

Application and verification of ECMWF products 2011 in the Czech Republic

Czech Hydrometeorological Institute (CHMI)

1. Summary of major highlights

The Centre's products have been widely used by the Central and Regional Forecasting Offices in Czech Hydrometeorological Institute for medium-range weather forecasts and to some extent also in short-range forecasting. The clusters, tubes, plumes and EPS-grams are considered in order to evaluate the credibility of the main deterministic forecast as well as to prompt for possible scenarios in situations of low determinism. The Extreme Forecast Index and other probabilistic products have been used especially in severe weather forecasting. The Centre's graphical products available on the web server are also used by the Czech Army's Weather Service.

At the beginning of 2007 the CHMI bought and implemented weather station Visual Weather IBL soft. Many of the products of deterministic model and some probabilistic products are visualised on this weather station both at the Central Forecasting Office and at the Regional Forecasting Offices. ECMWF products have become the main products to issue medium-range weather forecasts for both Czech Republic and regional forecasts.

2. Use and application of products

2.1.1 Statistical adaptation

No statistical adaptation of the ECMWF products is carried out.

2.1.2 Physical adaptation

No limited area modelling using the ECMWF products is carried out.

Three-dimensional wind forecasts over the Northern Hemisphere up to +120 hrs are used as the input to the trajectory model used for assessing of risk of distant nuclear or other major accidents.

Experimentally we use the prediction of precipitation and temperature of deterministic model as an input to hydrological models to predict water levels of major rivers up to ten days in advance. Although the results are not always successful enough, the qualitative use is possible. Next time we plan to use 25% and 75% percentiles of precipitation from EPS to estimate the probability and the range of inundation in the rivers.

Some of meteorological parameters (pressure, temperature, wind) predicted by ECMWF are used as an automatic input to some our products that are controlled and modified by forecasters.

2.1.3 Derived fields

No derived fields are calculated out of the ECMWF products.

2.2 Use of products

The final medium-range forecasts produced by forecasters are currently used in the general weather forecasting for public and state authorities and in the national Warning and Alert Service. Warning system has become the most important component of our service. Both probabilistic products and the Extreme Forecast Index are used to issue warnings. Ensemble products are considered in order to evaluate the credibility of the main deterministic forecast and to issue weather forecasts more than approximately 5 days in advance.

The seasonal and monthly forecasts are consulted in the long-range forecast process. Currently the results of both deterministic and ensemble forecasts up to 15 days in advance and monthly forecasts are used for identification of the weather type in the analogue-based forecasting method for monthly forecasting.

3. Verification of products

There is currently no objective or systematic subjective verification of ECMWF medium range forecast products carried out. The general scores calculated and published by ECMWF are considered informative. For now we also use verification of ECMWF products from the Green Book. Considering the character of medium-range weather forecasts, the verification scores from neighbouring countries are well applicable also for our service.

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

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

The seasonal and monthly forecast products are considered as having some informative value. However, the frequency of “no signal” of these forecasts is still considered too high.

4. References to relevant publications