# Presentation

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# PETROLOGY OF THE IGNEOUS ROCKS OF SAWTELL PEAK, IDAHO, U.S.A

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Sawtell Peak, which is 3,007 m high and rises ~1,100 m above the surrounding valleys, sits near the Continental Divide on the Idaho-Montana border. The peak and surrounding area is comprised of a thick (at least 300 m) sequence of Eocene shoshonite block lava flows that overlie local Paleozoic strata and are cut by feeder dikes. The Huckleberry Ridge Tuff (2.1 Ma), from the nearby Yellowstone Plateau volcanic field, onlaps these rocks at lower elevations. The volcanic features, petrography, and composition of the shoshonites are remarkably uniform throughout the section. The block flows are 1-10m thick. Dense flow bases are typically thinner than overlying flow rubble zones. Where slopes are steep the cross section of individual flow lobes are exposed. No pyroclastic rocks or lahars were observed. In a very few locations the flows are separated by small, thin (<3 m) sedimentary deposits. In some locations the sediments show clear bedding structures and appear to have infilled the rubble zones. In other locations the sedimentary deposits are matrix-supported and contain abundant, highly angular, weathered shoshonite clasts (<1 m). The flows are cut by linear, 1-2 m thick feeder dikes. Some dikes have chilled margins and others are surrounded by zones of hydrothermal alteration. Surface exposures of dikes are 10-100 m long. The flows are sometimes vesicular or amygdaloidal, are crystal rich, and contain euhedral cpx phenocrysts, commonly-altered ol phenocrysts, and microlites of plag and Fe-Ti oxides. Modal proportions are: 53-66% matrix, 21-34% cpx, 5-12% ol, 0.5–7% plag, and minor Fe-Ti oxides. Two units (one flow and one dike) were observed to contain biotite. The rocks are uniformly shoshonitic ($K_2O$ 2-5%), silica-oversaturated, magnesian, and calc-alkalic. Major (in wt. %) and trace element (in ppm) variations are relatively small, e.g., $SiO_2$ varies from 51.6-54.5, MgO from 5–9, $TiO_2$ from 0.7–0.8, Cr from 274-417, Ni from 54–106, Rb from 54–199, Sr from 412-799, Ba from 1389–1774, and Zr from 72-129. Compositions, including spider diagram patterns, suggest these rocks were derived above the subduction zone that existed beneath western North America during the Eocene. Because these rocks are located between the Absaroka and Challis volcanic fields their petrogenesis may yield useful insights into the Eocene petrotectonic history of western North America.

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