Chapter 7: Beaches & Nearshore Environment

General beach-nearshore profile

Basic Beach Types and Sediments

Seasonal Beach Cycles

Predicting Erosion and Accretion

**Nearshore:** includes shoal, break and surf zones up to the ridge and runnel system

Longshore Sand Bars are the main feature

**General Beach-Nearshore Profile**

Nearshore: includes shoal, break and surf zones up to the ridge and runnel system

Longshore Sand Bars are the main feature

**General Beach-Nearshore Profile**

Breaks in the longshore sand bar are usually locations of rip currents

**Nearshore:** includes shoal, break and surf zones up to the ridge and runnel system

**Foreshore:** intertidal region of the beach (spring high tide to spring low tide levels)

Ridge-Runnel system: small scale bar in lower intertidal zone

Most noticeable during strong west/northwest wind events

**General Beach-Nearshore Profile**

Ridge-Runnel System:
small scale bar in lower intertidal zone
Ridge = crest
Runnel = trough
Ephemeral, lasting a few weeks
Present during intermediate stages of beach erosion or building
Most noticeable during strong west/northwest wind events
Plunge Step:
Steep change in slope due to turbulence associated with surging/swashing of waves

Erosional Scarps:
during winter a beach may contain several scarps across the profile

Storm Ridges: coarse beaches (gravel/cobbles etc.) energetic swash builds ridge, no backwash due to percolation

Beach: consists of Foreshore and Backshore

Berm: Crest of the beach approximately spring high tide level

Beach Face: steep sloping section of the beach from the berm to the plunge step, created by wave swash.

Backshore: extends from the berm crest to the next physiographic feature (dune or bluff toe)

Erosional Scarps: sandy or bluff toe

Storm Ridges: coarse gravel beaches

Basic Beach Types and Sediments

Dissipative: gentle slope, wave energy gradually dissipated across surfzone. Spilling Breakers

Reflective: steep slope, surging breakers, wave energy reflects back to open ocean
Basic Beach Types and Sediments

<table>
<thead>
<tr>
<th>Beach Sediment</th>
<th>Gradient</th>
<th>Beach Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>mud</td>
<td>Gentle</td>
<td>Dissipative</td>
</tr>
<tr>
<td>sand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gravel</td>
<td>Steep</td>
<td>Reflective</td>
</tr>
<tr>
<td>cobbles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>boulders</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Seasonal Beach Cycles

- **Accretionary or Summer Beach**
  - mild wave energy and onshore winds transport sand onto the beach.

- **Storm or Winter Beach**
  - energetic wave conditions remove sand from the beach and create offshore bars.

Predicting Erosion and Accretion

Deep Water Wave Steepness
- Grain Size
- Settling Velocity