Met Office

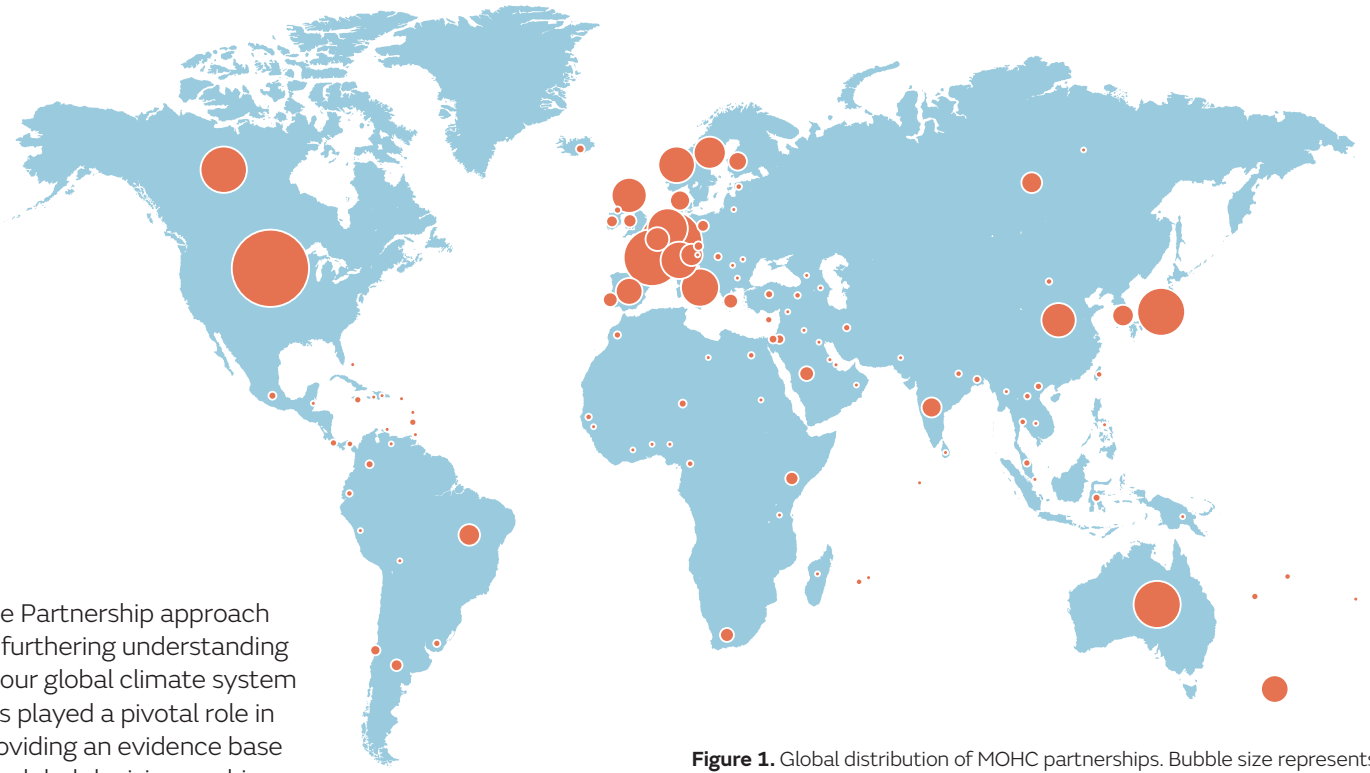
COP23: Met Office Hadley Centre

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 **113 countries** outside of the UK.



The Partnership approach to furthering understanding of our global climate system has played a pivotal role in providing an evidence base for global decision-making.

Figure 1. Global distribution of MOHC partnerships. Bubble size represents the number of papers that the Met Office has Co-authored in each country.

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 **1,900** peer-reviewed articles in scientific literature since 1990, with **152** articles published in 2016.
- producing high impact publications that have been cited more than **124,000** times.

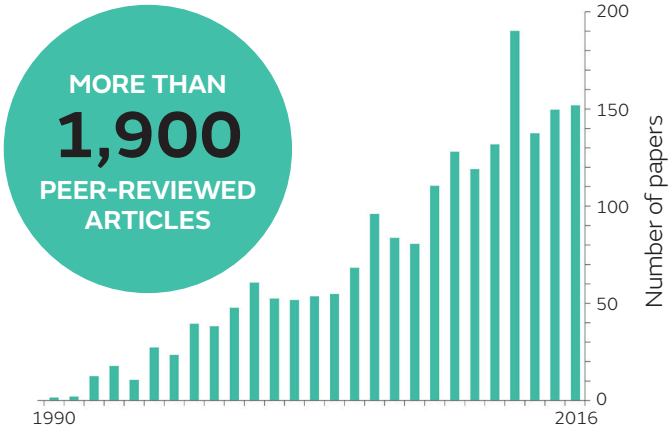
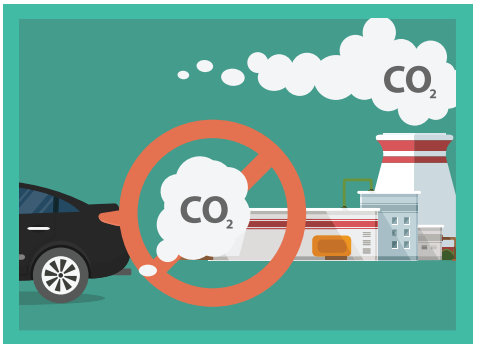


Figure 2. Peer-reviewed articles from 1990 - 2016

Prioritising our research around World Climate Research Programme priorities

Met Office research is helping to answer some of the fundamental questions in climate science. Below are just a few examples of our recent contributions.

1. Where do our carbon emissions go?



Earth system response to artificial carbon removal

A recent Met Office study using Earth system models suggests significant weakening, even potential reversal, of the ocean and land sinks under future low emission scenarios. Weakening of natural carbon sinks will hinder the effectiveness of negative emissions technologies and therefore increase their required deployment to achieve a given climate stabilisation target.

Increased climate change risk to permafrost

MOHC research suggests that climate change will thaw about 20% more permafrost than previously thought, potentially releasing significant amounts of greenhouse gases into the Earth's atmosphere four million square kilometres of frozen soil - an area larger than India - could be lost for every additional degree of global warming experienced.

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2. What risks from present and future weather?

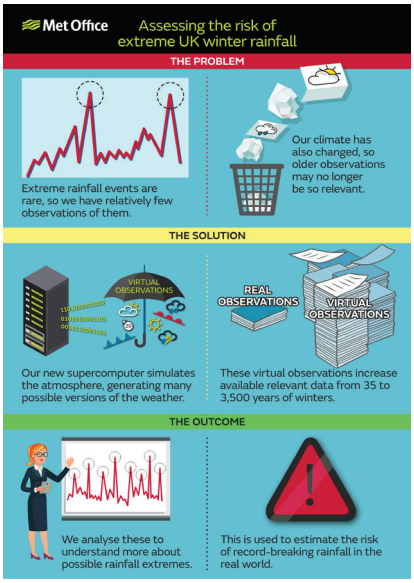
Assessing the risk of extreme UK winter rainfall

The new Met Office supercomputer enabled the Met Office decadal prediction system to be used to generate over 100 times more winters than available from historical observations – increasing the available observations from 35 to 3,500 years of winters.

Analysing these simulated events show there is a far higher risk of an unprecedented extreme month in at least one region of England and Wales in any given winter.

Reducing uncertainty in African rainfall projections

A convection-permitting regional climate simulation using the Met Office Unified Model has been run for the first time on an Africa-wide domain as part of the Future Climate for Africa project. Preliminary results show substantial improvements in average summer rainfall projections giving an indication of the benefits to be gained from running a convection-permitting simulation over the whole African continent.



Infographic explaining research looking at the risk of extreme UK winter rainfall in the current climate (Thompson et al, 2017)

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3. How does climate influence our health and prosperity?

Climate risk to global food security

Research under our Climate Science for Service Partnership (CSSP) China programme shows that the annual chance of severe maize production shocks occurring simultaneously across China and the United States is up to 6% per decade. Risk assessments based on recent observations may considerably under-estimate the true risk of shocks.

Early benefits of mitigation

Met Office research demonstrates the benefits of mitigation emerge more quickly than previously thought. It takes less than 20 years of emissions reductions in many regions for the likelihood of extreme seasonal warmth to reduce by more than half following initiation of mitigation. Aggressively reducing greenhouse gas emissions can halve risk of heat extremes within two decades in some regions.