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Verification of surface temperature forecast in southern Italy

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Operational gridded temperature forecast is issued for Calabria since January 2007 at CRATI Scrl in cooperation with ISAC-CNR. The forecast is based on the output of the RAMS model at 6 km horizontal resolution and is issued for the following 4 days.
Forecast quality and skill are determined relative to the Regional Meteorological Network which consists of more than 60 thermometers distributed, rather uniformly, over the Region. Measurements available are daily minimum, medium and maximum temperatures and verification refers to these parameters.
Cumulative statistics are used to reduce the dimensionality of the forecast verification. In particular, BIAS, RMSE (Root Mean Square Error) and MAE (Mean Absolute Error) are shown for each of the 4-day forecast. Skills are also presented as a function of the season.
The orographic complexity of the country is clearly reflected by the cumulative scores. Worst statistics are realized across northwest Calabria, where the resolution of the model is not enough to resolve the steep orographic gradient of “Catena Costiera”. Best scores are attained for the gentle terrain of “Marchesato” in the East side of the peninsula.
Statistics show the tendency of the model to over-predict maximum temperatures and to under-predict minimum temperatures. This tendency increases with forecast time and show a model drift to overestimate the diurnal cycle with forecasting time.
Murphy and Winkler (1987) summarize many of the limitations of the traditional accuracy cumulative measures. Alternatively, a distribution-oriented approach can be followed that uses the joint distribution of the forecast and observed values. The large dimensionality of the joint distribution approach is a significant drawback as a result of the large combinations of forecast and observations. Reduction in the dimensionality requires defining specific applications and verification goals. To reduce dimensionality we present joint distributions to assess general forecast tendencies.

Bibliography

Murphy, A. H. and R. L. Winkler, 1987: A general framework for forecast verification. Mon. Wea. Rev., 115, 1330–1338.