Associating extreme precipitation events to parent cyclones in gridded data

Ruari Rhodes (1), Len Shaffrey (2), and Sue Gray (1)

(1) Department of Meteorology, University of Reading, United Kingdom (r.rhodes@pgr.reading.ac.uk), (2) National Centre for Atmospheric Science, University of Reading, United Kingdom

When analysing the relationship of regional precipitation to its parent cyclone, it is insufficient to consider the cyclone's region of influence as a fixed radius from the centre due to the irregular shape of rain bands. A new method is therefore presented which allows the use of objective feature tracking data in the analysis of regional precipitation. Utilising the spatial extent of precipitation in gridded datasets, the most appropriate cyclone(s) may be associated with regional precipitation events. This method is applied in the context of an analysis of the influence of clustering and stalling of extra-tropical cyclones in the North Atlantic on total precipitation accumulations over England and Wales. Cyclone counts and residence times are presented for historical records (ERA-Interim) and future projections (HadGEM2-ES) of extreme (> 98th percentile) precipitation accumulations over England and Wales, for accumulation periods ranging from one day to one month.