



Asiantaeth yr
Amgylchedd Cymru
Environment
Agency Wales

Flooding in Wales:

A national assessment of flood risk



omes that are at threat from damage. Critical infrastructure such as water treatment works and power stations are often close to
ure. It is neither technically feasible nor economically affordable to prevent all properties from flooding. We therefore take a risk
cations for new building or development in flood and coastal risk areas. Our interventions help control development and preven
act of flooding can reduce if we continue to invest in flood warnings and public information campaigns. They help householder

We are Environment Agency Wales. 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 the Welsh Assembly Government, business and society as a whole, we are making your environment cleaner and healthier.

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

Published by:

Environment Agency Wales
Cambria House
29, Newport Road
Cardiff CF24 0TP

Tel: 08708 506 506

Email: enquiries@environment-agency.wales.gov.uk
www.environment-agency.wales.gov.uk

© Environment Agency 2009

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

Foreword

I'm very pleased to announce the Environment Agency's first national assessment of flood risk for Wales. This is a major piece of work that brings together our latest scientific and engineering knowledge to clearly describe the risks of flooding from rivers and the sea. It underpins our future investment in flood risk management as well as helping us to work together with our partners to protect the public and property from floods more effectively.

The events of the summer of 2007 demonstrated the major impacts floods can have. They also showed the importance of understanding the flood risks we face nationally so that we can be better prepared to face future risks. In all, around 357,000 properties in Wales, or about one in six buildings, are at risk of flooding. More than 357,000 people live in 220,000 properties that are at risk of flooding from rivers or the sea, 97,000 of which are also at risk of surface water flooding. A further 137,000 properties are susceptible to surface water flooding alone.

The scale of the challenge we face in managing these risks may be daunting but this report means that the Environment Agency and the organisations and people we work with can meet it more effectively. We must also make sure we build a better relationship between those at risk and those who manage this risk.

While celebrating the advances that this report provides, it is important to remember that the technology and skills available to map and measure risk are still developing. Rising sea levels and increasingly severe and frequent rainstorms caused by climate change mean that the risk of flooding will increase. This assessment is one step in an ongoing journey that we must take to ensure that our understanding of the risks keeps pace with these changes. It will be regularly updated, improved and published to keep you informed and to help us work together to manage floods.



Paul Leinster
Chief Executive of The Environment Agency

Contents

| | |
|---|-----------|
| Summary – National assessment of flood risk | 5 |
| 1 Introduction | 7 |
| 1.1 The causes of flooding | 7 |
| 1.2 A risk-based approach to managing floods | |
| 2 Managing the risks of flooding | 9 |
| 2.1 Strategy and policy framework | 9 |
| 2.1.1 Strategy and policy | 10 |
| 2.1.2 Responsibilities | 12 |
| 2.2 Flood risk assessment - understanding the risks | 13 |
| 2.3 Planning and development – living out of harm’s way | 13 |
| 2.3.1 Development | 13 |
| 2.3.2 Existing communities | 14 |
| 2.4 Protecting communities in the floodplain – flood defences | 15 |
| 2.5 Defending individual properties – resistance and resilience | 16 |
| 2.6 Protecting important national infrastructure and keeping essential services running | 17 |
| 2.7 Flood forecasting and warnings | 18 |
| 2.7.1 Detecting and forecasting floods | 18 |
| 2.7.2 Warning and communicating about floods | 19 |
| 2.8 Flood response and recovery | 21 |
| 2.9 Insurance – spreading risk and recovering quickly | 21 |
| 2.10 Funding to support flood risk management | 22 |
| 3 Who remains at risk of flooding? | 24 |
| 3.1 The National Flood Risk Assessment | 24 |
| 3.2 Local flood risk | 28 |
| 4 Protecting communities at risk in the longer term | 30 |
| 4.1 Catchment Flood Management Plans | 30 |
| 5 Investing for the future | 31 |
| References | 32 |

Summary – National assessment of flood risk

Introduction

Environment Agency Wales plays a central role in managing flood risk. We are responsible for managing flood risk from rivers and the sea, but we are not responsible for surface water, groundwater or sewer flooding, or for coastal erosion. This report explains how we tackle the risk of flooding in Wales, looking mainly at flooding from rivers and the sea.

Flooding is a part of nature. It is neither technically feasible nor economically affordable to prevent all properties from flooding. Environment Agency Wales' aim is to reduce flood risk and minimise the harm caused by flooding. We take a risk-based approach to achieve the best results possible using the budget and resources available. We are working to reduce both the likelihood of flooding and the impacts of a flood when it happens.

Managing the risks of flooding

Investment

Welsh Assembly Government recognises that it is important to invest in flood risk management and has committed to increase its funding to Environment Agency Wales from £26 million in 2006-2007 to £32.2 million in 2010-2011. This is an increase of 24 per cent in 4 years.

A main part of Environment Agency Wales' role is to improve and keep in good order over 1,800 miles of flood defences that help to reduce flood risk from rivers and the sea in Wales. In 2008-2009 we spent approximately two thirds of our flood risk management budget - £20 million - on building, improving and keeping flood defences such as managed river channels, walls and raised embankments, flood barriers and pumps in good condition.

This investment provides tangible benefits. Between 2003 and 2009, improvements by Environment Agency Wales reduced the risk of flooding to over 5,800 properties in Wales as well as protecting key infrastructure.

Development control

Locating property outside the floodplain is a prime way to reduce flood risk. If this is not practical, siting new buildings in areas of lowest risk is the next choice. Environment Agency Wales' role is to provide expert advice to Local Planning Authorities (LPAs) on flood risk in accordance with Planning Policy Wales and Technical Advice Note 15.

The latest figures for 2007-2008 show the Environment Agency Wales' advice is, in the main, accepted. In cases where we objected on flood risk grounds, and where LPAs have advised us of the final decision, 97 per cent of the decisions are in line with our advice.

Warning and preparedness

Ensuring the emergency services and the public know where and when it will flood, and how serious the flooding is likely to be, is a complex task. Environment Agency Wales has increased the number of households and businesses offered a flood warning service. We have launched a new national Flood Forecasting Centre with the Met Office that will allow us to better predict the scale and timing of rainfall and flooding events and monitor them as they happen. This will ensure that the emergency services and other local responders focus their efforts where the imminent risks are greatest – a difference that could save lives.

In 2008-2009, 57 per cent of people living in flood risk areas knew they were at risk and of these, three out of five had taken some action to prepare for a flood. This may have involved checking their insurance, signing up to Environment Agency Wales' flood warning service, or installing flood resistance and resilience measures.

Who remains at risk of flooding?

Environment Agency Wales' 2008 National Flood Risk Assessment shows there are 220,000 properties at risk of flooding from rivers and the sea in Wales. Our preliminary assessment of surface water flood risk also suggests that 97,000 of these are also susceptible to surface water flooding with a further 137,000 properties susceptible to surface water flooding alone. In all, around 357,000 properties in Wales, or one in six properties, are at risk of flooding. The expected annual damages to residential and non-residential properties in Wales at risk of flooding from rivers and the sea is estimated at about £200 million.

Floods can cause serious indirect impacts, including damage to important energy, water, communications and transport infrastructure. They can also interfere with basic public services such as schools and hospitals.

The National Flood Risk Assessment shows that a sizeable part of our important infrastructure and public services are in flood risk areas. This is especially so for water-related infrastructure that needs to be near rivers. For example, over 80 per cent of water and sewage pumping stations/treatment works are in flood risk areas, with 67 per cent at significant risk.

Protecting communities at risk

In consultation with many local organisations and groups, Environment Agency Wales has produced Catchment Flood Management Plans (CFMPs) covering the 10 main catchments in Wales. These documents set out the strategic context for managing flood risk in each catchment. They help decision makers by identifying the policy options being adopted to manage flood risks. They also help us form the position we take in our work to manage assets, watercourses, flood forecasting, and to help land use planning and development.

The CFMPs aim to promote the most effective approaches to managing flood risk, investing time and money to best effect. Even where it is not affordable or sustainable to maintain defence structures, CFMPs should set out other ways of managing risk. Where possible we also aim to work with nature to reduce flood risk, allowing floodplains and river corridors to return to their natural condition. This improves habitat for wildlife, increasing, conserving and protecting areas like wetlands and salt marshes.

Investing for the future

It is likely that with climate change (which could, for example, lead to increased rainfall, river flows, and higher coastal storm surges) and development pressures, flood risk in Wales is going to increase in the future, with the most significant changes likely to happen in the latter half of the century.

Environment Agency Wales is working with the Welsh Assembly Government to understand these future flood risks. We will be using the latest climate change predictions to estimate the funding needed to manage increasing flood and coastal risk. The intention is that this work, together with that on developing CFMPs, will be the beginning of a public debate on how society should manage flood and coastal risk.

1. Introduction

Environment Agency Wales is the lead organisation for providing flood risk management and warnings of flooding from main rivers and on the coast. Many different public and private bodies are involved in managing flood and coastal erosion risk, each accountable for different aspects of risk management. We work with these other organisations to plan for and respond to flooding incidents from all sources, whether it is from rivers, the sea, groundwater, reservoirs or surface water.

This report sets out the main findings of the 2008 National Flood Risk Assessment and places particular emphasis on the role played by Environment Agency Wales in tackling the risk of flooding from **rivers and the sea** in **Wales**.

1.1 The causes of flooding

In Wales, the most common forms of floods are:

- **River flooding** that occurs when a watercourse cannot cope with the water draining into it from the surrounding land. This can happen, for example, when heavy rain falls on an already waterlogged catchment.
- **Coastal flooding** that results from a combination of high tides and stormy conditions. If low atmospheric pressure coincides with a high tide a tidal surge may happen which can cause serious flooding.
- **Surface water flooding** which occurs when heavy rainfall overwhelms the drainage capacity of the local area. It is difficult to predict and pinpoint, much more so than river or coastal flooding.
- **Sewer flooding** that occurs when sewers are overwhelmed by heavy rainfall or when they become blocked. The likelihood of flooding depends on the capacity of the local sewerage system. Land and property can be flooded with water contaminated with raw sewage as a result. Rivers can also become polluted by sewer overflows.

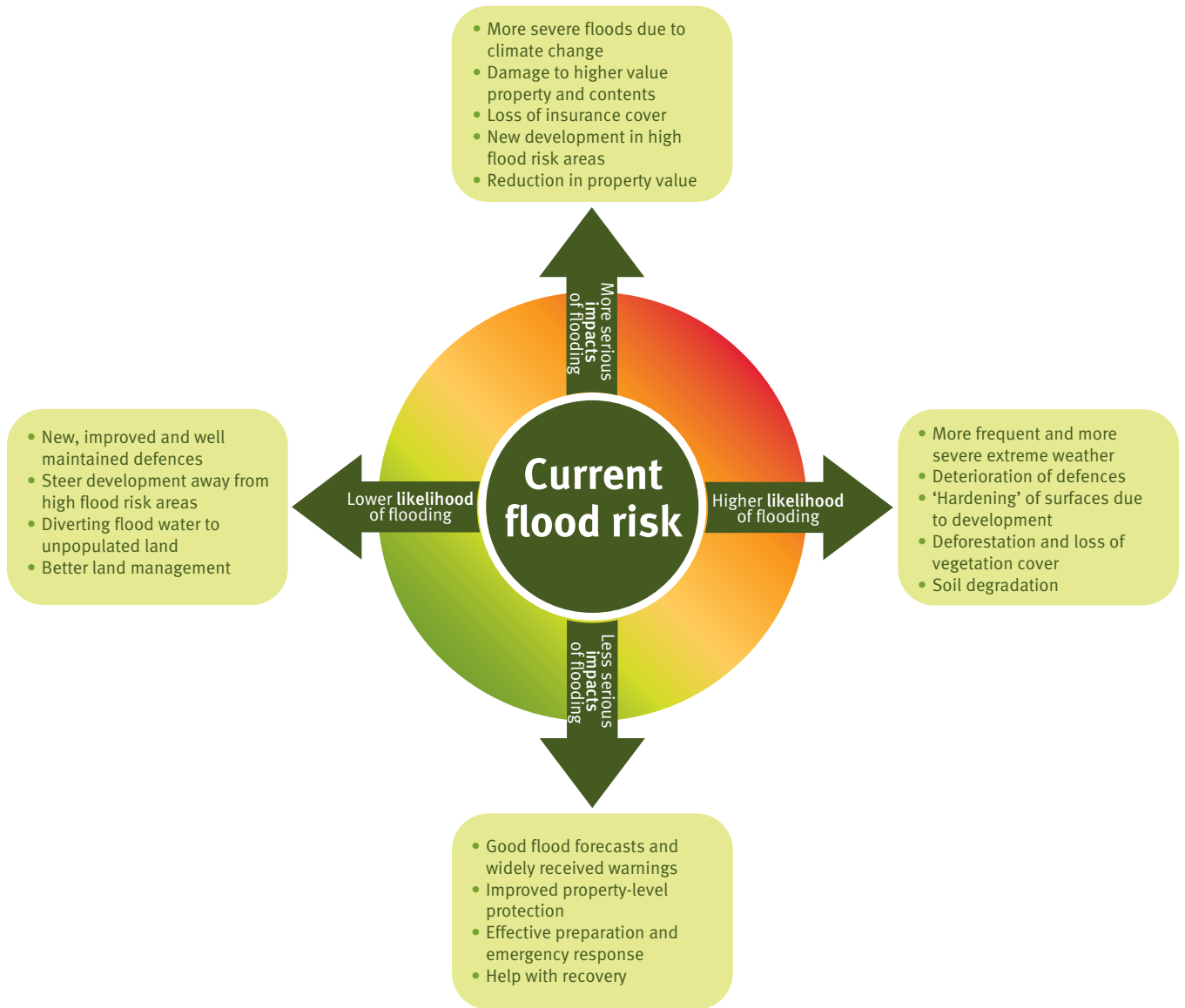
Groundwater flooding can occur when water levels in the ground rise above surface levels. It is most likely to occur in areas underlain by permeable rocks, called aquifers. This is not a significant source of flooding in Wales.

1.2 A risk-based approach to managing floods

Flood events are part of nature. It is not technically feasible nor economically affordable to prevent all properties from flooding. Therefore a risk-based approach is taken to achieve the best results possible using the budget and resources available. As almost all of our funding has historically come from the taxpayer, we have a responsibility to ensure we achieve as much benefit as possible from the funds provided. These include benefits for people, the economy and the environment and all are valued when we identify the need for investment in flood risk management.

Our aim is to minimise the harm caused by flooding. This involves **reducing the likelihood** of flooding and **reducing the impacts when flooding occurs**. At the same time there are underlying **pressures** that are increasing the risk, such as climate change, housing development or changes in land use. Sometimes we can affect these drivers, for example by influencing planning and land development. There are, however, other drivers that are beyond our direct influence, such as climate change impacts on the weather and sea level rise. Figure one shows some of the things that can change the risk of flooding.

Figure one: Managing flood risk – addressing likelihood and impacts



2. Managing the risks of flooding

The risk of flooding is a product of both the flood event itself and the vulnerability of the person, property or environment exposed to the event. Environment Agency Wales wants to reduce the likelihood and the effects of flooding and our 2009-2015 strategy for flood risk is currently under development and includes:

- A policy framework that sets principles, objectives and responsibilities.
- Flood risk assessment and flood mapping to understand which places are most at risk and in what circumstances.
- Development control through the planning system to prevent and reduce the risk to new developments and to ensure development in one place does not cause problems in another.
- Construction and maintenance of flood defences and other techniques for controlling or containing the flow of water from entering an area.
- Protective measures at individual properties to keep water from entering them, and to reduce the damage if water does enter.
- Protection of important infrastructure to avoid any secondary impacts associated with flooding including loss of energy, water, telecoms, transport and other public services.
- An early warning system that forecasts floods and provides personalised warning information in the best way, for example, using the internet, telephones, and television and radio broadcasts.
- A well-prepared emergency response to help people in danger and protect as many properties as possible from flooding.
- Strong and reliable insurance to spread risks and ensure coverage to as many properties as possible, so householders and business owners can recover quickly.
- Help with clean-up and recovery.
- Funding to support the flood risk management strategy.

Environment Agency Wales is responsible for managing flood risk from inland main rivers and the sea. However, under current legislation, we are not responsible for managing the flood risk from ordinary watercourses, surface water, sewers or groundwater, or for coastal erosion. Responsibility for surface water flooding in particular is not clearly defined. The forthcoming Flood and Water Management Bill, published as a Draft and out for consultation until July 2009, is expected to clarify responsibilities.

The rest of section 2 gives an overview of the overall approach to flood risk management outlined above.

2.1 Strategy and policy framework

Responsibility for flooding in Wales is devolved to the Welsh Assembly Government. We describe briefly the context in the following paragraphs.

2.1.1 Strategy and policy

Welsh Assembly Government strategy

The Climate Change Act (2008) requires a UK-wide climate change risk assessment every five years accompanied by a national adaptation programme that is also reviewed every five years. The Act has given Government new powers to require public bodies and statutory organisations such as water companies to report on how they are adapting to climate change. Welsh Assembly Government recently launched the second of two consultations¹ which will inform their climate change strategy, due to be published by the end of 2009.

The Environment Strategy for Wales² (May 2006) sets out the Welsh Assembly Government's 20 year strategy for the environment in Wales. The Strategy sets out two outcomes for flood risk management:

- Appropriate measures will be in place to manage the risk of flooding from rivers and the sea and help adapt to climate change impact.
- Everyone who lives in a flood risk area will understand the flood risk they are subject to, the consequences of that risk and how to live with that risk.

In July 2007, the Welsh Assembly Government launched its New Approaches Programme³ which aims to move from the traditional defence-based approach to flooding and coastal erosion to one incorporating a wider range of risk management measures. It is focused on ensuring that:

- All sources of flood risk are managed effectively looking at both immediate and longer term pressures, including climate change.
- A seamless service is provided with all the relevant operating authorities.
- People at risk of flooding are at the heart of service design and response.

The Pitt Review⁴ (2008) following the 2007 floods made 92 recommendations. While the Review was primarily concerned with the floods in England, there are clear implications for Wales.

In December 2008 the Minister for Environment, Sustainability and Housing in Wales responded to the Pitt Review⁵, emphasising that many of the recommendations are consistent with the New Approaches Programme. The recommendations for which Environment Agency is the lead organisation in Wales are already being implemented.

The Floods and Water Management Bill, published in April 2009 for public consultation and pre-legislative scrutiny, is an opportunity to review and update legislation and roles and responsibilities for flooding in Wales.

European policy

European Union Directives, including the Water Framework Directive (2000/60/EC) and Floods Directive (2007/60/EC), require consolidated river basin management planning, assessment and mapping of hazards and risks, and preparation and use of flood risk management plans. The frameworks set out in the Directives closely match those already applied in the UK.

Development control strategy

Welsh Assembly Government sets land-use planning policy for Wales. Flood risk planning policy and technical advice is contained in Planning Policy Wales (PPW)⁶ and Technical Advice Note 15 (TAN15): Development and Flood Risk⁷. Local Planning Authorities (LPAs) follow the guidance in these documents to decide whether to grant planning permission or not. The Environment Agency provides expert advice to LPAs on flood risk. We advise LPAs to undertake a Strategic Flood Consequences Assessment when they produce their Local Development Plans.

Local flood management strategy

Environment Agency Wales has produced Catchment Flood Management Plans (CFMPs) for the 10 main catchments in Wales. These are high-level planning tools, setting out objectives for flood risk management across each river catchment and estuary. They also identify flood risk management policies that are economically practical, have a potential life of 50 to 100 years, and will help us work with others to put them in place. The CFMPs consider inland flood risk from rivers, surface water, groundwater and tidal flooding but do not cover sewer flooding. However, at present our understanding of river and tidal flooding is stronger than that from other sources.

Shoreline Management Plans (SMPs) are produced by coastal groups and perform a similar role to CFMPs but examine coastal flooding and erosion risks. SMPs cover the entire coastline. We are working closely with maritime Local Authorities, who are currently reviewing existing SMPs. These reviews are due for completion by 2011.

2.1.2 Responsibilities

Many bodies and agencies have responsibilities to help tackle the risk of flooding. These are some of the organisations involved:

Table one: Organisations responsible for flood risk management in Wales

| | |
|---------------------------------|---|
| Welsh Assembly Government (WAG) | WAG determines flood and coastal erosion risk management policy, allocates responsibilities and provides funding through grants to the Environment Agency and to other operating authorities. |
| Environment Agency Wales | Environment Agency Wales is the principal flood risk management authority in Wales. It is responsible for forecasting and mapping flood risk, providing warnings, advising on flood risk associated with development in the floodplain, building and keeping defences in good order and taking part in emergency planning and response. |
| Local Authorities | Local Authorities lead in reducing risks from development in the floodplain and management of drainage and small watercourses. Local Authorities are likely to play an increasingly important role in helping to manage the risks associated with surface water flooding. They also take the lead in emergency planning for flooding and handling the recovery of areas that have been affected by flooding. |
| Internal Drainage Boards (IDBs) | IDBs are independent bodies responsible for land drainage in areas of special drainage need. These are mostly low-lying areas that need active management of water levels. |
| Flood Risk Management Wales | This is an executive committee of Environment Agency Wales and covers Wales. It was established in 2006, and replaced the several Local and Regional Flood Defence Committees. It has a duty to oversee all flood risk activities of the Environment Agency in Wales. It is responsible for decisions about the annual programmes of improvement and maintenance work carried out by the Environment Agency in Wales. |
| Local Resilience Fora (LRFs) | These are the local planning fora for all emergencies, including flooding. They bring together the emergency services, Environment Agency, Local Authorities, NHS and other bodies like water and energy companies. Together they plan for prevention, control and reducing the impact of floods on the public. |
| Insurance industry | The Association of British Insurers (ABI) and its members are vital in providing cover and handling claims for damages caused by a flood. Under an agreement with the Governments, they have committed to continue insurance coverage for most properties, even some at significant risk, in return for action by Governments to identify and manage risks. |
| National Flood Forum | A registered charity providing advice to those at risk and campaigning for better protection from flooding. |

2.2 Flood risk assessment - understanding the risks

Assessing and mapping flood risk is a complex skill. Over many years, Environment Agency Wales has developed increasing understanding of where and when flooding could happen and how serious it might be. Such assessments are a crucial undertaking on which all the other measures depend. They involve modelling the behaviour of the sea and river basins in different weather and tidal conditions, and matching this to knowledge of land topography to see where floods are likely to arise and how often.

There are two main mapping approaches covering flooding from rivers and the sea:

- **The Flood Map** is for use by property owners and Local Authorities and shows where floods may occur and how severe they could be. It is a map of the natural floodplain showing areas that could flood if no defence structures were in place. It helps property owners recognise risks and prepare for floods. The Flood Map is available from the Environment Agency's web site. Users enter a postcode to see the area of the Flood Map in which they have an interest.
- **The National Flood Risk Assessment** presents risk and vulnerability in greater detail. It differs from the flood map because it considers the impact of flood defence structures and other measures that reduce risk. Its purpose is to contribute to flood risk management policy and investment priorities, and to help insurers in setting risk-based premiums and excesses.

Our approach to flood risk mapping is constantly improving as we develop our knowledge and technical capacities. We have produced initial maps of areas susceptible to surface water flooding and provided these to Local Resilience Fora. The accuracy of these is being developed and they are not yet suitable for a house by house assessment of risk. These will provide further help to Local Authorities with emergency planning and in managing local flood risk, including taking action to tackle surface water risks.

2.3 Planning and development – living out of harm's way

2.3.1 Development

Building property and putting other assets away from the floodplain is the best way to reduce risk. If this is not possible then development should take place in areas of low flood risk. Welsh Assembly Government's planning policy, as set out in Planning Policy Wales and Technical Advice Note 15 (TAN15), requires that flood risk be a consideration at all stages of a planning application. This will help avoid development in areas at risk of flooding, and discourage building in areas of highest risk. In exceptional circumstances, where development can be justified in such areas, the policy aims to ensure that the consequences of flooding are understood and managed to an acceptable and safe level. Flood risk must not be displaced to other areas. The Association of British Insurers have said that their members will not necessarily offer to insure new properties sited in areas of flood risk.

Development Advice Maps (DAMs) are produced by Welsh Assembly Government and support TAN15 and planning policy in Wales. DAMs use information from the Environment Agency Flood Maps, as well as data from the British Geological Survey. Welsh Assembly Government have made DAMs available to Local Planning Authorities (LPAs).

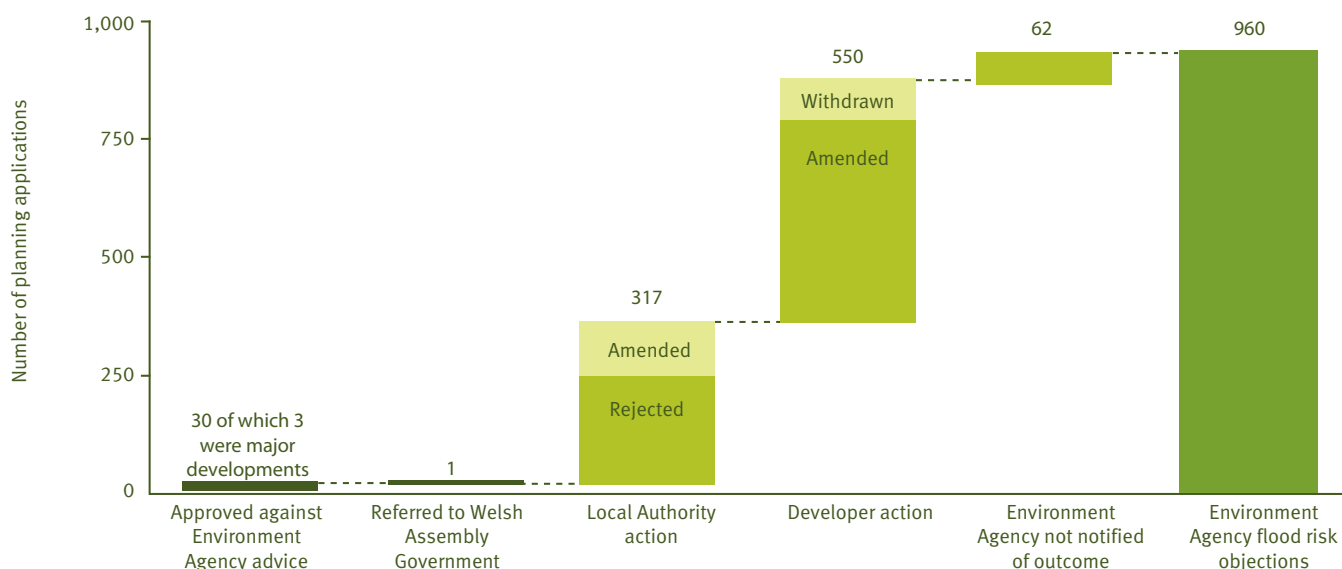
LPAs in Wales are advised to consult Environment Agency Wales on planning applications where the site is at any risk from flooding. Developers must also produce a Flood Consequence Assessment to show their development proposals comply with planning policy on flooding.

Environment Agency Wales provides technical advice to LPAs and developers on how best to avoid, manage and reduce the adverse impacts of flooding. We may object to planning applications that are inconsistent with Government policy, for example where the Flood Consequence Assessment is not provided or is inadequate. Local Authorities have to balance many development objectives and pressures, and can sometimes reject Environment Agency Wales' advice. We can advise Welsh Assembly Government of any concerns we have when

our advice is not heeded. Welsh Assembly Government has the power to ‘call-in’ any individual application for further scrutiny.

If we are to prevent inappropriate development in flood risk areas, we must give the highest quality technical advice to Local Authorities. Figures for 2007-2008 show the impact of our advice. In cases where we objected on flood risk grounds, and where LPAs advised us of the result, 97 per cent of the LPA’s decisions were in line with our advice. This figure has progressively increased since 2005-2006 when it was 84 per cent. In most cases where we objected, developers agreed to changes in their proposals, withdrew their application, or there was a refusal of planning permission from the LPA. Only 30 developments gained approval against our advice, and of these only three were for major developments.

Figure two: Resolution of planning applications where Environment Agency Wales objected on flood risk grounds, 2007-2008



Source: High-level target 13 report for 2007/2008: Environment Agency Wales/ Welsh Local Government Association

2.3.2 Existing communities

Though Environment Agency Wales can influence the planning process and work to stop developers building inappropriate properties in risk areas in the future, it must be remembered that there are some 220,000 properties already built in the floodplain.

Sometimes, natural events such as coastal erosion or sea level rise increase the risk of flooding to a point where it is technically impossible or financially impractical to continue a policy of defence. Environment Agency Wales and local government must then make difficult economic judgements as we both have a duty to achieve the maximum benefit to society and we may achieve more by defending properties elsewhere. These difficult decisions sometimes call for carefully managed realignment of the coast and floodplain to reflect the natural changes that happen over time. The long-term planning framework set out in Catchment Flood Management Plans and Shoreline Management Plans will help with this.

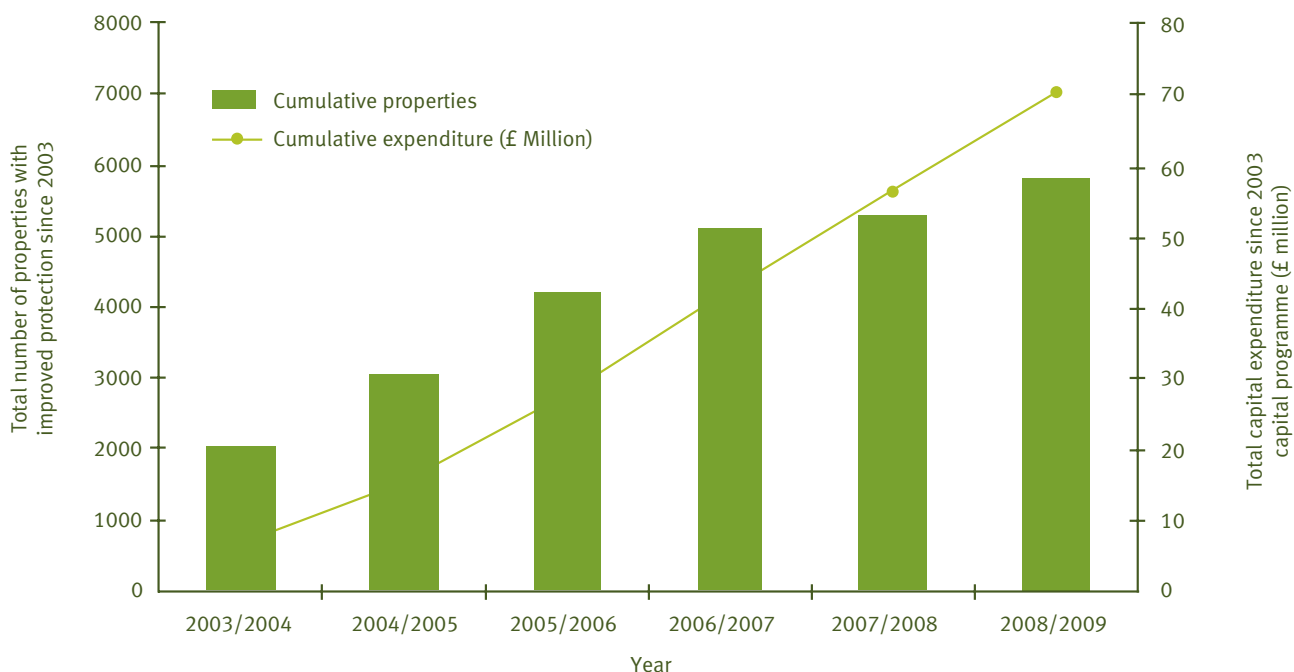
2.4 Protecting communities in the floodplain – flood defences

One of Environment Agency Wales’ main roles is to build, improve and keep flood defences such as maintained river channels, raised embankments, floodwalls and culverts, in good order to reduce flood risk from rivers and the sea. This work consumes the largest share of our budget by far. We also build and keep in good order sluices, outfalls, floodgates pumps and barriers. These reduce flood risk and manage water levels.

Environment Agency Wales is responsible for some 1,800 miles of flood defences and about 5,500 sluices, outfalls, floodgates and barriers in Wales. Using the average cost of building each of the different defences, and applying these to our database of flood defence structures, we estimate replacing all defences that we maintain could cost over £2 billion.

We spend most of our budget on improving flood defences and keeping them in good order. In 2008-2009 we spent approximately £20 million on this, or about two thirds of our total flood and coastal risk management budget. This investment gives tangible benefits. Between 2003 and 2009, improvements achieved by us reduced the risk of flooding to more than 5,800 properties.

Figure three: Properties benefiting from reduced likelihood of flooding since 2003-2004



We have identified projects with a total value averaging £20 million per year over the next 20 years. It is important to note that this future spend figure is approximate; for example it depends on the outcome from studies such as those currently underway for the Dee, Clwyd and Severn estuaries. This predicted future average spend of £20 million per year compares with the capital funds we currently receive from Welsh Assembly Government of £13 million – an obvious shortfall. This is likely to increase when the impacts of climate change are also incorporated.

The large base of flood defence assets needs continuous maintenance, and this is the second largest call on our budget after our work to improve assets. We routinely carry out visual inspections of all river and coastal flood defences using a risk-based priority programme, assessing their condition and identifying any causes for concern. Based on what defence it is, and the impact of flooding and the visual condition, we decide if a defence is in a satisfactory state, or if it needs further investigation or improvement.

The Environment Agency aims to ensure that 95 per cent of our assets perform as designed during a flood event.

Table two: Condition of flood risk assets in Wales (June 2009)

| Percentage of assets that perform as designed | Defences such as flood walls and embankments | Structures such as pumping stations, barriers, sluices and outfalls |
|---|--|---|
| Upkeep by Environment Agency | 94.6 | 96.3 |
| Upkeep by third party | 96.2 | 96 |
| All assets | 95.4 | 96.2 |

Summer 2007 put our flood defences across Wales and England to the test. Despite facing some of the biggest downpours ever recorded, 99.8 per cent of our flood defences performed as designed. We estimate that they protected more than 100,000 properties from flooding. Our experience is that fewer than one per cent of the impacts from flooding result from failure of flood defences.

Following the 2007 review in England by the National Audit Office and Public Accounts Committee⁸, we have reviewed our asset management planning processes across England and Wales to help to set priorities for spending on the highest flood risk areas. This planning will detail the full cost, both now and in the future, of the building, running, upkeep and replacement of flood defences. It will also set out the benefits of having the defences and reducing the damage from flooding.

We are continuously updating and improving our database of flood defences and their condition. This is helping us target investment more precisely to where there is most need.

2.5 Defending individual properties – resistance and resilience

It is impossible and impractical to reduce all flood risk, or to defend against all possible floods in all places. However, it is possible to reduce the impact of a flood at the individual property level through flood resistance and resilience measures. Flood resistance measures, such as door guards, help prevent floodwater getting into a property. Resilience measures are those that minimise the damage when floodwater is in a property. A typical example is water-resistant wall plaster.

The cost of damage to property as a result of a flood can be great. According to a report prepared for Defra, repairing a house after a flood can cost between £10,000 and £50,000 depending on the flood depth⁹. Defra also found the costs of applying resistance measures, such as waterproof doors, windows and airbricks, can range between £3,000 and £10,000 for a whole house. While the cost of such measures can appear expensive, some may not cost more than the standard repairs and are likely to pay for themselves after a single flood event.

Environment Agency Wales provides advice to property owners on how to prepare for a flood and is developing additional guidance about self-help home protection measures for householders, businesses and the building contractors that fit them. The National Flood Forum, a registered charity, provides information on products and techniques for protecting individual properties. The Association of British Insurers also encourages improved property level protection¹⁰. Some insurers already include flood risk information with renewal notices. This is expected to become increasingly widespread as we continue to refine flood risk mapping, identifying vulnerable properties with greater accuracy.

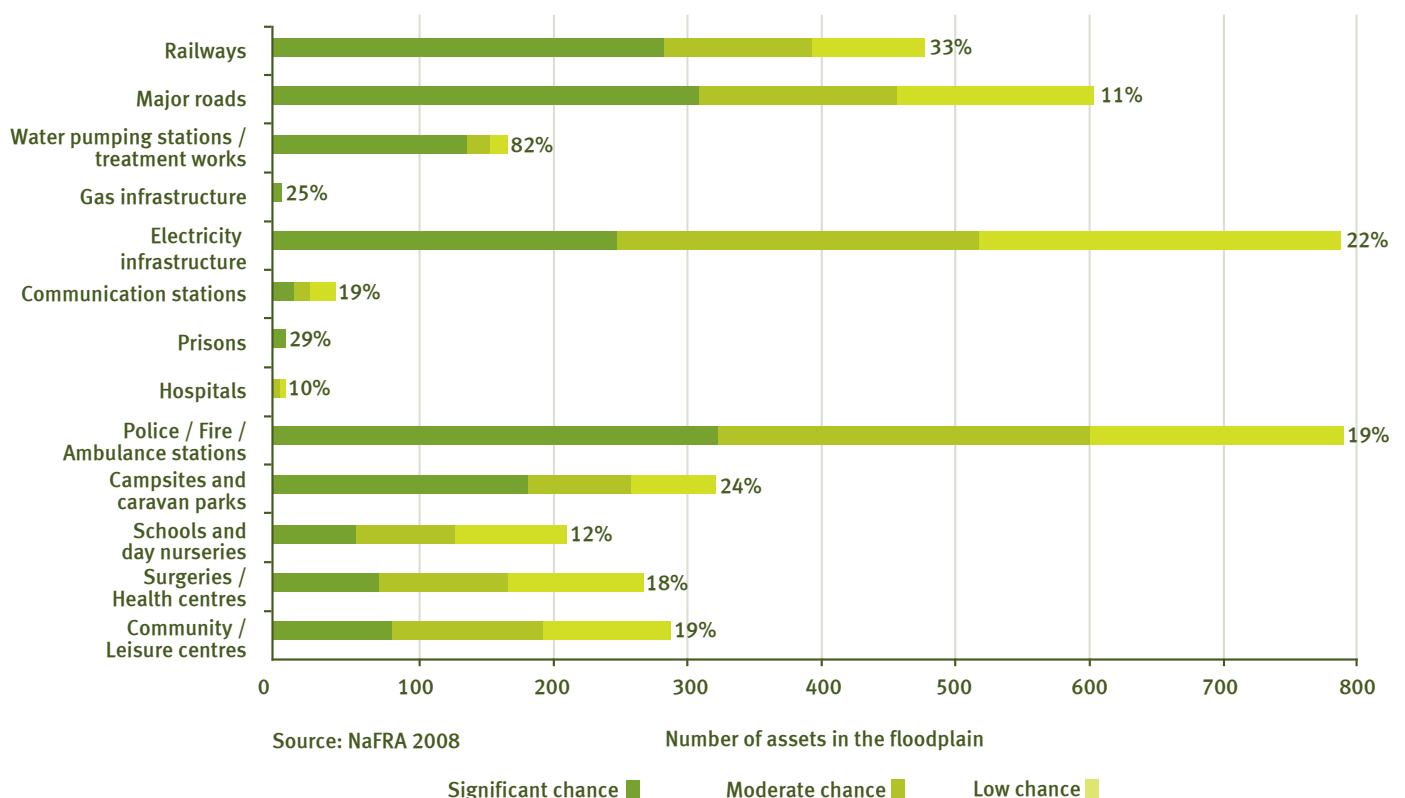
2.6 Protecting important national infrastructure and keeping essential services running

Floods can cause serious indirect impacts, including damage to important energy, water, communication and transport infrastructure. They can also interfere with basic public services such as schools and hospitals. For example, the Summer 2007 floods disabled major infrastructure in Gloucestershire. Flooding at Tewkesbury's Mythe water treatment works left 140,000 homes without clean water for up to 17 days. It was also necessary to shut down Castle Meads electricity sub-station, leaving 42,000 people without power in Gloucester for 24 hours. Flooding on the M5 motorway trapped 100,000 people, with many others stranded on the rail network. A big effort to set up temporary flood defences at Walham electricity sub-station saved the power supply to 500,000 people in Gloucestershire and South Wales¹¹. Other vulnerable infrastructure includes emergency service stations and headquarters, which may also be part of the response, and important public services such as hospitals, schools and care homes. Although the Summer 2007 floods did not have a severe impact in Wales, it could easily have had if the rain had fallen further West.

The 2008 National Flood Risk Assessment, which provides the information in this report, identifies the number and types of infrastructure and public services in flood risk areas. Water-related infrastructure like treatment works need to be close to rivers as their running depends on them. As a result, a high percentage of water company plant is in flood risk areas. For example, more than 80 per cent of pumping stations and water treatment works in Wales are in flood risk areas.

Other types of important national infrastructure are also at risk. Nearly 800 electricity infrastructure sites, some 22 per cent of all in Wales, are at flood risk. In addition, nearly 800 police, fire and ambulance stations, and about 11 per cent of main roads and 33 per cent of railways are within flood zones. It is important to assess the potential impact of flooding on these infrastructure sites. A loss of, or interference in, basic services may affect a wide area where many people also face the clean-up and recovery from a flood. In addition, many sites are inter-dependent. A pumping station, for example may not be at direct risk of flooding, but it may rely on an electricity sub-station that is in a high risk location.

Figure four: National infrastructure assets in flood risk areas in Wales



Local Resilience Fora (LRFs) perform the basic co-ordinating role at local level for preparing for emergencies, including flooding. Environment Agency Wales works with LRFs and emergency services to help protect critical infrastructure and utility supplies. We also provide a warning service to infrastructure operators through Floodline Warnings Direct.

Both economic regulators in the water and energy industries, OFWAT and Ofgem, are responding to the problem of defending important infrastructure. They are considering how to finance further investment in protecting this infrastructure through the pricing reviews that allow recovery of costs through customer bills.

2.7 Flood forecasting and warnings

Ensuring the emergency services and the public know where and when it will flood and how serious the flooding will be is a complicated task. Often the first step is linking a weather forecast to a model of how a river basin or coastal system behaves during flood conditions. This helps set out the scale, timing and location of the anticipated flood risk. We then issue a warning to people at risk with sound, specific information about what they should expect. All this needs to happen quickly and in a way that allows the emergency, utility and essential public services to prepare, and that gives people enough time to protect themselves, their family and their homes. There is a balance to strike between the need to provide advice and warnings in good time, and the risk that false alarms will lead to loss of confidence in the system.

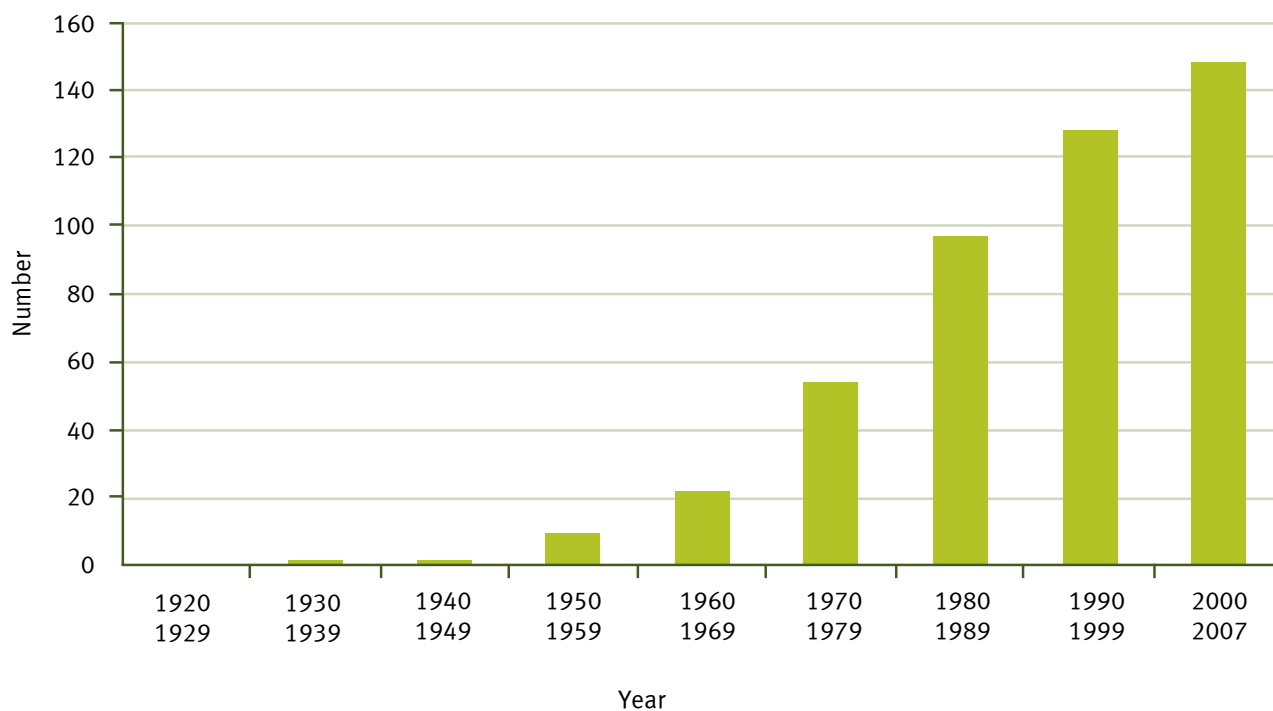
We provide advice to different audiences: to householders, businesses, public services, electricity and water companies, transport operators and to those involved in responding to a flood. Each audience has different needs and our communications must provide the information that will help them take the right actions at the right time.

2.7.1 Detecting and forecasting floods

Environment Agency Wales is constantly developing tools to make flood forecasting more accurate and detailed. The Met Office uses large and complex computer models of the atmosphere to help predict rainfall amounts and the scale of tidal surges. With the Met Office, we have developed a joint national Flood Forecasting Centre that brings together highly skilled hydrologists and meteorologists into one team that can give much better unified forecasts. Information provided by the Flood Forecasting Centre feeds into our computer models of rivers and coastal areas to predict the scale and timing of flood risks for specific areas.

Getting accurate and timely weather and flood predictions depends on forecasters receiving live data telling them what is happening in the atmosphere, on land and in the sea and rivers. We have an extensive system of 300 rain gauges and river level monitors across Wales, and we have installed 29 new rain and river gauges in the last three years. This is helping to improve the quality of computer models and the forecasts we can make. More tide level and wave gauges are also contributing to increased accuracy of forecasts for coastal flooding events.

Figure five: River measuring sites available to identify flood risk



We are working with partners to develop new ways of presenting information on flooding. These will help flood risk managers, and emergency planners and responders understand what is happening and so do their job with more confidence and knowledge.

2.7.2 Warning and communicating about floods

To be useful, flood warnings need to get to the people who need them in good time. Those who receive them also need to be ready and prepared to take action.

Since 2005-2006, we have progressively made our flood warning service available to more households and businesses at risk. In 2007-2008, 63 per cent of properties at risk across Wales could receive a flood warning if needed, and this was ahead of the target. Our present aim is to make our flood warning service available to 72 per cent of households and businesses at risk in England and Wales by April 2010-2011 and 80 per cent by April 2013. We are on track to achieve this.

Table three: Percentage of properties offered a flood warning in Wales

| Percentage of properties offered a flood warning | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 |
|--|---------|---------|---------|---------|---------|---------|
| Wales achieved | 34 | 51 | 63 | — | — | — |
| England and Wales target | 19 | 30 | 57 | 62 | 67 | 72 |

We issue flood warnings when our measurements of river or sea levels reach a threshold or trigger level, or when our forecasts show that high-water levels are imminent.

Our flood warning service combines services provided directly to those at risk, and information that is available to anyone via telephone, the web and the media. The service currently covers risk of flooding from rivers and the sea.

Our flood warning services

Floodline Warnings Direct (FWD) service provides flood warnings to the at-risk public by telephone, mobile, e-mail, SMS text message, fax or pager. There are over 47,000 properties currently registered on FWD in Wales, and numbers have grown every year since we introduced the service in 2004. In 2008-2009, an estimated 13,000 Flood Warning and Severe Flood Warning messages were sent to people registered on FWD in Wales.

Floodline (0845 988 1188) our 24-hour telephone helpline gives the public access to up-to-date information about flooding anywhere in England, Wales and Scotland. In 2008 Floodline received more than 290,000 calls. Over the last 10 years people have dialled the Floodline number more than 2,540,000 times.

The Environment Agency's Customer Charter states that: *We will provide flood warnings at least two hours before flooding happens in areas where a service can be provided.* During the 2007 floods four-fifths of our warnings achieved this standard, despite the almost unprecedented intensity of the rainfall.

We regularly carry out public surveys to understand people's awareness of flood risk and the extent to which they have prepared for the eventuality of a flood. By April 2009 the number of people living in flood risk areas that know they are at risk had risen to 57 per cent, up from 47 per cent in March 2008. Three out of five of those who are aware of their risk had taken some action to prepare for a flood. This may have involved checking their insurance, signing-up to Floodline Warnings Direct, knowing how to turn the electricity supply off, or installing flood resistance or resilience measures.

Looking ahead, we want to improve the accuracy, coverage and timeliness of our flood warning service through:

- Providing new forecasting and warning services for surface water and groundwater flooding. The Flood Forecasting Centre is testing an alert service for surface water flooding.
- Developing the current flood warning alerts and warnings to make them easier to understand and act on.
- Providing more detailed advice to emergency and public services before flooding so they can better prepare for the events expected.
- Working with telecommunications companies to ensure the majority of landline customers at high risk who have not registered for Floodline Warnings Direct, including ex-directory, can receive flood warnings by 2010.
- Engaging directly with communities through our Floodwise campaign to ensure more people take action to prepare themselves for the risk of floods in areas known to be at risk.

2.8 Flood response and recovery

When a flood happens, the emergency services, NHS, Local Authorities, and the Environment Agency take collective responsibility for minimising the harm to people and property. Working together they manage and involve other agencies, such as water and energy companies, mounting a strong, unified response. These 'responders' prepare their plans for flooding in advance and in detail. The 2004 Civil Contingencies Act provides the basis for planning for all types of emergency. It gives the responders a legal duty to work together to assess the risks and then make plans to prevent, reduce, control and mitigate the effects of an emergency.

Recovery from a flood can be a long and distressing experience for individuals and communities. For households, an important contribution to recovery comes from insurance claims that pay for rebuilding and repairs, and may contribute to temporary accommodation costs while a property dries out.

Local Authorities take lead responsibility for recovery at community level. Welsh Assembly Government is developing a Wales Flood Response Framework which defines roles and responsibilities during a flooding incident. This complements the new National Flood Emergency Framework across the whole of the UK, which will bring together information and guidance for use by all involved in emergency planning. Over the last year, the Environment Agency has been working with emergency responders to plan and produce 'Multi-Agency Flood Plans' to ensure a stronger and more consistent response to flood emergencies. Work on developing these plans will continue, as will emergency exercises to test the collective efficiency and competence of responders. A big flood emergency exercise across Wales and England will happen in 2011. The last of these, Exercise Triton, took place in 2006.

2.9 Insurance – spreading risk and recovering quickly

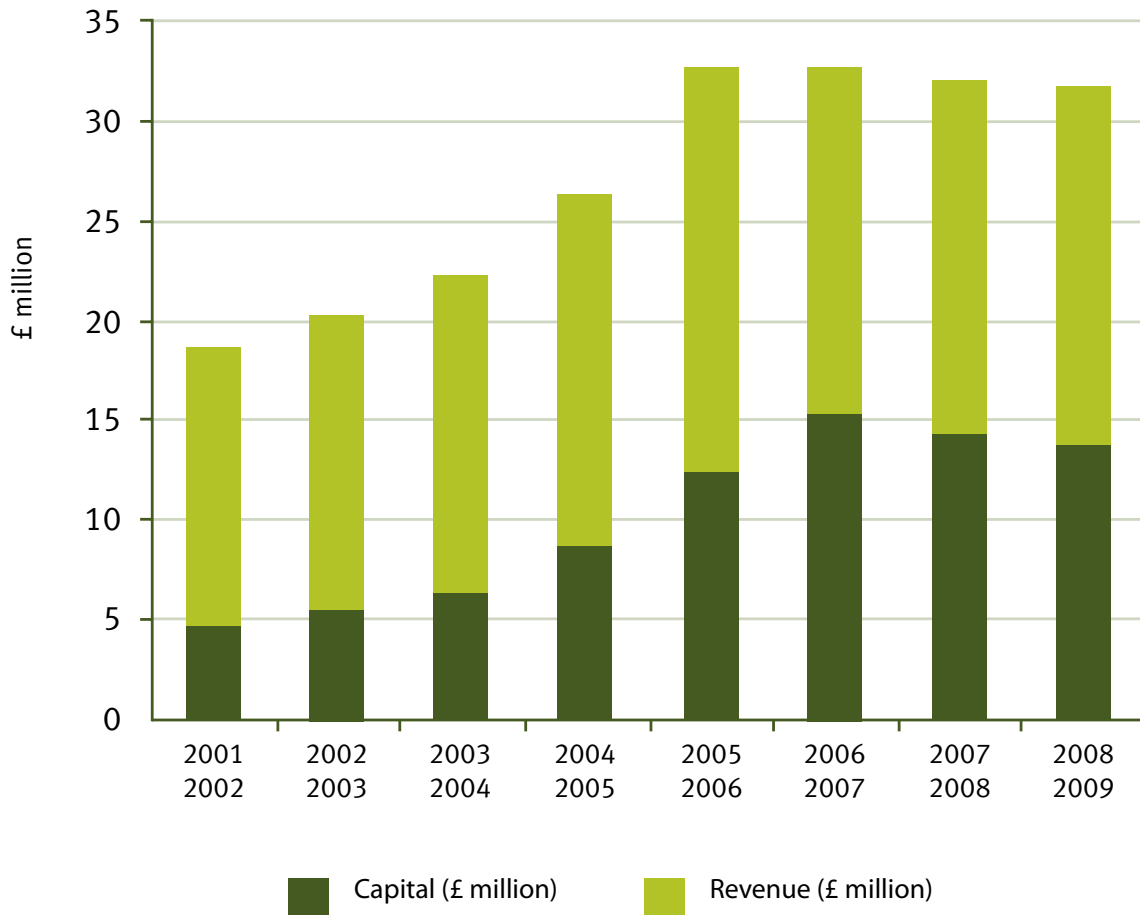
The insurance industry plays a major role in managing the recovery from flooding. Through the payment of premiums, policyholders pool their risks, gaining access to the funds when they need to replace and repair their property after a flood. The Association of British Insurers (ABI) puts the cost of the 2007 floods at £3 billion, with 135,000 claims from householders, 35,000 from businesses and 20,000 for damage to vehicles¹².

The improvement in risk information from Environment Agency Wales has implications for the insurance industry and policyholders. As risk information improves, insurance companies may choose to raise premiums or withdraw policies from those most at risk, and to charge lower premiums for those at lower risk. While there is an economic logic to this, it could lead to those most at risk facing severe financial losses in a flood, making it more difficult for them to recover from a flood if one happened. The ABI and its members are aware of this, and have made an agreement with Government that they will continue to provide insurance cover in most cases as long as certain conditions are met. In return for continuing to offer cover, insurance companies expect action by the Environment Agency to reduce flood risk in the areas of significant risk. This agreement is known as the 'Statement of Principles'.

2.10 Funding to support flood risk management

Welsh Assembly Government recognises flood risk management investment is important. We receive the majority of our funds from Welsh Assembly Government Grant in Aid. 94 per cent of our flood risk funding in 2008-2009 was from Welsh Assembly Government. Total funding has substantially increased since the floods of 2000.

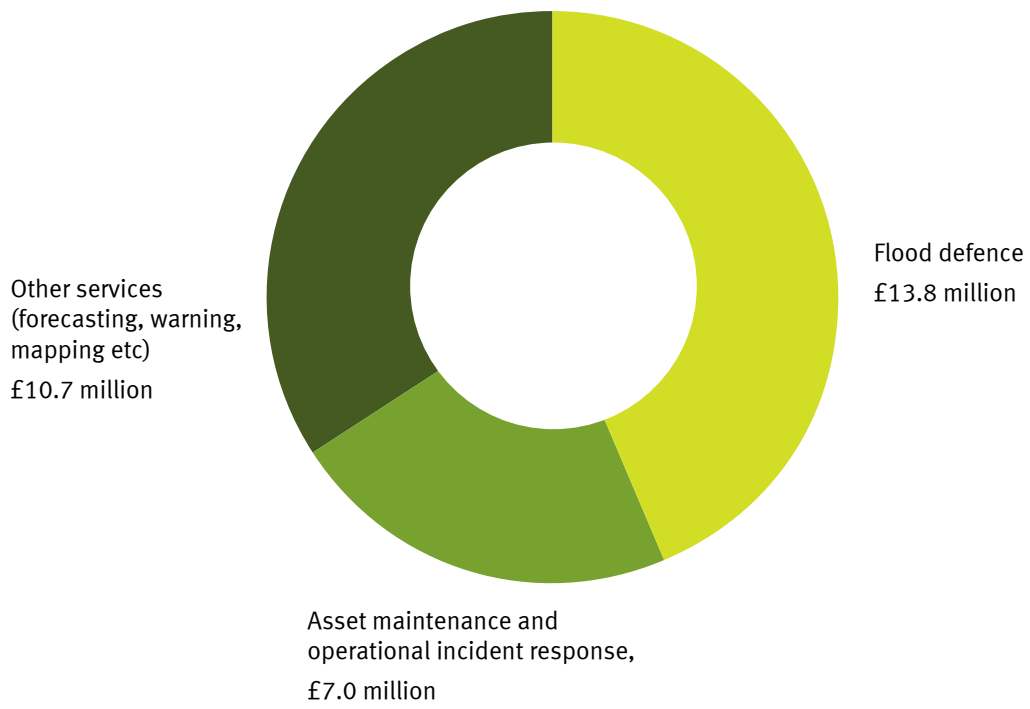
Figure six: Environment Agency investment in flood risk in Wales



Between 2004 and 2008, we obtained £6 million of additional European Union (EU) funds under the Objective One programme to boost our capital budget. This was match funded by Welsh Assembly Government to enable us to complete 10 new schemes which reduced flood risk for over 2,000 homes and businesses across Wales at locations such as Aberdare, St Clears, Glynneath, Pwllheli and Bangor. Environment Agency Wales has also successfully bid into the new round of EU funding, called Convergence. This will again help us to bring forward schemes across Wales. We are expecting £15 million worth of Convergence funding over the next five years.

The figure below shows where we invested the total funds in 2008-2009. Two-thirds of the money is invested in flood defence, maintenance and incident response.

Figure seven: Investment in flood and coastal risk management 2008-2009



3. Who remains at risk of flooding?

3.1 The National Flood Risk Assessment

The National Flood Risk Assessment (NaFRA) indicates where flooding could occur in all river catchments and the coastline around Wales using 39 weather patterns of varying severity and likelihood. The assessment includes the extent to which flood defence structures reduce the chance of flooding and what might happen if they overtop or fail. This understanding of the likelihood of flooding allows us to map the vulnerability and impacts of floods, including the people, property, infrastructure and land (including farmland) at risk. The national assessment gives a picture of the damage that may arise. This includes costs, and the numbers, types and location of properties affected. The current analysis has not looked at any other impacts of flooding that also contribute to the overall risk. These include measures such as risk to life, damage to crops and livestock, disruption to commerce and transport, long-term changes to habitats, land use and land value.

The national assessment identifies land at risk from flooding using three risk categories. These consider the chances of weather severe enough to cause a flood, and the likelihood this will overwhelm defence structures or lead to their failure.

Table four: NaFRA flood risk categories

| Risk category for a location | The chance of flooding in any year at that location | |
|------------------------------|---|--|
| Low | Less than 0.5 per cent | 1 in 200 chance in any given year |
| Moderate | 0.5-1.3 per cent | 1 in 200 to 1 in 75 chance in any given year |
| Significant | More than 1.3 per cent | 1 in 75 chance in any given year |

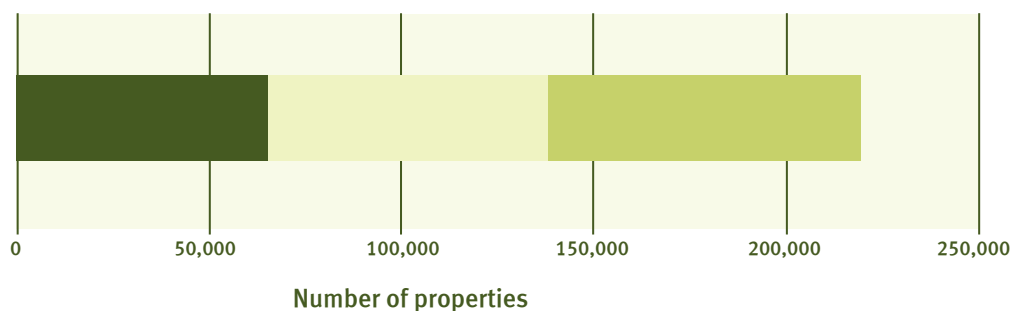
The risk categories assigned to locations are necessarily estimations because of the complexities of weather prediction and flood estimation. While the results provide the best national assessment of risk, we take great care to make sure we and others use the results correctly to avoid unnecessary blight or impact on property values or flood insurance. The national assessment is a snapshot of current conditions at the time we gather the data. However, the underlying pressures and drivers, and the flood risk management response to them, are changing all the time. The category of a location may change over time because of more accurate modelling, or better information on the flow of water, or because the risk itself is changing. For example this can happen because of changes in the catchment, or perhaps because of changes in the protection provided by flood risk management assets.

As an example, we estimate the 2000 flood in Mold had a 0.4 per cent (or 1 in 250) chance of occurring in any year. We recorded 61.5 mm on 29th October and 79.3 mm on 5th November of rain falling in the River Alyn catchment leading to widescale flooding of several communities. With climate change, severe conditions will occur more often in future and 1 in 250 chance events will become even more severe. For example, the 2008 updated Foresight Future Flooding report¹³ found that:

- Communities living behind good coastal defences currently protecting them against a flood with a chance of occurrence of one in 100 each year would have protection as low as one in five each year by the end of the century if we were to follow a business-as-usual flood management policy.
- The risk of inland flooding in the 2080s is expected to increase by between four and six times over present levels due to the impact of changes to precipitation.
- Future risk from surface water flooding may rise to be of the same order as river and coastal flood risk.

NaFRA shows that there are 220,000 properties in Wales at risk of flooding from rivers and the sea.

Figure eight: Properties in Wales at risk of river and sea flooding, by risk category



| | |
|---|--|
| Significant chance of flooding: more than 1:75 | |
| Moderate: 1:75 - 1:200 | |
| Low: 1:200 - 1:1000 | |

Source: NaFRA, 2008

The maps on the next two pages show two different views of flood risk by Local Authority area. Firstly, figure nine shows the proportion of the Local Authority land area at risk of flooding. This information should help Local Planning Authorities in their decision-making. Only 6.7 per cent of land is at risk from flooding from a rare extreme flood event of up to a 1 in 1,000 (0.1 per cent) chance in any year. We therefore place great emphasis on controlling flood risk by keeping inappropriate development away from the floodplain. As areas redevelop and regenerate, there must be maximum encouragement for developers to build property outside the floodplain and in those exceptional cases where building does take place in the floodplain to make it safe.

Secondly, figure ten shows the number of properties at significant risk – giving the extent to which buildings in the floodplain have more than a 1 in 75 (1.3 per cent) annual chance of flooding. This combines a measure of likelihood of a flood in an area and the results, which is the number of properties exposed to the flood event. This shows the areas where Local Authorities and Environment Agency Wales have the greatest challenges.

Figure nine: Percentage of land within the floodplain in Wales, by Local Authority

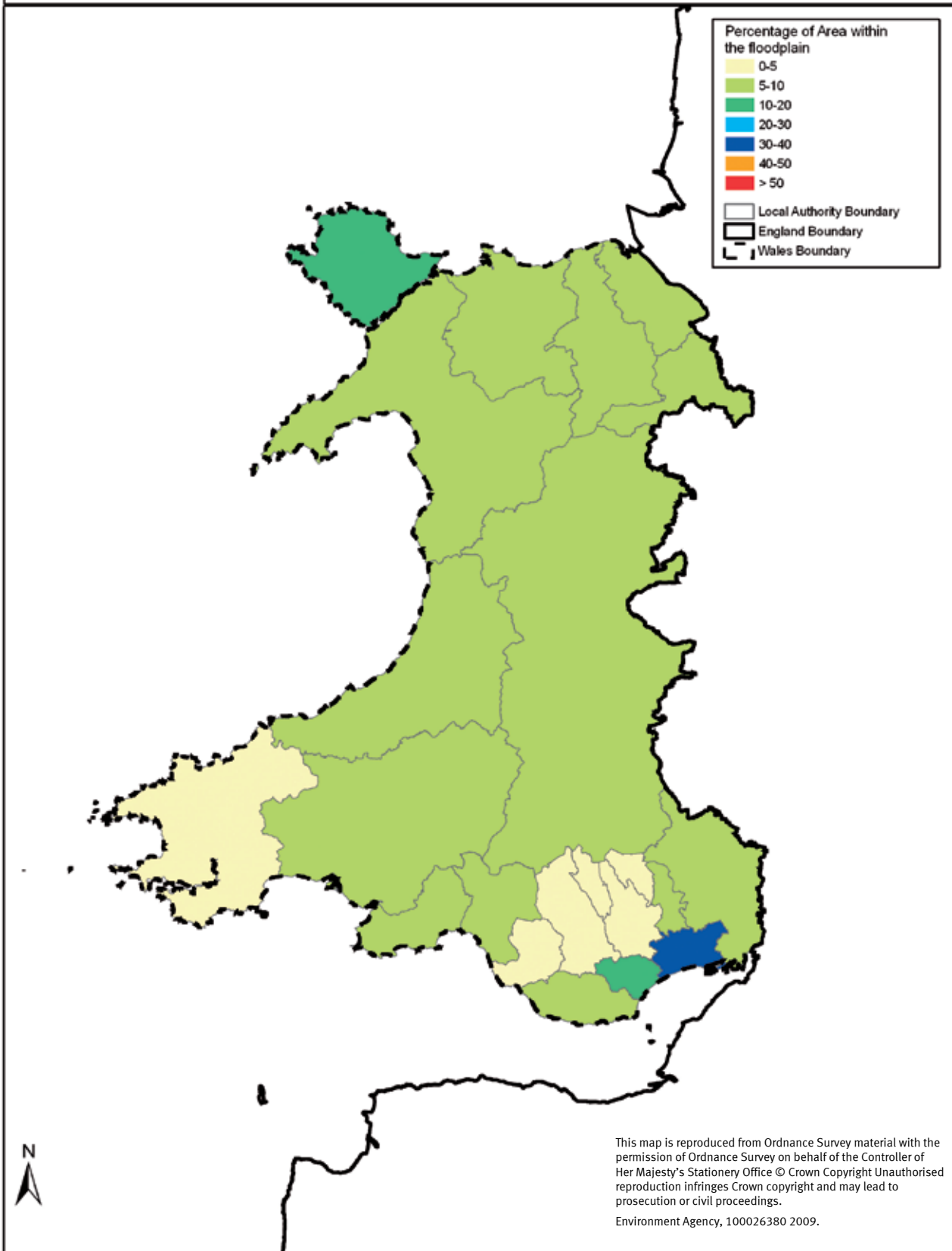
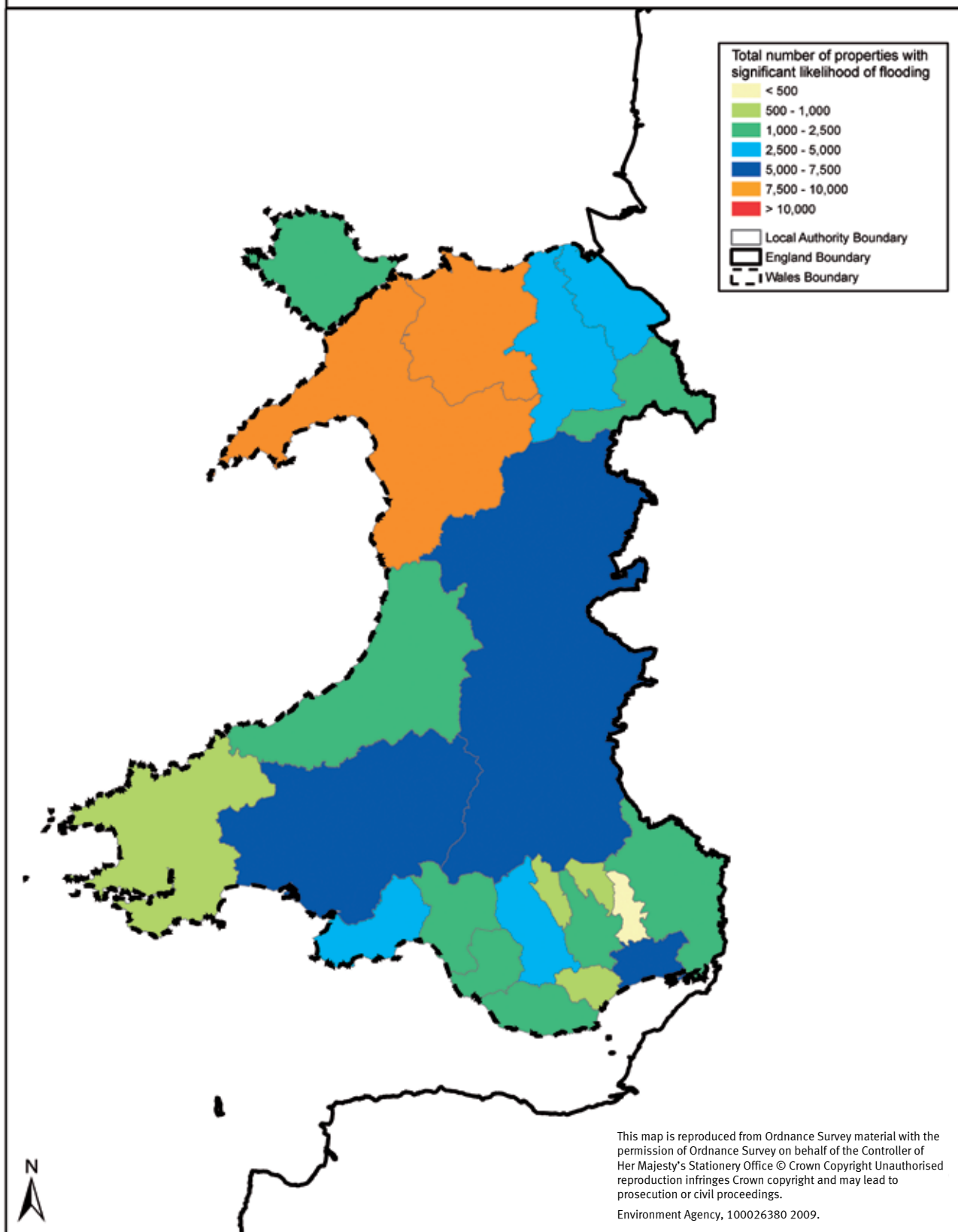


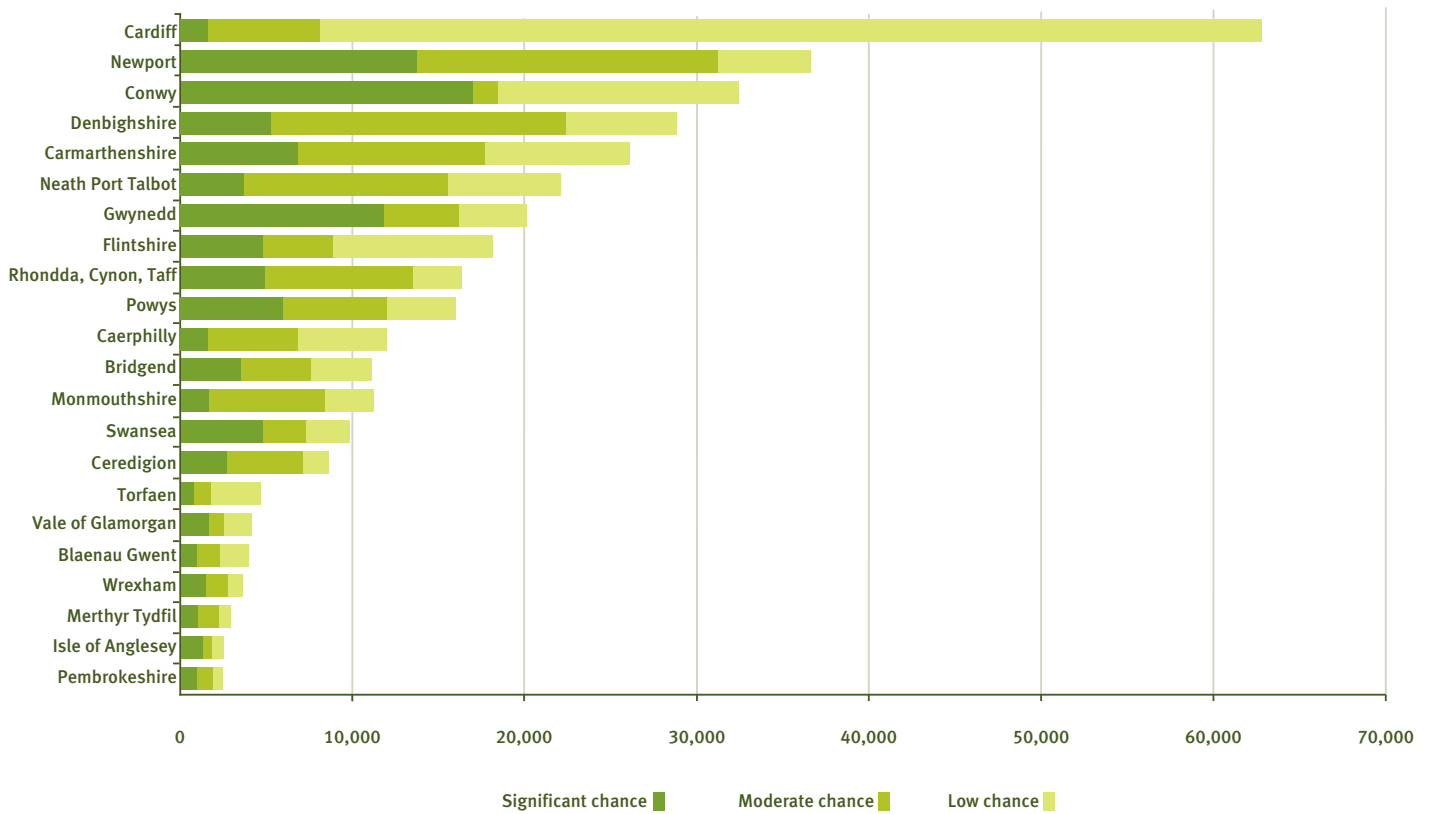
Figure ten: Number of properties in areas with significant likelihood of flooding in Wales, by Local Authority



3.2 Local flood risk

Across the Local Authorities in Wales, Cardiff has the highest numbers of properties at risk from flooding from rivers or the sea. However, many of these are at low risk (less than 1 in 200 chance in any given year), mainly because of the flood defence structures in place in Cardiff. Although Cardiff is well defended, if these defences were to be overtopped then the consequences could be severe.

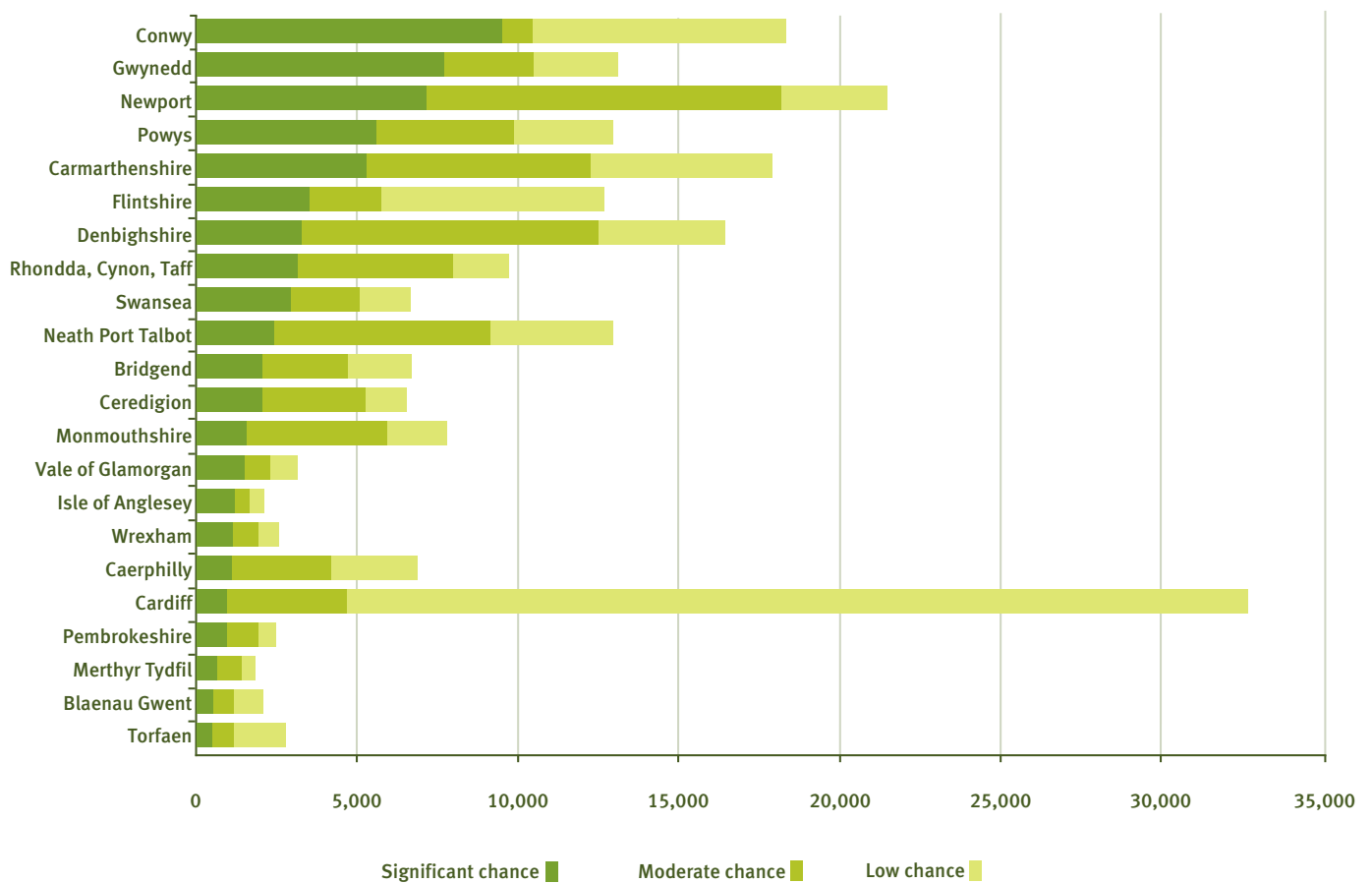
Figure eleven: Local Authorities in Wales ranked by the number of people at risk of flooding



Source: NaFRA 2008

Conwy has the largest number of properties at significant risk (greater than a 1 in 75 chance in any given year). This is largely because of the coastal flood risk. Coastal flooding is also the cause of the significant risk to property in Gwynedd and Newport. We have plans in place to manage flood risk in these areas. For example, we are working on a Clwyd Tidal Strategy, which will identify actions to manage the most significant flood risks in the Conwy Local Authority area.

Figure twelve: Local Authorities in Wales ranked by number of properties at significant risk of flooding



Source: NaFRA 2008

The national assessment is able to identify those Local Authorities with the most properties that have a significant chance of flooding from rivers and the sea. The properties in these Local Authority areas are likely to flood more often, so householders, businesses and Local Authorities need to plan and prepare for more regular flooding. These are areas where we have to make use of all the techniques available for managing flood risk – not just defence structures. Householders and business need to receive and respond to warnings, undertake property-level protection measures, and be ready for a flood.

The national assessment allows us to target staff and funding, and to give priority to those communities that face the greatest risks where risk is a combination of the chance of flooding and the consequences or impacts of flooding.

4. Protecting communities at risk in the longer term

4.1 Catchment Flood Management Plans

The challenge ahead for Environment Agency Wales is to create the right strategic approach to flood risk management for the longer term, bearing in mind the extent of defence and funding agreed by Welsh Assembly Government. Working with many local groups and organisations, we have produced Catchment Flood Management Plans (CFMPs) covering the main 10 river catchments in Wales.

The CFMPs build on the National Flood Risk Assessment data by understanding all of the mechanisms behind flood risk in a catchment, and how flood risk may change in the future as a result of climate change or different land use. Using this evidence base, the CFMPs set out our policy response to flood risk across each river catchment. They identify local flood risk management policies that are integrated and balance environmental, social and economic needs over the long term (50-100 years), and comply with government guidance. In practice, most of the policy actions concentrate on the first 25 years of the plan, recognising that there may be major changes in our priorities and the issues we need to respond to in planning 50 to 100 years into the future. They are locally specific and prepared using a consistent method. They follow national guidance and provide a broad assessment and plan, including:

- Catchment overview – a thorough overview of the hydrology, land use and other characteristics of the catchment.
- Current flood risks and management – a broad account of the existing flood risks and the protective regime already in place to manage them.
- Future flood risk – an assessment of how the risks may evolve, for example through climate change.
- Policy appraisal – an examination of what actions are possible to meet the objectives in each specific area within the catchment.
- Achieving the CFMP – how the policies identified will become action.

5. Investing for the future

Environment Agency Wales' National Flood Risk Assessment shows there are 220,000 properties at risk from flooding from rivers and sea in Wales, with more exposed to surface water and other forms of flooding. The expected annual damages to residential and non-residential properties in Wales at risk from flooding from rivers and the sea, including hospitals and schools, is estimated at about £200 million.

Environment Agency Wales plays a central role in managing flood risk. It is likely that with climate change and development pressures, the flood risk in Wales is going to increase in the future, with potentially the biggest change likely to happen in the latter half of the century. Our decisions and policy choices will influence and tackle flood risk both now and in the future. We are assessing the investment needs for the long term to allow us to understand the future risk, the costs and benefits of investment, and the choices available.

Welsh Assembly Government has increased its investment in flood risk management through its grant allocation to Environment Agency Wales, but the impact on households at risk and expected annual damages are both likely to increase. The 2004 Foresight Future Flooding report¹⁴ suggested that the annual economic damages in Wales will rise from £70 million in 2004 to £1,235 million in the 2080s under the most likely scenario. However, as the Stern Report¹⁵ found, taking action now can reduce the longer term total economic damage.

Identifying the funding needed to manage increasing flood and coastal risk is a key issue. However, we will also need to identify the best ways of working with central and local government, businesses and communities to fund and get the maximum benefit from all flood and coastal risk work. Catchment Flood Management Plans and Shoreline Management Plans, together with our assessment of future investment needs, will stimulate a public debate on how society manages flood and coastal risk in the future. It is clear, for example, that our knowledge and understanding of surface water flood risk is at a relatively early stage compared with river and coastal flooding.

References

1. Welsh Assembly Government (2009). Climate Change Strategy - Programme of Action Consultation. www.wales.gov.uk/consultations
2. Welsh Assembly Government (2006). Environment Strategy for Wales. www.wales.gov.uk/topics/environmentcountryside/epq/envstratforwales/?lang=en
3. Welsh Assembly Government (July 2007), The New Approaches Programme. www.wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/newapproaches/?lang=en
4. Sir Michael Pitt (2008). Learning Lessons from the 2007 Floods. Final Report. Cabinet Office, London. http://archive.cabinetoffice.gov.uk/pittreview/thepittreview/final_report.html
5. Welsh Assembly Government Minister for Environment Sustainability and Housing (2008). The Pitt Review – As Assessment for Wales, Written Statement by the Welsh Assembly Government, 17th December 2008. www.wales.gov.uk/about/cabinet/cabinetstatements/2008/pitt/?lang=en
6. Welsh Assembly Government (2002). Planning Policy Wales. www.wales.gov.uk/topics/planning/policy/?lang=en
7. Welsh Assembly Government (2004). Technical Advice Note 15: Development and Flood Risk. www.wales.gov.uk/topics/planning/policy/?lang=en
8. National Audit Office and Public Accounts Committee (2007). Building and Maintaining River and Coastal Flood Defences in England.
9. Bowker, P. (2007). Flood Resistance and Resilience Solutions. An R&D Scoping Study. R&D Technical Report.
10. Association of British Insurers, website www.abi.org.uk. Factsheet. Flood Resilient Homes: What Homeowners can do to reduced flood damage. Accessed May 2009.
11. As summarised in the Pitt Review, 2008. See reference 3.
12. Association of British Insurers, website www.abi.org.uk page “Latest flood costs” accessed 5 February 2009.
13. Evans, E.P., Simm, J.D., Thorne, C.R., Arnell, N.W., Ashley, R.M., Hess, T.M., Lane, S.N., Morris, J., Nicholls, R.J., Penning-Rowsell, E.C., Reynard, N.S., Saul, A.J., Tapsell, S.M., Watkinson, A.R., Wheeler, S., (2008) An update of the Foresight Future Flooding 2004 qualitative risk analysis. Cabinet Office, London.
14. Foresight Programme (UK Government), (2004). Foresight Future Flooding. www.foresight.gov.uk/OurWork/CompletedProjects/Flood/index.asp
15. Stern, N. (2006). The Economics of Climate Change – The Stern Review. Cabinet Office – HM Treasury, London. www.hm-treasury.gov.uk/stern_review_report.htm

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

* Approximate call costs: 8p plus 6p per minute (standard landline).
Please note charges will vary across telephone providers.



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.