





# a-level exam questions & answers:

## coastal systems & landscapes (section b) >

### mark scheme | 20-mark question #4

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Q.:	Sp. Ref.:	Information For Markers:	B'down:	Marks:
1)	3.1.3.3 	<p><b>With reference to a coastal environment at a local scale, assess the predicted impact of climate change upon the landscape.</b></p> <p><b>AO1</b> – Knowledge and understanding of a local scale coastal case study. Knowledge and understanding of the predicted impact of climate change.</p> <p><b>AO2</b> – Application of knowledge and understanding to assess the impact of climate change upon the chosen case study, including its different consequences such as sea level rise / change, increasing severity and regularity of storm events, erosion, weathering, transportation and deposition.</p> <p><b>Notes for answers</b></p> <p><b>AO1</b></p> <ul style="list-style-type: none"> <li>Recent and predicted climatic change and potential impact on coasts.</li> <li>Eustatic, isostatic and tectonic sea level change: major changes in sea level in the last 10 000 years.</li> <li>Coastlines of emergence and submergence. Origin and development of associated landforms: raised beaches, marine platforms; rias, fjords, Dalmatian coasts.</li> <li>Human intervention in coastal landscapes. Traditional approaches to coastal flood and erosion risk: hard and soft engineering. Sustainable approaches to coastal flood risk and coastal erosion management: shoreline management/integrated coastal zone management.</li> <li>Case study(ies) of coastal environment(s) at a local scale to illustrate and analyse fundamental coastal processes, their landscape outcomes and engage with field data and challenges represented in their sustainable management.</li> </ul> <p><b>AO2</b></p> <ul style="list-style-type: none"> <li>Expect to see the impacts categorised into three main areas: the impact on likelihood of flooding, increased erosion and damage to local habitats. In the assessment some may consider attempts to mitigate the predicted</li> </ul>	AO1=10 AO2=10	20

impact of climate change through management. This is a valid approach.

- E.g. The Norfolk coastal town of Great Yarmouth is around 30 km from Norwich, situated on the mouth of the River Yare. It provides access to the Norfolk Broads from the sea and one of its main industries is tourism (it has been a resort since 1760). More recently it has become an important servicing point for the offshore natural gas rigs. In the past Great Yarmouth was an important herring fishing port. Breydon Water and Halvergate Marshes, located at the rear of the town, are European-designated Special Protection Areas (SPA) and the North Denes area of the beach is home to a dune system, designated a Site of Special Scientific Interest (SSSI). Great Yarmouth (borough) has a population of approximately 93 400.
- Existing evidence suggests the main climate risks as related to fluvial and coastal flooding. This is an ongoing issue as evidenced by the four flooding events in 2006, the North Sea flood of 1953 and a 'near miss' in November 2007 when a tidal surge and high tides resulted in limited flooding. Longer, wetter winters that are forecast to arise as a result of climate change also pose a risk to the town in light of the orientation of the local economy. There may also be the possibility of increasing heatwave events
- In terms of indirect effects of climate change, Great Yarmouth may suffer reputational damage due to media reports on flooding as well as its prolonged wet winters. This may cause considerable economic damage.
- Halvergate Marshes is also under threat from sea level change. • The Local Authority have responded to these threats. One scheme is to lay an 877-metre long revetment of about 1,300 gabions – stonefilled and crushed concrete-filled cages – from the existing rock berm at Little Scratby Crescent, northwards across Scratby Beach to reach Newport.
- The three-metre-high gabions are being positioned at the toe of the soft, sandy cliffs, protecting the low dunes, which are their natural buffer from lapping waves. If left unprotected, these dunes take some years to recover once hit in a storm, meaning they are less effective at reducing erosion to the cliffs if there is another storm soon after.
- The added protection aims to delay the rate of erosion, giving the community time to adjust to coastal change, using the findings of the Government-funded Pathfinder Project, which identified the properties and areas at risk, and potential options, such as displacement land further back from the cliff which householders and businesses could relocate to.
- The scheme is designed to help protect 35 homes which are nearest to the cliff edge, over a 25-year period, and there are another 100 homes, further back which are at risk over a 100-year period.

	<ul style="list-style-type: none"> <li>Any assessment is likely to consider the costs of such management. This scheme cost £600 000 for example.</li> </ul> <p>Credit any other valid approach. Evaluation should be based upon preceding content.</p>		
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### Marking Level Criteria:

Level/Mark Range	Criteria/Descriptor
TOP LEVEL 4 (16-20 marks – 80+% - typically an A* answer)	<ul style="list-style-type: none"> <li>Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2).</li> <li>Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).</li> <li>Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).</li> <li>Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).</li> <li>Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1).</li> </ul>
HIGH LEVEL 3 (11-15 marks – 55-75% - B to A grade answer)	<ul style="list-style-type: none"> <li>Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question. Interpretations are generally clear and support the response in most aspects (AO2).</li> <li>Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).</li> <li>Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).</li> <li>Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).</li> <li>Generally clear and accurate knowledge and understanding of key concepts, processes and interactions and change (AO1)</li> </ul>
LOWER LEVEL 2 (6-10 marks – 30-50% - D-C grade answer)	<ul style="list-style-type: none"> <li>Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretations are partial but do support the response in places.</li> <li>Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).</li> <li>Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).</li> <li>Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).</li> <li>Some knowledge and understanding of key concepts, processes and interactions and change. There may be a few inaccuracies (AO1).</li> </ul>
LOW LEVEL 1 (1-5 marks) - <25% - E or below answer	<ul style="list-style-type: none"> <li>Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretation is basic.</li> </ul>

	<ul style="list-style-type: none"><li>• Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).</li><li>• Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).</li><li>• Very limited relevant knowledge and understanding of place(s) and environments (AO1).</li><li>• Isolated knowledge and understanding of key concepts, processes and interactions and change. There may be a number of inaccuracies (AO1)</li></ul>
LEVEL 0 (0 marks) – no answer provided	<ul style="list-style-type: none"><li>• Nothing worthy of credit (something has gone ridiculously wrong if you're here!)</li></ul>