Geophysical Research Abstracts
Vol. 12, EGU2010-3187, 2010
EGU General Assembly 2010

Large scale European drought within a high resolution climate model

Benjamin Lloyd-Hughes (1), Leonard C. Shaffery (2), Pier Luigi Vidale (2,3)

(1) Walker Institute for Climate System Research, Department of Meteorology, University of Reading, UK (b.lloydhughes@reading.ac.uk), (2) National Centre for Atmospheric Science, Department of Meteorology, University of Reading, UK, (3) UK-Japan Climate Collaboration, Earth Simulator Centre, Yokohama, Japan

Increased resolution has led to significant improvements in the representation of weather systems within coupled climate models. Droughts are amongst the most costly weather events that affect Europe and understanding the potential for change in the character of European drought is of tremendous societal importance. A prerequisite for confidence in predictions of the nature of droughts under future climates is that climate models can reproduce droughts characteristic of the present climate. Drought characterisation is an intrinsically spatio-temporal problem and we use an explicit 3-dimensional (longitude, latitude, time) structure-based method to compare modelled droughts with observations. Specifically, we compare European droughts generated by the HiGEM[1] coupled climate model run with present day atmospheric composition with drought events extracted from the CRU TS3 observational data set. The results demonstrate consistency in both the rate of drought occurrence and the spatio-temporal structure of the events. Estimates of the probability density functions for event area, duration and severity are shown to be similar with confidence $> 90\%$. Encouragingly, HiGEM is shown to replicate the extreme tails of the observed distributions and thus the most damaging European drought events.

[1] HiGEM is based on the latest climate configuration of the Met Office Hadley Centre Unified Model (HadGEM1) with the horizontal resolution increased to 1.25 x 0.83 degrees in longitude and latitude in the atmosphere and 1/3 x 1/3 degrees in the ocean.