



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

"AT THE FRONTLINE OF WEATHER, CLIMATE, WATER, AND OCEAN ACTION IN THE PACIFIC"

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"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 17.1: Review of PMC and PMDP

Update and Progress of Review

Purpose:

1. To update the Meeting on the progress of the Review of PMC and PMDP
2. To raise issues for discussion and input to the Review.

Background:

1. The Pacific Meteorological Council (PMC) was formed in 2010, replacing the series of Regional Meteorological Services Directors meetings that had begun in 1993. The PMC is constituted as a body of SPREP, with Terms of Reference as given in Appendix 1 to this paper.
2. This Review stems from discussions at the fifth meeting of PMC in 2019. It has been scoped with three objectives:
 - a. Review and develop governance/organizational structure, roles, functions and operation of the PMC and its Panels, the Pacific Ministerial Meeting on Meteorology (PMMM), and provide clear list of prioritized costed options and recommendations including budget and human resources as well as identifying resources requirements for its sustainable implementation.
 - b. Review and develop governance/organizational structure, roles, functions, and operation of the PMDP and provide clear prioritized costed options and recommendations, including identifying resourcing requirements for its sustainable implementation. The review should also consider the organisational structure established under the Weather Ready Pacific - Decadal Programme of Investment (WRP-DPI) including the Pacific Partnership Coordination Mechanism (PPCM).
 - c. Identify synergies and opportunities to align to the WMO restructure.
3. Work on the Review commenced in May 2024, and is expected to be completed by November 2024. This PMC Meeting provides an opportunity to provide input into the Review and shape the final Review reports and recommendations for consideration by PMC (expected to be at an out-of-session meeting later in 2024).

4. A summary and discussion of issues arising to date is given in the following pages. Responsibility for commentary in this paper is taken by the consultant (Dr Andrew Tupper, andrewtupper@naturalhazardsconsulting.com).

Recommendations:

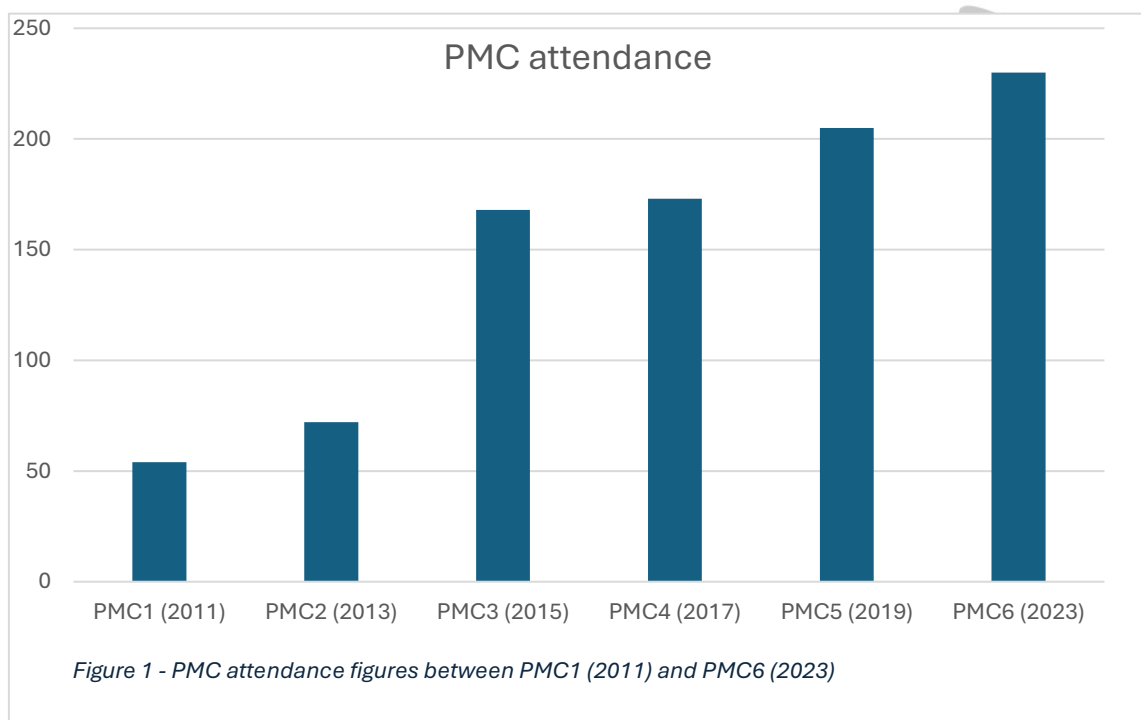
5. The Meeting is invited to:
 - a. Note that in-person consultations for the Review have largely concluded, and that virtual consultations will continue into October as the Review moves towards finalization
 - b. Note the preliminary findings given and views expressed, provide any additional input, and invite observers and other interested parties to give input.
 - c. Endorse the planned framing of the Review recommendations around the 2050 Strategy for the Blue Pacific Continent and the essential supporting role of hydrometeorological agencies, working in partnership with local, regional and global organisations.
 - d. Recommend that related strategic reviews (for example the Pacific Islands Meteorology Strategy update) also deeply consider the 2050 Strategy, for consistency of approach.
 - e. Note that the finalised Review recommendations will be considered at an out of session meeting of the PMC, likely during the October/November timeframe.

Discussion:

A: Insights from consultations and desktop review to date

6. The Review is progressing through the consultation process. To date, this has included physical consultations in:
 - a. Vanuatu (Workshop in May 2024 organised by PMDP, attended by majority of PMC members countries),
 - b. Samoa (visit to SPREP, WMO and MNRE),
 - c. New Zealand (MetService, NIWA, GNS NZ, CAA NZ),
 - d. Fiji (USP, PIFS, UNDRR, UNESCO, PDF, JICA, SPC, FMS),
 - e. Australia (BoM, DFAT),
 - f. Singapore (WMO), and
 - g. Geneva (WMO, SOFF).
7. Consultations continue and are also being conducted through videoconferencing. PMC-7 is a key opportunity to observe meeting processes and receive further feedback before formulating final options and recommendations.
8. Written evidence and insights from consulted parties have shown *many positive* aspects of the PMC / PMDP. These include:

- a. increased collaboration and coordination in hydrometeorological matters in general;
- b. a positive culture of collaboration, respect and mutual support within the PMDP staff in Apia, and between technical partners;
- c. the creation and update of the Pacific Islands Meteorological Strategy (PIMS);
- d. advocacy for the needs of the Pacific in hydrometeorology, and improved visibility of these needs nationally, regionally, and internationally
- e. improved project coordination, particularly for projects that SPREP is engaged with
- f. Pacific-led initiatives, particularly Weather Ready Pacific
- g. the creation of a point of physical coalescence for external parties interested in regularly meeting to understand the Pacific environment and priorities, as evidenced by strongly increasing attendance at PMC meetings over time (Figure 1).
- h. progress made on priority issues through the PMC Panels, which had provided additional focal points and opportunities for collaboration
- i. the positive impacts of the Ministerial Meetings on Meteorology, first held in 2015, in improving awareness, understanding, and commitment to hydrometeorology at Ministerial level.



9. However, significant issues also exist, and again have been evident in multiple threads of written and verbal evidence. Principally:
 - a. the PMDP resourcing has revolved around one full-time officer, assisted by in-kind and ad-hoc support from project officers and PMDP partners. As the PMC activities *and* the need for Pacific coordination in hydromet in general have grown (including managing the impact of bilateral, multilateral and global activities that occur without clear visibility or involvement of the PMC), the workload has become unsustainable, resulting in missed opportunities,

- slower than desirable progress on priority issues, limited support for Panels, and some frustrations for members, associates and technical partners;
- b. the PMDP feels isolated from projects that do not have the direct involvement of SPREP and has little resource to assist in harmonising them with other work being undertaken, resulting in increased risk of poor coordination, lower effectiveness and increased overheads for all parties;
 - c. in terms of the effectiveness of PMC Panels, there is a widespread view that the Panels are useful but could be much more effective with more consistent institutional support, with some Panels stronger than others in this regard. Where a Panel is closely aligned with project or programme support, it is much more effective;
 - d. human and financial resources do not permit close consultation with all the sectors relevant to hydrometeorology;
 - e. the PMDP Secretariat structure also essentially creates a single point of failure for the PMC, and poses health risks for the occupant of the full-time position and for other staff assisting during critical periods. Verbal evidence from staff underlines the risk of negative health and effectiveness outcomes from the current structure;
 - f. international organisations such as WMO have noted the difficulty of maintaining strong Pacific representation into international processes, noting also the extent to which Pacific NMHSs are stretched thinly and also the commonly unsuitable time zone for European-driven virtual meetings;
 - g. the PMC Meetings themselves function as a formal meeting of Directors of Hydrometeorological Services, and the rules of procedure reflect this. However, several parties consulted noted strongly that the PMC process is not ideal in terms of inclusive and consultative decision-making for the wider interested DRR community, and in some cases, PMC attendees felt excluded from the meeting process. It has also been noted that the wider the breadth of PMC deliberations, the more challenging it is to focus a truly *representative* and multi-disciplinary process through the Directors if there is not a stronger and more frequent consultation process leading to decision-making. In other words, the broader the practical scope and Terms of Reference of the PMC, the more difficult it is to operate under the current model.
10. Since 2011, the complexity of the international coordination environment in general has increased, together with needs for frequent consultation and harmonisation with interested parties. When asked about the effectiveness of international coordination in the Pacific, participants in the May Vanuatu workshop identified the positive impacts of the PMC (as noted above), but also articulated that some aspects of the overall situation (not necessarily directly associated with the PMC itself) were not improving or were getting worse, including:
- a) regional and international coordination in general,
 - b) sustainability of efforts made,
 - c) the time available to undertake related tasks
 - d) fragmentation of effort
 - e) diversity in hardware
 - f) the communication of funding opportunities

- g) degree of communication between UN-level bodies
 - h) quality of initial donor engagement
 - i) complex donor processes that result in underspending of donor funding
 - j) projects that are perceived as politically driven
 - k) alignment of national and international efforts
11. In addition, there are some long-standing challenges that may or not be improving but require *additional* attention in order to accelerate progress in the context of local, regional, and global imperatives. Many of these have been active topics at recent PMC meetings.
12. One particular issue that has repeatedly emerged in consultations (particularly during the Vanuatu workshop in May) has been the challenge of improving multi-disciplinary, multi-hazard warning systems, including for hydrological hazards and geohazards, in the context of the Sendai Framework, the Early Warnings for All Initiative, and the 2050 Strategy for the Blue Pacific. This is discussed further below.

B: Strategic Context: the 2050 Strategy for the Blue Pacific

13. The PMC-6 Meeting noted the development of the Implementation Plan 2023-2030 for the 2050 Strategy for the Blue Pacific, which was subsequently finalised and then endorsed by the 52nd Pacific Islands Leaders Forum in Rarotonga, Cook Islands, November 2023, along with an affirmation of the 2050 Strategy itself (Figure 2).
14. The 2050 Strategy and Implementation Plan provide a *strongly* defined umbrella under which CROP Agencies and bodies such as PMC operate. This is significant in the context of future PMC operations and strategic alignment, including in the review of the Pacific Islands Meteorological Strategy (PIMS) 2017-2026 and in any discussion of PMC arrangements. International commentators have already highlighted the potentially transformational nature of the 2050 Strategy¹, its role in shaping international actions around the Pacific, and the high engagement rate of international partners with the 2050 Strategy.²³ 'Blue Pacific' terminology and concepts are increasingly widely used in international discourse. Nevertheless, there remains a potential gap between rhetoric and action, and the actual effectiveness of the Strategy will be largely determined by systematic and substantial support for its implementation.

¹ Middleby Aumua, Audrey Soli, '2050: A Pacific Geostrategic Vision for the World's Only Blue Continent', Griffith Asia Insights, 8 August 2022, <https://blogs.griffith.edu.au/asiainsights/2050-a-pacific-geostrategic-vision-for-the-worlds-only-blue-continent/>.

² Baugh, Brittany, 'The 2050 Strategy for the Blue Pacific Continent: Political Actor or Political Pawn? Analysing Climate Change and Postcolonialism Discourse in the Post 2050 Strategy for the Blue Pacific Continent and the 2021 Post-Cotonou Agreement Context. What Is the EU's Role as a Climate Actor in the Pacific?' (University of Canterbury, 2023).

³ Joanne Wallis, Maima Koro, and Corey O'Dwyer, 'The "Blue Pacific" Strategic Narrative: Rhetorical Action, Acceptance, Entrapment, and Appropriation?', *The Pacific Review* 37, no. 4 (3 July 2024): 797–824, <https://doi.org/10.1080/09512748.2023.2253377>.

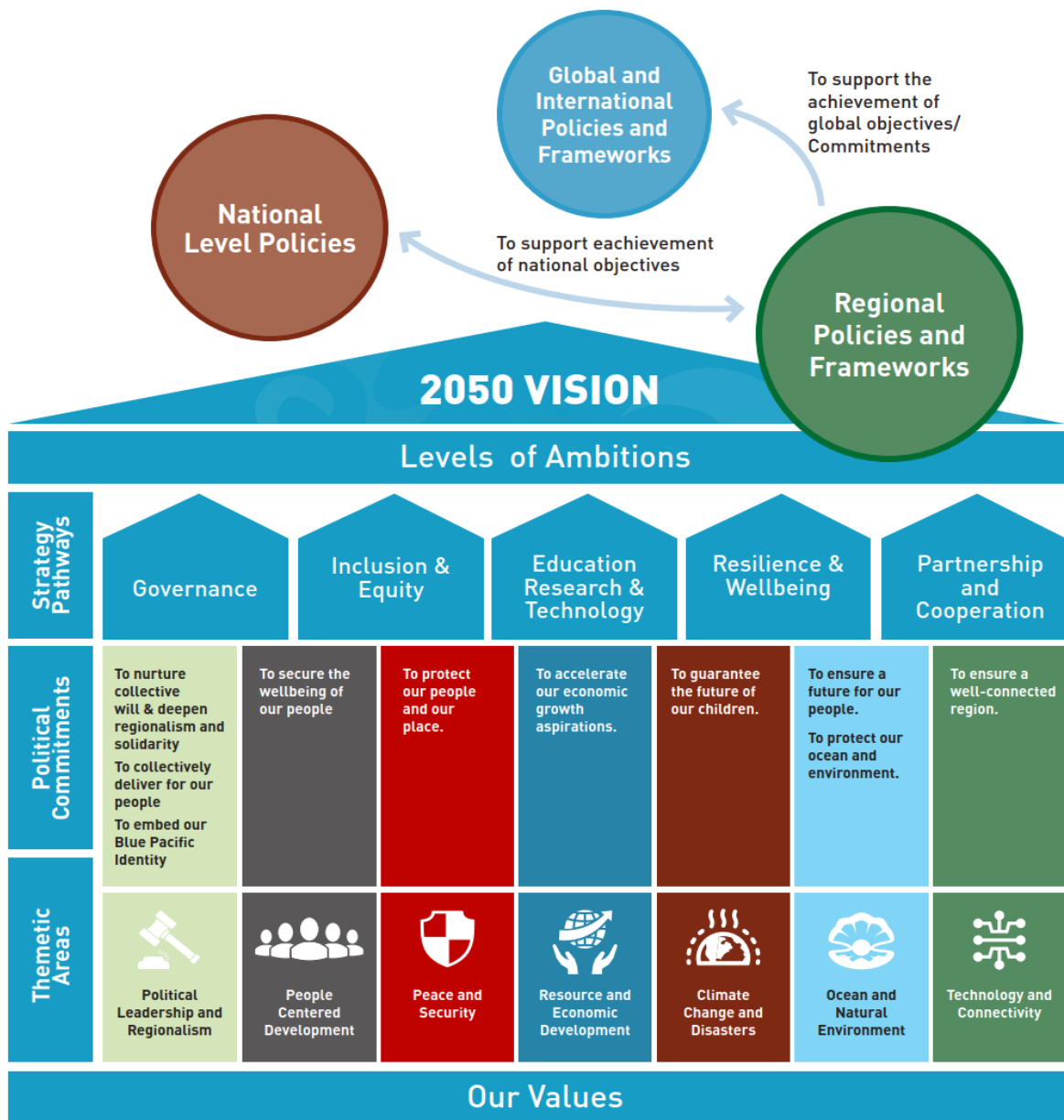


Figure 2 - Summary figure of 2050 Implementation Plan and Regional and National Level Linkages (2050 Strategy Implementation Plan 2023-2030).

15. The 53rd Pacific Islands Forum Leaders meeting in Tonga, August 2024 used noticeably strong language regarding the 2050 Strategy in its Communiqué. CROP agencies are urged to work in partnerships to help implement the Strategy, with thematic advisory Groups, reporting arrangements, alignment with the ongoing Review of Regional Architecture, and clear timeframes all discussed. As a body of SPREP, PMC is clearly required to support the broader work of SPREP and other CROP agencies in meeting the challenge articulated by Pacific leaders.
16. The 2050 Strategy has seven thematic areas (including “Climate Change and Disasters”), but also defines five cross-cutting Pathways that will be fundamental to the way that PMC operates now and in the future (Figure 2). Within these Pathways, eight cross-cutting Regional Collective Actions are also articulated.

17. Within each Thematic Area, there are Regional Collective Actions that are directly relevant to the PMC, including those relating to:
 - 1) institutional strengthening,
 - 2) gender equality and social inclusion,
 - 3) advocacy to the international community,
 - 4) strengthened security capabilities (noting that weather, climate and ocean services to defence forces are a major activity for many NMHSs around the world),
 - 5) sustainable fisheries,
 - 6) tourism,
 - 7) sea-level rise and other climate change impacts,
 - 8) end-to-end multi-hazard early warning systems,
 - 9) hazardous waste and pollution management, and
 - 10) land, sea, and air transport.

18. This represents a wide range of activities for hydro-meteorological involvement, all of which will require strong partnership approaches, including with CROP agencies, national governments, and international partners. The need for hydrometeorological support for achieving the Strategy extends far beyond the Climate and Disasters theme.

19. Positively viewed, the breath of activities implied by the 2050 Strategy is

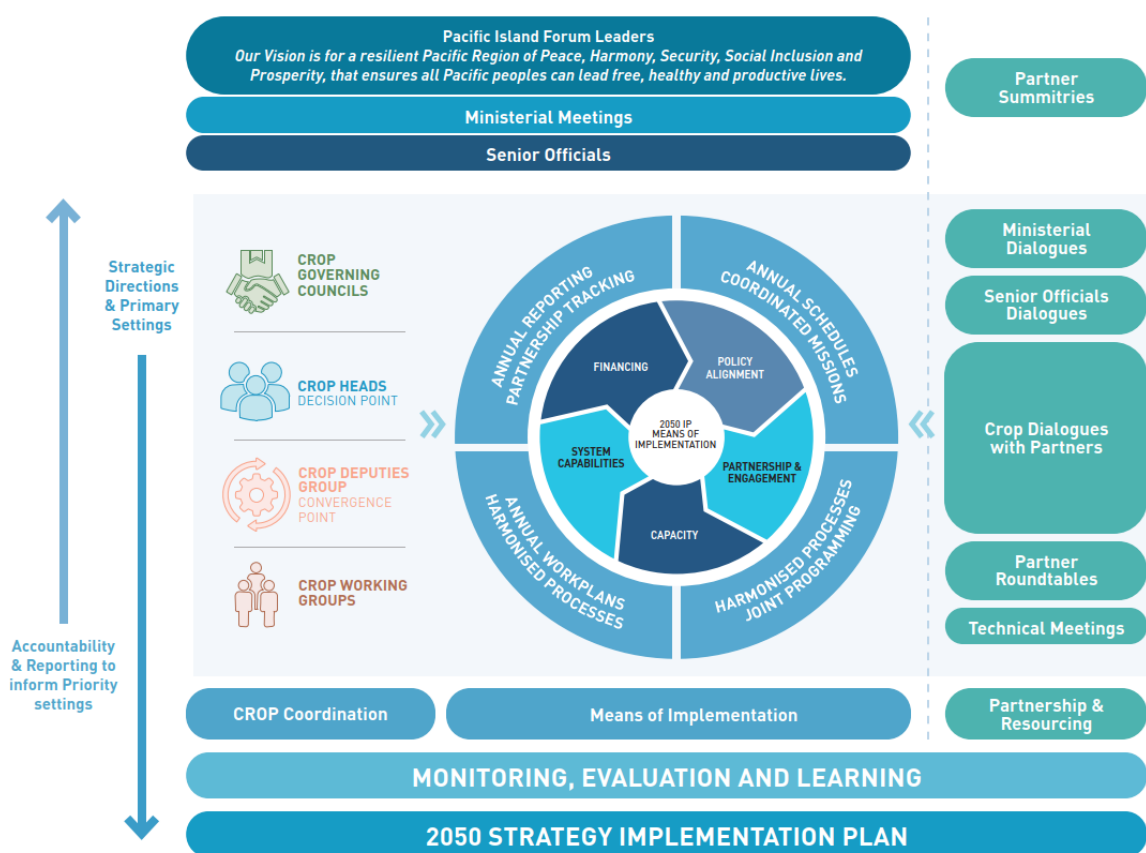


Figure 3 - 2050 Strategy Implementation Mechanism (from the Implementation Plan)

consistent with the themes of the current Pacific Islands Meteorological Strategy, and also the regional public good nature of PMC's activities. Taken together with

PMC's strong role as a regional body in connecting to the global public good nature of WMO and other UN organisations and relating that to the Pacific context, we can assert that there is *very strong* potential for PMC to contribute to the effective implementation of the 2050 Strategy. Conversely, if the challenges discussed previously are not effectively addressed, PMC will be unable to contribute to the extent that will be expected by Pacific leaders.

20. The mechanisms for implementing the 2050 Vision are defined in Figure 3. This implementation will continue to occur in a complex environment of national, bilateral, multilateral, and international projects and programmes relating to hydrometeorology, climate and hazards. The alignment of these in relation to the Vision will be variable, and PMC would be reasonably expected to play a strong role in encouraging harmonisation to the degree possible, working with other partners. Programmatic resourcing and partner support will be critical in this regard, including in situations where no specific project support is available.

C: Secretariat structure and resourcing

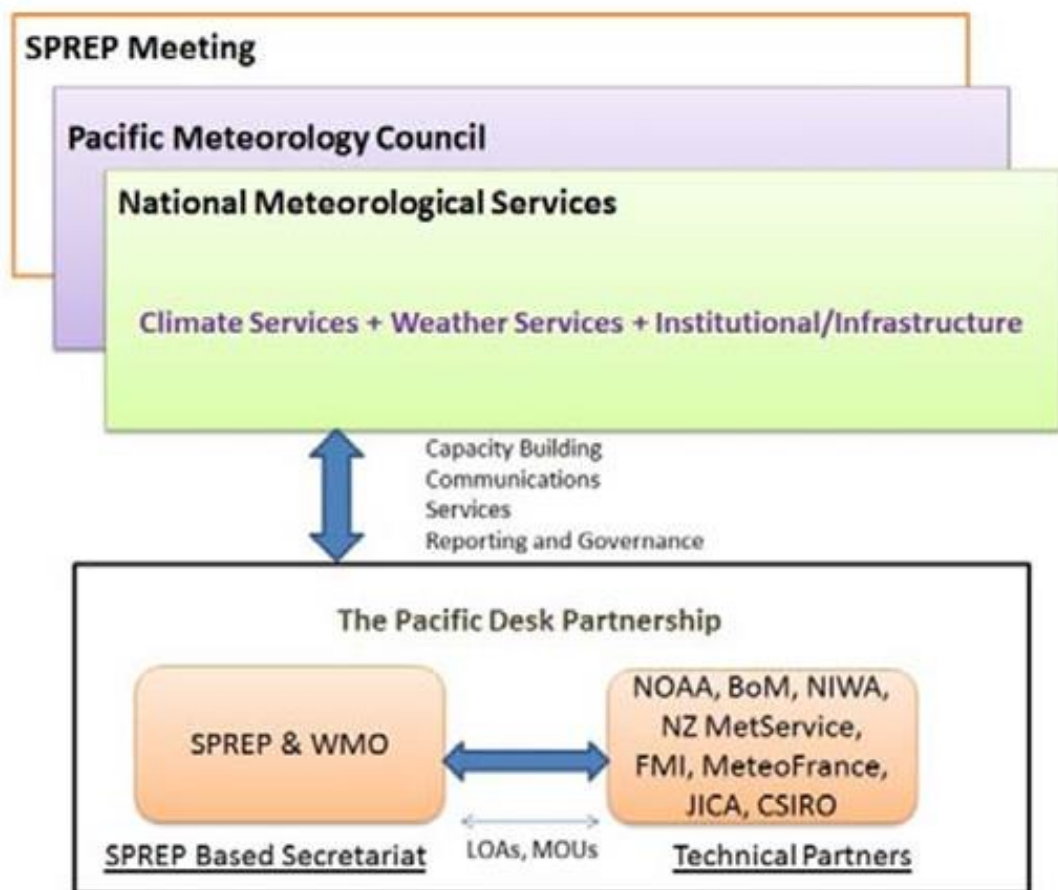


Figure 4 Current structural arrangements for PMC and PMDP (source: PMDP Secretariat)

21. Under current structural arrangements (Figure 4), one full-time SPREP staff member forms the kernel of the Secretariat, assisted by project-funded staff , by

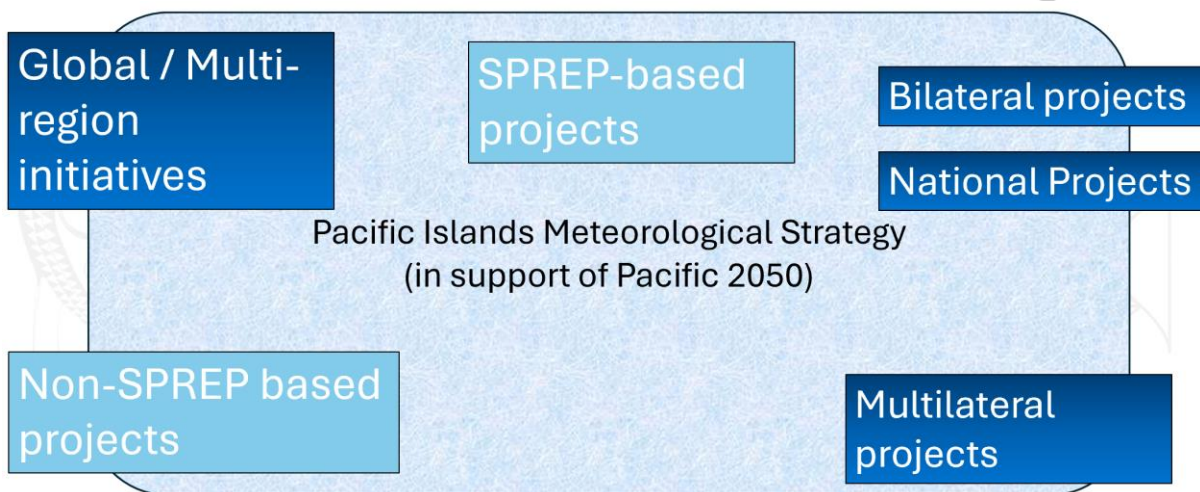
technical partners, and by the WMO Sub-Regional office, which is hosted by SPREP in Apia. The WMO Sub-Regional office consists of one ongoing officer and a project-funded officer, who coordinate with WMO's Regional Office in Singapore and with Geneva-based programs and projects.

22. Based on direct observations, including those reported earlier by stakeholders consulted, and including reviewer observations and the direct testimony of staff, resourcing is insufficient in the PMDP (as well as in WMO) to handle the workload and expectations of regional coordination, resulting in the situation described earlier.
23. The primary approach used by PMDP in managing this situation is to request time from project-based staff to assist in Secretariat functions. This is partially effective, but creates downstream issues:
 - a. diverting project resources will tend to reduce project effectiveness unless the quid-pro-quo of staff time is very tightly managed (which it is not),
 - b. project staff receive additional stress on top of their 'day job' as they attempt to juggle their defined and additional responsibilities,
 - c. project staff will usually be non-ongoing and recruited for particular project-related skills, meaning that they are not necessarily the most suitable for Secretariat functions in terms of their skill-set and institutional longevity (this is not intended to denigrate in any way the excellent team members, who do an extraordinary job),
 - d. donors may be frustrated at lack of clear lines of sight of project-time, and may be reluctant to support diversion of resources. In the worst case, donors may choose to not support new or continuing projects if they are not satisfied that governance is sufficiently transparent,
 - e. real or perceived conflicts of interest can arise between the host-organisation's project efforts (in support of defined outcomes, and indirectly supporting employment at the agency) and the work requirements of the PMDP Secretariat,
 - f. SPREP officers have also articulated that projects can also create a net drain on agency financing and resourcing, depending on agreements around overheads paid to SPREP for hosting the work, and
 - g. as noted earlier, little resource is available to engage with PMC-related coordination that is not directly related to projects with SPREP involvement. It is most important that PMDP Secretariat staff are funded and have sufficient time to strongly engage with donors, projects, and stakeholders that are *outside* the close orbit of SPREP.
24. Noting all of the above, including the strategic imperatives of Blue Pacific 2050, the increasing environmental complexity, and the unsustainable (and critically vulnerable) state of PMDP support arrangements, it is essential that PMDP is substantially expanded to help the PMC support Pacific needs for the future.
25. A conceptual model of the suggested way forward is shown in Figure 5. The approach shown is to grow the total investment into meteorological services in the region by focusing on the broadest possible application of the Pacific Islands

Meteorological Strategy, including for projects and programmes that are not in themselves providing resources to SPREP. This recognises that, while project investment in SPREP-based activities is very welcome, many activities will occur that do not have direct SPREP involvement, but nevertheless should be strategically aligned in order to maximise their effectiveness. The aim of PMC should be to grow the total investment *and* the efficiency of outcomes.



Figure 5 (above and below)., Conceptual model of evolution of PMC and PMDP influence on development of hydrometeorological services in support of Pacific 2050. The top frame represents the current state. The PMC is struggling to ensure that wide range of hydrometeorological activities across the region are consistent with Pacific needs. The concept centres on PMC growing its influence through coordination and partnerships in support of 2050, through ensuring that as much activity as possible is in line with the Pacific Islands Meteorological Strategy, including projects that are not based at SPREP. While requiring additional Secretariat staff, this approach seeks to maximise the width of the ‘pipe’ of investment in the region, and the effectiveness of that investment.



D: Approach for promoting programmatic investment into PMDP

- 26. SPREP-derived funding for PMDP stems largely from donors and (as is usually the case for CROP agencies) is stretched thinly. PMDP has several meteorological support positions on the books, but has only filled one of those positions on an ongoing basis. Although internal prioritisation is up to SPREP, the fragility of the current PMDP situation and high desirability of a sustainable future state should

provide impetus for strong consideration of resource prioritisation towards support for hydrometeorological coordination. Likewise, it would be hoped that WMO could consider whether the level of allocation of resourcing into the sub-regional office in Apia and the RAV Regional Office in Singapore is realistically consistent with the widely acknowledged importance of the Pacific in terms of global needs and commitment to (amongst other things) climate action.

27. The next obvious question is whether programmatic support can be increased through contributions of existing and new donors. Discussions during consultations so far have explored some possibilities in that area.
28. However, it is highly unlikely that additional investment could occur into the PMDP without that investment being articulated specifically towards the implementation of Pacific 2050, noting again the very high priority placed on this by Pacific leaders and the difficulty of getting 'airtime' for other issues.
29. Therefore, it is essential and urgent that the Terms of Reference and work programme of the PMC, the Pacific Islands Meteorological Strategy, and PMC's panel structures be considered and updated in light of Pacific 2050 and its Implementation Plan, and that this process be highly visible and transparent to all. Noting the breadth of effort required in the future to support the various facets of Pacific 2050, the pitch to donors for additional resources for the Secretariat should be framed around the need for *specific and systematic* support towards the implementation of the Goals and Regional Collective Actions of Pacific 2050.
30. There are numerous 'real world' justifications for such investment. To take just one example, scores (potentially hundreds) of Pacific Islanders die at sea every year in weather-related incidents, generally in small craft, and also in high-profile incidents. Reporting of this is usually very poor, and many of the deceased are highly vulnerable and with little agency to support their own safety⁴. The systematic effort required to address this would directly serve the 2050 goal of *'Improved access by all Pacific peoples to affordable, reliable, inclusive, accessible, regular, safe, clean and sustainable land, air and sea transport services.'*
31. While in this and other examples it could be argued that focus areas like this are covered under large and important efforts such Weather Ready Pacific, a higher degree of programmatic specificity from the Secretariat is almost certainly required to focus and track progress, including from the contribution of various projects. The marine safety problem is not easy to solve and requires an ongoing effort that considers accuracy, availability and 'last-mile' use of forecasts and warnings, coordinated strongly with national maritime authorities and NMHSs, and including

⁴ See, for example, the 2023 [Country Hydromet Diagnostics](#) Report for Papua New Guinea regarding the high annual death toll from small craft such as 'banana boats'. See also media coverage and reports of major incidents such as the sinking of the 2012 Rabaul Queen in PNG or the COVID evacuees washed overboard in 2020 from MV Taimareho in Solomon Islands. Forecaster input during the WMO Marine Services Training Course in 2021-22 strongly suggested that the major reported incidents are the 'tip of the iceberg' in terms of a widespread and underacknowledged issue.

efforts to improve statistics for weather-related maritime incidents on an ongoing basis. Efforts and progress in this area should be reported into 2050 implementation mechanisms in addition to wider ranging safety efforts. Aligning efforts in this way is also a way to attract any donor program funding that is targeted towards key results (in this example, marine safety). Any Secretariat resource funded would also be used for supporting the relevant PMC Panel (in this example, the marine panel). Such an enhanced focus would also be likely to result in a larger ability for the Pacific to provide experts into international expert teams on the issue, also in alignment with Pacific 2050's call for participation in international processes.

32. Figure 6 shows the suggested process for seeking additional resourcing in support of PMC goals and the Pacific 2050 Vision. Firstly, it is necessary to urgently reinforce the PMDP resourcing from internal SPREP resources if at all possible, to address critical risks and priorities. Work should then be rapidly undertaken to ensure that all PMC-related structures and policies are fully aligned with Pacific 2050, including the Panel structure. Following that, further funding should be sought, including from new donors and partners, to drive and report specific outcomes that are very highly aligned with Pacific 2050. During the process, the evidence base for effort-based results in each area should be strengthened to assist in Pacific 2050 reporting.

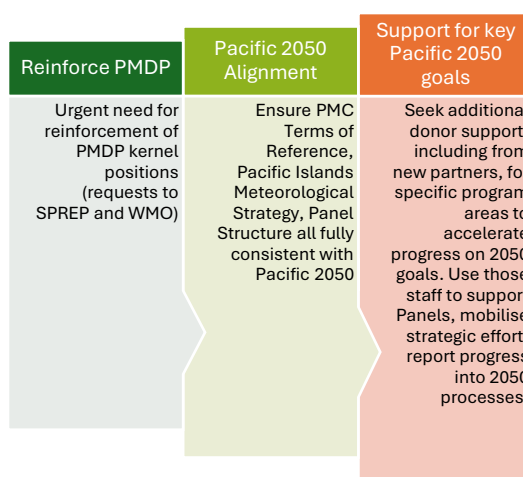


Figure 6 - Conceptual diagram of approach for seeking additional funding to support PMC activities

E: Discussion on the Panel Structure

33. The above discussion implies a reorganisation of the Panel structure to allow for full alignment with 2050. The current Panel structure is given in Figure. 7, together with some possible alternatives.



34. There are various ways to reframe the panels towards supporting the 2050 Vision, as shown in Figure 7. One possibility is a literal rendering of the thematic areas, which could, for example, pair aviation and marine services together with Communications and Infrastructure to make a 'super panel' in support of the Technology and Connectivity Thematic Area. This is possible, but should probably be avoided in order to promote a balanced effort.
35. An obvious 'missing' PMC Panel at present relates to the MHEWS element of the Climate Change and Disasters theme. The creation of an MHEWS Panel or similar,

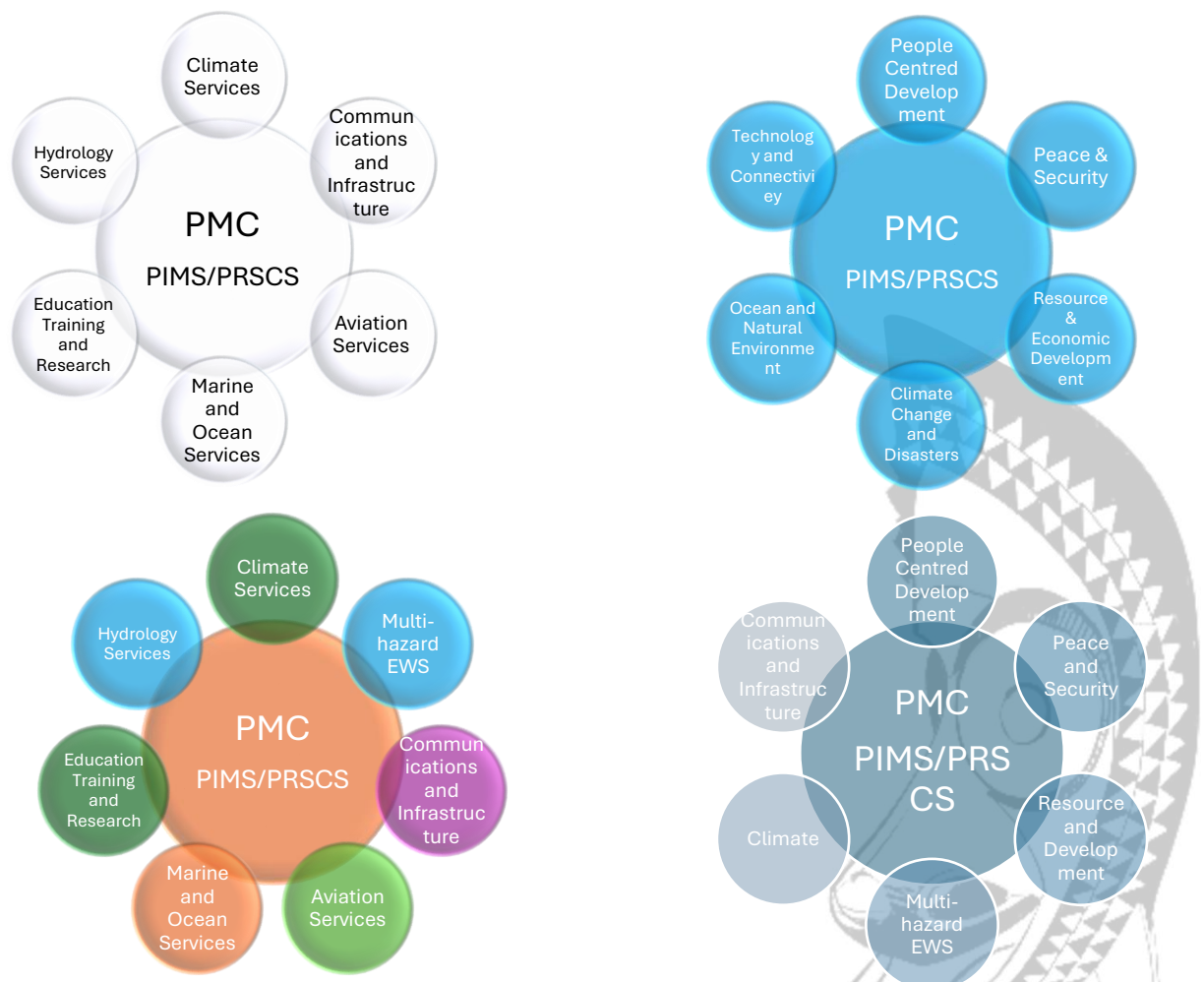


Figure 7- Current structure of PMC panels (top left) and some potential future structures. The structure on the top right aligns to the Pacific 2050 thematic areas, although that would tend to concentrate much of the work into particular themes. On the bottom left is a structure where a Multi-hazard Early Warning System panel is added, and on the bottom right is an alternative solution that would retain six panels that is influenced by Pacific 2050 but does not align exactly to it (in order to balance workload).

supported by dedicated resourcing and in close alignment with Weather Ready Pacific governance and Pacific Resilience Partnership arrangements, would help address the MHEWS-related points above. MHEWS considerations are discussed further in a following section.

36. Once mapped to the 2050 Strategy, Panel framing and composition can then also be considered in the light of WMO, UNDRR, UNESCO and other structures as needed

for an optimum result. In general, the Panels should aim to help focus available global resources onto the challenges of the Pacific, through providing a strong conduit to the Pacific user community, and by providing consistent representation into international processes.



Figure 8 Country Hydromet Diagnostics Element Maturity Scores, for the 20 countries assessed for the 2024 Hydromet Gap Report (WMO, 2024). Six Pacific countries are included here (further Pacific NMHS assessments are underway)

F: Systematic approaches to reporting NMHS improvement

37. Figure 8 shows a summary figure from the Alliance for Hydromet Development’s 2nd Hydromet Gap Report (WMO, 2024)⁵ Six Pacific NMHSs are included in this report,

⁵ Downloadable at <https://alliancehydromet.org/gap-report-2/>

with other assessments underway using the Country Hydromet Diagnostics peer-review tool and process⁶.

38. The development of relatively objective tools such as the Country Hydromet Diagnostics gives an opportunity for PMC to regularly measure progress of NMHS development against a global standard, consistent with the existing PMC Terms of Reference, and in particular to *'oversee progress in the implementation of strategies to support the advancement of meteorological and related services in the Pacific'*.
39. The Country Hydromet Diagnostics is a global tool with WMO as its custodian. It has been developed relatively recently, and future arrangements for undertaking assessments (in terms of timing and coverage) are still uncertain. However, the PMC could play a strong and positive role in this area by working with WMO to ensure that Pacific NMHSs are regularly assessed, and by using the results to consider whether services are systematically improving as a result of all the efforts being made. Additional assessments and reporting could be made on particular Vision 2050 topics outside the Country Hydromet Diagnostics scope, although the Country Hydromet Diagnostics itself is expected to further evolve in sophistication.
40. Tracking results against effort is an ideal and important role for PMC as a regional body to take, and leads to questions such as:
 - a. *Are our current approaches effective?*
 - b. *Does a country / region need additional support to address the need for better community outcomes?*
 - c. *Do we need to adjust the mixture of national, regional and global activities to improve outcomes, and if so, how?*
 - d. *Are we sufficiently critical of capacity development projects? Are there any approaches that are proven to be ineffective in the Pacific and where we should advise Members accordingly?*

By using the results from internationally recognised tools in this way, the PMC would greatly enhance its capacity to 'speak truth to power' on behalf of the Pacific.

G: Addressing the multi-hazard early warning system challenge

41. Under the Climate Change and Disasters theme, the 2050 Strategy Implementation Plan calls for a Regional Collective Action to *"mobilise resources to support people centred, end- to-end multi-hazard early warning for all PICTs in the implementation of the Weather Ready Pacific Programme in collaboration with national, regional and global partners."* This is a positive development but comes with associated challenges.
42. Firstly, following from the previous discussion, the acceleration of multi-hazard early warning systems (MHEWS) in the Pacific will be occurring within a complex environment, including global agreements (Sendai, Paris), initiatives (Early Warnings

⁶ <https://alliancehydromet.org/country-hydromet-diagnostics/>

For All), national, bilateral and multilateral projects and programmes. Much sustained investment is required. There should be no expectation that Weather Ready Pacific is *solely* responsible for all MHEWS-related actions: rather, that national, regional, and global actions could be led by multiple players, so long as they are harmonised through an actively implemented strategy.

43. Secondly, the grouping of Climate Change and Disasters into a single theme under the 2050 Strategy continues an approach established with the Framework for Resilient Development in the Pacific (FRDP) 2017-2030, but where progress has arguably been slower than desired. Many of the activities and areas of scientific specialisation under FRDP sit with Pacific Community (SPC), in the context of the Pacific Resilience Partnership (PRP), the umbrella implementation mechanism for the FRDP. In general, these areas require an acceleration of effort. It follows that effective coordination and acceleration of progress on MHEWS, including the connection to other Disaster Risk Reduction activities, will involve careful consideration and perhaps refreshment of joint SPREP-SPC arrangements under the PRP, and appropriate resourcing.
44. In particular, the improvement of MHEWS arrangements should include consideration of regional needs for:
 - a. seismic networks (for example the strengthening and maintenance of ORSNET),
 - b. volcanic monitoring (to ensure that ICAO's requirement for monitoring of active or potentially active volcanoes by all ICAO Member States is met, and that this monitoring is *also* used to serve the needs of marine, agricultural and emergency services users),
 - c. continued improvement of tsunami warning systems (which also benefit from improved seismic and volcanic monitoring), and
 - d. improved high resolution rainfall forecasting, to assist in landslide and lahar forecasting as well as hydrological applications such as flash flood forecasting.
45. Most of the above activities are, at least partly, outside the 'wheelhouse' of more traditional hydrometeorology, and require close cooperation with, or leadership from non-meteorological national agencies, SPC, regional operations centres such as the Pacific Tsunami Warning Centre, and international organisations such as UNESCO and UNDRR. In some cases, there are gaps in global international arrangements, and regional 'bottom up' approaches have a strong potential to help lead global thinking⁷.
46. Many PMC activities and principles can be relatively easily extended into non-hydrometeorological areas, if done collaboratively. These include:
 - e. technical training (for example, in maintenance of seismic instruments and in approaches for developing operational science professionals),

⁷ Andrew C. Tupper and Carina J. Fearnley, 'Disaster Early-Warning Systems Can Succeed — but Collective Action Is Needed', *Nature* 623, no. 7987 (November 2023): 478–82, <https://doi.org/10.1038/d41586-023-03510-8>.

- f. data-sharing principles (for example, ensuring that the WMO Unified Data Policy is applied for exchange of all critical environmental data),
 - g. media training and communications approaches,
 - h. methods for respecting country sovereignty for warning decisions while applying collective regional and global resources towards a problem (illustrated by, for example, the WMO Severe Weather Forecasting Program), and
 - i. approaches for bringing multi-disciplinary knowledge together to prepare user-centred warnings.
47. Professionals working the area of non-meteorological hazards (such as hydrologists, seismologists, volcanologists, space-weather specialists) also have much to offer severe weather professionals, as the nature of different hazards results in different insights and approaches.
48. Agency responsibilities are not consistently organised across the Pacific (or over the world). Some countries have responsibilities for weather, climate, hydrology and geohazards spread between departments, in whatever manner is appropriate for the countries concerned.
49. However, user expectations for integrated, end-to-end multi-hazard early warning systems apply *regardless* of whether meteorological, hydrological and geophysical agencies are organisationally co-located in each PICT, and also apply in the context of equity-driven imperatives. Therefore, PMC's partnership approach with others should be designed to achieve the same outcomes regardless of country circumstances and internal arrangements. If the PMC takes the leadership role in MHEWS development (and it is the only Pacific body currently positioned to do so), it must consider how participative and representative practices can be consistently applied to ensure that hydrological and geophysical voices are heard appropriately, including appropriate attention being given to long-term and 'slow-fuse' hazards alongside frequency occurring events. Unless there is a significant change in regional architecture, it is appropriate that such work occur in strong partnership with SPC and with leading national agencies in the region, as well as with global bodies such as UNESCO and UNDRR (and also seeking to account for gaps in the UN system, where they exist).
50. Project funding, including for climate change related initiatives, is often restricted to hydrometeorological matters only⁸. This creates difficulties for countries trying to create an integrated multi-hazard approach (raised specifically as an issue during consultations for this Review). PMC could positively influence this situation at a global level.

⁸ In fact, some geological hazards are affected by climate change. These include tsunamis (rising sea levels), landslides (increasing rainfall intensity), lahars (increasing rainfall intensity), lava dome collapses (increasing rainfall intensity), volcanic ash deposition (increasing rainfall intensity and wind regime changes), and earthquake related liquefaction (sea level rise and increasing rainfall intensity).

51. Through working in close partnership with global and regional agencies in support of improved MHEWS in the Pacific and under the 2050 strategy, PMC has the opportunity to exemplify how some of the more difficult parts of the Early Warnings For All initiative can be approached globally.

H: Preliminary Review Recommendations

52. The draft recommendations given below are for exposure and comment, and should in no way be taken as final.

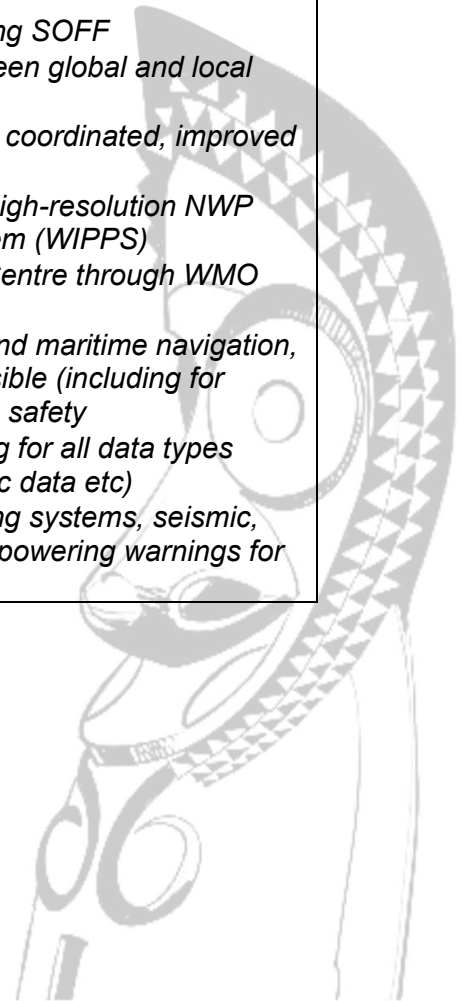
Governance/organizational structure, roles, functions and operation of the PMC and its Panels, the Pacific Ministerial Meeting on Meteorology (PMMM)
<i>a. PMC Terms of Reference should be adjusted in the light of the Pacific 2050 Vision (a proposed edit will be part of the Review Report)</i>
<i>b. Ensure that current PMC work programme is expressed largely in terms of contribution to Pacific 2050 Vision (both in terms of desired goals and specific initiatives). This does not mean 'exclusively 2050 Vision', since other activities are necessary, but the links must be clear.</i>
<i>c. Ensure that Pacific Islands Meteorological Strategy update is likewise framed largely in Pacific 2050 terms, particularly in terms of maximising regional public goods in support of the 2050 Vision's goals and Regional Collective Actions.</i>
<i>d. Consider articulating a clear statement of what levels of hydrometeorological service should be aspired to across the region, in consultation with users and the Pacific Islands Forum Secretariat, and noting the need to service vulnerable users including Smaller Island States.</i>
<i>e. Establish processes for monitoring progress against the desired levels of service, preferably using internationally recognised peer-assessment methodologies such as the Country Hydromet Diagnostics.</i>
<i>f. Establish a PMC management group for efficiency of process (noting that PMC has scope to refine its working arrangements under SPREP rules).</i>
<i>g. Continue Pacific Ministerial Meeting on Meteorology (PMMM), noting that meteorology is a cross-cutting activity and high visibility / accountability across multiple portfolios is desirable.</i>

Governance/organizational structure, roles, functions, and operation of the PMDP
<i>h. Urgently seek additional support from SPREP for PMDP Secretariat. Also raise with WMO the importance of support for the sub-regional office in Apia and Regional Office in Singapore.</i>
<i>i. Once realignment of PMC operations with Pacific 2050 is undertaken, explore with partners and donors the potential for specific Secretariat support to run Panels and activities in support of Pacific 2050, noting that over-use of project-funded staff can be problematic. Explore a wider funding base, including contributions from new national, private and philanthropic partners. Use any additional support to strengthen activities and reporting on progress on Pacific 2050 goals and to more strongly engage international community.</i>
<i>j. Ensure that regional and international partnerships are actively maintained as required by Pacific Leaders, building on the Pacific Partnership Coordination Mechanism and using more of a continuous engagement approach than large</i>

PMC meetings. A particular focus area should be SPREP/SPC practical arrangements in support of the Climate Change and Disasters thematic area of Pacific 2050 (and the Framework for Resilient Development in the Pacific). These arrangements should be agreed at the highest level, in consultation with the Pacific Islands Forum Secretariat.

Synergies and opportunities to align to the WMO restructure

- k. Avoid duplication of Panel activities with international expert teams (eg WMO teams). Instead, scope Panel composition and function with intent to make local progress on key focus areas consistent with Pacific 2050, provide representation into international processes (eg to WMO, ICAO, IMO, UNESCO, UNDRR) and bring international benefits into region in order to support Pacific 2050. Prioritise such representation, using NMHS and other representatives (including SPREP Secretariat staff) as agreed.*
- l. Consider establishment of joint Panel or Panels with SPC dealing with multi-hazard early warning systems, particularly noting the importance of hydrological and geohazard issues in the Pacific, the need for seamless links to other aspects of disaster risk reduction beyond Sendai Target 'G'.*
- m. Through work of Panels, articulate more strongly how Pacific and international standards, systems and processes will efficiently create regional public goods and help achieve Pacific 2050. Examples:*
 - Support for Global Basic Observing Network using SOFF*
 - Well-defined, complementary relationships between global and local initiatives (eg WRP, EW4All)*
 - Use of Severe Weather Forecasting Program for coordinated, improved warning coordination*
 - Negotiation with major partners for provision of high-resolution NWP under WMO Integrated Processing and Prediction System (WIPPS)*
 - Support for establishment of Regional Training Centre through WMO processes*
 - Work with ICAO, IMAS, WMO on safe aviation and maritime navigation, including progress on aviation cost recovery where possible (including for volcanic observatories) and particularly targeting marine safety*
 - Implementation of WIS2.0 to include data sharing for all data types necessary for Pacific needs (potentially including seismic data etc)*
 - Focused, improved support for flood early warning systems, seismic, volcanic, tsunami systems as regional public goods (empowering warnings for vulnerable populations).*



Appendix 1 – Terms of Reference for PMC



TERMS OF REFERENCE

FOR THE PACIFIC METEOROLOGICAL COUNCIL

1. Introduction

1.1. The Pacific Meteorological Council (PMC) is a specialized subsidiary body of the SPREP Meeting, established at the 14RMSD meeting in Majuro, RMI, to facilitate and coordinate the scientific and technical programme and activities of the Regional Meteorological Services. The PMC replaces the RMSD and provides policy relevant advice to the SPREP Meeting on the needs and priorities of SPREP member countries and territories in relation to meteorology (weather and climate) and related fields. These Terms of Reference describe the vision, objectives, principles, core roles and functions of the PMC, including its governance and administrative arrangements within the SPREP framework.

2. Vision

National Meteorological Services (NMHSs) of the PICTs are able to provide appropriate weather, climate, and early warning services to their nations and communities to safeguard life and property and contributing to national development programmes through sustained observing systems, telecommunications, and data processing and management systems serving end users.

3. Objective

3.1. The PMC will work to strengthen the capacity of the National Meteorological Services thus contributing to maximization of the safety, well-being, and development aspirations of the people of the Pacific with respect to provision of weather, climate, and related development services⁹¹ by:

- (a) Providing an open forum for members to discuss and collaborate on issues related to the advancement of meteorological services in the Pacific;

1. ⁹¹The PMC and the nature of its linkages to fields of disaster management, climate change, hydrology, and others will require that its Members shall coordinate their work mutually to facilitate enhanced effectiveness of services nationally and regionally.

- (b) Building on mutual and complementary strengths in order to develop innovative approaches that support the sustained achievement of agreed national and regional development goals;
- (c) Collaborating with partner organizations and agencies in related sectors.

3.2. This Terms of Reference is a tool to guide the Pacific Meteorological Council as to PMC membership, governance, meetings and principles of engagement and provide record of how Members of the PMC would like to work together, with a view to achieving a common understanding on its role, capacity and framework of operation.

4. Membership

4.1 The PMC comprises the Directors/heads of Meteorological Services of SPREP Members,

4.2 The PMC will actively engage with relevant CROP agencies, international agencies, development partners and donors. Representatives of these organizations shall be invited to PMC meetings to participate in and contribute to any PMC deliberations related to mutual and complementary fields of activity.

5. Governance

5.1 The SPREP and PMC Rules and Procedures will apply to the PMC meetings.

5.2 The Pacific Meteorological Council is established by endorsement of the 21st SPREP Meeting, Madang, Papua New Guinea, 2010. It is designated as a subsidiary body of the SPREP Meeting, operating within the bounds of the legal framework of the SPREP Agreement.

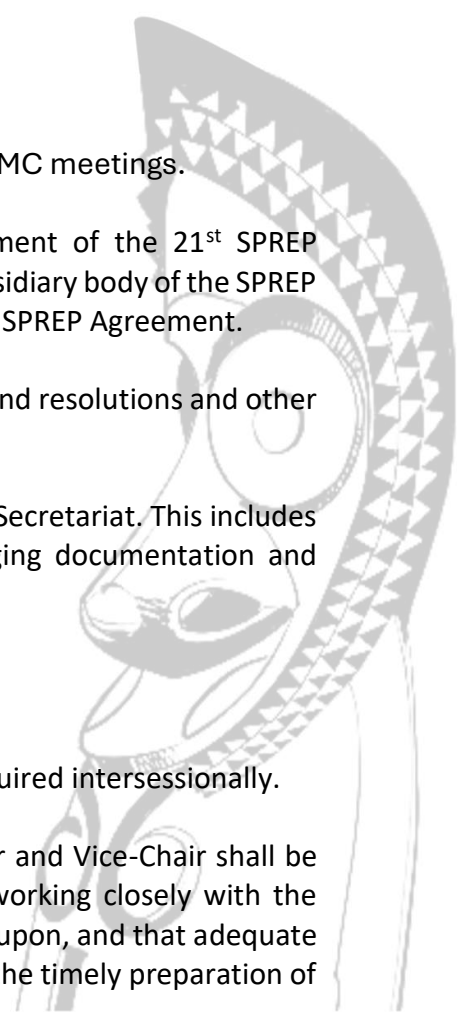
5.3 The PMC shall make reports to the SPREP Meeting on decisions and resolutions and other relevant outcomes from its meetings.

5.4. Secretariat support for the PMC shall be provided by the SPREP Secretariat. This includes planning and logistical support for PMC meetings and for managing documentation and procedures relating to planning and administration.

6. Meetings

6.1. The PMC will generally meet biennially, but may meet as required intersessionally.

6.2. At the commencement of each meeting of the PMC, a Chair and Vice-Chair shall be appointed. The Chair and Vice-Chair shall serve intersessionally, working closely with the Secretariat to ensure that decisions agreed by the Council are acted upon, and that adequate preparations are made for forthcoming Council meetings, including the timely preparation of relevant working papers and reports.



6.3. Secretariat support to the meetings of the PMC shall be provided by the SPREP Secretariat as per 5.4.

6.4. The PMC and Secretariats of the SPREP and WMO shall also seek opportunities for intersessional meetings where these present themselves and as when such meetings may be required.

7. Roles and Functions of the PMC

7.1. The PMC shall:

- (a) Provide an open forum for its members to discuss and collaborate on the needs of Pacific Island Countries and Territories with respect to weather and climate services, and related issues;
- (b) Promote capacity development within the region, focused on improving members' capability to provide accurate, timely and reliable weather forecasts, and warnings of severe weather, climate outlooks and scenarios, and associated hazards;
- (c) Develop strategies with associated goals and targets to support the advancement of meteorological and related services in the Pacific, in collaboration with WMO and relevant partner organizations;
- (d) Oversee progress in the implementation of strategies to support the advancement of meteorological and related services in the Pacific.
- (e) Provide guidance to Members and the SPREP Secretariat and partner organizations with respect to programs related to weather, climate and associated environmental matters in the Pacific
- (f) Collaborate with the Pacific Meteorological Desk Partnership on the implementation activities and priorities of Members, and contribute to the monitoring and evaluation of the Pacific Meteorological Desk Partnership.
- (g) Report regularly on the activities of the NMS so as to assist the advancements of meteorological services in the Pacific.

8. Principles of Engagement

8.1. The PMC subscribes to the following key principles:

- (a) *An open, trusting and safe environment:* The Pacific Meteorological Council will work to enhance transparency and accountability of its decision making process, through open dialogue and constructive engagement among the Council's members.



- (b) *Participatory approach:* The Pacific Meteorological Council will promote a participatory and inclusive environment incorporating gender equity which will continue to strengthen its participatory approach to decision-making. Decisions will be made by consensus and through a consultative process. Where this should prove unfeasible, the Chair will make a decision taking into account the majority of the views expressed by the Council
- (c) *Teamwork:* The Pacific Meteorological Council's members will create an environment to work collaboratively to achieve better results, learn from one another, and ensure the enhanced delivery of measurable results in support of the national, regional and international development agenda.
- (d) *Coherence:* Within the context on each NMHS objectives, deliverables and performance indicators the Council will proactively work to identify opportunities and synergies for joint regional approach.
- (e) *Respect for diversity:* The Pacific Meteorological Council will invest the necessary time and effort to understand each of its Member national goals, objectives, deliverables and performance indicators, and recognize and appreciate the cultural diversity among the Members program modalities, operational activities and capacities.
- (f) *Creativity and innovation:* The Pacific Meteorological Council will explore means of improving work towards achieving the desired outcomes for all NMSs in the Pacific region to being able to provide all relevant and appropriate meteorological services to their nations, and bringing them closer to their clients and partners.
- (g) *Accountability for results:* National ownership and leadership will drive the renewed focus on creativity and innovation. The Pacific Meteorological Council will be guided, to the extent possible by the national governments and authorities to determine the most appropriate actions to be taken both programmatically and operationally.
- (h) *Build on existing capacities:* Rather than creating new institutional units, the Pacific Meteorological Council will work with the capacities available within SPREP and WMO and NMSs to drive weather climate, and related fields in the Pacific region.

9. Update of the Terms of Reference

9.1. The Pacific Meteorological Council may update this Terms of Reference as the need arises.