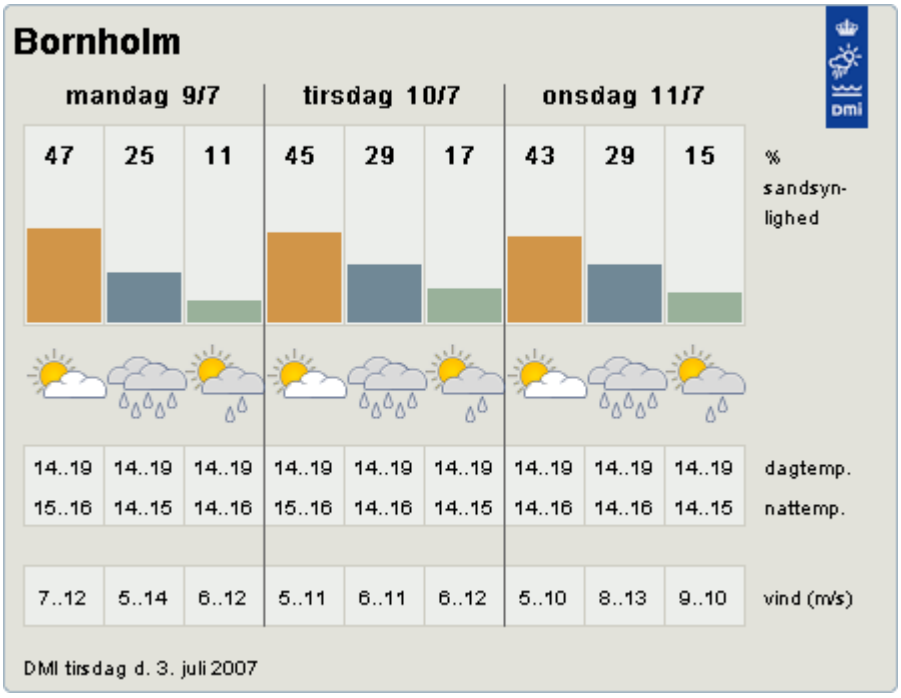
Application and verification of ECMWF products in Denmark 2007

1. Summary of major highlights

The ECMWF deterministic forecasts are used extensively by the duty forecasters and also to produce a wide range of automatic forecasts. The ocean model is primarily used by the Danish Maritime Service, one of the largest ship routing services in Europe.

The ensemble forecasts are used to produce automatic probability forecasts for Denmark day 7-9.

An example:



2. Verification of products

2.1 Objective verification

2.1.1 Direct ECMWF model output

2.1.2 ECMWF model output compared to other NWP models

Forecasts from ECMWF are used as boundary data for the DMI versions of HIRLAM. On a routine basis verification of 2 m temperature and 10 meter wind are made against 27 synop stations. In Figure 1 the hit rate for the 2 meter temperature being within two kelvin is shown for 12 and 24 hour forecasts. ECH corresponds to the ECMWF model (extracted in 1 degree resolution daily from MARS) and S05 is a 5 km HIRLAM model covering Denmark and the surrounding area.

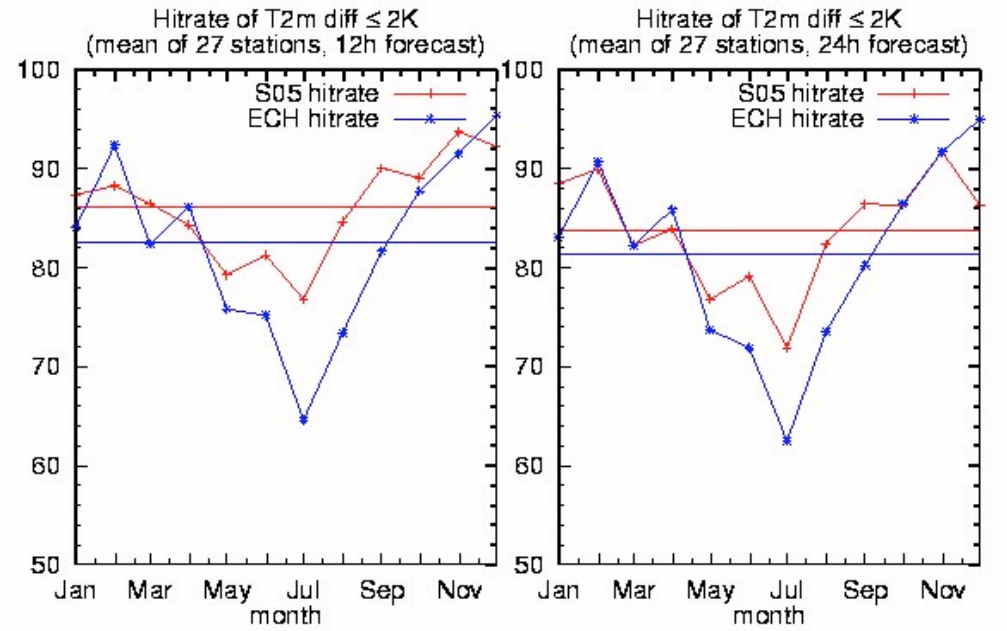


Fig. 1 Hit rate for S05 HIRLAM models and the ECH (ECMWF) for 2 meter temperature. The threshold used is 2 kelvin and 27 Danish stations are used for the verification covering the year 2006.

Figure 2 shows the hit rate for the 10 meter wind being with in 2 m/s for 12 and 24 hour forecasts.

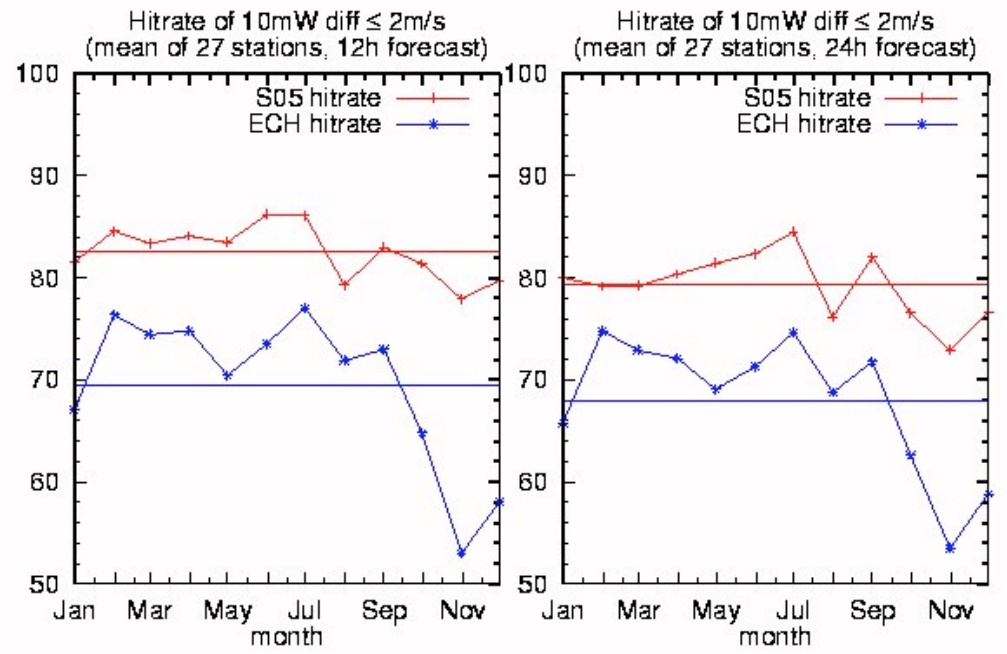


Fig. 2 Hit rate for S05 HIRLAM models and the ECH (ECMWF) for 10 meter wind. The threshold used is 2 m/s and 27 Danish stations are used for the verification covering the year 2006.

2.1.3 Post-processed products

2.1.4 End products delivered to users

2.1.5 Seasonal forecasts

The Danish Meteorological Institute produces a deterministic seasonal forecast for the temperature in Denmark. The forecast lead is one month and the averaging period is three months. The forecast shows the seasonal mean temperature anomaly and currently it is based directly on the ECMWF dynamical forecast System 2. The skill of the deterministic forecast is highest in the spring. The forecasts are published in Danish on the DMI homepage on the Internet, and they are often discussed broadly in the media in particular when the summer (June, July, and August) or winter (December, January, and February) forecasts are made public.

2.2 Subjective verification

3. References