Marine and Lacustrine Turbidite Records: Testing Linkages and Estimating Ground Motions, Central Cascadia Margin, USA

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1 Abstract

We are investigating a potential paleoseismic record at Bull Run Lake, 165 km inland and 260 km upstream on the western flank of Mt. Hood. Bull Run is potentially a good paleoseismic site, with no major stream inputs and a small catchment area. The watershed is well forested, and may contain ash and evidence of channel shifting. The lake is located in an area of active tectonics and is fed by the Willamette River, with a large catchment area. The lake is fed by the Willamette River, with a large catchment area.

2 Setting & Significance

Site Strategy

Lake Sawyer, WA

Lake sites that have the Maastrichtian ash necessary to test the hypothesis that the lake was affected by subduction zone earthquakes. The Maastrichtian ash is a well-dated and widespread ash layer that is commonly found in lake sediments across the Pacific Northwest. The ash layer is used to identify the location of subduction zone earthquakes and to estimate the age of the earthquake.

3 Preliminary Correlations

Lake Sawyer, OR

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4 PGA-PGV Sensitivity of Lake Sites

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Updated Rupture Modes

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Questions We Address

How can we apply paleoseismic and geotechnical engineering techniques to establish shaking levels for inland population centers?

What can we learn about the Cascadia "Locked Zone" from paleoearthquakes records?

Transport Mechanisms and Preliminary Interpretation

We suggest that only the very largest rupture events likely to be associated with an elevated regional seismic and surface deformation record. To the best of our knowledge, we have identified and characterized a number of small- to moderate-sized earthquakes that are consistent with the evidence of recent slip on the Cascadia subduction zone.

Distance (m)

B. Marine canyon wall resolution multibeam and backscatter data, along with a high resolution grid of CHIRP sub-bottom profiles, and seven new sediment gravity cores. We find

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Primary Result (Preliminary)

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