



Llywodraeth Cymru
Welsh Government

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National Strategy for Flood and Coastal Erosion Risk Management in Wales

November 2011



Ministerial Foreword

During 2011 we have been reminded of the devastating impacts and consequences of flooding from across the world. We know we have to adapt to a changing climate as the evidence suggests that we will see higher sea levels, increases in the intensity of rainfall and inevitably more frequent flooding. The consequences of that flooding will see greater risks to life, the economy and the environment. In addition to this rates of coastal erosion will increase, with more coastal communities facing the risks of loss of land and resources.



While we cannot prevent all flooding or coastal erosion there are actions we can take to manage the risks and reduce the consequences. We need to adopt a more holistic approach of defence combined with a range of other measures to help communities and the wider environment.

We have already gone some way in achieving this. The Flood and Water Act introduced in 2010 provides the Welsh Government and Risk Management Authorities with greater powers, providing clarified responsibilities and the framework for partners to work together.

We have seen improvements in our understanding of flood risk through modelling and mapping. The arrangements for flood forecasting and warning been improved and the capability for flood rescue enhanced. We have tested our new and improved response arrangements during Exercise Watermark, one of the UK's largest ever civil emergency exercise.

We have also invested heavily in engaging with our communities to raise their awareness of risks and the actions they can take in the event of flooding. However, more needs to be done.

Flood and Coastal Erosion Risk Management is an important aspect of the work the Welsh Government is doing to ensure the well being, safety and prosperity of our communities. Wales needs a modern, sustainable infrastructure to keep our communities and environment safe, maintain wellbeing and underpin economic growth.

Our people, businesses and communities need to have access to the right facilities and services where they live and work. Managing the risks locally is crucial to creating safer and more resilient communities.

This first National Strategy establishes the overarching framework for the development of a holistic flood and coastal erosion risk management system fit for Wales. It will embrace the actions of Welsh Government, Risk Management Authorities as well as communities and individuals to increase our nation's resilience to the impacts and consequences flooding and coastal erosion.

We are committed to delivering on the commitments set out in the National Strategy.

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.

A handwritten signature in black ink that reads "John Griffiths". The signature is written in a cursive style with a large initial 'J' and 'G'.

John Griffiths AM

Minister for Environment and Sustainable Development

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Executive Summary

1. Flooding and coastal erosion are two of the biggest natural hazard risks affecting the safety and sustainability of communities across Wales.
2. 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.
3. 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.
4. 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.

Communities at Risk

5. When we talk about communities it is easy to forget that we are talking about people, their lives, their homes, their businesses and their local surroundings.
6. Floods pose a real risk to life posed and we have seen deaths across the UK and Europe in the floods of the recent past. Beyond risk to life, and as we saw in Gloucester in 2007 and in Cumbria in 2009, a flood can destroy homes and businesses in minutes. Local economies can be devastated, residents made homeless and communities destroyed. The effects, and particularly the impacts on health, can last for months, years or decades depending on the speed and impact of the flood.
7. With coastal erosion, the impacts often happen over a longer timescale, but are no less devastating for those affected. As with flooding, homes and businesses can be lost and lives devastated. As the risks of coastal erosion increase in the future we face the very real possibility of some coastal communities having to relocate further inland, or disappear.

Welsh Government Commitment

8. In October 2011 the Welsh Government published the Programme for Government, detailing how we will make a difference to the lives of people in Wales.

The Welsh Government is committed to ensuring that Wales has healthy people living productive lives in a more prosperous and innovative economy; that we have safer and more cohesive communities, with lower levels of poverty and greater equality; that our environment is resilient, with more sustainable use of our natural resources and that Welsh society has a vital sense of its own culture and heritage.

9. Managing the risks of flooding and coastal erosion across Wales is integral to delivering on these commitments.

10. By managing the frequency and consequences of flooding and coastal erosion we can improve the safety of our communities. Raising awareness of the risks communities face will not only mean that the individuals who live and work there are better prepared for the risks they face, but that communities are brought together and involved in the decisions on how to address those risks, fostering community cohesion.

11. Investment in flood and coastal erosion risk management schemes will provide economic opportunities at a local and national level, with new, sustainable and innovative approaches required to ensure that in future we move beyond defence and drainage alone, and find ways to work with natural processes.

12. The Welsh Government is committed to ensuring that the actions we take are sustainable, and that we manage the risks to our wider environment. Where necessary and appropriate we will take action to compensate for the loss of European designated habitats, and we will work with the Environment Agency, the Countryside Council for Wales and others to ensure that Welsh biodiversity is protected.

13. We will also be working with Cadw to ensure that risks to our historic and culturally significant landscapes are managed.

National Strategy

14. This is the first National Strategy for Flood and Coastal Erosion Risk Management in Wales. Prepared under the terms of the Flood and Water Management Act 2010 the National Strategy sets four overarching objectives for the management of flood and coastal erosion risk in 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; and
- **prioritising investment** in the most at risk communities

15. 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 reduce the risks we face and improve the quality of life for communities across Wales.

16. The publication of this 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, and the National Strategy itself will be reviewed in 2016.

Introduction

17. Flooding and coastal erosion are already a significant risk for communities across Wales. As the climate changes we can expect those risks to increase, with more frequent floods, more severe floods, rising sea levels and faster rates of erosion of the coast. We can also expect more communities to be affected by flooding and coastal erosion, including many that are not currently considered to be at risk.

18. When talking about flooding and coastal erosion risk it is important to remember that this includes a combination of the likelihood of an event occurring and the consequences of that event. It is also important to remember that both flooding and coastal erosion are natural processes that would occur without human intervention, though the risks they pose can be greatly increased as a result of human actions.

19. The three main sources of flood risk for Wales are the sea, rivers and surface water. A lot of information is available on the risks posed by the sea and rivers, and on the measures that can be used to reduce them. However, surface water flooding, to the extent that we are seeing now, is a more recent phenomenon – there is less information available on how to manage the risks it poses, which are distinct from those from the sea and rivers.

20. The main source of coastal erosion is the sea, though there are also risks from weathering and land slips. As with flooding from rivers and the sea there is a lot of information on the risks and the measures we can implement to reduce them, but increasingly we have to consider coastal erosion as part of a wider process of coastal change.

21. While some parts of the coast are eroding, others are accreting and we need to better understand these interactions if we are to ensure the interventions we make to these natural processes are appropriate.

Traditional Approaches

22. Historically the traditional approaches to managing the risks of flooding have been centred on the principles of drainage and defence. Most of Wales' cities, like Cardiff, Swansea and Newport, have been protected from flooding by a combination of river defences in the form of embankments and walls and local piped drainage systems.

23. Defence has also played a key role in addressing coastal erosion, with the construction of sea walls, groynes and other structures designed to hold the line of the shoreline, retain the beach and to reduce the impact of tides and waves on the land.

24. As communities have developed so has a significant network of flood defences, coastal protection and drainage infrastructure to help reduce the risks faced. Although these arrangements have generally worked well in the past, and are

still working in most parts of Wales, the effects of climate change impacts mean that the pressure on our existing infrastructure will increase significantly.

25. Indeed, no matter how efficient the drainage system, there is always a risk that its capacity will be exceeded, and no matter how big the defence structure, there is always a risk that it can be breached or over-topped. Therefore, there will always be a residual risk that drainage and defence alone cannot address.

26. In recognition of this the Welsh Government has championed a move from a system based on these traditional approaches alone to one focussed around the principles of risk management. This move towards a risk management approach is underpinned by the Flood and Water Management Act 2010.

Risk Management

27. Drainage and defence still have a place within a flood and coastal erosion system based on the principles of risk management, but we also need to consider other options that could reduce both the likelihood of an event occurring and the consequences of those events.

28. Other options could include:

- making more use of the natural environment, like wetlands or salt marshes;
- deploying sustainable drainage systems much more widely;
- incorporating greater resilience into the design of developments (houses, buildings, roads and paved areas);
- identifying areas suitable for inundation and water storage;
- enabling those at risk of flooding to play a proactive role in shaping the flood risk management service they receive;
- supporting people in taking actions to make their buildings, land and activities more resilient to flooding; and
- ensuring wider awareness of individual risk to increase levels of preparedness and planning for flooding events.

29. Adopting a risk management approach is about recognising that drainage and defence may not always be the most appropriate solution, and that some circumstances may require a complex and interlinked approach combining several different options.

30. So, for example, for a community that often experiences localised flooding, that affects streets and gardens, but rarely homes the solution may be about reducing the amount of hard paved surfaces or increasing drainage capacity by improving maintenance of gullies and culverts. In contrast, for coastal communities that are at threat from erosion, public engagement may be more important, so that those at risk understand how coastal change is likely to affect them, how it will be managed and how they should plan for the future.

31. In all cases it is important that the wishes of the community are fully considered.

32. The Welsh Government is committed to supporting the development of a fairer society in which every person is able to make the most of their abilities and contribute to the community in which they live. Public engagement with solutions to the risks their communities face is an important part of this commitment. A community aware of the risks it faces can take more informed decisions.

Sustainable Development

33. Underpinning all of the work on flood and coastal erosion risk management is the Welsh Government's commitment to sustainable development, in terms of well-being, as our core organising principle. The key aspects of well-being include taking action on social justice, poverty and equality and living within environmental limits, and these are all integral to delivering an effective flood and coastal erosion risk management system for all.

34. The Welsh Government is committed to delivering a flood and coastal erosion risk management system that puts the needs of the people of Wales first. We want to ensure that access to risk management measures is available to everyone, and that the most deprived communities in Wales receive the same level of service as the most affluent. Delivering effective flood and coastal erosion risk management systems is one way of delivering strong and safe communities where people want to live and work and where business wants to invest.

35. We are also committed to ensuring that the actions we take to deliver an effective flood and coastal erosion risk management system in Wales are environmentally sustainable. We want to preserve our natural resources for future generations and ensure that they do not face an increased level of risk as a result of our actions. By working with natural processes, we can deliver an effective system that operates within Wales' environmental limits.

A National Approach

36. Under the terms of the Flood and Water Management Act 2010 this National Strategy is required to identify:

- 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; and
- how the strategy contributes towards the achievement of wider environmental objectives.

37. In addition to these statutory matters we have taken into account the recommendations made by the Sustainability Committee of the National Assembly for Wales following their Inquiry into Flooding in Wales which reported in 2010.

38. We have also taken into account the recommendations of the Wales Audit Office set out in their report into Coastal Erosion and Tidal Flooding in Wales and the report of the Public Accounts Committee of the National Assembly for Wales of the same name.

39. All three reports were very detailed and provided useful and insightful recommendations for the development of a flood and coastal erosion risk management system for Wales.

40. In the coming years we will have to ensure that all investment in flood and coastal erosion risk management delivers the best possible outcome for affected communities. The Welsh Government will directly invest over £100 million in flood and coastal erosion risk management in Wales over the life of this Strategy, and will also seek to increase opportunities to access funding from other sources. This includes opportunities for investment from the private sector and direct investment from communities where appropriate.

41. 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 Welsh Risk Management Authorities including the Environment Agency, the Local Authorities and the water and sewerage companies to ensure that we develop a holistic and sustainable flood and coastal erosion risk management system for Wales'

Section 1 - Flood and Coastal Erosion Risk Management in Wales

42. The climate is changing. Climate projections suggest that in the coming years Wales is likely to experience hotter, drier summers and warmer, wetter winters. Projections suggest that Wales will also see higher sea levels, increases in the intensity of rainfall and more frequent flooding.

43. As a result of these projected changes to the climate, more of us are likely to experience flooding, the consequences of that flooding will be greater, and the risks to life, the economy and the environment will increase. In addition to this, rates of coastal erosion are likely to increase, with more coastal communities facing the risks of both the loss of land and the loss of resources.

44. It is not possible to completely prevent flooding or stop coastal erosion; both are natural processes that happen regardless of human actions. However, we can take steps to manage the risks they present and reduce both their likelihood and their consequences.

45. Better management of the risks of flooding and coastal erosion is integral to delivering the Welsh Government's wider Programme of Government for Wales, supporting the development of strong, safe communities and securing sustainable investment in the Welsh economy and environment.

Defining Flood and Coastal Erosion Risk

46. Flood is defined within the Flood and Water Management Act 2010¹ as;

"...any case where land not normally covered by water becomes covered by water."

47. Under the terms of the Flood and Water Management Act 2010, a flood within the governing legislation does not include a flood from any part of a sewerage system (unless caused by an increase in rainwater entering and affecting the system) or a flood caused by a burst water main. Both of these events are dealt with by water and sewerage companies under the Water Industry Act 1991.

48. Despite this exclusion, the Welsh Government is aware that sewer flooding in particular can be very distressing for those affected. Reduction of sewer flooding is a key priority, and while primarily the responsibility of water and sewerage companies will require the involvement and cooperation of all Risk Management Authorities. Details on our policies in this area are contained in *Annex A: Sources of Flooding and Coastal Erosion*.

49. The main sources of flooding in Wales today are:

- sea flooding;

¹ Flood and Water Management Act 2010: www.legislation.gov.uk/ukpga/2010/29/contents.

- river flooding, including main rivers and ordinary watercourses; and
- surface water flooding

50. Currently around 357,000 properties in Wales, or one in six properties, are at risk of flooding from rivers, the sea and surface water². There are however other sources of flood risk including:

- the failure of dams;
- the failure of defence structures;
- canal breaches;
- groundwater and other water sources; and
- sewer flooding.

51. Detailing individual sources of risk does not imply that flooding can only ever occur for one reason, or that coastal erosion only ever has one outcome. Any and all of these 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, to increase the risk of either or both.

52. Within the Flood and Water Management Act 2010 Coastal erosion is defined as:

“...the erosion of the coast of any part of England or Wales.”

53. The shoreline is constantly changing shape due to the action of waves, tides and currents. These processes are causing long term changes but during coastal storms there can be dramatic loss of land such as cliff falls and land slips.

54. 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.

55. 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.

56. More information on the sources of flooding and coastal erosion is set out in *Annex A: Sources of Flooding and Coastal Erosion*.

57. When considering the risk associated with flooding and coastal erosion, the term *risk* encompasses two things:

- the *likelihood* of an event happening; and
- the *consequences* that will result if an event occurs.

² Flooding in Wales: www.environment-agency.gov.uk/research/library/publications/108958.aspx.

58. Both the likelihood and consequences of flooding and coastal erosion are anticipated to increase over time for a number of reasons.

Likelihood of Flooding and Coastal Erosion

59. The likelihood of flooding depends on a number of factors, including weather patterns, geology, topography and land use. A period of prolonged rainfall, for example, is likely to result in higher river levels, which increases the likelihood of a flood: it is more likely that the rivers will overflow.

60. In other circumstances, very heavy or intense rainfall events can increase the likelihood of rapid flooding of rivers and surface water flooding as the ground struggles to absorb the water, or where the drainage system is not able to carry the volume of water.

61. Differences in geology, topography, soil type and land use can also affect absorption rates, possibly increasing the likelihood of flooding. More severe surface water flooding is generally seen in urban areas, for example, where the number of impermeable surfaces like roads and pavements are higher.

62. Low lying coastal areas, or river flood plains also have an increased likelihood of flooding as a result of their proximity to water sources. Floodplains are a natural feature of the landscape.

63. The likelihood of coastal erosion and the rate at which it occurs also depends on a number of factors, including the prevailing sea conditions, the frequency and severity of coastal storm events, the amount of sand or shingle on a beach, sea levels, wave height and intensity, and the geology and topography of the coast and near shore zone area.

64. Harder rocks generally erode slowly, with impacts being more gradual. In contrast, erosion of softer rock formations or sand dunes will usually be faster, and this speed of erosion can pose a risk to coastal communities.

65. The level of beaches can be lowered by waves and tidal currents moving sand and shingle along the coast. This sediment transportation can expose the landmass behind the beach to bigger waves and increased erosion risk.

Consequences of Flooding and Coastal Erosion

66. Flooding and coastal erosion can have a variety of consequences and impacts, and in each case the consequences of the events differ.

67. All flood events carry a risk to life, either for those directly affected or for others involved in attempting to help those directly affected. The dangers of flood waters cannot be overstated. However, beyond the risk to life there are other consequences associated with flooding which must be considered.

68. During a flood event physical consequences can include the deposition of debris, mud and sewage in streets and properties. Buildings and structures can be

damaged and in extreme cases, like those in Cumbria in 2009, bridges and smaller scale constructions may be washed away or damaged by debris in the water. Roads can become impassable due to heavy water flow and in rural areas agricultural land and livestock can be lost.

69. All flooding poses a risk to Wales' national infrastructure, which comprises the facilities, systems, sites and networks necessary for the delivery of the essential services upon which daily life in Wales depends.

70. There are nine national infrastructure sectors which provide these essential services and the UK's infrastructure protection effort is organised around these nine sectors:

- Transport
- Water
- Health
- Communications
- Emergency Services
- Energy
- Finance
- Food
- Government

71. Not everything within a national infrastructure sector is 'critical'. In the sectors there are certain 'critical' elements of infrastructure, the loss or compromise of which would have a major, detrimental impact on the availability or integrity of essential services, leading to severe economic or social consequences or to loss of life. These 'critical' assets make up the nation's critical national infrastructure (CNI) and are referred to individually as 'infrastructure assets'. Infrastructure assets may be physical (e.g. sites, installations, pieces of equipment) or logical (e.g. information networks, systems)³.

72. Any damage to infrastructure assets can hamper rescue efforts during flood events, especially when transport infrastructure or the emergency services are affected. It can also make the effects more widespread, with the loss of energy substations or water or sewerage treatment works possibly affecting communities some distance from the floods themselves.

73. After the immediate consequences of the flood have been addressed, the process of clearing up begins. Clearing up can take anything from hours to months depending on the scale of the physical damage. In small scale flood events residents may be able to return to properties relatively quickly. In larger flood events, this may take considerably longer.

³ Taken from the website of the Centre for the Protection of National Infrastructure - www.cpni.gov.uk/about/cni/.

74. In some cases substantial structural work may be required to properties, often taking months. Temporary accommodation may become more permanent, with families experiencing significant disruption. Road and rail infrastructure may need to be repaired, alternative accommodation sought for GP surgeries, schools and hospitals and local residents re-housed.

75. If those affected do not have cover for flooding within their buildings and contents insurance, the financial consequences of flooding can be catastrophic. This is something that often adversely affects the poorer parts of society, where individuals cannot afford the insurance premiums. This can often delay action during flood events, as people may be reluctant to leave their homes and possessions or their businesses.

76. Flood damage to infrastructure and businesses can also affect employment and supply chains as local businesses may cease trading. The financial cost of the 2007 flooding in England has been put in the region of £3 billion⁴. Average annual costs of flooding in Wales are in the region of £200 million⁵.

77. The economic impact of flooding on a personal, regional and national level cannot be overstated. However, perhaps the most marked long-term impact is that on the wellbeing of those who have experienced flooding.

78. Medical treatment can be required for everything from minor scrapes and bruises through to broken limbs, placing additional requirements on the NHS. Where flood waters have been contaminated with sewage other ailments may occur. Depression, shock and mental health impacts often emerge in the longer term as the full scale of the physical damage emerges.

79. These effects can be particularly pronounced in certain vulnerable sections of the community. While flood water does not discriminate, and affects all sections of the community, certain groups are less able to cope with the effects of flooding. Elderly and disabled residents may require additional support to be evacuated during an event and temporary accommodation may not suit their health needs, making the effects of displacement more marked.

80. There may also be a disproportionate effect on some minority ethnic communities who may not understand or be able to access warnings because of language or cultural barriers, and who may find certain aspects of the rescue and recovery operation distressing for cultural or religious reasons.

81. For coastal erosion the impacts and consequences often take longer to become evident, but are no less devastating.

82. The first visible sign of erosion is often the loss of sand or shingle from a beach, exposing the underlying rock, mud, or peat. The loss of a beach exposes the land behind to bigger waves thereby increasing both the risk of erosion and the risk of sea walls and defences failing and being overtopped.

⁴ Taken from Environment Agency Report: The cost of Summer 2007 floods in England.

⁵ Figure taken from the Environment Agency report 'Future Flooding in Wales: flood defences' (2010).

83. Erosion does not occur at a constant rate and usually happens as discrete sections of cliff or land fall onto the foreshore at various stages. Coastal landslides can result in large areas of land slipping into the sea.

84. Historically coastal erosion has been low in Wales and it has been estimated that 1.4 km² of land and three properties have been lost to coastal erosion over the last 100 years⁶. With sea levels projected to rise by around a metre over the next 100 years⁷, both coastal erosion and the impacts on coastal communities are set to increase significantly.

85. Properties at risk of erosion are unlikely to be able to access insurance, often resulting in financial hardship for residents living there. Families may be unable to sell their properties, or only able to do so at a reduced value and so may feel trapped in houses at risk of structural damage or which will ultimately be lost.

86. As with flooding, the risk of coastal erosion carries long term health impacts, with depression and other mental health issues arising.

87. In addition to the human cost, both flooding and coastal erosion change the landscape; 75% of the Welsh coast is designated for its environmental importance and is therefore protected. Where coastal protection works lead to a loss of habitat within European designated sites, known as Natura 2000 sites, additional habitat will need to be provided to compensate for these losses. This will place more pressure on coastal resources and finances.

88. While some natural habitats also serve a flood defence function in their own right, other sensitive habitats may be damaged or lost to coastal erosion. Ecosystems can be destroyed or damaged to the point where they take many years to recover. This is directly damaging to the local environment and can also have wider cultural, social and economic impacts from the loss of ecosystem services.

89. Soil loss as a result of flooding can be significant as it supports agriculture biodiversity and can impact on water quality.

90. Some of our culturally significant sites are located in areas at risk of flooding and/or erosion. Natural and constructed tourist sites such as coastal paths, nature reserves, monuments and beaches are in at risk areas and there are some concerns that as these amenities erode, tourist levels may decline.

Climate Change

91. Climate change projections suggest that weather patterns will continue to change and that Wales will experience an increase in the intensity of rainfall, the frequency of sudden storms, and a rise in sea levels. Taken together these factors are likely to increase the likelihood and consequences of flooding and coastal erosion.

⁶ Taken from Environment Agency report 'Historical Losses to Coastal Erosion – Wales Region' commissioned for the National Coastal Erosion Risk Mapping project.

⁷ Taken from the medium emissions scenario set out within the UK Climate Projections 2009 using the central estimate of probability.

92. The evidence of the increasing risks from both flooding and coastal erosion is underpinned by a series of reports produced in the last few years including the *Foresight: Future Flooding Study*⁸, the *Stern Review on the Economics of Climate Change*⁹ and most recently, the *Pitt Review into the Summer 2007 Floods*¹⁰.

93. The key findings¹¹ for Wales from the UK Climate Projections 2009 suggest that by 2050:

- average annual temperatures are projected to increase by 2.3°C;
- summer daily maximum temperatures are projected to increase by 3.4°C;
- winter daily minimum temperatures are projected to increase by 2.5°C;
- rainfall is projected to increase in winter on average by 14 per cent and decrease in summer by 16 per cent;
- sea levels around Wales are predicted to rise by approximately 20cm; and
- storm intensity in summer and winter will increase, leading to more severe storms and larger waves attacking our shores.

94. If the rate of climate change is faster than suggested in the medium emissions scenario set out above, then the impacts are likely to be more severe. For example, higher sea levels than those suggested could result in even greater rates of erosion to our coast. Likewise, if the rate is slower then the impacts are expected to be less severe.

95. The projections are based on the best available information but there are still uncertainties. It is important that Risk Management Authorities consider the range of possible future climates when proposing ways to manage the risks of flooding and coastal erosion. Building in an ability to adapt approaches to address future changes in risk should also be considered.

96. The projected changes in sea levels and rainfall patterns will alter the way flooding and coastal erosion affects Wales. Unless steps are taken to manage these changes, sea level rises will increase the likelihood of flooding and the erosion of the coast and changes in rainfall patterns will result in more rapid floods.

97. Climate change is also expected to lead to changes in soil composition. A reduction in the carbon content of soil will lead to a reduction in the capacity of the soil to absorb rainfall. Climate change impacts are complex and interrelated and the full impact of climate change needs to be understood, not just its impact on rainfall events.

98. The Welsh Government is working with the Environment Agency to develop updated guidance on what Risk Management Authorities should plan for in relation

⁸ Foresight: Future Flooding Study - see Annex D.

⁹ Stern Review on the Economics of Climate Change - see Annex D.

¹⁰ Pitt Review: Learning Lesson from 2007 Floods - see Annex D.

¹¹ The key findings have been taken from the medium emission scenario, using the central estimate of probability.

to climate change when undertaking flood or coastal erosion risk management works, which will be available later in 2011. Information and advice on how people can improve their resilience to flooding is also available from the Environment Agency via their Floodline service.

99. It is important to understand the nature of the risks posed by climate change and the need to constantly assess how climate change is actually proceeding, compared with what has been planned for so that plans such as Catchment Flood Management Plans, Shoreline Management Plans and Local Flood Risk Management Strategies can be adjusted accordingly. To that end the Welsh Government is funding the Wales Coastal Monitoring Centre to collate and analyse the coastal monitoring data currently collected in Wales and provide a better understanding of actual change.

Demographics and Cultural Change

100. The likelihood and consequences of flooding and coastal erosion will also be influenced by changes in population levels, wealth and settlement patterns, as well as the way that land is managed.

101. More people living and working in an area that is at risk of flooding or erosion means that the consequences will be greater when events occur. All flooding poses a risk to life and in some more densely populated areas, where there may be very little time for residents to be warned, prepare themselves or be evacuated, that risk is increased.

102. The consequences of flooding are generally felt more by the vulnerable sections of the community including elderly and disabled residents as they are often less able to react to warnings. They may also be more adversely affected in the aftermath of events, especially if they cannot access the care and support services they require.

103. Poorer communities are generally hit harder by the financial losses caused by flooding, as they may have no or limited flood insurance coverage.

104. Modern homes contain more fixed fittings and possessions than those of past generations. Items likely to be damaged or lost include fitted kitchens, carpets and electrical goods. These are often proportionately more expensive for poorer communities in the first instance and as the value of these assets increase so do the financial costs of their replacement, increasing the potential financial consequences of both flooding and coastal erosion.

Risk Management

105. Traditionally, approaches to both flood and coastal erosion risk have focussed on the construction of defences.

106. These defences have provided communities with a certain level of protection from the impacts and consequences of both flooding and coastal erosion. However,

no defence can remove the risk 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.

107. 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.

108. 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.

109. 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.

110. Both the *Foresight: Future Flooding Study* and the *Stern Review on the Economics of Climate Change* recommended a move towards a risk management approach to flood and coastal erosion risk, which goes further than defence alone. Working with natural processes can contribute to a more sustainable ecosystem management approach, as promoted by the Welsh Government's Natural Environment Framework,¹² and also help deliver the requirements of the Water Framework Directive¹³.

111. A risk management approach encompasses a range of measures to help communities as well as the wider environment. By working with natural processes and applying the ecosystem approach, risk management measures can also be more sustainable, providing a holistic and flexible system suitable for the needs of Wales in the 21st Century.

112. 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;

¹² Natural Environment Framework:
wales.gov.uk/topics/environmentcountryside/consmanagement/nef/?lang=en.

¹³ Water Framework Directive:
wales.gov.uk/topics/environmentcountryside/epg/waterflooding/waterframework/?lang=en.

- 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.

Risk Management Authorities

113. Within Wales the Welsh Government has overall responsibility for all matters relating to flooding and coastal erosion.

114. The setting of national policy in relation to flood and coastal erosion risk management in Wales is a matter for the Welsh Ministers, who are also responsible for all legislation and the majority of the public sector funding invested in risk management works.

115. Flood and coastal erosion risk management is an important aspect of the work of the Welsh Government, making a significant contribution to the safety and prosperity of communities and businesses across Wales.

116. In implementing national policies, the Welsh Government is supported by a number of organisations. It is not possible for any one body to deliver the full range of flood and coastal risk management services across Wales. In recognition of this, the Flood & Water Management Act 2010 identifies specific bodies as 'Welsh Risk Management Authorities'.

117. Welsh Risk Management Authorities are defined as being:

- the Environment Agency;

- a Lead Local Flood Authority for an area wholly in Wales;
- a district council for an area with no unitary authority for an area wholly in Wales;
- an Internal Drainage Board for an internal drainage district wholly or mainly in Wales;
- a water company that exercises functions in relation to an area in Wales; and
- a highway authority for an area wholly in Wales.

118. In relation to Wales, a Lead Local Flood Authority is the county or county borough council for an area. In effect this makes each of the Local Authorities a Lead Local Flood Authority as they are all unitary authorities.

119. Certain Local Authorities are also designated as coastal erosion risk management authorities under the Coast Protection Act 1949¹⁴. Local Authorities in Wales also act as highways authorities in respect of local roads.

120. This means that there are 31 Risk Management Authorities as follows:

- the Environment Agency;
- the 22 Lead Local Flood Authorities;
- the three Internal Drainage Boards that are wholly or mainly in Wales¹⁵;
- the one water and sewerage company¹⁶ which serves Wales and the borders;
- the one water and sewerage company that serves parts of mid Wales¹⁷;
- the one water and sewerage company¹⁸ in Wales;
- the one water supply only company¹⁹ in Wales; and
- the one water supply only company²⁰ which serves Wales and the borders.

¹⁴ The Coast Protection Act 1949 was amended by virtue of Schedule 2 to the Flood and Water Management Act 2010. Previously coastal erosion risk management authorities were known as coast protection authorities and are often referred to as maritime Local Authorities.

¹⁵ The Environment Agency Wales administers a further 11 Internal Drainage Districts in North West Wales.

¹⁶ Dŵr Cymru Welsh Water provides water supply and sewerage services to over three million people in Wales and some of its adjoining areas.

¹⁷ Severn Trent Water provides water and sewerage services to over 8 million customers across the heart of the UK, stretching from the Bristol Channel to the Humber, and from mid-Wales to the East Midlands. ¹⁷ Severn Trent Water provides water and sewerage services to over 8 million customers across the heart of the UK, stretching from the Bristol Channel to the Humber, and from mid-Wales to the East Midlands.

¹⁸ Scottish and Southern Water provide water supply and sewerage services for the Valleywood site, Llanillid, Bridgend.

¹⁹ Albion Water delivers a bulk supply of potable and non-potable water to Shotton Paper Mill in Flintshire.

²⁰ Dee Valley Water plc is a water only supply company. The area of supply covers 831 square kilometres in North East Wales and the North West of England.

121. This may seem like a large number of bodies, and there have been calls in the past to establish a single body responsible for flood and coastal erosion risk management in Wales. This is something the Welsh Government has considered, but the sources and impacts of flooding and coastal erosion are diverse and require different skills and techniques to manage.

122. It would be difficult to establish one body to deliver all the various risk management measures required. There would also be considerable disruption during any transition period that would affect the quality of service. As a consequence, and in recognition of the need for greater collaboration, the Flood and Water Management Act 2010 imposes a duty to cooperate on the Risk Management Authorities to facilitate partnership working, the sharing of information and enhanced communications.

123. The Welsh Government and all the Risk Management Authorities are committed to delivering a service that, for the user, has the appearance of single body designed to meet their needs, realised through effective partnership working. The Flood and Water Management Act 2010 supports this by providing flexibility for Risk Management Authorities to work together to deliver flood and coastal erosion risk management solutions appropriate to local needs.

124. The potential long term benefits of adopting a flexible, partnership approach could include:

- reduced consequences of flooding;
- reduced costs of flood risk management activities;
- improvements in water quality, with less combined sewer overflows;
- reduced new sewer flooding problems; and
- increased capacity for new development.

125. There are other bodies that, whilst they have not been included as Risk Management Authorities, have responsibilities or functions that are informed by flood and coastal erosion risk management policies.

126. For instance the National Park Authorities have certain planning responsibilities that are informed by flood and coastal erosion risk management policies. Also Network Rail manages many kilometres of infrastructure which in many cases performs a flood and coastal defence function. These other organisations have an important role to play in protecting the communities at risk and Risk Management Authorities will need to engage and collaborate with such organisations to deliver flood and coastal risk management policies.

127. A summary of the differing roles and responsibilities of all the Risk Management Authorities is set out at *Annex B: Risk Management Authorities*.

128. Contact details for the Risk Management Authorities in Wales are set out in *Annex C: Contact Details* together with the contact details of other organisations that have an interest in flood and coastal erosion risk management.

Section 2 – Objectives for Managing Flood and Coastal Erosion Risk in Wales

129. The move towards flood and coastal erosion risk management in recent years has been made in recognition of the limitations of flood and coastal defence.

130. It is not possible to prevent all floods or stop coastal erosion, but by working together and employing a wider range of risk management measures, improvements can be made to the way the impacts and consequences of flooding and coastal erosion are managed.

131. 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.

132. 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; and

- takes account of the requirement of relevant European and domestic legislation including the Flood Directive, the Water Framework Directive and the Habitats Directive

Objectives for Managing Flood and Coastal Erosion Risk

133. The Welsh Government has set **four overarching objectives** for managing flood and coastal erosion risk in Wales over the life of the National Strategy:

- **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; and**
- **prioritising investment in the most at risk communities.**

134. These objectives will be delivered through the following measures.

Objective 1

Reducing the impacts on individuals, communities, businesses and the environment from flooding and coastal erosion

Sub-objective 1	Provide Strategic Leadership and Direction at a National Level	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	The provision of overarching national policies for the management of flood and coastal erosion risk through a National Strategy and associated guidance.	End of 2011	Welsh Government	Risk Management Authorities, Countryside Council for Wales
	The provision of national guidance relating to sustainable development, when exercising flood and coastal erosion risk management functions.	End of 2011	Welsh Government	Risk Management Authorities
	The provision of national guidance on the preparation of Local Flood Risk Management Strategies by Lead Local Flood Authorities.	End of 2011	Welsh Government	Risk Management Authorities
	Development of a toolkit to assist in raising community	End of 2011	Welsh Government	Risk Management Authorities

	awareness and preparation for of flood and coastal erosion risk.			
	Development of National Standard for Sustainable Drainage Systems and accompanying guidance	End of 2013	Welsh Government	Risk Management Authorities, Countryside Council for Wales, Developers
	Undertaking of a review of national policies in relation to coastal risk management including research on the options for communities facing increasing levels of risk.	End of 2013	Welsh Government	Risk Management Authorities, Countryside Council for Wales
	Development of a national funding policy and prioritisation methodology for the assessment of applications for funding for all flood and coastal erosion risk management activities funded from the Welsh Government.	End of 2013	Welsh Government	Risk Management Authorities, Countryside Council for Wales
	Establishment of a principle for ensuring access to buildings and contents flood insurance to replace the Statement of Principles.	June 2013	Welsh Government	Insurance Companies

	Drafting and commencement of legislation relating to flood and coastal erosion risk management as required through the life of this Strategy.	End of 2017	Welsh Government	Risk Management Authorities
	Raising awareness of the implications of flood and erosion risk across all business sectors over the life of this Strategy.	End of 2017	Welsh Government	Risk Management Authorities
	Delivery of a Climate Change Adaptation Knowledge Transfer Programme	Ongoing	Welsh Government	Risk Management Authorities

Sub-objective 2	Provide Strategic Leadership and Direction at a local Level	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Delivery of a coastal erosion map for Wales	2012	Environment Agency	Welsh Government, Risk Management Authorities, Countryside Council for Wales, Network Rail, National Parks Authorities

	<p>Delivery of the second round of Shoreline Management Plans by 2012 with proportionate implementation over the life of the Strategy.</p>	<p>2012</p>	<p>Coastal Groups</p>	<p>Welsh Government, Risk Management Authorities, Countryside Council for Wales, Network Rail, National Parks Authorities</p>
	<p>Development of the National Habitats Creation Programme as part of delivery of the Natural Environment Framework.</p>	<p>Delivery by 2012 with proportionate implementation by 2017</p>	<p>Environment Agency</p>	<p>Welsh Government, Risk Management Authorities, Countryside Council for Wales, National Parks Authorities</p>
	<p>Development of Local Flood Risk Management Strategies.</p>	<p>Delivery by 2013 with proportionate implementation by 2017</p>	<p>Lead Local Flood Authorities</p>	<p>Welsh Government, Risk Management Authorities, Countryside Council for Wales,</p>
	<p>Implementation of statutory responsibilities including those set out within the Flood and Water Management Act 2010 and the Flood Risk Regulations.</p>	<p>Statutory deadlines are set out within the relevant legislation. All deliverables should be complete by 2015 with proportionate implementation by 2017</p>	<p>Risk Management Authorities</p>	<p>Welsh Government, Risk Management Authorities</p>

	Appropriate mapping of all sources of flood risk.	2015	Welsh Government	Risk Management Authorities
	Proportionate implementation of the Catchment Flood Management Plans over the life of the Strategy.	2017	Environment Agency	Welsh Government, Risk Management Authorities, Countryside Council for Wales, National Parks Authorities, Network Rail, landowners

Sub-objective 3	Develop policies for effective land use management and enhanced development control procedures where appropriate	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Development of Local Development Plans that include adequate provisions in respect of flood and coastal erosion risk.	Ongoing	Local Planning Authorities	Welsh Government, Risk Management Authorities, Developers
	Compliance with the requirements of Planning Policy Wales and relevant Technical Advice Notes.	Ongoing	Local Planning Authorities	Welsh Government Risk Management Authorities, Developers
	Provision of appropriate advice on flood and coastal	Ongoing	Welsh Government	Risk Management Authorities, Developers

	erosion risk in relation to planning applications.			
	Appropriate undertaking of Strategic Flood Consequence Assessments and their use to inform Local Development Plans.	Ongoing	Local Planning Authorities	Welsh Government, Risk Management Authorities, Developers
	Approval and adoption of SuDS drainage systems by the SuDS Approving and Adopting Body.	Ongoing from 2013	SuDS Approving and Adopting Body (Local Authorities)	Welsh Government, Environment Agency, Developers
	Provision of advice and guidance on appropriate land use management.	Ongoing	Welsh Government	Risk Management Authorities, landowners

Sub-objective 4	Establish regular maintenance schedules for flood and coastal erosion risk management assets	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Development of a register of natural and manmade structures or features likely to have an effect on flood risk by 2014.	Ongoing	Lead Local Flood Authorities	Welsh Government, Environment Agency, Water and Sewerage Companies, Internal Drainage Boards, Countryside Council for Wales, Network Rail, Riparian Owners

	Establishment of a programme of regular and appropriate maintenance for flood and coastal erosion risk management assets.	Ongoing	Risk Management Authorities (in relation to their own assets)	Welsh Government, Risk Management Authorities
	Designation of natural and manmade structures or features likely to have an effect on flood or coastal erosion risk over the life of the Strategy.	Ongoing from 2012	Environment Agency, Lead Local Flood Authorities and Internal Drainage Boards	Welsh Government, Risk Management Authorities, Countryside Council for Wales, Network Rail, Riparian Owners

Objective 2

Raising awareness of and engaging people in the response to flood and coastal erosion risk

Sub-objective 5	Ensure that by 2026 everyone who lives in a flood risk area understands the flood risk they are subject to, the consequences of this risk and how to live with that risk	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Continuation and development of Flood Awareness Wales.	Ongoing	Environment Agency	Welsh Government, Risk Management Authorities, Community Groups, Members of the Public

	Programme of community based awareness and engagement activities, utilising the Flood Risk Management Community Engagement Toolkit.	Ongoing from 2012	Environment Agency, Lead Local Flood Authorities	Welsh Government, Risk Management Authorities, Community Groups
	Identification of at risk groups within communities, including vulnerable individuals.	2017	Lead Local Flood Authorities	Welsh Government, Risk Management Authorities, Community Groups, Town & Community Councils
	Development of a national Single Point of Contact for queries relating to flood risk.	2013	Welsh Government	Risk Management Authorities
	Continuation and expansion of the Floodline Warning Direct Service over the life of the Strategy.	2017	Environment Agency	Welsh Government, Risk Management Authorities

Sub-objective 6	Enhance property and community level resilience	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measure	Ensure property level flood resilience measures and the requirements for SuDS are incorporated into Building Regulations.	2017	Welsh Government	Risk Management Authorities, Developers

	Enhanced awareness of property level resilience measures and guidance on their use.	Ongoing	Welsh Government	Risk Management Authorities
	Development of a sustainable methodology for funding individual property level resilience measures.	2014	Welsh Government	Risk Management Authorities, Insurance Companies, Community Groups
	Provision of appropriate warnings in relation to all sources of flooding.	Ongoing	Environment Agency	Risk Management Authorities, Met Office, Emergency Planners

Objective 3

Providing an effective and sustained response to flood and coastal erosion events

Sub-objective 7	Ensure the preparation and testing of Emergency Plans	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Complete emergency plans for all sources of flood risk.	Ongoing	Category 1 and 2 responders under the Civil Contingencies Act	Welsh Government, Risk Management Authorities, Utility Companies, Emergency Services
	Development of community level emergency plans, as	Ongoing	Environment Agency	Welsh Government, Risk Management

	required by relevant communities.			Authorities, Utility Companies, Emergency Services, Community Groups
	A pan-Wales emergency exercise to test response and recovery arrangements by 2016.	2016	Welsh Government	Welsh Government, Risk Management Authorities, Utility Companies, Emergency Services
	Local level emergency exercises to test response and recovery arrangements over the life of the Strategy.	Ongoing	Category 1 and 2 responders under the Civil Contingencies Act	Category 1 and 2 responders under the Civil Contingencies Act

Sub-objective 8	Respond to events in a timely and appropriate manner	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Early and appropriate response to emergency events for all events.	Ongoing	Category 1 and 2 responders under the Civil Contingencies Act	Welsh Government, Risk Management Authorities, Emergency Services
	Development and implementation of effective evacuation protocols for emergency events	Ongoing	Category 1 and 2 responders under the Civil Contingencies Act	Welsh Government, Risk Management Authorities, Emergency Services
	Development of mutual aid protocols for resources,	Ongoing	Category 1 and 2 responders under the	Welsh Government, Risk Management

	<p>equipment and respite for emergency events.</p> <p>Identification and provision of suitable respite accommodation as appropriate over the life of the Strategy.</p>	Ongoing	<p>Civil Contingencies Act</p> <p>Local Authorities</p>	<p>Authorities, Emergency Services</p> <p>Welsh Government, Risk Management Authorities, Emergency Services</p>
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Sub-objective 9	Facilitate recovery from flooding within the shortest possible timescales	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Development of procedures for the effective clearance of debris.	Ongoing	Lead Local Flood Authorities	Welsh Government, Environment Agency, Countryside Council for Wales, Community Groups
	Development of repair schedules including provision for the installation of resilient measures by 2015.	Ongoing	Lead Local Flood Authorities	Welsh Government, Environment Agency, Countryside Council for Wales, Community Groups, Insurance Companies
	Investigations into the causes of flooding to be undertaken where necessary within one month.	Ongoing	Lead Local Flood Authorities	Welsh Government, Environment Agency, Countryside Council for Wales, Community Groups

Objective 4

Prioritising investment in the most at risk communities

Sub-objective 10	Develop a National Programme of investment for flood and coastal erosion risk management	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Undertake research into the costs and benefits of softer engineering approaches including the use of natural processes to flood and coastal erosion risk management.	2013	Welsh Government	Risk Management Authorities, Countryside Council for Wales
	Guidance on the comparative use of hard and soft engineering approaches to flood and coastal erosion risk management to be issued by 2013.	End of 2013	Welsh Government	Risk Management Authorities, Countryside Council for Wales
	Development of a national funding policy and prioritisation methodology for the assessment of applications for funding for all flood and coastal erosion risk management activities	End of 2013	Welsh Government	Risk Management Authorities, Countryside Council for Wales

	funded from the Welsh Government.			
	Development of a national priority schedule for flood and coastal erosion risk management schemes.	2014	Welsh Government	Risk Management Authorities, Countryside Council for Wales
	Development of a business case for the establishment of a single capital funding programme for Wales.	2014	Welsh Government	Risk Management Authorities, Countryside Council for Wales

Sub-objective 11	Increase the use of alternative sources of funding for flood and coastal erosion risk management	Delivery Deadline	Who will Lead Delivery	Relevant Stakeholders
Measures	Development of a national policy on the use of contributions towards flood and coastal erosion risk management schemes, including the National Habitat Creation Programme	2014	Welsh Government	Risk Management Authorities, Insurance Companies, Community Groups, Developers

Section 3 – Funding Flood and Coastal Erosion Risk Management

Funding Requirements

135. The risk and consequences of flooding and coastal erosion present a significant financial cost, both to the individuals affected and to the wider Welsh economy. As the climate changes that cost is expected to increase.

136. Estimates of future funding requirements set out in the 2010 Environment Agency report, *Future Flooding in Wales: flood defences*²¹ suggest that simply to maintain current levels of risk over the next 25 years – with one in six properties at risk of flooding in 2035 - Wales might need to treble current investment levels. To reduce levels of risk even slightly, more funding would be required again.

137. At present the majority of funding for flood and coastal erosion risk management in Wales comes directly from the Welsh Government. As the level and nature of risk changes in the future, Welsh Risk Management Authorities will need to find other sources of funding to ensure that communities across Wales receive the levels of funding they need to manage the risks they face.

Welsh Government Budgets

138. The Welsh Government receives its budget from the UK Government. The level of the budget is set by UK Government Spending Reviews and any subsequent adjustments. Adjustments to the Welsh budget are calculated through the Barnett formula.

139. Decisions on the allocation of funding to the devolved functions are made by the Welsh Ministers.

140. In 2011/12 the Welsh Government committed £36.6 million to flood and coastal erosion risk management in Wales. That funding is a mixture of capital funding, used mainly for the construction of defences, and revenue funding which is used for maintenance of existing defences and for a range of other costs including flood awareness initiatives, flood forecasting and warning systems and developing flood maps and models.

141. The Welsh Government allocates the majority of its budget for flood and coastal erosion risk management to the Environment Agency, with some funding retained for grants to local authorities, to fund research and development and to meet the costs of implementing new legislation. In doing so, the Welsh Government also set the proportion of the budget that is to be used for capital and revenue purposes.

²¹ Future Flooding in Wales: Flood Defences - www.environment-agency.gov.uk/research/library/publications/116654.aspx.

142. The breakdown of the budget for 2011/12 in millions was as follows:

	Capital	Revenue	Total
Welsh Government		2.664	2.664
Environment Agency	9.0	17.0	26.0
Local Authorities	8.0		8.0
Total	17.0	19.664	36.664

143. Of the £2.664 million in revenue funding retained by the Welsh Government £2 million was paid to local authorities in Wales in grants to assist with the implementation of the Flood and Water Management Act 2010.

Future Budgets

144. Welsh Government budgets are proposed three years in advance, however, they are still subject to an annual review as part of our Resource Assessment Exercise. During the Resource Assessment Exercise, all Welsh Government departments are required to submit business cases setting out their objectives and funding requirements for the next three years. These are then used to either confirm or adjust budget proposals.

145. The Final Budget 2011-12, which was approved by the National Assembly in February 2011, set indicative allocations for flood and coastal erosion risk management in future years was as follows:

- 2012/13 - £35.7 million; and
- 2013/14 - £37 million.

146. These figures represent the total Welsh Government funding, including both capital and revenue funding. While we have previously been in a position where budgets were increasing annually, this is now no longer the case.

147. The level of funding available to the Welsh Ministers is constrained by the amount of funding allocated to Wales by the UK Government through the annual block grant. This in turn is affected by the UK Government Comprehensive Spending Review (CSR) at UK level.

148. The last UK Spending Review took place in October 2010 and covers the four years from 2011-12 to 2014-15. As anticipated the Welsh Government received a reduced budget. Capital programmes were particularly affected, including those for flood and coastal erosion risk management.

149. In recognition of the increasing funding constraints we are proposing a number of actions to ensure more effective and efficient 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.

150. These proposals will be factored into all future Welsh Government decisions on budgets for flood and coastal erosion risk management in Wales. To support their implementation the Welsh Government will seek to maximise the effectiveness of its core funding for flood and coastal erosion risk management, and to access additional and alternative sources of funding where available.

Additional Funding

151. Wales currently benefits from European Structural Funds provided by the European Regional Development Fund and European Social Fund. The European Regional Development Fund is particularly important to Flood and Coastal Erosion Risk Management because we have been successful in applications for funding from this source to support significant works across Wales.

152. After 2014/15, when the current programme of European Structural Funds ends, Wales will experience a significant reduction in sources of capital funding. In this context, ensuring that flood and coastal risk projects are effective and efficient and deliver real value for money will be critical.

153. The Welsh Government is committed to ensuring we have a strong capital investment programme for flood and coastal erosion risk management despite the constraints in Government expenditure and we are exploring other sources of funding.

Centrally Retained Capital Funding

154. The successor to the Strategic Capital Investment Fund, the Centrally Retained Capital Funding is an additional source of funding Welsh Government departments can bid into. Bids have been submitted in relation to the 2012/13 financial year and we will continue to seek additional funding within the Welsh Government wherever possible.

European Funding

155. Funding from Europe is designed to encourage economic prosperity. It is directed to areas most at need of economic support with, in the current programme, significant funding (of around £1.69 billion) available to West Wales and the Valleys (Convergence Area)²² and a smaller amount of funding (around £110 million) available for East Wales (Competitiveness Area)²³.

156. The Welsh Government has received a £49.85 million commitment from the European Regional Development Fund for flood and coastal erosion risk management projects that will support a programme of just over £101 million. The funding is allocated across the whole of Wales, although due to the majority of the funding available from Europe being directed towards the more economically deprived areas of Wales, the greater portion of the funding (88%) is allocated to West Wales and the Valleys with the remainder to East Wales.

157. The funding will pay for an estimated 28 schemes to reduce flood and coastal erosion risk and surface water flooding in Wales. Each scheme comprises construction of a defence, work to raise awareness of the risk of flooding and improve resilience for those living in communities that are at risk of flooding.

158. The scale of the programme is such that it has allowed large coastal defence schemes like those at Borth and Colwyn Bay to proceed after many years of development.

159. This investment also means that the majority of the Welsh Government's available budget for flood and coastal erosion risk management over the coming period is committed to match fund the European Regional Development Fund money which ends in 2015. This has reduced flexibility within the Welsh Government budget, and requires careful management and prioritisation.

160. After 2013, it is likely that there will be another round of EU structural funds. Wales can potentially access this funding and the Welsh Government is working to ensure that the Programme Complement has appropriate references to flood and coastal erosion risk management works. These works would be delivered by Local Authorities, the Environment Agency and others.

²² Convergence funding applies to fifteen Local Authority Areas, namely: Denbighshire, Conwy, Anglesey, Gwynedd, Ceredigion, Carmarthenshire, Pembrokeshire, Neath Port Talbot, Swansea, Bridgend, Rhondda Cynon Taff, Merthyr Tydfil, Caerphilly, Torfaen and Blaenau Gwent.

²³ Competitiveness funding applied to seven Local Authority Areas, namely: Vale of Glamorgan, Cardiff, Newport, Monmouthshire, Powys, Wrexham and Flintshire.

Alternative Sources of Funding

161. In addition to direct Welsh Government funding and European Funding, there are already a number of other ways of paying for flood and coastal erosion risk management works.

162. The Environment Agency has powers to charge for certain aspects of its work under the Environment Act 1995. It also has power to charge fees for certain things, such as applications to undertake works on main rivers, and through Flood Risk Management Wales, its Regional Flood and Coastal Committee, the Environment Agency can raise a levy on local authorities to fund local flood and coastal erosion risk management works.

163. Local authorities have powers to require developers to undertake works on site including flood and coastal erosion risk management works, under Section 106 of the Town and Country Planning Act 1990. They also have powers to raise a Community Infrastructure Levy on developers, which could see funding raised for flood and coastal erosion risk management.

164. Internal Drainage Boards already raise the majority of their funding through levies, and these could be re-profiled where appropriate.

165. Some Risk Management Authorities could also consider schemes that allow individuals and communities to fund risk management works that they consider to be locally important. This could involve a partnership approach between the public and private sectors and the local community. For example, a Lead Local Flood Authority may want to work with a water and sewerage company and a local community to determine the causes of surface and sewer flooding and then work together to jointly develop and fund action to manage the risks.

166. In the future all Risk Management Authorities will need to consider ways of working together and collaboratively funding projects to achieve their objectives, both for flood and coastal erosion risk management and for the sustainability of the wider environment.

Prioritising Funding across Wales

167. In future years, Welsh Government investment in flood and coastal erosion risk management will need to be more rigorously prioritised.

168. In determining the type of risk management intervention required, the scale of investment and the share to be met by government, a range of factors, as listed below, will need to be considered:

- risk to life;
- longer term sustainability of the community, the approach taken and the wider environment;
- economic impacts, costs and benefits;
- impacts of flooding on the operational capacity of critical infrastructure;

- social impacts, costs and benefits;
- frequency of flooding;
- environmental costs and benefits derived from the work;
- availability of appropriate compensation sites where work impacts designated habitats;
- impacts on our wider cultural heritage; and
- multiple benefits in relation to human health and wellbeing.

169. Risk to life will always be the most significant factor in determining priority of investment.

Funding Prioritisation Methodology

170. The Welsh Government is committed to establishing a clearer funding prioritisation methodology for Wales which sets out:

- what projects we will consider for funding;
- how we will consider them;
- how we will compare traditional hard engineering options against softer risk management options;
- how we will take account of the use of alternative sources of funding or direct contributions; and
- who we will consult in making investment decisions.

171. It is intended that this will result in the establishment of a single Welsh Government funding scheme for all flood and coastal erosion risk management projects in Wales.

172. As part of establishing this single funding scheme the Welsh Government intends to produce a prioritised list of projects, along with an indication of both the funding to be provided by the Welsh Government and the timescale for that investment. Included with this we will also review the method for determining the grant rate for local authority capital schemes and whether a fixed grant rate is more appropriate.

173. In the past, the funding available from the Welsh Government for flood and coastal erosion risk management issues has generally coped with demand. As we now move to a position where demand outstrips the funding available we will need to improve our planning and programming of projects with:

- clear deadlines for the submission of funding application;
- a timetable for determination of applications;
- a clear procedure for objections to decisions to be considered; and
- better procedures for considering and resolving cost overruns.

174. Welsh Ministers have given a commitment not to prioritise investment within the flood risk areas identified through the first cycle of the Flood Risk Regulations 2009 because these have only been identified with reference to local flood risks and primarily surface water. However, in future cycles flood risk areas will be identified with reference to all flood risks and it may then be appropriate to consider prioritising investment in these areas.

175. In relation to flooding from rivers we will use the information contained in Catchment Flood Management Plans and for local flood risk including surface water flooding we will use the information in Local Flood Risk Management Strategies and the information prepared under the Flood Risk Regulations 2009.

176. In terms of coastal erosion, our Shoreline Management Plans are based on an understanding of coastal processes, planning issues, current and future land use, defence needs and environmental considerations. Each Shoreline Management Plan defines specific lengths of coast which each have a proposed shoreline management policy.

177. The preferred policy may change over the 100 year period of the Shoreline Management Plan as policies are defined for each length of coast in the short, medium and long term. Their aim is to sustainably manage the risks to people, property and land, taking into account likely sea level rise, and this information could be used to prioritise investment in coastal flood and erosion.

178. We also need to consider how best to prioritise the preservation of our landscape and our designated habitats. Not providing compensatory habitat carries the risks of harm to the natural environment, as well as risk of infraction and increased flood risk because we would not be able to progress a number of flood defence improvement schemes; we are required to protect designated sites under both the Habitats Directive and the Birds Directive.

179. A consultation on these matters, and on the possibility of establishing a single capital investment programme for flood and coastal erosion risk management in Wales, will take place in 2012.

Section 4 – Implementation and Review

Implementing Flood and Coastal Erosion Risk Management

180. Implementation of the National Strategy is not simply about the delivery of a flood and coastal erosion risk management system for Wales. The successful delivery of that system will impact across the breadth of Welsh society, with social, economic and environmental benefits.

181. In managing our communities' risks of flooding and coastal erosion, we are directly contributing to the quality of life of the people living there, helping to create strong and safe communities. Successful flood and coastal erosion risk management contributes to the sustainable delivery of wider public services, including education and healthcare and helps people to improve their own surroundings.

182. The estimated average annual damage from flooding is in the region of £200 million in Wales. By targeting our investment we can reduce the consequences of flooding and reduce that figure. Communities that are aware of the risks and prepared for them are more resilient; they will recover faster at a lower cost for individuals and businesses.

183. By working with natural processes where possible Risk Management Authorities can enhance both the flood and coastal erosion risk management actions taken and the wider landscape. Measures such as beach nourishment both contribute to the management of coastal risks and increase local amenities. They can even contribute to the economy by increasing tourism.

184. Just as implementing the National Strategy goes further than flood and coastal erosion risk management alone, implementation itself goes further than the Welsh Government.

185. All Welsh Risk Management Authorities are required to exercise their flood and coastal erosion risk management functions²⁴ in a manner which is consistent with the National Strategy. In exercising any other functions they hold that may affect a flood or coastal erosion risk, Welsh Risk Management Authorities are also required to have regard to the National Strategy.

186. Local Authorities are also required to ensure that their local flood risk management strategies are consistent with the National Strategy.

187. Effectively, this means that all Risk Management Authorities in Wales are required to implement the objectives and measures set out in the National Strategy, and not to contradict or undermine them. Compliance with these requirements is one of the matters the Environment Agency will monitor as part of their oversight role as defined in *Annex B: Risk Management Authorities*.

²⁴ This included functions in relation to the EU Flood Directive and the Flood Risk Regulations 2009 (SI/2009/3042) by virtue of the Flood Risk Management Functions Order 2010 (SI/2010/2232).

188. There is also a need to make sure that the wider public, private and third sectors understand the policies and objectives of the National Strategy and that they can support individuals, communities and businesses to make personal changes that make them more resilient.

Monitoring Implementation of the National Strategy

189. Implementation of the National Strategy is a matter for all Welsh Risk Management Authorities. Monitoring and reporting on the National Strategy's implementation is the responsibility of the Environment Agency. In undertaking this role they will:

- collect data on progress from Risk Management Authorities using existing avenues wherever possible; and
- report factual information to Welsh Government.

190. Reports on the implementation of the National Strategy will be published every two years, and will form part of a wider assessment of flood and coastal erosion risk in Wales and the management of that risk.

191. It is intended that the collection of data will be as proportionate as possible and will, wherever possible, take place through existing channels.

192. In the first instance the Environment Agency is likely to look for evidence of implementation of the measures outlined in the National Strategy by the Risk Management Authorities, as well as the details of any flood or coastal erosion risk management schemes underway or planned. This could include defence works.

193. It is not the Environment Agency's role to hold individual organisations to account for the implementation of the National Strategy or enforce its implementation. The Environment Agency will provide a factual report; it will be for the Welsh Government to ensure compliance with the National Strategy using the information contained in that report where appropriate.

194. It is the Welsh Government's intention to use the report prepared by the Environment Agency to identify trends, gaps and issues to be resolved and then to work in partnership with the Risk Management Authorities to address them.

Specialist Advisory Groups

195. Within the consultation paper we proposed the establishment of four dedicated support groups to monitor individual aspects of the National Strategy. This proposal received little support. Consequently, we have decided not to set up dedicated monitoring groups.

196. The Welsh Government does however recognise that from time to time we will need to access specialist advice on certain matters. This advice might be required to develop certain policies, guidance or legislation. Alternatively it might be required to ensure that actions being taken are appropriate and having the right effects.

197. We intend to retain the Wales Flood Group, whose remit is to consider and advise on matters relating to emergency response, recovery and resilience to flood events. We will also continue to work with the SuDS Working Party for Wales as we both develop and implement the National Standards and associated guidance for the use of SuDS in Wales.

198. Other similar groups may be created, on a permanent or time limited basis, as and when the need arises.

Review of the National Strategy

199. The National Strategy will be revised in line with the reporting cycle under the Flood Risk Regulations 2009 as a minimum. Those anticipate a six yearly reporting cycle and it is our intention to review the National Strategy at the end of that cycle.

200. The proposed timeline for review, which includes the Environment Agency's reporting timeline, is envisaged as follows:

Stage	Date
Publication of the first National Strategy	Autumn 2011
First Environment Agency report	Spring 2014
Publication of Flood Risk Management Plans and completion of the first cycle of the Flood Risk Regulations	December 2015
Second Environment Agency report	Spring 2016
Review of the first National Strategy	Summer 2016
Publication of the second National Strategy	Spring 2017
Third Environment Agency report	Spring 2018
Fourth Environment Agency report	Spring 2020
Publication of Flood Risk Management Plans and completion of the second cycle of the Flood Risk Regulations	December 2021
Fifth Environment Agency report	Spring 2022
Review of the second National Strategy	Summer 2022
Publication of the third National Strategy	Spring 2023

201. In reviewing the National Strategy it is our intention to take account of the Environment Agency reports, and to undertake a full public consultation. That consultation will include both the implementation of the out going National Strategy and the content of the incoming National Strategy.

202. Opportunities will be made available for scrutiny by the relevant Committees of the National Assembly for Wales and the public consultation will include consultation events where people can come to share their views in person.

203. The first review of the National Strategy will take place in 2016, with subsequent reviews every six years thereafter.

Sources of Flooding and Coastal Erosion

Flood Risk

204. The main sources of flooding in Wales today are:

- sea flooding;
- river flooding, including main rivers and ordinary watercourses; and
- surface water flooding.

Sea Flooding

205. Flooding from the sea usually occurs through a combination of high tides and waves and severe weather. The most severe storm conditions occur when an atmospheric depression and high onshore wind speeds combine and coincide with a high astronomical tide, to cause an increase in the tide level known as a tidal surge. Such conditions can damage defences, cause defences to fail, or result in wave overtopping throwing sea water and boulders into coastal communities.

206. The flooding of Towyn in North Wales in 1990, where around 2800 properties were affected, was as a result of a failure of the sea wall during severe storms.

River Flooding

207. River flooding is generally described as flooding from the larger main rivers such as the Severn, the Taff and the Dee, as well as smaller rivers or streams often referred to as ordinary watercourses. River flooding from either source is probably the most commonly recognised and understood source of flood risk.

208. River flooding usually occurs when the capacity of a river channel cannot contain the volume of water entering it, and water overflows its banks. This is a natural event. When a river does overflow, the resultant flood water can be both deep and fast flowing and can cause widespread inundation of the flood plain. It may also carry debris, which can increase the damage.

209. The impact can be even worse if a flood defence, built to contain high river flows, fails suddenly, often called a breach, causing a risk to life or injury with little warning.

Surface Water Flooding

210. Surface water flooding is common in built up areas where development, including roads, buildings and multiple other hard surfaces, may result in a lack of open spaces and permeable surfaces able to absorb rainfall. It can also be a problem in rural areas where during heavy rainfall water tends to run off steeply sloping fields affecting rural communities and can lead to significant loss of soil.

211. Where rainfall cannot be absorbed by the soil, rain is directed into the drainage systems instead. Typically piped drainage systems are designed to deal with frequent, relatively short duration rainfall events. They are not designed to deal with longer storms or more intense rainfall and surface water flooding occurs when those systems are unable to cope with the volume of water entering them and are more likely to become blocked with debris and silt.

Other Sources of Flooding

212. While the three sources of flooding listed above are the most commonly experienced there are however other sources of flood risk including:

- the failure of dams;
- the failure of defence structures;
- canal breaches;
- groundwater and other water sources; and
- sewer flooding.

213. The likelihood of failure of a dam is very low. Strict monitoring, maintenance and safety regimes are in place and recent legislative changes (under the Flood and Water Management Act 2010) to further strengthen arrangements are being implemented. However, if a dam failure occurred there would be a risk of significant amounts of water being released from any associated reservoir.

214. While not a traditional source of flooding in the same way as a river or a dam, the failure of a defence structure could significantly increase the impacts or consequences of a flood or coastal erosion event. An area previously considered to be protected could be placed at a level of risk residents are unprepared for.

215. There are also some risks of flooding from lakes and other water bodies. Groundwater levels can also impact on other sources of flooding, reducing capacity to absorb surface water for example. Groundwater flooding is not a widespread issue in Wales, but can occur in some areas, with consequences for land use and access. For example, Cardiff Bay has a pumping station to stop basements flooding from ground water levels.

216. From time to time other local flood risks involving water held within the ground occur. An example is the event at Parys Mountain, where water was held within the mountain in mine workings; flooding occurred when the water levels within the mountain mine workings increased following the closure of local mines. There is separate legislation governing the management of water levels in mines.

Flooding from Sewers

217. The risk of sewer flooding is not directly addressed within this strategy as it is the responsibility of the water and sewerage companies. However, the Welsh Government recognises the impacts and consequences sewer flooding can have.

218. Sewers come in three types:

- foul sewers, which are designed to carry soiled water that has been used for washing and cooking purposes, as well as the contents of toilets and trade effluent;
- surface water sewers, which are designed to carry rainwater runoff from roofs, yards and roads; and
- combined sewers, which receive a mixture of foul sewage and surface water.

219. Flooding from foul sewers is generally caused by blockages or the failure of pumped systems and usually affects only limited numbers of properties.

220. Flooding from surface water and combined sewers occurs when any of these types of sewer becomes overloaded due to heavy rainfall (or sometimes snow melt), when sewers become blocked, or more rarely, when mechanical or electrical equipment breaks down. The likelihood and severity of sewer flooding caused by overloading depends on the capacity of the sewerage system of sewers in question, which can be affected by a range of factors, including pipe size and weather conditions.

221. All sewer systems have a finite capacity and one way of reducing the risks of sewer flooding is reducing the amount of surface water running into the sewer network, and placing additional strain on systems.

222. While the depth of flooding caused by sewers is generally much less than that for the main sources, flood water containing foul sewage means that it does cause significant distress to those affected.

223. Management of sewer flooding is primarily the responsibility of the water and sewerage companies, and they are taking steps to address the causes and concerns. One such approach is the Surface Water Elimination and Reduction programme led by Dŵr Cymru Welsh Water. However, to effectively manage the risks of sewer flooding, water and sewerage companies will require assistance and cooperation from other Risk Management Authorities.

224. In 2011 the Welsh Ministers legislated to transfer responsibility for all private sewers and lateral drains to water and sewerage companies. The transfer removes the risk of significant costs for maintaining and repairing private sewers falling on individuals and is intended to provide wider benefits through the integrated management of the sewerage system.

225. The Welsh Government will also be consulting on proposals to introduce mandatory sewer design and build standards and on proposals to increase the use of sustainable drainage systems (SuDs) throughout Wales.

226. The SuDS approach to surface water uses a wider range of drainage techniques, such as infiltration and retention with the aim of mimicking the pattern of runoff from the site in its natural state. Rainwater is managed close to its source and

on the surface where possible. As a result, surface water is stored and released slowly and water quality is protected and improved. Overall there is less runoff, freeing up capacity in the sewer system and improving biodiversity and amenity.

Coastal Erosion Risk

227. Coastal erosion is the term used to describe the loss of land on the coast due to the action of the sea. The shoreline is constantly changing shape due to the action of waves, tides and currents. These processes are causing long term changes but during coastal storms there can be dramatic loss of land like cliff falls.

228. The level of beaches can be lowered by waves and tidal currents moving sand and shingle along the coast. This sediment transportation can expose the landmass behind the beach to bigger waves and increased erosion.

229. The very shape of Wales has been determined by the sea. Since the last Ice Age ended 10,000 years ago, sea levels have risen some 60 metres, flooding lowland plains and valleys²⁵. Coastal erosion is progressive, and causes permanent irreversible loss to property and infrastructure. Such losses can undermine the viability of coastal communities and have significant impacts on the local economy.

230. The rate at which the coast erodes depends on a number of factors including the prevailing sea conditions, the frequency and severity of coastal storm events, the amount of sand shingle and beach and as well as the geology and topography of the coast and near shore zone. Hard rocks erode slowly, with impacts being more gradual. In contrast, softer rocks rock formations or sand dunes will erode faster, and this speed of erosion can pose a risk to coastal communities.

231. In some areas the risk of erosion is compounded by unstable coastal land. Coastal erosion at the bottom of an unstable coastal slope may lead to a landslip affecting land further inland.

232. The rate of coastal erosion in Wales is generally low compared with some parts of England. However, evidence from our emerging Shoreline Management Plans²⁶ 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.

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

234. 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 coast²⁷.

²⁵ Caring for Coastal Heritage (Cadw)

www.cadw.wales.gov.uk/upload/resourcepool/coastal_heritage_e5957.html.

²⁶ More information on Shoreline Management Plans is available in Annex D (relevant docs).

²⁷ Marine Climate Change Impacts Partnership, Plymouth University, 2008

<http://www.mccip.org.uk/annual-report-card/2007-2008/marine-environment/coastal-erosion.aspx>.

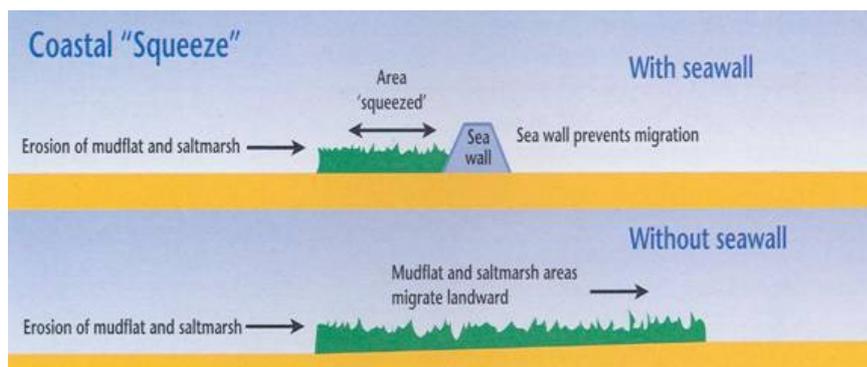
235. While the construction of defences allows us to delay erosion in certain areas for the life of the structure, this approach needs to be considered and balanced against impacts to other parts of the coast and the wider environment. Protecting one section of the coast may increase erosion in another part. The Welsh Government is co-funding research (on an England and Wales basis) to improve the understanding of coastal erosion risks.

Coastal squeeze

236. Coastal squeeze describes one of the consequences of sea level rise on our coast areas.

237. As sea levels rise, increasing wave height and intensity, sea waters move further inland with the consequential loss of low lying habitats and damage to the features of the habitat and associated species within it. This loss of intertidal habitat is referred to as coastal squeeze, and while generally referred to in relation to habitat, it can also have an impact on flood and coastal erosion risk.

238. Decreasing the extent of foreshore in front of a defence, for example, can create deeper water with a consequent increase in wave size. This can undermine defences or make it more likely that defences are overtopped.



Coastal Squeeze (Environment Agency, 1998).

239. Around the coast of Wales there are several significant areas where low lying habitat conservation sites are located between the sea and coastal defences, man-made structures and areas of higher ground. One example is the Newport coastline on the Severn Estuary. Many of these are protected by European and domestic legislation including the Water Framework Directive, the Habitats Directive and the Birds Directive.

240. It is important to note the role that coastal features like beaches and sand dunes can play in wider coastal protection. They can be significant natural buffers to sea flooding if considered as part of an integrated management strategy using natural processes and through this potentially reduce the maintenance costs or increase the lifespan of structures protected by them.

241. They also provide important ecological benefits such as fish nurseries, for example, as well as recreational and tourism opportunities for local communities.

These habitats can provide multiple benefits to society, the economy, and the environment.

242. This strategy is primarily concerned with the effects of flood and coastal erosion risk management on our coastal habitats. However, the Welsh Government recognises that managing coastal squeeze and the specialised habitats that are impacted is important and has further reaching consequences.

243. As some parts of the coast are washed away, others are enhanced. Coastal accretion is the name given to the process by which sediment which has been, transported by natural coastal processes, is deposited on the shoreline. Sand or shingle washed away from one beach is likely to drift further along the coast and be deposited elsewhere where it could form a new beach or raise the level of an existing one.

Combined Risk

244. Detailing individual sources of risk does not imply that flooding can only ever occur for one reason, or that coastal erosion only ever has one outcome. Any and all of these sources and facets can come together to produce what are called combination events.

245. An example of a combination flood is one occurring during a period of intense or prolonged rainfall. The rain would increase water levels in watercourses, saturate ground, increase flow through the drainage system and could enter the public sewerage system, increasing pressure. As all of these factors combine, watercourses, drains and sewers could all reach maximum capacity and with nowhere else to go the water could overflow from all of them, resulting in a combination of river, sewer and surface water flooding.

246. On the coast, a combination event could involve flooding from the sea where a storm delivers intense rainfall on the land and a storm surge and stormy seas, at the same time as a high tide. This results in an increase in tide and wave levels at the same time as flow from rivers to the sea increases. If the two meet, coastal communities could experience a mix of flooding from the sea and a river.

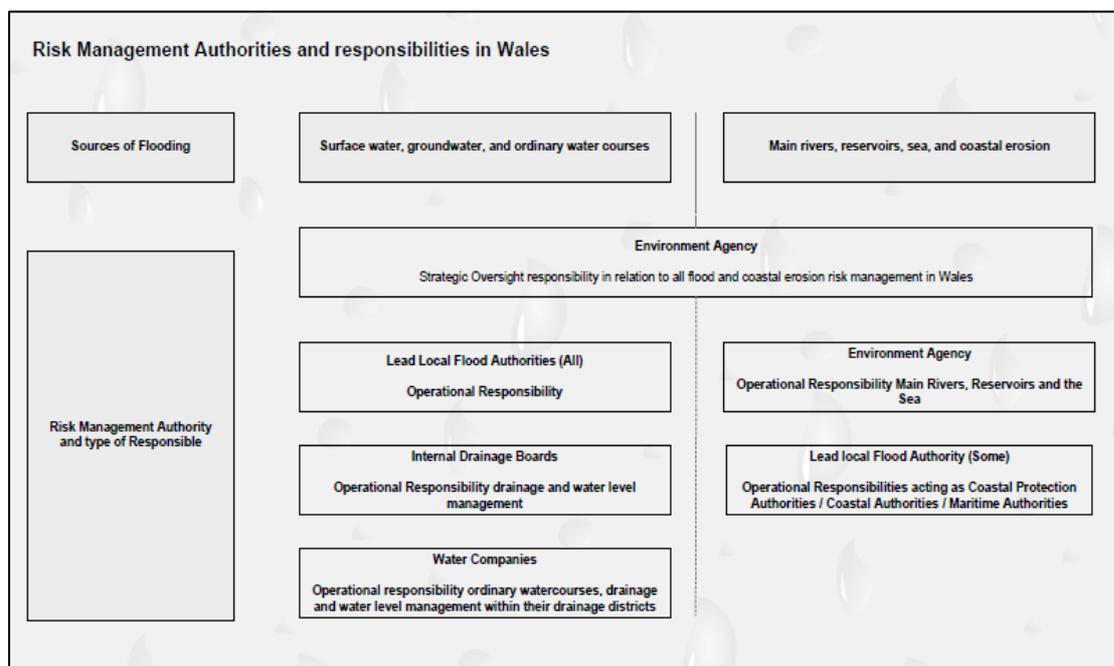
247. Depending on the intensity of the rainfall and the waves, such an event could also cause an increase in coastal erosion, resulting in long term damage to the coast, which could exacerbate future flood risks.

Risk Management Authorities in Wales

Roles and Responsibilities

248. There are currently 31 Risk Management Authorities in Wales:

- The Environment Agency.
- The 22 Lead Local Flood Authorities.
- Caldicot and Wentlooge Levels Internal Drainage Board.
- Lower Wye Internal Drainage Board.
- Powysland Internal Drainage Board.
- Dŵr Cymru Welsh Water.
- Severn Trent Water.
- Scottish and Southern Water.
- Albion Water.
- Dee Valley Water Plc.



Environment Agency

249. Historically the Environment Agency has led on the management of the risks of flooding from rivers and the sea. However, as a consequence of the Flood and Water Management Act 2010 certain changes have been made to the role and remit of the Environment Agency. In addition to flooding from main rivers and the sea, the Environment Agency has new operational responsibilities in relation to coastal

erosion and a wider oversight role for all flood and coastal erosion risk management in Wales.

250. This change means that the Environment Agency has a dual role:

- operational responsibilities for flooding from rivers, the sea and coastal erosion;
- oversight responsibilities in relation to all flood and coastal erosion risk management in Wales.

251. The operational change has been undertaken in recognition of the links between coastal flooding and coastal erosion, particularly in terms of consequences. Importantly from October 2011 Lead Local Flood Authorities will require Environment Agency approval for coast protection works.

252. Furthermore, as we move to introduce a national policy in relation to coastal change, including erosion, accretion, squeeze and managed realignment, allocating operational responsibility to the Environment Agency is intended to enhance existing partnership arrangements such as those seen in our coastal groups and through the establishment of the Shoreline Management Plans.

253. The oversight change is integral to the delivery of national policy on flooding and coastal erosion risk management and has been taken forward to ensure that the Environment Agency has the remit to support the Welsh Government across the full range of flood and coastal erosion risks affecting Wales.

254. As part of their oversight role the Environment Agency will lead on the provision of technical advice and support to the other Risk Management Authorities. They will also lead on national initiatives such as Flood Awareness Wales, the national raising awareness programme, and the single point of contact for inquiries and information on flood risk, currently being piloted via their Floodline Warning Service with input from Local Authorities.

255. The Flood and Water Management Act 2010 places a number of statutory duties on the Environment Agency including:

- cooperation with other Risk Management Authorities, including sharing data;
- reporting to the Welsh Ministers on flood and coastal erosion risk in Wales including the application of the National Strategy; and
- establishment of Regional Flood and Coastal Committees.

256. The Environment Agency will be the sole Risk Management Authority charged with monitoring and reporting on the National Strategy's implementation. In undertaking this role they will:

- collect data on progress from risk management authorities using existing avenues wherever possible; and
- report factual information to Welsh Government.

257. It will be for the Welsh Government to determine what if any action should be taken if the reports from the Environment Agency suggest the National Strategy is not being implemented or that actions being taken are increasing levels of risk.

258. In addition to their statutory duties, the Environment Agency has a number of what are called permissive powers. These are powers that allow them to do something, but do not compel them to and include:

- powers to request information;
- the ability to raise levies for local flood risk management works, via Flood Risk Management Wales, its Regional Flood and Coastal Committees;
- powers to designate certain structures or features that affect flood or coastal erosion risk;
- the expansion of powers to undertake works to include broader risk management actions; and
- the ability to cause flooding or coastal erosion under certain conditions.

259. This new allocation of responsibilities is also consistent with the Environment Agency's role in relation to the Flood Risk Regulations 2009. These Regulations allocate specific responsibility for conducting assessments in relation to mapping and planning for the risks of flooding from main rivers, the sea and reservoirs to the Environment Agency. The Environment Agency is also required by the Regulations to provide guidance to Local Authorities on these matters for flooding from other sources.

260. Under the Regulations the Environment Agency also take on a review and coordination role at a national level, ensuring the correct information is reported to the European Commission.

Single Environment Body for Wales

261. The Welsh Government is currently reviewing the role of the environmental public bodies operating in Wales; primarily the Environment Agency, the Countryside Council for Wales and the Forestry Commission. One of the options under consideration is the merger of these bodies insofar as they operate in Wales and the establishment of a Single Environment Body for Wales.

262. If established, a Single Environment Body for Wales would take on the functions of these three organisations insofar as they operate in Wales. This new body would take on all of the responsibilities of the Environment Agency in relation to flood and coastal erosion risk management in Wales and would undertake all of the functions described within this strategy.

263. No final decision in relation to the review of the environmental public bodies has been taken at the time of publication. Ministers are expected to make a decision in late 2011 and any proposals will be consulted on.

Lead Local Flood Authorities

264. Under the terms of the Flood and Water Management Act 2010, the Lead Local Flood Authorities are responsible for what are termed local flood risks. These include the risks of flooding from ordinary watercourses, surface water and ground water.

265. Local Authorities have always had certain responsibilities in relation to ordinary watercourses, and in practice most local authorities took the lead in dealing with surface water flooding incidents prior to the changes contained within the Flood and Water Management Act 2010. This is, however, the first time responsibility for the risks of flooding from surface water has been allocated to any body in law.

266. The Flood and Water Management Act 2010 places a number of statutory duties on Local Authorities in their new role as Lead Local Flood Authorities including:

- the preparation of Local Flood Risk Management Strategies;
- a duty to be consistent with the National Strategy;
- cooperation with other authorities, including sharing data;
- a duty to investigate flooding within its area, insofar as appropriate;
- a duty to maintain a register of structures and features likely to affect flood risk; and
- a duty to contribute to sustainable development.

267. In addition to these, Lead Local Flood Authorities have a number of what are called permissive powers. These are powers that allow them to do something but do not compel them to and include:

- powers to request information;
- powers to designate certain structures or features that affect flood or coastal erosion risk;
- the expansion of powers to undertake works to include broader risk management actions; and
- the ability to cause flooding or coastal erosion under certain conditions.

268. Lead Local Flood Authorities in Wales will also take on the role of the SuDS Adopting and Approving Body in relation to sustainable drainage systems. In this role they will be responsible for both approving the original design of the SuDS and adopting and maintaining the finished system.

269. The minimum statutory content of Local Flood Risk Management Strategies is set out in Section 10 of the Flood and Water Management Act 2010 and Lead Local Flood Authorities are required to consult with the public in preparing them. Local Flood Risk Management Strategies must set out the objectives and measures for managing local flood risks along with the timescales and costs of implementation.

270. To fully enable Lead Local Flood Authorities to implement their new roles and responsibilities in respect of local flood risk certain functions previously held by the Environment Agency have been transferred. This includes taking responsibility for consenting works on ordinary watercourses (from April 2012).

271. The allocation of responsibility for local flood risks is replicated in the Flood Risk Regulations 2009. These Regulations allocate specific responsibility for conducting assessments in relation to flood risk from everything other than main rivers, the sea and reservoirs to Lead Local Flood Authorities. Following those assessments, and only where flood risk areas are identified under the Regulations, Lead Local Flood Authorities are also required to map the risks and plan for their management.

272. A number of Local Authorities in Wales are also designated coastal erosion risk management authorities under the Coast Protection Act 1949, providing them with certain responsibilities in respect of coastal erosion and coastal protection. Formally referred to as coastal protection authorities they may also be referred to as coastal local authorities or maritime authorities and retain their current permissive powers in relation to coastal erosion risk management.

273. From October 2011 Lead Local Flood Authorities will require Environment Agency approval for coast protection works.

Internal Drainage Boards

274. Internal Drainage Boards are independent statutory bodies responsible for land drainage in areas of special drainage need. They are long established bodies operating predominantly under the Land Drainage Act 1991 and have powers to undertake work to secure drainage and water level management of their districts including flood defence works on ordinary watercourses.

275. No changes have been made to the core operational arrangements for Internal Drainage Boards. They will continue to act as the lead operational authority for ordinary watercourses and for drainage and water level management within their drainage districts.

276. The Flood and Water Management Act 2010 places a number of statutory duties on Internal Drainage Boards including:

- a duty to be consistent with the National Strategy and the relevant local flood risk management strategies;
- cooperation with other authorities, including sharing data; and
- a duty to contribute to sustainable development.

277. In addition to these Internal Drainage Boards have a number of *permissive powers*. These are powers that allow them to do something but do not compel them to and include:

- powers to designate certain structures or features that affect flood or coastal erosion risk;
- the expansion of powers to undertake works to include broader risk management actions; and
- the ability to cause flooding or coastal erosion under certain conditions.

278. Internal Drainage Boards will need to contribute to the preparation of Local Flood Risk Management Strategies prepared by the Lead Local Flood Authorities. Provisions to allow Internal Drainage Boards to act on behalf of the other Risk Management Authorities were also included within the Flood and Water Management Act 2010.

279. Proposals in relation to reform of Internal Drainage Boards were consulted on in 2009 as part of the draft Flood and Water Management Bill. While not contained within the Flood and Water Management Act 2010, the Welsh Government has continued to work with the UK Government and the Internal Drainage Boards to facilitate reform to governance and management arrangements.

280. Provisions to enable such reform are included within the Public Bodies Bill currently before the Houses of Parliament. The wider reform of drainage arrangements as overseen by Internal Drainage Boards will also be considered as part of the review of environmental public bodies in Wales.

Water and Sewerage Companies

281. Water and sewerage companies are responsible not only for the provision of water but also for making appropriate arrangements for the drainage of foul water, the treatment of waste, surface water sewers and combined sewers. They have primary responsibility for floods from water and sewerage systems, which can include sewer flooding, burst pipes or water mains or floods caused by system failures.

282. No changes have been made to the operational arrangements for water and sewerage companies in respect of flood risk.

283. The Flood and Water Management Act 2010 places a number of statutory duties on Water and sewerage companies including:

- a duty to act consistently with the National Strategy;
- a duty to have regard to the content of the Local Flood Risk Management Strategies; and
- cooperation with other Risk Management Authorities, including sharing data.

284. Water and sewerage companies often hold valuable information which could greatly aid the understanding of flood risks faced by communities across Wales. Water and sewerage companies will also need to contribute to the preparation of Local Flood Risk Management Strategies prepared by the Lead Local Flood Authorities.

Working in Partnership

285. With the new duty to cooperate set out within the Flood and Water Management Act 2010, the Risk Management Authorities will need to work together to develop a shared understanding of both the risks and the appropriate actions to manage them. It is important that all the risk management authorities work together in partnership if we are to avoid duplication of effort and investment, or worse, contradictory policies and actions that undermine one another.

286. Steps are already being taken to establish a more cohesive, partner based approach to managing flood and coastal erosion risk in Wales. The Environment Agency and Local Authorities are piloting the provision of a single point of contact for queries and information on flood risk, with a view to rolling the service out across Wales. This would mean the public only needed to call one number to report flooding incidents, regardless of the source of the water.

287. Lead Local Flood Authorities worked with the Environment Agency on a regional basis to prepare their preliminary flood risk assessments under the Flood Risk Regulations 2009, sharing information and best practice. The European Regional Development Fund investment in flood and coastal erosion risk management has also been used to encourage robust partnership working and public engagement across the sector.

288. It is not the intention of the Welsh Government to establish compulsory partnership arrangements for the Risk Management Authorities in Wales, but we will keep this under review. We will encourage them to work together on an appropriate basis, be that regionally or locally, and will provide advice and guidance on cooperation, data sharing and public engagement.

289. Providing a broad advisory framework for partnership working should allow systems to develop that are appropriate for local need.

Annex C

Contact Details

Welsh Government			
Address	Telephone details	Email Address	Website
Sustainable Places Welsh Government Cathay's Park Cardiff CF10 3NQ	(English) 0300 0603300 or 0845 010 3300 (Welsh) 0300 0604400 or 0845 010 4400 (International Enquiries) (+44) 1443 845500	FloodCoastalRisk@wales.gsi.gov.uk	www.wales.gov.uk

Environment Agency Wales			
Head Office	South West Area Office	South East Area Office	Northern Area Office
Tŷ Cambria House 29 Newport Road Cardiff CF24 0TP	Maes Newydd Llandarcy Neath Port Talbot SA10 6JQ	Rivers House St Mellons Business Park Fortran Road St Mellons Cardiff CF3 0EY	Ffordd Penlan Parc Menai Bangor Gwynedd LL57 4DE
<p>Phone Number: 08708 506 506 Email: enquiries@environment-agency.gov.uk Website: www.environment-agency.gov.uk</p> <p>Floodline - Phone Number: 0845 988 1188 (24 hour service) Type Talk: 0845 602 6340</p>			

Local Authorities (Lead Local Flood Authorities)

Blaenau Gwent County Borough Council	Bridgend County Borough Council	Ceredigion County Council	Cardiff Council	Carmarthenshire County Council
<p>Civic Centre Ebbw Vale Blaenau Gwent NP23 6XB</p> <p>Tel: 01495 311556 Minicom: 01495 355959 Email: info@blaenau-gwent.gov.uk Web: www.blaenau-gwent.gov.uk</p>	<p>Civic Offices Angel Street Bridgend CF31 4WB</p> <p>Tel : 01656 643643 Fax: 01656 668126 Email : talktous@bridgend.gov.uk Web: www.bridgend.gov.uk</p>	<p>Neuadd Cyngor Ceredigion Penmorfa Aberaeron Ceredigion SA46 0PA</p> <p>Tel : 01545 570 881 Email : reception@ceredigion.gov.uk Web: www.ceredigion.gov.uk</p>	<p>County Hall Atlantic Wharf Cardiff CF10 4UW</p> <p>Tel : (English) 02920 872087 (Cymraeg) 02920 872088 Text phone: 02920 872085 Fax: 029 2087 2086 Email: c2c@cardiff.gov.uk Web: www.cardiff.gov.uk</p>	<p>County Hall Carmarthen Carmarthenshire SA31 1JP</p> <p>Te : 01267 234 567 Email: direct@carmarthenshire.gov.uk Web: www.carmarthenshire.gov.uk</p>
Conwy County Borough Council	Flintshire County Council	Isle of Anglesey County Council	Swansea City & County Council	Vale of Glamorgan Council
<p>Bodlondeb Conwy North Wales LL32 8DU</p> <p>Tel: 01492 574 000 Fax: 01492 592 114 Email : information@conwy.gov.uk Web: www.conwy.gov.uk</p>	<p>County Hall Mold Flintshire CH7 6NB</p> <p>Tel : 01352 752121 Email : info@flintshire.gov.uk Web: www.flintshire.gov.uk</p>	<p>Council Offices Llangefni Anglesey LL77 7TW</p> <p>Tel: 01248 750057 Web: www.anglesey.gov.uk</p>	<p>Civic Centre Oystermouth Road Swansea SA1 3SN</p> <p>Tel : 01792 636 000 Web : www.swansea.gov.uk</p>	<p>Civic Offices Holton Road Barry CF63 4RU</p> <p>Tel : 01446 700111 Web : www.valeofglamorgan.gov.uk</p>

Local Authorities (Lead Local Flood Authorities)

Denbighshire County Council	Rhondda Cynon Taf County Borough Council	Caerphilly County Borough Council	Neath Port Talbot County Borough Council	Pembrokeshire County Council
<p>County Hall Wynnstay Road Ruthin Denbighshire LL15 1YN</p> <p>Tel : 01824 706 000 Customer service centre: (Cymraeg) 01824 706 100, (English) 01824 706 101 Minicom: 01824 706170 Fax: 01824 706180 Email : customerservice@denbighshire.gov.uk Web : www.denbighshire.gov.uk</p>	<p>Headquarters The Pavilions, Cambrian Park Clydach Vale Tonypany CF40 2XX</p> <p>Tel : 01443 424000 Out of hours emergency: 01685 876 831 Web: www.rhondda-cynon-taf.gov.uk</p>	<p>Tŷ Penallta House Tredomen Park Ystrad Mynach Hengoed CF82 7PG</p> <p>Tel : 01443 815 588 01495 226 622 Out of hours emergency: 01443 875 500 Text phone: 01443 863 474 Email : info@caerphilly.gov.uk Web: www.caerphilly.gov.uk</p>	<p>Port Talbot Civic Centre Port Talbot SA13 1PJ</p> <p>Tel : (English) 01639 686868, Phone number: (Cymraeg) 01639 686869 Fax: 01639 763444 Email: fcs@npt.gov.uk Web: www.neath-porttalbot.gov.uk</p>	<p>County Hall Haverfordwest Pembrokeshire SA61 1TP</p> <p>Tel: 01437 764 551 Out of hours emergency: 0845 601 5522 Fax: 01437 775 303 Email: enquiries@pembrokeshire.gov.uk Web : www.pembrokeshire.gov.uk</p>
Gwynedd County Council	Merthyr Tydfil County Borough Council	Powys county Council	Torfaen County Borough Council	Monmouthshire County Council
<p>Council Offices Shirehall Street Caernafon Gwynedd LL55 1SH</p> <p>Tel : 01766 771000 Fax: 01286 673 993 Web: www.gwynedd.gov.uk</p>	<p>Civic Centre Castle Street Merthyr Tydfil CF47 8AN</p> <p>Tel : 01685 725000 Email : customer.care@merthyr.gov.uk Web: www.merthyr.gov.uk</p>	<p>County Hall Llandrindod Wells Powys LD1 5LG</p> <p>Tel : 0845 055 2155 Out of hours emergency: 0845 054 4847 Email address: customer@powys.gov.uk Website: www.powys.gov.uk</p>	<p>Civic Centre Pontypool Torfaen NP4 6YB</p> <p>Tel : 01495 762200 Fax: 01495 755513 Email : your.call@torfaen.gov.uk Web : www.torfaen.gov.uk</p>	<p>County Hall Cwmbran Gwent NP44 2XH</p> <p>Tel : 01633 644644 Fax: 01633 644 666 Email : contact@monmouthshire.gov.uk Web : www.monmouthshire.gov.uk</p>

Local Authorities (Lead Local Flood Authorities)	
Newport City Council	Wrexham County Borough Council
<p>Civic Centre Newport South Wales NP20 4UR</p> <p>Tel : 01633 656656 Minicom: 01633 656657 Fax: 01633 244721 Email : info@newport.gov.uk Web : www.newport.gov.uk</p>	<p>The Guildhall Wrexham LL11 1AY</p> <p>Tel : 01978 292000 Minicom: 01978 292067 Email: webmaster@wrexham.gov.uk Web : www.wrexham.gov.uk/</p>

Welsh Local Government Association
Head Office
<p>Local Government House Drake Walk Cardiff CF10 4LG</p> <p>Tel : 02920 468600 Fax: 02920 468601 Website: www.wlga.gov.uk</p>

Internal Drainage Boards (IDBs) wholly or mainly in Wales		
Caldicot & Wentlooge Levels	Lower Wye	Powysland
<p>Pye Corner Broadstreet Common Nash Newport NP18 2BE</p> <p>Tel : 01633 275922 Fax: 01633 281155 Email: admin@caldandwentidb.gov.uk Web : www.caldandwentidb.gov.uk</p>	<p>Pye Corner Broadstreet Common Nash Newport NP18 2BE</p> <p>Tel : 01633 275922 Fax: 01633 281155 Email: admin@caldandwentidb.gov.uk Web : www.lowerwyeidb.org.uk</p>	<p>Wern Farm Burgedin Welshpool SY21 9LQ</p> <p>Tel: 01691 650200 Email : Gaw001@gmail.com Web : www.powyslandidb.org.uk</p>

Water Companies in Wales				
Dŵr Cymru - Welsh Water *	Severn Trent Water Ltd	Dee Valley	Albion Water Limited	Scottish & Southern Water
<p>Pentwyn Road Nelson Treharris CF46 6LY</p> <p>Head office phone number: 01443 452300</p> <p>Customer services: 0800 052 0140</p> <p>Web : www.dwrcymru.co.uk</p>	<p>Customer Relations Sherbourne House St Martin's Road, Finham Coventry CV3 6SD</p> <p>Tel: 024 7771 5000</p> <p>Web : www.stwater.co.uk</p>	<p>Packsaddle Wrexham Road, Rhostyllen Wrexham LL14 4EH</p> <p>Customer Services number: 01978 833200</p> <p>Fax: 01978 846888</p> <p>Leakline: 0800 298 7112</p> <p>Emergency: 01978 846946</p> <p>Email: contact@deevalleygroup.com</p> <p>Web : Dee Valley Group</p>	<p>78 High Street Harpenden Herts AL5 2SP</p> <p>Tel: 01582 767720</p> <p>Emergencies: 0800 917 5819</p> <p>Email: info@albionwater.co.uk</p> <p>Web : www.albionwater.co.uk</p>	<p>Scottish and Southern Energy plc. Inveralmond House 200 Dunkeld Road Perth PH1 3AQ</p> <p>Tel : 0845 744 4555</p> <p>Web : www.sse.com/Home/</p>
* Covers most of Wales				

Other Useful Contacts / Organisations
<p>Flood Risk Management Wales (FRMW)</p> <p><i>FRMW is the Regional Flood & Coastal Committee for Wales covering the Welsh flood risk management region.</i></p> <p>Administrative support for FRMW is provided by the Environment Agency, so to contact the FRMW committee please use the following details;</p> <p>Environment Agency Wales Head Office</p> <p>Tŷ Cambria House, 29 Newport Road, Cardiff, CF24 0TP Tel: 08708 506506 Email: enquiries@environment-agency.gov.uk</p> <p>National Flood Forum</p> <p><i>The National Flood Forum provides support and advice to communities and individuals that have been flooded or are at risk of flooding.</i></p> <p>The National Flood Forum, Snuff Mill Warehouse, Bewdley, Worcestershire, DY12 2EL</p> <p>Tel: 01299 403055 Fax: 01299 403101 Website: www.floodforum.org.uk/</p>

Schedule of Relevant Documents

GENERAL

Title:	Environment Strategy
Description:	The Environment Strategy is the Welsh Government's long term strategy for the environment of Wales, setting the strategic direction for the next 20 years.
Available from:	wales.gov.uk/docs/desh/publications/060517environmentstrategyen.pdf .
Title:	Strategic policy position statement on water
Description:	A statement highlighting how the Welsh Government will manage water resources sustainably and maintain and enhance water quality in Wales.
Available from:	wales.gov.uk/docs/desh/policy/090331waterpositionency.doc .
Title:	One Wales: One Planet, The Sustainable Development Scheme of the Welsh Government
Description:	The Scheme sets out our new vision of a sustainable Wales and the priority we attach to sustainable development. This is a response to the economic and environmental challenges we face and is the only approach that will secure a long term sustainable future for future generations.
Available from:	wales.gov.uk/topics/sustainabledevelopment/publications/onewalesoneplanet/?lang=en .
Title:	Climate Change Strategy for Wales
Description:	The Welsh Government has a clear role to play in tackling climate change, the Climate Change Strategy for Wales and the Delivery Plans confirm this commitment.
Available from:	wales.gov.uk/topics/environmentcountryside/climatechange/tacklingchange/strategy/walesstrategy/?lang=en .

Title:	Adaptation Delivery Plan
Description:	This plan sets out the specific policies and programmes that the Welsh Government expects to implement in delivering the Adaptation Framework. The Welsh Government's Adaptation Framework (explained in Chapter 15 of the Climate Change Strategy for Wales) is the national, co-ordinated approach we are taking to ensure that Wales understands the risks and opportunities these changes present and is well-placed to adapt in a sustainable way.
Available from:	wales.gov.uk/topics/environmentcountryside/climatechange/tacklingchange/strategy/walesstrategy/?lang=en .

Title:	Building Resilience to Climate Change
Description:	Approach to exercising powers to issue guidance and directions under Part 4 of the Climate Change Act 2008. Part 4 of the Climate Change Act 2008 gives the Welsh Ministers powers in relation to responding to the consequences of climate change and enabling effective adaptation action.
Available from:	cymru.gov.uk/consultations/environmentandcountryside/climatechangeresilience .

Title:	Planning Policy Wales (Edition 4, February 2011)
Description:	This document contains current land use planning policy for Wales. It provides the policy framework for the effective preparation of local planning authorities' development plans.
Available from:	wales.gov.uk/topics/planning/policy/ppw/?lang=en .

Title:	Technical Advice Notes (TANs)
Description:	TAN's should be taken into account by local planning authorities when they are preparing development plans. They should be read in conjunction with the Planning Policy Wales (PPW) document.
Available from:	wales.gov.uk/topics/planning/policy/tans/?lang=en .

Title:	Online DAMS
Description:	The Development Advice Maps (DAMs) are to be used alongside Planning Policy Wales and TAN 15 to direct new development in respect to flood risk. Together, they form a precautionary framework to guide planning decisions.
Available from:	data.wales.gov.uk/apps/floodmapping/ .

Title:	Foresight 'Future Flooding' report
Description:	<p>This report has been produced by the Flood and Coastal Defence project of the Foresight programme.</p> <p>Volume 1 identifies the many drivers of future risks of flooding and coastal erosion for the UK and analyses their operation and interaction.</p> <p>Volume 2 considers options for responding to those challenges. In so doing, it seeks to inform long-term policy in the management of flood risks.</p>
Available from:	www.bis.gov.uk/foresight/our-work/projects/published-projects/flood-and-coastal-defence/project-outputs/volume-1 . www.bis.gov.uk/foresight/our-work/projects/published-projects/flood-and-coastal-defence/project-outputs/volume-2 .

Title:	Stern Review on the Economics of Climate Change
Description:	In 2005, Sir Nick Stern was asked to lead a major review of the economics of climate change, to understand more comprehensively the nature of the economic challenges and how they can be met, in the UK and globally.
Available from:	webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/sternreview_index.htm .

Title:	The Pitt Review - Learning Lessons from the 2007 floods
Description:	Sir Michael Pitt's Interim and final reports on the lessons to be learned from the severe flooding which took place in England during June and July 2007.
Available from:	webarchive.nationalarchives.gov.uk/20100807034701/http://archive.cabinetoffice.gov.uk/pittreview/thepittreview.html .

Title:	Environment Agency - flooding in Wales: A national assessment of flood risk (2009)
Description:	This assessment sets out the current level of risk from rivers and the sea and what the Environment Agency is doing to manage it.
Available from:	www.environment-agency.gov.uk/static/documents/Research/ENV0005_Flooding_in_Wales_ENGLISH_AW_LR(1).pdf .

Title:	Environment Agency – Future flooding in Wales: Flood defences (2010)
Description:	This assessment considers the possible costs of building and maintaining river and coastal defences over the next 25 years.
Available from:	www.environment-agency.gov.uk/static/documents/Research/Flooding_in_Wales_Flood_defences_ENGLISH_V5.pdf .

Title:	English National Strategy & Guidance
Description:	The national FCERM strategy for England sets out the framework for managing flood and coastal erosion risk management in a co-ordinated way. All English Risk Management Authorities must act in a manner consistent with the national strategy.
Available from:	www.environment-agency.gov.uk/research/policy/130073.aspx .

Title:	Welsh – Strategic Environmental Assessment (SEA)
Description:	Copies of the SEA and associated documents prepared in relation to the development of the National Strategy.
Available from:	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en .

Title:	Welsh – Habitats Regulation Assessment (HRA)
Description:	Copy of the HRA completed in relation to the development of the National Strategy.
Available from:	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en .

CONSULTATIONS

Title:	Consultation on the development of the National Strategy for Flood & Coastal Erosion Risk Management: Wales
Description:	<p>The National Strategy is intended to set out our policies on flood and coastal erosion risk management. It should also establish a delivery framework that meets the needs of Wales both now and in the future.</p> <p>The consultation documents including a summary of the responses along with the Welsh Government's response can be found via the link provided below.</p>
Available from:	wales.gov.uk/consultations/environmentandcountryside/floodstrategy/?lang=en&status=closed .

Title:	A living Wales – a new framework for our environment, our countryside and our seas - Consultation on the National Environment Framework
Description:	Our new Natural Environment Framework (NEF) focuses on managing our environment as a whole rather than focusing on separate parts.
Available from:	wales.gov.uk/consultations/environmentandcountryside/eshlivingwalescons/?lang=en&status=closed .

Title:	Draft Flood and Water Management Bill and consultation
Description:	A draft Bill for new legislation for managing flood and coastal erosion risk in England and Wales. Published for public consultation in April 2009.
Available from:	www.official-documents.gov.uk/document/cm75/7582/7582.pdf .

Title:	Taking forward the draft Flood and Water Management Bill - The Government response to pre-legislative scrutiny and public consultation
Description:	The UK Government's response to each of the recommendations made by the Environment, Food and Rural Affairs (EFRA) Select Committee in its pre-legislative scrutiny report.
Available from:	www.defra.gov.uk/environment/flooding/documents/policy/fwmb/bill-consult-response.pdf .

Title:	Draft Flood and Water Management Bill: Summary of Consultation Responses received and considered by the Welsh Government.
Description:	A summary of consultation responses to the draft Flood and Water Management Bill considered by the Welsh Government.
Available from:	wales.gov.uk/docs/desh/consultation/091119floodingresponsesen.pdf .

LEGISLATION

Title:	Flood and Water Management Act 2010
Description:	The Flood and Water Management Act 2010 received Royal Assent on 8 April 2010. It was passed in recognition of the need to update the legislation governing flooding and coastal erosion.
Available from:	www.legislation.gov.uk/ukpga/2010/29/contents .

Title:	The Flood Risk Regulations 2009
Description:	The Flood Risk Regulations 2009 came into force on 10 December 2009 and transpose the EC Floods Directive (2007/60/EC) into UK law across Wales and England.
Available from:	www.legislation.gov.uk/uksi/2009/3042/contents/made .

Title:	EC Floods Directive (2007/60/EC)
Description:	The EC Floods Directive came into force on the 23 October 2007 with the objective of establishing a framework at community level for the assessment and management of flood risk across Member States.
Available from:	eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:288:0027:0034:EN:PDF .

Commencement Orders (Flood & Water Management Act 2010)	
At the time of publishing there have been five commencement orders enacting certain provisions within the Flood & Water Management Act 2010. Four of which have been completed on a composite basis covering Wales & England and one completed on an England only basis.	
Wales & England	
Title - SI No – Date Made	Available from:
The Flood and Water Management Act 2010 (Commencement No. 1 and Transitional Provisions) Order 2010 - 2010 No. 2169 (C. 108) - 31 August 2010	www.legislation.gov.uk/uksi/2010/2169/contents/made .
The Flood and Water Management Act 2010 (Commencement No. 2) Order 2011 - 2011 No. 95 (C. 4) – 18 January 2011	www.legislation.gov.uk/uksi/2011/95/made .
The Flood and Water Management Act 2010 (Commencement No. 3 and Transitional Provisions) Order 2011 - 2011 No. 694 (C. 25) – 7 March 2011	www.legislation.gov.uk/uksi/2011/694/introduction/made .
The Flood and Water Management Act 2010 (Commencement No. 4 and Transitional Provisions) Order 2011 - 2011 No. 2204 (C. 80) – 5 September 2011	www.legislation.gov.uk/uksi/2011/2204/introduction/made .
England Only	
Title - SI No - Date Made	Available from:
The Flood and Water Management Act 2010 (Commencement No. 1 and Transitional Provisions) (England) Order 2011 - 2011 No. 1770 (C.67) - 18 July 2011	www.legislation.gov.uk/uksi/2011/1770/made .

Title:	The Flood Risk Management Functions Order 2010
Description:	This Order specifies additional functions as flood risk management functions for the purposes of section 4(2) of the Flood and Water Management Act 2010. The effect of defining a function as a flood risk management function is to bring it within the scope of certain provisions in the Act which requires such functions to be performed in specified ways.
Available from:	www.legislation.gov.uk/uksi/2010/2232/article/1/made .

Title:	Flood and Coastal Erosion Risk Management Information Appeal (Wales) Regulations 2011
Description:	These Regulations provide a right of appeal against penalties imposed under section 15 of the Flood and Water Management Act 2010 in relation to Wales. They confer jurisdiction on the First-tier Tribunal to consider appeals made under these Regulations and make provision for procedure.
Available from:	www.legislation.gov.uk/wsi/2011/865/made .

Title:	The Environment Agency (Levies) (England and Wales) Regulations 2011
Description:	These Regulations provide for the issue of levies by the Environment Agency to lead local flood authorities under section 17(1) of the Flood and Water Management Act 2010 in respect of the Agency's flood and coastal erosion risk management functions under the 2010 Act. Section 17(3) of the 2010 Act provides that the Agency is a levying body within the meaning of section 74 of the Local Government Finance Act 1974.
Available from:	www.legislation.gov.uk/uksi/2011/696/contents/made .

Title:	The Regional Flood and Coastal Committees (England and Wales) Regulations 2011
Description:	These Regulations make provision for the procedure to be followed by the Environment Agency when dividing England and Wales into regions under section 22(1)(a) of the Flood and Water Management Act 2010. They also make provision about appointment of members to Regional Flood and Coastal Committees and proceedings of those Committees.
Available from:	www.legislation.gov.uk/uksi/2011/695/contents/made .

Title:	Climate Change Act 2008
Description:	The Act sets up a framework for the UK to achieve its long-term goals of reducing greenhouse gas emissions and to ensure steps are taken towards adapting to the impact of climate change.
Available from:	www.legislation.gov.uk/ukpga/2008/27/introduction .

Title:	The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003
Description:	These Regulations make provision for the purpose of implementing, in river basin districts within Wales and England, the EC Directive 2000/60/EC (WFD) establishing a framework for Community action in the field of water policy
Available from:	www.legislation.gov.uk/ukxi/2003/3242/made .

Title:	Water Framework Directive (WFD) (200/60/EC)
Description:	The WFD came into force on the 23 October 2000 and is designed to improve and integrate the way water bodies are managed throughout Europe.
Available from:	ec.europa.eu/environment/water/water-framework/index_en.html .

Title:	Conservation of Habitats and Species Regulations (2010)
Description:	These regulations transpose the Habitats Directive into UK law, with an aim to help maintain and enhance biodiversity in the UK and throughout the EU, by conserving natural habitats and protecting priority species and their habitats.
Available from:	www.legislation.gov.uk/ukxi/2010/490/pdfs/ukxi_20100490_en.pdf .

Title:	Habitats Directive
Description:	The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy.
Available from:	ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm .

Title:	Environmental Assessment of Plans and Programmes (Wales) Regulations (2004)
Description:	The regulations transpose into UK law the EC Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment, commonly known as the Strategic Environmental Assessment (SEA) Directive.
Available from:	www.legislation.gov.uk/wsi/2004/1656/contents/made .

Title:	European Directive 2001/42/EC (SEA Directive)
Description:	The Directives aim is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development.
Available from:	eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:197:0030:0037:EN:PDF .

Title:	Land Drainage Act 1991
Description:	An Act to consolidate the enactments relating to internal drainage boards, and to the functions of such boards and of local authorities in relation to land drainage.
Available from:	www.legislation.gov.uk/ukpga/1991/59/contents .

Title:	Civil Contingencies Act (2004)
Description:	An Act, which delivers a single framework for civil protection in the UK capable of meeting a full range of challenges, such as flooding.
Available from:	www.legislation.gov.uk/ukpga/2004/36/contents .

PLANS

Catchment Flood Management Plans (CFMPs) - Wales		
The Environment Agency has produced ten CFMPs for Wales. The locations of the summary reports and post adoption statements for each are listed below:		
CFMP	Summary report	Post Adoption Statement
Wye & Usk	http://publications.environment-agency.gov.uk/pdf/GEWA0110BRJW-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_WU_Post_Adoption_Statement.pdf .
Eastern Valleys	http://publications.environment-agency.gov.uk/pdf/GEWA0110BRJZ-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_EV_Post_Adoption_Statement.pdf .
Taff & Ely	http://publications.environment-agency.gov.uk/pdf/GEWA0110BRKR-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_TE_Post_Adoption_Statement(1).pdf .

Ogmore to Tawe	http://publications.environment-agency.gov.uk/pdf/GEWA0110BR/KI-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_OT_Post_Adoption_Statement.pdf .
Loughor to Taf	http://publications.environment-agency.gov.uk/pdf/GEWA0110BR/KC-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_LT_Post_Adoption_Statement.pdf .
Pembrokeshire & Ceredigion Rivers	http://publications.environment-agency.gov.uk/pdf/GEWA0110BR/KL-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_PCR_Post_Adoption_Statement.pdf .
North West Wales	http://publications.environment-agency.gov.uk/pdf/GEWA0110BR/KF-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_NWW_Post_Adoption_Statement.pdf .
Conwy & Clwyd	http://publications.environment-agency.gov.uk/pdf/GEWA0110BR/KU-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_CC_Post_Adoption_Statement.pdf .
River Dee	http://publications.environment-agency.gov.uk/pdf/GEWA0110BR/KO-e-e.pdf .	www.environment-agency.gov.uk/static/documents/Research/091208_RD_Post_Adoption_Statement.pdf .
River Severn	http://publications.environment-agency.gov.uk/pdf/GEMI0909BQY/M-b-e.pdf .	http://publications.environment-agency.gov.uk/pdf/GEMI1209BRLZ-e-e.pdf .

Shoreline Management Plans (SMPs)

SMPs are developed by Coastal Groups, who are principally made up of local authorities and the Environment Agency, one of whom adopts a leading role in coordinating the Coastal Group and writing the SMP for each stretch of coastline. There are four SMPs covering Wales and the links to these and other SMPs have been provided below.

Title / Lead Authority	Available from:
Anchor Head to Lavernock Point (Severn Estuary)/Monmouthshire Council	www.severnestuary.net/secg/smpr.html .
Lavernock Point to St Ann's Head/ Carmarthenshire Council	www.southwalescoast.org/ .
St Ann's Head to Great Ormes Head/ Pembrokeshire Council	www.westofwalesmp.org/ .
Great Ormes Head to Scotland/ Blackpool Borough Council	www.mycoastline.org/ .
Other SMPs	www.environment-agency.gov.uk/research/planning/105014.aspx .

Title:	Futurecoast
Description:	In 2000, the Department for Environment, Food and Rural Affairs (DEFRA) and the National Assembly for Wales commissioned Halcrow to develop Futurecoast, a completely new way of predicting shoreline evolution. The analysis it contained provided a better understanding of coastal systems and their characteristics, and it is being used to create the next generation of shoreline management plans. (SMP2)
Available from:	www.halcrow.com/Our-projects/Project-details/Futurecoast-England/ .

NATIONAL ASSEMBLY FOR WALES COMMITTEE REPORTS

Title:	Sustainability Committee: Inquiry into Flooding in Wales
Description:	The Sustainability Committee undertook an inquiry into flooding in Wales throughout 2009. The report was published in February 2010 and contained 28 recommendations.
Available from:	www.assemblywales.org/cr-ld7912-e.pdf .

Title:	Welsh Government Written Response to the Sustainability Committee's Report on their 'Inquiry into Flooding in Wales'
Description:	Written response by Jane Davidson AM, Minister for Environment, Sustainability and Housing.
Available from:	www.assemblywales.org/bus-home/bus-guide-docs-pub/bus-business-documents/bus-business-documents-doc-laid.htm?act=dis&id=177249&ds=4/2010 .

Title:	Sustainability Committee Report into the implications of the Draft Flood and Water Management Bill in Wales
Description:	The Sustainability Committee undertook an inquiry into the implications of the Draft Flood and Water management Bill in April 2009. The report contained 7 recommendations.
Available from:	www.assemblywales.org/bus-home/bus-guide-docs-pub/bus-business-documents/bus-business-documents-doc-laid.htm?act=dis&id=138382&ds=7/2009 .

Title:	Constitutional Affairs Committee Report on the Flood and Water Management Bill.
Description:	The Constitutional Affairs Committee considered the Flood and Water Management Bill on 21 January 2010. The Report which contained 4 recommendations was published in February 2010.
Available from:	www.assemblywales.org/bus-home/bus-guide-docs-pub/bus-business-documents/bus-business-documents-doc-laid/cr-id7900-e.pdf?langoption=3&ttl=CR-LD7900%20-%20Constitutional%20Affairs%20Committee%20Report%20on%20the%20Flood%20and%20Water%20Management%20B .

Title:	Public Accounts Committee: Coastal Erosion and Tidal Flooding Risk in Wales
Description:	On the basis of the report of the Auditor General for Wales on coastal erosion and tidal flooding risks in Wales, the Public Accounts Committee conducted an inquiry. The inquiry was completed and the report published in May 2010.
Available from:	www.assemblywales.org/bus-home/bus-guide-docs-pub/bus-business-documents/bus-business-documents-doc-laid.htm?act=dis&id=149678&ds=10/2009 .

WALES AUDIT OFFICE REPORT

Title:	Wales Audit Office Report: Coastal Erosion and Tidal Flooding in Wales
Description:	The Auditor General for Wales completed a full study which addressed the question: 'Should the Welsh public sector implement its planned proposal to address the changing risks associated with coastal erosion and tidal flooding
Available from:	www.wao.gov.uk/assets/englishdocuments/Coastal_flooding_eng.pdf .

OTHER REPORTS

Title:	Exercise: Watermark
Description:	A report produced following exercise Watermark, which tested exercise players across Wales and England against surface water, river and reservoir failure right through to tidal flooding.
Available from:	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/emergencies/?lang=en .

Pilot Study Reports	
<p>In 2007, in recognition of the need to change the way in which flood risks were managed at that time, the Welsh Government applied the principles of the New Approaches Programme (NAP) to three pilot studies. The primary aim of the NAP initiative was to facilitate the required change in the management of flood and coastal erosion risk across Wales, moving away from the defence dominated approaches of the past to a more holistic risk management approach. Three separate reviews were undertaken to learn from the lessons in adopting this new approach and links to these reports has been provided below.</p>	
Title	Available from:
Learning the lessons of adopting a different approach to managing flood risk in Coldbrook, Barry.	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en .
Learning the lessons of adopting a different approach to managing flood risk at Prestatyn.	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en .
Learning the lessons of adopting a different approach to managing flood risk at Pwllheli.	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en .

Title:	Flood Risk Management toolkit
Description:	In 2010, the Welsh Government commissioned a formal evaluation of flood risk management activities of the three 'NAP' pilot studies and a sample of the European Regional Development Funded capital programme. This evaluation formed the basis of a Flood Risk Management toolkit, which aims to provide guidance on how risk management authorities can effectively engage with communities to raise awareness of flooding.
Available from:	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en .

Title:	New Approaches Programme Closure Report
Description:	A report produced by the Welsh Government to review and close the initiative entitled the New Approaches Programme (NAP).
Available from:	wales.gov.uk/topics/environmentcountryside/epq/waterflooding/flooding/?lang=en .

Title:	National Coastal Erosion Mapping
Description:	The National Coastal Erosion Mapping (NCERM) project aims to map the risk of erosion for the whole of the coastline of England and Wales. Maps for Wales are likely to be published during 2011/12.

Title:	Economic Renewal: a new direction
Description:	Economic Renewal: a new direction sets out the role devolved government can play in providing the best conditions and framework to enable the private sector to grow and flourish.
Available from:	wales.gov.uk/topics/businessandconomy/economicrenewal/?lang=en .

Title:	Programme of Government
Description:	<p>The government's legislative programme was announced in an annual statement to the National Assembly for Wales on 12 July 2011.</p> <p>The new Programme for Government will be published on the Welsh Government web site shortly after it is announced by the First Minister in the Senedd.</p>
Available from:	wales.gov.uk/about/programmeforgovernment1/?lang=en .

Glossary of Terms

A

Act – a Bill approved by both the House of Commons and the House of Lords and formally agreed to by the reigning monarch (known as Royal Assent).

Accretion – The gradual extension of land by natural forces, as in the addition of sand to a beach by the sea, or the extension of a floodplain through the deposition of sediments by repeated flooding.

Assets – structures or a system of structures used to manage flood risk.

B

Bill – a proposal for a new law, or a proposal to change an existing law that is presented for debate before Parliament.

Building Regulations – The UK Building Regulations are rules of a statutory nature to set standards for the design and construction of buildings. Primarily to ensure the safety and health for people in and around those buildings, but also for the purposes of energy conservation and access to and about other buildings.

C

Catchment – An area that serves a river with rainwater that is every part of land where the rainfall drains to a single watercourse is in the same catchment.

CFMP – Catchment Flood Management Plans – plans that provide an overview of the flood risk across each river catchment and estuary. They recommend ways of managing those risks now and over the next 50-100 years.

Climate Change – any change in climate over time (usually decades or longer), whether due to natural variability or as a result of human activity.

Coastal erosion – the wearing away of coastline, usually by wind and/or wave action.

Coastal erosion risk – measures the significance of potential coastal erosion in terms of likelihood and impact.

Coastal erosion risk management – anything done for the purpose of analysing, assessing and reducing a risk of the wearing away of coastline.

Coastal Flooding – Occurs when coastal defences are unable to contain the normal predicted high tides that can cause flooding, possibly when a high tide combines with a storm surge (created by high winds or very low atmospheric pressure).

Coastal Squeeze – Where the coast is protected by engineering structures, the rising sea level results in a steepening of the intertidal profile, known as coastal squeeze.

Community Infrastructure Levy – a mechanism for raising additional funding at the local level.

Critical National Infrastructure – Infrastructure that supplies essential services, e.g. water, energy, communications, transport etc.

Cultural Heritage – Buildings, structures and landscape features that have an historic value.

Culvert – a covered structure under road, embankment etc, to direct the flow of water.

D

Defences – A structure that is used to reduce the probability of floodwater or coastal erosion affecting a particular area.

Deposition – The process whereby sediment is placed on the sea bed, shoreline, river bed or flood plain.

Draft Bill – a Bill published in draft before introduction before Parliament.

E

EAW/EA – Environment Agency Wales and Environment Agency – Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs and a Welsh Government sponsored Public Body responsible to the Welsh Ministers.

F

FCERM – Flood & Coastal Erosion Risk Management.

Flood – any case where land not normally covered with water becomes covered by water.

Flood and Water Management Act 2010 – an Act of Parliament updating and amending legislation to address the threat of flooding and water scarcity, both of which are predicted to increase with climate change.

Flood risk – product of the probability of flooding occurring and the consequences when flooding happens.

Flood risk management – the activity of understanding the probability and consequences of flooding, and seeking to modify these factors to reduce flood risk to people, property and the environment. This should take account of other water level management and environmental requirements, and opportunities and constraints.

Flood risk management measures – The way in which flood risks are to be managed.

Flood risk management Wales – The Regional Flood and Coastal Committee (RFCC) for Wales.

Flood Risk Regulations 2009 – Regulations which transpose the EC Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) into domestic law and to implement its provisions.

Floodline Warnings Direct – is a free service that provides flood warnings direct to you by telephone, mobile, email, SMS text message and fax.

G

Groundwater – water held underground in the soil or in pores and crevices in rock.

Groundwater Flooding – Occurs when water levels in the ground rise above the natural surface. Low lying areas underlain by permeable strata are particularly susceptible.

H

I

IDB - Internal Drainage Board – Independent statutory bodies responsible for land drainage in areas of special drainage need in Wales and England. They are long established bodies operating predominantly under the Land Drainage Act 1991 and have permissive powers to undertake work to secure drainage and water level management of their districts.

Intertidal – The area between low and high water tides.

J

K

L

LLFA – Lead Local Flood Authority – (Local Authority) the County Council or the County Borough Council for the area.

Local Authority special levies – are paid to Internal Drainage Boards by local authorities within a drainage district in relation to the benefits of water level management for non-agricultural land.

Local Flood Risk: defined within the Flood and Water Management Act 2010 as including surface runoff, groundwater and ordinary watercourses.

Local Flood Risk Management Strategy: required in relation to Wales by Section 10 of the Flood and Water Management Act 2010 local flood risk strategies are to be prepared by lead local flood authorities and must set out how they will manage local flood risks within their areas.

LRF - Local Resilience Fora – a group required under the Civil Contingencies Act, 2004 who are responsible for the coordination of emergency planning in local areas.

M

Main River – A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers.

Managed Realignment – A coastal defence technique which aims to achieve sustainable flood defence by recreating eroded salt marsh and mudflat habitats.

N

O

Ordinary Watercourse – all watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, Internal Drainage Boards.

P

Q

R

Recovery – The process of rebuilding, restoring and rehabilitating the community following an emergency.

Reservoir – an artificial lake where water is collected and stored until needed. Reservoirs can be used for irrigation, recreation, providing water for municipal needs, hydroelectric power or controlling water flow.

Residual risk – the risk that remains after risk control measures have been put in place. For example: a flood defence may reduce the likelihood of flooding, but if the flooding behind the defences is very deep, the residual risk to people is very high, and further action may be necessary to reduce the residual risk further.

Resilience – The ability of the community, services, area or infrastructure to avoid being flooded, lost to erosion or to withstand the consequences of flooding or erosion taking place.

RFCC – Regional Flood and Coastal Committee – An Environment Agency committee, responsible for consenting medium and long term plans and operational plans to the Agency's Board and Head Office. Monitors and reports on progress. In Wales there is only one RFCC and this is the FRMW (Flood Risk Management Wales) group.

Risk – measures the significance of a potential event in terms of likelihood and impact. In the context of the Civil Contingencies Act 2004, the events in question are emergencies.

Risk Assessment – A structured and auditable process of identifying potential significant events, assessing their likelihood and impacts and then combining these to provide an overall assessment of risk to inform further decisions and actions.

Risk Management – anything done for the purpose of analysing, assessing and reducing a risk.

Risk Management Authority – A Welsh risk management authority is defined in Section 6 of the Flood and Water Management Act 2010 as the Environment Agency, a lead local flood authority, a district council for an area for which there is no unitary authority, an IDB 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.

Risk Management Schemes – a range of actions to reduce flood frequency and/or the consequences of flooding to acceptable or agreed levels.

River flooding – occurs when water levels in a channel overwhelms the capacity of the channel.

Roll Back – as natural defences fail the coast will 'roll back' naturally, creating an opportunity for the expansion of intertidal and coastal habitats.

S

Sewer – An artificial conduit, usually underground, for carrying off sewage (a foul sewer) or rainwater (a storm sewer) or both (a combined sewer).

Shoreline Management Plans (SMPs) – A large-scale assessment of the risks associated with coastal processes and helps reduce these risks to people and the developed, historic and natural environments.

Statement of Environmental Particulars – A statutory requirement under the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004. It sets out how the findings of the Environmental Report have been taken into account and how views expressed during the consultation period have been taken into account during the development of the National Strategy.

SuDS – Sustainable Drainage Systems – Approach to surface water management which helps to deal with excesses of water by mimicking natural drainage processes and patterns

Surface Water Flooding – In the urban context, usually means that surface water runoff rates exceed the capacity of drainage systems to remove it. In the rural context, it is where surface water runoff floods something or someone.

Surface water runoff – This occurs when the rate of rainfall exceeds the rate that water can infiltrate the ground or soil.

T

Technical Advice Note 14: Coastal Planning – TAN 14 supports Planning Policy Wales and covers all aspects of planning for new development and the coastal zone.

Technical Advice Note 15: Development & Flood Risk – TAN 15 supports Planning Policy Wales and makes it clear how local authorities should make decisions about different types of development on flood plains, providing clear tests for justification and acceptability of flooding consequences, and enabling the consideration of risks over the lifetime of the new development.

Third Sector – Voluntary and not-for-profit organisations.

U

V

W

Wales Flood Group – a sub group of a Wales Resilience Forum.

Water company – a company which holds an appointment under Chapter 1 of Part 2 of the Water industry Act 1991 or a licence under Chapter 1A of Part 2 of that Act.

Watercourse – A channel natural or otherwise along which water flows.

Welsh Local Government Association (WLGA) – represents the interests of Local Authorities in Wales. The three fire and rescue authorities, four police authorities and three national park authorities are associate members.

WFD – Water Framework Directive

Y

Z