

HydroNet 1.2 Component: Nutrients as chemical drivers of fish productive capacity in regulated and unregulated rivers



Joseph Rasmussen

University of Lethbridge



Rationale: *While we have reasonable understanding of the importance of nutrients to primary productivity, relationships between nutrient parameters and fish production and biomass are weak. Moreover, the flux and distribution of nutrients within river systems can be altered by impoundments through their influence on flooding and sedimentation, and we know little about the effects of river regulation on nutrient regimes. Understanding nutrient processes on a watershed scale will allow us to provide a more accurate estimate of fish productivity potential in both regulated and unregulated aquatic systems.*

Description: *Nutrient and fish sampling are being conducted across a broad geographical spectrum within Canada (NFLD, QC, ON, AB, BC). Baseline relationships between nutrients and fish production and biomass will be used to derive empirical models of nutrient inputs to fish production and biomass. Nutrient samples (Total phosphorus and Total nitrogen) at paired regulated and unregulated rivers as well as up and downstream of reservoirs in were collected in the summer of 2011. 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.*

List of Student Project related to this component:

- Nutrients as chemical drivers in regulated and unregulated rivers across a geographically diverse range— Caitlin Good (M.Sc. University of Lethbridge)

Outcomes :

- *Models relating nutrient parameters to fish biomass and production, and how this varies among aquatic habitat types and geographical regions*
- *How river regulation will affect concentrations of available nutrients, and consequently fish biomass and production, downstream of impoundments*

Benefits of this research

Our models will provide a baseline for evaluating fish productive capacity based on nutrient availability across a diverse aquatic ecosystem types and geographical regions.