

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: Melbourne WMC

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)

Melbourne WMC is located between the southern Pacific and Indian oceans, within a vast region of (with the exception of Indonesia) generally low population and relatively poorly resourced NMCs. An important challenge for the WMC is to support the work of RSMCs Darwin, Wellington, and Nadi in the region in their specialist roles, as well as directly supporting the NMCs. In particular, there is the question of the successful Severe Weather Forecast Demonstration Project (SWFDP) in the South Pacific and its potential expansion westwards to include the highly populated areas of Papua New Guinea, Timor Leste, and Indonesia.

The SWFDP (as summarised within the Regional Subproject Implementation Plan) is: "...an excellent way to apply the cascading approach for forecasting severe weather in three levels, as follows:

- *Global Centres to provide a range of NWP products, including probability forecasts;*
- *Regional Centres to interpret information received from global NWP centres, run limited-area models to refine products and liaise with the participating NMHSs;*
- *NMHSs to issue alerts, advisories, severe weather warnings; to liaise with DMCPAs and the media, and to contribute to the evaluation of the project.*

The SWFDP implements a cascading forecasting process implying the participation of selected centres chosen within a geographical area affected by an agreed type of severe weather event. The cascading process aims to ensure the real-time distribution of the relevant available information produced by both a Global Centre(s) and a Regional Centre(s) to selected NMHSs. Moreover, it is necessary to continue the cascade by making the final authoritative products of hazardous conditions (advisories or warnings) produced by the NMHSs available to the final users such as media and local Services in charge of hydrology and/or DMCPAs.”

The Bureau of Meteorology regards the SWFDP as a best practice approach for supporting SIDS and LDCs in the region. Previous evaluation reports have highlighted the need to sustain and develop the approach, including at the in-country level. From the WMC perspective, there is a need to continue to sustain and develop products.

The Australian Bureau of Meteorology also has close bilateral relationships with countries outside the current SWFDP area (eg Papua New Guinea, Timor-Leste, Indonesia), and in particular has recently joined with Papua New Guinea under a formal Memorandum of Understanding in the transport sector, which includes the Papua New Guinea National Weather Service. Activity is underway to improve the observations from Papua New Guinea, and, following a collaboration during the 2018 APEC meeting and together with joint work on strategic planning, it is proposed to work on specific improvements to numerical weather prediction guidance to Papua New Guinea, which has very challenging topography.

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

In June 2018, Australia's PR confirmed existing WMC Melbourne mappings for global deterministic & ensemble, ocean prediction, in addition to RSMC Darwin functions for regional severe weather forecasting (as a mapping from its former geographic specialisation), and RSMC Melbourne's nuclear environmental emergency response function. The PR also noted that Australia will continue to carry out the international responsibilities of our Tropical Cyclone Warning Centres, will participate in the demonstration phase of the Regional Climate Centre Network in RA V, and will consider additional GDPFS activities on a case-by-case basis.

This remains the case. Australia is open to considering additional activities, but is also mindful that additional WMC and/or RSMC roles must be undertaken on a sustainable, long-term basis, and with the full support of relevant NMCs. As noted above, we believe that the full operationalization and possible expansion of the South Pacific instance of the SWFDP is a priority in the region.

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

IOC-UNESCO (eg tsunami warning arrangements - Melbourne is also a Tsunami Service Provider for the Indian Ocean)

UNDP - various interactions, particularly in areas of capacity building (eg Papua New Guinea, Timor-Leste)

ICAO (multi-faceted, including as a Volcanic Ash Advisory Centre for the International Airways Volcano Watch, which involves much liaison with regional NMSs)

SPREP (Secretariat Pacific Regional Environment Programme) - coordination of Pacific climate activities

Pacific Community - implementing partner

World Bank (PREP program in Tonga and Samoa)

South Pacific University

Numerous bilateral relationships.

4. In relation with question 1, what are the most difficult challenges you met and how you did overcome it, if you did.

The most difficult challenge in our opinion is to have a long-term, sustainable program with demonstrated benefits and continuous improvement. It is relatively easy to have a 'headline' capacity building project, but a consistent experience in the region is that benefits are not necessarily sustained, potentially leading to inefficient outcomes, disillusionment, and reputational damage. It is most important that WMO-associated projects do not result in these outcomes.

In this regard, it is important to again note the methodology of the Severe Weather Forecast Demonstration Project, which seeks impact-focused user feedback from the ground and on a long-term basis. This is essential for validation. The investment in this methodology is not trivial and should be borne in mind when seeking to expand WMC activities.

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.

Some recent improvements in coordination between GDPFS-related centres comes from the ICAO International Airways Volcano Watch, where social media and/or messaging platforms are now being used for real-time observation and opinion exchange between operational centres, including between centres where there are substantial language and disciplinary barriers, such as Australia (VAAC Darwin) and Indonesia (Centre for Volcanology and Geological Hazard Mitigation, MWOs Jakarta & Ujung Padang, Air Traffic Control, Airlines Operations Centres). These real time exchanges, backed up by diplomatic visits and joint projects, have proven highly effective during high-impact operational events and in situations where global, regional, and local considerations are at play. Because the information flow includes trusted users of the information, validation of the warning strategy and

commentary on the accuracy of VAAC advice is frequently obtained in real time.

Platforms such as this are very useful for moving from occasional interactions, including 1:1 telephone-based contact to a more solid online forecasting community that allows for multiple parties in a conversation and the fluid exchange of points of view.

Drawing from these experiences, Australia and Papua New Guinea used an online coordination mechanism during the APEC meeting in November 2018, during which Australia provided some 'embedded' forecasters to assist in operations, but broader support was drawn from RSMC Darwin as an extended forecasting team. The extended team proved critical in supporting critical 'on-ground' operations in a high-pressure situation.

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.

Local investment is critical for the success of the GDPFS. For example, a robust regional observations network, including upper air observations where possible, is a critical ingredient of analysis and modelling, and can be used as evidence for the SIDS and LDC contribution to the total system. Similarly the SWFDP (discussed above) relies on local event evaluations to inform continuous improvement and to validate the investment in the system.

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?

We recognise that the ability to 'dive into', manipulate, and critique data is important for NMSs at all scales. We note that, in our region, some NMSs have chosen to move to commercial visual display systems for that purpose, as an alternative to 'freeware' that may be less supported. On the other hand, some LDCs or SIDS, data transmission limitations mean that the chart-type products are a useful option. WMC Melbourne (on behalf of RSMC Darwin) provides global and regional NWP data to other NMSs as required, and also maintains a basic set of chart-type products.