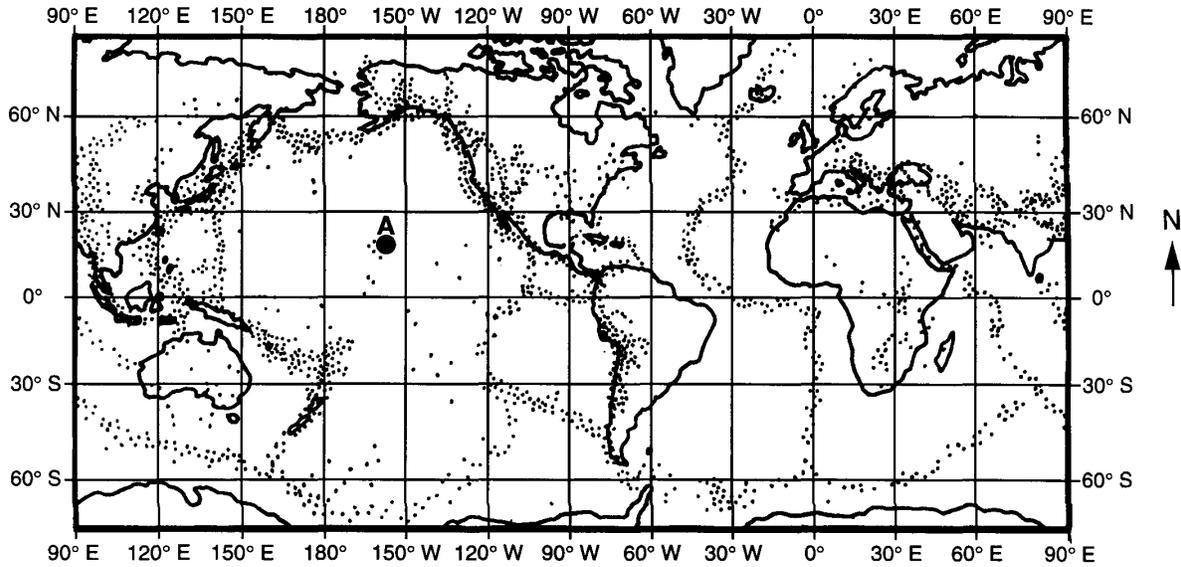


Mini-Lesson

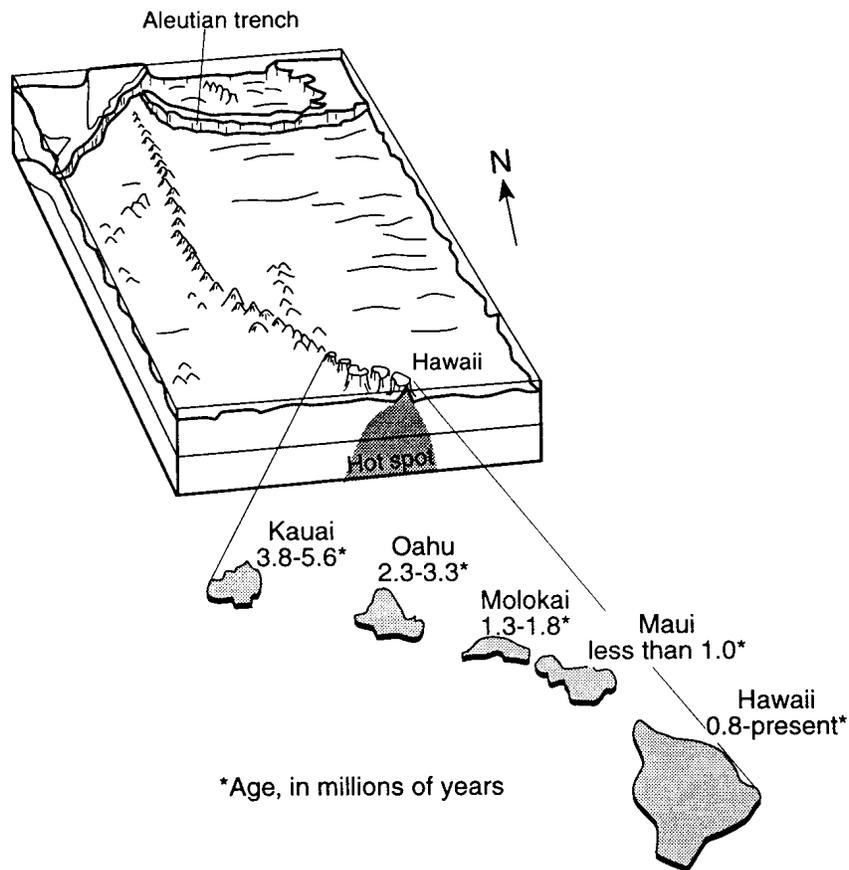
1) Base your answer to the following question on the map below. Dots on the map show the distribution of major earthquake epicenters. The shaded circle labeled A represents a location on Earth's surface.



Location A is best described as an area that is

- A) within a rift valley at a mid-ocean ridge
- B) at the boundary between two diverging plates
- C) within a deep-sea trench between two converging plates
- D) above a mantle hot spot near the center of a crustal plate

2) The block diagram below shows the bedrock age as measured by radioactive dating and the present location of part of the Hawaiian Island chain. These volcanic islands may have formed as the Pacific Plate moved over a mantle hot spot.

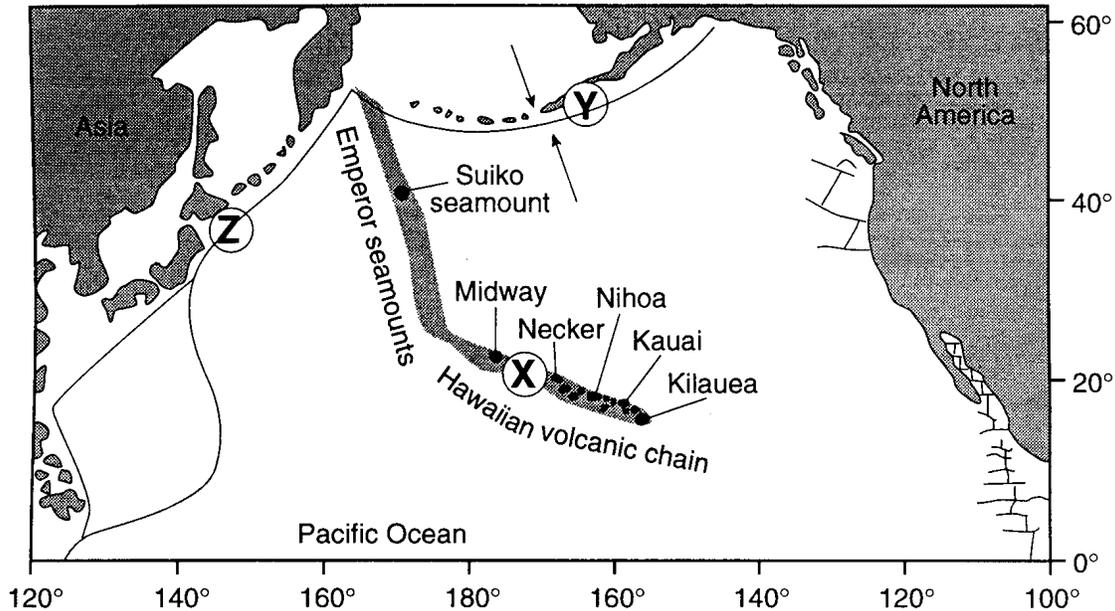


This diagram provides evidence that the Pacific Crustal Plate was moving toward the

- A) south      B) east      C) southwest      D) northwest

Base your answers to questions 3 and 4 on the map and data table below. The map shows the locations of volcanic islands and seamounts that erupted on the seafloor of the Pacific Plate as it moved northwest over a stationary mantle hotspot beneath the lithosphere. The hotspot is currently under Kilauea. Island size is not drawn to scale. Locations X, Y and Z are on Earth's surface.

Map of Volcanic Features

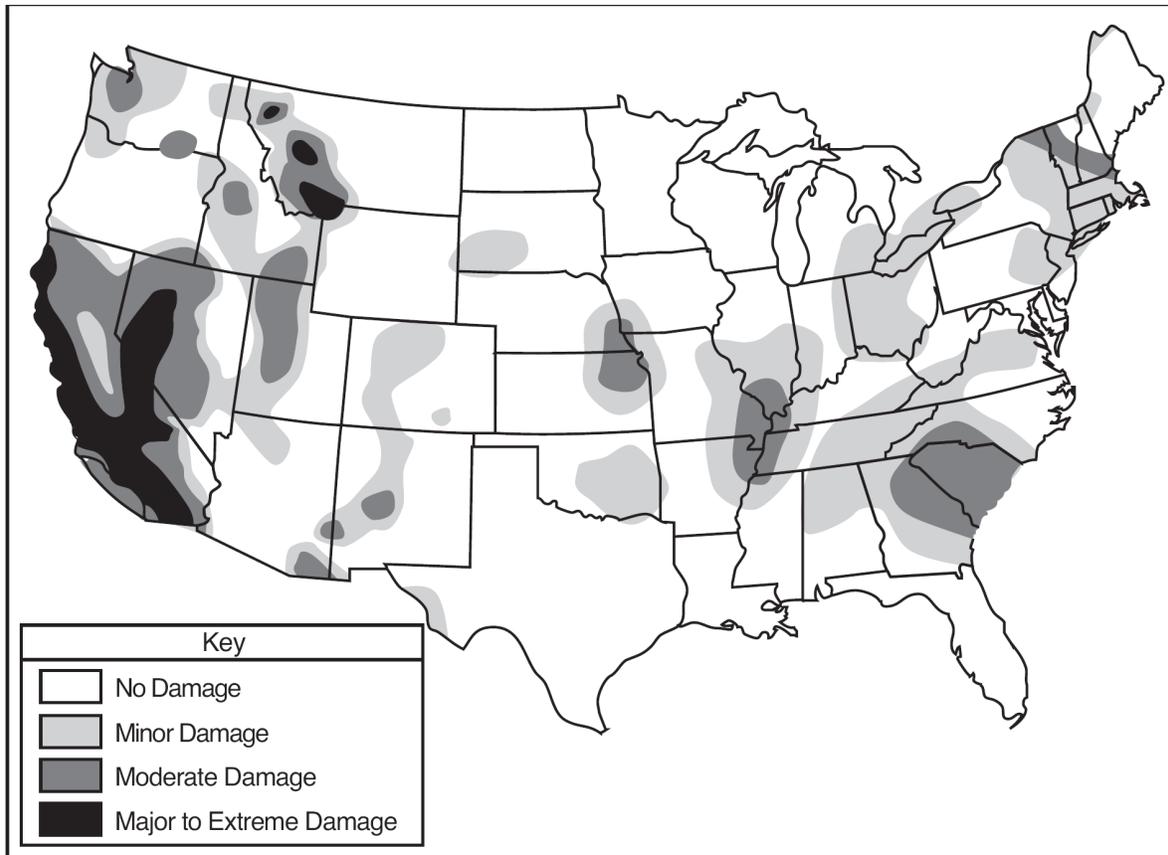


Data Table  
Age of Volcanic Features

Volcanic Feature	Distance from Kilauea (km)	Age (millions of years)
Kauai	545	5.6
Nihoa	800	6.9
Necker	1,070	10.4
Midway	2,450	16.2
Suiko seamount	4,950	41.0

- 3) Approximately how far has location X moved from its original location over the hotspot?
- A) 3,600 km    B) 2,500 km    C) 1,800 km    D) 20 km
- 4) According to the data table, what is the approximate speed at which the island of Kauai has been moving away from the mantle hotspot, in kilometers per million years?
- A) 1    B) 10    C) 100    D) 1,000

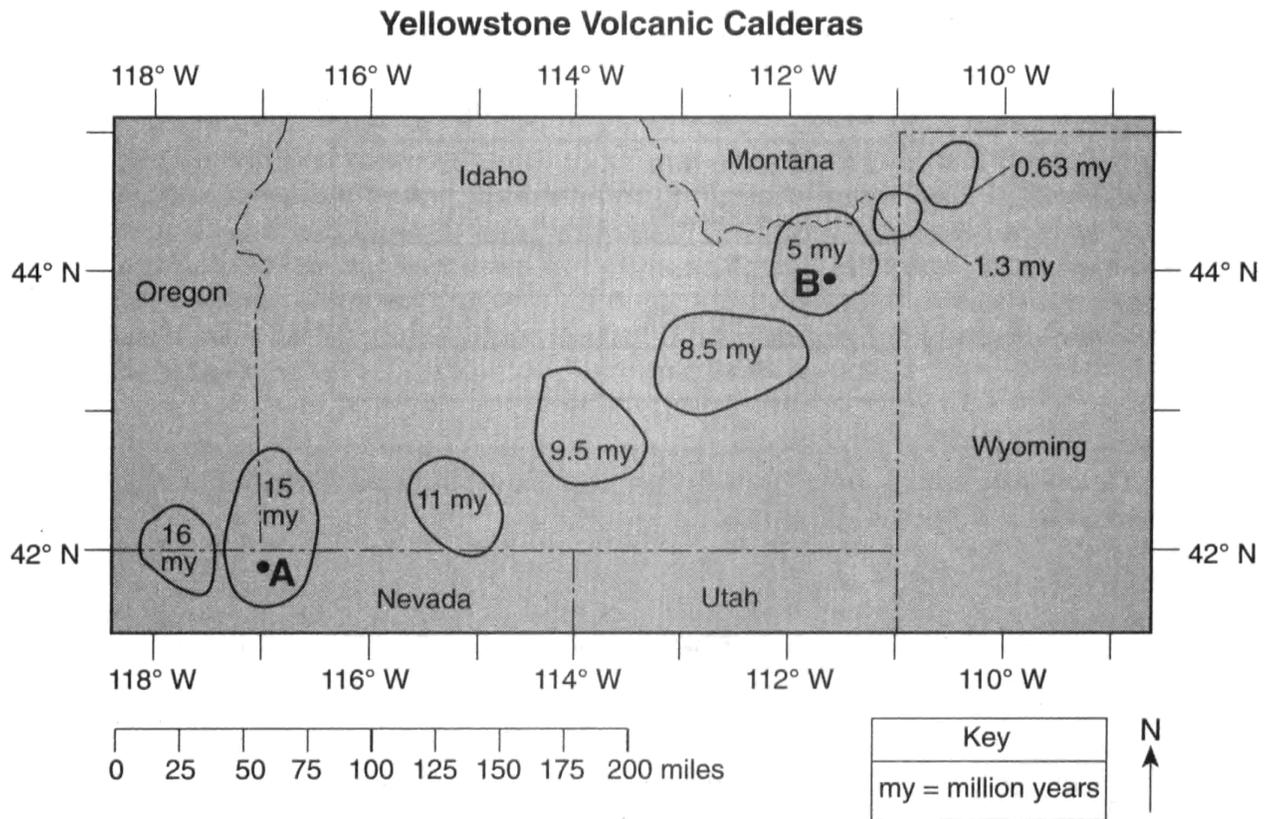
5) Base your answer to the following question on the map below, which shows the risk of damage from seismic activity in the United States.



In the United States, most of the major damage expected from a future earthquake is predicted to occur near a

- A) divergent plate boundary, only
- B) convergent plate boundary, only
- C) mid-ocean ridge and a divergent plate boundary
- D) transform plate boundary and a hot spot

6) Base your answer to the following question on the map and passage below. The map shows the outlines and ages of several calderas created as a result of volcanic activity over the last 16 million years as the North American Plate moved over the Yellowstone Hot Spot. *A* and *B* represent locations within the calderas.



### The Yellowstone Hot Spot

The Yellowstone Hot Spot has interacted with the North American Plate, causing widespread outpourings of basalt that buried about 200,000 square miles under layers of lava flows that are a half mile or more thick. Some of the basaltic magma produced by the hot spot accumulates near the base of the plate, where it melts the crust above. The melted crust, in turn, rises closer to the surface to form large reservoirs of potentially explosive rhyolite magma. Catastrophic eruptions have partly emptied some of these reservoirs, causing their roofs to collapse. The resulting craters, some of which are more than 30 miles across, are known as volcanic calderas.

The Yellowstone Hot Spot

Calculate, in miles per million years, the rate at which the North American Plate has moved over the Yellowstone Hot Spot between point *A* and point *B*.