Geophysical Research Abstracts
Vol. 12, EGU2010-15703, 2010
EGU General Assembly 2010

Plate Boundary Observatory Strain Recordings of the February 27, 2010, M8.8 Chile Tsunami

Kathleen Hodgkinson, Dave Mencin, Adrian Borsa, and Mike Jackson
UNAVCO, 6350 Nautilus Drive, Boulder, CO 80301-5554, USA (mencin@unavco.org; hodgkinson@unavco.org)

In the hours that followed the February 27, 2010 M8.8 Chile earthquake a tsunami swept across the Pacific Ocean causing alerts to be issued from Antarctica to Alaska. PBO borehole strainmeters, at Ucluelet, Bamfield and Port Alberni, on Vancouver Island, Canada, recorded the arrival of the tsunami along the British Columbia coastline. In this presentation we describe the nature of the strain signal generated by the February 27, 2010 tsunami and compare it to seismic, GPS, pore-pressure, barometric pressure and tide gauge measurements made at or near the PBO borehole installations. The Ucluelet and Bamfield strainmeters, on the west coast of Vancouver Island, recorded the arriving waves $\sim$ 16.5 hours after the M8.8 earthquake. The Port Alberni strainmeter, located on the northeast end of Alberni Inlet, a 1-2 km wide and 40 km long fjord recorded the first waves $\sim$45 minutes later. The Ucluelet and Bamfield strainmeter arrival times are consistent with tide gauge measurements made at Tofino, 30 km north of Ucluelet. Areal strain amplitudes of up to 15 to 20 nanostrain were recorded at the three strainmeters and significant tsunami oscillations persisted for days. A PBO strainmeter 2.5 km from the Oregon coast did record a tsunami related signal though it was much smaller than at the three Vancouver Island sites. The Oregon site thus provides information on the attenuation of the signal with distance from the coastline. The ability of the strainmeters to record the tsunami signals following the 2010 M8.8 Chile and 2009 M8.1 Samoa events suggest they, or possibly less costly borehole tiltmeters, could be used as land-based instruments to record tsunami arrival times and provide estimates of wave heights.