

**G322 Lab Exercise**  
**Neotectonic and Coastal Processes of Oregon**

**Part I. Pre-Lab Questions**

Use your notes, textbook, wall maps, and reading assignments to answer the following questions.

A. Match the Following Coastal Locations with the terms on the Right. List all that apply.

_____	1. Oregon Coast	Passive Margin Tectonics (inactive)
_____	2. Washington Coast	Active Margin Tectonics - subduction
_____	3. Southern California Coast	Active Margin Tectonics - transform
_____	4. Northern California Coast	Active Margin Tectonics - rifting / spreading
_____	5. Aleutian Islands of Alaska	Emergent Coastline
_____	6. Southeast Alaskan Coast	Submergent Coastline
_____	7. Gulf of Mexico - Texas	Active Subsidence
_____	8. Central Atlantic / U.S.	Active Uplift

B. Thinking Questions

9. The last major glaciation (i.e. a pervasive cold-wet climate regime) in the northern hemisphere was at its peak 18,000 to 20,000 years ago. 100's to 1000' of feet of Ice covered much of Canada and the northern tier of the U.S.

A. From what major hydrologic source does the precipitation that forms glacial ice originate?

B. Describe how this moisture is cycled into glacial ice (what are the processes associated with this part of the hydrologic cycle).

C. What happens to global sea level during a major glacial climate? What happens to global sea level during a major interglacial (i.e. warm / melting) climate?

D. What happens to land surface elevation at convergent tectonic boundaries (i.e. subduction zones), especially where accretionary tectonics is prevalent?

E. What happens to land surface elevation at passive tectonic boundaries, where sediment accumulates over time (think about what happens to water saturated sediment as it accumulates, becoming thicker over time, under increasing weight).

10. If global sea level is rising at a rate of 2 mm/yr, at a passive continental margin, how long will it take for sea level to rise 5 m? Show your math work.

11. If global sea level is rising at a rate of 5 mm/yr, and an active tectonic coastline is experiencing uplift at a rate of 5 mm/yr, what will be the net relative rate of sea level change at this location? Show your math work.
12. If global sea level is rising at a rate of 3 mm /yr, and a passive margin coastline is actively subsiding at a rate of 5 mm /yr, what will be the net relative rate of sea level change at this location? Show your math work. Is this coastline best characterized as "emergent" or "submergent"?
13. If global sea level is rising at a rate of 1 mm/yr and an active tectonic coastline is experiencing uplift at a rate of 5 mm/yr, what will be the net relative rate of sea level change at this location? Show your math work. Is this coastline best characterized as "emergent" or "submergent"?
14. List two dominant oceanic processes associated with the Oregon Coast.
15. List two dominant tectonic processes associated with the Oregon Coast.
16. List three geologic hazards that you can think of, associated with the Oregon Coast (think about the news reports that you hear every year).
17. In terms of temperature as related to the physics of volume expansion / contraction (think hot air balloon), which condition would have a greater volume, warm sea water or cold sea water?
18. In terms of density driven currents: warm sea water is \_\_\_\_\_ (more dense or less dense?) compared to cold sea water. Therefore, warm sea water will tend to \_\_\_\_\_ (rise or sink), and cold sea water will tend to \_\_\_\_\_(rise or sink?).
19. Similarly, in terms of density-driven motion in rock material: hot, young oceanic crust is \_\_\_\_\_ (more dense or less dense?) compared to cold, old oceanic crust. Therefore, hot, young oceanic crust will tend to (rise or sink?), and cold, old oceanic crust will tend to \_\_\_\_\_ (rise or sink?).
20. Question for you: What would happen to global sea level under conditions of very rapid seafloor spreading? Why?

What would happen to global sea level under conditions of very slow seafloor spreading? Why?