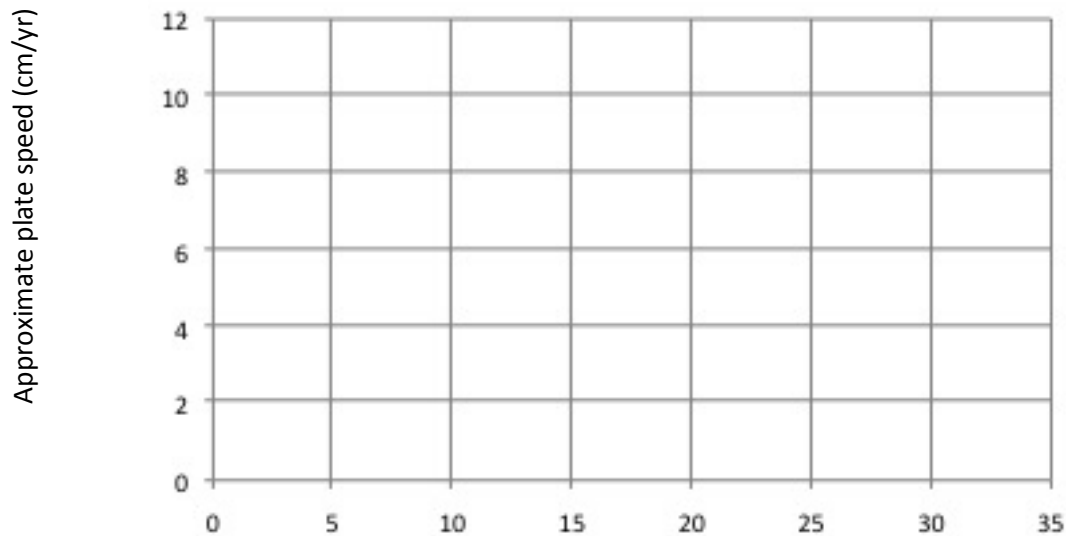


Figure The Hawaiian-Emperor volcanic chain showing ages (Ma) of particular islands or seamounts. (After D. A. Clague and others, 1975)

The figure above shows the Hawaiian Island chain and Emperor Seamount chain, both theorized to have formed from the same hotspot under the Pacific plate. The data given represents the approximate age of some of the islands and seamounts in millions of years before present (Ma).

1. On the figure above, circle the exact location where you would expect to find active volcanoes today and explain below why you would expect to find them there. (3 pts)
2. If the length of the Emperor Seamounts is about 1800 km, what was the average speed AND direction of the Pacific plate from 70 to 40 million years ago? (4 pts)
3. If the distance from the Big Island of Hawaii (age < 2 million years) to Necker (age about 10 million years) is about 1000 km, what was the average speed AND direction of the Pacific plate from 10 million years ago to present? (4 pts)

4. On the axes below, graph the approximate speed of the Pacific plate over the past 30 million years. (3 pts)



5. Unlike the Hawaiian Islands, there are many active and recent volcanoes along the entire stretch of the Aleutian Island arc. What type of zone or geologic feature is most likely found there? How do you know? (4 pts)
6. Why would you expect earthquakes near the Aleutian Island arc to be deeper than the earthquakes near Hawaii? (2 pts)