A Paleoseismic transect of Forearc Lakes at the Latitude of Seattle, Washington.

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Seismological Society of America Annual Meeting, April 30-May 3, 2014

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We sampled lake sediments collected from forearc lakes along a transect from just west of the Olympic Peninsula to the Cascade foothills at the latitude of Seattle, Washington. Working with Brian Sherrod (USGS), we used a modified Livingstone corer deployed from a small floating platform. The lakes are (west to east) Beaver Lake, Leland Lake, Tarboo Lake, Hall Lake, and Lake Sawyer. These lakes are small (2-113 ha), range in depth from 6-17 m, and are all kettle lakes other than Beaver Lake (a landslide-dammed lake). The sediment cores are composed primarily of organic-rich gyttja and visually show little downcore variability, except for the presence of a thick tephra at about 6-7 m at many of the sites (other than at Tarboo Lake which has little overland flow and thus much lower clastic input). The tephra is likely from the eruption of Mt. Mazama based on its similar depth occurrence in previously published cores. Computed Tomography (CT) density, gamma density, and magnetic susceptibility data show there is much more variability in sediment composition than is visually apparent, which initial investigation suggests is in part a function of variations in the percentage of clastics as compared to organics. Preliminary correlations of the core data along this 185 km transect show strong similarities in density variability between these cores over the past ~7600 years when anchored by the Mazama tephra. We have also made preliminary comparisons with offshore cores and find that the downcore variability in physical properties match the offshore cores equally well. Given the evidence for earthquake origin for the offshore cores, and the strong common signal across the lake transect, we suggest that the density and magnetic susceptibility patterns in the lake transect are most like of earthquake origin, representing turbidites generated internally within each lake, and therefore represent the first cross-forearc paleoseismic transect in Cascadia.