



Evaluating and comparing downscaling techniques for regional precipitation modelling.

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Statistical downscaling techniques are widely used for regional climate and impact modelling as they are faster and require less resources than dynamical downscaling from global climate models. Generally, only one approach or the other is used in climate and impact modelling studies, so few comparisons of the ability of both approaches to accurately model current climate variables are available. In particular, extremes and natural variability of precipitation have proven difficult to model accurately and both approaches have strengths and weaknesses in this regard, as evidenced in the results of the EU Statistical and Regional Dynamical Downscaling of Extremes for European regions (STARDEX) project.

In this study, a number of statistical and dynamical downscaling models are compared in order to determine which are most appropriate for generating probabilistic climate change scenarios for the Irish region from model ensembles. The optimal set of predictor fields for the statistical models are selected from the ERA-40 re-analyses and the models are calibrated over a training period. The dynamical downscaling models are selected from those used in the EU ENSEMBLES project and include different global-regional climate model combinations. The performance of the models in reconstructing spatial precipitation fields is then assessed against a regional network of observations over a validation period. Results presented will include evaluation and comparison of the ability of the different models to capture extreme precipitation values as well as occurrence and intensity.