

ABSTRACT:

Seismic Velocity Changes below the Great Sitkin Volcano in Central Aleutian Volcanic Arc Associated with Recent Eruptive Activities

Cody Kupres and Xiaotao Yang
Purdue University

Volcanic eruptions are potentially hazardous natural events. Understanding how magma accumulates, migrates, and erupts is important to understanding and, eventually, predicting volcanic eruptions. However, the variation in the scale of volcanoes, co-occurrence of earthquakes, and the duration of the eruption makes understanding these events difficult. Ambient noise interferometry is becoming an increasingly more popular tool to study and monitor active volcanoes. We use this method to characterize the variations of subsurface seismic velocities associated with different stages of the eruption process at the Great Sitkin Volcano in the central Aleutian volcanic arc. This volcano initially erupted in May 2021 with elevated seismicity and gas release, followed by the formation of a new lava dome starting July 2021. The volcano had an increase in seismicity in February 2020 but without any eruption activity reported. Measuring the variation of seismic velocities from August 2019 to March 2022, we observe a local decrease in velocity leading up to the eruption and an increase in velocity following the emplacement of the lava dome. We do not observe any velocity variations preceding the non-eruptive increase of seismic activity in February 2020. Despite its remote location and relatively small scale, the findings of this study at the Great Sitkin volcano have significant implications for understanding volcanism and the development and prediction of volcanic eruptions in general.

AV.GSSP.AV.GSSP at 0.4-1Hz xcomp cc_min:0.75 method: ts MWM_window:20

