



Aquatic impacts of an environmental disaster in a relatively pristine watershed: the breach of the Mount Polley Mine tailings impoundment, British Columbia, Canada

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On 4th August 2014, the tailings impoundment of the Mount Polley copper and gold mine in British Columbia failed. Material from the impoundment (surface area = 2.7 km²) flowed into nearby Polley Lake and Hazeltine Creek, before discharging into Quesnel Lake, a large (ca. 100 km long, >500 m deep), relatively pristine lake. Estimates suggest that approximately 25 Mm³ of tailings (water and solids), in addition to eroded soils and surficial materials from Hazeltine Creek, were delivered to Quesnel Lake, raising the lake by 7.7 cm. Much of this material was deposited at the bottom of Quesnel Lake but a large plume of fine-grained sediment (d₅₀ of ca. 1 μ m) moved both up-lake towards important salmon spawning areas and down-lake into Quesnel River, which in turn flows into the Fraser River. This movement of the sediment plume is controlled by the physical limnology of the lake, especially seiche events. Samples of lake water and sediment samples taken from the impacted area show elevated levels of metals and other elements, which may have important implications for the ecosystem in this watershed (>11,000 km²). This presentation describes the failure and presents preliminary findings of the aquatic impacts of this environmental disaster.