



# Climate

Northern Ireland

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## **CULTURAL HERITAGE**

**Northern Ireland Climate Change Risk Assessment**  
Risks & Opportunities



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# About Climate NI

**Climate**  
Northern Ireland

 Northern Ireland  
**environment  
link**

## Climate NI Programme Vision

“ *Climate Northern Ireland is a cross-sectoral partnership devoted to understanding and enabling adaptation and mitigation actions in Northern Ireland that can address the climate emergency.* ”

## Climate NI Programme Aims

- **Support development and implementation of climate policy** by enabling the exchange of expertise and advice between Government Departments, public bodies, and civil society.
- **Engage the research community** to help define and address evidence needs for climate policy and action.
- **Increase co-ordination and awareness on climate change** through partnership and clear communication.
- **Enable delivery of climate action in NI** by addressing barriers and building capacity at local, regional and national levels.

Funded via the Carrier Bag Levy by:

 Department of  
**Agriculture, Environment  
and Rural Affairs**  
[www.daera-ni.gov.uk](http://www.daera-ni.gov.uk)

An Roinn  
**Talmhaíochta, Comhshaoil  
agus Gnóthaí Tuaithe**

Department of  
**Fairmin, Environment  
an' Kintra Matthers**

*Climate Northern Ireland is funded by DAERA to raise awareness of and support climate change policy development through stakeholder engagement.*

# Climate Change & Northern Ireland

## Changes in average temperatures

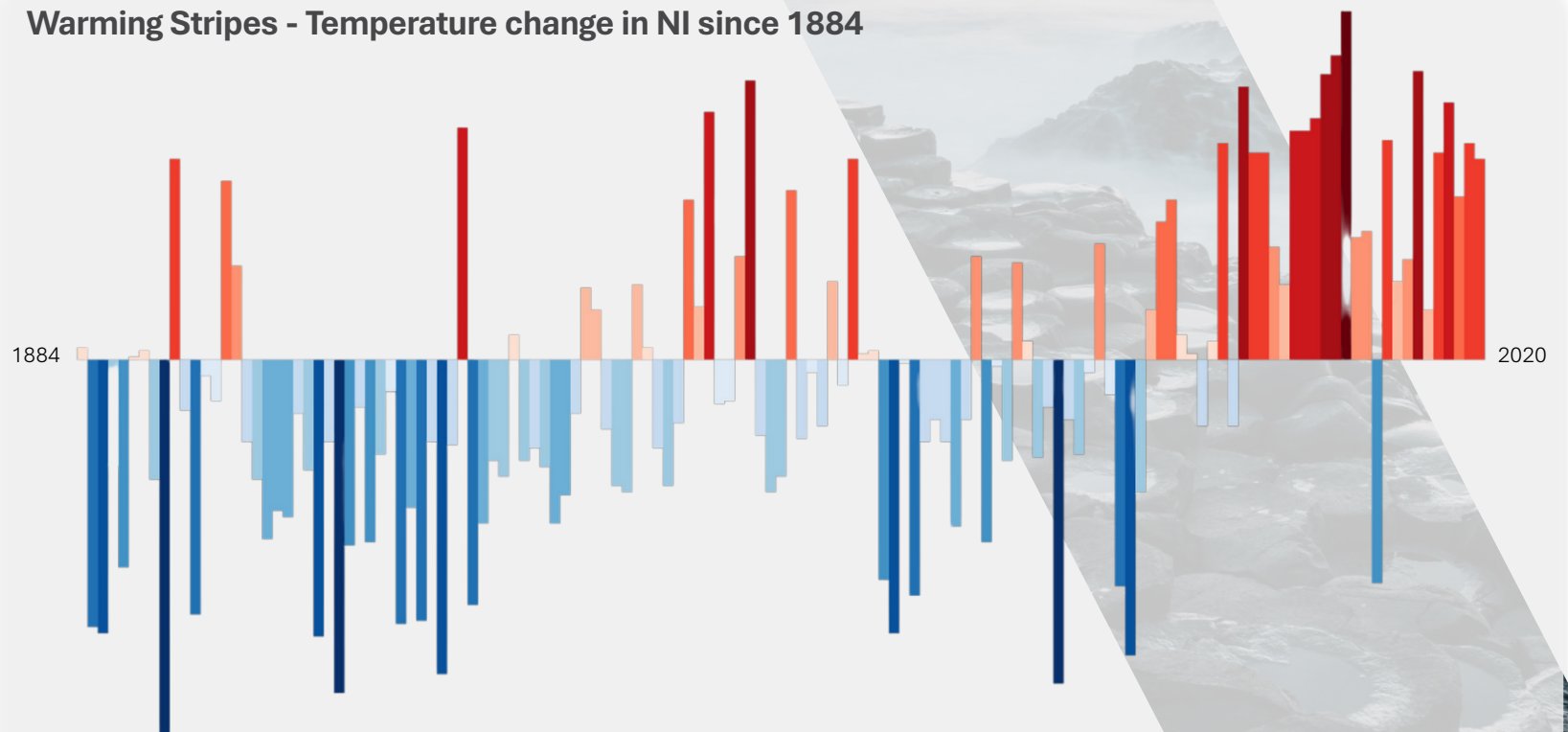
NI's climate is changing in line with the global average temperature.

“ An increased chance of warmer, wetter winters and hotter, drier summers along with an increase in frequency and intensity of extremes.

Met Office

Northern Ireland is **locked in to at least 11cm of sea-level rise by 2100**, but unless global emissions decline, that number could be as much as 94cm.

Warming Stripes - Temperature change in NI since 1884



Data source: Ed Hawkins- Showyourstripes.info

# Climate Change Risk Assessment

## The Third UK Climate Change Risk Assessment (CCRA3)

The evidence for the third UK **Climate Change Risk Assessment** (CCRA3) is compiled by the UK Government's independent advisors, the **Climate Change Committee** (CCC).

**61 risks and opportunities were assessed** in detail. Alongside technical reports a summary was produced for each region, including Northern Ireland.

**Each risk is assessed by answering the following questions:**

- 1** What is the current and future level of risk?
- 2** To what extent is the risk going to be managed?
- 3** Are there benefits of further action in the next five years, over and above what is already planned?



For detail on the climate risk for NI and a range of short sector briefing papers, check out:

[ukclimaterisk.org](https://www.ukclimaterisk.org)

# Climate Change Risk Assessment

## Urgency score for Climate Change Risk Assessment

Category	Description
More action needed	<p>New, stronger or different Government action, whether policies, implementation activities or enabling environment for adaptation – over and above those already planned – are beneficial in the next five years to reduce climate risks or take advantage of opportunities. This will include different responses according to the nature of the risks and the type of adaptation:</p> <p>Addressing current and near-term risks or opportunities with low and no-regret options (implementing activities or building capacity).</p> <p>Integrating climate change in near-term decisions with a long life-time or lock-in.</p> <p>Early adaptation for decisions with long lead-times or where early planning is needed as part of adaptive management.</p>
Further investigation	<p>On the basis of available information, it is not known if more action is needed or not. More evidence is urgently needed to fill significant gaps or reduce the uncertainty in the current level of understanding in order to assess the need for additional action. <i>Note the category of 'Research Priority' in CCRA2 has been replaced with 'Further investigation' in CCRA3. This is because of some confusion following CCRA2 that 'research priority' only denoted that more research was needed, when in fact the urgency is to establish the extent to which further adaptation is required.</i></p>
Sustain current action	<p>Current or planned levels of activity are appropriate, but continued implementation of these policies or plans is needed to ensure that the risk or opportunity continues to be managed in the future.</p>
Watching brief	<p>The evidence in these areas should be kept under review, with continuous monitoring of risk levels and adaptation activity (or the potential for opportunities and adaptation) so that further action can be taken if necessary.</p>

# Risk Overview

Risk	Urgency score
H3: Risk of flooding to buildings	More Action Needed
H4: Risk of sea level rise to coastal communities	Further Investigation
H5: Risk of moisture, wind and driving rain to building fabric	Further Investigation
H7: Risk of changes in indoor and outdoor air quality affecting health and wellbeing	Further Investigation
H11: Risks to cultural heritage	More action needed

Risk	Urgency score
B2: The risk of coastal flooding, extreme weather, erosion and sea level rise on coastal business locations and infrastructure	More Action Needed
B5: The risk of infrastructure disruption and higher temperatures in working environments to reduced employee productivity in businesses	Further Investigation
I7: Risk of subsidence to subterranean and surface infrastructure	Further Investigation
N18: Risks and opportunities from climate change to natural heritage and landscape character	Further Investigation

# Risk in Northern Ireland



**National  
Trust**

## Mount Stewart

Warmer summers, wetter winters, and rising sea levels are altering the National Trust Mount Stewart site and what can be grown. Modelling suggests, by 2080, sea levels in the area could rise by 60cm, increasing to 95cm with storm swells and nearly 3.5m during the most severe storms.

For Mount Stewart, this means that the coastal gardens areas will face an increasing amount of water coming in, and the sea plantation will see much more flooding with salt water. At high tide rainwater that currently drains from the gardens out into the lough will also have nowhere to go. It's very likely that the most famous area, the Formal Gardens, will be consumed slowly by both salt and rainwater sometime in the next 100 years.



## Read More

[A Climate for Change: Adaptation and the National Trust](#)



## H3: Risk of flooding to buildings

- The main associated risks are death or injury, long-term and severe impacts on mental health and wellbeing, damage to property, disrupted access to employment, education and health services, and illness from water-borne pathogens or chemical contaminants.
- The **dominant source of flood risk is from rivers** but if current levels of adaptation continue, **surface water and coastal risks will increase** in their relative contribution to Northern Ireland's flood risk. Groundwater continues to have a limited contribution at national scale, although will be important locally.
- Key challenges relate to **continued development on the floodplain**, the **management of surface water flooding** via SuDS, the **low take up of Property Flood Resilience (PFR)** and the **lack of UK-wide standards**.



Photo by C. Gallagher from Unsplash

## H3: Risk of flooding to buildings

- According to the Northern Ireland Flood Risk Assessment 2018, approximately **45,000 properties (c. 5%)** in Northern Ireland are located within either the 1% Annual Exceedance Probability (AEP) fluvial floodplain or in areas at risk of flooding from a 0.5% AEP surface event with a flood depth greater than 300mm.
- **Direct expected annual damages** from flooding in Northern Ireland for residential properties are currently around **£21.3m**, which equates to a high magnitude score.
- In future, climate change will **increase the number of properties at risk of flooding** from all sources, and these could be in areas that have not previously been at risk of flooding. The largest increase in risk in Northern Ireland is related to **coastal flooding**, which is **projected to increase by 550% by 2080s** (in a high population scenario and with 4°C global warming at 2100).

## H4: Risk of sea level rise to coastal communities



Castlerock. Photo by K. Mitch Hodge from Unsplash

- This risk is focused on coastal change, that is, the physical change to the shoreline caused by coastal erosion, coastal landslip, permanent inundation or coastal accretion that is of such severity that the long-term sustainability and viability of coastal communities (which also includes those living working or visiting coastal locations) is threatened.
- It is the **combination of sea level rise with storminess and coastal processes** such as sediment movement and erosion that creates a risk of such magnitude that it can **threaten the long-term sustainability of whole communities.**
- The most recent mapping of Northern Ireland estimates 32% of the coast is manmade structures and 68% is natural and about **19.5% of the Northern Ireland coastline is currently at risk from erosion.**
- Approximately **2,720 households are at risk of coastal flooding** in NI.

## H5: Risk of moisture, wind and driving rain to building fabric

- This risk is primarily concerned with homes and costs to households, resulting from damage to dwellings from moisture, high winds, subsidence, and insect damage.
- **Damp buildings cause harm to health and wellbeing**, and damage to dwellings from high winds can also risk injury.
- The analysis for this risk is largely described at the UK level.

Future change to climate variable	Projected future impact
Increases in precipitation	<ul style="list-style-type: none"> <li>• Requirement for increased ventilation to remove indoor moisture.</li> <li>• Winter ingress in building fabric after heavy rainfall events.</li> <li>• Increased water penetration of vertical walls in dwellings.</li> <li>• Increased indoor moisture detrimental to health of occupants.</li> </ul>
Increases in temperature	<ul style="list-style-type: none"> <li>• May help to reduce moisture content, although likely to be counterbalanced by precipitation increases.</li> <li>• Minor benefit of higher surface temperatures could reduce risk of mould growth but would likely be counterbalanced by an increase in air moisture content.</li> </ul>
Increases in windstorms	<ul style="list-style-type: none"> <li>• Climate change is likely to lead to increases in wind driven rain. Wind-driven rain is associated with storms and the intensity of rainfall in storm events is projected to increase (although there is limited evidence available to illustrate the impact of climate change on storm frequency and location).</li> </ul>
Increase in heatwaves	<ul style="list-style-type: none"> <li>• This could lead to an increase in subsidence and tends to be a greater risk for older properties, and new developments on clay soils.</li> </ul>

Figure 10: How climate change could affect building fabric (Recreated from Health, Communities and Built Environment technical chapter).

## H5: Risk of moisture, wind and driving rain to building fabric



Photo by T. Sara from Unsplash

- Damp or excessive moisture due to flooding and intense rain.
- Damp buildings causing harm to occupant health and wellbeing.
- Insufficient building regulations and standards to manage risks from moisture and damp.
- Structural damage and injury due to high winds.
- Subsidence caused by drought and dry soil.
- Costs to homeowners for repair.

## H7: Risk of changes in indoor and outdoor air quality affecting health and wellbeing



Photo by F. Jones from Unsplash

- Indoor air quality is dependent on building characteristics, ventilation, emissions from indoor sources and external air quality. Indoor air quality could be affected by interventions for Net Zero that can affect the ventilation of buildings.
- There is **very little evidence for the impact of climate change on indoor air quality**. Although, higher temperatures may improve or reduce indoor air quality. If temperatures are higher people may open windows more which could provide increased air circulation. However, in instances of poor outdoor air quality this could reduce the quality of indoor air.
- Natural (non-anthropogenic) sources of air quality related to pollen and mould that affect health. Pollen risks are likely to change with climate change although the implications for health are not clear.

## H11: Risks to cultural heritage



Photo by S. Hylands from Pexels

- Impacts of climate change on cultural heritage have already been observed.
- Continued monitoring is essential to inform risk management, especially for coastal sites.
- There is evidence that flood protection measures may do damage if not implemented appropriately.
- Coastal heritage is particularly at risk from climate change. Heritage organisations and communities may need to accept the loss of some heritage assets. This process of loss is likely to be a powerful motivator for engagement and action on climate change. It also provides opportunities to understand sites and places in a way that might have otherwise not been possible, for example new heritage discoveries being revealed by climate driven impacts.

## B2: The risk of coastal flooding, extreme weather, erosion and sea level rise on coastal business locations and infrastructure

- For most of the UK, a considerable amount of industrial and commercial activity, as well as infrastructure occurs along the coast.
- **Flooding and coastal change** risk to businesses is a **medium risk** now, is expected to rise to high risk in the future for Northern Ireland.
- Northern Ireland faces **increasing risks from coastal erosion** (c.19.5% of the coast is at risk of erosion) **and marine flooding**.
- The expected annual damages for UK-wide non-residential properties from coastal flooding is expected to increase by 30% by 2050 and 73% by 2080 given present day levels, under a +2°C at 2100 scenario and increase by 82% by 2050 and 181% by 2080 under a +4°C at 2100 scenario.



Portrush. Photo by K. M. Hodge

## B5: The risk of infrastructure disruption and higher temperatures in working environments to reduced employee productivity in businesses

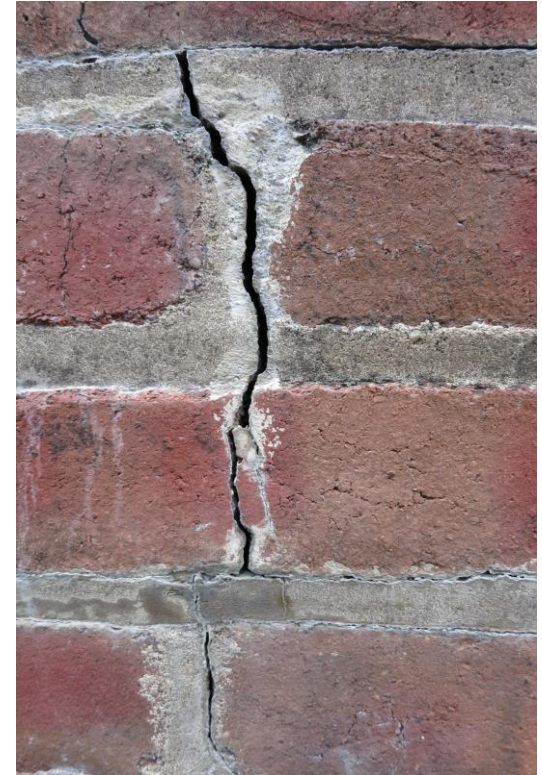


Photo by I. Andrade from Unsplash

- A changing climate has the potential to affect productivity, potentially both negatively and positively, as well as indirectly through infrastructure disruption and higher temperatures in working environments.
- There are **risks associated with extreme high temperatures**, which can have **negative impacts on employees' health and wellbeing and ability to commute to work**. There is some evidence that businesses are experiencing these impacts already.
- Workers engaged in certain occupations, for example heavy outdoor manual labour, are likely to be at the greatest risk of heat stress.

## 17: Risk of subsidence to subterranean and surface infrastructure

- Ground subsidence can occur due to shrinking and swelling of clay soils due to changes in soil water content and can also occur due to collapse of pre-existing cavities in the ground such as voids in soluble rocks and mine workings.
- The majority of damage from subsidence occurs to residential and commercial property.
- **Transport infrastructure and buried infrastructure is vulnerable to damage and disruption** due to climate change driven subsidence effects.



*Photo by H. Rudolph from Unsplash*

## N18. Risks and opportunities from climate change to natural heritage and landscape character

- Northern Ireland has a comprehensive assessment of both the 26 regional landscape character areas and the 24 seascape areas identified on the coast.
- This provides a good reference base from which to assess changes in the key characteristics that define these areas, but the information is yet to be updated based upon current knowledge of climate change risks, such as by using UKCP18 or CCRA2.
- Similarly, plans for designated Areas of Outstanding Natural Beauty (AONBs) are yet to be updated with robust climate change adaptation strategies.



*Photo by S. Forson from Pexels*

# References

1. [UK Climate Risk Website](#)
2. [UK Climate Risk Independent Assessment \(CCRA3\) Technical Report](#)
3. [Evidence for the third UK Climate Change Risk Assessment \(CCRA3\) Summary for Northern Ireland](#)

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