THE LEGACY OF 19TH CENTURY GOLD MINING IN FRASER RIVER

The geomorphic impact of 19th century placer mining along Fraser River is studied by estimating the volume and grain size distribution of excavated sediment, evaluating the transport potential for the sediment in Fraser River, and discussing the relation between placer waste sediment and observed morphodynamics of the lower river. The location and area of 456 mine excavations along 500 km of the river were mapped and a subset of these mines surveyed to create volume-by-area regression relations which were applied to all mapped mines along the river. On this basis, the total volume of material excavated at mine sites and lost to the river is estimated to be about 58x10^6 m^3 (bulk volume). Bulk sampling of mine scarp sediment and observation of mine lag sediment indicate that the discharged tailings consisted of 14±7% small cobbles, 32±9% gravel, 41±4% granules and sand, and 13±4% silt and clay. Sand and silt have washed into the river's delta. Gravel and cobbles are still interacting with the river. The rate of downstream movement of the placer-waste slug is estimated by applying established relations between channel width and sediment virtual velocity. The predicted rates of migration indicate that peak delivery of placer waste sediment to the distal gravel fan of the river may have occurred early in the 20th century, in good agreement with observed aggradation of 171,000 to 229,000 m^3a^-1 gravel (bulk measure) between 1952 and 1999 in the lower river.

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