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## Axial Seamount: A Wired Submarine Volcano Observatory in the NE Pacific

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Axial Seamount is the most active submarine volcano in the NE Pacific Ocean, and is monitored by instruments connected to a cabled observatory (the US Ocean Observatories Initiative Cabled Array), supplemented by autonomous battery-powered instruments on the seafloor at ~1500 m depth. Axial Seamount is a basaltic hot spot volcano superimposed on the Juan de Fuca spreading ridge, giving it a robust and apparently continuous magma supply. It has had three effusive eruptions in the last 23 years in 1998, 2011, and 2015. Deformation measurements have been conducted at Axial Seamount since the late 1980's with bottom pressure recorders (BPRs) that can detect vertical movements of the seafloor with a resolution of ~1 cm. This monitoring has produced a long-term time-series including co-eruption rapid deflation events of 2.5-3.2 meters, separated by continuous gradual inter-eruption inflation at rates that have varied between 15-80 cm/yr. The overall pattern appears to be inflation-predictable, with eruptions repeatedly triggered at or near a critical level of inflation. Using this pattern, the 2015 eruption was successfully forecast within a one-year time window, 7 months in advance. As of January 2021, Axial Seamount has re-inflated ~2.1 m (~83%) of the 2.54 m it deflated during the 2015 eruption, but the rate of inflation has been decreasing since then. Our current eruption forecast window is between 2022-2026, based on the latest rate of inflation. Modeling of the seafloor deformation data along with other recent results from ocean bottom seismometers and multichannel seismic surveys inform our interpretation of the subsurface structure of the volcano and the geometry and depth of the shallow magma storage system.