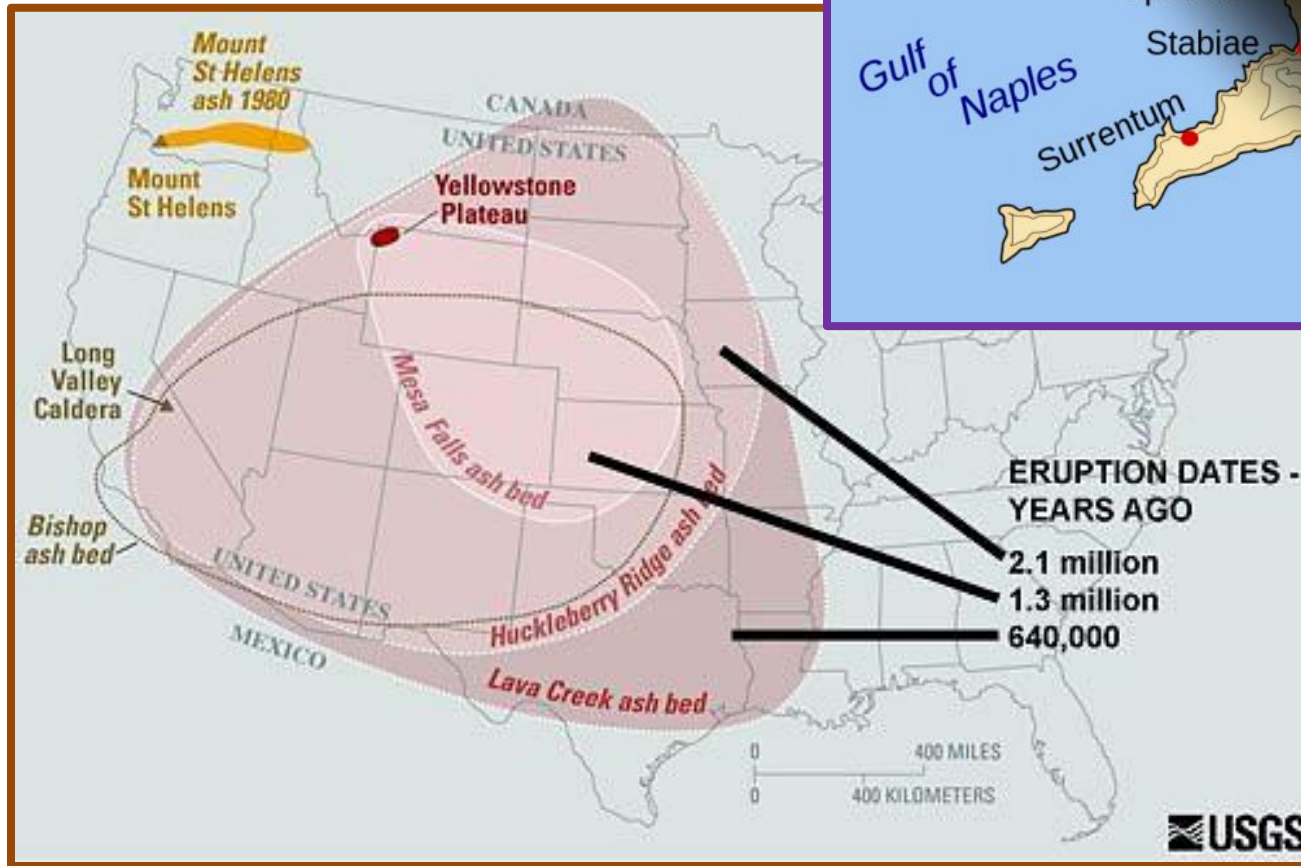


Volcanic Ash Fall Zone

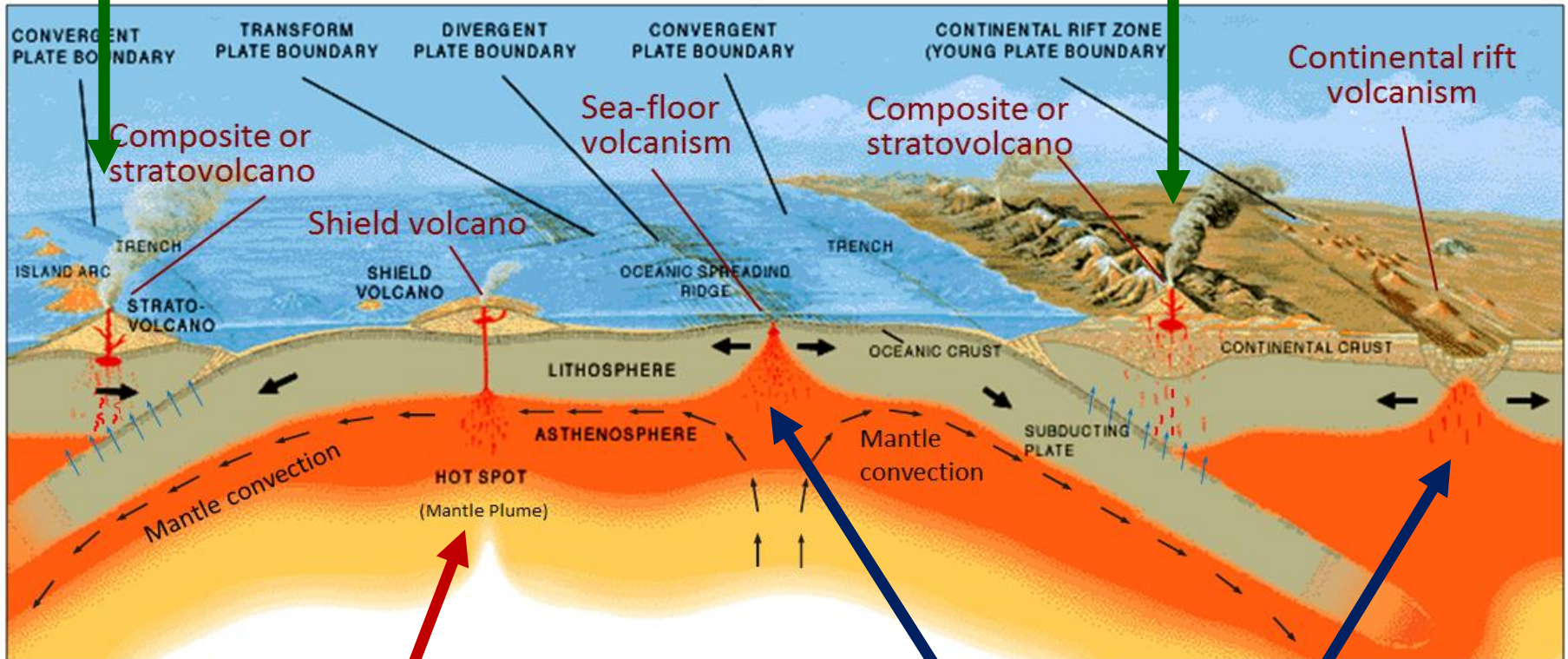
Can cover hundreds of thousands square miles!



Vesuvius ash fall zone was roughly 100 times smaller than that of the latest (640,000 YA) **Yellowstone** eruption!

Types of Volcanism

**Subduction zone volcanism
(most common)**



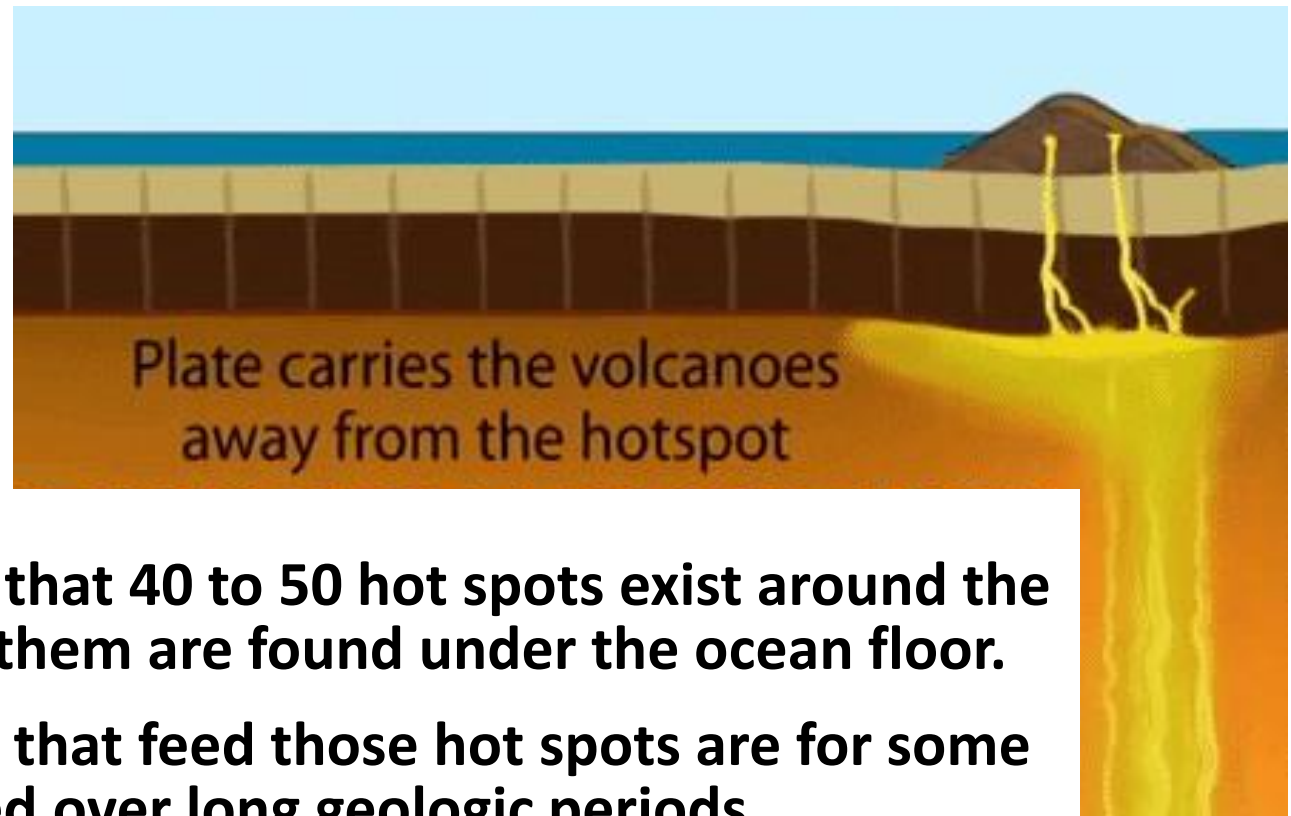
**Hot spot
volcanism (rare)**

**Spreading
ridge/rift volcanism**

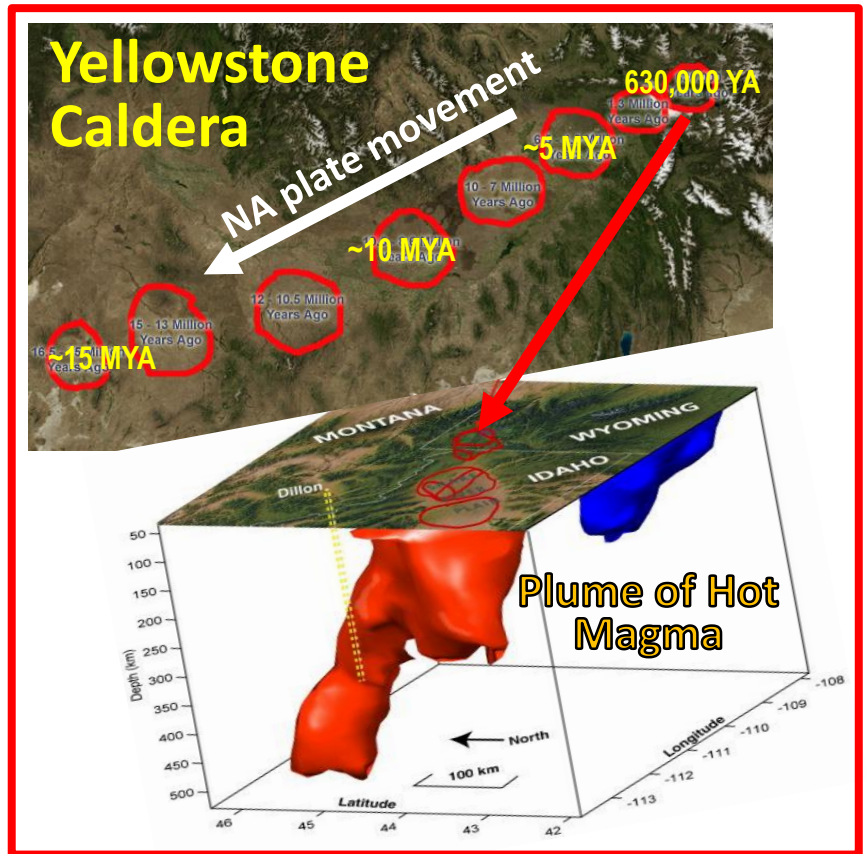
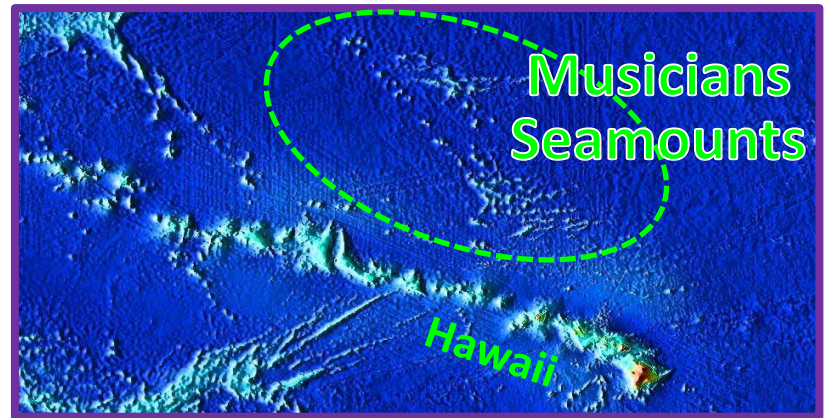
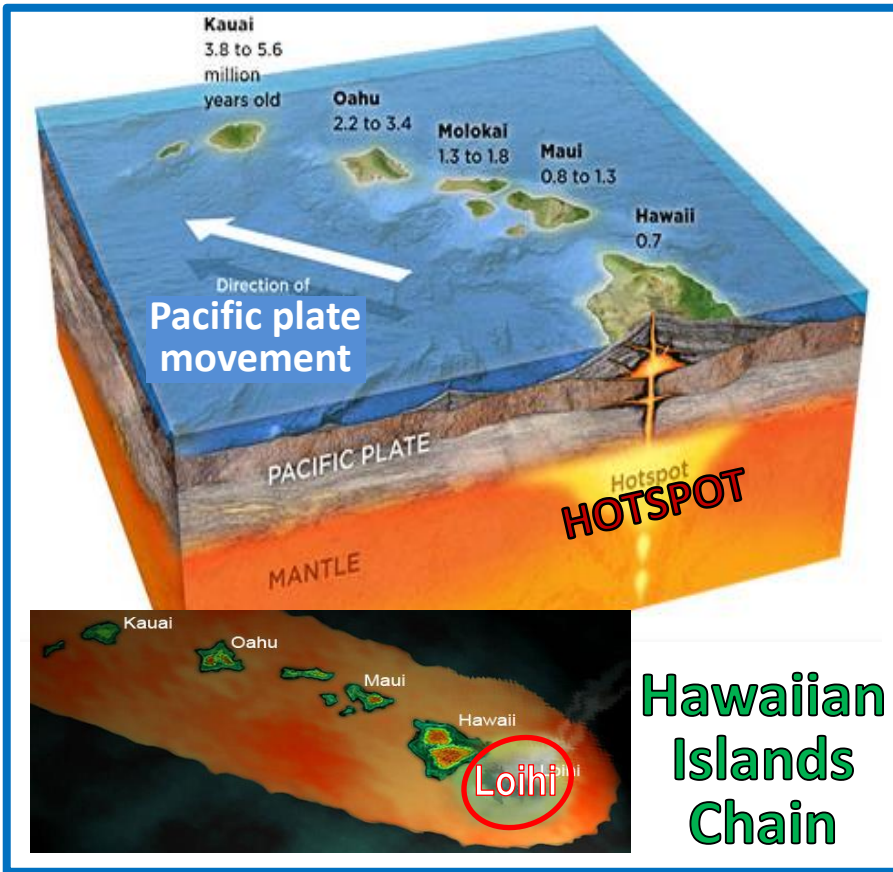
Hot Spot Volcanism

Hot spots are due to a **plume of hot magma** flowing up to the crust from the core-mantle boundary.

- Over time, the **tectonic plates of the Earth move over** the hot spots leaving a **trail of volcanoes**.



- Scientists think that 40 to 50 hot spots exist around the world; most of them are found under the ocean floor.
- Magma plumes that feed those hot spots are for some reason sustained over long geologic periods.
- Volcanoes carried far away from the hot spot become **extinct**.



Volcanic Landforms: Caldera

(Spanish for “cooking pot”)

Volcano rapidly empties its magma chamber, and support is lost. Overlying material collapses into the magma chamber: a caldera forms.

- **Explosive calderas**

Silica-rich magma feeding these volcanoes has high viscosity; gases tend to become trapped at high pressure within the magma, resulting in explosion.

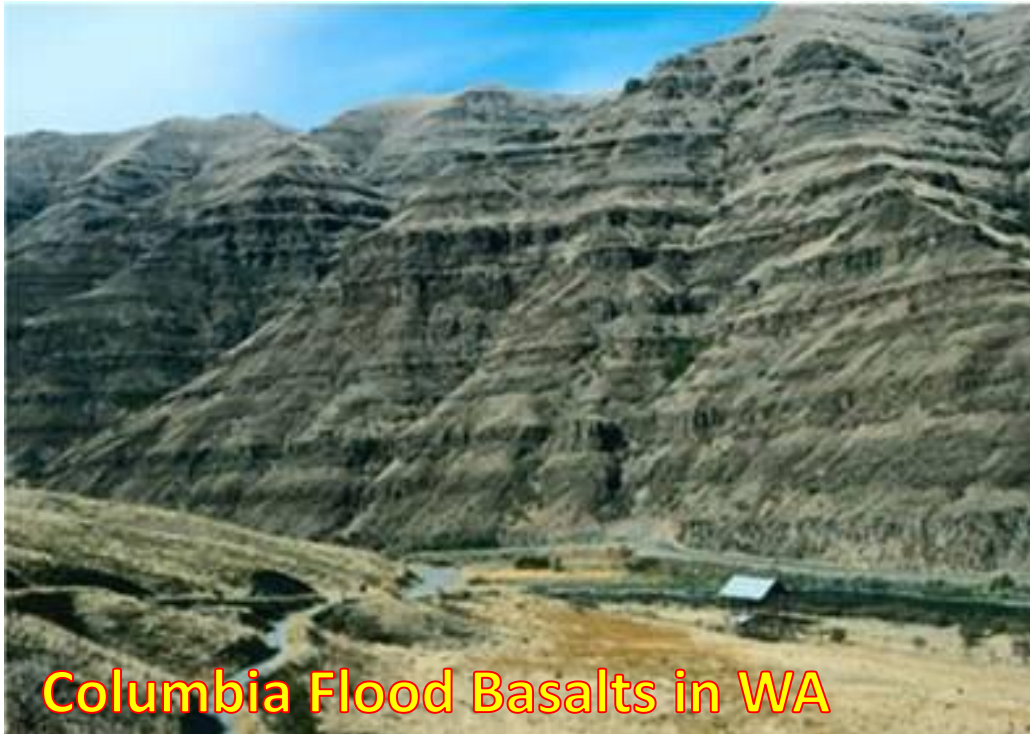


- **Non-explosive calderas**

Basaltic magma feeding these volcanoes is silica poor and much less viscous; the magma chamber is drained by large lava flows rather than by explosive events.



Volcanic Landforms: Flood Basalts



Columbia Flood Basalts in WA

- Multiple, “quiet” eruptions
- Lava *plateau* forms
- Flood basalt volcanism has been connected to major mass extinction events in the past.

- Large (10-100 square miles) outpourings of very low viscosity basaltic lava

