

Quake-Causing Hotspot Hides Under Eastern U.S.

Larry O'Hanlon, Discovery.com, 9-15-13

Is there a blow torch under North America that causes rare, but deadly, earthquakes? Some geologists think they might have found the buried track of just such a hotspot from Missouri to Virginia.

Hotspots are points in Earth's interior that melt the crust above, generally creating volcanoes. The classic hotspot is the Hawaiian Islands, which stretch out in a line for 1,500 miles, tracing the movement of the Pacific Plate over the Hawaiian hotspot over millions of years. Most hotspots are seen on thinner, oceanic crust, like that of Hawaii. When they burn up through continents, they generally leave their trace in the form of diamond-bearing rocks, which are pretty rare.

But a team of Chinese and American scientists think they have found the track of a hotspot hidden in the very old, thick crust of Eastern United States, based on seismic data from the 2011 Virginia 5.6-magnitude earthquake. That event essentially lit up the structure of the crust in that part of North America for the USArray seismic network to see.

That seismic data has revealed an unexpected scar in the lower part of the crust extending from eastwards from Missouri to Virginia, reported Risheng Chu of the Chinese Academy of Sciences and colleagues in the Sept. 15 issue of the journal *Nature Geoscience*.

The seismic anomaly, as it is called, cuts through the New Madrid rift system, which is responsible for some of the most powerful earthquakes in North American history. It also crosses a 75-million-year-old diamond-bearing formation in Kentucky. Despite all this, there is no sign of the hotspot track on the surface, they said.

To back up their claim, they created a geodynamic model to show how a plume of heat upwelling from the Earth's mantle could create just such a seismic feature on the underside of a thick continental crust.

"We suggest that the hotspot track could be responsible for...reactivation of the New Madrid rift system and seismicity of the eastern United States," the team wrote.

If so, this is a big deal and could explain a lot. It will be interesting to see how well this is accepted by other researchers.