

UK PHYSICAL LANDSCAPES: COASTAL LANDSCAPES (OPTION)

WAVE KEY TERMS



Crest: Point at the top of a wave.

Trough: Base of a wave.

Wave height: Distance between the trough and the crest.

Wave length: Distance between two wave crests.

Wave frequency: How often the waves break in a minute.

Swash: Waves running up the beach.

Backwash: Waves returning to the sea due to gravity.

A DESTRUCTIVE WAVE



Strong backwash drags material out to sea (destroys beach)

A CONSTRUCTIVE WAVE



Strong swash pushes material up the beach – building up the beach

WHAT AFFECTS THE STRENGTH AND HEIGHT OF WAVES?

- The speed of the wind
- The time the wind blows for
- The fetch (the distance of water the wind blows over)

EROSION WEARING AWAY OF ROCK

Hydraulic action:

Water is forced into cracks and weakens from within.

Abrasion: Sand/shingle scratches and scrapes cliff base.

Attrition: Pebbles collide with each other which wears sharp edges down.

Solution/corrosion: Chemicals in the water dissolve rock.



WEATHERING (THE BREAKING DOWN OF ROCK IN SITU)

Biological: Animals burrowing and plant roots.

Chemical: Rainfall creating a chemical reaction with rocks...

• **Carbonation** – carbonic acid reacts with calcium carbonate in limestone

• **Hydrolysis** – acid breaks down rock

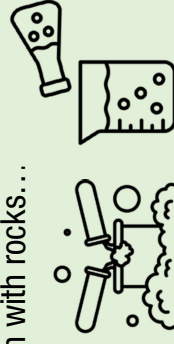
• **Oxidation** – oxygen and water react

Mechanical (physical): Changes in temperature or moisture

• Freeze-thaw – water in cracks freezes and expands and then thaws – process repeats causing rock to break away

• Onion skin (exfoliation) – rocks are heated so expand, then contract when cool – process repeats causing layers to flake off

• Salt weathering – salt from sea spray enters cracks – evaporates and crystallises making rock weaker

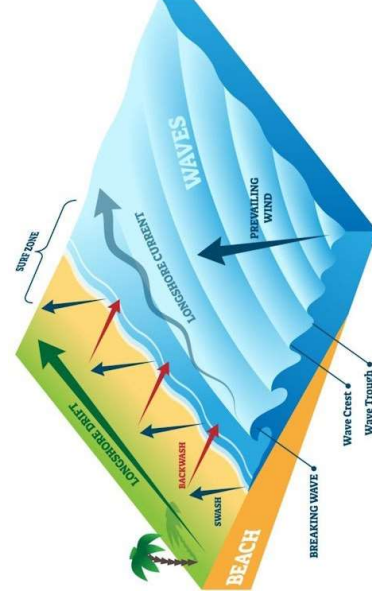


MASS MOVEMENT (ROCK, SOIL OR MUD) MOVING DOWN A SLOP DUE TO GRAVITY

Landslides: Downhill movement of large volumes of rock, soil and mud – often after heavy rain.

Rockfalls: Fragments of rock break away from cliff face, due to freeze-thaw weathering.

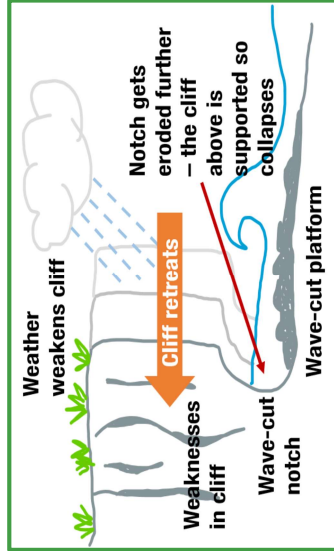
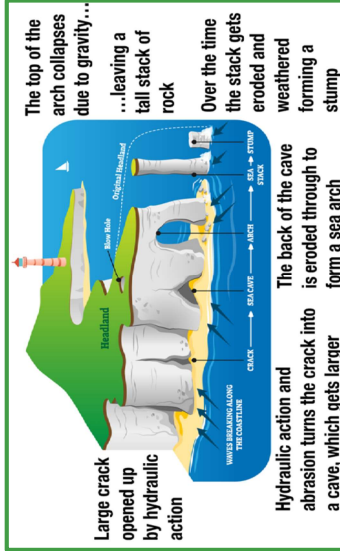
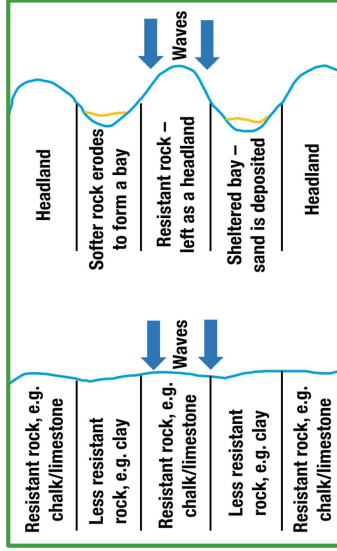
Slumping: Material moves down a concave cliff face – making the material rotate backwards into the cliff face as it slips down.



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EROSIONAL LANDFORMS

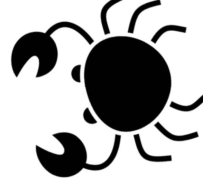
- Bays and headlands
- Caves, arches, stacks and stumps
- Wave-cut platforms



DEPOSITION

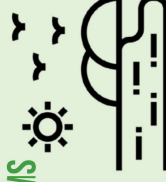
Where waves lose their energy so drop the sediment load they were carrying. Adds sediment to the beach so builds it up. Occurs where...

- the sea is shallow and sheltered
- there is lots of sediment,
- there is a large flat beach causing friction
- structures (e.g. groyne) trap sediment

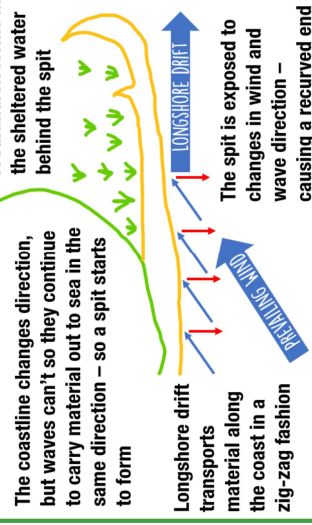


DEPOSITIONAL LANDFORMS

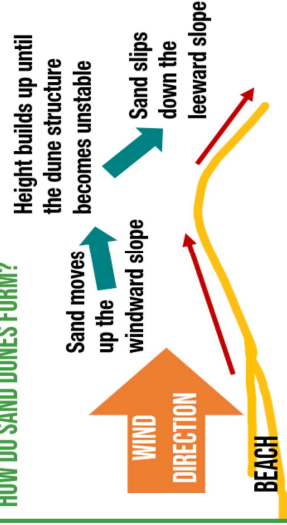
- Spits and bars
- Beaches
- Sand dunes



HOW DO SPITS FORM?



HOW DO SAND DUNES FORM?



HARD ENGINEERING STRATEGIES

Structures built to either stop flooding, reduce erosion, or both.

Sea walls: Stops sea water flooding the land behind – reflects wave power (curved); BUT very expensive, ugly, access issues, reflected waves can damage the beach.

Groynes: Prevents longshore drift from moving material and builds up beach – helps reduce erosion, and good for tourism; BUT Can starve areas further along the coast of material (leading to more erosion). Expensive to maintain. Access issues along beach.

Rock armour: Placed at the cliff base – gaps between the rocks slow down the wave's energy; BUT ugly, can cause damage when installed. Gaps in between can attract litter and vermin.

SOFT ENGINEERING STRATEGIES

Strategies that work with nature.

Beach nourishment/replenishment: Adding more sand to the beach – bigger beach = less erosion and more tourism; BUT needs annual maintenance as it is often just transported elsewhere.

Sand dune regeneration: Restoring existing dunes or artificially creating new ones to provide a barrier between land and sea; BUT fences off large part of the beach, subject to storm damage – unstable.

UK PHYSICAL LANDSCAPES: GLACIAL LANDSCAPES (OPTION)

GLACIAL PROCESSES

Freeze-thaw weathering: Repeated freezing and melting of water inside cracks – weakens rocks.

Erosion: Wearing away of rocks...

- **Abrasion** – ice scraping/scratching valley floor
- **Plucking** – meltwater freezes and sticks to rocks, pulling them loose as the glacier moves

Movement: Glaciers either move by sliding on meltwater, or more slowly as they are frozen to rocks below.

Transportation: Glaciers carry rocks on, in and below the ice – called moraine.

Deposition: Glaciers drop the material they have been carrying when ice melts...

- **Till** – jagged rocks left behind when glaciers retreat
- **Outwash** – material carried away from snout of glacier by meltwater rivers



EROSIONAL LANDFORMS

Corries: Armchair like hollows formed by abrasion and plucking.

Arêtes: Sharp ridge formed when 2 corries meet.

Pyramidal peaks: Formed when 3 or more corries meet.

Truncated spurs: Formed when glaciers cut through interlocking spurs (cutting them off).

Glacial troughs: U-shaped valleys with steep sided and flat bottoms formed when glaciers move down v-shaped valleys.

Ribbon lakes: Deeper depressions formed when ice melts.

Hanging valleys: Valleys from tributaries joining the main glacial trough which have eroded less.



LANDFORMS OF TRANSPORTATION AND DEPOSITION

Erratics: Large rocks left on top of different types of rock (transported and deposited by glaciers).

Drumlins: Egg-shaped hills with a blunt and pointed end.

Moraine: Material carried and deposited by a glacier – several types...

- **Ground moraine** – found under the glacier
- **Lateral** – found at the sides of a glacier
- **Medial** – found between 2 glaciers when they meet
- **Terminal** – found at the glacier's snout



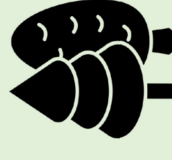
ECONOMIC ACTIVITIES

Tourism: Spectacular landscape – attracts thousands of visitors, potential for adventure tourism, e.g. hiking, mountain biking, skiing, climbing, etc.

Farming: Mainly grazing due to harsh climate and poor soils, particularly sheep farming as they can cope with the cold and wet weather.

Forestry: Many conifer plantations – grow well in acidic soil and can cope with the weather conditions. Cut down after 20-30 years for timber – quick growing trees.

Quarrying: Hard rocks found in glaciated upland areas, e.g. granite, slate and limestone, are ideal for construction.



CONFLICT

Between different land uses: e.g. quarrying may put off tourists, tourists may upset farmers by walking on their land;

Between development and conservation: e.g.

conservationists may argue that farms, quarries, tourists, etc, could harm the environment.

IMPACTS OF TOURISM

Social: Increase in house prices (second home demand).

Economic: Generates money/creates jobs – multiplier effect.

Environmental: Footpath erosion, congestion, air pollution from cars, lakes polluted, etc