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## *GREAT LAKES INSTITUTE FOR ENVIRONMENTAL RESEARCH GRADUATE STUDENT SYMPOSIUM—KEYNOTE SPEAKER*

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***THURSDAY APRIL 5th, 2018 (9:00 AM)***

## Dumped In My Back Yard (DIMBY): Downstream Perspectives of a Major Canadian Mining Disaster

The well-known acronym NIMBY (not in my back yard) signifies the attitude of many people who do not want developments in their neighbourhood given the possibility that detrimental effects or events will occur, altering the environment and the actual and/or perceived value of their land. The UNBC Landscape Ecology Field station, the Quesnel River Research Centre (QRRC) is located in a wilderness watershed but in a region that supports ecotourism, recreational and aboriginal fisheries and highly valued salmon spawning and nursery habitats along with resource extraction including forestry and mining. So while most people of this region do not endorse the NIMBY attitude, they were understandably irate when a local mine tailings impoundment broke and dumped its contents into Quesnel Lake. This talk will present findings from research conducted at the field station downstream of this mining catastrophe.

On August 4$^{th}$ 2014, the tailings storage facility at the Mount Polley gold-copper mine in British Columbia, Canada, failed releasing 25 x 10$^{6}$ m$^{3}$ of contaminated water, tailings and scoured overburden into the local watershed (~11,500 km$^{2}$). Most of this material was discharged into Quesnel Lake, one of the largest (262 km$^{2}$) and deepest (>510 m) lakes in the province. The coarsest material was deposited at the bottom of the lake but the finest material (mean d50 of ~1 µm) remained in suspension and moved both up-lake and down-lake due to the physical behaviour of the lake (e.g. seiching and overturn). Sediment and contaminants were also exported from the lake to Quesnel River. We have been monitoring the lake and river for a variety of physical, chemical and biological indicators since the spill. The sediment deposited in the lake and transported in Quesnel River was enriched in several metals including As and Cu. Typically values decreased with increasing distance from the tailing storage facility, although values for Cu were considerably greater than national sediment quality guidelines. The downstream export of metal-enriched sediment from the lake to Quesnel River was controlled by lake turnover and the annual freshet, thus there have been defined periods of sediment and metal transport and storage in the river and these effects continue to the present day. Samples of the biota collected from this lake–watershed system suggest that metals may be entering the food web. The long-term impacts of this spill on the aquatic and terrestrial ecosystems are uncertain but our ongoing work will contribute to the understanding of these ecosystem effects.