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UC **SANTA BARBARA**
Department of Earth Science

Earth Science Colloquium

THURSDAY May 7th., 2020 • 2:00 PM

Paleoseismic trenching reveals Holocene-Active right-lateral oblique slip on the Leech River fault: Implications for forearc strain accumulation in northern Cascadia

Nick Harrichhausen
Earth Science, UC Santa Barbara

In the forearc of the Cascadia subduction zone, a reduction, from south to north, in northward GNSS velocities and seismicity across the Olympic Mountains, Strait of Juan de Fuca, and the southern Strait of Georgia has been used to argue for permanent N--S crustal shortening. However, paleoseismic studies indicating right-lateral oblique slip on active ENE--WSW striking forearc faults north of the Olympic Mountains are more consistent forearc deformation models that invoke bending of an orocline and(or) the westward extrusion of the Olympic Mountains.

In this talk I will present data from a paleoseismic trenching that was conducted to determine the kinematics of the ENE--WSW striking Leech River fault, which is north of the Strait of Juan de Fuca, and at the same latitude that northward GNSS velocities diminish. Determining the kinematics of the Leech River fault system tests whether this structure has accommodated N--S shortening throughout the late Quaternary, or whether, similar to the other regional crustal faults, this fault has instead hosted oblique or strike-slip faulting.

Testing Links between the Franklin Large Igneous Province and the Onset of the Sturtian Snowball Earth

Judy P. Pu
Earth Science, UC Santa Barbara

The establishment of time-correlative glacial deposits around the world, coupled with paleomagnetic data and climate modeling, has shown that ice reached low latitudes at least twice during the Cryogenian Period. Proposed initiation mechanisms for the earlier Sturtian snowball Earth include chemical weathering of the Franklin large igneous province (LIP), or the radiative forcing from its sulfur aerosol emissions. New high precision ages obtained from zircon in other Franklin LIP sill samples using the chemical abrasion-isotope dilution-thermal ionization mass spectrometry (CA-ID-TIMS) technique refine previously published baddeleyite ages and are older than the most precise age constraint on the onset of the Sturtian glaciation by over a million years, which is more consistent with hypotheses linking weathering of the Franklin LIP to the onset of glaciation. Combining high-precision CA-ID-TIMS ages with stratigraphy provides the opportunity to approach the sub-million-year timescale needed for testing links between LIPs and environmental change