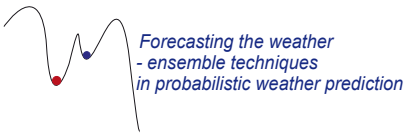
EMS Annual Meeting Abstracts
Vol. 8, EMS2011-538, 2011
11th EMS / 10th ECAM



Comparison of Different Verification Approaches for High Resolution NWP Precipitation Forecasts

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The MetGIS system (Spreitzhofer et al., 2006) is a java based tool to downscale the output of any NWP model to observation sites and to arbitrary grids with resolutions in the range of 100m to 10km. This is done by combining the forecast with high resolution geographical data. To control the quality of this forecast product different verification approaches were applied and compared.
In a first attempt Global Forecast System forecasts were downscaled to real time observation sites with MetGIS and simple verification statistics were applied. The results for observation sites suggested that the probability of detection of precipitation is not as sensible to the location, as forecasting the right amount of precipitation.
A second experiment followed the approach suggested by Ahrens et al. (2007), and involved upscaling of daily rain gauge data to the grid resolution of the forecast system. To quantify the influence of the upscaling procedure, IDW, block kriging, conditional Gaussian simulation and VERA (Steinacker et al., 2006) were used to upscale the precipitation data onto a regular grid. Different groups of precipitation events were derived from a dataset covering Austria (83800 km2) with 661 stations for the period between 1971 and 2006.
To provide decent NWP forecasts for the MetGIS tool, WRF, driven by NCEP reanalysis fields, was used to simulate theses precipitation events. A nested run covering the Alps was chosen to yield the advantage of having a coarse and high resolution forecast to drive MetGIS.
Comparing the output of the upscaling procedures with high resolution WRF output and forecasts downscaled to the same grid with MetGIS showed that the downscaling procedure is indeed refining the NWP output. Furthermore, preliminary results suggest that upscaling rain gauge data with VERA can yield results the same quality as block kriging, since there is much less agreement between VERA and IDW and block kriging and IDW.

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Ahrens, B. and Beck, A.: On upscaling of rain–gauge data for evaluating numerical weather forecasts, Meteorol. Atmos. Phys., in print, 2007.

Steinacker R, Ratheiser M, Bica B, Chimani B, Dorninger M, Gepp W, Lotteraner C, Schneider S, Tschannett S. 2006. A mesoscale data analysis and downscaling method over complex terrain. Mon. Weather Rev. 134: 2758–2771.