

Paper No. 84-9

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A NEW MODEL FOR BASALTIC LAVA POND AND FLOW FIELD FORMATION

[SAKIMOTO, Susan E.H.](#), Civil Engineering and Geological Sciences, University of Notre Dame, 156 Fitzpatrick Engineering Hall, Notre Dame, IN 46556, ssakimot@nd.edu, GREGG, Tracy, Department of Geological Sciences, The University at Buffalo, Buffalo, NY 14260, and HUGHES, Scott, Geosciences, Idaho State University, Pocatello, ID 83209

Basaltic plains-style volcanism is quite common on the terrestrial planets, and understanding this type of volcanism is therefore key in understanding a significant number of volcanic provinces on Earth as well as a substantial percentage of the surfaces of the Moon, Mars, and Venus as well. The Eastern Snake River Plains (ESRP) of Idaho have a wide range of volcanic landforms (e.g. flows, shields, eruptive vents, and rifts) that have proven to be well preserved, accessible, and illustrative for geochemical studies, physical volcanism models, and other insights. The landform scales and the range of landform expressions are certainly representative of a range of known plains-style eruptive processes. One type of features well-represented in parts of the ESRP are lava ponds. For many basaltic systems (subaerial or subaqueous), lava pond formation is often a constructional process including overflows and levees and a perched main pond level. Craters of the Moon National Monument and Preserve has a well-preserved example of another lava pond type. Instead of an overflow approach to levee-building, this type of lava pond has ample field evidence for wall movement in the radially outwards direction, significant pond wall inflation, and the capability of feeding major lava flows from breakouts at the external base of the pond wall, rather than by overflow over the top of the wall. This new pond eruption style is particularly interesting, because the wall topography and emanating flow channels allows us to constrain flow volume rates as well as wall bulk material properties that are otherwise difficult to estimate.

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