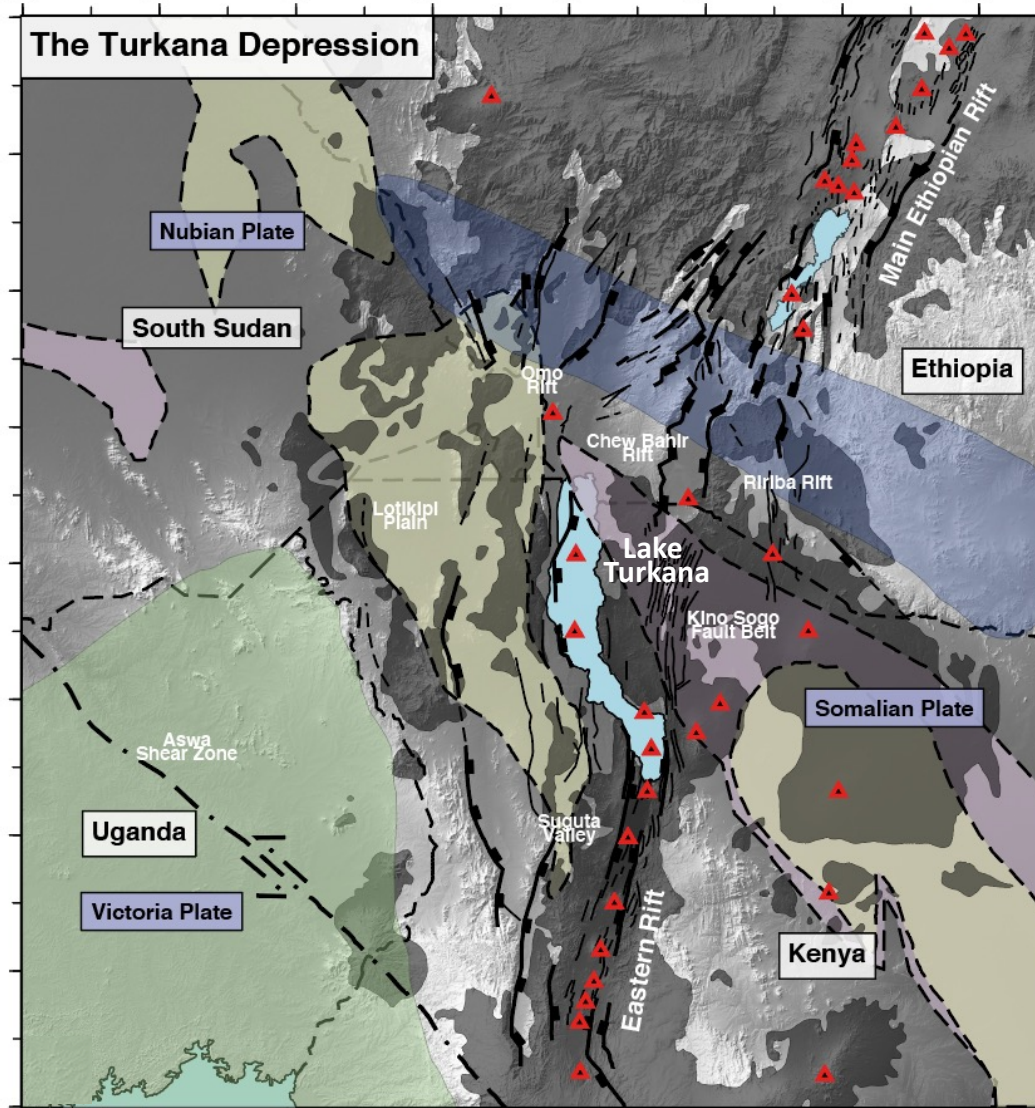
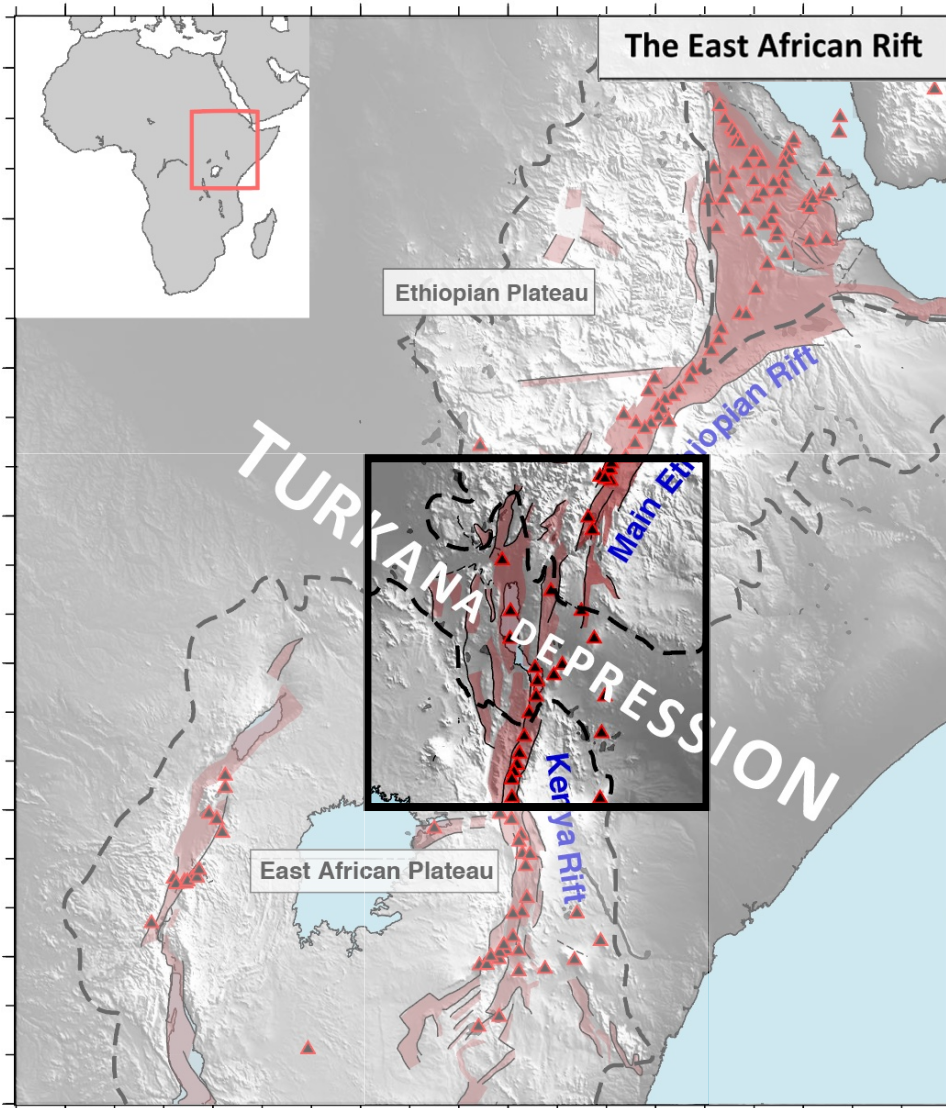
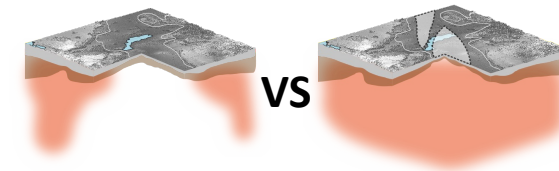


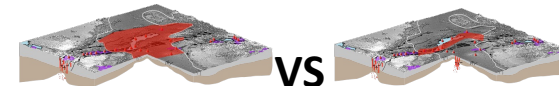
The Crust and Upper Mantle Structure of the Turkana Depression: Insights from Surface Wave Analysis



1 Why is Turkana low-lying?

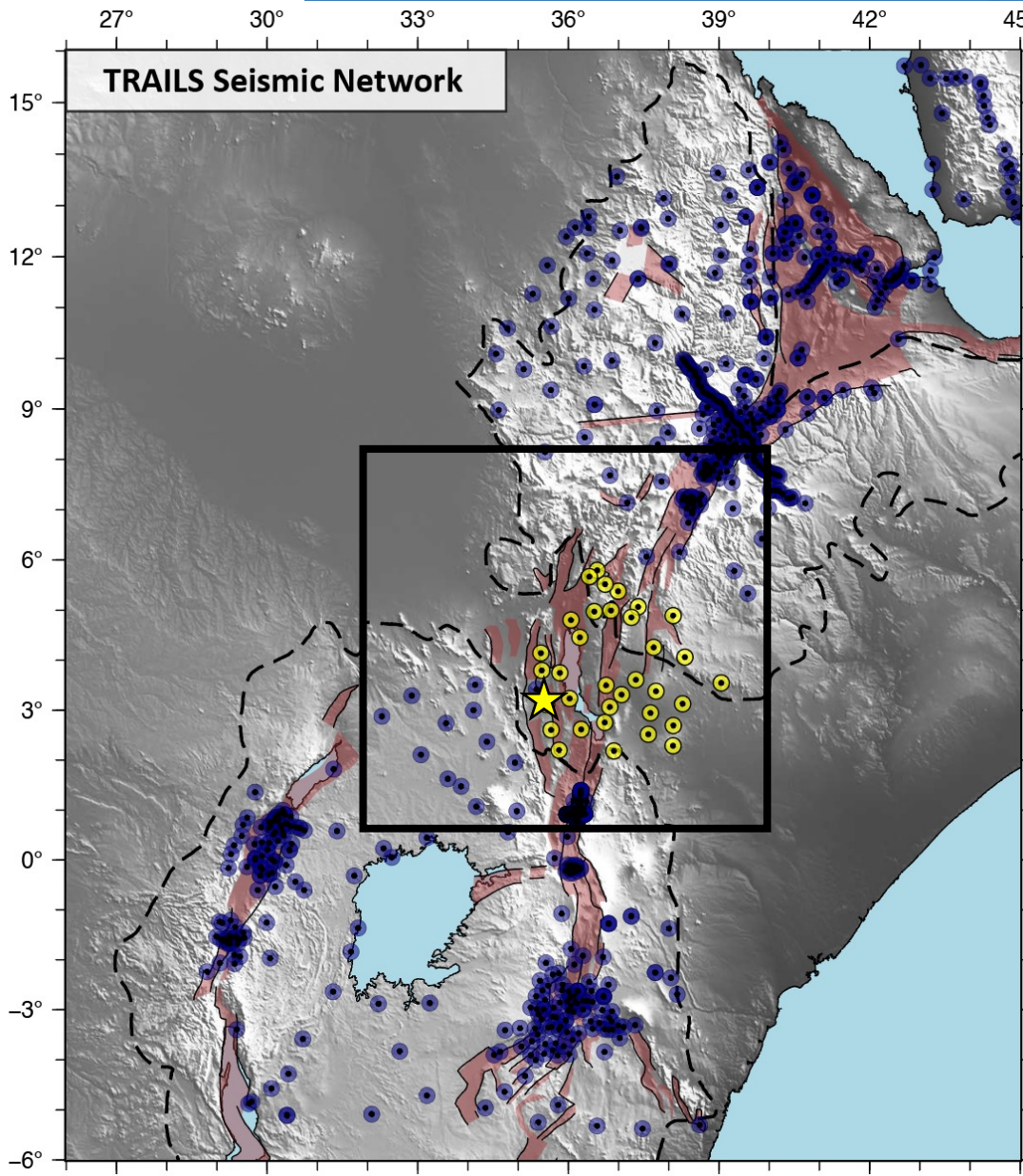


2 How has rifting developed through Turkana?



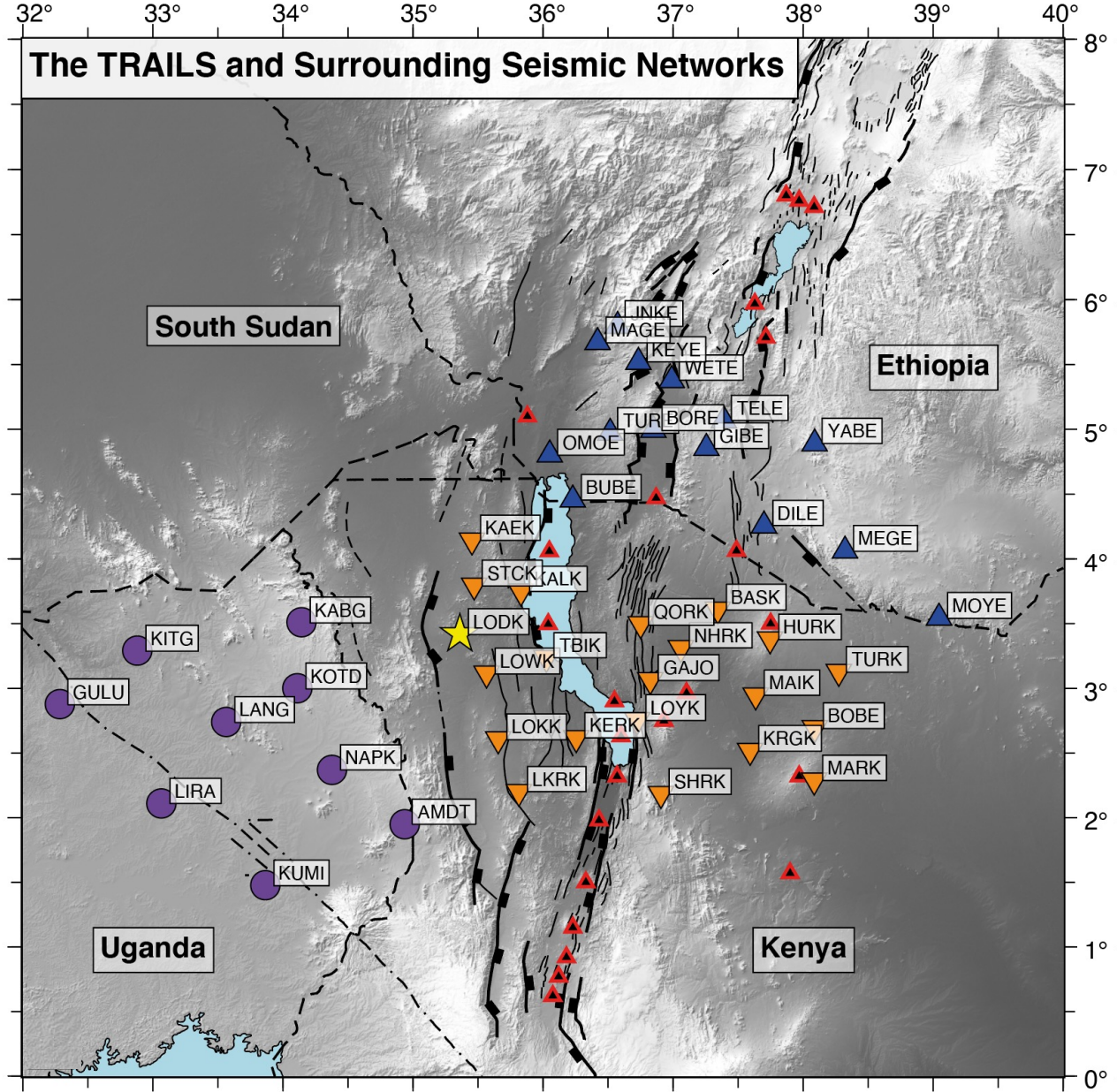
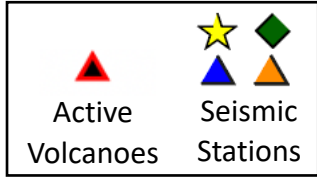
Rita Kounoudis, Ian Bastow,
Cynthia Ebinger, Fiona Darbyshire,
Freddie Ugo, Christopher Ogden,
Atalay Ayele, Rebecca Bendick,
Nicholas Mariita, Gladys Kianji,
Martin Musila, Garrett Sullivan,
Birhanu Kibret

Until now gaps in seismic coverage have hindered attempts at resolving these debates. TRAILS fills this critical gap in East Africa.

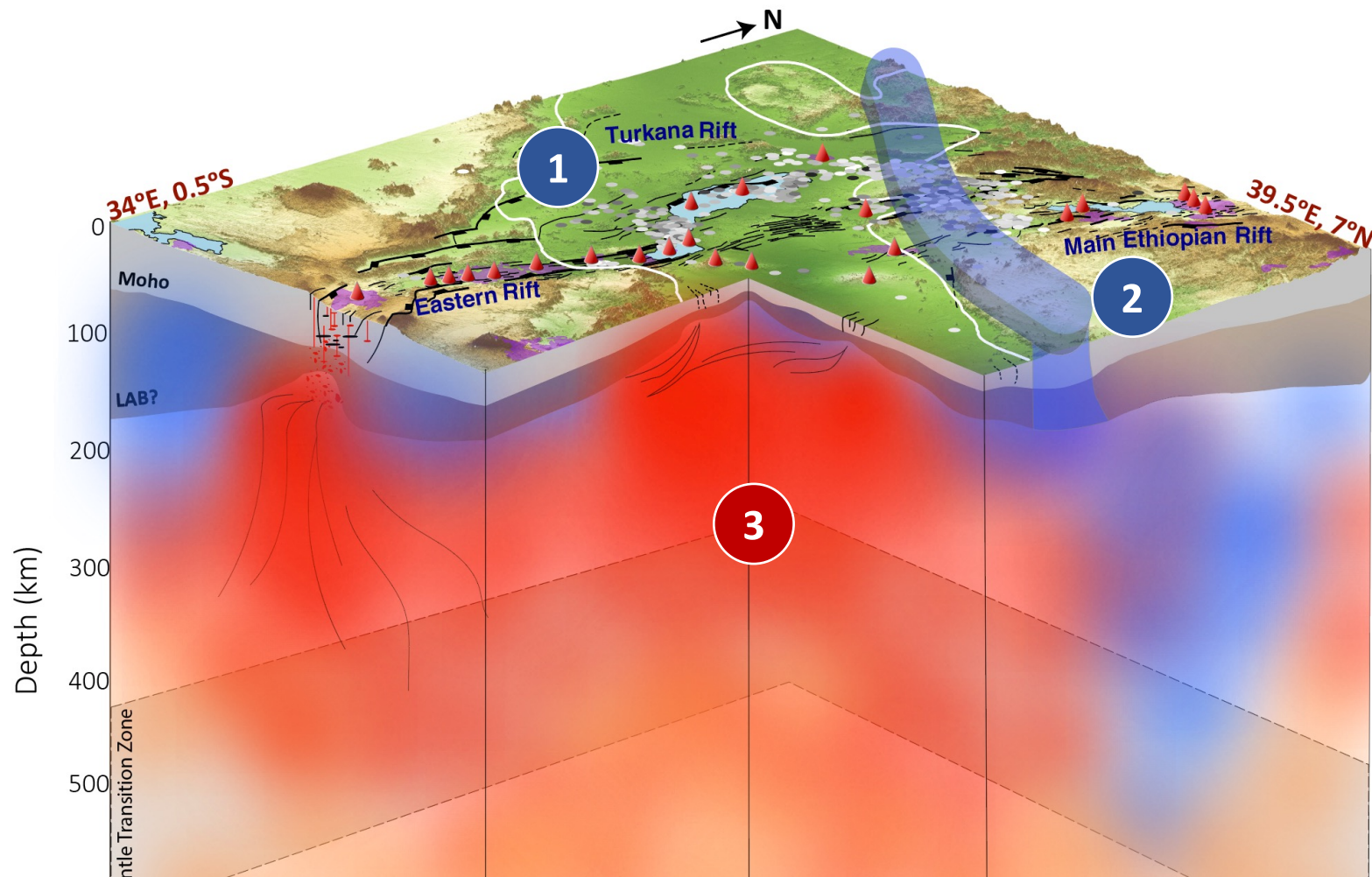


TRAILS
Network:
34 seismic
stations

Operating:
January 2019
to June 2021



So far we have produced the first images of Turkana's mantle, revealing complex lithosphere above deep mantle anomalies.



Lithospheric

1 A single focused zone of lithospheric extension is not as established below Turkana

2 Evidence for refractory Proterozoic lithosphere

Asthenospheric

3 No evidence for a lack of buoyant plume material

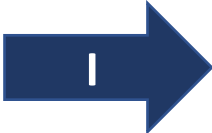
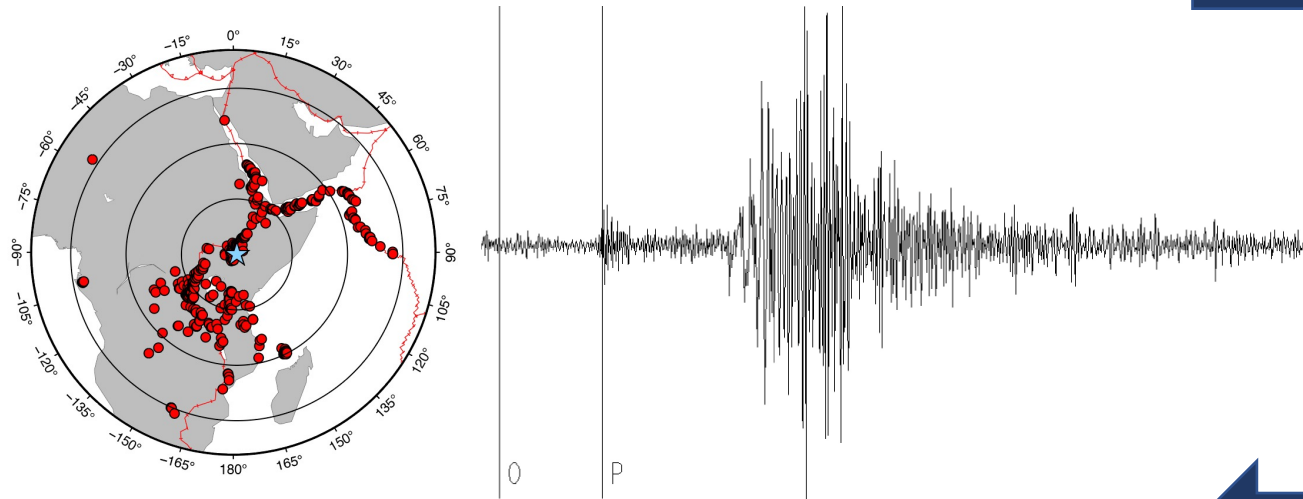
What about the crust?



Kounoudis, R. et al. (2021). Body-wave tomographic imaging of the Turkana Depression: Implications for rift development and plume-lithosphere interactions. *G3*, 22, e2021GC009782. <https://doi.org/10.1029/2021GC009782>

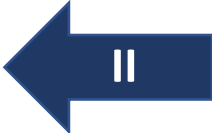
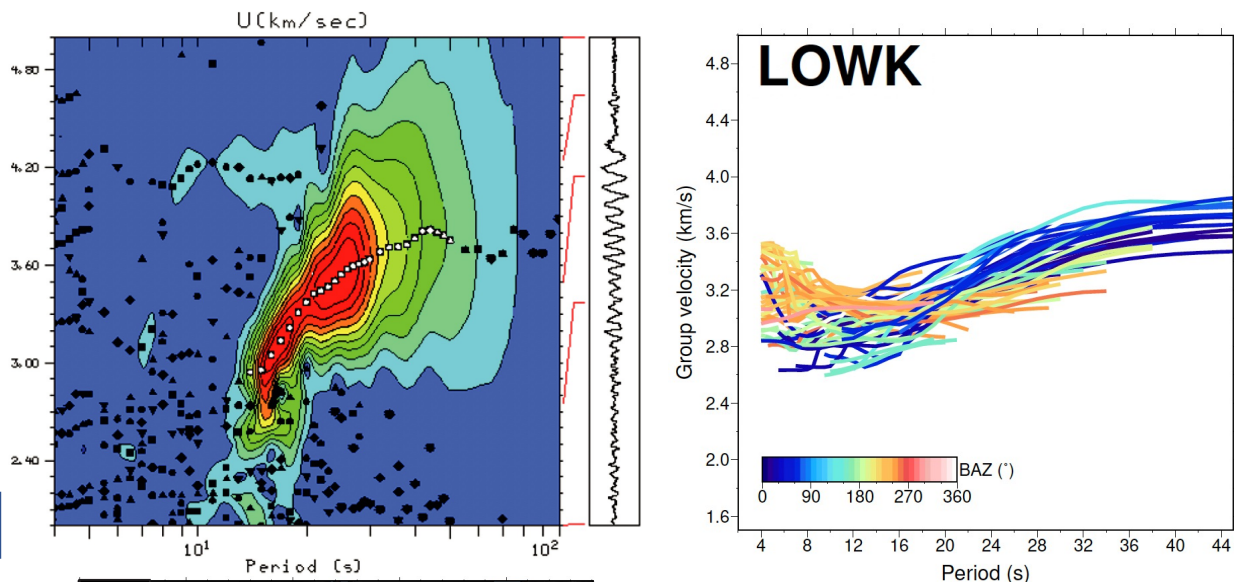
Rayleigh wave dispersion is used to determine the velocity structure along earthquake-station paths, then inverted for group velocity as a function of period.

Earthquakes and Quality Check



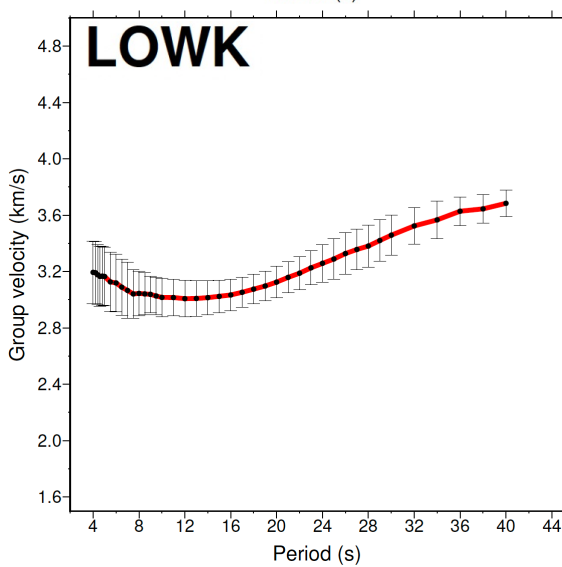
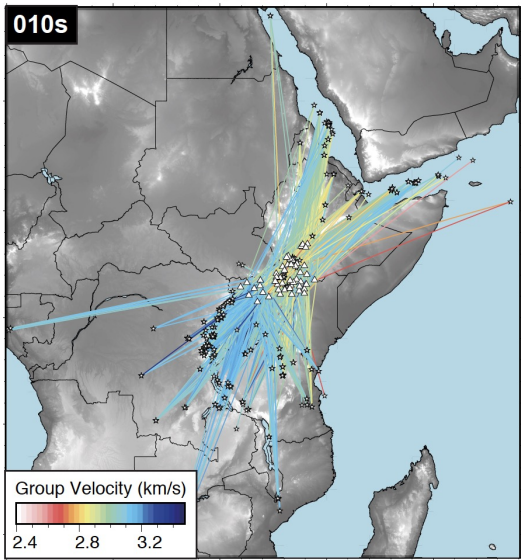
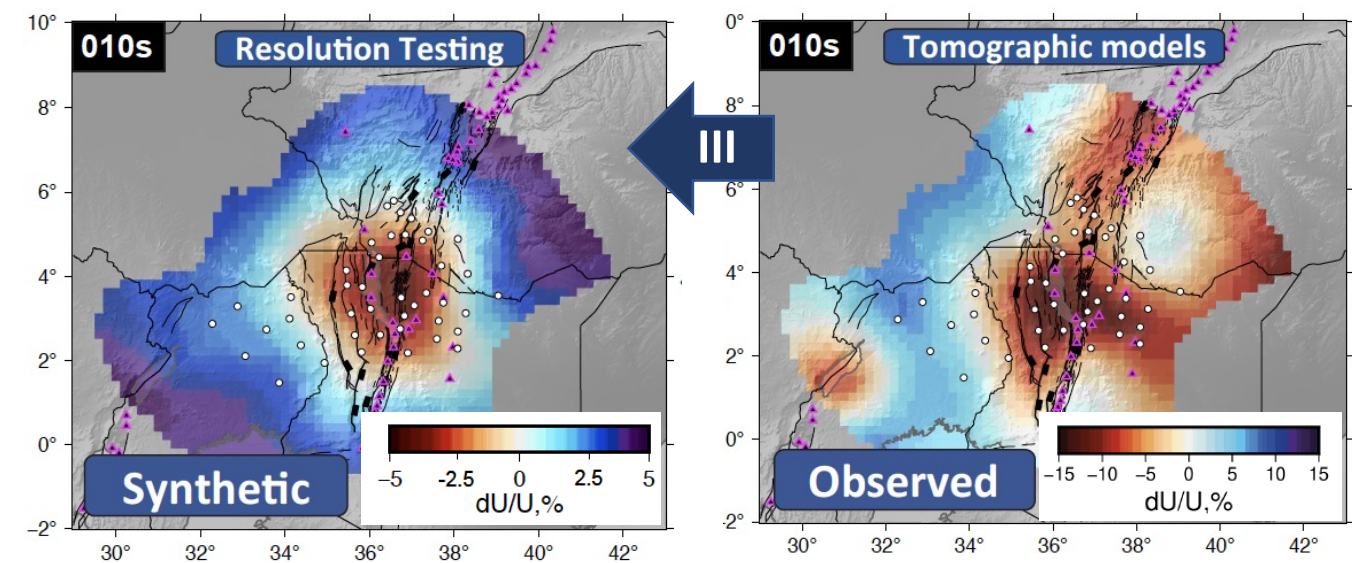
Dispersion Analysis

Herrmann (2013; SRL)



Invert for Crust and Mantle Wavespeeds

Deschamps et al. (2008; GJI)



Group velocity tomography maps at periods representing upper-crustal to uppermost mantle depths, reveal several tectonic features.

