Nutrients as chemical drivers in regulated and unregulated rivers across a geographically diverse range

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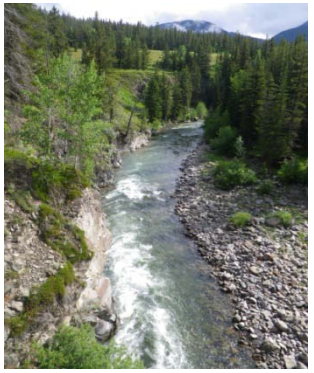

Rationale: *Our understanding of nutrient regimes across a wide geographical range is weak. Modification of flow due to hydropower development changes the longitudinal nutrient transfer throughout the river, disrupting natural flood pulses, trapping and releasing nutrients at different rates. Total phosphorus is considered a driver of aquatic productivity at lower trophic levels, and therefore is an important indicator of shifts in fish biomass. Understanding regulated and reference river nutrient regimes will provide a predictor tool for fish biomass potential across widespread aquatic systems.*

Description: *A local field study was completed in 14 mountain rivers in two geologically distinct regions of the Rocky and Purcell Mountains of BC. Baseline relationships between nutrients and fish production in these focus areas will be used to compare physical properties of watersheds and available nutrient resources that drive fish productivity.*

With a widespread sampling program, a comparison of nutrient regimes between regulated and reference rivers for sites across Canada in BC, AB, QC, ONT and NFL, nutrient samples (Total phosphorus and Total nitrogen) at paired regulated and unregulated rivers as well as up and downstream of reservoirs were collected in the spring and summer of 2011 and 2012.

Outcomes :

- *Comparison of nutrient regimes in systems modified by hydropower between regulated and reference rivers in BC, AB, QC, ONT and NL*
- *Monitor for nutrient trends in regulated rivers up and downstream reservoirs*
- *Continual development and expansion of a nutrient/ fish biomass database*
- *Use these nutrient relationships to estimate expected fish biomass from measured nutrient regimes*

Benefits of this research

Identifying trends in nutrient distribution downstream of reservoirs will give us a better understanding of shifts in nutrient allocation downstream of impoundments and the effect they have on fish productivity in regulated systems. Understanding this baseline productivity and the expected fish biomass will provide a useful predictive tool for hydropower management.