



## **Sediment Mediated Marine-derived Nutrient Transfers in Watersheds: the Dirt on Salmon Decay Products**

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The conveyance of nutrients and contaminants through aquatic systems is typically mediated by inorganic fine sediment. Its influence on the transfer of marine-derived nutrients through watersheds, however, is less well acknowledged. The ecological impact of the annual pulse of marine-derived nutrients (MDN) moved upstream into interior river systems via migrating salmon is thought to be significant as both local spawning reaches and the downstream nursery lakes have evidenced increased productivity following this nutrient pulse. The relationship between the number of upstream spawners and productivity in downstream nursery lakes is poorly defined as the conveyance of MDN between the two points of interest is influenced spatially and temporally by both channel and lake processes. A research project that specifically investigates the association between salmon decay products and sediment mediated transfers of these marine-derived nutrients downstream to the nursery lake is underway in the Horsefly River in British Columbia, an important sockeye river tributary to Quesnel Lake in the Canada's Fraser River watershed. Results from sampling freshet delivery to the lake in 2011 and 2012 will be presented as they represent two end members of the four year spawning cycle - snowmelt flushing following a high and low spawner return year. A continuous flow centrifuge was used to collect bulk suspended sediment 1) at points along the river, downstream of the spawning grounds, 2) along a transect from the river mouth where it enters Horsefly Bay and 3) at several other locations in the river plume during spring freshet. Stable isotopes ( $^{13}\text{C}$  and  $^{15}\text{N}$ ) were used to detect the MDN and chlorophyll *a* was analyzed to represent water column primary production. The relationships between sediment loads, nutrient delivery to the lake and primary productivity during this period will be presented in the context of upstream spawner biomass for both years.