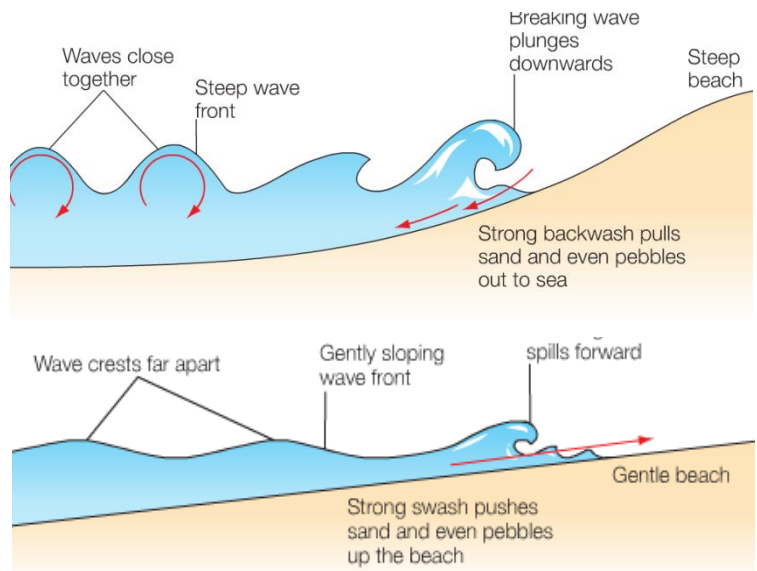


Destructive Waves operate in storm conditions and are about 5 or 6 metres high. The SWASH is weak, the BACKWASH is strong, and there is A LOT OF EROSION. The FREQUENCY is also high (12+ per minute), which means there are more hitting the beach in a minute than constructive waves.

Constructive Waves operate in calm weather and are about a metre high. The SWASH is strong and there is weak BACKWASH as the water percolates through the beach sediment. Erosion is LIMITED. They are involved with the TRANSPORT and DEPOSITION of material creating depositional landforms (beaches, bars etc.). LOW FREQUENCY (less than 10 per minutes)



5. What will determine how large a wave will be?

- i. The fetch – how far the wave has come from
- ii. How strong the wind is
- iii. How long the wind has blown for



6. How is the coastline eroded by the sea?

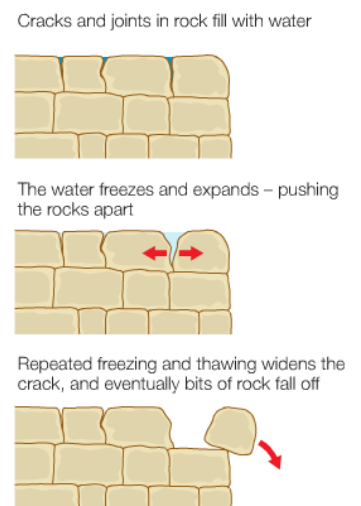
- I. **HYDRAULIC ACTION/ POWER** - water crashes against the cliffs/rocks, and the air and water is trapped and compressed in cracks. When the sea moves away, the air expands explosively weakening the rocks, enlarging the cracks and breaking pieces off.
- II. **ABRASION** (sometimes known as CORRASION) - is very effective and is caused by broken rock fragments battering the land, cliffs etc. and breaking off other pieces of rock. Operates like 'sandpaper'.
- III. **ATTRITION** - occurs when rock fragments collide into smaller and get worn down into smoother and smaller pebbles.

7. What role does weathering have to play along UK coasts?

WEATHERING is the breakdown of rock in situ (i.e. the stone doesn't move). This can happen due to **Mechanical Weathering** or **Chemical Weathering**:

Mechanical Weathering: includes **freeze-thaw**. Temperatures drop below freezing at night and then rise during the day. As a result, any water in the cracks freezes and expands and then thaws. Over time the expansion when the water turns to ice will break the rocks apart. Salt crystallisation can develop in cracks when the water evaporates and can eventually break them apart too.

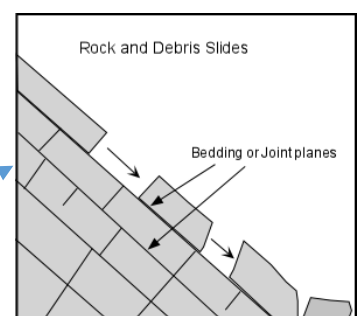
Chemical Weathering: Rainwater, which is slightly acidic, reacts with the calcium carbonate in rocks like limestone and chalk. The rocks are dissolved which is called **Carbonation**. **Oxidation** is when rocks are broken down by water and oxygen (rust)



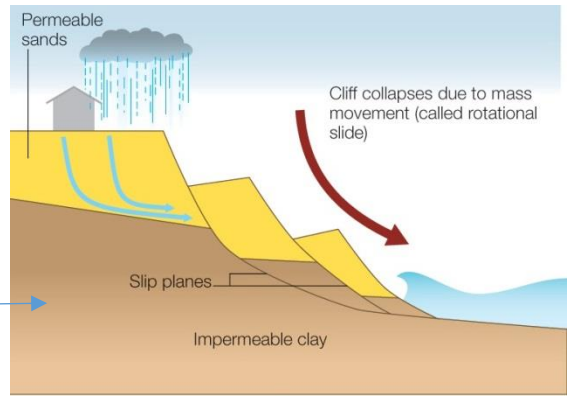
8. What is 'mass movement'? The downslope movement of rock, mud or soil due to gravity

The waves and the other processes discussed above can result in 'mass movements' on cliffs. There are two main types:

- **Sliding** – large chunks of rock slide down the slope quickly without warning along a slip plane - this is normally along a bedding plane. Mudslides can also occur on slopes that have little vegetation to secure the material.



- **Slumping** – rainwater moves through the permeable sands and gravels until it reaches the impermeable clay. The water collects at this boundary and the weight of the material above puts pressure on it. Eventually, the pressure will cause a weakness to develop at the top of the cliff and



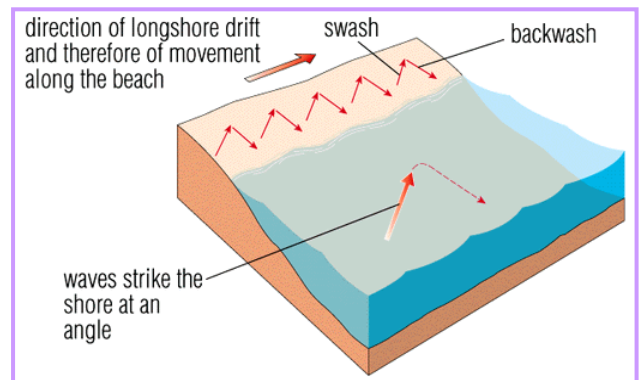
it tears away from the cliff face. The material then slumps down along the curved slip plane leaving material at the base of the slope.

- **Rockfalls** – these occur when well-jointed rocks (like limestone) are bare and left exposed. Freeze-thaw weathering can result in rocks becoming loose and they fall. The materials can often create a scree slope at the base of the cliff.

9. How is materials transported along the coast?

Transport along the coast is when waves move material across a beach. This is called LONGSHORE DRIFT.

- Longshore drift happens when waves break at an **OBLIQUE** angle to the shore (not right angles) due to the prevailing wind.
- This means that each wave pushes material along the beach a bit more (swash carries the material up the beach at an angle and the backwash drags the material down the beach at right angles).
- Many depositional features such as spits are formed by this process.



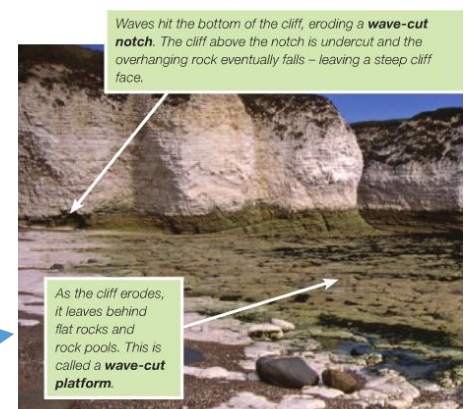
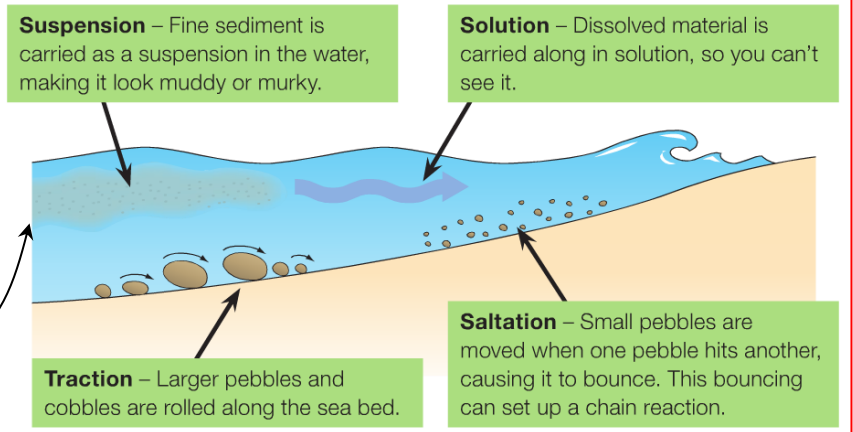
10. What other named processes of transport are there?

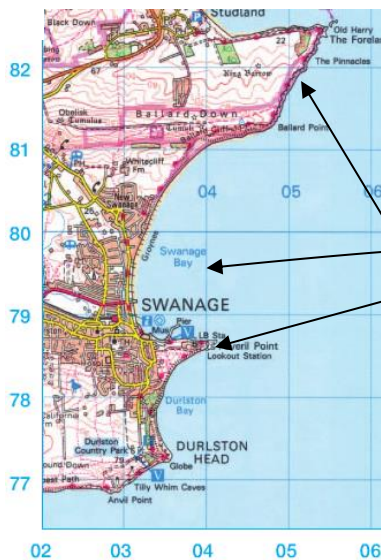
11. Why does deposition occur?

When waves have reduced energy, sediment can be deposited. There are other factors that can encourage deposition:

- Sheltered bays
- Areas behind spits, where waves energy is very low
- Wide, flat beaches
- Coastal management, where humans are deliberately attempting to trap sediment – e.g. groynes

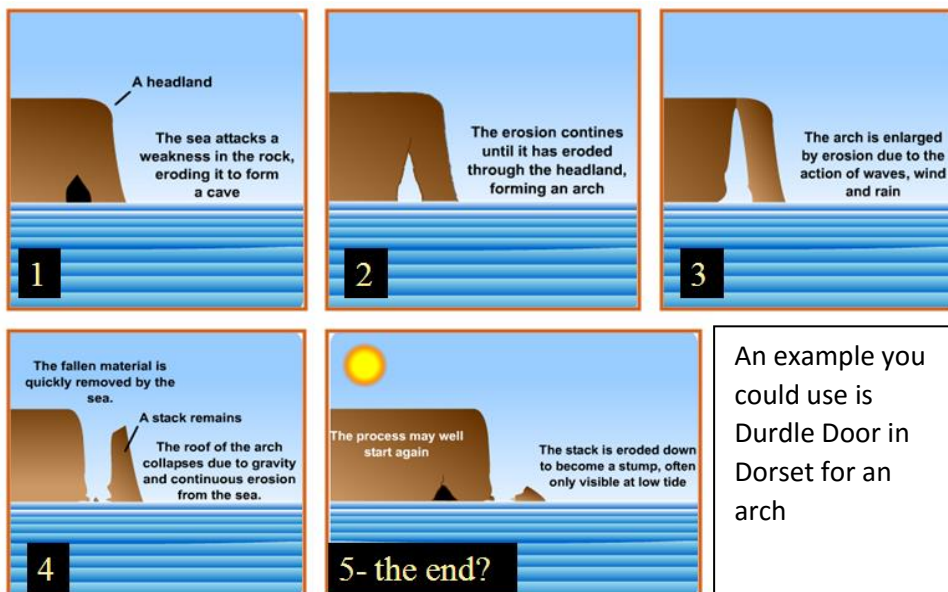
12. What are the landforms created by erosion?





WAVE-CUT PLATFORM - Waves erode rocks along the shoreline by hydraulic action, abrasion and corrosion. A notch is slowly formed at the high water mark which may develop into a cave. Rock above the notch becomes unstable with nothing to support it, and it collapses. The coastline (cliffs) can retreat over many years and a **WAVE-CUT PLATFORM** forms as this process continues as only the base of the cliffs are left as the cliffs recedes.

HEADLANDS AND BAYS - If there are alternate bands of hard and softer rock in the coastline, the harder rocks take longer to erode than the softer rocks- because the sea has less effect. The hard rock will be left jutting out forming one or more **HEADLANDS**, usually with cliffs. The softer rock will be eroded to form **BAYS**, the erosion means the bays will usually slope more gently inland, creating room for a **BEACH TO FORM**. Can you work out where the hard and soft rocks are found on this map of the coast at Swanage in Dorset?



An example you could use is Durdle Door in Dorset for an arch

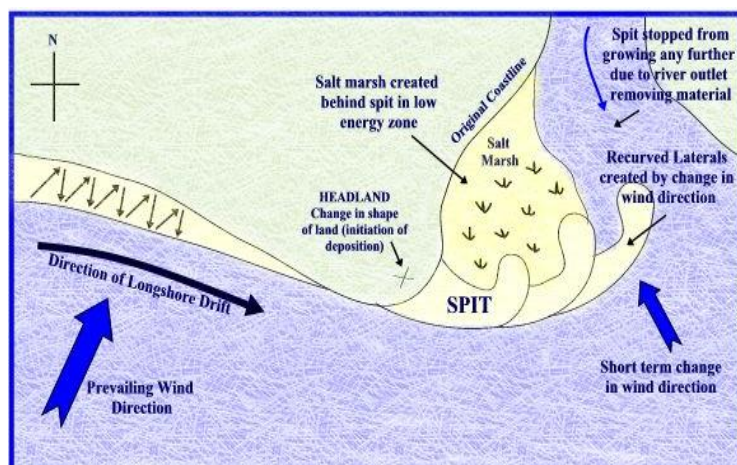
CAVES, ARCHES AND STACKS - A crack in a headland can be eroded- wave energy is usually strong there because the headland juts out. This forms one or more wave cut notches/caves. Further erosion enlarges the cave and it breaks through the headland forming an **ARCH**. The roof of the arch is often unstable and eventually collapses leaving a **STACK** or **SERIES OF STACKS**. Areas with limestone or chalk geology are prone to this kind of erosion. **MAKE SURE**

YOU REFER TO ACTUAL **NAMED PROCESSES** HERE.

13. What are the landforms of deposition?

BEACHES – The table on the right shows the main differences between pebble and sand beaches. Beaches can change throughout the year too. Destructive waves in winter can reduce the width of the beach and make it narrow/steep. Material can be removed offshore to create a bar. In the

Pebble Beach	Sandy beach
Shallow, flat, wide	Tend to be steep, not very wide
Constructive	Destructive
Can have sand dunes at their rear	Larger stones towards the back of the beach. Distinct ridges (berms)



summer, constructive waves brings that material back from the bar and makes the beach wider and shallower.

SPITS - Deposition also creates **SPITS** (East Head Spit!!)

- Spits are beaches joined to the coast at one end.
- At their seaward end shingle ridges form a series of recurves or hooks.
- Spits often develop across river mouths or where the direction of the coastline changes abruptly.

- Spits form by a process called LONGSHORE DRIFT (referred to earlier)
- Tucked away behind spits are quiet backwaters that waves cannot reach, where tidal currents deposit fine silt and build up MUDFLATS and SALT MARSHES.

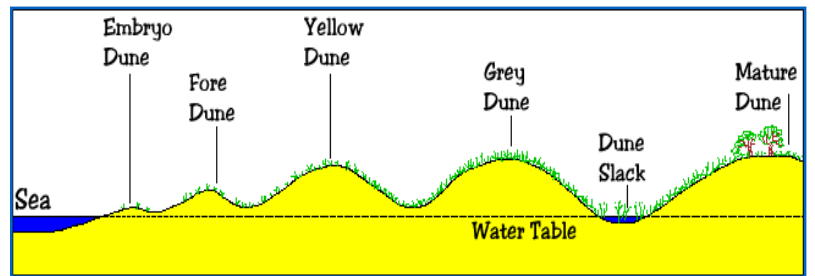


BARS - Deposition also creates **BARS**. Bars take spits one stage further and actually extends further and join up to another headland. This is able to happen due to the lack of a strong river current that would wash the sediment away like in the tidal race of a spit. A good example of this is Loe Bar in Cornwall or Slapton Sands in Devon (pictures right). These are called **BAY BARS**. You can also get **OFFSHORE BARS** (submerged), which run parallel to the coast.

SAND DUNES

Requirements for growth:

1. Frequent & strong onshore winds.
2. Wide foreshore exposed at low water so that the sand can dry out and be transported by the wind onshore.
3. Presence of a 'trap' for the blown sand to encourage accumulation- this can be drifted debris on the beach, shingle, tufts of grass etc.



How do they grow?

Vegetation can colonize. Marram grass, with its deep branching roots, stabilises the dune, but can only survive with continued inputs of sand. As you move inland more (and varied) vegetation grows. You can see in the diagram above the different names of the various dune ridges. As you move inland vegetation succession occurs, where decaying vegetation inputs nutrients into the sand, which allows for a soil to develop (dunes are yellow near the start and appear more grey as you move inland). This allows more luxuriant vegetation to grow until you see trees growing further inland.

14. An example of a stretch of UK coastline to show its major landforms of erosion and deposition (continued on next page)

The pink boxed off area will be used in the next section

Purple = deposition landform
Red = Erosion landform

Bournemouth Beach

Cliffs at Barton-on-Sea

Durdle Door

Lulworth Cove

Broad Bench

Swanage Bay

Old Harry Rock

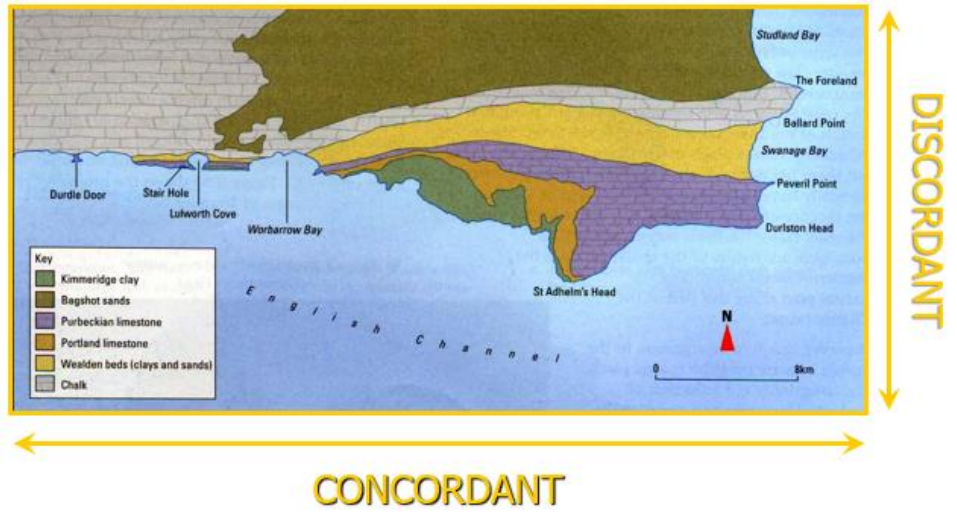
Studland Sand Dunes

Hurst Castle Spit

15. How can geological structure influence coastal landforms?

This geology map right is the pink area shown on the previous page.

It shows how geology can influence coastal landforms. For example, along the southern section of this coast the rocks are **CONCORDANT**, which means that they are aligned parallel to the coast. On the eastern section of this coast, the rocks are **DISCORDANT**, which means that they are aligned at 90 degrees to the coast.



Lulworth Cove is formed along the concordant section of the coast. The harder Portland and Purbeck limestone acts as a barrier to the sea. Once penetrated, the softer Wealden sand and clays + Greensand are easily removed, until the more resistant chalk is



reached at the back of the cove.

Durdle Door has exactly the same rock types present, albeit in narrower bands. This is why there is an arch parallel to the coast. The Wealden Clays and Greensand still remain to connect the promontory to the mainland.



At Swanage Bay (east of the map top right), the rocks are discordant. In this instance, the harder chalk and limestone bands are more resistant to erosion and consequently, have not eroded at the same rate of the bay (Wealden sand and clays); this differential erosion has created headlands and bays.



The 'dip' of the rocks also exerts an influence on coastal landforms. The rocks have been folded at Lulworth – you can see that they are beyond vertical (see orange lines on the picture). Consequently, the cliffs are near vertical. If the dip was shallow, you would see cliffs with a shallow gradient.

16. Who manages the coast? - DEFRA (Department for Environment, Food and Rural Affairs) is the government department responsible for coastal defence. The Environment Agency and local councils decide on how best to spend the money and protect the coastline.

17. How are coastlines actually protected?

Planners can use ‘hard’ strategies or ‘soft’ strategies.

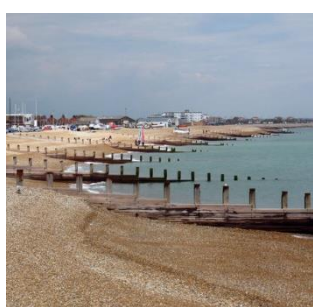
- **Hard management: physical structures** constructed to stop erosion by the waves – they tend to not blend in well with their surroundings
- **Soft management:** working with nature rather than against it. For example, beach nourishment – no physical structures built and often blend in

18. What are the hard management strategies employed? The table below shows how they work:

Hard-engineering method	How it works	Comment
Sea wall	Concrete structures which absorb the energy of the waves and provide a promenade for tourists, e.g. at Newton’s Cove below.	Costs £2000 per metre. A permanent structure that may last for many years.
Groynes	Long wooden fences, or piles of large rocks, built out into the sea to stop longshore drift and help build up sand on one side, e.g. on the beach at Swanage (see right).	Costs £2000 per metre. They stop the transport of sediment and increase the risk of erosion along the coast.
Rock armour	Large boulders piled up at the foot of cliffs to absorb the energy of the waves and stop them eroding the cliff.	Costs £300 per metre. An effective and simple method that looks more natural.
Gabions	Rocks or boulders held in wire mesh cages and used to protect vulnerable areas from destructive waves (below right).	Costs £100 per metre. The cheapest option but it’s not very strong.

19. What are the arguments for (benefits) and against (costs) hard management strategies?

	Benefits	Costs
Sea Wall	Promenade (walk/cycle etc.) Last a long time. Do not impede movement of sediment along the coast	£5k+ per metre – expensive. Expensive to maintain as well as build. Do not look good. Waves reflect and remove sediment in front of it.
Groynes	Relatively cheap and can last up to 40 years or so. Produces a larger beach, which is good for tourism.	Barriers on the beach for walkers. Trap sediment, which can cause problems downdrift. Require regular maintenance. The don’t look good?
Rock armour	Cheaper than sea wall (about £2000 per metre). Quick/ easy to build and maintain.	Ugly? Traps sediment. Reduce access to beach as difficult to walk over.
Gabions	Cheap (£100 / metre). Use local materials – quick and easy to construct. Blend in better as a result.	When damaged can be dangerous and look bad. Short life span. Need regular maintenance, so cheap to construct, but can be expensive in the longer term.



20. What are the hard management strategies employed? Beach nourishment/reprofiling and dune regeneration.



a). **Beach nourishment** – this where beach materials is brought in from elsewhere to make the beach larger. The idea being that a larger beach will be able to dissipate wave energy and protect the land. This has been done at Pevensey in East Sussex. Nourishment can also take place if materials is simply RECYCLED. For example, at East Head spit, materials has been taken from the distal (far) end of the spit and was placed at the proximal (where it connects to the mainland) end.



b). **Beach reprofiling** – when the material that is already present on the beach as re-shaped to make the beach higher. This means that waves can't go over the top and attack the land behind.

c). **Sand dune regeneration** – this is where existing dunes are improved. For example, marram grass can be planted to secure the dunes in place. Ropes/fences can be used to prevent trampling. Alternatively, it can be where new dunes are created – sand can be brought in and then planted with marram etc. The net effect being that the dunes provide a barrier between the sea and the land behind and prevent flooding.



21. What are the costs and benefits of these soft management strategies?

	Benefits	Costs
Beach nourishment	Wider beach – protects properties. Better for tourism. Looks good.	Cheaper than hard management, but still expensive, especially as regular maintenance is required.
Beach reprofiling	Beach higher, so land/property protected. Relatively easy to do.	£200,000 a year was spent at Selsey every year to perform this task – regular maintenance required.
Dune regeneration	Produce natural looking dunes. Costs are low. Enhances ecosystems/ habitats	To ensure that people do not trample on the dunes, boardwalks, fences, roped areas, signs etc. all have to be provided – this is expensive. It may not work – a large storm could destroy all of your efforts. It takes time for the vegetation to establish/flourish

22. What is coastal realignment?

Coastal realignment is often referred to as 'managed retreat'. It is when there is a new engineered position inland from the current position of the coast. Essentially, it is where coastal managers decide that 'holding the line' is no longer an option.

When it has been done, it has tended to be done in flat, low-lying areas of coast. People are moved out and buildings demolished and a breach is made in existing sea defences. This allows the seas to flood in to produce new inter-tidal habitats (salt marshes). A new embankment is made inland to prevent the water from going further inland.

It is done because sea levels are rising and it is believed that this is a better approach than constantly trying to shore up sea defences – i.e. it is a sustainable approach.

23. An example of a coastal management scheme in the UK

At Medmerry, near Selsey in West Sussex, a large-scale coastal management scheme has been undertaken – see red circle on the map.

In Q22, managed retreat/coastal realignment was discussed. This scheme is an example of exactly this. Therefore, the costs and benefits discussed of this scheme apply to Q22 too.

Where?: Medmerry, near Selsey, West Sussex.

What?: example of coastal realignment (largest in Europe)

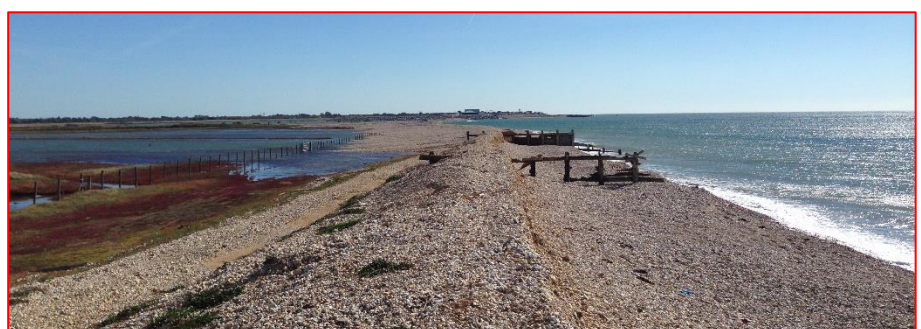
Why was it done?: The Environment Agency considered this area as most at risk from flooding. As has been mentioned previously, £200,000 was spent annually reprofiling the beach at Selsey. In addition, this has not always worked – the last breach occurred in 2008 and £5 million of damage was caused. It was suggested that things would only get worse (rising sea levels etc.), so a long-term solution was required.

What was actually done?: Completed in 2014. Embankment built 2km inland (see white dotted line on picture, right) using clay from the site itself to protect properties further inland, but also to enclose the new inter-tidal area. Sea defences breached to allow water in – this 100 metres entrance was protected by rock armour from Norway (60,000 tonnes).

What have been the impacts of the scheme?:



Benefits/ Positives	Costs/ Negatives
<p>Economic Tourism expected to increase – birdwatchers, new car parks etc. Fishing nursery in the new salt marshes – boost local fishing industry</p>	<p>Economic £28 million! £200,000 per year to reprofile the shingle wall? Value? Loss of farmland – valuable agricultural land wasted</p>
<p>Social Selsey is now unlikely to be flooded, which was not the case before 10km footpaths, 7km bike paths, 5km new bridleways have all been created</p>	<p>Social Land simply given up – many locals don't agree with this Huge cost – justifiable in such a sparsely populated area?</p>
<p>Environmental Species were protected before scheme was constructed 300 hectares of new inter-tidal habitat. Great for wildlife – huge RSPB nature reserve.</p>	<p>Environmental Loss of existing land –based habitats</p>

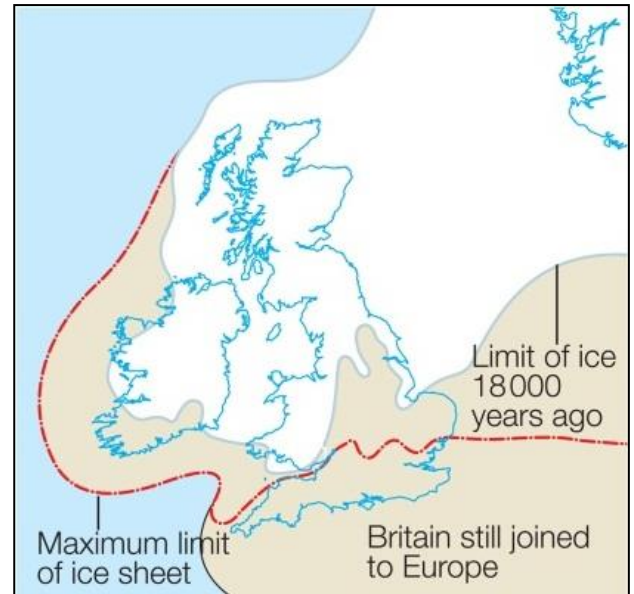


Part 3: UK Glacial Landscapes in the UK

24. What does the term 'Ice Age' mean?

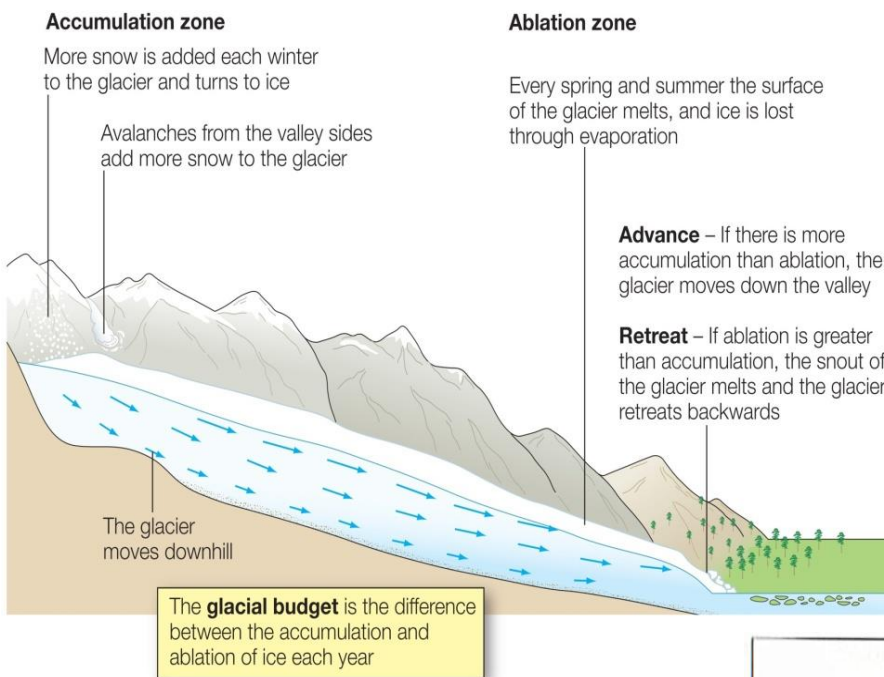
A period of time when ice sheets are found on continents. We still have glaciers on land today, so strictly speaking we are still in an Ice Age.

25. How long has the recent Ice Age lasted? - Scientists believe that the climate has been similar for the last 2 million years or so. This is called the **Pleistocene Era**. During that time, the glaciers have advanced and retreated and in doing so has created many impressive landscapes. In fact, Britain would have looked like Greenland in the past. The maximum extent of the ice is shown on the map on the right.



26. Are special names given for the periods for when glaciers advance and retreat? - Yes. Warmer periods are called **interglacial periods** and colder periods are called **glacial periods**. During the most extreme glacial periods during the Pleistocene, Britain was almost completely covered by a huge ice sheet. The map on the left shows this.

27. Glaciers move: how does this happen? (we don't have any in the UK now, but important as this helps to explain processes later on)



Glaciers move due to gravity. However the rate of movement is due to the **GLACIAL BUDGET**. This is the difference between the **accumulation** and **ablation** of ice each year. The diagram (left) explains it:

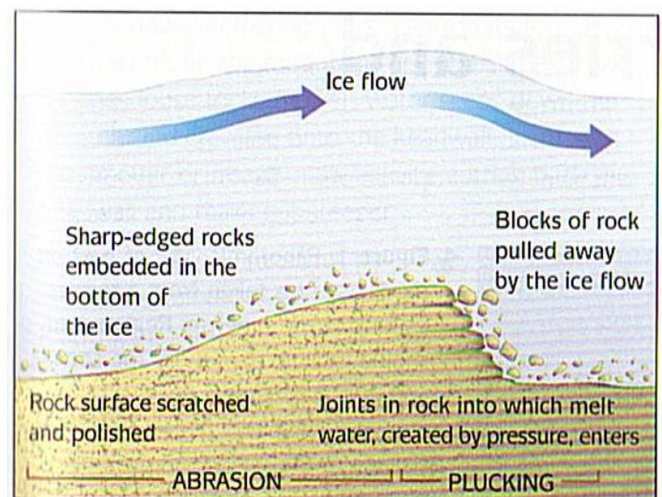
Glaciers have an accumulation (adding more) zone at the top, where it is coldest. However, as the glacier moves downhill the temperature increases and the ice will melt. This is called ablation (melting).

The balance of the accumulation and the ablation will determine whether a

glacier moves forward (**advance**) or move backwards (**retreat**) – i.e. as suggested by the **glacial budget**.

28. How does a glacier shape the land? - There are two main erosion processes: **Abrasion** and **Plucking**.

- **Plucking** is where a glacier moves over an area of rock. Due to friction, the glacier melts and water seeps into



crack around the rocks below. The water refreezes and the rock effectively becomes part of the glacier and is ripped out when the glacier continues to move forward.

- **Abrasion** is where rocks at the bottom of the glacier act like sandpaper – grinding over the bedrock. This can polish the rocks or create sharp grooves called striations.

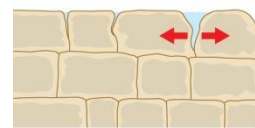
29. What weathering process takes place?

The main process is freeze-thaw weathering (discussed earlier in coasts section). The diagram on the right summarises this process – the key here is that temperatures often oscillate around 0 degrees Celsius, which makes this process prevalent. Water expands by about 10% when frozen, which forces the rocks apart. You can see scree slopes in the UK where frost shattered materials has accumulated at the base of the slopes. Much of this material may have been formed during the ice age, but it is still an on-going process.

Cracks and joints in rock fill with water



The water freezes and expands – pushing the rocks apart



Repeated freezing and thawing widens the crack, and eventually bits of rock fall off



30. How do glaciers move/transport material?

Bulldozing is where rocks that are in front of the glacier are physically removed by the advancing glacier. Rocks that have been subjected to freeze-thaw weathering may have fallen from slopes on to the glacier, which would have then allowed for movement. Materials plucked at the base of the glacier is then moved by it. Glaciers actually move due to gravity – the glaciers move on a film of meltwater under the glacier – this is called *basal flow*. If it is too cold and the film of water is not present, the glacier can still move by oozing along by behaving like a plastic. This is called *internal deformation*.

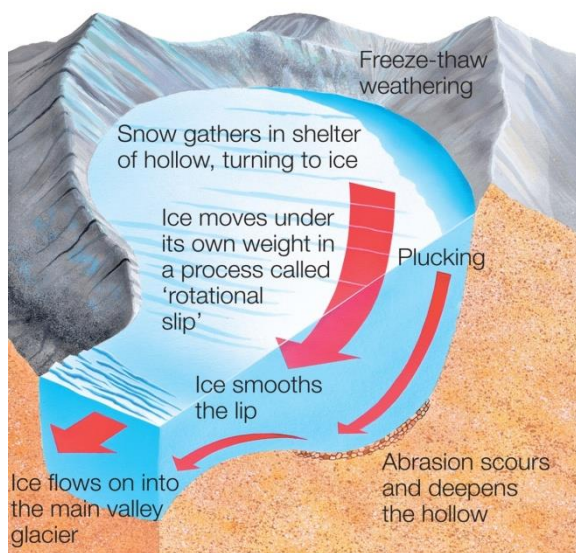


31. Why do glaciers deposit sediment?

Look back at Q27. You can see that glaciers flow from upland areas to lowland areas. As the glacier moves downhill it becomes warmer and therefore the glacier starts to melt. This meltwater can transport vast amounts of sediment. This is called **OUTWASH**. This material is rounded and smoothed by the running water. Eroded and weathered material dumped down by the glacier is called **TILL**. This differs from outwash as the material is angular and not sorted by size.



32. Landform created by erosion 1: Corries



Often found in North facing slopes. Snow doesn't melt in the summer and a glacier forms.

Plucking and freeze-thaw weathering remove rocks from the backwall making them very steep.

Abrasion occurs at the base when the glacier starts to move (**rotational slip** due to the weight) – rocks fed by freeze-thaw weathering helps this (**Bergschrund crevasse** allows rocks to fall through the glacier).

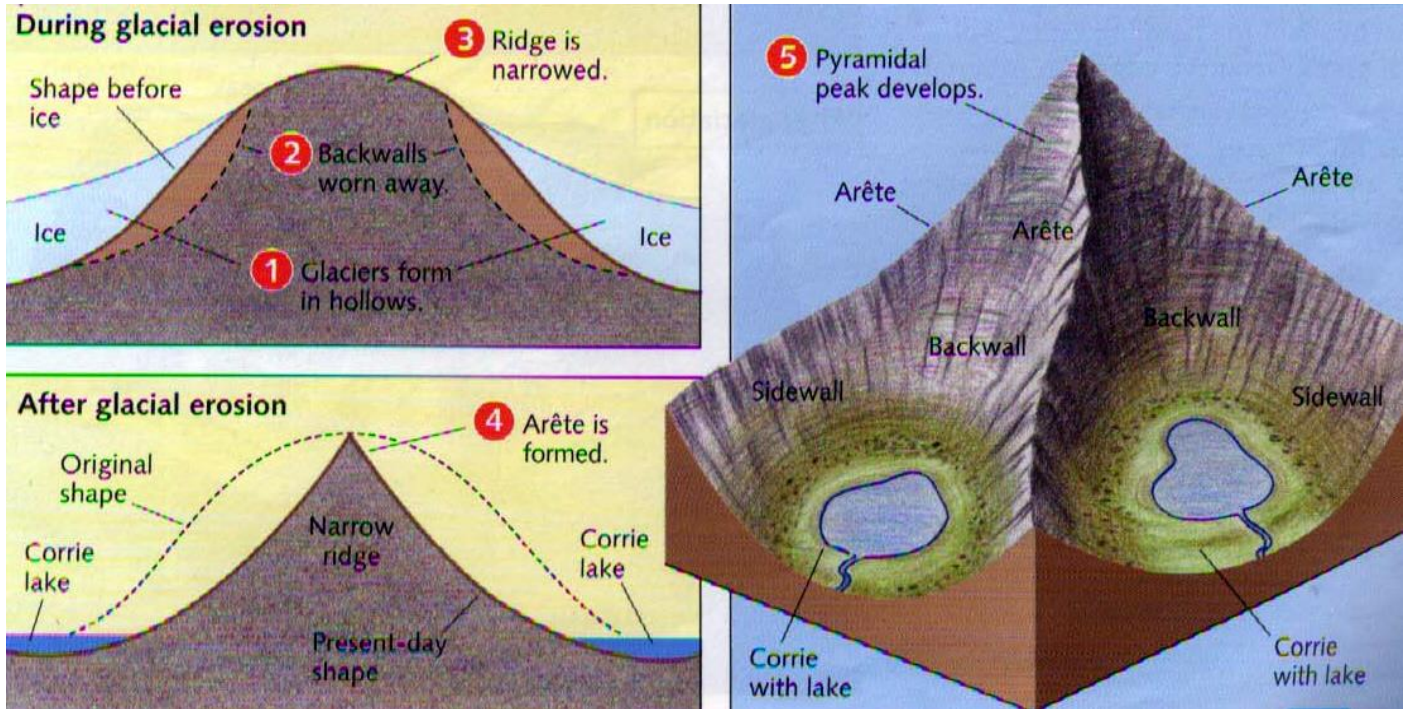
Less erosion takes place at the front of the corrie (less weight), so a rock lip is formed (moraine can also build up here). When the ice has gone this feature acts as a dam for a **tarn** to form.

33. Landform created by erosion 2: Arête - An arête is a sharp ridge cut when two corries either side of a mountain cut back to back. The back/ side wall of each corrie is attacked by freeze-thaw weathering and plucking leaving a sharp ridge between them. The picture on the right is Striding Edge in the Lake District.

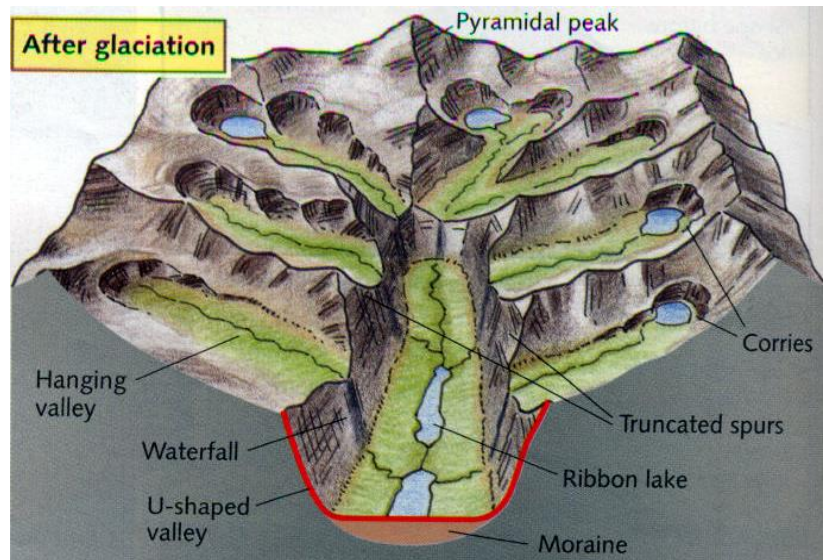


34. Landform created by erosion 3: Pyramidal Peak

When you have three or more corries surrounding a mountainside, they cut back and produce this feature. The diagrams below summarise arête and pyramidal peak formation.



35. Landforms created by erosion 4: Glacial Trough, Truncated Spurs and Hanging Valleys



Glacial Trough: due to abrasion, plucking and bulldozing, the glacier will erode the landscape as it moves downhill. Glaciers tend to occupy a former river valley and the erosion turns the V-shaped cross section into a U-shaped one. The valley becomes wider, deeper and straighter as interlocking spurs are removed.

Truncated Spurs: River valleys have 'Interlocking spurs' like the teeth in a zip that overlap (see above left). However, a glacier removes them and makes the valley straight.

Hanging Valleys: If you understand how a glacial trough is formed, then these are quite easy to understand. The main glacier is the most powerful at eroding the landscape and cuts down quicker than the smaller valley glaciers that feed into it. Therefore, once the ice has melted away, you are left with a main trough with small troughs feeding into the

main valley. However, the smaller troughs are way above the main valley as a result of their weaker erosive force. Waterfalls are often found cascading from the hanging valley into the main valley (see picture on the right).

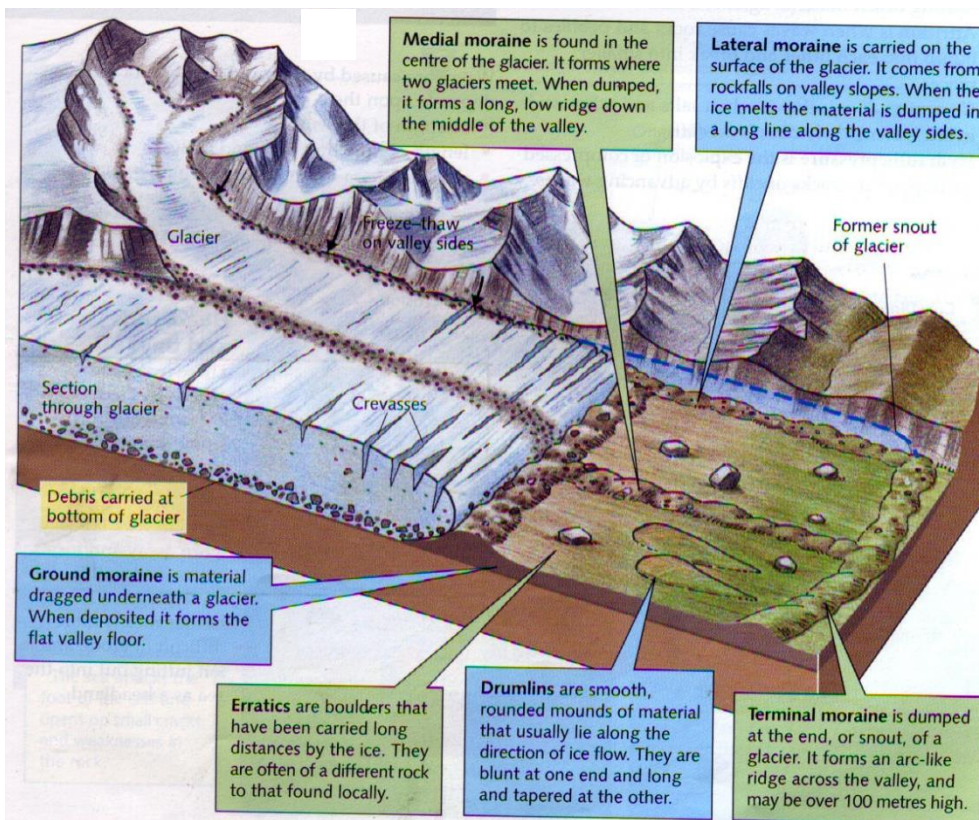
36. Landform created by erosion 5: Ribbon Lake



Ribbon Lakes are formed when a glacier moves down a valley and moves over an area of softer rock. This rock is eroded (abrasion/plucking) far more easily

than the surrounding rock and the valley is over-deepened at this point. When the glacier retreats the hollow left becomes filled with water and a ribbon lake is formed. These are long and narrow and occupy the U-shaped valleys – e.g. Lake Windermere in the Lake District. Ribbon lakes can also be formed by deposition too. When a terminal/recessional moraine is left by a glacier, this can act like a dam and trap the water behind to form a lake.

37. What depositional landforms are created by glaciers?

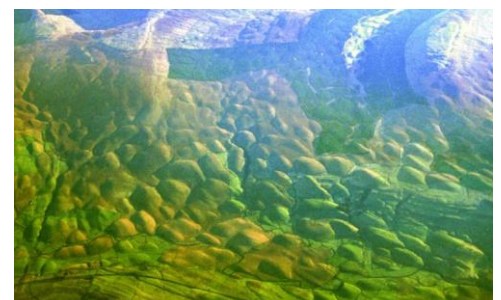


Moraines are left by a glacier. **Ground moraine** is the layer left under the glacier. **Lateral moraine** is found along both edges of the glacier; it is the weathered rock that has fallen from the valley sides. When these melt, ridges are left at the side of the valley. **Medial moraine** is where two glaciers have joined together to form a larger glacier. The lateral moraine of the two glaciers will be in the middle as a result. When the glacier melts a ridge will be found along the middle of the valley. **Terminal moraine** is dropped at the end of the glacier at its **snout**. This can be used to show the maximum extent that the glacier reached.

Moraines are shown on the

diagram above, but also drumlins are too .

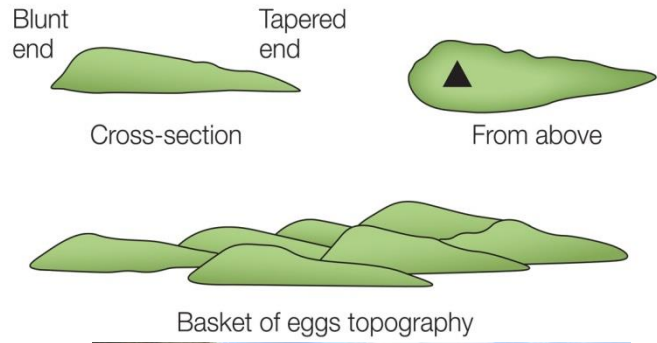
Drumlins are formed when glaciers shape the moraine on the valley floor into small hills. They are found in swarms and the landscape is described as having a 'basket of eggs topography'. As the glacier moves downhill it is running out of energy. It encounters an obstacle that it can't remove and flows over the top and around it. Material is deposited behind the obstacle, but as the glacier is still moving it streamlines it (i.e. blunt end and a tapered end - see diagram over the page)





Erratics are boulders left behind by a glacier once it has melted. The large boulder was transported by the glacier (see Q30), but was left behind as the glacier retreated.

Ice moved in this direction →



38. An example of a UK glaciated landscape – The Lake District



Great Langdale – Glacial trough



Swindale drumlins

Striding Edge (Arete)/ Red Tarn (Tarn in Corrie (on the Helvellyn mountain))



The Lake District is in NW England. The area is formed from volcanic rock, but was sculpted by glaciation. It got its name from the abundance of ribbon lakes in the area.



Lake Windermere – ribbon lake

Borrowdale field boundaries (moraines)



Conistone Water – ribbon lake

39. What are the economic activities in glaciated regions?

These are split into 4 main categories:

1. **Tourism** – Scenery, walking, heritage etc. – see the places in the Lake District!
2. **Farming** – Upland areas have thin soils, steep slopes, wet/windy conditions. Consequently, hill sheep farming is suitable. In the bottoms of the U shaped valleys the soils are thicker, so potatoes and cereals can be grown. In lowland areas, the soils are fertile and are suited to intensive arable farming.
3. **Forestry** – Conifer trees (Christmas trees) can be grown on the steep slopes/ poor soils. The wood can be sold for the construction industry and for paper.
4. **Quarrying** – Slate from the Lake District, limestone from the Pennines etc.



40. How can conflicts between different land uses and between development and conservation occur?

What sort of activities are done in glaciated regions that can cause disagreement (conflict) between users?

- Reservoirs – glacial troughs can be dammed, which is great for HEP and water supply **BUT** you lose settlements and countryside
- Wind turbines – Great for clean energy **BUT** not attractive? Deters tourists?
- Forestry – Conifer plantations can make money (see Q39) **BUT** can spoil the view. Does not encourage biodiversity. Also, when cut down, can cause soil erosion and flooding.
- Quarrying – makes money **BUT** visual appeal? Dust?
- Tourism – makes money **BUT** congestion, higher house prices, litter, disturbs farm animals, water sports on lakes noisy etc.



41. What can you do about resolving conflict in Q40? (we will pick this up again in the Lake District example)

- Signs – tell visitors what they can and can't do/ where they can or can't go
- Visitor limits – restrict numbers
- Show the benefit for locals – e.g. wind turbines in Kirkstone Pass (Lake District), which provided power for the local pub instead of using diesel generators
- Fix footpaths
- Park and Ride to ease congestion
- Seasonal closure

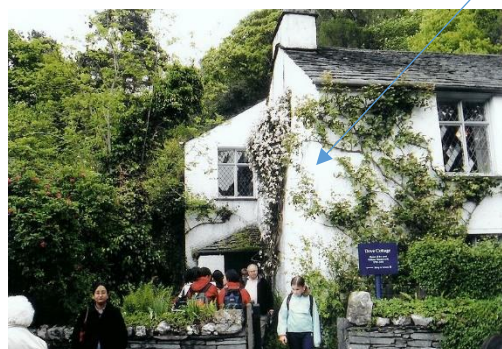


42. An example of a UK glaciated area used for tourism: The Lake District

a). **Attractions for tourists** (of which there are about 16.5 million a year! – 50% of the income in the economy comes from tourism. 16,000 jobs exist because of tourism).

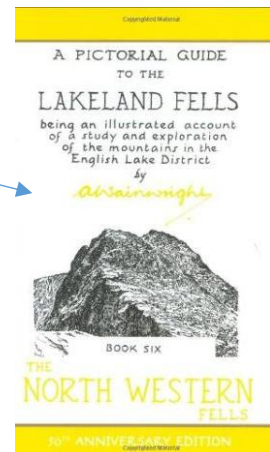
Glacial scenery – see Q38. Other 'physical' claims to fame: Largest lake in England – Windermere. Deepest lake in England – Wastwater – 74 metres. Highest mountain in England – Scafell Pike 978 metres. Activities associated with the landscape: walking, fell running, fishing, water sports etc.

Human attractions – Beatrix Potter (writer-Peter Rabbit. Many visit her family home ‘Hill Top’), William Wordsworth (poet).



Alfred Wainwright – writer of guide books, inspired people to visit.

I know I have been to these places as a result!!

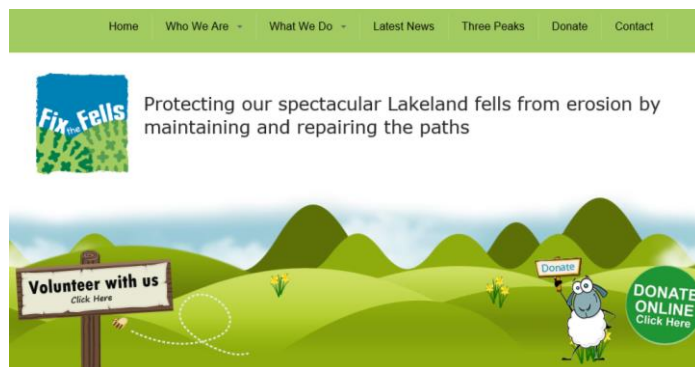


b). What are the impacts of tourism in the Lake District?

Economic	Social	Environmental
<ul style="list-style-type: none"> House prices high (people buying holiday homes, putting houses out of reach for locals) Narrow range of jobs (tourism jobs tends to be seasonal) Low wages 	<ul style="list-style-type: none"> 90% of tourists come by car – traffic congestions in summer months, particularly in towns where they were not designed for such a volume of traffic. Also a problem in <i>honeypot sites</i>. High number of holiday homes (20%) are often vacant – means that not enough people are there to keep local services (post office, shops etc.) going. This is bad for local people. 	<ul style="list-style-type: none"> Activities on water (lakes) an issue. People are often in conflict – some want peace and tranquillity, others want to use power boats etc. Tourism can cause footpath erosion and damage wildlife

c). What strategies are employed to manage the impact of tourism?

- ‘Fix the Fells’** – a conservation plan to maintain mountain paths in the Lake District. Repairing footpaths will encourage people to use them, which means that they will not venture away from them. This means that vegetation will be trampled. See website page right!
- Lake District National Park Authority** – ensure that the area is being used properly
- Speed limits** on Lake Windermere (10 knots for powered boats; some 6 knot limits in some areas)
- Restricted parking zones** have been set up in some villages, for example in Elterwater. The car park on the edge of the village has been expanded and parking on grass verges and near houses has been restricted.
- Public transport** has been improved and subsidised, for example the 'Langdale Rambler' bus service. Visitors are encouraged to use the buses instead of bringing their cars into the national park.



N.B. I will provide a separate maps skills booklet for identification of glacial and coastal features on maps (amongst other things) as a separate file.