Application and Verification of ECMWF Products 2021

NMS of Republic North Macedonia

1. Summary of major highlights

Our national service use ECMWF forecast products in operational work more than 10 years.
Our numerical weather prediction model in this moment use ECMWF boundary condition for work on 1 km and 3 km. spatial resolution to generate 5 day charts and other type of outputs.
We also use material from ECMWF for monthly forecast and seasonal forecasts for our country and people from our Hydrology department also need information from ECMWF for their water level forecast in particular river catchments.
Our service will continue to use ECMWF's products which play a major role in everyday operative work in the forecasting department. At the moment as forecasting staff We are using ECMWF products directly but not in the research and development work.

2. Use and application of products

In every day operative forecasting work the forecaster on shift mainly is using the large scale of the various ECMWF products such as:

- Ensemble (ENS) forecasts - medium-range high-resolution (HRES),
- Monthly forecasts and seasonal forecasts. Products are used with
- Chart dashboard
- EcCharts

Our forecasters use continuously :

- ENS meteograms by locations;
- Vertical profile emagrams for 3 locations;
- Extreme Forecast Index - EFI;

Example: Large number of meteorological field e.g. SLP, 850 hPa t, 500 hPa g, total precipitation, cloud cover, wind speed and direction and other.

- Spatial distribution of PV anomaly generated on chart dashboard

Our intention is to see early sign of intensive severe weather in evident cases.

In everyday activities we still not use "Open Charts" and their new web layout, but some of the forecasters follow regularly this materials.

2.1 Direct Use of ECMWF Products

Forecasting staff are using only direct products from the ECMWF web portal.

2.2 Other uses of ECMWF output

Describe the different ways in which you use ECMWF forecasts indirectly, in the following categories:

2.2.1 Post-processing

Not any in this moment.

2.2.2 Derived fields

Not any in this moment.

2.2.3 Modelling

In our HMS we are running twice a day WRF-NMM v.3.9.1, non-hydrostatic limited-area model, with boundary conditions from ECMWF.

3. Verification of ECMWF products

Despite the small number of meteorologists and facing a shortage of the experts this activity is not done at the moment..

3.1 Objective verification

Very limited staff resources not allow to stay on long activity of verifications of any kind. Meteorologists included in 24 hours shifts have some experience in this way, but not as one objective procedure.

3.1.1 Direct ECMWF model output (both HRES and ENS), and other NWP models

- Not any in this moment.

3.1.2 Post-processed products and end products delivered to users

- Not any in this moment.

3.1.3 Monthly and Seasonal forecasts

- Not any in this moment.

3.2 Subjective verification

3.2.1 Subjective scores

- Not any in this moment.

3.2.2 Case studies

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4. Requests for additional output

- No requests for now..

5. References to relevant publications

(Copies of relevant internal papers may be attached)

Smith, W. and **C. Jones**, 2005: Whatever the name of the article is. *Mon. Wea. Rev.*, **20**, 134–148