COASTAL LANDFORMS (32)

I Main topics
   A Why study coastal landforms?
   B Sediment budget and system response
   C Coastal landforms

II Why study coastal landforms?
   A Dynamic systems
   B Reflect geologic history and human influence
      1 Tectonics
      2 Sea level change
      3 Sediment budget
   C Provide a basis for predicting “long-term” future behavior of a coastal system
   D Dense populations
III Sediment budget and system response

A Where sediment input > sediment loss: accretion
B Where sediment loss > sediment input: erosion
C Where subsidence rate > sedimentation rate: submergence

http://en.wikipedia.org/wiki/Mississippi_River_Delta

IV Coastal landforms
A Beaches, berms, and bars

1 Beach: Accumulation of rock fragments that can be moved by ordinary wave action
2 Berm: The above water portion of a beach
3 Bar: The below water portion of a beach; bars typically extend to depths of ~10m below low tide level
4 Sand commonly moves offshore in winter, onshore in summer (berm→bar)

B Wave-cut bench

1 A narrow flat area created by wave erosion
2 Result from sea-level fall and/or land rise

Wave-cut bench, Hanauma Bay

http://en.wikipedia.org/wiki/Littoral_zone

http://w3.salemstate.edu/~lhanson/gls214/gls214_beach1.htm

http://sadtp.soest.hawaii.edu/space/hawaii/dfs/oahu/oahu_se/se.ground.photographs3.html
C Wave-cut terrace or platform

1. A broad flat area created by wave erosion
2. Result from sea-level fall and/or land rise

- Wave-cut terrace
  - Aberystwyth, Wales
- Wave-cut platform
  - Wilder Ranch State Park, California

D Deltas

1. Sedimentary bodies deposited at a river mouth
   a. Sediment sources
      i. Natural and artificial
      ii. Dynamic
   B. Influences
      i. Stream-dominated: distributaries prominent ("birdfoot" deltas)
      ii. Wave-dominated: delta shape asymmetric

- Mississippi River Delta

http://en.wikipedia.org/wiki/Wave-cut_platform
http://en.wikipedia.org/wiki/River_delta
E Spits

1. Attached, shore-parallel ridges of sand
2. Require a supply of sand, a transporting current, and a depositional site


Farewell Spit, South Island, New Zealand

F Barrier islands

1. Barrier islands: low, elongate, shore-parallel islands
2. Emergence of offshore bars
3. Submergence of beaches and beach dunes
4. Help protect landward coast from erosion

http://commons.wikimedia.org/wiki/File:Baie_de_Mobile.jpg

Barrier islands, Mobile Bay, Alabama
G Lagoons

1. Lagoon: a shallow body of water separated from a larger body of water by a shallow or exposed shoal, coral reef, or similar feature.

2. Commonly elongate, annular, or circular in map view.

H Reefs

1. Indicate approximate level of sea level at the time of reef formation.

2. Elevated reefs indicate former sea level highstands and/or coastal emergence.

3. Submerged reefs indicate former sea level lowstands or coastal subsidence.
H Reefs

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Estuaries

1. Inundated stream valleys
2. Typically reflect recent sea level rise
3. Sediment “traps”
J  Fjords

1  Inundated glacial valleys
2  Commonly very deep
3  Rockfalls common

Sognefjord, Norway
1300 m deep

Milford Sound, New Zealand
512 m deep

http://en.wikipedia.org/wiki/Fjord