The effects of flow regulation on the dynamic winter ice processes of the Kananaskis River. S. Emmer, J. Nafziger, F. Hicks, M. Loewen and V. McFarlane. University of Alberta, Department of Civil and Environmental Engineering (emmer@ualberta.ca: presentation).

Recent research has shown that winter is a critical time period for fish survival. Ice dynamics, and important aspect of winter stream habitat, are significantly affected by the sudden changes in flow caused by reservoir operation. The purpose of this project is to investigate and characterize the unique ice processes of regulated streams. Our study river is the Kananaskis River, a steep, gravel bed stream in the Rocky Mountains. Four sites were studied downstream of the Pocaterra dam, whose flowby fluctuates daily from 0.5 to 23 m3/s during the winter. Preliminary observations were made during the winter of 2011-2012, and more detailed observations including time lapse cameras, water level sensors, and temperature sensors were made during winter 2012-2013 to document ice processes. Data from this automated equipment was supplemented with direct observation and ice sampling. Patterns of frazil ice, border ice and anchor ice production unique to hydro-peaking rivers was observed. These observations will be compared to meteorological and flow conditions to build the groundwork for predicting how reservoir operation affects winter fish habitat for various physical and climate conditions.