

Amplifying integrated watershed research in the Nechako River Basin: A progress update from UNBC's Integrated Watershed Research Group (IWRG)

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Annual Meeting – 14 October 2025

Roots of Resilience: Forests and Water for a Sustainable Future

Photo by Phil Owens



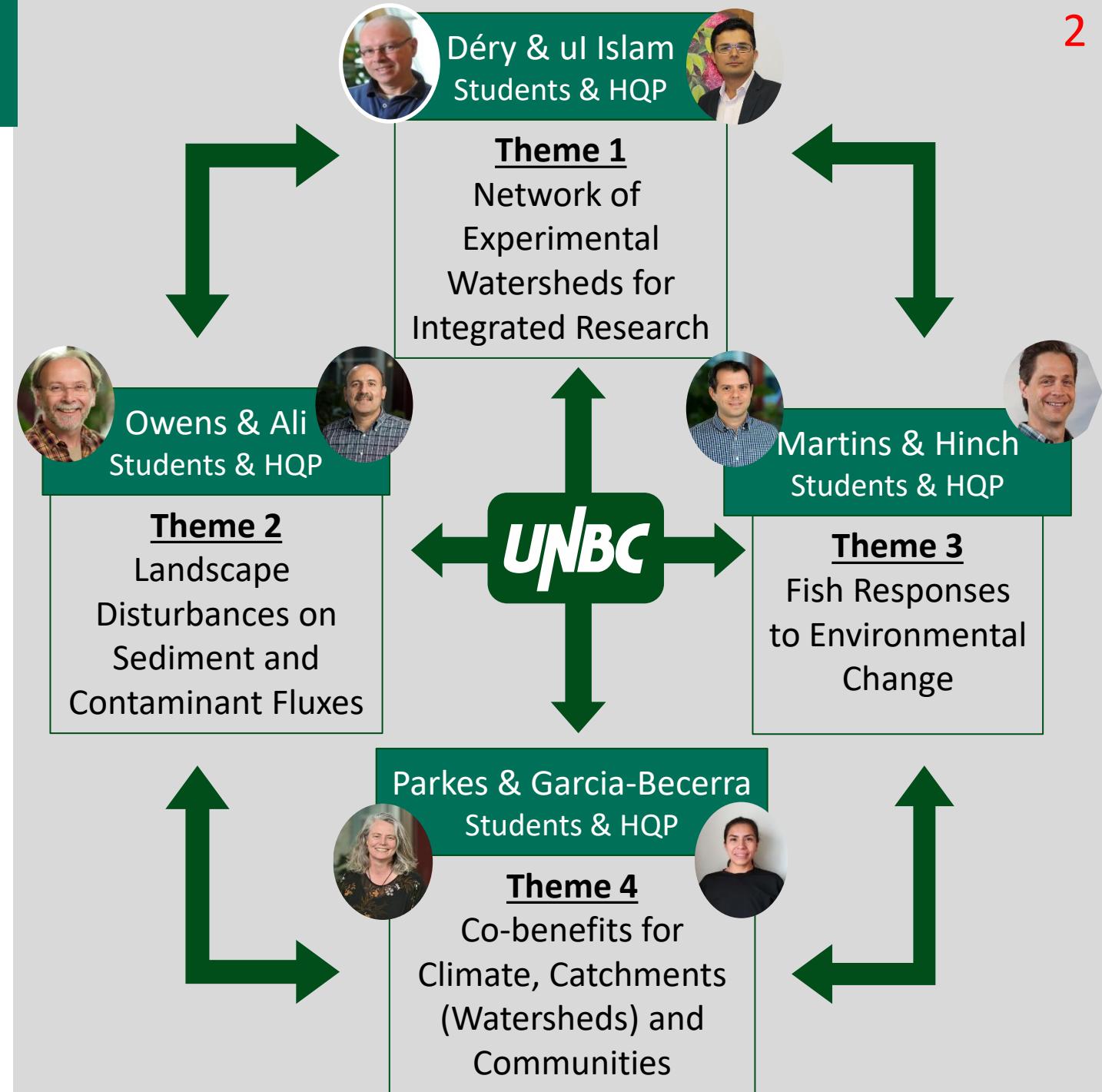
Nechako Reservoir - Unceded and Traditional Territory of Cheslatta Carrier Nation

Phase 3 team & themes

Overarching Goal and Theme: The climate crisis as a cross-cutting driver of watershed change in the Nechako: Strengthening preparedness for integrative responses to climate, water and community connections in the Nechako Watershed.

Timeline: 1 July 2023 to 31 August 2025 with final report submitted to NEEFS at end of September 2025.

Budget: Total value of the project was \$0.8M, with the total award from NEEF being \$0.4M and ECCC / CWA providing half of the required matching funds.



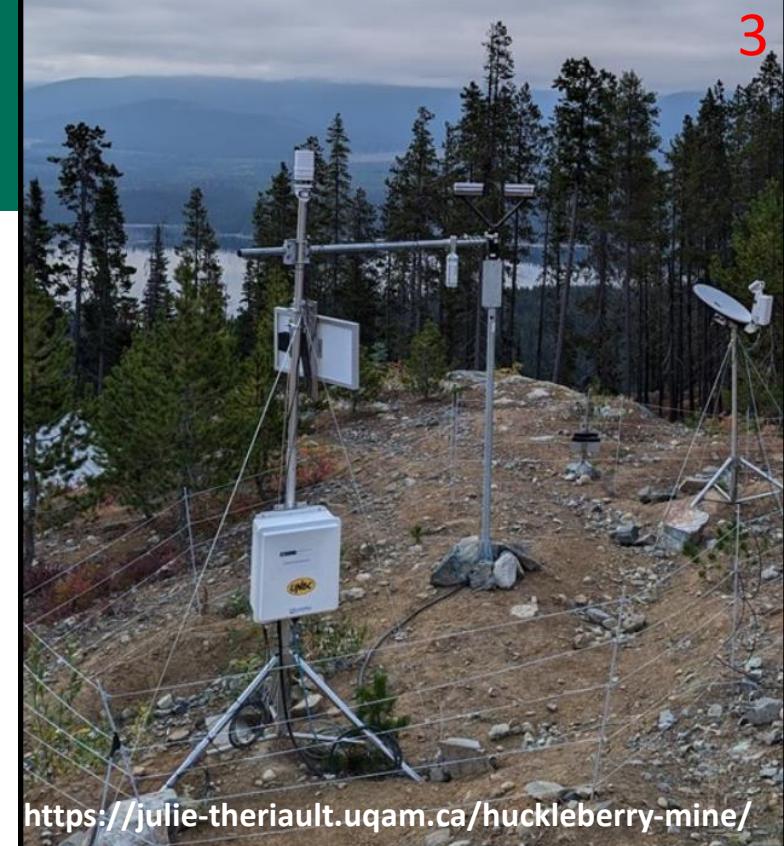
Theme 1: Network of Experimental Watersheds for Integrated Research (NEWIR)

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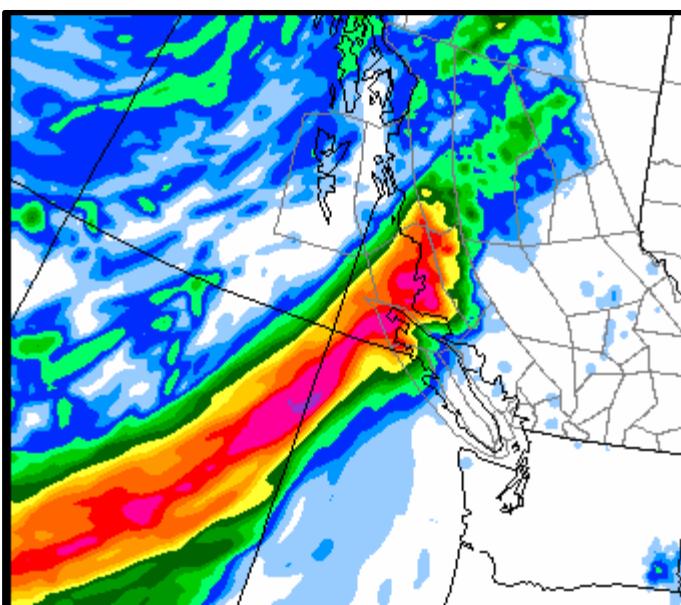
Aim: To develop a network of experimental watersheds to improve monitoring and understanding of the impacts of the climate crisis and land cover changes on terrestrial water fluxes.

Accomplishments:

- 1) Established and maintained a network of 8 research-grade and 5 other meteorological stations across the Nechako Watershed.
- 2) Maintained a network of 30+ water temperature monitoring sites with data deposited at Zenodo, Nechako Watershed Portal (with support from Theme 4 collaborator Dr. Margot Parkes), and on the NHG data visualization tool.
- 3) Undertook simulations of the Nautley River Basin's hydrology to establish impacts of forest cover changes on streamflow (with collaborator Dr. Siraj ul Islam and MSc student Krishna Kafle).
- 4) Tracked 2 seasons of atmospheric river activity in upper Nechako Watershed with Theme 2 collaborators Drs. Phil Owens and Kristen Kieta + analysis of hydrometeorological conditions.



<https://julie-theriault.uqam.ca/huckleberry-mine/>

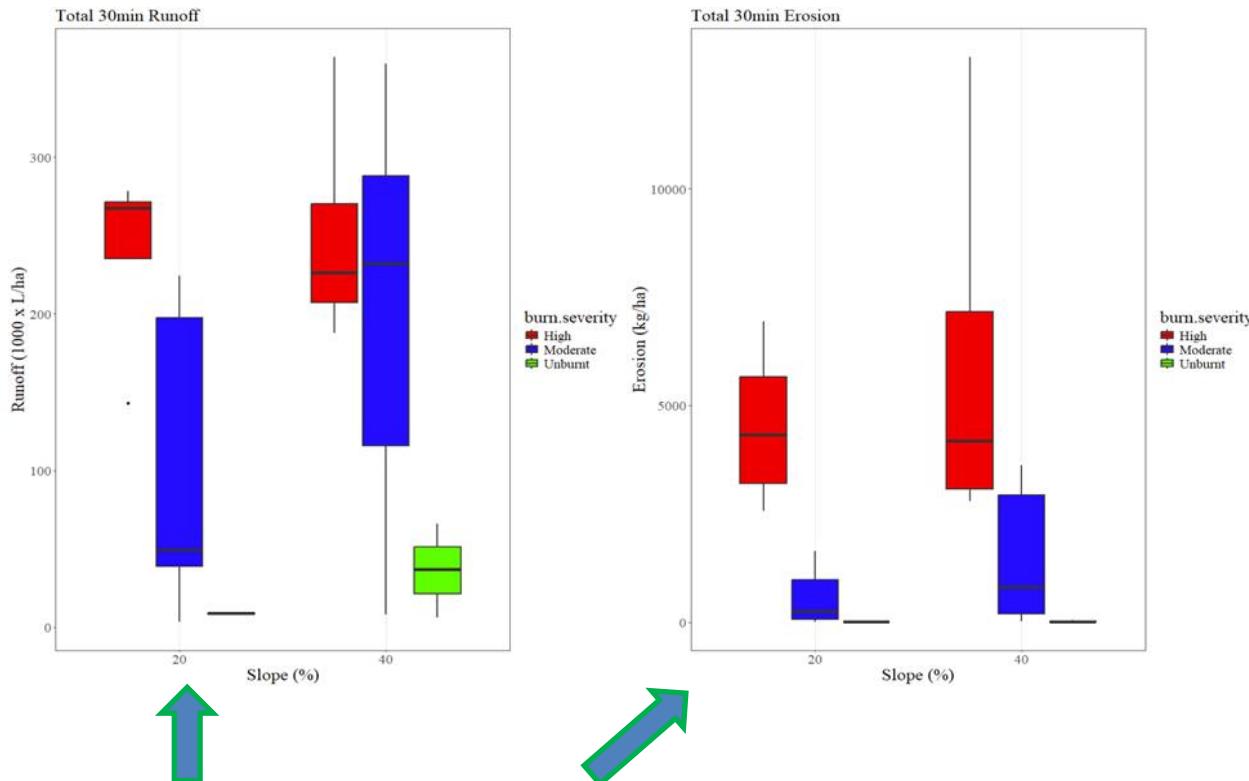


Theme 2: Effects of Landscape Disturbances on Sediment and Contaminant Fluxes

Aim: To determine how landscape disturbances, such as **4** land-falling **atmospheric rivers** and **severe wildfires**, modify erosion of the landscape and the delivery of fine sediment and associated chemicals to river channels.

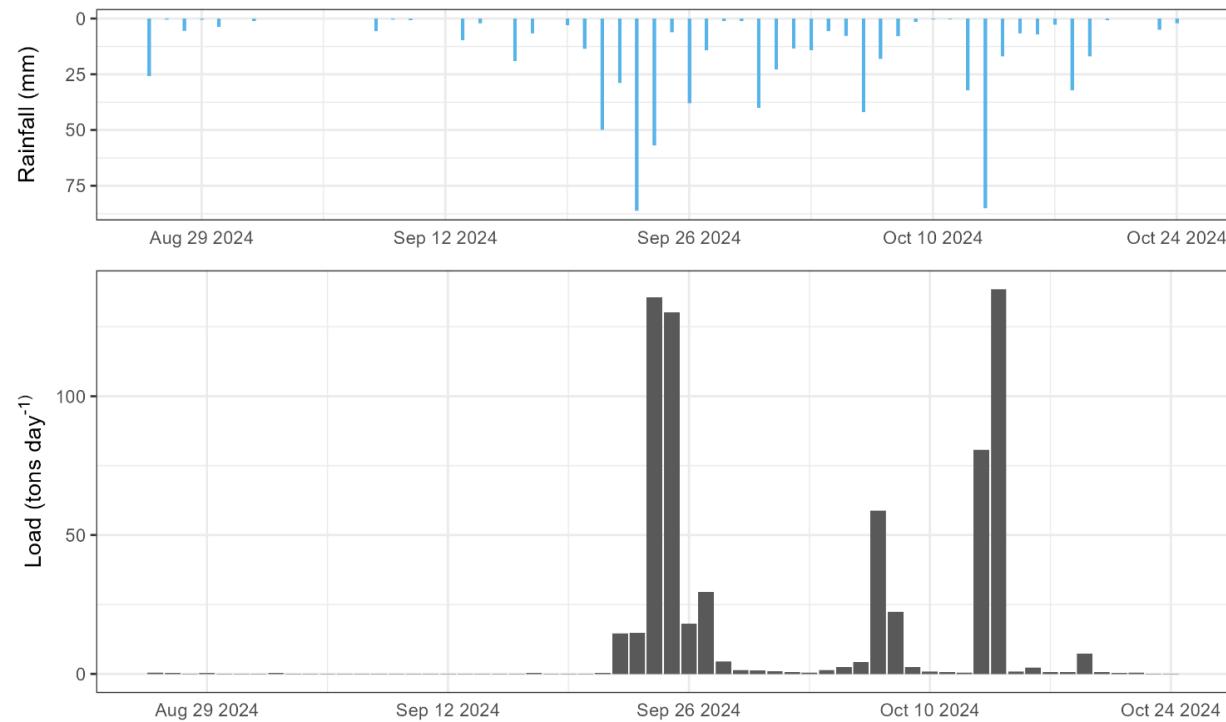
Accomplishments:

Wildfire work – funded by NEEF (Phase 3)



Hillslope runoff and soil erosion are greater following wildfires, especially at high soil burn severity sites (red boxes) compared to moderate soil burn (blue) and unburnt control sites (green)

Atmospheric rivers work – funded by CWA



Daily precipitation and sediment loads at Rhine Creek increase dramatically during atmospheric river events

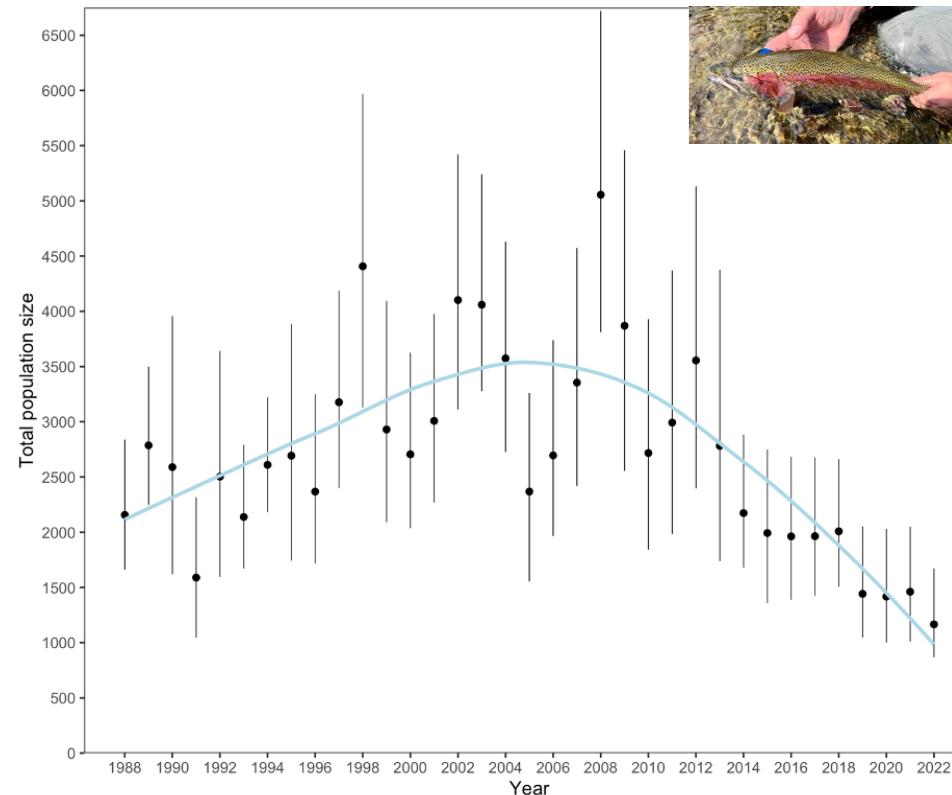
Theme 3: Fish Responses to Environmental Changes

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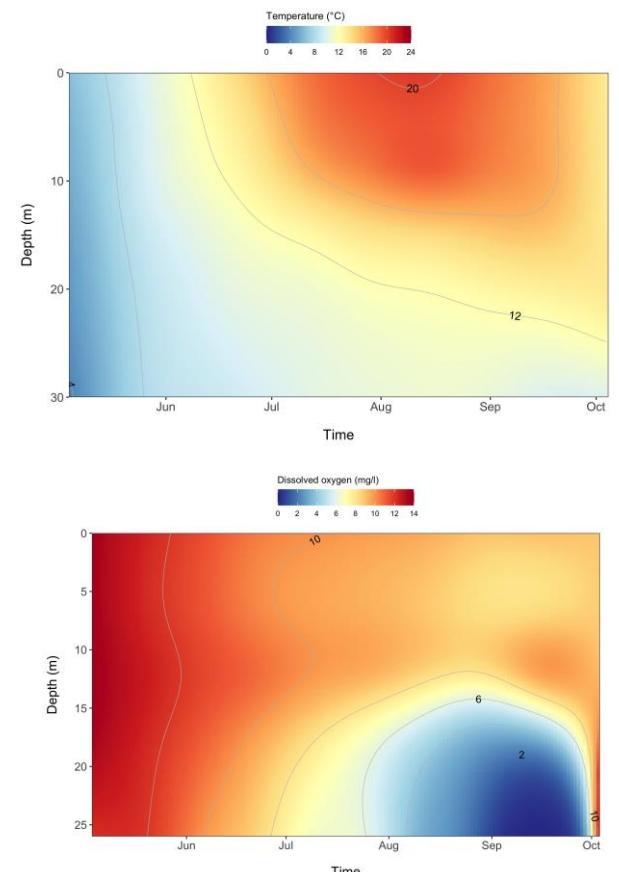
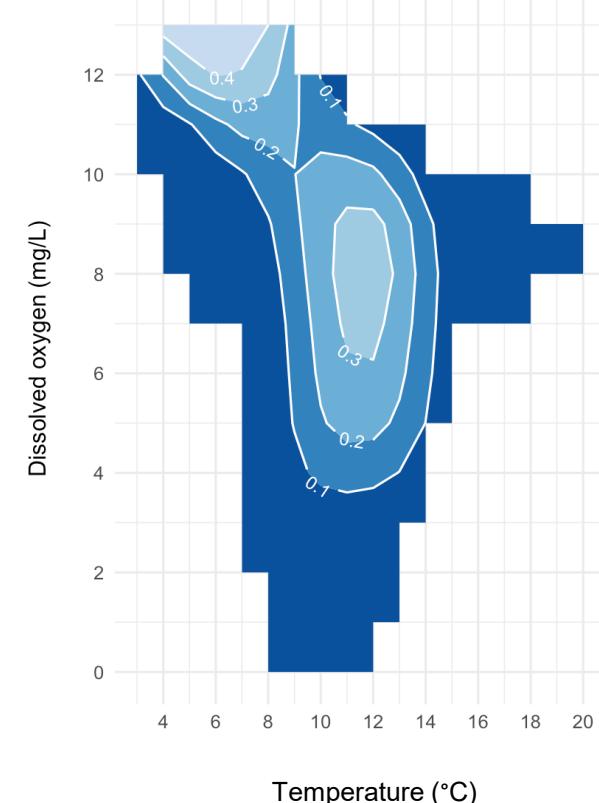
Aim: Investigate short- and long-term responses of fish to environmental changes including climate change in the Nechako Watershed.

Accomplishments:

Completed analysis of Stellako rainbow trout snorkel survey data (1988-2022)



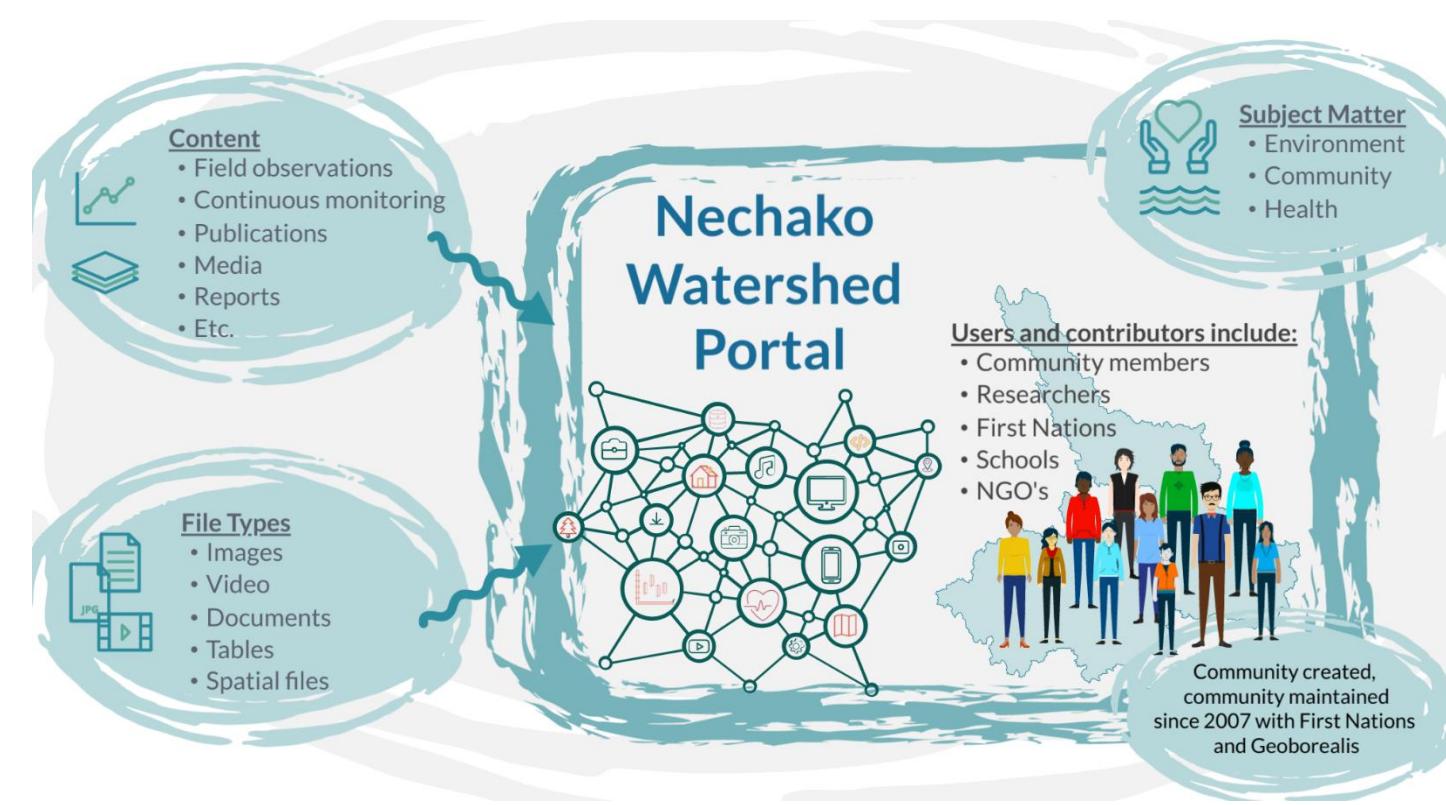
Completed analysis on oxythermal habitat use by burbot in Fraser Lake.



Theme 4: Amplifying Co-benefits for Climate, Catchments (Watersheds) and Communities

Accomplishments:

- Refined and strengthened the **Nechako Watershed Portal** to support the diverse data archiving, profiling and sharing needs of **established and emerging partners/audiences** such as:
 - **Nechako Watershed Roundtable** – connecting the dots across different information / knowledge
 - **School Districts 91 and 57** – cultivating youth curiosity (and other learners too!)
 - **Northern Health** – connecting climate, catchments and communities (Nechako as an exemplar).



Aim: to identify and amplify opportunities for co-benefits to contribute to a healthy, just and sustainable future in the Nechako.

- Identified and trialed integrative tools and processes to amplify co-benefits for climate, catchment/watershed and communities.
- Explored and expanded knowledge exchange opportunities to enhance partner learning, intersectoral action and to amplify the co-benefits of watershed security.

<https://nechakowatershed-portal.ca/>

Ongoing / Future projects and plans for the IWRG

- 2025 field season – site visits across Nechako Watershed along with data analysis
- Atmospheric river field campaign in the upper Nechako Watershed (joint effort Themes 1/2)
- Data quality assurance and control (QA/QC), long-term archiving and sharing
- Nechako Watershed Portal ongoing projects and routine updates/guides:
 - *Welcome to the Nechako* Project
 - *Climate and Health* Project
 - *Large Lakes Monitoring* Project
 - *Saturation Search* of publications
 - Still aiming to profile Cheslatta Carrier Nation Archives
- Potential funding application(s) to expand integrated watershed research in the Nechako
- Dissemination in various forums including publications and presentations
- Sincere thanks to Lucas Macedo Moura who completed his position as Research Manager on 30 September – all the best to Lucas as he now focuses on his PhD research at UNBC!

Thank you to our partners, funders, and for your attention!



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