WORLD METEOROLOGICAL ORGANIZATION WEATHER, CLIMATE AND WATER



TENTH MEETING OF THE RA IV WORKING GROUP ON HYDROLOGY

(SAN SALVADOR, EL SALVADOR, 23 FEBRUARY 2015)

FINAL REPORT

Session I: Opening and introduction (Chair: Mr. Eduardo Planos)

Opening addresses

- 1. At the kind invitation of the Ministry of Environment of El Salvador (MARN), the Meeting of the RA IV Working Group in Hydrology was held in San Salvador on 23 February 2015.
- 2. Mr. Eduardo Planos, RA IV Hydrological Adviser and Chairman of the Working Group on Hydrology (WGH), opened the meeting and thanked MARN, Ms. Celina Mena and Mr. Luis García for their kind invitation, as well as WGH members for attending the meeting. The Chair of WGH noted that this is the first WGH meeting after some years of inactivity and recalled that, coincidentally, the last meeting of a WGH was also held in El Salvador. He reminded that the purpose of this meeting was to discuss the priorities in hydrology in RA IV, which were defined through a long process of consultation and analysis. The contributions of the expert meeting held in Panama in 2013 were considered and a formal request to continue the work on hydrology was made at the RA IV-16 meeting in Curacao. Afterwards, important steps were taken, such as the creation of the WGH and the Virtual Hydrology Forum (VHF), which provided valuable inputs for the preparation of the work plan 2016-2019 proposed for discussion at the meeting. The Chair of the WGH reviewed the agenda and noted that the main outcome of this session is the approval of the above mentioned regional work plan. Mr. Juan Carlos Fallas, President of RA IV, expressed his satisfaction to be present at the meeting where WGH activities are retaken, and noted that in his later presentation he would be outlining some history of the reestablishment of the WGH during RA IV-16 (2013). The President of RA IV expressed how significant this meeting is to the work of the Regional Association in general and the hydrological activities in particular, while he extended his gratitude to the President of the Commission for Hydrology (CHy), Mr. Harry Lins, for his attendance and support to this gathering. Mr. Federico Gómez-Delgado welcomed the participants on behalf of the WMO Office for North America, Central America and the Caribbean (NCAC).

Organization of the meeting

Objectives

- 3. The objectives of this meeting of the WGH were to:
- Present the structure and programs of WMO, the Hydrology and Water Resources Programme and the CHy;
- Describe the terms of reference of both the RA IV WGH and the VHF;
- Review the RA Strategic Operating Plan for the Enhancement of National Meteorological and Hydrological Services in RA IV;
- Review the results of the survey on priority themes in RA IV according to the VHF;
- Present, amend and approve the work plan 2016-2019 for the WGH and the VHF;
- Agree to report its conclusions and recommendations to the forthcoming meeting of the RA IV Management Group, to be held possibly in May 2015 in Geneva.

Agenda

4. The Agenda of the meeting was adopted by the participants. A copy of the Agenda is included as Annex I.

Participants

5. The list of participants is included as Annex II.

Background and procedural matters

- 6. Mr. Planos presented some background to the current meeting, recalling that the last meeting of a WGH also held in El Salvador in 2006, produced a final report that had been made available online. Also that the fifteenth session of the RA IV held in Bahamas (April 2009) replaced the WGH by a task team. However, the practice showed that the existence of a WGH is necessary since hydrological issues are a permanent concern for the region. In March 2013 an Expert Meeting on Water Resources Assessment (WRA) was held in Panama to provide inputs to the corresponding WMO document on WRA, but it also allowed discussing and establishing some regional priorities on hydrology.
- 7. During the sixteenth session of RA IV held in Curacao in April 2013, the RA IV WGH was reestablished and the respective terms of reference approved. The composition of the WGH includes representatives from North America (Canada and Mexico), Central America (El Salvador and Panama), the Caribbean (British Caribbean Territories and France) and Cuba (Regional Hydrological Advisor). In addition, a VHF was created to improve the communication and coordination among NHSs, considering these as weaknesses for an efficient collaboration among all NHSs across the region, and despite the significant efforts made by institutions such as CIMH, as well as the recent re-launch of the Central American Hydrological Forum (supported by CRRH). The VHF is composed of participants from 16 countries and it has proved useful to both the organization of the current meeting and the drafting of a regional work plan on hydrology, which was based on a survey launched at the VHF to identify regional priority themes.
- 8. Other relevant topics that were to be discussed during this WGH meeting and the Workshop on Hydrological Networks and Data to be held in the following days were: possible work with other RA IV groups and activities (Hurricane Committee, TT DRR, TT GFCS, TT WIS/WIGOS), proposals of new regional projects like Carib-HYCOS II (with a new vision), development of a portal for Water Data Exchange, as well as Capacity Building in Hydrology. In order to support the analysis of the latter, a survey was to be circulated among the Workshop participants.

Introductory presentations

9. A presentation on WMO was made, describing its organizational structure, the Hydrology and Water Resources Program and its components, as well as some relevant technical regulations, guides and manuals on hydrology and water resources. The origin and characteristics of WHYCOS and WHOS were also presented, and also other relevant issues like capacity building and promotion of cooperation on water resources.

10. A presentation on CHy was made, describing its members, structure, theme areas, OPACHEs and the relationship between the CHy and the WGH of all Regional Associations (RAs), which facilitates the application of surveys on the adequacy of hydrological networks and stations, data transmission and processing, data repositories, requirements of Members on hydrological forecasting, as well as WMO standards and recommended practices. It was pointed out that activities within RAs tend to align with priority themes of CHy, which in many aspects are aligned with broader priorities of WMO Congress.

Session I: Conclusions and recommendations

- 11. Among the main conclusions and recommendations following session I were:
- The active participation of WGH members in the discussion of strategic but also technical issues through the VHF was important.
- The WGH agreed to invite all CHy members belonging to RA IV, to join the VHF as participants.
- Given the limited attributions of task teams, it was decided to recommend to the RA IV Management Group that the WGH be maintained in the future since its functions cannot be undertaken by a task team.
- The opportunity to work closely with both CHy and the WMO Hydrology and Water Resources Branch (HWRB) was stressed as well as the importance of discussing and approving a work plan for next WMO Congress, so that the Region can mobilize sufficient financial resources to accomplish it.
- WGH members should be seen as project coordinators and take responsibilities for specific actions of the work plan.
- The WGH acknowledged the importance of water quality in hydrology, and considered the possibility of including it as a priority theme for the region in the near future.
- The WGH is a good mechanism to define and transmit to the CHy any needs and priorities of member NHSs with regards to groundwater monitoring and analysis.
- It is important to integrate atmospheric, irrigation, surface and ground water monitoring networks and data, to better respond to information requirements at the national level.
- The WGH recognized the dependency that many NHSs have on specific products from national and regional climate outlook forums, as well as the need for appropriate hydrological models to provide projections up to nine months.
- It was recognized that Regional Hydrological Advisers are invited to the CHy
 meetings, which serves as a good coordination mechanism, provided the Adviser
 maintains close contact with the other members of the WGH.

- It was suggested that a closer coordination between the WGH and those CHy experts from RA IV be maintained, by inviting these experts to join the activities of the WGH.

Session II: Work plan for the RA IV Working Group on Hydrology (WGH) and the Virtual Hydrology Forum (VHF) (Chair: Mr. David Farrell)

<u>Strategic Operating Plan (SOP) for the Enhancement of National Meteorological and Hydrological Services (NMHSs) in RA IV</u>

- 12. Starting with a brief explanation of the WMO Strategic Plan 2012-15, the SOP for the Enhancement of NMHSs in RA IV was presented along with the RA IV SOP established at the RA IV-16 session held in Curacao in 2013, and aligned to the WMO Plan.
- 13. The main properties and changes in the WMO Strategic Plan 2016-2019 (to be approved in the coming World Meteorological Congress), with respect to the same document for the previous period were described. In the new document the three societal needs remain unchanged, but some priorities change as follows: a) DRR, b) GFCS, c) WIGOS/WIS, d) Aviation, e) Polar and high mountain regions, f) Capacity Development, g) WMO Governance. Some modifications were also introduced to the eight expected results.
- 14. In the particular case of RA IV, the priority areas for the next financial period 2016-2019 are: a) WIGOS/WIS, b) DRR, c) Aeronautical meteorology, d) GFCS e) Hydrology and water resources, f) Marine meteorology.
- 15. It was noted that the budget requirement projected in this SOP is high, especially in the case of aeronautical meteorology. The budget being requested to cover hydrological activities was considered reasonable. Funds are also being requested by the education and training focal point, in order to fund the development of cross-cutting training activities.

Virtual Hydrology Forum (VHF) and results of the VHF survey

- 16. The meeting recognized that the VHF is a valuable complementary tool to obtain feedback from Forum participants, allowing the WGH to make decisions based on genuine regional interests and to better respond to the needs expressed by RA IV experts. It requires, though, that WGH members assume responsibilities for the development of specific tasks.
- 17. The meeting was informed that the President of RA IV has promoted the VHF among members of the Central American Committee for Water Resources (CRRH), and has asked the board of directors of CRRH to encourage their hydrological advisers to actively participate in the virtual discussions.
- 18. The meeting discussed the convenience of inviting additional experts to the VHF according to their professional profiles and the topics under discussion. This would improve the quality of discussions and the timeliness of inputs. The WGH agreed on the need that experts appointed to both the WGH and the VHF fully understand their

responsibilities and have the time available to dedicate to these groups. Membership to the WGH could also be reviewed and work by delegation, if necessary.

19. The WMO Secretariat (NCAC) offered a presentation on the results of the survey on priority themes for RA IV circulated among the VHF participants. The priority themes within each of the five main categories were: 1) "Data Collection, Processing, Quality, Retrieval, Storage" and "Hydrometry", 2) "Hydrological Prediction and Forecast", 3) "Drought Forecasting and Early Warning System", 4) "Flood Risk Analysis and Management", 5) "Capacity Building on Integrated Water Resources Management". A full report is available at the "Documents" section of the VHF. These results were taken into account for the preparation of the work plan.

Session II: Conclusions and recommendations

- 20. Among the main conclusions and recommendations following session II were:
- The proposed work plan for 2016-2019 (included as Annex III) was presented to the WGH, and it was decided that WGH members had to take responsibility for particular activities, noting that some of these activities were related and could be grouped together.
- The WGH decided to establish Task Teams (TT) for the effective execution of each activity (or group of activities) of the work plan 2016-2019, for which, a post should be opened in the VHF with the intention of promoting discussion among TT members and other regional experts. In order to promote a more informed and oriented discussion, the Chair of the TT should upload a simple, descriptive conceptual document to the respective post.
- The WGH agreed the immediate establishment of the following Task Teams:
 - Capacity building in hydrology (Chair: Mr. David Farrell)
 - Hydrological networks and data (Chair: Mr. Eduardo Planos)
 - Flood risk analysis, management, prediction, forecasting and warning (Chair: Ms. Celina Mena)
 - Drought risk analysis, management, prediction, forecasting and warning (Chair: Mr. David Farrell)
 - Use of regional climate model outputs in water resources assessment and management (Chair: Mr. Diego González)
 - Assessment and feasibility of regional projects (Chair: Mr. Alain Laraque)
- Concerning the proposal for the development of a second phase of the Carib-HYCOS project and after an extensive discussion, the WGH agreed to request Mr. Alain Laraque, WGH member, to lead a TT in charge of carrying out a regional consultation intended to identify topics of interest among RA IV Members for the possible development of a regional project. The TT should deliver a project proposal, to be presented for approval at the next RA IV-17 session in 2017.
- It was suggested that the WGH requested support from CHy experts to address the regional work on Hydrological Prediction and Forecasting. It was also recommended that an expert from the CHy Advisory Working Group supported the Chair of the TT on Water Resources Assessment and Management (WRAM), starting by August-September 2015. Mr. David Farrell, Principal of CIMH, offered support from CIMH to

- work on WRAM, beginning in March 2015. Collaboration with the Central American Water Resources Committee (CRRH) should be also explored.
- Regarding the capacity building activities, the Principal of CIMH reminded how some specialized courses developed at CIMH in English were successfully translated into Spanish and shared with the Spanish-speaking countries. The President of CHy pointed out that the WMO Office in San Jose could help coordinating these training initiatives with the Secretariat in Geneva and the CHy.
- The proposed work plan on hydrology for 2016-2019 was approved.
- The meeting recognized the interactions between the activities of this work plan and those developed by the RA IV Hurricane Committee (HC) and emphasized the importance of a close coordination.
- The WGH highlighted the relevance and importance of these coordination meetings, in order to discuss and define regional priorities of work and collaboration in hydrology, and to plan, undertake, monitor and evaluate the activities intended to address the hydrology- and water-related needs of the Region.

ADOPTION OF THE REPORT

21. After discussing the English version of the report, projected on screen and reviewed paragraph by paragraph, the meeting adopted it unanimously, with the understanding that the Spanish version would be distributed as soon as it will be prepared by the Secretariat, and that it could be revised, should the participants consider that it does not represent a faithful translation of the agreed English version.

CLOSURE OF THE SESSION

22. The First Meeting of the RA IV Working Group on Hydrology (according to RA IV-16) closed at 17H30 on 23 February 2015.

ANNEX I

PROVISIONAL AGENDA

WORLD METEOROLOGICAL ORGANIZATION RA IV WGH/1-16/Doc. 1 FIRST MEETING OF THE RA IV WORKING GROUP ON HYDROLOGY (WGH RA IV)

23 February 2015 Holiday Inn Hotel, San Salvador, El Salvador

TIME	ITEM	RESPONSIBLE	
09:00 – 12:00	Session I: Opening and introduction	Chair: Eduardo Planos	
09:00 – 09:15	Opening addresses	Eduardo Planos, Juan Carlos Fallas, Federico Gómez	
09:15 – 09:30	Organization of the meeting:	Chair	
09:30 – 10:00	Presentations of the Director of WMO Hydrology and Water Resources Branch (HWRB) and the President of WMO Commission for Hydrology (CHy)	Claudio Caponi Harry Lins	
10:00 – 10:30	Discussion, questions and comments	All	
10:30 - 10:45	Coffee break	-	
10:45 – 11:00	Presentation of the Regional Hydrological Advisor: RA IV Working Group (WGH) & Hydrology Forum (VHF)	Eduardo Planos	
11:00 – 12:00	Discussion, questions and comments	All	
12:00 - 13:00	Lunch	-	
13:00 – 18:00	Session II: RA IV WGH/VHF work plan	Chair: David Farrell	
13:00 – 13:10	Strategic Operating Plan for the Enhancement of National Meteorological and Hydrological Services (NMHSs) in RA IV	Juan Carlos Fallas	
13:10 – 13:20	Results of the survey on priority themes in RA IV according to the VHF	Federico Gómez	
13:20 – 13:30	Proposed work plan for the period 2015-2019 (aligned to the RA IV Strategic Operating Plan)	Eduardo Planos	
13:30 – 14:45	Discussion, questions and comments	All	
14:45 – 15:00	Coffee break	-	
15:00 – 17:00	Amendment and approval of the work plan WGH/VHF	WGH	
17:00 – 17:20	Collaboration with other groups and activities from RA IV Hurricane C., TT DRR, TT GFCS, TT WIS/WIGOS	WGH	
17:20 – 17:30	Adoption of report and closure of the meeting	Chair: Eduardo Planos	

ANNEX II

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ANNEX III

WORK PLAN 2016–2019 RA IV WORKING GROUP ON HYDROLOGY AND VIRTUAL HYDROLOGY FORUM REGIONAL ASSOCIATION IV (RA IV) WORLD METEOROLOGICAL ORGANIZATION

Item No.	RKO	Activity	Period	Responsible	Budget
1	5.2	Share and adapt advances in science and software for Hydrological Prediction and Forecasting	2016– 2017	Hydrology Forum	Virtual Hydrology Forum
2	3.3 3.4	Support regular sessions of the Central American Hydrological Forum (in partnership with CRRH)	2016- 2019	Juan Carlos Fallas (support from CRRH)	40K (10K per year)
3	3.3	Building capacity: adaptation and development of training courses in Hydrology and Water Resources Assessment	2016– 2019	David Farrell (support from CIMH)	Virtual Hydrology Forum
4	3.3 3.4	Drought Risk Analysis, Management and Forecasting: analysis of hazards and vulnerabilities, monitoring, forecasting, modeling and communication of warnings	2016- 2019	David Farrell Horacio Rubio (support from CIMH)	Virtual Hydrology Forum
5	3.3	Meeting of the WGH (Preparation for RA IV-17) and Technical Workshop on Drought Risk Analysis, Management and Forecasting (November 2016)	2016	David Farrell (support from CIMH)	35K
6	3.3	Assessment and Management of Hydrological Networks and Data	2016– 2019	Eduardo Planos	Virtual Hydrology Forum
7	4.1 4.2	Assessment and feasibility of regional projects (Carib-HYCOS II, others)	2016- 2019	Alain Laraque Celina Mena Eduardo Planos	30K
8	5.4	Development of guidance material for using regional climate model outputs in Water Resources Assessment and Management	2017	Diego González (support from CIMH)	Virtual Hydrology Forum
9	3.3	Meeting of the WGH (Monitoring and Evaluation) and Technical Workshop on the usage of regional climate model outputs in Water Resources Assessment and Management (Nov 2018)	2018	Diego González (support from CIMH)	25K
10	2.1	To compile experiences on the results of the application of the Flood Warning Systems and prepare a report of inter comparison of results	2016– 2018	Celina Mena	Virtual Hydrology Forum
11	2.1	Flood Risk Analysis, Management and Forecasting: analysis of hazards and vulnerabilities, monitoring, forecasting, modeling and communication of warnings	2018– 2019	Celina Mena	Virtual Hydrology Forum
12	2.1	Technical Workshop on Flood Risk Analysis, Management and Forecasting (Nov 2019)	2019	Celina Mena	25K