

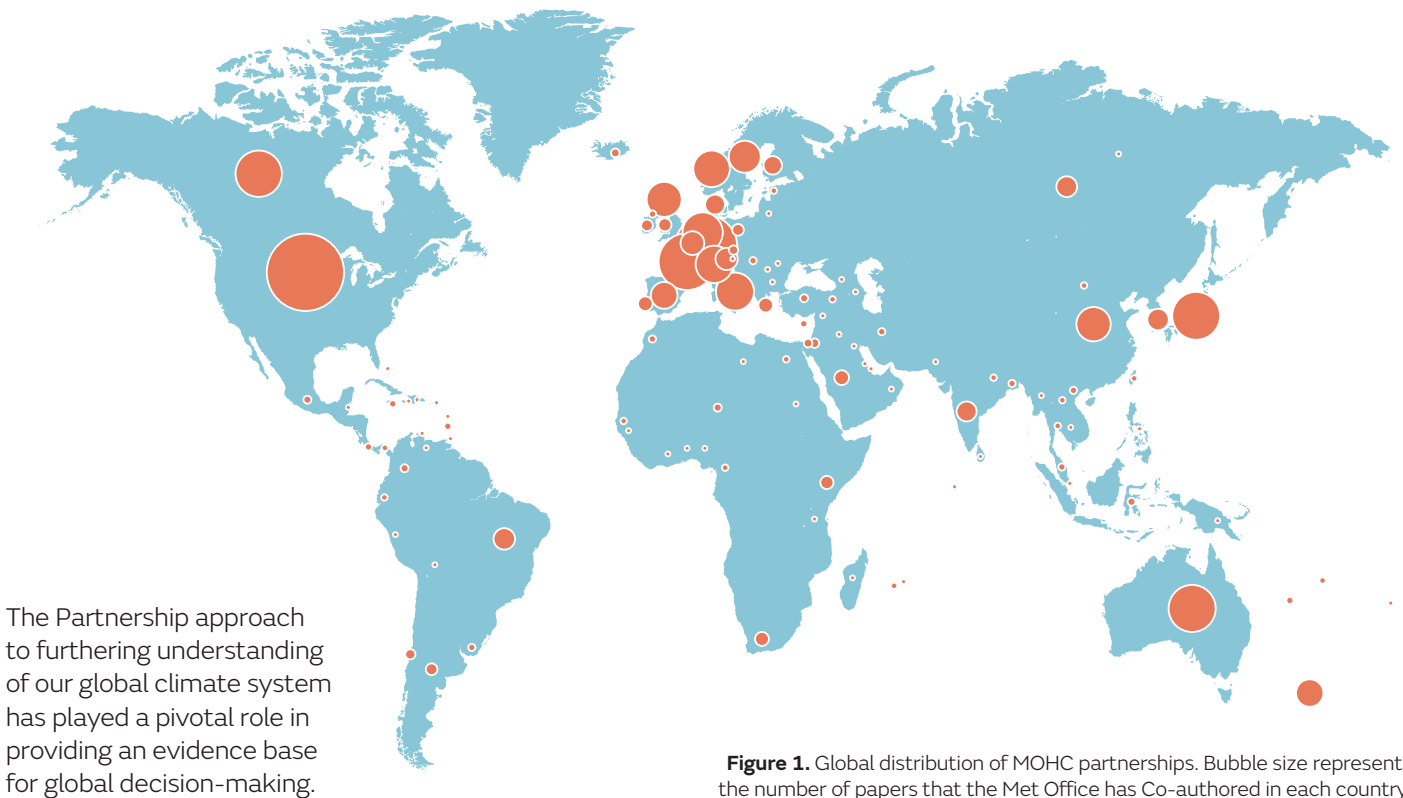
COP23: Met Office Hadley Centre

Our purpose

The Met Office Hadley Centre (MOHC) provides climate science and services to help people and organisations stay safe, well and prosperous. We do this by working with partners around the globe to carry out world leading research. This science is used for services which are developed together with end-users to find the most effective approach to managing climate risk.

Global partnerships

Since its foundation in 1990, the MOHC has been recognised as a **global partner** of choice for climate science and services. Through our years of pioneering research, our scientist have been working alongside international researchers from over **480 institutions** and **138 countries** outside of the UK.



World-leading research

The MOHC has been at the forefront of climate research by:

- contributing to all five of the Assessment Reports by the Intergovernmental Panel on Climate Change (IPCC) with **30 Lead or Coordinating Lead Authors, 115 Contributors and 147 Reviewers.**
- publishing more than **2,235** peer-reviewed articles in scientific literature since 1990, with **153** articles published in 2017.
- producing high impact publications that have been cited more than **163,513** times.

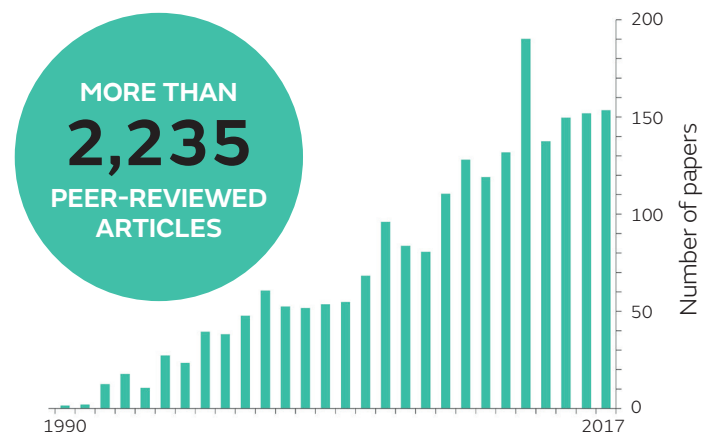


Figure 2. Peer-reviewed articles from 1990 - 2016

Cutting-edge science and services to inform decision-making

Met Office research is helping answer fundamental questions in climate science and apply that information through services which inform vital decisions on a range of timescales.

Met Office Hadley Centre Climate Programme

A major component of its science work is through the Met Office Hadley Centre Climate Programme. Supported by the UK Department of Business, Energy and Industrial Strategy (BEIS) and the Department for Environment, Food and Rural Affairs (Defra), it delivers world-leading scientific evidence on climate variability and change, benefitting the UK climate science base while serving the needs of UK Government.

The current 2018-2021 work plan has been designed around key questions that the UK Government has agreed the climate science community will need to answer over the next five years and beyond. The Met Office Hadley Centre will be one of the main contributors to answering these questions in collaboration with national and international partners.

Met Office Hadley Centre | Met Office Hadley Centre Climate Programme 2018-2021
World-class research to answer fundamental questions about current and future climate risk

- 1 What are the current weather and climate risks in the UK and globally?**
Heat extremes, Droughts, Storms, Extreme rainfall
- 2 What are the future risks we face from weather and climate under a range of possible scenarios?**
Lower emissions, Higher emissions
- 3 How can we avoid the most dangerous impacts of climate change?**
How much CO₂ can we emit and when do emissions need to reach net-zero?
What strategies to remove CO₂ from the atmosphere are viable?
What other emission cuts would limit warming?
Methane (CH₄), Nitrous Oxide (N₂O), Ozone (O₃)
- 4 What are the impacts and opportunities of limiting warming to different temperature targets?**
Graph shows the global temperature record since 1850
What are the co-benefits and trade-offs of mitigation and adaptation?
Air quality, Land available for crops, More resilient communities

Our science informs services to help the UK Government and policy decision-makers globally to prepare for and adapt to our changing climate.

- Risk assessment
- Mitigation advice
- Food security
- Environment
- City planning
- Energy
- Health
- International development

UK Climate Projections

The UK Climate Projections have been updated for 2018 to provide the most comprehensive picture yet of how the country's climate could change over the next century. It uses the latest scientific techniques to provide a range of tools which will help businesses and homes plan for the future. The projections are part of the Met Office Hadley Centre Climate Programme.

UKCP18 CLIMATE CHANGE OVER LAND

UKCP18 projects greater chance of hotter, drier summers and warmer, wetter winters
This is broadly consistent with UKCP09

Summer and winter changes by the 2070s

Summer rainfall change	Winter precipitation change	Summer temperature change	Winter temperature change
45% drier to 9% wetter	7% drier to 22% wetter	No change to 2.7°C warmer	-0.1°C cooler to 2.4°C warmer
17% drier to 2% wetter	2% drier to 22% wetter	1.2°C warmer to 3.8°C warmer	0.7°C warmer to 4.2°C warmer

For a location in central England

Summer rainfall change	Winter precipitation change	Summer temperature change	Winter temperature change
45% drier to 9% wetter	7% drier to 22% wetter	No change to 2.7°C warmer	-0.1°C cooler to 2.4°C warmer
17% drier to 2% wetter	2% drier to 22% wetter	1.2°C warmer to 3.8°C warmer	0.7°C warmer to 4.2°C warmer

For a location in central Scotland

Summer rainfall change	Winter precipitation change	Summer temperature change	Winter temperature change
45% drier to 9% wetter	7% drier to 22% wetter	No change to 2.7°C warmer	-0.1°C cooler to 2.4°C warmer
17% drier to 2% wetter	2% drier to 22% wetter	1.2°C warmer to 3.8°C warmer	0.7°C warmer to 4.2°C warmer

For a location in central Wales

Summer rainfall change	Winter precipitation change	Summer temperature change	Winter temperature change
45% drier to 9% wetter	7% drier to 22% wetter	No change to 2.7°C warmer	-0.1°C cooler to 2.4°C warmer
17% drier to 2% wetter	2% drier to 22% wetter	1.2°C warmer to 3.8°C warmer	0.7°C warmer to 4.2°C warmer

For a location in central Northern Ireland

Summer rainfall change	Winter precipitation change	Summer temperature change	Winter temperature change
45% drier to 9% wetter	7% drier to 22% wetter	No change to 2.7°C warmer	-0.1°C cooler to 2.4°C warmer
17% drier to 2% wetter	2% drier to 22% wetter	1.2°C warmer to 3.8°C warmer	0.7°C warmer to 4.2°C warmer

Greater chance of summers being hotter than 2018 in future

- In the recent past, the chance of seeing a summer as hot as 2018 was low (c.10%)
- By mid-century, hot summers could become common (c.50%)
- By the end of the century, if we continue with high greenhouse gas emissions, these hot summers will become even more likely

New advances in UKCP18

- State-of-the-art global climate models
- Innovative regional climate models
- Up-to-date observational data
- Significant user engagement

<http://ukclimateprojections.metoffice.gov.uk>
Working together on UK climate projections

UKCP18 MARINE CLIMATE CHANGE

How much will sea levels rise in the UK?
Projected sea level rise projections at four UK capital cities by 2100 relative to 1981-2000. The range for a low emission scenario (blue) and high emission scenario (red) are shown. (For reference, UK sea levels have risen by 16 cm since the start of the 20th century)

City	Low Emission Scenario (cm)	High Emission Scenario (cm)
Belfast	50cm	110cm
Edinburgh	50cm	110cm
Cardiff	50cm	110cm
London	70cm	130cm

Ice sheets
Sea levels could rise further if there is additional large-scale melting of ice sheets. Future melting of Antarctic ice sheets is particularly uncertain.

Sea level extremes
Risk of coastal flooding from storm surges and high tides will increase as sea levels rise

Sea levels beyond 2100
Sea levels will continue to rise beyond 2100, however the uncertainty also increases further into the future.

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Working together on UK climate projections