

## DO YOU REALLY WANT TO BUY THAT BEACHFRONT HOUSE?

Goal: Recognize the different types of coasts and shoreline features.

Describe the processes that change the shoreline

- Deposition (by rivers)
- Erosion (from bluffs)
- Waves (and tides)
- Historical changes in beaches & how the structures we build change the shoreline.



\*This week we will study the types of coasts and beaches and the natural processes that create and maintain them.

Major Zones: Coastal areas are regions of change in which the sea acts to alter the shape and the configuration of the land.

- Width varies
  - Geography
  - Climate
  - Vegetation
- Shore: outer limit of wave action on the bottom to the limit of the waves' direct influence on land.
- Beach: accumulation of sand or gravel that occupies part of the shore.

Finding the best beach to sunbathe or snorkel: WA shores and beaches

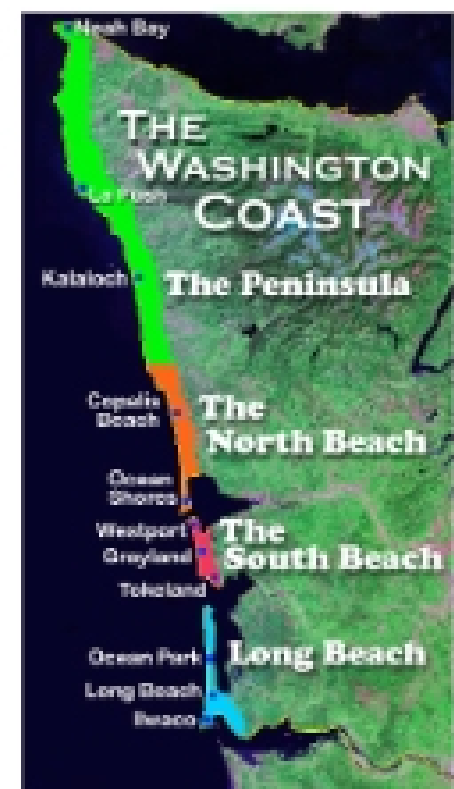
• Along WA coast and Puget Sound, beaches come in many textures and types

- Landforms include:
  - beaches
  - river deltas
  - tide flats
  - spits
  - forested slopes
  - steep bluffs



Where do you want to vacation?

- Puget Sound
  - Bluffs
  - Cobble beaches
  - Sandy beaches
- Olympic Peninsula Rocky beaches
- North, South, Long Beach
  - Sandy beaches
  - grayland = cranberry bogs
  - westport = charter fishing
  - long beach = long stretch of sandy beach



Why are some beaches sandy and others rocky?

- Where does beach material come from (or where does it go)?
- Substrate (bottom type) is determined by:
  - shore type
  - sediment supply
  - slope of shore
  - vegetation
  - wave action



How are beaches built?

- Supply versus removal
- Erosion of landforms and rivers supply shoreline with sediment (various sizes)
- Weather and waves pick up particles in one area and drop them off in another area
- Sediment flows along beaches (called longshore transport)\*
- Moves materials from eroding bluffs and streams to shorelines miles away

Where does the sediment come from?

- Rivers and streams
  - brings sediment down to the coasts
  - waves and currents sort these materials
- Erosion of shoreline
  - Bluffs (steep)
- Beach sediment or grain size dependent on wave energy
  - Large size = small waves

Size Matters

- Sediment particle or grain size
  - diameter of individual grain size
  - microscopic to boulders
- Sediment grain size found on beach provides information about how dynamic the forces on the shore
  - larger waves = bigger grain size
  - protected bay = small grain size

How do waves move sediment?

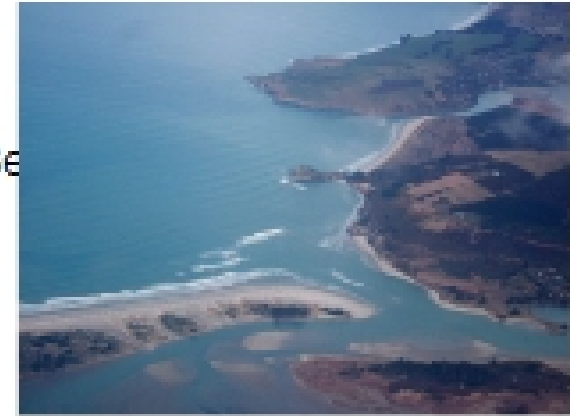
- Winds blow, waves form
- As a wave approaches shore, it feels the bottom (surf zone)
  - Speed changes, wave steepens and begins to break
- The turbulence generated from the breaking wave tumbles beach material (beach absorbs some of the waves energy)
- The "stronger" or more energetic a wave is, the more and larger grain size sediment it stirs up and tumbles
- Waves transport the sediment they stir up

### Mud beaches

- Only found in protected areas
- Why? Mud beaches are only found in protected areas because high waves and currents move mud away

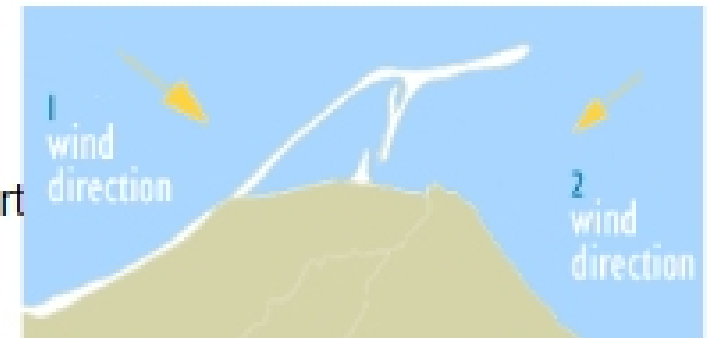
### Sand Beaches

- Scattered along Puget Sound and North, South, and Long Beach
- Have very little wave action
- Occur near the mouths of bays or rivers
- Surrounding bluffs



### Spits

- Strip of beach which extends into deeper water
- Most spits straighten a curving shoreline
- Often form a straight ridge of sediment across a bay
- Develop in the direction of shore drift (longshore transport)



### Dungeness Spit

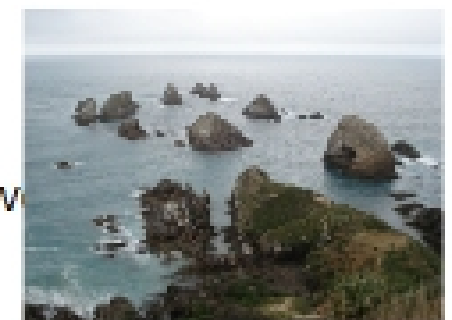
- Longest natural sand spit in the United States
- Extending 5 miles into the Strait of Juan De Fuca
- Grown about 15 feet per year for the past 120 years

### Gravel (or cobble) Beaches

- Most common beaches in Puget Sound and off Washington Coast
- Why? Supply? Removal?

### Rocky Beaches

- Made of bedrock and boulders too big to be moved by currents or waves
- Found in high wave energy environments.
- Olympic Peninsula and San Juan Islands.



### Sea Stacks

- Small rock islands or tall, slender pinnacles of rock
- Formed when part of a headland is eroded by wave action
  - Water weakens cracks in the headland, causing them to collapse
- Found along outer coast

What did the glaciers leave behind?