
Title: Geology of North Craters of the Moon National Monument, Idaho.

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The map area is located within Craters of the Moon National Monument at the southern margin of the Pioneer Mountains, in Blaine and Butte Counties, Idaho. Steep maturely dissected slopes in older rocks and recent lava flows and cinder cones of the Snake River Plain characterize the area.

The Mississippian Drummond Mine Limestone and Scorpion Mountain Formations are the oldest rocks in the area. The Drummond Mine Limestone has an exposed thickness of 100 ft
(30 m). The non-carbonate clastic rocks of the Scorpion Mountain Formation of the Copper Basin Group have an exposed thickness of 1600 ft (490 m). Thrusting from the west during the Late Mesozoic Sevier orogeny has caused northwest-trending inclined folds, which have widths of 1.5 mi (2.4 km) and amplitudes of 1000 ft (300 m). Anticlines plunge to the northwest and southeast.

Unconformably overlying these Paleozoic sedimentary rocks are the Eocene Challis volcanic rocks which have an exposed thickness of at least 3875 ft (1180 m). The Challis volcanic rocks compose a sequence of interbedded rhyodacite tuff-breccia, tuff, and lava flows. Individual units are lenticular and variable in thickness. A welded tuff bed unconformably caps the sequence.

The strata of Challis volcanic rocks are gently folded in a northwest-trending arch. They are intruded by stocks of biotite granite, hornblende quartz monzonite, and by small plutons and dikes of hornblende leucogranite porphyry, granite pegmatite and aplite, hornblende quartz syenite, and biotite-hornblende dacite, ranging in age from 35 to 58 m.y. Shattering of country rock near the intrusions has formed favorable hosts for sulfide mineralization. A hornsfel aureole of albite-epidote facies surrounds the margins of the stocks.

Deformation has continued into the Holocene. Undetermined thicknesses of olivine basalts have issued from Grassy
Cone, Sunset Cone, and North Crater, which are aligned on the northwest-trending Great Rift Zone of Craters of the Moon National Monument. This rift appears to follow older structures in the Pioneer Mountains. Holocene alluvium partly fills the major drainages of Big Cottonwood Creek and Little Cottonwood Creek.