

Introduction to Oceanography

EAS 4300

Homework #3:

Plate Tectonic

A) Figure 1 shows a map of the earth topography from satellite. Draw approximately the boundaries between plates. For each boundary area indicate if it is a constructive or destructive margin. Explain the differences between these two type of margins.

B) Indicate the relative age of the oceanic crust at locations A,B,C,D and E along the black lines drawn in the figure. Use the following labels: VO (very old oceanic crust), O (old oceanic crust) and Y (young oceanic crust). Is there a relationship between the age of the oceanic crust and the depth of the basin? Explain.

C) Label three regions where you would expect volcanic activity and explain why. Use the labels V1, V2 and V3.

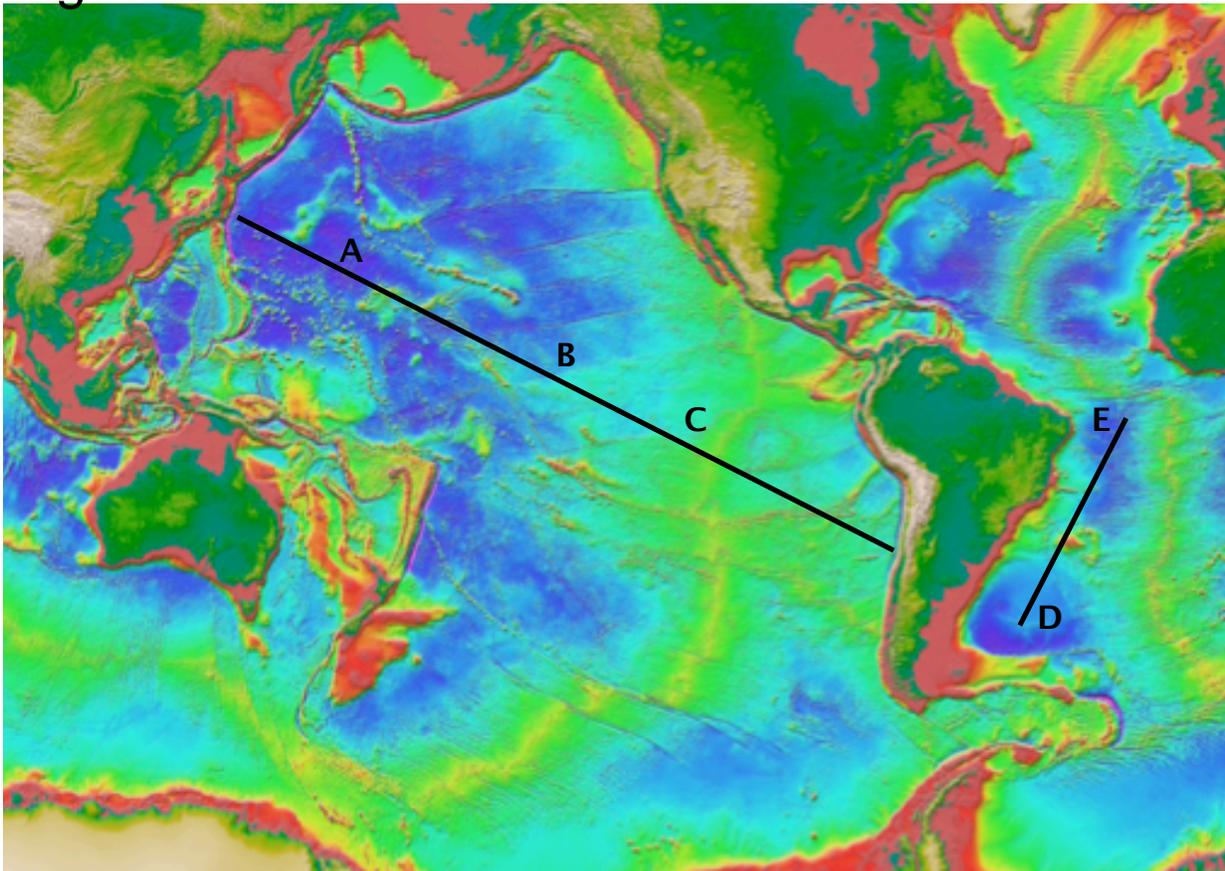


Figure 1

Sea Level

A) Figure 2 Panel A shows a diagram with two axes, the timing and the amplitude of sea level changes. List at least 4 processes that contribute to sea level corresponding to the black markers (label the diagram). Indicate also if these changes are Eustatic. For each process give a brief description.

B) Figure 2 Panel B shows how sea level has changed in the geologic past. Can you explain what process caused the peak at location Time X. Please explain why sea level went up and then why it went down.

C) What is Post Glacial Rebound (PGR)? How are changes in sea level associated with PGR different from those associated with 'steric' effects? Will global warming affect these two types of sea level change? If yes, how and with what speed?

D) What is the range of projections for global sea level rise by 2100AD, according to the IPCC? Explain why the IPCC may drastically under-estimate 21st century sea level rise?

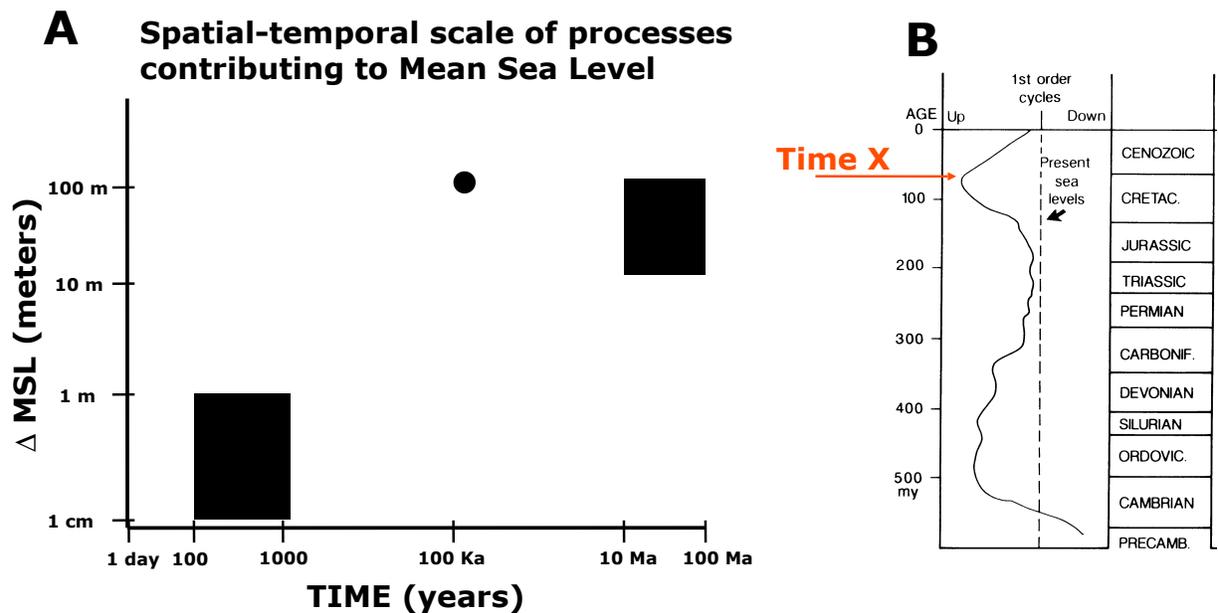


Figure 2