ECMWF MS/CS “Green Book” Report 2024

This report relates to Use and Verification of ECMWF products in Member and Co-operating States, since January 2022. Please add your text below under the appropriate headings. Mandatory questions are marked with a ''. Also,* ***please do include figures/tables wherever you feel they are appropriate****, with figure/table numbers (e.g. “Figure 1”) and explanatory captions underneath. You should aim for the finished report to be 8 pages or less. Once completed it would be help us if you could delete all the ECMWF instructions (in grey italics) such as this paragraph.*

Section 1: Background

* 1.1 Country

LUXEMBOURG

* 1.2 Author(s)

Luca MATHIAS

* 1.3 Organisation

MeteoLux

* Section 2: Summary of major highlights

Please detail here major highlights since January 2022. You may wish to complete this section at the end, after completing all others.

Section 3: Forecast Products

3.1. Direct use of ECMWF forecast products

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

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

Daily use of IFS deterministic and ensemble output.

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

Occasionally in case of press requests.

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

Occasionally in case of press requests.

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

EFFIS FWI is provided daily to the National Civil Protection.

3.2. Cycle 48r1

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. In sub-sections a and b below lease detail any positive or negative impacts of this cycle for your organisation.

*** a) Positive impacts of model cycle 48r1**

n/a

*** b) Negative impacts of model cycle 48r1**

n/a

c) Systematic changes in forecast output since model cycle 48r1 was implemented

n/a

3.3: Derived Fields

Do you modify ECMWF model output to create 'derived fields' (e.g. post-processed output, regimes, probabilities)? If so, please describe what you modify and how.

3.4: Artificial Intelligence (AI) / Machine Learning (ML) techniques

Do you currently use Artificial Intelligence (AI) and/or Machine Learning (ML) techniques in your service, in conjunction with standard ECMWF model output? - Please describe any such techniques and/or any future plans you have in this area.

3.5: Dynamical Adaptation

n/a

3.6: Data-driven (AI) models

In the last year or so ECMWF has made available, on ecCharts and OpenCharts, selected fields from AI models (e.g. Pangu Weather, AIFS).

*** a) ECMWF's real-time AI model initiative**

Good initiative. A better overview/comparison of the different model output parameters would be nice.

*** b) Use of AI forecasts for operational purposes**

None

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 verification evidence you have of performance changes since the introduction of cycle 48r1 would be very valuable.

4.1 Raw model output from ECMWF, and other operational models/ensembles

In sub-sections a and b below please describe your verification activities and show and discuss related scores, in the two lead-time categories. This should include, where possible, comparisons between ECMWF and 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

n/a

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

n/a

4.2 Post-processed products and/or tailored products delivered to users

n/a

4.3 Subjective verification

n/a

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. Add further sub-sections c, d etc manually if you have more case studies to highlight.

Section 5: Output Requests

Please describe, and illustrate if necessary, any particular requests you may have for new or modified ECMWF products. Add more sub-sections manually (c, d etc.) if you need them.

a) Product request 1: *Universal Thermal Climate Index*

Operational output of the UTCI (deterministic and EPS)

Section 6: References

n/a

Section 7: Additional comments and Feedback

n/a