



Identification of the large-scale processes that lead to UK summer extreme sub-daily rain

Adrian Champion and Richard Allan

University of Reading, Department of Meteorology, United Kingdom (a.j.champion@reading.ac.uk)

Short-lived, intense rainfall events cause significant damage and disruption throughout the world and are commonly related to convective processes. However, coarse resolution global climate models are unable to realistically resolve the fine-scale processes associated with these events yet can potentially represent the larger-scale driving processes. Therefore there is a need to determine and evaluate large-scale precursor conditions such that future projections of extreme convective rainfall with climate models may be better quantified.

This study investigates a series of metrics which are being used to link synoptic scale meteorology to localised hydrology without the need for downscaling. Using a recently available time-of-tip tipping bucket raingauge dataset, sub-daily extremes across the UK can be more easily identified. This allows for an hourly event dataset to be created and compared to the previously-available daily event dataset.

A number of different metrics, which have previously been shown to be associated with flooding in the UK, will be presented and their relevance to sub-daily rainfall demonstrated. New metrics will also be discussed which aim to improve the detection of the atmospheric precursors to hourly rainfall events in coarse resolution re-analysis datasets.