Glacier to Bay Sediment Analysis; Identifying Lahar, Interglacial and Glacial Sediment Deposits Along the Puyallup Watershed System

Lauren Jackson, Peter Selkin PhD

Tracking sediment back to its source can help researchers understand the history of geologic processes in watersheds. In Washington State, the topography of the land has been shaped in part by glacial, river, and volcanic processes. One case study for these processes is the Puyallup River Watershed in King and Pierce Counties, whose headwaters are in Mount Rainer's glaciers and whose outlet lies in Tacoma's Commencement Bay. To investigate sediment sources in the watershed, we collected fine sediment samples from known Osceola Mudflow deposits as well as modern and Pleistocene glacial and fluvial deposits and separated them into particle size fractions for magnetic and geochemical analysis. Silt from lahar deposits is characterized by heightened magnetic susceptibility and presence of ferromagnetic minerals such as titanomagnetite, higher Curie temperatures, and lower coercivity components than non-lahar sediments. This suggests that magnetic particles of similar sizes differ in mineralogy, providing unique markers which assist in tracing origins of lahar and non-lahar sediment. Continued collection and analysis of sediment samples within the region will aid in understanding river behavior, hazards, and potential impacts on communities within these hazard zones.