Crustal Activity

What are plate tectonics and how do they affect Earth?


Discovery
HDSHOWCASE

Crustal Activity

- Plate Tectonics - the study of the formation and movements of plates
- Plates - section of the lithosphere that moves around
- Lithosphere - Earth's solid outer crust
- Asthenosphere - partially melted layer that flows slowly and is located below the lithosphere

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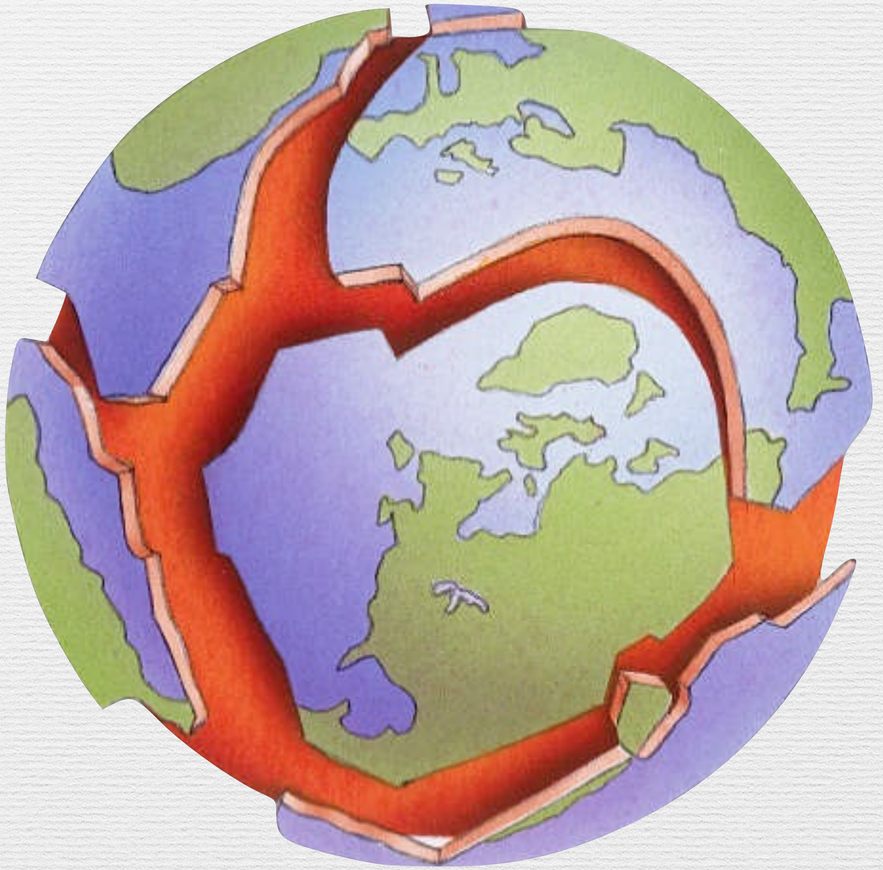
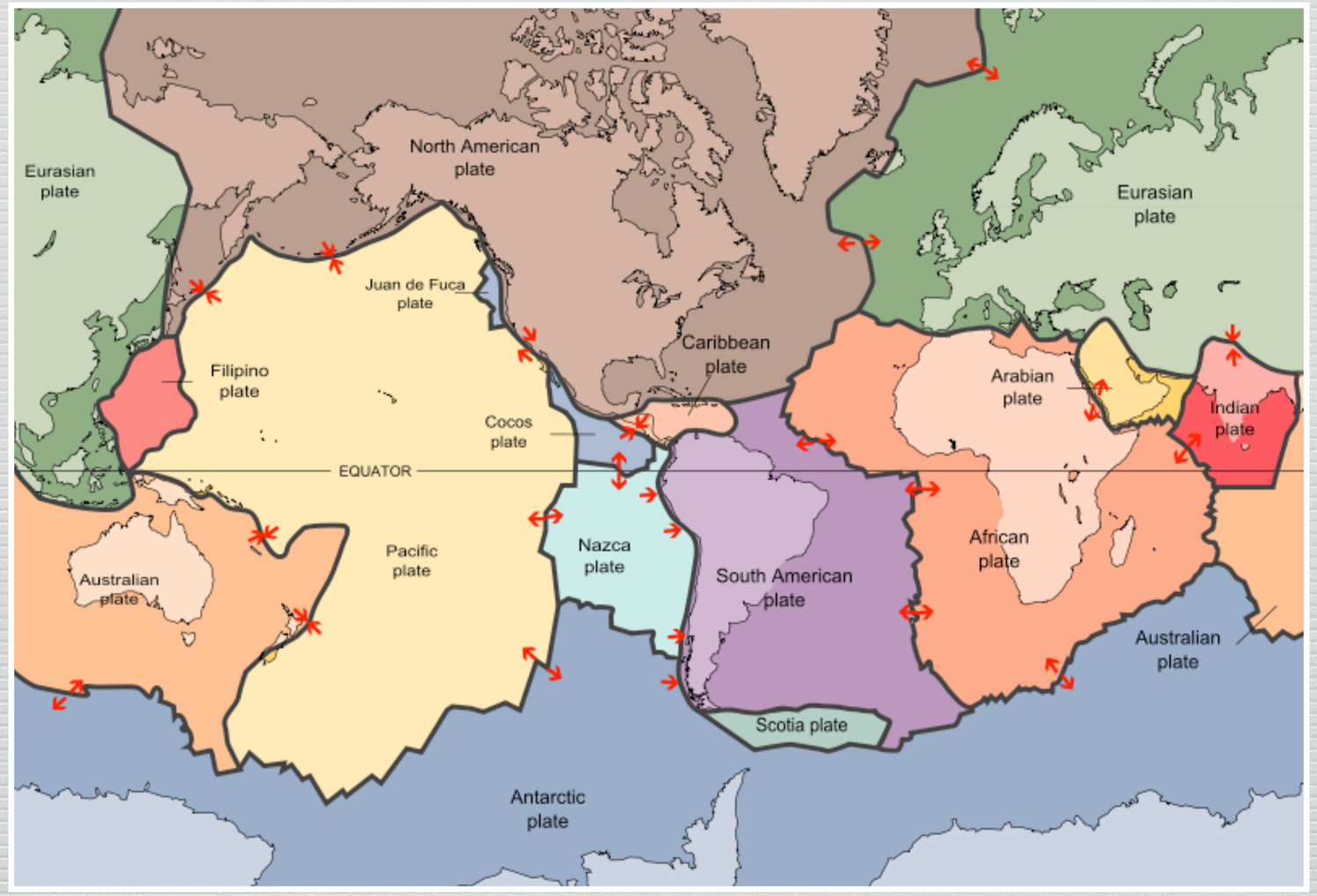
- Earth's surface consists of a dozen major plates and some minor ones
- The plates are moving at rates close to 10 cm/year





The Major Tectonic Plates

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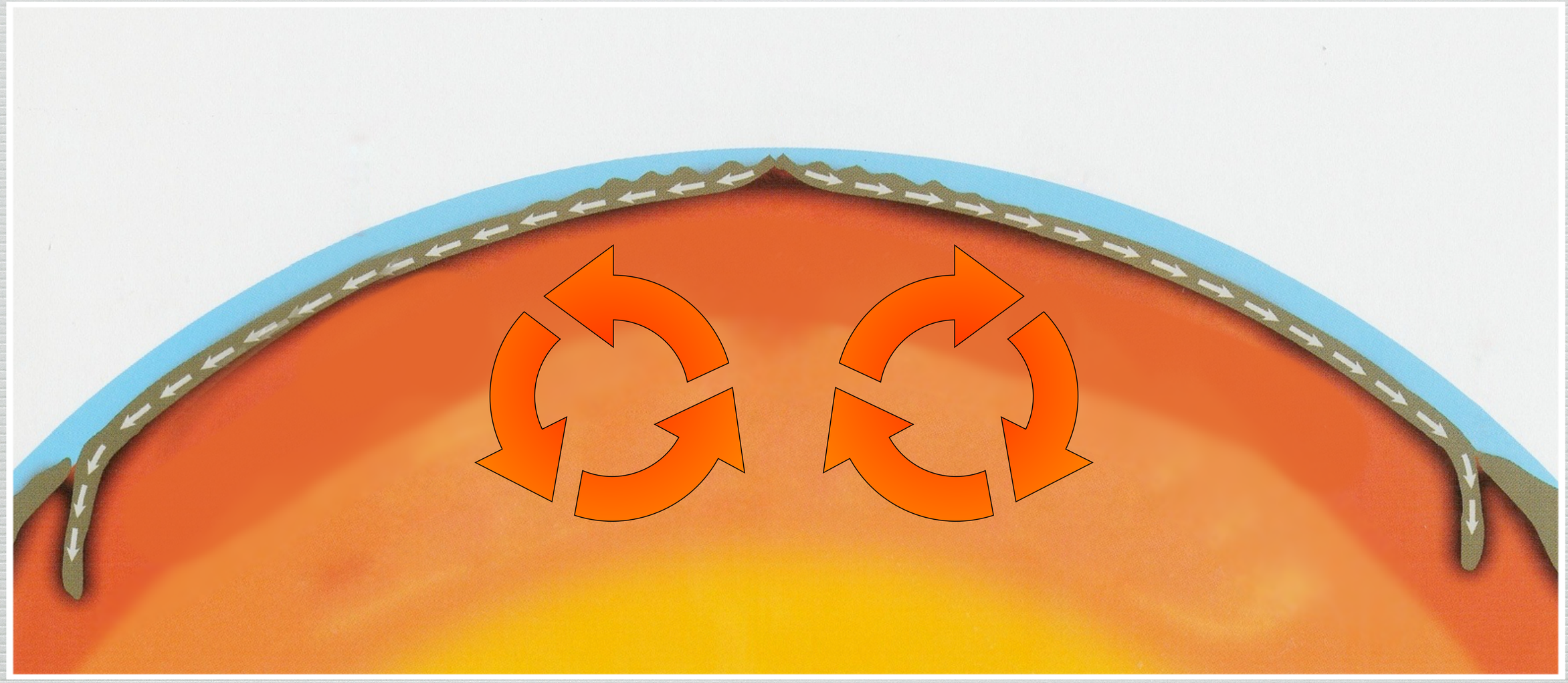
- Convection Currents - driving force of plate movement
    - Magma heats up causing it to expand and rise
    - Magma cools down causing it to contract and sink
- The solid lithosphere is moving on top of the partially melted asthenosphere due to density differences



Convection Currents

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- The idea of continental drift had been around since the early 1900's, but lacked enough scientific evidence to support the theory
- New advancements after World War II help provide the evidences needed to validate the Theory of Plate Tectonics

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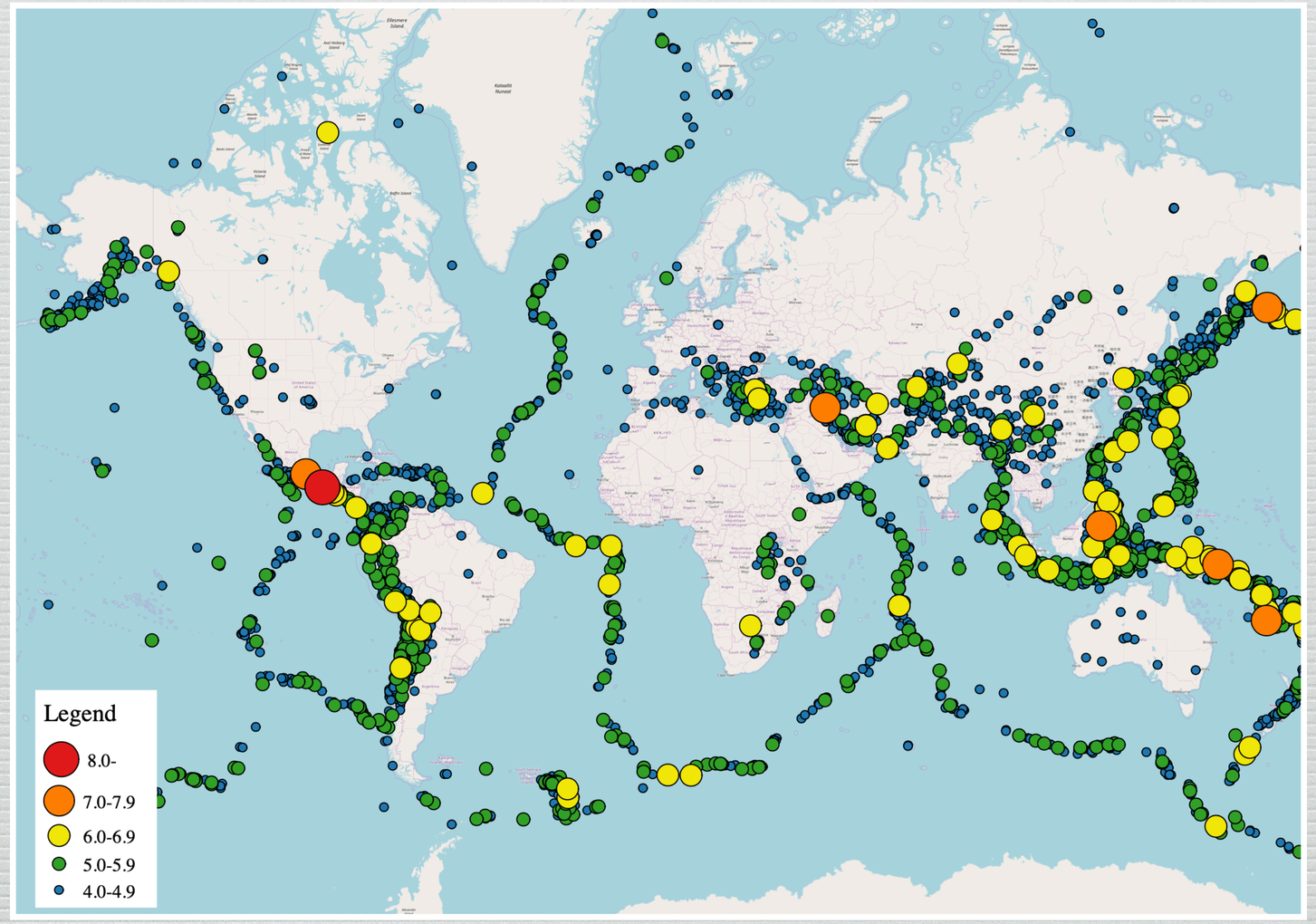
- Evidence of Plate Tectonics

    1. Earthquakes - when scientists plotted the locations of earthquakes they realized that they do not occur at random location, but run along isolated belts outlining the plate boundaries



2017 Earthquake Locations

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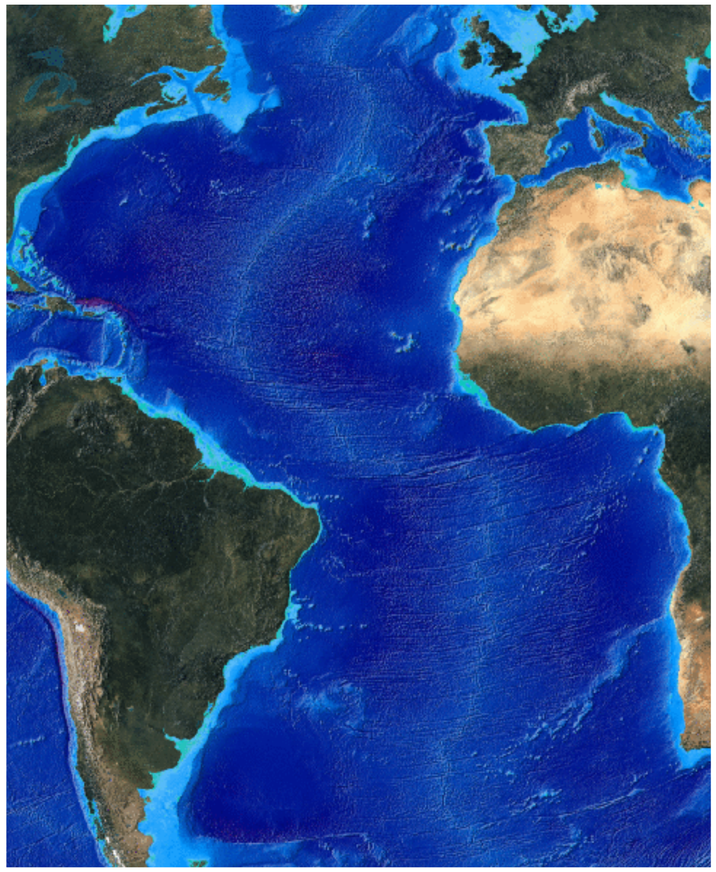
- Evidence of Plate Tectonics [continued]

    2. Volcanic Evidences - occurs at plate boundaries where plates are interacting



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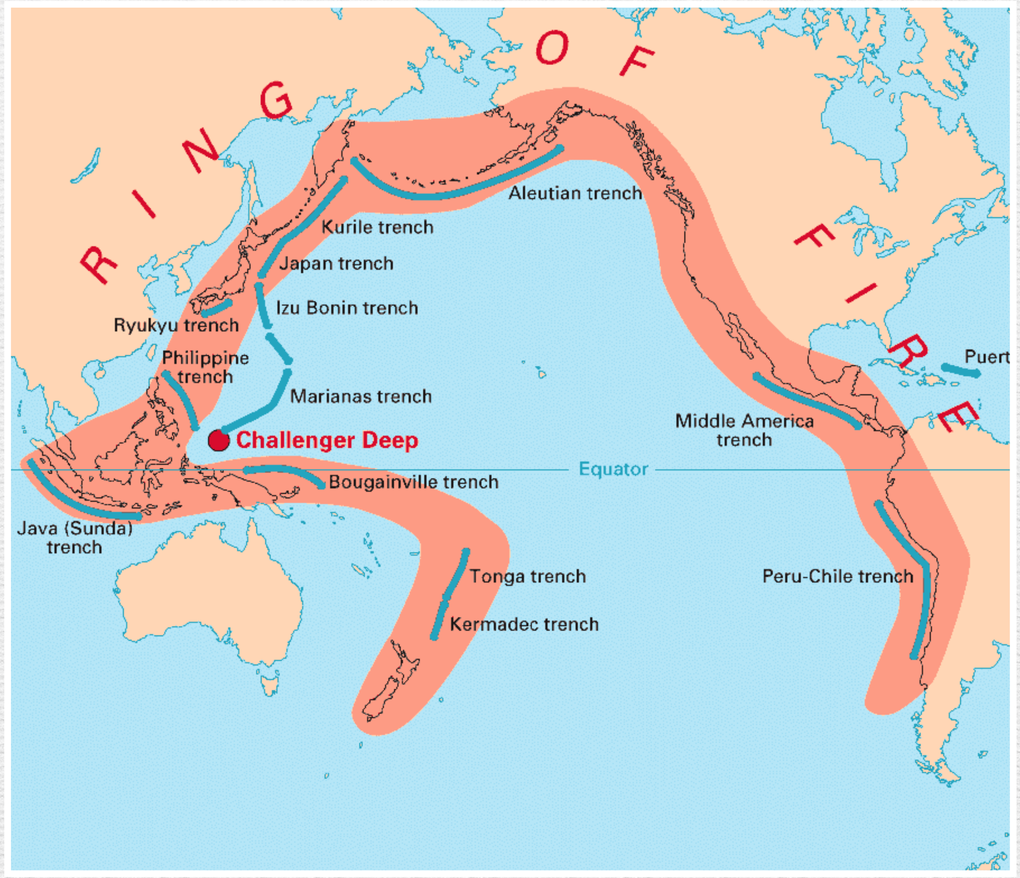
- Ring of Fire - isolated belt around the Pacific Ocean where 90% of the world's volcanoes exist



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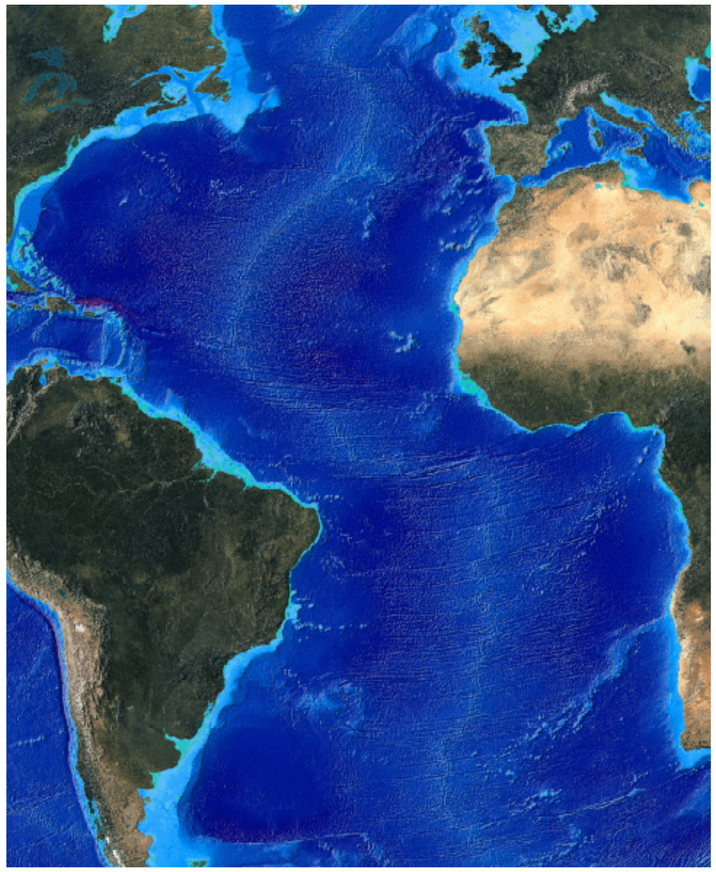
- Evidence of Plate Tectonics [continued]

    4. Rock Evidence - horizontally deposited rock layers sometimes tilt and fold when plates interact



Tilted Rock Layers

Folded Rock Layers

Folded Rock Layers

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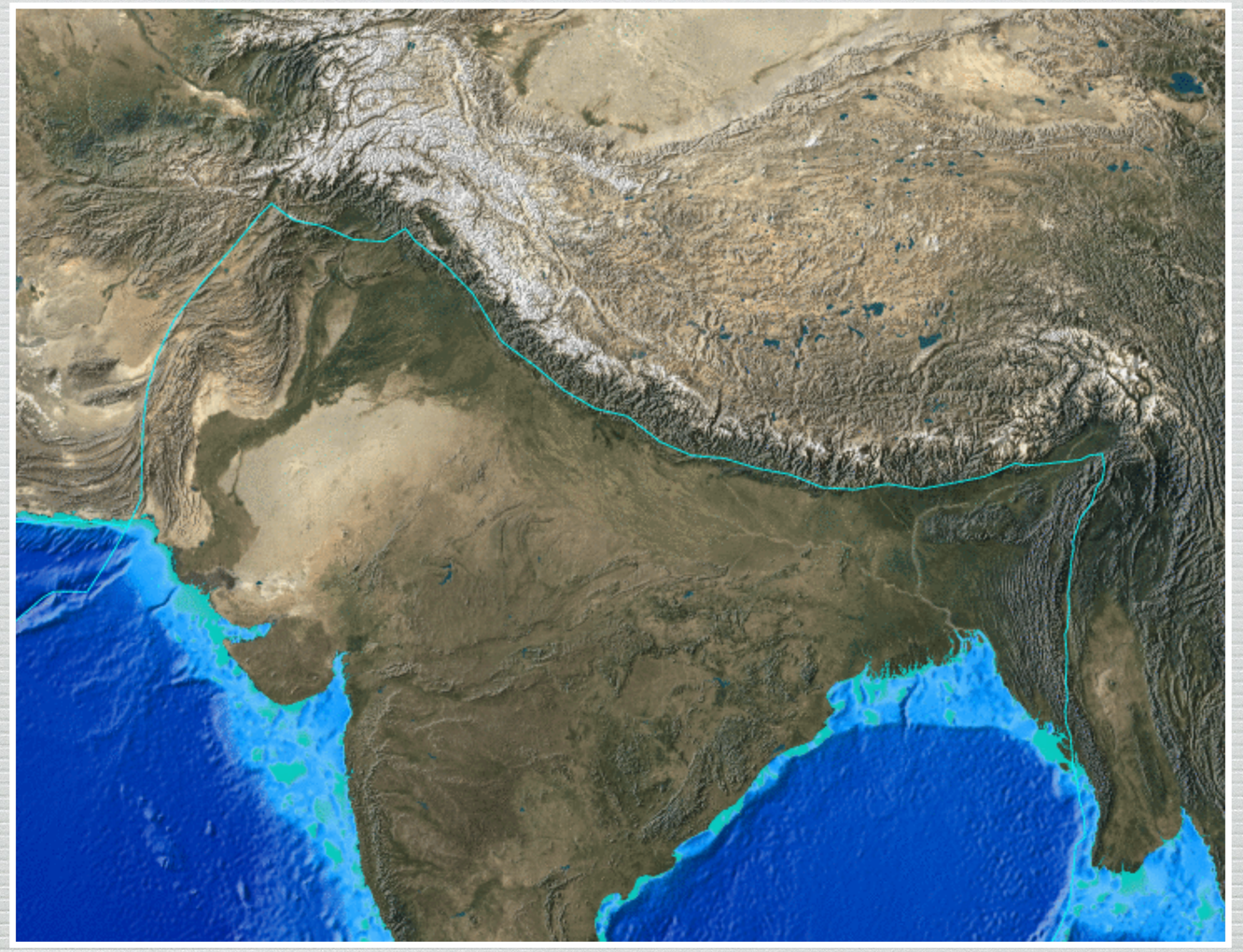
- Evidence of Plate Tectonics [continued]

    5. Mountain Evidence - as plates collide they sometimes are pushed upward or downward



Himalayan Mountain Formation

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- Evidence of Plate Tectonics [continued]

    6. Fossil Evidence - fossilized shallow marine organisms can be found at high elevations in rock layers

Mount Diablo, CA

Tectonic Plates