

Daily maps of minimum and maximum temperature for Norway

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Daily maps of surface air temperature with 1 km horizontal resolution are produced for the whole of Norway. The maps, currently published at <http://seNorge.no>, will be a key component of the new met.no climate service centre. Until present maps are only available for daily mean temperature. Maps of daily minimum and maximum temperature, however, are equally important for a lot of users.

Currently, daily mean temperatures are spatially interpolated using residual kriging of de-trended air temperatures with subsequent re-trending, with one of the trend components being altitude above sea level. The five trend components were established from monthly mean temperatures through multiple linear regression for each month of the year. During winter, however, temperatures are poorly described by simply using altitude as a predictor since such an approach has difficulties in describing inversions properly.

The above-described method is evaluated for daily minimum and maximum temperatures using leave-one-out cross validation. In comparison to daily mean temperatures, the method performs only slightly worse for daily maximum temperatures. However, for daily minimum temperatures the method performs considerably worse. This is not surprising as for daily minimum temperatures the vertical gradient can vary substantially from day to day, especially during winter when strong temperature inversions are frequently present.

A new approach using information on large-scale atmospheric circulation and local terrain patterns is suggested. The new method is evaluated for daily mean temperatures in general, and for daily minimum temperatures in particular. It is also investigated whether a similar method can be used for daily maximum temperatures.