National Strategy for Flood and Coastal Erosion Risk Management in Wales: Summary

April 2012
Contents

Introduction .......................................................................................................... 4

What is the National Strategy? ........................................................................... 5

Why Prepare a National Strategy? .................................................................... 6

What are the Flood or Coastal Erosion Risks in Wales? ................................. 8

Defining Risk ...................................................................................................... 8
Flooding ............................................................................................................ 9
Coastal Erosion ............................................................................................... 9

Who or what is at risk? ..................................................................................... 10

People ............................................................................................................. 10
Infrastructure ................................................................................................. 11
Tourism ........................................................................................................... 11
Environment ................................................................................................... 12

Who is responsible? ....................................................................................... 12

Funding ............................................................................................................ 16

The way ahead ................................................................................................. 17

More Information ........................................................................................... 17
Introduction

Flooding and coastal erosion are two of the biggest natural hazard risks affecting the safety and sustainability of communities across Wales.

Current estimates show that one in six properties in Wales are at risk of flooding from rivers, the sea and surface water. The number of properties at risk from coastal erosion is less well defined than those at risk of flooding, but the draft Shoreline Management Plans suggest that the numbers are significantly smaller, and that the majority of these would not be affected until the medium to long term, i.e. within the next 30-100 years.

Climate change projections suggest that Wales can expect to see different rainfall patterns in the future, along with rising sea levels. These projections suggest that Wales will experience more frequent and more severe flooding in the future, along with increased rates of coastal erosion. Communities at risk of flooding and coastal erosion can expect to see those risks realised more frequently and many more communities across Wales will begin to face the risks of flooding and coastal erosion themselves.

Just as the risks presented by flooding and coastal erosion are changing, so is the response. It will not be possible to simply continue to build more and bigger drainage systems and defences. In recent years Wales has moved towards a response rooted in the principles of risk management, providing a holistic approach to managing the risks, their consequences and the wider impacts on Welsh communities.

The publication, in November 2011, of the first National Strategy for Flood and Coastal Erosion Risk Management in Wales, provides the Welsh Governments response in meeting these challenges and a national framework for flood and coastal erosion risk management.

This document has been produced to provide a summary of the National Strategy and provide references to where further, more detailed, information can be found within the National Strategy itself.
What is the National Strategy?

1.1 Prepared by the Welsh Government, under the terms of the Flood and Water Management Act 2010, the first National Strategy for Flood and Coastal Erosion Risk Management in Wales was published in November 2011.

1.2 It provides the national framework for flood and coastal erosion risk management setting out the four overarching objectives required to achieve this for Wales:

- **reducing the consequences** for individuals, communities, businesses and the environment from flooding and coastal erosion
- **raising awareness of and engaging people in the response** to flood and coastal erosion risk
- **providing an effective and sustained response** to flood and coastal erosion events
- **prioritising investment** in the most at risk communities

1.3 Implementing these objectives will be the responsibility of everyone involved in or affected by flood and coastal erosion risk management, from the Welsh Government to the Welsh Risk Management Authorities and the people of Wales themselves.

"By working together we can adapt to the challenges of a changing climate ensuring that our communities, infrastructure and environment are more resilient to the impacts of flooding and coastal erosion, which will help create our vision for economic and environmental well being for people and communities, embodying our values of social justice."

John Griffiths AM
Minister for Environment and Sustainable Development

Welsh Risk Management Authorities, as defined within the Flood and Water Management Act 2010, include:

- the Environment Agency;
- a Lead Local Flood Authority;
- a highway authority;
- an Internal Drainage Board for an internal drainage district that is wholly or mainly in Wales; and
- a water company that exercises functions in relation to an area in Wales.

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3 A Highway Authority has the same meaning given by section 1 of the Highways Act 1980, Local Authorities act as highway authorities in respect of local roads with the Welsh Government is responsible for trunk roads and motorways in Wales.
## Why Prepare a National Strategy?

1.4 In keeping with the requirements laid out within the Flood and Water Management Act 2010, the National Strategy clearly sets out:

- the Risk Management Authorities in Wales
- the flood and coastal erosion risk management functions that may be exercised by those Authorities in relation to Wales
- the objectives for managing flood and coastal erosion risk
- the measures proposed to achieve those objectives
- how and when the measures are to be implemented
- the costs and benefits of those measures, and how they are to be paid for
- the assessment of flood and coastal erosion risk for the purpose of the strategy
- how and when the strategy is to be reviewed
- the current and predicted impact of climate change on flood and coastal erosion risk management
- how the strategy contributes towards the achievement of wider environmental objectives

1.5 The National Strategy is comprised of the following four sections:

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 1 – Flood and Coastal Erosion Risk Management in Wales.</strong></td>
<td>This section provides the context and challenges faced in flood and coastal erosion risk management introducing the Risk Management Authorities involved in meeting these challenges.</td>
</tr>
<tr>
<td><strong>Section 2 – Objectives for Managing Flood and Coastal Erosion Risk in Wales.</strong></td>
<td>This section explains the rationale behind the adoption of the flood and coastal erosion risk management system and the National Strategy’s objectives and measures required in delivering it.</td>
</tr>
<tr>
<td><strong>Section 3 – Funding Flood and Coastal Erosion Risk Management.</strong></td>
<td>This section provides the background to the funding of the objectives and measures and the various funding streams involved to deliver them. It also considers the need for establishing a clearer funding prioritisation methodology for Wales in the future.</td>
</tr>
<tr>
<td><strong>Section 4 – Implementation and Review</strong></td>
<td>This section considers how the National Strategy will be implemented, monitored and reviewed.</td>
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</table>
1.6 These are then supported by the following five annexes:

- Annex A – Sources of Flooding and Coastal Erosion
- Annex B – Risk Management Authorities
- Annex C – Contact Details
- Annex D – Schedule of Relevant Documents
- Annex E – Glossary

1.7 This document has been produced to provide a summary of the National Strategy and provide references to where further, more detailed, information can be found within the National Strategy itself.
What are the Flood or Coastal Erosion Risks in Wales?

Defining Risk

2.1 Before explaining where the risks come from, it is important that a common understanding of risk is established.

2.2 The risk, as referred to within the National Strategy, is calculated by taking the likelihood (i.e. chance of flooding or coastal erosion) and multiplying it by the consequences (i.e. impacts of the flooding or coastal erosion).

2.3 The likelihood of an event is usually expressed as either the probability or an annual chance, in any one year, for example:

- a 1% annual probability of flooding, or
- a 1 in 100 chance of flooding at a location in any one year.

2.4 The likelihood of flooding or coastal erosion depends on a number of factors as illustrated in table 1 below:

<table>
<thead>
<tr>
<th>Factors include</th>
<th>Event</th>
<th>Flooding</th>
<th>Coastal Erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weather patterns</td>
<td>Prevailing sea conditions</td>
<td>Frequency and severity of coastal storm events</td>
</tr>
<tr>
<td></td>
<td>Geology</td>
<td>The amount of sand or shingle on a beach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Topography</td>
<td>Sea levels</td>
<td>Wave height and intensity</td>
</tr>
<tr>
<td></td>
<td>Land use</td>
<td>Geology</td>
<td>Topography</td>
</tr>
</tbody>
</table>

Table 1 – Factors that may affect the likelihood of an event.

2.5 The consequences of flooding and coastal erosion events vary, and in each case the consequences of the events differ. All flooding or coastal erosion events carry a risk to life either for those directly affected or for others attempting to help those directly affected. Whilst these dangers to life cannot be overstated, beyond the risk to life there are other consequences that must be considered, such as:

- Building and structures can be damaged;
- The deposition of sewerage and debris in properties and streets;
- Road networks can become damaged and impassable;
- In rural areas livestock and / or agricultural land could be lost; and
- Key Infrastructure[^4] in Wales may be affected.

[^4]: Key infrastructure is a reference to maintaining Wales’ essential services, such as water related infrastructure including water supply, treatment works pumping stations and sewerage treatment works and other types of important infrastructure such as utility stations, hospitals, fire service, ambulance and police stations and transport systems including road and rail.
Flooding

2.6 A flood is defined within the Flood and Water Management Act 2010 as being “…any case where land not normally covered by water becomes covered by water.”

2.7 In Wales the most common forms of flooding 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** – this can occur 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 sewerage as a result and 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.

Coastal Erosion

2.8 Within the Flood and Water Management Act 2010, coastal erosion is defined as being “…the erosion of the coast of any part of England or Wales.”

2.9 The rate of coastal erosion in Wales is generally low compared with some parts of England. However, evidence from our emerging Shoreline Management Plans\(^5\) suggests that in the next 100 years we could see an increasing number of our coastal communities at risk from rising sea levels and eroding land.

2.10 The location of some of these communities will become unsustainable in the longer term, forcing those who live there to move.

2.11 The Welsh coast currently has in the region of 415km of constructed sea defence structures that protect over £8 billion of assets from coastal erosion and tidal flooding. It is estimated that erosion is occurring along 346km (23%) of the Welsh coast\(^6\).

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\(^5\) More information on Shoreline Management Plans is available - [http://www.environment-agency.gov.uk/research/planning/105014.aspx](http://www.environment-agency.gov.uk/research/planning/105014.aspx)

\(^6\) Marine Climate Change Impacts Partnership, Plymouth University, 2008.
2.12 However, the detailing of the individual sources of risk should not be taken to imply that flooding can only ever occur for one reason, or that coastal erosion only ever has one outcome. Any and all sources and facets can come together to produce what are called combination flood events. Coastal erosion and sources of flooding can also act in combination, which can increase the risk of either or both.

Who or what is at risk?

People

3.1 Approximately 600,000 people\(^7\), or 1 in 5 of the population, are estimated to be at risk from all sources of flooding. This has been calculated by considering the numbers of properties at risk, which is considered to be around 357,000 or 1 building in every 6.

3.2 As illustrated in the diagram below, of the 357,000 properties, 220,000 are considered to be at risk of flooding from the rivers and the sea, of these 97,000 are also considered to be at risk of flooding from surface water, with the remaining 137,000 properties considered to be at risk of surface water flooding alone.

3.3 However, with many towns and cities located on the coast, many more people work or travel through the areas at risk of flooding. It is estimated that sixty percent of Wales’ population live and / or work on the coast.

3.4 The number of properties at risk from coastal erosion is less well defined than those at risk of flooding, but the draft Shoreline Management Plans...
suggest that the numbers are significantly less. The majority of these would be affected in the medium to long term when the effects of sea levels result in increasing erosion.

3.5 The Environment Agency’s National Coastal Erosion Risk Mapping project, which is nearing completion, will improve our understanding of erosion risk in Wales and the numbers of properties threatened by coastal erosion.

Infrastructure\(^9\)

3.6 Nationally important infrastructure such as oil refineries (Milford Haven) and power stations (Wylfa, Aberthaw, Uskmouth and Pembroke) are located on the coast.

3.7 Other essential infrastructure located around the coast and within inland flood risk areas include water supply and treatment facilities, electricity supply and distribution sites as well as police, fire service and ambulance stations.

3.8 It is estimated that over 80% of ‘water’ related infrastructure, 22% of electricity related infrastructure, 22km of motorways, 2,300km of other roads and 400km of railway lines are all at risk from flooding from the rivers and the sea alone. Therefore, the potential for serious disruption to communities across Wales is considerable with the consequences affecting a much wider area than the flood risk area itself.

Tourism\(^{10}\)

3.9 Coastal erosion and flooding threatens our beaches and will therefore impact on tourism in Wales, which it is estimated contributes over £2.5 billion GDP each year to the Welsh economy. The coastal and marine environment is also estimated to support, both directly and indirectly, over 92,600 jobs.

3.10 Tourism accounts for over a third of coastal and marine employment in west Wales and over half of the coastal and marine sector jobs in south east Wales.

3.11 In north Wales, whilst tourism provides the majority of employment in this sector, there are also metal manufacturing, construction and marine related transport which provide significant numbers of jobs.

\(^8\) NCERM - In 2006, the Welsh Government and Defra asked the Environment Agency to produce nationally consistent coastal erosion information and to make this information available to the public. The public already have access to information on flooding on the Environment Agency’s website, and the NCERM project was set out to complement this. http://www.environment-agency.gov.uk/homeandleisure/107495.aspx


\(^{10}\) Source: National Trust – Valuing our Environment - Economic Impact of the Coastal and Marine Environment of Wales, 2006.
Environment

3.12 Coastal erosion and flooding will also have an impact on the environment and biodiversity. It is estimated that 75% of the coastline of Wales is currently protected and designated for its environmental importance.

3.13 Of the 17,100km² of agricultural land in Wales, 500km² (3%) of which is estimated to be at risk of flooding from the rivers and the sea. Estimates suggest that this is likely to increase by about 50% to approx 750km² (5%) by the 2080’s.

Please refer to paragraphs 66 – 104 of the National Strategy for further information

Who is responsible?

4.1 Many bodies and agencies have responsibilities to help tackle and manage the risks of flooding and coastal erosion in Wales.

4.2 The Flood and Water Management Act 2010 defines these as being Risk Management Authorities and the diagram below provides you with an illustration of who they are and their respective responsibilities for the different sources of flooding in Wales:

4.2 As you can see from the previous diagram, in considering sources of flooding, responsibilities for this risk is split between main rivers, sea and

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11 Source: Welsh Government – Protecting Welsh Seas, a draft strategy for marine protected areas in Wales, 2009
local flood risks (i.e. surface water, groundwater and ordinary watercourses).

4.3 Traditionally, the approaches taken to manage both flood and coastal erosion risk have been focussed on the construction of defences. Whilst these have provided communities with a certain level of protection from the impacts and consequences of both flooding and coastal erosion. However, no defence will be able to irrevocably remove the risks entirely. There is always the chance of a flood or erosion event that is sufficiently large to cause a defence to be overtopped or fail.

4.4 The current defence infrastructure also does not protect against all sources of flooding, for example surface water. In recognition of this, there has been a shift towards managing risk rather than aiming to provide total protection from risk.

4.5 The forecast effects of climate projections means the shift to managing risk now needs to be adopted across all aspects of flood and coastal erosion.

4.6 Simply constructing more and higher defences is not a sustainable solution environmentally, economically or socially and in some cases can increase the risk to life and injury should they fail. The location of defences can sometimes harm the wider environment and constructing and maintaining defences is becoming more expensive, leaving less money available to protect other communities.

4.7 The delivery of a successful flood and coastal erosion risk management system in Wales underpins much of the Welsh Government’s wider programme for delivery; it is not just about delivery of environmental policies. Flood and coastal erosion risk management is important for the establishment of strong and safe communities for people who live and work in Wales and to the provision of wider social justice principles.

4.8 The Welsh Government expects the Risk Management Authorities to deliver their flood and coastal erosion risk management functions in a manner that:

- embeds sustainable development as the central organising principle informing decisions and enhancing the economic, social and environmental wellbeing of people and communities, achieving a better quality of life for our own and future generations

- is focussed on the needs of individuals, communities and businesses and which recognises that different groups have different needs and varying capacity to deal with flood risk and that the service they receive must be tailored accordingly

- supports the wider economic renewal programme, ensuring investment in infrastructure is sustainable from a flood and coastal erosion risk perspective and investing in developing the skills
required to implement effective and innovative risk management measures across Wales

- promotes equality and does not exacerbate poverty
- is based upon a holistic understanding of the risks and consequences
- considers the full range of risk management responses including broader potential environmental, economic or social opportunities
- contributes to the holistic management of our water, land and marine resources reflecting the ecosystem approach set out in the Natural Environment Framework
- facilitates long term resource and investment planning
- enables effective prioritisation of investment, resources and actions
- Maximises opportunities to adapt to climate change
- Takes account of the requirement of relevant European and domestic legislation including the Flood Directive, the Water Framework Directive and the Habitats Directive

4.9 A risk management approach encompasses a range of measures to help communities as well as the wider environment. Examples of risk management measures, which in many cases would also be deployed alongside defence structures, include but are not limited to:

- developing better flood forecasting and warning systems
- ensuring effective emergency plans are in place for flood and coastal erosion events
- improving the response to events by the emergency response organisations, as well as individuals and businesses
- ensuring effective recovery arrangements are in place and supported by all relevant parties
- considering and implementing measures to ensure appropriate development is designed to be safe and resilient to flood, or coastal erosion, risk in the preparation of Local Development Plans and the assessment of all planning applications
- avoiding inappropriate development in flood and coastal erosion risk areas
• speeding up the recovery process by incorporating greater resilience measures into the design of new buildings

• increasing approaches that utilise the natural environment, like adopting soft engineering in place of traditional solutions, managing of the land to reduce storm runoff, creating more wetlands to store water or increasing beaches and salt marshes to absorb wave energy along the coast

• deploying the sustainable drainage systems (SuDS) approach for surface water management for both new and existing developments

• identifying and protecting areas suitable for inundation and water storage to prevent flooding elsewhere

• increasing levels of awareness of flood and coastal erosion risks among individuals and communities

• increasing individual and community preparedness for flood and coastal erosion events

• supporting the actions of individuals and communities and infrastructure providers to build their resilience to the consequences of a flood event

• ensuring accessibility to buildings and contents insurance for those at flood risk

• identifying ‘roll back’ and managed realignment in coastal areas where appropriate

4.10 By working with the natural processes and applying the ecosystem approach, risk management measures can also prove to be more sustainable, providing a holistic and flexible system suitable for the needs of Wales in the 21st Century.

4.11 It is vital that all the Risk Management Authorities work together in partnership if we are to avoid duplication of effort and investment, or worse, contradictory polices and actions that undermine one another. This is recognised within the Flood and Water Management Act 2010, which places a new duty to cooperate on Risk Management Authorities which emphasises the need to work together to develop a shared understanding of both the risks and the appropriate actions to manage them.

Please refer to paragraphs 105 – 128 and Annexes B & C of the National Strategy for further information
Funding

5.1 The National Strategy sets out the funding requirements in relation to the risk and consequences of flood and coastal erosion, providing details of the current and future budgets available to meet them and identifying additional sources of funding available.

5.2 In recognition of the changing nature and level of risk, and the increasing demands on budgets this will provide, it also proposes a number of actions to ensure more efficient and effective expenditure in relation to flood and coastal erosion risk management in Wales. These proposals are also designed to increase transparency within the funding system:

- investment will need to be strictly prioritised and a long term investment plan will set out the specific projects to be funded
- opportunities for joint funding for multiple benefits will be maximised across Welsh Government budgets, particularly in relation to regeneration and transport investment
- other sources of European funding will be sought, particularly for the period beyond 2015
- the private sector will be expected to contribute to the costs of protecting relevant major assets, but this will need to be managed to ensure that the prospect of funding does not unduly influence decisions on developments in inappropriate locations
- Flood Risk Management Wales (the Environment Agency Regional Flood and Coastal Committee for Wales), may need to exercise its levy raising powers in future
- Local Authorities may need to factor in additional expenditure on flood risk management in their area in setting future budgets and consider additional charges or levies

5.3 The National Strategy also sets out how the Welsh Government will prioritise funding and its commitment to establishing a clearer funding prioritisation methodology for Wales. Including proposals for a single capital investment programme for flood and coastal erosion risk management in Wales. A consultation on these matters will take place in 2012.

Please refer to paragraphs 135 – 179 of the National Strategy for further information
The way ahead

6.1 The publication of the National Strategy is not the end. Regular reviews of the changing nature of flood and coastal erosion risk in Wales will be undertaken over its life, with the National Strategy itself scheduled for review in 2016.

6.2 The Flood and Water Management Act 2010 also places a responsibility upon Local Authorities, (as Lead Local Flood Authorities (LLFAs)), to develop, maintain, apply and monitor a strategy for local flood risk management (Local Strategy).

6.3 In preparing their Local Strategies, each LLFA must ensure that they are consistent with the National Strategy and that they consult with the public and any other Risk Management Authorities affected. This consistency will ensure that the objectives set out within the National Strategy are delivered through the work of the Risk Management Authorities in Wales.

6.4 The Local Strategy will provide the framework within which communities have a greater say in local flood risk management decisions. In combination with the National Strategy, the Local Strategies will encourage more effective risk management by enabling people, communities, business and the public sector to work together.

6.5 The successful implementation of the National Strategy will require action from everyone at all levels of Welsh society. The Welsh Government is fully committed to its implementation and will be working with the Risk Management Authorities to ensure that we develop a holistic and sustainable flood and coastal erosion risk management system fit for Wales now and in the future.

More Information

7.1 Annex D of the National Strategy provides a schedule (including links) of the relevant documents for your consideration. To support the ongoing implementation of the Flood and Water Management Act 2010 the following guidance has also been produced for Risk Management Authorities and others.

Adapting to Climate Change

We asked the Environment Agency to prepare this guidance to assist Risk Management Authorities in Wales to adapt to climate change, available from:

http://wales.gov.uk/topics/environmentcountryside/epg/waterflooding/flooding/nationalstrategy/guidance/climateguide/?lang=en
Community Engagement Toolkit
The toolkit provides best practice for community involvement in flood and coastal erosion risk management, based on an evaluation of the effectiveness of recent flood risk management schemes. It is not intended to be prescriptive, but provides a range of ideas for effective community involvement and partnership working within flood risk management. Available from:
http://wales.gov.uk/topics/environmentcountryside/epg/waterflooding/flooding/communities/toolkit/?lang=en

Guidance on the Transfer of Ordinary Watercourse Regulatory Powers for Lead Local Flood Authorities in Wales
This guidance has been prepared by the Environment Agency on behalf of the Welsh Government to assist with the transfer of ordinary watercourse regulatory powers from the Environment Agency to Lead Local Flood Authorities in Wales. Available from:
http://wales.gov.uk/topics/environmentcountryside/epg/waterflooding/flooding/nationalstrategy/guidance/?lang=en

Local Flood Risk Management Strategy Guidance
Section 10 of the Flood and Water Management Act 2010 requires Lead Local Flood Authorities (local authorities) to develop, maintain, apply and monitor a strategy for local flood risk management in its area. Available from:
http://wales.gov.uk/topics/environmentcountryside/epg/waterflooding/flooding/nationalstrategy/guidance/localstrategy/?lang=en

Sustainable Development Guidance
Under Section 27 of the Flood and Water Management Act 2010 some Risk Management Authorities must consider sustainable development when exercising their flood or coastal erosion risk management functions. Available from:
http://wales.gov.uk/topics/environmentcountryside/epg/waterflooding/flooding/nationalstrategy/guidance/sdguidance/?SESSIONID=HnKHPV2Gfd75f3np76vLXITfPvFYFrG1MFjpl0hYJcZQw5GQ!-862695484?lang=en