

Idaho Geological Survey and U-Idaho explore for geothermal energy

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(Phys.org)—In an effort to provide the most accurate assessment of high-temperature geothermal energy potential in the region, the Idaho Geological Survey recently drilled new wells in southeastern Idaho.

"These new [thermal gradient](#) wells will provide the first accurate picture of the heat flow regime beneath this important volcanic province," said project leader John Welhan, University of Idaho faculty member and Idaho Geological Survey research geologist.

Workers successfully completed installation of three wells in the Blackfoot-Gem Valley volcanic field of southeastern Idaho during the fourth quarter of 2012. The wells were drilled within an 18-mile radius of China Hat, a 60,000-year-old region of volcanic rock near Soda Springs, Idaho.

The wells allow researchers to precisely measure heat coming out of the Earth, which will help them better understand Idaho's geologic framework, in addition to offering insight into the region's [geothermal energy](#) potential.

The China Hat area does not have surface features such as geysers or hot springs that usually indicate potential for geothermal energy. Welhan said the area almost certainly has deep-seated heat sources that are masked by cold groundwater flowing through the surrounding basalt.

"Southeast Idaho hosts one of the most puzzling combinations of

geothermal-related phenomena in North America," said Mike McCurry, a [volcanologist](#) at Idaho State University who is collaborating with the IGS.

A key goal of the heat flow drilling program is to test whether the presence of thrust faults – horizontal breaks in the Earth's crust that can extend for miles – affect how groundwater interacts with the cooling magma to redistribute heat in the shallow crust.

If so, this could explain why magmatic heat beneath China Hat has only a minor effect on the surface and why hot brines found in the adjacent Idaho-Wyoming thrust belt are so hot. These brines have been observed in oil and gas wildcat wells as far as 22 miles east of the Great Basin region, in which the China Hat volcanoes erupted.

The brines range from 320 to 420 degrees Fahrenheit at 9,500- to 16,000-foot depths and may represent China Hat's "missing" heat. Groundwater and hydrothermal fluids, heated to high temperatures by magma deep beneath China Hat, migrate along these thrust faults to collect in shallower reservoirs far from the source of the heat.

A key part of the drilling project's success has been the ongoing geothermal data compilation effort for the National Geothermal Data System project. The availability of such data has allowed researchers to formulate hypotheses on the Blackfoot-Gem Valley volcanic field's geothermal potential that will be tested with the data acquired from the newly drilled wells.

The data also can be accessed by any business or individual interested in Idaho's geothermal potential, whether for energy production, heating systems, greenhouses or other uses.

The next steps in the drilling program will be thermal profiling of the

new wells, measuring the rocks' thermal properties and performing [heat](#) flow calculations. The Idaho Geological Survey will accomplish this during the first half of 2013 in collaboration with the Utah Geological Survey, University of Utah and the Idaho National Laboratory.

Data from the project are now available on the National Geothermal Data System website, www.geothermaldata.org, and will be available in expanded format during summer 2013 on the Idaho [Geological Survey](#) website, www.idahogeology.org.

Provided by University of Idaho

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