

Researchers seek to find Old Faithful's underground plumbing

November 7 2016, by Matthew Brown

Scientists from the U.S. and Denmark are seeking to map out the plumbing system hidden inside the earth's crust that's responsible for the famous Old Faithful geyser and other hydrothermal features at Yellowstone National Park.

Throughout November the research team will conduct flights over the park using a giant, hoop-shaped electromagnetic system suspended from a helicopter. The device acts like an X-ray to determine where and how hot water flows beneath the surface.

The team also hopes to gain insights into the infrequent but sometimes massive hydrothermal explosions that occur in the park, said lead scientist Carol Finn with the U.S. Geological Survey.

One such explosion, or possibly multiple explosions, that occurred roughly 13,800 years ago left a crater that measures 1-1/2 miles (2.6 km) across beneath at the bottom of Yellowstone Lake. It's believed to be the largest such crater in the world.

Similar to the regular eruptions of Old Faithful, hydrothermal explosions occur when huge pockets of boiling water beneath the ground experience a sudden drop in pressure, causing the water to convert to steam and explode violently to the surface.

Similar work elsewhere in the U.S. has helped reveal hazards from volcanoes.

"Nobody knows anything about the flow paths" for the hot water that erupts from Yellowstone's geysers, Finn said. "Does it travel down and back up? Does it travel laterally?"

The electromagnetic system was developed in Denmark to map out groundwater supplies in Denmark. It's able to discern between water and rocks to a depth of about 1,500 feet beneath the surface.

In Yellowstone, a better understanding of the hydrothermal plumbing could help administrators plot out future development so tourists can enjoy the park's features without damaging them or being put into harm's way.

The study is a collaboration between the U.S.G.S., Yellowstone National Park, the University of Wyoming and Denmark's Aarhus University.

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