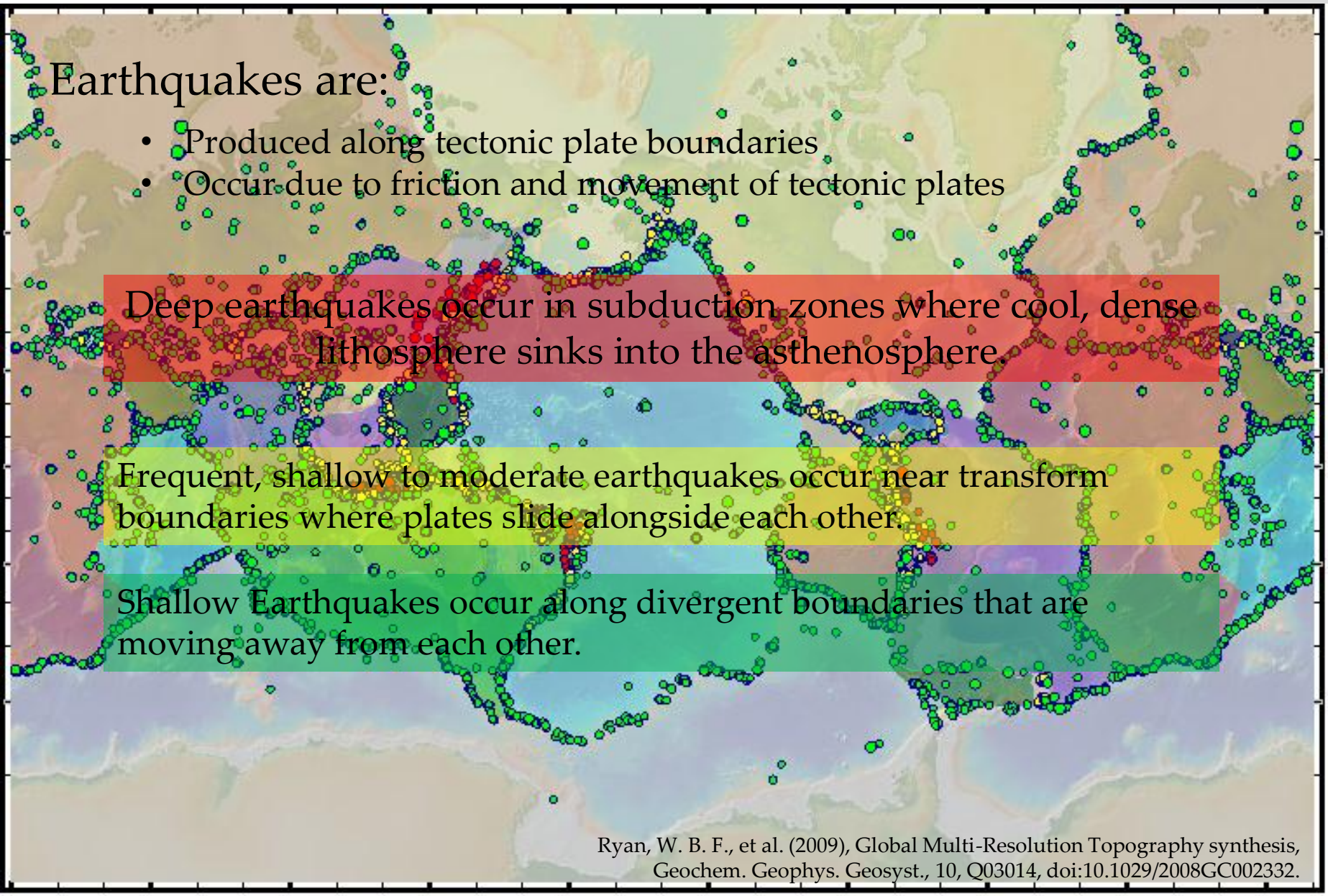
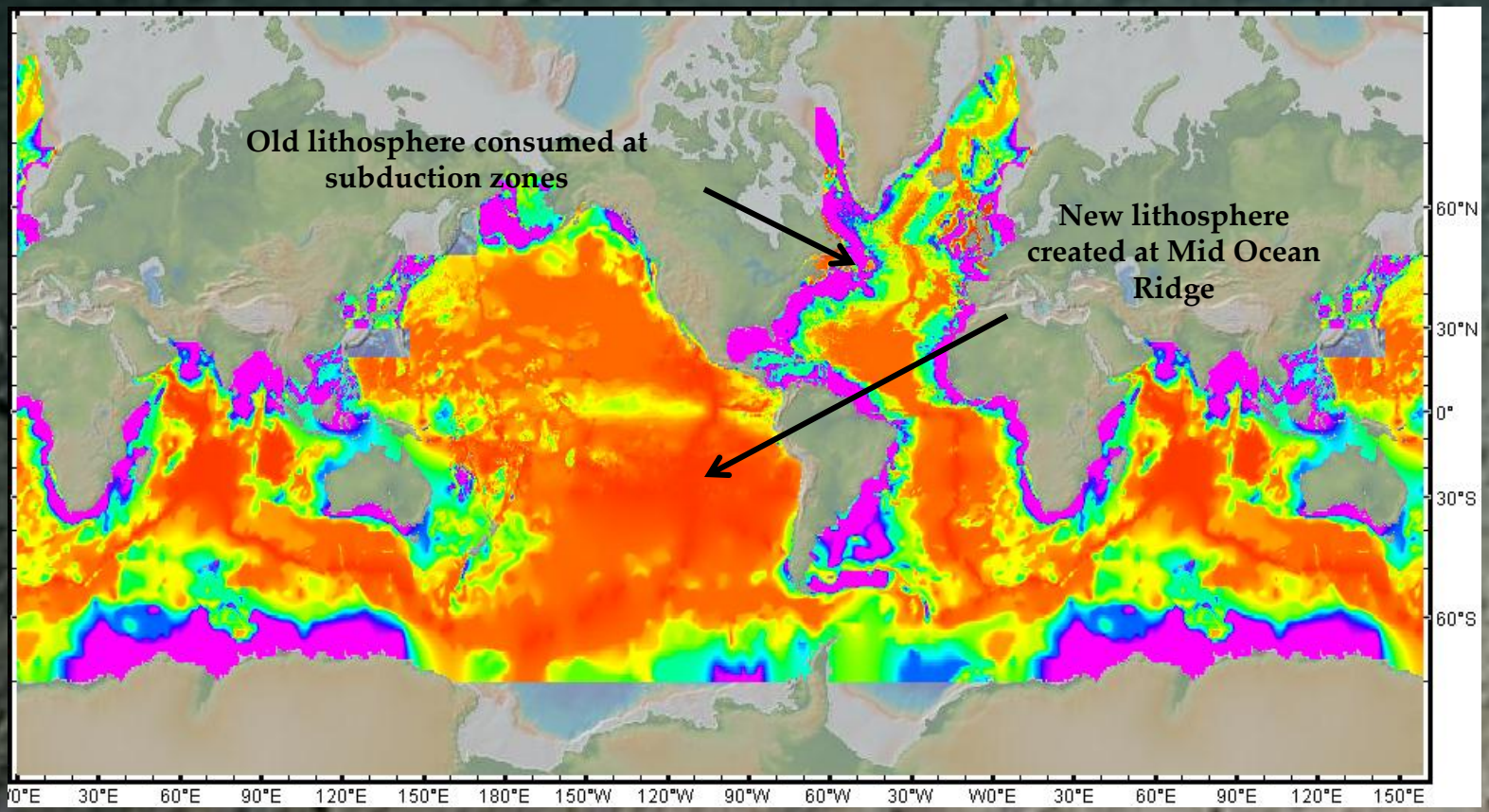
Global Earthquake Patterns



Ryan, W. B. F., et al. (2009), Global Multi-Resolution Topography synthesis, Geochem. Geophys. Geosyst., 10, Q03014, doi:10.1029/2008GC002332.

Seafloor Sediment Thickness

- Sediment is shallowest along the mid ocean ridge where it is initially formed
- Over time, sediment accumulates, thickening until it reaches a convergent boundary and is subducted.

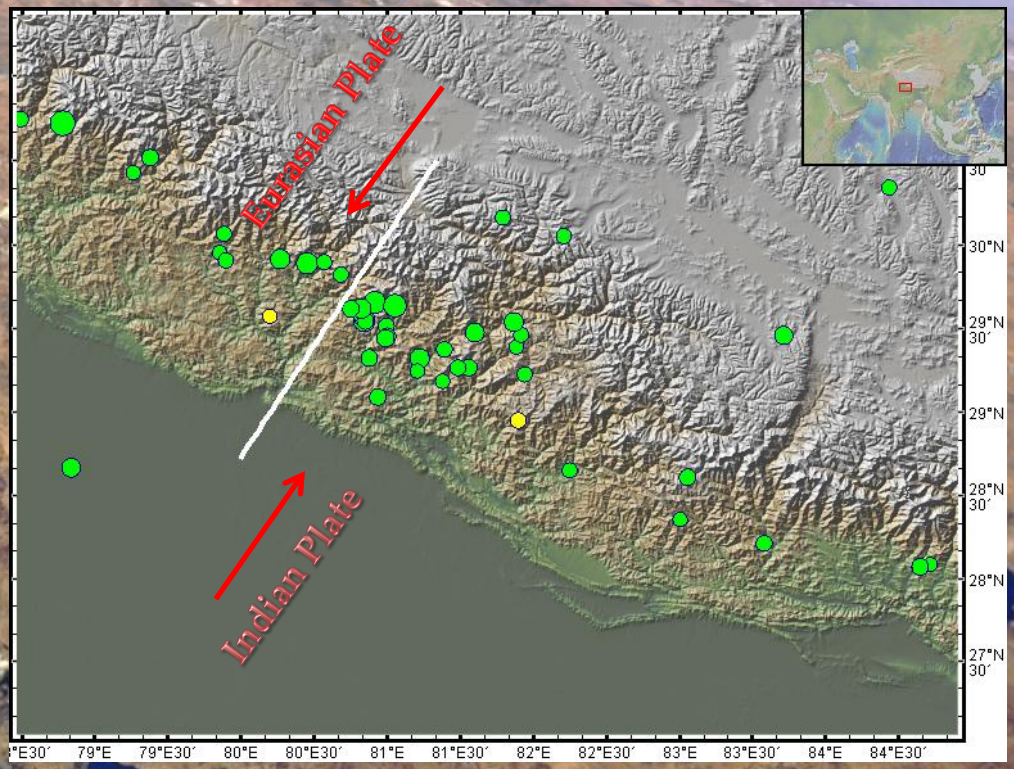


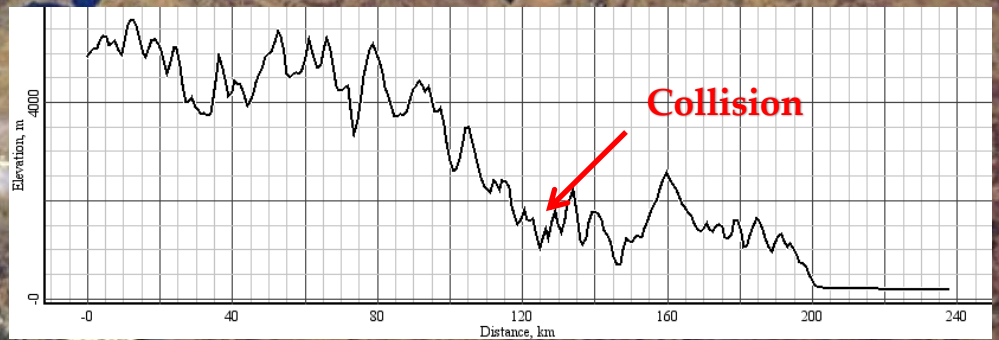
Convergent Continental Boundary

Himalayan Mountains

When 2 continental plates meet, it is known as collision.

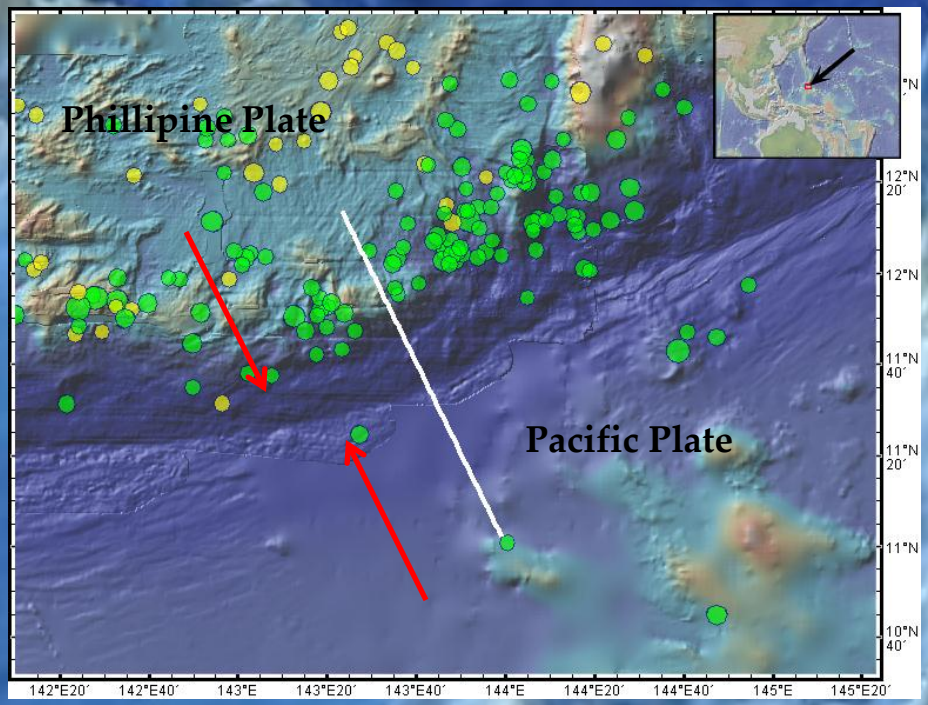
- **The thick continental crust will not sink,**
- **Instead, they slide underneath each other creating higher elevations,**
- **This is demonstrated by the Indian plate sliding underneath the Eurasian Plate.**

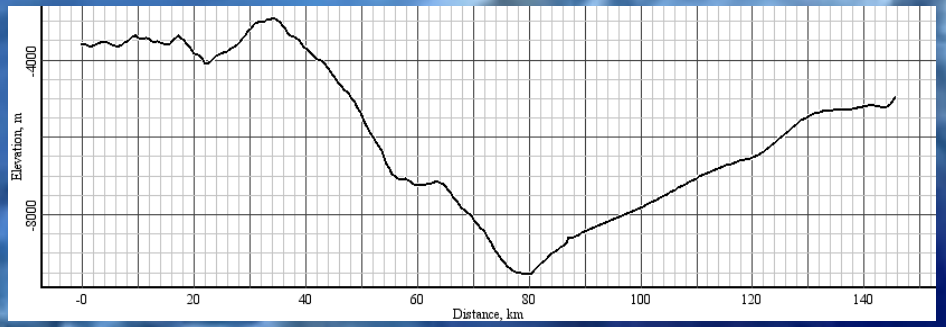




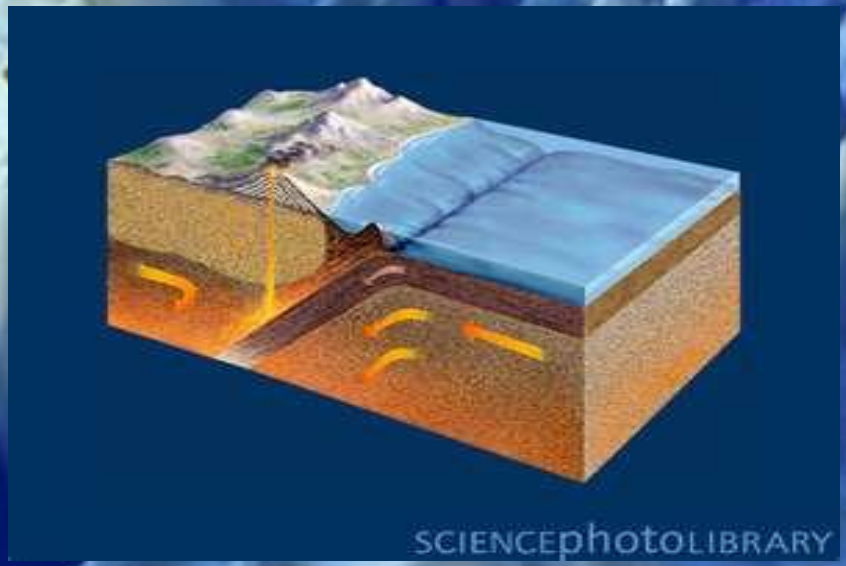
Convergent Oceanic Boundary

Mariana Trench



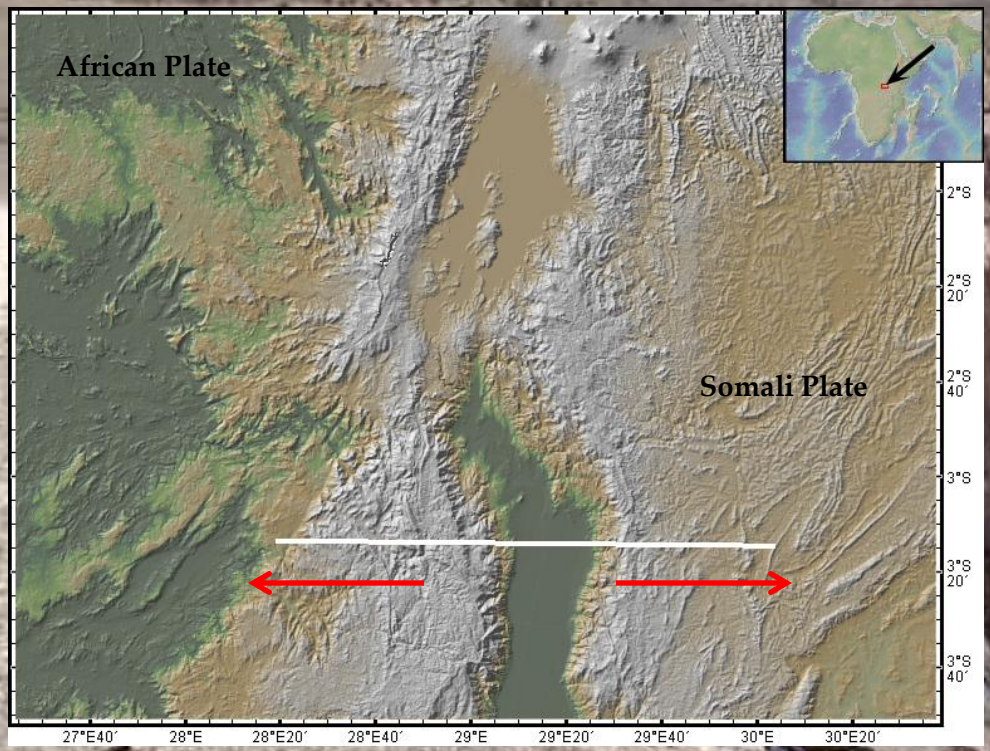


- **Subduction occurs where old oceanic lithosphere is consumed beneath a converging plate.**
- **This creates deep ocean trenches that follow the plate boundary.**
- **This can be observed by the locations of earthquakes in the area.**



Divergent Continental Boundary

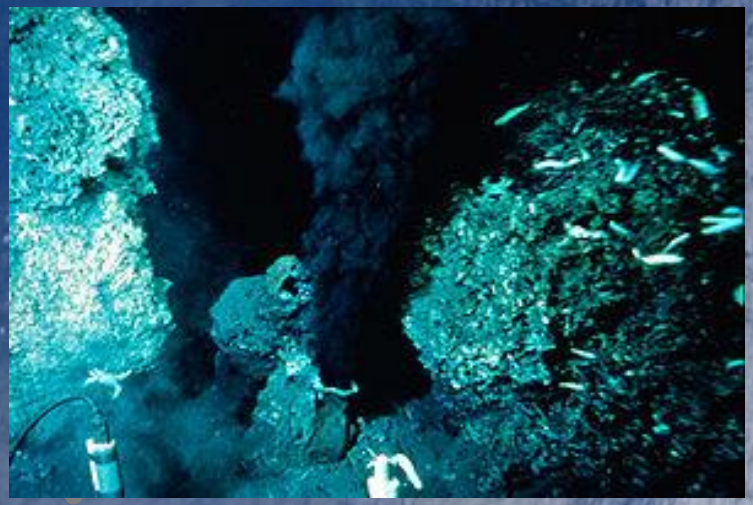
East African Rift



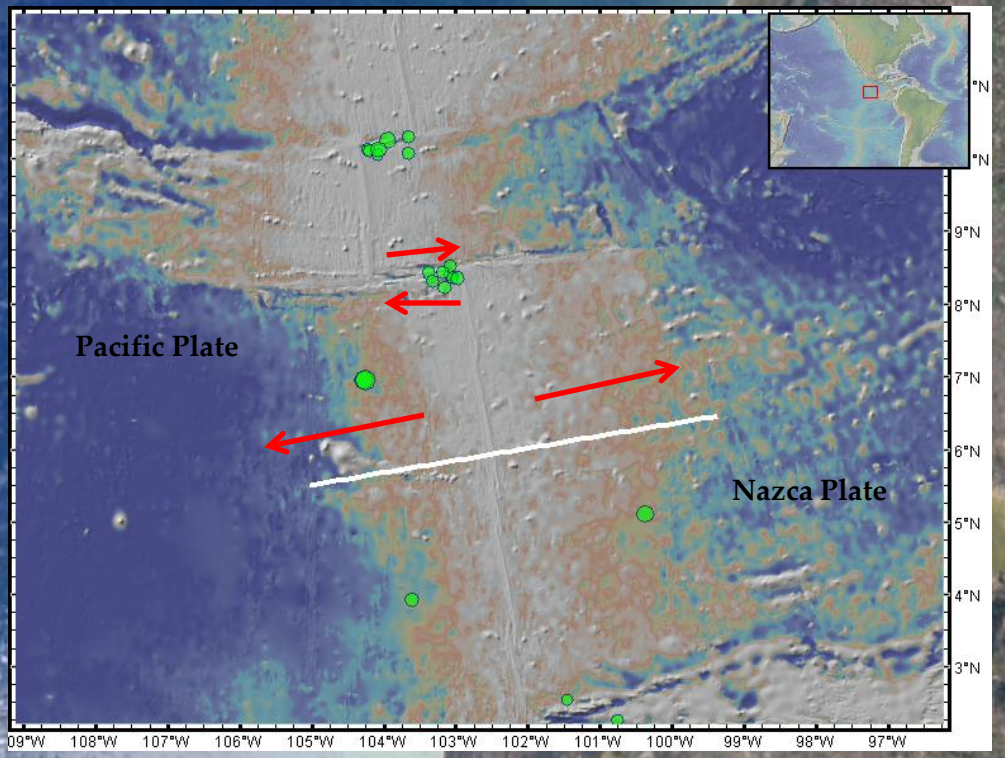
- When 2 continental plates begin to separate, it forms a rift.
- These rifts fill with broken rock and sediment, eventually becoming ‘rift basins’.
- Unique location for geologists to study a rift as it is forming.
- Over time, these basins will sink below sea level, and eventually flood.

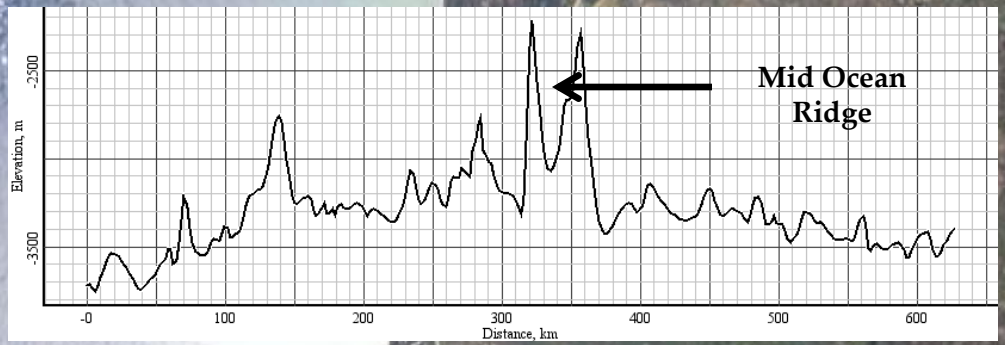
Divergent Oceanic Boundary

- As plates separate, hot magma flows to the surface, cbuilding up to create mid ocean ridges.
- This causes the sea floor to spread at a rate equal to plate subduction.
- Superheated water is vented and contacts colder sea water, creating 'black smokers'.



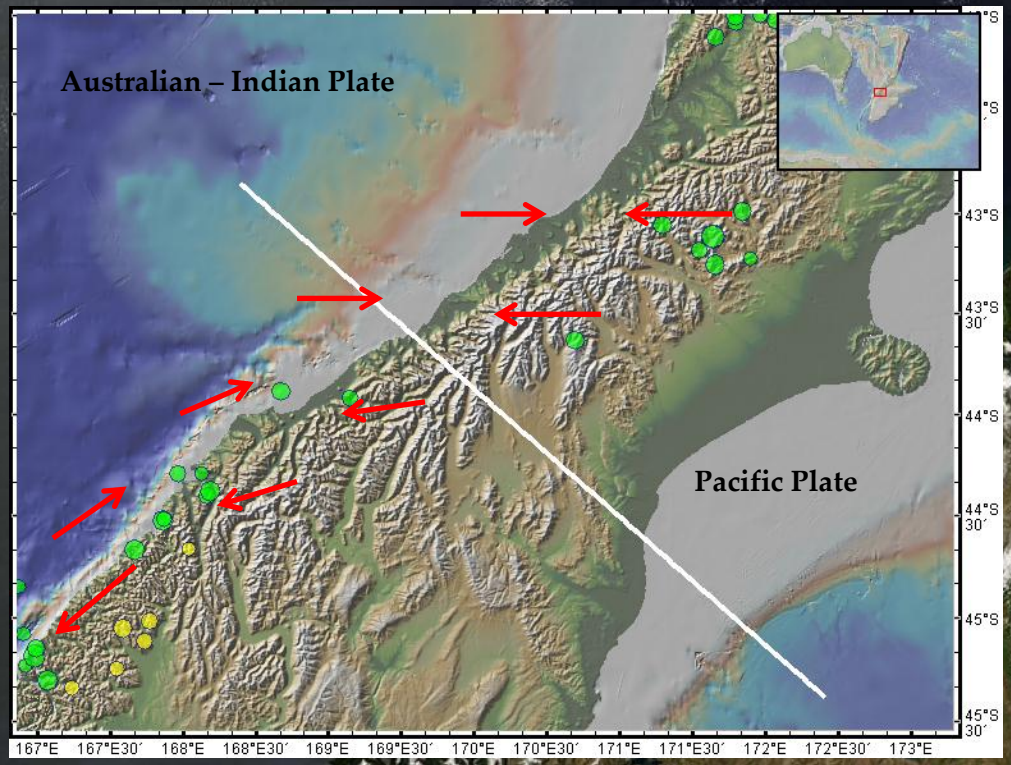
East Pacific Rise

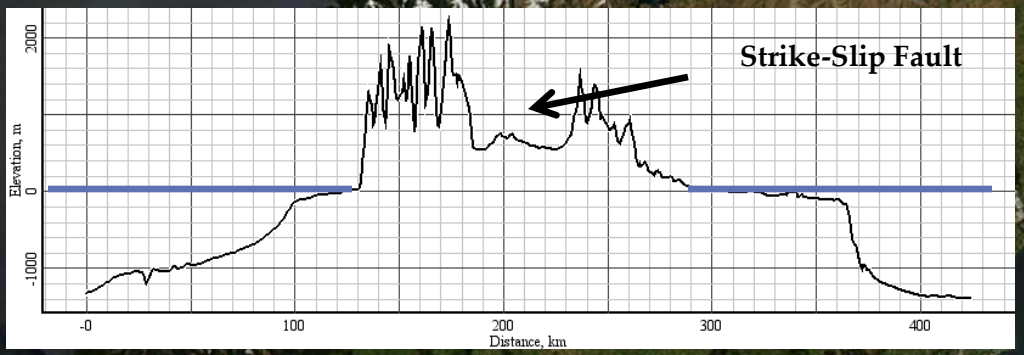




Transform Continental Boundary

New Zealand, South Island



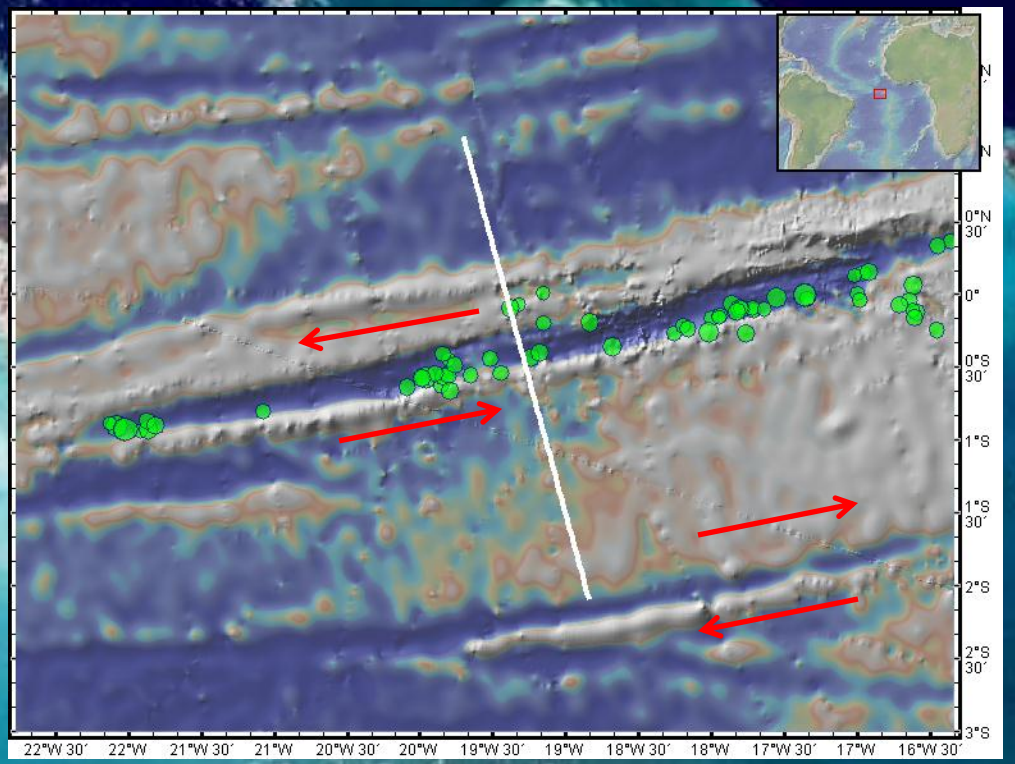


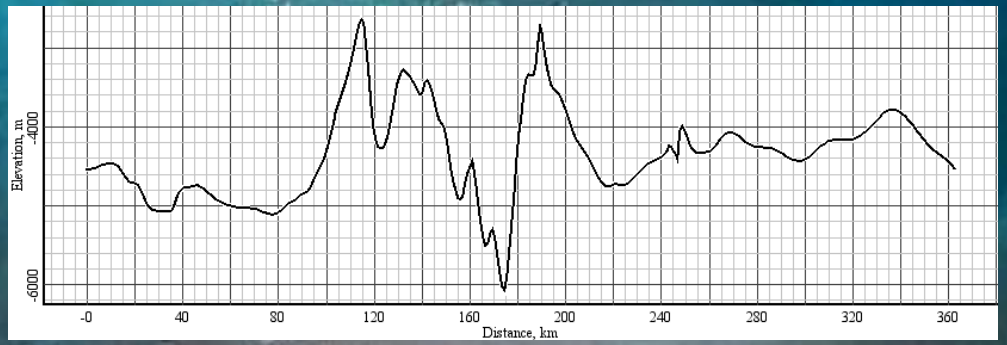
- This Alpine Fault, in New Zealand is a ridge system linking a mid-ocean trench with a fault zone.
- These plates slide horizontal to each other, neither creating nor consuming lithosphere.

Transform Oceanic Boundary

- Earthquakes along the Mid Atlantic Ridge show transform boundaries.
- These boundaries, such as the Romanche Trench, occur to accommodate sea floor spreading.
- As new sea floor is created, these faults are created tens of kilometers apart, allowing plates to slide past each other and expand.

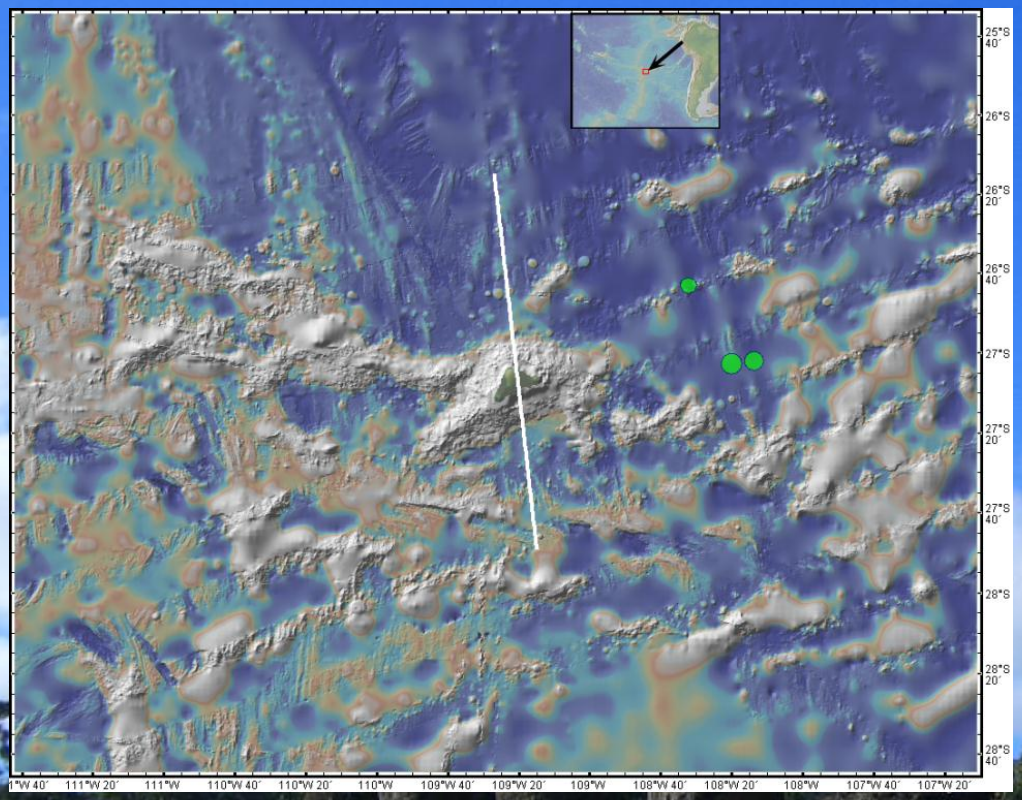
Romanche Trench

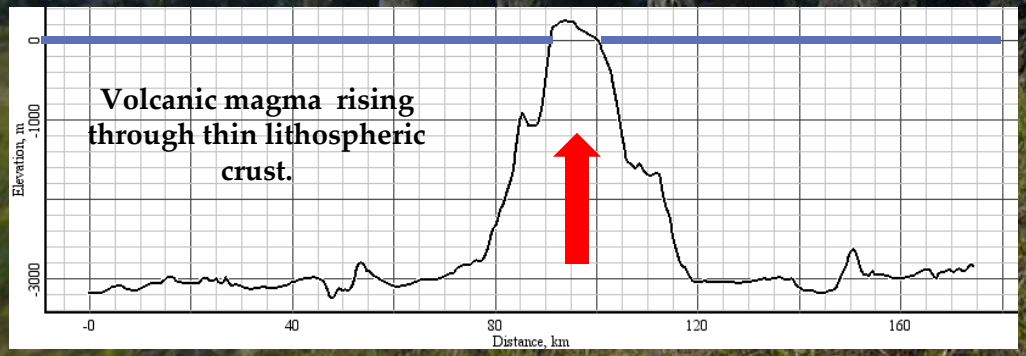




Intra-plate Tectonics – Volcanic Islands

Easter Island



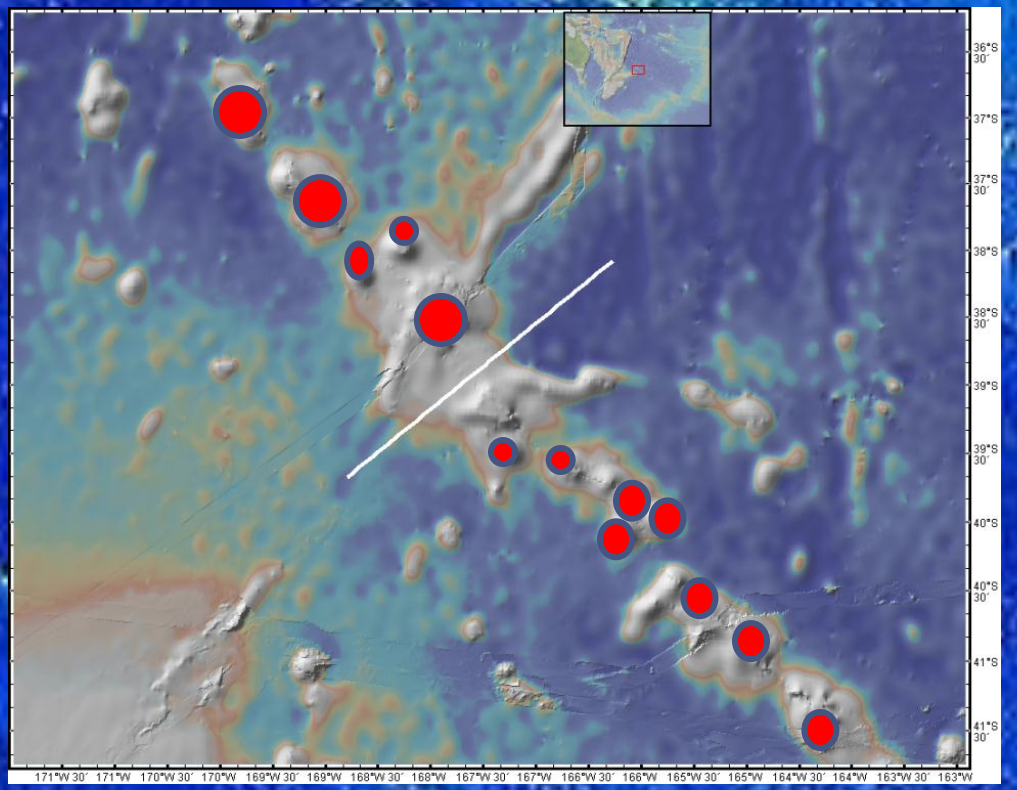


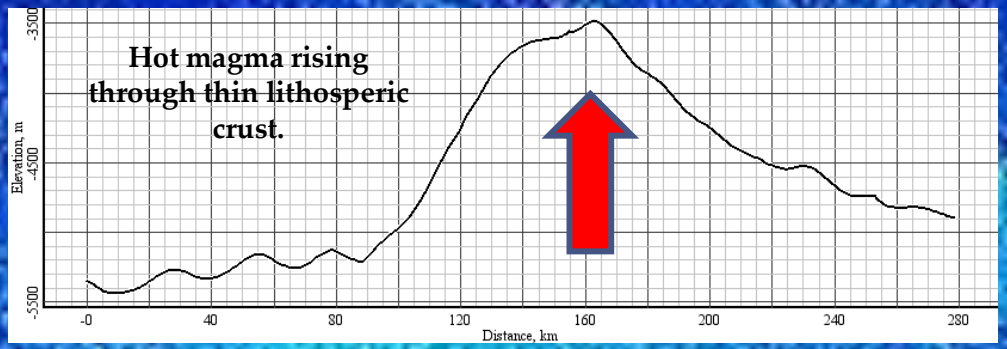
- Volcanic Islands are created as continents slide over mantle plumes.
- These 'hot spots' allow rising heated rock to partially melt and produce magma.
- This magma seeps through the lithosphere to create volcanoes.
- Volcanic island chains help you observe the direction of travel of the plate.

Intra-plate Tectonics – Seamount Chains

- Large volcanic mountains that do not break the ocean's surface are known as Seamount Chains.
- These chains are fairly common, and usually occur near spreading mid ocean ridges.
- Volcanic activity declines as the plate moves along the hotspot, until a new volcanic mountain begins.

Louisville Seamount Chain





What have I learned

- The global pattern of earthquakes is not random, but a map to tell us the behavior of plate tectonics.
- The Earth is continuously recycling itself.
- I found a much better grasp of technology like GeoMapApp and Microsoft Power Point, and was able to bring my information together easier and faster.
- I would like to learn more about Isostatic Rebound and how it affects geology away from active plate boundaries.