



Green Book 2024 - aka Use and verification of ECMWF products in the Member and Co-operating States

Fields marked with * are mandatory.

Introduction

Welcome to ECMWF new "Green Book" online submission system (aka "Use and verification of ECMWF products in the Member and Co-operating States")

This time we have two options for completion:

- Filling out the online questionnaire below (new for this year based on feedback from the Meteorological Representatives meeting in November 2023)
- Producing a single report offline (as done in previous years), and emailing the report as detailed in Section 1.

Both methods ask the same questions, however the questionnaire method requires no formatting and aims to make analysis of all responses easier. The questionnaire option also allows you to part-complete, and save your entries to come back to later (using the "Save as Draft" button in the top right corner of this page). Note that the EUSurvey page will timeout after 60 minutes of no activity, responses are usually saved however to be sure please "Save as Draft" to avoid losing responses.

The deadline for all submissions is 23:59UTC on Wednesday 15th May 2024

A summary of responses will be presented at UEF2024 with a summary report available in the ECMWF Publications library in due course.

Section 1: Background - please fully complete

* 1.1 Which Country is your submission for?

GE - Georgia

*** 1.2 Please provide your name(s)**

Davit Loladze

*** 1.3 Please provide your organisation**

National Environmental Agency, Hydrometeorological Department

*** 1.4 Please select your preferred submission method:**

- Producing a single report offline
- Online questionnaire

Online questionnaire

Please answer the following questions, and illustrate your answers, where appropriate, by also uploading clearly annotated images with image/figure numbers (max 1MB per file). More questions or options may appear, depending on answers to particular questions. Mandatory questions are marked with a '*'. Free text boxes appear to have a 5000 character limit (if your answers are longer than this please email them to Becky and they will manually added), answers don't need to fit the box size given, the boxes expand.

Responses to the questionnaire can be saved and returned to at a later date before submitting. To do this click the 'Save as Draft' button on the left, this will provide you with a link which you can return to to continue /complete your submission.

Section 2: Summary of major highlights

*** Please detail major highlights since January 2022**

You may wish to complete this section at the end, after completing all others.

The major highlight I can mention is the coordinates of the cities or places in Georgia, now they look much correct. Also, we see better results from ENS meteograms.

Section 3: Forecast products

3.1. Please outline what direct use you make of standard ECMWF model products (on ecCharts / OpenCharts / own workstation), for operational duties, in the following 4 categories (noting that new AI model output should be dealt with separately, via question 3.4).

*** a) Medium Range (e.g. for high impact weather forecasting)**

1. 500 hPa geopotential height and 850 hPa temperature
2. 2 m temperature and 30 m wind
3. Temperature and geopotential at various pressure levels
4. 2 m temperature and 10 m wind
5. Wind and relative humidity at various pressure levels
6. 500-1000 hPa thickness and mean sea level pressure
7. Indices (MUCAPE/Kindex/Totalx)
8. Precipitation during last 6 hours (total / large scale / convective)
9. Lightning flash density during last 6 hours
10. Height of zero degree level (temperature / wet bulb temperature)

Extreme forecast index

1. Multi-parameter EFI during last 24
2. EFI 2 m temperature
3. EFI 2 m minimum temperature
4. EFI 2 m maximum temperature
5. EFI wind gust
6. EFI precipitation
7. EFI snow fall
8. EFI CAPE and EFI CAPE shear

Point-based product

1. ENS Meteograms 10, 15 days ENSgrams, 15 days ENSgrams with Climate, Plumes and Waves ENSgrams.
2. Precipitation type meteograms
3. ENS visibility meteograms
4. EFI/CDF
5. Vertical profiles

*** b) Extended Range (monthly)**

Extended range forecast:

Weather regimes probabilities

Time-longitudes diagram

2m temperature, precipitation mean sea level pressure, 500 hPa height, 10 hPa temperature – Weekly mean anomalies, and Probability distribution for all parameters

*** c) Long Range (seasonal)**

OpenCharts:
Temperature 2m; Precipitation; MSLP; 500 hPa geopotential.

*** d) CAMS and Fire-related output (ecCharts mainly)**

Dust aerosol optical depth at 550 nm

3.2. ECMWF cycle 48r1 went live at the end of June 2023. Changes included a much higher resolution medium range ensemble, and much more frequent monthly forecasts.

*** a) Please describe any positive impacts of model cycle 48r1 for your service**

ECPDS disseminated 10 surface variables (2d, sund, tcc, ssrd, 10v,10u, tp, 2t, ptype, e) from HRES, feed Georgian climate services for agriculture, also probabilities (tpg10, tp20, tp25, tp50) form cycle 48r1. Two variables (167.128, 228.128) from 50 ensemble members of cycle 48r1 near real time download from MARS daily to feed hydrological impact-based forecast.

If you have any annotated graph/diagram/plot that would help clarify your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

*** b) Please describe any negative impacts of model cycle 48r1 for your service**

We are still on our way to validate, not done yet.

If you have any annotated graph/diagram/plot that would help clarify your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

*** c) Have you noticed any systematic changes in forecast output since model cycle 48r1 was implemented?**

- Yes
 No

*** 3.3: Do you modify ECMWF model output to create 'derived fields' (e.g. post-processed output, regimes, probabilities).**

- Yes

No

*** 3.4: Do you currently use Artificial Intelligence (AI) and/or Machine Learning (ML) techniques in your service, in conjunction with standard ECMWF model output?**

Yes

No

*** 3.5: Does your NMHS use ECMWF data for modelling purposes - e.g. by providing initial/boundary conditions for limited area model runs, or for hydrological models, or for dispersion models, etc...**

Yes

No

Please describe these activities

ECPDS disseminated initial/boundary condition of HRES used to run WRF-ARW lam 4 times a day, output feeds agricultural and hydrological applications on the short range (90 h), which is continued with direct HRES output for medium range (240 h).

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

*** 3.6: In the last year or so ECMWF has made available, on ecCharts and OpenCharts, selected fields from AI models (e.g. Pangu Weather, AIFS). Were you aware of this?**

Yes

No

*** a) What are your views on this initiative?**

We are interested in details, on how those AI models work.

*** b) Do you currently use AI forecasts for operational purposes?**

Yes

No

What would you need in order to use AI models in your forecast activities?

First of all environment. Currently, we are implementing ICT systems in our institution, due to some reasons, it took a while. would be interesting to get more information or practices, on how AI models are used in other institutions and what are the main requirements from our side to use them.

Section 4: Verification

ECMWF does extensive verification of its products in the free atmosphere. However, our verification of surface parameters is more limited and can be constrained to only using synoptic observations. More detailed verification of these surface weather parameters by National Services is always valuable to us. We are most interested in results for the last 1 or 2 years. Also, any evidence you have of performance changes since the introduction of cycle 48r1 would be very valuable.

* 4.1 Do you routinely verify raw model output from ECMWF model(s) and/or other operational models /ensembles?

- Yes
 No

Please describe your verification activities and show and discuss related scores in the the two lead-time categories shown below, including, where possible, comparisons with your own models /ensembles, and other models/ensembles.

Ideally focus on surface weather parameters in your own territory. Inclusion of conditional verification results is also strongly encouraged - e.g. stratification by a weather type - as these can provide very useful insights into model weaker points.

a) Short Range and Medium Range

Wind speed and wind gust performance verification, also gust factor assessment is in the process of development. Calibration of gust factor on the AWS points is the goal.

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

b) Extended Range (Monthly) and Long Range (Seasonal)

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

* 4.2 Do you routinely verify post-processed products and/or tailored products delivered to users?

- Yes
 No

*** 4.3 Do you perform any subjective verification of forecasts?**

- Yes
- No

Please describe and illustrate any activities and results in this area

We do subjective verification of the forecasts issued by the agency, but as I mentioned above, ICT system will give us an opportunity to go deep and make detailed verifications.

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

4.4: Case Studies. Please describe and illustrate any case study verification you have undertaken. Examples of both good and bad model performance are welcome. Severe weather events (and non-events) are of particular interest to us.

a) Case Study 1 - Please describe the forecast(s) and what happened

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

Case Study 1 is an example of:

- Good model performance
- Bad model performance
- Mixed (good and bad) model performance
- Other (please describe above)

Add another Case Study?

- Yes
- No

Section 5: Output Requests

5. Please describe, and illustrate if necessary, any particular requests you may have for new or modified ECMWF products.

a) Product request 1 - title / summary

Product request 1 - description of request

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

Add another Product Request?

- Yes
 No

Section 6: References

6. Are there any recent internal or external publications that relate to the questions in this survey? Please list them including the respective link/s. For any publications that cannot be readily downloaded via a link please attach a copy below (or email Becky Hemingway (becky.hemingway@ecmwf.int) and Tim Hewson (timothy.hewson@ecmwf.int) if too large to upload here).

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

Section 7: Additional comments and Feedback

7.1. Please use the box below if you have additional comments on topics that have not been covered in any of the questions above

We would like to ask you to update the base map of the EcCharts, where our cities are written incorrectly e. g. Bat'umi which should be Batumi, without apostrophes, this is just one example, there are a lot of locations

with incorrect names. Also, there are missing very important cities/resorts not included. We would like to update coordinates, which are much better after the big update which happened several months ago, but there are some places missing or incorrect.

If you have any annotated graph/diagram/plot that would help support your answer to the previous question, please upload here.

File types: most accepted, File Size: max 1MB per file.

7.2. This is the first time we have used a survey style structure for Green Book submissions. Your thoughts and feedback on this process are very welcome

Thank you for providing this opportunity to describe our needs or goals reached by our specialists. We really appreciate it and would be happy if you would improve above mentioned (base map/city names)

Thank you for taking the time to complete your Green Book report. Your feedback and comments are very valuable to us!

Contact

[Contact Form](#)