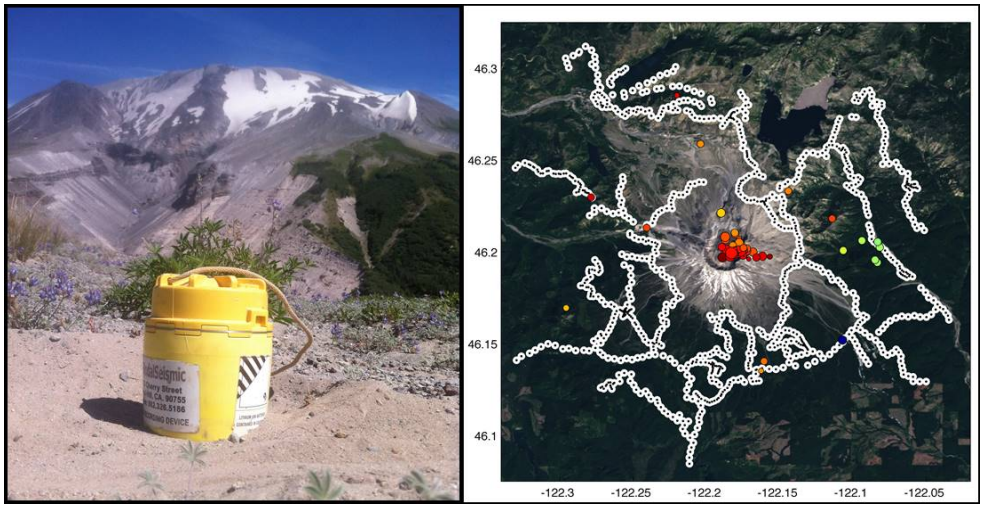
Brandon Schmandt
Assistant Professor
Earth and Planetary Science
University of New Mexico

“Investigating Mount St. Helens’ Seismicity and Magma Plumbing With a Hybrid Passive and Active Source Array



Mount St. Helens is an active volcano in the Cascade arc, which is famous for its Plinian eruption in 1980. Its most recent eruptive activity was in 2004-2008 and it continues to host a variable but high level of seismic activity. The potential hazards the volcano poses for multiple major cities and its relative accessibility have made it a focus area for multidisciplinary scientists seeking to understand the deep origins of arc volcanoes and interpret their ongoing activity. This presentation will focus on insights gained from a multi-institutional passive and active source seismic investigation. An unusual aspect of the project was the deployment of 900 continuously recording cable-free geophones within about 12 km of Mount St. Helens, which represents a temporary 100x increase compared to the long-term monitoring network. Such high-density continuous recording recently

became feasible in industrial exploration settings, and this array represents an initial application to an active magmatic system. So far the array has been used to detect and characterize diverse types of seismicity spanning most of the crustal column beneath the volcano, including detection of previously unrecognized long period seismicity in the upper crust at depths between the inferred magma reservoir that fueled prior eruptions and the summit crater. New seismic tomography and reflection imaging results will also be presented and used to help place seismicity in the context of hypotheses for the transport of volatiles and silicate melt through the subduction zone from the mantle to the surface.