

Crustal Boundaries

How do plates interact at their boundaries?

Crustal Boundaries

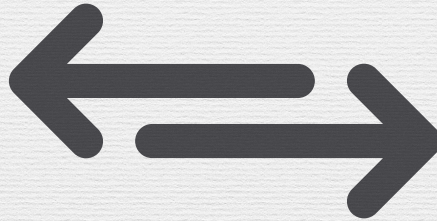
- Tectonic plates are constantly moving and interacting
- As they move across the asthenosphere and form plate boundaries they interact in various ways

Crustal Boundaries

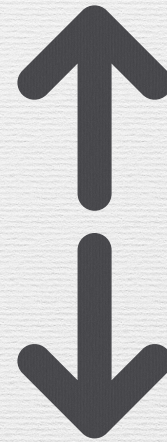
- The types of plate boundaries are:



Convergent



Transform



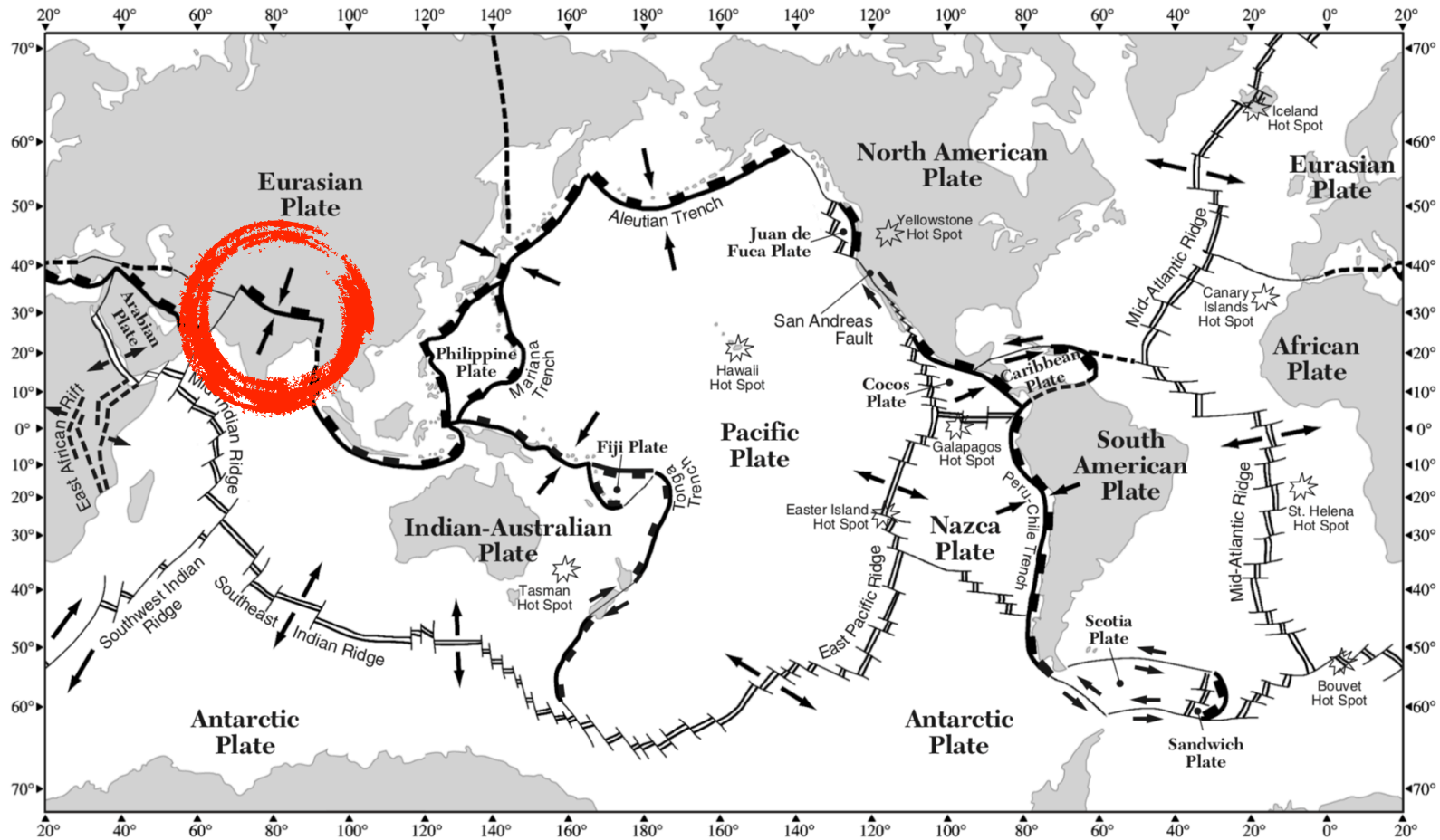
Divergent

Crustal Boundaries

- Convergent Boundary - boundary where two lithospheric plates are coming together
 - Example: the Indian-Australian Plate is pushing upward into Eurasian Plate



Tectonic Plates



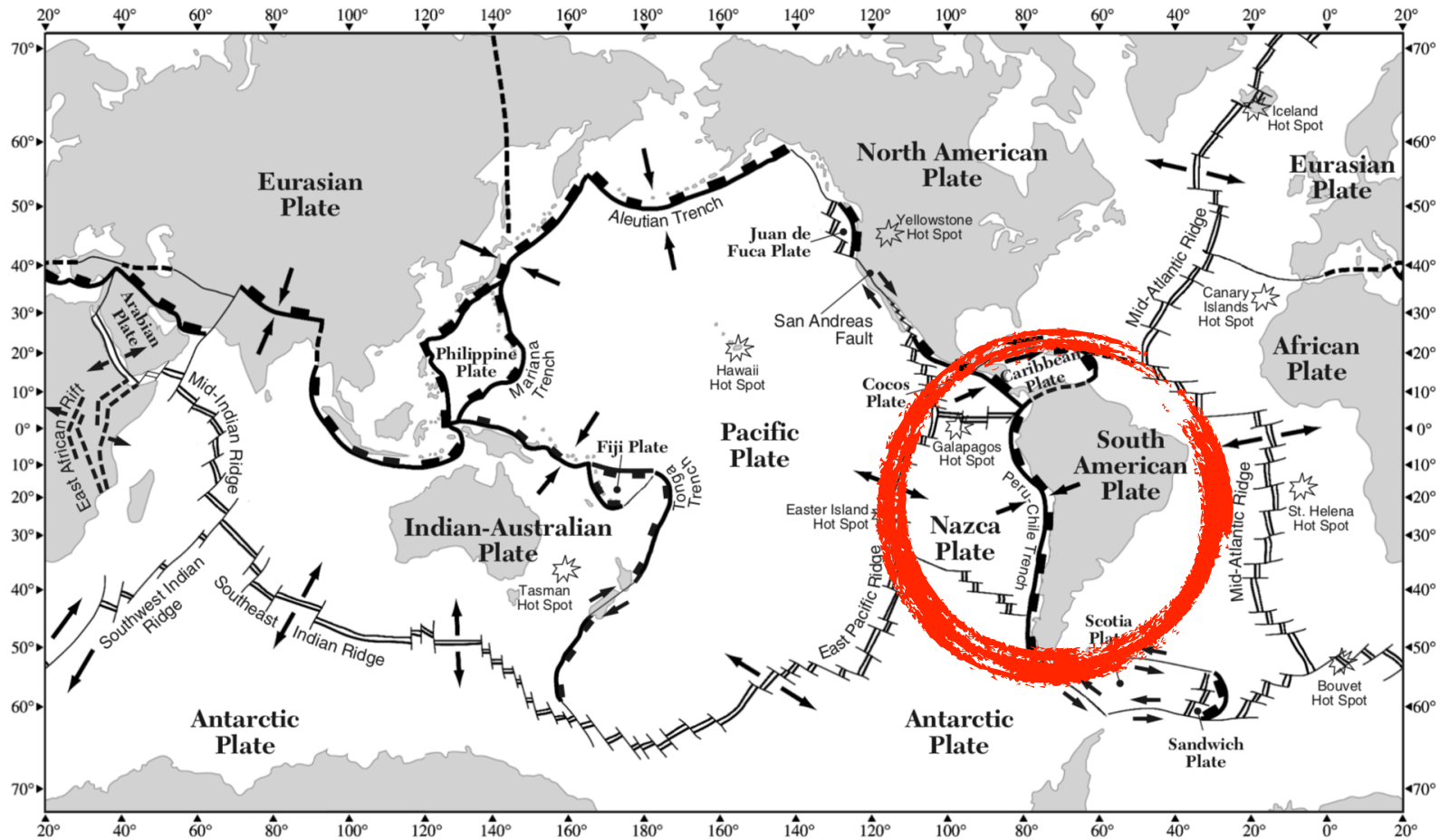


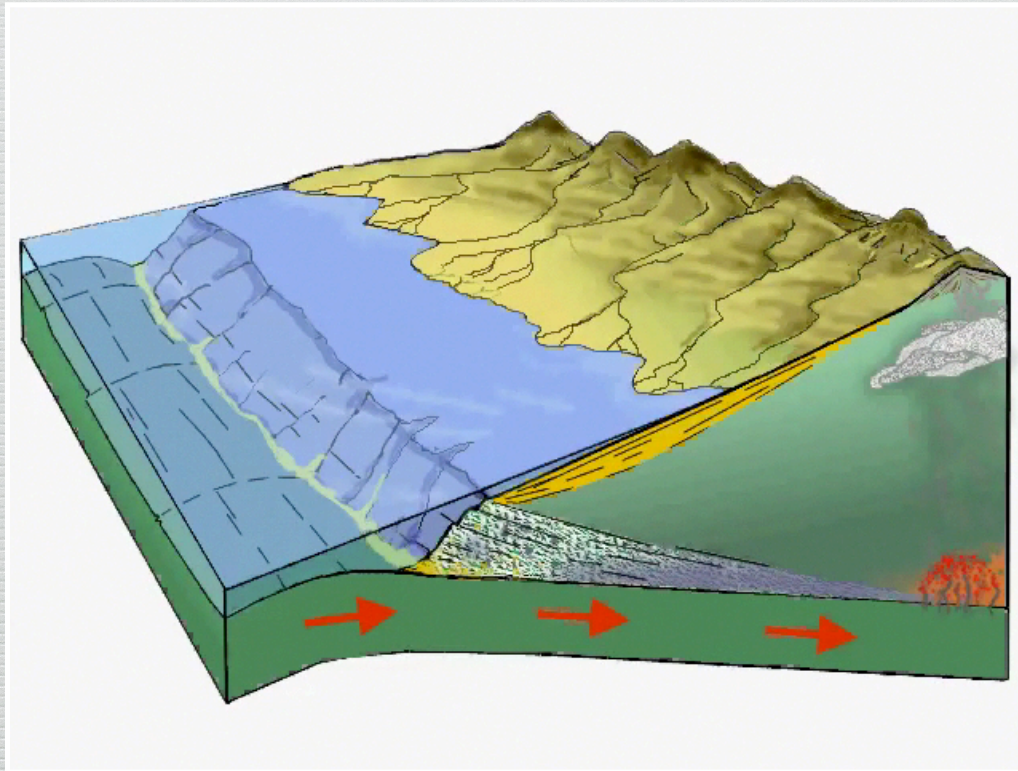
Convergent Plate Boundary - Himalayan Mountains

Crustal Boundaries

- Subduction - the process where one plate is pushed below another and consumed in the mantle
- Trench - long narrow depression of the sea floor that parallels a subduction zone
- Example: the Nazca Plate being consumed under the South American Plate

Tectonic Plates

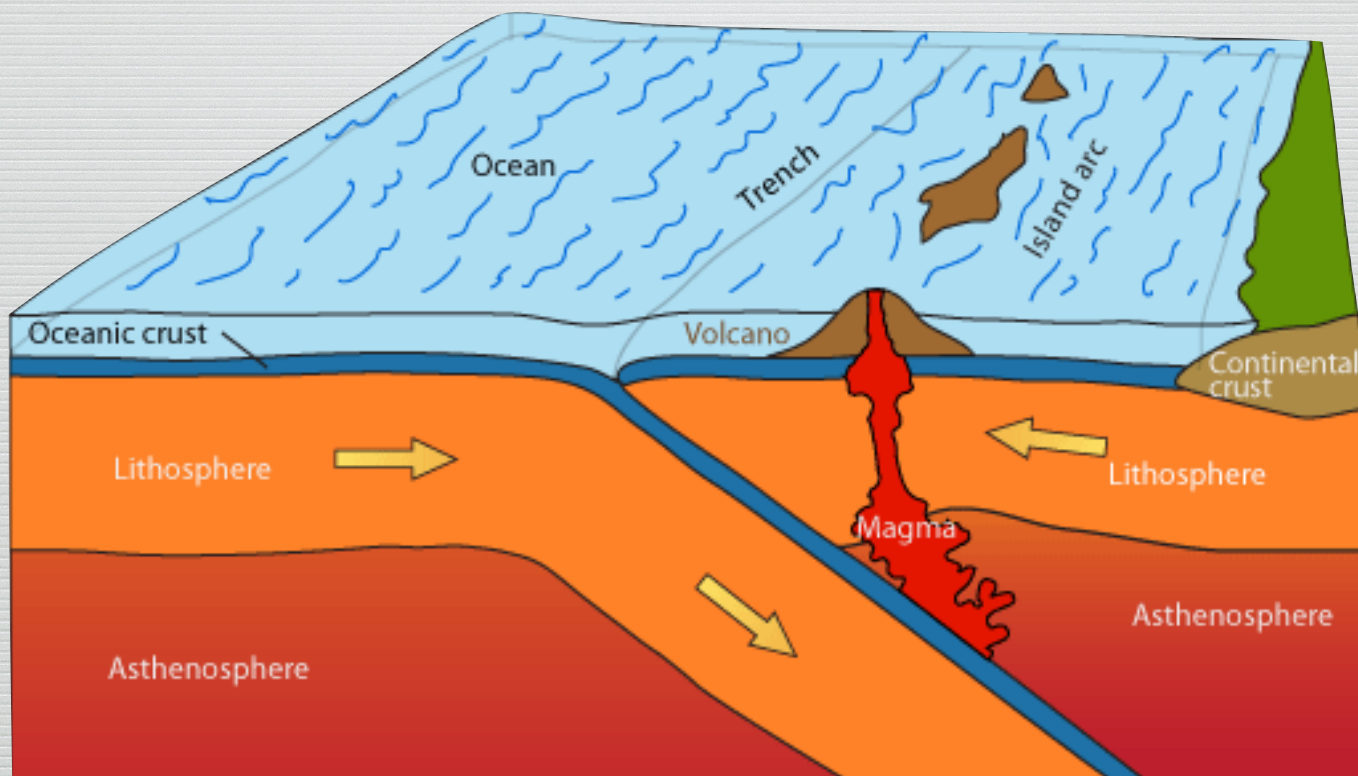




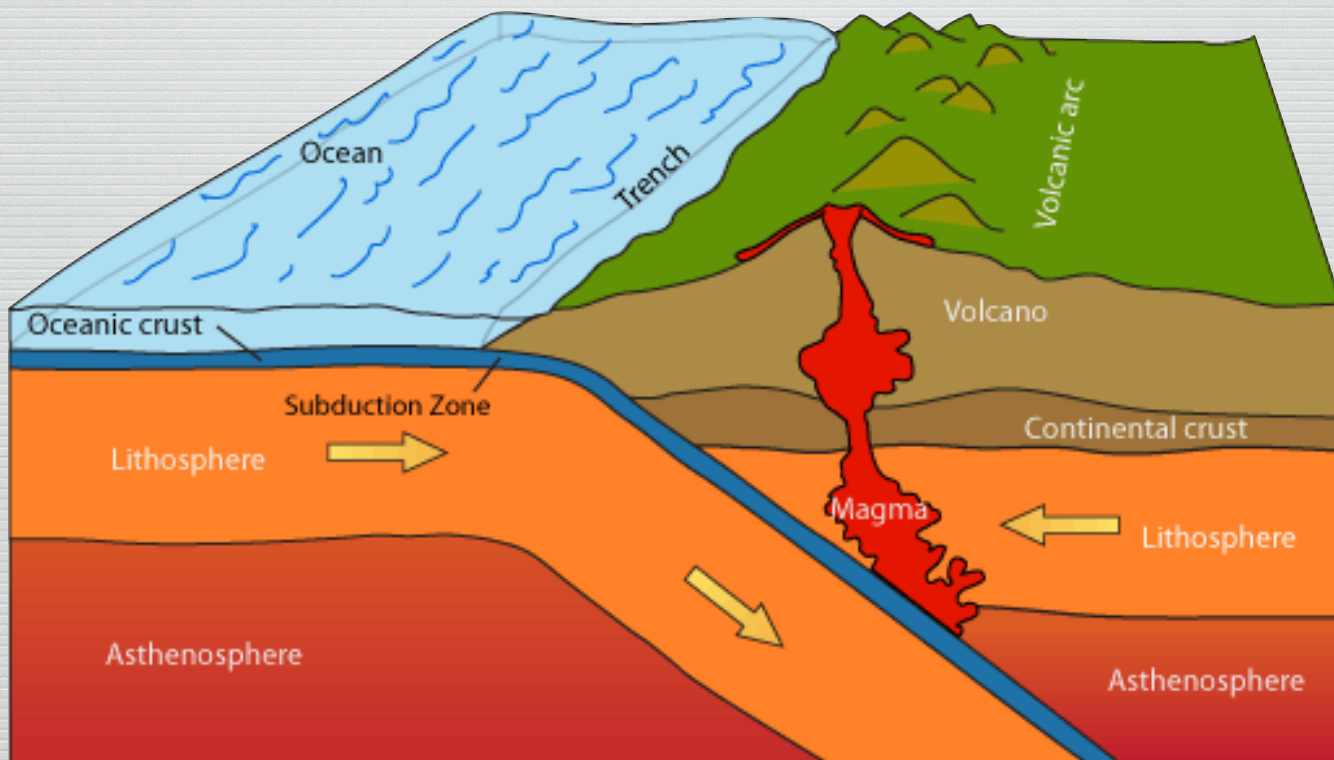
Subduction

Crustal Boundaries

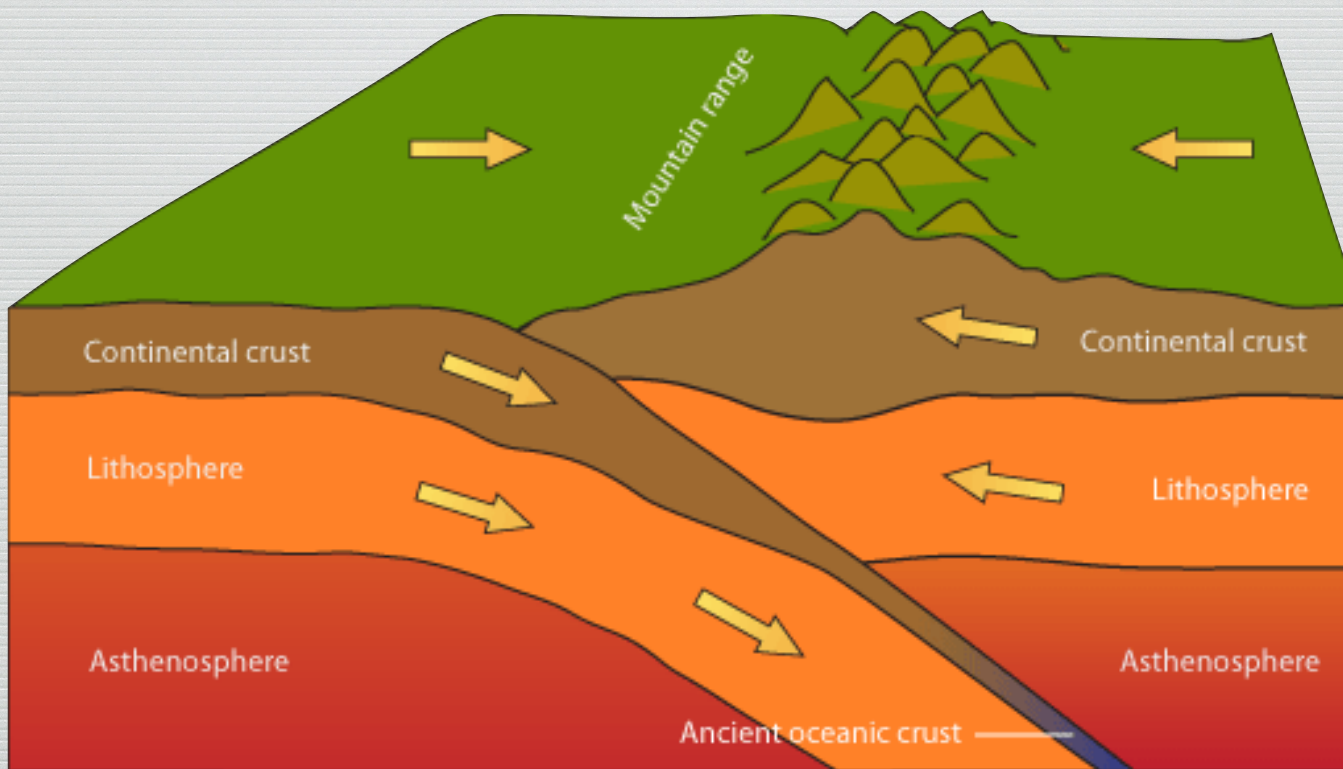
- Three Types of Convergent Boundaries:
 - Ocean - Ocean Boundary
 - Ocean - Continental Boundary
 - Continental - Continental Boundary



Ocean - Ocean Boundary



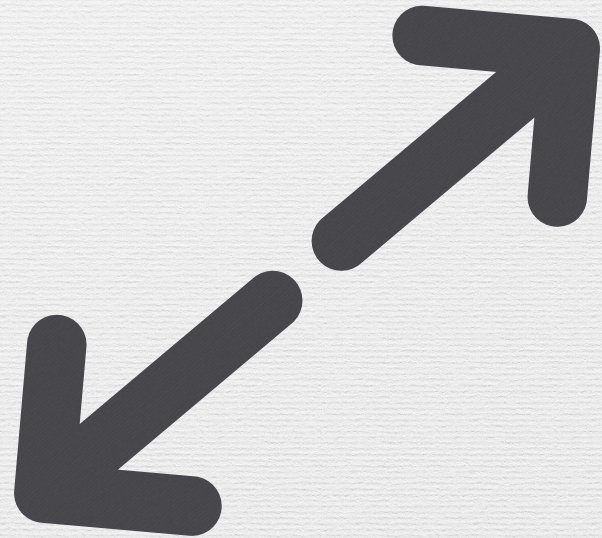
Ocean - Continent Boundary



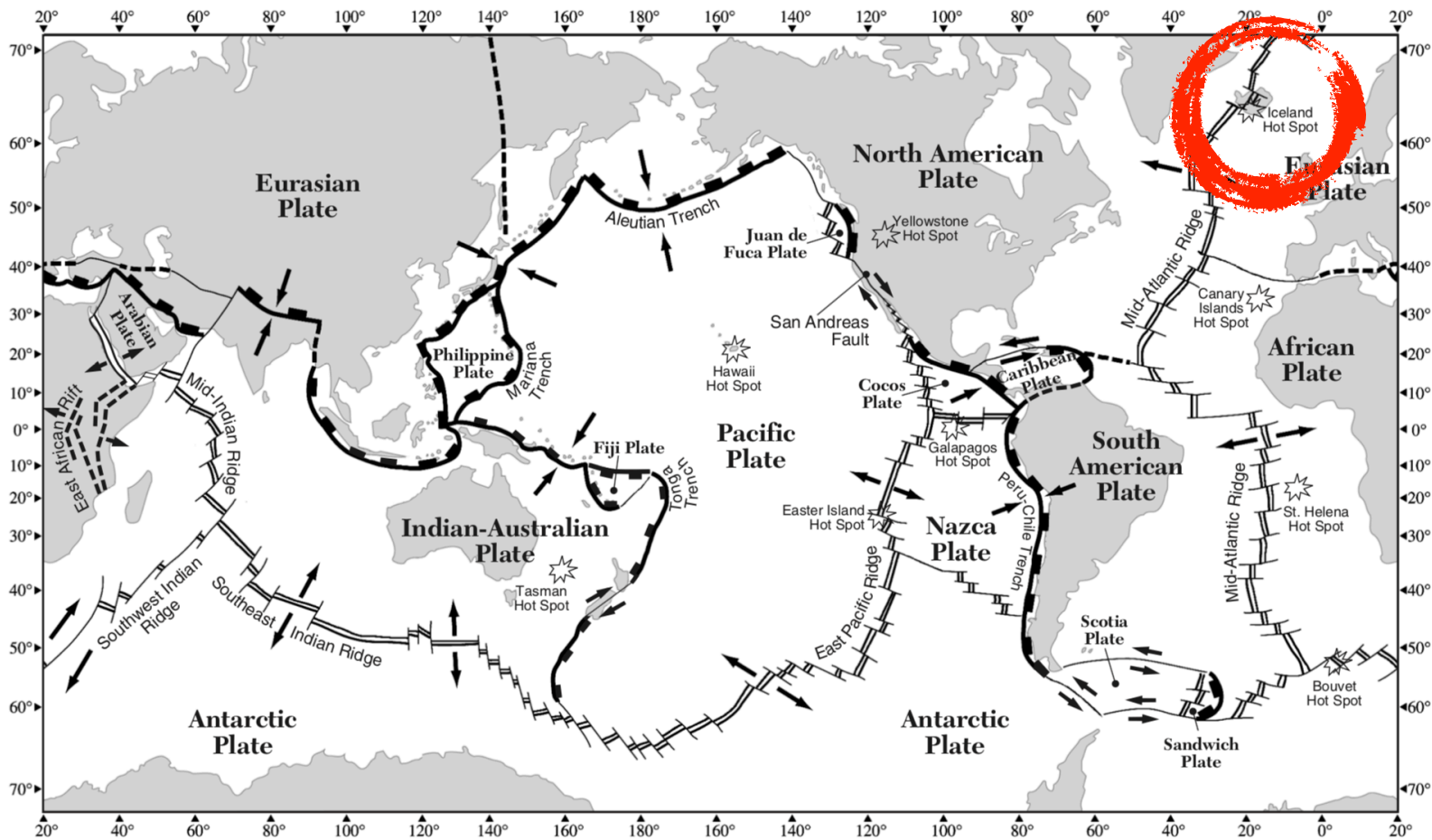
Continent - Continent Boundary

Crustal Boundaries

- Divergent Boundary - boundary where two lithospheric plates are moving apart
 - Example: part of the Mid-Atlantic Ridge emerges from the ocean and splits Iceland in half



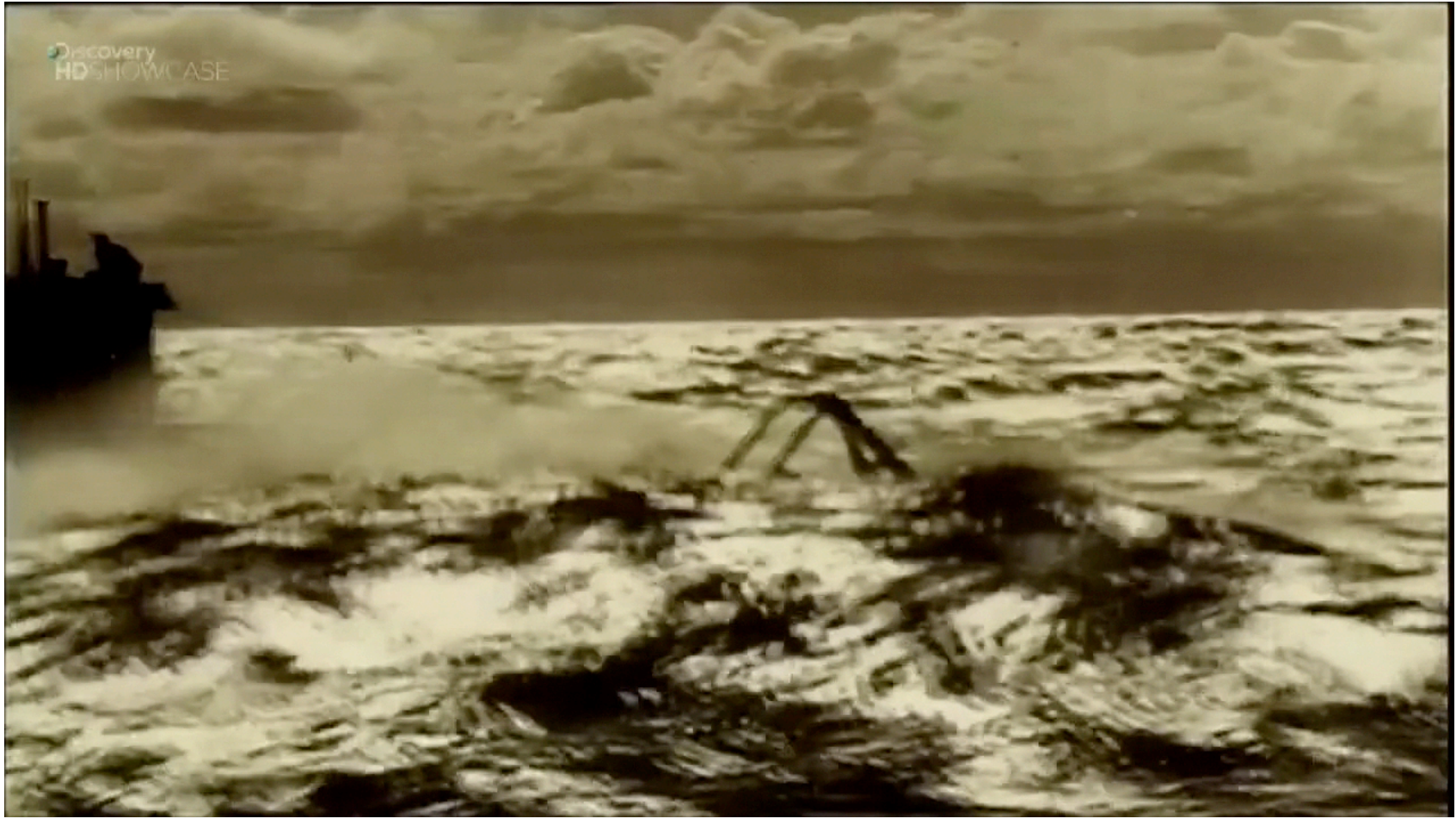
Tectonic Plates

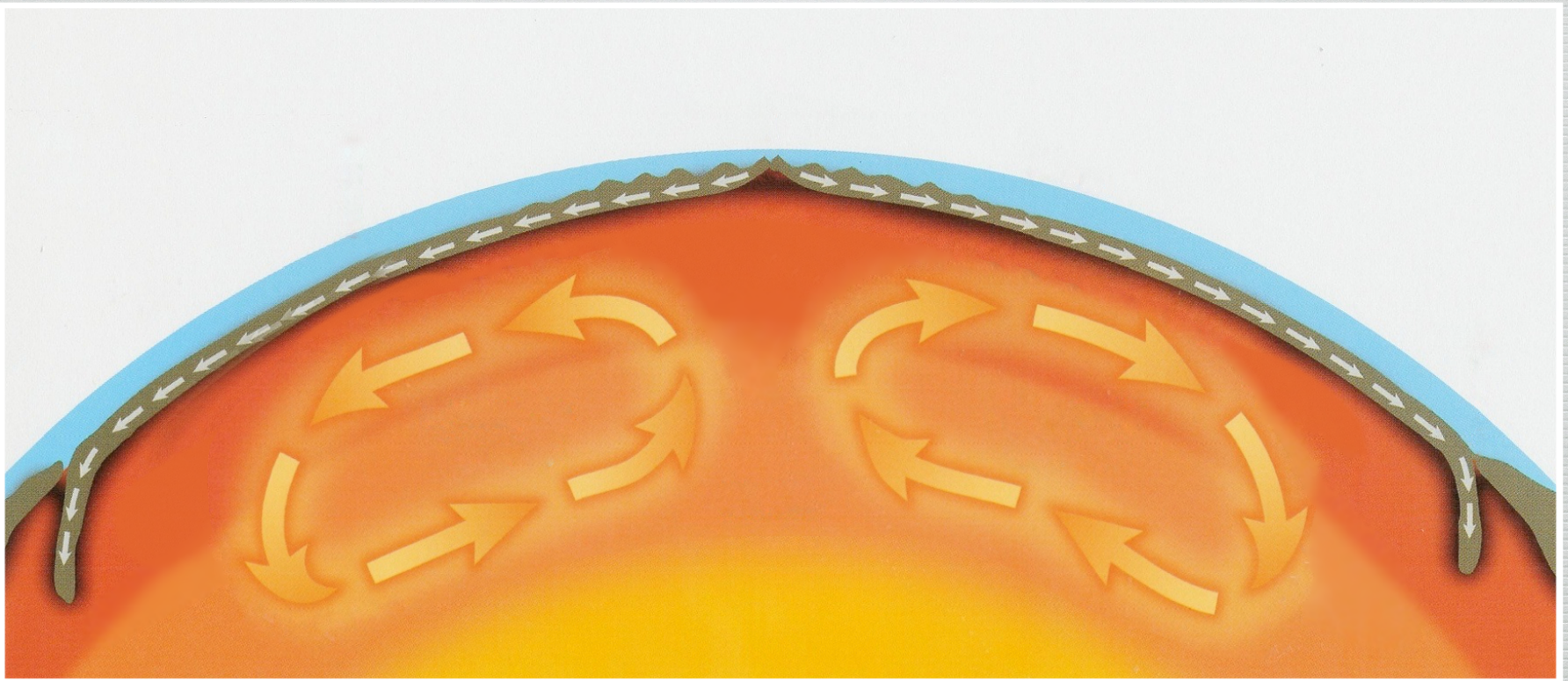




Divergent Plate Boundary - Iceland

Discovery
HD SHOWCASE





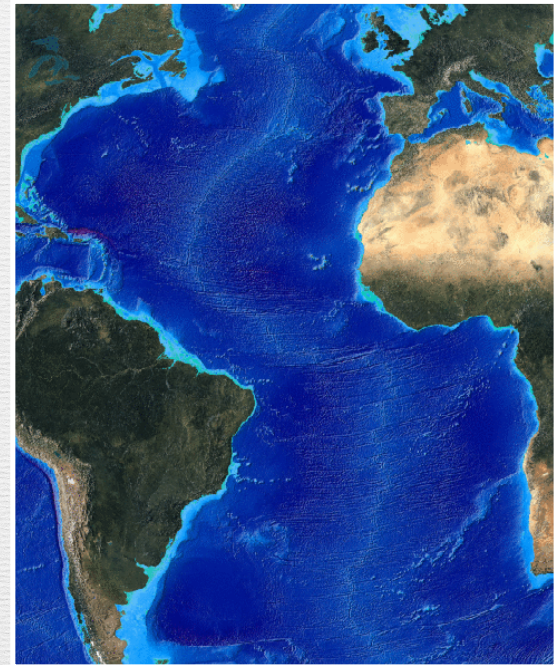
Divergent Plate Boundary

Crustal Boundaries

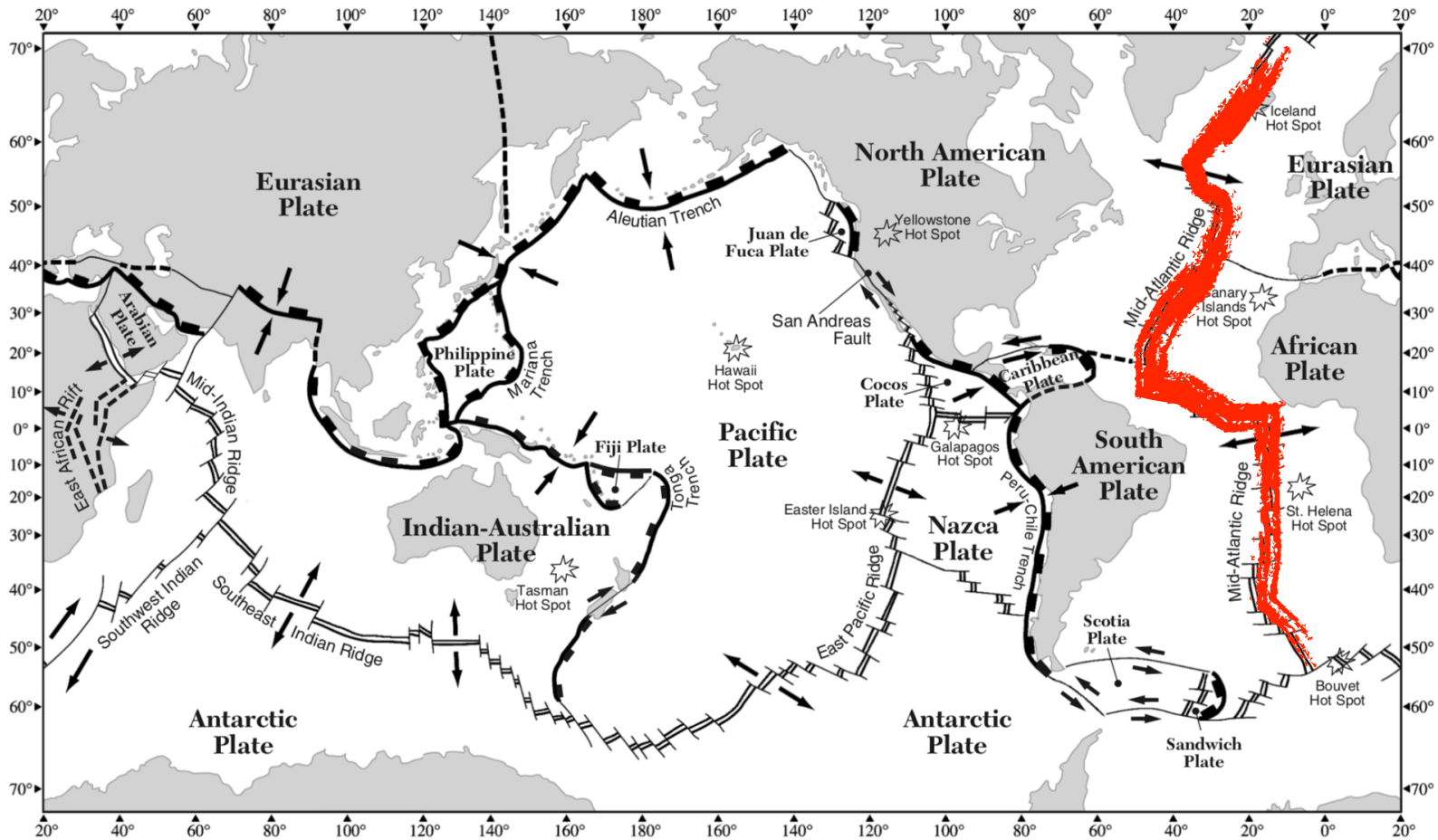
- Sea-Floor Spreading - the process where ocean floor is extended when two plates move apart
- Mid-Ocean Ridge - underwater mountain range created from a divergent plate boundary

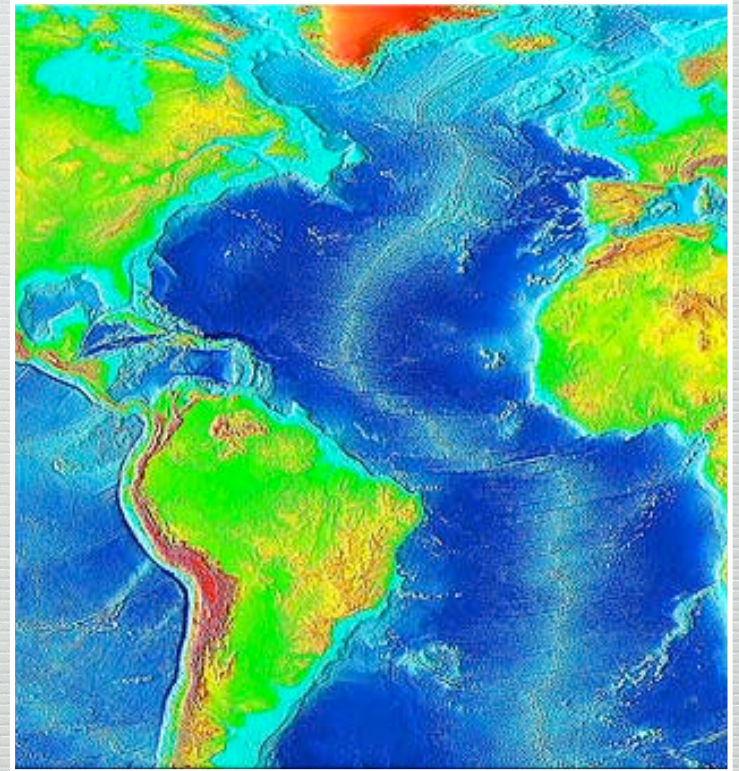
Crustal Boundaries

- Mid-Atlantic Ridge - a mid-ocean ridge that runs the length of the Atlantic Ocean
 - Separates the North and South American Plates from the Eurasian and African Plates



Tectonic Plates

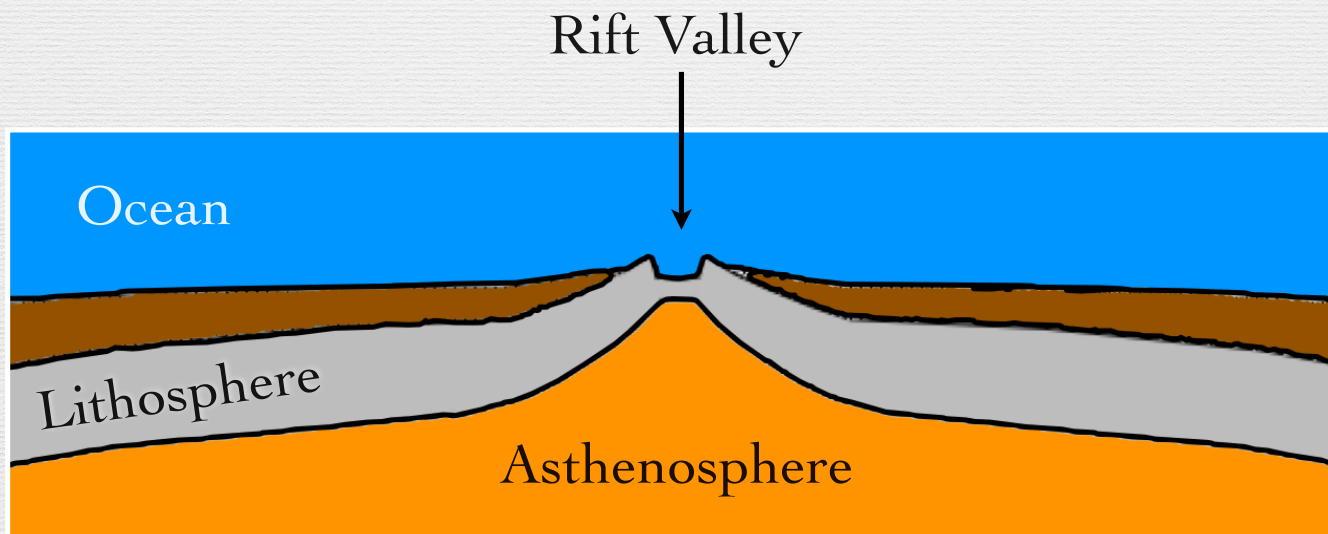




Mid-Atlantic Ridge

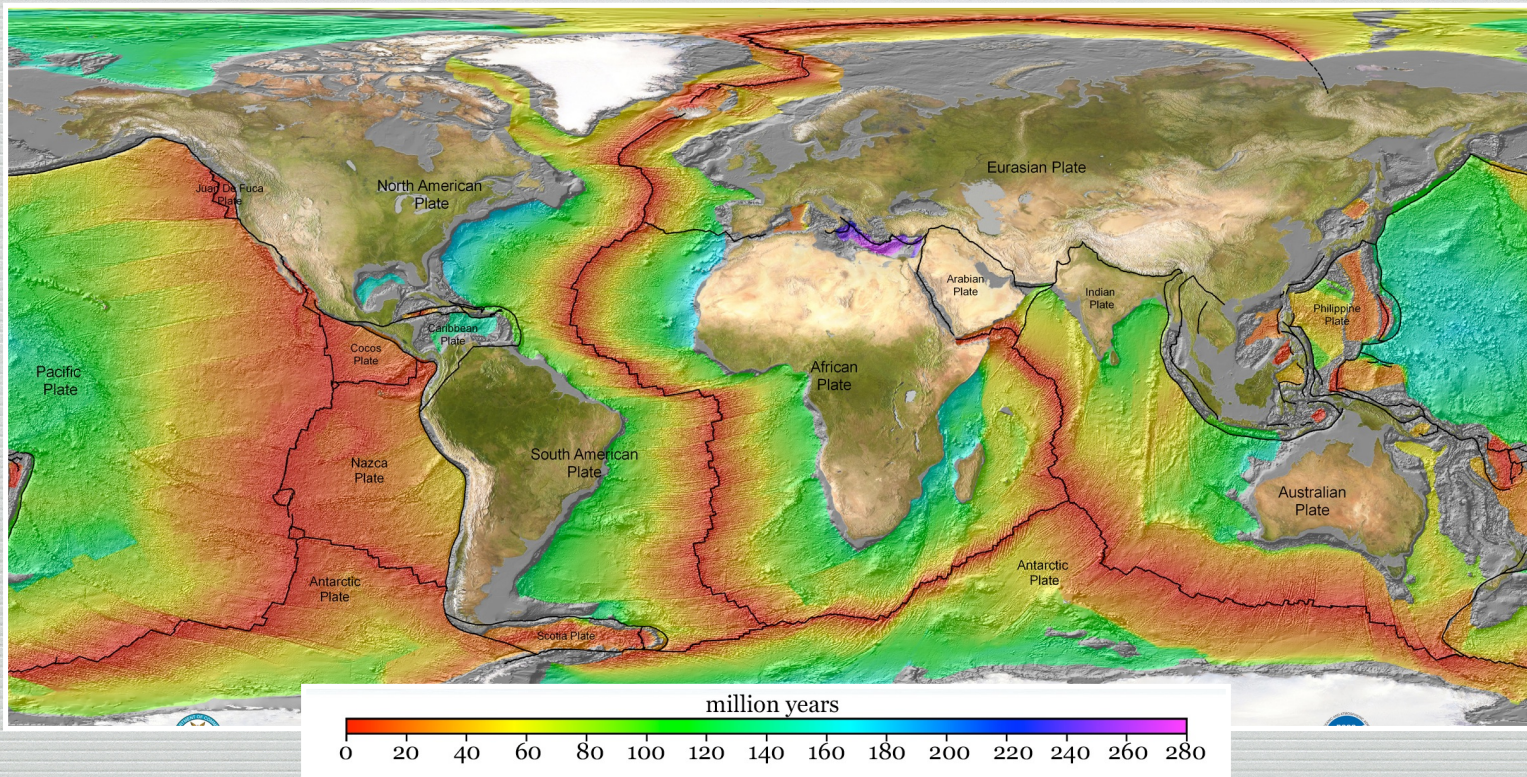
Crustal Boundaries

- Rift Valley - narrow valley that runs the length of a mid-ocean ridge



Crustal Boundaries

- Divergent Plate Boundary Evidence:
 1. Rock samples of the deep ocean floor show that basaltic oceanic crust becomes progressively younger as you approach the mid-ocean ridge

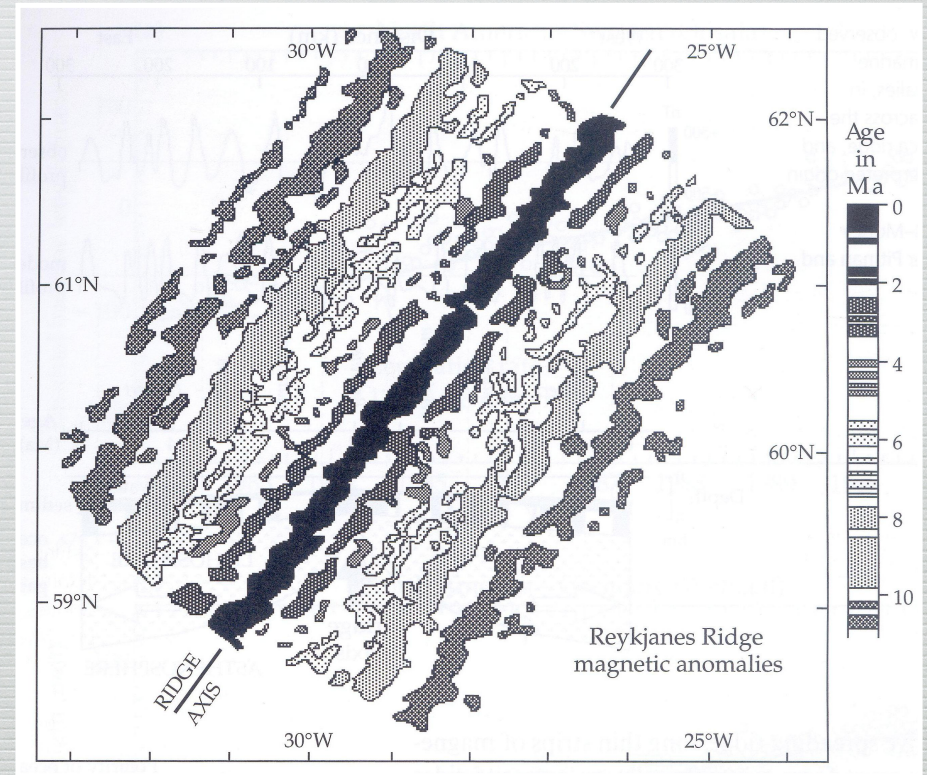
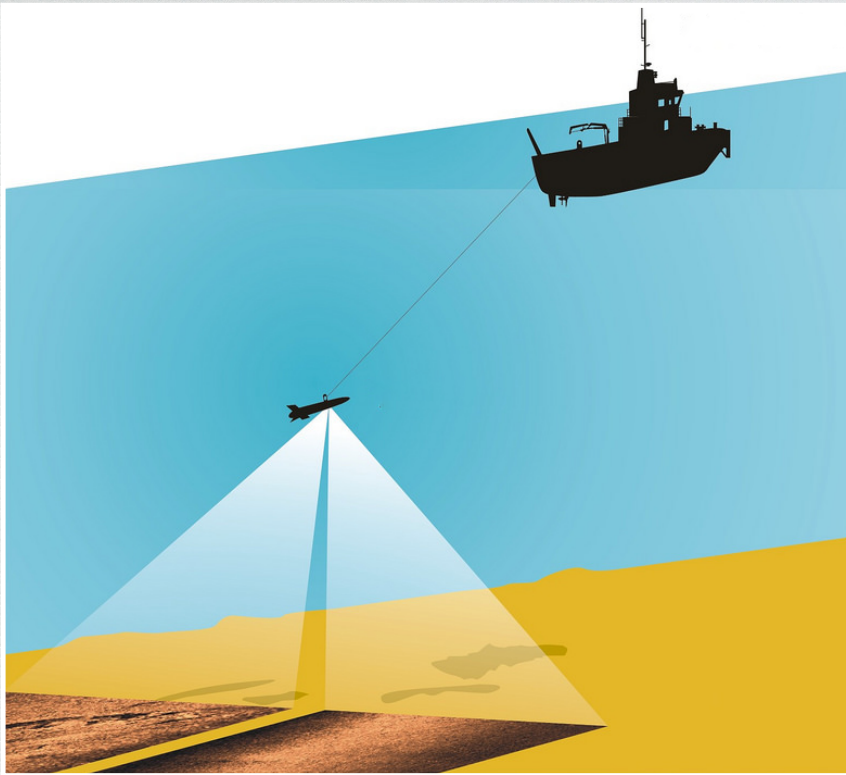


Age of the Seafloor

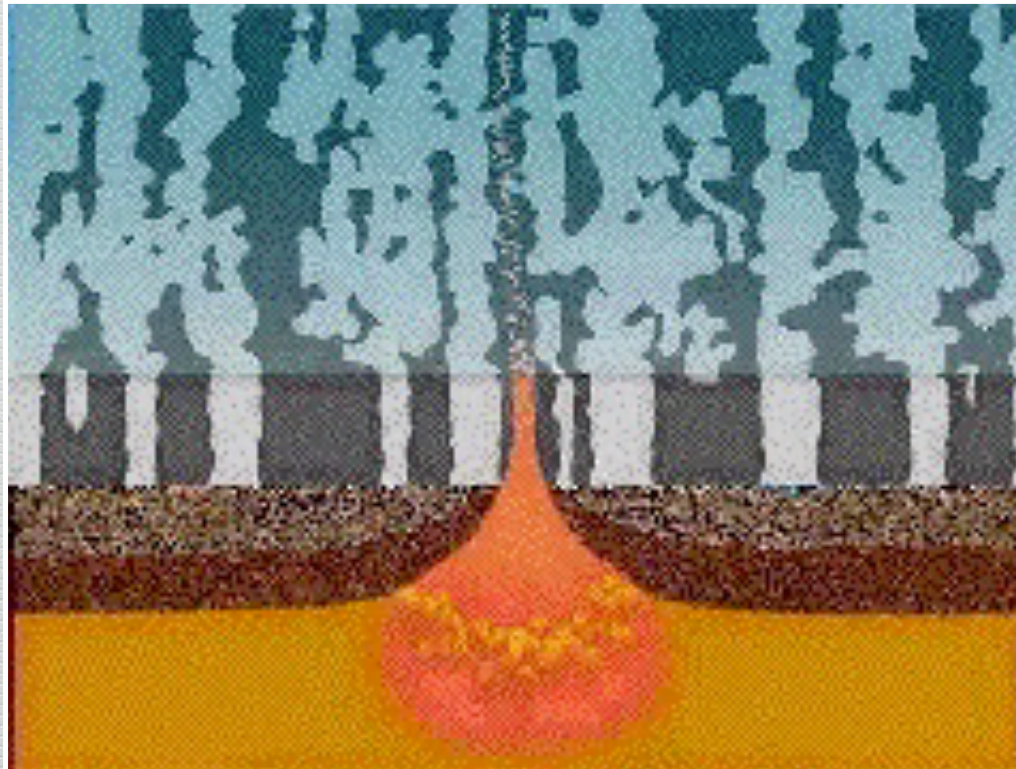
Crustal Boundaries

- Divergent Plate Boundary Evidence [continued]:
 2. Scientists dragged a magnetometer across the ocean floor and discovered a unique magnetic pattern where stripes of normal and reversed polarity parallel the mid-ocean ridge flipping every 200,000 to 300,000 years [the last one was 781,000 years ago].



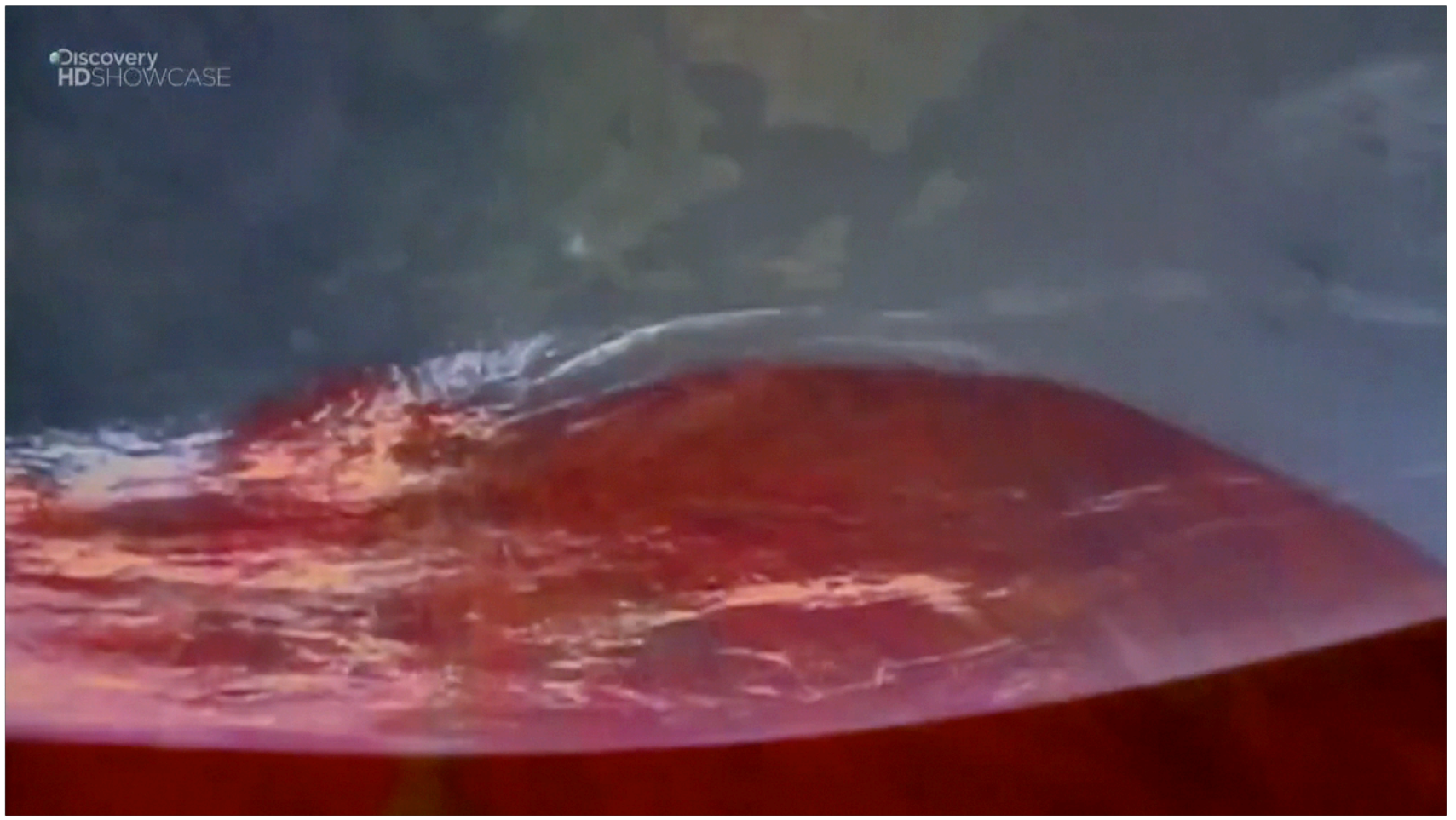


Mid-Atlantic Ridge



Sea-floor Spreading

Discovery
HD SHOWCASE



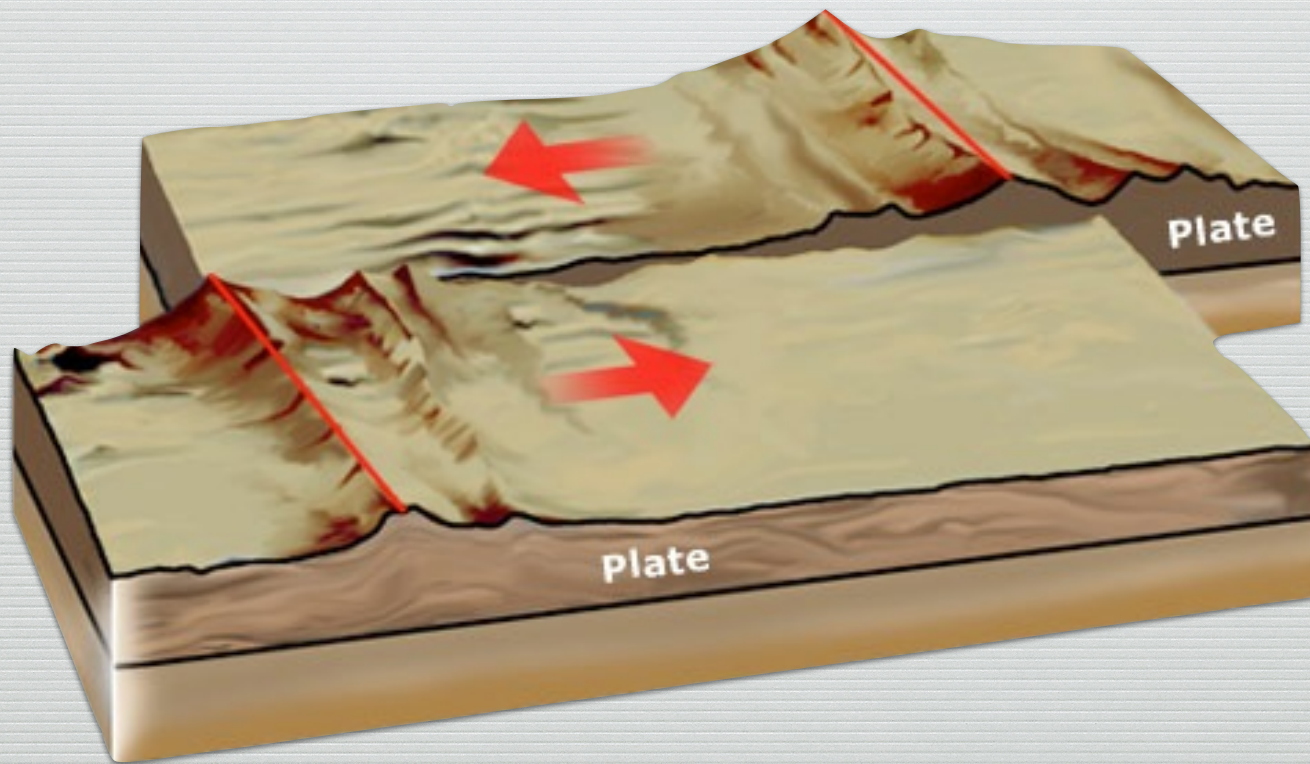
Crustal Boundaries

- Transform Boundary - boundary where two lithospheric plates are sliding past one another
 - Example: the San Andreas Fault is 800 km long and runs throughout California





San Andreas Fault, CA



Transform Plate Boundary