

# A Changing Coastline

## The impacts and how we can adapt



Storm Damage at Happisburgh - [cc-by-sa/2.0](https://creativecommons.org/licenses/by-sa/2.0/) - © Evelyn Simak - [geograph.org.uk/p/3774304](https://www.geograph.org.uk/p/3774304)

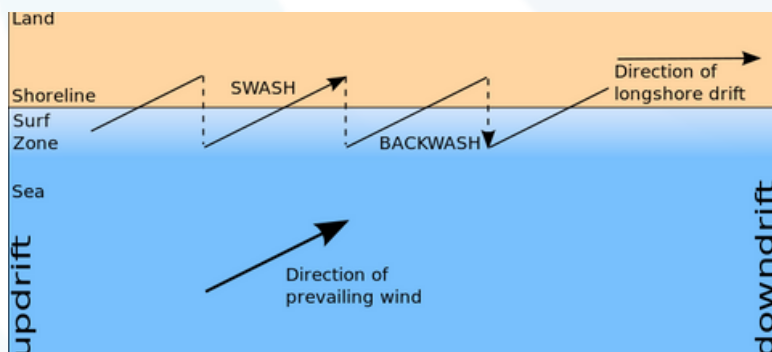
# A CHANGING COASTLINE

The coastline changes shape over time through natural processes, however, climate change, human activity and existing flood defences also have an effect too. The shape of our coastline is changing rapidly, putting many homes, businesses and coastal communities at risk of flooding and abandonment.

## FACTORS INFLUENCING COASTAL CHANGE

### Natural processes

Longshore drift is the natural process by which sediment and material is moved along the coast at right angles by wave action. This shapes the coastline by removing material (erosion) and depositing it elsewhere (accretion).



### Human activity

The coastline can draw in many tourists and provide economic opportunities for the tourism industry. Seaside towns have been developed over many years to create shops, hotels, piers, and roads on land that was once intertidal. Human activity in these areas can damage the effectiveness of sand dunes.



Image: The Flood Hub

### Reclaimed land

Land reclaimed from the sea enables development closer to the coast. Sea walls put up to protect the reclaimed land slow coastal erosion and therefore influence the shape of the coast.

On the other hand, managed realignment schemes set back flood defences further inland to create intertidal habitats in the form of mudflats and salt marshes. These coastal marshes help to dissipate wave energy and protect against coastal flooding and erosion.

## Flood Management Schemes

Some flood defence schemes that are put in place can influence the shape of the coastline by preventing the natural processes of coastal erosion and accretion, for example, sea walls.

Schemes that involve the mimicking of natural methods to manage flood risk, such as beach nourishment, replaces material that has been lost by the sea or wind to try and replicate the natural changing of the coastline.

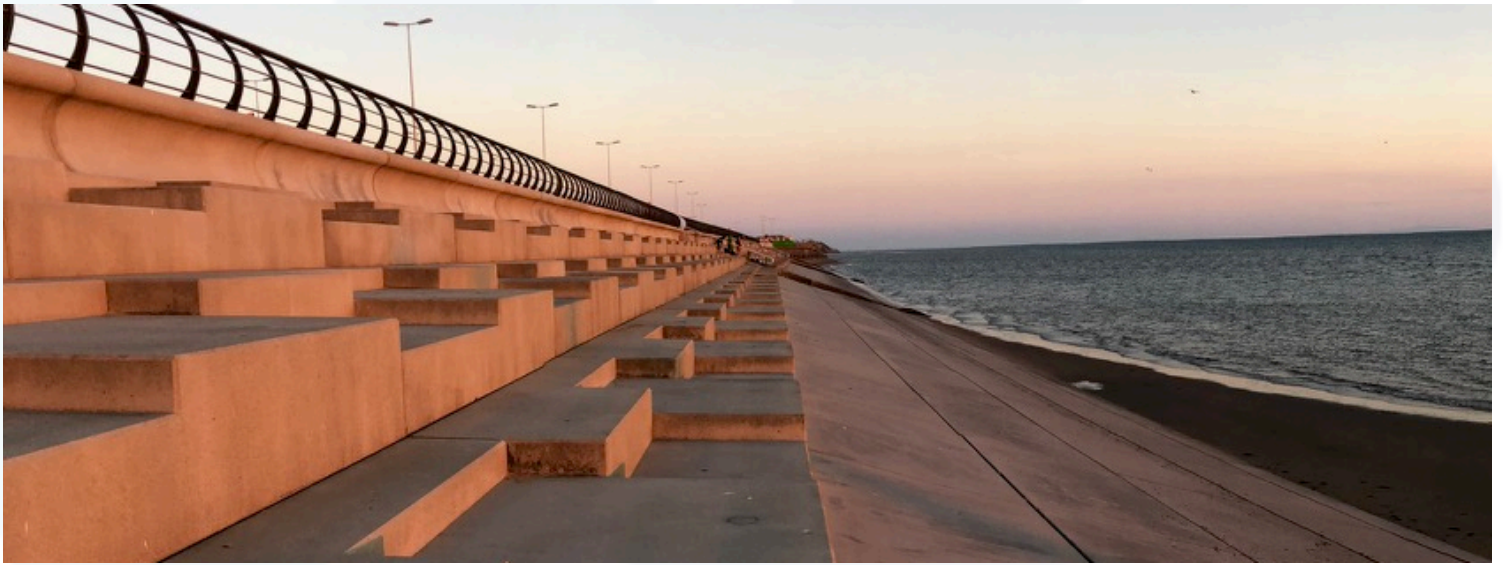


Image: The Flood Hub

## Climate change and sea-level rise



Our climate is changing and the Earth is heating up. As a result, the ice caps are melting and thermal expansion is causing sea levels to rise. Over time, higher sea levels may speed up erosion and inundate coastal land.

Climate change is also affecting weather patterns, causing an increase in wet and stormy weather. Larger and more frequent storm surges can speed up the rate of coastal erosion and increase the risk of flooding.



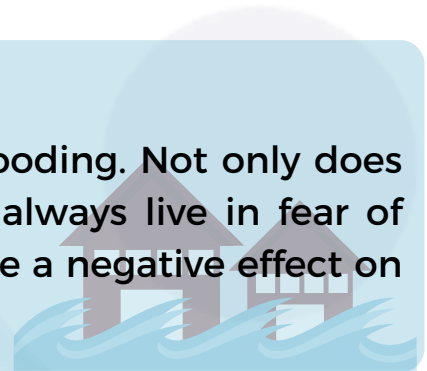
# IMPACTS OF A CHANGING COASTLINE

## WHAT DOES THIS MEAN FOR COASTAL COMMUNITIES?

Higher than average sea levels occur when there are both severe storms and high spring tides. With climate change, it is predicted that sea levels will rise considerably and there will be more extreme weather events, such as storms. This could result in accelerated coastal erosion and an increase in coastal flooding, which will have big effects on coastal communities, especially those situated on inter-tidal land.

### Increase in coastal flooding

Coastal communities will be subject to more frequent flooding. Not only does this have a negative economic impact, but people will always live in fear of heavy rain, storms and flooding. Over time, this could have a negative effect on the mental health of residents and business owners.



### Relocation

Due to increases in coastal flooding, there is a greater risk of some coastal settlements being inundated by the sea and it may be inevitable that residents and businesses have to relocate to a new area. This can cause a lot of stress due to an uncertain future.

This is the case in Fairbourne, Wales, where it is no longer economically viable to protect the village from coastal flooding and erosion. Eventually, the land will be returned to the sea and residents will be moved inland from 2045.



## Homes, businesses and farmland will be lost

Accelerated coastal erosion and more frequent coastal flooding caused by storms and higher sea levels will mean that coastal settlements are at risk of being destroyed and even falling into the sea. Funding for coastal schemes to protect against flooding and erosion is based on a number of factors. Therefore, it is not always economically viable to protect some coastal communities with extra defences.

## Loss of habitat and reduction in biodiversity

Mudflats and salt marshes which form on intertidal land are host to many habitats and species. By building on this land, many habitats and whole marine ecosystems can be lost.



## Lack of investment



Coastal areas which are frequently flooded and show evidence of significant erosion may be more likely to deter investment and less likely to attract new businesses into the area.

Due to the unpredictability of climate change, coastal flooding and erosion, people and business owners may be less likely to relocate to an 'at risk' area, with fear of flooding, abandonment and an uncertain future. Changes to the shape of the coastline may mean that recreational spaces and facilities are lost.

# ADAPTING TO A CHANGING COASTLINE

Adapting to a changing coastline is key to ensuring the impacts of climate change on peoples lives, towns and coastal areas are minimised. By planning ahead and putting provisions in place now, people can adapt to living with an eroding coastline and an increased risk of coastal flooding.

## Creating smarter and adaptive buildings and infrastructure

New developments could incorporate property flood resilience and sustainable drainage systems to be adaptable to the effects of future climate change. Using managed realignment to relocate defences, development, and infrastructure further inland leaves space for intertidal land to be naturally flooded and reclaimed by the sea, reducing risk to properties.



Sand Dunes at Formby Point  
cc-by-sa/2.0 - © David Dixon - [geograph.org.uk/p/568957](http://geograph.org.uk/p/568957)

## Working with natural processes

Encouraging soft engineering such as sand dune regeneration and salt marsh restoration can provide a natural defence against coastal flooding and erosion. These methods can reduce wave energy before they reach the shore, reducing both erosion and flooding.

## Creating a community resilience plan

Community resilience plans enable communities to be more prepared, efficient at responding and be able to recover more quickly from disruption. Community resilience plans can be extremely useful in a flood for highlighting who may be vulnerable and the contact details of residents with useful skills or emergency evacuation centres.



## Do your bit to reduce the impacts of climate change

By actively taking steps now to reduce our carbon footprint, we can reduce the impact we have on the environment. Collectively, we could slow down the impacts of climate change, such as rising sea levels and consequential coastal flooding and erosion.

## Expand building set backs - allow beaches and marshland to migrate

Managed realignment is the planned breach or relocation of sea defences and development further inland which leaves space for intertidal habitat in the form of mudflats and salt marshes. By not building on land close to the sea, it allows the land to be naturally flooded and reclaimed by the sea, reducing the risk of flooding and coastal erosion to properties and businesses.



## Repair existing, old and damaged structures

Over time, existing flood defence measures like sea walls become damaged due to wave power and subsequent erosion at their base. Rising sea levels may also make them ineffective. Consequently, they may not be able to suitably protect against the sea level which they were designed for at the time of their construction. Therefore by repairing existing structures and putting new schemes in place where necessary, enables essential coastal development to remain protected. Alternatively, old and damaged structures can be removed to let the land be reclaimed.

This resource and many more can be downloaded from  
The Flood Hub's Knowledge Hub:

[www.thefloodhub.co.uk/knowledge-hub/](http://www.thefloodhub.co.uk/knowledge-hub/)