



## **10,000 years of landslides and climate change in coastal western Canada**

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A conceptual model of landslide-induced denudation for coastal mountain watersheds spanning 10,000 years of environmental change is presented. The model uses a constructed paleo-climate based on vegetation climate transfer function and an established relationship between the landslide frequencies and precipitation. Landslide frequencies are determined for the early warm-dry Holocene (10,000 to 7,000 years ago), the warm wet middle Holocene (7,000 to 4,000 years ago), and modern climates (4,000 years ago to present). Average landslide rates vary between 0.005 landslides/y/km<sup>2</sup> and 0.008 landslides/y/km<sup>2</sup>. Recent human impacts are calculated by determining landslide frequencies for logged areas in the 20th century. The impact of logging during the last 100 years is unambiguous as landslide frequency increased to 0.015 landslides/y/km<sup>2</sup>, roughly twice the rate of the wettest period in the last 10,000 years, suggesting that the impact of logging outpaces that of climatic change. We estimate that debris slides and flows eroded an average of 0.7m/m<sup>2</sup> across the Vancouver Island during the last 10,000 years.