SANDY POST

Researchers from OSU discover reason for Mount Hood's nonexplosive nature

BY LISA K. ANDERSON

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Oregon State University researchers released a study last month revealing why Mount Hood is nonexplosive in nature.

Lead author Alison Koleszar and her colleagues describe in the online Journal of Volcanology and Geothermal Research how the mixing of magma deep beneath Mount Hood has prevented the mountain from blowing its top over the millennia.

Koleszar, a postdoctoral researcher in OSU's College of Earth, Ocean and Sciences, said eruptions at Mount Hood appear to be preceded by episodes of intense mixing between magmas of different temperatures.

Hot magma rises from deep below Mount Hood and mixes with the cooler magma that underlies the volcano. Heat from the deeper, hotter magma increases the temperature and lowers the viscosity of the magma that eventually erupts.

Then, instead of exploding, the magma oozes out the top of the volcano and piles up to form a lava dome.

Koleszar said studies of the rocks around Mount Hood show the volcano has never experienced Plinian eruption, or high-explosivity eruption.

This is interesting considering many volcanoes experience both kinds of eruptions and the Mount Hood rocks share similar chemical magma composition and gas contents to volcanoes that have gone through these high-explosivity eruptions.

During these eruptions, large amounts of magma are ejected at a high velocity, such as the 1980 eruption of Mount St. Helens and 1992 eruption of Mount Pinatubo in the Philippines.

"If you take a straw and blow bubbles into a glass of milk, it will bubble up and allow the pressure to escape," Koleszar said in a press release. "But if you blow bubbles into a thick milkshake you need more pressure and it essentially 'erupts' with more force as bits of milkshake get thrown into the air. Add a little heat to the milkshake, though, and it thins out and bubbles gently when you blow into it, more like the glass of milk.

"That's what Mount Hood has been doing," she added. "Heating things up enough to avoid a major explosion."

Adam Kent, an OSU volcanologist, calls this a hiccup. The low-explosivity eruptions have resulted in the formation of lava domes near Mount Hood's summit. Located on the south side of the mountain, Crater Rock is a remnant of the Mount Hood lava domes.

"Instead of an explosion, it would be more like squeezing a tube of toothpaste," said Kent, who also is an author on the study. "Lava piles up to form a dome; the dome eventually collapses under its own weight and forms a hot landslide that travels down the side of the volcano. In contrast, during a Plinian event such as the kind seen at other volcanoes, ash and rock are blown high into the air and distributed all over."

Researchers point out that the 11,240-foot Mount Hood peak may not be explosive, but that doesn't mean it's docile. Collapses of the lava dome at Crater Rock about 1,500 and 220 years ago sent scalding landslides of hot lava blocks down the side of the volcano.

Still, Koleszar called Mount Hood the poster child for low-explosivity eruptions.

"Mount Hood is really cool because it is such a model for one extreme of volcano," she said. "It may not have the colorful history of Mount Mazama or St. Helens, but it has its own niche among volcanoes, and now we better understand why it does."

Research for the OSU study was funded primarily by the National Science Foundation. The researchers analyzed three eruptions on Mount Hood from the past 30,000 years, the last of which occurred about 220 years ago.

Written about by Mark Floyd, the study is available online through the OSU Scholars Archive at hdl.handle.net/1957/27563 and will be printed this month.

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