

WORLD METEOROLOGICAL ORGANIZATION

**REGIONAL ASSOCIATION IV
(NORTH AND CENTRAL AMERICA)**

THIRTEENTH SESSION

MARACAY, VENEZUELA, 28 MARCH – 6 APRIL 2001

ABRIDGED FINAL REPORT WITH RESOLUTIONS

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- 846 — **Executive Council**. Forty-eighth session, Geneva, 10–21 June 1996.
- 867 — **Executive Council**. Forty-ninth session, Geneva, 10–20 June 1997.
- 880 — **Twelfth World Meteorological Congress**. Proceedings, Geneva, 30 May–21 June 1995.
- 883 — **Executive Council**. Fiftieth session, Geneva, 16–26 June 1998.
- 902 — **Thirteenth World Meteorological Congress**. Geneva, 4–26 May 1999.
- 903 — **Executive Council**. Fifty-first session, Geneva, 27–29 May 1999.
- 915 — **Executive Council**. Fifty-second session, Geneva, 16–26 May 2000.

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- 874 — **Regional Association III** (South America). Twelfth session, Salvador, 17–26 September 1997.
- 882 — **Regional Association VI** (Europe). Twelfth session, Tel Aviv, 18–27 May 1998.
- 890 — **Regional Association V** (South–West Pacific). Twelfth session, Denpasar, 14–22 September 1998.
- 891 — **Regional Association I** (Africa). Twelfth session, Arusha, 14–23 October 1998.
- 924 — **Regional Association II** (Asia). Twelfth session, Seoul, 19–27 September 2000.

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- 860 — **Commission for Marine Meteorology**. Twelfth session, Havana, 10–20 March 1997.
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- 893 — **Commission for Basic Systems**. Extraordinary session, Karlsruhe, 30 September–9 October 1998.
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CONTENTS

Page

GENERAL SUMMARY OF THE WORK OF THE SESSION

1.	OPENING OF THE SESSION	1
2.	ORGANIZATION OF THE SESSION	2
2.1	Consideration of the report of the credentials.....	2
2.2	Adoption of the agenda.....	2
2.3	Establishment of committees	2
2.4	Other organizational matters.....	2
3.	REPORT BY THE PRESIDENT OF THE ASSOCIATION.....	2
4.	WORLD WEATHER WATCH PROGRAMME – REGIONAL ASPECTS	3
4.1	WWW Planning and Implementation Programme, including the report of the chairperson of the Working Group on Planning and Implementation of the WWW in Region IV (RA IV/WG-PIW).....	3
4.2	Observing systems, including Instruments and Methods of Observation Programme (IMOP) and WMO Satellite Activities.....	4
4.3	Information Systems and Services, including Operational Information Service (OIS), Data Management and Regional Codes	8
4.4	Data-processing and Forecasting Systems.....	11
4.5	Tropical Cyclone Programme (TCP)	12
5.	WORLD CLIMATE PROGRAMME (WCP) - REGIONAL ASPECTS.....	12
5.1	Climate Programme Coordination and Support Activities	12
5.2	World Climate Data and Monitoring Programme (WCDMP).....	13
5.3	World Climate Applications and Services Programme (WCASP), including Climate Information and Prediction Services (CLIPS)	14
5.4	World Climate Research Programme (WCRP)	16
5.5	Global Climate Observing System (GCOS).....	16
6.	ATMOSPHERIC RESEARCH AND ENVIRONMENT PROGRAMME (AREP) - REGIONAL ASPECTS	16
6.1	Global Atmosphere Watch (GAW).....	16
6.2	World Weather Research Programme (WWRP)	17
6.3	Tropical Meteorology Research Programme (TMRP)	17
6.4	Programme on Physics and Chemistry of Clouds and Weather Modification Research (PCCWMR) ...	17
6.5	Support to Ozone and other Environment-oriented Conventions.....	18
7.	APPLICATIONS OF METEOROLOGY PROGRAMME (AMP) – REGIONAL ASPECTS	18
7.1	Public Weather Services Programme (PWSP).....	18
7.2	Agricultural Meteorology Programme (AgMP)	19
7.3	Aeronautical Meteorology Programme (AeMP)	20
7.4	Marine Meteorology and Associated Oceanographic Activities Programme (MMAOAP).....	22
8.	HYDROLOGY AND WATER RESOURCES PROGRAMME (HWRP) — REGIONAL ASPECTS	24
9.	EDUCATION AND TRAINING PROGRAMME (ETRP) – REGIONAL ASPECTS	26
10.	TECHNICAL COOPERATION PROGRAMME (TCOP)– REGIONAL ASPECTS.....	29
11.	INFORMATION AND PUBLIC AFFAIRS ACTIVITIES (IPA)	31
12.	LONG-TERM PLANNING (LTP) – REGIONAL ASPECTS.....	32
13.	ROLE AND OPERATION OF NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES (NMHSs)	33

	<i>Page</i>
14. INTERNATIONAL STRATEGY FOR DISASTER REDUCTION (ISDR)	34
15. INTERNATIONAL EXCHANGE OF DATA AND PRODUCTS	35
16. OTHER REGIONAL ACTIVITIES	36
16.1 Technical Conference for RA III/RA IV.....	36
16.2 Internal matters of the Association	36
17. WMO REGIONAL OFFICE FOR THE AMERICAS, INCLUDING THE SUBREGIONAL OFFICE	36
18. SCIENTIFIC LECTURES AND DISCUSSIONS	37
19. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION AND OF RELEVANT EXECUTIVE COUNCIL RESOLUTIONS	38
20. ELECTION OF OFFICERS	38
21. DATE AND PLACE OF THE FOURTEENTH SESSION.....	38
22. CLOSURE OF THE SESSION	38

RESOLUTIONS ADOPTED BY THE SESSION

<i>Final</i>	<i>Session</i>		
<i>No.</i>	<i>No.</i>		
1	4.1/1	Working Group on Planning and Implementation of the WWW in Region IV	39
2	4.2/1	Regional Basic Synoptic Network	41
3	4.2/2	Regional Basic Climatological Network	49
4	4.2/3	Rapporteur on Solar Radiation.....	53
5	4.2/4	Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building.....	54
6	4.5/1	RA IV Hurricane Committee.....	54
7	5.2/1	Data Rescue and ARCHISS Project in Region IV.....	56
8	5.3/1	Climate Information and Prediction Services (CLIPS)	56
9	5.3/2	Environment and Human Health.....	57
10	7.2(2)/1	Working Group on Agricultural Meteorology	58
11	7.4/1	Rapporteur on Regional Marine Meteorological Services.....	59
12	7.4/2	Support for JCOMM.....	59
13	8/1	Working Group on Hydrology.....	60
14	9/1	Rapporteur on Education and Training Matters.....	62
15	19/1	Review of Previous Resolutions and Recommendations of the Association.....	62

Page

ANNEX

Focal points on Regional Aspects of Aeraunautical Meteorology Programme in Region IV
(paragraph 7.3.12 of the general summary) 67

APPENDICES

A. List of persons attending the session 68
B. Agenda 70
C. List of Abbreviations 72

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 Venezuela, the thirteenth session of Regional Association IV (North and Central America) was held in Maracay, Venezuela, from 28 March to 6 April 2001.

1.2 The official opening ceremony took place at 10.00 a.m. on 28 March 2001.

1.3 The Permanent Representative of Venezuela, Air Force Colonel Francisco Camargo Duque, stated that the constant place of meteorology in the march of history was re-affirmed day by day, by all those who were part of the world meteorological family. For them, professionalism, skill and the fervent desire to contribute to the development of hydrometeorological services left no choice but to take up new challenges demanding accuracy, reliability and timely forecasting in delivering excellent products and in providing meteorological services for various applications. He extended a warm welcome to Professor G.O.P. Obasi, Secretary-General of the World Meteorological Organization (WMO), Dr Zillman, the President of WMO, Mr Arthur Dania, the President of RA IV, and the representatives of Members and Observers. He noted that the session was to discuss subjects of interest and importance for the Caribbean and Central and North American countries. He further thanked the WMO Secretariat and all Members of RA IV for having selected the Bolivarian Republic of Venezuela to host the session. In conclusion, he expressed a very cordial welcome to the various delegations and wished them a pleasant stay in Maracay.

1.4 The president of RA IV, Mr A. Dania (Netherlands Antilles and Aruba), welcomed the delegates and others attending the session. He recalled that since the last session held in May 1997 in the Bahamas, the Region had witnessed a series of events that had had a strong impact on meteorological activities, such as natural disasters associated with Hurricanes *Mitch*, *Georges* and *Keith* which had enormous repercussions on the social and economic development of the Region. The assistance provided by WMO, the United States, Canada and others had been noteworthy, but much remained to be done. The Central American region had received assistance through various projects. The Region, in particular in the south, urgently needed rehabilitation and improvement in national observation networks. In December 1999, the State of Vargas had borne the brunt of the heavy rains which had fallen on Venezuela, with severe and terrible loss of human life. Faced with the extreme nature of the events in the Region, selective warning systems were required, which could be provided through such programmes as VENHEMET, which is supported by the Venezuelan Government. On the other hand, in the past four years some of the events in the Region had been a source of

great satisfaction, such as the fact that a meteorological telecommunication satellite system, VSAT/STAR4, had propelled the Region to the forefront of meteorological communications. He thanked all the persons and institutions which had offered their cooperation in the past four years and expressed special appreciation to the Maracay authorities, the staff of the National Meteorological Service (NMS) and its Director, Air Force Colonel Hernán Omar Sanz López, the Ministry of Environment, the Permanent Representative of Venezuela with WMO, Colonel Francisco Camargo Duque, the WMO Secretariat and all those who had contributed to the preparation of this major WMO regional event.

1.5 Professor G.O.P. Obasi, Secretary-General of the WMO, warmly welcomed all the participants. He expressed thanks to the Government of the Bolivarian Republic of Venezuela for hosting the session in Maracay. He also expressed his gratitude to Colonel Francisco Camargo Duque, the Permanent Representative of Venezuela with WMO, and to his staff for the excellent arrangements made to ensure the success of the session. Thanks were also addressed to Messrs Arthur J. Dania and Carlos C. Fuller, respectively president and vice-president of the Regional Association, for their leadership and contribution to the success of the Association's activities in the inter-sessional period. The Secretary-General underlined that WMO served humanity as the authoritative voice in the United Nations System on the state and behaviour of the Earth's atmosphere, its interaction with land surfaces and the oceans, the climate it produces and the resulting distribution of fresh water. He also noted that data were essential for climate studies and for support to the main international instruments on the environment offered by WMO's World Weather Watch (WWW) and Global Atmosphere Watch (GAW). Another important initiative taken by WMO related to climate was the Climate Information and Prediction Services project (CLIPS). The global repercussions of climate change at the regional level were still somewhat unclear, however it was recognized that climate change could influence ecological and socio-economic systems in a significant way. As in many parts of the world, the countries of the Americas and the Caribbean were vulnerable to natural disasters such as hurricanes and associated storm surges, floods, droughts, forest fires and earthquakes. Recent examples included Hurricanes *Georges* and *Mitch* in 1998, mudflows in Venezuela in 1999, Hurricane *Keith* in 2000 and the recent devastating earthquakes in El Salvador. In 1997 WMO established the Subregional Office for North America, Central America and the Caribbean in San José, Costa Rica. The Regional Office for the Americas coordinated

the regional activities of RA III and RA IV, while the Subregional Office continued actively to assist NHMSs in RA IV in implementing WMO activities and programmes by mobilizing resources. In conclusion, he wished the participants a fruitful session and a pleasant stay in Maracay.

1.6 Air Force Major General Gabriel Chacón Quintana, the Venezuelan Air Force Chief of Staff, extended a warm welcome to the participants on behalf of the Bolivarian Republic of Venezuela, and said that he was very honoured by the presence of such distinguished officials and delegates from the different countries which would take part in such an important session. He expressed certainty that the conclusions of the Regional Association's work would contribute to the sustainable development of the region, and mentioned that it coincided with the 300th anniversary of the founding of Maracay. The session's work would contribute to ensuring the welfare of the entire population and would foster agriculture and the other economic sectors of the country. He mentioned the natural disasters which had taken place in 1999 in his country, had shaken the conscience of the authorities and had raised awareness among the population.

2. ORGANIZATION OF THE SESSION (agenda item 2)

The session was attended by 60 participants from 17 countries of the Regional Association. In addition, four representatives of other WMO Members and four representatives of other regional and international organizations took part. The list of the participants is given in [Appendix A](#).

2.1 CONSIDERATION OF THE REPORT ON CREDENTIALS (agenda item 2.1)

The Association noted that the credentials of the following Members had been found to be in order: Antigua and Barbuda, Australia (observer), Bahamas, Belize, British Caribbean Territories, Canada, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, France, Guatemala, France, Jamaica, Mexico, Netherlands Antilles and Aruba, Panama, Spain (observer), United States of America, Trinidad and Tobago, United Kingdom (observer) and Venezuela. The following international organizations also submitted credentials: the International Astronautical Federation (IAF), the International Civil Aviation Organization (ICAO) the Caribbean Meteorological Organization (CMO) and the International Strategy for Disaster Reduction (ISDR). The Association noted that in accordance with General Regulation 2 it would not be necessary to constitute a credentials committee.

2.2 ADOPTION OF THE AGENDA (agenda item 2.2)

The Association adopted unanimously the agenda which is given in [Appendix B](#).

2.3 ESTABLISHMENT OF COMMITTEES (agenda item 2.3)

The following committees were set up:

NOMINATION COMMITTEE

2.3.1 In accordance with General Regulation 24, a Nomination Committee was set up consisting of the Principal Delegate from Canada, Mr Marc Denis Everell, as chairman and the Principal Delegates from Trinidad and Tobago, Mr Eli Henry, and Cuba, Mr Tomás Gutiérrez, as members.

WORKING COMMITTEES

2.3.2 Two working committees were set up to study the various items on the agenda:

- (a) Committee A, chaired by Mr Eladio Zárate (Costa Rica), to study agenda items 4.1, 4.2, 4.3, 4.4, 4.5, 7.1, 7.2, 7.3 and 7.4;
- (b) Committee B, chaired by Mr Kenneth Lightbourne (Bahamas), to study agenda items 5.1, 5.2, 5.3, 5.4, 5.5, 6, 8, 9 and 10.

Mr Tyrone Sutherland, the Principal Delegate of the British Caribbean Territories, was designated vice-chairman of both committees.

COORDINATION COMMITTEE

2.3.3 In accordance with General Regulations 24 and 28, a coordination committee was set up, comprising the president and vice-president of RA IV, the chairmen of Committees A and B and the vice-chairman of both committees, the representative of the Secretary-General and the appropriate staff of the Secretariat.

2.4 OTHER ORGANIZATIONAL MATTERS (agenda item 2.4)

2.4.1 The Association established its work schedule for the session.

2.4.2 The Association agreed that no minutes of the plenary meetings would be produced, unless a Member specifically requested that it should be done for a particular item.

RAPPOREUR ON REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION AND OF RELEVANT EXECUTIVE COUNCIL RESOLUTIONS

The Association designated Ms Sylvia McGill (Jamaica) as rapporteur on previous resolutions and recommendations.

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

3.1 The Association took note with satisfaction of the report by the president of RA IV, who had carried out thorough analysis and a general evaluation of the Association's main activities since the twelfth session and had expressed his satisfaction with the efficient manner in which the Association's activities were carried out.

3.2 The Association commended its president, Mr Arthur Dania (Netherlands Antilles and Aruba) for his effective management of the Association's affairs, including his very active participation in the Executive Council and the Bureau, which contributed to the development of meteorology and hydrology in the

Region. It also commended the vice-president, Mr Carlos Fuller (Belize) for his contribution to the Association's work, and expressed its gratitude to the chairpersons and members of the working groups and the rapporteurs who had worked actively on the implementation of the Association's activities in the Region.

3.3 The Association extended its thanks to the Members who had hosted various regional meetings during the inter-sessional period, and encouraged them to continue providing the necessary assistance for the associations' activities.

3.4 The Association expressed its thanks to WMO and the Region's Members, in particular the United States of America and Canada, who had provided rapid and effective assistance to the countries of Central America and the Caribbean affected by Hurricanes *Mitch*, *Georges* and *Keith*. Their immediate intervention to help those countries restore damaged hydrological and meteorological infrastructure to an operational state was highly appreciated by the Association.

3.5 The Association endorsed several suggestions for important guidelines for the future of the Region. Among others, these included: the future role of NHMSs within the framework of globalization; meteorological services for aviation; cost recovery in meteorology; meteorological and hydrological data and product exchange; and possible changes to the WMO Convention. The Association noted the concerns and suggestions raised in the President's report and agreed that its views will be reflected under the relevant agenda items of the session.

4. WORLD WEATHER WATCH PROGRAMME - REGIONAL ASPECTS (agenda item 4)

4.1 WWW PLANNING AND IMPLEMENTATION PROGRAMME, INCLUDING THE REPORT OF THE CHAIRPERSON OF THE WORKING GROUP ON PLANNING AND IMPLEMENTATION OF THE WWW IN REGION IV (RA IV/WG-PIW) (agenda item 4.1)

REPORT OF THE CHAIRPERSON OF THE RA IV/WG-PIW

4.1.1 The Association received with appreciation the report of the chairperson of the WG-PIW, Mr C. Fuller. It was noted that the working group had made good progress, and its tasks were considered in greater detail under the relevant agenda items of the session.

4.1.2 The Association expressed its thanks to the National Meteorological Service of the Dominican Republic for hosting the third session of the WG-PIW, in Santo Domingo in April 2000 and to the Working Group's chairperson, coordinator and rapporteurs for the work accomplished.

4.1.3 The Association gave particular attention to Resolution 2 (Cg-XIII) — World Weather Watch Programme for 2002–2003, as well as the WWW Programme in the Fifth WMO Long-term Plan (5LTP), which confirmed that WWW continued to have the highest priority as the basic WMO Programme on which nearly all other WMO Programmes depended. It stressed

that the Association would continue to play an active role in the implementation and further development of the WWW in Region IV to keep the WWW Programme under continuous review and to recommend adjustments in the light of Members' changing requirements, as well as developments in science and technology. It should also identify deficiencies, propose remedial measures and develop system support projects on a regional scale.

4.1.4 The Association agreed that, taking into account the many tasks related to the basic WWW components, it was necessary to re-establish the Working Group on Planning and Implementation of the WWW in Region IV (RA IV/WG-PIW), and therefore **Resolution 1** (XIII-RA IV) was adopted. The Association noted with satisfaction that the new CBS working structure adopted by CBS-Ext(98), November 1998, Karlsruhe (Germany) and confirmed after a two-year trial by CBS-XII, December 2000, Geneva, strengthened the collaboration and links of the Regional Associations with CBS. This was, *inter alia*, manifested in the participation of the chairpersons of the Regional WG-PIW in CBS sessions as invited experts, and the membership of the regional rapporteurs/coordinators on the WWW component programmes in the corresponding Implementation/Coordination Teams (ICTs) of CBS.¹ It was also welcomed that provisions were made to invite two experts per Region into the ICTs of their choice as a capacity building measure, and the Association requested the chairperson of the WG-PIW, in consultation with the regional president, to coordinate the designation of these two experts.

4.1.5 The Association emphasized that the WWW was an essential system for supporting the Tropical Cyclone Programme (TCP) in the Region, and that the WG-PIW and the Hurricane Committee shared significant areas of common interest. It agreed that effective coordination mechanisms could enhance the output of both bodies in particular in light of the four meetings of the Hurricane Committee vis-à-vis one meeting of the WG-PIW in a WMO financial period. The Association, therefore, requested the respective chairpersons, in coordination with the Secretariat, to consider possibilities to improve the coordination and working arrangements with a view to expediting WWW implementation in the

¹ CBS-XII re-established the Open Programme Area Groups (OPAG) on the Integrated Observing Systems (IOS) covering all aspects of the GOS, on the Information Systems and Services (ISS) covering all aspects of the GTS and Data Management, on the Data-processing and Forecasting Systems (DPFS) covering all aspects of the GDPS and the Emergency Response Activity Programme (ERAP), and on the Public Weather Services Programme (PWSP). Each OPAG established several task-oriented Expert Teams (ET) and Rapporteurs and one ICT. An ICT includes in its membership the chairpersons of the ETs established under the OPAG and the regional rapporteurs/coordinators of the corresponding WWW component programmes as ex-officio members.

Region through, *inter alia*, feedback from the Hurricane Committee to the CBS and vice versa.

ANNUAL GLOBAL MONITORING OF THE WWW

4.1.6. The Secretariat received results of the 2000 round of annual global monitoring from six RA IV Members on electronic media (diskettes or on the Internet). The Association encouraged the participation of centres located in Region IV in the exchange of monitoring results on electronic media. It urged all NMCs to make every effort to participate in the monitoring exercises, at least by monitoring their national observational data.

4.1.7. The Association noted with appreciation the analysis of the monitoring results prepared by the Secretariat which included various bar diagrams, maps and tables providing a general comparison between Regions and with previous years, as well as a detailed regional analysis of the availability of SYNOP, TEMP, CLIMAT and CLIMAT TEMP reports at NMCs and at the WMC/RTH.

4.1.8. The availability of SYNOP reports (85 per cent) and of parts A of TEMP reports (86 per cent) continued to be relatively satisfactory while that of CLIMAT (75 per cent) and CLIMAT TEMP (53 per cent) reports was less satisfactory (the percentages are calculated with the RBSN as the reference). There was a slight increase in availability of SYNOP reports during the period 1998-2000 compared to previous years. There were no significant changes in the availability of TEMP reports during the period 1996-2000. The results for the timely receipt of these reports indicated an efficient data-collection via the RMTN in the Region.

4.1.9. The availability of reports was not homogeneous within the Region and the Association noted with concern the list of 'silent stations' from the RBSN for which SYNOP (29 stations) or TEMP (10 stations) reports were not received by any WWW centre during the monitoring period from 1 to 5 October 2000. There were also areas, especially in the southern part of the Region, where the availability of reports was not satisfactory. The Association noted with appreciation that the WG-PIW identified in detail these shortcomings, on the basis of the monitoring analysis, with a view to facilitating remedial action. The Association also noted that natural disasters had struck several countries in the Region with serious detrimental impacts on observational networks.

4.1.10 The Association expressed its concern at the continuing low availability of CLIMAT and CLIMAT TEMP reports and emphasized that all efforts should be pursued in the Region, but also at global level, to improve this situation as matter of urgency. More specifically, it requested its WG-PIW to investigate the reasons for this deficiency in the Regions and develop recommendations for a sustainable improvement taking into account the ongoing efforts in this area within CBS, other Regional Associations and GCOS.

4.1.11 The Association urged Members concerned to check the status of operation of these silent stations and duly inform their Regional Association through the Secretariat. On the other hand, it noted there were many

discrepancies in the information contained in *Weather Reporting*, Volume A — *Observing stations* (WMO-No. 9) and it urged all Members to review and update the relevant information included in this publication, in particular with respect to the RBSN stations. The Association also noted in this respect that CBS was considering new procedures and mechanisms for maintaining and updating operational information on observing stations, with a view to overcoming persistent shortcomings.

4.1.12 In prioritizing the assistance for Voluntary Cooperation Programme (VCP) projects related to the WWW in RA IV, the Association agreed that the highest priority should be given to projects which would have the greatest impact on the implementation of the WWW on regional and global scales. Following this, the highest priority should be given to projects related to the improvement of both the implementation and sustained operation of the upper-air network. The Association also gave a high priority to the implementation of automatic weather stations which were playing an increasingly important role in the framework of the WWW programme, as well as for climatic research purposes. It re-iterated the importance of training activities and fellowship.

4.2 OBSERVING SYSTEMS, INCLUDING INSTRUMENTS AND METHODS OF OBSERVATION PROGRAMME (IMOP) AND WMO SATELLITE ACTIVITIES (agenda item 4.2)

REGIONAL BASIC SYNOPTIC NETWORK (RBSN)

4.2.1 The RBSN is the minimum regional requirement to permit Members to fulfil their responsibilities within the WWW. The current RBSN in Region IV, which was adopted by Resolution 2 (XII-RA IV) comprised 514 surface stations, 143 upper-air stations and 25 automatic marine stations. The status of implementation of the RBSN in Region IV, as of November 1999, according to information provided by Members and reflected station by station in *Weather Reporting*, Volume A — *Observing stations* (WMO-No. 9), is approximately 90 per cent for surface observations and just over 90 per cent for upper-air observations.

4.2.2 The Association noted that WWW monitoring indicated that 440 stations, i.e. 85.6 per cent out of the total number of RBSN surface stations, were providing more than 50 per cent of expected SYNOP reports. It also noted that there was still a noticeable number of stations (48) providing less than 50 per cent of expected reports. It noted that gaps in the SYNOP data coverage exist over certain areas in the southern part of the Region.

4.2.3 The availability of upper-air data from RBSN stations indicated that 119 stations or 84 per cent of the total number of RBSN upper-air stations were providing at least 50 per cent of expected reports. The number of stations providing less than 50 per cent of expected TEMP reports continued to be significant, constituting 11 stations or almost 8 per cent of the total number of RBSN stations. There were gaps in TEMP data coverage, in particular in the Central American region. The major

difficulties experienced especially by developing countries in maintaining reliable implementation of RBSN stations were due to the high cost of consumables and spare parts, and the negative consequences caused by hurricane *Mitch* in Guatemala, Nicaragua and Honduras. Some NMHSs have also experienced serious difficulties and delays in the provision of spare parts and consumables for maintaining radiosonde stations, including hydrogen generators.

4.2.4 The Association considered the revised list of RBSN stations prepared by the WG-PIW, and in particular by the Rapporteur on Regional Aspects of the GOS, taking into account density requirement as recommended by CBS, actual information on the implementation of stations, the current 'silent' RBSN stations, as well as proposed RBSN stations by Members of the Region. By adopting [Resolution 2 \(XIII-RA IV\)](#), the Association approved the list of RBSN stations as given in the [annex to the resolution](#).

GCOS (GSN AND GUAN) STATIONS

4.2.5 The Association recalled that CBS through its Working Group on Observations had substantial contributed to the design and selection of upper-air and surface stations to the GCOS Upper-Air Network (GUAN) and the GCOS Surface Network (GSN). It noted that both networks were established and that presidents of Regional Associations had approved the lists of GSN and GUAN stations. It also noted that CBS-Ext.(98) had adopted a set of recommended best practices for GSN and GUAN stations developed by its former Working Group on Observations in the form of amendments to the *Manual on the GOS*. Members were requested to take specific immediate actions derived from best practices, which included: providing CLIMAT messages in a regular and timely manner from GSN stations; sending historical data and metadata from GSN stations in appropriate formats to World Centre A for Meteorology; developing national plans for archiving daily data from GSN stations; and sending the daily data to World Data Centre A for Meteorology. The Association urged all RA IV Members to consider these matters to be of the highest importance and to follow the best practices approved by the fifty-first session of the Executive Council.

4.2.6 The Association requested its WG-PIW, in particular the Rapporteur on Regional Aspects of the GOS to keep this matter under permanent review, in particular, to monitor the availability of CLIMAT and CLIMAT TEMP reports from GSN and GUAN stations in Region IV. The monitoring should be performed on the basis of results of Specific MTN Monitoring (SMM), of the reports on the availability and quality of upper-air data from GUAN stations provided by ECMWF and of reports from GCOS monitoring centres in Offenbach (Germany) and Tokyo (Japan). The Association urged Members of RA IV, which had not produced the required number of CLIMAT and CLIMAT TEMP reports to take remedial action. These activities would comply with the recommendation of CBS-Ext.(98) that monitoring of the operation of GUAN and GSN station in each Region

should be carried out by CBS in close collaboration with regional working groups.

REGIONAL BASIC CLIMATOLOGICAL NETWORK (RBCN)

4.2.7 The Association recalled [Resolution 3 \(X-RA IV\)](#) specifying the network of CLIMAT and CLIMAT TEMP reporting stations. One hundred and seventy seven (177) CLIMAT reporting stations were included in that Resolution, which was kept in force by the subsequent RA IV sessions.

4.2.8 The Association noted, however, that with the establishment of the GUAN in 1996 and GSN in 1999, the existing list of CLIMAT and CLIMAT TEMP reporting stations was not consistent with GCOS requirements as around 50 per cent of the GSN or GUAN stations were not included in [Resolution 3 \(X-RA IV\)](#).

4.2.9 The Association also noted that CBS, at its twelfth session in December 2000, was informed of the establishment of a RBCN in Region II and had agreed that such a network would provide valuable justification for maintaining a minimum number of CLIMAT reporting stations and could also serve as a target list for WWW monitoring. A RBCN should include GSN and GUAN stations and should be supplemented by other CLIMAT and CLIMAT TEMP reporting stations to meet regional climatological requirements.

4.2.10 The Association reviewed a list of RBCN stations in Region IV proposed by the Secretariat and based on the above principles. The list included the GSN and GUAN stations as well as those CLIMAT and CLIMAT TEMP reporting stations listed in *Weather Reporting, Volume A — Observing stations* (WMO-No. 9), which, in accordance with monitoring results and information provided by Members, carry out observations at synoptic hours. The Association therefore, adopted [Resolution 3 \(XIII-RA IV\)](#), establishing a RBCN in Region IV.

4.2.11 The Association noted the ever-growing requirement for climate observations. This was particularly obvious, for example, in the scientific evaluation of the impact of the last *El Niño* episode, research related to hurricane climatology and droughts and in the growing potential of seasonal prediction products. In light of this, the Association agreed to request its WG-PIW to assess the various requirements and develop recommendations on how they could best be met in the future through modifications to the RBSN and RBCN, including consideration of an increased density of the latter.

OTHER NETWORKS, INCLUDING SEA STATIONS

4.2.12 The total number of ships recruited by Members of RA IV increased to a total of about 2500 in 2000 compared to 1958 in 1996. However, the number of SHIP reports received at MTN centres in the Region, decreased considerably to a daily average of 1233 over the 15-day monitoring period in October 1999 compared to 3315 over the same period in 1996. The Association expressed concern at that decrease and requested its WG-PIW to study the reasons and develop recommendations for remedial measures. The

Association noted that, in partial compensation, there was a continuing increase in the deployment of other types of sea stations. The total number of active drifting buoys deployed by operators in two countries in the Region increased to 750. In addition, of course, numerous of drifting buoys deployed by operators from countries in other Regions were also reporting from waters within the Region. At the same time by mid-2000, agencies in two countries in Region IV were, on average, operating 120 moored buoys within regional waters. Reports from most of these automated sea stations were exchanged on the GTS. In view of the important impact of buoy data on operational meteorology in the Region, the Association felt that more information should be provided to NMHSs on the development of drifting and moored buoys and the relevant observational data made available.

4.2.13 As far as upper-air observations are concerned, one United States ship equipped with Automated Shipboard Aerological Programme (ASAP) units was operational during 1999. Fully automated systems under the ASAP are considered as a fully operational component of the WWW, with 15 units in operation by 1999 on ships in several parts of the world, primarily in the North Atlantic. The Association noted with some concern the limited number of ships equipped with ASAP.

4.2.14 The Association noted that following on from WMO's successful Aircraft to Satellite Data Relay (ASDAR) programme, the Aircraft Meteorological Data Relay (AMDAR) Panel was formally established in March 1998 with the goal to enhance the upper-air component of the Composite Observing System of the WWW. The Association underlined the significant improvement that has been achieved in the quality of NWP output through the availability, and use of, the AMDAR data.

4.2.15 The Association noted that, within the United States AMDAR programme called Meteorological Data Communications and Reporting System (MDCRS), a programme to develop a first generation operational water vapour sensor had resulted in the installation of the first sensors on up to 50 aircraft in the United States. Development of a second-generation sensor was almost complete and expected to become operational by 2002 in the USA. Canada had several discussions with airlines in Canada to obtain aircraft observations over Canada. Air Canada recently reiterated their commitment to the AMDAR programme and will make every effort possible to implement AMDAR systems as early as possible in their new aircraft. A Canadian regional carrier is expected to have the first AMDAR systems operational around mid-2001. There are also discussions with other Canadian regional carriers, which were expected to provide data in some remote areas.

4.2.16 The Association noted with appreciation that the AMDAR Panel would be assisted by the United States with the planning and development of a new programme in the region of the Caribbean, Gulf of Mexico and Central America. No new aircraft fleets in the Region would be recruited to provide data but

targeted observations from visiting aircraft would be used instead. Aircraft, principally from North America and Europe, would be coordinated to provide profile and overflight data as they operate into regional airports.

4.2.17 The Association noted that the daily volume of AMDAR data on the GTS had increased rapidly in recent years. In 1998, a maximum of approximately 50,000 observations were distributed daily. By the end of 2000, the number would be more than doubled with the US, Europe and Australasia producing around 75,000, 25,000 and 6,000 observations per day respectively.

WEATHER RADAR NETWORK

4.2.18 The Association noted that the project of a digital radar network consisting of 5 radars was entering the implementation phase in the Caribbean, and that it would be an essential component of the observing system in the Region. The plan included the preparation and distribution of composite mosaic radar images that would combine the images of these radars as well as the radars in Martinique and Guadeloupe, and the technical and operational arrangements were under development. It noted that the composite images of the radar stations in Guadeloupe and Martinique would be available by mid-2001 for NMHSs via the Internet and would be secured with password and user identification. The Association requested its WG-PIW to coordinate, as required, the smooth integration of the digital radar plan into the relevant regional WWW components. The Association also noted that Cuba was upgrading its current meteorological radars.

SPACE-BASED SUB-SYSTEM OF THE GOS AVAILABLE IN RA IV

4.2.19 The Association noted the status of the Space-based sub-system of the GOS available in RA IV, and in particular the polar-orbiting operational satellites, known as the 'NOAA' series, and the Geostationary Operational Environmental Satellites (GOES) operated by the National Oceanic and Atmospheric Administration (NOAA) in the USA. As of 1999, 17 out of 25 Members in RA IV were equipped with Low Resolution Polar-orbiting Receivers (LRPT), and 7 Members with High Resolution Polar-orbiting Receivers (HRPT). For the geostationary satellite receivers, 20 out of 25 Members have low-resolution WEFAX receivers and 5 out of 25 Members have high-resolution receivers. Twenty-one out of 25 Members had at least one geostationary receiver. When considering the WWW implementation goals, 18 out of 25 Members had at least one polar-orbiting receiver as well as one geostationary receiver, which was a slight increase from the situation in 1995.

INSTRUMENTS AND METHODS OF OBSERVATION PROGRAMME (IMOP)

4.2.20 The Association noted with interest the results of the twelfth session of the Commission for Instruments and Methods of Observation held in Casablanca, Morocco in May 1998. The Association was pleased that several experts from the Region were able to

attend the TECO-98/METEOREX-98 technical conference and exhibition, held in conjunction with CIMO-XII, as well as TECO-2000 and METEOREX-2000 (Beijing, China, October 2000). The Association also expressed its appreciation that the sixth edition of the *WMO Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8) was issued in all languages. The revised Guide was considered an important basis for the development of improved national guidelines for obtaining more accurate and reliable observations.

4.2.21 The Association also emphasized the value of close links and active exchange of experience with manufacturers and instrument developers in solving technical problems. It was welcomed that representatives of eight manufacturers attended as observers the session of the CIMO Working Group on Ground-based Upper-air Observing Systems (New Delhi, India, December 1999), which contributed significantly to the progress made on the reliability of observations obtained from GPS-based radiosondes. It was noted that, as a result of a recent initiative of the Secretary-General, based on the request by Thirteenth Congress, to strengthen collaboration between instrument manufacturers and WMO, plans have been prepared to establish an international association representing the hydrometeorological equipment industry, which would apply to the Executive Council to be granted 'consultative status'. The Association noted that such a status would greatly facilitate the desirable involvement of the private instrument and equipment sector as observers in the work of WMO bodies.

4.2.22 The Association agreed that the needs of NMHSs in the field of instrumentation should mainly be directed to long-term stability, maintenance and repair, as well as to calibration of sensors and equipment. Members were encouraged to develop capabilities for the maintenance and servicing of operationally-used instruments. In this connection, the Association welcomed that the president of CIMO, Dr Srivastava, India, initiated an Expert Meeting on Capacity Building related to Meteorological Instruments and Methods of Observation (Beijing, China, 1999) at which recommendations for enhancing the collaboration on matters related to IMOP within the Regions and strengthening the links between CIMO and Regional Associations were developed.

4.2.23 Members were urged to carry out frequent inspections of their networks of stations to ensure the correct functioning and calibration of instruments according to the procedures contained in the *WMO Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8). Special attention should be given to the frequent calibration of operationally-used barometers.

4.2.24 The Association confirmed the value of Regional Instrument Centres (RICs) for the proper calibration of equipment and for training of instrument operators. The Association invited the three RICs established in the Region in Barbados, Costa Rica, and the United States, to continue and enhance their collaboration in order to better use their available resources.

The RICs were encouraged to reach out to Members to inform them on their services and plans and Members were invited to take advantage of these services.

4.2.25 The Association re-iterated the great value of education and training of instrument operators for achieving the required high quality and reliability of observations for various operational and research applications. All NMHSs were encouraged to train and re-train their own staff as necessary and to give in this connection consideration to training facilities of other Members and the RICs if their own resources are not sufficient. Donors were invited to maintain strong support to training programmes in instrumentation.

4.2.26 The Association expressed its appreciation that the China Meteorological Administration had compiled and published the first edition of the CIMO Instrument Catalogue on behalf of WMO. The Catalogue would be useful particularly to NMHSs in selecting instruments and equipment for procurement.

RAPPORTEUR ON SOLAR RADIATION

4.2.27 The Association noted with appreciation the report of the Rapporteur on Solar Radiation, Dr I. Galindo (Mexico). It was informed that the rapporteur had collaborated closely with radiation experts of RA III, and also had participated at the Regional Pyrheliometer Comparison held at the Regional Radiation Centre (RCC) of Chile in 1997.

4.2.28 The Association noted with gratitude that national radiation networks had generally been improved, although some countries were not able to maintain the necessary level of implementation, mainly due to economic constraints. The Association therefore urged Members, where appropriate, to extend and modernize their radiation networks and to establish National Radiation Centres (NRCs) that would be equipped with, at least, one absolute pyrheliometer maintained as national radiation standard instrument.

4.2.29 The Association was pleased to note that the regional standard pyrheliometers of the three RRC for RA IV (operated by Canada, Mexico and the United States), as well as the national standard pyrheliometer of Cuba had been recalibrated against the World Standard Reference at the ninth International Pyrheliometer Comparison (IPC-IX) which was held at the same time as the third Regional Pyrheliometer Comparison (RPC-III) of RA IV at the World Radiation Centre (WRC) in Davos, Switzerland, in September/October 2000. It recognized that besides its main objective to calibrate regional and national standard instruments, the IPC/RPC was an excellent forum for the exchange of experience between radiation experts, through the scientific symposia as well as the training in radiation measurements and calibration held during the IPC/PRC. The final report of the IPC-IX will be published in 2001 and the Association requested Members to apply the latest calibration factors once they were published.

4.2.30 The Association underlined the importance of the regular calibration of operationally-used radiation instruments against national or regional standard

instruments. In this connection, it invited Members operating RRCs to offer their facilities for the calibration of national standard instruments, and to provide support in the training of personnel involved in radiation measurements.

4.2.31 The Association recognized that there was an increased need for making available more reliable and accurate solar radiation datasets for a variety of users within the meteorological community and beyond. Radiation data are nowadays not only used for operational and scientific applications, but there is also an enhanced requirement for application in the fields of social and economic activities. The Association noted in particular that:

- Governments and other national agencies responsible for development and planning, as well as private bodies, require solar radiation data on different time scales for industrial applications and architectural design, as well as for projects for generating electricity from solar radiation;
- Health ministries had shown increased interest for UV, and especially UVB, radiation data to carry out epidemiological studies of skin cancer;
- *El Niño*-related research asked for an enhanced solar radiation climatology to better estimate the impacts of *El Niño* on crop production;
- Energy balance models require solar radiation data.

4.2.32 The Association stressed the need for continuing the activities related to solar radiation measurements, and underscored the increased importance of solar radiation data for many applications. The Association agreed that the work in this field should be continued by a rapporteur and adopted [Resolution 4](#) (XIII-RA IV).

RAPPOREUR ON REGIONAL ASPECTS OF INSTRUMENT DEVELOPMENT, RELATED TRAINING AND CAPACITY BUILDING

4.2.33 The Association noted that it was not possible to designate Mr Carlos Espinosa González (Mexico) as Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building before 1999.

4.2.34 The Association noted that the rapporteur had begun the coordination of the work of the three RICs established within the Region in Barbados, Costa Rica and the United States. It felt that more efforts were still needed in relation to the operational application of well calibrated and maintained instrumentation to guarantee high quality observations.

4.2.35 The Association referred to the CIMO Expert Meeting on Capacity Building related to Meteorological Instruments and Methods of Observation (Beijing, China, 1999) and requested CIMO-XIII (September 2002) to develop practical guidance to be applied in the Region to enhance capacity building in that field.

4.2.36 The Association encouraged Members to make arrangements to continuously review the performance of instruments in common use in the Region. Particular attention should be paid to long-term stability, the need for and ease of maintenance and repair, the requirement

for and frequency of calibration, and to encourage the development of cost-effective instruments suitable for operation under extreme weather conditions. The Association agreed that the work to study all these problems should be continued by a Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building and adopted [Resolution 5](#) (XIII-RA IV).

4.3 INFORMATION SYSTEMS AND SERVICES, INCLUDING OPERATIONAL INFORMATION SERVICE (OIS), DATA MANAGEMENT AND REGIONAL CODES (agenda item 4.3)

REGIONAL METEOROLOGICAL TELECOMMUNICATION NETWORK (RMTN)

4.3.1 The Regional Meteorological Telecommunication Network (RMTN) based on two-way multipoint telecommunication services via satellite is operated through the International Satellite Communications System (ISCS) by the US National Weather Service (NWS). The Association noted with appreciation that all relevant NMCs (except Haiti whose system has not yet been installed) were equipped and that the system was fully operational and effective. The two-way VSAT and the associated PC workstations installed at NMCs in RA IV enabled NMHSs to handle both WAFS and WWW traffic. The Association was informed that two additional NMHSs (Ecuador, Surinam), as well as ACMAD in Niger planned to join the two-way ISCS system under bilateral arrangements with WMC/RTH Washington. The Association noted that these additional connections had not any impact on the operation of the RMTN in the Region.

4.3.2 The Association also noted with appreciation that the Y2K upgrades required on the PC workstations (STAR4) were accomplished well in advance of 1 January 2000, including the delivery of upgraded computers. Additional software modifications were disseminated over the GTS for the first time to reach all needed locations directly from RTH Washington. There were no significant Y2K problems reported and data flow continued as the year changed.

4.3.3 The Association was pleased to note that efforts to monitor the system had been ongoing and RTH Washington has an active data flow and site data ingest monitoring operation in place on a 24H/7 days basis, and that the coordination of the transmission programme for the satellite-based RMTN had been effective. Several new data and products were inserted on the GTS channels for the benefit of the Region. The Association also noted with appreciation current efforts to develop satellite imagery products for dissemination on the RMTN facsimile channel and the adjustments to the facsimile charts on the WAFS broadcast, including modification to the software ingest for the PC workstations (STAR-IV) so that any standard browser used for the Internet GIF or JPG graphics can display these imagery products. The Association was also informed of the possibility of generating and sharing with other countries in the Region the radar mosaics from radar

stations in the Central American countries, as well as Mexico and the Antilles.

4.3.4 The Association was pleased to note that a new contractor has taken over the task of maintaining the US-funded STAR systems for the period 1 February 2001 to 31 January 2002. It was now important to plan for the replacement of the STAR equipment and the Association welcomed that options are being studied that include the selection of an off-the-shelf system for this purpose. In this respect several workstation vendors attended the session and demonstrated their off-the-shelf systems. The Association was informed that the capacity of the WMO/ICAO ISCS has been reached, and it was no longer possible to include additional data and products in the broadcast programme. Plans were being considered in the US to replace the ISCS in the beginning of 2003 by an upgraded system.

4.3.5 The satellite-based RMTN is highly reliable and effective, but the Association agreed that back-up telecommunications arrangements were required in certain situations. The meeting underlined that the Aeronautical Fixed Telecommunications Network (AFTN) remained a useful back up for data-collection, and enabled the direct transmission of observational data, enveloped in an AFTN message, to RTH Washington. The Association also noted with appreciation that RTH Washington had developed a procedure for the ingestion of messages by FTP via the Internet, and that the detailed arrangements and procedures had been made available to NMCs. Internet connectivity available at the NMHS and a file transfer to a server located at the RTH into a directory under prior initial arrangement is all that is required. The Association was informed that the process was password-protected and that the required user registration should be initiated in time in order to ensure immediate access in an emergency situation. The Association invited all NMCs concerned to consider this possibility, which was efficient and relatively simple to operate when access to the Internet was available at the NMC.

INTERNET SERVICES

4.3.6 The Association noted with interest that a major web site had been developed at the RTH Washington. This centre will place all data and products required by users on the Web site once a formal request has been submitted to the NWS. The file and directory name structure had been changed to a standard to permit an easier means to find the desired data and products, and the goal was to make everything available that is received by the RTH. All of the global TEMP and surface synoptic data was already on line, and the National Centres for Environmental Prediction (NCEP) model data were to a great extent also available. Detailed descriptions of the new structure were available on the Web. The Web site also includes file servers for accessing various data files including warnings, forecasts and facsimile charts. The Association noted these capabilities as an efficient back-up for the RMTN distribution of data and products and invited NMCs to use these.

4.3.7 The Association reviewed the current telecommunication arrangements for the Caribbean meteorological offices not equipped with a VSAT (Anguilla, Dominica, Montserrat, Saint Kitts, Saint Vincent, and Tortola in the British Virgin Islands). These offices used to dial into a host STAR4 in Barbados or Antigua, and these arrangements were both expensive and not always efficient. With respect to observational data collection, the current arrangements, i.e. satellite data-collection units and AFTN back-up, could be maintained. The Association noted that some countries were having difficulties with the AFTN despite recent upgrades. The Association noted with appreciation the offer from RTH Washington to make available web resources (Web Home Pages and/or FTP access) on its server for those Member countries within the Region that might need access to datasets for use. The Web resources could be designed to their specific data needs.

4.3.8 The Association agreed that the following arrangements would be a cost-effective complement to the current system:

- The meteorological offices concerned (Anguilla, Dominica, Montserrat, Saint Kitts, Saint Vincent, and Tortola in the British Virgin Islands) should be equipped with up-to-date PCs enabling performant Internet functions (Browser, FTP);
- The connection between meteorological offices to their respective local Internet Service Provider (ISP) should be reliable and have sufficient capacity. The specifications and costs need to be negotiated with the respective local authorities and providers;
- The responsible forecasting centres (Barbados and Antigua) should transfer to RTH Washington via the RMTN/VSAT all the products (warning, forecasts, etc.) they prepare for insertion into the relevant RTH Web server pages or directories;
- The detailed data and products requirements of the meteorological offices concerned should be established.

4.3.9 The Association invited the NMHSs concerned, with the assistance and support of the CMO, RTH Washington and the WMO Secretariat, to facilitate an early implementation. The Association noted that the Sustainable Development of Small Island Developing States (SIDS) project for the Caribbean, supported by Finland, could be a source for funding this project and it invited the Secretary-General to take follow-up action in this respect.

GTS TECHNIQUES AND PROCEDURES

4.3.10 The Association noted the relevant conclusions and recommendations of the extraordinary session of CBS (Karlsruhe, 1998) related to GTS techniques and procedures, which have an impact on the implementation and operation of the RMTN of Region IV. WMC/RTH Washington was ready to accept messages longer than the present limit (3800 octets) according to the CBS recommendation to implement the length of the messages of 15 000 octets as from 6 November 2000. WMC/RTH Washington had implemented its routing

catalogues. As decided by CBS-Ext.(98) WMC/RTH Washington had also initiated the implementation of its part of the *Comprehensive Catalogue of Meteorological Bulletins* (Volume C1, WMO-No. 9).

RADIO-FREQUENCIES FOR METEOROLOGICAL ACTIVITIES

4.3.11 The Association noted with appreciation the very favourable outcome of the World Radiocommunication Conference 2000 (WRC-2000) as regards the several items of concern for meteorology. The active participation of WMO in the ITU preparatory activities was instrumental in ensuring that meteorological requirements were recognized and supported. Meteorological requirements in the band 401-406 MHz for meteorological aids (radiosondes) and meteorological satellite operation were acknowledged for the foreseeable future, and current allocations were not changed in the band 1670-1710 MHz, which is a main band for meteorological satellite operation worldwide, and in its lower part for radiosondes operation by many NMHSs, in particular in the Region. The allocations to spaceborne passive remote sensing of increasing importance for meteorology in the frequency range 71-275 GHz were re-organized to meet present and foreseeable future requirements, taking into account technological and scientific advances. The Association noted with satisfaction that the S band (2700-2900 MHz) in worldwide use by meteorological radars and particularly in the Region, including the new Caribbean radar network, was not retained by WRC-2000 as a band for the IMT-2000 operation (third generation of mobile phones). However the issue may be reconsidered by WRC-2006.

4.3.12 The Association noted that the pressure on radio frequency bands would continue with the increasing development and expansion of new radiocommunication systems. It noted that the fifty-second session of the Executive Council re-emphasized the importance of continuing to defend frequency allocations to meteorological systems and environmental satellites, and the Association fully concurred with this analysis. It was informed that the preliminary agenda for the next World Radiocommunication Conference (WRC-2003) included items of importance for meteorology, including the band 1683-1690 MHz, and it invited Members, CBS and the Secretariat to pursue their participation in the relevant ITU-R activities. The Association stressed the importance of WMO continuing to inform the NMHSs on the question, and that the NMHSs coordinate these issues with their national telecommunication administration.

DATA REPRESENTATION

4.3.13 The Association recognized that CREX was a table-driven alphanumeric data representation form and its fundamental objective was to serve as a tool to avoid the proliferation of new alphanumeric code forms by permitting the exchange of observations for which no traditional character code existed and which, for various reasons, could not be transmitted in BUFR. CBS-Ext.(98) had adopted the following recommendations to

promote the use of table-driven data representation forms CREX, BUFR and GRIB:

- (a) Urge WMO Members to use CREX when requirements were identified for new data types needed by Members who did not have the capability to handle binary data formats (BUFR);
- (b) Strongly encourage the use of CREX when new requirements for expansion of traditional codes were identified;
- (c) Support user requirements and facilitate the use of table-driven data formats whenever possible;
- (d) Request that new satellite data exchanged on the GTS would be encoded in BUFR or GRIB;
- (e) Encourage the development of standard software that was easy to install and use for handling data in CREX, BUFR or GRIB.

4.3.14 The Association recalled that CREX, a number of additions to code tables, and several modifications to character codes, including SYNOP, PILOT and TEMP were implemented for operational use as of 3 May 2000. All NMHSs in Region IV were urged to take any required steps to accommodate them, if this has not already been done.

4.3.15 The Association noted with interest that CBS-XII had given consideration to a strategy for the comprehensive migration from conventional character-based codes to the table-driven data representation forms BUFR and GRIB within a ten-year period. The Commission was studying the various implications such a strategy would have, and would, on the basis of the results, develop and recommend to the Executive Council an appropriate implementation plan. In this connection, the Association emphasized the need for training to prepare the NMHSs in time for the use of BUFR, and GRIB as well as CREX. It welcomed with gratitude the offer of the USA to provide some training courses for this purpose.

DATA MONITORING

4.3.16 The Association recognized that the current quality monitoring activities conducted by the lead centres designated by CBS were working well, and contributed to the resolution of deficiencies in the quality of observed data, particularly from upper-air and surface stations. The Association also noted the revised quantity monitoring procedures developed by CBS.

OPERATIONAL INFORMATION SERVICE (OIS)

4.3.17 The Association recalled that the objective of the OIS was to collect from and distribute to WMO Members and WWW Centres detailed and up-to-date information on facilities, services and products made available in the day-to-day operation of the WWW. This service included *Weather Reporting*, Vols. A, B, C1, C2 and D (WMO-No. 9) as well as in the *International List of Selected, Supplementary and Auxiliary Ships* (WMO-No. 47), METNO messages and the *WWW Operational Newsletter*.

4.3.18 The Association noted with appreciation that in order to improve data reliability, timeliness of distribution, and provision of additional information to Members, significant progress was made in the operation

of the OIS, which had been implemented at the Secretariat. WMO Publications Nos. 9 and 47 are maintained on PC databases, enabling the Secretariat to maintain and update the data promptly, as updated information is notified to the Secretariat, and to provide much greater flexibility in the evaluation and dissemination of the information. Volumes A (*Observing Stations*) and C1 (*Catalogue of Meteorological Bulletins*) of WMO-No. 9, WMO-No. 47, and the RBSN lists are available on WMO's Home Page or its FTP server. The information is also available in printed form and Members can request it by e-mail or fax. In addition access to the expanded diskette service and printed editions have been improved by eliminating long delays. For rapid access, the *WWW Operational Newsletter* was also available on the Internet.

4.3.19 The Association noted with concern that despite repeated appeals made to Members to notify the Secretariat of changes in their observation networks, there were discrepancies in the information contained in WMO-No. 9, Volume A and the real operation of the observing stations. The Association noted with appreciation that CBS was reviewing Volume A with respect to its contents and updating procedures, and was considering a possible master reference operational catalogue of observing stations.

4.3.20 The Association recalled that CBS-Ext.(98) had decided that as part of their responsibilities, WMCs and RTHs on the Main Telecommunication Network (MTN) were to review the catalogue of meteorological bulletins as regards bulletins issued by their relevant zones and notify the Secretariat by transferring updated files of the changes to be included in Volume C1. The Secretariat is tasked with maintaining a global database of Volume C1 accessible on its FTP server, and with regularly issuing the updated editions of Volume C1. The Secretariat has developed a system to update Volume C1 and to automatically prepare METNO (Vol. C1) messages. Under the new system, WMC/RTH Washington is expected, at least twice per year, to transfer the advanced notifications related to RA IV in the form of a file and its part of Volume C1 on the WMO FTP server and inform the Secretariat of the transfer by an Internet message. The Association urged all its Members to participate in the new Volume C1 mechanism and provide the relevant information to WMC/RTH Washington.

4.3.21 The Association further noted that WMO-No. 47 was being re-designed in order to improve its legibility and enhance the precision of metadata provided by the publication on the size, identity and meteorological instrumentation of the mobile ship stations included in the surface-based synoptic network sub-system of the GOS. Metadata contained in WMO-No. 47 was increasingly being incorporated into various ocean observation and climate research programmes, including in a new JCOMM programme.

4.4 DATA-PROCESSING AND FORECASTING SYSTEMS (agenda item 4.4)

4.4.1 The Association noted with appreciation that GDPS Centres in the Region continued to improve their

computing infrastructure and analysis/forecasting systems. Progress towards increasing model resolution and extending the period of validity of forecasts to the longer-range had continued. Both WMC Washington and RSMC Montreal were using 3D-Var assimilation systems. This method allowed to directly ingest types of measurements such as radiance data from satellite, radar data and others. Effort was continuing into improving these schemes and developing a 4D-Var assimilation system.

4.4.2 In particular, RSMC Montreal had implemented the Global Environmental Multiscale Model for the generation of NWP forecasts at all space and time scales (medium-range, short-range and very-short-range with high-resolution). The model ran at a resolution of 100 km to 10 days in the medium-range and 24 km to 48 hours in the short-range. A 16-member Ensemble Prediction System (EPS) was also run once a day; long-range forecasts (seasonal forecasts) of precipitation and temperature anomalies were also issued over Canada four times a year.

4.4.3 Furthermore, WMC Washington generated medium- and extended-range forecasts based on a T170L42 model through day 7 and a T62L28 model through day 16. The mesoscale ETA model ran four times per day for short-range forecasting (0-48 hours). A medium- and extended-range EPS was operated consisting of an ensemble of 17 forecasts up to 16 days. The Climate Prediction Centre produced seasonal forecasts for surface air temperature and precipitation over the United States. A coupled general circulation model was run four times each week out to 11 months to produce monthly averaged ensemble sea-surface temperatures.

ENVIRONMENTAL EMERGENCY RESPONSE (EER) ACTIVITIES

4.4.4 The Association noted that the two WMO designated centres in RA IV (RSMC Washington and RSMC Montreal) conducted monthly tests of the operational procedures, and prepare the required joint statements for the provision of atmospheric transport and dispersion modelling products for RA IV. RSMC Melbourne also took part in these tests since RSMC Montreal and RSMC Washington providing back-up for WMO RA V. The monthly tests were also used as a testbed for the development of new approaches to the exchange of electronic files and outputs in the context of RSMC response. It would also be used as a way to involve NMHSs more directly, help them gain training in EER, and demonstrate their role with their respective national emergency response organization.

CAPACITY BUILDING

4.4.5 The Association noted that several NMHSs in the RA IV region had participated in an Emergency Response Training seminar held in October 1997 in Montreal. A Regional Training Seminar on the Use of GDPS Products with Statistical Adaptation was held in San José, Costa Rica in July 1999. The Association underlined that several NMHSs expressed the need for training in adapting NWP model output to their country's requirements.

4.5 TROPICAL CYCLONE PROGRAMME (TCP) (agenda item 4.5)

4.5.1 The Association expressed its satisfaction with the achievements and the further progress being made in the implementation of both the general and regional components of TCP towards the mitigation of tropical cyclone disasters in the Region, especially in association with the ISDR (post-IDNDR) and in the context of the sustainable development of small island states.

4.5.2 The Association expressed its deep gratitude to Mr Jerry Jarrell (USA), the former Chairman of the Hurricane Committee until January 2000, for his outstanding leadership in guiding the work and the various endeavours of the Committee. The Association welcomed the new Chairman of the Committee, Mr Max Mayfield (USA) and noted with appreciation his informative report on the twenty-third session of the Hurricane Committee which was held in Maracay, Bolivarian Republic of Venezuela from 23 to 27 March 2001.

4.5.3 The Association expressed its appreciation to the United States for substantially upgrading the facilities, capabilities and advisory services provided by the RSMC Miami — Hurricane Center as an RSMC with activity specialization in hurricanes within the framework of the WWW Programme.

4.5.4 The Association invited Members to make full use of reports in the TCP series, such as the recently issued *Tropical Cyclone-related NWP Products and their Guidance* (TCP-41) and *Estimating the Amount of Rainfall Associated with Tropical Cyclones using Satellite Techniques* (TCP-42) which provided guidance and information for tropical cyclone forecasters. It was pleased to learn that these reports are available in English and Spanish, and would be available in French in May 2001. It also invited Members to take advantage of relevant training events such as the annual training workshops on hurricane forecasting and warning, at the RSMC Miami — Hurricane Center. The Association requested the Secretary-General to continue providing maximum support for training activities under the Committee's programme within available budgetary resources.

4.5.5 In view of the fact that International Workshops on Tropical Cyclones (IWTC) serve as a forum for the interaction between forecasters and researchers and encourage the application of research results to operational usage, the Association was pleased to learn that the next in this series of workshops would be held in Cairns, Australia toward the end of November 2002. It urged its Members to seek possible financial assistance to enable as many as possible tropical cyclone forecasters and researchers from the Region to participate. In this context, the Association noted with appreciation the offer of the United States to provide financial support for several experts from developing countries of the region to attend the above workshop.

4.5.6 Recognizing the fact that large land masses such as the northern part of South America enhance the hydrological effects of tropical cyclones, and that these

effects are not adequately documented and understood, the Association suggested that this could be a topic for discussion at the IWTC in 2002.

4.5.7 The Association approved the amendments made by the Hurricane Committee to the text of the RA IV Hurricane Operational Plan, as well as the updated version of the RA IV Hurricane Committee's Technical Plan and its Implementation Programme. It decided to keep in force Resolution 14 (IX-RA IV) — RA IV Hurricane Operational Plan and Resolution 8 (X-RA IV) — RA IV Hurricane Committee's Technical Plan and Implementation Programme, since those were playing an effective role in strengthening the warning services for hurricanes and associated storm surges, floods and landslides, as well as in disaster preparedness measures in the Region towards the mitigation of hurricane disasters.

4.5.8 In view of the vitally important role of the TCP in the ISDR, specifically in the work of the Hurricane Committee in Region IV, the Association decided to maintain the level of very high priority to the TCP in relation to regional priorities in the WMO Long-term Plan.

4.5.9 The Association was gratified that the Executive Council at its fifty-second session (Geneva, May 2000) had been pleased to note the very high priority attributed by RA IV to the work of the RA IV Hurricane Committee and that the Council had supported the request for WMO's continued support to the annual sessions of the Committee. It also acknowledged with gratitude that EC-LII expressed its appreciation to NOAA (USA) for:

- (a) Organizing annual workshops on Hurricane Forecasting and Warning, at the RSMC Miami — Hurricane Center;
- (b) The attachment of bilingual (English/Spanish) forecasters to RSMC Miami during the hurricane season;
- (c) Conducting Hurricane Awareness Tours in RA IV.

4.5.10 The Association was informed that the Hurricane Committee at its twenty-third session had again discussed the question of the non-participation of Haiti in the work of the Committee and had found that the normal procedure followed by WMO for inviting and supporting a Member country to the session was not sufficient in this particular case. The Association noted the proposal of the Committee that the WMO Secretariat make renewed efforts as a matter of urgency to bring about a change in this situation.

4.5.11 Recognizing the great importance of the further work to be implemented by the Committee in Region IV, the Association agreed that the RA IV Hurricane Committee should be re-established as a working group of the Association. **Resolution 6** (XIII-RA IV) was adopted accordingly.

5. WORLD CLIMATE PROGRAMME (WCP) – REGIONAL ASPECTS (agenda item 5)

5.1 CLIMATE PROGRAMME COORDINATION AND SUPPORT ACTIVITIES (agenda item 5.1)

5.1.1 The Association was informed of the overall coordination of the World Climate Programme (WCP).

In this regard, the Association noted with satisfaction the decisions made by Thirteenth Congress and the Executive Council related to the enhancement of activities within the framework of the *Climate Agenda*. The Association also noted the establishment of an EC Advisory Group on Climate and Environment, and requested that the outcome of its deliberations be made available to the Members of the Association.

5.1.2 The Association noted with satisfaction the actions taken by the Secretary-General to ensure the active participation of WMO and the NMHSs of its Member countries in the work of the United Nations Framework Convention on Climate Change (UNFCCC). It also noted that WMO, on its own and in collaboration with other organizations and agencies participating in the *Climate Agenda*, provided scientific and technical reports and information to various sessions of the Conference of the Parties (COP) to UNFCCC and to its Subsidiary Body for Scientific and Technological Advice (SBSTA). The Association appreciated the information provided by the Secretary-General through regular circular letters to Members on the decisions and activities of the UNFCCC and its bodies on research and systematic observation of the climate system. The Association noted that it was common for the coordination of national activities related to the UNFCCC to be carried out in parts of government not directly linked to NMHSs. The Association emphasized the critical importance of NMHS activities in supporting the Convention, especially those related to systematic observations. It urged its Members to continue to involve their NMHSs in the various processes related to the UNFCCC at national, regional and international levels, including the implementation of the relevant decisions.

5.1.3 The Association was informed of preparations underway within the UN System to review the outcomes of the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. The review, which would include a number of national, regional and international events, would culminate with the World Summit on Sustainable Development in the third quarter of 2002 in Johannesburg, South Africa. The Association urged its Members to become engaged in this important review, which would provide several opportunities to demonstrate the important role of NMHSs in achieving sustainable development. It requested the Secretary-General to continue to keep Members informed of activities of the UN System associated with the review, especially with respect to those most relevant to NMHSs.

5.1.4 The Association was also informed that the thirteenth session of the Commission for Climatology (CCI-XIII) would be held in Geneva in November 2001. The Association urged its Members to ensure representation at this session of the commission, which faces the challenging task of providing guidance for much of WMO's activity in an increasingly complex area.

5.2 WORLD CLIMATE DATA AND MONITORING PROGRAMME (WCDMP) (agenda item 5.2)

5.2.1 The Association expressed its satisfaction with the results of the meeting held in Jamaica in January

2000, which produced an initial set of regional climate indices. It urged Members to support the continuation of this initiative within their own NMHSs and to share results with other Members in the Region. The importance of developing regional climate indices in support of the IPCC process has been recognized. It is expected that this will facilitate the monitoring of climate variability and detecting climate change. The Association requested that these regional climate indices should be routinely made available to or exchanged between Members.

5.2.2 The Association welcomed the improved timely access to a variety of Climate System Monitoring (CSM) products through a dedicated Web site on the WMO Home Page. It urged its Members to develop their own national CSM products for the Web and to inform the Secretariat so that the appropriate links can be established with WMO's CSM Web pages.

5.2.3 The Association noted that the CLICOM Area Support Centre (ASC) at the Caribbean Institute for Meteorology and Hydrology (CIMH) in Barbados had made a significant contribution to the development of enhanced CLICOM project software (version 3.1) which was released in January 2000 and would continue to be supported indefinitely. The Association furthermore noted that seven of its Members had responded to an October 1999 questionnaire on the development of a future Climate Database Management Systems (CDMSs). Of these responses, five Members expressed some degree of interest in a new system. A significant number of WMO Member countries have expressed interest in a more advanced CDMS than the current CLICOM project software and believe they would benefit from the initiative that has been evolving since Twelfth Congress. The Association urged its Members to carefully examine their particular needs in this area and requested the Secretary-General to continue to give the project a high priority, and to provide information on options to meet the varying needs of members in the Region. The Association endorsed the recommendations of the CLICOM-DARE Workshop in Costa Rica in July 2000 on WMO's new CDMS strategy that will allow each country to choose from a number of documented systems the CDMS that suits its needs.

5.2.4 The Association noted the active involvement of a number of its Members in the CSM Project including the preparation of a high quality publication on the climate of the 20th century. The release date of the publication is now being planned in the context of the World Summit on Sustainable Development. To promote the widespread distribution of the publication, WMO Members in the Region are encouraged to help facilitate access to copies by prospective readers in developing countries. Consideration should also be given to facilitating publication in languages other than English.

5.2.5 Noting the establishment in 1999 of the GCOS Surface Network (GSN), the Association welcomed the establishment of monitoring centres in Germany and Japan along with the plans to scientifically evaluate the

designated stations with regard to their suitability and priority for climate change detection and attribution studies. All Members in the Region were urged to fully cooperate in the implementation and operation of the GSN by following established best practices endorsed by CBS-Ext.(98). These include routine transmission of monthly CLIMAT messages in an accurate (e.g. using the proper coding procedures) and timely manner, and making historical monthly and daily data, and related metadata, available for research purposes. If Members have difficulty in providing the historical data and metadata to the World Data Center A for Meteorology in the required digital format, they should request assistance from the WMO Secretariat.

5.2.6 Noting that the Region was the first to establish a RBCN, the Association recommended that its Members should review their contribution to this network and ensure that the related information in Volumes A and C of *Weather Reporting* (WMO-No. 9) is up-to-date (see also paragraphs 4.2.7 to 4.2.11).

5.2.7 The Association noted the report of the DARE IV rapporteurs and endorsed the recommendations of the CLICOM-DARE Workshop (Costa Rica, July 2000) and those of the DARE RA IV rapporteurs. It welcomed initiation of pilot projects in Honduras and Jamaica and urged continued progress in implementing the DARE IV plan. The Association was also informed of several other data rescue activities underway in the Region that were not directly linked to the WMO DARE project. It urged that every effort should be made to ensure coordination and, as appropriate, collaboration between the various activities. Noting the recommendation that climate data in archives outside the NMHSs should also be identified and made more accessible, the Association urged close collaboration and cooperation with the activities of the Archival Climate History project (ARCHISS). [Resolution 7 \(XIII-RA IV\)](#) was adopted.

5.3 WORLD CLIMATE APPLICATIONS AND SERVICES PROGRAMME (WCASP), INCLUDING CLIMATE INFORMATION AND PREDICTION SERVICES (CLIPS) (agenda item 5.3)

5.3.1 The Association recalled the objectives of the CLIPS Project as agreed by Thirteenth Congress, which were:

- To demonstrate the value and eventual socio-economic benefits of climate information and prediction services;
- To provide an international framework to enhance and promote climate information and prediction, including the establishment of criteria to measure forecast quality and to permit model intercomparison;
- To encourage the development of operational climate prediction; and,
- To facilitate the definition, the development and the strengthening of a global network of regional and national climate centres.

5.3.2 The Association recognized the critical impacts of climate variability on the socio-economic structures of all countries within the Region. Such variability is

linked to changes in ocean surface temperatures over the Pacific (ENSO – *El Niño*/Southern Oscillation) and Atlantic Oceans, which can result in interannual adjustments to tropical atmospheric forcing and hence in rainfall amounts in many parts of the Region. These adjustments can in turn lead to changes in tropical storm frequencies, intensities and tracks in both the Pacific and Atlantic oceans. The Association noted the encouraging level of predictability that was emerging with respect to hurricane frequencies and of rainfall totals on seasonal and interannual time scales as they relate to ENSO phenomena. The Association called upon Members to conduct more research and strengthen their activities in this area. In this regard the Association welcomed the activities being promoted by the Secretary-General to develop a user requirement for seasonal to interannual prediction. This was a prerequisite for the further development of an infrastructure for the provision of prediction information, and for the support of other activities that would carry substantial benefits for the Region. Recognizing that management strategies for dealing with climate variability and change could, in addition to predictions, improve with the increased use of climate information, the Association called for the further development of the use of climate information alongside the improvement of forecast services. Notwithstanding the real progress being made, the Association cautioned that the current level of skill and probabilistic nature of seasonal climate forecasts required the establishment of a strong rapport between users and providers.

5.3.3 The Association noted that NMHSs should play a pivotal role in the provision of climate information and prediction services and recognized that a key aspect in developing this role lies in the enhancement of expertise within the Services. The Association thus welcomed activities to develop expertise levels through the identification of CLIPS Regional Focal Points in combination with the creation of the CLIPS Curriculum.

5.3.4 The Association further recognized that enhanced benefit will be obtained through the appointment of regional Focal Points and proposed that their work be coordinated by a rapporteur to RA IV designated to report on CLIPS issues. These regional focal points would also facilitate interactions with the Commission for Climatology (CCI) on CLIPS issues. The Association therefore adopted [Resolution 8 \(XIII-RA IV\)](#) through which CLIPS Focal Points were nominated with responsibilities in the Caribbean, Central America and North America.

5.3.5 Prediction on seasonal to interannual time scales presents challenges in terms of information presentation and interpretation, in terms of conversion into decisions within each application area, and in the verification of predictions and elucidation to users of the inherent levels of prediction skill. The Association welcomed activities directed at examining and improving capabilities in each of these areas, and requested that benefits be transferred to the Region through: training; convening further Regional Climate Outlook Forums;

and the development of pilot projects. The Association noted that several of these forums have been held in the Region and it expressed a high level of satisfaction in their value in building confidence and understanding amongst users. Noting, however, that the Forums are costly to run and that their outputs for end-users need to be consolidated, the Association welcomed that these issues would be discussed at the International Expert Meeting on Regional Climate Outlook Forums in Pretoria, South Africa, which involved representatives from RA IV. Further, the Association noted the importance of verification in the development of understanding and in the applications, of forecasts. It requested the Secretary-General to continue to provide the necessary support to CLIPS in order to ensure the transparency of verification measures and to improve their relevance to applications planning. It further requested the Secretary-General to continue the dialogue with other sponsors of the Climate Outlook Forums with a view to resolving issues relating to their viability as a long-term option in the provision of seasonal climate information including forecasts.

5.3.6 The Association noted the activities being undertaken through the Executive Council and technical commissions to consider the possible roles of RCCs in the provision of climate information and prediction services. RCCs could be developed in locations serving a region in which there would be common needs for services, and thus more than one such Centre might be required within RA IV. The Association requested its Members to support these investigations by continuing to provide information on how RCCs might be identified and evolve within RA IV. The Association noted that there are existing guidelines for the establishment of regional specialized centres operating within the ambit of CBS. It believed that as far as possible this process should be used to establish centres specializing in climate matters and look forward to the report of Intercommission Task Team.

5.3.7 The Association noted the attention that had been given to Weather, Climate and Human Health as the theme of World Meteorological Day 1999 and in various publications. The Association further noted that aspects of bioclimatology relating to human health need to be emphasized in the development of climate information and prediction services. A special focus should be on conditions in the tropics, especially on the rapidly growing conurbations in which large sections of the populations are already directly affected by climate, its variation and change.

5.3.8 The Association noted the methodology used in the Climate and Human Health Showcase Projects related to Heat and Health Warning Systems that are being employed in cities in the United States, as well as in Regions II and VI. The Association requested the Secretary-General to assist in supporting and organizing similar showcase projects within the Region as requested by Members.

5.3.9 The Association noted with appreciation the activities in climate and health that are planned within

the Region. WMO is exploring the possibility of convening a conference on climate and health for small island states in collaboration with the WHO and the Pan American Health Organization (PAHO) in the Caribbean region in 2002.

5.3.10 The Association noted that the current Showcase Projects on Climate and Human Health have demonstrated the need for NMHSs to engage the health communities in their work. The Association also noted that there were other more complex health issues related to environmental change that needed attention. These include the increased risk of melanoma due to higher levels of UVB, the effects of particulates and poor air quality on the health of humans, especially those with cardio-respiratory illnesses, and the increasing potential for climate change to influence disease vectors. The Association also remarked on the pressure to develop environmental prediction systems, such as air quality predictions, to address these concerns.

5.3.11 The Association agreed that Members should develop the capacity in the Region to promote projects that address environment and health issues in addition to those relating to heat stress in urban environments. The Association emphasized the need for close collaboration between the CCI, the Commission for Atmospheric Sciences (CAS) and the health sector, including WHO and PAHO, and adopted [Resolution 9 \(XIII-RA IV\)](#).

5.3.12 The Association noted that several developments in the area of Urban and Building Climatology had been in focus in the last few years. The Plan of Action for the Tropical Urban Climate Experiment (TRUCE), as endorsed by the twelfth session of CCI, was considered a firm basis for actions in this sector and it was suggested that TRUCE should be considered in line with the further development of CLIPS-related projects. The Association was satisfied with the results of the International Conference on Urban Climates (ICUC'99) that was held jointly with the International Congress of Biometeorology (ICB'99) in Sydney, Australia, in November 1999, and expressed its gratitude to the Secretary-General for the support of participants from the Region.

5.3.13 The Association noted the importance of promoting a broader understanding of the relationship between climate and energy, based on the principle that national and international cross-discipline activities can apply climate information including predictions to improve energy decisions. There is a need for urgent actions to address the issues of declining national climate observing networks and the inadequate infrastructure for documenting climate variability and its consequences in many areas of the world. In this regard, the Association urged Members to increase their initiation of and participation in multi-agency, multi-stakeholder activities, including relevant aspects of the GCOS regional workshops on improving deficiencies in global climate observing systems. The Association also recommended that Members conduct case studies to illuminate the decision value of knowledge of climate

variability and the use of seasonal to interannual predictions, in energy production and use in both traditional and renewable forums.

5.4 WORLD CLIMATE RESEARCH PROGRAMME (WCRP) (agenda item 5.4)

5.4.1 Members of the Association continue to participate actively in many components of the WCRP. Particularly important activities are the Mackenzie GEWEX Study (MAGS) and the GEWEX Continental-Scale International Project (GCIP). The GCIP mission is defined as demonstrating the ability to predict changes in water resources on timescales up to seasonal and interannual as an integral part of a climate prediction system. Over the next two to three years GCIP is expected to evolve into the GEWEX American Prediction Project (GAPP). The GEWEX Hydro-meteorology Panel (GHP) Water and Energy Budget Synthesis (WEBS) has been activated to provide an opportunity to bring together a number of GCIP diagnostic studies. Considerable progress has been made in the development of plans for GCIP contribution to the GEWEX Coordinated Enhanced Observing Period (GEOP) over the period 2001-2003, in which common datasets from all the regional GEWEX studies will be collected, offering the possibility of assessing the influence of continental heat and moisture sources and sinks on the global climate system and its anomalies. The Association noted, however, that in global scale climate modelling studies, the impacts relevant to SIDS were often inadequately resolved. Given the knowledge and experience of NMHSs in the characteristics of regional climate, the Association urged that NMHSs should be requested to participate in the assessment of efforts to downscale the results of modelling studies of global climate change.

5.4.2 The Association expressed particular interest in the development of the World Climate Variability and Predictability (CLIVAR) research study to extend understanding of climate variability on seasonal to decadal timescales and further strengthen the scientific basis for practical climate prediction. The Association also noted the activities focused on monsoonal circulations in the Region and which were undertaken under the auspices of CLIVAR. The Association noted, in particular, the enormous value that the new Argos observing system would bring to the understanding of ocean processes and to advances in monitoring and predicting climate variability and change. The Association especially commended the United States for the leadership it had shown in supporting the development of the Argos concept and bringing it to its implementation phase.

5.4.3 The Association recognized that WCRP research activities must be complemented by systematic, sustained and re-inforced observations of all key climate variables, by capacity building involving all nations in climate research activities, and by improving interactions with other climate-related programmes within the framework of the international *Climate Agenda*. The

Association encouraged NMHSs to participate as fully as possible in national climate research programmes led by other national institutions.

5.5 GLOBAL CLIMATE OBSERVING SYSTEM (GCOS) (agenda item 5.5)

5.5.1 The Association noted with appreciation the progress report on GCOS. It noted that GCOS networks were being implemented in accordance with approved plans and that a data monitoring activity was in place for both the GSN (carried out jointly by the Japan Meteorological Agency and the Deutscher Wetterdienst) and the GUAN. As requested in the Secretary-General's letter of 20 September 1999, Members of the Association agreed to submit historical data and metadata from their GSN stations, as well as to provide ongoing support for their GSN and GUAN observations.

5.5.2 The Association recognized the importance of the decisions of COP5 to the UNFCCC on meteorological and hydrological observing systems. In particular, it welcomed the regional approach being taken by GCOS to identify and seek to address deficiencies in these observing networks. It urged Members, to the extent possible, to assist the GCOS Secretariat to organize sub-regional workshops within RA IV to explore the needs for systematic observations in the Region and the options for expanding the funding for observing systems through new partnerships and other means. The Association suggested that the annual meeting of the Region's Hurricane Committee could provide an opportunity to bring together a core of expertise around which to organize a regional GCOS meeting. The Association also urged Members to participate in preparing detailed reports on systematic observations and where possible to serve on their national delegations to COP in order to make the observing needs of their NMHSs known.

5.5.3 The Association appreciated the opportunity to review the GCOS Implementation Strategy and asked Members to provide comments on this strategy to the GCOS Secretariat as appropriate.

6. ATMOSPHERIC RESEARCH AND ENVIRONMENT PROGRAMME (AREP) - REGIONAL ASPECTS (agenda item 6)

The Association noted the numerous activities and initiatives that had taken place in AREP since its last session and that Members had taken an active or leading role in many of them. It recorded its specific comments on the various components in the following paragraphs. The Association noted that in 1998 the WMO Research Award for Young Scientists was awarded to a young scientist from the Region. It urged all Members to make every effort to nominate eligible scientists from their countries for consideration of this award.

6.1 GLOBAL ATMOSPHERE WATCH (GAW) (agenda item 6.1)

6.1.1 The Association noted the considerable contributions of its Members' in support to GAW, and that it remains a priority activity in the Region. The

Association has hosted several GAW-related meetings concerning precipitation chemistry, ultraviolet radiation and others on general atmospheric chemistry matters. Members were urged to continue their support for GAW, and those with no current activities were encouraged to consider participating, particularly in view of the increasing pollution problems in some of the rapidly growing urban centres. In this regard, the Association recalled that Thirteenth Congress had endorsed the establishment of an Urban Research and Meteorological Environment (GURME) project within GAW and that pilot projects were already underway in Beijing and Moscow.

6.1.2 The Association expressed its appreciation to the scientific community outside the NMHSs for their close interaction with GAW, especially the support given by NASA, the Commission on Atmospheric Chemistry and Global Pollution (CACGP of IAMAP), the International Geosphere-Biosphere Programme (IGBP of ICSU) and its International Atmospheric Chemistry Programme (IGAC), and the International Ozone Commission (IOC of IAMAP). Additionally, the close collaboration of WHO on the health related aspects of urban and regional pollution, and IAEA on forecasting the transport of hazardous substances were also recognized.

6.1.3 The Association acknowledged the importance afforded to the quality of atmospheric data originating from GAW. In this respect, Members had made significant contributions by establishing QA/SAC for the Americas at the State University of New York in Albany (USA) and co-located with the World Calibration Centre for Precipitation Chemistry. Other GAW World Calibration Centres (WCCs) in the Region are those for Environmental Radioactivity at the Environment Measurement Laboratory of the US Department of Energy in New York City; the Dobson spectrophotometer calibration centre at the Climate Monitoring and Diagnostic Laboratory (CMDL), Boulder, Colorado, USA; and the Brewer World Calibration Centre operated by the Meteorological Service of Canada (MSC) in Toronto.

6.1.4 World Data Centres (WDCs) where information is archived and made accessible to users complete the essential infrastructure of GAW. The Association was pleased that the Region also makes a substantial contribution to this vital activity. The MSC hosts the World Ozone and Ultraviolet Data Centre in Toronto, and the World Data Centre for Precipitation Chemistry is located in Albany, USA. Members and station operators were urged to continue submitting their data to these and other WDCs on a regular basis, including providing appropriate metadata information. The Association was advised that new funding arrangements for the GAW QA/SAC in Albany would need to be devised if it were to continue.

6.1.5 The Association noted that six new GAW Global stations had been established in developing countries in recent years, and that some Members had provided a great deal of expertise and logistical support to this major GAW initiative. It noted, in particular, the installation, with the assistance of Japan, of a GAW station in

Costa Rica. The Association expressed its appreciation for the efforts that had resulted in improved global monitoring of the atmosphere and urged Members with the requisite resources to continue their support, not only to these new GAW stations, but also to other activities within GAW such as ozone instrument calibrations.

6.2 WORLD WEATHER RESEARCH PROGRAMME (WWRP) (agenda item 6.2)

6.2.1 The Association noted with satisfaction the high level of interest shown by its Members in the activities and programmes of the recently established WWRP. Members from the Region have actively supported the WWRP's various Research and Development Projects and Forecasting Demonstration Projects, and have also hosted and participated in a number of meetings and workshops organized by the WWRP.

6.2.2 The Association was particularly pleased that Members were playing a lead role in the WWRP Aircraft In-flight Icing Project and the Hemispheric Observing System Research and Predictability Experiment (THORPEX) which holds out the promise of much improved weather forecasting skill. Members were urged to continue their active support for these and other relevant WWRP initiatives.

6.2.3 Members, it was noted, make regular contributions to the WMO annual progress reports on NWP and long-range forecasting that are particularly useful as a means of keeping all NMHSs apprised of current developments.

6.3 TROPICAL METEOROLOGY RESEARCH PROGRAMME (TMRP) (agenda item 6.3)

6.3.1 The Association noted that its Members continued to cooperate in the development of the TMRP. The Region had hosted the fourth WMO International Workshop on Tropical Limited Area Modelling in November 1999 with participants from other Regions. In addition, experts from the Region made major contributions to the success of the fourth WMO/ICSU Workshop on Tropical Cyclones held in China in April 1998. Some Members of the Association sponsored several participants to the workshop.

6.3.2 Members of the Region were urged to continue supporting the TMRP as most Members of the Association are affected by tropical weather systems.

6.4 PROGRAMME ON PHYSICS AND CHEMISTRY OF CLOUDS AND WEATHER MODIFICATION RESEARCH (PCCWMR) (agenda item 6.4)

6.4.1 The Association expressed its satisfaction that Members continued their support of this major programme. Since its last session, the Region has hosted the first International Conference on Fog and Fog Collection (Vancouver, 1998); played a significant part in the organization and participation in the seventh WMO Scientific Conference on Weather Modification held in Thailand in 1999; conducted a field experiment in Mexico followed by a scientific review of the

hygroscopic seeding technique pioneered in South Africa; and staged the fifth International Cloud Modelling Workshop in the USA in 2000. The United States also provided considerable input to the annual WMO Register of National Weather Modification Projects.

6.4.2 The Association urged Members to continue their support of the Programme in general, and specifically to support any follow-up actions arising from the review of hygroscopic seeding technique. The Association was informed that the second International Conference on Fog and Fog Collection would be held in Newfoundland, Canada in July 2001.

6.5 SUPPORT TO OZONE AND OTHER ENVIRONMENT-ORIENTED CONVENTIONS (agenda item 6.5)

6.5.1 The Association recalled that the atmospheric composition information provided by the GAW network in the Region constitutes a major contribution to the implementation to a number of UN environmental conventions. With respect to both the Vienna Convention for the Protection of the Ozone Layer and the UNFCCC, the Association noted that its Members operate a number of GAW stations and other central infrastructures that provide atmospheric ozone and greenhouse gas information for use by government policymakers. The Association noted that the GAW WCCs for Dobson ozone instruments and Brewer spectrometers, as well as the World Ozone and Ultraviolet Data Centre were all located in the Region. The United States and Canada were commended for their significant national efforts in maintaining these facilities in view of their international importance.

6.5.2 The Association noted with satisfaction that its Members had made substantial contributions to the 1998 Scientific Assessment of Ozone Depletion. Members were urged to continue their active support of the next assessment due in 2002. These quadrennial assessments are of great value to the Parties to the Montreal Protocol and its amendments.

7. APPLICATIONS OF METEOROLOGY PROGRAMME (AMP) – REGIONAL ASPECTS (agenda item 7)

7.1 PUBLIC WEATHER SERVICES PROGRAMME (PWSP) (agenda item 7.1)

7.1.1 The Association noted with satisfaction the continuing development and advancement of PWSP and recognized the progress made in accomplishing its objectives.

7.1.2 The Association was informed that following the restructuring of CBS in 1998, the Working Group on PWS was replaced by the OPAG-PWS. The work of the Programme is coordinated by three ETs and an ICT, with participation from experts from the Region.

7.1.3 The Association strongly supported the ongoing dialogue, through the Programme, with international media representatives on issues of 'single official voice' and 'on-air attribution' for the role of NMSs in the forecast and warning process, as they impact on the status and visibility of NMSs. It welcomed

the development of guidance on improving media relationships and proposals to improve international media access to official NMS forecasts and warnings. The Association noted that a project on the establishment of a regional Web site was developed by several NMHSs in the Region with financial assistance provided by the United States. The Project will provide assistance to NMHSs in the Region to develop their own Web sites, which will contain operational data and products, climatological data and any other relevant information regarding the NMHSs. Eventually, the Web sites of individual NMHSs will form an integral umbrella regional Web site for the southern part of RA IV and will be linked to other Web sites. A linkage of various Web sites should provide excellent opportunity for exchange of warnings and forecasts over the Region. In this regard, the Association voiced satisfaction with the effort made by WMO to promote the establishment of a prototype Web site for the distribution of tropical cyclone warnings. The Association requested that the results of the implementation of such prototype project (in Hong Kong, China) would be made available to other Regions. The Association was informed that in some cases, particularly in small island states, it was necessary to strengthen collaboration between NMHS and local security authorities in the matter of provision warning and forecasts by NMHSs.

7.1.4 The Association supported the recommendation for bilateral and/or regional cooperation and agreements to develop and expand arrangements for cross-border exchange of forecasts, warnings and information. It welcomed the preparation of relevant guidelines and noted they will include standardized formats and content of messages, as well as a list of hazard types and threshold values currently in use. In light of the proliferation of unofficial world city forecasts, the Association endorsed a proposal to designate a centre for collecting official NMHS forecasts or establishing links to them, and the generation of an integrated product of global city forecasts.

7.1.5 The Association agreed with proposals aimed at assisting Members in quantifying forecast uncertainty, verifying forecasts and warnings and service evaluation, as well as making improvements in the dissemination and presentation of PWS products. It expressed satisfaction that the following WMO Technical Documents have been prepared by PWS experts, particularly for small and developing countries:

- *Technical Framework for Data and Products in Support of Public Weather Services* (TD-1054);
- *Developing a Graphical Presentation System* (both technical and design aspects);
- *Guidelines on Performance Assessment of Public Weather Services* (TD-1023).

7.1.6 The Association welcomed the publication of the second edition of the *Guide to Public Weather Services Practices* in January 2000. This updated version stresses service provision and delivery based on strong user-focus, and was accompanied by a set of four complementary CD-ROMs that provide additional

examples of national practices to assist Members to develop their own programmes. The Association also noted the publication in May 1999 of *Public Weather Services in Focus* (WMO/TD-No. 974) which contains the results of the WMO 1997 global survey to assess the status of the PWS of Members. Ten of the Region's Members provided responses to the questionnaire.

7.1.7 In emphasizing the important role that high quality PWS play in demonstrating the value of government investment in NMSs, the Association noted with appreciation, the capacity building activities of the Programme in the Region. A PWS workshop was held in Miami, Florida, in April 1999, for participants from the Hurricane Committee Region. A similar PWS workshop for meteorologists in the Region was held at the same venue in April 2000. The Association was pleased to note that in order to ensure optimum use of available resources, these training events were held in collaboration with TCP, and followed the respective Training Workshops on Tropical Cyclones. The Association emphasized that the training activities on PWS, in particular on presentation of weather information on TV should be given high priority.

7.1.8 The Association supported the view that high priority issues for the PWSP in the Region include:

- Capacity building activities such as workshops and seminars, as well as transfer of knowledge and technology;
- Assisting Members with user-based service provision and delivery, as well as performance evaluation including verification of forecasts and warnings;
- Assisting Members in developing/expanding their programmes for cross-border exchange of forecasts, warnings and information;
- Assisting Members to improve their status and enhance their visibility, thereby demonstrating their important role in ensuring the safety of life, protection of property and in national development.

7.2 AGRICULTURAL METEOROLOGY PROGRAMME (AgMP) (agenda item 7.2)

7.2.1 The Association complimented the Secretary-General and the Commission for Agricultural Meteorology (CAGM) for the progress made in the field of agricultural meteorology, including the publication of a large number of technical notes and CAGM reports. The Association congratulated Dr Ray Motha (USA) on his election as President of the Commission.

7.2.2 The Association noted with appreciation the theme adopted by the Commission 'to promote agrometeorology and agrometeorological applications for efficient, sustainable agriculture, silviculture, and aquaculture for an increasing world population in rapidly changing environments' and stressed the need to increase the awareness of the users to the economic, environmental and health benefits of the application of meteorological, climatological and hydrological information to agriculture to meet the food, fodder and fuel needs of the growing populations in North and Central

America. The Association considered the theme to be very important to the Region. The Association noted with interest the intersessional activities of the CAGM and agreed that they will contribute greatly to the economic development of North and Central American countries.

7.2.3 The Association further noted the main topics discussed at the twelfth session of CAGM among which were the applications of seasonal to interannual climate forecasts and the products and services that are becoming available based on these forecasts. The Association supported the decision of the Commission to promote, survey and summarize, using case studies, the current applications of climate forecasts in agriculture, forestry and livestock management, and recommend ways and means to more optimally use climate forecasts in operational agriculture with emphasis on user needs, especially in the developing countries. In this context, the Association was pleased to note the initiative taken by the Programme to collaborate closely with the System for Analysis, Research and Training (START) of IGBP, WCRP and the International Human Dimensions Programme on Global Environment Change (IHDP) in the CLIMAG project. It congratulated the Secretariat on the successful organization of the International Workshop on CLIMAG in September 1999 in Geneva. The Association was pleased to note the conclusion of the CLIMAG workshop that, among others, there are specific areas in Central America where CLIMAG demonstration projects could be developed from existing pilot activities and that multi-disciplinary teams, including experts in climate, crop and economic modeling and agronomic expertise at various levels, including local farmers, would be involved in these regional CLIMAG demonstration projects. Noting that the partnership between START, WMO, IRI, APN, IAI and other relevant organizations, is an essential ingredient underpinning the effort of these multi-disciplinary teams, the Association encouraged WMO's continued participation in the activities of the CLIMAG Steering Committee.

7.2.4 The Association was pleased to note that a number of experts from the Region had participated in International Workshops organized by WMO in other Regions. The Association considered that such opportunities for an exchange of experiences between the Regions would help strengthen the agrometeorological activities in the Region and therefore urged the Secretary-General to continue to enhance inter-regional cooperation in agrometeorology.

7.2.5 The Association noted with satisfaction the training event held in the Region and strongly supported the continued organization of such events for the benefit of the participants from the Region. In this connection, the Association urged the Secretary-General to continue to provide strong support to the roving seminars in agricultural meteorology which are helping to build the much needed capacity to address this emerging issues in agrometeorology in the Region. The Association agreed that training in agricultural meteorology should receive high priority consideration for the

meaningful application of meteorological information to agricultural activities. In this regard, the Association was informed of a forthcoming Inter-Regional Workshop on Improving Agrometeorological Bulletins that would be held in Barbados in October 2001. It was agreed that it was important to involve users in training and capacity building events of this type and in any follow-up activities. The association also stressed the importance of building partnerships between NMHSs and national institutions and groups with responsibilities and activities relevant to WMO's AgMP. Such partnerships can work very effectively to improve the relevance and effectiveness of products and services provided by NMHSs.

7.2.6 The Association noted WMO's activities in combating desertification and urged Members to participate actively in the implementation of the United Nations Convention to Combat Desertification (UNCCD). The Association requested the Secretary-General to provide appropriate guidelines to Members in this regard. The Association further urged Members to benefit from the support of the Global Mechanism of the Convention for projects in this area. To promote capacity building in the development of National Action Plans, within the framework of the Convention, WMO, in collaboration with FAO, UNEP and the Secretariat of UNCCD, will organize roving seminars on the application of climatic data for drought preparedness and management of sustainable agriculture in a number of affected countries between 2001 and 2003. The Association was pleased to learn of opportunities for assistance to Members that may wish to host these seminars.

7.2.7 The Association complimented the chairman and the members of the RA IV Working Group on Agricultural Meteorology for the activities it carried out and for its final technical report. The Association recommended that the report be published by WMO and distributed widely. The Association noted the requirement for increased contacts between NMHSs in the area of agrometeorology and users. It suggested that the establishment of a suitable Web site could be very helpful in this regard. Furthermore, lists of e-mail addresses of training institutes dealing with agricultural matters could be drawn up with the aim of improving the flow of information on seminars, workshops and other events. Lists should include subjects dealt with by working groups and rapporteurs.

7.2.8 The Association was pleased to note that a RA III/IV Expert Group Meeting on Extreme Events was organized in Caracas, Venezuela, from 12 to 14 July 1999 and that the meeting had resulted in a very fruitful exchange of information, ideas, and scientific support to formulate suggestions to cope with extreme events more efficiently. The Association complimented the Secretariat for its timely publication of the Proceedings of this Meeting and urged its Members to use the information provided in the Proceedings in their strategies to cope with extreme events in the Region.

7.2.9 The Association complimented the chairman of the Working Group for his active participation in the

number of activities he undertook to strengthen agrometeorological applications in the Region.

7.2.10 The Association complimented the Institute of Meteorology of Cuba for the initiative taken to organize a short refresher course on Operational Techniques of Agrometeorological Information for Sustainable Agriculture in 2001 and urged Members in the Region to actively participate in the course.

7.2.11 The Association agreed that the application of meteorology to agriculture continues to be of high importance to the Region. Hence the activities of the Working Group on Agricultural Meteorology should be continued, taking into account the developments in the Region, such as the need for evaluation of the impact of ENSO on agriculture and forestry and the potential benefit of using seasonal to interannual climate forecasts, improved adaptation strategies to climate variability and climate change, as well as methods to cope with extreme meteorological events such as droughts and floods and the potential for developing improved agrometeorological applications using tools such as Geographic Information Systems (GIS). The Association therefore re-established a Working Group on Agricultural Meteorology with renewed terms of reference and adopted [Resolution 10](#) (XII-RA IV) accordingly.

7.3 AERONAUTICAL METEOROLOGY PROGRAMME (AEMP) (agenda item 7.3)

7.3.1 The Association noted with satisfaction that Thirteenth Congress re-emphasized the importance it attached to an expanded and vigorous Aeronautical Meteorology Programme (AeMP) to meet the needs of the worldwide aviation community and decided that the AeMP should be further strengthened. It was pleased to note that Congress requested the Secretary-General to assist in the implementation of the AeMP and, in particular, to give high priority to training requirements.

7.3.2 The Association noted with satisfaction that participants from 11 of the 15 countries of the Region attended the training seminars on the Processing, Manipulation and Display of WAFS Data and Products and on Cost Recovery for Aeronautical Meteorological Service respectively held in Mexico City, Mexico, in October 2000. The Association was grateful to WMO, ICAO and the NWS for jointly organizing the two events, to Mexico for hosting these two seminars, and to the UK Met Office for providing a resource person for the cost-recovery seminar. The Association noted with appreciation that the NWS provided the services of two lecturers for the WAFS seminar and financial support to participants at both training events. The Association was pleased to learn that two seminars – one on ATS/MET Coordination and the second on Volcanic Ash were planned to be held in November 2001 in Colombia for participants from RA III/RA IV Member countries. It expressed its appreciation to Colombia for hosting these seminars and to the United States for the financial support provided for the organization of these important events.

7.3.3 The Association welcomed the progress made towards the final phase of WAFS including the

continued implementation of transition plans for the handover of responsibility of Regional Area Forecast Centres (RAFCs) Brasilia and Buenos Aires to the Washington World Area Forecast Centre (W AFC). The Association noted the decision taken in May 2000 by the Aeronautical Meteorology Study Group (AERMETS G) of the ICAO CAR/SAM Regional Planning and Implementation Group (GREPECAS) to transfer responsibility for the generation of high-level SIGWX forecasts (SWH) to Washington W AFC effective on 1 September 2000. The Association was informed by the Representative of ICAO that AERMETS G would hold a meeting from 23 to 27 April 2001 in Martinique, to review the WAFS transition plan and develop some proposals regarding the generation of mid-level SIGWX (SWM) forecasts which could be provided for limited geographical areas as determined by regional air navigation agreement. Several Members of the Association informed the session that increase of low-level flights within the Caribbean Subregion was considerable. In view of the fact that WAFS had no obligation to produce SIGWX charts covering the layer below flight level FL100, the Association requested WMO and ICAO to investigate the possibility of broadcasting, as part of the WAFS products, low-level SIGWX charts for the southern part of the Region that would cover the layer extending from the surface to the flight level FL100.

7.3.4 The Association noted further that the two WAFCs had improved backup procedures to ensure the continued global availability of aviation data and products to users in case of a W AFC failure. Other measures implemented by the two WAFCs included the addition of two extra aviation NWP model runs per day, the broadcast of GRIB relative humidity fields up to 500hPa to meet aviation operational requirements and the successful BUFR-coded SIGWX forecast transmission trials. The Association noted that, although almost all RA IV Members had access to WAFS satellite broadcasts data through ISCS broadcasts, few operational problems, i.e. the use of the VSAT/STAR4, missing products and noted delays in receiving GRIB data, still remained to be addressed. The Association was informed however that these problems were discussed by the AERMETS G/IV meeting that concluded that the lack of training in the use of the VSAT/STAR4 was the main source of the difficulties.

7.3.5 The Association recognized that significant progress had been made in recent years on establishing ICAO's International Airways Volcano Watch (IAVW) and welcomed the provision of transport model products depicting volcanic ash by various WMO RSMCs that are also Volcanic Ash Advisory Centres (VAACs). The Association was pleased to learn that the United States had offered to extend the area of responsibility of the Anchorage VAAC to cover Eastern Siberia and the adjacent Pacific Ocean which have intense air traffic. It noted with appreciation the information supplied by the United States on upgrading a model for volcanic ash distribution and encouraged Members to provide all necessary data required for the successful running of the

model. The Association noted with satisfaction that the *Handbook on International Airways Volcanic Watch* had been recently published by ICAO.

7.3.6 The Association welcomed the adoption by CAeM-XI in March 1999 of the definition of visibility for aeronautical purposes and the guidance material for precipitation intensity and well-developed dust/sand whirls (dust devils) and funnel clouds. It noted with satisfaction the positive role played by the CAeM Working Group on the Provision of Meteorological Information Required by Civil Aviation (PROMET) in developing various amendments to ICAO Annex 3/WMO *Technical Regulations* [C.3.1] in close cooperation with ICAO and relevant CBS and CIMO Working Groups. Some of these amendments were included in Amendment 71 that became applicable on 5 November 1998. Other amendments, such as WAFS operational requirements, definition of visibility, information on volcanic ash, turbulence reporting, SIGMET information and the global exchange of OPMET information, would be implemented as part of Amendment 72 in November 2001.

7.3.7 The Association welcomed the establishment by ICAO of the Aerodrome Meteorological Observing Systems Study Group (AMOSSG) to examine operational requirements for automated observing systems at aerodromes in which WMO was actively involved. The Association noted with interest that the group held its first meeting in Montreal, Canada in May 2000 and that the second meeting of the group was held in February 2001 in De Bilt, the Netherlands. The Association noted with satisfaction the progress made by the study group in updating the current requirements for meteorological observations and reports at aerodromes, as contained in *Technical Regulations*, Volume II (WMO-No. 49) (C.3.1). The Association noted with interest the assessment by the group of current capability of automated weather observing stations to meet the future requirements and welcomed the group's intention to develop a *Manual on Automated Weather Observing Systems*.

7.3.8 The Association was informed that in line with the decision of the CAeM, a TAF Verification Expert Group has been established within the CAeM Working Group on Training, the Environment and New Developments (TREND). Held in Hong Kong in October 2000, the TREND session discussed progress so far achieved in TAF verification and asked the group to continue its work with a view to presenting a report to the next session of CAeM in 2002.

7.3.9 The Association recognized the positive role played by AMDAR Panel established in March 1998 in enhancing the upper-air component of the WWW Global Observing System (GOS). The Third AMDAR Panel meeting held in September 2000 noted with satisfaction that there had been an approximate 60 per cent increase in AMDAR reports per day since the Panel was established in 1998, and that over 100,000 AMDAR observations per day were being exchanged over GTS. The Association noted with appreciation that two RA IV Members — Canada and the United States — had

provided a great contribution to the development of AMDAR system (see also section 4.2). It noted with interest that the United States had funded a pilot project to obtain AMDAR data over the Caribbean and Central America in cooperation with WMO's AMDAR Panel. The United States also indicated that they would acquire automated low-level wind, temperature and moisture data from general aviation as part of its effort to improve flight safety. The Canadian AMDAR contribution to the meteorological community would likely be the availability of AMDAR data from the Pacific and Arctic oceans that currently have limited upper-air data. Furthermore, Canada was planning to use smaller aircraft on regional routes in addition to the conventional jet aircraft to collect AMDAR data. The Association urged RA IV Members to support the implementation of WMO's AMDAR Programme that was providing significant benefits to various WMO Programmes, including the AMP.

7.3.10 The Association congratulated the CAeM ATEAM Working Group for the updated publication of the *Methods of Interpreting Numerical Weather Prediction Output for Aeronautical Meteorology* (WMO-No. 770 and WMO-TN No. 195). The Association was pleased to note that the Spanish and French versions of the Technical Note were published in the second half of 2000 and that all Members in the Region would now benefit from this publication. The Association welcomed the publication in 1999 of the *Guide on Aeronautical Meteorological Services Cost Recovery* (WMO-No. 904) in four languages and requested the Secretary-General to keep under review the content of the Guide in view of new developments in this area. It also expressed the need to update ICAO document 7604 regarding Meteorological Authorities. The Association was informed that the preparation of the *Compendium on Tropical Meteorology* was at a very advanced stage and that the WMO Secretariat expected to publish it in the near future.

7.3.11 The Association was informed about the results of the ICAO Global Conference on the Economics of Airports and Air Navigation Services held in June 2000. It noted with concern the request by the IATA to the Conference to limit cost recovery for aeronautical meteorological service to facilities and services exclusively serving aviation therefore excluding the core services (i.e. synoptic, upper-air stations, satellite and radar facilities). The Association was informed that WMO's position was that existing ICAO guidance, developed by all stakeholders including IATA and WMO, and published only four years ago, setting out policy with regard to meteorological cost recovery should be retained. The Association noted with satisfaction that WMO's position — supported by 30 countries, including countries from RA IV — was endorsed by the Conference. Noting that the issue of the recovery of observational costs could again be raised by the aviation industry in the future, the Association encouraged Members to cooperate with IATA and the airlines in addressing any grievances they may have regarding the quality of service provided to aviation and the

transparency of meteorological costs. The Association urged Members to ensure closer contacts with aviation authorities at the national level to avoid any misunderstandings regarding the vital role played by NMSs in the provision of meteorological services to air navigation. In view of the importance of the cost recovery issue, the Association recommended that this item should be included in the agenda of the CAeM-XII which will be held jointly with the ICAO Meteorology Divisional Meeting in September 2002.

7.3.12 The Association felt that in view of vital importance of the AMP for the Region, it was necessary to have focal points which will be closely involved with AMP activities in the Region. The terms of reference for such focal points were developed and approved as given [in the annex to this paragraph](#). The Association decided to nominate the following persons as focal points on the Regional Aspects of Aeronautical Meteorology Programme:

Mr W. Stulz (Costa Rica)
 Mr W. Mills (Trinidad and Tobago)
 Mr H. Noguera (Venezuela)
 Mr K. McDonald (Canada)

7.4 MARINE METEOROLOGY AND ASSOCIATED OCEANOGRAPHIC ACTIVITIES PROGRAMME (MMAOAP) (agenda item 7.4)

7.4.1 The Association noted with interest that Thirteenth Congress had approved MMAOAP as part of the Fifth WMO Long-term Plan (5LTP). This programme provided overall objectives as well as detailed guidelines for Members, regional associations and WMO in this field. The Association further noted with interest that Congress had approved the establishment, primarily through the merger of the former CMM and the Joint IOC/WMO Committee for IGOSS, of a new Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). JCOMM had subsequently also received the formal approval of the 20th Assembly of the IOC (Paris, July 1999). As agreed by Congress and the Assembly, JCOMM will now be the coordinating and reporting body for all operational marine activities of WMO and IOC, as well as the primary implementation mechanism for an ocean observing system for climate in support of GOOS and GCOS. The Association recognized the potential importance of JCOMM to its Members and to WMO, and offered its strong support. Further specific action in this regard is recorded in a subsequent paragraph.

7.4.2 With regard to the implementation of marine meteorological services, specifically in Region IV, the Association noted with appreciation the report of the Rapporteur on Regional Marine Meteorological Services, Mr W. Appleby (Canada). Actions taken on various points raised in this report are recorded in subsequent paragraphs. The Association agreed that the further development in the Region of marine meteorological services, together with marine observing systems, particularly in the light of the opinions of Thirteenth Congress on the matter, should be an ongoing activity.

It therefore decided to re-appoint a rapporteur and adopted [Resolution 11](#) (XIII-RA IV).

MARINE METEOROLOGICAL AND OCEANOGRAPHIC SERVICES

7.4.3 The Association noted that the new WMO marine broadcast system under the Global Maritime Distress and Safety System (GMDSS) (forming a part of SOLAS) had been fully implemented, as planned, on 1 February 1999. It recalled that details of the system were formally adopted by the eleventh session of CMM (CMM-XI) and approved by the forty-fifth session of the Executive Council (EC-XLV) as part of the *Manual on Marine Meteorological Services* (WMO-No. 558). In particular, the Association noted with satisfaction that the meteorological services available through SafetyNET for the two METAREAS covering the Region had been operational for a number of years, and expressed its considerable appreciation to the United States for its efforts in maintaining these services as required under the GMDSS. At the same time, it recognized the need to continually review these services, including in particular the views of users. It therefore urged Members in the Region operating VOS to participate actively in the various marine meteorological services monitoring exercises being undertaken under JCOMM.

7.4.4 The Association recalled that a new, globally coordinated, Marine Pollution Emergency Response Support System (MPERSS) had been adopted by CMM-XI and, with the approval of EC-XLV, implemented on a trial basis as of 1 January 1994. The Association urged Members with agreed responsibilities under the MPERSS to make every effort to contribute to the ongoing trials, and to report the results of these trials to JCOMM.

7.4.5 The Association noted with appreciation that the Marine Climatological Summaries Scheme (MCSS), the Global Digital Sea Ice Data Bank (GDSIDB), and the Global Temperature Salinity Profile Programme (GTSP) were all being continually developed to meet requirements for various types of marine climate data to support global climate studies, GCOS and the provision of marine services. It therefore urged Members concerned in the Region to participate actively in these projects, which now all formed part of the JCOMM data management programme area. It expressed its particular appreciation to the United States for the maintenance of one of the global data banks for the GDSIDB, along with the Russian Federation, and to Canada and the United States for their substantive support to the GTSP.

SYSTEMS FOR MARINE OBSERVATIONS AND DATA COLLECTION

7.4.6 The Association noted with appreciation that, following the agreement of Eleventh Congress that WMO will cooperate with IOC in the development of the Global Ocean Observing System (GOOS), WMO was now a full co-sponsor of GOOS, along with ICSU, IOC and UNEP.

7.4.7 The Association shared the view of Thirteenth Congress that the development and implementation of GOOS was of considerable importance to WMO and to NMSs, because of the need for enhanced ocean data to

support meteorological and oceanographic services and global climate studies, and also because of their existing experience and facilities in this field. It further noted that a major initial task for JCOMM would be the implementation, international coordination and regulation of an operational ocean observing system for climate, in support of GOOS and GCOS. For this task, JCOMM would require the enhanced, active support of all maritime Members. The Association therefore adopted [Resolution 12](#) (XIII-RA IV) on the subject.

7.4.8 The Association agreed that the Voluntary Observing Ships (VOS) scheme, the Ships-of-Opportunity Programme (SOOP), the Global Sea-level Observing System (GLOSS), the ASAP programme, ocean data buoys and oceanographic satellites formed key components of both existing and future ocean observing systems. They will be coordinated under JCOMM and contribute directly to GOOS and GCOS. It therefore agreed on the importance of continued support by Members of the Association for those activities. The Association in particular urged its Members to:

- (a) Recruit more ships to the VOS programme; improve data quality and timeliness; strengthen their Port Meteorological Officers' (PMO) networks; and participate where possible in the new VOS Climate Project, the ASAP programme and the work of the ASAP Panel.
- (b) Participate whenever possible in the implementation and long-term maintenance of the operational SOOP plan, being coordinated by the SOOP Implementation Panel.
- (c) Develop and operate drifting buoy programmes in data-sparse ocean areas; and participate in the work of the DBCP and its regional action groups such as the International South Atlantic Buoy Programme (ISABP) and the International Arctic Buoy Programme (IABP).

7.4.9 The Association noted that the INMARSAT satellite system was a key element in the GMDSS and thus in the new WMO marine broadcast system, but also now the primary means for transmitting meteorological and oceanographic reports from the VOS, SOOP and ASAP ships from ship-to-shore. The Association agreed that continuing efforts were required to ensure that the most efficient and cost-effective use was made of Inmarsat, for the benefit of all Members. The Association further recognized that the Argos system continued to be widely used for the collection and location of data from unmanned, automated marine platforms, such as drifting and moored buoys and sub-surface floats. Non-commercial users of the system participated collectively in the Argos Joint Tariff Agreement, which served to secure a favourable price and conditions for such system users. The Association therefore urged Members operating such ocean platforms to participate in this agreement wherever possible, if they are not already doing so.

7.4.10 The Association noted and endorsed the support of Congress and the Executive Council for the new Argo project, to implement a global network of autonomous sub-surface ocean floats to provide

temperature and salinity profiles of vital importance to climate monitoring and prediction. In this context, it recognized that Argo constituted a component of the WCRP, GOOS and GCOS, and that it would also become part of an integrated operational ocean observing system coordinated and regulated through JCOMM. The Association noted with approval the efforts being made, jointly by WMO and IOC, to inform Members/Member States of Argo float deployments, to facilitate access to Argo data (which would be freely available in real time on the GTS) and information, and also to facilitate participation in the project. It agreed that an effective way of implementing these actions, as well as addressing technical aspects of data distribution and assisting in the integration of Argo with other ocean observation networks, would be through a technical coordinator, who could work in close collaboration with the existing DBCP/SOOP coordinator. It noted that, with the support of initial contributions from a small number of Members (including Canada and the USA), the recruitment of an expert to fill this position was now underway. It urged Members of the Association to make additional financial contributions to facilitate the work of the coordinator and the long-term maintenance of the position. The Association further noted with appreciation that implementation of the project itself was now underway, and regional implementation meetings held for the Pacific Ocean (Tokyo, April 2000) and Atlantic Ocean (Paris, July 2000), and the third meeting of Argo Science Team which took place in Sydney, Australia in March 2001.

PROGRAMME SUPPORT ACTIVITIES

7.4.11 The Association agreed that specialized seminars, workshops and similar events were of considerable value to Members involved in the operation of marine observing systems and in the provision of marine services, and should be continued. It requested its Members to consider the possibilities for hosting such activities in the future.

7.4.12 The Association noted with appreciation that a number of experts from many WMO Members worldwide had participated in an international workshop on numerical wave analysis and forecasting (Miami, USA, April-May 1997), and expressed its appreciation to the USA for hosting this workshop. Experts from maritime Members of the Association had also participated in the International Workshop for PMOs from RA III/RA IV (Valparaiso, Chile, September 1998), and again expressed its appreciation to the USA for supporting and co-sponsoring this workshop. The Association further noted with interest that experts from several Members had participated in an international workshop on the remote sensing of sea ice, which was hosted by the Canadian Ice Service in Ottawa in May 2000, and expressed its appreciation to Canada for hosting and supporting this workshop.

7.4.13 The Association was pleased to learn that a workshop on Wave and Storm Surges Forecasting is planned to be held in late November 2001 for participants from RA IV Members. It strongly supported the

organization of this training event and proposed that the training component on the provision of coastal marine forecasts would be included in the workshop programme.

8. HYDROLOGY AND WATER RESOURCES PROGRAMME (HWRP) - REGIONAL ASPECTS (agenda item 8)

GENERAL

8.1 The Association was pleased to note that, in general, the needs of Members in the Region were adequately reflected in the priority activities of WMO in hydrology and water resources highlighted in the WMO's 5LTP. It examined those topics in the Plan which were new or required more emphasis and recommended that the following aspects, considered to be of particular interest to countries in North and Central America, should be taken into account as appropriate in the future work of the Working Group on Hydrology (WGH):

- (a) Training and continuing education;
- (b) Hydrological warning systems;
- (c) Integrated water resources management;
- (d) Transboundary water resources management.

8.2 The Association noted with appreciation the report of the chairperson of the WGH, Ms C. Candanedo (Panama). Presenting her report to the session, she mentioned that participants from 20 countries including Haiti and observers from UNESCO, UNEP, WHO and CRRH (Regional Committee for Hydraulic Resources) attended the WGH session in Tegucigalpa, Honduras, November 1999. She informed the session that she was not in a position to continue chairing the working group. The Association thanked her for the excellent work she had carried out with outstanding expertise. She was requested to provide guidelines for the future work of the group. The session noted the progress made in carrying out studies of particular concern to Members through its nine rapporteurs who had been given specific assignments. In particular, it noted with interest the work carried out for the preparation of the technical reports on:

<i>Title</i>	<i>Rapporteur</i>
HOMS and Training	D. Harvey (Canada)
Hydrological Component - Hurricane Committee	F. Planos (Cuba)
WMO Standards and Recommended Practices in Hydrology	L. Rodriguez (Dominican Republic)
Water Quality, Pollution and Salt Water Intrusion	K. Narayan (British Caribbean Territories)
Hydrological Component of the World Climate Programme	H. Lins (United States)
Mathematical Models for Hydrological Forecasting	D. Espinosa (Panama)
Hydrometeorological Data Collection Platforms	M. Garcia (Colombia)
Hydrological Networks	A. Salcedo (Venezuela)
Cost Recovery for Hydrological Services	S. Laporte (Costa Rica)

8.3 The Association was pleased to note that its WGH had made significant inputs to the activities within HWRP and, as required by Congress, the Association's activities were well coordinated with those of the Commission for Hydrology (CHy).

8.4 On the basis of the recommendations of the WGH, and taking into account the decisions of Thirteenth Congress and the recommendations of the eleventh session of the Commission for Hydrology (CHy), the Association decided to re-establish the group, open to all Members of the Region. With respect to the group's membership, the Association requested its Members to ensure an adequate representation of the NHSs and other institutions working in the field of water. The Association also endorsed the future programme of work proposed by the WGH, which conformed closely to the 5LTP and included it in [Resolution 13 \(XIII-RA IV\)](#). It further recommended that at least one session of the working group should be arranged during the intersessional period and that financial assistance be provided by WMO to allow the core members to attend the session. The Association recommended that the last session of the working group should take place between nine and twelve months before XIV-RA IV.

8.5 In accordance with General Regulation 167, the Association designated its Regional Hydrological Adviser (RHA) through its [Resolution 13 \(XIII-RA IV\)](#).

REGIONAL IMPLEMENTATION OF THE HWRP

8.6 The Association was informed of the technical and administrative support that had been provided by the Secretary-General to the six WGHs of the Regional Associations in the implementation of their activities and in the organization of their sessions. It noted that, for some Associations, hydrology and water resources was one of the major areas of interest and concern. During their respective twelfth sessions the regional associations, decisions were taken to re-establish their WGHs which are open to experts of Members. The collective membership of these groups stands at 170; 44 of these members have been assigned specific tasks as rapporteurs or Subregional/sub-group coordinators. These groups had developed work programmes, which have become increasingly project-oriented.

8.7 The Association was informed on the discussions held during CHy-XI in relation to organizational matters and that CHy had considered that the structure and the organization of WMO has an important impact on how it is viewed by its various constituent communities, of which the hydrological community is one. Also important is the corresponding organizational structure at a national level, which can aid or hinder contacts and cooperation with WMO. WMO Regional and Subregional Offices, as presently constituted, do not include the hydrological expertise needed to serve the hydrology and water resources communities in the Regions, something that has been noted by the Executive Council in the past.

8.8 The Association was pleased to note that a number of activities had been carried out in the Regions.

These included a series of regional workshops to promote the use of the methodology contained in the WMO/UNESCO Publication *Water Resources Assessment – Handbook for Review of National Capabilities*. The Association noted that CHy-XI had considered this Handbook as a valuable contribution to WMO's regional activities.

8.9 The Association reviewed in particular the cooperation of WMO with UNESCO in matters concerning freshwater. It noted that this was based on an inter-secretariat agreement established in 1972 and focused on activities in water resources assessment, the preparation of the *International Glossary of Hydrology, WCP-Water and Education and Training in Hydrology and Water Resources*. The Association was informed on the outcome of the fifth UNESCO/WMO International Conference on Hydrology held in Geneva in February 1999. In relation to cooperation between UNESCO and WMO at regional level, the Association recognized the difficulty posed by the different regional divisions used by the two organizations. However, a new opportunity for cooperation may soon be offered by the meetings of IHP National Committees that will be convened in all UNESCO regions. The Association therefore recommended that WMO participate in these meetings whenever possible.

8.10 The Association noted that following the recommendations of the Steering Committee for HOMS and the fifth UNESCO/WMO Conference on Hydrology, an International Workshop on HOMS in the 21st Century, had been held in Geneva in September 1999. The Workshop developed an Implementation Plan for HOMS in the 21st Century, which was then reviewed and adopted by the Steering Committee. The Plan, which clearly sets the guidelines for the further development and update of the System, has been distributed to all HOMS National Reference Centres (HNRCs). The Association was informed that HOMS is now making use of the new information technology and that some components are now available directly through the Internet. The Association recommended that WMO assists countries in selecting HOMS components related to hydrological data management to substitute old components. The Association considered that a workshop on HOMS hydrological databases would be of extreme importance.

8.11 The Association was informed that WMO has organized or co-sponsored a number of courses and workshops in Hydrology and Water Resources during the past intersessional period which were of particular interest to the Region. These activities included: a course on Sedimentology in Fluvial Streams (Montevideo, Uruguay, November 1997) and two courses on Hydrometry and Telemetry (Itajuba, Brazil, November/December 1998). Participants from the Region attended two of the three regular courses supported by WMO had their most recent venues and dates being: the Latin American Course on Operational Hydrology (Caracas, Venezuela, March 2000) and the course on Hydrological Forecasting (Silver Springs, USA, October 2000). The Association was informed that a course for hydrological technicians will

soon be available on the MSC's WEB site. The Association recommended more courses should be held for English-speaking countries.

8.12 The Association was informed of the work carried out by the expert on Hydrological Models for Forecasting appointed by CHy-X with respect to the organization of a workshop related to a flash flood threshold pilot project, planned in coordination with representatives of WGHs of the RA III and RA IV. The Association was further informed that, during the last session of the RA III WGH (Santiago, Chile, October 2000), the Hydrological Adviser to the Permanent Representative of Colombia offered to make the necessary arrangements to host the workshop in Bogota. The Association recommended to support the workshop.

8.13 The Association noted that the chairman of the CHy Working Group on Applications had represented CHy at the Symposium on Flood Forecasting for the Americas held in Brasilia, Brazil, from 16 to 19 November 1999.

8.14 The Association was informed on the development of various HYCOS components and that a new proposal on CARIB-HYCOS had been prepared in December 2000. The Association noted the developments that had taken place in many countries with the support of the US Geological Survey and Canada and recommended to start with the implementation phase.

8.15 In relation to other technical cooperation activities in the field of water in the Region, the Association was informed of the implementation in Mexico, under a World Bank loan, of the National Water Resources Management Project (PROMMA). It was also informed of the preparation of project proposals on 'Support to Natural Disasters Prevention and Water Resources Management' for countries affected by Hurricane *Mitch* (Guatemala, Honduras, El Salvador and Nicaragua). More information can be found under item 10 of this report.

8.16 The Association welcomed the adoption of Resolution 25 (Cg-XIII) — Exchange of Hydrological Data and Products, as the basis for increased cooperation between countries, noting that it could help in the growing need to assess and manage water resources on a regional basis involving, in particular, rivers and other bodies of freshwater which extend across international borders. The Association requested that Regional Hydrological Advisers should be included in the process of preparation and approval of the guidelines of the application of the Resolution.

8.17 The Association was informed that WMO is cooperating with the UNCCD Secretariat in the organization of a workshop on Watershed Management for Latin America and the Caribbean. WMO has prepared a report on transboundary water resources management, which will be discussed during the workshop.

8.18 In relation to cooperation with non-governmental organizations, the Secretary-General advised the Association of developments since its last session as regards the Global Water Partnership (GWP). The Association noted the new dimension that this body and others, such as the World Water Council (WWC), brought

to international activities. The Association noted that GWP was an NGO and that the involvement of governmental institutions will be necessary when implementing any projects. Therefore RA IV recommended that the WGH should coordinate with the relevant bodies of the GWP.

9. EDUCATION AND TRAINING PROGRAMME (ETRP) - REGIONAL ASPECTS (agenda item 9)

GENERAL

9.1 The Association examined the information on the implementation of ETRP in the Region since its last session (Nassau, Bahamas, 12 to 21 May 1997). In noting with appreciation the progress achieved and the assistance provided to Members in developing their human resources, the Association stressed the importance of education and training to Members of RA IV and that such activities were fundamental for the success of all WMO Programmes.

9.2 The Association was pleased to note Chapter 6.6 of the 5LTP (2000-2009) as adopted by Thirteenth Congress (May 1999) and urged its Members to ensure that all the necessary actions were taken to meet the objectives of the Plan.

HUMAN RESOURCES DEVELOPMENT

9.3 The Association re-affirmed the importance of the human resources development for NMHSs, particularly in developing countries, in order to allow them to plan and mobilize the financial and other resources to meet Members training needs. In this respect the Association noted that only 30 per cent of its Members answered the 1998 survey of Members' training requirements for the thirteenth financial period (2000-2003) questionnaire and that the results of the survey were published as WMO/TD-No. 946.

9.4 The Association also noted that the survey carried out by the WMO Subregional Office for North America, Central America and the Caribbean offers important information on the status of current human resources for the Region as a whole as well as individual member countries. The Association was pleased to note the initiative of WMO, with the kind assistance of the United States, aimed at developing projects to satisfy both near- and long-term education and training requirements regarding continuing and specialized training. The Association noted the establishment of a Trust Fund 'RA IV Human Resources Development' to provide financial support to suitable candidates from RA IV to undertake training at professional meteorologists standards, and to meet all the costs related thereto. It requested Members to make efforts to contribute to this fund and to enhance their support to long-term and professional level training requirements in the region.

9.5 Noting the identified increase in the number of personnel to be trained, the Association encouraged its Members to make every effort to become self-reliant in the basic training of meteorological and operational hydrological personnel. The Association encouraged cooperation

and coordination among Members, on education and training activities to better meet the expressed needs and to use available capabilities effectively.

TRAINING ACTIVITIES

9.6 The Association noted that a number of training events had been organized or co-sponsored by WMO and that the wide range of topics addressed, especially on events of direct relevance to tropical cyclones, management of meteorological services and the use of new technologies. The Members of the Association also had the opportunity to benefit from other training events organized and hosted by national or international institutions, with partial financial support from WMO. In this regard the Association expressed its appreciation to the United States for the organization of training courses which were especially designed for Senior Managers in NMHSs of the Region, and for the provision of fellowships to allow participants to attend those courses. These events, which were listed in WMO Annual Reports, covered a wide range of subject areas of interest to the Region. The Association encouraged Members to report to the WMO Secretariat relevant information on training activities to ensure that forthcoming events are successfully organized, and to include in the proposals for the fourteenth financial period adequate suggestions to address the needs of the Region.

9.7 The Association noted that the quadrennial WMO Symposium on Continuing Education and Training in Meteorology and Operational Hydrology was successfully held in Tehran, Islamic Republic of Iran, in November 1999. The Association agreed that the recommendations of the Symposium were of considerable value as a guide to Members in their efforts to strengthen their human resources by improving the skills and knowledge of staff through continuing education and training.

9.8 The Association noted with satisfaction that participants from RA IV had attended the WMO Regional Training Seminar for National Instructors of RA III and RA IV held in Lima, Peru, from 11 to 22 September 2000. The Seminar aimed at developing and promoting new techniques for training of meteorological personnel and at upgrading the knowledge of instructors from WMO Regional Meteorological Training Centres (RMTCs) and national training institutions in specific subjects of meteorology.

9.9 The Association expressed its gratitude to those Members, as well as to Members from other Regions, who had made their national training facilities available for the training of meteorological and operational hydrological personnel in RA IV. The Association invited its Members to participate actively in the provision of training services to Members from other Regions and to WMO RMTCs. The Association agreed that it would be necessary to attract additional financial, manpower and other resources to enable the various identified training requirements to be met.

9.10 The Association noted with appreciation the activities of the Standing Conference of Heads of Training Institutions of National Meteorological Services

(SCHOTI). In particular, the fourth International Conference on Computer-Aided Learning (CAL) and Distance Learning in Meteorology which was held in Helsinki, Finland, from 14 to 18 June 1999 and organized by the SCHOTI Working Group on CAL. The Association noted with appreciation that the fifth meeting of SCHOTI endorsed the creation of a new working group to assist and promote the initiation of a web-based network that would link the WMO RMTCs and other training institutions together.

9.11 The Association noted with satisfaction the information on the activities of the WMO Training Library and the use made of its services by the Members. It also appreciated the continuous updating of the Virtual Training Library (VTL) in an effort to provide the latest and most suitable available training material through the Internet (<http://www.wmo.ch>), and recommended that those actions should be encouraged and continued. In this regard, the Association suggested that links should be established to include research centers, universities and other institutions working on hydro-meteorological applications for areas such as agriculture, environment, tourism, water resources and hydro-electric power generation. In this context, the Association noted the proposal made by the RMTC in Venezuela to introduce a specialization course in operational hydrology, which could be delivered through the Internet, virtual and traditional classroom courses and field activities.

REGIONAL METEOROLOGICAL TRAINING CENTRES (RMTCs)

9.12 The Association noted with appreciation that WMO RMTCs in the Region continued to carry out satisfactorily their routine training programmes and to organize specialized courses in response to the needs of Members in the Region, as well as in other Regions. In urging its Members to make the maximum use of the training programmes offered by the RMTCs, the Association agreed with the need, stressed by Thirteenth Congress, for more emphasis to be placed by RMTCs on regional training requirements for specialized courses in various subject areas. In this connection, Members were requested to assist RMTCs in organizing courses, through the provision of instructors for short-term assignments, relevant training materials, and other assistance under bilateral and multilateral arrangements.

9.13 The Association recommended that for the RMTC network in the Region to become more efficient and focused on the highest priority needs, RMTCs should maintain contact with Member countries to monitor their training needs and to respond to short-term and immediate urgent needs for trained personnel. The Association further recommended shortening the duration of long-term training by choosing candidates with university degrees or who have gone through a basic university course in their home countries, and to adapt RMTCs training programmes in order to make full use of the recess period.

9.14 The Association was pleased to note the proposal from the RMTC in Venezuela to continue the

organization of the international graduate course in Operational Hydrology which was organized in 1997 and 2000, and to carry out courses in hydrological models to contribute towards the preparedness and prevention of extreme weather events, as well as a course in Applied Climatology. The Association was also pleased to note the offer of the Government of Venezuela of introducing the capacity to training Meteorologists at the technical level through its Technical School of Aviation, located in Maracay, thereby extending the present capacities of the existing RMTc hosted by the Universidad Central de Venezuela. The Association endorsed this initiative, bearing in mind the potential benefits this offer represented for the Region. The Association requested the WMO Secretariat to ensure that the corresponding curricula is in conformity with established WMO guidelines and standards and to assist Venezuela in establishing and operating this new programme.

9.15 The Association expressed its appreciation for the proposal from the University Corporation for Atmospheric Research (UCAR), and specifically from the COMET and Unidata programmes, to establish a pilot project called MeteoForum. The project will strengthen and extend the capabilities of RMTcs in RA IV and RA III and, through the RMTc trainees, strengthen the capabilities of NMHS in the region. The Association endorses this proposal and encouraged the RMTcs and UCAR to implement this initiative with the support of the WMO Secretariat.

9.16 The Association was pleased to note that a meeting of Directors/Principals of WMO RMTcs was held on 11 November 1999 in Tehran, Islamic Republic of Iran and a meeting of Directors/Representatives of RMTcs in Argentina, Costa Rica and Venezuela was held on 14 September 2000 in Lima, Peru. The Association encouraged Members to strengthen the interaction among RMTcs and with other training and education centres, particularly from advanced countries, to bridge the present scientific and technological gap. The Association endorsed the establishment and maintenance of the RMTcs Web pages on the Internet and requested Members to explore eventual external support for the provision of hardware and software to establish such Internet connections.

9.17 The Association also noted that the meeting of Directors/Principals of WMO RMTcs had nominated a representative and an alternate to serve as a member of the Coordinating Committee (CO-COM) of SCHOTI.

NEW WMO CLASSIFICATION OF METEOROLOGICAL AND HYDROLOGICAL PERSONNEL

9.18 The Association noted that in accordance with the recommendation of Twelfth Congress, the new WMO Classification of personnel in meteorology and operational hydrology, comprising the two broad categories common to meteorological and operational hydrological personnel, had been approved by the fiftieth session of the Executive Council (Geneva, June 1998) and endorsed by Thirteenth Congress to be

effective from 1 January 2001. It was agreed that the actual implementation of the new classification should be gradual, in recognition that some NMHSs may require a longer transition period, but that it should not exceed four years.

9.19 The Association was pleased to note that, with respect to the new classification, a preliminary issue of Volume I of the *Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology* (WMO-No. 258) was issued and distributed to Members in June 2000. It also noted that Volume II - Hydrology will be ready in the first semester of 2002. The Association invited its Members and WMO RMTcs in the Region to take the necessary action for the appropriate implementation of the new classification and related curricula in the education and training process.

EDUCATION AND TRAINING FELLOWSHIPS

9.20 The Association noted that training through the provision of fellowships under the various components of WMO's Technical Cooperation Programme (TCOP) continued to be an effective way of assisting Members in the development of their required manpower. However, in noting that available financial resources did not allow all the needs of the Region to be met, the Association requested Members to consider the possibilities of meeting their requirements by using, to the maximum, the available facilities in the Region and by strengthening cooperation between countries through bilateral and multilateral schemes.

9.21 The Association expressed its appreciation to the authorities of the United States for maintaining a South American Desk and a Tropical Desk at the WMC in Washington D.C. which provides VCP short-term fellowships to operational meteorologists from the Region to enable them to obtain practical hands-on experience in the day-to-day workings of the WMC. The Association also noted with appreciation that Spain has offered many fellowships for on-the-job training in meteorology in Spain.

9.22 The Association expressed its appreciation to those Members from RA IV, as well as to Members from other Regions, particularly Spain which had provided training fellowships, and had arranged study programmes and tours for the benefit of many Members of the Region.

RAPporteur ON EDUCATION AND TRAINING

9.23 In view of continued pressing needs by Members for capacity building and human resources development in meteorology and specialized subjects essential to economic and social development in the Region, the Association agreed to nominate a Rapporteur on Education and Training Matters in order to coordinate and carry out an in-depth study of regional training needs.

9.24 The Association, accordingly, adopted [Resolution 14](#) (XIII-RA IV), which established the terms of reference of the rapporteur and requested that annual progress reports and a final report should be submitted

to the president of the Association, not later than six months prior to the fourteenth session of the Association.

10. TECHNICAL COOPERATION PROGRAMME (TCOP) – REGIONAL ASPECTS (agenda item 10)

GENERAL

10.1 The Association noted with satisfaction the assistance provided to NMHSs of countries in the Region. During the period between 1997 and 2000 WMO continued developing initiatives and projects responding to national and regional requirements of NMHSs of RA IV countries, particularly in the Central American and Caribbean region. The Association expressed its appreciation to donor Members and agencies who have contributed to the funding of technical cooperation activities in the region.

10.2 The Association noted that WMO continued the promotion of technical cooperation activities of RA IV Members, taking into account the new world scenario, including policies and procedures of funding agencies, the increased requirements of NMHSs, as well as the areas in which WMO has unique experience and advantages. Several innovative approaches for the mobilization of resources for the Programme have been developed, including:

- (a) Agreements between WMO and development banks;
- (b) Promotion of trust fund projects;
- (c) establishment of systematic contacts with development agencies; and,
- (d) Enhancement of relationships with the UNDP and other UN agencies.

10.3 The Association took note that WMO has concluded Memoranda of Understanding with the World Bank and with the Inter-American Development Bank (IDB) to develop joint initiatives and projects in the areas of natural disaster prevention and mitigation, climate change, water resources management and others. The cooperation with the IDB will lead to the development of a portfolio of projects based on the results of the Ibero-American Climate Project and the ENSO Study, as well as other activities of mutual interest to the Bank and to WMO.

10.4 The Association welcomed WMO's continued efforts to assist NMHSs and Governments through coordinated efforts of the Secretariat, especially TCO and the Regional Office for the Americas in Paraguay and the Subregional Office in Costa Rica, in mobilizing resources for the development of meteorological and hydrological services in support of the economic and social sectors. The Association also noted that several Members received assistance in the development of new projects in support of national and regional meteorological and hydrological projects. In this context, the Association encouraged Members to regularly provide information to the WMO Subregional Office, on planned and ongoing bilateral or multilateral projects concerning NMHSs in the region, thus allowing the Office to assist donors and recipients in coordinating their efforts.

ASSISTANCE PROVIDED DURING THE PERIOD FROM 1997 TO 2000

10.5 The Association expressed its satisfaction with the results obtained in the implementation of various projects in RA IV, especially the feasibility study of the Ibero-American Climate Project completed for Costa Rica, Mexico, El Salvador, Colombia and Venezuela which will serve as master plans for the modernization of the NMHSs of these countries. The Association noted that some of these countries have begun to secure funding for the implementation of the projects developed, and requested the WMO Secretariat to assist in liaising with the relevant national authorities and funding agencies concerned, especially the IDB. The radar networking system project supported by the European Union is being implemented and will benefit the Caribbean region by providing early weather warnings on hurricanes and severe weather. The Association re-iterated that this was a very important project for the Caribbean region and encouraged the CMO and other concerned entities, which includes France, to pursue their efforts to accelerate the full implementation of the project.

10.6 The Association noted that the feasibility study on the prediction and amelioration of socio-economic impacts of *El Niño* in Latin America and the Caribbean region which is funded by the Inter-American Development Bank is in progress. The study foresees the design of feasible Regional/Subregional early warning systems to ameliorate the socio-economic impacts of ENSO. The International Research Institute for Climate Prediction (IRI), NOAA's office of Global Programmes (NOAA/OGP) and IFPRI are assisting WMO in the implementation of the study.

10.7 The Association further noted that the SIDS-Caribbean project approved at the end of 2000 and funded by the Government of Finland will contribute to improvements to the telecommunication systems at national and regional levels; the rehabilitation and upgrading of the observing network; the renovation of the regional technical laboratory for the calibration and maintenance of instruments; the upgrading of the database management systems; the implementation of data rescue programmes; and human resources development and awareness building. The SIDS project will benefit CMO Member countries, such as the Bahamas, Cuba, Dominican Republic, Haiti and the Netherlands Antilles and Aruba. The Association expressed its appreciation to the Government of Finland and to the WMO Secretariat for the development of this initiative and requested the Secretariat to ensure the successful implementation of the project.

10.8 The Association was informed that WMO had continued providing technical assistance services to Mexico's large-scale water resources project (PROMMA) funded by the World Bank. The main achievements obtained so far include, among others, the completion of the network re-design of hydro-climatological networks in 14 priority river basins in Mexico, the development of a Hydrological Information System (HIS) for the Rio Bravo Basin where 44 automatic stations (DCPs) with satellite links were established and the personnel

trained. As a result of this technical assistance a total of 58 technical reports have been prepared and distributed to all areas of the National Water Commission (CNA) that participate in this project. The Association noted that the PROMMA project constituted a good example of national efforts to develop NMHSs and encouraged Members to exchange their experiences on such initiatives such as the one being carried out in Venezuela through the VENEHMET project.

10.9 The Association noted with appreciation that the implementation of the WMO/IAI/GEF Project 'Regional Cooperative Activities in Support of Climate Change Research in IAI countries' had been completed in 1998. RA IV countries participating in the RA IV project included Colombia, Costa Rica, Cuba, Dominican Republic, Guatemala, Mexico, Panama and Venezuela. Activities carried out in most participating countries included support in the installation of workstations and GIS-SPRING software, international and national training seminars and formal training through fellowships.

10.10 The Association also noted that several other important projects were being implemented in the region, in particular pilot projects such as the CARMEN project, the development of Web sites for NMHSs of the region and regional maintenance and support projects. It encouraged the development and expansion of similar projects in the region.

10.11 The Association recognized the important role of the VCP in the Region. Most of the developing Member countries in RA IV received assistance from VCP aimed at facilitating their effective participation in the WWW and other scientific and technical programmes. It noted with appreciation that 18 Members received support for a total of 46 VCP projects for equipment between 1997 and 2000. Of these projects, 24 were completed and 22 are in the process of being implemented: fourteen projects were aimed at re-entering upper-air observing stations, three at re-entering surface observing stations, two for data processing systems, 17 related to aeronautical meteorology activities and 10 for hydrological activities. In spite of the support obtained between 1997 and 2000, 15 valid projects have not received support as of 31 December 2000. The Association expressed its appreciation to major donors, namely Canada, France, Finland, the United Kingdom and the United States for their continued support to NMHSs in the region. The Association encouraged Members to participate actively with VCP. In this connection, the Association noted that one of its Members, Haiti, had not been participating in relevant activities and noted that the WMO Secretariat was taking steps to assist Haiti in this regard.

10.12 The Association was informed that 87 fellowships had been implemented under the WMO regular budget and the VCP. The fellows completed their training, while 16 fellows continued their studies into the year 2000. Despite these efforts, the Association re-iterated the need for further support in human resources development to ensure that NMHSs are able to have adequately trained staff in the next few years. The

Association's views on this matter are reflected under agenda item 9: Education and Training Programme.

10.13 The Association was also informed on the third session of the EC Advisory Group of Experts on Technical Cooperation held in May 2000 which made recommendations to the fifty-second session of the Executive Council on: the VCP coordinated programmes; allocations of the VCP(F); the concept of the establishment of an Emergency Assistance Response Team (EART) for timely; and coordinated assistance to NMHSs affected by disasters. The main mission of the EART which will be composed of representatives from the affected country, donors, regional organizations, experts and the WMO Secretariat including the relevant Regional/Subregional Office, is to assist in ensuring a coordinated response in the identification of the most urgent requirements and in the rehabilitation process of the meteorological and hydrological infrastructure of affected countries. The Association encouraged Members to participate in, and contribute to, EART activities. It further suggested that the EART could play the role of a clearing house to assist donors in coordinating their efforts, especially in the provision of meteorological and hydrological information during emergencies.

10.14 The Association endorsed the following:

- (a) Efforts will be made to continue the mobilization of resources for already formulated projects, or those under formulation, such as the Ibero-American Climate Project, the ENSO Study, the Carib-HYCOS project, and the natural disaster prevention project proposals for Central American countries.
- (b) WMO will continue supporting the implementation of the SIDS-Caribbean project, the ENSO Study, Mexico's large-scale water resources management project (PROMMA), the radar network for the Caribbean countries, as well as the development of new projects and joint initiatives with the IDB, the World Bank, GEF, UNDP, and other sources of funding.
- (c) As recommended by the Executive Council, WMO will develop stronger partnerships with NMHSs for the development and implementation of joint projects and programmes and for resource mobilization from bilateral and multilateral agencies and for further collaboration with the private sector, foundations and NGOs;
- (d) To support requirements made by NMHSs, a more constant and systematic contact with development funding Agencies will be developed by keeping updated the areas supported by these agencies, as well as the procedures to follow when submitting requests for funding.

10.15 The Association, considering the various requirements of the region, agreed that there was a need to develop a strategic approach to major issues such as observing networks, telecommunication facilities, and the provision of services to the user community, modelled on similar plans developed in RAs II and V. The Association requested the WMO Secretariat to assist NMHSs in the development of their national plans and

to assist in the development of a regional strategy plan for the enhancement of NMSs in the Region.

11. INFORMATION AND PUBLIC AFFAIRS ACTIVITIES (IPA) (agenda item 11)

11.1 The Association recalled that Resolution 22 of Thirteenth Congress had underlined the need for greater visibility of the Organization and NHMSs, the importance of communications in mitigating the devastating impact of the current trends of extreme climatic variability and the necessity for a WMO Global Communication Strategy to guide and enhance the process of making NMHSs and WMO more visible and better appreciated.

11.2 This Global Communication Strategy of the Organization comprises five basic elements: the need for the NHMSs to identify themselves as an integral part of the WMO system; constituency-building both at national and regional levels; development of effective key messages giving a local voice to a global undertaking and vision; fostering strategic alliances with the media; and promoting a communication culture through which to demonstrate the great relevance of WMO and NHMSs in the daily lives of all citizens of the world. In this context, the Association noted with appreciation, the increased cooperation with the mass media particularly, in the United States and Canada on the occasions of the 9th International Weather Festival in Quebec, April 1999, the 28th AMS Broadcast Meteorology Conference, (Orlando, USA, June 1999) and the 29th AMS Broadcast Meteorology Conference, (San Francisco, USA, June 2000) and the extensive media coverage of the 5th meeting of the Directors of NMHSs of the Ibero-American Countries, (Nicaragua, 1998).

11.3 In response to Resolution 22 of Thirteenth Congress, the Association invited its Members to ensure mutual assistance and support in matters related to public information and communication, including partnerships and constituency-building, resource mobilization and closer cooperation with the media, non-governmental organizations and advocacy groups, academic circles, parliamentarians, the private sector and corporate foundations and other civil society institutions and public entities. Within this context, the Association welcomed the decision of fifty-first session of the Executive Council to celebrate the World Meteorological Day 2001 with the theme 'Volunteers for Weather, Climate and Water'. It underlined that the theme gives NMHSs the possibility to honour their volunteers and their Region's multiple and fruitful volunteering experiences, and to take advantage of WMO's collaboration with the United Nations Volunteers (UNV) in commemorating 2001, which was designated as the International Year of Volunteers, as well as to network and enhance collaboration with the civil society at large.

11.4 The Association welcomed the new emphasis on enhancing the WMO Media Alliance Initiative launched in 1995, in particular the expansion of WMO's outreach to television networks and communication professionals around the world with a view to fostering

greater public awareness of the role and services provided by WMO and the NMHSs and their indispensable contribution to the socio-economic development and progress of all nations. The Association noted with satisfaction the fruitful participation of a large number of television weathercasters from the United States, Canada and Venezuela in the weather festival, press conference, round table discussions and scientific media conference on climate change held at WMO during the celebration of the 50th Anniversary of WMO which were held concurrently with World Meteorological Day (WMD) in March 2000, and the use by many of them of the live TV transmission facility from WMO Headquarters. The Association also noted that a number of additional events were organized at WMO Headquarters during the week 18 to 23 March 2000 with a view to enhancing the image of WMO and NMHSs, including open days and school visits.

11.5 The Association welcomed the increasing emphasis on media training, particularly broadcast media, to reflect current trends of climatic change and variability and other events such as *El Niño*, the depletion of the ozone layer, and growing water scarcity. It has also welcomed the IPA training programme for the current financial period, which includes a media training workshop for Region III with the participation of experts from Region IV; thus, fostering Inter-American Cooperation improvement of the quality of media communication and presentation skills.

11.6 The Association noted with appreciation the number of public information products developed and distributed to all Members in support of national plans for the celebration of the 50th WMO Anniversary. These included a Message by the Secretary-General, a Year 2000 calendar, a series of posters, a brochure on the theme of the World Meteorological Day, a special information kit with a series of media briefs on WMO Programmes, the WMO50 video and other materials, including a radio programme, public service announcement video spots and a special brochure for teenagers. Kensington Publications, a UK Publisher, also published a special publication entitled 'Weather, Climate and Water' in conjunction with WMO50, including several contributions from the Region. The Association noted with appreciation the large contributions of Members of the Region to the celebration of the 50th Anniversary through the organization of special commemorative events and production of commemorative items such as stamps, calendars among others.

11.7 The Association also noted with appreciation the development of a special WMO50 Web site, the WMO50 Home Page, which were linked to the home pages of Members' NMHSs. The Association further called upon the Secretariat to establish specific pages for the activities of the public information activities of the Regions as part of the IPA home page, and the addition of a Spanish version to the Public Information section particularly News and Press Releases.

11.8 The Association called upon Members to take appropriate measures to support the IPA Programme, to

develop an active public information programme at national and regional levels, and to provide a local voice to the WMO Global Communication Strategy.

11.9 The Association noted with satisfaction the efforts of the Subregional Office for North and Central America and the Caribbean as an information focal point in the WMO Secretariat for the Region. In order to enhance WMO's IPA Programme in the Region, it requested the Subregional Office to further strengthen its links with the Members of the Association.

12. LONG-TERM PLANNING - REGIONAL ASPECTS (agenda item 12)

12.1 The Association noted the adoption by Thirteenth Congress of the Fifth WMO Long-term Plan (5LTP) covering the period 2000-2009. It further noted that regional associations, among others, were requested to adhere to the policies and strategies set forth in the Plan and to organize their activities to achieve the main long-term objectives as defined in the Plan.

12.2 The Association expressed its appreciation for the publication of the 5LTP and a separate summary for decision makers which focused on the benefits to countries that will accrue from the successful implementation of the Plan.

12.3 The Association recalled that Thirteenth Congress had decided that the Sixth WMO Long-term Plan (6LTP) should be prepared. In so doing, Congress requested the Regional Associations to:

- (a) Provide a forum for consideration of the Plan and, in particular, to provide an integrated view of their respective activities and priorities within the context of the 6LTP;
- (b) Coordinate, as necessary, national contributions to regional projects of the Plan.

PREPARATION OF THE SIXTH WMO LONG-TERM PLAN (6LTP)

12.4 The Association noted that some Members from RA IV are involved in the Executive Council Working Group on Long-term Planning and agreed with the overall scope and direction of the 6LTP. The Association expressed the view that developing a plan that covers eight years may be an unreasonable timeframe and suggested that only the first four years should be identified as the plan and the subsequent four years should be more accurately identified as an outlook or strategy.

12.5 The Association noted that the vision statement and goals being developed accurately reflected core activities. The desired outcomes, namely: improved protection of life and property; increased safety on land, at sea and in the air; enhanced quality of life; sustainable economic growth; protection of the environment; and enhanced WMO effectiveness, resonate beyond NMHSs and will be useful for communicating their contributions to the public good and economic prosperity.

12.6 The Association recalled the concerns expressed by many Members on global and regional issues affecting their operations and the extreme importance of this planning process to consider these pressures. It noted that the socio-economic environment under which we

all must operate is changing the role and operation of NMHS and demanding more precision in our contributions to national goals. The Association felt that many of these concerns were captured within the global perspective and other preambles to the Plan. However, concerns were expressed on how to reflect the concerns of smaller NMHSs such as those in SIDS, in the LTP process, as these are very different than those of larger Members.

12.7 In terms of regional priorities, ensuring a robust and integrated observing system for weather, water and climate is a common goal, but the Association agreed that it would be necessary to consider how best to articulate regional goals in the global context. The Association agreed that the Region should develop a strategy for the development of meteorology and hydrology in the Region such as those formulated in RA II and RA V. The Association urged the president in liaison with the WMO Secretariat to undertake the process and to ensure the inputs of Members of the Region.

LONG TERM PLANNING PROCESS

12.8 The Association noted that the activities related to the LTP process have been carried out in isolation from the user community. The Association urged the Working Group on Long-term Planning (WG-LTP) and the Secretary-General to discuss WMO's vision, outcomes, strategies and associated goals with representatives of the private sector including media, instrument manufacturers and other users, as well as consumers of our information and services. It was also emphasized that the academic community needed to be fully engaged to help build partnerships in research and in fundamental education and training programmers for the sustainability of NMHSs. To this end, they encouraged the WG-LTP to engage, at an appropriate stage in the discussions, users and consumers of our information and services beyond the UN System.

MONITORING AND EVALUATION OF THE 6LTP

12.9 The Association, though recognizing the difficulty in developing performance measures for the activities of the Organization, supported the need for effective evaluation tools. It was noted that impacts on the viability and operations of NMHSs is the ultimate measure upon which the effectiveness of WMO and its programmes should be measured. The Association also noted that developing the LTP with clearer budget allocations would assist Members in making informed decisions on future WMO programmes.

MONITORING AND EVALUATION OF THE 5LTP

12.10 The Association noted that the initial evaluation period of 2000-2001 would be available in 2002 and agreed that a regional perspective of the outcomes of the 5LTP be conveyed to Fourteenth Congress in 2003. The Association requested its president to ensure the provision of relevant information to the monitoring and evaluation process.

REVIEW OF THE WMO STRUCTURE

12.11 The Association noted the work of the EC Task Team on WMO's Structure was in its early stages and that no information was yet available on their deliberations. The Association also noted that consistency between the 6LTP and the programme elements within a restructured WMO was essential. The Association encouraged the Task Team to communicate its findings at an early stage and asked the President to monitor progress and provide input on behalf of the Region. It was also noted that the authorities granted to Regional and Subregional offices be reviewed so that they may be harmonized to improve the efficiency of programme delivery.

GENERAL DISCUSSION

12.12 The Association urged the president, and all Members of RA IV, to follow closely the developments of the 6LTP. Further, as was noted in paragraph 12.8 above, that work commence with some urgency on developing a regional strategy for meteorology and hydrology in RA IV that reflects the global outcomes and goals stated in the Plan.

13. ROLE AND OPERATION OF NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES (NMHSs) (agenda item 13)

13.1 The Association recalled that Thirteenth Congress had discussed the role and operation of NMHSs, including issues, among others, on:

- NMSs and alternative service delivery;
- Legal instruments;
- Status and visibility of NMHSs;
- Capacity building;
- Provision of aeronautical meteorological services;
- Partnership and cooperation (with the media, private sector, academia and environmental agencies).

13.2 It noted that the Executive Council had provided guidelines on the role and operation of NMSs and that on the basis of this guidance, Thirteenth Congress adopted Resolution 26 which invited Members to take relevant actions to enhance the role and operation of NMSs.

13.3 The Association also recalled that Thirteenth Congress felt the need to draw the attention of States and Governments to various areas of concern relating to the functioning of NMSs and adopted the Geneva Declaration of the Thirteenth World Meteorological Congress. All the Members of RA IV were provided with copies of the Geneva Declaration. The Permanent Representatives of Members of WMO were requested to identify which authorities they wished the Declaration to be sent to. On the basis of responses from RA IV Members, five communications were addressed to high-level government authorities, including Heads of States and Governments.

13.4 The Association noted that Congress requested EC to keep this matter under review, and EC, in turn, established its Advisory Group on the Role and Operation of NMHSs to assist it in this area.

13.5 The Association also noted the discussions and decisions made by EC on the Role and Operation of NMHSs during its fifty-second session. These covered the following areas:

- Major issues facing NMHSs;
- Cooperation with related data and service providers;
- Involvement of the media, the private sector and academia in the work of WMO and the NMHSs;
- Cooperation with other international organizations and representatives;
- Definition of relevant terms;
- Role and operation of NMHSs.

13.6 The Association was informed that the following were expected to be produced in due course:

- (a) A WMO Policy Statement on the Role and Operation of NMSs which either confirms, updates and/or refines the EC Statement of April 1999 on NMSs, and alternative service delivery and elaborates the Geneva Declaration adopted by Thirteenth Congress;
- (b) A consolidated set of *Guidelines on the Role and Operation of NMSs*, making use when possible of relevant WMO materials already available;
- (c) A comprehensive EC report to Fourteenth Congress on action taken in response to Resolution 26 (Cg-XIII), possibly including proposals for the modification of the WMO Convention and Regulations to more clearly represent the essential role and primary responsibilities of NMSs in carrying out the objectives of WMO.

The Association was also informed that the Council agreed that similar tasks in respect of the role and operation of NMSs would be carried out.

13.7 Members of the Association expressed their views and shared their relevant experiences on the role and operation of NMSs. Among others, the Association recognized that NMSs should continue their efforts toward responding to major challenges such as globalization, the market economy, modernization, alternative services delivery, international data exchange, relations with the media and the private sector, and the search for legal instruments. The Association considered that attention should be given to ensuring that NMSs are recognized and designated as the single authoritative national source of meteorological warnings during major meteorological or hydrological related disasters and their follow-up after such events occur.

13.8 In connection with the various related topics such as those identified in paragraph 13.5 above, the Association was of the view that:

- (a) It was necessary to define clearly the basic functions of NMHSs, as well as their constraints, so as to permit NMHSs to coexist and interact in harmony with private sector service providers;
- (b) While Governments generally assigned the responsibility for protecting the life and property of their citizens to NMHSs, the major changes which had taken place in recent years obliged NMHSs to go

further and consider other alternatives given their justifications and financial implications;

- (c) In considering various alternatives available for NMHSs, it was necessary to take into consideration the education and training of managers so as to improve their management techniques.

13.9 The Association agreed that, as far as the Region was concerned, the main concerns involving challenges and opportunities for the Members were:

- (a) With the progress and development in recent years of information provision through the Internet, especially in developing countries, an enormous amount of information, such as weather warnings and advisories, is being provided to the public from sources outside their countries;
- (b) While the quality of certain advisories, warnings and forecasts from external sources may be good, their presentation may not be, which may lead to incorrect interpretations that tarnish the image and undermine the credibility of the NMHSs. The effects are all the more pernicious for the NMHSs if account is taken of information emanating from places of questionable credibility operating without any form of supervision;
- (c) In the future, NMHSs will need to redefine their roles and will have to be able to count on appropriate legal support in doing so;
- (d) Globalization has brought with it changes for NMHSs which make necessary both a reduction of costs and the integration of better science and technology to allow the Services to work differently;
- (e) Many of the activities currently carried out nationally can be conducted at the regional level;
- (f) It is important that more discussions, and more in-depth reflection take place concerning the future of NMHSs.

14. INTERNATIONAL STRATEGY FOR DISASTER REDUCTION (ISDR) (agenda item 14)

14.1 The Association noted with appreciation the report on activities and efforts to meet the goals of the IDNDR during the last four years. The IDNDR came to an end in December 1999 and the Association was informed of the closing events of the IDNDR and the new structure for continuing natural disaster reduction activities beyond the Decade.

14.2 The Association particularly expressed its appreciation to the Secretary-General for the leading role played by WMO through its major scientific and technical programmes in support of the IDNDR efforts as regards the mitigation of, and preparedness against, natural disasters of meteorological and hydrological origin. The Association was informed that an IDNDR Programme Forum under the title 'A Safer World in the 21st Century: Disaster and Risk Reduction' had been successfully held in July 1999 as the consolidation and closing event of the Decade. The Association noted with satisfaction that WMO and UNESCO, as the two principal United Nations agencies concerned with the scientific and technological aspects of disaster

reduction, convened a 'Sub-Forum on Science and Technology in Support of Natural Disaster Reduction' as a special contribution to the IDNDR Programme Forum. The participants at the Sub-Forum, which included several experts from RA IV, came from both the natural and social sciences and had both research and operational background in developing and developed countries. The Sub-Forum reviewed the various ways in which science and technology contribute to the disaster reduction process in particular, through:

- Assessment of vulnerability and enhancement of community awareness of the nature of the risk;
- Operation of integrated warning systems; and,
- Preparedness and education programmes.

The Sub-Forum reviewed recent progress and discussed future prospects in each of these three aspects of the application of science and technology to the reduction of the impacts of tropical cyclones, extra-tropical storms, storm surges, severe local storms and tornadoes, sand and dust storms, drought, extreme and persistent temperatures, fire weather, floods, landslides, avalanches, volcanoes, earthquakes and tsunamis.

14.3 The Association was informed that the IDNDR had been succeeded by a new substantive programme, the ISDR that included an Inter-Agency Task Force and Secretariat. On 23 December 1999, the UN General Assembly (UNGA) adopted resolution 54/219, which provides specific guidance for the future work of the ISDR. The main objectives of ISDR are to enable communities to become resilient to natural hazards and to proceed with an approach from protection against hazards through to the management of risk. It is structured around four main themes for action: public awareness; the commitment of community and public authorities; disaster resilient communities; and the reduction of socio-economic loss. The primary function of the Task Force will be to devise strategies and policies for the reduction of natural hazards; identify gaps in existing policies and programmes; ensure complementary action by agencies; provide policy guidance; and convene *ad hoc* meetings of experts on issues related to disaster reduction.

14.4 The Association also noted that the UN General Assembly (UNGA) had passed, in the context of natural disaster reduction, a further resolution relating to international cooperation to reduce the impact of the *El Niño* phenomenon (UNGA 54/220). The Association recalled the important role that WMO had played in the work of the UN Task Force on *El Niño* in reviewing the effects of the 1997/98 *El Niño* event and in the implementation of earlier UNGA resolutions (52/200 and 53/185). The Association agreed that WMO should continue to take a central role in providing scientific guidance and technical support in the implementation of UNGA resolutions relating to the *El Niño* phenomenon.

14.5 The Association noted that WMO had been designated as a member of the Inter-Agency Task Force for ISDR and endorsed a lead role for WMO in the Task Force. It was also noted that the Secretary-General had taken various initiatives, including those at the level of

the UN Administrative Committee on Coordination (ACC/UN) and the UN Secretary-General, on the structure of the ISDR to ensure a prominent role for science and technology and the operational activities of NMHSs in the implementation of the strategy.

14.6 The Association was informed that at its first meeting the ISDR Inter-Agency Task Force had established three *ad hoc* working groups to initiate its programme of work. WMO is a member of all three groups. The first would take over the responsibilities of the UN Task Force on *El Niño* with an expanded mandate to consider all climate-related aspects of disasters; the group would be led by WMO. The second working group, with UNEP as the lead agency, would consider early warning systems for disasters. UNDP would take the lead on the third working group dealing with vulnerability and risk assessment. Subsequently, a fourth group dealing with wildland fires was established. The Association noted the strong overlapping interests between these groups and requested the Secretary-General to seek assurances that they would interact effectively in areas of common ground. The Association, recalled the significant number of serious disasters that had affected the Region in recent years, and urged its Members to contribute to the work of these groups and to regional activities being initiated under the ISDR. In this respect, the Association was informed of ongoing activity in the Region related to disaster reduction within the framework of the ISDR, which was represented by a regional ISDR unit in Costa Rica. The Association also noted that there were a number of initiatives related to disaster prevention being organized by other groups in the Region, such as those being carried out by the Pan-American Health Organization (PAHO). It was agreed that there would be considerable advantages for NMHSs in developing close relationships with such groups, including collaboration on joint projects to assess risks and vulnerabilities and to mitigate the effects of natural disasters on an operational basis.

14.7 The Association requested the Secretary-General to continue to promote the role of NMHSs in disaster preparedness and mitigation by various means. Such means might include raising awareness among senior government officials, the preparation of promotional material and the organization of forums in which the experiences of different countries in the preparation and dissemination of early warnings could be exchanged. The Association noted that disasters of long duration and extensive impacts, especially those that severely affected less developed regions of the world, frequently became issues of worldwide attention. It was common in such cases for several UN agencies and non-governmental aid organizations to become involved. The Association noted that this globalization of disaster response activities was placing increasing demands on WMO and it agreed that it was appropriate for the Organization to develop modalities to respond to the challenges. The Association was informed that natural disasters would be a major focus of interest in the review process (RIO+10) leading up to the World Summit on Sustainable Development in Johannesburg in the third quarter of 2002.

14.8 The Association also noted that disasters could occur on a wide range of timescales and could be initiated by many forms of severe or unusual weather and climate-related events. Early warning systems, therefore, need to be tailored to meet particular circumstances. However, it is essential that different systems work together effectively when necessary, for example flood warning systems and tropical cyclone warning systems. The Association took note of the increasing value in the field of disaster preparedness that could accrue from early warnings on longer timescales derived from seasonal to interannual climate predictions. It agreed that the Subregional forums that were now regularly convened to develop outlooks for various seasons provided an excellent opportunity for cooperation between NMHSs and with user communities. The Association requested the Secretary-General to continue his support to improving the scope and effectiveness of these forums, which could be implemented within the framework of CLIPS.

14.9 The Association discussed the possibility of having an agenda item at future meetings focusing on the general topic of natural disasters, including sub-items addressing ISDR and lessons learned from past disasters in the Region.

15. INTERNATIONAL EXCHANGE OF DATA AND PRODUCTS (agenda item 15)

15.1 The Association recalled the discussions, which took place at Thirteenth Congress on international exchange of data and products. It was aware that the EC Advisory Group on the Exchange of Meteorological and Related Data and Products (EC/AGE) was addressing these developments and other related issues; EC/AGE held a meeting from 29 January to 1 February 2001 and would present its recommendations to the forthcoming session of Executive Council in June 2001.

15.2 As regards Resolution 40 (Cg-XII), the Association was informed that CBS had, as requested by the EC, carried out surveys on the possible change in the volume of data and products exchanged on the GTS since the adoption of Resolution 40 (Cg-XII). It was noted that the current quantitative monitoring procedure could not adequately address that question and the issue of whether or not all data and products required by Members as essential under Annex 1 was actually being exchanged. Consequently, CBS developed a new integrated WWW monitoring methodology for data exchanged on the GTS, which would be tested soon.

15.3 The Association noted that Congress had recognized that the experience with Resolution 40 (Cg-XII) had been largely positive and that there was generally a strong commitment to make it work. The Association requested its Members to continue to observe the letter and spirit of Resolution 40 (Cg-XII), and to help increase the volume of data and products being exchanged, consistent with the WMO principle of free and unrestricted international exchange of meteorological and related data and products.

15.4 As regards Resolution 25 (Cg-XIII) — Exchange of Hydrological Data and Products, the Association

urged the Members to make available on a free and unrestricted basis, data on water quality together with data on discharge and water levels. It welcomed that a brochure had been prepared, which explained the background and intent of Resolution 25 (Cg-XIII).

16. OTHER REGIONAL ACTIVITIES (agenda item 16)

16.1 TECHNICAL CONFERENCE FOR RA III/RA IV (agenda item 16.1)

16.1.1 The Association noted with satisfaction the successful organization of Technical Conferences in previous financial periods, as they served to increase the management skills of Directors of Meteorological Services in the Region. It noted with pleasure that a similar Conference was planned during the second biennium of the thirteenth financial period.

16.1.2 In this context, the Association endorsed the main subject of the forthcoming Technical Conference, 'Meteorology and Hydrology in the Americas – Partnerships for Economic Prosperity and Sustainable Development', and requested the president of the Association to liaise with the president of the RA III to decide on the theme for the joint Technical Conference.

16.2 INTERNAL MATTERS OF THE ASSOCIATION (agenda item 16.2)

16.2.1 The Association discussed several internal matters and, in particular, made several recommendations for the preparation and conduct of RA IV sessions, these were;

- (a) For the Regional and Subregional Offices to take a more active role in the preparation and presentation of the documents;
- (b) To shorten the draft summary text by referring to items as for 'information only' either in the background portion of the documents or in handouts. This would allow Members to more easily take follow-up actions;
- (c) To distribute documents early and handle as many items as practical by correspondence;
- (d) To allow more time for discussion by shortening presentations and focusing on action items;
- (e) To shorten further the duration of RA IV sessions.

The Association noted these suggestions and requested the Secretary-General to look into ways and means of implementing these suggestions, taking due account of the concerns expressed by some Members with respect to the need to ensure that sufficient background information is available to the Session, and to have adequate expertise from relevant scientific and technical programmes.

The Association was informed about the following meetings which were considered to be of interest to the region:

- (a) Thirty-fifth Congress of the Canadian Meteorological and Oceanographic Society (CMOS) on Extreme Weather, 28 May to 1 June 2001 in Winnipeg, Canada;
- (b) International Workshop on Operational Marine Forecasting, 18 to 22 November, 2001 in Halifax, Canada;

- (c) Quadrennial Conference of Commonwealth meteorological services 18 to 22 June, 2001 in Bracknell, United Kingdom;

- (d) Second International Conference on Fog and Fog collection. 15 to 20 July, 2001 in St. John, Newfoundland, Canada.

16.2.2 The Association requested the Secretary-General to take the appropriate measures to ensure the timely distribution, including by electronic means, of documents and correspondence to Members in the Region.

17. WMO REGIONAL OFFICE FOR THE AMERICAS, INCLUDING THE SUBREGIONAL OFFICE (agenda item 17)

17.1 The Association examined the activities of the Regional Office for the Americas and the Subregional Office for North and Central America and the Caribbean since the twelfth session. It noted that these Offices continued to fulfil their functions and responsibilities as an integral part of the Secretariat. It also noted that the Regional Office provided effective support to the president, vice-president, various working groups and rapporteurs of the Association in carrying out their tasks. Mention was also made of the excellent work carried out by the Subregional Office to support the RA IV Member countries. The Association expressed its appreciation to the Secretary-General and the staff of the Regional and Subregional Offices for their continued support to RA IV activities during the intersessional period.

17.2 The Association noted with satisfaction the increasing role of the Offices as focal points and information centres for regional activities and the collaboration with Members on developing NMHSs and implementing WMO Programmes and other relevant activities of interest to the Region. It acknowledged the special effort made by the Subregional Office to contribute to the Region's new priority activities.

17.3 The Association expressed its satisfaction at the successful execution of two important regional projects: the Ibero-American Climate Project, implemented from the Regional Office in Paraguay (the feasibility study was completed in 1999), and the feasibility study for the prediction and reduction of the socio-economic impacts of *El Niño*, which was initiated in March 2000 with the Subregional Office as the implementing office.

17.4 The Association expressed its satisfaction at the commendable efforts of the Subregional Office to be in close contact with Members through visits and support to regional events and to strengthen WMO activities in the fields of meteorology and operational hydrology in the Region. It also expressed its satisfaction at the close links with regional intergovernmental organizations. The Association welcomed the work done by the Subregional Office in support of NMHSs affected by Hurricanes *Mitch* and *Keith*. It invited the Offices to continue working with regional intergovernmental organizations and to use those fora to promote meteorology and operational hydrology and environmental issues and to raise awareness of policy-makers on the role of the NMHSs and WMO in contributing to sustainable development.

17.5 The Association noted that the biannual newsletter of the Regional Office was a useful vehicle for the exchange and dissemination of information on regional activities and a mechanism for maintaining close links between the Regional Office, the Subregional Office and the Members of Regions III and IV. The Association requested the Regional Office to produce the newsletter in both hardcopy and electronic versions as needed by Members and urged Members to participate actively by contributing news items and articles. The Association acknowledged the efforts made to improve and standardize the newsletter's presentation in order to make it more attractive and easier to read.

17.6 The Association noted the importance of Regional Technical Conferences and Regional Seminars as mechanisms for exchanging know-how and training. Those activities should be given high priority and included in the draft budget for the fourteenth financial period. The Association proposed that a Technical Conference be organized jointly with RA III in 2002 (see also item 16.1).

17.7 The Association expressed its satisfaction at the efforts made by the Secretary-General in organizing and conducting the Regional Technical Conference for RAs III and IV (Managua, Nicaragua, 1-6 November 1998), and the Regional Seminar on the Impact of the *El Niño* Phenomenon for RAs III/IV in Lima, Peru. With respect to the next Regional Seminar, the Association noted that it would be held jointly with RA III in November 2001, and would be on the commercialization of the activities of NMHSs.

17.8 In connection with the Subregional Office for North and Central America and the Caribbean, the Association noted that, following the decision by Congress, a study had been carried out to assess the operation of the Subregional Offices and the report of that study had been considered by the EC-LII. The Association also expressed its thanks to the Secretary-General for having ensured that the Subregional Office's activities made an effective contribution to supporting the work of NMHSs in the Region. Additionally it expressed its support and appreciation of the assessment carried out by EC-LII.

17.9 The Association noted that, both at Twelfth Congress and at the subsequent sessions of EC, opinions were voiced for the upgrading of the Subregional Office in San José to the status of Regional Office. This opinion was again strongly supported by many Members during the Thirteenth session of RA IV. The Association was of the opinion that Regional and Subregional Offices should have the same status within the WMO Secretariat structure, including the same levels of independence and flexibility. In this regard, the Association requested that this be brought again to the attention of the Executive Council for further consideration and for possible proposals to Fourteenth Congress. The Association stressed in this regard that there should be no significant financial implications to the WMO budget.

17.10 The Association noted that EC-LII had agreed that the study about the financial implications of the

potential move of the Regional Office in Asunción should be submitted for the consideration of both RA III and RA IV. The Association was informed of offers received from RA III Members.

17.11 The Association requested that, in the event that the Subregional Office was given the status of a Regional Office, Members in the Region should be invited to make offers for hosting this Office.

17.12 The Association recognized the actions taken by the Secretary-General to optimize Regional Office operations. It requested the Secretary-General to make further efforts to strengthen the Office in order to meet the needs of Members in both Regions.

17.13 The Association expressed its gratitude to the Governments of Paraguay and Costa Rica for hosting the Regional Office for the Americas and the Subregional Office for North America, Central America and the Caribbean, respectively.

18. SCIENTIFIC LECTURES AND DISCUSSIONS (agenda item 18)

18.1 The following scientific lectures were presented during the session:

- (a) 'Dissemination of Meteorological Information', by Messrs Roy Evers and Pieter Trappenberg (Netherlands Antilles and Aruba). The lecture described the development of the Netherlands Antilles and Aruba Web site and support for Web development and training of webmasters for the Members of RA IV. It also described the development of a weather portal for the Caribbean which would benefit Members in that area;
- (b) 'Floods and mudflows in the State of Vargas', by Lieutenant Ramón Velásquez and Mr Luís Felipe García (Venezuela). This presentation described the weather conditions which led to major floods and rockslides in the State of Vargas in December 1999, a major disaster which claimed some 20,000 lives and caused US \$3,237 million in damage;

18.2 The Association considered the lectures to be very interesting and of excellent quality. The Association thanked the lecturers for their presentations.

18.3 The Association noted with appreciation that during the session various additional presentations were given on highly relevant subjects. The Association expressed its thanks for the following contributions:

- (a) 'Automatic Weather Stations in Schools in Belize', presented by Mr Carlos Fuller (Belize). This presentation covered the installation and operation of automatic weather stations by students at schools in Belize, emphasizing the benefits that may be achieved by the students, the community and the NMS;
- (b) 'The Upper-Air Sounding Network for the Pan-American Climate Study: The PACS-SONET project', presented by Dr Michael Douglas and Dr Javier Murrillo (University of Colorado, USA). The purpose of the PACS-SONET project is the implementation of observations using pilot balloons for the study of low-level jet streams;

- (c) 'Meteoforum Project Proposal', presented by Dr Timothy Spangler (University Corporation for Atmospheric Research, USA);
- (d) 'Creating Change and Managing Diversity', presented by Ms Claudia Candanedo (Panama). This presentation gave a detailed description of how change and cultural, linguistic and other diversity could be integrated into institutional management;
- (e) 'Empowering People in Rural Communities with Weather and Climate Information', presented by Mr Mouhammed Boulahya (ACMAD). This presentation described the methodology used to provide rural communities with access to reliable, complete and timely information with a view to relieving poverty and contributing to sustainable development.

19. **REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION AND OF RELEVANT EXECUTIVE COUNCIL RESOLUTIONS (agenda item 19)**

19.1 The Association examined those of its resolutions, which were still in force at the time of the Thirteenth session.

19.2 The Association noted that most of its past resolutions had been replaced by new resolutions adopted

during the session. It further noted that while a few resolutions had been incorporated in the appropriate WMO publications, some of them still needed to be kept in force.

19.3 The Association accordingly adopted [Resolution 15 \(XIII-RA IV\)](#).

19.4 The Association considered that Resolution 2 (EC-XLIX) of the twelfth session of the Association need not be kept in force.

20. **ELECTION OF OFFICERS (agenda item 20)**

Mr A.J. Dania (Netherlands Antilles and Aruba) and Mr C. Fuller (Belize) were unanimously re-elected president and vice-president, respectively, of Regional Association IV.

21. **DATE AND PLACE OF THE FOURTEENTH SESSION (agenda item 21)**

The Association agreed that its fourteenth session should be held in 2005 at a place to be decided.

22. **CLOSURE OF THE SESSION (agenda item 22)**

The thirteenth session of Regional Association IV closed at 12.45 p.m. on 5 April 2001.

RESOLUTIONS ADOPTED BY THE SESSION

RESOLUTION 1 (XIII-RA IV)

WORKING GROUP ON PLANNING AND IMPLEMENTATION OF THE WWW IN REGION IV

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 2 (Cg-XIII) — World Weather Watch Programme for 2000-2001,
- (2) The report of the Chairman of the Working Group on Planning and Implementation of the WWW in Region IV,

CONSIDERING:

- (1) That WWW data and products are of vital importance to Members of RA IV to meet increased requirements for meteorological services and for tailored products,
- (2) That the implementation of the WWW in the Region needs to be kept under constant review,
- (3) That the introduction of new WWW concepts will be of great benefit to all Members in the Region,
- (4) That full integration of the WWW functional components requires careful coordination among Members of RA IV and constant evaluation of the related projects,
- (5) That the WMO Long-term Plan needs regular updating in view of regional requirements,

DECIDES:

- (1) To establish a Working Group on Planning and Implementation of the WWW in Region IV (RA IV/WG-PIW) with the following terms of reference:
 - (a) To monitor the progress made in the implementation and operation of the WWW in the Region and advise on possible improvements and priorities for appropriate actions to be carried out under the WWW Programme and the need for external support, where required;
 - (b) To keep under review the actions taken under the Fifth Long-term Plan with a view to updating and further developing the WWW Programme relating to RA IV;
 - (c) To develop proposals for the further development and full integration of the WWW components and functions with a view to achieving a cost-effective operation and a better supply of WWW data and products throughout the Region;
 - (d) To keep abreast of new developments in the field of meteorological data processing, forecasting, observing and information/communication techniques and to make recommendations for their application as appropriate in the Region;

- (e) To identify and keep under review regional requirements for the exchange of observational data and processed products and propose measures and procedures as appropriate to meet these needs for information from within and outside the Region;
 - (f) To develop proposals for implementation of the Public Weather Services Programme in the Region;
 - (g) To advise the president of the Association on all matters concerning the WWW;
- (2) That the working group should be composed of:
 - (a) A coordinator of a Sub-group on Regional Aspects of the Global Telecommunication System and Data Management;
 - (b) A Rapporteur on Regional Aspects of the Global Observing System;
 - (c) A Rapporteur on Regional Aspects of the Global Data-processing System;
 - (d) A Rapporteur on Regional Aspects of Public Weather Services;
 - (e) Other experts as nominated by Members;The terms of reference of the sub-group and the rapporteurs are indicated in the annex to this resolution;
 - (3) To designate in accordance with Regulation 32 of the WMO General Regulations Mr Carlos Fuller (Belize) as chairman of the working group; and to designate Mr Jim Fenix (United States of America) as Coordinator of the Sub-group on Regional Aspects of the Global Telecommunication System and Data Management;
 - (4)
 - (a) To invite Mr Guillermo Vega (Costa Rica) to serve as Rapporteur on the Regional Aspects of the Global Observing System;
 - (b) To invite Mr Louis Lafavre (Canada) to serve as Rapporteur on Regional Aspects of the Global Data-processing System;
 - (c) To invite Mr Emmanuel Moochan (Trinidad and Tobago) to serve as Rapporteur on Regional Aspects of Public Weather Services;
 - (5) To invite Members to nominate experts to serve in the group and in the subgroup;
 - (6) To request the chairman of the working group to submit progress reports at yearly intervals to the president of the Association and a final report not later than six months before the fourteenth session of the Association.

Note: This resolution replaces Resolution 1 (XII-RA IV) which is no longer in force.

ANNEX TO RESOLUTION 1 (XIII-RA IV)

**WORKING GROUP ON PLANNING AND IMPLEMENTATION
OF THE WWW IN REGION IV**

The terms of reference for the sub-group and rapporteurs are as follows:

(a) The Sub-group on Regional Aspects of the Global Telecommunication System and Data Management

- (i) To keep under review the status of implementation and operation of the Regional Meteorological Telecommunication Network, including routing arrangements for the exchange of observational data, processed information and related data and to formulate recommendations with a view to remedying shortcomings;
- (ii) To keep under review the organizational and planning aspects of the Global Telecommunication System in the Region and formulate recommendations for its further development and upgrading, in particular for the coordinated implementation of information and communication facilities, techniques and services at WWW centres;
- (iii) To keep under review data and information representation, including character and bit-oriented codes, and syntax conversion between formats and codes (binary, character and graphics);
- (iv) To keep under review data and product generation, selection and presentation to recipients (NMCs), including storage and retrieval of data and products and recovery procedures in case of major outages of key facilities;
- (v) To keep abreast of developments in information and communication techniques, procedures, services and equipment, including in particular satellite-based telecommunication services, the Internet and related equipment, and to advise on their applicability, as appropriate, to the Region;
- (vi) To keep under review and coordinate real-time and non-real-time monitoring of the WWW Programme in the Region, including quantity and quality aspects;
- (vii) To identify the training requirements of Members in the Region relating to relevant information and communication techniques;
- (viii) To keep under review and advise on telecommunication support provided by the RMTN to other WMO and international programmes;

- (ix) To advise and report to the chairman of the working group on all matters concerning regional aspects of the Global Telecommunication System and Data Management;

- (x) To represent the Region on the CBS Implementation/Coordination Team on Information Systems and Services.

(b) The Rapporteur on Regional Aspects of the Global Observing System

- (i) To review and advise on the observational data requirements of Members of Regional Association IV in the context of the WWW Programme in the Fifth WMO Long-term Plan;
- (ii) To review and advise on the design of observing systems in the Region, in particular the Regional Basic Synoptic Network of surface and upper-air stations, the Regional Basic Climatological Network and the weather radar network;
- (iii) To keep under review the status of implementation and operation of observing systems in the Region and to formulate recommendations with a view to remedying shortcomings;
- (iv) To keep abreast of matters related to the development and introduction of new observing systems, particularly space-based and surface-based remote sensing, and advise on their application in the Region;
- (v) To keep under review and coordinate WWW real-time and non real-time monitoring relating to the GOS in the Region;
- (vi) To identify the training requirements of Members in the Region relating to observations;
- (vii) To advise and report to the chairman of the working group on all matters concerning regional aspects of the Global Observing System;
- (viii) To represent the Region on the CBS Implementation/Coordination Team on Integrated Observing Systems.

(c) Rapporteur on Regional Aspects of the Global Data-processing System

- (i) To keep under review requirements of Members in the Region for GDPS products;
- (ii) To keep abreast of developments in data-processing and forecasting equipment and techniques which could be beneficially introduced at national and regional centres to improve their operational capability both within the WWW system and in related areas;

<ul style="list-style-type: none"> (iii) To formulate recommendations for coordinated implementation of data-processing facilities and techniques at national and regional centres and, if required, for multi-purpose use; (iv) To keep under review and coordinate WWW real-time and non real-time monitoring relating to the GDPS in the Region; (v) To identify the training requirements of Members in the Region relating to data-processing and forecasting; (vi) To advise and report to the chairman of the working group on all matters concerning data-processing and forecasting activities in the Region; (vii) To represent the Region on the CBS Implementation/Coordination Team on Data Processing and Forecasting Systems. <p>(d) Rapporteur on Regional Aspects of Public Weather Services</p>	<ul style="list-style-type: none"> (i) To keep under review the implementation of the Public Weather Services Programme in Region IV; (ii) To advise the chairman of the working group on matters relating to formulation, presentation and dissemination of forecasts and warnings and establishing good relations 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 Regional Aspects of the GDPS, aspects relating to exchange and coordination of hazardous weather information among neighbouring countries; (v) To represent the Region on the CBS Implementation/Coordination Team on Public Weather Services.
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RESOLUTION 2 (XIII-RA IV)

REGIONAL BASIC SYNOPTIC NETWORK

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 2 (XII-RA IV) — Regional Basic Synoptic Network,
- (2) The World Weather Watch Programme for the period 2000-2009,
- (3) The *Manual on the Global Observing System* (WMO-No. 544), Volume I, Part III, paragraphs 2.1.4, 2.1.5 and 2.1.6 and the definition of the Regional Basic Synoptic Networks,
- (4) The *Manual on the Global Telecommunication System* (WMO-No. 386), Volume I, Part I, Attachment 1-3, Section 3,

CONSIDERING that the establishment and maintenance of a regional basic synoptic network of surface and upper-air synoptic stations, adequate 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,
 DECIDES that the stations and the observational programmes listed in the Annex to this resolution constitute the Regional Basic Synoptic Network in Region IV;

URGES Members:

- (1) To spare no effort in their endeavours to secure, at the earliest date possible, full implementation of the network of stations and observational programmes set forth in the annex 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 *WMO Technical Regulations* (WMO-No. 49) and the *Manuals on the Global Observing System* (WMO-No. 544), *on Codes* (WMO-No. 306) and *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, minor amendments to the list of stations in accordance with the procedures laid down in the *Manual on the Global Observing System*, Volume II - Regional Aspects, Region IV (North and Central America).

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

ANNEX TO RESOLUTION 2 (XIII-RA IV)

LIST OF STATIONS COMPRISING THE RBSN IN REGION IV

Index No.	Station name	Observations	Status	Index No.	Station name	Observations	Status
ANTIGUA AND BARBUDA				71109	PORT HARDY A, BC	S	
78862	VC BIRD INT'L AIRPORT ANTIGUA	S		71109	PORT HARDY UA, BC	W R	
BAHAMAS				71114	HOPE, BC	S	
78062	FREEPOR, GRAND BAHAMA	S		71119	EDMONTON STONY PLAIN, ALTA	S	
78066	GREEN TURTLE CAY, ABACO	S		71119	EDMONTON STONY PLAIN, ALTA	W R	
78073	NASSAU AIRPORT	S		71120	COLD LAKE A, ALTA	S	
78073	NASSAU AIRPORT	W R		71122	BANFF CS, ALTA	S	
78088	COCKBURN TOWN, SAN SALVADOR	S		71123	EDMONTON INT'L A, ALTA	S	
78109	ABRAHAM BAY, MAYAGUANA	S		71125	MEADOW LAKE A, SASK	S	
BARBADOS				71129	KINDERSLEY A, SASK	S	
78954	GRANTLEY ADAMS	S		71130	NIPAWIN A, SASK	S	
78954	GRANTLEY ADAMS	W R		71131	EASTEND CYPRESS (AUT), SASK	S	
BELIZE				71135	ROCKGLEN (AUT), SASK	S	
78583	BELIZE/PHILLIP GOLDSTON INTL. AIRPORT	S		71137	VAL MARIE SOUTHEAST, SASK	S	
78583	BELIZE/PHILLIP GOLDSTON INTL. AIRPORT	W R		71141	NORWAY HOUSE A, MAN	S	
78596	HUNTING CAYE	S		71145	ISLAND LAKE A, MAN	S	
BERMUDA				71182	CHURCHILL FALLS, NFLD	S	
78016	BERMUDA NAVAL AIR STATION KINDLEY	S		71185	DANIELS HARBOUR, NFLD	S	
78016	BERMUDA NAVAL AIR STATION KINDLEY	W R		71187	BAIE COMEAU A, QUE	S	
CANADA				71196	BONAVISTA, NFLD	S	
71042	LUPIN CS, NU	S		71197	PORT AUX BASQUES, NFLD	S	
71043	NORMAN WELLS A, NWT	S		71207	SQUAMISH, BC	S	
71043	NORMAN WELLS UA, NWT	W R		71397	GREENWOOD A, NS	S	
71045	TESLIN (AUT), YT	S		71400	BADGER (AUT), NFLD	S	
71050	PUNTZI MOUNTAIN (AUT), BC	S		71403	BEAVER ISLAND (AUT), NS	S	
71051	SACHS HARBOUR, NWT	S		71411	WESTERN HEAD (AUT), NS	S	
71066	HIGH LEVEL A, ALTA	S		71421	LAC EON (AUT), QUE	S	
71068	PEACE RIVER A, ALTA	S		71433	CARIBOU ISLAND (AUT), ONT	S	
71069	SLAVE LAKE A, ALTA	S		71435	UPSALA (AUT), ONT	S	
71076	URANIUM CITY (AUT), SASK	S		71441	GRETNA (AUT), MAN	S	
71077	BUFFALO NARROWS (AUT), SASK	S		71443	SWAN RIVER (AUT), MAN	S	
71078	LYNN LAKE A, MAN	S		71447	MELITA, MAN	S	
71079	THOMPSON A, MAN	S		71474	CLINTON (AUT), BC	S	
71081	HALL BEACH A, NU	S		71510	ROSETOWN EAST, SASK	S	
71081	HALL BEACH UA, NU	W R		71600	SABLE ISLAND, NS	S	
71082	ALERT, NU	S		71600	SABLE ISLAND, NS	W R	
71082	ALERT UA, NU	W R		71603	YARMOUTH A, NS	S	
71083	RANKIN INLET A, NU	S		71603	YARMOUTH UA, NS	W R	
71090	CLYDE A, NU	S		71607	ST STEPHEN (AUT), NB	S	
71091	LONGSTAFF BLUFF, NU	S		71610	SHERBROOKE A, QUE	S	
71092	DEWAR LAKES, NU	S		71621	TRENTON A, ONT	S	
71093	CAPE HOOPER, NU	S		71624	TORONTO LESTER B. PEARSON INT'L A, ONT	S	
71094	CAPE DYER, NU	S		71625	PETAWAWA A, ONT	S	
71095	POND INLET A, NU	S		71627	MONTREAL/DORVAL INT'L A, QUE	S	
71101	SANDSPIT A, BC	S		71628	OTTAWA MACDONALD-CARTIER INT'L A, ONT	S	
71104	WILLIAMS LAKE A, BC	S		71630	MUSKOKA A, ONT	S	
				71633	WIARTON A, ONT	S	
				71705	MONCTON A, NB	S	
				71706	CHARLOTTETOWN A, PEI	S	
				71707	SYDNEY A, NS	S	
				71708	QUEBEC A, QUE	S	

Index No.	Station name	Observations	Status	Index No.	Station name	Observations	Status
71709	ILES DE LA MADELEINE A, QUE	S		71866	SASKATOON A, SASK	S	
71711	CHARLO A, NB	S		71867	THE PAS A, MAN	S	
71715	RIVIERE DU LOUP (AUT), QUE	S		71867	THE PAS UA, MAN	W R	
71719	MISCOU ISLAND (AUT), NB	S		71868	HUDSON BAY, SASK	S	
71722	MANIWAKI, QUE	W R		71869	PRINCE ALBERT A, SASK	S	
71725	VAL D'OR A, QUE	S		71870	SWIFT CURRENT A, SASK	S	
71726	PARENT (AUT), QUE	S		71871	LLOYDMINSTER A, ALTA	S	
71728	ROBERVAL A, QUE	S		71872	MEDICINE HAT A, ALTA	S	
71730	SUDBURY A, ONT	S		71874	LETHBRIDGE A, ALTA	S	
71731	NORTH BAY A, ONT	S		71876	NORTH BATTLEFORD A, SASK	S	
71733	GORE BAY A, ONT	S		71876	NORTH BATTLEFORD A, SASK	W R	
71735	EARLTON A, ONT	S		71877	CALGARY INT'L A, ALTA	S	
71738	WAWA A, ONT	S		71878	RED DEER A, ALTA	S	
71739	TIMMINS A, ONT	S		71880	CRANBROOK A, BC	S	
71749	THUNDER BAY A, ONT	S		71881	EDSON A, ALTA	S	
71799	VICTORIA INT'L A, BC	S		71882	REVELSTOKE, BC	S	
71800	CAPE RACE (AUT), NFLD	S		71883	BLUE RIVER CS, BC	S	
71801	ST JOHN'S A, NFLD	S		71889	PENTICTON A, BC	S	
71801	ST JOHN'S UA, NFLD	W R		71892	VANCOUVER INT'L A, BC	S	
71802	ST LAWRENCE, NFLD	S		71893	COMOX A, BC	S	
71803	GANDER INT'L A, NFLD	S		71894	ESTEVAN POINT CS, BC	S	
71808	BLANC SABLON A, QUE	S		71896	PRINCE GEORGE A, BC	S	
71810	PORT MENIER (AUT), QUE	S		71897	MCINNES ISLAND, BC	S	
71811	SEPT-ILES A, QUE	S		71898	PRINCE RUPERT A, BC	S	
71811	SEPT-ILES UA, QUE	W R		71899	LANGARA, BC	S	
71813	NATASHQUAN A, QUE	S		71902	NAIN A, NFLD	S	
71814	CHEVERY (AUT), QUE	S		71905	KUUJUARAPIK A, QUE	S	
71815	STEPHENVILLE A, NFLD	S		71906	KUUJUAQ A, QUE	S	
71815	STEPHENVILLE UA, NFLD	W R		71906	KUUJUAQ UA, QUE	W R	
71816	GOOSE A, NFLD	S		71907	INUKJUAQ A, QUE	S	
71816	GOOSE UA, NFLD	W R		71907	INUKJUAQ UA, QUE	W R	
71817	MARY'S HARBOUR, NFLD	S		71908	PRINCE GEORGE UA, BC	W R	
71818	CARTWRIGHT, NFLD	S		71909	IQALUIT A, NU	S	
71821	MATAGAMI, QUE	S		71909	IQALUIT UA, NU	W R	
71822	CHIBOUGAMAU, QUE	S		71910	CAPE DORSET A, NU	S	
71823	LA GRANDE IV UA, QUE	W R		71911	SHEPHERD BAY A, NU	S	
71825	WABUSH LAKE A, NFLD	S		71912	GILLAM A, MAN	S	
71827	LA GRANDE RIVIERE A, QUE	S		71913	CHURCHILL A, MAN	S	
71828	SCHEFFERVILLE A, QUE	S		71913	CHURCHILL UA, MAN	W R	
71831	KAPUSKASING A, ONT	S		71915	CORAL HARBOUR A, NU	S	
71832	NAGAGAMI (AUT), ONT	S		71915	CORAL HARBOUR UA, NU	W R	
71834	GERALDTON A, ONT	S		71917	EUREKA, NU	S	
71836	MOOSONEE A, ONT	S		71917	EUREKA UA, NU	W R	
71836	MOOSONEE UA, ONT	W R		71922	LA RONGE A, SASK	S	
71841	ARMSTRONG A AUT, ONT	S		71924	RESOLUTE A, NU	S	
71842	SIOUX LOOKOUT A, ONT	S		71924	RESOLUTE UA, NU	W R	
71844	BIG TROUT LAKE READAC, ONT	S		71925	CAMBRIDGE BAY A, NU	S	
71845	PICKLE LAKE A, ONT	S		71925	CAMBRIDGE BAY UA, NU	W R	
71845	PICKLE LAKE A, ONT	W R		71926	BAKER LAKE A, NU	S	
71850	KENORA A, ONT	S		71926	BAKER LAKE UA, NU	W R	
71854	RED LAKE A, ONT	S		71931	LAC LA BICHE (AUT), ALTA	S	
71855	DAUPHIN A, MAN	S		71932	FORT MCMURRAY A, ALTA	S	
71856	GIMLI INDUSTRIAL PARK, MAN	S		71933	FORT CHIPEWYAN A, ALTA	S	
71858	GRAND RAPIDS (AUT), MAN	S		71934	FORT SMITH A, NWT	S	
71861	BROADVIEW, SASK	S		71934	FORT SMITH UA, NWT	W R	
71862	ESTEVAN A, SASK	S		71935	HAY RIVER A, NWT	S	
71864	MOOSE JAW A, SASK	S		71936	YELLOWKNIFE A, NWT	S	
71865	WYNYARD (AUT), SASK	S		71937	LADY FRANKLIN POINT A, NU	S	

Index No.	Station name	Observations	Status	Index No.	Station name	Observations	Status
71938	KUGLUKTUK A, NU	S		DOMINICA			
71943	FORT ST JOHN A, BC	S		78905	MELVILLE HALL AIRPORT	S	
71944	MACKENZIE A, BC	S		78906	CANEFIELD AIRPORT	S	
71945	FORT NELSON A, BC	S		DOMINICAN REPUBLIC			
71945	FORT NELSON UA, BC	W R		78460	SANTIAGO	S	
71946	FORT SIMPSON A, NWT	S		78467	SABANA DE LA MAR	S	
71948	CAPE PARRY A, NWT	S		78479	PUNTA CANA	S	
71949	FARO (AUT), YT	S		78482	BARAHONA	S	
71950	SMITHERS A, BC	S		78486	SANTO DOMINGO	S	
71953	WATSON LAKE A, YT	S		78486	SANTO DOMINGO	W R	
71957	INUVIK A, NWT	S		EL SALVADOR			
71957	INUVIK UA, NWT	W R		78650	ACAJUTLA	S	
71958	DEASE LAKE, BC	S		78663	SAN SALVADOR/ILOPANGO	S	
71964	WHITEHORSE A, YT	S		GRENADA			
71964	WHITEHORSE UA, YT	W R		78958	POINT SALINES AIRPORT	S	
71966	DAWSON, YT	S		GUADELOUPE, ST MARTIN, ST BARTHELEMY (AND OTHER FRENCH ISLANDS IN THE VICINITY)			
71968	SHINGLE POINT A, YT	S		78890	LA DESIRADE	S	
71989	MOULD BAY CS, NWT	S		78894	GUSTAVIA, ST. BARTHELEMY	S	
CAYMAN ISLANDS				78897	LE RAIZET, GUADELOUPE	S	
78384	OWEN ROBERTS AIRPORT GRAND CAYMAN	S		78897	LE RAIZET, GUADELOUPE	W R	
78384	OWEN ROBERTS AIRPORT GRAND CAYMAN	W R		GUATEMALA			
CLIPPERTON				78627	HUEHUETENANGO	S	
78825	CLIPPERTON	S		78641	GUATEMALA (AEROP. LA AURORA)	S	
COLOMBIA (SAN ANDRES AND PROVIDENCIA ISLANDS)				78641	GUATEMALA (AEROP. LA AURORA)	W R	
80001	SAN ANDRES (ISLA)/ SESQUICENTENARIO	S		78647	SAN JOSE	S	
80001	SAN ANDRES (ISLA)/ SESQUICENTENARIO	W R		HAITI			
80002	PROVIDENCIA (ISLA)/EL EMBRUJO	S		78409	CAP-HAITIEN	S	
COSTA RICA				78447	LES CAYES	S	
78760	PUNTARENAS	S		HONDURAS			
78762	JUAN SANTAMARIA INT. AIRPORT	S		78501	ISLAS DEL CISNE	S	
78762	JUAN SANTAMARIA INT. AIRPORT	W R		78701	GUANAJA	S	
78767	PUERTO LIMON	S		78705	LA CEIBA (AIRPORT)	S	
CUBA				78706	TELA	S	
78310	CABO SAN ANTONIO, PINAR DEL RIO	S		78707	YORO	S	
78325	CASA BLANCA, LA HABANA	S		78708	LA MESA (SAN PEDRO SULA)	S	
78333	PLAYA GIRON, MATANZAS	S		78711	PUERTO LEMPIRA	S	
78338	SAGUA LA GRANDE, VILLA CLARA	S		78714	CATACAMAS	S	
78349	SANCTI SPIRITUS, SANCTI SPIRITUS	S		78717	SANTA ROSA DE COPAN	S	
78355	CAMAGUEY, CAMAGUEY	S		78720	TEGUCIGALPA	S	
78355	CAMAGUEY, CAMAGUEY	W R		78720	TEGUCIGALPA	W R	
78360	CABO CRUZ, GRANMA	S		JAMAICA			
78367	GUANTANAMO, ORIENTE	S		78388	MONTEGO BAY/SANGSTER	S	
78367	GUANTANAMO, ORIENTE	W R		78397	KINGSTON/NORMAN MANLEY	S	
78369	PUNTA DE MAISI, GUANTANAMO	S		78397	KINGSTON/NORMAN MANLEY	W R	
CURACAO AND BONAIRE				MARTINIQUE			
78988	HATO AIRPORT, CURACAO	W R		78922	CARAVELLE	S	
78988	HATO AIRPORT, CURACAO	S		78925	LE LAMENTIN	S	
78990	FLAMINGO AIRPORT, BONAIRE	S		MEXICO			
				76040	EJIDO NUEVO LEON BC.	S	
				76050	ENSENADA, B. C. (FAM)	S	
				76055	SAN FELIPE, BCN	S	
				76061	PUERTO PENASCO, SON.	S	
				76113	ALTAR, SON.	S	

Index No.	Station name	Observations	Status	Index No.	Station name	Observations	Status
76118	PILARES DE NACUZARI, SON.	S		76647	VALLADOLID, YUC.	S	
76122	NUEVA CASAS GRANDES, CHIH.	S		76654	MANZANILLO, COL.	S	
76160	HERMOSILLO, SON.	S		76654	MANZANILLO, COL.	W R	
76220	TEMOSACHIC, CHIH.	S		76656	CIUDAD GUZMAN, JAL.	S	
76225	CHIHUAHUA, CHIH.	S		76658	COLIMA, COL.	S	
76225	CHIHUAHUA, CHIH.	W R		76662	ZAMORA, MICH.	S	
76243	PIEDRAS NEGRAS, COAH.	S		76665	MORELIA, MICH.	S	
76253	SANTA ROSALIA, BCS	S		76675	TOLUCA, MEX.	S	
76256	EMPALME, SON.	S		76679	AEROP. INTERNACIONAL		
76256	EMPALME, SON.	W R			MEXICO, D.F.	W R	
76258	CIUDAD OBREGON, SON.	S		76680	MEXICO (CENTRAL), D.F.	S	
76305	LORETO, BCS	S		76683	TLAXCALA, TLAX.	S	
76311	CHOIX, SIN.	S		76685	PUEBLA, PUE.	S	
76323	HIDALGO DEL PARRAL, CHIH.	S		76687	JALAPA, VER.	S	
76342	MONCLOVA, COAH.	S		76692	HACIENDA YLANG YLANG		
76373	TEPEHUANES, DGO.	S			VERACRUZ, VER.	S	
76382	TORREON, COAH.	S		76692	HACIENDA YLANG YLANG		
76382	TORREON, COAH.	W R			VERACRUZ, VER.	W R	
76390	SALTILLO, COAH.	S		76695	CAMPECHE, CAMP.	S	
76393	MONTERREY, N.L.	S		76698	FELIPE CARRILLO PUERTO, Q.ROO	S	
76394	AEROP.INTERNACIONAL			76723	ISLA SOCORRO, COL.	S	
	MONTERREY, N.L. *	W R		76723	ISLA SOCORRO, COL.	W R	
76401	PUERTO CORTEZ, B. C. (SM)	S		76726	CUERNAVACA, MOR.	S	
76402	CIUDAD CONSTITUCION, BCS	S		76737	ORIZABA, VER.	S	
76405	LA PAZ, BCS	S		76741	COATZACOALCOS, VER.	S	
76405	LA PAZ, BCS	W R		76743	VILLAHERMOSA, TAB.	S	
76412	CULIACAN, SIN.	S		76750	CHETUMAL, Q.R.	S	
76423	DURANGO, DGO.	S		76751	CHETUMAL, Q.ROO (FAM)	S	
76458	COLONIA JUAN CARRASCO			76762	CHILPANCINGO, RO.	S	
	MAZATLAN, SIN.	S		76773	HUAJUAPAN DE LEON, OAX.	S	
76458	COLONIA JUAN CARRASCO			76775	OAXACA, OAX.	S	
	MAZATLAN, SIN.	W R		76805	ACAPULCO, GRO.	S	
76471	SOMBRERETE, ZAC.	S		76805	ACAPULCO, GRO.	W R	
76491	CIUDAD VICTORIA, TAMPS.	S		76833	SALINA CRUZ, OAX.	S	
76499	SOTO LA MARINA, TAMPS.	S		76840	ARRIAGA, CHIS.	S	
76519	COLOTLAN, JAL.	S		76843	TUXTLA GUTIERREZ, CHIS.	S	
76525	ZACATECAS, ZAC. (LA BUFA, ZAC.)	S		76845	SN. CRISTOBAL LAS CASAS, CHIS.	S	
76526	GUADALUPE, ZAC.	WR		76848	COMITAN, CHIS.	S	
76539	SAN LUIS POTOSI, S.L.P.	S		76855	PUERTO ANGEL, OAX.	S	
76548	TAMPICO, TAMPS	S		76855	PUERTO ANGEL, OAX.	W R	
76551	ISLAS MARIAS, NAY.	S		76903	TAPACHULA, CHIS	S	
76556	TEPIC, NAY.	S					
76571	AGUASCALIENTES, AGS.	S			NETHERLANDS ANTILLES AND ARUBA		
76573	LAGOS DE MORENO, JAL.	S		78866	JULIANA AIRPORT, ST. MAARTEN	S	
76577	GUANAJUATO, GTO.	S		78866	JULIANA AIRPORT, ST. MAARTEN	W R	
76581	RIO VERDE, S.L.P.	S		78873	ROOSEVELT AIRPORT ST. EUSTATIUS	S	
76585	MATLAPA, S.L.P.	S		78982	QUEEN BEATRIX AIRPORT, ARUBA	S	
76593	PROGRESO, YUC.	S					
76595	CANCUN	W R			NICARAGUA		
76612	GUADALAJARA, JAL.	S		78730	PUERTO CABEZAS	S	
76612	GUADALAJARA, JAL.	W R		78730	PUERTO CABEZAS	W R	
76625	QUERETARO, QRO.	S		78734	JINOTEGA	S	
76632	PACHUCA, HGO.	S		78739	CHINANDEGA	S	
76634	TULANCINGO, HGO.	S		78741	MANAGUA A.C.SANDINO	S	
76644	AEROP.INTERNACIONAL MERIDA,			78741	MANAGUA A.C.SANDINO	W	
	YUC	S		78745	BLUEFIELDS	S	
76644	AEROP.INTERNACIONAL MERIDA,				PANAMA		
	YUC	W R		78792	TOCUMEN	S	
				78793	DAVID	S	

Index No.	Station name	Observations	Status	Index No.	Station name	Observations	Status
78795	SANTIAGO	S		72211	TAMPA/INT., FL	S	
78808	ALBROOK	W R		72212	CROSS CITY/CROSS CITY A., FL	S	
PUERTO RICO AND US POSSESSIONS IN THE CARIBBEAN AREA				72214	TALLAHASSEE/MUN., FL	S	
78526	SAN JUAN/INT., PUERTO RICO	S		72214	TALLAHASSEE/MUN., FL	W R	
78526	SAN JUAN/INT., PUERTO RICO	W R		72215	PEACHTREE CITY, GA	W R	
78543	C. AMALIE/TRUMAN, ST. THOMAS	S		72217	MACON/LEWIS B.WILSON, GA	S	
RA-IV AUTOMATIC MARINE STATIONS				72218	AUGUSTA/BUSH FIELD, GA	S	
****	41001 (35 00N, 72 00W)	S		72219	ATLANTA/MUN., GA	S	
****	41002 (32 18N, 75 18W)	S		72220	APALACHICOLA/MUN., FL	S	
****	41010 (28 54N, 78 30W)	S		72223	MOBILE/BATES FIELD, AL	S	
****	42001 (26 00N, 90 00W)	S		72226	MONTGOMERY/DANNELLY, AL	S	
****	42002 (25 53N, 93 34W)	S		72230	SHELBY COUNTY AIRPORT, AL	W R	
****	42003 (25 56N, 89 55W)	S		72231	NEW ORLEANS/MOISANT INT., LA	S	
****	42019 (27 54N, 95 00W)	S		72233	SLIDELL/MUN. LA	W R	
****	42036 (28 31N, 84 31W)	S		72234	MERIDIAN/KEY, MS	S	
****	42039 (28 47N, 86 02W)	S		72235	JACKSON/ALLEN C. THOMPSON FIELD, MS	S	
****	44004 (39 00N, 70 00W)	S		72235	JACKSON/ALLEN C. THOMPSON FIELD, MS	W R	
****	44011 (41 05N, 66 35W)	S		72240	LAKE CHARLES/MUN., LA	S	
****	44137 (41 39N, 59 57W)	S		72240	LAKE CHARLES/MUN., LA	W R	
****	44138 (44 16N, 53 37W)	S		72243	HOUSTON/INTERCONTINENTAL, TX	S	
****	46001 (56 00N, 148 00W)	S		72248	SHREVEPORT/REG., LA	S	
****	46002 (42 30N, 130 00W)	S		72248	SHREVEPORT/REG., LA	W R	
****	46003 (52 00N, 156 00W)	S		72249	FT WORTH, TX	W R	
****	46004 (51 00N, 136 00W)	S		72250	BROWNSVILLE/INT., TX	S	
****	46005 (46 00N, 131 00W)	S		72250	BROWNSVILLE/INT., TX	W R	
****	46006 (41 00N, 138 00W)	S		72251	CORPUS CHRISTI/INT., TX	S	
****	46014 (39 13N, 123 58W)	S		72251	CORPUS CHRISTI/INT., TX	W R	
****	46035 (59 55N, 117 49W)	S		72253	SAN ANTONIO/INT., TX	S	
****	46036 (48 21N, 133 55W)	S		72254	AUSTIN/CTY, TX	S	
****	46059 (37 59N, 130 00W)	S		72255	VICTORIA/VICTORIA REGIONAL, TX	S	
****	46184 (53 54N, 138 52W)	S		72256	WACO, MADISON-COOPER, TX	S	
****	46207 (50 52N, 129 55W)	S		72259	DALLAS-FORT WORTH/FORT WORTH REG.AIRPORT, TX	S	
SAINT LUCIA				72261	DEL RIO/INT., TX	S	
78947	VIGIE	S		72261	DEL RIO/INT., TX	W R	
78948	HEWANORRA INT'L AIRPORT	S		72263	SAN ANGELO/MATHIS, TX	S	
ST. PIERRE AND MIQUELON				72265	MIDLAND/MIDLAND REG. AIR TERM., TX	S	
71805	SAINT-PIERRE	S		72265	MIDLAND/MIDLAND REG. AIR TERM., TX	W R	
TRINIDAD AND TOBAGO				72266	ABILENE/MUN., TX	S	
78962	CROWN POINT AIRPORT, TOBAGO	S		72267	LUBBOCK/LUBBOCK INTERNATIONAL, TX	S	
78970	PIARCO INT. AIRPORT, TRINIDAD	S		72268	ROSWELL/INDUSTRIAL AIR CENTER, NM	S	
78970	PIARCO INT. AIRPORT, TRINIDAD	W R		72270	EL PASO/INT., TX	S	
UNITED STATES OF AMERICA				72271	TRUTH OR CONSEQUENCES, NM	S	
72201	KEY WEST/INT., FL	S		72274	TUCSON/INT., AZ	S	
72201	KEY WEST/INT., FL	W R		72274	TUCSON/INT., AZ	W R	
72202	MIAMI, FL	S		72278	PHOENIX/SKY HARBOR, INT, AZ	S	
72202	MIAMI, FL	W R		72280	YUMA/YUMA INT., AZ	S	
72203	WEST PALM BEACH/ INT. FL	S		72290	SAN DIEGO/LINDBERGH, CA	S	
72205	ORLANDO/JETPORT FL	S		72293	SAN DIEGO/MIRAMAR, NAS, CA	W R	
72206	JACKSONVILLE/INTNL., FL	S		72295	LOS ANGELES /INT., CA	S	
72206	JACKSONVILLE/INTNL., FL	W R		72302	WILMINGTON, NC	S	
72207	SAVANNAH/MUNICIPAL, GA	S		72304	CAPE HATTERAS, NC	S	
72208	CHARLESTON/MUN., SC	S					
72208	CHARLESTON/MUN., SC	W R					
72210	TAMPA BAY AREA, FL	W R					

Index No.	Station name	Observations	Status	Index No.	Station name	Observations	Status
72305	NEWPORT, NC	W R		72429	SULPHUR GROVE, OH	W R	
72308	NORFOLK/INT., VA	S		72432	EVANSVILLE/REG., IN.	S	
72310	COLUMBIA, SC	S		72434	ST.LOUIS/LAMBERT, ST.LOUIS INT., MO	S	
72311	ATHENS/MUN., GA	S		72435	PADUCAH, KY	S	
72312	GREENVILLE/GREENVILLE SPARTANBURG, SC	S		72438	INDIANAPOLIS/I.-MUN/WEIR COOK, IN	S	
72314	CHARLOTTE/DOUGLAS, NC	S		72440	SPRINGFIELD/MUN., MO	S	
72317	GREENSBORO/G.-HIGH PT., NC	S		72440	SPRINGFIELD/MUN., MO	W R	
72317	GREENSBORO/G.-HIGH PT., NC	W R		72445	COLUMBIA/REGIONAL, MO	S	
72318	BLACKSBURG, VA	W R		72446	KANSAS CITY, INTNL., MO	S	
72323	HUNTSVILLE/MADISON CO., AL	S		72450	WICHITA/MID-CONTINENT, KS	S	
72324	CHATTANOOGA/LOVELL FIELD, TN	S		72451	DODGE CITY/MUN., KS	S	
72326	KNOXVILLE/MUN., TN	S		72451	DODGE CITY/MUN., KS	W R	
72327	NASHVILLE/METROPOLITAN, TN	S		72456	TOPEKA/MUN., KS	S	
72334	MEMPHIS/INTNL., TN	S		72456	TOPEKA/MUN., KS	W R	
72340	LITTLE ROCK/ADAMS FLD, AR	S		72458	CONCORDIA/BLOSSER MUN., KS	S	
72340	LITTLE ROCK/ADAMS FLD, AR	W R		72462	ALAMOSA, CO	S	
72344	FORT SMITH/MUN., AR	S		72464	PUEBLO/MEMORIAL, CO	S	
72351	WICHITA FALLS/SHEPS AFB/ WICHITA FALLS/MUN., TX	S		72465	GOODLAND/RENNER FIELD/ GOODLAND/MUN. KS	S	
72353	OKLAHOMA CITY/W. ROGERS WORLD, OK	S		72469	DENVER/STAPLETON INT., CO	W R	
72356	TULSA/INT., OK	S		72475	MILFORD MUNICIPAL, UT	S	
72357	NORMAN/MAX WESTHEIMER A, OK	W R		72476	GRAND JUNCTION/WALKER FIELD, CO	S	
72360	CLAYTON/MUN., NM	S		72476	GRAND JUNCTION/WALKER FIELD, CO	W R	
72363	AMARILLO/INTL., TX	S		72480	BISHOP, CA	S	
72364	SANTA TERESA, NM	W R		72486	ELY/YELLAND, NV	S	
72365	ALBUQUERQUE/INT., NM	S		72488	RENO/INT., NV	S	
72365	ALBUQUERQUE/INT., NM	W R		72489	RENO, NV	W R	
72370	KINGMAN/MOHAVE COUNTY A., AZ	S		72492	STOCKTON/METROPOLITAN CA	S	
72371	PAGE/PAGE A., AZ	S		72493	OAKLAND/METROP. OAKLAND INT., CA	W R	
72374	WINSLOW, AZ	S		72494	SAN FRANCISCO/INT., CA	S	
72376	FARMINGTON/FOUR CORNERS REGIONAL AIRPORT, NM	S		72501	UPTON, NY	W R	
72384	BAKERSFIELD/MEADOWS, CA	S		72503	NEW YORK/LA GUARDIA, NY	S	
72386	LAS VEGAS/MCCARRAN, NV	S		72508	HARTFORD/BRADLEY INTNL., CT	S	
72387	MERCURY/DESERT ROCK, NV	S		72509	BOSTON/LOGAN INT., MA	S	
72387	MERCURY/DESERT ROCK, NV	W R		72514	WILLIAMSPORT/LYCOMING COUNTY, PA	S	
72389	FRESNO/AIR TERM., CA	S		72515	BINGHAMTON/BROOME CO., NY	S	
72389	FRESNO/AIR TERM., CA	W R		72518	ALBANY COUNTY AIRPORT, NY	S	
72394	SANTA MARIA, CA	S		72518	ALBANY, NY	W R	
72401	RICHMOND/BYRD, VA	S		72519	SYRACUSE/HANCOCK, NY	S	
72402	WALLOPS ISLAND, VA	W R		72520	PITTSBURGH/GREATER PITTSBURGH INT., PA	S	
72403	STERLING, VA	W R		72520	PITTSBURGH/MOON TOWNSHIP, PA	W R	
72403	WASHINGTON/DULLES INT., VA	S		72524	CLEVELAND/CLEVELAND-HOPKINS, OH	S	
72407	ATLANTIC CITY, NJ	S		72526	ERIE/INT., PA	S	
72408	PHILADELPHIA/INT., PA	S		72528	BUFFALO/GREATER BUFFALO INT., NY	S	
72411	ROANOKE/MUN., VA	S		72528	BUFFALO/GREATER BUFFALO INT., NY	W R	
72412	BECKLEY (RALEIGH CTY. MEMORIAL AIRPORT), WV	S		72530	CHICAGO/O'HARE, IL	S	
72414	CHARLESTON/KANAWHA., WV	S		72532	PEORIA/GREATER PEORIA MUN., IL	S	
72417	ELKINS/ELKINS-RANDOLPH CO., WV	S		72533	FORT WAYNE/MUN., BAER FLD., IN	S	
72421	CINCINNATI/GREATER CINCINNATI, OH	S					
72422	LEXINGTON/BLUE GRASS, KY	S					
72426	WILMINGTON, OH	W R					
72428	COLUMBUS/PORT COLUMBUS, OH	S					
72429	DAYTON/. COX, OH	S					

Index No.	Station name	Observations	Status	Index No.	Station name	Observations	Status
70350	KODIAK	W R		Legend: Observations column: S = Surface observations requested W = Radiowind observations requested R = Radiosonde observations requested Status column: CN = Station already in current RBSN NS = New station in the RBSN			
70361	YAKUTAT	S					
70361	YAKUTAT	W R					
70381	JUNEAU	S					
70398	ANNETTE ISLAND	S					
70398	ANNETTE ISLAND	W R					
70414	SHEMYA AFB	S					
70414	SHEMYA AFB	W R					
VENEZUELA (ISLA DE AVES)							
80400	ISLA DE AVES (BASE CIENTIFICA NAVAL S. BOLIVAR)	S					

RESOLUTION 3 (XIII-RA IV)

REGIONAL BASIC CLIMATOLOGICAL NETWORK

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) The WMO *Technical Regulations*, Regulation (B.1) 3.1.1.2,
- (2) Resolution 3 (X-RA IV) Network of CLIMAT and CLIMAT TEMP reporting stations in RA IV,
- (3) The approval of lists of GSN and GUAN stations by the president of the Association,

CONSIDERING that the Thirteenth WMO Congress stressed the important role of regional associations in the evolution of networks of stations necessary to provide a good representation of climate on the regional scale, in addition to global scale,

DECIDES that the stations listed in the Annex to this resolution constitute the Regional Basic Climatological Network (RBCN) in Region IV;

URGES Members:

- (1) To spare no effort in their endeavours to ensure, at the earliest date possible, full implementation of the network of RBCN stations set forth in the annex to this resolution;

- (2) To comply fully with the global and regional coding procedures and data collection standards in accordance with procedures laid down in the WMO *Technical Regulations* (WMO-No. 49) and the *Manuals on the Global Observing System* (WMO-No. 544), *on Codes* (WMO-No. 306) and *on the Global Telecommunication System* (WMO-No. 386) when operating the RBCN;

AUTHORIZES the president of the Association to approve, at the request of Members concerned and in consultation with the Secretary-General, minor amendments to the list of RBCN stations;

REQUESTS the Secretary-General:

- (1) To arrange for the inclusion in publication WMO-No. 9, Volume A, the information concerning the CLIMAT and CLIMAT TEMP stations;
- (2) To bring the changes to this network approved by the president of the Association to the attention of all Members of WMO.

Note: This resolution replaces Resolution 3 (X - RA IV) which is no longer in force.

ANNEX TO RESOLUTION 3 (XIII-RA IV)

LIST OF STATIONS COMPRISING THE RBCN IN REGION IV

Index Number	Station Name	GSN	GUAN	CLIMAT	CLIMAT TEMP	Index Number	Station Name	GSN	GUAN	CLIMAT	CLIMAT TEMP
BAHAMAS						71862	ESTEVAN A, SASK	X		X	
78073	NASSAU AIRPORT	X		X	X	71867	THE PAS A, MAN	X		X	
BARBADOS						71869	PRINCE ALBERT A, SASK	X		X	
78954	GRANTLEY ADAMS	X	X	X	X	71870	SWIFT CURRENT A, SASK	X		X	
BELIZE						71872	MEDICINE HAT A, ALTA	X		X	
78583			X	X	X	71887	KAMLOOPS A, BC	X		X	
BERMUDA						71894	ESTEVAN POINT CS, BC	X		X	
78016	BERMUDA NAVAL	X	X	X	X	71905	KUJUUARAPIK A, QUE	X		X	
CANADA						71906	KUJUUJUAQ A, QUE	X		X	
71043	NORMAN WELLS A, NWT	X		X		71907	INUKJUAQ A, QUE	X		X	
71051	SACHS HARBOUR, NWT	X		X		71909	IQALUIT A, NU	X		X	
71066	HIGH LEVEL A, ALTA	X		X		71910	CAPE DORSET A, NU	X		X	
71069	SLAVE LAKE A, ALTA	X		X		71913	CHURCHILL A, MAN	X		X	
71074	ISACHSEN (AUT), NU	X		X		71915	CORAL HARBOUR A, NU	X		X	
71078	LYNN LAKE A, MAN	X		X		71917	EUREKA, NU	X		X	
71079	THOMPSON A, MAN	X		X		71918	CAM FOUR, NU	X		X	
71081	HALL BEACH A, NU	X		X		71924	RESOLUTE A, NU	X		X	
71082	ALERT, NU	X		X		71925	CAMBRIDGE BAY A, NU	X		X	
71090	CLYDE A, NU	X		X		71926	BAKER LAKE A, NU	X		X	
71093	CAPE HOOPER, NU	X		X		71932	FORT MCMURRAY A, ALTA	X		X	
71094	CAPE DYER, NU	X		X		71934	FORT SMITH A, NWT	X		X	
71095	POND INLET A, NU	X		X		71935	HAY RIVER A, NWT	X		X	
71101	SANDSPIT A, BC	X		X		71938	KUGLUKTUK A, NU	X		X	
71103	QUESNEL A, BC	X		X		71945	FORT NELSON A, BC	X		X	
71109	PORT HARDY A, BC	X		X		71946	FORT SIMPSON A, NWT	X		X	
71120	COLD LAKE A, ALTA	X		X		71950	SMITHERS A, BC	X		X	
71122	BANFF CS, ALTA	X		X		71953	WATSON LAKE A, YT	X		X	
71160	FORT RELIANCE (AUT), NWT	X		X		71957	INUVIK A, NWT	X		X	
71185	DANIELS HARBOUR, NFLD	X		X		71964	WHITEHORSE A, YT	X		X	
71197	PORT AUX BASQUES, NFLD	X		X		71966	DAWSON, YT	X		X	
71586	LA RONGE RCS, SASK	X		X		71989	MOULD BAY CS, NWT	X		X	
71600	SABLE ISLAND, NS	X		X		CAYMAN ISLANDS					
71603	YARMOUTH A, NS	X		X		78384	OWN ROBERTS AIRPORT	X		X	
71706	CHARLOTTETOWN A, PEI	X		X		COLOMBIA					
71713	LA POCATIERE CS, QUE	X		X		80001	SAN ANDRES	X		X	X
71721	MANIWAKI AIRPORT, QUE	X		X		80002	PROVIDENCIA			X	
71727	BAGOTVILLE A, QUE	X		X		COSTA RICA					
71733	GORE BAY A, ONT	X		X		78760	PUNTARENAS			X	
71803	GANDER INT'L A, NFLD	X		X		78762	JUAN SANTAMARIA		X	X	X
71811	SEPT-ILES A, QUE	X		X		78767	PUERTO LIMÓN	X		X	
71813	NATASHQUAN A, QUE	X		X		CUBA					
71816	GOOSE A, NFLD	X		X		78325	CASABLANCA, LA HABANA		X		
71818	CARTWRIGHT, NFLD	X		X		78367	GUANTANAMO	X		X	
71822	CHIBOUGAMAU, QUE	X		X		DOMINICAN REPUBLIC					
71828	SCHEFFERVILLE A, QUE	X		X		78486	SANTO DOMINGO			X	X
71831	KAPUSKASING A, ONT	X		X		EL SALVADOR					
71836	MOOSONEE A, ONT	X		X		78650	ACAJUTLA	X		X	
71842	SIoux LOOKOUT A, ONT	X		X		78652	LOS ANDES			X	
71844	BIG TROUT LAKE READAC, ONT	X		X		78663	SAN SALVADOR			X	
71855	DAUPHIN A, MAN	X		X							

Index Number	Station Name	GSN	GUAN	CLIMAT	TEMP	Index Number	Station Name	GSN	GUAN	CLIMAT	TEMP
GUADELOUPE, ST MARTIN, ST BARTHELEMY (AND OTHER FRENCH ISLANDS IN THE VICINITY)						76423	DURANGO, DGO.			X	
78897	LE RAIZET, GUADELOUPE	X		X	X	76458	COLONIA JUAN CARRASCO MAZATLAN, SIN	X		X	X
78925	LAMENTIN, MARTINIQUE			X		76471	SOMBRETE, ZAC.			X	
GUATEMALA						76491	CD. VICTORIA, TAMS.			X	
78640	GUATEMALA			X		76519	COLOTLAN, JAL.			X	
HONDURAS						76525	ZACATECAS, ZAC. (LA BUFA, ZAC.)			X	
78501	ISLAS DEL CISNE			X		76526	GUADALUPE, ZAC.				X
78700	AMAPALA			X		76539	SAN LUIS POTOSI, S. L. P			X	
78701	GUANAHA			X		76548	TAMPICO, TAMPS.			X	
78705	LA CEIBA			X		76551	ISLAS MARIAS, NAY.			X	
78706	TELA			X		76556	TEPIC, NAY			X	
78707	YORO			X		76571	AGUASCALIENTES, AGS.			X	
78708	LA MESA (SAN PEDRO SULA)			X		76573	LAGOS DE MORENTO, JAL.			X	
78711	PUERTO LEMPIRA			X		76577	GUANAJUATO, GTO.	X		X	
78714	CATACAMAS			X		76581	RIO VERDE, S. L. P			X	
78717	SANTA ROSA DE COPAN			X		76585	MATLAPA, S. L. P			X	
78718	NUEVA OCOTOPEQUE			X		76593	PROGRESO, YUC.			X	
78720	TEGUCIGALPA			X		76595	CANCUN, Q. ROO				X
78724	CHOLUTECA			X		76612	GUADALAJARA, JAL.			X	X
JAMAICA						76625	QUERETARO, QRO.			X	
78388	MONTEGO BAY/ SANGSTER	X		X		76632	PACHUCA, HGO.			X	
78397	KINGSTON/NORMAN MANLEY		X	X	X	76634	TULANCINGO, HO.			X	
MEXICO						76640	TUXPAN, VER.			X	
76040	EJIDO NUEVO. LEON, B.C.			X		76644	AEROP. INTERNACIONAL., MERIDA YUC.	X		X	X
76050	ENSENADA, B. C. (FAM)			X		76647	VALLADOLID, YUC.			X	
76055	SAN FELIPE, B.C.			X		76654	MANZANILLO, COL.	X	X	X	X
76061	PUERTO PENASCO, SON.			X		76656	CD. GUZMAN, JAL.			X	
76113	ALTAR, SON.			X		76658	COLIMA, COL.			X	
76118	PILARES DE NACUZARI, SON.			X		76662	ZAMORA, MICH.			X	
76122	NUEVA CASAS GRANDES CHIH.			X		76665	MORELIA, MICH.			X	
76160	HERMOSILLO, SON.			X		76675	TOLUCA, MEX.			X	
76220	TEMOSACHIC, CHIH.			X	X	76679	AEROP. INTERNACIONAL MEXICO, DF				X
76225	CHIHUAHUA, CHIH.			X		76680	MEXICO (CENTRAL), DF	X		X	
76243	PIEDRAS NEGRAS, COAH.			X		76683	TLAXCALA, TLAX.			X	
76253	SANTA ROSALIA, B. C. S.			X		76685	PUEBLA, PUE.			X	
76256	EMPALME, SON.			X	X	76687	JALAPA, VER.			X	
76258	CD. OBREGON, SON.			X		76692	HACIENDA YLANG YLANG VERACRUZ, VER.			X	X
76305	LORETO, B. C. S.			X		76695	CAMPECHE, CAMP.			X	
76311	CHOIX, SIN.	X		X		76698	F.CARRILLO PUERTO, Q. ROO			X	
76323	HIDALGO DEL PARRAL. CHIH.			X		76723	I. SOCORRO, COL.			X	X
76342	MONCLOVA, COAH.			X		76726	CUERNAVACA, MOR.			X	
76373	TEPEHUANES, DGO.			X		76737	ORIZABA, VER.			X	
76382	TORREON, COAH.			X	X	76741	COATZACOALCOS, VER.			X	
76390	SATILLO. COAH			X		76743	VILLAHERMOSA, TAB.			X	
76393	MONTERREY, N.L.	X		X		76750	CHETUMAL, Q. ROO.			X	
76394	AEROP. INTERNACIONAL MONTERREY. N. L.				X	76751	CHETUMAL, Q. ROO. (FAM)			X	
76401	PUERTO CORTEZ. B. C. (SM)			X		76762	CHILPANCINGO, RO.			X	
76402	CD. CONSTITUCION. B. C. S			X		76773	HUAJUAPAN DE LEON, OAX.			X	
76405	LA PAZ, B.C.	X		X	X	76775	OAXACA, OAX.			X	
76412	CULIACAN, SIN.			X		76805	ACAPULCO, GRO.			X	X
						76833	SALINA CRUZ, OAX.	X		X	
						76840	ARRIAGA, CHIS			X	
						76843	TUXTLA GUTIERREZ, CHIS.			X	

Index Number	Station Name	GSN	GUAN	CLIMAT	CLIMAT TEMP	Index Number	Station Name	GSN	GUAN	CLIMAT	CLIMAT TEMP
76845	S. CRISTOBAL DE LAS C. CHIS.			X			TX	X		X	
76848	COMITAN, CHIS.			X		72266	ABILENE MUN., TX	X		X	
76855	PUERTO ANGEL, OAX.			X		72270	EL PASO INT., TX	X		X	
76855	PUERTO ANGEL, OAX.				X	72274	TUCSON INT., AZ	X		X	
76903	TAPACHULA, CHIS.			X		72278	PHOENIX/SKY HARBOR, AZ	X		X	
NETHERLANDS ANTILLES AND ARUBA						72290	SAN DIEGO LINDBERGH, CA	X		X	
78866	JULIANA AIRPORT, ST. MAARTEN			X	X	72293	SAN DIEGO MIRAMAR, CA		X		X
78988	HATO AIRPORT, CURAÇAO			X	X	72295	LOS ANGELES INT.	X		X	
NICARAGUA						72304	CAPE HATTERAS, NC	X		X	
78741	MANAGUA			X		72306	RALEIGH, NC	X		X	
PANAMA						72312	GREENVILLE GR, SC	X		X	
78792	TOCUMEN			X		72315	ASHEVILLE MUN., NC			X	
PUERTO RICO & US POSSESSIONS IN THE CARIBBEAN AREA						72324	CHATTANOOGA, TN	X		X	
78526	SAN JUAN/INT., PUERTO RICO	X	X	X	X	72327	NASHVILLE METRO-POLITAN, TN			X	
TRINIDAD AND TOBAGO						72327	NASHVILLE/OLD HICKORY, TN				X
78970	PIARCO INTERNATIONAL AIRPORT			X	X	72340	NORTH LITTLE ROCK/AR			X	
UNITED STATES OF AMERICA						72344	FORT SMITH MU, OK	X		X	
70026	BARROW WSO AP, AK	X	X	X	X	72351	WICHITA FALLS, TX			X	
70086	BARTER ISLAND, AK	X		X		72353	OKLAHOMA CITY/W., OK	X		X	
70133	KOTZEBUE WSO AP, AK	X		X	X	72360	CLAYTON WSO AP, NM	X		X	
70200	NOME WSO AP, AK	X		X	X	72365	ALBUQUERQUE INT., NM	X		X	
70219	BETHEL AIRPORT, AR	X		X		72386	LAS VEGAS/MCCARRAN, NV	X		X	
70231	MCGRATH WSO AP, AK	X		X		72389	FRESNO AP, CA	X		X	
70251	TALKEETHA WSEMO, AK	X		X		72401	RICHMOND BYRD, VA			X	
70261	FAIRBANKS, AK	X		X		72403	STERLING, VA		X		X
70273	ANCHORAGE, AK			X	X	72405	WASHINGTON NATIONAL, DC	X		X	
70308	ST. PAUL ISLAND, WSO, AK	X	X	X	X	72422	LEXINGTON BLU, KY	X		X	
70316	COLD BAY WSO AP, AK	X		X	X	72428	COLOMBUS/FORT COLOMBUS, OH			X	
70326	KING SALMON WSO AP, AK	X		X		72429	DAYTON/COX MUN., OH			X	
70341	HOMER WSO AP, AK	X		X		72432	EVANSVILLE, IN	X		X	
70361	YAKUTAT WSO AP, AK	X		X	X	72434	ST. LOUIS LAMBERT, MO			X	
70398	ANNETTE WSO AP, AK	X	X	X	X	72438	INDIANAPOLIS, IN			X	
70414	SHEMYA AFG			X	X	72445	COLUMBIA REGI, MO	X		X	
72201	KEY WEST INT., FL	X	X	X	X	72451	DODGE CITY MU, KS	X		X	
72202	MIAMI INT. AIRPORT, FL			X		72458	CONCORDIA, KS	X		X	
72203	WEST PALM BEACH, FL			X		72476	GRAND JUNCTION, CO	X		X	
72206	JACKSONVILLE/IMESON, FL			X	X	72483	SACRAMENTO EX., CA	X		X	
72208	CHARLESTONE/MUNICIPAL, SC	X		X		72486	ELY YELLAND, NV	X		X	
72211	TAMPA AP, FL	X		X		72488	RENO INT., NV			X	
72219	ATLANTA, GA			X		72494	SAN FRANCISCO/INTERNATIONAL, CA			X	
72226	MONTGOMERY/DANNELLY, AL			X		72501	UPTON, NY				X
72231	NEW ORLEANS, LA	X		X		72503	NEW YORK/LA GUARDIA, NY			X	
72234	MERIDIAN KEY, MS	X		X		72507	PROVIDENCE GREEN STATE, RI			X	
72247	LONGVIEW, TX			X	X	72509	BOSTON/LOGAN INTERNATIONAL, MA			X	
72248	SHREVEPORT, LA	X		X	X	72519	SYRACUSE HANCKOCK, NY	X		X	
72250	BROWNSVILLE INT., TX			X		72520	PITTSBURGH, PA	X		X	
72253	SAN ANTONIO INT., TX	X		X		72528	BUFFALO/GREATER BUFFALO INT., NY			X	X
72255	VICTORIA/FOSTER, TX			X		72532	PEORIA, PL	X			
72261	DEL RIO INT., TX		X		X	72535	SOUTH BEND ST. JOSEPH, IN			X	
72263	SAN ANGELO MATHIS,					72546	DES MOINES/MUN., IA	X		X	

Index Number	Station Name	CLIMAT				Index Number	Station Name	CLIMAT			
		GSN	GUAN	CLIMAT	TEMP			GSN	GUAN	CLIMAT	TEMP
72556	NORFOLK, NE	X		X		72662	RAPID CITY/REGIONAL, SD				X
72562	NORTH PLATTE/LEE BIRD, NE	X		X	X	72666	SHERIDAN/COUNTY, WY	X		X	
72569	CASPER NATRONA COUNTY, INT., WY			X		72681	BOISE/MUN., ID	X		X	
72572	SALT LAKE/MUNICIPAL, UT			X		72688	PENDLETON, OR	X		X	
72576	LANDER HUNT, WY	X		X		72698	PORTLAND/INT., OR			X	
72578	POCATELLO MUN., ID	X		X		72712	CARIBOU/MUN., ME	X		X	
72583	WINNEMUCCA/MUN., NV	X		X		72743	MARQUETTE, MI	X		X	
72594	EUREKA WSO, CA	X		X		72745	DULUTH/INT., MN			X	
72597	MEDFORD/MEDFORD-JACKSON COUNTY, OR		X	X	X	72747	INT. FALLS/FALLS INT., MN			X	X
72613	MT WASHINGTON, NH	X		X		72764	BISMARCK/MUNICIPAL, ND	X	X	X	X
72617	BURLINGTON, VT	X		X		72768	GLASGOW INT., MT	X		X	
72632	WHITE LAKE, MI				X	72772	HELENA WSO, MT	X		X	
72641	MADISON DONE COUNTY, WI			X		72776	GREAT FALLS, MT			X	X
72654	HURON, SD	X		X		72785	SPOKANE/INT., WA			X	
72658	MINNEAPOLIS WSFO AP, MN	X		X		72786	SPOKANE, WA				X
72659	ABERDEEN REG., SD				X	72792	OLYMPIA, WA	X		X	
						72797	QUILLAYUTE, WA			X	
						74389	GRAY, ME				X
						74455	DAVENPORT, IA				X
						74492	BLUE HILL/OBSERVATORY, MA	X		X	

RESOLUTION 4 (XIII-RA IV)

RAPPORTEUR ON SOLAR RADIATION

THE REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) *The Abridged Final Report of the Twelfth Session of RA IV (WMO-No. 868)*, especially Resolution 5 (XII-RA IV) — Rapporteur on Solar Radiation,
- (2) Resolution 4 (EC-L) — Report of the twelfth session of the Commission for Instruments and Methods of Observation,
- (3) Resolution 13 (EC-XXXIV) — Development and comparison of radiometers,

CONSIDERING:

- (1) The requirements for high quality radiation measurements for meteorological and related environmental applications, for the development of renewable sources of energy and food production, as well as for research in the field of climate change,
- (2) The need for regular maintenance and calibration of radiation instruments and to apply consistent quality control procedures to the measured data, and regional cooperation in the processing of radiation data,
- (3) The need for technology transfer among Members, related to radiation measurements,
- (4) The need for updating the information on the status of instrumentation used in national networks and on maintenance and calibration of instruments,
- (5) The need to coordinate education and training activities for observers and technicians in the field of operation, maintenance and calibration of radiation instruments,

(6) The need to assist Members in the planning and implementation of radiation networks,

DECIDES:

- (1) To appoint a Rapporteur on Solar Radiation with the following terms of reference:
 - (a) To update the information on radiation instrumentation and national radiation networks, as well as on maintenance and calibration;
 - (b) To encourage Members to seek guidance from Radiation Centres on radiation instrumentation, techniques and their effective application and on archiving and presentation of data;
 - (c) To advise the president of the Association on issues related to National and Regional Radiation Centres and the radiation station network in the Region;
 - (d) To assist in the preparation and execution of Regional Pyrheliometer Comparisons of RA IV and in the evaluation of the results and their presentation;
 - (e) To support an enhanced collaboration with the Baseline Surface Radiation Network operators;
 - (f) To support the coordination of measures in the field of radiation measurement, including UV-B, in calibration of radiation instrumentation, as well as in education and training;

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| <p>(g) To initiate a closer collaboration with the related rapporteur of RA III in fields of common concern;</p> <p>(2) To invite Mr Edmond K. Wu (Canada) to serve as Rapporteur on Solar Radiation;</p> | <p>(3) To request the rapporteur to submit annual progress reports and a final report to the president of RA IV at least six months before the next session of the Association.</p> |
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RESOLUTION 5 (XIII-RA IV)

RAPPORTEUR ON REGIONAL ASPECTS OF INSTRUMENT DEVELOPMENT, RELATED TRAINING AND CAPACITY BUILDING

THE REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) *The Abridged Final Report of the Twelfth Session of RA IV* (WMO-No. 868), especially Resolution 4 (XII-RA IV) — Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building,
- (2) Resolution 4 (EC-L) — Report of the twelfth session of the Commission for Instruments and Methods of Observation (CIMO),

CONSIDERING:

- (1) The importance of information on instrument development as guidance for improving the equipment of surface-based observing stations with sensors and automatic weather stations,
- (2) The need for updating information on the status of instrumentation used at meteorological stations and on maintenance and calibration of instruments,
- (3) The need for coordinating education and training activities for observers, station inspectors and technicians in the field of operation, maintenance and calibration of meteorological instruments,

DECIDES:

- (1) To appoint a Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building with the following terms of reference:

- (a) To update information on instrumentation operated at meteorological stations and on its maintenance and calibration;
- (b) To prepare guidance for the best effective use of meteorological instrumentation;
- (c) To keep abreast of all matters related to instrument development;
- (h) To provide guidelines for coordination of education and training activities for instrument technicians in collaboration with the Regional Instrument Centres and the WMO Secretariat;
- (i) To facilitate communications between CIMO and the regional association on matters pertaining to capacity building in the field of instruments and methods of observation;
- (j) To collaborate with the CIMO co-Rapporteurs on Capacity Building;

- (2) To invite Mr Carlos Espinosa (Mexico) to serve as Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building;

- (3) To request the rapporteur to submit annual progress reports and a final report to the president of RA IV with a copy to the president of CIMO at least six months before the next session of the Association.
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RESOLUTION 6 (XIII-RA IV)

RA IV HURRICANE COMMITTEE

THE REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 5 (Cg-XIII) — Tropical Cyclone Programme,
- (2) Resolution 54/219 of the General Assembly of the United Nations on the successive arrangements to the International Decade for Natural Disaster Reduction (IDNDR),

- (3) With appreciation the reports of the sessions of the RA IV Hurricane Committee,
- (4) The section concerning the Tropical Cyclone Programme, Fifth WMO Long-term Plan, 2000-2009,

CONSIDERING the need for the countries affected by hurricanes to continue to work together to accelerate action, particularly under the International Strategy for Disaster Reduction (ISDR) (post-IDNDR), and within the

context of the Sustainable Development of Small Island Developing States, to reduce the loss of human life and damage caused each year by hurricanes and associated floods, landslides and storm surges,

DECIDES:

- (1) To re-establish a working group to be known as the RA IV Hurricane Committee with the following terms of reference:
 - (a) To coordinate hurricane forecast and warning operational procedures as a means of minimizing hurricane damage;
 - (b) To serve as a forum for exchange of information on new developments in the science and technology of hurricane observation and prediction;
 - (c) To make recommendations on improvements in facilities and procedures as needed to ensure efficient and effective warning systems against hurricanes and associated phenomena;
 - (d) To advise on the possible sources of technical and financial support and, where deemed necessary, to initiate positive action in this regard for the development and strengthening of such warning systems and their infrastructures;
 - (e) To cooperate, in carrying out its functions, with the RA IV Working Groups on Hydrology and on Planning and Implementation of the WWW in Region IV, and other groups or institutions as appropriate;
 - (f) To serve as a focus for hurricane disaster prevention and preparedness activities appropriate to meteorological and hydrological services:
 - (i) By ensuring adequate and appropriate community information, education and training, and awareness efforts on meteorological and hydrological effects of hurricanes;
 - (ii) By stimulating governments to adapt measures to mitigate the harmful effects of hurricanes;
 - (g) To foster cooperative efforts of WMO and other international bodies in those aspects of hurricane disaster preparedness and prevention which can benefit from meteorological and hydrological assistance;
 - (h) To promote the placing of greater emphasis on training activities through the provision of appropriate facilities and financial support as necessary;
- (2) To invite all Members of RA IV affected by hurricanes to nominate Directors of Meteorological, Hydrological and Hydrometeorological Services, or those individuals responsible for hurricane forecasting, to serve on the Committee. The chairman of

the RA IV Working Group on Hydrology and the chairman of the Working Group on Planning and Implementation of the WWW in Region IV are ex-officio members. The following experts were nominated by the respective Members during the session:

Mr A.W. Rolle (Bahamas)
 Mr T. Sutherland (British Caribbean Territories)
 Mr F. Sambula (British Caribbean Territories)
 Mr L. Rivera (Columbia)
 Mr E. Zarate (Costa Rica)
 Mr J. J. Plácido Cabrera (Dominican Republic)
 Mr S. de la O (El Salvador)
 Mr M. Merlet (France)
 Mr M. Bautista (Guatemala)
 Mr H. Flores (Honduras)
 Ms S. McGill (Jamaica)
 Mr A. Hernández Unzon (Mexico)
 Mr A. Dania (Netherlands Antilles & Aruba)
 Ms M. Milagros Castro (Nicaragua)
 Mr O. Isaacs (Panama)
 Mr W. Mills (Trinidad and Tobago)
 Mr H. Noguera (Venezuela)
 Mr R. Velásquez (Venezuela)
 Mr A. Piñero Díaz (Venezuela)

- (3) To designate, in accordance with Regulation 32 of the WMO *General Regulations*, Mr M. Mayfield (USA) as chairman of the Committee;
- (4) To designate Mr J. Rubiera (Cuba) and Mr C. Fuller (Belize) as vice-chairmen of the Committee;

REQUESTS the Secretary-General:

- (1) To accord very high priority to the convening of an annual session of the Committee prior to the hurricane season;
- (2) To take the necessary steps to assist the Committee and to ensure the provision of appropriate Secretariat support to its activities;
- (3) To ensure the necessary cooperation with the ISDR Secretariat, the International Federation of Red Cross and Red Crescent Societies (IFRC), the Caribbean Disaster Emergency Response Agency (CDERA), the Centre for Prevention of Natural Disasters in Central America (CEDEPRENAC), the Federal Emergency Management Agency (FEMA), the Inter-American Development Bank (IADB), the Organization of American States (OAS), the Office of U.S. Foreign Disaster Assistance (OFDA), and such other organizations and agencies as may be deemed appropriate;
- (4) To promote strong links with the other regional tropical cyclone bodies under the Tropical Cyclone Programme and relevant scientific bodies.

Note: This resolution replaces Resolution 7 (XII-RA IV), which is no longer in force.

RESOLUTION 7 (XIII-RA IV)

DATA RESCUE AND ARCHISS PROJECT IN REGION IV

THE REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

CONSIDERING:

- (1) The conclusions and recommendations of the DARE-CLICOM workshop held in Costa Rica (July 2000),
- (2) That specific recommendations to develop pilot projects for the DARE project in Region IV have been made at the CLICOM-DARE Workshop in Costa Rica, July 2000,
- (3) That climate data from outside the NMHSs should also be identified and made more accessible,
- (4) That Members of the Association should be fully involved in the data rescue activities and projects in Region IV,
- (5) The need to develop and implement new Climate Database Management Systems adapted to the country needs and capabilities,

AGREES that:

- (1) There is a need to combine these and other data rescue projects within the Climate Database Management System activities for the Region;
- (2) There should be a close collaboration and cooperation with the activities of the Archival Climate History project (ARCHISS);

URGES:

- (1) Member countries to identify the need for national data rescue activities;
- (2) Donors to consider funding data rescue projects in the Region;

DECIDES:

- (1) To appoint a Rapporteur on Data Rescue to promote the need for projects in the Region to be funded, to advise the president of the Association on an annual basis on the status of data rescue projects and to submit final reports not later than six months before XIV-RA IV;
- (2) That the specific tasks for the rapporteur be as follows:
 - (a) To identify opportunities to develop data rescue projects at national and regional levels;
 - (b) To assist in the development of the WMO Data Rescue projects, the Climate Database Management System activities and the ARCHISS project;
 - (c) To liaise, as appropriate, with national technical and operational focal points and relevant bodies involved in the development of the data rescue activities, including the WMO Commission for Climatology.

RESOLUTION 8 (XIII-RA IV)

CLIMATE INFORMATION AND PREDICTION SERVICES (CLIPS)

THE REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 8 (Cg-XIII) – Climate Information and Prediction Services Project,
- (2) That Members of the RA IV are contributing to a range of CLIPS activities,
- (3) The climatic anomalies, and their impacts, associated with the 1997/98 *El Niño* event and the subsequent *La Niña* event,

CONSIDERING:

- (1) That interannual climate variability, including, but not restricted to, variability linked to ENSO, substantially impacts socio-economic activities in the Region,
- (2) That effective use of current seasonal to interannual climate prediction technology can provide substantial benefit in socio-economic planning,
- (3) That improved use of climate information, in addition to, or in combination with, climate predictions, can provide further socio-economic benefit,
- (4) That the technology of seasonal to interannual climate prediction is developing rapidly,

- (5) That effective application of climate prediction and information services requires capacity building and development of correctly-designed projects,
- (6) That the implementation of CLIPS in the Region should be kept under constant review,
- (7) That there is a need for close coordination in the implementation of CLIPS in the Region,

DECIDES:

- (1) To appoint Mr H. Burton (British Caribbean Territories), Mr M. Cortes (Mexico) and Ms B. Alicia Almedo (Panama) as the co-Rapporteurs on the implementation of the CLIPS Project in North America, Central America and Caribbean Subregion, with the following terms of reference:
 - (a) To act in support of all CLIPS activities within the Subregion;
 - (b) To keep abreast of research activities on climate variability in the Subregion, including especially the activities and plans of WCRP/CLIVAR;
 - (c) To keep abreast of applications research pertaining to climate information and prediction services;

- (2) To request the co-Rapporteurs to submit annual progress reports to the president of the Association, and a final report not later than six months before XIV-RA IV;

URGES:

- (1) Members to supplement through extrabudgetary contributions the resources required for the further

development and implementation of the CLIPS Project; REQUESTS the Secretary-General:

- (1) To provide the necessary support to the co-Rapporteur on the Implementation of CLIPS in the Region;
- (2) To bring this resolution to the attention of all concerned.

RESOLUTION 9 (XIII-RA IV)

ENVIRONMENT AND HUMAN HEALTH

THE REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

CONSIDERING:

- (1) The conclusions and recommendations of the Meeting of Experts on Climate and Human Health, held in Freiburg, Germany, in January 1997 (WCASP-No. 42),
- (2) The endorsement of showcase projects by the CCI Advisory Working Group (Mauritius, February 1998; UK, April 2000),
- (3) The request by Thirteenth Congress to ensure progress in organizing showcase projects as a matter of urgency and that such projects have served as a useful testing ground for climate applications toward the protection of human health,
- (4) The concern expressed over increased mortality and morbidity caused by environmental change such as increased UVB radiation, heat stress, poor air quality including particulate matter and changes in disease vectors,
- (5) The demand on NMHSs to broaden their products and services to provide predictions of UVB, air quality and other environmental parameters as part of their role in ensuring public safety,
- (6) The Meeting of the Environment Ministers of the Americas that took place between March 28 and 30 in Montreal, Canada, which has elevated the profile of this issue throughout the Americas and presents an opportunity to raise the visibility of NMHSs role in such matters within the environment, health and other communities,

AGREES THAT:

- (1) There is a need to raise the awareness of institutions in the region on the health impacts of environmental change and the applications of environmental prediction toward improved health

services and warnings to the public;

- (2) There is a need to promote the development and implementation of projects on Climate and Human Health, Air Quality Prediction, UV and other forecast and warning services;
- (3) There should be collaboration and cooperation between the Regional Association and WMO Constituent Bodies such as the CCI, WMO Programmes and projects, in particular AREP/GURME and with agencies in the health sector, such as WHO and PAHO.

URGES:

- (1) Member countries to inform each other on national programmes;
- (2) Members to develop their national network of contacts on matters related to environment and health (e.g. the health sector and municipalities);
- (3) Donors to consider funding regional projects related to health and environment including climate and health;

DECIDES:

- (1) To appoint a Rapporteur on Environment and Health Issues with the following terms of reference:
- (a) To identify potential projects and mobilize resources;
- (b) To advise on the development of environment and health activities at the regional level;
- (c) To keep abreast of Showcase Projects on Climate and Human Health in other Regions;
- (d) To advise the president of the Association on an annual basis on the status of activities in climate and health in the Region;
- (2) To appoint Mr I. Galindo (Mexico) as Rapporteur on these issues.

RESOLUTION 10 (XIII-RA IV)

WORKING GROUP ON AGRICULTURAL METEOROLOGY

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 12 (Cg-XIII) – Agricultural Meteorology Programme,
- (2) *The Abridged Final Report of the Twelfth Session of the Commission for Agricultural Meteorology* (WMO-No. 900),
- (3) Resolution 9 (XII-RA IV) - Working Group on Agricultural Meteorology,
- (4) The recommendations made by the session of the RA IV Working Group on Agricultural Meteorology held in Caracas, Venezuela, from 15 to 17 July 1999,

CONSIDERING:

- (1) The economic importance of agriculture to the countries in Region IV,
- (2) The impact of *El Niño*/Southern Oscillation (ENSO) on Agriculture and Forestry in the Region,
- (3) The need for development of appropriate adaptation strategies to cope with climate variability and climate change,
- (4) That drought and deforestation continue to impact the sustainability of agriculture in the Region,
- (5) That extreme meteorological events continue to increase in frequency and affect the productivity of agriculture, forestry and fisheries in the Region,
- (6) The potential for improved applications of Geographical Information Systems (GIS) and Environmental Information Systems (EIS) in the development and dissemination of products to meet the user requirements for agrometeorological services,

URGES Members:

- (1) To undertake studies on applications of seasonal to interannual climate forecasts in developing sustainable agricultural strategies;
- (2) To assess the impacts of extreme meteorological events on sustainable agriculture in the Region and develop appropriate strategies to mitigate such impacts;
- (3) Strengthen relations between NMHSs and national agencies working in the fields of agriculture and the environment, in order to improve products in terms of users,

DECIDES:

- (1) To establish a Working Group on Agricultural Meteorology with the following terms of reference:
 - (a) To review and summarize the effects of climate change and climate variability on agriculture, animal husbandry, forestry and fisheries (food aspects);
 - (b) To promote the more active use of seasonal to interannual climate forecasts for sustainable agriculture;
 - (c) To review and evaluate the impacts of ENSO on agriculture, forestry and fisheries;

- (d) To review and summarize the current understanding of the physical mechanisms of droughts as well as the existing systems of drought monitoring and prediction and suggest appropriate coping strategies for droughts;

- (e) To review and evaluate the socio-economic impacts of extreme climatic events on agriculture, forestry and fisheries and the long-term and short-term remedial measures to deal with them;

- (f) Review and summarize the status of applications of new methods such as GIS, EIS and remote sensing in agrometeorology;

- (g) To evaluate the current procedures for the provision of agrometeorological advisories and services for farmers and end users and suggest the ways and means to improve them;

- (2) (a) To invite Mr O. Solano (Cuba) to act as chairman of the Working Group on Agricultural Meteorology;

- (b) To invite Mr H. Shannon (USA) to serve as Rapporteur on Agrometeorological Information on Field Crops;

- (c) To invite Mr G. Johnson (USA) to serve as Rapporteur on Impacts of *El Niño*/Southern Oscillation on Agriculture;

- (d) To invite the following experts to serve as members of the working group:

Mr T. Basden (Bahamas)

Mr R. Frutos (Belize)

Mr A. Trotman (British Caribbean Territories)

Mr G. Hurtado (Colombia)

Mr R. Villalobos (Costa Rica)

Mr D. Camacho (Dominican Republic)

Mr A. Deño (Dominican Republic)

Mr R. Zimmermann (El Salvador)

Ms M. Fabry (France)

Mr E. Garabito (Guatemala)

Mr E. Salgado (Honduras)

Mr J. Spooner (Jamaica)

Mr L. Tijerina (Mexico)

Mr S.C. Rosalia (Netherlands Antilles)

Mr M. Guitierrez (Nicaragua)

Mr O. Isaacs (Panama)

Mr W. Mills (Trinidad and Tobago)

Ms M. Puche (Venezuela)

Mr R. Hernandez (Venezuela)

Ms B. Lozada (Venezuela)

- (3) (a) To request the chairman to allocate responsibilities in consultation with the members of the group for the various tasks contained in the terms of reference;

- (b) To request the chairman to submit a final report comprising individual reports of the members to the president of the regional

association not later than six months before the next session of the Association.

RESOLUTION 11 (XIII-RA IV)

RAPPORTEUR ON REGIONAL MARINE METEOROLOGICAL SERVICES

THE REGIONAL ASSOCIATION FOR NORTH AND CENTRAL AMERICA,

NOTING the report of the Rapporteur on Regional Marine Meteorological Services,

CONSIDERING:

- (1) The need for continued development of marine meteorological and oceanographic services in Region IV,
- (2) The need to continue close liaison with JCOMM, in particular through its programme area on education, training and implementation support, with regard to matters affecting the Region,

DECIDES:

- (1) To appoint a Rapporteur on Regional Marine Meteorological Services with the following terms of reference:
 - (a) To continuously review the status of the implementation of marine meteorological services and marine observing systems in Region IV and to formulate suggestions for their further development;

- (b) To take action on marine meteorological matters assigned by the president of RA IV;
 - (c) To liaise with the appropriate JCOMM working groups and sub-groups, in particular within the programme area of education, training and implementation support, on specific matters concerning Region IV;
 - (2) To invite Ms M. McCulloch (Canada) to serve as the Rapporteur on Regional Marine Meteorological Services;
 - (3) To request the rapporteur to submit annual reports, as appropriate, to the president of the Association with a final report to be presented six months prior to the fourteenth session of the Association;
- REQUESTS the Secretary-General to assist the rapporteur in her work as appropriate.

Note: This resolution replaces Resolution 10 (XII-RA IV) which is no longer in force.

RESOLUTION 12 (XIII-RA IV)

SUPPORT FOR JCOMM

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 14 (Cg-XIII) - Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM),
- (2) IOC Assembly Resolution XX-12 - The Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM),

CONSIDERING that oceanographic and marine meteorological observations not only make a significant contribution to operational meteorology and the provision of marine services, but also are essential to global climate studies generally,

RECOGNIZING:

- (1) That JCOMM is now the appropriate and sole WMO body for the international coordination and regulation of a global operational ocean observing, data management and services system,

- (2) That some Members of the Association are actively involved in the deployment and maintenance of a variety of ocean observation facilities, for both operational and research purposes,
 - (3) That Members of the Association are also increasingly being required to provide coordinated meteorological and oceanographic services for a large variety of marine user groups,
 - (4) That the Global Telecommunication System (GTS) will continue to be essential for the operational collection and exchange of many types of ocean data;
- RECOGNIZING FURTHER that a substantial increase in the amount of ocean data available operationally is needed to satisfy the requirements of operational meteorology, oceanographic services and research and global climate studies for such data,

URGES Members:

- (1) To continue and, where possible, expand their existing operational ocean observing system

- facilities and activities, as contributions to the WWW, GCOS and GOOS and with international coordination effected through JCOMM;
- (2) To participate actively in the planning and implementation of these systems and in the work of JCOMM;
 - (3) To coordinate with appropriate national oceanographic agencies and institutions to ensure the long-term operational maintenance of oceanographic observing systems;
 - (4) To coordinate with appropriate national oceanographic agencies and institutions in developing oceanographic data management capabilities and oceanographic services;

- (5) To enhance two-way ship-to-shore telecommunication arrangements for oceanographic data and products, in particular through the greater use of satellite-based telecommunications facilities such as the INMARSAT and Argos systems;

REQUESTS the Secretary-General to take any action considered necessary, and within the available budgetary resources, to assist Members to participate in the development and maintenance of JCOMM.

Note: This resolution replaces Resolution 11 (XII-RA IV) which is no longer in force.

RESOLUTION 13 (XIII-RA IV)

WORKING GROUP ON HYDROLOGY

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) The report of its Working Group on Hydrology,
- (2) Resolution 16 (Cg-XIII) – Hydrology and Water Resources Programme (HWRP),
- (3) Resolution 37 (Cg-XIII) – Terms of Reference of the Technical Commissions,
- (4) The Fifth Long-term Plan (2000-2009),

CONSIDERING:

- (1) That the HWRP is a priority programme for the Region,
- (2) That Regional Association IV plays an important and active role in conducting regional WMO activities relating to hydrology and water resources,
- (3) That the Working Group on Hydrology of RA IV had developed important work of interest to the Region, participating in various other regional activities during the last intersessional period,
- (4) That the Working Group on Hydrology proposed at its eighth session new activities to be carried out during the next intersessional period,

DECIDES:

- (1) To re-establish the Working Group on Hydrology with the following mandate:
 - (a) To provide assistance and advice to the president of the regional association through the Regional Hydrological Adviser on all issues relating to the regional aspects of the HWRP;
 - (b) To determine the best way to meet the Region's needs in terms of hydrology and water resources;
 - (c) To carry out the HWRP-related activities listed in the annex to this resolution in close cooperation with the relevant CHy experts;
 - (d) To cooperate with CHy and other WMO bodies on projects relating to hydrology and water resources;

- (e) To collaborate on the creation and development of HYCOS components in RA IV;
- (2) To invite all Members in the Region to designate experts in hydrology and water resources, preferably including the Hydrological Advisers to the Permanent Representatives and representatives of the HOMs National Reference Centres and of other bodies working in the field of water, to participate in the working group on an ongoing basis and attend its meetings. In selecting such experts, Members should take into account that they will have to devote time and effort to the working group's activities;
- (3) To appoint Mr C. Barret (United States of America) as Regional Hydrological Adviser and chairperson of the working group and Mr E. Planos (Cuba) as vice-chairperson of the working group;
- (4) To appoint the following experts as members of the working group:
 - Mr P.S. Weech (Bahamas)
 - Mr R. Frutos (Belize)
 - Mr K. Narayan (British Caribbean Territories)
 - Mr D. Harvey (Canada)
 - Ms M. Garcia de Mejia (Colombia)
 - Mr S. Laporte (Costa Rica)
 - Mr L.A. Peña (Dominican Republic)
 - Mr M. Martinez (El Salvador)
 - Ms S. Roy (France)
 - Mr P.A. Tax (Guatemala)
 - Mr D. Alonso (Honduras)
 - Mr B. Fernández (Jamaica)
 - Mr A.I. Ramírez (Mexico)
 - Mr J. Aparicio (Mexico)
 - Mr C. Winkel (Netherlands Antilles and Aruba)
 - Mr L.P. Ruiz (Nicaragua)
 - Mr I. Jaramillo (Panama)
 - Mr R. Ramdin (Trinidad and Tobago)
 - Mr V. Schneider (United States of America)

Mr J. Slack (United States of America)

Ms C. Farías (Venezuela)

Ms C. Fermin (Venezuela)

- (5) To establish sub-groups to carry out the work mentioned in the annex to this resolution;

INVITES the Regional Hydrological Adviser and chairperson of the working group:

- (1) To prepare detailed terms of reference for the established sub-groups, complementing the annex to the present resolution;
- (2) To propose to the president of RA IV nominations for coordinators of the sub-groups;
- (3) To prepare an implementation plan and designate, in consultation with the president of the regional association, appropriate members from the working group to conduct activities within the sub-groups;
- (4) In conjunction with the coordinators of the sub-groups, to propose to the president of RA IV those

who should become core members of the sub-groups;

- (5) To participate in EC sessions, if invited, representing the regional interests in relation to hydrology and water resources and to coordinate the WGH activities with CHy and other regional WGH;
- (6) To submit to the president of the Regional Association an annual report on 31 December every year and a final report no later than six months before the fourteenth session of RA IV;

REQUESTS the Members concerned to give their full support to their country core members so that they may carry out the tasks entrusted to them;

INVITES the Secretary-General to provide assistance to hydrological activities in the Region, including seeking sources of finance and implementing the projects that could be prepared as part of the activities of the RA IV Working Group on Hydrology.

ANNEX TO RESOLUTION 13 (XIII-RA IV)

TERMS OF REFERENCE OF THE SUB-GROUPS

(1) Training and continuing education:

- (a) To define the regional needs in relation to education and training activities and to assess the possibilities of establishing an itinerant course;
- (b) To cooperate in the development of computer-aided learning courses in the field of hydrology and water resources at different levels (Hydrologists and Hydrological Technicians);

(2) Hydrological warning systems:

- (a) To organize a workshop on hydrological warnings in cooperation with CHy. After this workshop the group should assess the possibility of implementing a flash flood forecasting system;
- (b) To maintain updated the report on mathematical models for hydrological forecasting prepared in the previous intersessional period;

(3) Integrated water resources management:

- (a) To follow-up the Action Plan of the Conference on Water Resources Assessment

and Management Strategies in Latin America and the Caribbean;

- (b) To cooperate in the organization of a Workshop on the Application of the UNESCO/WMO *Handbook on Water Resources Assessment - Handbook for Review of National Capabilities*;

(4) Development of CARIB-HYCOS:

- (a) To provide inputs to CARIB-HYCOS. To follow-up the recommendations prepared by the last session of the WGH on the development of CARIB-HYCOS, particularly its division in various components;
- (b) To cooperate on the implementation of this WHYCOS component;

(5) Transboundary Water Resources Management:

- (a) To share, among all countries of the region, experiences in the execution of bi and multilateral projects for the use of water resources.;
- (c) To promote international agreements for the management of transboundary water resources.

RESOLUTION 14 (XIII-RA IV)

RAPPORTEUR ON EDUCATION AND TRAINING MATTERS

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 17 (Cg-XIII) – Education and Training Programme,
- (2) Paragraph 8.6 of the general summary of EC-XLVIII on the role of rapporteurs appointed by regional associations on education and training matters,

CONSIDERING that there continues to be a pressing need by Members for staff to be trained at all levels so that they can plan, direct, organize and carry out programmes in meteorology and related fields essential to economic and social development,

DECIDES:

- (1) To designate a Rapporteur on Education and Training Matters with the following terms of reference:
 - (a) To keep under review and provide advice on priority subject requirements for regional and specialized education and training;
 - (b) To examine the feasibility of introducing specialized training courses at the WMO RMTCs;

(c) To advise on the application of a technology-intensive approach to the education and training process;

(d) To identify and prioritize requirements for training materials and initiate the preparation of new training publications;

(e) To assess the needs in the training of instructors at national training institutions and WMO RMTCs;

(f) To advise on the implementation of the new WMO Classification of Personnel in Meteorology and Operational Hydrology and related curricula;

(g) To assist in the development of WMO Long-term Plans for the Implementation of the Education and Training Programme;

(2) To invite Mr W. Fernandez (Costa Rica) to serve as Rapporteur on Education and Training Matters;

(3) To request the rapporteur to submit to the president of the Association annual progress reports and to submit a final report six months prior to the fourteenth session of the Association.

RESOLUTION 15 (XIII-RA IV)

REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING paragraph 3.7.1 of the general summary of EC-IX,

CONSIDERING:

- (1) That a number of its resolutions adopted before its twelfth session have been revised and incorporated in resolutions of the thirteenth session;
- (2) That others of its 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:

(1) To keep in force Resolutions 25 (VI-RA IV); 7 (VII-RA IV), 9 and 16 (VIII-RA IV); 14 (IX-RA IV); 4 and 8 (X-RA IV); 4, 11, 13 (XII-RA IV);

(2) Not to keep in force the other resolutions adopted before its thirteenth session;

(3) To publish the text of the resolutions kept in force in the annex to this resolution.

ANNEX TO RESOLUTION 15 (XIII-RA IV)

REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION

Resolution 25 (VI-RA IV)

PARTICIPATION OF NATIONAL METEOROLOGICAL SERVICES IN PLANNING AND DEVELOPMENT BODIES

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 17 (Cg-VI) — Role of meteorology in social and economic development,
- (2) WMO World Weather Watch Planning Reports Nos. 4, 17 and 27,
- (3) Proceedings of the WMO/ECLA Regional Technical Conference on the Role of Meteorological Services in the Economic Development of Latin America,
- (4) Paragraph 5.5.11 of the general summary of the *Abridged Report of the Twenty-fourth Session of the Executive Council*,
- (5) Paragraph 3.3.9.4 of the general summary of the *Abridged Report of the Sixth World Meteorological Congress*,

CONSIDERING:

- (1) The important and decisive role played by meteorology and its applications in human activities dependent on the weather,
- (2) The urgent need for planning and development councils, secretaries of economy and other similar national bodies to receive meteorological advice for performing the evaluation of natural resources, promoting their rational utilization and management as well as protecting the environment,

RECOMMENDS that Members take the necessary steps to ensure:

- (1) That expertise of the national Meteorological Services be taken into account by their countries' national planning and economic and social development bodies; and
- (2) That, when possible, a representative of these Services participates in the activities of these bodies, particularly during the discussions of matters relative to the evaluation and management of natural resources, town and country planning, defense of the environment and other human activities influenced by weather and climate.

Resolution 7 (VII-RA IV)

INTERCHANGE VISITS OF PERSONNEL ENGAGED IN ANALYSIS AND PROGNOSIS ACTIVITIES

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING Resolution 3 (Cg-VII) — World Weather Watch,

CONSIDERING that there is a necessity for exchange of information on the methods of preparation of analyses and prognoses of interest to the Region,

URGES Members of Regional Association IV to encourage interchange visits of meteorological personnel between NMCs and the associated RMCs/WMCs to study and evaluate the analysis and forecast methods in use, in order to achieve efficient preparation and use of the output products of these centres;

REQUESTS the Secretary-General to assist in promoting this form of cooperation.

Resolution 9 (VIII-RA IV)

STRENGTHENING OF NATIONAL METEOROLOGICAL CENTRES

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 6 (VII-RA IV) — Strengthening of National Meteorological Centres,
- (2) Resolution 5 (Cg-VIII) — World Weather Watch,
- (3) The WWW plan and implementation programme 1980–1983,

CONSIDERING:

- (1) That the provision of processed meteorological information tailored to satisfy the requirements set out by various fields of human activities is one of the basic responsibilities of National Meteorological Services,
- (2) That this responsibility is critical in those cases where the meteorological information is required for the warning and alerting services related to extreme weather conditions, particularly in the tropical areas of the Region affected by hurricane and other tropical disturbances,
- (3) That these requirements, as well as others related to the social and economic development of the corresponding countries, can best be met through a well-equipped and staffed National Meteorological Centre,

URGES Members to develop their National Meteorological Centres, as necessary, to ensure that they are capable of providing adequate meteorological services on the national level to the various human activities affected by weather and climate;

REQUESTS the Secretary-General to assist the countries, if so requested, in the planning of the expansion and improvement of National Meteorological Services and the upgrading of the National Meteorological Centres.

NOTE: This resolution replaces Resolution 6 (VII-RA IV), which is no longer in force.

Resolution 16 (VIII-RA IV)

INCREASED OBSERVATIONS FROM SHIPS OPERATING IN THE TROPICS AND THE SOUTHERN OCEANS

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 15 (VII-RA IV) — Increased observations from ships operating in the tropics and the southern oceans,
- (2) The recommendation of the Informal Planning Meeting on the Improvement in Observational Data Coverage over the Oceans (Geneva, June 1976), that: "Meteorological Services should continue to select and equip suitable vessels to make weather observations, especially where this would be likely to augment the supply of information from data-sparse areas",
- (3) Recommendation 4 (CMM-VII) — Port Meteorological Services,

CONSIDERING:

- (1) That insufficient progress has so far been made in the implementation of Resolution 15 (VII-RA IV), whereas the need for observations from data-sparse areas in the Region still exists for scientific and operational purposes,
- (2) That the Port Meteorological Officer can play an important role in encouraging ships to report from data-sparse areas,
- (3) That the establishment of Port Meteorological Services will be of particular importance in obtaining increased observations, especially from the tropics and the southern ocean areas,

URGES:

- (1) Members of RA IV collecting ship' weather reports to ensure that all ships' weather reports collected at their centres are regularly disseminated within the Region; and
- (2) Members of RA IV to establish or expand Port Meteorological Services at all ports which are visited by ships operating in the tropics and the southern ocean areas;

REQUESTS the Secretary-General of WMO to assist Members of RA IV in the implementation of this resolution, particularly as regards the training aspects.

NOTE: This resolution replaces Resolution 15 (VI-RA IV), which is no longer in force.

Resolution 14 (IX-RA IV)

RA IV HURRICANE OPERATIONAL PLAN

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 2914 (XXVI) of the General Assembly of the United Nations — International action for

the mitigation of the harmful effects of storms,

- (2) Resolution 13 (IX-RA IV) — RA IV Hurricane Committee,

CONSIDERING:

- (1) The need to enhance the cooperative efforts of countries within Region IV in carrying out effectively their roles in preparing for and issuing meteorological forecasts and warnings of all tropical cyclones affecting the area,
- (2) That to achieve this aim it is essential to have an agreed 'Hurricane Operational Plan' defining the observing, forecasting and warning responsibilities of all cooperating countries,

DECIDES to adopt the 'Hurricane Operational Plan'*;

AUTHORIZES the president of RA IV to approve on behalf of the Association amendments to this Hurricane Operational Plan, as recommended by the RA IV Hurricane Committee;

REQUESTS the Secretary-General:

- (1) To maintain the WMO publication on the RA IV Hurricane Operational Plan in print and to keep it up to date;
- (2) To inform all Members concerned of any amendments and updating of the publication.

* Published as WMO-No. 524.

Resolution 4 (X-RA IV)

THE FURTHER DEVELOPMENT OF THE GLOBAL OBSERVING SYSTEM

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 25 (Cg-X) — Second WMO Long-term Plan, including the WWW Implementation Programme for RA IV (1988-1997),
- (2) The progress being made in the implementation of the ASDAR, ASAP and drifting buoy programmes,

CONSIDERING:

- (1) That parts of the Region are data-sparse areas,
- (2) The importance of an effective Regional Basic Synoptic Network and the essential need to integrate it with the overall GOS,
- (3) The need to have comprehensive and realistic information on the value of new observing systems, their costs and their interfaces with other parts of the regional programme,

INVITES Members to participate in the deployment and use of new observing systems and, individually or collectively, to evaluate the effectiveness of these systems and their integration in the WWW;

ENCOURAGES Members to seek VCP assistance for the installation of satellite-data ground receiving stations, weather radar and new observing systems such as ASDAR, ASAP and buoys;

URGES Members to:

- (1) Provide additional surface observations in ocean areas using the Voluntary Observing Ship Scheme, buoys and suitable fixed platforms;
- (2) Consider the possibility of deploying ASAP systems on ships and ASDARs or other automated data-collection systems on aircraft flying suitable routes over the ocean;
- (3) Examine the communication facilities and data quality-control procedures to ensure that the data are of high quality and received at the data-processing centres in a timely fashion;

REQUESTS the Rapporteur on the Regional Aspects of the Global Observing System to keep abreast of developments in the implementation of this resolution by Members and to report to the next session of the Association, through the chairman of the working group.

Resolution 8 (X-RA IV)

RA IV HURRICANE COMMITTEE'S TECHNICAL PLAN AND IMPLEMENTATION PROGRAMME

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 5 (Cg-X) — Tropical Cyclone Programme,
- (2) A series of resolutions of the General Assembly of the United Nations calling for international cooperation and action by WMO for the mitigation of the harmful effects of storms,
- (3) Resolution (42/169) of the General Assembly of the United Nations — International Decade for Natural Disaster Reduction,
- (4) With appreciation the final report of the eleventh session of the RA IV Hurricane Committee,
- (5) Resolution 7 (X-RA IV) — RA IV Hurricane Committee,

CONSIDERING:

- (1) The need for the Members affected by hurricanes to join together to develop a regional programme of action to reduce the loss of human lives and damage caused by tropical cyclones and associated phenomena,
- (2) The need to establish a regional plan and an implementation programme,

DECIDES to adopt the RA IV Hurricane Committee's Technical Plan and Implementation Programme given in the annex to this resolution;

AUTHORIZES the president of RA IV to approve on behalf of the Association amendments to the plan as recommended by the RA IV Hurricane Committee;

REQUESTS the Secretary-General:

- (1) To notify all Members concerned of any amendments to the plan adopted by the Association;
- (2) To assist Members concerned in the implementation of the plan.

Resolution 4 (XII-RA IV)

ESTABLISHMENT OF REGIONAL INSTRUMENT CENTRES

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) The evident benefit to Members and the experience gained from the establishment of Regional Instrument Centres,
- (2) Recommendation 14 (CIMO-IX) — Inter-comparison of instruments,

CONSIDERING:

- (1) The limited resources of many Meteorological Services for employing experts with a scientific background or technical experience in the field of meteorological instruments and methods of observation,
- (2) The difficulties met by several Members, in particular in developing countries, when attempting to calibrate or compare their meteorological instruments against recognized standard instruments,

RECOMMENDS that WMO Regional Instrument Centres be designated to carry out the following functions:

- (1) To assist WMO in organizing regional training seminars or workshops in the maintenance, calibration and comparison of meteorological instruments, by providing laboratory space, demonstration equipment and expert advisers;
- (2) To advise Members of their Region in their inquiries about the performance of instruments and the availability of related guidance material;
- (3) To maintain a library of texts and periodicals on instrumentation science and practice;
- (4) To maintain a set of meteorological standard instruments traceable to recognized international or national standards, and to keep a continuous record of their performance and traceability;
- (5) To assist Members of their Region to calibrate or compare their national meteorological standard instruments against the standards mentioned under (4) above and to keep the Members of the Region and the WMO Secretariat well informed of the standard instruments available;

APPROVES the establishment of an RA IV Regional Instrument Centre at the Mount Washington Observatory in New Hampshire, United States, at the Caribbean Meteorological Institute and at the RMTC in San José, Costa Rica.

Resolution 11 (XII-RA IV)

INVOLVEMENT IN OPERATIONAL OCEANOGRAPHY

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) Resolution 16 (Cg-XII) — WMO's involvement in operational oceanography,
- (2) Resolution 2 (EC-XLVIII) — Report of the seventh session of the Joint IOC/WMO Committee for IGOSS,
- (3) Resolution 10 (XI-RA IV) — Participation in the Joint IOC/WMO Integrated Global Ocean Services System (IGOSS),

CONSIDERING that oceanographic observations not only make a significant contribution to operational meteorology and the provision of marine services, but are also essential to global climate studies generally,

RECOGNIZING:

- (1) That many Members of the Association are actively involved in the deployment and maintenance of a variety of ocean observation facilities, for both operational and research purposes,
- (2) That many Members of the Association are also being increasingly required to provide coordinated meteorological and oceanographic services for a large variety of marine user groups,
- (3) That the GTS will continue to be essential for the operational collection and exchange of many types of ocean data,

RECOGNIZING further that a substantial increase in the amount of ocean data available operationally is needed to satisfy the requirements of operational meteorology, oceanographic services and research and global climate studies for such data,

URGES Members:

- (1) To continue and, where possible, expand their existing operational ocean observing system facilities and activities, as contributions to the WWW, IGOSS and GOOS;
- (2) To participate actively in the planning and implementation of these systems;
- (3) To coordinate with appropriate national oceanographic agencies and institutions to ensure the long-term operational maintenance of oceanographic observing systems;
- (4) To coordinate with appropriate national oceanographic agencies and institutions in developing oceanographic data management capabilities and oceanographic services,
- (5) To enhance two-way ship-to-shore telecommunication arrangements for oceanographic data and products, in particular through the greater use of satellite-based telecommunications facilities such as the INMARSAT system;
- (6) To collect digitized bathymetry data that can be used to produce storm surge risk maps;

REQUESTS the Secretary-General to take any action considered necessary, and within the available budgetary resources, to assist Members to participate in the development and maintenance of IGOSS and GOOS.

NOTE: This resolution replaces Resolution 10 (XI-RA IV), which is no longer in force.

Resolution 13 (XII-RA IV)

PARTICIPATION OF WOMEN IN THE WORK OF THE REGION

REGIONAL ASSOCIATION IV (NORTH AND CENTRAL AMERICA),

NOTING:

- (1) The UN Conference on Women (Beijing, 1995) and its recognition of the importance of women and their contributions to science,
- (2) Principle No. 3 adopted by the International Conference on Water and the Environment (Dublin, 1992), namely that: "women play a central part in the provision, management and safeguarding of water",
- (3) The appeals made in Chapter 24 of Agenda 21: Programme of Action for Sustainable Development (Rio de Janeiro, 1992) on: "Global action for women towards sustainable and equitable development",
- (4) The UNDP emphasis and priority on the advancement of women in meteorology and operational hydrology,
- (5) That the forty-eighth session of the Executive Council had requested Members to encourage the advancement of women in meteorology and operational hydrology,
- (6) That the tenth session of the Commission for Hydrology passed a recommendation encouraging increased participation by women in the work of the Commission,

CONSIDERING the projected shortage of trained hydrological and meteorological personnel in the Region,

WELCOMING the very active participation of women delegates at this session,

URGES Members to respond to the questionnaire on women distributed by the Secretariat;

FURTHER URGES Members to identify focal points in their NMHSs for this activity;

RECOMMENDS that Members:

- (1) Actively provide encouragement and support for an increased number to the extent possible of women to work as professional staff and at decision-making levels in NMHSs, other hydrological and meteorological institutions and in regional, national and international cooperation programmes;
- (2) Increase the representation of women in their delegations to sessions of RA IV and participation in RA IV working groups, expert group meetings and training activities to the extent possible;
- (3) Promote the study of meteorology and hydrology in the schools;

REQUESTS the President of the Association to report to the thirteenth session of RA IV on progress in the implementation of this resolution during the inter-sessional period.

ANNEX

Annex to [paragraph 7.3.12](#) of the general summary

FOCAL POINTS ON REGIONAL ASPECTS OF AERONAUTICAL METEOROLOGY PROGRAMME IN REGION IV

TERMS OF REFERENCE

1. To review and advise on observational data and product requirements of Subregional countries in the context of the Aeronautical Meteorology Programme (AMP);
2. To review the status of the implementation of AMP in the Subregion, including observing systems at aerodromes, aircraft data collection, as well as services provided by WAFS and VAACs and formulate proposals for their future development;
3. To monitor and promote capacity building activities related to the AMP area within the Subregion and to identify training requirements;
4. To keep abreast of matters related to the implementation of AMDAR project(s) in the Subregion;
5. To liaise by correspondence with CAeM Working Groups and ICAO AERMET Sub-group and Study Groups through the respective Secretariats on specific matters concerning the Subregion, in particular regarding matters on cost recovery of aeronautical meteorological services;
6. To provide advice to the president of RA IV on aeronautical meteorology matters and to take necessary actions in this regard.

<i>Organization</i>	<i>Name</i>		
Caribbean Institute for Meteorology and Hydrology (CIMH)	C. Depradine	Director, Regional Office for the Americas	R. Sonzini
Caribbean Meteorological Organization (CMO)	T. Sutherland	Director Coordinator, Climate	M. Coughlan
6. LOCAL SECRETARIAT		Activities Programmes Department	D. Schiessl
J. Pereira		Director, World Weather Watch - Basic Systems Department	
A. Palache Marín		Director, Technical Cooperation Department	H. Diallo
R. Soto		Acting Director, World Weather Watch – Applications Department	E. Sarukhanian
Y. Montero Peña		WMO Representative, WMO Sub-regional Office for North America, Central America and the Caribbean	O. Arango
7. WMO SECRETARIAT		Scientific Officer, Hydrology and Water Resources Department	G. Arduino
Secretary-General	G.O.P. Obasi	Conference Officer	E. Dar-Ziv (Ms)
Deputy Secretary-General	M. Jarraud		

APPENDIX B

AGENDA

<i>Agenda item</i>	<i>Document Nos.</i>	<i>PINK Nos. and person submitting</i>	<i>Resolutions adopted</i>
1. OPENING OF THE SESSION		1, President of RA IV	
2. ORGANIZATION OF THE SESSION			
2.1 Consideration of the report of the credentials		2, President of RA IV	
2.2 Adoption of the agenda	2.2(1); 2.2(2)		
2.3 Establishment of committees			
2.4 Other organizational matters			
3. REPORT BY THE PRESIDENT OF THE ASSOCIATION	3	3, President of RA IV	
4. WORLD WEATHER WATCH PROGRAMME – REGIONAL ASPECTS			
4.1 WWW Planning and Implementation Programme, including the report of the chairperson of the Working Group on Planning and Implementation of the WWW in Region IV (RA IV/WG-PIW)	4(1)	4, Chairperson of Committee A	1
4.2 Observing systems, including Instruments and Methods of Observation Programme (IMOP) and WMO Satellite Activities	4(1); 4(1), ADD. 1; 4(1), ADD. 2; 4(1), ADD. 3; 4.2(1); 4.2(2); 4(1)		2, 3, 4, 5
4.3 Information Systems and Services, including Operational Information Service (OIS), Data Management and Regional Codes			
4.4 Data-processing and Forecasting Systems	4(1)		
4.5 Tropical Cyclone Programme (TCP)	4.5	4.5, Chairperson of Committee A	6
5. WORLD CLIMATE PROGRAMME (WCP) - REGIONAL ASPECTS			
5.1 Climate Programme Coordination and Support Activities	5	5, Chairperson of Committee B	
5.2 World Climate Data and Monitoring Programme (WCDMP)	5		7
5.3 World Climate Applications and Services Programme (WCASP), including Climate Information and Prediction Services (CLIPS)	5		8, 9
5.4 World Climate Research Programme (WCRP)	5.4	5.4, Chairperson of Committee B	
5.5 Global Climate Observing System (GCOS)	5.5	5.5, Chairperson of Committee B	
6. ATMOSPHERIC RESEARCH AND ENVIRONMENT PROGRAMME (AREP) - REGIONAL ASPECTS			
6.1 Global Atmosphere Watch (GAW)	6	6, Chairperson of Committee B	
6.2 World Weather Research Programme (WWRP)	6		
6.3 Tropical Meteorology Research Programme (TMRP)	6		
6.4 Programme on Physics and Chemistry of Clouds and Weather Modification Research (PCCWMR)	6		
6.5 Support to Ozone and other Environment-oriented Conventions	6		
7. APPLICATIONS OF METEOROLOGY PROGRAMME (AMP) – REGIONAL ASPECTS			
7.1 Public Weather Services Programme (PWSP)	7.1	7.1, Chairperson of Committee A	
7.2 Agricultural Meteorology Programme (AgMP)	7.2(1); 7.2(2);	7.2, Chairperson of Committee A	10

<i>Agenda item</i>	<i>Document Nos.</i>	<i>PINK Nos. and person submitting</i>	<i>Resolutions adopted</i>
7.3 Aeronautical Meteorology Programme (AeMP)	7.3	7.3, Chairperson of Committee A	
7.4 Marine Meteorology and Associated Oceanographic Activities Programme (MMAOAP)	7.4(1); 7.4(2)	7.4, Chairperson of Committee A	11, 12
8. HYDROLOGY AND WATER RESOURCES PROGRAMME — (HWRP) REGIONAL ASPECTS	8(1)	8, Chairperson of Committee B	13
9. EDUCATION AND TRAINING PROGRAMME (ETRP) — REGIONAL ASPECTS	9	9, Chairperson of Committee B	14
10. TECHNICAL COOPERATION PROGRAMME (TCOP) — REGIONAL ASPECTS	10	10, Chairperson of Committee B	
11. INFORMATION AND PUBLIC AFFAIRS ACTIVITIES (IPA)	11	11, President of RA IV	
12. LONG-TERM PLANNING (LTP) – REGIONAL ASPECTS	12	12, President of RA IV	
13. ROLE AND OPERATION OF NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES (NMHSs)	13	13, President of RA IV	
14. INTERNATIONAL STRATEGY FOR DISASTER REDUCTION (ISDR)	14	14, Chairperson of Committee	
15. INTERNATIONAL EXCHANGE OF DATA AND PRODUCTS	15	15, President of RA IV	
16. OTHER REGIONAL ACTIVITIES			
16.1 Technical Conference for RA III/RA IV	16.1	16.1, President of RA IV	
16.2 Internal matters of the Association		16.2, Vice-president of RA IV	
17. WMO REGIONAL OFFICE FOR THE AMERICAS, INCLUDING THE SUBREGIONAL OFFICE	17	17, President of RA IV	
18. SCIENTIFIC LECTURES AND DISCUSSIONS	18	18, President of RA IV	
19. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION AND OF RELEVANT EXECUTIVE COUNCIL RESOLUTIONS	19	19, President of RA IV	15
20. ELECTION OF OFFICERS	20(2)	20, President of RA IV	
21. DATE AND PLACE OF THE FOURTEENTH SESSION	21	21, President of RA IV	
22. CLOSURE OF THE SESSION		22, President of RA IV	

APPENDIX C

LIST OF ABBREVIATIONS

5LTP	Fifth WMO Long-term Plan
6LTP	Sixth WMO Long-term Plan
ACC	United Nations Administrative Committee on Coordination
ACMAD	African Centre of Meteorological Applications for Development
AeMP	Aeronautical Meteorological Programme
AERMETS	Aeronautical Meteorology Study Group
AgMP	Agricultural Meteorology Programme
AMDAR	Aircraft Meteorological Data Relay
AMOSSG	Aerodrome Meteorological Observing Systems Study Group
AMP	Applications of Meteorology Programme
APN	Asia-Pacific Network for Global Change Research
AREP	Atmospheric Research and Environment Programme
ASAP	Automated Shipboard Aerological Programme
ASC	Area Support Centre
ASDAR	Aircraft to Satellite Data Acquisition and Relay
ATEAM	Advanced Techniques Applied to Aeronautical Meteorology
ATS/MET	Air Traffic Services/Aeronautical Meteorological Services
AWG	Advisory Working Group
CACGP	Commission on Atmospheric Chemistry and Global Pollution (IAMAP)
CAeM	Commission for Aeronautical Meteorology
CAGM	Commission for Agricultural Meteorology
CAR/SAM	Caribbean, Central and South America
CAS	Commission for Atmospheric Sciences
CBH	Programme on Capacity Building in Hydrology and Water Resources
CBS	Commission for Basic Systems
CCI	Commission for Climatology
CDERA	Caribbean Disaster Emergency Response Agency
CDMS	Climate Database Management System
CHy	Commission for Hydrology
CIMH	Caribbean Institute for Meteorology and Hydrology
CIMO	Commission for Instruments and Methods of Observation
CLIC	Climate and Cryosphere Programme
CLICOM	Climate Computing
CLICOM-DARE	Climate Computing-Data Rescue
CLIMAG	Climate Prediction and Agriculture
CLIPS	Climate Information and Prediction Services
CLIVAR	World Climate Variability and Predictability
CMDL	Climate Monitoring and Diagnostic Laboratory
CMM	Commission for Maritime Meteorology
CMO	Caribbean Meteorological Organization
CMOS	Canadian Meteorological and Oceanographic Society
CNA	National Water Commission (Mexico)
Co-Com	Coordinating Committee (of SCHOTI)
COMET	Cooperative Programme for Operational Meteorology Education and Training
COP	Conference of the Parties
CPO	CLIPS Project Office
CREX	Character form for the representation and exchange of data
CRRH	Regional Committee for Water Resources
CSM	Commission for Synoptic Meteorology
DBCP	Data Buoy Cooperation Panel
DCP	Data Collection Platform
DPFS	Data-processing and Forecasting Systems
EART	Emergency Assistance Response Team
EC	Executive Council

EC/AGE	Executive Council Advisory Group on the Exchange of Meteorological and Related Data and Products
EER	Environmental Emergency Response
EIS	Environmental Information System
ENSO	<i>El Niño</i> /Southern Oscillation
EPS	Ensemble Prediction System
ETRP	Education and Training Programme
FTP	File Transfer Protocol
FAO	Food and Agriculture Organization of the United Nations
GAAP	GEWEX American Prediction Project
GAME	GEWEX Asian Monsoon Experiment
GARP	Global Atmospheric Research Programme
GAW	Global Atmosphere Watch
GCIP	GEWEX Continental-scale International Project
GCOS	Global Climate Observing System
GDPS	Global Data-processing System
GDSIDB	Global Digital Sea-Ice Data Bank
GEF	Global Environment Facility
GEOP	GEWEX Coordinated Enhanced Observing Period
GEWEX	Global Energy and Water Cycle Experiment
GHP	GEWEX Hydrometeorology Panel
GIS	Geographical Information System
GLOSS	Global Sea-level Observing System
GMDSS	Global Maritime Distress and Safety System
GMS	Geostationary Meteorological Satellite
GOES	Geostationary Operational Environmental Satellite
GOOS	Global Ocean Observing System
GOS	Global Observing System
GPS	Global Positioning System
GPV	Grid Point Value
GRDC	Global Runoff Data Centre
GREPECAS	Regional Planning and Implementation Group
GRIB	Processed data in the form of grid-point value expressed in binary form
GRID	Processed data in the form of grid point values
GSN	GCOS Surface and Upper-Air Networks
GTOS	Global Terrestrial Observing System
GTS	Global Telecommunication System
GTSP	Global Temperature Salinity Profile Programme
GUAN	GCOS Upper-Air Network
GURME	GAW Urban Research Meteorological Environment Project
GWP	Global Water Partnership
HiRID	High Resolution Image Data
HIS	Hydrological Information System
HNRC	HOMS National Reference Centre
HOMS	Hydrological Operational Multipurpose System
HRIT	High Rate Information Transmission
HRPT	High Resolution Picture Transmission
HTML	Hypertext Mark-up Language
HWRP	Hydrology and Water Resources Programme
HYCOS	Hydrological Cycle Observing System
IABP	International Arctic Buoy Programme
IADB	Inter-American Development Bank
IAEA	International Atomic Energy Agency
IAF	International Astronautical Federation
IAHR	International Association of Hydraulic Engineering and Research
IAHS	International Association of Hydrological Sciences
IAI	Inter-American Institute for Global Change Research

IAMAP	International Association of Meteorology and Atmospheric Physics
IATA	International Air Transport Association
IAVW	International Airways Volcano Watch
ICAO	International Civil Aviation Organization
ICB	International Congress on Biometeorology
ICSU	International Council for Science
ICT	Implementation/Coordination Team
ICUC	International Conference on Urban Climates
IDB	Inter-American Development Bank
IDNDR	International Decade for Natural Disaster Reduction
IFPRI	International Food Policy Research Institute
IFRC	International Federation of Red Cross and Red Crescent Societies
IGBP	International Geosphere-Biosphere Programme (ICSU)
IGOSS	Integrated Global Ocean Station System
IGRAC	International Groundwater Assessment Centre
IHDP	International Human Dimensions Programme on Global Environmental Change
IHP	International Hydrological Programme (UNESCO)
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IRI	International Research Institute
ISABP	International South Atlantic Buoy Programme
ISCS	International Satellite Communication Systems
ISDR	International Strategy for Disaster Reduction
ISP	Internet Service Provider
ITU/R	International Telecommunication Union/Radiocommunication Sector
IWTC	International Workshops on Tropical Cyclones
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
LRPT	Low Rate Picture Transmission
MAGS	Mackenzie GEWEX Study
MCSS	Marine Climatological Summaries Scheme
MDCRS	Meteorological Data Collection and Reporting System
MDD	Meteorological Data Distribution
METNO	Advance telegraphic notification relating to the operation of WWW (Code form)
MMAOAP	Marine Meteorology and Associated Oceanographic Activities Programme
MMS	Marine Meteorological Services
MPERSS	Marine Pollution Emergency Response Support System
MSC	Meteorological Service of Canada
MTN	Main Telecommunication Network
NASA	National Aeronautics and Space Administration
NCEP	National Centres for Environmental Prediction
NHS	National Hydrological Service
NIS	Newly Independent States
NMC	National Meteorological Centre
NMHS	National Meteorological and Hydrological Service
NMS	National Meteorological or Hydrometeorological Service
NOAA	National Oceanic and Atmospheric Administration
NRC	National Radiation Centres
NWP	Numerical Weather Prediction
NWS	National Weather Service
OAS	Organization of American States
OGP	NOAA's office of Global Programmes
OIS	Operational Information Service
OPAC	Open Programme Area Group
PACS-SONET	Pan American Study Programme-Sounding Network
PCCWMR	Physics and Chemistry of Clouds and Weather Modification Research
PROMET	Provision of Meteorological Information Required by Civil Aviation

PWS	Public Weather Services
PWSP	Public Weather Services Programme
QA/QC	Quality Assurance and Quality Control
QA/SAC	Quality Assurance/Science Activity Centre
RA	Regional Association
RAFC	Regional Area Forecast Centre
RBCN	Regional Basic Climatological Network
RBSN	Regional Basic Synoptic Network
RCC	Regional Climate Centre
RIC	Regional Instrument Centre
RMTC	Regional Meteorological Training Centre
RMTN	Regional Meteorological Telecommunication Network
RPC	Regional Pyrheliometer Comparison
RRC	Regional Radiation Centre
RSMC	Regional Specialized Meteorological Centre
RTH	Regional Telecommunication Hub
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCHOTI	Standing Conference of Heads of Training Institutions of National Meteorological Services
SDW	Programme on Sustainable Development of Water Resources
SIDS	Small Island Developing States
SIGWX	Significant weather
SMM	Specific MTN Monitoring
SOLAS	International Convention for the safety of Life at Sea
SOOP	Ship-of-Opportunity Programme
START	SysTem for Analysis, Research and Training
SWH	Significant Weather Chart (high level)
SWM	Significant Weather Chart (medium level)
TAF	Terminal Aerodrome Forecast
TCOP	Technical Cooperation Programme
TCP	Tropical Cyclone Programme
THORPEX	Hemispheric Observing System Research and Predictability Experiment
TMRP	Tropical Meteorology Research Programme
TOPC	Terrestrial Observation Panel on Climate
TREND	Training, the Environment and New Developments
TRUCE	Tropical Urban Climate Experiment
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
VCP	Voluntary Cooperation Programme
VOS	Voluntary Observing Ship
VSAT	Very Small Aperture Terminal
VTL	Virtual Training Library
WAFC	World Area Forecast Centre
WAFS	World Area Forecast System
WCP	World Climate Programme
WCRP	World Climate Research Programme
WDC	World Data Centre
WEBS	Water and Energy Budget Synthesis
WEFAX	Weather Facsimile
WG/WWW	Working Group on Planning and Implementation of the WWW
WG-CRM	Working Group on Climate Related Matters

WGH	Working Group on Hydrology
WG-PIW	Working Group on Planning and Implementation of the WWW
WMC	World Meteorological Centre
WMD	World Meteorological Day
WMO	World Meteorological Organization
WRC	World Radiation Centre
WRC 2000	World Radio Communications Conference 2000
WWAP	World Water Assessment Programme
WWC	World Water Council
WWRP	World Weather Research Programme
WWW	World Weather Watch