

Regional Association III (South America)

Sixteenth session

Asunción

15–20 September 2014

Abridged final report with resolutions



**World
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Organization**

Weather · Climate · Water

WMO-No. 1141

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ISBN 978-92-63-11141-8

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION (agenda item 1)

1.1 At the kind invitation of the Government of the Republic of Paraguay, the sixteenth session of the Regional Association III (South America) was held in Asuncion, Paraguay, at the Bourbon Conmebol Hotel, from 15 to 20 September 2014. The session was declared open by Mr Julián Báez Benítez, acting president of RA III and Permanent Representative of Paraguay with WMO, at 10 a.m. on Monday, 15 September 2014.

1.2 His Excellency, Mr Horacio Cartes, President of the Republic of Paraguay, received in the National Lopez Palace the visit of Mr Michel Jarraud, Secretary-General of WMO, Ms Elena Manaenkova, Assistant Secretary-General, Mr Luis Manuel Aguirre Martínez, president of the Paraguay Directorate of Civil Aviation (DINAC), Mr Julián Báez Benítez, acting president of RA III and Permanent Representative of Paraguay with WMO, and Mr Miguel Rabiolo, Director of WMO Office for the Americas. Mr Cartes welcomed the delegation stressing the importance of this regional meeting and the growing role of WMO in climate, weather and water issues in South America. He underlined that one of the priorities of the Paraguayan Government is the prevention and mitigation of climate related disasters and recalled that his country suffered the impacts of severe weather events particularly in the areas of housing and agriculture.

1.3 Mr Luis Manuel Aguirre Martínez, president of DINAC, Mr Eladio Loizaga, Minister of Foreign Affairs, Mr Joaquín Roa Burgos, Minister for National Emergencies, and Mr Michel Jarraud, Secretary-General of WMO, opened the official ceremony at 5 p.m., on 15 September 2014, in the Bourbon Conmebol Hotel. Mr Aguirre Martínez extended a warm welcome to all participants and recalled that three important international meetings related to meteorology, hydrology and climate were successively held in the city of Asuncion: the Extraordinary session of the Commission for Basic Systems (CBS-Ext. (8–12 September, 2014)), the RA III Technical Conference (RA III RECO, (13–15 September 2014) and the sixteenth session of the Regional Association III (15–20 September 2014)).

1.4 Mr Aguirre Martínez stressed that the societal requirements to the National Meteorological and Hydrological Services in South America are increasingly demanding, and that the economies in the region are highly dependent on climate conditions. He recalled the severe drought in the Northeast of Argentina and the South of Paraguay during 2008, which represented a loss of yield of about 20%. He also recalled that the extensive flood occurred early in 2014, after fifteen years of drought, resulted in the displacement of thousands of families living near the Paraguay River and also in the Southern Paraguay. Mr Aguirre Martínez underlined the need of coordination of the countries in South America to better monitor the weather-related phenomena and its consequences. He was pleased to mention a governmental project to reinforce the National Meteorological and Hydrological Service in Paraguay.

1.5 Mr Michel Jarraud, Secretary-General of WMO, in his address expressed his deep appreciation to the Government of Paraguay through Mr Eladio Loizaga, Minister of Foreign Affairs, Mr Joaquín Roa Burgos, Minister, Department of National Emergencies, and Mr Luis Manuel Aguirre Martínez, president of DINAC, for hosting the session in the city of Asuncion. Mr Jarraud thanked Mr Julián Báez Benítez, acting president of RA III and Permanent Representative of Paraguay with WMO and Mr Carlos Naranjo Jácome, vice-president of RA III and Permanent Representative of Ecuador, for their strong leadership in the implementation of the programmes and activities of the Association during the intersessional period following the fifteenth session of RA III, held in Bogota in September 2010.

1.6 Mr Jarraud stressed that this meeting takes place only few months before the seventeenth session of the Congress and offers an opportunity to review the progress made and define priorities and needs for the Region to bring to the attention of WMO governing body.

1.7 He recalled that the contribution of the Region to the work of the Organization extends beyond its boundaries, underlining that he was particularly pleased because a woman climatologist from RA III has been elected vice-president of the Commission for Climatology, becoming one of the six women among the thirty-one officers of regional associations, technical commissions and the Intergovernmental Board on Climate Services. He stressed that it makes almost twenty per cent of female officers of WMO constituent bodies and he hoped that this percentage will increase in the future to achieve gender balance.

1.8 In looking to the future, the Secretary-General said that development of human capacities in meteorology and hydrology remains one of the highest priorities of the Organization as a long-term investment. He emphasized the regional dimension of training and education and was particularly pleased that RA III offers three regional training centres on meteorology and one specialized in hydrology, which have made good steps in the development of training and education courses to fully take their regional responsibilities. In the current and future context of climate change, Mr Jarraud stated that the provision of effective climate services for decision-making will be a long-standing priority for WMO, and fulfilling the goals of an ambitious interagency initiative, such as the Global Framework for Climate Services (GFCS), will require the full support of WMO Members with stronger coordination and partnerships at both the national and subregional levels. Finally, he expressed his gratitude to Mr Báez Benítez and all his staff at the National Meteorological Service of Paraguay for the excellent arrangements and support, and he wished to all the participants fruitful discussions and success in the future activities of the Association.

1.9 Mr Joaquín Roa Burgos, Minister, Department of National Emergencies, addressed the session on behalf of the Government of Paraguay. He stated that Paraguay has now a new paradigm to face emergency situations requiring rigorous scientific information to implement the necessary prevention measures. In this context, the role of Meteorological and Hydrological Services become essential. After a period of serious meteorological events affecting 48,000 families placed under the responsibility of the Department of National Emergencies, and that it is impossible to face these severe phenomena without a collaborative approach of national and International institutions. The information provided by the Paraguay NMHS enabled his ministry to design a response and evaluate risks using case studies statistics and scenarios. This support and information are essential elements of this scheme. He expressed his strong belief that the decisions made during the RA III session would increase the capacity of the Department of National Emergencies and help the population of Paraguay and South America. He welcomed all participants and wished all delegates an enjoyable stay in Asuncion and a most successful and productive meeting.

2. ORGANIZATION OF THE SESSION (agenda item 2)

2.1 Consideration of the report on credentials (agenda item 2.1)

2.1.1 The representative of the Secretary-General presented reports on credentials taking into account the documents received prior to and during the session. The Association accepted the reports and decided that it would not be necessary to establish a Credentials Committee.

2.1.2 The session was attended by 29 participants from 9 Members of Regional Association III (South America), 8 observers from 3 Members from outside the Region, 5 observers from regional and international organizations and 13 invited experts. The list of participants is given in the [appendix to the present report](#).

2.2 Adoption of the agenda (agenda item 2.2)

The proposed annotated agenda for the session was unanimously adopted, as contained in RA III-16/Doc. 2.2(2).

2.3 Establishment of the committees (agenda item 2.3)

2.3.1 It was agreed that the work of the session be carried out in plenary sessions to deal with the various agenda items as follows:

- (a) The General Plenary, chaired by Mr Julián Báez Benítez, acting president of RA III, assisted by Mr Robert Masters, Director of the WMO Department of Development and Regional Affairs, and Mr Miguel Rabiolo, Director of WMO Regional Office for the Americas;
- (b) The Plenary A, chaired by Mr Antonio Divino Moura (Brazil), assisted by Mr Óscar Arango, WMO Representative, Office for North America, Central America and the Caribbean;
- (c) The Plenary B, chaired by Mr Carlos Naranjo Jácome (Ecuador), assisted by Mr Andrés Orías-Bleichner, Programme Officer for the Americas.

Nomination Committee

2.3.2 A Nomination Committee was established composed of Mr Guillermo Navarro (Chile) and Mrs Celeste Saulo (Argentina). Mr Guillermo Navarro was designated Chairperson.

Coordination Committee

2.3.3 A Coordination Committee was established composed of the president, the vice-president, the representative of the Secretary-General, the chairpersons of Plenaries A and B and secretaries of Plenary Sessions. A representative of the local organizing committee was also invited to participate in the meetings of the Committee.

2.4 Other organizational matters (agenda item 2.4)

2.4.1 The Association established its working hours for the duration of the session. The Association agreed that no minutes of the Plenary sessions would be produced unless the Association specifically requested that it should be done for a particular item.

2.4.2 The Association designated Ms Amelia Díaz Pablo (Peru) as rapporteur on Agenda item 9 — Review of previous resolutions and recommendations of the Association and of relevant Executive Council Resolutions.

2.4.3 The Association agreed to waive Regulation 109 for the duration of the session.

3. REPORT BY THE PRESIDENT OF THE ASSOCIATION (agenda item 3)

3.1 The Association noted with appreciation the report of the acting president of Regional Association III (RA III), which provided an overall review and assessment of the major activities of the Association since its fifteenth session and expressed satisfaction at the effective manner they were being undertaken. The acting president also highlighted the issues that the Association would have to address, such as the development of the Strategic Plan for the Enhancement of South American National Meteorological and Hydrological Services (NMHSs); the future working mechanism of the Association and other priority activities.

3.2 The Association commended its acting president, Mr Julián Báez Benítez (Paraguay) for the dedication, enthusiasm and initiative with which he had conducted the affairs of the Association, since 21 October 2011 when he replaced Ms Myrna Araneda (Chile), contributing to the development of the meteorological, climate and hydrological services in the Region. The Association also commended Mr Carlos Naranjo Jácome (Ecuador), who had been acting as vice-president since 7 May 2012. It also expressed its appreciation to the chairpersons and members of

the working groups and rapporteurs who had effectively collaborated in carrying out the activities of the Association in the Region.

3.3 The Association extended its appreciation to Members who hosted various regional events during the intersessional period and encouraged them to continue to provide the necessary support to the activities of the Association.

3.4 The Association took due note of the main achievements mentioned in the report of the acting president as well as follow-up of decisions and recommendations made during the intersessional period:

- (a) The timely completion by the Management Group of the working group's membership as established by the fifteenth session of RA III, and the related task teams with their terms of reference and work programmes allowing the initiation of the work of subsidiary bodies with no delay;
- (b) The implementation of a new telecommunications network (using VPN technology through the Internet) which was a priority for the Region since it offers a cost-effective mechanism to exchange large volumes of information available from the global, regional and national forecasting centres, as well as from climate centres, and all the basic weather information on surface and altitude;
- (c) The discussion and development of the WIGOS Plan for RA III during a Joint Meeting of RA III and RA IV, held in November 2012, in San José, Costa Rica, following which various tasks to be implemented and the Plan itself were put into consideration for approval during the sixteenth session of RA III;
- (d) The implementation of three Regional Climate Centres (RCCs) in the Region: the RCC for the western part of South America (established in the International Research Center on El Niño Phenomenon (CIIFEN), based in Guayaquil, Ecuador), which has been designated, and the RCC for the southern part of South America (virtually established between NMHSs of Paraguay, Uruguay, Brazil and Argentina) in the process of demonstration, while the RCC for the northern part of South America (established in the NMHSs of Brazil and French Guiana) is still in its inception phase;
- (e) The active contribution by RA III Members to climate system monitoring services including the regular publications of the Monthly and Annual Bulletins on Climate in Region III; the WMO Annual and Decennial Statements on the Status of the Global Climate; and the Annual Bulletin of the American Meteorological Society (ABAMS);
- (f) The significant progress in the implementation of the WIS under the regional plan which allowed engagement of most of the RA III Members, including: the establishment of an effective monitoring mechanism through a regional focal point from Brazil, in close coordination with the Secretariat; the operation of the planned GISCs in RA III by the respective host countries; the designation of the National Centres (NCs) and WIS focal points by the Members;
- (g) The establishment and operation of a new Regional Training Centre in the National University of La Molina (Lima, Peru) to amplify options on capacity development for hydrometeorological staff in the Region, giving the possibility of partial scholarships for the Plurinational State of Bolivia, Ecuador and Colombia and, if not otherwise covered, for the rest of Ibero-American NMHSs.

3.5 The Association noted with appreciation the participation of certified professionals from the Region on Integrated Flood Management activities and national workshops on this subject, including preparation of demonstrative projects in the Plurinational State of Bolivia and Paraguay. The Association was informed that the Pilot Project on Early Warning Systems of Hydrometeorological

threats, particularly sudden floods, was maintained as a regional priority by NMHSs and its location would be defined promptly by the Working Group on Hydrology.

3.6 The Association recognized that training activities and capacity-building matters continue to be essential priorities in the Region, aiming to improve the services provided by NMHSs for the socio-economic development of the countries. Particular efforts should be continued and measures taken for the QMS certification of the aeronautical forecasters competencies.

3.7 The Association requested the collaboration and support from the WMO Secretariat for the fulfilment of the Oyapock-HYCOS. It also requested support for the feasibility studies on the HYCOS Projects in the Amazon River and Rio de la Plata basins, both projects requiring resource mobilization activities.

3.8 The Association re-emphasized the continued need to count with higher frequency satellite imagery relating to South America, at times of severe phenomena occurrences in the Region. It also wished to obtain information, from satellite providers, about cost and technical requirements to allow regional satellite stations to receive data from the planned new generation satellites.

3.9 The Association also commended the acting president for his active involvement in the work of the WMO Bureau, the Meetings of the Presidents of Regional Associations (PRAs) and the joint Meeting of the Presidents of Regional Associations and Presidents of Technical Commissions (PRAs/PTCs) in which he successfully presented the views and needs of the Association. The Association appreciated the active participation of the acting president in the EC Working Group on the Strategic and Operational Planning (EC WG/SOP) and the EC Working Group on Capacity Development (EC WG/CD).

3.10 The Association further acknowledged the efforts made by the acting president to establish close cooperation and collaboration with other Regions, in particular, with the neighbouring Region IV (North America, Central America and the Caribbean) to address issues of common interest. It recognized also his efforts in establishing better coordination with technical commissions, including CBS, CHy, CAgM and JCOMM.

3.11 The Association noted with satisfaction the appreciation expressed by the acting president to the WMO Secretariat, to the Department of Development and Regional Activities (DRA) and its Regional Office for Americas (RAM), and particularly to the WMO Office in Asunción, Paraguay, for the assistance provided to him and for the effective and efficient organization of the activities of the Association during the intersessional period.

3.12 The Association noted the sincere thanks expressed by the acting president to all experts from the Region who greatly contributed to the work of the Association, in particular the chairpersons and the members of different subsidiary bodies who devoted their efforts to advance the regional tasks. He appreciated the spirit of cooperation and volunteerism within the Region and appealed to the Permanent Representatives of RA III Members to continue supporting regional activities in spite of the funding difficulties they have been experiencing.

3.13 The Association expressed its appreciation to the Spain State Meteorological Agency (AEMET) for the Trust Fund established to the advantage of the Programme of Cooperation in Meteorology and Hydrology in the Ibero-American countries, which supported several events in RA III during the intersessional period. The Association further expressed its recognition to Spain and other WMO Members for supporting scholarships, organizing study programmes, and hosting activities that confer benefits to the Region.

3.14 The Association acknowledged with appreciation the funds offered by the Government of Finland through the Andean Regional Programme to Strengthen Weather, Water and Climate Services and Development (PRASDES), as well as the bilateral cooperation initiatives in favour of the Andean countries through the International Monetary Fund (IMF).

3.15 The Association took note of the recent WCRP conference for Latin America and the Caribbean, held in Montevideo, Uruguay, in March 2014, and acknowledged the need for strengthened interaction between the Region and the various WCRP programmes in the context of the GFCS implementation.

4. PROGRAMME ACTIVITIES – REGIONAL ASPECTS (agenda item 4)

4.1 Service quality and service delivery (agenda item 4.1)

4.1.1 Public Weather Services (agenda item 4.1.1)

The WMO Strategy for Service Delivery

4.1.1.1 The Association recalled that the Sixteenth World Meteorological Congress (Cg-XVI, Geneva, May-June 2011) had adopted the “The WMO Strategy for Service Delivery” (herein referred to as “The Strategy”), and had consequently requested regional associations (RAs) to facilitate its adoption by Members. The Association further noted that the sixty-fifth session of the WMO Executive Council (EC-65, Geneva, May 2013) had adopted Resolution 4 (EC-65) – Implementation Plan of the “WMO Strategy for Service Delivery”. The Association expressed its appreciation that the Public Weather Services (PWS) Programme had provided support in the development of “The Strategy” and its Implementation Plan (IP) through facilitating wide consultations with the presidents of regional associations, presidents of technical commissions, experts from a number of National Meteorological and Hydrological Services (NMHSs), as well as all the WMO Programmes whose roles include service delivery. It welcomed the fact that “The Strategy” and its IP were in the process of being published in all official WMO languages. The Strategy and the IP can be freely accessed through the following web link: http://www.wmo.int/pages/prog/amp/pwsp/documents/WMO_Strategy_for_Service_Delivery.pdf. The Association therefore adopted [Resolution 1 \(RA III-16\) – Implementation of the WMO Strategy for Service Delivery in Regional Association III \(South America\)](#), in which the Association requested its appropriate working group to ensure a harmonized and synchronized implementation of the Strategy by Members of RA III.

Social and economic benefits of meteorological and hydrological services

4.1.1.2 The Association noted that EC-65 had strongly supported assisting NMHSs acquire capacities to assess and communicate the social and economic benefits of their services to their respective governments and to other decision-makers. It was pleased that the PWS Programme was leading the initiative of collaboration with the World Bank (WB), in the preparation of an authoritative publication on methodologies for the assessment of Socio-Economic Benefits (SEBs) of Meteorological and Hydrological Services to be published by early 2015. The Association underlined the importance of such a publication, and urged its Members to use it as a practical guide in the design of assessment methodologies and the implementation of SEB activities in RA III (South America). It also welcomed the request by the sixty-sixth session of the Executive Council (EC-66, Geneva, June 2014) that training on the application of the methodologies contained in the publication, be provided to the senior staff of NMHSs and that pilot projects be developed on testing the methodologies. The Association requested that RA III be considered for such training and pilot projects.

Incorporation of the PWS concepts contained in the SWFDP into the Virtual Centre for Disaster Prevention in Southern America

4.1.1.3 The Association appreciated the continued success of the implementation of SWFDP in Southern and Eastern Africa (RA I, Africa), the South Eastern Asia and the Bay of Bengal (RA II, Asia) and the South Pacific Islands (RA V, South-West Pacific) where the Global Data-processing and Forecasting System (GDPFS) and the PWS Programmes were collaborating in enhancing forecasting and service delivery capacities of NMHSs. The Association reiterated its decision to incorporate the PWS concepts contained in the SWFDP into the Virtual Centre for Disaster

Prevention in Southern America. It noted that this action would assist NMHSs improve their delivery of forecast and warning services through enhanced user engagement as well as through multiple channels including mobile technology and social media.

Improving forecast and warning services

Impact-based forecasts and risk-based warnings

4.1.1.4 The Association strongly supported the outcome of EC-66 in which the Council noted that NMHSs traditionally provided advice based on thresholds of environmental parameters such as temperature, wind speed, river levels, etc. Such advice leaves the recipient to judge the impact of the predicted conditions on their activities, and the consequent risk to life, property and infrastructure. Impact-based forecasts and warnings combine prediction of the environmental conditions with an assessment of the vulnerability of the recipients to those conditions. Impact-based warning takes into account the meteorological phenomenon, the place, the time, the circumstances and consequences. The level of warning is agreed in advance in a combined analysis of impact with the specific user and, in a sense, is issued on their behalf. The Association supported this approach, which would enable NMHSs to provide advice that is tailored to specific users' needs and circumstances and therefore more relevant and actionable by them.

4.1.1.5 The Association supported the preparation of guidance material for NMHSs on developing multi-hazard impact-based information and warning services, by the Commission for Basic Systems Open Programme Area Group on Public Weather Services Expert Team on Meeting User Needs in Reducing the Impacts of Hydrometeorological Hazards (CBS/OPAG-PWS ET/DPM), in collaboration with the relevant CBS OPAGs, as approved by the fifteenth session of CBS (CBS-15, Jakarta, September 2012). The guidance material, which will be published by the end of 2014, will highlight the challenges of impact-based forecast services in view of national circumstances as regards the responsibilities of NMHSs and existing task sharing in national risk management and will be enriched with existing examples and best practices of impact-based forecast and warning services. The Association urged Members to make use of the guidance materials once they were made available to NMHSs, in order to increase the effectiveness of their Services.

4.1.1.6 Noting the global trend to move towards forecasting the impacts of severe weather events, the Association requested that training activities and a pilot project on impact-based warning be organized in RA III in order to ensure that NMHS staff acquire the necessary skills in impact-based forecasts and risk-based warnings.

Implementing the Common Alert Protocol (CAP) standard

4.1.1.7 The Association welcomed the initiatives that the PWS Programme had taken in recent years towards promotion of the implementation of the Common Alerting Protocol (CAP) standard for communicating alerts, in line with the decision of the fifteenth World Meteorological Congress (Cg-XV, Geneva, May 2007). It appreciated the value of the CAP standard in the communication of all types of alerts through all media. It noted that the PWS Programme had organized a number of regional "CAP Jump-Start Workshops". In addition, the PWS Programme had organized three "CAP Implementation Workshops" and "CAP Jump-Start Workshops" since 2011 in an effort to develop the capabilities of Members to adopt the CAP standard. The last such events were held in Negombo, Sri Lanka in June 2014. The Association recognized that the application of the CAP standard was not yet widely implemented in RA III, and that NMHSs needed assistance, through initiatives such as the CAP Jump-Start workshops, in becoming familiar with this technology and its utility. It noted with appreciation that such training was being organized in the Plurinational State of Bolivia, Colombia and Ecuador. It urged its Members to take up the CAP Jump-Start Offer, as described at the following web page: http://www.wmo.int/pages/prog/amp/pwsp/CAPJumpStart_en.html, and to visit the PWS CAP web pages, for more information and guidelines at: http://www.wmo.int/pages/prog/amp/pwsp/CommonAlertingProtocol_en.html.

4.1.1.8 The Association acknowledged the importance of the “International Register of Alerting Authorities” in promoting the “single official voice” status for NMHSs in issuing weather warnings. It noted that 6 out of the 13 Members had assigned editors for the Register. The Association encouraged the remaining seven (7) Members who had not yet joined the initiative to actively participate in the Register initiative by nominating editors to populate the web pages of the Register, with government departments and other institutions authorized to issue warnings in their respective countries. It encouraged Members to make full use of the PWS Technical Document entitled, “Administrative Procedure for Registering WMO Alerting Identifiers” (PWS-20, WMO/TD-No. 1556). This publication is freely accessible at the following web link: http://library.wmo.int/pmb_ged/wmo-td_1556_en.pdf.

The World Weather Information Service (WWIS)

4.1.1.9 The Association appreciated the launching of the new version of the World Weather Information Service (WWIS) website (<http://worldweather.wmo.int/>) which now has modern web tools and is available in ten language versions, namely: Arabic; Chinese; English; French; German; Italian; Polish; Portuguese; Russian; and Spanish. WWIS is providing forecasts for over 1,700 cities and has cumulative page visits surpassing 1.3 billion. It was also pleased with the recent launch of the “MyWorldWeather” iPhone (<https://itunes.apple.com/hk/app/myworldweather/id453654229?mt=8>) and Android (https://play.google.com/store/apps/details?id=hko.my_world_weather&hl=en) applications. The Association noted that all the 13 Members of RA III had joined the WWIS initiative and were providing forecasts and climate information for uploading on the website. However, it was noted that the number of cities for which forecasts were provided could be considerably greater than at present. It therefore encouraged Members to continue to increase the number of cities for which they provided forecasts, the lead time, as well as the frequency of updating the forecasts. It also urged Members to make use of the recently issued PWS *Guidelines on Participation of National Meteorological and Hydrological Services in the WMO World Weather Information Service* (PWS-25, WMO-No. 1096), to assist NMHSs enhance their participation in WWIS. This publication can be accessed at: http://library.wmo.int/pmb_ged/wmo_1096_en.pdf.

Provision of weather forecast and warning services to megacities

4.1.1.10 The Association supported the outcome of EC-66 with regard to the development of NMHSs to provide climate, weather and environmental services for megacities in order for them to be resilient in withstanding the impacts of environmental hazards on all timescales related to floods, heat wave and cold spells, Ultra Violet (UV) radiation, ozone concentrations, haze and air quality, among others. It noted with interest that megacities and large complexes in RA III could greatly benefit from a focus on the specific problems of such cities as regards the provision of useful and user-friendly information, forecasts and advice. It agreed that NMHSs needed to improve in communication and client relations through a robust multi-channel system of dissemination and communication of information to all partners and the public in a megacity. In this context, the Association welcomed the work of the PWS Programme to address these challenges, including contribution to a set of guidelines for establishing weather, climate, water and related environmental services for megacities and large urban complexes.

Capacity development and training

4.1.1.11 The Association stressed the need for organizing capacity-building activities for improvement of service delivery; implementation of SEB studies and analyses by NMHSs; and improvement of warning services such as through the CAP standard. In this regard, the Association expressed pleasure with the various guidelines that the PWS Programme had produced during the intersessional period and which were freely available online at the following web link: http://library.wmo.int/opac/index.php?lvl=etagere_see&id=41. The Association also stressed that effective public weather services are dependent on building capacity of NMHSs personnel in social sciences and communication.

Competency requirements for PWS forecasters

4.1.1.12 With regard to the recommendation of Cg-XVI that all technical commissions define competency requirements for their core job-tasks, the Association was pleased that CBS, through its OPAG/PWS, was developing competency requirements for PWS forecasters, together with an additional competency framework for more specialized roles such as forecasters working in the media, with emergency management, and on the development of focused products for users. It noted that these competency frameworks would not have regulatory force as is the case with competency standards in aviation, but would serve to provide guidance to Members in establishing and demonstrating appropriate levels of competency among their forecast staff. The Association was informed that following the review of the requirements by CBS-15, they were being further developed within CBS and the EC Panel of Experts on Education and Training for presentation to the 2014 extraordinary session of CBS (CBS-Ext.(2014)), Asunción, September 2014) for approval.

4.1.2 Aeronautical meteorology (agenda item 4.1.2)

General

4.1.2.1 The Association noted that aeronautical meteorology continues to be a high priority service area for all Members in the Region. It was also noted that the arrangements for the provision of aeronautical meteorological service to international air navigation varied from country to country. There is a clear distinction between Members where aeronautical meteorology service is provided by the NMHS and those where the service provider belongs to other organizations (usually air navigation service providers (ANSP)). As highlighted during the Technical Conference "Aviation Meteorology – Building Blocks for the Future" (TECO-2014), which preceded the fifteenth session of the Commission for Aeronautical Meteorology (CAeM-15), the ANSP-affiliated MET service providers have easier access to ICAO planning and implementation workshops and material and are better integrated in the national planning of ATM. NMHSs which provide aeronautical meteorology service usually suffer from lack of information and direction due to lack of financial support to attend ICAO meetings. The basic issue for many Members is that they are still struggling to keep up with recent amendments to ICAO Annex 3/WMO Technical Regulations (WMO-No. 49, Vol. II) requirements such as QMS and aeronautical meteorology personnel competence standards. In this regard, the Association urged its Members to strengthen the cooperation between the NMHSs, the meteorological authorities and meteorological service providers, and the respective Civil Aviation Administrations (CAA) to improve the mutual awareness and proper integration of the aeronautical meteorology in the national plans for enhancing air traffic management in accordance with the ICAO Global Air Navigation Plan (GANP).

4.1.2.2 The Association also noted that some Members experienced difficulties with the provision of basic requisite services, such as meteorological observations and reports at aerodromes, due to inadequate resources for continuous operations. It requested the Management Group to address the issues of maintaining the quality of observational data through regular calibration and maintenance and ensuring reliable telecommunication means for international exchange at regional level.

Quality Management System (QMS)

4.1.2.3 The Association noted the concern expressed by the Executive Council at its sixty-sixth session (EC-66, June 2014) regarding the achieved level of implementation of QMS with most of the Regions still far below 50% with regard to ISO certification. For RA III, six Members have reported that the QMS implementation has been completed including ISO 9001 certification. EC-66 emphasized that the delay in QMS implementation affects the credibility of the NMHSs and other aviation meteorology service providers and has a negative impact on their attempts to establish cost-recovery mechanisms. It was also noted that the ISO 9001 compliant QMS, once established, would require continuous effort to sustain and undergo regular checks and re-certification, thus, the NMHSs and other service providers should plan resources accordingly. The Association

reaffirmed its strong encouragement to all Members to complete and sustain the QMS for the provision of aeronautical meteorological service and requested the Management Group to assign high priority to this task in the work programme for the next intersessional period.

Competence of Aeronautical Meteorological Personnel (AMP)

4.1.2.4 The Association noted that, as of 1 December 2013, the Aeronautical Meteorological Services (AMS) should ensure that their aeronautical meteorological personnel (AMP), both forecasters and observers, meet WMO competence standards for aviation meteorological forecasting and observing personnel. To meet these requirements, Members will be expected to provide evidence of their aeronautical personnel's competence as part of their Quality Management System. Members will also need to show that their AMP are continuing their professional development.

4.1.2.5 The Association expressed concern on the fact that only seven Members responded to the survey conducted by the Secretariat and the Commission for Aeronautical Meteorology on the status of implementation of the WMO competency standards. Therefore, the Association urged all Members to report to the Secretariat as soon as possible on the national plans and actions undertaken to achieve compliance with the competency standards for aeronautical meteorological forecasters and aeronautical meteorological observers.

4.1.2.6 The Association welcomed the plan for a regional workshop on competency requirements for aeronautical meteorology personnel (AMP) to be hosted by Argentina in November 2014 and facilitated by the CAeM Expert Team on Education, Training and Competencies (ET-ETC). This event will provide an opportunity for all RA III Members to receive training on the methods and procedures for competency assessment, which will help in building respective national assessment plans. The Association appreciated the assistance by the WMO Secretariat in organizing this event and strongly encouraged all its Members to send experts to the workshop in order to foster the practical implementation of the competence standards at their aeronautical meteorology service providers.

4.1.2.7 In view of the urgency of achieving compliance with the WMO competency standards, the Association requested the Management Group to task an appropriate subsidiary body to follow the national developments and provide assistance in establishing national programmes for competency assessment and continuous professional development of the AMP. In this regard, the Association appreciated the CAeM Competence Assessment Toolkit, developed by relevant CAeM task and expert teams, and supported a cost-effective approach through mapping of required competencies to web-based and other training material, with a view to addressing any competency deficits detected by the assessments. The Association strongly recommended Members to make best use of the <http://www.caem.wmo.int/moodle/> website for full information.

Qualifications requirements

4.1.2.8 The Association further noted that the qualifications requirements included in the *WMO Technical Regulations* (WMO-No. 49, Vol. 1) will become a standard practice on 1 December 2016. This will imply an obligation to Members to provide evidence of compliance for their aviation meteorological forecasters (AMF). The Association strongly encouraged its Members to initiate respective action as soon as possible. Members were also reminded that the required qualifications for work areas and job functions of an AMF have to include the relevant elements of the Basic Instruction Package – Meteorology (BIP-M) at university degree level.

4.1.2.9 To facilitate the implementation of the qualification requirements, Members were strongly encouraged to advise the Regional Training Centres on their needs for remedial or additional training as soon as possible to allow sufficient time to develop options for meeting these requirements.

4.1.2.10 The Association strongly encouraged all Members to provide the Secretariat with regularly updated information on their compliance with the relevant technical regulations, in

particular, those related to QMS, competences and qualification requirements, as major implementation areas in the next intersessional period. Having up-to-date information on attained compliance would allow the Secretariat to advise the RA III president and the Management Group on the necessary capacity development actions to resolve any deficiencies and enhance the compliance status.

Volcanic ash

4.1.2.11 The Association recalled that Region III is among the volcanic active regions in the world and that volcanic ash (VA) continues to be a serious aviation safety hazard. The Association expressed appreciation to Argentina for hosting the Buenos Aires Volcanic Ash Advisory Centres (VAAC) providing VA advisories to Members' Meteorological Watch Offices (MWO) responsible for the issuance of VA SIGMET. Furthermore, the Association strongly supported the work of the Volcanic Ash Scientific Advisory Group (VASAG), co-sponsored by WMO and the International Union of Geodesy and Geophysics (IUGG), for advancing the scientific understanding of volcanic ash detection and forecasting in support of continued safe and efficient civil aviation operations.

4.1.2.12 The Association noted that further improvement of the coordination between the MWOs, volcano observatories and air traffic services (ATS) is necessary to ensure prompt VA SIGMET issuance immediately following a volcanic eruption. In this regard, the Association recalled that a joint circular letter by the Secretary-General of WMO and the Secretary-General of ICAO had strongly requested all Members to support and enhance the observation programmes that would allow to objectively determine the location, height and density of volcanic ash clouds. EC-65 supported the notion that, as part of the WMO Integrated Global Observing System (WIGOS), an integrated observing system with both ground- and space-based segments would fulfil the requirements for resolution, coverage and reliability of observations of volcanic ash (as a specific form of litho-aerosols). To ensure an effective follow-up of these recommendations and initial actions, the Association requested its Subgroup on Observation Systems (as defined in [Resolution 14 \(RA III-16\)](#)) to coordinate Members' actions aimed at enhancing volcanic ash monitoring capabilities as part of the RA III WIGOS Implementation Plan.

Outcome of the Conjoint ICAO/WMO Meteorology Divisional Meeting and the fifteenth session of CAeM

4.1.2.13 The Association noted that the Conjoint ICAO/WMO Meteorology Divisional Meeting and the fifteenth session of the Commission for Aeronautical Meteorology (CAeM) were held at ICAO Headquarters in Montréal Canada from 7 to 18 July 2014 (including a WMO Technical Conference "Aviation Meteorology – Building Blocks for the Future" on 7 and 8 July 2014). The Conjoint meeting discussed and outlined major changes in the future aeronautical meteorology services including service delivery models and related procedures. Supporting the ICAO "One Sky" concept through the enhancement of meteorological service for international air navigation was the main focus of the Conjoint meeting. The "One Sky" concept will be realized through a Global Air Navigation Plan (GANP) and the Aviation System Block Upgrade (ASBU) methodology, intended to bring sector-wide operational improvements needed to cope with the high demand for capacity and efficiency, while maintaining and improving the level of safety. The ASBU consists of 5-year blocks of planned Air Traffic Management (ATM) improvements with a horizon 2028 and beyond. Among the envisaged changes in the meteorological service provision is the transition from "product-centric" to "data-centric" services through the System-Wide Information Management (SWIM) approach. These changes will affect the traditional way of production and dissemination by the MET service providers and further regionalization of the service provision, with significant impacts on existing national and regional arrangements, including cost-recovery.

4.1.2.14 The Association also expressed concern of the possible significant implications of the numerous and complex ATM developments currently being planned at the global and regional level on future aviation MET service provision. Therefore, the Association agreed on the need to gain a greater understanding of these issues to better inform future decisions and requested the WMO Secretariat to organize during the next intersessional period, in coordination with relevant international and regional partners, an appropriate regional event that would build on the outcomes

of the Conjoint MET Divisional Meeting in July 2014. The Association adopted [Resolution 2 \(RA III-16\) – Regional event on the future of meteorological service provision to civil aviation in Region III \(South America\)](#).

4.1.2.15 Noting the above emerging issues affecting the meteorological service for aviation, the Association addressed this matter to the Management Group and relevant RA III subsidiary body as decided under item 5.3.

4.1.3 Marine Meteorology and Oceanography, including the national sub-projects of the Coastal Inundation Forecasting Demonstration Project implemented in RA III (agenda item 4.1.3)

4.1.3.1 The Association noted the summary report of the fourth session of the Joint WMO-Intergovernmental Oceanographic Commission (IOC) Technical Commission for Oceanography and Marine Meteorology (JCOMM-IV, Yeosu, Republic of Korea, 23–31 May 2012), including the resolutions and recommendations that were approved by the WMO Executive Council at its sixty-fourth session through Resolution 2 (EC-64). The Association welcomed the newly elected JCOMM co-presidents, Dr Nadia Pinardi (Italy) and Mr Johan Stander (South Africa).

4.1.3.2 The Association noted the priority challenges of JCOMM in response to the priorities of WMO and IOC, and encouraged its Members to actively conduct related national activities in view of implementing the approved workplan of JCOMM for 2012–2017.

4.1.3.3 The Association acknowledged that further efforts should be made to fill the regional and technological gaps in ocean observations and services, including support for the establishment of marine Data Collection or Production Centres (DCPCs) and Regional Marine Instruments Center(s) (RMIC) in the Region, and encouraged JCOMM to expand capacity building initiatives to support the Commission's regional workplan.

Regulatory framework and guidance for marine meteorological services

4.1.3.4 The Association noted the *WMO Manual on Marine Meteorological Services* (WMO-No. 558) supported by the *WMO Guide to Marine Meteorological Services* (WMO-No. 471) for the globally agreed procedures and process for marine meteorological services. It noted that these publications would assist Members to ensure consistent and streamlined service provision. The Association agreed that the current revision of the Manual and related Guide would help Members to ensure a reliable and streamlined service, and asked the Secretariat to report regularly on progress in the revision.

4.1.3.5 The Association noted the ongoing development of the WMO Marine Weather Forecaster (MWF) Competence Standard Framework. It also noted the MWF competencies proposed for adoption for the respective regional/national functions. The Association noted that the draft Framework would be submitted to the Seventeenth session of the World Meteorological Congress (Cg-17) for consideration. The Association noted the considerable variation of functions of the Marine Weather Offices in the Region.

IMO/WMO World Wide MetOcean Information and Warning Services

4.1.3.6 The Association noted that the World-Wide Met-Ocean Information and Warning Service (WWMIWS) was formally adopted by the twenty-seventh session of the International Maritime Organization (IMO), Resolution 1051/A27, 20 December 2011, and had been implemented through the collaboration of WMO, the International Maritime Organization (IMO) and the International Hydrographic Organization (IHO). The WWMIWS introduced the role of METAREA Coordinators and identified their responsibilities to ensure that the provision of met-ocean information and warnings is consistent in meeting the obligations of the International Convention for the Safety of Life at Sea (SOLAS). This also ensures consistency with other aspects of safety information provided under the Convention, in particular, Navigation Warnings, which are provided under the auspices of the International Hydrographic Organization, and are

coordinated by NAVAREA Coordinators. In this context, the Association noted the successful outcome of the Second Maritime Safety Services Enhancement Workshop, held in Wellington, New Zealand, 18–22 August 2014 (<http://www.jcomm.info/MSS2>), in parallel with the sixth meeting of the World-wide Navigational Warning Service Sub-committee (WWNWS-6) of the International Hydrographic Organization (IHO). Given the importance of close coordination with the Sub-Committee at national and global levels, and the need to improve WWMIWS collaboration in the Region through the METAREA coordinators, the Association urged the Secretariat and METAREA coordinators to create opportunities for coordination and training of Maritime Safety Information (MSI) Services.

4.1.3.7 The Association recognized the need of ensuring maritime weather and sea ice safety services, and acknowledged the acceptance of the following Members to serve as coordinators of the corresponding Metareas in the Region: IV and XII (United States of America), V (Brazil), VI (Argentina), XV (Chile), XVI – ad interim – (United States of America). The Association further recognized the request from Peru to become the METAREA XVI Coordinator and Issuing Service, and encouraged Peru to continue the process of completing the agreed procedure requested by WMO based on the positive advice of USA and JCOMM/Expert Team on Maritime Safety Services (ETMSS).

4.1.3.8 The Association encouraged Members to actively link with the METAREA Coordinators of the Region to enhance coordination among met services in the same METAREA to ensure seamless service of the meteorological Maritime Safety Information (MSI), and expressed its appreciation to the responsible Services for METAREA Coordination for providing the necessary input for WWMIWS implementation on a regular basis, including the confirmed contact information for METAREA Coordinators and the METAREA Self-Assessments.

Marine environmental emergencies

4.1.3.9 The Association noted the establishment of an ad hoc Task Team on JCOMM Coordination for Marine Environmental Emergency Responses, in pursuing the role in supporting Members/Member States to respond to marine environmental emergencies including the maritime radioactive material discharge. The Association support the work of the ad hoc Task Team to develop, in close liaison with other partners (such as IAEA, IMO, IHO, and IOC of UNESCO), a clear concept including the user perspectives and requirements for the delivery of information regarding marine environmental emergency responses.

Coastal Inundation Forecasting Demonstration Project

4.1.3.10 The Association recalled the joint efforts of JCOMM and CHy through the Coastal Inundation Forecasting Demonstration Project (CIFDP), <http://www.jcomm.info/CIFDP>, to demonstrate how integrated coastal inundation forecasting and warnings can be improved and effectively coordinated by the National Meteorological and Hydrological Services (NMHSs). The Association noted the importance of CIFDP to enhance capacity of NMHSs for coastal disaster risk reduction, and to improve interaction with users of the NMHSs' information services. The Association noted that CIFDP sub-projects had been successfully implemented in Bangladesh, Fiji, Indonesia, and extended to the Caribbean beginning with the Dominican Republic.

4.1.3.11 The Association noted linkages with related programmes and projects with CIFDP, including the Storm Surge Watch Scheme (SSWS), Severe Weather Forecast Demonstration Project (SWFDP), eSurge project of the European Space Agency (ESA), the WMO Working Group on Societal and Economic Research Applications (WG-SERA), IOC Working Group on Tsunamis and Other hazards related to sea level Warning and mitigation Systems (TOWS-WG) and many others. The Association requested JCOMM and CHy, with support from the Secretary-General, to ensure continuing and close coordination with these activities, for synergies in strengthening national capacities under the respective subprojects, and encouraged the Members of the Region to provide support to these efforts, as appropriate.

4.1.3.12 The Association was informed that the NOAA Pacific Tsunami Warning Center (PTWC) has developed new, enhanced tsunami warning products coming into operation in October 2014. The Association noted that the IOC announcement and users guide are available respectively at http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=13964 and at ptws-ptwcnewproducts.info. The Association further noted that the Working Group on Tsunamis of the Permanent Commission for the South Pacific has already successfully tested the new products of the PTWC in the Region.

4.1.3.13 The Association acknowledged the relevance of JCOMM contributions to the Global Framework for Climate Services (GFCS). JCOMM expertise in ocean observations, ocean modelling, and ocean forecasting services, including for coastal inundation, are one of the foundational components that enable the GFCS.

Services for ocean fisheries

4.1.3.14 The Association noted with satisfaction the joint effort by JCOMM and the Commission for Agricultural Meteorology (CAgM), through the Joint JCOMM-CAgM Task Team on Weather, Climate and Fisheries (TT-WCF9), <http://www.jcomm.info/TT-WCF>, to enhance understanding and capabilities in marine climatology/oceanography and their impact on ocean fisheries, particularly in the Pacific Island Countries (PICs). The Association noted that this would contribute to the GFCS implementation in addressing the priority area of Food Security. The Association emphasized the need for enhanced effort to maintain and extend marine climatology, encompassing regions and sub-regions, and particularly for the extreme phenomena affecting the productivity of fisheries. The Association encouraged its Members to engage in this type of work in the South Eastern Pacific region with the regional organizations and centres, such as the Permanent Commission on the South Pacific (CPPS) and the CIIFEN, and requested the Secretary-General and the relevant Technical Commissions JCOMM and CAgM to consider an appropriate support to such effort.

4.1.4 Agricultural meteorology (agenda item 4.1.4)

4.1.4.1 The Association noted the new workplan of the sixteenth session of the Commission for Agricultural Meteorology (CAgM) and revised working structure consisting of four Open Panels of Agricultural Meteorology Experts (OPAMEs) with the focus areas: Operational Agricultural Meteorology, Science and Technology in Agricultural Meteorology, Natural Hazards and Climate Variability/Change in Agriculture, and Capacity Development in Agricultural Meteorology (<http://cagm-16.wmo.int>). The Association encouraged its Members to nominate experts to these focus areas in order to provide knowledge and expertise from the South America Region to promote the use of weather and climate information by agricultural communities.

4.1.4.2 The Association noted that the World AgroMeteorological Information Service (WAMIS) (<http://www.wamis.org>) has products from over 55 countries, seven in South America, and provides tools and resources to help countries improve their bulletins and services. Considering the benefits of WAMIS to Members, the Association urged Members to actively participate in WAMIS, through which their products can be disseminated to the global community. The Association recognized the importance of developing new technologies such as agrometeorological forecasts and applications based on Numerical Weather Predictions, crop models outputs, remote sensing data and products and GIS technologies and welcomed the efforts of Members to assist the WMO Secretariat in developing projects incorporating these advances.

4.1.4.3 The Association noted with appreciation the organization of the several CAgM meetings during the past four years. The Association thanked all the co-sponsors who supported WMO in organizing workshops and the Expert Team meetings in RA III and encouraged the Secretariat to organize more CAgM meetings in the Region in the coming intersessional period.

4.1.4.4 The Association appreciated that the RA III Sub-group on Agrometeorology of the Working Group on Climate Services has been particularly active in the previous CAgM intersessional period and thanked the leader of the sub-group, Ms Liliana Nuñez (Argentina), for her excellent work. The Association noted that the sub-group included participants from Brazil,

Colombia, Chile, Ecuador, Paraguay, Uruguay and the Bolivarian Republic of Venezuela and that a survey on the status of, and requirements for, improving agricultural meteorological and climate services had been conducted. The Association also noted that the sub-group concluded that enhanced capacity building is needed for crop and fisheries modelling, remote sensing and GIS tools and that standards for those tools are needed to support the elaboration of products in the Region. The Sub-group on Agrometeorology also identified the need to develop sub-regional projects on climate and weather risk management in agriculture.

4.1.4.5 The Association was particularly appreciative that many Roving Seminars on Weather, Climate and Farmers have been held in several Regions, including RA III. The Association urged its Members to support more seminars in the Region and requested the Secretariat to facilitate efforts to mobilize financial resources to support them.

4.1.4.6 The Association noted that Roving Seminars provided means of engagement with the agricultural community to promote the use of climate information as part of the implementation of the Global Framework for Climate Services. The Association encouraged its Members to engage the agricultural community in National and Regional Climate Outlook Forums and other GFCS related activities.

4.2 Disaster Risk Reduction (agenda item 4.2)

Disaster risk reduction activities

Support to decision-making in disaster risk reduction

4.2.1 The Association stressed that protection of lives, property and livelihoods is at the core of the priorities of the WMO Members and the National Meteorological and Hydrological Services (NMHSs). Furthermore, the implementation of the Hyogo Framework for Action 2005–2015 (HFA) through regional and national strategies in Disaster Risk Reduction (DRR) is leading to changes in national DRR policies, legal and institutional frameworks, with implications on the role, responsibilities, and new working arrangements for the NMHSs in the Region. These changes provide opportunities such as increased recognition of the NMHSs by their governments and DRR stakeholders, strengthened partnerships and opportunities for increased resources. However, they are also leading to increasing demands and liabilities related to the provision of products and services to a larger and more diverse group of DRR stakeholders (e.g., government authorities, public and private sectors, NGOs, the general public, and media) who have direct responsibilities for DRR decision-making. To meet these new challenges, the Association recalled:

- (a) The WMO DRR framework for development and delivery of weather, hydrological and climate services, underpinned by national governance and institutional framework and needs and requirements of the DRR users at the national level;
- (b) The establishment of DRR User-Interface Expert Advisory Groups (UI-EAGs) in three areas: (i) Hazard/Risk Analysis; (ii) Multi-Hazard Early Warning System (MHEWS); and (iii) Disaster Risk Financing and Insurance; by providing input on the users' needs and requirements for the development of WMO guidelines in these areas of DRR;
- (c) The establishment of the Commission for Basic Systems (CBS) Task Team on the Provision of Operational Meteorological Assistance to Humanitarian Agencies, in coordination with the Commission for Climatology (CCI), and the Commission for Hydrology (CHy), with focus on development of requirements of the humanitarian community for weather and climate services.

4.2.2 In recognizing that DRR and climate adaptation are among high priority areas and considering a number of good practices in the Region, the Association urged its Management Group and other subsidiary bodies in collaboration with the Secretariat to ensure that the Strategic Operating Plan of the Association addresses DRR and climate adaptation and that the good practices of the Members are documented and shared within the Region and with other WMO Regions.

DRR thematic guidelines, recommended practices and standards and related training modules

4.2.3 The Association urged its Members to utilize and provide feedback to the Secretariat on the effectiveness of the following three guidelines to support the NMHSs:

- (a) “WMO Guidelines for National Meteorological and Hydrological Services on Institutional Partnerships in Multi-Hazard Early Warning Systems and Needs and Requirements for Weather, Hydrological and Climate Services to Support Emergency Preparedness, Response and Early Recovery” engaging the DRR Expert Advisory Group on Multi-Hazard Early Warning Systems (EAG-MHEWS);
- (b) “Guidelines for Hazard Definition, Classifications, Hazard Databases and Metadata and Modelling to Support Loss and Damage Data Collection and Risk Analysis,” engaging the DRR Expert Advisory Group on Hazard/Risk Assessment (EAG-HRA);
- (c) “Requirements for Weather and Climate Services to Support Disaster Risk Financing and Insurance,” engaging the DRR Expert Advisory Group on Disaster Risk Financing and Insurance (EAG-DRFI).

4.2.4 The Association requested support from the WMO Secretariat and the WMO Regional Training Centres (RTCs) for provision of training in DRR, noting that in 2014, the WMO Secretariat in cooperation with the Education and Training Programme (ETR), a number of leading RTCs, and the United Nations International Strategy for Disaster Risk Reduction (UNISDR) system partners, would develop the first comprehensive set of training modules in DRR targeted at NMHS executives, their staff and stakeholders, leveraging the above guidelines, training modules in MHEWS, and relevant modules developed by partner agencies.

4.2.5 The Association urged its Members to participate in the Second WMO National and Regional DRR Survey to be conducted in 2014/2015, as per the request of Cg-XVI to measure the progress made, as well as challenging opportunities and gaps at national and regional levels spanning governance, institutional, technical, and operational aspects for development and provision of weather, hydrological, and climate-related products and services through the NMHSs and the WMO global operational network of Global Producing Centres (GPCs), Regional Specialized Meteorological Centres (RSMCs), Regional Climate Centres (RCCs) and other regional structures related to WMO since the first survey in 2006.

National DRR and climate adaptation capacity development projects with regional cooperation frameworks aligned with the GFCS

4.2.6 Recognizing the fundamental importance of multi-hazard information and services provided by NMHSs in support of risk-informed and impact-based DRR decision-making, the Association encouraged its Members to actively participate in the national process for risk analysis, building partnerships and working arrangements with national agencies responsible for collection of loss and damage data. In addition, the Association expressed the need for development of national, holistic sector-driven DRR and climate adaptation capacity development projects with regional cooperation frameworks, and therefore requested its Management Group to explore the possibility of developing such projects with support from the WMO Secretariat, liaising closely with other relevant projects and organizations. At the same time, the Association requested the Secretary-General to consider holding a “Workshop on MHEWS for Urban Areas” (as a follow-up to the workshop organized in December 2013 in San José, Costa Rica) to facilitate dialogue and knowledge transfer among countries in Latin America.

The Global Framework for Climate Services and DRR

4.2.7 The Association noted that a number of WMO DRR activities directly contributed to the development of all the five components of the Global Framework for Climate Services (GFCS), namely the User Interface Platform (UIP), Climate Services Information System (CSIS), Observations, Research and Capacity Building and the GFCS DRR Exemplar. In this regard, the

Association stressed that its activities pertaining to the implementation of the GFCS for DRR applications could be a critical contribution of the Association and subsequently that of the WMO to the implementation of the GFCS. The Association requested its Management Group, with support from the WMO Secretariat and the GFCS Office, to document the Region's initiatives for implementation of climate services for WMO DRR activities and to formulate concrete recommendations to WMO constituent bodies as input to the implementation of the GFCS.

Post-2015 Framework for Disaster Risk Reduction

4.2.8 The Association noted that the Hyogo Framework for Action (HFA) 2005–2015 is drawing to an end, and was informed that the Third United Nations World Conference on Disaster Risk Reduction (WCDRR-III, 14–18 March 2015, Sendai, Japan) would consider for adoption the post-2015 Framework for DRR. The Association further noted that regional and global consultations are under way in 2014, facilitated by the United Nations International Strategy for Disaster Risk Reduction (UNISDR) and the regional socio-economic groupings for drafting of the post-2015 Framework for DRR. The Association encouraged its Members to actively participate in and provide input to these national and regional consultations, as well as to the WCDRR-III event, to showcase:

- (a) The importance of operational weather, hydrological and environmental services in support of disaster risk reduction decision-making; and
- (b) Technical capacities and challenges faced by Members in implementing impact-based forecasts and early warning systems in support of risk-informed decision-making.

4.2.9 The Association agreed on the need for suitable working arrangements to support DRR-related projects, proposals for further development and scaling up as well as coordination with regional DRR mechanisms related to the post-2015 Framework for DRR and adopted [Resolution 3 \(RA III-16\) – Implementation of disaster risk reduction activities in Region III \(South America\)](#).

4.3 Data processing and forecasting: weather, climate and water (agenda item 4.3)

4.3.1 Weather issues (agenda item 4.3.1)

Global Data-processing and Forecasting System (GDPFS)

4.3.1.1 The Association recalled that the Global Data-processing and Forecasting System (GDPFS), including Emergency Response Activities (ERA), is a critical component of its end-to-end Basic Systems (from observing to delivering services), whose scope spans across multi-scales (space and time). The GDPFS includes a global operational forecasting infrastructure, operated by WMO Members that supports and contributes to their respective national programmes in Weather, Climate and Water, including the production of meteorological warnings and services. The Association therefore encouraged Members running global, regional or limited-area meteorological prediction models, including those of RSMCs, to continue to make their products available on WIS for the benefit of all countries in RA III, who in turn are urged to contribute verification and feedback on their quality and usefulness, especially in forecasting meteorological hazards. In addition, the Association requested:

- (a) Its Members to consider providing within their training courses for forecasters, materials on the use and interpretation of their NWP products, including how to integrate Ensemble Prediction Systems (EPS) outputs into routine operational forecasting, especially for severe and high-impact weather forecasting;
- (b) The Conference of Directors of Ibero-American NMHSs (CIMHET) to retain among its priority courses on the use and interpretation of NWP products;

- (c) The WMO Secretariat and the Commission for Basic Systems (CBS) to assist NMHSs in the uptake, including in the interpretation and application, of such products for their national purposes. The Association noted that CBS has completed a set of Guidelines on EPS and Forecasting to aid forecasters in effective application of EPS. The Guidelines include links to other sources of guidance and learning, e.g., from the ECMWF User Guide, or the COMET on-line training programme.

Severe weather forecasting

4.3.1.2 The Association recalled that significant benefits have been realized from the Severe Weather Forecasting Demonstration Project (SWFDP), either underway or under development in five project regions around the world. The Association appreciated that the successes of SWFDP relied on effective partnerships in the “Cascading Forecasting Process”, which provided improved access to, and effective use by forecasters of existing and newly developed products and tools made available by advanced operational global and regional centres.

4.3.1.3 The Association noted that, in the context of sharing operational weather forecast systems for improving warnings of hazardous weather conditions and weather-related hazards, a Virtual Centre for Disaster Prevention in South America was established in 2009 for the south-eastern part of South America, following a resolution of the Ibero-American Conference of Directors of NMHSs. The Association requested the relevant RA III working group to consider incorporating into the Virtual Centre concept relevant elements of the SWFDP for enhancing the production of forecasts and warnings and the delivery of forecasting services, therefore further contributing to disaster risk reduction goals in affected countries. In this context, the Association encouraged its Members to identify areas for improvement in severe weather forecasting to improve warning services, possibly for inclusion in, or in coordination with, the plans for the Virtual Centre. The necessary improvements can then be addressed through capacity and resilience development activities under various regional programmes.

4.3.1.4 In addition, the Association recognized that advances made in NWP/EPS by advanced global centres require product downscaling and tailoring for practical use by NMHSs. As a lesson from the SWFDP, the Association agreed that strengthening and sustaining WMO operational centres, particularly the RSMC(s) within the Region, through their operational linkages to national centres, will increase and sustain the benefits of the development of much needed capabilities at NMHSs of developing and least developed countries (which typically lack the basic human and financial capacity) for delivering weather, climate and hydrological forecasting and warning services.

Operational weather forecasting

4.3.1.5 The Association noted that in RA III, the number of centres operating NWP systems remained the same since the last session. Argentina, Brazil, Chile, Colombia, Ecuador, Peru and Uruguay operated Limited Area Models (LAMs). Additionally, CPTEC (Brazil) is a Global Producing Centre (GPC) for Long-Range Forecasts (LRF). The Association encouraged its Members to further invest in the implementation of NWP, including EPS, for improved operational weather forecasting, especially for severe and high-impact weather forecasting.

4.3.1.6 Noting that a broad range of global and regional products and datasets had been available on the Intranet and local servers of individual Members, in addition to those products made freely available on their public Web sites, the Association stressed that these products had not been shared within the Region, and therefore urged Members to facilitate access to these products by all Members in the Region.

4.3.1.7 The Association encouraged its Members to increasingly integrate outputs from ensemble prediction systems (EPS) into the process of forecasting to enhance the production of forecasts and warnings. It stressed that continuing support for capacity development in the use of EPS products was needed (for example, as achieved through the SWFDP), especially in developing countries. The Association agreed that the introduction of EPS outputs into the Virtual

Centre would be central to demonstrating methods for using probabilistic methods to extending the lead-time for alerting of possible severe weather.

Long-range forecasts (LRF)

4.3.1.8 The Association recalled the operational nature of the Global Producing Centres (GPCs) for Long-Range Forecasts and that Cg-XVI envisaged that some GPCs could play an important role in providing global climate predictions from sub-seasonal to longer time-scales, within the context of the Climate Services Information System (CSIS) component of the GFCS. While the Regional Climate Centre (RCC) structure is still in development in the Region, the Association acknowledged that GPC CPTEC (Brazil) is prepared to collaborate with the RCC developments with the view to facilitate consolidation and prioritization of regional requirements, provision of data products and predictions, making available verification information and advice, and to assist in their uptake by NMHSs. The Association recalled the recent announcement by the WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble (LC-LRFMME) to the effect that the centre is no longer able to provide open access to its database. The Association urged the lead centre to maintain access to research institutions that work in close collaboration with NMHSs for the development of climate services. This would guarantee that NMHSs that lack resources to develop seasonal forecast sub-products could still have access to these products through the research community.

4.3.1.9 In this context, the Association noted with appreciation that a CBS/CCI Workshop on “Operational Long-range Forecasting: GPCs and RCCs, in support of NMHSs and Regional Climate Outlook Forums (RCOFs)” was held in Brasilia, Brazil from 25 to 27 November 2013, to identify priorities for strengthening cooperation and enhanced exchange of data, methods and tools between GPCs and RCCs, and ways to improve operational practice in long-range forecasting, including in support of NMHSs and RCOFs. The Association noted the recommendations of the workshop on the steps needed to strengthen the process of generating long-range forecasts through increased capability for synthesis of prediction information on global, regional and national scales and urged its Members to take an integral part in this process.

Emergency response activities (ERA)

4.3.1.10 The Association recalled that a number of major ERA events with significant impacts have occurred around the world since its previous session, including volcanic ash from eruptions, accidental release of hazardous chemicals to the atmosphere, and the catastrophic Fukushima Daiichi NPP accident in Japan triggered by the Great East Japan Earthquake and Tsunami of March 2011. The Association noted the significant operational impact of these events on the operations of the network of RSMCs with activity specialization in the provision of atmospheric transport modelling for environmental emergency response (EER) and/or backtracking, including those supporting RA III (i.e. RSMC Montreal and RSMC Washington). The Association also noted the need of public education to promote the public awareness on emergency response.

4.3.1.11 In the context of response to a nuclear accident, the Association noted a number of experiences reported not only by RSMCs and relevant international organizations, but also by NMHSs in many regions of the world, including the increasing need for related meteorological information on the spread of radioactivity from the accident for general public interest as well as specialized users. While acknowledging the existence of Environmental Emergency Response (EER) arrangements and standards for guidance products from the RSMCs, as stated in the *Manual on the GDPFS* (WMO-No. 485, Part II, Appendix II-7) and further documented in the WMO Technical Document No. 778 (documentation on RSMC support for EER targeted for meteorologists at NMHSs), the Association noted that there were other products available on the open Internet from other sources, which could cause misinformation. Therefore, the Association requested the Secretary-General and the Commission for Basic Systems (CBS) to promote the use of ERA-related products by NMHSs and assist them in the uptake, including in the interpretation and application of such products for their national purposes.

4.3.1.12 The Association was pleased to note that INMET (Brazil) has represented WMO in the Regional Workshop on Protection of Nuclear Installations against External Hazards (Rio de Janeiro, Brazil, May 2013), organized by the International Atomic Energy Agency (IAEA).

4.3.1.13 The Association noted that global and regional arrangements for non-nuclear ERA have been developed and tested in a specific location in RA III, and involving the participation of its Members. Noting that capacity development is required to take these activities on board, the Association requested the Secretary-General and CBS to consider developing specific training modules on non-nuclear ERA to assist NMHSs with the uptake, including in the interpretation and application of such non-nuclear ERA products for their national purposes.

4.3.2 Climate issues (agenda item 4.3.2)

4.3.2.1 The Association noted that the World Climate Programme (WCP) has been restructured to more optimally support the implementation of the Global Framework for Climate Services (GFCS). The Association urged its Members to closely align their operational climate service capabilities with the ongoing requirements of the GFCS. The Association further urged swift implementation of the actions to address the priority needs and challenges identified at the noted the outcomes of the World Climate Research Programme (WCRP) Conference for Latin America and the Caribbean: Developing, linking and applying climate knowledge, held from 17–21 March 2014 in Montevideo, Uruguay.

4.3.2.2 The Association noted the outcomes of the Sixteenth session of the Commission for Climatology (CCI-16) held from 3 to 8 July 2014 at Heidelberg, Germany, particularly its new working structure consisting of five Open Panels of CCI Experts (OPACEs). The Association further noted with satisfaction that RA III was adequately represented both at CCI-16 and in the new working structure of CCI (http://www.wmo.int/pages/prog/wcp/ccl/index_en.php). The Association noted with appreciation the election of Ms Bárbara Tapia (Chile) as Vice-president of CCI.

4.3.2.3 The Association noted with appreciation that the Guide to Climatological Practices (WMO-No. 100) has been translated into all WMO official languages and that the Spanish version is available online at: http://www.wmo.int/pages/prog/wcp/ccl/guide/guide_climat_practices.php. The Association urged Members to use the Guide in their operational climate activities and to provide feedback to CCI for further improvements and updates.

4.3.2.4 The Association recalled the valuable contribution of the WMO to the work of the UNFCCC, and noted with appreciation that the Twentieth Session of the Conference of Parties (COP 20) is scheduled to be held in December 2014 in Lima, Peru. The Association emphasized that this is an excellent opportunity for the Region to strengthen its engagement with the UNFCCC processes, and urged Members to actively participate in and contribute to COP 20 and related events.

Climate system monitoring and assessment

4.3.2.5 The Association noted with appreciation the work of the joint CCI/WCRP-CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices (ET-CCDI), in particular the outcomes of the WMO Regional Training Workshop on Statistical Analysis of Climate Extremes for South America, 17–21 January 2011, Guayaquil, Ecuador including a peer-reviewed scientific publication.

4.3.2.6 The Association welcomed the initiative of ET-CCDI to expand the work on climate indices to better reflect marine climate, and highlighted the need for marine climate services to enhance understanding of the impact of climate change on coastal areas as well as on fishery activities in the Region. It further emphasized the need for continued regional capacity building for the monitoring of changes in extremes, and urged the Secretariat and ET-CCDI to organize a regional workshop in collaboration with the WCRP, JCOMM, and other stakeholders.

4.3.2.7 The Association noted with appreciation the ongoing efforts of the CCI Task Team on National Climate Monitoring Products (TT-NCMP) to develop the list of national climate monitoring products to be produced by the Members, which will greatly facilitate regional and global climate system monitoring activities by standardizing and operationalizing basic national contributions. The Association urged Members to follow the CCI TT-NCMP guidance while producing climate monitoring products at national scale.

4.3.2.8 The Association recalled Resolution 1 (XV-RA III) on the implementation of the Climate Watch System (CWS), highlighting the role of NMHSs in the provision of timely weather and climate advisories for warning of extreme weather and climate events. The Association urged its Members to strengthen their cooperation on the CWS, to ensure its harmonized implementation, interoperability and timely exchange of related data and products. The Association emphasized that these systems should be developed as an integral part of NMHSs' efforts in support of climate risk management and disaster risk reduction. It encouraged Members to provide regular information to the Working Group dealing with climate services, the president of RA III and the Secretariat to facilitate monitoring the implementation of CWS activities and the planning of further assistance for the delivery of CWSs at national level.

4.3.2.9 The Association was pleased to note the contribution provided by the Members to the publication "The Global Climate 2001–2010, A Decade of Extremes", which received excellent attention by Members and the media. It further urged the Members to sustain and enhance their contributions to the WMO climate monitoring publications by providing relevant climate information based on their monitoring activities.

4.3.2.10 The Association noted with appreciation valuable and sustained contribution of RA III Members to the WMO Annual Statements on the Status of the Global Climate. The Annual Statements, which are released every year on the occasion of the World Meteorological Day, in all WMO official languages, review climate conditions including extreme weather and climate events in the regions. The Association noted the important role of the Statement in raising public awareness of climate change and agreed that these efforts should be sustained and enhanced.

4.3.2.11 The Association welcomed the WMO initiative to issue regional supplements to the annual statements on the status of the climate. The Association was informed that the first edition of the African Annual Statement on the Status of Climate in 2013 is being published with involvement of experts from Africa and support from the Secretariat. Furthermore, with due consideration of the needs and requirements as discussed and agreed under 4.3.2.9 to 4.3.2.11, the Association adopted [Resolution 4 \(RA III-16\) – Launching the Annual Statement on the Status of the Climate in the South American Region](#), as a mechanism to further support climate monitoring and assessment and the implementation of the GFCS at the regional scale.

Climate Services Information System

4.3.2.12 The Association noted that WMO had already put in place, or identified, several entities to specifically support NMHS climate operations, including the highly specialized centres designated by WMO based on standards and criteria. The Association noted with satisfaction that these entities are appropriately highlighted in the GFCS implementation plan as part of its Climate Services Information System (CSIS) pillar, approved by the First Session of the Intergovernmental Board on Climate Services (IBCS-1). The Association urged its Members to enhance the Region's contributions to the GFCS by strengthening the existing CSIS entities and also identifying and filling gaps, both at regional and national levels.

4.3.2.13 The Association noted that National Climate Outlook Forums (NCOFs), and National Climate Forums (NCFs) are envisioned as key national platforms for promoting regular dialogue and inter-agency coordination in responding to climate variability and change, providing climate information at national level at relevant timescales through a regular and sustained multi-stakeholder dialogue process among stakeholders at the national level, and serve as an effective and sustained user interface platforms for CSIS. The Association noted with appreciation that WMO has been actively encouraging the implementation of NCOFs through supporting pilot

NCOFs in some countries. Furthermore, referring to the Recommendation 4 (CCI-16), the Association urged Members to take up NCOF/NCF implementation as a key component of GFCS implementation at the national level, and requested the Secretary-General to facilitate the development of guidance to help NMHSs to set up and coordinate NCOFs/NCFs on a regular basis using global and regional operational products that meet WMO standards.

4.3.2.14 The Association noted with appreciation that, following successful completion of its demonstration phase, on 11 September the Commission for Basic Services during its extraordinary session (2014) recommended the formal designation of the RA III RCC for Western South America (RCC-WSA) hosted by CIIFEN and proposed an amendment to the Manual on the Global Data Processing and Forecasting System (GDPFS) to that effect. The Association further noted with satisfaction that an RCC-Network for the South of South America (RCC-Network-SSA), led by the Meteorological Services of Brazil (INMET) and Argentina (SMN), began the demonstration phase on 21 May, 2014, and will operate in a network serving six of the South American countries: Argentina, Plurinational State of Bolivia, Brazil, Chile, Paraguay and Uruguay. The Association urged Members to actively support the operational activities of the RA III RCC-WSA and RCC-Network-SSA as a valuable contribution to the implementation of the GFCS in the Region. The Association committed to expedite implementation of the RCC-Network for the North of South America (RCC-Network-NSA) as well, to ensure full RCC coverage in the Region. It noted that preparations undertaken for the demonstration phase for RCC-Network-SSA could be used to accelerate the launch of a RCC-Network-NSA before Cg-17 in 2015 with support from Members in RCC-Network-SSA and France. The Association further urged the president of RA III to promote effective utilization and feedback by NMHSs of RCC products and services. The Association adopted [Resolution 5 \(RA III-16\) – Implementation of Regional Climate Centres and Networks in Region III \(South America\)](#).

4.3.2.15 The Association appreciated the sustained operation of RCOFs in RA III and noted that two RCOFs have successfully operated in the Region for more than a decade, namely the Western Coast of South America Climate Outlook Forum (WCSACOF) coordinated by RCC-WSA and the Southeast of South America Climate Outlook Forum (SSACOF) coordinated by the RCC-Network-SSA. The Association noted the growing benefits of RCOFs in fostering networking amongst climate experts, building capacity, and in the development of consensus-based forecasts for the concerned sub-regions. The Association urged the relevant coordinating agencies to promote an increase in the participation of climate-sensitive sectors as well as sub-regional entities in RCOFs, providing a much broader ownership of the process. The Association urged RCOF stakeholders to seek efficiency through low-cost options offered by on-line collaboration and to seek stakeholder support to ensure their sustainability.

Climate information for adaptation and risk management

4.3.2.16 The Association urged its Members to support and to promote user engagement through RCOFs and NCOFs, by end-use or sector-driven climate forums (e.g., hydrological-, agricultural- or health-focused forums), interdisciplinary workshops and training, and field activities including roving seminars, a notable success in delivering climate services for the agriculture sector.

4.3.2.17 The Association noted the needs of key socio-economic sectors for reliable, relevant, actionable climate information for Climate Risk Management (CRM) and for adaptation, and the need to improve the practical application of CRM at local levels, in order to reduce climate impacts, build resilience to climate variability and change and contribute to poverty reduction and development. The Association appreciated CCI guidance on CRM and urged its Members to use the recommended CRM approaches for improving decisions and climate-related socio-economic outcomes. The Association urged development of case studies demonstrating good practices in CRM, and that these be shared with the CCI to help further elaborate the CRM concepts.

4.3.2.18 The Association noted with appreciation that an inception workshop for the Western South American sub-region was organized in Guayaquil, Ecuador, 10–14 June, 2013, to demonstrate and provide training on the use of the software package called “ClimPACT”,

developed by the CCI Expert Team on Climate Risk and Sector-Specific Climate Indices (ET-CRSCI), in which country experts from climate, water, agriculture and health sectors were brought together to apply the software. The Association appreciated the intention of the CCI ET-CRSCI to work further on improving the indices as well as updating the software. The Association also recognized the added value of application-oriented climate information and encouraged the members to widely use the software, ensuring an easy and consistent way of calculating the indices.

4.3.2.19 The Association recalled with appreciation the development of the Guidance on Implementation of Heat Health early Warning Systems (HHWS), scheduled for publication by the end of 2014, as a result of collaborative and concerted efforts of the experts from WMO and WHO. The Association recognized the critical importance of the Guidance in view of increased frequency and intensity of heat waves in recent decades accompanying global warming and further urged Members to implement integrated HHWS as described in the Guidance.

Drought initiatives

4.3.2.20 The Association noted the successful organization of the High-Level Meeting on National Drought Policy (HMNDP) by WMO and other partners held in Geneva, Switzerland in March 2013, and the [HMNDP declaration](#). The Association supported the outcomes of HMNDP, and urged its Members to use them as guidance to facilitate development and implementation of national drought management policies.

4.3.2.21 The Association supported the establishment of the Integrated Drought Management Programme (IDMP) by WMO in collaboration with the Global Water Partnership (GWP). The Association expressed its interest in the work of IDMP and urged its Members to participate in it, especially in developing potential IDMP projects in the Region, noting a need in particular for a system for operational drought forecasting coordinated through the RA III CRCs (<http://www.droughtmanagement.info/>). The Association noted that IDMP is an important contribution to GFCS.

4.3.2.22 The Association noted that the UN-Water Decade Programme on Capacity Development (UNW-DPC), WMO, UNCCD and FAO are collaborating on the National Drought Management Policies Initiative which aims to provide capacity development on this issue through four regional workshops during the period March 2013 to December 2014. The Association was appreciative that the Regional Workshop in Latin America and the Caribbean was held in Fortaleza, Brazil in December 2013 and that the proceedings of this workshop will be published (<http://www.ais.unwater.org/droughtmanagement>). The Association encouraged the Secretary-General to harmonize as much as possible the efforts of this initiative with the IDMP.

4.3.3 Water issues (agenda item 4.3.3)

4.3.3.1 The Association noted that during the last intersessional period, the needs of Members in the Region were adequately addressed by the Hydrology and Water Resources Programme, as adopted by Sixteenth Congress.

Regional Association Working Group on Hydrology and Water Resources

4.3.3.2 The Association noted with appreciation the report of the current chairperson of the Working Group on Hydrology and Water Resources (WGHWR), Ms Dora Goniadzki (Argentina). It noted the multiple activities the chairperson had undertaken in representation of the RA III WGHWR during the period, such as participating in EC sessions, in meetings of the RA III Management Group, of the Advisory Group of the WMO Flood Forecasting Initiative, and of the WHYCOS International Advisory Group.

4.3.3.3 The Association was pleased to learn the outcomes of the meeting of the WGHWR, which was held in Montevideo from 25 to 27 March 2014. It noted the progress made by the WGHWR in the fulfilment of the various items of its terms of reference. In particular, it welcomed the agreement reached in selecting the basin of the Zarumilla River for the implementation of the

demonstration project of the Flash Flood Guidance System for South America (to be funded by USAID), the advances in defining HYCOS projects and in developing hydrological outlooks in the region, the courses and projects on Integrated Flood Management, the improvement of the WGHWR website.

4.3.3.4 The Association also noted the major challenges facing the National Hydrological Services (NHSs) in the Region, including the training needs identified by the working group in the following order of priorities:

- (a) Operation and maintenance of automatic stations;
- (b) Sediment transport monitoring and networks;
- (c) Hydrological forecasting techniques, with emphasis in flash floods.

4.3.3.5 The Association noted the recommendations from the working group for the future work in the field of hydrology and water resources at the regional level. This consisted of adding the following issues to the existing terms of reference of the WGHWR:

- (a) Capacity building, education and training;
- (b) Databases;
- (c) Hydrological hazards monitoring by remote sensing;
- (d) GIS and hydrological modelling;
- (e) Forecast and assessment of debris flow, considering also spatial tools.

4.3.3.6 As regards the other recommendations made by the WGHWR, the Association endorsed them in general and offered the following observations for the following individual recommendations:

- (a) With respect to the implementation of a demonstration Flash Flood Guidance System in the Zarumilla River basin between Ecuador and Peru, the Association requested the Secretariat to assist in mobilizing the resources required to ensure the organization of a workshop to present and discuss the result obtained in the implementation phase to all WGHWR members;
- (b) With respect to the proposal made by Uruguay to extend the Early Warning System of the River Yí to two other basins, noting that some resources had been allocated for such initiatives on the regional level in the Hydrology and Water Resources Programme budget, the Association supported the initiative and requested the Secretariat to ensure the extension of this experience to other basins in the Region.

WMO Commission for Hydrology

4.3.3.7 The Association was informed about the outcome of the fourteenth session of the Commission for Hydrology (CHy). It took note that the Commission had re-established an Advisory Working Group (AWG) composed of ten members and had identified four Open Panels of CHy Experts (OPACHes) to deal with five thematic work areas: Quality Management Framework – Hydrology (QMF–Hydrology); Data Operations and Management; Water Resources Assessment; Hydrological Forecasting and Predictions; and Water, Climate and Risk Management. The Association was pleased to note that Mr Harry Lins (United States) was elected as president of CHy and that Mr Antonio Cardoso Neto (Brazil) was appointed AWG member co-responsible for Water Resources Assessment. The session encouraged Members to nominate experts to the OPACHes set up for each thematic area, and to contribute actively to the work programme.

4.3.3.8 The Association commended the number of manuals and guidelines which have been published or are under development in the framework of the Quality Management Framework - Hydrology (QMF-H) and their usefulness in support of day-to-day activities of NHSs. It was pleased to note that the extensive training material on the *Manual on Stream Gauging* (WMO-No. 1044) and the *Manual on Flood Forecasting and Warning* (WMO-No. 1072) had been translated into Spanish, the latter thanks to the voluntary contribution of Mexico. It encouraged the Secretariat to translate other QMF-H publications into Spanish to ensure wide use and benefits and encouraged Members to volunteer translating those more relevant for the Region.

4.3.3.9 The Association learned with interest the development of the CHy Communities of Practice, (<http://www.wmo.int/chy/communities/>) in particular the one for the MCH database management system and that for the Stream Gauging Training Material for Instructors. It welcomed the presence of abundant material in Spanish and encouraged its Members to appoint experts in the related fields to actively participate in the activities undertaken in those communities.

4.3.3.10 The Association noted the recent work of CHy in hydrological data exchange and in particular the development of demonstration projects to assist Members in their decision on the adoption of WaterML 2.0 as a WMO standard. The Association expressed its interest that one of such demonstration projects be undertaken in the Region.

4.3.3.11 The Association noted that a workshop on the use of the DEWETRA platform had been held in Quito, Ecuador, from 4 to 8 August 2014. The DEWETRA platform is a real-time integrated system for hydro-meteorological and wildfire risk forecasting, monitoring and prevention. It has the capability to ingest data from different sources and produce several types of integrated maps, useful for risk-management decision makers. The Association noted that Italy had offered to make the DEWETRA platform freely available to members of CHy and that a Cooperation Agreement between WMO and the Italian Department of Civil Protection (the "owner" of the software) had been signed.

Capacity development in hydrology and water resources

4.3.3.12 Noting that an Ibero-American Course for Stream Gauging Instructors had been held in Mexico City from 11 to 15 November 2013 and that nine instructors from eight RA III Members had participated, the Association encouraged its Members to support those instructors in organizing national and regional courses in this fundamental aspect of NHS operations. In particular, the Association requested assistance in organizing training activities on the criteria for acquisition, operation and uncertainty estimation of modern instruments, such as ADCPs.

4.3.3.13 The Association expressed its appreciation to the Government of Spain for the support provided to training activities in Integrated Flood Management, in the Management of Networks of Automatic Stations and in the Operation and Maintenance of Automatic Hydrometric and Meteorological Stations. The session also recognized the support of Spain to the activities of the Ibero-American Network for the monitoring and forecasting of hydrometeorological phenomena (PROHIMET), including workshops and two demonstration projects, one in Colombia and one in Uruguay, as part of the Flood Forecasting Initiative (FFI).

4.3.3.14 The Association was informed of the activities developed by PRASDES, funded by Finland and implemented by CIIFEN regarding the integration of meteorological and hydrological databases in the Andean countries as well as the improvement in the use of spatial analysis tools (GIS) for hydrological purposes.

4.3.3.15 The Association welcomed the intervention of the Secretary-General of the Intergovernmental Coordinating Committee of the La Plata Basin Countries (CIC). He recalled that in 2000 WMO and CIC had signed an MoU to cooperate in areas of common interest. He noted that the possibilities of cooperation were multiple, in areas such as enhancement of hydro-meteorological networks, modeling, climate services. The Association welcomed the suggestion of revitalizing the MoU through specific projects aimed at enhancing the cooperation among the NMSs and NHSs of the region.

4.4 WMO Integrated Global Observing System and WMO Information System (agenda item 4.4)

4.4.1 WMO Integrated Global Observing System (agenda item 4.4.1)

The WIGOS framework implementation

4.4.1.1 The Association considered the actions to be undertaken by its Members and subsidiary bodies in implementation of the WMO Integrated Global Observing System (WIGOS). In this consideration, the Association took into account decisions of Cg-XVI, EC-64, CBS-15, EC-65 and EC-66 on the WIGOS implementation.

4.4.1.2 The Association recalled Resolution 50 (Cg-XVI) – Implementation of the WMO Integrated Global Observing Systems, by which the regional associations were requested: (a) to develop their regional WIGOS implementation plans; (b) to coordinate WIGOS implementation activities with the WMO Information System (WIS) in their operating plans and work programmes; and (c) to promote capacity-building and outreach activities to assist Members in the implementation of WIGOS. The Association agreed that WIGOS would provide a framework for improved collaboration and coordination across WMO Programmes, across WMO observing systems and between NMHSs and relevant national, sub-regional/regional and international organizations.

4.4.1.3 The Association emphasized that strong support and close collaboration among Members were needed to advance scientific knowledge and technical infrastructure to meet the regional WIGOS requirements. Therefore, it would be desirable to strengthen cooperation and partnership through Region-wide organizations or sub-regional groupings overseeing the WIGOS component observing systems. It specifically referred to enhanced cooperation among meteorological, hydrological, marine/oceanographic and environmental institutions/services where they are separated at the national level.

4.4.1.4 The Association recalled Resolution 10 (EC-64) – WIGOS Framework Implementation Plan (WIP) developed by the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS); it noted its significance in establishing a clear understanding of the WIP ten Key Activity Areas that must be tackled in order to implement the WIGOS framework. The Association expressed its concern that the timely completion of WIGOS implementation in the Region would directly depend on the available resources (expertise and funds). The Association further underlined that WIGOS implementation at national and regional levels would require initial investment, specifically for improvement of coordination and technological infrastructure. This investment should be a significant component of WIGOS implementation plans of individual NMHSs. In this regard, the Association urged Members to provide resources to support the implementation of WIGOS in the Region.

4.4.1.5 The Association also urged its Members to continue providing resources, through the WIGOS Trust Fund and seconded experts or Junior Professional Officers, to help support the implementation of WIGOS.

4.4.1.6 The Association noted that CBS-15 considered the new “Implementation Plan for the Evolution of Global Observing Systems” (EGOS-IP) that was subsequently approved by EC-65. In this regard, the Association requested its Members to: (a) nominate national focal points tasked to monitor the implementation of the EGOS-IP nationally, report on implementation issues, and provide feedback to CBS through the Secretariat; and (b) address the actions listed in the EGOS-IP in collaboration with partner organizations and agents identified in the EGOS-IP. It also encouraged Members to mobilize additional resources to drive these activities forward. It further requested the relevant RA III subsidiary bodies to address the EGOS-IP in their work programmes, and promote its effective implementation. The Association also noted that the EGOS-IP builds on the analysis and guidance of the WMO Rolling Review of Requirements (RRR) process, and provides a substantial contribution to the third WIGOS Key Activity Area on design, planning and optimized evolution of WIGOS component observing systems.

4.4.1.7 The Association noted with great appreciation that, in response to the request from Cg-XVI, the development of the Regional WIGOS Implementation Plan for RA III (R-WIP-III) was accomplished by the RA III Working Group on Infrastructure and Technological Development (WG-ITD). The Association expressed its appreciation to WG-ITD for the development of R-WIP-III.

4.4.1.8 The Association accordingly adopted [Resolution 6 \(RA III-16\) – Regional WMO Integrated Global Observing System Implementation Plan](#). The Association agreed that the implementation of R-WIP-III be supported by all the Members of the Region, and be guided, supervised and monitored by the Management Group of RA III, with periodic reports from appropriate subsidiary bodies in charge of WIGOS. In this regard, the Association emphasized that commitment by Members to WIGOS is essential and urged their Members to support implementation of WIGOS in their Region, including providing sufficient resources. In particular, the Association urged Members to make experts available to contribute to relevant regional working groups.

4.4.1.9 The Association further agreed that R-WIP-III be further revised to accommodate new projects which would be submitted by Members and authorized the president to approve any revisions of R-WIP-III during the intersessional period in consultation with the Management Group. In this regard, the Association agreed that the regional WIGOS projects should be expandable to include more sub-regional and national projects.

Regional Basic Synoptic Network (RBSN) and Regional Basic Climatological Network (RBCN)

4.4.1.10 The Association noted with satisfaction the proposal presented by the Chairperson of the RA III Working Group on Infrastructure and Technology Development (WG-ITD) on a concept document ([Annex I to the present report](#)) concerning a project for the integration and exchange of hydro meteorological information from the Plata Basin within the framework of the RA III Regional WIGOS Implementation Plan. The Association recognized the relevance of the Project called WIGOS-SAS for the southern part of South America and requested the President of RA III to coordinate its development taking into account the general guidelines included in the Concept document.

4.4.1.11 The Association noted that owing to Members' efforts, the RBSN and RBCN have demonstrated sustainable performance. However, the Association recognized that further efforts should be made by Members to improve the data sustainability and availability performance to a satisfactory level to meet service requirements. It also recognized that in order to further maximize the availability of CLIMAT messages, greater efforts by Members should be made in ensuring that their operational observing stations compile and transmit the climate-related messages according to existing WMO regulations. The Association also recalled that quality management is a key activity area of the WIGOS framework Implementation Plan and noted that improved monitoring is a significant element of this activity.

4.4.1.12 By adopting [Resolution 7 \(RA III-16\) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region III \(South America\)](#), the Association approved the new list of RBSN and RBCN stations as given in [Annexes I and II to the resolution](#). The Association noted that the concepts behind the RBSN and RBCN are becoming outdated as Members implement a wider range of observing systems in integrated composite networks serving multiple purposes. The Association noted further that an aim of WIGOS is to develop the definition of an integrated Regional Basic Observing Network (RBON) together with a new database of station information which will more completely describe the WMO observing capabilities achieved collectively by Members. It requested the CBS and relevant technical commissions, the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS), with the support of WIGOS Project Office, to give priority to making progress on these matters and to keep WMO Members and this regional association well informed of developments in this regard.

Marine and oceanographic observations

4.4.1.13 The Association noted that implementation of the marine observing network in the Region has remained relatively stable in the last four years thanks to global efforts and to the prominent role of Members in the Region. The Association noted with interest the valuable data provided by the Tropical Moored buoy arrays in the Equatorial Pacific (TAO) and Atlantic (PIRATA) Oceans, the Pacific part of which is a central component of the ENSO Observing System, and deployed specifically for research and forecasting of El Niño and La Niña. These networks also contribute valuable upper-ocean and surface meteorological data for Numerical Weather Prediction, and tropical cyclone forecasting.

4.4.1.14 However, the Association expressed concerns that data availability for both the moored buoy arrays in the Tropical Pacific (TAO, now complete with 67 units) and Atlantic oceans (PIRATA: complete with 18 units) is not at its optimum (reduced to 50% only) due to vandalism on the data buoys, and difficulties to assure maintenance due to the cost of ship time and piracy. The Association urged its Members to contribute to the JCOMM Observations Programme Area Implementation Goals (http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=8930) and thereby invest additional resources in the further development of ocean observing systems in order to address the increasing needs for climate applications, and services. The Association recommended that its Members work closely with the Data Buoy Cooperation Panel (DBCP), the Global Drifter Programme, and the Argo programme for providing opportunities for the deployment of drifting buoys and profiling floats in the equatorial and south sectors of the Eastern Pacific and Western Atlantic Oceans. The Association urged its Members to install barometers on all drifters they are planning to deploy in the Region.

4.4.1.15 The Association invited its Members to investigate providing the infrastructure for establishing WMO-IOC Regional Marine Instrument Centre(s) (RMIC) in the Region in order to assure traceability of the marine observations, improve data quality, permit bias correction, and facilitate adherence of observational data, metadata, and processed observational products to higher level standards.

Aircraft observations

4.4.1.16 The Association was advised that a new programmatic structure for the development and maintenance of aircraft-based observations and the WMO AMDAR observing system had now been established within the WMO Technical Commissions, CBS and CIMO.

4.4.1.17 The CBS Expert Team on Aircraft-based Observing Systems, in line with the global actions on Aircraft Meteorological Stations within the CBS, Implementation Plan for Evolution of the Global Observing System, WIGOS Technical Report No. 2013–4, has offered to collaborate with each WMO Regional Association towards the development, maintenance and application of regional aircraft-based observations implementation plans.

4.4.1.18 The Association noted with satisfaction that two AMDAR projects were already underway in the Region, carried out by the National Meteorological or Hydrometeorological Services of Brazil and Argentina. Those projects had been presented during the recent RECO conference held in Asuncion, Paraguay, from 11 to 13 September 2014, in conjunction with the extraordinary session of the Commission for Basic Systems (CBS).

4.4.1.19 The Association also acknowledged the contribution of the Argentinian NMS to the Spanish translation of the manual entitled *Requirements for the Implementation and Operation of an AMDAR Programme* (WIGOS, Technical Report No. 2014-02).

4.4.1.20 The Association agreed to keep the AMDAR development as one of the priority tasks of the regional WIGOS implementation, and requested the Working Group on Infra-structure and Technological Development (WG-ITD) to be responsible for planning and coordination of regional activities on aircraft-based observations coverage improvement over South America.

Cryospheric observations and Global Cryosphere Watch (GCW)

4.4.1.21 The Association expressed its interest in the on-going development of the Global Cryosphere Watch (GCW) as reported to EC-66, the recent availability of the GCW Implementation Plan and a need for the engagement of experts from RA III in GCW activities. Members were urged to provide comments on the GCW Implementation Plan and to indicate those activities in which they would like to be engaged. It urged those Members that routinely measure solid precipitation and snow and ice parameters to consider the establishment of GCW reference sites as part of GCW's CryoNet initiative. The Association urged interested Members to nominate national focal points for GCW activities and to review and provide the EC Panel of Experts on Polar Observations, Research and Services (EC-PORS) with information on how GCW could help them.

WMO polar activities

4.4.1.22 The Association acknowledged the importance of WMO polar initiatives and the need for on-going coordination of activities with the regional associations and technical commissions. It urged Members to review and comment on the International Polar Partnership Initiative (IPPI) Concept for follow-on activities in the Polar Regions and to provide their guidance on what the role of WMO could be in the IPPI.

Terrestrial observations – Water cycle

4.4.1.23 The Association noted the importance of information exchange standards such as WaterML 2.0 and supported the potential adoption of WaterML 2.0 as a WMO standard for information exchange managed by WMO (supported by the WMO/OGC MOU), subject to the successful implementation of the testing programme proposed.

4.4.1.24 The Association encouraged further work by WMO in the evaluation of the usefulness and suitability of the HY_Features model to WMO applications.

4.4.1.25 The Association noted further that CHy-14 had invited Members that had developed good practices in the use of radar data for nowcasting in operational hydrology to support the AWG member responsible for Data Operations and Management (Tony Boston (Australia)) in providing guidance, advice and training in this regard. The Commission also recommended better communication with the satellite community in order to understand the capabilities and limitations of satellite data and to make satellite-based information and products for hydrological purposes available to National Meteorological and Hydrological Services (NMHSs).

4.4.1.26 The Association was informed of the progress in the development of a plan for the implementation of the Oiapock-HYCOS project between Brazil and French Guyana.

Instrument standards and best practices

4.4.1.27 The Association recalled that Cg-XVI stressed that Regional Instrument Centres (RICs) should provide effective support to Members in ensuring the traceability of their standards and reaffirmed the need to regularly assess their capabilities making use of the evaluation scheme that was developed to this effect. The Association noted that Regional Radiation Centres (RRCs) should provide support to Members for the traceability of radiation measurements. The Association requested its Members hosting RICs and RRCs to reconfirm their on-going willingness to provide these facilities and their compliance with the relevant Terms of Reference of these centres at the latest by December 2014 as they play a crucial role in ensuring traceability of measurement to the International System of Units (SI), and capacity building which is fundamental for the development of WIGOS.

4.4.1.28 The Association noted the support expressed by Congress and the Executive Council to the further development of the Siting classification for observing stations on land that was published in the *Guide to Instruments and Methods of Observations* (WMO-No. 8), as

a common ISO-WMO standard. The Association urged its Members to implement this classification and to share experience gained in this process.

4.4.1.29 The Association noted that CIMO proposed to carry out an extensive revision and update of the *International Cloud Atlas – Manual on the Observation of Clouds* (WMO-No. 407, Volumes I and II), parts of which constitute Annexes to WMO *Technical Regulations* (WMO-No. 49). This would make it the undisputable web-based global reference standard for the classification and reporting of clouds and meteors. The Association noted that funding had to be identified for this activity as the document had not been updated since 1975 (Volume I) and 1987 (Volume II) and no technical commission was in charge of this document since then. In view of the importance of this document to Members, in particular for developing countries which still make extensive use of human observers, the Association strongly supported this proposal and recommended that funding possibilities be identified to develop this new edition.

4.4.1.30 The Association expressed its appreciation for the on-going Solid Precipitation Intercomparison Experiment (SPICE) activity under the lead of CIMO, within which substantial progress is expected in the understanding and calibration of solid precipitation measuring equipment. It further stressed that the measurement and exchange of cryospheric data at synoptic and climate stations, where appropriate, but particularly in mountain and high land regions, would be especially useful to meet the operational, research and service needs of weather, climate, hydrology and environmental science nationally, regionally and globally. The Association noted that one RA III site (Tapado, Chile) was taking part in the WMO Solid Precipitation Intercomparison Experiment (SPICE), which encompasses overall 20 sites in 15 countries with instruments of 30 different types in various set-ups. The main measurement phase will last 2 winters, until 2014/15. The Association welcomed the plan to complete the data analysis and publish the final report of the intercomparison by 2016 in spite of the complexity of the experiment and noted that external resources would be needed for this purpose. It, therefore, encouraged its Members to support this initiative either by secondment of experts for the data analysis or through financial contribution to the CIMO Trust Fund.

Radio frequency coordination

4.4.1.31 The Association recalled Resolution 11 (EC-64) on radio frequencies for meteorological and related environmental activities. It noted that its Members, both individually and through the participation in the CBS Steering Group on Radio Frequency Coordination (SG-RFC), had contributed significantly to the WMO success at the International Telecommunication Union (ITU) World Radiocommunication Conference 2012 (WRC-12) in protection of the existing and providing additional radio-frequency spectrum employed by meteorological and Earth observation systems and applications. However, there remains increasing pressure to share (also allocate) radio-frequency bands used for meteorological purposes that could impact on Members' operations, in particular their observing systems.

4.4.1.32 The Association noted Resolution 9 (EC-65) relating to the ITU World Radiocommunication Conference 2015 (WRC-15) to be held in November 2015. It further noted EC-66 had restated the need to keep Resolution 9 (EC-65) as a priority and that according to the WMO Preliminary Position Paper on WRC-15 Agenda (<http://wis.wmo.int/file=965>) there are many WRC-15 Agenda items that may affect the operation of systems/applications of NMHSs. As most countries in RA III are members of the Inter-American Telecommunication Commission (CITEL), which is one (out of six) of the regional telecommunication organizations participating in the ITU preparation to WRC-15, the Association emphasized the necessity of appropriate representation of meteorological requirements/interests in the relevant national and CITEL activities. It further noted that Permanent Representatives in RA III should endeavour to ensure that the WMO Position on radio-frequency matters is made known to their national and CITEL representatives.

4.4.1.33 The Association noted the pressure to share frequencies presently allocated to radiolocation, meteorological satellite and Earth observation radiocommunication services and used by systems/applications for meteorological and related environmental observations with International Mobile Telecommunication (IMT) and Radio Local Area Network (RLAN) systems.

Of special concern to RA III WMO Members are the initiatives from countries in RAs IV and VI to allocate to the mobile service and identify to RLAN C-Band frequency range 5 350–5 470 MHz. This frequency range is allocated to the Earth exploration satellite (active) and radiolocation services, and used, in particular, by the Synthetic Aperture Radars (SAR) for remote sensing from satellites (e.g. Sentinel and Radarsat) as well as ground-based weather radars. Studies to date show that the use of RLAN systems in this frequency range could have significant negative impact on the above-mentioned systems/ applications. This in turn relates to RA III's current and future use of these remote sensing systems for improved environment monitoring, disaster prediction and warning systems, especially in remote areas.

4.4.1.34 In order to protect present and future services provided by NMHSs for timely warning of impending natural and environmental disasters, accurate climate prediction and detailed understanding of the status of global water resources, it is essential that WMO Permanent Representatives ensure that national positions on radio frequency matters recognize the results of studies related to sharing of frequency bands allocated for meteorological and related environmental activities with other radiocommunications systems and especially that IMT/RLAN systems are made available to the wider radio frequency management community.

4.4.1.35 The Association supported the need for all Members to participate actively in national, regional and international activities on radio frequency spectrum regulatory and use issues in order to defend radio frequency bands used for meteorological and environmental activities. Noting the draft "WMO Strategy on Radio Frequency Protection for Meteorology" developed by the SG-RFC and provided to EC-65 as an information document (<http://ec-65.wmo.int/information-papers-e-f>), the Association requested CBS to provide, as a matter of priority, guidance material for NMHSs on radio frequency coordination and on how to effectively participate in this important activity.

4.4.2 WMO Space Programme (agenda item 4.4.2)

Continuity of satellite observations

4.4.2.1 The Association recalled the vital role of satellite observations from various orbits for permanent weather monitoring, and forecasting. It also recognized that in addition to operational meteorology, space-based observations cut across all component observing systems of the WIGOS, with satellite capabilities contributing to observing and monitoring climate and climate change, ocean surface, atmospheric composition, hydrological and cryosphere variables, space weather, etc.

4.4.2.2 In particular, the Association underlined the importance of frequent geostationary satellite observations to support nowcasting and very short-range forecasting and recalled the valuable service provided by the United States through the operation of a relocated GOES satellite delivering 15-minute imagery over South America from December 2006 to August 2013. Following the termination of this GOES-South America mission, the Association welcomed the measures taken by NOAA to optimize GOES-East operations, in close consultation with experts from RA III and RA IV Members, with a view to ensure at least hourly coverage of most of the Region during rapid-scan operation over North America.

Access to satellite data and products

4.4.2.3 Recalling EC-65 Resolution 12 - Regional Requirements for Satellite Data Access and Exchange, the Association confirmed the need for a standing regional mechanism enabling a structured dialogue between regional satellite data user communities and satellite operators. Such a mechanism should raise users' awareness of available satellite data, foster the expression of user requirements, and improve data access and exchange. Since both RA III and RA IV rely heavily on the same NOAA geostationary satellites operated by the United States, a joint mechanism can be an efficient way to address these issues.

4.4.2.4 The Association acknowledged the useful role played by the Coordination Group on Satellite Data Requirements for RA III and RA IV established in 2012 in response to an invitation

from the Secretary-General. This group currently includes experts from seven RA III and RA IV Members (Argentina, Brazil, Canada, Colombia, Chile, Trinidad and Tobago, and the Bolivarian Republic of Venezuela) and three satellite operators (CONAE, EUMETSAT, NOAA). It has documented initial user requirements which led to improved data services via the GEONETCast-Americas and EUMETCast dissemination systems; it contributed to a better understanding of the value of satellite data for regional applications; furthermore, it has facilitated a coordinated input from satellite data users in South America, allowing NOAA to refine the specification of geostationary image coverage of the South American continent by GOES-East as indicated above.

4.4.2.5 The Association considered recognition of this joint group as a technical advisory body of the RA III Working Group on Infrastructure and Technology Development under agenda item 5.3. It noted that the Group had worked primarily through teleconferences, with face-to-face meetings typically once every two years on the occasion of a regional satellite conference, subject to availability of funding. Corresponding resources should thus be planned. The Group would continue to be supported by the WMO Secretariat, through the Space Programme office and the Regional Office for the Americas. The Terms of Reference for the Group are laid out in [Annex II to the present report](#). The Association is interested in continuing to use the EUMETCast-Americas system, as already mentioned in various declarations of the Ibero-American Conference of Directors of Meteorological and Hydrological Services (CIMHET), and in increasing as far as possible the number of GOES satellite products distributed through this system.

Preparing users to new generation of geostationary satellites

4.4.2.6 The Association noted with appreciation that in 2016 the United States are planning to launch the new-generation geostationary satellite GOES-R, which is expected to deliver considerably improved support for nowcasting and a range of applications, thanks to an advanced 16-channel imager and a lightning mapper. Recalling the CBS Guideline for Ensuring User Readiness for New Generation Satellites, adopted by CBS-15, it stressed the need to actively prepare to access and use the future GOES-R data and services. The Association noted with appreciation the preparatory activities undertaken by NOAA through the GOES-R Proving Ground Program and highlighted the importance of keeping the regional user community informed of early technical information on data access and utilization. In this respect, it welcomed the establishment of the online Satellite User Readiness Navigator (SATURN) by the WMO Secretariat to facilitate discovery and diffusion of such information (<http://www.wmo-sat.info/satellite-user-readiness/>).

4.4.2.7 The Association recommended a special training effort to prepare for the new-generation satellite and encouraged all Members to set up internal user preparation projects at the national level, in accordance with the CBS-15 Guidelines.

Transition scenario

4.4.2.8 The Association noted that the implementation schedule of the GOES-R series would be finalized by NOAA at a later stage taking into account the health of GOES-13, 14 and 15 and the need to maximize the operational life of the spacecraft. Depending on whether the new spacecraft is put in GOES-West, GOES-East or in a storage location, the actual operational start of a new-generation GOES over South America may vary by several years. The Association recognized this uncertainty as an additional difficulty to plan and engage the investments needed for new GOES receiving stations. As no parallel operation is foreseen between the current and the future generation, there is a high risk that some Members will remain unprepared and that the switch to GOES-R (or GOES-S) will result for them in a temporary disruption of the operational service.

4.4.2.9 The Association noted the importance, as highlighted by the CBS Expert Team on Satellite Utilization and Products (ET-SUP), to facilitate a seamless transition to GOES-R for RA III users, and the suggestion from ET-SUP to disseminate a subset of pre-operational GOES-R data through an independent means as a risk reduction measure. The RA III/IV Coordination Group on Satellite Data Requirements (SDR), mentioned in 4.4(2).4 above, was instrumental in meeting South American GOES-East user needs in the region. It is therefore recommended that the SDR

monitor the GOES NOP to GOES-R transition and coordinate the related activities. NOAA will provide users with more details at the 2015 NOAA Satellite Conference.

Building capacity in the use of satellite data and products

4.4.2.10 The Association recalled the role of the two Centres of Excellence of the Virtual Laboratory for Education and Training in Meteorology (VLab) in Brazil and Argentina, sponsored by NOAA/NESDIS. The Association noted in particular that a number of training sessions have been organized in Brazil over the past years and encouraged both centres to continue to take an active role in regional user training. It also welcomed the organization of virtual sessions, online weather briefings and webinars (e.g. recent webinar on “GEONETCast Americas: Remote Sensing Tools for Decision Making Environmental Phenomena and Disasters in Latin America and the Caribbean” provided in July 2014 by NOAA/NESDIS). The two Centres of Excellence have also contributed to the Conceptual Models for Southern Hemisphere (CM4SH) project, together with Australia and South Africa. It also acknowledged the usefulness of the courses on operational use of data from meteorological satellites, offered since 2003 in the framework of the training activities suggested by CIMHET in collaboration with EUMETSAT.

4.4.2.11 The Association underlined the usefulness of regional satellite users conferences to increase user awareness and exchange of experience. It noted that the 2015 NOAA Satellite Conference would be held in Greenbelt, Maryland from 27 April to 1 May 2015 and encouraged Members to participate.

Space weather

4.4.2.12 The Association noted that the Inter-Programme Coordination Team on Space Weather (ICTSW) included experts from 23 WMO Members, including one RA III Member (Brazil). It invited other Members with national observation capabilities of the sun, the solar wind, the magnetosphere, the ionosphere or the geomagnetism to contribute to this activity. Furthermore, it raised the attention of Members that Space Weather information was under consideration by the International Civil Aviation Organization (ICAO) to be included in future requirements for “meteorological” services in support of international air traffic navigation.

4.4.3 WMO Information System (agenda item 4.4.3)

WIS Implementation Plan

4.4.3.1 The Association expressed its appreciation to the RA III Working Group on Infrastructure and Technological Development (WG-ITD) for the Regional WIS Implementation Plan (see [annex to Resolution 8 \(RA III-16\)](#)). It noted that the plan aims to assist RA III Members to implement WIS functionality in their National Meteorological and Hydrological Services (NMHSs) and other identified national centres (NCs) or Data Collection or Production Centres (DCPCs) in order to become effective WIS users in a timely and harmonized manner.

4.4.3.2 Noting the objective set by the Sixteenth World Meteorological Congress (Cg-XVI) for achieving the implementation of WIS in all NMHS national centres by 2015, the Association highlighted the important role the national WIS Focal Points have in the coordination and monitoring of WIS implementation as well as authorizing access to WIS (for the terms of reference of national WIS focal points see http://www.wmo.int/pages/prog/www/CBS/Lists_WorkGroups/CBS/cross-cutting/fp%20wis-gts/tors). The Association emphasized that all Members should have clearly identified National Focal Points for WIS and should keep the WMO Secretariat informed of any changes of the status and operation of their centres and/or changes of their focal points information.

4.4.3.3 The Association thanked Argentina and Brazil for the demonstrations of WIS functionality at TECO and at this sixteenth session of RA III. It highlighted that the implementation of WIS functionality can be achieved internally by upgrading a Member’s current information management and message switching system, or by making use of the remote WIS services

offered at the GISCs or RTH Buenos Aires complementing their current GTS and Internet connectivity. The Association encouraged its Members to ensure that WIS functionality was taken into consideration in future information management and message switching systems. The Association highlighted that regardless of which technical solution is chosen for implementing WIS, a major effort will be required by centres to ensure staff are appropriately trained in the skills required to use WIS effectively in their activities. It noted the progress in the work of CBS in identifying WIS competencies and learning guides and encouraged Members to take advantage of this information in the implementation and sustainability of their WIS functionality. In this regard, it should be noted that WIS competencies and learning guides are in development and can be viewed at <http://wis.wmo.int/file=687> (competencies) and <http://wis.wmo.int/file=689> (training and learning guide).

4.4.3.4 The Association reminded its Members that, in order to derive benefits from WIS, accurate WIS Discovery Metadata records describing the information provided through the WIS needs to be ensured. This includes registering data and products available for national usage. It further encouraged its Members to enable their national web pages to include remote search of their Principal GISC metadata catalogues to facilitate national users' access to all WIS data and products.

4.4.3.5 The Association noted that RA III was still to connect to the WIS Core Network as required by the *Manual on the WMO Information System* (WMO-No. 1060). It expressed its appreciation to Argentina and Brazil for maintaining its interim arrangements through GISC Washington and encouraged GISC Brasilia and RTH Buenos Aires, as a part of the regional implementation of WIS, to finalize the desired full connectivity to the WIS core network as soon as possible. It appreciated that the current Internet-based structure of the RA III RMTN had proven reliable and effective; however, it considered there was still room for improvement and noted that an important activity for the infrastructure of the Region for the coming cycle should be to review the network architecture and technology to modernize the infrastructure and practices. The Association adopted [Resolution 8 \(RA III-16\) – Regional WIS Implementation Plan](#).

WIS Discovery Metadata

4.4.3.6 The Association agreed that the WIS Discovery Metadata allows users to find out what information is available through the WIS, and entries within metadata records control how GISCs serve information to users in response to requests for subscriptions or ad hoc delivery. The initial WIS Discovery Metadata records for information exchanged on the GTS were derived from Volume C1 using an automated tool. The Association urged its Members to review the WIS Discovery Metadata records that correspond to information the Members generate and to correct the records, if needed, to reflect more accurately the information provided. The Association reminded its Members that metadata records describing information that Members are willing to share but that are not exchanged as a matter of routine could also be provided.

Migration to Table Driven Code Forms

4.4.3.7 The Association noted the progress made in migrating to Table Driven Code Forms (TDCF) was well behind that required for the November 2014 deadline. Emphasizing the approaching deadline, the Association reminded Members of the need to prioritize preparation for the migration. It noted that the Members needed to consider their ability to display non-TAC data and products as well as their ability to transmit in TDCF, in particular observations in BUFR. It noted the recommendation of the workshop on TDCF Migration conducted in Uruguay in November 2013 and stressed that all Members should make their best effort to meet the deadline and that any Member experiencing problems should notify the WG-ITD and Regional Office for the Americas and ask for assistance.

4.4.3.8 The Association reminded Members that some information will only be available in TDCF. Zero snow depth, for example, cannot be reported unambiguously in TAC, but knowing that there is no snow is essential for creating climate statistics.

4.4.4 Global Climate Observing System (agenda item 4.4.4)

4.4.4.1 The Association recalled that undertaking the actions identified in the 2010 updated Implementation Plan for the Global Observing System for Climate in Support of the United Nations Framework Convention on Climate Change (UNFCCC) would address many of the needs for climate observations in support of the Global Framework for Climate Services (GFCS). The Association was reminded of the importance of a strengthened Global Climate Observing System (GCOS) to the successful implementation of the GFCS, recognizing that observations and monitoring constitute one of its essential pillars. The Association reiterated its urgent call to Members to assist and advise international and national organizations in the implementation of the global observing systems for climate.

4.4.4.2 The Association was informed on the next steps of the GCOS improvement and assessment cycle. At the thirty-seventh session of the Subsidiary Body for Scientific and Technical Advice (SBSTA) of the UNFCCC in November 2012, GCOS was invited to submit an assessment of the adequacy of the global observing system for climate to SBSTA in 2015, and a new Implementation Plan in 2016, with a draft of the latter encouraged to be provided one year before. The Association noted the recommended planning and requested that the GCOS Secretariat report back on the process at the next Association session.

GCOS expert panels for land, atmosphere and oceans

4.4.4.3 The Association noted that the GCOS/GTOS/WCRP Terrestrial Observation Panel for Climate (TOPC) had held its sixteenth session from 10 to 11 March 2014, at the Joint Research Centre (JRC) of the European Commission, in Ispra, Italy. TOPC reviews the climate observing components of terrestrial global observing systems and is managed by the GCOS Secretariat. This years meeting focused on discussing the status of terrestrial ECVs in light of the next GCOS assessment cycle, as well as in regard to the adequacy of the global observing system on climate in the next two years to come.

4.4.4.4 The Association noted the most recent outcomes of the GCOS/WCRP Atmospheric Observation Panel for Climate (AOPC), which met for its 19th session from 9 to 11 April 2014, at JRC, in Ispra, Italy. Members commended the Panel's work as an efficient platform for discussions on the climate components of existing research and operational atmospheric observing systems and the related programmes, including important cross-cutting links to the World Climate Research Programme (WCRP) as well as to the Global Atmosphere Watch (GAW) Programme. The Members appreciated in particular the Panel's work on the GCOS Surface Network (GSN), the GCOS Upper-Air Network (GUAN) and the GCOS Reference Upper-Air Network (GRUAN). The Association requested the Panel, in its future sessions, to continue to advise explicitly on climate observing elements of the WMO Integrated Global Observing System (WIGOS), and to ensure that there is full cooperation between GCOS, WIGOS and the WMO Information System (WIS) as they develop. It was noted that the AOPC was preceded by an expert meeting from 7 to 8 April 2014 which discussed the principal design and quality criteria of the GSN and GUAN.

4.4.4.5 The Association was informed that following the approval of the Framework for Ocean Observations the panels of the Global Ocean Observing System (GOOS) have been reorganized. GOOS will now be overseen by a steering committee and three panels for Ocean Physics, which is equivalent to GCOS Ocean Observations Panel for Climate (OOPC), Biogeochemistry (the International Ocean Carbon Coordination Project will expand to include nutrients and oxygen) and a new Biology Panel. At the sixteenth session of the OOPC, a workplan for the coming five years was developed. Key tasks included coordinating an evaluation of the Tropical Pacific Observing System (TPOS), reducing uncertainty in air-sea flux estimates and identifying requirements for observations of western boundary currents. The panel is also expected to expand its focus to the coastal oceans and shelf seas. The Evaluation of the TPOS was the first priority of the panel: in particular, due to the challenges in sustaining the Tropical Atmosphere Ocean (TAO/TRITON) mooring array across the Tropical Pacific: the backbone of the El Niño-Southern Oscillation (ENSO) monitoring system. A TPOS 2020 workshop was held at Scripps Institution of Oceanography, San Diego, 27–30 January 2014, involving both scientists and agency

representatives with an interest in the Tropical Pacific region. The seventeenth session of the OOPC was held in Barcelona, Spain, from 21 to 23 July 2014. The Association recognized the impact of the reduction of ocean observations in the Tropical Pacific to monitor and predict ENSO. The Association urged the WMO Secretariat to coordinate with IOC and Permanent Commission for the South Pacific (CPPS) to identify the potential support for TAO-TRITON array (i.e. ship time for equipment maintenance) and to explore the potential contributions from the region to the TPOS 2020 which is a finite lifetime project to oversee the transition of the Tropical Pacific Observing System to be more robust, integrated and sustainable and to meet future needs.

4.4.4.6 In the context of the GCOS Panels' work, the Association noted the importance of liaising closely with space agencies on dedicated space-based observations for climate, in particular through the Committee on Earth Observation Satellites (CEOS), the Coordination Group for Meteorological Satellites (CGMS), the WMO Space Programme and their development of the architecture for climate monitoring from space. The Association recommended that progress and future needs in the development of the architecture for climate monitoring from space be addressed in the next GCOS Adequacy Report and requested the GCOS Secretariat to remain engaged in the next stages of development and implementation of the architecture.

GCOS Reference Upper-Air Network (GRUAN)

4.4.4.7 The Association noted that the implementation of GRUAN has progressed steadily over the past years and initial GRUAN-quality data can be accessed at NOAA's National Climatic Data Center (NCDC). As the GRUAN currently consists of 16 initial reference sites, which are predominantly located in the Northern Hemisphere mid-latitudes, the Association encouraged its Members to support GRUAN operations, in particular in arctic and tropical regions, and also to collaborate with scientific institutions to reach better global coverage over major climatic zones. It welcomed the exemplary collaboration between an operational service and a scientific institution at the new GRUAN site of Ny-Ålesund. The Association also noted that criteria for site assessment and certification, and the process for implementation, had been developed. It encouraged those Members maintaining GRUAN sites to undergo the formal GRUAN certification and assessment process. The Association welcomed that representatives of the WMO Technical Commissions (CBS, CIMO, CAS and CCI) are now officially represented at the Working Group on GRUAN. It was recognized that whilst good progress has been accomplished in implementing the GRUAN, funding the operation of reference sites was an ongoing challenge. The Association urged its Members to work with GRUAN and the GCOS Secretariat to ensure the long-term sustainability of the network.

GCOS cooperation mechanism

4.4.4.8 The Association recognized that the cooperation mechanism of the GCOS programme to improve climate observation networks, most recently focused in RA I and parts of RA III and RA V, has made good progress in improving the coverage and performance of the networks. In addition, good progress was made in obtaining CLIMAT reports from the Regional Basic Climatological Network (RBCN) stations. The Association noted that strengthening of such networks was an important requirement for an effective GFCS. The GCOS Steering Committee had noted in its last session that many Members of WMO were not preparing and sending CLIMAT reports from all of their listed RBCN stations. The Association recalled the recommendation of Congress that Members were encouraged to expand these networks and urged Members to take appropriate actions.

4.4.4.9 The Association emphasised the importance of the GCOS for the Region, especially given the vulnerability of many Members to the impact of climate change. The Association explicitly thanked Germany, Japan, Switzerland and the United Kingdom of Great Britain and Northern Ireland who have contributed to the GCOS Cooperation Mechanism in the past four years. In particular, the Association thanked the Government of the United Kingdom (Department of Energy and Climate Change) and the UK Met Office who support the position of the GCOS Implementation Manager in the GCOS Secretariat since 1 March 2013. The Association urged Members and the Secretary-General, with the

support of the GCOS Secretariat, to continue efforts to mobilize additional resources to maintain an effective and sustainable GCOS network in the Region.

4.4.4.10 The Association thanked the Government of Chile and the Dirección Meteorológica de Chile for their hospitality in hosting a very successful bi-annual CBS Lead Centre meeting for GCOS, in Santiago, Chile from 8 to 10 October 2013. This meeting focused on the Quality Management service provided by these Lead Centres, in terms of monitoring the network, diagnosing any issues and their methods of communication.

4.4.5 Climate data management and applications (agenda item 4.4.5)

Climate data management

4.4.5.1 The Association was informed on the outcome of the WMO survey on the implementation of climate database management systems by Member's National Meteorological and Hydrological Services (NMHSs). The survey reveals that more than half of the 137 responding Members do not have a proper or fully operational Climate Management Data System (CDMS) in place. The Association agreed that concerted efforts are needed to improve availability of, and access to, quality controlled and long-term climate data that is needed for research, applications and climate services.

4.4.5.2 The Association recalled the availability of a variety of CDMS solutions that Members can use in undertaking essential climate data management functions at national level, including, among others, solutions to those CDMS that have been evaluated and made available through WMO.

4.4.5.3 The Association further appreciated the recent development and implementation of open source based systems, which includes MCH (Meteorological, Climatological and Hydrological Database Management System; developed and offered to WMO Members by Mexico and Spain) and CliDE (Climate Data for the Environment, developed and offered to WMO Members by Australia). The Association welcomed the efforts being taken by CIIFEN and NMHSs in the Andean countries, including the Plurinational State of Bolivia, Colombia, Ecuador and Peru on developing modern and inter-operable systems which integrates meteorological and hydrological databases as part of the regional Andean Programme to Enhance Weather, Water, Climate Services and Development (PRASDES) project, which is funded by the Government of Finland.

4.4.5.4 The Association welcomed the Commission for Climatology's (CCI) efforts and its Expert Team on Climate Database Management Systems in developing a CDMS specifications publication. The publication provides guidance for developing and acquiring suitable CDMSs in compliance with new and evolving technological requirements and standards. CCI-16 endorsed the *Climate Data Management Specifications* (WMO-No. 1131).

4.4.5.5 The Association noted with concern the induced relative costs for upgrading CDMSs or acquiring new ones, which poses financial challenges to some countries due to incurred relatively high fees related to software licenses, installation and training. The Association further encouraged Members to actively create sub-regional CDMS user groups as a cost-effective means of CDMS modernization, maintenance and information sharing.

Data rescue (DARE)

4.4.5.6 The Association recalled WMO Resolution 16 (Cg-XVI) on climate data requirements which decided that priority be given to accelerating rescue and digitization of climate records and promoting global and regional initiatives to collaborate on Data Rescue (DARE) and the exchange of related scientific knowledge and technological advances. It further recalled that accelerating DARE is one of the priority projects of the GFCS implementation plan.

4.4.5.7 The Association appreciated the progress made in DARE activities carried out in the Region with the support and guidance from CCI, and implementation support given by various

international and regional projects and programmes, such as WMO DARE, CIIFEN, IEDRO, ACRE in close collaboration with NMHSs and universities in the Region.

4.4.5.8 The Association further urged Members to work individually and collectively to make all possible efforts to mobilize the required financial and human resources to accelerate the preservation, recovery and digitization of all climate records, hence preventing unparalleled climate observations from unrecoverable deterioration.

4.4.5.9 The Association welcomed CCI's plan to develop an International Data Rescue portal (I-DARE) to inform on data rescue activities worldwide and provide information services on data inventories, best practices and technologies that will help Members in carrying out Data Rescue more effectively and efficiently.

4.4.5.10 The Association urged Members to work closely with WMO and CCI on I-DARE with provision of suitable expertise, infrastructure and financial resources that the project may require during its implementation phase. A white paper has been produced by the CCI Task Team on Data Rescue.

World Weather Records (WWR)

4.4.5.11 The Association recalled Resolution 16 (Cg-XVI) on climate data requirements and the subsequent Resolution 14 (EC-64) on the submission of the ten year WWRs of the period pertaining to 1991–2000 and 2001–2010, and the shift from the ten year to an annual submission, which should apply to the WWRs of 2011 and onwards. It urged Members who have not yet submitted their WWRs to do so as soon as possible.

International Climate Assessment and Dataset (ICA&D)

4.4.5.12 The Association welcomed CCI and Members' efforts to extend the concept of the European Climate Assessment and Dataset (ECA&D) to a more International Climate Assessment and Dataset initiative under WMO/CCI auspices (ICA&D) to support GFCS product generation and services. ICA&D aims at providing access to high-quality station data sets with a daily resolution and producing climate monitoring and climate change information. The Association appreciated the implementation of this system in the South American Region, namely the Latin America Climate Assessment & Dataset (LACA&D), which is hosted by CIIFEN in close collaboration with several contributing Member countries in the Region; with technical support provided by KNMI. It urged Members to collaborate enthusiastically with the RCCs of the Region - designated or in the pilot phase - in fulfilling their mandatory data management function, by sharing the required data and metadata necessary for the regular provision of derived climate products and services to the contributing countries and to produce high-quality gridded data sets for the South American Region.

WMO climate normals

4.4.5.13 The Association took note of a proposal for amending the WMO Technical Regulations concerning the provision and updates of Climate Normals. The new model, endorsed at EC-65 and CCI-16, comprises: (i) a varying 30 year period updated every 10 years (Climatological Standard Normal); and (ii) a fixed reference period (1961–90) for long-term climate variability and change assessment. This reference period should be applied until such time as there is a compelling scientific case for changing it.

Global Data Management Framework for Climate

4.4.5.14 The Association welcomed the CCI plan to work closely with other Commissions and programmes to set up a high-quality global data management framework for climate. The aim of this initiative is to establish a global infrastructure for ensuring that climate-relevant data are consistently managed, at global, regional and national levels, using a commonly agreed and well described minimum set of procedures, regulations and system specifications.

Training and capacity development

4.4.5.15 The Association reiterated the need for climate data related capacity building including training in the Region to further raise the profile of its Members' NMHSs as well as to underpin climate service capabilities where required. In this regard, the Association welcomed the multitude of capacity building activities in the Region in the domains of climate data management, CDMS implementation and data rescue.

4.5 Research and technology development (agenda item 4.5)

4.5.1 World Climate Research Programme (agenda item 4.5.1)

4.5.1.1 The Association noted with satisfaction the wide array of activities that the World Climate Research Programme (WCRP) is conducting globally and in the Region. The Association recalled with appreciation that WCRP organized the very successful Open Science Conference (OSC) entitled "Climate Research in Service to Society" (<http://conference2011.wcrp-climate.org>) (Denver, Colorado, United States, October 2011) which attracted over 1,900 participants including a number of researchers from Latin America. A major emerging theme from the OSC was the science support to climate-reliant decision-making. The highlight of regional WCRP activities since the fifteenth session of the Association has been the WCRP Conference for Latin America and the Caribbean: Developing, linking and applying climate knowledge" (<http://www.cima.fcen.uba.ar/WCRP>) (Montevideo, Uruguay, March 2014) hosted by the Universidad de la República de Uruguay. The Association noted the relevance of the outcomes of the Conference to the Region and that strengthened linkages between academic and operational entities will be essential in order to translate research results emanating from the Conference into operational improvements. The 34th session of the WCRP Joint Scientific Committee (JSC) took place in Brasilia, Brazil, in May 2013. The 20th session of the WCRP SPARC Project Scientific Steering Group and a regional meeting on stratospheric research were held in November 2012 in Buenos Aires, Argentina. A joint meeting of the GEWEX Hydroclimatology and Data and Assessments Panels took place in September 2013 in Rio de Janeiro, Brazil.

4.5.1.2 The Association was pleased to note that as result of the community consultation culminated at the OSC in Denver, the WCRP JSC had identified six Grand Science Challenges as follows:

- (a) Provision of skilful future climate information on regional scales;
- (b) Regional sea-level rise;
- (c) Cryosphere in a changing climate;
- (d) Clouds and climate sensitivity;
- (e) Changes in water availability; and
- (f) Prediction and attribution of extreme events.

These research topics had been identified by WCRP as scientific challenges of particularly high societal importance and as areas of research in which it is possible to expect significant progress within the next five to ten years. They will also serve as unifying themes across the four WCRP core projects and the various working groups. The Association noted that WCRP and its constituencies were developing implementation plans for the Grand Challenges. It emphasized that progress in the research on provision of skilful regional future climate information and climate extremes would be of high importance for the Region.

4.5.1.3 The Association noted with appreciation that WCRP led the development of the Research, Modelling, and Prediction Annex to the GFCS Implementation Plan, which was endorsed by the first session of the Intergovernmental Board on Climate Services in July 2013.

The Association noted that the Annex pays significant attention to the development of regional climate services. The research activities for the GFCS aim at establishing partnerships to conduct effective research in areas of initial priority for the GFCS and making the wealth of experimental climate information available to users. They will also create a scientific basis for account of climate information uncertainty in decision-making and will address a number of pressing science issues such as improved understanding of predictability and skill of prediction technologies.

4.5.1.4 The Association took note with interest that the WCRP JSC at its 34th session (Brasilia, Brazil, May 2013) endorsed the Earth System Grid Federation (ESGF) as a WCRP-recommended data and information access mechanism. Through ESGF, WCRP is enabling access to the climate model outputs and observational products for all scientists in the world, with data being available on the same grid, uniformly formatted and documented through the WCRP-led Observations for Model Intercomparison Projects (Obs4MIPs) initiative. The first WCRP initiatives that use this mechanism are the Coupled Model Intercomparison Project (CMIP), seasonal predictability experiments under the Climate system Historical Forecast Project (CHFP, with a core data node in Buenos Aires), and the Coordinated Regional Downscaling Experiment (CORDEX). The Association recommended to Members to study effective ways of accessing and evaluating the vast amount of research-based climate information that WCRP makes available through ESGF.

4.5.1.5 The Association also noted with appreciation a major contribution of WCRP and its affiliated scientists to the Fifth Assessment Report of IPCC, especially to the WG I Report "Climate Change 2013: The Physical Science Basis". The WCRP intercomparison experiment CMIP Phase 5 (CMIP5) provided an unprecedented dataset of model projections, which were widely used around the world to study climate variability and change and the impacts of climate change. The CMIP5 output constituted the basis for more than 350 scientific publications. The Association was pleased to learn that WCRP is now working on the design of CMIP6, which is expected to make climate predictions even more robust and comprehensive.

4.5.1.6 The Association recognized significant progress on a number of research priorities pursued by WCRP, including, but not limited to, some issues of high importance for RA III. Major achievements have been made in advancing understanding of regional climate, especially through the successful implementation of the Coordinated Regional Downscaling Experiment (CORDEX) in many regions of the world. The WCRP Conference in Latin America and the Caribbean identified several research priorities for supporting the development of climate services in the Region. WCRP will take into account these scientific issues in order to articulate a regional research agenda that builds on the achievements of the CLIVAR VAMOS study (1998–2013). The Association noted plans of WCRP CLIVAR and GEWEX projects to establish a WCRP CLIVAR/GEWEX Monsoons Panel with a working group on American Monsoons. This new initiative may benefit from a number of recent WCRP research activities in the Region such as MESA (Monsoon Experiment South America), SALLJEX (South American Low Level Jet Experiment), and VOCALS (CLIVAR VAMOS Ocean-Cloud-Atmosphere-Land Study). A high priority topic for regional research pursued by WCRP CLIVAR is evolution and predictability of ENSO in a changing climate. The Association appreciated the continued focus on ENSO research, noting that the III International Conference on ENSO, to be held in Guayaquil, Ecuador from 12–14 November 2014, will bring together scientists and experts involved in research, observations and operational climate services to build on new knowledge for improving the prediction of ENSO and its regional impacts as a means of better linking science with decision support. The Association also acknowledged a very successful regional WCRP Workshop on the Climatic Effects of Ozone Depletion in the Southern Hemisphere: Assessing the Evidences and Identifying the Gaps in Current Knowledge (February–March 2013, Buenos Aires, Argentina).

4.5.1.7 The Association noted with appreciation the contribution of WCRP regional panels and grouping to establishing a scientific basis and motivation for development and maintenance of the regional observing systems, including ones spearheaded by GCOS and GOOS, such as TOGA TAO and TRITON in the Pacific and PIRATA in the equatorial Atlantic, SAMOC with the SAMBA array in the South Atlantic, and the SOOS in the Southern Ocean. New and continuing experiments and regional research activities such as SPICES will continue to contribute to the development of a regional observing system for climate. The two Regional Hydroclimate Projects

of the WCRP GEWEX Project in RA III, namely the Large-scale Biosphere-Atmosphere Experiment in Amazonia (LBA) and the La Plata Basin experiment, will also serve as the foundation for renewing a number of regional research campaigns in the Region. The Association emphasized that effective collaboration of National Hydrometeorological Services and diverse research groups coordinated by WCRP would go a long way in the development of regional climate services.

4.5.1.8 The Association acknowledged with appreciation the WCRP commitment to capacity development in the domain of climate research and its support to Early Career Scientists (ECS), as well as students and scientists from developing countries. The Association also noted with appreciation the increasing number of WCRP science and training events, such as the First VAMOS/CORDEX Workshop on Latin America and Caribbean, CORDEX LAC: Phase I - South America (September 2013, Lima, Peru) and the Second VAMOS/CORDEX Workshop on Latin America and Caribbean, CORDEX LAC: Phase II (April 2014, Santo Domingo, Dominican Republic) that aimed to foster collaboration among participants focusing on Vulnerability Impact and Adaptation (VIA) needs for the Region. The Association also took note of the very successful 2014 WCRP Summer School on attribution and prediction of extreme events (July-August 2014, Trieste, Italy), in which four students from RA III participated.

4.5.2 World Weather Research Programme (agenda item 4.5.2)

4.5.2.1 The Association acknowledged the research successes and advancements in the World Weather Research Programme (WWRP) including The Observing system Research and Predictability EXperiment (THORPEX), in meeting Members' needs, including the successful transition of research into operations through WWRP Forecasting Demonstration Projects (FDPs) (e.g. MAP-DPHASE, Beijing08), the closer collaboration with the Severe Weather Forecast Demonstration Projects (SWFDPs) with CBS, the new sub-seasonal to seasonal prediction project with the World Climate Research Programme (WCRP), the polar prediction project with strong linkage to WCRP, the new high-impact weather project, the collaboration between WWRP and the Integrated Research on Disaster Risk (IRDR), as well as the model research development by the Working Group on Numerical Experimentation (WGNE).

4.5.2.2 The Association noted that there are several ongoing or proposed Research and Development Projects (RDPs)/Forecast Demonstration Projects (FDPs) based on nowcasting and mesoscale research aimed at addressing specific weather-related research needs identified by Members. In South America, a RDP was proposed to the WWRP/Scientific Steering Committee (SSC) and THORPEX International Core Steering Committee (ICSC): the La Plata Basin (LPB) project, to improve forecasts in severe precipitation events over the basin, and was approved. The Association encouraged Members in the Region to participate in the implementation of the project and to provide necessary support to the project and also to mobilize the resources required.

4.5.2.3 The Association noted the lack of contributions by Members to the Trust Fund for Weather Modification Research, which was established at the request of Cg-XV to support WMO centres of research that will advance the practice of sound science in weather modification. This holds a considerable risk to the future activities, including challenges in updating the WMO statement on weather modification. In order to sustain sound advice on weather modification activities, the Association requests interested Members to contribute to its trust fund.

4.5.2.4 The Association noted that, based on the necessity of developing a scientifically-based WMO position on weather modification, CAS-16 provided advice on the relative priority and sustainability of this activity in relation to other emerging issues, for example climate- / geo-engineering, and made recommendations to EC-66.

4.5.2.5 The Association noted that the THORPEX is due to conclude in 2014 and that it has demonstrated significant benefits to the global meteorological science community. The Association acknowledged the leadership role of Canada, China, France, Germany, Japan, Republic of Korea, Norway, the United Kingdom and the United States in THORPEX activities, through their financial contributions to the THORPEX trust fund.

4.5.2.6 The Association also welcomed the activities of the five THORPEX Regional Committees, including the Southern Hemisphere Regional Committee, and was pleased that each Regional Committee had developed broad research and implementation plans.

4.5.2.7 The Association recognized that the successful establishment of the THORPEX Interactive Grand Global Ensemble (TIGGE) database was a major achievement and acknowledged the significant contributions of the ten data providers, including CPTEC, Brazil in RA III, and three archive centres; ECMWF, NCAR and CMA.

4.5.2.8 The Association was pleased to note that the forecast guidance products from the TIGGE archive may provide a new insight for the development and execution of the SWFDPs. The probabilistic forecasts based on the TIGGE database may add additional information for forecasters and decision-makers.

4.5.2.9 The Association expressed its satisfaction with the establishment of three THORPEX legacy projects aligned to the requirements of Members and the GFCS namely, the Sub-seasonal to Seasonal Prediction Project (S2S) which is a joint initiative with WCRP, the Polar Prediction Project (PPP) and the high-impact weather (HIWeather) project. The Association encouraged Members to participate in the implementation of these projects and provide the resources required. More detailed information on the first two projects is provided in paragraphs 4.5(4).9–4.5(4).12 of the present report.

4.5.2.10 The Association recognized that the third THORPEX legacy project on high-impact weather (HIWeather project), from minutes to weekly timescale, with a strong socio-economic application component, has been requested by a number of Members. The development of its implementation plan is ongoing. The Association welcomed that EC-66 endorsed the establishment of the project and its trust fund.

4.5.2.11 The Association was pleased to note that the World Weather Open Science Conference (OSC), was held from 15 to 21 August 2014 in Montreal, Canada, with the theme: Seamless Prediction of the Earth System: from nowcasting through medium-range to seasonal forecasts. The Association requested its Members to take note of the outcomes of this conference as it provides useful information on how weather science and services will likely evolve in the future.

4.5.2.12 The Association noted that more intensive training programmes to the South American modelling community are needed. The focus would be on the application and development of state-of-the-art coupled chemistry-meteorology models tuned for South America-related problems (e.g. biomass burning and urban pollution, severe weather and its interplay with urban surface and urban aerosols). The Association encouraged Members to increase coordination and collaboration in this important field of research (and forecasting) between different South American countries.

4.5.3 Global Atmosphere Watch Programme (agenda item 4.5.3)

4.5.3.1 The Association agreed that the priorities for the development of the Global Atmosphere Watch Programme (GAW) provided by the sixteenth session of the Commission for Atmospheric Sciences (CAS-16) are relevant for the Region.

4.5.3.2 The Association agreed that observations constitute the basis for the delivery of GAW products and services relevant to Members and that the observations are also essential in support of environmental conventions, the Global Framework for Climate Services (GFCS), the WMO Integrated Global Observing System (WIGOS), the Global Climate Observing System (GCOS) and many other initiatives. Regarding these observations, the Association noted that the observational network for atmospheric composition measurements is still quite sparse in the Region. The Association urged its Members to address these observational gaps.

4.5.3.3 The Association noted with pleasure the support of several Members for the GAW Programme. In this regard, the Association appreciated the establishment and further development of a Brazilian greenhouse gas monitoring network run by the Instituto de Pesquisas Energeticas e

Nucleares (IPEN), Sao Paulo, with support from NOAA, United States, and the installation of an Amazonian Tall Tower Observatory, with support from the Max Planck Institute for Biogeochemistry, Germany. The Association noted that the development of the greenhouse gas observational network in the Region will contribute to the establishment of an Integrated Greenhouse Gas Information System (IGIS), which is indicated as one of the CAS-16 priorities.

4.5.3.4 The Association expressed its satisfaction with the extension of measurement capabilities at the regional GAW station Chacaltaya in the Plurinational State of Bolivia, jointly run by an international consortium and the Laboratorio de Física de la Atmósfera at the Universidad Mayor de San Andrés in La Paz. The Association appreciated the efforts of Argentina and Spain to conduct ozone soundings at the Ushuaia GAW Global station. Moreover, the Association noted the efforts by Argentina towards the establishment of continuous in-situ ground-based CO₂ and CH₄ observations at Ushuaia. The Association appreciated the collaboration between Argentina and Uruguay on the establishment of surface ozone, solar radiation and UV measurements at the GAW Regional Station El Salto, Uruguay. The Association further stressed that collaboration between Academia and National Meteorological Services, as well as collaboration with international partners, is an efficient way for observational network development and capacity building in the Region.

4.5.3.5 The Association was pleased with the global initiative by Switzerland to enhance atmospheric composition measurements, specifically those related to climate, through the Capacity Building and Twinning for Climate Observing Systems (CATCOS) project, which includes support for the El Tololo station in Chile. The Association expressed its gratitude to the Finnish Meteorological Institute that installed the container with new instruments at the Marambio station, managed in agreement with the Argentinian Servicio Meteorológico Nacional.

4.5.3.6 Noting that Andean glaciers and snowpacks constitute the most important source of fresh water for countries along both sides of the mountain range and that air pollution plays an important role, especially through black carbon, in the lifecycle of glaciers, the Association welcomed the collaboration agreement between the GAW Programme and the Pollution and its Impact on the South American Cryosphere (PICAS) initiative in 2014 and is looking forward to a fruitful collaboration under the agreement.

4.5.3.7 The Association noted that the GAW Station Information System (GAW SIS, <http://gaw.empa.ch/gawsis/>) provides up-to-date information on GAW networks and urged the Members that operate regional, global or contributing GAW stations to make sure that their information is updated regularly. Taking note of the decline in data submission of several GAW parameters, the Association reminded Members that recent data is needed in order for GAW to deliver required services and up-to-date information and urged Members to submit GAW observational data to the respective data centres as agreed, normally within one year after the measurement. The Association welcomed the recent surface ozone data submissions from four Argentinian stations.

4.5.3.8 Regarding near real-time (NRT) data delivery and usage, Members could utilize existing collaborations such as with Copernicus (former GMES) in Europe and similar initiatives in other Regions, especially for integrated urban and non-urban data and forecasting services (e.g., chemical weather forecasting, or forest fires forecast and impact). In this respect the Association welcomed the efforts of Argentina on NRT provision of data from Ushuaia for model validation in the MACC-II project (Monitoring Atmospheric Composition and Climate).

4.5.3.9 The Association emphasized the importance of quality assurance and control (QA/QC) in GAW and requested Members to implement the WMO Quality Management Framework (WMO-No. 1100) for atmospheric composition measurements. The Association appreciated the contribution of Argentina to the GAW quality assurance system through hosting the Regional Dobson Calibration Centre and Regional Calibration Centre for surface ozone. The Association welcomed the organization of Dobson, UV broadband and solar radiation intercomparisons in 2010, 2012 and 2013 and the 4th tropospheric ozone analyser intercomparison in 2010.

4.5.3.10 The Association welcomed the plan for an Integrated Global Aerosol Observation System, based on GAW Report No. 207 “Recommendations for a Composite Surface-based Aerosol Network”. The Association recommended that this should address in particular observational gaps and filling these. In this respect the Association welcomed the recognition in 2013 of the Latin America Lidar Network (ALINET) as a contributing network to the GAW Programme.

4.5.3.11 The Association noted the importance that biomass burning plays in the Region on air quality and was pleased to note that WMO, together with IGAC and iLEAPS, have initiated the Interdisciplinary Biomass Burning Initiative (IBBI) to address this topic (<http://www.igacproject.org/BiomassBurning>).

4.5.3.12 As regards GAW products, the Association noted the importance of the WMO Greenhouse Gas Bulletin, an authoritative WMO publication on the state of the key greenhouse gases in the atmosphere with valuable contributions from Members and urged for this to be supported. The Association further recognized that the measurements from South America constitute an important contribution to the WMO/UNEP Scientific Assessment of Ozone Depletion, for satellite validation and the annual WMO Antarctic Ozone Bulletins. Regarding the recently published precipitation assessment, produced by an international team of 21 scientists from 14 countries under the auspices of the WMO/GAW Scientific Advisory Group for Precipitation Chemistry (<http://www.sciencedirect.com/science/journal/13522310/93/supp/C>), the Association noted that also for these measurements there is a need for enhanced observations in the Region.

4.5.3.13 The Association noted the need for capacity development in the Region. It further acknowledged the usefulness of the GAW Training and Education Centre (GAWTEC) in Germany as well as that of co-sponsored summer schools and other training events. Know-how transfer, capacity-building and thus activities toward the sustainability of the South American operations were in particular accomplished through training of nine operators from GAW stations in South America in GAWTEC sessions between 2010 and 2013. The Association appreciated organization of training schools in the Region, including aerosol training in La Paz, Plurinational State of Bolivia, in June/July 2013.

4.5.3.14 The Association was pleased to note that GAW will celebrate its 25th anniversary in conjunction with the 13th Quadrennial ICACGP Symposium and 13th IGAC Conference in Natal, Brazil, from 22 to 26 September 2014, with several highlights planned for GAW.

4.5.3.15 The Association recognized that the rapid urbanization that is currently taking place in many parts of South America, coupled with rapid industrialization and land use changes, are the primary drivers causing large quantities of harmful pollutants, and greenhouse gases, to be emitted into the atmosphere, affecting population health and ecosystems. The Association noted the importance of further collaboration and cross-cutting activities in this field (see paragraphs 4.5.4.8 and 4.5.4.9 of the present report).

4.5.4 Joint initiatives of the World Climate Research Programme, World Weather Research Programme and Global Atmosphere Watch (agenda item 4.5.4)

Sixteenth session of the Commission for Atmospheric Sciences (CAS-16)

4.5.4.1 The Association noted that the sixteenth session of the Commission for Atmospheric Sciences (CAS-16) was held from 20 to 26 November 2013 in Antalya, Turkey. The Technical Conference “Responding to the Environmental Stressors of the 21st Century” (Antalya, 18–19 November 2013) preceded the session. CAS-16 reviewed progress in the World Weather Research Programme (WWRP), including the successful conclusion of The Observing system Research and Predictability EXperiment (THORPEX), the development of the Global Atmosphere Watch (GAW) Programme, including GAW Urban Research Meteorology and Environment (GURME), considered WMO priorities, especially regarding activities in the Global Framework for Climate Services (GFCS) and WIGOS/WIS, identified, with the assistance of Members, emerging research priorities, and provided holistic guidance to the future activities of WWRP, including the post THORPEX legacy.

Working Group on Numerical Experimentation (WGNE)

4.5.4.2 The Association acknowledged the outcomes of the 29th session of the Working Group on Numerical Experimentation (WGNE) held in Melbourne, Australia, 10–14 March 2014. WGNE has the responsibility of fostering the development of atmospheric circulation models for use in weather, climate, water and environmental prediction on all time and spatial scales and identifying and resolving shortcomings. The session addressed a number of important topics such as Polar Prediction and Sub-seasonal to Seasonal Prediction Projects, studies of surface drag in NWP and climate models, and the linkages between weather/climate models and aerosols. The session report is available at http://www.wmo.int/pages/about/sec/rescrosscut/resdept_wgne.html.

4.5.4.3 The Association noted with appreciation the outcome of the 4th WGNE Workshop on Systematic Errors in Weather and Climate models held at the UK MetOffice, Exeter, 15–19 April 2013, which aimed at understanding the nature and causes of systematic errors in weather and climate prediction using diagnostic techniques, observations, process models and simplified experiments. The workshop recommended a more seamless approach to model evaluation through close collaboration between WCRP and WWRP, encouraged a wider range of diagnostic techniques supported by dedicated model and observational data sets in common formats, called for appropriate observations in polar and tropical regions and surface fluxes over the ocean and suggested the development of research efforts linking dynamical and physical processes in models. More information is available at <http://www.metoffice.gov.uk/conference/wgne2013>.

4.5.4.4 The Association noted that the WCRP/WWRP Madden-Julian Oscillation (MJO) Task Force will now report directly to WGNE because it is widely recognized that improved understanding and prediction of MJO and related tropical Intraseasonal variability (ISV) is crucial for both the climate and weather communities, especially in South America. This Task Force is expected to make a major contribution to the Sub-seasonal to Seasonal (S2S) Prediction Project and will now be organized around four subprojects: (a) process-oriented diagnostics and metrics for MJO simulations; (b) boreal summer monsoon ISV monitoring and forecast metrics; (c) simplified MJO metrics and Coupled Model Intercomparison Project phase 5 analysis; and (d) vertical structure and diabatic processes of MJO.

4.5.4.5 The Association noted that active interaction between the meteorological, environmental and climate communities is required to ensure the development of new generation coupled chemistry – meteorology models and their applications for numerical weather prediction, atmospheric pollution and climate studies. The International Conference on Coupled Chemistry – Meteorology Modelling, will be held in Geneva, 9–11 February 2015. Active participation of WGNE and in particular the CPTec (Brazil) in these activities is acknowledged and further encouraged by the Association.

4.5.4.6 The Association further encouraged the emerging cooperation between WGNE and GAW, including a focus on aerosols and GURME. The Association stressed that new types of services making best use of science and technology will be needed to assist cities in facing hazards such as storm surge, flooding, heat waves, and air pollution episodes. These new services include observational systems focused on the urban environment; high resolution coupled environmental prediction models that include realistic city-specific processes, boundary conditions and fluxes of energy and physical properties; as well as technical skill and institutional capacity to make best use of the latest available technologies. In this respect the Association welcomed the organization of the workshop “Towards and Integrated Observing System for South America: air quality assessment and forecasting in Megacities” in Santiago, Chile, January 2012.

4.5.4.7 The Association noted that the concept paper for the above new urban cross-cutting activity, Integrated Urban Weather, Environment and Climate Service has been developed (http://www.gfcs-climate.org/sites/default/files/events/Expert%20Workshop/WMO_Megacity_IMP_Plan.pdf) and recommended that the climate service needs for megacities and large urban complexes be considered as a priority in the GFCS.

4.5.4.8 The Association noted the importance of the WGNE projects focussing on the treatment of surface drag in models, led by Environment Canada, and the aerosol project, led by Centro de Previsão de Tempo e Estudos Climáticos (CPTEC), Brazil, with the objective to evaluate aerosol impacts on weather and climate predictions. The Association invited its Members to participate actively in these projects.

Sub-seasonal to Seasonal Prediction Project

4.5.4.9 The Association noted the establishment of the S2S Steering Group and supported the development of the five sub-projects (for extreme weather, monsoons, MJO, Africa, and verification), as South America is strongly influenced by MJO, Monsoon and extreme weather events. The Association appreciated the establishment in November 2013 of the International Coordination Office hosted by the Korean Meteorological Administration at the National Institute of Meteorological Research in Jeju, Republic of Korea. To achieve the goals of these sub-projects, the Steering Group advocates for the establishment of an extensive database of sub-seasonal (up to 60 days) forecasts and reforecasts, from multiple data providers, including CPTEC.

4.5.4.10 To ensure that the S2S project has adequate resources for implementation of its planned activities, the Association encouraged Members to contribute to its trust fund.

Polar Prediction Project

4.5.4.11 The Association noted the activities of the newly established 10-year Polar Prediction Project (PPP), especially the finalization of the Implementation Plan and the progress on planning for the Year of Polar Prediction under the leadership of the PPP Steering Group and in close collaboration with the WCRP Polar Climate Predictability Initiative. The aim of the PPP is to “Promote cooperative international research enabling the development of improved weather and environmental prediction services for the Polar Regions, on time scales from hours to seasons”. PPP represents a fundamental component of the emerging WMO Global Integrated Polar Prediction System.

4.5.4.12 The Association noted that the Alfred-Wegener-Institute for Polar and Marine Research (AWI), Germany, hosts the PPP International Coordination Office (ICO). The Association acknowledged that the ICO in AWI does represent a tangible and substantial contribution to the project. The Association encouraged Members to consider contributing to the PPP trust fund, to ensure that the project has adequate resources for its planned activities, especially in Antarctica.

Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)

4.5.4.13 The Association expressed its satisfaction with activities within the SDS-WAS which has led to better understanding of the atmospheric dust processes, sand and dust impacts on climate and the environment, and the provision of observation data and forecast products. Three SDS-WAS nodes (for Asia, for Northern Africa, Middle East and Europe and for Pan America, which covers South America) have been established that provide efficient regional cooperation and exchange of products through regional web portals. The Association encouraged Members to participate in the Pan American SDS-WAS node and in the system implementation for South America.

4.5.4.14 The Association was pleased to note that through collaboration between CAS and CBS, mandatory functions for Regional Specialized Meteorological Centre(s) with specialization in Atmospheric Sand and Dust Storms Forecasts (RSMC-ASDF) have been developed and approved by EC-65 and that the SDS-WAS regional node in Spain, operating under AEMET and the Barcelona Computing Centre, was designated as the first RSMC-ASDF.

4.5.4.15 The Association noted that EC-66 adopted a resolution on Sand and Dust Storm Warning Advisory and Assessment System to establish the SDS-WAS Steering Committee and its trust fund to support global coordination of the regional SDS-WAS research activities.

4.6 Capacity development in Regional Association III (agenda item 4.6)

4.6.1 WMO Capacity Development Strategy Implementation Plan 2012–2015 (agenda item 4.6.1)

Capacity Development Strategy

4.6.1.1 The Association recalled the discussions in Cg-XVI on the need for a cohesive and coordinated approach to capacity development to maximize the outcome of capacity development activities. It further noted the importance of regional and subregional efforts to support the capacity development of NMHSs given the large number of existing and planned regional centres and the regional emphasis of development partners. In this regard, the Association welcomed the WMO Capacity Development Strategy (CDS) and the CDS Implementation Plan (CDSIP) that had been approved at EC-64 and EC-65 respectively, and acknowledged the key role that the Association would have to play in implementing the CDS (<http://www.wmo.int/pages/prog/dra/CDS.html>).

4.6.1.2 While the Association noted the progress of capacity development activities in the Region, it also recognized the need to further strengthen and harmonize such activities to address existing gaps in human, institutional, infrastructural and procedural capacities for many RA III Members. To foster the capacity development in the Region, the Association encouraged its Members to implement the CDS and adopted [Resolution 9 \(RA III-16\) – Implementation of the WMO Strategy for Capacity Development in Regional Association III](#). In order to utilize limited resources effectively and efficiently the Association urged its Members to consider the strategic approaches to capacity development corresponding to the six Strategic Objectives of the CDS.

4.6.1.3 The Association was informed of the ongoing efforts of the EC Working Group on Capacity Development (EC-WG/CD) which led to the approval by EC-64 and EC-65 of the Capacity Development Strategy (CDS) the CDS Implementation Plan (CDSIP) respectively for 2012–2015. The Association noted the creation of EC-WG/CD Task Teams on the Country Profile Database and on the Categorization of NMHSs by level of service provision. At this point, the Association thanked representatives and experts from Argentina, Brazil, Paraguay and other Members of the Region for their participation in the Working Group and related programmes and encouraged them to continue providing a regional perspective to the Working Group, especially as it considers further implementation priorities for 2016–2019.

4.6.1.4 The Association requested the Secretary-General to further enhance the capacity development in the Region taking into account the needs reflected in the RA III survey on institutional arrangements for NMHSs and identification of future priorities and as expressed by some of the NMHSs during the RA III-16 session.

4.6.1.5 The Association also agreed to reinforce the work of the Management Group in coordinating and harmonizing capacity development activities in line with the CDS and [Resolution 9 \(RA III-16\)](#).

4.6.1.6 The Association reviewed two tools being developed as part of the CDS: the on-line Country Profile Database; and the on-line Guide for the Role and Operations of Meteorological Services. Following a demonstration of these tools, the Association discussed how the tools could be used to support the NMHSs in RA III, offered suggestions for further improvements, potentially having them available in Spanish, and expressed their support for the deployment of these tools in 2014.

4.6.1.7 The Association encouraged its Members to support the Country Profile Database (CPDB) by updating their information during the roll-out of the CPDB initial operating capability and by maintaining the information contained in the database thereafter.

Special focus on LDCs and SIDS

4.6.1.8 The Association recalled the discussions in Cg-XVI on the importance of the WMO Programme for the Least Developed Countries (LDCs) and the high priority to be continually attached to it. It welcomed Congress' decision to continue and enhance the WMO Programme for the LDCs to address the obstacles and constraints limiting NMHSs in LDCs and Small Island Developing States (SIDS) to provide relevant weather, water and climate information and services and to strengthen their capabilities to meet the demands and requirements of the priority areas for action as defined in the Istanbul Programme of Action (IPoA) for the LDCs for the decade 2011–2020. In this connection, the Association encouraged the Secretariat to ensure that all WMO's scientific and technical programmes continue to give higher and visible priority to LDCs and SIDS in their assistance and capacity development activities.

4.6.1.9 The Association encouraged its Members to participate actively in, and to contribute to the maximum extent possible, the funding of the WMO Programme for the LDCs, including through the WMO trust funds for NMHSs of LDCs and SIDS.

4.6.1.10 The Association noted that there are capacity-building needs relevant to South America included in the WMO Strategy, for Improved Climate Services that should also be considered in the implementation of the Capacity Development Strategy.

4.6.2 Human capacity development, including education and training (agenda item 4.6.2)

4.6.2.1 The Association acknowledged the importance of education and training for all Members in RA III, and the varying capabilities of RA III Members to address their national needs. The Association noted that there were few institutions offering graduate level forecasting courses in the Region and none currently offering some or all of these courses online to reduce the time and expense associated with personnel being absent from their service. The large distances, relatively small staff numbers and cost of travel make the utilization of distance learning very important for South America to ensure that these NMHSs are able to access education and training opportunities.

Role of education and training in helping the Regional Association meet its goals

4.6.2.2 The Association acknowledged the key role education and training would have to play in meeting the goals outlined in its 2011 to 2014 Operating Plan and the 2015 to 2018 intersessional period. The Association thus requested its president and the RA III Management Group to put in place actions to help identify any education and training gaps that could impact upon successfully achieving the goals and expected results of those plans. This gap analysis should be seen as part of the risk management actions and be based around the Member's need in the high priority areas vis-à-vis Members' and Regional Training Centres' existing education and training capabilities. The Association recommended that the Management Group make any necessary adjustments to the operational plan if the gap analysis revealed deficiencies in meeting the training needs of the Region. In particular, noting the 1 December 2013 deadline for meeting the requirements for competencies and 1 December 2016 deadline for qualifications for aeronautical meteorological personnel laid down in the WMO Technical Regulations, the Association recommended that the determination of the regional needs and ability to address the aeronautical issue should be accorded high priority.

4.6.2.3 The Association recalled that the Region was represented on the WMO Executive Council Panel of Experts on Education and Training and that this Panel member should act as an interface between the Panel and the Management Group to ensure smooth coordination and communication between the Panel and the Region. The Association recommended that the Management Group nominate one of its members to be the focal point for the ongoing assessment of the regional education and training needs against the operational plans and the ability of the regional training institutes to deliver that training. The focal point should also liaise with the regional member of the EC Panel of Experts on Education and Training.

Fellowships

4.6.2.4 The Association noted that over the intersessional period 34 fellows from ten of its Members had been supported by the WMO Fellowship Programme. The fellowship durations ranged from 4 months to 5 years with the majority (24) undertaking four-month secondments to the South America Desk at the National Centre for Environmental Prediction (NCEP) in the United States through the US Voluntary Contribution Programme. The Association noted that WMO has considerably increased its outreach to more partners for support to WMO fellowship activities in general, and hence increase in opportunities available to Members in the Region. The Association thanked its Members, and those from outside of the Region, particularly the United States, for the support they provided to the WMO Fellowship Programme and requested all Members to provide further support for this important programme. The Association encouraged Members who did not have national training institutes and were not able to fully fund staff development to consider cost sharing options with WMO for on-the-job training opportunities for their staff in more developed services in the Region.

4.6.2.5 The Association recalled that 1 December 2016 was the deadline for Members to demonstrate that their Aeronautical Meteorological Forecasters (AMF) met the qualification requirements approved by the Sixteenth World Meteorological Congress in May 2011 (Resolution 53 Cg-XVI). The Association recalled the discussion in EC-64 (para 4.6.20 WMO-No._1092) regarding advice from the EC Panel of Experts on Education and Training on determining the qualifications of AMF who had completed their training up to 30 years ago. The EC-64 advice was to use the Basic Instruction Package – Meteorology (BIP-M) that was applicable at the time the AMF undertook their training. The Association further recalled that the Government of Spain, through the Spanish Meteorological Service, had offered training for WMO Class II personnel over a period of more than 30 years and that many of these staff were still actively working as AMF in the region. The Association agreed that for the purposes of meteorological support to international air navigation in RA III those staff who had successfully completed the Spanish “Curso Internacional de Meteorología class II OMM” course could be considered as meeting the AMF qualification requirements as specified in Resolution 53 of Cg-XVI. The Association further noted that the AMF also needed to be assessed at national level as being competent in their current roles. The Association approved [Resolution 10 \(RA III-16\) – Qualifications of aeronautical meteorological forecasters](#).

4.6.2.6 The Association noted that the RTCs hosted in Argentina, Brazil and Costa Rica had also provided Class II training courses for the Region. The Association requested the Permanent Representatives of Argentina, Brazil and Costa Rica to liaise with the RTCs hosted in their countries to identify whether the RTCs would be able to provide RA III Members similar assurance to Spain regarding the successful graduates of their Class II courses and whether the content and level of the Class II courses met the BIP-M requirements at that time.

4.6.2.7 The Association welcomed advice that Spain was to offer a blended learning course to staff from the NMHSs in Ibero-American countries that would certify successful participants as meeting the BIP-M requirements that come into force on 1 December 2016 for aeronautical meteorological personnel. The Association noted that this course required that participants be certified as possessing the required knowledge in the basic subject matters included in the BIP-M; that they take a 600-hour online course from their home country and participate in a training course of approximately two months held in Spain, as part of a WMO Fellowship award. The Association endorsed the preliminary proposal for the course as suitable to the needs of the Region, and thanked Spain for its constant help. Furthermore, the regional association expressed the need to know as soon as possible how many WMO fellowships were available for the course, and asked interested Members to propose candidates as quickly as possible, taking into account the requirements for enrolment.

Regional Training Centres

4.6.2.8 The Association recalled that in previous sessions it had requested the Executive Council to recognize the following institutions as WMO Regional Training Centres (RTCs) to address the

education and training needs of RA III Members and, where possible, assist in addressing the needs of WMO Members outside the Region: RTC Argentina composed of the Universidad de Buenos Aires (UBA) and Servicio Meteorologico Nacional (SMN); RTC Brazil Universidade Federal do Para (UFPA) in Belem; RTC Peru composed of Universidad Nacional Agraria La Molina (UNALM); and RTC Venezuela composed of Universidad Central de Venezuela (UCV).

4.6.2.9 The Association noted that the CRFM-UNALM (RTC Peru) has opened an admission process for courses in 2015. The Association noted that members would be able to apply for scholarships jointly funded through WMO and the CLIMANDES PROJECT. The scholarships would be detailed in a Memorandum of Understanding to be signed between SENAMHI, CRFM and meteorological services in the Region. The Association recognized the strategic alliance between the National Service of Meteorology and Hydrology (SENAMHI) and the CRFM - UNALM that under the support of CLIMANDES PROJECT allowed during 2012 –2014: (1) the development of 6 courses related to Coastal and Andean climate of the South American region, with the participation of professionals of Ecuador, Chile, the Plurinational State of Bolivia and Argentina, students, teachers of CRFM - UNALM and staff of SENAMHI; (2) the development of virtual learning module of climatology (as curricular complement students of CRFM), developed by the University of Bern-Switzerland and; (3) the proposal on the creation of the School of Meteorology for the formation of Meteorological Technicians, whose curriculum responds to the PIB-T-WMO.

4.6.2.10 The Association welcomed advice from the Permanent Representative of Argentina that the RTC in Argentina would be offering an option for students with sufficient mathematics and physics to undertake a 2.5 year Baccalaureate in Atmospheric Sciences at the University of Buenos Aires, commencing early in 2015. The RTC in Argentina was also offering a blended learning course for national trainers to qualify them to provide meteorological observation training. The Association took note of the request from the Permanent Representative of Argentina for assistance in accessing financial support for the trainers to undertake the one-week residence component of this course.

4.6.2.11 The Association noted with some concern that the report provided to the EC Panel of Experts on Education and Training on activities in each of the RTCs indicated a relatively low use of the RA III Regional Training Centres by Association Members (see [Annex III to the present report](#)). The Association was particularly concerned that no reports had been received from the RTC in the Bolivarian Republic of Venezuela and requested the Permanent Representative of that country with WMO to work with the RTC to urgently address this situation. The Association further noted that under the revised EC criteria for the recognition and reconfirmation of RTCs approved at EC-66, all future sessions of the Association would be required to make recommendations to EC on whether to continue each of the centres as RTCs. Given statistics such as those provided to the EC Panel of Experts on Education and Training, the Association noted that it would be difficult for the next session to recommend reconfirmation of the Universidade Federal do Para or Universidad Central de Venezuela unless significant improvements were made in the next four years.

4.6.2.12 Recalling its concern regarding the performance of the RTC in Brazil, the Association discussed the proposal from the Permanent Representative of Brazil to move from a single institution (Universidade Federal do Para (UFPA) in Belem) to a network of well-respected Education and Training institutions (see [Annex IV to the present report](#)) working as a Virtual RTC. The Association recognized that the proposed group would provide Undergraduate Diploma, Master of Sciences and PhD degrees as well as a Technical Education Certificate. The Association noted that such an RTC was consistent with the proposal for a WMO Global Campus discussed at EC-66. The Association further noted that the range of institutions involved in this virtual RTC would enable it to address many of the high priority education and training areas identified by the Association (in Portuguese and Spanish) in this session through the provision of distance and face-to-face education and training opportunities. Additionally, the Association further recognized that this virtual RTC would also be able to assist Portuguese-speaking countries in Africa. The Association approved [Resolution 11 \(RA III-16\) – Recognition of the virtual Regional Training Centre in Brazil](#), requesting the seventeenth session of the World Meteorological Congress to recognize this RTC. The Association requested the Permanent Representatives of Argentina, Peru and the Bolivarian Republic of Venezuela to work with the RTCs in their countries

and the Permanent Representative of Brazil to investigate options for the virtual RTC in Brazil to develop closer cooperation and coordination with their RTCs to improve the range and level of education and training for all RA III Members and beyond. The Association requested the Permanent Representative of Brazil and the Secretary-General to widely promote the new RTC within the Region should the Seventeenth World Meteorological Congress approve the recommendation.

Training activities

4.6.2.13 The Association noted with pleasure the variety of training activities that had been provided to Members by WMO and Members from RA III and other Regions during the intersessional period. These activities ranged from regular online weather briefings such as Regional Focus Group weather discussions and other offerings from the WMO Virtual Laboratory groups in the United States to workshops co-sponsored under WWRP. The Association recognized the contributions of workshops and training opportunities from Members outside the Region such as China, Finland, France, Israel, Japan, Spain, Switzerland, the United Kingdom and the United States. The Association further noted and appreciated the assistance from the United States to fund the translation into Spanish of many of the COMET modules.

4.6.2.14 The Association welcomed a presentation on the South America Desk from Dr Jose Galvez Research Meteorologist at NCEP. The Association considered approaches to adapting and possibly restructuring the programme to include additional aspects of interest to the Association such as production and use of climate data and services, without compromising the excellent operational education and training currently being provided.

4.6.3 Resource mobilization and development partnerships (agenda item 4.6.3)

Resource mobilization, development cooperation and partnerships, including development of infrastructure and operational facilities

4.6.3.1 Countries in the Region benefited from the support from the Voluntary Cooperation Programme (WMO-VCP) during the period 2011–2014. In total, seven requests for support were received from the Region and of these six have been supported to date (see [Annex V to the present report](#)).

4.6.3.2 The Association expressed its appreciation to WMO Members, particularly Australia, Canada, China, Finland, France, Germany, Indonesia, Japan, Korea, Norway, New Zealand, Spain, Switzerland, United Kingdom and United States for the financial and in-kind support that they have provided to WMO Members within and from outside the Region, through the VCP. Total VCP contributions have remained steady over the intersessional period at approximately USD 27 to 29 M.

4.6.3.3 The Association noted also the successful relationships being established for major hydrometeorological development projects between WMO and national aid agencies and in most cases with the partnership of the respective NMHS representing some tens of millions of USD in financial terms, in particular the support of Switzerland (Swiss Development Cooperation) and MétéoSuisse for CLIMANDES and CATCOS in the context of GFCS activities in the Region, (see <http://www.wmo.int/pages/prog/dra/vcp/InformalPlanningMeeting2014.php> for global report, and [Annex VI to the present report](#) for key regional initiatives); support of Spain through the Ibero-America Cooperation Programme and Trust Fund established in the WMO; and support from the US through its VCP Programme TF.

4.6.3.4 The Association welcomed the information that significant bi-lateral support is being given to Hydrometeorological Services development as evidenced by the reports of the Informal Planning Meeting (IPM) on the VCP. It encouraged RA III Members to continue to contribute to and participate more actively in the Programme to address the requirements of NMHSs in the Region (see <http://www.wmo.int/pages/prog/dra/vcp/InformalPlanningMeeting2014.php>).

4.6.3.5 The Association welcomed the establishment of the Project Coordination Unit within the Office for Resource Mobilization to enhance delivery of multi-disciplinary projects and donor reporting and the change of name to Office for Resource Mobilization and Development Partnership (RMDP) to better reflect the focus of the Office not only on resource mobilization but also strengthening development partnerships with key organizations, including the Multilateral Development Banks such as the World Bank (WB), the Asian Development Bank and the African Development Bank, the European Commission, Regional Economic Communities, UN System Partners, bilateral development agencies, among others. It welcomed also the support provided to the PCU through secondment from the United Kingdom, Germany, Norway and Finland through the JPO programme.

4.6.3.6 The Association requested the Secretary-General to further enhance the resource mobilization and capacity development in the Region taking into account the needs reflected in the recent regional survey and expressed by some of the NMHSs during the RA III session.

4.7 Partnership and cooperation in Regional Association III (agenda item 4.7)

4.7.1 Partnerships (agenda item 4.7.1)

4.7.1.1 The Association noted with satisfaction the strengthening of cooperation activities with the regional bodies of the United Nations (UN) system, particularly the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), as well as with the Inter-American Development Bank (IDB), the Organization of American States (OAS), the Latin American Energy Organization (OLADE) and the Center for Weather Forecasting and Climate Studies (CPTEC), and the Intergovernmental Coordinating Committee of the La Plata River Basin Countries (CIC).

4.7.1.2 The Association highlighted the importance of cooperation with the UN International Strategy for Disaster Reduction (UNISDR), particularly in preparation for the Third World Conference on Disaster Risk Reduction, scheduled to take place in Sendai, Japan in March 2015. Following Members' participation in the Regional Platform for Disaster Risk Reduction in the Americas in Guayaquil, Ecuador on 27–29 May 2014, the Association reaffirmed its commitment and that of its Members to participation in the remaining global preparatory meetings. The Association sought the support of WMO Secretariat to provide relevant information and assist the president and Members with respect to key messages for interventions at these events.

4.7.1.3 In this respect, the Association welcomed that WMO Secretariat, in collaboration with the Global Facility for Disaster Reduction and Recovery (GFDRR) and the World Bank and other partners, have been working to strengthen national capacities towards the modernization of National Meteorological and Hydrological Services in a significant number of RA III Members. As these efforts seek to build capacity towards greater disaster risk management, climate adaptation and sustainable economic development, the Association encouraged its Members to develop relationships between their NMHSs and the DRR actors at both national and regional levels, including by creating User Interface Platforms within the GFCS context.

4.7.1.4 The Association recognized the role of the Regional Office for the Americas as the institutional interface with regional organizations, and encouraged the Office to continue strengthening partnerships and collaboration with them including the consolidation of the International Research Center on El Niño Phenomenon (CIIFEN) based in Guayaquil, Ecuador, as the Regional Climate Center (RCC) for the western part of South America, which is now in its demonstration phase.

4.7.1.5 Following the conclusion of a Memorandum of Understanding (MoU) between WMO and the Agencia Estatal de Meteorología (AEMET) in October 2011, the Association welcomed the new programme of activities aimed to promote cooperation within the Region and beyond for meteorological research and education.

4.7.2 Information and public affairs (agenda item 4.7.2)

4.7.2.1 The Association recalled that the Sixteenth Congress by its Resolution 27 (Cg-XVI) on the WMO Information and Public Affairs Programme sought to advance “the aim of consolidating the WMO Web presence, including in social media, mobile telephone technology and other new media to reach out to people worldwide, in particular to youth, and paying special attention to the needs of developing countries”. Congress invited its Members to continue to contribute actively to this aim and more generally to regional cooperation on communications and public affairs.

4.7.2.2 The Association recognized that the WMO Secretariat is committed to making significant improvements to the WMO website over the coming year. As a first step the Communications and Public Affairs Office (CPA) has launched a new “youth corner” for the website. As the WMO website should represent and promote the entire WMO community, the Association stressed that it is important that as many Members as possible engage in strengthening WMO’s presence on the Internet.

4.7.2.3 The Association appreciated that, despite increasing competition for attention by the media, global press coverage of WMO activities and programmes continues to increase every year. WMO’s reports on the status of the global climate, the Greenhouse Gas Bulletin, the WMO/WHO Atlas of Health and Climate, the WMO/CRED Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes, and other regular and periodic publications play an important role in raising public awareness about the issues of “weather, climate and water”. These reports are increasingly providing regional information, and their public impact in the Regions relies on the cooperation of the entire WMO community.

4.7.2.4 The Association noted that CPA works with Members and partners to promote WMO activities around the world, including conferences, workshops and launches of reports. Upcoming events in RA III include the 20th Session of the Conference of the Parties to the UN Framework Convention on Climate Change. The Association encouraged its Members to support outreach and communications for COP 20 and other relevant events in the Region.

4.7.2.5 The Association requested WMO-affiliated centres and facilities, such as the International Research Centre on El Niño (CIIFEN), the Climate Outlook Forums for the Southeast of South America (SSACOF) and the Western Coast of South America (CSACOF), and WIS centres, to provide visible WMO identity on their websites.

4.7.2.6 The Association invited its Members to:

- (a) Link NMHSs’ websites to the <http://www.wmo.int> website;
- (b) Contribute to the “News from Members” section on the WMO website;
- (c) Designate and empower an IPA Focal Point;
- (d) Promote regional cooperation on information and public affairs.

5. EFFECTIVENESS AND EFFICIENCY IN REGIONAL ASSOCIATION III ACTIVITIES (agenda item 5)

5.1 WMO strategic planning – Regional aspects (agenda item 5.1)

Consideration of the Executive Council draft Strategic and Operating Plans 2016–2019

WMO Strategic Plan 2016–2019

5.1.1 The Association recalled that the Sixteenth Congress requested regional associations to:

- (a) Provide regional needs and priorities that should be taken into consideration in developing the WMO Strategic Plan 2016–2019; and
- (b) Coordinate, as necessary, national contributions to regional aspects of the Plan;
- (c) Develop their own Operating Plans 2016–2019 in support of the implementation of the next WMO Strategic Plan.

5.1.2 The Association noted with appreciation the active involvement of its Members and the president of the Association in the development of the WMO Strategic Plan 2016–2019 (SP) under the guidance of the Executive Council and its Working Group on Strategic and Operational Planning (WG-SOP), and with contributions from all regional associations (RAs) and technical commissions (TCs).

5.1.3 The Association recalled that in December 2013 the Secretary-General communicated the draft Strategic Plan to all WMO Members for their input and indication on whether the capacity of NMHSs to provide services would be improved if the WMO followed the strategic directions proposed in the Plan, and if the Members would be able to use the Plan to inform the governments of the strategic directions and priorities of WMO.

5.1.4 The Association noted that the latest draft SP, which the sixty-sixth session of the WMO Executive Council (EC-66) recommended to Congress, and requested the president to work with the EC-SOP to finalize the document, with the following seven priorities:

- (a) Improve the ability of NMSs to meet ICAO requirements focusing on accelerating the implementation of competency standards and QMS to: (a) meet the emerging needs of the global air navigation plan; (b) meet the emerging issues in WMO Regions; and (c) strengthen cost recovery frameworks;
- (b) Implement climate services under the GFCS Implementation Plan particularly in countries that lack them, focusing on supporting the establishment of regional climate centres; identifying user requirements for climate products; and developing the Climate Services Information System (CSIS);
- (c) Complete the implementation of the WIGOS/WIS focusing on the implementation of all the building blocks of the framework and supporting the uptake at regional and national levels;
- (d) Improve operational polar weather, climate, and hydrological services focusing on operationalizing the Global Cryosphere Watch and advancing the Global Integrated Polar Prediction System (GIPPS);
- (e) Enhance the capacity development of NMHSs to deliver on their mission by helping them to enhance their human resources, technical capacities and their infrastructure, particularly in developing, least developed and small island developing states;
- (f) Improve expertise in providing high quality impact-based forecasts and, in particular, early warning of high impact weather, climate and water events, thereby contributing to international efforts on Disaster Risk Reduction and Prevention; and
- (g) Conduct a strategic review of WMO structures, operating arrangements and budgeting practices focusing on the effectiveness of constituent body activities and the Secretariat arrangements;

5.1.5 The Association considered the above priorities in the draft SP and agreed that while these were all important areas, the most pressing issues for the Region are:

- (a) WIGOS/WIS;
- (b) Impact-based forecasts and early warnings for DRR;
- (c) Capacity development for NMHSs; and
- (d) GFCS.

WMO Operating Plan 2016–2019

5.1.6 The Association recalled that the Sixteenth Congress requested the regional associations to prepare their operating plans to support the implementation of the WMO Strategic Plan. The Executive Council further decided that the Organization should have a single integrated Operating Plan that includes the activities of RAs and TCs and incorporates their own operating plans. The Association urged its president and Management Group to develop the regional operating/action plan for 2016–2019 and submit it as a contribution to the WMO Operating Plan (OP).

5.1.7 In order to ensure timely provision of the Association's contribution to WMO integrated strategic planning process in the future, the Association requested its president and Management Group to set up a process and develop and submit such contributions, as required, in consultation with Members of the Association during the intersessional period.

Monitoring and evaluation

5.1.8 The Association noted that the Secretariat continued to develop and implement the WMO Monitoring and Evaluation (M&E) System and that the Executive Council encouraged constituent bodies to make use of the M&E System and Guide prepared by the Secretariat and provide feedback for further improvement.

5.1.9 The Association also noted that under the guidance of the Executive Council its WG-SOP continued to further develop and improve the implementation of the M&E System. This particularly required better coordination with RAs to increase the level of Member's response to questionnaires. The Association noted with concern that only 58% and 50% of Members from the Region responded to the surveys on impacts of achieved results on Members conducted in October 2012 and November 2013, respectively. The Association noted the decision of EC requesting Members to identify focal points to improve the levels of responses to surveys. It encouraged its Members to respond to M&E surveys to provide information that would assist in further development of their NMHSs.

5.2 Regional Association III strategic and operational planning (agenda item 5.2)

RA III Strategic and Operating Plan 2012–2015

5.2.1 The Association recalled that RA III-XV (Bogota, Colombia, September 2010) agreed on the necessary processes for the development and adoption of the RA III Strategic and Operating Plan (SOP) for 2012–2015 (WMO-No. 1067 (paragraphs 5.2.1–5.2.11)), and endorsed the proposed roadmap towards development, refinement and endorsement of the Plan. The revised RA III SOP 2012–2015, developed by the Management Group (MG) and approved by the president of the Association, had been adopted by RA III Members in December 2010. In this respect, the Association expressed its appreciation to its Members and the MG for developing, refining and implementing the RA III SOP for 2012–2015.

5.2.2 The Association noted that at the 2012 Meeting of the Presidents of Regional Associations (RAs) and Technical Commissions (Geneva, January 2012), the presidents of the RAs agreed to develop the Operating Plans 2012–2015 of the RAs as part of the WMO-wide Operating Plan 2012–2015 by adjusting the current Regional Strategic and Operating Plans to align with the Congress decisions and the WMO-wide Operating Plan. In considering the above

decision, the Management Group requested the RA III Task Team on Strategic and Operating Planning (TT-SOP) to further develop an Operating Plan for RA III 2012–2015 using a new format and requested the Secretariat to facilitate the working groups' activities for inputs to the further development of the RA III OP 2012–2015.

5.2.3 The Association affirmed that there was a need to identify concrete activities and deliverables to complete the RA III OP 2012–2015, which could also be necessary for monitoring and evaluation. The Association was pleased to note that the TT-SOP prepared the deliverables and activities, adopted them for the period 2012–2015, as given in Appendix C to this document, and requested the president, with the assistance of the MG, to keep the RA III OP 2012–2015 under review and report to the EC and Congress as required.

RA III Strategic and Operating Plan 2014–2019

5.2.4 The Association accordingly adopted [Resolution 12 \(RA III-16\) – Regional Association III Strategic Plan \(2014–2019\)](#). The Association agreed that the implementation of this Strategic Plan, as given in the [annex to this resolution](#), requires the support by all the Members of the Region, and should be guided, supervised and monitored by the Management Group of RA III, through periodic reports.

5.2.5 The Association further reviewed the deliverables and activities of RA III OP 2012–2015 prepared by the TT-SOP, as given in Appendix C to this document. The Association extended its appreciation to the TT-SOP and the chairpersons of the WGs for their dedicated efforts in completing the RA III SOP 2012–2015, and contributed key deliverables and activities to the RA III Operating Plan 2014–2019 such as guidelines for further improvements.

5.3 Internal matters of the Association (agenda item 5.3)

5.3.1 Review of the subsidiary bodies of the Association (agenda item 5.3.1)

5.3.1.1 In the context of the WMO Strategic Plan for 2012–2015, the Association noted the key priorities of WMO for 2012–2015: Global Framework for Climate Services (GFCS); Capacity Building; WMO Integrated Global Observing System and WMO Information System (WIGOS/WIS); Disaster Risk Reduction; and Aviation Meteorology.

5.3.1.2 The Association noted further the recommendations that have been considered by the Executive Council regarding the review of the WMO constituent bodies, their strategic alignment and their processes and practices for continuous improvement to better deliver the priorities of the Strategic Plan, and in particular that of Capacity Development. In this regard, it has been agreed that the identification of regional priorities and action lists by regional associations and their alignment with the technical commission activities was a crucial element in the integrated WMO strategic and operational planning and that these priorities should be one of the main driving forces of the activities of the technical commissions.

5.3.1.3 Several specific measures have been discussed by the EC regarding concrete changes to existing processes, such as: the development of simplified documentation for constituent body sessions to improve decision-making; further optimization of the schedule of the sessions of the constituent bodies; better involvement of the experts of the technical commissions in the subsidiary bodies of the regional associations and in conjoint projects and activities; reducing the intergovernmental part of constituent body sessions and redirecting the savings to increased technical activities, etc. Cg-XVI requested the EC to continue to work on, and implement as appropriate, continuous improvement of WMO processes and practices, and bring back to Cg-17 specific proposals, which may include changes to the General Regulations or the WMO Convention as necessary.

5.3.1.4 The Association was briefed on the follow-up of Resolution 1 (EC-64), Review of the role and responsibilities of regional associations, by the EC-WG-SOP at its meeting in January 2013. The EC-WG-SOP reviewed proposals for better definition of the role and

responsibilities of regional associations in the WMO integrated planning and implementation process. The Association noted the current provisions of the WMO Convention and the General Regulations, as well as further tasks and responsibilities assigned to regional associations by Congress and EC decisions, including responsibilities outlined in the WMO Technical Regulations. The Association further recommended to review the terms of reference of the working groups and focal points to make sure that they correspond to the RA III Operating Plan 2016–2019.

RA III Management Group

5.3.1.5 The Association noted with appreciation the reports of the RA III Management Group (MG). The Association complimented Mr Julián Báez Benítez, president of the Association and chairperson of the RA III MG, and members of the Group for the activities carried out according to its terms of reference, in particular for guiding the development of the Operating Plan for the Enhancement of NMHSs in RA III, for monitoring the work of RA III working groups and rapporteurs, as well as for the advancement of the WMO Programmes and activities in the Region.

Working groups and other subsidiary bodies of the Association

5.3.1.6 The Association noted with appreciation the information provided by the president on the activities of the RA III subsidiary bodies during the intersessional period. It expressed its satisfaction with the activities performed by the working groups and rapporteurs, but noted with concern that some had not been able to perform satisfactorily for various reasons. The Association encouraged Members to provide the necessary support to the designated members of working groups and other subsidiary bodies to allow them to discharge their responsibilities efficiently. The Association agreed on the need to allocate adequate financial resources for the MG and other subsidiary bodies to conduct their work effectively, noting the potential for cost-saving through tele-video conferencing.

5.3.1.7 The Association supported the need to align the working mechanism of the Association to the Strategic Thrusts and Expected Results of the WMO Strategic Plan as well as Expected Results of the RA III Operating Plan. For that purpose, the following subsidiary bodies were re-established in accordance with [Resolutions 13 \(RA III-16\) – Regional Association III Management Group](#), [Resolution 14 \(RA III-16\) – Regional Association III Working Group on Infrastructure and Technological Development](#), [Resolution 15 \(RA III-16\) – Regional Association III Working Group on Climate](#), and [Resolution 16 \(RA III-16\) – Regional Association III Working Group on Hydrology and Water Resources](#):

- (a) Management Group (MG);
- (b) Working Group on Infrastructure and Technological Development (WG/ITD);
- (c) Working Group on Climate (WG/C); and
- (d) Working Group on Hydrology and Water Resources (WG/HWR).

5.3.1.8 With regard to the working mechanism of the Association, the following general managing principles were considered:

- (a) The work structure of the Association has been simplified and aligned with the new Expected Results of the WMO Strategic Plan for 2012–2015, to ensure a consistent approach in the implementation of the WMO Programmes;
- (b) The overall goal of the established work structure is the implementation of the regional aspects of the WMO Strategic Plan. Therefore, the resources should be used in accordance with the established key regional priorities and expected results;
- (c) The current structure consists of four working groups with Terms of Reference focused on a sub-set of regional expected results and related deliverables;

- (d) The work programmes of the working groups consist of specific tasks designed to implement the regional aspects of the WMO Strategic Plan over the intersessional period. The working groups have the flexibility to propose to the MG the establishment of a manageable number of task teams to address specific tasks, as necessary, for the progress of the work programmes; and
- (e) Cross-cutting issues are addressed through coordination and collaboration between the working groups, each of them providing the necessary expertise. The MG facilitates the coordination process.

5.3.1.9 Considering the above general managing principles, the Association agrees on the subsidiary bodies listed below, with their respective chairpersons and vice-chairpersons, for the next intersessional period:

Management Group (MG)	Chairperson: Mr Julián Báez Benítez (Paraguay) Vice-chairperson: Mr Carlos Naranjo Jácome (Ecuador)
Working Group on Infrastructure and Technological Development (WG/ITD)	Chairperson: Mr José Arimatea de Sousa Brito (Brazil) Vice-chairperson: Mr Gastón Torres (Chile)
Working Group on Climate (WG/C)	Chairperson: Ms Bárbara Tapia (Chile) Vice-chairperson: Ms María de los Milagros Skansi (Argentina)
Working Group on Hydrology and Water Resources (WG/HWR).	Chairperson: Ms Dora Goniadzki (Argentina) and consequently, Regional Hydrological Adviser Vice-chairperson: Mr Fabio Bernal (Colombia)

5.3.1.10 Members in the Region were requested to nominate experts to these subsidiary bodies. The core membership of RA III working groups and task teams will be a selected number of nominated experts. The MG will review the membership of each of the subsidiary bodies and proposals from the chairpersons regarding procedures and substructures that will assist in accomplishing the work.

5.3.1.11 The Association suggested that the subsidiary groups meetings in the intersessional period be organized by the WMO departments related to those issues, in coordination with the Regional Office for the Americas (WMO Office in Asunción). The agenda for these meetings would be coordinated by the president of the Association and the Regional Office for the Americas. In addition, the Association requested that the budget for these meetings, with an attendance of between 8 to 10 participants, be considered.

Volunteerism in the work of Regional Association III

5.3.1.12 The Association recalled that the Executive Council at its sixtieth session (June 2008) agreed in principle with the suggestions of the presidents of the Commission for Basic Systems (CBS) and the Commission for Hydrology (CHy) to award recognition to the experts who volunteered to devote their time to undertake the activities planned by technical commissions and regional associations. The Council also urged Permanent Representatives to facilitate the participation and voluntary contribution of experts, not only from the NMHSs but also from other institutions, to the activities of WMO.

5.3.1.13 In this context, the Association expressed its deep appreciation to the chairpersons and members of the working groups and rapporteurs, who had effectively collaborated in

carrying out the activities of the Association during the intersessional period, by giving recognition to their valuable work for the regional association.

5.3.2 Representation of the Association in the Executive Council (agenda item 5.3.2)

5.3.2.1 The Association recalled that Cg-XVI, in considering the discussions at EC-LXII and the recommendations of the EC Working Group on Strategic and Operational Planning, approved the amendments proposed by the president of RA I to the General Regulations by introducing a regulation concerning the distribution of EC seats that reflected the gentlemen's agreement negotiated at Cg-XIV (2003) and Cg-XV (2007), for the total of 37 seats.

5.3.2.2 The Association noted that Cg-XVI acknowledged the proposal made by the president of Regional Association II (Asia) to increase the number of EC members to enable this Region to obtain an extra seat with respect to the distribution of seats adopted by Resolution 44 (Cg-XVI) for consideration at Cg-17 (2015), in accordance with the procedures described in the WMO Convention. The Association also noted the discussions and reservations of RA I (Africa), RA IV (North America, Central America and the Caribbean) and RA V (South-West Pacific) in reaction to this proposal, all considering that the arguments to justify such a change would be difficult to articulate if it is perceived as the preoccupation of one Region alone. The Association particularly noted the position of RA VI (Europe) to keep the current number of 37 seats, while reserving the right to request one additional seat, should the other Regions propose an increase. The Association further noted that EC-66 recommended that the matter of the number and distribution of seats per Region in the Executive Council be placed in the context of the various challenges faced by the Organization, requesting the Secretary-General to ensure a timely communication on this matter to the Members at least six months before the Seventeenth Congress as per Article 28 of the WMO Convention.

5.3.2.3 In that respect, the Association requested the Management Group to further review the issue to consider the appropriate approaches, including working with the Management Groups of other Regions to contribute to the comprehensive overview to be provided to Congress, which should take into account current problems with EC and RAs representation, the steps taken to overcome these issues so far, as well as clarify the benefits and the additional costs of an increase of seats. The Association requested the president of the Region to contribute to the drafting of a resolution for Cg-17 that would amend Article 13 of the WMO Convention and the General Regulations.

5.3.2.4 The Association also agreed to keep the current number of seats (37) and reserved the right to request an additional seat should other regions propose to increase that number.

5.3.3 Seventh Technical Conference on Management of Meteorological Services in Regional Association III (South America) (agenda item 5.3.3)

5.3.3.1 The Association expressed its appreciation to the Secretary-General for assisting Members in developing their National Meteorological Services (NMSs), particularly by organizing regional events including technical conferences on management to enable them to exchange views on, and share experience in the management and operation of the NMSs. The Association noted that the Sixth Technical Conference on Management of National Meteorological Services in Regional Associations III and IV on WMO Integrated Global Observing System (WIGOS) and the WMO Information System (WIS) was held in San José, Costa Rica, on 3 and 4 March 2011, at the kind invitation of the Government of Costa Rica. The conference was attended by Directors and/or senior officials of NMSs in Regions III and IV and invited lecturers. Many Directors and senior officials of NMSs, as well as invited users, had presented lectures or case studies on social and economic benefits of weather, climate and water services.

5.3.3.2 Considering that constant improvement on management techniques and practices is needed for NMSs to increase efficiency of their Services and to improve the ability to address challenges they are facing under financial and other constraints, the Association agreed that the Seventh Technical Conference on Management of National Meteorological Services in Regional

Associations III and IV be held during the sixteenth financial period with the following topics, among others, which were identified in the Joint Management Groups Meeting of Regions III and IV, held during EC–65:

- (a) The importance of WIGOS/WIS in both Regions III and IV;
- (b) Quality Management of the aeronautical services and accreditation of forecaster courses and degrees;
- (c) Severe events in Regions III and IV and its connection to climate change.

5.3.3.3 During the XI Conference of Directors of National Meteorological and Hydrological Services (NMHSs) of Ibero-America it was proposed that the VII Joint Technical Conference on Management of National Meteorological Services be held in San José, Costa Rica, during the first trimester of 2015. This proposal was analysed by the RA IV Management Group during the recent AMS meeting. In addition to the agreement on the place and date, the RA IV Management Group proposed the Global Framework on Climate Services (GFCS) as one possible topic, inviting experts and possible donors to participate in this conference.

5.3.3.4 The RA IV Management Group meeting held its fourteenth session in June 2014 during the EC–66 session at the WMO headquarters. Taking into consideration the budgetary priorities, it was decided to use the WMO funds budgeted for the RA III/RA IV Joint Conference for the implementation of activities of its Task Teams.

5.3.3.5 Therefore, the Association decided not to hold the Joint Technical Conference with RA IV and to use the funds earmarked for this event to hold meetings of its three working groups in 2015.

6. GLOBAL FRAMEWORK FOR CLIMATE SERVICES (agenda item 6)

Outcomes of the Extraordinary Session of the World Meteorological Congress

6.1 The Association recalled the vision of the Global Framework for Climate Services (GFCS) to enable society to manage better the risks and opportunities arising from climate variability and change, especially for those who are most vulnerable to climate-related hazards. The Association recalled that effective climate services would facilitate climate-smart decisions that will reduce the impact of climate-related disasters, improve food security and health outcomes, and enhance water resource management, among other societal benefits. All countries will benefit, but in the initial stages priority shall go to building the capacity of developing countries vulnerable to the impacts of climate variability and change. The GFCS aims to bridge the gap between those that need to know the climate and those that have such knowledge, thus empowering, in particular, the vulnerable.

6.2 The Association recalled that the GFCS identified four initial priority areas; agriculture and food security, water, health and disaster risk reduction. To ensure that the entire value chain for the production and application of climate services is effectively addressed in support of effective decision-making in the four priority areas, the following components or pillars have to be implemented:

- (a) *The User Interface Platform* — to provide ways for climate services users and providers to interact to identify needs and capacities and improve the effectiveness of the Framework and its climate services;
- (b) *The Climate Services Information System* — to produce and distribute climate data, products and information according to the needs of users and to agreed standards;

- (c) *Observations and Monitoring* – to generate the necessary data for climate services according to agreed standards;
- (d) *Research, Modelling and Prediction* — to harness science capabilities and results and develop appropriate tools to meet the needs of climate services;
- (e) *Capacity Development* — to support the systematic development of the institutions, infrastructure and human resources needed for effective climate services.

6.3 The Association recalled that the Extraordinary Session of the World Meteorological Congress (Geneva, October 2012) adopted three resolutions pertaining to: (a) the Implementation Plan of the GFCS for the subsequent consideration by the Intergovernmental Board on Climate Services; (b) the establishment of the Intergovernmental Board on Climate Services as an additional body accountable to Congress under Article 8(h) of the Convention of the WMO; and (c) financing of the Intergovernmental Board on Climate Services, Secretariat and Implementation Plan of the GFCS.

6.4 The Association noted that a dialogue for Climate Services Users and Providers was organized prior to the Extraordinary Congress from 26 to 27 October 2012. During the dialogue a publication containing case studies on experiences around the world on the development and application of climate services in various socio-economic sectors titled “Climate Exchange” was launched. The dialogue, besides allowing the exchange of experiences and good practices, provided participants with valuable information in preparation for the session of the Extraordinary Congress. An Atlas of Health and Climate produced through collaboration between WMO and WHO was launched at the Extraordinary Congress. It illustrates the geographical extent and impacts of climate-induced health epidemics and gives practical examples of how the use of weather and climate information can protect public health and improve health outcomes (http://www.wmo.int/ebooks/WHO/Atlas_EN_web.pdf).

First session of the Intergovernmental Board on Climate Services (IBCS-1)

6.5 The Association recalled that the first session of the Intergovernmental Board on Climate Services (IBCS-1) was held in Geneva from 1 to 5 July 2013. As part of the session, a one-day workshop on “Operational Climate Services: a dialogue on practical action” (<http://gfcs.wmo.int/node/264>) demonstrated the value of an organized and coordinated system to maximize synergies in addressing the entire value chain for the production and application of climate services and provided examples of concrete activities from the global to the national levels.

6.6 The Association noted that IBCS-1 took the following decisions:

- (a) Approved the Implementation Plan of the GFCS and a Compendium of initial GFCS projects for immediate implementation;
- (b) Established the Management Committee and selected the Members forming the Management Committee of the Board, including Argentina, Brazil and Peru from the Region;
- (c) Agreed on the definition of processes and substructures supporting its advancement;
- (d) Established a stakeholder engagement mechanism;
- (e) Elected Dr Anton Eliassen (Norway) as the Chairperson, Dr Linda Makuleni (South Africa) and Dr Laxman Singh Rathore (India) as the Co-Vice-Chairpersons.

Progress on implementation of the GFCS

6.7 With respect to implementation, the Association noted with appreciation the efforts of the WMO Secretary-General to mobilize support from partner agencies for the GFCS. In this regard Memoranda of Understanding were signed with the International Federation of the Red Cross/Red Crescent Societies (IFRC), International Union for the Conservation of Nature (IUCN), International Commission on Irrigation and Drainage (ICID), United Nations Economic Commission for Africa (UNECA) and United Nations Institute for Training and Research (UNITAR). The Association also noted efforts to strengthen synergies with the European Commission, the Green Climate Fund, the United Nations Development Programme (UNDP) and the World Bank to ensure that their initiatives and investments take into account the priorities under the GFCS.

6.8 The Association noted that a number of countries are conducting their national consultations intended to identify gaps and needs and to establish the internal coordination mechanisms needed to ensure that the entire value chain for the production and application of climate services in the country is effectively addressed (see <http://gfcs.wmo.int/upcoming-events>). These consultations allow the identification of key gaps in the various components of the GFCS to support the development and application of climate services. They also facilitate the identification of critical elements that are supporting the development of guidelines for the establishment of frameworks for climate services at national level. In this regard, the Association encouraged its Members to initiate frameworks for climate services at national level as the coordination mechanism to ensure effective implementation of the GFCS.

6.9 The Association was pleased to note that a Regional Workshop on Climate Services at the National Level for Latin America was held in San José, Costa Rica from 28 to 30 July 2014. The consultation allowed the identification of priorities for implementation for the three regions that comprise Latin America: Western South America, South Eastern South America and Mesoamerica.

6.10 The Association was pleased to note the various initiatives for the implementation of climate services underway in the Region. These include the Regional Committee for Water Resources and the Regional Climate Centres for Western and Southern South America. In addition the Association noted with appreciation that Peru, with the support of Switzerland, is implementing the project **CLIMANDES** (Servicios climáticos con énfasis en los Andes en apoyo a las decisiones). The project seeks to improve climate services for the Peruvian region. In addition, the project aims at increasing the number of professionals and students trained in meteorology and climatology in support of the newly established WMO Regional Training Centre (RTC) in Lima, hosted by the National Agrarian University La Molina (UNALM). The Association stressed that its Members should be actively involved in the implementation of the GFCS through supporting the ongoing initiatives and active involvement of the projects and activities identified in the Implementation Plan of the GFCS and in the Compendium of initial GFCS projects.

6.11 The Association noted with appreciation the establishment of a joint WMO/WHO climate and health Project Office under the GFCS Office to support implementation of the health priority area. The health sector has been identified as a priority in the Region; therefore, the link between health and climate services needs to be strengthened. The Association requested the cooperation of the WHO/WMO Project Office in sensitizing governments so that the health authorities become aware of the importance of NMHS support to improve health management. The Association appreciated the secondment of an expert by the Global Water Partnership to the Climate and Water Department of WMO to support the water priority area, particularly the programmes on flood and drought management. Furthermore, the Association was pleased to know that WFP is in the process of recruiting an expert to be deployed in the GFCS Office to support the agriculture and food security priority area.

6.12 The Association reiterated that effective implementation of the GFCS will depend on the clear identification of roles and contributions of the various stakeholders for realizing the results envisaged for the 2-, 6-, and 10 years' time frames identified in the Implementation Plan of the GFCS. In this regard the Association appreciated the efforts being undertaken to enable the

activities contained in the implementation plan to occur. Specifically, the Association appreciated current efforts to organize a meeting to develop a matrix where the specific contributions of the various actors, including WMO constituent bodies, partner agencies and key stakeholders will be depicted. The Association was informed that the meeting is scheduled to take place at the end of September 2014 in Geneva.

6.13 The Association noted that the success of the GFCS would depend on the active and full participation of Members and partners in its implementation. In this regard, the Association urged its Members to establish frameworks for climate services at national level, identify gaps at regional and national levels, prioritize needs for climate services and initiate activities at national and regional levels to fill the identified gaps, contribute to the identification and documentation of existing climate services delivery mechanisms at national and regional levels, identification of partnerships with all potential stakeholders, identification of funding mechanisms, and the sharing of experiences in implementation of the GFCS. In addition, the Association urged its Members to strengthen the structures that support the pillars of the GFCS. The Association also requested the GFCS Office to promote greater coordination among organizations working in climate-sensitive sectors in the Region, including United Nations entities, through its governance structures such as the Programme Advisory Committee and Project Oversight Board. Furthermore the Association urged its Members to make contributions to the GFCS Trust Fund and to second their experts to the GFCS Office to enable it to fully discharge its functions.

6.14 The Association noted that the Executive Council Task Team on WMO Policy for International Exchange of Climate Data and Products to support the implementation of the GFCS, established by EC-64, had developed a draft resolution on WMO policy for International Exchange of Climate Data and Products to support implementation of the GFCS that was considered by EC-66, prior to submission to Cg-17. The resolution reiterates and complements Resolution 40 (Cg-XII) – WMO policy and Practice for the Exchange of Meteorological and Related Data and Products including Guidelines on the Relationships in Commercial Meteorological Activities and Resolution 25 (Cg-XIII) – Exchange of Hydrological Data and Products. Issues related to GCOS and climate data management systems are dealt with under agenda items 4.4(4) and 4.4(5) respectively.

6.15 The Association noted that the Secretary-General had requested Members and Partners to report to the GFCS Office projects and activities they are implementing that contribute to the implementation of the GFCS. The reported projects and activities must comply with the criteria that were updated by the first meeting of the Management Committee of the Intergovernmental Board on Climate Services, which was held in Geneva on 15 and 17 June 2014. The Association urged its Members to report, as the information that will be compiled would allow an appreciation of the activities under the pillars and priority areas that are being currently implemented so as to maximize efficiencies in the implementation of the GFCS.

6.16 The Association noted that the second session of the Intergovernmental Board on Climate Services will take place in Geneva, Switzerland from 10 to 14 November 2014 and encouraged Members to include users of climate services and partners in their delegations or select national focal points from other sectors to ensure that the IBCS was true to the principles of user-driven climate services and intradisciplinarity.

7. EMERGING ISSUES AND SPECIFIC CHALLENGES FOR REGIONAL ASSOCIATION III (agenda item 7)

7.1 The Association noted with appreciation the outcomes of the survey on institutional arrangements, carried out between April and July 2014, to identify challenges and future priorities in the Region. The Association noted further that these challenges and priorities have also emerged in the conclusions and recommendations of the meetings of the subsidiary groups during the intersessional period, and are in line with the current RA III Strategic Plan.

7.2 The Association reviewed the survey report which included the analysis of responses from eight RA III Members on: institutional arrangements, management and organization, operations and services, challenges and priorities, as well as expected outcomes from the sixteenth session of RA III. The Association noted that NMHSs in the Region show several common aspects as follows:

- (a) Most of the NMHSs are under the Ministries, Secretaries or General Directions of Defence, Agriculture or Environment. Also, most of them are Decentralized Public Organisms, Institutes or State Enterprises;
- (b) A law, decree, or other legal instrument, regulates the functions of all NMHSs. In all cases the Government provides the financial resources;
- (c) Six out of the eight NMHSs supply meteorological services to aviation, and four NMHSs are in charge of operational hydrology.

7.3 The Association recognized that the survey report highlighted some of the challenges and priorities for the NMHSs in RA III, providing key elements for further discussion and actions. The challenges identified by the survey include the following aspects, among others:

- (a) Lack of qualified personnel and the need for ongoing training, as well as replacement of staff who are close to reaching the age of retirement;
- (b) Need to improve institutional arrangements, including enabling legislation, effective fiscal management, and securing of increased financial resources from Governments and other sources;
- (c) Need to improve horizontal cooperation and partnerships with key national, regional and global bodies, including funding agencies, in order to enhance the service delivery and sustainability of NMHSs in the Region;
- (d) Need to improve access to, and usage of, Numerical Weather Prediction (NWP) guidance material as underlying support to make better service delivery;
- (e) Need to address gaps in regional observing and telecommunications systems for the improvement of the monitoring, forecasting, and dissemination of products relating to weather, water and climate;
- (f) Need to address inadequacies of early warning services supporting Disaster Risk Reduction (DRR);
- (g) Need to fully implement and sustain a quality management system in each NMHS; and
- (h) Need to improve communication with users and stakeholders for better delivery of user-focused services (e.g. climate services).

The priorities identified 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, including radar and upper-air observation systems;
- (b) **Strengthening of climate services in the Region** including the implementation of the GFCS at regional and national levels: and the advancement in the implementation of the three Regional Climate Centres (RCC) of South America in its different stages;

- (c) **Full implementation and maintenance of a Quality Management System (QMS)** in RA III and the consolidation and maintenance of competency standards consistent with the QMS;
- (d) **Improvement of Service Delivery of RA III NMHSs, in line with technical standards and best practices**, especially focusing on strengthening of the Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (*SWFDDP*) and demonstrating the social and economic benefits of these services, through tailor made information and effective communication;
- (e) **Enhancement of partnerships** to demonstrate the benefits of weather, hydrological and climate services to the community by increasing cooperation and partnership for outreach, with regional partners, national and local governments and NGOs;
- (f) **Strengthening of national capacities in hydrology and water resources**, especially with regard to modernization of hydrometric activities, assessment of water resources and hydrological forecasts; and
- (g) **Carrying out in-depth studies and analyses of climate change** and adaptation to climate variability and change.

These improvements, which will result in a better service delivery at regional, national and local levels, also require:

- (a) Enhancement of regional activity effectiveness and efficiency, building a common position on issues like data policy, commercialization and public/private sector relationships;
- (b) Enhancement of existing partnerships with development partners and creation of new partnerships that will lead to long term sustainability of the services; and
- (c) Addressing the capacity development issues related to education and training needs, budget and staff resource deficiencies, including cost recovery, and Numerical Weather Prediction (NWP) utilization.

7.4 The Association recognized that the financial and staffing constraints were one of the main challenges limiting the possibilities of many NMHSs to participate in regional activities and bodies, pushing RA III Members to look for support from other WMO Members through joint/ twinning projects, capacity building activities, as well as technical, QMS and infrastructure issues, and requesting the WMO Secretariat support to enable participation in regional events.

7.5 The Association acknowledged these challenges and priorities, which should be reflected in the RA III Operating Plan and WMO Strategic Plan 2016–2019. It also requested the Secretary-General that every effort be made to meet the mentioned priorities, taking into account the new distribution of budgetary resources for the new financial period.

8. WMO REGIONAL OFFICE FOR THE AMERICAS INCLUDING THE WMO OFFICE FOR SOUTH AMERICA (agenda item 8)

8.1 The Association reviewed the activities of the Regional Office for the Americas (RAM) since its fifteenth session. It noted that the Office carried out its functions and responsibilities as an integral part of the Development and Regional Activities (DRA) Department of the WMO Secretariat. It also noted the effective assistance provided by the Office to the president, vice-president, and subsidiary bodies of the Association in discharging their responsibilities. It expressed its appreciation to the Secretary-General and to the staff of the Office for their continued support to the activities of the Association during the intersessional period.

8.2 The Association noted that the number of activities organized and/or coordinated by the Regional Office for the Americas has increased substantially and appreciated in particular the support by RAM to its subsidiary bodies. During the intersessional period, RAM supported the organization of meetings of the Management Group (normally, one dedicated meeting and one side-event during the EC sessions) and the respective meetings of the three different Working Groups. The Association highlighted that these meetings benefited from the timely provision of all necessary documents and logistics information, travel arrangements, secretarial support during the meeting and preparation of an action-oriented meeting report.

8.3 The Association further noted with satisfaction that the Office also improved communication methods by organizing meetings via teleconference and Webex. The Association appreciated in particular the fact that the Working Groups were able to conduct Webex meetings moderated by RAM remotely, which proved to be a viable option to face-to-face meetings when urgent coordination or quick progress review were to be conducted. The Association strongly recommended that the Office promote further the use of such forms of work of the subsidiary bodies.

8.4 The Association highlighted the increasing role played by the Regional Office to help the Members in the implementation of the WMO technical and scientific programmes and other activities of regional concern. The Association underlined the contribution of the Regional Office to the growing function of NMHSs as information and services providers in their respective countries. The Association further noted the fast response of the Office to the NMHSs, supporting their requirements for the mobilization of resources.

8.5 The Association noted the appreciation expressed by the president of RA III to the WMO Secretariat, in particular, to the Department of Development and Regional Activities (DRA) and its Regional Office for the Americas, in particular the WMO Office for South America in Asunción, Paraguay, for the assistance provided and the effective and efficient organization of the activities of the Association during the intersessional period.

8.6 The Association acknowledged the measures adopted by the WMO Secretariat for the successful re-installation of the Regional Office for the Americas in Asunción, Paraguay, which widely fulfilled the objective of providing major support to NMHSs, strengthening technical cooperation activities and resource mobilization at the regional level, as well as optimizing the use of the budget. The Association further expressed its acknowledgement to the Secretary-General for the results achieved and its appreciation to the Government of Paraguay for hosting the Office.

8.7 The Association expressed its thanks to Members that contributed to the organization of events and encouraged all Members to continue their support by assisting in the organization and hosting of regional activities. (See RA III-16/INF. 3, List of regional events in RA III (2010–2014)). The Association took note that during the intersessional period the following high profile regional events had been organized by the RAM Office in collaboration with the relevant technical departments of the Secretariat:

- (a) Sixth Joint Technical Conference on Management of Meteorological Services in RAs III and IV, San José, Costa Rica, 3–4 March 2011;
- (b) IX Meeting of the Conference of Directors of the Ibero-American NMHSs; Brasilia DF, Brazil, 9–11 November 2011;
- (c) First Forum on Climate Perspectives for South America (COF), Guayaquil, Ecuador, 1–4 October 2012;
- (d) X Meeting of the Conference of Directors of the Ibero-American NMHSs, Boadilla del Monte, Spain, 22–24 October 2012;
- (e) RA III and RA IV Joint Workshop on the WIGOS Regional Implementation Plan, San José, Costa Rica, 26–30 November 2012;

- (f) XI Meeting of the Conference of Directors of the Ibero-American NMHSs, Quito, Ecuador, 27–29 November 2013;
- (g) RA III Working Group on Hydrology and Water Resources, Montevideo, Uruguay, 25–27 March 2014.
- (h) First session of the Working Group on Infrastructure and Technology Development (WG-ITD) in RA III, Asunción, Paraguay, 12–16 May 2014.
- (i) Second meeting of the WMO RA III Working Group on Climate Services, Quito, Ecuador, 5–7 May 2014

8.8 The Association noted with appreciation that the RAM Office was instrumental in providing advice to Members on queries and requests on technical or organizational matters. The Office conducted several fact-finding missions to Members and provided respective governments with detailed reports with recommendations on best practices, improvements of institutional and technical matters and resolution of deficiencies. The Association felt that such dedicated WMO missions to Members were an effective mechanism for assistance and encouraged the Secretary-General to ensure that such missions are supported during the next intersessional period. The Association also encouraged those Members who need expert assistance through dedicated WMO missions to send their requests to the Secretary-General.

8.9 The Association noted that many of these cooperation activities provided opportunities for capacity development of the NMHSs of RA III Members. Acknowledging that a number of international partner organizations and investment institutions have special interest in areas like disaster risk reduction, climate change adaptation and enhancement of climate services, the Association encouraged the Secretary-General to ensure that the Regional Office strengthen its role as a WMO regional hub for inter-agency cooperation in support of resource mobilization for enhancement of meteorological, hydrological and climatological services provided by Members.

8.10 The Association underlined the important results achieved in the implementation of technical cooperation projects in RA III. During the period 2010–2014, WMO continued developing initiatives and projects in response to national and regional needs of the NMHSs of the countries in RA III, with special emphasis on the following projects:

- (a) The valuable and uninterrupted cooperation provided since 2003 by the Ibero-American Cooperation Project, financed by AEMET, Spain, in the Ibero-American countries, with activities, basically oriented to professional training and transfer of knowledge;
- (b) The activities and supply of equipment in the framework of the Trust Fund for the technological and scientific modernization of the National Meteorological Institute of Brazil (INMET);
- (c) The continued cooperation and support to the International Research Centre for El Niño Phenomenon (CIIFEN), established in Guayaquil, Ecuador, including the selection process of its International Director, the management of the CIIFEN Trust Fund financed by the Ibero-American Project (AEMET), and the participation in the International Board meetings, seminars and other activities organized by this Centre in RA III;
- (d) The coordination by the RAM Office on behalf of WMO, since 2012, of the Andes-Based Climate Services for Decision-Makers (CLIMANDES) Project, financed by the Swiss Agency for Cooperation and Development (COSUDE) implemented jointly by the National Meteorological and Hydrological Service of Peru (SENAMHI), the Federal Office of Meteorology and Climatology of Switzerland (METEOSWISS), in collaboration with La Molina Agrarian National University (UNALM), the University of Berne (UNIBE) and Meteodat (GmbH).

8.11 The Association acknowledged the considerable progress of the Office in providing the required services to its Members. The Association requested that this trend continue during the next intersessional period. It strongly supported further improvements in the use of information technologies, in particular, further enhancement of the regional office Website, on-line forums, remote meetings via Webex, on-line surveys and databases, recognizing the benefits of these practices in regional activities in light of the limited resources of the Office.

8.12 The Association requested the Secretary-General to continue his efforts to enhance the regional and technical cooperation activities to satisfy the needs of the Members in the Region, and expressed satisfaction regarding a series of measures taken by the Secretary-General to modify the structure and the organization of the Secretariat, particularly those referred to the Regional Offices of WMO and the Development and Regional Activities Department (DRA) with a view to improve the rendering of services to the Members and to intensify the collaboration with the national and regional institutions and organizations.

8.13 The Association noted that the Regional Office for the Americas continued as focal point and information centre for regional activities and has established collaboration mechanisms with the Members to improve the National Meteorological and Hydrological Services (NMHSs), and implement the WMO Programmes and relevant activities of regional interest. It also pointed out that the Office had participated actively with others local organs of the United Nations system in Paraguay, as well as non-governmental institutions, in various local activities. The Association expressed its gratitude to the Government of the Republic of Paraguay for hosting the Office and providing the required support for its functioning.

9. SCIENTIFIC LECTURES AND DISCUSSIONS (agenda item 9)

9.1 The following scientific lectures were presented during the session:

- (a) Implementation of the new NOAA Meteorological Satellite Generation (Mr Steve Goodman, Senior Scientist for the NOAA GOES-R Series Satellite Programme, United States);
- (b) AMDAR (aircraft) and Radar Data Assimilation (Mr Ming Hu, Cooperative Institute for Research in Environment Sciences (CIRES), University of Colorado at Boulder, and Earth System Research Laboratory (NOAA), United States);
- (c) Use of Meteorological Radars in Nowcasting and Quantitative Precipitation Estimation (QPE) (Mr Cesar Benetti, Executive Director of the Meteorological System of Parana (SIMEPAR), Brazil).

9.2 The lectures were followed by fruitful discussions with an active participation of delegates. The Association expressed its appreciation to the lecturers for their interesting and informative presentations. It requested the Secretary-General, in consultation with the president of RA III, to make the necessary arrangements for scientific lectures during the next session of the Association.

10. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION AND OF RELEVANT EXECUTIVE COUNCIL RESOLUTIONS (agenda item 10)

10.1 The Association examined those of its resolutions that were still in force at the time of the sixteenth session.

10.2 The Association noted that most of its previous resolutions had been replaced by new resolutions adopted during the session.

10.3 The Association accordingly adopted [Resolution 17 \(RA III-16\) – Review of previous resolutions and recommendations of the Association](#).

11. ELECTION OF OFFICERS (agenda item 11)

The Association unanimously elected Mr Julián Báez Benítez (Paraguay) as president and Mr Carlos Naranjo Jácome (Ecuador) as vice-president of WMO Regional Association III (South America).

12. DATE AND PLACE OF THE SEVENTEENTH SESSION (agenda item 12)

12.1 In accordance with Regulation 171 of the WMO General Regulations, the president of the Association should determine the date and place of the seventeenth session in agreement with the President of the World Meteorological Organization and after consultation with the Secretary-General, during the intersessional period.

12.2 The Association noted with appreciation the kind offer extended by Argentina and Chile to host the seventeenth session, subject to further confirmation.

13. CLOSURE OF THE SESSION (agenda item 13)

The sixteenth session of Regional Association III (South America) closed at 13h12 on 20 September 2014.

RESOLUTIONS ADOPTED BY THE SESSION

Resolution 1 (RA III-16)

IMPLEMENTATION OF THE WMO STRATEGY FOR SERVICE DELIVERY IN REGION III (SOUTH AMERICA)

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) That the Sixteenth World Meteorological Congress had approved the WMO Strategy for Service Delivery,
- (2) That the Executive Council at its sixty-fifth session had endorsed the Implementation Plan for the Strategy,
- (3) That the Strategy and its Implementation Plan were cross-cutting and could be applied in the development both of weather and warning services, and of climate and hydrological services,
- (4) That the Strategy and its Implementation Plan were published in March 2014,

Noting further:

- (1) That Congress at its sixteenth session had requested regional associations to make full use of the Strategy in developing specific plans for their own regions and engaging in regional partnerships,
- (2) That Congress had also requested regional associations to seek every opportunity to transfer knowledge through advanced capacity-building approaches presented in the Strategy,

Having considered:

- (1) That regional associations, including Regional Association III (RA III), had expressed the desire for ownership of the Implementation Plan, taking the responsibility to carry it through in their respective regions,
- (2) That RA III priorities for service delivery were fully catered for in the Strategy and its Implementation Plan,

Decides to assign to the RA III Management Group the task of ensuring a harmonized and synchronized implementation of the Strategy by Members, as agreed in [Resolution 13 \(RA III-16\) – Regional Association III Management Group](#);

Requests the Secretary-General to provide support to the Association in the implementation of this decision;

Requests the WMO Programmes to support the implementation of the Strategy in RA III by providing expertise and other forms of assistance, as may be requested.

Resolution 2 (RA III-16)**REGIONAL EVENT ON THE FUTURE OF METEOROLOGICAL SERVICE PROVISION
TO CIVIL AVIATION IN REGION III (SOUTH AMERICA)**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting the outcomes of the Conjoint ICAO/WMO Meteorology Divisional Meeting and the fifteenth session of the Commission for Aeronautical Meteorology (CAeM-15) (Montreal, 7–18 July 2014), and the related challenges and opportunities for Members as outlined by Aviation Meteorology – Building Blocks for the Future, the WMO technical conference held in Montreal on 7 and 8 July 2014,

Noting also the plans of the International Civil Aviation Organization (ICAO) for significant changes in global Air Traffic Management, as stipulated in the “One Sky” concept, the Global Air Navigation Plan and the Aviation System Block Upgrade methodology, which will have a significant impact on the meteorological service for international air navigation,

Noting further the potentially serious legal and safety consequences of non-compliance with essential ICAO and WMO Standards and Technical Regulations,

Considering:

- (1) The importance of aviation as an enabler of socioeconomic development,
- (2) The needs of the aviation industry for timely and accurate meteorological information and services contributing to safety, efficiency and regularity of air transport,
- (3) The specific challenges facing Regional Association III (RA III) Members in ensuring continuous service at the required quality level, which may need innovative national and regional solutions,

Considering further the urgency of raising awareness of the coming changes in the global and regional Air Traffic Management and related changes in meteorological service provision,

Requests the Secretary-General, in close cooperation with ICAO, relevant regional partners and other international organizations concerned with aviation safety, efficiency and regularity, to organize a regional conference on the future of meteorological service provision to civil aviation, in order to explore coordinated regional approaches in RA III in response to the evolving ATM system and information-centric requirements, based on the outcomes of the Conjoint ICAO/WMO Meteorology Divisional Meeting mentioned above;

Urges Members to actively participate in the preparation of the conference and provide support for its organization, as appropriate.

Resolution 3 (RA III-16)

IMPLEMENTATION OF DISASTER RISK REDUCTION ACTIVITIES IN REGION III (SOUTH AMERICA)

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) The *WMO Strategic Plan 2012–2015* (WMO-No. 1069),
- (2) The *Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress* (WMO-No. 1077),
- (3) The *Abridged Final Report with Resolutions of the Extraordinary Session of the World Meteorological Congress* (WMO-No. 1102),
- (4) The decisions of the First Session of the Intergovernmental Board on Climate Services (IBCS-1),

Noting further:

- (1) The *Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters*,
- (2) The Work Programme on Loss and Damage adopted by the nineteenth Conference of the Parties to the United Nations Framework Convention on Climate Change (Warsaw, 2013),

Considering:

- (1) Disaster Risk Reduction (DRR) as one of the five priority areas of WMO and one of the initial four high-priority areas of the Global Framework for Climate Services (GFCS),
- (2) The importance of a user-driven approach to development and delivery of weather, hydrological and climate services to support policy development, risk analysis, multi-hazard early warning systems, sectoral risk management and disaster risk financing,
- (3) The establishment of the DRR User Interface Expert Advisory Groups related to the thematic priority areas of WMO in DRR including: (a) hazard and risk analysis; (b) multi-hazard early warning systems; (c) sectoral risk management in areas such as land zoning, infrastructure and housing, agriculture and food security, water resource management, and health; and (d) disaster risk financing and insurance. Three concrete guidelines were under development targeted at National Meteorological and Hydrological Services (NMHSs) and their stakeholders in the areas mentioned under (a), (b) and (c) above,
- (4) The establishment of the Commission for Basic Systems Task Team on the Provision of Operational Meteorological Assistance to Humanitarian Agencies, in coordination with the Commission for Climatology and the Commission for Hydrology, with focus on development of requirements of the humanitarian community for weather and climate services,
- (5) The outcomes of the WMO DRR Survey 2006 and the implementation of the second WMO DRR National and Regional Survey (2014/2015) to assess national and regional capacities to support DRR,
- (6) Regional consultations for the Post-2015 Framework for Disaster Risk Reduction coordinated by the United Nations Office for Disaster Risk Reduction (UNISDR),

- (7) The Third United Nations World Conference on Disaster Risk Reduction to be held from 14 to 18 March 2015, in Sendai, Japan, which would review and adopt the Post-2015 Framework for Disaster Risk Reduction,

Considering further:

- (1) The expressed need of Members for guidelines, standards and training modules for development and delivery of weather, hydrological and climate services to support decisionmaking in disaster risk reduction, in alignment with the principles of Quality Management System,
- (2) The experience of Regional Association III (RA III) in addressing natural hazards,
- (3) The opportunities for coordination with regional DRR strategies, provided by the Association's strategy and implementation plan, through active engagement of the Association with regional and subregional DRR platforms and events,
- (4) That the Region offered some of the best practices in disaster risk management for a regionally coordinated meteorological network and that it was developing similar regionally coordinated institutional capacities for climate services,
- (5) That the good practices of a number of NMHSs in the Region could support the development of DRR knowledge products and training materials,
- (6) That a group of DRR focal points, representing technical commissions and technical programmes, is working to develop a holistic approach to supporting Members in activities related to disaster risk reduction,

Requests the Secretary-General:

- (1) To provide further regular updates on requirements, needs and progress in the implementation of WMO DRR activities to the Association's Management Group, relevant subsidiary bodies and RA III Members;
- (2) To provide assistance with resource mobilization for projects in support of DRR and climate adaptation capacity development with a holistic user-driven approach to decisionmaking, which would link to the implementation of the GFCS;
- (3) To assist the president of the Association, the Management Group and relevant subsidiary bodies, in coordination with the UNISDR Regional Office for the Americas, in contributing to the regional consultation for the Post-2015 Framework for Disaster Risk Reduction;
- (4) To coordinate and present a position paper to the Third UN World Conference on Disaster Risk Reduction to be held in Sendai, Japan, in 2015, in which the operational efforts of the regions would be clearly reflected as key contributions to the post-2015 DRR framework; the position paper, which would present DRR as a priority in the region, would also acknowledge that efforts to improve early warning and decision support systems require sustained political and financial backing;

Requests the president of the Association and the Management Group:

- (1) To document the Region's initiatives for implementation of the GFCS-related DRR activities and to formulate concrete recommendations to WMO governing bodies based on the development of climate services for DRR;
- (2) In collaboration with the Secretary-General, to actively participate in the regional consultations underway, coordinated by UNISDR, to ensure that the need to strengthen

national and regional capacities for development and provision of weather, hydrological and climate services is considered an integral part of DRR strategies and development plans at national and regional levels, particularly in reference to the GFCS;

- (3) To address DRR-related matters, as appropriate, in the respective areas of expertise of the Association's subsidiary bodies;
- (4) To nominate an RA III DRR focal point to join the group of WMO DRR focal points, to ensure that regional views are considered;

Urges Members:

- (1) To support the implementation of the WMO DRR activities in the context of regional/national capacity development and contributions through documentation of their respective good practices;
- (2) To contribute to the preparation of and to consider participating in the Third UN World Conference on Disaster Risk Reduction, which will be held in Sendai, Japan, in March 2015;
- (3) To participate actively in the 2014/2015 second WMO DRR National and Regional Survey.

Resolution 4 (RA III-16)

**LAUNCHING THE ANNUAL STATEMENT ON THE STATUS OF THE CLIMATE
IN THE SOUTH AMERICAN REGION**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) That the successful provision of the WMO annual statement on the status of the global climate since 1993 has resulted in high scientific and policy impacts at a global scale,
- (2) The growing need of the scientific community, decisionmakers and the public to have access to regional and national climate assessment on a regular basis,

Appreciating:

- (1) The collaborative spirit within the Region, as demonstrated during the publication of the high-value peer-reviewed article, Warming and wetting signals emerging from analysis of changes in climate extreme indices over South America, *Global and Planetary Change*, Volume 100, 2013,
- (2) The valuable contribution of Members of the Region to the WMO annual statement on the status of the global climate, as well as to *The Global Climate 2001-2010: A Decade of Extremes* (WMO-No. 1103),

Considering:

- (1) The implementation of the Global Framework for Climate Services, particularly with respect to two of its pillars: Observations and Monitoring, and Climate Service Information System,

- (2) The need for an enhanced collaboration mechanism to provide timely and high-quality climate monitoring information, focusing on regional temperature trends and weather and climate extreme events and their impacts, to be taken into account by policy and decisionmakers,

Decides to start issuing an annual Statement on the Status of the Climate in the South American Region starting from the year 2015, as an on-going endeavour, complementing the WMO annual Statement on the Status of the Global Climate with additional regionally relevant information and detail,

Invites:

- (1) Members to actively collaborate on this important project;
- (2) The president of Regional Association III to consult with the Secretary-General, in order to establish an ad-hoc mechanism convening experts and climate institutions of the Region, with additional supporting expertise from other regions if necessary, to define and launch the first edition of the Statement in English and Spanish and to assist in mobilizing resources for launching the project;
- (3) The Secretary-General to bring this resolution to the attention of Members.

Resolution 5 (RA III-16)

**IMPLEMENTATION OF REGIONAL CLIMATE CENTRES AND NETWORKS IN
REGION III (SOUTH AMERICA)**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) *The Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress* (WMO-No. 1077),
- (2) *The Abridged Final Report with Resolutions and Recommendations of the Sixteenth Session of the Commission for Climatology* (WMO-No. 1137),
- (3) *The Abridged Final Report with Resolutions and Recommendations of the Fifteenth Session of the Commission for Basic Systems* (WMO-No. 1101),
- (4) *The Manual on the Global Data-processing and Forecasting System* (WMO-No. 485),
- (5) *The Abridged Final Report with Resolutions of the First Session of the Intergovernmental Board on Climate Services* (WMO-No. 1124),
- (6) The report of the Regional Association III (RA III) Working Group on Climate,

Recognizing:

- (1) The enhanced worldwide attention to climate change, the associated vulnerabilities in the Region and the need to support decisionmaking for adaptation to climate change and variability with more detailed regional climate information,

- (2) The criteria and process for formal WMO designation of Regional Climate Centres (RCCs) and RCC Networks in the WMO Technical Regulations, as set out in the *Manual on the Global Data-processing and Forecasting System* (WMO-No. 485), Volume I – Global Aspects,
- (3) The recommendation made by the Commission for Basic Systems during its extraordinary session (Asunción, 8–12 September 2014) to formally designate the RCC for Western South America,
- (4) The role of RCCs in the implementation of the Global Framework for Climate Services (GFCS),

Decides:

- (1) That RCC implementation in Region III will comprise an RCC for Western South America, an RCC Network for Southern South America and an RCC Network for Northern South America;
- (2) That the operation of RCCs and RCC Networks in Region III, including demonstration phases, be guided by the RA III Working Group on Climate, with oversight by the president of the Association and the RA III Management Group in close consultation with the Commission for Climatology and the Commission for Basic Systems;
- (3) To promote two-way communication between the RCCs/RCC Networks and National Meteorological and Hydrological Services (NMHSs) in the Region, to ensure effective uptake of RCC products, enhanced national inputs and user feedback;
- (4) To facilitate collaboration with the RCCs of other regional associations to address cross-regional issues;
- (5) To update NMHS requirements for RCC products, particularly taking into account their evolving needs and bearing in mind the implementation of the Global Framework for Climate Services at the regional and national levels;
- (6) To keep under review the mandatory as well as highly recommended functions of the RCCs and RCC Networks in the light of new requirements and capabilities, and develop an updated implementation plan as appropriate, including additional functions and nodes;

Urges:

- (1) The president of RA III, with support from the concerned subsidiary body of the Association, to consult with the Commission for Climatology, the Commission for Basic Systems and the WMO Secretariat on the effective implementation of RCCs and RCC Networks in the Region;
- (2) The RA III RCCs and RCC Networks to actively support the development and sustainable operation of Regional Climate Outlook Forums in the Region;
- (3) The RCCs and RCC Networks in the Region, including those in the demonstration phase, to submit activity reports on an annual basis to the concerned subsidiary body and to undertake recommended actions to ensure fulfilment of WMO designation criteria;
- (4) All Global Producing Centres for Long-range Forecasts and other centres in the Region routinely producing global climate information to support and collaborate with the RA III RCCs and RCC Networks;
- (5) All RA III Members to support the activities of the RCCs in the Region, use their products, and provide feedback to RCCs and Global Producing Centres on their effectiveness for further improvement and tailoring of products to user needs;

- (6) All those concerned with the implementation of RCCs and RCC Networks in Region III to keep themselves apprised of the implementation of the GFCS, and to adjust and align their activities on an ongoing basis to support GFCS implementation, especially at regional and national levels;

Requests the RA III Management Group to assist the president of the Association in all matters related to RCC implementation;

Requests the president of RA III:

- (1) To facilitate coordination within the Association in all matters related to RCC implementation, with assistance from the Management Group;
- (2) To consult with the Commission for Climatology, the Commission for Basic Systems and the WMO Secretariat on the effective implementation and further development of RCCs and RCC Networks in the Region;

Requests the presidents of the Commission for Climatology and the Commission for Basic Systems, and the Secretary-General to facilitate the necessary technical guidance for the operation and development of the RA III RCCs and RCC Networks;

Requests the RCCs and RCC Network nodes in Region III and their respective coordinators to closely liaise with the RA III Working Group on Climate, the Commission for Climatology and Commission for Basic Systems to ensure sustained and effective RCC operations.

Note: This resolution replaces Resolution 2 (XV-RA III) which is no longer in force.

Resolution 6 (RA III-16)

REGIONAL WMO INTEGRATED GLOBAL OBSERVING SYSTEM IMPLEMENTATION PLAN

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) Resolution 50 (Cg-XVI) – Implementation of the WMO Integrated Global Observing System,
- (2) Resolution 10 (EC-64) – WMO Integrated Global Observing System Framework Implementation Plan,
- (3) The final report of the first session of the Regional Association III (RA III) Working Group on Infrastructure and Technological Development, held in Asunción from 16 to 20 May 2014,

Noting further the final reports of the first, second and third sessions of the Inter-commission Coordination Group on the WMO Integrated Global Observing System (ICG-WIGOS) and the recommendations on WIGOS implementation, including the development of Regional WIGOS Implementation Plans,

Decides to adopt the WIGOS Implementation Plan for Regional Association III (South America) as presented in the annex to this resolution;

Requests the Management Group:

- (1) To regularly review and update the Implementation Plan; to guide, prioritize elements, oversee and monitor progress in the implementation of the Plan, and to submit amendments/updates to the Plan to the president of the Association for approval;
- (2) To oversee the implementation of the Regional Plan and consult with the appropriate technical commissions on technical aspects of the implementation;

Requests Members:

- (1) To develop their national WIGOS implementation plans;
- (2) To organize their activities so as to realize WIGOS goals and associated outcomes as described in the RA III WIGOS Implementation Plan;
- (3) To communicate and promote the concept of WIGOS and the benefits of this system for the Region and nationally;
- (4) To continue providing resources, including through the WIGOS Trust Fund and/or seconded experts, and in-kind contributions to support the implementation of WIGOS;

Requests the Secretary-General to provide the necessary assistance and Secretariat support for WIGOS implementation in RA III;

Invites partners to participate in relevant implementation activities as specified in the RA III WIGOS Implementation Plan.

Annex to Resolution 6 (RA III-16)

**WMO INTEGRATED GLOBAL OBSERVING SYSTEM IMPLEMENTATION PLAN FOR
REGIONAL ASSOCIATION III**

WORLD METEOROLOGICAL ORGANIZATION

**WMO INTEGRATED GLOBAL OBSERVING SYSTEM
(WIGOS)**

**WIGOS IMPLEMENTATION PLAN
FOR
REGIONAL ASSOCIATION III (SOUTH AMERICA)**

**(R-WIP-III)
Version 1.0
(19/09/2014)**



VERSION CONTROL

Version	By	Date	Changes
0.9	Working Group on Infrastructure and Technological Development (WG-IDT)	21/06/2014	Final Draft for RA III-16
0.9.1	WIGOS-PO	01/07/2014	Editorial (consistency with WIP, v3.0)
1.0			

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WIGOS FRAMEWORK IMPLEMENTATION PLAN

1. INTRODUCTION AND BACKGROUND

1.1 Purpose of WIGOS and scope of the RA III WIGOS Implementation Plan (WIP)

The WMO Integrated Global Observing System (WIGOS) provides a new framework for WMO observing systems and the contributions of WMO to co-sponsored observing systems. It is important to recognize that WIGOS is not replacing the existing observing systems, but is rather an over-arching framework for the evolution of these systems which will continue to be owned and operated by a diverse array of organizations and programmes. WIGOS will focus on the integration of governance and management functions, mechanisms and activities to be accomplished by contributing observing systems, according to the resources allocated on a global, regional and national level.

The WIGOS Framework Implementation Plan (WIP) addresses the necessary activities to establish an operational WIGOS by the end of the period 2012-2015, as per the direction of WMO Congress. Yet WIGOS will continue to evolve and improve beyond 2015 through the governance and management mechanisms established by the execution of this plan.

The WIP also addresses a number of additional activities that would substantially improve the operational capabilities of WIGOS beyond the 2012-2015 implementation; however these activities are dependent on resources in addition to the regular budget. If these activities are not completed, WIGOS can still be considered operational. The resulting system will, however, be less effective in achieving its goals and benefits to Members will be reduced or delayed.

The WIP provides a basis for the development of the regional WIGOS framework implementation plans (R-WIP). The Members of a Region will adhere to the global WIP and to their regional framework (R-WIP) in the design, operation, maintenance and evolution of their national observing systems.

This plan is laid out in several chapters that identify and describe the various activity areas to be addressed within this Region. Specific regional/national activities for each area are included in Table 2 (see Section 4), which identifies deliverables, timelines, responsibilities, costs and risks, and whether the activity requires regional and/or national implementation. Similar activities are grouped under the title corresponding to the respective sub-section of Section 2.

1.2 WIGOS vision and Congress guidance for WIGOS implementation

The Sixteenth World Meteorological Congress decided that enhanced integration of the WMO observing systems should be pursued as a strategic objective of WMO and identified this as a major expected result of the WMO Strategic Plan.¹

The WIGOS vision calls for an integrated, coordinated and comprehensive observing system to satisfy, in a cost-effective and sustained manner, the evolving observing requirements of Members in delivering their weather, climate, water and related environmental services. WIGOS will enhance the coordination of WMO observing systems with those of partner organizations for the benefit of society. Furthermore, WIGOS will provide a framework for enabling the integration and optimized evolution of WMO observing systems, and of WMO's contribution to co-sponsored systems. Together with the WMO Information System (WIS), this will allow continuous and reliable access to an expanded set of environmental data and products, and associated metadata, resulting in increased knowledge and enhanced services across all WMO Programmes.

¹ See http://www.wmo.int/pages/about/documents/1069_en.pdf.

The implementation of WIGOS should build upon and add value to the existing WMO observing systems with emphasis on integration of surface- and space-based observations in an evolutionary process to satisfy requirements of WMO and WMO co-sponsored Programmes.

In implementing WIGOS, it is imperative that the current management, governance and support activities be reviewed and aligned with WMO priorities. This alignment would promote cooperation and coordination at the technical, operational and administrative levels.

The integrated satellite systems are a unique source of observational data for monitoring of weather, climate and the environment. It is important to further advance instrument intercalibration, data exchange, data management standardization, and user information and training, in order to take full advantage of space-based capabilities in the context of WIGOS.

WIGOS will be essential for the Global Framework for Climate Services (GFCS), aviation meteorological services, disaster risk reduction, and capacity development, each of which is a WMO priority. It will also ensure a coordinated WMO contribution to the co-sponsored Global Climate Observing System (GCOS), Global Ocean Observing System (GOOS), Global Terrestrial Observing System (GTOS), and the Global Earth Observation System of Systems (GEOSS).

2. KEY ACTIVITY AREAS FOR REGIONAL WIGOS IMPLEMENTATION

To migrate the existing global observing systems (the Global Observing System (GOS), the Global Atmosphere Watch (GAW), the WMO Hydrological Cycle Observing System (WHYCOS) and the Global Cryosphere Watch (GCW), including surface-based and space-based components and all WMO contributions to GFCS, GCOS, GOOS, GTOS and GEOSS), particularly their regional components, into a more integrated single system that is WIGOS, focused effort is required at the regional level in the following key areas, detailed in the sub-chapters to follow:

- (a) Management of WIGOS implementation;
- (b) Collaboration with the WMO co-sponsored observing systems and international partner organizations and programmes;
- (c) Design, planning and optimized evolution;
- (d) Observing system operation and maintenance;
- (e) Quality management;
- (f) Standardization and interoperability;
- (g) The WIGOS Information Resource;
- (h) Data discovery and availability (of data and metadata);
- (i) Capacity development;
- (j) Communication and outreach.

2.1 Management of WIGOS implementation in RA III

WIGOS implementation is an integrating activity for all regional components of the WMO and co-sponsored observing systems: it supports all WMO Programmes and activities.

Executive Council

The WMO Executive Council (EC) will continue to monitor, guide, evaluate and support the overall implementation of WIGOS. Following the guidance by Cg-XVI, EC-LXIII established the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS) with a view to providing technical guidance and assistance for the planning, implementation and further development of the WIGOS components. Progress on implementation of WIGOS will be reported to subsequent sessions of

EC. The Council designated the president of the Commission for Basic Systems (CBS) as chairperson of ICG-WIGOS.

Regional associations

The regional associations will play a key role in WIGOS implementation in the Regions. Regional Association III, through its Working Group on Infrastructure and Technological Development (WG-IDT), will coordinate planning and implementation of WIGOS on the regional level taking into account all WMO future priorities, such as GFCS and disaster risk reduction (DRR). WG-IDT, under guidance from ICG-WIGOS, and with the support, where required, of the WIGOS Project Office in the WMO Secretariat, will be responsible for:

- (a) The development of the Regional WIGOS Framework Implementation Plan (R-WIP);
- (b) The integration of WIGOS regional network components; and
- (c) The evolution of their regional networks according to the implementation plan for the evolution of global observing systems (EGOS-IP).²

R-WIP will also address regional aspects of requirements, standardization, observing system interoperability, data compatibility, data management, Quality Management System (QMS) procedures including performance monitoring and data quality monitoring, and proposed improvements in observing networks/systems. An important role of the regional association will be to assess and continuously monitor regional requirements, identify regional gaps and identify capacity development projects within the Region to address those gaps.

The Members of the Regions

Members will plan, implement, operate and maintain national networks and observing programmes based on the standards and best practices stated in the WMO Technical Regulations, the WIGOS Manual and the respective manuals of the WIGOS component observing systems (e.g. GOS, GAW, WHYCOS and the Global Cryosphere Watch (GCW)). They will be encouraged to adopt a composite network approach to their networks and to include the acquisition, and onward transmission, of data from external sources, including National Meteorological and Hydrological Services (NMHSs) and other government agencies, the commercial sector and members of the public. A particular area of focus for Region Members under WIGOS will be increased attention to site protection and radio frequency spectrum protection.

Plans should also be developed to strengthen cooperation through partnership with different owners overseeing the WIGOS observing components within their countries. Specifically, these activities aim to enhance cooperation amongst meteorological, hydrological, marine/oceanographic and academic/research institutions/services where they are separated at the national level.

Concerning Radio Frequency Spectrum Protection, RA III Members should maintain close coordination with their national telecommunication authorities to register their frequencies for adequate protection, and to defend the availability of frequencies for Meteorology, Climatology and Earth observations, influencing positively the national delegations to the World Radiocommunication Conferences (WRC).

2.2 Collaboration with the WMO co-sponsored observing systems and international partner organizations and programmes

WIGOS will be an integrated, comprehensive, and coordinated system primarily comprising the surface-based and space-based observing components of the GOS, GAW, GCW, and WHYCOS, plus all WMO contributions to GCOS, GOOS and GTOS. It should be noted that in contrast to the primarily NMHS-owned observing systems upon which the WWW was built, the proposed WIGOS component observing systems are owned and operated by a diverse array of organizations, both research and operational. Therefore, the interaction between these various communities at the regional and national

² See <http://www.wmo.int/pages/prog/www/OSY/gos-vision.html#egos-ip>.

levels is important for the implementation of WIGOS within the Region. In particular, strengthening the interaction between research and operational observing communities is important for sustaining and evolving observing systems and practices, in line with new science and technology outcomes.

Partner organizations

At the regional level, coordination and cooperation will be supported by a mechanism to be defined by the regional associations and the respective regional bodies, such as WG-IDT, the Working Group on Climate Services (GTSC), Working Group on Hydrology and Water Resources (GTHyRH) and RA III Management Group (GM), in order to solve any problems in data policy, product delivery and other governance issues. This interagency and inter-observing system coordination mechanism will need to be complemented and supported through similar cooperation and coordination arrangements among NMHSs and through national implementation mechanisms for GFCS, GCOS, GOOS, GTOS, and GEOSS.

The architecture for climate monitoring from space has been defined as an end-to-end system, involving the different stakeholders, including operational satellite operators and R&D space agencies, the Coordination Group for Meteorological Satellites (CGMS), the Committee on Earth Observation Satellites (CEOS), the Global Climate Observing System (GCOS), the World Climate Research Programme (WCRP) and the Group on Earth Observations (GEO). Within the regional context, the architecture is to be part of the space-based component of WIGOS. Therefore, particular emphasis will be placed on their coordinated contribution to WIGOS, building on existing coordination mechanisms stated above.

2.3 Design, planning and optimized evolution of WIGOS component observing systems

WMO has agreed on the vision for the global observing systems in 2025³ which provides high-level goals to guide the evolution of the global observing systems over the coming decades. To complement and respond to this Vision, an Implementation Plan for the Evolution of Global Observing Systems (EGOS-IP) has been considered by CBS-15. This EGOS-IP focuses on the long-term evolution of WIGOS observing systems components, while the WIP focuses on the integration of these observing system components. Beyond 2015 these plans will provide Members of the Regions with clear and focused guidelines, specifying actions that stimulate the cost-effective evolution of the observing systems to address in an integrated way the requirements of all WMO Programmes and relevant parts of co-sponsored programmes.

Concerning the surface-based sub-system of WIGOS, the current composition of mainly separate networks of observing stations comprises numerous different types of sites. With the implementation of WIGOS, these separate networks will continue to evolve but will also be given a more prominent collective identity as the WIGOS surface-based sub-system and for some purposes may be considered as a single composite system of observing (fixed or mobile) sites/platforms. The regional association will adopt a broader role in coordinating the implementation of relevant elements of the WIGOS surface-based sub-system, evolving from the previous concepts of mainly the Regional Synoptic and Climatological Networks into an integrated concept of a WIGOS regional network.

Similarly, the space-based sub-system of WIGOS is composed of many different platforms and types of satellites. There is already partial integration due to the existence of a globally coordinated plan, which is maintained by WMO and CGMS, and which takes into account the needs of a number of application areas. However, it should be further developed and expanded to better support certain application areas that, at present, are not benefiting from the full potential of space-based observations, for example, other components of GAW and WHYCOS and new initiatives like GFCS and GCW. In addition, further integration will be pursued in terms of inter-calibration, data and product harmonization, and composite product delivery. The regional associations will adopt an active role in compiling the views of Members and

³ Available from the WMO website at: <http://www.wmo.int/pages/prog/www/OSY/gos-vision.html>

maintaining documented requirements and priorities for data and products to be available for the Regions from the WIGOS space-based sub-system.

Rolling Review of Requirements (RRR)⁴

Coordinated strategic planning at all levels will be based on the RRR process, and will be supported by the WIGOS regulatory material. This activity will be carried out primarily at the **global level** under the guidance of the ICG-WIGOS.

The RRR process involves regularly reviewing the observational data requirements⁵ for each of the defined WMO application areas and all required variables (see Table 1). The RRR process also involves reviewing the capabilities of WMO observing systems and co-sponsored systems, and the details of the networks/platforms in existence,⁶ for both space-based and surface-based systems, in delivering data on different variables. The comprehensive information collected for the globe on both requirements and capabilities is quantitatively recorded in a database accessible through the Observing Systems Capability Analysis and Review tool (OSCAR⁷) of the WIGOS Information Resource (WIR, see section 2.7 below). The information on surface-based networks and instrumentation details is currently recorded in Volume A, but will ultimately be available, with additional metadata, through the OSCAR tool. Space-based capabilities are also recorded and made available through the OSCAR tool. OSCAR allows gap analyses to be performed to identify weaknesses in existing observing programmes.

The above steps represent the analysis phase of the RRR, which is as objective as possible. Next is the prioritization and planning phase in which experts from the various application areas interpret the gaps identified, draw conclusions, identify key issues and priorities for action. This input is composed as Statements of Guidance (SoG) from each application area. The technical commissions respond to the SoG by formulating new global observing system requirements and the regulatory and guidance publications to assist Members in addressing the new requirements. Additionally, CBS and other technical commissions draw on the SoGs to develop a vision and an implementation plan for further developments of WIGOS.

Table 1. The 12 recognized WMO application areas

No.	Application area	No.	Application area
1	Global NWP	7	Ocean applications
2	High-resolution NWP	8	Agricultural meteorology
3	Nowcasting & very short-range forecasting	9	Hydrology ⁸
4	Seasonal to inter-annual forecasts	10	Climate monitoring
5	Aeronautical meteorology	11	Climate applications
6	Atmospheric chemistry	12	Space weather

⁴ Currently specified in the *Manual on the Global Observing System* (WMO-No. 544), elaborated in the *Guide to the Global Observing System* (WMO-No. 488), and described further on the WMO website at <http://www.wmo.int/pages/prog/www/OSY/GOS-RRR.html>

⁵ The RRR describes data requirements, which are expressed in terms of space/time resolution, uncertainty, timeliness, etc., for each of the required observed variables, and are measures independent of observing technology.

⁶ Capabilities are derived from the individual platforms characteristics submitted by Members to WMO e.g. through WMO-No. 9, Volume A, or its evolution.

⁷ The following components are currently available via the WMO website: User Requirements: <http://www.wmo.int/pages/prog/www/OSY/RRR-DB.html>; and space-based capabilities: http://www.wmo.int/pages/prog/sat/gos-dossier_en.php. The surface-based capabilities part is currently under development

⁸ Hydrological information only; water quality monitoring and information is currently excluded.

Regional level

Although the primary coordination of the RRR will lie with CBS for overall WIGOS planning, the regional association, through WG-IDT, will follow the technical guidance of the technical commissions as represented in the EGOS-IP and other observation system implementation plans in order to evolve and implement observing systems in the Region.

The regional associations will examine, and report back to CBS, their requirements for data, and any issues they identify with the global WIGOS design, taking into account the particular requirements of the Regions and international river basin authorities. This process will involve, in essence: (1) the use of the global data to prepare regional data requirements; (2) use of these data for detailed planning of observing system components at the regional scale; and then (3) encouragement of Members of the Regions to implement these components, subject to further review at the national or sub-regional level, where appropriate.

National or sub-regional level

The Members of the Regions will contribute to the collective regional effort to: (1) assess the regional data requirements and plan the regional observing system components; and (2) implement and evolve observing systems following this plan, the EGOS-IP and other observation system implementation plans.

The Members of the Regions will also have available the global and regional data requirements information to use as guidance for the preparation of national requirements information which can then be used to assist with the detailed planning for evolution of national observing components of WIGOS.

In some cases, where countries are small and geographically close or already have established multilateral working relationships, there may be more merit in taking a sub-regional, as opposed to national, approach to WIGOS observing infrastructure planning. In this case, it will be necessary for the Members concerned to work in close cooperation to prepare sub-regional reviews of requirements to be used as a basis for detailed planning at that scale.

2.4 Observing system operation and maintenance

Observing system owners or custodians are responsible for operating and maintaining their systems and for complying with the regulations of the WMO and co-sponsored observing systems to which they contribute. System owners are generally NMHSs or other organizations within WMO Member countries but are sometimes other entities.

WIGOS on the regional level involves a process for sharing of operational experiences, practices and ideas, for sharing of expertise and for pooling resources for joint activities. The benefit is to realize synergies and greater efficiencies. These interactions may be between different teams within a single organization (such as an NMHS) or between regional organizations. These may benefit from technical guidance from relevant technical commissions and, while occurring primarily at a national level, there is a regional role to be played. Within Regional Association III, the following regional activities will be important:

- (a) Contribute to WIGOS promotion and outreach;
- (b) Increase the regional interchange of information from automatic weather stations;
- (c) Create a regional weather radar network;
- (d) Strengthen regional and interregional cooperation.

2.5 Quality management

The Regions recognize that meeting the quality requirements and expectations of users will be critical to the success of WIGOS. This will require an in-depth examination of current practices used by WMO observing programmes, specific mission-related requirements that are already in place, and available technological opportunities.

The WIGOS quality management approach is to apply the WMO QMF to the WIGOS observing components (see *Technical Regulations* WMO-No. 49, Part 4). WIGOS quality management will strive for compliance of all components of WIGOS with international standards, such as ISO 9001/9004 and the ISO 17025 standard where appropriate (i.e. with respect to instrument calibration and traceability of data). Compliance with international standards should be pursued in all quality assurance (QA) procedures applied by Members of the Regions to all their national WIGOS observing components. In addition to the WMO QMF document, further guidance to Members will be provided by WMO via the standards and best practices described in the regulatory materials, such as the WIGOS Manual and Guide. Such guidance, for both mandatory and desirable practices, can be referred to for the application and implementation of quality management in national observing systems. In this context, the Regions will give attention to:

- (a) The examination of current quality management practices being used in the Regions;
- (b) The documentation of the quality of observations from the WIGOS regional networks at all stages of data processing; and
- (c) Ensuring, where possible, traceability of observations to the International System of Units (SI).

CGMS, in coordination and collaboration with WMO, supports the development of quality assurance standards and formats for satellite observations, multi-satellite and multi-sensor algorithms for estimating retrieved data and products, and advanced atmospheric sounding derivation packages for use by WMO Members. To assist this effort, the Regions will ensure that surface-based sites that are needed for calibration/validation of satellite data are specified.

A key aspect of regional quality management that requires particular attention under WIGOS is the systematic and rigorous performance monitoring and evaluation (PM&E) of WIGOS capabilities, in terms of both: (a) the flow of observational data/products to models; and (b) provision of products/information for decision-support tools and services in accordance with requirements specified by end users. Effective PM&E can improve the overall performance of WIGOS and its ability to effectively interact with its user community and to meet community needs and requirements.

Members of the Regions will be responsible for ensuring compliance with the WIGOS quality management principles (such as ISO 9001, 9004 and 17025).

2.6 Standardization and interoperability⁹

The WIS has an important role in regional WIGOS implementation, in relation to data exchange and discovery, and the provision of effective standards and practices for data management. Therefore, the Regions will coordinate WIGOS and WIS implementation activities.

Taking into account the ongoing rapid progress in technology that will continue to provide a basis for further improvements in the capability, reliability, quality and cost-effectiveness of observations, the Members of the Region will ensure that WIGOS utilizes international standards and best practices set by WMO and partner organizations and described in the WMO Regulatory Materials in the following areas:

- (a) Instruments and methods of observation across all components including surface-based and space-based elements (observations and their metadata);
- (b) WIS information exchange, as well as discovery, access and retrieval (DAR) services; and

⁹ Interoperability is a property referring to the ability of diverse systems to work together (inter-operate).

- (c) Data management (data processing, quality control, monitoring and archival).

The Regions will support all activities leading to the interoperability (including data compatibility) of WIGOS observing components through utilization and application of the same, internationally accepted standards and best practices (that is, standardization). Data compatibility is also supported through the use of standardized data representation and formats.

Any regional deviations from the standard practices (documented in the WMO Technical Regulations through the WIGOS Manual and other relevant manuals) will be reported to the WIGOS Project Office.

2.7 The WIGOS Information Resource

The WIGOS Operational Information Resource (WIR), accessible via a centralized point (web portal), will provide all WIGOS-related operational information, including observational user requirements, a description of the contributing observing networks (instrument/site/platform metadata), and their capabilities, list of standards used in the WIGOS framework, data policies applicable, and information on how to access data. It will also provide general information on WIGOS benefits, and impacts to Members. It will be a tool for conducting critical reviews as part of the Rolling Review of Requirements, and can assist Members and the regional associations in conducting observing network design studies as appropriate. It will provide guidance on how to develop capacities in developing countries according to WIGOS requirements, and will provide Members of the Regions with a toolbox to be used nationally if and when required. The information collected is intended in particular to identify the gaps in the observational networks, identify areas where existing observing systems could be used, or where their scope could be expanded at limited cost to address the requirements of more application areas. The information provided on standards will support the production of more homogeneous data-sets and make the observations traceable and of known quality.

The key support tools of WIGOS are: (a) a central web portal (WIGOS Portal); (b) The WIGOS Standardization of Observations Reference Tool (SORT); and (c) the Observing System Capabilities Analysis and Review tool (OSCAR) which includes information on observational user requirements and observing systems capabilities, and allow the critical review to be performed by comparing the two.

Understanding that sources of the individual components of the WIGOS Operational Information Resource rely on the inputs from its Members, the Regions are committed to providing regular inputs to keep the information resource up-to-date.

2.8 Data discovery and availability (of data and metadata)

Within the WIGOS framework, the WMO Information System (WIS¹⁰) provides exchange of data and interpretation metadata,¹¹ and management of related discovery metadata.¹² These discovery metadata play an important role in the discovery, access and retrieval of WIGOS observations and products by the entire WMO community.

Submission, management and archival of the data themselves is generally the responsibility of observing system owners/data custodians. However, several World Data Centres and a number of regional or specialized data centres exist that collect, manage and archive basic observational data that are relevant to WMO applications. Members of the Region are responsible for submitting their data to these regional or specialized data centres. The regional associations will encourage their Members to abide by this commitment.

¹⁰ See page: <http://www.wmo.int/wis>.

¹¹ Interpretation metadata is the information required to interpret the data.

¹² Discovery metadata is the information describing the data-sets, generally using the ISO-19115 standard, and WMO core profile in case of WIS.

Members of the Region will adopt WIGOS and WIS standards and make their data and metadata available through WIS for delivery or for discovery, access and retrieval services. In this regard, promotion and implementation of DCPCs (Data Collection and Production Centres) as well as National Centres will be supported and encouraged by the regional associations. Guidance will be developed and provided through the appropriate WIGOS regulatory and technical documents.

RA III is in the process of implementation of one GISC and one DCPC. NCs are naming focal points and subscribing to the GISC and DCPC for metadata and data exchange.

2.9 Capacity development

A coordinated capacity development effort at global, regional and national levels is of paramount importance to the developing countries in the implementation of WIGOS. This is especially the case for NMHSs of Least Developed Countries (LDCs) and Small Island Developing States (SIDSs), to enable them to develop, improve and sustain national WIGOS observing components. This needs to be complemented by capacity development efforts outside of WIGOS but in closely related areas to improve access to and effective utilization of observations, data and products, and related technologies. The WIGOS capacity development activities at the regional level are focused on:

- (a) Providing assistance to Members of the Region to introduce or improve institutional mandates and policies that enable effective implementation, operation and management of observing systems;
- (b) Filling the existing gaps in the design, operation and maintenance of WIGOS observing systems, including both the infrastructure and human capacities development;
- (c) Technological innovation, technology transfer, technical assistance and decision-support tools. In RA III, there will be a great emphasis on horizontal cooperation, mainly for the exchange of best practices.

Capacity development in satellite applications for developing countries, LDCs and SIDSs are also addressed in the Implementation Plan for the Evolution of the GOS (see WMO/TD-No. 1267). The virtual lab (VL) will continue to grow and help all WMO Members realize the benefits of satellite data.

2.10 Communication and outreach

The Regions will establish their communication and outreach strategy through the efforts of WMO Members, programmes, Regional Associations (RAs) and Technical Commissions (TCs), and co-sponsors. The strategy will provide details on WIGOS benefits, increased effectiveness, and efficiency, and impact on the activities of the Members of the Regions, as well as on the socio-economic benefits of WIGOS data. It will take advantage of outreach programmes developed and effectively deployed so far by WMO and its partner organizations within the Regions.

The WIGOS portal will provide convenient access to relevant information on regional communication, outreach and capacity development, aimed at complementing, not duplicating, others' efforts. A variety of outreach materials will be developed to educate the Members, funding agencies, policy-makers and the general public, on the importance of WIGOS to society. These will include posters and other educational material for elementary and high school classes, a WIGOS brochure, a semi-annual or annual newsletter, an online photo and video library, and information on the current state of the observing systems. A regional WIGOS portal is planned and under development. The sites of all NMHSs will have links pointing to the regional WIGOS site.

3. REGIONAL PROJECT MANAGEMENT

RA III will undertake the project through WG-ITD with the support of the Regional Office for the Americas. It is planned to have a Rapporteur on the Regional Implementation of WIGOS in the structure of WG-ITD.

3.1 Project monitoring, review and reporting mechanism

- (a) The regional association, through its Management Group, will monitor, review, guide and support the overall implementation of WIGOS in the Region;
- (b) The regional association, through the WIGOS focal point appointed by the president of the Region, will report to the ICG-WIGOS and the WIGOS Project Office on the progress in implementation of WIGOS in the Region;
- (c) The president will report at the RA's sessions on WIGOS implementation.

3.2 Project evaluation

The evaluation methodology will be designed against WIGOS implementation activity tables, i.e. with respect to the activities, deliverables, timeline, responsibility and budget allocations. This will include a schedule of monitoring and evaluation activities and related responsibilities. Mid-term evaluation, interim progress reports and post-implementation reviews are planned as a means of providing early feedback on progress towards success, and as a means of meeting accountability and transparency requirements for the whole implementation phase. RAs and NMHSs will provide progress reports at the request of the WIGOS Project Office.

4. IMPLEMENTATION

4.1 Activities, deliverables, milestones, costs and risks

Table 2 presents the key implementation activities that are required for the regional WIGOS implementation within the timeframe 2012-2015. The table is arranged to correspond to the activity areas presented in Section 2. In the table each implementation activity is presented along with its associated deliverables, timelines, responsibilities, costs and associated risk.

For each activity in Table 2, a detailed activity plan will be developed by the responsible entity or entities, with the support of WG-IDT. WG-IDT has responsibility for tracking execution of these activities and this plan itself.

Table 2. WIGOS implementation activities¹³

No.	Activity	Deliverables	Timeline	Responsibility	Estimated Costs (2012–2015) K CHF			Potential risks
					Total	Available regular budget	Short-fall	
1. Management of WIGOS implementation in RA III								
1.1 R	Devise and keep up to date the WIGOS Regional Implementation Plan	WIGOS Regional Implementation Plan	2014–2015	RA III Working Group on Infrastructure and Technological Development (WG-ITD)				Low (ongoing)
1.2 R	Report progress on implementation to the RA III management group	Annual progress reports	2014–2015	RA III WG-ITD				Low

¹³ Activities in bold are considered the most critical for WIGOS to gain operational acceptance by 2015. Depending on the implementation scale, planned activities are specified as follows: **R** = Regional activity and **N** = National activity.

No.	Activity	Deliverables	Timeline	Responsibility	Estimated Costs (2012–2015) K CHF			Potential risks
					Total	Available regular budget	Short-fall	
1.3 R	Protect radio frequencies used in meteorology, climatology and Earth observations	Registration of radio frequencies used in observations and telecommunications with national telecommunication administrations. Maintaining periodical coordination meetings concerned with protection of such frequencies.	2014–2015	Members				Low
2. Collaboration with the WMO co-sponsored observing systems and international partner organizations								
2.1 R	Identify and involve potential partners for regional data collection, clarifying areas of cooperation and governance mechanisms.	Increase the number of observations.	2014–2015	WG-ITD with the support of the RA III Working Groups on Climate and Hydrology Services and Water Resources				High
2.2 N	Encourage Member countries to identify and involve potential partners for national data collection, clarifying areas of cooperation and governance mechanisms.	Increase the number of observations.	2014–2015	Permanent Representatives of the Member countries				Medium
2.3 R	Devise mechanisms to integrate observing systems with RA IV.	Compatibility of observing systems and data management	2014–2015	Presidents of regional associations and Member countries				Medium
3. Design, planning and optimized evolution of WIGOS and its regional, subregional and national observing components								
3.1 R	Update inventory of national networks, identifying the status and potential for exchange at the regional and international levels.	Status report	2014–2015	WG-ITD observation subgroup, through WIGOS focal points, NMHSs and working groups				Medium

No.	Activity	Deliverables	Timeline	Responsibility	Estimated Costs (2012–2015) K CHF			Potential risks
					Total	Available regular budget	Short-fall	
3.2 N/R	Develop a consultation mechanism for defining requirements of users in the Region in terms of the twelve WIGOS application areas, using tools (RRR) available on the WMO website, https://www.wmo.int/pages/prog/www/OSY/GOS-RRR.html	Table of requirements of the various users or areas	2014–2015	WG-ITD observation subgroup through NMHSs and working groups				Medium
3.3 R	Identify missing information in line with needs of users and design optimal regional network.	Status report and proposed network design	2014–2015	WG-ITD observation subgroup with Member countries				Medium
3.4 R	Maintain and update the regional requirements for satellite information.	Up-to-date reports on the requirements of each country	2014–2015	Specific working group to be set up, with experts from space agencies and NMHSs in Regions III and IV				Low
3.5 R	Develop an implementation plan for a regional radar network, taking account of experience in Region IV.	Implementation plan	2014–2015	RA III Working Group on Infrastructure and Technological Development (WG-ITD)				Medium
4. Observing system operation and maintenance								
4.1 R	Exchange experience with Members of the Region on best practice for operating and maintaining observing systems.	Examples of best practice	2014–2015	Regional association, WMO Regional Office with the cooperation of the countries under the leadership of a WG-IDT expert				Low
5. Quality Management								
5.1 N/R	Assess and document the current status of meteorological instrument calibration	Status report	2014–2015	Regional Instrument Centre with the support of the countries and CIMO focal point in the Region				Medium

No.	Activity	Deliverables	Timeline	Responsibility	Estimated Costs (2012–2015) K CHF			Potential risks
					Total	Available regular budget	Short-fall	
5.2 N/R	Maintain calibration levels and gradually achieve instrument traceability in accordance with international standards.	More countries meeting established standards	2014–2015	National Meteorological Services				Medium
5.3 N/R	When calibration laboratories are established, efforts should be made to implement a quality management system based on ISO/IEC 17025.	Improve Members' capabilities	2014–2015	National Meteorological Services				High
6. Standardization, system interoperability and data compatibility								
6.1 N/R	Complete the migration to TAC/TDCF coding in accordance with the requirements of the Commission for Basic Systems.	Migration complete in the Region	2014	Telecommunications subgroup with the National Meteorological Services				Low
6.2 N	Encourage countries to provide metadata from the observing station network, based on the standards to be defined by ICG/WIGOS.	Availability of metadata	2014–2015	Members of RA III				Medium
7. WIGOS Information Resource								
7.1 R	Encourage Members to provide up-to-date metadata to the WIGOS Information Resource and ensure that it is maintained at all times.	Keep up-to-date metadata at the WMO Secretariat	2014–2015	RA III Working Group on Infrastructure and Technological Development (WG-ITD) and Members				Low
8. Data discovery and availability								
8.1 R	Encourage Member countries to exchange data via WIS, including NMHSs and other organizations.	New sources of data available through WIS	2014–2015	Telecommunications subgroup with the National Meteorological Services				Medium

No.	Activity	Deliverables	Timeline	Responsibility	Estimated Costs (2012–2015) K CHF			Potential risks
					Total	Available regular budget	Short-fall	
9. Capacity development ¹⁴								
9.1 R	Coordinate activities and training for the areas involved in WIGOS/WIS.	Enhanced capacity of Member countries through workshops and horizontal cooperation	2014–2015	WMO and Member countries				Low
9.2 R	Training in methods for quality control, calibration and traceability of meteorological instruments	Enhanced quality of observations	2014–2015	WMO and Member countries in coordination with CIMO				Low
9.3 R	Coordinate training activities in the use of satellite data and products, especially the new generations.	Improved capabilities for using satellite data and products	2014–2015	WMO and Member countries in coordination with CBS				Low
10. Communication and outreach								
10.1 R	Contribute to WIGOS outreach by setting up an RA III website and help to raise the profile of WIGOS by: (a) A link featured on the websites of each Meteorological Service; (b) Using materials to be provided by the WIGOS Project Office; (c) Materials produced in the Region with the support of the WIGOS Project Office.	Greater awareness and visibility of WIGOS in the Region	2014–2015	Paraguay Meteorological Service, in cooperation with other countries and the WMO Secretariat				Low

¹⁴ Congress stressed that an effective capacity-building strategy is an essential component of the WIGOS implementation. Specialized education, training activities and improvement of necessary observing infrastructure should be reflected in the regional, sub-regional and national WIGOS implementation plans, especially for NMHSs of LDCs, LLDCs and SIDS. Hence, capacity building is not to be limited to scientific and technological concerns, but also to strategic and management consideration including human resources development, resource mobilization and communications and outreach activities.

No.	Activity	Deliverables	Timeline	Responsibility	Estimated Costs (2012–2015) K CHF			Potential risks
					Total	Available regular budget	Short-fall	
10.2 R	Contribute to WIGOS/WIS outreach by running a workshop for all Members of the Region.	Greater awareness and visibility of WIGOS/WIS in the Region	2014	WMO				Low
10.3 R	Promote national meetings to identify potential partners.	Effective incorporation of national partners in WIGOS	2014–2015	Permanent Representatives of the Member countries				Low

5. RESOURCES

The corresponding resources will be identified at a later stage after analysis and discussion at regional level and in coordination with the WIGOS Project Office and the WMO Secretariat.

6. RISK ASSESSMENT/MANAGEMENT

A risk management plan (RMP) will be devised for each activity or project, including risk mitigation.

The following risk areas have been identified:

- (a) Lack of resources (funds and expertise);
- (b) Lack of understanding of the benefits that WIGOS can bring to the Region and Members;
- (c) Lack of cooperation and collaboration with key partners and other stakeholders;
- (d) Lack of commitment by Members.

7. OUTLOOK

This document has described the key activities for the period 2014-2015. As determined by Cg-XVI, the goal is to have WIGOS operational by 2016. This is a challenging task. The experience gained during the WIGOS test of the concept phase clearly shows that it will be impossible to complete integration of all observing systems on global, regional and national levels in only four years. While WIGOS operations should start in 2016, there will still be a strong need to continue a significant number of implementation activities.

LIST OF ACRONYMS

CBS	Commission for Basic Systems
CEOS	Committee on Earth Observation Satellites
CGMS	Coordination Group for Meteorological Satellites
DCPC	Data Collection and Production Centre
FAO	Food and Agriculture Organization
GAW	Global Atmosphere Watch
GCOS	Global Climate Observing System
GEO	Group on Earth Observations
GEOS	Global Earth Observation System of Systems
GFCS	Global Framework for Climate Services
GOOS	Global Ocean Observing System
GOS	Global Observing System
GTOS	Global Terrestrial Observing System
ISO	International Organization for Standardization
NMHS	National Meteorological and Hydrological Service
NWP	Numerical weather prediction
OSCAR	WIGOS Observing Systems Capabilities Analysis and Review tool
QMF	Quality Management Framework
RA	Regional Association
SI	International System of Units
SIDS	Small Island Developing States
WCRP	World Climate Research Programme
WHYCOS	World Hydrological Cycle Observation System
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WWW	World Weather Watch

Resolution 7 (RA III-16)

REGIONAL BASIC SYNOPTIC NETWORK AND REGIONAL BASIC CLIMATOLOGICAL NETWORK IN REGION III (SOUTH AMERICA)

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) Resolution 3 (XV-RA III) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region III,
- (2) The *Manual on the Global Observing System* (WMO-No. 544), Volume I, Part III, Regulations 2.1.3.1-2.1.3.5, and the definition of Regional Basic Synoptic and Climatological Networks,
- (3) The *Manual on Codes* (WMO-No. 306),
- (4) The *Manual on the Global Telecommunication System* (WMO-No. 386),

Considering:

- (1) That the establishment and maintenance of an adequate regional network of surface and upper-air synoptic stations to meet the requirements of Members and of the World Weather Watch constitute one of the most important obligations of Members under Article 2 of the WMO Convention,
- (2) That the Fourteenth World Meteorological Congress welcomed the establishment of Regional Basic Climatological Networks (RBCNs) in all WMO Regions and urged Members to ensure that their operational observing stations compile and transmit CLIMAT messages according to existing regulations,

Decides:

- (1) That the stations and observational programmes listed in Annex I to this resolution constitute the update of the Regional Basic Synoptic Network (RBSN) in Region III;
- (2) That the stations listed in Annex II to this resolution constitute the update of the RBCN in Region III;

Urges Members:

- (1) To secure, at the earliest date possible, full implementation of the RBSN and RBCN stations and observational programmes set forth in Annexes I and II to this resolution;
- (2) To comply fully with the standard times of observation, the global and regional coding procedures and data collection standards as laid down in the *Technical Regulations* (WMO-No. 49), *Manual on the Global Observing System* (WMO-No. 544), *Manual on Codes* (WMO-No. 306) and *Manual on the Global Telecommunication System* (WMO-No. 386);

Authorizes the president of the Association to approve, at the request of the Members concerned and in consultation with the Secretary-General, amendments to the list of RBSN and RBCN stations in accordance with the procedures laid down in the *Manual on the Global Observing System* (WMO-No. 544), Volume II – Regional Aspects, Region III (South America); to monitor the Members' implementation and to address non-compliance in consultation with the Member concerned and the Secretary-General.

Annex I to Resolution 7 (RA III-16)

UPDATE OF THE REGIONAL BASIC SYNOPTIC NETWORK IN REGION III *

INDEX	SUB INDEX	STATION NAME	OBSERVATIONS		
			SURFACE	RADIOSONDE	RADIOWIND
<i>(ADDITIONS TO THE RBSN)</i>					
ARGENTINA					
87715	0	NEUQUEN AERO		R	
CHILE					
85467	0	DESIERTO DE ATACAMA	S		
85577	0	QUINTA NORMAL	S		
85744	0	ARAUCANIA	S		
85874	0	BALMACEDA	S		
85921	0	PUERTO NATALES	S		
PERU					
84628	0	LIMA/CALLAO		R	
URUGUAY					
86440	0	MELO	S		
86460	0	PASO DE LOS TOROS	S		
86490	0	MERCEDES	S		
86545	0	FLORIDA	S		
<i>(DELETIONS FROM THE RBSN)</i>					
CHILE					
85470	0	COPIAPO	S		
PERU					
84331	0	ANDOAS	S		
84377	0	IQUITOS		R	
84401	0	PIURA	S	R	
84440	0	RIOJA	S		
84444	0	CHACHAPOYAS	S		
84531	0	CHIMBOTE	S		
84542	0	ANTA/HUARAZ	S		
84564	0	HUANUCO	S		
84593	0	ATALAYA	S		
84720	0	NAZCA	S		
84773	0	ILO	S		

* Update to [Resolution 3 \(XV-RA III\)](#) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region III

Annex II to Resolution 7 (RAIII-16)

UPDATE OF THE REGIONAL BASIC CLIMATOLOGICAL NETWORK IN REGION III*

INDEX	SUB INDEX	STATION NAME	CLIMAT	GCOS ^a	
				GSN	GUAN
<i>(ADDITIONS TO THE RBCN)</i>					
CHILE					
85432	0	CALAMA	X		
PERU					
84370	0	TUMBES		X	
84378	0	MORONA			X
84401	0	PIURA		X	
84452	0	CHICLAYO		X	
84501	0	TRUJILLO		X	
84628	0	LIMA/CALLAO		X	
84686	0	CUZCO		X	
84691	0	PISCO		X	
84782	0	TACNA	X	X	
URUGUAY					
86460	0	PASO DE LOS TOROS	X		
86560	0	COLONIA	X		
<i>(DELETIONS FROM THE RBCN)</i>					
CHILE					
85470	0	COPIAPO	X		
PERU					
84390	0	TALARA	X		
84405	0	HUANCABAMBA	X		
84425	0	YURIMAGUAS	X		
84435	0	MOYOBAMBA	X		
84455	0	TARAPOTO		X	
84472	0	CAJAMARCA	X		
84474	0	JUANJUI	X		
84531	0	CHIMBOTE	X		
84534	0	TINGO MARIA	X		
84542	0	ANTA/HUARAZ	X		
84564	0	HUANUCO	X		
84658	0	PUERTO MALDONADO	X		
84670	0	QUILLABAMBA	X		
84673	0	AYACUCHO	X		
84677	0	QUINCEMIL	X		
84680	0	CASTROVIRREYNA (SINTO)	X		
84721	0	SAN JUAN	X		
84773	0	ILO	X		
URUGUAY					
86360	0	SALTO	X		
86370	0	TACUAREMBO	X		

* Update to Resolution 3 (XV-RA III) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region III

^a GCOS Surface Network (GSN)/GCOS Upper-air Network (GUAN) for reference only

Resolution 8 (RA III-16)**REGIONAL WMO INFORMATION SYSTEM IMPLEMENTATION PLAN**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) Resolution 4 (Cg-XVI) – Report of the Extraordinary Session (2010) of the Commission for Basic Systems relevant to Technical Regulations concerning the Global Telecommunication System, data management and the WMO Information System,
- (2) The *Manual on the WMO Information System* (WMO-No. 1060),

Noting further:

- (1) The importance of implementing the WMO Information System (WIS) to support the priority areas of work of the Organization, including the WMO Integrated Global Observing System and the Global Framework for Climate Services,
- (2) That the new functionality of WIS became operational in January 2012 and that the Global Information System Centre in Brasilia and the Regional Telecommunication Hub in Buenos Aires, along with the Global Information System Centres in Toulouse and Washington, are providing operational support and capacity-building for the Region,

Decides to endorse the WMO Information System Implementation Plan 2014–2016 for Regional Association III, included as an annex to this resolution;

Requests the Management Group of Regional Association III (RA III) to monitor WIS implementation within the Region, noting the desire of the Association that all of its Members be able to use WIS by the end of 2015;

Requests:

- (1) All Members that have yet to do so, to confirm their principal GISC and national WIS Focal Point as soon as possible in writing to the Secretary-General and to report on the progress of WIS implementation to the RA III Management Group;
- (2) All Members to make the implementation of WIS a priority in their national centres and Data Collection or Production Centres so that staff supporting WIS components are appropriately trained in support activities, in particular the creation and management of discovery metadata;

Requests all Global Information System Centres supporting RA III to work with Members to ensure that associated centres are compliant with the relevant standards laid out in the *Manual on the WMO Information System* (WMO-No. 1060) and to confirm compliance in writing to the Secretary-General;

Requests the Secretary-General to monitor WIS implementation and ensure liaison between Members, the Association and the technical commissions concerned.

Annex to Resolution 8 (RA III-16)**WMO INFORMATION SYSTEM IMPLEMENTATION PLAN (2014–2016)
FOR REGIONAL ASSOCIATION III**

**WORLD METEOROLOGICAL ORGANIZATION
REGIONAL ASSOCIATION III
(SOUTH AMERICA)**

**RA III WIS IMPLEMENTATION PLAN
2014–2016**



MAY 2014

VERSION CONTROL

Version	By	Date	Changes
0.1	WG-ITD	12/05/2014	Initial draft based on RA V WIS Implementation Plan v0.5.
0.2	WG-ITD	15/05/2014	Interim WG-ITD workshop draft
0.3	WG-ITD	16/05/2014	Final WG-ITD workshop draft
1.0	RA III-16	xxx	[Approved RA III-16]

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- 1 Executive Summary
- 2 Introduction
- 3 Scope and purpose of the RA III WIS Implementation Plan
- 4 Description of WIS
 - 4.1 WIS Services
 - 4.2 The structure of WIS
 - 4.3 WIS Centres
 - 4.4 WIS data networks
 - 4.5 Benefits of WIS
 - 4.6 WMO information sources and regulations on WIS
- 5 WIS in Region III (South America)
 - 5.1 Current status of RA III telecommunication
 - 5.2 WIS centres in RA III
- 6 WIS planning and implementation by RA III Members
 - 6.1 Prerequisites for the participation of NMHSs in WIS operation as NCs
 - 6.2 Prerequisites for the participation of other centres in WIS operation
- 7 Challenges associated with WIS implementation in RA III
 - 7.1 Insufficient bandwidth of communication links
 - 7.2 General WIS acceptance
 - 7.3 Lack of staff resources for operational WIS centre
 - 7.4 Discovery Metadata knowledge
- 8 RA III WIS Implementation Plan – Execution and Timeline
 - 8.1 Approval
 - 8.2 Regional coordination and monitoring
 - 8.3 National Implementation Plans
 - 8.4 Capacity building – training and support
 - 8.5 Goals and timeline
 - 8.6 Progress and Performance Monitoring

Appendices:

Appendix I: Action Plan for implementing a NC in RA III under WIS

Appendix II: Action Plan for implementing a DCPC in RA III under WIS

Appendix III: Sample letters

Appendix IV: NC Demonstration Test Cases

Appendix V: List of acronyms

Appendix VI: Contact points for this plan

Appendix VII: Survey Benchmark

1. EXECUTIVE SUMMARY

Benefits for the Member countries of WMO Regional Association III (South America) arising from the full implementation of WIS (the WMO Information system) will include:

- Continued and enhanced operation of the GTS (WMO's Global Telecommunication System) providing a reliable and timely collection and dissemination service for time-critical and operation-critical data and products;
- The GTS will continue to make better use of public communications including the Internet where appropriate, and supported by advanced satellite distribution systems;
- The GTS data management framework will continue to pursue fast and efficient coding practices and data representations;
- A new system of catalogues available through a Global Information System Centre (GISC) portal, enabling online search, discovery and access of available data and products. This facilitates access to a much greater range of current and archived data and products;
- Download or re-runs of GTS data and products published in the past 24 hours;
- Simplified processes for Member countries to update GTS routing and provide information about available data and products.

The WIS Implementation Plan (WIS-IP) is aimed at guiding RA III Members to implement WIS functionality in their identified centres and to become effective WIS users in a timely and harmonized manner. Therefore, it concentrates on enablement of new WIS functionality by NMHSs as National Centres (NC), i.e. it focuses on helping the members of RA III to set up WIS functionality in their National Centres (NC) connected to their principal GISC in the Region. Although the establishment of Data Collection or Production Centres (DCPC) has been mentioned briefly, the implementation detail is not covered by this document, because implementation procedures for DCPCs are documented in the Manual on WIS¹ and WIS Demonstration Process "Procedures and Guidelines"².

The WIS-IP outlines: the features of WIS; the benefits for Members to be connected to WIS; the current status of WIS in RA III; the telecommunication network used for meteorological data and products; then goes on to describe steps for implementation in RA III. The list of countries in RA III together with their proposed principal GISC provides an overview of the structure of WIS after its regional implementation. The steps an NMHS has to take to function as a WIS NC are described in detail. The initial steps to establish a DCPC are also mentioned. Sample step-by-step implementation approach for these two cases is provided in the Appendices.

Challenges associated with the WIS implementation in RA III are identified, together with possible remedies. The responsibilities of the GISCs in the WIS implementation monitoring are described with their importance for the successful implementation of the plan. The participation and cooperation of the national WIS Focal Points is stressed. The future activities to implement the plan are listed with the goal that most of the RA III Members will be WIS enabled by the end of 2015.

Member countries and specifically their national WIS Focal Points are urged to maintain active collaboration with their principal GISC. For many RA III countries that is GISC-Brasilia for which the contact details are provided in Appendix VI.

¹ Manual on the WMO Information System (WMO-No. 1060) - <http://wis.wmo.int/wis-manual>

² WIS Demonstration Process Guidelines - <http://www-db.wmo.int/WIS/centres/guidance.doc>

2. INTRODUCTION

In 2003, the World Meteorological Congress (Cg-XIV) stated that an overarching approach for solving the data management problems for all WMO and related international programmes, a single coordinated global infrastructure was required. This solution was named the WMO Information System (WIS) with the following features:

- WIS would be used for the collection and sharing of information for all WMO and related international programmes;
- WIS would provide a flexible and extensible structure allowing the participating centres to enhance their capabilities as their national and international responsibilities grow;
- Implementation of WIS should build upon the most successful components of existing WMO information systems in an evolutionary process;
- WIS development should pay special attention to a smooth and coordinated transition;
- The basis for the core communication network should be the communication links used within the World Weather Watch (WWW) for the high priority real-time data;
- WIS should utilize international industry standards for protocols, hardware and software.

Between Cg-XIV (2003) and Cg-XV (2007), good progress was made in demonstrating the technological solutions for WIS through pilots and prototypes projects.

Cg-XV agreed that the WMO Information System should provide three fundamental types of services to meet the different requirements, as follows:

- (a) Routine collection and dissemination service for time-critical and operation-critical data and products;
- (b) Data discovery, access and retrieval service;
- (c) Timely delivery service for data and products.

Cg-XV also emphasized that the WIS implementation should build upon existing WMO information systems in a smooth and evolutionary process. It agreed that the WIS implementation plan should have two parts that would be developed in parallel:

- **Part A:** the continued consolidation and further improvements of the GTS for time-critical and operation-critical data, including its extension to meet operational requirements of WMO Programmes in addition to the World Weather Watch (including improved management of services);
- **Part B:** an extension of the information services through flexible data discovery, access and retrieval services to authorized users, as well as flexible timely delivery services.

Cg-XV further emphasized that the support and involvement of all NMHSs, including regional associations and technical commissions in the WIS development was a crucial factor for ensuring a successful implementation and a shared ownership of the system.

During the period 2007–2011, between Cg-XV and Cg-XVI, under the leadership of the CBS, the development of WIS progressed both in terms of technological solutions and preparation of regulatory and guidance material for its implementation. Thus, Cg-XVI (2011) noted the significant progress achieved by Members in implementing WIS with 18 Members/organizations that have entered into the first round of the demonstration process for a total of 13 GISCs and 56 DCPCs (some of these centres had been in pre-operational mode since May 2010). Congress accepted the recommendation by CBS on the designation of the initial set of WIS centres. Congress

requested that after the initial designation of WIS centres, further designations will be performed by EC in accordance with the Manual on WIS.

Cg-XVI stated that WIS had moved from a development stage into an operational stage and advised Members and relevant international organizations that WIS activities in 2012–2015 should focus on:

- (a) Complete WIS implementation across all WMO Centres;
- (b) Capacity-building to ensure support of all WMO Members;
- (c) Leveraging WIS advantages for all WMO Programmes; and
- (d) Taking advantage of WIS in all WMO Data Management.

Cg-XVI became a turning point for intensive global, regional and national planning for the implementation of WIS and emphasized that although the implementation of the new functionality of WIS had been advanced in a few core centres, many Members were yet to begin their implementation. Cg-XVI expected that the full implementation of WIS by all Members will take at least the whole of the 2012–2015 financial period.

Congress set-up the following major activities and implementation target dates, urging all Members and the Secretary-General to identify the necessary resources for reaching the objectives:

- (a) Improving the knowledge and capabilities of Members to benefit from WIS functionality, in particular least developed countries, developing countries and small island states through regional workshops and information sessions: 2012–2013;
- (b) Implementation of WIS at all NMHS national centres (NCs): 2012–2015;
- (c) Implementation of remaining candidate GISCs: 2012–2013;
- (d) Implementation of more DCPCs, i.e. WIS interfaces at WMO Programmes' centres: 2012–2015.
- (e) Amendments to the Manual on WIS for enhanced operational arrangements of WIS centres, especially GISCs: 2014.

The introduction on WIS presented above shows that the implementation of WIS in the WMO community opens the new chapter for the global data exchange. The benefits for the Member countries of WMO Regional Association III (South America) arising from the full implementation of WIS will include:

- Continued and enhanced operation of the GTS (WMO's Global Telecommunication System) providing a reliable and timely collection and dissemination service for time-critical and operation-critical data and products;
- The GTS will make better use of public communications including the Internet where appropriate, and supported by advanced satellite distribution systems;
- The GTS data management framework will continue to pursue fast and efficient coding practices and data representations;
- A new system of catalogues available through a GISC portal, enabling online search, discovery and access of available data and products. This facilitates access to a much greater range of current and archived data and products;
- Download or re-runs of GTS data and products published in the past 24 hours;
- Simplified processes for Member countries to update GTS routing and provide information about available data and products.

At the fifteenth session of World Meteorological Organization (WMO) Regional Association III (RA III), Colombia (September 2010), and at the first session of the RA III Management Group, the following subsidiary bodies were established:

- Working Group on Infrastructure and technology Development (WG-ITD);
- Working Group on Climatology;
- Working Group on Hydrology.

The structure of WG-ITD is indicated below. Mr Jose Arimatea de Sousa Brito (Brazil) and Mr Gaston Torres (Chile) were designated Chairperson and Vice-chairperson of WG-ITD, respectively:

Chairperson of the Working Group;

Vice-chairperson of the Working Group;

Sub-group on Competences in matters of telecommunications;

Sub-group on Competences in matters of data management;

Sub-group on Integrated Observing Systems;

Sub-group on Regional Aspects of Data Processing and Forecasting World System;

Sub-group on Regional Aspects of Public Meteorological Services.

The objective of the Working Group on Infrastructure and Technology Development (WG-ITD) is to contribute to the improvement of infrastructure (data and information services) for weather, climate and water in Region III through implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS).

One of the tasks for WG-ITD is to develop the RA III WIS Implementation Plan. A new structure will be submitted to RA III to better address WIS and WIGOS implementation in RA III

In conclusion, the RA III WIS Implementation Plan is an all-inclusive guiding document for RA III Members to follow in building an effective and efficient WIS infrastructure, in line with the guidance given by Cg-XVI for a fast transition from development to implementation phase of the WIS.

3. SCOPE AND PURPOSE OF RA III WIS IMPLEMENTATION PLAN

The RA III WIS Implementation Plan is aimed at guiding RA III Members to implement WIS functionality in their identified centres and to become effective WIS users in a timely and harmonized manner. Therefore, it concentrates on enablement of new WIS functionality by NMHSs as National Centres (NC). Included in the scope of this plan is assisting Members to understand the benefits of WIS and convey these benefits to stakeholders.

In order to facilitate the implementation process, RA III GISCs should establish close contacts with the NCs in their areas of responsibility. They are GISC Brasilia supported by GISCs Washington and Toulouse. In particular, GISCs should act as "help desks" and provide assistance to build the capacity of the NCs to handle the required discovery metadata. Also, the plan states the standards for WIS compliance of NCs for the guidance of Members and their principal GISCs.

The regional dimension of the implementation process is addressed in this WIS-IP. This dimension is important because it facilitates a synchronized and coordinated implementation by all Members and partner organizations of the Region. The existing capacity gaps, both technical and human resource related, could be addressed through the cooperation and assistance mechanisms of the

Regional Association, which would accelerate the implementation and bring the expected benefits to all Members.

The Plan also provides practical guidance and a step-by-step approach towards the WIS implementation by Members in their National Centres. A primary task for the NMHSs is ensuring compliance with the WIS requirements established by the WMO regulatory material *WMO Technical Regulations, Volume I* (WNO-No. 49) and its *Annex VII, Manual on the WMO Information System* (WMO-No. 1060).

4. DESCRIPTION OF WIS

WIS is the global infrastructure for managing and making available weather, water and climate information. WIS meets the requirements for routine collection and automated dissemination of observed data and products, as well as data discovery, access and retrieval services for all weather, climate, water and related data and products provided by centres and Member countries in the framework of all WMO Programmes.

4.1 WIS Services

While WIS builds on and extends the GTS, it is also a new approach to data discovery and data provision in the meteorological community. WIS goes far beyond providing telecommunication services, and offers new and modern data management services to its users. These are essentially the possibility to discover all data and products of the wider WMO community, as well as the means and information on how to obtain the data. For this purpose, all information within WIS is described by discovery metadata in accordance to the WMO Metadata Core Profile. It is assumed that WIS by including the GTS and the Internet will have sufficient bandwidth/link capacity available to fulfil future user needs. To this end, WIS provides three types of services:

- (a) **Routine collection and dissemination service for time-critical and operation-critical data and products:** This service is an extension of the current GTS. It is based on subscription to real-time “push and forward” distribution systems, including multicast and broadcast, and implemented mostly through dedicated telecommunication means providing a guaranteed quality of service. An important component of this service will be the “all hazards warning network” facilitating warnings to be distributed from one point in WIS to all other points within 2 minutes;
- (b) **Service for the timely delivery of non time-critical, operationally critical or voluminous data and products:** This is a new service which allows users to subscribe to data that would not otherwise have been available through the GTS because it is too voluminous or because the delivery is not so critically time- or operationally- dependent. Thus, the delivery method for these data does not need to use the capacity of the GTS. It is also suitable for those users not connected to the GTS. The service is focused on a “push” mechanism and implemented mostly via public data-communication networks, such as the Internet. As with the time and operationally critical service (1), users may use the discovery service (3) to search for the information they would like to access or subscribe to;
- (c) **Data Discovery, Access and Retrieval (DAR) service:** This is a new service where the user can use a variety of discovery services to search for data, products or other information registered within the WIS. Depending on the access policy for the data, the user may also access and download the data. The service is based on a request/reply “pull” mechanism and is to be implemented mainly through the Internet, but the user may also subscribe to receive data or products via the GTS or any other delivery mechanism available between the information provider and the user (for example via e-mail, SMS, facsimile, courier or postal services). In this way, WIS users can potentially discover and access all WMO data and products without having an extensive knowledge of the information practices and procedures of the WMO Programme responsible for the data or product. Note that if a user has an account at a GISC, then, depending on the data policy, it may be able to access information directly from the GISC, all of which hold information that is available for global exchange for at least 24 hours.

4.2 The structure of WIS

The WIS services described above are realized by WMO Members and associated centres through three types of WIS centres as well as the WIS data communication network. WIS centres need to be endorsed by WMO in accordance with the regulations described in the *WMO Technical Regulations* (WMO-No. 49) and the *Manual on WIS* (WMO-No. 1060).

The concept of interoperability guarantees that the overall functionality of WIS is realized by each WIS centre through implementing the specifications required for this type of centre. The four core components are:

- Global Information System Centres (GISC);
- Data Collection or Production Centres (DCPC);
- National Centres (NC);
- Data networks.

4.3 WIS Centres

GISCs collect and distribute information for routine global dissemination, such as GTS data. They serve as collection and distribution centres in their areas of responsibility and they provide access points for any request for data held within the WIS. A WIS user accessing the web portal of any GISC will be able to browse any data catalogue of information available in WIS.

DCPCs are connected to the GISCs and are responsible for the collection or generation of specialized sets of data, forecast products, processed or value-added information beyond the scope of NCs, and/or for providing archiving services.

NCs collect, produce and distribute data and products on a national basis and coordinate or authorize the use of the WIS by national users, normally under a policy established by the respective Permanent Representative with WMO.

The terms NC, DCPC and GISC are used for describing the necessary functions, not actual organizational entities. There may be organizations, such as NMHSs, which combine all three functions within their structure. There may be several GISCs in a Regional Association (RA). NCs and DCPCs can be associated with several GISC but have to choose one of the GISCs as their principal GISC for the purposes of uploading and managing discovery metadata. The following diagram provides an overview of the various components:

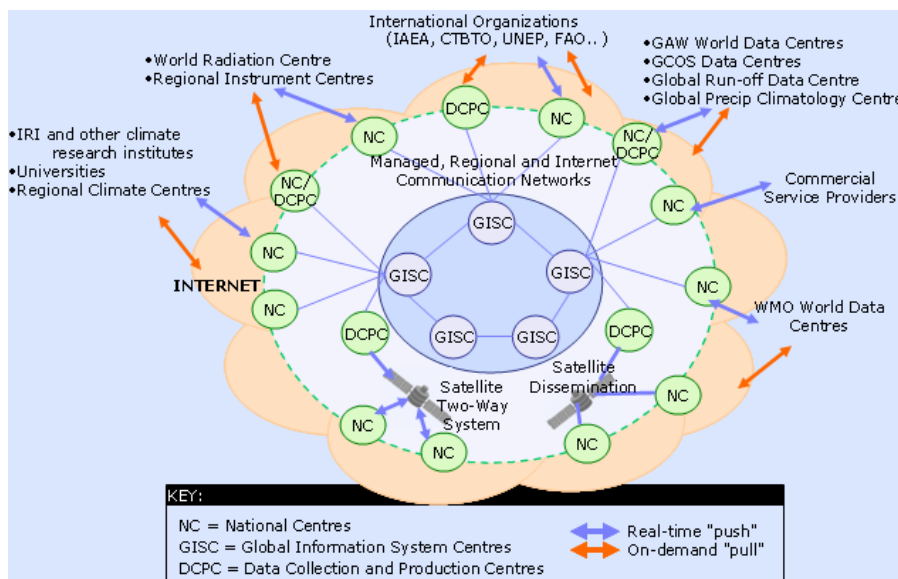


Figure 1. WIS core components and Information Exchange

4.4 WIS data networks

The WIS network structure consists of a WIS Core Network connecting all GISCs to each other. Each GISC has an Area Meteorological Data Communication Networks (AMDCN) connecting them to NCs and DCPCs in their area of responsibility. This is illustrated in Figure 2. An NC or DCPC may be in multiple AMDCNs. The AMDCNs incorporate GTS infrastructure and may involve single, partial or multiple regional meteorological telecommunication networks.

The data communication networks that can be used in WIS include:

- The Main Telecommunication Network (MTN) of the GTS³ forms the WIS Core Network;
- GISCs are also connected by the Internet, which presently is being used for discovery metadata synchronization;
- The GTS (MTN and RMTN) provides the dedicated network component of the AMDCNs, especially for meeting real-time exchange requirements and the all hazards network. Note that the GTS includes extensive use of Internet through Virtual Private Networks (VPN) in many areas where no alternatives exist;
- Satellite distribution systems such as those described by the Integrated Global Data Dissemination Service (IGDDS) form an essential part of the GTS and therefore the WIS, especially for the support of remote areas where terrestrial communication systems do not effectively meet the need. This includes data collection systems for remote platforms as well as for distribution of data and products related to the WMO Space Programme;
- Terrestrial links or managed data network services;
- The Internet, either open or utilizing VPN, which will be used in the AMDCNs to increase bandwidth capacity to many centres as well as providing connectivity for non-GTS centres and for individual users accessing WIS.

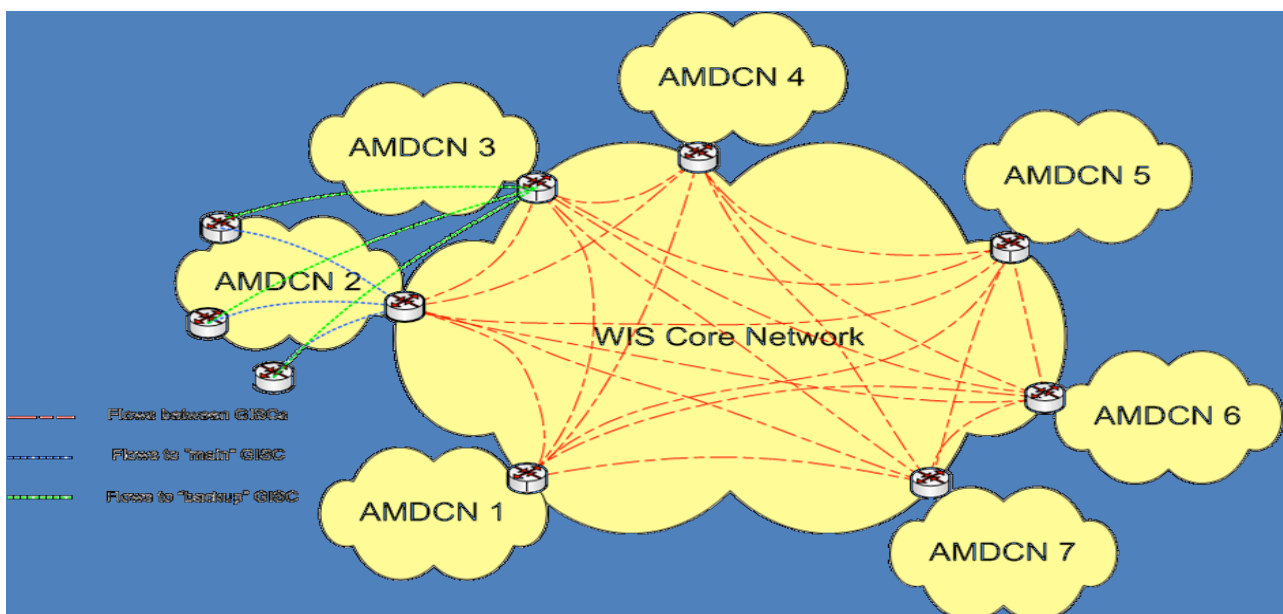


Figure 2. WIS network topology

³ A full description of the existing GTS structure and networks can be found in the Manual on the GTS (WMO-No. 386). <http://wis.wmo.int/gts-manual>

4.5 Benefits of WIS

As an integrated part of WIS from the World Weather Watch Programme (WWW), the aim of the GTS is to ensure delivery of time-critical and operation-critical data, products and services for all WMO Programmes, including warnings to and from NMHSs. GTS realizes this through the "Routine collection and dissemination service for time-critical and operation-critical data and products", mentioned above.

The GTS will continue to develop and incorporate new technology, linking all WMO Members with a dedicated, secure network. This network will continue to be supported by advanced satellite distribution systems. In addition, the GTS will also be able to supplement the private networks and make better use of public communications such as the Internet, where appropriate.

The GTS data management framework will include the development of data representations, including fast and efficient coding practices that allow increasingly voluminous data streams to reach countries with less advanced or low capacity communication systems. New functionality of WIS for GTS users will include:

- Online discovery of which data and products are available on the GTS by interactively accessing a GISC portal;
- Download or re-runs of GTS data and products published during the past 24 hours. This is of interest for users that have missed data because of a failure of IT systems, equipment or networks;
- Updating of GTS routing based on online subscription services rather than service messages requesting the GTS Point of Contacts to change the routing. An NMHS may configure its own routing information. Thus, a centre need only deal with its associated GISC for changing subscription and publishing schedules;
- Configure upload of data to the GTS. Rather than requesting the GTS Point of Contact and WMO to change information about the data that is uploaded to the GTS, the NMHS may do the configuration.
- Ensure that the ownership and availability of the data provided is advertised by using the DAR metadata.

Existing centres within WMO Member States that comply with the required WIS functions and technical specifications will be designated as one of the three types of WIS centre. While Members can choose to apply for a type of centre matching their level of responsibilities and commitment, the expected mapping of WWW centres into WIS centres remains to be:

WWW Centre	WIS Centre
NMC	NC
RSMC	DCPC
WMC	DCPC and/or GISC
RTH	DCPC
RTH on MTN	DCPC and/or GISC
Others	NC and/or DCPC

4.6 WMO information sources and regulations on WIS

Information on all aspects of WIS is available on the WMO website at: <http://www.wmo.int/wis>.

The implementation of the WIS is coordinated through a Global Project and Implementation Plan available at: <http://www.wmo.int/pages/prog/www/WIS/documents/WIS-ProjectPlan-v1-2-1.doc>.

The technical regulations related to WIS are published in the *WMO Technical Regulations* (WMO-No. 49), Volume 1, General Meteorological Standards and Recommended Practices, Part I, Section 3, and in Annex VII, *Manual on the WMO Information System* (WMO-No. 1060). Practical guidance on the implementation of the technical regulations is provided in the *Guide to the WMO Information System* (WMO-No. 1061).

5. WIS IN REGION III (SOUTH AMERICA)

5.1 Current status of RA III telecommunication

The current GTS in RA III is a hierarchical structure with three Regional Telecommunications Hubs (RTH); Brasilia, Buenos Aires and Maracay. All Members are connected to at least one RTH. The data is sent from RTH to RTH and then from the RTHs to the other nodes connected to it. The current communication links between the centres are given in Fig. 3a and 3b below.

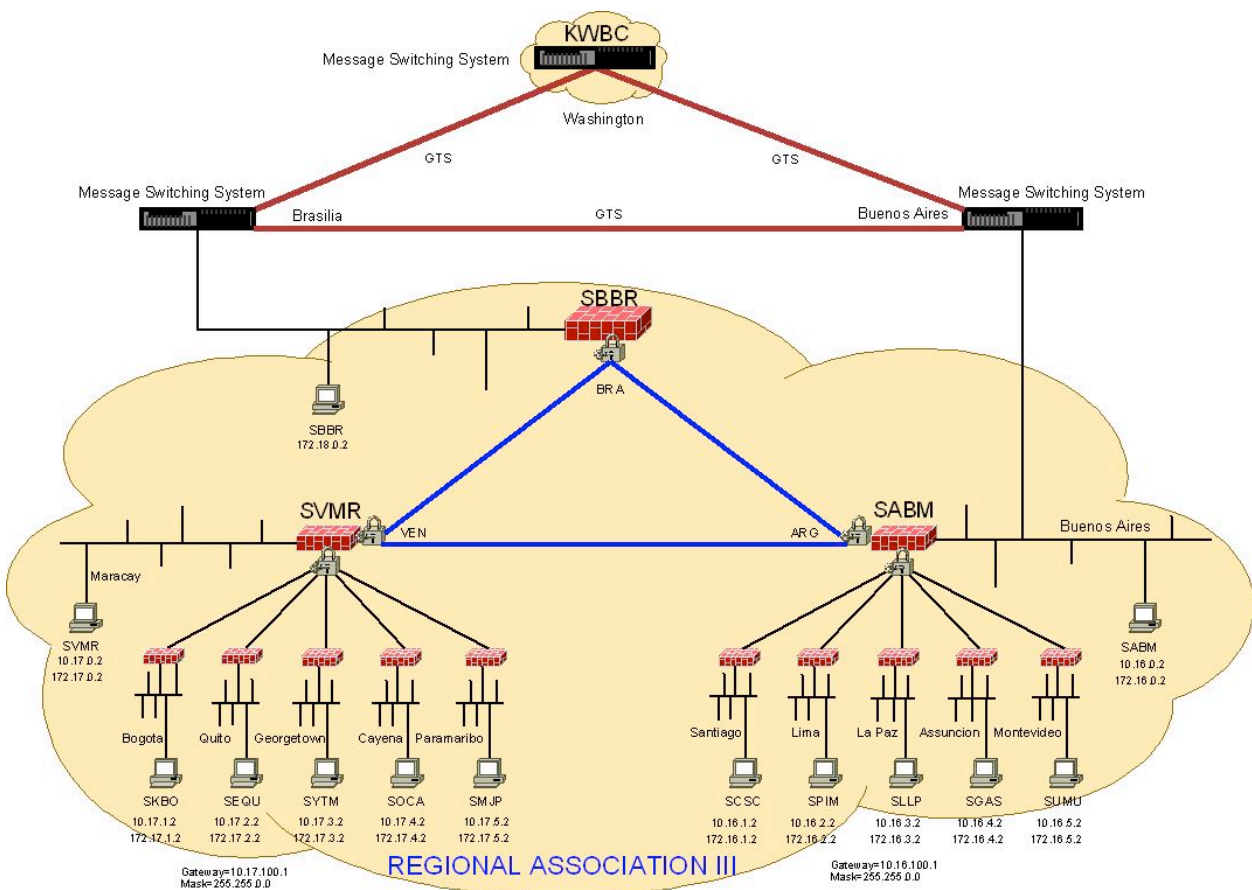


Figure 3a. Communication network in RA-III

REGIONAL ASSOCIATION III

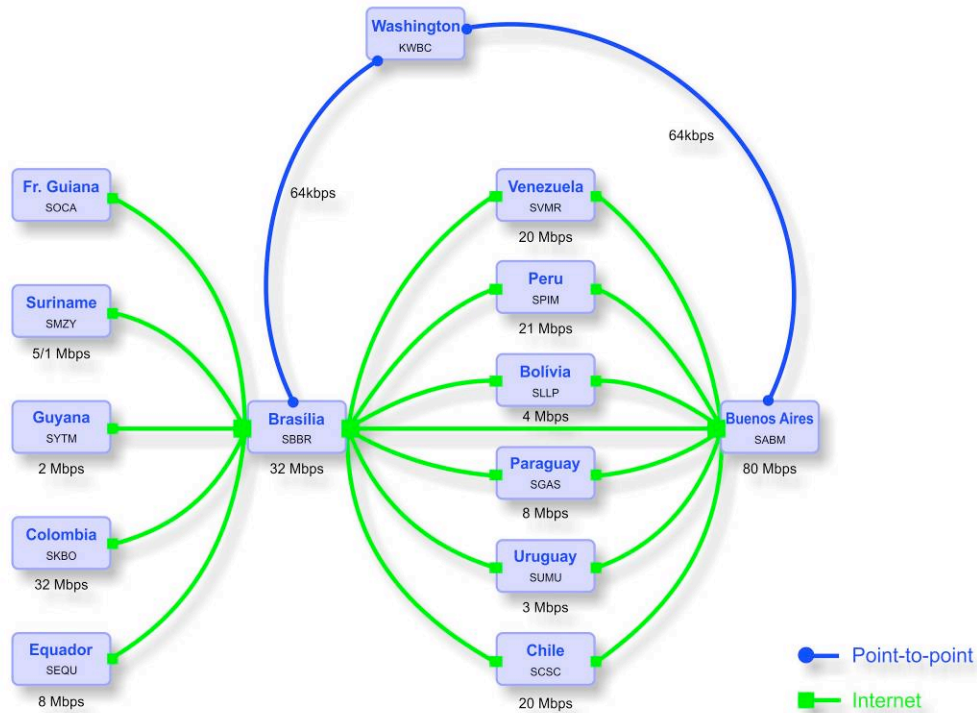


Figure 3b. Connectivity Diagram and connection speeds

GISC Brasilia has still to join the Regional Meteorological Data Communication Network (RMDCN)⁴ however; GISC Brasilia provides an Internet Protocol (IP) network infrastructure utilising VPN technology over the Internet. Table 1 shows access speeds for Members' centres. GISC Brasilia provides the gateway for the meteorological community in RA III through bilaterally agreed links to other GISCs including Washington. Brasilia will be connected to all GISCs once it establishes its RMDCN connection.

Table 1. Internet connection speeds for RA III centres

Country	CCCC	Internet Access May 2014
Argentina	SABM	80 Mbits/s + (150 Mbits/s on demand next 2 months)
Bolivia (Plurinational State of)	SLLP	4 Mbits/s
Brazil	SBBR	32 Mbits/s
Chile	SCSC	20 Mbits/s + 100 Mbits/s
Colombia	SKBO	32 Mbits/s + 16 Mbits/s
Ecuador	SEQU	8 Mbits/s + 8 Mbits/s
French Guiana	SOCA	
Guyana	SYTM	2 Mbits/s
Paraguay	SGAS	8 Mbits/s

⁴ see <http://www.ecmwf.int/en/computing/our-facilities/rmdcn>

<i>Country</i>	<i>CCCC</i>	<i>Internet Access May 2014</i>
Peru	SPIM	21 Mbits/s
Suriname	SMZY	5120/1024 kbits/s
Uruguay	SUMU	3 Mbits/s + 8 Mbits/s
Venezuela (Bolivarian Republic of)	SVMR	20 Mbits/s + 2 x 2Mbits/s

The architecture of RA III GTS was developed to take into account improved and cost effective secure connectivity. It has proven to be very effective and robust. WG-ITD plans to undertake a review of the architecture with an aim to modernising the components and further enhance the performance and capacity of the network.

5.2 Status of WIS Centres in Region III (South America)

The procedures for the designation of the three types of WIS centres are provided in the *Manual on WIS* (WMO-No. 1060), Part II. After successful completion of the designation procedure, the centre is included in Appendix B to the Manual, Approved WMO Information System Centres.

Note: Information on the current status of the designation of centres by Members is available on: http://www.wmo.int/pages/prog/www/WIS/centres/index_en.php.

GISCs in RA III

GISC Brasilia is the only GISC located in RA III having been conditionally designated by Congress in June 2011. It was endorsed by CBS in April 2013 and plans to be fully operational in 2015.

DCPCs in RA III

Table 2 below provides information on the DCPCs in RA III with their planned functions and designation status (as of February 2014).

Table 2. DCPCs in RA III

<i>Member/Org</i>	<i>Function</i>	<i>Principal GISC</i>	<i>Const. Body</i>	<i>Endorsement CBS</i>	<i>Congress/EC</i>
Argentina	RSMC-Geographical	Brasilia	CBS	Not submitted to TT-CAC	
Argentina	VAAC	Brasilia	CAeM	Not submitted to TT-CAC	
Argentina	RTH	Brasilia	CBS	Not submitted to TT-CAC	
Argentina	RIC	Brasilia	CBS	Not submitted to TT-CAC	
Argentina	Regional Ozone Centre	Brasilia	CAS	Not submitted to TT-CAC	
Brazil	RTH	Brasilia	CBS	Approved by Cg/EC	2011-06-01

NCs in RA III

In accordance with the Manual on WIS (WMO_No. 1060), each WMO Member shall notify WMO of the name and location of its centre(s) that are to be designated as NC(s). It is therefore expected that each Member will have at least one NC in WIS.

In February 2012, WMO circulated a letter to all Members inquiring information from the Permanent Representatives regarding: (1) nomination of a principle GIS which will be associated with the WIS centre(s) of the Member; and (2) nomination of a focal point for WIS/GTS related matters).

Table 3 below presents the current status⁵ of the designation of NCs in RA III with their associated GIS and Focal Points.

Table 3. RA III NCs

Member/ Org	Function	Principal GIS	Focal Point (FP)	FP confirmed to WMO
Argentina	NMC	Brasilia	GIANNI, José Luis	Yes
Bolivia (Plurinational State of)	NMC	Brasilia	REVILLA, Antonio Terán	Yes
Brazil	NMC	Brasilia	REZENDE, Jose Mauro	Yes
Chile	NMC	Brasilia	LAZCANO Luis	Yes
Colombia	NMC	Brasilia	FRANCO BUITRAGO, Julio César	Yes
Ecuador	NMC	Brasilia	CRUZ, Edison	Yes
France	WSO (French Guiana)	Toulouse		
Guyana	NMC	Brasilia	Ms DANNY, Haymawattie	Yes
Paraguay	NMC	Brasilia	RODUS, Raúl	Yes
Peru	NMC	Brasilia	SOLIS, Olimpio	Yes
Suriname	NMC	Brasilia	Mrs WARSODIKROMA, T	Yes
Uruguay	NMC	Brasilia	ESPINOZA, Marcelo Chico	Yes
Venezuela (Bolivarian Republic of)	NMC	Brasilia	GARCIA, Kleiver José	Yes

Note: In view of the important role the national WIS focal points plays in the coordination of the WIS implementation, the Members who have not yet responded to the WMO circular letter are strongly encouraged to do so as soon as possible. Members should also keep the WMO Secretariat informed of any changes of the status and operation of their centres and/or changes of their focal points information.

6. WIS PLANNING AND IMPLEMENTATION BY RA III MEMBERS

In planning the WIS implementation at national level, Members should strive to comply with the relevant WMO technical regulations, that include procedures, specifications and functional

⁵ The current status is based WMO [WIS Centres Database](http://www.wmo.int/pages/prog/www/WIS/circular_letters_questionnaires.html). Focal Point is based responses to the letter of 10 February 2012 (http://www.wmo.int/pages/prog/www/WIS/circular_letters_questionnaires.html) requesting PRs to nominate WIS focal points and Principal GISCs.

requirements, provided in the WMO Technical Regulations (WMO-No. 49), Volume I, Part 1, Section 3, and the Manual on WIS (WMO-No. 1060). The Guide to WIS (WMO-No. 1061) complements the technical regulations with additional description and explanation of the WIS, which would assist Members in their implementation actions.

6.1 Prerequisites for the participation of NMHSs in WIS operation as NCs

For a NMHS, there are several requirements to be met by a current GTS centre and thus become a compliant NC. They are mostly concerned with administrative issues and less with technical matters.

When a centre plans to use WIS, the PR of the country should nominate a “WIS Focal Point” and a “Principal GISC”.

WIS Focal point

The WIS Focal⁶ point should be a member of staff who is familiar with the service, in particular the current GTS support. The person will receive all WIS related information with regard to the country on one hand, but is expected on the other hand to inform WMO and its relevant bodies about any progress or problems encountered when using WIS. He/she will attend training courses organized by WMO or WIS centres and serve as the national distributor of WIS knowledge, in particular the concept of metadata. It is envisaged that the WIS Focal point will provide the necessary monitoring information.

Since the structure of WIS assumes that an NC is connected to a GISC for its WIS functions and thus participates in the AMDCN organized by that GISC, it is necessary to set up the required administrative links with the GISC. In principle, an NC may belong to the users of any GISC, unless the network connectivity only allows one choice. In any case, an agreement should be reached between the NC and the GISC about their relationship, including identifying their “Principal GISC” for the purposes of managing discovery metadata, of which the WMO should be notified together with the nomination of the WIS Focal point (see Appendix).

For users who want to access GISC system for services and request an account on the GISC system, the GISC is required to seek permission from the WIS Focal Point of the country where the users are from.

Principal GISC

The principal GISC will ensure within its AMDCN that all connected centres will receive all the data meant for them, be it globally distributed, additional or addressed data. The principal GISC will also collect the data sent by NCs and distribute them in accordance with GTS/WIS regulations. It will maintain the global metadata catalogue and provide means for its AMDCN centres to create/ update those parts of the discovery metadata catalogue describing their own data and products, possibly via Internet access.

The principal GISC is to be contacted first by any of its connected centres about any issue related to WIS. It will organize regular meetings with the WIS Focal Points of the centres belonging to its AMDCN and provide training material and courses as required. It will support the metadata activities in its area of responsibility in a suitable manner and provide data for the regional WIS monitoring.

Member countries and specifically their national WIS Focal Points are urged to maintain active collaboration with their principal GISC. For many RA III countries that is GISC-Brasilia for which the contact details are provided in Appendix VI.

⁶ Terms of Reference for WIS Focal Points http://www.wmo.int/pages/prog/www/CBS/Lists_WorkGroups/CBS/cross-cutting/fp%20wis-gts/tors

Besides the principal, a back-up GISC is required for operational continuity in case the partial or total failure of the principal GISC. To guarantee at least the dissemination and collection of the globally distributed GTS data, the principal GISC need to consider a communication connection being established between NCs and the backup GISC, in collaboration with the NC and the backup GISC. Agreement needs to be reached on the network specific details, the conditions when it should be used and the actual services provided by it. The primary role of the backup GISC is to ensure data and products continue to be collected and distributed within RA III and shared with other regions. Regular tests should be carried out to ensure the availability of the back-up when suddenly required. Details of further back-up arrangements to be provided still need further work by the relevant CBS WIS expert teams. The backup GISC for Brasilia is GISC Washington.

In addition to direct interaction with their principal GISC Brasilia, local arrangements for data flow and metadata management in RA III have certain centres working through RTH Buenos Aires as follows. It is planned to provide initial WIS functionality for metadata and subscription management at GISC Brasilia and RTH Buenos Aires where French Guiana, Suriname, Guyana, Colombia, and Bolivarian Republic of Venezuela will operate with GISC Brasilia, the remaining countries through RTH Buenos Aires.

Connectivity

RA III members are connected to RTH Brasilia, RTH Buenos Aires and RTH Maracay through VPN over the Internet. Connection to WMC Washington is via fixed line between Brasilia and Washington, and from Buenos Aires fixed line to Washington. This provides alternative routes between Washington and RA III. Both centres are making efforts to connect to the RMDCN (WIS Core Network) as soon as possible.

Bandwidth

The GTS in RA III is based on the internet. As per guidance from CBS, effective bandwidth and access speeds for the RA III GTS are measured by the centres access speed to the Internet. Current access speeds are recorded in Table 1 maintained by the Working Group on Infrastructure and technology development

Discovery Metadata

Whereas the GTS data is defined by its header which is recorded in the relevant volumes, held by WMO, the data in WIS is described by a discovery metadata record in accordance to the WMO Metadata Core Profile and is stored in a metadata catalogue for each GISC and shared amongst all GISCs at regular intervals. It is the responsibility of the data owner to generate the corresponding discovery metadata record and to maintain it. However, in order to facilitate the initial deployment of WIS, Météo-France generated metadata records for all data currently exchanged via the GTS. In the longer term though, these initial records have to be taken over by the relevant data owners and updated if required. In addition, if any new data is being considered for exchange, a corresponding discovery metadata record has to be generated and sent to the principal GISC in advance of the data.

Each NC, therefore, requires personnel with metadata knowledge and responsibility. To train the staff of NCs in discovery metadata handling, their principal GISC will offer regular training courses in addition to WMO sponsored training events like the WMO WIS Centre Jump-Start Offer⁷. Each NC should make sure that staff are knowledgeable about the WMO Metadata Core Profile and are able to update its metadata records.

⁷ WIS Jump Start - <http://www.wmo.int/pages/prog/www/WIS/documents/JumpStartFlyer.doc>

Access to metadata editor

The editor for metadata records consists of a software tool which can be used locally by an NC or remotely at a GISC which makes this service available to NCs. New or modified records have to be made available to the principal GISC for feeding them into the WIS.

Demonstration of WIS Compliance

A National Centre will need to demonstrate its compliance with WIS standards as laid out in the Manual on WIS. This is achieved by the centre working with the principal GISC to successfully complete the three test cases in Appendix IV and advising the secretariat that the GISC has endorsed the centre as having demonstrated its compliance with relevant WIS standards.

6.2 Prerequisites for the participation of other centres in WIS operation

There may be other WIS centres besides the NC of an NMHS within a country. For example, the NMHS might also operate one or more DCPCs for specialized data or there may be multiple DCPCs run by different organizations like hydrology and oceanographic centres. It is also possible, though unlikely, that a centre other than the NMHS could operate an NC.

DCPC

As stated earlier, a DCPC is the WIS categorization of a programme centre that provides programme-specific data, e.g. An RTH is a centre supporting the GTS, or a RSMC providing specialized products under the GDPFS. Therefore, it has to be sponsored by a WMO Programme and connected to a GISC in the Region with sufficient bandwidth. In addition, special software to support the WIS functions of the centre has to be implemented. Once this has been achieved, the relevant PR may submit a proposal to WMO for the DCPC to be accepted, nominating a staff member responsible and stating the commitment to operate the DCPC after its validation.

In accordance with the Manual on WIS, a number of certifications and tests by WMO and, in particular, the CBS expert team designated for this role, will subsequently be carried out. When all operational and administrative requirements have been met successfully, including the handling of metadata in accordance with WMO Metadata Core Profile, CBS will propose to the EC that the DCPC becomes part of WIS.

NC

Any NC additional to that of the NMHS will have to adhere to the same procedures as stated in 6.1 Its WIS centre Focal point should work closely with the national WIS Focal point of the NMHS who will be the main WIS interface of the country.

7. CHALLENGES ASSOCIATED WITH WIS IMPLEMENTATION IN RA III**7.1 General WIS acceptance**

The benefits of WIS rely to a large extent on the global acceptance of WIS as the standard communication, discovery and access platform for WMO and associated institutions. Although WIS has been declared operational in January 2013, many NMHC centres in RA III are still in the process of learning and understanding WIS. It is, therefore, necessary to raise the awareness of WIS in the Region. GISCs should help centres to gain in-depth knowledge of how WIS works and what the benefits are. Other WMO initiatives such as WIGOS and GFCS are encouraged to use WIS as their information system, which will ensure the full benefits of WIS to all WMO Programmes and activities.

7.2 Lack of staff resources for operational WIS centre

Depending on the type of WIS centre being considered, there may be a concern of staff resources. For example, to operate a DCPC, staffs are required, who understands the software/system such as DAR to support the metadata. For an NC, the requirements can usually be met by the available resources for the on-going GTS support. Generally, staffs need to be trained to run WIS system and handle WIS related requests.

7.3 Discovery Metadata knowledge

Initially, there may be a lack of relevant metadata knowledge amongst the staff of the prospective WIS centre. It is therefore important to train staff on the WMO Metadata Core Profile and metadata in general. In addition, the WMO would try to arrange for training courses and support the attendance of relevant staff from developing countries. The necessary training material should be widely circulated. Furthermore, centres may take the WIS Jump-Start offered by the WMO secretariat or GISCs.

8. RA III WIS IMPLEMENTATION PLAN – EXECUTION AND TIMELINE

8.1 Approval

This Implementation Plan prepared by WG-ITD will be presented to RA III-16 for approval.

8.2 Regional coordination and monitoring

The regional WIS implementation will be coordinated by RA III WG-ITD, with the support from GISC Brasilia. An important aspect of the regional approach is the monitoring of the implementation actions that would allow quick identification and response to the problems and deficiencies. Without monitoring, there is a high risk that the implementation of WIS in some parts of RA III would be delayed. The monitoring procedures will be defined to include regular information flow between RA III WIS Focal Points, and WG-ITD. GISCs and DCPCs will play an important role in the monitoring as described in 8.6 below.

8.3 National implementation plans

Members are expected to develop their national WIS Implementation Plans by December 2014. The national WIS Focal point should communicate the national plans to the RA III WG-ITD the target dates for the planned operation of WIS centres (NC, DCPC). The national plans should be coordinated with the principal GISC and should be in agreement with the RA III WIS Implementation Timeline.

8.4 Capacity building – training and support

Noting the WIS competencies identified by CBS and the need to enable WIS functionality by all Members by the end of 2015, an essential activity in RA III is to provide “train-the-trainer” metadata management training as soon as possible. It is suggested that at least one expert be trained in each NMHS. Members are encouraged to utilize the WIS competencies and training guide in undertaking their capacity development and staffing.

Regional capacity development should utilize the GISC Brasilia and RTH Buenos Aires, for capacity building through regional horizontal cooperation.

8.5 Goals and timeline

The main goal of the WIS implementation in RA III is that the majority of RA III Members should be WIS users by December 2015, which means that most NMHSs are:

- (a) Certified as a NC or DCPC, according to the WMO WIS centre certification procedure outlined in the Manual on WIS. The principal GISC of those NMHSs shall help in this process by providing technical support and conducting test for all WIS related operations together with the NCs or DCPCs;
- (b) Able to participate in major WIS operations, i.e. a NC or DCPC should be able to obtain data and products from WIS system of its principal GISC, and to provide its own observation data and other products, along with the associated metadata, to its principal GISC.

The WIS implementation efforts so far and future timeline is as follow:

- (a) May 2014: RA III WG-ITD meeting – set the direction for WIS (and WIGOS) implementation;
- (b) September 2014: RA III-16 to review Regional WIS Implementation Plan;
- (c) Early 2015: GISC Brasilia launch and WIS training workshop;
- (d) Adjacent to GISC Brasilia Launch, and subject to funding approval, conduct “train the trainer” metadata management workshop;
- (e) April–December 2015: Act on the National WIS Implementation plan by each member, with the help and support from its Principal GISC, to archive the goal outline at the beginning of this paragraph.

8.6 Progress and Performance Monitoring

RA III WG-ITD in conjunction with GISC Brasilia and RTH Buenos Aires will play an active role in monitoring the progress of the WIS implementation in the Region. A half-yearly report will be issued to the RA III Management Group including updates from the RA III online WIS Survey to report the overall progress of the implementation. The members of the WG-ITD should also report their experience with metadata and problems encountered, as well as other implementation related issues, so that this information can be shared among the members through the half-yearly report.

Further improvement of the communications connectivity in RA III is an ongoing task, which is crucial for the success of WIS implementation in the Region. It is important to cooperate with other Task Teams within WG-ITD to work on this task.

APPENDIX I – NC ACTION PLAN

Implementing an NC in RA III under WIS

1. Make (national) decision to join WIS as a NC.
2. Identify the Principal GISC.
3. Nominate the WIS Focal Point for the NC. The person should preferably be knowledgeable on current GTS operation and the concept of WIS.
4. Review the status of the information technology and communication network, in particular the bandwidth to the current RTH and the bandwidth of the Internet connection.
5. Review the current GTS operation in terms of data exchange and ensure that the communication network is sufficient to send and receive data a reliable and timely fashion under WIS. If this is not the case, the improvement of the communication network would be a priority. Solutions, such as increasing the bandwidth existing network or adopting additional communication means (e.g. satellite communication etc.) need to be implemented.
6. Communicate with the chosen Principal GISC for support in the process of NC certification. Test cases listed in Appendix IV need to be carried out in cooperation with the GISC and approved by GISC.
7. Set up a communication link to the principal GISC and create user accounts at the GISC for using the GISC systems.
8. Decide whether the metadata generation/update should be supported locally or remotely by the GISC. In view of this decision, set up the necessary software environment: either by installing the metadata editor on a local server or by setting-up a connection to the GISC to use the metadata editing facility on GISC system.
9. Inform WMO by letter from the PR on: (a) the decision to become an NC and the endorsement from the Principal GISC after the success in performing the test cases; and (b) the choice of the principal GISC and the nomination of the WIS Focal point, if haven't done so yet.
10. Train a staff member and, if possible, a back-up in the WMO metadata Core Profile by sending them to training courses organized by WMO or the GISC. It is also possible to ask for on-site support/training through the WMO WIS Jumpstart Offer.
11. Take over responsibility for the metadata records describing the data submitted by the NMHS and modify/update them, if necessary.
12. Start using the WIS functionality for sending and receiving data with their associated metadata.
13. Join the user group of the GISC by attending meetings and other organized events.
14. Support the monitoring of the regional WIS operation by responding to queries and/or questionnaires from the Principal GISC, which collects information, including availability of service, network traffic status, errors and other comments etc.

APPENDIX II – DCPC ACTION PLAN

Implementing a DCPC in RA III under WIS

1. Make (national) decision to join WIS as a DCPC. Inform WMO, in particular CBS, by letter from the Director of the Organization about the wish to become a DCPC.
2. Identify the Principal GISC.
3. Nominate the WIS Focal Point for the DCPC. The person should preferably be knowledgeable on current GTS operation and the concept of WIS.
4. Review the status of the communication network, in particular the bandwidth to the current RTH and the bandwidth of the Internet connection.
5. Review the current GTS operation in terms of data exchange and ensure that the communication network is sufficient to send and receive data a reliable and timely fashion under WIS. If this is not the case, make sure that an upgrade of the communication network is planned and implemented prior to the operation as a DCPC.
6. Select and install system(s) that can provide required services by a DCPC, as described in the Manual on WIS, in particular the metadata management, which is new under WIS.
7. Communicate with the chosen Principal GISC for support in the process of DCPC certification. Contact CBS ET-WISC to organize demonstration of DCPC capability, in order to be endorsed by CBS and designated by WMO Cg as a DCPC.
8. In accordance with the Manual on WIS, collaborate with the relevant CBS ET's to pass all the necessary tests for a DCPC, which are outlined in the WIS Demonstration Process "Procedures and Guidelines" (<http://www-db.wmo.int/WIS/centres/guidance.doc>).
9. Once the tests have been passed successfully and the centre has been endorsed by WMO Congress/EC, set up operations as a DCPC.
10. Join the user group of the GISC by attending meetings and other organized events.
11. Support the monitoring of the regional WIS operation by responding to queries and/or questionnaires from the Principal GISC, which collects information, including availability of service, network traffic status, errors and other comments etc.

APPENDIX III**Sample letter by PR of country to WMO for Establishment of NC, nomination of the WIS Focal point and the Principal GISC**

To: the Secretary-General

WMO

Subject: Proposal for designation of WIS National Centre.

Dear Secretary-General,

In accordance with the *Manual on the WMO Information System* (WMO-No. 1060), paragraph 2.4.2, and as part of the national plan for the implementation of the WIS, I would like to request that the centre [*name, location*], which is part of the [*name of the NMHS*], be designated as a National Centre (NC) of the WMO Information System (WIS), in accordance with the established procedure. I would like to inform you that the principal Global Information System Centre (GISC) associated to NC [*name*] should be [*GISC name*].

For coordination of WIS-related issues, I hereby nominate Mr/Ms [*name, position, email address, phone*] as the national WIS Focal Point.

Please update the records accordingly.

I look forward to receiving your advice on the action taken on the above request.

Yours sincerely,

Permanent Representative of [*WMO Member*]

APPENDIX IV – NC Demonstration Test Cases

Test Case Name: NC Demonstration Test Case 1			
Uploading of Discovery Metadata for Data and Products into DAR catalogue			
Test Case ID	NC-TC1		
Component	Metadata Management		
Purpose of test			
<p>Validate the function of adding, updating and deleting metadata records from NC to the Principal GISC.</p> <p>All metadata records must be checked against the relevant schemas. (e.g. The record should be rejected if not fitting the schema)</p> <p>Note 1: The term “upload” refers to the movement of metadata records between the National Centre that provides the metadata and the WIS center that manages the DAR catalogue hosted by the Principal GISC. It can actually be implemented as a “pull” initiated from the DAR catalogue site, or as a “push” initiated by the metadata provider.</p> <p>Note 2: this functionalities can be implemented as:</p> <ul style="list-style-type: none"> • A web interface allowing registered users to manage their metadata interactively • A machine-to-machine interface allowing automated batch processing of metadata <p>All GISCs support both methods. The NC may choose one or both methods</p>			
Relevant technical specifications			
<ul style="list-style-type: none"> • Tech specs 1 (Uploading of metadata) • Tech specs 8 (DAR Catalogue Search and Retrieval) 			
Precondition			
<ol style="list-style-type: none"> 1. Network connection (dedicated and/or public connection) exists between the NC and GISC 2. GISC has a file upload facility for collecting metadata from other WIS centre(s) 3. GISC has a fully functional DAR catalogue 4. GISC has a registered user/process that is authorized to manage metadata of a given WIS centre 5. GISC has a web interface to the DAR catalogue that allow searches (see WIS-TC6¹) 			
Test Steps			
	Description	Expected Results	Actual Results
1	A user/process adds a valid metadata record to the DAR catalogue	The metadata record must be found when browsing/searching the DAR catalogue	
2	A user/process modifies a record from the DAR catalogue,	The modification should be immediately visible when browsing/searching the DAR catalogue	

¹ WIS Demonstration Process – <http://www-db.wmo.int/WIS/centres/guidance.doc>

3	A user/process deletes a record from the DAR catalogue,	The deleted record should not be found when browsing/searching the DAR catalogue													
...	A authorized user/process attempts to upload an invalid metadata record	The user/process must be notified of the fact that the metadata record is invalid. The addition/update operation is aborted. The DAR catalogue is unchanged.													
...	A authorized user/process attempts to upload a record with a unique identifier that is already in the DAR catalogue	The DAR catalogue should not contain record with duplicate identifiers. Either: 1. The new metadata record replaces the old metadata record. The old metadata record should not be present in the catalogue. The new metadata record must be found when browsing/searching the catalogue 2. The user/process must be notified of the fact that the record is a duplicate. The addition/update operation is aborted. The DAR catalogue is unchanged. Note: it is essential to ensure an update is an edit and not an accidental duplication													
...	Access control No unauthorized addition 1	A non-authorized user/process should not be able to add a metadata record to the DAR catalogue													
...	Access control – No unauthorized addition 2	A user/process should not be able to add a metadata record to the DAR catalogue representing data from another WIS centre													
...	Access control No unauthorized modification 1	A non-authorized user/process should not be able to modify a metadata record from the DAR catalogue													
...	Access control No unauthorized modification 2	A user/process should not be able to modify a metadata record from the DAR catalogue that belongs to another WIS centre													
...	Access control No unauthorized deletion 1	A non-authorized user/process should not be able to delete a metadata record to the DAR catalogue													
...	Access control No unauthorized deletion 2	A user/process should not be able to delete a metadata record from the DAR catalogue that belongs to another WIS centre													
<table border="1"> <tr> <td>Centre</td> <td></td> <td>Organization</td> <td></td> <td>Country</td> <td></td> </tr> <tr> <td>Test Date</td> <td colspan="5"></td> </tr> </table>				Centre		Organization		Country		Test Date					
Centre		Organization		Country											
Test Date															

Test Case Name: NC Demonstration Test Case 2				
Uploading and downloading of data between WIS centres				
Test Case ID	NC-TC2			
Component				
Purpose of test				
Validate the upload and download of data and products and association with metadata				
Requirements Covered				
<ul style="list-style-type: none"> • Tech specs 2 (Uploading of data and products) • Tech specs 10 (Downloading file via dedicated network) • Tech specs 11 (Downloading file via non-dedicated network) • Tech specs 12 (Downloading file via other methods) 				
Precondition				
<ol style="list-style-type: none"> 1. Network connection (dedicated and/or public connection) between the NC and GISC (includes via RTH where relevant) 2. Have file upload and download facilities (FTP, mail, HTTP, ...) 3. Have data available for upload or download 4. Have DAR facilities available at GISC 				
Test Steps				
	Description	Expected Results	Actual Results	
1	a. upload a file which is associated with a metadata record in the DAR catalogue of the GISC to a GISC centre b. use DAR facilities to search the metadata then retrieve the file	a. The uploaded file has been delivered to the GISC and match with the corresponding metadata b. The file can be downloaded		
Center		Organization		Country
Test Date				

Test Case Name: NC Demonstration Test Case 3			
Maintenance of users, roles, authorization and authentication			
Test Case ID	NC-TC3		
Component	Management of users and access		
Purpose of test			
Create and exercise a variety of user types.			
Note: A centre may use a GISC user control interface			
Relevant Technical Specifications			
<ul style="list-style-type: none"> • Tech specs 4 (Maintenance of User Identification and Role Information) • Tech specs 6 (Authentication of a User) • Tech specs 7 (Authorization of a User Role) • Tech specs 13 (Maintenance of Dissemination Metadata) 			
Precondition			
<ol style="list-style-type: none"> 1. The Centre has authority to provide access to users (i.e. PR approval) 2. A process is in place between the NC and GISC for the Centre to authorize its users to use the GISC with appropriate access levels 3. The user interface is via the Internet (i.e. web page) 			
Test Steps			
	Description	Expected Results	Actual Results
1	Provide access for an external user to search metadata	Temporary user can search metadata, but not access data from the GISC or cache, or subscribe to data.	
	<ol style="list-style-type: none"> a) User goes to search web page b) User makes metadata search c) Tries to access data 	<ol style="list-style-type: none"> a) User has access to search page b) User finds metadata c) User tries to access data and is referred to authorization page at data source. Cannot access data without validating in an authorized user role 	
2	Create accounts with access to WIS metadata and data for a WMO centre authorized user	Two users are created. One with access to metadata only, the other with the ability to access the Centre subscription service or ad hoc request from the cache	
	<ol style="list-style-type: none"> a) User goes to registered user web page b) User is required to login or create account 	<ol style="list-style-type: none"> a) User has access to login page b) New user, so has to create an account 	

	<ul style="list-style-type: none"> c) User registers account and selects role of valid WMO member with authority to access WIS data (eg is from WMO NC) d) User enters login details e) User makes metadata search f) Tries to access WMO globally available data from the centre g) User tries to access additional data at centre that he is not authorized to access h) Tries to access data or product at another site i) User subscribes to data for future delivery from centre j) User returns on another session and reuses login to search or subscribe k) User edits subscription details l) User cancels a subscription m) User logs out or leaves centre's site and tries to return to a bookmarked page at a later date and access data 	<ul style="list-style-type: none"> c) User account is validated as a WMO NC member and account is created. The user receives a user login (e.g. code via e-mail or encrypted symbol) d) User is logged in. As user is validated as WMO NC member, he is allocated access to search and access to download data from cache and to subscription services e) User finds metadata f) User successfully accesses data from centre g) User receives advice that he is not authorized to access this data and referred to access page where he can request change in user role or re-login as another user h) User is referred to authorization page at other site. i) User receives scheduled data via agreed method at agreed time j) User maintains successful access with same access rights k) Users subscription details are updated and reflected in subsequent deliveries l) Users subscription details are updated and receives no further deliveries m) Attempting to use a bookmarked page from earlier session to access data, directs the user to the registered user login page. 	
4	User checks status of account and subscriptions	User can view his account and subscription details, including historic and future transactions, and the status of current transactions	
...			

Center		Organization		Country	
Test Date					

APPENDIX V - LIST OF ACRONYMS

AMDCN	Area Meteorological Data Communication Network
CBS	Commission for Basic Systems
Cg	Congress
DAR	Data Access and Recovery
DCPC	Data Collection or Production Centre
ECMWF	European Centre for Medium-range Weather Forecasts
ET-WISC	CBS Expert Team on WIS Centres (responsible for GISC/DCPC demonstration process)
GFCS	Global Framework for Climate Services
GISC	Global Information System Centre
GTS	World Weather Watch Global Telecommunication System
IGDDS	Integrated Global Data Dissemination Service
IMTN	Improved Main Telecommunication Network
MPLS	Multi-protocol Label Switching
MTN	Main Telecommunication Network
NC	National Centre
NMHS	National Meteorological and Hydrological Service
PR	Permanent Representative
RA	Regional Association
RMDCN	Regional Meteorological Data Communication Network
RMTN	Regional Meteorological Telecommunications Network
RTH	Regional Telecommunication Hub
WG-ITD	RA III Working Group on Infrastructure and Technology Development
VPN	Virtual Private Network
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO	World Meteorological Organization
WWW	World Weather Watch

APPENDIX VI - CONTACT POINTS FOR THIS PLAN

The following contact details are referred to within the text of the plan. These are recorded in this Appendix so that they can be updated without changing the text of the plan itself.

GISC Brasilia

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D.F.
Brazil

Fax: +55 61 2102 4650

Tel: +55 61 2102 4621

E-mail: jmauro.rezende@inmet.gov.br

APPENDIX VII – WIS IMPLEMENTATION MONITORING (SURVEY RESULTS¹)

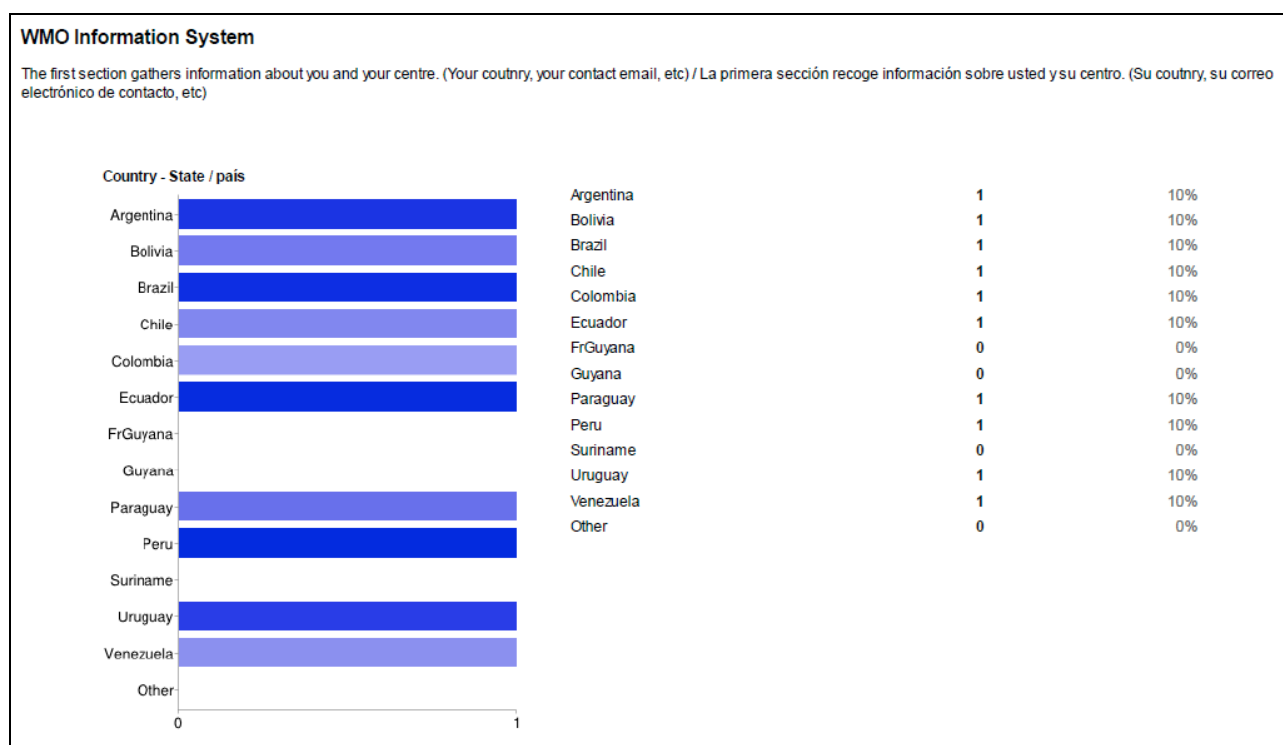


Figure 4. Countries

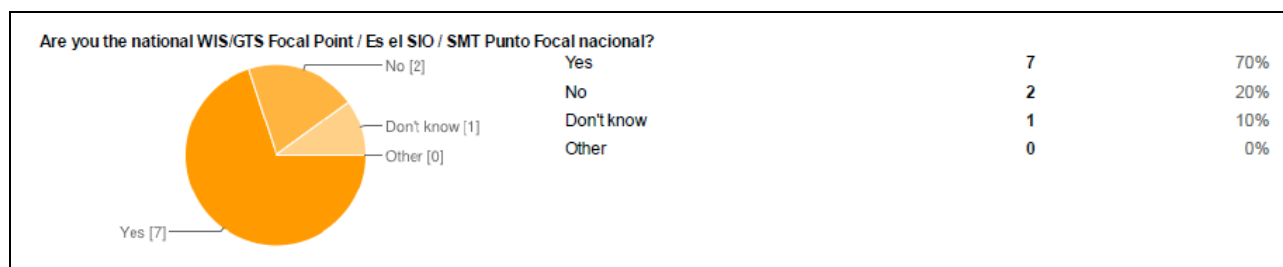


Figure 5. WIS Focal Points

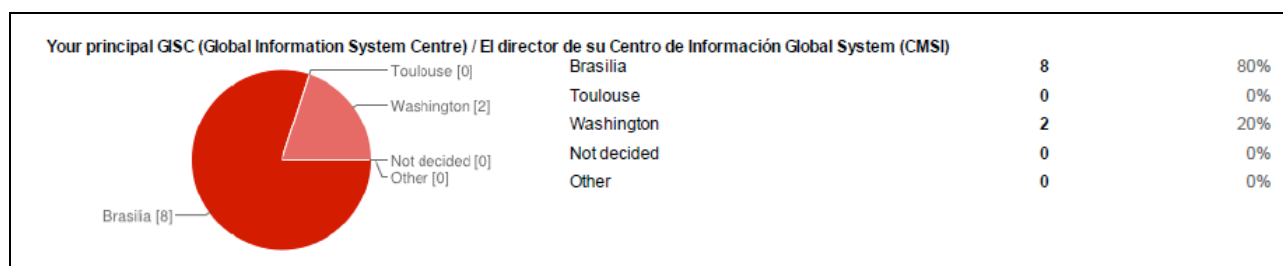


Figure 6. Principal GISC

¹ See pdf of survey questions at: <http://wis.wmo.int/doc=3239>, and May 2014 results at: <http://wis.wmo.int/doc=3237>

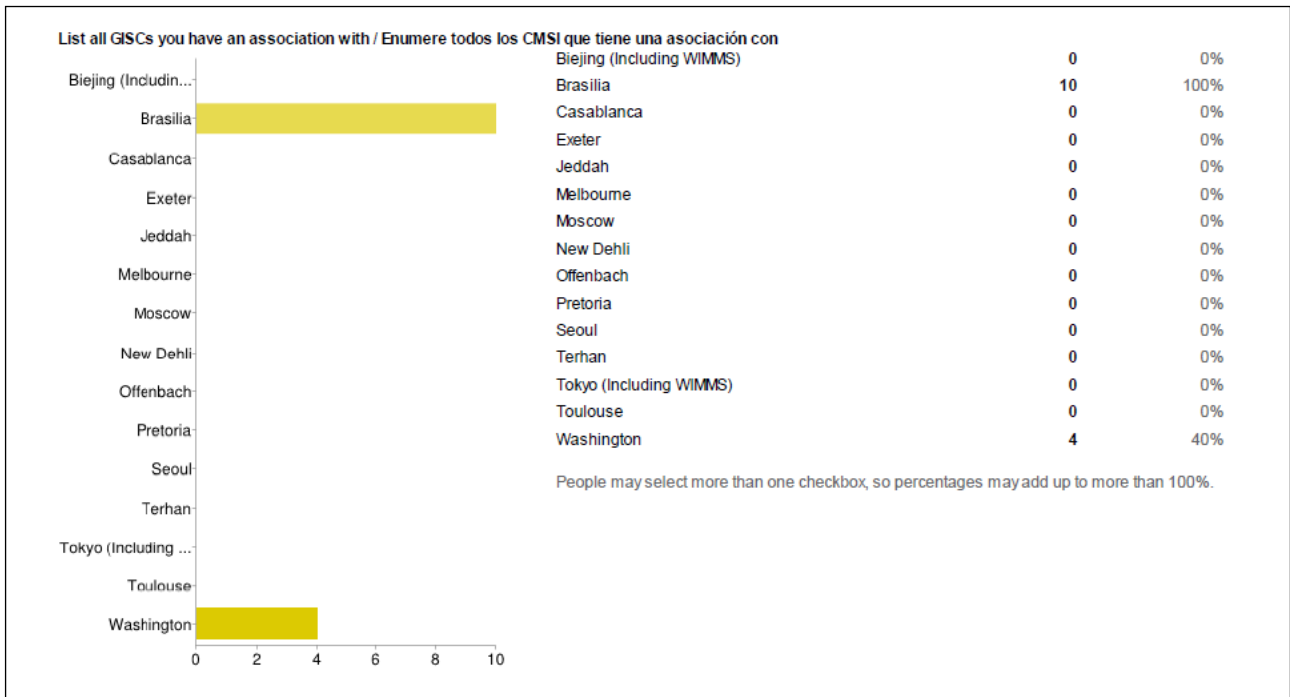


Figure 7. Associated GISCs

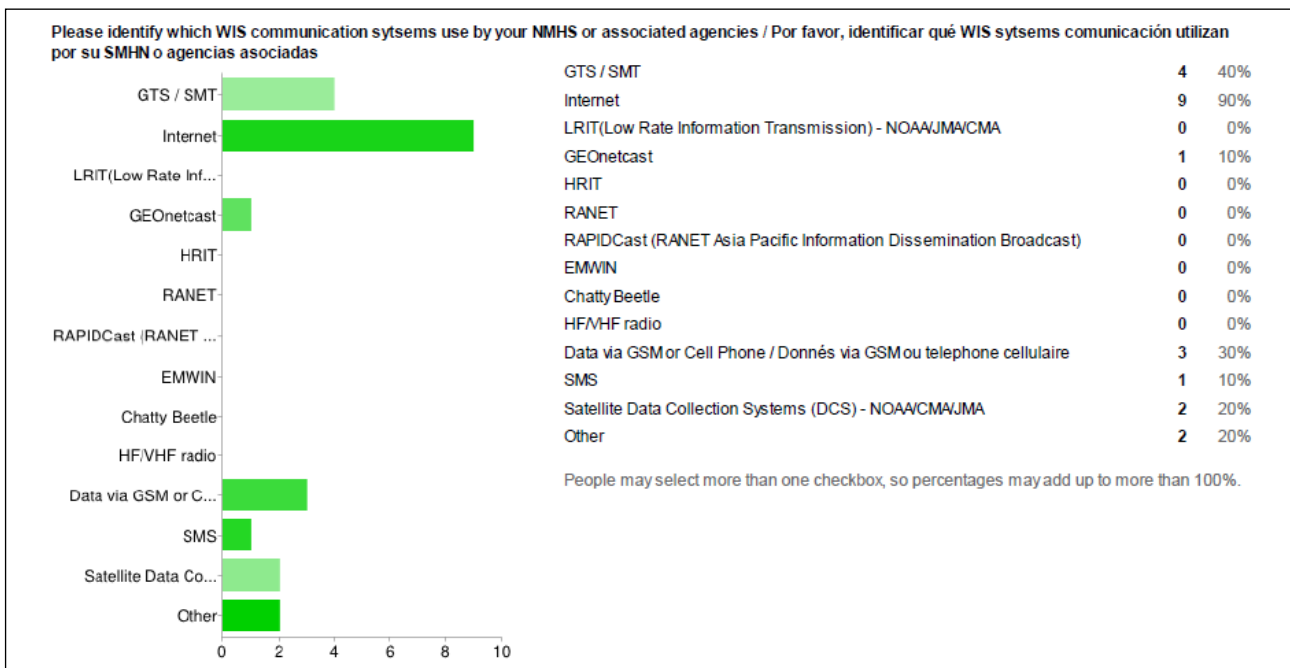


Figure 8. Communication technologies

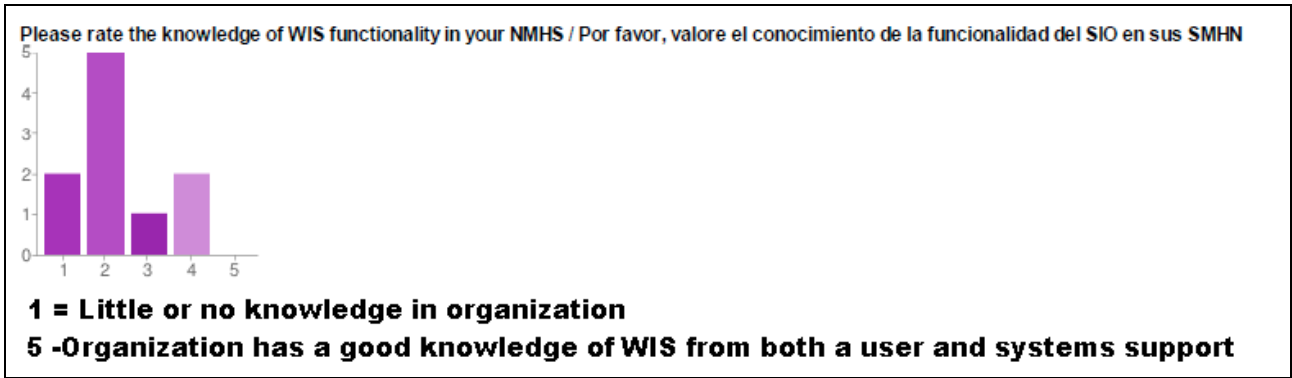


Figure 9. Level of organizational knowledge of WIS

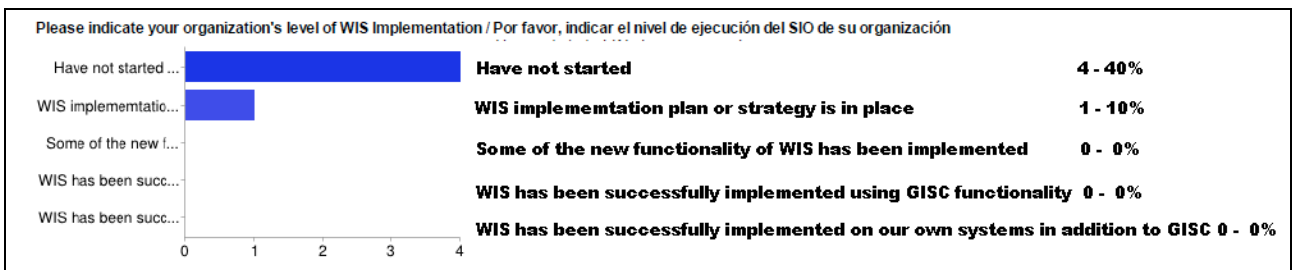


Figure 10. WIS implementation progress

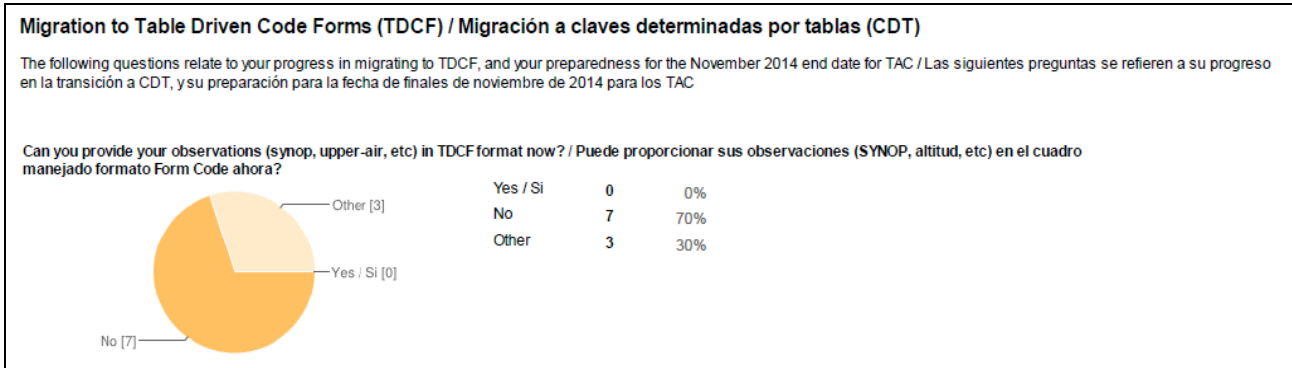


Figure 11. Progress in TDCF Migration

Resolution 9 (RA III-16)

IMPLEMENTATION OF THE WMO STRATEGY FOR CAPACITY DEVELOPMENT IN REGIONAL ASSOCIATION III (SOUTH AMERICA)

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) That the Executive Council at its sixty-fourth session (June-July 2012) had approved the Capacity Development Strategy that had been developed following the decision of the Sixteenth World Meteorological Congress (May-June 2011),
- (2) That the Executive Council at its sixty-fifth session (May 2013) had commented on and adopted the draft Capacity Development Strategy Implementation Plan developed by the Executive Council Working Group on Capacity Development,

Noting further:

- (1) That the Executive Council at its sixty-fifth session had urged regional associations to collaborate in and provide all possible support for the Capacity Development Strategy Implementation Plan,
- (2) That the Capacity Development Strategy as approved by the Executive Council at its sixty-fourth session offers important support to its Members,

Decides to assign to the appropriate mechanism within the Association the task of ensuring a harmonized and synchronized implementation of the Strategy by Members;

Requests Members to coordinate and support the implementation of the Capacity Development Strategy, especially in Region III;

Requests the Secretary-General to provide support to the Association in the implementation of the decision;

Requests the WMO Programmes to support the implementation of the Strategy in Regional Association III by providing expertise and other forms of assistance, as may be requested.

Resolution 10 (RA III-16)

QUALIFICATIONS OF AERONAUTICAL METEOROLOGICAL FORECASTERS

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting the 1 December 2016 deadline for Members to demonstrate that their Aeronautical Meteorological Forecasters meet the qualification requirements agreed by the World Meteorological Congress at its sixteenth session (May 2011), as contained in Resolution 53 (Cg-XVI) – Aeronautical Meteorology Programme,

Noting further:

- (1) The guidance provided by the Executive Council regarding the assessment of qualifications, particularly for Aeronautical Meteorological Forecasters (see *Abridged Final Report with Resolutions of the Sixty-fourth Session of the Executive Council* (WMO-No. 1092), 4.6.20),
- (2) That the international course on meteorology offered by the Spanish meteorological service for Class II meteorological personnel met the requirements of the Basic Instruction Package – Meteorology that were current at the time the training course was provided,
- (3) That Aeronautical Meteorological Forecasters have been subject to competency requirements since 1 December 2013 and will be subject to qualification requirements from 1 December 2016,

Decides that, for the purposes of meteorological support to international air navigation in Region III, successful graduates of the international course on meteorology for Class II personnel, organized by the Spanish meteorological service, could be considered as meeting the qualification requirements for Aeronautical Meteorological Forecaster within the scope of Resolution 53 (Cg-XVI).

Resolution 11 (RA III-16)**RECOGNITION OF THE VIRTUAL REGIONAL TRAINING CENTRE IN BRAZIL**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting Resolution 15 (EC-66) – Executive Council Criteria for the Recognition and Reconfirmation of WMO Regional Training Centres,

Noting further:

- (1) The increasing demand for education and training from Members of the Association,
- (2) The large number of education and training institutions in Brazil with expertise in areas of interest to Members,
- (3) The potential synergy between the proposed Virtual Regional Training Centre in Brazil and the WMO Global Campus endorsed by the Executive Council at its sixty-sixth session,
- (4) The roles and responsibilities of the Association, the Permanent Representative of the host country and the institution(s) making up a Regional Training Centre, which were approved by the Executive Council at its sixty-sixth session,

Decides to request the Seventeenth World Meteorological Congress to consider recognizing the consortium of institutions nominated by the Permanent Representative of Brazil as a Regional Training Centre;

Requests the Secretary-General, in accordance with the processes outlined in the Executive Council Criteria for the Recognition and Reconfirmation of Regional Training Centres, to inspect the proposed Regional Training Centre to assist the Congress in its deliberations.

Resolution 12 (RA III-16)

REGIONAL ASSOCIATION III STRATEGIC PLAN (2014–2019)

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) Resolution 38 (Cg-XVI) – Preparation of the Strategic Plan for 2016–2019,
- (2) The decision on the parameters for the development of the next Strategic and Operating Plans, taken by the Executive Council at its sixty-fourth session (2012),
- (3) The decision on the priorities and drafting of the WMO Strategic Plan 2016–2019, taken by the Executive Council at its sixty-sixth session,

Decides to adopt the Strategic Plan for Regional Association III (South America), as presented in the annex to this resolution, which contributes to the implementation of the WMO Strategic Plan 2016–2019;

Requests the Management Group to guide, prioritize elements, oversee and monitor progress in the implementation of the Strategic Plan for Regional Association III, and to provide periodic reports to the Members;

Requests the Members:

- (1) To organize their activities so as to realize the goals and objectives of the Strategic Plan for Regional Association III;
- (3) To facilitate the exchange of technical and management skills and to promote the concept of the regional Strategic Plan nationally;
- (4) To continue communicating with the Management Group in order to monitor the implementation of the plan and report on action taken or to be taken;

Requests the president, with the assistance of the Management Group, to develop the Regional Association III Operating Plan 2014–2019 as part of the WMO-wide Operating Plan 2016–2019 in alignment with the decisions on regional priorities taken by the Association at its sixteenth session;

Requests the Secretary-General to provide the necessary assistance and Secretariat support for the implementation of the Regional Association III Strategic Plan.

Annex to Resolution 12 (RA III-16)

REGIONAL ASSOCIATION III STRATEGIC PLAN (2014–2019)

**REGIONAL ASSOCIATION III
(SOUTH AMERICA)**

**STRATEGIC PLAN
(2014–2019)**

Development of meteorological and hydrological services in the Region

RA III MANAGEMENT GROUP

2014



RA III STRATEGIC PLAN (2014-2019)

1. OBJECTIVES

The main objective of the RA III Strategic Plan is to enable the Members in the Region to work together to meet needs with regard to weather, climate and water and questions relating to the environment in general, in addition to contributing to WMO's Strategic Plan for the benefit of all Members.

The Plan was prepared on the basis of an analysis of the current situation, future prospects and new needs in the Region, as well as an analysis of strengths, weaknesses, opportunities and threats (SWOT), which served to frame the issues and strategic options as well as the search for ways to move ahead in the short- and medium-term.

In the final analysis, the purpose of the Strategic Plan is to help RA III Members to secure individual benefits through joint action. The expected results from joint undertakings are generally consistent with national priorities, which include:

- Safety and well-being of peoples;
- Socio-economic development;
- Environmental protection;
- Climate change adaptation.

There is growing awareness in the Region that daily life and the sustainable development of society are being shaped by changes impacting the weather, climate, water resources and the environment. Knowledge of and information on weather, climate and water help inform social and economic decisions taken on a daily basis in various fields:

- Emergency and security situations;
- Efficient power generation;
- Safe and efficient transport by air, land, river and sea;
- Management of agricultural production and water resources;
- Environment and climate change;
- Planning of economic and social development.

The majority of natural disasters are related to the weather, climate and water. What's more, climate variability and climate change are creating new challenges, especially with regard to meteorological and hydrological factors.

It is for each Member to decide as to how best use its own capacities, but many tasks should be shared due to technical and financial considerations. This Strategic Plan establishes how the Region must act collectively with a view to:

- Maximizing use of current capacities in the Region to meet constantly changing needs and requirements;
- Strengthening the capacity of all RA III Members to provide their users with better services;

- Establishing common priorities for the Region and demonstrating the added value of working together;
- Acting as a leader within the WMO framework while making the best possible use of this global framework;
- Developing cooperation with other Regions.

It is hoped that successful execution of the Plan will lead to the following outcomes:

- An improvement in terms of services, especially those with a high social and economic impact;
- Better regional integration as regards activities relating to weather, climate and water;
- Recognition by governments, decision-makers and society in general;
- Closer ties between relevant organizations in the Region;
- Support for and strengthening of WMO;
- More appropriate governmental action to adapt to the impact of climate change.

To sum up, the main objective of the Strategic Plan is to identify areas of mutual interest and apply effective mechanisms aimed at improving regional cooperation for the benefit of the different Members.

2. ANALYSIS OF THE SITUATION IN THE REGION

Regional strengths

- Capacity of the most developed NMHSs and their desire to cooperate with the other NMHSs;
- Availability of professionals with knowledge and experience in different fields, in both the NMHSs and in academia;
- A growing culture of cooperation, by means of collaboration and technology transfer;
- Existence of regional bodies which strengthen ties between Members and neighbouring countries;
- Increased visibility of NMHSs through the media;
- Development of joint projects such as the Virtual Center for Severe Meteorological and Hydrological Phenomena, in the part concerning South America;
- Experience with and development of CIIFEN activities in the north and west of the Region;
- Launch of the Iberoamerican Climate Project (CLIBER) in some countries in the Region;
- Positive experience with the Iberoamerican Network for Monitoring and Predicting Hydrometeorological Phenomena (PROHIMET);
- Presence and activities of the Conference of Directors of the Ibero-American NMHSs (CIMHET) which is a forum for dialogue and cooperation among NMHSs in Regional Associations III and IV. Since 2003, CIMHET has facilitated the development of the Ibero-American cooperation programme in the field of meteorology.

Regional weaknesses

- Limitations with regard to basic infrastructure;
- Existing technology gap between the NMHSs of the most developed countries and those of the developed countries within RA III;
- Low visibility of NMHSs with governments and intergovernmental bodies;
- Lack of effective mechanisms for cooperation between public and private sectors and between scientific disciplines and technical fields;
- Under-utilization of regional facilities (e.g. SRMC, RICs, RTCs);
- Lack of joint projects;
- Lack of capacity in some NMHSs to meet growing needs for better weather, climate and water information.

Opportunities for regional development

- Growing awareness among the public and decision-makers of the impact of weather, climate, water resources and the environment (drought, flooding, etc.) on daily life and the sustainable development of society;
- Increasing demand for a broader range of environmental services;
- Possibilities for using new and evolving technologies;
- Support for the Iberoamerican Cooperation Project and the possibility of implementing national or international projects in areas relating to climate, water and the environment, including support for projects aimed at modernizing the NMHSs;
- Cooperation between WMO and other UN agencies and further international organizations leading to an increase in regional projects and initiatives;
- Gradual inclusion of topics relating to climate change adaptation and mitigation in Members' political agendas;
- The development of and a commitment to further develop the Global Framework for Climate Services (GFCS);
- Evolution of basic WMO services towards WIS and WIGOS.

Threats to regional development

- Rapidly changing regional demand and the inability of NMHSs to offer services which meet present needs;
- Insufficient governmental funding to meet the NMHSs' needs;
- Lack of recognition of the socio-economic value of the information provided by the NMHSs;
- Need to improve governance and management practices, especially with regard to plans to modernize the NMHSs.

3. KEY STRATEGIC ASPECTS

On the basis of an analysis of the current situation, trends, development and evolution of needs of Members and the Region in general, it has been possible to identify the following topics and challenges of relevance to RA III:

- An adequate infrastructure for generating and delivering services;
- High-quality forecasts and warnings for high-impact events;
- Effective participation of the NMHSs in preventing and mitigating natural disasters;
- A decline in funding for the NMHSs;
- The need to intensify regional cooperation, in particular by seeking joint management mechanisms to ensure the continuous operation of basic systems (response, consumables, etc.);
- Climate-related risks and urban migration.

4. STRATEGIC OPTIONS

The following strategic options are proposed to help tackle the issues that have been identified:

- Establish an adequate basic infrastructure:
 - Implement the WIGOS Regional Plan and the WIS Regional Plan;
 - Improve basic working tools (models, visualization, etc.);
 - Adapt to new generations of geostationary and polar orbiting meteorological satellites;
 - Set up a regional radar network based on national capacities;
 - Create a regional weather radar network;
 - Create a regional AMDAR programme on the basis of existing activities;
 - Step up regional exchange of information from automatic weather stations;
 - Improve quality control elements for observations in the Region.
- Strengthen Members' research Capacity:
 - Expand and improve research in the field of weather, climate, water and related environmental science;
 - Incorporate technology development into the NMHSs' activities.
- Improve service delivery:
 - Encourage NMHSs to participate more in disaster prevention and mitigation efforts;
 - Improve communications with governmental bodies, the general public and the media;
 - Consider introducing quality management systems (QMS) in the NMHSs for activities other than aeronautical meteorology;

- Introduce a regional early warning system for natural disaster risks related to meteorology, climatology and water resources, in support of civil defence authorities and the public in general.
- Participate in activities related to climate services:
 - Move ahead with the various stages in the establishment of the Regional Climate Centres, such as the CRC-SAS, CRC-WSA y CRC-NAS;
 - Participate actively in the GFCS;
- Make improvements in the field of hydrology and water resources:
 - Improve the quality and delivery of products to mitigate the effects of flash floods;
 - Improve cooperation with regard to transboundary basins, for example through HYCOS projects;
 - Continue to emphasize integrated flood management (IFM) throughout the Region.
- Make improvements in the field of education and training:
 - Improve the quality of existing staff and automate processes where it is not possible to maintain operators and observers;
 - Encourage Members to use the capacities of the Regional Training Centres;
 - Promote the Regional Training Centres by offering programmes suited to regional needs.

5. HOW CAN RA III TAKE UP THE CHALLENGES?

- By facilitating the exchange of technical and management skills between Members, with the establishment of joint projects;
- By making better use of the existing or available regional infrastructure of Members and WMO (for example, SRMC, RCCs);
- By improving interfaces with WMO Technical Commissions and international research projects (e.g. WCRP);
- By improving governance and striving for more effective management.

6. NEED FOR AND ROLE OF INTERNATIONAL COOPERATION

- Horizontal cooperation via regional exchange of best practices and implementation of joint projects, especially those concerning operational infrastructure;
- Cooperation through WMO and funding agencies to solve common problems involving operations and applied research.

7. IMPLEMENTATION OF THE STRATEGY

- Development of a Plan of Action with clear objectives and targets and well-defined deadlines, taking WMO's strategic and operational plans into consideration;
- Full commitment of Permanent Representatives to the execution of the Plan of Action;

- Monitoring, through the Management Group, of the execution of the plan and reporting on action taken or to be taken.

8. MAIN RESULTS

- Major benefits for the individual NMHSs;
- Greater capacity in the Region for input into WMO policy-making;
- Greater capacity in the Region to participate in the work of WMO's Technical Commissions.

9. KEY SUCCESS FACTORS

- An effective Management Group, which meets at least once a year to take major decisions;
- A realistic Plan of Action with a vision of modernization and regional integration;
- Full commitment of all Members and support from the most advanced NMHSs.

10. BASES FOR THE PLAN OF ACTION

The Plan of Action (separate document) will be developed considering the strategic issues covered in this Strategic Plan and take up the following points:

- Forecasts and warnings: weather, climate, water resources and natural disasters
 - Numerical modelling, forecasting of sets, new data assimilation techniques;
 - Multi-risk early warning systems.
- Members' research capacity
 - Meteorological, climate and hydrological models;
 - More immediate applications within the NMHSs.
- Implementation of the Global Framework for Climate Services (GFCS)
 - Regional Centres and climate services;
 - Baseline climate network.
- Implementation of the WIGOS Regional Plan
 - Homogeneous regional observation network;
 - Weather radar;
 - Meteorological satellites;
 - Automatic weather stations;
 - AMDAR observations.
- Implementation of the WIS Regional Plan
 - Evolution of the IP-VPN regional telecommunications network;

- Evolution of the regional GISC and DCPC;
 - Automation of the National Meteorological Centres (NMCs);
 - Migration of regional NMCs to the WIS National Centres.
 - Regional capacity-building
 - Improve course offerings and the utilization of regional training and maintenance centres, creating the notion of a network of centres;
 - Pursue a regional policy of requesting scholarships from WMO (VCP, etc.);
 - Implement horizontal cooperation for the exchange of best operational and management practices of the NMHSs.
 - Hydrology and water resources
 - Better integrate the hydrological community into WMO Programmes in general;
 - Implement and oversee regional HYCOS, FFGS and GIC projects;
 - Improve collaboration with Prohimmet and optimize use of its resources.
 - Service delivery
 - Improve mechanisms for communicating with the public in general and with users from economic and social sectors.
 - Effective, efficient functioning of regional bodies under the supervision of the Region's Management Group
 - Improve cooperation between Permanent Representatives, hydrological advisors and working groups;
 - Ensure better utilization of the Regional Office;
 - Encourage regional participation in the Technical Commissions;
 - Maintain the CIMHET (with the participation of Spain and Portugal);
 - Enhance the efficiency of the working groups and regional boards.
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Resolution 13 (RA III-16)

REGIONAL ASSOCIATION III MANAGEMENT GROUP

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) *The Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress (WMO-No. 1077),*

- (2) *The Abridged Final Report with Resolutions of the Fifteenth Session of Regional Association III (South America)* (WMO-No. 1067),
- (3) The reports of the meetings of the Regional Association III (RA III) Management Group during the period 2010–2014,
- (4) *The WMO Strategic Plan 2012–2015* (WMO-No. 1069),
- (5) *The WMO Operating Plan 2012–2015* (October 2011 version),
- (6) The Regional Association III Operating Plan 2010–2014,

Noting further:

- (1) The effective work done by the Management Group of the Association during the period 2010–2014 and its proposals for the structure of the working groups for the next intersessional period,
- (2) The growing need to plan and coordinate the Association's activities in order to achieve the expected results and key outcomes of the WMO Strategic Plan and the RA III Operating Plan,
- (3) The need to establish an effective and efficient structure of subsidiary bodies, and to guide and coordinate their activities during the intersessional period, making the necessary adjustments to the working structure to address emerging issues,
- (4) The need to constantly keep abreast of Members' needs and issues and communicate their requirements through appropriate technical commissions and the Secretariat,
- (5) That there is a need for a mechanism to address issues not handled by other working groups or task teams, in particular activities related to Expected Results 6, 7 and 8 of the WMO Strategic Plan 2012–2015,

Decides:

- (1) To re-establish the Management Group of Regional Association III with the following terms of reference:
 - (a) To advise and assist the president of RA III on all matters related to the work of the Association, in particular:
 - (i) Emerging matters requiring actions during the intersessional period;
 - (ii) Prioritizing, planning, coordinating and actively managing the work of the Association and its subsidiary bodies, as well as monitoring progress in accordance with the established work programme;
 - (iii) Ensuring an adequate internal structure, through the establishment of relevant task teams proposed by the chairpersons of the working groups and effective working methods of the Association, while making the adjustments needed to achieve the desired outcomes;
 - (iv) Addressing emerging issues and challenges as identified by Regional Association III at its sixteenth session, and ensuring that these issues are adequately included in the work programmes of the working groups;

- (v) Ensuring continuity of the strategic planning process and developing coordinated regional inputs for the next WMO Strategic Plan and related Operating Plan, including regional priorities and key outcomes;
 - (vi) Maintaining and promoting partnership and collaboration with international and regional organizations, and with other bodies and research institutes that contribute to different WMO Programmes;
- (b) To coordinate and monitor the implementation of the RA III Operating Plan and other regional implementation plans approved by the president; to assess and evaluate the performance of Regional Association III as per the WMO Strategic Plan;
 - (c) To oversee, in collaboration with the Secretariat, the activities of the Regional Specialized Meteorological Centres, Regional Climate Centres, Regional Instrument Centres, WMO Information System centres and Regional Training Centres;
 - (d) To coordinate the activities of the Association with respect to the WMO Capacity Development Strategy taking into account the needs of Members, existing resources and capacity-development mechanisms;
 - (e) To systematically address the need to harmonize the capabilities for provision of meteorological, climatological and hydrological services among different subregions;
- (2) To invite the president to act as chairperson of the Management Group, which is composed of the president, the vice-president, the regional hydrological adviser, the Permanent Representatives of RA III Members and the chairpersons of the working groups;
 - (3) That the president may also invite, as appropriate, other experts to participate in the meetings of the RA III Management Group;

Requests the president:

- (1) To ensure that, subject to available resources, the Group meets annually or as needed, preferably in conjunction with other meetings and events, using electronic means to the extent possible;
- (2) To report to the Association, during the intersessional period as needed and at its next regular session, on the activities of the Management Group and relevant decisions taken on behalf of the Association;

Authorizes the president to take the decisions required on urgent matters on behalf of the Association, after consultation with the Management Group;

Requests the Secretary-General to take into account the work of the RA III Management Group in the provision of support to the Region, especially through the Regional Office for the Americas.

Note: This resolution replaces Resolution 5 (XV-RA III) which is no longer in force.

Resolution 14 (RA III-16)**REGIONAL ASSOCIATION III WORKING GROUP ON INFRASTRUCTURE AND TECHNOLOGICAL DEVELOPMENT**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) *The Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress* (WMO-No. 1077),
- (2) *The Abridged Final Report with Resolutions of the Fifteenth Session of Regional Association III (South America)* (WMO-No. 1067),
- (3) *The WMO Strategic Plan 2012–2015* (WMO-No. 1069),
- (4) *The WMO Operating Plan 2012–2015* (October 2011 version),
- (5) The Regional Association III (RA III) Strategic and Operating Plans (2010–2014),
- (6) The Report of the First Session of the Working Group on Infrastructure and Technological Development (Asuncion, May 2014),

Noting further:

- (1) That the implementation of the WMO Information System (WIS) and the WMO Integrated Global Observing System (WIGOS) in Region III has been accorded the highest priority by RA III Members,
- (2) The need for harmonized and synchronized implementation throughout the Region of all components of the WIS, WIGOS, Global Data-processing and Forecasting System (GDPFS) and Public Weather Services, as a crucial factor for success and shared ownership of the systems, which will maximize the benefits for RA III Members,
- (3) The need to promote further regional cooperation on forecasting and warning systems for severe weather events,
- (4) The need to ensure the quality of observational data through vigorous control of compliance by Members with WMO regulations related to calibration and maintenance of observing instruments,

Recommends:

- (1) That the Regional Association III Working Group on Infrastructure and Technological Development be re-established with the following terms of reference:
 - (a) To monitor, promote and elaborate strategies for the regional development and sustainable implementation of WIGOS; to provide guidance and propose priority projects for the implementation of WIGOS in the Region;
 - (b) To monitor, promote and elaborate integrated strategies for the regional development and sustainable implementation of the observing systems of WMO and co-sponsored programmes; this would entail monitoring the composition and changes of the Regional Basic Synoptic Network (RBSN) and Regional Basic Climatological Network

(RBCN), promotion of traceability of instrument calibration to international standards, building on the effective operation of Regional Instrument Centres, and adopting relevant elements of the WMO Implementation Plan for the Evolution of Global Observing Systems;

- (c) To monitor, promote and elaborate strategies for the regional development and sustainable implementation of the WMO Information System. The highest priority remains that of overcoming the persistent shortcomings of the Regional Internet Protocol- Virtual Private Network (IP-VPN) for time-critical and operation-critical data exchange. Attention must be paid to the new functionality of WIS for flexible data discovery, access and retrieval services, and to speeding up the migration from traditional alphanumeric codes to table-driven formats (BUFR);
 - (d) To monitor, promote and elaborate strategies for the regional development and implementation of numerical weather prediction activities. The exchange of products and experiences and the implementation of severe weather warning systems remain the highest priority;
 - (e) To monitor, promote and elaborate strategies for the regional development and implementation of public weather service activities. The delivery of services to users remains the highest priority ;
 - (f) To identify means for strengthening liaison with bodies involved in the development and implementation of relevant observing and information systems and public weather service delivery;
 - (g) To coordinate regional radio-frequency activities, liaising with the Steering Group on Radio-frequency Coordination of the Commission for Basic Systems (CBS) and following related activities of the Inter-American Commission on Telecommunication of the Organization of American States;
 - (h) To identify education and training requirements for relevant information and communication techniques, observing and forecasting systems, system operations and public weather services;
 - (i) To keep abreast of WMO regulatory material related to observation and information systems, and to inform Members accordingly;
 - (j) To permanently follow up measures adopted within the framework of the RA III Strategic Plan (2014–2019) so as to update and continue implementing regional priorities;
 - (k) To define and follow up on the regional needs for exchange of data and products, proposing appropriate measures and procedures to comply with such needs inside and outside the Region. Priority will be given to the new automatic weather station networks, the extension of collection and distribution in the Region of information from the aircraft meteorological data relay (AMDAR), the definition of requirements for satellite data and products from current and new series of polar and geostationary satellites, and the regional distribution of meteorological radar data and products;
 - (l) To coordinate the work of the subgroups and report advances or problems to advise the RA III president and Management Group;
- (2) That the Working Group be composed as follows:
- (a) A chairperson;
 - (b) A vice-chairperson;

- (c) A Subgroup on Observation Systems;
 - (d) A Subgroup on Information and Communication Technology;
 - (e) A Subgroup on Data Processing and Forecasting;
 - (f) A Subgroup on Public Weather Services;
 - (g) Rapporteurs will be designated in each subgroup, as needed, for specific tasks. Initially, the Subgroup on Observation Systems should have one rapporteur on WIGOS implementation, one on satellite observations and one on meteorological radars. The Subgroup on Information and Communication Technology should have one rapporteur on WIS implementation. The Subgroup on Data Processing and Forecasting should have one rapporteur on Numerical Weather Prediction. The Subgroup on Public Weather Services should have one rapporteur on service delivery. The terms of reference and specific tasks of the rapporteurs will be defined by the chairperson of each subgroup in coordination with the chairperson of the Working Group and will be submitted to the RA III Management Group for approval;
 - (h) Experts from Members may be invited for specific activities;
- (3) That the terms of reference of the subgroups that are part of the Working Group on Infrastructure and Technological Development be as follows:
- (a) Subgroup on Observation Systems:**
- (i) To follow closely the regional WIGOS Implementation Plan to advise Members and the RA III Management Group on the WIGOS concept and Implementation Plan; to establish a regional implementation strategy, with proposals for specific WIGOS projects;
 - (ii) To identify opportunities and priorities for regional actions related to the development of observing systems, such as surface-based remote sensors and profilers, AMDAR, volcanic ash detectors and drifting buoys;
 - (iii) To review and advise on the design and implementation of the Regional Basic Synoptic Network of surface and upper-air stations with a view to improving data quality and coverage of surface and upper-air observations of the RBSN and RBCN, with emphasis on reviewing exchange possibilities among automatic meteorological stations within the Region;
 - (iv) To identify the training requirements of RA III Members for the regional observing systems and WIGOS, in order to advise the Implementation Coordination Team on Integrated Observing Systems;
 - (v) To collaborate in the implementation of the Plan for the Evolution of Global Observing Systems and to monitor progress in the regional aspects of the observing system, acting as regional contact point of the Expert Team on Evolution of Global Observing Systems;
 - (vi) To identify the training needs of Members in the Region regarding observing systems;
 - (vii) To liaise and closely collaborate with the Coordination Group on Satellite Data Requirements for Region III and Region IV;

- (viii) To serve as regional rapporteur for the WMO Space Programme on matters related to the space component of WIGOS;
- (ix) To provide advice to the Working Group on the above issues;
- (x) To represent the Region at sessions of the expert and implementation teams of the CBS Open Programme Area Group (OPAG) on Integrated Observing Systems, as required;
- (xi) To coordinate with the chairperson of the working group, within three months of his/her election, the presentation of a workplan for the next four years, and to submit annual activity reports to the chairperson of the working group and a comprehensive report not later than 3 months before the scheduled meeting of the working group;

(b) Subgroup on Data Processing and Forecasting:

- (i) To keep abreast of developments in data-processing equipment and techniques, and in numerical analysis and prediction system techniques and applications which could be beneficially introduced at National Meteorological Centres or Regional Specialized Meteorological Centres to improve their operational capability;
- (ii) To formulate recommendations for coordinated implementation of data-processing and forecasting facilities and techniques at GDPFS and other centres and, if required, for multi-purpose use;
- (iii) To identify the training requirements of Members in the Region for the successful implementation, operation and maintenance of the data-processing and forecasting system, with emphasis in numerical models;
- (iv) To advise the chairperson of the working group on all matters concerning data-processing and forecasting activities;
- (v) To represent the Region at sessions of the expert and implementation teams of the CBS OPAG on Data-processing and Forecasting System, as required;
- (vi) To coordinate with the chairperson of the working group, within three months of his/her election, the presentation of a workplan for the next four years, and to submit annual activity reports to the chairperson of the working group and a comprehensive report not later than 3 months before the scheduled meeting of the working group;

(c) Subgroup on Information and Communication Technology:

- (i) To follow closely the regional WIS Implementation Plan in order to advise Members and the RA III Management Group on the WIS concept and Implementation Plan; to establish a regional implementation strategy for WIS and propose specific WIS-related activities;
- (ii) To keep abreast of developments in new telecommunication technology and equipment and to study their possible adaptation to the requirements of an efficient regional meteorological telecommunication system; to explore the opportunities to be derived from space communication techniques, using commercial and meteorological satellites; and to promote the involvement of the Region in WIS implementation;

- (iii) To keep under review the regional telecommunication plan, particularly as regards the new design and development of IP-VPN;
- (iv) To identify the training requirements of Members in the Region for the successful implementation, operation and maintenance of the regional component of the WMO Information System;
- (v) To advise the chairperson of the working group on matters concerning the regional telecommunication systems and regional aspects of the WMO Information System;
- (vi) To represent the Region at sessions of the expert and implementation teams of the CBS OPAG on Information Systems and Services, as required;
- (vii) To keep under review and coordinate the regional migration plan to Table-driven Code Forms, and to promote and assist in the development of national migration plans;
- (viii) To coordinate the real-time and non real-time aspects of data management in the Region, including data quality control and data recovery;
- (ix) To identify the training requirements of Members in the Region regarding data management;
- (x) To advise the chairperson of the working group on matters related to data management and meteorological codes and practices in the Region;
- (xi) To coordinate with the chairperson of the working group, within three months of his/her election, the presentation of a workplan for the next four years, and to submit annual activity reports to the chairperson of the working group and a comprehensive report not later than 3 months before the scheduled meeting of the working group;

(d) Subgroup on Regional Aspects of Public Weather Services:

- (i) To keep under review the implementation of the Public Weather Services Programme in Region III, including the Implementation Plan of the Strategy for Service Delivery;
- (ii) To advise the chairperson of the working group on matters relating to formulation, presentation and dissemination of forecasts and warnings, and to establish good relation with the media and the private sector;
- (iii) To keep under review education and training requirements related to the Public Weather Services Programme;
- (iv) To keep under review, in coordination with the rapporteur on the regional aspects of the Global Data-processing System, those aspects that relate to the exchange and coordination among neighbouring countries of information on hazardous weather;
- (v) To represent the Region at sessions of the expert and implementation teams of the CBS OPAG on Public Weather Services, as required;
- (vi) To coordinate with the chairperson of the working group, within three months of his/her election, the presentation of a workplan for the next four years, and to submit annual activity reports to the chairperson of the working group and a

comprehensive report not later than 3 months before the scheduled meeting of the working group;

- (4) That, in accordance with Regulation 33 of the General Regulations of the World Meteorological Organization, Mr José Arimatea de Sousa Brito (Brazil) and Mr Gastón Torres (Chile) be designated as chairperson and vice-chairperson respectively of the Working Group;

Requests the chairperson of the Working Group:

- (1) Within three months of being elected, to submit to the Management Group a work programme for the period 2015–2018, as well as the final version of these terms of reference, with due account of the deliverables outlined in the RA III Operating Plan;
- (2) To submit to the Management Group a proposal for the establishment of specific groups or rapporteurs, including terms of reference, as necessary, to facilitate the successful implementation of the RA III Operating Plan in the area of responsibility of the working group;
- (3) To provide to the RA III president an annual progress report and a final report at least three months before the next session of the Association;

Invites Members:

- (1) To nominate experts who are committed to serving on the working group, with due attention to gender balance;
- (2) To support the activities of the working group.

Note: This resolution replaces Resolution 5 (XV-RA III), which is no longer in force.

Resolution 15 (RA III-16)

REGIONAL ASSOCIATION III WORKING GROUP ON CLIMATE

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) *The Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress* (WMO-No. 1077),
- (2) *The Abridged Final Report with Resolutions of the Extraordinary Session of the World Meteorological Congress* (WMO-No. 1102),
- (3) *The Abridged Final Report with Resolutions of the First Session of the Intergovernmental Board on Climate Services* (WMO-No. 1124),
- (4) *The Abridged Final Report with Resolutions of the Fifteenth Session of Regional Association III (South America)* (WMO-No. 1067),
- (5) *The WMO Strategic Plan 2012–2015* (WMO-No. 1069),

- (6) The *WMO Operating Plan 2012–2015* (October 2011 version),
- (7) The Regional Association III Operating Plan (2010–2014),
- (8) The Report of the Working Group on Climate Services (2010–2014),

Noting further:

- (1) The need for highest priority to be accorded to implementation of the Global Framework for Climate Services (GFCS) by Members of Regional Association III (RA III) in the next intersessional period,
- (2) The need for harmonized implementation throughout the Region of all components of the GFCS as a crucial factor for success and shared ownership, which would maximize the benefits for RA III Members,
- (3) The need to promote broad regional cooperation, particularly in support of the World Climate Programme and the Agricultural Meteorology Programme,
- (4) The need to coordinate the regional activities on climate, jointly and individually, in accordance with the WMO Strategic Plan and RA III Operating Plan,

Decides:

- (1) To re-establish the Regional Association III Working Group on Climate with the following terms of reference:
 - (a) To advise and assist the president of RA III in the implementation of the GFCS, particularly with regard to the World Climate Services Programme and the Agricultural Meteorology Programme in the Region;
 - (b) To liaise with the relevant regional panels of the World Climate Research Programme; to identify and communicate regional climate research requirements, and promote uptake of research advances in operational climate services;
 - (c) To promote climate watch systems in the Region and advise on best practices for their implementation;
 - (d) To assess the status of progress on data rescue and digitization of climate records, and promote related projects in collaboration with the Commission for Climatology and international projects and mechanisms;
 - (e) To advise on modern tools, specifications and standards for the archiving, management and use of climate and related applications and services;
 - (f) To advise and assist the president of the Association in all matters concerning the implementation of Regional Climate Centres in Region III;
 - (g) To promote sustained Regional Climate Outlook Forum mechanisms in the Region and assist Members in the implementation of such mechanisms, including through training and capacity-building activities, and participation of user groups in Regional Climate Outlook Forums;
 - (h) To assist Members in establishing sustainable climate services at the national level, including through national frameworks for climate services, National Climate Outlook Forums and National Climate Forums;

- (i) To promote the use of climate information, including relevant agrometeorological data, in risk management and adaptation activities in the agricultural sector;
 - (j) To coordinate capacity development efforts in the Region for climate services and agricultural meteorology;
 - (k) To improve and promote climate model verification techniques, and to support climate services, such as drought monitoring, services related to health, and other services that can be set up in the Region;
- (2) That the Working Group shall be composed of:
- (a) A chairperson;
 - (b) A vice-chairperson;
 - (c) Task teams, as decided by the Management Group, covering matters related to both climate and agricultural meteorology, with the task team leaders serving as core members of the Working Group;
 - (d) Other experts as necessary, taking into account that, due to funding constraints, the composition of working groups should be kept to the minimum needed for effective operation during the intersessional period;
- (3) To designate, in accordance with Regulation 33 of the General Regulations of the World Meteorological Organization, Ms Bárbara Tapia (Chile) as chairperson and Ms María de los Milagros Skansi (Argentina) as vice-chairperson of the Working Group on Climate;

Requests the chairperson of the Working Group:

- (1) Within three months of being elected, to submit to the Management Group a workplan for the period 2015–2018 and the final version of these terms of reference, taking due account of the deliverables outlined in the RA III Operating Plan;
- (2) To submit to the Management Group proposals for the establishment of task teams, including their terms of reference, as necessary, to facilitate the successful implementation of the RA III Operating Plan in the area of responsibility of the Working Group;
- (3) To provide to the RA III president an annual progress report and a final report at least three months before the next session of the Association;

Invites Members:

- (1) To nominate experts who are committed to serving on the Working Group, with due attention to gender balance;
 - (2) To support the activities of the Working Group.
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Resolution 16 (RA III-16)**REGIONAL ASSOCIATION III WORKING GROUP ON HYDROLOGY AND WATER RESOURCES**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

- (1) The *Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress* (WMO-No. 1077),
- (2) The *Abridged Final Report with Resolutions of the Fifteenth Session of Regional Association III (South America)* (WMO-No. 1067),
- (3) The *WMO Strategic Plan 2012–2015* (WMO-No. 1069),
- (4) The *WMO Operating Plan 2012–2015* (October 2011 version),
- (5) The Regional Association III Operating Plan (2010–2014),
- (6) The Report of the Working Group on Hydrology and Water Resources (2010–2014),

Noting further:

- (1) The priority of hydrology and water resources for the Region, as stated in numerous occasions by the Association,
- (2) That the Working Group on Hydrology and Water Resources has fulfilled the duties indicated in its terms of reference for the period 2010–2014 to the satisfaction of the Association,
- (3) That the Working Group on Hydrology and Water Resources constitutes the only platform for National Hydrological Services in the Region to discuss matters of common concern and is the natural link between the Regional Association and the Commission for Hydrology,

Decides:

- (1) To re-establish the Regional Association III Working Group on Hydrology and Water Resources with the following terms of reference:
 - (a) To participate in initiatives aimed at improving hydrological networks, such as:
 - (i) Activities related to the WMO Integrated Global Observing System, the World Hydrological Cycle Observing System, the Oyapock river project and similar initiatives;
 - (ii) Databases such as the Hydrological Information Referral Service, the Meteorological, Climatological and Hydrological Information System, and the World Hydrological Observing System;
 - (iii) Work related to underground water, in synergy with other regional programmes such as the International Hydrological Programme of the United Nations Educational, Scientific and Cultural Organization;

- (b) To coordinate flash flood activities with the Commission for Hydrology and the WMO flood forecasting initiative, such as monitoring the implementation of the demonstration project in the Zarumilla river basin, between Ecuador and Peru;
 - (c) To promote joint hydroclimatic prediction initiatives in cooperation with Regional Climate Centres, the Commission for Hydrology and the Intergovernmental Committee of the River Plate basin;
 - (d) To share experiences in integrated management of transboundary basins;
 - (e) To promote integrated flood management through courses, workshops and demonstration projects;
 - (f) To promote work on early warning systems through dissemination of the Yi river experience and other national initiatives;
 - (g) To develop and implement a work programme on the new areas of interest identified in its last intersessional period, such as: (a) Monitoring of hydrological hazards by remote sensing; (b) use of Geographical Information Systems in hydrological modelling; and (c) forecast and assessment of mud flow;
 - (h) To improve and optimize the working group website in order to facilitate internal communication and present the outcome of the work carried out by the group.
- (2) That the Working Group shall be composed of:
- (a) A chairperson;
 - (b) A vice-chairperson;
 - (c) Other experts as necessary, but at least one for each interested RA III Member, taking into account that due to funding constraints the composition of working groups should be kept to the minimum needed for effective operation during the intersessional period;
- (3) To designate, in accordance with Regulation 33 of the WMO General Regulations, Ms Dora Goniadzki (Argentina) as chairperson and Mr Fabio Bernal (Colombia) as vice-chairperson of the working group;

Requests the chairperson of the Working Group:

- (1) Within three months of being elected, to submit to the Management Group a work programme for the period 2015–2018 and the final version of these terms of reference, taking due account of the deliverables outlined in the RA III Operating Plan;
- (2) To provide to the RA III president an annual progress report and a final report at least three months before the next session of the Association;

Invites Members:

- (1) To nominate experts who are committed to serving on the working group, with due attention to gender balance;
 - (2) To support the activities of the working group.
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Resolution 17 (RA III-16)**REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION**

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting the *Abridged Final Report with Resolutions of the Ninth Session of the Executive Committee* (WMO-No. 67), paragraph 3.7.1,

Considering:

- (1) That a number of the resolutions adopted before the sixteenth session have been revised and incorporated in resolutions of the sixteenth session,
- (2) That some of the previous resolutions have been incorporated in appropriate WMO publications or have become obsolete,
- (3) That some of the previous resolutions are still to be implemented,

Decides to keep in force Resolution 3 (XV-RA III) – Regional Basic Synoptic Network and Regional Basic Climatological Network in Region III, as updated through Resolution 7 (RA III-16).

Note: This resolution replaces Resolution 6 (XV-RA III), which is no longer in force.

ANNEXES

ANNEX I

Annex to [paragraph 4.4.1.10](#) of the general summary

CONCEPT DOCUMENT ON THE WIGOS-SAS PROJECT (Regional WMO Integrated Global Observing System Implementation Plan)

COMMON HYDROMETEOROLOGICAL OBSERVATION NETWORK IN SOUTHERN SOUTH AMERICA

Introduction

There are several hydrometeorological networks operating in Southern South America by a number of regional or sub regional entities. NMHS, power utility companies, state and local government agencies are involved in the acquisition and operation of such networks.

In important river basins there are agreements for data exchange and operation of hydrometeorological forecast models. A significant number of hydrometeorological stations are already in operation, as well as a small number of meteorological radars. There is an effort to increase the number of meteorological radars to support hydrometeorological early warning systems.

The objectives of the Project

The main objective of the Project is to use the WIGOS framework to create a homogeneous hydrometeorological network in Southern South America, involving the following countries and entities:

Countries: Argentina, Bolivia, Brazil, Paraguay and Uruguay

Partners: SMHN of concerned countries, Water agencies of concerned countries

Participating organizations: CIC, WMO

Project Governance

The following project working structure is proposed:

Project overall supervision: President of RA-III

Project Coordinator: Chair WG-ITD

Project members:

Representative designated by RA-III WG on Hydrology

Representative of RA-III WG on Climate Services

Regional Rapporteur on WIGOS

Representative designated by CIC

Note: Target is to have one expert from each participating country (Total is five)

Project activities

A governance mechanism will be established together with very specific Task Teams through a Memorandum of Understanding.

The governance mechanism and Task Teams will deal with the Project activities in close relationship with the WIGOS Key Activities, part of the RA-III R-WIP, including:

- Project implementation and evaluation – The development of detailed integration plans for the existing networks
- Conclusion of collaboration mechanisms involving other participating organizations such as WMO and CIC (There is a MoU between both)
- Adjustment of the existing networks, optimizing distribution, expanding the radar network and inclusion of AMDAR data
- Improve overall operation and maintenance
- Introduction of common quality control processes and standardization of methods of observations
- Full use of regional WIS facilities, including GISC-Brasilia and DCPC-Buenos Aires
- Create a mechanism to keep WIR updated (WIGOS Metadata)
- Exchange best practices of observations through workshops and on the job training
- Create and maintain a Project Web page

A number of conventional and Automatic Weather and hydrological stations are already in place and future acquisitions should take this into account. Similarly, a number of radars are installed, but they belong to different entities and do not provide homogeneous information. There is already an effort to identify all of them and their respective processing capabilities and formats to make their information easily available to all. A number of AMDAR information is already available and a regional AMDAR plan is under development.

Project Schedule

- Initial Discussions: CIC Seminar in Asuncion (May, 2014), GFCS Workshop in San José, Costa Rica (July 2014)
- Presentation of Draft Project: TECO/RECO in Asuncion (September, 2014)
- Establishment of governance mechanism and Task Teams (Example of RCC-SAS): By December 2014
- Development of the detailed Project: May 2015
- Implementation of Project components: Starting July 2015
- End of Project (sustained operation): End 2016

Project Resources

The initial phase of the Project will focus on the integration of the existing capacities, not requiring significant investments in equipment and instruments. Most of the work of the management and

Task Teams will be carried out remotely with need of one or two face to face meetings of a small group of experts in the project period.

It is known that some of the proposed participating agencies are planning to upgrade their observing systems. Doing this with the collective vision of the region will benefit all.

Contribution from Partners

The project team will compile the contribution from each partner comprising the list of observing stations and meteorological radars, AMDAR data and other facilities available.

ANNEX II

Annex to [paragraph 4.4.2.5](#) of the general summary

TERMS OF REFERENCE OF THE REGIONAL COORDINATION GROUP ON SATELLITE DATA REQUIREMENTS

1. The Group consists of a representative number of members from the satellite data user community in the Region, joined, as associate members, by satellite data providers and WMO. The Group is chaired by one or two representatives from key satellite data user organizations of the Region.
2. The Group maintains an updated list of satellite data and products available to the Region through existing dissemination services. Data and products shall be classified by categories of variables and derived products.
3. The Group regularly reviews sources of regional needs and undertakes, as needed, further information gathering, such as surveys, to ensure that views of WMO Members in the Region are adequately represented.
4. The Group analyses the requirements for each relevant category of product, and identifies which requirements are not adequately met by existing services. The unmet requirements are prioritized, taking into account:
 - (a) The applications supported and their impact;
 - (b) The number and representativeness of the users;
 - (c) The status of the required data or products;
 - (d) The quality and suitability of the required data or products.
5. In summary the Group formulates recommendations pertaining to:
 - (a) Existing satellite data/products (with detailed references) to be included in existing distribution services, or moving a product from one service to another, or assigning lower priority to an existing product (or removing it if obsolete);
 - (b) Amendments of existing products or development of new products;
 - (c) Evolution (upgrade, or consolidating) of data dissemination means, or other (e.g. training, tools, user equipment);

- (d) Short-term action to implement these recommendations.
6. The Group maintains a dialogue with satellite data providers of relevance to the Region, and other partners as needed, to ensure that its recommendations are implemented.
 7. The Group uses the [WMO Procedure for Documenting Regional Requirements for Satellite Data Access and Exchange](#), for guidance.
 8. The Group meets in person at least every two years, and, to ensure continuity, works through collaborative tools during the intersessional period.

ANNEX III
Annex to [paragraph 4.6.2.11](#) of the general summary

ACTIVITIES CARRIED OUT BY REGIONAL TRAINING CENTRES IN 2010–2013^a

WMO Member	2010 & 2011			2012 & 2013		
	Local Participants	Foreign Participants	No. Courses	Local Participants	Foreign Participants	No. Courses
Argentina	1,129	113	98	976	14	1
Brazil	733	0	2	723	0	–
Peru ^b	–	–	–	160	21	–
Venezuela (Bolivarian Republic of)	–	–	–	–	–	–

^a Extracted from the report of the twenty-sixth session of the Executive Council Panel of Experts on Education and Training, Seoul, 24–28 March 2014.

^b Peru became an RTC in 2012.

ANNEX IV

Annex to paragraph 4.6.2.12 of the general summary

VIRTUAL REGIONAL TRAINING CENTRES NETWORK (CVEN – BRAZIL):
LIST OF PARTICIPATING INSTITUTIONS

MSc and PhD level	City/State	Research and application areas	Internet Portal
Federal University of Rio de Janeiro – UFRJ	Rio de Janeiro/RJ	Weather and Climate studies and applications. Micrometeorology. Engineering and Environment. Radiation and Remote Sensing.	http://www.meteorologia.ufrj.br/pos/index.htm
National Institute for Space Research – INPE	São José dos Campos /SP	Research and Modelling of Weather and Climate. Remote Sensing of the Atmosphere. Air–sea interactions. Biosphere–atmosphere interactions. Environmental Meteorology.	http://www.inpe.br/pos_graduacao/cursos/met/
Federal University of Campina Grande – UFCG	Campina Grande/PB	Synoptic Meteorology. Tropical Atmosphere Dynamics. Climatology. Radiation and Remote Sensing. Agrometeorology, Micrometeorology, Agroclimatology.	http://dca.ufcg.edu.br/posgrad_met/index.html
Federal University of Pará – UFPA	Belém/PA	Physics of Climate. Amazonian ecosystems and Socio-environmental Dynamics. Climate–Environment interactions.	http://www.ppgca.ufpa.br/
University of São Paulo – USP	São Paulo/SP	Micrometeorology. Atmospheric electricity. Studies on large-scale and meso-scale dynamics. Air pollution. Air–sea interactions. Biosphere–atmosphere interactions. Hydrometeorology. Remote sensing of the atmosphere.	http://www.iag.usp.br/pos/node/150
Federal University of Pelotas – UFPEL	Pelotas/RS	Climatology. Meso-scale and Micro-scale Meteorology.	http://www2.ufpel.edu.br/meteorologia/pos-graduacao/
Federal University of Alagoas – UFAL	Maceió/AL	Micrometeorology. Agrometeorology. Atmospheric air pollution. Atmospheric teledection. Hydrometeorology. Numerical Weather and Climate Prediction. Climatology and Synoptic Meteorology.	http://www.ufal.edu.br/unidadeacademica/icat/pos-graduacao/meteorologia
Federal University of Santa Maria – UFSM	Santa Maria/RS	Micrometeorology. Weather and Climate Studies and Applications.	http://w3.ufsm.br/meteorologia/pos/

Undergraduate (BSc) level	City/State	Degree granted (Diploma)	Internet Portal
Federal University of Rio de Janeiro – UFRJ	Rio de Janeiro/RJ	Meteorology	http://www.meteorologia.ufrj.br/grad/index.htm
Federal University of Campina Grande – UFCG	Campina Grande/PB	Meteorology	http://www.dca.ufcg.edu.br/grad_met/uaca3.html
Federal University of Pará – UFPA	Belém/PA	Meteorology	http://www.ig.ufpa.br/site/index.php?option=com_content&view=article&id=24&Itemid=36
University of São Paulo – USP	São Paulo/SP	Meteorology	http://www5.usp.br/ensino/graduacao/cursos-oferecidos/meteorologia/
Federal University of Pelotas – UFPEL	Pelotas/RS	Meteorology	http://www2.ufpel.edu.br/meteorologia
Federal University of Alagoas – UFAL	Maceió/AL	Meteorology	http://www.ufal.edu.br/unidadeacademica/icat/graduacao/metereologia
Federal University of Santa Maria – UFSM	Santa Maria/RS	Meteorology	http://w3.ufsm.br/meteorologia/index.php
State University of Amazonas – UEA	Manaus/AM	Meteorology	http://cursos3.uea.edu.br/apresentacao.php?cursold=76
Federal University of Itajubá – UNIFEI	Itajubá/MG	Atmospheric Sciences	https://portalacademico.unifei.edu.br/index.php?link=cursos&subsistema=grad&cursocod=068
Federal University of Santa Catarina – UFSC	Florianópolis/SC	Meteorology	http://meteorologia.grad.ufsc.br/
State University of São Paulo – UNESP	Bauru/SP	Meteorology	http://www.fc.unesp.br/#!/cursos/meteorologia/
State University of North Fluminense – UERJ	Macaé/RJ	Meteorological Engineering	<i>(course yet being implemented)</i>

Technical level	City/State	Training area (Certificate)	Internet Portal
National Institute of Meteorology – INMET	Brasília/DF	Meteorological instrumentation. Meteorological Monitoring networks. Automatic Weather stations.	http://www.inmet.gov.br/portal/
Federal Institute of Santa Catarina – IFSC	Florianópolis/SC	Intermediate level Technician in Meteorology	http://meteorologia.florianopolis.ifsc.edu.br/webmeteoro_ifsc/
Federal Technological Education Centre Celso Suckow da Fonseca – CEFETRJ	Rio de Janeiro/RJ	Intermediate level Technician in Meteorology	http://portal.cefet-rj.br/maracana-ensino/tecnico/97-curso-tecnico-de-meteorologia-.html
University of the Paraíba Valley – UNIVAP	São José dos Campos/SP	Intermediate level Technician in Meteorology	http://ava.univap.br/~moodle/course/category.php?id=41
Instituto Federal de Minas Gerais – IFMG	MG	Intermediate level Technician in Meteorology	<i>(course yet being implemented)</i>

ANNEX V
Annex to [paragraph 4.6.3.1](#) of the general summary

DEVELOPMENT OF INFRASTRUCTURE AND OPERATIONAL FACILITIES (VCP)

COUNTRY	TITLE/FOCUS	YEAR	STATUS	DONOR
Uruguay, Ecuador, Cuba, Panama, Peru, Honduras, Plurinational State of Bolivia, Dominican Republic, Colombia, Argentina, Costa Rica, Paraguay	Provision of Hg Barometers	2011	Completed	Germany
Guyana	Acquisition of CLICOM database software and computer	2012	Completed	VCP(F)
Uruguay	Support for the implementation of QMS in the aeronautical meteorological service	2012	Completed	VCP(F)
Guyana	Expert assistance to develop long term strategic plan for Hydrometeorological Service in Guyana	2013	Completed	VCP(F)
Guyana	Expert from RTC Brasilia or Argentina to implement the new RAIII VPN telecommunications network	2013	Completed	VCP(F)
Paraguay	Expert services – Strengthening National Hydrological Services in Paraguay	2013	Completed	VCP(F)

ANNEX VI
Annex to paragraph 4.6.3.3 of the general summary

**KEY HYDROMETEOROLOGICAL DEVELOPMENT PROJECTS SUPPORTED
 BY NATIONAL AID AGENCIES**

Project Title	Countries	Focus	Donor	Duration
1. CLIMANDES Phase II	Peru and neighbouring countries in the Region through the RTC Federal Office of Meteorology and Climatology MeteoSwiss	Restructuring the science curriculum at the National Agricultural University La Molina (UNALM) and applied training for operational forecasters at the National Peruvian Meteorological and Hydrological Service (SENAMHI)	Swiss Development Cooperation 3.17 M CHF	2012–2105
2. CATCOS (Phase I & II)	Central Asia and South America (Plurinational State of Bolivia, Chile, Colombia, Ecuador) Federal Office of Meteorology and Climatology MeteoSwiss	Improving the capacity to measure Essential Climate Variables (aerosols, greenhouse gases, glaciers) in developing and emerging countries transfer of newly generated atmospheric and terrestrial data to the designated International Data Centers. Training people on-site.	Swiss Development Cooperation 3.09 M CHF	Phase I 2012–2104 Phase II 2014–2016
3. Programme of Cooperation for IberoAmerica	All	Annual Conference of CIMHET Capacity Building Programme across all sectors of HydroMet Service Delivery	Spain	Ongoing
4. Flash Flood Guidance System (FFG)	Zarumilla River basin, which is shared basin between Peru and Ecuador	The purpose of this programme is to develop and implement activities to lessen the impact of hydrometeorological hazards such as floods, cyclones, droughts, and other climate, weather and water induced disasters. In particular this programme supports the Flash Flood Guidance System (FFGS).	USAID-OFDA	2014

Project Title	Countries	Focus	Donor	Duration
5. Strengthening the Regional Climate Center for the Western Coast of South America (RCC-WCSA)	Bolivarian Republic of Venezuela, Colombia, Ecuador, Peru, Plurinational State of Bolivia, and Chile	(i) Improve the existent regional climate information and data processing system; (ii) Disseminate to users the information generated; and (iii) Strengthen the capacity of the NMHSs to handle, manage, and disseminate the products of this operation.	Germany	Submitted
6. CLIMANDES Phase II	Peru and neighbouring countries in the Region through the RTC Federal Office of Meteorology and Climatology MeteoSwiss		Swiss Development Cooperation 2–3 M CHF	2015–2106

APPENDIX

LIST OF PARTICIPANTS

1. Officers of the session

Julián BÁEZ BENÍTEZ	Acting President
Carlos Hugo NARANJO JÁCOME	Vice-President

2. Representatives of WMO Members within Region III

Argentina

Andrea Celeste SAULO (MS)	Principal Delegate
Dora GONIADZKI (MS)	Delegate
Mónica B. MARINO (MS)	Delegate
Rodrigo Agustín MIRANDA	Delegate
Sebastián Lucas NICOLINO	Delegate

Brazil

Antonio Divino MOURA	Principal Delegate
José Arimatea DE SOUSA BRITO	Alternate
Otávio TRINDADE	Alternate
José Antonio ARAVÉQUIA	Delegate
Angela FERNANDES (MS)	Delegate
Cleber SOUZA CORRÊA	Delegate

Chile

Guillermo NAVARRO	Principal Delegate
Enrique GARRIDO	Delegate

Colombia

Omar Franco TORRES	Principal Delegate
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Ecuador

Carlos Hugo NARANJO JÁCOME	Principal Delegate
Aníbal VACA	Delegate

France

Jacques Max REYAL	Principal Delegate
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Paraguay

Julián BÁEZ BENÍTEZ	Principal Delegate
Raúl Enrique RODAS	Alternate
José Luis ÁVILA	Delegate
José Luis HERMOSA	Delegate
Noé MONTENEGRO MENÉSEZ	Delegate
Óscar Hugo RODRÍGUEZ SALCEDO	Delegate
Carlos Roberto SALINAS ROJAS	Delegate
Jorge Aníbal SÁNCHEZ	Delegate

Peru

Amelia DÍAZ (MS)	Principal Delegate
Jorge CHIRA	Delegate

Uruguay

Gabriel PISCIOTTANO	Principal Delegate
Silvana ALCOZ (MS)	Delegate

3. Representatives of WMO Members outside Region III (observers)

Finland

Edith RODRIGUEZ (MS)	Observer
Joanna SAARINEN (MS)	Observer
Petteri TAALAS	Observer

Spain

Jorge TAMAYO CARMONA	Observer
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United States of America

José Manuel GÁLVEZ	Observer
Steven J. GOODMAN	Observer
James PERONTO	Observer
Susan WEST (MS)	Observer

4. Representatives of international organizations (observers)

Centro Internacional para la Investigación del Fenómeno de El Niño (CIIFEN)

Rodney MARTINEZ	Observer
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Comisión Permanente del Pacífico Sur (CPPS)

Marcelo NILO	Observer
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Comité Intergubernamental Coordinador de los Países de la Cuenca del Plata (CIC)

José Luis GENTA	Observer
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The Association of Hydro-Meteorological Equipment Industry (HMEI)

Ashish RAVAL	Observer
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World Federation of Engineering Organizations (WFEO)

Sandra FERNANDEZ (MS)	Observer
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5. Invited experts

Fernando Pio BARRIOS PEDRETTI	Observer
Cesar BENETI	Observer
Fred BRANSKI	President of CBS
Victoria CALLE MONTES (MS)	Observer
Juan Carlos FALLAS SOJO	President of RA IV
David GRIMES	President of WMO
Ming HU	Observer
Niceforo ITA MAGUIÑA	Observer
Richard JEFFRIES	Observer
Albert MARTIS	Vice-President of RA IV
Victor MOREL	Observer
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