



## PBO Borehole Strainmeter Recordings Of Tsunami on the West Coast of North America

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The Plate Boundary Observatory (PBO), funded by the U.S. National Science Foundation, consists of over 110 continuously operating GPS sites and 79 borehole installations. Typical PBO borehole sites include strainmeters, seismometers, barometric pressure sensors and rainfall gauges. The borehole sites are installed in arrays in areas where it is thought that plate boundary deformation may be accommodated via short-term, aseismic strain transients. An unexpected finding is that PBO strainmeters located within a few hundred meters of the coastline can record tsunamis as they arrive on the west coast of North America. Three PBO strainmeters recorded the arrival of tsunamis generated by the 2010 M8.8 Chile and the 2009 M8.1 Samoa earthquakes on the Pacific coastline of Vancouver Island, Canada. We can extract the tsunami signals from the strainmeter data by band-pass filtering at a few minutes out to three hours. In this presentation we will show that the tsunami arrival times are consistent with those recorded by nearby tide-gauges and that the strain data are of sufficient quality to compare the frequency content of the strain signal in the days before and after the tsunami arrival. We also show that the tsunami strain measurements are comparable with those predicted by theory given the tide-gauge data. Fortuitously, the configuration of these three strainmeters is particularly useful for tsunami warnings for the city of Port Alberni which is located at the north-east end of Port Alberni Inlet and, was devastated by the tsunami following the 1964 M9.2 Alaska earthquake. Two of the PBO strainmeters are located on the Pacific coast side at the mouth of the Barkley Sound - Port Alberni Inlet system, the third is located near the town of Port Alberni. The strain data indicates a tsunami can take up to 30 minutes to travel the length of the Port Alberni Inlet. The strainmeters on Vancouver Island could therefore act as a land-based tsunami early-warning system for the city Port Alberni and provide a template for a land-based tsunami early-warning system for other coastal inlet systems.