LANDSLIDES IN THE BROOKS PENINSULA STUDY AREA, VANCOUVER ISLAND; LANDSCAPE EVOLUTION IN A NATURAL SYSTEM

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Two hundred and one debris slides and debris flows, ranging in size from 0.05 ha to 11.5 ha, were analyzed from an untouched portion of the west coast of Vancouver Island in British Columbia, Canada. The study examined nearly 300 km squared of rugged terrain on the Brooks Peninsula and Nasparti River Inlet. The land is devoid of roads, logging or other human encroachment and provides an unusual opportunity to examine an active natural system through time. Data were analyzed from air photographs for 50 years at intervals of approximately 15 years and characteristics of landslides were documented. Landslide frequency in this study area is higher than natural landslide frequencies from other Vancouver Island watersheds and several explanations are proposed including physiographic location, glacial history and bedrock geology. In a striking contrast, however, other Vancouver Island watersheds were developed and landslide rates increased substantially. In the Brooks Peninsula area the rate of landslides remained relatively constant through time and are therefore currently below those of developed areas. Magnitude-cumulative frequency data plotted well on two curves: a power law curve for landslides 1 ha and larger, and an exponential function for landslides less than 1 ha, with r-squared values of 0.99 in both cases. Because the landslides in this study are expected to be genetically linked to precipitation events, the possible influence of climate change was examined. While no significant change in mean frequencies were detected, spatial and temporal analysis revealed trends that are significant in light of future climate scenarios.