

Shoreline Features

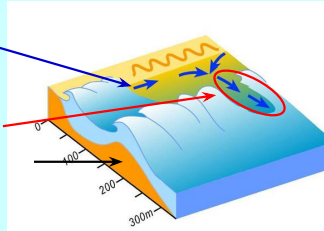


The shoreline is constantly changing.

Waves are the #1 cause!

Shoreline Currents

- Longshore current
- Rip current



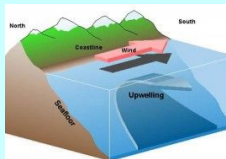
Shoreline Currents

- Longshore current: flows parallel to shore
- Rip current: strong currents that flow out to sea through gaps in the longshore bar.



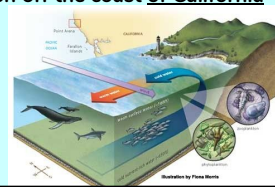
- Is the rising of cold water from deeper layers which replaces warmer surface water along a shoreline
- Caused by wind moving parallel to shore
- Coastal winds combined with the Coriolis Effect cause warm surface water to move away from shore.
- Cold water rises from up below to fill in the area the warm water leaves.

Upwelling Currents



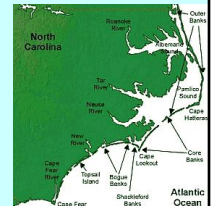
Upwelling Currents (continued)

- Brings greater concentrations of dissolved nutrients such as nitrates and phosphates to the ocean surface
- Responsible for the booming marine life population off the coast of California



Barrier Islands (like the NC Outer Banks)

- Long ridges of sand separated from mainland
- Deposited by longshore currents
- Highly unstable
- Protect mainland beaches and ecosystems from storm surges



Sand Dunes

- Can be covered in grass
- Provide habitat for a variety of creatures: birds, rodents, crustaceans
- Highly unstable and will shift over time due to wind and water currents



Estuaries and Salt Marshes

- Form when rivers empty into a body of salt water (aka an ocean) and deposit sediment at the mouth
- Host to numerous plant and animal species (birds, mollusks, a juveniles)
- Provide important area for water filtration and sediment entrapment
- Very little open or deep water



Beaches – large deposit of sand along a shoreline

East Coast (Irregular)

Wide & flat
Many inlets & bays

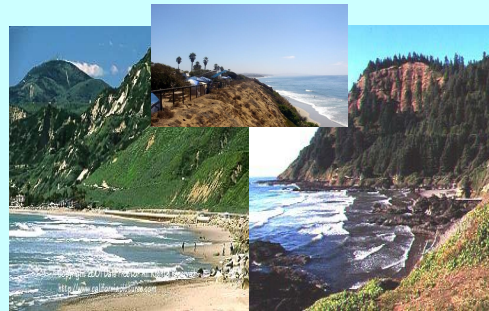
West Coast (Regular)

Narrow & steep
Relatively straight line

East Coast Beaches



West Coast Beaches



Beach Erosion

Waves tend to move sand from one location to another.

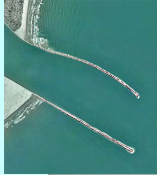
Numerous man-made constructions attempt to prevent this erosion:

- Sand fences
- Jetties
- Groins
- Breakwaters
- Sea Walls

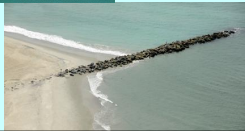


Preventing Beach Erosion Jetties and Groins

- Areas of rock placed to prevent sand migration (deposition & erosion)
- Negative: prevents sand from reaching downshore beaches



Jetties are built in pairs while groins are individual structures.



Preventing Beach Erosion—Sand Fences



- Designed to create and hold sand dunes in place
- Negative: require frequent replacement and do not work on a large scale

Preventing Beach Erosion—Breakwaters

- Structures made off shore to decrease wave energy and thus wave erosion
- Negative: sand fills in between the breakwater and the shore



Preventing Beach Erosion—Sea Walls



- Large structures built on shore to reduce the effects of incoming waves
- Negative: eventually the sand in front of the walls erodes and the wall falls into the ocean

“Fixing” Beach Erosion— Beach (Re)nourishment

- Periodically, sand is brought in from another location (or even from ocean floor near by) and added to the beach to make it larger.
- Negative: a temporary fix that must be repeated and is expensive

