



Temperature and precipitation extremes at the station and climate model grid-point scales: some lessons learnt from the statistical and dynamical approaches to downscaling used in the STARDEX project

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The EU-funded STARDEX project on the STAtistical and Regional dynamical Downscaling of EXtremes for European regions has undertaken a rigorous and systematic inter-comparison and evaluation of statistical and dynamical downscaling methods for the construction of scenarios of extremes. The more robust techniques have been identified and are being used to produce scenarios of extremes for European case-study regions for the end of the 21st century. These scenarios will help to address the vital question as to whether extremes will occur more frequently in the future.

In order to construct and analyse these scenarios, work has been undertaken on a number of issues related to the understanding and modelling of temperature and precipitation extremes and their spatial and temporal variability, including: (1) analysis of observed changes in indices of extremes over the last 40 years; (2) investigation of the changes in circulation and other climatic variables underlying these observed changes; (3) exploration of the spatial and temporal scales at which the performance of statistical and dynamical downscaling can be considered optimal; and, (4) inter-comparison of linear and non-linear statistical downscaling methods, and of statistical and dynamical downscaling methods.

In order to ensure that these intercomparisons are fair, STARDEX has had to upscale observed data and climate model output to common grids, as well as downscale climate model output. Upscaling requires the availability of a dense and reliable network

of observed data, thus the emphasis here is on Alpine precipitation. Various illustrative analyses will be presented, including extreme value analyses of regional climate model output from the PRUDENCE project (<http://prudence.dmi.dk/>).

Further information about the STARDEX project can be found here: <http://www.cru.uea.ac.uk/cru/projects/stardex/>