**Flow regimes of natural versus regulated rivers.**

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Abstract

This study aims to characterize the impacts of river damming on a variety of ecosystem related metrics of river flow regime alteration at Hydronet study sites across Canada. The study will thus supply key information to the SNG modeling effort on the specific flow alterations in each study system that act as drivers of short term and long term changes to fish habitats.

River discharge (flow, m3·s-1), the product of velocity and the river’s cross sectional area is naturally variable and dependent on regional climate and seasonal precipitation as well as watershed scale relief and storages such as lakes and aquifers, factors that vary widely across Canada. When discharge is regulated for hydropower, five main flow characteristics are affected, including: magnitude, duration, timing (seasonality), recurrence frequency and rates of change (Magilligan and Nislow, 2001, 2005). All affect riverine biota directly and indirectly via short term and long term impacts on fish behaviour and habitat, e.g. on the calibre and mobility of channel substrate, on channel width, bar structure and bank erosion rates, side channel number and complexity, on floodplain plant succession, on pond water balance and river thermal and chemical regimes (Richter et al. 1996).

One masters project has begun in September 2011 and is the subject of a separate presentation. The main objectives of this project are to estimate flow alteration metrics and to analyse in a subset of Hydronet study systems how the altered flow regime has modified the ‘channel forming’, geomorphologically dominant flow level and affected cross sectional morphology and habitat conditions.