



Climate

Northern Ireland

HOUSING

Northern Ireland Climate Change Risk Assessment Risks & Opportunities



www.climatenorthernireland.com

Subscribe to our [monthly newsletter](#).

About Climate NI

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.

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

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

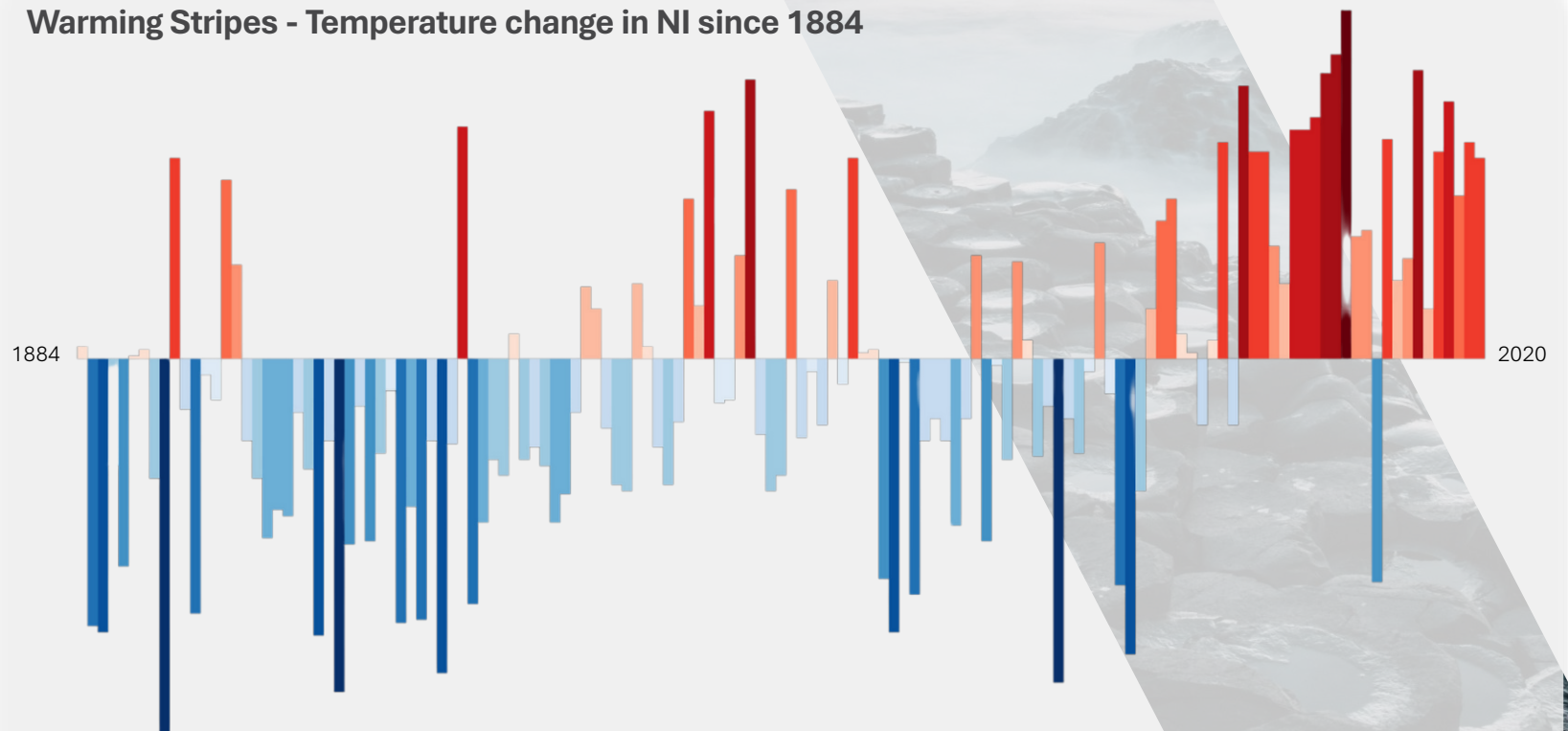
NI's climate is changing in line with the global average temperature.

“ 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
H1: Risk of high temperatures affecting health and wellbeing	More Action Needed
H3: Flooding affecting people, communities and buildings	More Action Needed
H5: Risk of moisture, wind and driving rain to building fabric	Further Investigation
H6: Summer and winter temperature changes affecting household energy demand	More Action Needed
H7: Changes in indoor and outdoor air quality affecting health and wellbeing	Further Investigation
H10: Water quality and household water supply affecting health	Further Investigation
I7: Risk of subsidence to subterranean and surface infrastructure	Further Investigation

**Risks,
opportunities,
and benefits of
further action**



More action needed

Further investigation

Sustain current action

**Maintain a
watching brief**

Average UK wide scores

H1. Risks to health and wellbeing from high temperatures

H3. Risks to people, communities and buildings from flooding

H5. Risks to building fabric from moisture, wind and driving rain

H10. Risk to water quality and household water supply

H6. Risks and opportunities from summer and winter household energy demand

H7. Risks to health and wellbeing from changes in air quality

Risk in Northern Ireland



Photo by K. Mitch Hodge on Unsplash

“Northern Ireland floods: More than 100 people rescued” – B B C

23 August 2017

More than 100 people had to be rescued in Northern Ireland after being trapped by overnight flooding. The north west was worst affected, particularly Londonderry, as well as other parts of the county and Tyrone.

Firefighters rescued 93 people who were trapped by flood water in their cars or homes. At one point, the fire service got an emergency call every 45 seconds.

The Met Office confirmed that 63% of the average August rainfall fell within an eight-to-nine-hour period. The coastguard rescued more than 30 people, with helicopters brought in from Scotland, Wales and Sligo.

H1: Risk of high temperatures affecting health and wellbeing



Photo by Tom O'Neill on Unsplash

- Northern Ireland dwellings are at risk of overheating, with research showing that existing NI homes are likely to overheat by mid-century onward.
- Some housing types would require mechanical cooling or significant interventions such as solar shading to ensure comfortable internal temperatures. Dwellings with higher energy efficiency ratings and those built more recently are expected to have higher summer internal temperatures.
- Design and construction strategies used to meet Net Zero, such as energy efficiency and reduced ventilation, tend to increase overheating risk unless designed appropriately with adequate ventilation installed. Whilst loft and wall insulation can help to prevent heat penetration through roofs and walls, once heat has entered a home, insulation can reduce heat loss through the building fabric at night and increase overheating risk.
- **The present and future magnitude of this risk is high in NI.**

H3: Flooding affecting people, communities and buildings

- About 33,000 people in NI are currently at significant risk of flooding: c. 10,000 from fluvial, c. 1,000 from coastal, & c. 22,000 from surface water.
- Direct expected annual damages from flooding in NI for residential properties are currently around £21.3m, which equates to a **high magnitude score**.
- 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.
- 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).

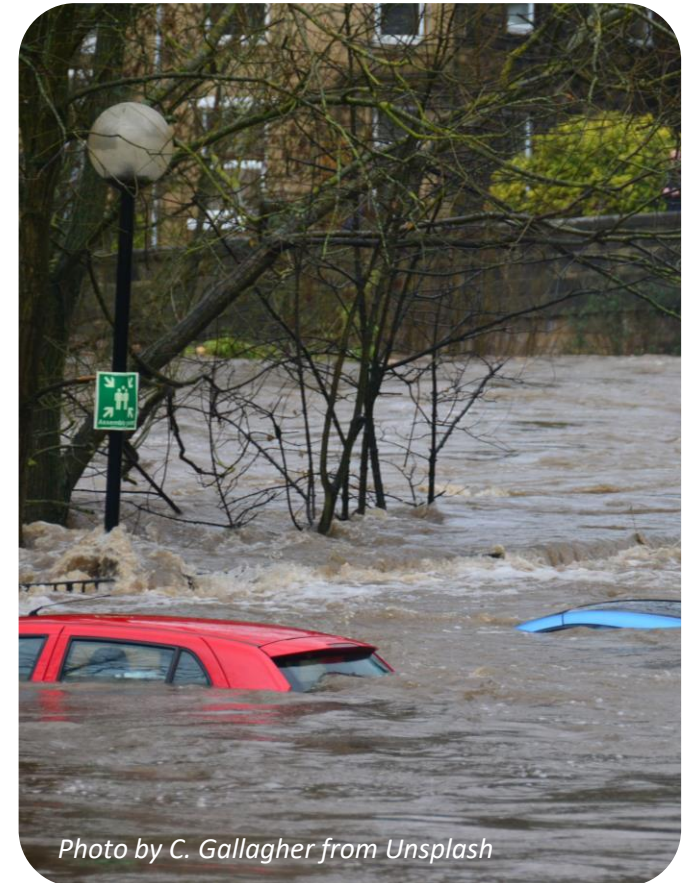


Photo by C. Gallagher from Unsplash

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

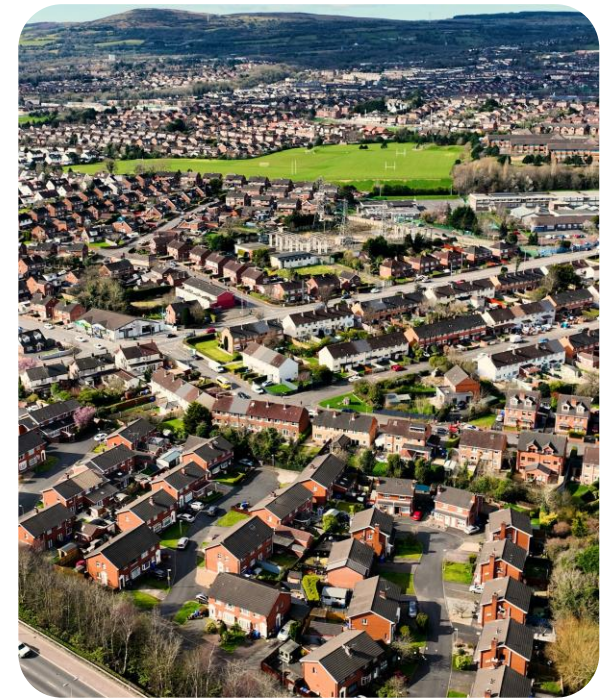
- Net zero policies that improve energy efficiency in housing can affect risks associated with moisture.
- Creating low energy buildings with increasing amounts of insulation and airtightness can lead to an increased risk of moisture-related damage to the structure and internal environment. Without considering additional ventilation this can lead to higher indoor vapour and mould growth.

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

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

H6: Risk of summer and winter temperature changes affecting household energy demand

- Climate change will **reduce future heating demand** and the magnitude of this opportunity is high in the future in Northern Ireland.
- The opportunities from reduced heating costs are not being fully realised and there is **insufficient action being undertaken** to understand and take advantage of the future warmer climate.
- The **future level of benefit is uncertain** and depends on numerous factors such as socioeconomic factors, building standards and energy prices.
- There is **limited data for future cooling demand in Northern Ireland** but higher temperatures in summer may increase the potential need for cooling.
- Net zero policies will have big interactions with these risks and opportunities which may present additional costs to households to increase energy efficiency.



Aerial view of Residential homes in Belfast, Northern Ireland Cityscape. Photo by Peter Steele

H7: Changes in indoor and outdoor air quality affecting health and wellbeing

- Outdoor air quality associated with anthropogenic sources (including traffic, industry and agricultural sources) and wildfires. Modelling studies indicate that ozone levels may decrease but not under all scenarios.
- Air pollution emissions from combustion are falling rapidly and are expected to decline significantly under Net Zero carbon scenarios, thus the baseline level of pollution and interactions with climate change will reduce the future risk for outdoor air quality.
- Poor indoor air quality may cause or aggravate allergic and asthma symptoms, airborne respiratory infections, chronic obstructive pulmonary disease, cardiovascular disease and lung cancer.
- Household energy efficiency measures related to achieving Net Zero greenhouse gas emissions have the potential to worsen indoor air quality unless specific measures are taken to avoid this.
- Higher external temperatures may improve or reduce indoor air quality due to changes in behaviours such as patterns of window opening.

H10: Water quality and household water supply affecting health



Photo by L. Tosta from Unsplash

- Higher rates of warming may lead to interruptions of household water supplies which would have health, social and economic impacts, particularly for vulnerable households.
- **Climate change may increase the risk of contamination of drinking water** through increased runoff and flooding events that overwhelm current water treatment approaches.
- Risks to health from contact with bathing water (sea, lakes and rivers) and harmful algal blooms may increase with climate change.
- Private water supplies are most vulnerable to current climate hazards that affect water quality and quantity.

I7: 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.

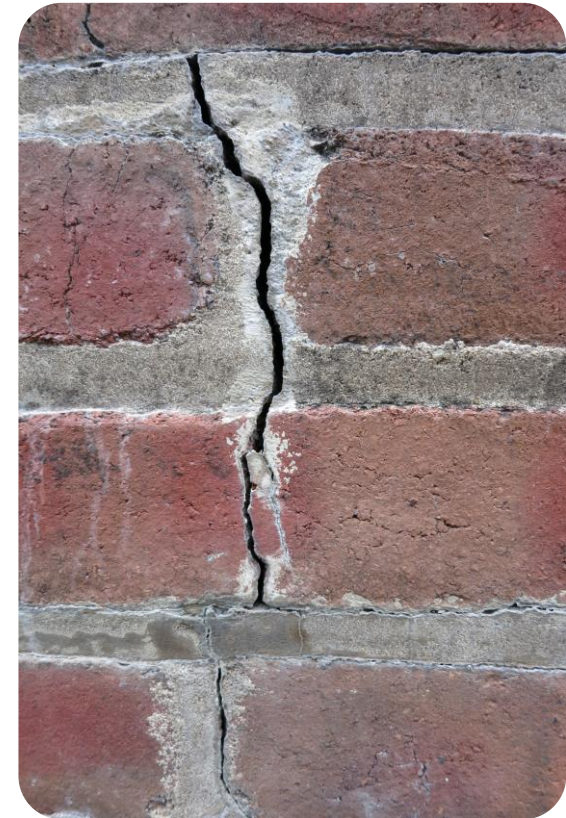


Photo by H. Rudolph from Unsplash

I7: Risk of subsidence to subterranean and surface infrastructure



Photo by rüveyda from Pexels

- The formation of sinkholes under road and rail infrastructure can be precipitated by prolonged or extreme rainfall. Areas underlain by soluble rocks are most vulnerable though the collapse of poorly capped and filled mineshafts can exhibit the same effects.
- There are over **2,400 known abandoned mine workings in Northern Ireland**, containing vertical shafts and horizontal adits extending underground to great distances.
- The current risk is deemed low, rising to medium in future. Confidence in this assessment is low as no further quantitative evidence has been identified since CCRA2 on the potential future risk.

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](#)

Funded via the Carrier Bag Levy by:



An Roinn
Talmhaíochta, Comhshaoil
agus Gnóthaí Tuaithe

Department o'
Fairmin, Environment
an' Kintra Matthers

UK CLIMATE
RISK

Climate
Northern Ireland

