8 September 2021

Climate risk and adaptation: People, health systems and the built environment

Chaired by: Mike Davies, Adaptation Committee member

Panellists:

- Sari Kovats, LSHTM and Rachel Brisley, JBA Consulting (Technical Report authors)
- Gemma Holmes, CCC
- Owen Landeg, PHE and Julie Godefroy, CIBSE

UK CLIMATE RISK

Climate Change Risk Assessment 3
Chapter 5 – Health, Communities and the Built Environment

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Aim of assessment

‘Exam question’

‘based on the latest understanding of current, and future, climate risks/opportunities, vulnerability and adaptation, what should the priorities be for the next UK National Adaptation Programme and adaptation programmes of the Devolved Administrations?’

- Urgency scoring framework – 3-step process

Steps

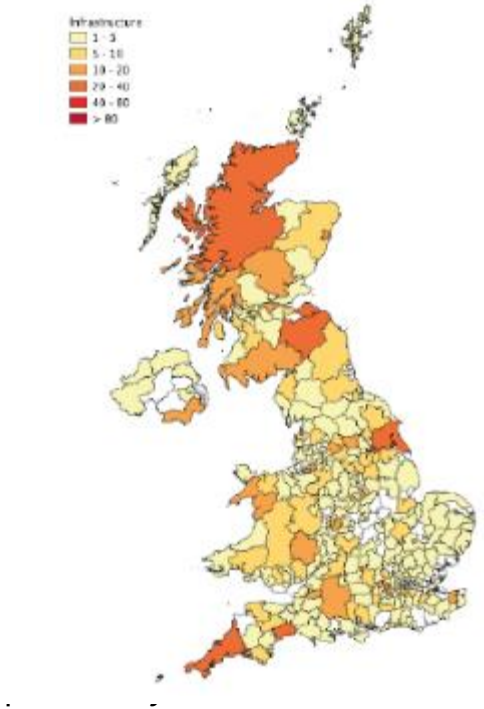
1. *What is the current and future level of risk/opportunity?*
2. *Is the risk/opportunity going to be managed, taking into account government commitments and non-government adaptation?*
3. *Are there benefits to further action in the next five years, over and above what is already planned?*

What did we do?

- Calls for evidence
- Stakeholder workshops
- CCRA3 Research projects
- External review

What's new?

- Net Zero
- COVID-19
- Extreme events
- Inequality



CCRA3 stakeholder workshop February 2020 (left), example output from CCRA3 updated projections for flooding (Sayers et al, 2020)

CCRA3 Risks and Opportunities

61 risks and opportunities identified – 54 with high urgency scores

N1 Risks to terrestrial species and habitats	**N2** Risks to terrestrial species and habitats from pests, pathogens and INNS	**N4** Risk to soils from changing conditions, including seasonal aridity and wetness	**N5** Risks to natural carbon stores and sequestration from changing conditions	**N6** Risks to and opportunities for agricultural and forestry productivity	**N7** Risks to agriculture from pests, pathogens and INNS	**N8** Risks to forestry from pests, pathogens and INNS	**N11** Risks to freshwater species and habitats
N12 Risks to freshwater species and habitats from pests, pathogens and INNS	**N14** Risks to marine species, habitats and fisheries	**N16** Risks to marine species and habitats from pests, pathogens and INNS	**N17** Risks and opportunities to coastal species and habitats	**I1** Risks to infrastructure networks from cascading failures	**I2** Risks to infrastructure services from river and surface water flooding	**I5** Risks to transport networks from slope and embankment failure	**I8** Risks to public water supplies from reduced water availability
I12 Risks to transport from high and low temperatures, high winds, lightning	**H1** Risks to health and wellbeing from high temperatures	**H3** Risks to people, communities and buildings from flooding	**H4** Risks to people, communities and buildings from sea level rise	**H6** Risks and opportunities from summer and winter household energy demand	**H8** Risks to health from vector-borne diseases	**H11** Risks to cultural heritage	**H12** Risks to health and social care delivery
H13 Risks to education and prison services	**B1** Risks to business sites from flooding	**B2** Risks to business locations and infrastructure from coastal change	**B6** Risks to business from disruption to supply chains and distribution networks	**ID1** Risks to UK food availability, safety, and quality from climate change overseas	**ID5** Risks to international law and governance from climate change overseas that will impact the UK	**ID4** Risks to the UK from international violent conflict resulting from climate change	**ID9** Risk to UK public health from climate change overseas
ID7 Risks from climate change on international trade routes	**ID10** Risk multiplication from the interactions and cascades of named risks across systems and	**N3** Opportunities from new species colonisations in terrestrial habitats	**N9** Opportunities for agricultural and forestry productivity from new species	**N10** Risks to aquifers and agricultural land from sea level rise, saltwater intrusion	**N15** Opportunities for marine species, habitats and fisheries	**N18** Risks and opportunities from climate change to landscape character	**I3** Risks to infrastructure services from coastal flooding and erosion
I4 Risks to bridges and pipelines from flooding and erosion	**I6** Risks to hydroelectric generation from low or high river flows	**I7** Risks to subterranean and surface infrastructure from subsidence	**I9** Risks to energy generation from reduced water availability	**I10** Risks to energy from high and low temperatures, high winds, lightning	**I13** Risks to digital from high and low temperatures, high winds, lightning	**H2** Opportunities for health and wellbeing from higher temperatures	**H5** Risks to building fabric
H7 Risks to health and wellbeing from changes in air quality	**H9** Risks to food safety and food security	**H10** Risks to health from poor water quality and household water supply interruptions	**B3** Risks to businesses from water scarcity	**B5** Risks to business from reduced employee productivity – infrastructure disruption and higher	**B7** Opportunities for business - changing demand for goods and services	**N13** Opportunities to marine species, habitats and fisheries	**I11** Risks to offshore infrastructure from storms and high waves
B4 Risks to finance, investment, insurance, access to capital	**ID8** Risk to the UK finance sector from climate change overseas	**ID2** Opportunities for UK food availability and exports	**ID3** Risks to the UK from climate-related international human mobility	**ID6** Opportunities (including Arctic ice melt) for international trade routes			

More Action Needed

Further Investigation

Sustain Current Action, Watching Brief

UK CLIMATE RISK

Health, communities and built environment urgency scores

H1 Risks to health and wellbeing from high temperatures	**H2** Opportunities for health and wellbeing from higher temperatures	**H3** Risks to people, communities and buildings from flooding	**H4** Risks to people, communities and buildings from sea level rise	**H5** Risks to building fabric	**H6** Risks and opportunities from summer and winter household energy demand	**H7** Risks to health and wellbeing from changes in air quality	**H8** Risks to health from vector-borne diseases
H9 Risks to food safety and food security	**H10** Risks to health from poor water quality and household water supply interruptions	**H11** Risks to cultural heritage	**H12** Risks to health and social care delivery	**H13** Risks to education and prison services			

More Action Needed
Further Investigation
Sustain Current Action, Watching Brief

Risks	England	N.Ireland	Scotland	Wales
Risks to Health and Wellbeing from High Temperature				
Opportunities for Health and Wellbeing from Warmer Summers and Winters				
Risks to People, Communities and Buildings from Flooding				
Risks to the Viability of Coastal Communities from Sea Level Rise				
Risks to Building Fabric				
Risks and Opportunities from Summer and Winter Household Energy Demand				
Risks to Health and Wellbeing from Changes in Air Quality				
Risks to Health from Vector-Borne Disease				
Risks to Food Safety and Security				
Risks to Water Quality and Household Water Supply				
Risks to Cultural Heritage				
Risks to Health and Social Care Delivery				
Risks to Education and Prison Services				

UK CLIMATE RISK

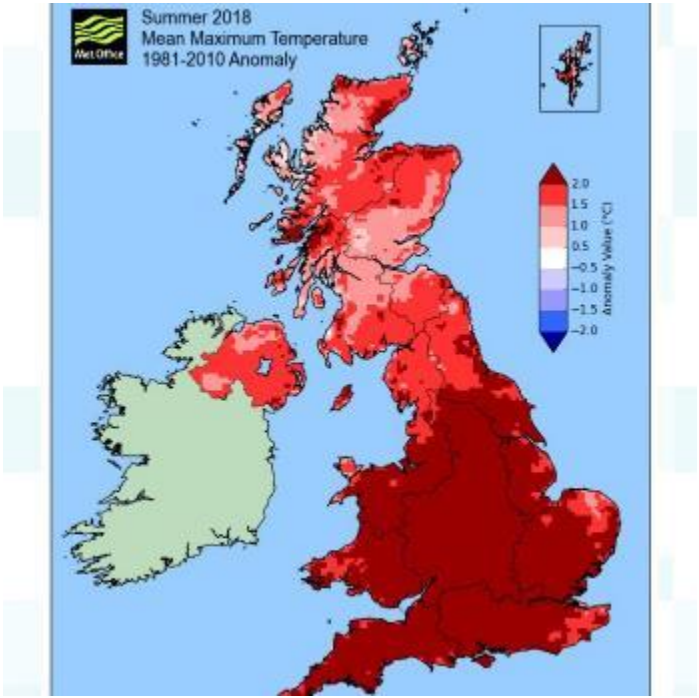
Key messages – Heat risks

Heat risks

- Risks to Health and Wellbeing from High Temperatures
- Opportunities for Health and Wellbeing from Warmer Summers and Winters
- Risks and Opportunities from Summer and Winter Household Energy Demand

- Risks to Health from Changes in Air Quality
- Risks to Health from Vector-Borne Disease
- Risks to Food Safety and Security

- Risks to Health and Social Care Delivery
- Risks to Education and Prison Services

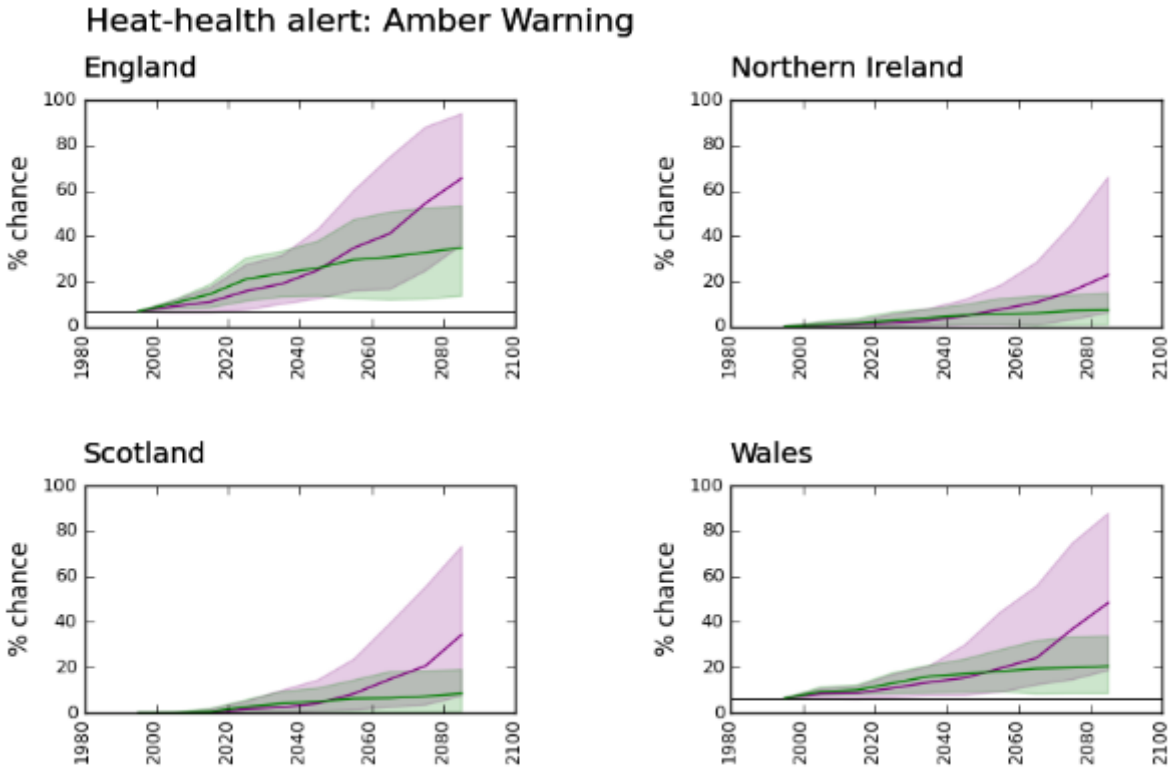


Increases in heatwaves and hot weather

Annual likelihood of at least one heatwave event

UKCP18 projections constrained to pathways to 2°C, and 4°C global warming at 2100

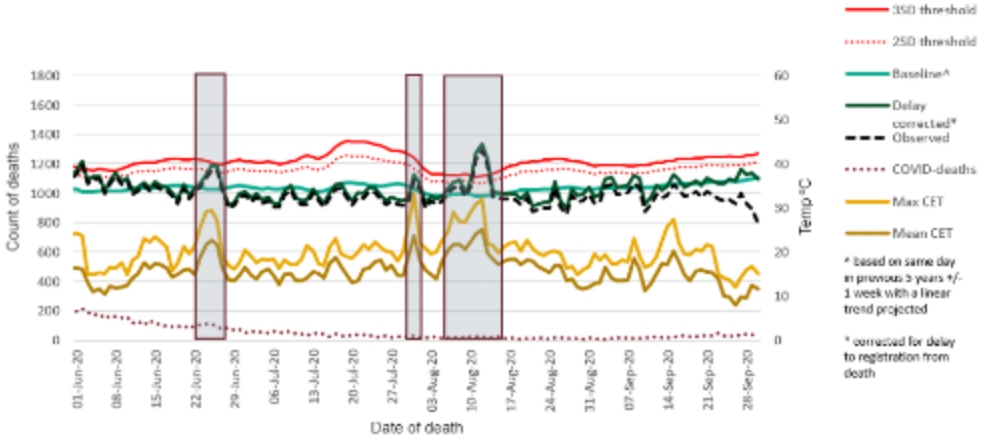
Source: Arnell et al. 2020.



Impacts of heat

- Temperature-related mortality, heatwave deaths
- Hospital admissions
  - Respiratory, renal, diabetes
- Occupational hazard, accidents
- Disruptions to public services
  - Overheating leading to closures, absences
  - Hospitals, care homes, schools and prisons
- Impacts on wellbeing
  - Learning and cognition
  - Sleep disruption, anxiety
- Maternal health
  - Risks to preterm birth
- *Reduced labour productivity (see chapter 6 - Business)*

2,556 deaths in 2020 heatwaves
[official estimate from PHE, excl C-19]



Adaptation shortfall

- Housing not well adapted
- 20-26% of English dwellings overheat in typical summer
- No **building standards** that address overheating
  - MHCLG and Welsh Government are consulting on overheating
  - Lack of public information on how to manage overheating in buildings
- Lack of incentives for retrofitting
- Heatwave plan for England
  - evidence of effectiveness for heatwave days
- Lack of consideration of overheating and heatwave planning in health and social care sector

More action needed

- Action on overheating
  - Building standards are needed for new dwellings
  - Incentives for retrofitting
  - Better building design
  - Ensure that energy efficiency measures/Net Zero does not increase risk of overheating
- Behaviour change
  - Evidence based strategies
- Cooling measures in urban planning
  - Nature based solutions
- Reduce overheating in hospitals and schools
- Ensure access to cooling for everyone (equity)

UK CLIMATE RISK

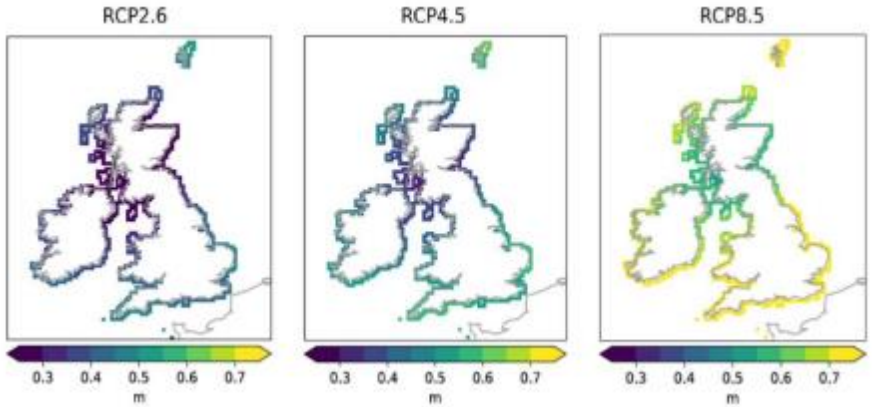
Key messages – Flooding and coastal change

Flooding and coastal change risks

- Risks to People, Communities and Building from Flooding
- Risks to the Viability of Coastal Communities from Sea Level Rise

- Risks to Building Fabric
- Risks to Cultural Heritage
- Risks to Health and Social Care Delivery
- Risks to Education and Prison Services

Projected UK Sea Level Rise

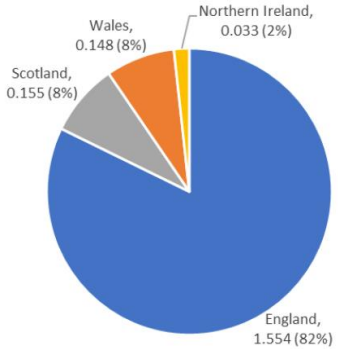


Spatial pattern of absolute change around the UK (including vertical land motion) at 2100, relative to 1981-2000, using the central estimate for each RSP. Palmer et al (2018).

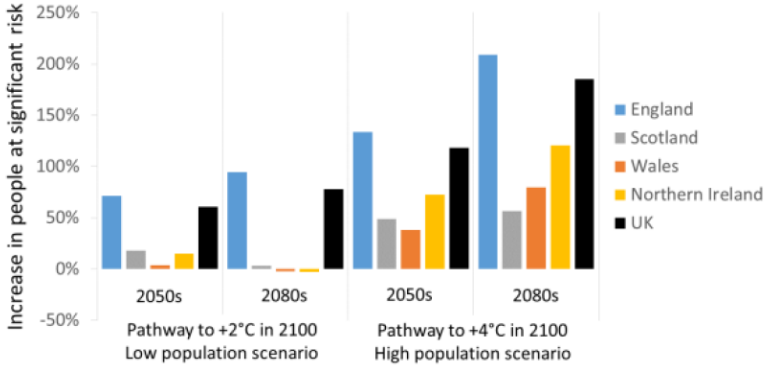
UK CLIMATE RISK

Current and future flood risk

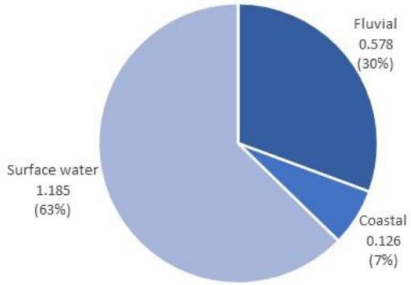
People count in bands - significant, present day (millions), by nation



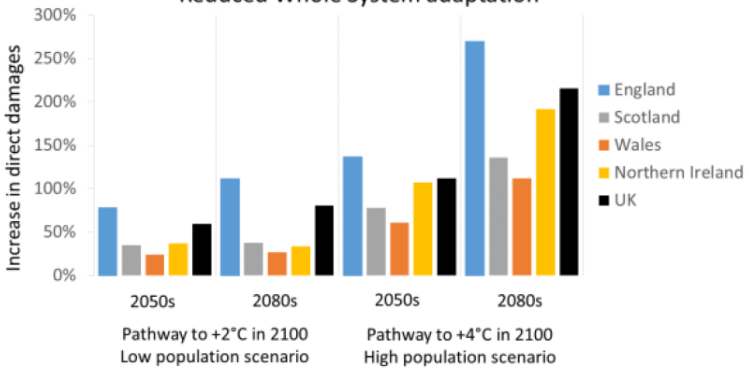
People at significant risk: all sources of flooding
Reduced Whole System adaptation



People count in bands - significant, present day (millions), by source



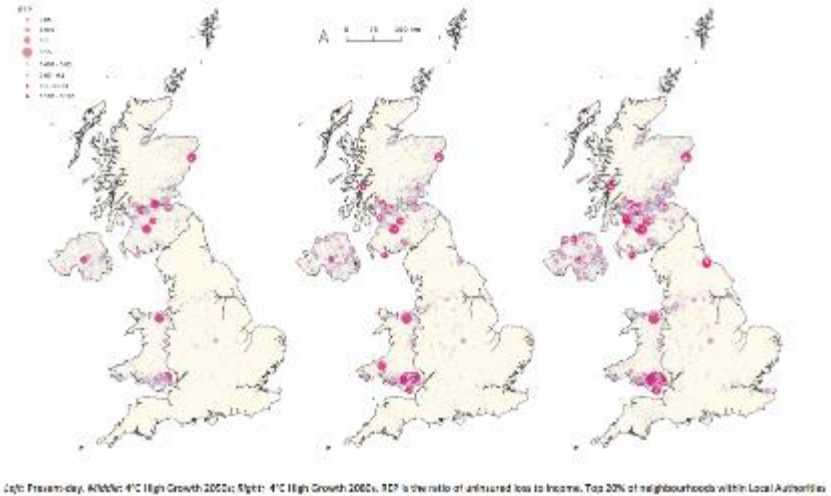
Residential property damage: all sources of flooding
Reduced Whole System adaptation



Impacts of flooding and coastal change

- Death, injury, illness, displacement, damage and disruption
- Long term mental health implications
- Disproportionate impact on disadvantaged and BAME communities
    - Severe coastal impacts
- Increased subsidence, damp/moisture and structural damage
- Loss of recreational and leisure amenity and cultural heritage
- Economic and environmental costs
- Loss of coastal communities
    - Eastern/Southern England, west Wales
- Disruption to health care, prisons and education

Current levels of adaptation – Relative Economic Pain, all sources of flooding



Source data: Sayers et al (2020) Third UK Climate Change Risk Assessment (CCRA3) Future flood risk

Adaptation shortfall

- Policy accounting for climate change evident except in NI
- Lock in from new development
- Shift from protection to resilience
- Limited mandatory SUDS
- Low uptake of Property Flood Resilience
- Inequalities
- Responsibility and accountability
- Maintenance budget sustainability
- Lack of coastal erosion monitoring
- Scale/location of potentially unviable communities not known
- Strategies for adaptive pathways but limited action

National mapping of coastal erosion

Short Term to 2038 (20 years)

Medium Term to 2068 (50 years)

Defra (2018) Adaptation to Coastal Change: Quick Scoping Review

More action needed

- Sharing good practice re shift from protection to resilience
- Increase investment in socially vulnerable areas
- Monitoring of development in high risk areas
- Introduce mandatory ‘green SUDS’ across the UK
- Act on recommendations to increase PFR uptake
- National conversation regarding ‘risk acceptability’ and coastal communities
- Legal framework and funding to support adaptation and roll back
- Clear, effective and timely engagement with stakeholders
- Monitoring coastal erosion and its impacts

UK Climate Risk – State of the Nation Webinar 1:
Climate risk and adaptation: People, health systems and the built environment

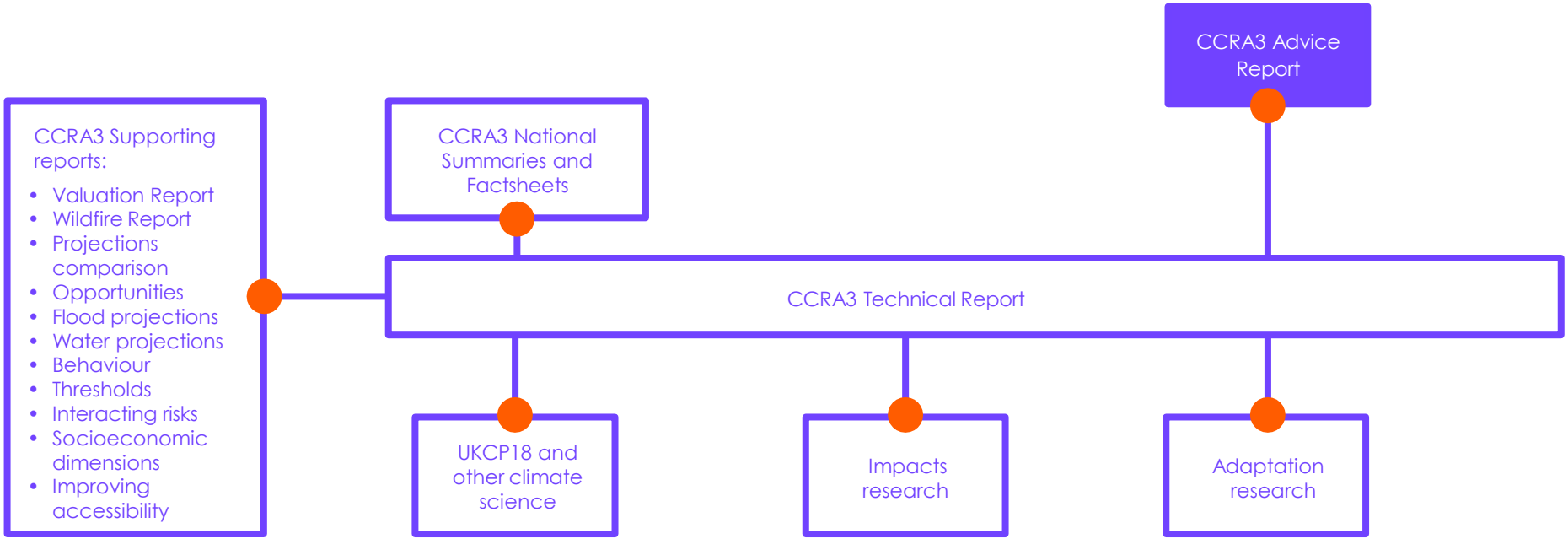
CCC's Independent Assessment

Gemma Holmes, Senior Analyst - adaptation

Climate Change Committee

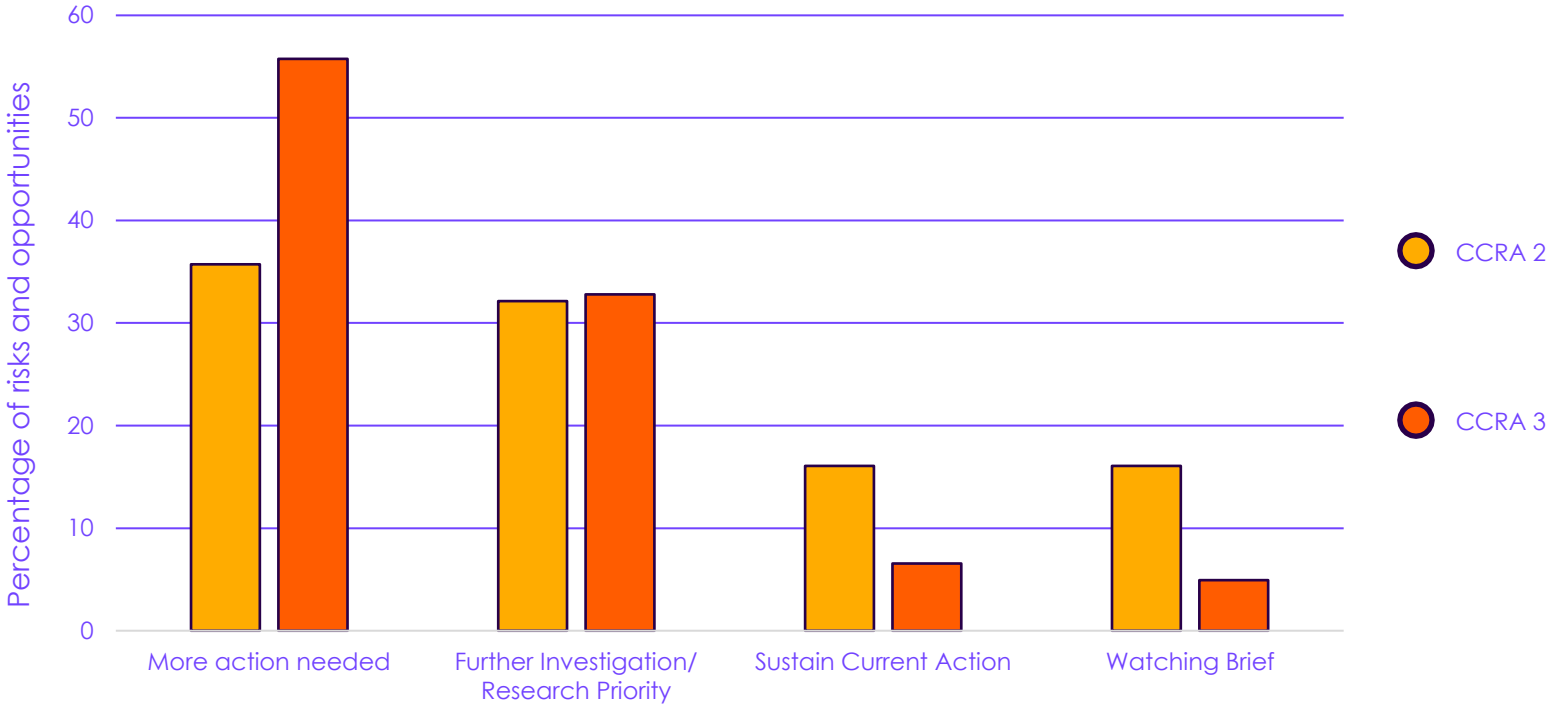
Independent Assessment of UK Climate Risk

A comprehensive assessment of climate risks and opportunities



Changes in urgency scores between CCRA2 and CCRA3

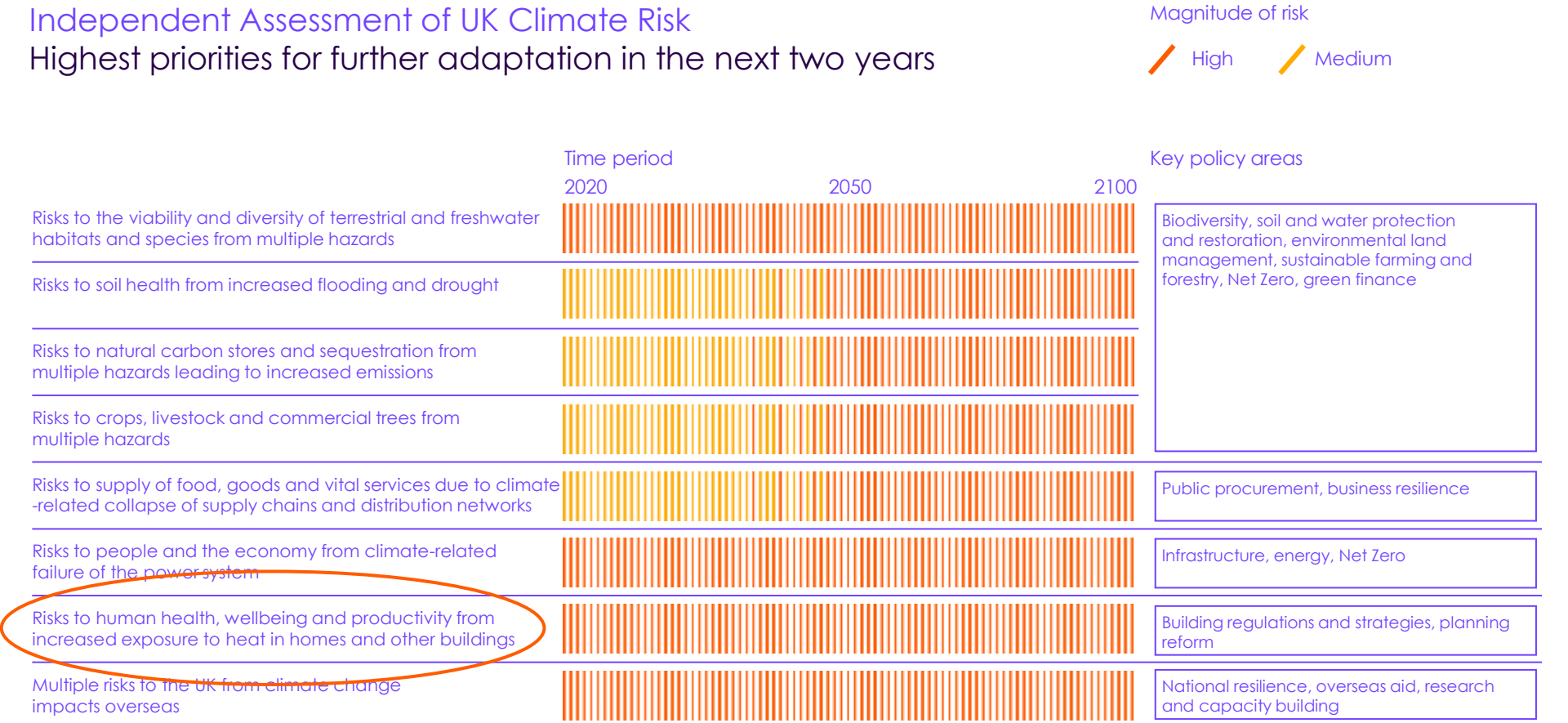
The level of urgency of adaptation has increased since CCRA2 was published in 2017



Source
CCC Analysis

Independent Assessment of UK Climate Risk

Highest priorities for further adaptation in the next two years



Risks to human health, wellbeing and productivity from increased exposure to heat in homes and other buildings

- More evidence about the risks of overheating in buildings and the effectiveness and limitations of strategies for space cooling.
- Building designs and technology exist that, if implemented at scale, could deliver buildings which have high levels of thermal efficiency while being moisture-safe and with excellent indoor air quality.
- Policies still remain largely absent to address the risks to health from heat.
- Opportunities exist to integrate adaptation into major forthcoming policies.

Risk of flooding and coastal change

Flooding and coastal change are not included in the Committee's top eight risks for action in the two years.

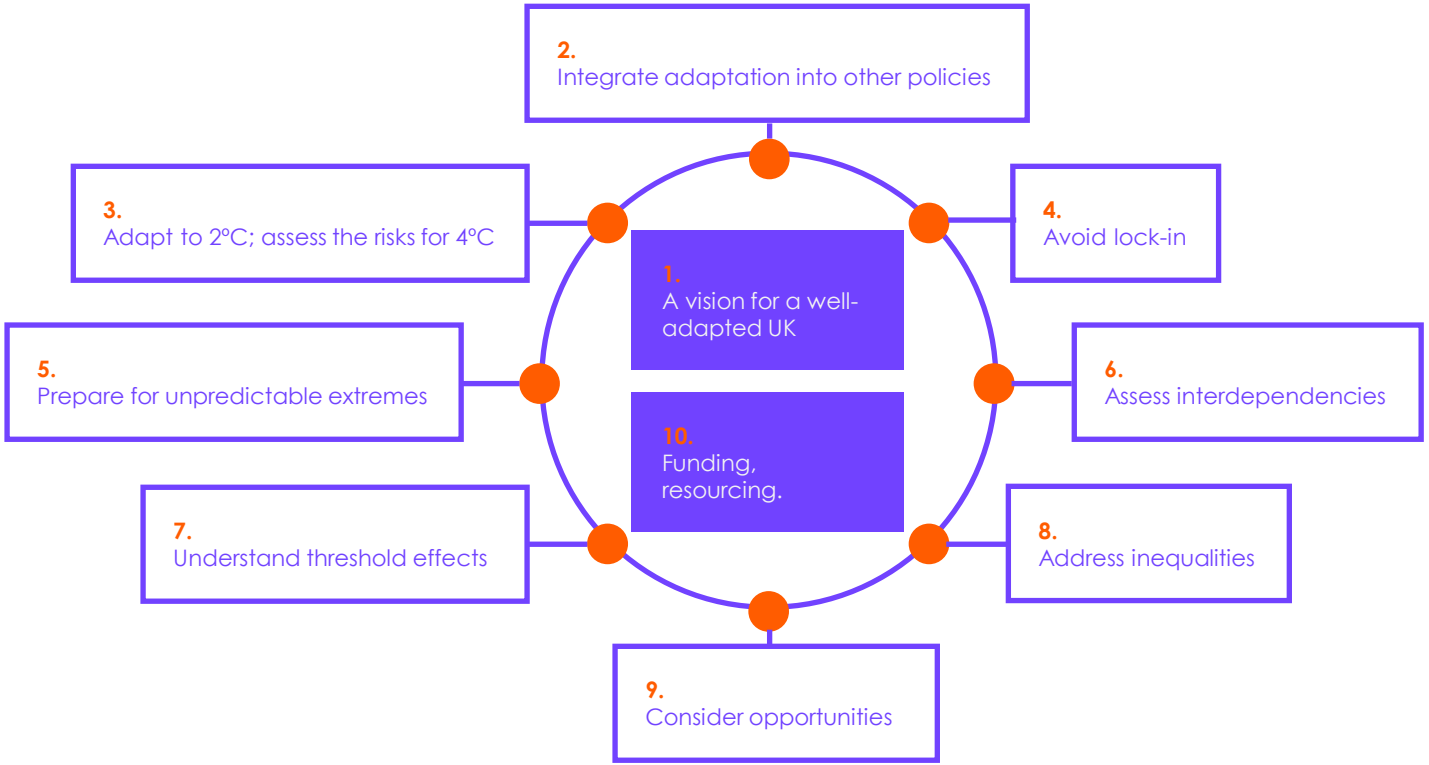
However, more action, over and above what is planned is still needed, particularly to:

- Manage surface water flooding
- Create a forward looking outlook on flood risk for new developments
- Increase property level resilience
- Create a national dataset of properties lost to coastal erosion and tracking of SMP implementation

Climate Change Committee

Independent Assessment of UK Climate Risk

Principles for effective adaptation policy



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