EMS7/ECAM8 Abstracts,
Vol. 4, EMS2007-A-00345, 2007
7th EMS Annual Meeting / 8th ECAM


# A quarter century of operational end forecast verification

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The operational weather service of Finnish Meteorological Institute (FMI) established an operational end forecast verification system at its Central Forecasting Office (CFO) as early as in the summer of 1979. Verifiable forecasts as produced by human forecasters thus exist over a period of more than a quarter century. The verification system was further elaborated into a close-to-real-time verification package in the mid-1990s applying the then novelty Internet framework. A regional forecasting office (RFO) structure was formed by FMI around the same time and, consequently, the verification scheme included the RFOs. Hence there are over ten years of data to facilitate comparisons between centrally and locally produced end forecasts. The comprehensive verification datasets cover a number of inland locations at which point forecasts of nighttime minimum and daytime maximum temperature as well as nighttime and daytime probability of precipitation (PoP) forecasts have been produced. The longest time-series (covering up to 28 years) are for some of the temperature parameters, whereas the PoP approach was not introduced in operations until in the early 1990s.

The verification results prove a remarkable improvement in the maximum temperature forecasts: 48 hour forecasts of today are at the same level as 24 hour forecasts c. 20 years ago. A systematic forecasting error behavior has decreased during the years but there still appears a slight negative bias, on average. The quality of the minimum temperature forecasts is somewhat more difficult to interpret due to strong local, site-dependent features. There is not as positive a trend in the PoP forecasts as for temperature. The results also imply a pronounced overforecasting bias which may be due to the forecasters' unfamiliarity with the probabilistic concept. The nighttime PoPs are

somewhat better than the corresponding daytime ones. The forecasts of the CFO and RFOs represent more or less similar quality.