

Sistemas Costeiros (Mestrado em Geociências UC)

TEMA 10 - Praias (parte I): deriva litoral



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TEMA 10 - Praias (parte I): movimento de sedimento

1 - MORFOLOGIA E ZONAÇÃO

2 - CLASSIFICAÇÃO DINÂMICA DAS PRAIAS

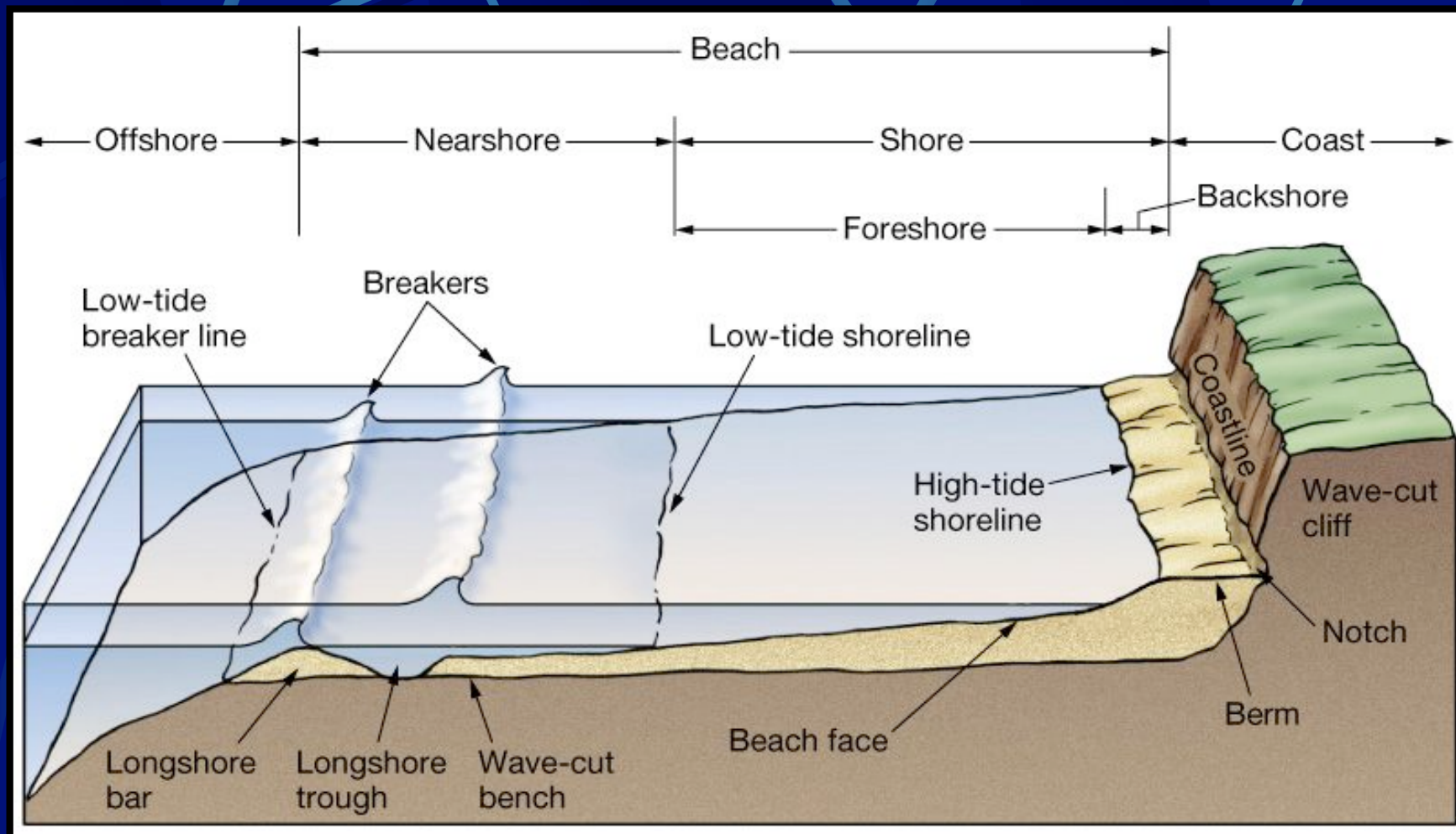
3 - MOVIMENTO VERTICAL DE PARTÍCULAS

4 - MOVIMENTO LONGITUDINAL DE PARTÍCULAS

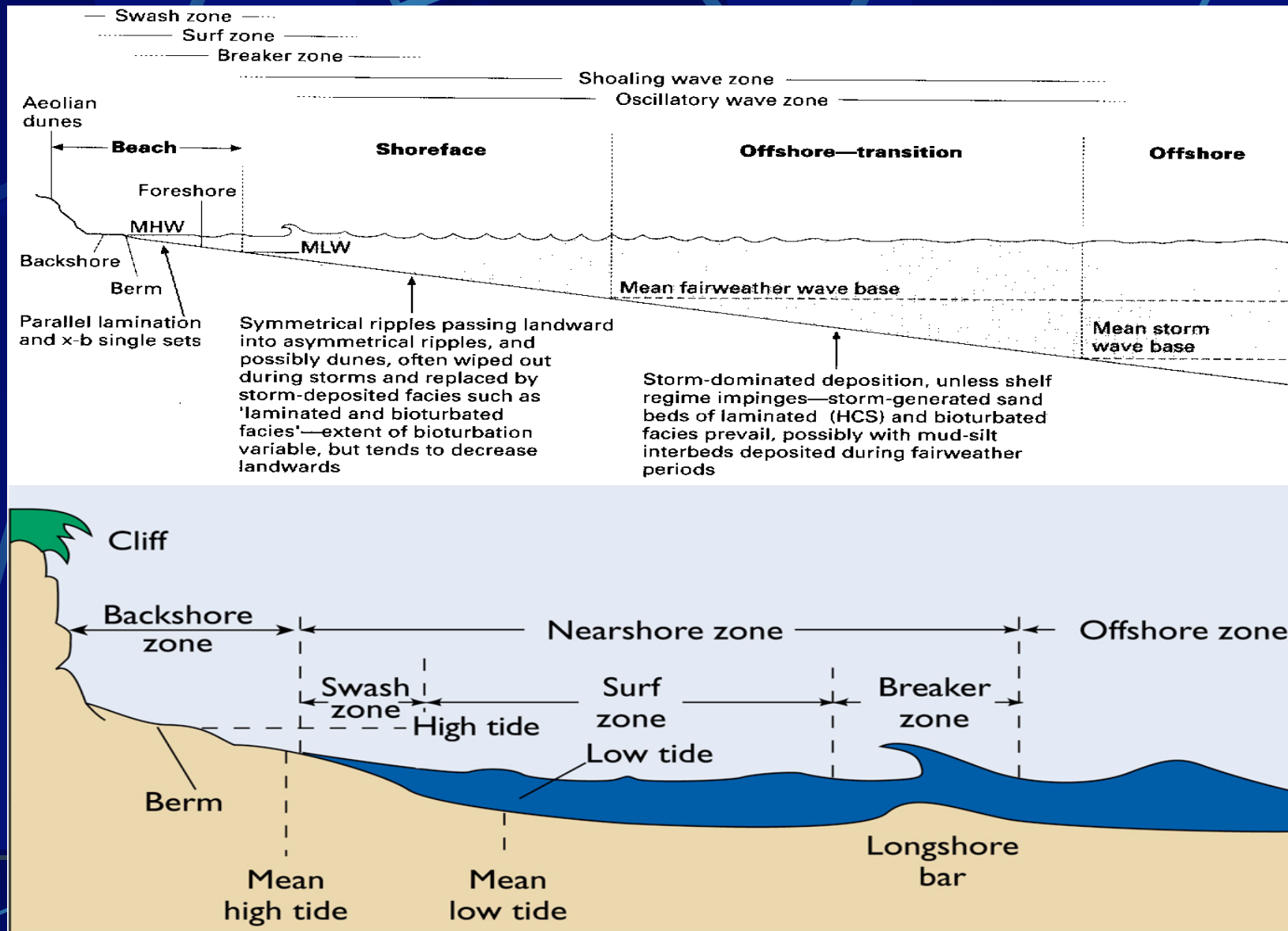
5 - O BALANÇO SEDIMENTAR NA PRAIA



1 - MORFOLOGIA E ZONAÇÃO

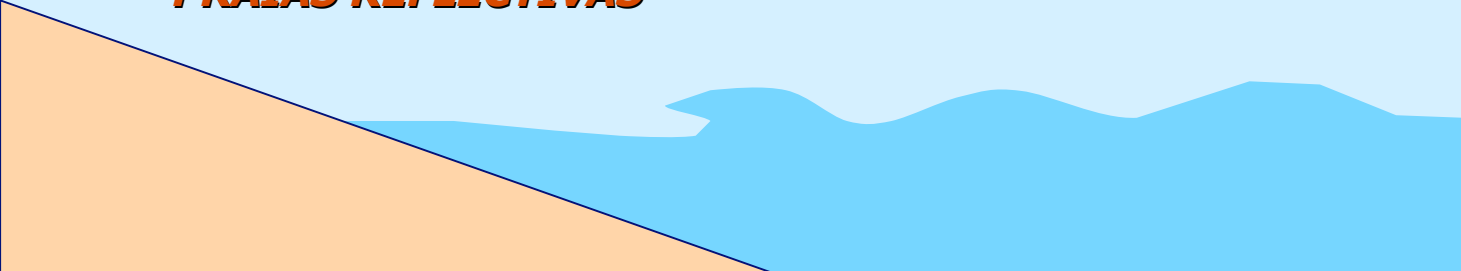


1 - MORFOLOGIA E ZONAÇÃO



2 - CLASSIFICAÇÃO DINÂMICA DAS PRAIAS

PRAIAS REFLECTIVAS



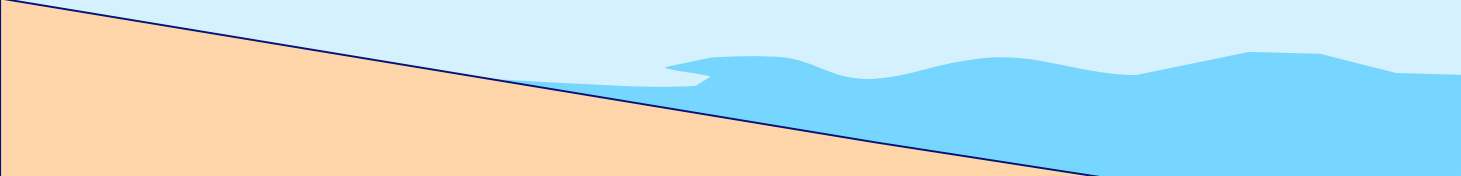
A cross-sectional diagram of a reflective beach. It features a steep, wide sand dune on the left side that slopes down to a very shallow, flat beach area. The water is depicted as a thin layer with small, gentle waves breaking near the shore.

PRAIAS DISSIPATIVAS COM BANCOS



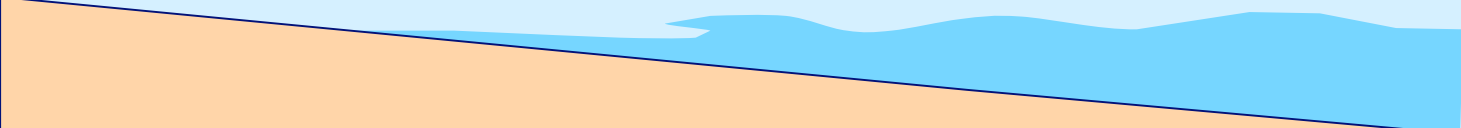
A cross-sectional diagram of a dissipative beach with sandbars. The sand dune on the left is more gradual than in the reflective type. The beach area is wider and flatter, with several distinct, rounded sandbars (bancos) protruding into the water. The water is deeper than in the reflective type, with more pronounced, wavy breaking patterns.

PRAIAS DISSIPATIVAS SEM BANCOS



A cross-sectional diagram of a dissipative beach without sandbars. The sand dune on the left is very gradual, leading to a wide, flat beach. The water is deep and extends further from the shore, with a continuous, wavy breaking pattern across the entire beach area. There are no distinct sandbars visible.

PRAIAS ULTRADISSIPATIVAS



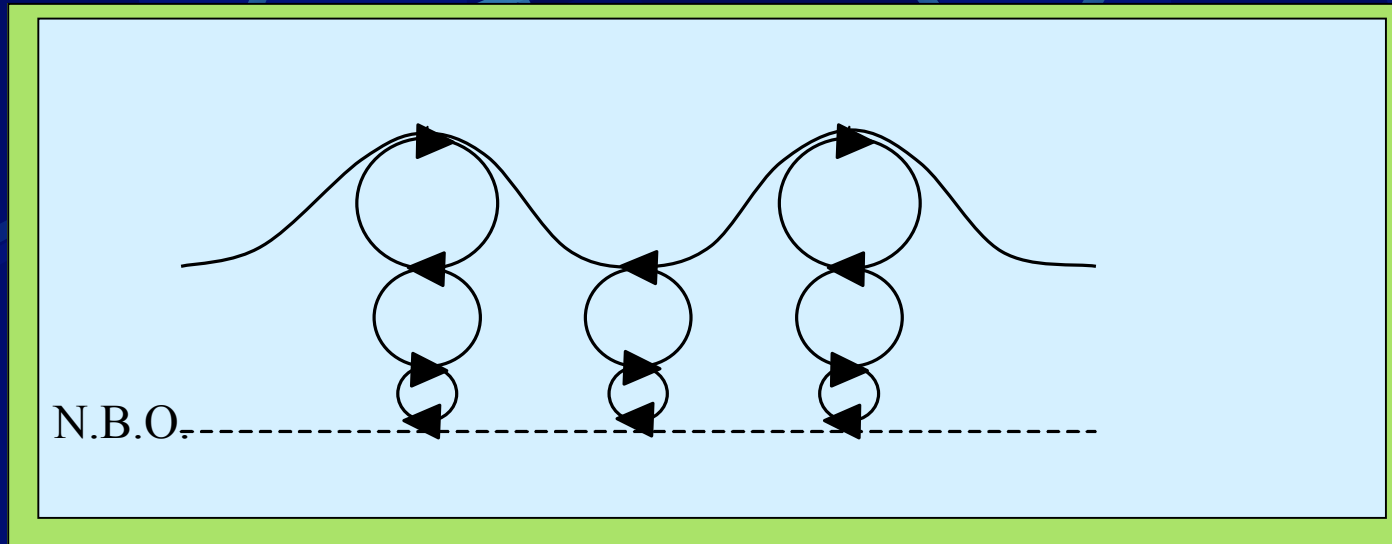
A cross-sectional diagram of an ultradissipative beach. The sand dune on the left is extremely gradual, resulting in a very wide, flat beach area. The water is the deepest of the four types, with a continuous, wavy breaking pattern that extends far from the shore. The beach area is the widest and flattest.

2 - CLASSIFICAÇÃO DINÂMICA DAS PRAIAS



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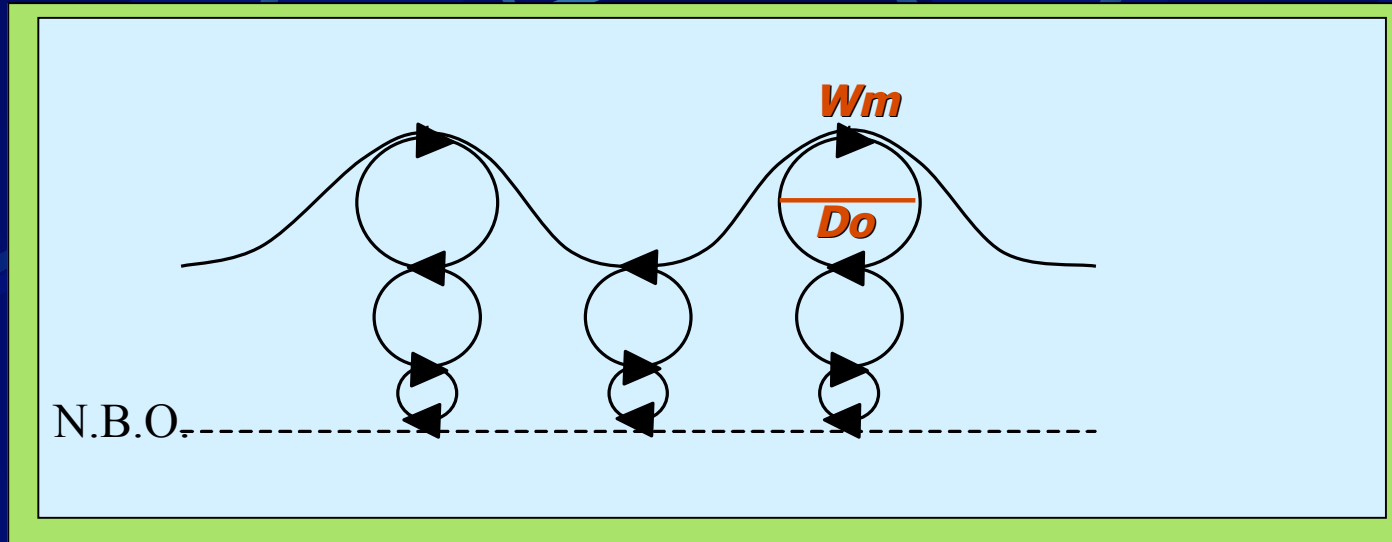
3 - MOVIMENTO VERTICAL DE PARTÍCULAS



Movimento orbital das partículas por efeito da ondulação

Distinção entre zona aberta, zona de rebentação (surf) e zona espraído

3 - MOVIMENTO VERTICAL DE PARTÍCULAS



W_m : VELOCIDADE ORBITAL

D_o : DIÂMETRO ORBITAL

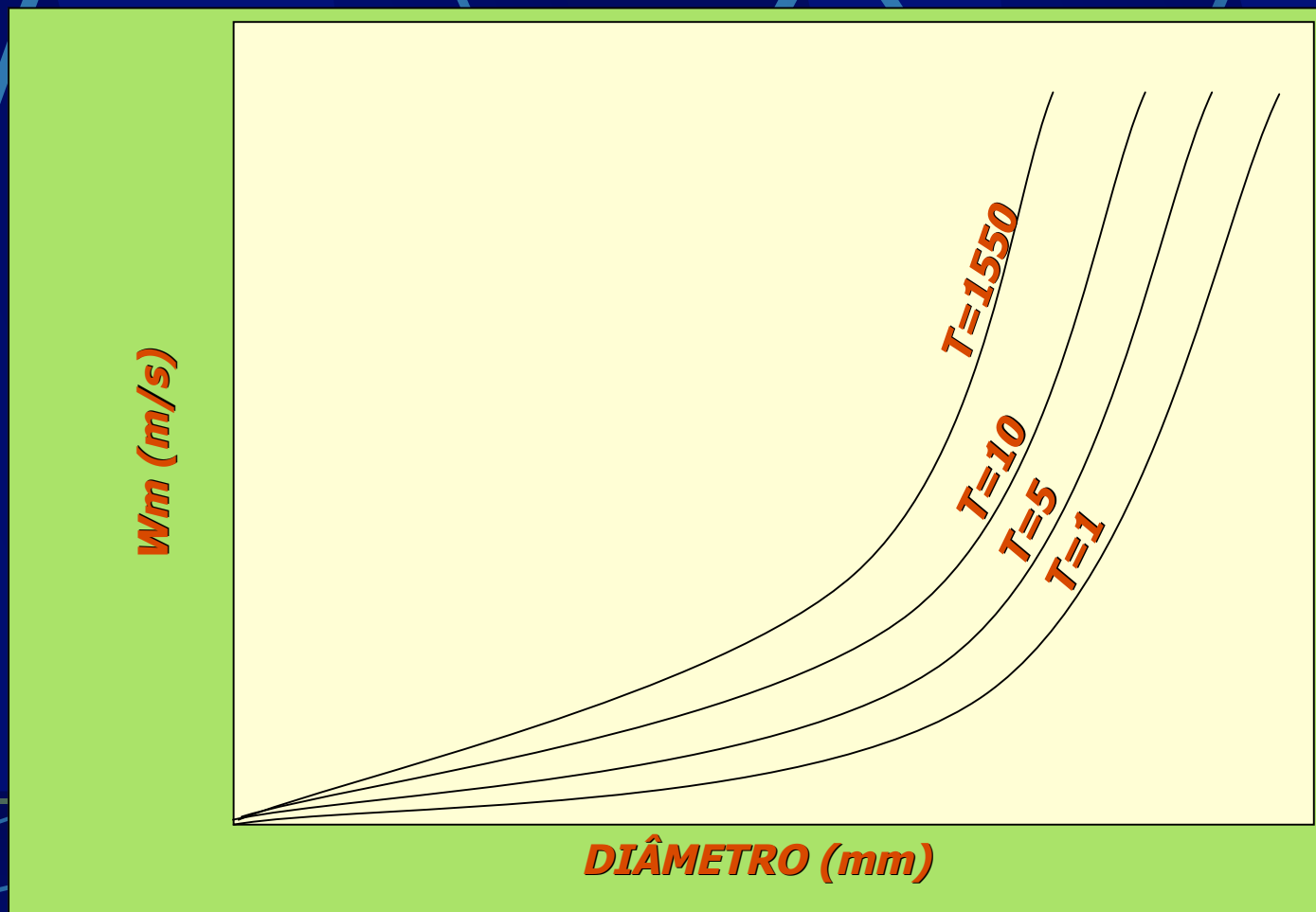
ZONA ABERTA: $W_m = (\pi D_o)/T$

ZONA DE SURF: $W_m = HC/2 d = H/2 \sqrt{g/d}$

ZONA DE ESPRAIADO: $W_m = (\pi H)/T \sinh (2 \pi d/L)$

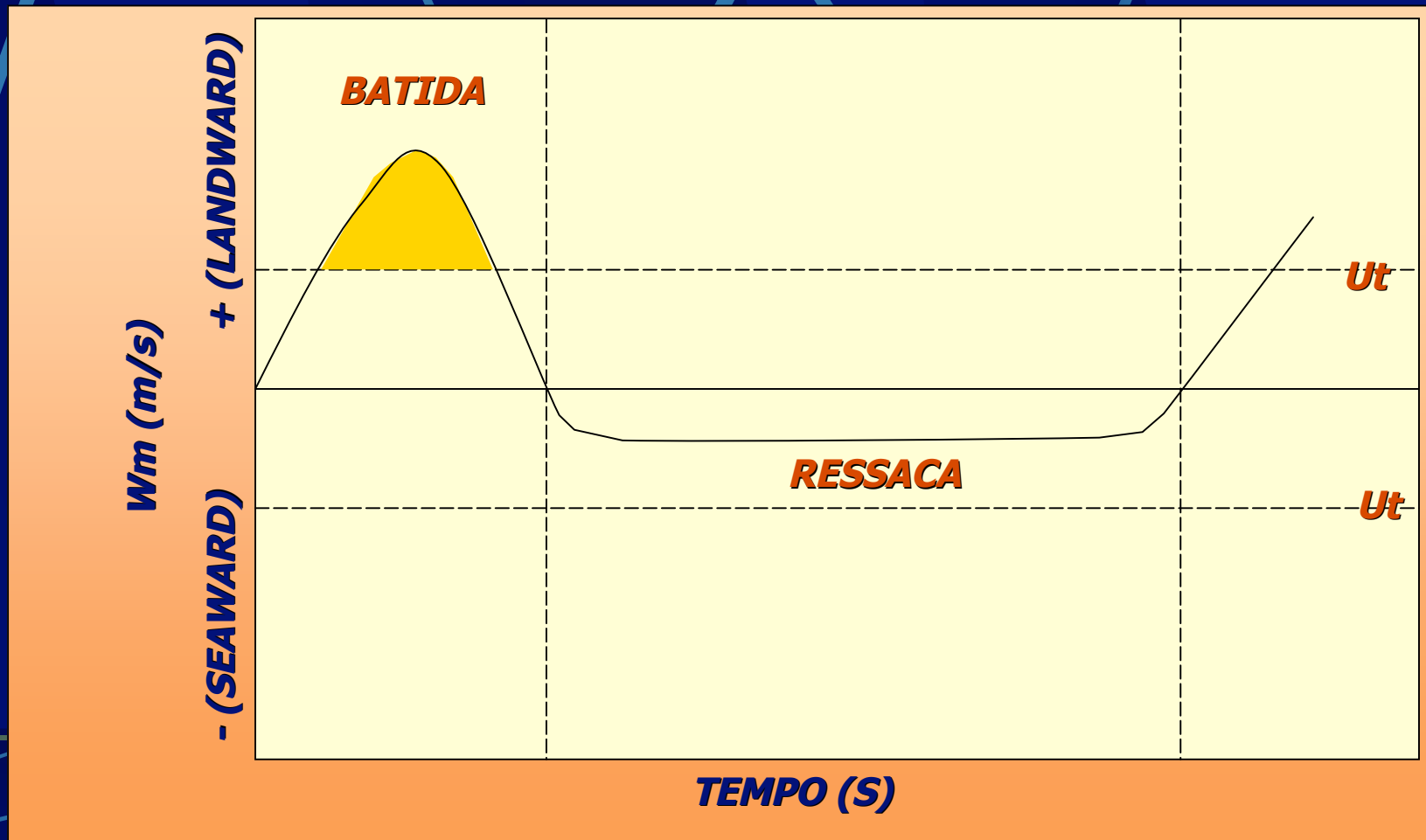
3 - MOVIMENTO VERTICAL DE PARTÍCULAS

O LIMIAR DE EXTRACÇÃO DAS PARTÍCULAS DE AREIA (U_t) DEPENDE DE W_m , DO TAMANHO DE GRÃO E DO PERÍODO

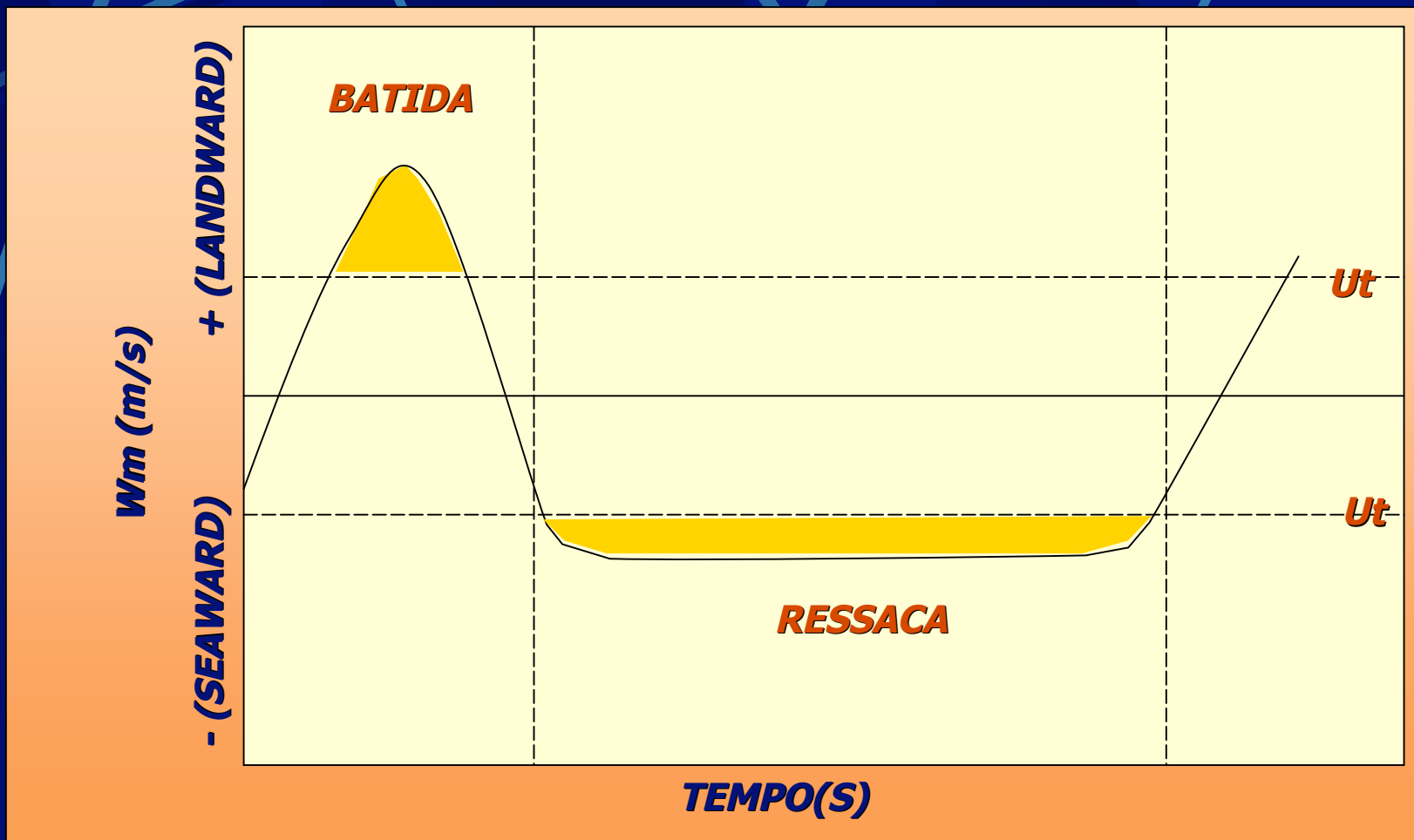


3 - MOVIMENTO VERTICAL DE PARTÍCULAS

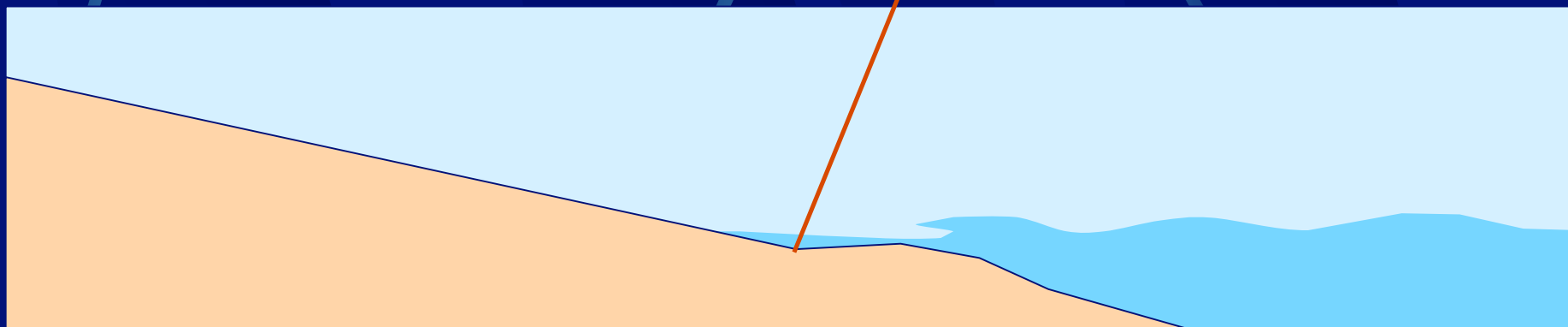
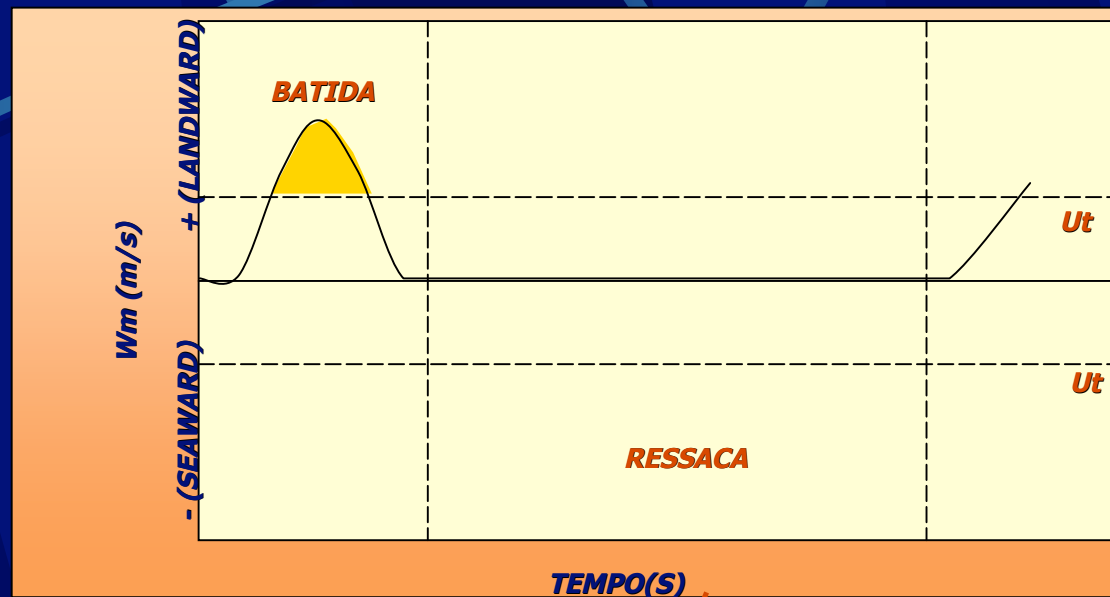
O SENTIDO DO MOVIMENTO DEPENDE DA ZONA DA PRAIA
NA ZONA DE SURF:



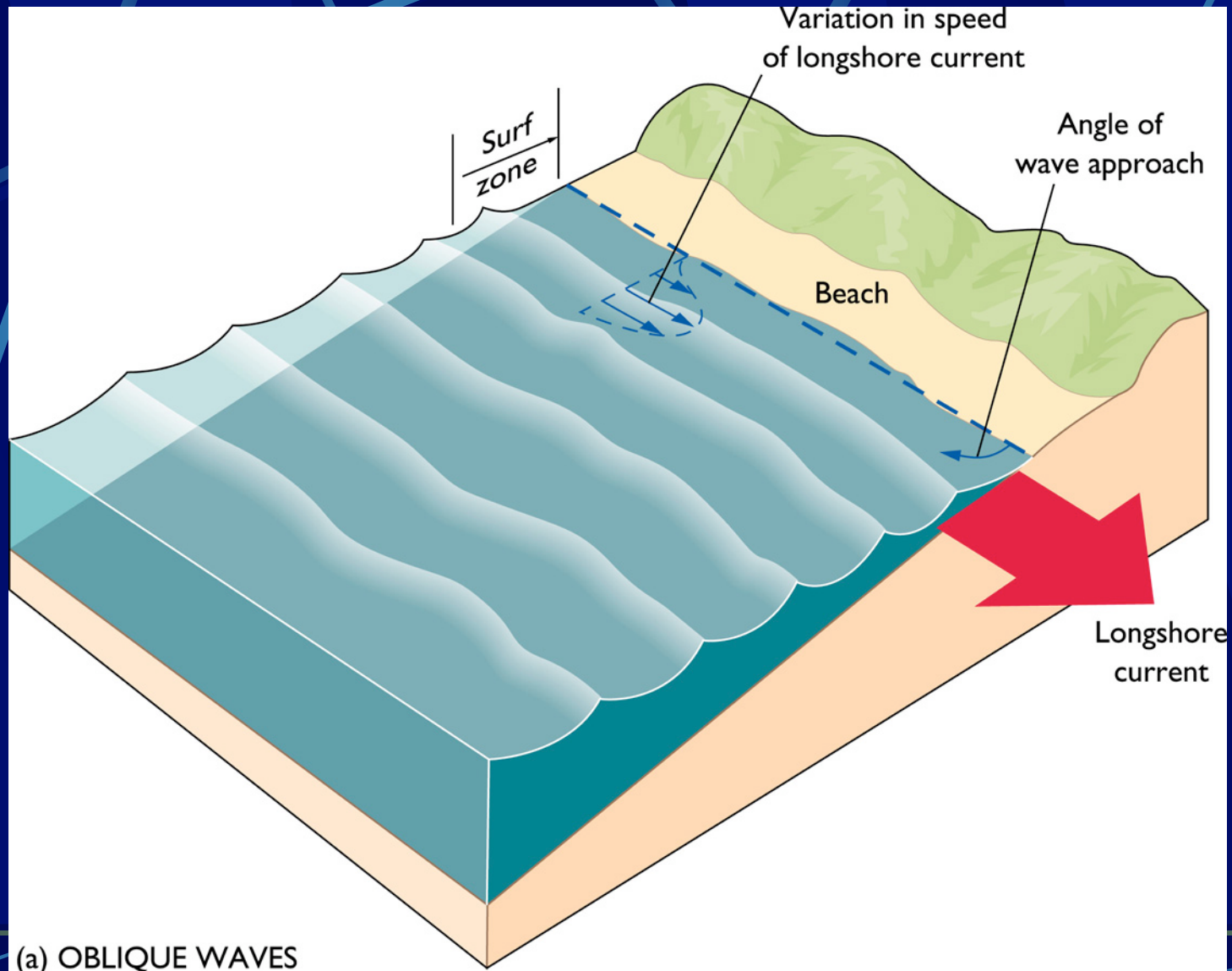
3 - MOVIMENTO VERTICAL DE PARTÍCULAS NA ZONA DE BATIDA:



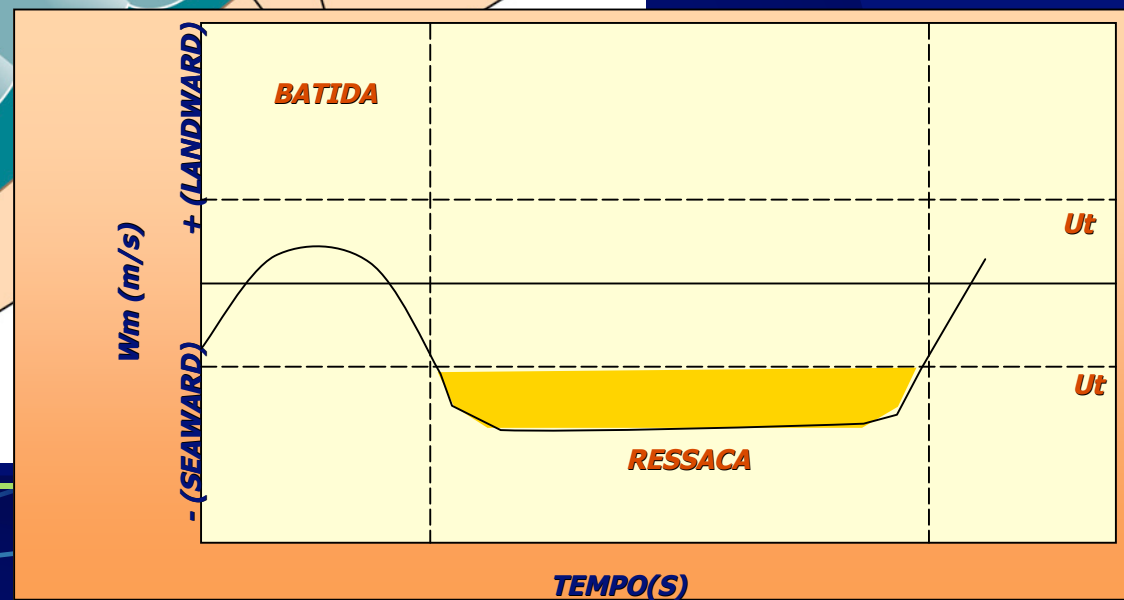
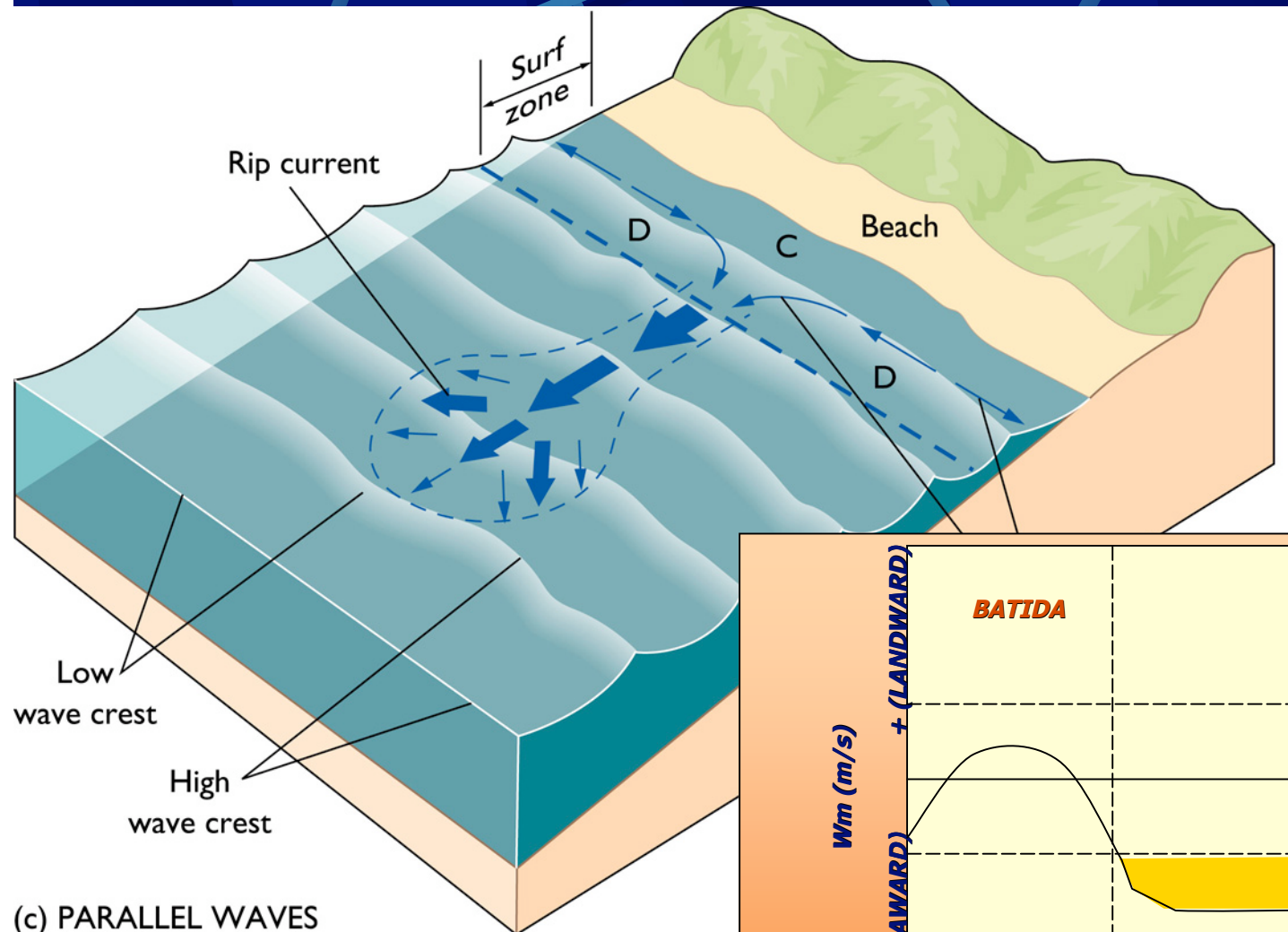
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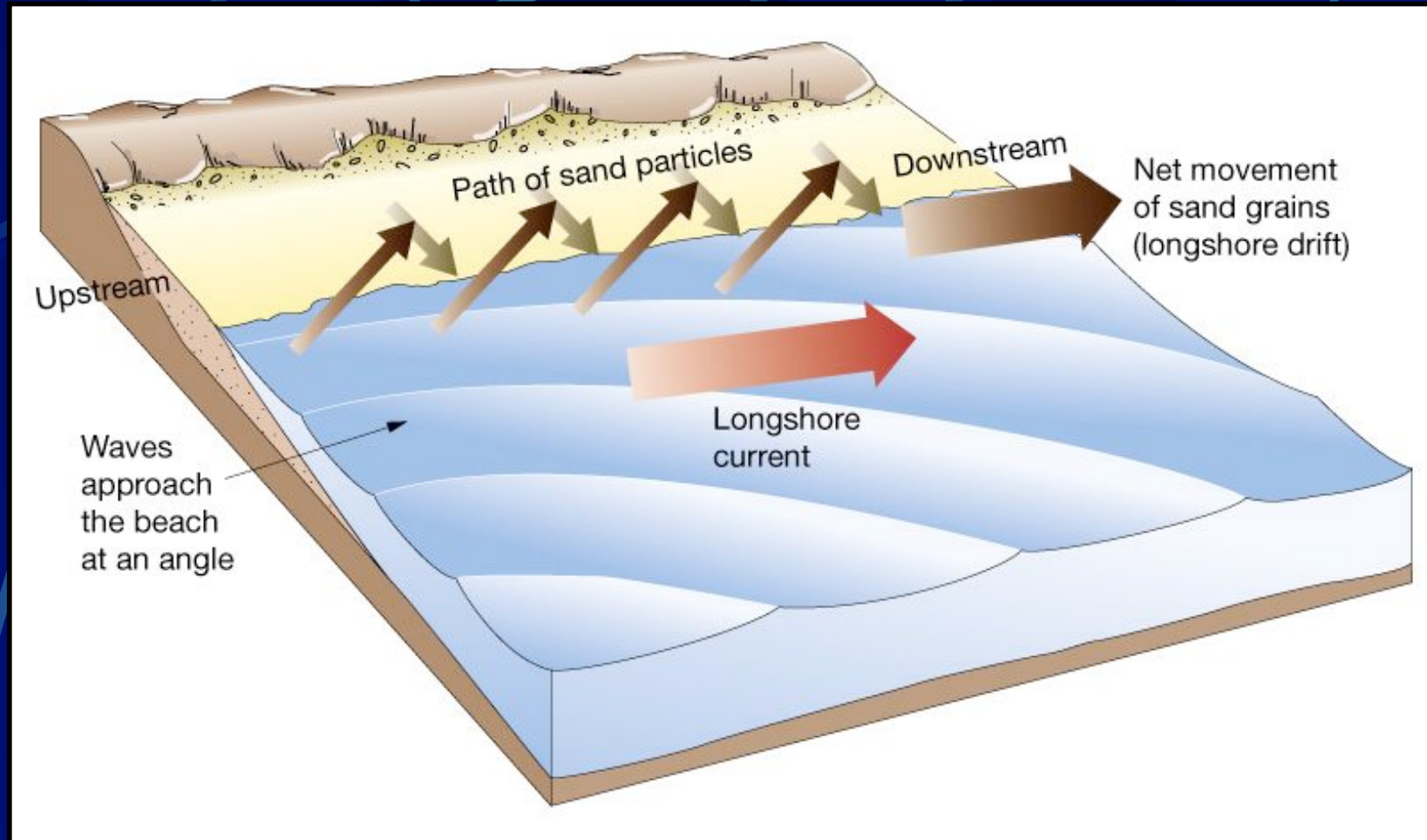
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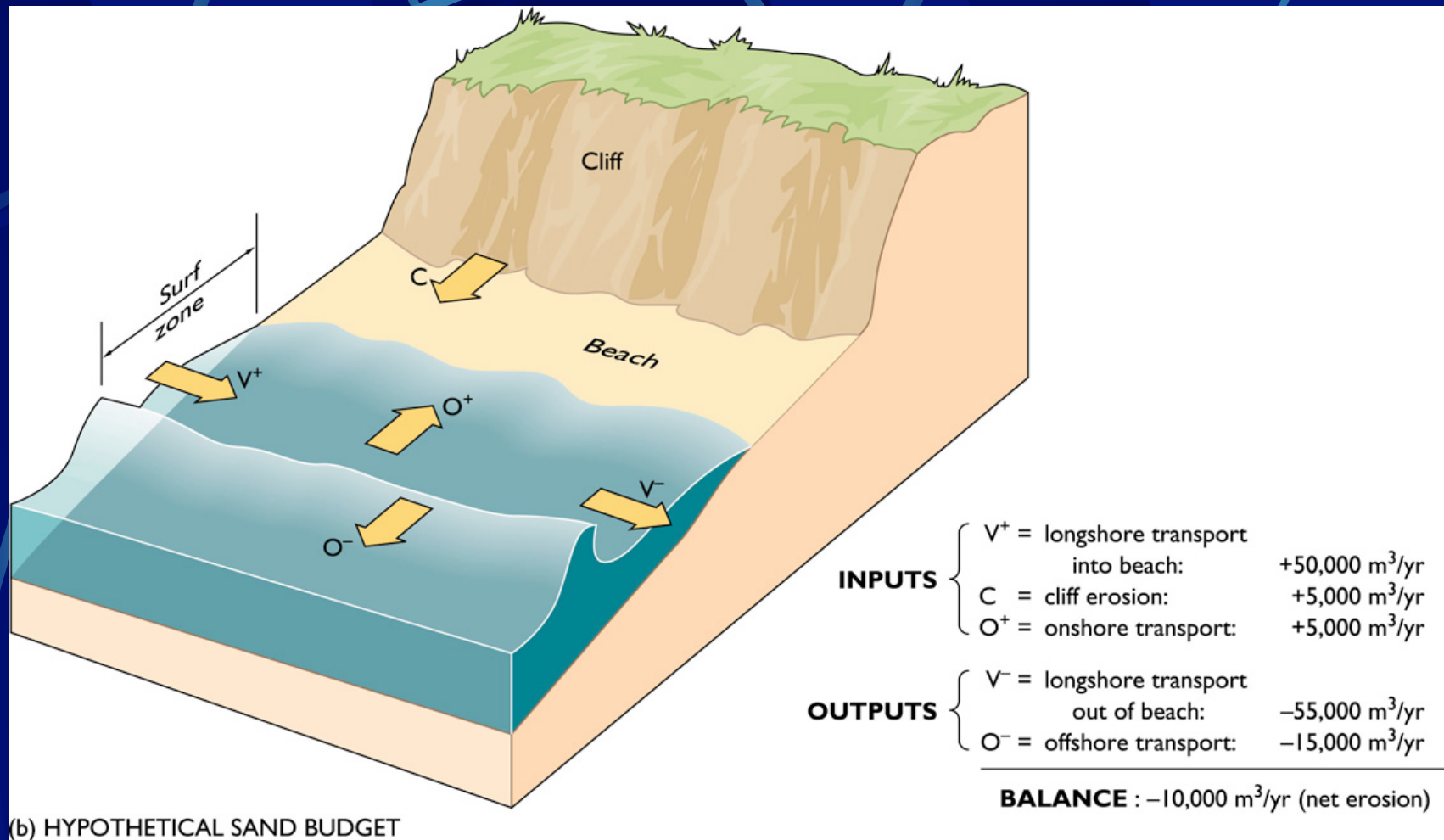
DERIVA POTENCIAL (TAXA DE TRANSPORTE LONGITUDINAL)

$$Ql = \frac{0,77 P}{0,6 g (\delta s - \delta l)}$$

P : POTÊNCIA DE PICO DA ONDA

$$P = C E = C ((\delta l G H^2)/8)$$

5 - O BALANÇO SEDIMENTAR NA PRAIA



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<u>INPUTS</u>	+	<u>OUTPUTS</u>	=	<u>BALANCE</u>
Longshore transport into beach		Longshore transport out of beach		Accretion
River supply		Offshore transport		Erosion
Cliff erosion		Wind transportation into dunes		Steady state
Onshore transport				

(a) PRINCIPAL COMPONENTS OF A SAND BUDGET

SAND BUDGET

INPUTS

Sediments eroded from backshore cliffs by waves

Sediments eroded from upcurrent beach by longshore drift and current

Sediments brought in by rivers

OUTPUTS

Sediments transported to backshore dunes by offshore winds

Sediments transported downcurrent by longshore drift and current

Sediments transported to deep water by tidal currents and waves

