



## **Rifting in central Botswana**

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Botswana forms a major gap in our knowledge of the tectonic structure of southern Africa. Using data of the NARS-Botswana network complemented with those of AfricaArray and SAFARI networks, we imaged the crustal and upper mantle velocity structure and results suggest active rifting in northern and central Botswana.

The NARS-Botswana seismic network was established in 2013 to provide broadband recordings from Botswana, one of the least studied regions in the world. The area is for a large part covered by Kalahari sands, but also encompasses the southwesternmost branch of the East African Rift under the Okavango Delta.

Our inferred crustal and upper mantle structure is based on receiver function analysis and surface wave tomography. The receiver functions reveal crustal thickness variations between 34 and 49 km that are largely related to variations between basins and cratons. The (ambient noise and earthquake) surface wave tomography results show an anomalously low crustal shear velocity anomaly in central Botswana which appears to be linked to deeper low velocity structures in the mantle. Furthermore, the area of the anomaly includes the location of the magnitude 6.5, normal faulting earthquake of April 3, 2017. Combined with a relatively thin crust, this evidence points to an extensional stress regime in central Botswana. The low velocity anomaly also appears to be linked to the Okavango rift system in northern Botswana, suggesting that central Botswana may become part of the greater East African Rift System.