Project acronym: DUCCEM

Project title: Detecting Upriver Climate Changes Effects in the Mackenzie River

Project leader: Bennet Juhls, Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI), Germany

Discipline: Earth Sciences & Environment: Water sciences/Hydrology

Station(s): Western Arctic Research Centre (WARC) (Canada)

Our project, Detecting Upriver Climate Change Effects in the Mackenzie River (DUCCEM), collects water samples from the Mackenzie River at Inuvik in order to measure parameters related to upriver changes such as the thawing of permafrost. By partnering with WARC as our INTERACT station, samples can be collected from the eastern arm of the Mackenzie River where it passes Inuvik during spring to fall 2023. Sampling occurs weekly to show how changing seasons and events like storms or abrupt thaw affect water chemistry. The water samples undergo simple preservation after collection and, later, laboratory analyses for basic chemistry and in particular for bulk organic carbon content and colour. These data reveal how the proportions of water sources for the river shift between snowmelt, rainfall and groundwater (and perhaps other sources), and how these are related to the quality of carbon transported by the Mackenzie River to its mouth and the coastal areas beyond. We envision a TA period (2 persons for 8 days) in April 2023 to co-initiate the sampling and a RA period from April 2023 to October 2023 (40 days of sampling) for the continuous sampling by WARC.