



## Step 01 - Understand Your Context

# What is Climate Change and How Does it Impact NI?

## What is climate change?

Climate change refers to the long-term shift in temperature and average weather patterns across the globe. Since the mid-1800s, human activities, particularly the release of carbon dioxide and other greenhouse gases, have driven a steady rise in global temperatures<sup>1</sup>. So far, average temperatures have increased by about 1.1°C since the Industrial Revolution.

The impacts from climate change are already being experienced today and will continue to intensify in the coming years. Even if all emissions stopped tomorrow, some degree of warming is inevitable.

However, the extent of future warming depends on the actions we take now. If we continue to burn fossil fuels and cut down forests at current rates, the planet could warm by more than 4°C by 2100<sup>1</sup>. This warming could fundamentally change life on earth and carry significant consequences.

## Observed changes in our climate

### Headlines

- Northern Ireland's climate is changing in line with the global average temperature.<sup>2</sup>
- Temperatures are rising across all seasons.<sup>3</sup>
- Sea levels are rising.<sup>3</sup>
- The frequency and intensity of extreme weather events is changing.<sup>3</sup>

Northern Ireland is already experiencing rising average temperatures, with measured warming of around 1°C above pre-industrial levels<sup>4</sup>. This trend is in line with global average temperature trends. All the top 10 warmest years for the UK in the series from 1884 have occurred since 2003<sup>5</sup>.

- The average UK temperature of the decade 2013-2022 was 1.1°C warmer than the 1961-1990 average<sup>5</sup>.

- Winters In the UK during the same decade (2013–2022) have been 25% wetter than 1961–1990<sup>5</sup>.
- In the UK overall, the most recent decade (2013–2022) has been 8% wetter than 1961–1990<sup>5</sup>.
- Mean sea level around the UK has risen by about 18.5cm since the start of the 20th century<sup>5</sup>.

## Projected changes in our climate

Met Office: “an increased chance of warmer, wetter winters and hotter, drier summers along with an increase in the frequency and intensity of extremes.”

- A greater chance of more rainfall in the winter but less rainfall in the summer<sup>6</sup>
- A greater chance of higher average temperatures across both summer and winter<sup>6</sup>
- At least 11cm of sea-level increase ‘locked-in’ by 2100 regardless of emissions reduction<sup>7</sup>

Cold snaps, drier winters and wet summers will still occur. This means we must be prepared for a greater range of extremes.

### Sea Level Rise

- Northern Ireland is locked into at least 11cm sea-level rise by 2100, but unless global emissions decline, that number could be as much as 94cm<sup>7</sup>
- It is expected that there will be an increase in both the frequency, and magnitude of, extreme water levels around our coastlines<sup>4</sup>.

### Increasing Frequency of Extreme Weather

UK projections anticipate increases in extreme weather events with higher intensity rainfall events, storm events and increased flood risk<sup>6</sup>.

### Increasingly Hot Summer Days

Hot summer day temperatures are expected to increase by between 3.8°C to 6.8°C by the 2070s in ‘high emissions’ scenarios, along with an increase in the frequency of hot spells (wherein there are two or more consecutive days over 30°C)<sup>6</sup>. A summer heatwave like summer 2018 is expected to happen in one in every two years by 2050<sup>8</sup>.

### More Intense Summer Rainfall Events

Despite the trend towards drier summers, future increases in the intensity of heavy summer rainfall events are projected. For urban areas particularly, this will impact on the frequency and severity of surface water flooding.

## Fewer Winter Cold Snaps

Cold snaps like -18.7°C in Castleterg in 2010 will still occur as a result of natural variations in the climate system, but are projected to be less frequent as winters become warmer on average.

## Wetter Winters

Though projections vary in the severity of increase of winter precipitation, all sets of projections and predications show an increase in winter rainfall levels.

## Climate Impacts in Northern Ireland

Northern Ireland is already being affected by weather extremes. These are known as direct impacts, but other indirect impacts will also be important to consider:<sup>3</sup>

- **Rising ocean levels** – Rising temperatures are causing glaciers and ice sheets to melt, adding more water to the oceans and causing the ocean level to rise. Oceans absorb 90% of the extra heat from global warming: warmer water expands, and so our oceans are taking up more space.
- **Ocean acidification** – Ocean acidification occurs when the ocean absorbs carbon dioxide and becomes more acidic. This has impacts on marine organisms with its effects cascading throughout the food web.
- **Extreme weather events** – Climate change is causing many extreme weather events to become more intense and frequent, such as heatwaves, droughts, floods, tropical storms and hurricanes.
- **Flooding of coastal regions** – Coastal cities (e.g. Belfast) are at risk from flooding as sea levels continue to rise.
- **Food insecurity** – High temperatures, extreme weather events, flooding, and droughts damage farmland. This makes it difficult for farmers to grow crops and means that their yield of crops each year is uncertain.
- **Conflict and climate migrants** – Climate change can exacerbate existing problems, such as lack of food or shelter. This may cause global conflict over resources (food, water, and shelter) and cause others to migrate in large numbers.
- **Damage to marine ecosystems** – Rising ocean temperatures, ocean acidification, and ocean anoxia (lack of oxygen) are damaging to marine life such as fish and coral reefs.
- **Biodiversity loss** – Rising temperatures, changing rainfall patterns and extreme weather events are disturbing natural habitats and putting pressure on species already threatened by other human activities.

## Extreme Weather Events experienced across NI

The consequences of climate change in Northern Ireland will include flooding, extreme storm surges, heat waves, wildfires and drought. Extreme events are already impacting on our society,

communities, economy and natural environment. A timeline of past extreme weather events in Northern Ireland is available on the [Climate NI Extreme Weather Timeline](#).

## Resources - What impact will climate change have on Northern Ireland?

View the “What Will Climate Change mean for Northern Ireland?” infographic [here](#).

For more information about the climate risks facing Northern Ireland over the next five years, see the [UK Climate Change Risk Assessment 2021 \(NI summary\)](#).

There are many risks facing people and our built environment. View the CCRA Sector Briefs for accessible summaries of specific risks [here](#).

Climate NI has also produced CCRA overview slides for the following sectors:

- [Agriculture & Environment](#)
- [Business](#)
- [Infrastructure](#)
- [Built Environment](#)
- [Health and Wellbeing](#)

Figure 1: Climate hazards facing people and the built environment in the UK

	Communities & settlements	Buildings	Health & social care system	Population health
Heatwaves	Heatwaves urban heat island, air pollution	Overheating	Overheating risks to patients, social care, occupational risks, energy use	Heatwave risks to populations, mortality, injury etc.
Floods	Flooded communities, resilience, relocation, blight/economic effects	Flood damage, damp, mould	Flood risk to NHS assets, service disruption	Flood impact on mental health, deaths and injuries
Drought	Risk to water supply, drought	Subsidence	Service disruption	Water supply failure, risks to public health
Cold	Risk from extreme weather	Damp homes, cold homes	Service disruption	Cold risks to mortality and morbidity

## References

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