

Question 3-9. For the sake of simplicity, let's assume that the Oregon coast has been tectonically stable for the late Pleistocene (which, we know is false, but let's make it simple). According to the graph in Fig. 5D, what was the position of relative sea level, compared to modern, along the Oregon coast 120,000 years ago? How about 50,000 years ago?

Task 5C. Figure 5E is a topographic profile of the Oregon coast at the latitude of Newport. Note the position of modern sea level, the continental shelf, and continental slope. Using colored pencils, draw and label the position of sea level along the Oregon coast at 120,000 years ago and 50,000 years ago (refer back to your graph in Fig. 5D).

Question 3-10. Comment on what the topography of the Oregon coast looked like 120,000 and 50,000 years ago, compared to that of today. Were there rocky shorelines and sea cliffs? Was there more or less "beach" area. What did the coastal rivers (e.g. Yaquina, Nestucca, Columbia) look like at those times, compared to today? Draw diagrams as necessary to support your answer.

Part 4. Rates of Coastal Erosion in Oregon.

Coastal Oregon is very dynamic with respect to geomorphic process. Cliff erosion, beach erosion, landsliding, and flooding are common occurrences, particularly during the stormy winter months. Each year, millions of dollars in damage occurs to property along the Oregon coast. The understanding of geomorphic process is critical for the appropriate design of land-use regulations and housing plans.

Figure 6 is a map of the Nye Beach area of Newport, OR. The Jumpoff Joe sea cliff area is a classic example of very active historic erosion along the Oregon coast. By examining historic aerial photographs, it is possible to map out the position of the sea cliffs, and the rate of erosion over time. The map shows sea cliff positions for the years 1868, 1939, and 1967. The black squares represent the position of buildings and houses during this time frame.

Task 6. Using the map data in Fig. 6, determine the historic rates of sea cliff erosion at the Nye Beach area. Fill in the table below for cross-sections A-A', B-B', and C-C'.

Section I.D.	Record Period (date range)	Retreat Distance (meters)	Time Interval (years)	Retreat Rate (m/yr)
A-A'	1868-1939	_____	_____	_____
A-A'	1939-1967	_____	_____	_____
A-A'	1868-1967	_____	_____	_____
B-B'	1868-1939	_____	_____	_____
B-B'	1939-1967	_____	_____	_____
B-B'	1868-1967	_____	_____	_____
C-C'	1868-1939	_____	_____	_____
C-C'	1939-1967	_____	_____	_____
C-C'	1868-1967	_____	_____	_____

Question 4-1. How does the rate of sea cliff erosion vary spatially from section A-A', south to section C-C' along Nye Beach?

Question 4-2. How has the rate of sea cliff erosion varied temporally between 1868 and 1967, at each of these localities? Which show the highest rates, the lowest rates, how have the rates changed over time?

Question 4-3. Hypothesize why the rates of sea cliff erosion have slowed in the Jumpoff Joe area, historically.

Question 4-4. Look at a geologic map of Oregon (e.g. on the lab room wall), what geologic unit(s) underlies the Nye Beach area? Hypothesize how bedrock geology may be controlling the spatial patterns you observed in Question 4-1.

Question 4-5. What has happened to the large cluster of houses between points B and B'? When did this happen? List the processes that were likely involved.

Question 4-6. Given the 1939-1967 rates of erosion in the Jumpoff Joe area (line A-A'), how long did it take for the three houses southeast of the 1967 shoreline to bite the dust? Do you think they are still there? Why or why not?

Figure 6. Map showing sea cliff retreat in the Jumpoff Joe area of Newport, Oregon (from Komar, 1992; as documented by Stembridge, 1976).

