Oxford Revise | AQA A Level Geography | Answers

Chapter 3

Exemplar answers have been written by the author of the revision guide and are not created or approved by AQA. They do not necessarily represent the only possible solution or way to answer the question. All exemplar answers are likely to be in the top mark band.

Questions 1–8 are point-marked. Allow 1 mark per valid point with extra marks for development.

1 AO1 = 4

- Wind creates waves when it blows over the surface of the sea (1). The friction causes the particles to rotate (1).
- Wind determines wave energy, as wave energy is influenced by wind speed, duration, strength, and the length of fetch (1).
- The energy of the waves can influence the processes and landforms found in the coastal environment (1).
- A high-energy environment is characterised by powerful, destructive waves and high rates of erosion (1).
- Destructive waves have a backwash which has more energy than the swash and will remove material from the beach (1).
- Low-energy environments have a higher rate of deposition due to less powerful, constructive waves for most of the year and are more likely to be sandy and estuarine coasts (1).
- Constructive waves have a swash which has more energy than the backwash and will build up a beach (1).

Example answer: *Wind creates waves when it blows over the surface of the sea, as the friction causes the particles to rotate. Wind speed, duration, strength, and the length of fetch will determine the wave's energy. The energy of the waves can influence the processes and landforms found in the coastal environment. A high-energy environment is characterised by powerful, destructive waves and high rates of erosion. Low-energy environments have a higher rate of deposition due to less powerful, constructive waves for most of the year and are more likely to be sandy and estuarine coasts.*

2 AO1 = 4

- The impact of erosional processes is influenced by the type of wave (destructive waves have more erosional power) (1) and rock type (weaker rocks are more susceptible to erosion) (1).
- The processes of marine erosion are:
    - Hydraulic action – waves force air into the cracks in cliffs. The compressed air bubbles create a mini explosion (cavitation) (1). The repeated increase in pressure will force cracks to widen and break pieces off the cliff (1).
    - Solution – a chemical process where limestone is dissolved by carbonic acid in seawater (1). It is the only erosional process which is not more effective under storm conditions (1).
    - Abrasion/corrasion – sediment that is carried by the waves is thrown at the cliffs and wears the cliff face away (1).
    - Wave quarrying – the removal of loosened material by wave action (1).
    - Attrition – pieces of sediment that are carried in the waves knock against each other, breaking parts of the rock down and creating smoother, smaller and rounder particles (1).
- Marine erosion is responsible for the creation of distinctive coastal landforms (1), such as cliffs, wave-cut platforms, and cliff profile features such as stacks (1).
- Coastal erosion will also contribute to the retreat of coastlines (1).

3 AO1 = 4

- Waves attack cliffs between the high- and low-tide marks (1); marine erosion creates a wave-cut notch (1).
- Continued undercutting creates an overhang (1).
- The unsupported overhang eventually collapses (1), and the cliff retreats (1).
- Fallen debris is removed from the base of the cliff by wave action (1).
- A wide, gently sloping platform is left behind at the base of the cliff which is covered at high tide (1). The cliff has retreated from its previous position (1).

4 AO1 = 4

- Longshore drift transports sediment along the coastline, in the direction of the prevailing wind (1).
- When the coastline changes direction, due to a bay, estuary or indent, longshore drift continues to carry material out into the open sea (1).
- Sediment is deposited and this process continues until the sediment is visible above the water line (1).
- A secondary wind, or a change in wave direction, can create a recurve at the distal end, creating a compound spit (1).
- The area behind a spit is sheltered, and pioneer species may establish there, creating a salt marsh (1).

5 AO1 = 4

- Mudflats and saltmarshes develop in areas with low wave energy and shelter, such as estuaries, bays, and behind spits (1).
- For example, Keyhaven salt marshes have formed behind Hurst Castle spit on the UK's Hampshire coastline (1).
- Fine, suspended sediment forms into clumps which are deposited between high and low tide levels (1).
- The first plants to grow in saltmarshes are small pioneer plants and algae (1). Both help to bind the mud and clays together and trap sediment (1).
- Halophytes (salt-tolerant plants) establish themselves next and decompose, adding organic matter to the soil (1).
- Over time, a wider variety of plants will be able to survive in the saltmarsh, reducing the wave action further and encouraging more deposition (1).

6 AO1 = 4

- Isostatic factors lead to a local change in the land level, leading to a relative change in sea level (1).
- Land can subside due to the weight of the ice stored on it, leading to a relative sea level rise (1).
- Land that was once covered in ice during the last ice age is still rising and falling in a process called glacial isostatic adjustment (1).
- A high rate of deposition within a sediment cell may increase the level of the land, leading to a relative sea level fall (1).
- Tectonic processes, such as volcanic activity on the seafloor or subduction zones, can displace the ocean and lead to sea level change (1).

7 AO1 = 4

- Waves attack geological weaknesses in a headland, such as joints and cracks (1).
- These geological weaknesses are eroded easily and widen and deepen to form a cave (1).
- Back-to-back caves eventually join and break through the headland to form an arch (1).
- Continued marine erosion at the base of the arch and subaerial processes on the roof cause the arch to collapse (1).
- A tall, isolated pillar of rock, a stack, stands separate from the headland, which has retreated (1), e.g. The Twelve Apostles are a collection of limestone stacks in Victoria, Australia (1).

- Erosion at the base of the stack can create a notch (1) which is unable to support the weight above, so the stack collapses to form a stump which may only be visible at low tide (1).

Questions 9–17 are level-marked.

8 AO3 – Analysis of the data evidence of predicted sea level rise in three different scenarios to identify patterns, anomalies and using data manipulation to support response.
AO3 = 6

Level	Marks	Description
2	4–6	• Clear analysis of the quantitative evidence provided, which makes appropriate use of evidence in support. • Clear connection(s) between different aspects of the evidence.
1	1–3	• Basic analysis of the quantitative evidence provided, which makes limited use of evidence in support. • Basic connection(s) between different aspects of the evidence.

- Global sea level will vary globally but with no clear pattern.
- Most areas will experience regional mean sea level rise (pink/red areas).
- The highest levels of sea level rise will occur between 2081 and 2100 (the darker red colour).
- RCP 8.5 shows the highest level of sea level rise for most regions in both time periods.
- The range of sea level change for all RCPs across both time periods is 2.4 metres.
- Some areas show regional sea level falling, e.g. north-east of Canada and Greenland. This fall will be the most significant for RCPs 2.6 and 4.5 between 2081 and 2100 (the darker blue).
- Land areas may have been better shown in a different colour, as it is difficult to differentiate between them and the areas of zero mean level change.

Example answer: *The maps show future sea level change will vary globally but most areas will experience regional mean sea level rise. There is no clear pattern for where sea level change is higher or lower. The highest levels of sea level rise will occur between 2081 and 2100. RCP 8.5 shows the highest level of sea level rise for most regions in both time periods. The range of sea level change shown across all maps is 2.4 metres. Some areas will experience a regional sea level fall, specifically in the north-east of Canada and in Greenland. This fall will be the most significant for RCPs 2.6 and 4.5 between 2081 and 2100. it is not clear whether the white areas are land areas, or 0 metres mean sea level change.*

9 AO3 – Analysis of the data evidence of the average rate of cliff retreat in California to identify patterns, anomalies and using data manipulation to support response.
AO3 = 6

Level	Marks	Description
2	4–6	• Clear analysis of the quantitative evidence provided, which makes appropriate use of evidence in support. • Clear connection(s) between different aspects of the evidence.
1	1–3	• Basic analysis of the quantitative evidence provided, which makes limited use of evidence in support. • Basic connection(s) between different aspects of the evidence.

- The map shows variation in the rate of cliff retreat along the California coastline over a 52-year period.
- Cliff retreat appears to be higher in areas of Franciscan Complex geology (0.20–0.25 metres per year), and is highest around the area of Big Sur.
- Cliff retreat appears to be lower in areas of granitic rocks (0.12 metres per year), in the northern part of the coastline.
- Study area 4 shows a higher rate of cliff retreat (0.22 metres per year) but, as the map shows the area is mainly granitic rock, there must be other factors influencing the higher rates of cliff retreat, other than geology.
- The map does not show evidence of other factors that may be influencing the rate of cliff retreat, such as management, impact of marine processes and presence of landforms.

10 AO1 – Knowledge and understanding of the transportation processes related to the development of spits.
AO2 – Application of this knowledge to the novel situation; specifically, in accounting for the formation of spits.
AO1 = 2 AO2 = 4

Level	Marks	Description
2	4–6	• AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. • AO2 – Applies knowledge and understanding to the novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance.
1	1–3	• AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. • AO2 – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance.

AO1

- Origin and development of landforms and landscapes of coastal deposition – spits; factors and processes in their development.
- Distinctively coastal processes: marine: transportation, traction, suspension (longshore/littoral drift) and deposition.

AO2

- Longshore drift transports sediment along the coastline, in the direction of the prevailing wind. Sediment within the waves travels by traction and suspension.
- When the coastline changes direction, due to a bay, estuary or indent, longshore drift continues to transport material out into the open sea.
- Sediment is deposited and this process continues until the sediment is visible above the water line.
- The spit in the photo has a curved end. A secondary wind, or a change in wave direction, can create a recurve at the distal end, creating a compound spit.

- There is considerable deposition of sediment behind the spit in the photo. The area behind a spit is sheltered, and pioneer species may establish there, creating a salt marsh.
- The spit in the photo has well-established vegetation, which has colonised the spit over many years helping to stabilise it.

Generic explanation of the formation of spits (with no attempt to apply knowledge to the resource and associated information) should be held to Level 1.

11 AO1 – Knowledge and understanding of the role of wave energy related to the development of coastal landscapes.
AO2 – Application of this knowledge to the novel situation; specifically, in accounting for the formation of coastal landscapes – bays, headlands and cliffs.
AO1 = 2 AO2 = 4

Level	Marks	Description
2	4–6	• AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. • AO2 – Applies knowledge and understanding to the novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance.
1	1–3	• AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. • AO2 – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance.

AO1

- Origin and development of landforms and landscapes of coastal erosion: cliffs and wave cut platforms, cliff profile features including caves, arches, and stacks; factors and processes in their development.
- Sources of energy in coastal environments: winds, waves (constructive and destructive), currents and tides. Low energy and high-energy coasts.

AO2

- There are several factors and processes that affect the development of coastal landforms and landscapes.
- The photo shows a bay, with a headland in the foreground and background – a discordant coastline.
- Destructive, storm waves have more energy and lead to higher rates of erosion and cliff retreat.
- Constructive waves with less energy have deposited sediment in the bay creating the beach shown in the photo.
- The photo shows some steep cliffs with evidence of mass movement at the foot.
- The cliffs appear to be stabilised by vegetation growth.
- Geology will have affected the development of this landscape. Geology has two aspects, lithology (the geological structure of a rock), and rock type.
- Soft, sedimentary rocks are more susceptible to erosion and higher rates of coastal recession, whereas harder rock types, such as igneous and metamorphic, are less easily eroded and weathered.

- Joints and faults are fractures which create points of weakness in rocks, which are then vulnerable to weathering and erosional processes. They can be exploited to form wave-cut notches and caves in the cliff.
- Angle of dip may have affected the steepness of the cliff profiles. Steeper cliffs in the background may have rocks that dip towards the land.
- There is no evidence of human activity to manage this coastline, so it cannot be seen that management or development is affecting the natural processes which create this coastal landscape.

Generic explanation of the formation of coastal landforms such as bays, beaches, headlands, and cliffs (with no attempt to apply knowledge to the resource and associated information) should be held to Level 1.

12 AO1 – Knowledge and understanding of the role of vegetation related to the development of coastal landscapes.
AO2 – Application of this knowledge to the novel situation; specifically, in accounting for the formation of saltmarshes and mudflats.
AO1 = 2 AO2 = 4

Level	Marks	Description
2	4–6	• AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. • AO2 – Applies knowledge and understanding to the novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance.
1	1–3	• AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. • AO2 – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance.

AO1

- Estuarine mudflat/saltmarsh environments and associated landscapes; factors and processes in their development.
- Distinctively coastal processes: deposition.

AO2

- The photo shows a well-established saltmarsh. There are several factors and processes that affect the development of saltmarsh environments.
- Deposition occurs when waves lose their energy and drop the sediment that they are carrying.
- Mudflats and saltmarshes develop in areas with low wave energy, and shelter, such as estuaries, bays, and behind spits e.g. Keyhaven salt marshes have formed behind Hurst Castle spit on the UK's Hampshire coastline.
- Fine, suspended sediment forms into clumps which are deposited between high and low tide levels.
- The first plants to grow in saltmarshes are small pioneer plants and algae. Both help to bind the mud and clays together and trap sediment.
- Halophytes (salt-tolerant plants) establish themselves next and decompose to add organic matter to the soil. It appears that this is the stage that this saltmarsh has reached.

- Over time, a wider variety of plants will be able to survive in the saltmarsh, reducing the wave action further and encouraging more deposition.

13 AO1 – Knowledge and understanding of the role of soft engineering and its protection from coastal erosion.
AO2 – Application of this knowledge to the novel situation; specifically, coastal protection.
AO1 = 2 AO2 = 4

Level	Marks	Description
2	4–6	• AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change. • AO2 – Applies knowledge and understanding to the novel situation offering clear evaluation and analysis drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance.
1	1–3	• AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. • AO2 – Applies limited knowledge and understanding to the novel situation offering only basic evaluation and analysis drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance.

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.

AO2

- The photo shows a cliff which appears vulnerable to sub-aerial processes of weathering and mass movement.
- There is a narrow beach which means that destructive waves will attack the base of the cliff.
- The geology of the cliff appears unstable.
- Soft engineering that could be used here includes beach nourishment, cliff regrading and drainage. There are no coastal ecosystems, such as salt marshes or sand dunes, to revegetate or stabilise.
- Cliff regrading and drainage involves reducing the angle of the cliff to lower the risk of mass movement and to drain water out.
- Cliff regrading and drainage removes part of the cliff, and overextraction of water can increase vulnerability of collapse.
- If beach nourishment is used, sediment is continually transported away so needs constant replenishing.
- The narrow beach and weak cliffs may benefit from hard engineering strategies, such as groynes to create wider beaches, or a sea wall to protect the cliffs from destructive waves.

14 AO1 – Knowledge and understanding of the challenges for sustainable management of a coastline at a local scale.
AO2 – Application of knowledge and understanding to assess the challenges of sustainable management.
AO1 = 10 AO2 = 10

Level	Marks	Description
4	16–20	• AO2 – 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. • AO1 – 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.
3	11–15	• AO2 – 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. • AO1 – 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.
2	6–10	• AO2 – 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. • AO1 – 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.
1	1–5	• AO2 – 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.

		• AO1 – 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.
0	0	• Nothing worthy of credit.

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.
- Case study(ies) of coastal environment(s) at a local scale to illustrate and analyse fundamental coastal processes and their landscape outcomes as set out above and engage with field data and challenges represented in their sustainable management.
- Geomorphological processes: weathering, mass movement, erosion, transportation, and deposition.

AO2

- The Holderness coast in East Yorkshire runs from Flamborough Head in the north to Spurn Head in the south and experiences rapid coastal recession, around two metres a year.
- Rapid coastal recession is due to strong, destructive waves with a long fetch, soft and easily eroded geology, strong rip currents, lack of sediment accumulation on beaches and regular stormy weather.
- The predominant rock types are chalk (at Flamborough Head) and boulder clay (a mixture of rock material formed by the deposition of sediment carried by glacier), which are both soft and vulnerable to erosion.
- Transportation processes – sediment is carried southwards, towards Spurn Head, by longshore drift, which prevents sediment accumulation on beaches, allowing for high rates of cliff erosion.
- There has been much conflict between local stakeholders over which areas should be protected.
- Sustainable management of coastlines involves being managed by a shoreline management plan (SMP). Each Plan is devised by local councils and the Environment Agency, with input from other organisations, and outlines a sustainable approach to managing the threats to the coastline over 100 years, as it works with natural processes and allows natural coastal change.
- It identifies the opportunities to improve the coastal environment, the best approach to defend coastal assets and manage risks, and the consequences of putting the management in place.
- Holderness has had a Shoreline Management Plan since 1998.
- Some areas of the coastline are protected from geomorphological processes - the main settlements, Bridlington, Hornsea, Mappleton, and Withernsea, are protected by hard engineering, with a combination of sea walls, groynes, and rock armour. The gas terminal at Easington is also protected with a 1km long revetment.
- The gas terminal at Easington is also protected with a 1 km-long revetment.
- Groynes used in some areas of the coastline have led to sediment starvation and increased erosion southward.

Example answer: *The geomorphological processes of erosion, weathering, transportation, and deposition present challenges for the sustainable management of the Holderness coast in East Yorkshire. The coastline from Flamborough Head in the north to Spurn Head in the south experiences rapid coastal recession, around two metres a year. The rapid coastal recession is due to high rates of erosion. The waves are strong, and destructive due to the long fetch and frequent stormy weather brought to the UK by mid-latitude low pressure systems. The predominant rock types are chalk (at Flamborough Head) and boulder clay (a mixture of rock*

material formed by the deposition of sediment carried by glacier), which are both soft and vulnerable to erosion. Transportation processes are also presenting challenges, as sediment is carried southwards, towards Spurn Head, by longshore drift, which prevents sediment accumulation on beaches, allowing for high rates of cliff erosion.

Some areas of the coastline are protected from geomorphological processes. The main settlements, Bridlington, Hornsea, Mappleton and Withernsea, are protected by hard engineering, with a combination of sea walls, groynes, and rock armour. The gas terminal at Easington is also protected with a 1km long revetment. However, the groynes used in some areas of the coastline have led to barriers to transportation and has resulted in sediment starvation and increased erosion southward of the groynes. There has been much conflict between local stakeholders over which areas should be protected.

Sustainable management of coastlines involves being managed by a shoreline management plan (SMP). Each Plan is devised by local councils and the Environment Agency, with input from other organisations, and outlines a sustainable approach to managing the threats to the coastline over 100 years, as it works with natural processes and allows natural coastal change. Holderness has had a Shoreline Management Plan since 1998 to try to address the challenges caused by geomorphological processes.

On Holderness, it is not the geomorphological processes alone which are causing challenges for sustainable management. It is also the natural geology, the weather, and the existing choice of management of the area, which presents challenges. A combination of these factors, with the geomorphological processes which are acting on the coastline, are presenting the challenges of rapid coastal recession and coastline loss.

15 AO1 – Knowledge and understanding of the risks and opportunities for human occupation and development at a coastline beyond the UK.
AO2 – Application of knowledge and understanding to assess the risks and opportunities for human occupation and development.
AO1 = 10 AO2 = 10

Level	Marks	Description
4	16–20	• AO2 – 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. • AO1 – 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.
3	11–15	• AO2 – 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. • AO1 – 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.
2	6–10	• AO2 – 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. • AO1 – 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.
1	1–5	• AO2 – 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. • AO1 – 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.
0	0	• Nothing worthy of credit.

AO1

- 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 to evaluate human responses of resilience, mitigation, and adaptation.
- Sustainable approaches to coastal flood risk and coastal erosion management; shoreline management/integrated coastal zone management.

AO2

- The Odisha coastline is around 450 km long and found in north-east India. There are many depositional landforms along the coastal plain, including six large deltas. Chilika Lake is the largest brackish coastal lagoon in the world and is home to a number of threatened species, such as the Irrawaddy dolphin.
- The coastline is attractive for human settlement.
- There are large populations dependent on the coastline for resources, such as shrimp farming.
- Mangrove ecosystems provide fuelwood, land for reclamation, cultivation, and timber.
- Urbanisation, maritime transport, fishing, tourism, mining and offshore oil and gas production have led to resource exploitation.
- There are extreme tidal variations, frequent tropical cyclones and the area is at severe risk of sea level rise.
- Between 1990 and 2015, the shoreline receded 10–15 m/year which risks the livelihoods of the large population living along the coastline.
- Many countries use sustainable ICZM strategies to manage extended areas of the coastline within sediment cells. ICZM involves all stakeholders, taking their views and needs into account, ensures that approaches in one area of the cell do not have negative impacts elsewhere, ensures that management is long-term, sustainable and allows for economic development, and can change as the threats to coastal areas develop.
- The Government of India and the World Bank have created an ICZM to manage the coastline sustainably and balance the needs of all stakeholders.
- The ICZM promotes small-scale eco-tourism activities which offer employment for locals and sustainable income.
- Communities are trained to plant and protect mangroves, which are being replanted to improve coastal protection and reinstate habitats.
- Marine transport is being regulated and boats are being replaced with vessels that don't use diesel.
- Rehabilitation colonies have been set up to rehome displaced people whose villages have been submerged.

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

16 AO1 – Knowledge and understanding of the different factors responsible for the development of landscapes of coastal deposition.
AO2 – Application of knowledge and understanding to assess the different factors responsible for the development of landscapes of coastal deposition.
AO1 = 10 AO2 = 10

Level	Marks	Description
4	16–20	• AO2 – 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. • AO1 – 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.

3	11–15	• AO2 – 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. • AO1 – 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.
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0	0	• Nothing worthy of credit.

AO1

- Origin and development of landforms and landscapes of coastal deposition. Beaches, simple and compound spits, tombolos, offshore bars, barrier beaches and islands and sand dunes; factors and processes in their development.
- Estuarine mudflat/saltmarsh environments and associated landscapes; factors and processes in their development.

- Distinctively coastal processes: transportation; traction, suspension (longshore/littoral drift) and deposition.
- Case study(ies) of coastal environment(s) at a local scale to illustrate and analyse fundamental coastal processes, their landscape outcomes.

AO2

- There are many factors responsible for the development of landscapes of coastal deposition such as deposition, transportation, wave energy, tides, weather events, vegetation, presence of rivers.
- Deposition occurs when waves lose their energy and drop the sediment that they are carrying.
- Coastal landscapes of deposition have a sediment budget which is experiencing losses of sediment.
- Beaches are a key feature of these landscapes as they are an accumulation of deposited sediment. There are found in a low-energy environment, which has a higher rate of deposition due to less powerful, constructive waves for most of the year.
- An offshore bar is a narrow ridge of sediment which runs parallel to the coast and is formed when backwash removes material from the beach and deposits it in the offshore zone.
- There are many factors which affect beach morphology: sediment type, wave energy, tides, and weather events.
- Spits are another feature of landscapes of coastal deposition. Spits are more common in areas with low tidal ranges.
- Spits which form across an estuary become cut off when the river current is too strong to allow deposition to continue.
- Blakeney Point in Norfolk is an example of a compound spit with many recurves.
- If a spit extends out to reach an island, it can join that island to the mainland, creating a tombolo, e.g. Tombolo di Orbetello in Italy, where three spits have linked the island of Monte Argentario to the mainland.
- If a spit extends out across a bay, it can connect to the headland on the other side and create a bar or barrier beach, with a lagoon of brackish water forming on the landward side.
- If the barrier beach becomes disconnected from the mainland, it forms a barrier island, e.g. the Friesian Islands in the Netherlands and Germany are Europe's biggest barrier island system.
- Vegetation also plays an important role in the development of landscapes of coastal deposition. Xerophytes and halophytes stabilise landforms such as sand dunes and salt marshes.
- Mudflats and saltmarshes develop in areas with low wave energy and shelter, such as estuaries, bays, and behind spits, e.g. Keyhaven salt marshes have formed behind Hurst Castle spit on the UK's Hampshire coastline.