Part 1

Welcome to Earth Science Week, I'm Laura Waters a faculty member in the Earth and Environmental Science Department at New Mexico Tech.

Did you know that New Mexico has its very own super-volcano? The super-volcano is located high up in the rolling hills above Los Alamos and just North of Santa Fe National Forest- maybe you guessed it: it's Valles Caldera National Preserve. If you've ever visited the national preserve, you might think of the steep mountains, excellent fishing and hunting, or maybe even an opportunity to see a large herd of elk. When a geologist goes to Valles Caldera, they see a living volcanic system.

About 1.6 million years ago, Valles began erupting huge volumes of magma. When the eruptions finished a total of ~800 cubic kilometers of magma was erupted over New Mexico. 800 cubic kilometers is a hard number to understand. If we were to pile up that 800 cubic kilometers of volcanic material over the city of Albuquerque, the layer of magma would be a mile thick. So, the eruptions from Valles were enormous!

After all those eruptions, a caldera was left behind. A caldera is what remains after a large volcano collapses following eruption- the name caldera comes from cauldron, a deep metal pot. You might see cauldrons used as some Halloween decorations soon. When you visit Valles Caldera you are actually standing on the floor of a super volcano- in a caldera so big you can't actually see both sides of it at once.

Since the eruptions and formation of the caldera, the volcano still shows some activity. From the visitor's center, you can see many large dome-shaped hills. These are all little volcanoes that erupted slowly, or effusively, out of the caldera floor- this is where my work comes in.

More on that tomorrow...

Celebrating Earth Science Week, I'm Laura Waters, a faculty member in the Earth and Environmental Science Department at New Mexico Tech.

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Part 2

Welcome to Earth Science Week, I'm Laura Waters a faculty member in the Earth and Environmental Science Department at New Mexico Tech.

Yesterday we talked about New Mexico's very own Super Volcano - the Valles Caldera near Los Alamos, which began erupting 1.6 million years ago. Though it's been a while since the volcano erupted, geologists still find evidence of volcanic activity in the caldera. I want to understand where the recent eruptions at Valles were stored within the Earth- I want to know the depths and temperatures associated with their storage prior to eruption to better understand the threat to surrounding communities.

The volcanic rocks from Valles contain little crystals that provide a record of temperatures, pressures and events that happened to magmas prior to their eruption. My students and I examine crystals in the recent eruptions from Valles Caldera, and then try to recreate those crystals by making magma in the lab.

In my lab at New Mexico Tech, I have experimental vessels that can recreate the temperatures and pressures of magmatic systems. My system can simulate temperatures of 800°C to 1000°C, which is three times greater than the maximum temperature of your normal oven at home. I can also simulate pressure of magmatic systems, which is, on average, about 1000 times more than pressure in your car tires. Using this experimental system, my students and I grow crystals at magmatic conditions that might be beneath Valles caldera. We compare the crystals we grew in our experiments with crystals from the natural samples to see how well they match- the better the match the closer we are to understanding where the recent eruptions from Valles were stored prior to eruption.

We just started the project, so it is very much a work in progress, so I hope to be back with an update soon. Celebrating Earth Science Week, I'm Laura Waters, a faculty member in the Earth and Environmental Science Department at New Mexico Tech.

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