

## Strengthened Monitoring and Evaluation: A Priority for NICCAP3

### How do I use this document in my NICCAP3 submission?

The document below is intended to provide examples of indicators which have been identified as priorities or gaps in NI. This is not comprehensive, and you are welcome to use your own indicators in the submission instead. However, NICCAP3 is an opportunity to encourage both government and non-government actors to collaborate in addressing priority evidence gaps. If you are collecting or able to collect data on any of the listed indicators, please include it in your submission.

Indicators are listed (pages 3-19) under 13 key systems identified by the Climate Change Committee. the document may seem daunting; however it is likely that you will only need to look through one or two of the most relevant sections.

Do reach out and let us know if you would like further assistance.

The Climate NI Team

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### Introduction

In its [April 2023 report](#) on Northern Ireland's progress in adapting to climate change<sup>1</sup>, the Climate Change Committee (CCC) made observation and recommendations. The report found that more than 60% of adaptation outcomes in NICCAP2 could not be evaluated due to missing data, and that NI lies behind the rest of the UK its assessment of adaptation measures:

*“While indicators relating to the outcome objectives were included in NICCAP2, the monitoring and evaluation for the next programme needs to be strengthened and expanded to fill the significant gap in data for assessing the effectiveness of adaptation actions. These indicators must be more comprehensive, maintained to a high quality, and updated at least annually. Our assessment found it was not possible to evaluate 29 out of 45 outcomes due to data gaps. These data gaps come from insufficient inclusion and identification of indicators in NICCAP2, gaps in data collection, non-public data sets and datasets that do not allow trends over time to be estimated. The data availability to assess adaptation delivery in Northern Ireland is lagging behind the rest of the UK and needs to be urgently addressed by the next programme”.*

For the CCC's recommendation to be met, effective monitoring systems should be considered alongside the policy response to any of the risks in the Third Climate Change Risk Assessment ([CCRA3](#)).

Furthermore, opportunities to develop data sets / indicators to support adaptation progress monitoring should be considered for inclusion in NICCAP3.

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<sup>1</sup> Adapting to climate change - Progress in Northern Ireland  
<https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-northern-ireland/>

The table below provides suggested potential indicators to measure progress on adapting to the risks within each of the CCC's [thirteen Key Systems areas](#) which they have developed as part of their new [adaptation monitoring framework](#).

Indicators will necessarily be specific to the policy or project that they are intended to measure progress against. As such whilst the following list makes suggestions for indicators to assist with the thought process, it is not a comprehensive list, and in some cases it refers to indicators that will require the development or strengthening of data sets. Organisations may have their own pre-existing indicators which they would prefer to use.

Particular attention should be paid to the points listed as “**CCC Recommendations for Further Investigation**” and consideration given to ways in which your organisation could feed into addressing these data gaps as these have been specifically highlighted in CCRA3.

CCC Review – 13 Key Systems	Potential Indicators including recommendations for following on from gaps in indicator data identified by the CCC in their April 2023 report:
<p><b>1. Nature</b></p> <p>See link to CCC System Map:</p> <p><a href="https://theccc.org.uk/wp-content/uploads/2023/03/Figure-2.1-Nature-1.svg">theccc.org.uk/wp-content/uploads/2023/03/Figure-2.1-Nature-1.svg</a></p> <p><u>General recommendation of the CCC from their April 2023 report:</u></p> <p>Improved data for measuring and monitoring ecosystem health across land and seascapes are needed to track if outcomes are being achieved. Ensuring key datasets are publicly available for assessment will enhance transparency. More robust and frequently collected indicators across a wider range of species and ecosystems are needed to monitor progress in reducing climate change risk and the effectiveness of different interventions (pg 48)</p>	<p>Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each <a href="#">component of the System</a>.</p> <p>Other potential indicators measure, assess, or track:</p> <ul style="list-style-type: none"> <li>• Invasive, non-native species established in freshwater habitats.</li> <li>• Invasive, non-native species established in terrestrial habitats.</li> <li>• Invasive, non-native species established in marine habitats.</li> <li>• Number of incidents/scale of Harmful Algal Blooms.</li> <li>• Freshwater ASSIs in favourable condition.</li> <li>• Variance of annual average water temperatures from long-term mean.</li> <li>• Variations in river flow.</li> <li>• Pressures on biodiversity, such as overexploitation, habitat change, or pests and diseases.</li> <li>• Resilience for species, such as genetic diversity.</li> <li>• Progress related to enablers e.g., skills/workforce, data/monitoring/research.</li> <li>• Uptake of NbS for adaptation across all headline outcomes.</li> <li>• Geographic range shifts in communities of species.</li> <li>• Individual and combined impacts of acidification, temperature, and salinity on marine species.</li> <li>• Changes in pressures on the seabed from human activity (e.g., bottom trawling or litter).</li> <li>• Biodiversity (% of protected area under favorable management).</li> <li>• Indicators for coastal squeeze (for example, sand dunes, intertidal flats and marshes and also maritime grasslands in clifftop locations).</li> <li>• Collect data that support monitoring of pests, pathogens and invasive non-native species for forests, fisheries, and agriculture.</li> <li>• Quantity, quality and connectivity of habitats.</li> <li>• Condition of peatlands: <ul style="list-style-type: none"> <li>▪ Condition of key habitats;</li> <li>▪ Extent of key habitats;</li> <li>▪ Annual greenhouse gas (GHG) emissions;</li> <li>▪ Peatland area restored.</li> </ul> </li> </ul>

## 2. Working land and seas

See link: [theccc.org.uk/wp-content/uploads/2023/03/Figure-3.1-Working-land-and-seas-1.svg](https://theccc.org.uk/wp-content/uploads/2023/03/Figure-3.1-Working-land-and-seas-1.svg)

General recommendation of the CCC from their [April 2023 report](#):

Robust data are required to track changes in climate risks, hazards, and improvements in resilience of our working lands and seas, which will help target the most effective interventions. Priorities include metrics to track soil health, impacts of funding and interventions on productivity, nature and climate resilience, and data on missing indicators. (Pg71)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- The percentage of fish caught using sustainable harvesting methods in line with scientific evidence.
- Adaptive management of aquaculture production and fisheries harvests.
- Northern Ireland commercially important fish stocks maintained at healthy status.
- Temperature and chemistry trends within Northern Ireland's seas and oceans.
- Populations of commercially important fish stocks in NI waters to determine if and how they are moving in response to climate change.
- Area of agricultural land covered by soil conservation measures.
- Investment in research into soil conservation.
- Agricultural losses from pests/pathogens.
- Timber losses from pests/pathogens.
- Proportion of Marine Protected Areas (SACs/SPAs/SSSIs/MCZs) in unfavourable condition.
- Monitoring data from the implementation of the All-Ireland Pollinator Plan.
- Tracking of Sea Temperature.
- The impacts of extreme, unpredictable, and unseasonal weather, such as:
  - yield and profit changes;
  - crop and livestock losses to agriculture due to flooding, heat stress and drought;
  - losses of fish stocks and shellfish due to sea temperature rises and ocean acidification.
- The assessment of resilience of commercial species, such as genetic diversity of crops, livestock, trees, and fish.
- The prevalence of localised wildfire plans which are in place and the capacity of local firefighters to address wildfires in agriculture and forestry.
- The management of fuel load to mitigate wildfires.
- Localised, fine-scale marine and coastal water temperatures and acidification.
- Cost and yield consequences of extreme weather events on agriculture, forestry, and fisheries.
- soil erosion, soil organic matter, soil biodiversity and a range of soil types and uses.
- Monitor the number of local fish species extinctions and new fish species appearing in Northern Ireland.
- Progress on extent and condition of sustainable harvesting of fish stocks in Northern Ireland.

- The prevalence of pests, pathogens and invasive non-native species for forests, fisheries, and agriculture.

### **CCC Recommendations for Further Investigation**

- Emerging plans from the commercial forestry and fisheries sectors indicate both are taking steps to meet the risks and opportunities from changing climate conditions, although agriculture lacks an effective plan. Furthermore, an acute lack of data means it is challenging to undertake a comprehensive assessment of the rate and effectiveness of implementation of adaptation policy within the respective sectors.
- Robust data are required to track changes in climate risks, hazards, and improvements in resilience of our working lands and seas, which will help target the most effective interventions. Priorities include metrics to track soil health, impacts of funding and interventions on productivity, nature and climate resilience, and data on missing indicators.

### **Additional potential areas for investigation**

- Under the EJP Soil initiative, AFBI will soon start work on a number of projects in Northern Ireland. These projects complement the work commissioned to AFBI from DAERA. They will involve multiple EU partners and will focus on 'Soil organic carbon sequestration potential of agricultural soils in Europe' (CarbpoSeq); 'Sensor data for downscaling digital soil maps to higher resolutions' (SensRes); Stocktaking for Agricultural Soil Quality and Ecosystem Services Indicators and their Reference Values and designing Innovative Soil Management Practices across Europe (i-SoMPE).

### 3. Food security

See link: [theccc.org.uk/wp-content/uploads/2023/03/Figure-4.1-UK-food-security.svg](https://theccc.org.uk/wp-content/uploads/2023/03/Figure-4.1-UK-food-security.svg)

General recommendation of the CCC from their [April 2023 report](#):

As much of the food system relies on the private sector, information on the performance of the food system will be particularly important to understand and guide how well-adapted it is to climate change. Food quality monitoring can provide information on any changes in nutrition or prevalence of food-borne pathogens. Climate stress testing by large food and feed companies would also provide important information on the resilience of the system to climate hazards. Reporting on food waste reduction initiatives is also important to understand the efficiency of the system. (Pg92)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- Supply chain management, capacity, or diversification.
- Supply chain shortening or efficiency.
- Food waste reduction measures.
- Levels of local or sustainable foods available.
- Levels of protective measures for local food production.
- Levels of diversification in local food production.

#### **CCC Recommendations for Further Investigation**

- The draft Food Strategy Framework considers risks to the food system, but it is not yet published.

#### **Additional potential areas for investigation**

- Reporting from the private sector will have a role in monitoring progress in this system. While mandatory reporting will soon come into force for large UK companies, it is unlikely to apply to many companies in Northern Ireland due to the eligibility criteria for size and turnover. While reporting from major UK supermarkets and companies working across the food supply chain would improve information gaps, the data may not be disaggregated to Northern Ireland.
- Currently, the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022 make provision within the Companies Act 2006 to require certain traded, banking and insurance companies, which have more than 500 employees, to provide climate-related financial disclosures in their strategic report. The companies are listed in section 414CA(1) of the Companies Act 2006.

#### 4. Water Supply

See link: [theccc.org.uk/wp-content/uploads/2023/03/Figure-5.1-Water-supply.svg](https://theccc.org.uk/wp-content/uploads/2023/03/Figure-5.1-Water-supply.svg)

General recommendation of the CCC from their [April 2023 report](#):

Effective monitoring and visibility of the water network enables better identification of where water is going and who is using it, allowing interventions on demand and leakage to be better targeted. (Pg107)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- Pollution loads entering waters.
- Serious pollution incidents to water environment.
- State of the water environment.
- Groundwater Quality
- Condition of bathing waters.
- Water bodies achieving sustainable abstraction criteria.
- Natural functions of water and wetland ecosystems.
- Health of freshwaters assessed through fish populations.
- Amount of actual and planned investment in resilience measures by NI Water.
- Water bodies achieving sustainable abstraction criteria.
- Disruption or unwanted impacts caused by drought.
- Investment in leakage management, system resilience, demand reduction, transfer infrastructure.
- Financial support for efficiency in low-income households
- Public awareness of climate risks to water how to adapt.
- Household consumption of water.
- Reduction of household demand.
- Reservoir capacity and connectivity between regions.

#### **CCC Recommendations for Further Investigation**

- Non-household water demand has fallen, but only in part due to water efficiency measures and there is a lack of recent data.

#### **Additional potential areas for investigation**

- Mandatory reporting on climate related indicator data could be considered under the Public Body Reporting Duty.

## 5. Energy

See link: [theccc.org.uk/wp-content/uploads/2023/03/Figure-6.1-Energy.svg](https://theccc.org.uk/wp-content/uploads/2023/03/Figure-6.1-Energy.svg)

General recommendation of the CCC from their [April 2023 report](#):

National data on weather and climate related impacts on the energy system, and on the extent of adaptation actions being delivered, will enable a better understanding of the extent to which the energy system is climate resilient. (Pg129)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- Extreme weather impacts and degree of vulnerability of assets.
- Asset level flood resilience, condition of infrastructure, ground conditions and use of abstraction restrictions.
- Total abstraction of water (surface, groundwater, estuarine and sea) for energy.
- Achievements or developments arising from the Industry Security of Supply Meetings.
- Progress towards taking advantage of energy opportunities resulting from climate change.
- Resilience of energy infrastructure
- The number of assets at suitable resilience standards in Northern Ireland.
- Minimum resilience standards for generators and transmission and distribution companies.
- Frequency and extent of power outages including duration and number of businesses/homes affected.
- Standards of energy efficiency in domestic houses and businesses.
- Vulnerability from some hazards, such as overheating.

### **CCC Recommendations for Further Investigation**

- Digital infrastructure services in Northern Ireland are privately operated and there is no overview of the extent to which climate change risks have been adequately identified and how these risks are being managed within the sector. There is a lack of data to evaluate progress.
- There is very limited evidence available on the number of energy assets at risk from extreme weather impacts and the degree of vulnerability in future climate change scenarios. There are no data for other hazards such as overheating, landslides and subsidence.
- Streamlined monitoring data is needed on indicators for reduced vulnerability of energy assets and system level security of supply to extreme weather.



	<p><b>Additional potential areas for investigation</b></p> <ul style="list-style-type: none"> <li>• Mandatory reporting on climate risk and adaptation plans by public bodies that oversee implementation action from all generators, network operators and regulators could be considered under the Public Body Reporting Duty.</li> <li>• Reporting from the private sector will have a role in monitoring progress in this system. Currently, the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022 make provision within the Companies Act 2006 to require certain traded, banking and insurance companies, which have more than 500 employees, to provide climate-related financial disclosures in their strategic report. The companies are listed in section 414CA(1) of the Companies Act 2006.</li> </ul>
<p><b>6 Telecommunications and ICT</b></p> <p>See link: <a href="https://theccc.org.uk/wp-content/uploads/2023/03/Figure-7.1-Telecommunications-ICT.svg">theccc.org.uk/wp-content/uploads/2023/03/Figure-7.1-Telecommunications-ICT.svg</a></p> <p><u>General recommendation of the CCC from their April 2023 report:</u></p> <p>Data on weather and climate related impacts on telecoms and ICT networks, and on the extent of adaptation actions being delivered, will enable a better understanding of how climate resilient the system is. (Pg150)</p>	<p>Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each <a href="#">component of the System</a>.</p> <p>Other potential indicators might measure, assess, or track:</p> <ul style="list-style-type: none"> <li>• Assets at risk of flooding.</li> <li>• Data centre clusters developed in areas of flood risk.</li> <li>• Condition of cables and other network infrastructure.</li> <li>• Heat protection/operating thresholds of operating centres and other network infrastructure.</li> <li>• Level of redundancy in system design and operation for power supply, emergency generation, comms, cooling.</li> <li>• Extent of contingency plans for weather related outages.</li> <li>• Diversity of technologies (mobile, copper lines, digital, satellite).</li> </ul>

### **CCC Recommendations for Further Investigation**

- Digital infrastructure services in Northern Ireland are privately operated and there is no overview of the extent to which climate change risks have been adequately identified and how these risks are being managed within the sector. There is a lack of data to evaluate progress.

### **Additional potential areas for investigation**

- Reporting on some aspects of risk and adaptation planning and delivery could be explored. This will improve understanding of the national picture of sectoral adaptation, as well as in other sectors upon which telecoms and ICT networks depend, including energy and transport.
- Similarly, the Communications Act 2003 provides various reporting functions on OFCOM in relation to public electronic communications networks and services which could be considered for existing data.
- Currently, the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022 make provision within the Companies Act 2006 to require certain traded, banking and insurance companies, which have more than 500 employees, to provide climate-related financial disclosures in their strategic report. The companies are listed in section 414CA(1) of the Companies Act 2006.

## 7 Transport

See link: [Figure-8.1-Transport.png \(1041×1256\) \(theccc.org.uk\)](#)

General recommendation of the CCC from their [April 2023 report](#):

Effective monitoring of weather-related incidents and maintenance activities will improve understanding of the impacts of climate change on transport infrastructure and the actions being taken to manage them. (Pg165)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- Weather-related incidents and maintenance activities
- Frequency and extent of disruptions to services in the rail and road networks.
- Frequency and extent of disruptions to services in the aviation networks.
- Progress towards improved resilience of road, rail and aviation networks.
- Instances of freight tonnage delayed or disrupted due to weather.
- impact of high and low temperatures, wind, and lightning on road infrastructure.
- Airports at risk of flooding.
- Airport asphalt condition.
- Number of properties removed from the 'Out of Sewer Flooding' Register.
- % uptake of Sustainable Drainage Systems for new Article 161 Sewer Adoption Agreements.
- Amount spent on structural drainage.
- Overall reliability and resilience of airports.
- Strategies and capacities to deal with large scale disruption in travel including delays and cancellations.
- Impacts of floods on strategic and local roads, as well as monitor impacts from other extreme weather events. Currently this data is not specific for strategic and local roads and so should be disaggregated.

### **CCC Recommendations for Further Investigation**

- High-level baseline data on coastal erosion risk but many new and updated datasets are not yet published.
- There are no timeseries data on the number of people and buildings at risk of coastal erosion.
- Preliminary baseline maps suggests that the risk of coastal erosion is high but there are limited data on delivering adaptation actions to manage this risk.
- We lack some key data for tracking the number of properties and land lost to coastal erosion.
- Some of the key policy milestones to minimise risk of harmful impacts from river and coastal flooding on towns and cities are in place. Evidence for their effective delivery is not yet fully available.

- Further data are required to understand the proportion of properties at flood risk as a total of all buildings.
- Strategic road embankment and bridge conditions are not known.
- There is no rolling programme of maintenance and inspection of bridges for signs of climate related deterioration from flooding and heat.
- There is very limited evidence available on the number of energy assets at risk from extreme weather impacts and the degree of vulnerability in future climate change scenarios. There are no data for other hazards such as overheating, landslides and subsidence.

#### **Additional potential areas for investigation**

- Most airport operations are privately managed and policy levers are with Department for Transport and the Civil Aviation Authority, however airports could be caught by the Public Body Reporting duty as they meet the definition under section 42(2) of the Climate Change Act (NI) 2022 insofar as they are statutory undertakers within section 250(1) of the Planning Act (NI) 2011.
- The development of consistent indicators of resilience to flood risk across all critical national infrastructure sectors and networks should be considered.
- Actions being taken to reduce risk by the rail industry are likely to be reducing vulnerability in some areas, but evidence is currently lacking - Enhanced weather incident reporting, asset condition monitoring and revised standards would help with this gap.
- Translink plan to carry out a detailed tree survey which will examine the risk of tree related incidents due to high wind events – to include relevant indicators.

## 8. Towns and cities

See link: [Towns-cities.png \(1041×1254\) \(theccc.org.uk\)](#)

General recommendation of the CCC from their [April 2023 report](#):

More standardised approaches to risk mapping across scales and consistent asset registry is crucial for systems approaches which work across catchments and regions. Good practices of data sharing across sectors, regions and risk management authorities are key to enabling planning. Monitoring changes in risk and the status of adaptation actions, such as the runoff reduction from sustainable urban drainage systems, will enable prioritisation of actions. (Pg186)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- Changes in risk and the status of adaptation actions, such as the runoff reduction from sustainable urban drainage systems, to enable prioritisation of actions.
- Consistent time series data of people and buildings moving into or out of flood risk.
- Increased centralised monitoring of flood risk management data on the characteristics and monitoring of delivery and maintenance of flood risk management projects.
- Information on implementation of natural flood management measures and catchment approaches.
- The storage capacity of urban drainage systems.
- The number and characteristics of SuDS installations.
- % uptake of Sustainable Drainage Systems for new Article 161 Sewer Adoption Agreements.
- The number of buildings at risk of groundwater flooding.
- Funding and investment in climate adaptation areas/policies.
- Levels of workforce including levels of those with required skills.
- Investment and improvement in data monitoring.
- Levels of public and stakeholders understanding and acceptance of adaptation.

### **CCC Recommendations for Further Investigation**

- There are no timeseries data on the number of people and buildings at risk of coastal erosion.
- We lack some key data for tracking the number of properties and land lost to coastal erosion.
- Some of the key policy milestones to minimise risk of harmful impacts from river and coastal flooding on towns and cities are in place. Evidence for their effective delivery is not yet fully available.
- Further data are required to understand the proportion of properties at flood risk as a total of all buildings.
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## 9 Buildings

See link: [theccc.org.uk/wp-content/uploads/2023/03/Figure-10.1-Buildings.svg](https://theccc.org.uk/wp-content/uploads/2023/03/Figure-10.1-Buildings.svg)

General recommendation of the CCC from their [April 2023 report](#):

There is currently a lack of large-scale monitoring of overheating incidences and flood risk across the building stock. Without monitoring, people may be unaware that there is a risk that they should be mitigating. (Pg222)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- % of properties at risk of flooding.
- Levels of preparation for flooding.
- Monitoring of indoor temperatures.
- Proportion of hospitals/care homes/ schools/ workplaces that experience overheating
- % of buildings at risk of excessive heat during heatwaves.
- Annual number of cooling measures installed in homes.
- Area of green roofs.
- Awareness amongst the public about how to manage internal temperatures.
- Rollout of active cooling (This indicator would serve two purposes. In addition to the benefit of knowing the number of buildings with cooling 227 Chapter 10: Buildings installed, tracking the rollout of active cooling would help estimate the potential future power demand for air conditioning in summer).
- Climate resilience of buildings.

### **CCC Recommendations for Further Investigation**

- Given the uncertainty related to the climate risks to building fabric, regarding how the risks will vary over time and what an appropriate adaptation response should be, a policy score for this outcome is not included in this assessment.
- Data for residential and non-residential overheating is sparse or not available.

## 10 Health

See link: [theccc.org.uk/wp-content/uploads/2023/03/Figure-11.1-Health.svg](https://theccc.org.uk/wp-content/uploads/2023/03/Figure-11.1-Health.svg)

General recommendation of the CCC from their [April 2023 report](#):

Regular monitoring of overheating, flooding incidences and air quality levels in health and social care settings is needed, which could be built into pre-existing reporting requirements. In addition, continued and widened monitoring of those vectors and infectious disease prevalence impacted by climate change is required. (Pg246)

Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each [component of the System](#).

Other potential indicators might measure, assess, or track:

- Surveillance of climate sensitive infectious diseases.
- Environmental public health tracking.
- Delivery and implementation progress.
- Number of air quality warnings issued.
- Number of people living with chronic respiratory conditions
- Overheating, flooding incidences and air quality levels in health and social care settings.
- Data on overheating across all hospitals, care homes GP surgeries and other healthcare buildings in Northern Ireland.
- Data on health and social care services which have been disrupted by heatwaves or flooding. This could include information on A&E statistics, hospital admissions, or ambulance callouts at times of weather extremes.
- Data on health and social care facilities with passive cooling measures, adaptation plans, heat management plans or flood protection measures.
- Data on instances of overheating in health and social care (HSC) settings in Northern Ireland.
- Health and wellbeing impacts and benefits from climate change and from adaptation.

### **CCC Recommendations for Further Investigation**

- Regular monitoring of overheating, flooding incidences and air quality levels in health and social care settings is needed.
- There is limited information available on changes in rates of vector borne diseases related to climate change in Northern Ireland

### **Additional potential areas for investigation**

- Undertake a regular health vulnerability and adaptation assessment across the department and with arm's length bodies and agencies, including gathering information about impacts on health and social care which are caused by weather extremes.

	<ul style="list-style-type: none"> <li>• Work with other departments to collate research into the risk of overheating occurring in various building types which could allow adaptation actions to be planned for buildings most susceptible to overheating occurring in the future.</li> </ul>
<p><b>11 Community preparedness and response</b></p> <p>See link: <a href="https://theccc.org.uk/wp-content/uploads/2023/03/Figure-12.1-Community-preparedness-response.svg">theccc.org.uk/wp-content/uploads/2023/03/Figure-12.1-Community-preparedness-response.svg</a></p> <p><u>General recommendation of the CCC from their April 2023 report:</u></p> <p>Data are needed on local-level adaptation actions and discussions which may already be happening. Data sharing on climate risks between organisations and early warning systems for climate hazards will also be important for local action. For conserving local cultural heritage, community-led heritage asset surveys can provide useful data on heritage assets and their potential exposure to climate change. (Pg262)</p>	<p>Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each <a href="#">component of the System</a>.</p> <p>Other potential indicators might measure, assess, or track:</p> <ul style="list-style-type: none"> <li>• Data for recovery time from extreme weather events, or year on year comparative data for damage from extreme weather events.</li> <li>• Data on cultural heritage risk from climate comes from high-level modelling in the Department for Infrastructure (DfI) Flood Risk Management Plan. More detailed data are likely available but are either not centrally gathered or not accessible.</li> <li>• Monitoring of extreme weather impacts on emergency response.</li> <li>• Number of responses undertaken by each Emergency Preparedness Group (EPG).</li> <li>• Number of trained incident responders.</li> <li>• Commercial impact of flooding, such as average business days and schooldays lost due to flooding, and commercial insurance claims.</li> <li>• Average length of time between flood events and people returning to their home.</li> <li>• Number of emergency service stations/hospitals/GP surgeries/ care homes/ schools flooded.</li> <li>• Communities resilient to flooding and coastal erosion.</li> </ul> <p><b>CCC Recommendations for Further Investigation</b></p> <ul style="list-style-type: none"> <li>• Regular monitoring of overheating, flooding incidences and air quality levels in health and social care settings is needed.</li> </ul>



	<p><b>Additional potential areas for investigation</b></p> <ul style="list-style-type: none"> <li>• Develop a publicly available database for local-scale flood risk, coastal erosion and (where possible) overheating risk. Which can be used for community resilience and awareness initiatives.</li> <li>• The creation of a condition baseline for future monitoring of the rate of climate change impacts, and actions to promote and assess the use of adaptation guidance among wider cultural heritage owners.</li> <li>• Cultural Heritage Owners and Arm’s Length Bodies could be required to report on adaptation actions and risk assessment under the Public Body Reporting duty.</li> </ul>
<p><b>12 Business</b></p> <p>See link: <a href="https://theccc.org.uk/wp-content/uploads/2023/03/Figure-13.1-Business.svg">theccc.org.uk/wp-content/uploads/2023/03/Figure-13.1-Business.svg</a></p> <p><u>General recommendation of the CCC from their <a href="#">April 2023 report</a>:</u></p> <p>Data and monitoring are essential to enable robust risk assessment, tracking of effective actions, data on adaptation intervention costs and benefits, and understanding of interdependencies. Building greater evidence to quantify and monetise benefits of adaptation action can enable investment. (Pg286)</p>	<p>Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each <a href="#">component of the System</a>.</p> <p>Other potential indicators might measure, assess, or track:</p> <ul style="list-style-type: none"> <li>• Number of non-residential properties at risk of flooding.</li> <li>• Proportion/number of businesses at risk of flooding taking up property-level flood protection measures.</li> <li>• Number of non-residential properties at risk of overheating.</li> <li>• Levels of strategies in place to respond to incidents of disruption due to climate effects.</li> <li>• Levels of understanding and acceptance of the need for climate change adaptation.</li> <li>• Establishment of Business Champion Programmes to exemplify good climate adaptation practice.</li> <li>• Development of climate adaptation resources to support business adaptation, resilience, bounce-back and understanding.</li> <li>• Government determination of consistent standards, scenarios and data provision.</li> </ul> <p><b>CCC Recommendations for Further Investigation</b></p> <ul style="list-style-type: none"> <li>• Non-household water demand has fallen, but only in part due to water efficiency measures and there is a lack of recent data.</li> <li>• Data for residential and non-residential overheating is sparse or not available.</li> </ul>

	<p><b>Additional potential areas for investigation</b></p> <ul style="list-style-type: none"> <li>• The Climate Change Act (Northern Ireland) 2022 has a provision for climate change reporting by public bodies.</li> <li>• Similarly, the Companies (Strategic Report) (Climate-related Financial Disclosure) Regulations 2022 make provision within the Companies Act 2006 to require certain traded, banking and insurance companies, which have more than 500 employees, to provide climate-related financial disclosures in their strategic report. The companies are listed in section 414CA(1) of the Companies Act 2006.</li> </ul>
<p><b>13 Finance</b></p> <p>See link: <a href="https://theccc.org.uk/wp-content/uploads/2023/03/Figure-14.1-Finance.svg">theccc.org.uk/wp-content/uploads/2023/03/Figure-14.1-Finance.svg</a></p> <p><u>General recommendation of the CCC from their April 2023 report:</u></p> <p>Data and monitoring covering corporate assets and monitoring of financial flows to adaptation, and establishing ways to verify adaptation plans, quantify effectiveness of adaptation and its return on investment. (Pg307)</p>	<p>Indicators that measure progress towards the Required Outcomes, Enablers, or Policies and Plans outlined in the System Map are suggested under each <a href="#">component of the System</a>.</p> <p>Other potential indicators might measure, assess, or track:</p> <ul style="list-style-type: none"> <li>• Progress on the resilience of the financial system in Northern Ireland to climate hazards.</li> <li>• Financial flows into adaptation action. Financial disclosures need to move beyond physical risk identification and focus more on adaptation actions taken.</li> <li>• The positive or negative contribution an investment portfolio is making or has made to adaptation outcomes.</li> <li>• Information on the proportion of households or businesses reporting access to finance as a barrier for adaptation, or the level of insurance coverage and premiums for businesses and households.</li> </ul> <p><b>CCC Recommendations for Further Investigation</b></p> <ul style="list-style-type: none"> <li>• Building greater evidence to quantify and monetise benefits of adaptation action can enable investment household water demand has fallen, but only in part due to water efficiency measures and there is a lack of recent data.</li> </ul> <p><b>Additional potential areas for investigation</b></p> <ul style="list-style-type: none"> <li>• Engagement with UK Government to strengthen adaptation reporting requirements across the Sustainability Disclosure Requirements could be investigated.</li> </ul>