Sea Defences

"Hi I'm Ernie the engineer. I like to build strong sea defences and so does nature -look at this shingle beach."

Shingle defending houses Shingle Street

Suffolk's coast and estuaries have natural sea defences including sand dunes, mudflats, salt marshes and shingle beaches.

These help to protect the shore from wind and waves. They are really important parts of the landscape and contribute to the natural beauty of the area. They also provide places for wildlife and plants to live, which are called habitats.

The coast is always changing. Cliffs are worn down (eroded) by weather and waves and new beaches are made from whatever falls from the cliffs. Sand, mud and shingle are often thrown up by waves and tides onto the beach. This deposition helps to top up the beach, replacing any material that has been taken away by high tides and storms.

Saltmarshes defending farmland Butley Creek

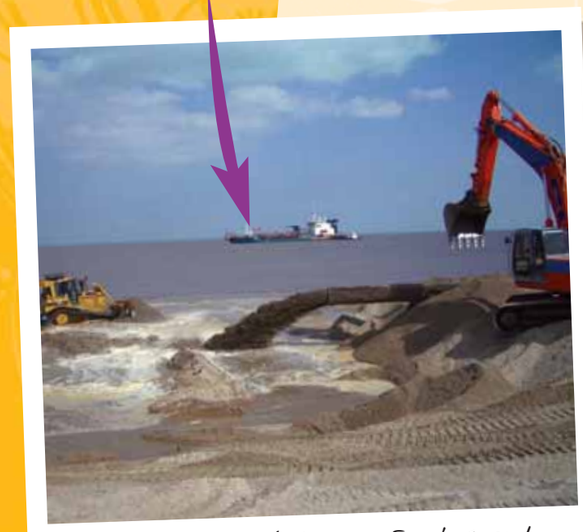
"I build lots of different defences along the shore to help protect you and your homes. However, sometimes these defences can cause problems further along the coast by stopping movement of sand and pebbles, so I need to be very careful."

There are another two types of sea defence that are more environmentally friendly:

Recycled natural materials

This replaces mud, sand and shingle that have been removed by erosion or longshore drift. These materials are transported in by lorries or a boat called a dredger from nearby. This method recycles materials therefore it is better for the environment and encourages growth of habitats.

Ship pumping sand onto the beach from the sea bed



Beach recharge between Eccles and Winterton Norfolk

Sea allowed in through gaps in sea wall

Managed realignment at Wallasea Island in Essex

Heavy machinery used to spread out defences evenly

Managed realignment

This occurs when a large gap is made in a defence to allow the sea water in to make new space for wildlife and water. Managed realignment can create new salt marshes and mudflats to replace habitats lost by erosion and they can also reduce flooding in some areas by providing space for water. Managed realignment can be expensive because careful planning is needed to make it work.

Get arty:

Design your own defence

Draw your favourite defence and explain why you have chosen it.

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NATURAL ENGLAND

Suffolk Coast & Heaths
Area of Outstanding Natural Beauty

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Man-made sea defences are very expensive and sometimes do not last very long. Natural defences like shingle can be just as strong and have often lasted for hundreds of years. Large man-made defences are mainly used to protect towns like Southwold, Woodbridge, Lowestoft, Ipswich and Felixstowe and the people who live in them.

The main types of man-made defences are:

Things to do:

Be a wave

Run up a steep hill. Notice how you lose energy and slow down as it gets steeper – this is what happens when a wave meets a curved sea wall.

Sea walls

The first sea walls were straight and flat but they were often damaged during storms and were too expensive to repair. Modern sea walls are now built with a sloping face and a curved top. They break up waves and reduce the energy, slowing them down and stopping water going over the top of the wall during storms.

Curved sea wall

Sea wall at Felixstowe

Things to do:

Build a cliff and a defence

Get a sandwich box, sand, pebbles and a jug of water. Pile up the wet sand at one end of the box as high as you can like a cliff. Put the lid against the sand to support it and then pour water in. Taking the lid away use it to make waves in the water. See what happens? Try again this time putting pebbles at the bottom of the cliff. Do the pebbles make a difference?

Rock armour and breakwaters

Rock armour and breakwaters absorb the energy of the waves, but let water and sand pass through, just like a large sieve. This scatters the energy of the waves and reduces the amount of erosion they can cause. The boulders must be large, strong and resistant to erosion as small, weak rocks would be quickly worn down and washed away.

Rock armour at Bawdsey

Groynes

These stop sand and shingle from being moved along the shore by waves and currents, a process called longshore drift. They help collect sand on the beach from which you can make sand castles. If you go to a beach with groynes you will see more sand or shingle on one side of the groyne than the other. This is because the groyne has provided shelter to the shore allowing sand or shingle to build up to give protection.

Rocks held together by metal nets

Groynes at Slaughden

Gabions at Shotley Gate

Wooden groyne

Out and about:

Spotting longshore drift

Got to a beach that has groynes, like Felixstowe or Aldeburgh near the Martello tower, and measure the height of shingle each side of the groyne. Does the groyne work? Which direction do you think the sand and shingle is trying to travel?

Gabions

A gabion is a large steel cage filled with rocks. They can be stacked on top of each other to create a wall. This is a cheap option compared to sea walls. This method is only a temporary option as they are easily damaged by powerful storm waves.

Things to do:

Become a coastal engineer

Gather different rocks and design an experiment to test the strength of each, to help Ernie choose one for a rock armour defence.

"I like gabions. Fine small spaces provide a habitat for plants and animals between the rocks. These trap sand, allowing plants to take root, giving a more natural appearance."