

5 Spurn Peninsula

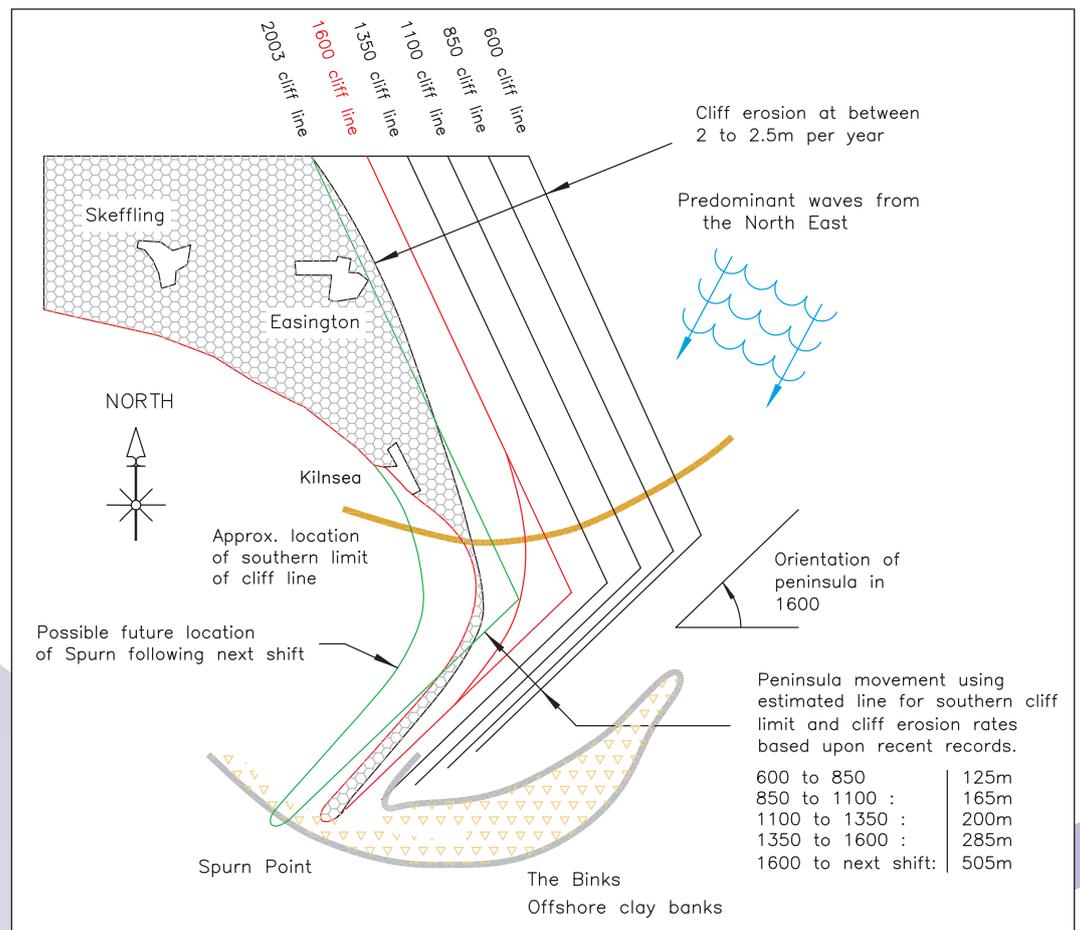
Development of the first peninsula at Spurn began following the retreat of the last ice age and the subsequent flooding of the North Sea basin about 6,000 years ago. Once exposed to the sea the newly created boulder clay cliffs soon began to erode, liberating sediment that the predominant north-easterly waves began to move in a net southerly direction. As sand from this sediment travelled south past the southern limit of the cliff line it settled in their lee forming a sandbank that steadily grew in a south-westerly direction. As this spit's length increased additional protection against the sea and Humber tidal currents was given by a ridge of offshore clay banks known as The Binks. The ice sheets deposited these moraine clays as they paused on a line running along the Humber north bank, around Spurn point and northwards into deeper water.

Under normal circumstances a stable spit will have been formed, however Spurn is unusual in that soon after its creation the continued cliff recession of up to 2 metres a year places the peninsula in an increasingly exposed and unsustainable location. Erosion by the sea of the newly deposited sands at its root and along the neck starts a process of decay that ultimately leads to its destruction. As it narrows breaches begin to occur across its neck, these gradually deepen and widen forming a permanent channel that allows the Humber to drain directly into the North Sea. With the loss of the spit the continued southerly transport of sand leads to the development of a new spit west of the original in the lee of the new cliff line. It has been suggested using historical records that this destruction and rebirth follows a 250 year cycle.

Interestingly the last cycle ended in the mid 1800's a time when erosion of the peninsula prompted the construction of extensive coast protection works. It is likely that had these defences not been built then Spurn peninsula as we know it would have been washed away decades ago. Construction of the defences has however only delayed the inevitable, as in 1961 the decision was taken following escalating maintenance costs, to abandon the defences and allow the natural processes to take control once again.

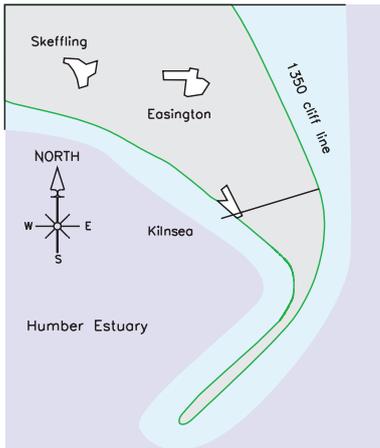


What happens next is open to debate. It has been suggested that sand blown over the peninsula and driven around its tip by wave action is capable of producing a steady westerly movement to keep pace with cliff erosion. Historical records that describe the loss and re-growth of Spurn on a regular basis and the morphology of spit development at other sites counteracts this argument. It is likely that the crumbling defences and ever narrowing neck, which is now barely 10m wide in places, will soon fail. Breaches will then become common as erosion continues to lower foreshore levels allowing the area to flood on each high tide. Eventually the Humber will use this channel to drain into the North Sea causing rapid erosion and possible loss of the entire peninsula. Spurn Point, which will have become an island, will now be starved of sand and rapidly erode. Its ultimate survival will be dependent upon the time taken for the peninsula to reform. Looking further ahead the new peninsula will develop at some point west of its current location and rapidly grow south-westwards.



To estimate how far the peninsula is likely to move, a stable spit shape has been superimposed upon a series of historical cliff lines. Using the current cliff erosion rate of approximately 2 metres per year as a starting point the peninsula could move by as much as 500 metres with every formation. However due to the orientation of the peninsula in relation to the line of the southern edge of the cliffs this is likely to reduce to a few hundred metres. From this work it is then possible to forecast where the next spit is likely to form. Holding the peninsula in its current position has extended its life by some 150 years but during this time the cliffs to the north have continued to erode westward, the estimated movement has therefore increased to between 250 and 500 metres.

Possible Evolution of Spurn Peninsula

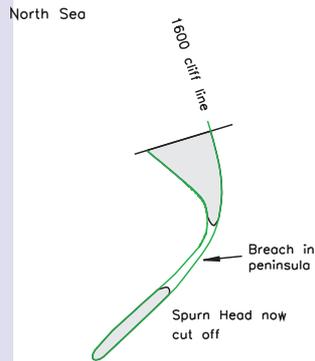


Date: 1350

Peninsula reformed following earlier breaches with its seaward edge aligned to suit the then current cliff line opposite Kilnsea.

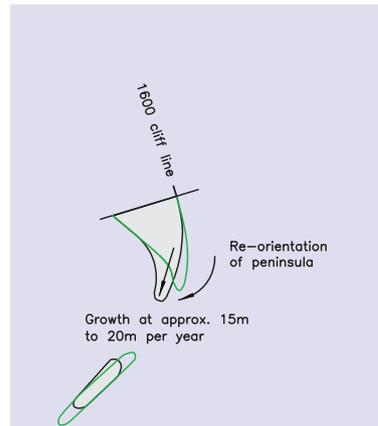
Date: 1350 - 1600

Cliff erosion to the north leads to increased exposure and erosion of peninsula neck.



Date: 1600

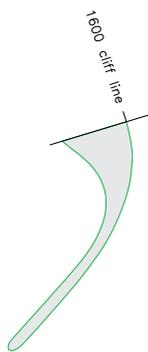
Peninsula narrows to a point where breaches occur creating a new channel between the Humber and North Sea.



Date: 1600 - 1700

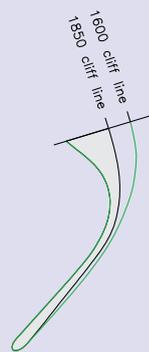
Breach in peninsula causes realignment of north end root as southerly deposition of sand starts to rebuild the peninsula in lee of the new cliff line.

Erosion gradually reduces the size of the southern island, gaining protection from the Binks it may have survived and rejoined the peninsula or been lost and reformed at a new location several hundred metres west.



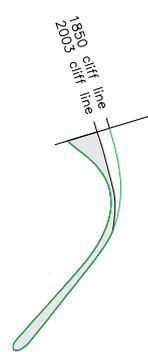
Date: 1600 - 1700

Peninsula reformed following breach now grows in size as sand is driven along its length by waves and over its width by wind and storm waves.



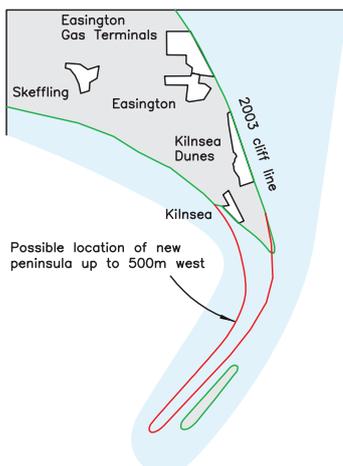
Date: 1700 - 1850

As the cliffs to the north erode, the neck of the peninsula became increasingly exposed to erosion until it narrowed to a point where breaches began to occur. However, in the 1850s coastal defences were put in to prevent further erosion, thus holding its position beyond its normal life span.



Date: 1850 - 2004

As the exposure increased it became impossible to maintain the peninsula's defences and so the decision was taken to allow them to deteriorate and let the natural processes take control again.



Date: 2004 to immediate future

At some point in the near future Spurn Peninsula will breach cutting off Spurn Point. Over the following years a channel will form as the peninsula floods on each high tide. This channel may then deepen as the Humber drains through it or remain shallow and passable at low tide. At the same time sand will begin to be deposited along the northern bank reforming the neck of the peninsula in a new sheltered location. This reforming and growth of a new peninsula may take up to a hundred years to complete, during which time the southern island now starved of sand will steadily erode. Whether it survives or not will depend upon the protection given by the Binks and any remaining defences and how major the relocation is.

Note: As Spurn has been artificially held in position over 150 years past its normal life-span this readjustment may cause major reshaping of the whole peninsula and a shift westward by as much as 500m or more.



Approximate Dates	Peninsula Development	Date	Historical Event	Name of Peninsula
4,000 BC	Initial formation of spit following recovery from last ice age			
600	Possible start of spit formation following earlier breaches			Comu Vallis
800 to 850	Possible date for destruction and start of spit reformation	670 to 770	Chapel and community of St. Andrew established on peninsula.	
	Fully developed peninsula	950	Icelandic hero of Egil's Saga shipwrecked on peninsula	Hrafnseyr later called Ravenser
1100 to 1150	Possible date for destruction and start of spit reformation	1066	Olaf and the remaining Viking army sails from peninsula following defeat at Stamford Bridge. Ravenser village develops north of peninsula.	Ravenser Odd
1350 to 1400	Possible date for destruction and start of spit reformation	1235 to 1360	Port and town of Ravenser Odd established on peninsula, growing rapidly to rival Grimsby.	
		Approx. 1400	Henry Bollingbrooke who later became Henry IV lands on peninsula	Ravenser Spurn or Ravenspurn later called Spurn Head
		1427	A hermit named Reedbarrow built the first recorded lighthouse on the peninsula	
		1471	Edward Duke of York who later became King Edward IV lands on Ravenspurn with forces from Burgundy	
1580 to 1600	Possible date for destruction and start of current spit reformation			The Spurn later called Spurn Point
	New peninsula grows quickly to become the present Spurn Peninsula	1674	Angels Lighthouse built at the then end point, later lengthening of the peninsula would now put it at about the mid point.	
		1776	John Smeaton completes construction of two lighthouses at Spurn Head one at 90ft in height and one at 50ft. With two lighthouses fisherment were able to navigate past Spurn and into the Humber. At the same time Angell's lighthouse was lost due to erosion.	
		1776 to 1851	Smeaton's 'low light' soon last several further replacements constructed and lost before current built in 1852.	
		1810	First lifeboat provided on Spurn Point, gaining a full time crew in 1819.	
		1820's to 1840's	Earlier removal of sand and shingle for use as shipping ballast increases to a point where reports suggest a reduction in peninsula width by up to a half. This reduction may however have been more a part of the natural cycle of destruction and rebirth associated with Spurn.	
1849	Wide breach opens across neck of peninsula following storm surge leaving Spurn as a series of islands at high tide.			
1850	Peninsula reached its normal expected life span of 250 years	1850's	Defence works began in response to breaches in peninsula neck, firstly the gaps were sealed through placement of chalk fill and then to retain beach sand a groyne field was constructed.	
1850's	Groyne field effective in holding sand, dune width increases 35m.			
1850 to present	Due to the construction of coastal defences the peninsula's life has been extended by some 150 years, breaking the natural cycle of destruction.	1852	The last 'low light' lighthouse built on Humber side of peninsula; structure still stands but is now redundant.	
		1883/84	Timber revetment constructed along neck and groyne field extended north to Warren Cottage and south towards lighthouse.	
		1893	Current lighthouse built to replace Smeaton's tall lighthouse that was demolished in 1895. Current lighthouse taken out of commission in 1985.	
		1914 to 1918 1939 to 1945	During the first and second world wars Spurn's importance as a defensive position saw it develop as a military stronghold. During this period the military also extended and upgraded the coastal defences and to aid supply lines a jetty at Spurn Point and a rail link to the base at Kilnsea were built.	
		1946	Yorkshire Naturalists' Union establishes Spurn Bird Observatory to study bird migration.	
		1957	Spurn earns designation as a Site of Special Scientific Interest	
		1961	Due to escalating coastal defence maintenance costs the MOD sold Spurn to Yorkshire Wildlife Trust. The Trust now runs the area as a nature reserve and is allowing the defences to deteriorate so that the natural processes take over.	
Mid 1990's to present	As the defences fall into disrepair erosion continues to eat into the peninsula, narrowing of its neck now allows numerous minor wash-overs and regular undermining of the defences and access road.	1990's to present 1996	Ad-hoc repairs continue to patch local failures but no attempt is being made to prolong the life of the main defence structures. Spurn becomes a National Nature Reserve	