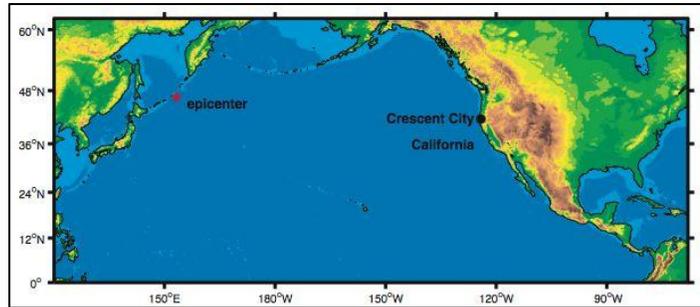


2006 Kuril Islands Tsunami

Description

The magnitude 8.3 Kuril Islands earthquake on November 15, 2006, occurred at the continental slope of the deep Kuril-Kamchatka Trench. The earthquake was the largest earthquake to have occurred in the central Kuril Islands since the early 20th century, and generated the strongest trans-Pacific tsunami since the Alaska tsunami of 1964. Tsunami warnings, advisories and watches were issued for the coastal areas in Alaska, Hawaii, British Columbia, Washington, Oregon and California; Crescent City, California, registered a wave height of nearly 6 feet.



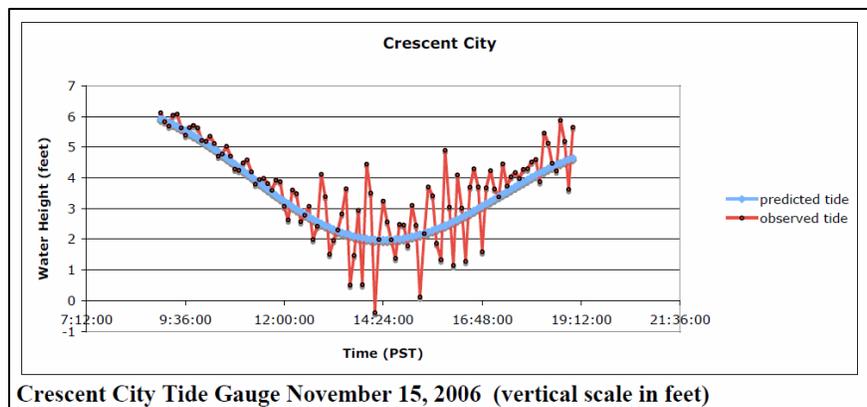
Above: Location of Crescent City in relation to the epicenter of the earthquake. Credit: USC Tsunami Research Group.

Below: Sea levels recorded during the tsunami. Credit: California Department of Transportation

Impact

Fortunately, in spite of its strength, the tsunami did not cause fatalities or catastrophic damages. The near-field waves hit uninhabited islands in the Kuril Islands, and although not observed, post-tsunami surveys

confirmed waves of more than 70 feet high in some places. After-event survey teams observed severe erosion on shorelines, previously-buried remnants of World War II military equipment lying exposed, and a lake that had been breached and drained.



Crescent City Tide Gauge November 15, 2006 (vertical scale in feet)



In Crescent City, California, tsunami waves damaged three docks and sunk a boat, causing nearly \$20 million in damages. In Hawaii, one person who was swimming before the tsunami arrived was injured when she was sucked through an opening in a seawall as the water receded.

Left: Damage to docks at Crescent City Harbor. Credit: Professor Lori Dengler, Humboldt State University

Lessons Learned

This event provided valuable data for tsunami research. The Central Kuril Islands had been given a high probability of an imminent earthquake after the 2004 Sumatra Earthquake, and for that reason, pre-event data had been collected in 2005 and 2006 by the Russian Academy of Sciences. The results were used to develop different scenarios for tsunami waves; the model calculations corresponded qualitatively to actual observations, supporting the potential for using this type of pre-event modeling for other high-probability areas.

The event also demonstrated that a tsunami can carry away far more sand and dirt than it deposits. A team of researchers led by the University of Washington, who had coincidentally collected field data on the Kuril Islands for another project, discovered that in some places the amount of sand and soil removed by tsunami erosion was nearly 50 times greater than the amount deposited. The team also noticed that wherever there had been human disturbance prior to the event, there appeared to be deeper erosion than for undeveloped sites.



Above: Prior to the tsunami, this area on Matua Island in the Kuril Islands was covered by about 6 feet of sand and soil, about even with the top of the 6'6" white rod (see arrow). There was no indication of boulders during previous excavation work at the site. Original image: Washington EDU/Breanyn MacInnes

In California, the event identified a communications issue with the upgraded tsunami warning system. Del Norte County, home to Crescent City, had received the initial warning that was later cancelled. However, when it became apparent that the tsunami may hit one or more harbors along the West Coast after all, a new warning was faxed, but Del Norte County was somehow missed in the communication chain, and only learned of the new alert from a neighboring county.

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