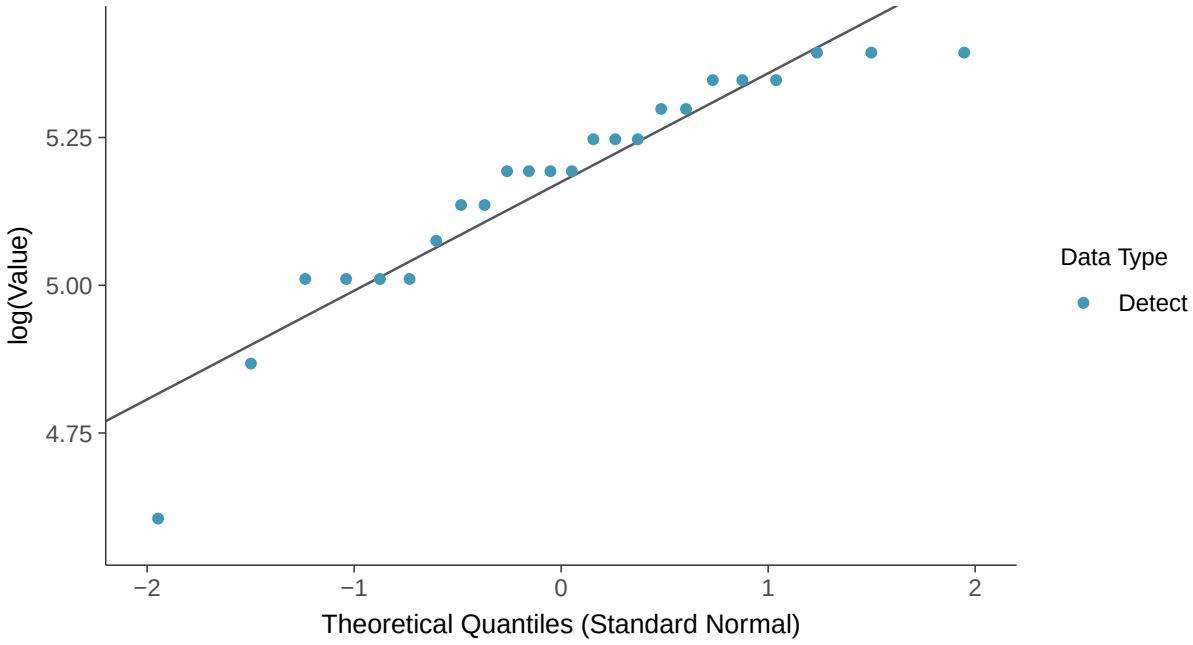
Normal Q-Q plot

Calcium, MW-27, MW-33, MW-34 (mg/L)



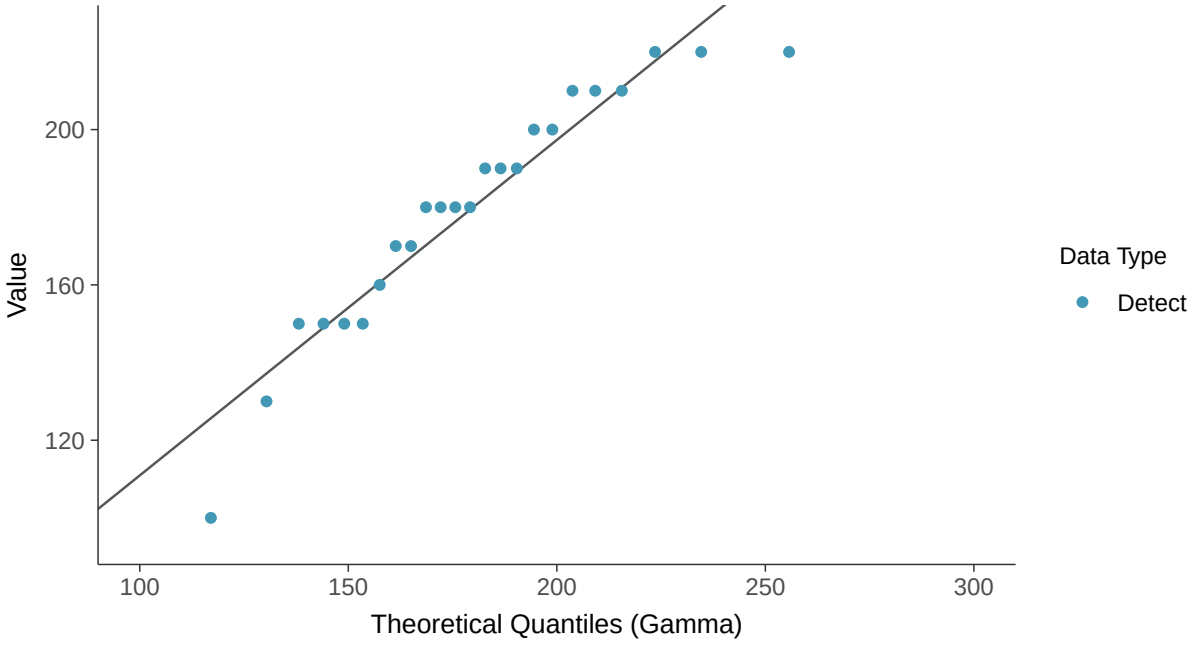
Lognormal Q-Q plot

Calcium, MW-27, MW-33, MW-34 (mg/L)



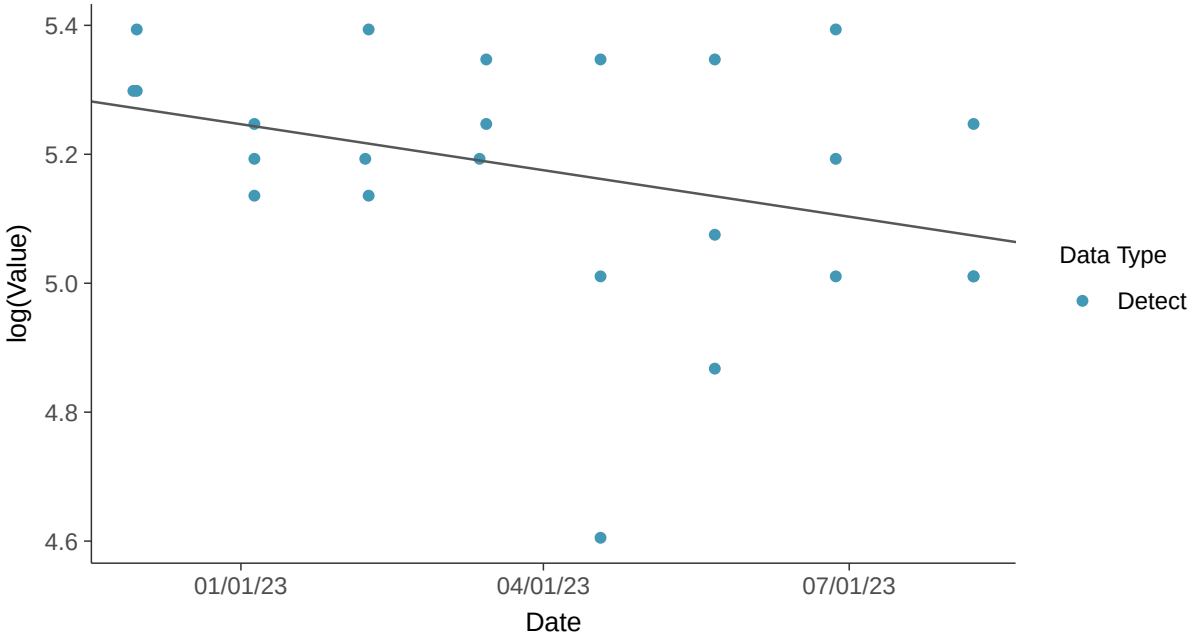
Gamma Q-Q plot

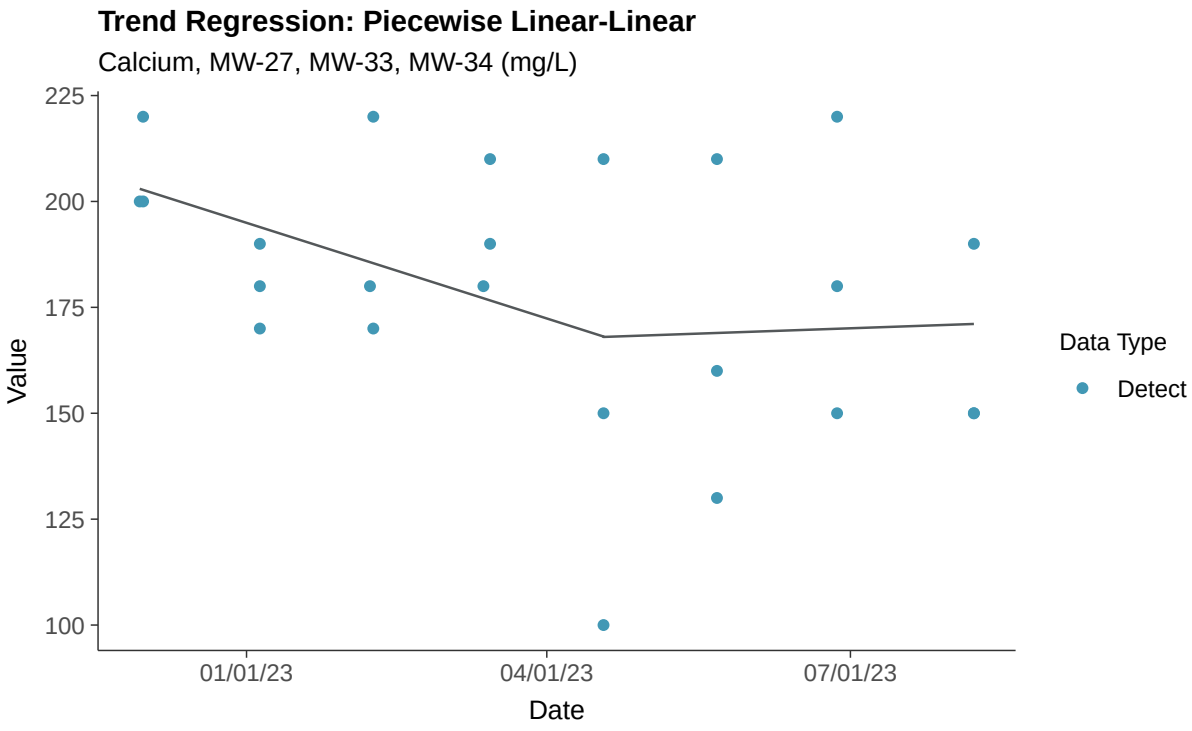
Calcium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Lognormal MLE

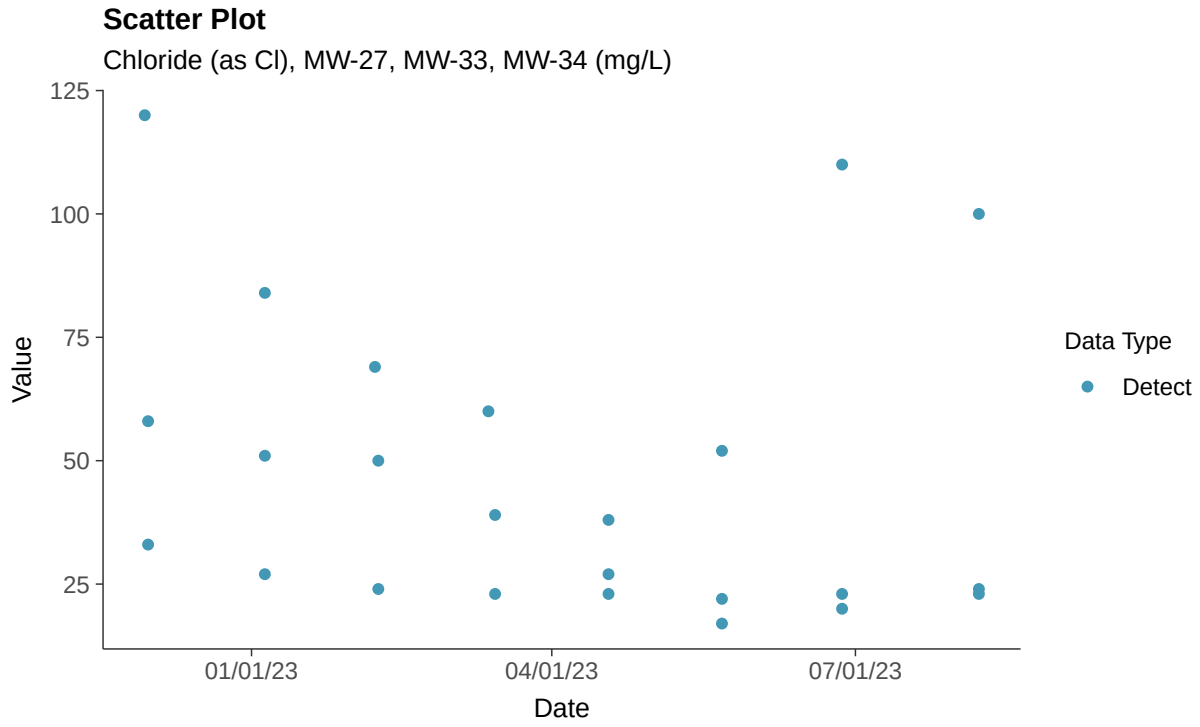
Calcium, MW-27, MW-33, MW-34 (mg/L)

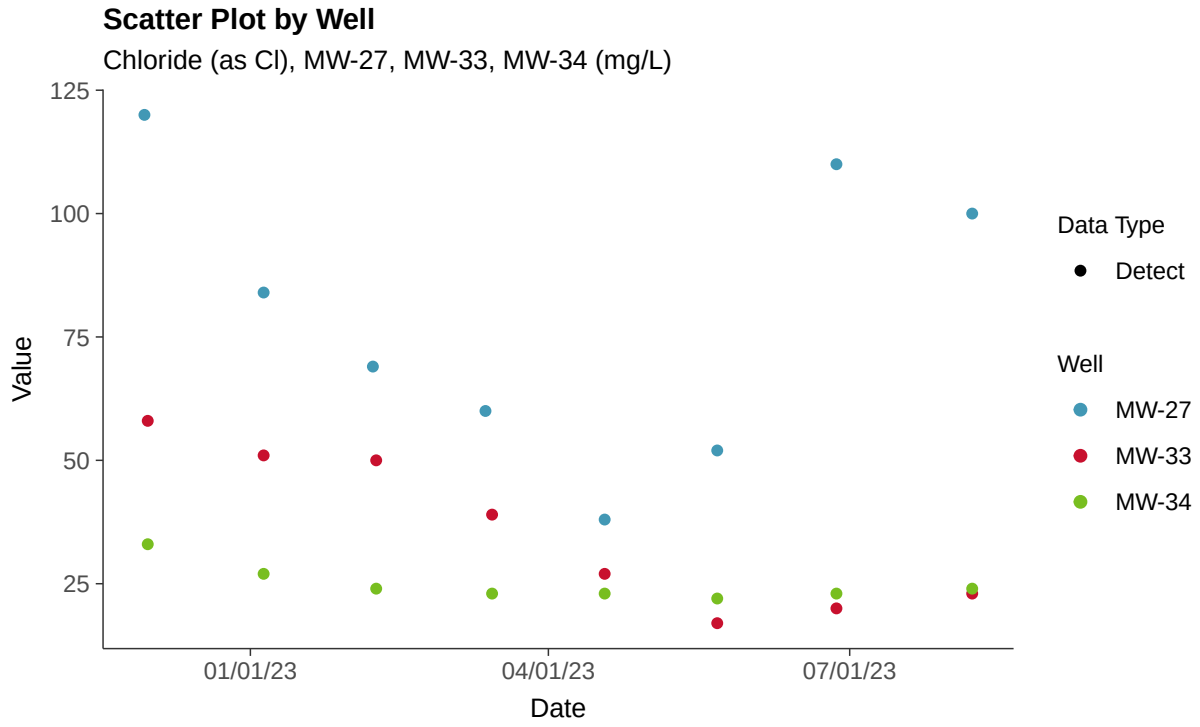



Trend Regression: Piecewise Linear-Linear
Calcium, MW-27, MW-33, MW-34 (mg/L)
225
200
175
150
125
100
Value
01/01/23
04/01/23
07/01/23
Date
Data Type
Detect

Appendix III: Chloride (as Cl), MW-27, MW-33, MW-34

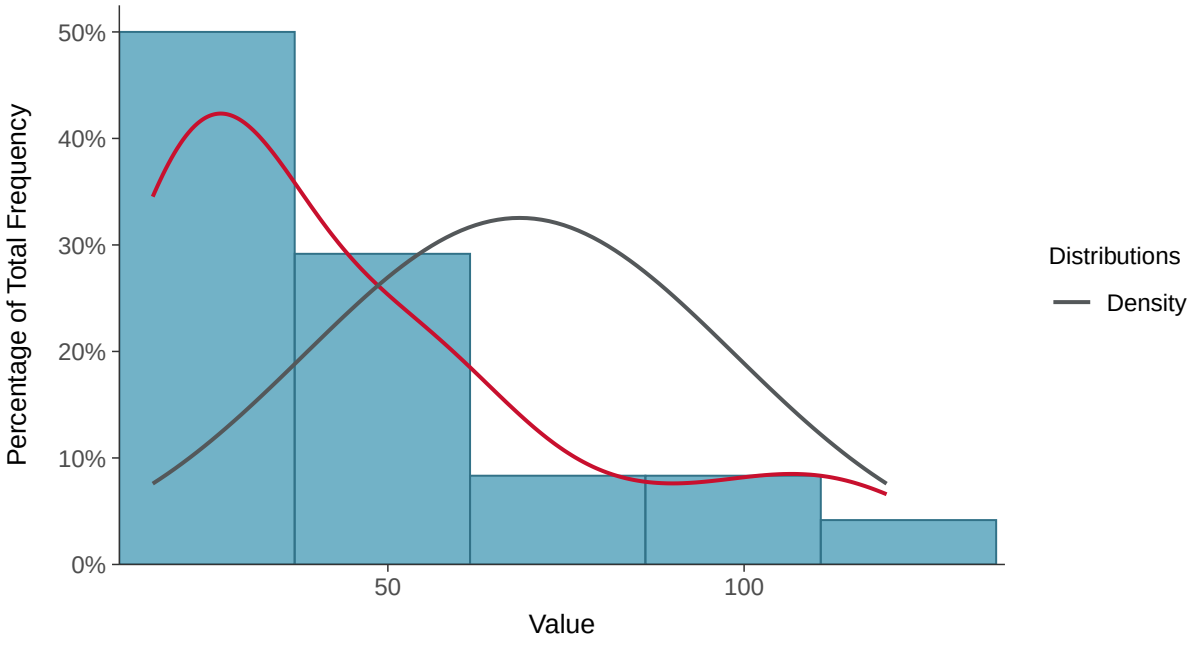
ID: 4_108





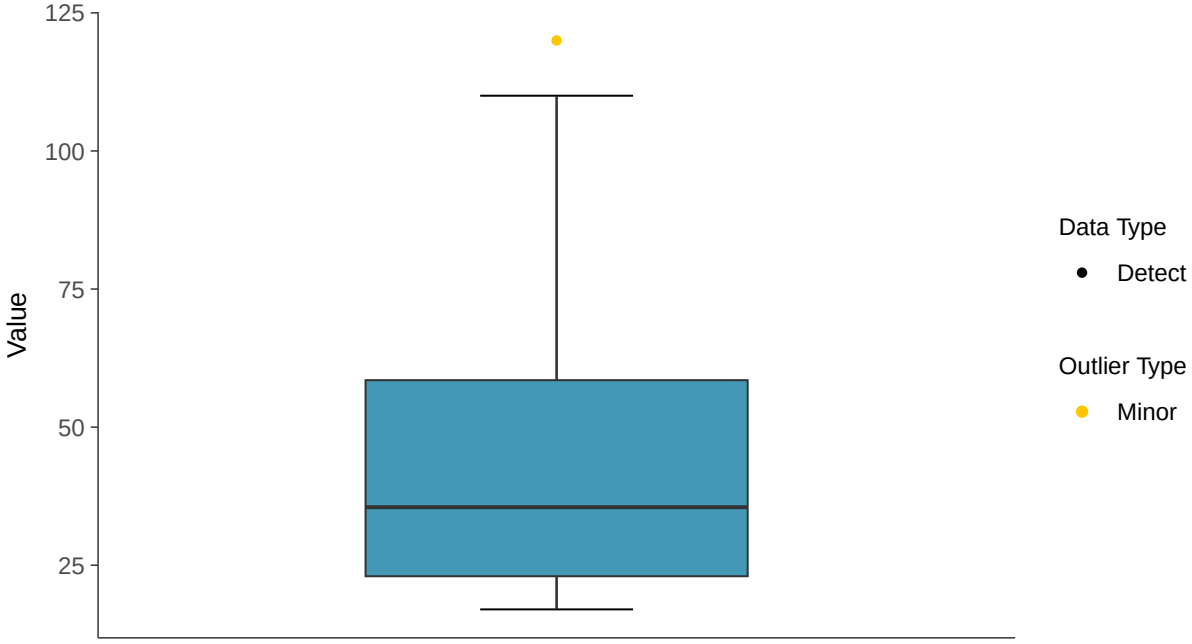
Histogram

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



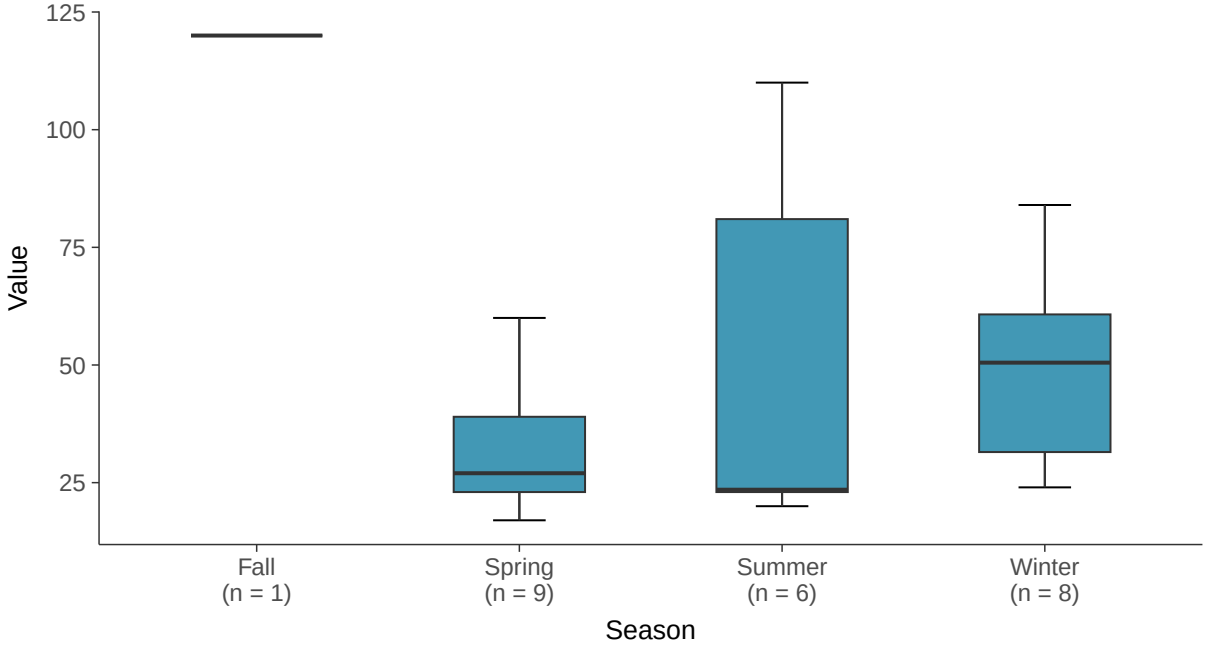
Boxplot

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



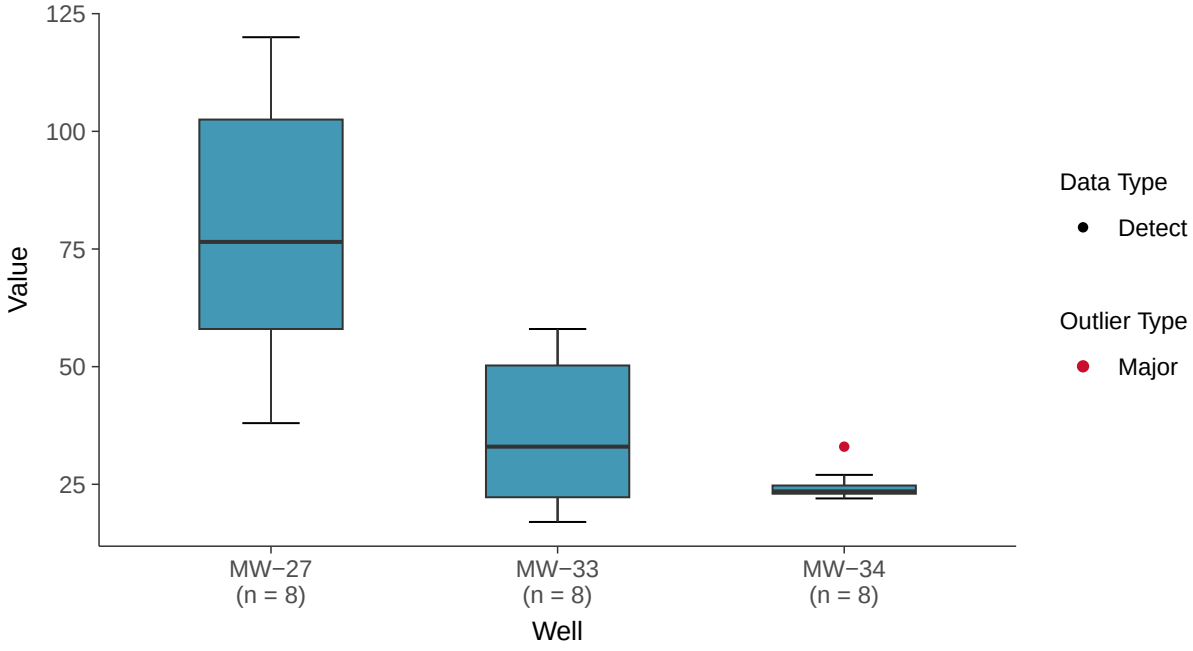
Boxplot by Season

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



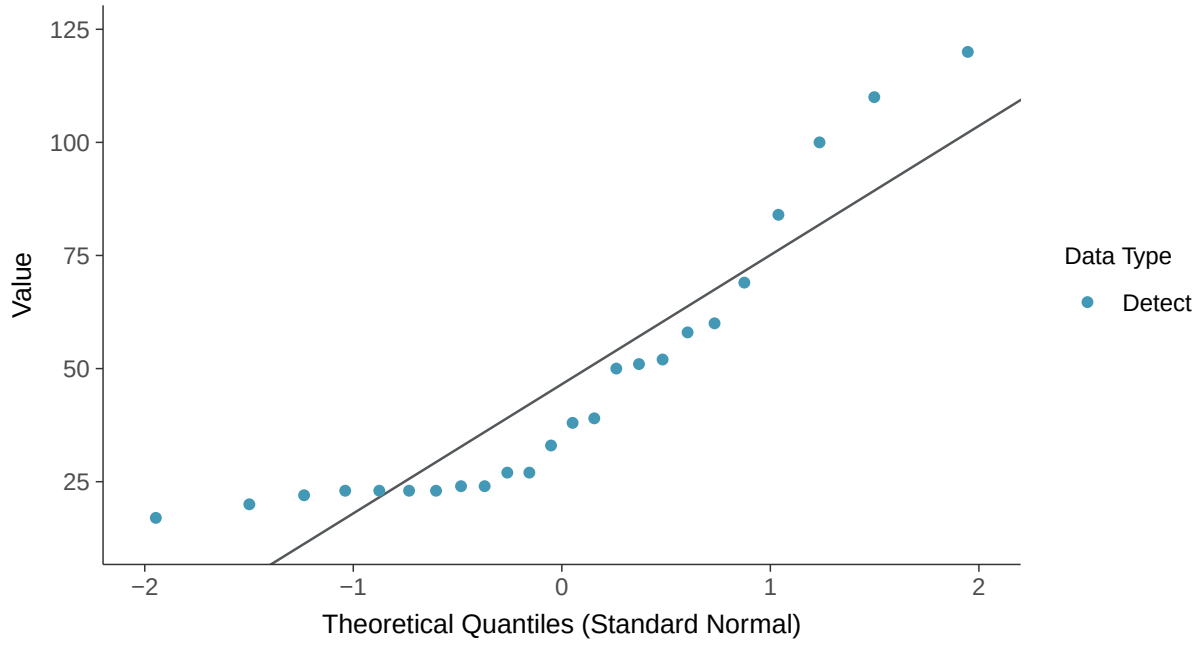
Boxplot by Well

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



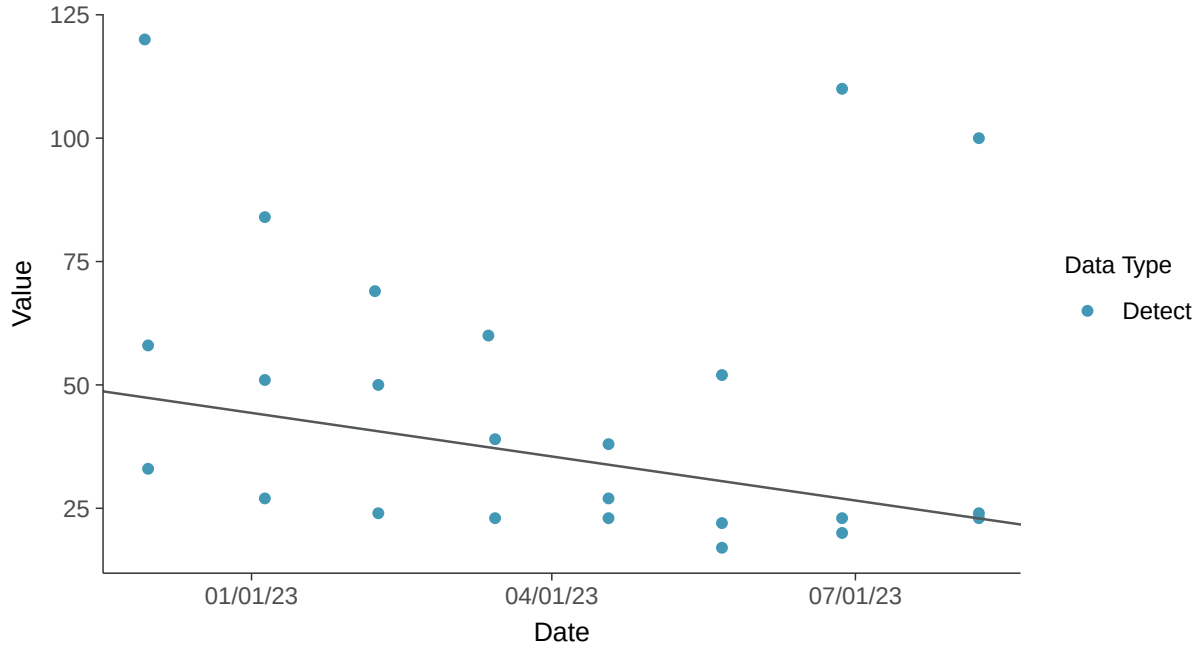
Normal Q-Q plot

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



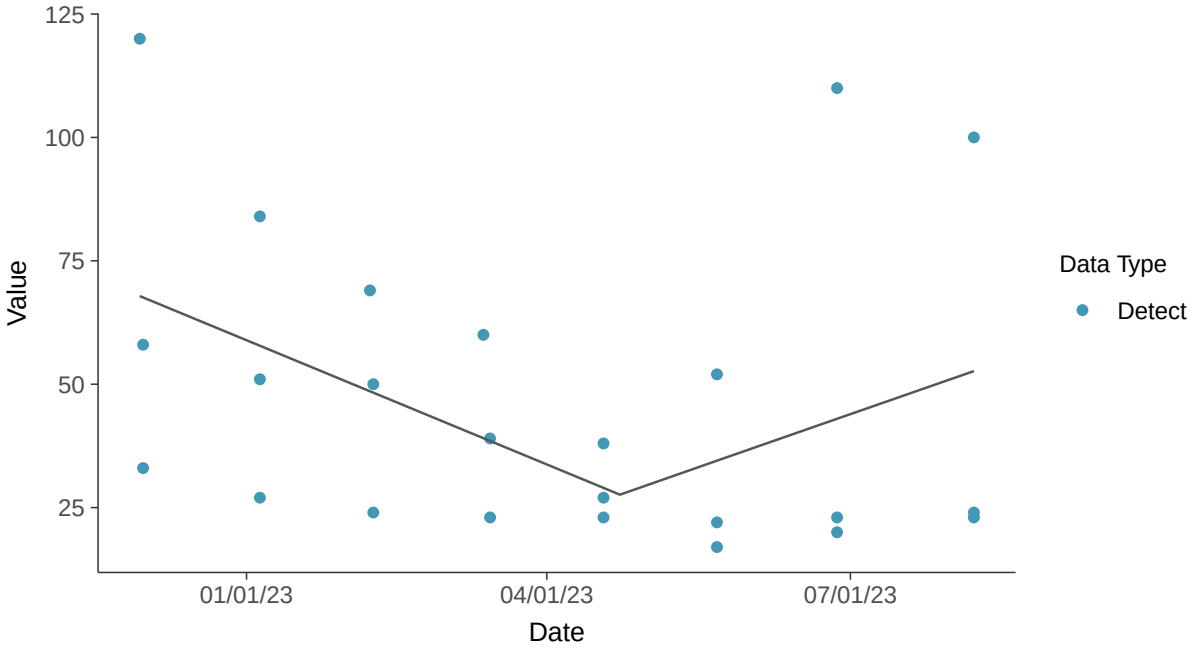
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



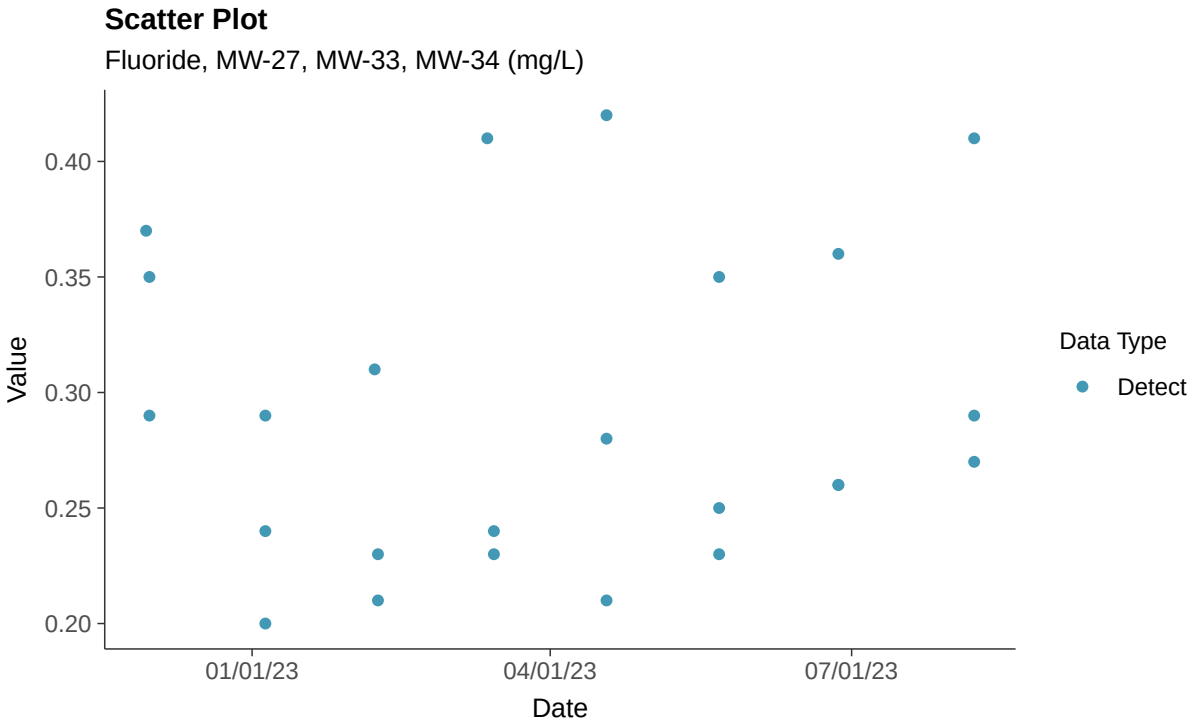
Trend Regression: Piecewise Linear-Linear

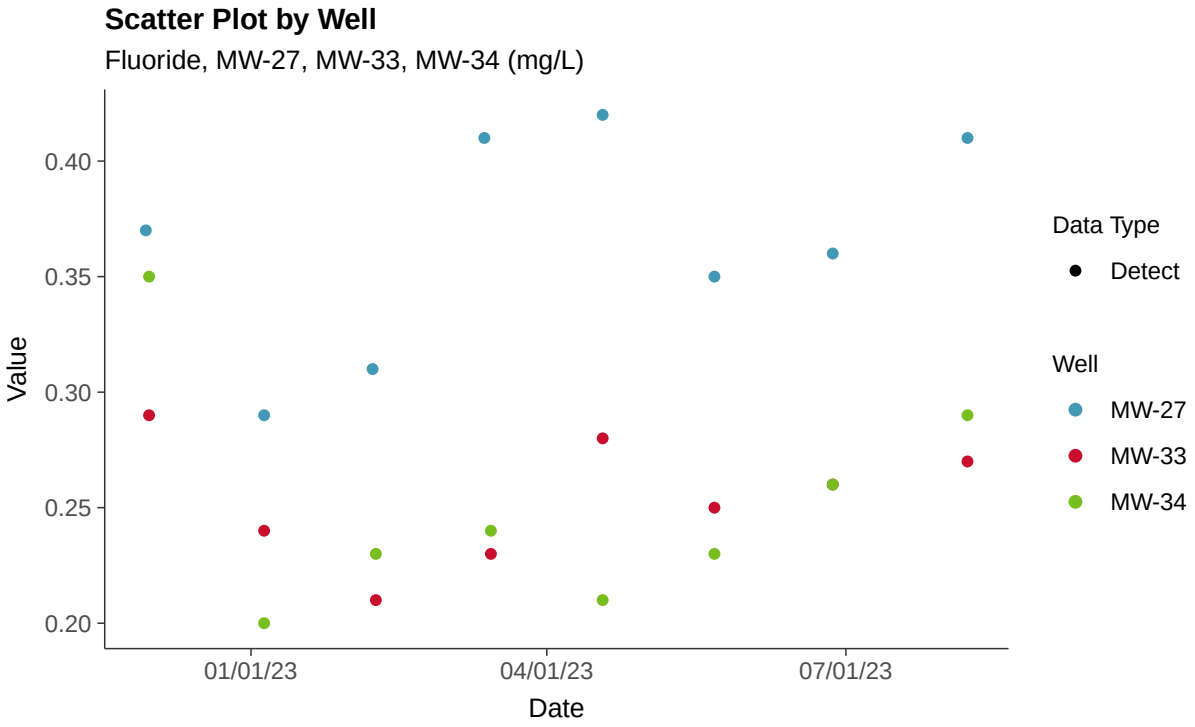
Chloride (as Cl), MW-27, MW-33, MW-34 (mg/L)



Appendix III: Fluoride, MW-27, MW-33, MW-34

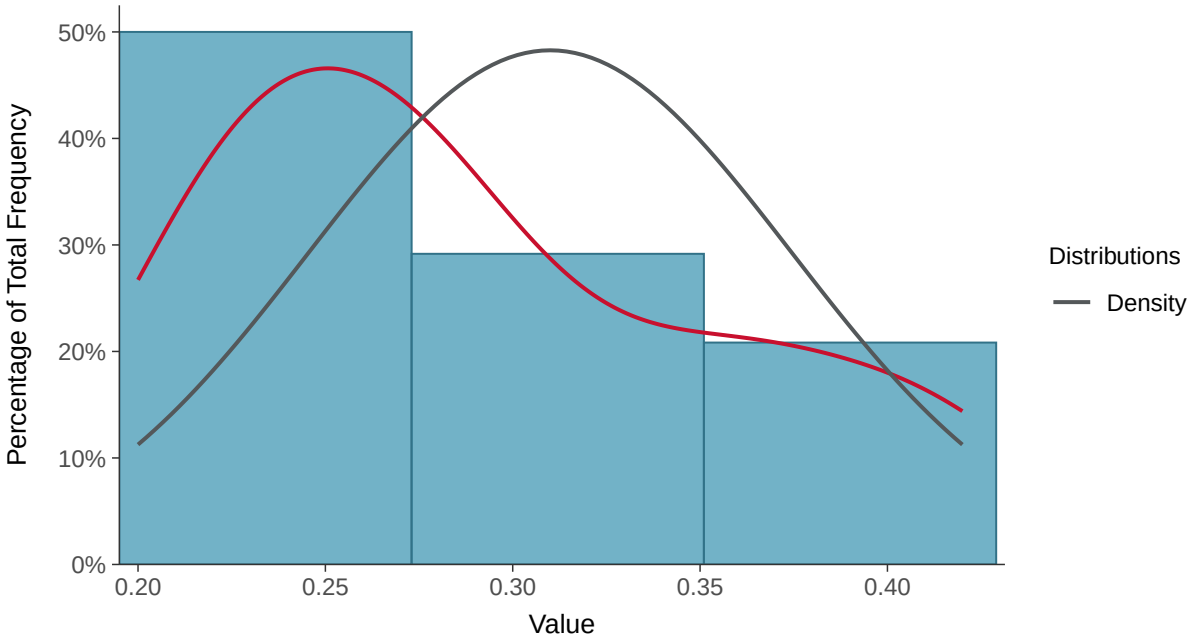
ID: 4_112





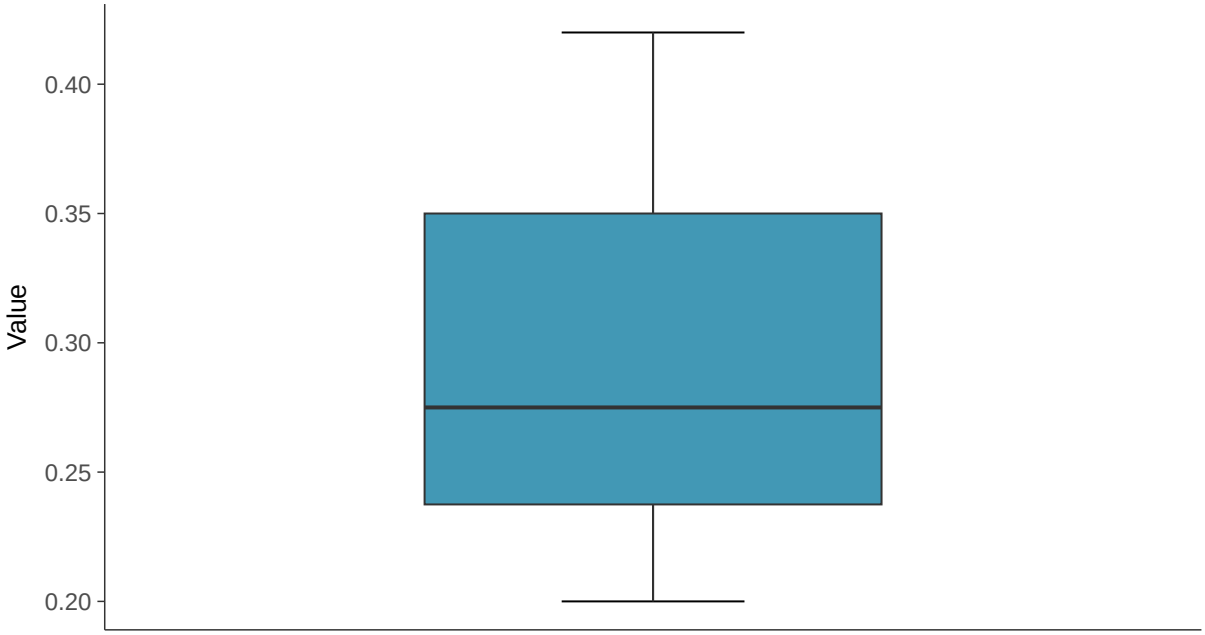
Histogram

Fluoride, MW-27, MW-33, MW-34 (mg/L)



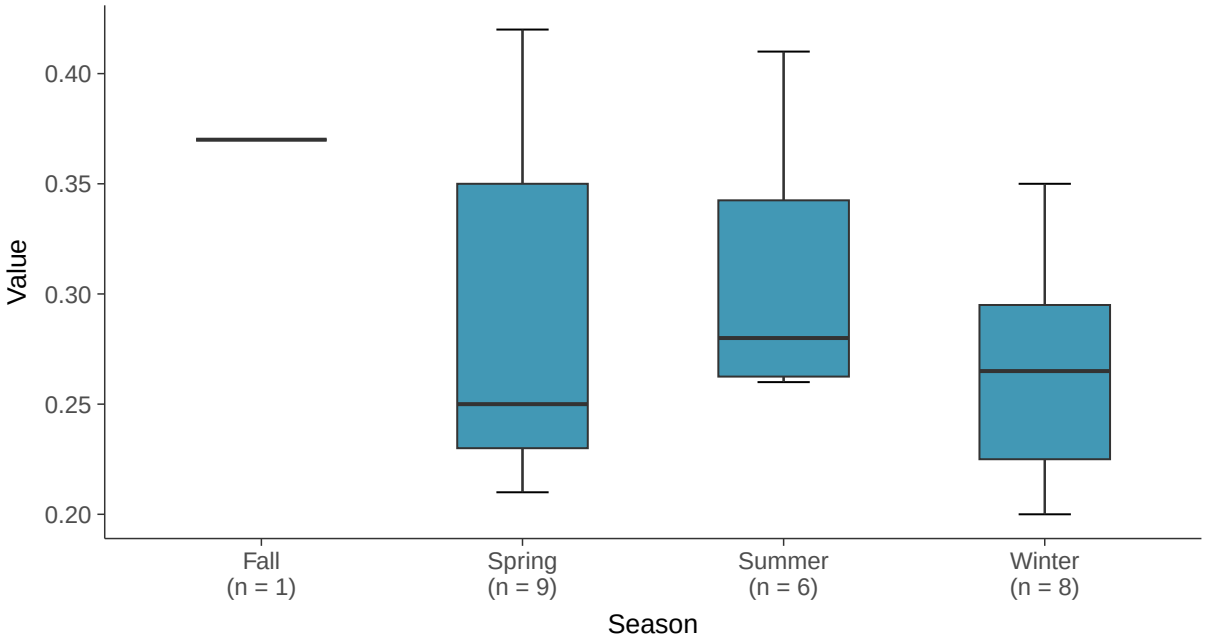
Boxplot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



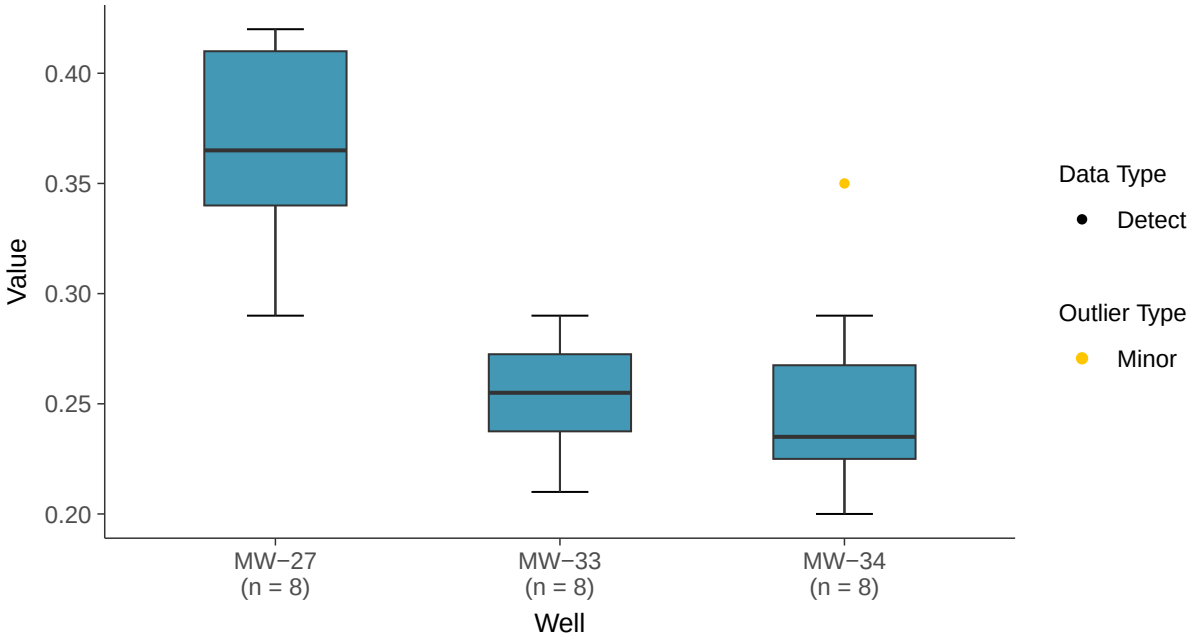
Boxplot by Season

Fluoride, MW-27, MW-33, MW-34 (mg/L)



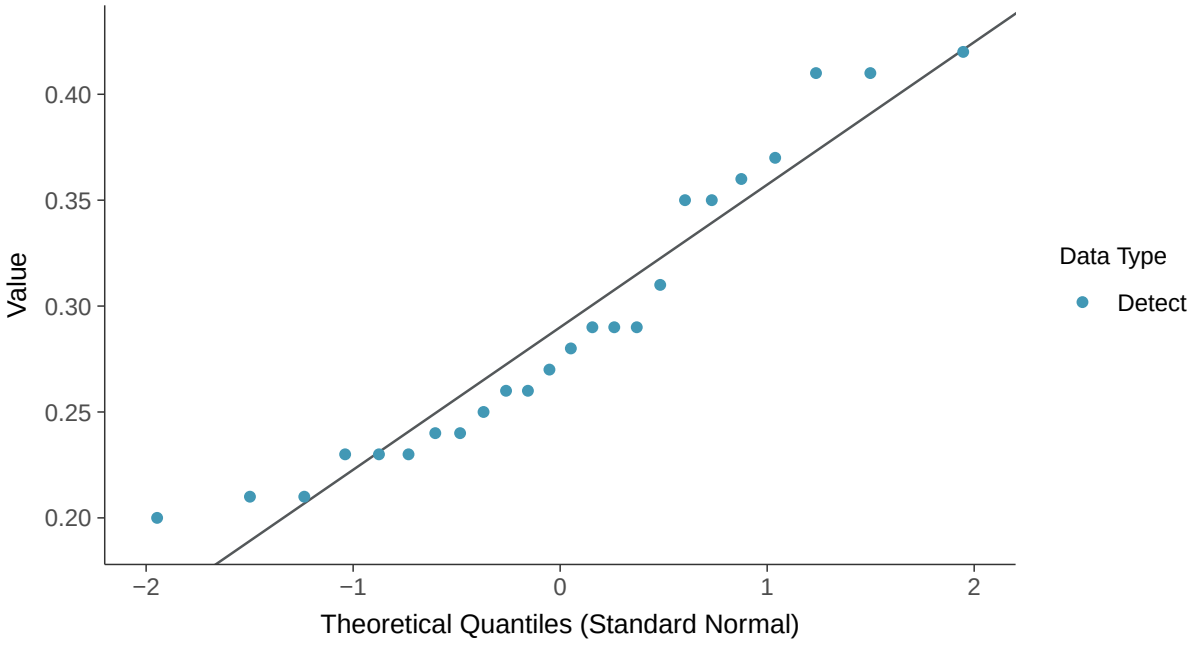
Boxplot by Well

Fluoride, MW-27, MW-33, MW-34 (mg/L)



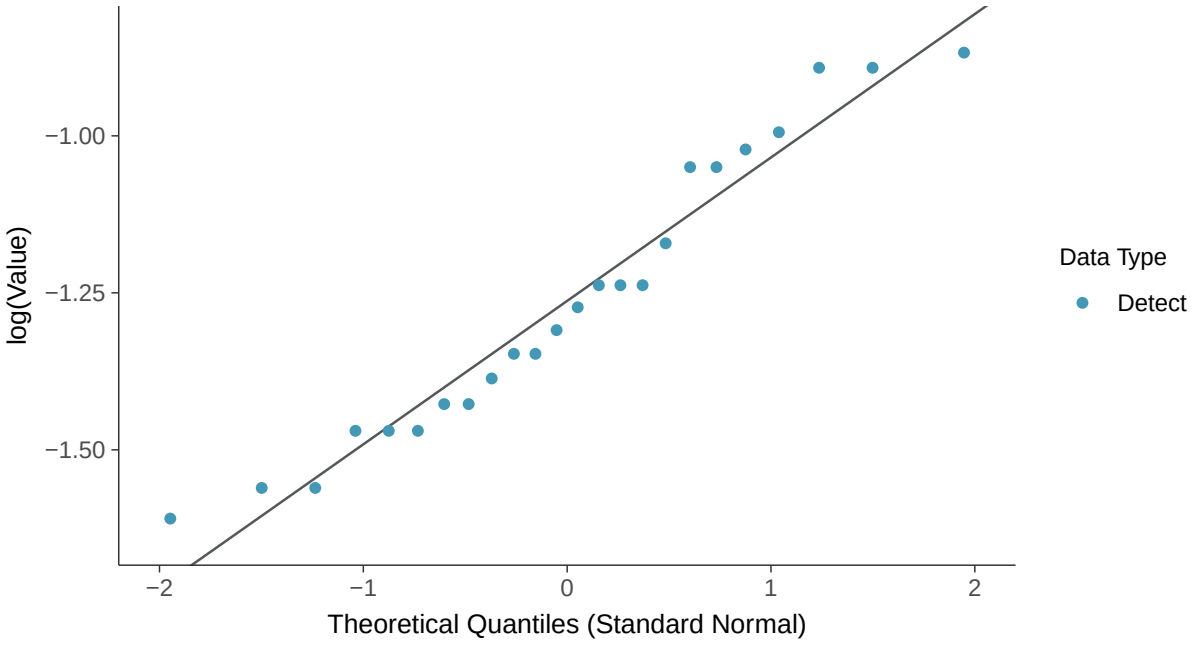
Normal Q-Q plot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



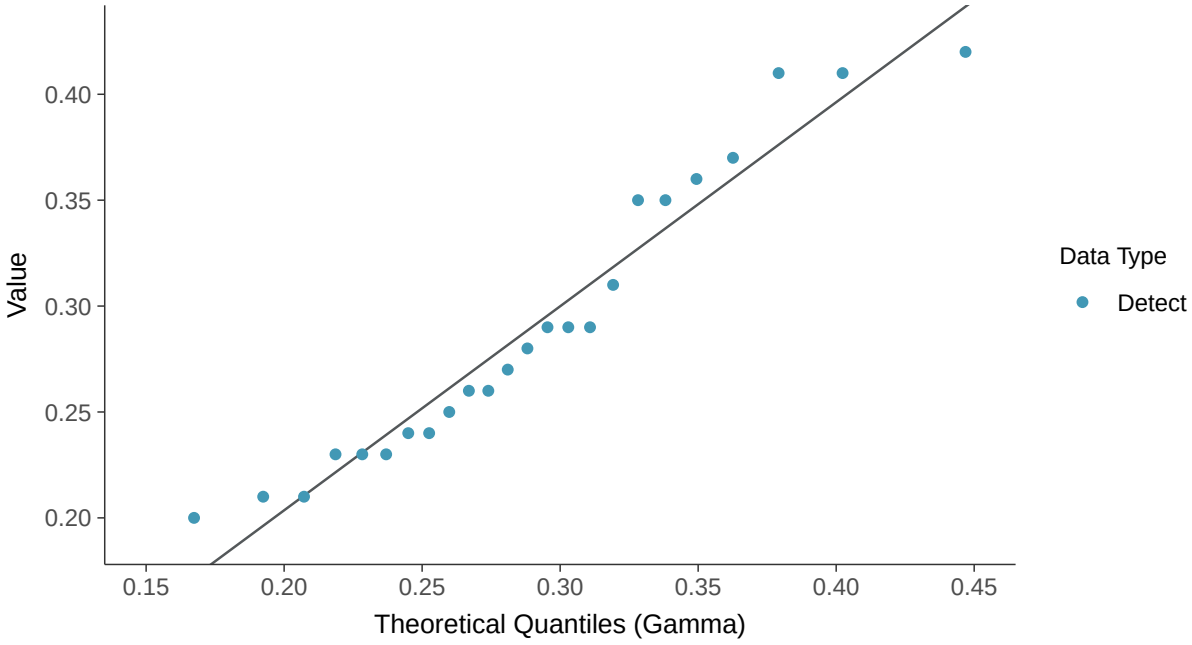
Lognormal Q-Q plot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



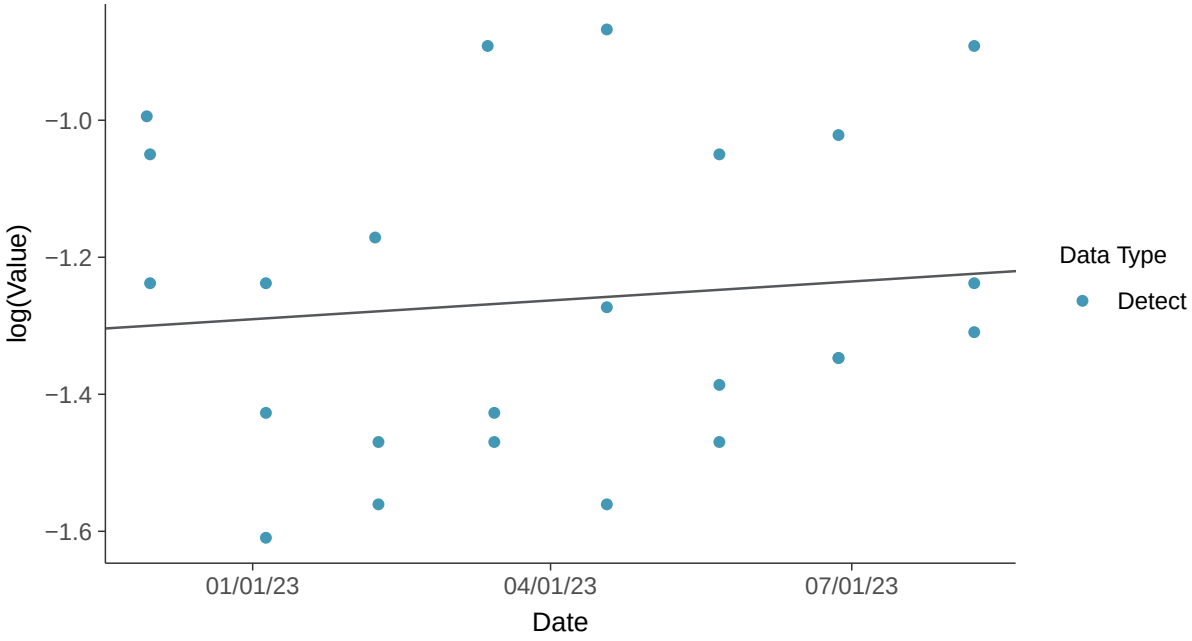
Gamma Q-Q plot

Fluoride, MW-27, MW-33, MW-34 (mg/L)



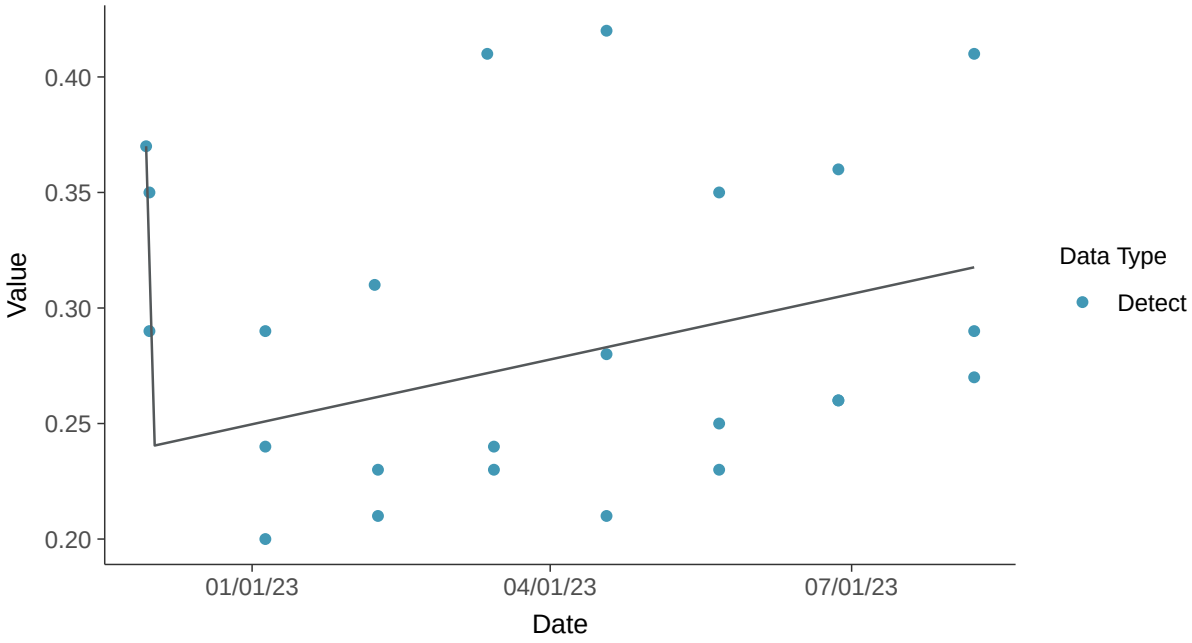
Trend Regression: Lognormal MLE

Fluoride, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Fluoride, MW-27, MW-33, MW-34 (mg/L)

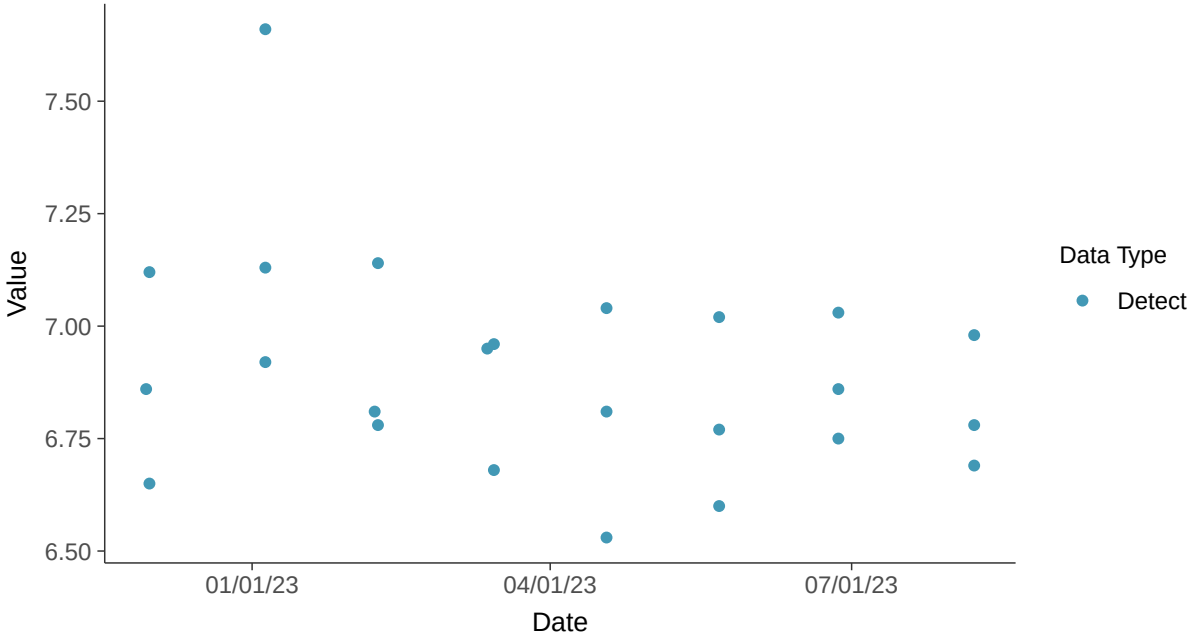


Appendix III: pH (field), MW-27, MW-33, MW-34

ID: 4_120

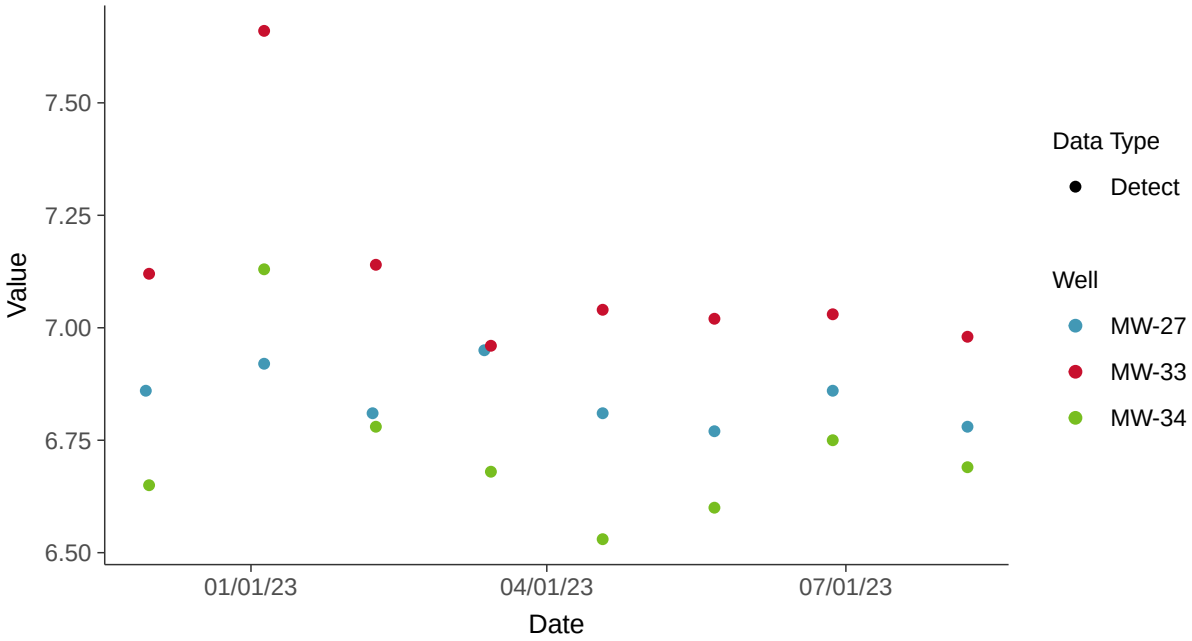
Scatter Plot

pH (field), MW-27, MW-33, MW-34 (su)



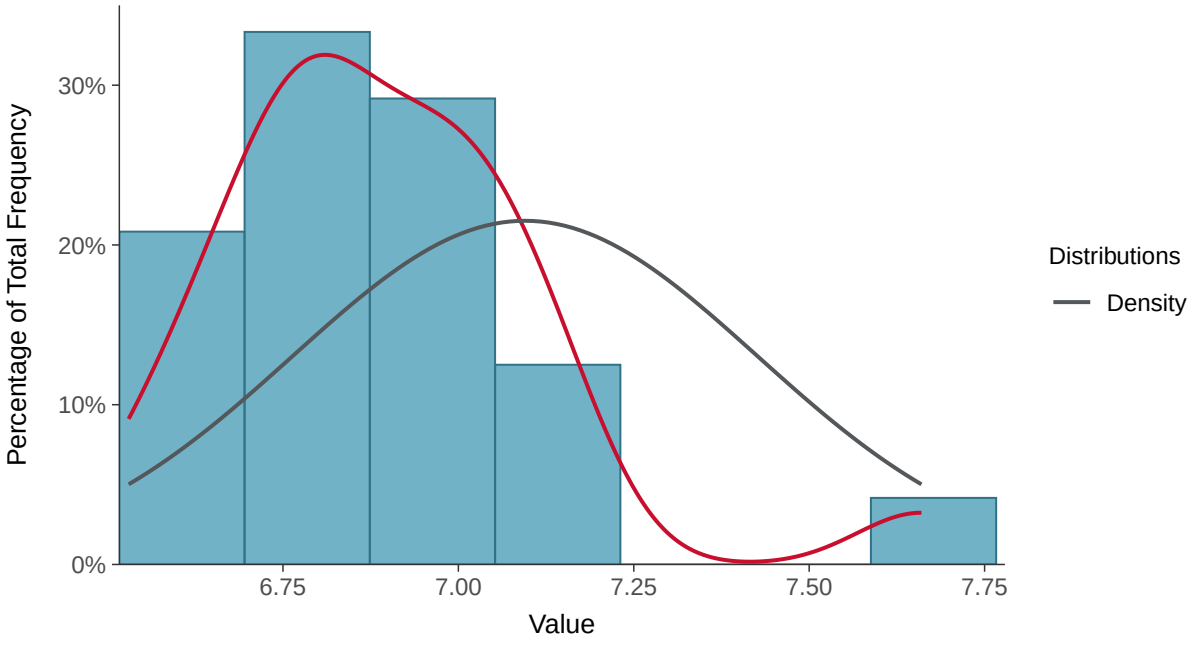
Scatter Plot by Well

pH (field), MW-27, MW-33, MW-34 (su)



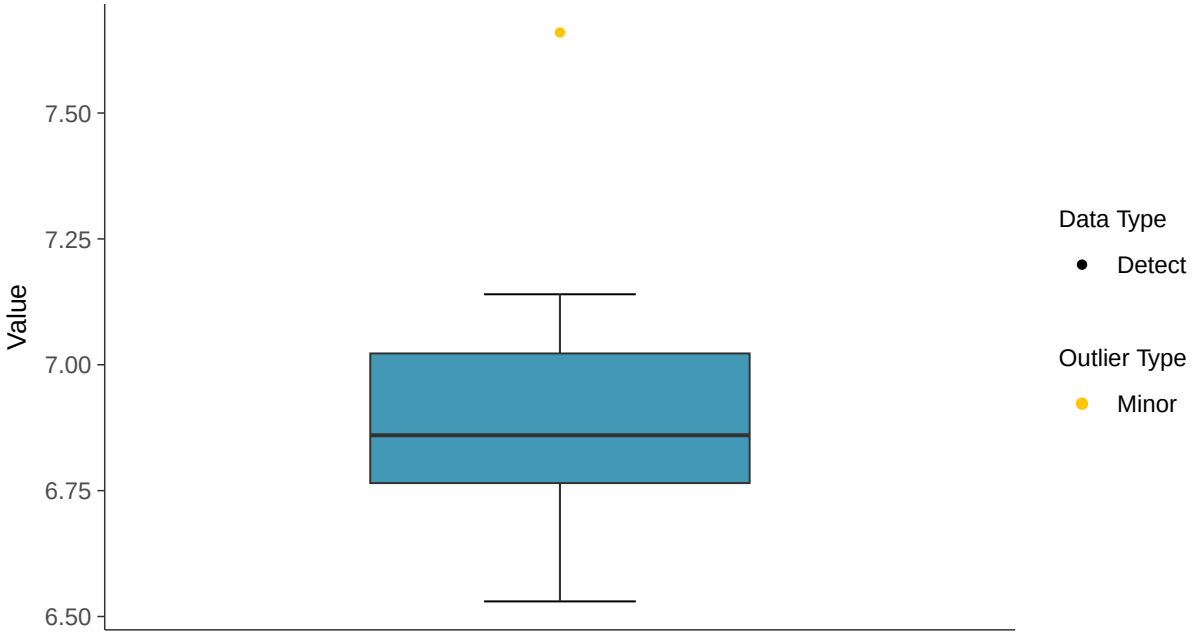
Histogram

pH (field), MW-27, MW-33, MW-34 (su)



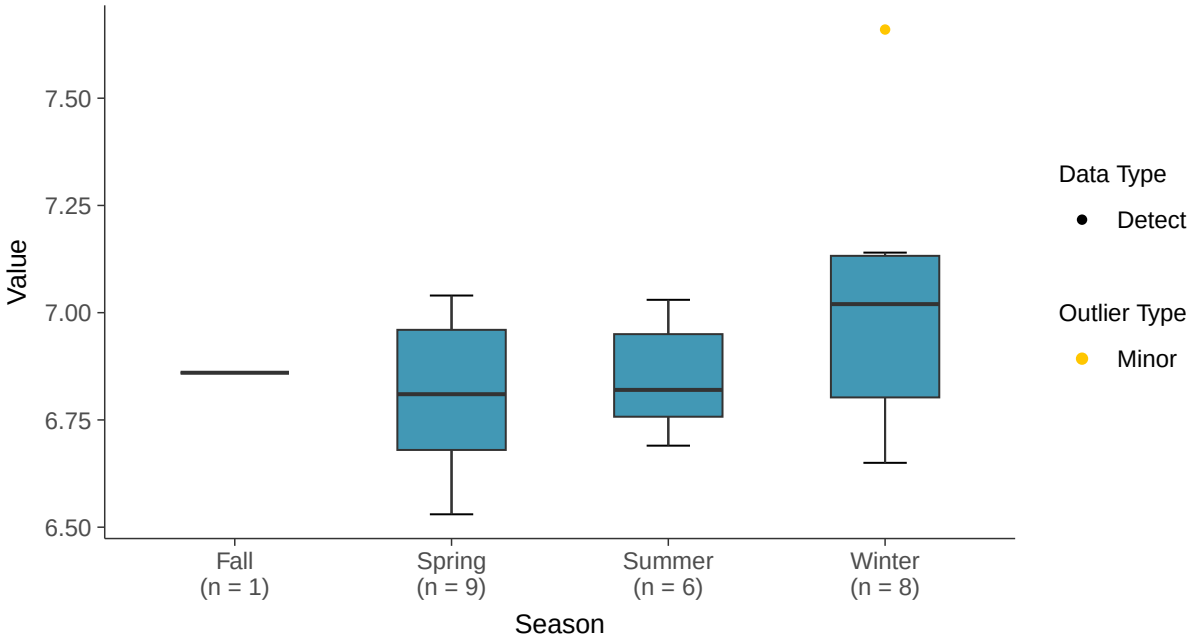
Boxplot

pH (field), MW-27, MW-33, MW-34 (su)



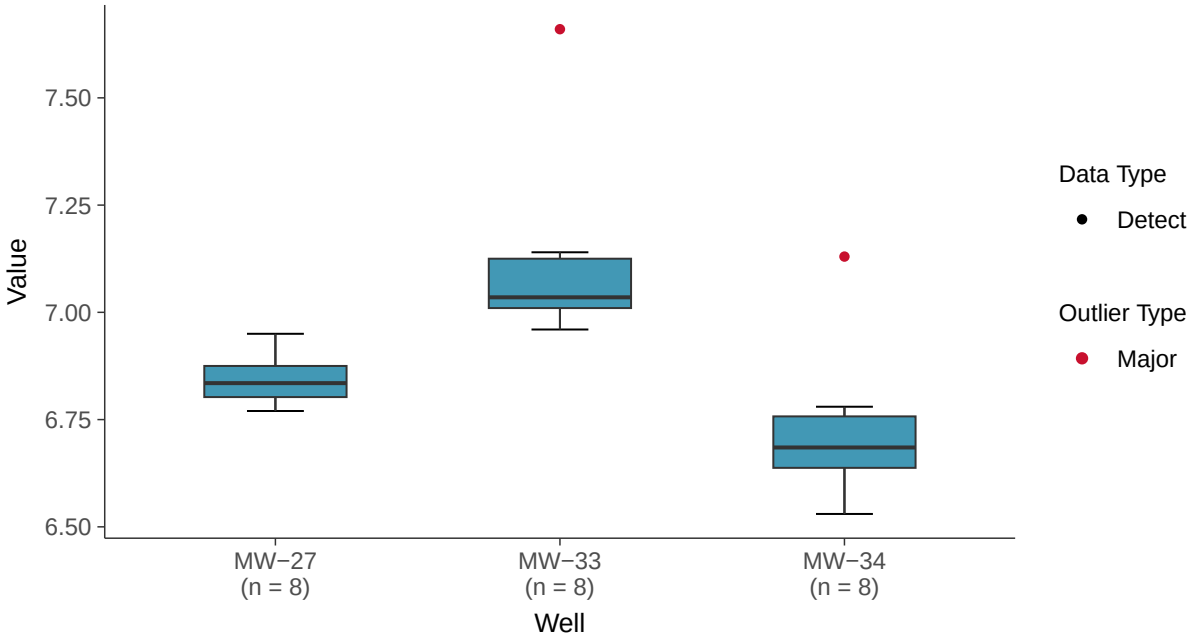
Boxplot by Season

pH (field), MW-27, MW-33, MW-34 (su)



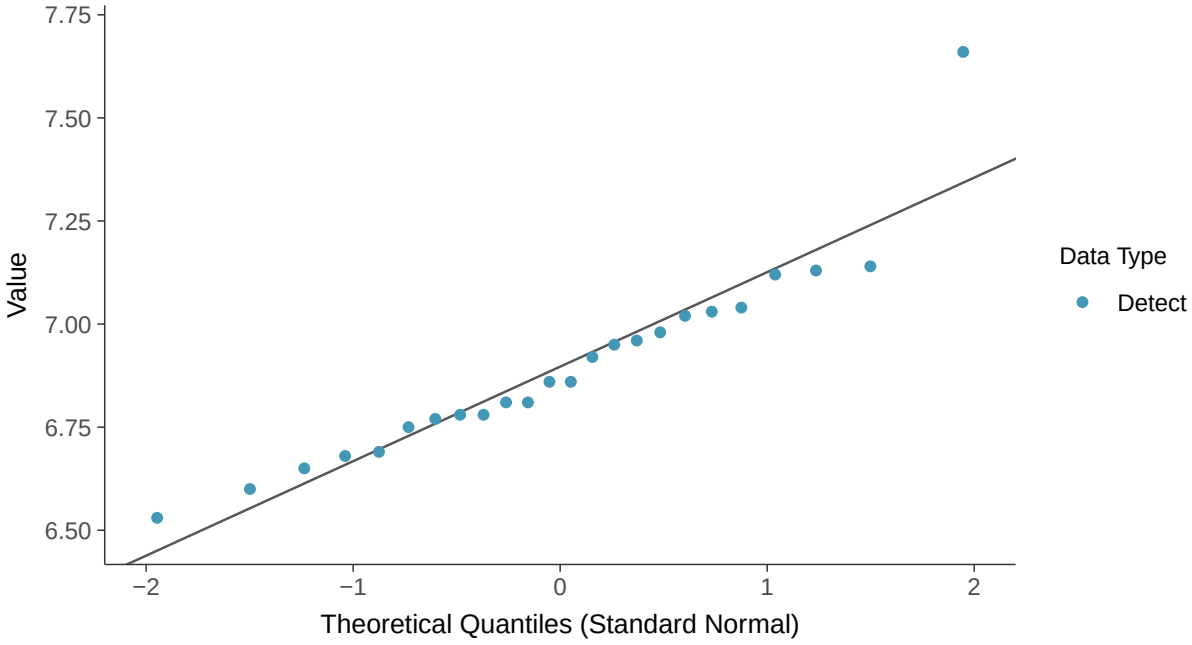
Boxplot by Well

pH (field), MW-27, MW-33, MW-34 (su)



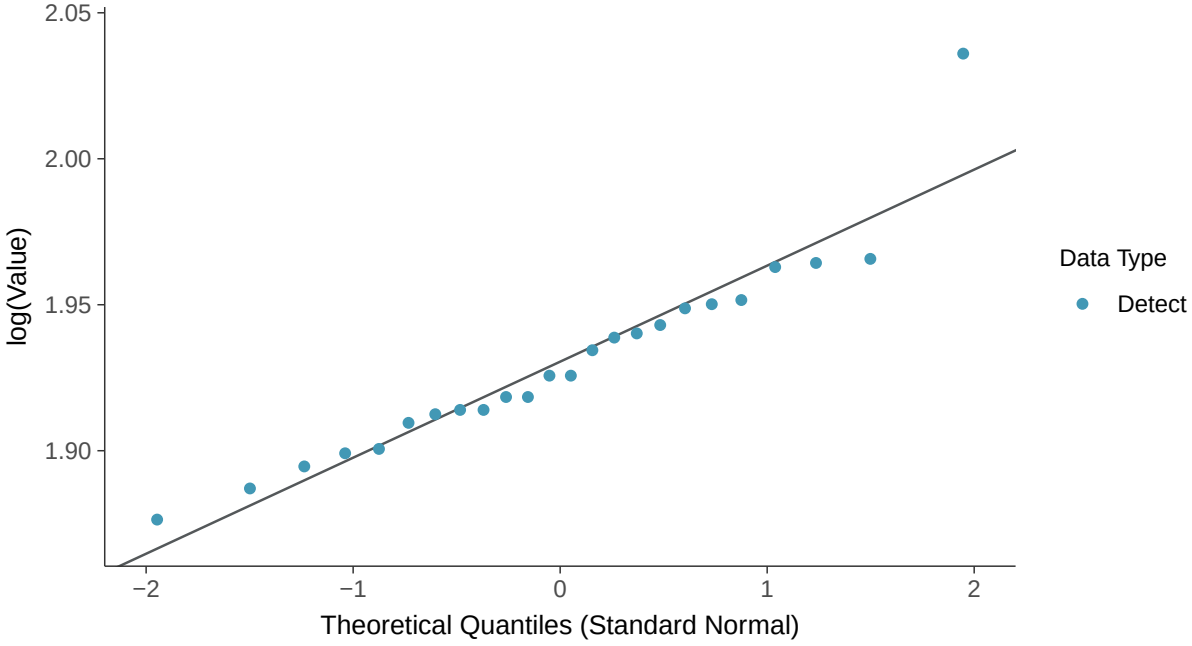
Normal Q-Q plot

pH (field), MW-27, MW-33, MW-34 (su)



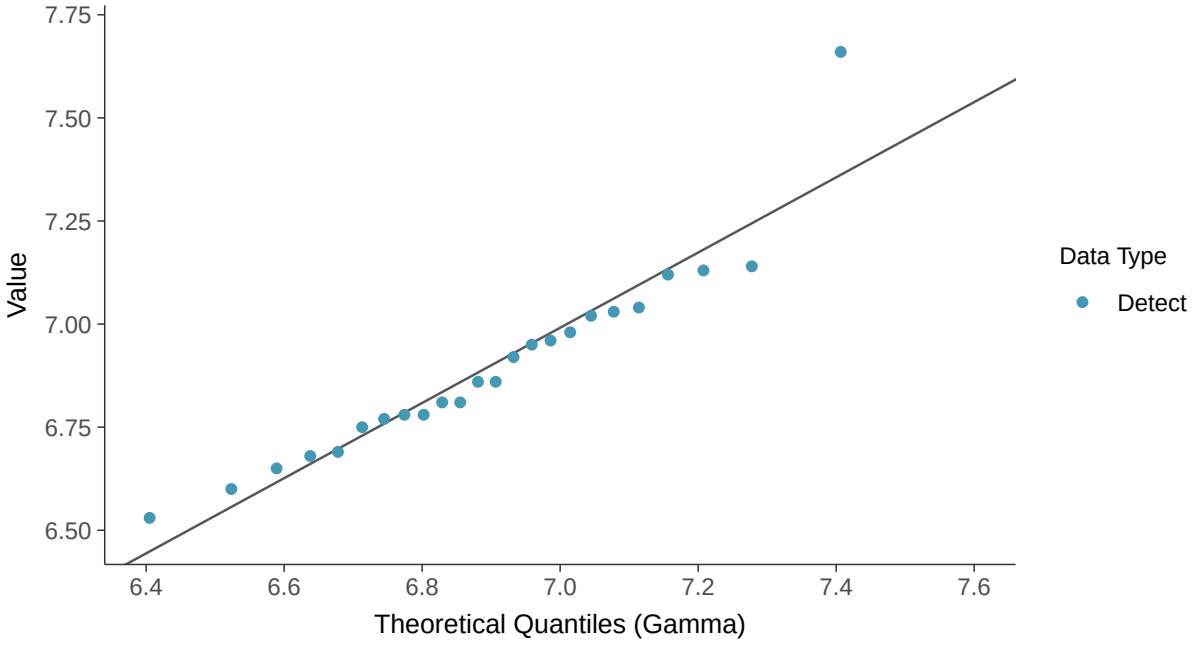
Lognormal Q-Q plot

pH (field), MW-27, MW-33, MW-34 (su)



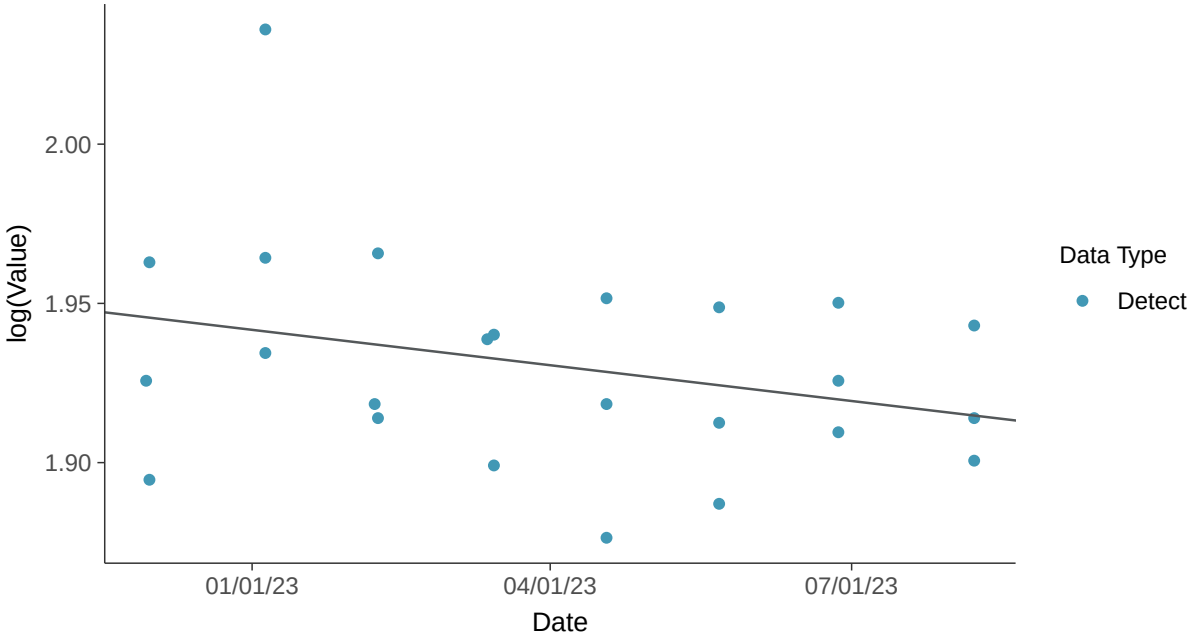
Gamma Q-Q plot

pH (field), MW-27, MW-33, MW-34 (su)



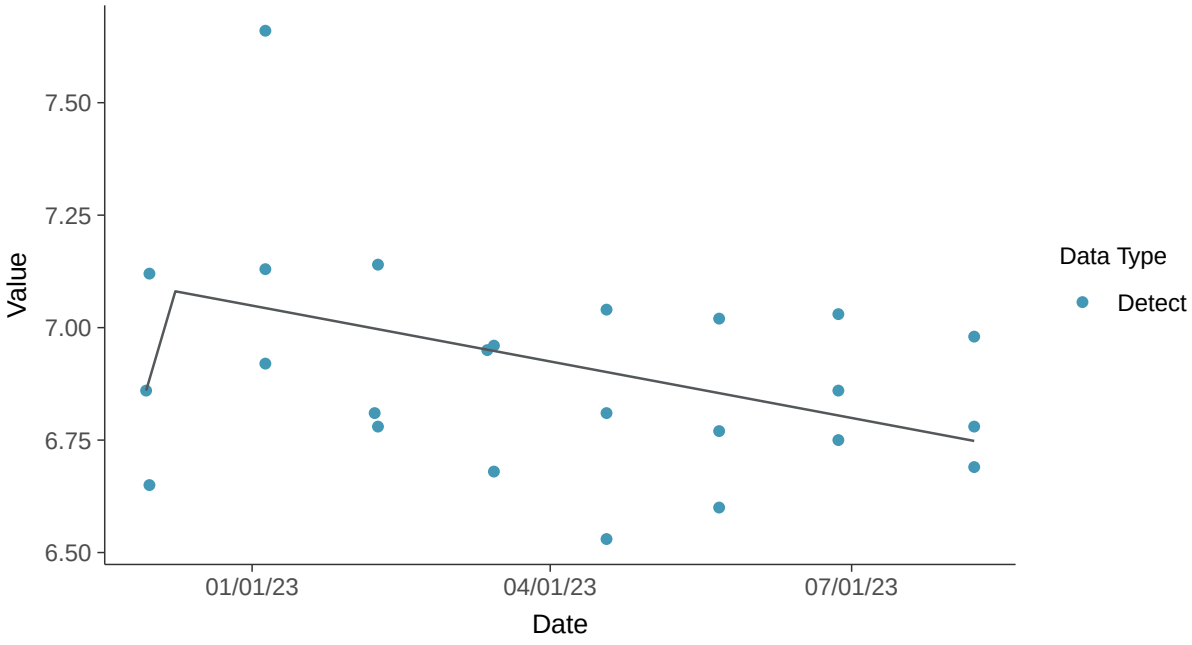
Trend Regression: Lognormal MLE

pH (field), MW-27, MW-33, MW-34 (su)



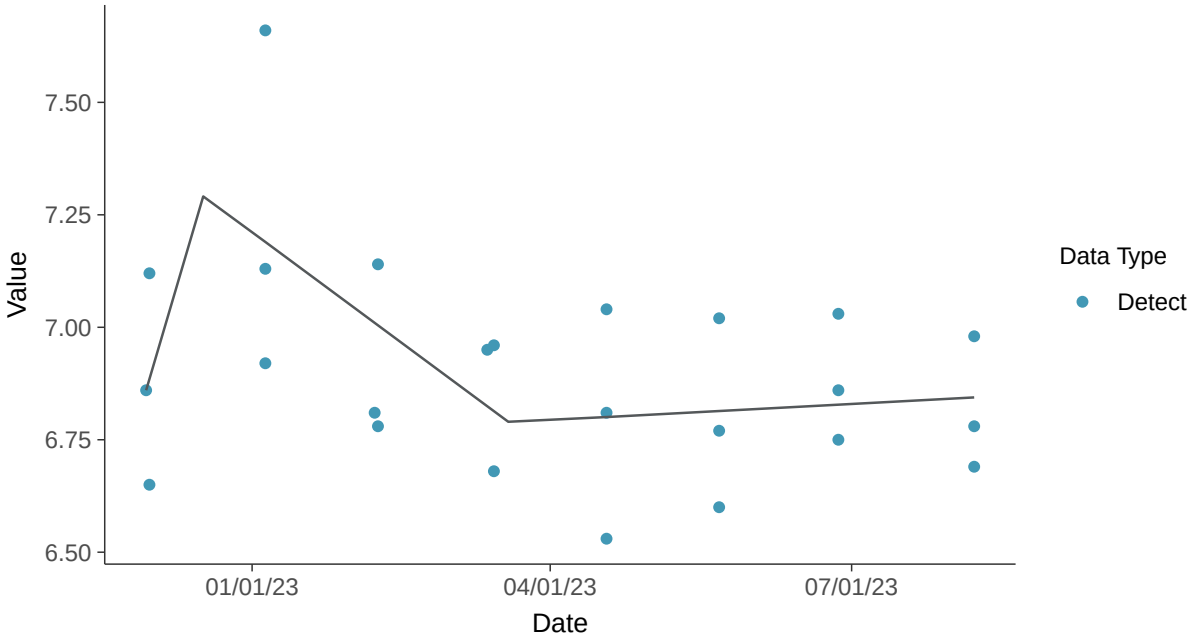
Trend Regression: Piecewise Linear-Linear

pH (field), MW-27, MW-33, MW-34 (su)



Trend Regression: Piecewise Linear-Linear-Linear

pH (field), MW-27, MW-33, MW-34 (su)

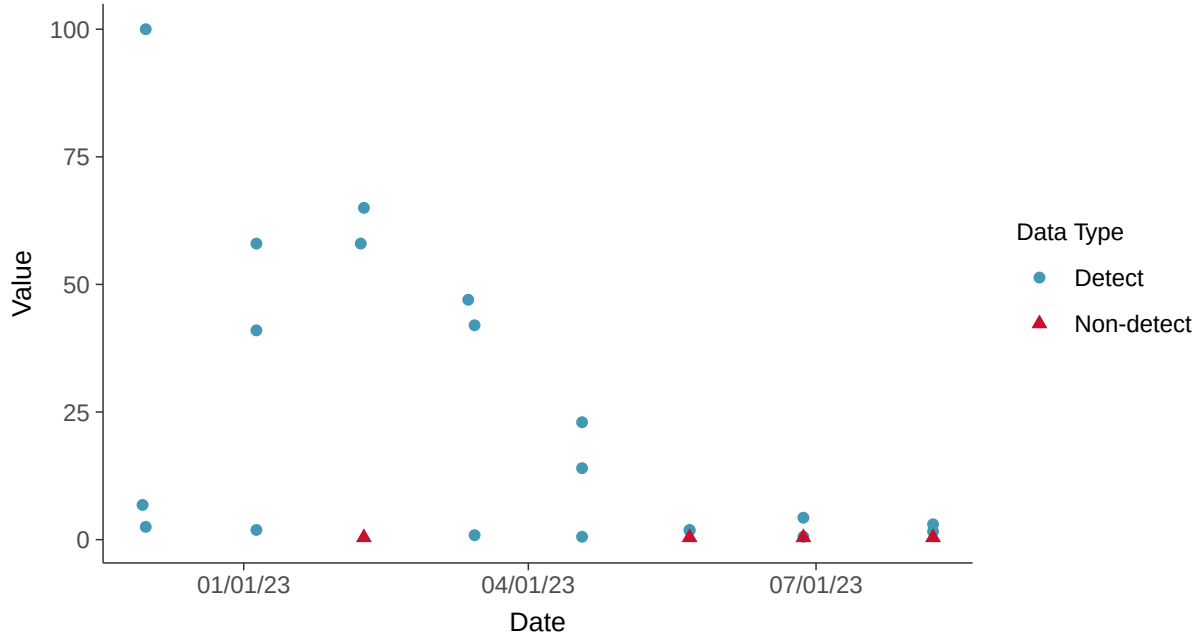


Appendix III: Sulfate (as SO4), MW-27, MW-33, MW-34

ID: 4_124

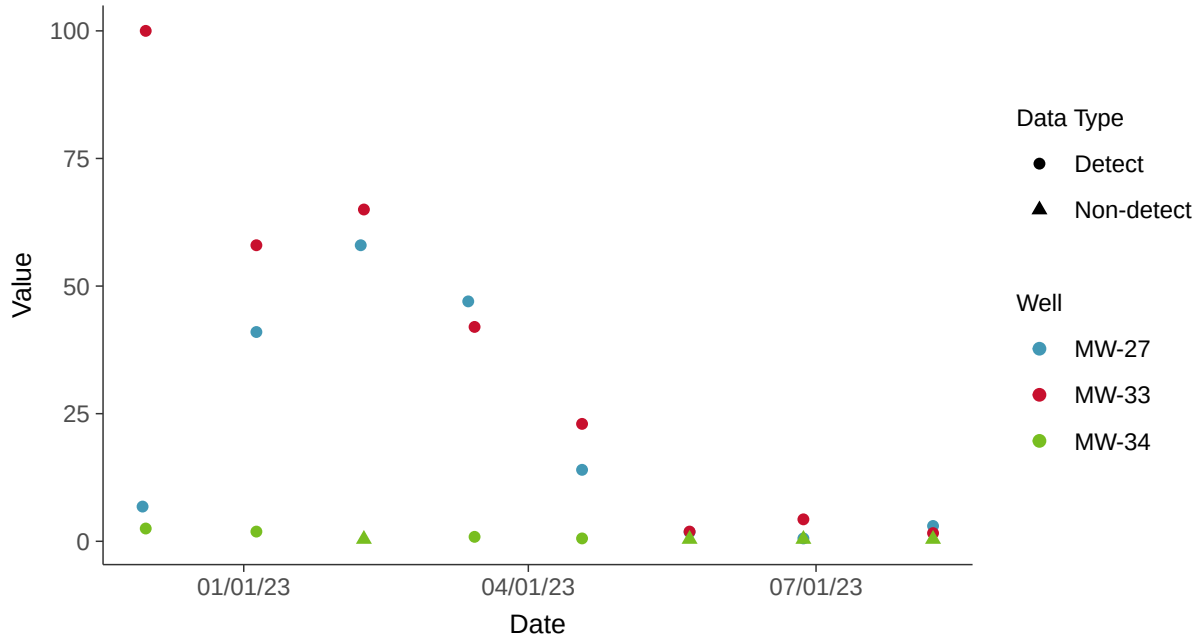
Scatter Plot

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



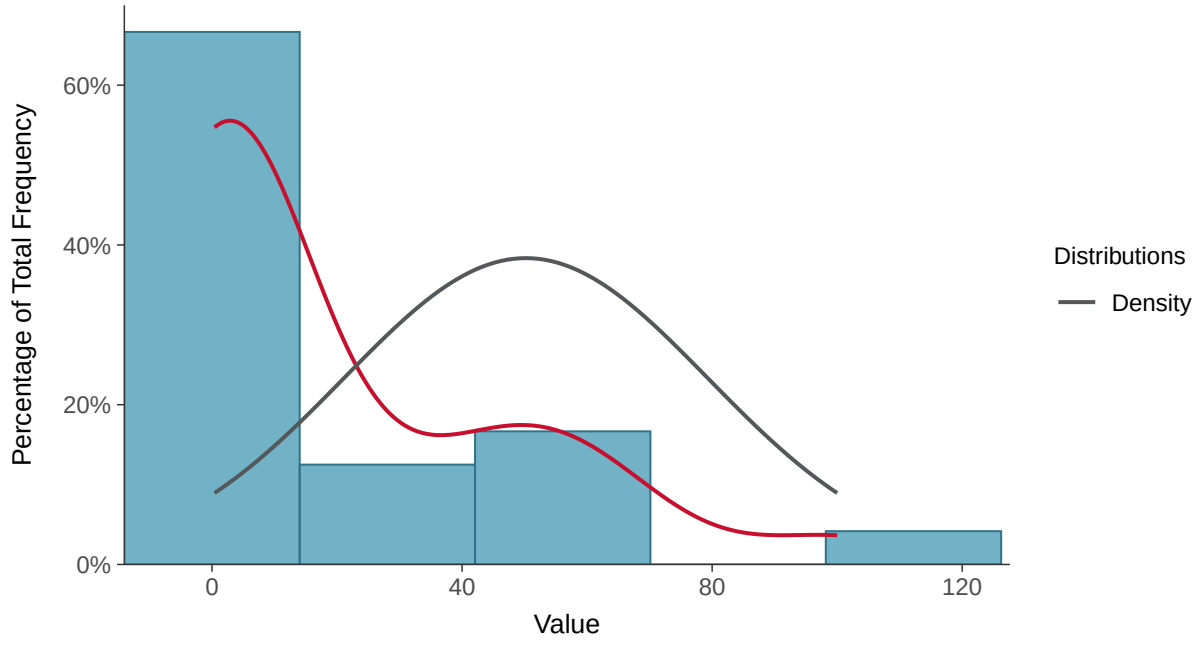
Scatter Plot by Well

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



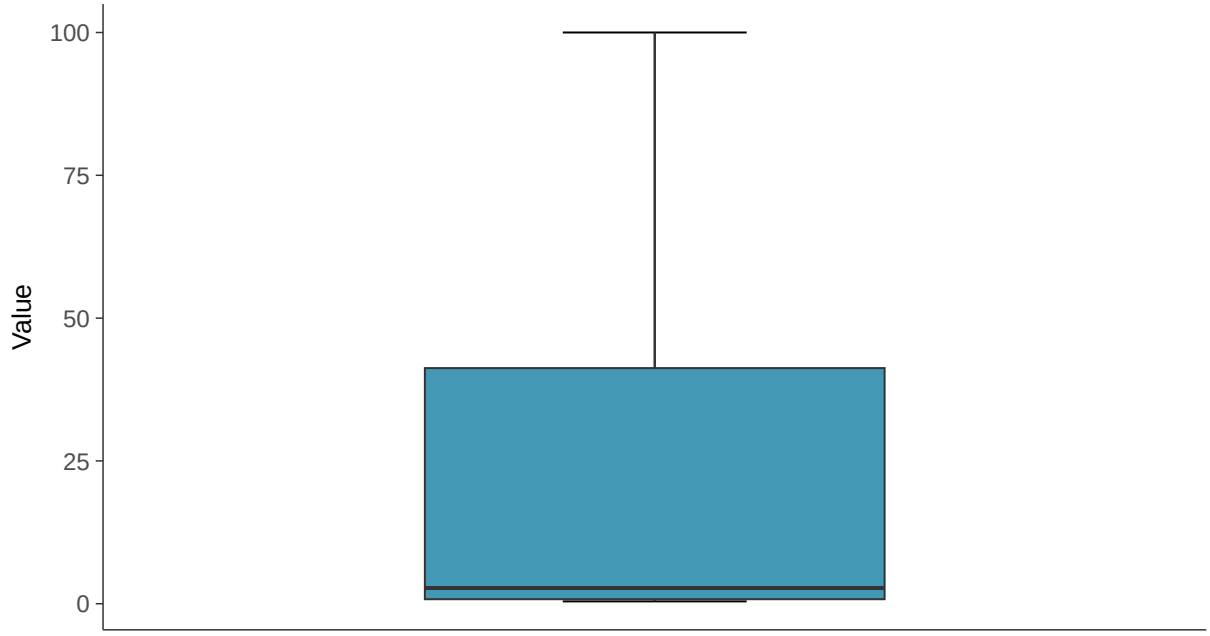
Histogram

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



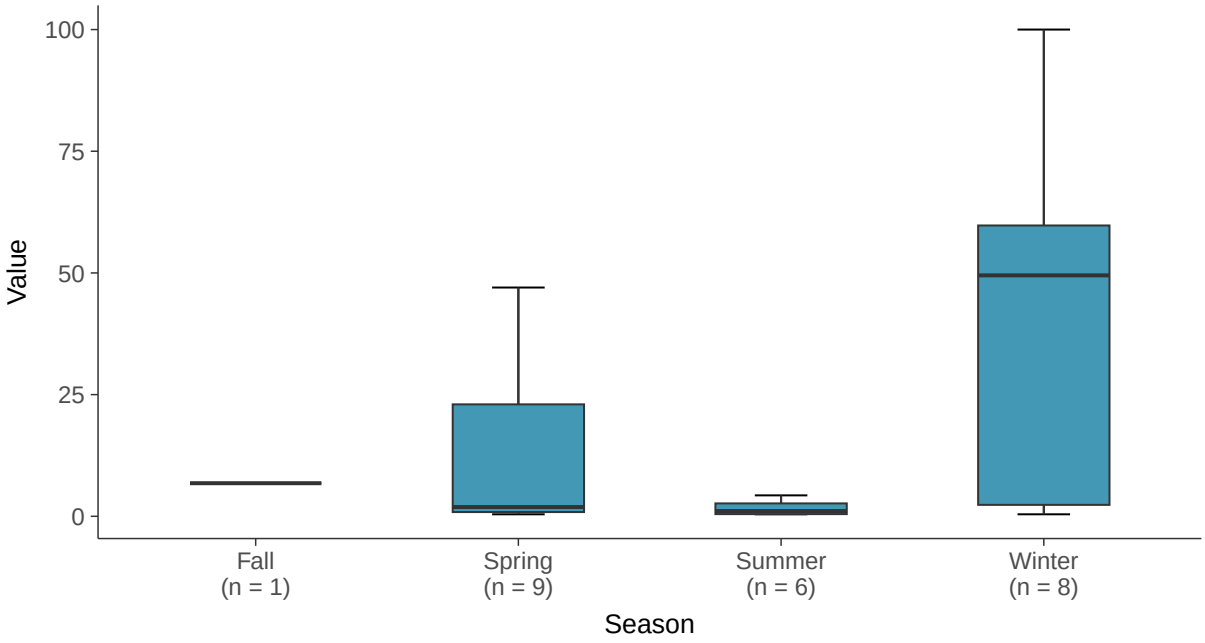
Boxplot

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



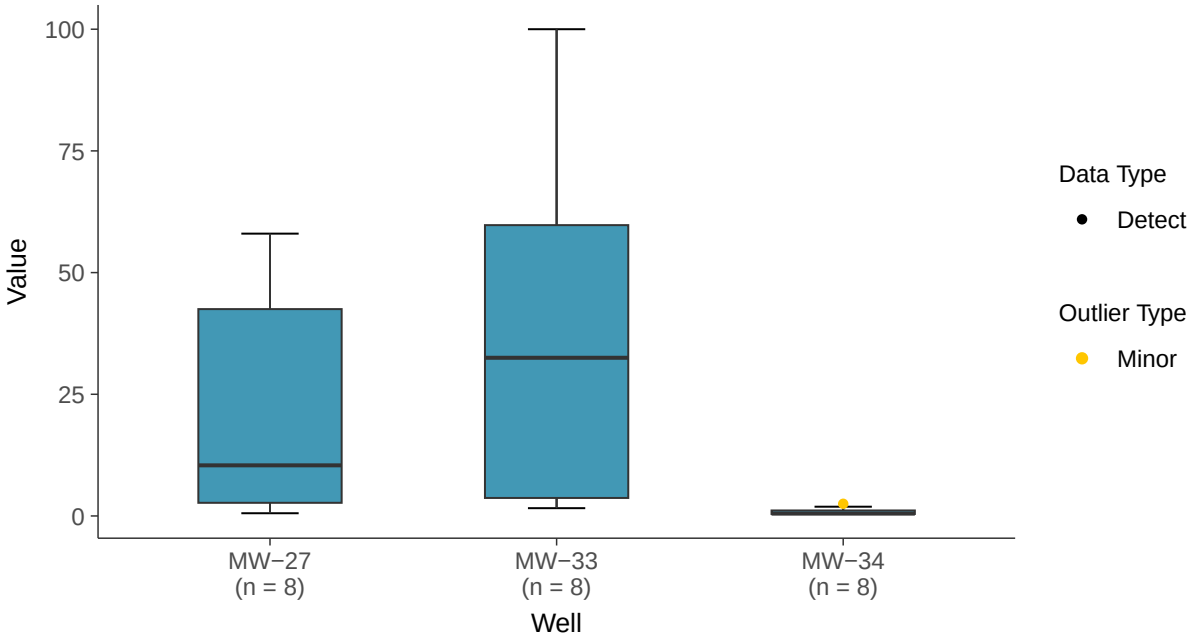
Boxplot by Season

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



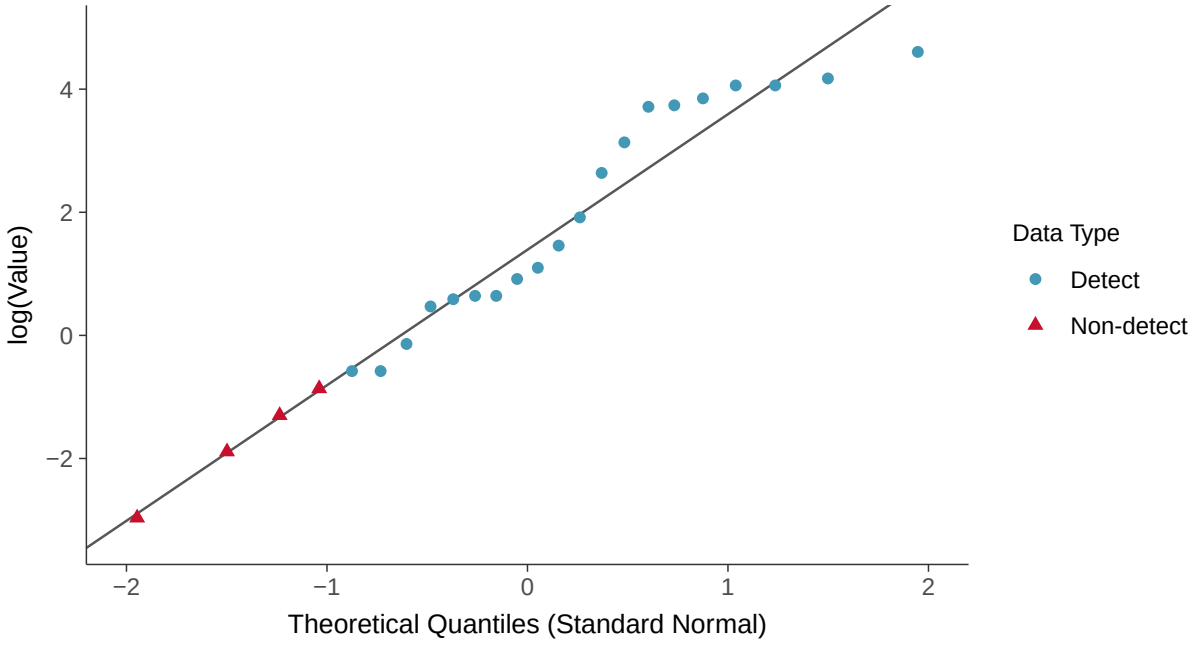
Boxplot by Well

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



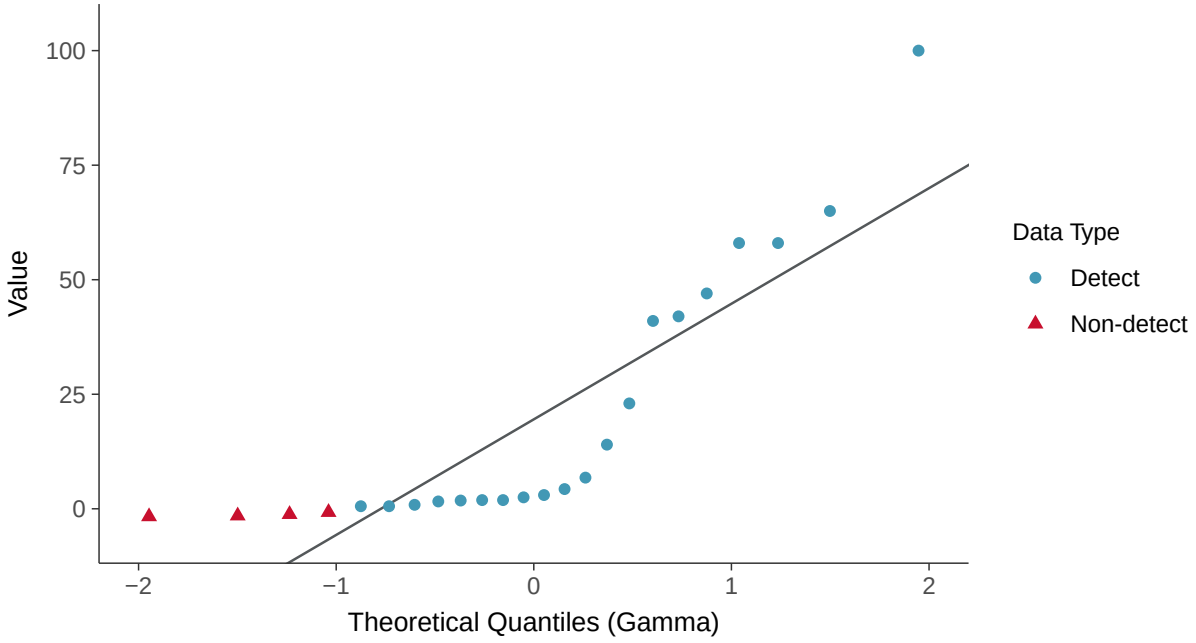
Lognormal Q-Q plot using ROS Imputed Estimates

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



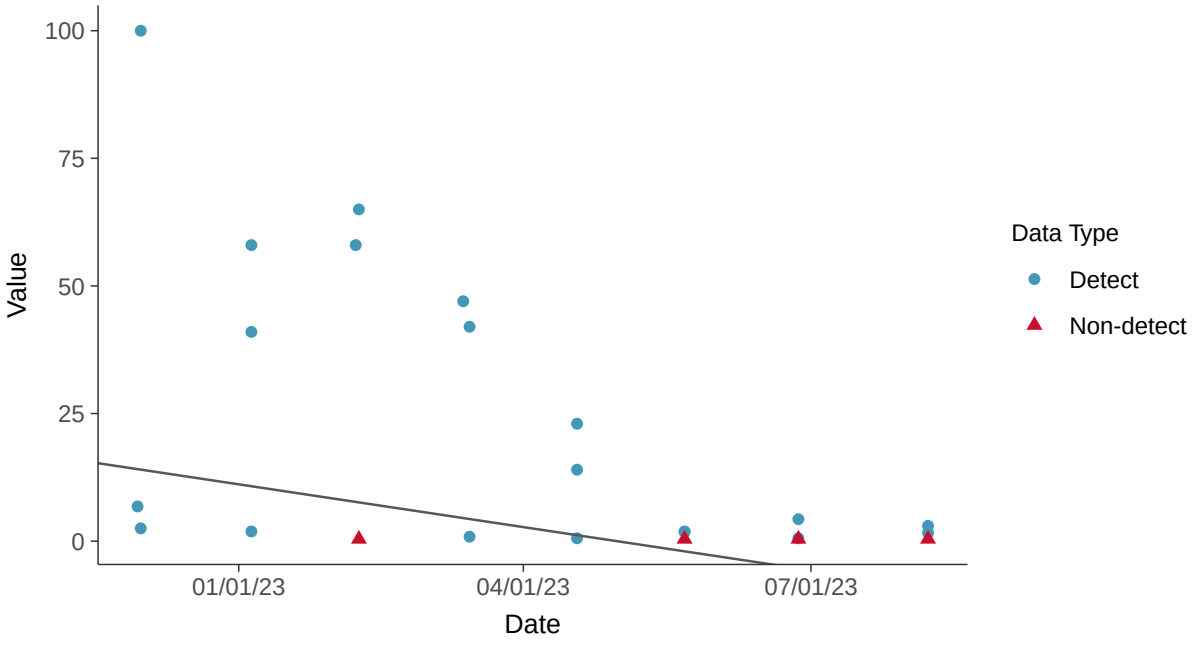
Gamma Q-Q plot using ROS Imputed Estimates

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



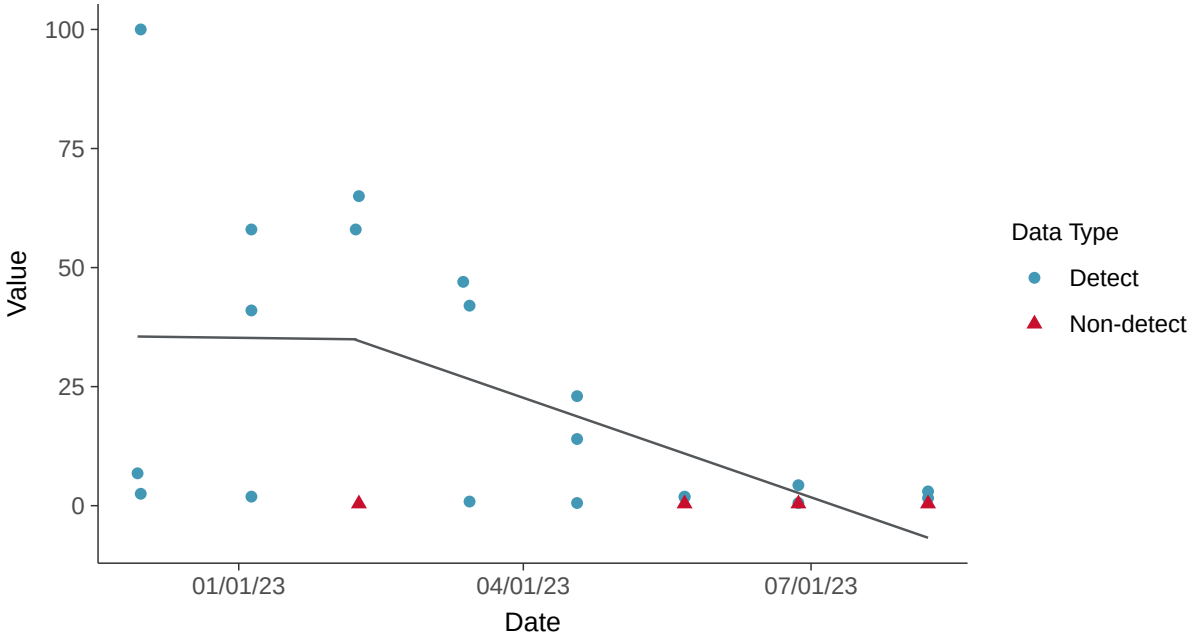
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



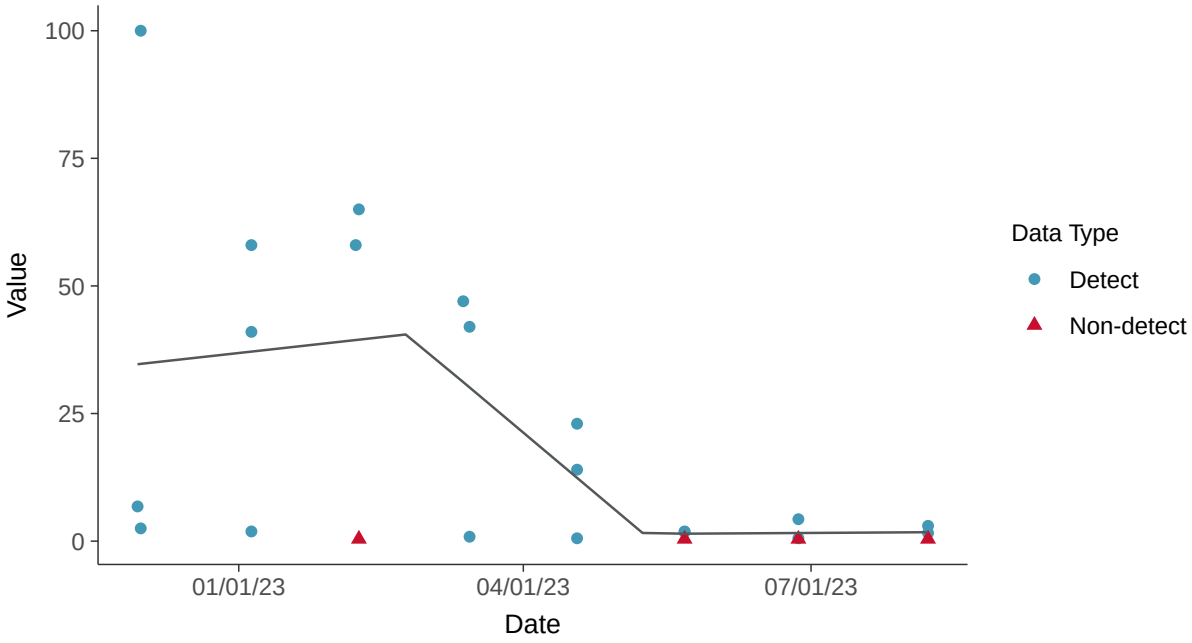
Trend Regression: Piecewise Linear-Linear

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Sulfate (as SO4), MW-27, MW-33, MW-34 (mg/L)

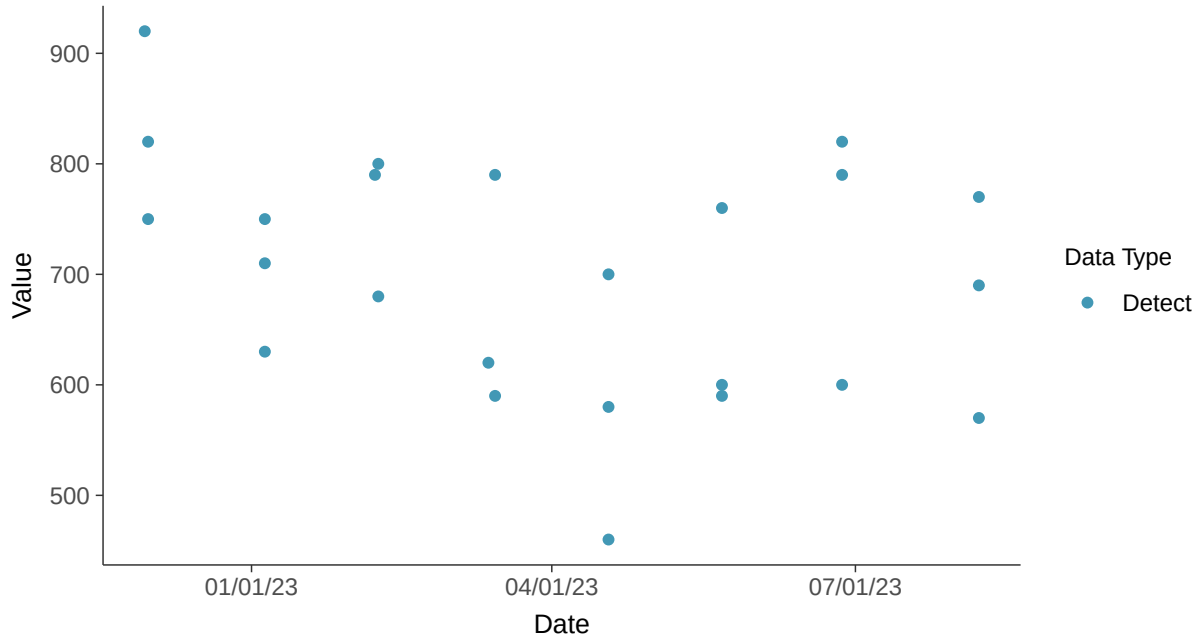


Appendix III: Total Dissolved Solids, MW-27, MW-33, MW-34

ID: 4_126

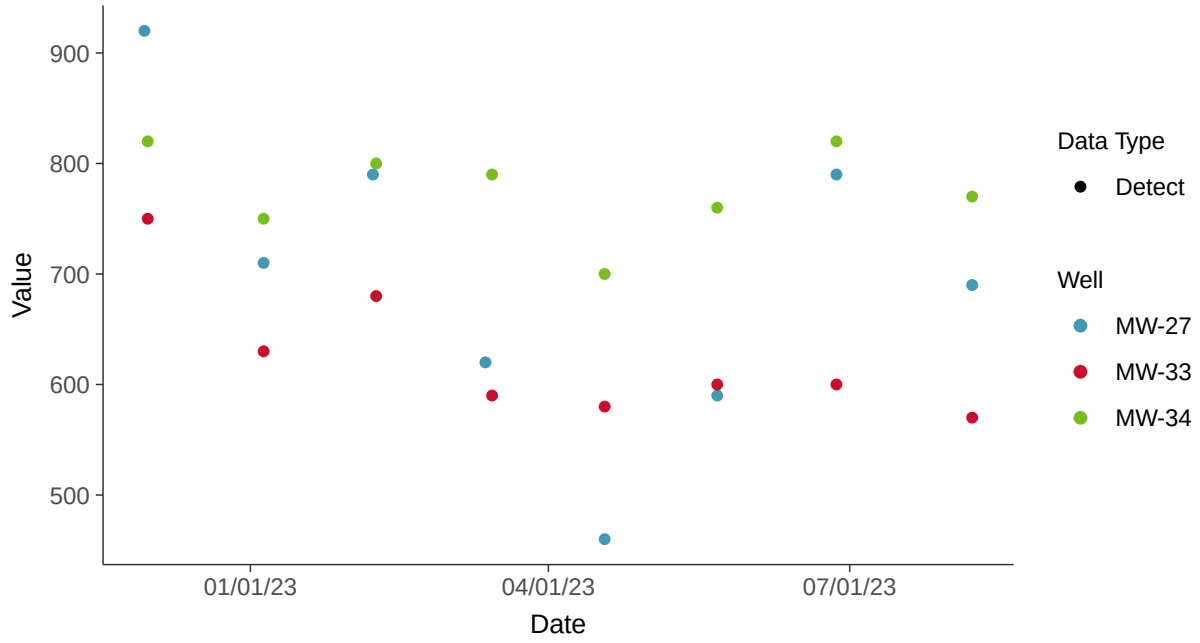
Scatter Plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



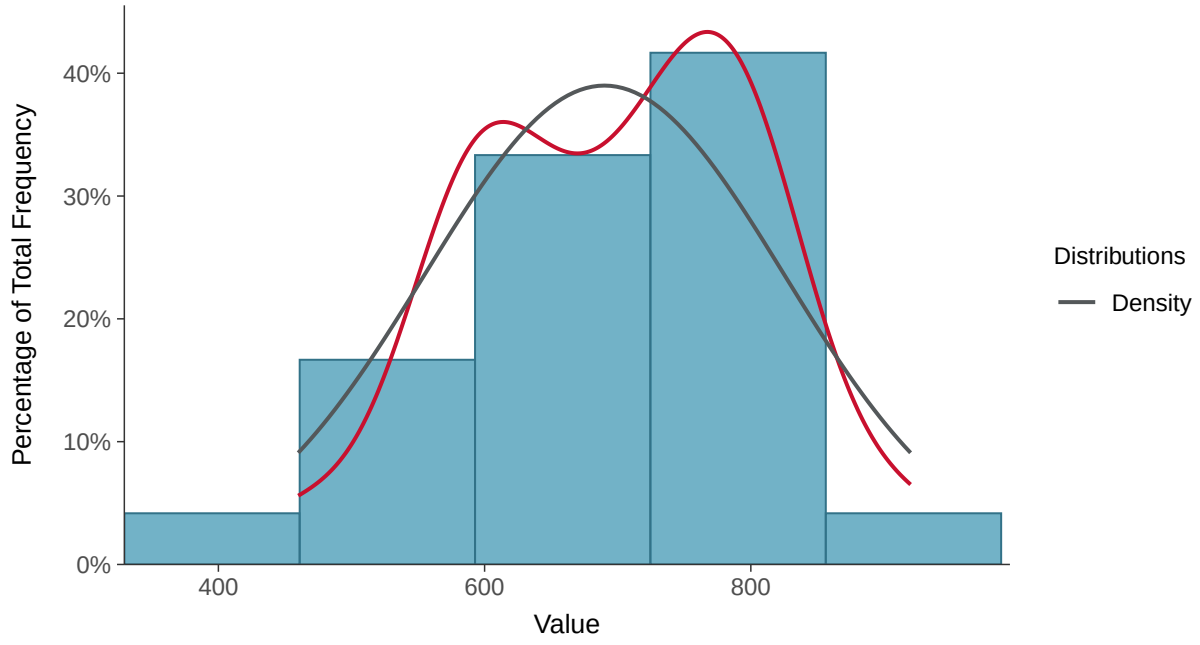
Scatter Plot by Well

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



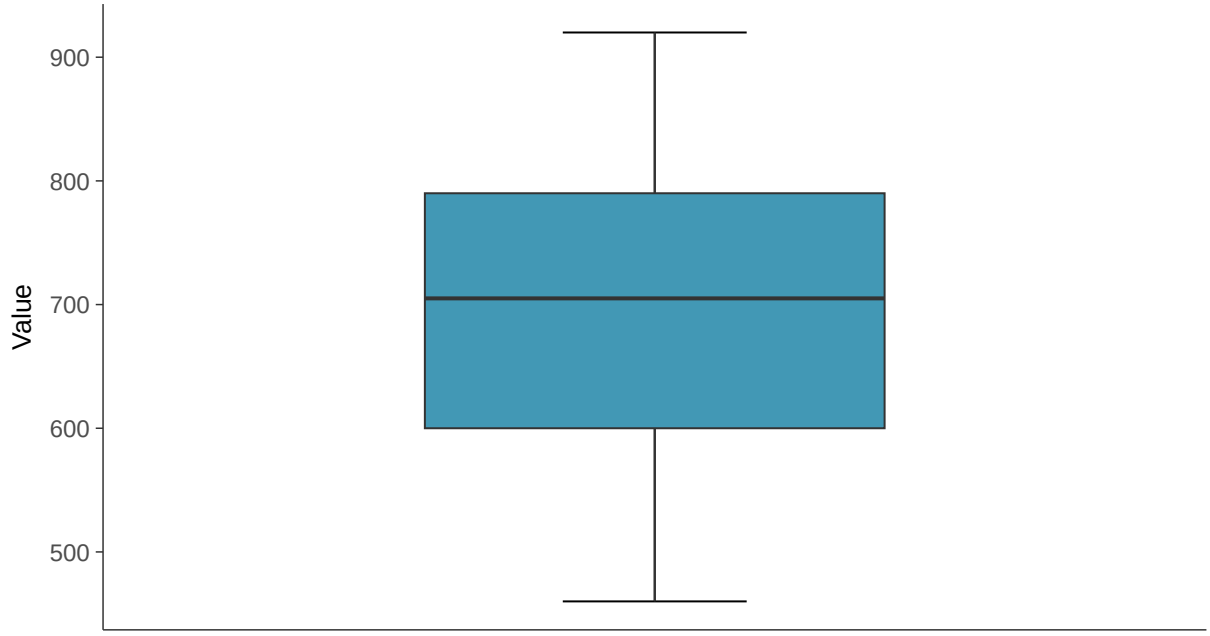
Histogram

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



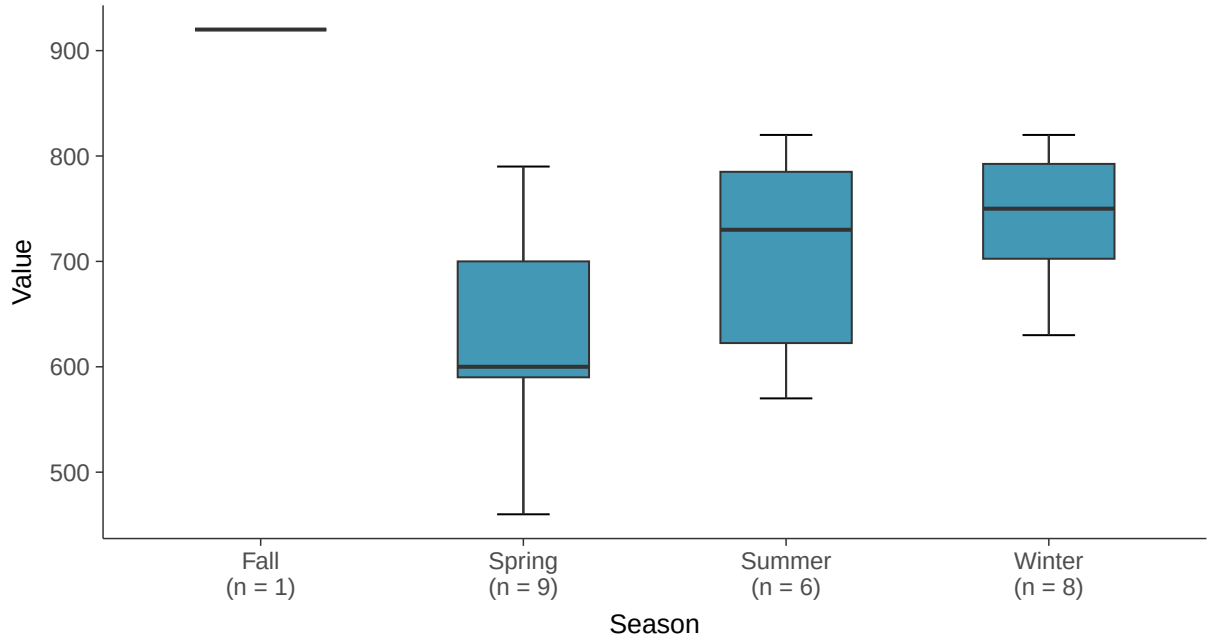
Boxplot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



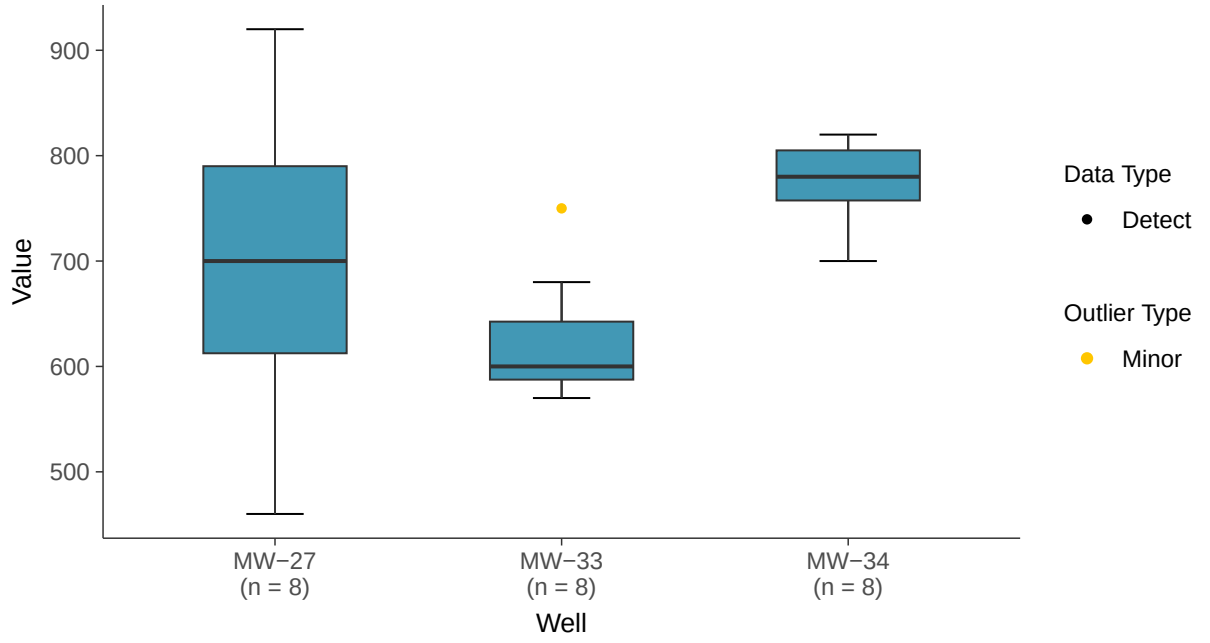
Boxplot by Season

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



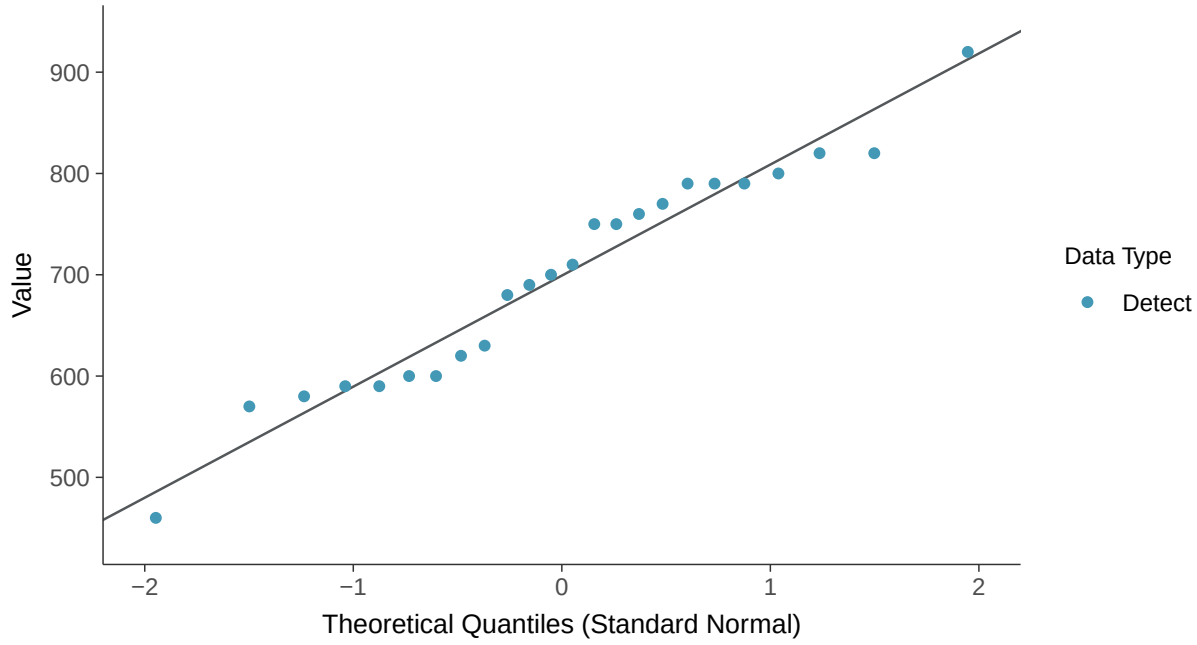
Boxplot by Well

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



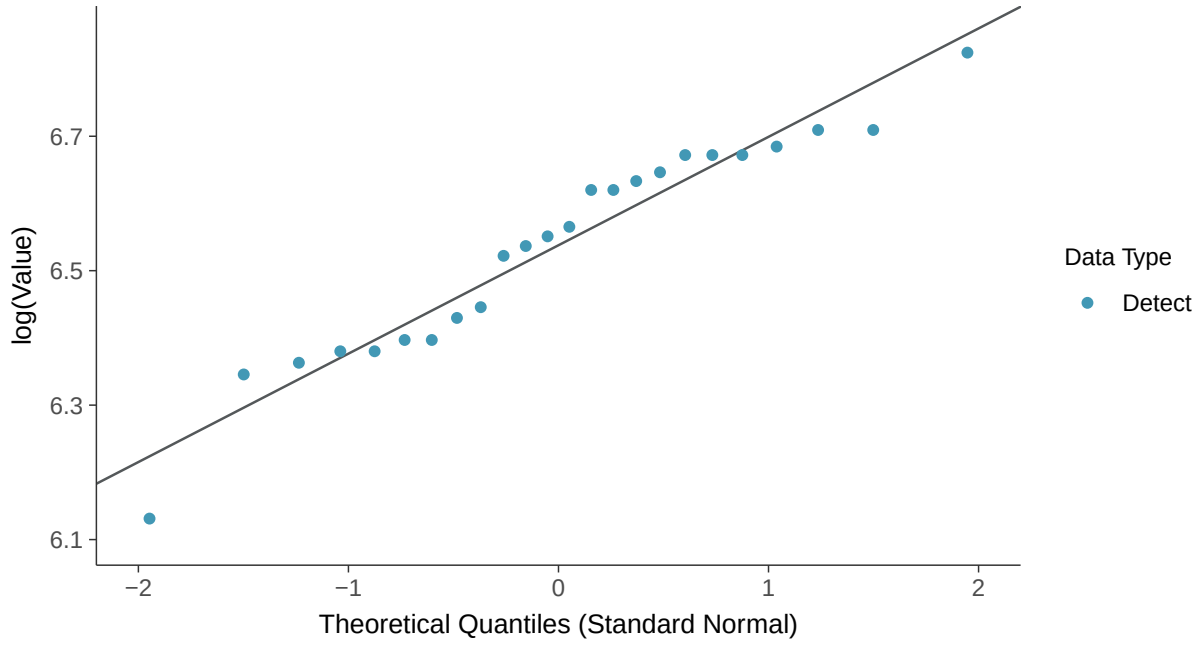
Normal Q-Q plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



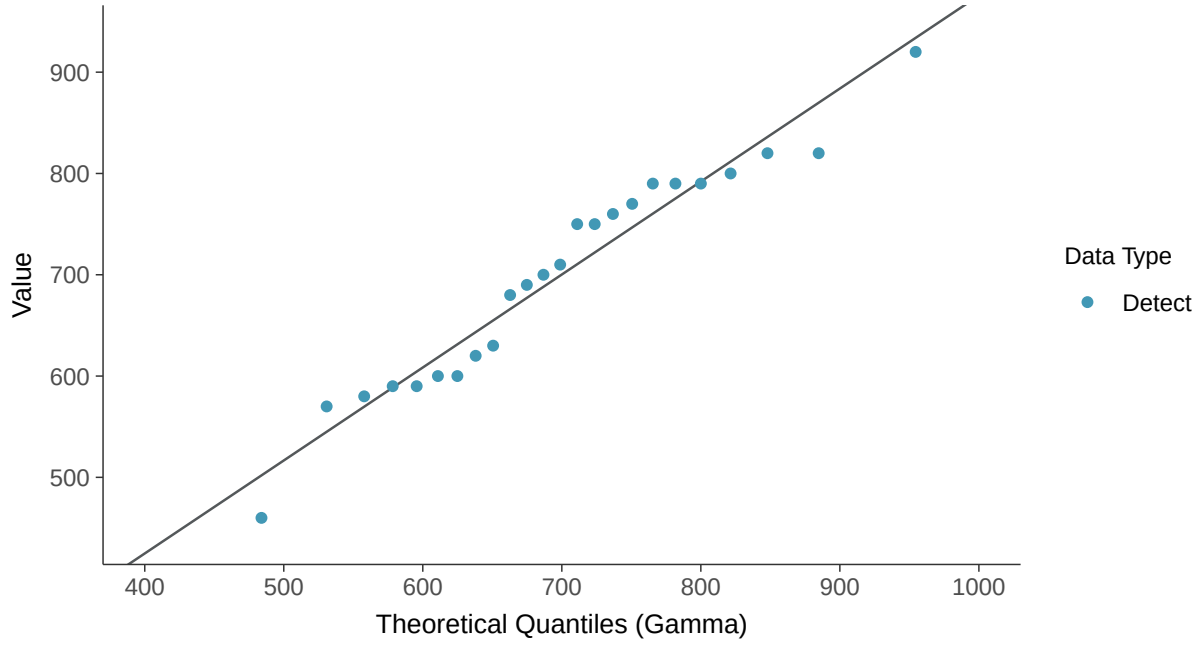
Lognormal Q-Q plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



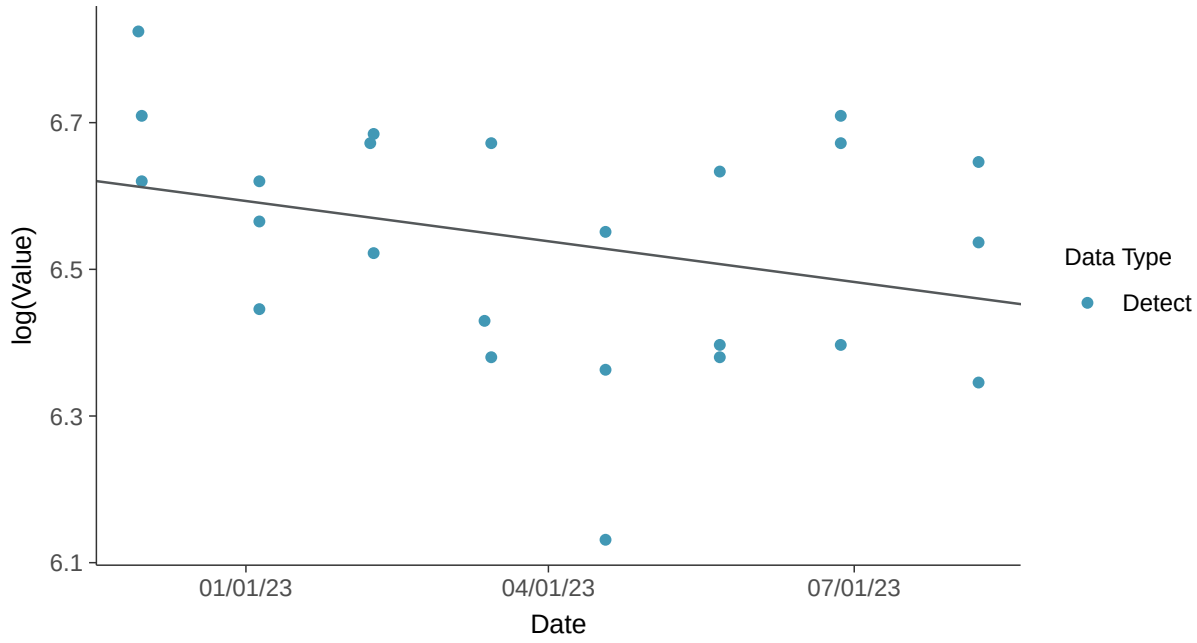
Gamma Q-Q plot

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



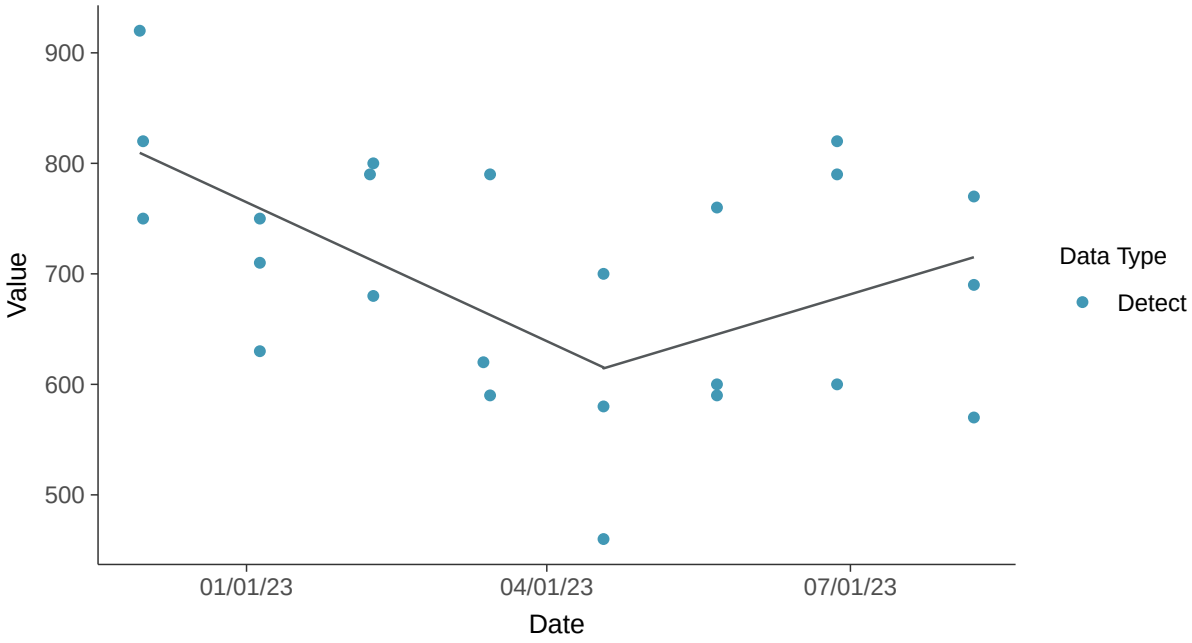
Trend Regression: Lognormal MLE

Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



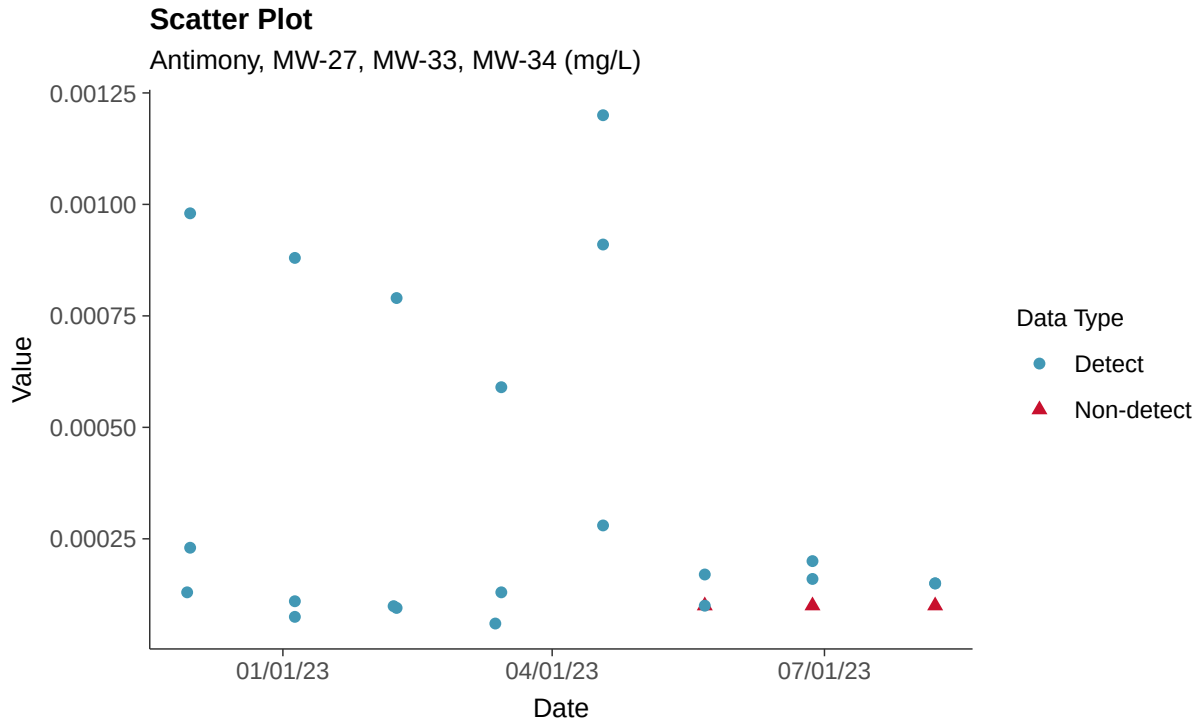
Trend Regression: Piecewise Linear-Linear

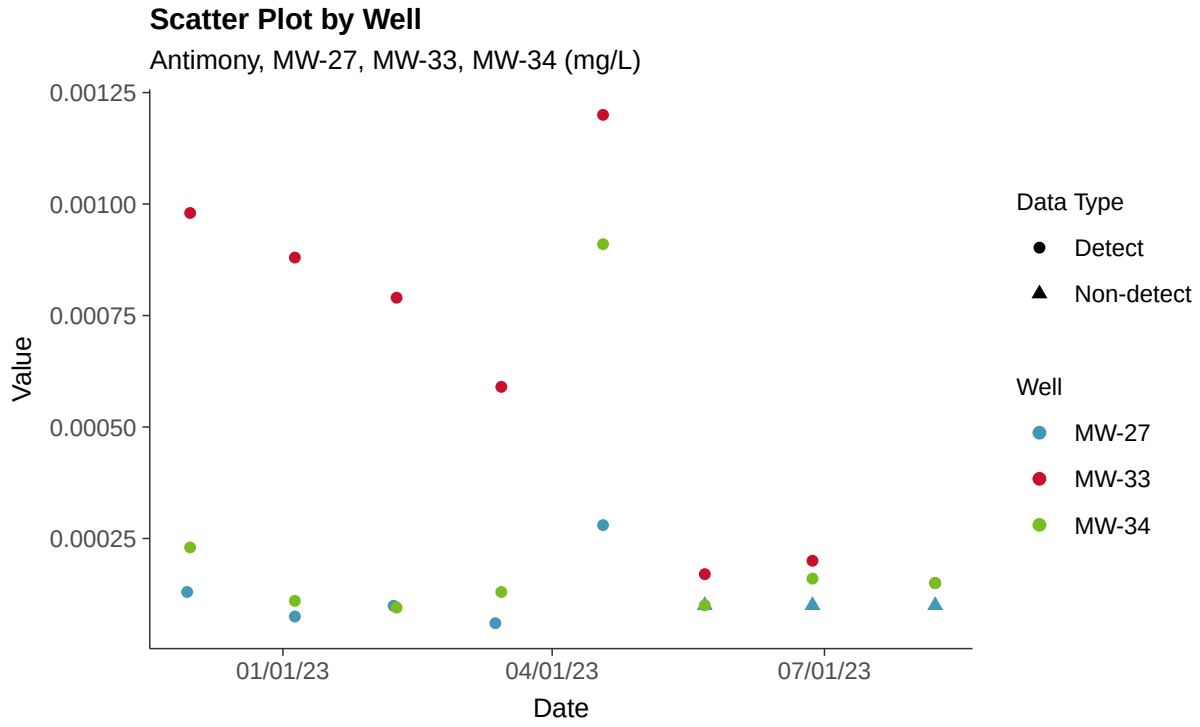
Total Dissolved Solids, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Antimony, MW-27, MW-33, MW-34

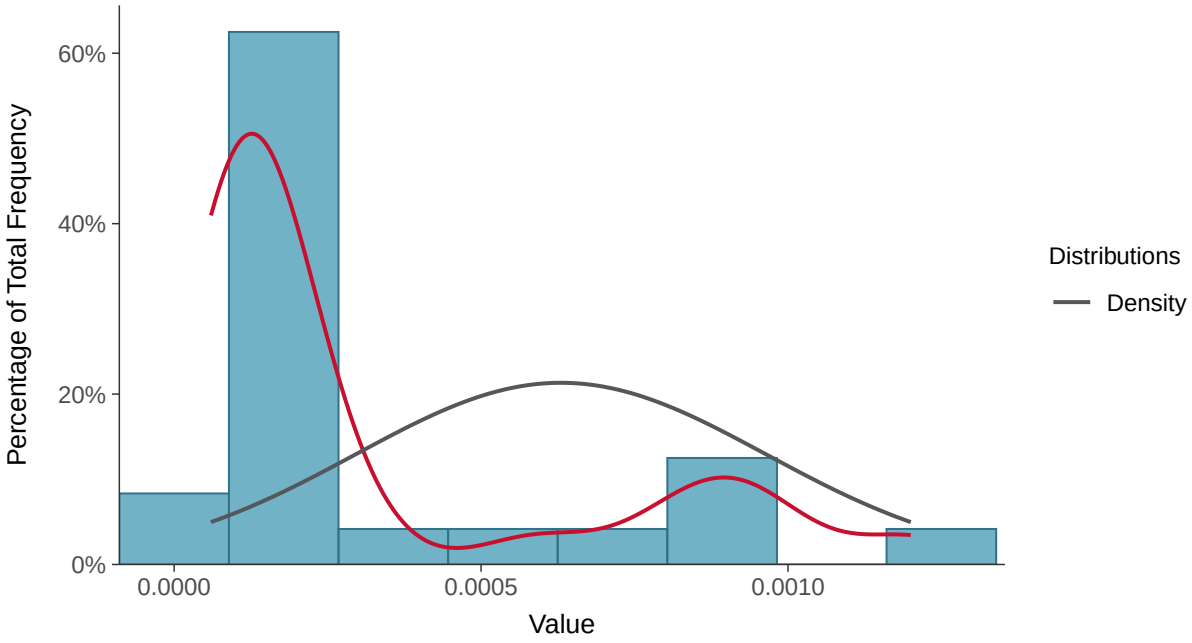
ID: 5_101





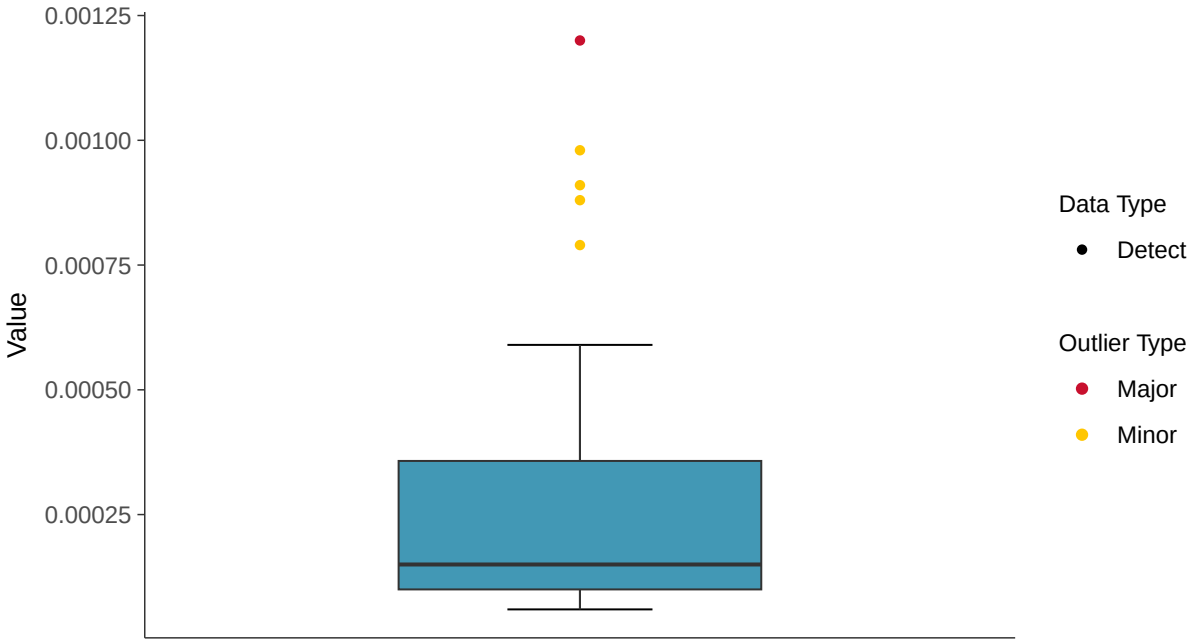
Histogram

Antimony, MW-27, MW-33, MW-34 (mg/L)



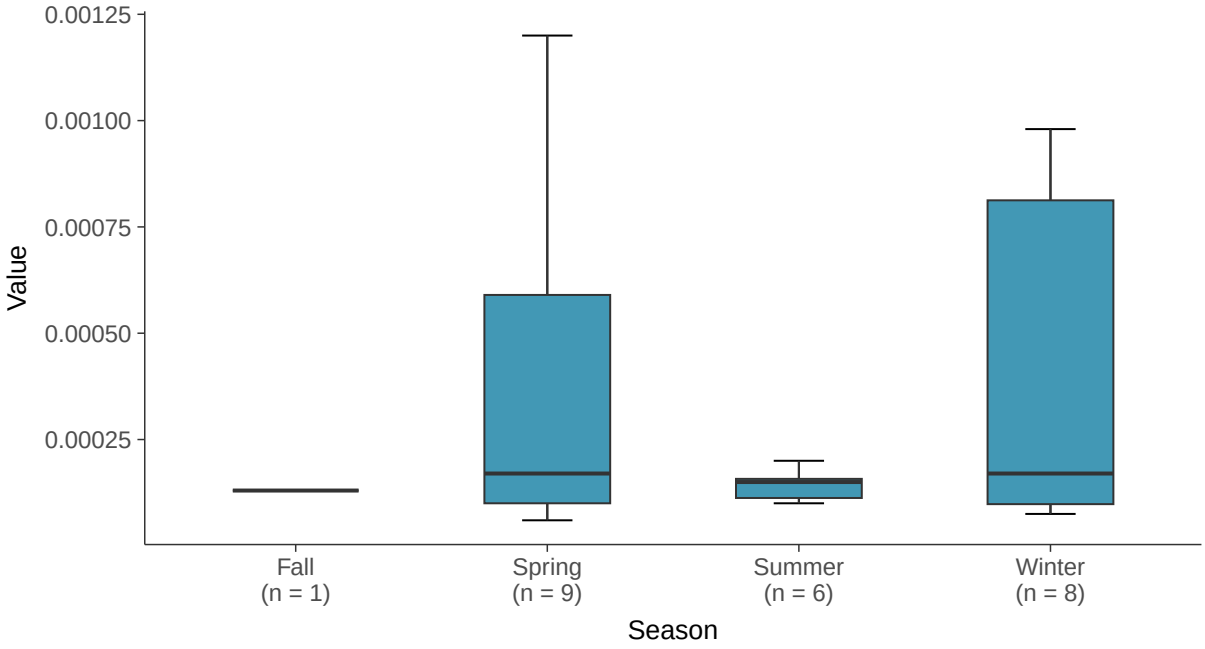
Boxplot

Antimony, MW-27, MW-33, MW-34 (mg/L)



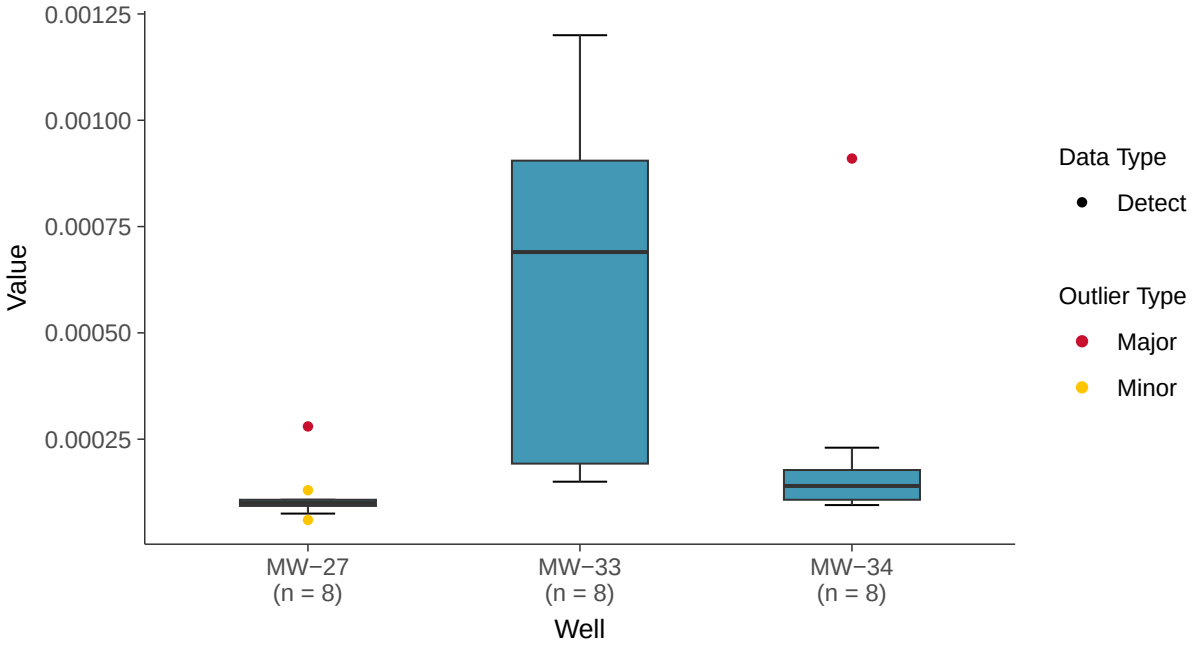
Boxplot by Season

Antimony, MW-27, MW-33, MW-34 (mg/L)



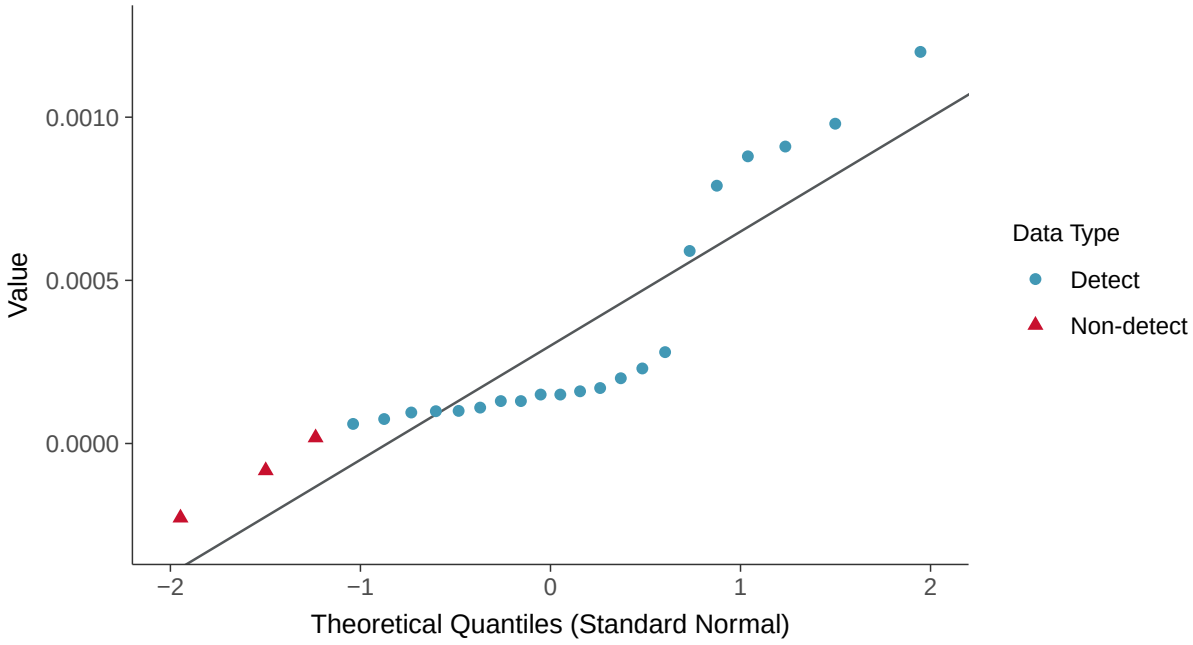
Boxplot by Well

Antimony, MW-27, MW-33, MW-34 (mg/L)



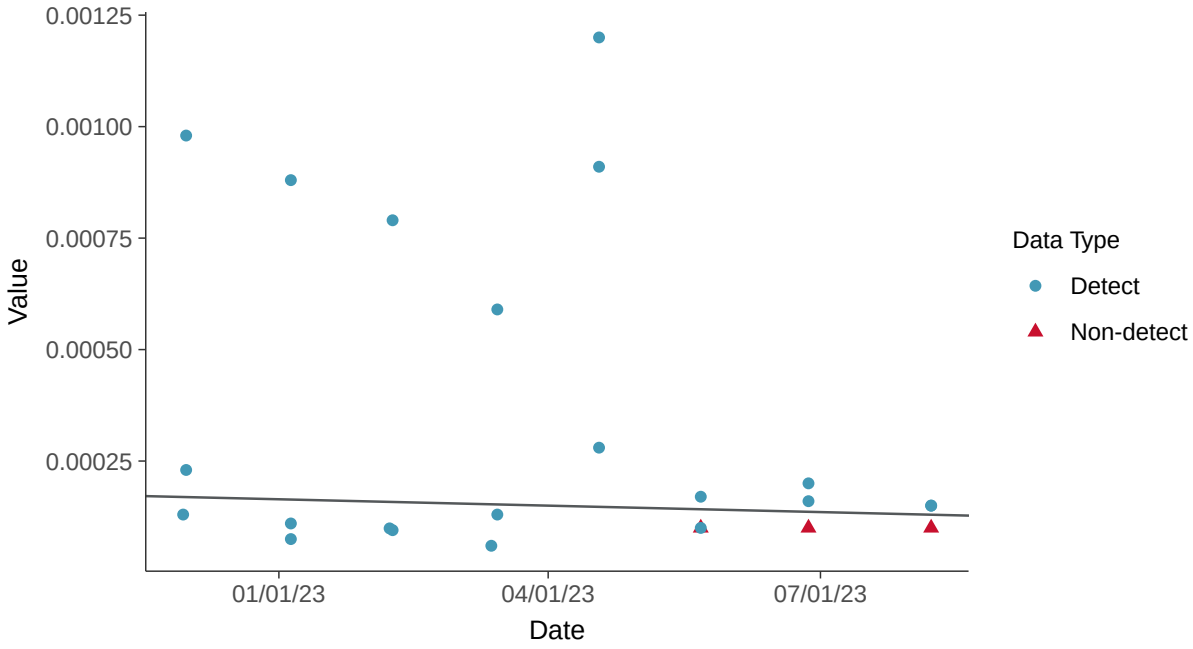
Normal Q-Q plot using ROS Imputed Estimates

Antimony, MW-27, MW-33, MW-34 (mg/L)



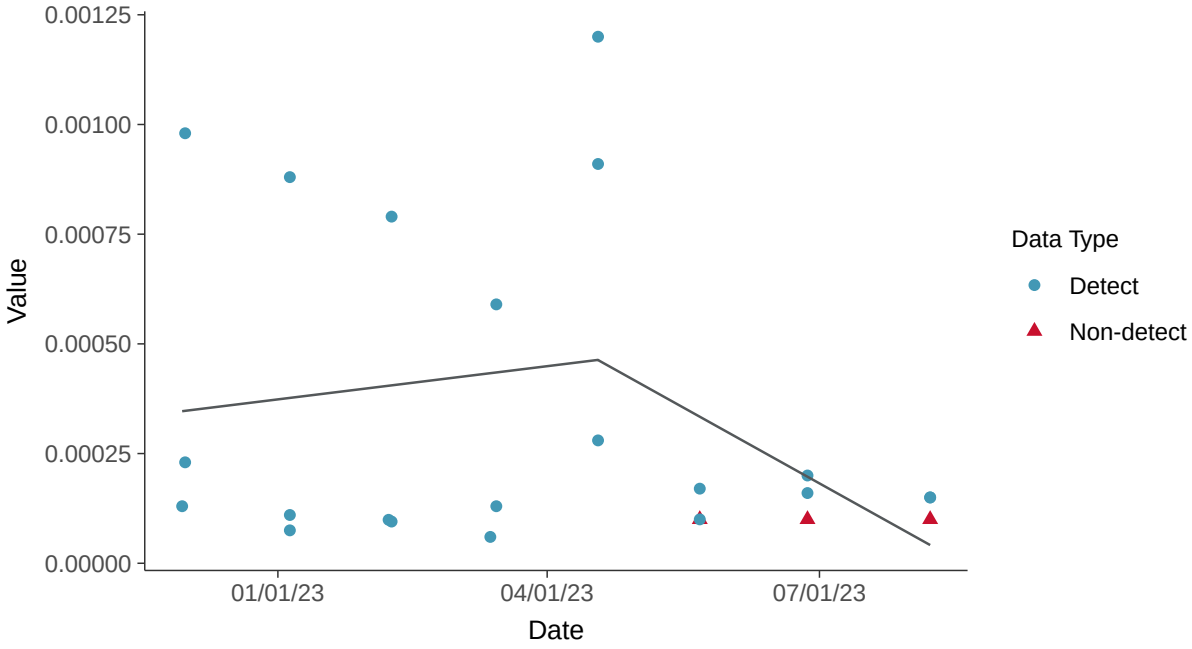
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Antimony, MW-27, MW-33, MW-34 (mg/L)



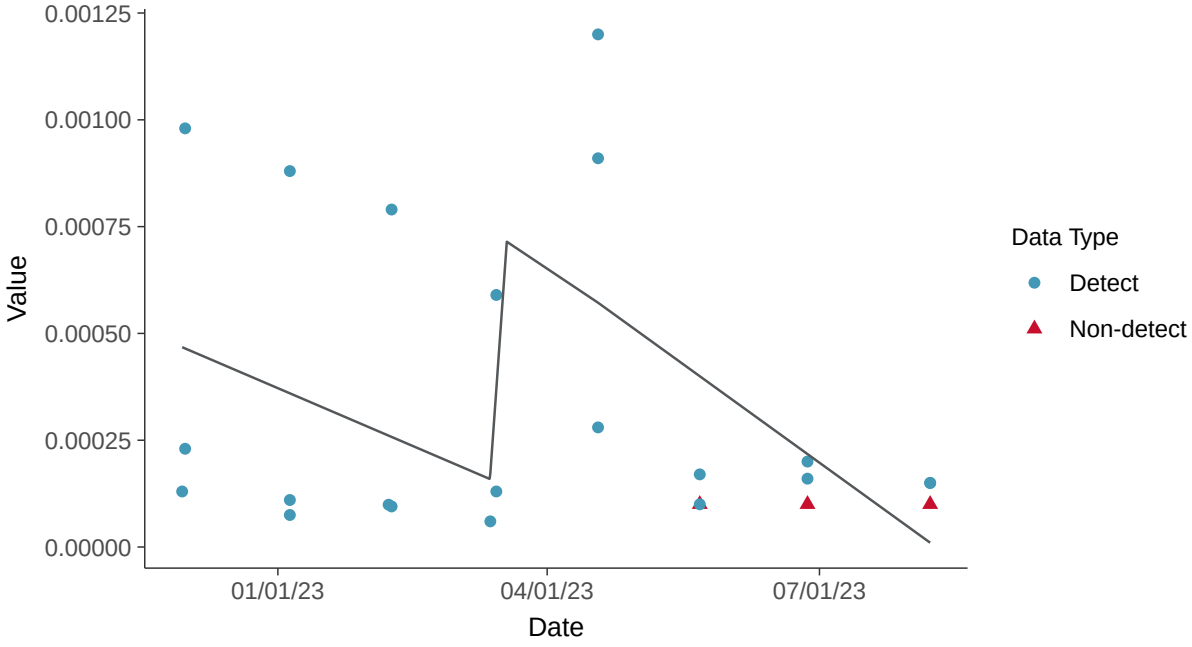
Trend Regression: Piecewise Linear-Linear

Antimony, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Antimony, MW-27, MW-33, MW-34 (mg/L)

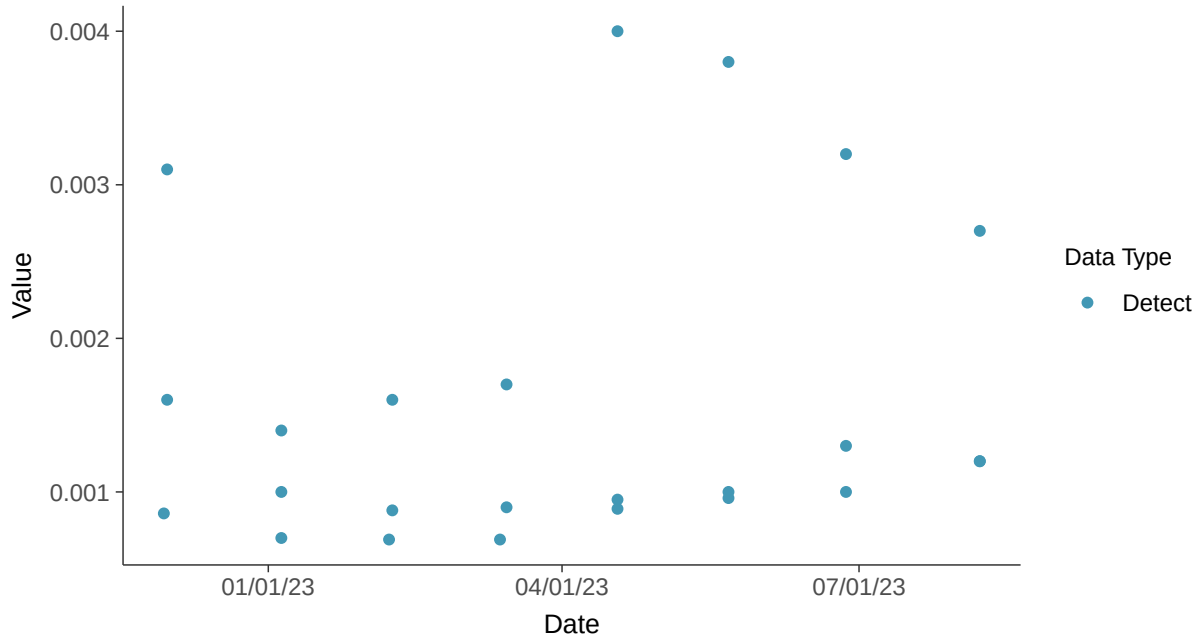


Appendix IV: Arsenic, MW-27, MW-33, MW-34

ID: 5_102

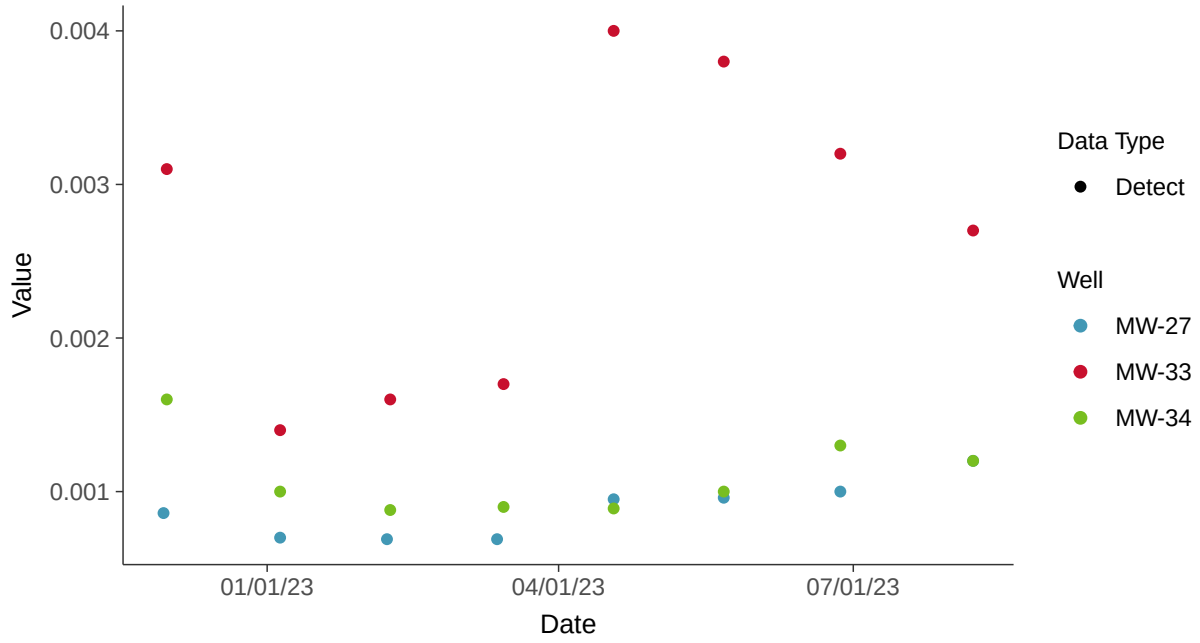
Scatter Plot

Arsenic, MW-27, MW-33, MW-34 (mg/L)



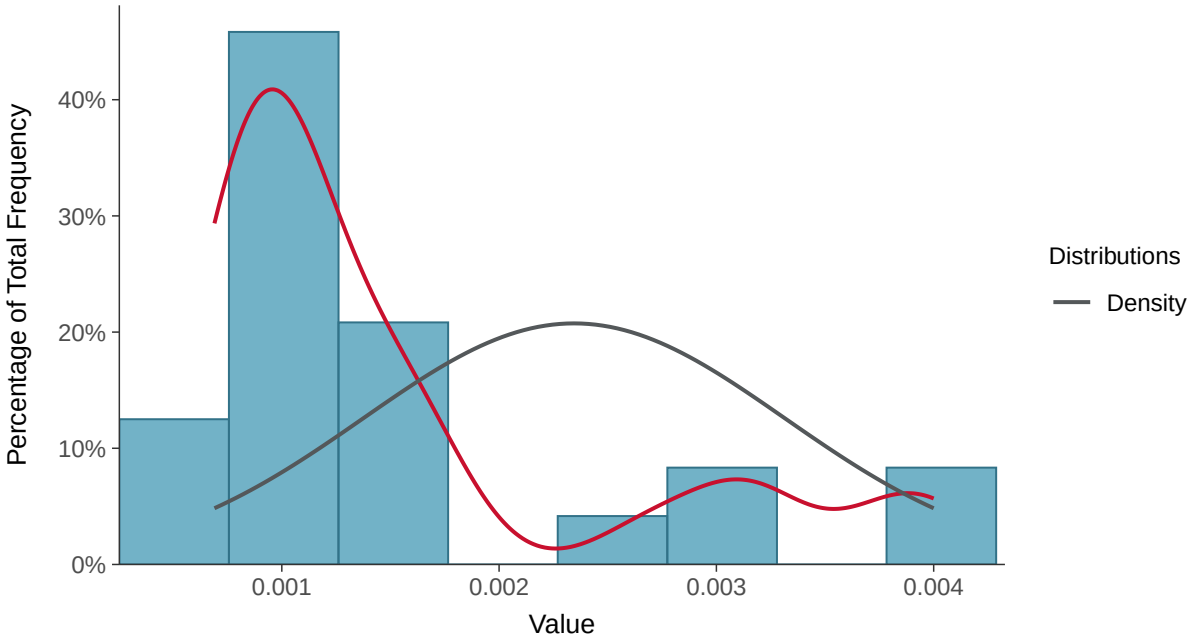
Scatter Plot by Well

Arsenic, MW-27, MW-33, MW-34 (mg/L)



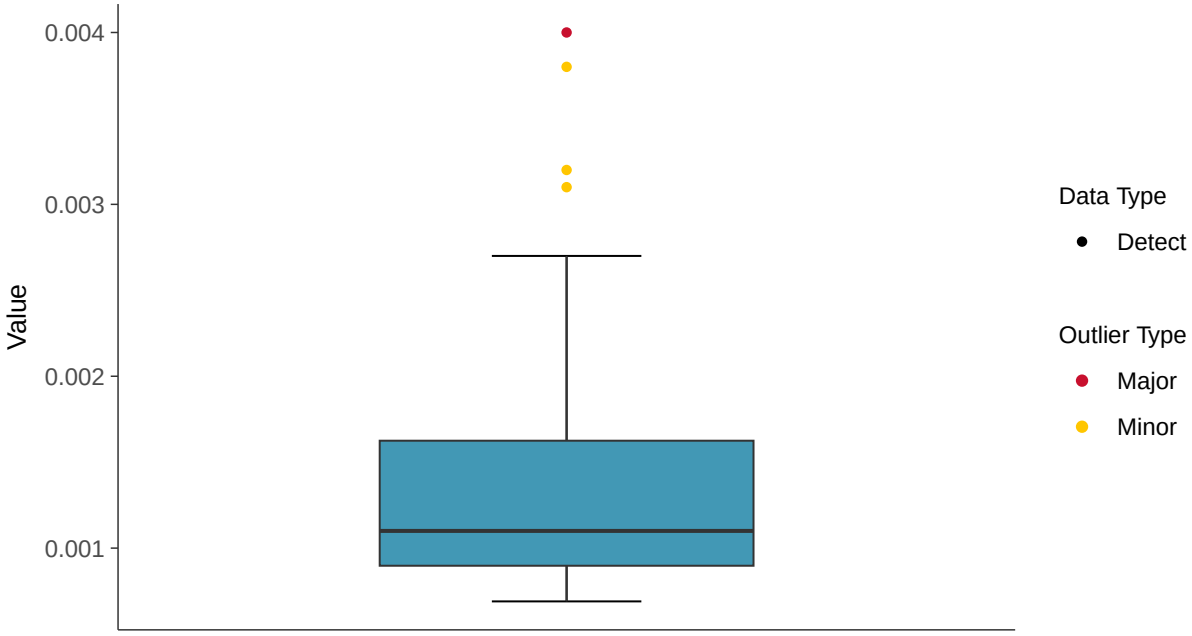
Histogram

Arsenic, MW-27, MW-33, MW-34 (mg/L)



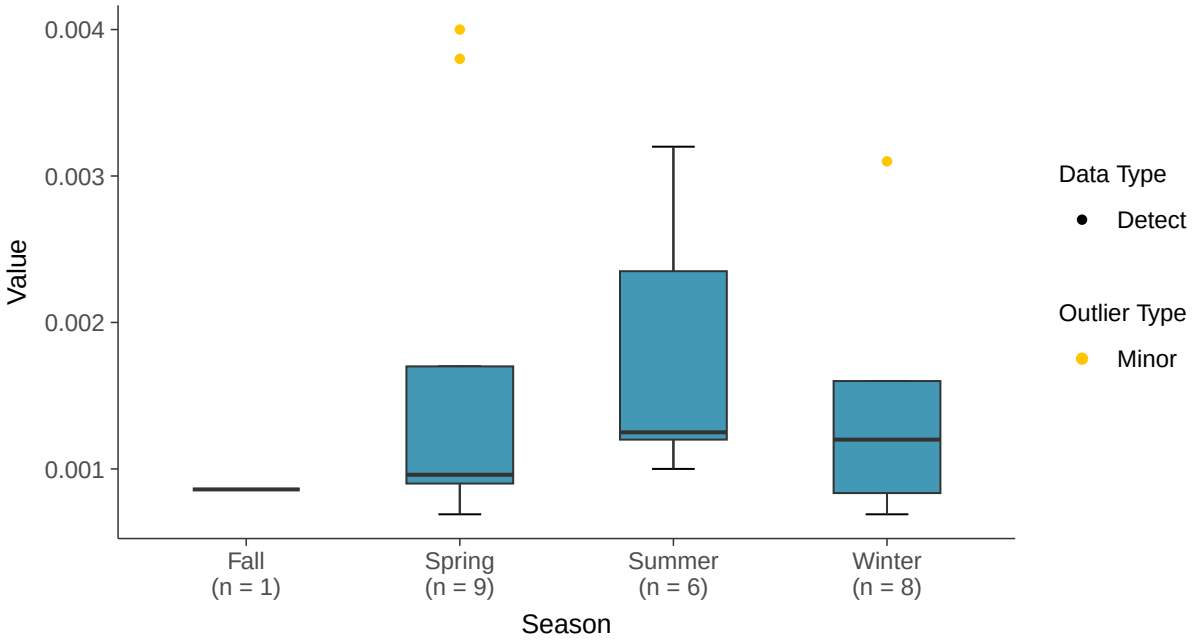
Boxplot

Arsenic, MW-27, MW-33, MW-34 (mg/L)



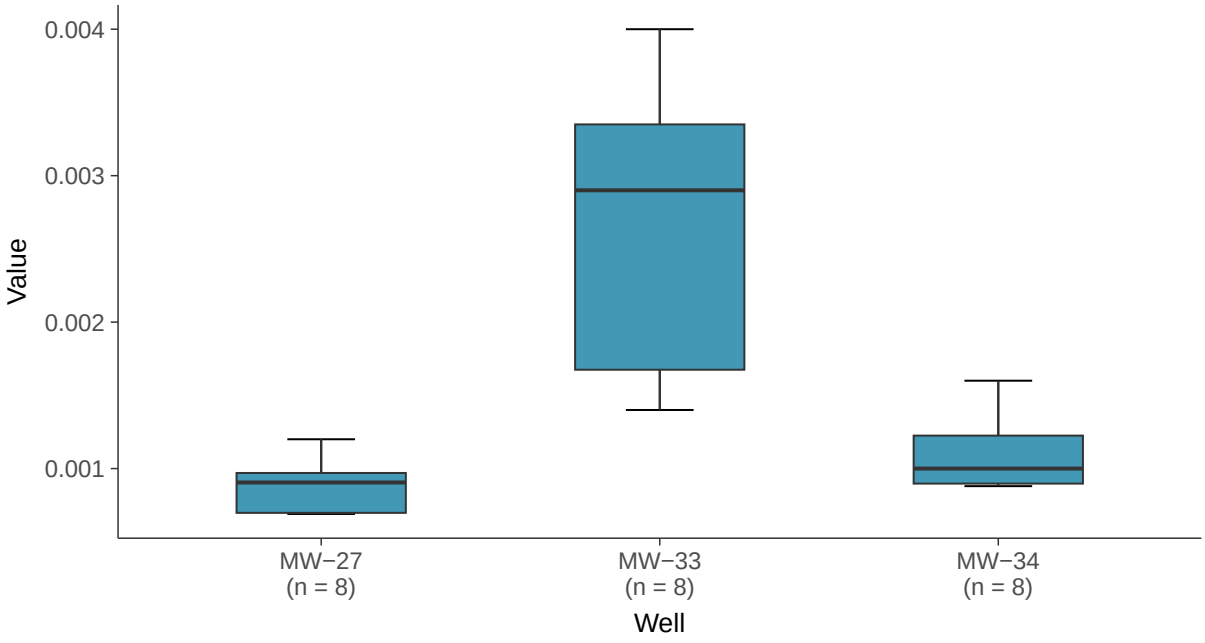
Boxplot by Season

Arsenic, MW-27, MW-33, MW-34 (mg/L)



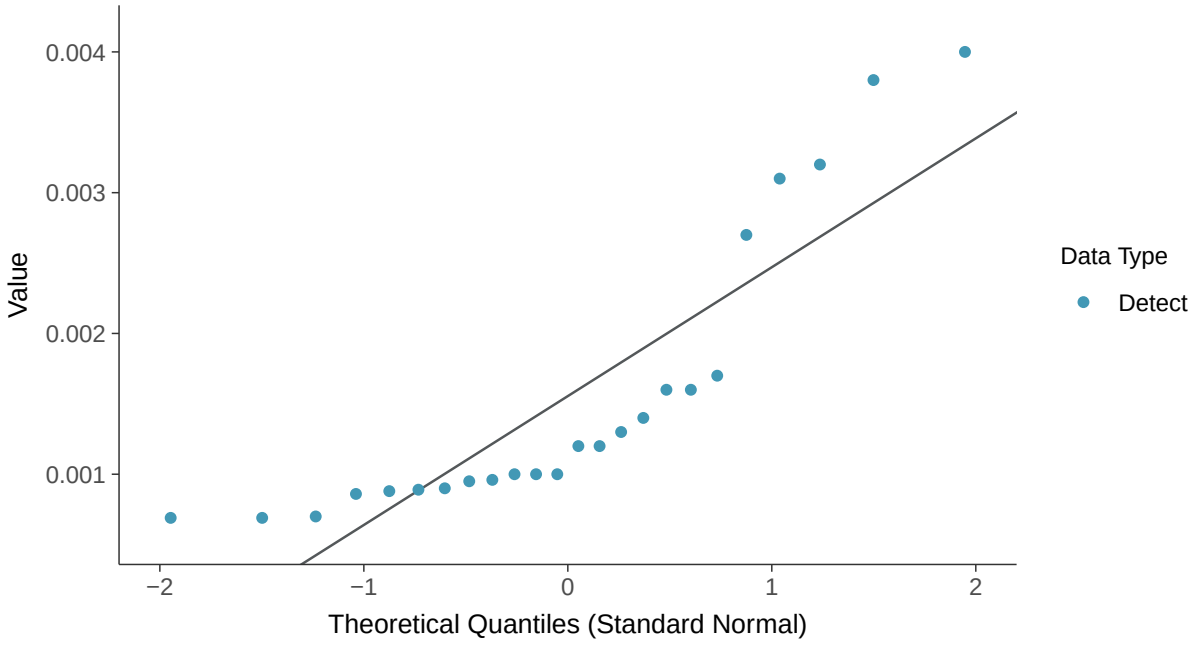
Boxplot by Well

Arsenic, MW-27, MW-33, MW-34 (mg/L)



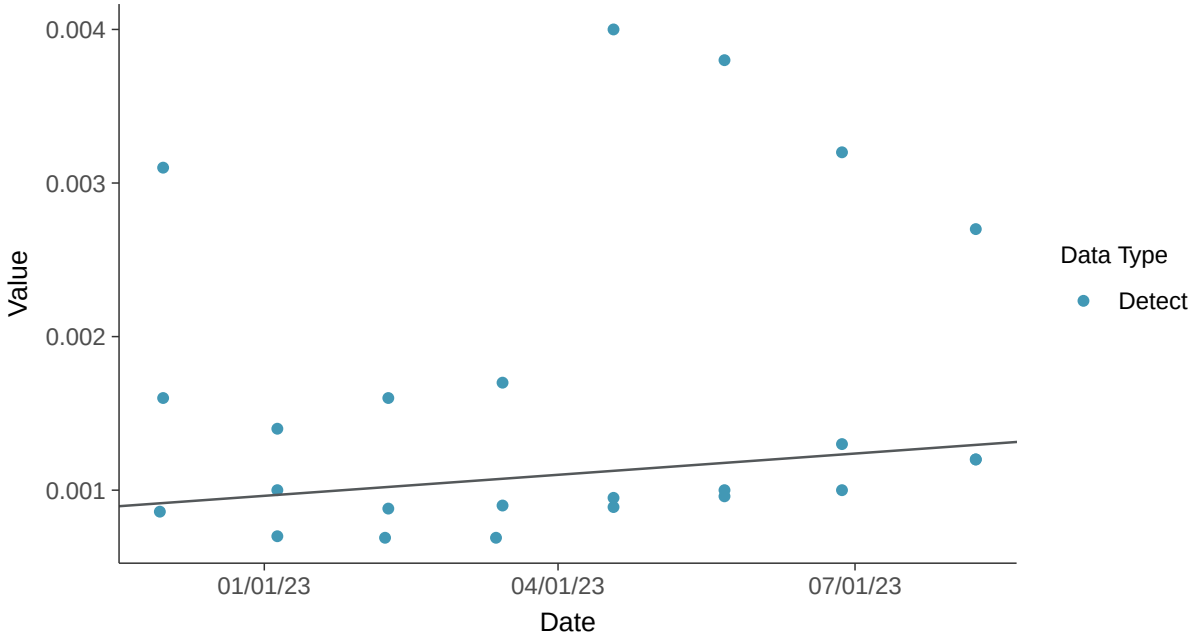
Normal Q-Q plot

Arsenic, MW-27, MW-33, MW-34 (mg/L)



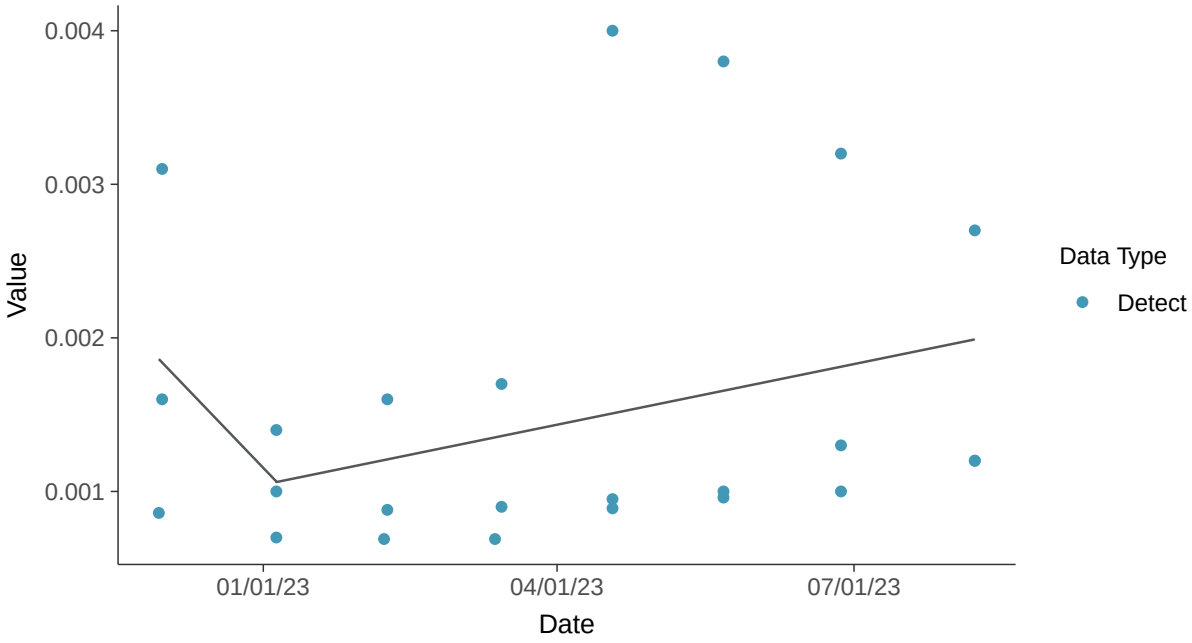
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Arsenic, MW-27, MW-33, MW-34 (mg/L)



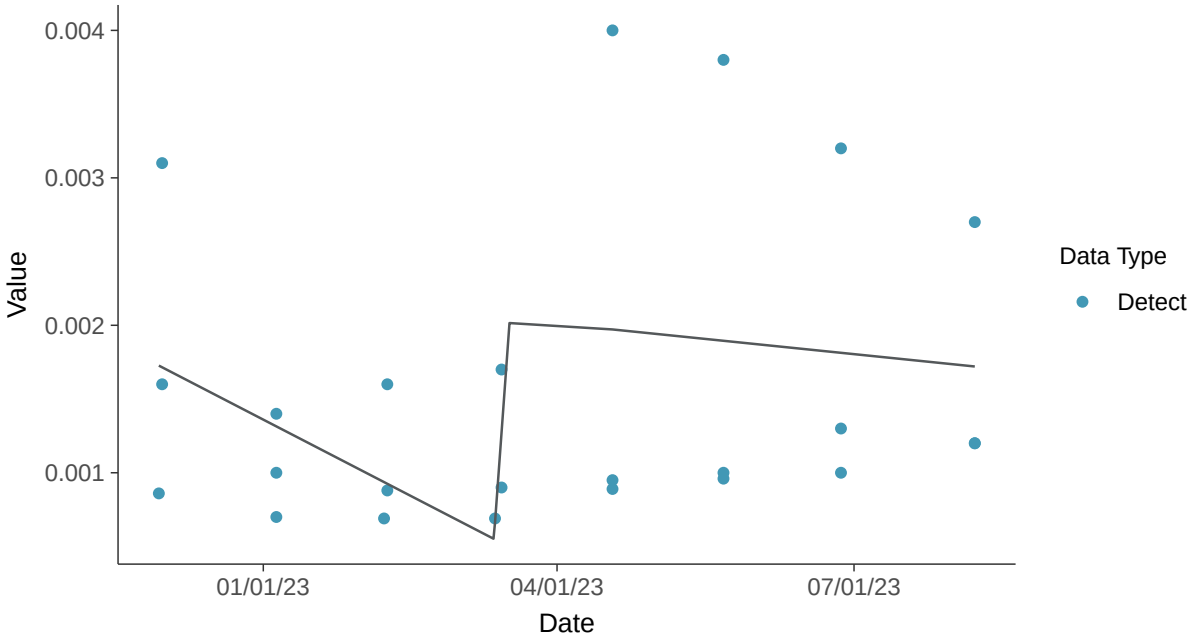
Trend Regression: Piecewise Linear-Linear

Arsenic, MW-27, MW-33, MW-34 (mg/L)



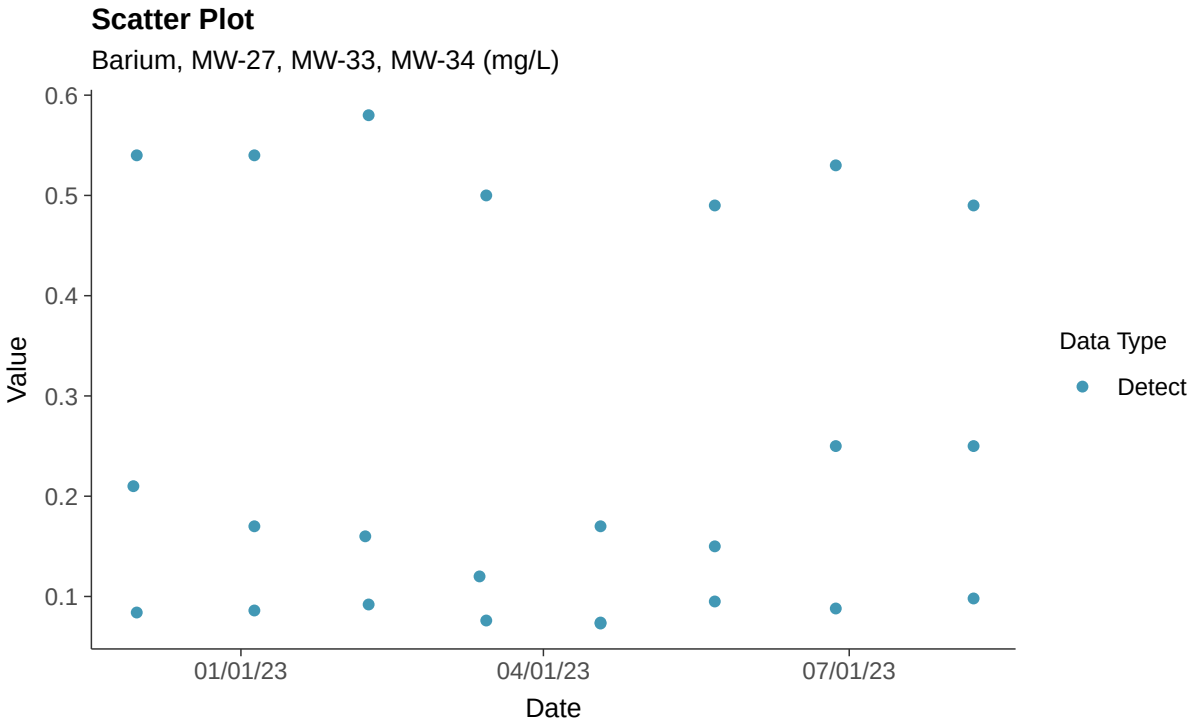
Trend Regression: Piecewise Linear-Linear-Linear

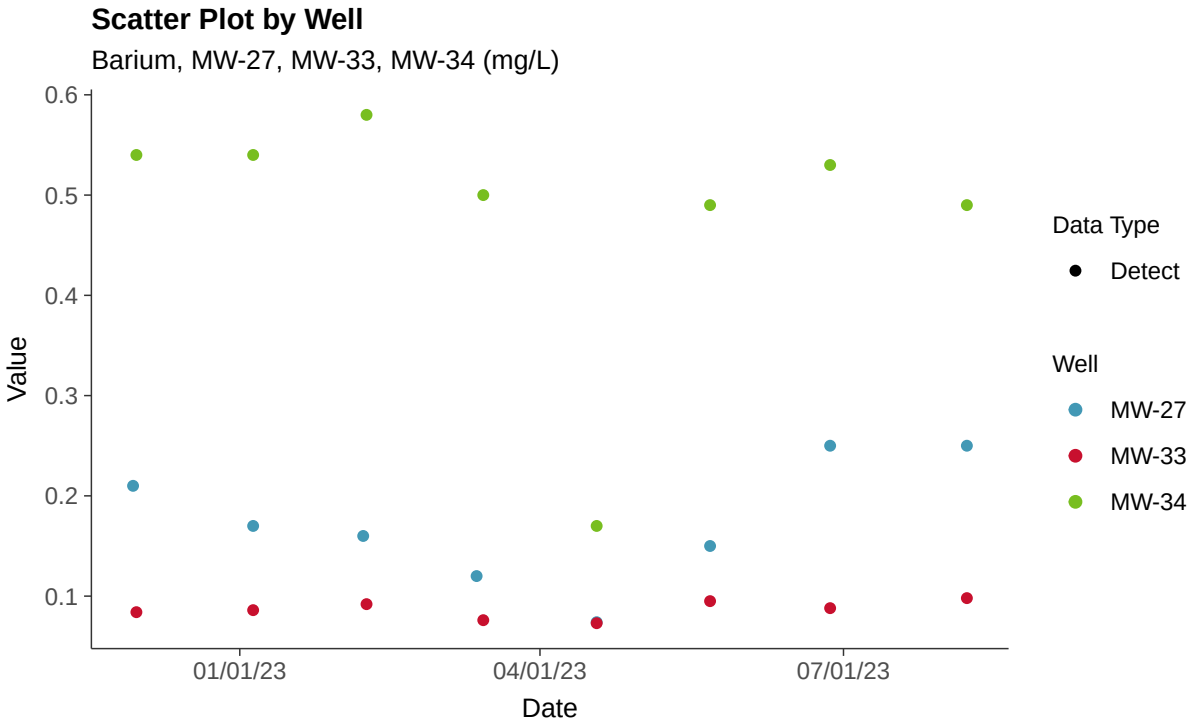
Arsenic, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Barium, MW-27, MW-33, MW-34

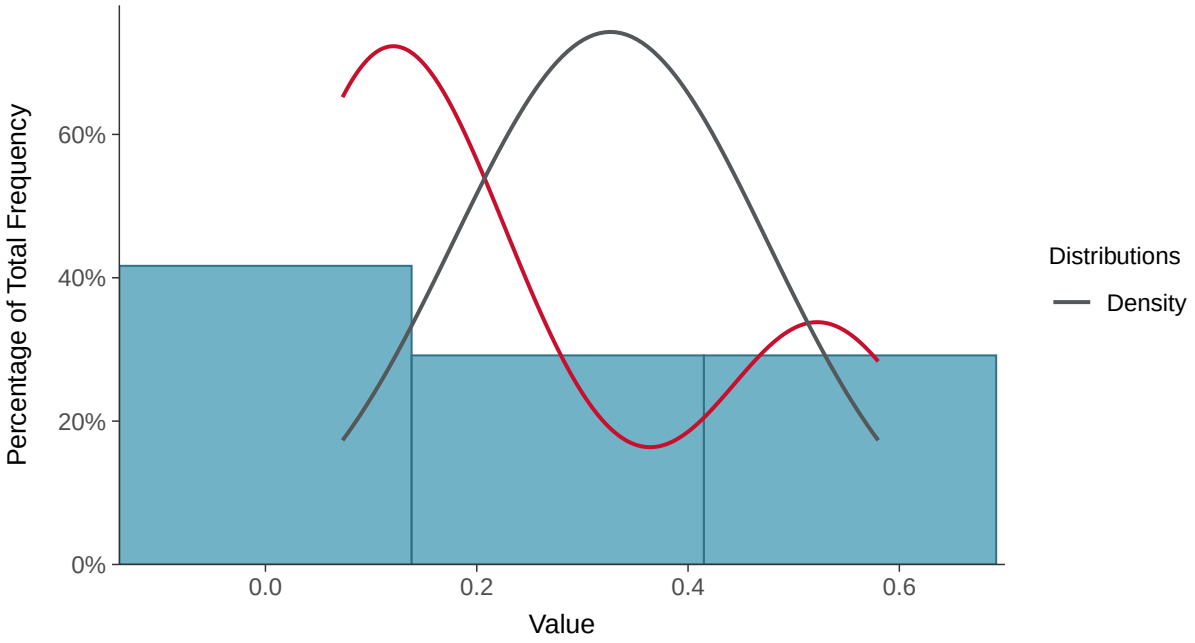
ID: 5_103





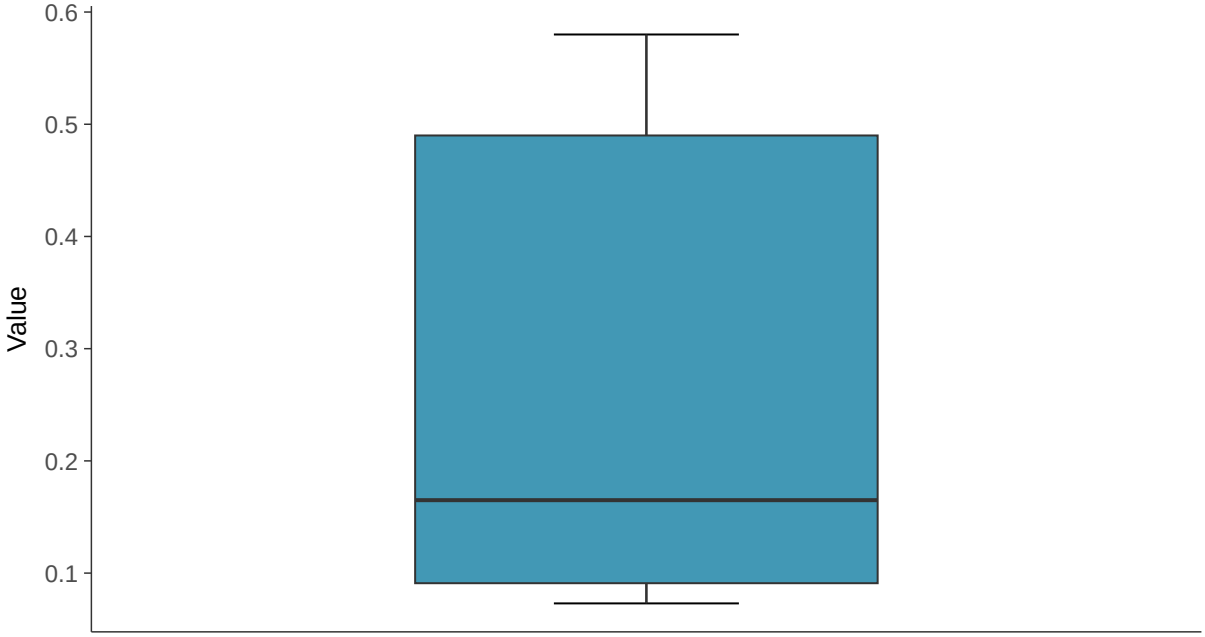
Histogram

Barium, MW-27, MW-33, MW-34 (mg/L)



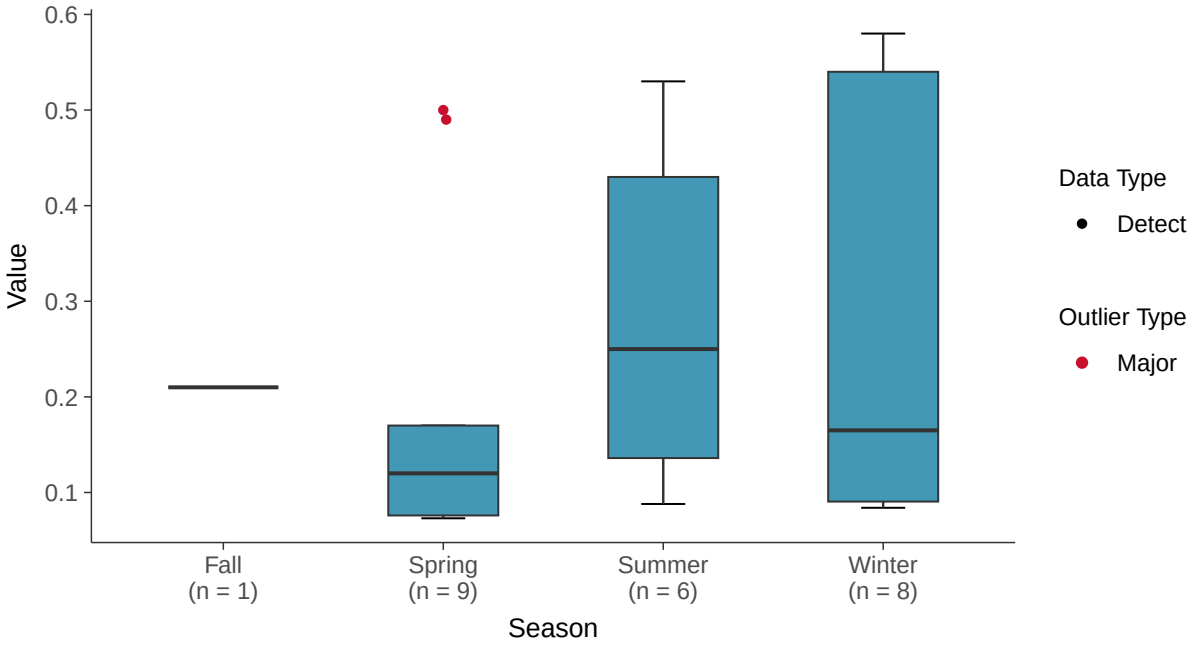
Boxplot

Barium, MW-27, MW-33, MW-34 (mg/L)



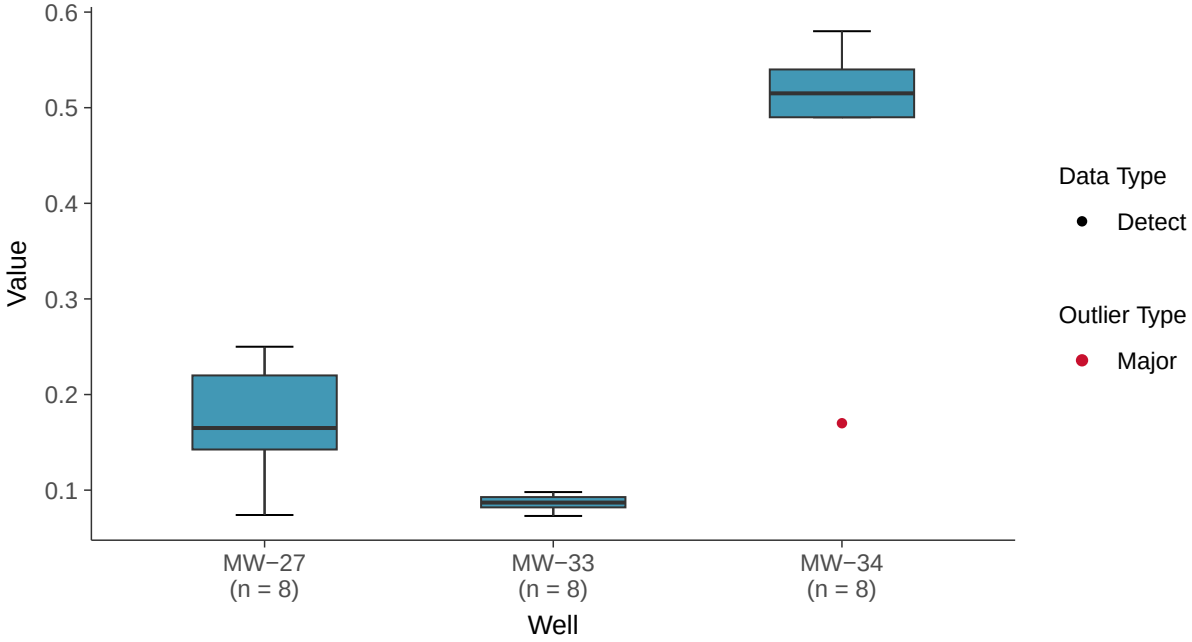
Boxplot by Season

Barium, MW-27, MW-33, MW-34 (mg/L)



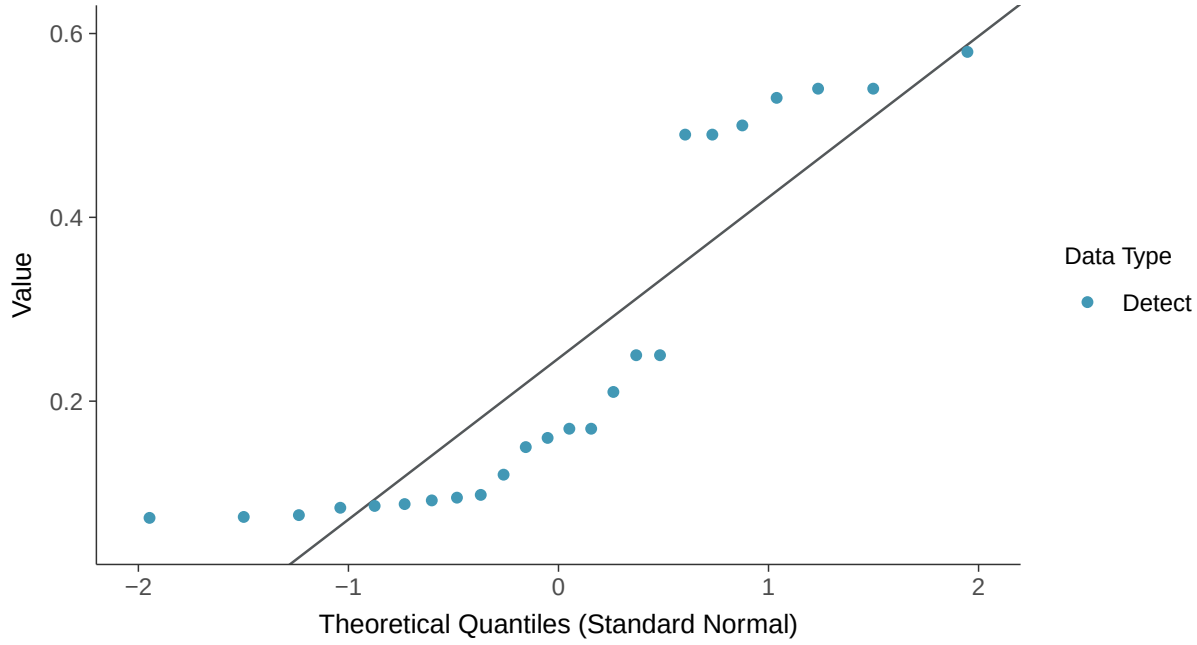
Boxplot by Well

Barium, MW-27, MW-33, MW-34 (mg/L)



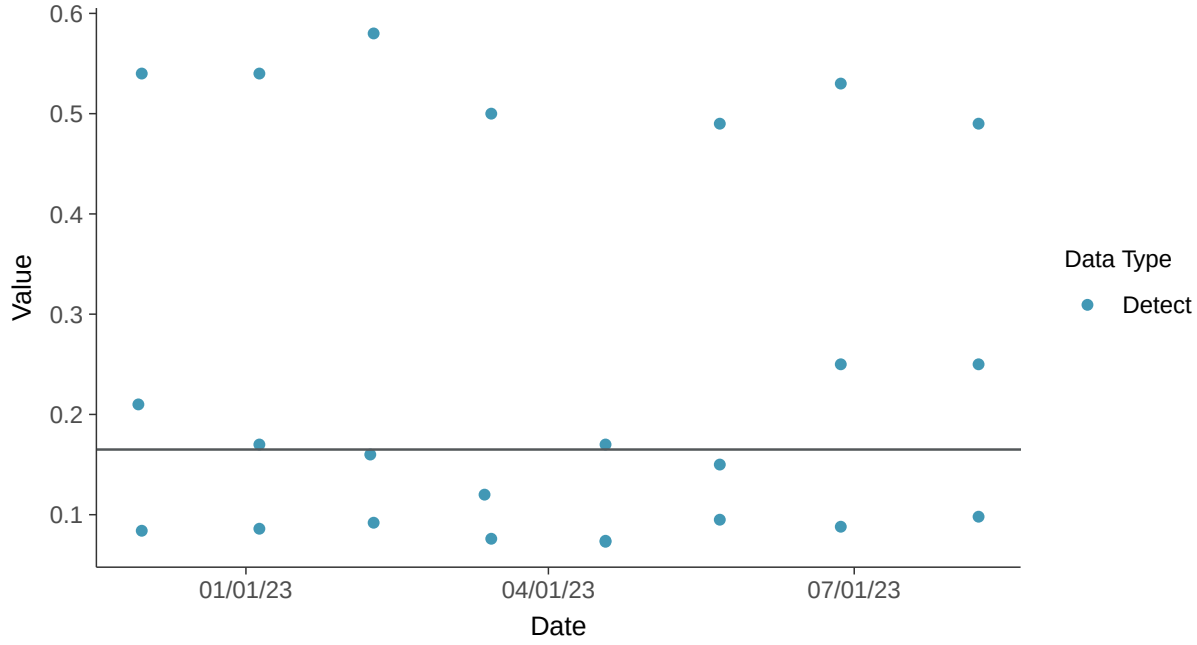
Normal Q-Q plot

Barium, MW-27, MW-33, MW-34 (mg/L)



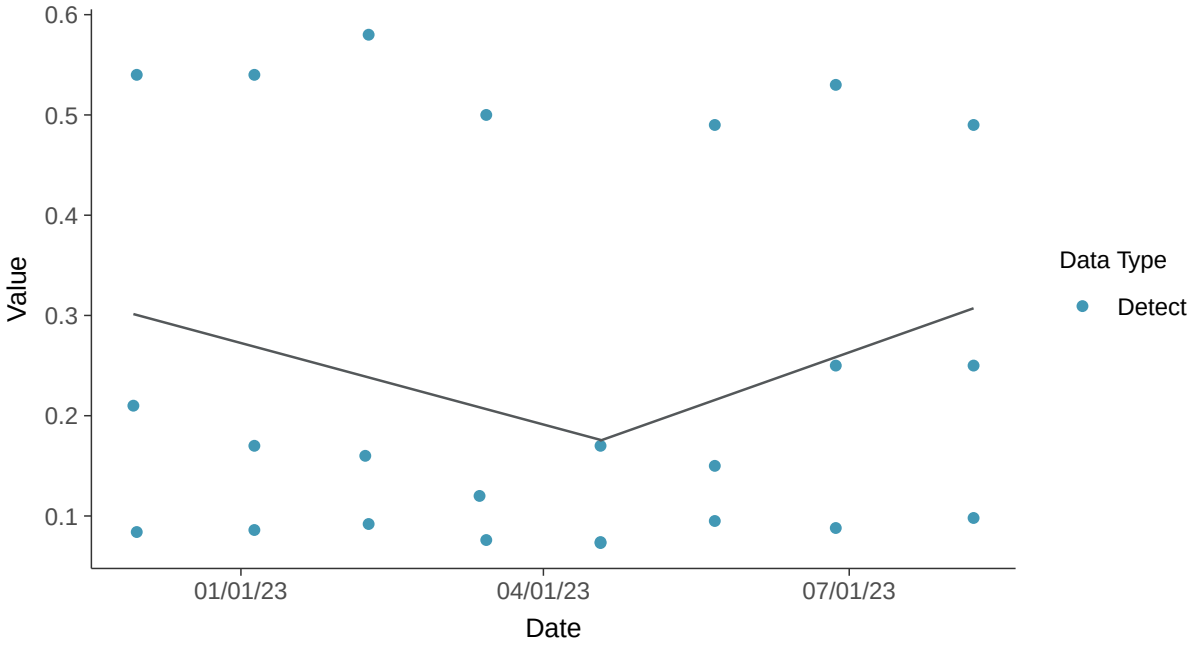
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Barium, MW-27, MW-33, MW-34 (mg/L)



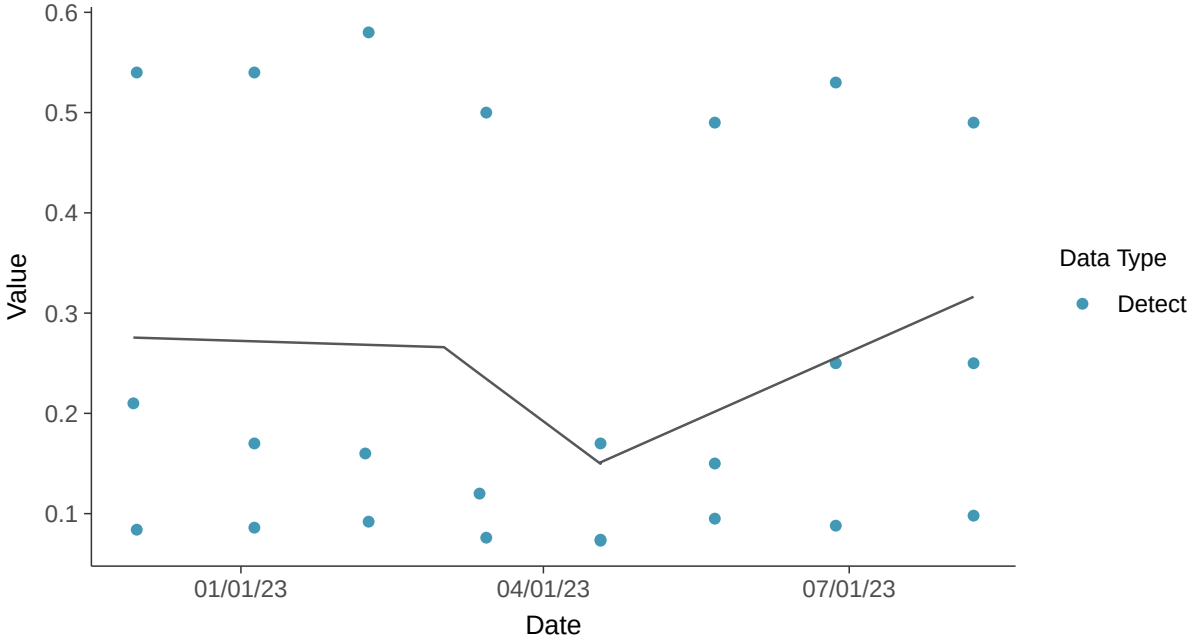
Trend Regression: Piecewise Linear-Linear

Barium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Barium, MW-27, MW-33, MW-34 (mg/L)

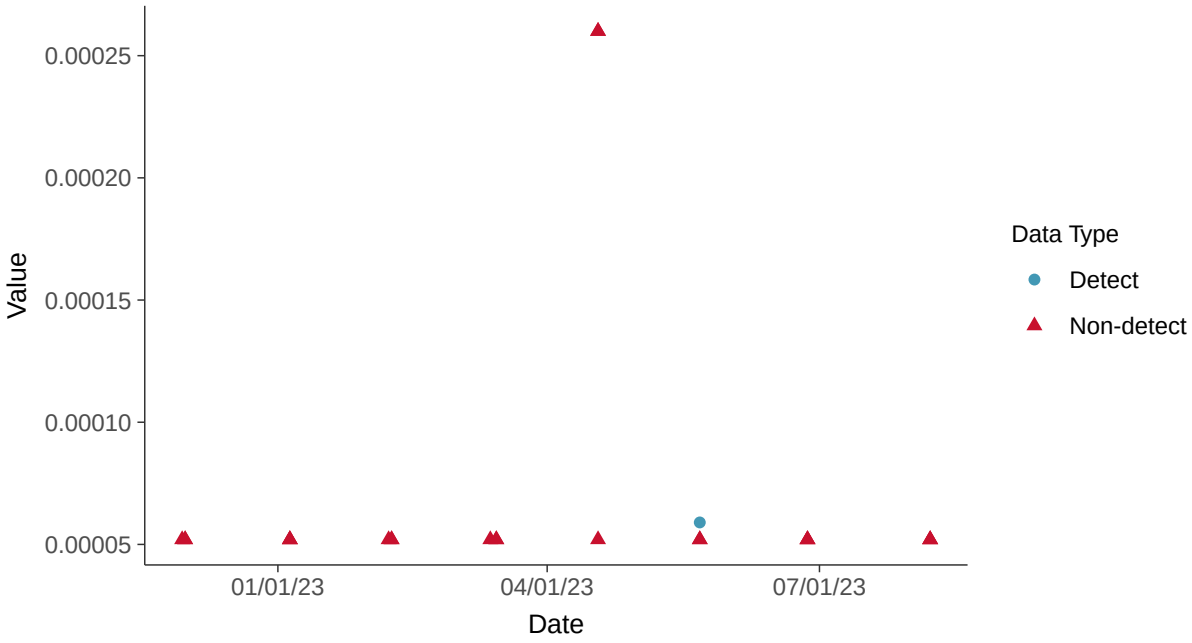


Appendix IV: Beryllium, MW-27, MW-33, MW-34

ID: 5_104

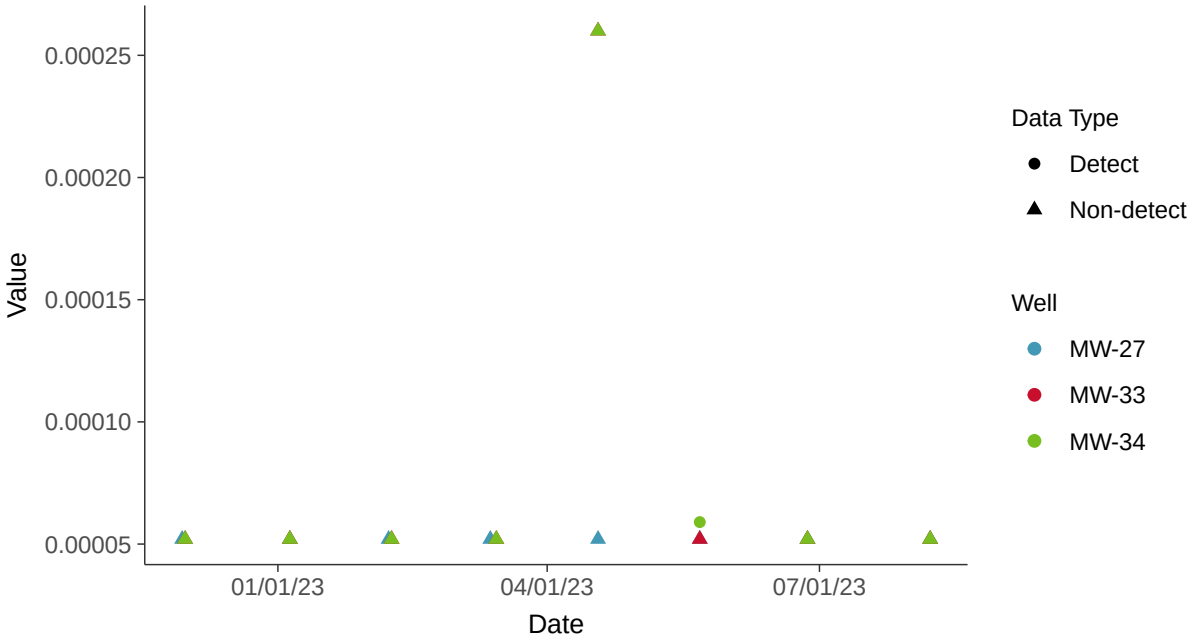
Scatter Plot

Beryllium, MW-27, MW-33, MW-34 (mg/L)



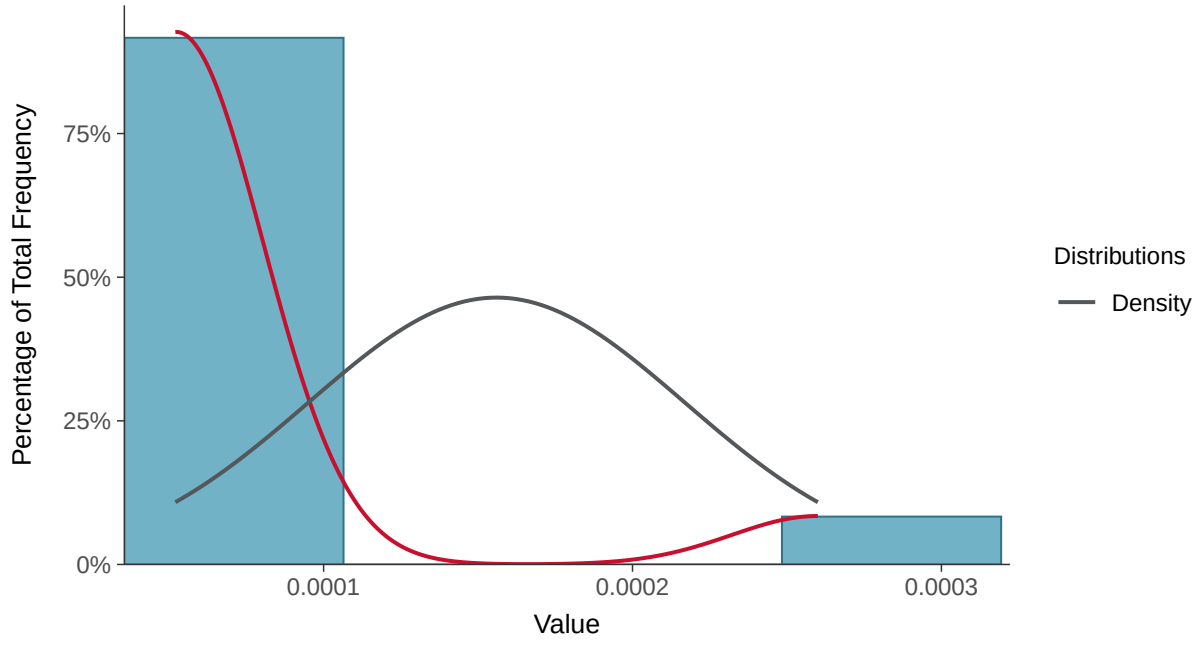
Scatter Plot by Well

Beryllium, MW-27, MW-33, MW-34 (mg/L)



Histogram

Beryllium, MW-27, MW-33, MW-34 (mg/L)

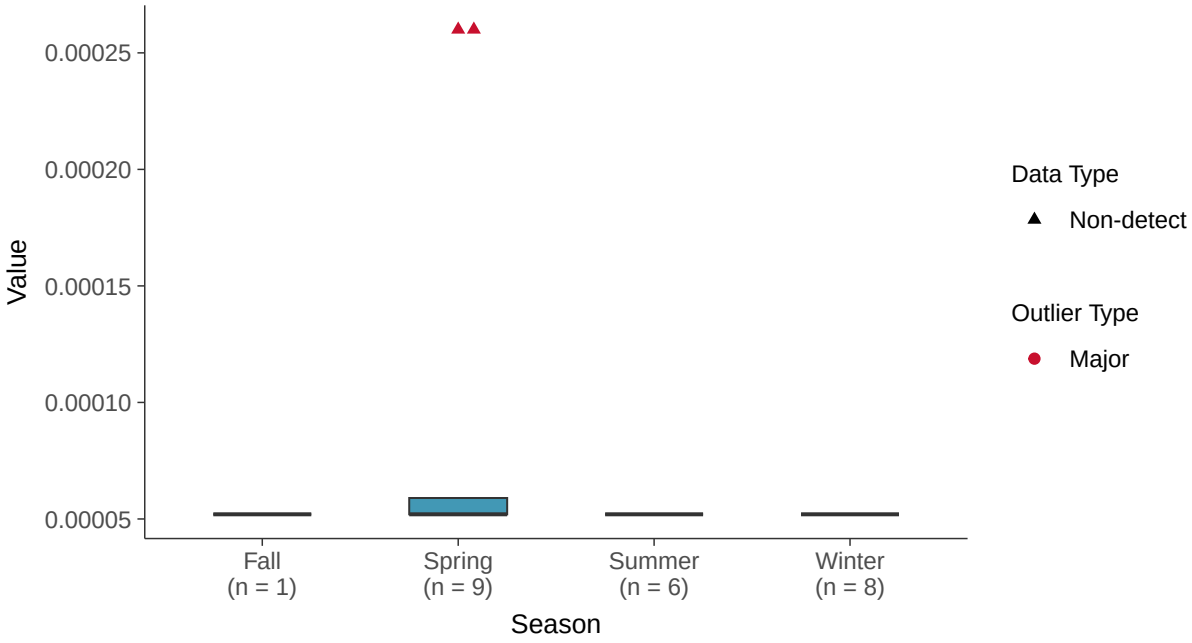


Boxplot

Beryllium, MW-27, MW-33, MW-34 (mg/L)

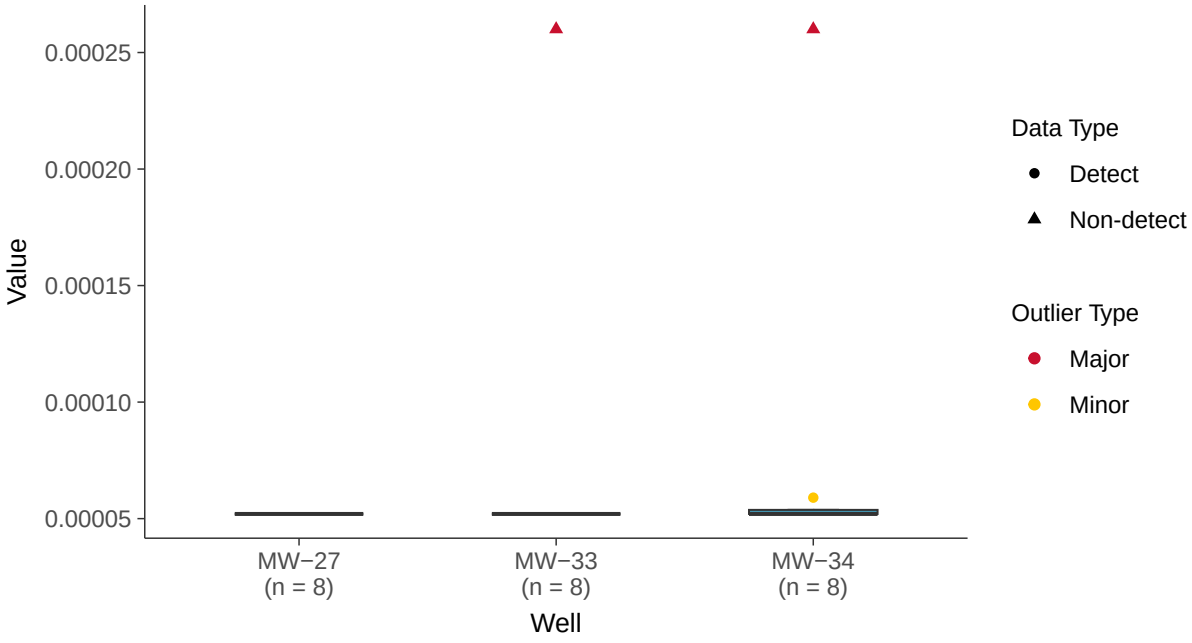
Boxplot by Season

Beryllium, MW-27, MW-33, MW-34 (mg/L)



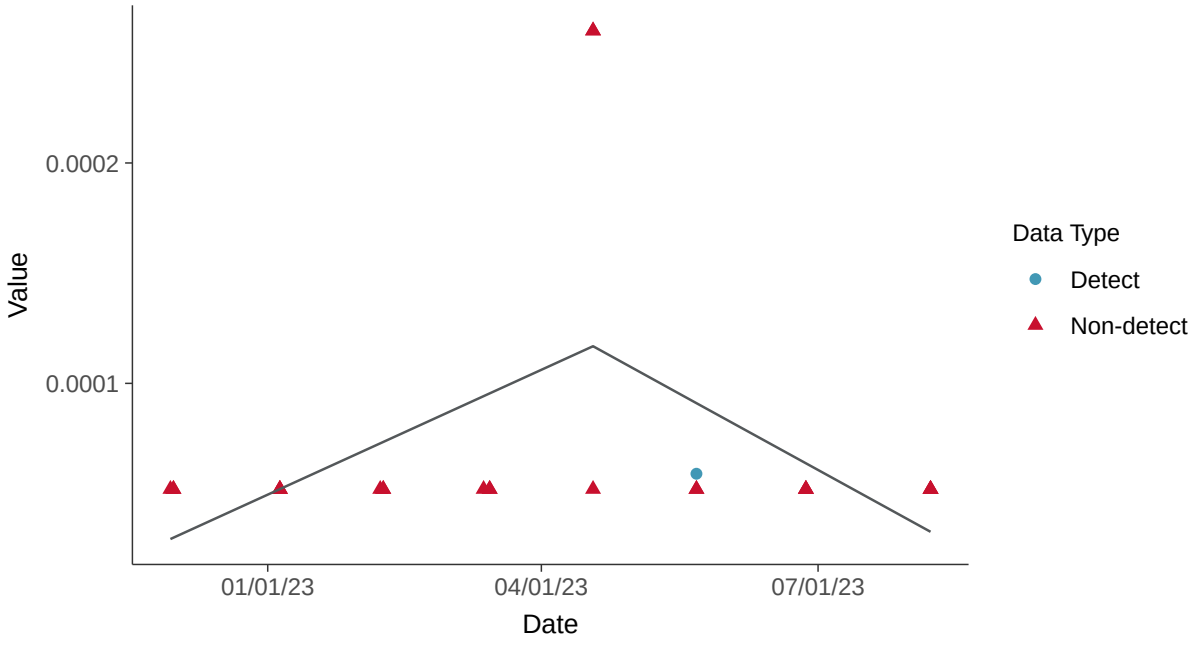
Boxplot by Well

Beryllium, MW-27, MW-33, MW-34 (mg/L)



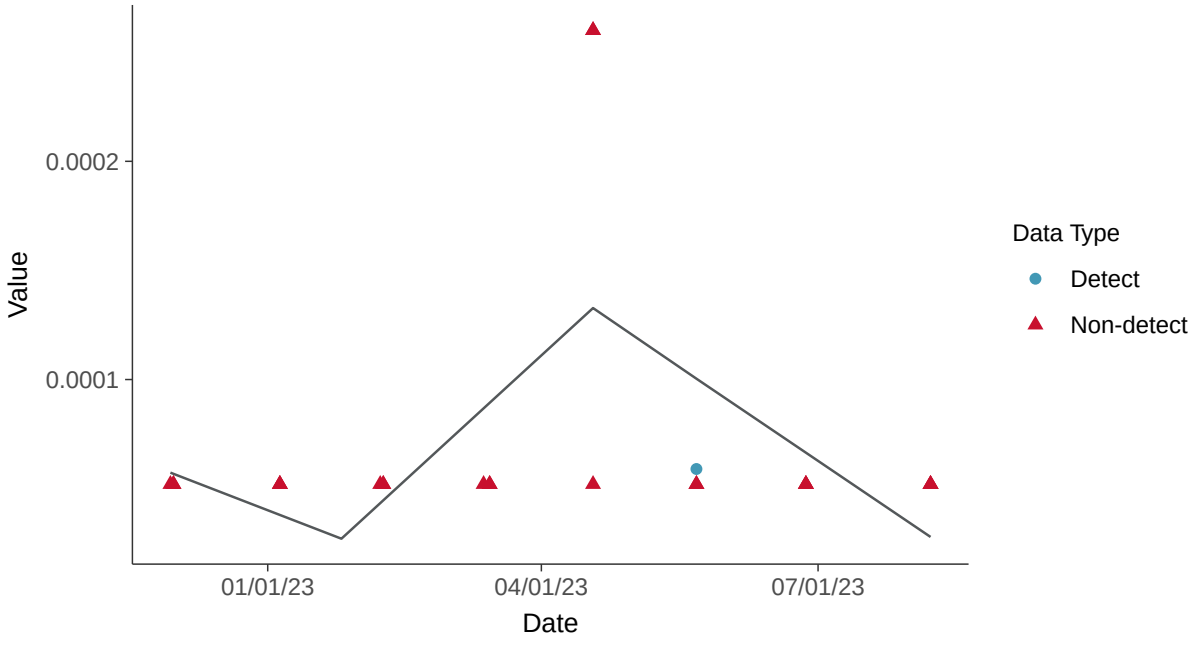
Trend Regression: Piecewise Linear-Linear

Beryllium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Beryllium, MW-27, MW-33, MW-34 (mg/L)

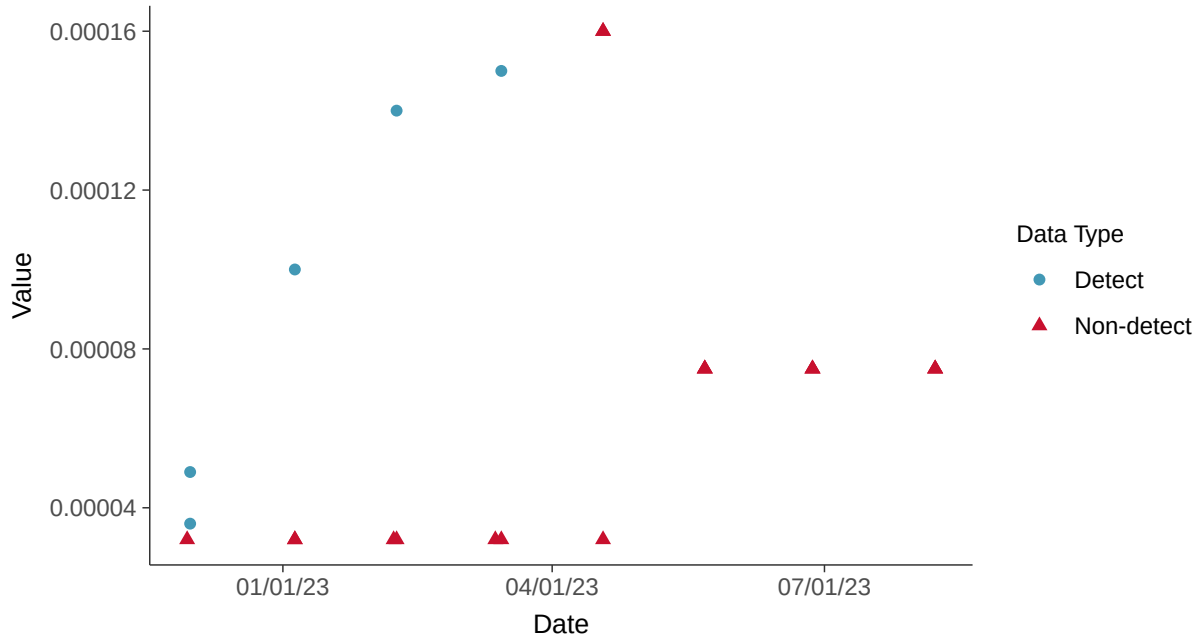


Appendix IV: Cadmium, MW-27, MW-33, MW-34

ID: 5_106

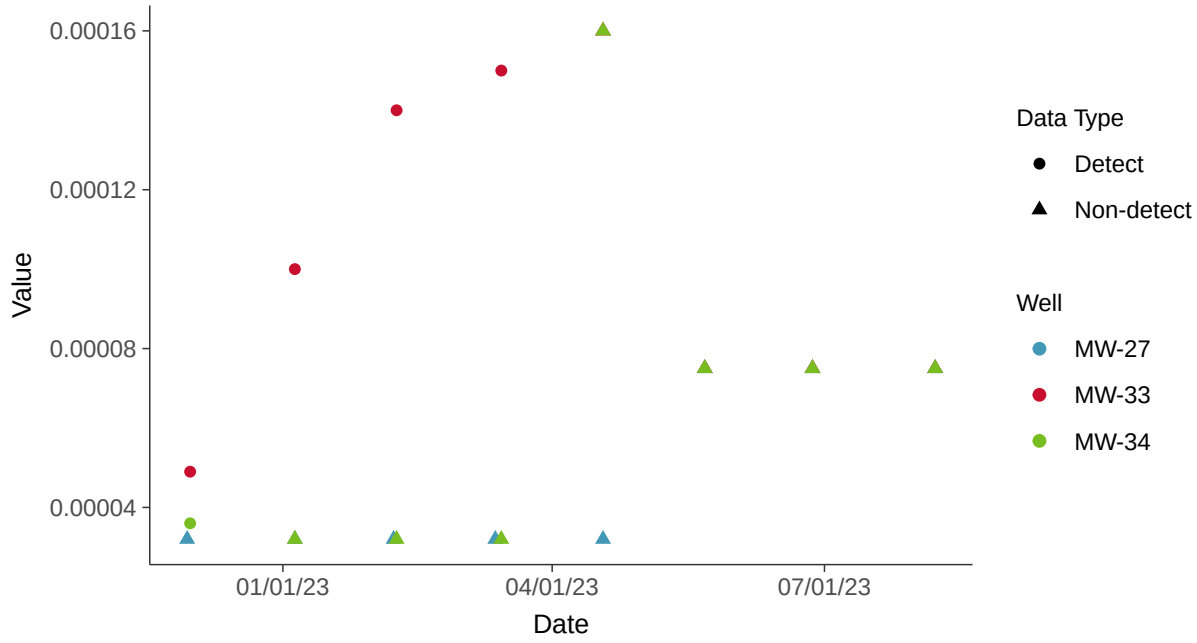
Scatter Plot

Cadmium, MW-27, MW-33, MW-34 (mg/L)



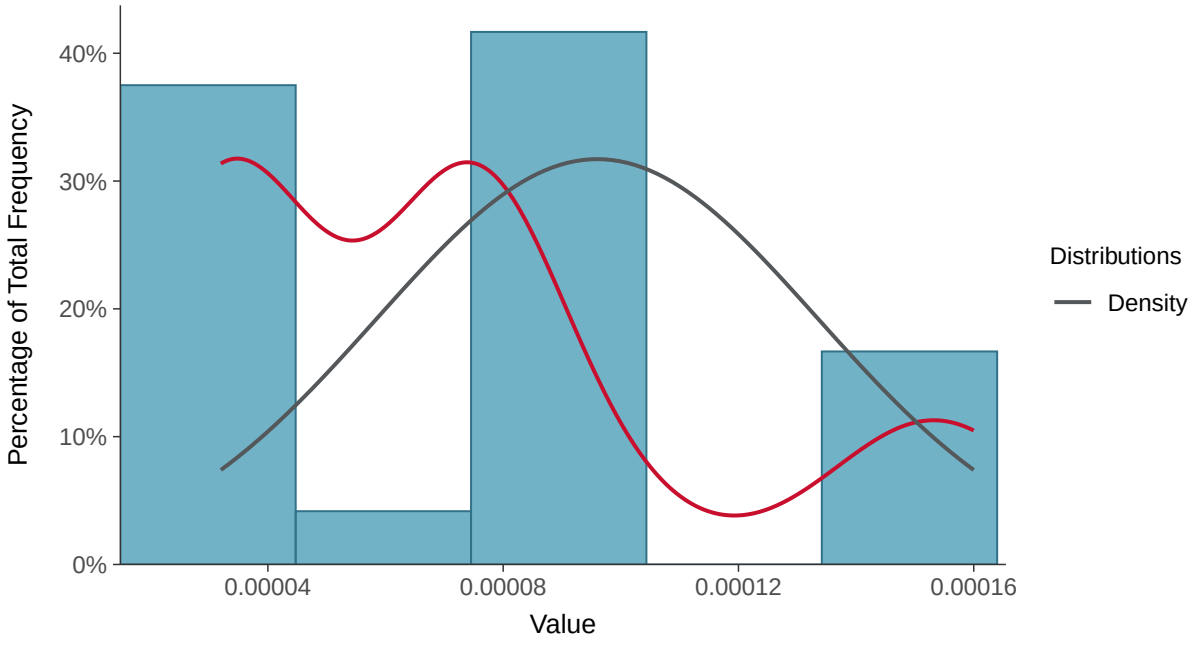
Scatter Plot by Well

Cadmium, MW-27, MW-33, MW-34 (mg/L)



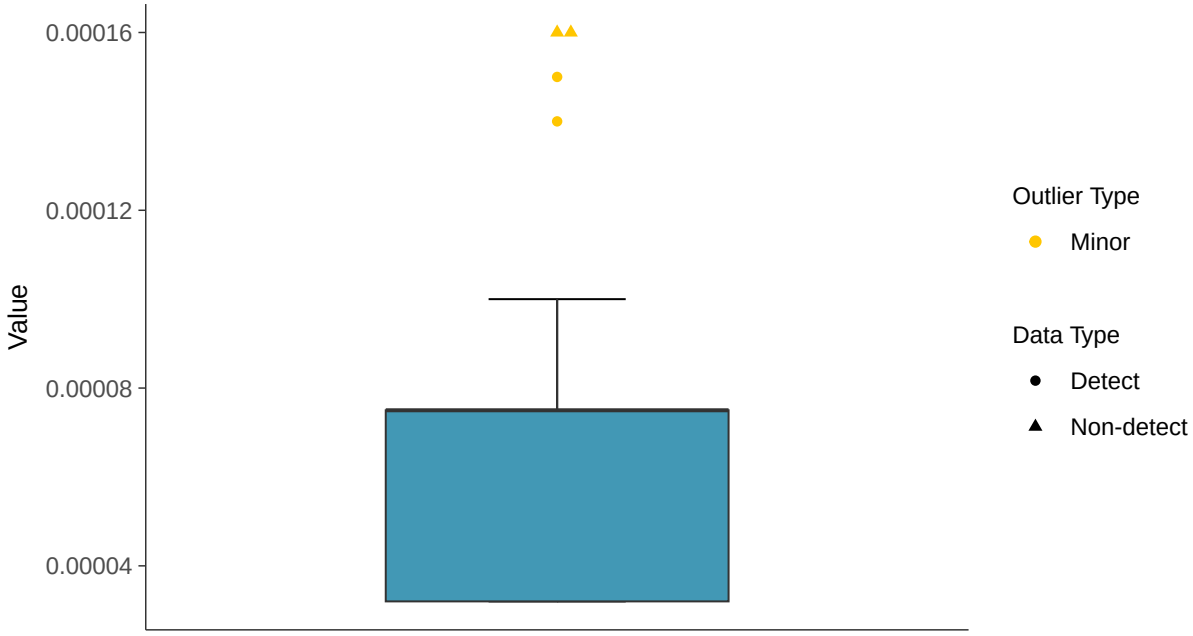
Histogram

Cadmium, MW-27, MW-33, MW-34 (mg/L)



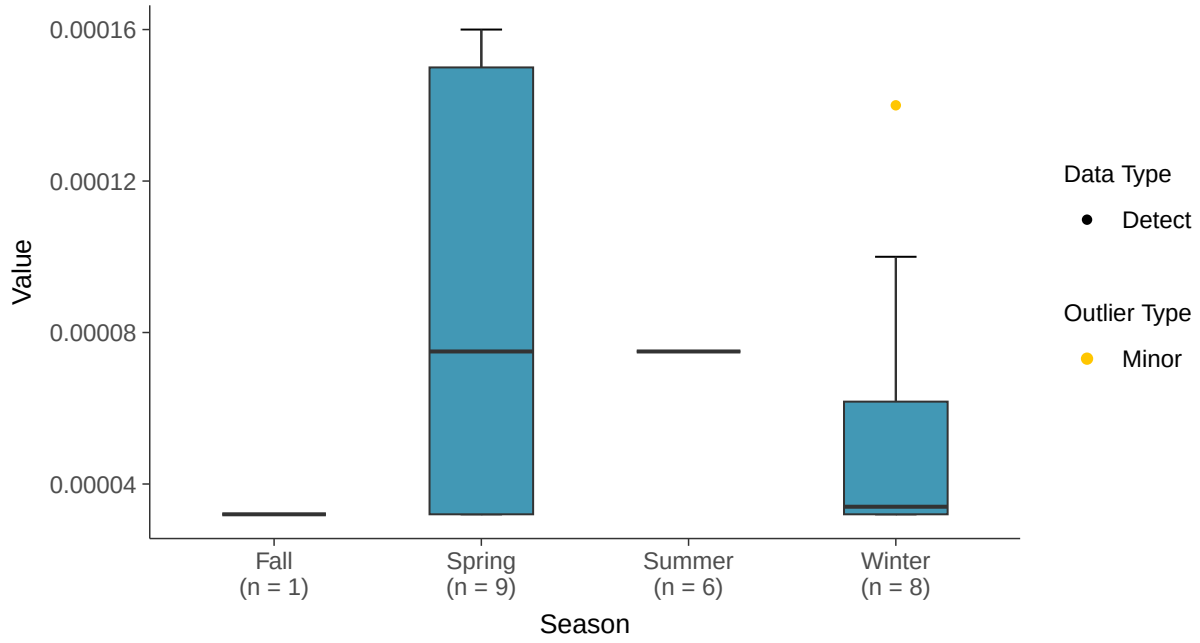
Boxplot

Cadmium, MW-27, MW-33, MW-34 (mg/L)



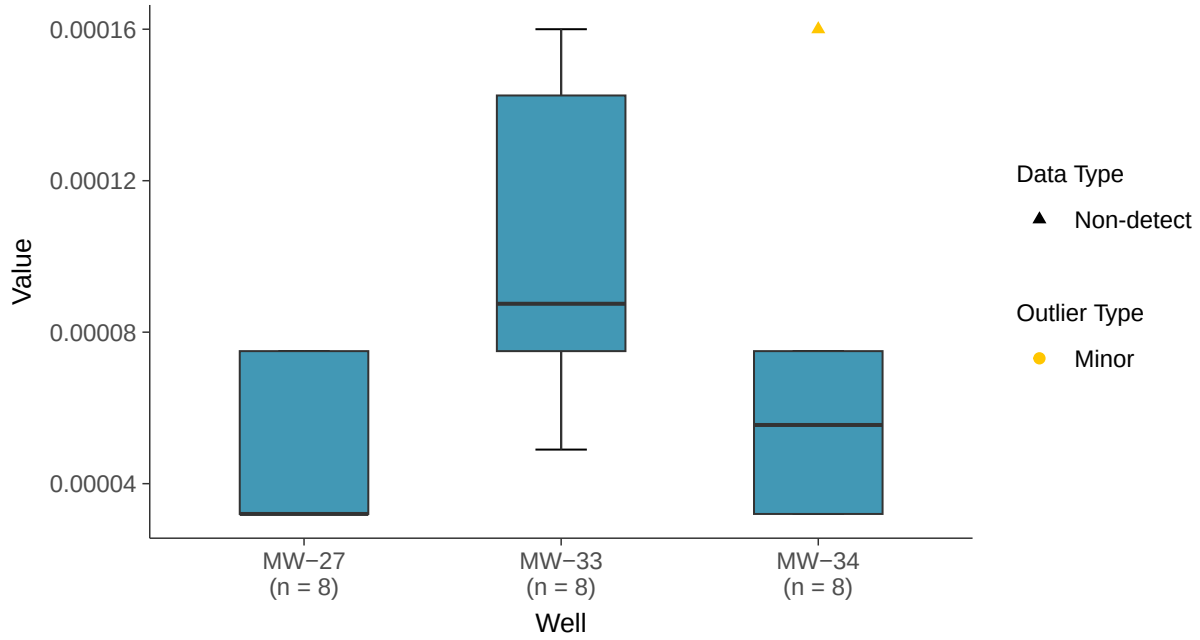
Boxplot by Season

Cadmium, MW-27, MW-33, MW-34 (mg/L)



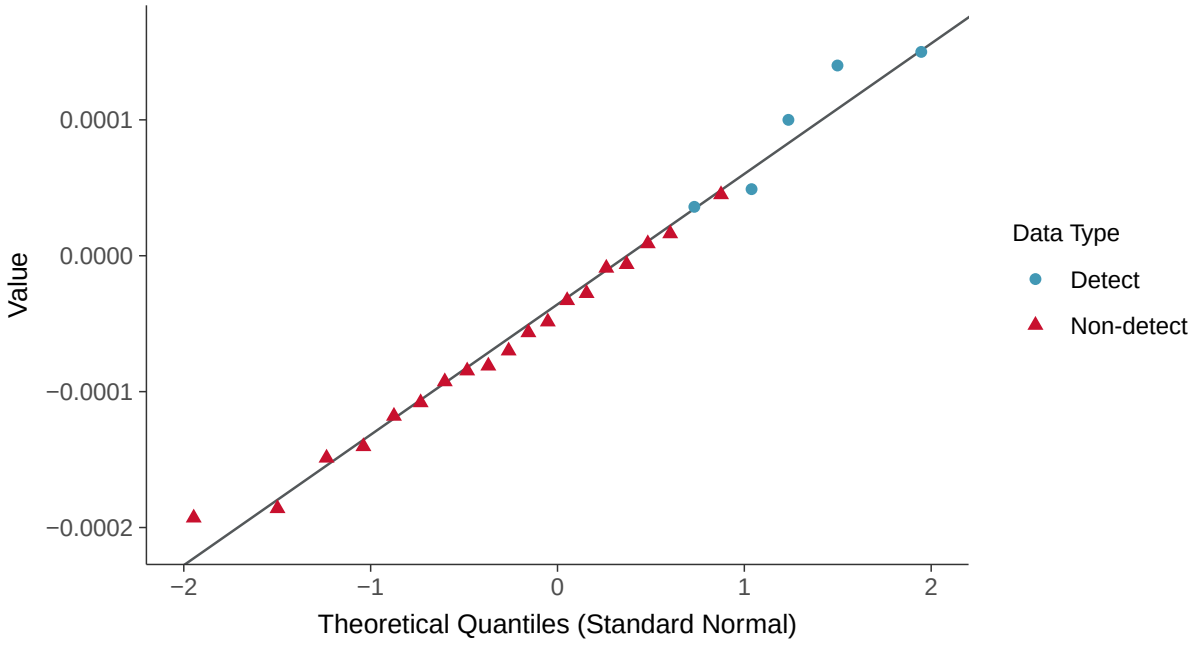
Boxplot by Well

Cadmium, MW-27, MW-33, MW-34 (mg/L)



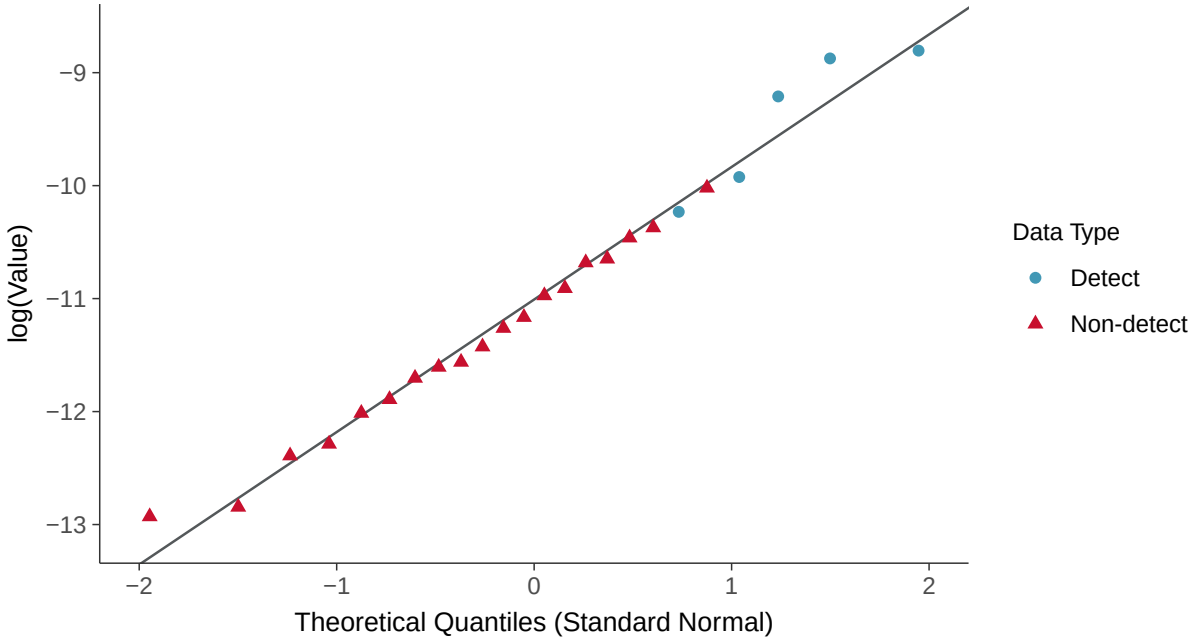
Normal Q-Q plot using ROS Imputed Estimates

Cadmium, MW-27, MW-33, MW-34 (mg/L)



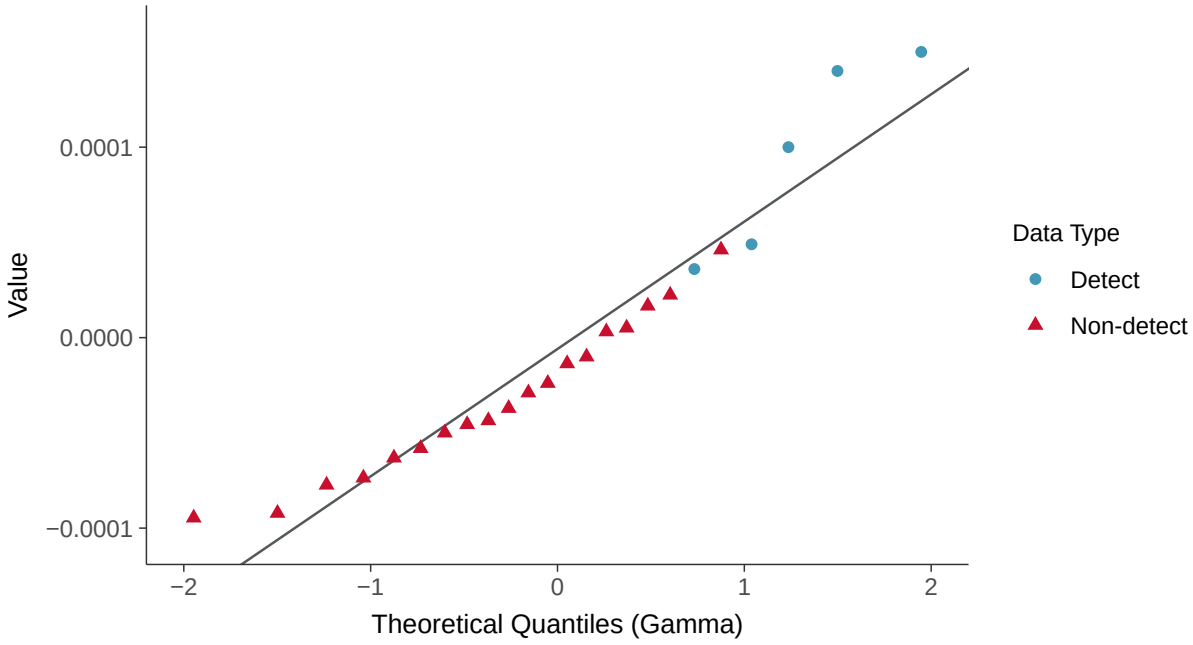
Lognormal Q-Q plot using ROS Imputed Estimates

Cadmium, MW-27, MW-33, MW-34 (mg/L)



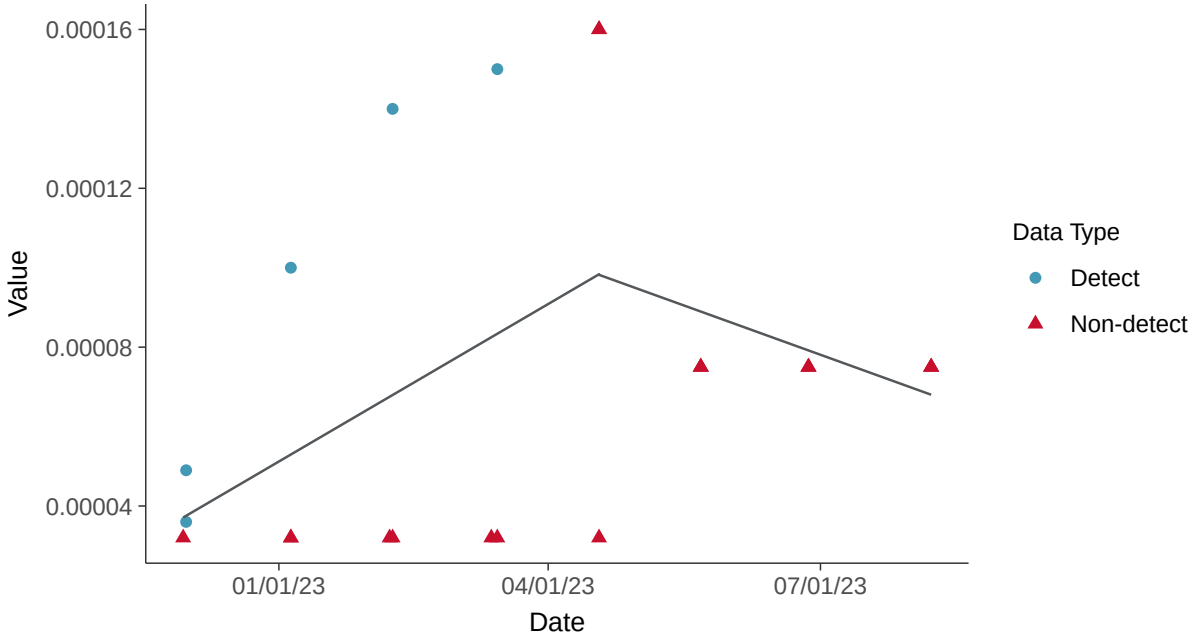
Gamma Q-Q plot using ROS Imputed Estimates

Cadmium, MW-27, MW-33, MW-34 (mg/L)



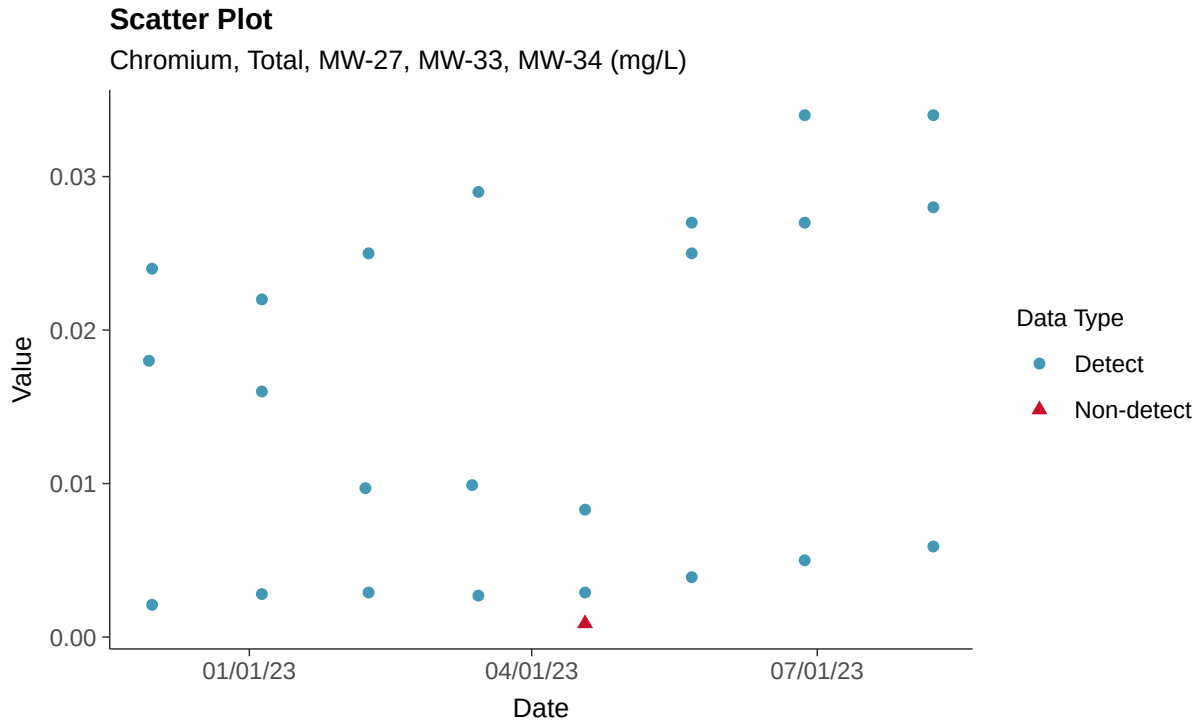
Trend Regression: Piecewise Linear-Linear

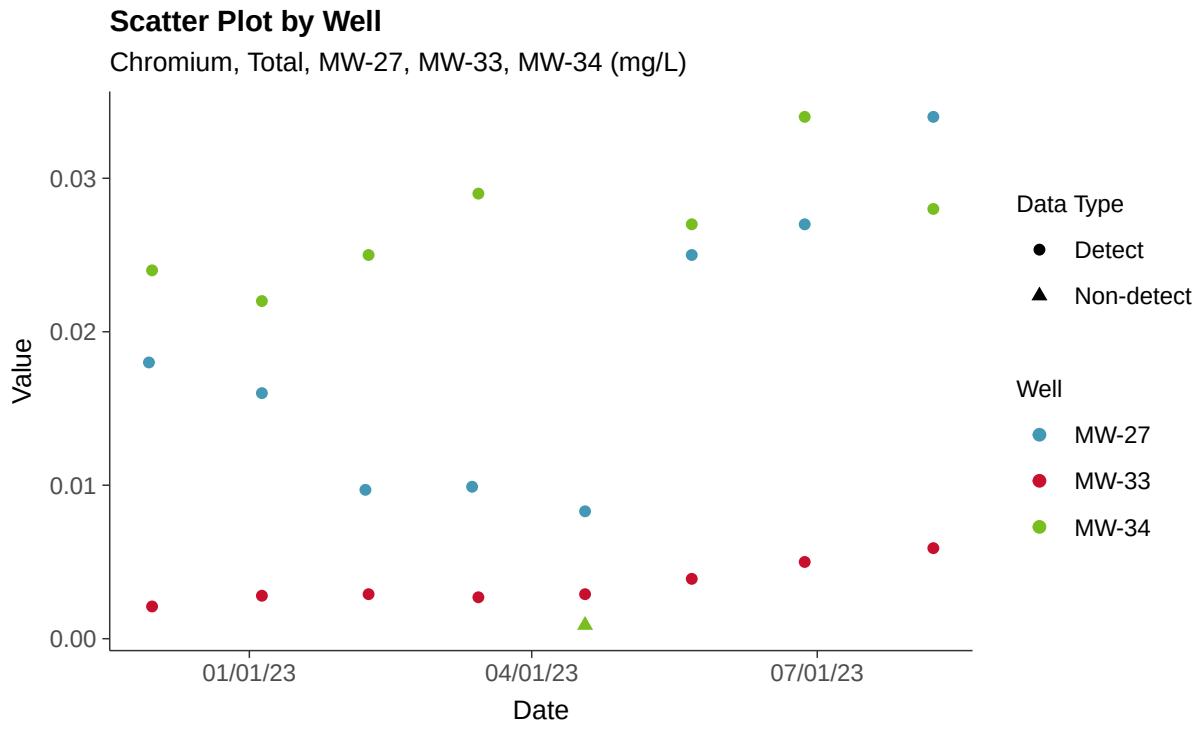
Cadmium, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Chromium, Total, MW-27, MW-33, MW-34

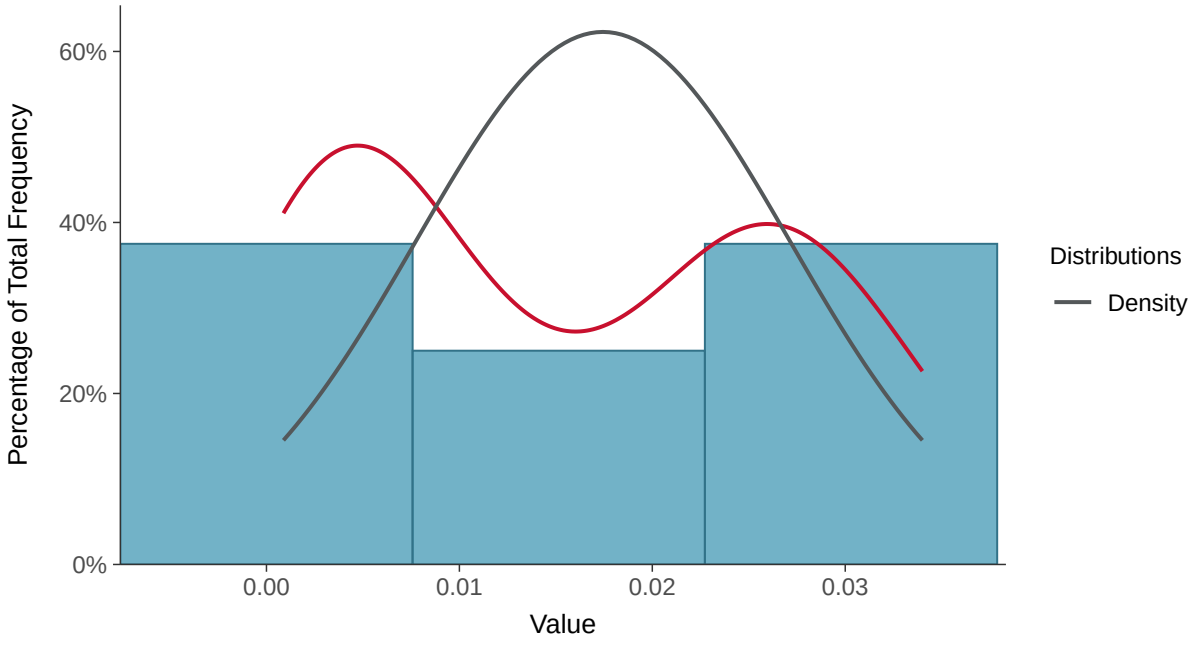
ID: 5_109





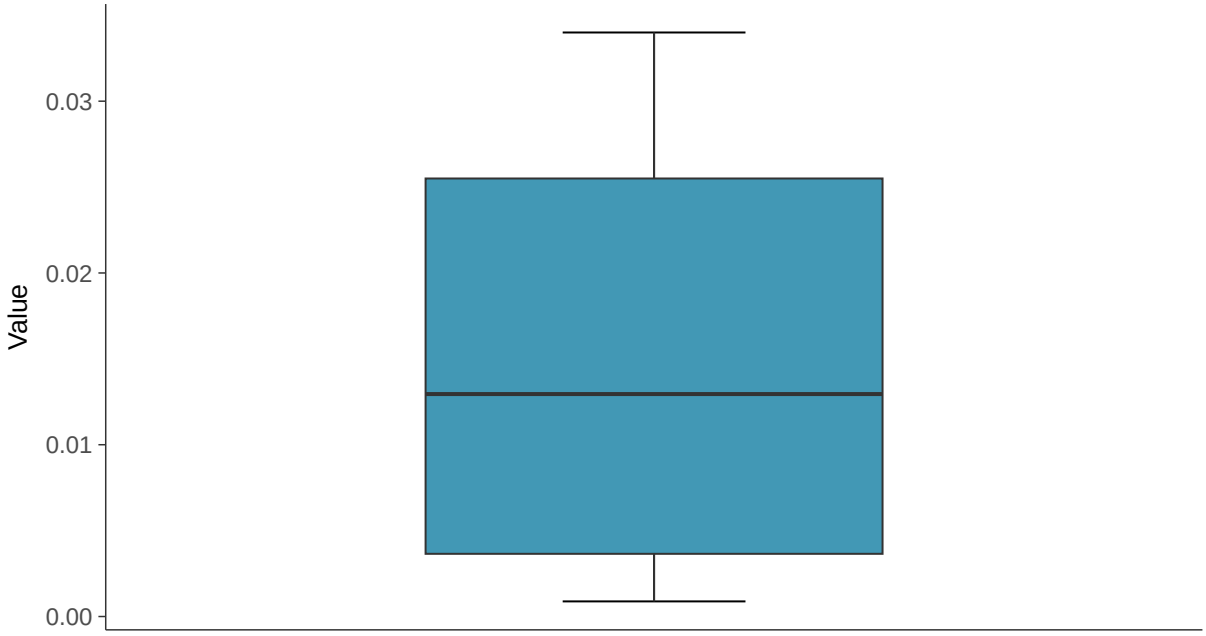
Histogram

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



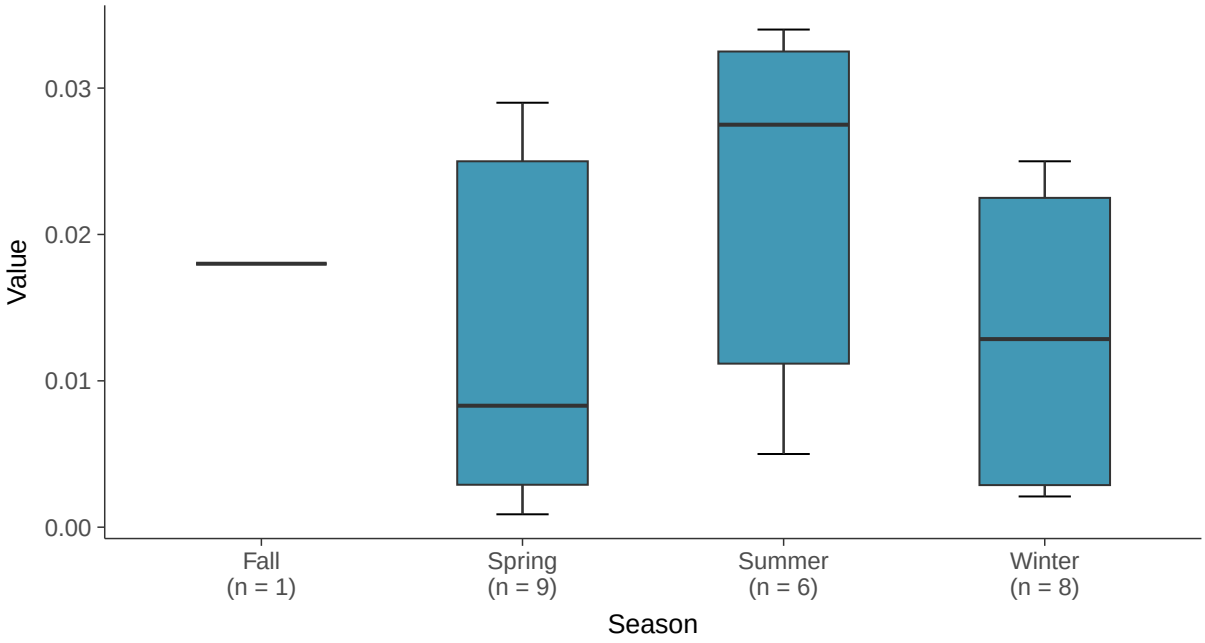
Boxplot

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



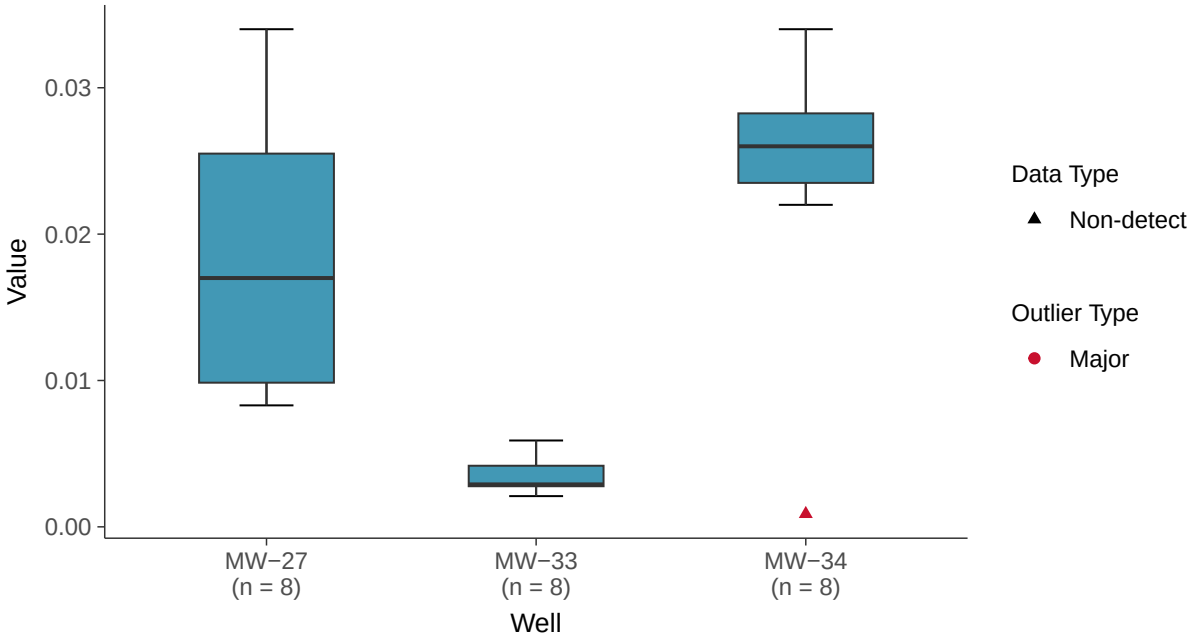
Boxplot by Season

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



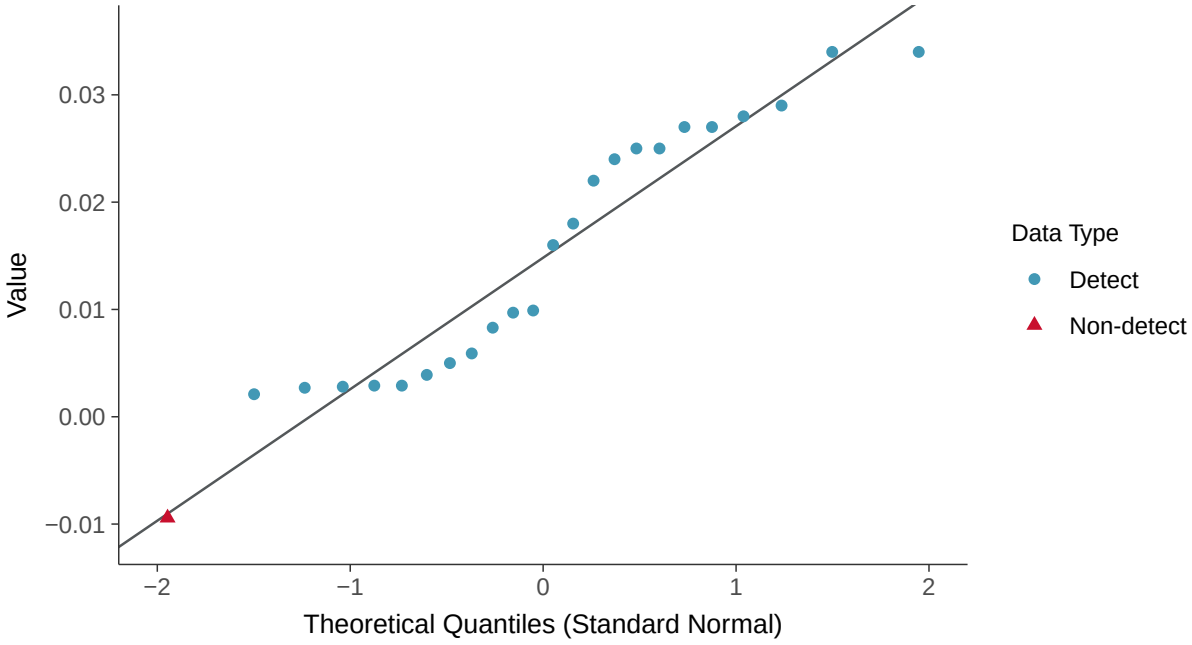
Boxplot by Well

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



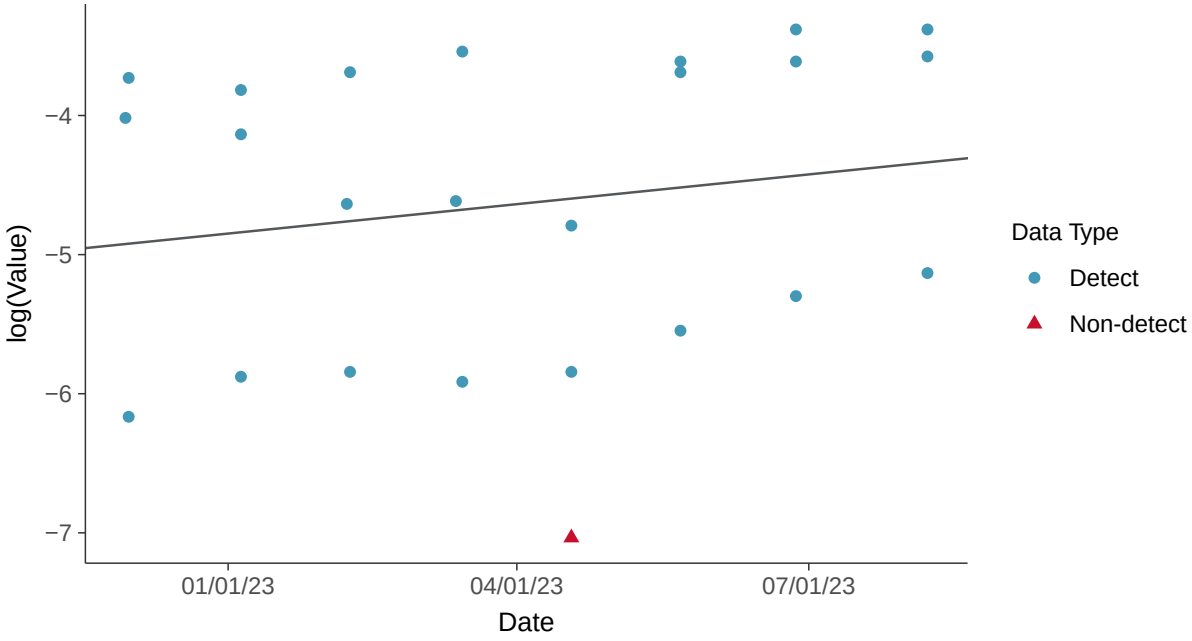
Normal Q-Q plot using ROS Imputed Estimates

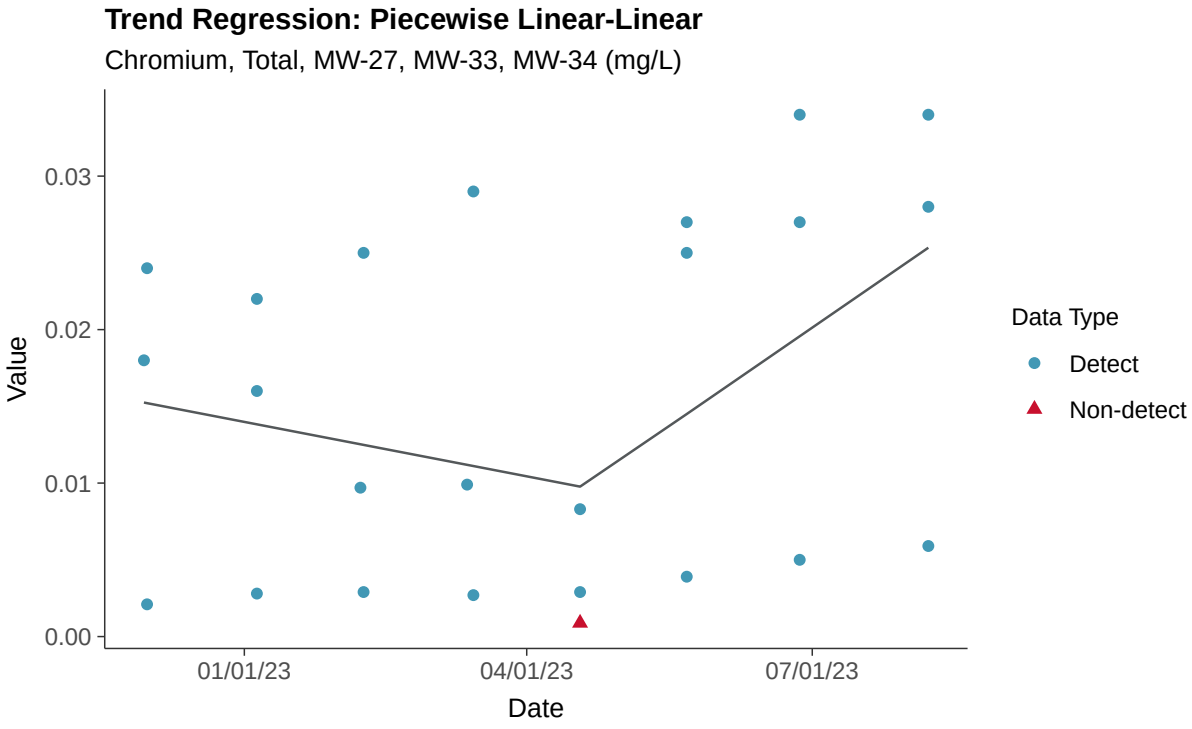
Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Lognormal MLE

Chromium, Total, MW-27, MW-33, MW-34 (mg/L)



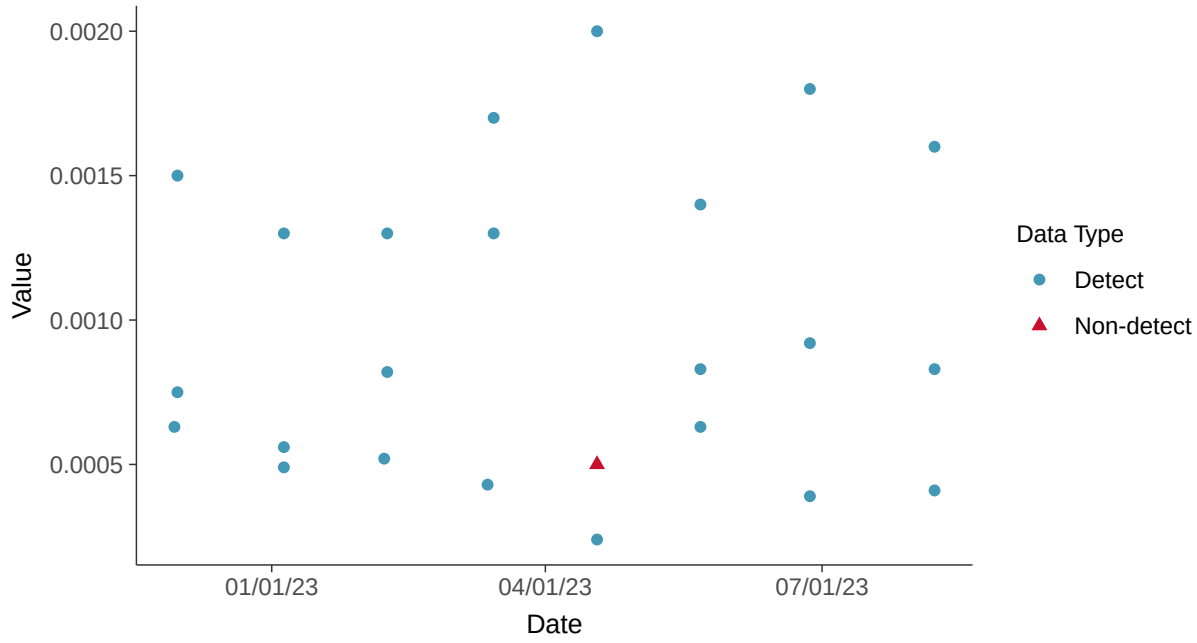

Trend Regression: Piecewise Linear-Linear
Chromium, Total, MW-27, MW-33, MW-34 (mg/L)
Value
0.03
0.02
0.01
0.00
01/01/23
04/01/23
07/01/23
Date
Data Type
Detect
Non-detect

Appendix IV: Cobalt, MW-27, MW-33, MW-34

ID: 5_110

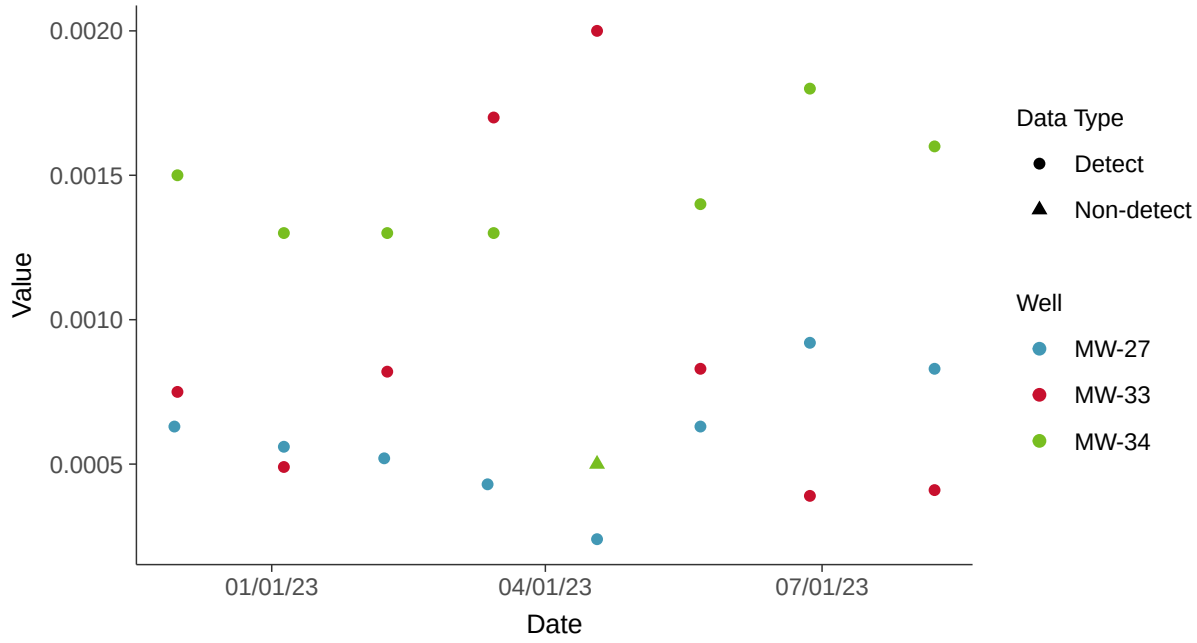
Scatter Plot

Cobalt, MW-27, MW-33, MW-34 (mg/L)



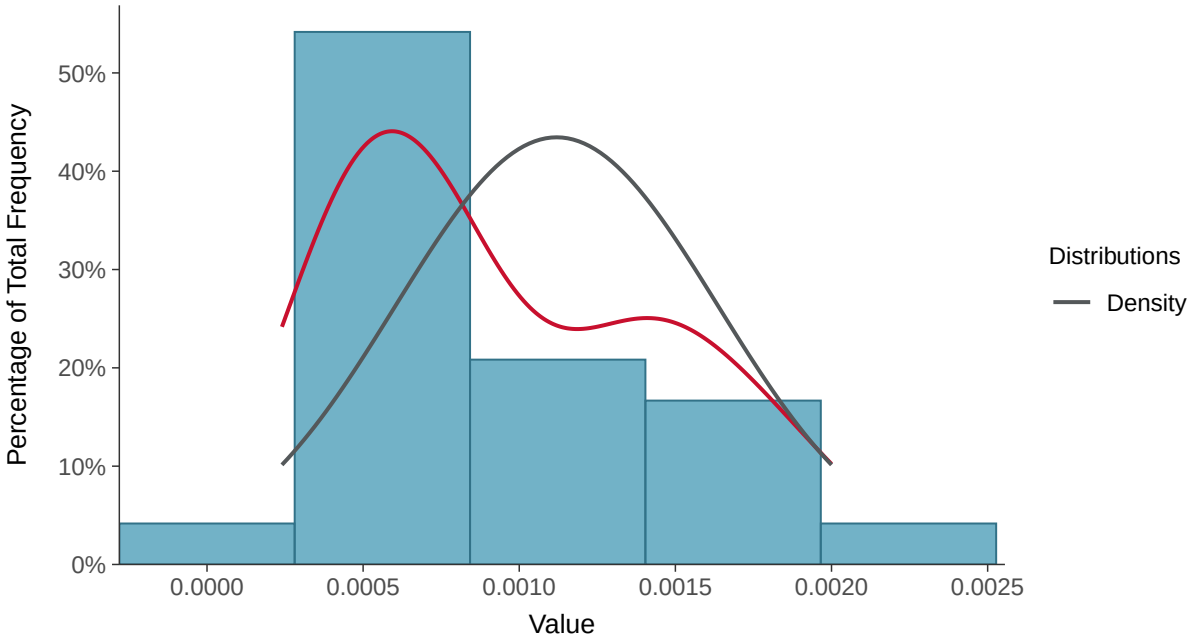
Scatter Plot by Well

Cobalt, MW-27, MW-33, MW-34 (mg/L)



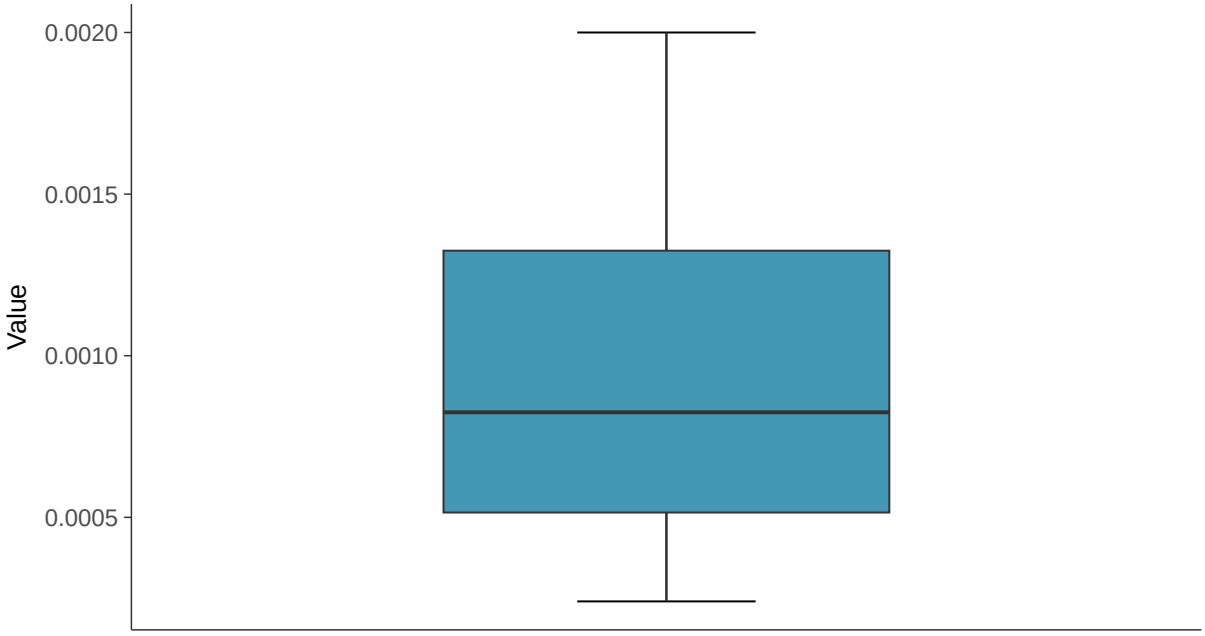
Histogram

Cobalt, MW-27, MW-33, MW-34 (mg/L)



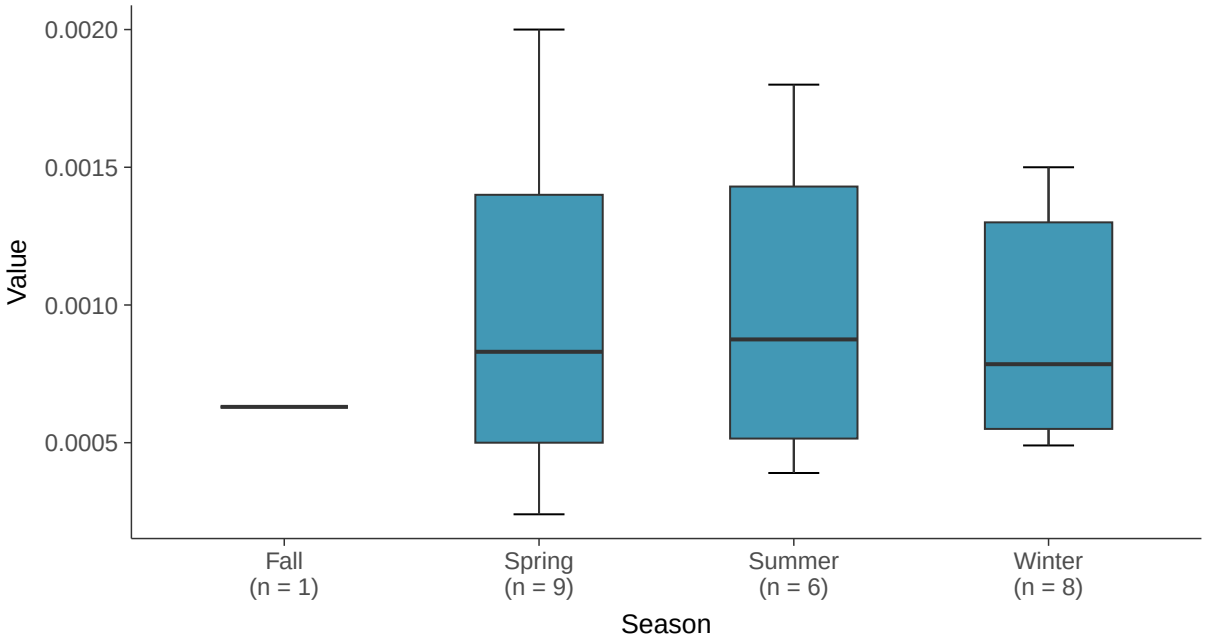
Boxplot

Cobalt, MW-27, MW-33, MW-34 (mg/L)



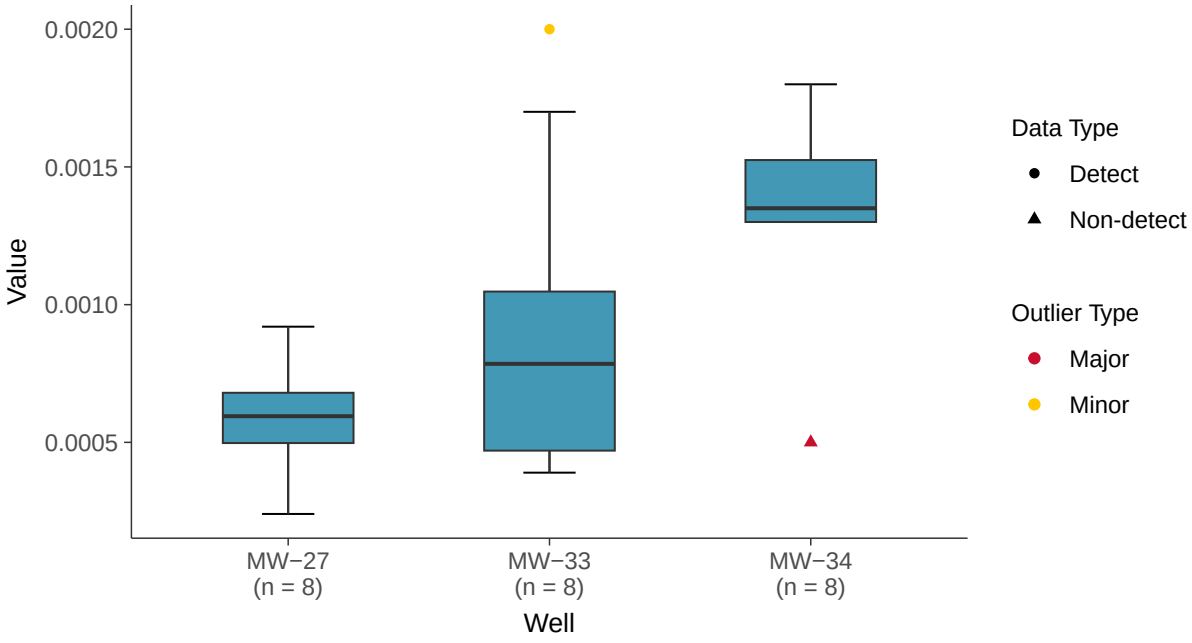
Boxplot by Season

Cobalt, MW-27, MW-33, MW-34 (mg/L)



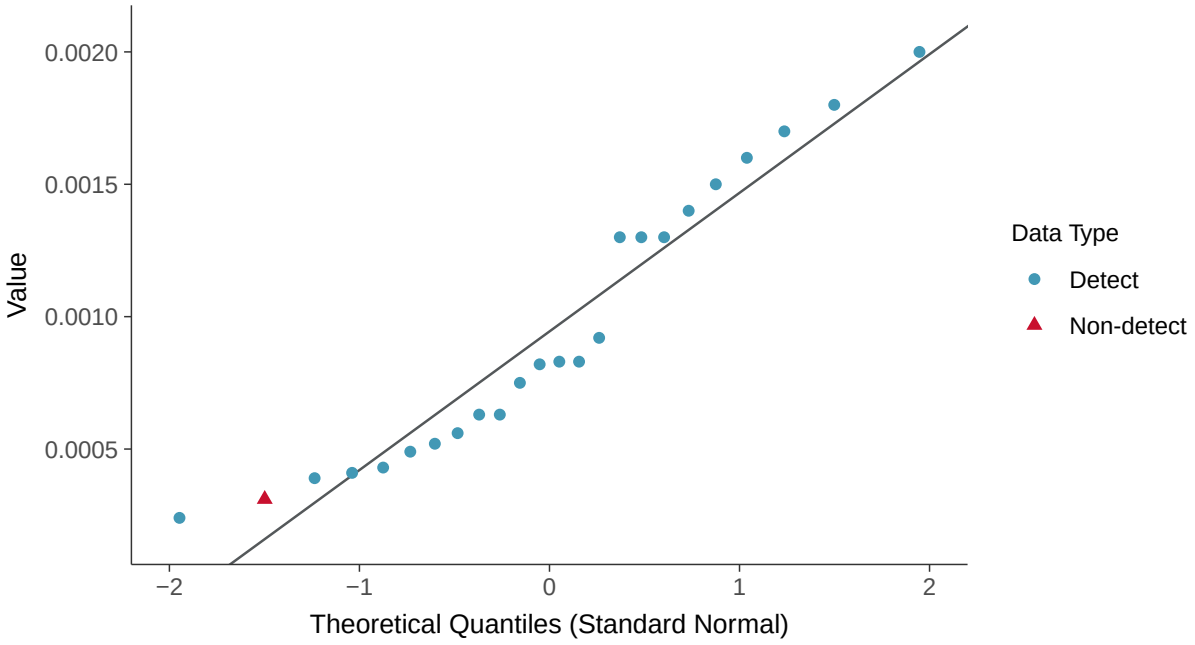
Boxplot by Well

Cobalt, MW-27, MW-33, MW-34 (mg/L)



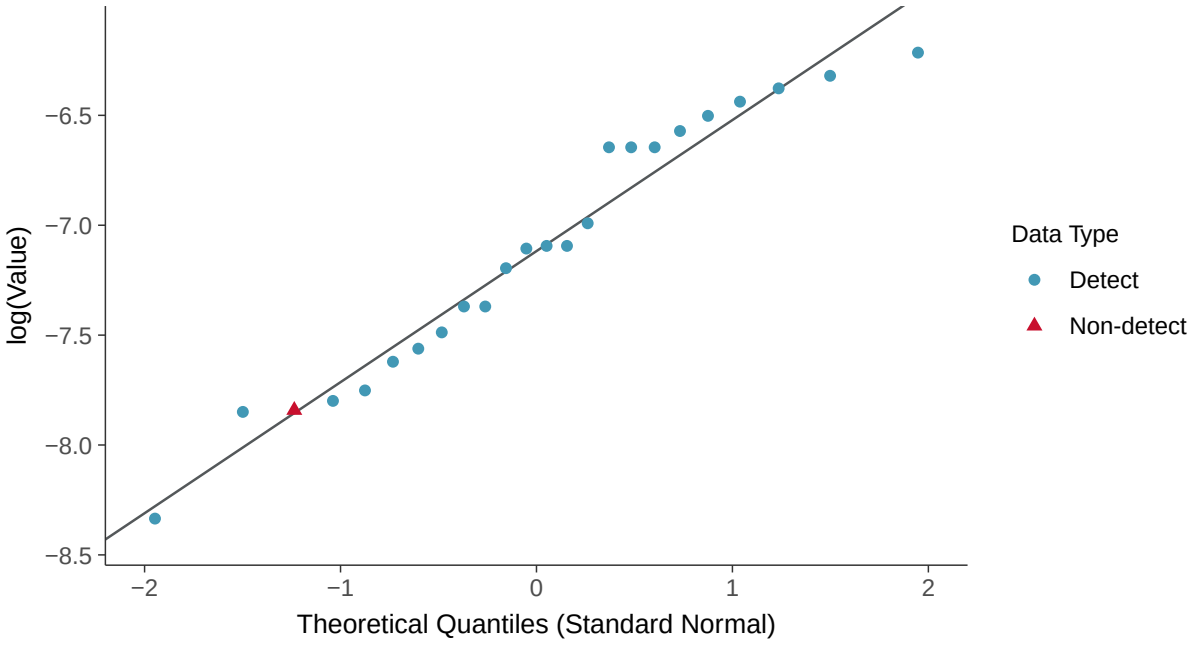
Normal Q-Q plot using ROS Imputed Estimates

Cobalt, MW-27, MW-33, MW-34 (mg/L)



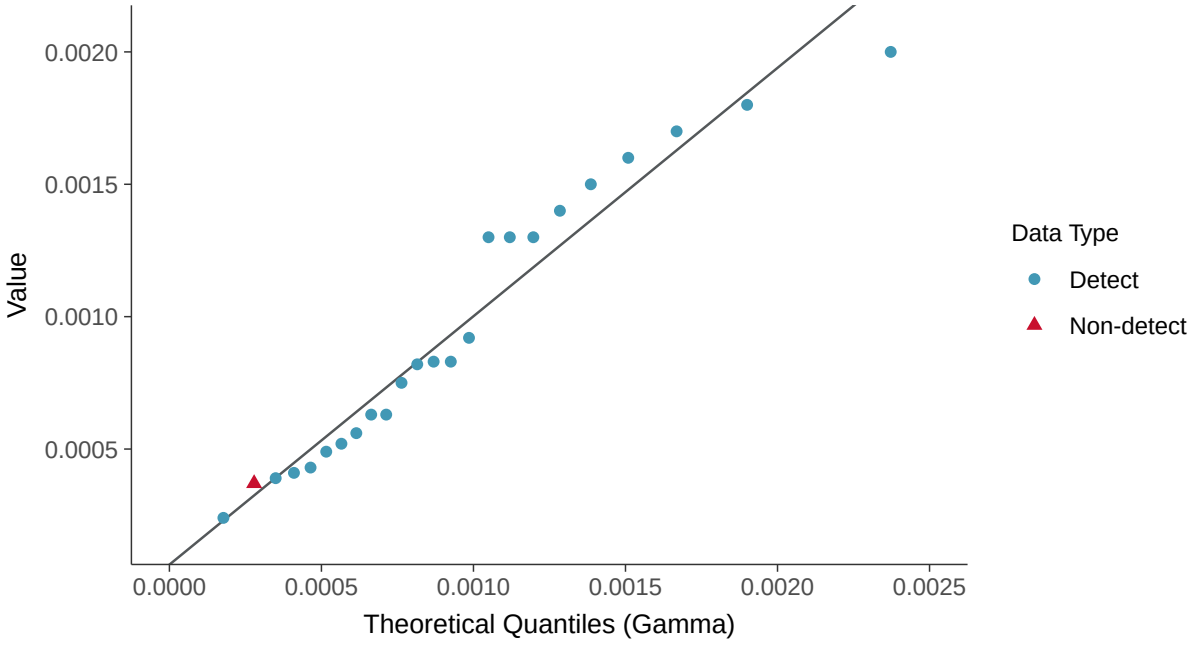
Lognormal Q-Q plot using ROS Imputed Estimates

Cobalt, MW-27, MW-33, MW-34 (mg/L)



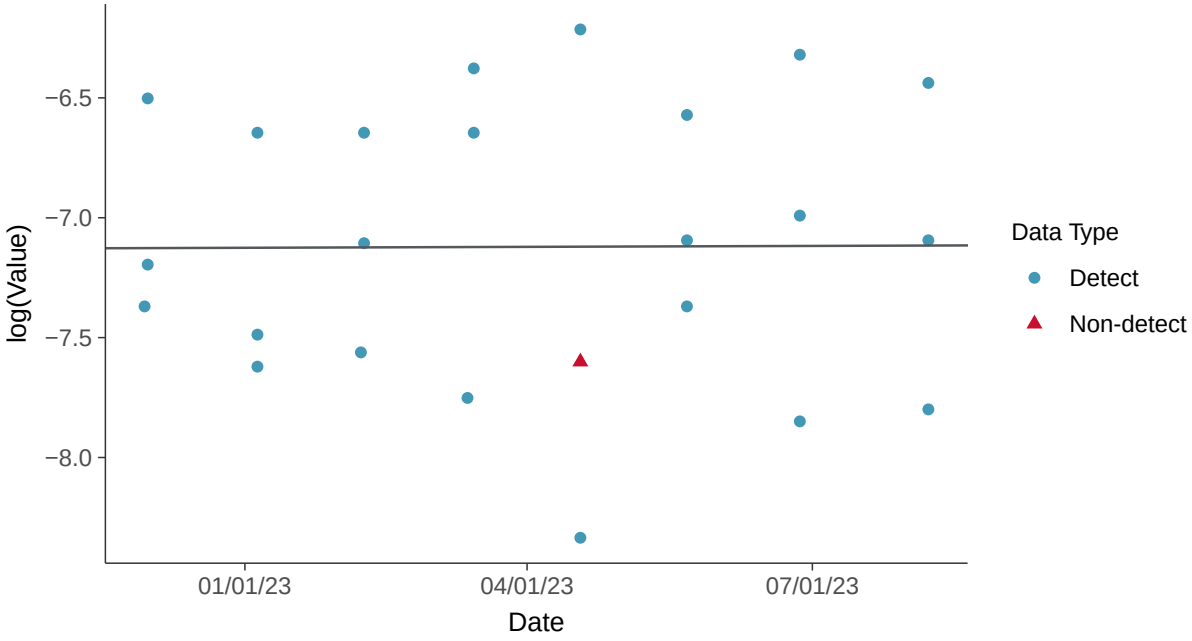
Gamma Q-Q plot using ROS Imputed Estimates

Cobalt, MW-27, MW-33, MW-34 (mg/L)



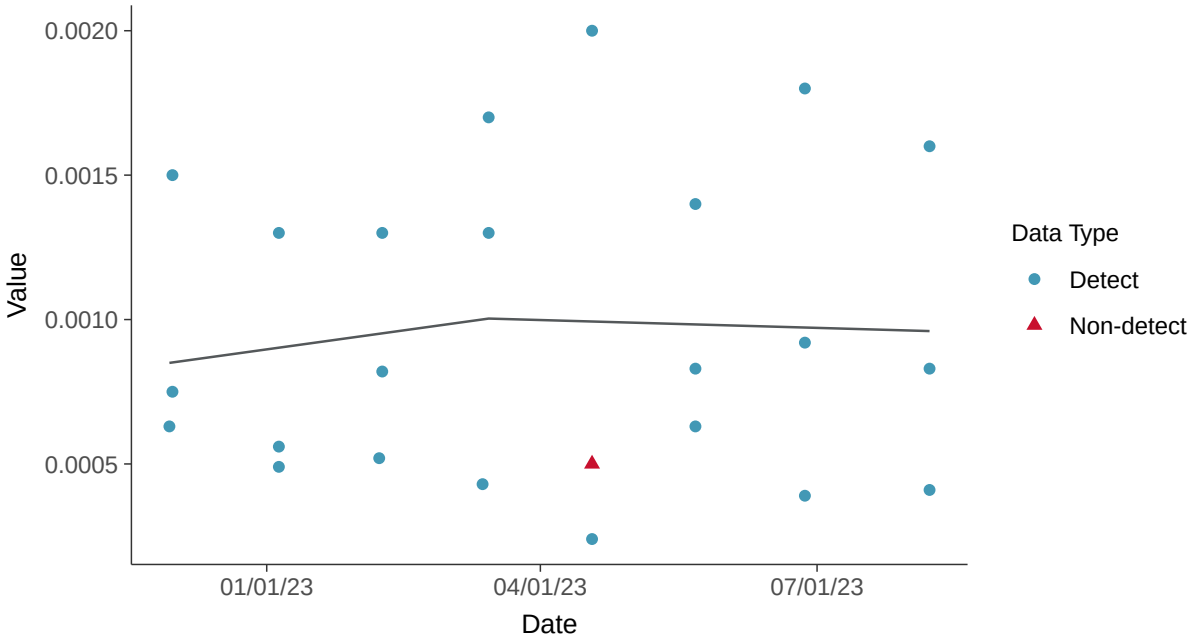
Trend Regression: Lognormal MLE

Cobalt, MW-27, MW-33, MW-34 (mg/L)



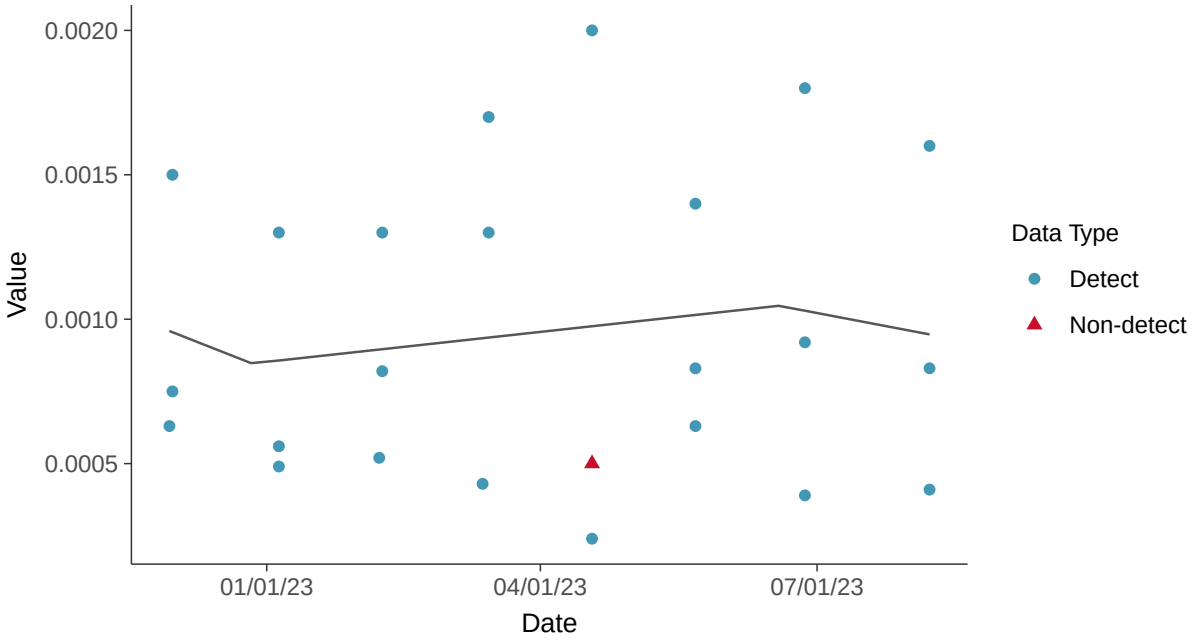
Trend Regression: Piecewise Linear-Linear

Cobalt, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Cobalt, MW-27, MW-33, MW-34 (mg/L)

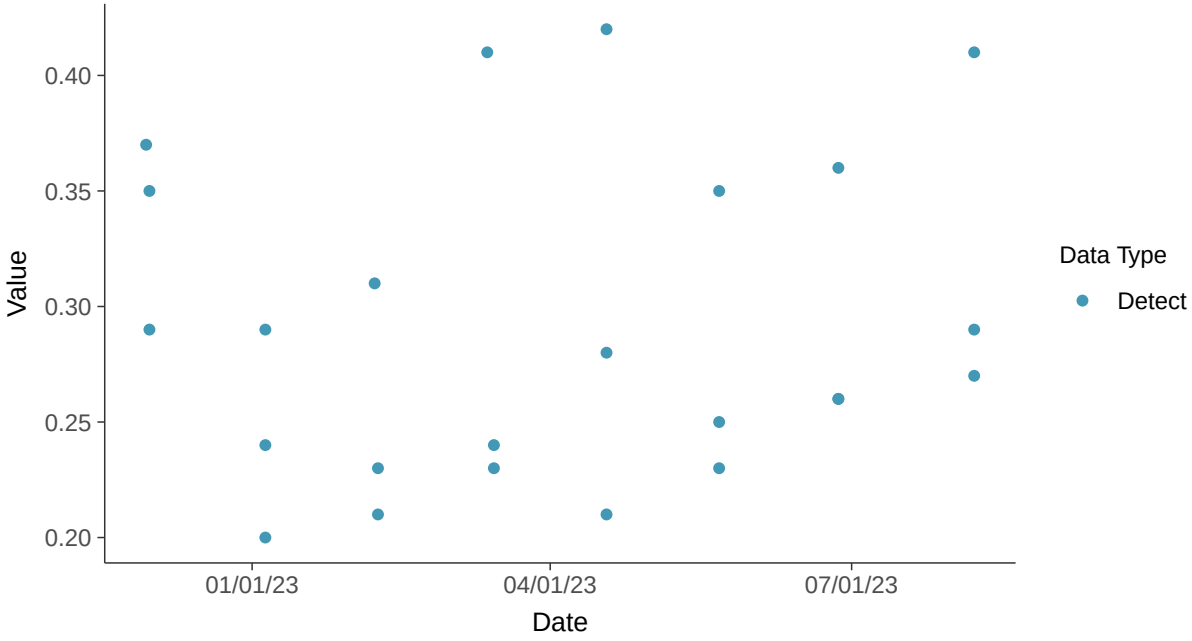


Appendix IV: Fluoride (App IV), MW-27, MW-33, MW-34

ID: 5_113

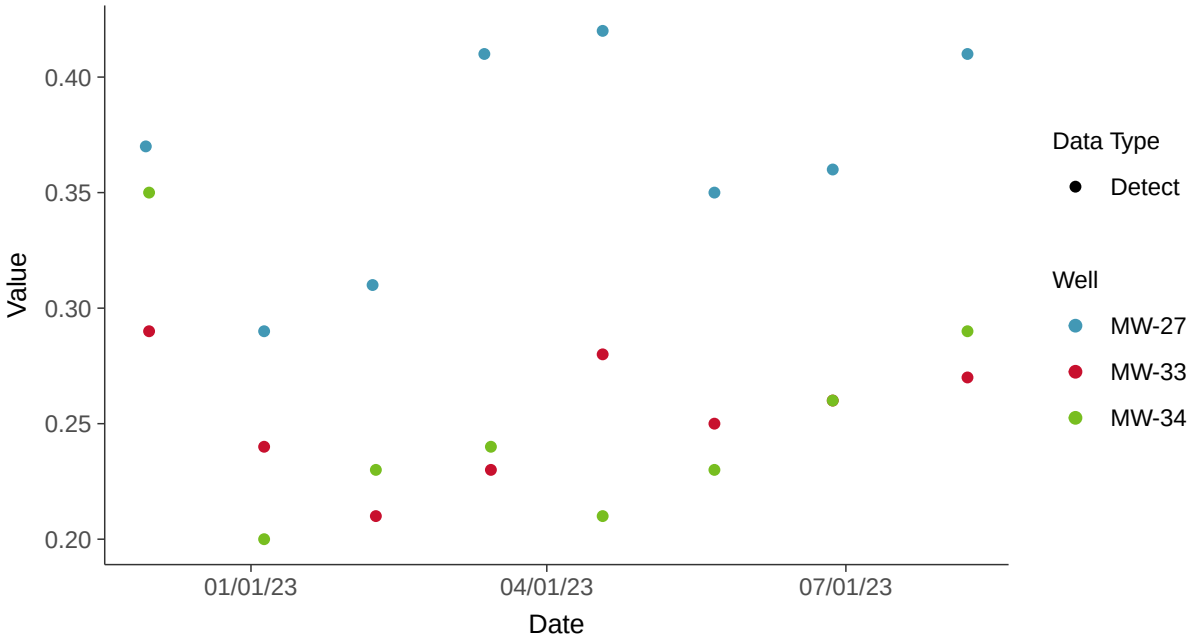
Scatter Plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



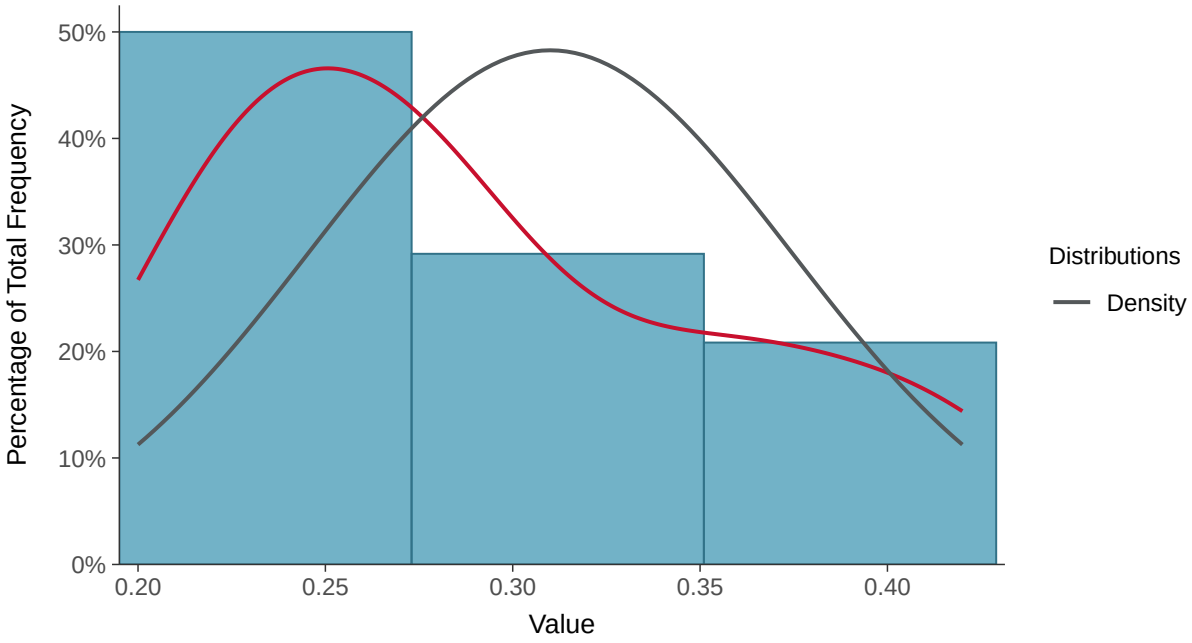
Scatter Plot by Well

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



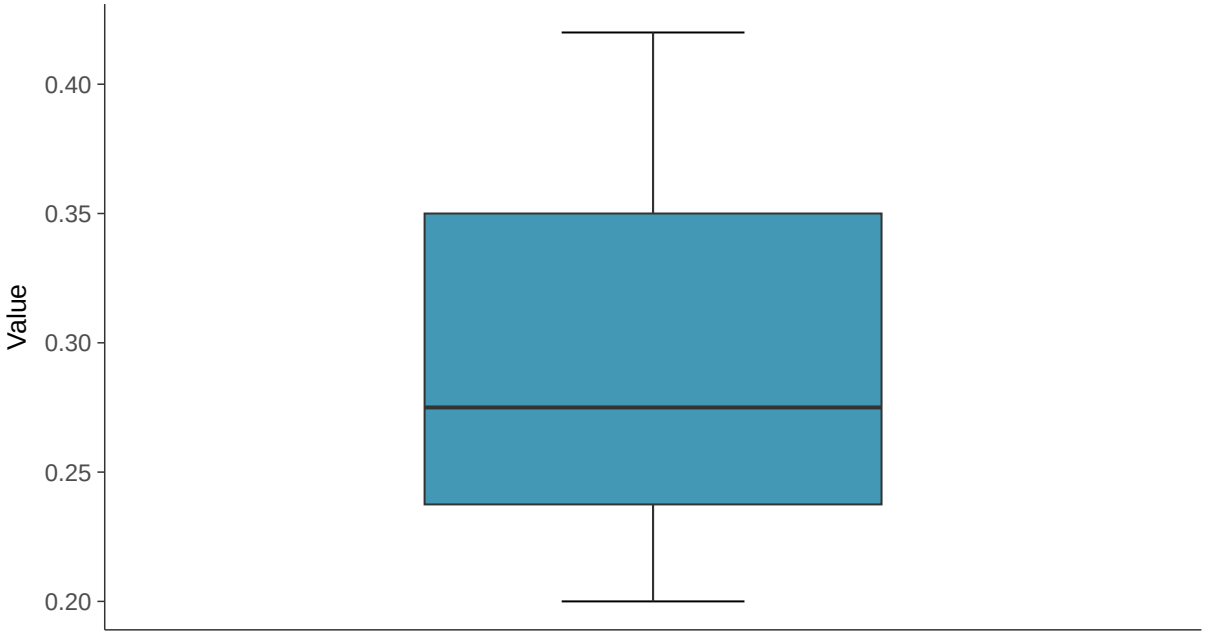
Histogram

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



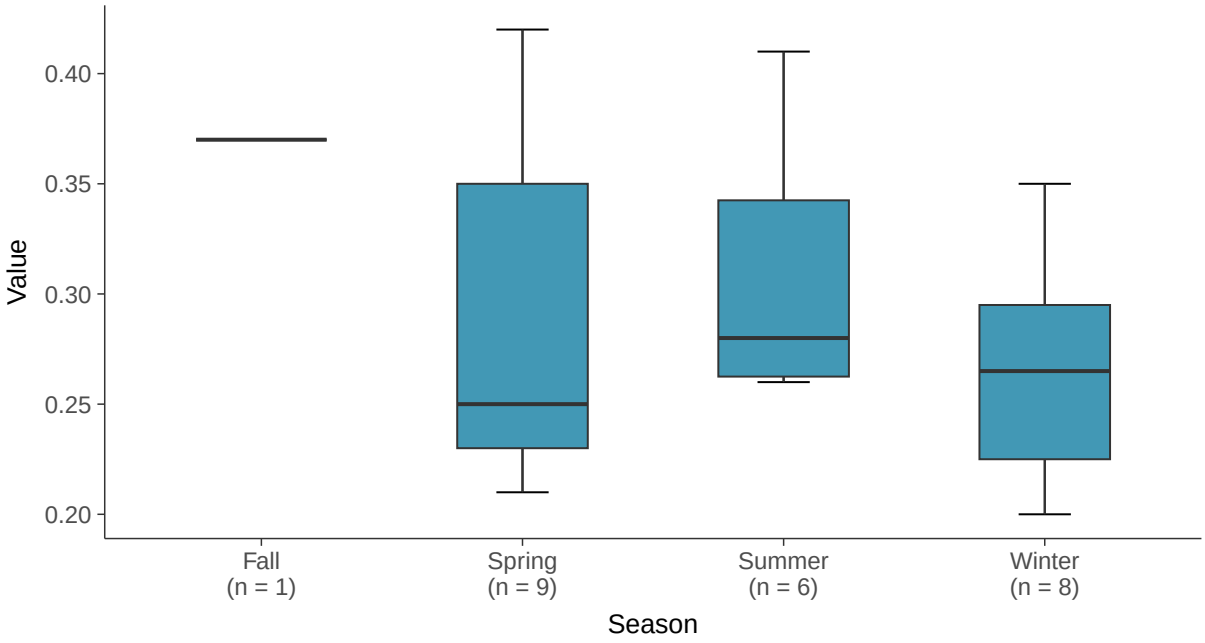
Boxplot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



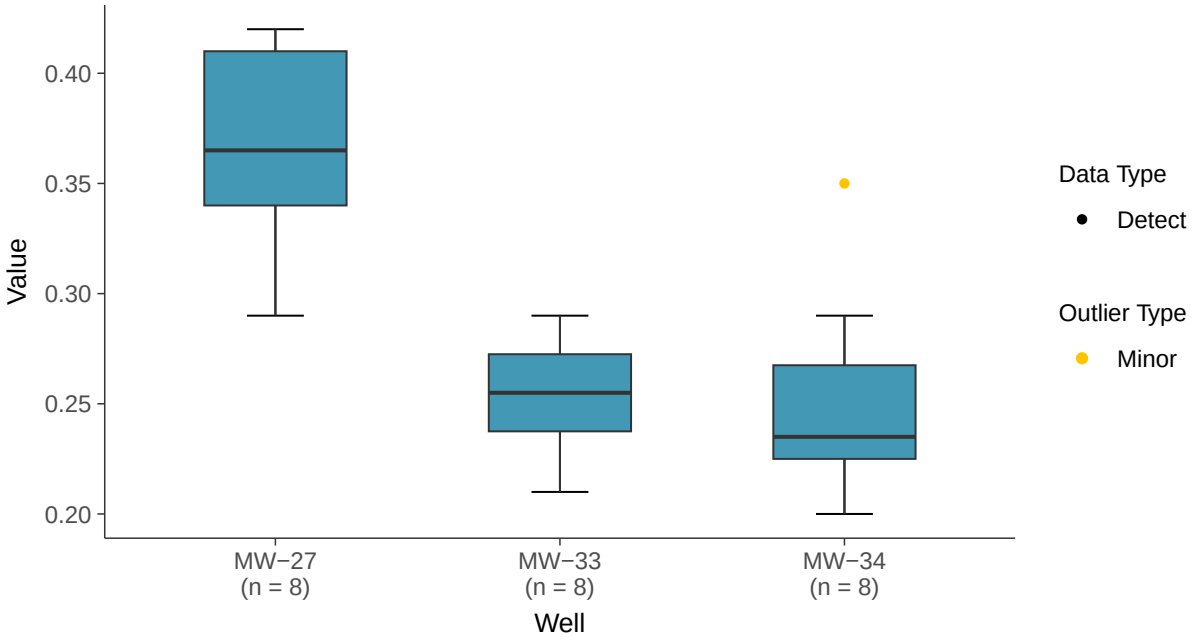
Boxplot by Season

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



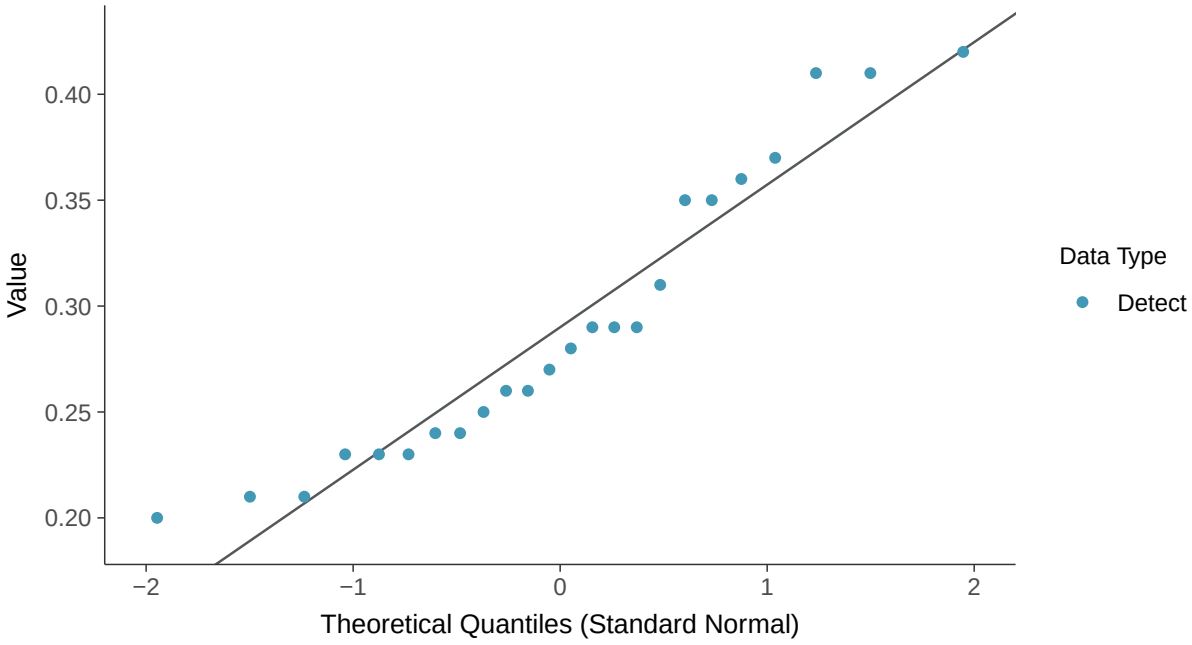
Boxplot by Well

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



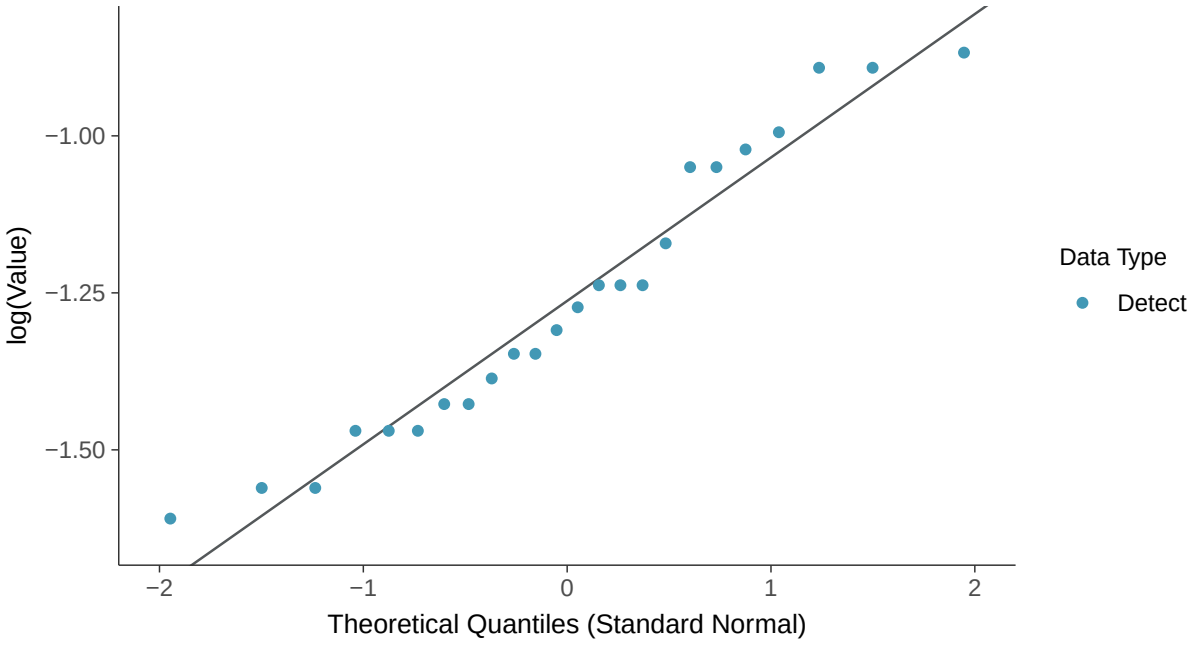
Normal Q-Q plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



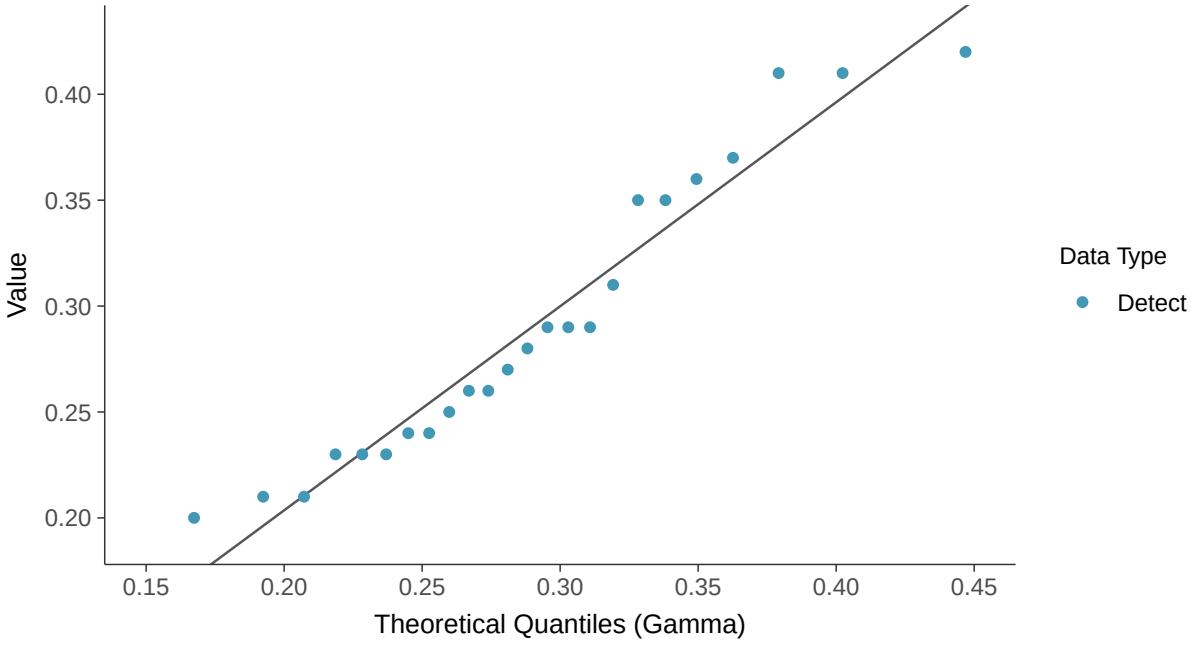
Lognormal Q-Q plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



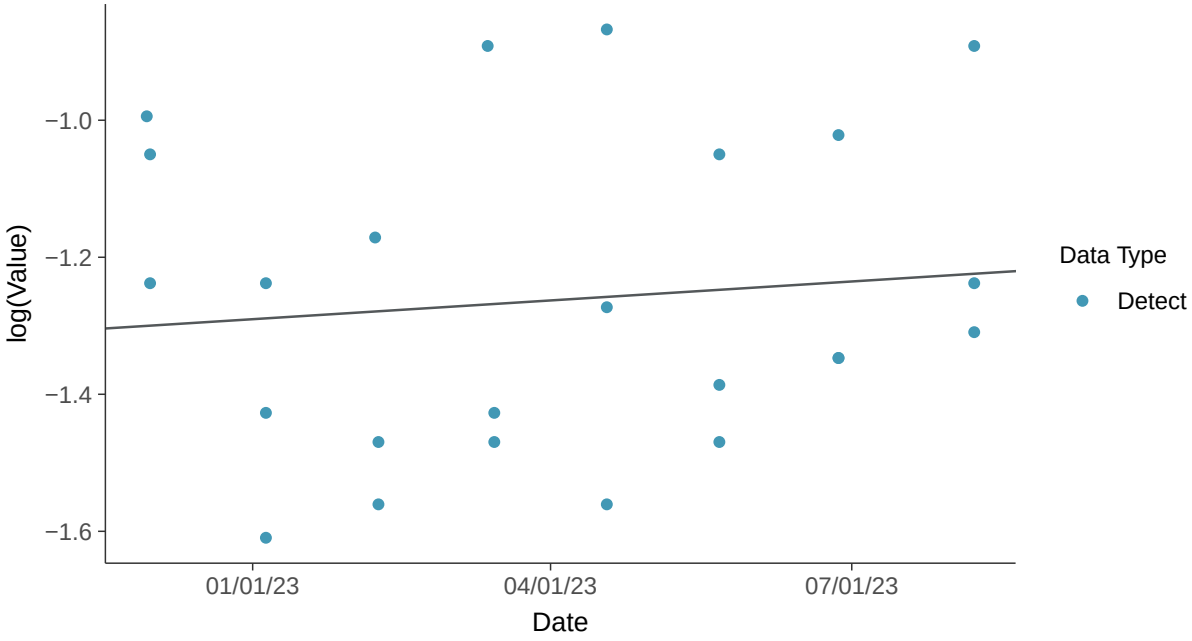
Gamma Q-Q plot

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



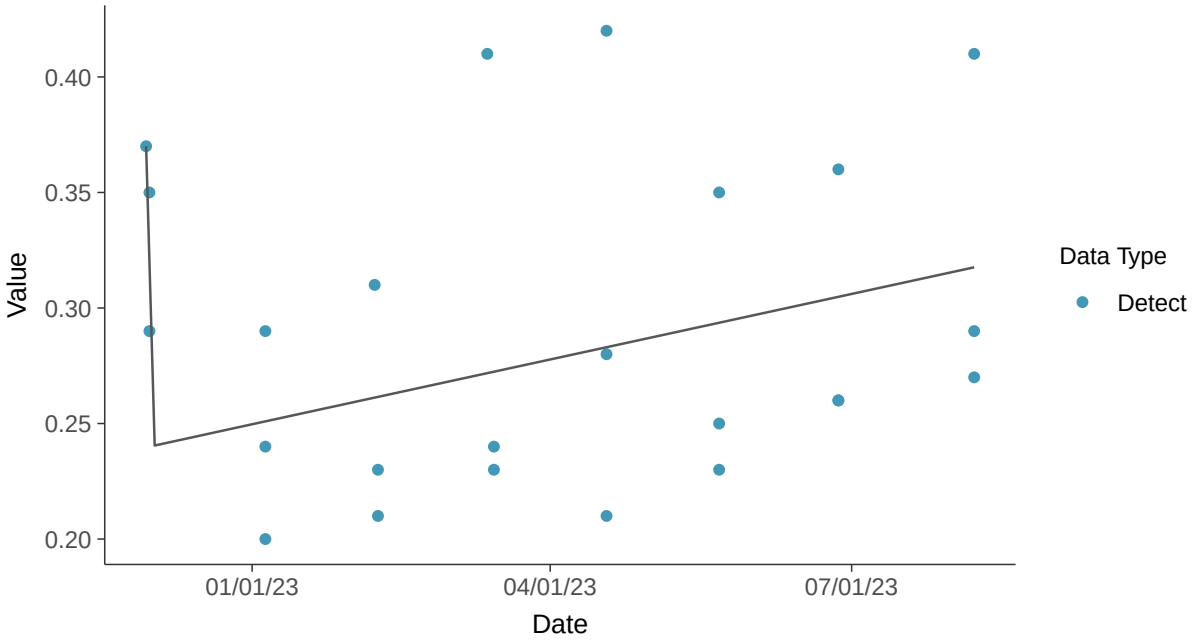
Trend Regression: Lognormal MLE

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Fluoride (App IV), MW-27, MW-33, MW-34 (mg/L)

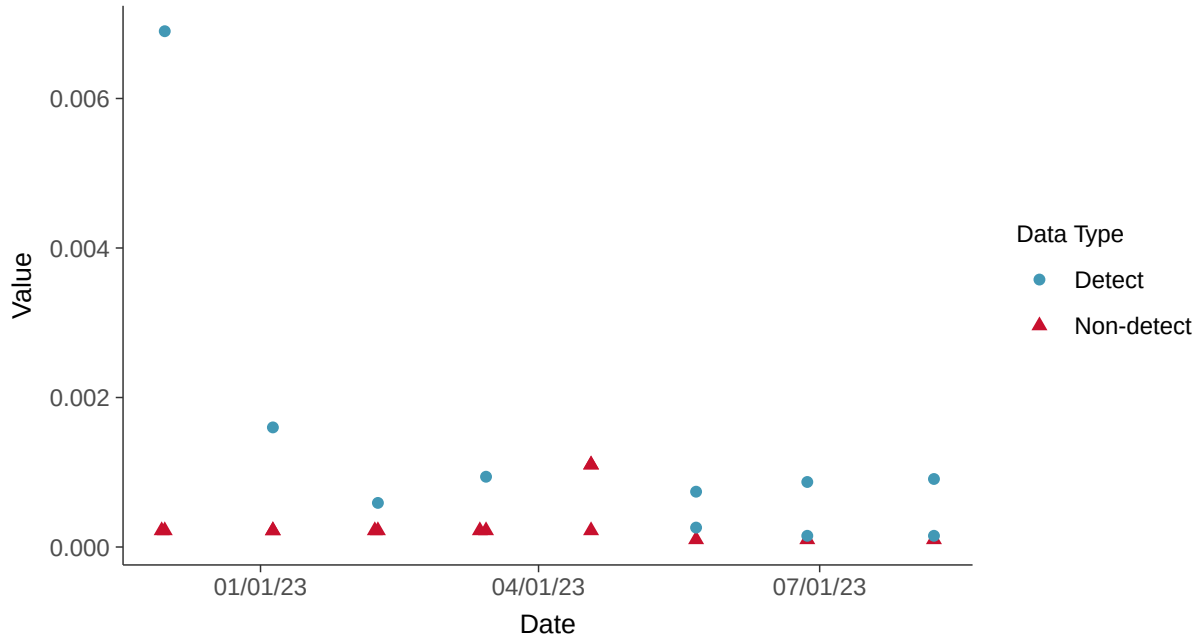


Appendix IV: Lead, MW-27, MW-33, MW-34

ID: 5_115

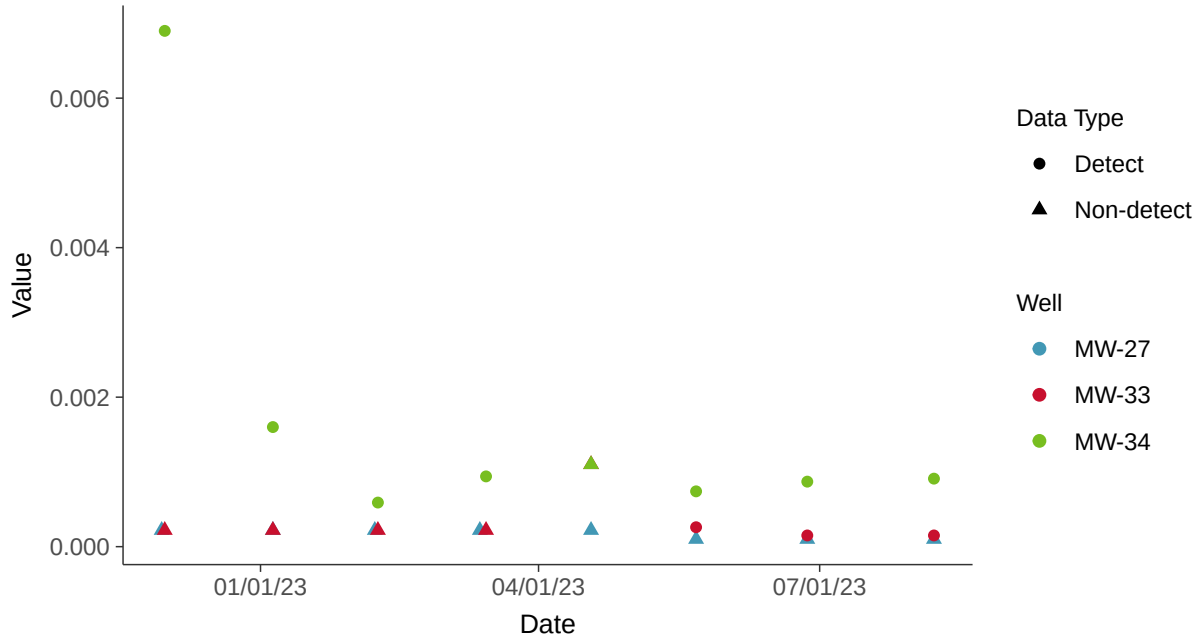
Scatter Plot

Lead, MW-27, MW-33, MW-34 (mg/L)



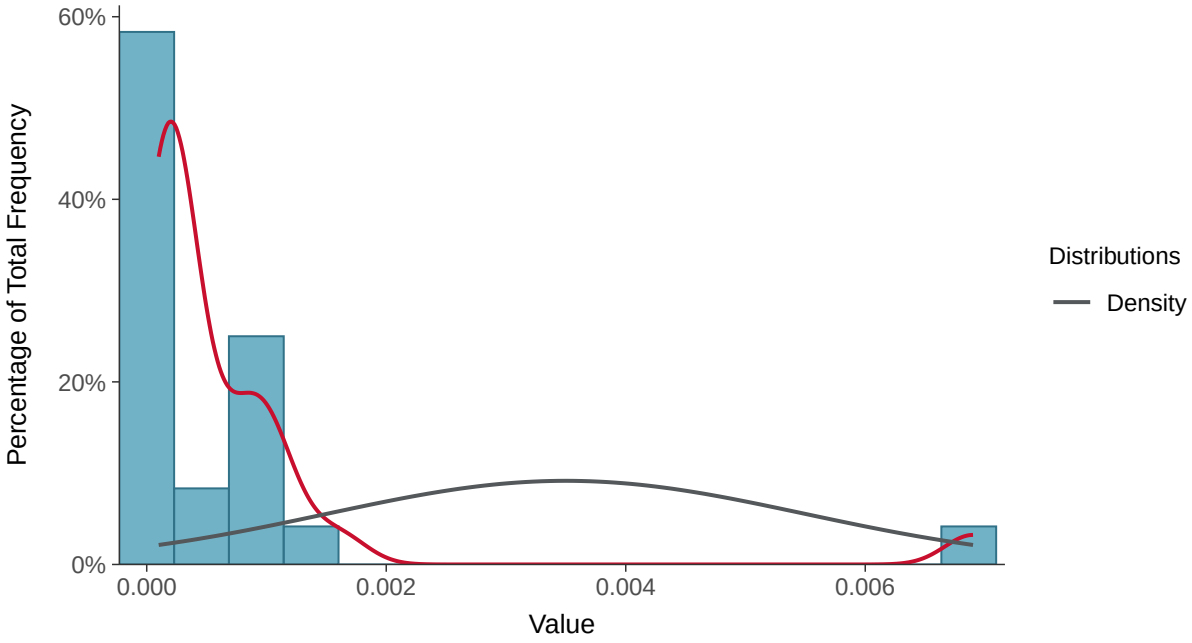
Scatter Plot by Well

Lead, MW-27, MW-33, MW-34 (mg/L)



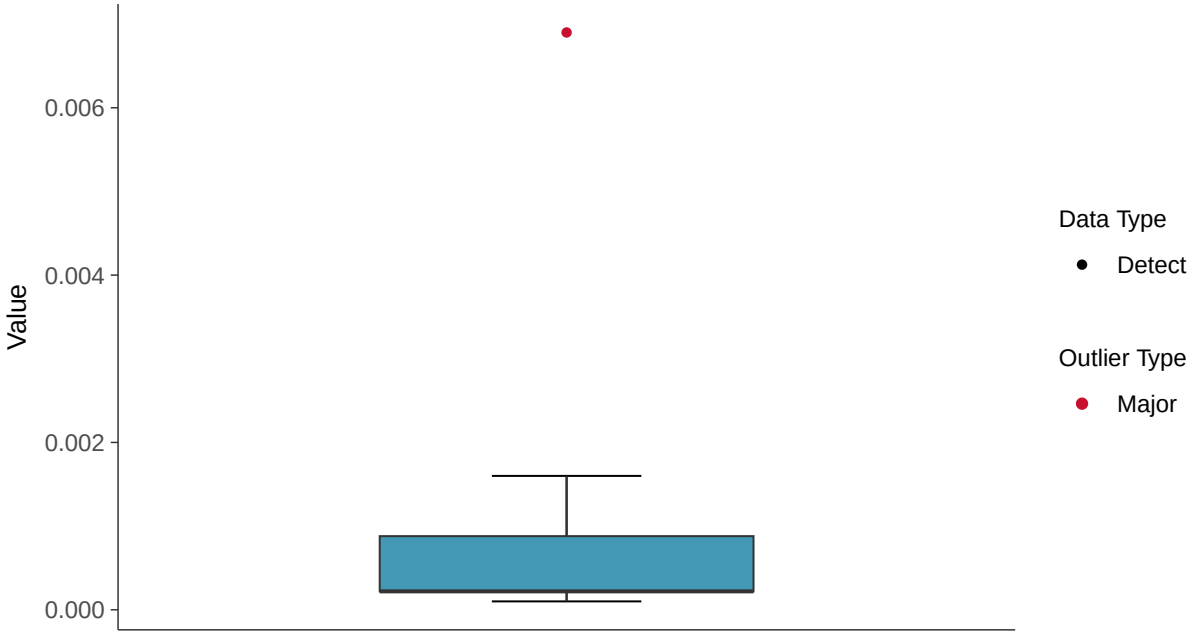
Histogram

Lead, MW-27, MW-33, MW-34 (mg/L)



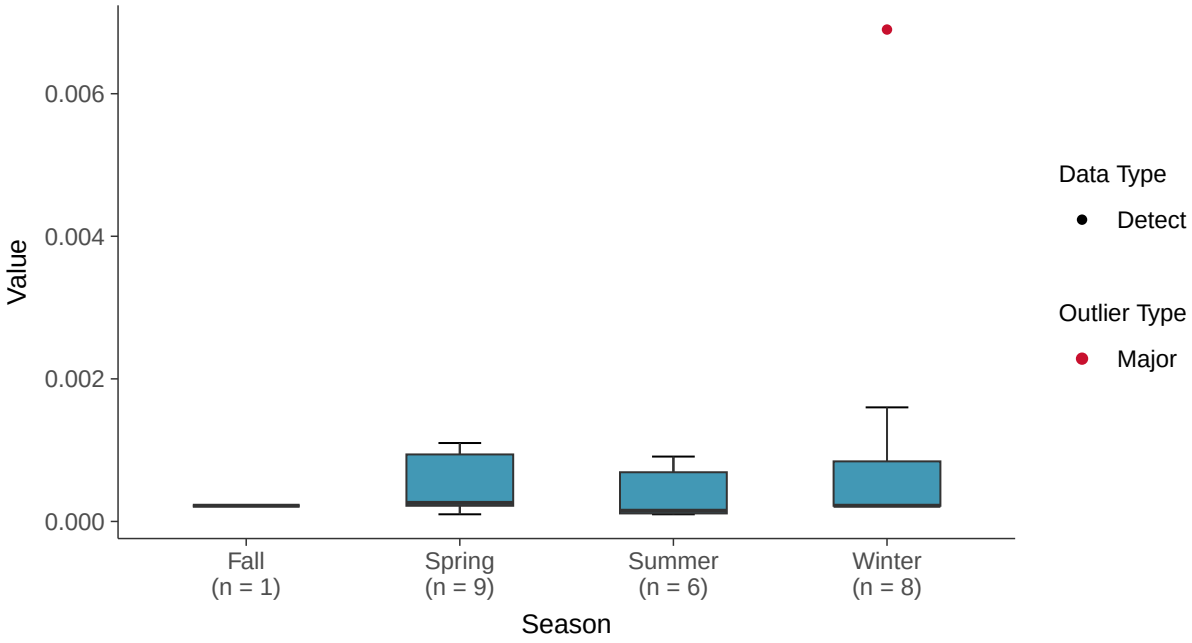
Boxplot

Lead, MW-27, MW-33, MW-34 (mg/L)



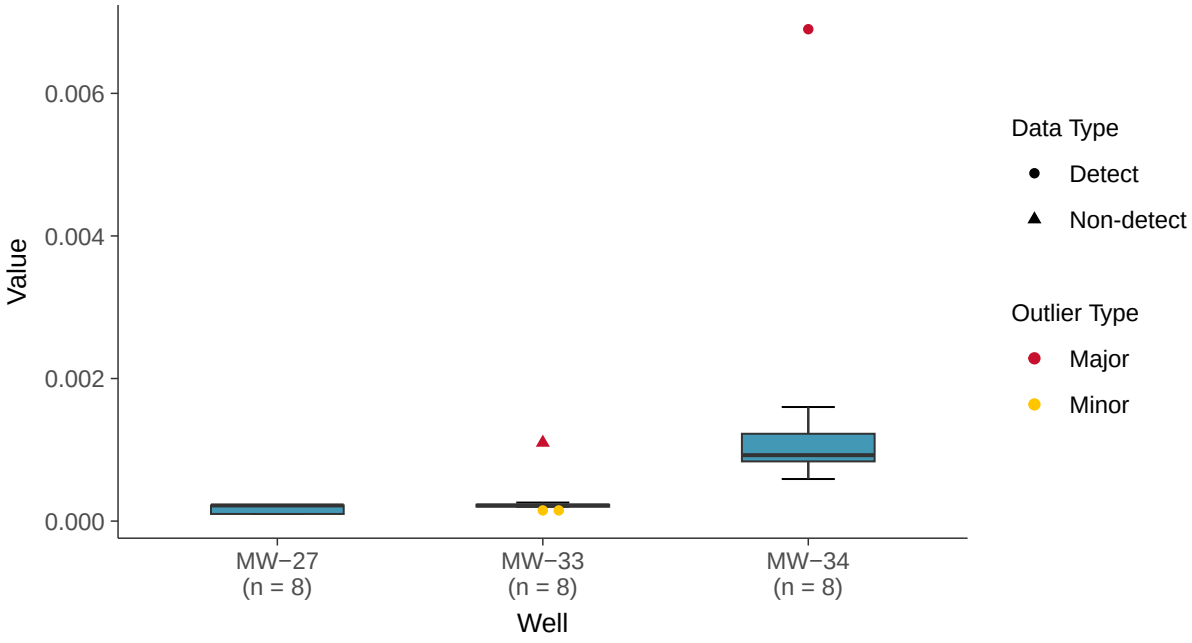
Boxplot by Season

Lead, MW-27, MW-33, MW-34 (mg/L)



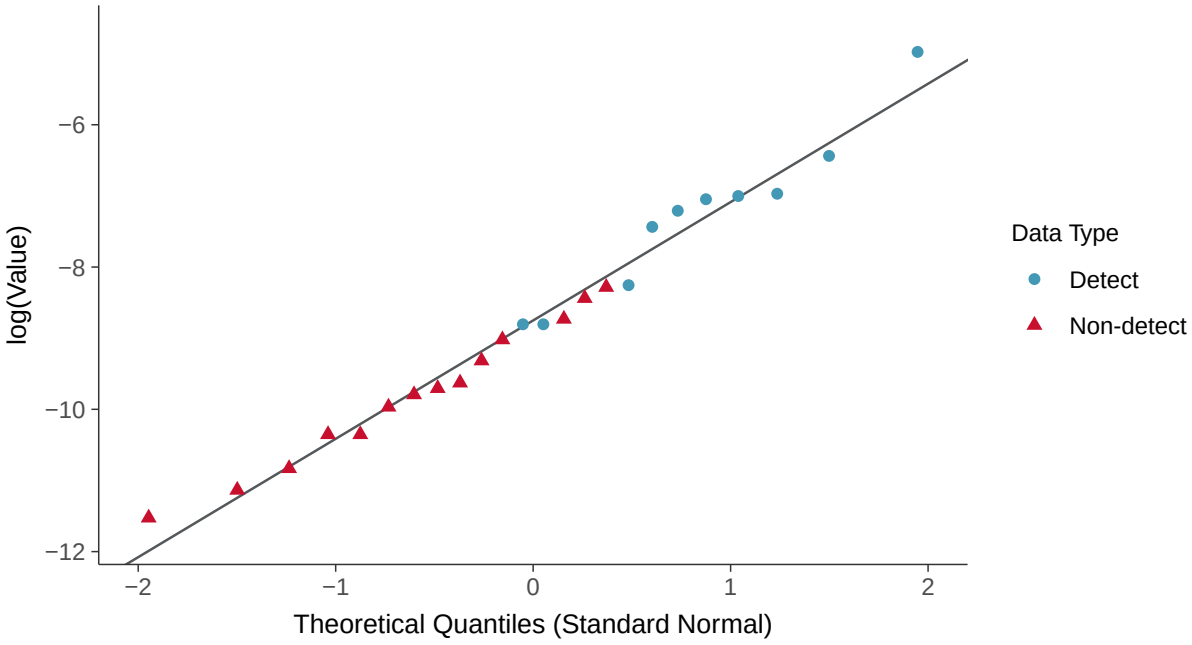
Boxplot by Well

Lead, MW-27, MW-33, MW-34 (mg/L)



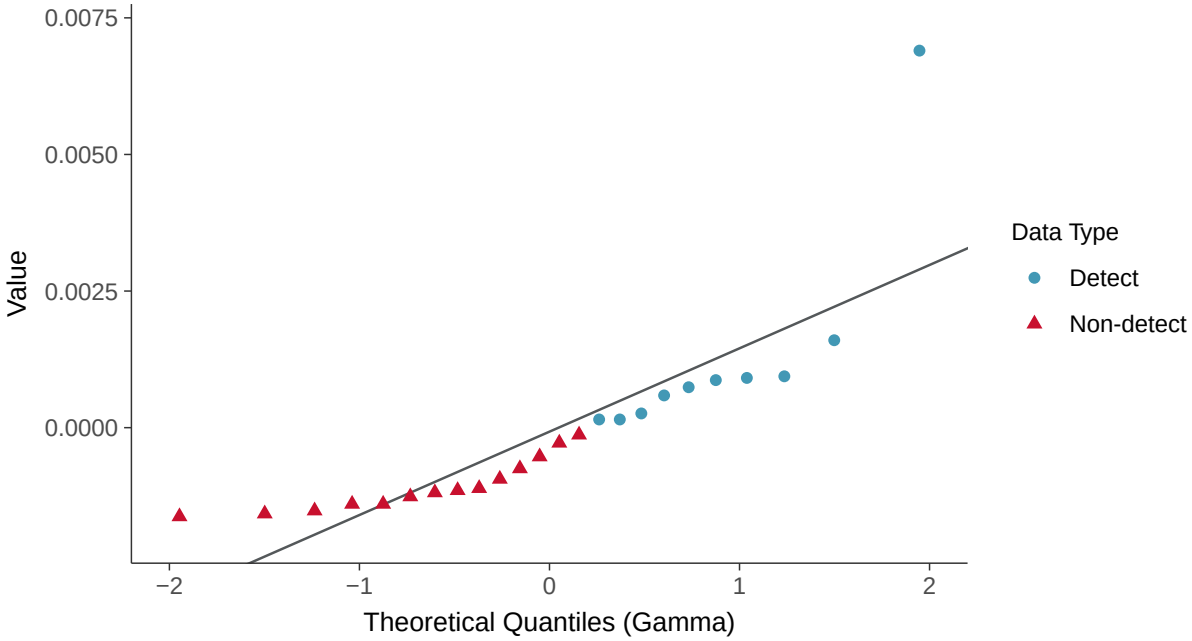
Lognormal Q-Q plot using ROS Imputed Estimates

Lead, MW-27, MW-33, MW-34 (mg/L)



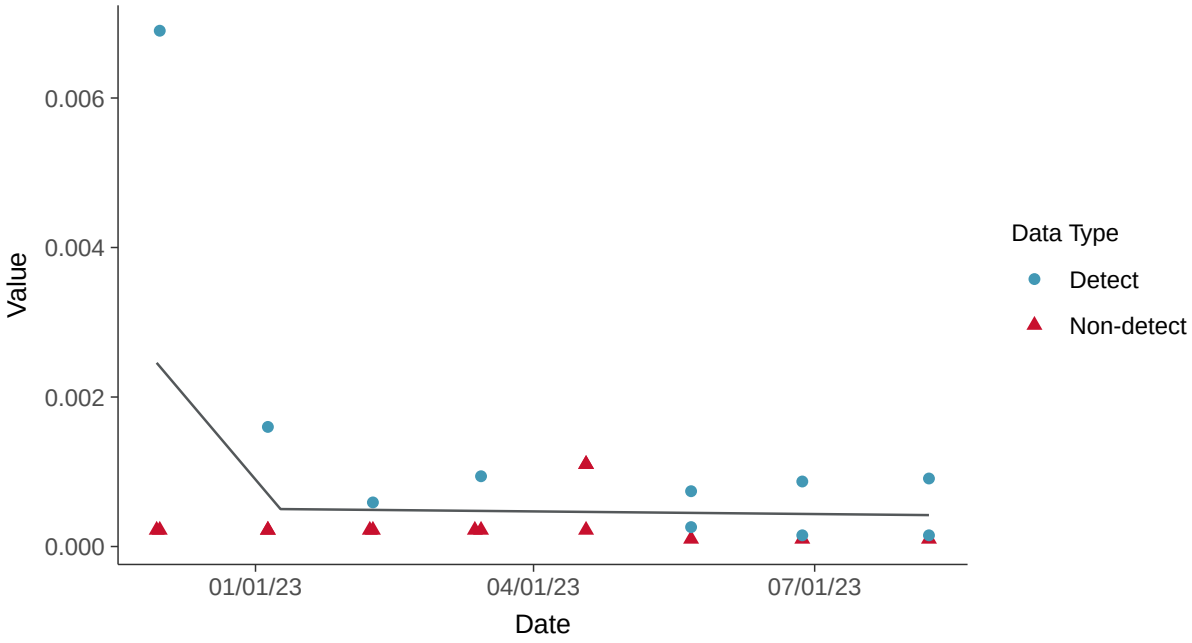
Gamma Q-Q plot using ROS Imputed Estimates

Lead, MW-27, MW-33, MW-34 (mg/L)



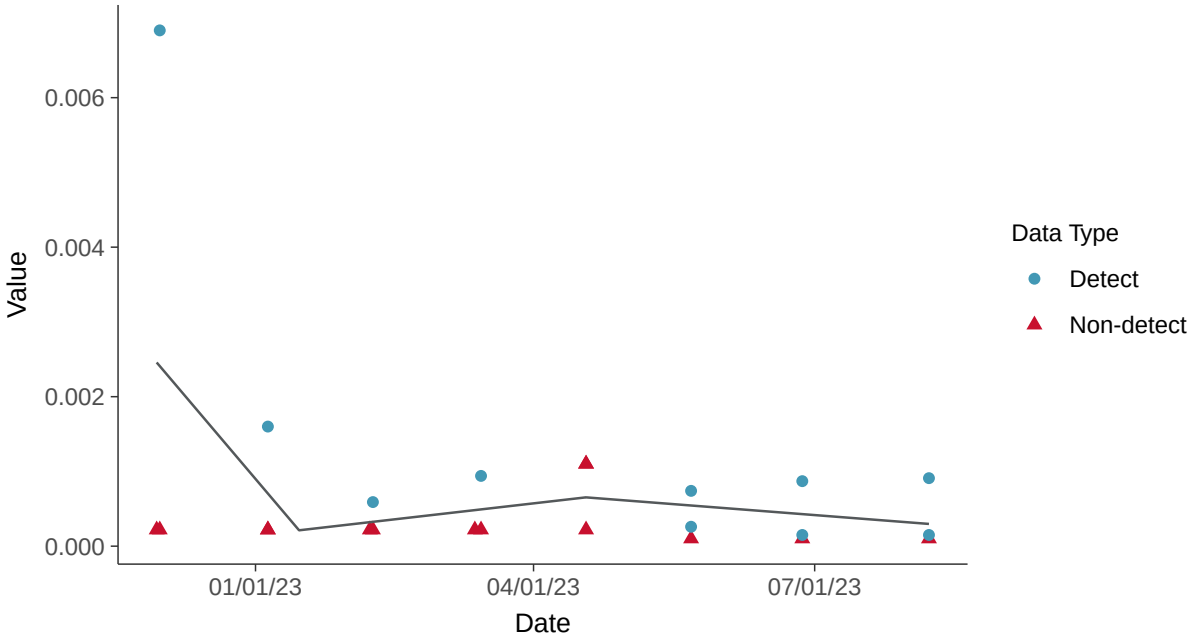
Trend Regression: Piecewise Linear-Linear

Lead, MW-27, MW-33, MW-34 (mg/L)



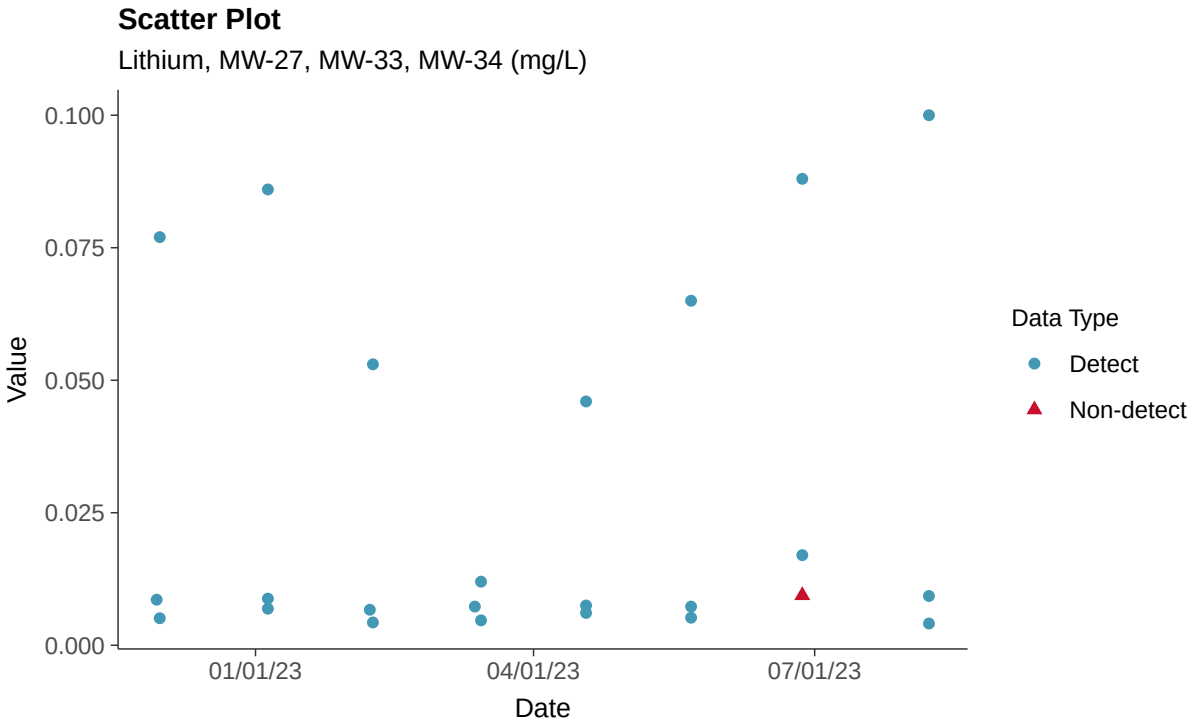
Trend Regression: Piecewise Linear-Linear-Linear

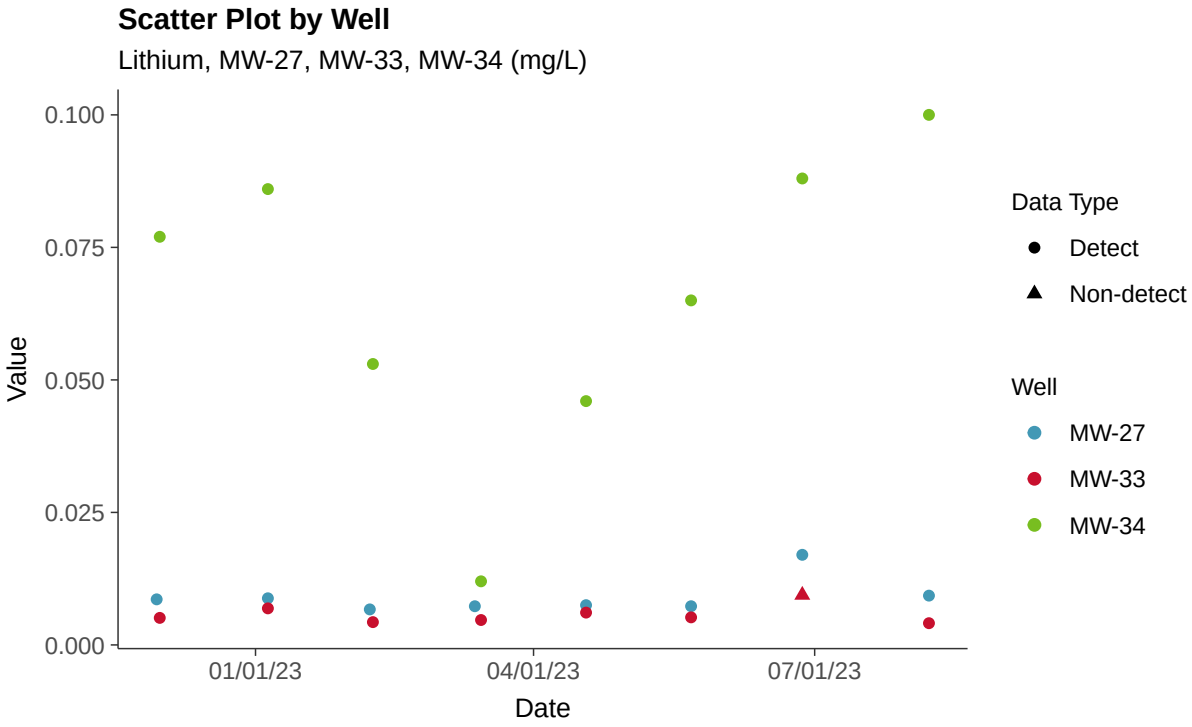
Lead, MW-27, MW-33, MW-34 (mg/L)



Appendix IV: Lithium, MW-27, MW-33, MW-34

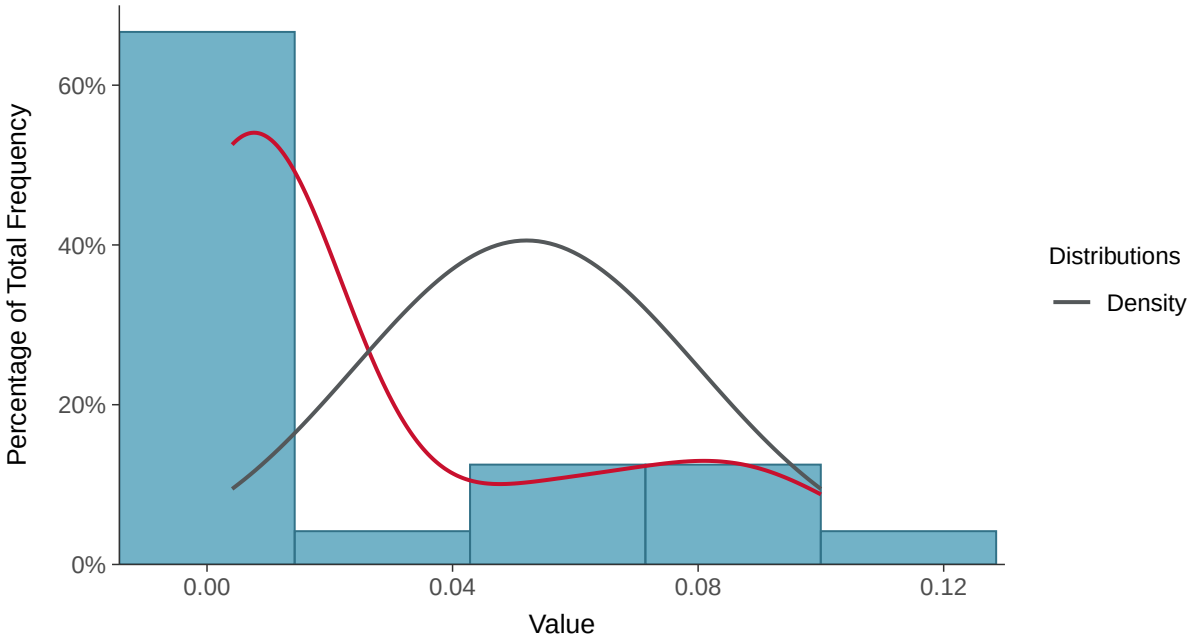
ID: 5_116





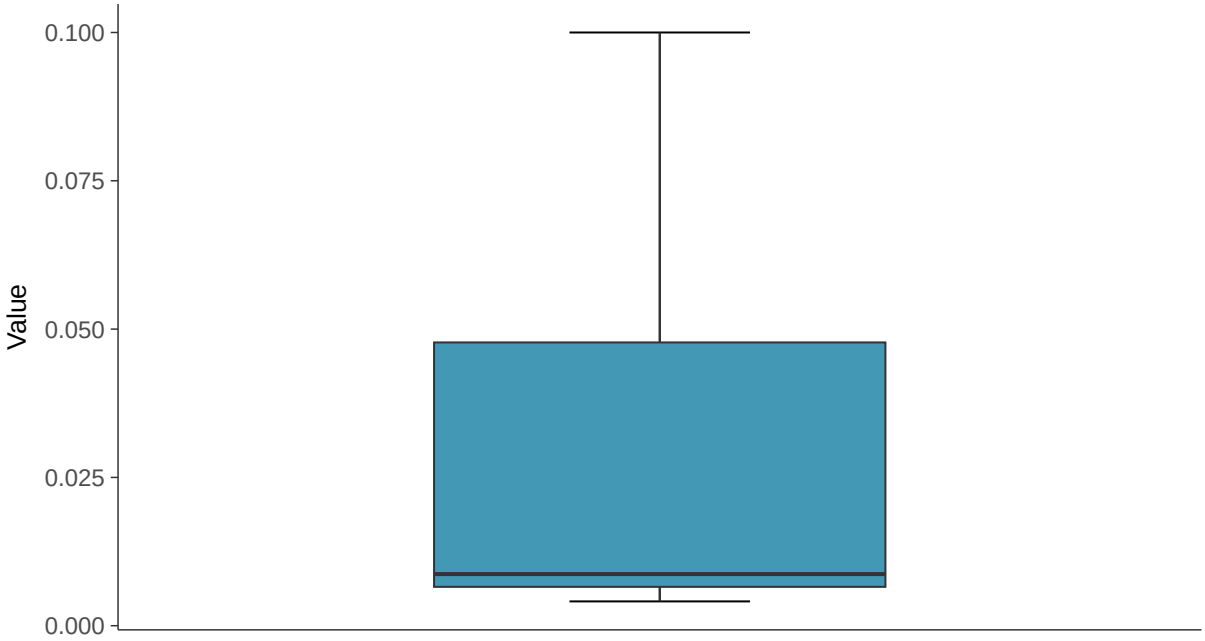
Histogram

Lithium, MW-27, MW-33, MW-34 (mg/L)



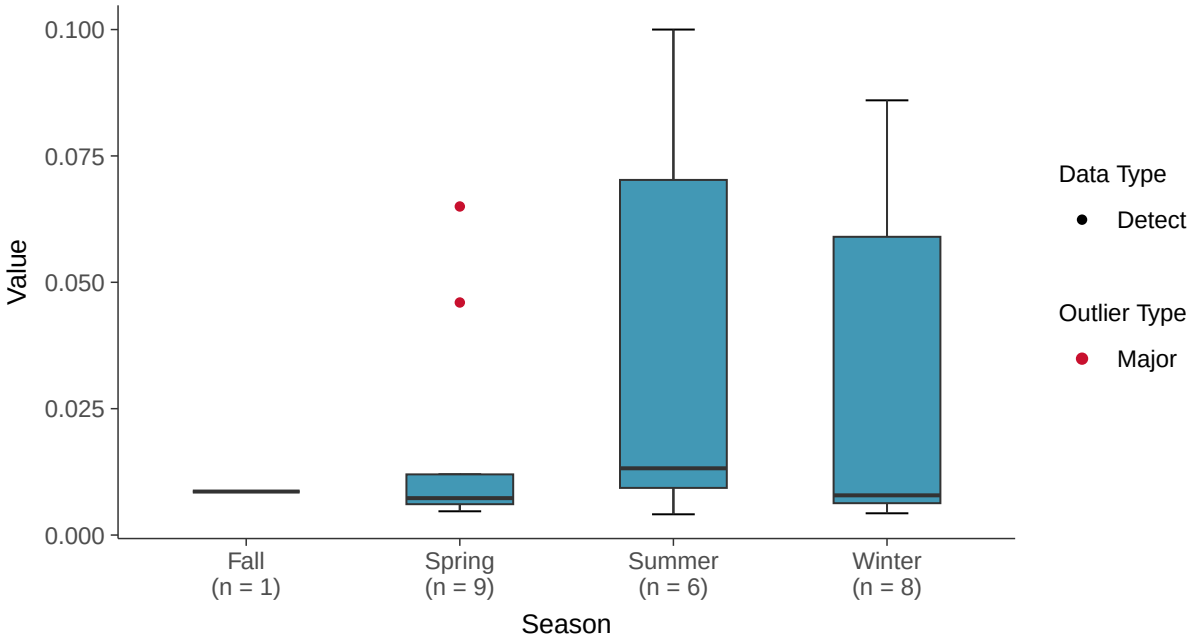
Boxplot

Lithium, MW-27, MW-33, MW-34 (mg/L)



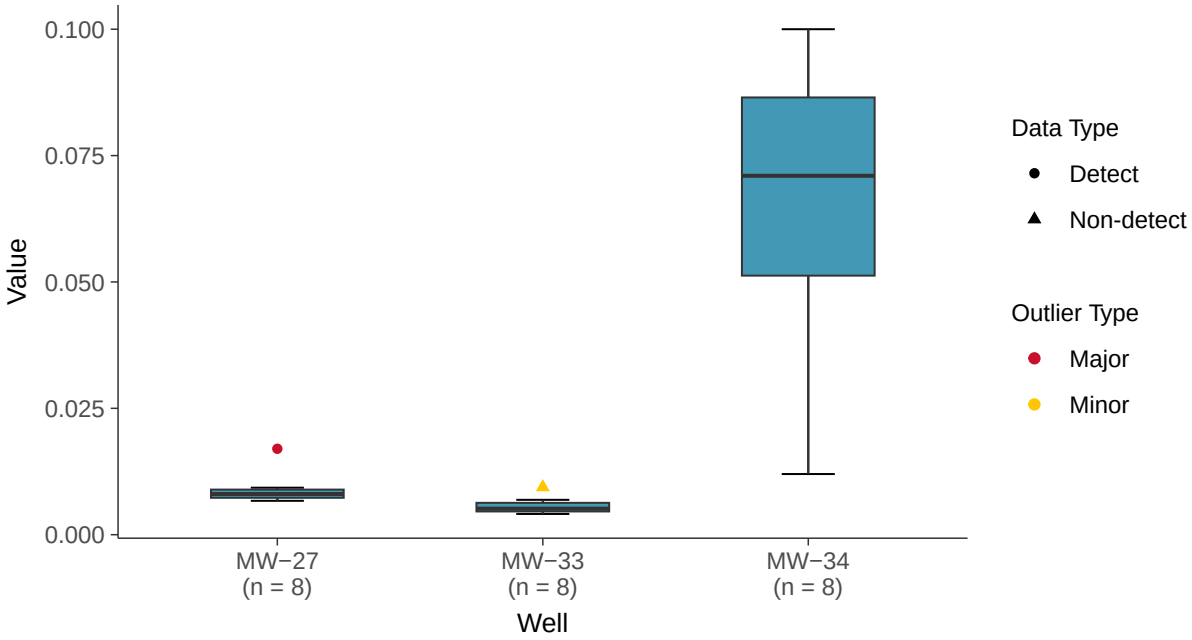
Boxplot by Season

Lithium, MW-27, MW-33, MW-34 (mg/L)



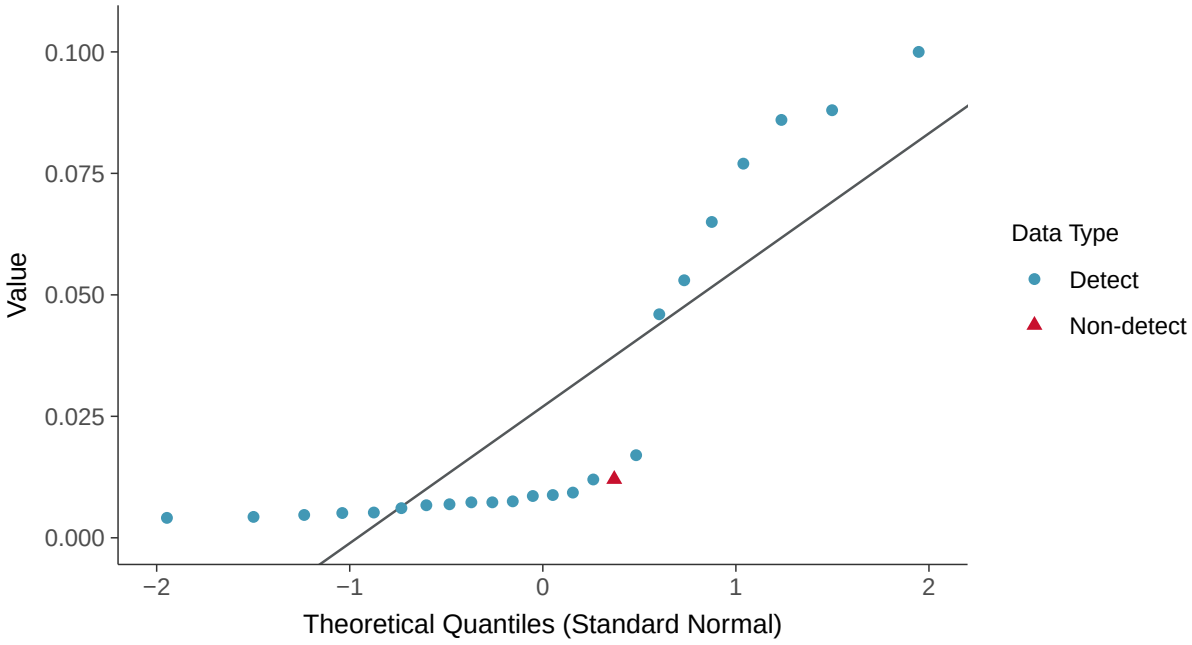
Boxplot by Well

Lithium, MW-27, MW-33, MW-34 (mg/L)



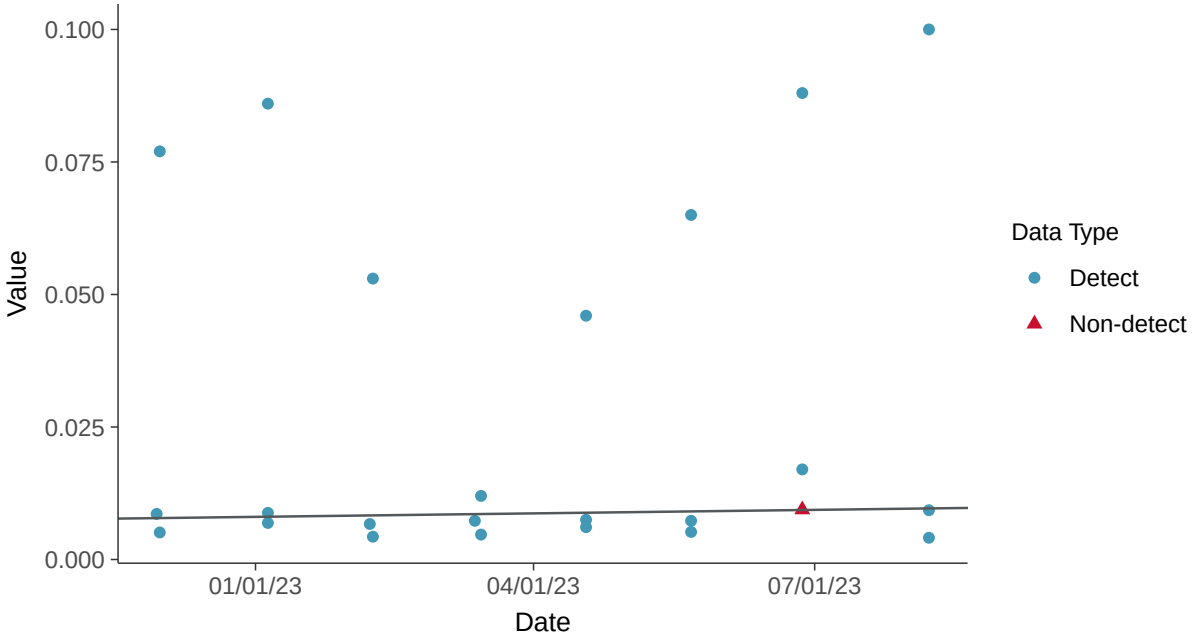
Normal Q-Q plot using ROS Imputed Estimates

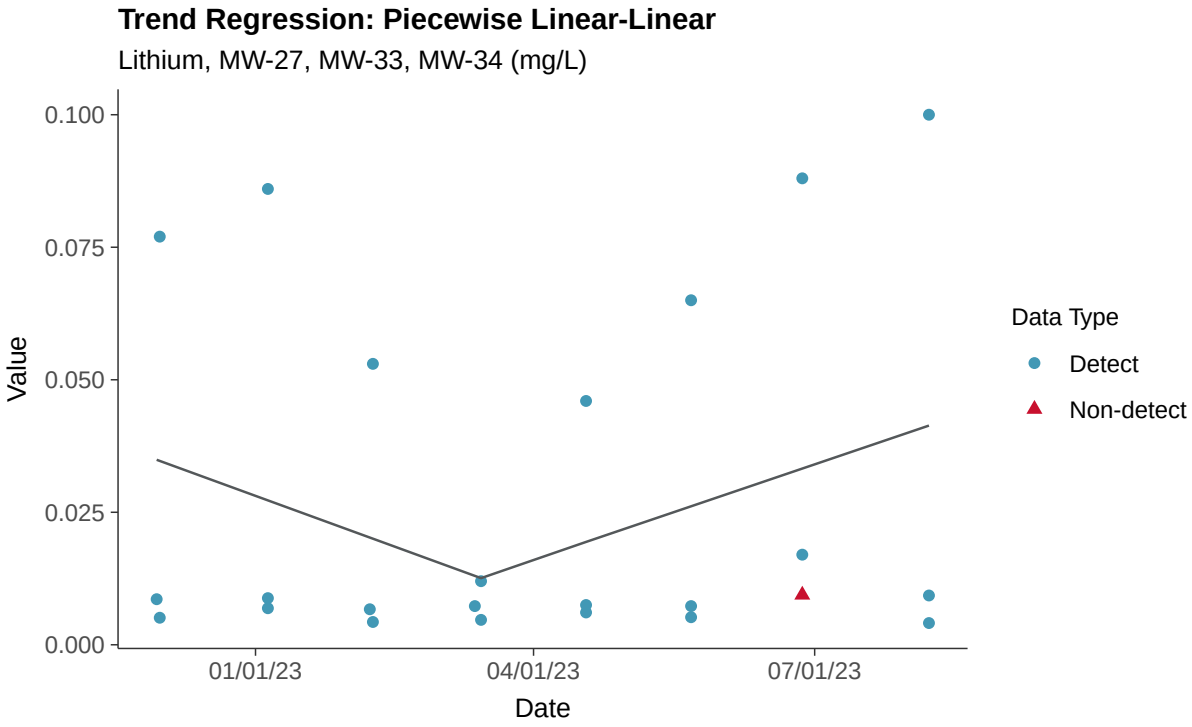
Lithium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Mann-Kendall/Theil-Sen Estimate

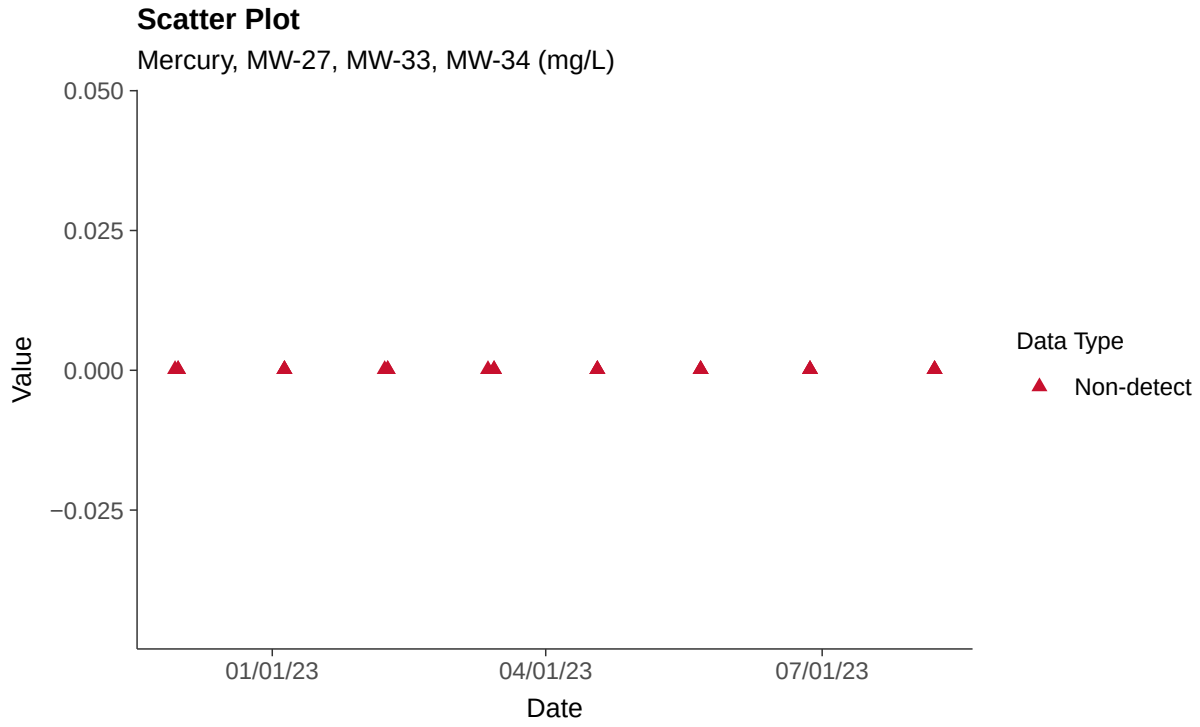
Lithium, MW-27, MW-33, MW-34 (mg/L)

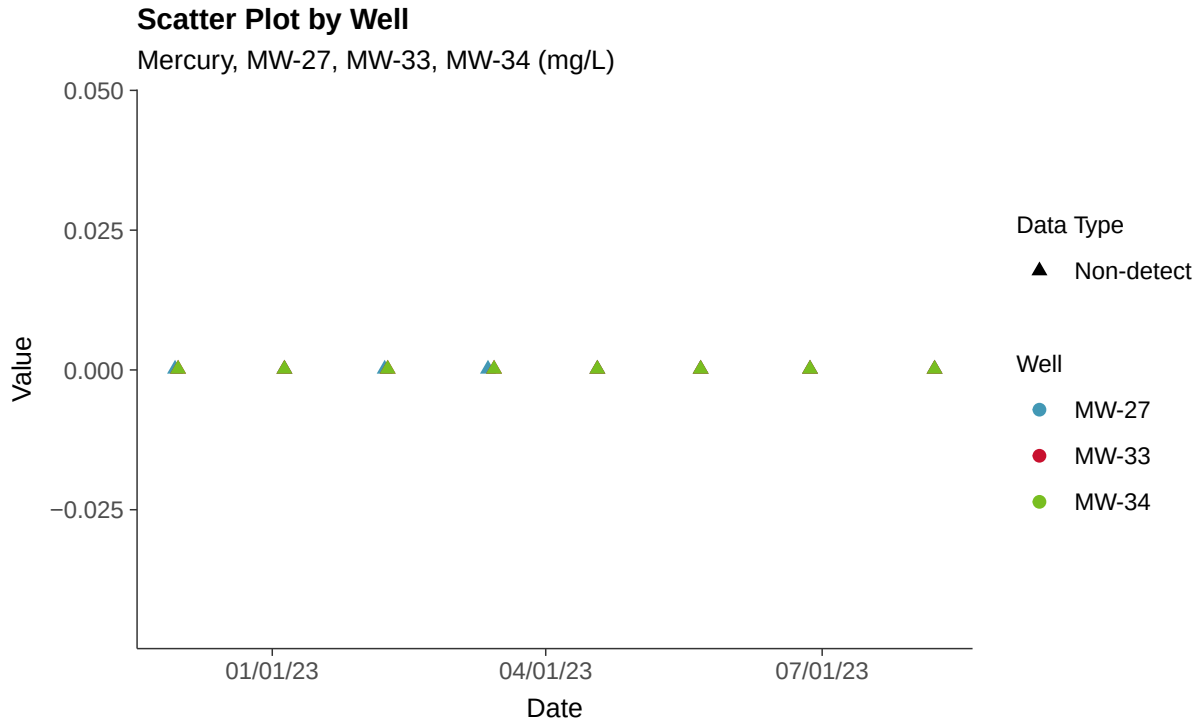



Trend Regression: Piecewise Linear-Linear
Lithium, MW-27, MW-33, MW-34 (mg/L)
Value
0.100
0.075
0.050
0.025
0.000
01/01/23
04/01/23
07/01/23
Date
Data Type
Detect
Non-detect

Appendix IV: Mercury, MW-27, MW-33, MW-34

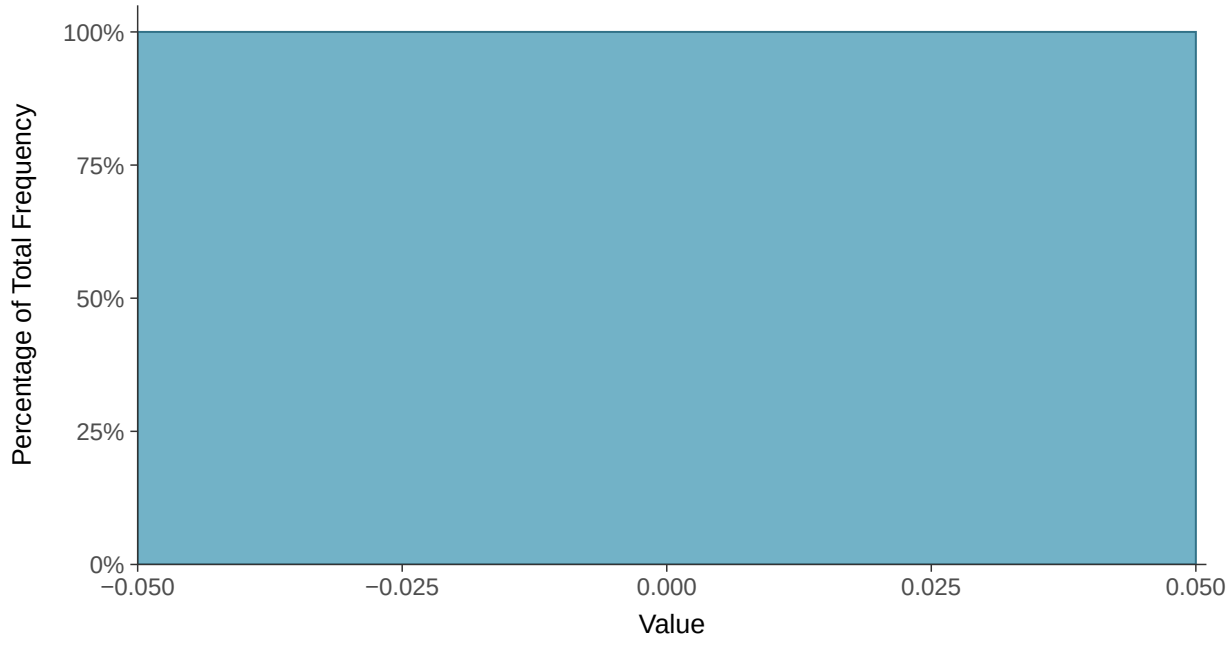
ID: 5_117





Histogram

Mercury, MW-27, MW-33, MW-34 (mg/L)

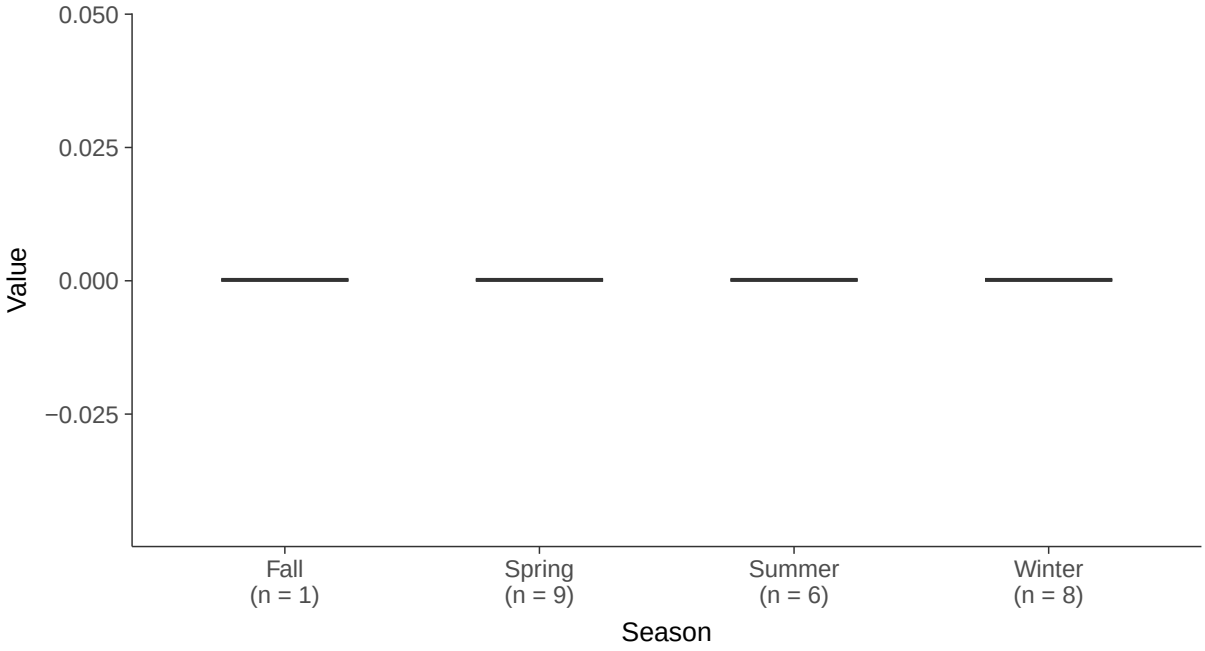


Boxplot

Mercury, MW-27, MW-33, MW-34 (mg/L)

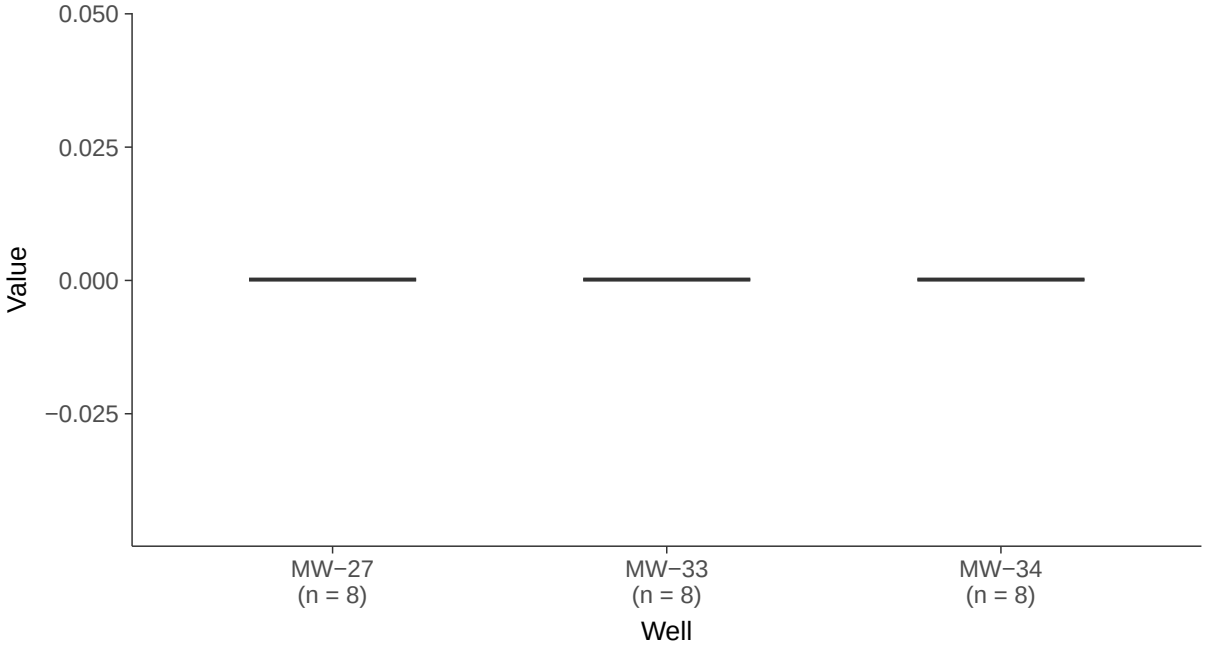
Boxplot by Season

Mercury, MW-27, MW-33, MW-34 (mg/L)



Boxplot by Well

Mercury, MW-27, MW-33, MW-34 (mg/L)

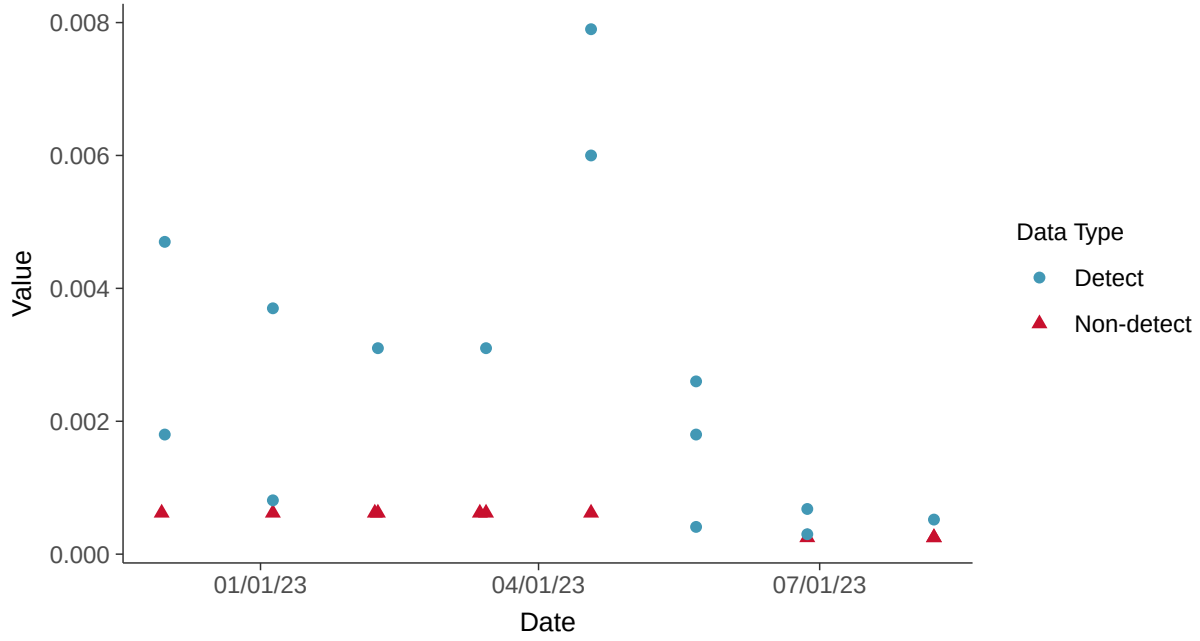


Appendix IV: Molybdenum, MW-27, MW-33, MW-34

ID: 5_118

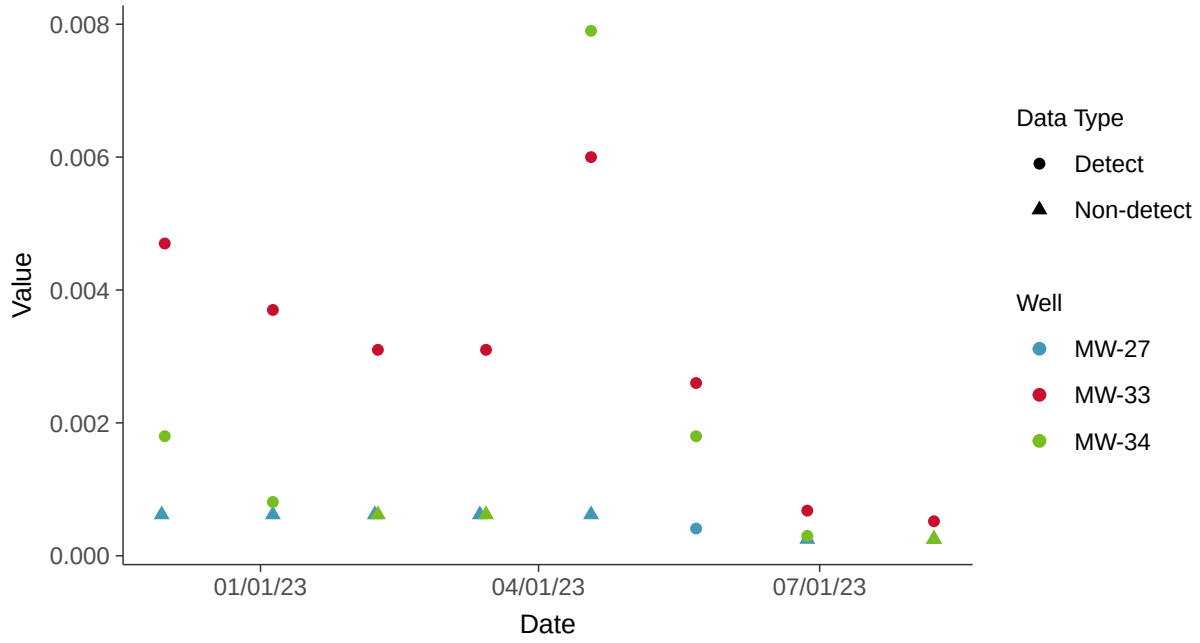
Scatter Plot

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



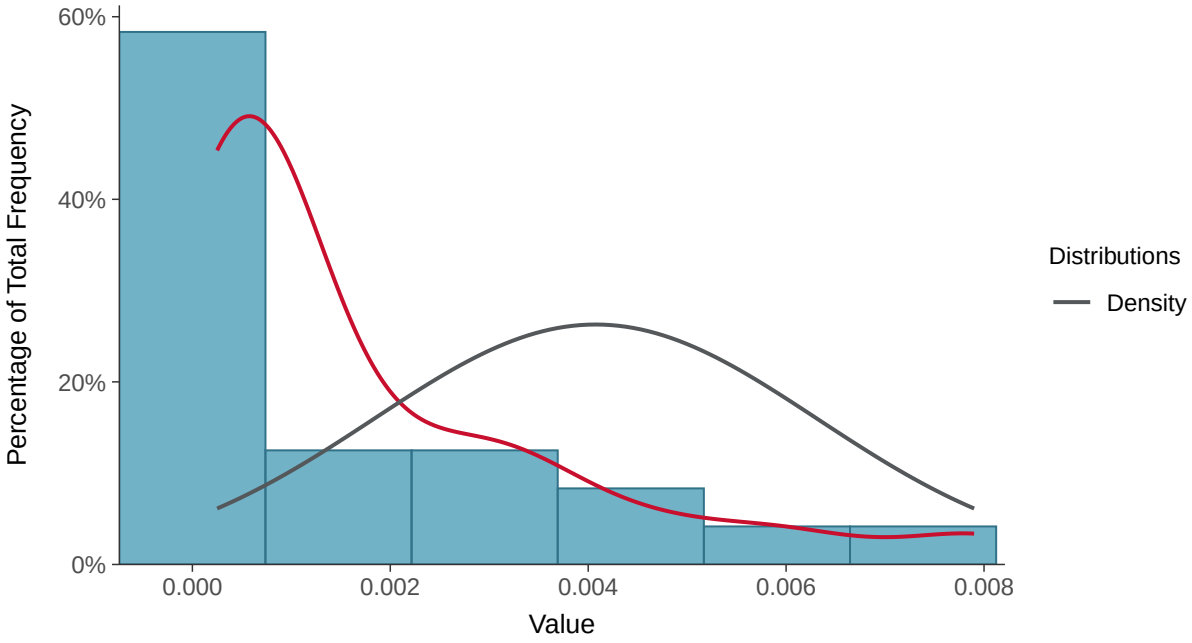
Scatter Plot by Well

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



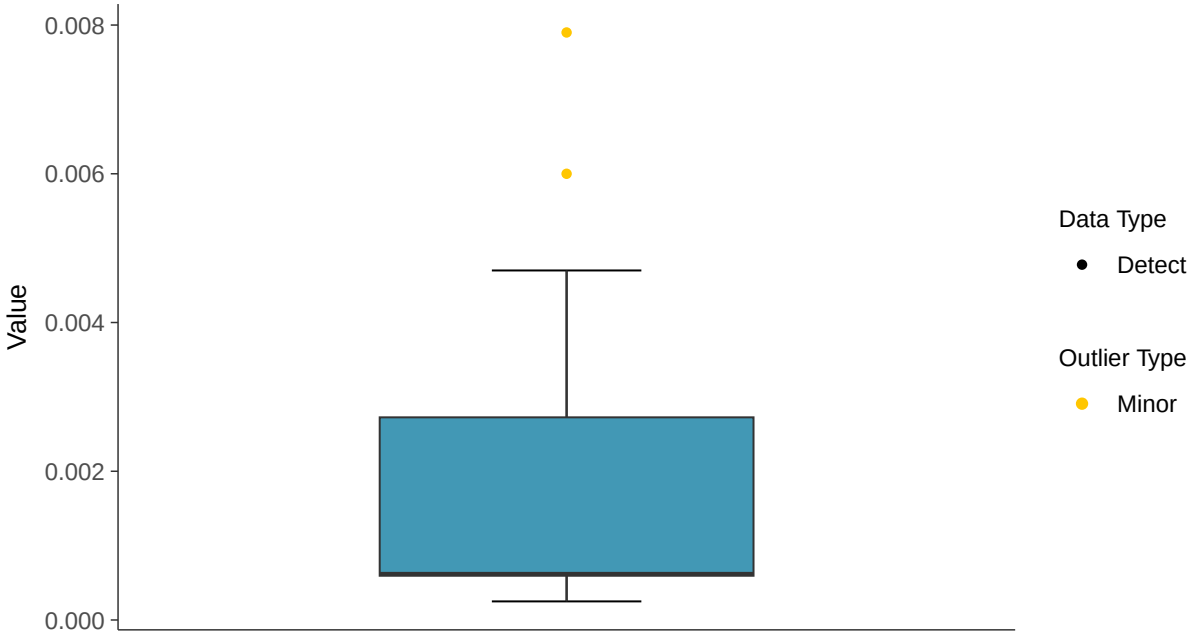
Histogram

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



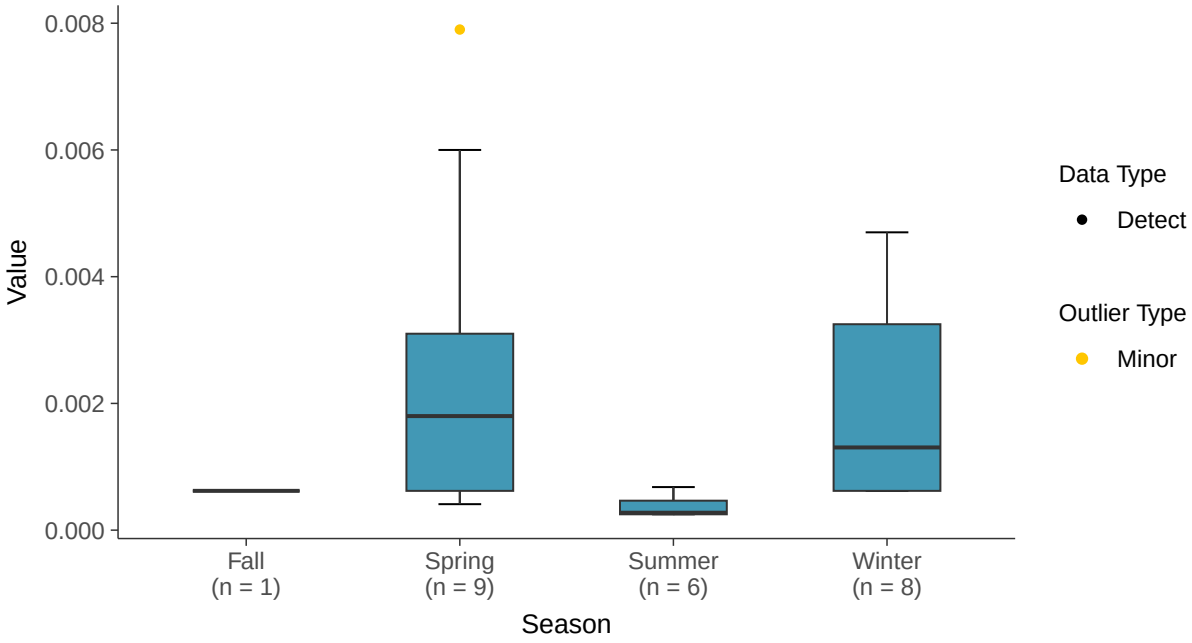
Boxplot

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



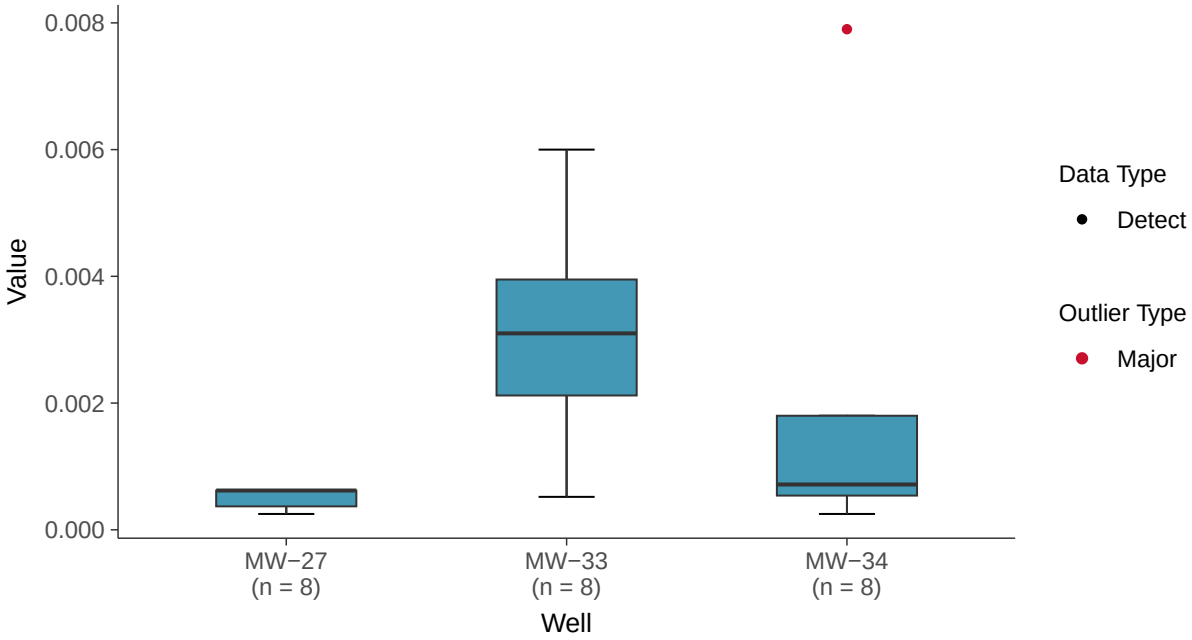
Boxplot by Season

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



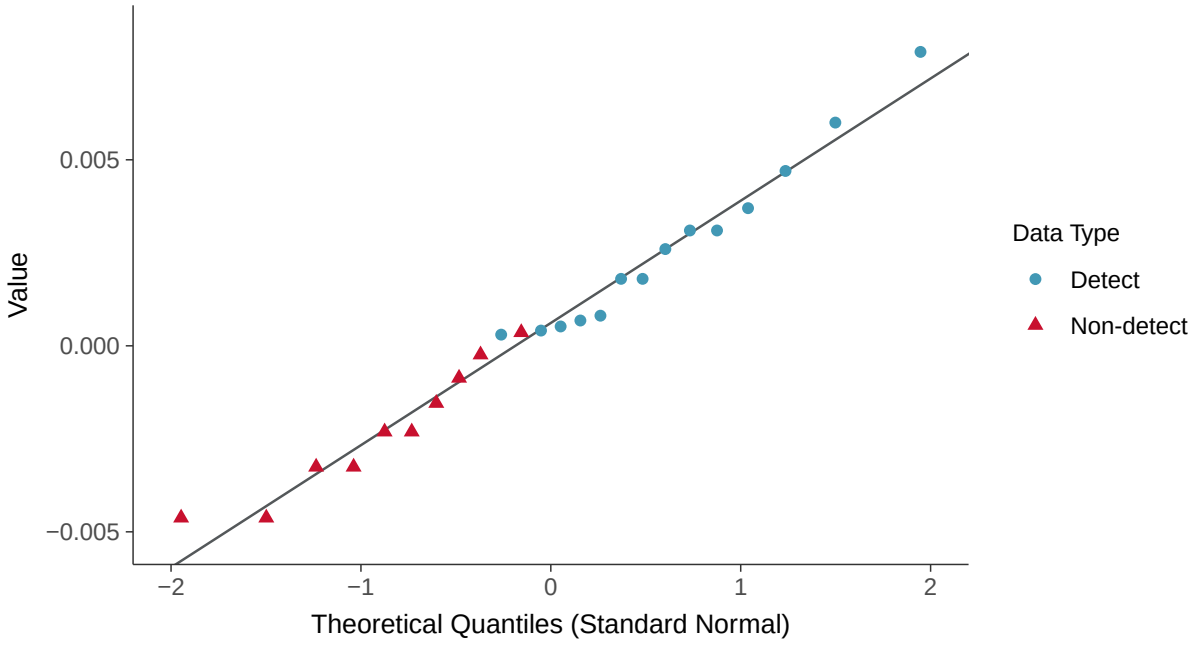
Boxplot by Well

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



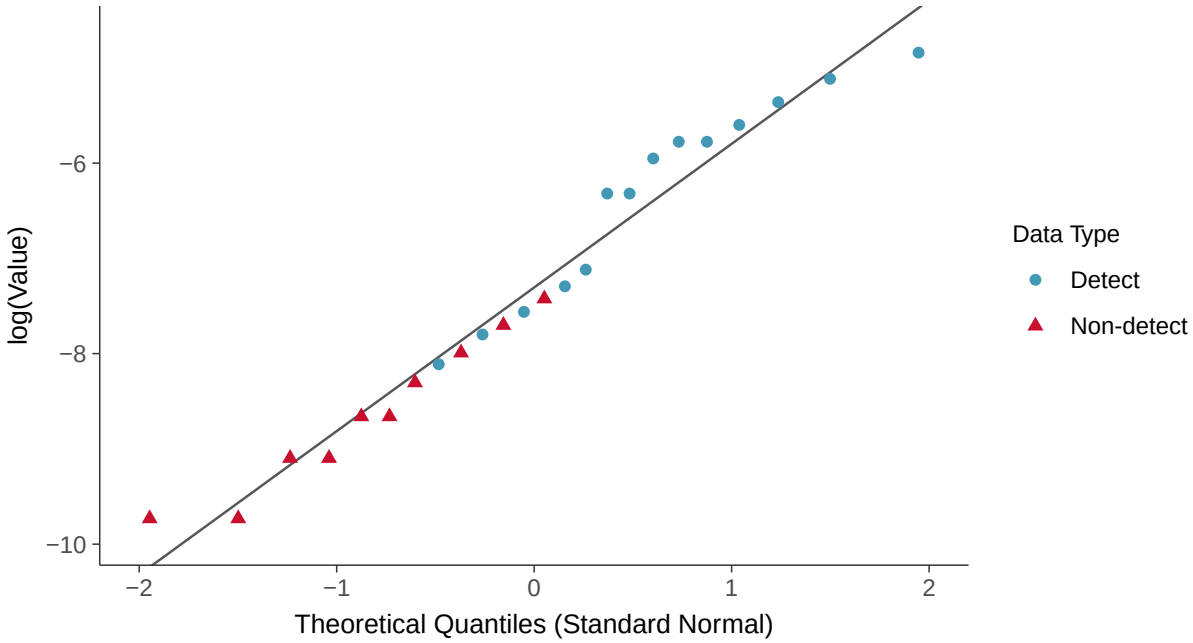
Normal Q-Q plot using ROS Imputed Estimates

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



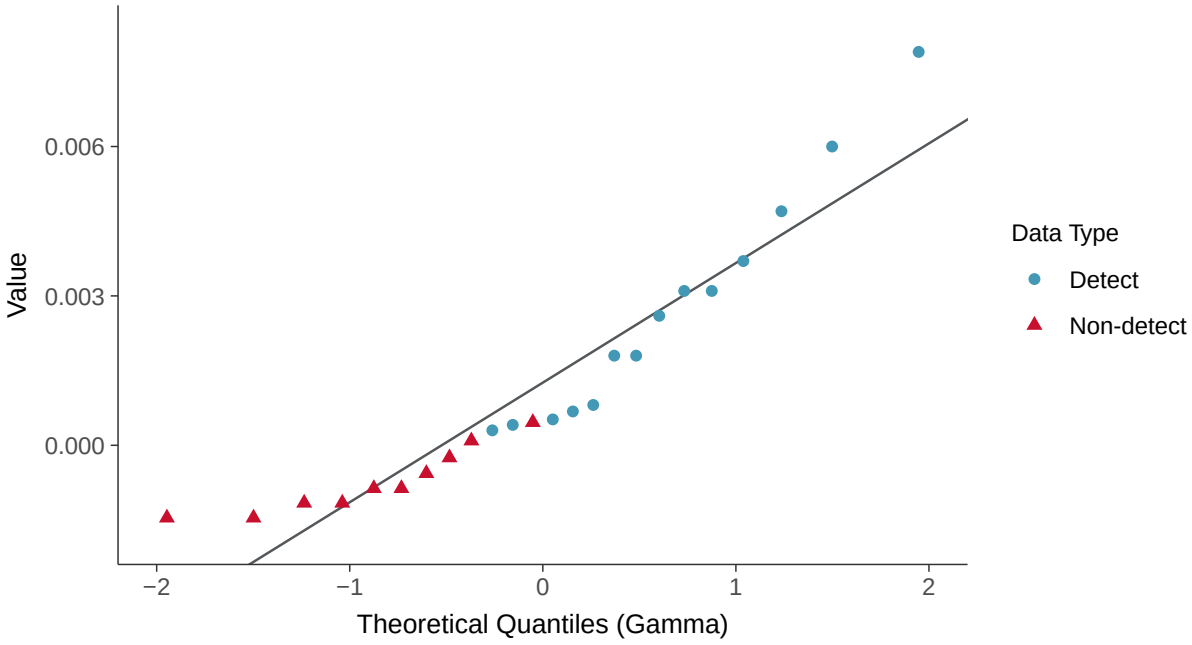
Lognormal Q-Q plot using ROS Imputed Estimates

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



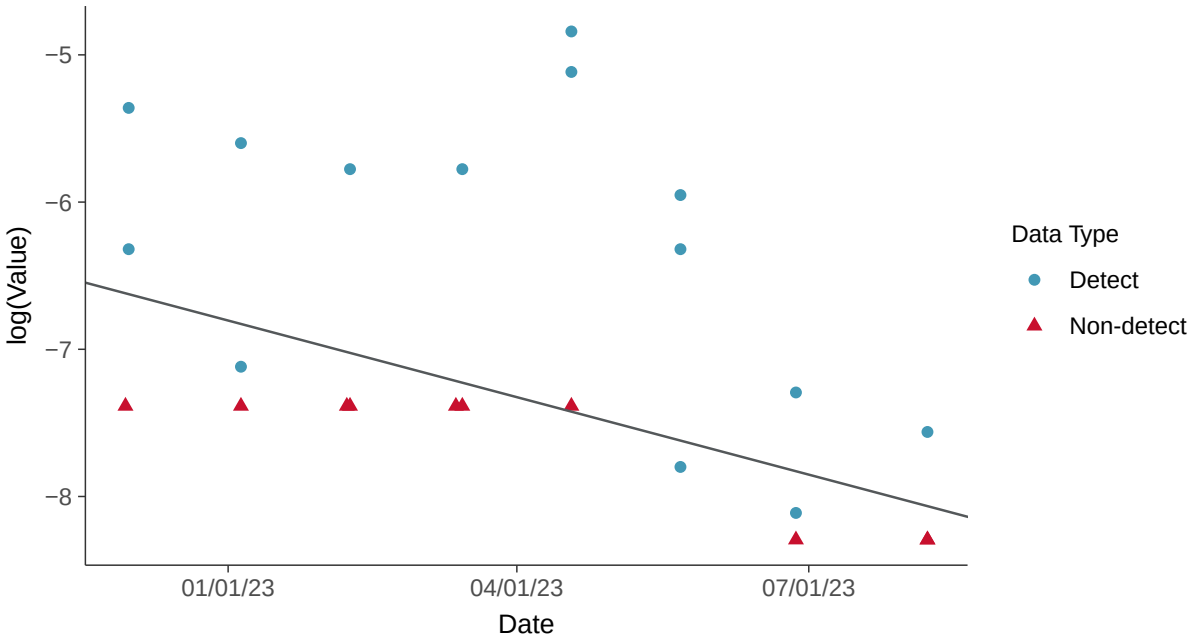
Gamma Q-Q plot using ROS Imputed Estimates

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



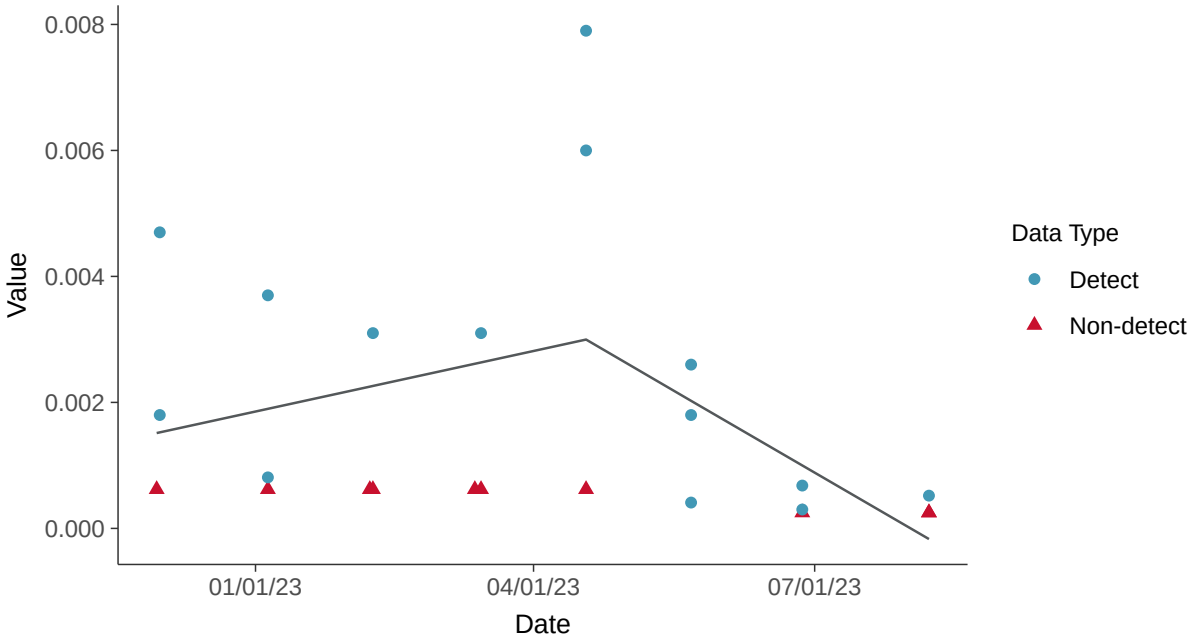
Trend Regression: Lognormal MLE

Molybdenum, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Molybdenum, MW-27, MW-33, MW-34 (mg/L)

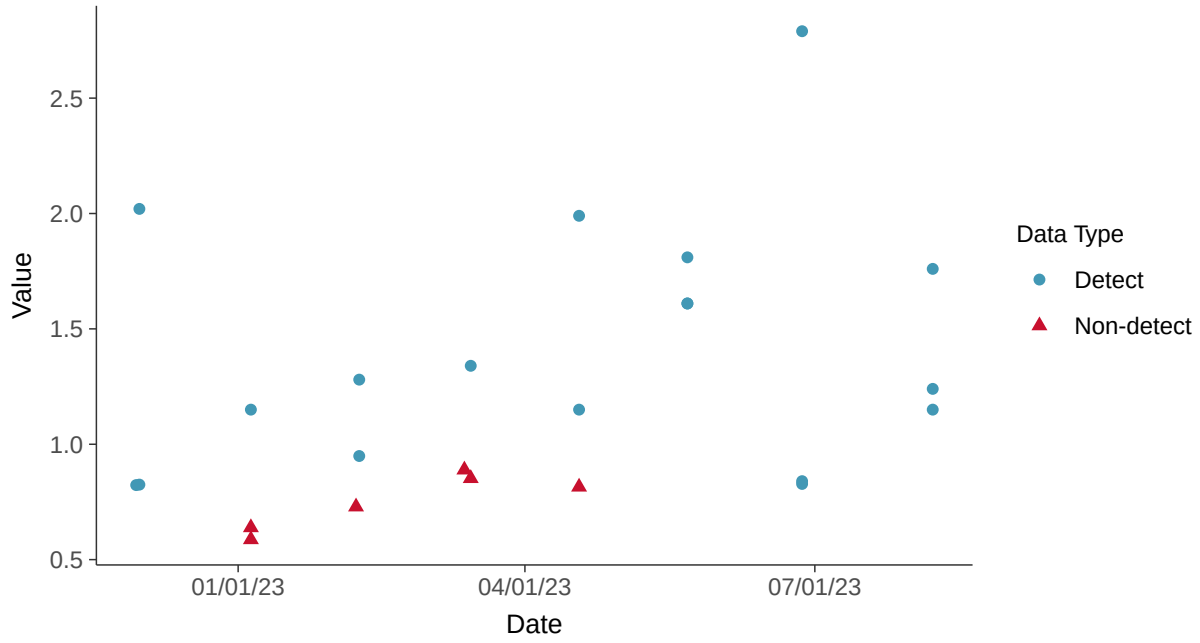


Appendix IV: Radium 226 and 228, MW-27, MW-33, MW-34

ID: 5_121

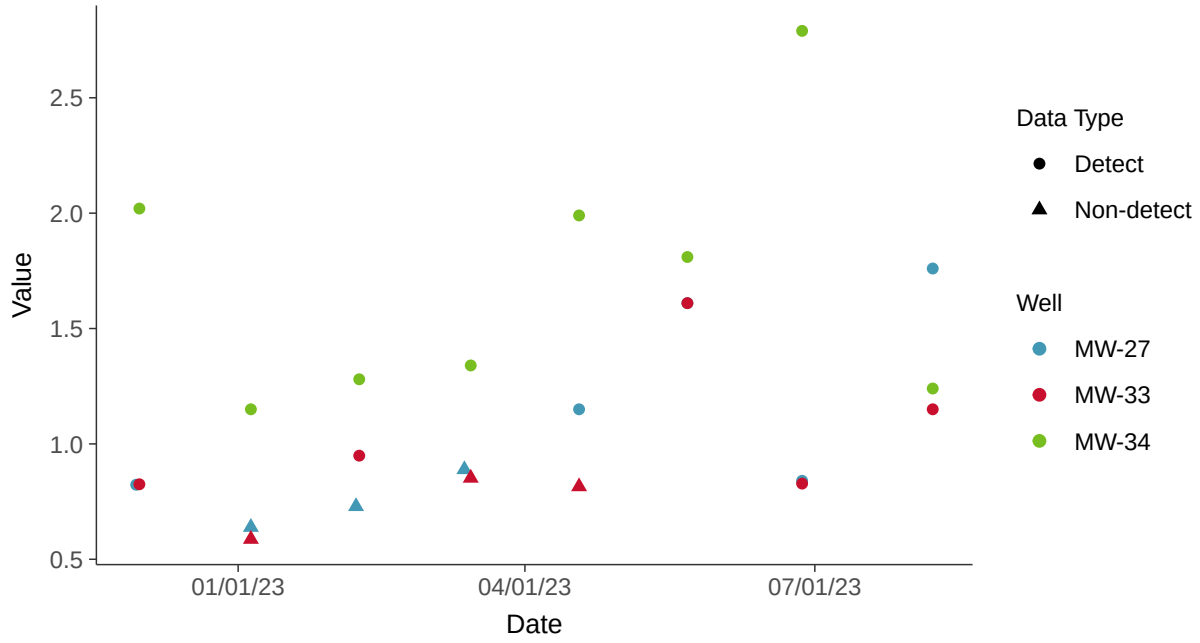
Scatter Plot

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



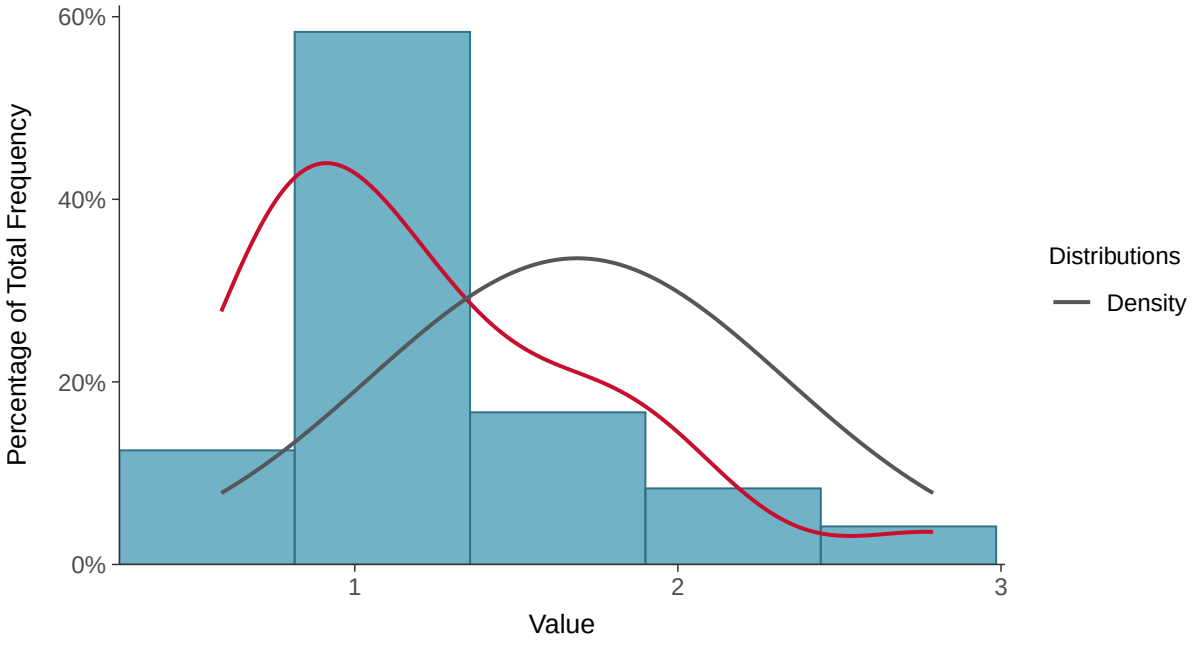
Scatter Plot by Well

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



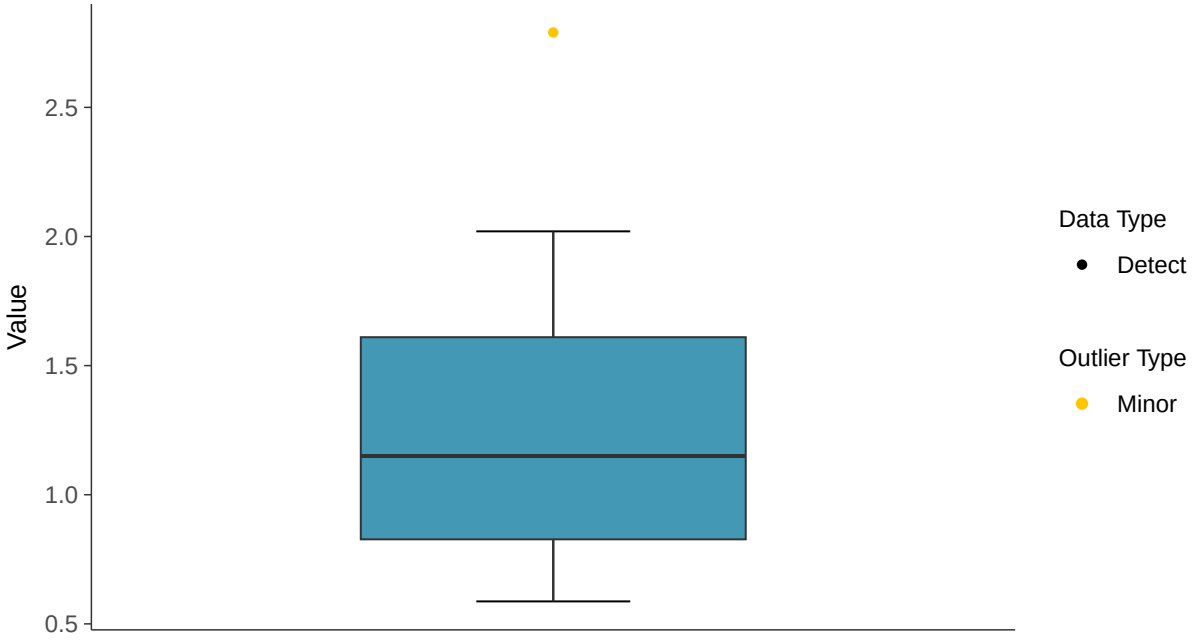
Histogram

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



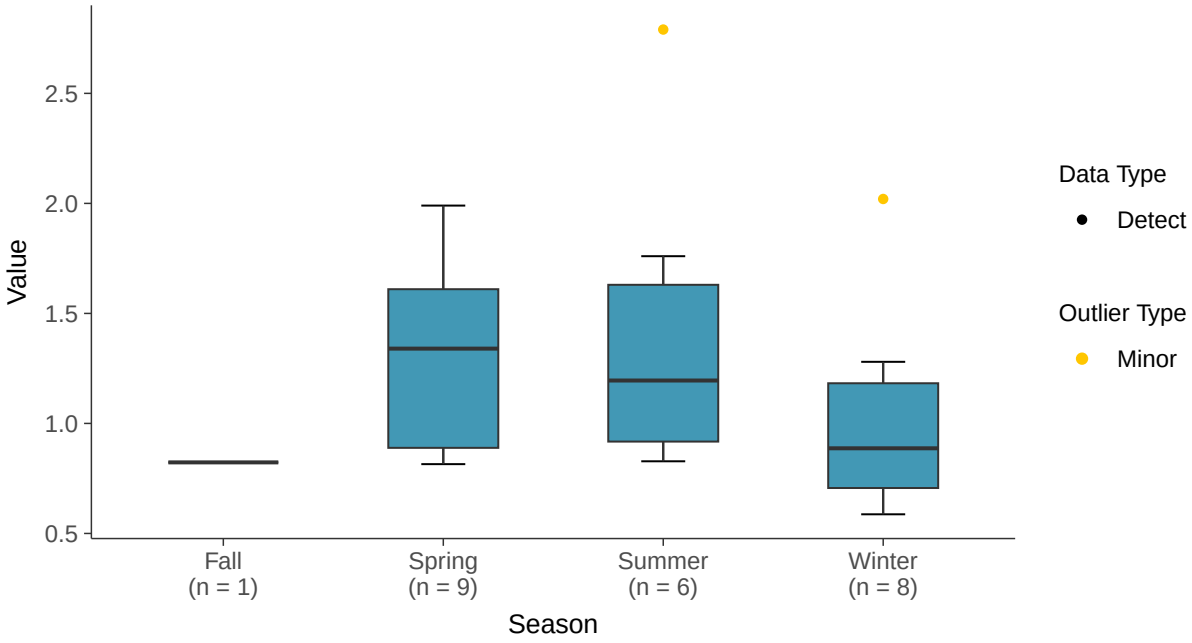
Boxplot

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



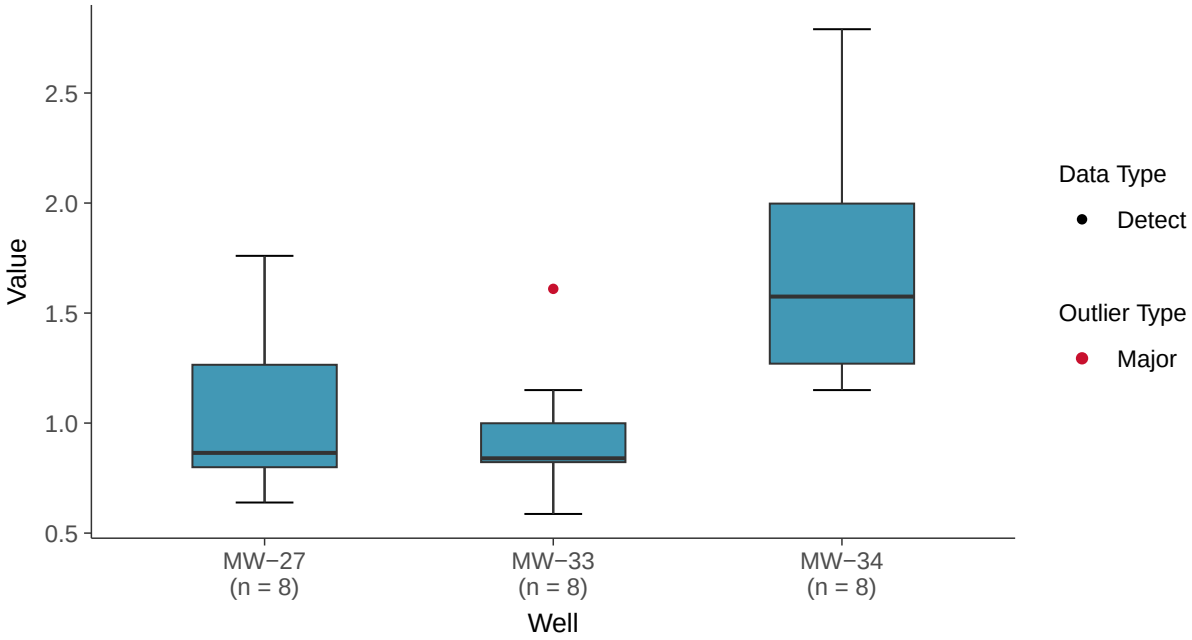
Boxplot by Season

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



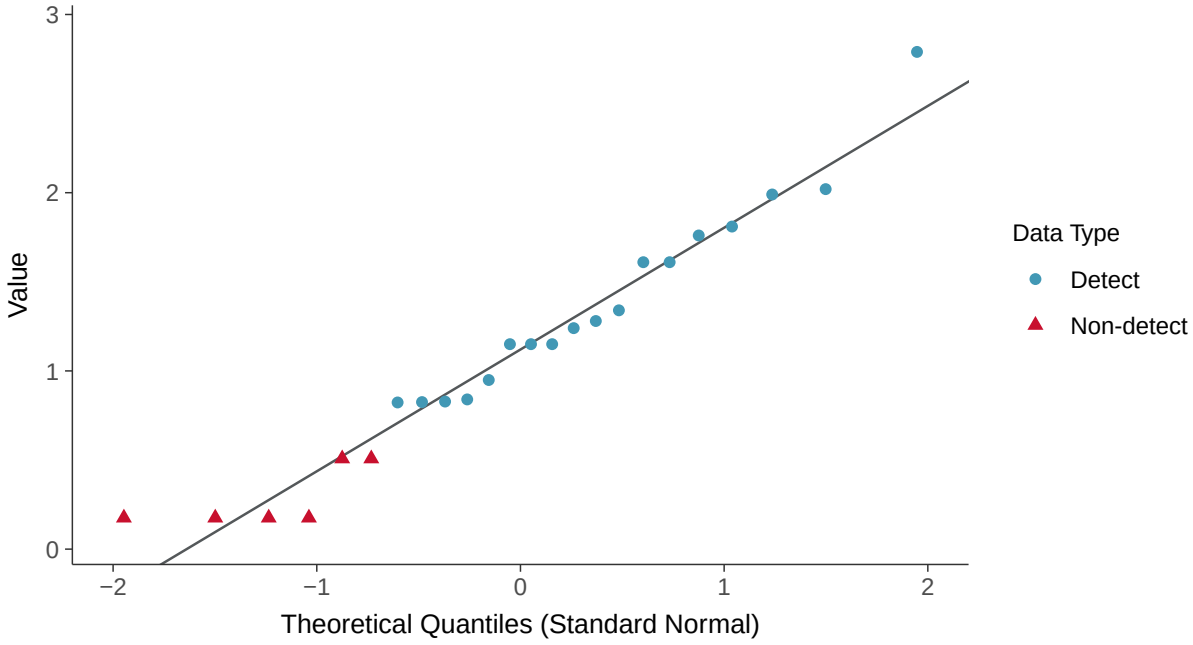
Boxplot by Well

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



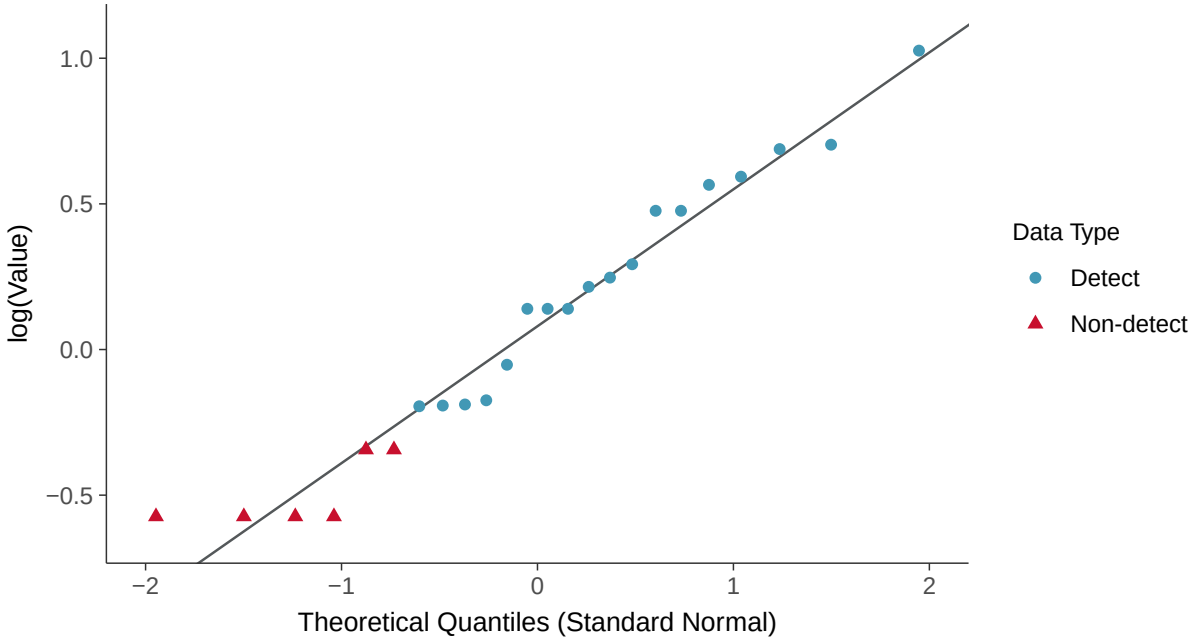
Normal Q-Q plot using ROS Imputed Estimates

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



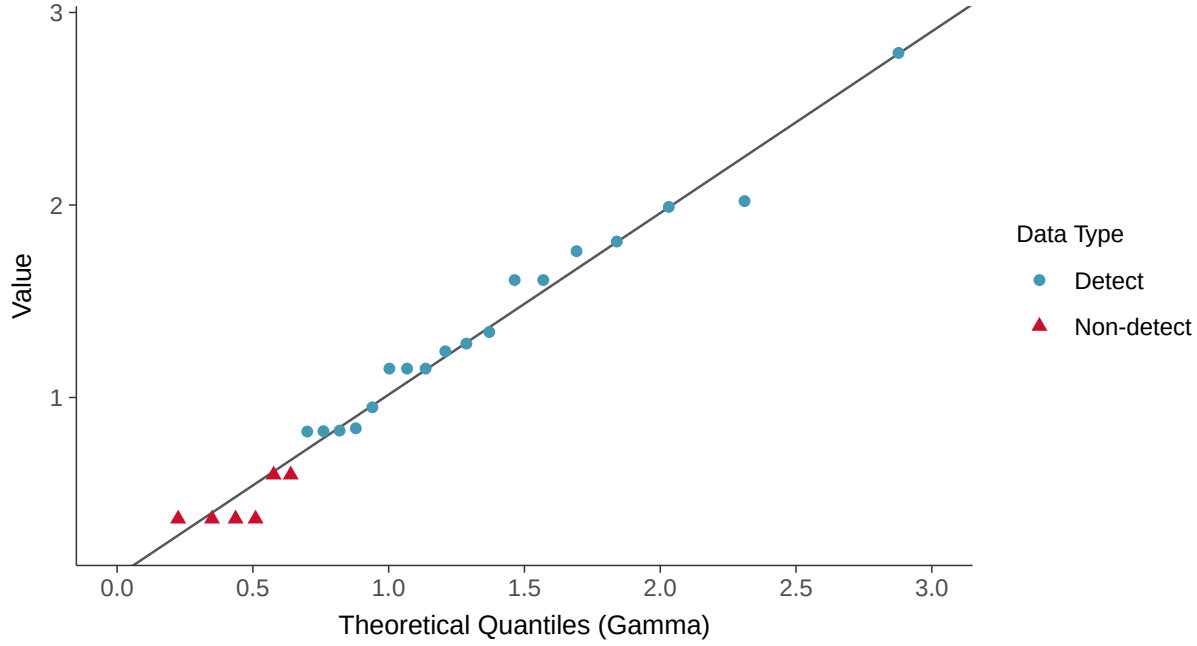
Lognormal Q-Q plot using ROS Imputed Estimates

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



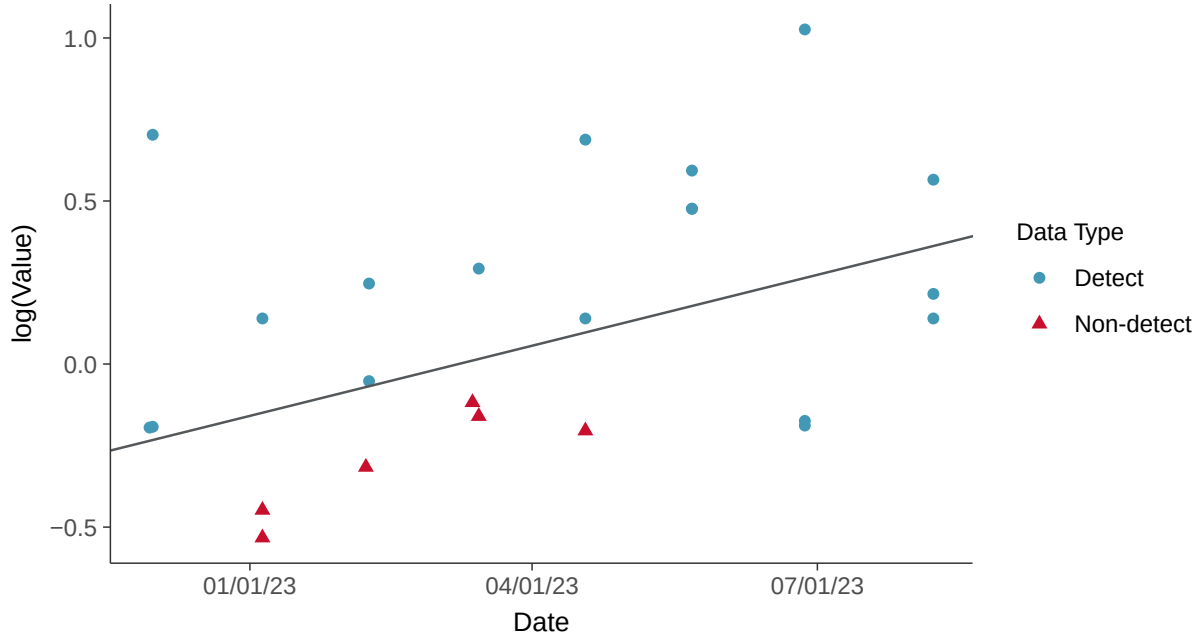
Gamma Q-Q plot using ROS Imputed Estimates

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



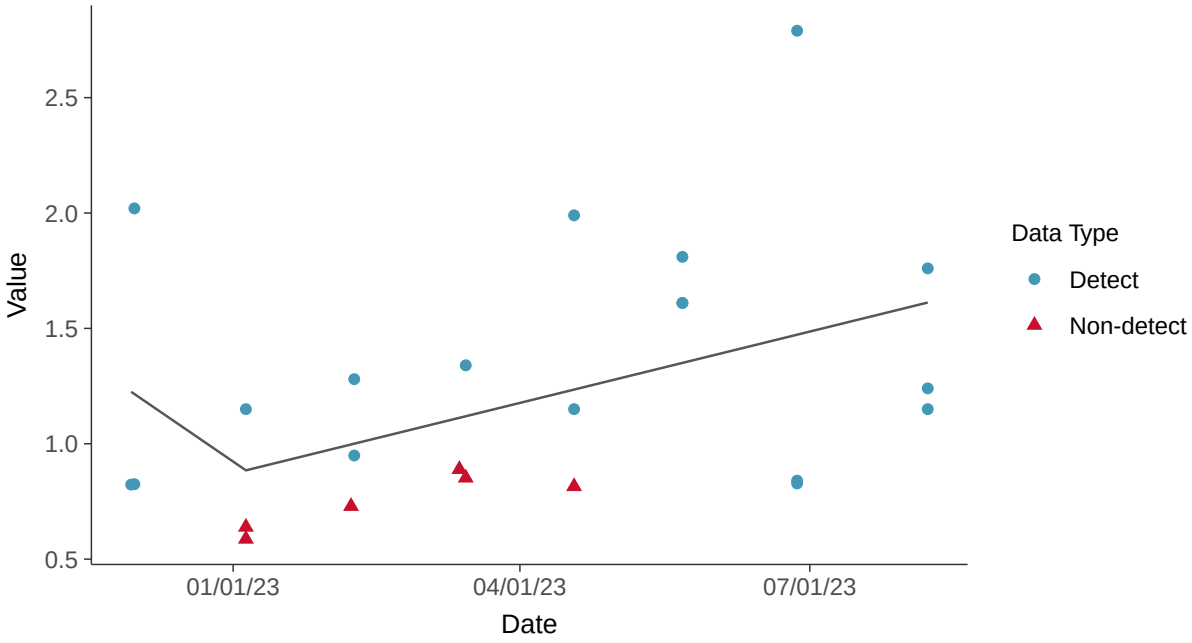
Trend Regression: Lognormal MLE

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



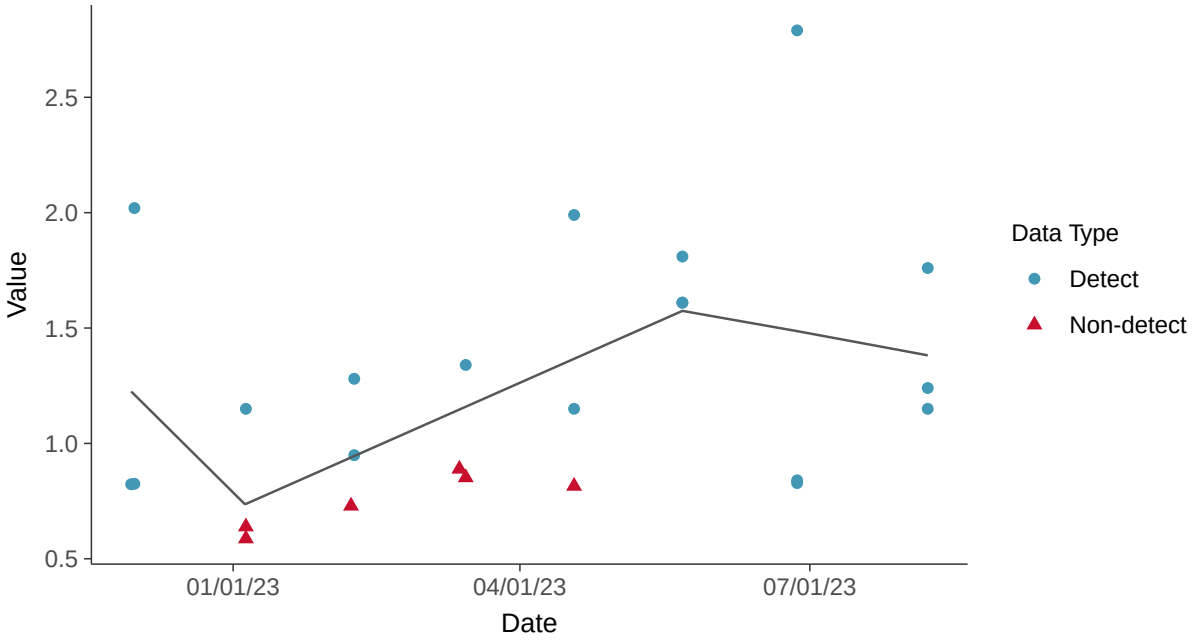
Trend Regression: Piecewise Linear-Linear

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)



Trend Regression: Piecewise Linear-Linear-Linear

Radium 226 and 228, MW-27, MW-33, MW-34 (pCi/L)

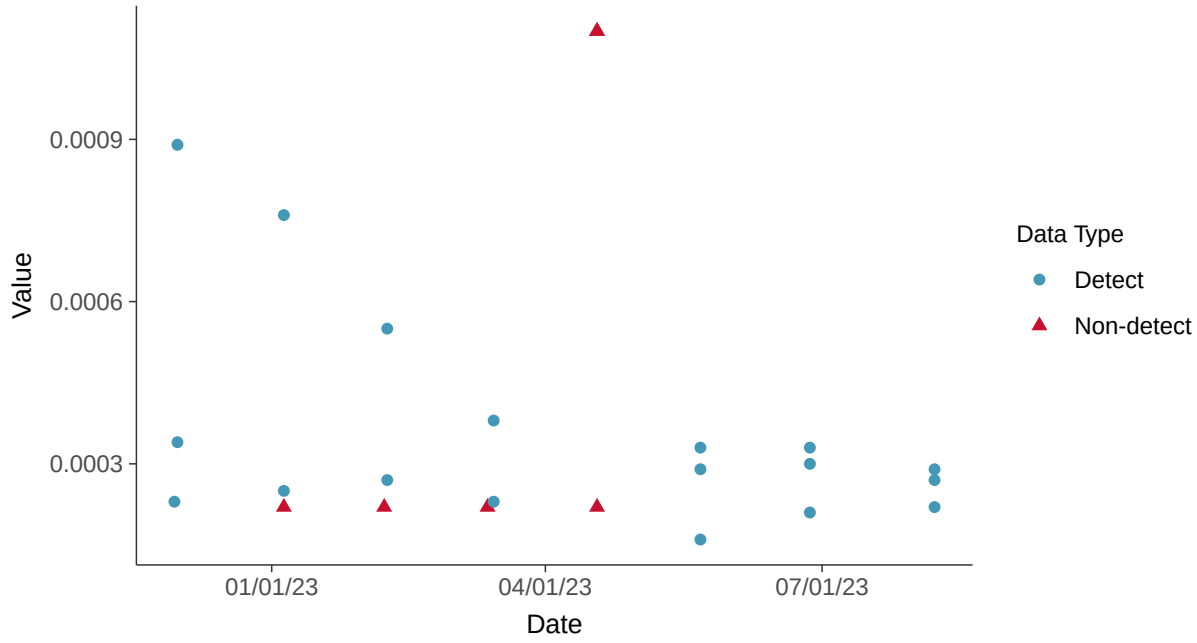


Appendix IV: Selenium, MW-27, MW-33, MW-34

ID: 5_122

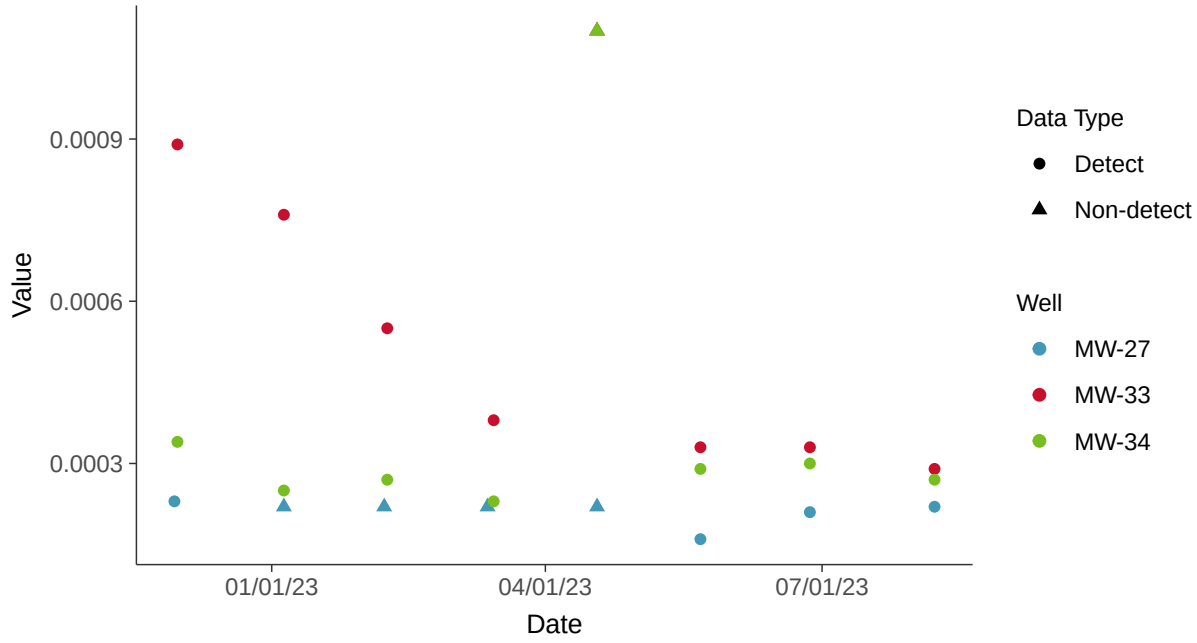
Scatter Plot

Selenium, MW-27, MW-33, MW-34 (mg/L)



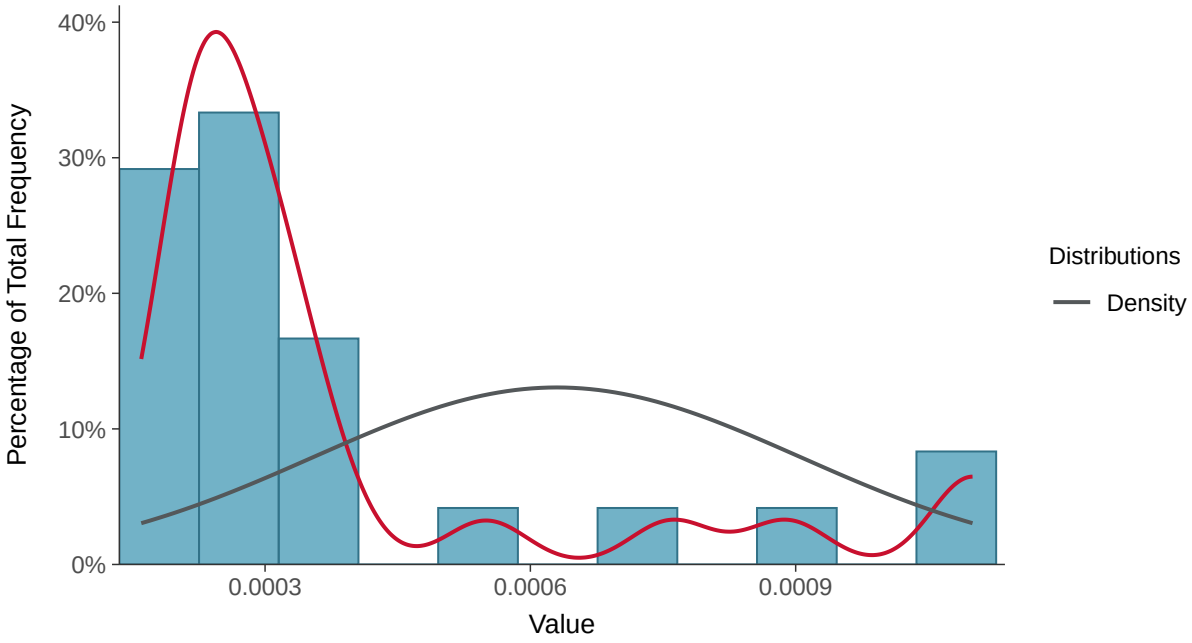
Scatter Plot by Well

Selenium, MW-27, MW-33, MW-34 (mg/L)



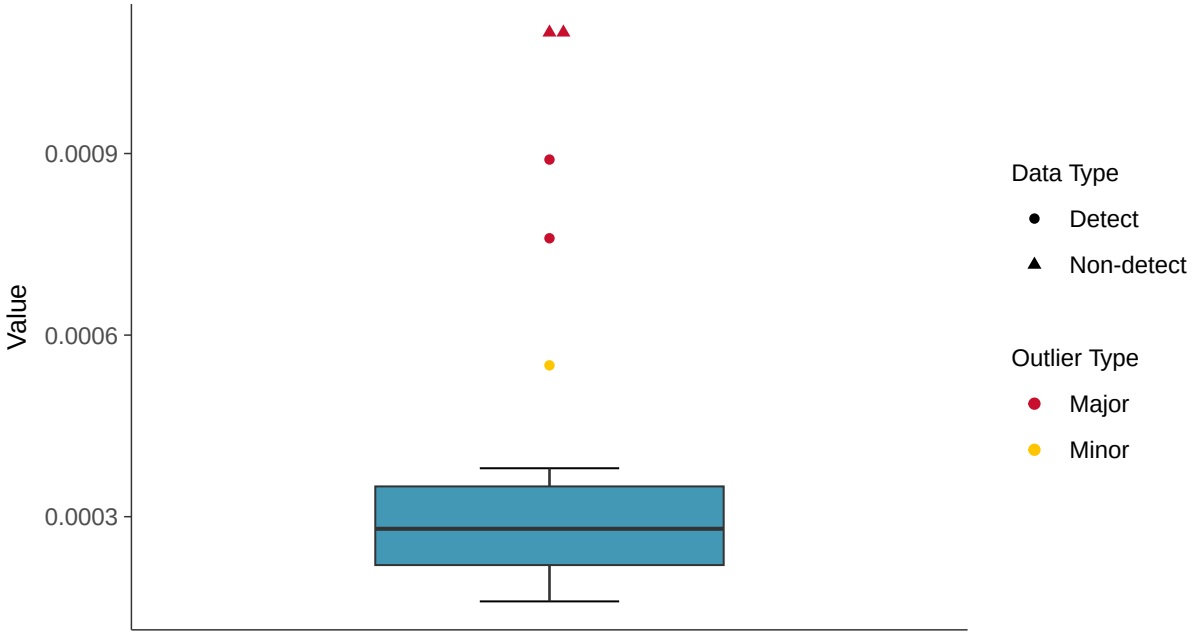
Histogram

Selenium, MW-27, MW-33, MW-34 (mg/L)



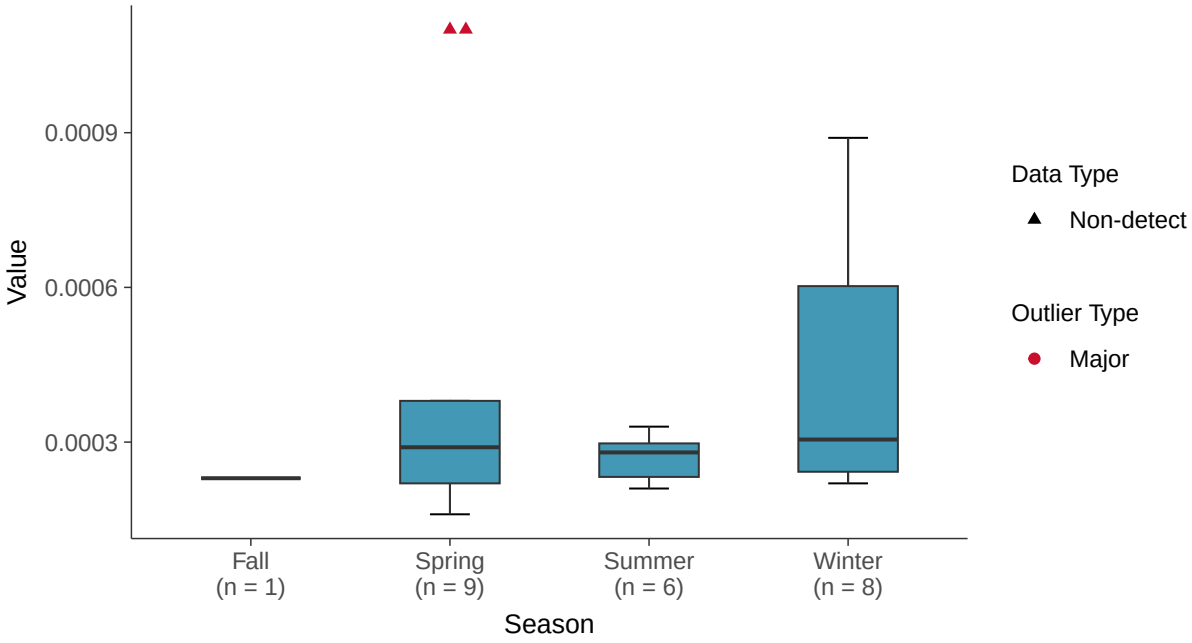
Boxplot

Selenium, MW-27, MW-33, MW-34 (mg/L)



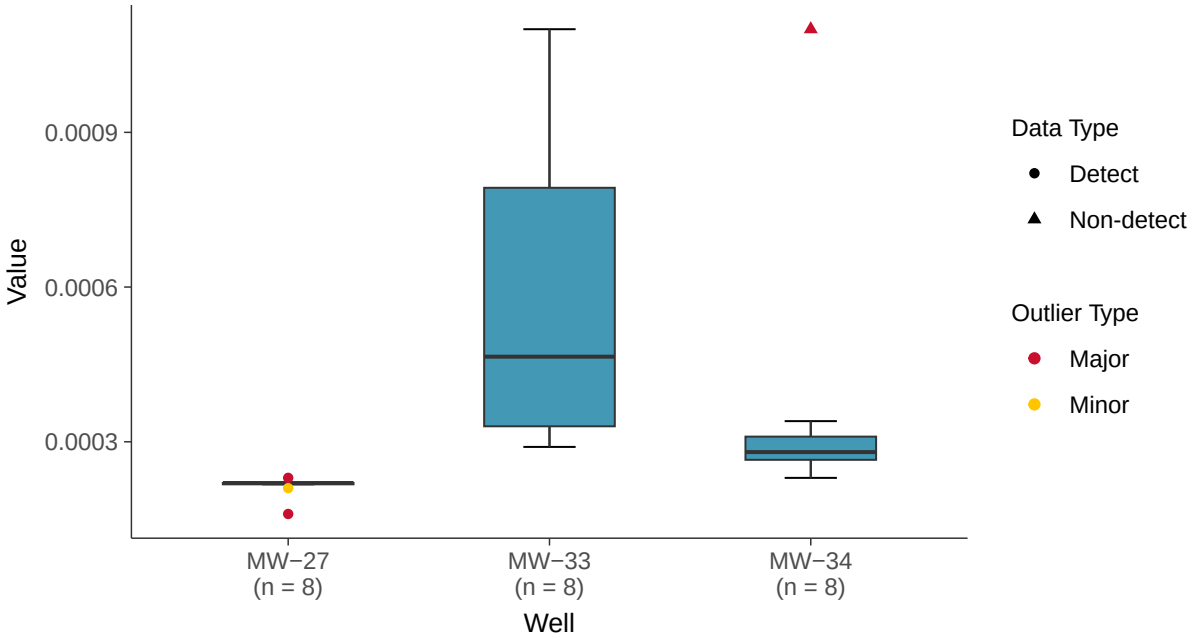
Boxplot by Season

Selenium, MW-27, MW-33, MW-34 (mg/L)



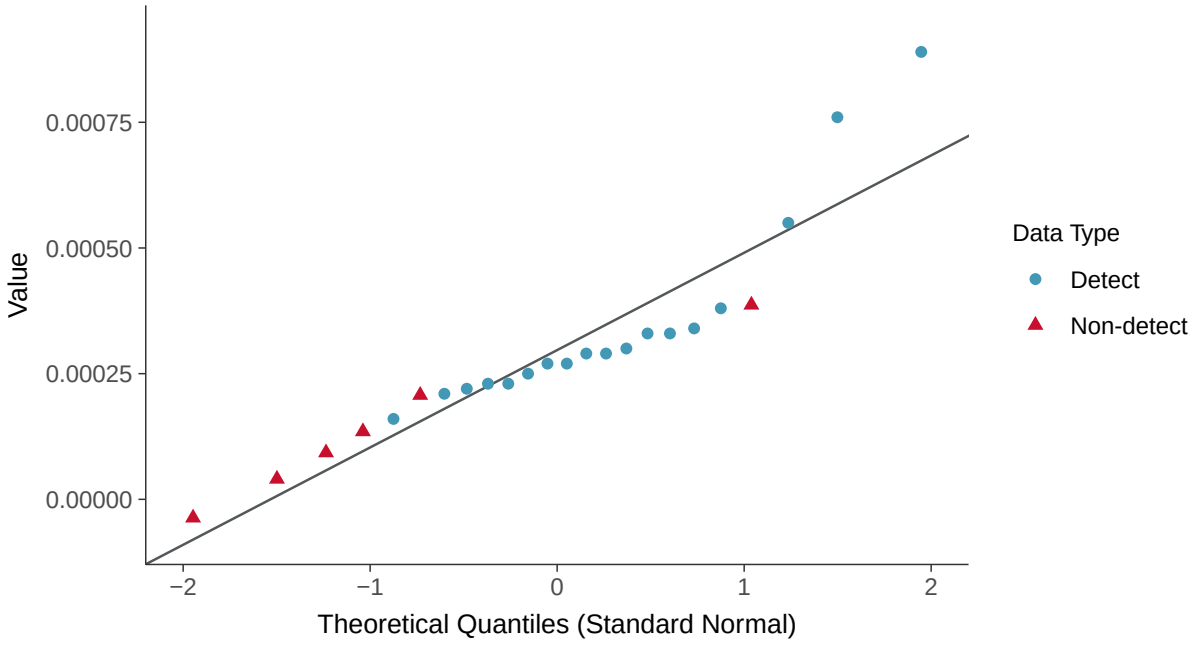
Boxplot by Well

Selenium, MW-27, MW-33, MW-34 (mg/L)



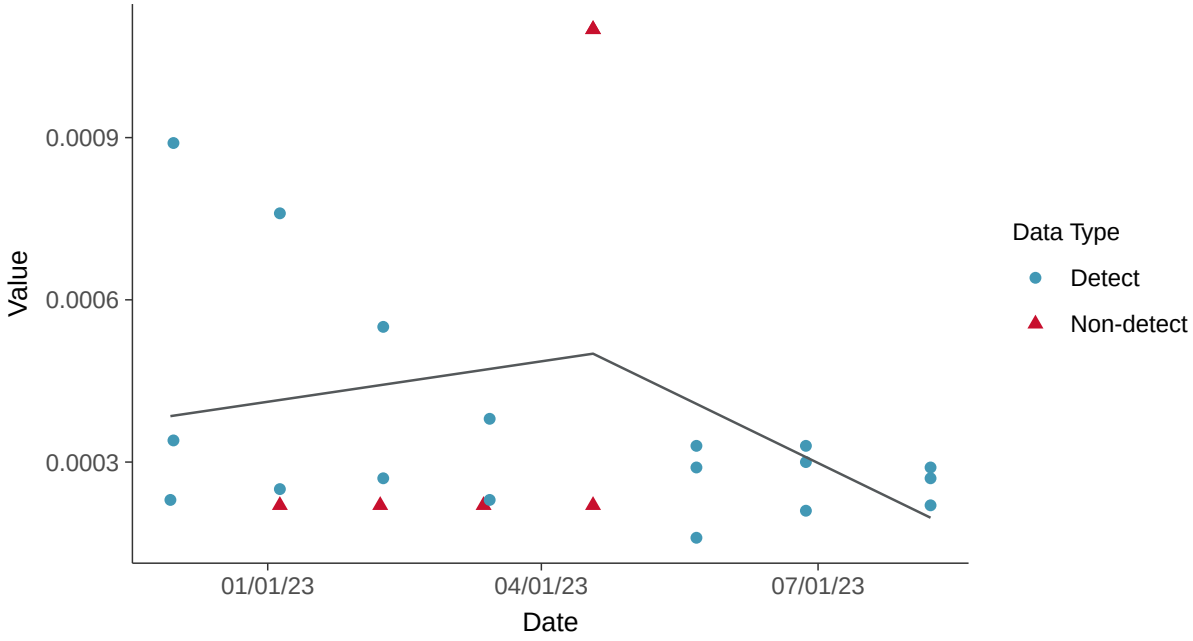
Normal Q-Q plot using ROS Imputed Estimates

Selenium, MW-27, MW-33, MW-34 (mg/L)



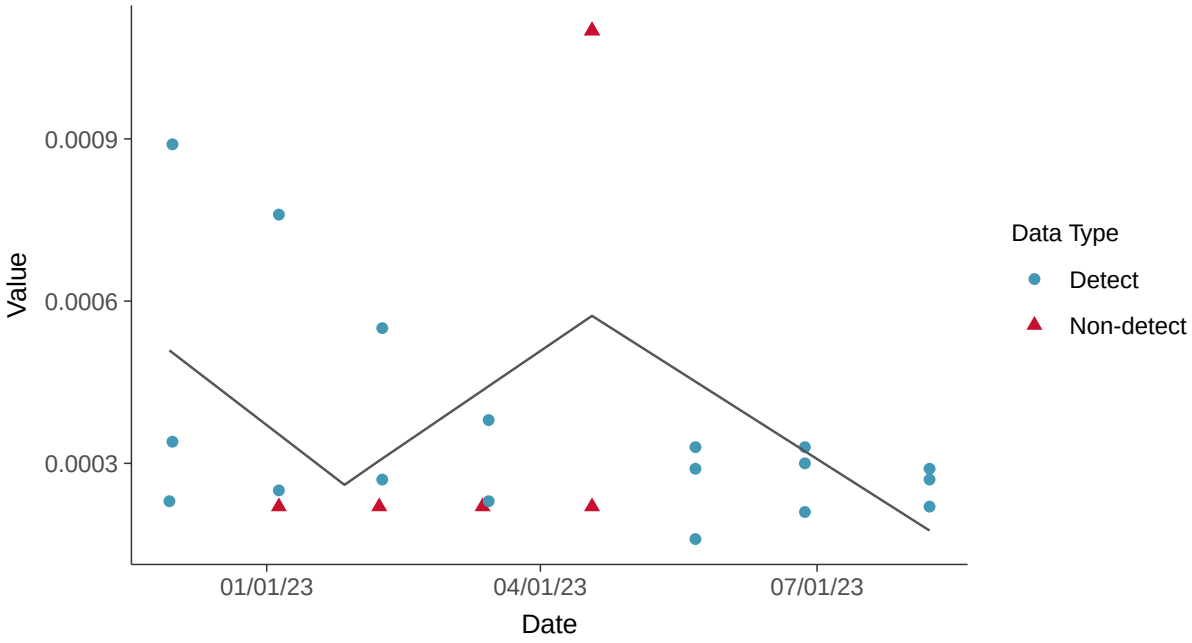
Trend Regression: Piecewise Linear-Linear

Selenium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Selenium, MW-27, MW-33, MW-34 (mg/L)

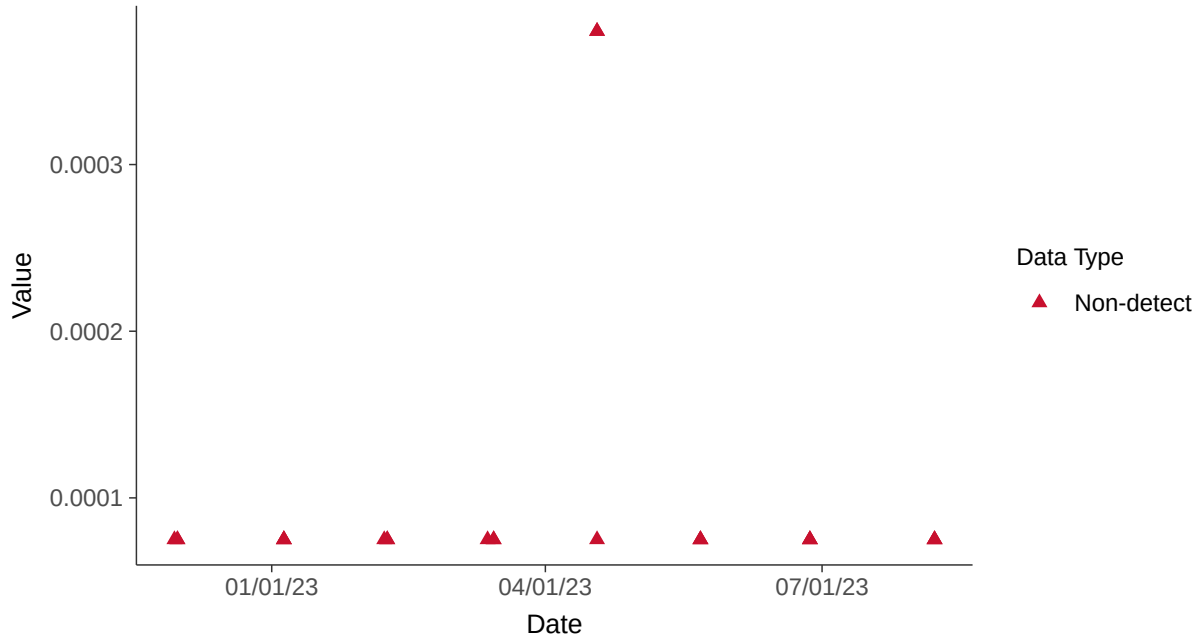


Appendix IV: Thallium, MW-27, MW-33, MW-34

ID: 5_125

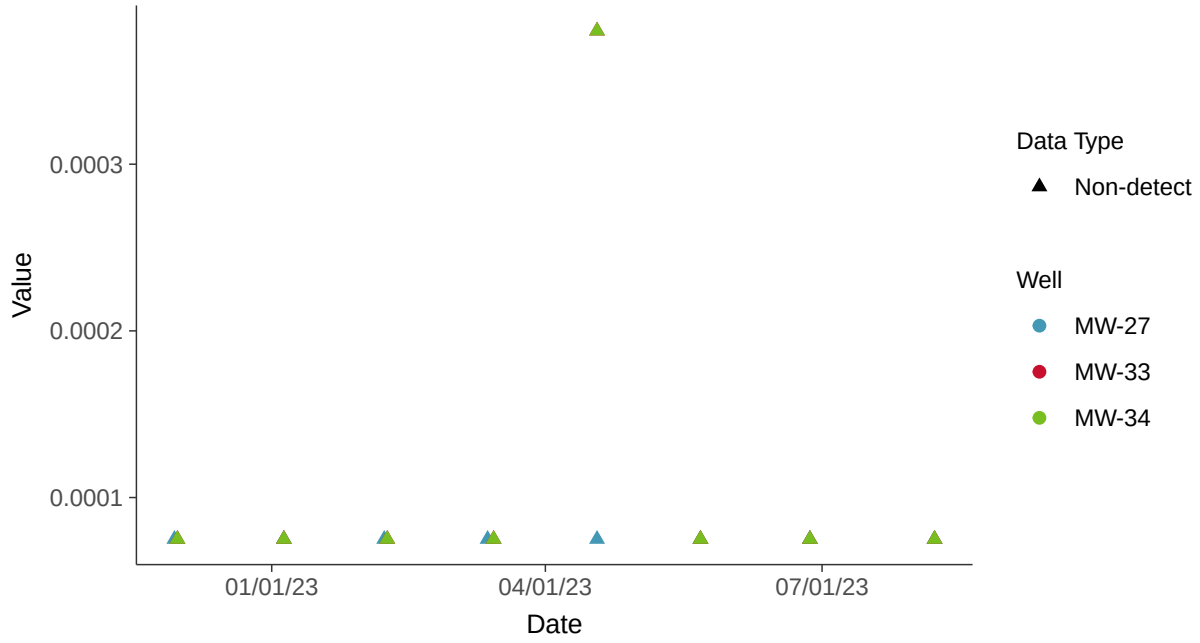
Scatter Plot

Thallium, MW-27, MW-33, MW-34 (mg/L)



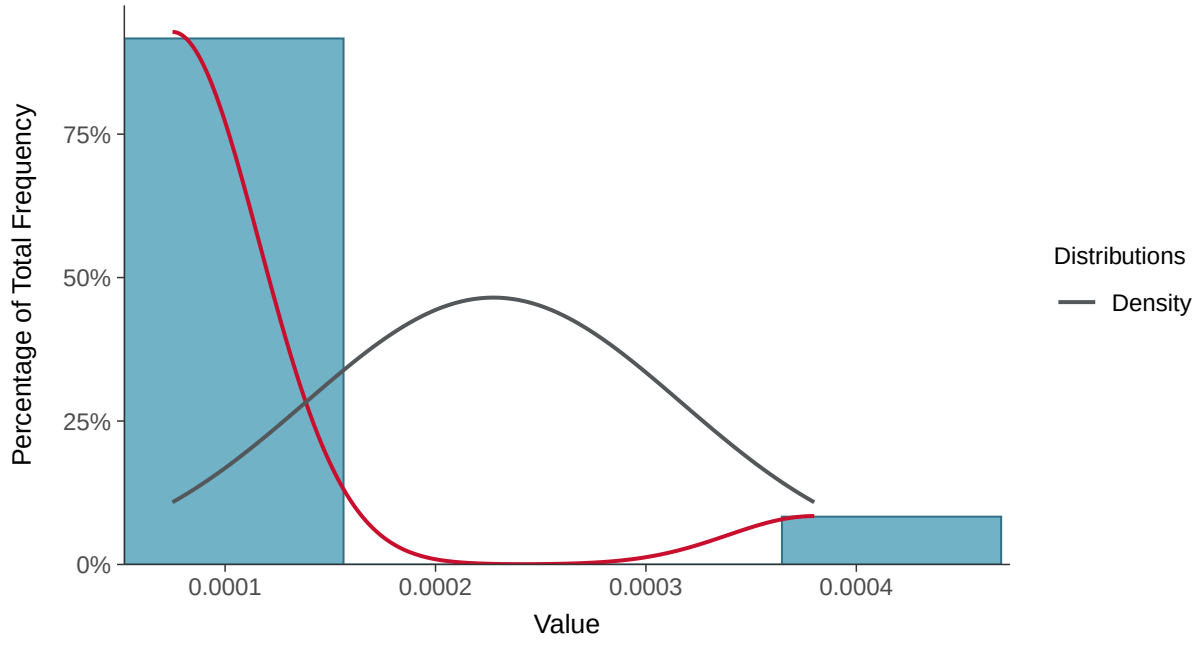
Scatter Plot by Well

Thallium, MW-27, MW-33, MW-34 (mg/L)



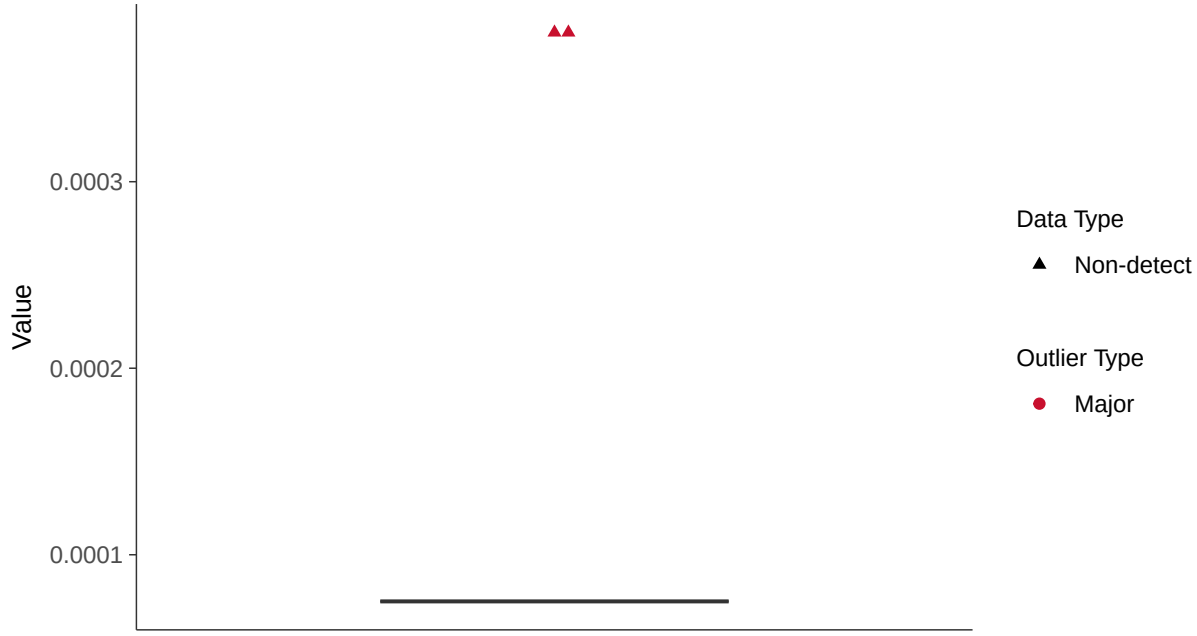
Histogram

Thallium, MW-27, MW-33, MW-34 (mg/L)



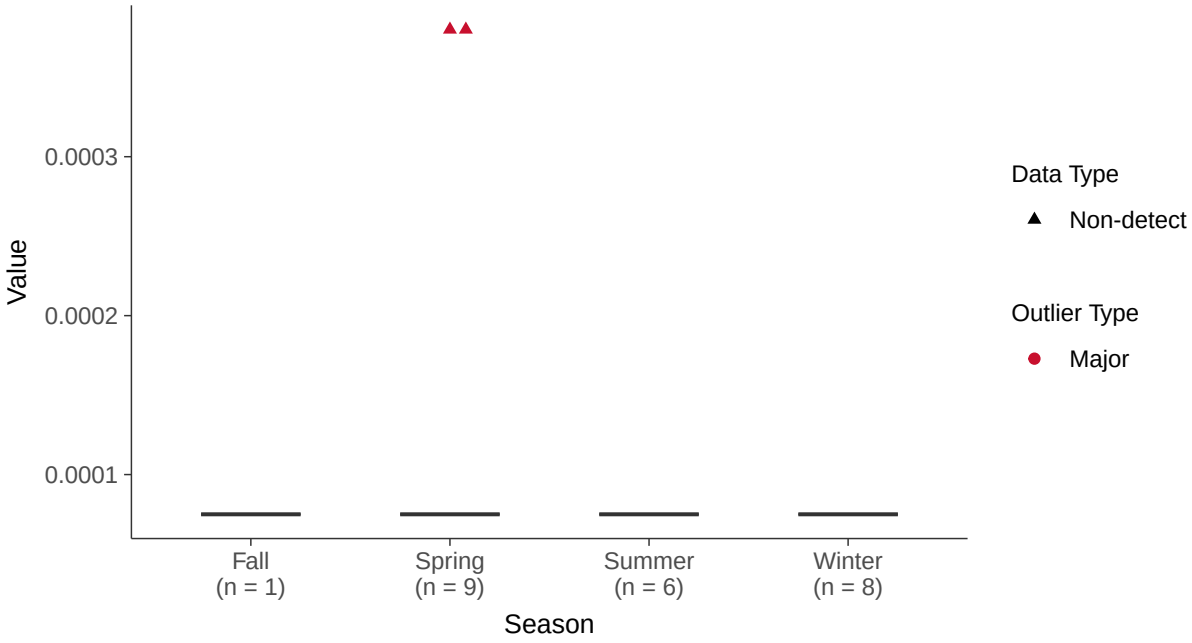
Boxplot

Thallium, MW-27, MW-33, MW-34 (mg/L)



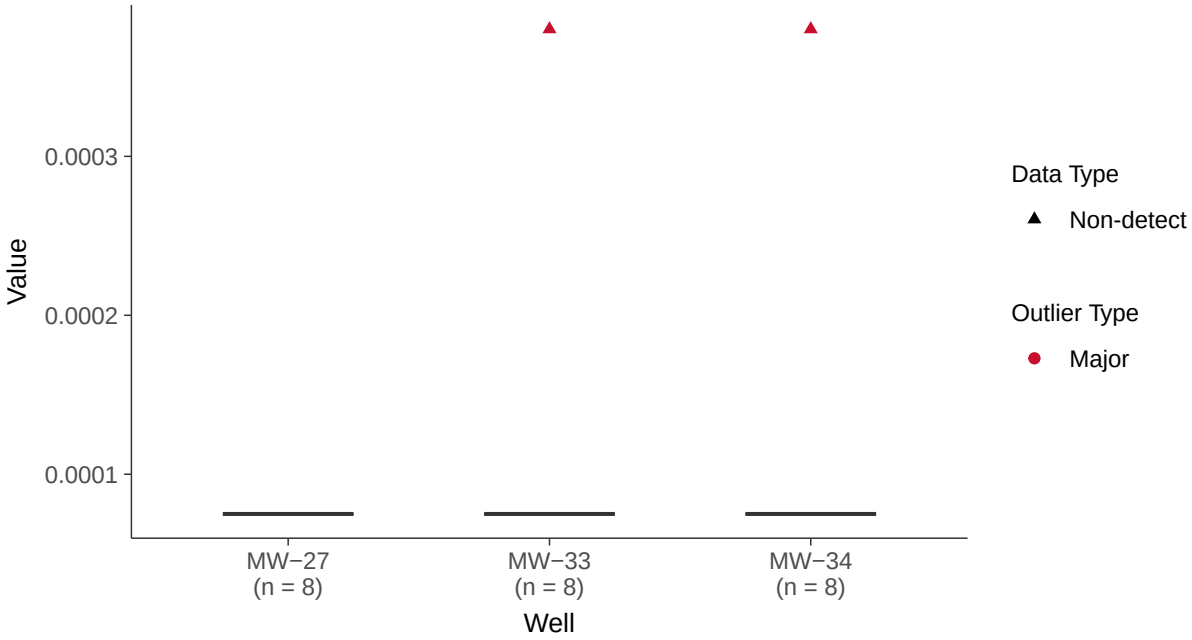
Boxplot by Season

Thallium, MW-27, MW-33, MW-34 (mg/L)



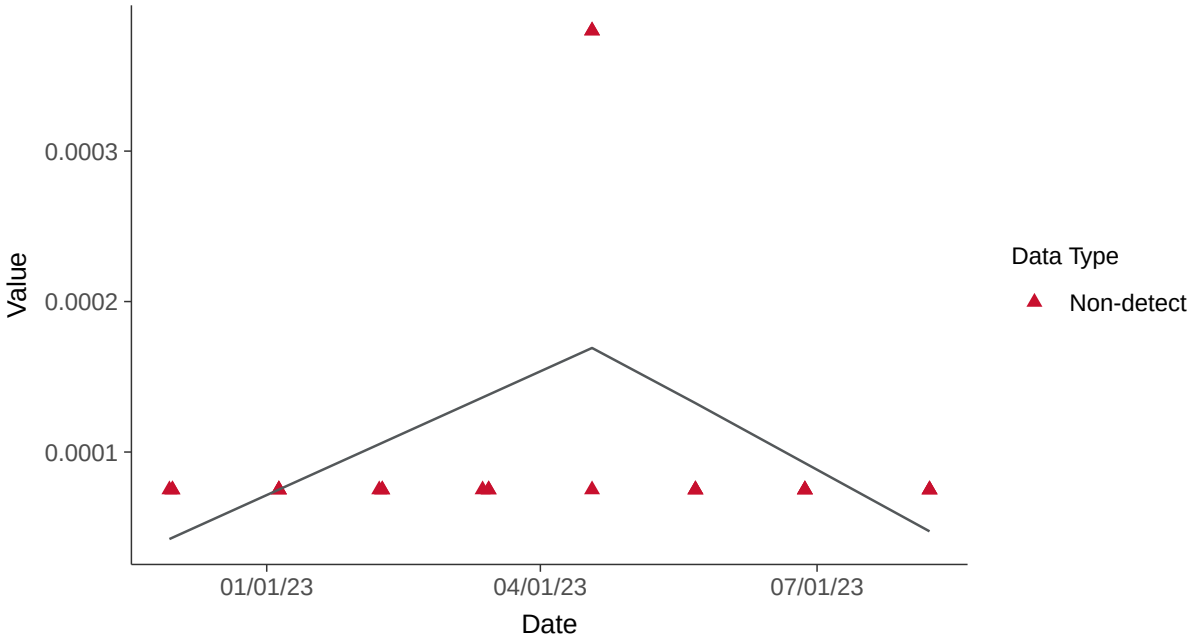
Boxplot by Well

Thallium, MW-27, MW-33, MW-34 (mg/L)



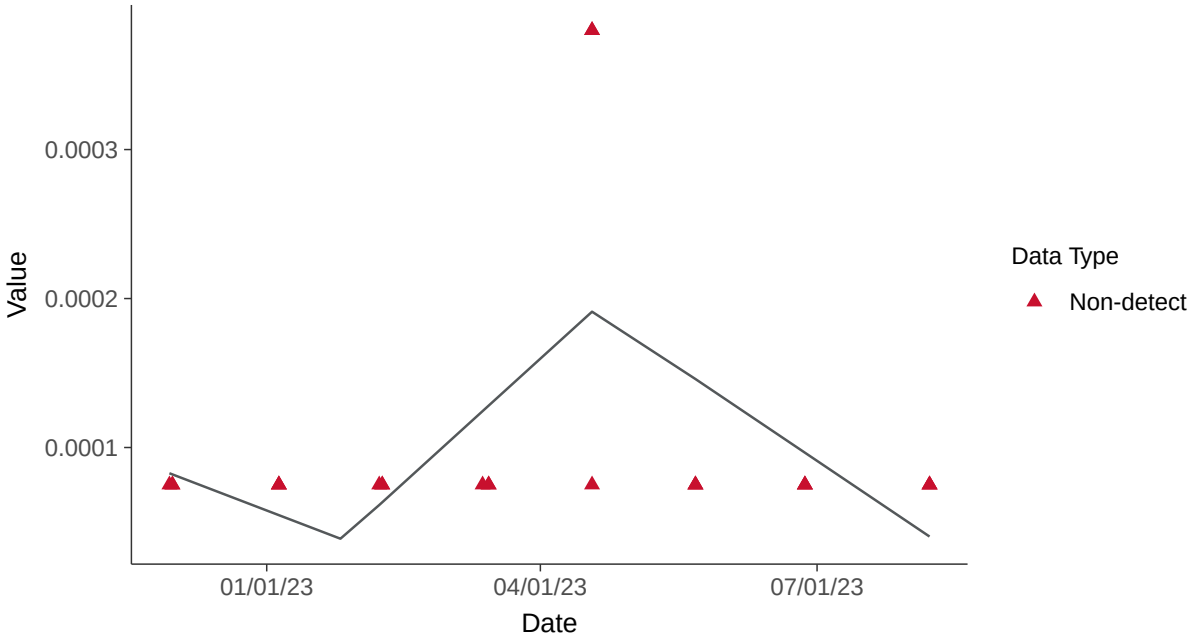
Trend Regression: Piecewise Linear-Linear

Thallium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Thallium, MW-27, MW-33, MW-34 (mg/L)

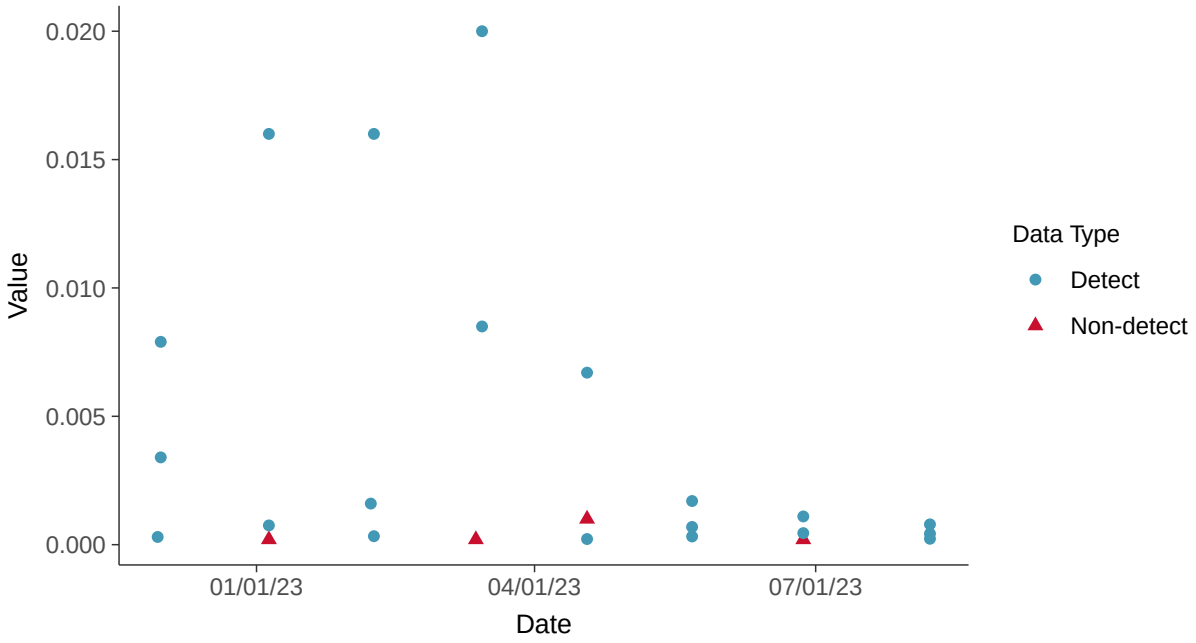


Part 115: Copper, MW-27, MW-33, MW-34

ID: 6_111

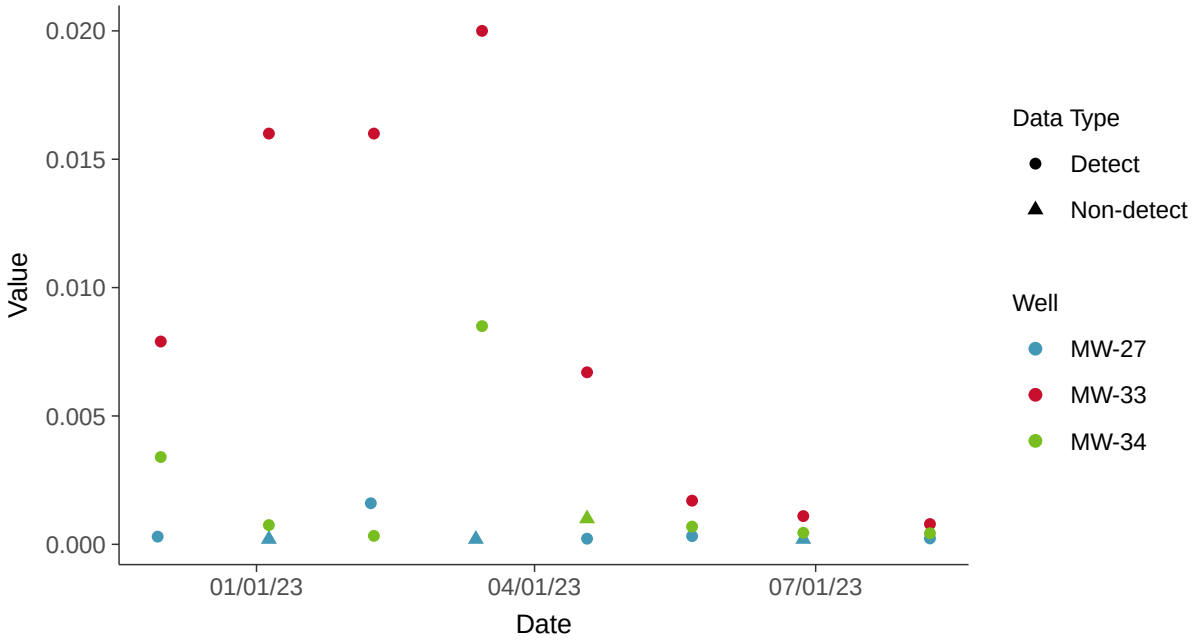
Scatter Plot

Copper, MW-27, MW-33, MW-34 (mg/L)



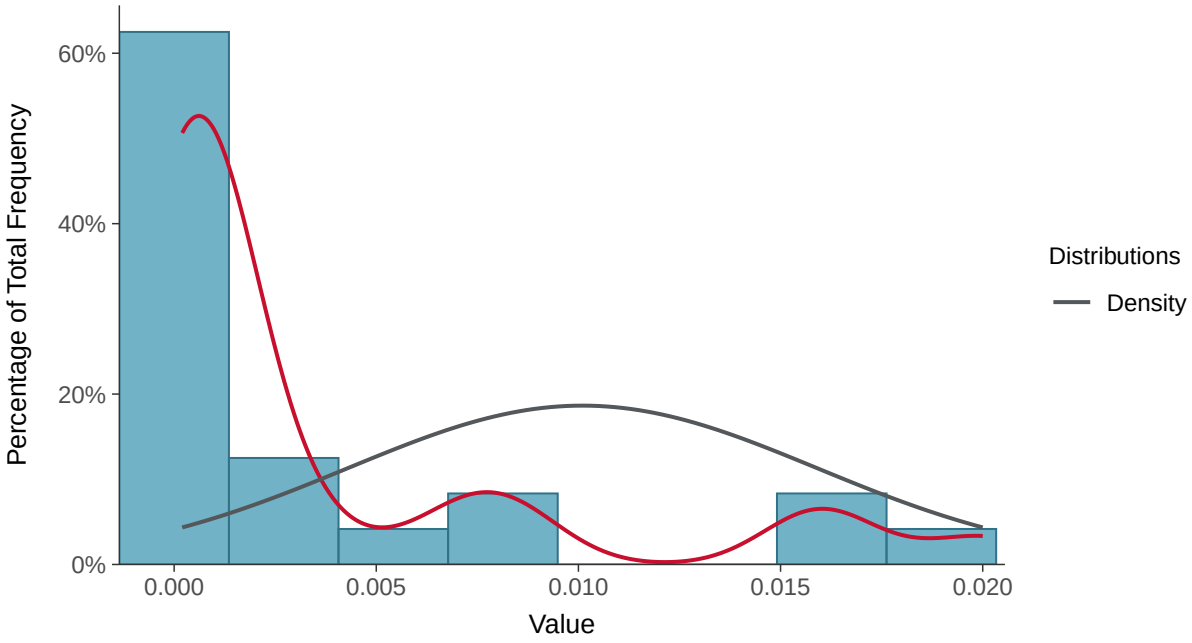
Scatter Plot by Well

Copper, MW-27, MW-33, MW-34 (mg/L)



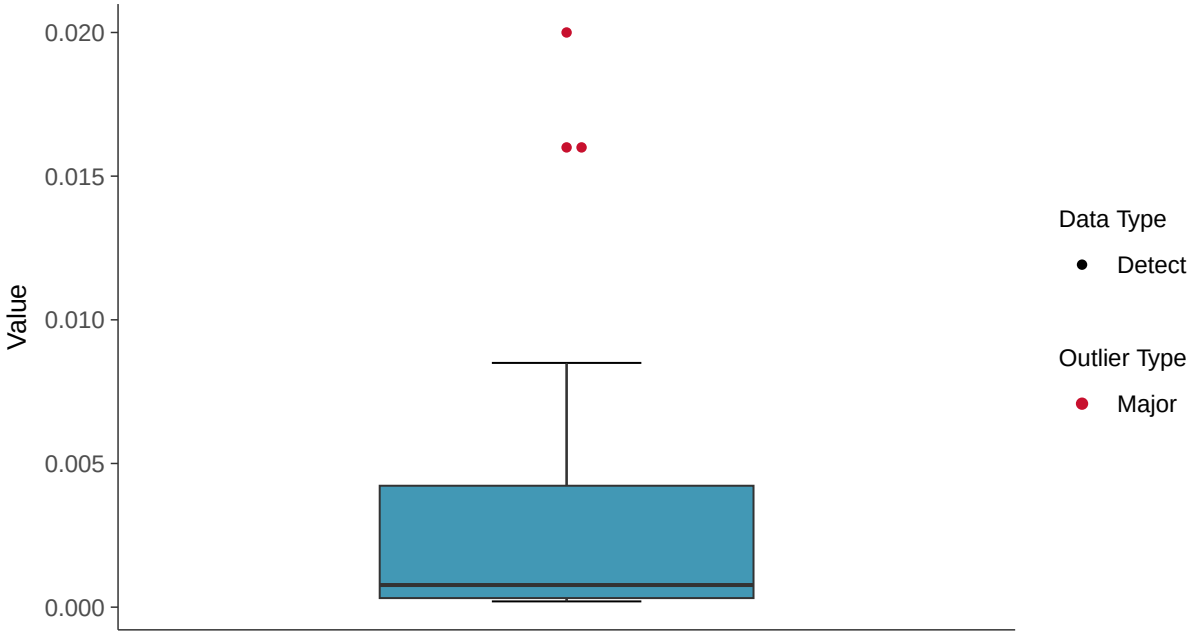
Histogram

Copper, MW-27, MW-33, MW-34 (mg/L)



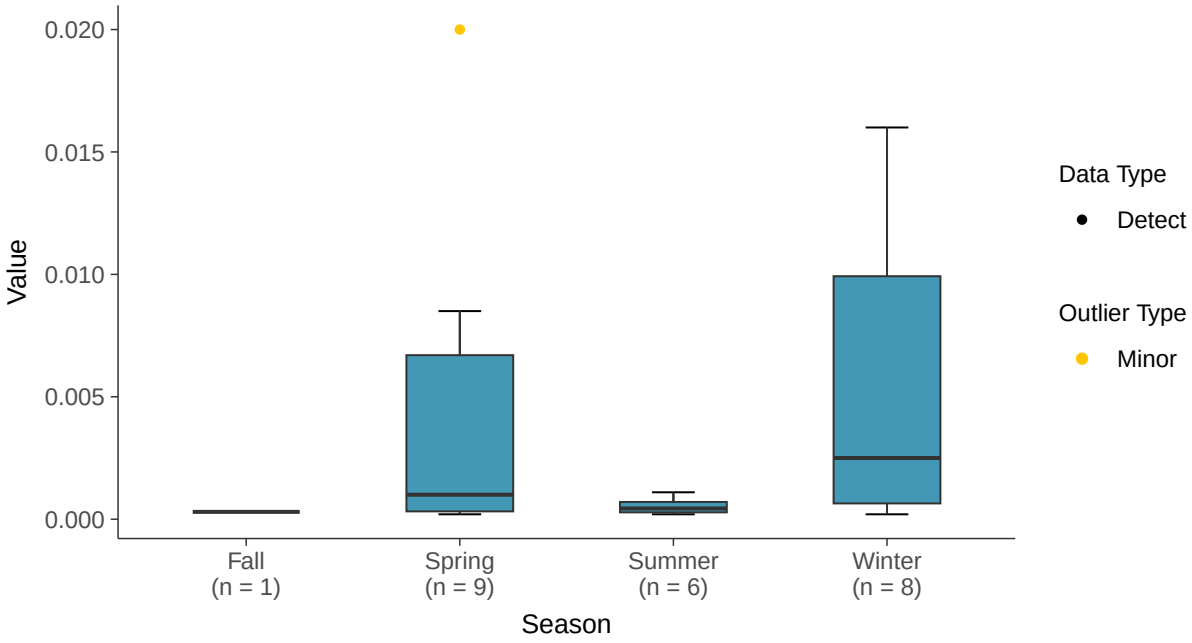
Boxplot

Copper, MW-27, MW-33, MW-34 (mg/L)



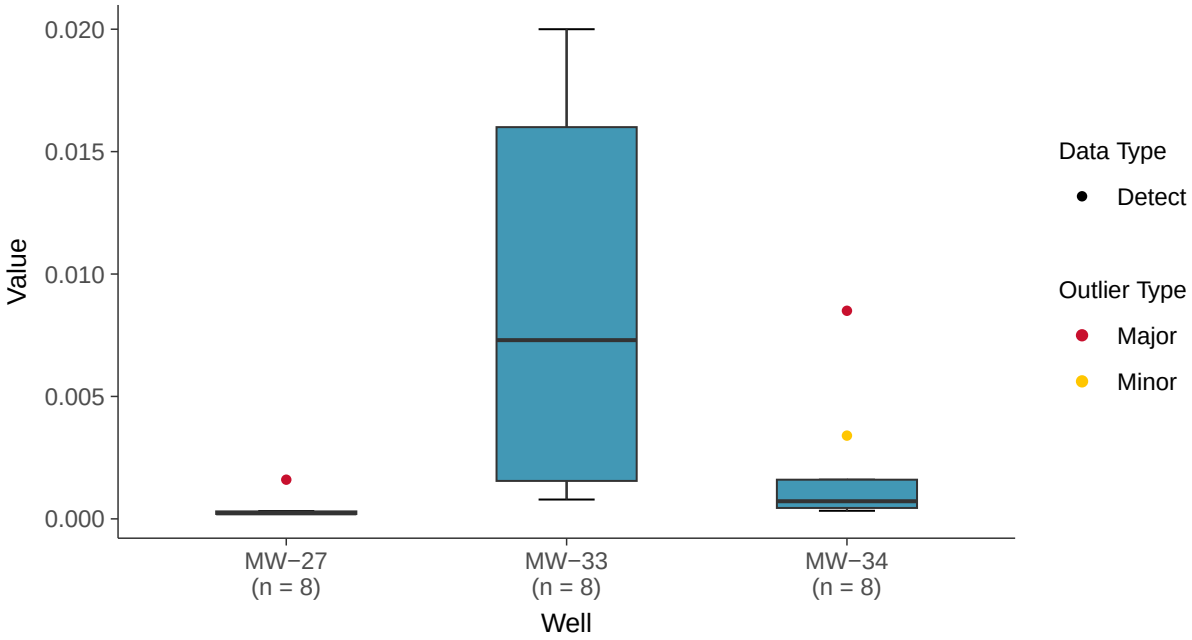
Boxplot by Season

Copper, MW-27, MW-33, MW-34 (mg/L)



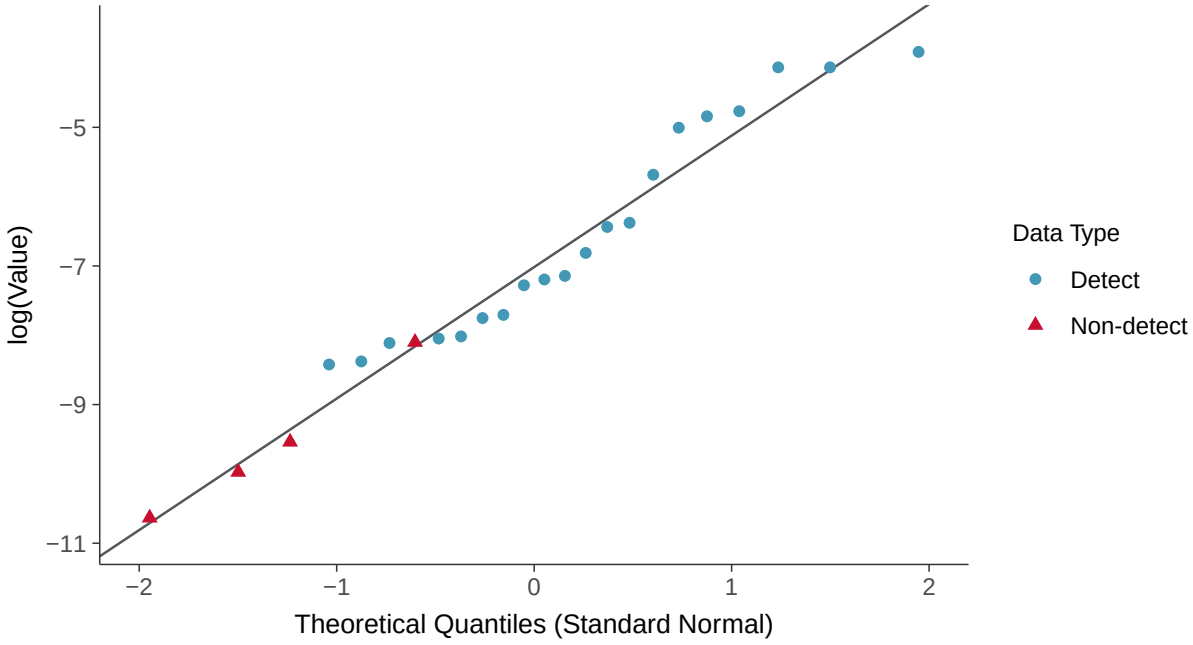
Boxplot by Well

Copper, MW-27, MW-33, MW-34 (mg/L)



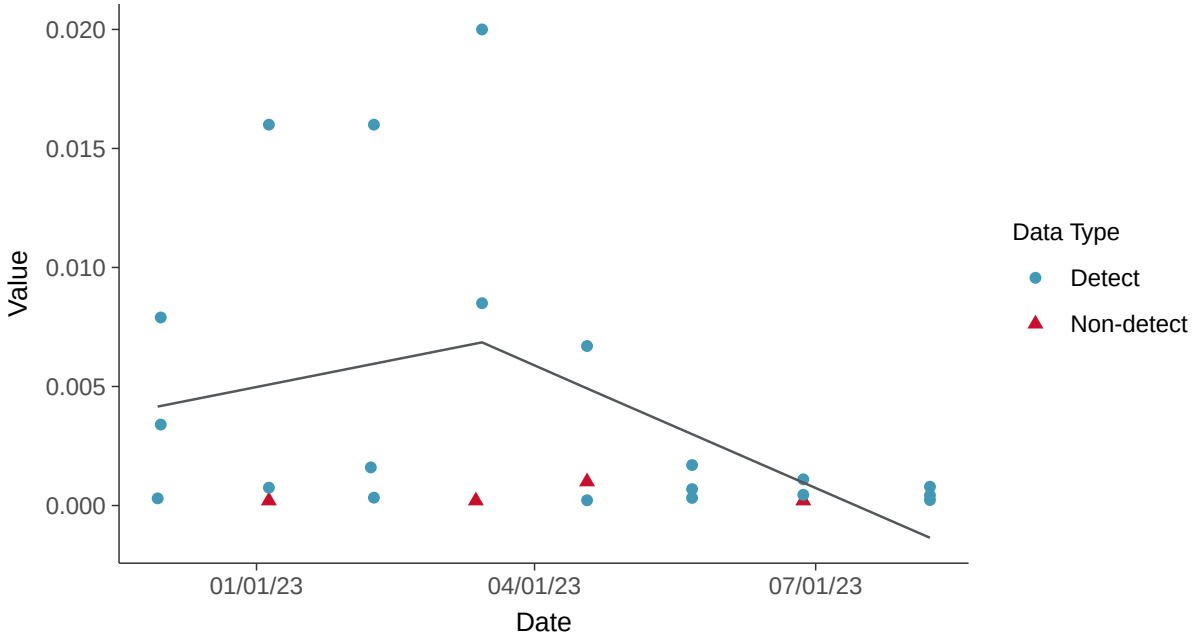
Lognormal Q-Q plot using ROS Imputed Estimates

Copper, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Copper, MW-27, MW-33, MW-34 (mg/L)

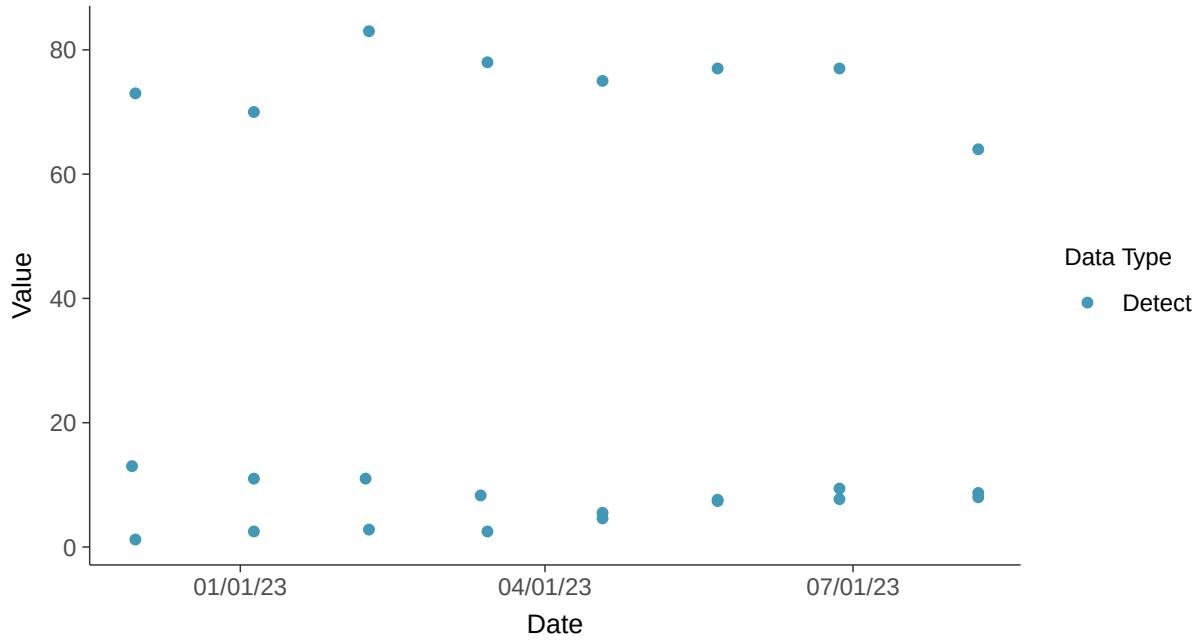


Part 115: Iron, MW-27, MW-33, MW-34

ID: 6_114

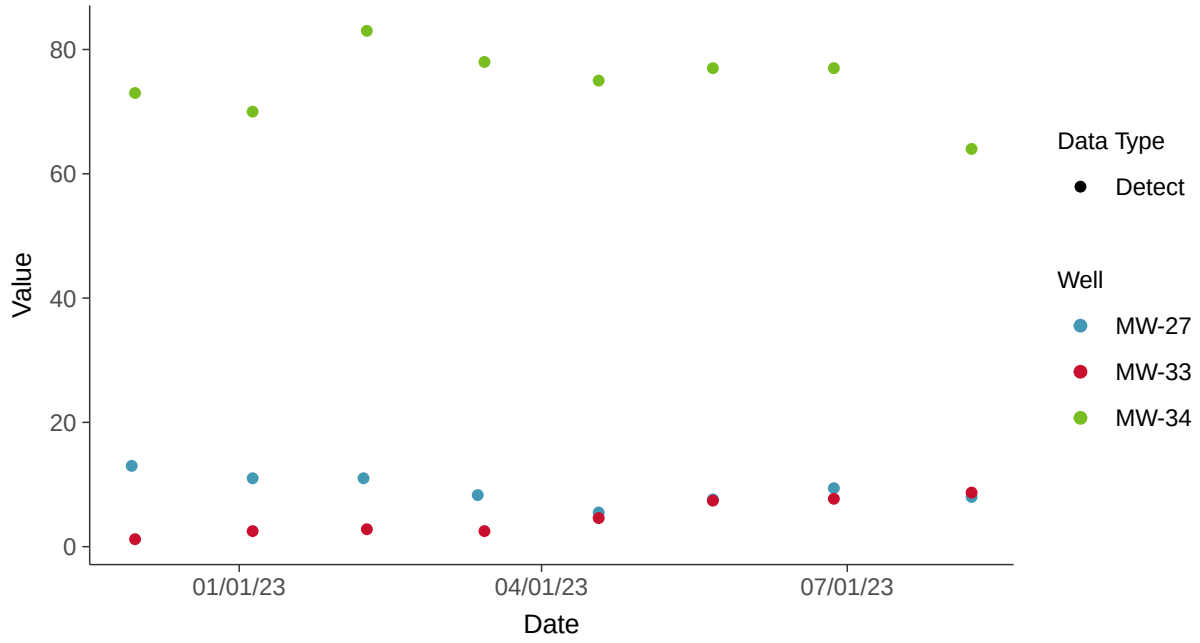
Scatter Plot

Iron, MW-27, MW-33, MW-34 (mg/L)



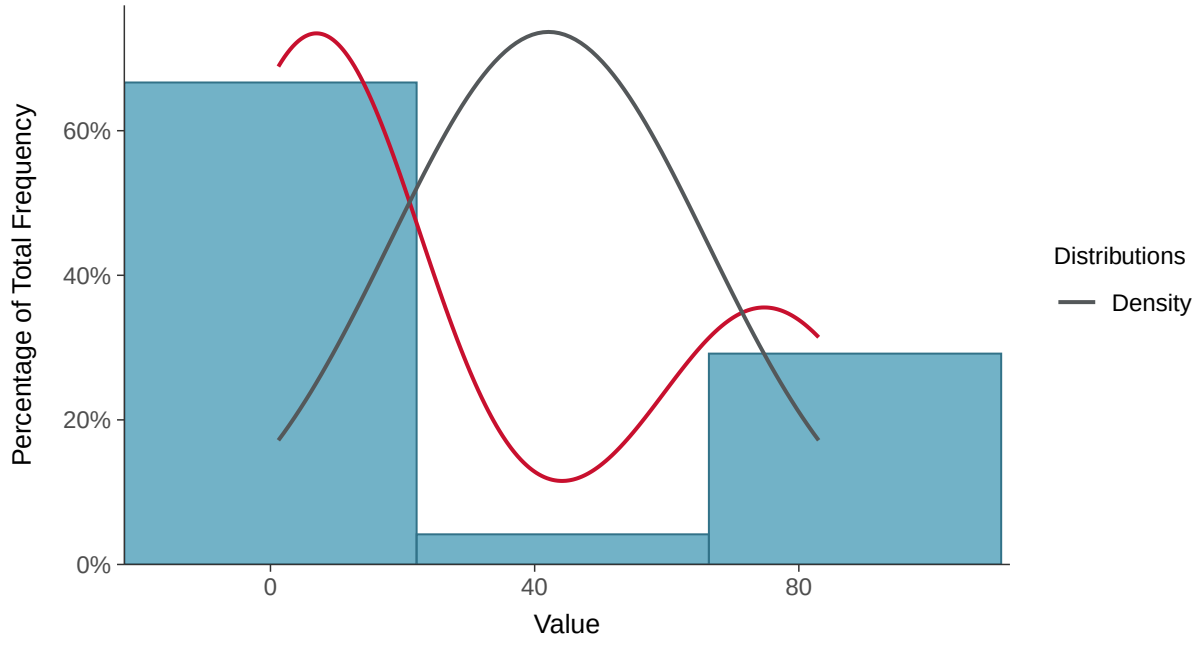
Scatter Plot by Well

Iron, MW-27, MW-33, MW-34 (mg/L)



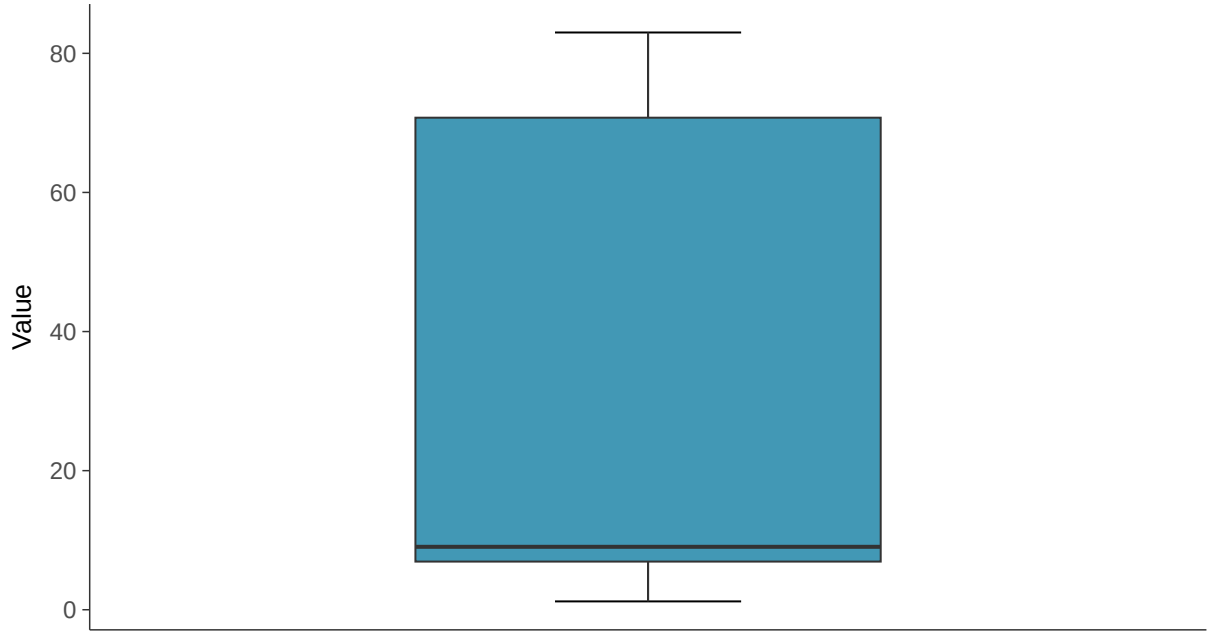
Histogram

Iron, MW-27, MW-33, MW-34 (mg/L)



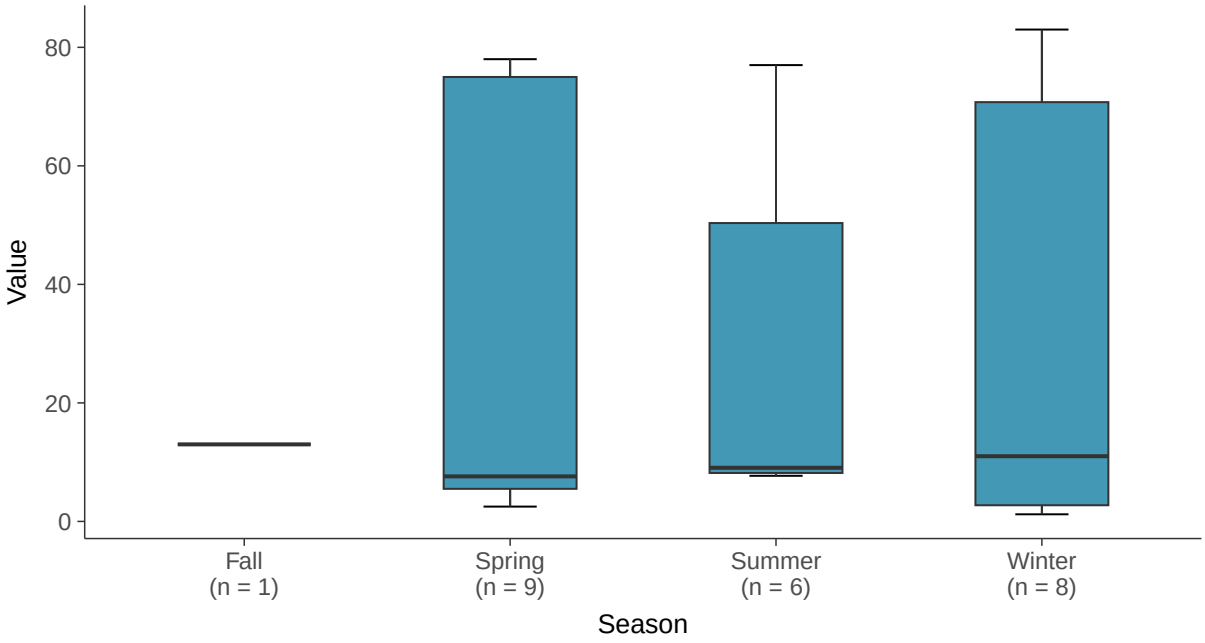
Boxplot

Iron, MW-27, MW-33, MW-34 (mg/L)



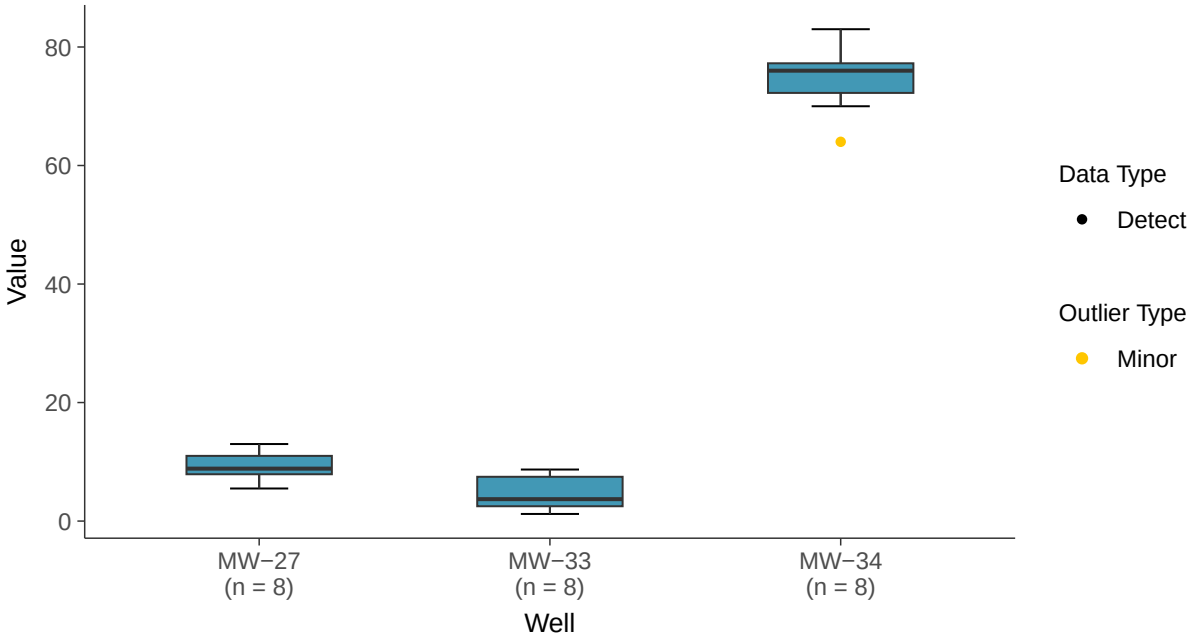
Boxplot by Season

Iron, MW-27, MW-33, MW-34 (mg/L)



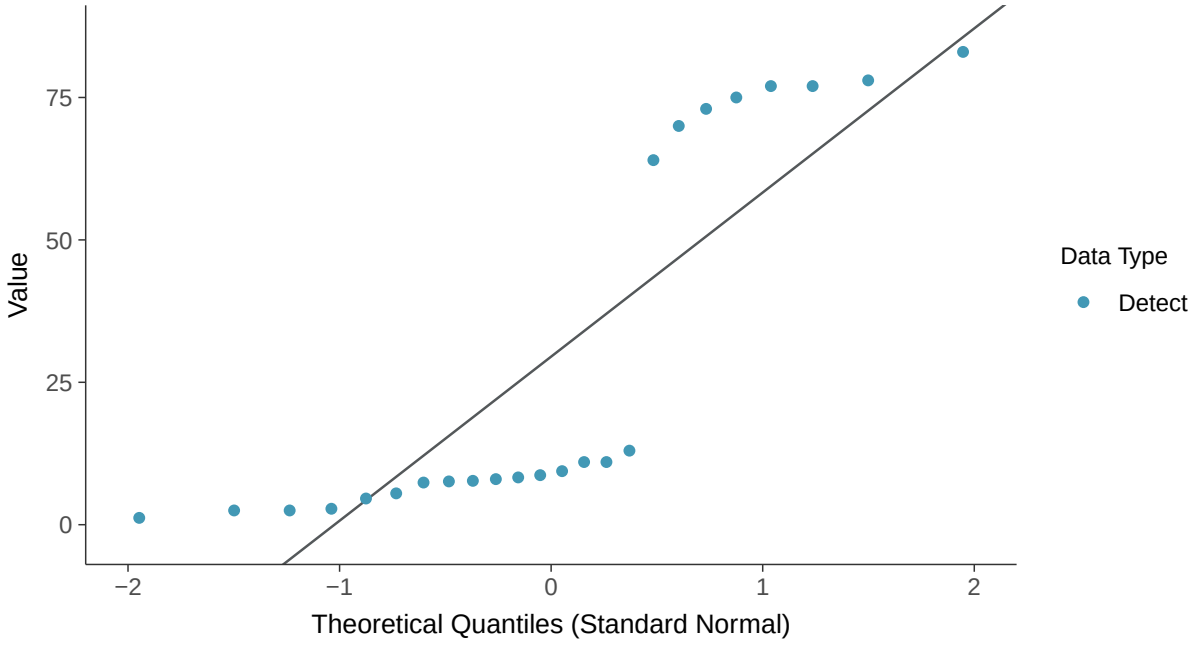
Boxplot by Well

Iron, MW-27, MW-33, MW-34 (mg/L)



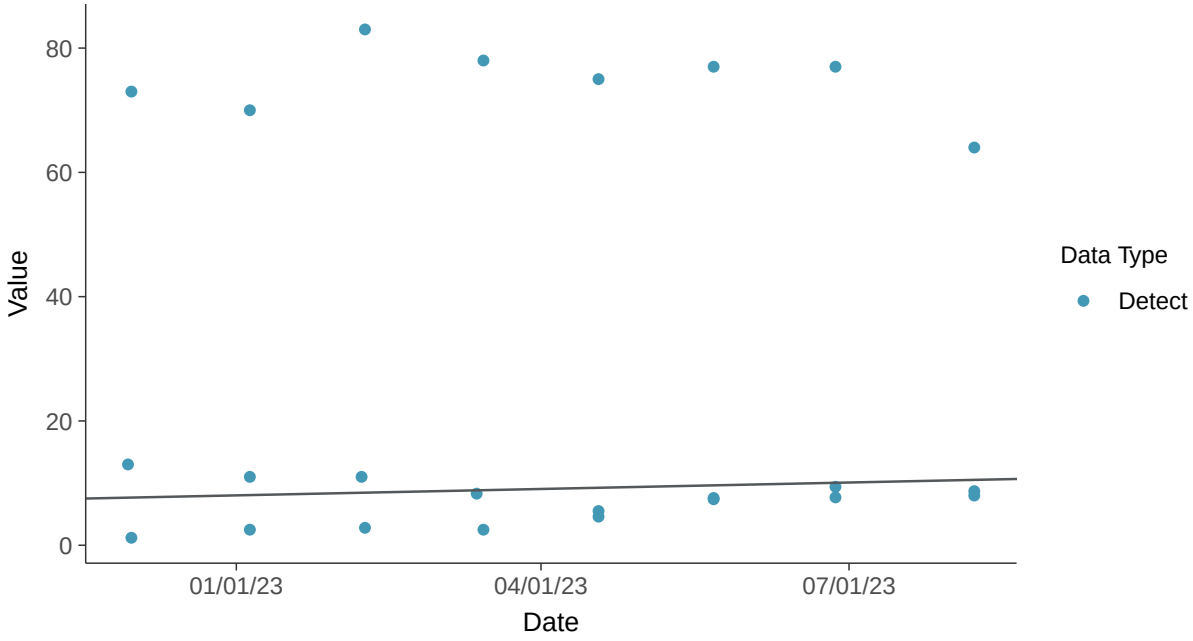
Normal Q-Q plot

Iron, MW-27, MW-33, MW-34 (mg/L)



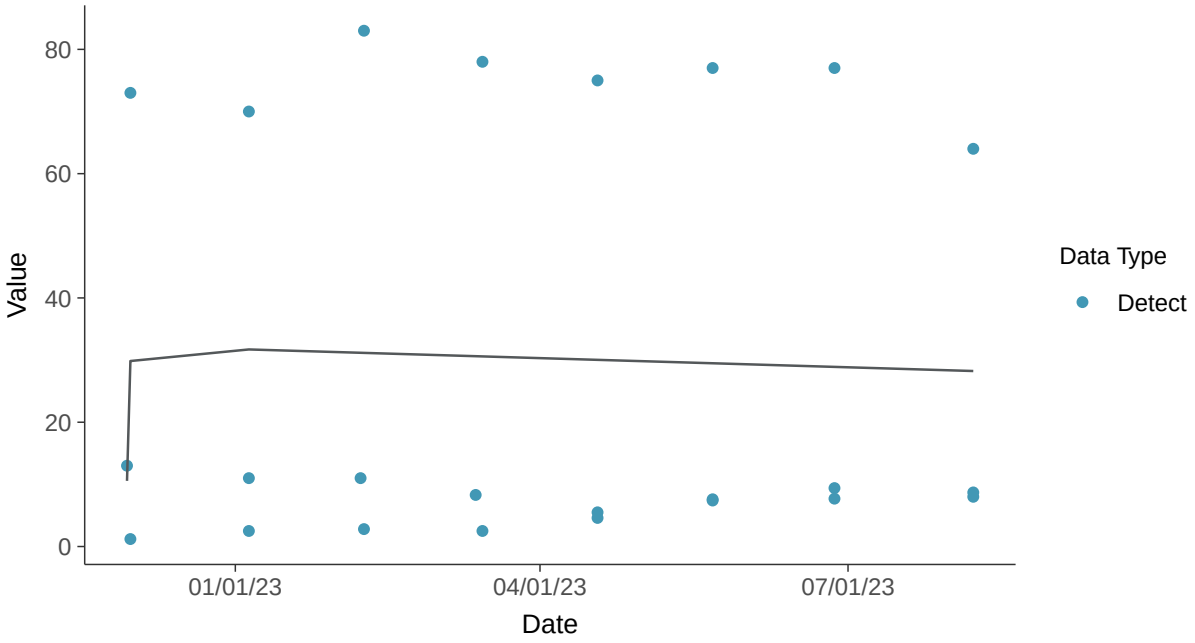
Trend Regression: Mann-Kendall/Theil-Sen Estimate

Iron, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Iron, MW-27, MW-33, MW-34 (mg/L)

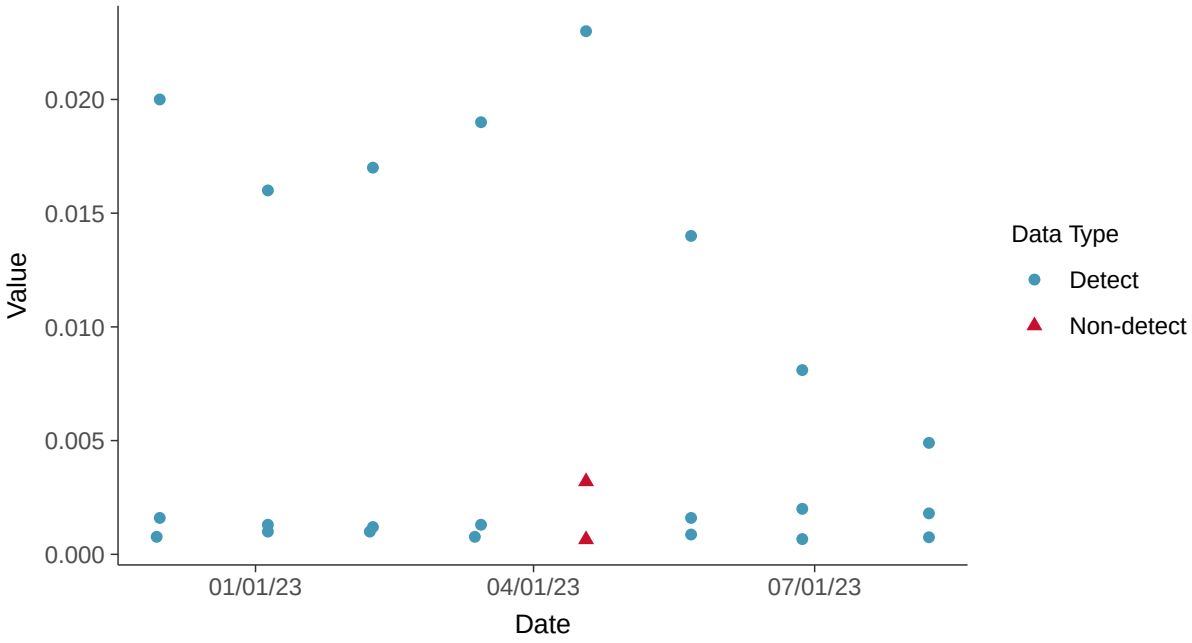


Part 115: Nickel, MW-27, MW-33, MW-34

ID: 6_119

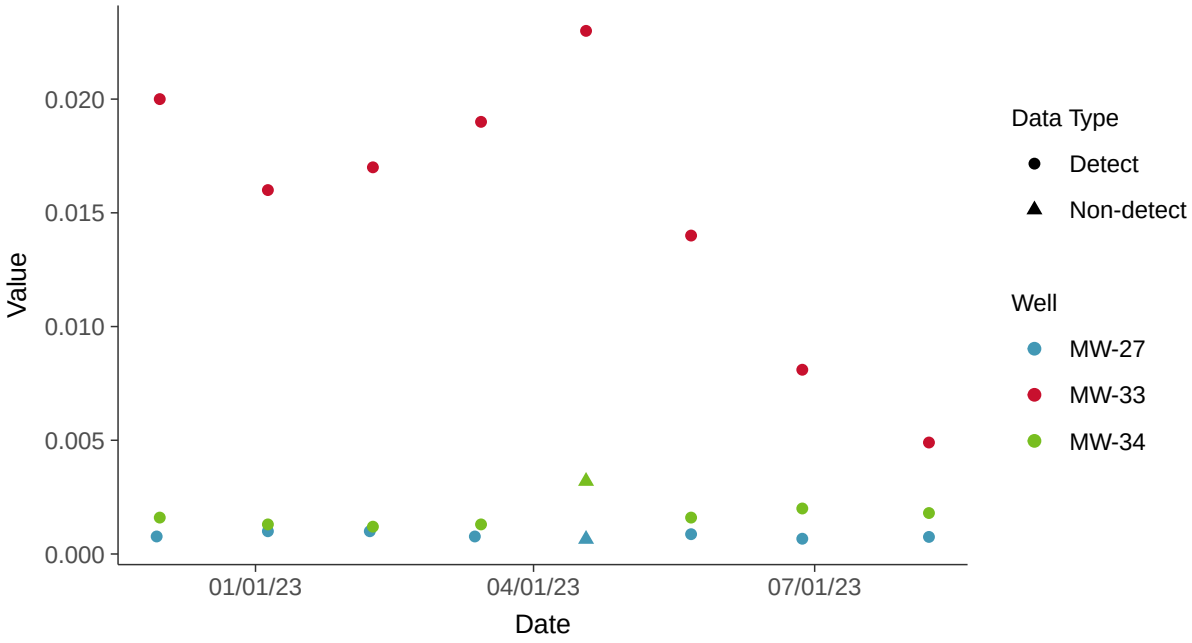
Scatter Plot

Nickel, MW-27, MW-33, MW-34 (mg/L)



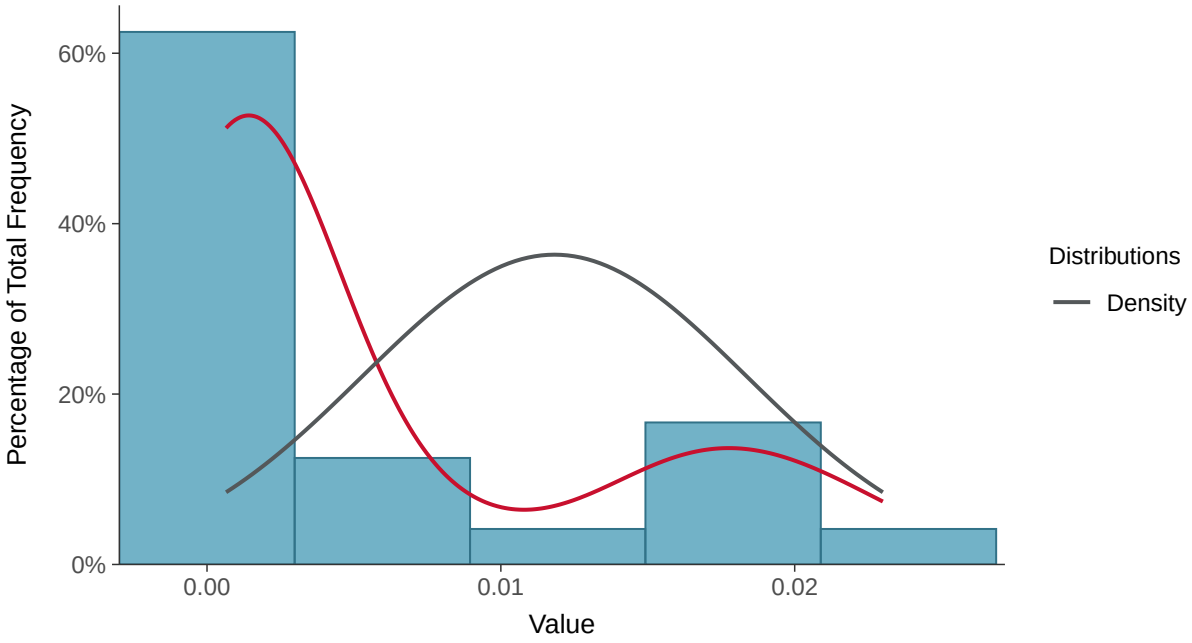
Scatter Plot by Well

Nickel, MW-27, MW-33, MW-34 (mg/L)



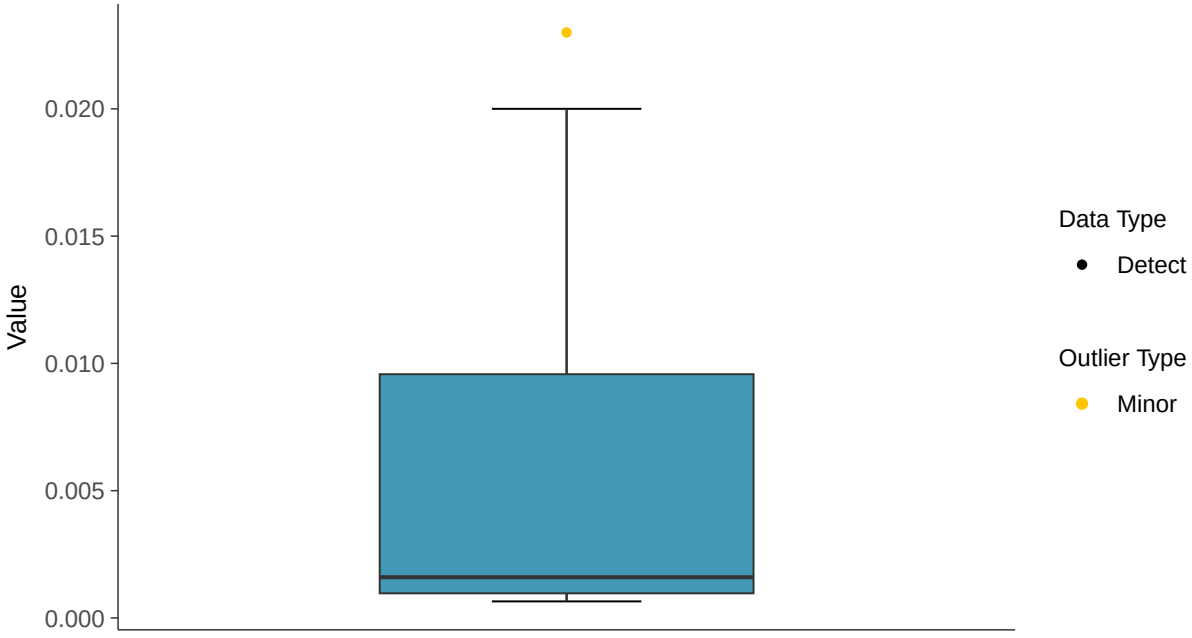
Histogram

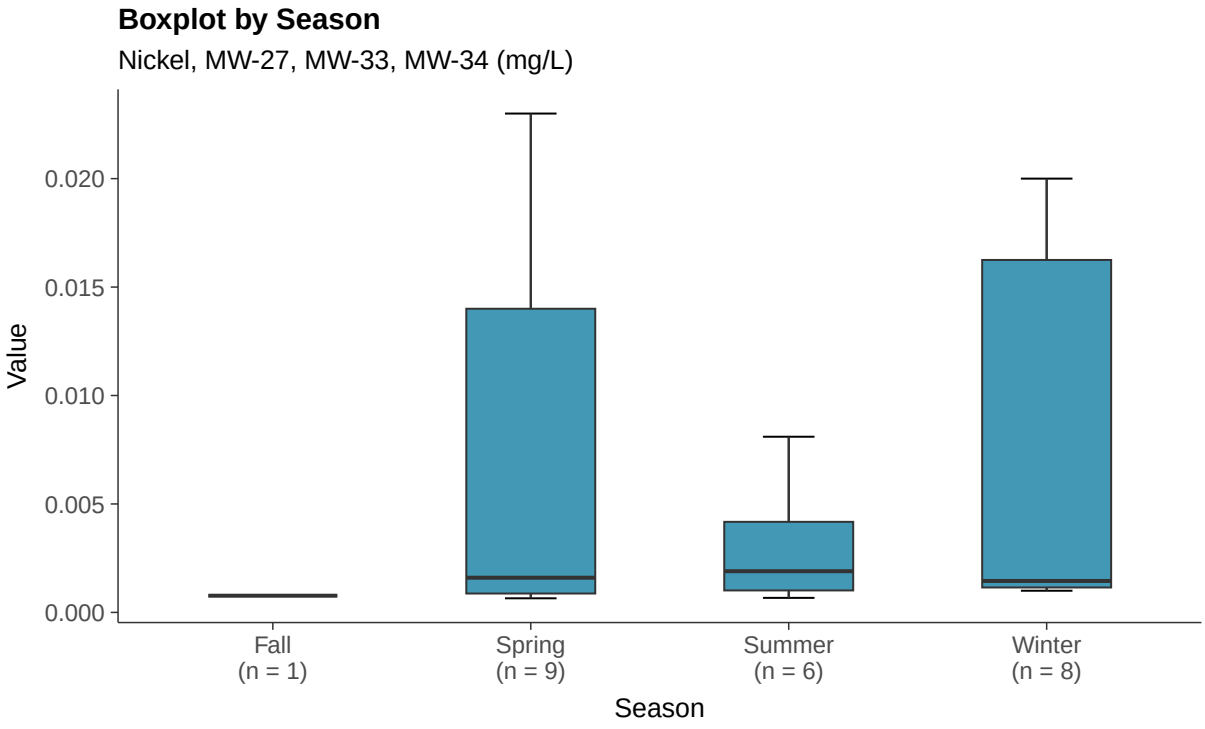
Nickel, MW-27, MW-33, MW-34 (mg/L)

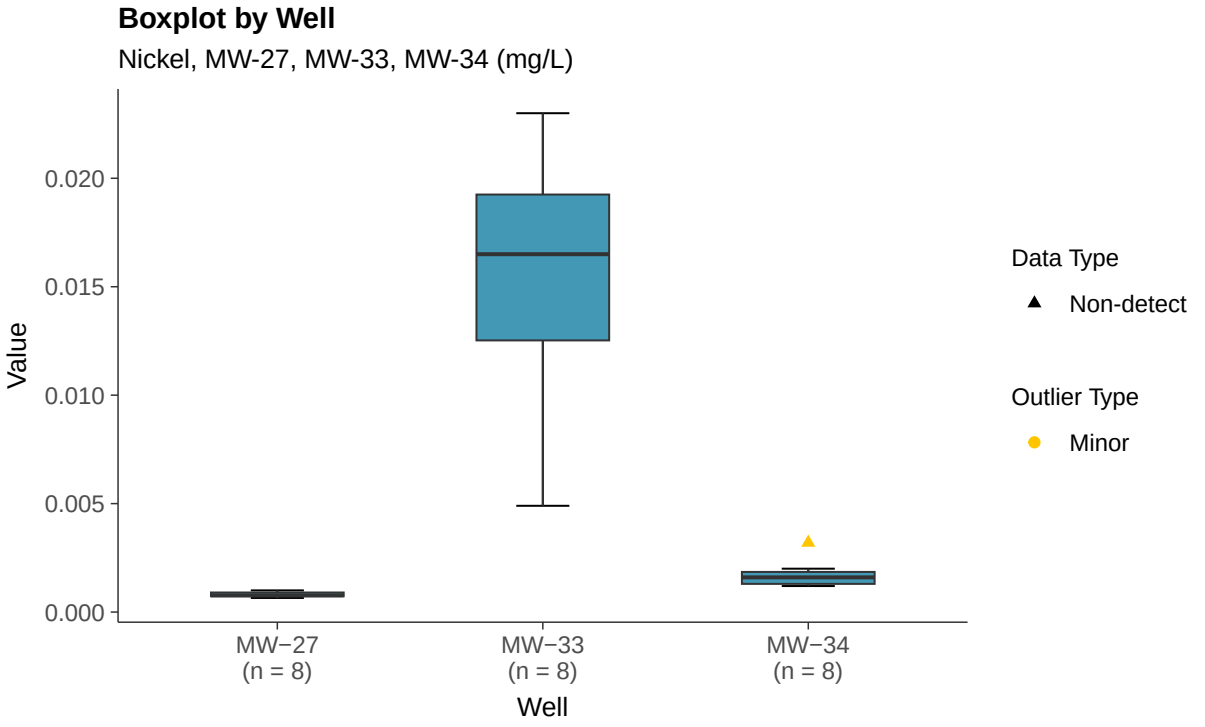


Boxplot

Nickel, MW-27, MW-33, MW-34 (mg/L)

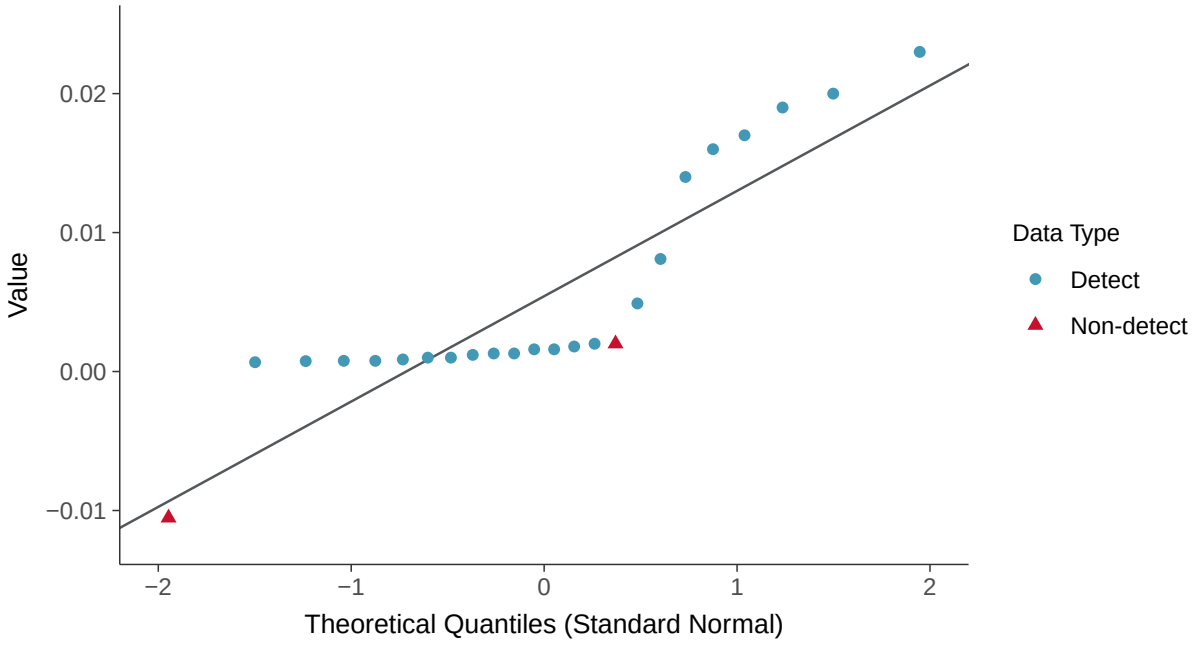



Boxplot by Season
Nickel, MW-27, MW-33, MW-34 (mg/L)
Value
0.020
0.015
0.010
0.005
0.000
Fall
(n = 1)
Spring
(n = 9)
Summer
(n = 6)
Winter
(n = 8)
Season


Boxplot by Well
Nickel, MW-27, MW-33, MW-34 (mg/L)
Value
0.020
0.015
0.010
0.005
0.000
MW−27
(n = 8)
MW−33
(n = 8)
MW−34
(n = 8)
Well
Data Type
Non-detect
Outlier Type
Minor

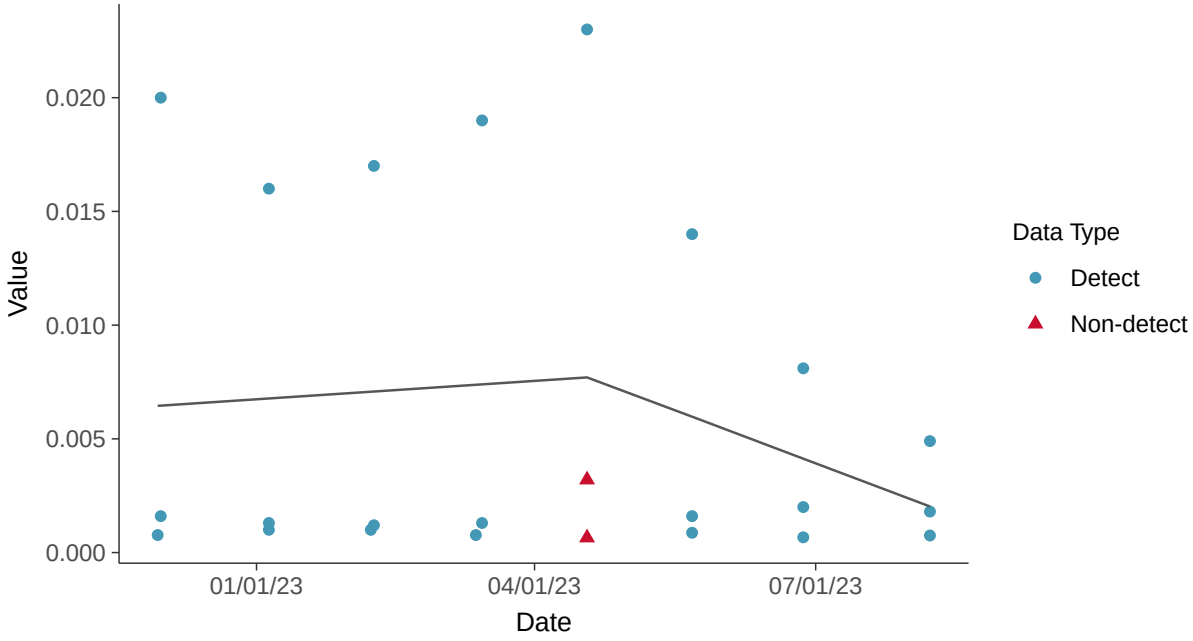
Normal Q-Q plot using ROS Imputed Estimates

Nickel, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Nickel, MW-27, MW-33, MW-34 (mg/L)

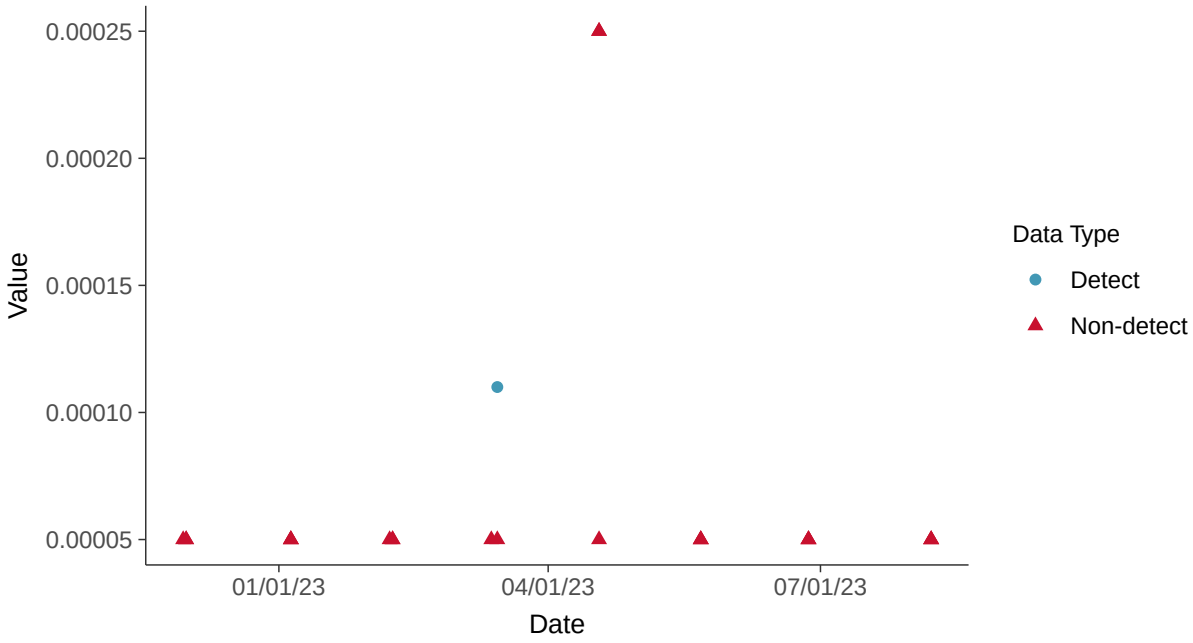


Part 115: Silver, MW-27, MW-33, MW-34

ID: 6_123

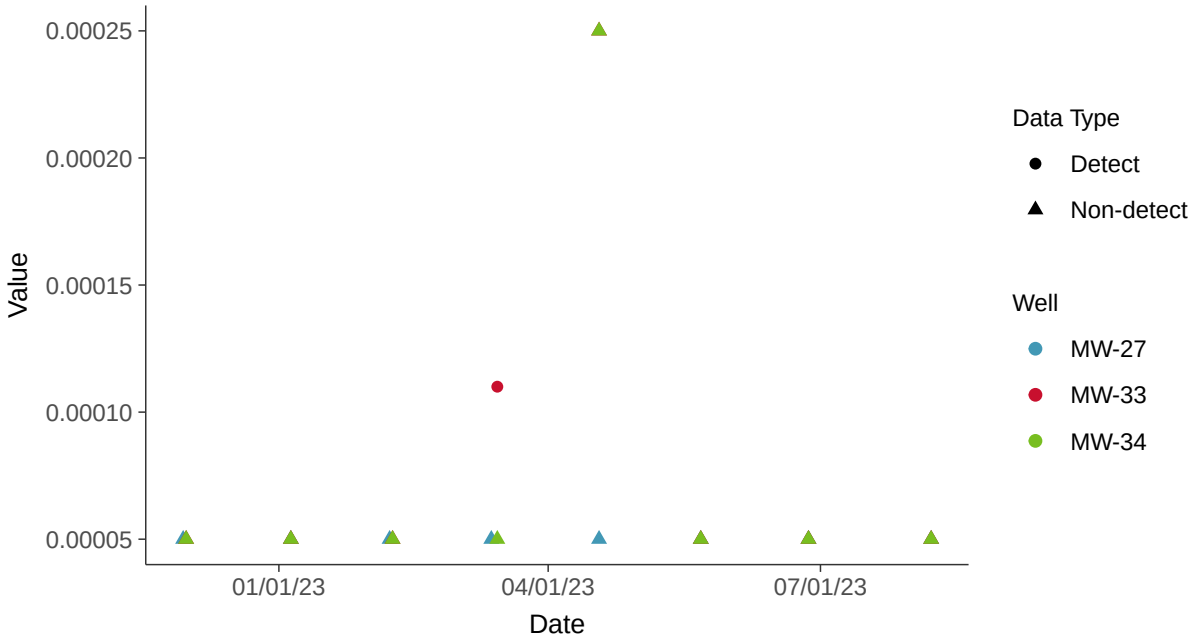
Scatter Plot

Silver, MW-27, MW-33, MW-34 (mg/L)



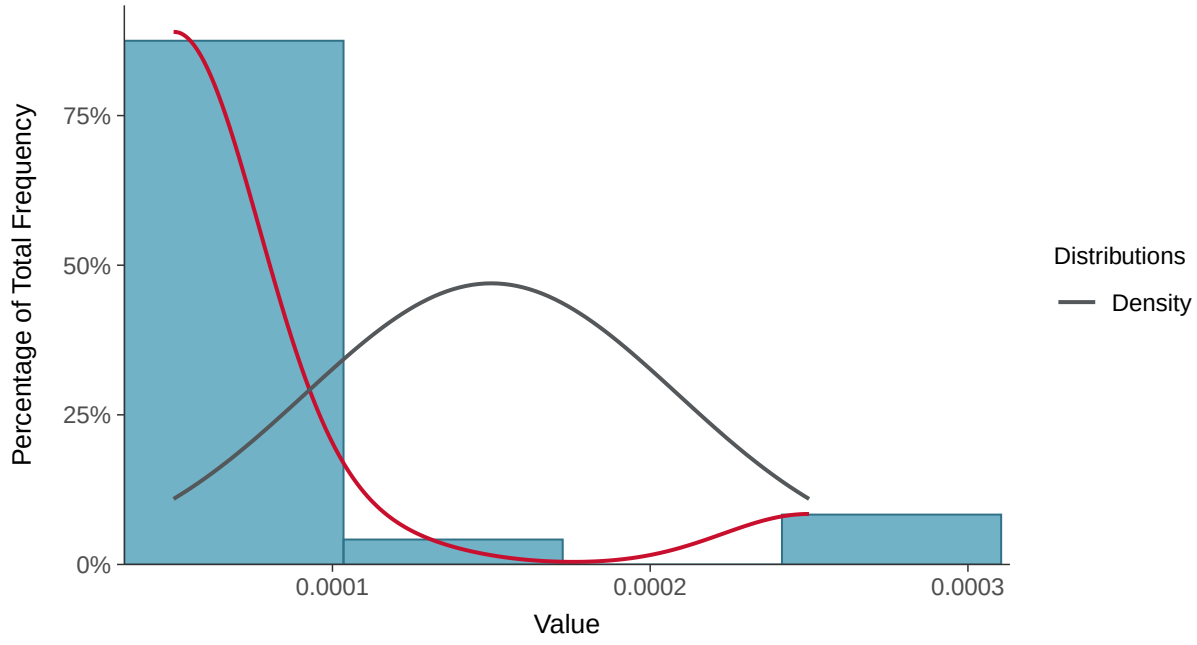
Scatter Plot by Well

Silver, MW-27, MW-33, MW-34 (mg/L)



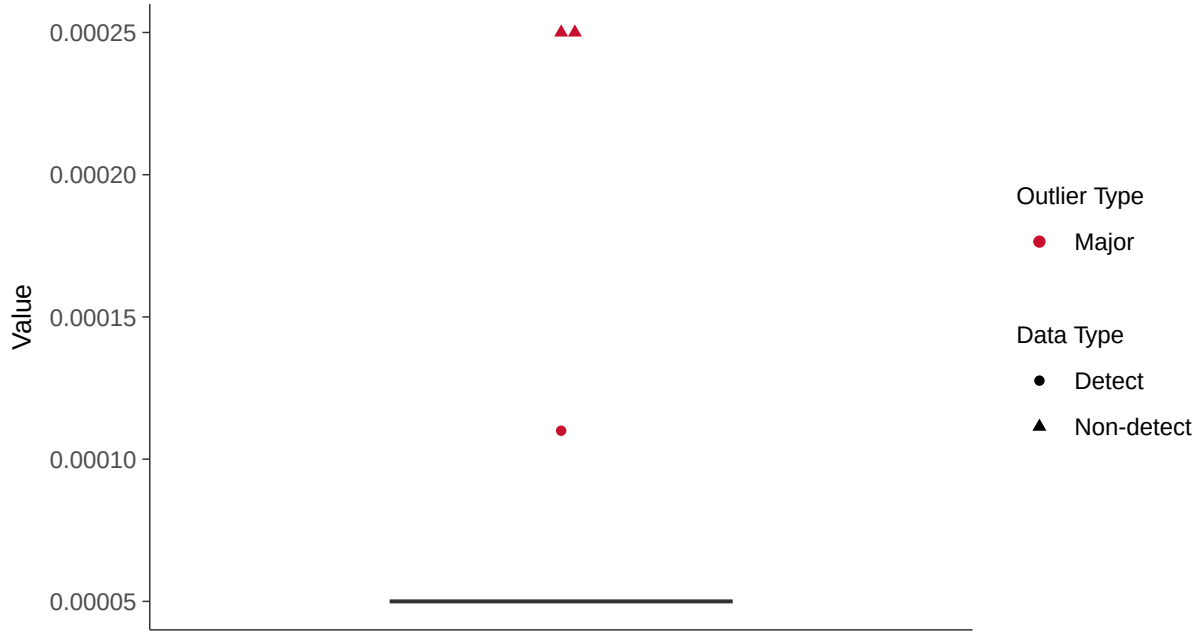
Histogram

Silver, MW-27, MW-33, MW-34 (mg/L)



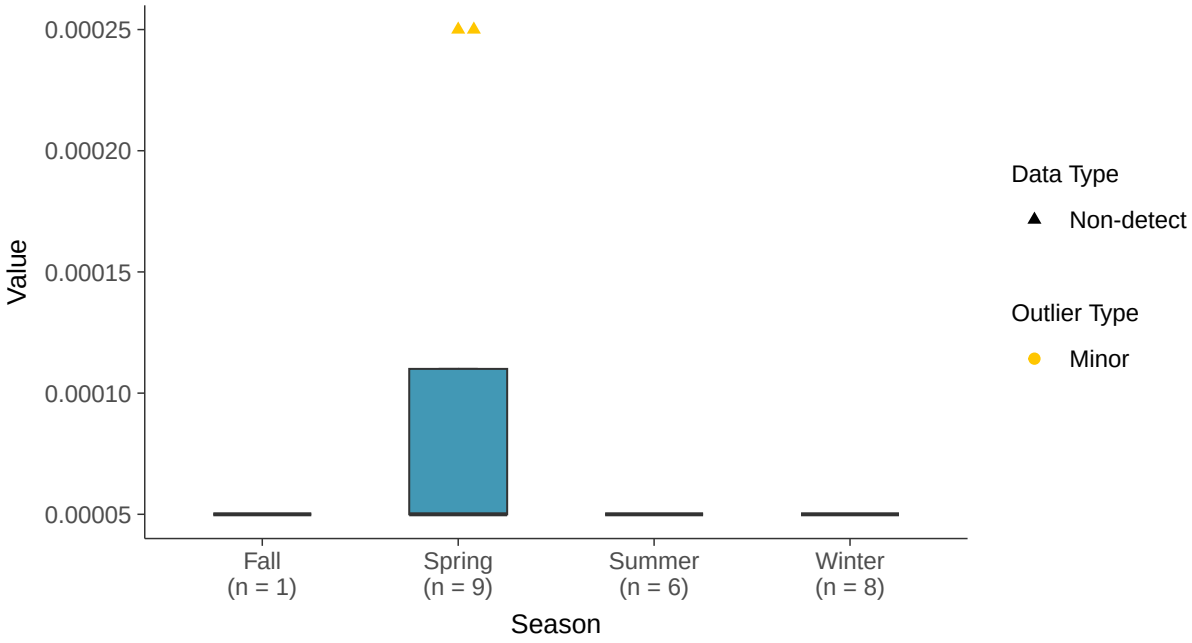
Boxplot

Silver, MW-27, MW-33, MW-34 (mg/L)



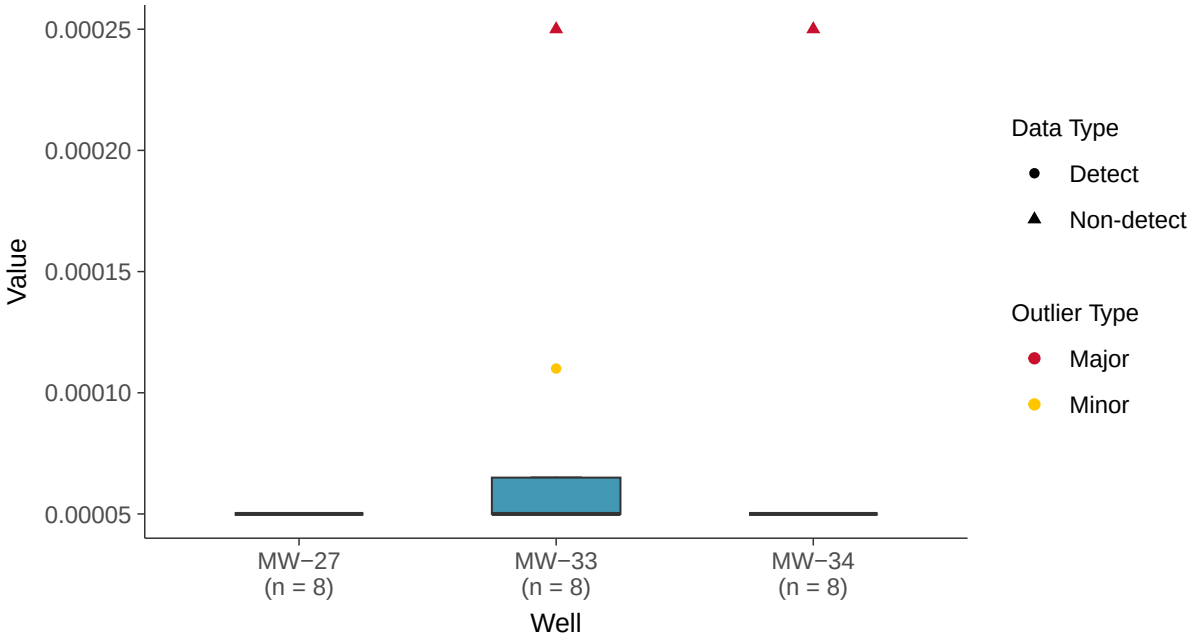
Boxplot by Season

Silver, MW-27, MW-33, MW-34 (mg/L)



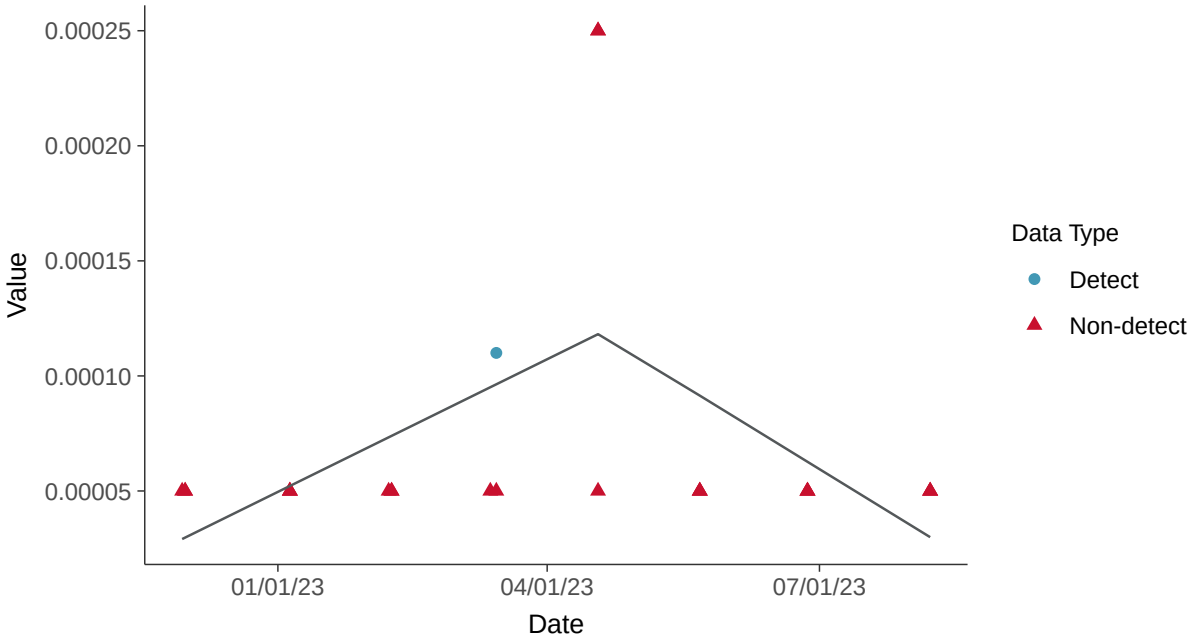
Boxplot by Well

Silver, MW-27, MW-33, MW-34 (mg/L)



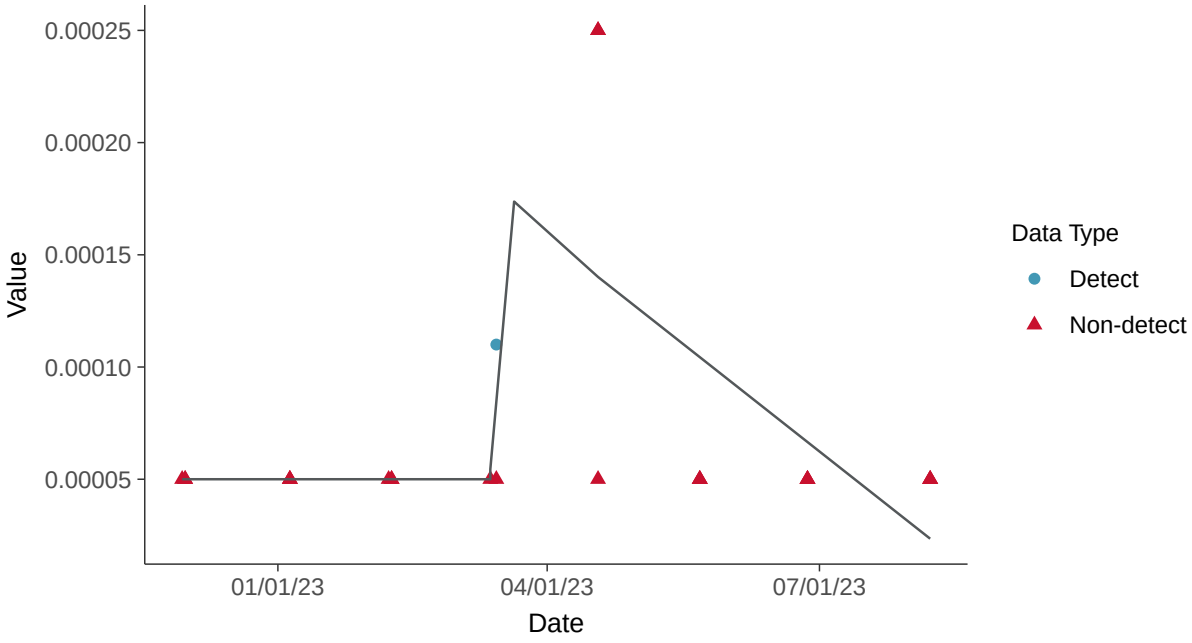
Trend Regression: Piecewise Linear-Linear

Silver, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Silver, MW-27, MW-33, MW-34 (mg/L)

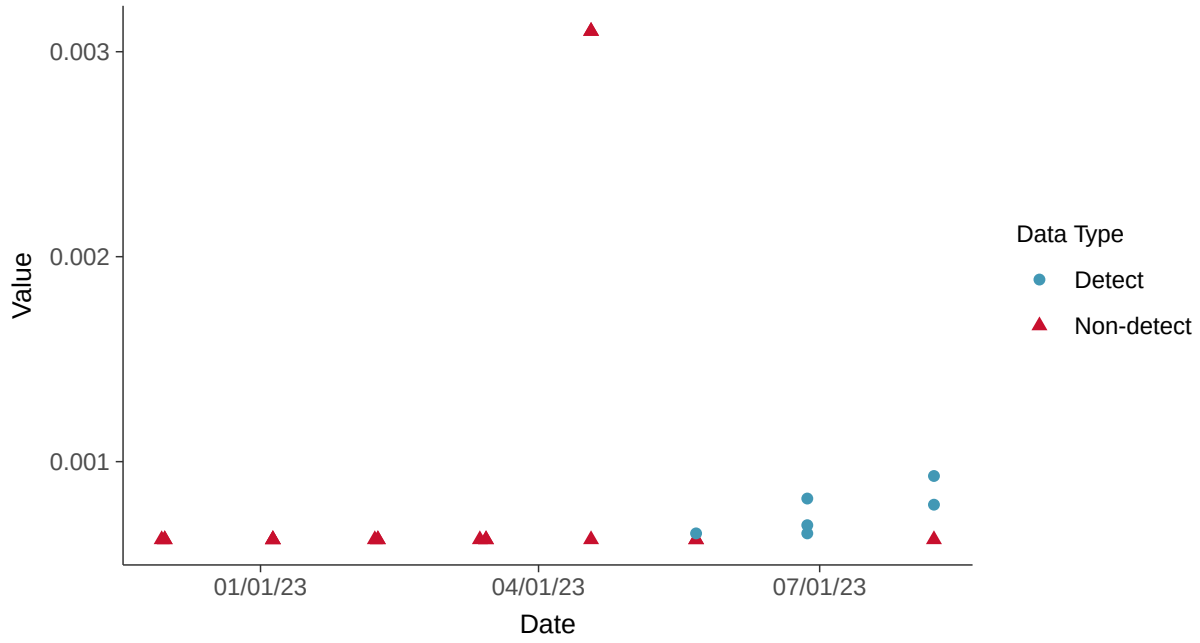


Part 115: Vanadium, MW-27, MW-33, MW-34

ID: 6_129

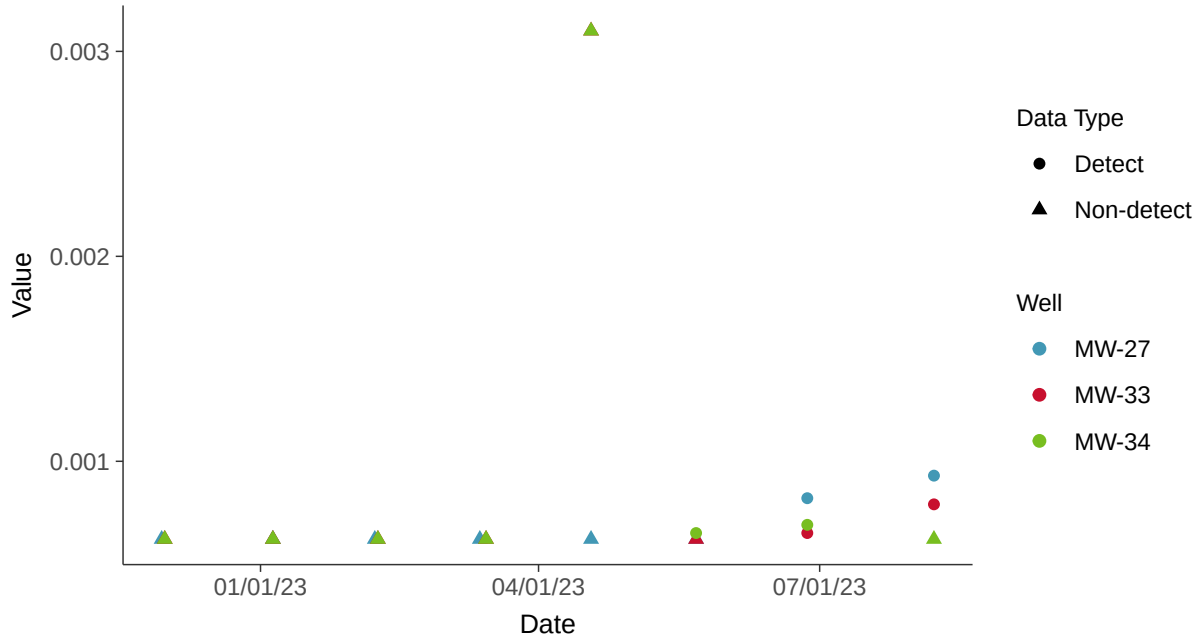
Scatter Plot

Vanadium, MW-27, MW-33, MW-34 (mg/L)



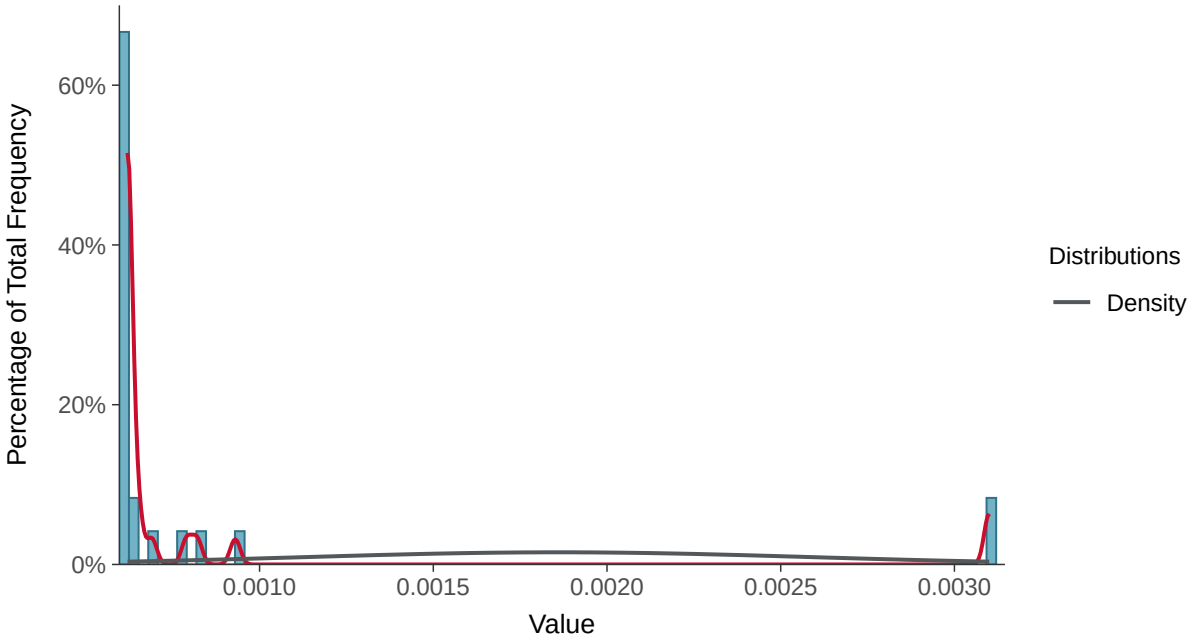
Scatter Plot by Well

Vanadium, MW-27, MW-33, MW-34 (mg/L)



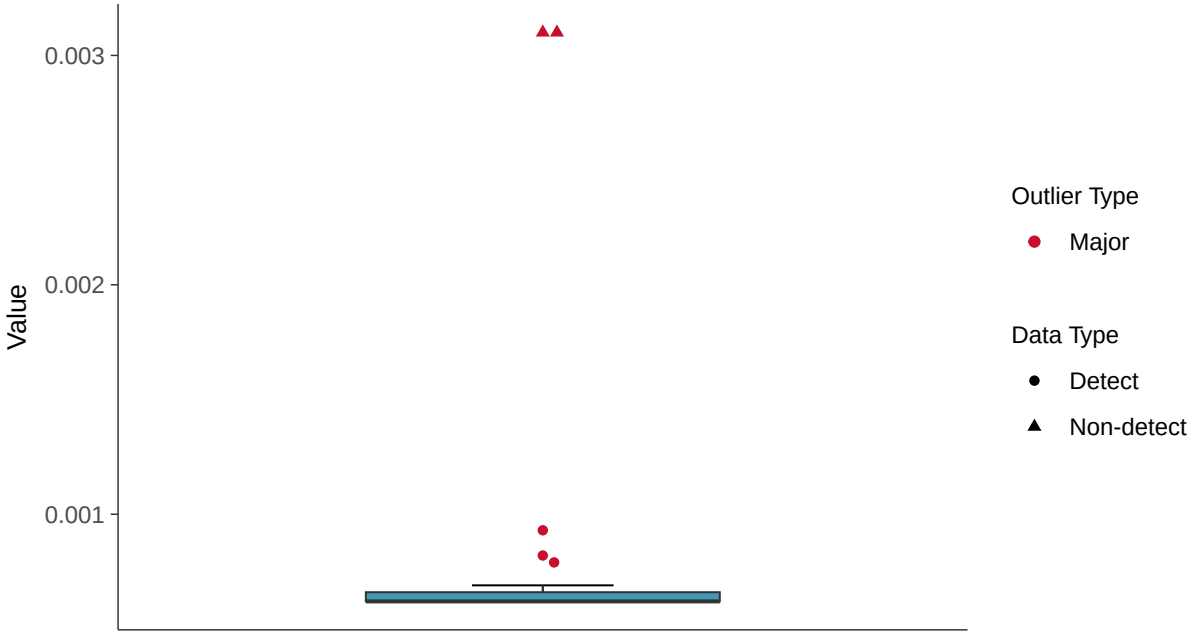
Histogram

Vanadium, MW-27, MW-33, MW-34 (mg/L)



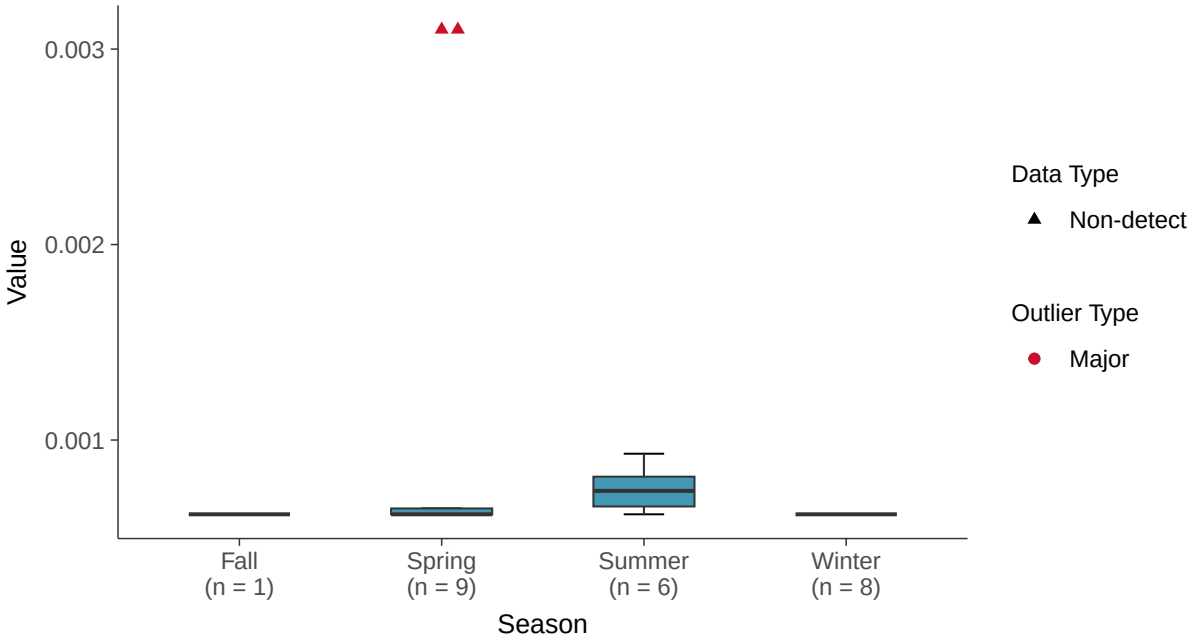
Boxplot

Vanadium, MW-27, MW-33, MW-34 (mg/L)



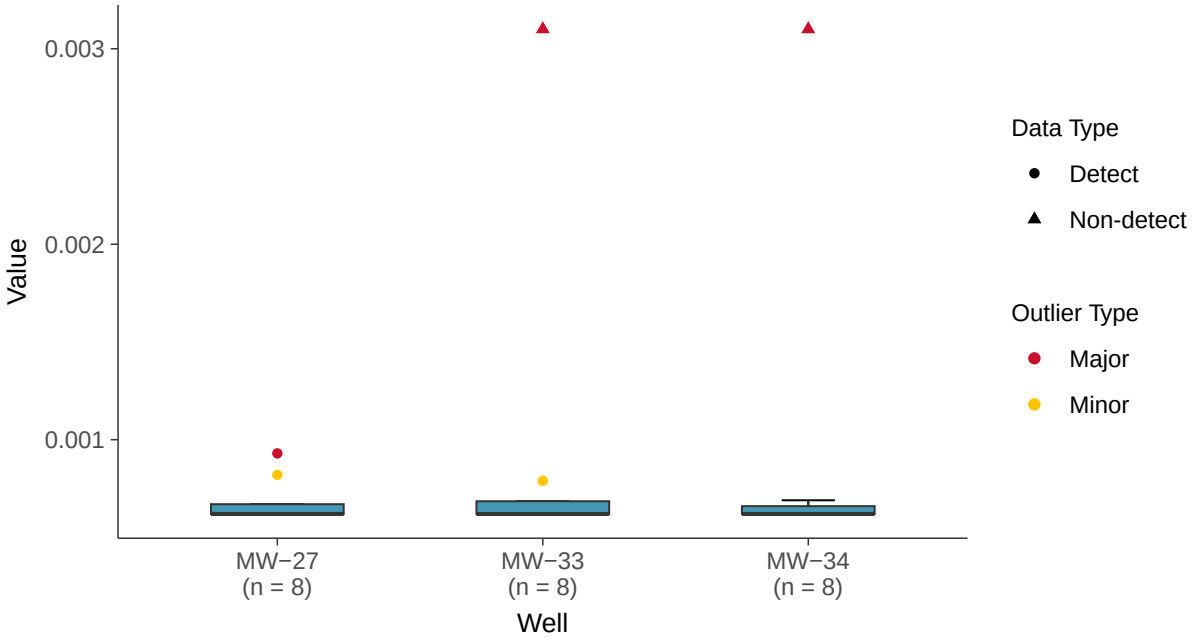
Boxplot by Season

Vanadium, MW-27, MW-33, MW-34 (mg/L)



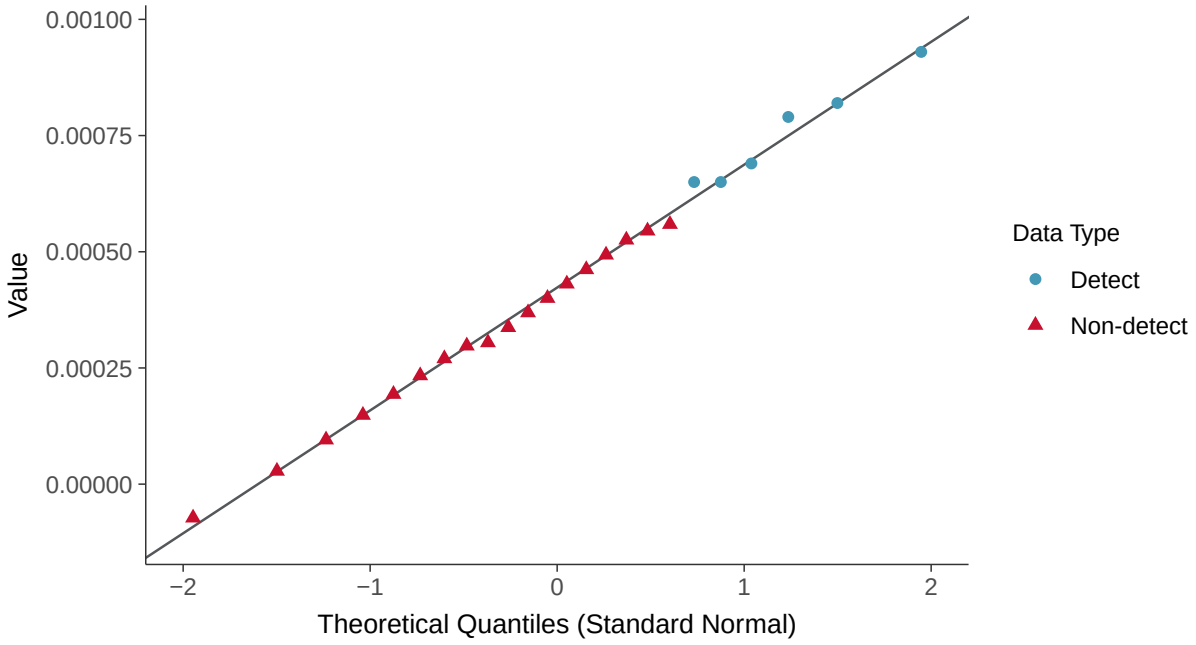
Boxplot by Well

Vanadium, MW-27, MW-33, MW-34 (mg/L)



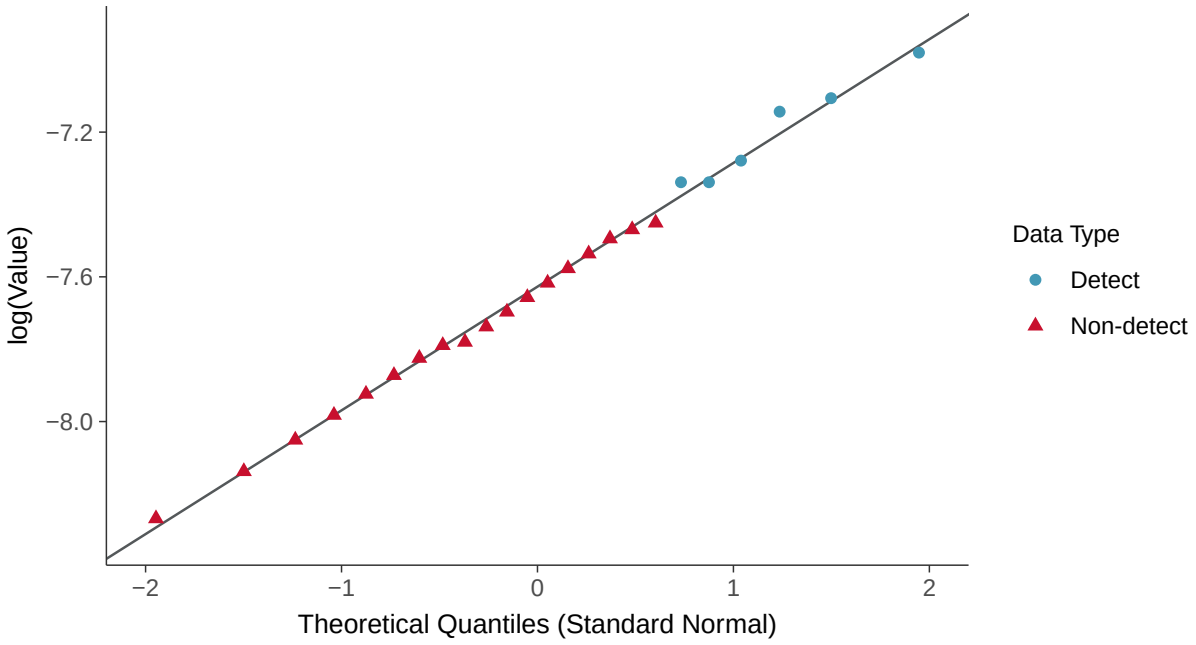
Normal Q-Q plot using ROS Imputed Estimates

Vanadium, MW-27, MW-33, MW-34 (mg/L)



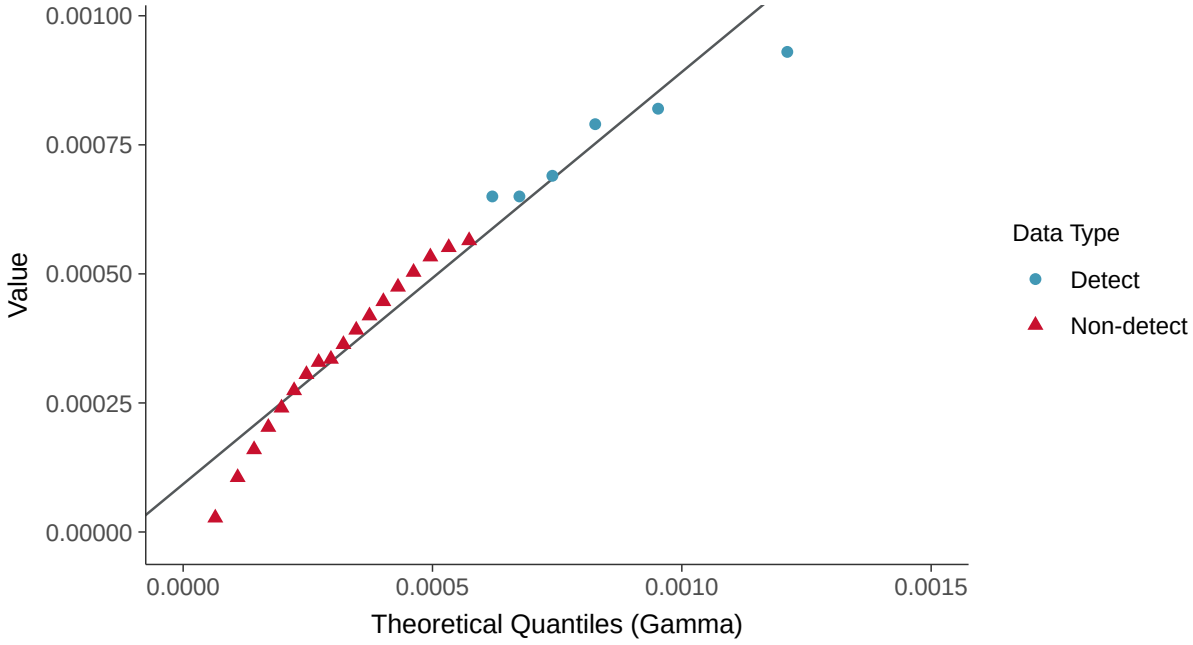
Lognormal Q-Q plot using ROS Imputed Estimates

Vanadium, MW-27, MW-33, MW-34 (mg/L)



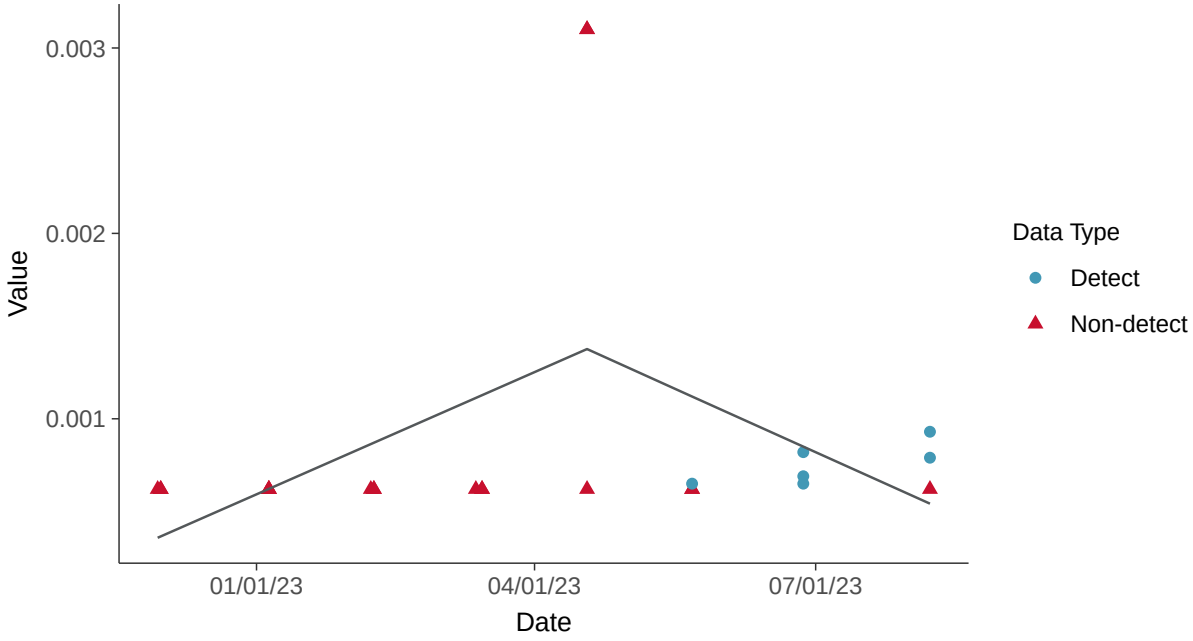
Gamma Q-Q plot using ROS Imputed Estimates

Vanadium, MW-27, MW-33, MW-34 (mg/L)



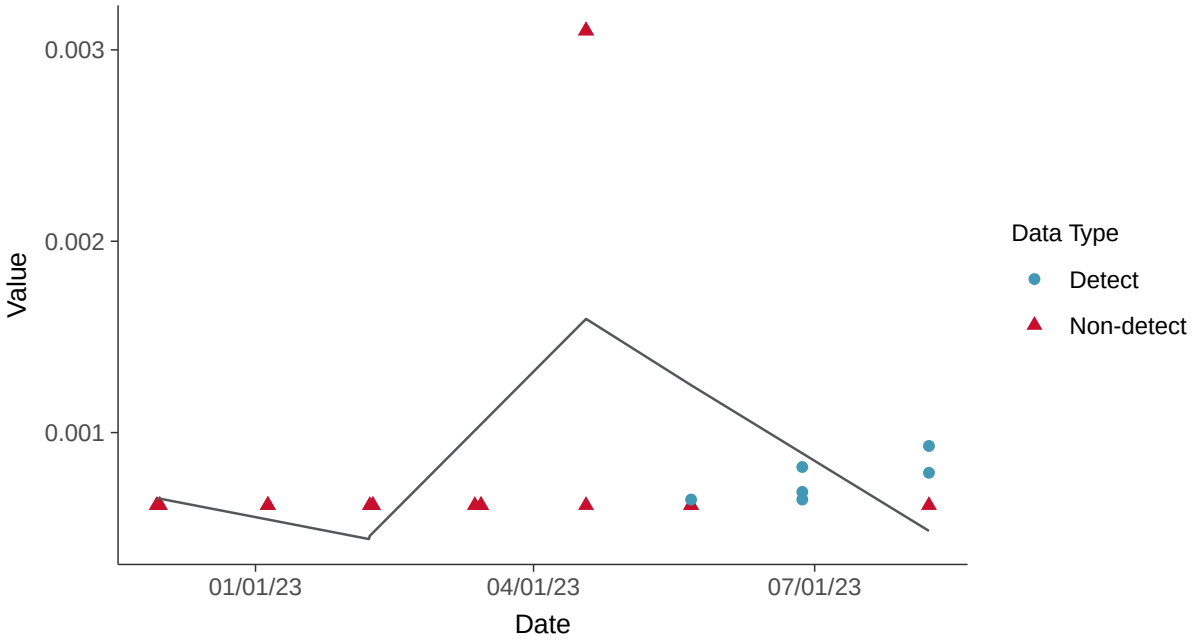
Trend Regression: Piecewise Linear-Linear

Vanadium, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Vanadium, MW-27, MW-33, MW-34 (mg/L)

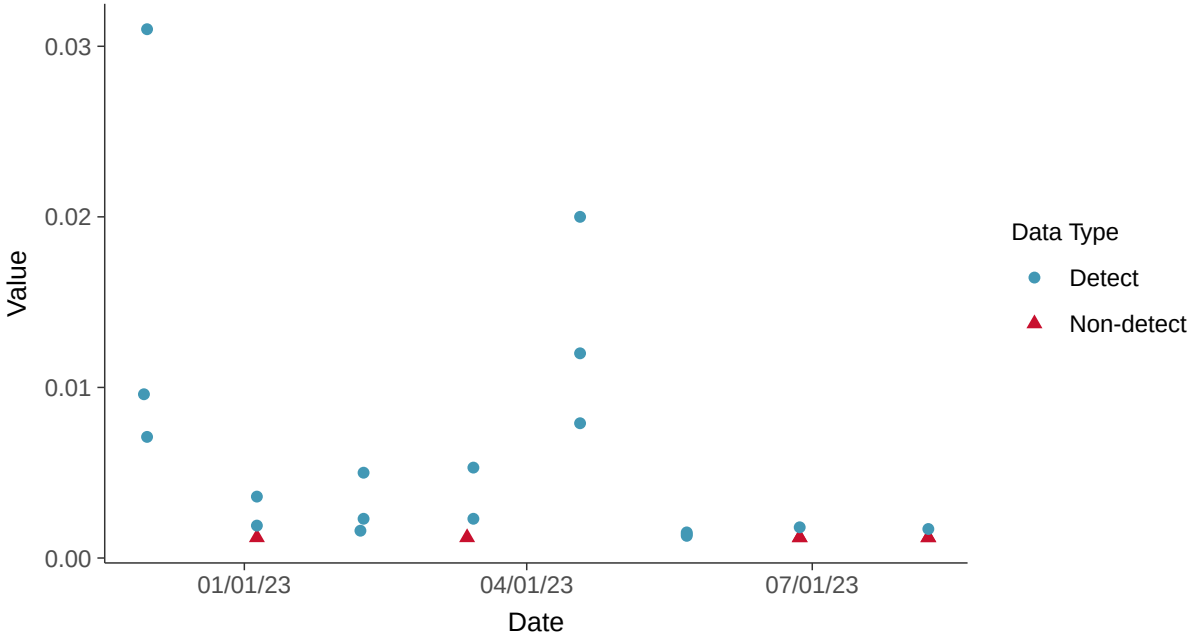


Part 115: Zinc, MW-27, MW-33, MW-34

ID: 6_130

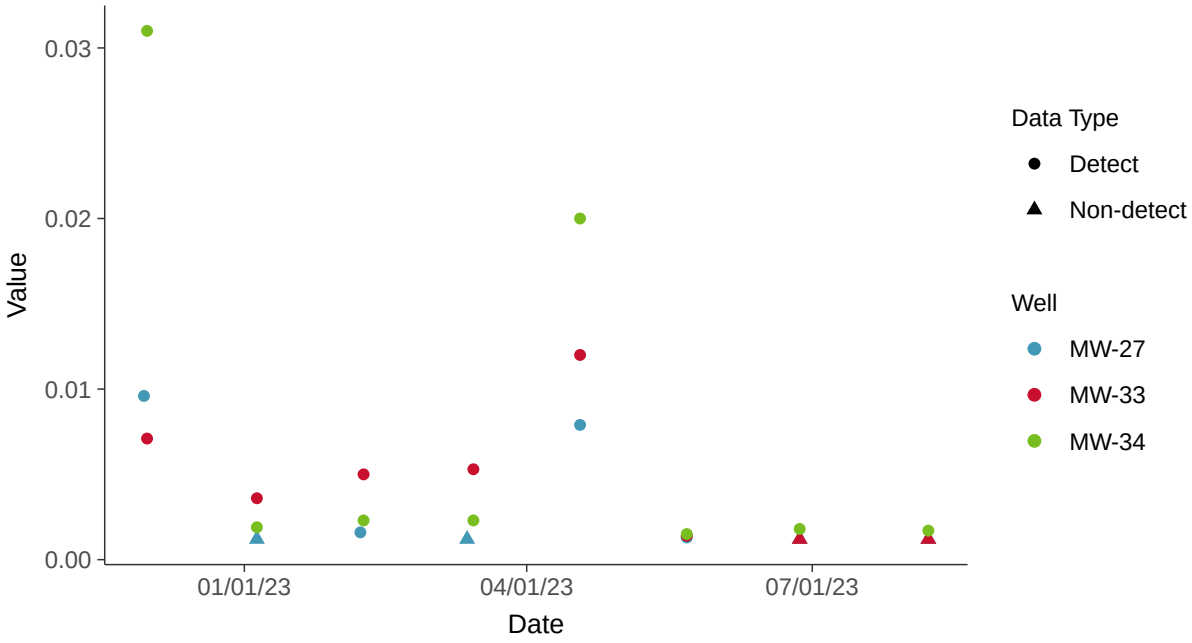
Scatter Plot

Zinc, MW-27, MW-33, MW-34 (mg/L)



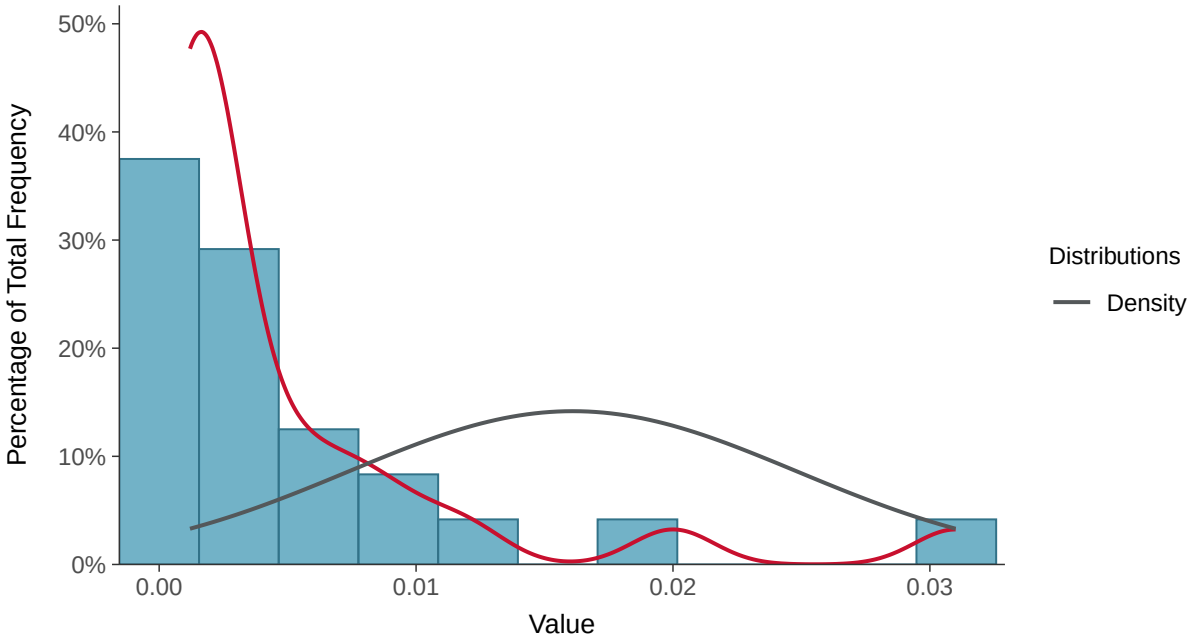
Scatter Plot by Well

Zinc, MW-27, MW-33, MW-34 (mg/L)



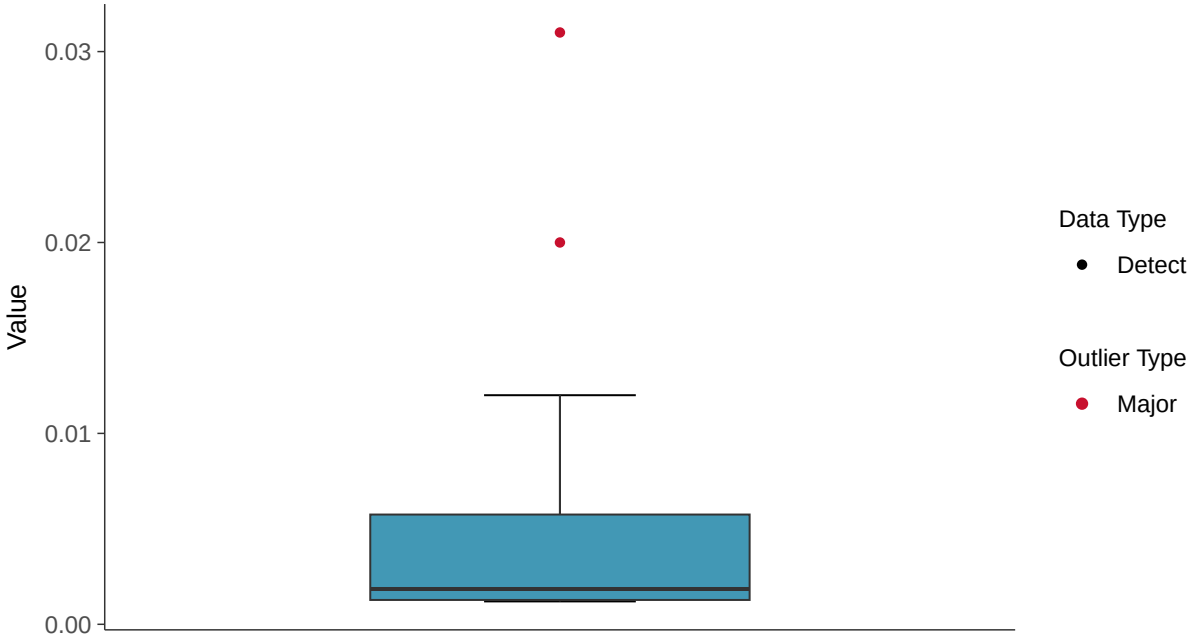
Histogram

Zinc, MW-27, MW-33, MW-34 (mg/L)



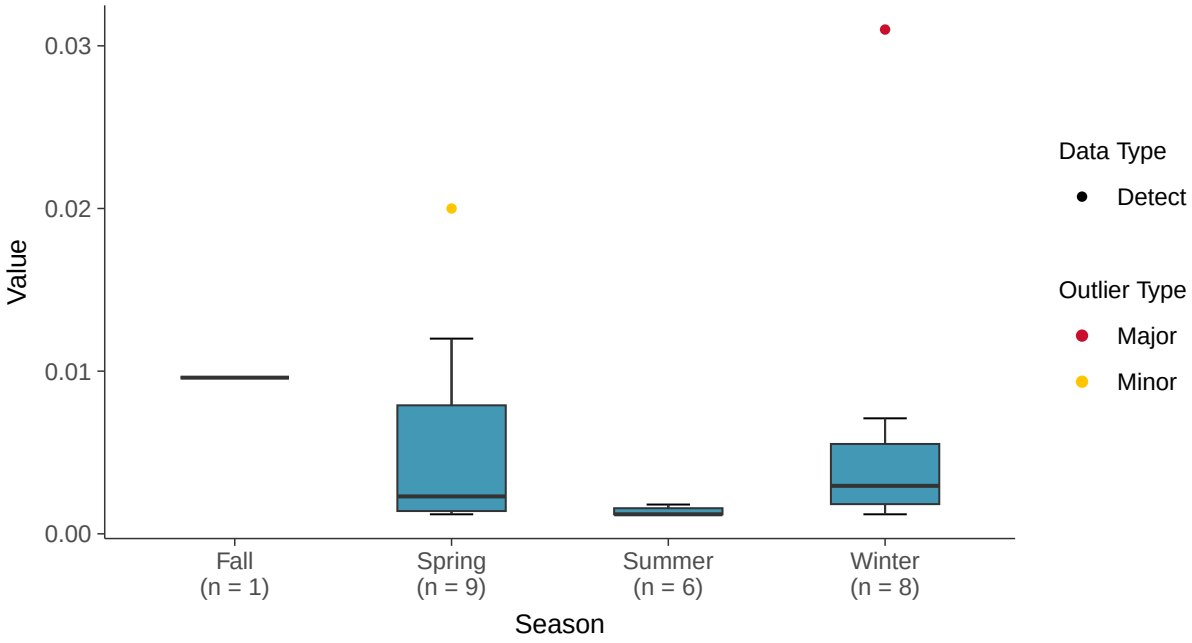
Boxplot

Zinc, MW-27, MW-33, MW-34 (mg/L)



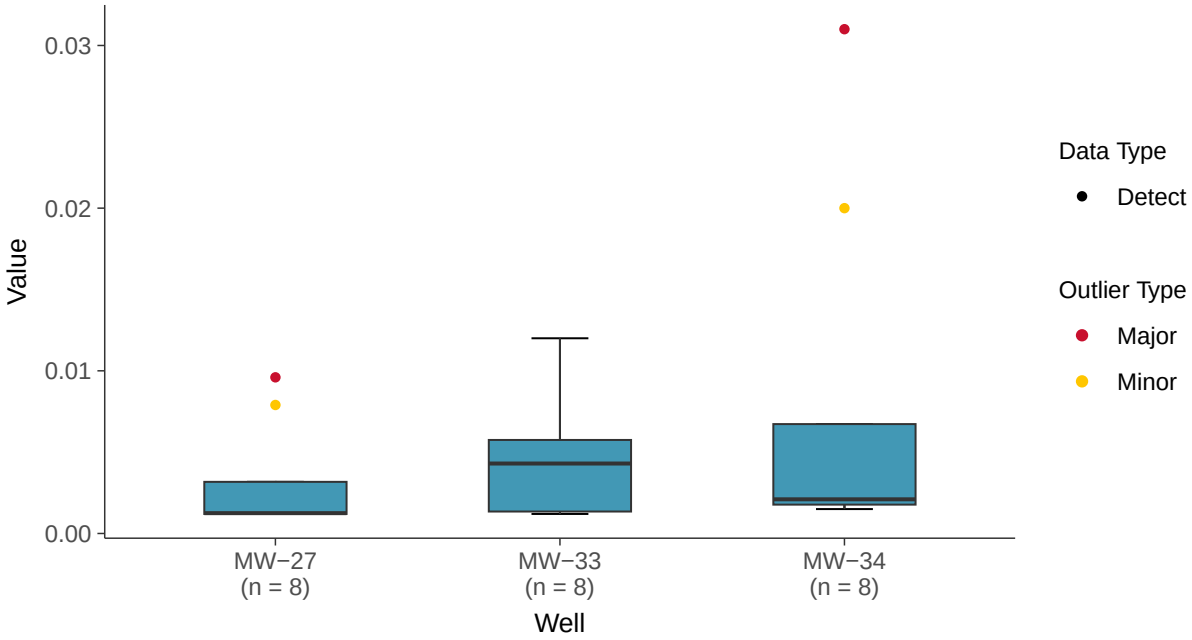
Boxplot by Season

Zinc, MW-27, MW-33, MW-34 (mg/L)



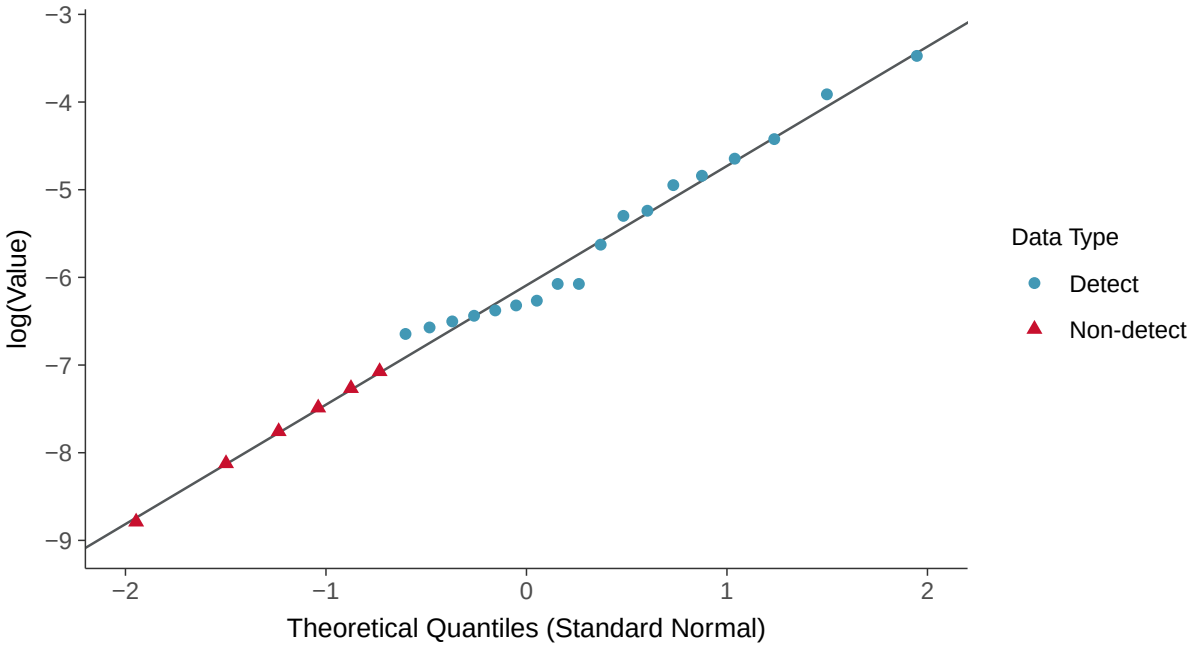
Boxplot by Well

Zinc, MW-27, MW-33, MW-34 (mg/L)



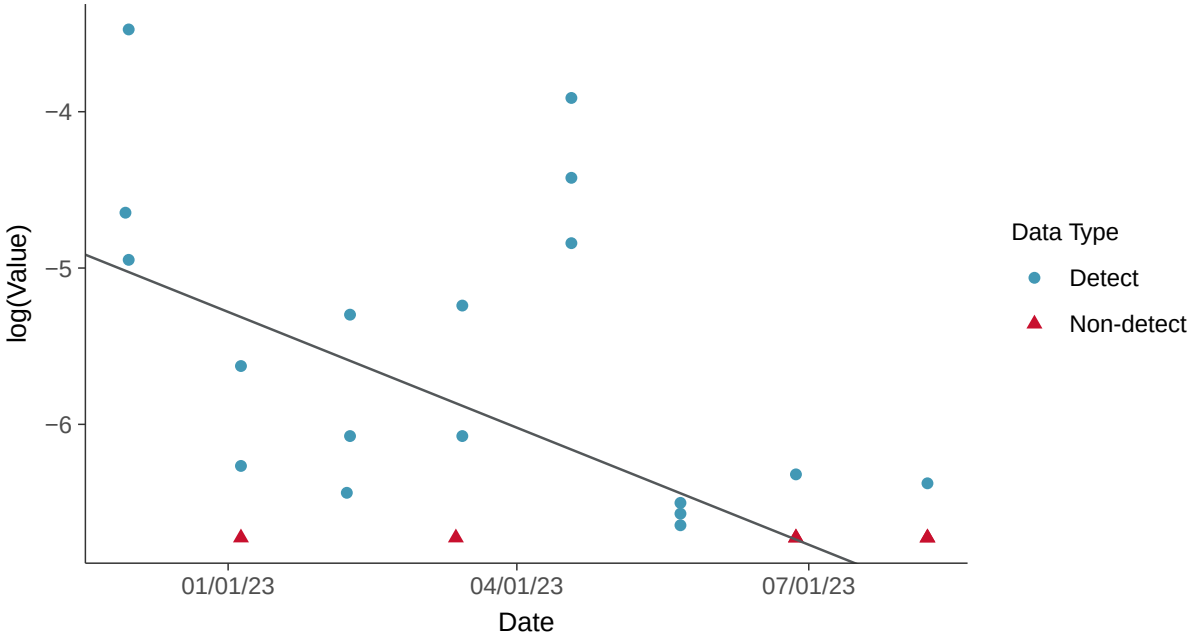
Lognormal Q-Q plot using ROS Imputed Estimates

Zinc, MW-27, MW-33, MW-34 (mg/L)



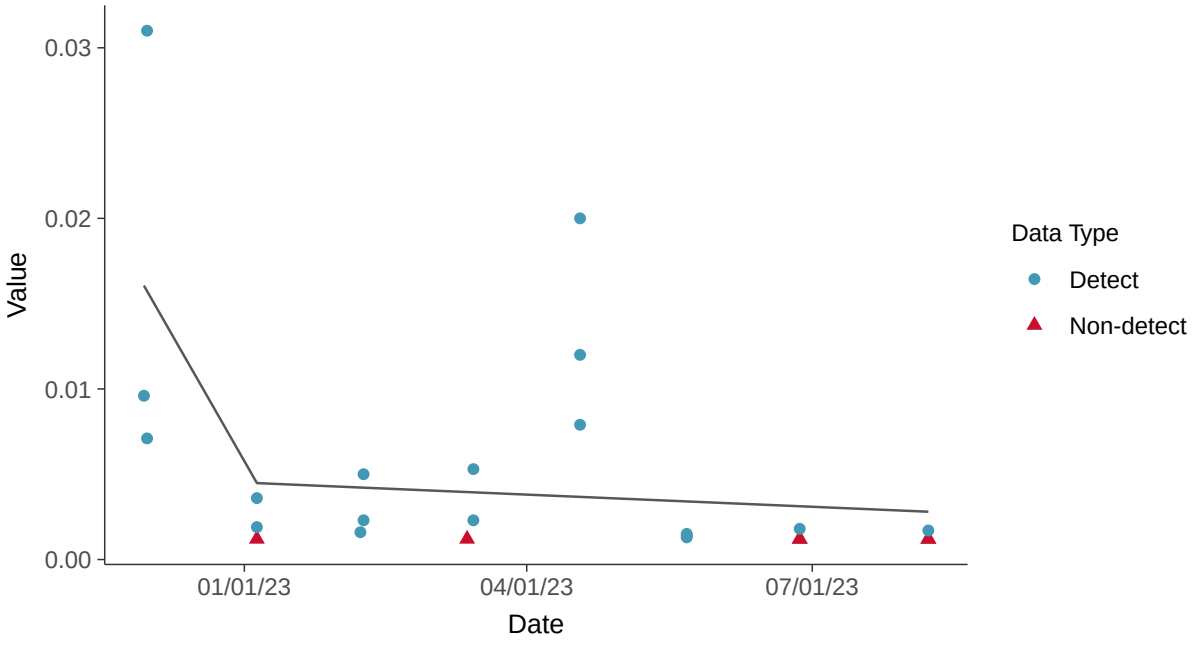
Trend Regression: Lognormal MLE

Zinc, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear

Zinc, MW-27, MW-33, MW-34 (mg/L)



Trend Regression: Piecewise Linear-Linear-Linear

Zinc, MW-27, MW-33, MW-34 (mg/L)