

M.Sc. Opportunity in Northern Hydrometeorology

Project Summary:

The Nechako River is the second largest tributary to the Fraser River and an important waterway for migrating and spawning salmon, the endangered white sturgeon, and many other aquatic species. Unlike other tributaries of the Fraser River, the Nechako River is highly regulated, with an interbasin diversion and flow regulation affecting downstream water conditions. Water management in the Nechako not only affects downstream flows but also river water temperatures. Thus the primary goal of this effort is to quantify the individual roles of flow regulation, climate variability and climate change on trends in water temperatures for the main stem Nechako River during the past six decades. This study will first employ long-term observed daily air temperature and hydrometric records as input to the Air2Stream water temperature model to simulate the 1950-2015 water temperatures at several river sites across the Nechako watershed. Each river site will be selected based on the availability of water temperature observations to calibrate and validate the model simulations. Thereafter, a series of sensitivity simulations will be undertaken to assess the impact of flow regulation, climate variability and change on water temperatures. We will first use the naturalized streamflow data for the main stem Nechako River and the original air temperature records to assess impacts of flow regulation on water temperatures. We will repeat the two simulations using a detrended record of air temperatures to further assess the role of climate change. In a third set of simulations we will use recursively a climatology of air temperature and streamflow to assess the 'equilibrium' water temperatures of the Nechako River under naturalized and regulated conditions. Other simulations will be conducted to test the efficacy of the Summer Temperature Management Program (STMP) in keeping water temperatures on the main stem Nechako River below 20°C. STMP focuses on protecting sockeye salmon during up-river migrations through the Nechako River.

We invite applications for a potential M.Sc. student having a comprehensive knowledge of cold regions hydrometeorology, and excellent computational, programming and communication skills. The student may also participate in field work related to the deployment of water temperature loggers across the Nechako watershed as well as in outreach activities in communities within the Nechako watershed. Interested applicants are highly encouraged to contact Dr. Stephen Déry at sdery@unbc.ca and Dr. Siraj Ul Islam (Sirajul.islam@unbc.ca) with a cover letter highlighting research interests and experience relevant to this position, an up-to-date curriculum vitae, unofficial transcripts, and the names of at least two potential references. The deadline for submitting these documents is Friday 23 November 2018 (or until the position is filled). The successful candidate will then be required to submit an application for entry to the Natural Resources and Environmental Studies (NRES) graduate program at the University of Northern British Columbia (UNBC) situated in Prince George, British Columbia, Canada. The deadline for UNBC graduate admission applications is on Saturday 15 December 2018. Applicants whose first language is not English may need to submit evidence of English language proficiency prior to admission. The successful candidate will receive 2-year of financial support starting with the UNBC academic session in September 2019.