

SUBMARINE FAILURES IN SAND AND GRAVEL SHORELINE DEPOSITS IN  
THE STRAIT  
OF GEORGIA, BRITISH COLUMBIA (INCLUDING THOSE OF THE 1946  
VANCOUVER  
ISLAND EARTHQUAKE).

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British Columbia hosts Canada's most rapidly developing coastal communities along the semi-enclosed waterway of the Straits of Georgia. This region also is Canada's most seismically active zone. In 1946, the Vancouver Island M7.2 earthquake caused a number of submarine failures of sandy and gravelly shoreline deposits, (destroying coastal facilities, shearing submarine cables and causing large waves. One such wave flipped a boat in Deep Bay, causing the only death in the 1946 event. Multibeam sonar has been used to map out two submarine landslides, at Goose Spit near Comox and Mapleguard Spit in Deep Bay. These data image the failures in great detail, providing important information on size and style of mass-wasting. Submarine cores show the failures consisted of well-rounded beach gravel, cobble and sand, sometimes suspended in a cohesive mud matrix. Cone penetration tests at Goose Spit show soil profiles prone to liquefaction and lateral spreading. In addition, failures unrelated to seismicity occurred at Mapleguard Spit on April 27th, 1998 and on April 21, 1999, and were possibly related to tidal drawdown. These latter failures appear to differ from the earthquake-induced landslides in that neither debris lobes nor coherent blocks of sediment are observed at the base-of-slope.