

Data Release Report: 1991 Copper, Tanada and Ptarmigan Lake Surveys, Wrangell-St. Elias National Park and Preserve

National Park Service

Wrangell-St. Elias National Park and Preserve

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Introduction

In 1991 the National Park Service (NPS) released a report, ‘Progress report for the Copper, Tanada and Ptarmigan lake surveys, Wrangell-St Elias National Park and Preserve, Alaska’ (Cook and Blakesley, 1991), containing physical and chemical attributes of Copper, Tanada and Ptarmigan lakes in Wrangell-St. Elias National Park and Preserve (WRST), Alaska. Physical and chemical water quality data, including conductivity, hypolimnion, pH, secchi depth, thermocline and turbidity, were published in Tables 1 and 2 of that report, but were not made available in digital format for analysis or integration with larger water quality databases. These data are a valuable asset for long-term baseline monitoring of water quality in WRST.

Files in this release

Files included in this data release are shown in Table 1 and have been published in the NPS Data Store at <https://doi.org/10.57830/2318706>.

Table 1. Files included in this release.

File
1991_WRST_Lakes_Water_Quality_Parameters.csv
1991_WRST_Lakes_Physical_Parameters.csv

License

The data in this release are freely available as U.S. Government Works. Data and content created by government employees within the scope of their employment are not subject to domestic copyright protection under 17 U.S.C. 105. Government works are by default in the U.S. Public Domain.

Methods

Cook and Blakesley (1991) collected data on lake depth, thermocline, hypolimnion, secchi depth, alkalinity, hardness, pH, conductivity, and turbidity in Copper, Tanada and Ptarmigan Lakes in

Wrangell-St. Elias National Park and Preserve (Figure 1, Table 2). Data collection methods are described in Cook and Blakesley (1991) and not repeated here. Sampling occurred over multiple events from July through September, 1991 (Figure 2, Table 3). While the locations of the lakes are known, there are no spatial coordinates available to pinpoint the sampling station locations. I used artificial intelligence to convert screenshots of Tables 1 and 2 of Cook and Blakesley (1991) to raw comma separated values text files. I then tidied the data, assessed quality and generated basic summary tables and plots to assess data quality. Cook and Blakesley (1991) reference additional data beyond what I could find in the report, but I could not find such data in NPS libraries to include them here.

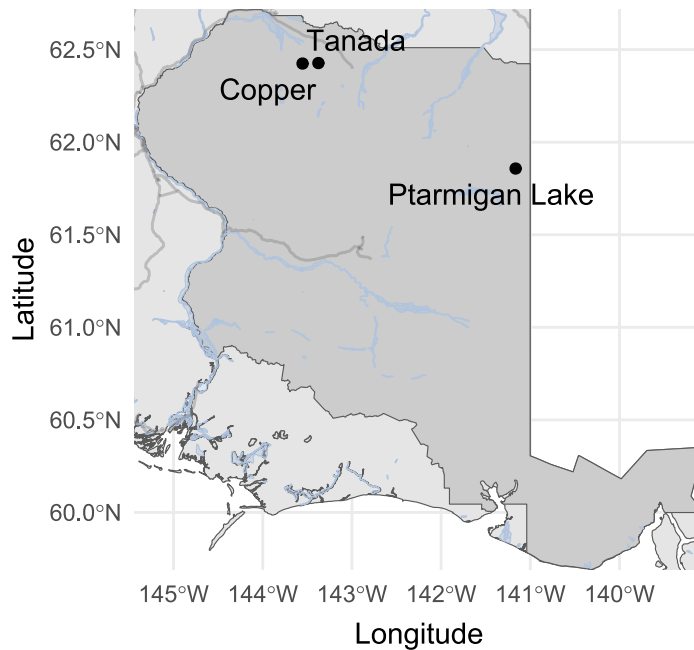


Figure 1. Lake locations map in Wrangell-St. Elias National Park and Preserve.

Table 2. Lake locations table. Coordinates are in Geographic Coordinate System, WGS1984 datum.

Lake	Longitude	Latitude
Ptarmigan Lake	-141.1646	61.85767
Tanada	-143.3761	62.42742
Copper	-143.5536	62.42476

Table 3. Sampling events.

Lake	Date
Copper	1991-07-07
Copper	1991-07-11

Lake	Date
Copper	1991-08-05
Copper	1991-09-17
Ptarmigan	1991-08-15
Ptarmigan	1991-08-17
Tanada	1991-07-10
Tanada	1991-08-06
Tanada	1991-09-19

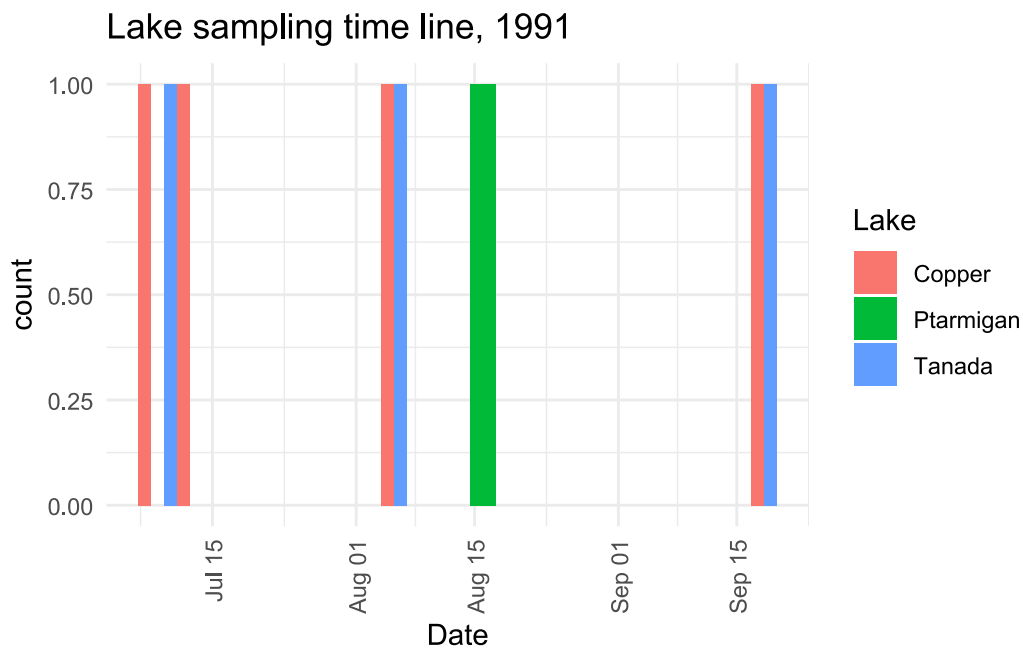


Figure 2. Timeline of sampling by lake.

Summary of datasets

Lake physical attributes

Lake physical attributes collected in WRST included lake depth, thermocline and hypolimnion and secchi depths. These data are summarized in this section.

Depth, thermocline and hypolimnion.

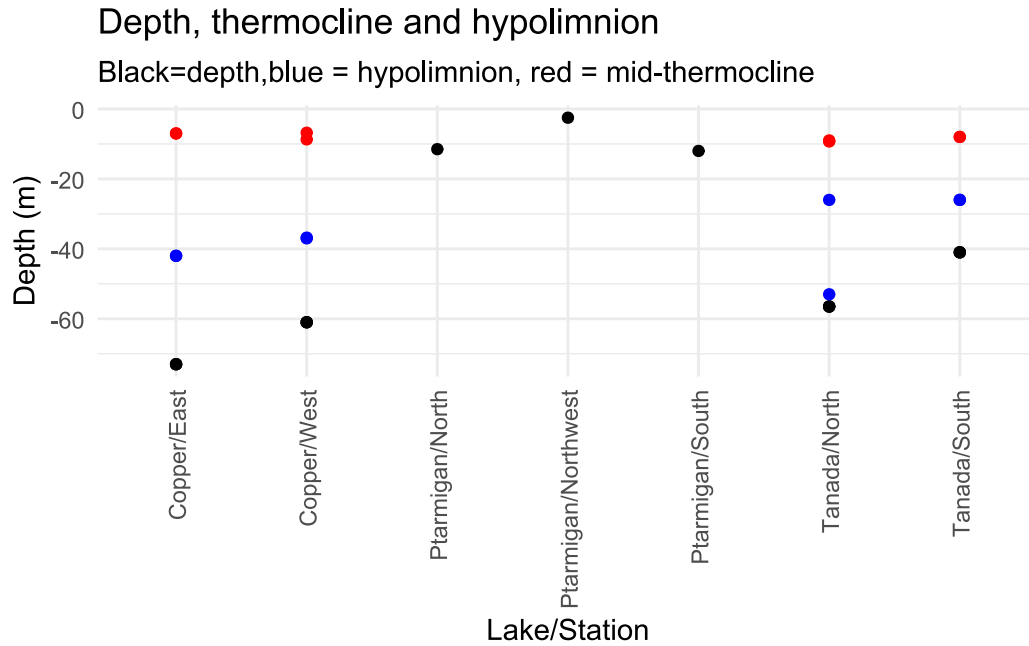


Figure 3. Depth, hypolimnion and thermocline of large lakes by sampling station in Wrangell-St. Elias National Park and Preserve.

Table 4. Depth, hypolimnion and thermocline of large lakes by sampling station in Wrangell-St. Elias National Park and Preserve.

Lake	Copper	Ptarmigan	Tanada
Mean thermocline depth (m)	-7.375		-8.575
Thermocline s.d.			
Mean hypolimnion depth (m)	-39.45		-32.75
Hypolimnion s.d.			
Mean depth (m)	-67.000000	-8.666667	-48.750000
Depth s.d.			
n	6	3	6

Secchi depth

Secchi depth measurements are summarized in Table 5.

Table 5. Secchi depth measurements.

Lake	Mean Secchi depth (m)	s.d.	n
Copper	-4.331667	1.0694562	6
Ptarmigan	-3.330000	0.7264296	3
Tanada	-4.295000	1.4322535	6

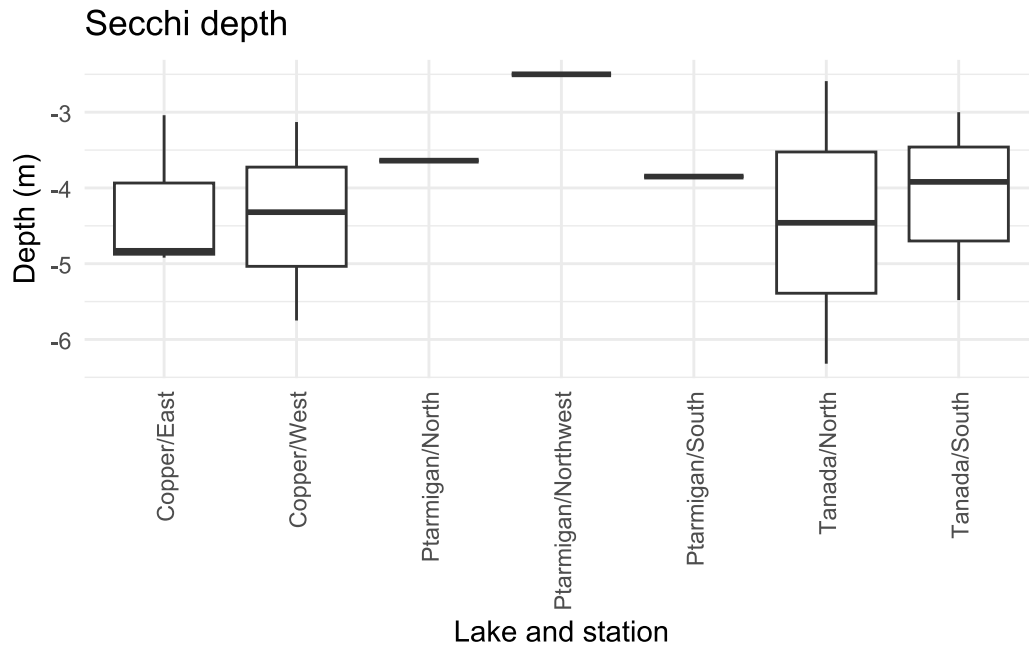


Figure 4. Secchi depths.

Metadata for physical parameters

I present the dataset structure below (Table 5).

Table 5. Metadata for water quality parameters.

ColumnName	DataType	Units	Description
Lake_Station	character		Lake and Station.
Lake	character		Lake.
Station	character		Station.
Date	Date		Date of observation.
Station_Depth_m	numeric	Meters	Station depth.
Thermocline_Min_m	numeric	Meters	Thermocline minimum.
Thermocline_Max_m	numeric	Meters	Thermocline maximum.
Thermocline_Mid_m	numeric	Meters	Thermocline midpoint.

ColumnName	DataType	Units	Description
Hypolimnion_Mid_m	numeric	Meters	Hypolimnion midpoint.
Secchi_Depth_m	numeric	Meters	Secchi depth.

Lake Water quality attributes

Lake water quality attributes collected in WRST included alkalinity, hardness, pH, conductivity, and turbidity. These data are summarized in this section.

Sample depths

Table 6. Water depth summary.

Lake	Station	SampleDepth_m	n
Copper	East	1.0	2
Copper	East	39.0	1
Copper	East	42.0	2
Copper	East	49.0	1
Copper	West	1.0	2
Copper	West	30.0	1
Copper	West	37.0	2
Copper	West	49.0	1
Ptarmigan	North	1.0	1
Ptarmigan	North	5.5	1
Ptarmigan	Northwest	1.0	1
Ptarmigan	Northwest	2.0	1
Ptarmigan	South	1.0	1
Ptarmigan	South	6.0	1
Tanada	North	1.0	2
Tanada	North	25.0	1
Tanada	North	28.0	1
Tanada	North	35.0	1
Tanada	North	53.0	1
Tanada	South	1.0	2
Tanada	South	20.5	1
Tanada	South	25.0	1

Lake	Station	SampleDepth_m	n
Tanada	South	26.0	1
Tanada	South	52.0	1

Alkalinity

Alkalinity data are summarized in Figure 5.

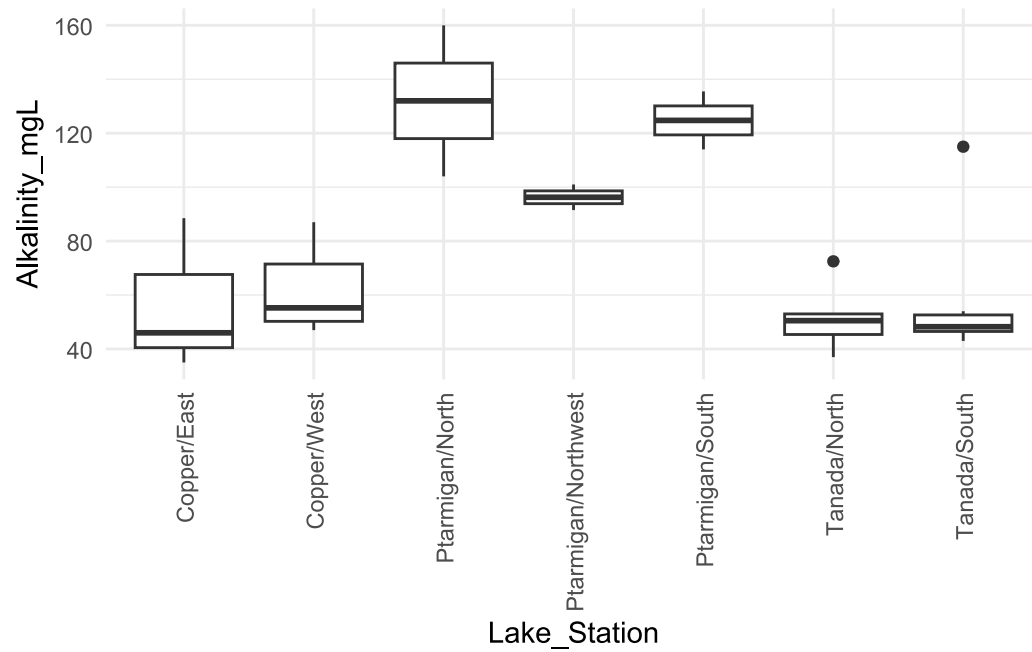


Figure 5. Alkalinity.

Hardness

Hardness data are summarized in Figure 6.

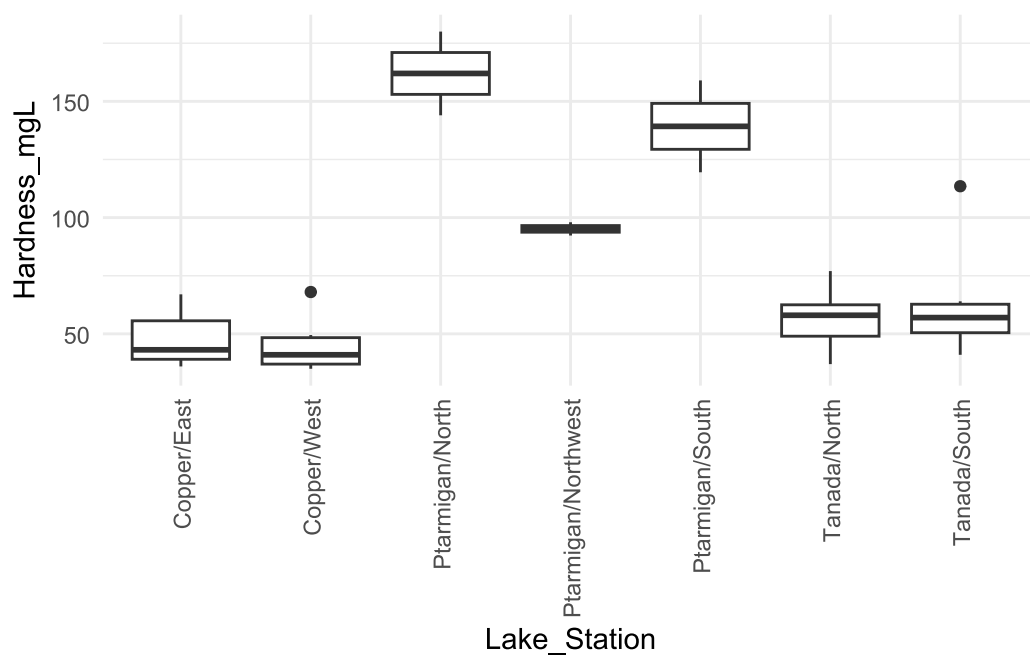


Figure 6. Hardness.

pH

pH data are summarized in Figure 7.

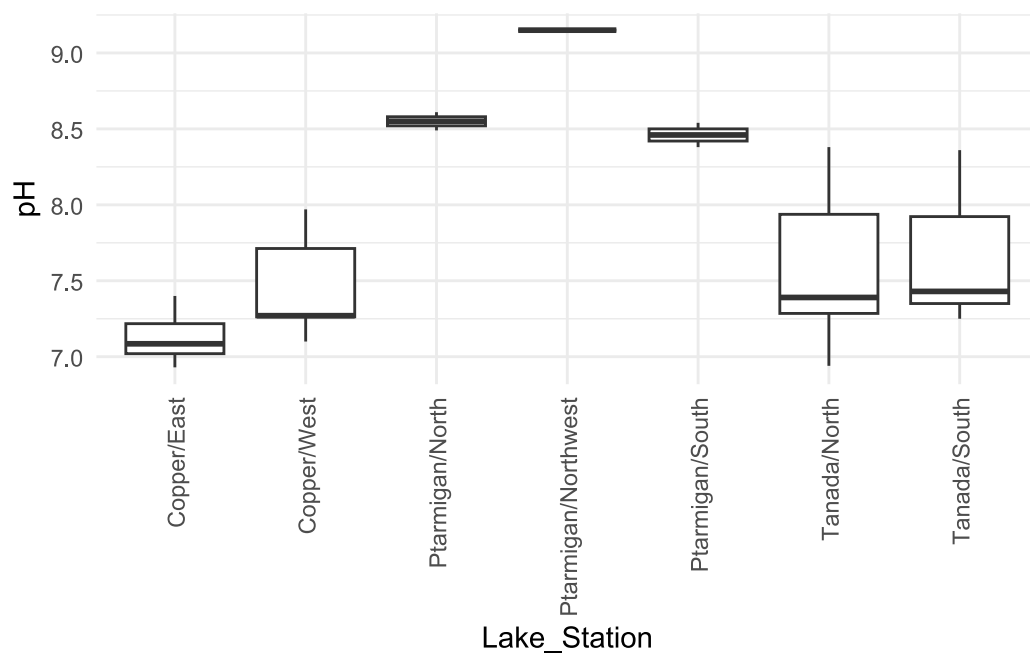


Figure 7. pH.

Conductivity_uMHOS

Conductivity data are summarized in Figure 8.

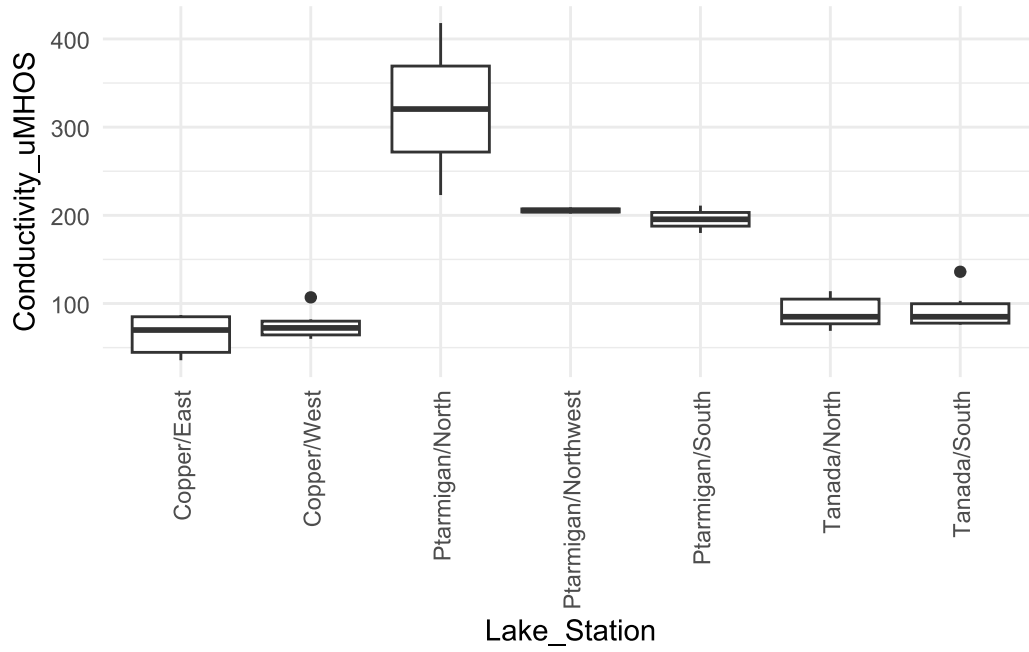


Figure 8. Conductivity.

Turbidity_NTU

Turbidity data are summarized in Figure 9.

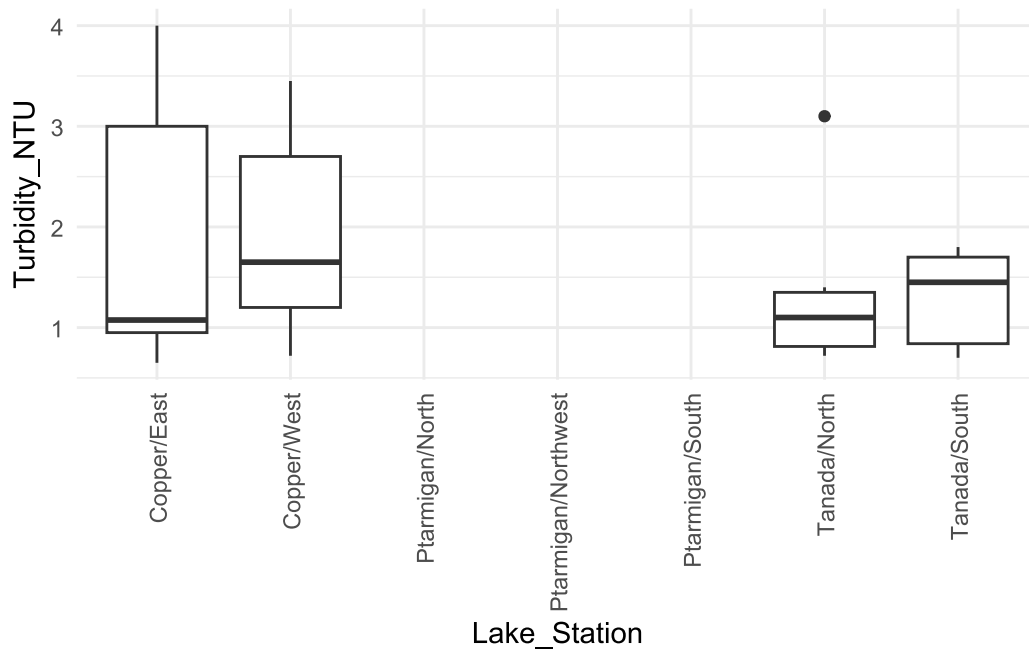


Figure 9. Turbidity.

Metadata for water quality parameters

I present the dataset structure below (Table 7).

Table 7. Metadata for water quality parameters.

ColumnName	DataType	Units	Description
Lake	character		Lake.
Station	character		Station.
Date	Date		Date of observation.
SampleDepth_m	numeric	Meters	Sample depth.
Alkalinity_mgL	numeric	mg/L	Alkalinity
Hardness_mgL	numeric	mg/L	Hardness
pH	numeric	pH units	pH.
Conductivity_uMHOS	numeric	uS/cm	Conductivity.
Turbidity_NTU	numeric	Nephelometric Turbidity Units	Turbidity.
Lake_Station	character		Lake_Station.

Reference

Cook MB and Blakesley A. 1991. Progress report for the Copper, Tanada and Ptarmigan lake surveys, Wrangell-St Elias National Park and Preserve, Alaska. National Park Service. Copper Center, Alaska. U.S.A <https://irma.nps.gov/DataStore/Reference/Profile/170320>.