Hydrology and Earth System Sciences

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Discussions

Interactive comment on "Climate change increases the probability of heavy rains like those of storm Desmond in the UK – an event attribution study in near-real time" *by* van Oldenborgh et al.

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As far as we can see there is no physical reason for the difference in trends between these two regions, just natural variability. Both regions are on the (south)western side of mountains and should respond similarly to changes in circulation. As can be seen from our Fig. 1, winter precipitation extremes are similar in size to these regions. As first-oder assumption we assume that previous extremes just happened to hit Scotland more than Northwest England. As we mention, the two trends are well within each other's uncertainty intervals. We average them to obtain an estimate of the region that had the heaviest precipitation during Storm Desmond. We reformulated this section to

"The Northwest England region shows no trend in the maximum daily precipitation over October–February, with a 95 % uncertainty margin on the change in return times of these extremes of a factor 0.3–2.1 (1 indicates no change). In South Scotland there is a strong positive trend in precipitation, giving an increase in probability of 1.8–4 times what it used to be at the beginning of the series, 1931. This is due to large extent to a heavy precipitation event in 2005. However, even without that year the trend is positive. The trends in the two regions are compatible with each other: the difference is not statistically significant. We therefore assume that the difference in trends is mainly due to natural variability. This is supported by the observation that the maxima in these two regions are uncorrelated. Averaging them gives the best estimate for the observed trend in the region affected by Storm Desmond. This gives an increase in probability of a factor 1.3–2.8 (95 % confidence interval)."

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