Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09754, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09754
EGU General Assembly 2008

The annual cycle of UK daily precipitation extremes

D. Maraun (1), H.W. Rust (2) and T.J. Osborn (1)

(1) Climatic Research Unit, School of Environmental Sciences, University of East Anglia, Norwich, NR4 7TJ, UK (2) Physics Institute, University of Potsdam, Am Neuen Palais 10, 14469 Potsdam, Germany (d.maraun@uea.ac.uk)

The strongest impact of weather and climate on human society is caused by extreme events. In the UK, extreme precipitation has a considerable impact on agriculture, economy and society. Several studies have been carried out to assess annual extremes. This approach, however, ignores the annual cycle of extremes, i.e. the changing character of strong precipitation throughout the year. Yet the effect of extreme precipitation on crops, erosion and flooding depends on the season. We therefore explicitly model the annual cycle of precipitation extremes, using daily data from 689 rain gauges across the UK. We fit a generalised extreme value distribution (GEV) with time dependent parameters to the monthly extremes. The annual cycle of both the location and the scale parameter is well approximated by a harmonic function, whereas the variation of the shape parameter is erratic and mainly consistent with a constant. We reveal distinct spatial patterns for the annual mean values of the location parameter, the scale parameter and the shape parameter as well as for the annual cycle of the location parameter and the scale parameter: The annual mean of the location parameter is highest in West Scotland, and generally high along the West coast; it is lowest in East Anglia. The annual mean of the scale parameter shows a similar pattern. The annual cycle of the location parameter is strong in the North West of the UK as well as in East Anglia, and low in the Midlands; it peaks in late autumn in the West and in the North, and in late summer in East Anglia. The annual cycle of the scale parameter is strongest in East Anglia and weakest in West Scotland; it peaks in winter in West Scotland and in summer in East Anglia. The shape parameter, modelled constant throughout the year, shows a strong East-West gradient from positive values in the East to negative values in some coastal areas in the West. We discuss possible relations between these

patterns of certain parameter regimes and different precipitation processes.