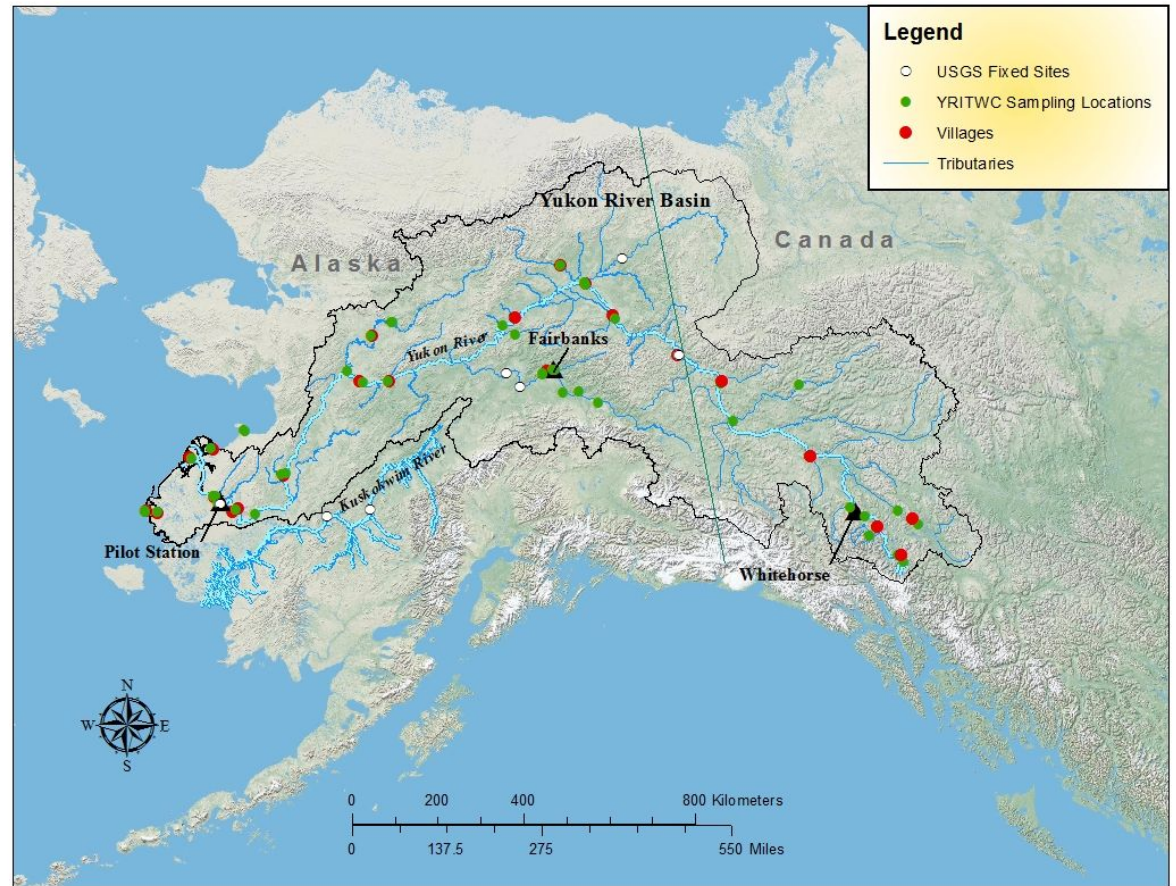


A scenic view of a river flowing through a forested valley, with mountains in the background. The river is surrounded by dense green forest, and the water is a light blue color. The title text is overlaid on the image.

Yukon Environment Target of Intent (YETI) Yukon River Basin

By: Jillian Sternig, Paige Aldred, Neil-Jean Baptiste, Austin
Gray

Complete Map



Outline

- Background and Environmental History
- Mission Statement
- Policies and Mandates in Place
- Problem and Goal One
- Problem and Goal Two
- Problem and Goal Three
- Conclusion



Background and History



- International watershed that is located in the state of Alaska, USA and the province of Yukon, Canada.
- Fourth largest basin in the world with 5 National Park and 9 Wildlife refuges
- Home to various forms of wildlife, indigenous tribes, as well as endangered species
- YRB flows out to the Bering Sea and Pacific Ocean.
- First discovered by the Russians in 1846 but was not well known until gold discovery in 1896

Mission Statement

YETI's goal is to analyze the impacts that climate change is having on this watershed basin and provide recommendations on how to lessen the severity of impact. With these recommendations we hope to improve water quality overall so that the water is not negatively impacting the ecological surrounding habitat. YETI aims to bring awareness to nutrient pollution, the effects of permafrost melting, as well as impact that the rise in Mercury levels is causing.



Policies and Mandates

United States

- **National Environmental Policy Act (NEPA):** Requires agencies to assess the environmental impact of prospective federal projects before implementing them.
- **Clean Water Act (CWA):** Maintains the chemical, biological, physical stability of flowing water in the US. Sets a federal standard for how much pollution can be discharged into waterways.
- **National Historic Preservation Act (NHPA):** Protects land with historical, cultural, archaeological significance.
- **Federal Land Policy and Management Act:** Established that the Bureau of Land Management(BLM) should manage federal lands.
- **Wild and Scenic Rivers Act (WSRA):** Protects free-flowing water bodies that have recreational, geological, agricultural, and similar values.

Canada

- **Fisheries Act:** The Department of Fisheries and Ocean(DFO) is to protect the fisher and fish habitats of Canada.
- **Devolution Transfer Agreement:** The management and control of the Yukon's resources belongs to the territorial government.
- **Environment Canada:** This federal agency conserves the natural environment, flora and fauna, and resources of Canada.
- **Yukon Environmental and Socio-Economic Assessment ACT (YESAA):** assessment of all projects in the Yukon territory.

United States and Canadian Policies

- **Yukon River Salmon Agreement:** Passed in 2001, this policy recognizes the need to maintain viable salmon fisheries in both the US and Canada, and works to rebuild, conserve, manage, and maintain the fisheries more effectively.
- **Pacific Salmon Treaty:** commitment made by Canada and the US to ensure both countries prevent overfishing, provide optimum production, and ensure both countries receive benefits equal to the production of salmons in their waterways.



Understanding Indigenous Governance

- Tribal jurisdiction limits the ability of tribal governments to take advantage of federal environmental regulations, which creates barriers in water access and safety.
- Often times, tribes must be able to qualify as states to implement their own water quality treatment programs.
- It is important for tribes to be familiar with existing federal laws and know how to preserve and protect the watershed.
- The Bureau of Indian Affairs in the United States and the Indigenous Services Canada work to provide services and support for indigenous communities.
 - **Executive Order 13007, “Indian Sacred Sites”**: Protects the physical integrity of sacred and cultural sites on Indian land.
 - **Archaeological Resources Protection Act**: Oversees the archaeological sites on Federal and Tribal land.
 - **Constitution Act of 1982**: Canada is required to protect the rights of the indigenous Yukon peoples and Canadian fisheries

Watershed Governance Structure

- **Yukon River Inter-Tribal Watershed Council (YRITWC)**
 - Established by over 60 Tribes and First Nations in the watershed basin.
 - Combines modern science and policy with traditional indigenous policy and knowledge.
 - Objectives include:
 - Sustaining habitats and ecological functions for fish and wildlife in the basin;
 - Sustaining the health of all people that come into contact with or drink water from the basin;
 - Sustaining the traditional and subsistence uses of the watershed.
- **Yukon River Drainage Fisheries Association (YRDFA)**
 - Mission includes policy advocacy, conservation and restoration, cultural preservation, economic opportunity, and information sharing.
 - Created in 1990 to provide for the participation of indigenous communities in the decision-making process regarding the conservation of salmon runs.
 - Serves as a leading research organization in the region.

Watershed Governance Structure

- **Yukon River Panel**
 - 12-person body with 6 panel members from the United States and Canada each that represent the interests of Yukon fishers, First Nations, Tribal Councils, fisheries managers, and others.
 - Created in conjunction with the signing of the Yukon River Salmon Agreement in 2001 to implement the policy.
- **Association of Village Council Presidents (AVCP)**
 - Provides services pertaining to community development, education, social services, culturally relevant services, and advocacy of communities in the region.
- **Council of Athabaskan Tribal Governments (CATG) and Tanana Chiefs Conference (TCC)**
 - Work to support self-determination, regional unity, and self-governance.

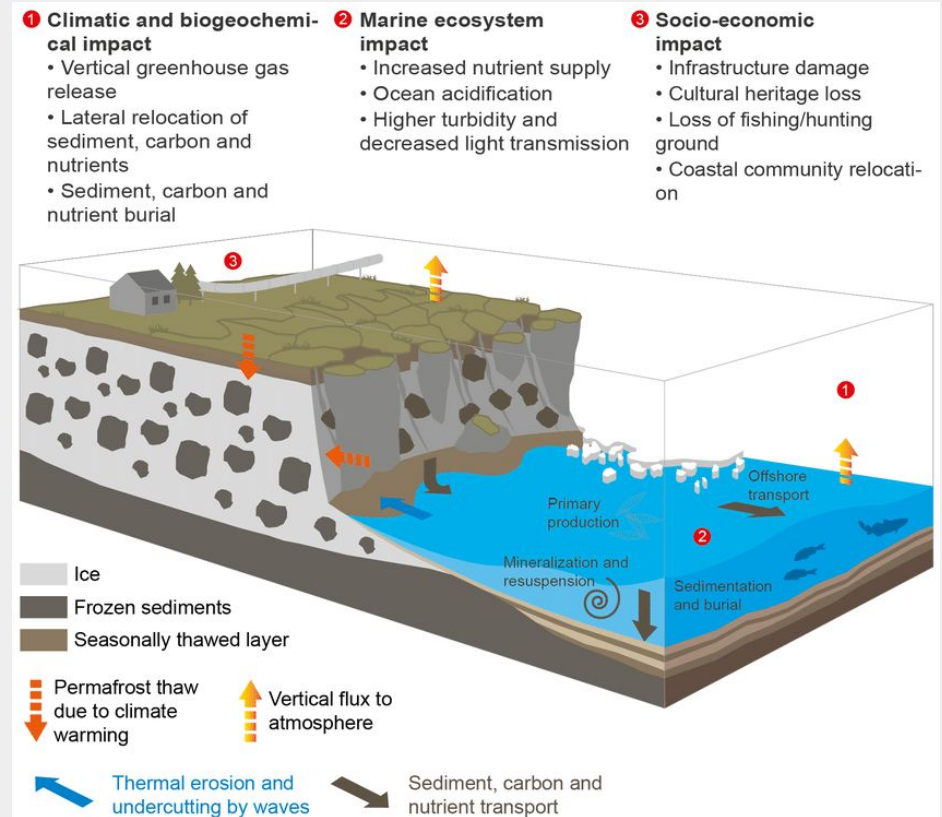
Problem 1: Nutrient Pollution

Description:

- Permafrost forms beneath the surface in the Yukon River Basin.
 - Nutrients and minerals, as well as contaminants
- When permafrost thaws out, new paths open for water
 - More chemicals are added to the water flow
- Yukon and Tanana Rivers have seen *major* increases in
 - Calcium, magnesium, phosphorus and sulfite
 - Sulfite alone has increased by 60% and phosphorus by 100%.
 - Resulting increase in the likelihood of red tides.
- Globally, melting permafrost releases 300–600 metric tons of carbon, resulting in increased air and sea-surface temperatures.

Causes of Nutrient Pollution

- Climate change in Alaska
- Permafrost Loss
- Decreased levels of dissolved oxygen
- Eutrophication
- Mining industry



Problem 2: Erosion

Description:

- Kaskawulsh Glacier in Yukon retreated
 - Water from melting glaciers has altered the direction of flow (stream capture)
 - Led to an imbalance of water levels
 - One stream is seeing increased flooding, and another is seeing reduced levels of water.
- Erosion
 - Leads to sediment deposited into areas of streams
 - Increase in sediment disrupts the food chain and causes habitat loss
 - Decline in fish populations.
- As more permafrost is lost, more water is being released.
 - Water weathers down the bedrock and soil.

Causes of Erosion

- Melting of permafrost
- Sea level rise
- Mining industry
- Sediment buildup
- Climate change in Alaska



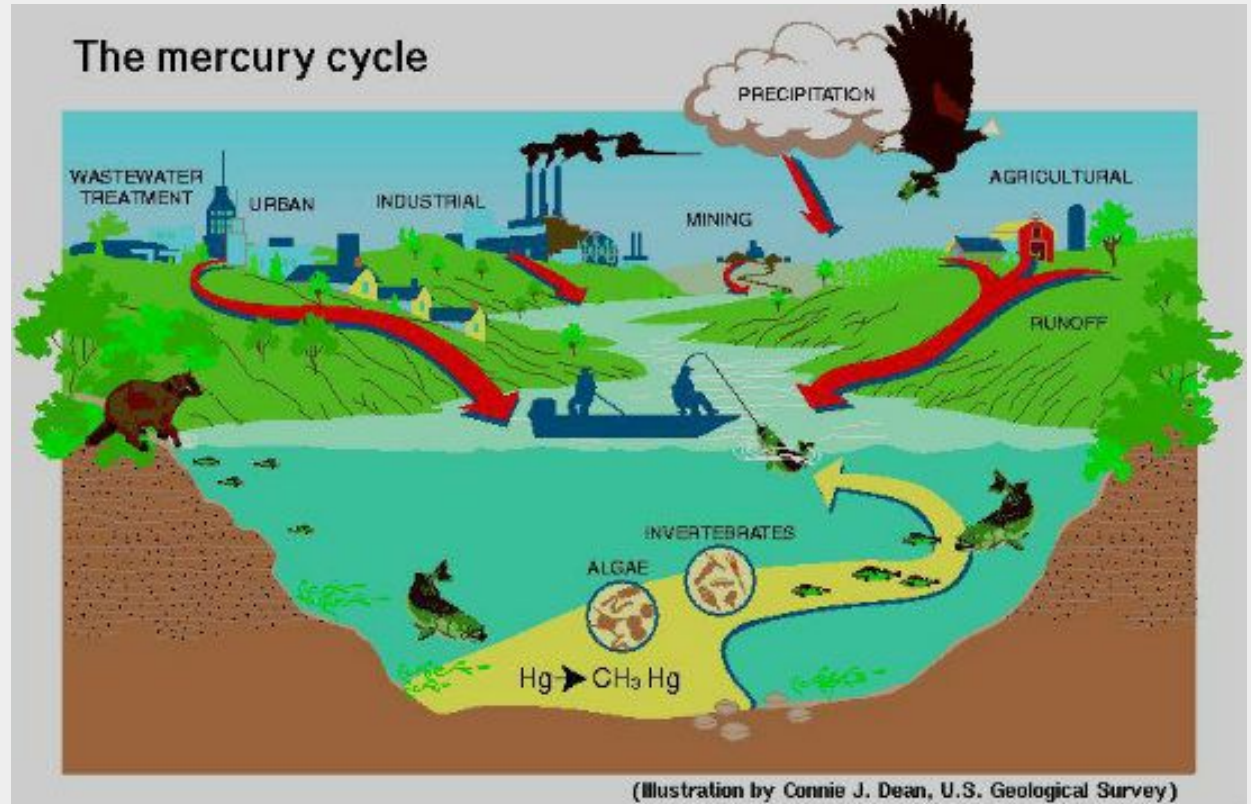
Problem 3: Increasing Mercury Levels

Description:

- Alaska is a biological and physical resource that millions of animals like birds, fish and marine mammals migrate to reproduce. These migrating animals also serve as a huge food source for the human population in this area.
- The Yukon itself is dumping about five tons of mercury a year.
 - Distributing 32 times more mercury into the environment than water basins that are of similar size.

Causes of Increasing Mercury Levels

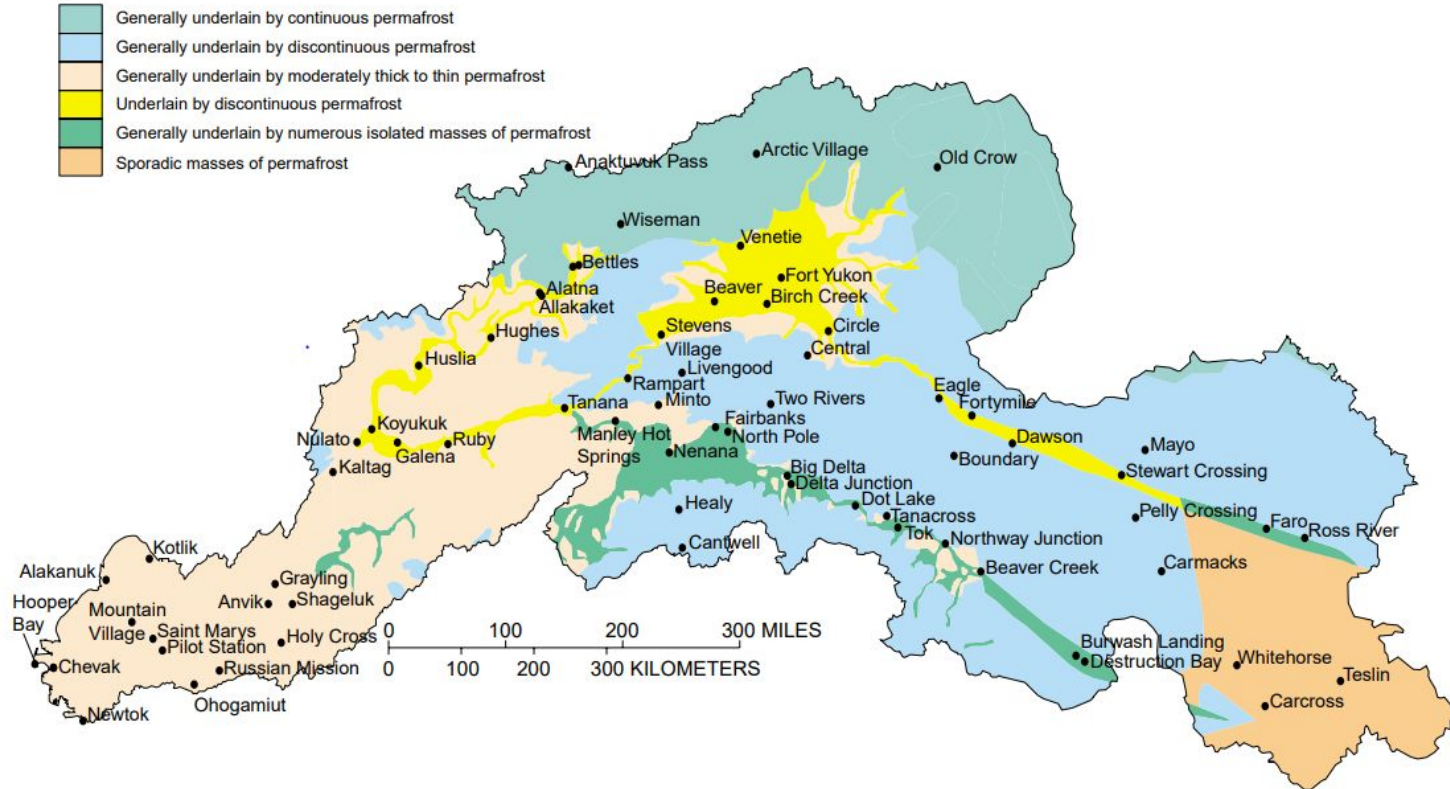
- Melting of permafrost
- Emission from Asia brought in by the winds
- Impacts of fishing industry



Goal 1: Stop Rapid Melting of Permafrost

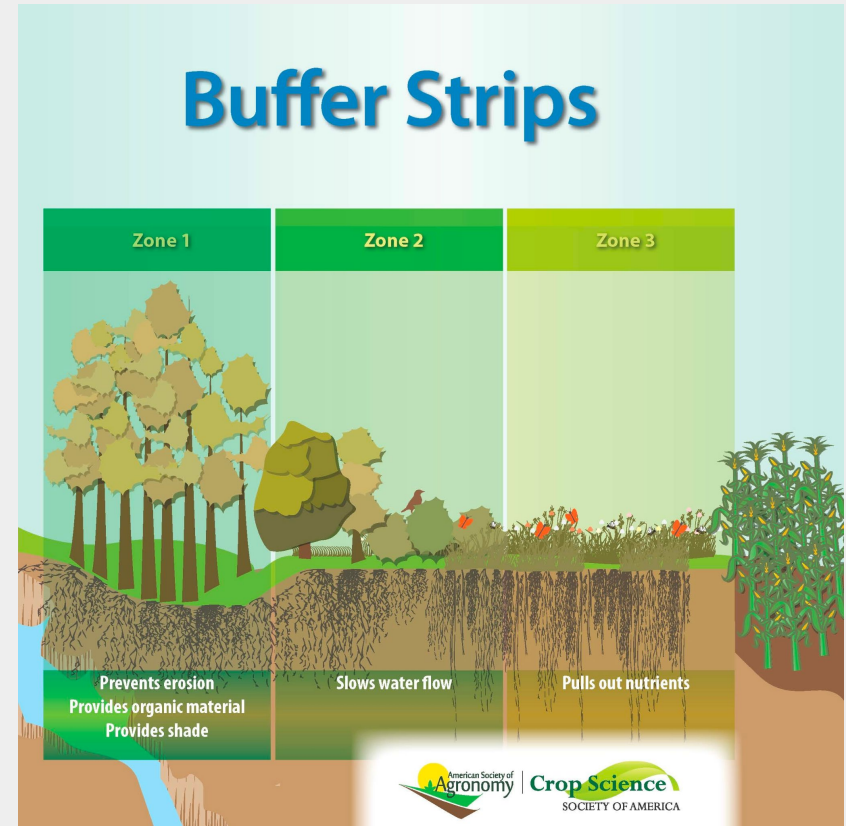
- Plant communities like moss, trees and shrubs help to control the temperature of the soil and help to shade it from the sunlight.
 - Keeps the ground cooler and leads to less meltage.
- Composition of the soil affects the thawing of the permafrost.
 - If more soil was added »»» reduce the melting of permafrost.
- Climate change would need to be addressed in order to reduce permafrost melting.
 - With increasing global temperatures and ocean temperatures, ice can't survive.

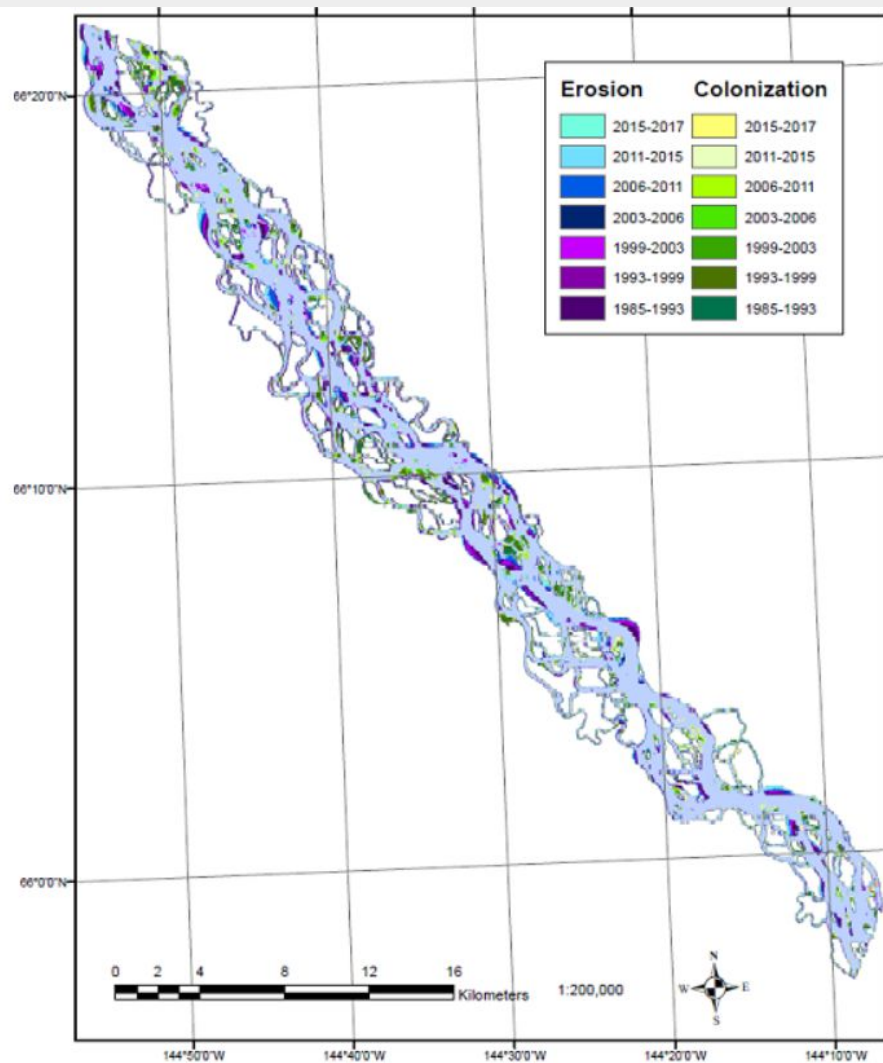
PERMAFROST REGIONS



Goal 2: Reduce Erosion

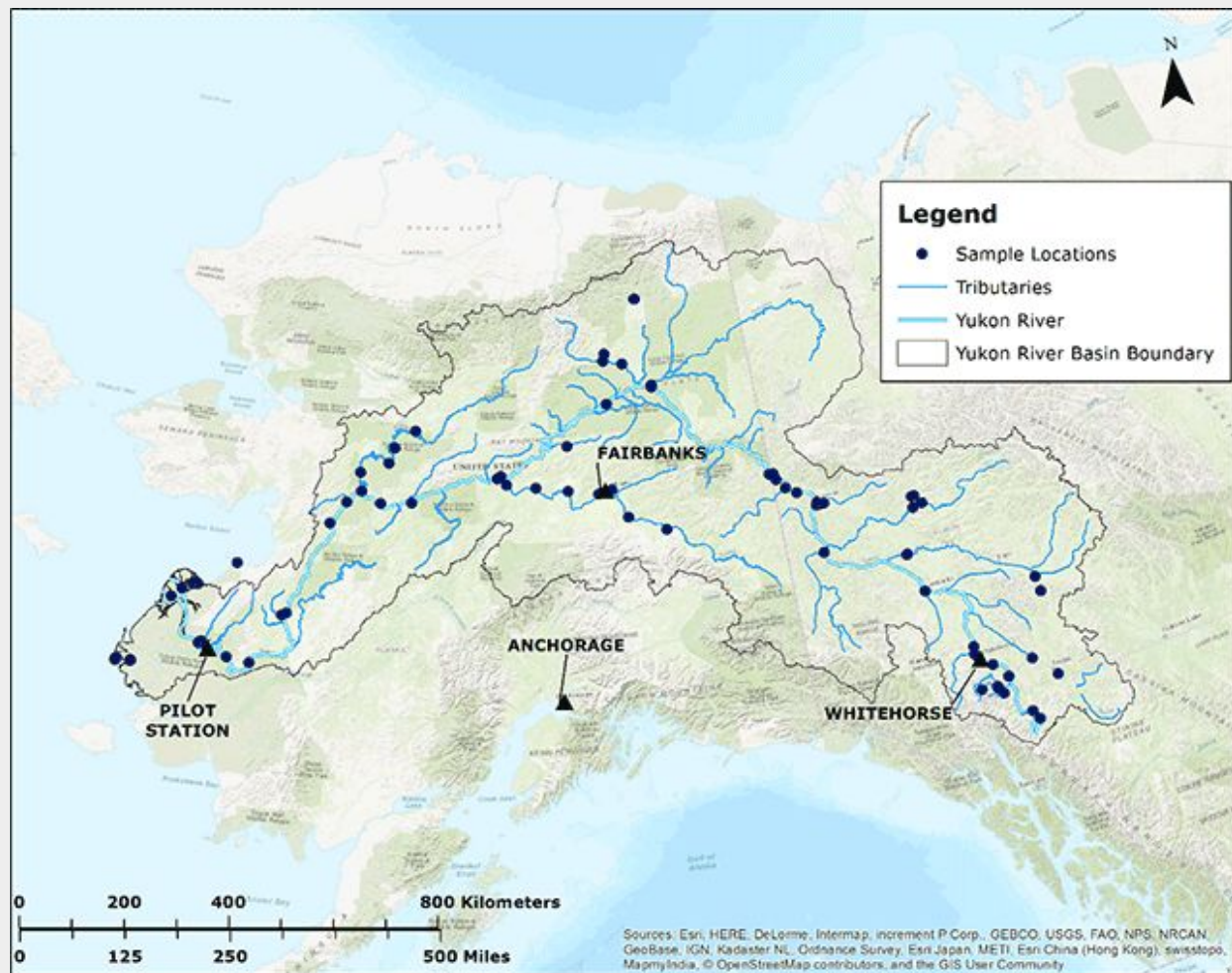
- Enhance riparian buffers
 - Plant more native species
 - The roots of plants help hold the soil to the ground
- Building check dams
 - Help to slow surface runoff.
- *It is also helpful to redirect and capture runoff*
- Stricter mandates on mining and fracking industries in the YRB and surrounding areas





Goal 3: Removing Mercury

- Facility Solutions:
 - Coagulation
 - Granular Activated Carbon
 - Lime Softening
 - Reverse Osmosis technologies.
- Regulatory Solutions:
 - Minimize use of coal power and shift to cleaner energy sources.
 - Making international treaties to reduce overall emissions to minimize the impact of pollution.
 - Invest in Mercury free products



Conclusion

Overall the issues within the YRB are manageable on their own, however when combined together they threaten the quality of life for surrounding areas and population. The YETI plan hopes to implement several solutions in order to reduce the effects that permafrost, nutrients and mercury are having on the environment. YETI understands the relationship between these issues and the wildlife, endangered animals, indigenous population and surrounding areas. YETI wishes to not only make efforts to solve these problems but as well make sure that those being most impacted are being protected and advocated for in the best possible way.



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