

Application and verification of ECMWF products 2013

National Meteorological Administration

1. Summary of major highlights

No major changes in the statistical post-processing and forecast verification system.

No major changes in use of products

2. Use and application of products

2.1 Post-processing of model output

2.1.1 Statistical adaptation

The MOS statistical models have been in operational use since 2004. No major changes in basic models since that time. The models provide twice on a day, local forecasts up to 10 days, to 163 meteorological stations for the following main parameters: 2m temperatures, extreme temperatures, 10m wind speed and direction, total cloudiness(3 classes) and total precipitation. The results are plotted in map forms and displayed on the web site.

Since 2010 - MOS_MIXTE model using MOS_ECMWF RUN 12 UTC and MOS_ARPEGE RUN 00 provide once a day extremes temperatures for 163 meteorological stations.

2.1.2 Physical adaptation

2.1.3 Derived fields

2.2 Use of products

The EUMETSAT Nowcasting SAF MSG application supports numerical models outputs in GRIB formats, and it is configured by default to use ECMWF products. The SAFNWC/MSG products are further processed and made available for the Forecasting Center in real time on a satellite data Intranet site. Figure 1 represents an example of a SAFNWC/MSG Seviri Physical Retrieval Total Precipitable Water product (date 26.06.2014, 12:00 UTC).

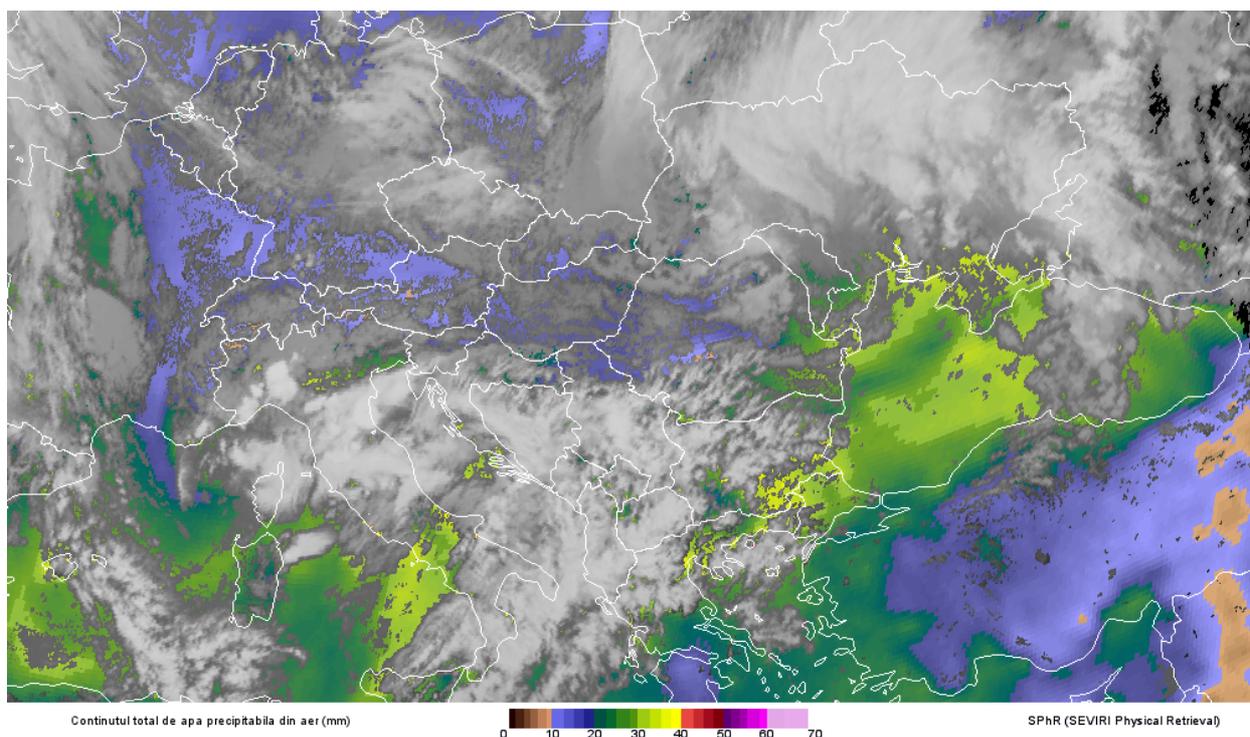


Fig 1. Example of SAFNWC/MSG Seviri Physical Retrieval Total Precipitable Water product (date 26.06.2014, 12:00 UTC).

In 2013 we developed some specific tasks for viewing EPS products for small domain. An web interface allows the user to select the type of product and view maps on a selected area. Examples in Fig 2 and 3.

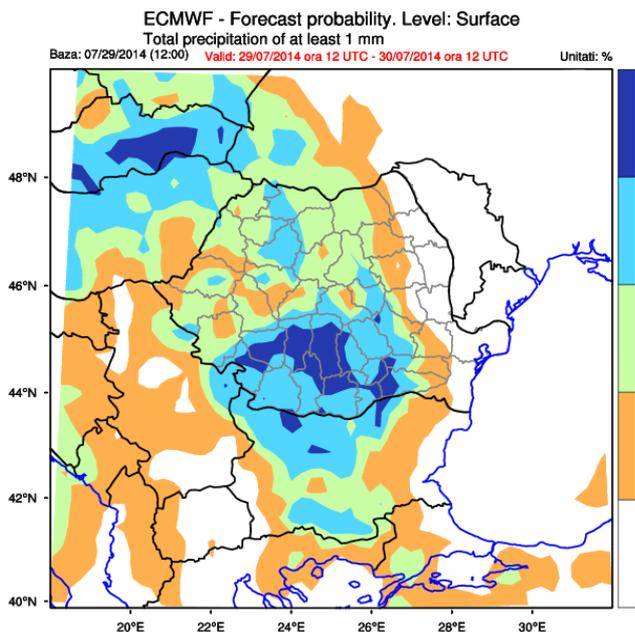


Fig 2. Example of forecast probability map

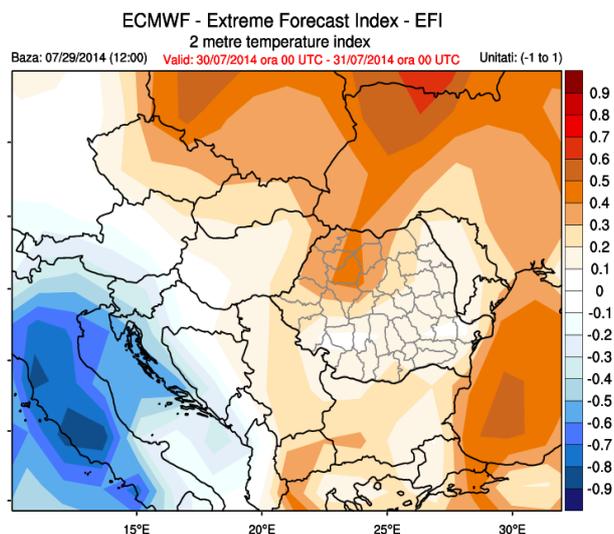


Fig 3. Example of EFI map

Also in 2013 we were concerned to use in operative activity some products of WAM model disseminated by ECMWF on the Black Sea domain. A variety of maps, graphs and tables are generated twice a day in order to be used in operational activity at CNPV and both in Constanta Regional Center. Example of user interface, maps and graphs are presented in next figures:

[ECMWF - WAM-model](#)

[GRAFICE ECMWF - WAM-model](#)

[TABELE ECMWF - WAM-model](#)

[ANM - WAGROM-model](#)

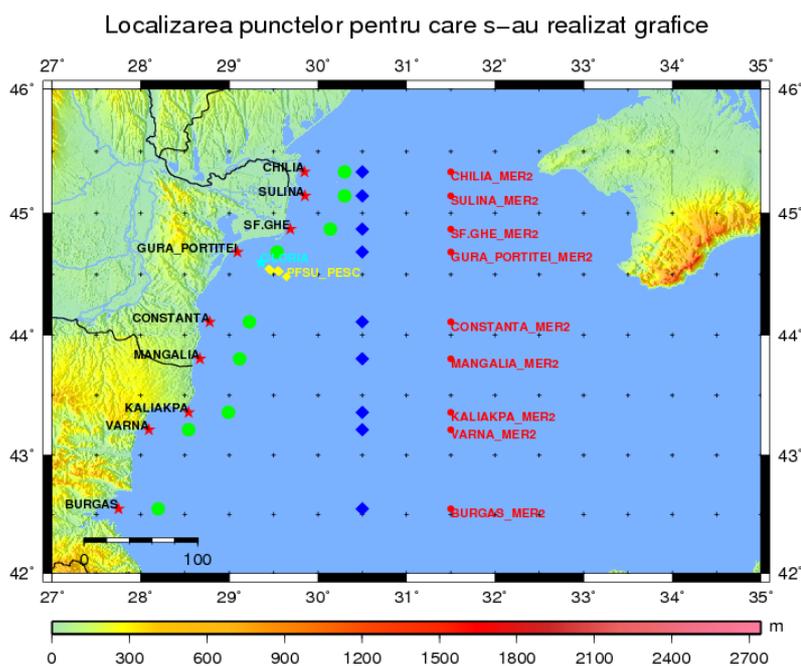


Fig. 4. User Interface and points used for local graphs

MODEL WAM_ECMWF - Baza: 29/7/2014 (12:00 UTC) + 0 h

Valid: 29/7/2014-12UTC

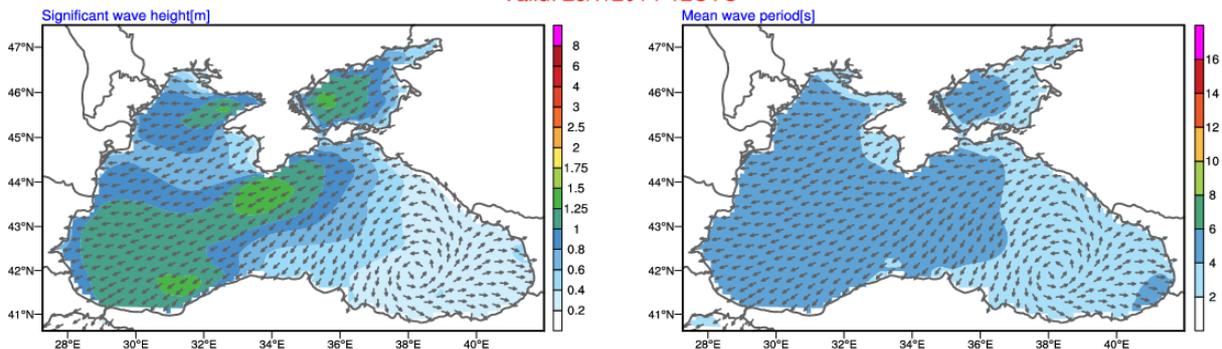


Fig. 5 Example of maps used in operational activity

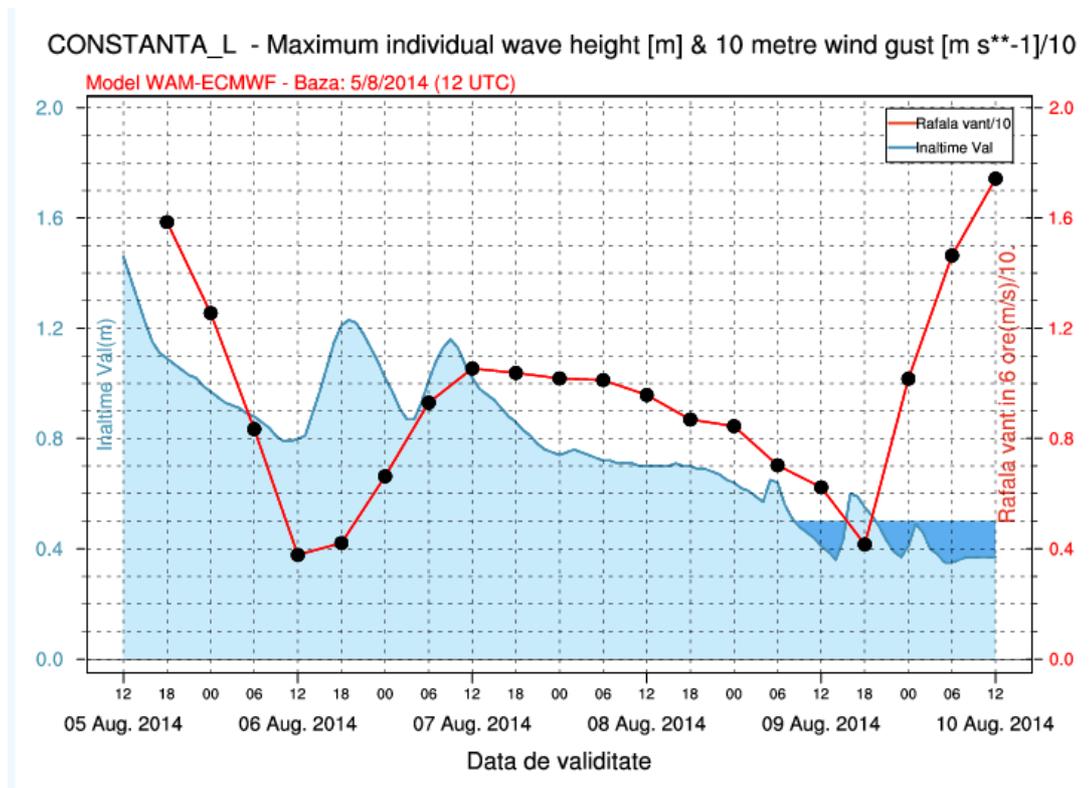


Fig. 6. Graph example in specific point over the sea.

3. Verification of products

3.1 Objective verification

3.1.1 Direct ECMWF model output (both deterministic and EPS)

The objective verification has been continued in 2013, using the **VERMOD** - an unitary system for objective verification of all models used operationally by the National Meteorological Administration (NMA): ECMWF, ARPEGE, ALADIN, ALARO COSMO_RO. A wide range of statistical verification measures are computed daily and monthly. The results are disseminated via dedicated *statistical and verification* web-site. The results are averaged over different stations selections.

3.1.2 ECMWF model output compared to other NWP models

Comparison of performance of ECMWF model to other NWP models used by NMA is performed daily and monthly, for the most important surface weather parameters: 2m temperature, 10m wind speed, total cloudiness, mslp pressure and 24 h total amount of precipitation. Graphs of the main verification scores are available on the web-site and also an overview of the performances of the models for all year.

The monthly scores are presented on the web-site in the graphs form. The monthly comparative BIAS and RMSE distribution for 2013 – 2m temperature- is shown in Fig 7.

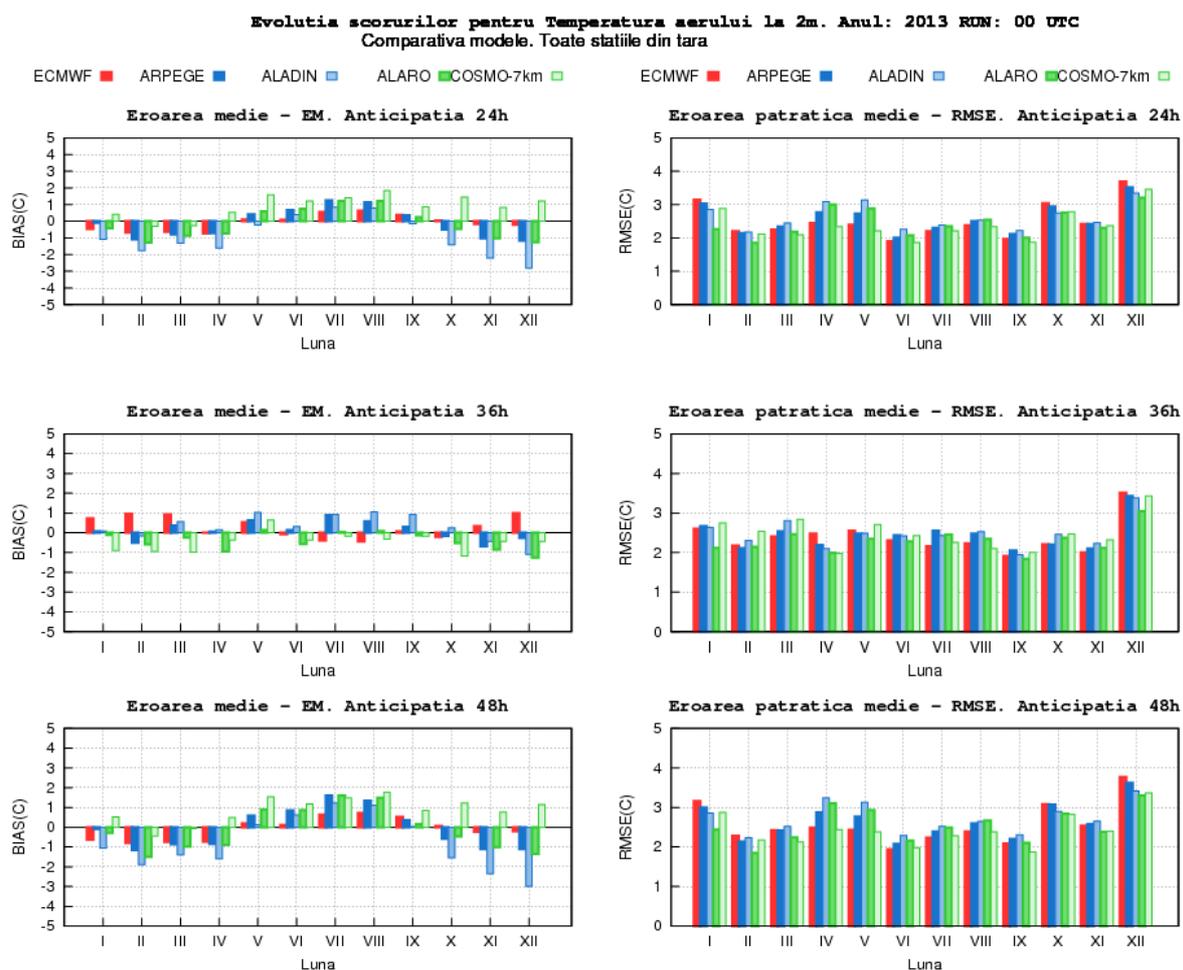


Fig.7. 2m Temperature. Mean monthly BIAS and RMSE scores distribution using all meteorological stations. Year – 2013

3.1.3 Post-processed products

All MOS forecasts have been verified every month since 2004, and the results have been displayed on the web site. A comparison between MOS and meteorologist forecasts, for extreme temperatures, total cloudiness and precipitation (Yes/No) is performed daily and monthly. There were no major changes during 2013.

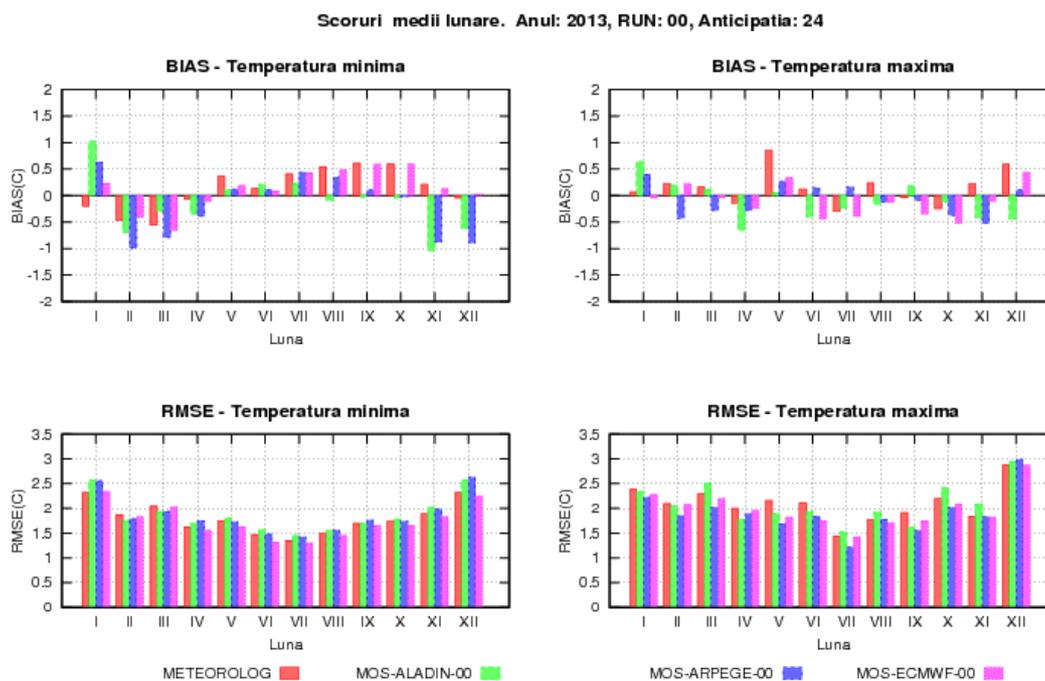


Fig. 8. 2m Temperature. Mean monthly BIAS and RMSE scores distribution using all meteorological stations. MOS against MET(forecaster) forecastings.
Year – 2013

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

(Copies of relevant internal papers may be attached)

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