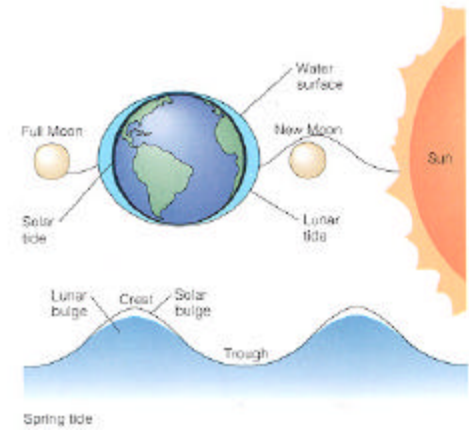
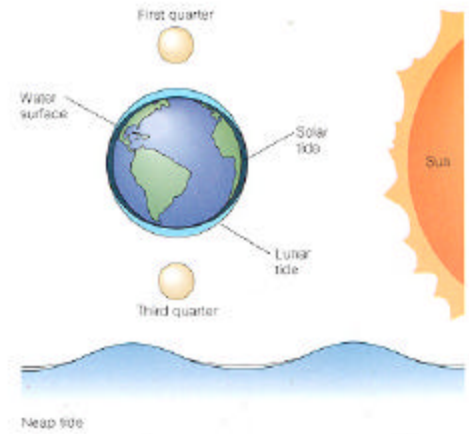
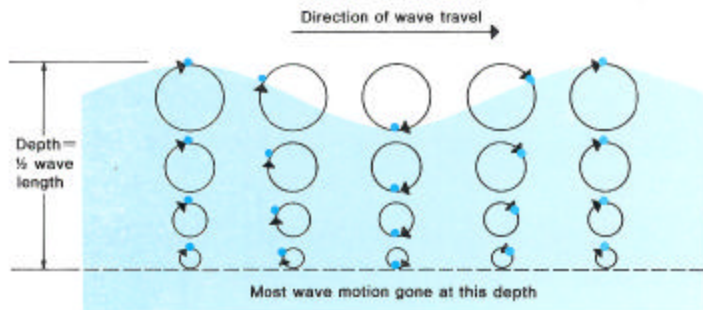
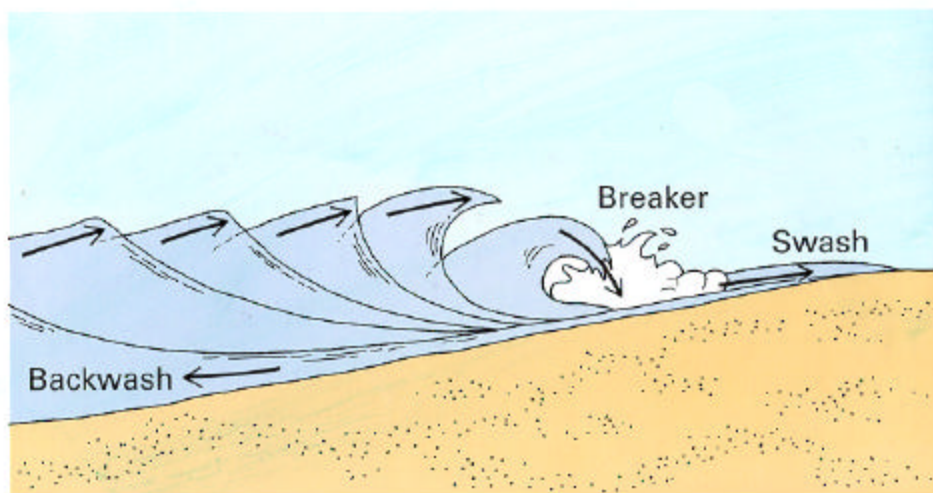


Figure 1. Coastal landforms of Oregon, consisting of stretches of rocky shorelines and headlands, separating pockets of sandy beaches. From Komar (1985).

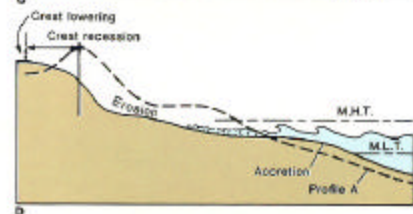
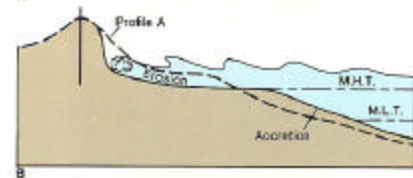
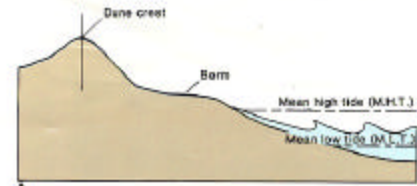
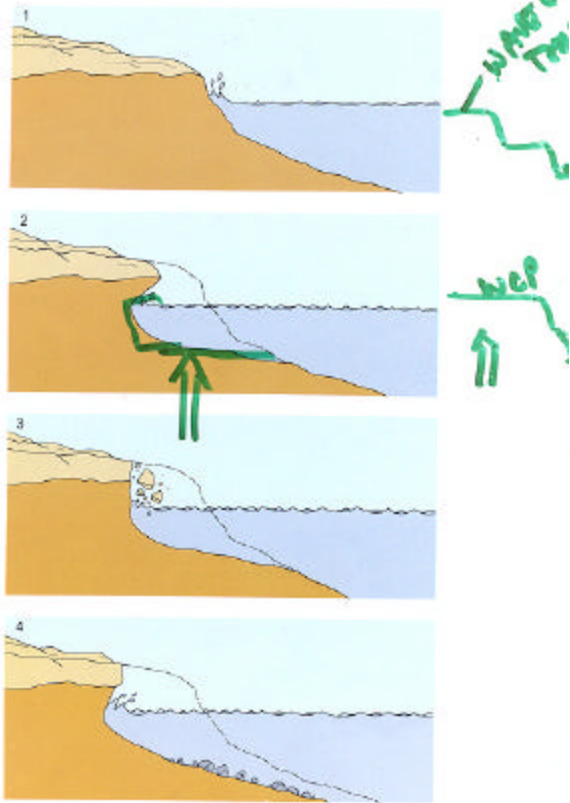


A breaking wave

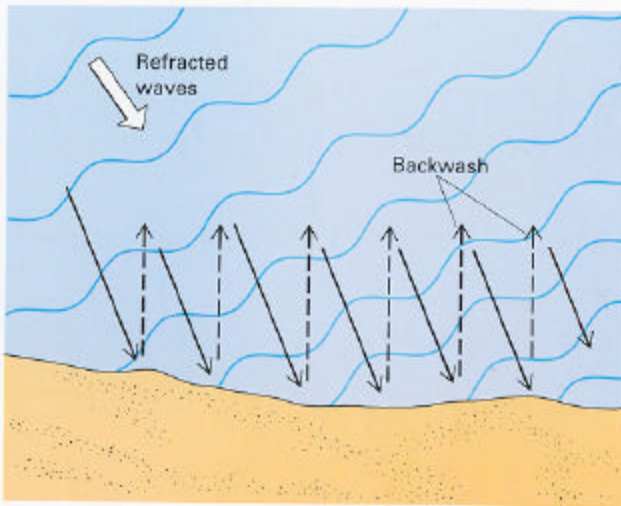
T69

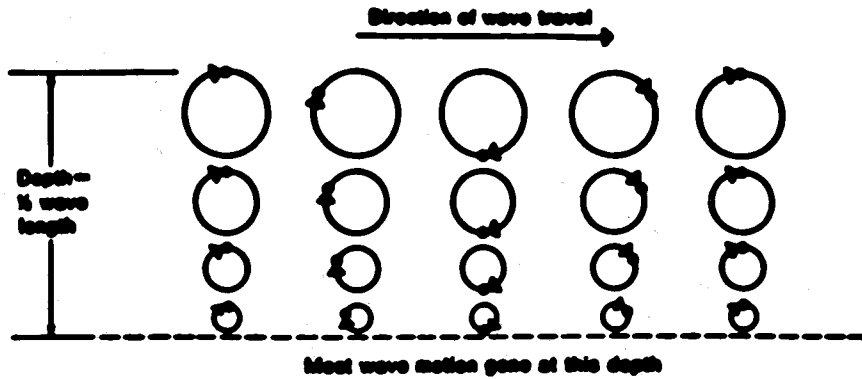


Waves pounding on exposed headlands accomplish the most effective erosion at water level

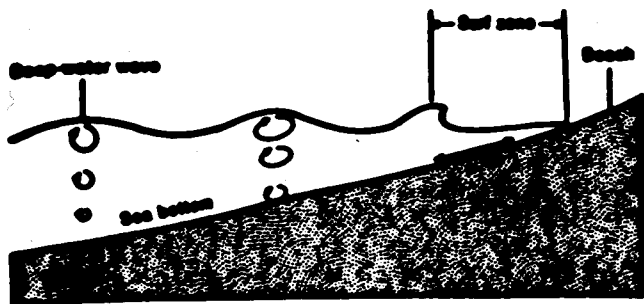


Beach drifting involves a zigzag movement in a general downwind direction along the coast

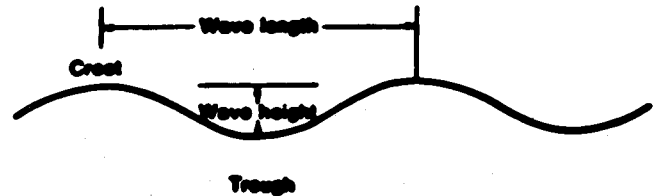




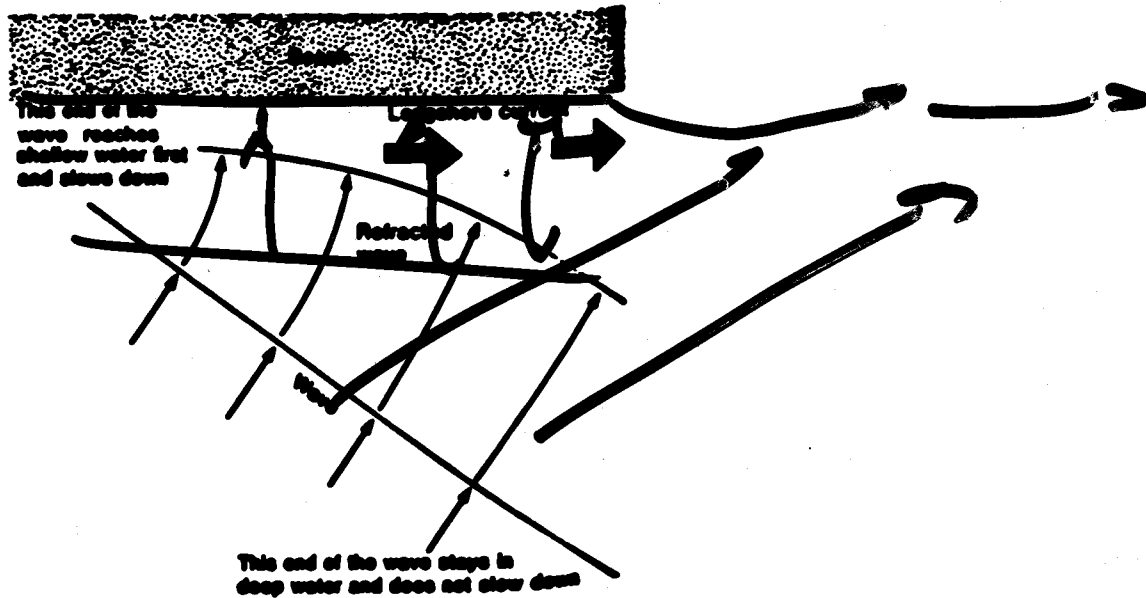
**Figure 14.3**  
 Orbital motion of water in waves dies out with depth. At the surface the diameter of the orbits is equal to the wave height.



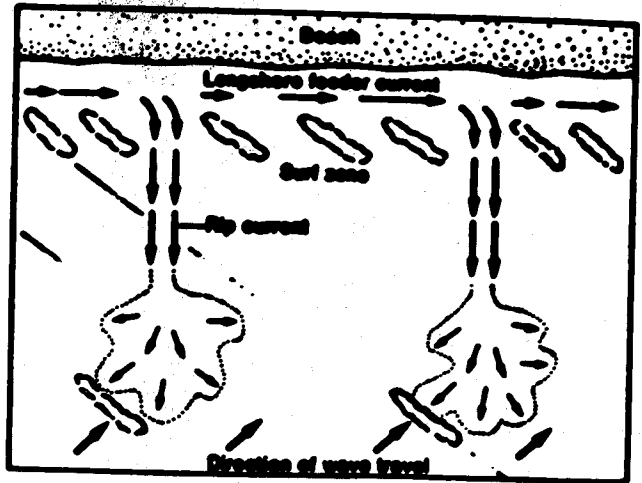
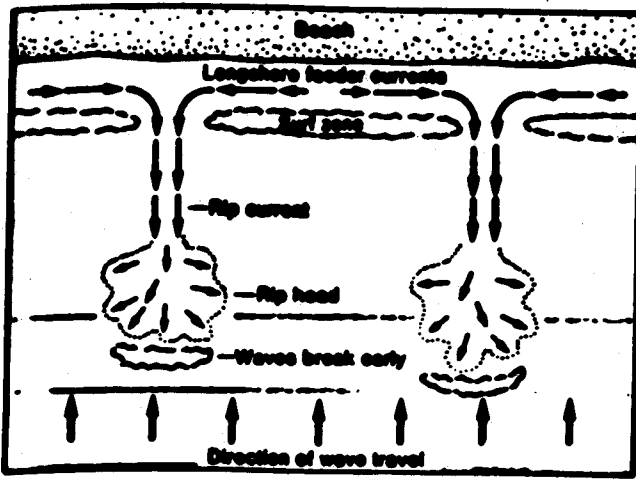
**Figure 14.4**  
 As a deep-water wave approaches shore, it begins to "feel" the sea bottom and slow down. Circular water orbits flatten and the wave peaks and breaks. In the foamy surf zone, water moves back and forth rather than in orbits.



**Figure 14.2**  
 Wave height is the vertical distance between the wave crest and the wave trough. Wave length is the horizontal distance between two crests.

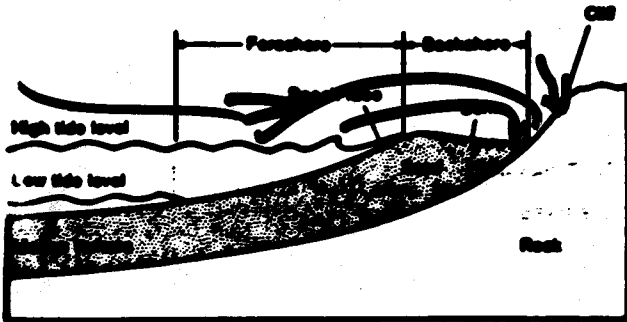
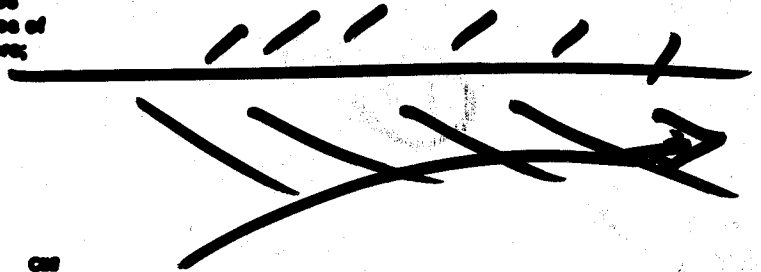


**Figure 14.6**  
 Wave refraction changes the wave direction, bending the wave so it becomes more parallel to shore. The angled approach of waves to shore sets up a longshore current parallel to the shoreline.



**Box 14.1 Figure 1**

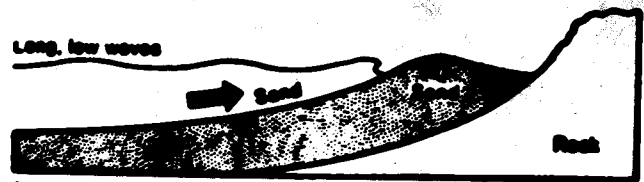
Rip currents and their feeder currents can develop regardless of the angle of approach of waves. (A) Waves approach parallel to shore; feeder currents on both sides of rip currents. (B) Waves approach at an angle to the shore; feeder current on only one side of rip current.



A

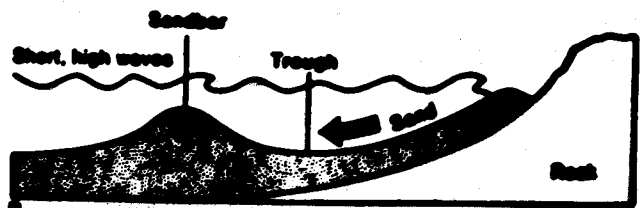
**Figure 14.7**

(A) Parts of a beach. (B) The beach face (on the left) and berm (on the right) on a northern California beach. Photo by K. Lajolis, U.S. Geological Survey.



A

Summer beach



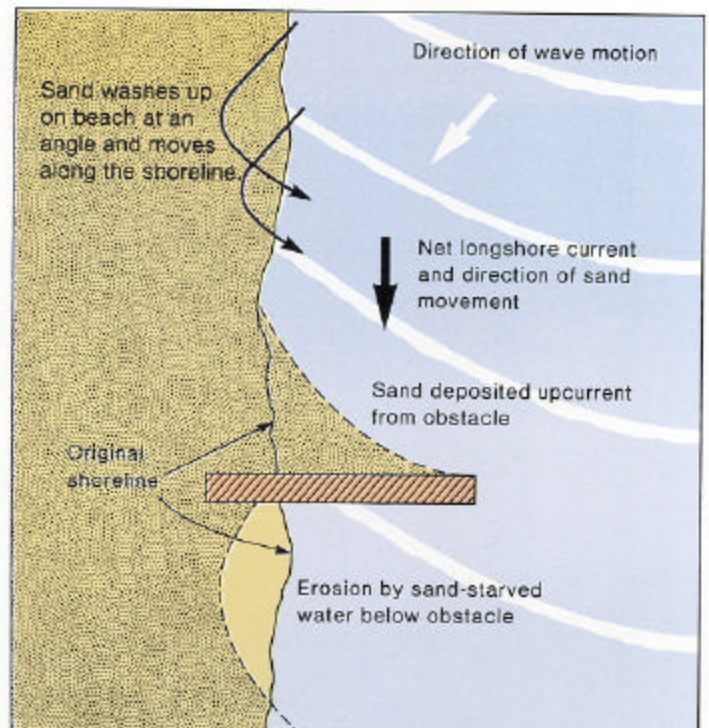
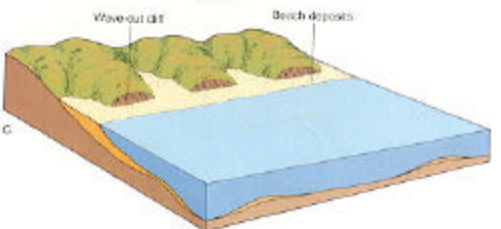
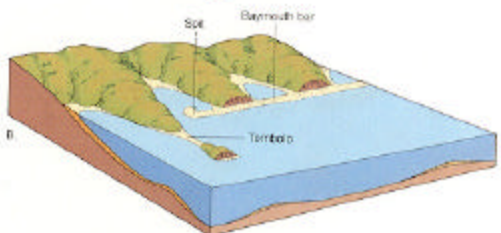
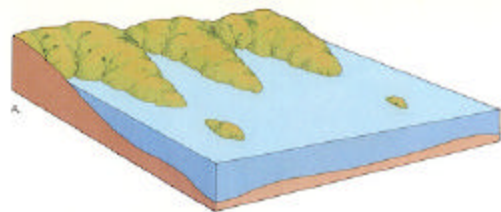
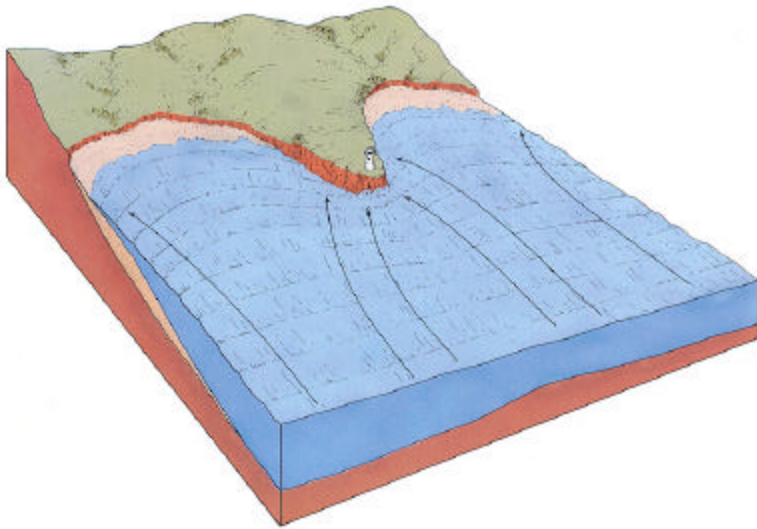
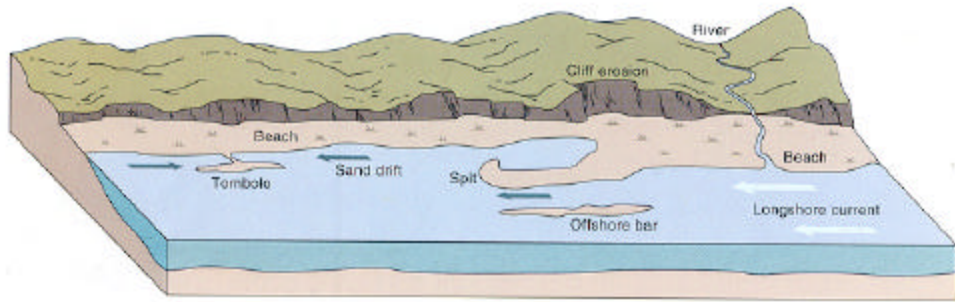
B

Winter beach

**Figure 14.8**

Seasonal cycle of a beach caused by differing wave types. (A) Summer beach. (B) Winter beach. Waves may break once on the winter sandbar, then re-form and break again on the beach face.





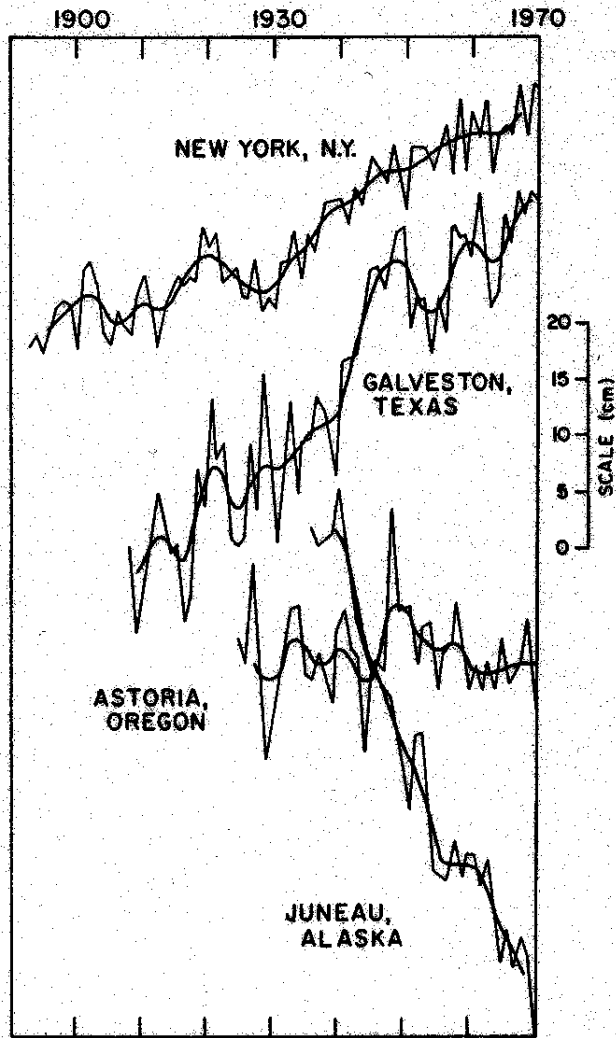


Figure 2. Yearly changes in sea levels determined from tide gauges at various coastal stations. After Hicks (1972).

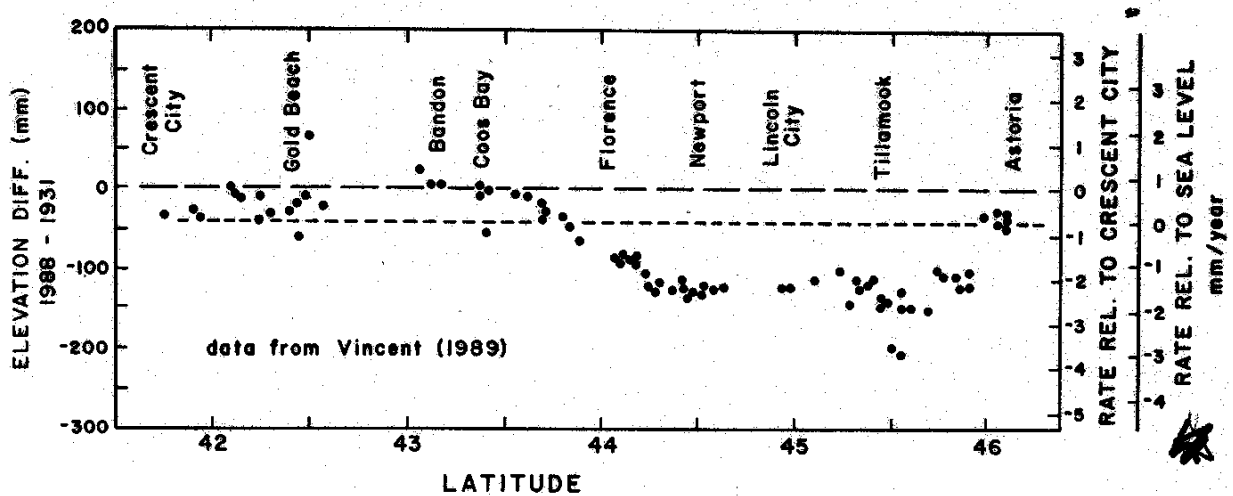
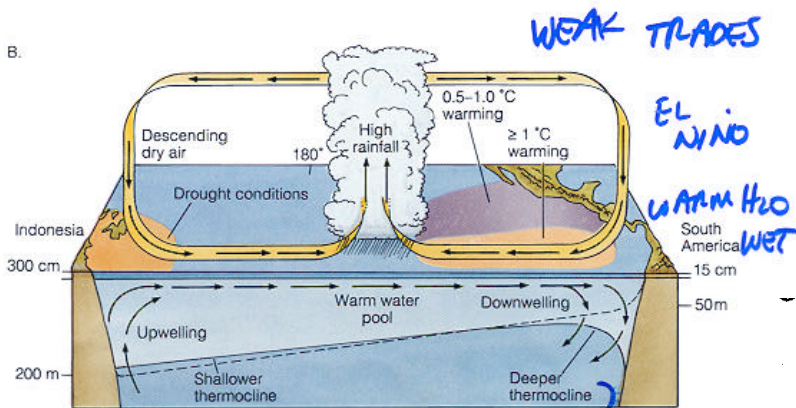
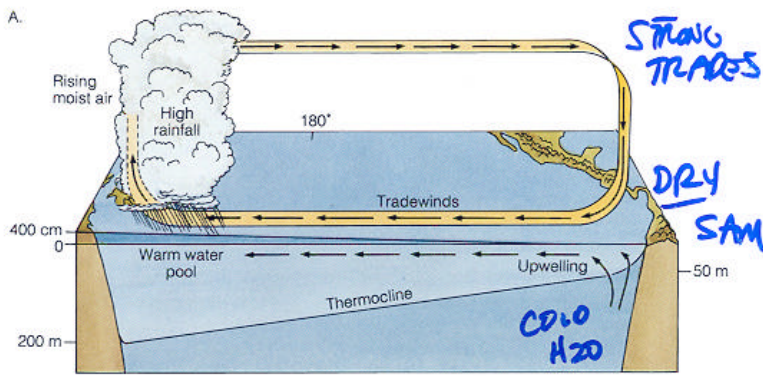


Figure 3. Elevation changes and the relationship to sea-level rise along the length of the Oregon coast from Crescent City in California north to Astoria on the Columbia River, based on repeated geodetic surveys along the coast. After Vincent (1989).



... in the samples at the end of the year,

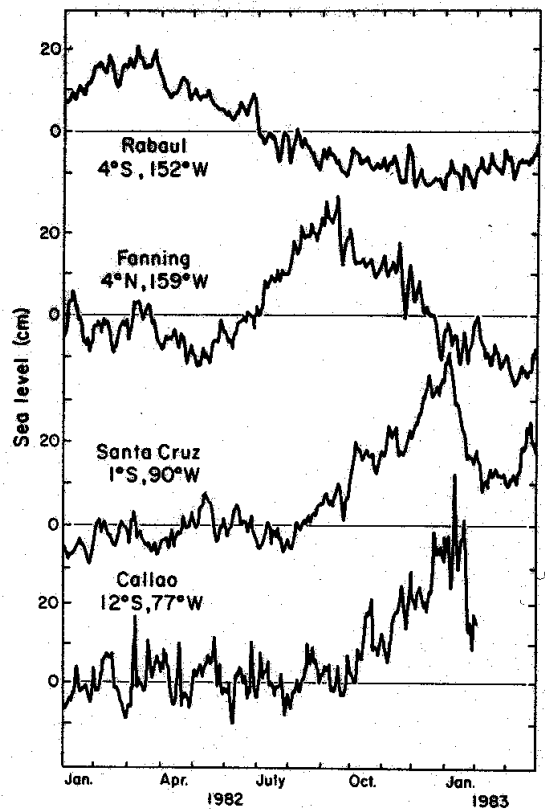


Figure 20. Sea-level "wave" during the 1982-83 El Niño measured at a sequence of islands from west to east near the equator, and finally at Callao on the coast of Peru. After Wyrski (1984).