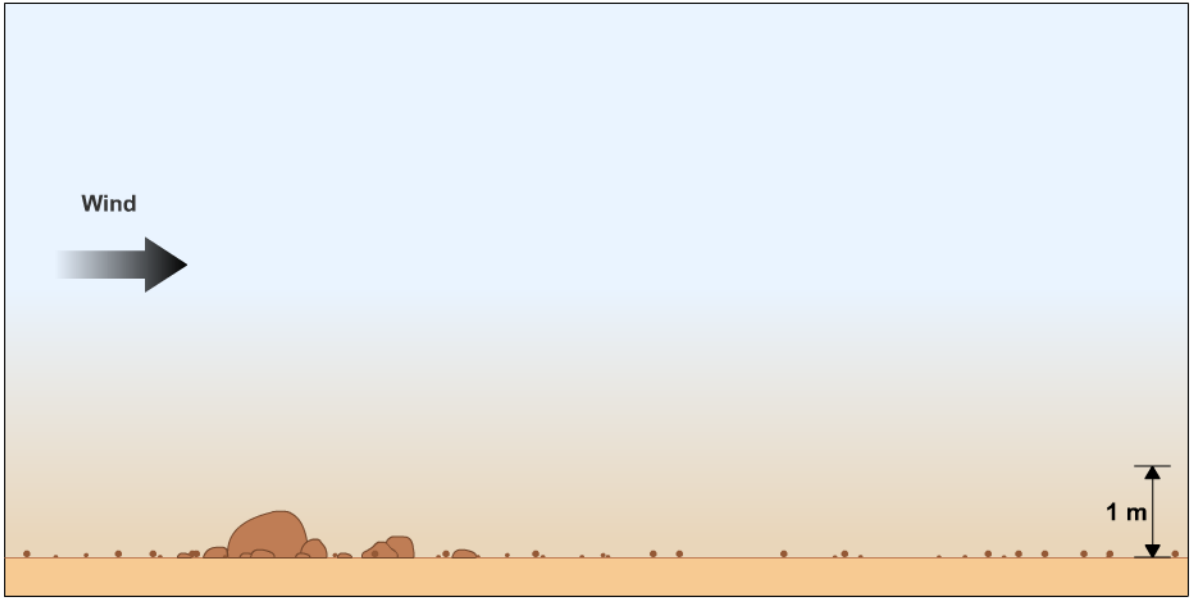
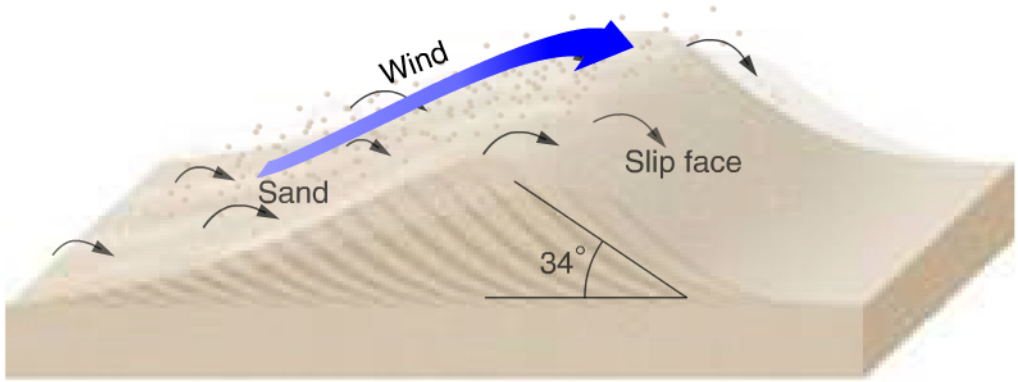
Shores and Coastal Processes

Introduction

Coastlines are dynamic features, changing shape continually and confounding human efforts to tame them. Why are coastal areas so moody? Why does each passing storm leave its imprint (erosion, deposition, or both) on a coastline that has existed for millennia? The answers to these questions lie in the nature of coastal processes, the ways in which waves affect the coast, the source of the sediment, and human interference in the whole scheme. This module will help you explore these processes and see how society's interactions can interrupt or

Sediment transport by wind




Wind
Sand
Slip face
34°

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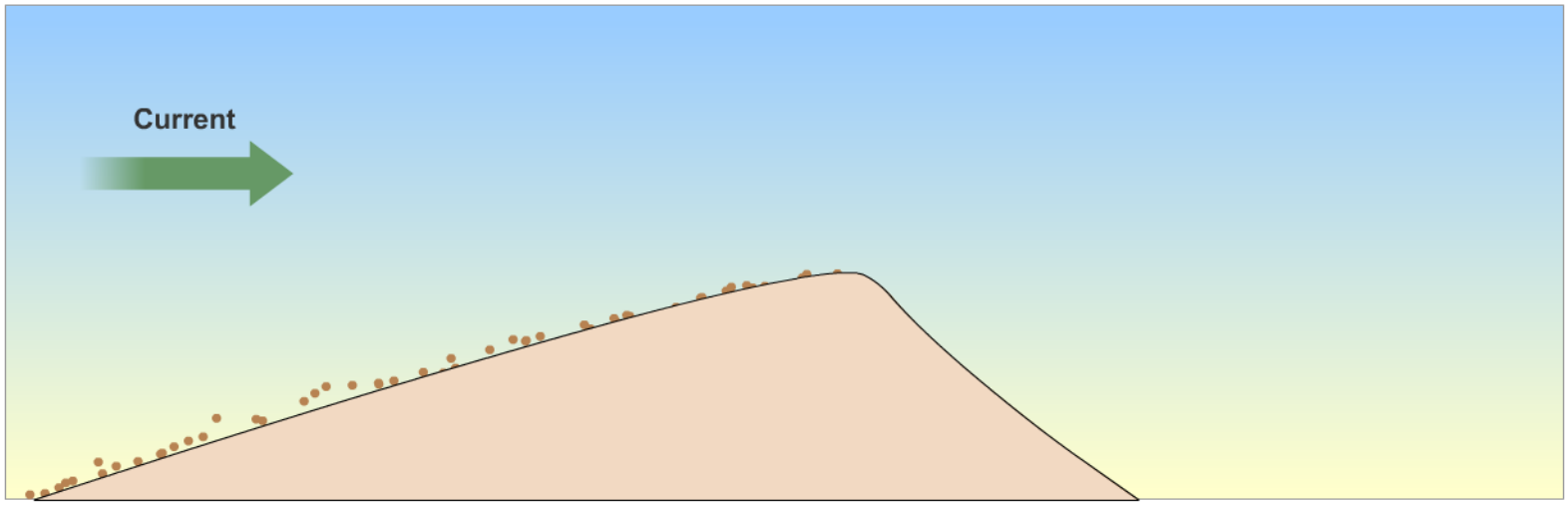
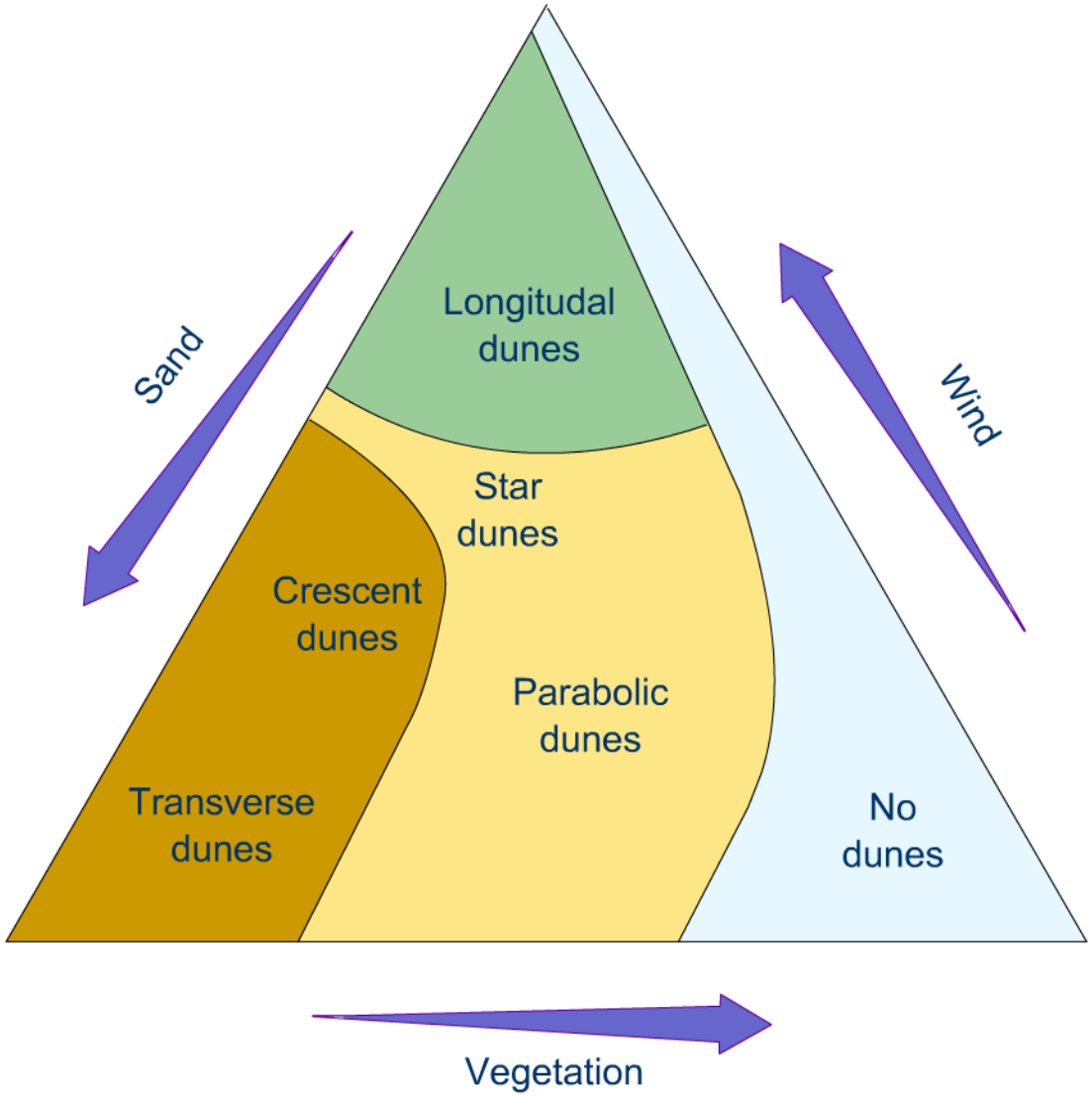
Formation of Cross-bedding



Types of dunes

Click on any area of the illustration to view an example of the type of dune described.

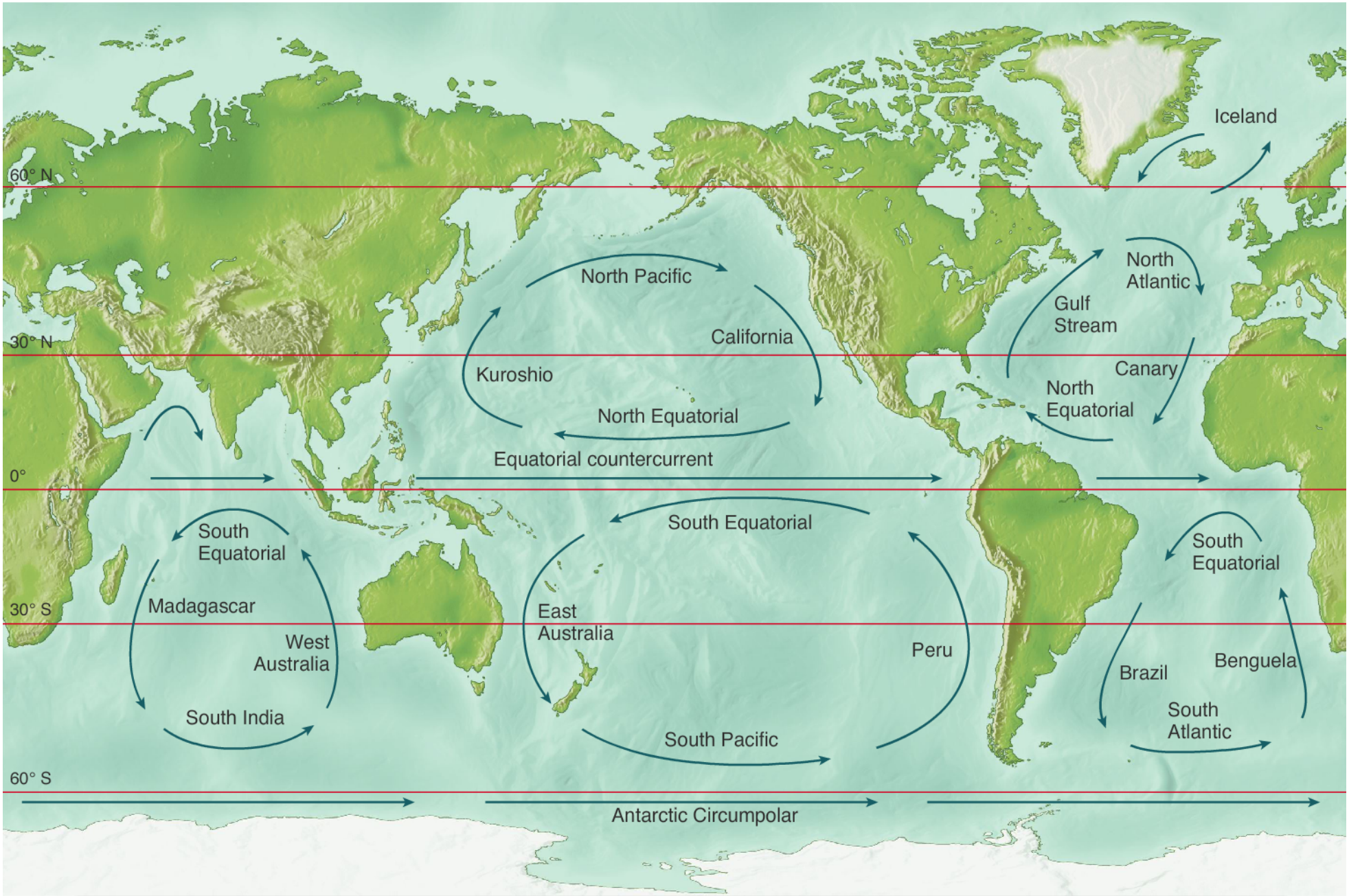


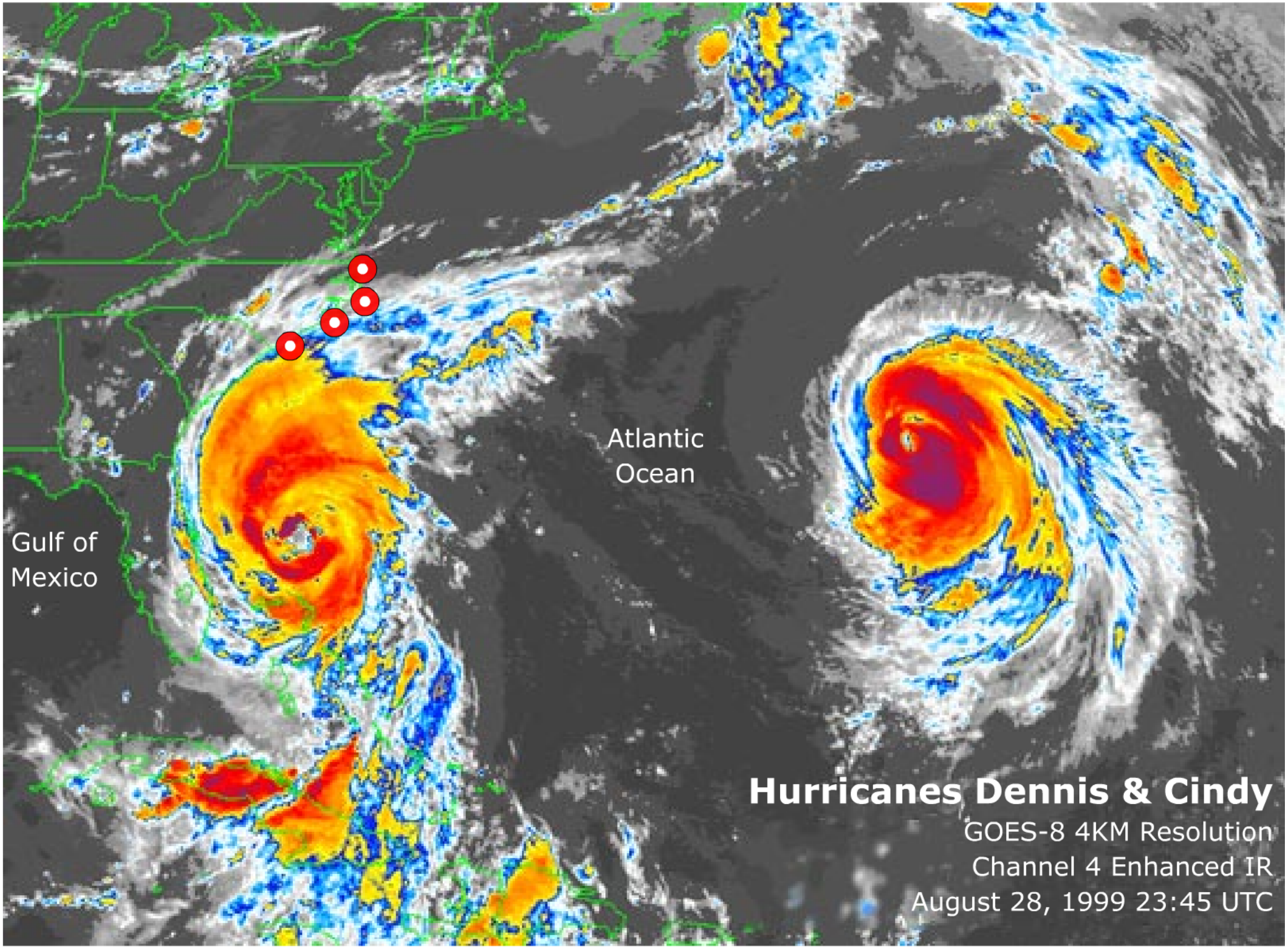
Dunes Triangle

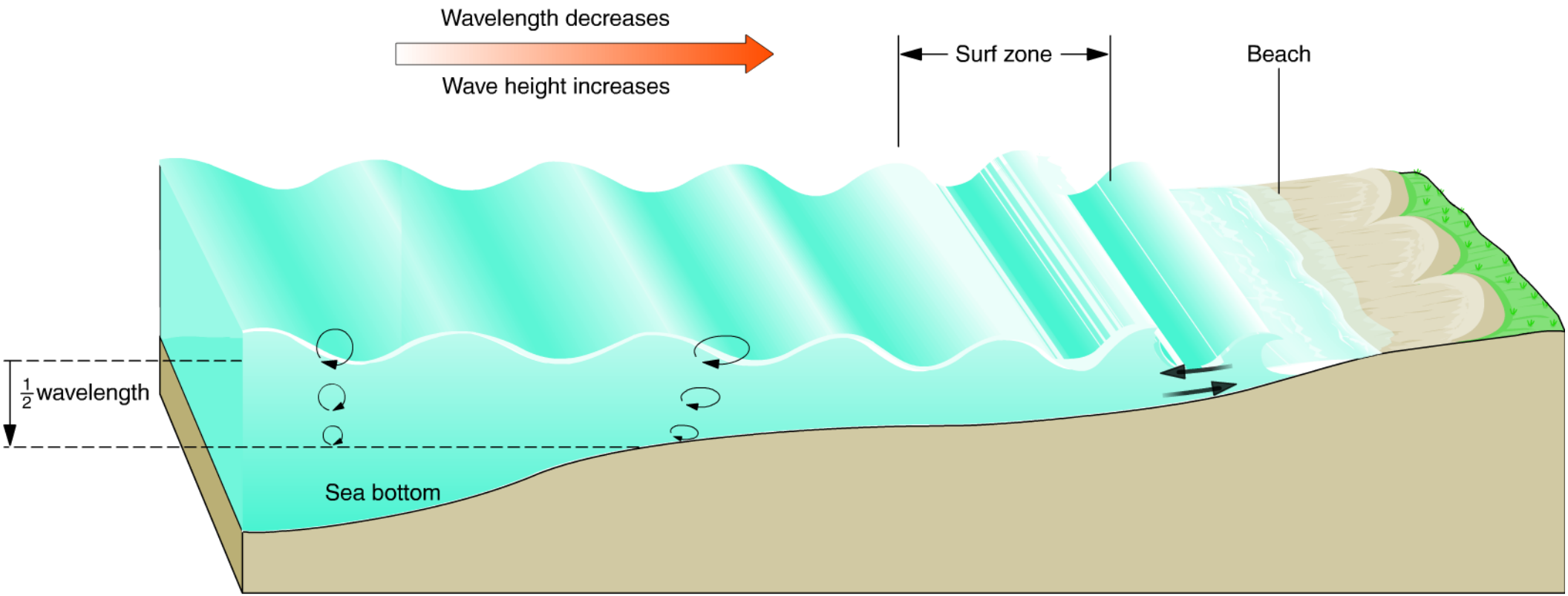
Ripples and Cross Bed Formation

McGraw-Hill Higher Education

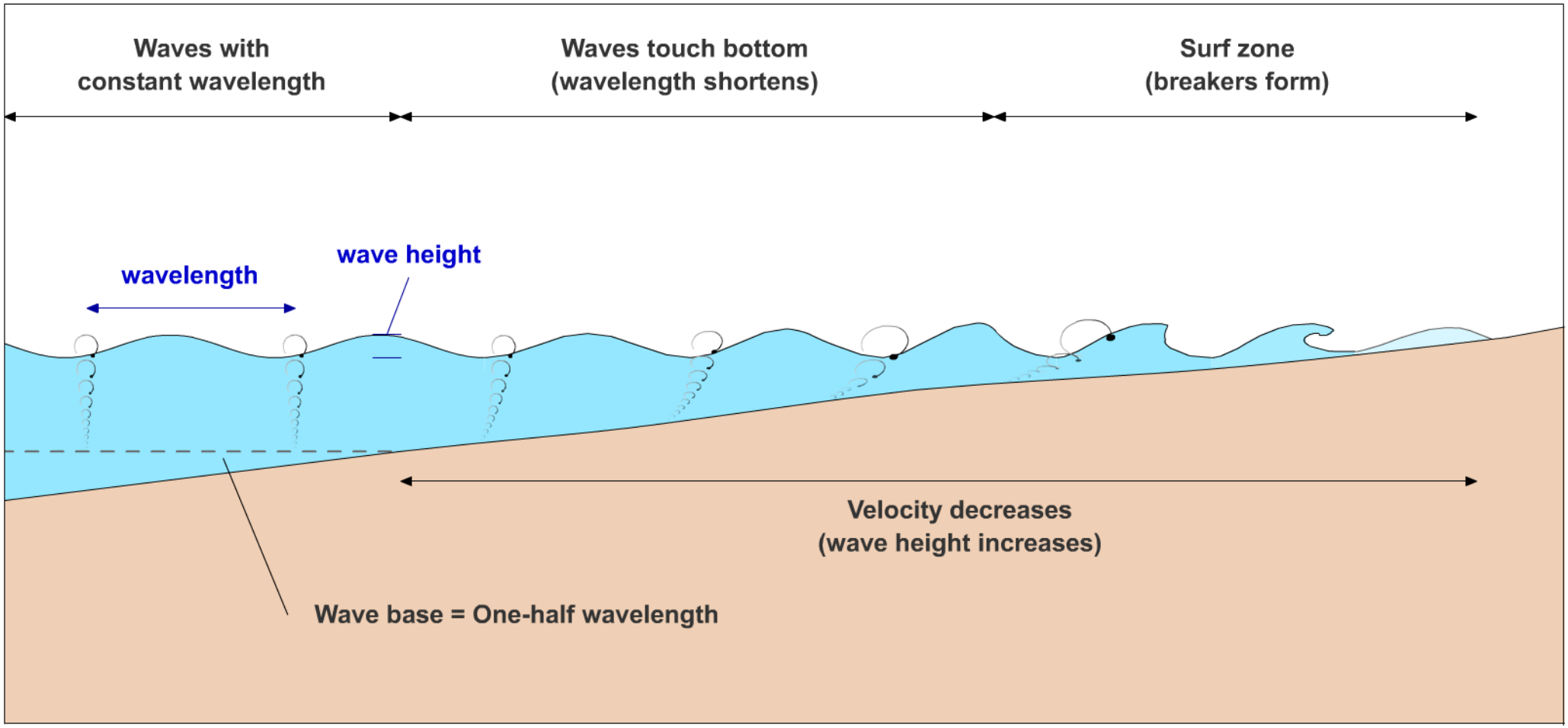
Ocean Currents




Atlantic
Ocean
Gulf of
Mexico
Hurricanes Dennis & Cindy
GOES-8 4KM Resolution
Channel 4 Enhanced IR
August 28, 1999 23:45 UTC


Wavelength decreases
Wave height increases
Surf zone
Beach
$\frac{1}{2}$ wavelength
Sea bottom

Click "Wave Refraction" for Headland and Seastack discussion.



Wave Motion

Wave Refraction

Labels Off

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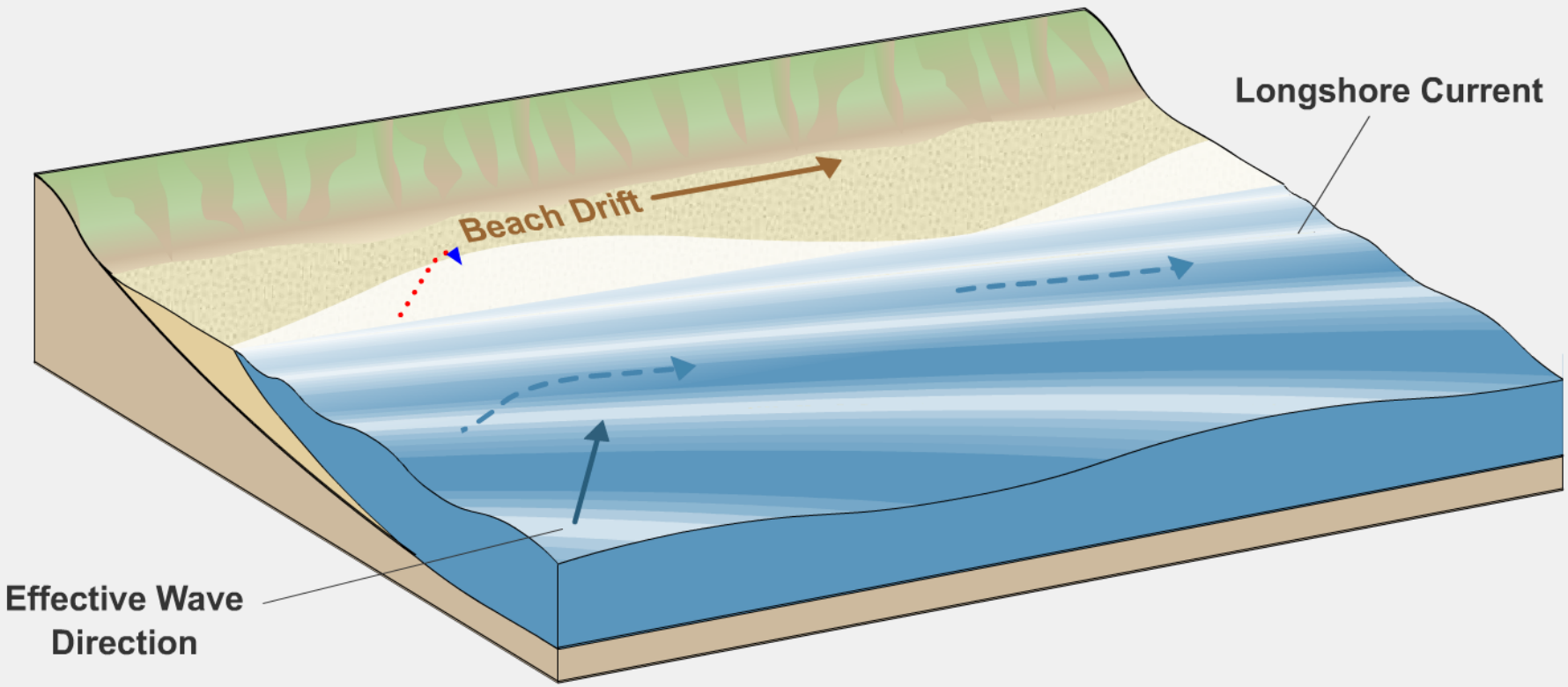

Labels Off

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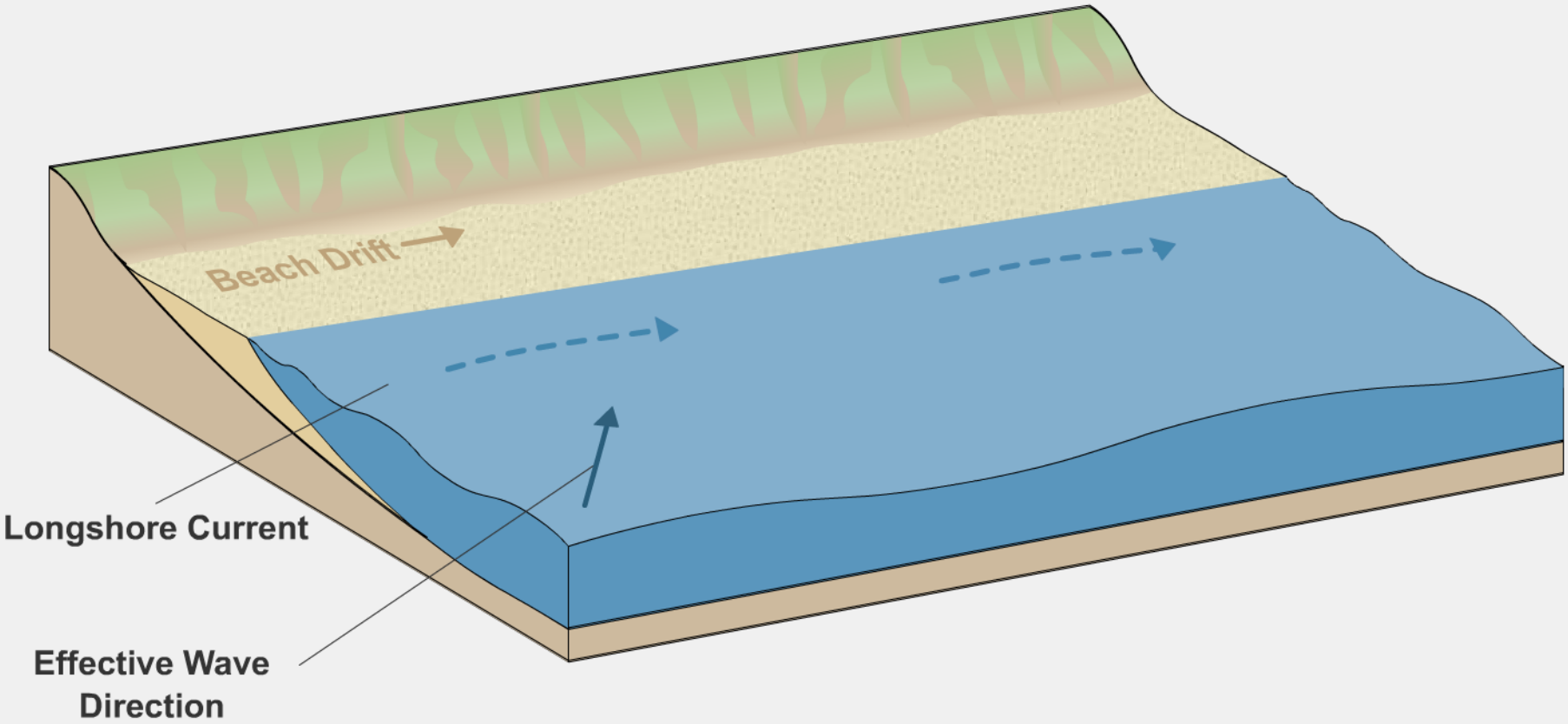
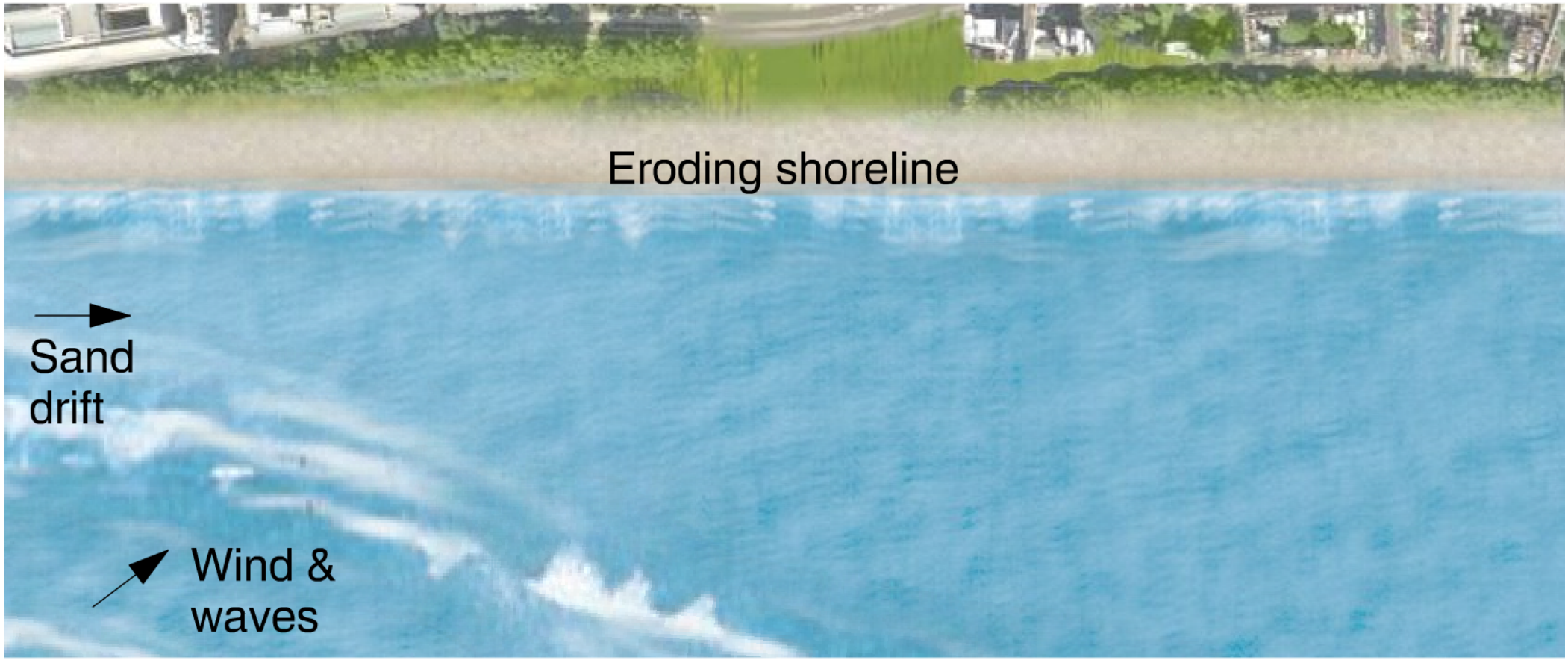
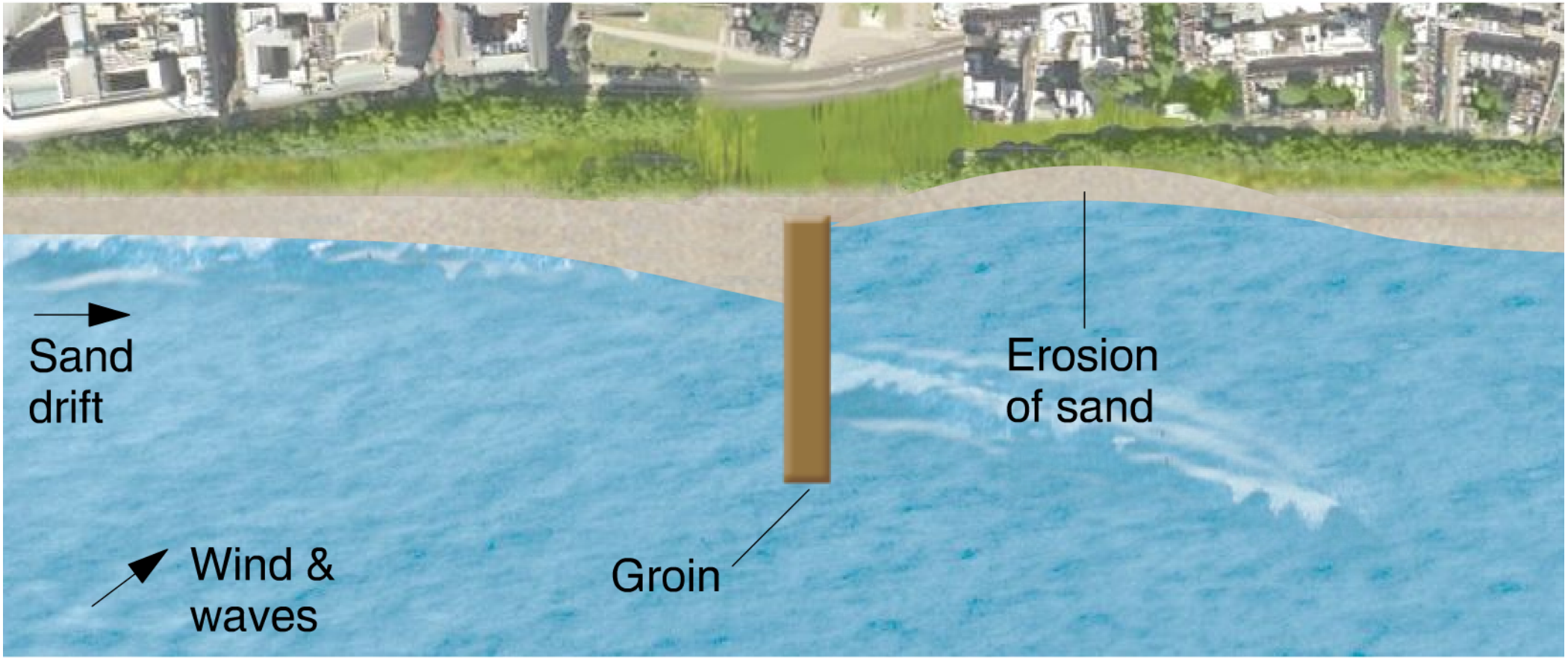
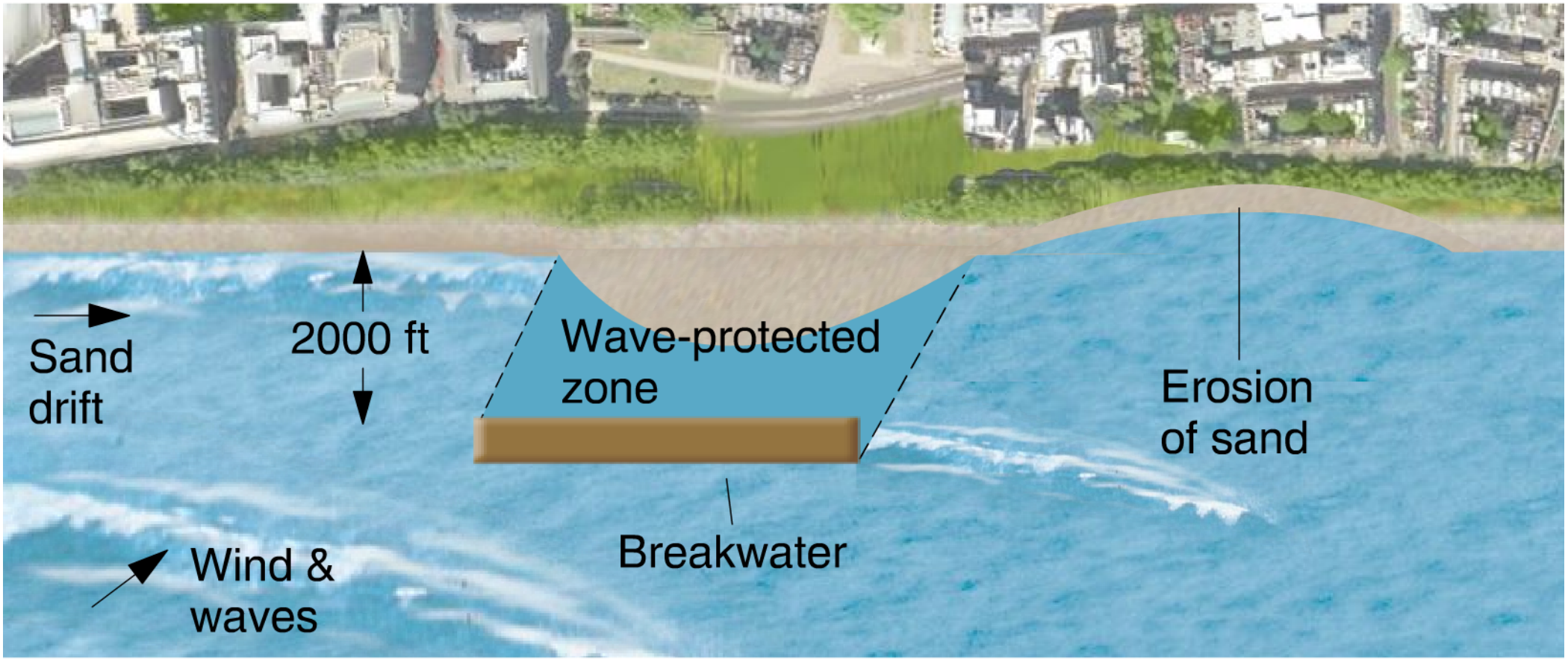
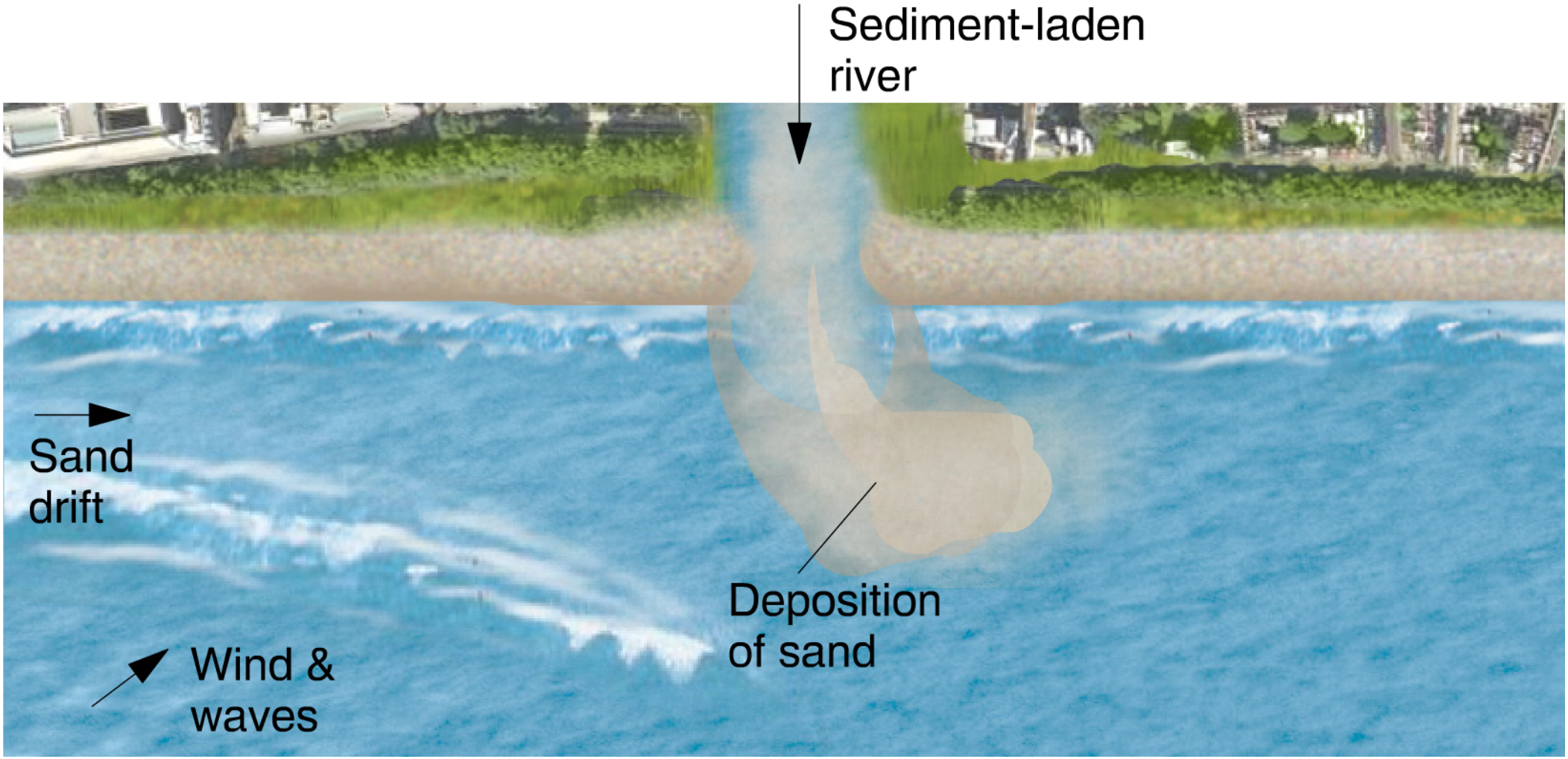


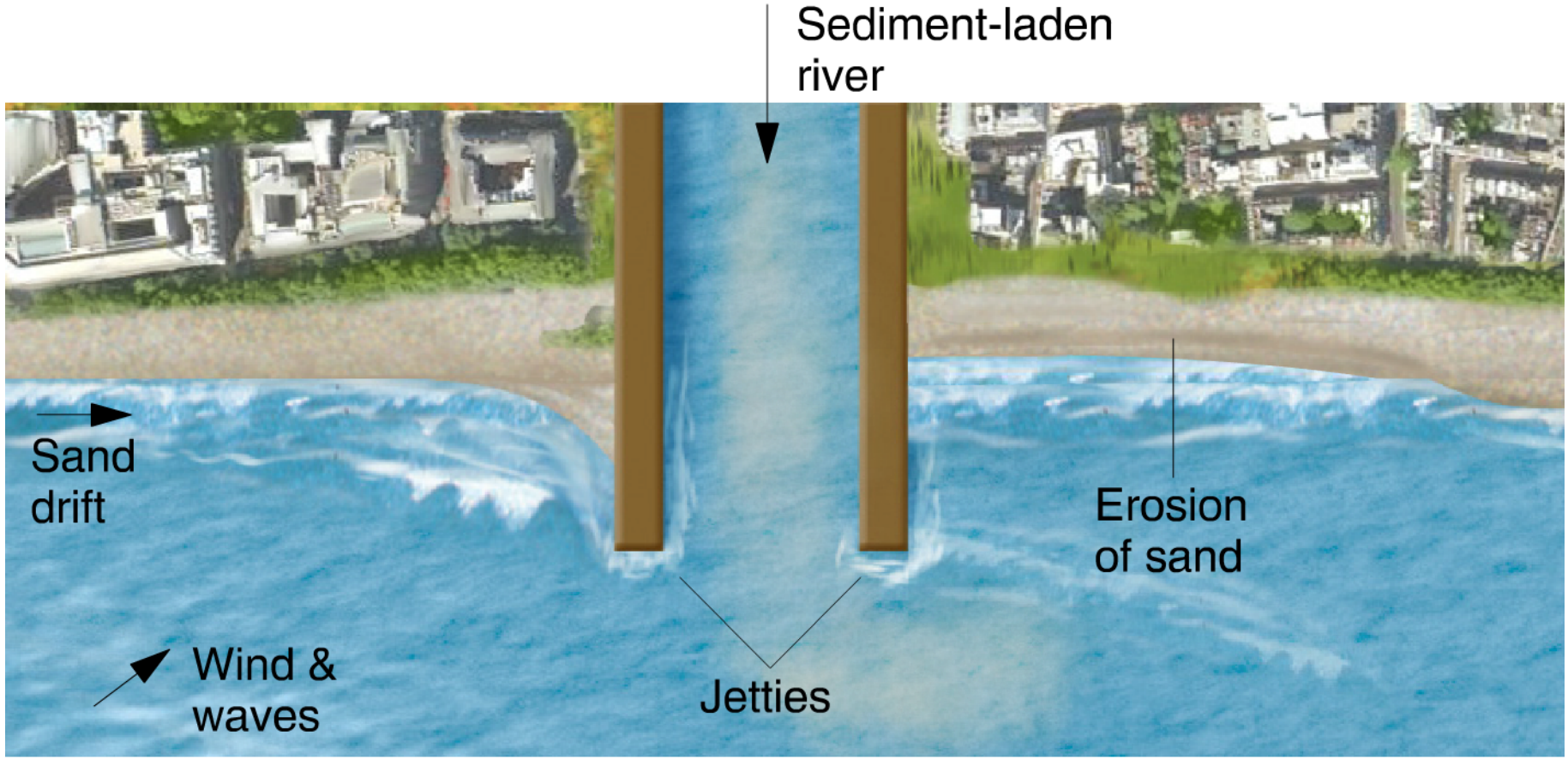
Add Groins | Add Jetties | Add Breakwater | Labels Off

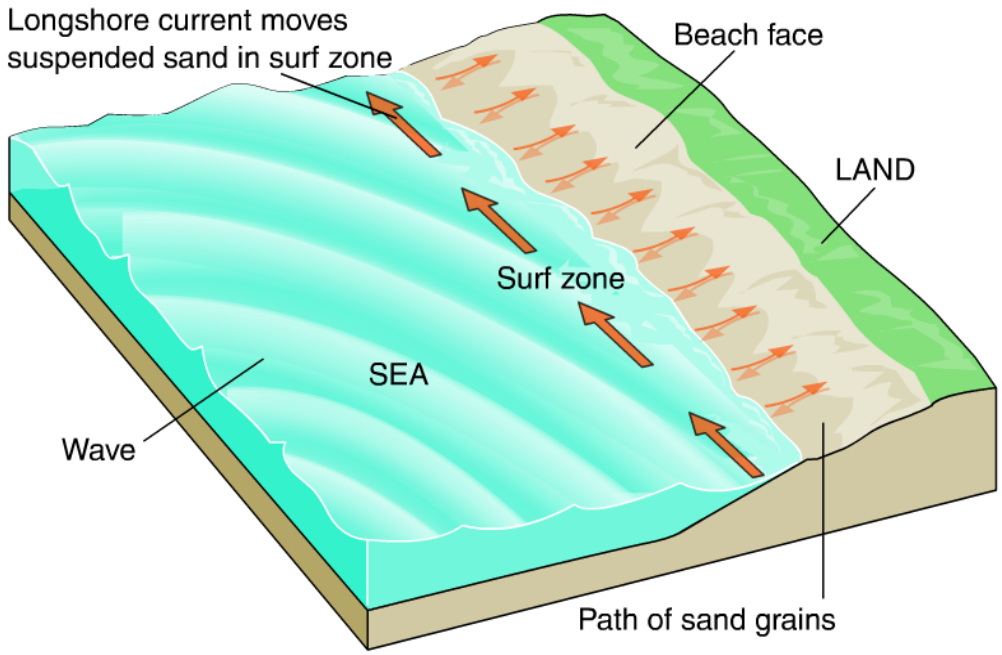

Eroding shoreline
Sand
drift
Wind &
waves

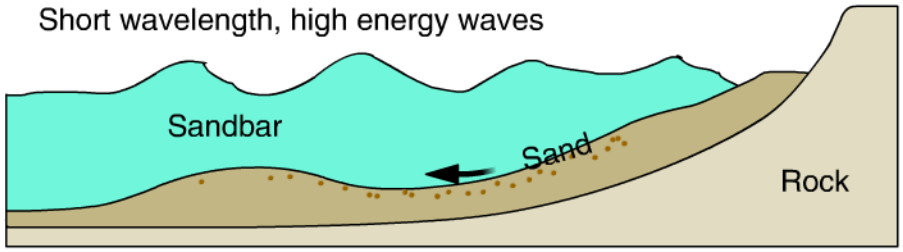

Sand
drift
Erosion
of sand
Wind &
waves
Groin


Sand
drift
2000 ft
Wave-protected
zone
Erosion
of sand
Breakwater
Wind &
waves

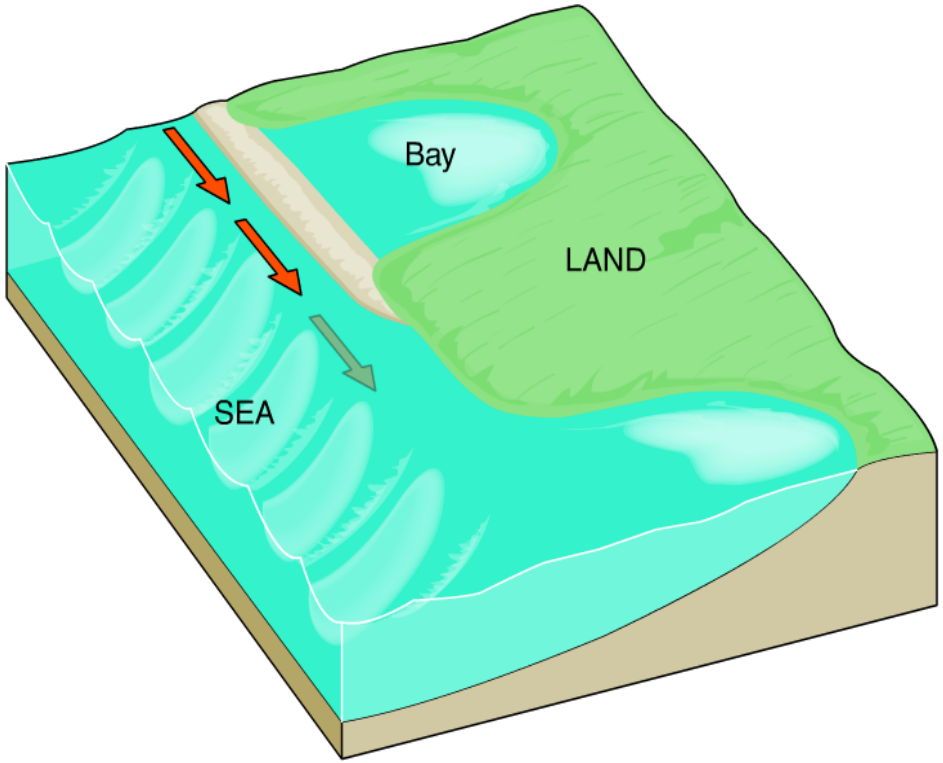

Sediment-laden
river
Sand
drift
Deposition
of sand
Wind &
waves

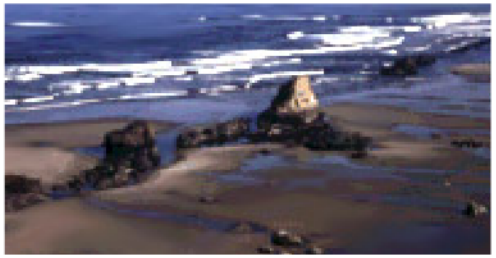

Sediment-laden
river
Sand
drift
Erosion
of sand
Wind &
waves
Jetties

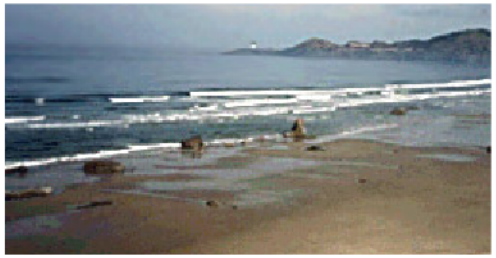

Longshore current moves
suspended sand in surf zone
Beach face
LAND
Surf zone
SEA
Wave
Path of sand grains



Winter beach


Bay
LAND
SEA





Parke D. Snavely, Jr., USGS

1890

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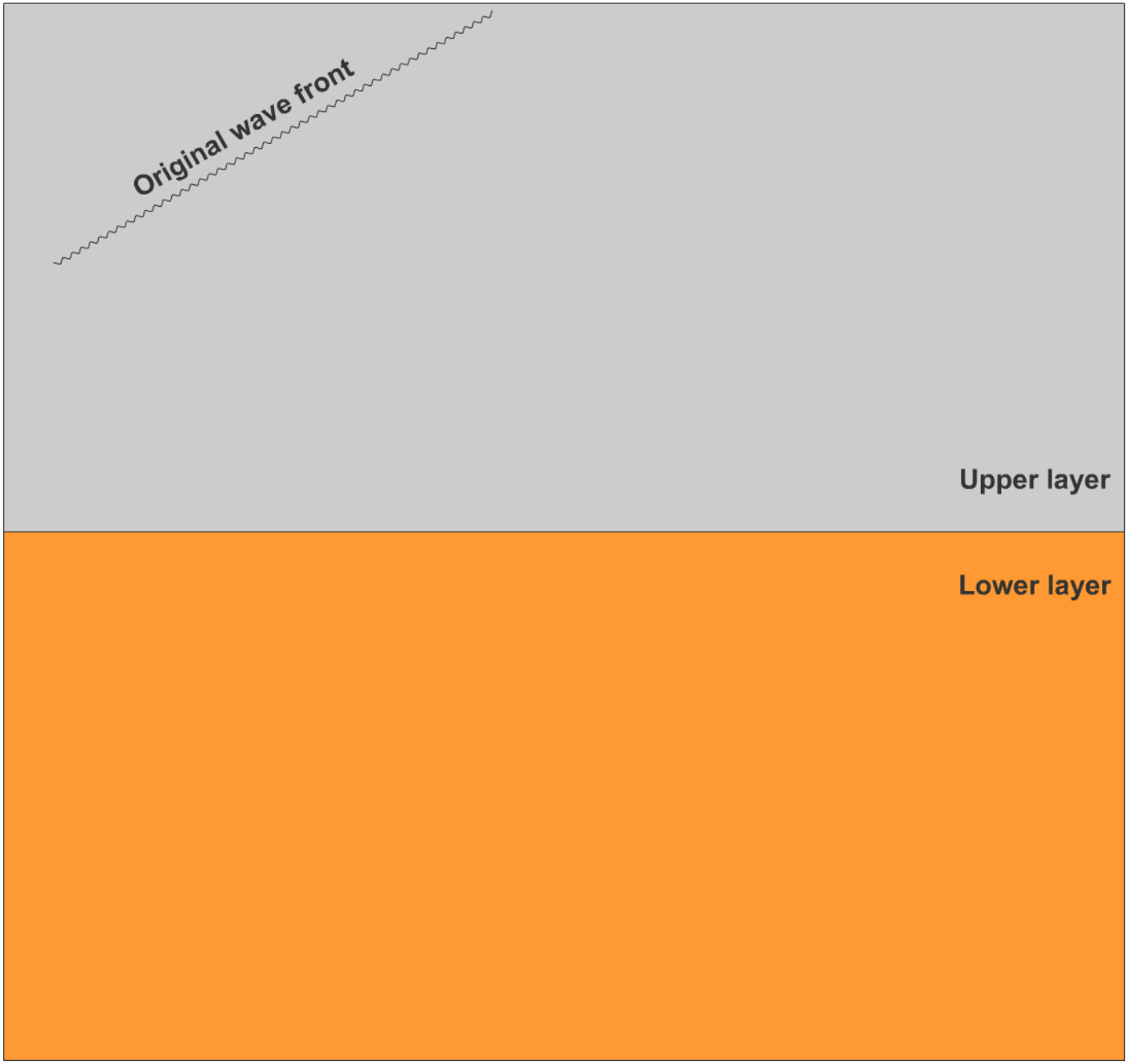

Wave reflection

Wave refraction

Select

Refraction & reflection

Select

Play