Handout
Oceans, Coastal Processes, and Landforms

Coastal System Outputs
Coastlines are active portions of continents, with energy and sediment continuously delivered to a narrow environment. The action of tides, currents, wind, waves, and changing sea level produces a variety of erosional and depositional landforms.

Erosional Coastal Processes and Landforms
The active margins of the Pacific Ocean along the North and South American continents are characteristic coastlines affected by erosional landform processes (also called emergent coastlines). Erosional coastlines tend to be rugged, of high relief, and tectonically active, as expected from their association with the leading edge of drifting lithospheric plates. Five erosional landforms follow:

1) **Sea cliffs-** formed by the undercutting action of the sea. Indentations or "notches" are produced at water level causing the cliff to collapse and retreat.
2) **Sea arch-** formed by hydraulic pounding of ocean waves and tides and differential erosion.
3) **Sea stack-** formed by hydraulic pounding of ocean waves and tides and differential erosion; usually a result of a collapsed sea arch.
4) **Sea cave-** formed by hydraulic pounding of ocean waves and tides and differential erosion.
5) **Wave-cut platform** (aka "wave-cut terrace) - a horizontal bench in the tidal zone, extending from sea cliff out to the sea. Multiple platforms or terraces may develop over time and are indicators of an emerging coastline.

Depositional Coastal Processes and Landforms
Depositional coasts generally are located along land of gentle relief, where sediments are available from many sources (also called submergent coastlines). Such is the case with the Atlantic and Gulf coastal plains of the US, which lies along the relatively passive, trailing edge of the North American lithospheric plate. Erosional processes and inundation, particularly during storm activity, influence these depositional coasts. Four depositional landforms follow:

1) **Barrier spit -** consists of material deposited in a long ridge extending out from a coast attached at one end; it partially crosses and blocks the mouth of a bay. A spit generally forms a bay barrier after a time.
2) **Bay barrier** (aka "baymouth bar") - material deposited in a long ridge which completely cuts off the bay from the ocean and forms an inland lagoon.
3) **Tombolo -** occurs when sediment deposits on an underwater wave-built terrace connect the shoreline with an offshore island or sea stack.
4) **Beach -** (the most familiar depositional feature) a location along a coast where sediment temporarily resides while it is in active transit along the shore.