

Glossary - COASTS

BACKWASH	
SWASH	
BIOLOGICAL WEATHERING	
CHEMICAL WEATHERING	
MECHANICAL (FREEZE-THAW) WEATHERING	
SOFT ENGINEERING	
HARD ENGINEERING	
CONSTRUCTIVE WAVE	
DESTRUCTIVE WAVE	

Catholic Social Teaching

In this topic the Catholic Social Teaching of STEWARDSHIP is focused upon. This topic delves into Earth’s processes, such as erosion, deposition and transportation. This helps with the belief and understanding of the Earth and how it is everyone’s duty to protect it for the future.



Glossary - RIVERS

CROSS PROFILE	
LONG PROFILE	
DISCHARGE	
HARD ENGINEERING	
SOFT ENGINEERING	
HYDROGRAPH	
LATERAL EROSION	
VERTICAL EROSION	
FLOOD	

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Maths Skills

WRITING ABOUT DATA:

Positive correlation

An increase in one set of data leads to an increase in another set of data. *E.g. There is a positive correlation between an increase in GDP and the number of doctors per person.*

Negative correlation

An increase in one set of data leads to a decrease in another set of data. *E.g. There is a negative correlation between an increase in GDP and infant mortality.*

CALCULATE:

MEAN (average)

Add up all the values, then divide by how many values there are

RANGE

Take the smallest value away from the largest value

MODE

Find the value that appears the most

MEDIAN

Order the values from smallest to largest, then find the value that is in the middle of the list

English Skills

Connectives	Opinion phrases	Geographical key words
therefore moreover nevertheless on the other hand because this means that this suggests whereas however likewise nonetheless seemingly despite this so	in my opinion in conclusion conclusively overall clearly to a large extent to a small extent arguably undoubtedly the evidence suggests in summary ultimately finally for this reason	social economic environmental political local global national international north/south/east/west impact/effect response immediate long-term sustainable

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Geography –UK Landscapes

Relief of the UK

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

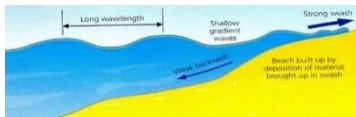


Areas +600m:
Peaks and ridges cold, misty and snow common.
i.e. Scotland

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

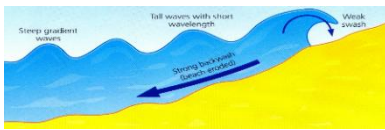
Constructive Waves

This wave has a **swash** that is **stronger** than the backwash. This therefore builds up the coast.

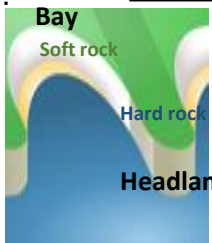


Destructive Waves

This wave has a **backwash** that is **stronger** than the swash. This therefore erodes the coast.



Formation of Bays and Headlands



- 1) Waves attack the coastline.
- 2) Softer rock is eroded by the sea quicker forming a bay, calm area cases 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 a Spit (depositional landform)

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

Mechanical Weathering Example: Freeze-thaw weathering

Stage One
Water seeps into cracks and fractures in the rock.



Stage Two
When the water freezes, it expands about 9%. This wedges apart the rock.



Stage Three
With repeated freeze-thaw cycles, the rock breaks off.



Types of Erosion

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 Transportation

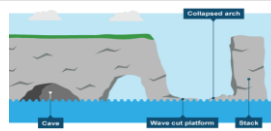
A natural process by which eroded material is carried/transported.

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.

Mass Movement

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

Landslide	When a large area of land becomes unstable and moves downwards
Rock fall	When rocks fall from a cliff/ mountain
Mudflow	Saturated mud becomes fluid and flows downwards
Rotational slip	A cliff collapses on a fault line. The cliff partially collapses, creating a terrace like formation.



Formation of Coastal Stack (erosional landform)

- 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 leaves a stump.

Coastal Erosion Case Study: Holderness Coast

Location and Background

Located on the North-East coast of Yorkshire. The coast is a popular sea resort for tourists to visit all year round. Highest rate of erosion in Europe at an average of 2m per year.

Geomorphic Processes

- Most of the coastline is made from soft glacial boulder clay.
- Prevailing winds lead to destructive waves.
- Longshore drift is moving material south along the coastline.
- Towns, Farms, businesses and people at threat.
- Over 11km is managed because:
 - towns and villages eg Hornsea pop. 8000 & Withinsea pop.6000
 - Important infrastructure eg B1242 road linking towns
 - Esasnton Gas Terminal that supplies 25% of the UK's gas.

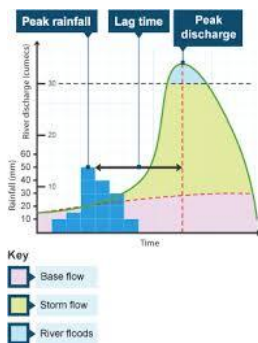
Management

- Mableton
 - 1991, 450m of coastline protected at a cost of £2 million
 - Rock Armour (61,000 tonnes of rock) & Groynes
- Management Conflict -Mableton vs Great Cowden
- Groynes in Mableton hold the material and therefore no sand is reaching Great Cowden.
- Therefore, gaining no protection from the sea leading to erosion.
- No sand is leading to a loss in animal habitats in Spurn Head

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

1. Peak discharge is the discharge in a period of time.
2. Lag time is the delay between peak rainfall and peak discharge.
3. Rising limb is the increase in river discharge.
4. Falling limb is the decrease in river discharge to normal level.



Flood Management Case Study: Boscastle

Location and Background

Boscastle is a village on the north coast of Cornwall. Vulnerable to flash flooding due to its surrounding relief and annual rainfall.

Why the Scheme is Required?

- Village is located at the foot of a steep valley & land upstream has been cleared of vegetation.
- Therefore, surface runoff has increased leading to quick increases in river discharge.
- Boscastle relies on tourism, making for 90% of the total economic income.



Management Issues

- Social – Residents' lives were disrupted for years during construction. Residents are now safer.
- Economic – Cost £4 million. Businesses and homes are now at less risk. Insurance costs lowered.
- Environmental – Biodiversity has improved. New channel engineered to look natural.

Coastal Defences

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.
Gabions or Rip Rap	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.

Water Cycle Key Terms

Precipitation	Moisture falling from clouds as rain, snow or hail.
Interception	Vegetation prevents 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 to runoff.	Physical: Geology Impermeable rocks cause surface runoff to increase river discharge.
Physical: Relief Steep-sided valleys channel water to flow quickly into rivers causing greater discharge.	Human: Land Use Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

River Management Schemes

Soft Engineering	Hard Engineering
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.	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.

Formation of a Waterfall

	1) River flows over alternative types of rocks.
	2) River erodes soft rock faster creating a step.
	3) Further hydraulic action and abrasion form a plunge pool beneath.
	4) Hard rock above is undercut leaving a cap rock which collapses providing more material for erosion.
	5) Waterfall retreats leaving a steep-sided gorge.