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Universiti Malaysia PAHANG
Engineering • Technology • Creativity

BET4733 Introduction to Coastal Infrastructures

Nearshore Currents

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BY NC SA

Outline

- Nearshore Currents
  - ✓ Wind Generated Currents
  - ✓ Tide Generated Currents
  - ✓ Wave Generated Currents
- Longshore Currents
- RIP Currents

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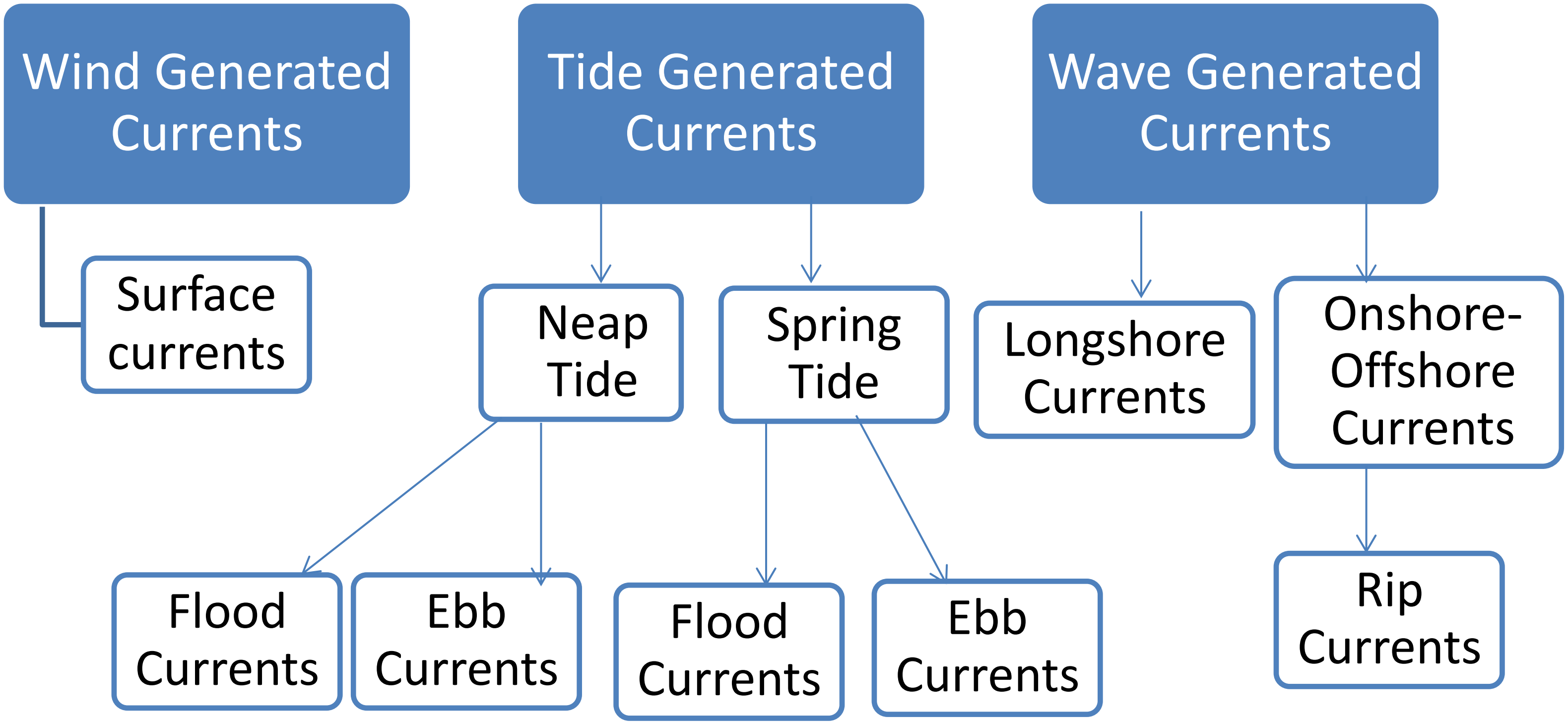
NEARSHORE CURRENTS



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Wind Generated Currents

- Depends on offshore wind conditions.
- Magnitude of currents based on wind intensity and duration.
- Influenced by monsoons.
- Can be used as an indicator for the extent of environmental pollution in coastal environment (e.g oil spill).

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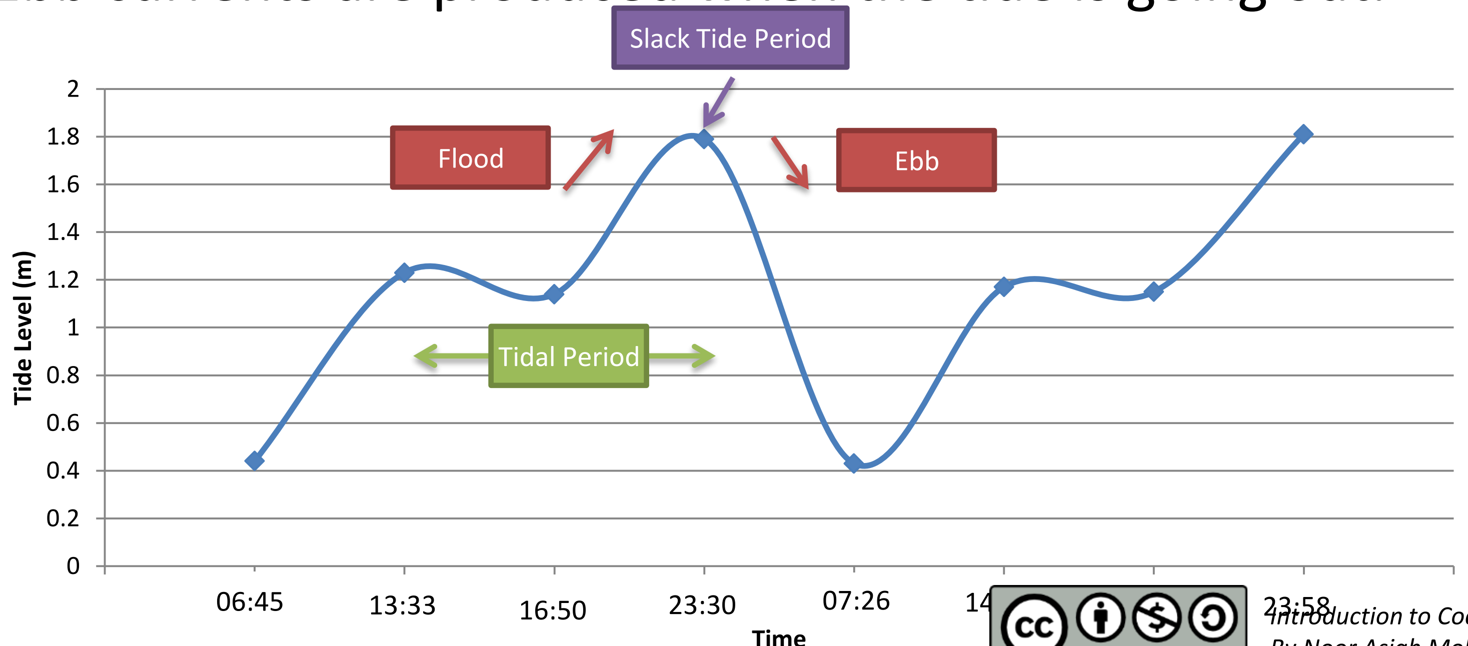
Tide Generated Currents

- Tidal currents are produced due to differences in water surface elevation
- Flood currents are produced when the tide is coming in.
- Ebb currents are produced when the tide is going out.



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Tide Generated Currents

- Slack tide period is the period during the turning point of each tide
- Higher tidal range produce higher magnitude of currents
- Strong tidal currents occur at tidal inlets and constricted channels at river mouths

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Wave Generated Currents

Wave Generated Currents

Wave breaking at an angle to the beach

Variations in wave breaker height

Variations in wave sets up

* Wave set-up is the elevation of water surface over normal surge elevation due to onshore mass transport of water by wave action alone

* Large incident wave = strong longshore currents

sets up

Cross-shore Component

Longshore Currents

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Onshore-Offshore Currents

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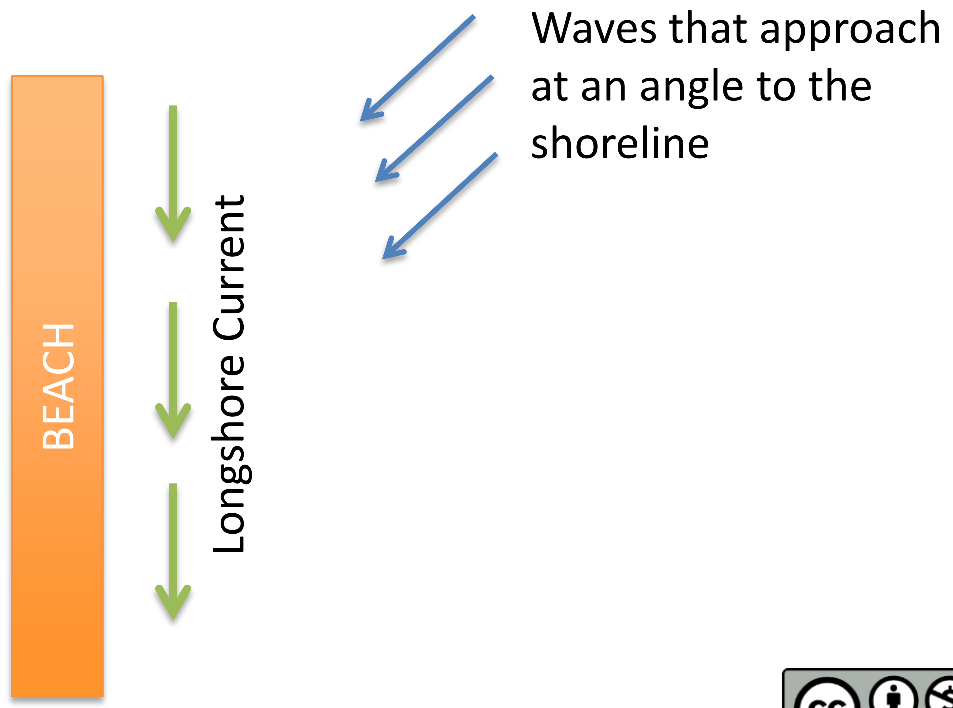
LONGSHORE CURRENTS

- Flow parallel to the shoreline.



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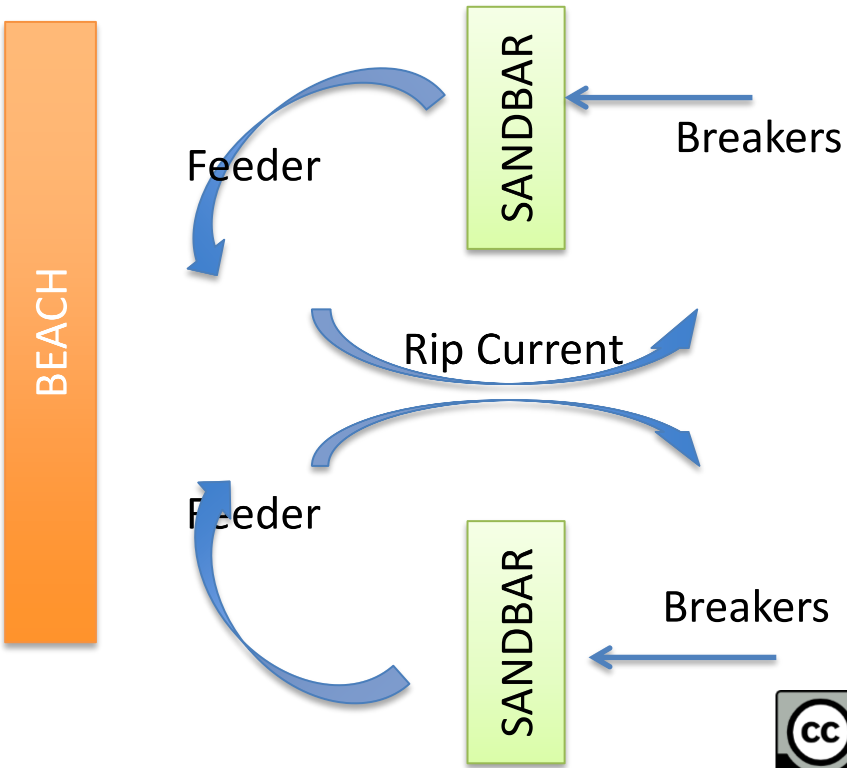
RIP CURRENTS

- A strong surface current flowing seawards from the shore.



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