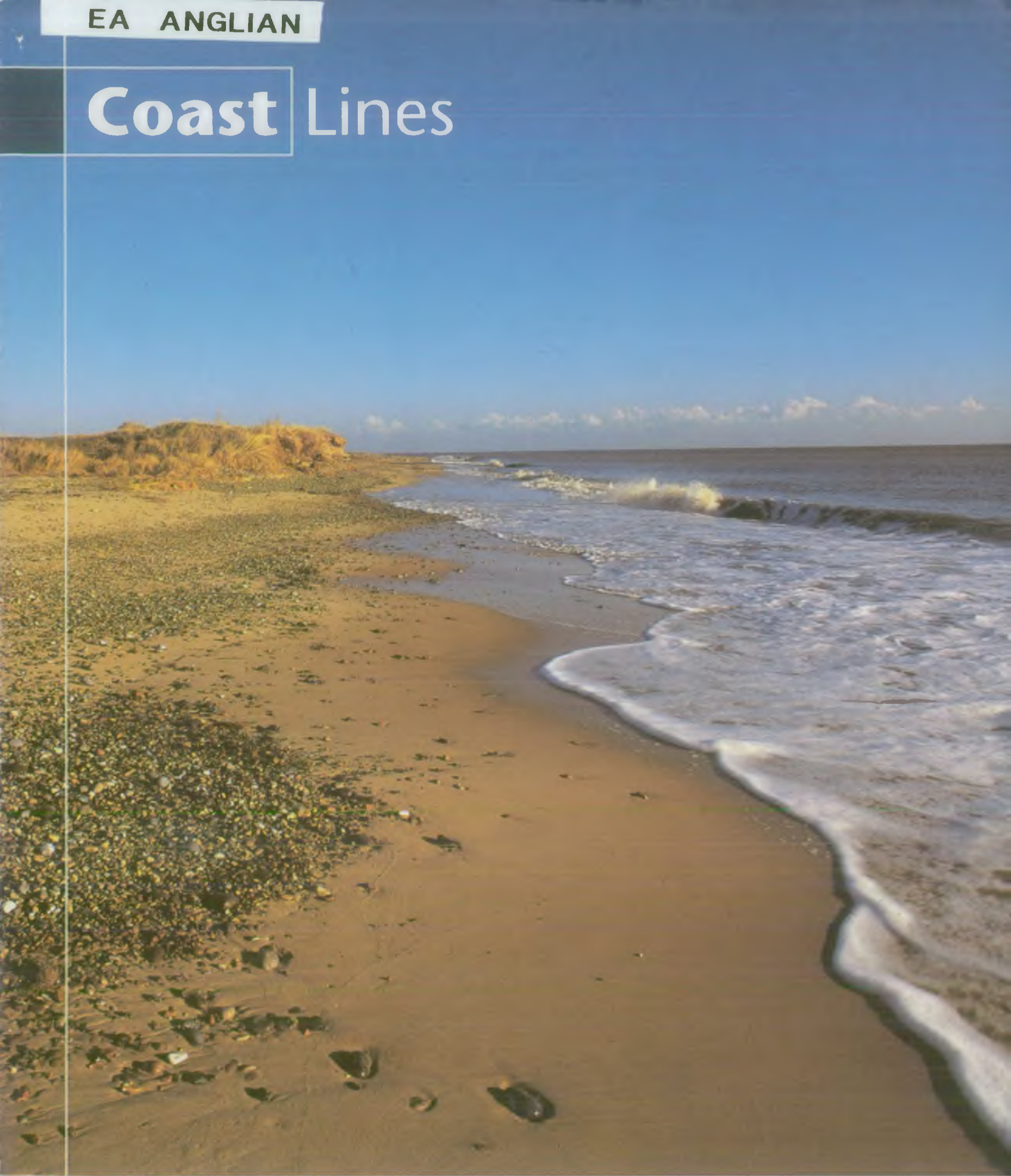


EA ANGLIAN

# Coast Lines



ENVIRONMENT  
AGENCY





**Over the next 50 years,** the Environment Agency aims to

- gain an improved understanding of climate change, and how this will affect sea levels and coastal flood defences
- provide sustainable coastal defences, which work in harmony with natural coastal processes
- reduce the loss of life and damage to property caused by flooding
- meet our statutory obligations under the Habitats Directive
- enhance threatened habitats and species as identified in Biodiversity Action Plans

The Environment Agency is one of the most powerful environmental regulators in the world. We protect and manage the environment of England and Wales by regulating activities of land, air and water. We have powers to provide flood defences including those along the Anglian coast.



# Coast Lines

An Environment Agency Anglian Region Publication

Issue 1 April 2003

**F**ifty years ago, one of the worst natural disasters to strike Britain took place – the 1953 East Coast Flood. This resulted in over 300 deaths, damage to 24,500 houses and flooding of vast areas of farmland and many towns and villages.

Following that disastrous flooding event, defences were rebuilt, and have generally performed well. However, we are aware of the new threats associated with climate change – as sea level rise combines with high tides and storm conditions, our flood defences are increasingly threatened.

The Environment Agency, together with the Department of Environment, Food and Rural Affairs (Defra), are committed to reducing the loss of life

and damage to property caused by flooding. In order to deliver this objective, the Environment Agency fully recognises the need to work in conjunction with other people and organisations.

Our flood defence activities include the planning, building and repair of sea walls and embankments. Where possible we like to work in harmony with natural coastal processes. We undertake monitoring of the coastline to understand how these processes work, we forecast flood events and issue flood warnings through the media and our website and we have a 24 hour response team to deal with emergencies.

Through this newsletter we aim to give more information about what we do, and how and why we do it.



ENVIRONMENT  
AGENCY



# The Agency's Vision for the coastline

"A better environment in England and Wales  
for present and future generations"

We will achieve this by:

- **working in effective partnerships**
- **focusing on environmental outcomes**
- **being flexible, embracing change, learning & improvement**
- **being robust and exerting real influence**



In terms of flood defence delivery for the Anglian region shoreline, our Vision is translated into the following aims:

- **to reduce the loss of life and damage to property caused by flooding.**
- **gain an improved understanding of climate change, and how this will affect sea levels and coastal flood defences**
- **provide sustainable coastal defences, which work in harmony with natural coastal processes**
- **meet our statutory obligations under the Habitats Directive**
- **enhance threatened habitats and species as identified in Biodiversity Action Plans**



# Climate Change and Sea Level Rise

Climate Change - the greatest environmental challenge facing us this century



**C**limate change simply means that the average weather patterns are set to change. This is primarily due to industrial emissions of carbon dioxide, which is increasing the 'greenhouse effect' - where the atmosphere traps part of the Sun's heat and stops it going back out into space. It is an essential system which makes the Earth warm enough for life, but scientists believe we are adding dangerously to this natural system. The UK Government is working with others at a global scale, agreeing measures to reduce global warming. The 1997 Kyoto Protocol sets targets and timetables for 38 nations to control emissions of greenhouse gases. The Environment Agency has a role to play in both ensuring a reduction in greenhouse gas emissions and managing the potential impacts of a changing climate on environmental resources.

Under the 'worst-case scenario' for the eastern coast of England, it is predicted that by the 2080s, there will be:

- an annual warming of 4.5°C
- wetter winters by up to 30%
- drier summers by up to 50%
- rising sea levels of between 16-69cm
- increases in wave surge height by up to 1.4m

The chances of coastal flooding in future years will increase, as high winds and high tides are more likely to coincide to catastrophic effect, potentially causing sea defences to be overtopped or breached.

East Anglia is particularly vulnerable to the effects of sea level rise due to its extent of low-lying land. As well as global sea level rise which is affecting many countries, East Anglia is also suffering from the effects of the last ice age - we are slowly sinking into the sea. Being bounded by the North Sea also brings the hazard of storm surge - this is an increase in sea level produced by wind and atmospheric pressure variations. Surges of about 1 metre sweep the coast three or four times a year, but they rarely coincide with high tides and bad weather as they did in 1953.

The Environment Agency already includes an allowance of 6mm sea level rise per year for new flood defences. In the future, it will not always be possible to raise the height of existing defences. Our longer-term plans consider where these defences may be located in the future. More information on that process will be given in the next issue.

## More information can be found at:

**The Environment Agency**  
[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

**UK Climate Impacts Programme**  
[www.ukcip.org.uk](http://www.ukcip.org.uk)

**The Tyndall Centre (for climate change)**  
[www.tyndall.ac.uk](http://www.tyndall.ac.uk)

**Hadley Centre, Meteorological Office**  
[www.met-office.gov.uk/research/hadleycentre/index](http://www.met-office.gov.uk/research/hadleycentre/index)

## ANGLIAN REGION ADDRESSES

### REGIONAL OFFICE

Environment Agency  
Kingfisher House  
Goldhay Way  
Orton Goldhay  
Peterborough PE2 5ZR  
Tel: 01733 371 811  
Fax: 01733 231 840

### NORTHERN AREA OFFICE

Environment Agency  
Waterside House  
Waterside North  
Lincoln LN2 5HA  
Tel: 01522 513 100  
Fax: 01522 512 927

### CENTRAL AREA OFFICE

Environment Agency  
Bromholme Lane  
Brampton  
Huntingdon  
Cambs PE28 4NE  
Tel: 01480 414 581  
Fax: 01480 413 381

### EASTERN AREA OFFICE

Environment Agency  
Cobham Road  
Ipswich  
Suffolk IP3 9JE  
Tel: 01473 727 712  
Fax: 01473 724 205

- Area Administrative Boundaries
- Regional Boundary
- Area Office
- ▲ Regional Headquarters



[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

ENVIRONMENT AGENCY  
GENERAL ENQUIRY LINE

**0845 9 333 111**

ENVIRONMENT AGENCY  
FLOODLINE

**0845 988 1188**

ENVIRONMENT AGENCY  
EMERGENCY HOTLINE

**0800 80 70 60**



**ENVIRONMENT  
AGENCY**





# The Wash Banks Flood Defence Scheme

**M**uch of the land around the Wash has, over the last centuries, been reclaimed from the sea. As the land has been drained and farmed, levels have been lowered and now much of the area is 3 metres below surge tide levels. Sea defences are therefore very important to protect properties and industry in thousands of hectares of land.

Sea defences are continually inspected and maintained in response to the pressure of the sea. In this region, sea levels are rising and some of these defences are increasingly being attacked by waves. This is felt most where there is no saltmarsh in front of the defence, these marshes and the mudflats in front of them are the best natural defence available and as waves wash over them, their energy is reduced and the defences are sheltered from attack.

The flood defence strategy study for the north west side of The Wash showed that many kilometres of embankments should be raised and strengthened. However, some fields at Freiston were reclaimed as recently as the 1970s and 1980s, and the defence here was known as the 'bank too far'. It was proving very difficult and costly to maintain a defence in this position because of the direct wave attack. For this small frontage length, the best option was to raise and strengthen the old defence (about 400m inland) and breach the existing poor seaward defence, allowing the sea back into the site. This is known as 'managed realignment' and because the new defence has more land in front of it to break down the waves, it is better protected from the attack by the sea. As a result, a better standard of defence has been given to the large area of land behind the new bank.

Over the next few years, saltmarsh species will start to grow in the newly flooded fields. These will act as an improved natural defence, as well as a very valuable habitat for a range of species, and a feeding ground for visiting birds. In future this type of scheme will help to provide both flood defence and replacement areas of habitat in more and more areas where saltmarshes are being eroded as sea levels rise.

Flood defence schemes can bring other benefits too – in this case the area is now an RSPB reserve, attracting many visitors to the area. Due to flood defence investment at the site, improved access, car parks, a cycle route and bird hides have all been provided by European Funding.

#### **Managed realignment**

"Identifying a new line of defence and, where appropriate, constructing new defences landward of the original defences" Defra, 2001

#### **More information can be found at:**

**RSPB reserve office 01205 724678**

[www.rspb.org.uk](http://www.rspb.org.uk)

**The Wash Banks Website**

[www.thebostonwashbanks.com](http://www.thebostonwashbanks.com)

**Jane Rawson**

[jane.rawson@environment-agency.gov.uk](mailto:jane.rawson@environment-agency.gov.uk) Tel: 01733 371 811





# Questions and Answers

**Q: If sea levels are rising, why don't you simply raise the defences?**

**Answer:** There are approximately 450 km of coastal defences and a similar length of estuary defences in the Anglian region, simply making it too expensive to maintain them all. It would also be impossible to replace inter-tidal habitats, which would be lost due to sea level rise 'squeezing-out' such environmentally important areas. A pragmatic approach is therefore needed, balancing the needs of residential and rural areas.

**Q: Can you guarantee protection from flooding following the completion of flood defence schemes?**

**Answer:** No! We can only minimise the frequency of flooding, where technically, economically and environmentally feasible to do so. All coastal flood defence schemes are designed to prevent flooding from an event that has a probable frequency of occurrence, such as a 2% chance per year. Although the frequency of flooding should be less following the completion of a flood defence scheme, nature will on occasion inevitably deliver conditions that will overwhelm any man made defence.

**Q: Who pays for flood defence work?**

**Answer:** The Environment Agency pays using public money, supported by Defra grants. This is provided

that individual scheme proposals are justified. The value of the property, land and environment protected needs to be greater than the cost of providing the defence. Conversely, if the scheme advantages are more social or environmentally focused, then financial support might be available from other organisations with similar aims.

**Q: Do you consider the protection of people and property less important than the environment?**

**Answer:** No, both are important. We aim to provide protection to people and property in residential and commercial areas that are at high risk from flooding. However, we also have commitments to protect and enhance the environment, especially areas of international importance. We will be covering this issue in more detail in our next edition.

**In the next edition:**

- Monitoring along the coastline
- The Habitats Directive
- Management plans for the coast
- The Regional Coastal Partnership

**and much more!**

This newsletter has been produced by the Regional Strategy Unit of the Environment Agency, Anglian Region. For further information, please contact: Clive Flanders, Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough PE2 5ZR Tel: 01733 371811 Email: [clive.flanders@environment-agency.gov.uk](mailto:clive.flanders@environment-agency.gov.uk)



# Coast Lines

An Environment Agency Anglian Region Publication

Issue 2 November 2003

**W**elcome to the second issue of **Coast Lines**. We had a great response to our first edition, and hope that this November update gives you more useful information about what we do at the coast. Remember, if you have any comments, questions or feedback, please contact us and let us know.

In the Anglian Region, a strategic programme of physical coastal monitoring has been ongoing since 1991. The programme covers the whole region, from the river Humber to the river Thames, and is partly funded by the Department for Environment, Food & Rural Affairs (Defra). The data produced has been instrumental in supporting the design of a wide range of coastal defence schemes since the early 1990s.

The regional monitoring programme is managed by the Shoreline Management Group, and comprises several data sets including:

- **Summer and winter beach profiles at 1km spacing along the whole Anglian coastline**
- **Bathymetric survey to - 10m depth**
- **Colour aerial photography at 1:5000 scale**
- **Sediment sampling**
- **Wave & tide recording**

This information can be made available for most academic and general study purposes by contacting the Regional Strategy Unit.

Other departments of the Environment Agency also monitor water quality, water levels, and biological parameters. For information about what data is available, please contact Customer Services at your nearest area office, shown on the back page.

## Monitoring the Coastline

It is widely recognised that work undertaken in the coastal zone is greatly enhanced by a good understanding of how the coastal system works. Only by monitoring can we build up a picture of the links between beaches, waves and tides, and offshore processes. Programmes of strategic survey and monitoring give us valuable data sets to help analyse how the coast behaves now, and help us understand how it may evolve in future. Generally, the longer the monitoring record, the better!



**ENVIRONMENT  
AGENCY**



# Biodiversity and the Regional Coastal Partnership



**B**iodiversity is simply the wealth of all wildlife. Government has identified habitats and species which have undergone significant decline and which require positive action to stop continuing losses. Some of these habitats and species occur around our coast; as the region is so low lying and made up of soft beach materials, we have a lot of saltmarsh and mudflat, soft maritime cliffs and sand dunes. Where old glacial materials occur, we also have important features like shingle ridges and spits. These habitats are the homes to rare species like the Reed Bunting and the Essex Emerald moth.

Partly as a result of ongoing natural changes, and the effects of sea level rise (see last edition) we are losing these habitats. Essex saltmarshes account for 10% of the national resource, and between 1973 and 1998 around 950 Ha (26% of the total) were lost. Overall, Essex and Suffolk have lost an area equivalent to 750 football pitches in 25 years. To help stop this decline many organisations have joined together to form a Regional Coastal Partnership. The aim is to make sure that the way we work to manage our coast delivers improvements for coastal biodiversity.

The partners (Environment Agency, RSPB, WWF-UK, English Nature, the region's Wildlife Trusts, and the National Trust) are looking for projects to work on together to show that wildlife benefits can be

delivered alongside flood risk management. An example of a successful partnership project, at Freiston Shore, was described in the last edition, and this group hopes to deliver more projects like that.

John Sharpe, RSPB Conservation Manager for Eastern England, said "the RSPB is pleased to be involved in this partnership which will be critical in creating new coastal habitats to offset losses due to climate change and sea level rise."



## More information can be found at:

### RSPB

[www.rspb.org.uk](http://www.rspb.org.uk)

### English Nature

[www.english-nature.org.uk](http://www.english-nature.org.uk)

### Wildlife Trusts

[www.wildlifetrusts.org](http://www.wildlifetrusts.org)

### National Trust

[www.nationaltrust.org.uk](http://www.nationaltrust.org.uk)

### WWF-UK

[www.wwf.org.uk](http://www.wwf.org.uk)

### Wendy Brooks

Tel: 01733 371811

[wendy.brooks@environment-agency.gov.uk](mailto:wendy.brooks@environment-agency.gov.uk)





# Management Plans

**T**here are lots of plans affecting the coastline relating to flood and coastal defence, the natural environment and the built environment. The relationship between plans can be confusing, especially as there are so many different organisations, government bodies, and individuals all having an interest in the coastal zone. For defence, it is important to use the best available science to understand how the coast wants to evolve over long time periods so that we can aim to work with nature, rather than against it. In addition, the money available to provide defence against erosion and flooding is limited. Works will only be carried out where they are economically, environmentally and technically sound, and planning allows us to prioritise where and how this can be achieved, in line with government guidance. Some of the key types of plans, and their aims, are:

## Shoreline Management Plan (SMP)

This is the high-level long-term plan for how coastal defences should be managed. Based on predictions of coastal movement, and the risk associated with each option, each area of the coast is given a management policy, such as 'hold the line', 'managed realignment',

'no active intervention'. These plans take account of legislation and existing planning initiatives and are now in place throughout the coast of England and Wales — 6 cover the Anglian region. The revision of these plans is due to start soon. .

## Strategy

Once the high level policy is set in the SMP, then a strategy goes into more detail to look at how the defence authorities can actually deliver the management option. If the option was to 'hold the line', a strategy could use surveying, modelling, software and risk analysis to come up with the ways of best defending each length, possibly by raising and strengthening sea walls, or nourishing beaches. The Essex Estuary Strategies are examples of strategies (see opposite). The engineering, renourishment or other works are called schemes, and these are then taken ahead through construction works.

## Coastal Habitat Management Plan (CHaMP)

A CHaMP aims to show how the management of internationally important natural coastal habitats can be undertaken in a way which ensures that the value of the sites is not lost over the next 70-100 years. There are 3 CHaMPs in the Anglian region, in areas where the valuable 'salty' and freshwater habitats are under pressure from the sea. These documents do not take coastal defence and economics into account, but simply look at physical processes and ecological functioning. They are an important document to support the development of the next generation of SMPs, to make sure these are compliant with nature conservation legislation.



*SMPs in the Anglian Region*

**More information can be found at:**

[www.defra.gov.uk](http://www.defra.gov.uk)

[www.english-nature.org.uk/livingwiththesea](http://www.english-nature.org.uk/livingwiththesea)



## ANGLIAN REGION ADDRESSES

### REGIONAL OFFICE

Environment Agency  
Kingfisher House  
Goldhay Way  
Orton Goldhay  
Peterborough PE2 5ZR  
Tel: 01733 371 811  
Fax: 01733 231 840

### NORTHERN AREA OFFICE

Environment Agency  
Waterside House  
Waterside North  
Lincoln LN2 5HA  
Tel: 01522 513 100  
Fax: 01522 512 927

### CENTRAL AREA OFFICE

Environment Agency  
Bromholme Lane  
Brampton  
Huntingdon  
Cambs PE28 4NE  
Tel: 01480 414 581  
Fax: 01480 413 381

### EASTERN AREA OFFICE

Environment Agency  
Cobham Road  
Ipswich  
Suffolk IP3 9JE  
Tel: 01473 727 712  
Fax: 01473 724 205

- Area Administrative Boundaries
- Regional Boundary
- Area Office
- ▲ Regional Headquarters



[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

ENVIRONMENT AGENCY  
GENERAL ENQUIRY LINE

**0845 933 3111**

ENVIRONMENT AGENCY  
FLOODLINE

**0845 988 1188**

ENVIRONMENT AGENCY  
EMERGENCY HOTLINE

**0800 80 70 60**



ENVIRONMENT  
AGENCY



# Essex Estuaries

## Background

The Environment Agency aims to promote flood management schemes, enhance the natural environment and regenerate coastal habitat within the Essex estuaries by means of flood management strategies. These strategies will set out the options for efficient and sustainable management of the estuary flood defences over the next 100 years. They will consider the impact of defences on the natural development of the whole estuary system.

## What is a sustainable estuary?

Recent studies carried out in the Essex estuaries have shown that human activities, including the historic reclamation of land from the sea, have resulted in the development of an unnatural estuary shape. This means that maintaining the existing shape of the estuary at certain locations can result in "stress" being applied to the coastal defences.

One of the objectives of these flood management strategies is to develop a more sustainable estuary shape, by predicting geomorphological change, taking into account future changes in sea level, river flow and sediment supply, and the constraints which already exist in the estuary (roads, towns and so on). This will help to determine the most efficient long term strategy for flood management. It will protect the most people and property possible as well as minimising harm and maximising benefits to nationally and internationally designated environmental sites.

## Why undertake another study?

The Essex Shoreline Management Plan recognised that there are significant pressures on the Essex coast, particularly in the face of sea level rise. It also found that not enough was known about the way the estuaries work to make detailed decisions on the future management of these important areas. To make these decisions, the Essex Estuaries Flood Management Strategies are using the most up to date information and methods available. Following Defra guidelines they are taking a fully co-ordinated approach towards developing flood management schemes that are sustainable. We need to develop these studies, with our partner organisations, to



progress the future management of these areas in a supported way. This will help attract funding to provide and maintain necessary defences as well as enhance the natural environment.

## Consultation

Many different groups will be involved in the development of the Flood Management Strategies. These will include the project team, Steering Group, statutory authorities, residents, landowners, businesses, non-governmental organisations, general public and the media.

The strategies are being produced on a rolling programme and all Essex estuaries should have a flood management strategy in place by 2007. The Roach and Crouch Flood Management Strategy is already underway and is to be followed by the Colne and Blackwater, the Stour and Orwell and finally Hamford Water.

## More information can be found at:

### The Essex Estuaries Website

[www.essex-estuaries.co.uk](http://www.essex-estuaries.co.uk)

### Karen Thomas

Tel: 01473 727712

[karen.thomas@environment-agency.gov.uk](mailto:karen.thomas@environment-agency.gov.uk)





# Questions and Answers

**Q: How does the Regional Coastal Partnership deliver anything if all of the works are planned in the SMPs and Strategies?**

**A:** The SMPs and Strategies identify what we would like to do at the coast, and the actual works that will reduce flood and erosion risk. They also identify things we could do to improve biodiversity and wildlife. However, it is sometimes difficult to get agreements and funding in place to deliver everything, especially as national spending priorities change. By working in partnership we have shown in this region that more can be achieved by working together. For example, we are more likely to be successful at winning European funding and lottery funds which can then pay for other benefits for people to enjoy the coast, such as car parks, wheelchair access, bird hides and cycle routes.

**Q: Why don't you plan to defend everywhere?**

**A:** There simply isn't enough money to defend everywhere, and even if there was funding, despite best possible attempts there will never be an engineering solution to every problem. Simply building defences higher, or encasing the whole coast with concrete, would not only be unacceptable both legally and to individuals, but could lead to higher losses when large floods do occur. Also, there is no legal requirement for any council or the Environment Agency to defend against flooding or erosion. No individual has the automatic right to have defences, and we only have permissive powers to build, improve

and maintain defences. Works will only be carried out where they are economically, environmentally and technically sound, in line with government guidance.

**Q: Now I've read about flooding, I'm worried my house may be at risk - how do I find out more?**

**A:** Our website gives you the chance to find out 'What's in Your Backyard' - search by postcode for the Indicative Floodplain Maps which provide an overview of natural floodplains potentially at risk of flooding from rivers or the sea. The maps use the best information currently available, based on historical flood records and geographical models. However the maps do not show flood defences which offer vital protection in many areas. We will continue to improve and refine the maps as new information becomes available. You can also check out what flood warnings are in operation, investigate the bathing water quality at your local beach, find out what discharges are made into the sea, and lots more at our website [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

## In the next edition:

- The Habitats Directive - what it is and what it means
- Coastal management and land use planning
- A day in the life of Environment Agency staff

**and much more!**

This newsletter has been produced by the Regional Strategy Unit of the Environment Agency, Anglian Region. For further information, please contact: Clive Flanders, Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough PE2 5ZR Tel: 01733 371811 Email: [clive.flanders@environment-agency.gov.uk](mailto:clive.flanders@environment-agency.gov.uk)



# Why is the Anglian Region at risk?

- One fifth of the region is below sea level
- The south east of England is sinking and sea level is rising
- We have a long history of coastal erosion and flooding
- The east coast is exposed to heavy wave action and North Sea surges
- Coastal towns and holiday properties have historically been built in flood risk areas





## So who does what?

There are lots of people and organisations working on our coastline, and we recognise that it is important to work together.

### **Defra** (Department for Environment, Food and Rural Affairs)

Gives financial support, guidance and advice to the flood and coastal defence authorities (the Environment Agency and Local Authorities), to provide sound and sustainable flood and coastal defences, and early warning systems.

### **The Environment Agency**

Works on defending low-lying areas from flooding, issuing warnings and responding to emergencies.

### **Maritime Local Authorities**

Work on coast protection issues such as cliff erosion, and protecting seaside promenades. They manage beach and tourism amenities.

### **English Nature**

English Nature is the Government agency that champions the conservation of wildlife and geology throughout England. They have an interest in the habitats and species of coasts, estuaries and seas.

### **Others**

Other individuals or organisations may also own or manage coastal defences. These can include private landowners, Nuclear Electric, National Trust and Ministry of Defence.





# THE ENVIRONMENT AGENCY AND FLOOD DEFENCE

The aim of flood defence is to reduce the risks of flooding from rivers and the sea to people, property and the natural environment by providing effective defences and warnings. It involves six main areas:

## Planning

Provides the framework for the sustainable management of flood defence for the future. The six Shoreline Management Plans for the Anglian region form the top level of coastal defence policy. They look at how the coast is developing, where defences should be maintained or built, and how we need to monitor coastal change.

## Monitoring

The Shoreline Management Group has been monitoring the coast and estuaries of our Anglian Region since 1991. Each year we take aerial photographs and measure the beaches and waves, to help us understand how the coast is evolving. In this way, long term management decisions can be made based on good science.



## Construction

The Agency has powers to build flood defences where justified, in order to reduce the risk of flooding. This could involve building sea walls, groynes, offshore reefs re-instating sandy beaches or moving defence lines.

## Maintenance

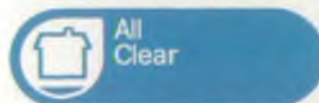
We maintain our flood defences so that they are in good condition to continually provide protection from flooding. Our annual maintenance programme includes defence repairs, grass and weed cutting, desilting, and routine servicing of sluices and tidal gates.

## Emergency Response

We have a 24 hour team to respond to emergencies affecting the environment. These include flooding or pollution incidents.

## Warning

We forecast floods, and issue warnings by phone, television, radio and the internet. We also offer advice on taking action before, during and after a flood event.



**Floodline**  
**0845 988 1188**  
**ENVIRONMENT AGENCY**