



# How Temperature and Turbidity Change From April to October on Clearwater River Delta Junction, Alaska

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## Introduction

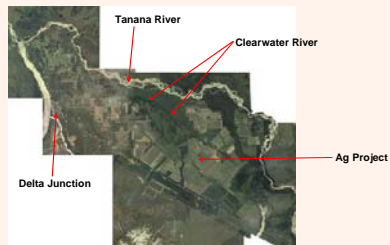
The Delta-Clearwater River Watershed contains about 232,000 acres. Major subwatersheds include Sawmill Creek, Granite Creek, and Rhodes Creek. About 34,900 acres drain directly or through smaller tributaries into the Delta-Clearwater River. The Granite Mountains provide the headwaters of these creeks starting at an elevation of about 500 feet. After leaving the mountains, Sawmill Creek, Granite Creek and Rhoads Creek flow north over a gently sloping outwash plain of the Tanana River. The flow of these creeks is at times substantially infiltrated into the coarse sediments of the outwash plain. The Delta-Clearwater River itself originates from springs surfacing close to the Tanana River. The Delta-Clearwater River is used heavily for recreation and is also impacted by flooding and agricultural run-off.

Water quality monitoring along the Delta Clearwater River has not been done on a consistent basis. The last tests were completed in the early 1990's. At that time there were concerns about pesticides and fertilizers causing potential water quality problems in the watershed. In 2006 the SWCD started a water quality monitoring program on the Clearwater River to monitor the overall health of Clearwater River.

## Materials and methods

Water quality tests are conducted in April, June, August and October each year. The tests are conducted at four sites along the river. Near milepost(mp)15, mp 9, mp 5, and mp 3. The site at mp15 is the farthest upriver that is easily accessible. MP9 is the farthest location upriver of year round residents, mp5 is lowest downriver site of full time residents and mp3 is where the river slows down considerably and is only influenced during breakup with runoff.

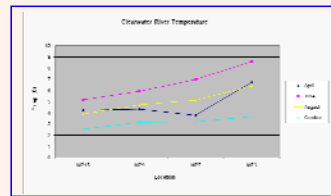
The complete set of tests include temperature, dissolved oxygen, pH, turbidity, conductivity, nitrate, nitrite and phosphate. Measurements are made using a Hach HQ20 for DO and pH. A Hach sension 5 is used for conductivity, a Hach Colorimeter 850 for nitrate, nitrite, and phosphate and a Hach 2100P for turbidity. Measurements are made in accordance with the Quality Assurance Project Plan established by the Delta-Salcha Soil and Water Conservation District.



## Data analysis

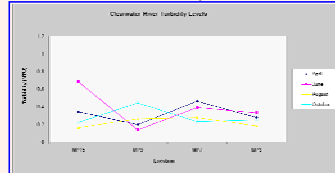
Water samples are taken at each of the sites. Samples are then measured twice and recorded. The graphs below show the averages for temperature and turbidity taken in 2006

Temperature (C)



	MP15	MP9	MP7	MP3
April	4.25	4.35	3.8	6.75
June	5.2	5.95	7	8.6
August	3.9	4.7	5.15	6.4
October	2.55	3.15	3.2	3.65

Turbidity (NTU)



	MP15	MP9	MP7	MP3
April	0.345	0.2	0.465	0.28
June	0.685	0.14	0.395	0.335
August	0.185	0.265	0.28	0.185
October	0.225	0.445	0.235	0.255



Location of sampling sites along Clearwater River

## Results

### Temperature

Clearwater River is well within range of Alaska water standards. In 2006 the river was warmest in June and coldest in October. The river shows a warming trend as the water moves from upriver toward downriver due to solar heating.

### Turbidity:

Clearwater River's name is well deserved. Its turbidity falls below even drinking water standards. Drinking is 5 NTU, recreational water in Alaska is 10 NTU. Even the highest reading, taken at MP15 in June, was below 1 NTU. A possible reason for the high reading in June was likely due to sampling error by simply not waiting long enough to take the water sample after landing the river boat. Data collected in 2006 falls slightly lower than data collect by SWCD in 1992.



Clearwater River near mp3



Clearwater River at mp15



Home along Clearwater River where mp9 sample is taken. Warning sign is posted on the drive to the property.

## Conclusions

In all the test taken in 2006 on the Clearwater River the data is within Alaska Water Standards. In those cases where there are none, it was still below what is generally considered to be acceptable levels. In fact, data collect for NO3, NO2 and PO4 was so low that a sample was taken to Analytica in Fairbanks for comparison of results. The tests showed similar values to tests done locally. The test for nitrite was below the minimum detection limit indicating that our low levels were reasonable. Additionally, in comparison to data collected by the USGS and by the SWCD 15 and 25 years ago the data collected in 2006 was comparable to results they obtained. Although there has been an increase in houses and cabins built along the river there impact has been negligible.

## Literature cited

### Alaska water resources

<http://www.dec.state.ak.us/water/wqsar/wqs/wqs.htm>

[http://www.dec.state.ak.us/water/wqsar/wqs/pdfs/18%20AAC\\_70%20\\_Amended\\_December\\_28\\_2006.pdf](http://www.dec.state.ak.us/water/wqsar/wqs/pdfs/18%20AAC_70%20_Amended_December_28_2006.pdf)

## Acknowledgments

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## For further information

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## Delta Junction, Alaska

