

Scientists Map Yellowstone Magma Plume

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JACKSON, Wyo.—Information from a vast seismograph network confirms a magma plume extends at least 500 miles below Yellowstone National Park, scientists say.

The scientists from Utah, Massachusetts, Michigan, Norway, Taiwan and Switzerland used a network of 150 seismographs over an area 435 miles long and 310 miles wide to record seismic waves from earthquakes around the world to make a three-dimensional image of the plume.

They published their findings last month in the *Journal of Volcanology and Geothermal Research*.

"I think for the first time it all fits together," said Robert Smith, professor of geophysics with the University of Utah Department of Geology and Geophysics, and coordinating scientist with Yellowstone Volcano Observatory. "This is integration of various kinds of data" from several different fields of science.

He said the bottom of the magma plume is unclear, though instruments show it extends at least 500 miles below the Earth's surface.

"It wouldn't surprise me that it would go deeper," he said.

Smith said the Earth's mantle, the layer below the crust, is flowing from the northwest to the southeast and deforming the magma plume. Meanwhile, he said, the North American tectonic plate is sliding to the southwest.

"This hot, melted material is coming up (at an angle)," Smith said. "It would normally rise vertically."

He said the new image of the magma plume gives researchers a better understanding of what happened in the past and what could happen in the future.

"Yellowstone has affected five or six states in the western United States over the last 17 million years," Smith said. "Yellowstone's had a profound affect on the topography and the drainage and the mountain ranges for millions of years."

Earlier this year Smith reported that an earthquake swarm of more than 800 earthquakes was the most intense swarm recorded in Yellowstone since a swarm that rattled the West Yellowstone area in 1985.