

Climate Change Adaptation Strategy

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Introduction

In 2019 North Somerset Council declared a climate emergency with the aim to become a carbon neutral council and area by 2030.

The same year the council adopted a [Climate Emergency strategy](#) followed by a refreshed [Climate Emergency action plan](#) in November 2022. Climate change adaptation has been identified as one of the key priorities as part of the council's response to tackle climate change.

The development of North Somerset Council's Climate Change Adaptation Strategy follows the UK Government's [Climate Change Act 2008](#), which set a legally-binding target for cutting emissions and tackling the climate crisis, as well as creating a framework for building the UK's ability to adapt to climate change, including:

- a UK-wide climate change risk assessment that must take place every five years
- a national adaptation programme which must be in place and reviewed every five years to address the most pressing climate change risks to the UK.

This strategy includes the assessment of the key climate-related risks for North Somerset in line with the UK Government's [National Adaptation Framework](#) and [UK Climate Risk Assessment](#), as well as a detailed action plan with five key principles:

1. Governance
2. Infrastructure, transport and assets
3. Natural environment
4. Health, communities and the built environment
5. Business and industry

The climate change adaptation strategy takes into consideration the data available through the North Somerset [joint strategic needs assessment](#) and supports the council's strategic vision by aligning with:

- [Corporate Plan](#)
- [Climate Emergency action plan](#)
- [Health and Wellbeing strategy](#)
- [Flood Risk Management strategy](#)
- [Green Infrastructure strategy](#)
- [Local Plan](#)
- [Waste Management strategy](#)

What is climate change adaptation?

Climate change adaptation refers to the process of adjusting our lifestyles and practices to cope with the current or expected impacts of climate change.

In North Somerset, current and projected impacts of climate change include:

- warmer and drier summers likely to break temperature records¹
- wetter and warmer winters
- more extreme weather events including devastating flooding²
- sea level rise.

Adaptation will enhance our resilience to the impacts of climate change.

Why do we need climate change adaptation?

North Somerset Council has emphasised climate change adaptation as a critical component of our Climate Emergency action plan.

The action plan highlights expected challenges such as more frequent floods, higher temperatures, extreme weather, water scarcity, and deteriorating air quality.

North Somerset Council's response to the climate emergency addresses not only the need to reduce emissions but also to prepare our communities and businesses for the realities of a changing climate.

Successful climate change adaptation works alongside climate change mitigation to minimise the future effects of climate change while managing current ones and leveraging any potential benefits. Without taking steps towards adaptation, the financial burdens of climate change will increasingly fall on households, businesses, and government.³

In addition, there is strong evidence of direct links between climate impacts and public health⁴. Extreme weather events will create additional pressure on local health services including increase in hospital admissions and mental health care⁵.

The Climate Change Committee's [climate risks assessment](#) estimated some of the economic and social impacts of recent extreme weather events, as seen in Table 1.

¹ Source: [Record breaking 2022 indicative of future UK climate - Met Office](#)

² Source: [Climate change insights, health and well-being, UK - Office for National Statistics](#)

³ Source: [The Third National Adaptation Programme \(NAP3\) and the Fourth Strategy for Climate Adaptation Reporting – UK Government](#)

⁴ Source: [Main Climate Change and Public Health Indicators: scoping review – UK Government](#)

⁵ Source: [A method for monetising the mental health costs of flooding – Defra and Environment Agency](#)

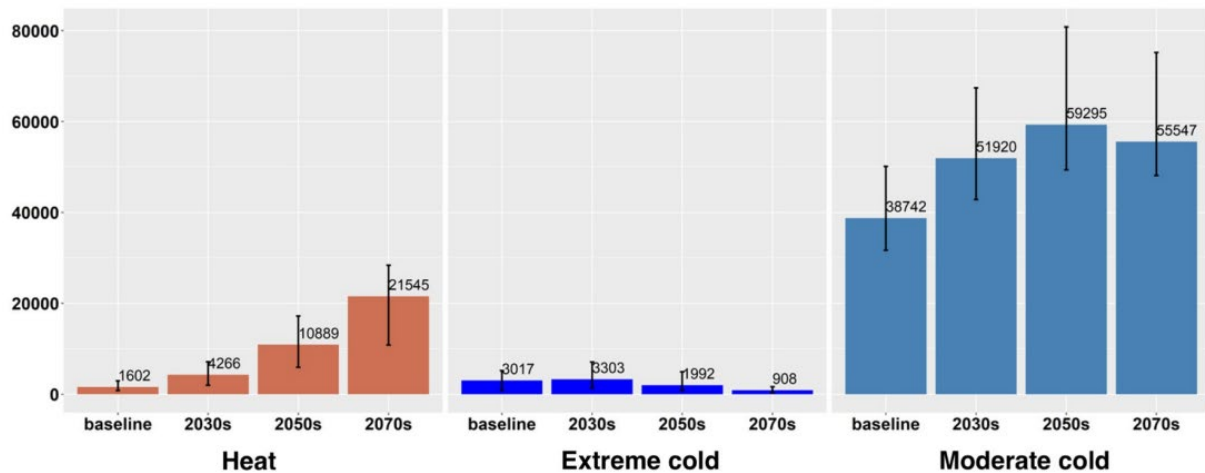
Table 1 – impacts of various extreme weather events in the UK, taken from the Climate Change Committee’s [climate risks assessment](#)

	Economic damages	Deaths	Other environmental impacts
Summer heatwaves	£770 million – total estimated productivity loss of 2010 heatwave	2500+ heat-related deaths were recorded during the summer of 2020 in England: the highest number since 2003	Localised fish die-offs due to de-oxygenation of streams and rivers during the 2018 heatwave
Flooding	£1.6 billion – overall cost of the 2015-16 winter floods	10-15 deaths recorded as a direct result of flooding in 2007	30% increase in topsoil degradation during winter 2015-16 floods in a sample of Scottish catchments
Drought	Economic costs of the 2012 drought were estimated at £165 million in revenues and £96 million in profit	No direct deaths recorded due to drought in the last 10 years	A net reduction in carbon uptake of ecosystems was observed during the 2018 drought across Europe
Wildfire	£32 million – agriculture sector losses from wildfire in 2020	No direct deaths recorded due to wildfire in the last 10 years	174,000 tonnes of carbon estimated to have been lost from the Flow Country wildfire in Scotland 2019

A recent report from the UK Health Security Agency on the [health effects from climate change](#) further outlines the negative impacts of climate change on the UK population, indicating an increase of mortality in the absence of adaptation measures.

Figure 1 illustrates UK heat and cold-related deaths for all ages at baseline (2007 to 2018) and projected for 2030s, 2050s and 2070s. The bars represent the mean across the 12 climate model realisations and the error bars are minimum and maximum ranges of the scenarios. Population growth and ageing are included.

Figure 1 - annual temperature-related death in UK, taken from the UK Health Security Agency's report on the [health effects from climate change](#)



National and global context

Over the last few decades, there has been increasing recognition of climate change impacts at both national and global levels, compelling governments and international bodies to act. This recognition has been formalized through a series of agreements, policies, and frameworks designed to address and mitigate the effects of climate change.

Key international work in the past decade includes:

- [Paris Agreement 2015](#): the United Nations Climate Change Conference (COP21) in Paris saw a landmark agreement being made between nearly 200 countries which agreed to cut emissions to attempt to limit the rise in global temperatures to less than 2°C. The deal is a legally binding international treaty on climate change and united all the world's nations in a single agreement on tackling climate change for the first time in history.
- [The Intergovernmental Panel on Climate Change \(IPCC\) report 2018](#): the report focused on the projected impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways. This aimed to strengthen the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.
- [IPCC report 2021](#): the IPCC published a subsequent report indicating that we are due to reach 1.5°C increase by 2040, revealing that climate change is happening faster than we expected and it is going to affect the whole world.

The UK has been proactive in addressing climate change through a series of legislative and policy measures which emphasize the need for both mitigation and adaptation:

- [Climate Change Act 2008](#)
- [National Adaptation Framework](#)
- [UK Climate Risk Assessment](#)
- [Environmental Improvement Plan](#)

- Defra’s [Good Practice Guide on preparing for a changing climate](#)
- [progress report on adapting to climate change](#) as presented to Parliament in March 2023 by the Climate Change Committee
- [independent assessment of UK climate risk](#) advice to UK Government from the Climate Change Committee
- the Climate Change Committee’s [Sixth Carbon Budget](#) reported recommendations to the UK Government and local councils for delivering adaptation measures.

Since 2019, over two thirds of local authorities have set a net zero target, and across the country, the lexicon of the climate crisis is embedded in people’s everyday lives.

Since the updated targets of the 2021 IPCC report (referenced above), we have seen record-breaking temperatures, catastrophic weather events and 2023’s average temperature proved to be 1.5°C above the baseline temperature⁶.

Although this will also have been influenced by the [El Nino](#) (which increases the temperatures in the Pacific Ocean and has a direct impact on global weather), this situation highlights the complex link between international climate change policies, global temperature patterns and the actions we take locally.

Climate projections

The UK Government’s current [Environmental Improvement Plan](#) states that:

“while we aim to limit global warming to 1.5°C, evidence shows that we must be prepared for warming up to 4°C”.

The Climate Change Committee’s advice is to plan for 2°C of global warming and assess the risks for 4°C of global warming by 2100.

The climate projections continue to intensify. While the projections depend on global actions aimed at reducing greenhouse gas emissions, the current trends for the south west of England (from the [2018 UK Climate Projections](#)) predict a significant increase in temperatures in the second half of the century and are shown in Tables 2 and 3.

The temperature projections shown in Tables 2 and 3 are calculated using the Representative Concentration Pathways (RCP). These are a calculation of a greenhouse gas concentration trajectory which the IPCC adopted and uses for their climate modelling and research.

⁶ Source: [World's first year-long breach of key 1.5C warming limit - BBC News](#)

Table 2 – projected temperature increases for south west of England

	2050s RCP2.6 (50th percentile)	2050s RCP6.0 (50th percentile)	2080s RCP2.6 (50th percentile)	2080s RCP6.0 (50th percentile)
Mean annual temperature	up to +2°C	between +2°C and +4°C	up to +2°C	up to +3°C
Mean winter temperature	up to +1°C	up to +2°C	up to +2°C	up to +3°C
Mean summer temperature	up to +2°C	between +2°C and +4°C	between +2°C and +3°C	up to +4°C

The [Climate impacts tool](#) provides the data for several factors for +2°C and +4°C scenarios in England based on the [UK Climate Risk Indicators](#), as seen in Table 3.

Table 3 – projected climate change impacts and temperature increases for England

Climate impact	Effect of climate change	Present day	By 2050 (+2°C) scenario	By 2100 (+2°C) scenario	By 2100 (+4°C) scenario
Summer mean daily max temp	warmer	20.4°C	+2.4°C	+3.7°C	+ 6.6°C
Summer mean rainfall	drier	206 mm	-56 mm	- 66 mm	- 91 mm
Winter mean daily max temp	warmer	7.5°C	1.5°C	2.1°C	3.4°C
Winter mean rainfall	wetter	240 mm	+24 mm	+38 mm	+58 mm
Sea level rise (1981-2000 baseline)	higher	+0.1 m	+0.4 m	+0.8 m	+1.2m
Hot days – chance of reaching 40°C	hotter more often	once a century	once every 20 years	once every 3-15 years	once every 3-15 years
Peak rainfall intensity (1981-2000 baseline)	heavier		+45%		+50%
Peak river flow (1981-2000 baseline)	more extreme		+35%		+127%
Low river flow (1981-2000 baseline)	more extreme		-60%		-85%

Flood risk

Rising sea level will have significant impacts on the prosperity, health and wellbeing of North Somerset's residents.

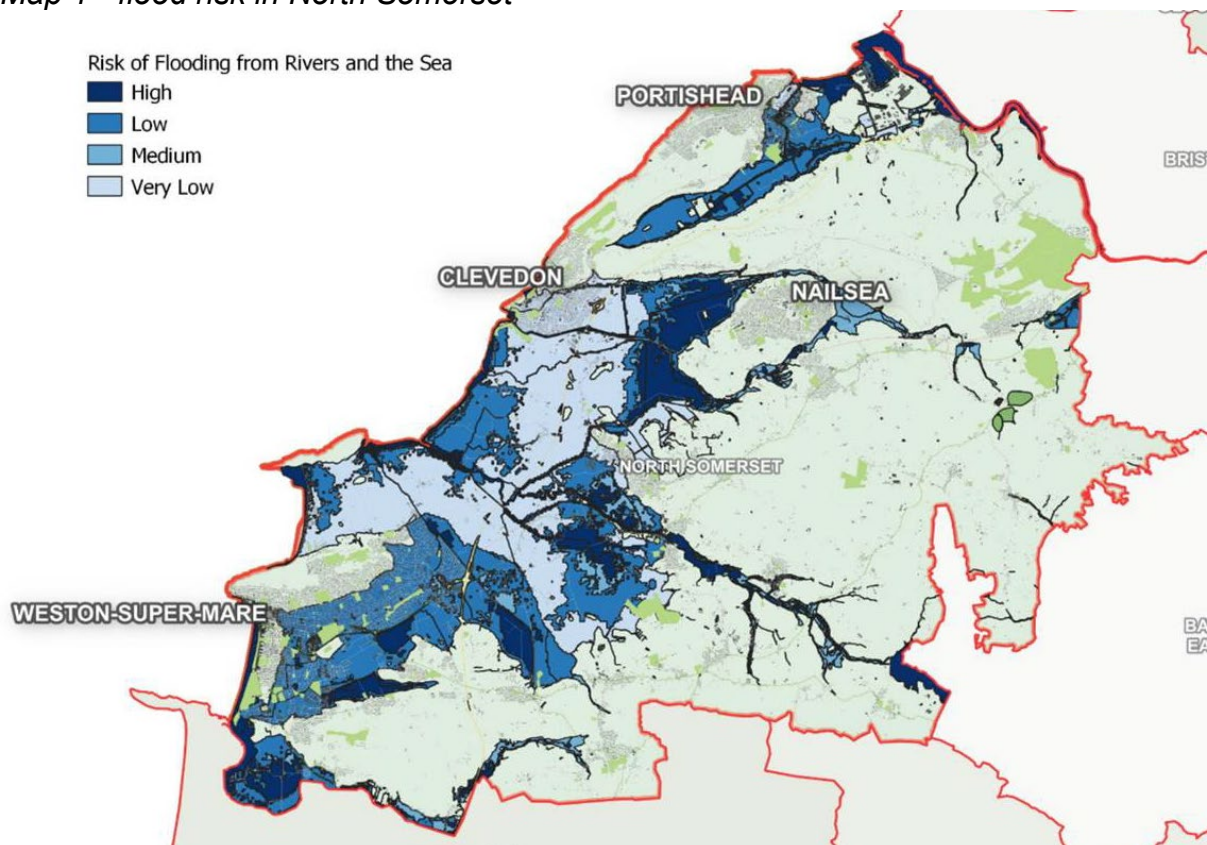
4,300 properties in the region are already at medium risk of flooding (between 1% and 3.3% chance of flooding happening each year, also known as a 1 in 100-year event)⁷ and approximately a quarter of the area of North Somerset is at risk of flooding.

The tidal flood defence network across the area is well-developed and at present flooding rarely occurs due to tidal levels alone.

However, climate change and associated sea level rise will increase the risk of flooding. By 2080, without improvements to flood defences, as many as 63,000 North Somerset properties could be at risk⁸.

Map 1 shows the potential flooding in North Somerset linked to extreme storm events by 2100 including sea level rise and taking account of flood defences.

Map 1 - flood risk in North Somerset



⁷ Source: [Local Flood Risk Management Strategy - North Somerset Council](#)

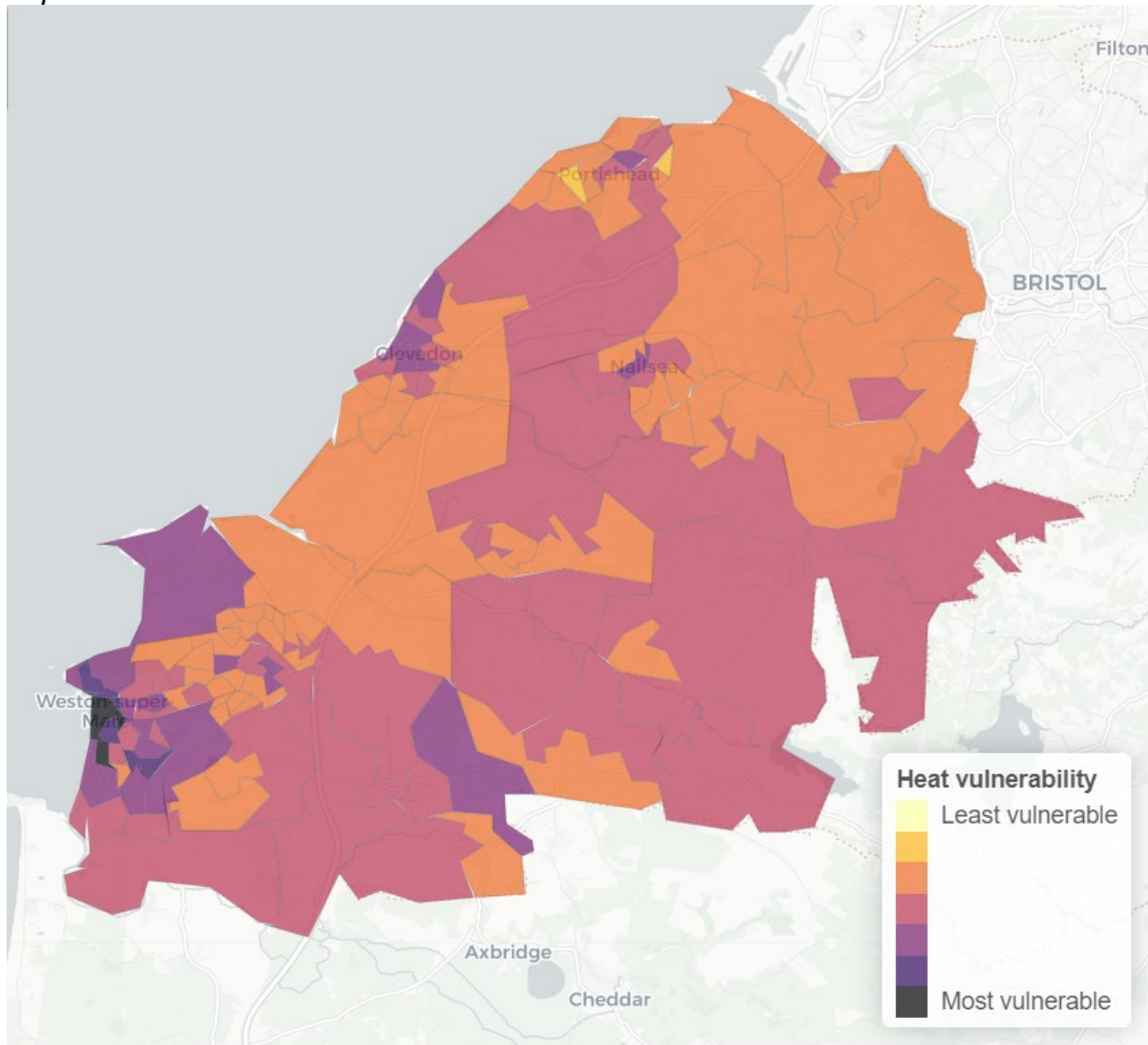
⁸ Source: [Check your area's long term flood risk - GOV.UK](#)

Heat vulnerability

The increase in global temperatures forecast rising temperatures in North Somerset, which could lead to extreme weather events such as heat waves.

Map 2 demonstrates the areas in North Somerset where social vulnerability and exposure to heat coincide. The data is based on the [Emergency Planning Tool](#) methodology, which takes into account age and health, income, mobility and crime, as well as physical environment and housing characteristics.

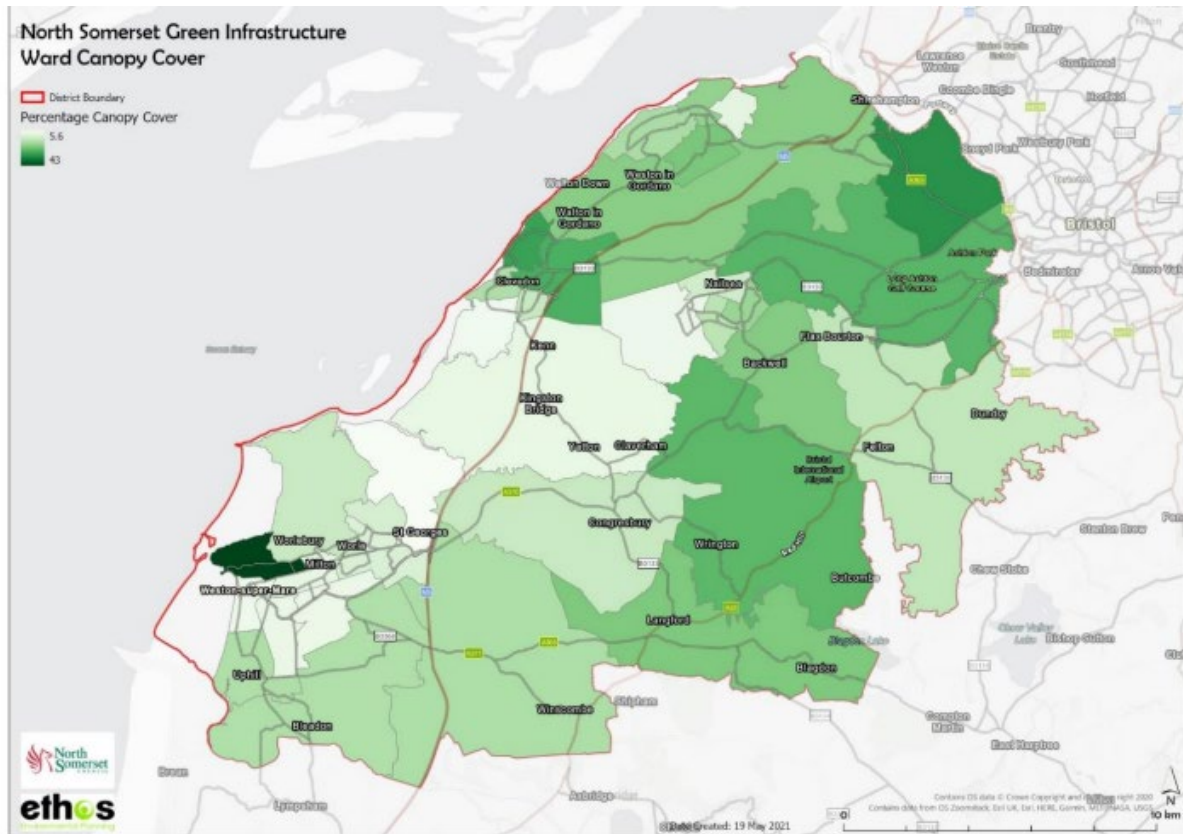
Map 2 - social and heat vulnerabilities in North Somerset



There are several factors that can increase heat vulnerability, including housing characteristics and green spaces.

North Somerset Council's [Green Infrastructure Strategy](#) explores current tree canopy cover and sets out measures to increase the council's green infrastructure assets.

Map 3 – North Somerset tree canopy cover, by ward



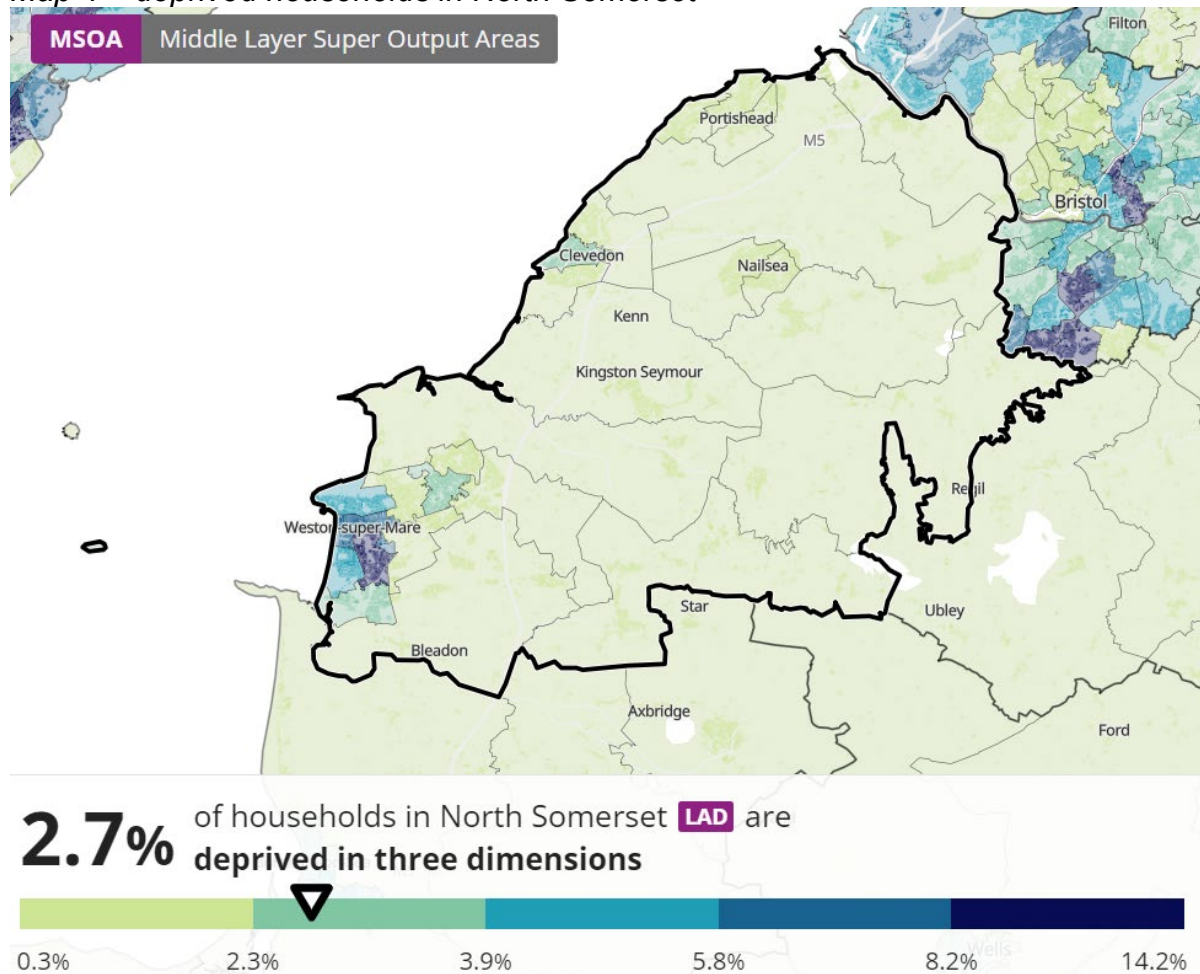
Local context

Who will be affected the most?

Based on climate change projections and vulnerability maps, it is evident that certain wards in North Somerset will be affected by the impacts of climate change more than others.

North Somerset has an aging population and residents living in several areas experience significant health and socio-economic deprivation. This means that large numbers of our residents are particularly vulnerable to the impacts of climate change, and at the same time many will not have the resources to be able to prepare.

Map 4 – deprived households in North Somerset⁹



The impacts of climate change for North Somerset are likely to be most severe in those wards that are the most deprived.

Map 4 shows that a large proportion of these challenges are consistent across wards affected by climate change, increasing the issue of inequalities.

The consequences of no further action to support climate change adaptation will further increase the persistent inequalities gap in the region and create additional challenges for disadvantaged communities and people with protected characteristics.

⁹ Source: [Household deprivation - Census Maps, ONS](#)

Climate risk assessment

This strategy includes the assessment of the key climate-related risks for North Somerset in line with the [Third National Adaptation Framework](#) and [UK Climate Risk Assessment](#) (CCRA).

As part of the strategy development, several internal and external workshops were held to identify and assess the risks in North Somerset.

Four categories of urgency scores were defined:

1. More action needed (red shading in risk assessment)

New, stronger or different Government action, whether policies, implementation activities or enabling environment for climate change 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 climate change adaptation:

- addressing current and near-term risks or opportunities with low and no-regret options (implementing activities or building capacity)
- integrating climate change adaptation in near-term decisions with a long life-time or lock-in. Early adaptation for decisions with long lead-times or where early planning is needed as part of adaptive management.

2. Further investigation (amber shading in risk assessment)

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. 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 climate change adaptation is required.

3. Sustain current action (green shading in risk assessment)

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.

4. Watching brief (green shading in risk assessment)

The evidence in these areas should be kept under review, with continuous monitoring of risk levels and climate change adaptation activity (or the potential for opportunities and climate change adaptation) so that further action can be taken if necessary.

Based on the [Local Partnerships climate risk tool](#) and internal consultation workshops, the risks and opportunities in North Somerset associated with climate change have been outlined in Table 4.

The urgency scores have been determined through internal consultation workshops based on data availability, local knowledge and level of investment in place. The

risks and opportunities are specific to North Somerset, but fall in line with the UK-wide climate risk assessment.

Table 4 – climate risk assessment for North Somerset

Risk or opportunity	Risk ID	Description	Urgency score
Infrastructure			
Risk	I01	Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures	More action needed
Risk	I02	Risks to infrastructure services from river, surface water and groundwater flooding	More action needed
Risk	I03	Risks to infrastructure services from coastal flooding and erosion	Further investigation
Risk	I04	Risks to bridges and pipelines from flooding and erosion	Further investigation
Risk	I05	Risks to transport networks from slope and embankment failure from water saturation	More action needed
Risk	I07	Risks to subterranean and surface infrastructure from subsidence	Further investigation
Risk	I08	Risks to public water supplies from reduced water availability	More action needed
Risk	I10	Risks to energy supplies from high and low temperatures, high winds, lightning	Further investigation
Risk	I11	Risks to offshore infrastructure from storms and high waves	Sustain current action Watching brief
Risk	I12	Risks to transport from high and low temperatures, high winds, lightning	More action needed
Risk	I13	Risks to digital connectivity from high and low temperatures, high winds, lightning	Further investigation
Natural environment			
Risk	N01	Risks to terrestrial species and habitats from changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology (including water scarcity, flooding and saline intrusion)	More action needed
Risk	N02	Risks to terrestrial species and habitats from pests, pathogens and invasive species	More action needed
Opportunity	N03	Opportunities from new species colonisations in terrestrial habitats	Further investigation
Risk	N04	Risk to soils from changing climatic conditions, including seasonal aridity and wetness	More action needed
Risk	N05	Risks and opportunities for natural carbon stores, carbon storage from changing climatic conditions, including temperature change and water scarcity	More action needed
Risk	N06	Risks to agricultural and forestry productivity from extreme events and changing climatic conditions (including temperature change,	More action needed

		water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion)	
Risk	N07	Risks to agriculture from pests, pathogens and invasive species	More action needed
Risk	N08	Risks to forestry from pests, pathogens and invasive species	More action needed
Opportunity	N09	Opportunities for agricultural and forestry productivity from new/alternative species becoming suitable	Further investigation
Risk	N10	Risks to aquifers and agricultural land from sea level rise, saltwater intrusion	Further investigation
Risk	N11	Risks to freshwater species and habitats from changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	More action needed
Risk	N12	Risks to freshwater species and habitats from pests, pathogens and invasive species	More action needed
Opportunity	N13	Opportunities to freshwater species and habitats from new species colonisations	Sustain current action Watching brief
Risk	N14	Risks for marine species, habitats and fisheries from changing climatic conditions, including ocean acidification and higher water temperatures.	More action needed
Opportunity	N15	Opportunities to marine species, habitats and fisheries from changing climatic conditions	Further investigation
Risk	N16	Risks to marine species and habitats from pests, pathogens and invasive species	More action needed
Risk	N17	Risks to coastal species and habitats due to coastal flooding, erosion and climate factors	More action needed
Health, communities and built environment			
Risk	H01	Risks to health and wellbeing from high temperatures	More action needed
Opportunity	H02	Opportunities for health and wellbeing from higher temperatures	Further investigation
Risk	H03	Risks to people, communities and buildings from flooding	More action needed
Risk	H04	Risks to the viability of coastal communities from sea level rise	More action needed
Risk and opportunity	H06	Risks and opportunities from summer and winter household energy demand	More action needed
Risk	H07	Risks to health and wellbeing from changes in air quality	Further investigation
Risk	H08	Risks to health from vector-borne disease	More action needed
Risk	H09	Risks to food safety and food security	Further investigation
Risk	H10	Risks to water quality and household water supplies	Further investigation

Risk	H11	Risks to cultural heritage	More action needed
Risk	H12	Risks to health and social care delivery	More action needed
Risk	H13	Risks to education and prison services	More action needed
Business and industry			
Risk	B1	Risks to businesses from flooding	More action needed
Risk	B2	Risks to businesses and infrastructure from coastal change from erosion, flooding and extreme weather events	More action needed
Risk	B3	Risks to business from water scarcity	Further investigation
Risk	B4	Risks to finance, investment and insurance including access to capital for businesses	Sustain current action Watching brief
Risk	B5	Risks to business from reduced employee productivity due to infrastructure disruption and higher temperatures in working environments	Further investigation
Risk	B6	Risks to business from disruption to supply chains and distribution networks	More action needed
Opportunity	B7	Opportunities for business from changes in demand for goods and services	Further investigation

North Somerset Climate Adaptation Action Plan 2024-2029

Our action plan was developed based on a number of factors, including the evidence-based approach, national policy as outlined in this strategy, and internal workshops with technical and specialist teams.

We will monitor progress with the action plan through the Climate Emergency governance structure:

Climate Executive Member briefing	every fortnight
Directorate leadership team	every month
Climate officers group	every other month
Corporate leadership team	every three months
Executive Members	every three months
Wider directorate leadership team	every three months
Scrutiny Panel	progress report every six months
Full Council	progress report every six months

Performance against actions will be publicly available through a data dashboard on the council's website at www.n-somerset.gov.uk/climateadaptation.

This strategy includes the assessment of the key climate-related risks for North Somerset in line with the UK Government's [National Adaptation Framework](#) and [UK Climate Risk Assessment](#), as well as a detailed action plan with the following key principles:

1. Governance

This theme sets out actions for North Somerset Council to deliver and monitor the Climate Change Adaptation Strategy. Policies that could be implemented to support climate adaptations are also included. This section underlines the importance of the council's partnership working and engagement.

2. Infrastructure, transport and assets

Actions include climate change adaptation measures to improve the local highways network. This includes strategic active travel routes, to reduce the region's vulnerability to flooding and overheating, and commitments to reduce the vulnerability of transport and the council's assets.

3. Natural environment

This principle includes a set of actions the council can deliver or act as an enabler to, to support nature recovery, reducing flood and heat risks through the delivery of the council's Green Infrastructure Strategy.

4. Health, communities and the built environment

This theme explores actions the council could take or enable that can support wider outcomes for North Somerset residents. This includes climate justice, improving health and wellbeing and embedding climate change adaptations into the housing stock.

5. Business and industry

Actions include understanding the evidence behind business and industry vulnerabilities to climate change, as well as setting out initiatives to engage local businesses in adapting to climate change impacts.

The action plan sets out how North Somerset Council will implement support for local residents, businesses, natural environment and infrastructure, and actions are directly linked to the risks associated with climate change.

Given limited funding opportunities and internal resources, the action plan identifies potential delivery partners and funding opportunities to support plan implementation.

The action plan priorities are linked to the risk assessment and are identified as Very High (VH), High (H), and Medium (M). The action plan timescales are identified as short (within the next two years), medium (2-10 years) and long (over 10 years).

The action plan will be available as a separate document on our website at www.n-somerset.gov.uk/climateadaptation.

Glossary

Climate justice is a term which acknowledges that the impacts of climate change will have disproportionately harmful impacts on more vulnerable groups in society.

Built environment the human-made surroundings that provide the setting for human activity, ranging from buildings and parks or green space to neighbourhoods and cities. Can often include their supporting infrastructure, such as water supply or energy networks

Carbon footprint is the amount of carbon emitted by an individual or organisation in a given period of time, or the amount of carbon emitted during the manufacture of a product.

Carbon neutral is a process where there is no net release of CO₂. Achieving carbon neutrality is often done through carbon offsetting schemes.

Carbon sink is any process, activity, or mechanism that absorbs more carbon dioxide from the atmosphere than it releases. Forests, oceans, and soil are the world's largest natural carbon sinks.

Decarbonisation is reducing the amount of greenhouse gas emissions that an activity produces, as well as increasing the amount that is being absorbed. Commonly used when referring to buildings and energy.

Emissions are any release of gases such as carbon dioxide which cause global warming.

Global warming is the steady rise in global average temperature in recent decades, which experts believe is largely caused by human-produced greenhouse gas emissions.

Greenhouse gases (GHG's) are gases in the atmosphere, which absorb thermal infra-red radiation emitted by the Earth's surface, the atmosphere and clouds e.g. water vapour, carbon dioxide, methane and nitrous oxide.

IPCC is The Intergovernmental Panel on Climate Change is a scientific body established by the United Nations and the World Meteorological Organisation.

Just Transition is defined by the [International Labour Organization \(ILO\)](#) as: "Greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind."

Net Zero is a term used to describe any process where there is no net release of carbon dioxide (CO₂). Achieving net zero is usually done by reducing emissions as much as feasibly possible, then offsetting the remainder.

Renewable energy is energy derived from natural sources that are constantly being replenished, such as wind, sunlight, the flow of moving water, and geothermal heat.

Retrofit refers to any improvement work on an existing building to improve its energy efficiency, making them easier to heat, able to retain that heat for longer, and replacing fossil fuels with renewable energy.

For more information on other commonly used terminology please refer to:

[The Climate Dictionary: An everyday guide to climate change](#)

[Glossary – Climate Change: Vital Signs of the Planet](#)

Further information sources and tools

Tools:

[Climate Just Tool](#)

[Climate Risk Indicators Explorer](#)

[Emergency Planning Tool](#)

[Flood risk checker, GOV.UK](#)

[Flood risk maps for rivers and sea in England](#)

[Local Climate Adaptation Tool](#)

[Sign up for flood warnings](#)

[Tree Equity Score Tool](#)

Information sources:

[ADEPT and DEFRA Guidance for local authorities](#)

[Climate ADAPT: summary of UK resources](#)

[Climate Change Projections over land](#)

[Climate Change Risk Assessment and Adaptation Guidance, GOV.UK](#)

[Climate Impact Tool: Guidance for Environment Agency Staff](#)

[Environmental Improvement Plan 2023](#)

[Independent Assessment of UK Climate Risks \(Climate Change Committee\)](#)

[Intergovernmental Panel on Climate Change \(IPCC\)](#)

[National Flood and Coastal Erosion Risk Management Strategy for England](#)

[National Framework for Water Resources](#)

[The Third National Adaptation Programme](#)

[UK Climate Change Risk Assessment 2022](#)