

A photograph of a vast agricultural field, likely a cornfield, with rows of crops stretching to the horizon under a clear blue sky. The rows are evenly spaced and recede into the distance, creating a strong sense of perspective. The crops are a vibrant green color. In the far distance, there are some trees and utility poles on the horizon line.

Earthquakes

Miss Clement

What do mountains
and earthquakes
have in common?









Earthquakes and Plate Tectonics

- Earthquakes are vibrations of the earth's crust.
- Usually occurs when rocks under stress suddenly shift along a fault.
- When the stress becomes too great along a fault, rocks suddenly slip and grind past each other.
- This slipping causes trembling and vibrations of an earthquake.

Elastic Rebound Theory

- According to the theory, the rocks on each side of a fault are moving slowly.
- If the fault is locked, stress in the rocks increases.
- When the stress reaches a certain point, the rocks react by
 - fracturing,
 - separating at their weak point
 - Springing back to their original shape
 - Or rebound

Elastic Rebound Theory

- As they slip into their new position, the rocks energy is released in form of vibrations called seismic waves.
- The release of this stress, often increase stress in other rocks along the fault, causing them to fracture and spring back.
- This reaction is the reason that many earthquakes have aftershocks.

Elastic Rebound Theory

- Where the slippage occurs is known as the **focus** of the earthquake.
- The point on the earth surface where the slippage occurs is known as the **epicenter**.
- Seismic Waves are sent outward in all direction from the focus.

Depths of Earthquake Focuses

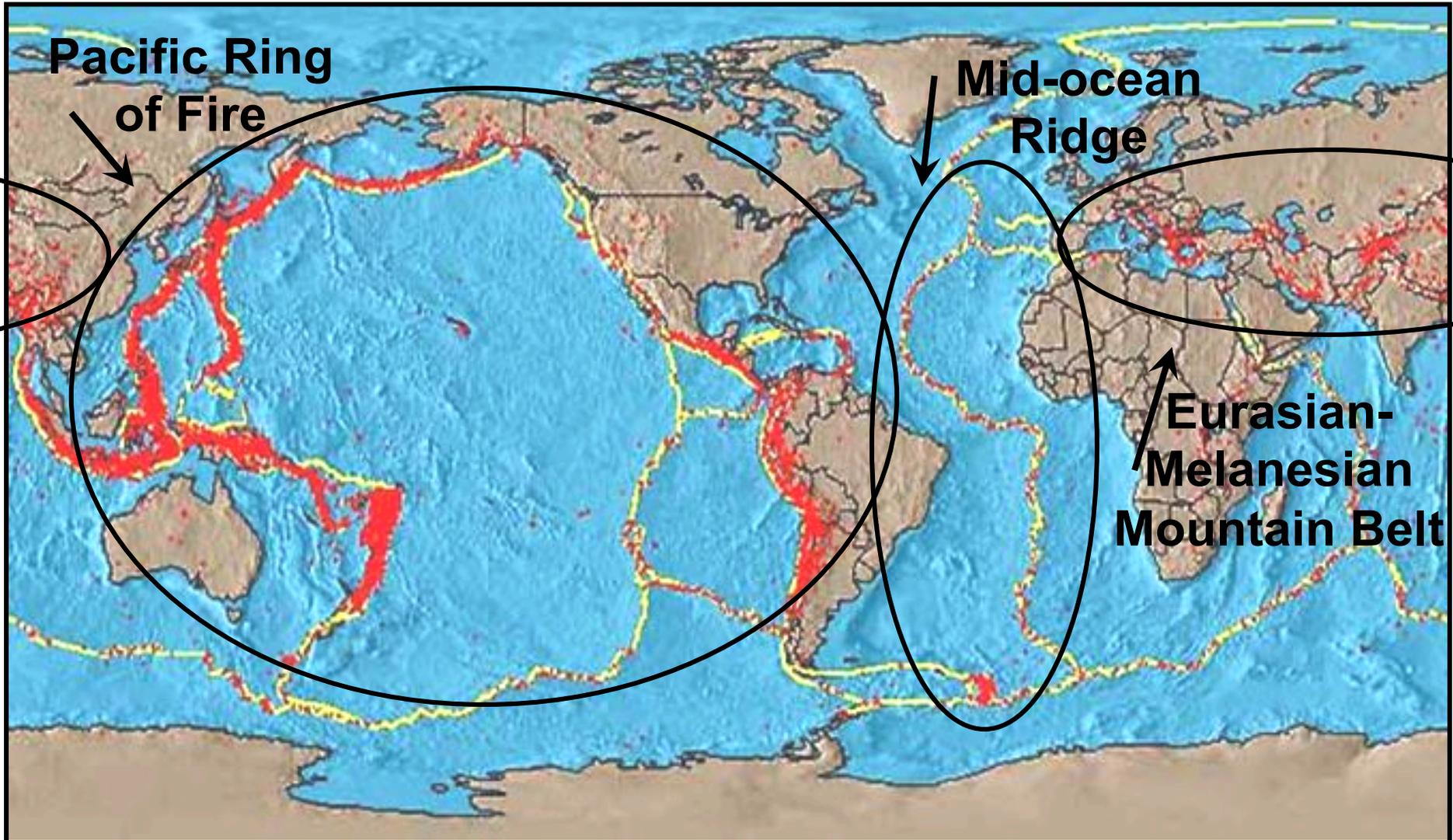
90% of earthquakes have a **shallow focus**.

- **Shallow-focus** earthquakes have a depth of **70km or less**.
- **Intermediate-focus** earthquakes occur at **70-300km**.
- **Deep-focus** earthquakes occur at **300-650km**.
 - Why do you think earthquakes do not happen

Major Earthquake Zones

- Most earthquakes occur along the edges of lithospheric plates.
 - The largest zone is known as the **Pacific Ridge of Fire.**
 - Second major earthquake zone is along the Mid-Atlantic Ridge.
 - The third zone is the Eurasian- Melanesian Mountain Belt

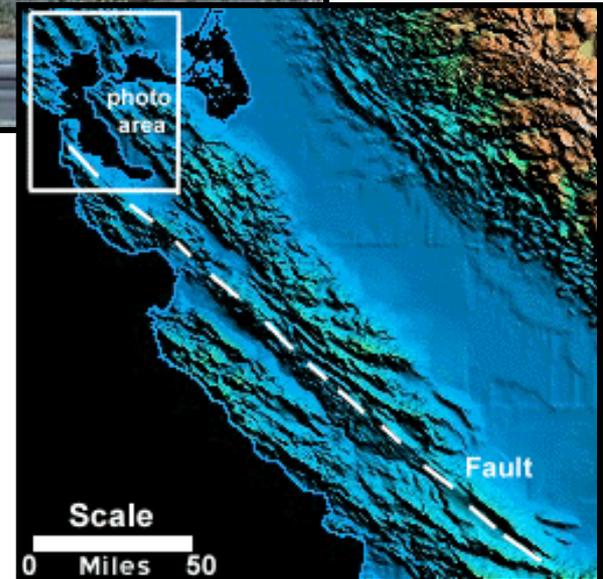
Major Earthquake Zones



Fault Zones

- Fault Zones are groups of interconnecting faults that come together on a boundary.
 - Example: San Andres Fault Zone
- Any such movement along the zone could cause a major earthquake.
- However, not all earthquakes occur along a plate boundaries.

San Andres Fault



Review Questions

1. Explain the rebound theory.
2. In earthquakes that cause the greatest damage, at what depth would slippage most likely occur?
3. Why don't earthquakes occur below 650km under the surface?