

Rocky Mountain Section - 68th Annual Meeting - 2016

Paper No. 10-5

Presentation Time: 8:00 AM-6:00 PM

OVERLAPPING PHREATIC BLASTS AT KINGS BOWL, IDAHO

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Kings Bowl pit is a 2.2ka crater created by a phreatic blast through a solidifying lava pond in the eastern Snake River Plain (ESRP), Idaho. The main crater (80m x 30m x 30m) is located along the Great Rift. The phreatic blast occurred at the end of the effusive eruption that formed the lava pond, following drain-back and local solidification of the basalt. East of the main pit, ballistic blocks are mantled by fine tephra mixed with eolian dust, up to a thickness of ~0.6m (see Sandmeyer et al. and Trcka et al., this conference). West of the pit, blocks are exposed in an ejecta field reaching >100m from the vent. While the ejecta historically has been assumed to have come from a single blast event at the main Kings Bowl pit, field measurements of several hundred ejecta blocks with >20cm diameter suggest that there was actually more than one vent involved. We use differential GPS to map the distribution of ballistic blocks on the west side of the fissure along multiple transects parallel to the fissure and three transects radial to the main pit, recording position, percent vesiculation, and the length of three mutually perpendicular axes for each block. The distribution of ejecta blocks clearly indicates that more than one vent along the fissure experienced phreatic explosion in

the final stages of the Kings Bowl eruption. Small pits that were previously identified as draw-down or local collapse areas along the fissure correlate with areas of increased linear block frequency and size, depicting approximately 6 distinct additional phreatic vents immediately to the north of the main pit; preliminary work suggests that there are more phreatic blast sites further along the Kings Bowl fissure, beyond the scope of this work. The smaller phreatic pits noted immediately north of the main pit along the Great Rift correspond broadly with the limits of the local tephra/dust field east of the fissure. Ballistic parameters, used to calculate ejection velocities typical of each pit, support the argument that the difference in pit size within the Kings Bowl volcanic feature is a function of limiting magmatic heat rather than water, though both were involved in the blast.

Session No. 10--Booth# 29

T13. Cenozoic Volcanism in the Inland Northwestern United States
(Posters)

Wednesday, 18 May 2016: 8:00 AM-6:00 PM

Clearwater Room (Idaho Commons Conference Center)

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