

enhancing... improving... cleaning... restoring
changing... tackling... protecting... reducing...
create a better place... influencing... inspiring
advising... managing... adapting...

National Flood Risk Assessment 2005

Key facts

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

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

The Environment Agency. Out there, making your environment a better place.

Published by:

Environment Agency
Rio House
Waterside Drive, Aztec West
Almondsbury, Bristol BS32 4UD
Tel: 0870 8506506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

© Environment Agency

All rights reserved. This document may be reproduced with prior permission of the Environment Agency.

Prepared by Halcrow group Ltd (halcrow.com) at the instruction of its client, the Environment Agency.

Foreword

Flooding is a natural process – we can never stop it happening altogether – but we can prepare for it.

We gather flood risk data from across England and Wales to help us understand both the chance (likelihood) and consequence of flooding. Through a better understanding of flood risk, we can take action to reduce the risks where it will make the most difference and be prepared for when flooding occurs. We can also work with business, government and communities to share our understanding and support them in preparing for floods and taking action to reduce the impact on them.

This report offers some key facts about flood risk across England and Wales. The information is taken from our 2005 national flood risk assessment (NaFRA) and our Flood Map. These are freely available on our website at www.environment-agency.gov.uk/flood.

Contents

| | |
|---|----------|
| Introduction | 1 |
| Flood Map | 1 |
| National Flood Risk Assessment (NaFRA) 2005 | 1 |
| Data Quality | 2 |
| England and Wales | 3 |
| Regional Planning Bodies | 4 |
| Local Authorities | 8 |

Introduction

We have an important role in understanding flood risk and reducing the adverse consequence of flooding from rivers and the sea on people, property and the environment.

The Flood Map and the National Flood Risk Assessment (NaFRA) 2005 help us to understand and communicate the different levels of flood risk.

In this report, we present an analysis of the approximate number of properties and people located with areas that could flood from rivers and the sea in England and Wales.

These key facts are designed to raise awareness of flooding and help regional and local government, and their communities, understand more about flood risk and how flooding could affect them.

Over time, we will be able to track how flood risk is changing in response to our changing climate, taking into account property and infrastructure development patterns and investment to improve flood risk management.

Flood Map

The first step in the process is for us to understand the likelihood (or chance) of flooding i.e. where flooding occurs and how often it could happen. This is not the same as flood risk, as risk is also influenced by what lies within the floodplain and potential damage that would be caused by a flood.

Our Flood Map shows where flooding from rivers and the sea could occur, ignoring the presence of flood defences, in flood events with:

- A chance of flooding in any year of 1% (1 in 100) from rivers or 0.5% (1 in 200) from the sea;
- A chance of flooding in any year of 0.1% (1 in 1000) from rivers and the sea, or greatest recorded historic flood, whichever is greater.

The Flood Map is can be viewed on our website at www.environment-agency.gov.uk

National Flood Risk Assessment (NaFRA) 2005

The data in this report comes from a new method of flood risk assessment that we are developing to help us to understand flood risk in a consistent way across the whole of England and Wales. This method is called Risk Assessment for Strategic Planning (RASP). It takes into account the location, type and condition of flood defences. These defences help to reduce flood risk but they can still be overtopped or fail in extreme weather. Therefore, areas that benefit from flood defences still need to be aware of the chance of flooding and what action may be necessary to prepare for flooding.

The RASP method works by dividing the areas that could flood (as shown on our Flood Map) into 100m squares (called impact zones), or smaller areas where the square is crossed by a river or coastline. It then calculates the likelihood that the centre of each 100m square will flood in a range of floods. The method considers the probability that the flood defences will overtop or fail, and the distance from and height above the river or the sea.

This new method was used to produce the national flood risk assessment for England and Wales for 2005. This is a high level assessment of the likelihood of flooding to land from rivers and the sea, at a national scale, based on assessments undertaken for 85 river catchments and coastal cells. It enables a comparison of the relative risks and their distribution within each of these catchments, rather than a detailed, local assessment of the risk at a specific location.

Our analysis of the results from the national flood risk assessment has used the 3 categories devised by the insurance industry and government for flooding. These are:

| | |
|-------------|--|
| | The chance of flooding in any year is: |
| Significant | greater than 1.3 per cent (1 in 75 chance) |
| Moderate | 1.3 per cent (1 in 75 chance) or less, but greater than 0.5 per cent |
| Low | 0.5 per cent (1 in 200 chance) or less |

The results presented in this report give an indication of the:

- total number of properties within the floodplain
- total number of properties at significant, moderate and low chance (likelihood) of flooding
- percentage of properties that fall in the floodplain
- percentage of properties at significant, moderate and low chance of flooding
- percentage of land within the floodplain
- percentage of land at significant, moderate and low chance of flooding
- property density in areas that could flood.

In this analysis, we are not seeking to present a full picture of flood risk. For example, while we can show the number of people and properties in areas with a low, moderate or significant chance of flooding, this report does not provide information on the financial, social or environmental impacts of flooding. Whilst it is possible to calculate the likelihood of certain depth of flooding, we do not generally hold information on properties (including floor levels and form of construction) to say whether flooding of a certain depth would enter into a property and cause damage.

Data Quality

Developing a sound understanding of flood risk is highly complex. It is not possible to achieve as detailed a level of understanding when looking at the national picture as we can when looking at one specific area. Simplifications are necessary at the national scale because of limitations with data. Therefore, what we present in this report is indicative only.

We are still refining and improving this new method for flood risk assessment by comparing these results with our local knowledge, improving our data and by embracing advances in technology. Therefore, whilst the results we present in this report are the best available national picture of flooding, we do expect the results to improve in future assessments.

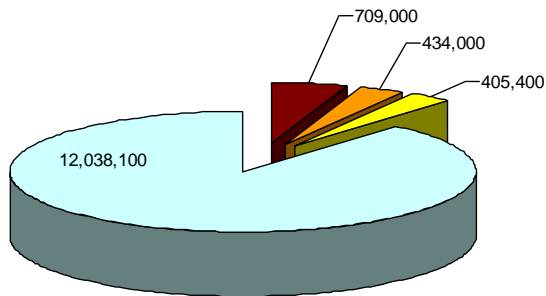
Our analysis assesses the number of properties in areas at risk. Where we have presented the number of people living in flood risk areas, this is estimated from the national average number of people per domestic property, and on the national average ratio of commercial to residential properties.

Due to limitations of the data and method, 0.07% of all properties and 0.06% of land area within England and Wales are in locations where no results were obtained from the 2005 assessment.

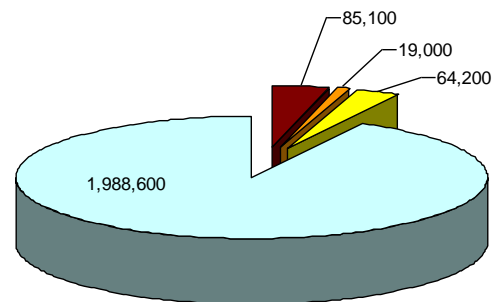
England and Wales

In England and Wales, over 11 per cent of land – 1.7 million hectares – could flood from rivers or the sea. These areas of land are known as the floodplain. Eight per cent (over 1.2 million hectares) has a **moderate** or **significant** chance (or likelihood) of flooding and 5 per cent (0.8 million hectares) has a **significant** chance in any year.

England - area of land (hectares)



Wales - area of land (hectares)



■ Significant chance
 ■ Moderate chance
 ■ Low chance
 ■ Outside floodplain

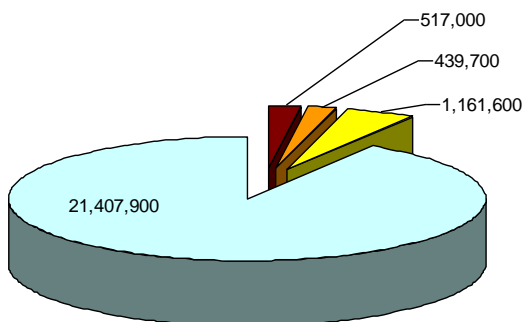
Located within the floodplain are around 2.3 million properties – 9 per cent of all properties in England and Wales. Of those, over 1 million properties are in areas with **moderate** or **significant** chance of flooding, possibly affecting around 2 million people.

At risk from flooding from rivers or the sea:

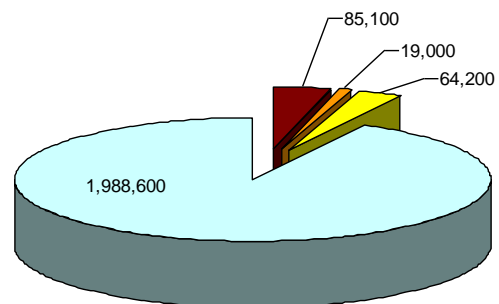
- 11% of land
- 1.7 million hectares
- 2.3 million properties
- 4.4 million people

A number of properties lie in areas with a significant chance of flooding: 2 per cent in England and 4 per cent in Wales.

England - number of properties



Wales - area of land (hectares)



■ Significant chance
 ■ Moderate chance
 ■ Low chance
 ■ Outside floodplain

Regional Planning Bodies

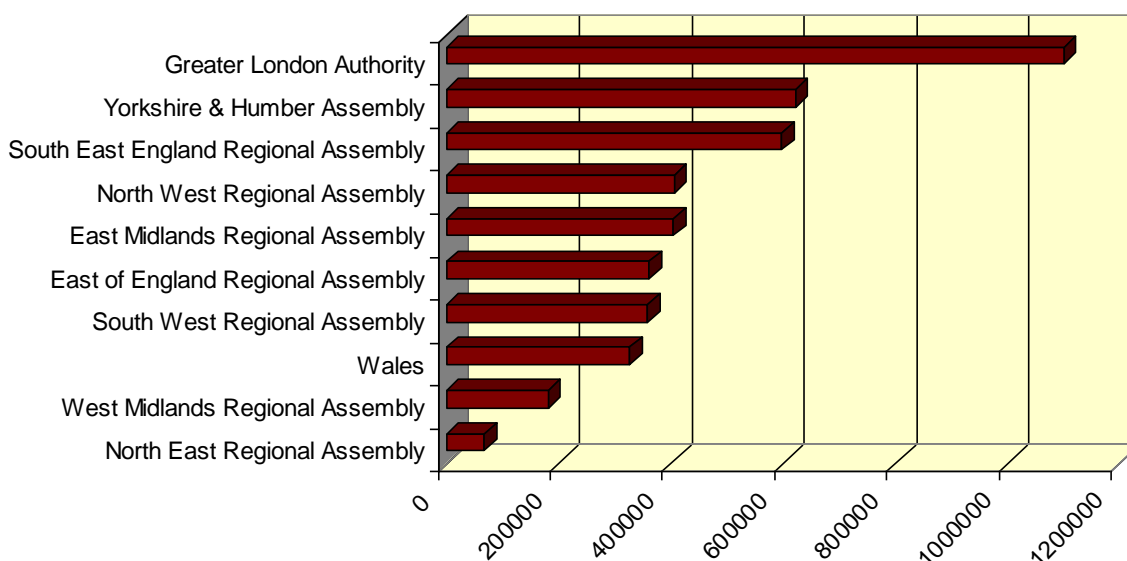
There is a concentration of properties that could be flooded in the heavily populated south east of England. The Greater London Authority has almost 250,000 more properties than any other region located within the floodplain, with 573,000 properties – around 1.1 million people.

At risk from flooding in the Greater London Authority:

- **573,000 properties**
- **250,000 more properties than any other region**
- **17% of all land area**
- **1.1 million people**

In contrast, 95 per cent of properties in the West Midlands and the North East Regional Assemblies lie outside of areas at risk from flooding from rivers and the sea.

Regional planning bodies, ranked by number of people living in the flood plain

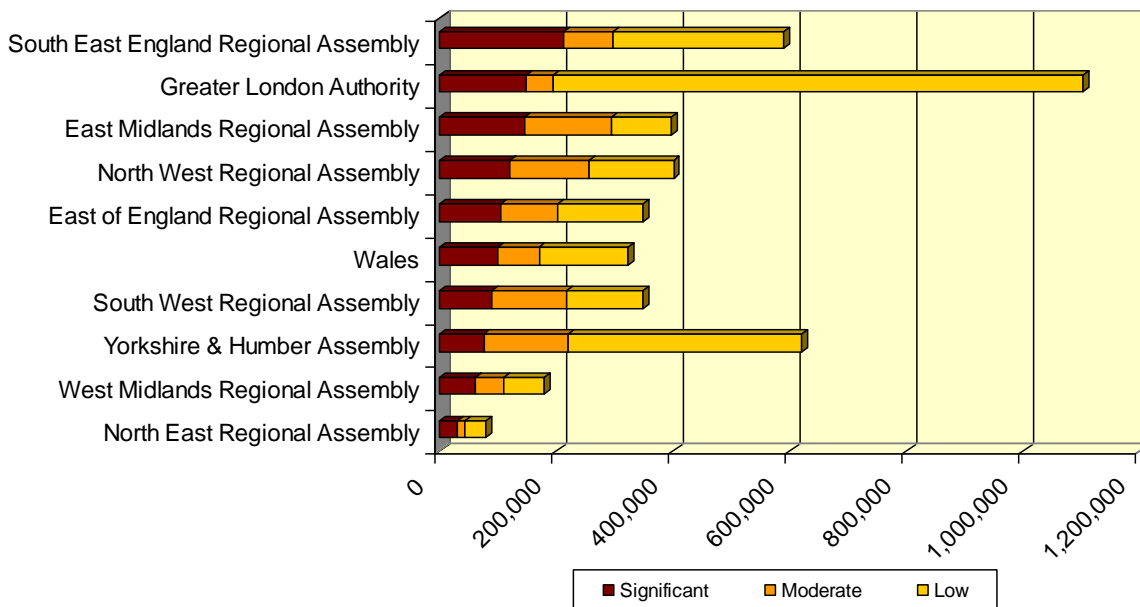


The number of properties located in areas with a **significant** chance of flooding are highest in the South East Regional Assembly, which has 33,000 more properties – around 63,000 people – at this level of risk than any other region. It also has the highest number of properties – over 154,000, or around 293,000 people – in areas with a **moderate** or **significant** chance of flooding.

Although the Greater London Authority has the largest number of properties located within the floodplain, 473,000 of these – 82 per cent – are in areas with a **low** chance of flooding.

The East Midlands Regional Assembly has nearly as many properties in areas with a **moderate** or **significant** chance of flooding – almost 154,000 – as the south east of England.

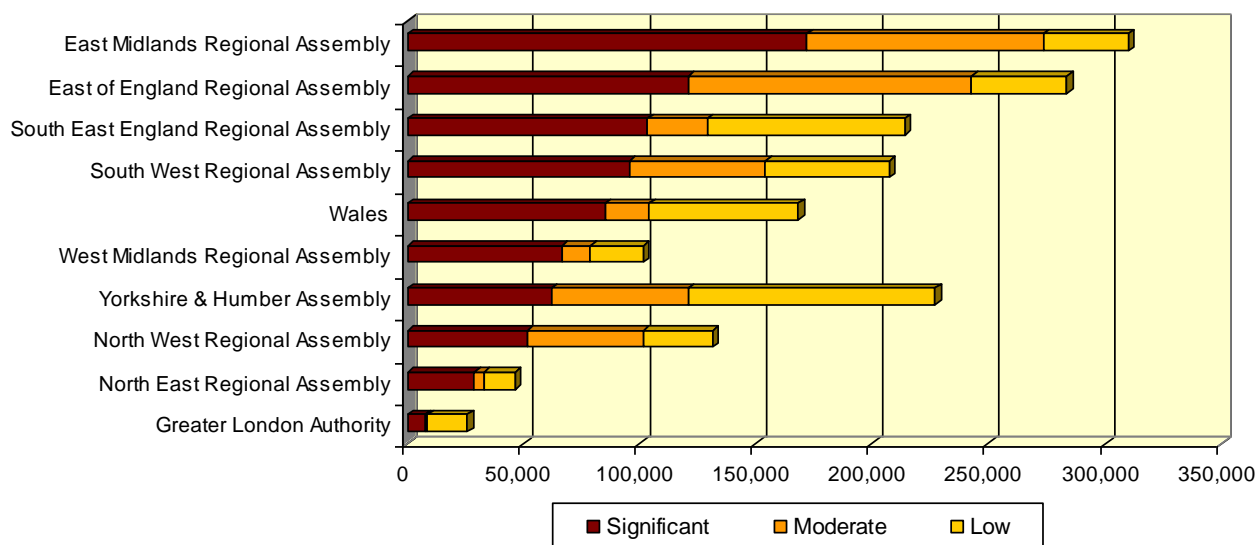
Regional planning bodies, ranked by number of people living in areas with a significant chance of flooding



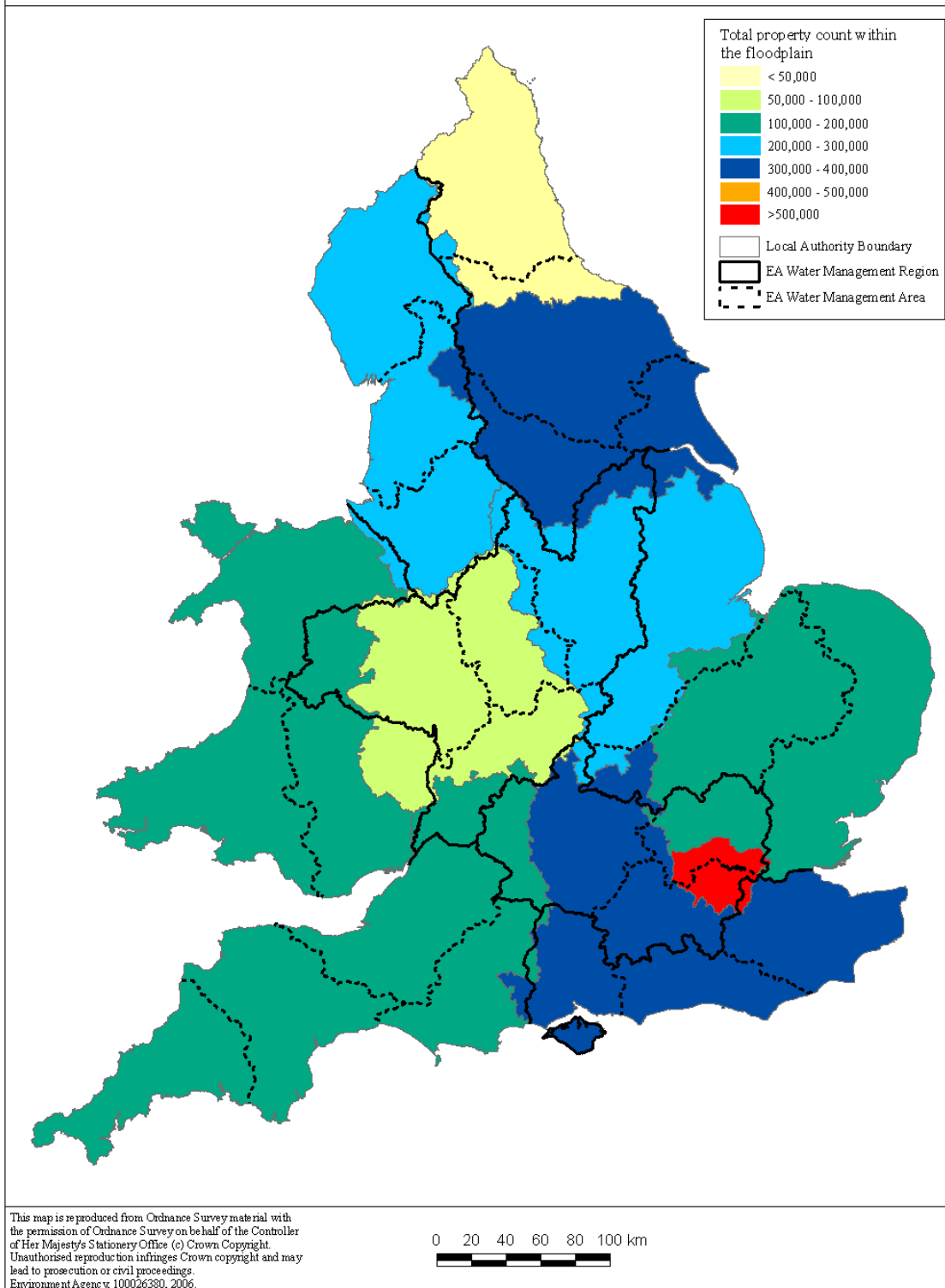
The East Midlands Assembly has almost twice the percentage of land at **significant** chance of flooding than the next highest region. It also has the highest percentage of land – 16 per cent – at a **moderate** or **significant** chance of flooding.

The Greater London Authority has almost the same percentage of land area in the floodplain, but 66 per cent of it has at low chance of flooding. It has over 15 times more properties per hectare within the floodplain than any other region.

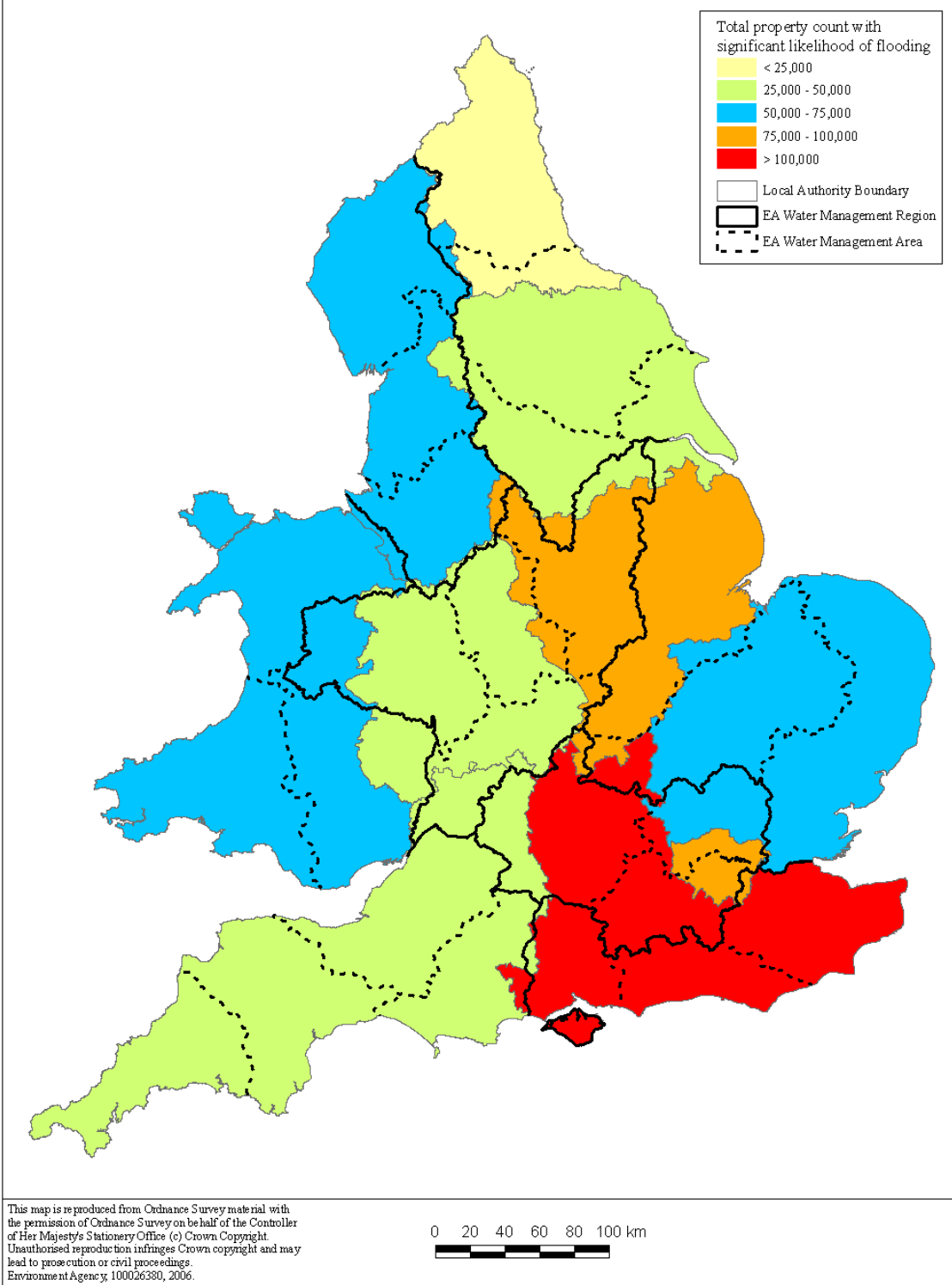
Regional planning bodies, ranked by area of land with a significant chance of flooding



Regional Planning Bodies Number of Properties within the Floodplain



Regional Planning Bodies Number of Properties in Areas with Significant Likelihood of Flooding

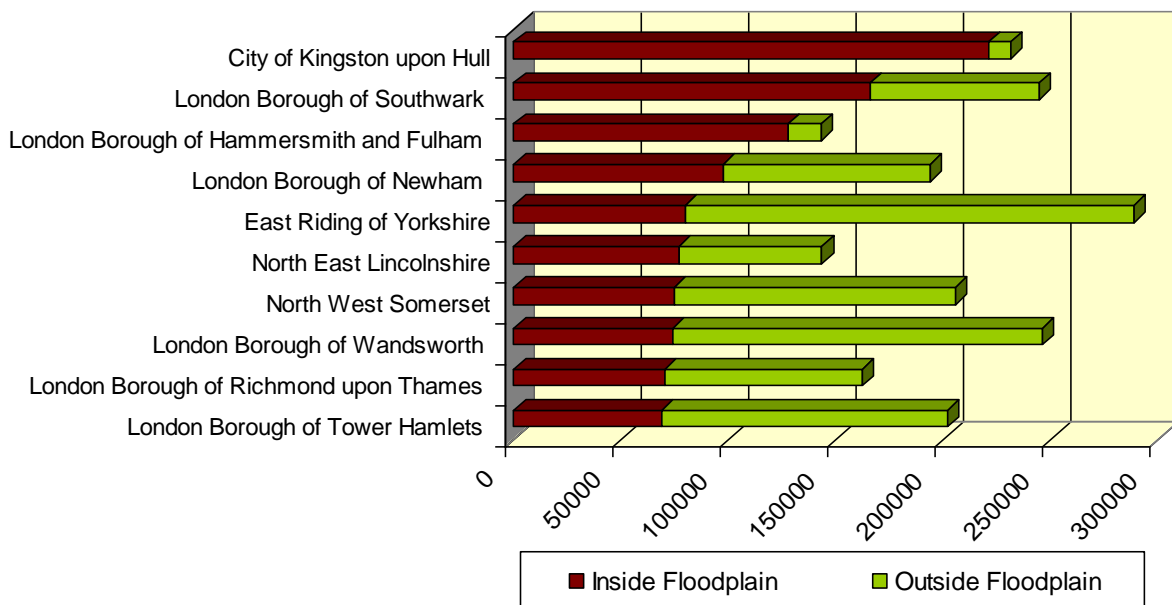


Local Authorities

Six of the top ten local authorities with the highest number of people living within the floodplain fall within the Greater London Authority.

Both City of Kingston upon Hull and Boston have over 95 per cent of their population living in the floodplain, compared with the average in England and Wales of 9 per cent (see case studies below).

Top 10 Local Authorities ranked by highest number of people living in the floodplain



Case study – City of Kingston upon Hull

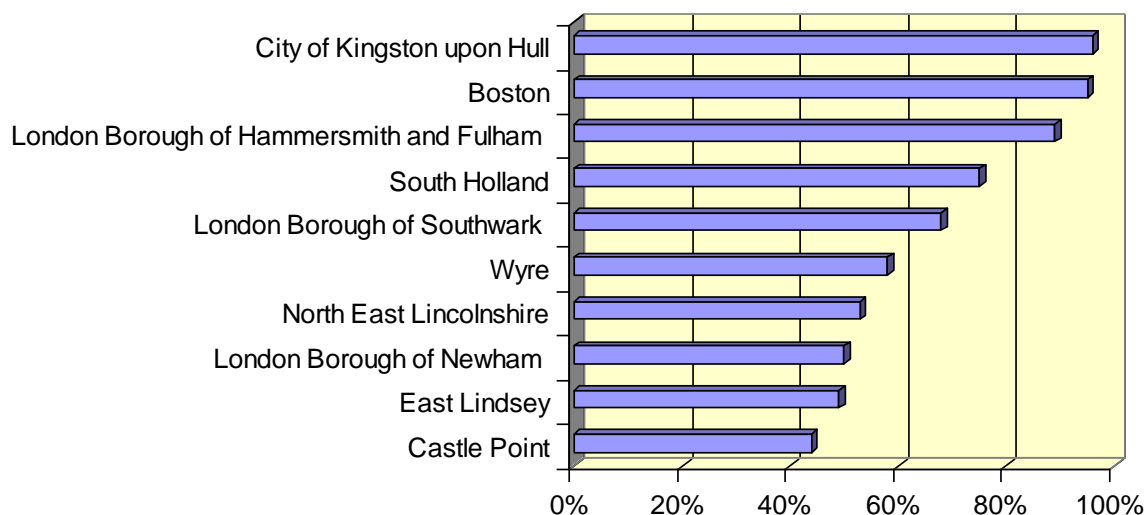
With 115,000 properties in the floodplain, the City of Kingston upon Hull has 30,000 more properties in areas at risk from flooding than any other local authority. This is likely to affect 221,000 people - 58,000 more than any other area.

Although 96 per cent of all properties within this local authority lie in areas at risk from flooding – compared to the average or 9 per cent in England and Wales – 74 per cent of them are in areas with a **low** chance of flooding.

The City of Kingston upon Hull has 83 per cent of its land area at risk from flooding, compared with the average of 11 per cent, but the majority of this land has a **low** chance of flooding as a result of the protection provided by flood defences.

City of Kingston upon Hull is one of four local authorities with over 26,000 properties – around 50,000 people – in areas with a **moderate** or **significant** chance of flooding, the others being South Holland, Boston and Wyre.

Top 10 Local Authorities ranked by highest percentage of properties within the floodplain



Case Study – Boston

Boston has twice as many properties in areas with a **significant** chance of flooding than the next highest authority. 78 per cent of properties in Boston – over 21,000 – are located in these areas, compared with the average in England and Wales of 2 per cent.

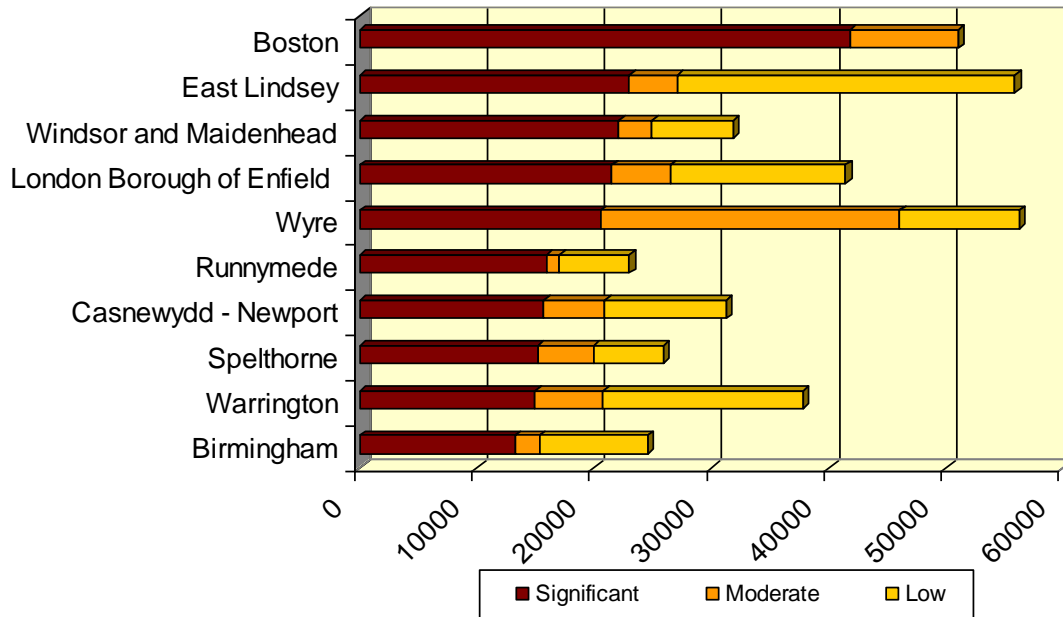
95 per cent of its properties are in areas with a **moderate** or **significant** chance of flooding, compared with the average of 4 per cent.

Over twice the percentage of land area in Boston has a **significant** likelihood of flooding, compared to the next-ranked local authority. Boston also has the highest percentage of land – 85 per cent – at **moderate** or **significant** chance of flooding, compared with the average in England and Wales of 11 per cent.

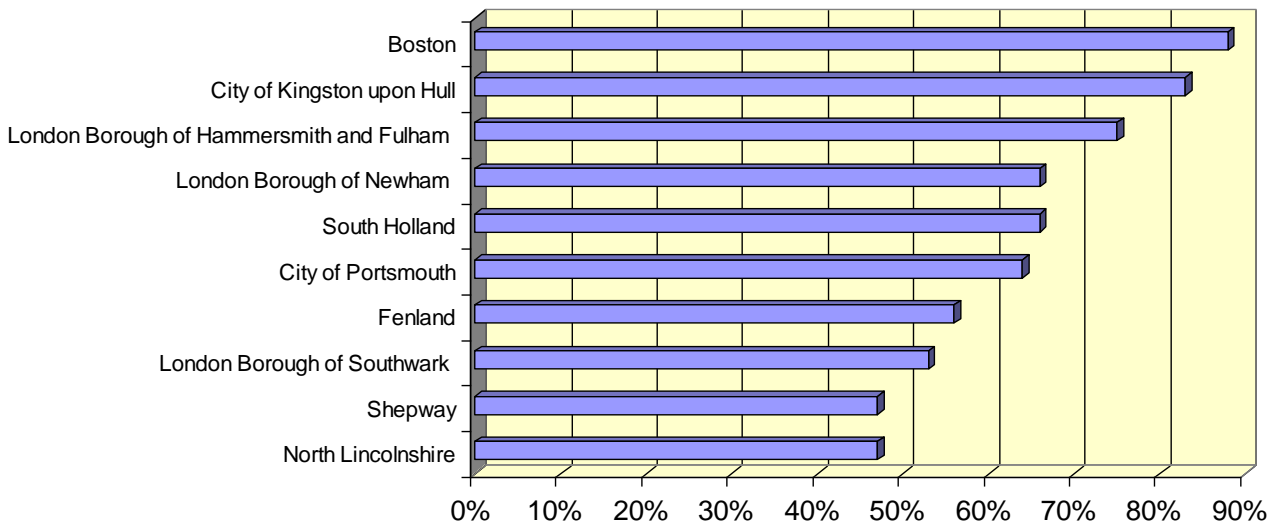
Boston is one of four authorities with over 26,000 properties – around 50,000 people – in areas with a **moderate** or **significant** chance of flooding.

It is also one of the two highest-ranked authorities for number of properties with a **moderate** or **significant** likelihood of flooding, alongside South Holland, which also falls within the East Midlands Regional Assembly.

Top 10 Local Authorities ranked by number of people living in areas with a significant likelihood of flooding



Top 10 Local Authorities ranked by highest percentage of land area within the floodplain



The City of Westminster and the London Boroughs of Southwark, Hammersmith and Fulham, and Lambeth have on average over 96 people per hectare living within the floodplain. This equates to over 388,000 people in the four London Boroughs combined.

53 per cent of the area of land within the London Borough of Southwark is in the floodplain. 166,000 people (an average of 104 people per hectare) live in this area. However, the majority of land area has a **low** chance of flooding.

75 per cent of the London Borough of Hammersmith and Fulham land area is within the floodplain. This area of land has 128,000 people (an average of 100 people per hectare) living in the floodplain. However, the majority of land area has a **low** chance of flooding.

London and the South East

Six of the top ten local authorities with the **highest number of properties** within the floodplain fall within the Greater London Authority.

Five of the top ten local authorities with the highest percentage of land area at **significant** risk of flood fall within the South East of England Regional Assembly.

The top ten local authorities with the greatest density of properties within the floodplain are all within the Greater London Authority.

In the London Borough of Southwark, 53 per cent of the land area is floodplain, although the majority is at **low** risk because of flood defences.

75 per cent of the land area in the London Borough of Hammersmith and Fulham is floodplain, but the majority of the floodplain is at **low** risk because of flood defences.

The City of Westminster and the London Boroughs of Southwark, Hammersmith and Fulham, and Lambeth have over 96 people per hectare living within areas at risk of flooding.

The Thames Barrier:

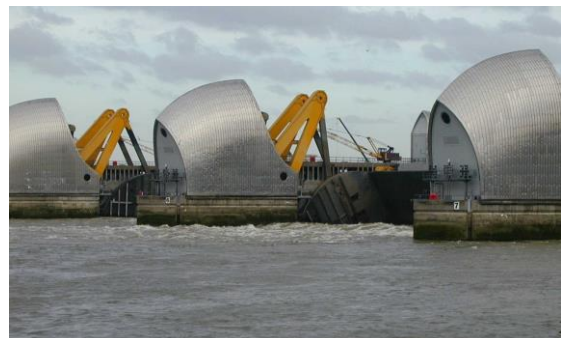
.....**designed to reduce flood risk in London to 2030**

.....**opened in 1984**

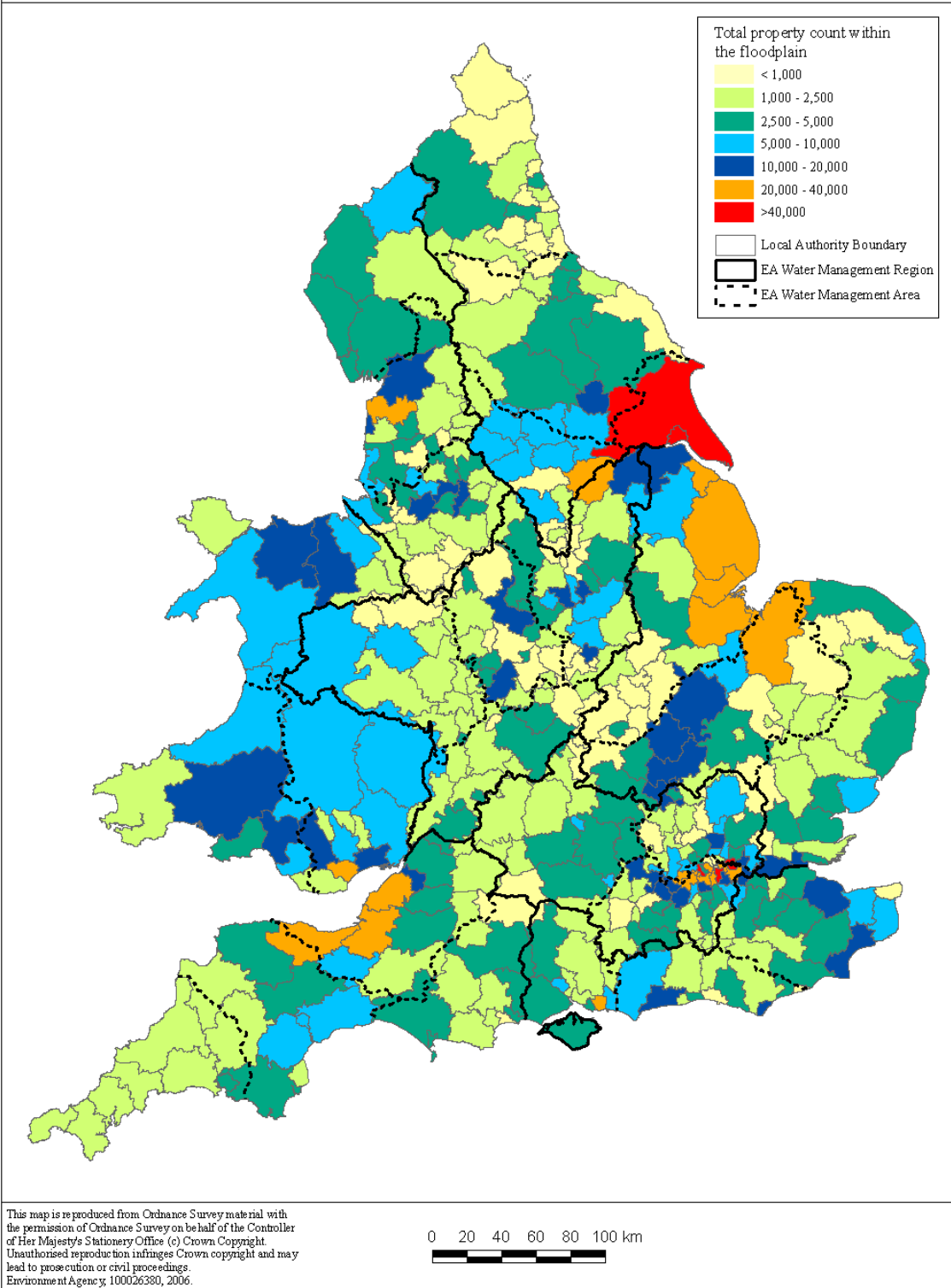
.....**costing around £535m**

Thames Estuary 2100 is a major programme of studies that is developing a strategy for flood risk management in the Thames Estuary for the next 100 years.

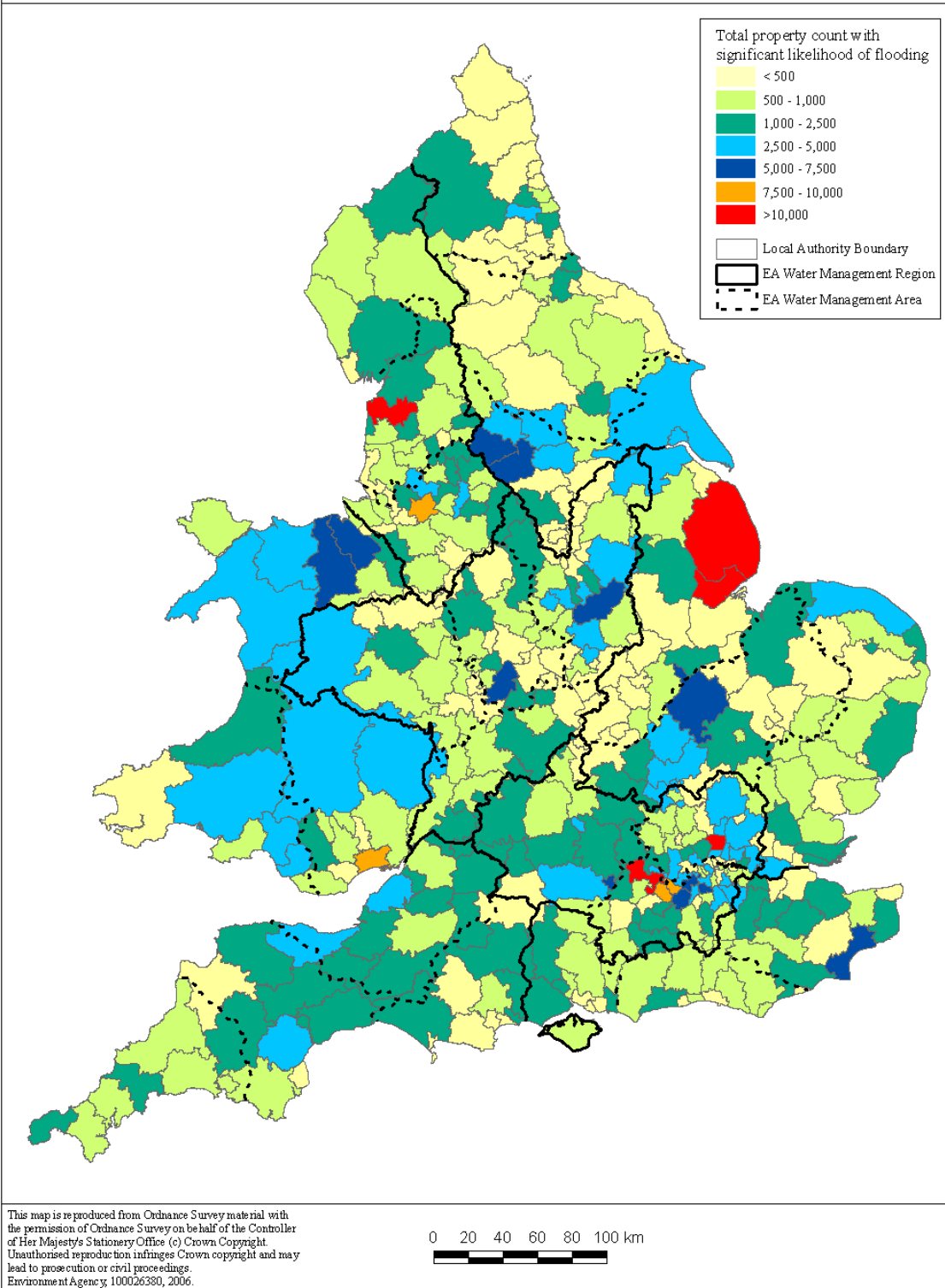
For more information, visit www.thamesweb.com.



Local Authority Boundaries Number of Properties within the Floodplain



Local Authority Boundaries Number of Properties in Areas with Significant Likelihood of Flooding



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

Then call us on 08708 506 506 (Monday to Friday, 8am to 6pm)

email enquiries@environment-agency.gov.uk

or visit our website

www.environment-agency.gov.uk

incident hotline 0800 80 70 60 (24 hours)

floodline 0845 988 1188



Environment first: This publication is printed on paper made from 100 per cent previously used waste.

By-products from making the pulp and paper are used for composting and fertiliser, for making cement and for generating energy.