

# The Fourteenth and Final Meeting of the Regional Meteorological Services Directors and the First Pacific Meteorological Council

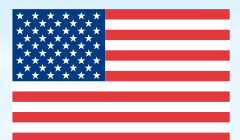
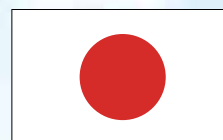


8–12 AUGUST, 2011

INTERNATIONAL CONFERENCE CENTER, MAJURO,  
REPUBLIC OF THE MARSHALL ISLANDS



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**SPREP**

Secretariat of the Pacific Regional  
Environment Programme

The Pacific environment – sustaining our livelihoods and natural heritage in harmony with our cultures.

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# Glossary of Acronyms

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<b>ADB</b>	Asian Development Bank
<b>ALADIN</b>	Aire Limitée Adaptation Dynamique Développement International
<b>APAN</b>	Asia Pacific Adaptation Network
<b>APEC</b>	Asia Pacific Economic Corporation
<b>AWS</b>	Automated Weather Stations
<b>BOM</b>	Bureau of Meteorology
<b>CCA</b>	Climate Change Adaptation
<b>CCM</b>	Climate Change Mitigation
<b>CNMI</b>	Commonwealth of Northern Marianna Islands
<b>CLiDEsc</b>	Climate Database for the Environment
<b>CLIMRAP</b>	Climate Change Information for Risk and Adaptation
<b>COP</b>	Conference of the Parties
<b>COSPPac</b>	Climate and Oceans Support Programme for the Pacific
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>CROP</b>	Council of the Regional Organisations of the Pacific
<b>DRR</b>	Disaster Risk Reduction
<b>DRM</b>	Disaster Risk Management
<b>ECCT</b>	EC Task Team
<b>ECMWF</b>	European Center for Medium Range Weather Forecasts
<b>EMWIN</b>	Emergency Managers Weather Information Network
<b>ENSO</b>	El Nino Southern Oscillation
<b>EU</b>	European Union
<b>FAR</b>	Fourth Assessment Report
<b>FINPAC</b>	Finland Pacific
<b>FMI</b>	Finland Meteorological Institute
<b>FMS</b>	Fiji Meteorological Service
<b>FSM</b>	Federated States of Micronesia
<b>GCOS</b>	Global Climate Observation Systems
<b>GFCS</b>	Global Framework for Climate Services
<b>GTS</b>	Global Telecommunications System
<b>GUAN</b>	Global Upper Air Network
<b>HYCOS</b>	Hydrological Cycle Observing System
<b>ICCAI</b>	International Climate Change Adaptation Initiative
<b>ICAO</b>	International Civil Aviation Organisation
<b>ICCRAHS</b>	Integrating Climate Change Risk into the Agriculture and Health Sectors in Samoa

<b>ICSHMO</b>	International Conference on Southern Hemisphere Meteorology and Oceanography
<b>ICT</b>	Information Communications Technical
<b>IGES</b>	Institute for Global Environmental Strategies
<b>IOC</b>	International Oceanographic Commission
<b>ISDR</b>	International Strategy for Disaster Reduction
<b>JICA</b>	Japan International Cooperation Agency
<b>JMA</b>	Japanese Meteorological Agency
<b>KPI</b>	Key Performance Indicators
<b>LDC</b>	Least Developed Country
<b>MCO</b>	Meteorology and Climate Officer
<b>M&amp;E</b>	Monitoring and Evaluation
<b>METPI</b>	Multi-model Ensemble Tool for Pacific Islands
<b>MFA</b>	Ministry of Foreign Affairs
<b>MOU</b>	Memorandum of Understanding
<b>NCEP</b>	National Centres for Environmental Prediction
<b>NMHS</b>	National Meteorological and Hydrological Services
<b>NMSs</b>	National Meteorological Services
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NWP</b>	Numerical Weather Prediction
<b>NZ</b>	New Zealand
<b>NZ CAA</b>	New Zealand Civil Aviation Authority
<b>PACIFIC HYCOS</b>	Pacific Hydrological Cycle Observing System
<b>Pacific RISA</b>	Pacific Regional Integrated Sciences and Assessments
<b>PaCIS</b>	Pacific Climate Information System
<b>PASAP</b>	Pacific Adaptation Strategies Assistance Programme
<b>PCCR</b>	Pacific Climate Change Roundtable
<b>PCCSP</b>	Pacific Climate Change Science Project
<b>PDN</b>	Pacific Disaster Network
<b>PEAC</b>	Pacific ENSO Applications Climate
<b>PICCC</b>	Pacific Islands Climate Change Cooperative
<b>PI-CCP</b>	Pacific Islands Climate Change Programme
<b>PI-CPP</b>	Pacific Islands Climate Prediction Project
<b>PIFACC</b>	Pacific Islands Framework for Action on Climate Change
<b>PIFS</b>	Pacific Island Forum Secretariat
<b>PI-GCOS</b>	Pacific Islands Global Climate Observation Systems
<b>PI-GOOS</b>	Pacific Islands Global Oceanographic Observing Systems
<b>PMC</b>	Pacific Meteorological Council
<b>PMDP</b>	Pacific Meteorological Desk Partnership
<b>PMSP</b>	Pacific Meteorological Strategic Plan

<b>PNG</b>	Papua New Guinea
<b>POD</b>	Probability of Detection
<b>PPDRM</b>	Pacific Platform for Disaster Risk Management
<b>PRIMO</b>	Pacific Risk Management Ohana
<b>PTWC</b>	Pacific Tsunami Warning Centre
<b>QMS</b>	Quality Management Systems
<b>RANET</b>	Radio Internet Telecommunications
<b>RAV</b>	Regional Association V(5)
<b>RBSN</b>	Regional Basic Synoptic Network
<b>RMI</b>	Republic of the Marshall Islands
<b>RMSD</b>	Regional Meteorological Services Directors
<b>RSMC</b>	Regional Specialised Meteorological Centre (Fiji)
<b>SD</b>	Sustainable Development
<b>SIDS</b>	Small Island Developing States
<b>SIS</b>	Small Island States
<b>SOE</b>	State Owned Enterprise
<b>SOP</b>	Strategic Operational Plan
<b>SOPAC</b>	South Pacific Geo-Science Commission
<b>SPC</b>	Secretariat of the Pacific Community
<b>SPREP</b>	Secretariat of the Pacific Regional Environment Programme
<b>SPSLCMP</b>	South Pacific Sea Level Climate Monitoring Project
<b>SWFDDP</b>	Severe Weather Forecasting and Disaster Risk Reduction Project
<b>TA</b>	Technical Assistant
<b>TCC</b>	Tropical Cyclone Committee
<b>TOR</b>	Terms of Reference
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organisation
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>USA</b>	United States of America
<b>VCP</b>	Voluntary Cooperation Programme
<b>WCC</b>	World Climate Conference
<b>WIGOS</b>	WMO Integrated Global Observing System
<b>WIS</b>	WMO Information System
<b>WMO</b>	World Meteorological Organisation



# CLIMATE SERVICES TRAINING WORKSHOP

REGIONAL METEOROLOGICAL SERVICES DIRECTORS MEETING





# Official opening ceremony

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The Regional Meteorological Services Directors (RMSD) Meeting convened for its 14th session at the International Conference Centre in Majuro, Republic of the Marshall Islands from 9–12th August 2011. It was preceded by a Pacific Regional Meteorological Services Directors Workshop in Support of Climate Adaptation Planning in the Pacific Islands on 8th August. The objectives of the meeting were for participants to formulate and establish a clear understanding of the Pacific Meteorological Council (PMC), the Pacific Desk Partnership concept (since renamed as the Pacific Meteorological Desk Partnership, PMDP), and the Pacific Meteorological Strategic Plan (PMSP) (2012–2015). A total of 54 participants attended the meeting. Primarily the participants were Meteorological Service Directors and representatives from American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, New Caledonia, New Zealand, Palau, Papua New Guinea, Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, United States of America and Vanuatu. Representatives of the Finnish Meteorological Institute, SPREP, SPC, WMO, UNESCO-IOC, Institute for Global Environmental Strategies, University of Oklahoma, Pacific ENSO Applications Climate (PEAC) Centre (co-located at the University of Hawaii and the University of Guam) were also present.

Dr. Netatua Pelesikoti, Pacific Futures Programme Manager, speaking on behalf of the SPREP Director, noted that the RMSD was launching a new era in the field of meteorology in the region. Based on the outcomes of the review of the Regional Meteorological Strategy (2009) and bearing in mind the decisions of the 21st SPREP Meeting, this meeting would launch the PMC and the new strategic plan, and the Pacific Desk Partnership. Dr Pelesikoti also outlined the approach that SPREP is seeking to take on climate change adaptation and disaster risk reduction and how meteorological services underpin those efforts. The host country aptly demonstrates the sheer vulnerability of atoll and small island countries. Dr Pelesikoti emphasized that there is now a chance of meaningful change to assist Pacific meteorological services to provide much needed assistance for the enhancement of livelihoods of the peoples of the region.

The Honourable Ruben Zackhras, Minister in Assistance to the President of RMI, thanked the RMSD for agreeing to meet in RMI. He welcomed the participants on behalf of the Government, and noted that the Pacific is a major driver of the global climate system, while on the other hand the islands are the smallest and most vulnerable to climate change. He stressed the importance of the role of the meteorological services in providing advice and assistance to policy and decision makers.

The RMSD elected Reginald White of Marshall Islands as Chair of the 14th RMSD and Salesa Kaniaha of Vanuatu as Vice-Chair by acclamation.

# Progress since 13RMSD

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Mr. Dean Solofa (Global Climate Observation Systems officer, SPREP) presented on the outcomes of the 13RMSD and actions taken as a result by the Secretariat and different partners, and also in the context of various other regional meetings and efforts. This was explained by way of analysis of clusters of outcomes from the 13RMSD report.

He also explained that the Vice Chair would no longer automatically be the next host, in order to allow joint meetings to be held with the Pacific Climate Change Round Table (PCCR) and the Pacific Disaster Network (PDN) platform.

The Chair (Mr. Reginald White, RMI) noted that many of the recommendations have been acted upon. The format over the years has been a system of champions and Mr. Solofa has been doing the work alone. The Chair noted that the RMSD can do better with the more targeted support from SPREP and from national meteorological services. It is now time for moving forward with more formalized and positive arrangements.

Samoa requested to comment on the outcomes of the 13RMSD, at least to commend the Secretariat for the actions they have taken, and hoped that this sort of progress would continue under the PMC.

## OUTCOMES

The RMSD agreed that the future host country for the PMC would no longer be automatically tied to the country from which the Vice-Chair is elected as consideration is being made for convening the next meeting back to back or in parallel with other relevant regional forums such as the Pacific Climate Change Roundtable (PCCR) and the Pacific Platform for Disaster Risk Management (PPDRM).

The RMSD noted progress made at the national and regional level in relation to the implementation of decisions and recommendations arising from the 13th RMSD and commended the Secretariat and partners for their support to national and regional meteorological support activities in the Pacific Island Countries and Territories. The RMSD requested the Secretariat and partners further enhance their support with more targeted efforts.



# Country Presentations

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The Chair invited country presentations on progress made since 13RMSD.

**AMERICAN SAMOA** (Mr. Leilua Mase Akapo) reported on the impacts of the 2009 tsunami and the efforts to take the lessons learned and make positive remedial steps such as the local tsunami warning centre and the discussions with Samoa on other joint efforts, especially to avoid confusing messages on early warning systems. Outreach programmes are continuing and these will prevent future loss of life. Local tsunami warnings can now be issued for earthquakes of 7.1 scale or above but this will be reviewed in light of recent modelling studies. Staffing levels have not changed much but American Samoa is seeking to more than double the numbers of trained meteorologists. They are also engaging high school students in training programmes to raise the level of interest in this field of work. They are seeking to expand their information technology (IT) capacities and their network of Automated Weather Stations (AWS). There is scope for cooperation with the AWS systems in Samoa.

**AUSTRALIA** (Mr John Gill) was of the opinion that there had been a number of landmark occasions in the region, such as the review of the met services; the work on the Pacific Desk and the Pacific Meteorological Council (PMC); and the development of the strategic plan. Australia is supportive but there is a lot of work to refine these projects to make them fully operational in servicing the needs of the region.

**COOK ISLANDS** (Mr. Arona Ngari) has moved its Meteorological Service out of the Ministry of Police to the Ministry of Transport, and have carried out a functional review of services and number of outputs have been reduced from seven to four. The Cook Islands have sought to comply with the various QMS regulations, assisted by New Zealand and the Finnish Meteorological Institute (FMI). The Cook Islands are seeking to become a meteorological authority, so as to better benefit from the revenue generated by the services to aviation. Staff levels have increased, and visibility of the Cook Islands Meteorological Service has been increased at the national and regional level. The Cook Islands welcomed the opportunity to share information and ideas through the RMSD process and the PMC into the future.

**FEDERATED STATES OF MICRONESIA (FSM)** (Mr. Eden Skilling) reported no major policy or organizational changes, and funding appears to be secured. FSM has engaged in capacity building in the individual states' weather services.

**FIJI** (Mr. Alipate Waqaicelua) reported that there has been some progress but many challenges remain relating to equipment maintenance. The Fiji Meteorological Service (FMS) is going through reform to be completed by 2012, and is struggling to comply with several other certification requirements. He listed a number of areas where there were specific needs and actions required in order to meet standards. New equipment and techniques necessitate new training programmes and competency standards. There are also additional challenges to train and retain staff.

**FRENCH POLYNESIA** (Mr. Gerard Therry) outlined the services provided at present. It is a challenge to cover the area and territory with sufficient service levels. French Polynesia has adopted certification standards to meet the European single sky regulations. He also explained efforts at finer scale of modelling under the ALADIN programme. A new early warning system is also being developed for meteorological risk to allow more efficient decision making on various risks.

**GUAM** (Mr Charles Chip Guard) noted progress made in terms of training and awareness-raising. The Guam Meteorological Service has responsibility for not only Guam but also the Commonwealth of the Northern Mariana Islands (CNMI) and provides assistance to the Republic of the Marshall Islands (RMI), Federated States of Micronesia (FSM) and Palau. Staffing levels have remained fairly stable, and the technicians have been used for specialized training within the warning area. Turnover of people though has been a challenge, and there has been a need to re-write technical materials to fit circumstances in the region.

**KIRIBATI** (Mr. Rition Kabunateiti) noted some of the successes since 13 RMSD and the challenges in securing sufficient resources from the national government, as resources have steadily declined since 2009. In terms of needs, they wish to have a Technical Assistant (TA) to spend time with staff for forecasting training.

**NEW CALEDONIA** (Mr. Phillippe Frayssinet) also representing Wallis and Futuna, reported on some new services and initiatives to improve analysis and early warning in the territories. New Caledonia is seeking to upgrade services and systems such as fire early warning and dengue warning systems. In terms of regional projects, they are cooperating with Vanuatu and through Meteo France and NIWA on various training services. Mr Frayssinet also reminded the RMSD of the International Conference on Southern Hemisphere Meteorology and Oceanography (ICSHMO) which will be hosted by New Caledonia in 2012, and invited RMSD to look at their new website.

**NEW ZEALAND** (Mr Norm Henry) The representative of New Zealand (MetService) informed the meeting of latest developments to enhance the provision of weather services in New Zealand. Substantial improvements to MetService's observing network have been made since the last report, presented at the 13th RMSD in 2009. Two new Doppler C-band weather radar systems have been commissioned – at Mahia (eastern North Island) in October 2009 and at Rotorua (central North Island) in September 2010. Two additional radars will be commissioned over the next 18 months – one on the West Coast of the South Island and the other in the Far North – which will bring most populated areas under radar coverage.

The AWS network has been increased from 81 to 142 sites to provide improved coverage in some areas, assist with validation of radar rainfall estimates, and to support the development of a winter road icing programme with the New Zealand Transport Agency. A major modernisation programme for MetService's aviation AWS sites was completed early in the review period, with sensor suites at all major aerodromes upgraded to an appropriate standard for AUTO METAR implementation.

MetService runs a comprehensive suite of forecasting programmes, addressing the needs of the aviation, marine, industry and media sectors, as well as the New Zealand public. Severe weather warnings are verified using POD and FAR statistics, and have continued to exceed corporate Key

Performance Indicator (KPI) targets for performance of broad-scale rain, snow and wind warnings. Additional KPIs related to temperature and rainfall forecasting, as well as investment in observing and forecasting programmes, were introduced in the 2009/10 financial year.

The Doppler radar network supports a new severe convection warning programme, introduced in July 2009 to provide short lead-time (up to two hours) warnings of severe convective storms and associated hazards. The service relies on radar-based severe storm detection methods, and the service has been extended to all areas covered by high-resolution radar data.

Development of the Southwest Pacific Severe Weather Forecasting and Disaster Risk Reduction Project (SWFDDP) has led to a range of new forecasting services being provided by the Wellington RSMC to participating countries. Wellington RSMC produced a set of South Pacific Guidance charts twice daily for five days for the area from 150°E to 150°W and from 2°N to 25°S. The charts highlighted areas of expected heavy rain, strong winds and large waves, with emphasis on the synoptic scale. They were intended as guidance to assist forecasters from the nine participating countries (Solomon Islands, Vanuatu, Kiribati, Tuvalu, Fiji, Samoa, Tonga, Niue and Cook Islands) in their own right or with the assistance of Fiji to assess how this information might be incorporated in local forecasts. The participating countries were encouraged to seek clarification with Wellington on any aspects of the South Pacific Guidance and a few countries have done so.

Delivery of SWFDDP forecasting support is done mainly through MetConnect Pacific, a web-based product delivery system developed at MetService. The layout of the website is arranged to capture the project's "Cascading Process", with information flowing from Global Centres to RSMCs and NMHSs and eventually to emergency management authorities, local media and the public. There is a wealth of model data provided by the UK Met Office, ECMWF, JMA, NCEP and RSMC Darwin to assist in the production of the Wellington RSMC guidance and the various forecasts and warnings issued by participating countries. The website also contains satellite and surface observations, and a range of other information to help with evaluation and reporting, and operational contacts. There have been two releases of MetConnect Pacific, most recently in December 2010.

The initial round of SWFDDP training was conducted in-country, enabling forecasters in participating countries to learn how to use the website effectively and develop their skills at interpreting the guidance charts. Efforts were also made to increase and improve the communication at the delivery end by including emergency managers and other key customers in the training where possible. The next round of in-country training is planned to be completed before the start of the 2012/13 cyclone season.

Metservice gratefully acknowledges funding assistance for these SWFDDP initiatives from WMO VCP, AusAID, the Australian Bureau of Meteorology, US NOAA, UK Met Office and the New Zealand Ministry for the Environment.

MetService maintains an active programme of in-service training for its forecasting team as well as ab initio training of new forecasters. The last ab initio course was held in 2009, with eight trainees successfully completing the programme. MetService is now recruiting up to 10 university graduates to participate in the next course, to be held in 2012.

MetService forecasters are supported with a wide range of NWP model guidance, including global model data from NCEP, the UK Met Office and ECMWF, as well as high-resolution grids and statistical guidance from its in-house modelling programme. Since 2009, MetService has implemented a

4-km resolution version of the WRF model, which is complemented by a suite of 8-km models that are initialised from the three above-noted global models to provide a 'mini-ensemble'. Current development work is focused on local data assimilation and improved land-surface modelling within the WRF framework.

MetService is a State Owned Enterprise (SOE), and is required to act as a commercial company, delivering a reasonable return on investment to its two shareholding ministers. All of its activities are supported through commercial contracts. Basic NMS functions, including severe weather warning services, marine forecasts and warnings, and New Zealand's involvement in the WMO and other international activities, are provided under contract to the Ministry of Transport. MetService currently has 225 staff, including roughly 70 meteorologists, supported by 25 staff responsible for the observing network, and a team of five engaged in meteorological training. Remaining staff are focused on IT services, NWP modelling, Sales and Marketing, and Corporate Services.

**PALAU** (Ms Maria Ngamaes) reported on surveying activities that have been carried out at the national level in terms of climate change impacts. Palau has used traditional knowledge to explain and raise awareness. Palau has also worked with their protected areas network in order to pursue better returns for environmental services. Local and international departure taxes have been increased and will go to a national fund for protecting these areas and to finance the various supporting services required to maintain these. Palau has also benefitted from training on the Geographical Information System (GIS) and remote sensing.

**PAPUA NEW GUINEA (PNG)** (Mr. Samuel Maiha) has seen the prioritization of meteorological services in the new national planning as part of the climate change initiatives. This will increase the possibilities for improved work programmes for the meteorological service through an enhancement of funding by 45 percent. Capacity constraints in management of programmes have been an obstacle, and recruitment is progressing, inclusive of climate and environmental training. PNG has increased technical staff from 6 to 14 and has become a semi-corporate entity.

**SAMOA** (Mr. Mulipola Ausetalia Titimaea) reported on the enhanced corporate structure for the meteorology division. AWS have been increased by a further three installations for real time data delivery. Under current planning they will be expanding the number of sea level gauges, and upgrade some current AWS. Samoa is looking at using relay stations for setting up some more AWS. All manual rainfall stations have been upgraded under the ICCRAHS project. Challenges faced under the tsunami included congestion of the SMS system and limits to media operation times. Samoa is looking at new systems to enhance early warning systems. Funding for meteorological services has improved through climate change financing of projects.

**SOLOMON ISLANDS** (Mr. David Hiba Hiriasia) reported on the ministry level changes where disaster management has been merged with climate change and environment. He also reported on a number of activities supported by partners and the proposed deployment of AWS at strategically chosen locations. A national climate change website will be enhanced through Asian Development Bank (ADB) funding. They are also working on tsunami and flood early warning services.



**TONGA** (Mr. Ofa Faanunu) has participated in all the regional projects and programmes already reported on. The Meteorological Service has combined with the Coast Radio Services to train their personnel to conduct observations and to upgrade the services. Tonga has reconstructed the AWS destroyed by the 2009 tsunami. All meteorological observers have been certified in 2010. Draft legislation for meteorological services is being developed. Tonga also wished to comment on the agenda, and noted that the strategy should be aligned with RAV strategic plan. There is a need to formalize arrangements for the Pacific Meteorological Council (PMC) so that all issues brought forward end with decision and action, and there is formal documentation of all discussions that are based on working papers. The Pacific Meteorological Desk Partnership should be accountable to the PMC so its organizational structure should be reviewed.

**TUVALU** (Ms. Hilia Vavae) The main organizational changes have been in the Ministry, now Transport and Communications. Tasks that are needed to be done are beyond what the meteorological team can do, but Tuvalu is benefitting from greater critical mass of personnel in the overall Ministry. Staffing for the meteorology service has not increased and Tuvalu is having some difficulties as it is not a World Meteorological Organisation (WMO) member. Capacity building activities have been carried out to some benefit. Tuvalu have installed one new RANET system. Internet connectivity is a major impediment.

**UNITED STATES OF AMERICA (USA)** (Mr. Edward Young) would like to see the MOU with WMO and SPREP in order to see how this can be enhanced. The USA would like to see more coordination between SPREP and SPC (SOPAC division). They are also seeking a Memorandum of Understanding (MOU) between NOAA and SPREP. The USA is concerned at the level of support being provided to the Pacific Desk by SPREP and hence its support to the PMC. They need more details on the Commonwealth Secretariat support. The USA will re-start their Pacific Training Desk in 2012 based on needs of the meteorological services. The financial situation for provision of services is in a fairly dire situation, but some activities will go forward.

**VANUATU** (Mr. Kaniaha Salesa Nihmei) will provide more detailed papers, but highlighted the new Government funded meteorological facility. Vanuatu has moved from 23 to 73 staff in the last 10 years, and is grateful to partners for assisting with the strengthening of the service since 2009. Vanuatu also acknowledged the support by numerous partners and Pacific Island meteorological services for assisting.

**REPUBLIC OF THE MARSHALL ISLANDS (RMI)** (Mr. Reginald White) has sought to link the northern Pacific with the Pacific Climate Change Science Project (PCCSP), through the Pacific ENSO application centre. This will include research, forecasting and regional climate change studies.

SPREP was asked for clarification on the Memorandum of Understanding (MOU) with WMO and on the coordination between SPREP and SPC being made more visible and effective. SPREP responded that a major part of the MOU is the general working relationship between the two organizations, and any issues requiring resourcing will be entered into separately. The MOU was supposed to have been signed last month, and SPREP advised it will be signed soon. The level of coordination is possibly more visible at the national level. Collaboration between SPREP and SPC has more areas of cooperation

than meteorology services. SPREP advised that if there is a need to step up that visibility, then the PMC will launch that cooperation. The Pacific Digital Strategy is being handled by the Secretariat of the Pacific Community (SPC) Information Communications Technical (ICT) Division. The Commonwealth Secretariat recruitment is being completed, with the aim to have the position hopefully in place before the SPREP Meeting in September 2011.

## Key outcomes from the country presentations

The RMSD acknowledged the reports by National Meteorological Service Directors for the richness of their contributions to the regional knowledge base on best practices, challenges and future directions for cooperation in weather, climate, water and related environmental matters in the region.

The RMSD appreciated the valuable contributions to improve services and observations infrastructure by the many international and regional partners in support of meteorological services in the region.

The RMSD noted that certain issues raised in country presentations required further discussion during the meeting, and these included the International Civil Aviation Organization (ICAO) requirements for nuclear dispersion products and baseline measurements to support their development, and its application in the region. A number of announcements of planned training opportunities were made in the presentations.

The RMSD agreed that the key development plans and priorities (for example, weather and climate forecasting training, telecommunications support, improved regional support from CROP and WMO, development of national strategic development plans for meteorology) presented by the National Meteorological Service Directors are encouraging steps in the right direction, but noted that there are still many challenges. In particular, capacity and funding issues remain key to the further development and enhancement of meteorological services in the region. There were valuable lessons learned from the presentations by National Meteorological Service Directors including the experience of those who have been able to engage with other sectors in order to secure more resources, such as with adaptation projects in the water and climate change sectors, and encouraged others to do the same.

The RMSD recognized that organizational restructuring in some countries has resulted in greater capacity which has enabled those NMSs to be more effective in providing services and working across other sectors, in particular in disaster risk reduction.

The RMSD also recognized that a number of countries have been affected by recent tsunami events and as a result numerous NMSs are reconsidering their mandates to tackle tsunami events, including capacity needs. In this regard, NMSs articulated the need for assistance with these efforts including policy and technical support.



## Outcome of WMO XVI Congress including the Global Framework for Climate Services

Mr. Henry Taiki from WMO presented on the key outcomes, which largely revolved around the Global Framework for Climate Services. Strategic planning at the global level also has impacts on the regional meteorological strategy. WMO will also prioritize capacity building, global observation and information systems, and disaster risk reduction. The WMO Congress also made decisions on gender mainstreaming, the role of national meteorology services and agreed to a pilot project for the Secretariat Quality Management Framework. Immediate tasks include the launching of the Global Framework for Climate Services (GFCS) office, mobilizing resources and preparing for a number of international meetings.

A question was asked – is WMO in a position to support any of the Meteorology Directors to attend the 17<sup>th</sup> Conference of the Parties (COP 17) to the United Nations Framework Convention on Climate Change (UNFCCC) in December, 2011. At COP 16 in Cancun there were only two Meteorology Directors. The representative from WMO could not make any commitments at this stage, but would follow this up as a recommendation of the meeting.

Australia asked about the Global Framework for Climate Services (GFCS) office and the resource mobilization, and what has happened since Congress. The response from the WMO representative was that at this stage there is no information.

The Cook Islands recommended that all the Meteorology Directors make this recommendation to their own countries (to have Meteorological Services Directors attend the UNFCCC meetings) and that they could utilize Small Island States (SIS) funds, managed by the Pacific Islands Forum Secretariat (PIFS).

### OUTCOMES

The RMSD welcomed the outcomes of the 16th WMO Congress (Cg-XVI), in particular, the new WMO Strategic Plan, 2012–2015 and its corresponding Strategic Operational Plan, and the WMO Regional Association V (RAV) Strategic Operational Plan, 2012–2015. WMO requested inputs from Meteorological Service Directors for the regional implementation of the WMO Plans. The meeting endorsed the priority areas for WMO and RAV, as agreed to under both Plans, namely; Global Framework for Climate Services (GFCS), sustainable aviation services, capacity building for developing and Least Developed Countries (LDCs), implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information system (WIS), and Disaster Risk Reduction (DRR).

The RMSD reiterated the need to have representation from the National Meteorological Service on national delegations to key global conferences that will consider the sustainability of meteorological services, such as the UNFCCC Conference of the Parties at its 2011 and 2012 sessions and Rio+20. It was also noted that such participation should be considered in the regional preparatory processes for these meetings. National Meteorological Service Directors also agreed to ensure that such representation requests are made through their own national decision making processes.

The RMSD noted the importance of highlighting the linkages between the global and the regional strategies for enhancing meteorological services.

# WMO Region V Strategic Operational Plan (2012–2015) and Working Mechanism

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As part of the background information, Mr. Henry Taiki from WMO had circulated documentation in advance to all participants. From the table presented there were eight expected results that would give rise to outcomes and key indicators. The WMO representative then explained how some of these expected results are linked to key outcomes that have been selected by the region. These are also linked to contributing programmes that are planned or ongoing. WMO is hopeful that partners will mobilize to support the implementation of these key outcomes.

Samoa asked if another strategic plan would assist the Pacific, as in the past few years WMO needs to improve on its performance. Some donors have started moving to more programmatic support, and that requires meteorological services to be more visible to the Ministry of Finance. In Samoa they are visible due to their involvement with climate change, and this requires WMO to do more in support of the meteorological services. A review of the last plan and how much has been done on the ground, would indicate very little progress.

WMO responded that their support to the Pacific Island Countries is dependent on resources accessed from their full membership. The WMO representative noted that he has routinely requested resources for the region, and some funds have come in recently to support the region. There has been a number of training support activities to the region, with some not always direct to the region but through SPREP and SPC. WMO is not able to support all meeting participation that is not directly related to Congress or technical trainings.

New Zealand asked for clarification if firm measurable targets were intended for these goals. WMO noted that New Zealand has taken the lead on this, but that consensus was more in favour of flexible and general indicators.

Samoa reiterated that there needs to be more upfront awareness of the added value of the partnership between the region and WMO. PNG noted that there were some perceptions that the region was benefitting from assistance from USA and Australia and didn't require further assistance. WMO noted that there are key benefits from membership in the WMO, but it is challenging to ensure that the region is heard amongst the many competing calls for assistance.

RMI outlined the process that they have gone through in acceding to the WMO and is hopeful that the final formalities can be completed at the present parliamentary session.

Fiji asked whether the connection to the Pacific strategic plan, the RAV plan and the WMO plan was being made.

American Samoa asked for a breakdown of regional activities and services provided by WMO in the region, which would allow for better appreciation of the work by WMO.

SPREP noted that all of these services and strategies should be converging to support the national meteorological services in the region.

The WMO representative thanked RMI for their efforts, and responded to Fiji that the starting point was the global plan, working down through to the regional RAV and then to the Pacific strategy and the need to link these, while at the same time highlighting the specific Pacific needs.

## OUTCOMES

The RMSD agreed the PMSP needs to be simplified to clearly articulate the scope, audience, objectives and application.

The RMSD noted that there was general agreement to ensure that the plan is generic enough to be understood and used by non-meteorological professionals, policy makers and the wider community.

The RMSD noted that there was general agreement that the plan should be country-driven and reflect NMSs priorities.

The RMSD acknowledged the links to other regional strategies and frameworks.

The RMSD agreed on the need for a strong governance structure.

The RMSD endorsed the proposal to task the Secretariat to commission a Technical Assistant to undertake further consultations and prepare a re-draft of the strategic plan for consideration by early 2012.

The RMSD noted the need for specific references to national priorities on drought in the PMSP.



# Formulation of the Pacific Meteorological Council

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Dr Netatua Pelesikoti referred to the information paper on the Pacific Meteorological Council which was distributed ahead of the meeting. Key events leading to the PMC included the first meeting of the RMSD, organised by SPREP in 1993. It was in this first meeting that discussions took place on the need for a mechanism to formalise the Pacific Meteorological Service Directors meetings. The issue of the PMC was raised again at 12RMSD, due to the fact that climate meteorological services were in high demand in the region, and needed to inform climate change adaptation in the region. 12RMSD recommended that the Secretariat explore this concept further, and submit their findings to the SPREP Meeting. In 2007, Small Island States leaders called for a strengthening of national and regional meteorological services, particularly in the area of weather and climate services.

In 2008 the 19th SPREP Council (the Council) noted with appreciation SPREP's role in coordinating past RMSD meetings. The Council considered the recommendation from the 13RMSD meeting held in Rarotonga, Cook Islands in July 2007, calling for the establishment of a Pacific Meteorological Council (PMC) to replace the RMSD. It requested the SPREP Secretariat to prepare a paper on how the PMC could be officially instituted within the CROP system. In 2009, the 20th SPREP Council considered the paper on the PMC prepared by the Secretariat and agreed in principle to the establishment of the PMC. It directed SPREP to develop a draft terms of reference (TOR) for the PMC for consideration by the 14th RMSD scheduled for August 2011. It also directed the SPREP Secretariat to provide an update on the establishment of the PMC to its 22nd session to be held in Samoa in October 2011.

The PMC paper distributed to delegates provides a history of this initiative, as well as draft terms of reference for the PMC. RMSD meeting delegates were invited to implement SPREP's recommendation of establishing a PMC, and to provide input into and endorse the TOR for this council. It was also proposed that this PMC would replace the RMSD.

New Zealand asked for clarification on whether there is a requirement for this meeting to decide on a resolution for the PMC to be created, or has this been pre-decided by the SPREP meeting?

Dr Netatua Pelesikoti responded that the SPREP meeting has made the decision for the PMC to be established. Dean Solofa also clarified that the SPREP Meeting endorsed the idea of a PMC to be formed, but that the PMC itself would develop and adopt its own terms of reference.

Tonga sought clarification from SPREP on the differences between the three types of bodies that could be formed under the SPREP meeting (i.e. committees, sub committees and subsidiary bodies), and the funding implications of forming such bodies. He also asked for clarification if the Pacific Desk would be funded through SPREP's core budget. Dr Pelesikoti informed the meeting that the Pacific Desk Concept would be included in SPREP's core programme, but funded through project funds as a longer term initiative.

Dr Pelesikoti invited general comments on the proposal, but suggested that a smaller drafting group be formed to finalise the terms of reference.

The United States asked for clarification on the current status of the RMSD (in terms of SPREP's rule 13.1), and asked how the formation of the PMC would change this status? Dr Pelesikoti explained that the formation of the PMC would be a formalisation of the RMSD.

Australia asked what the process would be going forward, noting that they have had limited opportunity to view the paper, and supported the suggestion of a smaller working group to develop the terms of reference and governance structure further.

Samoa supported the establishment of the PMC, and supported the idea of a smaller working group to further develop the terms of reference. It is important that the governance of the PMC is within the region.

Dr Pelesikoti asked that the second presentation (on the Pacific Meteorological Desk Partnership (PMDP)) be made, before working groups are established to look at the terms of reference on both the PMC and PMDP.

The Chair reminded delegates that this has been an ongoing process since 2009, and that it is important to reach conclusions on these issues soon.



# The Pacific (Meteorology) Desk Partnership Concept

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Mr. Dean Solofa reminded participants that the concept of a Pacific Desk Partnership has been in development for over one year. The Review of the Pacific National Meteorological services recommended that a Pacific Desk be established, to strengthen regional coordination. This would bring together technical support agencies to work together more effectively, complementing and building upon efforts and strengths, working to an agreed strategy, and be accountable to national stakeholders (National Meteorological Services) and regional mechanisms (SPREP Meeting). A diagram was shown using the 'pearl approach' where the National Meteorological Services would be supported by the Pacific Desk Partnership. Governing this desk would be the PMC, and it would report to countries and donors through the annual SPREP Meeting.

The Pacific Desk partnership would be made up of two components: (a) the secretariat role, of SPREP and WMO and (b) technical partnerships (i.e. NOAA, Australia Bureau of Meteorology, NIWA, New Zealand Meteorological Service, Fiji Meteorological Service, Finnish Meteorological Institute, Meteo-France, JICA and Commonwealth Scientific and Industrial Research Organisation (CSIRO)). The Pacific Desk Partnership would also deliver: weather and climate forecasting training; infrastructure development; climate services development; sectoral products and services development; strategic planning; and undergraduate training. It would align its work to the core functions of national meteorological services, i.e. climate services, institutional infrastructure and weather services. It would provide capacity building, communications, technical and governance support.

The core of the PDP would be partnerships, with technical and partner agencies coordinating to deliver specialist skills to assist and strengthen Pacific national meteorological services. The delivery mode would be through partnership agreements (with technical agencies) to deliver jointly developed strategies, with an Apia based secretariat responsible for overall coordination.

The PDP would require monitoring and evaluation through annual reporting, quarterly updates on activities and a dedicated online presence and regular communications. The PDP would report to the PMC (on technical achievements) and the SPREP Meeting. SPREP has committed to supporting the coordination lead role for the PDP and has created three new positions, including the Meteorology Climatology Advisor, Meteorology Climatology Officer, and Finance and Administration Officer. Funding has been secured for the first position, for a period of two years from the Commonwealth Secretariat. The PDP would sit within the Science and Policy division of SPREP's Climate Change Programme.

The PDP would be guided by the Regional Strategy, which is currently under development. Some early indication of priority areas have already been scoped from earlier consultations with meteorological directors, technical partners and donors, which would also form the basis for the PDP programme. The work would also be linked to the Regional Association Strategic Plan and WMO Strategic Plan.

The Chair invited participants to read the three key documents (PMC, PDP and Regional Strategy) to allow for a decision to be taken in RMI during the week.

Guam asked for clarification on the difference between the advisor and officer's positions. It was noted that the advisor's role is more senior than the officer's role.

Fiji asked for clarification on why on one slide WMO is shown as part of the PDP Secretariat, but is missing from later slides. It was suggested that maybe WMO is better reflected as a technical partner, rather than a part of the SPREP Secretariat. It was clarified by SPREP that WMO is currently based in Apia, in the SPREP secretariat office, hence the position of WMO in the diagram.



Samoa expressed a desire to have the RMSD recognised by the region. Samoa is supportive of the formation of the PMC and asked for clarification of whether the PMC Chair will be invited to report directly to the SPREP Meeting. SPREP confirmed that it is the intention of SPREP to invite the Chair of the PMC to report to the SPREP Meeting on an annual basis. This would begin at the 22<sup>nd</sup> SPREP meeting in Apia, in September 2011.

SOPAC noted that globally meteorology and hydrology are strongly linked and asked how the PDP will work with this linkage. SPREP responded that such partnerships will be formed at the national level, between national meteorology and hydrology services. It was noted that capacity of hydrology services varies markedly between countries, and while the initial focus of the PDP will be on strengthening meteorological services, there may be opportunities later to work with SOPAC on extending this support. SOPAC suggested that these linkages between meteorology and hydrology should also be promoted at this higher regional level, to demonstrate their importance to countries.

Fiji asked if the PDP would not be taking over the responsibilities of the WMO sub-regional office.

Papua New Guinea noted their appreciation for the presentations. PNG, however, also had some reservations. This has come at a time when funding is being sought for national work, and PNG wanted to know what guarantee is there that this will improve weather services on the ground. PNG weather services have had little benefit from SPREP, and would like to see a guarantee of the PDP delivering additional funding (including the European Union (EU)).

New Zealand thanked SPREP for their presentation, and requested a copy. They also noted that it would be useful to see how the terms of references between the PMC and RMSD differed.

Dr Netatua Pelesikoti clarified that the RMSD does not currently have a terms of reference. The PMC proposal would formalise this council. This would also allow for a strengthening of the Secretariats support to the RMSD/Council. The success of the PDP would depend very much on the technical partnerships. In response to the concerns expressed by PNG, SPREP explained that funding is currently being sought, including from the EU.

Vanuatu endorsed the proposals to establish a PMC and PDP in principle. Vanuatu asked for clarification on where NMSs could go to require assistance for national initiatives, and noted that the PDP could be well placed to provide such assistance. It is important to also align these initiatives to climate change adaptation and disaster risk reduction, and national development strategies.

Cook Islands endorsed the proposals put forward by SPREP, as this will enhance visibility both within the region and within WMO. Cook Islands noted that not all island states in their region are WMO members, but through affiliation with regional groups have been invited to meetings.

SOPAC shared some reflections from the Disaster Management community. This community has seen value in formalising the structure of their meetings. SOPAC also gave thanks to Dean Solofa from SPREP for his efforts to drive this forward.

Tonga believes that just changing the name from RMSD to PMC is a step forward. Past RMSD have produced a list of recommendations but they would like the PMC to take decisions, and for these decisions to be forwarded to the annual SPREP Meeting. For the PMC to work, full secretariat support is needed.

RMI fully endorsed the papers presented.

The RMSD endorsed the concept of the Pacific Desk Partnership on its final day, but renamed it to the Pacific Meteorological Desk Partnership (PMDP).

# Developing the Strategic Operational Plan for Meteorology in the Pacific (2012–2015)

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A presentation was made jointly by Dr Netatua Pelesikoti and Mr Dean Solifa, where it was explained that the proposed 2012 – 2015 Strategic Operational Plan should link to Strategic Plan for the Development of Meteorology (SDMP) 2000 – 2009, and continue the vision and mission goals from previous strategies. The plan also links to the relevant regional frameworks, such as the Pacific Islands Framework for Action on Climate change (PIFACC), Disaster Risk Management (DRM) platform, and other relevant strategies. A lot of the plan remains in draft form, and one of the key issues that needs to be further developed is a governance aspect, to ensure that there are responsible agencies to implement the plan. The plan has yet to build in the PMC and PDP into its governance, as well as the annual SPREP Meeting. A monitoring and evaluation framework is also yet to be developed. This can either be built into the strategy, or developed once the strategy is accepted.

It was proposed that the highest level of governance for this strategic plan would be through the SPREP Annual Meeting. The RMSD/PMC will be responsible for planning of projects and programmes, decision making, capacity building, network and the biennial meeting. At the third level of governance will be the Pacific Meteorology Strategy, and underneath this will be the Pacific Desk Partnership, which will coordinate the work plans, fundraising and capacity building.

The strategy links closely to the WMO Region V Strategic Operational Plan (WMO RAV SOP), highlighting key Pacific outcomes which relate directly to regional and global outcomes. The current strategy is in draft form, and lists examples of potential priority actions, but these are still very much open to Directors input.

It was agreed that the next steps would be for this meeting to agree on the form of a draft plan, the regional and national elements for description for inclusion, and the outcomes, priority actions, and performance indicator connections between the RAV SOP and this draft plan.

Dr. Netatua Pelesikoti clarified the process of how the current draft of this strategic plan was developed. The technical team who had assisted the secretariat to develop the meeting agenda (for RMSD 14) had also suggested that the Secretariat develop a draft strategic plan. SPREP are also aware, however, of the need identified by Meteorological Directors to reflect national priorities. A smaller working group will be formed out of this meeting to ensure that such national priorities are reflected. The strategic plan will not necessarily be endorsed at this meeting, but may be further worked upon outside of this 14<sup>th</sup> session.

Samoa sought clarification on how to align national strategic priorities with this plan, and how to ensure that national priorities fit into this plan? Dr Netatua Pelesikoti responded countries should ensure that what is here complements the priorities of national meteorological services.

SOPAC were encouraged by the level of detail in the results matrix, and noted that the DRM platform (held during August 1 – 5<sup>th</sup>, 2011) proposed the establishment of an early warning working group.

It was also noted that for the monitoring and evaluation (M&E) sections there should be some linkages shown to the implementation of the DRM and PIFACC frameworks. It was also stressed that it will be important that the M&E requirements do not place additional burdens on countries. SPREP will work with SPC and SOPAC and other regional organisations to develop the M&E framework.

In response to SOPAC's mentioning of the DRM platform proposal to establish an early warning working group, Australia noted that there is already in existence, within the meteorological community, a tropical cyclone operational structure with warnings at the regional level. Tsunamis have an International Oceanographic Commission (IOC) driven warning group. The Tropical Cyclone (TCC) Committee looks after the regional aspect of tropical cyclone warnings and is a very established and visible working group of RAV. There is a need for an internal sharing of procedural aspects and delivery of warnings, but in terms of a regional working group on multi hazards, it is important to see where exactly this will fit.

The representative from the International Oceanographic Commission (IOC)/United Nations Educational, Scientific and Cultural Organisation (UNESCO) noted that the DRM Platform was not trying to create a new working group altogether, but rather drawing on the expertise of existing groups. The IOC has a regional implementation plan which lists priorities of the national delegates, which are then reported against in terms of implementation. There is a need to establish working groups under the activities listed, to ensure that they are implemented.

The RMSD then broke out into three working groups, allowing each group the opportunity to review and comment on the draft strategic plan in more detail.

## Comments from the working groups on the draft strategic plan

Group one commented that we need to be very clear about what the process is going forward on the development of the document. It may be helpful to put together a terms of reference that states the structure. The group also noted that the second week of November is the RAV Technical Conference, Solomon Islands which might provide an opportunity to work on the document further.

Group two commented on the structure of the matrix and on the critical need for it to be a Pacific-owned document. While the link to WMO strategies should remain clear, the Pacific priorities must be at the forefront. The governance structure should also directly reference the PMC. The document should also take into consideration gender issues, and should be passed through the Pacific gender working group. There is also a need to simplify the language in the document so it can be delivered and shared with other sectors.

Group three commented that we must ensure that the document recommends that all the island needs are addressed from most developed to least developed. There may also be a need to separate out references to both droughts and floods.

New Zealand noted that the previous plan was meteorology only, and hydrology came under SOPAC's mandate. New Zealand asked if the plan is addressing both or just meteorology. New Zealand requested guidance from the Secretariat.

Australia also asked who is going to do the work on this strategy, and use this as the guide for how to get PMC activities done. Australia suggested turning the strategy into a working document where the actions are tracked and executed. Clarification was also asked if the scope of this strategy can go beyond the SPREP's mandate, and if not, how the hydrology actions happen. Australia suggested that hydrology does not come under the plan.

IOC/UNESCO suggested that at this stage, organisations' mandates should not be the focus but rather, the focus should be on what it is that makes a meteorological service function appropriately.

SOPAC also suggested that this same document could be used to inform sectors and Ministers on what the meteorological services are doing to support them.

The role of having key partners and stakeholders involved in the plan's development was also stressed.

It was agreed that SPREP would put together a terms of reference for a technical assistant to complete the development of the strategic plan. This would be done over a six month period.

## Side Event – South Pacific Tropical Cyclone Climatology Update

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Mr. Howard Diamond provided a lunch time side event presentation on an update on research begun in 2006 on South Pacific tropical cyclone climatology. The research has been carried out as part of his doctorate studies. Mr. Diamond acknowledged the kind assistance of many of the Directors who had provided assistance in the form of tropical cyclone track data he had used to compile the climatology. Mr. Diamond's presentation covered an update of the historical tracks he had managed to digitize and incorporate into a new database compiled specifically for the research and which would be available as a resource in future for studying historical tropical cyclone tracks. Mr. Diamond also covered his methodology and final conclusions drawn from the research now completed. The participants welcomed and congratulated Mr. Diamond on his research, and results and findings, and encouraged the use of this information as a resource to improving the understanding of tropical cyclones and their forecasting.

# Report on the outcomes of the 2011 Pacific Climate Change Roundtable

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It was agreed that due to the fact that a report on the Pacific Climate Change Roundtable (PCCR) had been presented at the Climate Services meeting (Monday 8<sup>th</sup> August) that this report was not necessary, and to allow more time to be given to other presenters.

# Report on the outcomes of the 2011 Pacific DRR/DRM

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Dr Netatua Pelesikoti (SPREP) and Mosese Sikivou (SOPAC) gave an update on the outcomes of the 2011 Pacific Disaster Risk Reduction/Disaster Risk Management Platform (held from 1 – 5 August, 2011). The draft outcomes from this platform were distributed to RMSD participants, and can be found at [www.pacificdisaster.net](http://www.pacificdisaster.net)



# Presentation on a joint Road Map towards an Integrated Strategy for Disaster Risk Management and Climate Change Adaptation and Mitigation by 2015

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The Pacific DRR/DRM had a lot of discussion on the issue of regional coordination. This joint presentation by SPREP and SOPAC should be seen as an example of such coordination between CROP agencies.

The current situation is that there are two separate regional policies – a Disaster Risk Management Action Framework (2005 – 2015) and the Pacific Islands Framework for Action on Climate Change (PIFACC 2005 – 2015), the key policy driver for climate change in the region. Both documents were approved by the Pacific Island Forum Leaders. This road map is to bring these two frameworks together by 2015.

Disaster and climate change concerns overlap in many ways, but there are differences. Two separate UN organisations drive these areas: ISDR and Hyogo Framework drive the DRM work while the UNFCCC drives the climate change work. All Pacific countries have signed on to both of these international frameworks. At the regional level, regional frameworks have been developed, reflecting regional priorities. DRM focuses on seismic and other risks, while the climate change focus is on the reduction of greenhouse gas emissions. Both also have similarities in focus, i.e. reducing risk to development sectors posed by disaster and climate risks, with similar goals and principles. The Regional policy frameworks currently have similar focuses. Pacific Island countries are also already integrating DRM and climate change efforts, i.e. Tonga, Cook Islands, Marshall Islands, Niue, Tuvalu, Fiji and FSM are developing Joint National Action Plans (JNAPs).

The purpose of the road map is to establish a way forward or a process for developing an integrated Pacific regional strategy for disaster risk management (DRM), climate change adaptation (CCA) and climate change mitigation (CCM). It will suggest key milestones and the formation of a technical working group to facilitate the development of the integrated strategy. It will cover implementation arrangements, including financing and M&E, and best practice studies in DRM, CCA and CCM. The expected outcomes of the road map will be an integrated Pacific regional strategy for DRM, CCA and mitigation.

In the Pacific, DRM is divided into two areas: disaster risk reduction and disaster management. It is also important to understand the concepts associated with these work areas. Climate Change must be considered in the context of other development pressures.

The draft road map attempts to keep things as simple and clear as possible. The road map approach will be to continue implementing some of the existing initiatives in DRM, CCA and CCM, and to integrate key milestones.

This will be a country-driven document. Inclusion, leadership and ownership by Pacific Island Countries and Territories, and supporting partner organisations are the guiding principles. It recognises that a significant body of work has already been undertaken in relation to integration at national level (and is ongoing). It also recognises that currently separate regional fora and regional organisations exist to guide DRM, CCA and CCM respectively and these are to be respected and maintained.

An integrated strategy will work to map institutions and policies to ensure better coordination; develop innovative funding to enhance DRM and CCA/CCM; take stock of available information on

hazards, exposure and risk; and allow for multi stakeholder consultations at the national level. It will also develop technical leadership and capacities; strengthen regional information management; and carry out advocacy of the DRM Framework and PIFACC. SPC and SPREP will appoint a technical working group to draft this integrated regional strategy.

By 2012, this work will be well underway to develop a regional synthesis report of progress on DRM and CCA/CCM as well as develop case studies in these areas. By 2013, there will be a joint meeting of the PCCR, Pacific Platform for DRM and RMSD. By 2014, there will be a review of progress, and by 2015 the integrated strategy would go to the SPREP Council and Pacific Leaders meeting.

At the DRR/DRM platform, questions were posed to the participants, asking them if the road map makes a compelling case for a strategy, does it need strengthening and is sufficient guidance provided to complete it by 2015. Participants were also asked which of the activities proposed might be addressed as a matter of priority. Participants of the RMSD are also encouraged to send comments on this proposed road map to SPREP (Dr Netatua Pelesikoti) or SOPAC (Mosese Sikivou) over the next two weeks.

The United States noted that it sees this road map as a positive step forward, supporting Meteorological Services, with linkages at all levels. Australia noted that they would have to think about how the Meteorological Strategy will dovetail into this road map, and how Australia could contribute. Vanuatu pointed out that science must be included.

SPREP noted that the comments made by countries are important. There are several existing arrangements that need to be considered and explained in this road map, i.e. PCCR, DRM Platform etc. While the linkages will be drawn in the document, it will also be important to maintain existing strategic plans. There is also an opportunity to have members of the meteorological community in the technical committee.

SOPAC noted that the Pacific Platform for DRM is aligned to the International Strategy for Disaster Reduction (ISDR) concepts of regional platforms for DRR. It aims to harmonise and not replace existing fora. Guiding principles include build on existing mechanisms and structures, foster multi stakeholder participation, avoid duplication, and ensure transparency and accountability. Regional structures relevant for DRM include the Regional Disaster Risk Management Partnership meeting etc.

On an annual basis there is a regional Disaster Management meeting, as well as an annual Pacific DRM partnership network meeting. It is planned that in 2012 there will be a joint meeting of DRM and other groups, i.e. meteorology, geology, water, agriculture etc. In 2013, it aims to bring together the Pacific Climate Change Roundtable (PCCR), DRM platform and RMSD.

Agreed areas of work include advocacy, disaster risk budgeting and financing, integration of DRM and climate change, natural resource management, early warning preparedness and response, community, risk governance capacity, information knowledge and education.

## OUTCOMES

The RMSD confirmed their support for a joint meeting of the PCCR, DRM communities and the Regional Meteorological Services Directors in 2013.

The RMSD agreed on the need to ensure input from the meteorological community into the CCA/CCM & DRM technical working group.

The RMSD endorsed in principle the road map.

# Update on the Implementation of Pacific Islands national Meteorological Services Quality Management Systems (QMS) for Aviation Services

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An update was provided by Mr Jaakko Nuottokari and Mr Harri Pietarila on the Finnish funded project on the implementation of Pacific Island national meteorological services quality management systems for aviation services. Under this project, three workshops were conducted in the region, with significant Pacific participation. The presentation outlined the degree to which each country had completed the QMS training, and noted that further steps in the project would be presented later during the week.

Samoa noted that the training events were useful, and acknowledged the representation of WMO in the Tonga workshop.

The USA asked if there were any linkages between the decisions of the WMO Congress with these training activities and what was implemented in the region.

## OUTCOMES

The RMSD acknowledged the successes to date of the project and commended the FMI and the Government of Finland for their excellent efforts in working with Pacific Island Countries and SPREP on this project. The meeting endorsed the continuation of this partnership and agreed that the next phase SPREP-Finland (through its Ministry of Foreign Affairs) Project Document be circulated for review and comments to the Meteorological Directors.

The RMSD noted that, since 2002, the U.S. has funded the PI-GCOS position at SPREP. However, instead of being dedicated to coordinating and progressing the PI-GCOS program, the PI-GCOS role has been used primarily to fulfil the duties of the long-dormant, but clearly required, SPREP Meteorology and Climatology Officer (MCO). An example of this is the ongoing use of the PI-GCOS Officer to administer the RMSD (and now PMC) process. Use of the PI-GCOS position in this way will continue to be an obstacle to the effective and sustainable advancement of meteorological and climate services in the region.

The RMSD emphasized the importance of building in the costs of ongoing maintenance of equipment procured under the project to ensure the sustainability of any new equipment purchased by the project.

The RMSD noted the opportunity for this project to build upon the existing RANET work.

The RMSD agreed on the need to take a multi donor approach to this project, and invited additional partners to provide support.

The RMSD emphasized that the project should take into account other projects happening in the region, the smallness of NMHS and their capacity constraints, and should take a holistic regional approach.

The RMSD noted the role of the Pacific Desk Partnership as an important tool for coordinating with donors to assist in the leverage of additional partnership support and ensure the sustainability of projects.



# Pacific Tsunami Warning Centre (PTWC) Presentation of Tsunami warnings for the Pacific

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Mr. Rajendra Prasad presented on the Pacific Tsunami Warning Centre for the Pacific. There is a continuing challenge to supply seismic and tsunami information given the scarcity of monitoring sites. PTWC has responded to 2000 global earthquakes, issued messages for 1314 earthquakes, and eight tsunami warnings for eight Pacific region earthquakes. There are challenges to improve the speed of the system's reaction time. PTWC sends out messages through the GTS and numerous other systems, including more traditional fax and email, as well as through RANET (requires mobile SMS number). PTWC is seeking to verify communications through same time tests rather than randomly. The use of faxes can become costly for events, for example, the Samoa 2009 tsunami cost US\$15,000 and \$31,000 for the Japan warning. Ways of reducing these costs have been looked at, including reducing the number of faxes for focal points. The PTWC aims to increase the seismic networks, improve real time coastal and deep ocean data coverage, implement monthly communications tests, find ways to reduce fax costs, and make recommendations to improve procedures.

The presenter explained the current PTWS warning criteria, and the types of warnings that emanate as a result. There are challenges in some areas that are not properly covered by monitoring stations. Proposed changes include the provision of expected levels of impact. The presenter showed how different events had been monitored, and how the way forward is to develop new procedures and products, such as PacWave 11 Exercise which is currently in experimental test mode.

The IOC/UNESCO representative highlighted some of the other ideas being discussed in terms of the criteria and parameters in the task team, and recommended Pacific Island Countries nominate experts to be a part of this team.

The US noted that often important information for meteorological services does not get to the relevant focal point. The IOC doesn't have focal points listed for many Pacific Island Countries. This is related to non-membership in IOC. There is also a need to look at how information is channelled to ensure that it reaches the right people in the right country.

## Report on the outcomes of the Climate Services Providers Meeting

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A presentation was made by Mr. John Marra on the workshop on Climate Services held on Monday 8<sup>th</sup> August 2011. A number of recommendations were put forward for consideration by PMC. These have been attached as Annex 1 and were adopted by the PMC.

## Report on the outcomes of the Radio Internet (RANET) Telecommunications Meeting

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Mr Edward Young, the Chair of the RANET network, and Mr Collin Schulz made a presentation regarding the workshop on RANET held on Saturday 6<sup>th</sup> August 2011. A number of recommendations were put forward for consideration by RMSD. These have been attached as Annex 2 and were adopted by the PMC.

## Side Event on the Launching of the Pacific Climate Change Science Project (PCCSP) Products

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A side event was held in the evening, where the Australian Department of Climate Change and Energy Efficiency (represented by Dr. Gillian Cambers and Mr. Cameron Darragh) launched the Pacific Climate Change Science Project products, which provide Pacific country specific updates on climate and climate variability. The event highlighted the culmination of several years of cooperative work between the PCCSP and the Pacific Island Countries in the areas of climate change science and meteorology support, and presented the outcomes of tools developed in the context of this partnership. Further materials will be presented later in the year as the PCCSP completes other areas of work.

# Presentation and Review of a Proposal for Phase 2 of the Pacific Small Island Developing States NMSs Capacity Building Project

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Harri Peitarila and Jaakko Nuattokari, representing the Finnish Meteorological Institute (FMI), presented on their proposal for phase 2 of a project to build the capacity of national meteorological services in the Pacific. The FMI budget for 2010 was 65 million Euro, and was funded through 63% from the government and 37% from research and commercial activities. Fifty-seven percent of the research activities are externally funded. Staff are made up of 60% academic degree holders, with 19% having PhD degrees.

FMI offers three types of services:

- Basic weather services i.e. safety and activity conditions of whole society
- Full cost customer services i.e. for aviation and military; international development cooperation projects
- Commercial services. Consulting services include air quality expert services and international consulting. International expert services cover all the expert areas of FMI, i.e. institutional capacity building, training, consulting, measurements and modelling. Consulting services are world wide i.e. Caribbean SIDS, Pacific SIDS, Central Asia, and Africa.

Most projects are funded by the Finnish government, but FMI also mobilises funding from the EU, and helps countries who are seeking membership into the EU to meet EU standards. Some projects are also funded by Asian Development Bank (ADB) and World Bank.

The presenters shared an example of a project in the Caribbean. FMI has a long history in the Caribbean since 2001, and coordinated a project on preparedness to climate variability and global change in SIDS, in the Caribbean region in 2001 – 2003. The total budget was 3.5 million USD, financed through Finland. Project components included the improvement of telecommunications systems in the Caribbean. It also had large capacity building components. This project was followed up with a weather production pilot project from 2003 – 2004, looking at automated weather systems for the Caribbean. From 2010 to 2012 FMI have four new projects in the Caribbean, focusing on training and helping with the QMS of aviation weather services. Projects are being held in Trinidad & Tobago, Jamaica, Barbados and the wider Caribbean region.

The goal of FMI is not just about delivering projects, but also looking to longer term partnerships and seeking concrete results to help sister organisations deliver better services for their societies.

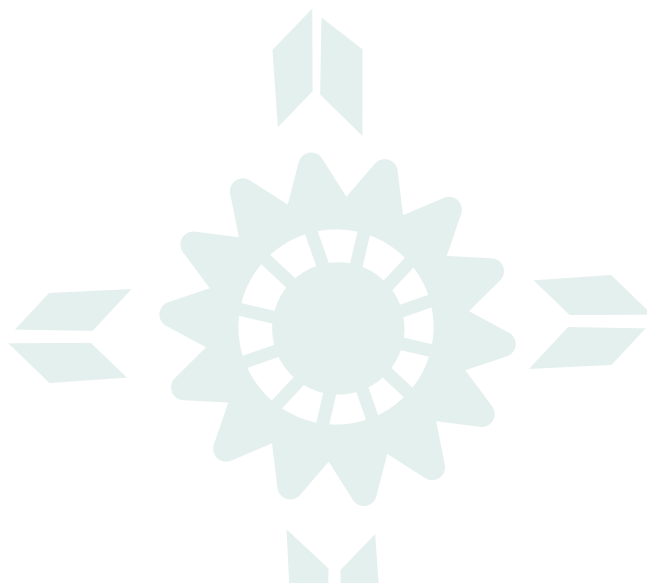
# Results from the current FMI-SPREP Project and outlined opportunities for future cooperation

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The FMI presenters (Harri Peitarila and Jaakko Nuattokari) shared results of an existing project, and also invited comments on a follow up project which has been implemented and developed in partnership with SPREP. This project was launched in 2009. It saw three QMS training workshops in Apia, Tonga and Fiji. There was also a workshop on communications and information services in meteorology in Nadi, in 2010. The project also provided support to national meteorological services to attend the WMO RA V meeting in Bali, as well as funding support for RMSD 14. It was noted by FMI that the project has progressed as planned. The QMS implementation has progressed well and all workshops have been successful. The project officially ends in December 2011, and is yet to produce a socio-economic overview paper for the Pacific. It is now in the process of developing the next phase of funding, in partnership with SPREP. SPREP support has been crucial for this project, and FMI thanked all who had been involved in its implementation.

The US noted that the FMI project has competed for scarce resources, in terms of SPREP time. This was all done with no official communication to GCOS. FMI has diverted staff time away from the GCOS project, for example. The US asked if any follow on project with FMI will be paying back the time/lost resources to the GCOS project, and if it would cover the costs of an additional staff member, so that the GCOS work can continue, noting that the GCOS funds are now severely restricted.

FMI responded that such issues are better addressed within SPREP internally. It was up to SPREP to allocate staff toward the project and it was not the intention of the FMI project to disturb other projects. The follow up project will have an improved approach to the human resources.



# Phase Two: FINPAC: Improved Climate Change Adaptation Capacity of Pacific Island Countries through Enhanced Meteorology Services

A number of guiding documents and strategies have influenced the planning for the next phase of the project, including the Review of Regional Meteorological Services (April, 2010); WMO RAV Strategy; SPREP Pacific Desk Strategy; SPREP Strategy for the Development of Meteorology in the Pacific (pending); Finnish Development Policy; and United Nations Millennium Development Goals. A development case must be made for a technical project which supports regional services, through a regional agency.

Taking the development view point, the project objective must be to reduce poverty and save lives. The project will have three results:

1. Improve regional meteorological services
2. improve delivery and availability of early warning services
3. improve the use and effectiveness of weather and climate information.

The project structure will see a direct contract between the Government of Finland and SPREP, and FMI will only provide technical assistance to some of the project areas, where expertise exists.

Activities under Result 1 (Improved Regional Weather Services) will include supporting a regional framework for weather services; improving the visibility of NMHS; supporting the implementation of QMS in the PIC NMHSs; improving severe weather forecasting through improved use of lightning detection data; and strengthening the Pacific Desk for Meteorology at SPREP (including funding for MCO).

Activities under Result 2 (Enhanced Dissemination of Information/Early Warning Systems) will include enhancing availability and dissemination of early warning information through the RANET programme and establishing a warning exchange/dissemination service on line following the MeteoAlarm principles.

Activities under Result 3 (Improved use of weather and climate services in island communities) will include supporting the role of woman in the early warning process; enhanced cooperation between national disaster risk management agencies and NMHS; and supporting island communities to improve use of weather and climate information through community projects.

The project will run for four years (2012 to 2015), with a maximum overall budget of 4 million Euro. Funding will go to SPREP, including funding for the Meteorology Climatology Officer (MCO) position for the duration of the project. This is currently in the development phase, and SPREP is expected to submit to the Ministry of Foreign Affairs (MFA) in September/October 2011, with the project to launch, at earliest, in 2012.

FMI technical assistance will support the areas where FMI has existing technical expertise. FMI will also support SPREP with reporting requirements to MFA, and will continue current activities in QMS.

Input to where technical assistance is needed was sought from the participants.

The United States asked if there would be funding for infrastructure. FMI confirmed that this was the case. The US also asked if there would be funds for sustained and ongoing maintenance, as previous experience has shown that this has been a short fall in the past, in donor funded projects. It is important, therefore, to build a maintenance sustainability aspect into any new projects.

Samoa expressed concerns about the securing of funds for this project, as experience in designing previous projects has led to a need of downscaling activities, when full budgets were not realised. Samoa asked FMI how confident they are in securing the full amount of funds budgeted for phase two.

FMI explained that there has been a change of government in Finland, which does bring about some uncertainty. On the other hand, FMI has received very positive feedback from the Ministry of Foreign Affairs to date, including positive feedback on SPREP, and the government has now down scaled its development budget. FMI cannot give any guarantees, but does have a high level of confidence on the chances of securing the full budget.

The US noted that there is an interest in working with the US to support the RANET programme and asked what would be appropriate to help further develop this section of the collaboration. FMI responded that more information was needed on the rationale of why the project will support RANET.

Australia noted that the project will be running under SPREP, and wanted to know if SPREP was moving into more technical areas of delivery, and required more information on the project structure and governance. For example, will there be a larger project team?

FMI responded that overall guidance from the funding agency requires that there has to be an overall project steering committee, which will involve FMI, SPREP and members of NMHS. There will be a supporting project manager from FMI, plus FMI technical assistance, with an opportunity of sending an additional person into the region.

SPREP noted that in areas where technical assistance is not possible from Finland, other technical partners would be engaged to assist with the project (through MOUs). New Zealand noted that its own meteorology service would also be willing to share the technical capacity and skills that exist in Wellington.

The United States reminded of the importance of sustaining any new systems which are installed. The Cook Island also cautioned that a potential downfall of this project will be sustainability. The Cook Islands have a small NMHS, so projects need to be mindful of the need to have enough staff to implement this and other projects that come through. The Cook Islands asked that a holistic approach be taken, and that Meteorological Directors be given the opportunity to give feedback into this proposal.

FMI responded that it is not possible to increase the budget at this stage, but there may be an opportunity to convince the government to lengthen the period of support to develop longer term partnerships. The MFA is looking to take a multi donor approach, and is seeking additional partnerships which could bring in additional resources.

SPREP noted the example of the Australian partnership which built upon the PACC project, and explained that SPREP will continue to seek additional partners to support this initiative.

Australia also noted the importance of the Pacific Desk Partnership in this work.

Vanuatu noted their appreciation for this project and noted that there are many other similar projects in the region, and requested that there is sufficient discussion between other regional partners.

# Presentation and Reviewing of the Proposal for Climate and Oceans Support Programme for the Pacific (COSPPac)

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Ms Juanita Pahalad from the Australian Bureau of Meteorology provided an update on the current proposal for the climate and oceans support programme for the Pacific.

Discussions focused on the importance of mainstreaming initiatives into one, and the fact that the regions capacity to absorb multiple projects needs to be considered. It was also noted that the implementation of COPAC needs to be at a regional level. It was noted that the management of the South Pacific Sea Level Climate Monitoring Project (SPSLCMP) was originally based in the Pacific, and the suggestion was made that since countries worked very closely with CROP agencies, it might be better placed in the Pacific again.

The representative of COSPAC noted that there would be a regional coordinator based in the region, but the overall manager would be based in the Australian Bureau of Meteorology, who would also work closely with regional contacts.

SPREP also noted that they looked forward to playing a more active partnership role with the COSPAC initiative.

It was also suggested that a representative of the regional meteorological services be included on COSPAC's Steering Committee.

## OUTCOMES

The RMSD welcomed the proposal to include two representatives of Meteorological Directors (to be nominated by the PMC) into the Steering Committee of the COSPPac initiative and recommended that the representative of a Pacific Desk Partnership also be included as a member of the Steering Committee.

The RMSD requested that a copy of the draft design for the COSPPac Initiative be shared with Meteorological Directors, regional partners and relevant stakeholders, before it is finalised.

The RMSD noted the need to include national and regional organisations as partners in the delivery of training initiatives in the region, and to ensure the sustainability of such skill transfer beyond the life cycle of projects/initiatives.

# Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project with WMO

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James Lunny from the Meteorological Service of New Zealand presented an update of the Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP).

The SWFDDP aims to improve severe weather forecasting and build closer relations between meteorological offices, disaster risk reduction services and various media in the South-West Pacific.

The project is a WMO initiative with MetService New Zealand playing a major role. MetService has created MetConnect Pacific; a password protected website which makes available guidance and numerical weather prediction (NWP) products and observations central to forecasting severe weather in the tropical South-West Pacific. The pilot project commenced in November 2009 for four island states: Fiji, Samoa, Solomon Islands and Vanuatu. The full demonstration phase began in November 2010, with Tuvalu, Cook Islands, Niue, Kiribati and Tonga joining.

The SWFDDP uses a cascading forecast guidance process i.e. Global NWP centres (e.g. the UK Met Office) feed information to Regional centres (e.g. Wellington) who in turn, feed National centres (e.g. the Solomon Islands) who then relate information to local authorities such as emergency management authorities and various media.

In-country training was provided through 2009/10.

Regional Basic Synoptic Network/GCOS and Upper Air Network (RBSN/GUAN) monthly statistics have recently been made available through MetConnect Pacific. Funding has also been secured for future in-country training through the New Zealand Ministry for the Environment, and will be held predominantly April to November 2012. The next round of in-country training will focus on the reporting process by the NMHS and the interaction with disaster management authorities.

Tonga noted that this has been a helpful tool for forecasting but that they are not quite clear what is the DRR part of this project. In the RA V strategic plan, DRR is referred to as part of this project, and as such, they requested to know more about this component. The presenter explained that this component will be made clearer, through training, and will focus on improving coordination between Meteorological Services and disaster management authorities.

Tonga also asked if there was an opportunity to include tsunami aspects into this project. The presenter responded that with the project in its demonstration phase tsunamis are not part of the SWFDDP, but there may be opportunities for its consideration in the future.

UNESCO/IOC noted the need to involve other regional partners.

## OUTCOMES

The RMSD noted that there was a request to extend the scope of this project to include tsunamis, but as this is currently outside the scope of this initial phase of the project, it will not be considered at this time. Furthermore, concern was expressed by Tonga about the effectiveness of the DRR aspect of the project and that more attention needed to be given to engaging with, and meeting the needs of the DRR community.



# Pacific Australia Climate Change Science and Adaptation Programme (PACCSAP) – an update for the RSMD Meeting, 2011

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Cameron Darragh presented on the Pacific Australia Climate Change Science and Adaptation Programme. The umbrella programme is Australia's International Climate Change Adaptation Initiative (ICCAI), which represents the Australian government's commitment to fast-start funding. This will be in the measure of 150 million AUD from mid 2008 to mid 2011, and 178.2 million AUD from mid 2011 to mid 2013, globally.

The project aims to establish policy, scientific and analytical basis for climate change adaptation; increase understanding of climate change impacts on natural and socio-economic systems; enhance capacity to assess vulnerabilities and risks, formulate adaptation strategies and mainstream adaptation into decision making; and help finance priority adaptation activities.

Existing programmes include the Pacific Climate Change Science programme (PCCSP) and the Pacific Adaptation Strategy Assistance programme (PASAP). PCCSP was allocated 20 million AUD over a three year period and focused on undertaking new research in climate drivers, ocean processes and acidification and climate projections, and providing tools and training for Pacific island countries. PASAP was allocated 12 million AUD over three years, and supported country-led adaptation activities, and also provided support to develop policies and plans for adaptation.

Under the Australian Department of Climate Change and Energy Efficiency, Australia is now moving into a new and different phase. For the Pacific, this will be the Australia Climate Change Science and Adaptation Programme (PACCSAP), which now integrates the former PCCSP and PASAP initiatives. This is based on consultations held with countries and partners in Port Vila, April 2011. The new phase will focus on four main areas of work.

1. Developing the capacity of Pacific National Meteorological Services to use climate change science.
2. Communications, i.e. synthesise, communicate and raise awareness of climate change projections and adaptation good practice and planning frameworks among Pacific Island countries' stakeholders.
3. New science, i.e. produce new science led by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Australian Bureau of Meteorology (BoM) to better understand likely implications for food security, water security, coasts and infrastructure of the effects of climate changes on oceans process, climate variability and extremes.
4. Adaptation planning – producing new analysis, tools and assessments to develop the capacity of Pacific decision makers and planners to develop and implement adaptation responses.

The current status of this work is that the concept was approved through an AUSAID peer review in July 2011. Regional organisations were involved in this review. The project is currently in the three month inception phase (July to September) to carry out detailed planning, specify activities and dialogue with country and regional partners, and finalise governance and coordination arrangements. There will be additional regional or sub-regional meetings in September/October 2011, to confirm the implementation approach with partners.

Some areas that may be relevant to national meteorological services includes activities on capacity building, including a training package to assist NMS gather, analyse, interpret and disseminate climate change science. This will be conducted through training the trainer programmes, short term courses and the development of training materials. There will also be internships and mentoring opportunities, both in-country and in Australia. There will be engagement with regional universities. As well as co-authored peer review papers or products by Pacific and Australian scientists. The initiative will continue the development of software tools such as CLide, Data portal and Cyclone portal and climate futures, and support data rescue (scanning and digitisation).

## OUTCOMES

The RMSD noted that climate initiatives to engage with the Pacific Desk Partnership and coordinate with other partners must be taken into account in the development of PACCSAP.

# Pacific Tsunami Warning and Mitigation System

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Mr. Rajendra Pasad from UNESCO-IOC presented on the activities in the region. In terms of membership, FSM; Kiribati; Palau and RMI are not members of the IOC but could easily become so by letter from their respective Ministry of Foreign Affairs. Tsunami response plans are underway for Fiji, Tonga and Vanuatu, including training and awareness activities. SOPAC is also being contracted to carry out these activities. The recent meeting of the intergovernmental working group had little representation from the Pacific Island Countries, with only Samoa attending. Countries do need to be more involved. There will be a workshop on the 2009–11 tsunamis, leading to enhancing response, such as through the Pacific Wave 11 exercise (9–10 November 2011). Pacific Island Countries are encouraged to actively participate in this exercise, and a detailed manual on how to participate has been issued, available through Disaster Net. Technical working groups have also been established. The next session of the group will be in September 2013 in Vladivostok, Russian Federation.

# Review of the PMC Terms of Reference

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The Secretariat requested guidance from the RMSD on the comments received from the working group on the PMC, in terms of the timing of the establishment of the PMC.

Cook Islands noted that the general consensus has been to go ahead with the establishment of the PMC, and that some of the earlier concerns have now been addressed in the paper. As an initial stage, the PMC should be established and further issues addressed later.

Guam noted that we need to continue to address the tsunami issue in the PMC, especially in relation to the exercise planned for November. The Secretariat noted that it would be possible to include this issue, time permitting.

It was agreed that the RMSD could approve the PMC terms of reference (TOR) in principle, establish the PMC and then address any outstanding issues around the TOR after the session. Countries were given the TOR to review overnight, so that it could be adopted in time for the PMC to convene on the Friday morning.

Fiji asked for clarification on who should be approving the TOR, and the Secretariat noted that the RMSD could do so, as approval to form the PMC had already been given through the 21<sup>st</sup> SPREP Meeting, in 2010.

The RMSD adopted the PMC TOR on the final day of the meeting.



# The Pacific Meteorological Council (PMC)

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The PMC was formally convened on the 12<sup>th</sup> of August, 2011 and, on nomination by Tonga and USA, elected Reginald White (RMI) as Chair, and Salesa Kaniaha (Vanuatu) as Vice-Chair.

The PMC endorsed the RMSD meeting outcomes (Annex 1), including the resolution and the terms of reference for the PMC.

The PMC noted the process for the completion of the Pacific Meteorological Strategic Plan.

The PMC agreed on the need for active participation in the Pacific Wave 11 exercise and requested National Meteorological Service Directors to follow up with their national tsunami focal points.

The PMC noted the importance of having in-country capacity building and training for tsunami preparedness and early warning systems, and called on partners to give consideration to such requests from National Meteorological Services.

All PMC Members and several partner organizations offered their thanks to the Chair and the Vice-Chair for their able handling of the meeting, expressed their gratitude to the Government and People of the Republic of the Marshall Islands for the excellent hosting facilities and hospitality, and thanked the Secretariat for organizing the meeting.

The Chair offered his thanks to the participants and to the partners who had funded the RMSD and the PMC, and officially closed the 1<sup>st</sup> meeting of the PMC.

## Donor presentations

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Cameron Darragh from the PASAP Project of the Department of Climate Change and Energy Efficiency gave a short presentation on Australian funding opportunities. Cameron stressed the importance that before countries approach donors, they must first have their priorities clearly articulated.

Bart Deemer, the USAID Representative for the Northern Pacific also gave a presentation on opportunities, particularly related to Disaster Management in the Northern Pacific countries.

# ANNEXES

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# Annex 1

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## Report on the Outcomes of the Climate Services Training Workshop – Majuro, Marshall Islands – August 8, 2011

The September 2009 World Climate Conference–3 (WCC–3) Declaration decided to establish a Global Framework for Climate Services (GFCS) to strengthen the production, availability, delivery, and application of science-based climate prediction and services. The GFCS, with the following components, was endorsed by the 16th WMO Congress held in Geneva from 31 May to 3 June 2011:

- The User Interface Platform
- The Climate Services Information system
- The Observations and Monitoring component
- The Research, Modelling, and Prediction component
- The Capacity Building component

Many in the Pacific Islands region recognize the importance of providing climate services to their communities to achieve sustainable development. With this understanding, and in response to the outcomes of the WCC–3, this ‘Pacific Regional Meteorological Services Directors Workshop in Support of Climate Adaptation Planning in the Pacific Islands’ was organized with the following theme:

“Global Framework for Climate Services (GFCS): The role of Pacific Islands National Meteorological Services (NMSs) and development partners in implementing the GFCS to support National Programs of Action for climate change adaptation in the Pacific”

This workshop report, for delivery ahead of the 2011 APEC Leaders meeting in Hawaii in November, summarizes the outcomes of the Pacific Regional Meteorological Services Directors Workshop in Support of Climate Adaptation Planning in the Pacific Islands, held in Majuro, Republic of the Marshall Islands, on August 8, 2011.

The objectives of the workshop included assessing the role of Pacific Islands NMSs and development partners in implementing the GFCS; improving technical and substantive engagement in regional efforts related to climate services and promoting expert and practitioner-level relationships at the technical level; and identifying mechanisms to incorporate applied science and research to support climate change adaptation activities.

Outcomes of the workshop discussions fall into six general areas:

1. The role of Pacific Islands NMSs in implementing the GFCS
2. Engagement in regional efforts related to climate services
3. Climate data exchange and WMO Resolution 40
4. Linking climate change adaptation with disaster risk reduction and sustainable development activities
5. Building the capacity of institutions, infrastructure and human resources

6. Integrating regional climate-related web-portals for all users.

## 1) The role of the Pacific Islands NMSs in implementing the GFCS

NMS directors and development partners identified NMSs as the link between users and providers. NMSs provide a vital role in delivery of climate products and services to the people that need it. Examples of effective communication of climate-related data, information and services were shown from Samoa, Vanuatu and Kiribati, consistent with the GFCS components and structure.

It was recognized that:

- Community consultation is a key element of effective delivery and adoption of climate products and services. An ongoing and sustained evaluation process is needed to ensure that climate information is used effectively for decision-making.
- Coordination between NMSs and other sector-based agencies, institutions, national climate change committees, and organizations is vital to ensure data and information is available and is tailored to the users needs in terms of content, format, and timing.
- Sustained observations and monitoring that support weather services are the foundation for the development of data and information of a quality needed to support climate services. Dedicated resources are needed in NMSs to support continued sustainable data monitoring, coordinated data management and stewardship. Adherence to WMO standards for the collection and analysis of information should be encouraged across the region as a means to ensure quality and consistency of data from multiple sources.

It was further recognized that some Pacific Island nations have limited capacity for delivering climate services. There is a need for capacity mapping across the region to identify where additional resources and support are needed to raise all NMSs to a comparable level of effective climate service delivery. Such information could be used to identify potential 2012–2015 fast-track projects under the GFCS.

## 2) Engagement in regional efforts related to climate services

NMS directors and development partners recommended that further investigation is required on organizational structures and functions at the regional level to support climate services consistent with the GFCS, to minimize gaps and overlaps, and to align climate service activities that already exist in the region. The investigation should consider geographic, sectoral and functional core capabilities (e.g. observations and data management) as a basis for supporting the effective delivery of climate products and services.

This recommendation is consistent with WMO RA V Resolution 2 (XV-RA V) “Establishment of Regional Climate Centres” which calls for an assessment of current RCC functions that occur within the region and a subsequent gap analysis.

Good examples were demonstrated of cross-region collaboration, research and integrated delivery of climate services that already exist within and between agencies, institutions, and organizations (including NMSs) in the region, conducting activities such as: PI-GCOS, PI-GOOS, Pacific HYCOS, PI-CPP, APAN, SPSLCMP, PCCSP, PASAP, CLIMRAP, METPI, CliDEsc, PaCIS, PEAC, PICCC, PRIMO, Pacific RISA, and PCCR, amongst others.

### 3) Climate data exchange and WMO Resolution 40

NMS directors discussed issues surrounding data sharing across and outside of the region as it relates to the GFCS and to the provision of a solid basis for climate products and services in the region. NMSs' directors identified the following issues:

- Benefits of data sharing need to be returned to the NMSs
- Ensure high quality data are available for sharing
- Lack of resources to respond to data requests
- The intellectual property of the data needs to be recognized and preserved
- Costs of data collection, management and delivery need to be recovered
- Sovereignty of data needs to be recognized
- National policies and legislation need to be considered
- Capacity for data sharing varies across the region
- Ownership of data needs to be respected
- Leverage for obtaining funds should be retained
- Revenue generation from data provision should not be compromised.

NMS directors particularly noted the need for re-investment locally to support infrastructure and data management systems. They also noted that memorandums of understandings or formal letters of agreements represent a practical mechanism for data exchange, yet these mechanisms are not necessarily the most effective tools.

NMS directors and development partners recommended that further investigation is required to address the above issues related to data sharing.

### 4) Linking climate change adaptation with disaster risk reduction and sustainable development activities

NMS directors and development partners highlighted the need to link climate change adaptation (CCA) activities with disaster risk reduction (DRR) and sustainable development (SD) initiatives. Such linkages provide opportunities to support continued sustainable data monitoring, coordinated data management and ongoing provision of climate products and services. They also highlighted the need to acknowledge existing and ongoing partnerships within and outside of the region between donors, agencies, and communities.

NMS directors and development partners recommended that future RMSD/PMC meetings be linked with those of the Pacific Platform for Disaster Risk Management and the Pacific Climate Change Roundtable.



## 5) Building the capacity of institutions, infrastructure and human resources

NMS directors and development partners emphasized the need to support systematic development of the necessary institutions, infrastructure and human resources to provide effective climate services. Areas identified where capacity building is needed included:

- Coordinated data rescue, digitization and management
- Sustainable observations, monitoring and communications equipment meeting WMO standards and related physical infrastructure
- Additional staff and training to enable the continuing development and delivery of local products and services
- Effective interaction through dialogue and workshops with sector representatives and other users to inform product and service requirements
- Web-based and other IT systems and tools to enhance the access and use of data and products.

## 6) Integrated regional climate-related web-portals for all users

NMS directors and development partners recommended the coordination of web-based portals, clearing houses etc. aimed at the discovery of and access to regional information on climate data, activities, products and research. The aim of this coordination is to minimize overlaps, identify gaps, and align current and future dissemination of information from projects within the region.

There was also recognition that web-based platforms should not be the sole mechanism for information dissemination due to poor internet access in some countries within the region.

## Resolution on the Outcomes of the Climate Services Training Workshop – Majuro, Marshall Islands – August 8, 2011

### 14th Meeting of Regional Meteorological Services Directors Meeting – Majuro, Marshall Islands – 9–12 August 2011

**Recognizing** that the climate is changing and that the Pacific Islands are among the most vulnerable to the impacts of climate change.

**Recognizing** that the provision of climate services is critical to the sustainable development of Pacific Island countries.

**Recalling** that the September 2009 World Climate Conference–3 (WCC–3) Declaration decided to establish a framework to strengthen the production, availability, delivery, and application of science-based climate prediction and services.

**Recalling** that the Global Framework for Climate Services (GFCS) with the following components was endorsed by the 16th WMO Congress held in Geneva from 31 May to 3 June 2011: The User Interface Platform; The Climate Services Information system; The Observations and Monitoring component; The Research, Modeling, and Prediction component; and The Capacity Building component.

**Reflecting** on the outcomes of the “Pacific Regional Meteorological Services Directors Workshop in Support of Climate Adaptation Planning in the Pacific Islands” (the Workshop) held in Majuro, Marshall Islands on August 8, 2011.

**Acknowledging and appreciating** the assistance of agency, institution and organization-based development partners operating in the region.

**Requests** the RAV Meteorological Service Directors adopt the findings and recommendations (listed below) of the report on the outcomes of the Workshop:

#### RECOMMENDATION 1:

NMS directors and development partners recommended that further investigation is required on organizational structures and functions at the regional level to support climate services consistent with the GFCS, to minimize gaps and overlaps, and to align climate service activities that already exist in the region. The investigation should consider geographic, sectoral and functional core capabilities (e.g. observations and data management) as a basis for supporting the effective delivery of climate products and services.

#### RECOMMENDATION 2:

NMS directors and development partners recommended that further investigation is required to address identified issues related to data sharing.

#### RECOMMENDATION 3:

NMS directors and development partners recommended that future RMSD/PMC meetings be linked with those of the Pacific Platform for Disaster Risk Management and the Pacific Climate Change Roundtable.

#### **RECOMMENDATION 4:**

NMS directors and development partners recommended the coordination of web-based portals, clearing houses etc. aimed at the discovery of and access to regional information on climate data, activities, products and research.



## ANNEX 2

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### Recommendations of the RANET Telecommunications Meeting

14RMSD, Saturday 6 August 2011, Malele Conference Room, Marshall Islands Resort.

The RANET Telecommunications Meeting was held on 6 August, at the Marshall Islands Resort, and drew the participation of Directors of Pacific National Meteorological Services (NMS); representatives of technical agencies from the US, Australia, and New Zealand; and representatives from CROP and other agencies in the region. The meeting dealt primarily with the telecommunications issues and development work recently undertaken in the past two years since the previous meeting at the 13th Regional Meteorological Services Directors meeting in 2009. It also spent time discussing the planned work on RANET and telecommunications in the next couple of years. Discussion was had on several aspects of the progress of the implementation of several works in the past year including upcoming works. This brief report presents the key recommendations from this meeting for consideration of the Directors at their 14RMSD meeting. Mr. Edward Young, Deputy Director of NOAA Pacific Region Headquarters, chaired and facilitated this meeting.

**Recommendation 2011–1** RANET systems need more formalized and clear guidance with a thrust towards recommendations for new technologies, expanding past current RANET systems into different and newer forms of technology.

**Recommendation 2011–2** Other avenues should be investigated to improve meteorological communications networks for Met Service Offices.

**Recommendation 2011–3** A task team is needed to evaluate the capabilities and make recommendations on priorities that have to be a part of the WMO RAV Working Group on Infrastructure, and be part of the Operating Plan for the WMO RAV Typhoon Committee.

**Recommendation 2011–4** RMSD meeting should ensure its priorities are reflected in the Pacific Islands Meteorological Strategic Plan, and how to evolve these backup communications systems. The strategy should address questions about the direction and need for connectivity to regional networks, national, and local networks, and reduce overlapping programs where possible

**Recommendation 2011–5** Plans for regional systems that support national and local communications needs should be better linked to national development and assistance plans, which is where AID agencies are looking to fund national priorities. Expressions of needs should come from Pacific Islands Countries and Territories (PICTs).

**Recommendation 2011–6** Closer follow-up for ongoing efforts to strengthen tsunami capacity building efforts between the national tsunami warning entity and the NDMO is needed.

**Recommendation 2011–7** A small team be tasked with working with Met Service Directors to assess their technical maintenance training needs for the communications systems they utilize, and that the curriculum matches those identified priorities and technical competencies.

**Recommendation 2011–8** Recommended HF communications be included as part of the Pacific Islands Meteorological Strategic Plan.

**Recommendation 2011–9** Recommend SPREP work with SOPAC to review its capability to provide technical training and instrument calibration support to the Met Service community, and report back its findings.

**Recommendation 2011–10** Ensure coordination of plans to deploy RapidCast receiving systems with Met Offices occurs, instruction manuals are received prior to deployment, and onsite training plans are confirmed with receiving Met Service Offices.

**Recommendation 2011–11** Endorsed a key outcome on Early Warning Systems from the 3rd Session of the Pacific Platform for Disaster Risk Management, held August 1–5, 2011, in Auckland, New Zealand, that recommends the establishment of a “Pacific regional early warning working group to coordinate and complement the efforts of other working groups and Pacific Island Countries and Territories to assist in the development of early warning systems both at regional and national levels and to establish clear standard operating procedures for relevant agencies, as well as simplify and standardize early warning messages and alerts for inclusion in ongoing education and public awareness programmes.

**Recommendation 2011–12** A copy of the draft installation schedule for installing EMWIN and RapidCast systems be made available for review and endorsement.

**Recommendation 2011–13** Ensure tsunami regional and national products and warning messages are placed on EMWIN, and that resources are identified to sustain the replacement EMWIN system once it has been re-deployed to the NDMOs and refreshed at the Met Service Offices.

**Recommendation 2011–14** Review the need for EMWIN type systems beyond the national Met and Disaster Management Offices, consistent with national action plans.

**Recommendation 2011–15** Re-circulate the Communications Survey of 2010 to Met Service Directors, and urge them to complete the survey, so the results can be utilized to identify national and regional priorities for communications requirements.

**Recommendation 2011–16** Agreed to survey Met Service Directors on their priorities for 3 new products needed to be uploaded to the new GOES-West broadcast.

**Recommendation 2011–17** Recommended a broader approach for coordination between SPREP, SOPAC Division and SPC, utilizing the results of the Pacific Communications Survey and the SOPAC Tsunami Warning and Mitigation Systems.

**Recommendation 2011–18** Recommended that Met Service Directors review the current Tsunami SMS Distribution List and coordinate corrections with the International Tsunami Information Center (ITIC) and UNESCO/IOC Regional Officer in Suva, Fiji.

**Recommendation 2011–19** A task team should be appointed to work out protocols and standard operating procedures for use of the RANET Chatty Beetles among participating agencies.

## ANNEX 3

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### Outcomes of the 14th RMSD and 1st PMC

The RMSD convened for its 14<sup>th</sup> session at the International Conference Centre in Majuro, Republic of the Marshall Islands from 9–12<sup>th</sup> August 2011. It was preceded by a Pacific Regional Meteorological Services Directors Workshop in Support of Climate Adaptation Planning in the Pacific Islands on 8<sup>th</sup> August. The objectives of the meeting were for participants to formulate and establish a clear understanding of the Pacific Meteorological Council (PMC), the Pacific Desk Partnership concept, and the Pacific Meteorological Strategic Plan (PMSP) (2012–2015). A total of 54 participants attended the meeting. Primarily the participants were Meteorological Service Directors and representatives from American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, New Caledonia, New Zealand, Palau, Papua New Guinea, Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, United States of America and Vanuatu. Representatives of the Finnish Meteorological Institute, SPREP, SPC, WMO, UNESCO-IOC, Institute for Global Environmental Strategies, University of Oklahoma, Pacific ENSO Applications Climate (PEAC) Centre (collocated at the University of Hawaii and the University of Guam) were also present.

Dr. Netatua Pelesikoti, Pacific Futures Programme Manager, speaking on behalf of the SPREP Director, noted that the RMSD was launching a new era in the field of meteorology in the region. Based on the outcomes of the review of the regional Meteorological strategy (2009) and bearing in mind the decisions of the 21<sup>st</sup> SPREP Meeting, this meeting would be launching the PMC and the new strategic plan, and the Pacific Desk Partnership. She also outlined the approach that SPREP is seeking to take on climate change adaptation and disaster risk reduction and how meteorological services underpin those efforts. The host country aptly demonstrates the sheer vulnerability of atoll and small island countries. She emphasized that there is now a chance of meaningful change to assist Pacific meteorological services to provide much needed assistance for the enhancement of livelihoods of the peoples of the region.

The Honourable Ruben Zackhras, Minister in Assistance to the President of RMI, thanked the RMSD for agreeing to meet in RMI. He welcomed the participants on behalf of the Government, and noted that the Pacific is a major driver of the global climate system, while on the other hand the islands are the smallest and most vulnerable to climate change. He stressed the importance of the role of the meteorological services in providing advice and assistance to policy and decision makers.

The RMSD elected Reginald White of Marshall Islands as Chair of the 14<sup>th</sup> RMSD and Salesa Kaniaha of Vanuatu as Vice-Chair by acclamation.

### Organizational matters and national reporting

#### THE RMSD

1. Agreed that the future host country for the PMC would no longer be automatically tied to the country from which the Vice-Chair is elected as consideration is being made for convening the

next meeting back to back or in parallel with other relevant regional forums such as the Pacific Climate Change Roundtable and the Pacific Platform for Disaster Risk Management.

2. Noted progress made at the national and regional level in relation to the implementation of decisions and recommendations arising from the 13<sup>th</sup> RMSD and commended the Secretariat and partners for their support to national and regional meteorological support activities in the Pacific Island Countries and Territories.
3. Acknowledged the reports by National Meteorological Service Directors for the richness of their contributions to the regional knowledge base on best practices, challenges and future directions for cooperation in weather, climate, water and related environmental matters in the region.
4. Appreciated the valuable contributions to improve services and observations infrastructure by the many international and regional partners in support of meteorological services in the region.
5. Noted that certain issues raised in country presentations required further discussion during the meeting, and these included ICAO requirements for nuclear dispersion products and baseline measurements to support their development, and its application in the region. A number of announcements of planned training opportunities were made in the presentations.
6. Agreed that the key development plans and priorities ( for example, weather and climate forecasting training, telecommunications support, improved regional support from CROP and WMO, development of national strategic development plans for meteorology) presented by the National Meteorological Service Directors are encouraging steps in the right direction, but noted that there are still many challenges. In particular, capacity and funding issues remain key to the further development and enhancement of meteorological services in the region. There were valuable lessons learned from the presentations by National Meteorological Service Directors such as the experience of those who have been able to engage with other sectors in order to secure more resources, for example with adaptation projects in the water and climate change sectors, and encouraged others to do the same.
7. Recognized that organizational restructuring in some countries has resulted in greater capacity which has enabled those NMSs to be more effective in providing services and working across other sectors, in particular in disaster risk reduction.
8. Also recognized that a number of countries have been affected by recent tsunami events and as a result numerous NMSs are reconsidering their mandates to tackle this, including capacity needs. In this regard, NMSs articulated the need for assistance with these efforts including policy and technical support.

## Outcomes of the 16th WMO Congress

### THE RMSD

9. Welcomed the outcomes of the 16th WMO Congress (Cg-XVI), in particular, the new WMO Strategic Plan, 2012–2015 and its corresponding Strategic Operational Plan, and the WMO Regional Association V (RA V) Strategic Operational Plan, 2012–2015. WMO requested inputs from Meteorological Service Directors for the regional implementation of the WMO Plans. The meeting endorsed the priority areas for WMO and RA V, as agreed to under both Plans, namely; Global Framework for Climate Services (GFCS), sustainable aviation services, capacity building for

developing and Least Developed Countries (LDCs), Implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information system (WIS), and Disaster Risk Reduction (DRR).

10. 10. Reiterated the need to have representation from the National Meteorological Service on national delegations to key global conferences that will consider the sustainability of meteorological services, such as the UNFCCC Conference of the Parties at its 2011 and 2012 sessions and Rio+20. It was also noted that such participation should be considered in the regional preparatory processes for these meetings. National Meteorological Service Directors also agreed to ensure that such representation requests are made through their own national decision making processes;
11. 11. Noted the importance of highlighting the linkages between the global and the regional strategies for enhancing meteorological services;

## **Pacific Meteorological Strategic Plan (PMSP)**

### **THE RMSD**

12. Agreed the PMSP needs to be simplified to clearly articulate scope, audience, objectives and application.
13. Noted that there was general agreement to ensure that the plan is generic enough to be understood and used by non-meteorological professionals, policy makers and the wider community.
14. Noted that there was general agreement that the plan should be country-driven and reflect national NMS priorities.
15. Acknowledged the links to other regional strategies and frameworks
16. Agreed on the need for a strong governance structure.
17. Endorsed the proposal to task the Secretariat to commission a Technical Assistant to undertake further consultations and prepare a re-draft of the strategic plan for consideration by early 2012.
18. Noted the need for specific references to national priorities on drought in the PMSP

## **Road map towards an integrated regional strategy for DRM and CCA and Mitigation by 2015.**

### **THE RMSD**

19. Confirmed their support for a joint meeting of the PCCR, DRM communities and the Regional Meteorological Services Directors in 2013.
20. Agreed on the need to ensure input from the meteorological community into the CCA/CCM & DRM Technical Working group.
21. Endorsed in principle the roadmap.



## Climate Services Workshop

22. A presentation was made regarding the workshop on Climate Services held on Monday 8<sup>th</sup> August 2011. A number of recommendations were put forward for consideration by PMC. These have been attached as Annex 1 and were adopted by the PMC.

## Pacific-Finland Project

### THE RMSD

23. Acknowledged the successes to date of the project and commended the FMI and the Government of Finland for their excellent efforts in working with the Pacific Island Countries and SPREP on this project. The meeting endorsed the continuation of this partnership and agreed that the next phase SPREP-Finland (through its MFA) Project Document be circulated for review and comments to the Met Directors.
24. Noted that, since 2002, the US has funded the PI-GCOS position at SPREP. Instead of being dedicated to coordinating and progressing the PI-GCOS program, the PI-GCOS role has been used primarily to fulfil the duties of the long-dormant, but clearly required, SPREP Meteorology and Climatology Officer (MCO). An example of this is the ongoing use of the PI-GCOS Officer to administer the RMSD (and now PMC) process. Use of the PI-GCOS position in this way will continue to be an obstacle to the effective and sustainable advancement of meteorological and climate services in the region.
25. Emphasized the importance of building in the costs of ongoing maintenance of equipment procured under the project to ensure the sustainability of any new equipment purchased by the project.
26. Noted the opportunity for this project to build upon the existing RANET work.
27. Agreed on the need to take a multi donor approach to this project, and invited additional partners to provide support.
28. Emphasized that the project should take into account other projects happening in the region, the smallness of NMHS and their capacity constraints, and should take a holistic regional approach.
29. Noted the role of the Pacific Desk Partnership as an important tool for coordinating with donors to assist in the leverage of additional partnership support and ensure the sustainability of projects.

## Pacific Tsunami Warning Centre

30. Presentations were made by NOAA and a number of issues raised were noted by the participants as requiring further consideration, such as guidance products, Pacific Wave 2011, etc.

### RANET

31. A presentation was made regarding the workshop on RANET held on Saturday 6<sup>th</sup> August 2011. A number of recommendations were put forward for consideration by RMSD. These have been attached as Annex 2 and were adopted by the PMC.

## Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project

### THE RMSD

32. Noted that there was a request to extend the scope of this project to include tsunamis. As this is currently outside the scope of this initial phase of the project, it will not be considered at this time. Furthermore, concern was expressed by Tonga about the effectiveness of the DRR aspect of the project and that more attention needed to be given to engaging with, and meeting the needs of, the DRR community.

## COSPPac

### THE RSMD

33. Welcomed the proposal to include two representatives of Meteorological Directors into the Steering Committee of the COSPPac initiative to be nominated by the PMC, and recommended that the representative of the Pacific Desk Partnership also be included as a member of the Steering Committee.
34. Requested that a copy of the draft design for the COSPPac Initiative be shared with Meteorological Directors, regional partners and relevant stakeholders, before it is finalised.
35. Noted the need to include national and regional organisations as partners in the delivery of training initiatives in the region, and to ensure the sustainability of such skill transfer beyond the life cycle of projects/initiatives.

## Pacific Australia Climate Change Science and Adaptation Programme (PACCSAP)

### THE RMSD

36. Noted the need for climate initiatives to engage with the Pacific Desk Partnership and coordinate with other partners to be taken into account in the development of PACCSAP.

### THE RMSD RECOMMENDED:

- a) That the Secretariat and partners be requested to further enhance their support with more targeted efforts in relation to outcomes and decisions of meetings of the RMSD.
- b) That a regularly updated events calendar is created and disseminated by the Secretariat in cooperation with partner organizations, particularly WMO, and that the announced new applications and technologies by several partners should be made available by email distribution and websites.
- c) That Meteorological Service Directors should become more engaged in other national climate change initiatives, in particular for adaptation in the water and food security sectors as well as for mitigation resource analysis, in order to contribute expertise and to benefit from these new funding opportunities.

- d) The Secretariat be requested to provide regular updates on developments relating to staffing support for the Pacific Desk, and to enhance the visibility of its partnerships with SPC (in particular its SOPAC Division).
- e) The Secretariat is requested to synthesize the specific needs identified by National Meteorological Service Directors in their presentations and country papers, and to regularly update these for information and dissemination.
- f) That the WMO secretariat prepared a paper outlining its key achievements in the region in the past 10 years and highlights the benefits that have accrued to the region as a result. It was noted that WMO visibility has not been high enough and that its support for National Meteorological Services has not been recognized by some partners and further support, in particular from RA V, was required.
- g) That WMO secretariat be requested to strengthen resources of the WMO South West Pacific Office in Apia and provide clear communication about roles and responsibilities for the officer and the assistant proposed at the RA V meeting. The respective roles in coordination of the WMO and SPREP Secretariats must be communicated to the RMSD/PMC for their input and guidance. They also called for more information on the coordination efforts between WMO, its sub- regional office and national meteorological services.
- h) That the Secretariat in consultation with RMSD and partners develop a Terms of Reference for a consultant to further refine and develop the draft PMSP through consultation with RMSD, partners and regional organizations, and other stakeholders, and requested the Secretariat to report back to the RMSD in early 2012 with the outcome of that work.
- i) That Pacific Island Countries and Territories (PICTs) be encouraged to participate in the work of the IOC Tsunami Early Warning System working groups. PTWC requested inputs and participation from the RMSD in relation to:
- the review of new warning products
  - participation in the November 9–10 PACWAVE, focused on local events
  - designation and regular updates of tsunami focal points, who will receive tsunami early warning messages and the method of delivery and dissemination (noting the prohibitive costs of the fax method and the need for costs efficiency).
- j) To support a continuation of the partnership between the FMI and the Government of Finland, SPREP and PICTs.
- k) That national meteorological directors be urged to provide comments on the development of the new FMI project, and requested the Secretariat to ensure that there would be sufficient personnel available for implementing the new project without detriment to other programme areas, and called for active engagement between Directors, partners and SPREP management in this regard.
- l) That in developing new projects and programmes for the region, regional meteorological service directors are consulted in relation to the national resources and capacity to respond to project needs, and request partners to be aware of national mandates that may inhibit their full participation, requiring alignment with national strategic and operational plans.
- m) The role of the Pacific Desk Partnership should involve coordination with donors to ensure the sustainability of projects and assist in the leverage of additional partnership support.
- n) That in relation to the DRM/CCA road map agreed to provide input to SPREP/SPC(SOPAC Division) by 31/8/2011.

## THE PMC

1. The PMC was formally convened on the 12<sup>th</sup> of August, 2011, and upon nomination by Tonga and USA elected Reginald White (RMI) as Chair, and Salesa Kaniaha (Vanuatu) as Vice-Chair.
2. The PMC endorsed the RMSD meeting outcomes, including the resolution and the terms of reference for the PMC.
3. The PMC noted the process for the completion of the Pacific Meteorological Strategic Plan.
4. The PMC agreed on the need for active participation in the Pacific Wave 11 exercise and requested National Meteorological Service Directors to follow up with their national tsunami focal points.
5. The PMC noted the importance of having in-country capacity building and training for tsunami preparedness and early warning systems, and called on partners to give consideration to such requests from National Meteorological Services.
6. All PMC Members and several partner organizations offered their thanks to the Chair and the Vice-Chair for their able handling of the meeting, expressed their gratitude to the Government and People of the Republic of the Marshall Islands for the excellent hosting facilities and hospitality, and thanked the Secretariat for organizing the meeting.
7. The Chair offered his thanks to the participants and to the partners who had funded the RMSD and the PMC, and officially closed the 1<sup>st</sup> meeting of the PMC.

## RMSD Country reports

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### Cook Islands Progress Report since 2008 RMSD

15 July 2011

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***1. What are the key policy changes, if any, or proposed changes in organisational structure and roles on the NMS since the last RMSD or in the near future, and in response to the Review of the Pacific NMSs (e.g. in FMS), and upcoming report of the HLTF GFCS?***

- The Ministry under which the Met Service is housed has changed. The Cook Islands Meteorological Service (CIMS) will become part of the Ministry of Transport which currently has three outputs. The CIMS will add that number to four outputs as of July 1 2011.
- The Review will have paved the way for some of the issues with the functional review of CIMS and the role it plays in association with other line departments and Ministries. Climate Change is a fundamental concern for CIMS and its commitments to the monitoring of the scientific evidence via its affiliated network, such as the PIGCOS, must be fully supported.

- Key policy changes include working together with DRR and UNFCCC to align their tasks and outputs to those of their respective agencies that share this common goal of monitoring climate change.

## ***2. List any new or emerging needs and how these relate to the above***

Quality Management Systems need to be put in place to provide a service to its stakeholders, especially to the aviation industry.

This issue raises another issue that is clearly identified in the Review – capacity building and human resources. During the last two years, there has been a project in the region to teach the technical and hard tasks required to carry out quality management systems. The practicality of this project is doubtful as there is no proof from the participants that these systems are in place, especially where there is a deadline for such systems to be in place as required by ICAO and WMO.

## ***3. List any changes in resource allocation (staffing, funding) since last RMSD – provide trends in resource allocation including a comparative table from the previous two years.***

- CIMS staff has increased. Funding has been retained as last reported. An incentive for CIMS has been introduced to recover costs from the aviation industry for the services they provide. This will be extended to other airlines as more aircrafts arrive and depart Rarotonga on a weekly basis because of the booming tourism industry.

One process that has been put in place, due to the QMS and QA introduced by ICAO, is the performance appraisal of staff which is carried out every six months. This process only needs the implementation of rewards for staff due reward and improvements required of staff in need of improvement.

## ***4. List any changes in infrastructure (buildings, reporting networks, communications, equipment, observing networks) since the 13th RMSD***

No changes to the infrastructure apart from some minor amendments for safety and requirement purposes. Monitoring of the networks has seen an improvement of the stations from two to three stations. This trend is expected to increase to four by the end of July and five by the end of August. It is expected that there will be seven stations operating by the start of the upcoming cyclone season.

Upper air data was collected from September 2010 until late June 2011. Good performance was achieved during those months. Funding is being waited upon from WMO to re-commence this project hopefully in the near future.



5. Provide a summary of proposed, ongoing or recently completed (since the last RMSD) projects/activities. For uniformity of input please use the table below.

RAV SOP Priorities	List of national related activities or planned activities	State of implementation (some estimation of level of implementation success)	Contribution to Regional / National Strategic Frameworks (refer national plans, RAV SOP or Sub-Regional Plan, or national and regional disaster and climate change frameworks)
Better climate services	Climate and Growers	Implemented Growers have a website that they can obtain information on climate as well as use to promote their products.	RA V
Sustainable aviation services	Part 174 Certification	Fully implemented and certified by NZCAA. Have received an annual certificate for the last 4 years and currently awaiting for an update of such certification	ICAO and NZCAA
Capacity Building	Basic meteorology taught to all observers on a class per week basis.	Implemented and performance appraisal was based on this process.	National Strategic Plan
Improved infrastructure (data and information services for weather, climate and water)	Mauke AWS Aitutaki AWS Mangaia AWS Manihiki AWS Penryhn AWS Pukapuka AWS Rarotonga GUAN	Implemented in July Will be done in July August 2011 September 2011 September 2011 October 2011 August 2011	National Plan National Plan National Plan National Plan National Plan National Plan National Plan
Improved end-to-end Multi-Hazard Early Warning Systems (MHEWS)	Cyclone SOP Tsunami SOP SWFDDP	Implemented Implemented Implemented	National Plan and RA V National Plan and IOC National Plan and RA V

6. List any regional and multilateral projects or training events (in which the NMS has participated since the last RMSD by using the table below.

National Needs (new) List only	Status (project developed, negotiation with donors, nothing yet initiated etc)	Confirmed donors (name of donors)	Expected start date and completion date
Scopic	Completed Vanuatu	BoM	17–21 Aug 2009
Tsunami	Completed Honolulu	NOAA	24 Aug – 9 Sep 2009
QMS	First of 3 Samoa	Finland	14–18 Sept 2009
Climate Workshop	BoM Nadi	BoM	21 Sep – 3 Oct 2009
Tropical Cyclones	8th Southern Hemisphere Melbourne	WMO	29 Sep – 16 Oct 2009
PCCSP	Vanuatu	BoM	12–16 Oct 2009
Severe Weather	Tahiti	Meteo France	12–16 Oct 2009
Climate Matters	Nadi	WMO	27–29 Oct 2009
Operational Forecasters	Nadi	WMO	23 Nov – 4 Dec 2009
World Weather Watch	Honolulu	WMO	2–10 Dec 2009
RAV WG on Hydrology	Jarkarta	WMO	14–18 Nov 2009
Pacific Desk	Honolulu	NOAA/NWS	19 Jan–26 Feb 2010
Sea Level Rise	Melbourne	BoM	13,14 Mar 2010
Wind Analysis	Nadi	SPREP	26–30 Apr 2010
Tropical Cyclones	Bali	WMO	26–29 Apr 2010
13th RA V	Bali	WMO	30 Apr–6 May
Seasonal Climate Prediction	Melbourne	BoM	24–28 May 2010
PCCSP	Darwin	BoM	31 May–10 June
Climate and Health	Auckland	WHO	2–4 June 2010
Seismology	Suva	SOPAC	12–23 Jul 2010
SPCZ	Samoa	BoM	24–26 Aug 2010

PICCP & PASAP	Auckland	BoM	24 Sep 2010
SWFDDP	Wellington	WMO	1–4 Nov 2010
Sea Level & CC	Wellington	UNFCCC	8–10 Nov 2010
IWTC	La Re Union	WMO	15–20 Nov 2010
Water Quality	Rarotonga	NIWA	25–29 Nov 2010
Mini-RMSD	Vanuatu	BoM	11–15 Apr 2011
Coupled modelling	Rarotonga	BoM PASAP	13–15 June 2011

**6. Provide any other information in brief that you think is important and that is not covered above.**

Calibration of equipment that is required to provide services to NMSs is an essential part of the monitoring of the quality of information that is required by stakeholders. Calibration is also required of test and monitoring equipment. The high cost that is associated with this process needs to be strategically planned and maybe some sort of consortium is required within the region to carry these calibrations on a regular basis. This can also promote a maintenance and inspection programme for all NMSs as part of their QMS.

## Fiji Meteorological Service Progress Report since 2009 RMSD

*Report completed by: Alipate Waqaicelua*

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**1. What are the key policy changes, if any, or proposed changes in organisational structure and roles on the NMS, since the last RMSD or in the near future, and in response to the Review of the Pacific NMSs (e.g. in FMS), and upcoming report of the HLTF GFCS?**

- Fiji Meteorological Service (FMS) reform from a Government Department to become a Government Commercial Statutory Authority (CSA) by 2012;
- ISO 9001:2008 for Aviation Meteorological Services by November 2012.
- WMO Competence Standards for Meteorologists and Meteorological Technicians by end of 2013
- 63rd Executive Council (EC-LXIII) resolution on EC Task Team (ECTT) on a Global Framework for Climate Services (GFCS) (Resolution 3/10 (EC-LXIII)).
- 63rd Executive Council (EC-LXIII) resolution EC Working Group on Service Delivery (Resolution 3/9 (EC-LXIII)).



## ***2. List any new or emerging needs and how these relate to the above***

- a) Institutional/organisational reform
  - i. Establishment of Legal Framework
  - ii. Policy Directions
  - iii. Regulatory Authority
  - iv. Operational Services and Oversight
  - v. Establishment of Data and Service Agreements, MOUs/As, SLAs, etc.
  - vi. Establishment of Charging Policy and subsequent fees, fines and charges.
- b) Capacity building and institutional strengthening, especially personnel development – specialised training for Meteorologists, Meteorological Technicians, Information Communications Technologists (ICT), Researchers (Meteorologists and Climatologists).

For example:

- i. Thorough appreciation and sustainable technical/engineering expertise in specialised meteorological equipment, e.g. radar (conventional and doppler); AWSs, lightning detection and warnings systems, profilers, nuclear observing platforms, and space-based platforms.
  - ii. Technical systems and solutions development capability.
  - iii. Archival of quality and compliant data sets
  - iv. Scientific research and modelling capability for meteorologists and climatologists
  - v. Software and hardware solutions development in support of rapidly advancing needs
- c) Compliance to QMS and ISO as well as WMO Competence Standards and Government's Service Excellence Framework
  - i. Awareness and Training
  - ii. Implementation and sustainable management/operations
  - iii. Future developments
- d) Competitive and viable commercial activities
  - i. Strategic planning and risk management
  - ii. Aggressive marketing and customer feedback
  - iii. Development and enhancement of dynamic products and services
- e) As a member of the ECTT-GFCS, to have consultations, broadly at an early stage, with other members, agencies within the UN System, international and regional organizations, governmental organizations, non-governmental bodies, and other relevant stakeholders.
- f) As EC-WG Service Delivery, required to provide guidance on further development and implementation of Service Delivery; DRR Programmes; address other matters relating to disaster risk reduction and service delivery as requested by the Executive Council; provide support, guidance and advice for strengthening of NMHS as part of the national reconstruction and DRR planning following a major disaster; provide advice, guidance and recommendations for improving the service delivery capability of the Global Framework for Climate Services in the context of climate variability and climate change at national, regional and global levels, working in close contact with the EC Working Group on Climate, Water and Environment and other subsidiary bodies of EC tasked with offering advice on the GFCS and its implementation.

**3. List any changes in resource allocation (staffing, funding) since last RMSD – provide trends in resource allocation including a comparative table from the previous two years.**

- Staff allocation has not changed, though numbers and experience remains a challenge.
- Funding

Expenditure Account	Estimate 2010 (000s FJD)	Revised 2010 (000s FJD)	Estimate 2011 (000s FJD)	Projection 2012 (000s FJD)
Operating	3169.4	2767.1	3316.3	3316.3
Capital	950.0	1520.0	992.0	727.0
VAT	239.9	295.8	316.2	276.5
<b>Total</b>	<b>4359.3</b>	<b>4582.9</b>	<b>4624.5</b>	<b>4319.8</b>

*2012 Budget Envelope for Dept. of Meteorological Services = \$7.9m as endorsed by Cabinet.*

**4. List any changes in infrastructure (buildings, reporting networks, communications, equipment, observing networks) since the 13th RMSD**

- i Vanua Levu Radar completed and commissioned in March 2011
- ii VTSat (satellite communications) for the Vanua Levu radar
- iii Increasing utilisation of Cellular Networks' General Packet Radio Service (GPRS) – a packet-switching technology for meteorological and hydrological data transfers
- iv Utilisation of Government's services on the internet via its Online Portal to remote locations for meteorological data and products transfer
- v Telecom Fiji's VTSat services to remote locations of Fiji researched for back-up comms means for FMS service delivery
- vi Upgraded of rainfall network and installation of two full meteorological AWSs to serve both weather and climate purposes
- vii Installation of AWSs at Vanua Levu Airstrips
- viii Supported Ministry of Agriculture and Hydrology Section of Water authority of Fiji (WAF) in site surveys and installation of rain and river gauges in the Nadi Basin Catchment for the purpose of early flood warning and forecasting in the basin
- ix Supported the National Disaster Management Office, Ministry of Agriculture and Hydrology in setting up rain gauges and communications systems for a community-based pilot project undertaken by JICA for flood monitoring and forecasting in the Ba Basin.

5. Provide a summary of proposed, ongoing or recently completed (since the last RMSD) projects/activities. For uniformity of input please use the table below.

RAV SOP Priorities	List of national related activities or planned activities	State of implementation (some estimation of level of implementation success)	Contribution to Regional / National Strategic Frameworks (refer national plans, RAV SOP or Sub-Regional Plan, or national and regional disaster and climate change frameworks)
<b>Better climate services</b>	Upgrade (automation) of rainfall network. Installation of 2 AWSs – with full set of met sensors. Maintenance of Tideda/Flosys server Active participation in national committees on climate, climate change, health, environment and disaster management. Active collaboration with PCCSP and PI-CPP and implementation of agreed components	Completed Completed Ongoing Ongoing Ongoing	RAV SOP and National DRR and Climate change frameworks. RAV SOP and National DRR and Climate change frameworks. RAV SOP and National DRR and Climate change frameworks. National, Regional and International obligations. National and Regional obligations
<b>Sustainable aviation services</b>	ISO 9001:2008 certification for aviation met services; 2 Meteorologists undertaking the DipMet course in BoM Training of Met Observers Direct phone line link with WFO/RSMC Honolulu Finnish Met Institute- sponsored Regional Quality Management Systems (QMS) training workshop for Aviation Weather Services in the Southwest Pacific region	Pre-Certification. Ongoing till Dec 2011 Midway through the two-month course Ongoing Ongoing	ICAO, WMO and ISO standards ICAO, WMO standards ICAO, WMO and ISO standards and national as well as regional obligation. Regional and National frameworks ICAO, WMO and ISO standards
<b>Capacity Building</b>	Continual personnel development. Pacific Public Sector Linkages Program coordinated by BoM. Visiting Scientists Review of organisation structure	Ongoing Ongoing Discussion stage already undertaken with PCCSP and PASAP coordinators Ongoing	National, ICAO, WMO and ISO obligations International, Regional and National Frameworks National obligations National and regional obligations
<b>Improved infrastructure (data and information services for weather, climate and water)</b>	Vanua Levu radar. VTSat for Vanua Levu radar comms Cellular GPRS networks for data transfer Government online portal for data transfer. Meso-scale modeling (MM5) partnership with University of Hawaii	Completed Completed Ongoing Ongoing Ongoing	RAV SOP, National DRR RAV SOP, National DRR National obligation National obligation International, Regional and National frameworks
<b>Improved end-to-end Multi-Hazard Early Warning Systems (MHEWS)</b>	Flood monitoring and early warning system for Nadi Basin Catchment. Flood monitoring and early warning system for Ba Basin – community-based pilot.	Implementation Implementation	RAV SOP, National DRR RAV SOP, National DRR

6. List any regional and multilateral projects or training events (in which the NMS has participated since the last RMSD by using the table below.

National Needs (new) List only	Status (project developed, negotiation with donors, nothing yet initiated etc)	Confirmed donors (name of donors)	Expected start date and completion date
<b>PROJECTS/ACTIVITIES</b>			
Pacific Public Sector Linkages Program by the Australian BoM	Ongoing	AusAid	2009/10, 2010/11 TC Seasons
South Pacific Sea Level and Climate Monitoring Project (SPSLCMP)	Ongoing since the late 90s	AusAid	
Pacific Climate Change Science Program (PCCSP)	Ongoing	AusAid	
Pacific Islands Climate Predictions Project (PI-CPP)	Ongoing	AusAid	
Pacific Strategy for Adaptation (PASAP)	Ongoing		
Online Climate Outlook Forum (OCOF)	Ongoing		
Island Climate Update (ICU)	Ongoing		
Counter Test Ban Treaty Organisation (CTBTO) Radionuclide Station	Ongoing		
JICA training series supported by JICA and coordinated by FMS and WMO in Fiji in 2009, 2010 and 2011	Ongoing	JICA/FMS/WMO	
Regional Meteorological Observers. Training for Vanuatu Meteorological Service personnel undertaken by FMS and supported by WMO	As and when	WMO/FMS	Needs basis
United Nations Framework Convention on Climate Change (UNFCCC)	Ongoing		
Inter-governmental Panel on Climate Change (IPCC)	Ongoing		
WMO El Nino and La Nina Update	Ongoing		

## TRAINING EVENTS

International Conference on Southern Hemisphere Meteorology and Oceanography

International Workshop on content communication and use of weather and climate products

Seminar on fighting climate change for developing countries

Climate Change: Present and Future Opportunities for Vulnerable Asia Pacific Countries

WMO RAV Climate Matters Meeting

SPREP Meeting

Development Of Strategies on Climate Change

Communications and Information Services in Meteorology

Climate Data, Variability and Change – Research and Training Workshop

Regional Training Workshop on Seasonal Climate Prediction

SCOPIIC – Climate validation in Pacific

METPI & SCOPIIC Island Climate Update Workshop for Climatologists.

PCCSP

Seminar On Policy Planning and Climate Change

Climate Futures Workshop

Greenhouse 2011 Conference

Project Design Workshop

Regional Training on Agro-Meteorological Applications and Climate Change Impact Assessment

Tsunami Training ITP Hawaii 2009, ITIC and PTWC, Hawaii, USA

WMO's SH TC training course and Public Weather Service Workshop, Melbourne, Australia

First (International Best Tracks Archive for Climate Stewardship) IBTrACS Workshop, Asheville, North Carolina

Oceanographic and marine observations on board Vessel R/V MIRAI in Tahiti, New Zealand, Tonga, Fiji, Vanuatu and Australian Waters.

SWFDDP Workshop in French Polynesia

Second International Workshop on Tropical Cyclone Landfall Processes (IWTCLP-II), Shanghai, China

Second IBTrACS Workshop and International Workshop on Satellite Analysis and Tropical Cyclones (IWSATC), Honolulu, Hawaii

RAIV Tropical Cyclone Forecasting and Warning Training Course, Miami, USA

Finnish Met Institute-sponsored Regional Quality Management Systems (QMS) training workshop for Aviation Weather Services in the Southwest Pacific region

**7. Provide any other information in brief that you think is important and that is not covered above.**

- Establishment/enhancement/upgrade of dynamic observing networks and technical expertise to sustain them, ensuring routine acquisition and archival of quality meteorological, hydrological, environmental, oceanographic, bathymetric, etc... datasets for weather, climate and DRR purposes.
- Data Policy/Agreements to protect abuse and misuse.
- Scientific expertise to analyse and produce sound information and advice to the general communities and Governments for necessary decisions and actions.
- Future component of the report to record potential threats to continued weather and climate services thus prompting NMHS to take necessary measures to minimise negative impacts.

## 14 RMSD Report – RSMC NADI – TROPICAL CYCLONE CENTRE 2009–2010

### Tropical Cyclone (TC) Season Summary

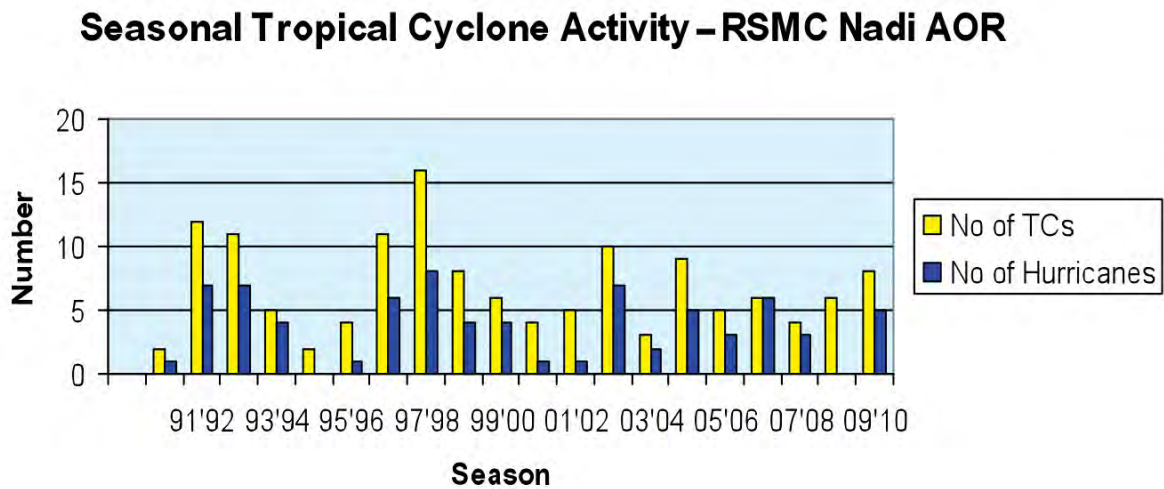
#### Introduction

A summary is presented of tropical cyclone activity during the 2009/2010 Tropical Cyclone Season for the Regional Specialised Meteorological Centre, Nadi – Tropical Cyclone Centre (RSMC Nadi-TCC) Area of Responsibility (AOR) covering from Equator to 25°South Latitude and 160°East to 120°West Longitude. The official tropical cyclone season, hereafter referred to as Season, for this region commences on November 1<sup>st</sup> and ends on April 30<sup>th</sup>.

Meteorological satellite data (both from MTSAT and GOES-11) was the mainstay for tropical cyclone forecasting at RSMC Nadi in the season. Tropical Cyclone forecasters also utilized a wide variety of microwave and scatterometer data to determine position and intensity estimates. Further, conventional weather radar data was used to estimate positions as soon as cyclone centres moved within radar range.

Tropical cyclone activity during the 2009/10 Season, in the RSMC Nadi AOR was around and about the climatological average of around 9 to 11 named systems. The last time this level was attained was in the 2004/05 Season. In total, eight tropical cyclones occurred in the region. Five of these cyclones attained hurricane intensity (one category 5, three category 4 and one category 3), one storm (category 2) and two gales (category 1).

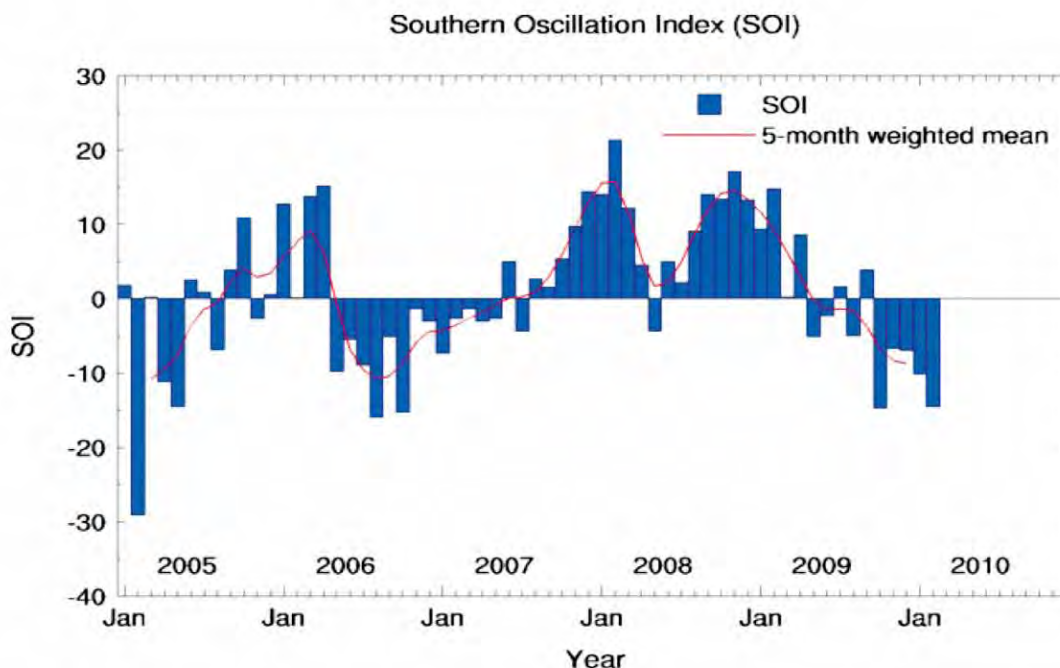
Figure 1. Tropical Cyclone Activity in RSMC Nadi AOR by Season



## Climatic Indices

The season was characterized by a warm ENSO episode that peaked in late December but persisted through till April. SOI values consistently remained negative throughout the season, typical of an El Niño event. Trade winds in the tropics have remained weak, allowing the Pacific to remain warm and hence slowing the decay of the El Niño event. Subsequently, cloudiness remained enhanced in areas east of the dateline. Computer models suggest Pacific Ocean temperatures will cool steadily over the coming months, returning to neutral levels during the southern autumn. Such timing is typical of the decay stage of an El Niño event. The active MJO phase generally coincided with increased convective activity in the region. However, in March, only a weak pulse traversed the region but at the same time a solid N=1 ER wave tracked westwards and triggered *Tomas* (cat 4) and *Ului* (cat 5). MJO periodicity varied between 30 and 45 days.

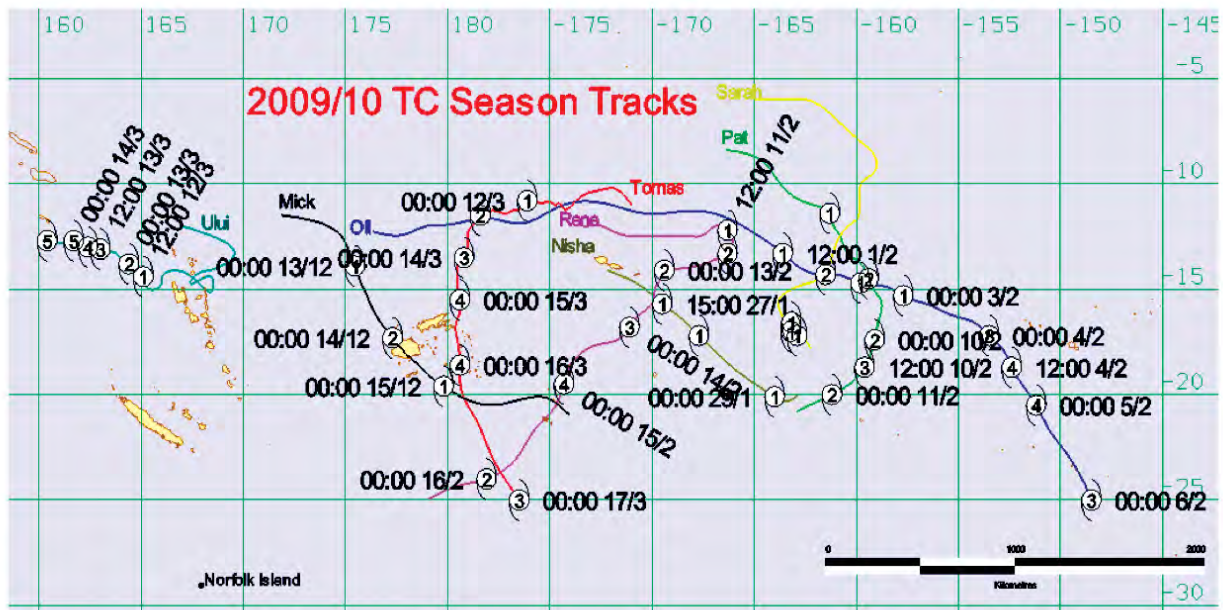
Figure 2. Southern Oscillation Index values vs 5-Month Running Means



## Occurrence

A total of fifteen significant tropical disturbances were monitored and assigned numbers of the series (01F, 02F,.....etc) in the 2009/10 season by RSMC Nadi. Eight of these eventually developed into tropical cyclones. Six cyclones originated east of the Dateline, about the Samoa/Cook Islands region. Only two, which incidentally were the first and last of the season, developed west of the Dateline, in the Coral Sea region.

**Fig 3:** Tracks of Mick, Nisha, Oli, Pat, Rene, Sarah, Tomas and Ului.



**Table 1:** Summary on countries affected

No.	Name	Dates	Peak Intst (kt)	Cat	Countries Affected
1	Mick	13 – 15 Dec 09	60	2	Fiji
2	Nisha	27 – 29 Jan 10	40	1	No land area
3	Oli	01 – 06 Feb 10	100	4	French Polynesia
4	Pat	08 – 11 Feb 10	75	3	Southern Cook Islands
5	Rene	11 – 16 Feb 10	90	4	N Cooks, American Samoa, Tonga
6	Sarah	26 – 28 Feb 10	35	1	No land area
7	Tomas	12 – 17 Mar 10	95	4	Wallis & Futuna, Southern Tuvalu, Fiji
8	Ului	12 – 20 Mar 10	115	5	Queensland, Australia



## 2010–2011 TC Season Summary

*Note: The 2010/11 TC Season Summary data is still being re-analysed. Once complete, the final version should be released by the end of September 2011.*

### Introduction

Tropical cyclone activity during the 2010/11 Season, in the RSMC Nadi AOR was around and about the climatological average of around nine to 11 named systems. The last time this level was attained was in the 2004/05 Season. In total, eight tropical cyclones occurred in the region.

**TABLE 1: SUMMARY ON COUNTRIES AFFECTED**

No.	Name	Dates	Peak Intst (kt)	Cat	Countries Affected
1	Vania				
2	Wilma				
3	Yasi				
4	Zelia*				
5	Zaka				
6	Anthony*				
7	Atu				
8	Bune				

*Note: \* Developed and named by Brisbane TCWC inside the Brisbane Area of responsibility (AOR) before moving into Nadi AOR.*

#### *RSMC Nadi Meteorologists Level to date*

- 11 operational forecasters, including the Director.
- Four of the 11 are TC competent.
- Two local graduates currently undertaking meteorologists' course at the Australian BoM Training Centre under WMO and AusAid scholarships.

#### *Pacific Public Sector Linkages Programme*

The AusAID funded Project's objective is to build capacity and support tropical cyclone and severe weather warning services in South Pacific NMHS and support the implementation of the regional Severe Weather Forecast Demonstration and Disaster Risk Reduction Project (SWFDDP)

Activities of the programme are aimed at upgrading and supporting the development of the severe weather forecasting capabilities of regional meteorological services to governments, the public and NDMOs as a key step in the mitigation of weather-related natural disasters.

The Fiji Meteorological Service (FMS) provides tropical cyclone warning services throughout the Pacific region as part of the World Meteorological Organization (WMO) designated RSMC. The viability and capacity of the RSMC is essential to providing this service and FMS, with the support of BoM, is working towards sustainability through the training and up-skilling of professional meteorologists. The Pacific Forum Secretariat, in collaboration with SPREP and SOPAC, has recently completed a review of current arrangements.

One Senior Meteorologist from BoM, with tropical cyclone (TC) forecasting capabilities, was released on secondment to RSMC Nadi, in the 2009/10, 2010/11 Tropical Cyclone Season. The secondees worked on the TC bench during TC events, provided TC forecasting and warning training to local forecasters as well as the operations and management of the Tropical Cyclone Module Application. Towards the end of their secondment, they visited Vanuatu, Solomon Islands, Tonga, Samoa and other Pacific Islands NMSs to provide TC training including TC Module as part of their assignment.

### ***Tropical Cyclone Forecasting Training***

In support of RSMC Nadi's viability and capacity, BoM undertook a three week training course on TC forecasting and warning, including Dvorak Technique, in the third quarter of 2010.

Likewise, WMO, following the recommendations of the Fact Finding Mission on RSMC Nadi viability, funded a senior meteorologist for the three week TC forecasting and warning training at the National Hurricane Center, Miami, Florida, in 2011.

Additionally, WMO is funding two senior forecasters to attend the Southern Hemisphere TC forecasting training course and the Public Weather Services course? to be conducted at the Australian BoM later this year.

For all the invaluable assistance rendered to RSMC Nadi, Fiji extends its sincere appreciation to BoM and WMO.

## **RSMC NADI SERVICES IN SUPPORT OF THE SOUTHWEST PACIFIC COUNTRIES AND SWFDDP**

### ***3-day TC Outlook***

In 2009, RSMC Nadi began issuing 3-day TC Outlooks, daily, for the Southwest Pacific region. This product is usually issued during the TC Season and made available via the GTS and FMS website. In 2010, this product has been issued graphically.

### ***72-hour Threat Forecast and Uncertainty Track Maps***

RSMC Nadi puts out the above products via the FMS website during TC events inside Fiji's AOR. The 72-hr Threat Map is essentially the best description of conditions in that time frame. The Uncertainty Track Maps are essentially provided for Disaster Managers to give consensus-based indications of scenarios one may encounter with regards to track (TC centre location) and wind distribution at any particular time along the projected solution. These track maps are supported by tables of values of the previously mentioned parameters.

### ***RSMC Nadi Attachments***

In support of RAV/TCC training needs of Pacific NMSs, RSMC Nadi has accommodated attachees from the region for the objective of familiarisation, insight into RSMC Nadi operations, first-hand experience including issuance of attachees' country forecasts from Nadi and other operational needs of the participating NMSs. RSMC Nadi uses this arrangement to help Pacific NMSs take up their own national weather forecasting responsibilities, thus releasing RSMC Nadi to concentrate on its core business of providing advisories only.

### ***SWFDDP – Acknowledgement***

RSMC Nadi is grateful to MetService NZ Ltd for hosting and managing the SWFDDP Metconnect Page as well as the provision of guidance data to the Pacific NMSs with the purpose of enhancing national capacities in severe weather forecasting and warning.

### ***In-Season coordination between TCWC Wellington and RSMC Nadi***

In support of homogenising understanding of weather across the Pacific as well as forecast policies, during the TC Seasons, TCWC Wellington Lead Forecasters and Nadi forecasters engage in once a week discussions on the tropical weather activities and possible future scenarios, including NWP thinking, which they should be well aware of in advance. This informal teleconference has greatly helped the Nadi forecasters' confidence and general understanding of weather and forecasting.



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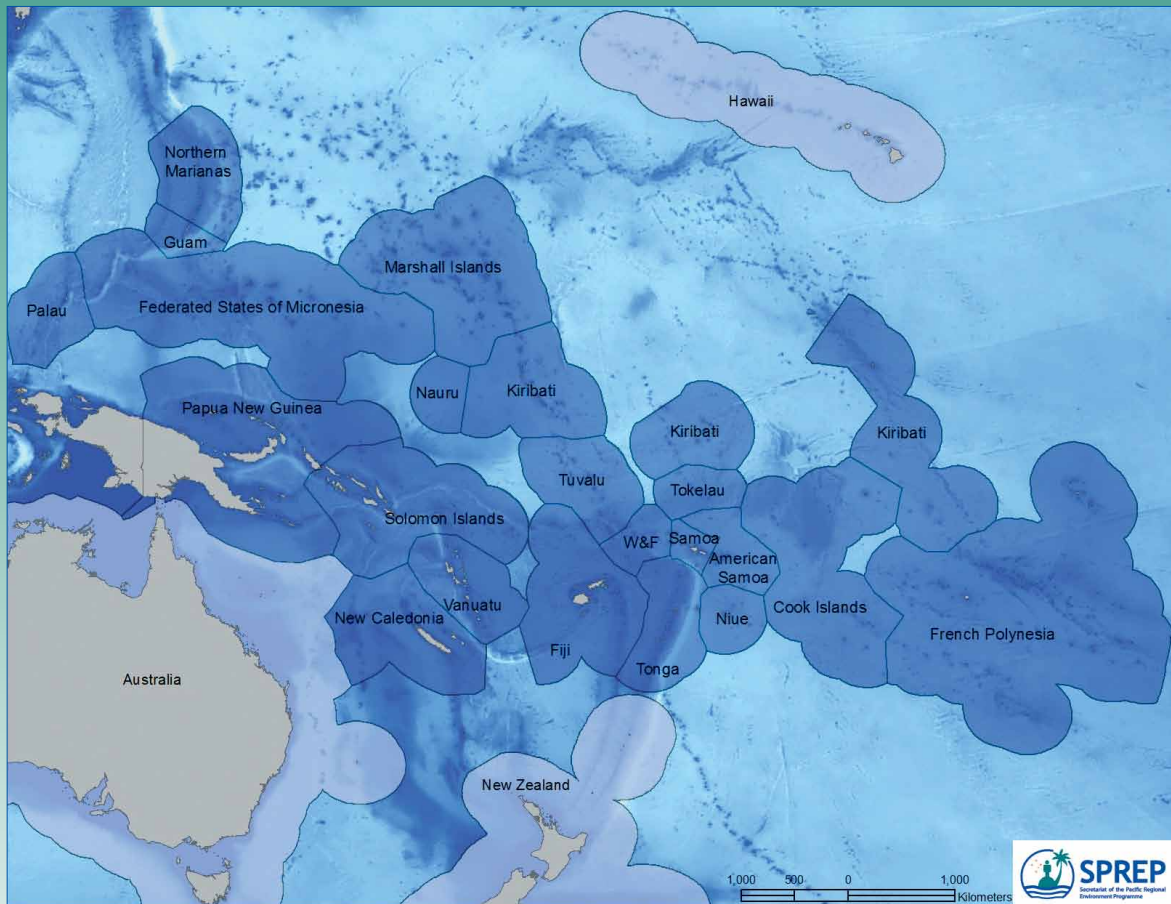
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# THE PACIFIC ISLANDS REGION



*This map is indicative only of agreed and potential maritime jurisdictional limits within the Pacific region. It does not imply the expression of an opinion by SPREP on the legality of any boundary shown.*

SPREP Members comprise 21 Pacific island countries and territories, and four developed countries\* with direct interests in the region:

American Samoa, Australia\*, Cook Islands, Federated States of Micronesia, Fiji, France\*, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, New Zealand\*, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States of America\*, Vanuatu, Wallis and Futuna.

The Pacific Regional Environment Programme (SPREP) is the primary intergovernmental environmental organisation working in the Pacific. SPREP has 25 Members with direct interests in the region. SPREP works to promote cooperation in the Pacific region and provide assistance in order to protect and improve its environment and to ensure sustainable development for present and future generations.







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