

A Level Geography

Specification and PLC (Personal Learning Checklist)

AREA OF STUDY: 1: Dynamic Landscapes

Topic 2B: Coastal Landscapes and Change

Spring Term

Overview:

Coastal landscapes develop due to the interaction of winds, waves and currents, as well as through the contribution of both terrestrial and offshore sources of sediment. These flows of energy and variations in sediment budgets interact with the prevailing geological and lithological characteristics of the coast to operate as coastal systems and produce distinctive coastal landscapes, including those in rocky, sandy and estuarine coastlines. These landscapes are increasingly threatened from physical processes and human activities, and there is a need for holistic and sustainable management of these areas in all the world's coasts. Study must include examples of landscapes from inside and outside the UK.

Enquiry question 1: Why are coastal landscapes different and what processes cause these differences?				
Key Idea	Detailed content	PLC		
		RED	AMBER	GREEN
2B.1 The coast, and wider littoral zone, has distinctive features and landscapes.	a. Define (and locate) littoral zone, backshore, nearshore and offshore zone.			
	b. Understand the littoral zone includes a range of coastal types and is a dynamic zone of rapid change.			
	c. Understand how coasts can be classified by using longer term criteria such as geology and changes of sea level or shorter term processes such as inputs from rivers, waves and tides.			
	d. Describe characteristics of rocky coasts (high and low relief) result from resistant geology (to the erosive forces of sea, rain and wind), often in a high-energy environment.			
	e. Describe characteristics of coastal plains (sandy and estuarine coasts) found near areas of low relief and result from supply of sediment from different terrestrial and offshore sources, often in a low-energy environment.			
2B.2 Geological structure influences the development of coastal landscapes at a variety of scales	a. Explain how geological structure is responsible for the formation of concordant and discordant coasts.			
	b. Explain how geological structure influences coastal morphology (Dalmatian and Haff type concordant coasts and headlands and bays on discordant coasts).			
	c. Explain how geological structure (jointing, dip, faulting, folding) is an important influence on coastal morphology and erosion rates, and also on the formation of cliff profiles and the occurrence of micro-features, e.g. caves.			
	a. Understand that bedrock lithology (igneous, sedimentary, metamorphic) and unconsolidated material geology are important in understanding rates of coastal recession.			

2B.3 Rates of coastal Recession and stability depend on lithology and other factors.	b. Explain how differential erosion of alternating strata in cliffs (permeable/impermeable, resistant/less resistant) produces complex cliff profiles and influences recession rates.			
	c. Explain how vegetation stabilises sandy coastlines (dune succession and marsh succession).			

Enquiry question 2: How do characteristic coastal landforms contribute to coastal landscapes?				
Key Idea	Detailed content	PLC		
		RED	AMBER	GREEN
2B.4 Marine erosion creates distinctive coastal landforms and contributes to coastal landscapes.	a. Differentiate between constructive/destructive waves.			
	b. Explain how wave type influences beach morphology and profiles at a variety of timescales (daily/longer periods).			
	c. Recall and differentiate between erosion processes (hydraulic action/ corrosion/ abrasion/ attrition).			
	d. Describe how erosion types are influenced by wave type, size and lithology.			
	e. Describe the formation of erosional landforms - wave cut notch, wave cut platform, cliffs, cave-arch-stack-stump.			
2B.5 Sediment transport and deposition create distinctive landforms and contribute to coastal landscapes.	a. Describe/Explain the process of longshore drift and how it affects sediment transport (as well as angle of wave attack, tides and currents).			
	b. Describe the formation of transportation and depositional landforms - beach, recurved and double spits, offshore bars, barrier beaches and bars, tombolos and cusped forelands - which can be stabilised by vegetation succession.			
	c. Understand the coast as a system using the Sediment Cell concept (sources, transfers and sinks) - including negative and positive feedback - as an example of dynamic equilibrium.			
2B.6 Subaerial processes of mass movement and weathering influence coastal landforms and contribute to coastal landscapes.	a. Define and differentiate between mechanical, chemical and biological weathering.			
	b. Understand why weathering is important in sediment production and influences rates of recession.			
	c. Define and differentiate between blockfall, rotational slumping and landslides (mass movement).			
	d. Understand why it is important on some weak/ complex coasts.			

	e. Describe the formation of mass movement landforms - rotational scars, talus scree slopes, terrace cliff profiles.			
--	---	--	--	--

Enquiry question 3: How do coastal erosion and sea level change alter the physical characteristics of coastlines and increase risks?				
Key Idea	Detailed content	PLC		
		RED	AMBER	GREEN
2B.7 Sea level change influences coasts on different timescales.	a. Understand eustatic and isostatic factors lead to longer term sea level change, as well as tectonics.			
	b. Describe the features associated with emergent coastlines (raised beaches with fossil cliffs).			
	c. Describe the features associated with submergent coastlines (rias, fjords and Dalmation).			
	d. Explain the risk to contemporary coastlines from global warming and tectonic activity.			
2B.8 Rapid coastal retreat causes threats to people at the coast.	a. Explain the physical factors (geological and marine) that lead to rapid coastal recession, as well as the human (dredging, coastal management). (See: Nile Delta, Guinea and California coastline).			
	b. Describe subaerial processes and their influence on the rate of coastal recession.			
	c. Explain the factors (short and long term) that influence the rate of coastal recession (wind direction/fetch, tides, seasons, weather systems and occurrence of storms).			
2B.9 Coastal flooding is a significant and increasing risk for some coastlines.	a. Explain (local) factors that increase flood risk on some low-lying and estuarine coasts (height, degree of subsidence, vegetation removal), as well as the risk from global sea level rise. (See: Bangladesh, the Maldives for examples).			
	b. Evaluate the impacts (short term) of storm surge events causing severe flooding (depressions, tropical cyclones). See: the Philippines, Bangladesh for examples).			
	c. Evaluate the increased risk caused by climate change (frequency and magnitude of storms, sea level rise), refer to mitigation and adaptation.			

Enquiry question 4: How can coastlines be managed to meet the needs of all players?				
Key Idea	Detailed content	PLC		
		RED	AMBER	GREEN
2B.10 Increasing risks of coastal recession and coastal flooding have serious consequences for affected communities.	a. Describe economic losses (housing, businesses, agricultural land, infrastructure) and social losses (relocation, loss of livelihood, amenity value) from coastal recession.			
	b. Evaluate their significance, especially in areas of dense coastal developments (see: Holderness, North Norfolk).			
	c. Evaluate the serious economic and social consequences for coastal communities that coastal flooding and storm surge events can have, in developing and developed countries. (See: Philippines, Bangladesh, Netherlands for illustration).			
	d. Understand why climate change may create environmental refugees. (See: Tuvalu Islands).			
2B.11 There are different approaches to managing the risks associated with coastal recession and flooding.	a. Discuss advantages/disadvantages of hard engineering approaches (groynes, sea walls, rip rap, revetments, offshore breakwaters).			
	b. Discuss advantages/disadvantages of soft engineering approaches (beach nourishment, cliff re-grading and drainage, dune stabilisation).			
	c. Examine local conflicts in (many) countries caused by the implementation of sustainable management of future threats (increased storm events, rising sea levels) - refer to mitigation and adaptation. (See: Maldives, Namibia for illustration).			
2B.12 Coastlines are now increasingly managed by holistic integrated coastal zone management (ICZM).	a. Evaluate the sustainable schemes that use holistic ICZM strategies to manage extended areas of coastline - referring to littoral cells.			
	b. Evaluate policy decisions (No Active Intervention, Strategic Realignment and Hold The Line Advance The Line) based on complex judgements (engineering feasibility, environmental sensitivity, land value, political and social reasons). Include reference to Cost Benefit Analysis (CBA) and Environmental Impact Assessment (EIA) used as part of the decision-making process.			
	c. Examine conflict over policy decisions between different players (homeowners, local authorities, environmental pressure groups) with perceived winners and losers in countries at different levels of development (developed and developing or emerging countries). (See: Hapisburgh and Chittagong).			

Topic 2B: Geographical Skills (focus on quantitative skills)			
<i>Note: These skills are not exclusive to the topic areas under which they appear; you will need to be able to apply these skills across any suitable topic area throughout their course of study.</i>	PLC		
	RED	AMBER	GREEN
GIS mapping of the variety of coastal landscapes, both for and beyond the UK.			
Satellite interpretation of a variety of coastlines to attempt to classify them.			
Field sketches of contrasting coastal landscapes.			
Using measures of central tendency to classify waves into destructive and constructive wave types.			
Using student t-test to investigate changes in pebble size and shape along a drift aligned beach and also across the littoral zone to above the storm beach.			
Map and aerial interpretation of distinctive landforms indicating past of sea level change.			
Use of GIS, aerial photos and maps to calculate recession rates for a variety of temporal rates (annual changes and longer-term changes).			
Interrogation of GIS of management cells to ascertain land use values and develop cost/benefit analysis to inform the choice of coastal management strategy.			
Photo interpretation of a range of approaches to management to assess environmental impact.			
Sand dune or salt marsh surveys to assess the impact of succession using an index of diversity, X^2 (Chi-square to compare features of the various zones).			

NOTES/CASE STUDIES