Scientists make discoveries about the ways oceans form

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(PhysOrg.com) -- Scientists at Missouri University of Science and Technology have discovered magnetic stripes in Ethiopia that could indicate the coming formation of a new ocean basin in the next two million years or so. The findings are reported in the March issue of the journal *Geology*.

This is the first time these magnetic stripes have been discovered on land. They are known to exist on the bottom of oceans, and are involved in the "flipping" of the Earth's magnetic poles -- which last happened 780,000 years ago. Scientists can learn the timing of ocean formation from the magnetic stripes.

"The really interesting thing is that some of the oceanic basins may perhaps be a little bit younger than we currently believe," David Bridges, a post-doctoral researcher at Missouri S&T, told OurAmazingPlanet.

The researchers set out to study how narrow rifts have separated continents in the past to create ocean basins like the Atlantic Ocean and the Red Sea. Current rift valleys are found in Africa, Russia and in the southwestern U.S. The U.S. rift is located along the Rio Grande River.

"If the current trend continues for millions of years, there will be an ocean separating western and eastern Colorado, western and eastern New Mexico, and western Texas and northern Mexico," says Dr. Stephen Gao, professor of geophysics at Missouri S&T.

However, Gao says there have been a lot of failed rifts in the Earth's history. One so-called failed rift is the Reelfoot in southeast Missouri, where the New Madrid seismic zone is now located.

In Africa, 50 earthquake-detecting instruments called seismographs are being installed across the rifted valleys to image the deep structure of the Earth. The techniques are similar to the methods doctors use to image the body.

In addition to Bridges and Gao, other researchers involved include Dr. Mohamed Abdelsalam, professor of geology; Dr. John Hogan, associate professor of geology; and Dr. Kelly Liu, professor of geophysics.

The research has been funded by multiple awards from the National Science Foundation, the American Chemical Society and Statoil.

"The latest discovery was a milestone in S&T's long-history of geophysical investigations of the forces that fracture continents and form new oceans," Gao says.

Provided by Missouri University of Science and Technology