

Large Scale Mapping and New Interpretation of the Geology in Proximity to the Visitor Center: Evidence for a Missing Cinder Cone and Refined Mapping of Volcanic Features, Craters of the Moon National Monument and Preserve, Idaho

Tiffany A. Rivera<sup>1</sup>, Shaina M. Keane<sup>2</sup>, Douglass E. Owen<sup>3</sup>, Mary E. Caress<sup>4</sup>

Recent detailed field mapping at Craters of the Moon National Monument and Preserve (CRMO) near the visitor center revealed evidence for a missing cinder cone, named the South Highway Cone (SHC), partially swallowed during magma chamber collapse and rafted away by younger flows. Recognition of a largely missing SHC agrees with earlier workers' data showing the volume of material rafted from the North Crater cinder cone (NC) cannot be contained within the modern NC breach. Paleomagnetic data collected by earlier workers from a SHC remnant on the north flank of NC shows that these two cones may be coeval. The northern rim of SHC acted as a topographical boundary for the Highway (Hwy) Flow, diverting most of the flow eastward along the cone. We re-interpret the Hwy Flow as also flowing 300m to the west between SHC and cinder mounds of unknown source and age. We believe that a normal-faulted segment of the Hwy Flow, marked by draperies, signifies a former magma chamber collapse. The drapery features are areas of the flow that drained over the fault scarp, suggesting the flow was likely contemporaneous with faulting. The collapse may have consumed a substantial portion of SHC and later covered by the NC Flow. The NC Flow was diverted around previously entrained rafted blocks, boulders of the Hwy Flow, and cinder material hypothesized to be from SHC. High standing monoliths surrounded by the NC Flow, which have been interpreted by others as volcanic necks, also support the proposition for a missing cone.

Moreover, we have identified two previously unmapped eruptive fissures that cut cinder mounds of the NC complex as well as unmapped non-eruptive fissures that are parallel to but offset from the Big Craters eruptive fissure and vent complex. Finally, we recognized several

areas of platy jointing within the Hwy Flow, indicating internal shear occurred within the flow. Locating features such as these supports the need for intimate mapping of CRMO. Using field data, we generated a 1:12,000 digital geologic map of our re-interpretations and a “Points of Interest” section. This accompanying section promotes mapping and understanding of volcanic terrains by offering the reader a series of features with explanations for their formation. The publication will be available to the public via the CRMO website and encouraged for use by geology field camps.

- 1) Boise State University, Department of Geosciences, 1910 University Dr. Boise, ID 83725  
tiffanyrivera@mail.boisestate.edu
- 2) Washington State University, School of Earth and Environmental Sciences, PO Box  
642812 Pullman, WA 99164  
shaina\_keane@wsu.edu
- 3) Craters of the Moon National Monument and Preserve, National Park Service, P.O. Box 29  
Arco, ID 83213  
Doug\_Owen@nps.gov
- 4) 421 Calle Familia, San Clemente, CA 92672  
marycaress@yahoo.com