GCSE Geography Coastal Revision Guide

Improve that grade!

What am I revising? Unit 1: Managing places in the 21st century

Section A – The Coastal Environment

With over four billion people living in coastal areas and numbers growing rapidly the need to understand and appreciate the issues involved in managing these areas is critical. Coastal areas are one of the most dynamic global environments and are being constantly re-shaped by both natural processes and the demands of economic development. They have both economic and environmental value and are consequently areas where conflicting demands create the need for complex management and planning strategies. With the increasing threat of rising sea levels the demand for the sustainable management of coastal areas will become even more critical.
Below are the key questions that the exam board set for you. It looks a lot but we have broken it down for you so you can cover everything.

1. **Why are coastal areas a valuable economic and environmental resource?**
    a. How are coasts multiuse areas – give examples of the range of human activities found e.g. Dubai, Miami, Cornwall.
    b. Know a case study of a coastal area that has been developed as an economic resource (Dubai)
    c. describe why there has been an increase in the number of people living on the coast and how this has caused conflict (social, economic and environmental) with examples e.g. great barrier reef, Mediterranean.
2. **How have physical processes created the coastal landforms that exist today?**
    a. Define weathering and erosion, fetch and SUST.
    b. Describe the differences between constructive and destructive waves
    c. explain the formation of erosional landforms (headlands and bays, wave cut platforms, cliffs, caves stacks and arches) in the correct order using key terms and diagrams.
    d. Explain the formation of depositional landforms (spits, bars, tombola's) and LSD in the correct order using key terms and diagrams.
    e. explain how weathering and erosion can cause slumping
3. **Why are decisions made to manage coastal areas?**
    a. give examples of hard and soft coastal engineering and evaluate them (e.g. groynes, sea walls, beach replenishment)
    b. use examples to show how areas of the coast can be managed in different ways and who makes these decisions (DEFRAs SMPS and criteria for protection). One area that has been managed and one area that hasn't and has been left to erode and the consequences.
    c. use examples to show conflict in areas of coastal management
    d. Explain what the threats are in coral reefs and the methods used to protect them.
4. **How can the management of coastal areas be increasingly sustainable?**
    a. examine how the coast can be managed sustainably with one example – Mediterranean ICZM.
    b. explain how managed retreat can be used to protect the environment from flooding and coastal erosion
    c. what will the effects of climate change and increasing population have on the coast and management?
    d. Explain what the response project is and how it may protect some areas from a possible rise in sea level.

What is the examiner looking for?

The examiner wants to know that you can:

Assessment Objectives		% Weighting
AO1	Recall, select and communicate their knowledge and understanding of places, environments and concepts.	30%
AO2	Apply their knowledge and understanding in familiar and unfamiliar contexts.	30%
AO3	Select and use a variety of skills, techniques and technologies to investigate, analyse and evaluate questions and issues.	40%

What types of questions will I have to answer?

To demonstrate the above you will answer a variety of questions.

These with range from defining key terms and looking at patterns e.g.

1 (c) Weathering and erosion are important physical processes in coastal areas.

1 (c) (i) What does weathering mean?

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(2 marks)

to recalling your understanding of a topic;

1 (a) (iv) Explain why the Mediterranean coastal region is called a 'multi-use' area.

Use **Figure 1** and your own knowledge.

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and then analysing an issue in more depth;

1 (d) Modern industries are often found in science and research parks.

Explain why there has been a growth in the number of science and research parks in more developed countries.

You will always be given a source to use in the exam. Examples could be a photo, a map, a newspaper extract or a graph. Remember that they have spent time and money on reproducing these resources so the answer will be in the resource! Spend time looking carefully at it before attempting to answer the question.

You may also be asked to use the resource and your own knowledge to answer the question. This means that they want you to give another example as well!

Key tips for the exam:

Practise – answer practise exam questions and hand them to your teacher for feedback!

Read the question – what are they asking you to do?

Answer the question – this may appear obvious but don't just write about everything you know actually write about the question they are asking you

Case studies – put in examples and data to show the examiner you actually know your stuff!

General Mark Scheme for long answers

Level 1 : Basic
Knowledge of basic information
Simple understanding
Little organisation; few links; little or no detail; uses a limited range of specialist terms
Reasonable accuracy in the use of spelling, punctuation and grammar
Text is legible.

Level 2 : Clear
Knowledge of accurate information
Clear understanding
Organised answers, with some linkages, occasional detail/exemplar; uses a good range of specialist terms where appropriate
Considerable accuracy in spelling, punctuation and grammar.
Text is legible.

Level 3 : Detailed
Knowledge of accurate information appropriately contextualised and/or at correct scale
Detailed understanding, supported by relevant evidence and exemplars
Well organised, demonstrating detailed linkages and the inter-relationships between factors.
Clear and fluent expression of ideas in a logical form; uses a wide range of specialist terms where appropriate
Accurate use of spelling, punctuation and grammar
Text is legible ,
A perfect answer is not usually expected, even for full marks.

Managing places in the 21st Century – Revision Notes (not everything!)

Coasts are multi use areas – for example they attract:
a wide range of industry (oil refinery)
and businesses e.g. hotels, shops;
opportunities for recreational activities;
multiplier effect - workers then need other **services** to be provided to support their lifestyles and so new businesses open to cater for them.
Second homes as people become more affluent (rich)
tourism as the climate and environment attract holiday makers
retirement locations (relaxing)

☺ Case Studies you could use: Miami and Dubai.

Location	Dubai, United Arab Emirates
Key Facts	The largest and most expensive coastal development scheme is taking place Construction of the Palm Springs – a palm shaped island in the sea along with the world' 300 islands in the shape of the earth's continents and solar system. this increasing the Dubai coastline by 400km. New business opportunities, millions spend on improving local infrastructure. 24 theme parks and shopping malls built, port for cruise ships, largest ski dome in the world (Dubai is in the desert) in addition they are building industrial estates and finance centres
Issues	Migrant workers are being paid very little and work in terrible conditions Local people will not benefit as greatly – some job opportunities Destroying natural environment Marine ecosystem destroyed as LSD interrupted Energy consumption very high (ski slopes in the desert!) = climate change ☹

Location	Miami, USA
Key Facts	4th Largest city in the USA (all of the others are coastal cities too!) Known for the international banking HQ's, entertainment, tourism and the port. The port has the largest concentration of cruise ships in the world 3rd richest city in the USA, 22nd in the world Originally agricultural centre – oranges and lemons. In the 1920s the Florida East Coast railways linked Miami to other areas in the USA and its industrial expansion grew. Developers were attracted to the area for its tropical climate and people wanted to move there for the work, sea and sun. Key area in WW2 (Naval Base) and many Cubans fled to Miami in the 50's and 60;s from Fidel Castro Many retired people move there for the climate
Issues	Urban sprawl Management of Coastal area Protection of Natural habitats and animals from tourism and the many boats Risk of Flooding as sea levels rise

Conflict

Conflict and pressure can occur because of all of the demands on the coast.

Social	Environmental	Economic
• Pressure in the summer from tourists in the local area/conflict over demands and needs • Increase in second homes that can be empty for most of the year destroys the atmosphere of a village e.gh. Cornwall • Culture might change e.g. Dubai	• Loss of habitat as new hotels/industry built • increased need for water by tourists • littering by tourists • pollution in the sea damages marine habitats and animals • over fishing • corals destroyed	• seasonal employment • cost of managing the area or putting in sea defences

Weathering: the breaking down/rotting/decay of rock 'in situ' by the action of the weather for example freeze thaw, acid rain, chemical or biological weathering.
Hint: you should be able to describe one or more of these types of weathering.

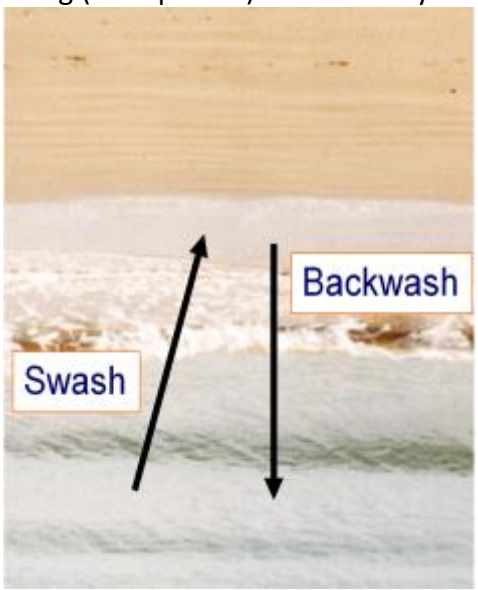
Erosion: the wearing away and *removal* of rocks by water or wind for example, hydraulic action, corrosion, abrasion or attrition.
Hint: you should be able to explain all of these types of erosion and use these terms in your writing

Long shore Drift

The process where material moves along (transported) the beach by the action of the waves and the wind.

1. As waves approach the beach they pick up sediment and carry it up over the beach in the direction of the wave

2. The movement up the beach of the sediment is called the swash.



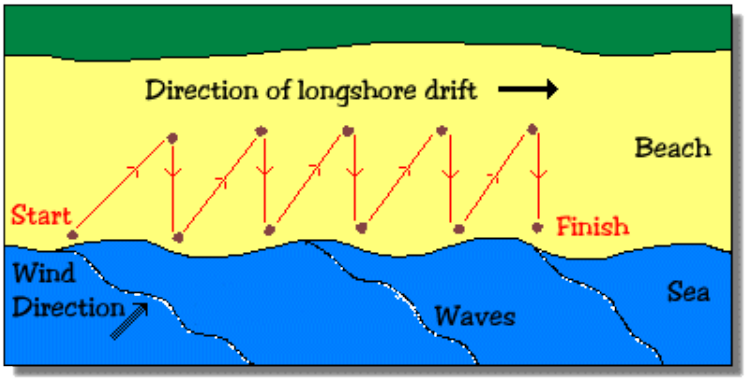
3. Gravity pulls the wave (and the sediment) back down the beach in a straight line

4. This movement is called backwash

5. this process continues over and over again as sediment is moved all around the coast

Remember!!

- in some places there is stronger swash than back wash so the beach builds up ☺ these are known as **constructive** waves and are generally gentle waves
- in other places there is stronger backwash and the beach material is taken away ☹ these are known as **destructive** waves and are normally stronger and often erode the bottom of cliffs
- humans can interfere with LSD by using sea defences.



You need to be able to draw this diagram and explain it in the exam.

Erosional Features of the coast

Cliffs and Wave cut platform

1. Cliffs can be made of different material. The harder the rock the less it will be eroded

2. As the cliff is **undercut** by **hydraulic action** the top of the cliff becomes unstable and collapses

3. The slumped (collapsed) cliff material is carried away over time by Long shore drift and the cliff retreats (moves backwards)

4. A wave cut platform is a 'pavement' of rock left behind as the cliff erodes

Hint: remember to use key terms when describing the formation of these features

S.U.S.T

A good way to remember the effects of soft cliffs being eroded is to use SUST.

Saturation
(Rain socks into the top of the cliff making it unstable)

Undercutting
hydraulic action erodes the base of the cliff making it more unstable

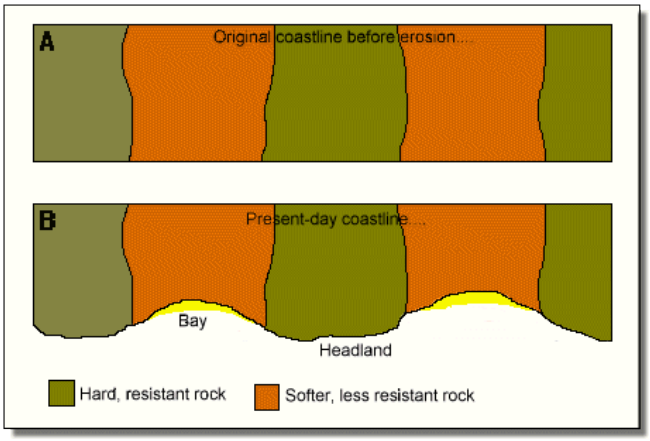
Slumping
the cliff collapses (and any houses on top)

transportation
the sea carries away the material by LSD and the process starts again

Headlands and Bays

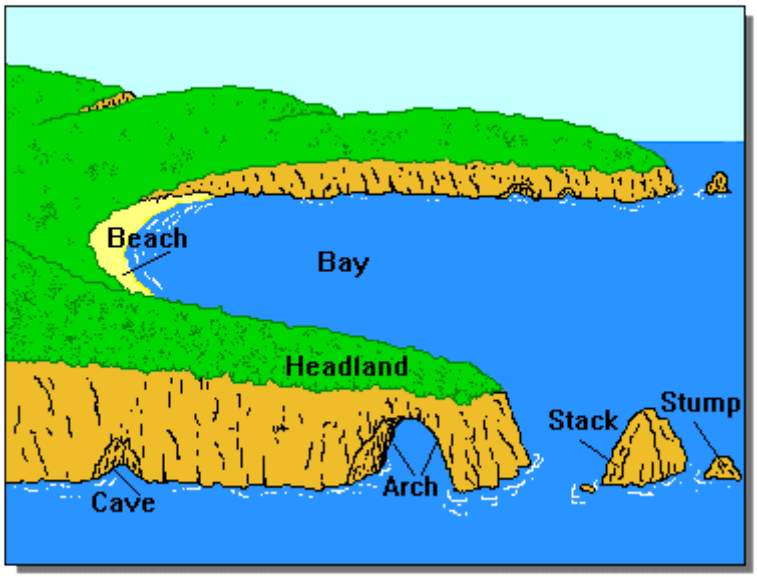
When coastlines are made of different materials they erode at different speeds

The softer the rock the quicker it erodes. the soft rocks erodes to form sheltered bays with beaches



The hard rock is eroded much more slowly and forms headlands

Caves, arches, stacks and stumps



1. A crack or fault in the cliff face is widened into a **wave cut notch** by the action of eh waves. This is hydraulic action.
2. abrasion and hydraulic action widens the crack over time to form a sea cave.
3. the sea caves continuously erodes and eventually the power of the waves erodes through the headland to form an arch.
4. Weathering and sea spray attack the arch and as there is nothing to support it, the arch eventually collapses leaving a stack.
5. over time the stack is eroded (through hydraulic action and abrasion) and this will eventually collapse forming a stump.
6. A wave cut platform is left – this is the base of the original cliff and can be seen at low tide.

Old Harry

Depositional Features of the coast

Remember that beaches are a depositional landform too!

Spits, bars and Tombola's (you will need a real life example of this

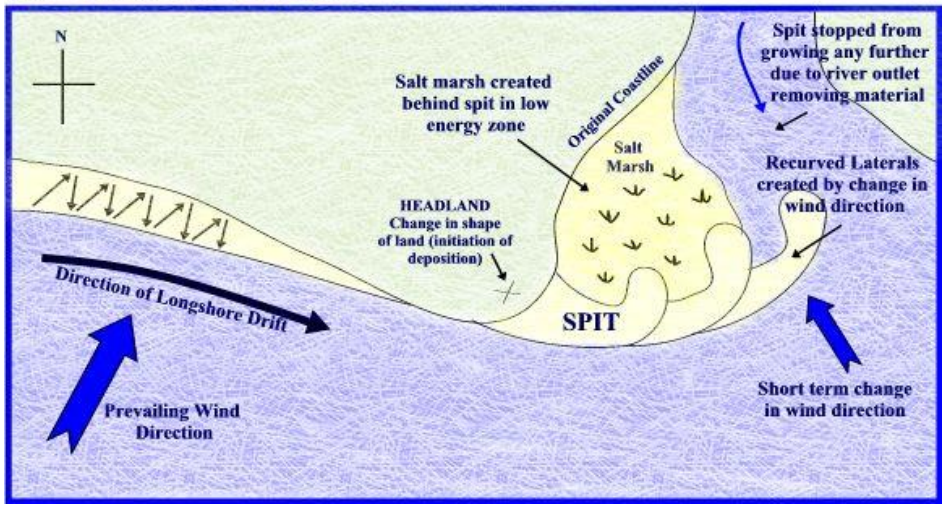
– Hurst Spit, Wessex, or Chesil Beach)

Longshore drift transports material along the coastline. Spits are formed in areas of relatively shallow and sheltered water where there is a change in the direction of the coastline.

As the spit continues to grow outwards, a short term change in wind direction may result in a change in the direction of the spit forming a curved end (recurved laterals).

If growing across a river estuary, the length of the spit will be restricted by the river outlet washing sediment away. A salt marsh may form behind the spit.

The Formation of a Spit



Bar – when a spit continues to grow across a headland, it creates a lagoon (a lake) behind that will eventually fill in. Examples are Slapton sands in Devon

Tombola – a spit that joins an island to the main land for example Chesil Beach

Coastal management techniques

The UK manages the coastal are by dividing the coastline into manageable chunks called sediment cells. There are 11 main cells and each one has an SMP – a shore line management plan.

1. Hold the line – protect the coast from further erosion e.g. sea walls
2. Advance the line – build up the beach or buffer zone e.g. groynes, beach replenishment
3. Managed retreat or realignment – allow certain areas to flood and protect the coastline further back
4. Do nothing – as it says! Leave the natural environment to flood or erode

Hard engineering controls the power of the sea by building barriers to prevent erosion or reduce sediment loss

Soft engineering attempts to work with the natural environment by replenishing the beach or allowing areas to flood naturally.

Types of coastal management

Type	How it works	Ads/disads
Sea Wall (curved, stepped, straight)	Stops the force of the wave from hitting the base of the cliff. Absorbs the energy and reflects the wave back into the sea	☹ looks ugly ☹ very expensive ☺ lasts for a while ☺ effective at stopping erosion ☺ can be used for promenades
Groynes	Wooden fences that are at right angles to the beach, they stop the action of long shore drift and build up the beach or the buffer zone. This protects the base of the cliff	☺ builds up beach good for tourism ☺ cheaper ☹ made from tropical hard wood from the rainforests ☹ can ruin the look of the beach ☹ stops sand from moving further down the beach and erosion may be worse there
Rip Rap	Large hard rock boulders places at the base of cliffs or sea walls. The waves hit the rocks and lose their energy so stopping erosion.	☺ easy to put in place ☺ relatively cheap ☹ can be moved in storms
Gabions	Metal cages filled with stones placed at the bottom of cliffs. This reduces the wave energy and stops undercutting and slumping	☺ cheap ☹ doesn't last very long ☹ If wire rusts away can be dangerous
Off Shore Break Water	Rocks or other natural materials built up into off shore bars to make the waves break before they reach the beach	☺ reduces erosion at the base of the cliff ☹ can change the pattern of the waves so more erosion occurs away from the break water ☹ can ruin the surf for sports
Revetments	Sloping wooden fences that run along the base of the cliff. Waves break on the revetment so losing energy before they reach the base of the cliff. Dropping the material through the holes in the revetment means the beach is built up.	☺ creates a bigger buffer zone and protects the cliff ☺ cheaper than sea walls ☹ don't last very long ☹ ruins the look of the beach ☹ makes access to the sea harder
Beach replenishment	Sediment is taken from the sea bed and put back onto the beach	☺ natural defence ☺ keeps beach looking nice and so attracts tourists ☹ short term effect – will need to be redone every year
Beach recycling	As material builds up at one end of the beach the sediment is moved back to the end that is losing the material	☺ natural defence ☺ keeps beach looking nice and so attracts tourists ☹ short term effect – will need to be redone every year

Case studies

You can use other case studies that you have studied. Remember to achieve a level 3 you need to discuss a number of case studies in your answer

Location	Wallasea Wetlands, Essex
Key Facts	Located on the Essex coast. Area of managed retreat (what is that?)
Issues	Was protected by a sea wall but it was falling down and by 2004 was collapsing in many places. Rising sea levels would mean that the sea wall would not work. So the area was managed through managed retreat. • New mudflats and salt marshes created a habitat for wildlife • Salt marshes provide a natural defence against flooding and are increasingly in important as sea levels rise • Reduces the risk of flooding further in land • Improved fish nurseries in the areas • There were not many buildings so less cost of property to be relocated • The farm land that was used was poor quality anyway that was flooded so cost benefit analysis showed it was worthwhile How the scheme was carried out; 1. A new sea wall was built inland of existing coastline 2. An earth bund (a pile of earth) was built to separate fresh water from salt water 3. A number of artificial islands were created to provide nesting places for birds 4. 700,000 tonnes of mud pumped into the area to create a salt marsh 5. June 2006 the old sea wall was demolished to allow natural flooding to take place.

Location	**Soufriere Marine Management Area, St Lucia**
Key Facts	Coral reefs are fragile environments – important because they are unique habitats and are easily spoilt. Source of income for many people. Major tourist attraction for 250 million people.
Issues	• they are slow to develop so if damaged will take a long time to recover • coastal development and pollution damages to reefs • over fishing of fish reduces the numbers • dynamite fishing and cyanide fishing breaks and kills the coral • deforestation means that there is increased runoff with sediment which covers the coral and blocks out the light killing it. • Tourists break of pieces and take it home • Tourist boats drop their anchors and break the coral • Increasing sea temperatures and rising sea levels leads to coral bleaching- where coral is under stress and dies – as they need specific conditions and depth of water to survive.
Solutions	SMMA set up to protect the coral reefs and divide the area either side of Soufriere into 5 main zones where certain activities are allowed in each zone. Wardens patrol and enforce the strict rules. Water quality and coral conditions are regularly managed. Sustainable – so caters for local needs (ensuring that money is still made) whilst not further damaging the environment. It has been a success as surveys show that the damage has reduced. 1. Marine reserves – areas of high value where plants and animals are protected. Limited amount of organised diving is allowed (permits needed)

	2. Fishing priority areas – commercial fishing area 3. Recreational areas – swimming, sunbathing 4. Multipurpose areas – all activities allowed along as don't ruin the environment Go to www.smma.org.la for more info Other solutions in places like the Great Barrier Reef: Education of local people to reduce dynamite fishing and use of anchors Banning dynamite fishing Fishing quotas to stop over fishing and introduce fishing nurseries in mangroves Educate tourist about coral and ensure that they are always accompanied by a guide

Location	Mediterranean
Key Facts	Mediterranean coast includes over 20 countries from 3 continents, resident population of 300 million which doubles during the summer months due to the number of tourists. There are 600 cities along the coast Tourist numbers are going to double over the next 20 years
Issues	Pressures on the coast include: • increasing levels of sea pollution as industrial waste and sewage is pumped into the sea from increasing numbers of hotels and houses (due to multiplier effect) • increasing urbanisation of coastal areas as population increases – loss of habitat and green space, pressure on water resources • damage to natural environments • growing threat of desertification as water is used up and growth of cities into marginal land • growing levels of air pollution • increased risk of sea accidents as numbers of ships increases • damage to marine environments and over fishing
Solutions	Designed an ICZM - integrated coastal management zone – where the whole area is managed as one so there are no conflicting views. The EU introduced the ICZM and checks the levels of damage, put in place recommendations and check that they are being followed (accountability) the blue plan – a sustainable future for the Mediterranean included • making 10% of all coastal areas nature reserves and protected • reducing the numbers of buildings being built along the coast and introducing green areas that are protected from development to preserve habitats and stop over development • develop tourism inland to reduce the pressure on the coast (e.g. forest walks, water parks, nature trails) • issue guidelines to make sure tourist development fits in with the coast • treat all sewage and water before it is pumped into the sea • encourage water conservation methods e.g. notices in hotels, not having clean towels every day • introduce stricter rules about pollution • develop renewable energy and encourage greener living.

Planning for the future

Climate change will affect coastal areas in the following ways:

- Sea levels are likely to rise and low lying lands flooded
- More winter storms
- Rates of coastal erosion are likely to increase
- Coral reefs will be under threat.

Protecting the coastline will become more difficult and expensive.

The **response project** has been developed by European coastal experts and identifies areas that are at risk from rising sea levels and recommends methods to try and reduce the risks, putting the information in a series of maps that planners and decision makers can use to help them.

Hint: think about what how these issues will affect other coastal features e.g. coral reefs.