**Q1.** With reference to a coastal landscape beyond the UK that you have studied, assess the extent to which people will be able to successfully adapt to the risks they face in living on the coast in the future.

**[9 marks]**

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**Q2.** What are sustainable approaches to flood risk and coastal erosion?

**[1 mark]**

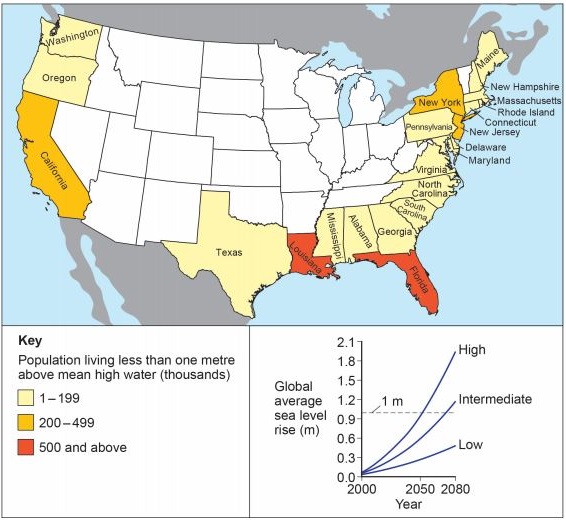
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| --- | --- | --- |
| **A** | Actions that advance the line and build new defences with no assessment of their potential economic and environmental impacts. |  |
| **B** | Integrated plans that seek to manage coastal risks using appropriate technology in an economically viable and environmentally acceptable way. |  |
| **C** | Physical changes to coastal landscapes using resistant materials like concrete, large boulders, wood and metal structures. |  |
| **D** | Strategies that successfully protect one stretch of coastline but have a significant negative impact on the environment in a neighbouring coastline. |  |

**Q3.** ‘Shoreline management / integrated coastal zone management can effectively tackle the expected eustatic sea level change and associated threat to coastal landscapes over the coming decades.’

To what extent do you agree with this view?

**[20 marks]**

**Q4.** The diagram below shows the population in the coastal states of the USA living less than one metre above mean high water, and a range of projections for sea level change.



Analyse the information shown in the diagram above.

**[6 marks]**

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**Q5.** ‘Sustainable approaches to coastal management will become more important than traditional approaches in dealing with the impacts of climate change.’

To what extent do you agree with this view?

**[20 marks]**

**Q7.** ‘No amount of coastal intervention by people can halt the natural processes which continue to present potentially serious risks to coastal communities now and even more so in the future.’

To what extent do you agree with this view?

**[20 marks]**

**Q8.** ‘Coastal flooding and erosion will become a more common occurrence over the coming decades.’

To what extent do you agree with this view?

**[20 marks]**

**]**

Mark schemes

**Q1.**

**AO1** – Knowledge and understanding of the adaptations made by people to cope with the risks they face in a coastal setting beyond the UK.

**AO2** – Application of knowledge and understanding to analyse and assess the extent to which people have successfully adapted to the risks they face in the case study location.

**Level 3 (7–9 marks)**

**AO1** – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change. These underpin the response throughout.

**AO2** – Applies knowledge and understanding appropriately with detail. Connections and relationships between different aspects of study are fully developed with complete relevance. Assessment is detailed and well-supported with appropriate evidence.

**Level 2 (4–6 marks)**

**AO1** – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. These are mostly relevant, though there may be some minor inaccuracy.

**AO2** – Applies clear knowledge and understanding appropriately. Connections and relationships between different aspects of study are evident with some relevance. Assessment is evident and supported with clear and appropriate evidence.

**Level 1 (1–3 marks)**

**AO1** – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change. This offers limited relevance with inaccuracy.

**AO2** – Applies limited knowledge and understanding. Connections and relationships between different aspects of study are basic with limited relevance. Evaluation is basic and supported with limited appropriate evidence.

Notes for answers

**AO1**

•   The relationship between process, time, landforms and landscapes in coastal settings.

•   Case study of a contrasting coastal landscape beyond the UK to illustrate and analyse how it presents risks and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaptation.

**AO2**

•   Responses are likely to be heavily influenced by the exemplification and case study material.

•   Expect an assessment of the nature of the risks likely to be faced by the people in the chosen coastal landscape in the future.

•   Expect an assessment of the adaptations people may make in the future in the chosen coastal landscape.

•   Assessment should focus on the extent to which the adaptations people may make will, or will not be, successful in either allowing them to cope with, or mitigate the impacts of the risks they may face.

•   Responses may assess the extent to which adaptations are successful in improving the level of resilience to, and mitigation of, the risks people face.

•   Responses may come to an overall view of the likely level of success of the adaptations made, or assess the possible successfulness of specific adaptations.

Credit any other valid assessment as long as the argument is coherent and feasible.

**AO1 = 4, AO2 = 5**

**[Total 9 marks]**

**Q2.**

B

**AO1 = 1**

**[Total 1 mark]**

**Q3.**

**AO1** – Knowledge and understanding of integrated shoreline management plans and their role in mitigating the impact of sea level change.

**AO2** – Application of knowledge and understanding to evaluate the role of shoreline management plans in managing changing coastal landscapes.

Notes for answers

**AO1**

•   Recent and predicted climatic change and potential impact on coasts.

•   The relationship between process, time, landforms and landscapes in coastal settings.

•   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.

•   Case study(ies) of coastal environment(s) at a local scale to illustrate and analyse fundamental coastal processes, their landscape outcomes as set out above and engage with field data and challenges represented in their sustainable management.

•   Case study of a contrasting coastal landscape beyond the UK to illustrate and analyse how it presents risks and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaptation.

**AO2**

•   Expect to see some definition of the concept of the integrated shoreline management plan (ISMP). The basic idea is that shoreline management should be considered in terms of managing the processes operating within distinct sediment cells. This is a relatively new way of thinking about coastal management (last 30 years or so) as it does not take into account the artificial boundaries established to maintain the administrative responsibilities of Local Authorities. This latter approach was deemed to be unsystematic producing shoreline management strategies which were sometimes conflicting and certainly not taking into consideration the knock-on effects of decision making in one place.

•   The plans were introduced in 1995 with short, medium and long term elements to each strategy. Many of the short term plans were designed to last up to 20 years and have been continually reviewed updated and modified.

•   The key purpose of the plans has been to provide local authorities with research and analysis to help manage risks related to sea level change, erosion and flooding. There is also an element of sustainability attached to plans in that the primary purpose of any recommendations is to protect the coastline in a long term and sustainable fashion. This takes into account maintenance of the physical environment, protection for people, environmental sustainability and habitat protection.

•   In terms of evaluation, ISMPs have delivered a much more coherent and sustainable approach to coastal management than was previously the case by providing research and analysis related to risk in each location. The second round of ISMPs has now been established across the country with decision making based upon the best fit approach within each sediment cell.

•   Options are hold the line, advance the line, do nothing and managed retreat.

•   Expect to see case studies used to exemplify different aspects of shoreline management plans and specifically how these plans are / were designed to tackle erosion, flooding and or mitigate the risks associated with rising sea levels.

•   In assessing the effectiveness of ISMPs as a tool to mitigate sea level rise, there should be some understanding that cost is huge and a decisive factor in decision making. Tough decisions have to be made and not every area of the country can be protected to the satisfaction of local interests.

•   Case studies involving successes and perceived failures of ISMPs may feature e.g. Happisburgh.

**Credit any other valid approach. Evaluation should be based upon preceding content.**

**Level 4 (16–20 marks)**

•   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).

•   Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).

•   Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).

•   Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1).

•   Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).

**Level 3 (11–15 marks)**

•   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).

•   Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).

•   Generally clear and accurate knowledge and understanding of key concepts, processes and interactions and change (AO1).

•   Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

**Level 2 (6–10 marks)**

•   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.

•   Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).

•   Some knowledge and understanding of key concepts, processes and interactions and change. There may be a few inaccuracies (AO1).

•   Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).

**Level 1 (1–5 marks)**

•   Very limited and / or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question. Interpretation is basic (AO2).

•   Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).

•   Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Very limited relevant knowledge and understanding of place(s) and environments (AO1).

•   Isolated knowledge and understanding of key concepts, processes and interactions and change. There may be a number of inaccuracies. (AO1).

•   Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).

**Level 0 (0 marks)**

Nothing worthy of credit.

**AO1 = 10**

**AO2 = 10**

**[Total 20 marks]**

**Q4.**

**AO3** − Clear use of both diagrams in analysing the extent of the potential flood risk.

Mark scheme

**Level 2 (4−6 marks)**

**AO3** − Clear interpretation and analysis of the quantitative evidence provided, which makes appropriate use of data in support. Clear connection(s) between different aspects of the data and evidence.

**Level 1 (1−3 marks)**

**AO3** − Basic interpretation and evaluation of a geographical issue or question. Basic interpretation and evaluation of the quantitative evidence provided, which makes limited use of data and evidence in support. Basic connection(s) between different aspects of the data and evidence.

Notes for answers

**AO3**

•   Responses are required to analyse both the comparative line graph and the density shading map. They work in conjunction with each other in terms of understanding the risks.

•   The data suggests that by 2070, (based upon the intermediate projection), every part of the United States coastline will be adversely affected by sea level change.

•   Based upon an increase of 3.3 feet (approximately 1 metre) every state will contain people at risk of coastal flooding.

•   On the west coast, typically 10 -99,000 people are likely to be affected.

•   There are two anomalies in this regard. Florida and Louisiana are both expected to see much higher numbers of people affected, presumably due to either higher density of population or more people living in coastal areas below the threshold.

•   Others may suggest that this is a limitation of the resource as this sort of shading indicates a misleading uniformity of impact when actually it is only a narrow coastal belt which is likely to be affected in most cases (depending upon relief).

•   On the west coast there are only three states affected and overall, the impact appears to be lower though there are still up to 499,000 Californians at risk.

•   Some responses may contrast the projections stating that there is a much worse case scenario with the Highest Sea Level Projection. Some may even go beyond the scope of the comparative line graph and note that there appears to be no sign of levelling off and that the future looks to be very precarious with potentially tens of millions of Americans affected by sea level change.

**AO3 = 6**

**[Total 6 marks]**

**Q5.**

**AO1** − Knowledge and understanding of sustainable and traditional approaches to coastal management. Knowledge and understanding of the impacts of climate change on coasts.

**AO2** − Application of knowledge and understanding to come to an evaluative conclusion as to whether sustainable approaches or traditional approaches will be more important in dealing with impacts of climate change. Analysis and evaluation of approaches to coastal management in dealing with impacts of climate change. Assessment of the view that sustainable approaches will be more important than traditional approaches. Should come to a view on ‘extent’.

Notes for answers

**AO1**

•   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.

•   Recent and predicted climate change and potential impact on coasts.

•   Eustatic, isostatic and tectonic sea level change: major changes in sea level in the last 10,000 years. Changes in sea level relative to the land should be considered in the context of the question. Whilst isostatic and tectonic will have little relevance, eustatic should feature in the context of possible impacts of climate change.

•   The relationship between process, time, landforms and landscapes in coastal settings. This should focus upon the link between processes such as sea level change, its negative impacts upon coastal landscapes and the different approaches used to deal with these impacts. Erosion and flooding may also be considered in this context.

•   Case study(ies) of coastal environment(s) at a local scale to illustrate and analyse fundamental coastal processes, their landscape outcomes in the context of the question and the challenge represented in their sustainable development.

•   Case study of a coastal landscape to illustrate and analyse how it presents risks and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaptation.

**AO2**

•   Evaluation − Some will take the approach of evaluating the role and effectiveness of different approaches to coastal flood risk and erosion management. This may involve ideas such as cost benefit analysis of different approaches in different settings supported by illustrative examples.

•   Evaluation − Responses should provide an evaluation of what the impacts of climate change will be. The question does not set any spatial or temporal parameters on this, so responses may focus on local or global perspectives, but the specification does refer to recent and predicted climate change, so expect reference to the mid-20th to late 21st centuries. This may include impacts such as rising sea levels, increased frequency and magnitude of storm events and increased rates of coastal erosion. As long as evaluation is supported with appropriate evidence either approach is valid.

•   Evaluation − Responses should consider the role of coastal management as mitigating the negative impact of erosion and managing flooding. For traditional approaches expect reference to hard and soft engineering. Hard engineering is likely to consider the effectiveness / importance of groynes, revetments, sea walls and rip rap. Soft engineering is likely to consider beach nourishment, dune regeneration, planting vegetation or managed retreat. In the context of the question the effectiveness / importance of both hard and soft approaches together should be assessed. Sustainable approaches are likely to consider shoreline management and integrated coastal zone management.

•   Evaluation − In the context of the question it is the effectiveness or validity of the different approaches to coastal management that should be assessed, in relation to specific threats from climate change.

•   Evaluation − expect responses to illustrate their evaluation of the issues raised by the question with reference to both / either local or global scale case studies.

Overall assessment − Expect responses to come to the view that sustainable approaches will become more important, however, some will argue that different locations will require a combination of different approaches depending upon the specific nature of the impacts of climate change in that location and the nature of the coastline being managed and protected. Either view is valid as long as the response assesses the relative importance of the different approaches and there is clear rationale based upon preceding content.

**Level 4 (16−20 marks)**

•   Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2).

•   Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).

•   Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).

•   Full and accurate knowledge and understanding of key concepts and processes throughout (AO1).

•   Detailed awareness of scale and temporal change which is well-integrated where appropriate (AO1).

**Level 3 (11−15 marks)**

•   Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2).

•   Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).

•   Generally clear and accurate knowledge and understanding of key concepts and processes (AO1).

•   Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

**Level 2 (6−10 marks)**

•   Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2).

•   Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).

•   Some knowledge and understanding of key concepts, processes and interactions and change (AO1).

•   Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).

**Level 1 (1−5 marks)**

•   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).

•   Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).

•   Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Very limited relevant knowledge and understanding of place(s) and environments (AO1).

•   Isolated knowledge and understanding of key concepts and processes.

•   Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).

**Level 0 (0 marks)**

•   Nothing worthy of credit.

**AO1 = 10, AO2 = 10**

**[Total 20 marks]**

**Q7.**

**AO1** − Knowledge and understanding of the physical processes affecting coastlines; those associated with waves, currents, tides, erosion, transport and deposition. Knowledge and understanding of eustatic and isostatic sea level change. Knowledge and understanding of the impact of coastal management.

**AO2** − Application of knowledge and understanding to analyse and evaluate how climate change links to sea level change and can exacerbate flooding and erosion as well as creating change to the physical landscapes (including landform development). There should be some evaluation of the extent to which the statement is valid.

Notes for answers

There are clear inter-related strands to this question. The focus is upon the challenges associated with coastal management. The assertion is that natural processes will prevail and that human activity designed to protect coastlines is effectively a waste of time and money. There is also an aspect of alternative possible futures. Responses should look ahead and integrate the changing coastal dynamic into their responses.

**AO1**

•   A range of processes affecting coastlines. Expect to see reference to: waves (constructive and destructive); prevailing currents; the role of wind and its connection to fetch.

•   Erosional processes and associated landforms − abrasion, attrition, hydraulic action and solution − landscapes of erosion may feature.

•   Transportation processes of traction, saltation, solution and suspension. Links to longshore drift are likely. Some may connect wave action and longshore drift.

•   Deposition should feature in relation to a variety of landforms such as beach, dunes, spits and bars.

•   The contribution of these processes (erosion, transport and deposition) to the development of low and high energy environments may also feature. Expect to see stronger focus upon high energy environments with links to erosional coastlines and those at risk of flooding.

•   Coastal management strategies to include hard engineering soft engineering and other approaches such as managed retreat.

•   Alternative possible futures should emerge and include the potential impact of sea level change upon both process, landform, but also how this impacts upon attitudes to coastal management.

•   Risks associated with living along coastlines under threat from erosion and flooding.

•   Learned case study support may be used to exemplify.

Many will use case studies from within the UK and beyond the UK in supporting their responses.

**AO2**

•   Evaluation − some debate is encouraged here. Some coastlines are coping relatively well with issues arising out of natural processes. Estuaries such as the Thames, with considerable financial investment in flood and erosion defence schemes, is well protected against the natural processes threatening it.

•   Analysis − In the UK, expect to see reference to locations / coastlines such as Happisburgh. Here isostatic changes are combining with a eustatic rise in sea level to create significant risk of flooding and erosion. Also local geology is adding to the issue as the rocks are easily eroded. Added to this, both areas are relatively close to sea level, just a few metres above.

•   Evaluation − Some may engage in a debate around the value of intervention. Responses are likely to consider the challenges of defending coastal locations in a financial climate of scarce resources. Policy dilemmas associated cost and options such as with managed retreat are likely to feature. This may be linked to the ‘knock-on effects’ of intervention in natural processes. Interference in the movement of beach material in sediment cells is credited with causing considerable issues in places where no management exists.

•   Analysis and evaluation − Some students may use recent storm events as part of a case study to exemplify the impact on the local area and how these events are forecast to increase in frequency and severity as a result of climate change. This is one alternative possible future associated with increased flooding.

•   Evaluation − Further abroad, some may consider locations such as the Maldives, whose very existence is under threat as a result of sea level change. The highest point of the Maldives is only 8 m above sea level.

•   Analysis and evaluation − Some may suggest that impacts of climate change are minimal due the actions of people in mitigation. For example, mitigation against the impact of sea level rise in the Maldives through a combination of hard and soft engineering strategies, such as the development of mangrove and the hard engineering work taking place around the islands economic hubs, such as the capital, Malé.

•   Overall evaluation is likely to acknowledge that coastal management is set to become an increasingly challenging issue for governments around the world over the coming decades. Whilst it is possible to interfere with natural processes, human induced climate change and the scarcity of financial resources make decisions about where to protect and how much to invest extremely difficult. Places such as the Maldives have no real viable future if the climate models and expected sea level changes emerge. Other places such as the Netherlands have managed to fight these natural processes with massive financial investment and considerable technological advancement.

**Level 4 (16−20 marks)**

•   Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2).

•   Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).

•   Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).

•   Full and accurate knowledge and understanding of key concepts and processes throughout (AO1).

•   Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).

**Level 3 (11−15 marks)**

•   Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2).

•   Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).

•   Generally clear and accurate knowledge and understanding of key concepts and processes (AO1).

•   Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

**Level 2 (6−10 marks)**

•   Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2).

•   Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).

•   Some knowledge and understanding of key concepts, processes and interactions and change (AO1).

•   Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).

**Level 1 (1−5 marks)**

•   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).

•   Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).

•   Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Very limited relevant knowledge and understanding of place(s) and environments (AO1).

•   Isolated knowledge and understanding of key concepts and processes (AO1).

•   Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies (AO1).

**Level 0 (0 marks)**

•   Nothing worthy of credit.

**AO1 = 10, AO2 = 10**

**[Total 20 marks]**

**Q8.**

**AO1** − Knowledge and understanding of the causes of flooding and erosion. Awareness of both the natural factors and the human activities which exacerbate flooding and erosion. Knowledge and understanding of approaches to coastal management.

**AO2** − Applies knowledge to place and shows understanding of the future focus of the question. Analysis and evaluation of factors affecting coastal erosion and flooding going forward, most notably the impact of sea level change as well as decisions by coastal managers in determining whether (and what type of) intervention should occur. May see human activity and natural factors working in conjunction with each other. Should come to a view on ‘extent’.

Notes for answers

**AO1**

•   Eustatic, isostatic and tectonic sea level change: major changes in sea level in the last 10,000 years. These changes in sea level relative to land should be considered in the context of the question. Whilst isostatic and tectonic may not feature strongly, eustatic should feature in alternative possible futures.

•   Recent and predicted climatic change and potential impact on coasts.

•   The relationship between process, time, landforms and landscapes in coastal settings. This should focus upon the link between processes such as sea level change and its impact upon coastal landscapes. Erosion and flooding may also be considered in this context.

•   Origin and development of landforms and landscapes of coastal erosion. These must be referred to within the context of the question i.e. to what extent are these erosional features likely to develop further in the future.

•   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. This element should feature in balancing the assertion in the question. Management offers the opportunity to mitigate against the likelihood of increasing erosion and flooding.

•   Case study of a coastal landscape to illustrate and analyse how it presents risks and opportunities for human occupation and development and evaluate human responses of resilience, mitigation and adaptation.

**AO2**

•   Analysis and evaluation − Some will take a more physical approach by examining evidence in support of the statement, i.e. that coastal flooding and erosion are set to become increasing problems. Such approaches will consider issues associated with areas vulnerable to erosion and how this is being exacerbated by coastal management strategies, local geology and local geomorphology. Climate change is also likely to feature in such responses. Here candidates are likely to consider the impact of climate change on sea levels and associated expected changes to weather patterns. Many will argue that these combined issues will impact on both flooding and erosion.

•   Analysis and evaluation − Responses should consider coastal management as a way of mitigating the impact of erosion and managing flooding. For coastal management, expect to see reference to schemes which involve hard and / or soft engineering. Some may define such terms as part of a brief introduction. Hard engineering is likely to consider groynes, revetments, sea walls and rip rap. Soft engineering is likely to consider beach replenishment, vegetation planting and managed retreat. The distinction is in the way soft engineering attempts to manage flooding and erosion in a more natural and sustainable fashion, working with nature more effectively. Evaluation is likely to consider the effectiveness of the scheme and the cost. Some may evaluate soft versus hard engineering in relation to environmental impact. Managed retreat may also feature as an approach to address the challenges associated with alternative possible futures.

•   Overall evaluation − This evaluation may acknowledge that the coastline of many countries is likely to become more susceptible to erosion and flooding as a result of predicted sea level change. There may be acknowledgement that action can be taken but that this comes at considerable cost.

**Level 4 (16−20 marks)**

•   Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question (AO2).

•   Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2).

•   Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1).

•   Full and accurate knowledge and understanding of key concepts and processes throughout (AO1).

•   Detailed awareness of scale and temporal change which is well integrated where appropriate (AO1).

**Level 3 (11−15 marks)**

•   Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question (AO2).

•   Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Generally clear and relevant knowledge and understanding of place(s) and environments (AO1).

•   Generally clear and accurate knowledge and understanding of key concepts and processes (AO1).

•   Generally clear awareness of scale and temporal change which is integrated where appropriate (AO1).

**Level 2 (6−10 marks)**

•   Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2).

•   Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2).

•   Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1).

•   Some knowledge and understanding of key concepts, processes and interactions and change (AO1).

•   Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies (AO1).

**Level 1 (1−5 marks)**

•   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).

•   Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).

•   Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2).

•   Very limited relevant knowledge and understanding of place(s) and environments (AO1).

•   Isolated knowledge and understanding of key concepts and processes (AO1).

•   Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies. (AO1).

**Level 0 (0 marks)**

•   Nothing worthy of credit.

**AO1 = 10, AO2 = 10**

**[Total 20 marks]**

Examiner reports

**Q1.**

This question proved accessible to students around 90% of responses reached Level 2 or higher. The best answers gave clear assessment and supported their points with good specific details from their chosen case study. Many such responses also showed clear understanding of the specific future risks, with many showing clear understanding of issues relating to climate change, sea level rise and population pressures, amongst others. Weaker responses either did not focus on the future, or showed little appreciation of the concept of “adaptation”, and made general points about managing risks.

**Q2.**

The vast majority of students correctly shaded lozenge B.

**Q3.**

Shoreline Management Plans / Integrated Coastal Zone Management were implicit in a number of responses. Some simply considered the merits and costs of different approaches to coastal management. Whilst not strictly focused on the question, there was some credit for this approach. Holderness and Odisha featured in many responses though some simply evaluated the policies rather than dealing with the question in relation to the expected eustatic change. For instance, with Holderness, many referred to strategies in relation to coastal erosion and not the expected eustatic change in the coming decades. The best responses understood the basis of the approaches and were able to show how these plans, did at least attempt to take a broader, joined up approach to coastal management than perhaps has historically been the case.

**Q4.**

This response only averaged 2.9 out of the available 6 marks, with 45% accessing Level 2. Students simply had to show understanding of the potential impact of the variable projections upon the coastal states of the USA.

Too many failed to engage with the projections graph, dealing only with the basic patterns displayed upon the map which constituted a limited answer. More sophisticated responses showed that there are potentially millions of people at risk of coastal flooding if the intermediate projections materialise.

There was no credit for offering reasons for the sea level change or drifting into the potential impact and mitigation / coastal management strategies that could be employed in response. This constituted application of knowledge (AO2) and was not being tested in this question.

**Q5.**

This question proved reasonably accessible to most candidates. 56% of students reached Level 3 or better. The thrust of the question was coastal management in the future in response to impacts of climate change. Many students did make clear reference to possible impacts of future climate change, with detail relating to possible sea level change and changing weather events. These generally scored well. The specification identifies “hard and soft engineering” as traditional approaches and “shoreline management / integrated coastal zone management” as sustainable approaches. Very few responses followed this interpretation. Most responses gave a debate between “hard” and “soft” engineering, with hard presented as the traditional approach and soft as the sustainable. This was credited and could score well as long as the assessment focused on their importance in terms of dealing with the impacts of climate change. Many misinterpreted the question and presented a debate focusing on which is more sustainable, hard or soft engineering. This was not the thrust of the question and did not score well. Many of the best responses were supported with specific detail from illustrative examples. These were often very perceptive and showed a clear engagement with specific issues places are going to face in the coming decades as sea levels rise and coastal populations increase. Many had detailed discussions about the costs and benefits of maintaining and enhancing current defences against making difficult land use planning decisions in the light of future impacts of climate change.