



National  
Trust

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# Shifting Shores — adapting to change

# Adapting to change

Almost a decade ago the National Trust investigated how our coastline was likely to change over the next 100 years. Out of this research came the seminal *Shifting Shores* report (2005), which held one clear message – as a nation we can no longer build our way out of trouble on the coast.

Fast-forward to this past winter and a succession of violent storms and extreme tides saw the erosion and flooding we thought could happen over the next 5 to 15 years occurring overnight. Increasingly, ‘defence’ as the only response looks implausible. Instead we must adapt and take the longer view.

Today the Trust cares for more than 742 miles of coastline, almost a tenth of the total in England, Wales and Northern Ireland – from sand dunes and saltmarshes to villages and harbours. And through our *Shifting Shores* work we are already putting into practice adaptive approaches to management.

There will be places where we continue to maintain sea defences. But we’re clear that we should make use of these structures to buy time to develop more long-term and sustainable approaches to managing our future coast based on adaptation.

By recreating a naturally functioning shoreline we free ourselves from the ‘sea defence cycle’ of construct, fail and reconstruct. This must surely be more cost effective in the long run and more desirable in terms of maintaining the coast’s natural beauty. It does mean making some tough choices, but we can’t just store up the problems for future generations to deal with.

The Trust is often on the frontline of change affecting the natural environment. With climate change, sea level rise and increasing frequency of extreme weather, this rapid change is a vivid demonstration of the shape of things to come. In all of this partnerships are vital, and we are already working with communities and organisations to adapt to the change.

The winter storms have put us on fast-forward – decisions and changes we thought we had a decade or more to make now have to be made almost overnight.

Dramatic storms and constant change are inherent features of where land meets the sea, and the forces of nature are part of the beauty and appeal of our coast. We want to work with nature rather than against it, and embrace adaptation rather than relying solely on defence.

**Phil Dyke**

*Coast and Marine Adviser, National Trust*

*April 2014*



# Valuing the coast

“Seventy percent of our coastline is largely undeveloped, and for so many that’s what draws them there and connects them with nature.

“In recent years, our coastal values surveys have revealed that 40 per cent of us value the coast for the sense of peace and freedom it gives, and half of us keep a ‘treasure’ at home that we found on a beach. We also daydream about being by the sea as we go about our daily lives.

“Whether you live by the coast or love to visit, we must all continue to value it, even as it changes before our eyes.”

*Phil Dyke*

## What is adaptation?

Adaptation is all about long-term planning and accepting that our coast has always, and will always, be changing.

‘Rolling back’ is one clear way of adapting. It involves moving key infrastructure back out of harm’s way – such as moving a water treatment works up on to higher ground where it won’t flood.

A light touch can also be taken – repairing a footpath that gives access to a popular beach in a simpler and more cost effective way than before, knowing that it might be swept away in the next big storm but can be readily replaced.

## Working with natural processes

We favour working with the grain of nature because it has multiple benefits for people and wildlife, and provides long-term solutions. Creating space at the coast for natural features, such as saltmarshes and sand dunes, not only provides essential habitats for wildlife but also acts as natural coastal defences.

Waves crashing on the shoreline naturally shift the sand and shingle around, and when a storm hits a beach with a seawall the damage can escalate. The wall stops sand now suspended in the fierce waves from naturally moving up the beach, instead taking it out to sea and depositing it in deeper water – a process known as beach lowering.

Removing these solid sea defences as they fail in the future will allow beaches to work more naturally, and ensure we have sandy beaches for future generations to enjoy.

We must also think carefully about any new development by the coast, and assess the vulnerability of each location.

In parallel to adapting our coast to cope with climate change there is a clear need to reduce greenhouse gas emissions to avoid further accelerating climate change and the risk of even more dramatic storm damage.



# Coastal hotspots

It's predicted, with increasing confidence, that climate change will lead to continued sea-level rise and increased storminess, which in turn accelerates the scale and pace of coastal change.

In the 20th century global sea levels rose by 19 centimetres; in the 21st century the prediction is that they will rise by up to 80 centimetres, clearly illustrating the challenges ahead for people managing and living on the coast.

To help plan for this uncertain future, we carried out a coastal risk assessment to look in depth at how our coastline is likely to change over the next 100 years.

Through the resulting *Shifting Shores* report, first published in 2005, we identified 70 'hot-spot' coastal change locations – places where increased flooding and coastal erosion, driven by sea level rise, pose an increasing threat to people and places.

Only by being flexible in our management of the coast can we prepare ourselves for the changes coming our way.

## Coastal risk assessment results

The assessment indicates that over the next century:

### 169 sites

along some 380 miles (60%) of National Trust-owned coastline could lose land by erosion.

### 10% of this loss

could be between 100 to 200 metres inland.

### 5% more

could be losses of over 200 metres inland.

### 126 sites

with land covering 4040 hectares are currently at risk from tidal flooding.

### 33 further low-lying sites

are at risk of combined tidal and river flooding within the next 100 years.



## Future proofing

We are now seeing dramatic changes happening in a very short space of time. In the winter storms at Birling Gap in East Sussex we saw cliff erosion that we would normally expect to see over seven years occur in just two months. And at Formby on the north west coast eight metres of sand dunes were lost in one afternoon. Access to the world-famous Rhossili beach on the Gower became virtually impossible as the bottom 50 metres of footpath were washed away.

The challenges are complex and so we are developing strategies to help our decision making, with specific plans for each of the hotspot sites – looking at how it can be adapted, and working with local communities and partner organisations to keep beaches and coastal areas accessible to all.



*Coastal erosion, Rhossili beach*

Soft ‘defences’ such as coastal marshes and sand dunes can take out the power of storm surges and prevent flooding inland, but they require sediment from eroded material elsewhere to replenish them.

The Trust has many structures on or near the shoreline – houses, cafés, lighthouses, beach huts, toilets, car parks and roads. We need to consider their futures in the face of sea level rise and erosion.

At Birling Gap we have been planning for the need to take down the café and shop and move them out of harm’s way as the chalk cliffs erode. On Studland Beach in Dorset, the iconic beach huts are being ‘future proofed’ – redesigned so that they are robust and flexible enough to be there for a very long time.



*Moving back, Birling Gap*

## Difficult choices

There is no guarantee that hard defences work in the long term; they are often only a temporary solution. As sea levels rise and severe storms increase, it will become ever more difficult and expensive to build and maintain effective defences. They can also disfigure the coast and cause environmental harm by moving the problem to another location or causing beach lowering. We believe therefore that hard defences should only be used as a last resort.

Many of our sites on undeveloped natural coast are now suffering the knock-on impacts of hard engineering further along the coast. For example, hard defences can help to accelerate the process of coastal erosion elsewhere.

Sometimes the choices made will be difficult because there may be adverse consequences whatever the decision. We will engage with communities and all levels of Government about the importance of working with natural coastal processes – taking the long-term view and supporting adaptation as a realistic and viable alternative to solely relying on defence.

# Adaptation in action



Murlough



Formby



Blakeney Freshes



Gower



Birling Gap



Studland



South Milton Sands



## Studland Beach, Dorset

“The winter storms were a reminder of how vulnerable the Studland peninsula is to extreme weather in the long-term.

“With each tide, the beaches lose and gain sand but it is the hard structures – cafés, toilets, beach huts, slipways and parking facilities – which remain inflexible and at risk. We’ve already had to move the beach huts twice.

“Students from the Arts University Bournemouth have been challenged with designing a ‘future proof’ beach hut. They must be in keeping with the local environment, withstand extreme weather and create an enjoyable beach hut experience – all without costing the earth!”

**Elli MacDonald**

*Project Manager,  
Living with a Changing Coast*



Watch the video

<https://www.youtube.com/watch?v=BD3BjT2pl8>

## South Milton Sands, Devon

“South Milton Sands is a much loved beach, and over recent years in consultation with the local community and stakeholders we’ve been designing a scheme which allows the dunes to erode and build according to natural processes. Failing sea defences have been removed and dunes re-profiled.

“But this year’s winter storms damaged the dune system and access track significantly, and we now need to adapt long term to this faster pace of change. Working together we’re developing a plan that deals with immediate concerns such as breaching of the track as well as the future impacts of coastal change.”

### David Ford

*General Manager for South Devon*





## Gower, South Wales

“Constant rain and pretty relentless stormy weather for months caused the last 50 metres of the main access path to Rhossili to be washed away.

“The design for the new footpath has a lighter touch and is sustainable in nature. The old one was concrete and its weight and inflexibility, combined with the non-stop rain and high tides, led to its collapse.

“The new path is made of compacted gravel held in place with wooden shutters. This is much lighter and more easily repaired, and can tolerate small amounts of movement on the slope.

“Ultimately we want to make the new path as economically sustainable as we can, while maintaining good access to this hugely popular beach.

“This past winter the exceptional rainfall combined with high tides and storm surges also damaged the mediaeval sea wall at Cwm Ivy on Gower. The wall was built to keep the sea from the land, so that it could be farmed with livestock.

“However, as sea levels rise and winter storms become increasingly severe the National Trust is investigating the long-term viability of ‘keeping the sea out’, and looking to work with Natural Resources Wales to consider the option of returning the area to its natural state of saltmarsh. We’ll also be working with the local community and the farmer throughout the process to get this right.”

**Alan Kearsley-Evans**  
*Countryside Manager for Gower*



JOHN MILLER

[Watch the video](#)

<https://www.youtube.com/watch?v=mnXfzxCJgIQ>

## Murlough, Northern Ireland

“In recent storms, a two-mile stretch along Murlough has been affected and in places we’ve lost up to 10 metres of sand dunes.

“We must adapt to the changes. Murlough’s sand dunes are mobile systems, so as long as we allow them to be mobile they can start to re-colonise elsewhere.”

### David Thompson

*Coast and Countryside Manager*

“Around a quarter of all sandy beaches in Northern Ireland are backed by sea defences and consequently, at this time of rising sea level, they will become narrower and ultimately disappear. At the same time, the costs of maintaining and upgrading defences will increase.

“The diversity of organisations who install and maintain sea defences means that there is no record of how much of the coast is defended, how much is being spent on sea defences, nor of the individual or cumulative environmental effects of the defences. Without a strategic approach that recognises sustainable adaptation measures, the entire coast of Northern Ireland could be transformed from a beautiful, natural ecosystem into a continuous line of walls.”

### Professor Andrew Cooper

*Professor of Coastal Studies, University of Ulster*



PATRICK LYNCH



## Formby, Sefton coast

“This is the fastest eroding property in the Trust’s care, and it’s predicted to lose 400 metres in the next century, changing this stretch of coastline forever.

“In December we had two years of erosion in one afternoon. We’re dealing with the immediate aftermath at the moment – reinstating access routes to the beach, erecting new dune fences and dealing with the buried rubble and historic debris which has been washed out of the dunes.

“We’re also beginning to think long-term about how we are going to manage this intense change at a much-loved stretch of the Sefton coast.”



**Kate Martin**

*Area Ranger for Formby*



## Blakeney Freshes, Norfolk

“The spectacular shingle spit at Blakeney National Nature Reserve is constantly changing with the movement of the sea. And behind the spit is an area of saltmarsh, dunes and grazing marsh – home to several species of breeding birds, overwintering wildfowl and wading birds, and increasing numbers of grey seals.

“As the reserve lies just above high tide it is already at risk from flooding. But more frequent storm events and higher tides could wash away important breeding colonies of little, sandwich and common terns, and also affect valuable habitats such as freshwater marsh and coastal reed bed.

“There has been significant damage to the flood defences surrounding the freshwater marshes and we’re working with the Environment Agency, Natural England and other stakeholders to restore access to the area as an interim solution while planning for the longer term future of the site.”

### Victoria Egan

*Countryside Manager for the North Norfolk Coast*

### Watch the video

<https://www.youtube.com/watch?v=9bVNh0VHzys>



MIKE PAGE



GRAHAM LUBBOCK

## Birling Gap, East Sussex

“The speed of erosion at Birling Gap has been breathtaking. We would expect to lose about a metre a year but this last winter we’ve had about seven years of erosion on the chalk cliffs in just two months. This left the sun lounge and ice cream parlour just five metres from the cliff edge – so we quickly decided to take both bits down.”

“As sea-levels rise and storminess increases the erosion could accelerate and buildings continue to be lost. We’re working with coastal change, closing the original rooms as we need to and creating similar-sized rooms at the back of the building. In the future, we also plan to design simple new structures that can easily be taken down and re-built. That way we can stay ahead of the eroding cliff line.”

### Jane Cecil

*General Manager for the South Downs*



JOHN MILLER [X2]

Watch the video

[https://www.youtube.com/watch?v=ZXAgTVj\\_weA](https://www.youtube.com/watch?v=ZXAgTVj_weA)



# Planning for the future



The Trust is taking a long-term view, working with natural coastal change wherever possible. We favour adaptation, because this will give the time and space to adjust with the coastline.

To help us deal with these challenges we've developed a set of coastal management principles – planning for the long term, adapting rather than defending, working in partnership and working with nature rather than against it.

## Taking the long view

The potential impact of climate change and sea-level rise means that we need to plan for the future, looking at what will happen in the next century. If we start planning now, building in flexibility in the way that we plan, we can find solutions that work for people and places.

## Adapting to change

The coastline is constantly changing, but it's the speed of change that means that we need to work with the natural processes. Coastal defences have their place, but we must think about how we adapt at the coast so that we can cope with rising sea levels and the impact of extreme weather.

## Working together

A partnership between coastal communities and organisations is vital for adaptation to have an impact. Adaptation will only work if we talk about the changes ahead in terms of erosion and flooding, and how we can collectively find solutions to create a coastline that is future-proofed.

## Working with nature

The Trust's experience of working on the coast is that it's best to work with rather than against natural processes. This will mean taking difficult decisions about coastal defences and letting the coast realign naturally, or looking at how we encourage natural defences such as beaches to develop.

# A manifesto for change

**To put these principles into practice, the National Trust will have adaptation strategies in place for all its coastal hotspots by 2020.**

We have mapped our coastal hotspots at risk of erosion and flooding and will work to develop adaptation plans for them. The winter storms of 2014 have accelerated this process, and on many of our sites we're bringing forward our decision-making on how to adapt access to beaches, secure the future of buildings and car parks and create space for nature.

## The wider challenges

Although there is much we can do on our coastal sites, the National Trust is not alone in facing the challenges of natural coastal change. In *Shifting Shores* (2005) we identified the need for a new approach for all coastal communities to plan for our future coast and to manage the risks these changes will bring.

Some welcome progress has been made in the last 10 years. To build on this progress, we believe there are three key areas that should be a focus for everyone concerned with coastal management:

### 1. Better planning for coastal change

National planning policy sets a good framework for councils to manage coastal change, but there is too little evidence that this framework is being reflected in local plans and planning decisions on the coast. Discrepancies in approach are also clear across England, Wales and Northern Ireland, the latter still needing to establish a system of shoreline planning.

### 2. People and coastal change

A clearer mechanism for people to find out if their home or business lies within a coastal erosion risk zone; and to consider what assistance can be given to homes and businesses under threat, in lieu of investing large sums on renewing sea defences.

### 3. Cooperation

As coastal change areas frequently stretch across administrative boundaries, achieving a coherent coastal planning policy remains difficult. In England the new 'Duty to cooperate' applies for coastal planning, but we would like to see far more evidence that it is being applied at the coast.

The events of this winter bring home to us the challenges of adapting to climate change. There is a need for recognition of the threat that climate change poses and the importance of international and domestic leadership to reduce emissions and adapt to a changing climate.\*

\* For more information on climate change:

- *Climate Change*, IPCC (Intergovernmental Panel on Climate Change), 2014 [<http://www.ipcc.ch>].
- *Managing the Land in a Changing Climate*, Committee on Climate Change, 2013 [<http://www.theccc.org.uk/publication/managing-the-land-in-a-changing-climate>].





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