

Geomorphic controls on physical habitat variability in a hydropeaking system



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Project Code: 1.3.3



Rationale: Physical habitat variability is an important part of fluvial ecosystems and is dependent on geomorphic processes acting at multiple scales. To assess how the effects of hydropeaking interact with a changing geomorphic template to control habitat patches and flow depth/velocity distributions, continuous high-resolution analyses of variability and morphodynamics are needed at a riverscape scale.

Description: Spatial patterns of physical habitat variability on the Kananaskis River, Alberta downstream of Pocaterra Dam will be assessed through bathymetric maps produced from high-resolution air photos taken during the summer of 2011 and field-based measurements. These patterns will be interpreted in terms of broad-scale controls on channel morphology to link geomorphic theory and predictive models to fine-scale habitat features relevant to fish. Two-dimensional morphodynamic numerical models (e.g CCHE2D) will then be combined with historical air photos to evaluate how altered flow regimes affect channel morphology and instream habitat along the length of the river.

Outcomes:

- A better understanding of cross-scale linkages between geomorphology and physical habitat variability
- Quantitative analysis of the morphodynamic effects of hydropeaking

Benefits from this research: This study will develop methods to determine what controls the distribution of physical habitat structure, which will support the investigation of continuous patterns of productive capacity of fish habitat in regulated rivers.



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