

## **Using paleolimnology to establish baseline sediment metal concentrations and to reconstruct hydroecological conditions, Marian River Watershed, NWT**

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Tłchq Lands occupy approximately 39000 km<sup>2</sup> in the Northwest Territories between Great Slave and Great Bear lakes. Established in 2013, the Marian Watershed Stewardship Program (MWSP) is designed to assess and monitor areas within the Marian River watershed important to traditional livelihoods. The program aims to assess ecosystem health through monitoring and sampling of water, sediment, and fish. Of particular concern is the proposed NICO mine and the potential for cumulative effects of development, land disturbance, and climate change in the Marian River watershed. Working with the MWSP, this research uses paleolimnological approaches to establish baseline sediment metal concentrations in lakes and to reconstruct past hydroecological conditions using lake sediment cores obtained in late summer 2015. Sediment cores will be analyzed for radiometric (<sup>210</sup>Pb, <sup>137</sup>Cs), physical (loss-on-ignition), geochemical (organic carbon and nitrogen elemental and isotope composition, cellulose oxygen isotope composition), and biological parameters (diatoms, pigments), and metal concentrations. Hydroecological reconstructions will place recent low water conditions into a longer temporal context needed to assess potential causes, and provide knowledge to interpret stratigraphic trends in natural metal concentration prior to the Nico mine development.