

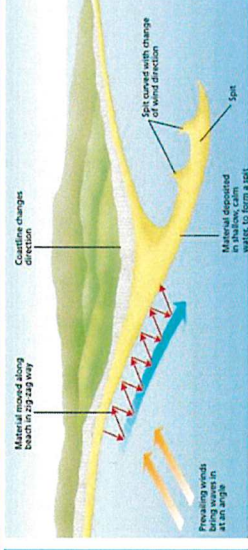
ief of the UK
be divided
o uplands and
/lands. Each
/e their own
racteristics.



+600m:
Peaks and
ridges cold,
misty and
snow
common.
i.e. Scotland

Areas -
200m: Flat
or rolling
hills.
Warmer
weather.
i.e. Fens

Formation of Coastal Spits - Deposition



Example:
Spurn
Head,
Widerness
Coast.

Swash moves up the beach at the angle of the prevailing wind. Backwash moves down the beach at 90° to coastline, due to gravity. Zigzag movement (Longshore Drift) transports material along beach. Deposition causes beach to extend, until reaching a river estuary. Change in prevailing wind direction forms a hook. Sheltered area behind spit encourages deposition, salt marsh forms.

How do waves form?

Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

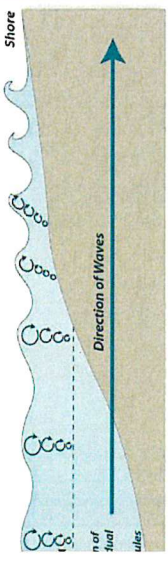
Why do waves break?

Waves start out at sea.

As waves approaches the shore, friction slows the base.

This causes the orbit to become elliptical.

Until the top of the wave breaks over.



The break down and transport of rocks - smooth, round and sorted.

Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolves rocks.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.

Types of Weathering

Weathering is the breakdown of rocks where they are.	
Carbonation	Breakdown of rock by changing its chemical composition.
Mechanical	Breakdown of rock without changing its chemical composition.

A natural process by which eroded material is carried/transported.

Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.

Unit 1c

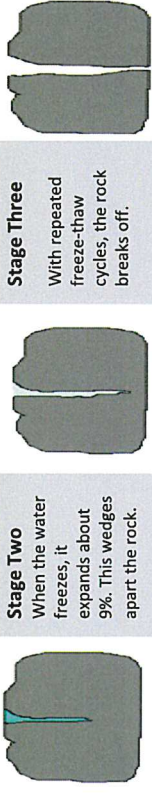


What is Deposition?

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

Physical Landscapes in the UK

Mechanical Weathering Example: Freeze-thaw weathering



Size of waves

- Fetch how far the wave has travelled
- Strength of the wind.
- How long the wind has been blowing for.

Types of Waves

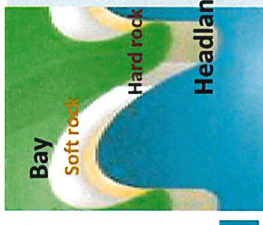
Constructive Waves	This wave has a swash that is stronger than the backwash. This therefore builds up the coast.
Destructive Waves	This wave has a backwash that is stronger than the swash. This therefore erodes the coast.

A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.

- 1 Rain saturates the permeable rock above the impermeable rock making it heavy.
- 2 Waves or a river will erode the base of the slope making it unstable.
- 3 Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
- 4 The debris at the base of the cliff is then removed and transported by waves or river.

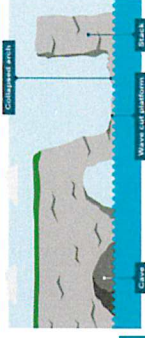


Formation of Bays and Headlands



- 1) Waves attack the coastline.
- 2) Softer rock is eroded by the sea quicker forming a bay, calm area causes deposition.
- 3) More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

Formation of Coastal Stack



Example:
Old Harry
Rocks,
Dorset

- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below - arch collapses leaving stack.
- 6) Further weathering and erosion eaves a stump.

Hard Engineering Defences

Groynes	Wood barriers prevent longshore drift, so the beach can build up.	<ul style="list-style-type: none"> Beach still accessible. No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	<ul style="list-style-type: none"> Long life span Protects from flooding Curved shape encourages erosion of beach deposits.
Sea Defences	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	<ul style="list-style-type: none"> Cheap Local material can be used to look less strange. Will need replacing.

Soft Engineering Defences

Beach nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	<ul style="list-style-type: none"> Cheap Beach for tourists. Storms = need replacing. Offshore dredging damages seabed.
Managed retreat	Low value areas of the coast are left to flood & erode.	<ul style="list-style-type: none"> Reduce flood risk Creates wildlife habitats. Compensation for land.

Case Study: Hunstanton Coast

Location and Background
 Located on the North-West coast of Norfolk. The town is a popular resort for tourists to visit all year round. In 2013, the town suffered damage from a storm surge. The sea life there was flooded and closed for a number of months.

Geomorphologic Processes
 Hunstanton is dominated by dunes that are formed when sand is trapped and built up behind objects.
 Hunstanton Cliffs are made from three different bands of rock: sandstone, red chalk and white chalk.
 Hunstanton Cliff are exposed to cliff retreat. This is when a wave-cut ch develops enough for the cliff face to become unstable and eventually collapses.
 Longshore drift travels from Sheringham in the north to the Wash in the south.

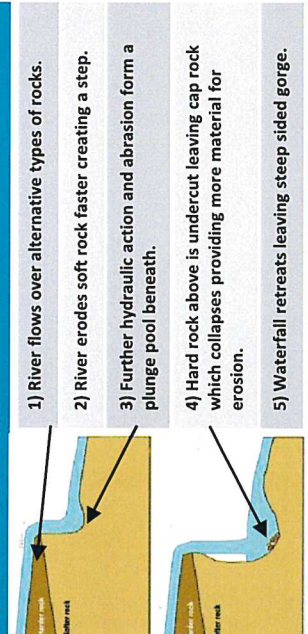
Management
 Hunstanton is protected by a number of groynes. These trap sand to build up the beach for better protection.
 The town is also protected by large sea walls to prevent flooding and deflect the waves energy.
 £5 million has been spent on beach nourishment to add sediment to the beach for increased protection against flooding.

Precipitation	Moisture falling from clouds as rain, snow or hail.
Interception	Vegetation prevent water reaching the ground.
Surface Runoff	Water flowing over surface of the land into rivers
Infiltration	Water absorbed into the soil from the ground.
Transpiration	Water lost through leaves of plants.
Physical and Human Causes of Flooding	
Physical: Prolong & heavy rainfall	Long periods of rain causes soil to become saturated leading runoff.
Physical: Geology	Impermeable rocks causes surface runoff to increase river discharge.
Human: Land Use	Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

Upper Course of a River

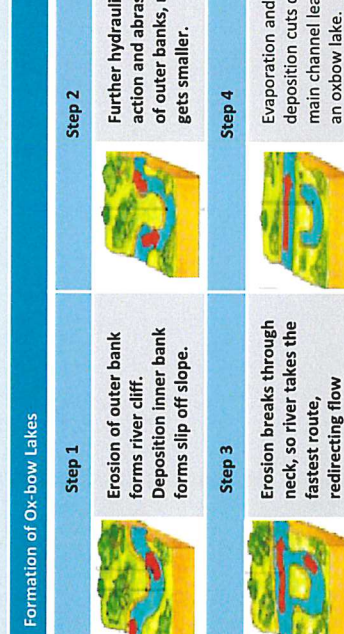
Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall

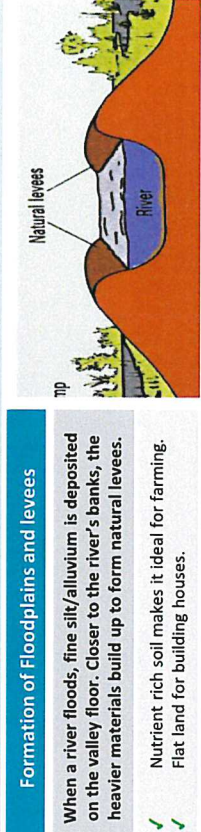


Middle Course of a River

Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.



Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

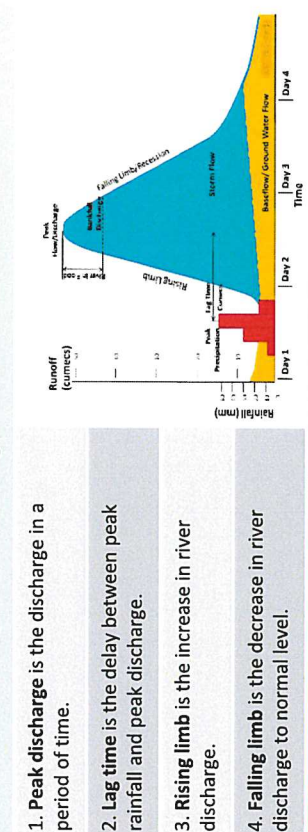


River Management Schemes

Soft Engineering	<ul style="list-style-type: none"> Afforestation – plant trees to soak up rainwater, reduces flood risk. Demountable Flood Barriers put in place when warning raised. Managed Flooding – naturally let areas flood, protect settlements.
Hard Engineering	<ul style="list-style-type: none"> Straightening Channel – increases velocity to remove flood water. Artificial Levees – heightens river so flood water is contained. Deepening or widening river to increase capacity for a flood.

Hydrographs and River Discharge

River discharge is the volume of water that flows in a river. Hydrographs show discharge at a certain point in a river changes over time in relation to rainfall



Case Study: The River Tees

Location and Background
 Located in the North of England and flows 137km from the Pennines to the North Sea at Red Car.

Geomorphologic Processes
Upper – Features include V-Shaped valley, rapids and waterfalls. Highforce Waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.
Middle – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.
Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.

Management
 - Towns such as Yarm and Middleborough are economically and socially important due to houses and jobs that are located there.
 - Dams and reservoirs in the upper course, controls river's flow during high & low rainfall.
 - Better flood warning systems, more flood zoning and river dredging reduces flooding.