

Sea-level change

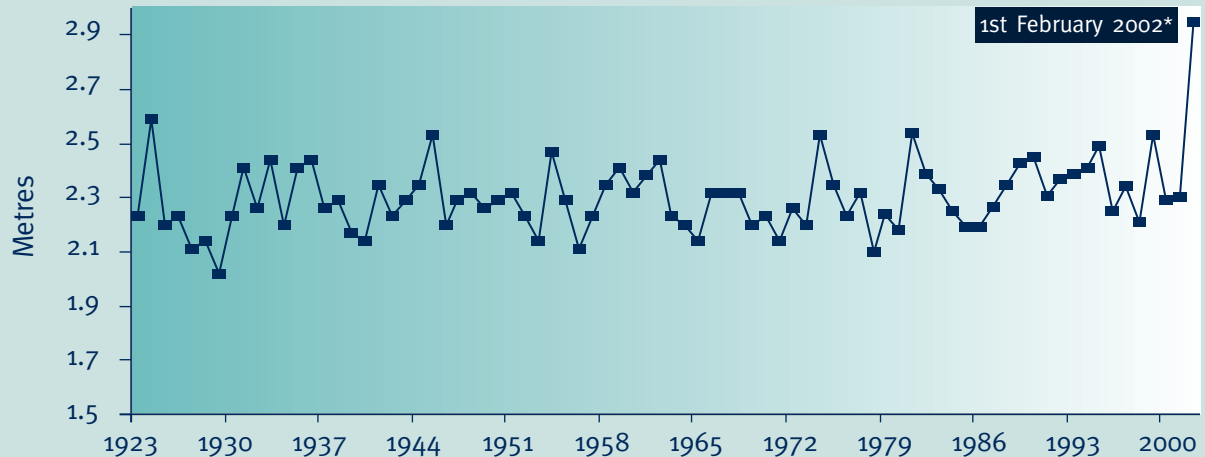
Globally, sea-level

is estimated to be currently rising at a rate of 1-2 mm per annum. Global Climate Model (GCM) projections of sea-level over the course of the present century indicate a rise of approximately 0.5 metres as a consequence of increasing temperatures. This will pose a significant threat to many areas, including many major world cities, densely populated deltas and low-lying islands. This rise in sea level will result from a combination of factors such as thermal expansion of the ocean and melting of glaciers and large ice sheets.

Approximately 70% of the Earth's freshwater resources are stored in the Greenland and Antarctic ice sheets and these two ice sheets may play a critical role in future sea-level rise as a consequence of climate change. While the Greenland ice-sheet is expected to contract considerably as global warming proceeds, the behaviour of Antarctic ice remains somewhat uncertain and the current consensus is that catastrophic collapse of the West Antarctic ice-sheet is unlikely to occur over the course of the present century. Since oceans and ice sheets respond only very slowly to changes in climate, sea levels will continue to rise for centuries, even if greenhouse gas concentrations were stabilised at present levels. Thus sea level rise will continue to present a serious future threat.



Annual High Water at Dublin Port



* Latest available data

Source: Dublin Port Company



Climate and Sea Level Change

Likely Implications for Ireland

Inundation and subsequent loss of low-lying coastal land will occur in Ireland as a consequence of any rise in sea level. Increased rates of erosion of the 'softer' coastlines, comprised of unconsolidated glacial deposits such as sands and gravels, around the south and east are also likely. Incidences of flooding along the coast and inland along major river networks are also likely to increase, particularly during storm surge events occurring with heavy precipitation and high tides. Coastal habitats for birds and plants, such as estuaries and wetlands, are also likely to suffer. Economic losses are likely to be greatest in urban locations, including the major cities of Cork, Limerick, Dublin and Galway. Infrastructural assets such as railways, roads and airports, located close to present sea level, will also be at increased risk.

How can we reduce our vulnerability to sea-level rise in Ireland?

The key priority is to provide an adequate safety margin above the water level likely to be experienced during the lifetime of structures close to the coast. This should be conservative and include consideration of the storm event likely to be experienced only once in two centuries. For the present century, based on recent storm surge measurements in the Dublin area, during which an extreme high water level of 2.95m was experienced in February 2002, a figure of 4m above present sea level would be appropriate for the east coast of Ireland. This figure comprises a rise in sea level of 0.5m, a storm surge of 2.95m, together with a safety margin.

The following general guidelines should also be adhered to in all coastal regions of Ireland:

- No building or development within 100 metres of 'soft' shorelines
- No further reclamation of estuary land
- No removal of sand dunes, beach sand or gravel
- All coastal defence measures should be assessed for environmental impact.
- Careful consideration should be given to cost-benefit analysis, before 'hard engineering' solutions are contemplated.

For further information see www.ipcc.ch



3rd Scientific Statement

Climate and Sea Level Change

This is the third in a series of scientific statements by the ICC. Previously published statements:

• A general statement on Climate Change and Ireland

- Climate Change and Irish Agriculture

Forthcoming scientific statements will include:

- Climate Change and Natural Ecosystems
- Greenhouse Gases
- Climate Change and Water Resources

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