

K-Ar evidence for provenance of fine-grained sediments off Vancouver Island:
A Proposal to the Climate Center for Undergraduate Research

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Abstract- More than 80 years ago, Harlan Bretz first saw evidence for catastrophic floods draining into the NE Pacific in the morphological features of the Channeled Scablands, the Columbia Gorge and the Willamette Valley. Several subsequent studies have succeeded in identifying sediments associated with outburst flooding from Lake Missoula. Several subsequent studies have succeeded in identifying sediments associated with outburst flooding from Lake Missoula with freshwater diatoms and sedimentary provenance in marine sediment cores. Multiple sources of outburst flooding could have deposited sediment at the proposed core site off Vancouver Island. Outburst floods are known to have come from Lake Missoula and the Chehalis River Valley and it is possible that other floods may have drained the Cordilleran Ice Sheet margin on Vancouver Island or other, more inland locations. K-Ar dating of fine grained sediments (as well as minerals within the sand fraction of sediment core where possible) will provide data for discriminating between these possible source regions. Understanding provenance variation in the sediment core will provide constraints on the evolution of the Cordilleran Ice Sheet over time. Hendy has found variations in the major element chemistry which seem to indicate a variety of terrestrial silicate sources to the site. She is currently working to more precisely pinpoint the provenance of these sediments. K-Ar dating of these sediments will work in concert with Hendy's geochemical methods to produce greater understanding of sediment provenance and climate/oceanographic variability, while providing a unique opportunity for an undergraduate to explore the applicability of K-Ar ages of sediments in identifying sources of sediment transported by meltwater.