REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)

TWELFTH SESSION OF THE RAV MANAGEMENT GROUP

GENEVA, 23 JUNE 2014

FINAL REPORT



WORLD METEOROLOGICAL ORGANIZATION

TWELFTH SESSION OF THE RA V MANAGEMENT GROUP (Geneva, Switzerland, 23 June 2014)

1. ORGANIZATION OF THE SESSION

1.1 The twelfth session of the RA V Management Group (MG-12) was held at the WMO Headquarters in Geneva on Monday, 23 June 2014, during the sixty-sixth session of the Executive Council (EC-66). The Group adopted the provisional agenda as given in Annex I.

2. MATTERS ARISING FROM THE ELEVENTH SESSION

2.1 The Group recalled that the eleventh session of the RA V Management Group (MG-11: Jakarta, 7 May 2014) focused mainly on the review of the key outcomes from the sixth Regional Conference for Regional Association V and the sixteenth session of Regional Association V including identification of the regional challenges and future priorities, establishment of a new working mechanism of the Association, and the follow up to the outcomes and recommendations from the sixteenth session of Regional Association V including the completion of membership of the new subsidiary bodies, development of the RA V Operating Plan 2016-2019, and development of Work Plans for Working Groups (WGs) and the Tropical Cyclone Committee (TCC) to facilitate the activities of the subsidiary bodies.

2.2 The Group underscored the importance of addressing the regional priorities to the members and delegate the individual priorities to the subsidiary bodies, and recommended that the Terms of Reference for the MG should be reviewed during the following MG meetings or through online focusing on the inclusion of capacity development and research.

3. REPORT ON THE KEY OUTCOMES FROM THE 16th SESSION OF REGIONAL ASSOCIATION V

3.1 The Group expressed its appreciation to the Government of Indonesia for hosting the sixteenth session of the Regional Association V (South-West Pacific) (RA V-16, Jakarta, Indonesia, 2-7 May 2014), and congratulated again the newly elected office bearers of RA V, the president, Dr. Andi Eka Sakya (Indonesia) and the re-elected vice president, Mr. 'Ofa Fa'anunu (Tonga).

3.2 The Group noted with pleasure the report of the newly elected president of RA V to the sixtysix session of the Executive Council (EC-66), with a focus on the major outcomes from the RA V-16. The most important achievements of the RA V included, among others:

- (a) Identification of challenges and high priority areas in the Region;
- (b) Refinement and implementation of the RA V Strategic Operating Plan 2012-2015 and the development of the RA V Operating Plan 2016-2019;
- (c) Adoption of a Regional WIGOS Implementation Plan (R-WIP-V) and a Regional WIS Implementation Plan (R-WIS-IP);
- (d) Adoption of a new working mechanism for the RA V and establishment of a Management Group, four Working Groups and a Tropical Cyclone Committee; and
- (e) Engagement and contribution to the Third International Conference on Small Island Developing States (SIDS) to be held in Apia, Samoa from 1 to 4 September 2014.
- 3.3 The Group recalled that the challenges in the Region include:
 - (a) Lack of qualified personnel and the need for ongoing competency assessments, particularly in the field of aeronautical and marine meteorology;

- (b) Need to improve institutional arrangements of Member NMHSs, including enabling legislation, support effective fiscal management, and securing of financial resources from Governments and other sources;
- (c) Need to improve partnerships with key national, regional and global bodies, including funding agencies in order to enhance the service delivery and sustainability of the Member NMHSs;
- (d) Need to improve access to, and usage of, NWP guidance material as underlying support to make service delivery better;
- (e) Need to address inadequacies in regional observing and telecommunications systems for monitoring, forecasting, and dissemination of products for weather, water and climate;
- (f) Need to address inadequacies of early warning services supporting DRR;
- (g) Need to fully implement and sustain a quality management system; and
- (h) Need to improve communication with users and stakeholders for better delivery of user-focused services (e.g. climate services to support the agriculture sector) through the implementation of GFCS perspective.
- 3.4 The Group recalled that the priorities in the Region include:
 - (a) Implementation of WIGOS and WIS in each Member country focusing on concrete and urgent needs related to the maintenance and improvement of the observing and communications systems, and the quality of observations, including radar and upper air observation systems;
 - (b) Strengthen Regional climate services including improvement of existing climate services and the start of implementation for GFCS at regional and national levels: specific activity to include implementation of Regional Climate Centre networks in the Pacific and in South East Asia which was also raised during the 16th RA-V Session;
 - (c) Full implementation and maintenance of a Quality Management System (QMS) in each Member of the Association and the consolidation and maintenance of competence standards consistent with QMS implementation;
 - (d) Improve Service Delivery of hydrological and meteorological services of Members aligned with technical standards and best practice especially with a major focus on strengthening of the SWFDDP and demonstration of the social and economic benefits of these services through tailor made information and effective communication;
 - (e) **Enhance partnerships** to demonstrate the benefit of weather, water, and climate services to the community by increasing cooperation and partnership for outreach; this will be done through engagement with regional partners, national and local government and NGOs.
 - (f) Improve the effectiveness and efficiency of the regional activities, building common position on issues like data policy, commercialization and public/private sector relationships;
 - (g) Enhance partnerships with existing development partners and create new partnerships that will lead to long term sustainability of the services; and
 - (h) Undertake capacity building to address issues relating to education and training needs, budget and staff resource deficiencies (including cost recovery), NWP utilization and insufficient qualified personnel through optimally utilizing the existing RTCs,

and the Group further recalled that (f)-(h) are necessary to make the improvements in (a)-(e), which will result in improved service delivery at regional, national, and local levels.

3.5 The Group noted that the RA V-16 agreed on the following four priorities for the Region for the period 2016-2019:

- (a) Maintenance and improvement of observations and telecommunication networks at the regional and national level through completion of the implementation of the WMO Information System (WIS) and the WMO Integrated Observing System (WIGOS);
- (b) Delivery of improved climate services through the establishment of the optimum network of the Regional Climate Centers (RCCs) to sustainably implement the Global Framework for Climate Services (GFCS);
- (c) Implement effective education and training programmes that build the capability of NMHSs in resource management, advocacy and outreach, and the National Weather Prediction (NWP) utilization;
- (d) Achievement by all Members of the standards required for quality management and staff competencies, with a focus on aviation and marine meteorology.

3.6 The Group also recognized the importance of strengthening existing multi-hazard early warning systems in light of disastrous tropical cyclones/typhoons, floods, drought, earthquakes and tsunamis such as Typhoon Haiyan (Yolanda) in the Philippines in November 2013, and Tropical Cyclone Ian in Tonga in January 2014.

4. REPORT ON THE FIFTEENTH SESSION OF THE RA V TROPICAL CYCLONE COMMITTEE

4.1. The Group was pleased to note that the fifteenth session of the Tropical Cyclone Committee for the South Pacific and Southeast Indian Oceans (TCC-15) was held in Port Vila, Vanuatu from 26 to 30 May 2014, and it expressed its appreciation to the Government of Vanuatu for hosting and providing support for the TCC-15.

4.2. The Group was pleased to note that the TCC-15 designated its current Chairperson, Mr Mike Bergin (Australia) to continue to lead the Committee. The Group also welcomed Australia's offer to officially communicate and confirm to the Secretariat of Mr Bergin's designation as Chairperson of the TCC.

4.3. The Group also noted that Mr Bergin would like seek a new Chairperson of the TCC and the Committee would discuss the matter during its sixteenth session in 2016. The Group was also pleased to note that Mr Bergin has offered to continue providing support to the work of the TCC as a mentor to the new Chairperson.

4.4. The Group noted that the TCC-15 discussed the idea of designating a vice-Chairperson, but the Committee decided to continue discussion on the idea during its sixteenth session in 2016. In the meantime, the TCC would maintain its current practice of designating a vice-Chairperson during, and for a period of each of its sessions. The Group further noted that the transition of leadership and mentoring arrangement highlighted in paragraph 4.3 would also provide an opportunity to introduce a vice-Chairperson for the Committee.

4.5. The Group also noted that the TCC-15 acknowledged the RA V-16 decision on the formation of the Task Team on Severe Weather Forecast Demonstration Project including Data Processing and Forecasting Systems (TT-SWFDP/DPFS) and the Task Team on Coastal Inundation and Storm Surges (TT-CISS). It was recognized that although the TCC focuses in general on Southern Hemisphere tropical cyclone matters, the SWFDP and CISS activities are of interest to all RA V Members, including northern hemisphere Members who are not formally represented on the TCC. The Group therefore reflected on how all RA V Members might participate in this work, and that although the TCC decided to postpone discussion on TCC membership until its sixteenth session in 2016, the Group felt that the matter needed to be addressed more urgently. In this connection, the Group requested the Chairperson of the TCC, in consultation with the Secretariat in particular the Tropical Cyclone Programme (TCP), Marine Meteorology and Oceanography Programme (MMOP), and the Data Processing and Forecasting

Systems Programme (DPFSP), to prepare a way-forward, including addressing the questions of Terms of References, memberships, and institutional arrangement for inclusion of the TT-SWFDP/DPFS and TT-CISS in the TCC, for the Management Group to consider during its thirteenth session.

4.6. The Group was pleased to note that the TCC-15 built upon the regional priorities as agreed to by the RA V-16 for Region V for 2016-2019, and discussed and identified the Committee's specific regional priorities and activities for 2016-2019 as given in Annex II.

4.7. The Group also noted that the TCC has provided deliverables and activities as contributions to the RA V Operating Plan 2016-2019.

5 FOLLOW UP THE SIXTEENTH SESSION OF REGIONAL ASSOCIATION V

5.1 Nomination of Membership

5.1.1 The Group recalled that the RA V-16 decided its future working mechanism as contained in the document - *RA V-16/Doc. 5.3(1), 7.V.2014, APPROVED* including: (a) Resolution 5.3(1)/1 (RA V-16) – RA V Management Group (MG); (b) Resolution 5.3(1)/2 (RA V-16) – RA V Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean (TCC); (c) Resolution 5.3(1)/3 (RA V-16) – RA V Working Group on Hydrological Services (WG-HYS); (d) Resolution 5.3(1)/4 (RA V-16) – RA V Working Group on Climate Services (WG-WXS); (e) Resolution 5.3(1)/5 (RA V-16) – RA V Working Group on Climate Services (WG-CLS); and (f) Resolution 5.3(1)/6 (RA V-16) – RA V Working Group on Infrastructure (WG-INFR).

5.1.2 The Group also recalled that the RA V-16 encouraged Members to nominate the Leads and vice Leads of the Working Groups and the Chairperson of Tropical Cyclone Committee, and members of the Task Teams, and the Secretariat circulated an official nomination letter along with nomination form as given in Annex III to Members.

5.1.3 The Group noted that the nominations were received from four members (Indonesia, New Zealand, Philippines, and Singapore) for the Leads/vice Leads of the Working Groups and experts for the Task Team. The Group was informed that the fifteenth session of the Tropical Cyclone Committee for the South Pacific and Southeast Indian Oceans (TCC-15, Port Vila, Vanuatu, 26-30 May 2014) designated its current Chairperson, Mr. Mike Bergin (Australia) to lead the Committee.

5.1.4 The Group endorsed Mr. Mike Bergin (Australia) designated by the TCC-15 as the Chairperson of the TCC.

5.1.5 Recognizing that more nominations should be added through additional nomination process, the Group requested the Secretariat to inform the RA V Members of the outcomes by emails of the membership status agreed at the MG-12 and solicit further nominations for the vacancies by the end of July 2014. The Group also agreed that the president should finalize the membership of Leads/vice Leads of WGs in consultation with MG members, and the newly appointed Leads/vice Leads of WGs and the Chair of TCC should submit the membership of experts of Task Teams in consultation with MG members to the president of the Region for approval.

5.2 DEVELOPMENT OF THE RA V OPERATING PLAN 2016-2019

5.2.1 The Group noted that the RA V-16 requested its president with the assistance of the MG, to develop the RA V Operating Plan 2016-2019 as part of the WMO-wide Operating Plan 2016-2019 in alignment with the decisions on the regional priorities of Region V for the period 2016-2019, and to reflect activities contained in the Pacific Islands Meteorological Strategy (PIMS) 2012-2022,

which are based on the needs of the Pacific National Meteorological and Hydrological Services, into the WMO Operating Plan and RAV Operating Plan 2016-2019.

5.2.2 The Group reviewed the draft RA V Operating Plan 2016-2019 as given in Annex IV, and was pleased to note that it provided an excellent basis for the comprehensive list of deliverables and activities in the Region for the next fiscal period 2016-2019. The Group also noted that the draft Operating Plan 2016-2019 would require further improvements based on the future priorities in the Region decided by the RA V-16. The Group requested the RA V Task Team on Strategic and Operating Planning (TT-SOP) to improve the draft Operating Plan 2016-2019 in consultation with Members of RA V, Leads of the Working Groups (WGs), and Chairpersons of the Tropical Cyclone Committee (TCC) and the WMO Technical Departments by the end of September 2014, for consideration by the seventeenth session of World Meteorological Congress (Cg-17).

5.2.3 The Group expressed its appreciation to Mr Jon Gill (Australia), Chairperson of TT-SOP for the preparation of the draft RA V Operating Plan 2016-2019, and commended the Leads of WGs, the Chairperson of the TCC, and WMO Technical Departments for providing inputs to the RA V Operating Plan 2016-2019.

6. OTHER BUSINESS

7. CLOSURE OF THE SESSION

7.1 The president thanked all the participants for their fruitful discussion and expressed his satisfaction with the outcomes made in the session, and the list of participants is attached as Annex V to this report. He also thanked the WMO Secretariat for the arrangements for the session.

7.2 The twelfth session of the RA V Management Group closed at 14:40 on Monday, 23 June 2014.

ANNEX I

TWELFTH SESSION OF THE RA V MANAGEMENT GROUP (Geneva, Switzerland, 23 June 2014)

AGENDA

- 1. Organization of the Session
- 2. Matters arising from the Eleventh Session
- 3. Report on the key outcomes from the sixteenth session of Regional Association V
- 4. Report on the fifteenth session of RA V Tropical Cyclone Committee
- 5. Follow up to the sixteenth session of Regional Association V
 - 5.1 Nomination of Membership
 - 5.2 Development of the RA V Operating Plan 2016-2019
- 6. Other Business
- 7. Closure of the Session

TCC REGIONAL PRIORITIES AND ACTIVITIES FOR 2016-2019

Regional priorities for Region V 2016- 2019	Regional priorities for TCC 2016-2019	TCC activities 2016-2019
Maintenance and improvement of observations and telecommunications' networks at the regional and national level through completion of the implementation of the WMO Information System (WIS) and WMO Integrated Global Observing System (WIGOS).		
Delivery of improved climate services through the establishment of the optimum network of Regional Climate Centers (RCCs) to sustainably implement the Global Framework for Climate Services (GFCS)		
Implement effective education and training programs that build the capability of NMHSs in resource management, advocacy and outreach, and Numerical Weather Prediction (NWP) utilization.	Capacity development including education and training in the areas of tropical cyclone forecasting.	Organize session(s) of the RA V TCC. WMO Southern Hemisphere Training Courses tropical Cyclones (biennial). Updating and training in the implementation and of the tropical cyclone module. Organize annual forecaster attachment training at RSMC Nadi –TCC. Pacific International Training Desk at RSMC Honolulu.
		Develop and implement competencies assessment for tropical cyclone forecasters. Provide support to TCC members to participate in IWTC(s).
	Access to and utilization of satellite data and information.	WMO-CGMS Virtual Lab for Education and Training in Satellite Meteorology (centre of excellence, supported by BoM and JMA. Assist Members to receive meteorological satellite information / images from new and advanced generations of satellite systems such as
	Access to and utilization of the NWP including wave and storm surge models.	the replacement of MTSAT. Access to, and utilize available tools, techniques and information to predict wave heights. Establish and operationalize early warning system for storm surges. Access to, and utilize available tools,
	Continued implementation of the Severe Weather Forecast and Disaster Risk Reduction Demonstration Project (SWFDDP).	techniques and information to predict storm surges. Transition of the SWFDDP to operational stage. Establish and operationalize national early warning system for severe weather events other than tropical cyclones.
Achievement by all Members of the standards required for quality	Delivery and communicating tropical cyclone warnings to the users including	NMHSs transmit / communicate advisories/warnings to disaster

management and staff competencies,	the "last mile".	management agencies.
with a focus on aviation and marine meteorology.		Regular briefings from NMHSs to the
motorology.		disaster management agencies on early
		warnings for disasters related to tropical
		cyclones.
		Establish and operationalize early
		warning system for severe weather
		events other than tropical cyclones
		Establish national back-up or redundant
		system(s) related to early warning
		system for tropical cyclones.
		Regular discussions between NMHSs
		and local communities to help them to
		improve understanding of early
		warnings for disaster related to weather.
		Develop weather related
		hazard/disaster response plans for local
		communities.
		Develop weather related
		hazard/disaster response plans for
		economic sectors.
	Research and transition of research to	Develop case studies of high impact
	operation of tropical cyclone forecasting	weather events.
	techniques.	Conduct research on high impact
		weather events related to monsoons
		such as heavy rainfall episodes due to
		cold surge.

ANNEX III

NOMINATION OF MEMBERSHIP



Weather • Climate • Water

Organisation météorologique mondiale Secrétariat 7 bis, avenue de la Paix - Case postale 2300 - CH 1211 Genève 2 - Suisse Tél.: +41 (0) 22 730 81 11 - Fax: +41 (0) 22 730 81 81 wmo@wmo.int – www.wmo.int

Temps • Climat • Eau

Our ref.: DRA-AP/RAV-16/WGM GENEVA, 22 May 2014

Annexes: 3 (available in English only)

Subject: Nomination of experts for RA V subsidiary bodies

Action required: To return to the WMO Secretariat a completed nomination form for each expert not later than 13 June 2014

Dear Sir/Madam,

I wish to refer to the decision of the sixteenth session of Regional Association V (South-West Pacific) (RA V-16) held in Jakarta, Indonesia from 2 to 7 May 2014 concerning the new working mechanism of the subsidiary bodies of the Association.

The Association agreed on the future working structure of RA V subsidiary bodies as illustrated in the Annex I, and urged the Management Group to complete the establishment of the subsidiary bodies for approval by the President of the Region.

In this context, I would like to kindly invite you to nominate appropriate experts from your country who could be candidates for undertaking the duties of members of Working Groups (WGs) and Tropical Cyclone Committee (TCC) and their Task Teams during the forthcoming four-year intersessional period. I am attaching the structure of RA V subsidiary bodies in Annex I for your easy reference. Additional details on the duties for WGs and TCC could be referred to the approved resolutions of RA V-16 on its WGs and TCC as given in Annex II.

It would be appreciated if you could nominate your candidates by completing one nomination form (see Annex III) for each expert. Please send completed form(s), accompanied by one-page curriculum vitae, to the Secretariat as soon as possible, but preferably not later than 13 June 2014 in order to ensure that this information will be available for consideration by the Management Group.

Yours faithfully

(Robert O. Masters) Director Development and Regional Activities Department

To: Directors of Members of Regional Association V

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)

PARTICULARS OF EXPERTS PROPOSED FOR CONSIDERATION AS MEMBERS OF WORKING GROUPS

Member:	
1. Personal Information:	
Surname (Dr, Mr, Ms) F	irst name:
Tel: E-mail:	
Institution:	
Position held:	
2. Participating Working Group/Task Team (see Anno	ex I):
(i) Lead/Vice-lead of Working Group on: WXS (); (Chair of TCC () <i>; or</i>	CLS(); HYS(); INFR(); or
(ii) Member of Working Group on: WXS (); CLS (TCC () with expertise relevant to the following	
Task Team on	
Date: Signat	ture: (Permanent Representative)
✓ Please return this form with <u>one-page curricul</u>	
The Secretary-General World Meteorological Organization 7bis, avenue de la Paix Case postale No. 2300 1211 GENEVA 2	Attention: Dr Yongseob LEE Tel: +41 22 730 85 76 Fax: +41 22 730 81 18 E-mail: ylee@wmo.int

ANNEX IV

RA V OPERATING PLAN 2016-2019 (DRAFT)

DEPT	BRANCH	ER	KEY OUTCOME	KEY PERFORMANCE INDICATOR	DELIVERABLE	PRORGAMME	тс	REGION	LDCs, SIDS, GENDER	ACTIVITY	Y2016	Y2017	Y2018	Y2019	Total
DRA	RAP	1	1.1		Improved coordination of weather services in the Region.	PWS, WXS, TCC	CBS	RA V		Organize session of RA V WG/WXS.					
DRA	RAP	1	1.1		Enhanced timely and accurate	AeMP, WXS	CAeMP	RA V		Aviation client survey to be done at least once a year					
					weather forecast / warning for aviation.			RA V		Attachment/training at world class meteorological centres in weather analysis, forecast and warning for aeronautical purposes (military and civil aviation)					
								RA V		Regional workshop to raise awareness and and improve understanding of ICAO- WMO requirements among NMHSs and various agents of aviation sectors in the Pacific region on avaition meteorological services.					
								RA V	SIDS	Assist to develop inter-agency formal agreements for aviation weather services between Fiji Meteorological Services / RSMC-Nadi and other NMHSs in the Pacific Islands (Cook Islands, Kiribati, Nauru, Niue, Samoa, Tonga, and Tuvalu).					
								RA V	SIDS	Assist to develop national inter-agency formal agreements for aviation weather services between NMHSs and Civil Aviation Authorities or equivalents in the Pacific Islands (Cook Islands, Fiji, Kiribati, Nauru, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu).					
								RA V		Assist to harmonize or align legislations or equivalents of NMHSs and Civil Aviation Authorities or equivalents to meet ICAO- WMO requirements,					
								RA V		Resolve Asia/Pacific deficiencies as identified by ICAO in the area of SIGMET, especially in the Pacific Islands (Cook Islands, Kiribati, Nauru, Solomon, Islands, and Tonga)					
								RA V	LDCs, SIDS	Install equipment including hardware and software for verification of TAF in NMHSs of Pacific Islands (Fiji, Papua New Guinea, and Vanuatu).					
DRA	RAP	1	1.1	1.1.1	Implemented QMS for aviation	AeMP, WXS	CAeM	RA V							
					meteorological service providers			RA V		QMS guidance (WMO webpage & forum, input into WMO/ICAO publications and COMET module)					
								RA V		Internal Auditor Training					
								RA V		Twinning' to mentor Members on QMS processes and audits					

								RA V		Lead Auditor training (international qualification)	
								RA V	LDCs, SIDS	Assist Pacific Islands Meteorological Authorities, NMHS and Civil Aviation Authorities to enhance QMS for aviation meteorological services.	
DRA	RAP	1	1.1	1.1.1	Implemented cost recovery for aviation meteorological service providers	AeMP, WXS	CAeM	RA V	LDCs, SIDS	Conduct a survey on cost recovery for aviation meteorological services in RA V Members.	
								RA V	LDCs, SIDS	Develop and provide guidance on cost recovery for aviation meteorological services.	
					-			RA V	LDCs, SIDS	Assistance to Members with cost recovery implementation including development of policies and guidelines.	
					Implemented competency assessment for aviation meteorological service	AeMP, WXS	CAeM	RA V	LDCs, SIDS	Conduct a survey to determine current status of the implementation of competency assessment for AMO and AMF in RA V Members.	
					providers			RA V		Develop and provide guidance to assist Members in RA V to mplement competency assessment for AMO and AMF.	
								RA V	LDCs, SIDS	Assist Members with implementation through in-countries traning and visits including competency assessment training for AMO and AMF Cook Islands, Federated States of Micronesia, Kiribati, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu.	
DRA	RAP	1	1.1	1.1.2	Enhanced wave modeling and NWP products.	MMOP, WXS, TCC	JCOMM	RA V		Enhance wave modeling capability, including 3 wave models with wind inputs from NCEP-GFS and NAVGEM (now running operationally.	
								RA V	LDCs, SIDS	Install equipment including hardware and software in, and/or make available tools, techniques and information to, NMHSs in Pacific Islands to predict wave heights.	
								RA V	LDCs, SIDS	Install equipment including hardware and software in, and/or make available tools, techniques and information to, NMHSs in Pacific Islands to predict storm surges.	
DRA	RAP	1	1.1	1.1.2		MMOP, WXS, TCC,	JCOMM	RA V		Provide forecasts for marine activities	
					inter-islands boat operators, port authorities and enforcement agencies obtain	PWS		RA V		Client summary at least once a year	
					marine forecasts.			RA V	LDCs, SIDS	Strengthen relationships between NMHSs and relevant marine agencies through developing agreements or equivalents with port authorities	
								RA V	LDCs, SIDS, Gender	Develop and conduct public awareness and education in the Pacific slands for inter-island boats operators and small crafts operators on the use and interpretation of marine weather information and forecasts.	
								RA V	LDCs, SIDS,	Installation of marine weather and climate observations equipment on ferries / inter-island shipping / boats.	
DRA	RAP	1.1	1.1	1.1.2	Implemented QMS for marine meteorological service providers	MMOP, WXS	JCOMM	RA V	LDCs, SIDS	Provide guidance to Members on the implementation of QMS for marine meteorological services.	
DRA	RAP	1	1.1	1.1.2	Improved accuracy of public forecasts and warnings	PWS, WXS,	CBS	RA V		Inter-agency committee is formed to conduct research on the mprovement of forecast accuracy	

								RA V		Enhance NWP limited area model, including MMD-WRF high resolution model (1-4 KM).		
DRA	RAP	1	1.1	1.1.2	Displayed forecasts at	PWS, WXS,	CBS	RA V		Provide forecasts to motorists at major expressways		
					billboards located along the major expressways and via other means and at other locations.			RA V	LDCs, SIDS	Regular dialogues between NMHSs and communities including women, children, youth, disable people, and vulnerable communities, on weather information, forecast and warnings.		
								RA V	LDCs, SIDS	Install TV systems/Screen display for weather presentation.		
DRA	RAP	1	1.1	1.1.2	Issued timely and accurate	PWS, WXS, TCC,	CBS	RA V		Attachment/training at world class meteorological centres		
					public weather forecast/ warning	DPFS		RA V		Public and communities' surveys to be done at least once a year.		
DRA	RAP	1	1.1	1.1.2	Increased value-added public weather forecasts available online.	PWS, WXS, TCC		RA V		Weather advisory and weather briefing as requested		
				Enhanced human capital	PWS, WXS, TCC,		RA V		Lectures/training on meteorological courses.			
					development.	DPFS		RA V		Forecast for Search and Rescue (SAR) operations.		
DRA	RAP	2	2.1	2.1.1	Improved coordination of tropical cyclone warnings in Region V.	TCC	CBS	RA V		Organize session of RA V TCC.		
DRA	RAP	2	2.1	2.1.1	Received advisories/warnings via various channels (SMS, telephone calls and fax) by disaster management agencies	WWW, TCP, DRR, TCC		RA V		NMHSs transmit / communicate advisories/warnings to disaster management agencies.		
DRA	RAP	2	2.1	2.1.1	Improved provision of early warning disaster information to the government and stakeholders	WWW, TCP, DRR, TCC	CBS	RA V	LDCs, SIDS, Gender	Regular briefings from NMHSs to the disaster management agencies on early warnings for disasters related to weather.		
DRA	RAP	2	2.1	2.1.1	Enhanced suite of EWS	WWW, TCP, DRR,	CBS	RA V		Develop case studies of high impact weather events		
					products	TCC, DPFS		RA V	LDCs, SIDS, Gender	Establish and operationalize early warning system for severe weather events other than tropical cyclones.		
						WWW, MMOP, TCP, DRR, TCC,	, JCOMM	RA V	LDCs, SIDS, Gender	Establish and operationalize early warning system for storm surges.		
						WWW, TCP, TCC, DRR, TCC	CBS	RA V	LDCs, SIDS, Gender	Establish national back-up or redundant system(s) related to early warning system for tropical cyclones.		
								RA V	LDCs, SIDS, Gender	Improve regional back-up and redundant system(s) related to early warning system(s) for tropical cyclones.		
						WWW, TCP, DRR, TCC	CBS	RA V	LDCs, SIDS, Gender	Regular dialogues between NMHSs and media sectors to help media sectors improving understanding of terminologies used in weather information, forecasts and warnings and to develop communication strategy for NMHSs and the media sectors		
								RA V	LDCs, SIDS, Gender	ntegrate early warning systems for disasters related to weather into regional, national and local policies or equivalents.		

DRA	RAP	2	2.1	2.1.1	Improved communities and	WWW, TCP, DRR,	CBS	RA V	1	Engage with stakeholders to develop new products
					other stakeholders safety	TCC		RA V		Conduct regular community surveys
								RA V		Regular completion of verification spread sheets by NHMs
								RA V		Regular completion of in-country progress reports for SWFDDP
								RA V	LDCs, SIDS, Gender	Regular discussions between NMHSs and local communities to help them to improve understanding of early warnings for disaster related to weather.
								RA V	LDCs, SIDS, Gender	Develop weather related hazard/disaster response plans for local communities.
								RA V	LDCs, SIDS, Gender	Develop weather related hazard/disaster response plans for economic sectors
DRA	RAP	2	2.2	2.2.1	Improved flood forecasting systems and techniques	HWRP, HYD, TCC	CHy, CBS	RA V		Implementation of FFGS in Region V
								RA V		Reports on regional applications; IFAS, TopNet, IFFRM, Delft-FEWS etc.
								RA V	LDCs, SIDS, Gender	Strengthen or establish early warning systems for floods in Members of RA V.
DRA	RAP	2	2.2	2.2.1	Improved linkages with DRR community and other stakeholders.	HWRP, HYD, TCC	CHy, CBS	RA V		Hydrological inputs to end-to-end multi-disaster warning systems - CIFDP
								RA V	LDCs, SIDS, Gender	Regular discussions between NMSs and NHSs.
								RA V	LDCs, SIDS, Gender	Develop national policies for early warning systems for floods inclusive of women, girls, youth, children, disable people and the most vulnerable communities.
								RA V		Strengthen or develop national joint programmes between NMSs, NHSs and NDMOs on public awareness and education on floods that is inclusive of women, girls, youth, children, disable people, and vulnerable communities.
DRA	RAP	2	2.3	2.3.1	Improved drought monitoring and management capabilities.	HWRP, HYD, WCP, CLS	CHy, CCI	RA V		Evaluate accuracy of seasonal predictions for water management purposes;
								RA V		Improve water elements in CliDE;
								RA V	LDCs, SIDS, Gender	Enhance or establish drought prediction and early warning services at national levels in Members of Region V.
								RA V	LDCs, SIDS, Gender	Develop strategies or equivalents for early warning services for drought events.
								RA V	LDCs, SIDS,	Regular discussions between providers of drought prediction and early warning services and users of these services through

									Gender	RNCOFs.
					_			RA V	LDCs, SIDS, Gender	Develop SOPs for delivery of drought prediction and early warning services at the national, local communities, and sectors' levels.
					_			RA V	LDCs, SIDS, Gender	Integrate drought prediction and early warning services into government policies or equivalents.
DRA	RAP	2	2.2	2.2.1	Achieved benefits for the	WCP, CLS, HWRP,	Chy, CCI	RA V		Develop and implement water sector project(s) as part of GFCS.
					water sector through the implementation of GFCS	HYS		RA V		RA V WG/HYS participates in GFCS initiatives
DRA	RAP	3	3.1	3.1.1	Improved coordination of climate services in Region V.	WCP, CLS	CCI	RA V		Organize session of RA V WG/CLS.
DRA	RAP	3	3.1	3.1.1	Improved regional coordination mechanism to develop climate products for	WCP, CLS	Chy, CCI	RA V	LDCs, SIDS, Gender	Establish Regional Climate Centers (RCCs) in Region V for intra and inter regional cooperation.
					Members of Region V.			RA V		RCCs develop and issue regional climate seasonal predictions.
								RA V		RCCs develop and issue regional climate bulletins.
								RA V		RCCs develop and issue regional climate projections.
DRA	RAP	3	3.1	3.1.1	Enhanced climate services	WCP, CLS, HWRP, HYS	CCI	RA V	LDCs, SIDS, Gender	Develop strategies for climate services to reflect the implementation of GFCS at the national, local communities, and sectors' levels.
					_			RA V	LDCs,	Regular discussions between providers of climate services and users of climate services through <i>R</i> /NCOFs.
								RA V	LDCs, SIDS, Gender	Develop SOPs for delivery of climate services at the national, local communities, and sectors' levels.
								RA V	LDCs, SIDS, Gender	Integrate climate services into government policies or equivalents.
								RA V	LDCs, SIDS, Gender	Establish national climate centers to produce and deliver climate services to users at the national and local levels.
								RA V	LDCs, SIDS, Gender	Establish Regional Climate Centers to produce seasonal prediction and regional climate bulletins.
								RA V	LDCs, SIDS, Gender	NMSs and NHSs have access to and use ENSO, ITCZ, monsoons and MJO related products.
								RA V	LDCs, SIDS, Gender	Develop a simple dynamic model that can operate with limited resources.
								RA V	SIDS,	Develop public awareness / education programmes on climate services / GFCS including publication of materials that are inclusive of women, youth, girls, children, disable people and vulnerability communities.
DRA	RAP	3	3.1	3.1.1	Published technical papers	WCP, CLS		RA V		Conduct research on modeling of surface air temperature

					and maps of surface air temperature.			RA V		Provision of climate services to relevant agency		
DRA	RAP	3	3.1	3.1.1	Improved regional coordination mechanism for hydrology and water resources and services in Region V.	HWRP, HYS	Chy	RA V		Organize session of RA V WG/HYS.		
DRA	RAP	3	3.3	3.3.1	Prepared Guidance and training on water information systems, Neon and Delft- FEWS	HWRP, HYS	Chy	RA V		Workshop on improved presentation of hydrological data and information		
DRA	RAP	3	3.3	3.3.1	Prepared SEA HYCOS Phase I concept document	HWRP, HYD		RA V		Establish a sub-group of the RA V WG/HYS to develop SEA HYCOS concept document.		
DRA	RAP	3	3.3	3.3.1	Prepared Pacific HYCOS Phase II concept document	HWRP, HYD, HYS				Establish a sub-group of the RA V WG/HYS to develop Pacific HYCOS concept document.		
DRA	RAP	3	3.3	3.3.1	Improved quantitative precipitation estimates and forecasts	HWRP, HYS, TCC	CBS	RA V		Develop and implement joint activities with SWFDP including framing cascading mechanism within G/R/LNWP		
DRA	RAP	3	3.3	3.3.1	Guidance materials on rainfall based flood forecasts are developed.	HWRP, HYS, TCC	CHy, CBS	RA V		Develop guidance materials on rainfall-based flood forecasts.		
DRA	RAP	3	3.3	3.3.1	Accessibility to available information, tools, and techniques to aid monitoring, preparation, and issuing / dissemination of floods' -information and warnings.	HWRP, HYS	СНу	RA V	LDCs, SIDS	NMSs and NHSs have access to and be able to use: (a) GIS; (b) hazard maps; © population maps; and other socio-economic data and maps that will aid the monitoring of floods and the preparation and issuing / dissemination of floods information and warming.		
								RA V	LDCs, SIDS, Gender	NMSs and NHSs have access to hydrological and meteorological information, tools and techniques that will aid the monitoring of floods and issuing of floods warnings.		
DRA	RAP	4	4.1	4.1.1	Improved regional coordination of infrastructure of NMHSs.	WWW, GCOS, INFR	CCI, CBS	RA V		Organize session of RA V WG/INFR.		
DRA	RAP	4	4.1	4.1.1	Stations metadata provided to WMO regularly.	SP, GCOS, WCP, WWW, WICOS INFR	CCI, CBS	RA V		Publicize and/or develop communication strategy or MoU or equivalents to enhance and enable NMHSs to have access and to utilize facilities and expertise in Regional Instrument Centres to calibrate meteorological instrument		
								RA V		Enhance the capacity of Members in RA V to achieve traceability.		
								RA V		Monitor and detect discrepancies between current performance and the metadata lodged with WMO.		
								RA V		Implement new WIGOS metadata standards in Members of RA V.		
DRA	RAP	4	4.1	4.1.1	implemented WIGOS across Region V.	WWW, OBS, WIGOS, WCP, INFR	CBS	RA V	LDCs, SIDS	Develop national WIGOS implementation plans.		
								RA V	LDCs, SIDS	Organize regional workshops for managers of weather and climate observations to discuss WIGOS.		

								RA V	LDCs, SIDS	Assess and provide profiles of national observing systems and networks against WIGOS requirements / standards		
DRA	RAP	4	4.1	4.1.2	information / images from new and advanced generations of	SP, GCOS, WCP, WWW, WICOS INFR		RA V	LDCs, SIDS	Assist Members to receive meteorological satellite information / images from new and advanced generations of satellite systems such as the replacement of MTSAT.		
					satellite systems by Members in the Pacific			RA V	LDCs, SIDS	Document RA V user requirements and priorities for satellite data and products		
								RA V		Document regional satellite requirements using CBS / Space programme guidelines.		
DRA	RAP	4	4.1	4.1.2	Increased availability of aircraft-based (AMDAR) observations in Region V.	SP, GCOS, WCP, WWW, AeM, INFR	CAeM, CBS	RA V		Develop, complete and implement Aircraft-Based Observations Implementation Plan for RA-V within the perspective of GANP.		
								RA V		Discuss with Pacific national and regional airlines participate in AMDAR observations programme.		
DRA	RAP	4	4.1	4.1.2	Consolidated the implementation of basic networks (RBSN and RBCN	WWW, WCP, HWRP, MMOP, INFR, HYD	CBS	RA V		Regularly review monitoring reports and bring to the attention of Member countries.		
					including GSN and GUAN)	INTX, IIID		RA V		Restore silent RBSN stations.		
								RA V		Access to and to be able to utilize ocean surface wind vector data, and satellite radar altimetry (wave height) data.		
								RA V		Restore silent RBCN stations.		
					_			RA V		Restore silent GUAN stations.		
DRA	RAP	4	4.2	4.2.1	Implemented WIS across Region V.	WWW, WIS, WCP, INFR	CBS	RA V	LDCs, SIDS	Develop national WIS implementation plans or equivalents for Members of RA V based on ASBU's road map, WIS RAV Implementation Road Map		
								RA V		Implement RA V WIS implementation plan.		
								RA V	LDCs, SIDS	Organize regional workshops on WIS.		
DRA	RAP	4	4.2	4.2.1	Enhanced capability and	WWW, WIS, INFR	CBS	RA V		Implement RA V WIGOS implementation plan.		
DRA	RAP	4	4.2	4.2.1	capacity of Members in the Pacific to understand and meet their communication			RA V		Provide training and support in WIS and other communication systems to Members of RA V.		
					needs and to participate in the international exchange of data			RA V		Provide information and advice to Member countries on communication options		
								RA V	LDCs, SIDS	Implement WIS in Pacific Islands' NMHSs.		
DRA	RAP	4	4.2	4.2.2	Improved data processing and forecasting system in Pacific Islands' NMHSs			RA V	LDCs, SIDS	Install data processing and forecasting systems which are compliant with WIS in Pacific Islands' NMHSs.		
DRA	RAP	4	4.3	4.3.1	Operationalized 70 % of GCOS stations network in	WWW, GCOS, INFR	CBS, CCI	RA V		Develop regional GCOS implementation plan.		
					Region V					Implement GCOS implementation plan.		

DRA	RAP	4	4.4	4.4.1	Preserved historical climatological data	WCP, CLS	CCI		LDCs, SIDS	Complete digitization of paper records of climatological data in Pacific Islands.		
								RA V	LDCs, SIDS	Develop climate data policies or equivalents.		
DRA	RAP	4	4.4	4.4.2	Maintained climate database	WCP, CLS	CBS, CCI	RA V	LDCs, SIDS	Provide training in the management and maintenance the climate database.		
								RA V	LDCs, SIDS	Upgrade existing or to develop new CDMS for Pacific Islands' NMHSs.		
								RA V	LDCs, SIDS	Establish back-up CDMSs for Pacific Islands' NMHSs.		
DRA	RAP	5	5.1	5.1.1								
DRA	RAP	5	5.2	5.2.3								
DRA	RAP	5	5.3	5.3.1	Strengthened global GAW	GWAP		RA V		Organize GAW data to also contribute to GFCS.		
DRA	RAP	5	5.3	5.3.1	stations and regional / contributing GAW stations.			RA V		Maintain and enhancement of 1 global GAW stations and 2 regional GAW stations		
DRA		5	5.3	5.3.1	Improved sharing of information air quality in	GWAP		RA V		Support training and capacity building activities related to atmospheric chemistry		
					Region V.			RA V		Enhance GAW activities.		
										Organize technical exchange and cooperation on atmospheric composition observation		
DRA	RAP	5	5.3	5.3.2								
DRA	RAP	5	5.3	5.3.2								
DRA	RAP	5	5.4	5.4.1	Enhanced accuracy (temporal and spatial) of forecasts and warnings.	WWRP, CLS	CBS, CCI	RA V		Conduct studies on monsoons and their interactions with ENSO, IOD and MJO.		
DRA	RAP	5	5.4	5.4.1	Increased lead time on warning of heavy rainfall.	WWRP, HWRP, CLS, TCC, HYS	CBS, CCI	RA V		Conduct research on high impact weather events related to monsoons such as heavy rainfall episodes due to cold surge		
								RA V				
DRA	RAP	6	6.1	6.1.1	Conducted technical training at least one country per year (topics to include highest priority as determined by Members)	HWRP,ETR, WXS		RA V	LDCs, SIDS	Identify Members requiring training; seek sponsorship; and undertake the training.		
DRA	RAP	6	6.1	6.1.1	Provided training in quality assurance to NMHSs.	HWRP, WXS, ETR		RA V		Conduct a training session based on guidance material developed under data management theme.		
DRA	RAP	6	6.1	6.1.1	Prepared catalogue of available of technology in use in the Region.	HWRP, OBS, WXS		RA V		Use existing survey of instrumentation.		
DRA	RAP	6	6.1	6.1.1	Reinforced communication platform for hydrological services in the region	HWRP, WXS, HYS		RA V		Build on IWRM forum, e-mail and other platforms		
DRA	RAP	6	6.1	6.1.1	NMHSs contributed to national / regional policy settings	DRA, RMPO, CER		RA V	LDCs, SIDS	Review and update existing or develop policies, legislations or equivalents for NMHSs.		

							RA V	LDCs, SIDS	Review and update existing or develop strategy and implementation plans for NMHSs.	
							RA V	LDCs, SIDS	Provide support to NMHSs participation in policy or equivalents related national, regional and international forums.	
DRA	RAP	6	6.1	6.1.1	Continued support to the Pacific Meteorological Council (PMC).	DRA, RMPO, CER	RA V	LDCs, SIDS	Co-sponsor and co-organize the 2015 and 2019 PMC meeting.	
DRA	RAP	6	6.1	6.1.1	Established Pacific Ministers for weather and climate services forum / meeting.	DRA, RMPO, CER	RA V	LDCs, SIDS	Co-sponsor and co-organize the 2015 and 2019 Pacific Ministers for Weather and Climate Services forums.	
DRA	RAP	6	6.3	6.3.1	Provided training by national / regional institutions and	RTC, ETR, WXS, TCC	RA V		WMO Southern Hemisphere Training Courses tropical Cyclones (biennial)	
					improved capacity of NMHSs in weather forecasting		RA V		Training in the implementation of the tropical cyclone module.	
					including tropical cyclone		RA V		Organize annual forecaster attachment training at RSMC Nadi -TCC.	
					warnings.		RA V		Pacific International Training Desk at RSMC Honolulu.	
							RA V		Develop and implement competencies assessment for tropical cyclone forecasters.	
DRA	RAP	6	6.3	6.3.1	Provided training by national / regional institutions and improved capacity of NMHSs in satellite meteorology	RTC, ETR, WXS, TCC	RA V		WMO-CGMS Virtual Lab for Education and Training in Satellite Meteorology (centre of excellence, supported by BoM and JMA.	
DRA	RAP	6	6.3	6.3.1	Provided raining by national / regional institutions and	RTC, ETR, WXS	RA V	LDCs, SIDS	Training in project management.	
					inproved capacity of NMHSs in management (human		RA V	LDCs, SIDS	Training in financial management.	
					resources, project, finance, etc)		RA V	LDCs, SIDS	Training in human resources management	
DRA	RAP	6	6.3	6.3.2	Increased number of meteorologists and tropical cyclone forecasters in Pacific	ETR, RTC, DRA, WXS, TCC	RA V	LDCs, SIDS, Gender	Support 3 to 4 staff from Pacific Island Countries NMHSs per year to the post-graduate meteorology training programme at the relevant institutions.	
					Island Countries		RA V	LDCs, SIDS, Gender	Support 3 to 4 staff from Pacific Island Countries NMHSs to the master degree programme in meteorology at the relevant institutions.	
							RA V	LDCs, SIDS, Gender	Support 3 to 4 students from the Pacific Island Countries to undertake University undergraduate studies in meteorology in China,	
DRA	RAP	6	6.3	6.3.2	Increased number of climatologists in Pacific Island Countries	ETR, RTC, WCP, DRA, CLS	RA V	LDCs, SIDS, Gender	Support 3 to 4 staff from Pacific Island Countries NMHSs per year to the post-graduate diploma in climatology at the relevant institutions	
							RA V	LDCs, SIDS, Gender	Support 2 to 3 staff from Pacific Island Countries NMHSs per year to the master degree or doctorate programme in climatology at the relevant institutions	
DRA	RAP	6	6.3	6.3.2	Increased number of hydrologist in Pacific Island Countries	ETR, RTC, HWRP, DRA, HYS	RA V	LDCs, SIDS, Gender	(i) Support 3 to 4 staff from Pacific Island Countries NHSs per year to the post-graduate degree in hydrology at relevant institutions	

DRA	RAP	6	6.3	6.3.2	Met the BIP-MT requirements / standards in all existing weather and climate observers in Pacific Island Countries NMHSs	OBS, WIGOS, WIS,	RA	V LDCs, SIDS, Gender	Support Pacific Islands NMHSs to ensure that all their existing and new weather and climate observers meet BIP-MT requirements.
DRA	RAP	6	6.3	6.3.2	Met the AMO requirements in all existing and new aviation weather observers	ETR, RTC, DRA, AeMP, WXS, WCP, CLS	RA	V LDCs, SIDS, Gender	Support Pacific Islands NMHSs to develop competency assessments for AMO.
								LDCs, SIDS, Gender	Assist Pacific Island Countries NMHSs to conduct competency assessment for AMO
DRA	RAP	6	6.3	6.3.2	Met the AMF requirements in all existing and new aviation weather observers	ETR, RTC, DRA, AeMP, WXS	RA	SIDS, Gender	Support Pacific Islands NMHSs to develop competency assessments for AMF.
								LDCs, SIDS, Gender	Support Pacific Island Countries NMHSs to conduct competency assessment for AMF
DRA	RAP	6	6.3	6.3.3					
DRA	RAP	6	6.3	6.3.3					
DRA	RAP	6	6.4	6.4.1					
DRA	RAP	6	6.4	6.4.1					
DRA	RAP	7	7.1	7.1.1					
DRA	RAP	7	7.1	7.1.1					
DRA	RAP	7	7.1	7.1.2	Continued support to the Pacific Meteorological Desk Partnership (PMDP).	DRA, RMPO, CER	RA	V	Renew Letter of Agreement with SPREP to support to the operation of the PMDP.
DRA	RAP	7	7.1	7.1.2					
DRA	RAP	7	7.1	7.1.3					
DRA	RAP	7	7.1	7.1.3					
DRA	RAP	7	7.2	7.2.1					
DRA	RAP	7	7.2	7.2.1					
DRA	RAP	7	7.2	7.2.2					
DRA	RAP	7	7.2	7.2.2					
DRA	RAP	7	7.2	7.2.3	Provided training by national / regional institutions and	RTC, ETR, WXS, TCC		RA V	WMO Southern Hemisphere Training Workshop on public weather services.
					improved capacity of NMHSs in communicating weather information including warnings		F	A V LDCs, SIDS, Gender	Training in communication.
					to the communities.		F	A V LDCs, SIDS, Gender	Training in media presentations (interview and writing articles)
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ANNEX V

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