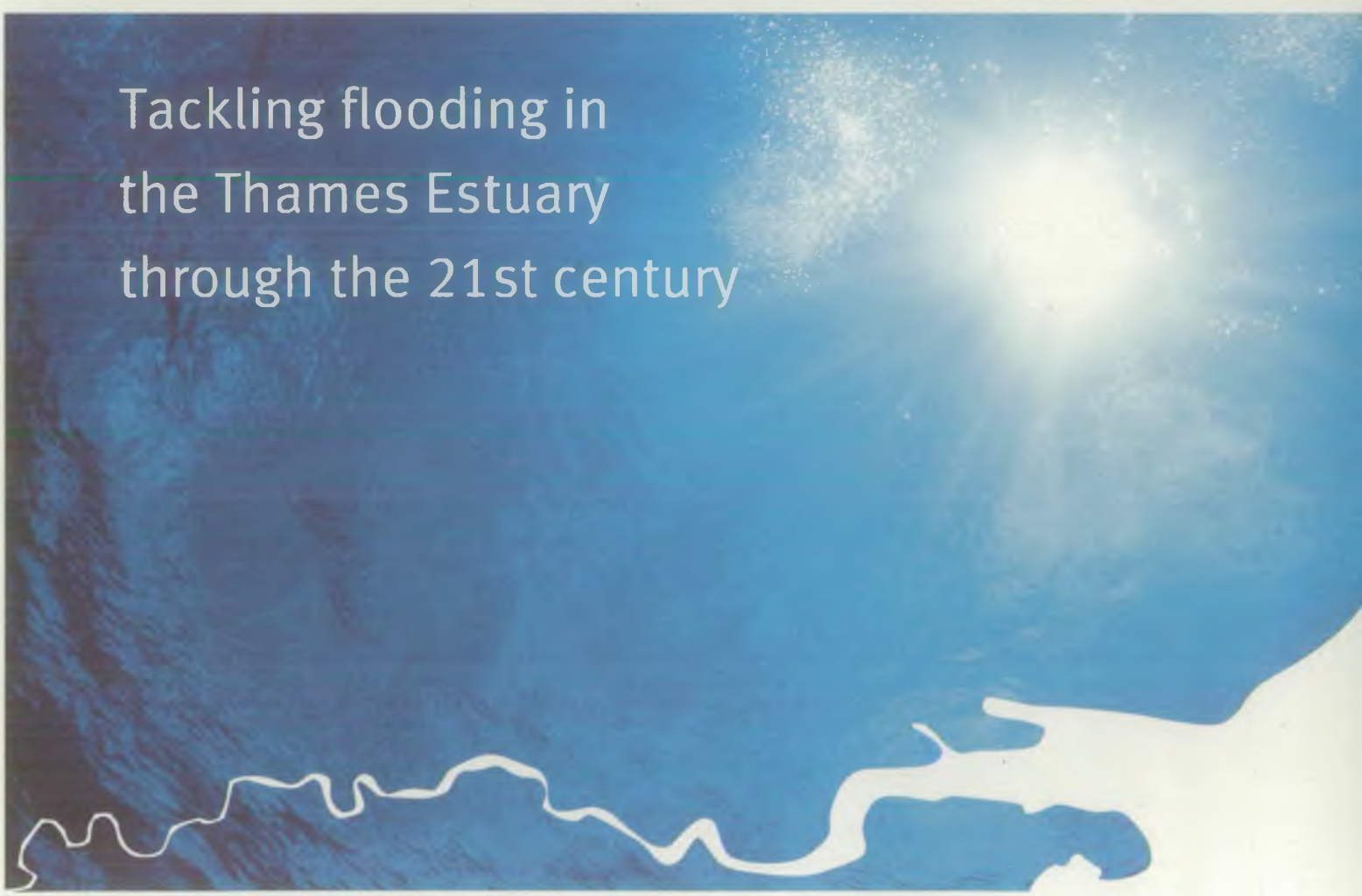
Environment Agency

Thames Estuary 2100

# Protecting your future

Tackling flooding in the Thames Estuary through the 21st century



We are the Environment Agency. It's our job to look after the environment and make it a better place – for you, and for future generations.

The environment is the air we breathe, the water we drink and the ground we walk on. Working with business, Government and society as a whole, we are making our environment cleaner and healthier.

Published by:

Environment Agency
Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ
Tel: 0870 8506506
Fax: 0118 9592160
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

# The tide is turning

Our changing climate creates a threat to people, places, and wildlife across the planet. The Environment Agency is working tirelessly to reduce the causes of this change and the risks it brings. Increased flooding is one of those risks.

This leaflet introduces you to the extensive work we are doing to reduce the risks and effects of flooding in London and the Thames Estuary now and over the next 100 years. We know that we need to act today if we want to safeguard our environment for tomorrow.

We have a number of options and we will be seeking the views of a wide range of people and organisations to make sure we choose an approach that is affordable, acceptable to all and improves the environment.

## Let's take action now

Devastating floods have happened before and will certainly happen again if we do nothing. We need to take action now. Together with the Government, we are facing some serious decisions about how to live with the increasing risk of flooding in the Thames estuary. The risk of flooding is low but we need to act now to prevent the catastrophic impact of flooding on homes, businesses and our way of life in the future.

3,000 AWAIT RESCUE BOATS

"DAILY MIRROR" REPORTERS

THREE thousand people in Plaistow and West Ham, in the worst-hit flood areas of London, were waiting last night for rescue by a fleet of small craft rounded up by the Thames Police.

For hours, strings of boats sailed up the streets to houses and blocks of flats where whole families were at the upper windows.

"Children first" was the order. They were ferried to high ground, where convoys of trucks took over and ran a shuttle service to improvised refuges centres.

Drowned in Air Raid Shelter

A man aged seventy was drowned in an air-raid shelter when a stream feeding the Thames at Barnes overflowed, and a raging torrent swept along Rectory-road. For ten years Herbert Haines had slept in the shelter in a garden of one of the houses there—"to be away from the noise." In the darkness he was trapped before the alarm could be raised.

A watchman at a factory on the Belvedere Marshes, on the Thames Estuary, was drowned when he, too, was swept by the sudden torrent which reared through a breach in the river bank.

A police launch saved people marooned in their houses as the water spread over an area of 700 acres of the marshes.

For hours, in the early morning, police radio cars toured riverside areas of London, warning sleeping families to get up—and in some cases to flee from their threatened homes.

The caravans float like matchboxes

By NOEL WHITCOMB

LOOKING down from an aeroplane on the watery tragedy that hit England yesterday, it was not so much the appalling pictures of Mablethorpe, Canvey Island and Great Yarmouth that struck home the full terror wrought by the cruel sea.

It was sights like the farmer standing on his roof, surveying the sandy beach that had been his fields; the flotilla of painted boats at Skegness which turned out to be no flotilla at all, but Butlin's camp.

It was the sight of a farmer with two of his horses standing on the cart; of two bodies, which might have been ... but didn't ...

work and hope and saving, suddenly washed out by the sea and the wind.

We seemed down to look at a lighthouse—and found it was a windmill.

It wasn't possible to follow the old, familiar coastline, for it has disappeared. This storm has changed the map.

Just Twisted Metal

Playgrounds, putting greens and fun fairs are not where they used to be. They are, in many places, just struts of twisted metal.

Caravans lost like matchboxes. Red, white and green holiday villas are in the sea. In what may have been the front garden of one such villa I saw ...

THE ISLAND OF ...

"DAILY MIRROR" REPORTER

... happened to ... can't tell how many people ... men, women ... if any, are dead.

Canvey Island:
Rescue from 1953 floods.
Supplied by Empics.

Extract from Daily Mail 1953.
Copyright Mirrorpix.

"Flooding affects us all... the risks are set to increase over the next hundred years due to changes in the climate and in society... hard choices need to be taken now."

Sir David King KB ScD FRS
... Advisor


## What is Thames Estuary 2100?

The Environment Agency has the direct responsibility for building and managing flood defences such as the Thames Barrier. We also plan future defences and recommend to Government what form they should take.

Thames Estuary 2100 (TE2100) is a high profile, far reaching project aimed at protecting London and the people living in the Thames Estuary from flooding now and into the next century. The Thames Estuary is a vital corridor, linking London, Kent and Essex to the North Sea. Over 1.25 million people (one sixth of London's population) are at risk from flooding. The plan we develop will tackle increasing flood risk, from Teddington in the west to Sheerness in the east.

### Why are we taking action?

The Thames Barrier and associated defences provide a very high level of protection against river and tidal flooding – one of the best in the world. But, sea levels are continuing to rise, and our changing climate makes heavy rainfall and stormy conditions in the future more likely. This means a greater risk of flooding from both higher water levels in the rivers, and surges of high sea water being pushed by storms into the estuary.

### Why now?

The Thames Barrier will continue to provide an excellent level of flood defence until the year 2030. At this point London and the Thames Estuary will still receive a good standard of protection, but with climate change and sea level rise this will decrease year on year – with defences getting older and more costly to maintain. By 2080 we expect the sea level in the Thames Estuary to rise by an average of 1 to 3 feet (26cm to 86cm), with extreme conditions pushing water levels up to 7ft (2 metres) higher. If we do nothing, thousands of lives and properties face a very real threat.

Although 2030 is still some time away, it takes a long time to research, design and build a major flood management system. By starting now, we will have plans in place and work completed before the risk of flooding becomes too high.

### How will we deliver?

We are taking a new approach and not just relying on building

ever bigger and higher defences. We will consider a variety of flood risk management methods to find ways of reducing both the risks of flooding and the effects it has.

We are gathering a wide range of information and carrying out many studies to see how these methods will reduce risks, but also to find out what effect they will have on the people, businesses and environment of the estuary.

## Have your say

Together with these studies, we will be asking people and organisations in flood risk areas for their views.

We want to produce a plan to tackle flooding that we can afford, that improves the environment, and that the vast number of people that live and work in the flood plain of the tidal Thames agree with.

**'By 2080 we expect the sea level in the Thames Estuary to rise by an average of 1 to 3 feet (26cm to 86cm), with extreme conditions pushing water levels up to 7ft (2 metres) higher'**

# Tackling flooding

The Thames Estuary covers a diverse and changing landscape. Given the varied nature of the Estuary, we will be looking at different ways to manage the risk of flooding that are appropriate to each location.

## What defends us now?

London and the communities along the Thames Estuary are already very well protected by over 185 miles of floodwalls, embankments and nine tidal barriers, including the Thames Barrier, as well as 35 major gates and over 400 minor gates. Most of the present defence system was designed in the 1970s to cope with rising sea levels expected by 2030. It was also a response to the damaging east coast floods of 1953 when more than 300 people died.

### Walls and embankments

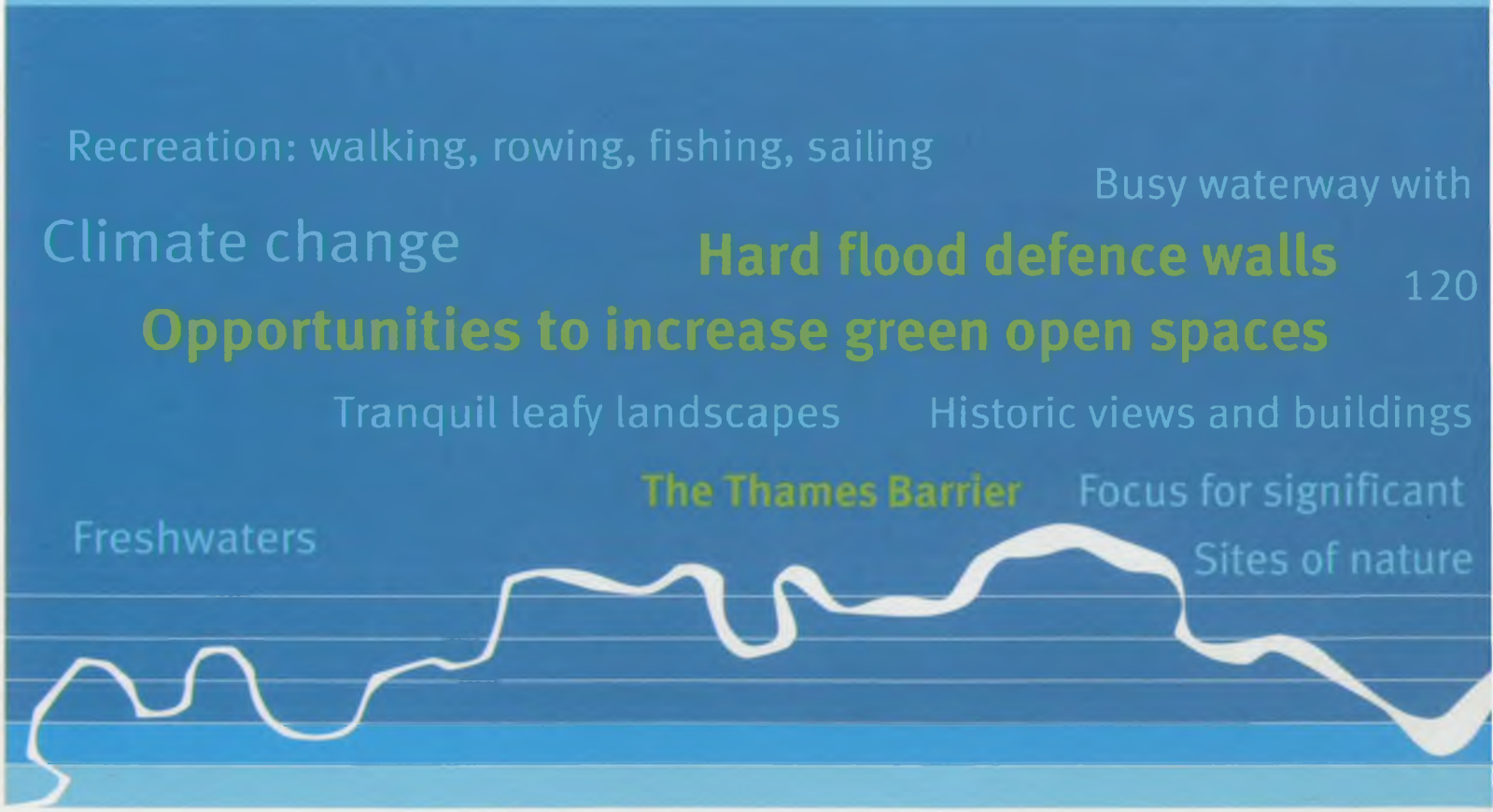
Many of these structures have been raised several times over the years. As part of our planning for the future, TE2100 will look at the condition and level of the tidal walls and embankments and how well these structures contribute to reducing flood risk.

### Barriers and floodgates

We own and operate nine flood defence barriers and floodgates in the Thames Estuary. Today, each of these barriers and floodgates form an integral part of the flood defence of Central London and communities within the Thames Estuary. TE2100 will be assessing the future role of each of these flood defences.

- 1.25 million people (one sixth of London's population)
- £80 billion of property
- 400 schools
- 16 hospitals
- 8 power stations
- 68 underground and Docklands Light Railway stations
- 30 mainline railway stations
- City airport

## Challenges and Choices – what's important to you?



# Making space for water

## How and where to defend in the future?

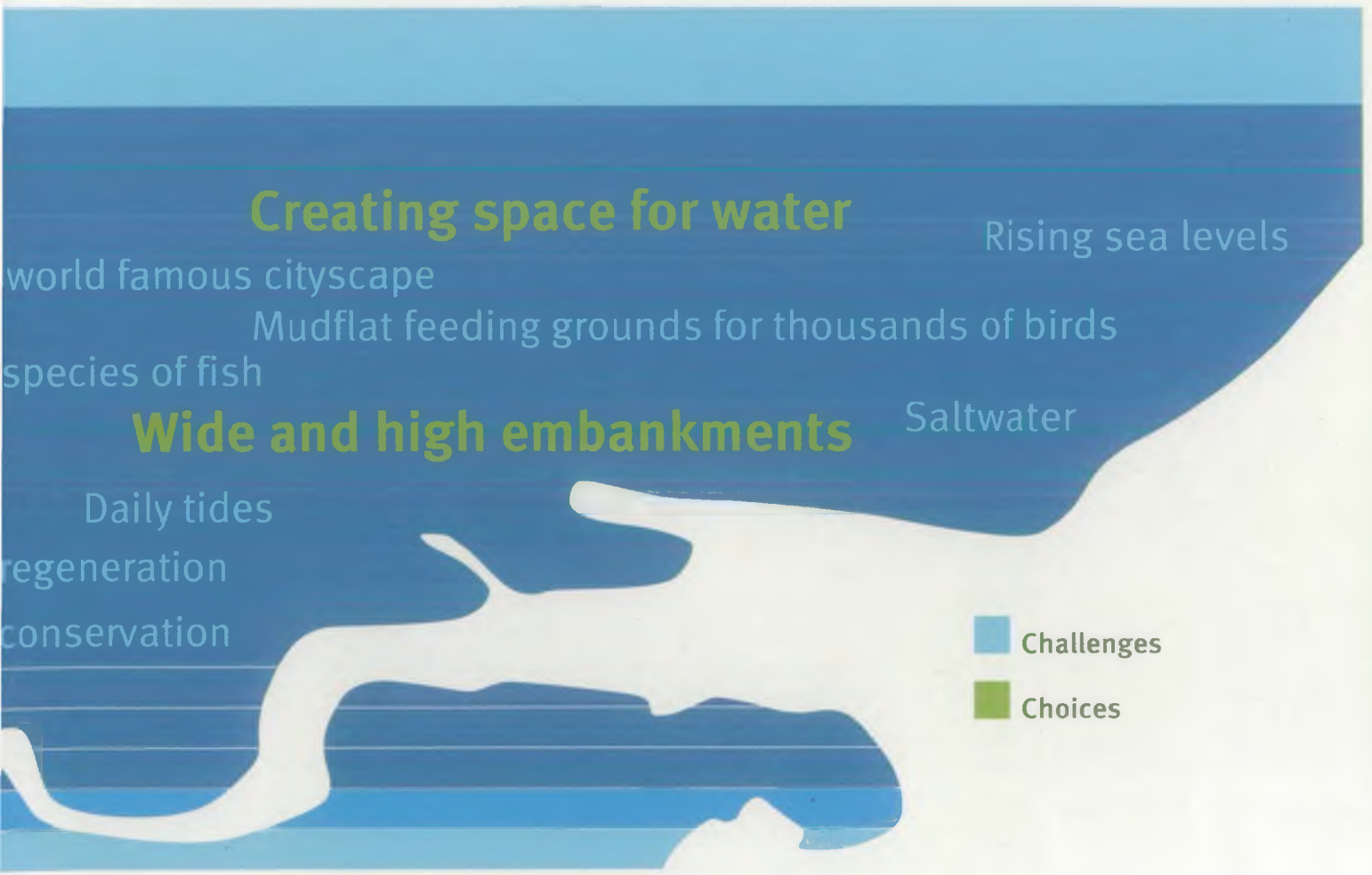
As the present defences need maintaining and possibly upgrading, moving, or replacing, we will have to decide how and where to defend in the future. Renewing or adapting current systems for the next 100 years could cost in the region of £4 billion at today's prices. With limited resources, we need to consider new approaches to flood defences that will see us into the next century.

Alternative options that could reduce long term costs include:

- allowing some floodplain areas to flood naturally
- moving back defences so that they are more easily maintained or raised in the future
- avoiding development in the highest risk flood areas

These options may also provide opportunities to create space for leisure and recreation, and improve the natural environment.

In some non-developed areas however, maintaining the current defences and accepting a lower level of protection in the future may be the most appropriate option.



# Challenges and choices

The options we choose to reduce the long-term risk of flooding in the future will also affect people's daily lives in the present, and the businesses and natural processes that rely on the Thames.

## Meeting the challenges

Planning to reduce the risk of flooding in the Thames Estuary for the next 100 years is a massive task. We need to make sure that we consider the needs of a wide range of interests. Gaining the support of local people, protecting the environment and the economy are all important considerations.

### A better place to live

In the past 50 years, the Thames Estuary has been radically transformed back into a more thriving and biologically rich community.

The estuary is an important spawning ground for many fish and a major feeding site for aquatic birds. Any work on the tidal defences needs to be carried out carefully and sensitively to avoid disturbing this delicate balance. We will find ways to improve the natural environment where we can.

### Supporting regeneration

The Thames Gateway is a major regeneration and development project planned to provide up to 120,000 new homes and 180,000 new jobs for people in the South East by 2016.

We will take developments like this into account when deciding on future flood management options. The developments themselves will need to be located and designed to minimise any flood risks, and we are already working with Government and planning authorities to achieve this.

### Living with the water

The estuary is also a place which supports a huge array of activities, both commercial and leisure.

Shipping, and the transport of people and materials within the estuary is increasing. Fishing and boating is popular along the river, and many thousands of tourists enjoy the views, walks, and heritage associated with the Thames. These are all important considerations when developing our plan. We will talk to the many individuals, groups and businesses that use and enjoy the river so that we can plan to minimise impacts on these activities, and where possible enhance their potential.

### Counting the cost

The potential cost of doing nothing about flood risk in London and the Thames Estuary is enormous.

Apart from damage to assets of more than £80 billion, the economic damage to the entire country caused by major disruption to the nation's capital would be catastrophic.

Against this, the possible cost of new flood defences of around £4 billion may seem reasonable.

In addition to considerable financial costs, there may also be major impacts on the natural environment and character of the river and upon riverside users.

**We will evaluate the costs and implications of these impacts and find ways to minimise and manage them.**

## The choices

In planning future flood defences for the Thames Estuary we have several options. We can maintain or change the current defences, build new ones in new locations or do a combination of both. We can also manage flood risk by changing land use, or building design, as well as increasing flood warning and emergency planning.

## The options for managing flood risk

The following options are just what might be possible. As we develop the plan through studies and consultation we will be able to decide which of them are affordable, acceptable to people and businesses, and good for the environment.

### Control structures

These options include:

- barriers across rivers (such as the Thames or Barking barriers)
- fixed permanent defences (such as walls, channels, embankments)
- movable permanent defences (such as gates)
- removable defences (such as temporary flood walls)
- an outer estuary barrier
- narrowing the river to restrict surge flows entering the estuary

### Flood water storage

These options include:

- pumped drainage systems (storing water in low lying drainage areas to be pumped into the river when the risk has passed)
- surface and waste water management to store and reduce water entering the river
- reducing upstream river flows (controlling the rate at which freshwater enters the tidal Thames)
- controlled flooding of tidal floodplain (allowing parts of the floodplain to be flooded at times of risk, and then drained)
- restoring natural floodplains along the river
- realigning defences and changing land use

### Changing land use and behaviour

These options include:

- issuing guidance and working with Government to create new policy
- changing or introducing legislation (such as EU directives and the Thames Barrier Act) by working with Government
- working with local and regional planning authorities to guide the type and location of developments in risk areas
- building in resilience to flooding through working with developers
- improving the understanding of flood risk among the public and business

### Warning and response

These options include:

- building upon peoples' existing knowledge about the risks of flooding (Floodline Direct helpline)
- building in emergency planning for new developments
- working more effectively with the emergency services

Other questions we have to answer:

## Who pays and when?

In the past, tidal defences have been paid for by a mix of public and private money. Further work to renew and update flood defences will probably be paid for in a similar way. However, there may be opportunities to work with developers and regeneration agencies to help provide defences for the future.

## What standard of protection is needed?

Up until 2030 most of our defences will protect us to at least a 1 in a 1000 likelihood of a flood happening in any year. The project will examine whether this is a sufficient level of protection for the future or whether it should be raised or lowered in some locations.

## What happens next?

**Following extensive consultation and research, and a number of interim reports, we aim to complete a first draft of our flood risk management plan in 2008. In the meantime, we will continue to monitor and regulate the necessary repairs and replacement to existing flood defences and the Thames Barrier will also continue to provide London with a world class level of protection. Over the next 15 years more than £200 million will be invested to make sure that London and the Thames Estuary remains protected to the very highest standard.**

Children fishing in the Thames tideway

# Other languages

Environment Agency, Thames Estuary 2100 Project, Kings Meadow House, Kings Meadow Road, Reading RG1 8DQ

Telephone 08708 506 506 [Mon-Fri 8-6]

**If you would like a summary of this document in your language, please phone the number above or contact us at the address above.**

**(العربية) Arabic**

إذا كنت ترغب في الحصول على ملخص هذه الوثيقة بلغتك، يرجاء الاتصال برقم الهاتف الموضح أعلاه أو الاتصال بنا على العنوان الموضح أعلاه.

**Bangla** (বাংলা)

আপনি যদি নিজের ভাষায় এই দলিলের একটা সংক্ষিপ্ত বিবরণ চান তাহলে অনুগ্রহ করে উপরের ফোন নম্বরে অথবা ঠিকানায় যোগাযোগ করুন।

**Chinese (中文)**

如果需要此文件概要的中文版本，
請致電以上號碼或與上面的地址聯絡

**Greek (Ελληνικά)**

Εάν θα θέλατε περίληψη του παρόντος εγγράφου στη δική σας γλώσσα, παρακαλείστε να μας καλέσετε στον παραπάνω αριθμό ή να επικοινωνήσετε μαζί μας στην παραπάνω διεύθυνση.

**Gujarati** (ગુજરાતી)

જો તમને આ દસ્તાવેજના સારાંશ તમારી ભાષામાં જોઈતી હોય તો, કૃપા કરી આપેલ નંબર ઉપર ફોન કરો અથવા ઉપર સરનામે સંપર્ક સાધો.

**Hindi** (हिन्दी)

यदि आप इस दस्तावेज का सार अपनी भाषा में चाहते हैं, तो कृपया ऊपर दिये गये फोन अथवा ऊपर दिये गये पते पर हमसे संपर्क करें।

**Punjabi** (ਪੰਜਾਬੀ)

ਜੇ ਤੁਹਾਨੂੰ ਇਸ ਦਸਤਾਵੇਜ਼ ਦਾ ਸਾਰਾਂਸ਼ ਆਪਣੀ ਭਾਸ਼ਾ ਵਿੱਚ ਚਾਹੀਦਾ ਹੈ, ਤਾਂ ਉਤੇ ਦਿੱਤੇ ਹੋਏ ਨੰਬਰ 'ਤੇ ਫੋਨ ਕਰੋ ਜਾਂ ਉਪਰ ਦਿੱਤੇ ਪਤੇ 'ਤੇ ਸੰਪਰਕ ਕਰੋ।

**TURKISH (TÜRKÇE)**

Bu belgenin kendi dilinizde bir özetini isterseniz, lütfen yukarıda verilen telefonu arayın veya yine yukarıda yer alan adrese bizzat başvurun.

**Urdu** (اردو)

اگر آپ اس دستاویزکا خلاصہ اپنی زبان میں چاہتے ہیں، تو براہ کرم اپر دیئے گئے نمبر پر فون کریں یا اُپر دیئے گئے پتہ پر رابطہ قائم کریں۔

**Vietnamese (Tiếng Việt)**

Nếu bạn muốn có bản tóm tắt của tài liệu này bằng ngôn ngữ của bạn, xin vui lòng gọi tới số điện thoại trên hoặc liên lạc với chúng tôi ở địa chỉ trên.

# Your views count

The way flood risk is managed in the Thames Estuary will affect everyone who lives and works there. We will be seeking views and reactions from a wide range of people and organisations throughout the development of the plan.

If you would like to be kept informed of the progress of the project, or would like to be involved in consultations as the plan develops, please send the following details.

**Name:**

**Organisation you represent** (if relevant):

**Email address:**

**Or mail address** (if not on email):

**To:**
TE2100@environment-agency.gov.uk

**Or**
Environment Agency
TE2100 Project Office
Thames Barrier
Eastmoor Street
Charlton
London
SE7 8LX

If you would like more information on the TE2100 project, or about flood risk in your area, visit our website: www.environment-agency.gov.uk

## Would you like to find out more about us, or about your environment?

Then call us on
08708 506 506 (Mon–Fri 8–6)

email
enquiries@environment-agency.gov.uk

or visit our website
www.environment-agency.gov.uk

incident hotline 0800 80 70 60 (24hrs)

floodline 0845 988 1188

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