

Holderness coastline

Physical processes

There are a wide range of factors affecting the Holderness Coast, the three main factors are:



Weather – Winter storms produce stronger waves and higher sea levels (surge). In addition, the rain from the storms, intensifies **sub aerial erosion** processes. The saturated clay cliffs suffer increased runoff leading to **rotational slumping** and other forms of mass-movement.



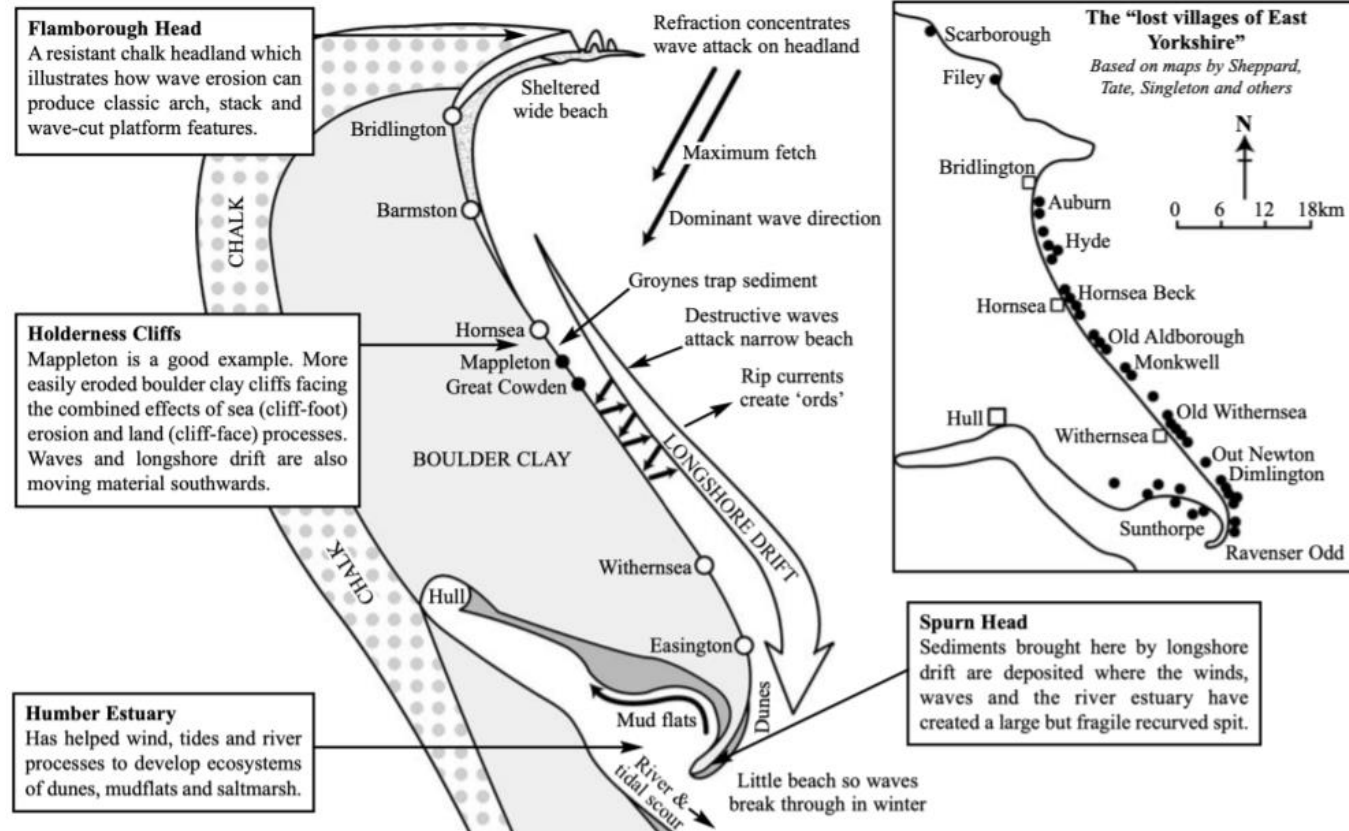
Waves – The dominant waves are from the north east which is also the direction of the largest fetch. **Destructive waves** erode the beaches and attack the foot of the cliffs, removing the clay in **suspension**. **Longshore drift** then carries this material southward. Tides move the material south and they collect forming a spit and sand dunes near to Spurn Head.



Geology - The two main types of rock found along the coast are **chalk** and **boulder clay**. The more resistant chalk has survived large-scale erosion and this has created the classic features of Flamborough Head. The **boulder clay cliffs to the south are more easily eroded** and their retreat has formed the sweeping bay of Holderness. It is this differential rate of erosion that has given the coastline its distinctive shape

The Holderness coastline is the fastest eroding in Europe. It is located in eastern England.

There is almost constant erosion of the weak cliffs, with lots of this material is transported southwards by longshore drift.



Human activities



Flamborough Head – offers fabulous views out to sea – popular for Camping, but also popular for walkers with many car parks and footpaths to accommodate them.

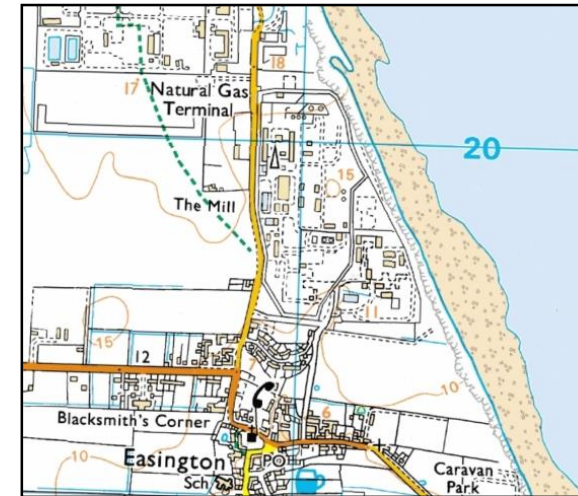


Great Cowden– small settlement, with abandoned homes due to rapid rates of erosion. Land not protected due to limited value of agricultural land.



Aldbrough – some caravan parks are moving caravans back due to rapid rates of erosion. This has an impact of the tourism industry in the area (a negative multiplier effect).

Easington – protection here along the cliff base is due to the economic importance of protecting the gas terminal which bring in gas from the North Sea.



Management

Hornsea

- This is a holiday resort with a promenade and hotel frontage. Here the beach is of great importance both as a tourist feature and a means of protecting the seawall from wave erosion and winter flooding.
- Groynes** have been repaired and new ones built at a cost of over £5.2 million.
- In **addition steel 'doors'** guard the entrance to the beach and the old seawall has been raised slightly.
- Sand dunes in the south beach are being planted with trees

Advantages – groynes seem locally effective, they are relatively low cost, they are acceptable visually and development of low-lying land has now been possible

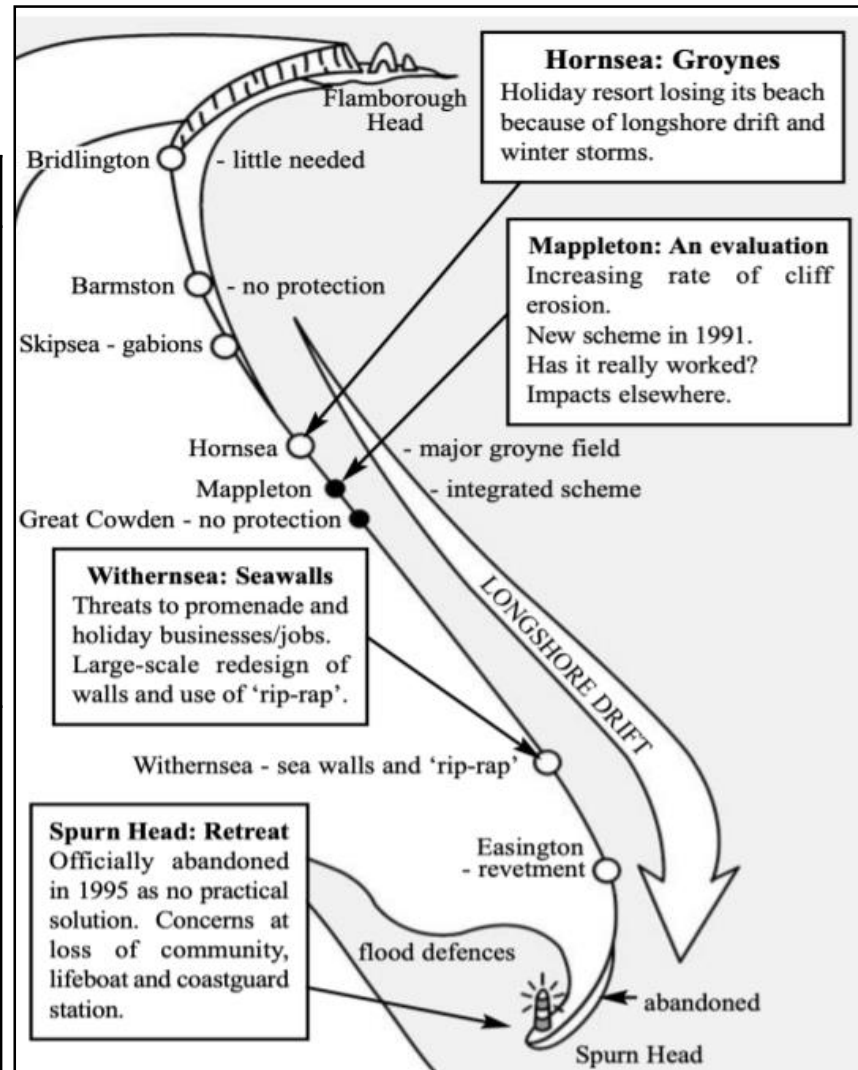
Disadvantages – this trapping of sand may have caused erosion further south along the coastline in Mappleton. Groynes rarely work on their own, maintenance is continual and groynes do not hold mud.

Spurn Head

- This a spit and the management strategy here is perhaps best described as 'abandonment'. Following successive winters when storms enabled the sea to wash over the neck of the spit, Holderness Borough Council decided that it could no longer afford to repair the damage. It was officially abandoned in 1995.

Advantages – the growing annual costs of protection were saved, some evidence suggests that it may repair itself, and not all environmental groups were against it becoming an island. There may be no other long term solution.

Disadvantages – the community of lifeboat men and coastguards and their families may have to move elsewhere. There may be loss of a 'heritage coast' site and an important bird habitat (Yorkshire Wildlife Trust)



Mappleton

- Mappleton** - Erosion rates at Mappleton have long been recorded, and in 1786 the village was 3.5 kms from the sea.
- By 1988 the sea was on its doorstep, access to the beach was impossible and houses in Cliff Road were quite literally falling into the sea.
- There was tremendous pressure from local residents to save the village, though in the end it was the threat to the coast road that won the day. In 1991 a scheme was implemented at a cost of £2.1 million supported by EU funding.

Advantages – Two rock groynes are in place and are designed to trap beach sediment, along with a rock revetment to prevent erosion of the cliffs.

Disadvantages – beyond the second groyne the large rocks are being undermined (eroded) and the cliff face below the car park has begun to erode.

Great Cowden

Worryingly for Great Cowden is the very rapid erosion of beaches, cliffs and farm buildings here. This settlement is 3 km to the south and the sand being trapped by the groynes at Mappleton, may be limited the sand at Great Cowden. This means that the beach is narrower and provides less protection to the cliffs.

Management

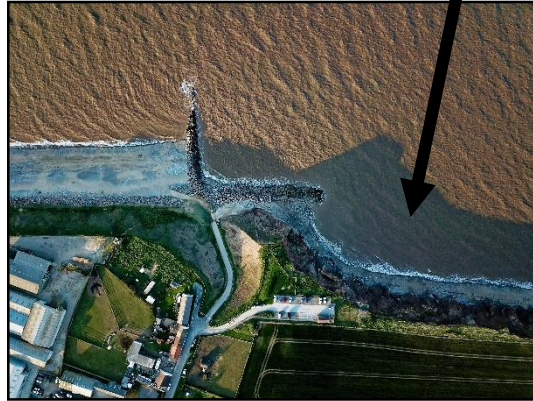
Mappleton– Rock groynes in place to stop longshore drift



At Mappleton, the cliffs themselves were re-graded to reduce slumping and there was some nourishment of the beach to encourage deposition.

Has it worked?

The regraded cliffs looked secure and so a new access road was built and a car park and toilets for visitors. However in 2002 all is not well. The re-graded cliffs behind are showing early signs of slumping.



Soft engineering



Mappleton– beach nourishment to add sand lost to longshore drift back onto the beach



Mappleton– cliff regrading – changing the shape of the cliff to make it less steep – has occurred here



Spurn Head– Soft engineering strategies like matting to protect footpaths are no longer being invested in