

Key messages from the Synthesis Report



The global climate is changing, with greenhouse gas emissions from human activity the dominant cause. The global increase in temperature of 0.85°C since 1880 is mirrored in the UK climate, with higher average temperatures and some evidence of more extreme weather events. Average annual UK temperatures over land and the surrounding seas have increased in line with global observations, with a trend towards milder winters and hotter summers in recent decades. Sea levels globally and around the UK have risen by 15-20 centimetres since 1900. Whilst natural variability in the climate will continue to have a considerable influence on individual weather events, the recent episodes of severe and sustained rainfall are consistent with climate change projections.

Global emissions will need to peak soon and then decline rapidly for the Paris Agreement goals to be feasible. Even in this scenario the uncertain sensitivity of the climate to greenhouse gases means there would remain at least a small chance of 4°C or more of warming by 2100. It is therefore prudent to prepare for further warming whilst pursuing more stringent emission reductions as part of the global effort.

The overall aim of the CCRA Evidence Report is to assess the urgency of further action to tackle current and future risks, and realise opportunities, arising for the UK from climate change. Figure 1 presents the top six groups of risks where there is a need for additional, co-ordinated steps to be taken within the next five years and notes the chapters where the individual risks are discussed.

Figure 1: Top six areas of inter-related climate change risks for the United Kingdom

Flooding and coastal change risks to communities, businesses and infrastructure (Ch3, Ch4 Ch5, Ch6)	MORE ACTION NEEDED
Risks to health, well-being and productivity from high temperatures (Ch5, Ch6)	
Risk of shortages in the public water supply, and for agriculture, energy generation and industry (Ch3, Ch4, Ch5, Ch6)	
Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity (Ch3)	
Risks to domestic and international food production and trade (Ch3, Ch6, Ch7)	
New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals (Ch3, Ch5, Ch7)	RESEARCH PRIORITY
NOW -----> RISK MAGNITUDE -----> FUTURE <div style="display: inline-block; margin-left: 10px;"> LOW MEDIUM HIGH </div>	

Note: Future magnitude is based on a combination of climate change and other drivers of risk (e.g. demographic change), taking account of how current adaptation policies and plans across the UK are likely to reduce risks. The urgency categories are defined as follows:

- **More action needed:** New, stronger or different government policies or implementation activities – over and above those already planned – are needed to reduce long-term vulnerability to climate change.
- **Research priority:** Research is needed to fill significant evidence gaps or reduce the uncertainty in the current level of understanding in order to assess the need for additional action.
- **Sustain current action:** Current or planned levels of activity are appropriate, but continued implementation of these policies or plans is needed to ensure that the risk continues to be managed in the future. This includes any existing plans to increase or change the current level of activity.
- **Watching brief:** The evidence in these areas should be kept under review, with long-term monitoring of risk levels and adaptation activity so that further action can be taken if necessary.

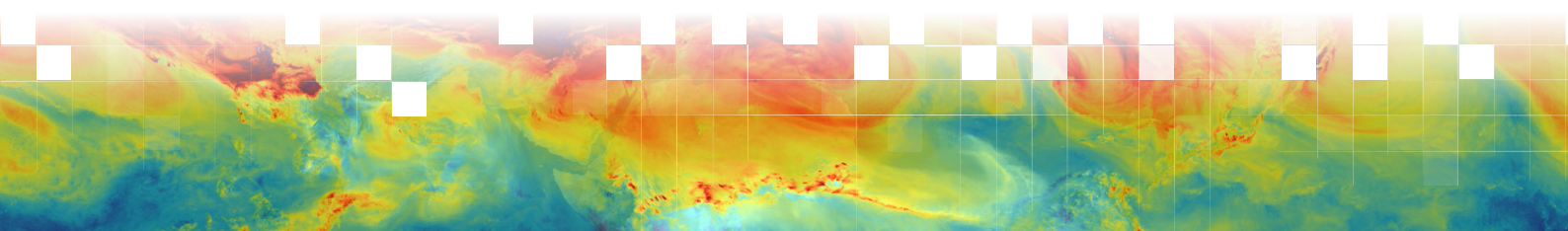




Figure 2 presents the full list of climate change risks and opportunities considered in the assessment. These include the exposure of interdependent infrastructure networks to multiple, correlated hazards (e.g. flooding and high winds), as well as the vulnerability of certain infrastructure types to specific hazards (e.g. road surfaces to high temperatures). Air quality in both urban and rural areas could deteriorate further though climate change will have less influence than

pollution from transport, industry and farming. Risks will arise for culturally-valued buildings and landscapes from a combination of higher temperatures and rainfall intensities. There are also uncertain but potentially very significant international risks arising from climate-related human displacement, and the possibility of violent inter state conflict over scarce natural resources.

Figure 2: Urgency categories for climate change risks and opportunities for the UK

MORE ACTION NEEDED	RESEARCH PRIORITY	SUSTAIN CURRENT ACTION	WATCHING BRIEF
Ne1: Risks to species and habitats from changing climate space	Ne3: Changes in suitability of land for agriculture & forests	Ne9: Risks to agriculture, forestry, landscapes & wildlife from pests/pathogens/invasive species	Ne14: Risks & opportunities from changes in landscape character
Ne2: Opportunities from new species colonisations	Ne7: Risks to freshwater species from high water temperatures	Ne10: Extreme weather/wildfire risks to farming, forestry, wildlife & heritage	In7: Low/high riverflow risks to hydroelectric generation
Ne4: Risks to soils from increased seasonal aridity and wetness	Ne13: Ocean acidification & higher water temperature risks for marine species, fisheries and marine heritage	Ne11: Saltwater intrusion risks to aquifers, farmland & habitats	In8: Subsidence risks to buried/surface infrastructure
Ne5: Risks to natural carbon stores & carbon sequestration	In5: Risks to bridges and pipelines from high river flows/erosion	In13: Extreme heat risks to rail, road, ICT and energy infrastructure	In10: Risks to electricity generation from drought and low flows
Ne6: Risks to agriculture & wildlife from water scarcity & flooding	In11: Risks to energy, transport & ICT from high winds & lightning	In14: Benefits for infrastructure from reduced extreme cold events	PB3: Opportunities for increased outdoor activity in warmer weather
Ne8: Risks of land management practices exacerbating flood risk	In12: Risks to offshore infrastructure from storms and high waves	PB13: Risks to health from poor water quality	PB12: Risks of food-borne disease cases and outbreaks
Ne12: Risks to habitats & heritage in the coastal zone from sea level rise; loss of natural flood protection	PB2: Risks to passengers from high temperatures on public transport	PB14: Risk of household water supply interruptions	Bu4: Risks to business from reduced access to capital
In1: Risks of cascading infrastructure failures across interdependent networks	PB6: Risks to viability of coastal communities from sea level rise	Bu3: Risks to business operations from water scarcity	Bu7: Business risks /opportunities from changing demand for goods & services
In2: Risks to infrastructure from river, surface/groundwater flooding	PB7: Risks to building fabric from moisture, wind, and driving rain	Bu6: Risks to business from disruption to supply chains	It7: Opportunities from changes in international trade routes
In3: Risks to infrastructure from coastal flooding & erosion	PB8: Risks to culturally valued structures and historic environment		
In4: Risks of sewer flooding due to heavy rainfall	PB10: Risks to health from changes in air quality		
In6: Risks to transport networks from embankment failure	PB11: Risks to health from vector-borne pathogens		
In9: Risks to public water supplies from drought and low river flows	Bu2: Risks to business from loss of coastal locations & infrastructure		
PB1: Risks to public health and wellbeing from high temperatures	Bu5: Employee productivity impacts in heatwaves and from severe weather infrastructure disruption		
PB4: Potential benefits to health & wellbeing from reduced cold	It2: Imported food safety risks		
PB5: Risks to people, communities & buildings from flooding	It3: Long-term changes in global food production		
PB9: Risks to health and social care delivery from extreme weather	It5: Risks to the UK from international violent conflict		
Bu1: Risks to business sites from flooding	It6: Risks to international law and governance		
It1: Weather-related shocks to global food production and trade			
It4: Risks from climate-related international human displacement			

KEY TO CHAPTERS:

- Chapter 3: Natural environment and natural assets
- Chapter 4: Infrastructure
- Chapter 5: People and the built environment
- Chapter 6: Business and industry
- Chapter 7: International dimensions

Note: Individual risks and opportunities are presented in the order they are discussed in the chapters (not in priority order).