

Application and verification of ECMWF products 2011

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1. Summary of major highlights

ECMWF products are intensively used at EMHI. The main idea behind current application system is the locally tailored visualisation of the basic meteorological products through EMHI's internal web portal or visualisation with the meteorological workstation. The year 2010 has not introduced major changes to the usage of ECMWF products at EMHI. As a new system, ecCharts is getting attention from forecasters.

2. Use and application of products

Include medium-range deterministic and ensemble forecasts, monthly forecast, seasonal forecast

2.1 Post-processing of model output

2.1.1 Statistical adaptation

2.1.2 Physical adaptation

ECMWF model fields from boundary conditions project are used as boundary fields for limited area numerical weather prediction model HIRLAM.

2.1.3 Derived fields

Including post-processing of EPS output e.g. clustering, probabilities

2.2 Use of products

Use of ECMWF products in operational duties, in particular use in severe weather situations.

The ECMWF deterministic model output is the backbone of EMHI's operational 7-day and longer forecasts. Model fields in GRIB format are received and visualised on SmartMet meteo-workstation.. Alternatively the fields are visualised with GrADS software package and internal web-portal is used to supply the images to forecasters. The web-portal images have better local focus and higher temporal resolution than ECMWF web products. Some of the images are prepared on ecgate at ECMWF. Following maps are provided to forecasters:

1. 12–186 h forecasts with 6 h interval, Northern Europe area

1. mean sea level pressure together with 6h precipitation fields. Rain, sleet and snow phases are separated with colouring.
2. 10 m wind and 2 m temperature
3. 850 mb temperature, geopotential and wind
4. 300 mb geopotential and wind
5. 500 mb geopotential and 1000–500 mb thickness
6. 500 mb potential vorticity
7. 700 mb relative moisture and vertical velocity
8. false colour cloud map similar to ECMWF web product

2. 12–186 h forecasts with 6 h interval, Estonian area

1. 2 m temperature
2. 6h precipitation

3. 12–186 h forecasts with 6 h interval, the Baltic Sea area

1. mean sea level pressure together with 10 m wind. Wind field is shaded with different colours when certain level of warning is exceeded

4. analysis, Northern Europe area

1. mean sea level pressure together with Meteosat image
2. mean sea level pressure
3. 10 m wind and 2 m temperature
4. 850 mb temperature and 500 mb geopotential
5. 700 mb relative moisture

5. analysis, northern hemisphere

1. mean sea level pressure together with 200 mb wind velocity and vectors

6. probabilistic products

1. 24–196 h probability of precipitation exceeding 1, 5, 10 and 20 mm per 24 hours
2. 24–196 h probability of wind gusts exceeding 15, 20 and 25 m/s
3. 24–168 h probability of temperature dropping below 0 C
4. 24–144 h probability of wave height exceeding 2, 4, 6 and 8 m in Baltic Sea
5. epsgrams of 5 major cities

7. additional maps

1. sea level temperature analysis, European area
2. sea-ice cover analysis, Northern Europe

Longer than 7 day forecasts are given only on request and data from ECMWF website is then used.

ECMWF model output is used to pre-fill tables of weather of towns in global, European and local scale. Very simple diagnostics are applied to determine weather category icon. The tables are later checked by the forecaster and supplied to a newspaper or TV-station.

A 72 h 10-m wind forecast at two points are provided in table form operationally to energy company “Eesti Energia” for wind-generator production estimation calculations.

For severe weather predictions a very important product for EMHI is the probability of wind gusts exceeding certain level.

3. Verification of products

3.1 Objective verification

3.1.1 Direct ECMWF model output (both deterministic and EPS)

3.1.2 ECMWF model output compared to other NWP models

Simple comparison between the performance of ECMWF’s deterministic forecast, local HIRLAM forecast and EMHI’s official forecast (produced by duty forecasters) for basic surface parameters is performed routinely, results are for EMHI’s internal use only so far.

3.1.3 Post-processed products

3.1.4 End products delivered to users

3.2 Subjective verification

3.2.1 Subjective scores (including evaluation of confidence indices when available)

3.2.2 Synoptic studies

4. References to relevant publications