

Application and verification of ECMWF products 2013

Czech Hydrometeorological Institute (CHMI)

1 Summary of major highlights

ECMWF products have been widely used by the Central and Regional Forecasting Offices in Czech Hydrometeorological Institute (CHMI) for medium-range weather forecasts and to some extent also to issue short-range weather forecasts. 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. ECMWF graphical products are also used by the Weather Service of Army of the Czech Republic.

At the beginning of 2007 CHMI implemented weather station Visual Weather of IBL soft. Many of 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. Using this weather station products of other models including Aladin model (operated in CHMI) and GFS model can be easily displayed and compared to ECMWF model.

ECMWF products have become the main products to issue medium-range weather forecasts for both the whole territory of Czech Republic and particular regions of Czech Republic.

2 Use and application of products

2.1. Post-processing of model output

2.1.1. Statistical adaptation

No statistical adaptation of the ECMWF products is carried out.

2.1.2. Physical adaptation

No limited area modeling using the ECMWF products is carried out operationally, but ECMWF lateral boundary conditions can be used as a back-up for the ALADIN model.

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.

ECMWF deterministic temperature and precipitation forecast serves as optional input to hydrological model in cases that prolonged lead time is demanded (especially for the purpose of reservoir management), however it is quite rare practice in Czech Republic.

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 of CHMI 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 neighboring 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 considered still too high.

4 References to relevant publications