



An Ensemble Version of the Daily E-OBS Dataset

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E-OBS is formed from an interpolation of the blended station series contained in the ECA&D database, and provides daily values of temperature (maximum, minimum and mean daily values), precipitation and mean sea-level pressure for the European domain on uniform grids of around 25km resolution. The series extends back to 1950 and are updated on a rolling monthly basis. In this paper we describe a new version of the daily gridded temperature and rainfall data that contain a number of significant developments over earlier releases. Notably, uncertainty estimates are generated from a 100-member ensemble of realizations of each daily gridded field. In this new version of E-OBS we still provide "best-guess" and uncertainty estimates, in a similar manner to previous E-OBS releases, but in addition the ensemble members will also be made available to users. In this way uncertainty estimates can be calculated in a more meaningful way in derived data, such as in the generation of indices of extremes. In order to produce a consistent ensemble of realizations, the original interpolation method used in E-OBS has been overhauled. In contrast to the kriging/spline method used in earlier versions, we have made use of Generalized Additive Modelling. Topographic effects are integrated through the modelling of gridded background fields that are calculated using month-by-month climatological averages calculated over the period 1961-90. In addition to altitude, these background fields also incorporate additional environmental factors, such as coastal proximity and slope/aspect. To assess the success of the new interpolation method, the gridded data are compared against several high-resolution gridded datasets produced by National Meteorological Services (NMS) across Europe. These datasets generally contain many more station data and are therefore expected to replicate the true daily fields of temperature or precipitation more accurately than E-OBS, but do so at a scale that is comparable to E-OBS. On the whole the new version of E-OBS has reduced error relative to these NMS datasets compared to the current operational version of the dataset (version 14.0).