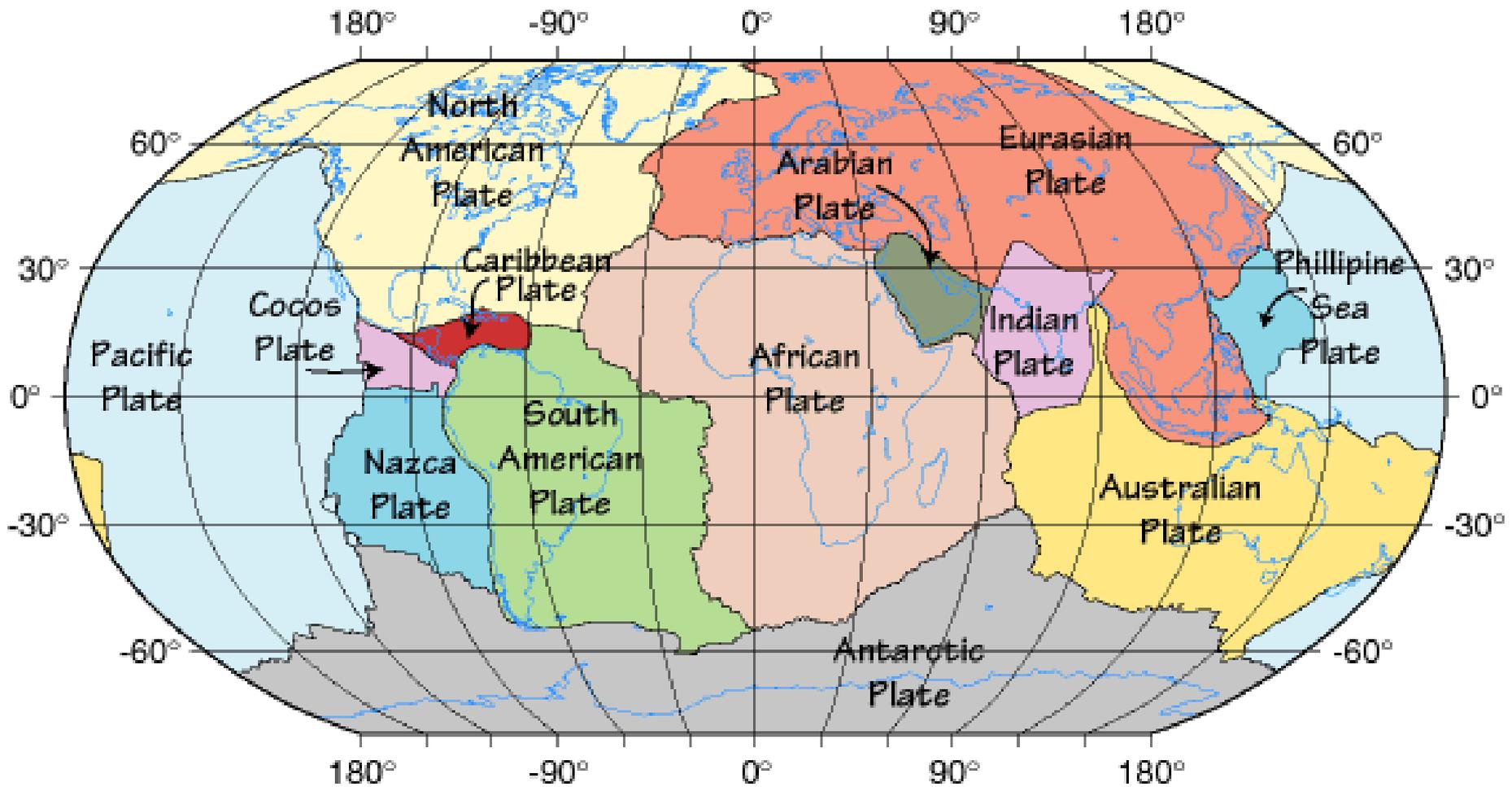


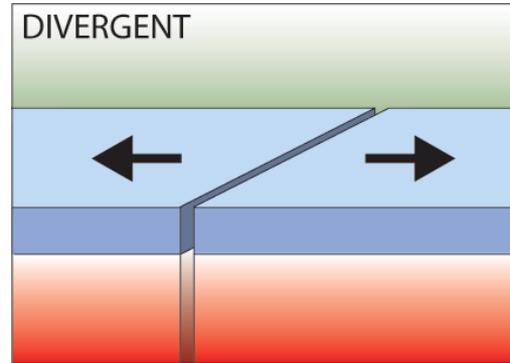
Plate Tectonics



The tectonic plates of the World were **mapped** in the second half of the 20th century.

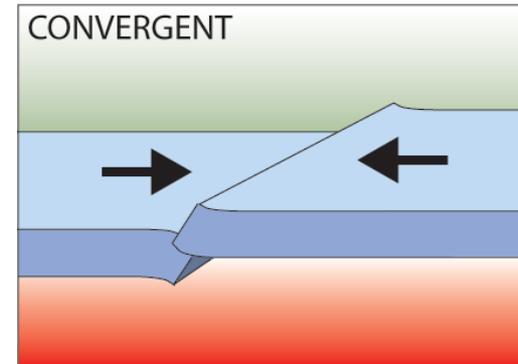
Three types of plate boundary

- **Divergent**

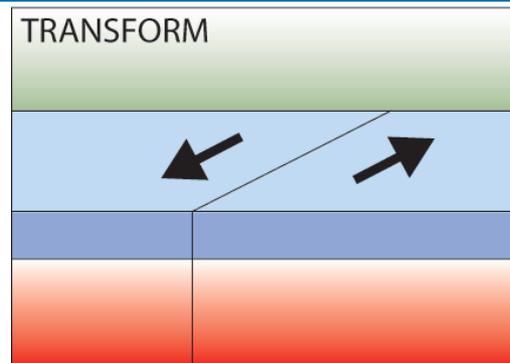


*our focus
today*

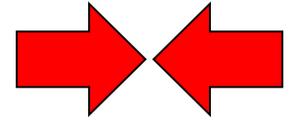
- **Convergent**



- **Transform**

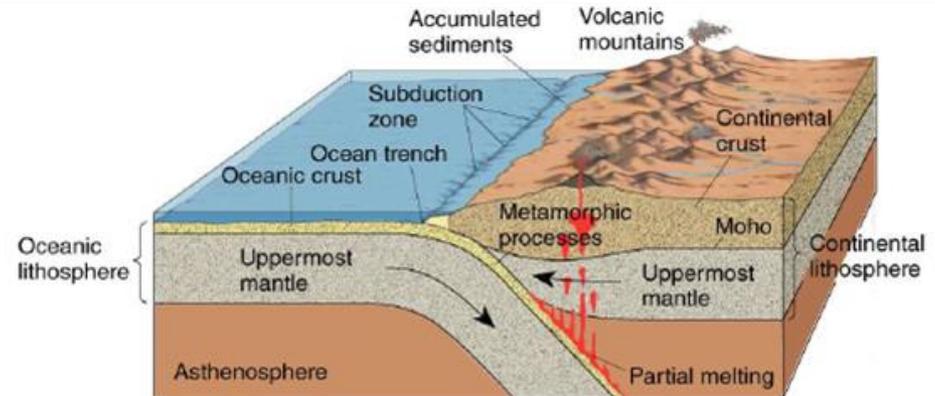


Convergent Boundaries

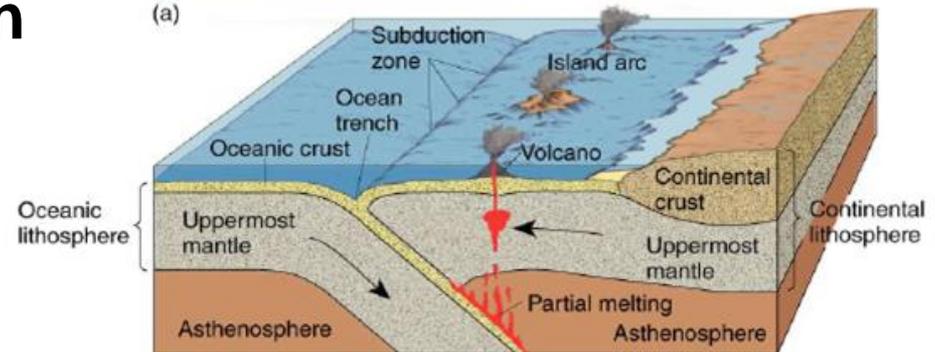


Three types:

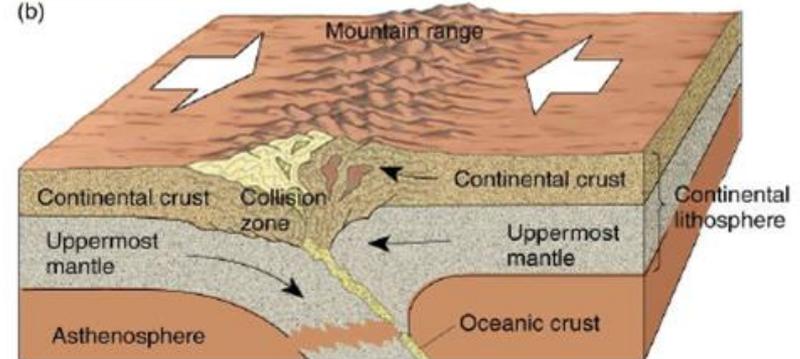
- Continent-oceanic crust collision
- Ocean-ocean collision
- Continent-continent collision



(a)



(b)



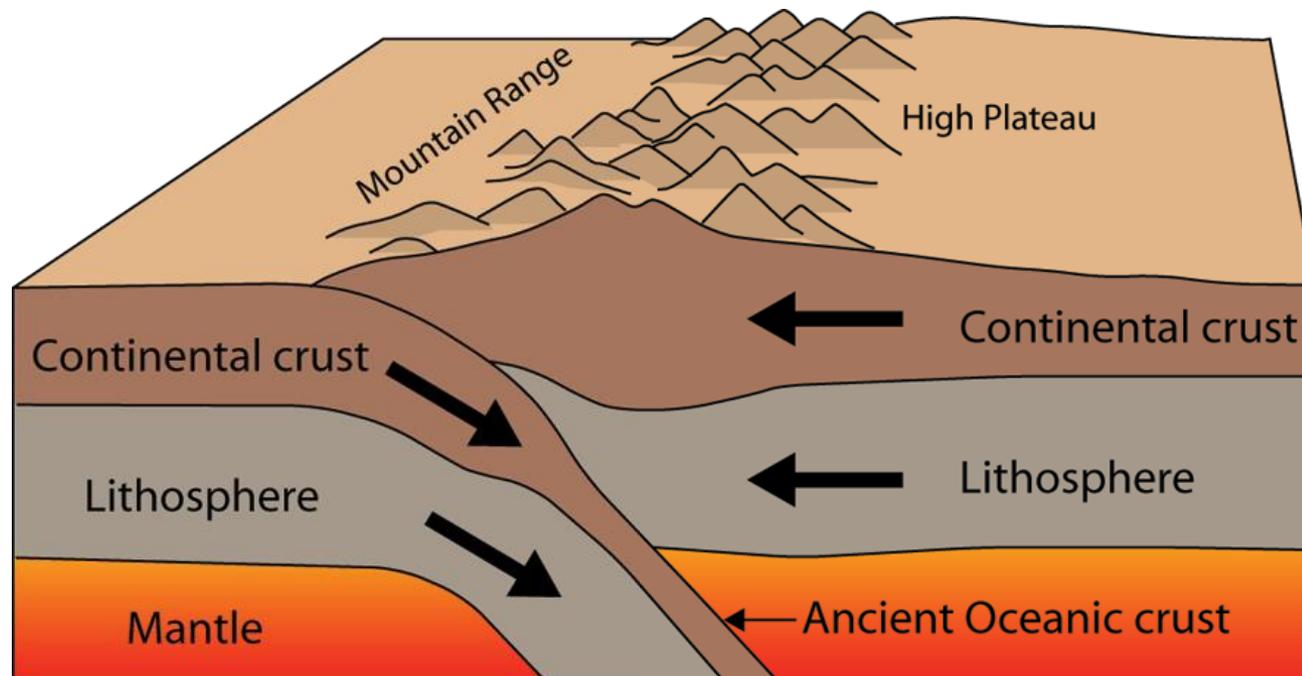
(c)

Convergent boundaries are also called destructive plate boundaries.

Why?

Continent-Continent Collision

- Plates push against each other



- **Forms mountains** (European Alps, Himalayas)

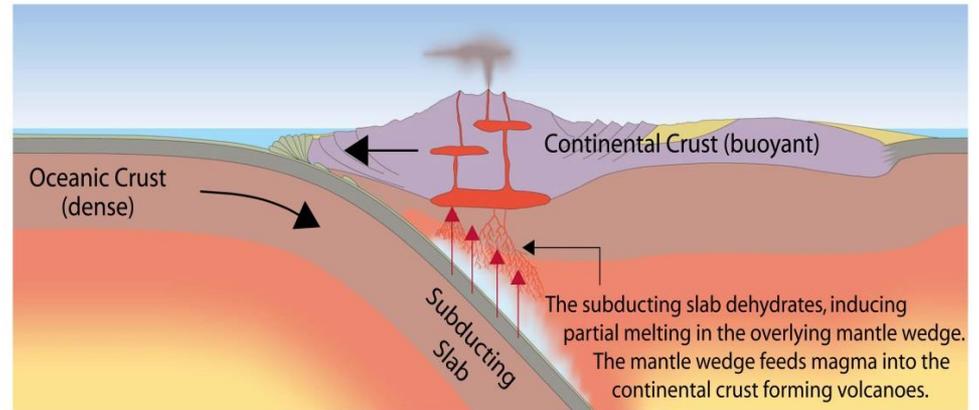
Himalayas

Himalayan range is home to more than one hundred mountains exceeding 7,200 m (23,600 feet) in elevation, and all of the planet's peaks exceeding 8,000 m, including the highest, Mount Everest.



Continent-Oceanic Crust Collision

“Subduction”

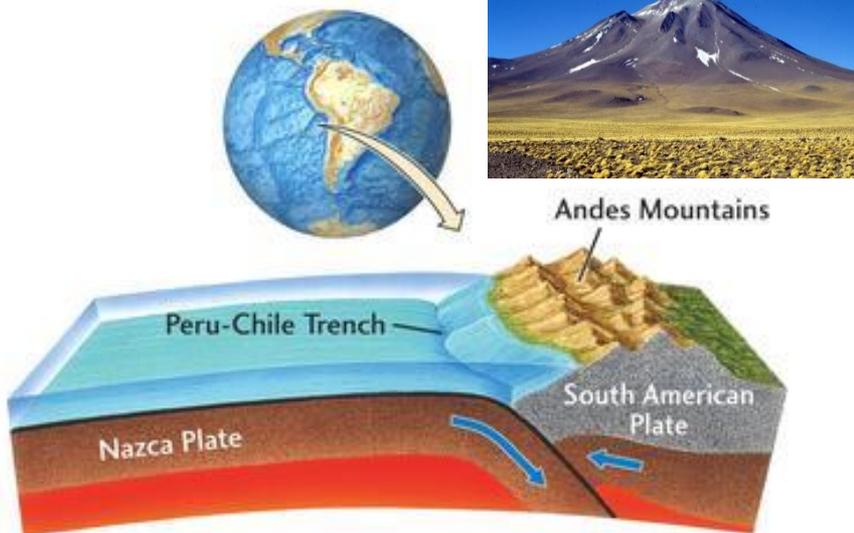


- **Oceanic** lithosphere subducts underneath the **continental** lithosphere.

- As it subsides, oceanic lithosphere heats and dehydrates.

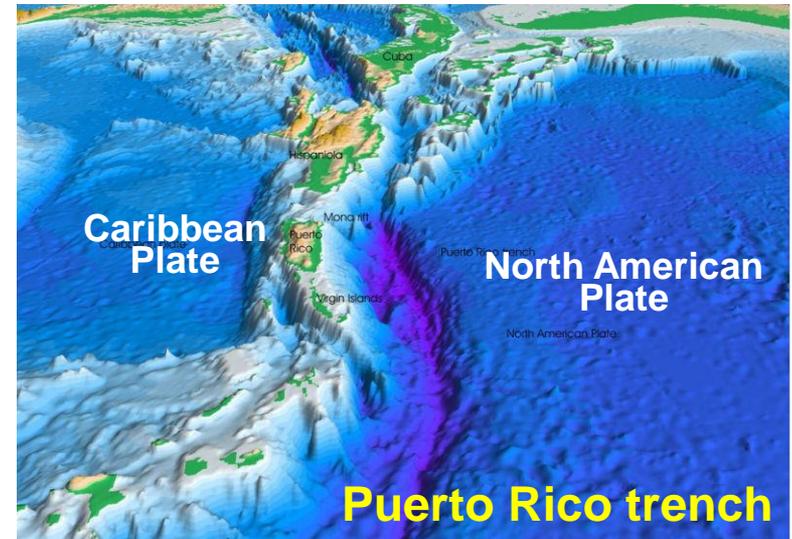
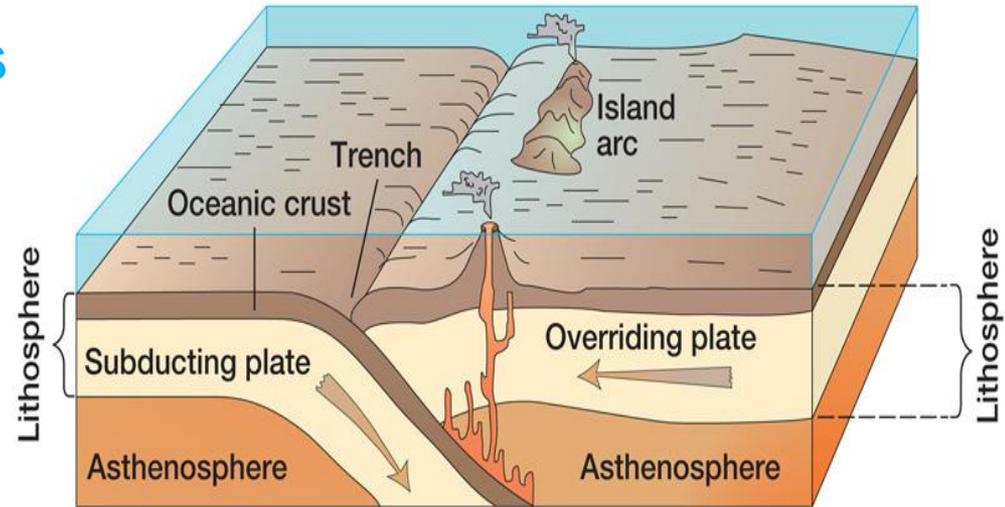
- The melt from mantle rises forming **volcanism**.

- Example: the Andes.



Ocean-Ocean Plate Collision

- When **two oceanic plates** collide, the **younger one runs over the older one** which causes it to sink into the mantle forming a **subduction zone**.
- The subducting plate is bent downward to form a **very deep depression** in the ocean floor called a **trench**.
- **Volcanic island arc** is usually formed fairly close to, but not right next to, the trench.
(ex: Mariana Islands, Aleutian Islands, Japanese Archipelago, Lesser Antilles)

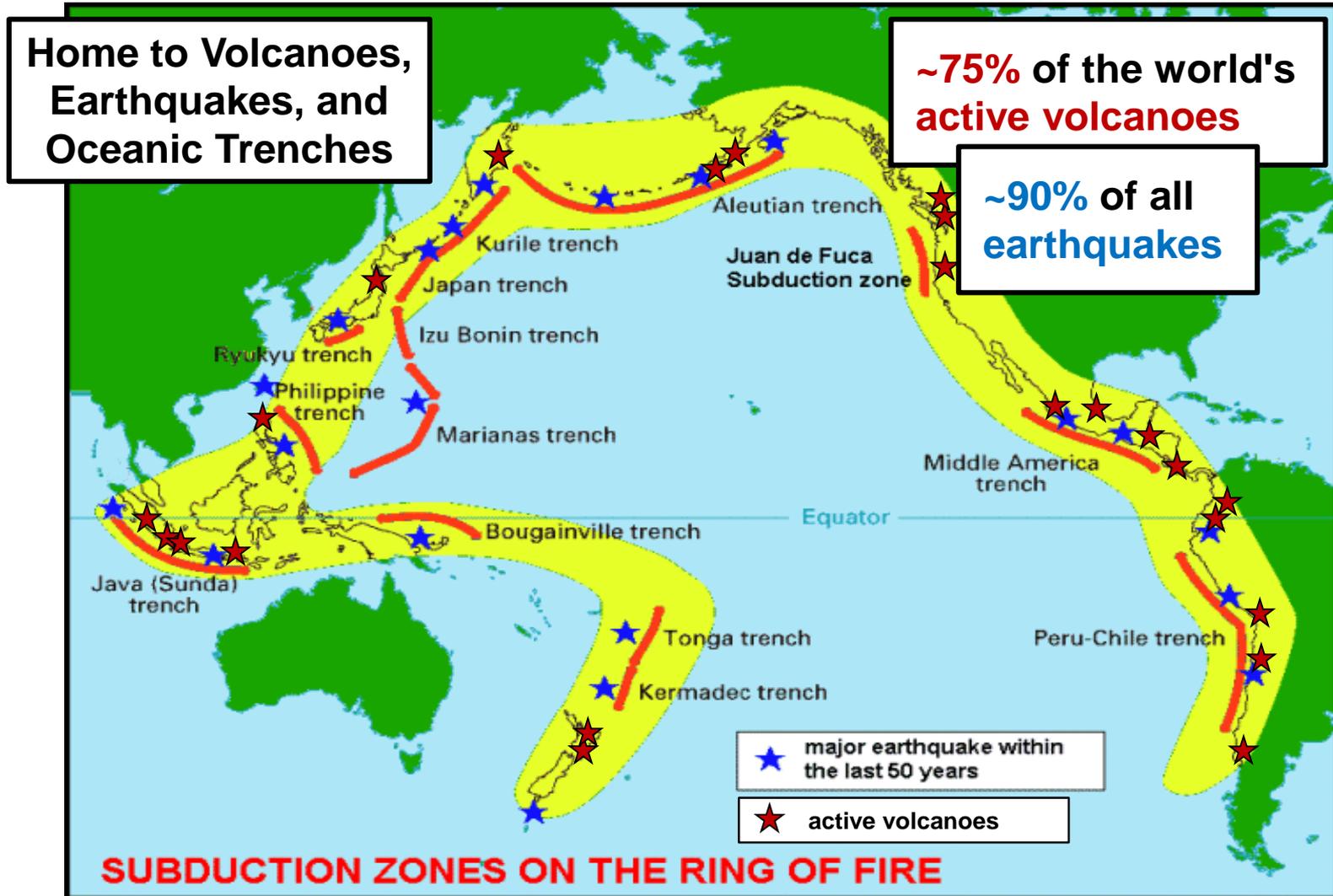


What are the consequences of the tectonic plates movement?

- Landscape formation
- Volcano formation
- Orogeny (mountain formation)
- Crust recycling
- Earthquakes
- Tsunami formation



The Pacific Ring of Fire



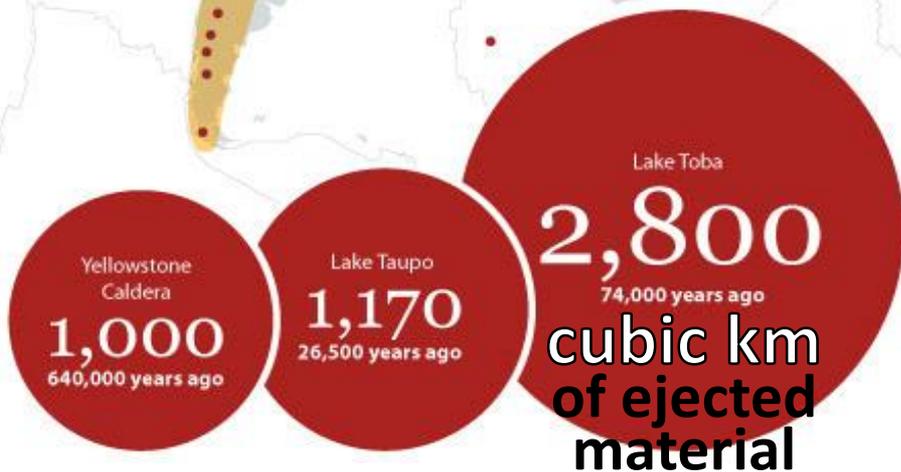
Greatest Volcanic Eruptions

Past 1 MY



The largest volcanic eruptions in human history and in the last million years

(given in cubic kilometers of ejecta)



Notable Volcanoes

- **Mt. Etna, Italy**
Continuous eruption
for almost 110 years!



- **Kilauea, Hawaii**
Largest observed lava lake



Notable Volcanoes

- **Taupo, New Zealand**

Largest known supervolcano eruption in the past 50,000 years.



NOW

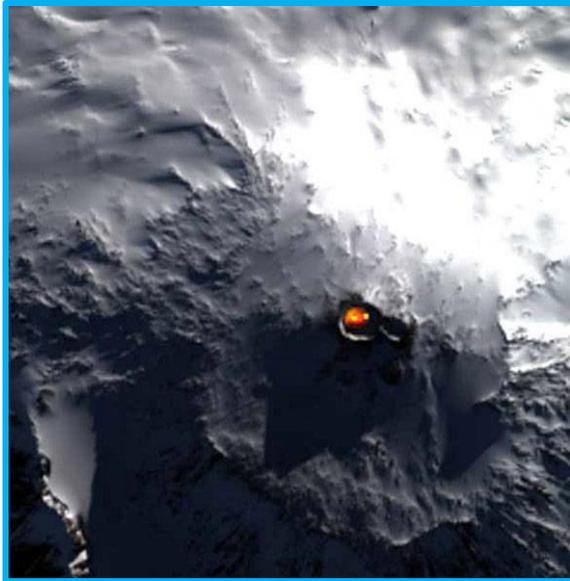
THEN

- **Krakatoa, Indonesia**

1883 explosive eruption produced huge tsunamis as well as loudest sound ever heard in modern history.



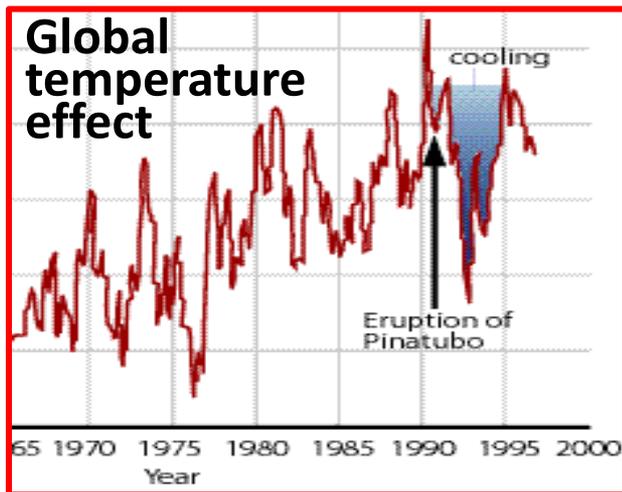
Notable Volcanoes



- **Mt. Erebus, Antarctica**
Southernmost active volcano on Earth.



- **Mt. Pinatubo, Philippines**
Second largest eruption of the 20th century, June 1991.



The Most Powerful Volcanic Eruption of the 20th Century

People in Juneau, Alaska, about 750 miles from the volcano, heard the sound of the blast – *over one hour after* it occurred.

• **NOVARUPTA**
Alaska 1912
3 cubic miles

