

WORLD METEOROLOGICAL ORGANIZATION
WEATHER, CLIMATE AND WATER



**RA V WORKING GROUP ON HYDROLOGICAL
SERVICES – NINTH SESSION**

(BRISBANE, AUSTRALIA, 9-13 NOVEMBER 2015)



FINAL REPORT

1. OPENING OF THE SESSION (agenda item 1)

1.1 At the kind invitation of the Government of Australia, the ninth session of the RA V Working Group on Hydrological Services (WG-HYS) opened at 9:00am on Monday November 2015 at the Queensland Regional Office of the Bureau of Meteorology (BoM) in Brisbane. A list of participants is provided in Annex I.

1.2 Mr Rob Webb, Deputy Director of Hazards, Forecasts and Warnings Division, welcomed the participants on behalf of BoM and in his remarks highlighted the relevance of the subject matter of the WG for Australia and Queensland in particular, where extreme hydrometeorological events are quite usual, as witnessed by the ongoing drought. He noted that BoM pays special attention to the importance of understanding the decision making process of users of hydrological forecasting services, values the establishment of partnership to learn from and share with other organizations and is keen to stay up-to-date as regards technology, as witnessed by the transformation process it is implementing.

1.3 On behalf of Mr Michel Jarraud, Secretary-General of the World Meteorological Organization (WMO), Claudio Caponi also welcomed the participants to Brisbane and thanked BoM and the Government of Australia for hosting the meeting. He recognized that in the past the RA V WG-HYS had suffered some difficulties in its functioning, but noted several positive elements which made him optimistic, such as the fact that for the first time in many years the WG was meeting at the start of the intersessional period with the possibility of having a second meeting in two years, and the presence of both the president of the Commission for Hydrology (CHy) and of the Vice-president of RA V among the participants, to ensure the links with the Commission and the meteorological community, respectively.

1.4 Finally, the Chair of the RA V WG-HYS, Mr John Fenwick (New Zealand) thanked BoM, WMO and CHy for the support they gave to the meeting and to hydrological activities in the region and highlighted that the challenges faced by the water sector in RA V could and should be turned into opportunities.

1.5 A round of introductions and general comments was undertaken, which allowed first time participants to get acquainted with their colleagues.

2. APPROVAL OF THE AGENDA (agenda item 2)

The Group adopted the draft agenda without modifications and decided on the organization of work, including the working hours and tentative work plan, included as Annex II.

3. REVIEW OF RELEVANT DECISIONS OF RA V-16, Cg-17, EC-67 and CHy-14 (agenda item 3)

3.1 After briefly recalling the main decisions of interest to RA V adopted by CHy-14 and noting that those of Cg-17 and EC-67 were covered under Agenda Items 4 and 6 below, the Group focused on the decisions on water matters adopted by RAV-16 and in particular developed the terms of reference for its four Task Teams, included in Annex III, as requested by the Regional Forum of Directors of National Meteorological and Hydrological Services (NMHSs) in RA V, held in Fiji from 28 to 30 October 2015.

3.2 In addressing the requests of RAV-16, the Group noted that the activities related to promoting a quality management approach in hydrology were of a cross-cutting nature and did not fit exactly under any of the Task Team titles approved by the Regional Association. It therefore agreed to modify the title and scope of the Task Team on Hydrology Database Management to give it the added responsibility of promoting the adoption of a Quality Management Framework - Hydrology in the Region.

4. REPORT ON ACTIVITIES OF CHy OF INTEREST TO THE REGION (agenda item 4)

4.1 The president of CHy, Mr Harry Lins, presented the concept of the WMO Hydrological Observing System (WHOS) and its development in two phases, which will be discussed and presumably endorsed at CHy-15 in December 2016. The following discussion focused on how the National Hydrological Services (NHSs) of the region could be encouraged to provide updated links to their online hydrological data.

4.2 The CHy communities of practice were presented and the Group found the ones for stream gauging instructors and for the database management system MCH particularly interesting. On a related note, the virtual forums developed by working groups on hydrology of other regions were presented and the Group agreed on developing a similar approach for RA V.

4.3 The DEWETRA platform was briefly presented and the modalities to take advantage of the offer by Italy to make it available to WMO members were discussed. The Group noted that the Philippines was the first country having accepted such offer and was informed that the platform had proven useful but further customization to ingest radar data was needed to optimize its use.

4.4 Mr Harry Lins briefly described the concept under development of a Global Hydrometry Support Facility, to be established in 2016 in the WMO Secretariat, with the financial support of the Swiss Agency for Development and Cooperation (SDC). The Group noted that the Facility would concentrate all hydrometry-related activities of WMO and have at its core a WHYCOS office and an Innovation Hub, which would undoubtedly prove of great assistance to the sustainability of HYCOS projects to be developed in the region.

4.5 Mr Dasarath Jayasuriya (Australia) presented the work undertaken by the two joint WMO/GWP initiatives of which he is a Steering Committee member: the Associated Programme on Flood Management (APFM) and the Integrated Drought Management Programme (IDMP). He highlighted the HelpDesk function of both programmes and strongly encouraged all WG-HYS members to take advantage of this useful facility.

5. REPORT ON ACTIVITIES IN THE REGION OF RELEVANCE TO THE WG-HYS (agenda item 5)

5.1 The Chair of the WG-HYS, Mr John Fenwick, reported on the main outcomes of the Regional Forum of Directors of NMHSs in RA V, which he had recently attended. He explained that the main priorities identified by the Forum in the area of hydrology were related to disaster risk reduction, in particular the development of simple flash flood forecasting products, usable seasonal/drought predictions, and the need to evolve to impact-based forecast products. The Forum also expressed the need of developing methods for assessing the quality of hydrological data and products, including QMSs, development of competencies and training programmes, and capacity building in general.

5.2 Mr Andy Barnes (Australia) presented the BoM HyFS, the Bureau's next generation forecasting system, based on an adaptation of Delft-FEWS, designed to produce user-oriented flood warning services. Mr Jeff Sabburg (Australia) introduced the BoM climate outlook services, which had recently improved from statistical to dynamic forecasting methods, and drought services, stressing the importance given to the incorporation of stakeholder feedback in their development. Ms Victoria Dodds (Australia) presented the Flood Warning Competency Framework currently being developed by the Bureau, expected to be completed by 2016. The Group commented that the framework could be a contribution from the region to the ongoing work of CHy on the definition of competencies for a series of core jobs for hydrologists and hydrological technicians.

5.3 Mr John Fenwick (New Zealand) informed the Group of the work undertaken by NIWA in Fiji, Samoa and the Solomon Islands, initiated as a contribution to the Global Framework for Climate Services (GFCS), to implement in those countries end to end hydrometric and climate data

capture and information systems, from stations/sensors to web delivery. Mr Christian Zammit (New Zealand) presented the approach taken in New Zealand in rainfall-based flood forecasting across different time scales, with a focus on the challenges of establishing a national forecasting system in the particularly testing conditions of New Zealand.

5.4 All the above presentations were distributed to the participants on a flash drive and will be uploaded on the meeting web site.

6. PROGRAMME OF WORK OF THE WG-HYS FOR THE PERIOD 2016-2018 (agenda item 6)

6.1 The discussion of the work plan 2016-2018 of the four Task Teams was led by their respective leaders:

Disaster risk reduction - water-related disasters	- Mr Jeff Perkins (Australia)
Hydrology database management and QMF-H	- Ms Margaret Bautista (Philippines)
Water and Climate	- Mr Christian Zammit (New Zealand)
Training and capacity building in hydrology	- Mr Petrus Syariman (Indonesia)

6.2 The resulting agreed Work Plan consisting of the proposed activities for each Term of Reference, with an indication of the member responsible for their implementation and their tentative starting date is presented in Annex IV.

7. RECOMMENDED TOPICS OF RELEVANCE TO THE REGION TO BE SUGGESTED FOR INCLUSION IN THE PROGRAMME OF WORK OF THE COMMISSION FOR HYDROLOGY AT CHy-15 (agenda item 7)

7.1 The Group discussed several topics to be brought forward by its Chair to the next meeting of the Advisory Working Group of CHy in February 2016, which were felt to be of relevance to the region. The general topics discussed were: i) operational use of remote sensing in estimating precipitation and other hydrological variables, ii) preparation of tutorials and other dissemination material on extended hydrological prediction, iii) new efforts in conveying probabilistic forecasting to the water community, iv) hydrological aspects of rainfall harvesting, and v) definition of hydrological normals.

7.2 The group agreed that the Chair will provide more specific information on the activities it was suggesting CHy undertake and for this he may get back to the Group via email for advice.

8. COOPERATION WITH OTHER INTERNATIONAL ORGANIZATIONS (agenda item 8)

8.1 Mr Peter Sinclair presented the hydrological activities undertaken by the Secretariat of the Pacific Community (SPC) in recent years, with particular emphasis on the implementation of Pacific-HYCOS from 2006 to 2010. He highlighted the main lessons learned and expressed his reflection that support to national hydrological activities should be longer term than generally permitted by current project funding cycles, a consideration which met with general agreement by the Group. He also presented on additional initiatives, such as KIRIWATSAN (water resources assessment in the outer islands of Kiribati), the Bonriki Inundation Vulnerability Assessment (BIVA) and the Climate and Abstraction Impacts in Atoll Environments (CAIA) to assess impacts of sea level rise and climate variability on groundwater resources in atoll environments, the Lifuka, Tonga project to assess the impact of earthquake-induced sea level rise on water resources adaptation strategies and the New Zealand Water Security Project, which supports five countries in improving their resilience to drought.

8.2 The desire to continue cooperation of the RA V WG-HYS with SPC is reflected in various section of the Work Plan contained in Annex IV.

8.3 Other organizations active in the Region, such as SPREP, UNESCO-IHP, GWP, AHA and IAH, were mentioned, but as they were not present at the meeting, further consultation would be needed for establishing cooperation in some of the work areas of the Group.

9. FIELD VISIT (agenda item 9)

The Group conducted a field visit to the Brisbane city flood gauge and historical flood markers and discussed the history of flooding in Brisbane.

10. ADOPTION OF THE REPORT (agenda item 10)

The report was adopted by consensus.

11. ANY OTHER BUSINESS (agenda item 11)

11.1 The Group agreed that the assessment of capabilities (Activity 1 of the Work Plan) should be undertaken periodically, in order to assess progress across the scope of work covered by the Task Teams.

11.2 The Group recommended that a follow-up meeting be held before the end of the intersessional period, in late 2017 or early 2018. Tonga expressed interest in hosting such a meeting.

11.3 The Group discussed the desirability of having more national Hydrological Advisers appointed by the Members of RA V, and agreed that the WG-HYS Chair will coordinate with the president of RA V to contact Permanent Representatives and encourage them to consider nominating HAs and updating WMO Publication No 5.

11.4 The Group also tasked its Chair to address all RA V Members to promote the nomination of experts in the different Open Panels of CHy Experts (OPACHes).




11.5 The Group thanked the Queensland Regional Office of the BoM for their warm hospitality throughout the meeting.

12. CLOSURE OF THE MEETING (agenda item 12)

The Chair closed the meeting at 13h43 on Friday 13 November 2015.

REGIONAL ASSOCIATION V WORKING GROUP ON HYDROLOGICAL SERVICES

LIST OF PARTICIPANTS

Chair	
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President of the Commission for Hydrology (CHy)	
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Other organizations	
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Secretariat	
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REGIONAL ASSOCIATION V
WORKING GROUP ON HYDROLOGICAL SERVICES
NINTH SESSION
Brisbane, Australia, 9 to 13 November 2015
TENTATIVE WORK PLAN

Monday 9 November 2015			Led by
Hours	Agenda Item	Title	
9:00 – 10:15	1	Opening of the session – welcome remarks by BoM, WMO , WG-HYS Chair	Jeff, Claudio, John
10:15-10:30	2	Organization of work and approval of the agenda	John / Claudio
10:30 – 11:00	<i>Coffee break</i>		
11:10 – 11:45	3	Review of relevant decisions of RA V-16, Cg-17, EC-67 and CHy-14	Claudio
11:45 – 12:30	4	4. Report on activities of CHy relevant to the Region 4.1 WHOS – Phases I and II	Harry
12:30 – 14:00	<i>Lunch</i>		
14:00 – 15:30	4 (cont.)	4. Report on activities of CHy relevant to the Region (cont.) 4.2 CHy communities of practice 4.3 DEWETRA platform 4.4 “Global Hydrometry Support Facility” project 4.5 CHy Task Team on QMS	Claudio Roy/Claudio Claudio/Harry Claudio / John
15:30 – 16:00	<i>Coffee break</i>		
16:00 – 17:30	5	5. Report on activities in the Region of relevance to the WG-HYS 5.1 RA V Regional Forum - discussions on priorities related to the Working Group	John

		5.2 BoM HyFS – the next generation flood and short term flow forecasting system	Jeff /BoM
		5.3 BoM new Flood warning Training and Competency program using blended learning	Jeff /BoM
		5.4 Bureau presentation on Seasonal streamflow forecasting, climate forecasting and drought service	Jeff /BoM
		5.5 Systems of end to end hydrometric and climate stations - sensors to web delivery.	John
		5.6 Rainfall-based flood forecasting - the Topnet option	Christian
Tuesday 10 November 2015			
9:00 – 10:30	6	Programme of work of the WG-HYS for the period 2016-2018 6.1 Disaster Risk Reduction – Water-related Disasters	Jeff
10:30 – 11:00	Coffee break		
11:00 – 12:30	6 (cont.)	6.1 Disaster Risk Reduction – Water-related Disasters (cont.)	
12:30 – 14:00	Lunch		
14:00 – 15:30	6 (cont.)	6.2 Hydrology Database Management	Margaret
15:30 – 16:00	Coffee break		
16:00 – 17:30	6 (cont.)	6.2 Hydrology Database Management (cont.)	

Wednesday 11 November 2015			
9:00 – 10:30	6 (cont.)	6.3 Water and Climate	Christian
10:30 – 11:00	Coffee break		
11:00 – 12:30	6 (cont.)	6.3 Water and Climate (cont.)	
12:30 – 14:00	Lunch		
14:00 – 15:30	6 (cont.)	6.4 Training and Capacity Building in Hydrology	Petrus

15:30 – 16:00	Coffee break		
16:00 – 17:30	6 (cont.)	6.4 Training and Capacity Building in Hydrology (cont.)	

Thursday 12 November 2015			
9:00 – 10:30	7	Recommended topics of relevance to the Region to be suggested for inclusion in the programme of work of the Commission of Hydrology at CHy-15	John / Claudio
10:30 – 11:00	Coffee break		
11:00 – 12:30	8	Cooperation with other international organizations	Claudio/Peter
12:30 – 14:00	Lunch		
14:00 – 15:30	9	Possible field visit	Jeff
15:30 – 16:00	Coffee break		
16:00 – 17:30	9 (cont.)	Possible field visit	Jeff

Friday 13 November 2015			
9:00 – 10:30	10	Consideration of the meeting report	Claudio / John
10:30 – 11:00	Coffee break		
11:00 – 12:30	10	Consideration of the meeting report	Claudio / John
12:30 – 14:00	Lunch		
14:00 – 14:45	10	Adoption of the meeting report	Claudio / John
15:00 – 15:15	11	Any other business	John
15:15 – 15:30	12	Closure of the meeting	Jeff, Claudio, John
15:30 – 17:30		Reserved	

TERMS OF REFERENCE OF RA V WG-HYS (2015-2018)

WMO RA V WORKING GROUP ON HYDROLOGICAL SERVICES (WG-HYS)

- (a) To monitor, promote and develop strategies and activities that will enhance the capabilities of RA V Members to improve the quality of hydrological services and to deliver and improve access to these services, with an emphasis on improved observation and monitoring systems;
- (b) To coordinate with relevant WMO bodies, particularly the Commission for Hydrology, and other groups to enable improved forecasting capabilities, including the provision of more accurate, timely and reliable forecasts and warnings and enhanced delivery of related information and services;
- (c) To assist RA V Members to apply a quality management approach that will enable and support the sustainability of hydrological services;
- (d) To provide hydrological advice and guidance to RA V regarding the development of the new WMO programme for SIDS and Member island territories;
- (e) To establish and coordinate task teams, as required, to complete specific activities related to the objectives, priority areas and planned deliverables of the Working Group;
- (f) To report and provide advice to the RA V Management Group on the above issues;

TASK TEAM ON TRAINING AND CAPACITY BUILDING IN HYDROLOGY (TT- TCB-H)

The Terms of Reference of the Task Team are:

- Assess the Education and Training needs (ETR) in HWR in the region and prepare with the assistance of the Secretariat a realistic plan to respond to highest priority needs;
- Contribute to the preparation of relevant training material for courses of regional interest;
- Guide the design and implementation of potential regional and sub-regional components of WHYCOS in RA V;

- Support the potential development of a SEA-HYCOS and a Phase 2 of Pacific-HYCOS; and
- Provide advice to the WG-HYS on the above issues.

TASK TEAM ON HYDROLOGY DATA MANAGEMENT AND QMF-H (TT- HDM/QMF-H)

The Terms of Reference of the Task Team are:

- Support the implementation of QMF-Hydrology in Region V;
- Continually seek ways to improve the effectiveness of implementing and maintaining QMF- HYDROLOGY by regional collaboration and mentoring;
- Promote the use of WMO Manuals and Guidelines in Region V;
- Assist in the adoption of standardization measures in Region V;
- Promote data exchange and availability at national, regional and global level;
- Assist NHSs in selection of appropriate, robust and sustainable DBMSs; and
- Provide advice to the WG-HYS on the above issues.

TASK TEAM ON DISASTER RISK REDUCTION –WATER-RELATED DISASTERS (TT- DRR-W)

The Terms of Reference of the Task Team are:

- Promote coordinated activities on operational flood forecasting in Region V particularly with respect to impact-based products and services;
- Take the lead in identifying and sharing information on available tools or methodologies including telemetered data acquisition, flood forecasting tools, and information products suitable for Disaster Risk Reduction (DRR) agencies and communities;
- Promote best practice flash flood forecasting and warning services in RA V; and
- Provide advice to the WG-HYS on the above issues.

TASK TEAM ON WATER AND CLIMATE (TT-WC)

The Terms of Reference of the Task Team are:

- Promote coordinated activities on climate change and climate variability related to hydrology and the water resources sector, including drought vulnerability, in Region V;
- Support development of products to assist national and regional strategies for adaptation to climate change in the water sector; and
- Provide advice to the WG-HYS on the above issues.

#	ToR	Actions	Responsible	Time frame
1	Promote coordinated activities on operational flood forecasting in Region V particularly with respect to impact-based products and services;	<p>a. Baseline the current capabilities of the countries in RA V by developing and facilitating a capability self assessment based on the TORs of the TTs of this working group and the WMO NHMS capability assessment framework</p> <p>b. Develop a simple strategy and implementation approach for collecting flood impact and intelligence information across the region</p>	<p>a. Jeff Perkins and Christian Zammit</p> <p>b. 'Ofa Fa'anunu, Andre Siohane, Jeff Perkins, Margaret Bautista, Lamako Asora</p>	<p>a. June 2016 (launch the survey)</p> <p>b. 2016</p>

2	<p>Take the lead in identifying and sharing information on available tools or methodologies including telemetered data acquisition, flood forecasting tools, and information products suitable for Disaster Risk Reduction (DRR) agencies and communities;</p>	<p>c. Develop a community of practice in RA V by implementing a blog or portal for WG-HYS, HAs, CHy and OPACHE members and other interested practitioners for sharing information from all Task Teams on training, policy, science, tools and systems</p> <p>d. Share information on use and application of Himawari8 data for hydrological services</p>	<p>c. Claudio Caponi, Jeff Perkins, John Fenwick, Christian Zammit & all WG-HYS members</p> <p>d. Jeff Perkins, Peter Sinclair, Margaret Bautista, Christian Zammit, 'Ofa Fa'anunu</p>	<p>c. December 2015</p> <p>d. After c.</p>
3	<p>Promote best practice flash flood forecasting and warning services in RA V;</p>	<p>e. Further investigate the use of FFGS in the region and investigate the possibility of coupling FFGS with Himawari8 remotely sensed rainfall, building on the SAOFFGS</p> <p>f. Share information or access to the information in the Australian BoM National Flash Flood Information Repository (NFFIR) to all interested agencies in the region and collect feedback</p>	<p>e. Christian Zammit, Peter Sinclair, Claudio Caponi, W. Putuhena</p> <p>f. Jeff Perkins</p>	<p>e. Initiate before Feb 2016</p> <p>f. After June 2016</p>

4	Support the implementation of QMF-Hydrology in Region V;	<p>g. Assist the CHy Task Team in collecting and reviewing case studies of QMS implementation, in particular for implementation by small agencies and add material where relevant.</p> <p>h. Investigate the need for training on implementation of QMS, using where applicable, existing CHy publications and new material provided by the CHy Task Team, and facilitate this, possibly in conjunction with a course based on WMO No. 1003 (see ítem 11).</p>	<p>g. John Fenwick</p> <p>h. John Fenwick</p>	<p>g. Ongoing until CHy-15</p> <p>h. 2017</p>
5	Continually seek ways to improve the effectiveness of implementing and maintaining QMF- HYDROLOGY by regional collaboration and mentoring;	<p>i. Promote the sharing of material and ideas related to quality management via the Regional on-line forum.</p>	<p>i. John Fenwick & all WG-HYS members</p>	<p>i. From early 2016</p>
6	Promote the use of WMO Manuals and Guidelines in Region V;	<p>j. Ensure that WMO Manuals and Guidelines are referenced, when and as relevant, in communications especially via the Regional on-line forum, and by ensuring that all WG-HYS members are well informed on relevant items.</p>	<p>j. All WG-HYS members</p>	<p>j. ongoing</p>

7	Assist in the adoption of standardisation measures in Region V;	k. In communications and projects across the region, ensure that standardisation of equipment, tools, applications, methods and conventions is given due consideration.	k. All WG-HYS members	k. ongoing
8	Promote data exchange and availability at national, regional and global level	<p>l. Encourage through regular communications the active participation of RA V NHSs in the WHOS framework</p> <p>m. Encourage the free and timely exchange of relevant hydrological information to national agencies, for instance through projects and activities supported by the WG</p>	<p>l. Margaret Bautista</p> <p>m. All WG-HYS members</p>	<p>l. Ongoing. First communication after update of national HAs</p> <p>m. ongoing</p>
9	Assist NHSs in selection of appropriate, robust and sustainable DBMSs	<p>n. Consider the relevance of MCH for countries in the region;</p> <p>o. Review existing CHy documentation on assessing the appropriate DBMS for a given NHS</p>	<p>n. Margaret Bautista, Peter Sinclair, André Siohane</p> <p>o. Claudio Caponi, Margaret Bautista, Peter Sinclair, André Siohane</p>	<p>n. 2016</p> <p>o. 2016</p>

10	Assess the Education and Training needs (ETR) in HWR in the region and prepare with the assistance of the Secretariat a realistic plan to respond to highest priority needs.	<p>p. Investigate the applicability of the WMO/COMET DL Courses for the region and promote their uptake where applicable</p> <p>q. Provide guidance for the nomination of suitable candidates to the groundwater course for SIDS</p> <p>r. Maintain engagement with the Joint Task team on BIP and competencies for hydrologists and hydrological technicians</p> <p>s. Investigate the possibility of promoting horizontal technical cooperation</p>	<p>p. V. Dodds, C. Caponi, J. Fenwick, P. Syariman, Elizabeth Holland</p> <p>q. 'O. Fa'anunu , P. Sinclair, A. Siohane</p> <p>r. C. Pearson, V. Dodds</p> <p>s. C.Caponi</p>	<p>p. Before November 2016</p> <p>q. Before May-June 2016</p> <p>r. Ongoing</p> <p>s. December 2015</p>
11	Contribute to the preparation of relevant training material for courses of regional interest.	<p>t. Investigate the need for a training course based on WMO No 1003 "Guidelines on the operation and management of NHS" and prepare training material</p> <p>u. Facilitate delivery of the course, if resources are available</p>	<p>t. J. Fenwick, T. Abrate</p> <p>u. J. Fenwick</p>	<p>t. June 2016</p> <p>u. 2017</p>

12	Guide the design and implementation of potential regional and sub-regional components of WHYCOS in RA V	v. Ensure the cross-fertilization of regional and sub-regional HYCOS projects	v. All WG-HYS members involved in the projects	v. ongoing
13	Support the potential development of a SEA-HYCOS and a Phase 2 of Pacific-HYCOS	w. Request SPC in collaboration with other regional organizations, e.g. SPREP, USP to develop with the WG and the Secretariat a concept note for a Phase II of Pacific-HYCOS x. Prprepare a concept note for SEA-HYCOS	w. J.Fenwick, 'O. Fa'anunu x. R. Badilla, J.Fenwick	w. December 2015 x. 2016
14	Promote coordinated activities on climate change and climate variability related to hydrology and the water resources sector including drought vulnerability in Region V;	y. Work with the climate research community to develop and implement 1-week-to-one-month climate outlooks for the water sector z. Include in the baseline assessment a section on seasonal predictions aa. Investigate the need and facilitate workshop(s) on drought management in cooperation with SPC and IDMP	y. Chair (regional level) C.Caponi (WMO level) z. C.Zammit aa.C.Zammit, P.Sinclair, 'O. Fa'anunu , A. Siohane, C.Caponi, D. Jayasuriya	y. Ongoing y. Jan-Jun 2016 z. By first quarter of 2016 aa. Workshop on 2nd half 2016

15	Support development of products to assist national and regional strategies for adaptation to seasonal climate variability in the water sector	<p>bb. Include the TT leader in the development/review of the guidance material on Extended Hydrological Predictions and consider its eventual regional adaptation</p> <p>cc. Take responsibility for developing a water session in the Regional Climate Outlook Forums, following the model being developed by CHy for the South Asian Climate Outlook Forum (SASCOF)</p>	<p>bb. H.Lins, C.Zammit</p> <p>cc. J.Fenwick (to assign the task)</p>	<p>bb. December 2015 bb. Before December 2016 (review)</p> <p>cc. 2017</p>
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