



COLLEGE OF FISHERIES AND OCEAN SCIENCES

University of Alaska Fairbanks

I would like to acknowledge and thank the Yukon First Nations and Alaska ancestral lands I traveled through and collected samples from. I look forward to continue focusing on research reciprocity with the people living in these communities and sharing of the information I find.

What happens on the Yukon River leaves genetic traces; analysis of eDNA samples from a thousand-mile canoe expedition



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Results

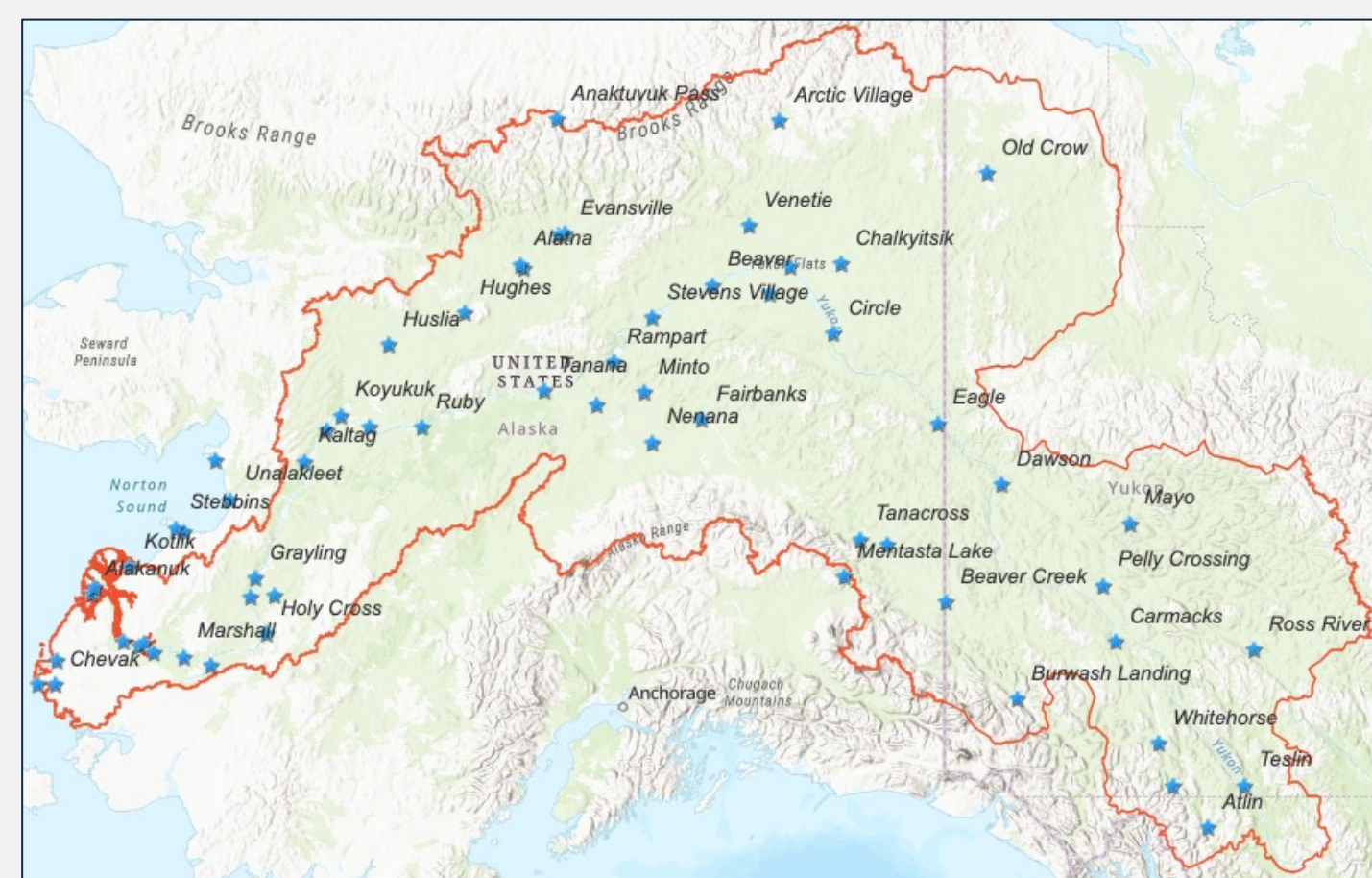
Sample Site	Mean DNA per Sample (ng/μL)
1. Marsh Lake	1.75
2. Below 1st dam, main flow of Yukon	1.16
3. Below 2nd dam, Whitehorse	2.80
4. Takhini River	1.09
5. Lac Lagerge	4.53
6. Teslin River	1.24
7. Big Salmon River	2.62
8. Pelly River	3.05
9. White River	0.59
10. Charley River	1.08
11. Porcupine River	1.34
12. Mile 950, main flow of Yukon	0.88

Significance

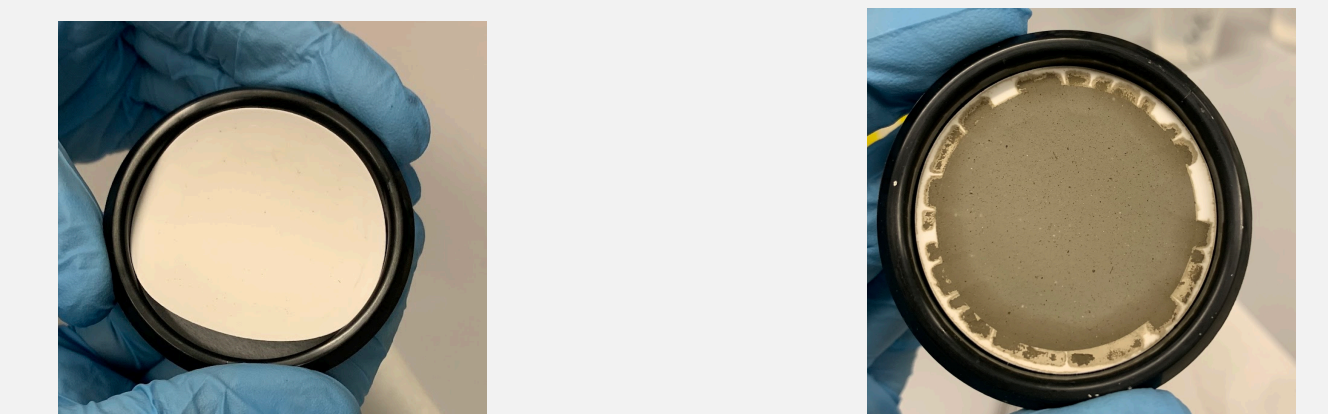
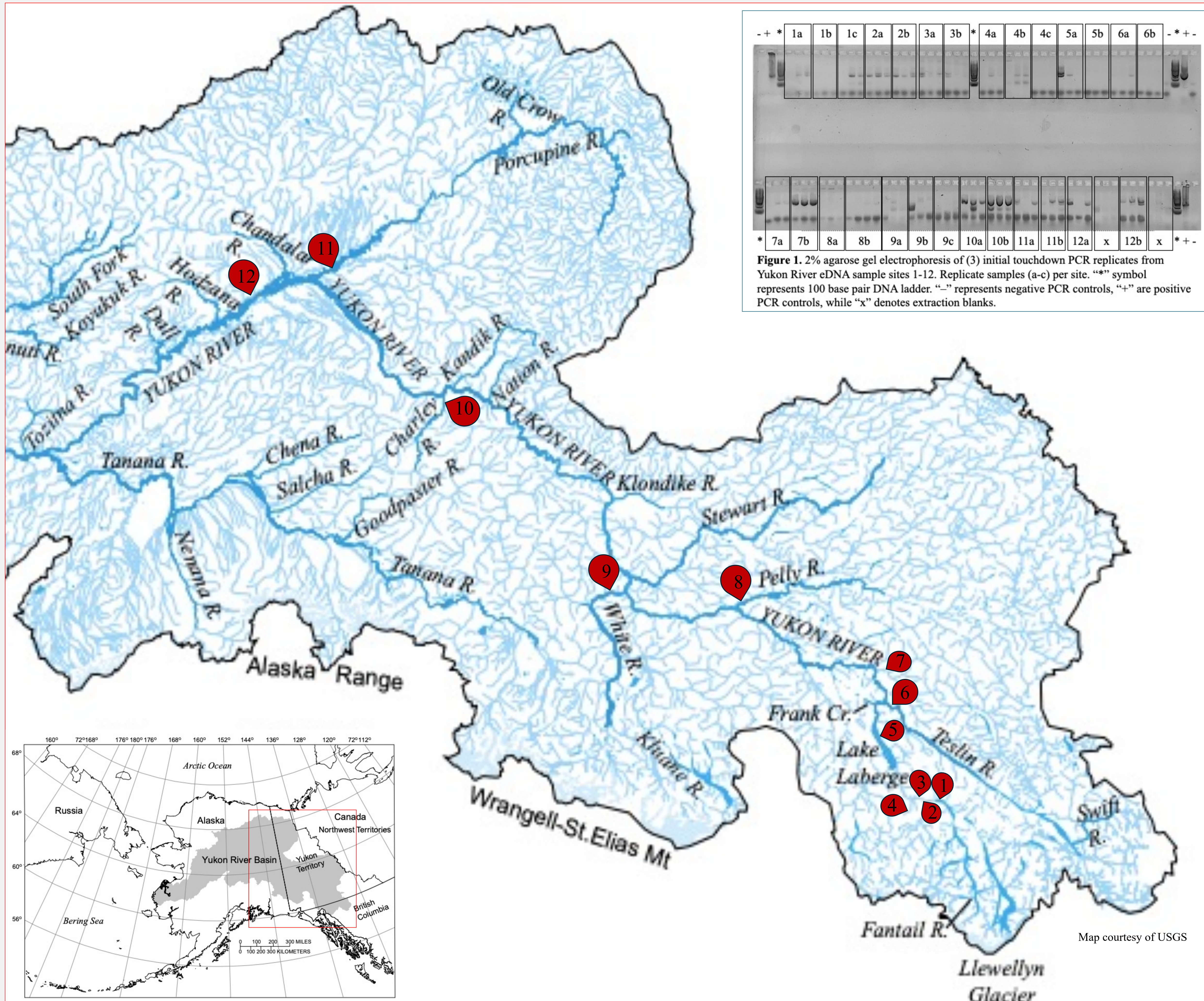
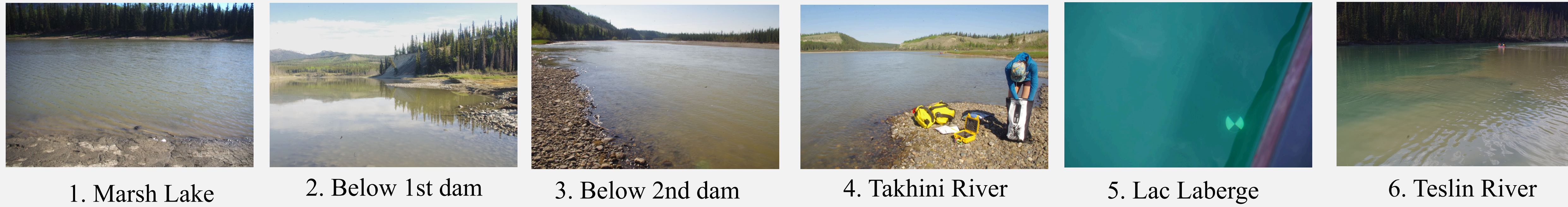
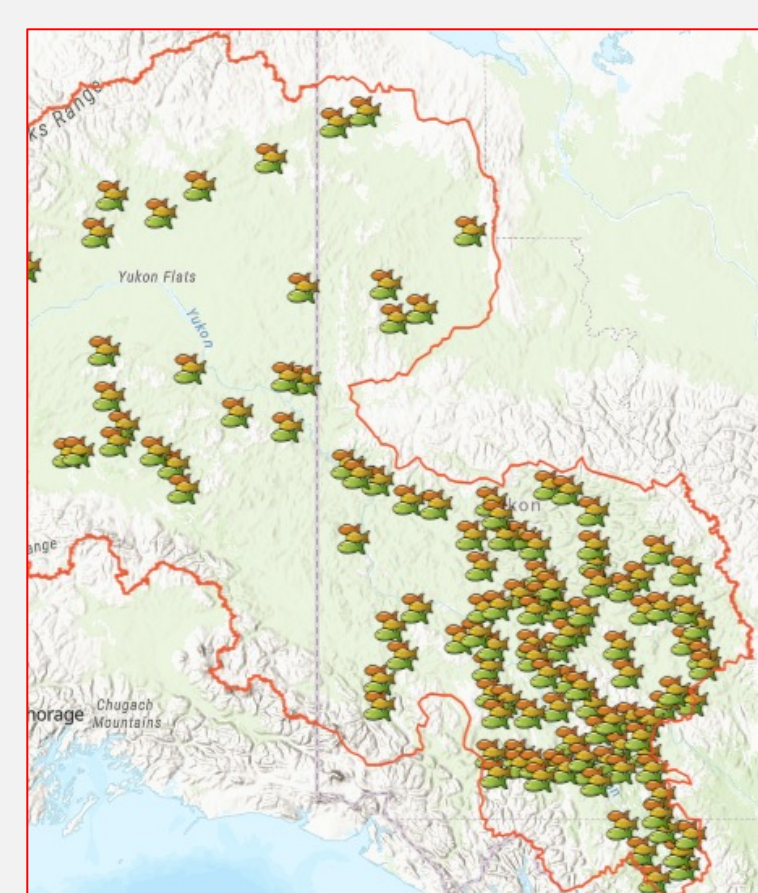
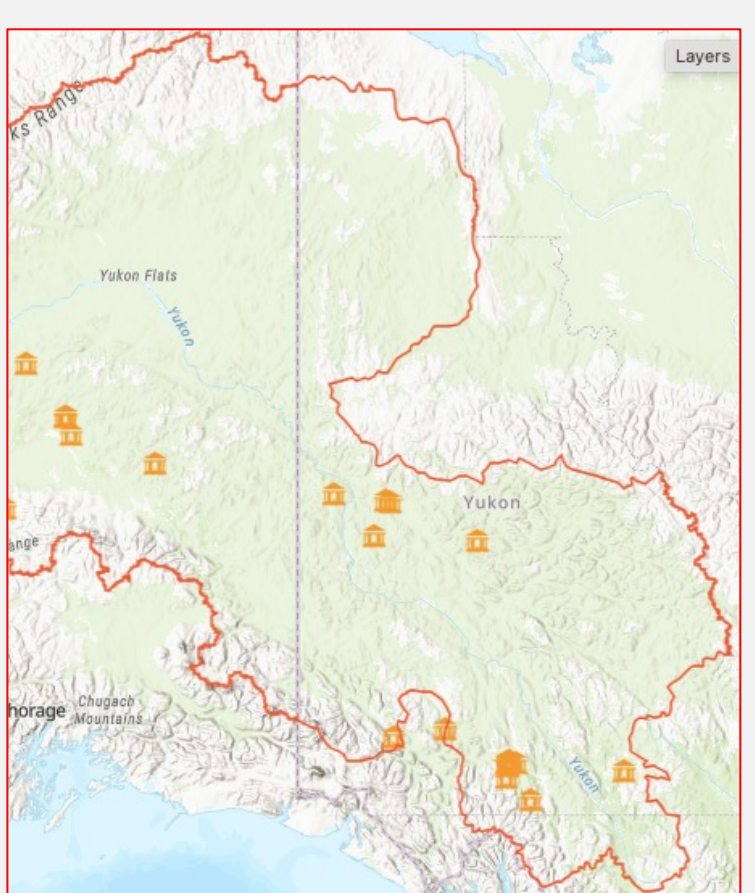
Aquatic diversity of the Yukon River is an important indicator of watershed health in interior Alaska, USA and Yukon, CAN. Presence absence data of anadromous species may also be used to describe how rapidly Subarctic and Arctic marine environments are changing. Many communities in this watershed are remote and rely on anadromous and resident fish populations to support traditional food and cultural practices.

Question 1

Are eDNA field protocols effective in the interior subarctic given higher sediment loads due to glacially influenced rivers?



Above. Red outline is Yukon River watershed boundary. Blue stars represent member communities of the Yukon River Inter-Tribal Watershed Council. Below. Right, Dams in the watershed in orange. Left, Known Chinook salmon spawning sites marked by fish. Figures above and below provided by the YRITWC.



Above. Examples of difference in sediment loads, left, Lac Lagerge (oligotrophic), right, White River (glacier-fed).

Question 2

What fish species are present in the mainstream and tributaries of the Yukon River?

A continuation of this experiment is processing of extracted samples for preparation of DNA sequencing libraries targeting a short segment of mitochondrial genomes. Mitochondrial DNA sequences obtained from river samples will be compared against reference databases to generate a fish assemblage of sample sites.

Acknowledgements

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