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Fourth UK Climate Change  
Risk Assessment (CCRA4)

# Technical Report

## Executive Summary

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# 3 Executive Summary

## 4 **Headline findings**

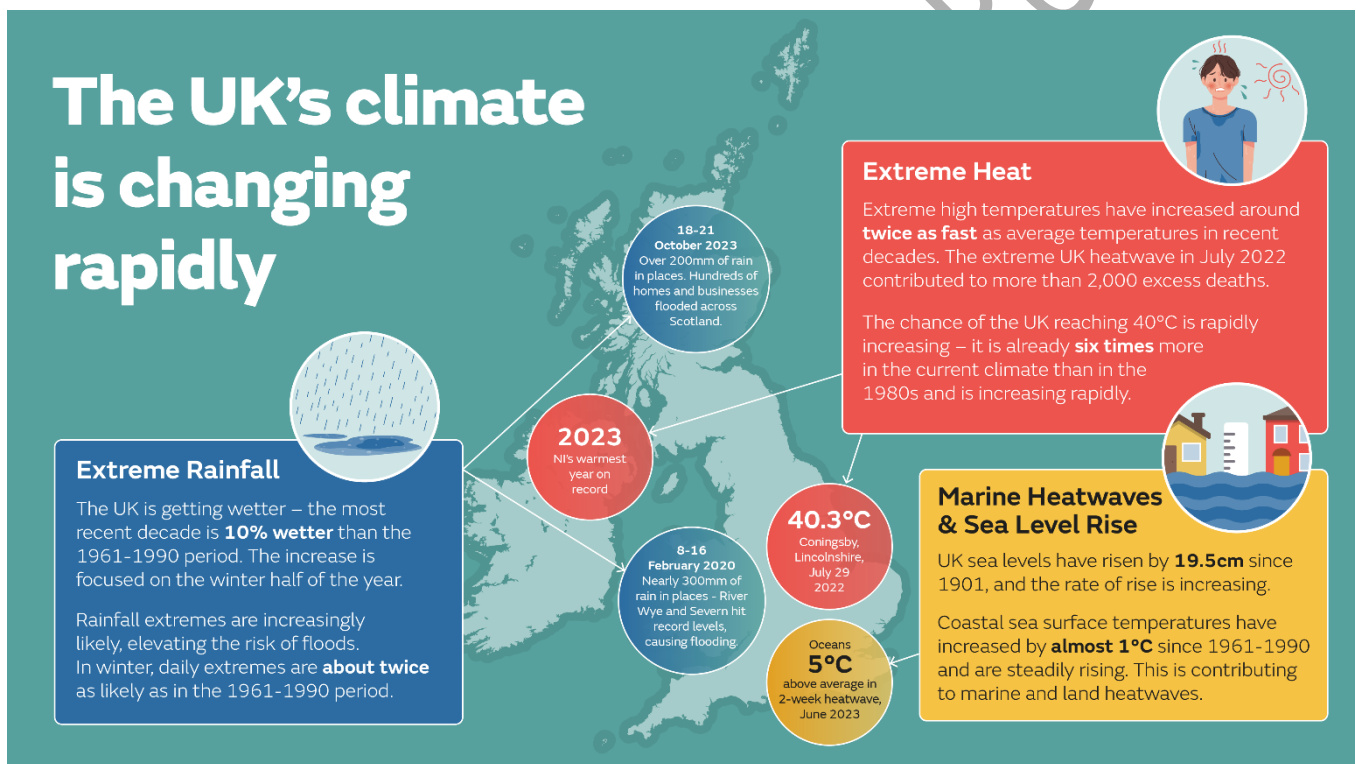
- 5 • **Climate change is causing serious near-term impacts.** More than half of the risk descriptors have a High  
6 or Very High impact (or “magnitude”) on the UK by the 2030s. Climate change is already having  
7 significant negative impacts across the UK, and there will be further impacts in the future, although the  
8 severity will vary between nations.
  
- 9 • **Many aspects of climate change are accelerating, causing unprecedented extreme weather events and  
10 serious impacts.** Global warming has accelerated since the previous Climate Change Risk Assessment  
11 Technical Report, CCRA3-IA-TR in 2021. The increase in extreme events such as UK heatwaves and other  
12 impacts of climate change (such as sea level rise) is also accelerating. There have been numerous  
13 unprecedented extreme weather events leading to serious impacts. For example, the UK experienced  
14 temperatures of over 40 °C for the first time during the 2022 heatwave; this led to wildfires and  
15 contributed to almost 3,000 deaths across the five heat episodes that summer. As further climate  
16 change is inevitable, we will continue to experience previously unprecedented events. The magnitude of  
17 long-term impacts will depend on future global greenhouse gas emissions.
  
- 18 • **Climate risks to the UK are now higher than in previous assessments.** Due to changes in the  
19 methodology, it is not possible to directly compare CCRA4-IA-TR and CCRA3-IA-TR, but expert judgement  
20 of the report authors affirms that current and future impacts from climate risks are, overall, higher than  
21 for the last assessment published in 2021. Evidence of accelerating changes in climate alongside a lack of  
22 adaptation action have increased risks. New scientific evidence has reduced uncertainty in many sectors.
  
- 23 • **In the new study we assess 44 risk descriptors, of which there are 41 risks and 3 opportunities. By  
24 2050, around one third of the risk descriptors are assessed as being Very High magnitude.** A new  
25 category of ‘Very High magnitude’ has been added to the assessment to quantify impacts in the order of  
26 billions of pounds of economic damages per year, thousands of deaths per year, or the loss of species  
27 groups. The number of Very High magnitude risk descriptors underlines the increasing level of risk faced.  
28 For example:
  - 29 ○ Risks to people from heat are already causing deaths in the UK, and this is projected to rise  
30 significantly in the future, increasing by several thousand people per year by the 2050s.
  - 31 ○ Flood risk to buildings and communities across the UK despite significant public investment in  
32 flood defences, with approximately 25% of properties in England alone expected to be at risk  
33 from various flood sources.
  - 34 ○ Risks to UK macroeconomic performance and stability with even the most cautious estimates of  
35 GDP losses projecting damages that greatly exceed 1% of GDP.
  - 36 ○ Risks to the delivery of infrastructure services (such as road, rail, digital communications, and  
37 water) from interdependencies with other infrastructure systems with resultant economic  
38 impacts possibly reaching billions of pounds per year.
  - 39 ○ Risks to terrestrial and coastal ecosystems meaning that for example, UK seabirds such as  
40 puffins, storm petrels, and Arctic skuas are possibly declining by up to 80% due to warming seas.

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- **Many overseas climate change risks have important consequences for the UK.** Climate change impacts overseas are having damaging effects on the UK. For example, noticeably higher food prices and a lack of products on supermarket shelves are related to disruptions to imports of products and raw ingredients for processed foods. Many critical international supply chains are sensitive to weather extremes and pose risks to UK prosperity. These risks are expected to increase.
  - **Current and planned adaptation measures are not sufficient to manage these risks or take advantage of new opportunities.** Current and planned adaptation measures do not change significantly the assessed magnitude for most risk descriptors. Adaptation plans are not keeping pace with climate change and there is not enough evidence that these plans are effective. Sustain Current Action is judged as insufficient for almost all of the risk descriptors considered.
  - **More than half of the risk descriptors are assessed as needing increased adaptation action to manage potential impacts from climate change.** A more urgent category of adaptation action has been added to the assessment. In total, 8 of the risk descriptors are in the new highest Critical Action Needed category, covering risks to ecosystems, agriculture, interdependencies within the infrastructure system, economic stability and financial system, physical assets of UK businesses, health risks, and risks to buildings and communities. A further 16 risk descriptors are assessed as More Action Needed.
  - **Around a third of the risk descriptors require Critical Investigation.** There are significant evidence gaps or uncertainties that must be addressed before these potentially significant risks can be fully assessed. However, in some cases these risks are accompanied by strong evidence of the need for increased adaptation in the near-term whilst the longer-term consequences of the risk are investigated.

## 62 Rapid changes in UK climate

63 **The UK climate is changing rapidly and significant impacts are now caused by extremes of heat and rainfall, as**  
64 **well as from rising sea levels.** The UK has warmed by around 0.25 °C per decade since the 1980s and is warming  
65 faster than the global average. In 2022, the UK experienced its first 40 °C day, virtually impossible without  
66 climate change. A 40 °C day has become four times more likely over the last three decades. Rainfall has also  
67 increased with the most recent decade being 10% wetter than the 1961-1990 average, mostly due to increases in  
68 winter rainfall. UK sea levels have risen by over 19 cm since 1901 and this rate of increase is accelerating – with  
69 two thirds of this rise in the last 30 years. The infographic below (Figure E1) shows a range of extreme weather  
70 and climate trends that are causing impacts to all parts of the UK. In many cases it is now possible to estimate  
71 how much human driven climate change has altered changes in climate extremes. Further examples are also  
72 shown in Figure E1.

73 *Figure E1: Infographic of example observed changes in UK climate.*



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76 **Climate change is causing warmer, wetter winters and hotter, drier summers in the UK.** Further changes in  
77 climate and extreme weather events are inevitable but the rate and magnitude of the changes will depend on  
78 future global emissions. More extreme weather events will occur over all parts of the UK, but there will be some  
79 differences in rates of change at different locations.

80 Compound extremes refer to multiple hazards occurring simultaneously or in close succession, amplifying their  
81 impacts. Climate model projections show a sizeable increase in compound summer rainfall events, with an  
82 increase in heavy rainfall occurring within a short time window, potentially driving more flash flooding.  
83 Compound wind and rainfall extremes are projected to increase, driven by increased rainfall intensity and a  
84 strengthened jet stream, and potentially causing more damage to infrastructure during winter storms.

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85 Compound flooding from storm surges and riverine flooding is likely to increase, leading to more damage in low  
86 lying coastal areas.

87 The potential for further changes, associated with earth system tipping points cannot be ruled out. These  
88 include abrupt or irreversible changes, such as major changes in the circulation of the Atlantic Ocean, which  
89 would have a major impact on UK extreme weather, or accelerated sea-level rise resulting from more rapid loss  
90 of ice from the continental ice sheets. The likelihood of these tipping points being triggered over the next few  
91 decades remains uncertain but will increase with the level of global warming. If triggered many of the impacts of  
92 tipping points won't be fully experienced for decades or even centuries.

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94 **There is increasing evidence that climate change is already having significant impacts.** Increasing evidence  
 95 highlights that changes in the types of extreme weather experienced by the UK are driving many types of  
 96 impact. Many studies have now directly linked the rising severity and frequency of weather extremes to  
 97 warming caused by greenhouse gases (see Table E1). Growing consequences of climate change are evident on  
 98 people, infrastructure and nature.

99 *Table E1: Summary of recent attribution studies for UK climate hazards.*

| Event                          | Date                                      | Description  | Conclusions  | Reference  |
|--------------------------------|---|--|--|--|
| <b>Summer heatwave</b>         | June-August 2025                          | Hottest summer on record for UK mean temperature June-August   | The probability of summer 2025 temperatures has <b>increased by around 70 times</b> compared to a pre-industrial period.   | Logan et al. 2025: <a href="https://doi.org/10.1002/joc.8460">hctn_summer_2025_analys_v1.1.pdf</a>   |
| <b>Winter Storms</b>           | October 2023-March 2024                   | During the winter half-year of 2023/2024, western Europe experienced a series of damaging storms. These storms led to disruptions and the associated precipitation caused exacerbated flood risks  | Observations and models indicate that average rainfall on stormy days <b>increased by about 20%</b> due to human induced climate change, or equivalently the 2023/24 level has become about a factor of 10 more likely.                        | Kew et al. 2024: <a href="https://doi.org/10.1002/joc.8460">Autumn and winter storm rainfall in the UK and Ireland was made about 20% heavier by human-caused climate change – World Weather Attribution</a>                 |
| <b>Winter floods</b>           | Five flood events in winter 2015 and 2020 | Extreme rainfall leading to flooding from storm Eva (2015), storm Desmond (2015), storm Ciara and Dennis (2020)  | Results were fairly similar for each event studied, with the events being found to <b>become from 1.4 to 2.6 times more likely.</b>  | Cotterill et al. 2024: <a href="https://doi.org/10.1002/joc.8460">https://doi.org/10.1002/joc.8460</a>   |
| <b>Wildfires</b>               | Summer 2022                               | Hot and dry conditions in summer 2022 saw a four-fold increase in wildfire occurrence compared to the previous year. The extreme heatwave in July saw widespread fires across London and other parts of England.   | <b>At least a 6-fold increase</b> in the probability of very high fire weather (conditions conducive to fire) in the UK due to human influence.  | Burton et al 2025 Environ. Res. Lett. 20 044003 DOI 10.1088/1748-9326/adb764   |
| <b>Extreme heat</b>            | July 2022                                 | On 19 July 2022, an exceptional heatwave affecting large parts of the UK peaked. It was the first time that temperatures of 40°C have been observed in the UK.   | Human-caused climate change made the event <b>at least 10 times more likely.</b> The likelihood of 40°C has been accelerating and we estimate a 50–50 chance of another exceedance in the next 12 years.                                       | Zachariah et al. 2022: <a href="https://doi.org/10.1002/wea.7741">Without human-caused climate change temperatures of 40°C in the UK would have been extremely unlikely – World Weather Attribution</a>                      |
| <b>Intense summer downpour</b> | July 2021                                 | On 4 July 2021, a band of high-intensity rain tracked across the city of Edinburgh, Scotland, releasing an intense downpour (“cloudburst”) directly over Edinburgh Castle for about 15 min.  | The probability of an event similar to that which occurred in July 2021 is estimated to <b>be about 30% larger</b> due to observed warming of the climate, and would be about 70% larger in a world 2°C warmer than preindustrial.             | Kay et al. 2025: <a href="https://doi.org/10.1175/BAMS-D-22-0196.1">https://doi.org/10.1002/wea.7741</a><br>Tett et al. 2023 <a href="https://doi.org/10.1175/BAMS-D-22-0196.1">https://doi.org/10.1175/BAMS-D-22-0196.1</a> |
| <b>Wettest Day</b>             | October 2020                              | On October 3, 2020, the UK set a new record for the country's wettest day. The UK recorded 30.0 mm of rain, on average, across the entire UK and this was widely reported in the media at the time as enough rainwater to fill Loch Ness (7.6 cubic kilometres). | The record rainfall of the wettest day in year 2020 is estimated to have <b>become about 2.5 times more likely</b> because of human influence, while its return time, currently about 100 years, will decrease to only about 30 years by 2100. | Christidis et al. 2021 <a href="https://doi.org/10.1002/asl.1033">https://doi.org/10.1002/asl.1033</a>   |

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## A robust methodology with innovations – Box E1

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This Technical Report is part of the package of information being produced for the fourth climate change risk assessment (CCRA4). It forms part of the independent assessment commissioned by the Climate Change Committee (CCC) and is produced by a consortium of researchers led by the Met Office. This report focuses on the physical risks and opportunities to the UK from future weather and climate hazards. Potential responses to the risks and opportunities from climate change are not discussed in this report but are covered by other parts of CCRA4's Independent Assessment, including the "Well Adapted UK" report and the advice provided by the Climate Change Committee to government.

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The purpose of the Technical Report is to provide an independent assessment of the risks and opportunities that climate change poses to the UK. It has been designed to inform subsequent National Adaptation Programmes and wider policy making. A set of 44 risk descriptors were defined in conjunction with risk owners such that they align better with governance structures in the UK. Each risk has been assessed for each nation by leading experts in their respective fields, following a strict methodology that was designed in conjunction with the CCC to ensure a consistent approach to the assessment of risk and opportunities across five different sectors. The sectors covered are the Built Environment, Economy, Health and Wellbeing, Infrastructure and Land, Food and Nature. The results have been peer reviewed by a panel of experts and by an open process with the wider scientific and policy communities.

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Since CCRA3-IA-TR, published in 2021, the methodology has been updated. This involved (1) defining a smaller but more understandable set of names and descriptions used to describe the risk descriptors, (2) adding an additional Very High magnitude category and (3) updating the classification used to estimate the urgency scores from the magnitude estimates. In doing so, it has been necessary to add two new critical categories of action, namely Critical Action Needed and Critical Investigation both of which are a level above the previous highest category of More Action Needed. The need for this change was motivated by the increasing magnitude of impacts from the risk descriptors contained in this assessment as well as providing the means to highlight a subset of the most important for action. The CCRA4-IA-TR prioritises the consideration of near-term climate risk such that Critical Action Needed and Critical Investigation are only valid for the present day, 2030s and 2050s.

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A full description of the urgency framework is included within the Methods chapter together with the full description of the urgency score definition. We have summarised these below in priority order:

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- Critical Action Needed: Very High magnitude combined with a strong evidence base calls for critical, stronger or different Government action.
- Critical Investigation: Very High magnitude combined with poor evidence base calls for Government to prioritise action to fill significant evidence gaps. In many cases, more action is also needed on adaptation to accompany the Critical Investigation.
- More Action Needed: High / Medium magnitude combined with High / Medium confidence in the evidence base which calls for new, stronger or different Government action.
- Further Investigation: Low confidence in the evidence base such that more evidence is required to assess the need for additional action.
- Watching Brief: magnitude considered to be Low coupled with Low confidence in the evidence base means that these areas should be kept under review such that further action can be taken if necessary.
- Sustain Current Action: magnitude considered to be Low coupled with a High / Medium confidence in the evidence base. Current or planned levels of activity are appropriate.

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141 It is important to acknowledge that many risk descriptors interact, often in complex ways, which can amplify the  
142 magnitude of the impacts caused by weather and climate change. However, these interactions remain difficult  
143 to quantify and evidence on the magnitude of these effects remains limited. Where possible, these interactions  
144 are highlighted throughout the chapters. Furthermore, some risks are “imported” from outside the UK, for  
145 example those related to food security and supply chains, where climate change beyond the UK has a range of  
146 damaging effects on the UK. Unlike previous reports, these are now treated in the sector chapters of this report  
147 rather than as a standalone chapter. Like the direct risks from climate change within the UK, these are expected  
148 to increase over time.

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150 In total, the report assesses 44 risk descriptors to the UK, looking across all four nations, from present day to the  
151 2080s. Two scenarios of climate change are considered – a central case based on current policies for regulating  
152 global emissions of greenhouse gases, and a high case that could result from either higher emissions or a more  
153 sensitive climate response to those emissions.

154 **End of box E1.**

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## Climate Risks affect all sectors across all parts of the UK

Figure E2: Infographic of the urgency of responding to all risk descriptors impacting the UK.



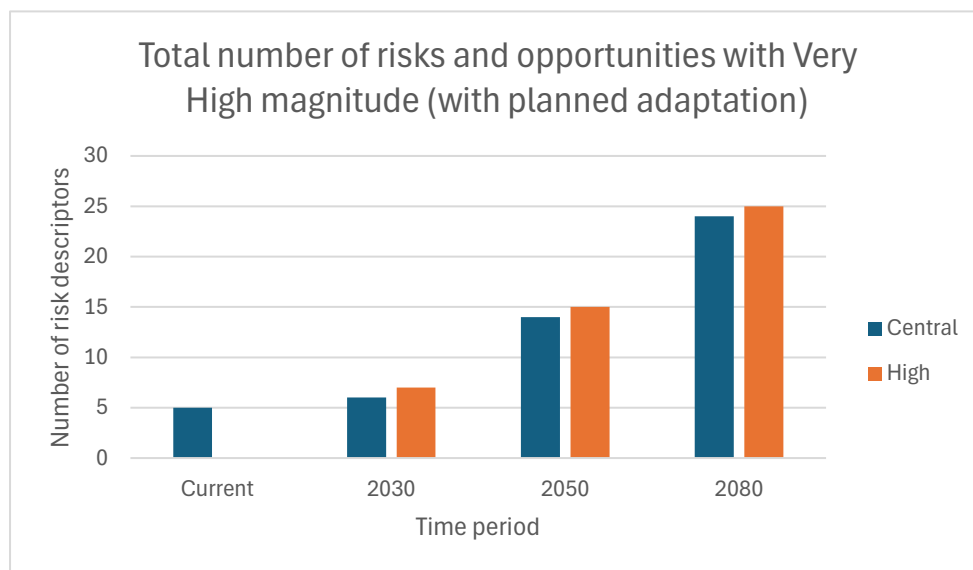
159 This latest assessment focuses on 44 risk descriptors, which have been updated since CCRA3-IA-TR in  
 160 consultation with risk owners in Government. This includes merging some of the risk descriptors so that the  
 161 overall coverage of the risk descriptors is similar to CCRA3-IA-TR. Taken together across all sectors and all parts  
 162 of the UK, the overall finding is that climate risk to the UK is now higher than in previous assessments.

### 163 Magnitude of Risk to the UK

164 The consequences of climate change are being felt across all parts of the UK. While there are some differences in  
 165 risk magnitudes between the nations of the UK, climate change will have negative consequences in the future  
 166 across all four nations and for all sectors considered in the risk assessment.

168 The report finds that all four nations and all sectors have risk descriptors at the Very High magnitude (the  
 169 highest level of potential impact) by the 2050s and a significant proportion of the resultant consequences will be  
 170 felt much sooner. In this report we assess that 13 of the 41 risks and 1 of the opportunities are scored at the  
 171 Very High magnitude in at least one nation by the 2050s, even after accounting for planned adaptation. Every  
 172 sector assessed has at least one Very High magnitude risk descriptor by the 2050s. Fourteen risk descriptors  
 173 have a Very High magnitude across all nations by the 2050s. When the higher climate scenario is considered, the  
 174 risks increase, with some Very High magnitude impacts happening earlier.

176 The consequences of many climate hazards will be experienced even in the near-term. Of all the risk descriptors  
 177 assessed as Very High magnitude by the 2050s, 43% will reach this threshold in the 2030s and 36% have already  
 178 reached this threshold in the present day. The timing of different magnitude levels, taken as the highest from  
 179 any of the four nations and including planned adaptation is shown in Figure E3 below.



*Figure E3. Bar chart showing number of risk descriptors (taking the maximum score across all nations and the case with planned adaptation) in the Very High magnitude category for each time period.*

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### Urgency of action

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Urgency scores are summarised in Figures E2 and E4. When taken across the UK using the highest component score from any of the nations, eight risks are now judged as Critical Action Needed (i.e. where there is established evidence of Very High risks combined with limited action planned), with a further 16 risks as More Action Needed (Methods Chapter). This means that 55% of all risks considered require additional adaptation as currently planned measures are considered insufficient to manage the risk effectively. Additionally, there are 15 risks and 1 opportunity requiring Critical Investigation, 2 risks and 2 opportunities requiring Further Investigation. Sustain Current Action or a Watching Brief is judged to be unsuitable for any risks or opportunities. The overall urgency scoring for risks in each category are summarised in Figure E4. The urgency scores for the different nations of the UK are shown in more detail in Table E3.

|                               |  |  |   |  |   |   |  |  |   |   |
|-------------------------------|--|--|---|--|---|---|--|--|---|---|
| <b>Built Environment</b>      | <b>BE1:</b> Risks to buildings and communities from heat   | <b>BE2:</b> Risks to buildings and communities from flooding               | <b>BE3:</b> Risks to buildings and communities from coastal change                                | <b>BE4:</b> Risks to buildings and communities, excluding from heat, flooding and coastal change | <b>BE5:</b> Risks to indoor environmental quality                   | <b>BE6:</b> Risks to cultural heritage and landscapes | <b>BE7:</b> Risks to facilities delivering public services, excluding health and social care | <b>BE8:</b> Risks to local resilience planning and emergency service response capabilities | <b>BE9:</b> Risks and opportunities to households from changing energy demand |   |
| <b>Economy</b>                | <b>E1:</b> Risks to UK macroeconomic performance and stability   | <b>E2:</b> Risks to domestic and overseas physical assets of UK businesses | <b>E3:</b> Risks to domestic and international supply chains and resource inputs of UK businesses | <b>E4:</b> Risks to Productivity and Availability of Labour in the UK                            | <b>E5:</b> Risks to financial institutions and the financial system | <b>E6:</b> Risks to public finances                   | <b>E7:</b> Risk to household finances  | <b>E8:</b> Opportunities to UK businesses from delivering adaptation goods and services    |   |   |
| <b>Infrastructure</b>         | <b>I1:</b> Risks to the delivery of infrastructure services from interdependencies with other infrastructure systems | <b>I2:</b> Risks to electricity generation                                 | <b>I3:</b> Risks to electricity transmission and distribution systems                             | <b>I4:</b> Risk to fuel supply infrastructure  | <b>I5:</b> Risks to road transport systems                          | <b>I6:</b> Risk to rail transport systems             | <b>I7:</b> Risks to aviation, shipping, and other transport systems                          | <b>I8:</b> Risks to digital and communications systems                                     | <b>I9:</b> Risks to water supply and wastewater systems                       | <b>I10:</b> Risks to waste management systems, excluding wastewater systems |
| <b>Land, Nature, and Food</b> | <b>N1:</b> Risks to terrestrial and coastal ecosystems   | <b>N2:</b> Risks to freshwater ecosystems                                  | <b>N3:</b> Risks to marine ecosystems   | <b>N4:</b> Risks to soil ecosystems  | <b>N5:</b> Risks to natural carbon stores and sequestration         | <b>N6:</b> Risks to agriculture                       | <b>N7:</b> Risks to fisheries and aquaculture  | <b>N8:</b> Risks to forestry   | <b>N9:</b> Opportunities for agriculture, fisheries, aquaculture and forestry | <b>N11:</b> Risks to food security  |
| <b>Health &amp; Wellbeing</b> | <b>H1:</b> Risks to people from heat   | <b>H2:</b> Risks to people from extreme weather, excluding heat            | <b>H3:</b> Risks to people from changes in air quality  | <b>H4:</b> Risks to people from climate-sensitive diseases                                       | <b>H5:</b> Risk to food safety and nutrition                        | <b>H6:</b> Risks to health and social care delivery   | <b>H7:</b> Opportunities for health and wellbeing  |  |   |   |

- CAN:** Critical action needed
- CI:** Critical investigation
- MAN:** More action needed
- FI:** Further investigation
- WB:** Watching brief
- SCA:** Sustain current action

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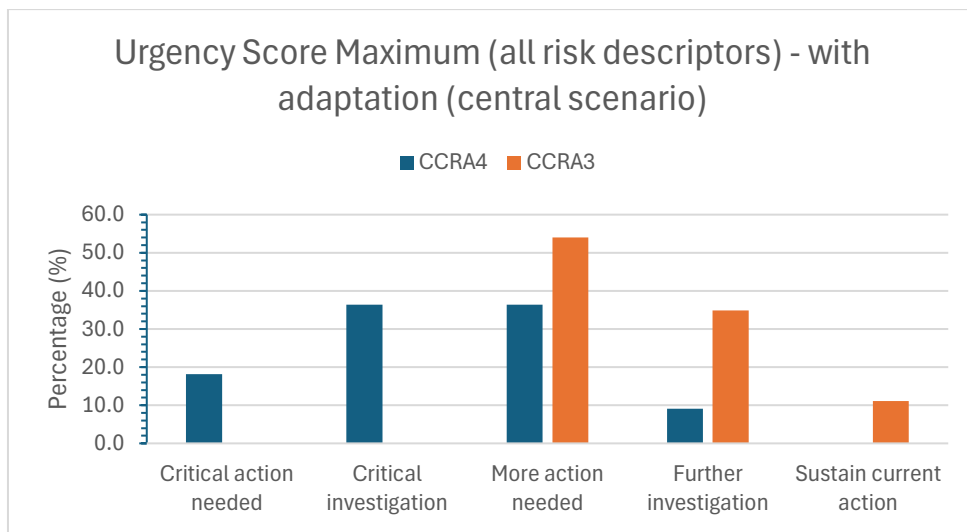
210 Taking account of all evidence, the authors of this report have concluded that the magnitude of impact from the  
 211 risks are likely to be significantly higher than that in previous assessments. As further evidence of the impact of  
 212 our changing climate accumulates each year, coupled with the latest research on future climate change, this  
 213 trend will undoubtedly continue without increased adaptation efforts. Many risks that were previously  
 214 highlighted as requiring Further Investigation are now judged to require Critical Investigation. In many cases,  
 215 alongside this investigation, more action is needed now to address the nearer term consequences (Figure E5).

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Figure E5. Percentage of risks in each urgency category from CCRA3-IA-TR and CCRA4-IA-TR. More Action Needed, Further Investigation and Sustain Current Action have the same meaning in both assessments. The Critical Action Needed and Critical Investigation are new categories for CCRA4-IA-TR.



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## 222 The evidence for informing risks in the UK is improving but gaps remain.

223 There exist limitations in data and knowledge for some risk descriptors, but expert judgement from the authors  
224 of the report concludes that there is sufficient information to form a detailed view of how risks from climate  
225 change are and will continue to impact the UK across all the sectors considered in the report.

226 It is clear that the evidence base has continued to improve since CCRA3-IA-TR, but significant evidence gaps  
227 remain across all five sectors. Some of these pertain to uneven data and evidence availability across the four  
228 nations, with more pertinent gaps evident in Scotland, Wales and Northern Ireland, and some of these are also  
229 due to the rapidly changing nature of some of the sectors. In general, evidence for current levels of risk is  
230 stronger than future levels especially when considering adaptation. This is because adaptation plans can be  
231 uncertain, making their long-term effectiveness as climate change progresses difficult to assess. Further research  
232 is also needed to better understand cascading risks.

233 In quantitative terms, 45% of the risk descriptors in this assessment require some additional investigation  
234 (Further Investigation and Critical Investigation), compared with 35% in CCRA3-IA-TR (Further Investigation).  
235 Three quarters of these are in the Critical Investigation category. The reason these are marked as critical is that,  
236 while the confidence in the evidence is lower for these risk descriptors, there is sufficient reason to judge that  
237 they could be classed in the Very High magnitude category. Improved evidence is needed quickly to establish if  
238 critical action will be needed Furthermore, for several of the risks in the Critical Investigation category, there is  
239 stronger evidence that in the present day and near term that at least more adaptation action is needed. The  
240 risks for which there is a clear case for at least More Action Needed whilst the critical investigation also takes  
241 place are shown in table E2.

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Table E2: Risk descriptors rated Critical Investigation overall that have at least one time period up to the 2050s that include More Action Needed.

| Risk Code | Risk Name   | Years Rated MAN |
|-----------|---|-----------------|
| BE6       | Risks to cultural heritage and landscapes   | Present, 2030   |
| BE8       | Risks to local resilience planning and emergency service response capabilities                          | Present, 2030   |
| E3        | Risks to domestic and international supply chains and resource inputs of UK businesses                  | Present         |
| E4        | Risks to Productivity and Availability of Labour in the UK  | Present, 2030   |
| E6        | Risks to public finances  | Present, 2030   |
| E7        | Risk to household finances  | Present         |
| E8        | Opportunities to UK businesses and financial institutions from delivering adaptation goods and services | Present, 2030   |
| I3        | Risks to electricity transmission and distribution systems  | Present         |
| I5        | Risks to road transport systems   | Present, 2030   |
| N1        | Risks to terrestrial and coastal ecosystems   | Present         |
| N4        | Risks to soil ecosystems  | Present, 2030   |
| N5        | Risks to natural carbon stores and sequestration  | Present         |

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## 247 Key evidence gaps highlighted for critical investigation across sectors – Box 248 E2

- 249 • Built Environment: Notable evidence gaps relate to the impacts of climate change on cultural heritage  
250 and landscapes, as well as a wider range of public service facilities.
- 251 • Economy: The chapter found inconsistencies, lack of granularity, and limited integration. Dynamic  
252 modelling of financial system risks is limited, and there is incomplete data concerning private sector  
253 climate adaptation.
- 254 • Health and Wellbeing: Evidence is weaker for cause-specific mortality, with an urgent need for more  
255 climate modelling studies for climate-sensitive infectious diseases, and to a lesser extent for food safety  
256 and nutrition.
- 257 • Infrastructure: Further investigation is required regarding the impact of climate change on digital and  
258 communication systems. There is also a need for more work quantifying the vulnerability of rail  
259 networks to extreme weather events. The chapter highlights the insufficient consideration of systems  
260 interdependencies, especially for energy supply and transmission, which could affect risk scoring.
- 261 • Land, Food and Nature: The complexity of natural systems does mean that our understanding is  
262 constantly improving and provides a sound basis for expert judgement. However, greater precision will  
263 be obtained by additional quantification for risks across the entire portfolio for a wider range of  
264 scenarios and time horizons.

265 **End of box E2**

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Table 1: Summary table of the national urgency score for the risk descriptors in the Built Environment chapter. The urgency scores are abbreviated as follows: Critical Action Needed – CAN, Critical Investigation – CI, More Action Needed – MAN, Further Investigation – FI, Watching Brief – WB, Sustain Current Action – SCA.

| ID                       | Risk description  | England | Northern Ireland | Scotland | Wales |
|--------------------------|---|---------|------------------|----------|-------|
| <b>Built Environment</b> |   |         |                  |          |       |
| BE1                      | Risks to buildings and communities from heat  | CAN     | CI               | CAN      | CAN   |
| BE2                      | Risks to buildings and communities from flooding.                                   | CAN     | CAN              | CAN      | CAN   |
| BE3                      | Risks to buildings and communities from coastal change                              | MAN     | FI               | FI       | FI    |
| BE4                      | Risk to buildings and communities, excluding from heat, flooding and coastal change | MAN     | MAN              | MAN      | MAN   |
| BE5                      | Risk to indoor environmental air quality  | MAN     | MAN              | MAN      | MAN   |
| BE6                      | Risk to cultural heritage and landscapes  | CI      | CI               | CI       | CI    |
| BE7                      | Risk to facilities delivering public services, excluding health and social          | MAN     | FI               | FI       | FI    |
| BE8                      | Risk to local resilience planning and emergency service response capabilities       | CI      | CI               | CI       | CI    |
| BE9                      | Risks and opportunities to households from changing energy demand                   | MAN     | SCA              | SCA      | MAN   |

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Table 2: Summary table of the national urgency score for the risk descriptors in the Economy chapter. The urgency scores are abbreviated as follows: Critical Action Needed – CAN, Critical Investigation – CI, More Action Needed – MAN, Further Investigation – FI, Watching Brief – WB, Sustain Current Action – SCA.

| ID             | Risk description  | England | Northern Ireland | Scotland | Wales |
|----------------|---|---------|------------------|----------|-------|
| <b>Economy</b> |   |         |                  |          |       |
| E1             | Risks to UK Macroeconomic performance and stability   | CAN     | CAN              | CAN      | CAN   |
| E2             | Risks to domestic and overseas physical assets of UK businesses   | CAN     | CAN              | CAN      | CAN   |
| E3             | Risks to domestic and international supply chains and resource inputs                                   | CI      | CI               | CI       | CI    |
| E4             | Risks to the productivity and availability in labour in the UK  | CI      | CI               | CI       | CI    |
| E5             | Risks to financial institutions and the financial system  | CAN     | CAN              | CAN      | CAN   |
| E6             | Risks to public finances  | CI      | CI               | CI       | CI    |
| E7             | Risks to household finances   | CI      | CI               | CI       | CI    |
| E8             | Opportunities to UK businesses and financial institutions from delivering adaptation goods and services | CI      | CI               | CI       | CI    |

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Table 3: Summary table of the national urgency score for the risk descriptors in the Health and Wellbeing chapter. The urgency scores are abbreviated as follows: Critical Action Needed – CAN, Critical Investigation – CI, More Action Needed – MAN, Further Investigation – FI, Watching Brief – WB, Sustain Current Action – SCA.

| ID                          | Risk description   | England | Northern Ireland | Scotland | Wales |
|-----------------------------|--|---------|------------------|----------|-------|
| <b>Health and Wellbeing</b> |  |         |                  |          |       |
| H1                          | Risks to people from heat                                  | CAN     | CI               | CAN      | CAN   |
| H2                          | Risks to people from extreme weather, excluding heat       | MAN     | MAN              | MAN      | MAN   |
| H3                          | Risks to people from changes in air quality                | CI      | CI               | CI       | CI    |
| H4                          | Risks to people from climate-sensitive infectious diseases | MAN     | MAN              | MAN      | MAN   |
| H5                          | Risks to food safety and nutrition                         | FI      | FI               | FI       | FI    |
| H6                          | Risks to health and social care delivery                   | MAN     | MAN              | MAN      | MAN   |
| H7                          | Opportunities for health and wellbeing                     | FI      | FI               | FI       | FI    |

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Table 4: Summary table of the national urgency score for the risk descriptors in the Infrastructure chapter. The urgency scores are abbreviated as follows: Critical Action Needed – CAN, Critical Investigation – CI, More Action Needed – MAN, Further Investigation – FI, Watching Brief – WB, Sustain Current Action – SCA.

| ID                    | Risk description  | England | Northern Ireland | Scotland | Wales |
|-----------------------|---|---------|------------------|----------|-------|
| <b>Infrastructure</b> |   |         |                  |          |       |
| 11                    | Risks to the delivery of infrastructure services from interdependencies with other infrastructure systems | CAN     | CAN              | CAN      | CAN   |
| 12                    | Risk to electricity generation  | MAN     | MAN              | MAN      | MAN   |
| 13                    | Risk to electricity transmission and distribution systems   | MAN     | CI               | MAN      | MAN   |
| 14                    | Risk to fuel supply systems   | CI      | CI               | CI       | CI    |
| 15                    | Risk to road transport systems  | CI      | CI               | CI       | CI    |
| 16                    | Risk to rail transport systems  | MAN     | MAN              | MAN      | MAN   |
| 17                    | Risks to aviation, shipping, and other transport systems  | CI      | CI               | CI       | CI    |
| 18                    | Risk to digital and communications systems  | FI      | FI               | FI       | FI    |
| 19                    | Risk to water supply and wastewater systems   | MAN     | MAN              | MAN      | MAN   |
| 110                   | Risk to waste management systems  | FI      | FI               | FI       | CI    |

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Table 5: Summary table of the national urgency score for the risk descriptors in the Land, Food and Nature chapter. The urgency scores are abbreviated as follows: Critical Action Needed – CAN, Critical Investigation – CI, More Action Needed – MAN, Further Investigation – FI, Watching Brief – WB, Sustain Current Action – SCA.

| ID                    | Risk description                                      | England | Northern Ireland | Scotland | Wales |
|-----------------------|---|---------|------------------|----------|-------|
| Land, Food and Nature |   |         |                  |          |       |
| N1                    | Risks to terrestrial and coastal ecosystems           | MAN     | CI               | MAN      | MAN   |
| N2                    | Risks to freshwater ecosystems                        | MAN     | MAN              | MAN      | MAN   |
| N3                    | Risks to marine ecosystems                            | MAN     | MAN              | MAN      | MAN   |
| N4                    | Risks to soil ecosystems                              | CI      | CI               | CI       | CI    |
| N5                    | Risks to carbon stores and sequestration              | MAN     | CI               | MAN      | MAN   |
| N6                    | Risks to agriculture                                  | MAN     | MAN              | MAN      | MAN   |
| N7                    | Risks to fisheries and aquaculture                    | MAN     | MAN              | MAN      | MAN   |
| N8                    | Risks to forestry                                     | MAN     | SCA              | MAN      | MAN   |
| N9                    | Opportunities for agriculture, forestry and fisheries | FI      | FI               | FI       | FI    |
| N10                   | Risks to food security                                | CAN     | CAN              | CAN      | CAN   |

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