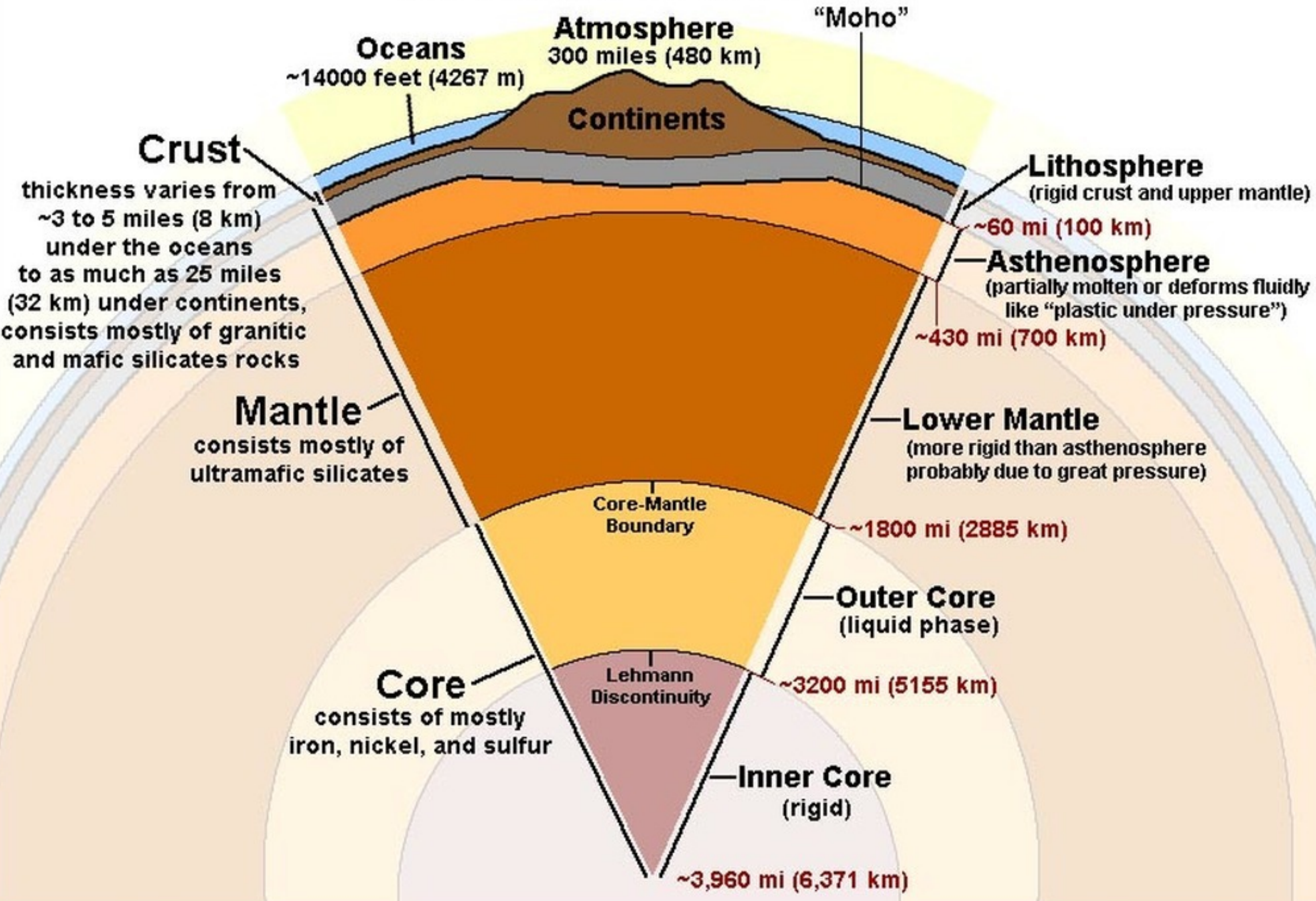


Proof and driving mechanisms of plate tectonics

Structure of the Earth



Review

- Layers of the earth: crust, mantle, outer core inner core
- Detailed outer layers: continental crust, oceanic crust, lithosphere, asthenosphere, mesosphere
- Lithosphere = sphere of rock crust and outer edge of mantle
- Asthenosphere = out section of mantle just below asthenosphere where subduction occurs



Plate Boundary Types

- Convergent boundaries can occur as ocean - ocean, ocean - continental, or continental - continental
- Convergent boundaries are when 2 plates collide
- Divergent boundaries are when 2 plates spread apart, generating new oceanic lithosphere
- Transform fault boundaries are when 2 plates slide along side one another without destruction of lithosphere

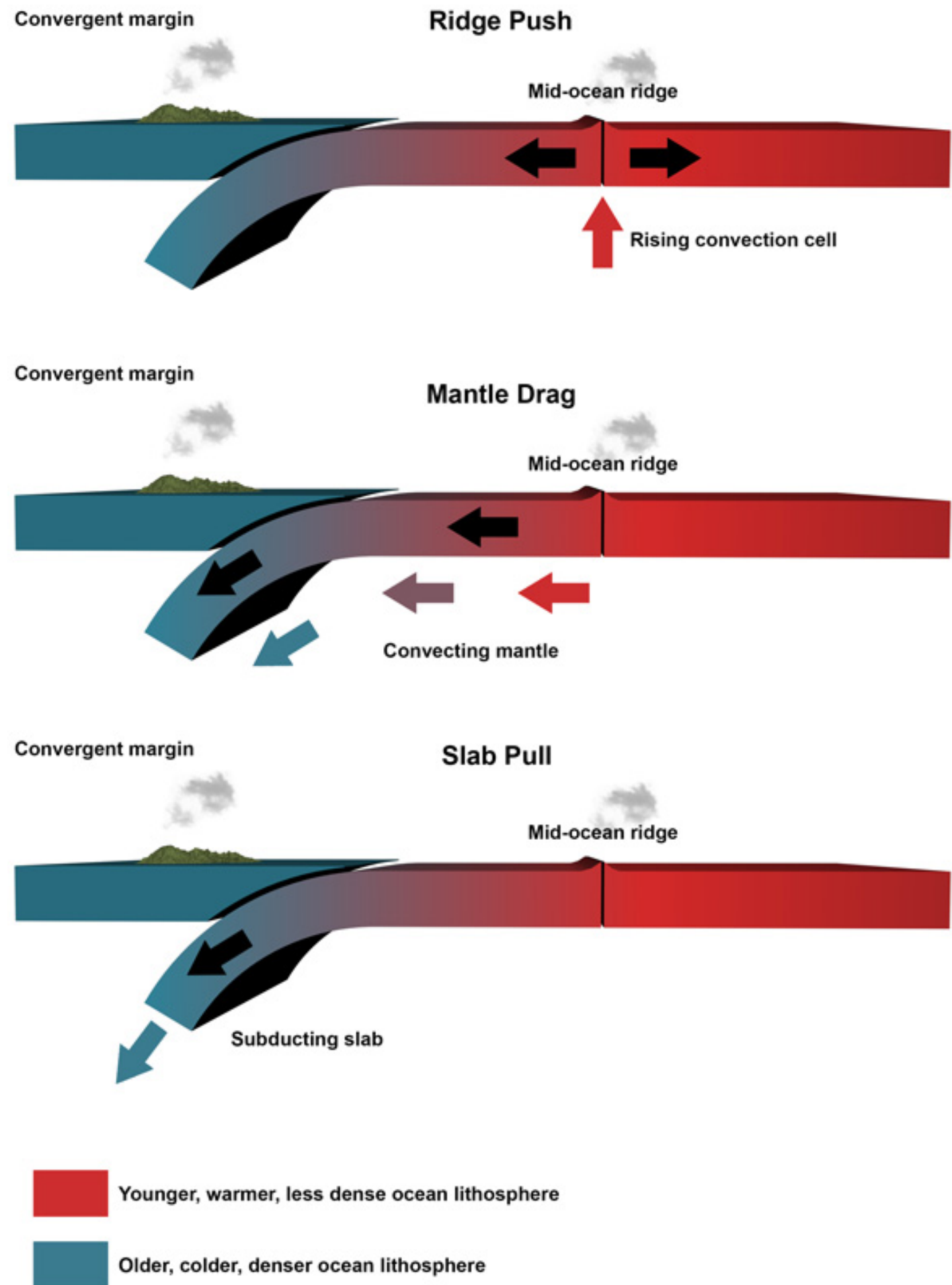


Review

- Continental drift theory has been supported by the ideas of fossil records, plant life, and sea floor spreading
- Alfred Wegener proposed the initial idea of continental drift
- A New Problem: not all plates move at the same speed...why???

Describing Plate Motion

- Ridge Push
- Mantle Convection
- Slab pull



Ridge Push

- As divergent plates move away from one another, the upswell of molten magma concentrates along the divergent boundary
- The added force of magma “pushes” the two plates away from each other with added force

Mantle Convection

- Very hot, low density magma rises from the lower mantle to the upper mantle
- As the magma cools, new minerals form and increase the density, which causes the molten magma to cycle back down towards the lower mantle
- The continuous cycle create a current affecting the lithosphere

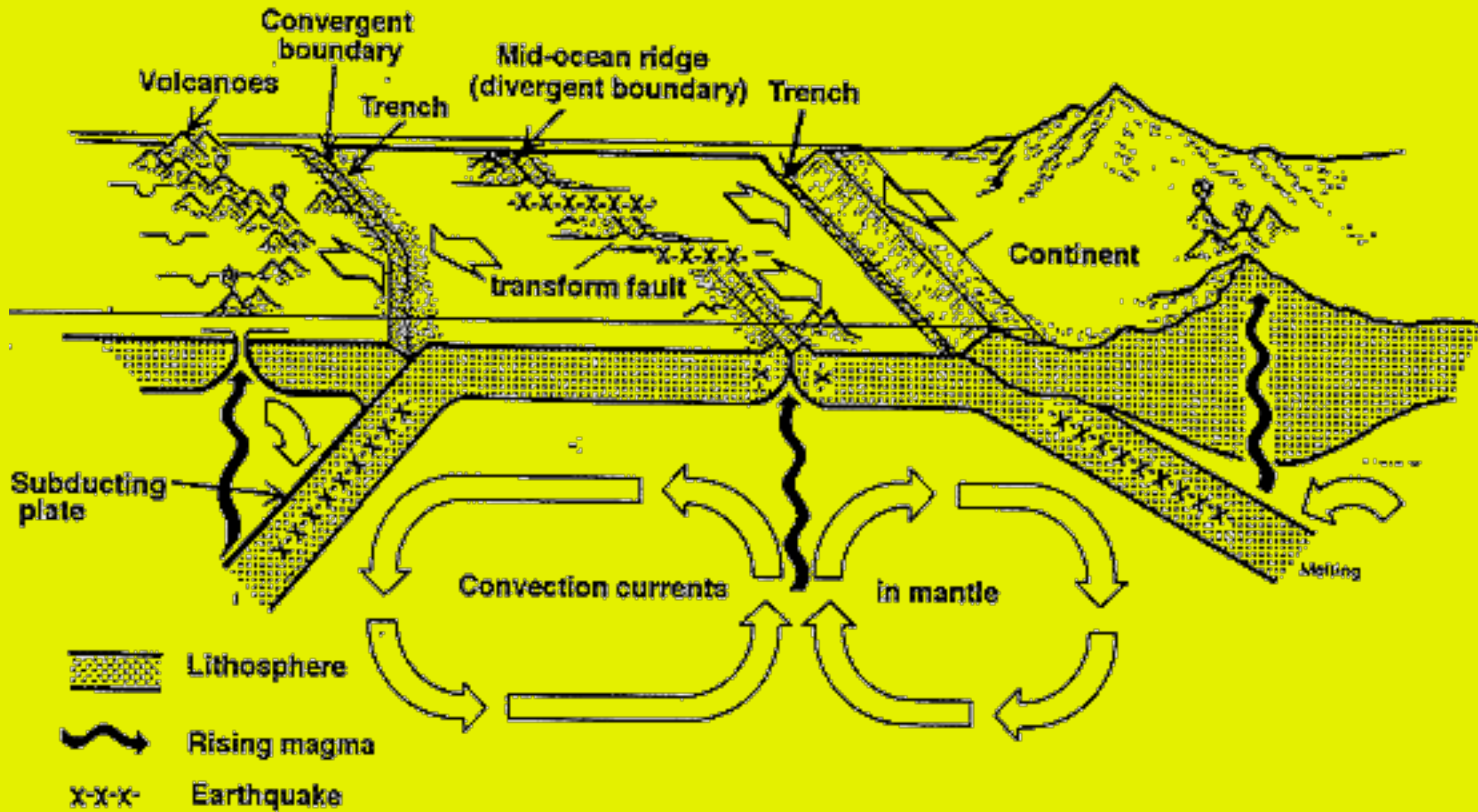


Figure 2. Sea-floor spreading. Modified from NSTA/FEMA(1988).

Slab Pull

- As large solid slabs of oceanic crust are subducted into the mantle, they pick up speed
- A suction force is created, from the magma around the plate resulting in an increased speed of plate subduction

Possible driving forces for Plate Tectonics

