

4/2/08

GEOL 117 Notes 30: BEACH PROCESSES

Beach dynamics: sediment supplies and transport

Human intervention in beach processes

BEACH PROCESSES -- Natural

Beach = accumulation of sediments from rivers, headland erosion

Beach dynamics -- continuous sediment movement due to waves and longshore transport

- Summer -- gentle waves, onshore transport & deposition
- Winter -- storm waves, erosion and seaward transport

Constant losses and gains at any given point

We can think of each place as having a sediment budget

If gains – losses is positive, the beach grows

If gains – losses is negative, the beach shrinks

HUMAN INTERVENTION IN BEACH/COASTAL PROCESSES

(1) Dams on rivers reduce sediment input to coasts; beaches become “sediment starved”

- Longshore transport continues carrying sediments away
- Beaches are eroded

(2) "Groins" designed to minimize loss of beach sand

- Upwind side: deposition
- Downwind side: erosion; beaches starved of their sediment supply

(3) Breakwaters to protect harbors

- Reduce wave energy --> deposition in harbor because it's quiet
- Need frequent dredging
- Sediment supply to downwind beaches cut off- they shrink

Beach dynamics

2 Common themes:

1. Longshore sediment transport links all beaches, sediment sources, and sediment traps on a coastline
2. Intervention to address a single demand of society often leads to a chain of unforeseen consequences due to erosion or deposition.