



Stream Turbidity within Degrading Permafrost Terrain in the Tasiapik Valley, Umiujaq Region, Nunavik

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Permafrost degradation caused by rising temperatures has had a significant impact on northern ecosystems. For example, it contributes to greenhouse gas emissions, increased recurrence of landslides, and changes in water resources. Sediment migration to the soil surface has also been observed during soil settlement caused by thawing permafrost. Soil settlement increases the flow of water, which is enriched in organic matter and mineral sediments, toward streams and lakes, resulting in increased suspended sediment load and increased river turbidity. Furthermore, during flood episodes in spring and high rainfall in autumn, the loose sediment is supported and transported toward the river by surface runoff. This increase in turbidity can have negative effects on the trophic chain, especially on fish as a result of the abrasion of their gills.

Variations in river turbidity have been examined in several studies (Lawler et al., 2006; Hamilton and Luffman, 2009). However, in the context of current and future climate change, there is limited knowledge about the effects of variations in river turbidity associated with permafrost degradation. Thus, the objective of this research is to track variations in river turbidity in the periglacial context in relation to environmental field parameters.

The Tasiapik Valley is located 5 km east of the village of Umiujaq, Nunavik (Canada). A central stream drains the valley which contains discontinuous and degrading permafrost mound and surface water ponds. The stream collects water from tributaries originating from the northern slopes of the valley and flows into Lake Tasiujaq, which is part of Tursujuq National Park. The surrounding environment is a unique and important place for fishing and outdoor activities both for the Umiujaq community and for the increasing number of tourists. In addition, the valley is the subject of numerous scientific and environmental research projects being conducted by the Centre d'études nordiques (CEN; Centre for Northern Studies) of Université Laval.

Characterization of the local environment has already been completed through geomorphological surveys, while sedimentological analyses of fluvial samples will be carried out. Turbidity data are being collected during the river's frost-free period using submersible turbidity meters. These measurements will be analyzed and correlated with weather data from the CEN VDT-SILA meteorological station in order to examine the relationship between variations in turbidity and environmental parameters such as air temperature and precipitation.