

Weather & Climate Science for Service Partnership (WCSSP) Programme

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A Global Network Centred on a Shared Challenge

The Weather and Climate Science for Service Partnership Programme is developing **a global network of partnerships** that harness the **scientific expertise** needed to **strengthen our resilience to weather and climate variability**.



This network enables us to **accelerate our shared scientific understanding** and ability to apply this knowledge to develop **innovative services** that **manage the risks and opportunities** associated with the weather and climate change.



Weather and Climate Science for Service Partnership

Building the basis for services to support
climate and weather resilient economic development and social welfare through strong
strategic partnerships harnessing scientific expertise.
A global network of partnerships

Weather & Climate Science for Service Partnership Programme (WCSSP Programme)

CSSP China



WCSSP South Africa



CSSP Brazil



WCSSP SE Asia



WCSSP India



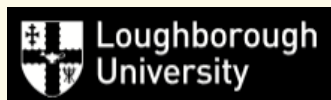
- **Scientific advances accelerated and shared** across the Programme.
- Realising the **value and impact of focused science** in weather and climate services that protect lives and livelihoods, prosperity and well-being.



Met Office Partnership model in the UK



Imperial College
London



Using common structure... Science to Service

Climate services
that support climate-resilient economic
development and social welfare

5. Climate services



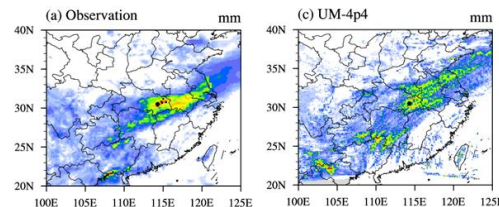
Underpinning Science

1. Monitoring, attribution and reanalysis

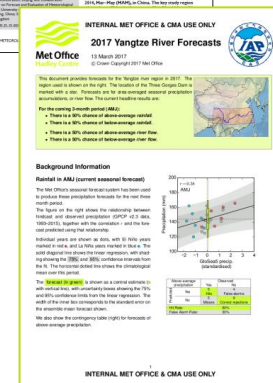
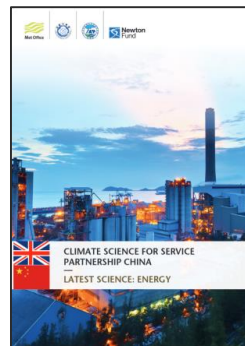
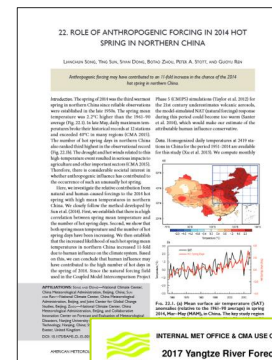
2. Global dynamics of climate variability and change

3. East Asian climate variability and extremes

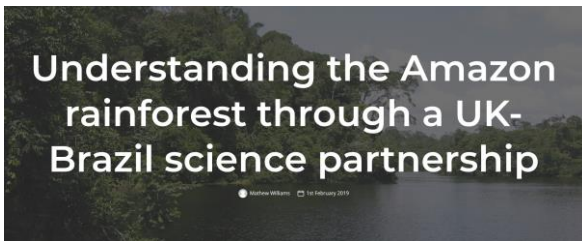
4. Development of models and climate projection systems



High resolution modelling of the rainfall
event leading to severe flooding in
Wuhan in July 2016



Understanding the Amazon rainforest through a UK-Brazil science partnership



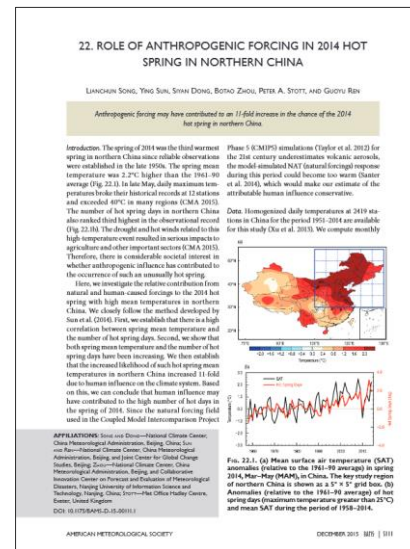
Joint workshops for early-career scientists



Annual Science Workshops



Scientist exchange programmes



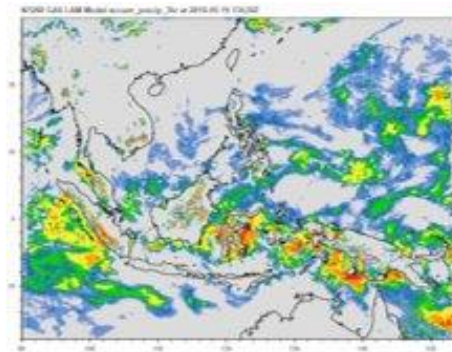
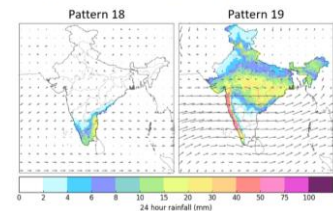
Joint peer-reviewed publications



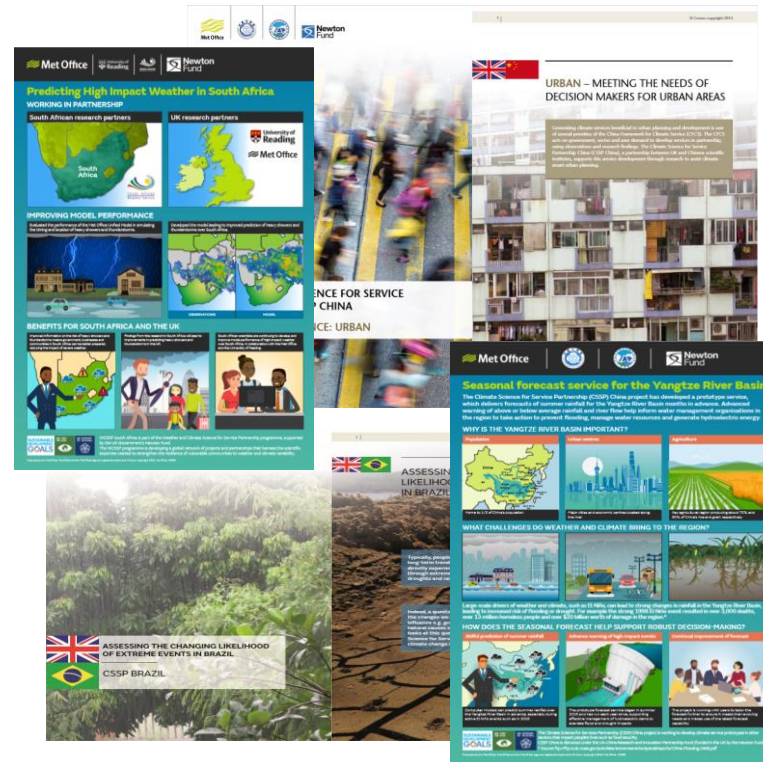
- Over **250 papers published**
- Over **1000 paper citations in literature**
- Over **100 visiting scientist exchanges and workshops**
- **Improved modelling techniques** to accurately capture high impact weather
- Prototype **weather and climate services** e.g. in Yangtze River Basin

Large-scale weather regimes over India follow a relatively predictable evolution throughout the course of the year, driven predominantly by the onset and retreat of the Asian summer monsoon. This new research investigates circulation variability within each of these large-scale weather regimes, with the aim of identifying the sub-weekly weather patterns responsible for the within-regime rainfall variability.

A set of 30 weather patterns were generated in total, by clustering daily wind fields over a 38 year period from reanalysis data. The resulting weather patterns exhibit strong seasonality, with each weather pattern typically occurring for between 3 and 6 months of the year, with near zero occurrences for the other 6 to 9 months. Some weather patterns also have breaks in their months of occurrence, whereby they occur during monsoon onset and withdrawal but not during summer or winter.

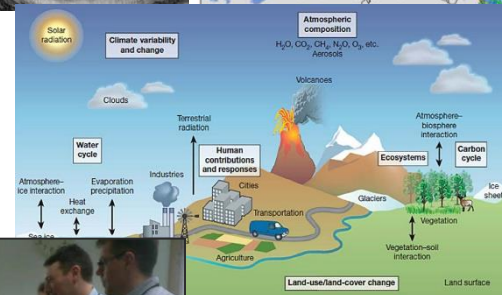
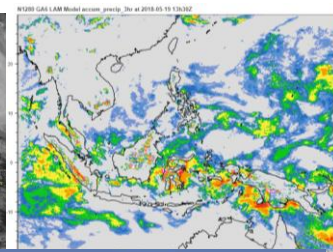
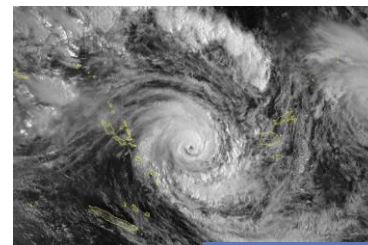


- Hazards of Great El Nino events
- The **UNSEEN** (Unprecedented Simulated Extremes with Ensemble) method.
- High Resolution Modelling
- Madden-Julian Oscillation
- Impact-Based Forecasting (IBF)
- Climate attribution



High Resolution Modelling

- WCSSP Southeast Asia focuses on tropical cyclones, maritime continent and precipitation forecasting.
- WCSSP India focuses on extreme precipitation, winds and coastal inundation in a coupled atmosphere-ocean-land model.
- Potential for large domain high resolution models covering Indian Ocean and Southeast Asia.
- WCSSP South Africa pulls science through to operations and runs high resolution models.
- Complementary projects, ensuring no duplication of effort.





Greater coordination and collaboration in pioneering research



Cutting edge science for innovative services



More Regional/ Multilateral projects



Cross-cutting projects to realise the benefits of the network



Shared learning, for example gender diversity

*“Science workforce diversity refers to cultivating talent, and promoting the full inclusion of excellence across the social spectrum. **Diversity leads to better problem-solving, expands the talent pool and is important for long-term economic growth.**”* - Gibbs, K. *Diversity in STEM: What It Is and Why It Matters*, 2014

Increasing the diversity of the workforce increases the **diversity of ideas and perspectives**.

What can we do?

1. A 'Diversity Ambassador' who can consider 'Women in STEM' representation.
2. Learn from partners who are close to achieving gender equality.

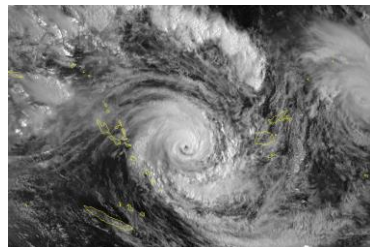
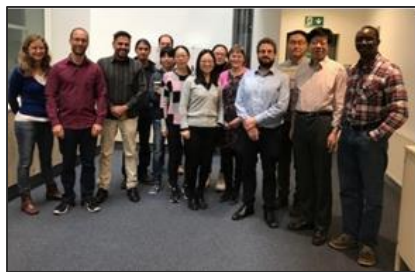
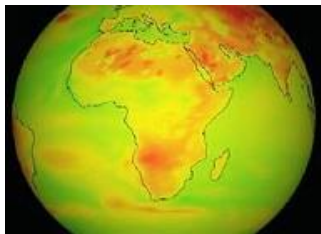


Science, Technology, Engineering and Mathematics

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Newton
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Thank you

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