



2021 Waterbody Field Report

Chena River

Fairbanks, Alaska



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Abstract

The Chena River watershed is designated as high priority, due to its important contribution of Chinook salmon to the Yukon River, and the commercial and residential development within the watershed. The Alaska Department of Conservation conducted monitoring on the Chena River as part of the Watershed Health Assessment and Data Analysis program in 2020. Tanana Valley Watershed Association continued collection of water quality data on the Chena River during the summer of 2021. Results did not show any pollutants above regulatory limits, and no aromatic hydrocarbons were present in detectable quantities. Zinc contamination from the filtration process was an issue. Further sampling will occur in 2022.

Basic Waterbody Information

Table 1. Basic Waterbody Information

Assessment Unit ID	Chena River Site 1	Chena River Site 2
Assessment Unit Name	Downstream of urban center	Upstream of urban center
Location description	West of BLM Visitor parking, downstream of University Bridge Latitude 64.840411°; Longitude -147.817437°	Chena River Recreation Area River Park, downstream of Moose Creek Dam and boat launch Latitude 64.794985° Longitude -147.193524°
Water Type	Flowing river	Flowing river
Area sampled	Just below left bank	Just below left bank
Time of year sampled	Summer (May, June, July, August)	Summer (May, June, July, August)

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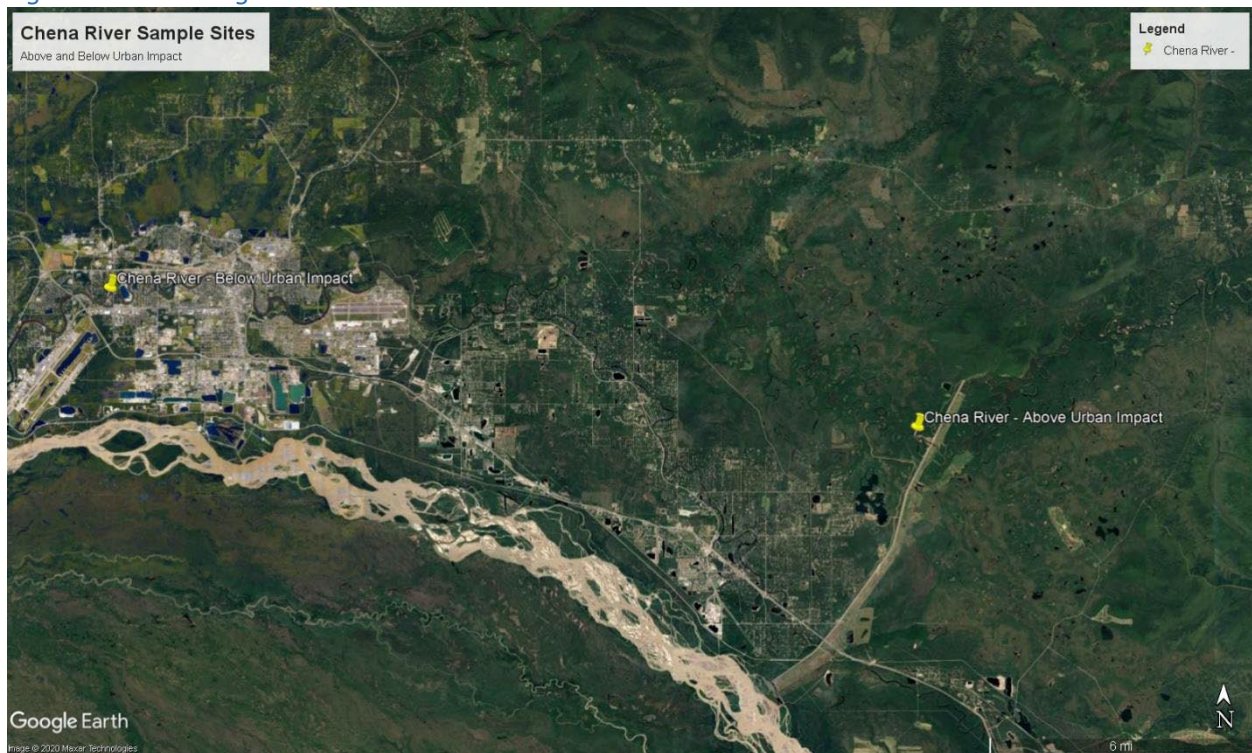
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Water Quality Evaluation

Background

The Chena River water quality was sampled by Tanana Valley Watershed Association in 2021 to build on prior sampling under the Alaska Department of Environmental Conservation (ADEC) led Watershed Health Assessment and Data Analysis (WHADA) project. The Chena River was one of several high priority watersheds sampled by the Alaska Department of Environmental Conservation under the Watershed Health and Assessment and Data Analysis (WHADA) project in 2020. The QAPP and Sample Plan for WHADA and TVWA projects are available from DEC staff upon request.

Figure 1. Monitoring locations on the Chena River.



Objective

The primary objective of this project is to characterize the environmental conditions of the Chena River, a high priority watershed. This project will collect water quality data to establish baseline conditions and to identify any potential water quality concerns, particularly those that could adversely affect salmonid spawning, growth, or migration. These data can be used to inform future more intensive water quality sampling, watershed planning priority actions, and development of Best Management Practices within the watershed designed to protect and improve water quality.

Methods

TVWA personnel collected in-situ measurements (water temperature, pH, conductivity, dissolved oxygen, and turbidity) using a Hach HQ2100 Portable Multi-Meter for pH, Conductivity and Dissolved Oxygen and the Hach2100Q Turbidity Meter for turbidity measurements. Reported values were averaged over three measurements. Air temperature was measured by vehicle thermometers.

Grab samples were collected for settleable solids, hardness, dissolved metals (cadmium, calcium, copper, lead, magnesium, selenium, and zinc), bacteria and total aromatic hydrocarbon analysis. The samples for dissolved metals were filtered in the field with filters provided by the laboratory (Pollen Environmental), as were all sample bottles. Bacteria samples were collected weekly for 5 weeks from July 21st through August 18th in 2021.

2021 Results Summary

No detectable results were found for any of the hydrocarbons from either of the two samples (July 21 and August 25), so these results are not reported in Table 3. Zinc was found in the field replicates, and through further testing was determined to be in the filters. Running a 10 ml syringe of river water through the filters twice before filling the sample bottle seems to have significantly reduced the amount of zinc in the sample (0.075 mg/L in the August 25th sample of Site 1).

Field replicate values are not included in Table 3. Dissolved metals and hydrocarbons were analyzed by Eurofins Eaton Analytical Laboratory, except for the August 25th sample, which was analyzed by Eurofins Lancaster Laboratories. This laboratory analyzed all dissolved metals using method 200.7 and reported results in mg/L, while Eurofins Eaton Analytical used 200.7 for Calcium and Magnesium, and 200.8 for all other dissolved metals, and reported results in ug/L. Results in Table 3 are converted to µg/L for comparison purposes.

Table 3. data summary of the 2021 monitoring season.

Characteristic/ Pollutant	Site 1 Range of Results	Site 2 Range of Results
Water temperature	7.6-16.9 °C	9.0-15.3 °C
pH	6.89-7.82	6.99-8.04
Conductivity	136.4-203.6 µS/L	142.6-193.7 µS/g
Dissolved oxygen	8.1-11.21 mg/L	7.39-10.93 mg/L
Turbidity	3.61-14.6 NTU	1.88-9.15 NTU
Air temperature	8.9-31.1 °C	7.2-28.9 °C
Settleable solids	<0.1 mL/L/Hour-0.1 mL/L/Hour	< 0.1 mL/L/Hour-0.1 mL/L/Hour
Hardness	103.7-114.9 mg/L	92.5-111.2 mg/L
Cadmium	<0.001 mg/L-<1.0 µg/L	<0.001 mg/L-<1.0 µ/L
Calcium	30-33 mg/L	27 mg/L-33 mg/L
Copper	<0.012 mg/L-<1.0 µg/L	<0.012 mg/L-<1.0 µg/L
Lead	<7.3-<1.0 µ/L	<7.3-<1.0 µ/L
Magnesium	6.7 mg/L-7.9 mg/L	6.1-7.3 mg/L
Selenium	<16-<2.0 µg/L	<16-<2.0 µg/L
Zinc	11-75 µg/L	9.9-100 µg/L
E. coli	14.6 MPN/100mL-290.9 MPN/100mL	10 MPN/100mL-125.9 MPN/100mL
Fecal coliform	17.7 MPN/100mL-222.4 MPN/100mL	2 MPN/100mL-58.3 MPN/100mL

Conclusion

Most characteristics were similar between sites, but there were some differences. Turbidity was consistently higher at Site 1, but since a new bridge was being constructed just upstream, that may account for it. E. coli and fecal coliform counts were also higher at Site 1, which would be expected since it is approximately 30 river miles downstream and is below most of the development on the river. No pollutants were above regulatory levels, and no hydrocarbons were present at detectable levels. Measurable zinc concentrations were found in all field replicates so the results for zinc are not reliable.

Recommended Next Steps

Another season of data collection is planned for 2022. Better filtration methods for dissolved metals should be investigated.