

## Workshop Chair's Guidance Note

### **Conference format and how the Workshops fit in with this**

This year the Conference is trying a new format to its programme – you can find details of the full programme on the Conference website at '<http://www.rmets.org/events/conference/conference-2009.php>'. The conference is broken down into three main Themes:

Theme	Co-chairs
The Water Cycle	Professor Keith Shine, University of Reading Dr Alison Stirling, Met Office
Predicting Hazards and Risk	Dr Brian Golding, Met Office
Ecosystems, atmospheric composition, weather and climate	Professor Colin Prentice, University of Bristol Professor Hugh Coe, University of Manchester

In each of these Themes there will be a Poster Session on the day before the scheduled Workshop, then up to four invited talks in the following day, and after lunch the Workshop sessions. The Posters and the Workshop sessions will be the main way in which participants will be able to present and discuss their work. There will not be any non-invited oral presentation sessions at the conference.

In each Theme we have 4 Workshops selected by the programme committee. This means that the Workshops within a Theme will run in parallel with each other. The full list of conference Workshops are attached for information below.

### **Format of the Workshop Sessions**

There are no prescriptive guidelines for the Workshop sessions, they are a free format and open to each of the Workshop Chairs as to how they would like to run their particular Workshop.

What we do ask of the Workshop Chairs is to decide on how they would like to run the session and set a target outcome, so that the two-hour slot produces some form of outputs. As a minimum we would like all Workshop Chairs to write up a 1-page summary of the session, which we will publish in *Weather* and on our Conference Website.

We are also happy to publish any additional workshop material on the website. Where this involves things such as presentation material provided by participants we ask that the Chairs obtain permission from those providing the material to make this public. Any advanced material to promote the Workshop can be sent in to the Society (to [sue.brown@rmets.org](mailto:sue.brown@rmets.org)) **from now until Friday 22 May**. All the subsequent material from the workshop that you would like to put on the Society website, including the write-up, should reach the Society by **Friday 4 September**.

### **Technical support**

Included in this pack is a form that all Workshop Chairs are asked to complete, giving their requirements for technical support and room layout. We will do our best to accommodate any requirements that you have. Please return the Workshop Facilities Booking Form by close of play on **Wednesday 25 March**.

Each workshop room will have the usual AV facilities available for presenting PowerPoint or PDF presentations, but you will need to request a laptop if required.

A technician will be available in the Workshop rooms 15-20 minutes before the start of each session to check the system is working OK and to pre-load any presentational material, or to help in connecting your own laptop facilities. This technician will be available for the whole course of the workshop if required.

### ***Allocation of rooms and signage***

There is currently a selection of five rooms available for the workshop sessions which are all located in the Palmer Building. These include the two main lecture theatres and three of the upstairs classrooms, which can be used in different combinations.

When we confirm registration we will be asking delegates to give a preference for which Workshop they would like to attend. This will help us to allocate rooms to each Workshop ahead of the event. Details of which room has been allocated to which Workshop will be sent to all Workshop Chairs the week before the conference. The Workshops and locations will be well signed to conference delegates during the event.

### ***Reminder List for Workshop Chairs:***

- Workshop Chairs can provide any information they would like to the Society to put on the Conference Website – **from now until Friday 22 May.**
- Completed Workshop Facilities Booking Form to be returned to the Society by the **Wednesday 25 March.**
- All chairs need to complete a registration form, which is attached to this information pack, and return to the Society by **Friday 24 April.**
- Obtain permission from workshop participants to use any material for publication on the Society website, and complete a 1-page summary of the Workshop session by **Friday 4 September.**

## RMetS Conference 2009 Workshops

Workshop ID	Workshop Title	Chairs	Symposium	Contact Email
75	<u>Spectroscopy and radiative effects of water vapour and its continuum</u>	Shine	The Water Cycle	<a href="mailto:k.p.shine@reading.ac.uk">k.p.shine@reading.ac.uk</a>
79+81	<u>Tropical climate and rainfall variability</u>	Guilyardi & Williams	The Water Cycle	<a href="mailto:c.j.r.williams@reading.ac.uk">c.j.r.williams@reading.ac.uk</a> & <a href="mailto:E.D.A.Guilyardi@reading.ac.uk">E.D.A.Guilyardi@reading.ac.uk</a>
87	<u>Land-atmosphere coupling strength and the hydrological cycle</u>	Verhoef	The Water Cycle	<a href="mailto:p.l.vidale@reading.ac.uk">p.l.vidale@reading.ac.uk</a>
88	<u>Small-scale precipitation processes in a warming climate</u>	Kirshbaum	The Water Cycle	<a href="mailto:d.kirshbaum@reading.ac.uk">d.kirshbaum@reading.ac.uk</a>
80	<u>Observations needed for high resolution NWP models.</u>	Illingworth	Predicting Hazards and Risk	<a href="mailto:a.j.illingworth@reading.ac.uk">a.j.illingworth@reading.ac.uk</a>
82	<u>Data assimilation for hydro-meteorological hazard forecasting</u>	Dance	Predicting Hazards and Risk	<a href="mailto:s.l.dance@reading.ac.uk">s.l.dance@reading.ac.uk</a>
86	<u>climate modelling and risk assessment in the insurance industry</u>	Strachan	Predicting Hazards and Risk	<a href="mailto:j.strachan@reading.ac.uk">j.strachan@reading.ac.uk</a>
90	<u>From local weather forecasts to dangerous climate change</u>	Forsyth	Predicting Hazards and Risk	<a href="mailto:iain.forsyth@metoffice.gov.uk">iain.forsyth@metoffice.gov.uk</a>
71	<u>Stratospheric influence on tropospheric climate</u>	Haigh	Ecosystems, atmospheric composition, weather and climate	<a href="mailto:j.haigh@imperial.ac.uk">j.haigh@imperial.ac.uk</a>
72	<u>Convection**</u>	Vaughan	Ecosystems, atmospheric composition, weather and climate	<a href="mailto:jmarsham@env.leeds.ac.uk">jmarsham@env.leeds.ac.uk</a>
76	<u>The Decadal Predictability and Variability of Climate and its Impacts**</u>	Hawkins	Ecosystems, atmospheric composition, weather and climate	<a href="mailto:L.C.Shaffrey@reading.ac.uk">L.C.Shaffrey@reading.ac.uk</a>
85	<u>The impact of aerosol on weather and climate</u>	Highwood	Ecosystems, atmospheric composition, weather and climate	<a href="mailto:e.j.highwood@reading.ac.uk">e.j.highwood@reading.ac.uk</a>

# A full list of Workshop Abstracts in numerical order

## 71 - Stratospheric influence on tropospheric climate

Contact: [j.haigh@imperial.ac.uk](mailto:j.haigh@imperial.ac.uk)

Presentation  
Type: workshop

Created: 10th October, 2008

Status: **accepted**

Symposium: Ecosystems, atmospheric  
composition, weather and climate

Author: Joanna Haigh  
Andrew Charlton-Perez

Keywords:

**Workshop:** There is an increasing body of evidence which shows that changes in the thermal structure of the stratosphere may be followed by, or associated with, changes in the troposphere. Other studies have suggested that GCMs without a complete representation of the stratosphere may produce poorer forecasts of tropospheric climate change. The mechanisms determining these relationships, however, are far from certain. For this workshop we invite contributions on all aspects of stratosphere-troposphere coupling including: • Stratospheric variability and climate change. • The impact on GCM climate of the representation of the stratosphere. • Processes of stratosphere-troposphere dynamical coupling. • Stratospheric data assimilation and NWP. • The polar stratosphere, annular modes and seasonal weather prediction. • The impacts of stratospheric ozone depletion and recovery on Southern Hemisphere climate.

## 72 - Convection

Contact: [jmarsham@env.leeds.ac.uk](mailto:jmarsham@env.leeds.ac.uk)

Presentation  
Type: workshop

Created: 20th October, 2008

Status: **accepted**

**Symposium:** Ecosystems, atmospheric composition, weather and climate

**Author:** Geraint Vaughan

**Keywords:** convection, initiation, aerosol

**Workshop:** This workshop will consider new results on convective initiation and convective processes, with an emphasis on recent field campaigns. It could fit into any of the three themes. John Marsham has agreed to coordinate it.

# 75 - Spectroscopy and radiative effects of water vapour and its continuum

Contact: [k.p.shine@reading.ac.uk](mailto:k.p.shine@reading.ac.uk)

Presentation Type: workshop

Created: 21st October, 2008

Status: **accepted**

**Symposium:** The Water Cycle

**Author:** Keith Shine

**Keywords:** water vapour, radiative processes, spectroscopy, continuum absorption

**Workshop:** This workshop will highlight the role of water vapour in radiative process in the atmosphere. It will cover continuing advances in our understanding of the spectroscopy of water vapour, at all wavelengths, the sensitivity of the Earth's radiation budget, climate feedbacks and remote sounding techniques to improvements in this understanding, and the impact of actual or possible future changes in water vapour on the radiative balance. One focus will be on the characteristics and causes of the water vapour continuum. There has been renewed interest in the water vapour continuum as a consequence of improved laboratory measurements and advances in theoretical techniques, including those as part of the ongoing NERC/EPSC consortium .CAVIAR. (Continuum Absorption of Visible and Infrared Radiation and its Atmospheric Relevance). In particular, the possibility that at least some part of the water vapour continuum may be due to water dimers, has attracted attention. Another focus will be the role of water vapour in understanding changes and variability of the radiation balance, including possible past or future changes in water vapour driven by human activity. Contributions to this workshop could include theoretical .ab initio. calculations of the absorption spectrum of water vapour and its continuum, high spectral resolution laboratory and field campaign measurements, calculations of the role of water vapour in the radiation budget and in climate feedbacks, and the role of water vapour in remote sensing techniques, whether it be the target gas or an interfering species.

# 76 - The Decadal Predictability and Variability of Climate and its Impacts

Contact: [L.C.Shaffrey@reading.ac.uk](mailto:L.C.Shaffrey@reading.ac.uk)

Presentation Type: workshop

Created: 22nd October, 2008

Status: **accepted**

**Symposium:** Ecosystems, atmospheric composition, weather and climate

**Author:** Ed Hawkins  
Len Shaffrey  
Rowan Sutton

**Keywords:** Decadal Predictability, Climate Variability, Climate Impacts

**Workshop:** Understanding how climate will change over the next few decades, particularly regional climate and high impact weather, is central to informing strategies for societal adaptation to climate change. A recent development in understanding near-term climate change is the emerging science of decadal prediction, where coupled climate models are initialised with information about the state of the ocean. The hope of decadal prediction is that the use of present day ocean information will constrain decadal predictions of future climate change. It is clear, however, that in order to further develop models capable of making skilful decadal predictions, we need to more fully understand the key processes that determine how climate varies on decadal timescales. This workshop will focus on emerging science of decadal prediction and the scientific understanding of decadal climate variability that underpins it. There will also be a focus on how we can best use models to make projections of changes in regional climate and high impact weather, and to use those projections to assess the societal and economic impacts of climate change.

# 79+81 - Tropical climate and rainfall variability

Contact: [c.j.r.williams@rdg.ac.uk](mailto:c.j.r.williams@rdg.ac.uk)  
[e.d.a.guilyardi@reading.ac.uk](mailto:e.d.a.guilyardi@reading.ac.uk)  
[a.g.turner@rdg.ac.uk](mailto:a.g.turner@rdg.ac.uk)

Presentation Type: workshop

Created: 24th October, 2008

Status: **accepted**

**Symposium:** Ecosystems, atmospheric composition, weather and climate

**Author:** Dr Charlie Williams (NCAS-Climate, University of Reading)  
Dr Andy Turner (NCAS-Climate, University of Reading)  
Dr Eric Guilyardi (IPSL/LOCEAN, Paris & NCAS-Climate, University of Reading)

**Keywords:** Climate variability, tropical precipitation, MJO, ENSO

**Workshop:** Understanding climate variability in the tropics, which form arguably the most important part of the global hydrological system, is of key benefit to many of the world's developing nations.

This workshop will focus on tropical precipitation variability at various space and time scales, ranging from African Easterly Waves, the Madden-Julian Oscillation to the monsoon systems and El Nino-Southern Oscillation and their interactions, and beyond to decadal variations. Due to the global influence of the tropics, discussion may also include tropical-extratropical interactions. The physical mechanisms underlying such interactions and the phenomena themselves will be the key focus of discussion. In particular, contributions are invited on ocean-atmosphere and land-atmosphere interactions, and the atmospheric processes such as cloud feedbacks necessary for successful simulation or prediction of ENSO.

The session aims to understand tropical climate variability using both global and regional climate models, however contributions based on observations and including satellite-derived rainfall estimates are also invited. It is framed on the understanding of tropical climate variability using numerical modelling techniques to understand the observed system however, contributions based on the historical record are also invited.

# 80 - Observations needed for high resolution NWP models

Contact: [a.j.illingworth@reading.ac.uk](mailto:a.j.illingworth@reading.ac.uk)

Presentation Type: workshop

Created: 23rd October, 2008

Status: **accepted**

**Symposium:** Predicting Hazards and Risk

**Author:** Anthony Illingworth

**Keywords:** forecast, models, observations, high resolution,

**Workshop:** The new generation of 1km high resolution NWP models promises to revolutionise the accuracy of short term weather forecasts of hazardous weather. Doubtless some of the improved performance of these models arises from a better representation of orography and the land-sea boundary, but they would benefit from better atmospheric observations which need to be at high resolution in both time and space. At present it is not clear what observations would have most impact and what are the required accuracy and resolution. Obvious variables would be temperature, wind, humidity, rainfall and aerosol properties in the lowest few km of the atmosphere. These variables are generally difficult to infer from space because of intervening cloud when there is severe weather. If such observations are to be useful to the NWP model then it is essential that they are accompanied by an error covariance. This workshop would explore the possible new sources of observations. Examples of candidates would be the 15 minute data available from Meteosat second generation, the high resolution data from the operational radars, and networks of low cost ground based observing stations. Using miniaturised sensors and mobile phone technology such stations could be deployed quite cheaply. GPS receivers using tomography have the potential to infer the humidity structure in the lowest few km; maybe the same information is available from the 'wet delay' introduced into digital radio broadcast signals. New developments in radar suggest that changes in surface level humidity within 30km of the radars can be inferred. Would low cost networks of wind profilers be a sensible option? Turning to aerosols and other pollutants what chemical species need to be measured and with what resolution? What is the scope for remote sensing of aerosols using the new generation of low cost lidars?

# 82 - Data assimilation for hydro-meteorological hazard forecasting

Contact: [s.l.dance@reading.ac.uk](mailto:s.l.dance@reading.ac.uk)

Presentation Type: workshop

Created: 24th October, 2008

Status: **accepted**

**Symposium:** Predicting Hazards and Risk

**Author:** Sarah Dance  
Sue Ballard  
Dan Cornford  
Nancy Nichols

**Keywords:** hydro-meteorological hazards, data assimilation, ensemble methods, stochastic modelling; model error, new observation types

**Workshop:** Storms, floods and droughts have a major impact on everyday life around the world. There are complex feedbacks between the hydro-meteorological processes that govern such hazardous events. For example, quantitative precipitation forecasts represent a significant source of uncertainty to hydraulic flood and drought models. Land-surface processes provide important forcing for atmospheric moist processes. Nevertheless, models of these phenomena are becoming increasingly sophisticated. For example, operational weather centres are currently developing storm-scale numerical weather prediction (NWP) models that allow better hazardous weather forecasts through explicit, rather than parameterized convection, and high resolution orography. To capitalize on these improvements in modelling, it is vital to provide accurate initial conditions on appropriate scales via data assimilation. Traditional synoptic observations do not provide enough detail for this purpose, and it is important to use these in synergy with new types of remote sensing data. This presents major challenges. Furthermore, for storm-scale NWP or hydraulic modelling, the basic character of the dynamical system is rather different from synoptic scale weather forecasting, and many of the assumptions used in synoptic scale assimilation algorithms are violated. There is a need to develop new methods that take better account of multi-scale effects, nonlinearity and uncertainty, including model errors such as biases. The aim of the workshop is to survey recent new developments in data assimilation for hydro-meteorological hazard forecasting, ranging from near operational applied developments in the use of observations, microphysics and ensemble treatments of uncertainty, to blue skies research using mathematical ideas about dynamical systems, stochastic processes and multi-scaling. The workshop will also promote discussion on the most promising new directions.

# 85 - The impact of aerosol on weather and climate

Contact: [e.j.highwood@reading.ac.uk](mailto:e.j.highwood@reading.ac.uk)

Presentation Type: workshop

Created: 24th October, 2008

Status: accepted

**Symposium:** Ecosystems, atmospheric composition, weather and climate

**Author:** Eleanor Highwood

**Keywords:** aerosol, climate, weather, models, observations

**Workshop:** It is becoming increasingly apparent that atmospheric aerosol plays several important roles in the climate system. The direct effect of aerosol on solar radiation and the indirect effect on cloud microphysics are perhaps the most well known effects, but recent observational and modelling studies suggest that aerosol can have more subtle effects on the temperature structure of the atmosphere thereby leading to "semi-direct" effects on convection, cloud formation and dynamics. Ecosystems are both sources of, and affected by aerosol. Aerosols are extremely important for regional climate simulations. IPCC 2007 suggests that aerosols still remain one of the largest uncertainties in predictions of future climate. Additionally many proposed geo-engineering solutions involve aerosols. This area increasingly sits at the interface of traditional boundaries e.g. composition, weather and climate. This is a rapidly developing and expanding field. Improvements in computing capacity allow more sophisticated treatments of aerosol processes, and/or additional aerosol types to be simulated interactively in a range of models including large eddy simulations, numerical weather prediction and global and regional climate models. Observations with which to validate these models are also becoming more sophisticated, particularly in terms of the use of satellite data. It is therefore timely to review this rapidly developing and expanding field and to establish whether lessons learned from one type of model or study can be utilised by others to maximise rapid increases. The aims of the workshop are as follows: To update the aerosol modelling community on results from observational campaigns; To update the aerosol observational community on capabilities and sensitivities of models including aerosol; To compare experience of aerosol impacts in different types of models; To establish areas where knowledge/experience remains lacking and to facilitate collaborative work to address these problems.

# 86 - climate modelling and risk assessment in the insurance industry

Contact: [j.strachan@reading.ac.uk](mailto:j.strachan@reading.ac.uk)

Presentation Type: workshop

Created: 24th October, 2008

Status: **accepted**

**Symposium:** Predicting Hazards and Risk

**Author:** Jane Strachan  
Pier-Luigi Vidale  
Renato Vitolo  
Matthew Foote  
Kirsten MitchellWallace

**Keywords:** GCM, high-resolution, risk assessment, insurance industry

**Workshop:** Extreme weather events, when affecting areas where insured assets are exposed, can cause large losses. Hurricane Katrina resulted in insured losses of \$41.1bn. Risk assessment, in the form of catastrophe modelling, is used by the insurance industry to estimate potential loss from catastrophic events. Catastrophe models are stochastic models, which use synthetic event-sets, based on historical event data, to estimate the probability of incidence, impact and location of destructive weather events, such as tropical cyclones, extra-tropical storms and floods. Current modelling approaches do not take into account the non-stationary nature of the global climate system, nor the potential shift in weather risk presented by a changing climate. Simulations using dynamical climate models, including global general circulation models and regional models, contain a wealth of information that may be of huge value to this risk assessment process. This is especially true for high-resolution GCMs which have sufficient resolution to begin to simulate the evolution of extreme weather events in a global climate context. Catastrophe risk modelling is starting to integrate results from climate modelling studies and this has the potential to revolutionise the risk assessment process. Results from climate research are also helping the insurance industry understand important climate risk relevant processes, such as how natural climate variability can lead to teleconnection patterns and so potential accumulation of seemingly unrelated risks. We propose a workshop, which will consist of a panel representing the relevant parties: (a) Scientists researching the climate modelling of extreme events (b) Risk analysts from the insurance industry (b) Catastrophe model developers Who, through short (5-10 minute) presentation, will introduce their own perspectives on this topic. This will be followed by an open discussion to address some of the main questions to arise from the process of applying climate research to inform the insurance industry.

# 87 - Land-atmosphere coupling strength and the hydrological cycle

Contact: [p.l.vidale@reading.ac.uk](mailto:p.l.vidale@reading.ac.uk)

Presentation Type: workshop

Created: 24th October, 2008

Status: accepted

**Symposium:** The Water Cycle

**Author:** Pier Luigi Vidale  
Anne Verhoef

**Keywords:** terrestrial water balance, land-atmosphere interactions, coupling strength, high-resolution climate models and extremes

**Workshop:** The land-atmosphere coupling strength in GCMs has been under scrutiny in the last few years, due to its role in closing the hydrological cycle at several time scales, which it modulates via memories in the terrestrial water balance. Model intercomparison studies have indicated that there is no consensus on the correct magnitude of the coupling strength and several hypotheses to explain the disagreement have been raised, involving precipitation frequency/intensity characteristics, soil processes (infiltration, runoff generation, root extraction), and boundary layer dynamics. For impacts studies, the increasingly more credible representation of climate extremes in higher-resolution climate models (e.g. floods, droughts), makes higher demands on the capabilities of the land surface component of climate models, which were originally unable to produce realistic high-frequency variability. Aims of the workshop: To improve our understanding of: - the coupling and feedbacks between climate variability and the terrestrial water balance components - climate change impacts on terrestrial hydrological stores and fluxes (soil moisture, groundwater, runoff and evaporation) - climate biases which may be caused by an incorrect coupling strength To address: - What hydrological and soil physical aspects of current land surface model (LSM) parameterisations need improving to ensure reliable short- and long term terrestrial water balance predictions over a range of scales - The sensitivity of predictions of the terrestrial water balance by LSMs to specific land surface parameters - To what extent emerging facilities and technologies, such as recent /future satellite launches (e.g. SMOS), data assimilation, or wireless sensor networks (potentially better spatial coverage of verification variables) can help to constrain our predictions on the dynamics of the terrestrial water balance - The design of numerical experiments that can exploit new observations to renew the quantification of the land surface-atmosphere coupling strength - Where future efforts need to be focussed to obtain better large-scale validation datasets (evaporation, distributed soil moisture, river discharge, snow cover extent).

# 88 - Small-scale precipitation processes in a warming climate

Contact: [d.kirshbaum@reading.ac.uk](mailto:d.kirshbaum@reading.ac.uk)

Presentation Type: workshop

Created: 24th October, 2008

Status: **accepted**

**Symposium:** The Water Cycle

**Author:** Daniel Kirshbaum  
Manoj Joshi

**Keywords:** Precipitation, climate, extreme weather, hydrology

**Workshop:** Processes such as convective and orographic precipitation are characterized by small horizontal and temporal scales. They cannot be adequately resolved in operational weather forecasts, let alone in long-term climate simulations, which forces the use of parameterization schemes to capture their basic behavior. In a warming climate these processes are expected to change, although the magnitude and impacts of such changes are uncertain. Some of this uncertainty may be reduced by high-resolution, cloud-resolving simulations that explicitly capture the processes of interest and their sensitivity to changes in their large-scale conditions. In this workshop, we will examine the effects of changing climatic conditions on various small-scale precipitation mechanisms.

# 90 - From local weather forecasts to dangerous climate change

Contact: [ian.forsyth@metoffice.gov.uk](mailto:ian.forsyth@metoffice.gov.uk)

Presentation Type: workshop

Created: 27th October, 2008

Status: **accepted**

**Symposium:** Predicting Hazards and Risk

**Author:** Iain Forsyth

**Keywords:** Communicate, Changing, Impact, Climate, Events, Frequency,

**Workshop:** I would be interested in how we can communicate the changing impact of weather events over time as Climate change takes effect. We often use language like normal or average but what does this mean with climate change and more importantly what is the impact on the public as the frequency and/or intensity of events changes. e.g. frequency and intensity of summer showers, frequency and impact of winter snow, frequency of extreme events