



## **Projections of damaging hail over the UK and Europe for the twenty-first century**

M.G. Sanderson (1), W.H. Hand (2), P. Groenemeijer (3), L.J. McColl (4), J.D.C. Webb (5), and P. Boorman (6)  
(1) Met Office Hadley Centre, Exeter, UK (michael.sanderson@metoffice.gov.uk), (2) Hay Tor Vale, Devon, UK (will@lyneside.demon.co.uk), (3) European Severe Storms Laboratory, Wessling, Germany (pieter.groenemeijer@essl.org), (4) Select Statistics, Exeter, UK (lynsey@select-statistics.co.uk), (5) Tornado and Storm Research Organisation, Oxford, UK (jonathan.webb@torro.org.uk), (6) Met Office Hadley Centre, Exeter, UK (penny.boorman@metoffice.gov.uk)

A simple model of hailstone formation has been driven using meteorological data produced by a regional climate model to project how numbers of days with damaging hailstones (greater than 15 mm diameter) storm numbers and hailstone sizes could change during the twenty-first century. This is the first time a hail-specific climate modelling study has been performed for Europe. Evaluation of the modelled hailstone sizes, numbers and spatial distributions over the UK showed that they agreed reasonably well with observations from the TORRO database. The effect of climate change on the numbers of damaging hail storms in the UK was then investigated. A downward trend in the total number of damaging hail storms was projected, with statistically significant trends for hailstones with diameters between 21 and 50 mm. Reduction in instability within the clouds (implying reduced strength of convective updrafts) was the main cause of the reductions in damaging hailstone numbers. Melting of hailstones made little contribution to the projected reduction in their sizes. Some preliminary results for the rest of Europe will also be presented. Uncertainties in the results will also be discussed.