

How are coasts eroded? essay sample



**ASSIGN
BUSTER**

Waves are the agents of costal erosion, weathering also occurs on coastlines. Wind, Rain, Chemical, Biological weathering also affects the coast.

What cause's waves?

Wind cause's waves, a wave is a ripple on the surface of a water body created by wind passing over it. A wave breaks because the water at the bottom of the wave is slowed down by friction in the shallower water of the beach/coast which cause the top of the wave to go faster than the bottom which cause's the arch shape which then topples over. The water does not move in a wave, it's the energy that's passing though the water like a surge (The water molecules go round in circles).

What Affects The Force of A Wave?

- * The strength of the wind.
- * The depth of the sea.
- * The ' Fetch' of the wave.

All affect the force of a wave.

The Fetch is the length of water over which the wave has passed. The Fetch is longer on the west coast of the United Kingdom because the prevailing wind and water has travelled all the way across the Atlantic Ocean. The North Sea is smaller than the Atlantic so the east coast doesn't get as big waves. One would expect the erosion to be greater on the west coast because of the long fetch but its not because the rocks in the east are far weaker than the rocks in the west, therefore erosion is greater in the east.

Wave Terms

Wavelength is the distance between two successive crests or troughs. Wave Frequency is the number of waves per minute. Wave height is the distance between the trough and the crest. The fetch is the amount of open water over which a wave has passed. Velocity is the speed a wave travels at, and is influenced by wind, fetch and depth of water. The Swash is the movement of water up the beach. Backwash is the movement of water down the beach. Constructive waves are when the swash is greater than backwash. Destructive Waves are when the backwash is greater than the swash.

How Is The Coast Eroded?

(Pic) <- A destructive wave

The Power Of Destructive Waves

Destructive waves have three main features:

- 1) They are high in proportion to their length.
- 2) The backwash is much stronger than the swash so that rocks, pebbles and sand are carried back out to sea.
- 3) They are frequent waves, breaking at an average rate of between eleven and fifteen per minute.

The Power Of Constructive Waves

(Pic)<-Features of a constructive wave.

Deposition

The load of the waves – sand, shingle and pebbles – is deposited by constructive waves. Such waves add more material than they remove from the coastline. Constructive waves have three main features:

1) They are long in relation to their height.

2) They break gently on the beach so that the swash carrying materials up the beach is stronger than the backwash carrying them away.

3) They break gently, with between only six and nine waves per minute.

These waves are associated with calm sea conditions when winds are light and are not blowing directly onshore. Therefore they occur more often in summer than in winter. Constructive waves operate most effectively in sheltered coastal locations such as in a bay sheltered by rocky headlands on both sides.

Processes Of Coastal Erosion

There are many similarities between the ways in which rivers and waves erode, which is why the names used for the processes of erosion are the same.

A) Hydraulic Power: This is the sheer weight and impact of the water against the coastline. It is greatest under storm conditions when hundreds of tonnes of water may hit the rock face. Also air trapped in cracks and caves is suddenly compressed by breaking waves, which increases the pressure on the rock.

B) Corrasion: Another name for this is abrasion. The breaking waves throw sand and pebbles against the rock face. These break off pieces of rock and cause undercutting. In large storms boulders will also be flung against the cliff face causing even greater damage.

C) Attrition: Particles carried by the waves are by the waves are reduced in size as they collide with the rock face and one another. Boulders and pebbles are broken down into sand sized particles, which are easier for the waves to carry away.

D) Corrosion: This is the chemical action on rocks by seawater and is most effective on limestone rocks, which are carried away in solution.

Coast Transportation

1) Traction – Movements of large stones, pebbles rocks (rolling motion).

2) Saltation – Stones, pebbles are ‘bounced’ along (insufficient energy to ‘carry’ the particles in).

3) Suspension – Sufficient energy to carry sand particles and maybe pebbles for a short period.

4) Solution – Material is dissolved.

Long Shore Drift

1-5 Movement of pebbles along the beach.

<- Long shore drift pic.

Long shore drift creates dispositional features, the most common being a beach.

Beach – Dispositional feature. Area of sand pebbles and shingles between the high and low tides/waters

Coastal Management

1) High amounts of erosion take place on the Holderness coast due to several factors: There is no beach, which means that waves can crash into the coast with nothing to stop them. The rock is comparatively soft, compared to rock on the west coast of the UK, which takes a lot longer to erode. Human factors such as the erection of sea defences just around the coast, which slow down erosion but can increase its rate at another point along the coast. Also, no money has been invested into the protection of the coast at Holderness because the land is of little financial value so there isn't much point in wasting money to stop erosion of this land.

2) A) Spurn head is a spit.

B) A spit is a feature of coastal deposition. The long shore drift of material from North to South can lead to a build up of material, which gets trapped and doesn't carry on down the coast. The material originates from cliffs that erode easily up the coast.

C) This feature creates a place/habitat for animals, especially birds, that wasn't there before. For Humans though it creates land in the form of salt marches, but this land cannot be built on due to its instability.

D) The Humber Estuary was formed by the river Humber. However, it has been pushed down the coast by the positioning of the spit. The spit has grown, widening the estuary and creating a constant build up of materials.

3) What you could say is... The land is not worth protecting because its only farmland. Also, the local town (Mablethorpe) has had a £2 million investment to protect it and the vital main road. This leaves very little council money, so it would very simply cost too much to protect it. Another factor is, the erosion of cliffs around Holderness is creating material such as sand, which will get washed down coast and will help protect some other poor and helpless town or city from erosion.

4) Easington provides the road to Spurn Head, which would be cut off by road if the land were eroded at Easington, Easington is also the end of a main road.

5) A) The area at greatest risk from coastal flooding in Britain would be low areas along the coast, especially the East coast. This is because the land is much, much flatter, with hardly any hills.

B) There would have to be millions of pounds worth of investment to stop regular flooding if sea level rise occurs. The price of housing would drop and people would move in land where there isn't much fear of flooding.

6) A) The Dutch have built lots of big and little dams and installed sand dunes in an effort to protect their coast. The Great Dyke is a brilliant example of this. It was built to stop waves; it is over 20km's long.

B) The management of the coast is vital here because all Holland's major cities, industry and best farmland are all by the coast. This would make flooding and erosion in Holland very serious matter.

C) A polder is a piece of land created to help stop the current and slow the erosion process.

D)The national policy is better for coastal management in Holland than Britain. This is because Holland is a small country where no one is far away from the coast. It is low-lying which makes it very easy to flood. All the good farmland, major cities and industry is near the coast, so much more money is spent protecting them than in Britain.