

Geologists suggest Horseshoe Abyssal Plain may be start of a subduction zone

8 May 2019, by Bob Yirka



A composite image of the Western hemisphere of the Earth. Credit: NASA

A team of geologists led by João Duarte gave a presentation at this past month's European Geosciences Union meeting that included a suggestion that the Horseshoe Abyssal Plain may represent the start of a new subduction zone. They presented evidence of possible peeling on the bottom of the tectonic plate that lies off the coast of Portugal.

Duarte noted that ever since the 1969 [earthquake](#) that struck off the coast of Portugal, he has been wondering how it happened—the area is not part of a subduction zone. It is quite the opposite, in fact. Duarte described it as like the plain of Kansas covered in water. It lies at the opposite end of the world from the so-called ring of fire, which hosts 90 percent of the world's earthquakes. Notably, most

of those quakes are due to [tectonic plates](#) pushing against one another. Over by the Iberian Peninsula, the opposite appears to be happening—the African and Eurasian plates are pulling apart as the former creeps east toward the Americas. Duarte noted that back in 2012, other researchers conducting seismic wave tests found what appeared to be a dense mass of unknown material beneath the epicenter of the 1969 quake. Some in the field suggested it could be the start of a subduction zone. Then, last year, another team conducted high-resolution imaging of the area and also found evidence of the mass, confirming that it truly existed. Other research has shown that the area just above the mass experiences routine tiny earthquakes.

Duarte suggests the evidence to date indicates that the bottom of the plate is peeling away. This could happen, he explained, due to serpentinization in which water percolates through [plate](#) fractures and reacts with material beneath the surface, resulting in the formation of soft green minerals. The soft mineral layer, he suggests, is peeling away. And if that is the case, then it is likely the area is in the process of creating a subduction zone. He reports that he and his [team members](#) built models of their ideas and that they confirmed what he suspected. The earthquakes were the result of the process of birthing a new subduction zone.

More information: Delamination of oceanic lithosphere in SW Iberia: a key for subduction initiation? European Geosciences Union 2019. meetingorganizer.copernicus.org/.../019/EGU2019-6001.pdf

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