

❖ Coastlines

o Emergent coasts

- Uplifted, tectonically active coasts often rocky
- Land uplifts/sea level drops
- Rocky headlands alternate with pocket beaches formed by wave erosion

o Erosion coastal features

- Wave cut platforms
 - Breaking waves + pebbles/boulders/etc. = erosion
 - Abrasion across surf zone erodes bedrock flat - common feature on rocky coasts
- Sea stacks
 - Remnants of erosion
 - Arch has collapsed
- Sea arches
 - Remnants of erosion
- Uplifted beach terraces
 - Can be either wave cut platforms or beaches or both
 - Common on emergent coasts

o Submergent coasts

- Land drops/sea level rise
- Estuary: drowned river valley
- Tied Island: island connected to mainland by tombolo
- Fjord: drowned glacier valley

❖ Tides

o Ocean tides are the result of the gravitational attraction of the moon and sun on the ocean

- Causes the water to bulge outward on the side nearest to the moon
- On the opposite side, inertia created by Earth's rotation causes ocean water to bulge outward in the opposite direction
- 2 oceanic bulges so 2 sets of tides daily
- When a location lies under a bulge, it experiences a high tide & when a location passes under a depression, it feels a low tide
 - Extra low tides (Neap Tide)
 - o Sun and Moon are at right angles (quarter moon) - extra low high tides
 - Extra high tides (Spring Tide)

- o Sun and Moon are in line with each other
- Number of factors influence the timing and reach of tides:
 - Sun's gravity - Sun's attraction counteracts the Moon's gravity
 - The difference between high and low tide varies in different parts of the ocean depending on how much space the water has to go into.

❖ Coastal Erosion

- o Preventing beach erosion
 - Structural approaches (e.g. groins, breakwater, jetties): typically cause increased erosion down-current of structure
 - Groins: catch part of the "river of sand" from longshore drift
 - Breakwater: reduces local wave energy so sand is deposited, not carried away
 - Seawall and riprap
 - Sand bagging: does not work
 - Jetties: basically a groin placed at the mouth of a river
 - Non-structural approaches (e.g. beach nourishment, land use planning): expensive, but doesn't cause erosion in new areas
 - beaches can be replenished by pumping in sand; usually it doesn't last more than a few years
 - Miami Beach = one of the few success stories