Project Report

1. Contribution Agreement Number: 26-04-001
2. Project Title: Health of Arctic Char in the Coppermine River and surrounding area
3. Project Leader: Eric Hitkolok
4. Summary:

The river is low and people in my community are worried about where the fish are going and the health of the fish. To see what might be happening to the fish in the Coppermine River, I took water samples and measured contaminants in fish tissue. From the water samples, it looks like the river is still safe for fish and for drinking water. All the fish I sampled had low amounts of mercury, selenium, and cadmium, and were below consumption guidelines so there are no restrictions in the amount of fish people can eat. Arsenic was high in some tissue samples, but not all arsenic is harmful. This year I sent some tissue samples to a lab to find out how much of each type of arsenic is in the fish. From the one sample that I have results from so far, the lab could not detect the most harmful types of arsenic. The arsenic that they could detect was non-toxic. This was also the first year that I was able to catch char at the right time above the falls. The char were migrating up the falls in August. The goal was to find out if there were any snagged fish that could make it past the falls. So far I have not found any snagged fish that made it past the falls.

I taught youth how to set nets, take fish and water samples, and travel on the land like how to read a GPS. I think it's important to bring youth and teach youth, because fishing is part of Inuit culture and some youth don't have the opportunity to go out and learn these things. It is important to keep doing water sampling and tissue sampling because there is a mine at the lake where the Coppermine River comes from, and our drinking water comes from the Coppermine River. They are closing the mine and reconnecting the mine site to Lac de Gras and the Coppermine River, so I want to make sure that our fish and water are still safe. I think it is good for people to see Inuit-led research. It's important for people from the community to see someone else in the community who is doing this kind of work.

5. Project Objectives:

I was successful in all my project objectives:

- I let fishers know to bring me sick and snagged fish
- I fished above the falls to see if any snagged fish made it up the falls
- I collected tissue samples from healthy fish
- I found a lab that can measure the different types of arsenic in fish and I sent fish samples to that lab
- I took water samples to monitor contaminants in the Coppermine River
- I taught youth how to set nets in the summer and winter, and how to take fish and water samples

6. Materials and Methods:

For sick and snagged fish, I put up posters around town and let people in the community know I was collecting sick and snagged fish. I also made a post on Facebook. This year, no one brought me sick or snagged fish.

For fishing above the falls, we went by ATV above the falls. We set nets in a few different areas in a little inflatable boat. We set nets and checked them for six days in mid-August. When we caught char, we looked at them to see if they had any snag marks and if snagged fish were able to make it up the falls.

We set out nets to catch fish and get fish samples to send to a lab to see what contaminants are in the fish. We set nets by boat near Old Man Island (3.5 miles east of Kugluktuk) and at the mouth of the Coppermine River, and under the ice at the mouth of the Coppermine River. We take the fish sample from the left side of the body, behind the head, on the upper back of the muscle. We put the sample into a bag with a label and the date so we don't get the samples mixed up, and we put the samples in a freezer. We sent the samples to a lab in Edmonton called Caro. That lab sends them to another Caro lab in BC, where they analyze metals in the fish samples. Caro also takes some of each sample and sends them to a different lab, called ALS, to measure the types of arsenic in the fish tissue.

I took youth boating up the Coppermine River to teach them how to set nets. I also taught youth how to set nets through the ice. When we caught fish, we taught the youth how to take samples from fish. I taught them how to take tissue samples and how to take the ear bones out of the fish.

I took six water samples from Coppermine River: by boat in August and October, and under the ice in November, December, January, and February. I sent the water samples to the Taiga lab in Yellowknife. They measured nutrients and metals.

7. Results:

I sent 25 fish tissue samples to the Caro lab in the fall. I took samples from 11 more fish during a workshop I had to share results with my community. I sent those samples to the lab and they are analyzing contaminants in the samples and are sending them to be tested for the different types of arsenic. I don't have the results from these samples, because they were taken late in the year.

From the 25 samples that I took earlier in the year and other samples that I took for my project in previous years, all the samples had less mercury than the consumption guideline for subsistence (Health Canada 2004). I also looked at selenium and cadmium in the fish tissue. There was very low selenium and cadmium in the fish tissue. There are no restrictions for eating these fish because of selenium and cadmium (USEPA 2000). So far we only have arsenic results for one fish. The lab could not detect the harmful types of arsenic in that one sample. The types of arsenic the lab could detect were non-toxic.

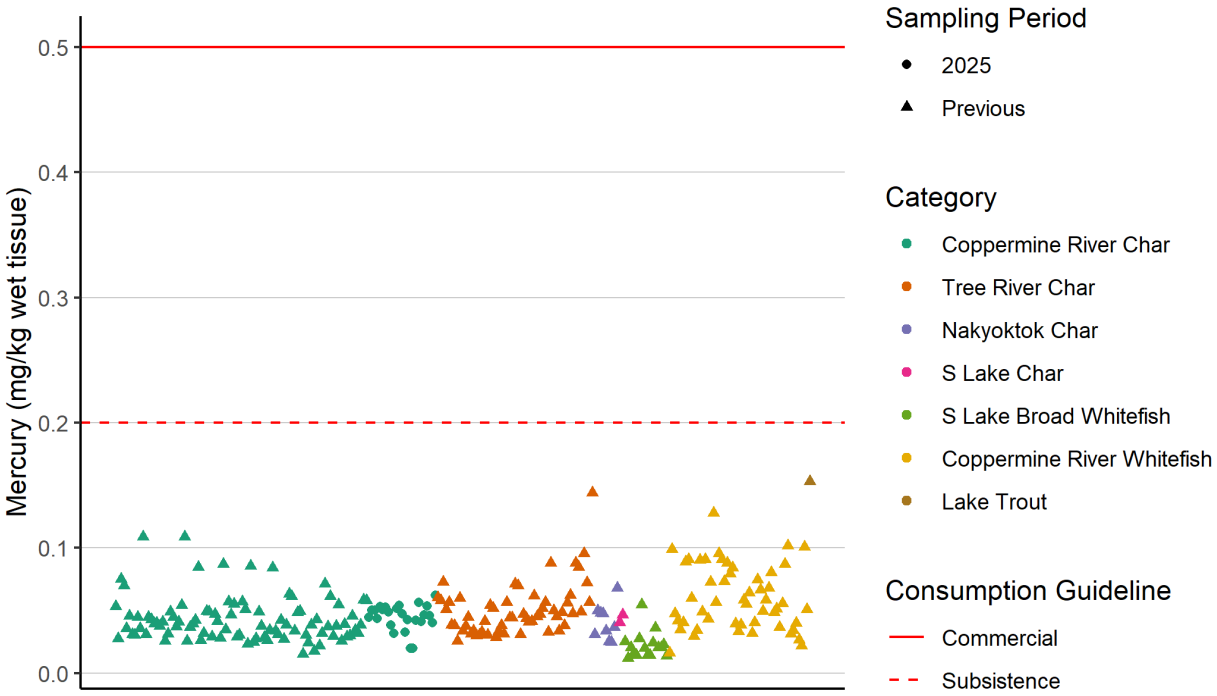

Figure 1: Mercury in fish tissue. Each point shows one fish. Circles indicate fish sampled during the current year of funding (2025) and triangles indicate fish sampled during previous years. All fish are below the consumption guideline for subsistence fishers, so there are no restrictions for how much fish people should eat.

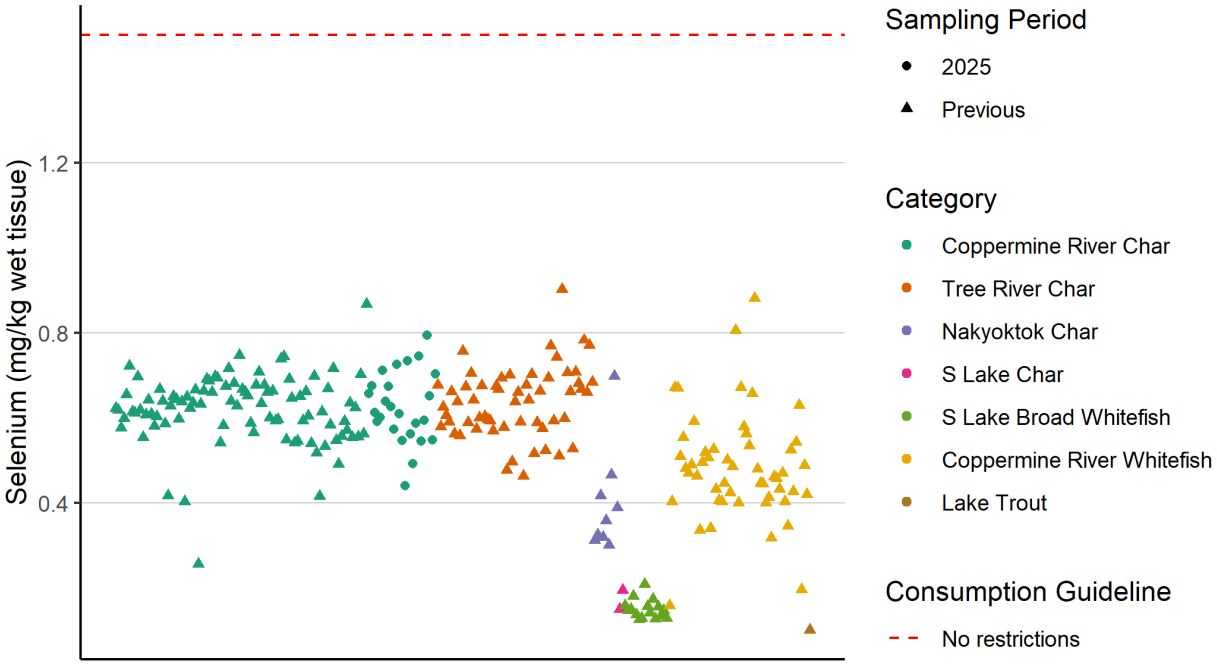

Figure 2: Selenium in fish tissue. Each point shows one fish. Circles indicate fish sampled during the current year of funding (2025) and triangles indicate fish sampled during previous years. All fish are below the consumption guideline, so there are no restrictions for how much fish people should eat.

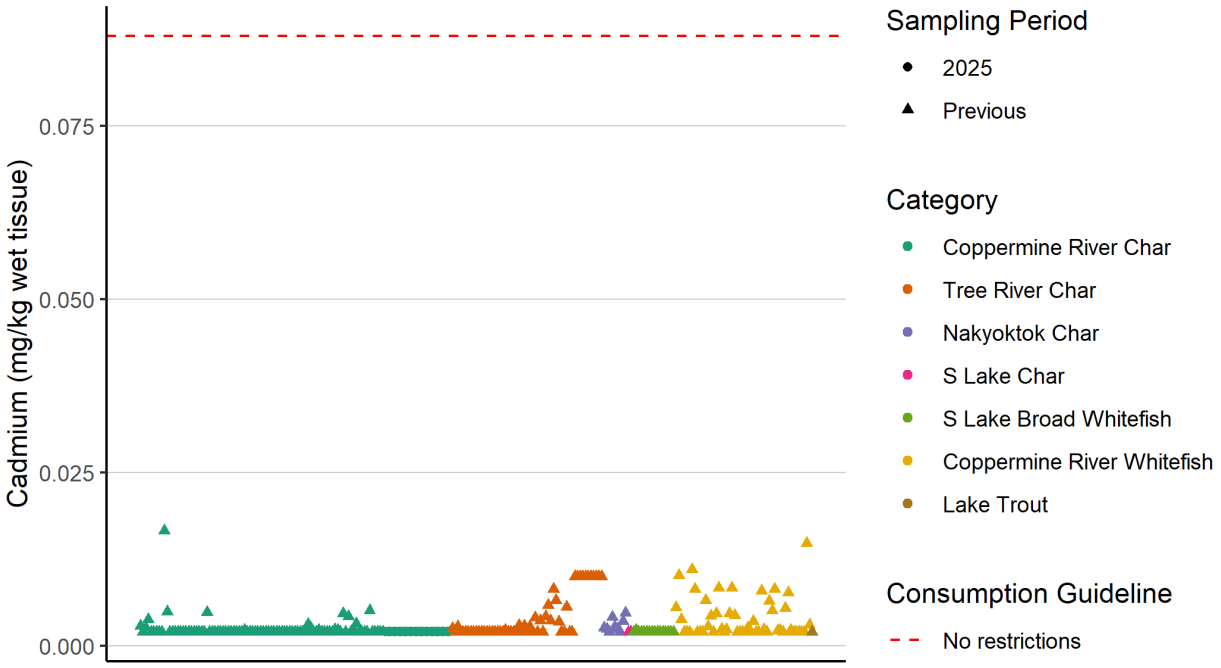

Figure 3: Cadmium in fish tissue. Each point shows one fish. Circles indicate fish sampled during the current year of funding (2025) and triangles indicate fish sampled during previous years. All fish are below the consumption guideline, so there are no restrictions for how much fish people should eat.

All six water samples from the Coppermine River were safe to drink (Health Canada 2025). For aquatic life, including fish, the Coppermine River was always safe for both short-term and long-term exposure (CCME 2025). This year I did not receive funding until the summer, so I could not take a water sample in the spring. Last year (2024), for long-term exposure for aquatic life, the spring sample had too much iron, mercury, aluminum, and copper.

8. Discussion and Management Implications:

I didn't send snagged fish to the vet this year, but in earlier years I found out from the vet that snagged fish have less flexibility, so it's harder for them to pass the rapids at Bloody Falls. If they can't make it up the falls, then they can't make it to their spawning grounds. It could mean that we have less fish the next year.

This year was the first year that I was fishing above the falls at the right time to catch char. None of the char that I caught above the falls had marks from snagging. In the future, I would like to fish above and below the falls at the same time, so I can compare both sites if I catch snagged fish.

In my opinion, I want to ban snagging because it hinders the char that are going up the river to spawn.

I want to keep learning about sick fish, what is making them sick, and how to identify what type of sickness there is from the appearance of the fish. There was less sick fish this year than in previous years, but I want to keep sending sick fish out in the future. I think it's important to keep monitoring sick fish because it can help people learn what is safe to eat or touch. This year I

found out that Polar Knowledge Canada hired a fish vet in Whitehorse. I will contact her about sick fish in the future, since she specializes in fish.

For contaminants in fish tissue, I would like to collect more tissue samples from fish. So far, contaminants were really low in fish. I think it's important to keep monitoring contaminants in fish because water levels are low and getting lower each year, and the metals could be more concentrated in the water. In the future there could be more metals going from the land into the river from creeks. The mine at Lac de Gras is closing. Lac de Gras is at the headwaters of the Coppermine River. The mine will be reconnecting the mine site to the lake and the river. I would like to keep taking water samples and comparing them to older samples to see what's coming down the river.

I took ten different youth out to set nets, sample fish, and take water samples. The youth were excited to learn how to set nets and to get experience fishing. I think it's important for youth to know what they can learn about their fish and if there's programs going on like this, then they could pursue projects they want to do. I want to help give youth knowledge and let them know they can get their own funding from places to start their own projects.

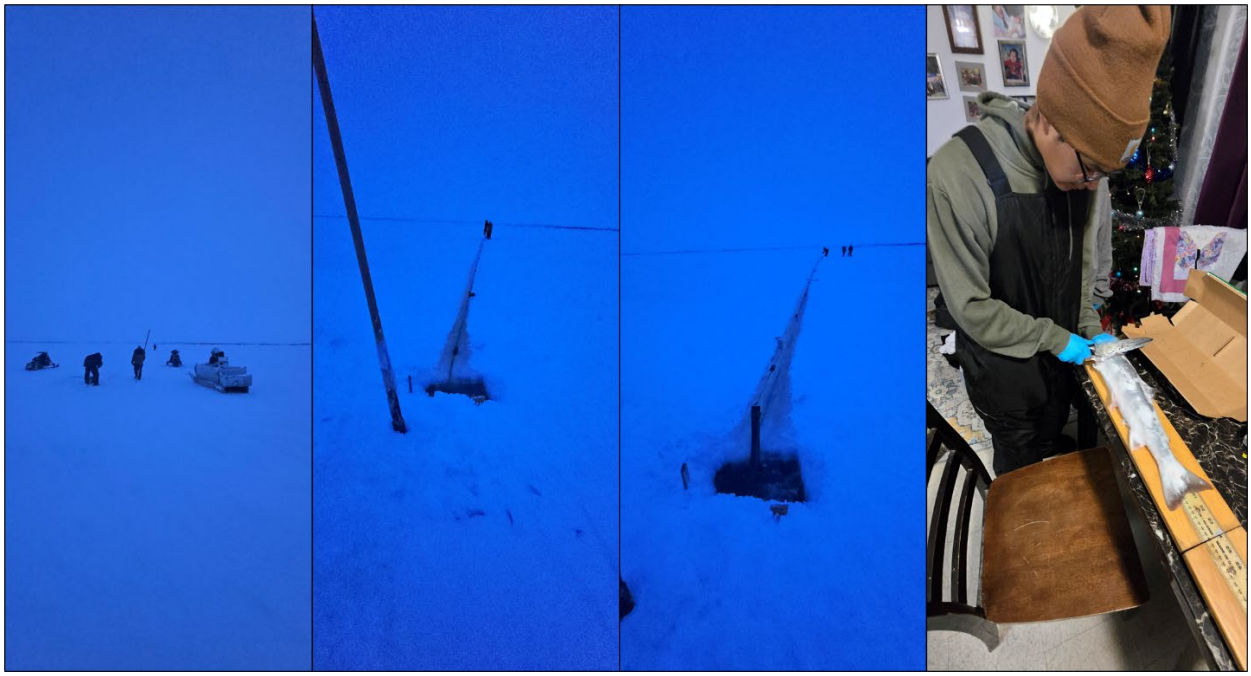

Figure 7: Here we are checking the net in the winter time. We check the net daily to check for fish. Here, some youth are helping to check nets (left and middle), and taking a tissue sample (right).

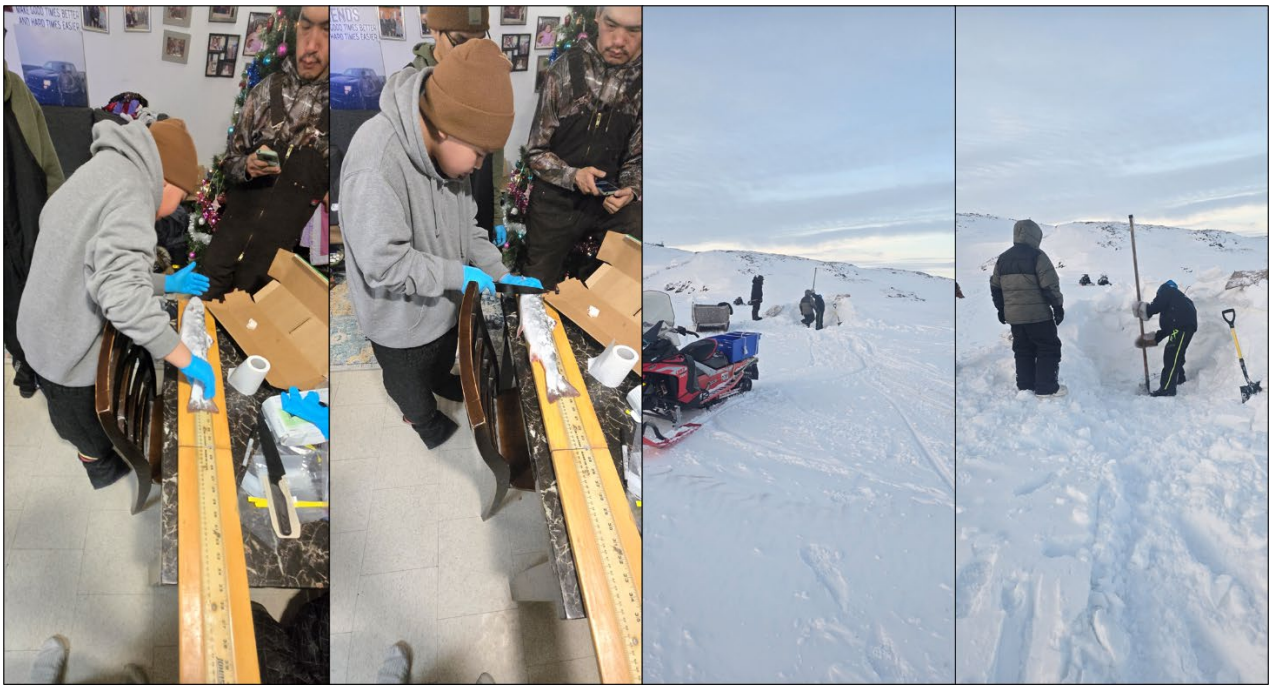

Figure 8: Here is another youth measuring the length of the fish (left) and taking a sample (middle left). An Elder came with us to check the net and teach the youth about catching fish (middle right and right)

Figure 9: Here are two youth collecting water samples under the ice.

9. Reporting to Community and Resource Users:

On March 12 I did a presentation and workshop at the Milukshuk building in Kugluktuk about how to do fish sampling. I invited youth and other assistants to help with the event. We presented results from tissue samples, results from snagging, and results from water sampling. We had one table set up for water sampling to teach how to measure salinity and temperature with the YSI. We had a table with pictures of youth setting nets and taking samples. We had tables for water sampling results, sick and snagged fish, and tissue results. I had saved 11 fish through the winter and showed the community how to measure the fish and take samples from the fish. After, I gave the fish to people who came to the presentation.

Figure 10: Sampling fish with youth at the community workshop. We measured the length of the fish (middle) and the weight of the fish (right).

Figure 11: Removing the otoliths (ear bones) from the fish (left) and talking about water sampling (right) with youth at the community workshop.

10. References

Canadian Council of Ministers of the Environment (CCME) 2025. Canadian Water Quality Guidelines for the Protection of Aquatic Life. https://ccme.ca/en/resources/water-aquatic-life#

Health Canada 2004. Mercury – Your Health and the Environment: A Resource Tool. https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/contaminants/mercury/mercur-eng.pdf

Health Canada 2020a. Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Escherichia coli. https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-escherichia-coli.html

Health Canada 2020b. Guidelines for Canadian drinking water quality: Guideline technical document – Total coliforms. https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guideline-technical-document-total-coliforms.html

Health Canada 2025. Guidelines for Canadian Drinking Water Quality - Summary Tables. https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html

United States Environmental Protection Agency (USEPA) 2000. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume 2: Risk Assessment and Fish Consumption Limits. Third Edition. Washington, DC. https://www.epa.gov/sites/default/files/2015-06/documents/volume2.pdf

Financial Report

1. Contribution Agreement Number: 26-04-001
2. Project Title: Health of Arctic Char in the Coppermine River and surrounding area
3. Project Leader: Eric Hitkolok
4. Original Project Budget:

Item	Funds ($)	Funded by NWMB (Yes/No)
Gift cards to fishers that submit sick fish	$100	Yes
Fish necropsies	$1200	Yes
Fish samples – contaminant analysis	$3125	Yes
Fish samples – arsenic analysis	$2500	Yes
Water sample analysis	$3200	Yes
Sampling bags and supplies	$500	Yes
Supplies for workshop	$475	Yes
Shipping	$1500	Yes
Boat rental	$4000	Yes
ATV rental	$2400	Yes
Salary for project participants	$11 000	Yes
Total:	$30 000	

5. Original Contributions:

Contributor	Funds ($)/In-kind (PY)
Kugluktuk HTO (admin, office space, power)	In-kind, estimated value $5000
University of Waterloo (admin, tech support)	0.1 person/year
NWMB	$30 000

6. Explanation of Changes:

There were no changes to the contributions.

7. Financial Report:

Budget Item	Budgeted	Disbursed	Variance
Gift cards to fishers that submit sick fish	$100	$0	$100
Fish necropsies	$1200	$0	$1200
Fish samples – contaminant analysis	$3125	$9183.31	-$6058.31
Fish samples – arsenic analysis	$2500	$0	$2500
Water sample analysis	$3200	$3081.75	$118.25
Sampling bags and supplies	$500	$410.04	$89.96
Supplies for workshop	$475	$311.80	$163.20
Shipping	$1500	$563.10	$936.90
Boat rental	$4000	$750	$3250
ATV rental	$2400	$2600	-$200
Snow machine rental	$0	$3250	-$3250
Salary for project participants	$11 000	$9600	$1400
Total:	$30 000	$29 840.37	-$159.63

8. Explanation of Variances:

- Gift cards to fishers that submit sick fish – nothing was spent on gift cards because no one brought me sick fish.
- Fish necropsies – less was spent on fish necropsies because no one brought me sick fish. Maybe the fish were healthier this year. I did not send any fish out for necropsies.
- Fish samples (contaminant analysis and arsenic analysis) – the arsenic analysis was subcontracted from the Caro lab to the ALS lab, so the cost for the arsenic analysis was included with the contaminant analysis. This makes it look like nothing was spent on the arsenic analysis. The money that was saved on fish necropsies and shipping costs was spent on analyzing contaminants in more fish.
- Water sample analysis –the cost of analyzing water samples was very close to what I budgeted.
- Sampling bags and supplies – I had lots of leftover sampling supplies, so the cost was a bit less than budgeted.
- Supplies for workshop – I spent less because the complex was fully booked during the week of my workshop and the Milukshuk building was cheaper to rent than the complex.
- Shipping – shipping cost less than I thought
- Boat rental – less was spent because I did not receive funding until partway through the summer and I could not do as much sampling in the summer as I expected.
- ATV rental – there was one extra day of ATV rental, for the winter sampling with the youth.
- Snow machine rental – I did not include snow machine rentals in the original budget. The money that was not spent on boat rentals was spent on snow machine rentals for winter sampling.
- Salary for project participants – less was spent on salary because I brought youth and an Elder out for sampling for six days instead of seven, and less paid time was spent on admin (preparing for workshop, sample shipping, reporting, etc.)

9. Verification of Information Provided:

I certify that this is an accurate statement of the Board project funds received and disbursed in accordance with the joint contribution agreement.

Eric Hitkolok
Signature

April 10, 2026
Date