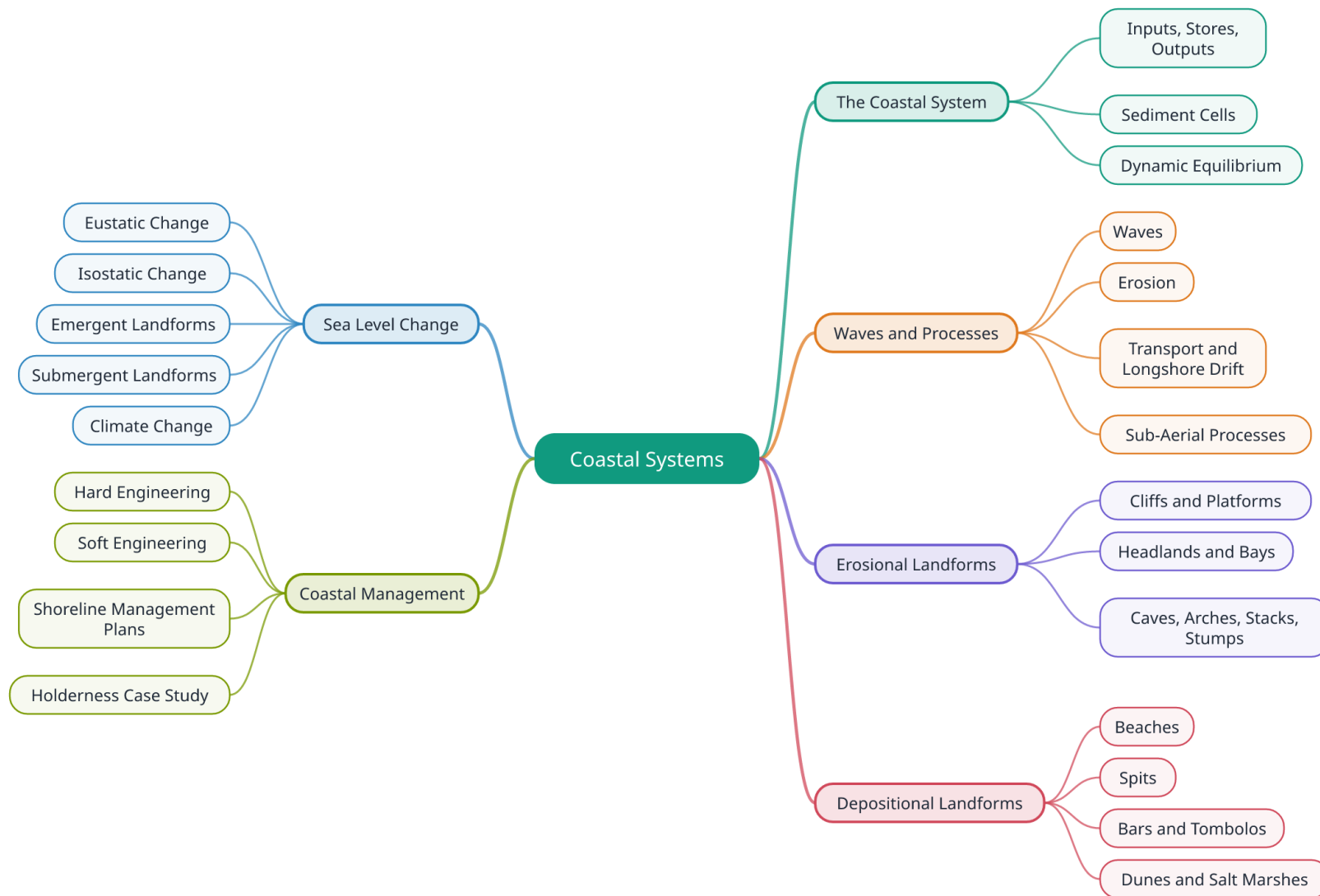


Coastal Systems and Landscapes Mind Map (A Level)

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Coastal Systems and Landscapes mind map explained

The Coastal System

An open system, with energy and sediment moving in and out.

Inputs, Stores, Outputs

Inputs include energy from waves, wind and tides, and sediment from rivers, cliffs and the sea bed. Stores include beaches and spits. Outputs include sediment carried offshore.

Sediment Cells

Stretches of coast where sediment movement is largely self-contained. England and Wales are divided into eleven major cells.

Dynamic Equilibrium

When inputs and outputs balance, the landscape stays stable. A change triggers negative feedback, which tends to restore the balance.

Waves and Processes

Energy from waves shapes the coast.

Waves

Wave energy depends on wind speed, duration and fetch. Constructive waves (strong swash) build beaches; destructive waves (strong backwash) erode them.

Erosion

Hydraulic action, abrasion, attrition, solution and wave quarrying.

Transport and Longshore Drift

Sediment moves by traction, saltation, suspension and solution. Waves hitting the coast at an angle move it along the shore by longshore drift.

Sub-Aerial Processes

Weathering (mechanical, chemical and biological) and mass movement, such as rockfalls and rotational slumping, weaken and remove cliff material.

Erosional Landforms

Most common on high-energy, rocky coasts.

Cliffs and Platforms

Erosion at the cliff base forms a wave-cut notch; the cliff collapses and retreats, leaving a wave-cut platform.

Headlands and Bays

Form on discordant coasts, where bands of resistant and less resistant rock meet the sea.

Caves, Arches, Stacks, Stumps

Erosion exploits weaknesses in a headland, forming a cave, then an arch, then a stack and finally a stump. Old Harry Rocks and Durdle Door in Dorset are classic examples.

Depositional Landforms

Form where sediment is deposited, usually in low-energy areas.

Beaches

Stores of sand and shingle, shaped by constructive and destructive waves, with features such as berms and cusps.

Spits

Longshore drift carries sediment past a change in the coastline, building a ridge out to sea, often with a hooked end. Example: Spurn Head.

Bars and Tombolos

A bar joins two headlands, often trapping a lagoon, as at Slapton Ley. A tombolo joins an island to the mainland, as Chesil Beach does with Portland.

Dunes and Salt Marshes

Sand dunes develop through plant succession (a psammosere); salt marshes form in sheltered estuaries (a halosere).

Sea Level Change

Long-term changes in sea level shape the coast.

Eustatic Change

A global change in sea level, from changes in the volume of ice or the thermal expansion of seawater.

Isostatic Change

A local change in the level of the land. After the last ice age, Scotland is still rising while southern England sinks.

Emergent Landforms

Where land has risen relative to the sea: raised beaches and relict cliffs.

Submergent Landforms

Where the sea has risen relative to the land: rias (drowned river valleys) and fjords (drowned glacial valleys).

Climate Change

Rising sea levels and stormier weather increase flooding and erosion risk.

Coastal Management

Protecting people and property, balancing cost, effectiveness and environmental impact.

Hard Engineering

Sea walls, groyne, rock armour, gabions and revetments. Effective but expensive, and groynes can starve beaches further along the coast of sediment.

Soft Engineering

Beach nourishment, dune regeneration and managed realignment, which work with natural processes.

Shoreline Management Plans

Set a policy for each stretch of coast: hold the line, advance the line, managed realignment or no active intervention.

Holderness Case Study

One of Europe's fastest-eroding coastlines, losing around 2 metres a year on average. Groynes and rock armour at Mablethorpe protect the village but increase erosion to the south.

How to revise with this mind map

1. Use systems language. Describe coasts in terms of inputs, stores, flows, outputs and feedback: examiners reward it.
2. Learn landforms as sequences with labelled diagrams, such as the cave to arch to stack to stump sequence, or how a spit forms. Each stage needs a process.
3. Know located examples. Name and locate a real place for each landform and each management approach, with specific details.
4. For management questions, evaluate. Weigh cost, effectiveness, sustainability and the impact on other stretches of coast, and reach a judgement.
5. Make it yours. Build your own coasts map in Mindmapi from your notes, and ask the AI about any landform or case study you are unsure of. The answer is saved into that branch's notes for next time.