



Comparative thermal modeling of a regulated and unregulated river.

Laurie Beaupré, M sc. candidate

Institut national de la recherche scientifique (INRS-ETE)

Supervisor: André St-Hilaire Co-Supervisors: Normand Bergeron, Anik Daigle

Participant: CIRSA

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**Rationale:** Water temperature is an important variable in aquatic ecosystem studies because it is a limiting factor of the productive capacity of fish habitat. Since dams are known for modifying water temperatures, it is important to characterize those changes in order to properly manage fish habitat and fisheries resources.

**Description:** Research efforts are carried out in two reaches of the Fourchue River (St-Alexandre-de-Kamouraska, Québec) upstream and downstream of a major dam (18 m crest height). The aim of the project is to predict water temperature in regulated and unregulated rivers by comparing a statistical model with a deterministic model. These models will be compared on their efficiency to predict important temperature descriptive statistics (or temperature indices) (e.g. maximum daily, weekly or monthly temperature) to better understand distribution, diversity and growth of fish communities.

Electrofishing and snorkeling observations will help lead to a better understanding of the distribution and densities of fish as a function of temperature and other habitat variables in these two contrasting rivers.

#### Outcomes :

- Comparisons of a deterministic and a statistical model which allows to predict water temperature in regulated rivers.
- Quantification of changes of the thermals regimes of the Fourchue River caused by the dam and the impacts of these changes on the distribution and diversity of fish in that river.

**Benefits from this research:** In addition to better understanding of the impacts of dams on the thermal regimes of rivers, the results of this project will help guide management efforts in the choice of analysis tools in order to better predict water temperature and hence increase management efficiency of aquatic resources.



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