
261-7 - EVIDENCE FOR VOLCANIC DISTURBANCE IN THE MIDDLE MIOCENE SUCCOR CREEK FLORA (OREGON AND IDAHO)



Wednesday, 12 October 2022



3:25 PM - 3:40 PM



Mile High Ballroom 4B (Colorado Convention Center)

Abstract

The fossil record of the U.S. Pacific Northwest preserves a large number of Middle Miocene floras, with potential for revealing long-term climate-vegetation dynamics during the Miocene Climatic Optimum. However, concurrent, intense volcanism (e.g., Yellowstone hotspot) and the possibility of Milankovitch-scale climatic oscillations may obscure the record of long-term climate change. We present pollen, X-ray fluorescence geochemistry, and U-Pb geochronological data from a 65-m thick lacustrine section from the Watersnake locality of the Succor Creek Flora, southwestern Idaho to assess mechanisms of vegetation change at high resolution. Throughout the record, dramatic, stepwise shifts in the pollen spectra coincide with the deposition of ash-flows tuffs. Following deposition of one tuff in the lake (8.5-m thick), vegetation dominated by Cupressaceae/Taxaceae and upland conifers is replaced by an early successional community with abundant *Alnus*, *Betula*, *Fagus*, and *Liquidambar*. Above a thicker (13-m thick) tuff, Cupressaceae/Taxaceae and upland conifers are nearly lost, and *Alnus*, *Betula*, and *Ulmus/Zelkova* become dominant. In each case, following the abrupt change, gradual recovery of the forest is evidenced by increased abundance of Cupressaceae/Taxaceae and upland conifers. A secondary trend, a shift from Cupressaceae/Taxaceae dominance to *Tsuga* and other upland conifers coincides with a shift from shale to claystone deposition and higher sediment Ti concentrations. This shift is attributed to a change in the physical hydrology of the lake, wherein the loss of surrounding *Glyptostrobus* (Cupressaceae) swamp enabled enhanced siliciclastic sedimentation. Climate is ruled out as a primary mechanism of vegetation change throughout the section due to stepwise transitions, coincidence of vegetation change with tuff deposition, and the short interval of ≤ 30 ka represented by the section, from isotope dilution U-Pb zircon ages for the ash-flow tuffs. This trend is comparable to stratigraphic pollen sections studied elsewhere in the Succor Creek Flora, suggesting persistent volcanic disturbance through Succor Creek time.

Geological Society of America Abstracts with Programs. Vol 54, No. 5, 2022
doi: 10.1130/abs/2022AM-380693

© Copyright 2022 The Geological Society of America (GSA), all rights reserved.

Author



Christopher Schiller
University of Washington

Authors



Alexander J. Lowe
University of Washington



Caroline A.E. Stromberg
University Of Washington
University of Washington



Mark D. Schmitz
Boise State University



Thomas A. Dillhoff
Evolving Earth Foundation



Patrick F. Fields
College of Idaho



Ralph E. Taggart
Michigan State University

View Related
