



1. Characterizing contributions of glacier melt and groundwater in alpine glacierized watersheds of the Saint-Elias Mountain range (Canada)

Emilie Bouchard, Michel Baraer, and Anna Chesnokova

Changes in the hydrological processes of alpine glacierized watersheds have been observed in most regions of the world; these have an important impact on water resources and can affect downstream ecosystems and populations. Subarctic catchments such as those found in southern Yukon (Canada) are particularly sensitive to climate related hydrological changes. To further understand the ongoing evolution of subarctic hydrological systems, we applied natural tracers based investigations in the Saint-Elias mountain range of the Yukon. The main goal was to identify water sources and their relative contributions to outflows in an alpine glacierized catchment. During the summer of 2015, we collected more than 100 water samples in two sub-watersheds of the glacier-fed Duke River watershed. Samples were analyzed for organic carbon, major ions and stable water isotopes ($\delta^{18}\text{O}$ and $\delta^2\text{H}$). The resulting dataset was then processed using statistical methods and the hydrochemical basin characterization method (HBCM). Results show that on the sampling period, watershed outflows consisted mainly of glacier meltwater with a non-negligible contribution of other water sources such as icings and ice-cored moraines. In this study, supraglacial processes are shown playing a particularly important role in the watersheds' hydrology.