



Second Session Pacific Islands Marine and Ocean Services Panel

23 May 2016, IRD Campus, Noumea, New Caledonia

**First Draft Report
15 June 2016**

Introduction and Meeting Overview

The Second session of the Pacific Island Marine and Ocean Services Panel (PIMOS/2) was held from 09:00 to 17:00 at the IRD Campus in Noumea, New Caledonia on 23 May 2016. PIMOS/2 was held immediately prior to the 2nd DBCP Marine and Ocean Services Capacity Building Workshop (PI-2) to take advantage of the related meetings. Included with this report is the meeting agenda (Annex I), the participant list (Annex II), the revised ToR (to be circulated to the PIMOS Panel), the four priority areas working groups (Annex III), and a GCF funded project from Malawi that might be a model to build on here (Annex IV).

As was noted in the discussion concerning the agenda for PIMOS/2, one of the challenges that the PIMOS Panel faces is a lack of an overarching structure or goal. For example, the PICS Panel has benefited from the GFCS and the PIAWS Panel will benefit from the aviation standards from ICAO. Thus, the primary goal of PIMOS/2 was to identify key priority areas for engagement by Pacific island NMSs and to develop an action plan around this for endorsement at PMC-4. Discussions during PIMOS/2 were intentionally kept open, with no attribution to speaker unless necessary, so as to minimize territorial silos and worries about speaking on behalf of their country/organization.

Initial discussion during PIMOS/2 centred on the priority areas from the PIMOS ToR and issues related to them. This was followed by a discussion of linkages to key sectors and regional/international partners. During these discussions four priority issues were chosen to focus on:

- Inundation and Coastal Hazard
- Maritime Safety
- Observations and Data Management
- Communications and Capacity Development

To help guide future discussions and activities around the first two topics (Inundation and Coastal Hazards, and Maritime Safety), it was decided that the basic structure of the Pacific NMSs should be used as a guide:

- Observations and Data Management
- Forecasting
- Climate Services
- Communications, Capacity Development, and Knowledge

During PIMOS/2 it was felt that Observations and Communications were in particular need of attention., as they are essential for forecasting and climate services.

To better facilitate the development of an action plan and activities around the four priority areas it was decided to form working groups around the four priority areas. The working groups are intended to be small(ish) groups that will explore in detail the needs and gaps in the region pertaining to their priority area and propose options for how to address these issues. Membership on the working groups is open to all PMC members, partners and experts, and the initial members from PIMOS/2 are listed in Annex III.

Agenda item 1: Opening and Overview of PIMOS Panel ToR

Dr. Tommy Moore (SPREP), Chair of the PIMOS Panel, called the session to order at 09:00 on 23 May 2016. The chair welcomed everyone and thanked IRD for hosting the meeting and the participants for attending.

The PIMOS ToR, relevant priority areas from the PIMS, and outcomes from Cg-17 and PMC-3 were briefly discussed.

Agenda item 2: Argo and TPOS

The meeting deviated from the Agenda, and it was decided to have the brief presentations on Argo and TPOS 2020 before the overview of the US and Australian Marine and Ocean Services.

Dr. Stephen Piotrowicz gave the first presentation on the Argo programme. During the presentation it was noted that Argo has fundamentally changed oceanography, providing almost global coverage of temperature and salinity in the upper 2000m of the ocean every ~10 days. Data collected by the programme is very cost effective, with the life-span of the average float lasting for more than 4 years. The Argo program is currently also expanding its mission with the development of Bio-Argo floats (that can measure dissolved oxygen, nitrate, pH), and Deep Argo floats which can profile the full ocean depth. All data collected by the program is freely available, with data often available within an hour of transmission.

During the presentation it was also noted that the Argo program does not deploy floats in EEZs without permission from the country. This is of particular importance in the Pacific islands as their EEZs cover 1/3 of the Pacific Ocean. It was noted that the Argo program is currently working on developing an agreement with FSM, as FSM is not covered under the SOPAC agreement (which allows for Argo float deployment in much of the Pacific islands region).

Dr. Tommy Moore (SPREP) presented on TPOS. TPOS began in the 1980's in response to a severe El Niño with the deployment of the TAO array. In 2014 the array dropped below 30% operability, and the array is currently back above 80% operability. In response to the decline in the array TPOS is currently under review (TPOS 2020), which is reviewing the current system and providing recommendations on how TPOS can be improved. It was noted during discussion that designed for atmospheric monitoring, and that TPOS 2020 is looking to increase resolution so as to better resolve ocean processes.

It was noted that TPOS (and Argo) make up the majority of ocean observing in the Pacific island region, and that it is essential in supporting region meteorological and climatological forecasts. There is a need to make sure that the Pacific islands are more engaged with TPOS in future (there will be opportunities for this in the near future as part of the TPOS 2020 Resource Forum). Engagement by the Pacific islands is particularly important as the array passes through most of the

equatorial countries, and it has been proposed to expand part of the array further south for better coverage of the SPCZ.

Agenda item 3: US and Australia Marine and Ocean Services Overview

An overview of US Marine and Ocean Services was presented by Dr. Melissa Iwamoto (PacIOOS). She noted that PacIOOS covers all of the US territories and associated islands in the region (including Palau, RMI and FSM). She further noted that PacIOOS is not a US federal agency, but is instead operated out of the University of Hawaii and is the only non-federal certified regional coordination entity.

Some of the services provided by PacIOOS include 6 day sea level forecasts (astronomical tides and sea level anomalies), inundation forecasts, and the PacIOOS Voyager data portal. Of note was a concept being developed for ship-based tsunami wave detection. This would take advantage of ships of opportunity (mainly commercial vessels), and they could be equipped for ~USD 20,000 + a monthly communications fee.

Questions for Melissa were focused on which data products are the most used and valued. Wave buoys have the most data access, the highest valued is not certain at this point. Outside of Hawaii the Marjuro inundation forecast might have the highest impact. Forecasts are available online, and on-island liaisons make sure that notifications reach communities. In support of this UH Seagrant created a “How to prepare for inundation events”, with information on how to prepare if you have a few days warning or a few hours warning. There was interest in seeing if this could be more widely distributed across the region, including local language translations.

An overview of Australia’s Marine and Ocean Services was presented by Dr. Craig Steinberg (AIMS/CSIRO). He noted a number of programs in Australia, including the Pacific Sea Level Monitoring Program, PACCSAP, CliDe, COSPPac, Global Ocean Acidification Observing Network, and their contributions to TPOS and coordination with PacIOOS. He also noted the upcoming APEC Earth and Marine (EMO) meeting to be held in Canberra in September, and that it would be good for the Pacific islands to be involved. A new project of note was work being done to calculate wave properties from satellite images. This is still a work in progress, but has promise.

Questions following his talk focused on the EMO meeting and access to satellite data. It was noted that Fiji Met and BOM have an agreement for data access, and that BOM has a good data viewer tool. One challenge is the volume of data, as this can be challenging in countries with limited internet bandwidth.

Agenda item 4: PIMOS Priority Areas

Discussions here centred on the priority areas outlined in the PIMOS ToR, with an aim of gaining a better understanding of the issues and identify issues for the panel focus on in the near term. Below

are the priority areas from the PIMOS ToR, the key points raised for each on, and a summary of the discussions.

1. Oceanography and marine meteorology

- Underlying data inventory and needs (what do have, what do we need)
- Hydrography (coastal bathymetry, navigational charts)
 - Data inventory and gridding
- Discussion – In addition to the points raised above it was noted that improved hydrography is important for updating navigational charts and reducing risks to ships. This would be a good synergy between NMHSs and Ports Authorities.

2. Coastal inundations and hazards, and Coastal MHEWS (waves, flooding, tsunami) at the community, national and regional levels

- Coastal erosion and storm surge
- Salt water intrusion
- The need to record inundation events in a standard format, integrate into CLIDE
 - FSM reports every month to Regional Centre (Guam)
 - Outer island reporting?
 - Tsunami risk to cruise ships?
- Discussion – The importance of including tsunami's was noted, as NMHS in the region provide tsunami warnings, and that there might be confusion if EWS's for tsunamis and inundation were separate. It was noted that we need a standardized method for reporting inundation events. There are biases in historical records as they don't account for factors such as increases in population density, people living in more vulnerable areas, etc. Attempts to do hindcasts in Fiji using media reports had poor success. Tuvalu currently has a reporting system, and there was broad interest in including more inundation data (and other marine data) in CliDE.

3. National preparedness and maritime safety support mechanisms at the national and regional level (it was noted that this is similar to number 1)

4. Ocean observing –coastal and pelagic (it was noted that this a tool, and falls under oceanography and hydrography)

- Argo
- TPOS
- Sea Level
- Waves
- Local knowledge/TK
- Discussion – It was noted that capacity for this is very limited, with sea level being most commonly observed (outside of autonomous systems). There was also interest in incorporating traditional knowledge.

5. Advising on the impacts of climate and climate change on oceans

- coral bleaching
- salt water intrusion
- ocean acidification
- sea level rise
- warming
- Discussion – It was noted that sub-seasonal, seasonal, annual, and climate change impacts on oceans are still climate and should be incorporated as into national climate services. This priority area overlaps with the PI Climate Services Panel and should be coordinated with them.

6. Information related to coastal zone management and marine spatial planning

- Hazard and risk mapping

7. Capacity building

- Buoy maintenance
- Basic oceanography
- Forecasting
- Discussion – It was noted that this priority area overlaps with the PI Education, Training and Research Panel and should be coordinated with them.

8. Dedicated oceans focal points in countries

- NMHSs and other relevant sectors
- Discussion – It can be challenging figuring out who to contact in country for marine issues. Having focal points imbedded in ministries would help remedy this issue. It was noted that this is an issue that could be raised at the PMC, and that we should try to make sure the NMHSs are included as part of national ocean policies.

9. Volcanism

Overall, it was also noted that the discussion was heavy on products and lacking in engagement and delivery. One lesson learned from the delivery of climate services is that we need to tailor information to the communities. It was also noted that countries need internal data management systems to facilitate marine climate and weather forecasting. When developing an action plan/framework we should use the GFCS as guide and do so with services/impact forecasting in mind.

Following the discussion of the PIMOS priority areas there was a brief discussion on the key sectors and areas of engagement. The key sectors and areas are listed below.

Sector Linkages

- Environment
 - Coastal erosion
 - Corals
- Fisheries
 - Marine Hazards
 - Inundation
 - Enforcement
 - Bleaching and heat
- NDMO
 - Marine Hazards
 - Bleaching
- Tourism
 - Surf
 - Marine Hazards
 - Water, food, agriculture
 - Bleaching
 - Cruise ships
- Ports
 - Marine Hazards
 - Hydrography/oceanography
- Maritime Transport
 - Marine Hazards
- Urban Planning
 - Inundation
 - Sea Level

- Erosion
- Mitigation solutions
- Water
 - Salt water intrusion/overtopping of reservoirs
 - Run off
- Food/Agriculture
 - Salt water intrusion
 - Land based pollution
- Military/coast guard
 - Marine Hazards
- Hydrographic offices
 - Run off
- Education and Research and Training
 - Ocean Data View, NetCDF, Python and R (open source)
 - OTGA
 - Data portals
- Local communities
 - NGOs – Red Cross, conservation groups, etc
 - Communication channels
 - Community guides and preparedness
 - Cultural challenges
 - Businesses?

During the discussion multi-stakeholder meetings were discussed. It was noted that NOAA has done away with these types of meetings and is more focused on action and service delivery. In contrast, it was noted that community and stakeholder climate services consultations were very useful, especially when first starting service delivery. It was noted that the CIFPD can help develop protocols and methodologies regarding inundation, and that it would be good to have a regional meeting with international experts to explore how to best design inundation forecasting and warning systems for the region. There was also some discussion around the appropriateness of a regional forecasting system (similar to Fiji's role in regards to Cyclones) vs. a national system. It was noted that the Pacific Tsunami Warning Center used to issue warnings, but now that national capacities are higher they no longer do so. A similar approach could be adopted for the region.

Following this discussion was a brief discussion on relevant regional and international partners, project and frameworks:

- CROP Agencies
- WMO
- NOAA/BoM/NIWA/CSIRO
- JCOMM
- 2nd phase of coastal inundation demonstration project
- CREWS
- APEC
- IMO
- IOC-UNESCO and UNCLOS
- UNSOLAS
- Sendai Framework
- Paris Agreement
- SAMOA Pathway

- FAO
- SDGs
- UNDP
- NGOs and CSOs
- Private sector/industry
- IHO
- USAID/DFAT/MFAT/WB/EU/ADB (development partners)
- Safety of Life at Sea

Agenda item 5: Action plan and priority areas

Based on the previous discussions two major priority areas were identified that would be supported through the basic structure of the NMHSs:

Major priority service areas:

- Coastal inundation
- Maritime safety

NMHSs Structure to support these services:

- Observations/ Data management
- Forecasting
- Climate services
- Communications and Capacity development/ knowledge management

One issue raised around this was the inclusion of volcanic and seismic warnings.

To support the development of the action plan it was agreed to form working groups focused on inundation, maritime safety, observations, and communications and capacity building. Meeting participants volunteered to be part of the working group(s) of their choice, and it was agreed to welcome participation from the members of the PIMOS Panel who were not in attendance. Working group members are listed in Annex III.

It is anticipated that a draft action plan will be prepared for consideration by at PMC-4.

Agenda item 6: Review of ToR and election of a vice-chair

The meeting finished with a review of the ToR the discussion of electing a vice-chair. Suggested revisions are included in the updated ToR, to be circulated with this report. Of note was the request by Tuvalu and CSIRO to become members of the Panel. It was agreed that if there were no further revisions the Panel would seek to have the PIMOS ToR approved out of session by the PMC or at PMC-4.

It was decided that no vice-chair was needed at the time.

Annex I: Workshop Agenda

Second PIMOS Panel Meeting

23 May 2016

IRD, Noumea, New Caledonia

EXPECTED OUTCOMES OF THE MEETING

The Second Session of the PIMOS Panel aims to bring together representative experts of the Panel and technical observers to review the priority needs and gaps in relation to marine and ocean services. Specifically, it should result in:

1. Review of PIMOS Panel Terms of Reference
2. PIMOS Priority Areas
3. Linkages with sectors and regional/international organizations
4. Draft Action Plans and Priority Activities
5. Election of Vice-Chairman

AGENDA

Time	Activity	Details
09:00 – 10:00	Opening and Overview of PIMOS Panel ToR US and Australia Marine and Ocean Services Overview	Welcome Remarks (SPREP, PIMOS Panel Chair) Overview of PIMOS Panel ToR Brief presentations and discussion on the marine and ocean services provided by the US and Australia
10:00 – 10:30	Morning Tea (Group Photo)	
10:30 – 11:00	Argo and TPOS 2020	Program overviews, how data is used in the region, how the region can effectively engage with these programs. Discussion on Marine Scientific Research and Technology Transfer
11:00 – 12:30	PIMOS Priority Areas Linkages	Review priority areas in ToR and from PMC, explore other priorities as needed Explore linkages with sectors and other regional/international organizations. Identify priorities and strategies for engagement
12:30 – 13:30	Lunch	
13:30 – 14:30	PIMOS Priority Areas and Linkages (cont.)	
14:30 – 15:30	Draft Action Plan and Priority Activities	Outline an action plan, a costed workplan, explore the formation of working groups (suggestion for Tsunami and EWS, Data and Knowledge Management, Ocean Observations, Coastal Zone (including inundation and safety at sea for small-scale fishermen) Prioritize activities and explore potential donors and projects (i.e. formation of a project pipeline)
15:30 – 16:00	Afternoon Tea	
16:00 – 16:45	Draft Action Plan and Priority Activities (cont.) Review of PIMOS Panel ToR	Review of PIMOS Panel ToR, if no further changes then move for endorsement by PMC members out of session
16:45 – 17:00	Election of Vice-Chairman Closing Remarks	Election of Vice-Chairman if desired Next steps and meeting end

Annex II: Meeting Participants

Name	Organization	E-mail
Tommy Moore	SPREP	tommym@sprep.org
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Annex III: Working group members

Coastal Inundation and Hazards	Maritime Safety	Ocean Observations	Communications and Capacity Building
Maria Negames (Palau)	Herve Damlamian (SPC)	Maria Negames (Palau)	Melissa Mathews (BoM)
Boyd Mackenzie (FSM)	Grant Smith (Bom)	Niko Iona (Tuvalu)	Herve Damlamian (SPC)
Niko Iona (Tuvalu)	Cyprien Bosserelle (SPC)	Mulipola Ausetialia (Samoa)	Grant Smith (BoM)
Jennifer Lewis (NOAA – placeholder for NOAA engagement)	Jens Kruger (SPC)	Max Siota (SI)	Cyprien Bosserelle (SPC)
Grant Smith (BoM)	Ron Hoeke (CSIRO)	Stephen Piotrowicz (NOAA)	Jens Kruger (SPC)
Cyprien Bosserelle (SPC)		Herve Damlamian (SPC)	Molly Powers-Tora (SPC, willing to lead)
Jens Kruger (SPC)		Grant Smith (BoM)	
Ron Hoeke (CSIRO)		Cyprien Bosserelle (SPC)	
		Jens Kruger (SPC)	
		Molly Powers-Tora (SPC)	
		Ron Hoeke (CSIRO)	