SEVENTH MEETING OF THE PACIFIC METEOROLOGICAL COUNCIL (PMC-7)

"At the Frontline of Weather, Climate, Water, and Ocean Action in the Pacific"

17-19 September 2024, Warwick Le Lagon-Vanuatu Resort, Port Vila, Vanuatu

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Agenda Item 14.2: Guiding Principles for Observations, Communications and ICT Infrastructures

Purpose:

1. To inform the meeting on the common challenges that need to be considered related to the investment and operation of basic observing and communications infrastructure supporting the delivery of services across the region
2. To propose a forum across the PMC panels to engage and discuss observing and communications infrastructure priorities, development and crosscutting issues.
3. To seek the meeting's guidance and invite comments and endorsement of the recommendations of the PICI Panel.

Objectives:

1. Setup and align the Pacific Regional Basic Observing Network (RBON) to support the needs of NMHS and Weather Ready Pacific
2. Identify priority investments and actions required to enable ICT to support the communication of observations and services across the region

Background:

It is well recognised that sustainable hydro-meteorological products and services require robust infrastructure in observing, communications and ICT infrastructure in order to capture, process and exchange observations, and to generate and disseminate forecasts and warnings through national, regional and global networks.

For many years this foundational infrastructure within the region has suffered from unreliable or intermittent investment and support, the results of some of which can be seen in the WIGOS Data Quality Monitoring System (www.wdqms.wmo.int) where the availability of some observations from the region is inconsistent, varying from week to week or month to month. WDQMS Daily Result for 1 September 2024.

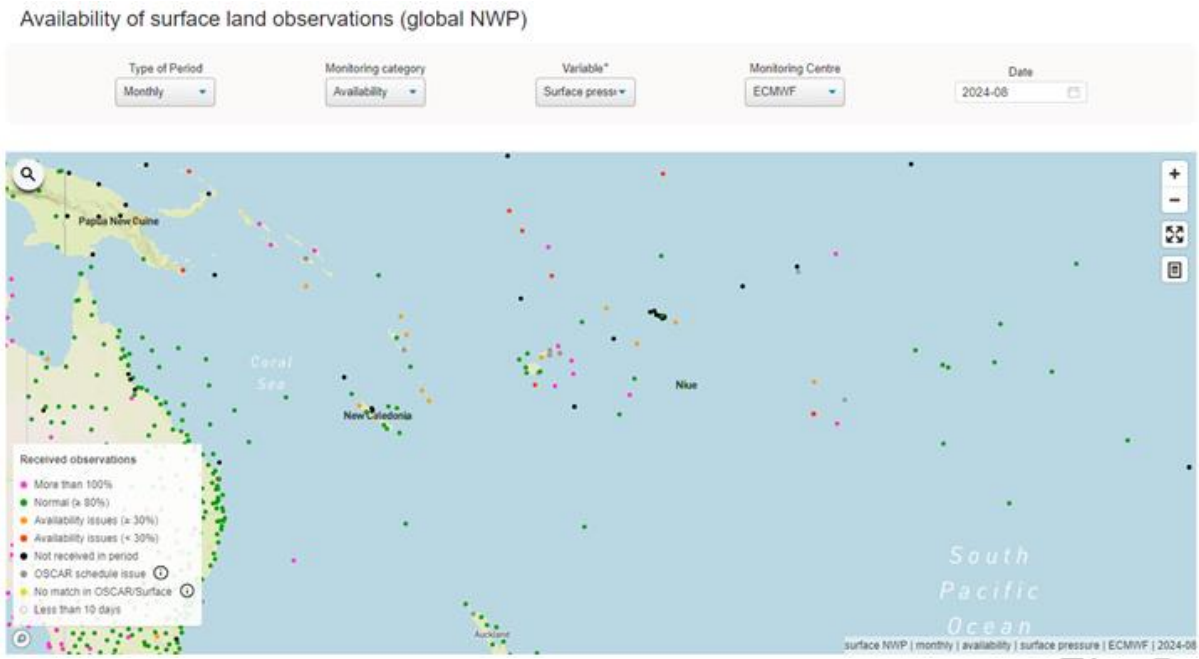

Figure 1. Monthly reports of surface pressure for August 2024 based on WIGOS Data Quality Monitoring System (WDQMS).

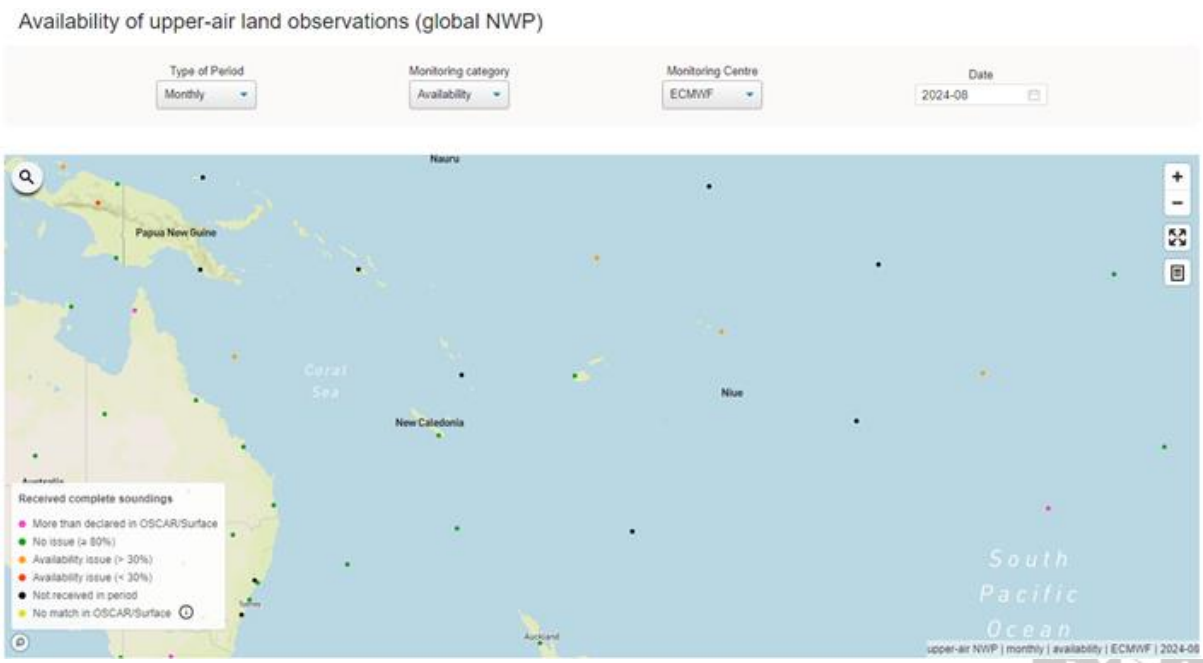

Figure 2. Monthly reports of Upper Air profiles for August 2024 based on WDQMS.

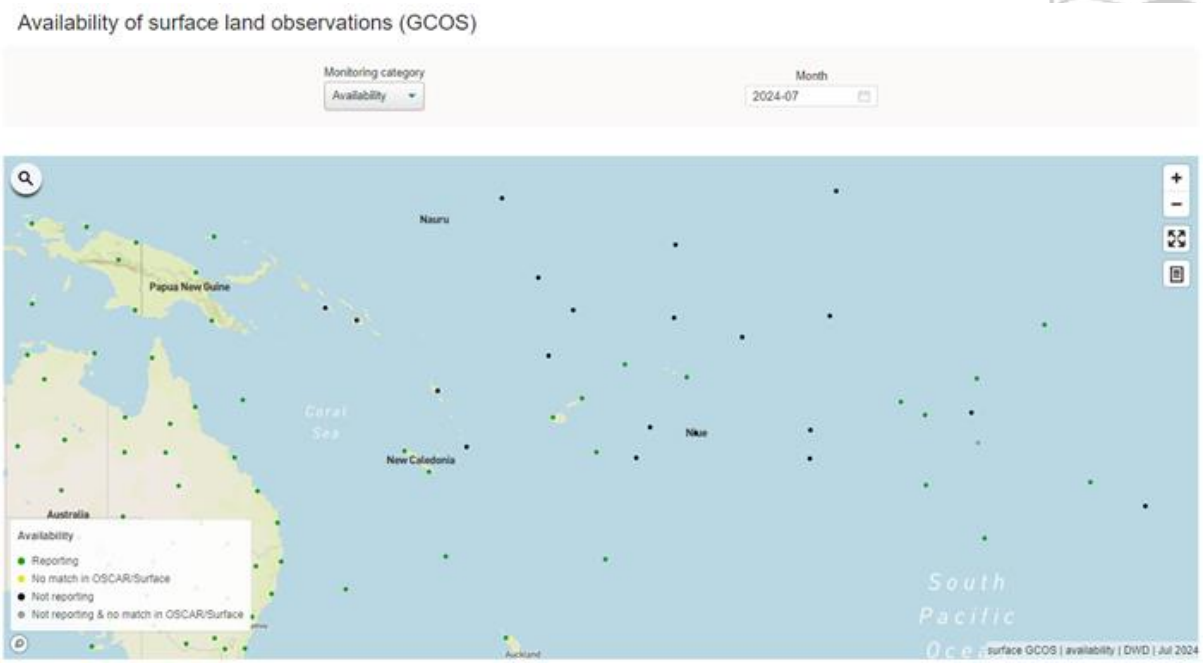

Figure 3. Monthly reports of GCOS CLIMAT reports for July 2024 based on WDQMS.)

In addition, 85% of stations from the Pacific registered on OSCAR are in desperate need of repairs or updating.

Table 1: Number of Stations in the Pacific registered on OSCAR

No. of stations registered in Oscar Surface	>230
No. of these stations needing updating	196 (85%)

Major new infrastructure projects introduced to the region have typically not been funded beyond their project implementation timelines. This has resulted in significant new infrastructure maintenance costs being expected from, or imposed on, the recipient governments or NMH Services (NMHS).

Not only does a NMHS need to undertake a regular observation programme, manage their national communication systems and the associated ICT infrastructure, they should also:

1. Maintain their observing station metadata through the WMO Observing Systems Capability Analysis and Reporting tool – OSCAR Surface.
2. Ensure observation data reaches regional forecasting centres and Global NWP centres through robust communications infrastructures (GTS / WIS 2.0) in prescribed code forms.
3. Manage data information management quality through carefully planned maintenance programmes, and through regular traceable calibration services.
4. Ensure adequate budget planning and provision at the national level to enable costs for staff time, travel and materials (e.g. spare sensors and other hardware) to be covered to support routine operational troubleshooting and maintenance.
5. Have planned for and implemented resilience across their key infrastructure components to manage risks associated with equipment failure, or failures in supply chains e.g., having appropriate Service Level Agreements in place with ICT suppliers, Telcos etc.

Guiding Principles

When considering the need for a regional approach to the GBON Implementation plan, insights from recent Peer Advisor activity undertaking SOFF Assessments in the region point to a need for a set of guiding principles to help guide investment decisions to not just deliver the infrastructure the region requires, but to also maximise the value of infrastructure investments flowing into the region. This will help overcome the cyclical

nature of infrastructure investment where support for operational or maintenance activities ceases at each project termination.

A set of regionally developed and national relevant guiding principles might include and such things as:

- Standardization guidance of observation technologies and communication infrastructure, for example a regional telemetry system that maximises the return on continued infrastructure investment and leverages shared costs wherever possible, such as bulk purchasing of satellite services and other common observation and communication infrastructure needs. (Noting the examples and best practices implemented by NOAA in the North Pacific Weather offices and other US Territories)
- Selection of communication technologies for regional use with SLAs that meet the special characteristics of individual countries,
- Adoption of robust ICT systems that leverage existing in-region and national capabilities.
- Guidance on systematic cost analysis, budget planning and provision for core system monitoring and maintenance to help NMHS to build sustainability into basic services.
- Develop and implement robust methods for cost benefit analyses of core services to help benchmark sustainability investments and whole-of-life costs for infrastructure, risk management, and decision-support services
- Guidance for training on observing technologies and communication infrastructure, quality management, alternative communication infrastructure and connectivity redundancy options
- All observing and monitoring data collected at the national and regional level is stored in the region and at the national level.
- Guidance for data sovereignty, archiving and security policies and procedures.
- Encourage development of tailored Accredited training on observing technologies and communication infrastructure

Guiding principles will, to a degree, simplify already complex issues related to regionally inconsistent infrastructure implementation and operation, and will provide additional benefits in the training of staff and the provision of support, and this will, in turn, help to maximise the value of any investment initiatives delivered under the Weather Ready Pacific Programme.

Recommendations:

The Meeting is invited to:

- **Note** that reliable communication infrastructure and observations are the cornerstone to all weather, climate and hydrological forecast and warning services.
- **Recognise** the varying degree of ICT and observing capabilities and resources between countries across the region and the need to tailor and implement appropriate activities accordingly.
- **Recommend** NMHS to apply systematic budget analysis and planning for the maintenance and sustainability of core NMH Communication and Infrastructure services.
- **Recommend** partners and donors to use national and regional analyses to incorporate sufficient funding to support training, maintenance and sustainability of Observations Communication and Infrastructure services
- **Recommend** the setup of a forum for Inter-Panel engagement and discussion on infrastructure priority development and crosscutting issues across the PMC panels of experts.
- **Recommend** all NMHS, technical partners and donors to adopt quality management standards for observation networks and equipment in alignment with WMO standards (e.g. ISO27001).
- **Recommend** the Secretariat and the Panel Chairs to investigate the development of a regionally relevant Guiding Principles Framework for observing, communications and ICT infrastructures to maximise the value of investments delivered through the Weather Ready Pacific Programme and all other related projects