Workshop of World Meteorological Centres

Beijing, China, 26-29 March 2019

Questionnaire for World Meteorological Centres

(as of 27 February 2019)

Note: The following seven questions will be used to orient participants' discussion on:

- *Agenda III. WMCs in the context of WMO Constituent Bodies Reform*, and
- *Agenda IV. Overall coordination mechanism between WMCs and WMCs/RSMCs to support Members*.

Your answers will be distributed to all participants in advance.

I would deeply appreciate if you could send your feedback **before or on 15 March** 2019

Name of World Meteorological Centres: ECMWF

Agenda III

1. What areas your WMC wants to improve in near future and in the long-term by considering the functionality described in WMO-No. 49

Note: World Meteorological Centre (WMC). A centre of the GDPFS that has the primary purpose of issuing meteorological analyses and prognoses, including probabilistic information and long-range forecasts on a global scale. (WMO-NO. 49, Technical Regulations, Basic Documents No. 2, Volume I – General Meteorological Standards and Recommended Practices)

ECMWF strategy can be found at
https://www.ecmwf.int/sites/default/files/ECMWF_Strategy_2016-2025.pdf.

This highlights a goal for operational ensemble-based analyses and predictions that describe the range of possible scenarios and their likelihood of occurrence and that raise the international bar for quality and operational reliability. Skill in medium-range weather predictions in 2016, on average, extends to about one week ahead. By 2025 the goal is to make skillful ensemble predictions of high-impact weather up to two weeks ahead. By developing a seamless approach, we also aim to predict large-scale patterns and regime transitions up to four weeks ahead, and global-scale anomalies up to a year ahead. These directions will lead to improved deterministic and ensemble medium-range predictions and seasonal predictions as required of a WMC (and additionally improved subseasonal predictions).

Additionally ECMWF takes an Earth System Approach, both to improve 'traditional' forecasts and, particularly through the Copernicus Atmosphere Monitoring Service and

Copernicus Climate Change Services, to allow predications and monitoring of a wider range of environmental variables. Key areas include waves, air quality, flooding (GLOFAS), fire and climate reanalyses.

2. What could be additional roles of your WMC to support the WMO Constituent Body Reform and Strategic Plan of WMO, especially Strategic Objectives 2.3

Note: Strategic Objective 2.3: Enable access and use of numerical analysis and prediction products at all temporal and spatial scales from the WMO seamless Global Data Processing and Forecast System

References:

- *Reform presentation - CBR-TF-sc,*
- *Constituent Bodies Reform - substructures and presidents and vice presidents,*
- *EC70 Strategic Plan*

Available at http://www.wmo.int/pages/prog/www/DPFS/Meetings/WMCs-Workshop_Beijing2019/Docplan.html

Continued improvement in data currently provided as WMC, with focus on integrated ensemble system.

Potential broadening of scope with ECMWF capabilities on subseasonal timescales, and in wider environmental prediction e.g. air quality, hydrology etc through Copernicus.

Developments in cloud (European Weather Cloud) have potential to facilitate access to / use of more data.

Continued role in training - programme focused on Member and Co-operating States but ECMWF also carries out training activities in support of WMO SWFDPs. Copernicus Climate Change Service training developments also potentially relevant.

Agenda IV

3. Please provide the name of organizations that you are currently working with / worked / will work, identifying the nature of the work and your role and responsibilities.

Note: organizations can be UN agencies, NGOs, Regional entities such as RIMES and other GDPFS Centres

Very strong links within (22) Member and (12) Co-operating States - particularly to NMHSs who use our forecasts (directly and to drive LAMs) but also other users and academia. Also training role.

Footprint on a global scale through

- Provision of deterministic, ensemble and seasonal data as required through role as WMC
- Provision of wider range of data through license (discounted for public task use by WMO members)
- Involvement in SWFDPs (including training)

- Research links (bilateral and through WMO e.g. S2S project, WGNE…..)
- Engagement with observation providers eg EUMETSAT, WMO co-ordination

4. In relation with question 1 (assuming this should this be 3?), what are the most difficult challenges you met and how you did overcome it, if you did.

Prioritization of training needs around SWFDPs etc. More structured approach through GDPFS would be useful.

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5. Is there a good example of coordination mechanism between your WMC and other centres you want to share. Tell us why it is a good example of coordination mechanism.

We have established processes to work with our Member and Co-operating States.

More generally we provide 24/7 services to support forecasters and users.

We have formal cooperation agreements with a number of organizations globally (e.g. CMA, INPE, NOAA). Through these we exchange expertise, knowledge and get feedback on our products. However, in addition a huge number of less formal links, particularly in terms of research (e.g. 80% of ~150 scientific papers published annually including non-ECMWF author from another country).

6. As a WMC, do you have specific request to make to SIDS and LDCs to help improve your system?

Note: For instance, Ghana utilized cloud resources with Reading University for forecasting drought. They provided their observations which were assimilated in UKMO Land Surface Model to enhance quality of drought forecast.

Maintain/expand free exchange of observational data (including observations of wider earth system variables (e.g. snow, hydrology). Feedback on the quality of our products is also always appreciated.

7. LDCs and SIDS are interested in not only chart-type products but also NWP output. To help them to develop applications (post-processing), how do you see your WMC addressing these needs?

They could benefit from non-commercial licenses

In the future developments in cloud services (’European Weather Cloud’) expected to improve access to NWP data (reducing need for transfer of large volumes).

Copernicus data is freely available, and already making use of cloud technologies for user access e.g. climate data store.