

Is Wales ready for sea level rise and flooding?

Victoria Paris

With relative sea levels predicted to rise, the cost of flood damages is set to increase. Is Wales ready and able to deal with this challenge?

Some consider flooding to be the biggest climate change related threat the UK faces.

The annual economic damages from flooding in Wales will potentially increase 18 fold from 2004 to the 2080s, although it is accepted that this challenge may be even greater.

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Due to climate change and sea level rise it is expected that the coastline will be subjected to more frequent and severe storms and wave action which will increase coastal erosion, damage to coastal defences and the likelihood and consequences of coastal flooding.

Flood risk

At present 220,000 properties in Wales, or around 11 per cent of all properties, are at risk of flooding from rivers and the sea. Of those 65,000 are at significant likelihood of flooding. On average flooding is estimated to cause in the region of £200 million of damage in Wales each year.

Predicted UK sea level rise

It is difficult to predict sea level rises as it depends on numerous factors including:

- increases in greenhouse gases in the atmosphere;
- the heating and expansion of ocean water;
- melting of the world's ice sheets, ice caps and glaciers;
- vertical land movement (Wales is currently subsiding around 0.5mm per year while Scotland is rising);
- local currents;
- variations in salinity and water temperature.

The most recent projections of sea level change for the UK are set out in the UK Climate Projections 2009. Projections of change in the UK suggest a rise of between 12 and 76cm by 2095, compared to a 1980-1999 baseline. This approximately equates to rates of between 1.2 and 7.6mm per year respectively. Due to projected land movements, a greater rise in southern regions of the UK is likely relative to the north.

Predicted sea level rise in Wales

Under a medium greenhouse gas emission scenario it is projected that Cardiff could experience a relative sea level rise (taking into account land level changes) of 21-68cm by 2095. Whilst the forecast of relative sea-level rise is for Cardiff, the geographic variations in sea level around Wales are small.

This has major implications for coastal communities. Coastal flooding and erosion

threatens beaches and therefore tourism in Wales, which contributes over £2.5 billion each year to the Welsh economy.

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Around 60 per cent of the population of Wales live in coastal areas and in some regions communities exist below the high tideline. For example, Aberaeron and Borth lie below the tideline and rely on sand dunes and shingle beaches for tidal flood defence.

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

Coastal erosion

In 2004 it was estimated that the English and Welsh coastline was being eroded 20-67m every 100 years, but this is predicted to increase to 82-175m depending on the emissions scenario considered.

Rising sea levels will lead to the loss of land and further coastal erosion as the high tideline moves further up the shore. Increases in wave height and storm surges may also increase the rate of coastal erosion.

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

In some areas such as Penmaenmawr in North Wales, railways and roads run within metres of the tideline.

Defences

Coastal defences currently protect nearly 28 per cent of the Welsh coastline and £8 billion of assets from coastal erosion and flooding. However, these defences do not sufficiently manage the existing risk of coastal erosion, and climate change and sea level rise will further reduce their efficacy.

Building coastal defences can be technically difficult and may not be affordable in all locations in the future.

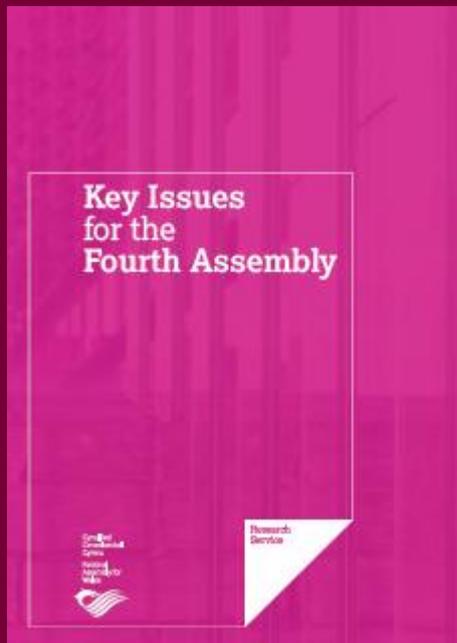
Hard, and perhaps unpopular, choices will need to be made about how and where investment is best directed.

The previous Welsh Government invested £39 million during 2010-11 in flood and coastal erosion risk management in Wales. If investment in flood risk management is maintained at current levels then by 2035 the number of properties in Wales at significant likelihood of flooding would increase from 65,000 to 115,000, with a consequent increase in expected annual damages.

To maintain the number of properties at flood risk in 2035 at levels comparable to now may require trebling investment levels, while reducing the number of properties at risk would require further investment again.

A wider range of actions may be necessary to manage the impacts of current and future flooding. How is Wales preparing for this? Would Wales be prepared, and indeed able, to abandon certain areas and assets to the sea?

Article taken from Research Service publication



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This document has been specially prepared for Assembly Members by the Research Service. It sets out some of the key issues likely to matter to Members during the Fourth Assembly.

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Research Service
National Assembly for Wales
Cardiff Bay
CF99 1NA

Email: **Research.Service@wales.gov.uk**

Twitter: **[@NAWResearch](https://twitter.com/NAWResearch)**