

Data Release Report: 2003 Water Quality Data, Denali National Park and Preserve and Wrangell - St. Elias National Park and Preserve, Alaska

National Park Service

Central Alaska Inventory and Monitoring Program

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April 02, 2026

Introduction

This Data Release Report describes physical and chemical water quality observations collected by the National Park Service (NPS) from 39 sites in Wrangell - St. Elias National Park and Preserve (WRST) and Denali National Park and Preserve (DENA) in Alaska from May 21 to September 08, 2003.

Methods

Water quality data were collected from 8 sites in Wrangell - St. Elias National Park and Preserve and 31 sites in Denali National Park and Preserve in Alaska, from May 21 to September 08, 2003. Physical and chemical parameters, descriptions, instrumentation and methodologies are described in Tables 1 and 2, below. Table 1 lists the dataset's column names, units of measure and method report levels. Table 2 describes instrumentation and analytical methods.

Table 1. Data columns, structure and definition.

Column Name	Units	Method Report Level
Alkalinity (CaCO ₃) (mg/L) (Lamotte)	mg/L	4 mg/L
Alkalinity(CaCO ₃) (mg/L)	mg/L	4 mg/L
Aluminum (mg/L)	mg/L	0.06 mg/L
Aluminum (mg/L) Note		
Cadmium (mg/L)	mg/L	0.0002 mg/L
Cadmium (mg/L) Note		
Calcium (mg/L)	mg/L	0.05 mg/L
Chromium (mg/L)	mg/L	0.0005 mg/L
Chromium (mg/L) Note		

Column Name	Units	Method Report Level
Conductivity (mS/cm)	mS/cm	
Conductivity (mS/cm) Temp (C)	C	
Copper (mg/L)	mg/L	0.01 mg/L
Copper (mg/L) Note	mg/L	
Creek or River Gradient (%)	%	
Creek or River Gradient Text		
Date		
Dissolved Organic Carbon (mg/L)	mg/L	1 mg/L
Dissolved Organic Carbon (mg/L) Note		
Dissolved Oxygen (% O2)	%	
Dissolved Oxygen (% O2) Temp (C)	C	
Dissolved Oxygen (mg/L)	mg/L	
Dissolved Oxygen (mg/L) Temp (C)	C	
Elevation (m)	Meters	
Flow Volume (ft ³ /sec)	ft ³ /sec	
GPS Error (+/-m)	m	
Iron (mg/L)	mg/L	0.03 mg/L
Iron (mg/L) Note		
Latitude	Decimal WGS1984	degrees.
Lead (mg/L)	mg/L	0.001 mg/L
Lead (mg/L) Note		
Longitude	Decimal WGS1984	degrees.
Magnesium (mg/L)	mg/L	0.05 mg/L
Magnesium (mg/L) Note		
Max Depth (m)	m	
Park		
pH		

Column Name	Units	Method Report Level
pH Temp (C)	C	
Potassium (mg/L)	mg/L	0.04 mg/L
Potassium (mg/L) Note		
Salinity (coastal locations)	Unknown	
Salinity Temperature	Unknown	
Site Name		
Sulfate (mg/L)	mg/L	0.4 mg/L
Sulfate (mg/L) Note		
Time		
Total Dissolved Solids (mg/L)	mg/L	
Total Dissolved Solids (mg/L) Temp (C)	C	
Turbidity (NTU)	NTU	
USGS Quad		
Weather		
Zinc (mg/L)	mg/L	0.01 mg/L
Zinc (mg/L) Note		
Chloride (mg/L)	mg/L	0.1 mg/L
Chloride (mg/L) Note		
Nitrate-N (mg/L)	mg/L	0.1 mg/L
Nitrate-N (mg/L) Note		
Total Nitrites / Nitrates-N (mg/L)	mg/L	0.1 mg/L
Total Nitrites / Nitrates-N (mg/L) Note		
Chlorophyll-a (mg/m3) Corrected	mg/m ³	0.04, 0.08, 0.2, 0.3, 0.4, or 0.8 mg/m ³
Chlorophyll-a (mg/m3) Corrected Note		
Chlorophyll-a (mg/m3) Uncorrected	mg/m ³	0.04, 0.2, 0.3, 0.4, or 0.8 mg/m ³
Chlorophyll-a (mg/m3) Uncorrected Note		

Column Name	Units	Method Report Level
Total Suspended Solids (mg/L)	mg/L	1.8 mg/L
Total Suspended Solids (mg/L) Note		
Total Nitrogen (mg/L)	mg/L	
Total Nitrogen (mg/L) Note		
Total Kjeldahl Nitrogen (mg/L)	mg/L	1 or 2 mg/L
Total Kjeldahl Nitrogen (mg/L) Note		
Total Phosphate-P (mg/L)	mg/L	0.01 mg/L
Total Phosphate-P (mg/L) Note		
Air Temp (C)	C	
Water Temp (C)	C	
Comments/ Hydro Tech notes		

Table 2. Data columns, methods and descriptions.

Column Name	Analysis Method	Data Source
Alkalinity (CaCO ₃) (mg/L) (Lamotte)	Lamotte 2020 Meter	HL
Alkalinity(CaCO ₃) (mg/L)		NTL
Aluminum (mg/L)	Aluminum (mg/L)/mg/L	NTL
Aluminum (mg/L) Note		
Cadmium (mg/L)	SM 3030K/EPA 200.9	NTL
Cadmium (mg/L) Note		
Calcium (mg/L)	SM 3030K/EPA 200.7	NTL
Chromium (mg/L)	SM 3030K/EPA 200.9	NTL
Chromium (mg/L) Note		
Conductivity (mS/cm)	Corning II Probe	HL
Conductivity (mS/cm) Temp (C)		
Copper (mg/L)	SM 3030K/EPA 200.7	NTL
Copper (mg/L) Note		
Creek or River Gradient (%)	USGS Quadrangle Map	HL

Column Name	Analysis Method	Data Source
Creek or River Gradient Text		
Date		
Dissolved Organic Carbon (mg/L)		NTL
Dissolved Organic Carbon (mg/L) Note		
Dissolved Oxygen (% O ₂)	Chemets test kit or Corning II Probe	HL
Dissolved Oxygen (% O ₂) Temp (C)		
Dissolved Oxygen (mg/L)	Chemets test kit or Corning II Probe	HL
Dissolved Oxygen (mg/L) Temp (C)		
Elevation (m)	Plugger	HL
Flow Volume (ft ³ /sec)	Swoffer 2100 Meter	HL
GPS Error (+/-m)		
Iron (mg/L)	SM 3030K/EPA 200.7	NTL
Iron (mg/L) Note		
Latitude	Plugger	HL
Lead (mg/L)	SM 3030K/EPA 200.9	NTL
Lead (mg/L) Note		
Longitude	Plugger	HL
Magnesium (mg/L)	SM 3030K/EPA 200.7	NTL
Magnesium (mg/L) Note		
Max Depth (m)	Fishfinder or estimate	HL
Park		
pH	Corning II Probe	HL
pH Temp (C)		
Potassium (mg/L)	SM 3030K/EPA 200.7	NTL
Potassium (mg/L) Note		
Salinity (coastal locations)		
Salinity Temperature		
Site Name		
Sulfate (mg/L)	EPA 300.0	NTL
Sulfate (mg/L) Note		

Column Name	Analysis Method	Data Source
Time		
Total Dissolved Solids (mg/L)	Corning II Probe	HL
Total Dissolved Solids (mg/L) Temp (C)		
Turbidity (NTU)		
USGS Quad		
Weather		
Zinc (mg/L)	SM 3030K/EPA 200.7	NTL
Zinc (mg/L) Note		
Chloride (mg/L)	EPA 300.0	NTL
Chloride (mg/L) Note		
Nitrate-N (mg/L)	SM 4500-NO3E	NTL
Nitrate-N (mg/L) Note		
Total Nitrites / Nitrates-N (mg/L)	SM 4500-NO3E	NTL
Total Nitrites / Nitrates-N (mg/L) Note		
Chlorophyll-a (mg/m3) Corrected	SM 10200H	NTL
Chlorophyll-a (mg/m3) Corrected Note		
Chlorophyll-a (mg/m3) Uncorrected	SM 10200H	NTL
Chlorophyll-a (mg/m3) Uncorrected Note		
Total Suspended Solids (mg/L)		NTL
Total Suspended Solids (mg/L) Note		
Total Nitrogen (mg/L)	SM 4500-N	NTL
Total Nitrogen (mg/L) Note		
Total Kjeldahl Nitrogen (mg/L)	SM 4500-N-B	NTL
Total Kjeldahl Nitrogen (mg/L) Note		
Total Phosphate-P (mg/L)	SM 4500-P-E	NTL
Total Phosphate-P (mg/L) Note		
Air Temp (C)	Mercury thermometer	
Water Temp (C)	Mercury thermometer	
Comments/ Hydro Tech notes		

HL = Hydrologic technician, NTL = Northern Testing Laboratories.

Study Area

Data in this release were collected within Wrangell - St. Elias National Park and Preserve and Denali National Park and Preserve in Alaska (Figure 1).

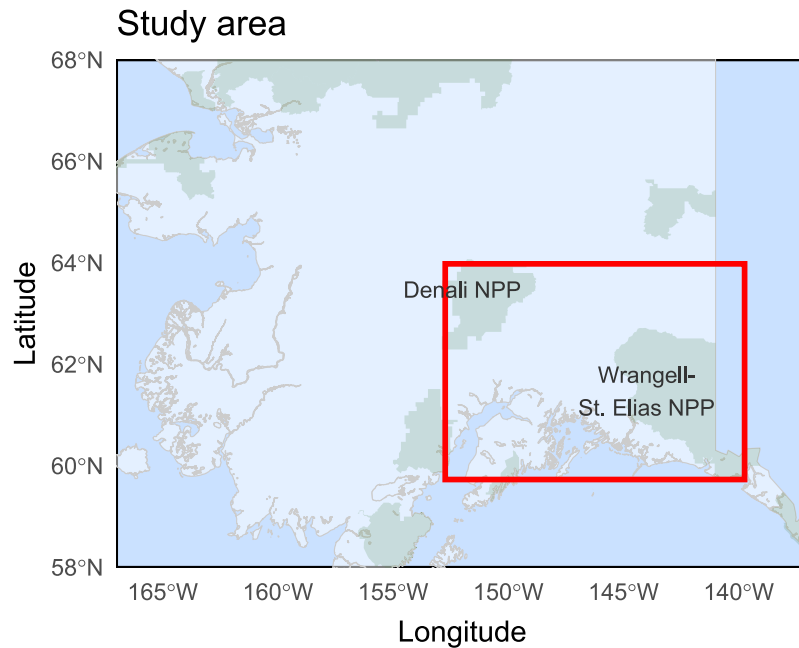


Figure 1. Study area, Denali National Park and Preserve and Wrangell - St. Elias National Park and Preserve.

Files Included In This Release

This data release consists of the files include in Table 1.

Table 3. List of files included in this release.

File
2003 DENA and WRST Water Quality Data.csv
2003 DENA and WRST Water Quality Data.csv Metadata.csv
Data Release Report DENA WRST Water Quality Data 2003.pdf

Sites

Water quality data were collected in 8 sites in Wrangell - St. Elias National Park and Preserve, and 31 sites in Denali National Park and Preserve (Table 4, Figures 2 and 3).

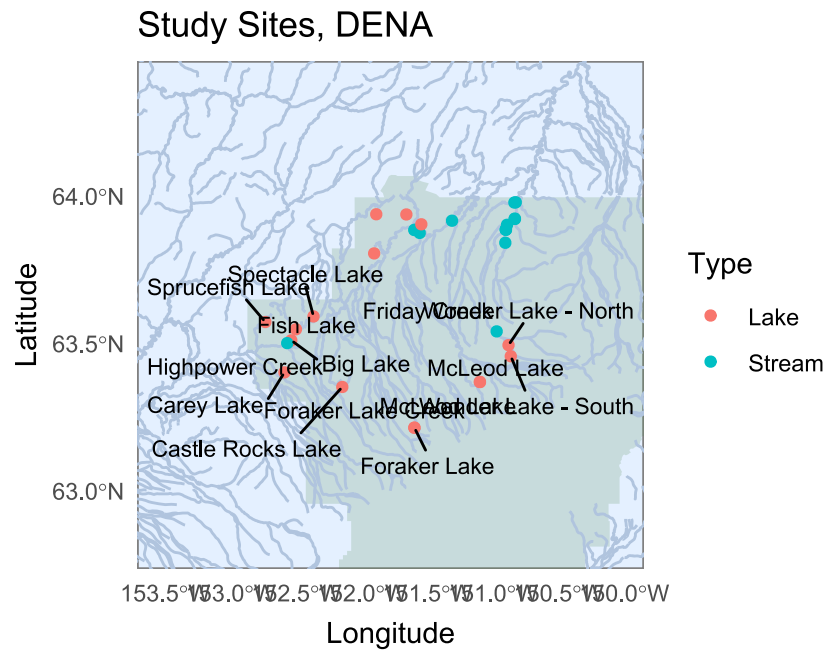


Figure 2. Map of study sites in Denali National Park and Preserve.

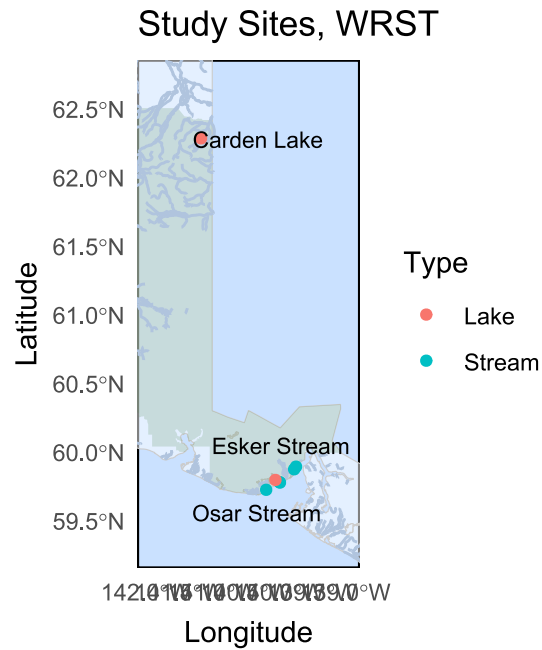


Figure 3. Map of study sites in Wrangell - St. Elias National Park and Preserve

Table 4. List of study sites.

Park Site Name	Longi- tude	Lati- tude
DENBear Creek	-150.8268	63.98023
DENBear Creek	-150.8371	63.97950
DENBearpaw River	-150.9014	63.88794
DENBearpaw River	-150.9064	63.84301
DENBig Lake	-152.5387	63.51212
DENBirch Creek	-151.6008	63.88639
DENCarey Lake	-152.5910	63.40342
DENCarlson Lake	-151.9066	63.80695
DENCastle Rocks Lake	-152.1497	63.35401
DENFish Lake	-152.5031	63.54956
DENForaker Lake	-151.5998	63.21586
DENForaker Lake Creek	-151.5998	63.21586
DENFriday Creek	-150.9723	63.54248
DENHighpower Creek	-152.5695	63.50271
DENKantishna River	-151.3126	63.91783
DENLake Chilchikabena	-151.5469	63.90567
DENMcKinley River	-151.5594	63.87646
DENMcLeod Lake	-151.1003	63.37096
DENMcLeod Lake	-151.1000	63.37088
DENMoose Creek	-150.9023	63.88775
DENMoose Creek	-150.9029	63.88723
DENMuddy River	-151.5952	63.88707
DENOtter Creek	-150.8331	63.92382
DENOtter Creek	-150.8346	63.92490
DENSpectacle Lake	-152.3690	63.59320
DENSprucefish Lake	-152.7366	63.57427
DENStarr Lake	-151.6610	63.93902
DENUnnamed Creek (west off of Bearpaw north of Diamond)	-150.8932	63.90400
DENUnnamed Lake (adjacent to Muddy River; largest lake nw of Billberg Lake)	-151.8905	63.93974

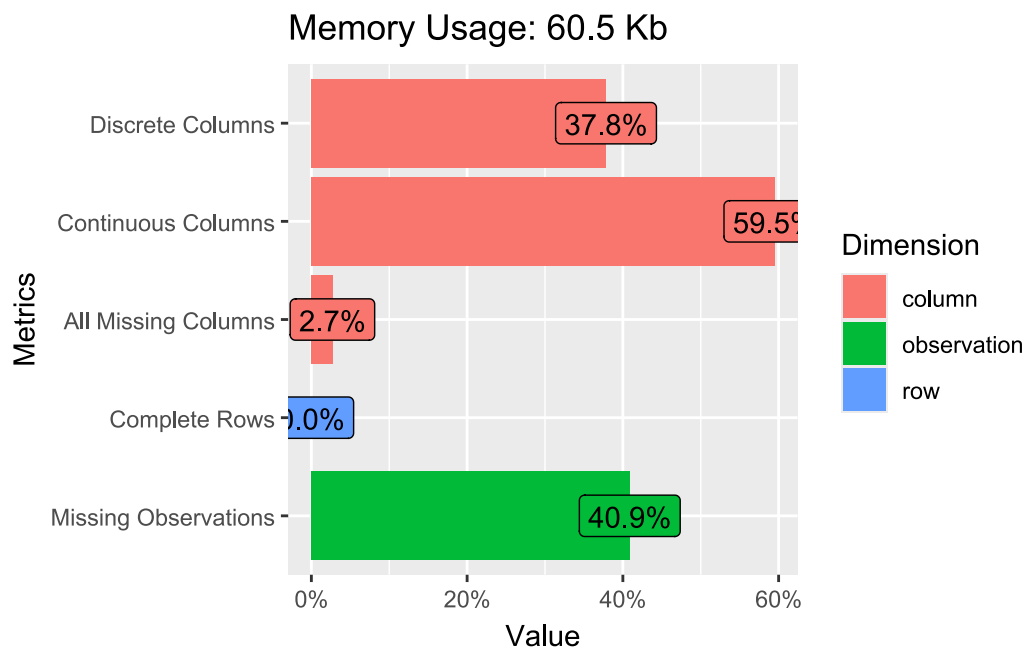
Park Site Name	Longi- tude	Lati- tude
DENWonder Lake - North	-150.8820	63.49589
DENWonder Lake - South	-150.8647	63.45823
WRSTarden Lake	-141.1710	62.29021
WRSEsker Stream	-139.7429	59.89866
WRSEkame Stream	-139.9912	59.78589
WRSEkame Stream tributary	0.0000	59.79106
WRSElittle Esker Stream	-139.7717	59.87926
WRSMalaspina Lake	-140.0527	59.80173
WRSDsar Stream	-140.1918	59.72986
WRSTudden Stream slough	-139.9847	59.78241

Data Quality

The sections below characterize the quality of the dataset.

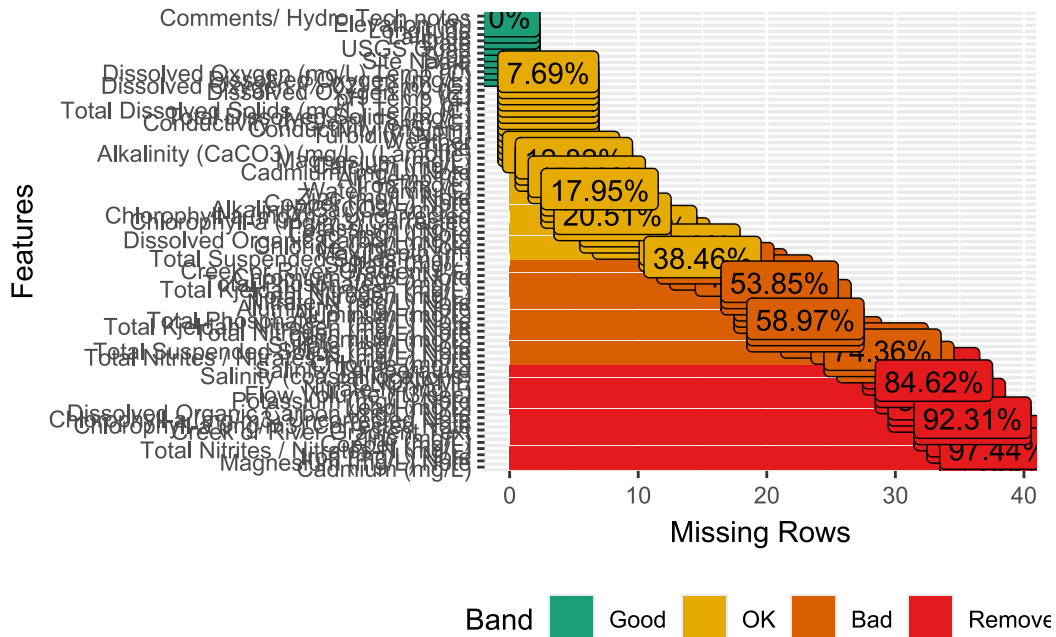
Dataset Attributes

The plot in this section summarizes discrete and continuous data columns, and proportions of complete records and records missing values. Note that some missing values were measured below minimum detection levels and such cases are represented with NULL values.



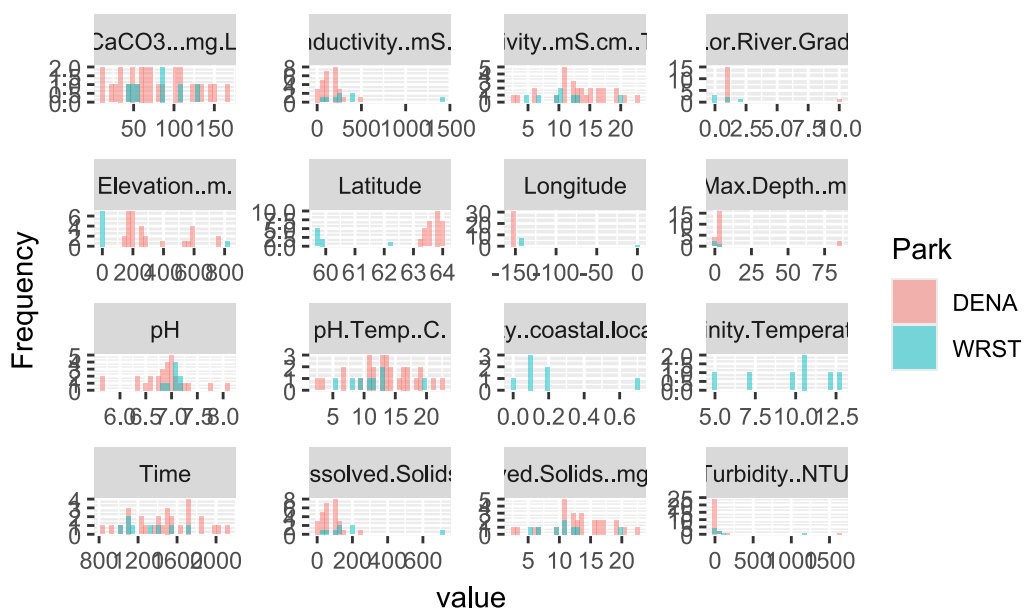
Missing Values Summary

Missing values are summarized in the plot below. Note that many values were measured below minimum detection level and these cases will show in the data as NULLs.

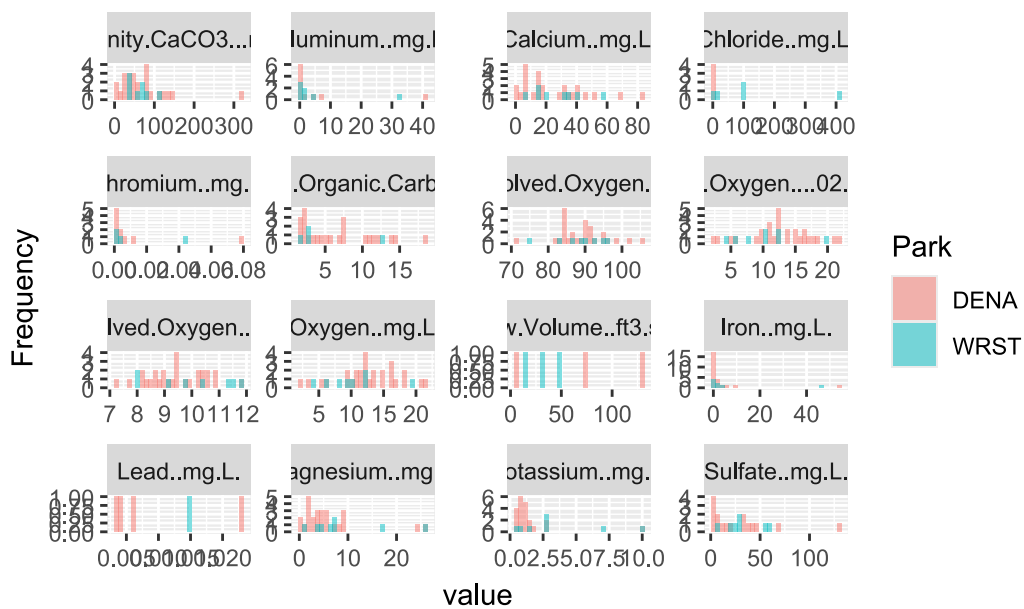


Values Distribution Plots

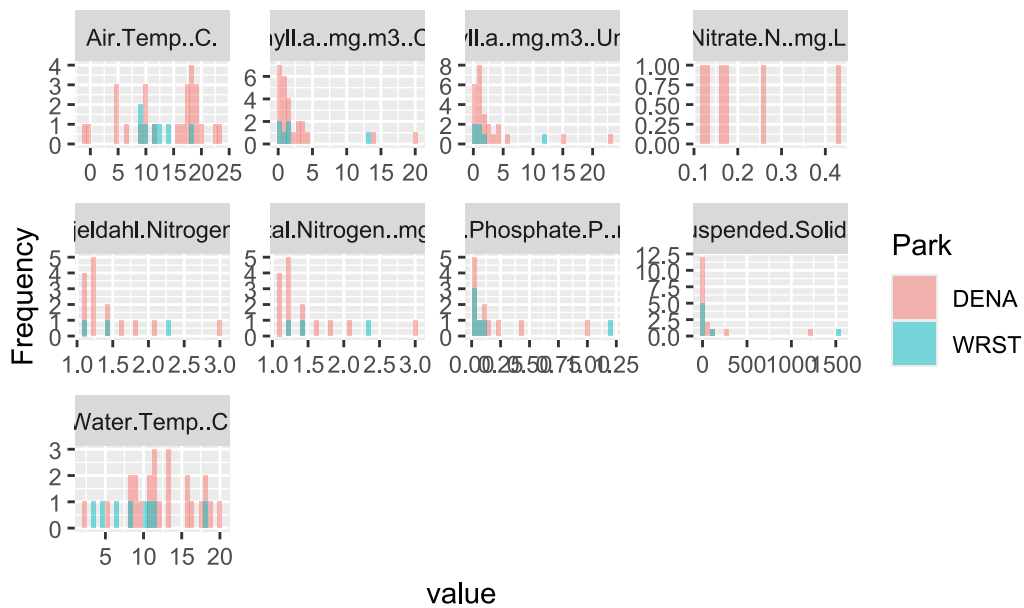
The plots in this section show the distribution of numeric values for water quality parameters by Park.



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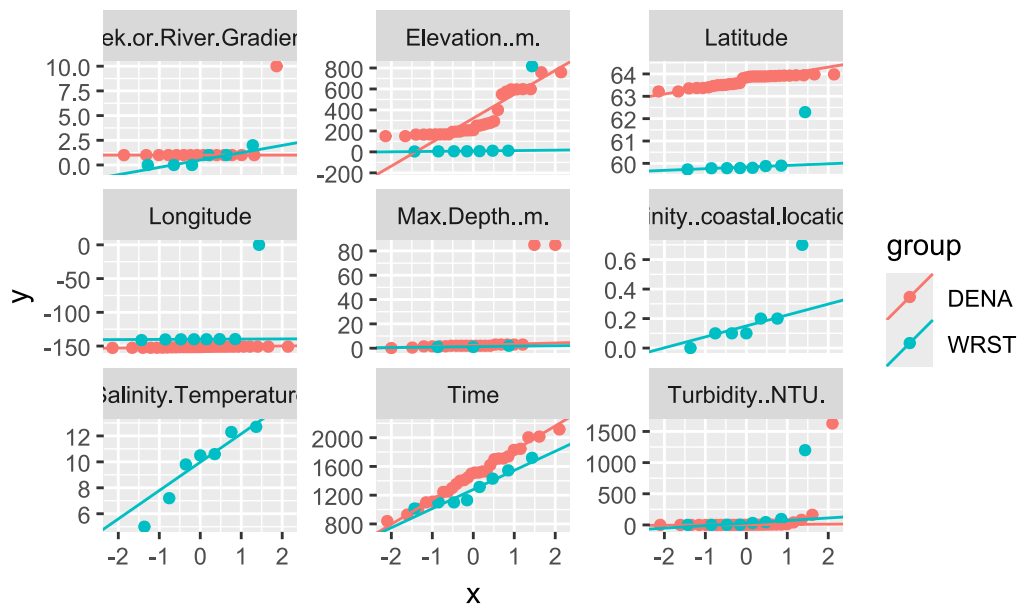
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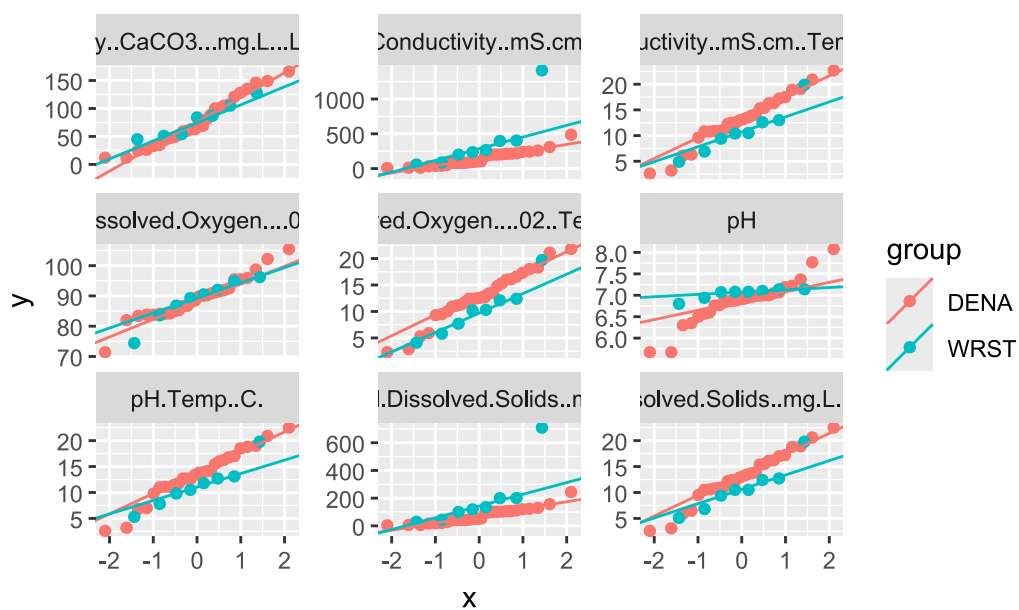
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Quantile - Quantile Plots

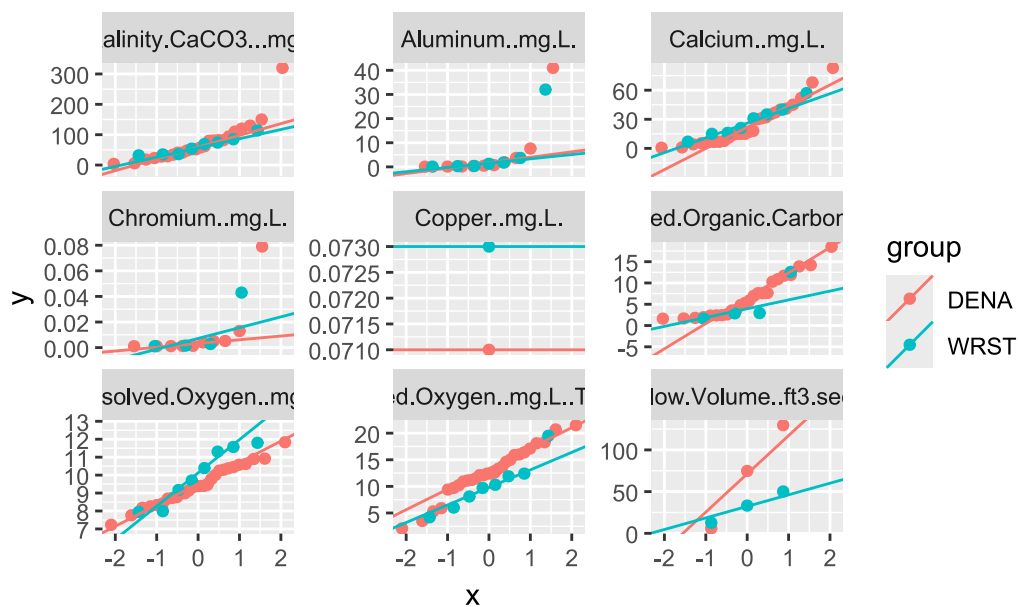
Quantile - quantile are presented in this section for each numeric water quality parameter.



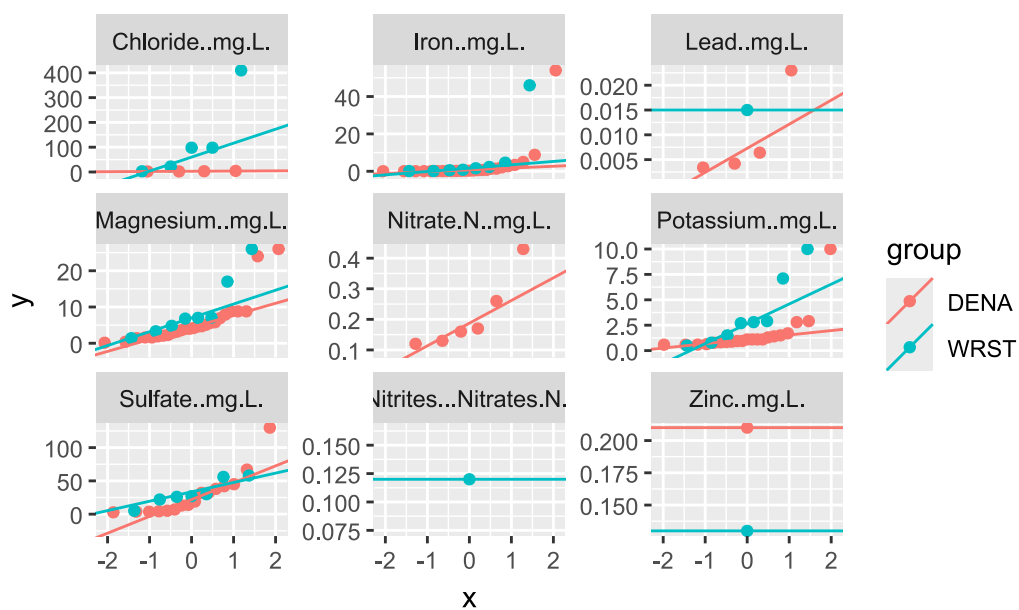
Page 1



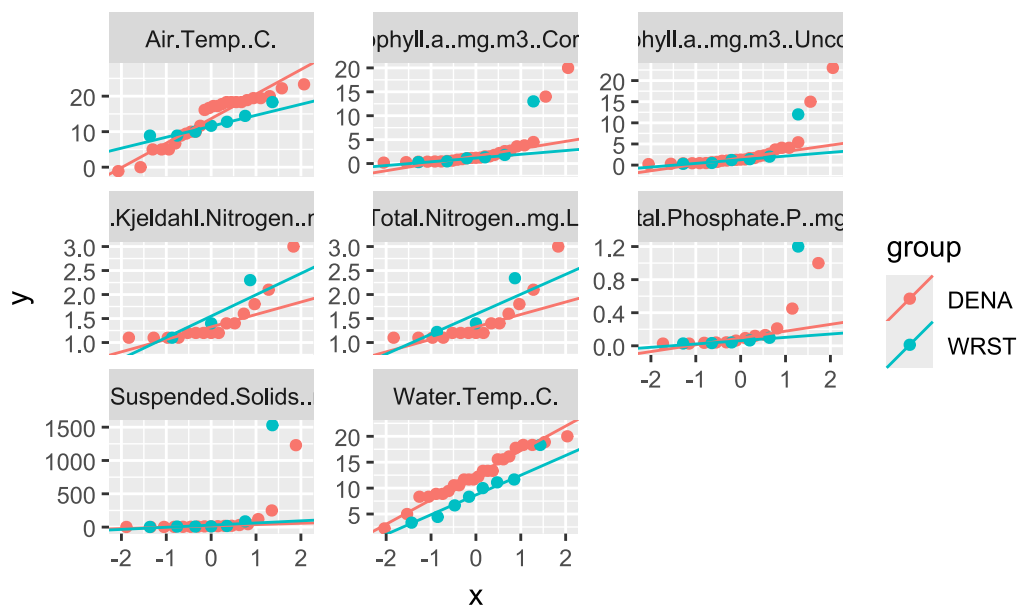
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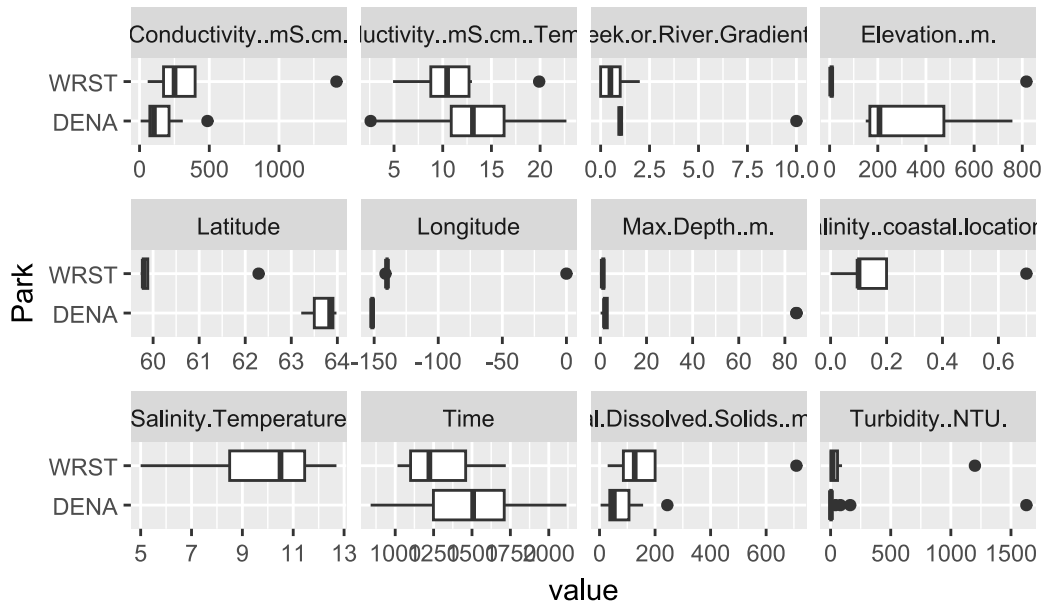


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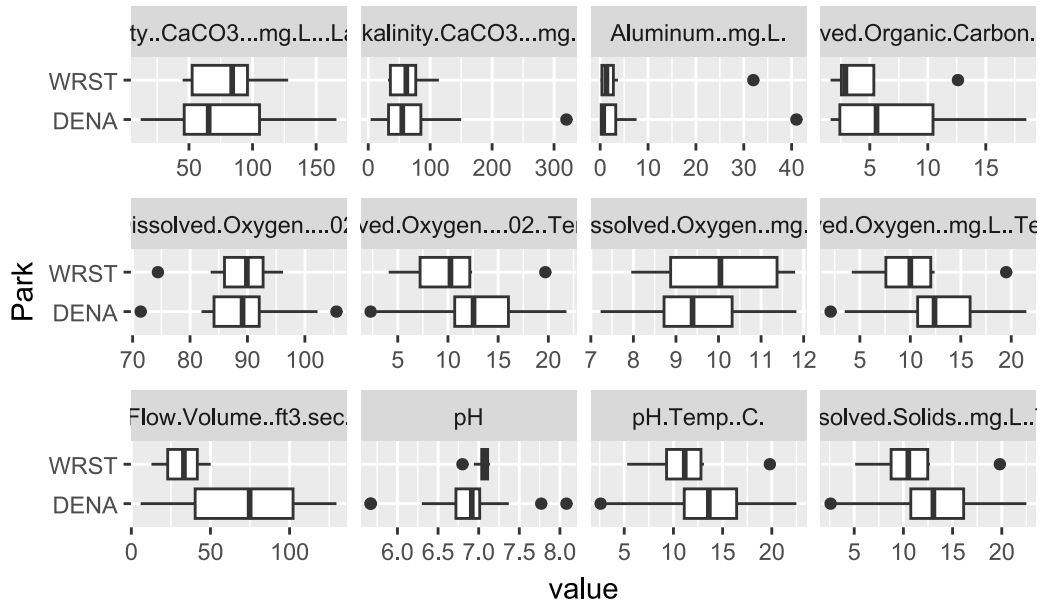


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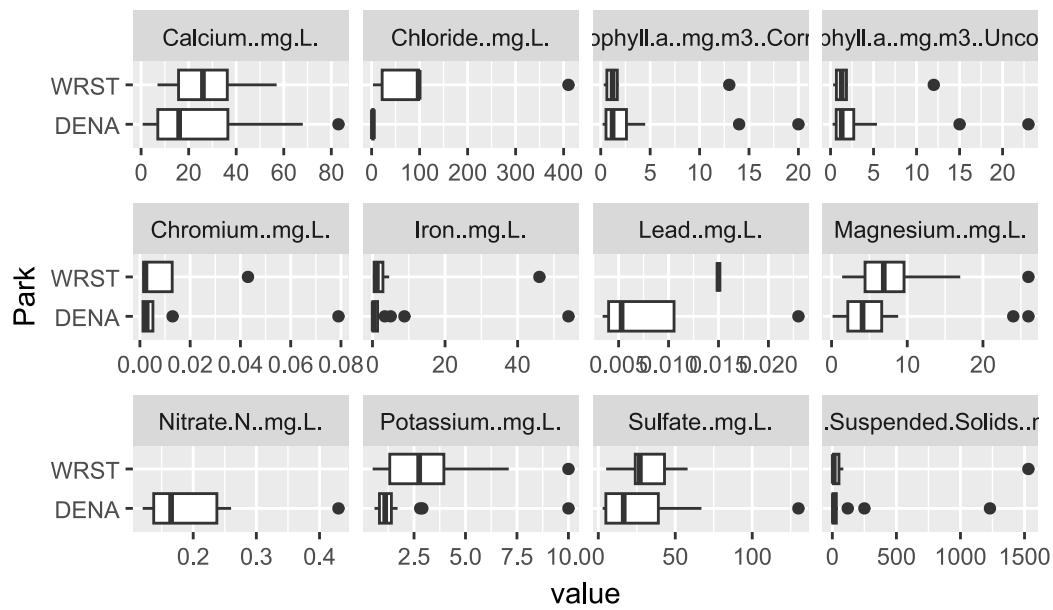
Box Plots



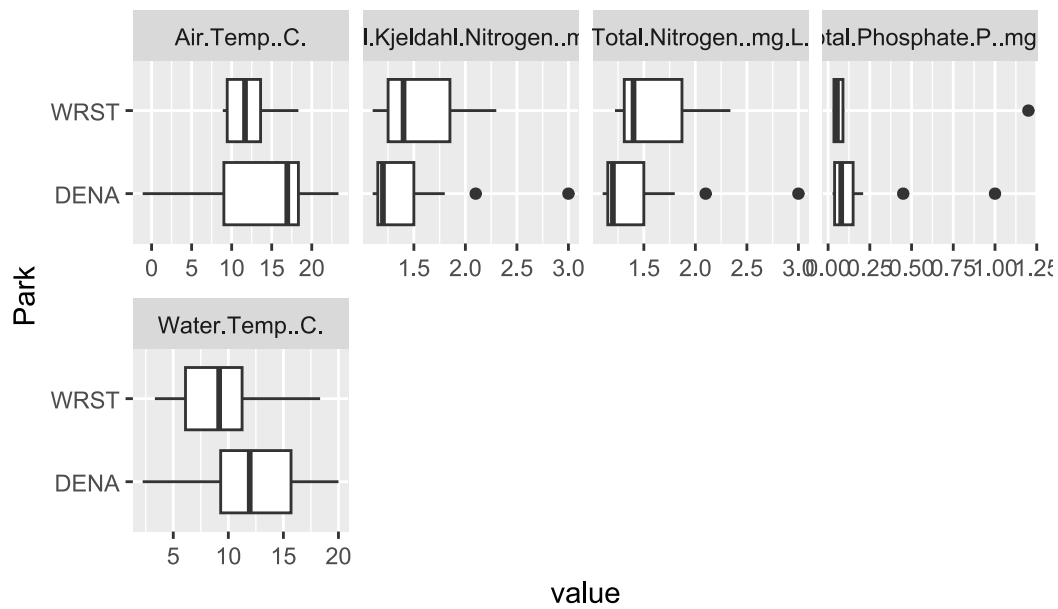
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