WORLD METEOROLOGICAL ORGANIZATION

Weather • Climate • Water

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN)

FOURTEENTH SESSION

SAN JOSÉ, 5–15 APRIL 2005

ABRIDGED FINAL REPORT WITH RESOLUTIONS

WMO-No. 987

Secretariat of the World Meteorological Organization - Geneva - Switzerland

REPORTS OF RECENT WMO CONSTITUENT BODY SESSIONS

Congress and Executive Council

915 — Executive Council, fifty-second session, Geneva, 16–26 May 2000
929 — Executive Council, fifty-third session, Geneva, 5–15 June 2001
932 — Thirteenth World Meteorological Congress, Proceedings, Geneva, 4–26 May 1999
945 — Executive Council, fifty-fourth session, Geneva, 11–21 June 2002
960 — Fourteenth World Meteorological Congress, Geneva, 5–24 May 2003
961 — Executive Council, fifty-fifth session, Geneva, 26–28 May 2003
972 — Fourteenth World Meteorological Congress, Proceedings, Geneva, 5-24 May 2003
977 — Executive Council, fifty-sixth session, Geneva, 8–18 June 2004

Regional associations

927 — Regional Association IV (North and Central America), thirteenth session, Maracay, 28 March–6 April 2001
934 — Regional Association III (South America), thirteenth session, Quito, 19–26 September 2001
942 — Regional Association VI (Europe), thirteenth session, Geneva, 2–10 May 2002
944 — Regional Association V (South-West Pacific), thirteenth session, Manila, 21–28 May 2002
954 — Regional Association I (Africa), thirteenth session, Mbabane, 20–28 November 2002
981 — Regional Association II (Asia), thirteenth session, Hong Kong, China, 7–15 December 2004

Technical commissions

931 — Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology, first session, Akureyri, 19–29 June 2001
938 — Commission for Climatology, thirteenth session, Geneva, 21–30 November 2001
941 — Commission for Atmospheric Sciences, thirteenth session, Oslo, 12–20 February 2002
947 — Commission for Instruments and Methods of Observation, thirteenth session, Bratislava, 25 September–3 October 2002
951 — Commission for Agricultural Meteorology, thirteenth session, Ljubljana, 10–18 October 2002
953 — Commission for Aeronautical Meteorology, twelfth session, Montreal, 16–20 September 2002
955 — Commission for Basic Systems, extraordinary session, Cairns, 4–12 December 2002
979 — Commission for Hydrology, twelfth session, Geneva, 20–29 October 2004
985 — Commission for Basic Systems, thirteenth session, St. Petersburg, 23 February–3 March 2005

In accordance with the decision of Congress, the reports are published in the following languages:

Congress	—	Arabic, Chinese, English, French, Russian, Spanish
Executive Council	—	Arabic, Chinese, English, French, Russian, Spanish
Regional Association I	—	Arabic, English, French
Regional Association II	—	Arabic, Chinese, English, French, Russian
Regional Association III	—	English, Spanish
Regional Association IV	—	English, Spanish
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Regional Association VI	—	Arabic, English, French, Russian
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WMO issues authoritative publications on scientific and technical aspects of meteorology, hydrology and related subjects. These include manuals, guides, training materials, public information and the WMO *Bulletin*.

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2005

ISBN 92-63-10987-7

NOTE

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION (agenda item 1)

1.1 At the kind invitation of the Government of Costa Rica, the fourteenth session of Regional Association IV (RA IV) (North America, Central America and the Caribbean) was held in San José, Costa Rica, from 5 to 13 April 2005. The session was opened by Mr A. Dania, president of the Association on 5 April 2005 at 2:00 p.m.

1.2 In his remarks, Mr Dania expressed his appreciation to the Costa Rican authorities for hosting the session of the Association. He stated that the Regional Association had catered for the regional implementation of the operational, technical and scientific components of the various Programmes of the World Meteorological Organization (WMO), and seen to the concrete and tangible implementation of the WMO Programmes in the Region for the benefit of all communities in the 26 Members. He drew attention to the important contribution of the meteorological and hydrological communities of the Region in safeguarding human lives and property, as well as significant support to socio-economic growth and development in the Region. He expressed his thanks to the Director of the National Meteorological Institute and Permanent Representative of Costa Rica with WMO, Mr P. Manso, as well as his staff for their support to the session.

1.3 His Excellency, Mr A. Flores Moya, Vice-Minister of Environment and Energy, extended a cordial welcome to all participants on behalf of the Government of Costa Rica. He pointed out that pertinent technological advances had resulted in a better understanding of the atmosphere, oceans and their interactions. In turn, this had led to unprecedented improvements in the quality and accuracy of meteorological predictions and advisories. At the same time, he underscored that natural disasters of hydrological origin continued to be an important obstacle to sustainable development for countries in the Region because economies were very vulnerable to weather, climate, its variability and climate change. This called for meteorological services that were effective not only in preventing or reducing the impact of hydrometeorolgical extremes, but also that could contribute to practically all sectors of the economy, such as health, transport, water resources and energy management, food security, and tourism, among others. He recognized the important role played by WMO in assisting Members in their quest for sustainable development.

1.4 In his address, Mr M. Jarraud, Secretary-General of WMO, expressed appreciation to the Government of Costa Rica for hosting the session in San José. He recalled that Costa Rica had a long tradition of actively supporting Programmes of the WMO, particularly by hosting the WMO Subregional Office as well as one of the Organization's Regional Meteorological Training Centres (RMTCs). He also conveyed his thanks to the president and vice-president of RA IV, Mr A. Dania and Mr C. Fuller, as well as to the rapporteurs, chairpersons and members of the Region's working groups. He also expressed gratitude to Mr Manso and his staff for the excellent arrangements made to ensure the success of the session. He extended a warm welcome to all participants.

1.5 Mr Jarraud recalled several events and developments of relevance to the Region that had taken place since the last session of RA IV four years ago, particularly natural disasters that had resulted in considerable loss of life and socio-economic impacts. He also referred to developments relating to the Global Earth Observation System of Systems (GEOSS), which would contribute to meeting the demands of sustainable development in the twenty-first century. He said that new programmes related to cross-cutting issues, such as disaster mitigation and space activities, had made a very good start and had produced tangible results.

1.6 He shared some comments which he hoped would be useful for the implementation of RA IV's plans on the following, among others:

(*a*) Notable gaps and shortcomings in observations and telecommunications remain, while noting progress made through a number of initiatives;
(*b*) Climate change and climate variability, as well as hydrology and water resources presented challenges;
(*c*) Need for greater involvement in wider environmental concerns;
(*d*) Education and training needs;
(*e*) Bridging the gap in the level of meteorological and other relevant services;
(*f*) Increased partnership and cooperation including with key regional institutions;
(*g*) National Meteorological and Hydrological Services' (NMHSs) contribution to achieving sustainable development.

1.7 He expressed confidence that the session would address the concerns of its Members with foresight and determination, in WMO's traditional spirit of cooperation. He also expressed his personal commitment to supporting the initiatives of the Association. He wished all delegates an enjoyable stay in San José and a most successful and productive session.

2. ORGANIZATION OF THE SESSION (agenda item 2)

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

2.1.1 The representative of the Secretary-General presented reports on credentials taking into account the credentials received prior to and during the session. The

Association accepted the reports and decided that it would not be necessary to establish a Credentials Committee.

2.1.2 There were 45 participants at the session from 22 Members of the Association, three observers from two Members outside the Region, and nine observers from seven international, regional and national organizations. The president of Regional Association III (South America) (RA III) also attended. A complete list of participants is given in Appendix A to this report.

2.2 ADOPTION OF THE AGENDA (agenda item 2.2)

The provisional agenda for the session was approved with two new items added:

15.6 Internal matters of WMO;

15.7 Brainstorming session.

2.3 ESTABLISHMENT OF COMMITTEES (agenda item 2.3)

The following committees were established for the duration of the session:

NOMINATIONS COMMITTEE

2.3.1 A Nominations Committee was established for the duration of the session composed of the principal delegates of Bahamas, Trinidad and Tobago, and Venezuela.

ORGANIZATION OF WORK

2.3.2 The president informed the Association of discussions concerning the possible use of plenary (i.e. without working committees) throughout the sessions of constituent bodies. He proposed this approach, which was accepted by the Association for use in this session. It was agreed to assign the various agenda items as follows:

(*a*) Plenary chaired by the president: agenda items 1, 2, 3, 13, 15.1, 15.2, 15.3, 15.6, 15.7, 16.2, 17, 18, 19, 20 and 21;

(*b*) Plenary co-chaired by Mr C. Fuller (vice-president): agenda items 4, 6, 7.1, 7.3, 7.4, 11, 12, 15.4 and 15.5;

(*c*) Plenary co-chaired by Dr M. Rosengaus (Mexico): agenda items 5, 7.2, 8, 9, 10, 14 and 16.1.

2.3.3 It was further agreed that since the meetings were in plenary, the Association could adopt the draft text for inclusion in the report of the session at any stage if no changes were proposed to the draft. However, if changes were proposed, the text would need to be transformed into a working paper and/or a PINK.

COORDINATION COMMITTEE

2.3.4 A Coordination Committee composed of the president, the vice-president, the co-chairperson of the plenary, the representative of the Secretary-General, and the secretaries to the plenary, was established.

2.4 OTHER ORGANIZATIONAL MATTERS (agenda item 2.4)

2.4.1 The Association decided on the working hours for the duration of the session. It was decided that there would be no minutes of the plenary meetings of the session unless otherwise decided for special items.

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

2.4.3 The Association designated Ms S. McGill (Jamaica) as Rapporteur on agenda item 18: Review of previous Resolutions and Recommendations of the Association and of relevant Executive Council Resolutions.

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

3.1 The Association noted with appreciation the report of the president of RA IV which provided an overall review and assessment of the major activities of the Association since its twelfth session and expressed satisfaction at the effective manner in which the activities of the Association were being undertaken.

3.2 The Association commended its president, Mr A. Dania (Netherlands Antilles and Aruba), for effectively conducting the affairs of the Association, thus contributing to the development of meteorology and hydrology in the Region. The Association also commended the vice-president, Mr C. Fuller (Belize) for his contribution to the work of the Association. It expressed its appreciation to the chairpersons and members of the working groups and rapporteurs, who had actively collaborated in carrying out the activities of the Association in the Region.

3.3 The Association extended its appreciation to Members, which had hosted various regional events during the intersessional period and encouraged all Members to continue to provide the necessary support to the activities of the Association. It welcomed the United Kingdom as its newest Member.

3.4 The Association gave its full support to the priorities and, in particular, to those related to WMO's scientific and technical programmes which focus on the specific needs and requirements of the Region and new priority areas such as climate change and related environmental issues. It requested the Secretary-General to take into consideration regional needs in the future work plan of the Association.

3.5 The Association extended its appreciation to the Members of the Region, especially the United States and Canada, which had provided prompt and effective assistance to the countries of Central America and the Caribbean affected by Hurricanes *Ivan*, *Frances*, *Jeanne*, and others. Their immediate action in assisting those countries to put back in operation the damaged meteorological and hydrological infrastructure was highly appreciated by the Members of the Association. The Association also invited Members of the Association to contribute to WMO's Emergency Fund and to collaborate in the strengthening of early warning systems for natural disaster reduction.

3.6 The Association was pleased to note the progress made during the preceding intersessional period in a number of areas, including, among others:

(*a*) Institutional aspects

(i) Effective functioning of the Regional Specialized Meteorological Centre (RSMC) for tropical cyclone warnings, the Hurricane

Committee (HC) and the Subregional Office in San José;
(ii) Meetings of Ibero-American countries in Guatemala and Colombia.

(*b*) Training and other events
(i) Annual training in tropical cyclone tracking and forecasting;
(ii) On-the-job training of operational forecasters in RSMC Miami;
(iii) Various short duration training events (e.g. Webmasters, public weather services, hydrological forecasting, agrometeorology, cost recovery, marketing);
(iv) Hurricane awareness tours.

(*c*) Operations
(i) Implementation of new International Satellite Communication Systems (ISCS)/ Regional Meteorological Telecommunication Networks (RMTNs);
(ii) Regional equipment maintenance project;
(iii) Global Climate Observing System (GCOS) station maintenance project;
(iv) Replacement of ten upper-air systems in the Region.

(*d*) Technical Cooperation
(i) Assistance to Haiti and Dominican Republic;
(ii) Capacity-building through the Small Island Developing States (SIDS) Caribbean Project;
(iii) Large-scale water resources project in Mexico, i.e. Programme for the Modernization of Water Resources Management (PROMMA);
(iv) WMO/US regional project on satellite meteorological application (using the Regional and Mesoscale Meteorology Advanced Meteorological Satellite Demonstration Interpretation System (RAMSDIS) at the RMTCs in Costa Rica and Barbados.

(*e*) Others
(i) Operation of web sites for NMHSs;
(ii) Pilot project for RA IV Regional Climate Centre in Central America;
(iii) Feasibility study on the socio-economic impacts of El-Niño.

3.7 The Association agreed that priority attention should be given to the following during the coming intersessional period:

(a) Institutional aspects
(i) Enhanced responsibility of the WMO Office in San José, Costa Rica;
(ii) Support for annual meetings for the HC and other subsidiary bodies;
(iii) Full implementation of the Regional Climate Centre (RCC);
(iv) Implementation of the regional component of the WMO Natural Disaster Prevention and Mitigation Programme (DPM);
(v) Foster participation of RA IV Members in the Global Earth Observations (GEO) initiative;
(vi) Improved visibility of NMHSs;
(vii) Better representation of RA IV in the activities of WMO constituent bodies and in the Secretariat.

(*b*) Training and other events
(i) Annual training on tropical cyclone tracking and forecasting;
(ii) Long-term fellowships at university and/or via e-learning.

(*c*) Operations
(i) Centralized system of equipment maintenance;
(ii) Tsunami warning system.

(*d*) Technical Cooperation
(i) Implementation of EU-funded Caribbean Meteorological Organization (CMO) radar project;
(ii) More involvement of, and support to, Haiti.

4. World Weather Watch (WWW) Programme — regional aspects (agenda item 4)

4.1 WWW planning and implementation programme, including the report of the chairperson of the working group (agenda item 4.1)

4.1.1 The Association noted with appreciation the report of the chairperson of the Working Group on Planning and Implementation of the WWW (WG-PIW) in Region IV (RA IV/WG-PIW), Mr C. Fuller (Belize). It was noted that the working group had made good progress and the major results were considered in detail under the relevant agenda items of the session.

4.1.2 The Association expressed its thanks to the National Meteorological Service of Belize for hosting the fourth session of the RA IV/WG-PIW in Belize City in October 2004, and to the working group chairperson, coordinator and rapporteurs for the work accomplished during the intersessional period.

4.1.3 The Association considered the results of the monitoring of the operation of the WWW in 2003-2004 from the annual global monitoring (October each year) and the quarterly special Main Telecommunication Network monitoring (SMM). It noted with satisfaction that the SMM was providing monitoring information during the hurricane season. The Association noted that the availability of SYNOP and TEMP reports from Regional Basic Synoptic Network (RBSN) stations was relatively satisfactory, while the availability of CLIMAT and CLIMAT TEMP reports from Regional Basic Climatological Network (RBCN) stations was less satisfactory. (Further details are given in paragraphs 4.2.3.)

4.1.4 The Association gave particular attention to Resolution 2 (Cg-XIV) — World Weather Watch Programme for 2004-2007 and Resolution 25 (Cg-XIV) — Sixth WMO Long-term Plan (6LTP), which confirmed that the WWW continued to have the highest priority as the basic WMO Programme and provided the basis for NMHSs operations and international exchange of data and products. The Association also noted Resolution 5 (Cg-XIV) — WMO Space Programme, under which a new major WMO Space Programme had been established

to increase the effectiveness and contributions from satellite systems to WMO Programmes as indicated in the Sixth WMO Long-term Plan (6LTP). As regards Resolution 29 (Cg-XIV) — Natural Disaster Prevention and Mitigation Programme, the Association emphasized the important role of the WWW system at the regional level, and in particular its information systems and services component for the exchange of early warnings and related information.

4.1.5 The Association stressed that it 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, bearing in mind the principles and directives laid down in the 6LTP. It would also identify deficiencies, propose remedial measures, and develop system support projects on a regional scale.

4.1.6 The Association agreed that, taking into account the many tasks related to the basic WWW components, it was necessary to re-establish the WG-PIW in Region IV. Accordingly, Resolution 1 (XIV-RA IV) was adopted. The Association identified the specific tasks, as listed in Annex I to this report, that the WG-PIW should carry out during the forthcoming intersessional period with a view to further developing implementation of WWW in the Region and to effectively meeting evolving requirements.

4.1.7 The Association emphasized that the WWW was an essential system in providing support to the Tropical Cyclone Programme (TCP) in the Region, and that the WG-PIW and the HC shared significant areas of common interest. It agreed that effective coordination mechanisms could enhance the output of both bodies and noted that the WG-PIW had recommended that, for the forthcoming RA IV intersessional period, the WG-PIW should hold two shorter meetings (two to three days) the first and third years after the RA IV session, in coordination with, and just before, the corresponding HC meetings. These arrangements were expected to benefit both bodies by facilitating larger participation in the WG-PIW and therefore enhancing the outcome of the meetings, including WWW support to the TCP, while limiting the overlapping of activities.

4.2 Integrated Observing System, including Instruments and Methods of Observation Programme (IMOP) (agenda item 4.2)

4.2.1 The Association recalled that the Global Observing System (GOS) described in the 6LTP was a composite system comprising the surface-based and space-based subsystems. The former was composed of the Regional Basic Synoptic Network (RBSN) of surface and upper-air stations and other networks of observing stations on land, at sea and in the air, and the latter of near-polar orbiting and geostationary environmental observation satellites with associated ground-stations.

Surface-based subsystem

Regional Basic Synoptic Network (RBSN)

4.2.2 The Association recalled that its previous session had approved the list of RBSN stations comprising 512 surface stations, 143 upper-air stations and 25 automatic marine stations. Following standing WWW observational procedures, RBSN surface stations should make observations at four main and intermediate standard times from 0000 GMT to 2100 UTC, while RBSN upper-air stations should make radiowind and radiosonde observations at 0000 and 1200 UTC.

4.2.3 The Association noted that WWW monitoring had indicated that 449 stations, i.e. almost 88 per cent of the total number of RBSN surface stations, were providing more than 50 per cent of expected SYNOP reports. The number of surface observation reports actually received at Main Telecommunication Network (MTN) centres varied from between 79 and 85 per cent during the period 2000-2004. The number of silent stations was still 30 stations a year (quarterly monitoring). The Association noted that gaps in the SYNOP data coverage existed over certain areas in the southern part of the Region. The availability of upper-air data from the RBSN stations indicated that 126 stations or 89 per cent of the total number of RBSN upper-air stations were providing at least 50 per cent of expected reports. The number of upper-air observation reports also varied between 79 and 87 per cent (with an increasing trend of 82 per cent to 85 per cent in the first half of 2004). Nine upper-air stations were silent stations. 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. The Association agreed to take immediate action through its WG/PIW, in particular its Rapporteur on Regional Aspects of the GOS and assisted by the Secretariat, to resolve the problem of the silent stations, in particular in the southern part of the Region. This should include an analysis, station by station, of the persisting deficiencies and proposals of measures, support, etc., necessary for reactivating each of the relevant stations.

4.2.4 The Association recalled the following principles for revising the list of the RBSN stations:

(*a*) The recent monitoring report showed that the availability of SYNOP and TEMP/PILOT reports from RBSN stations in Region IV was relatively satisfactory but could be enhanced in some parts of the Region. In order to obtain a better implemention level, the RBSN list should be updated in the light of density requirements and actual information on the implementation of stations (*Weather Reporting* (WMO-No 9, Volume A);

(*b*) *The Manual on the Global Observing System* (WMO-No. 544) recommended that the requirements for horizontal resolution for both surface stations and upper-air stations should be 250 km. For surface stations, a denser network was required;

(*c*) The mean distance between two stations should be 150 km for surface, and 250 km for upper-air stations;

(*d*) The current RBSN stations, which showed silent in the monitoring report, should be carefully considered. If there was another observing station less than 100 km away with better reporting availability, the silent station should be excluded from the list. If no better station existed nearby, the silent station should be kept on the RBSN list.

4.2.5 The Association noted with appreciation efforts by the Rapporteur on Regional Aspects of the GOS to compile, in coordination with the Secretariat, the revised list of RBSN stations based on the above principles. The Association also noted that the proposed list of RBSN stations had been reviewed by the WG/PIW and circulated among RA IV Members prior to the session. By adopting Resolution 2 (XIV-RA IV), the Association approved the new list of RBSN stations as given in the annex to the resolution.

4.2.6 The Association emphasized that the optimal use of operational resources in the Region had led to an operational practice for upper-air observations that differed somewhat from the RBSN observation requirements (i.e. two upper-air observations per 24 hours). Outside the hurricane period, only one observation per day was made in the southern part of the Region, while during the hurricane period, two or even more observations were carried out. The Association therefore agreed that a possible adaptable RBSN should be considered for the Region, and it tasked its WG-PIW to study and develop, as a matter of urgency, the relevant specifications and operational practices. The Association also emphasized that the monitoring procedures would also need to be adapted to properly reflect how the requirements would be met. It requested the Secretary-General to adapt the monitoring analysis for the RA IV RBSN. The Association also agreed to modify the current 50 per cent threshold used for depicting the availability of TEMP reports in monitoring analysis, which was unfavourable for stations making one TEMP report per day (a single report missing would depict the stations in the one but worst category). It was of the view that a threshold of 40 per cent (i.e. 0 per cent-1 per cent-40 per cent-90 per cent-100 per cent) would be more appropriate.

Regional Basic Climatological Network (RBCN)

4.2.7 The Association noted with satisfaction that the establishment of an RBCN in all WMO Regions and in the Antarctic allowed more effective and consistent monitoring of climatological data. The contribution of Region IV to the global RBCN constituted only 12 per cent (298 stations) and 11 per cent (58 stations) in providing CLIMAT and CLIMAT TEMP reports, respectively. The Association noted with concern that the availability of CLIMAT and CLIMAT TEMP messages was 73 per cent and 45 per cent, respectively, of the expected reports. In order to increase the availability of CLIMAT messages, further efforts by Members should be made to ensure that their operational observing stations compiled and transmitted the CLIMAT and CLIMAT TEMP messages according to existing WMO regulations. The Association appreciated the development and publication (in four languages and on CD-ROM) of the WWW *Technical Report Handbook on CLIMAT and CLIMAT TEMP Reporting* (WMO/TD-No. 1188), which was specifically addressed to personnel responsible for compiling and transmitting CLIMAT and CLIMAT TEMP messages at national level. It also noted the organization of the RA II/RA VI subregional training seminar on CLIMAT and CLIMAT TEMP Reporting (Moscow, Russian Federation, 2–4 November 2004), the first in a series of seminars for countries in WMO Regions experiencing problems in generating and exchanging climate data. The Association requested the Secretary-General to organize similar training workshops, with cooperation and support from the Global Climate Observing System (GCOS), for personnel from concerned countries in the Region.

4.2.8 The Association noted that the proposed list of RBCN stations had been reviewed by the WG-PIW and circulated among RA IV Members prior to the session. By adopting Resolution 3 (XIV-RA IV), the Association approved the list of RBCN stations in Region IV.

Other networks, including sea stations

4.2.9 The Association noted that the total number of ships participating in the WMO Voluntary Observing Scheme (VOS) had decreased in recent years. However, the number of SHIP reports available on the Global Telecommunication System (GTS) was increasing, due in part to ships spending more days at sea and to a rise in the number of automated shipboard systems producing hourly reports. At the same time, there had been a dramatic increase in the deployment of other types of sea stations, including 1 902 active drifting buoys (July 2004) and 300 moored buoys. Reports from a large percentage of these different automated sea stations were exchanged in real-time on the GTS. In September 2004, 1 361 sub-surface profiling floats of the Argo project were operational globally, including 744 from two Members of the Region. As far as upper-air observations were concerned, no RA IV ships had been equipped with Automated Shipboard Aerological Programme (ASAP) units, but the United States was contributing to the ASAP, by supporting the Worldwide Recurring ASAP Project (WRAP).

4.2.10 The Association was pleased to note that the number of automated AMDAR observations globally exchanged on the Global Telecommunication System (GTS) had increased to nearly 150 000 AMDAR observations per day in 2003. The majority of the AMDAR data generated in the Region was produced over the United States and Canada but some valuable data was also produced over the Caribbean region, North Atlantic and Pacific Oceans. The Association further noted that following the recommendations of Congress and the Executive Council, arrangements for the future integration of AMDAR into the WWW programme had been initiated.

Weather radar network

4.2.11 The Association noted that the Caribbean Weather Radar Network project was planning a regional radar network comprising four new digital Doppler weather radars within the framework of the European

Commission Regional Project, in addition to existing radars in the Caribbean. It also noted that a project for the implementation of radars in Central American countries was being considered by the Committee of Hydrological Resources (Regional Committee for Water Resources (of the Central American Isthmus) (CRRH)). The Association emphasized that the new radar network would be an important component of the GOS in the Region. It tasked its WG-PIW to develop the required operational arrangements for the generation and exchange on the RMTN of the required radar data, in particular composite radar images, in close coordination with the Regional Coordination Unit of the project.

Space-based subsystem

4.2.12 The Association noted with appreciation the implementation and future plans for space and ground segments of the space-based subsystem of the GOS. It acknowledged the valuable inputs to NMHS operations in the Region provided by operational meteorological polar-orbiting and geostationary satellites and, in particular the 'NOAA' polar-orbiting satellite series, and the Geostationary Operational Environmental Satellites (GOES) operated by the United States' National Oceanic and Atmospheric Administration (NOAA). It noted that research and development (R&D) satellites were now contributing to the space-based subsystem of the GOS.

Instruments and Methods of Observation Programme (IMOP)

4.2.13 The Association noted the outcome of the thirteenth session of the Commission for Instruments and Methods of Observation (CIMO) (Bratislava, Slovakia 25 September–30 October 2002). It stressed that IMOP was of fundamental importance in ensuring the quality and reliability of meteorological and related observations that were essential to Members operational and research activities.

4.2.14 The Association also noted that the technical conference, TECO-2002, and the exhibition of meteorological equipment and systems, METEOREX-2002, held conjointly with CIMO-XIII (Bratislava, Slovakia, 23–25 September 2002) had been very successful, and that 17 participants from the Region had been able to attend. The Association underlined the importance of such technical conferences as a means of exchanging technical information and experience, and of facilitating technology transfer and capacity-building. In that regard, the Association was informed that TECO/METEOREX-2005 would be held in Bucharest, Romania, from 4 to 7 May 2005.

4.2.15 The Association noted that steps had been taken to proceed with the urgently needed WMO intercomparisons according to the action plan set-up by CIMO-XIII. Specifically, the WMO Intercomparison of Rainfall Intensity Gauges started in September 2004 in laboratories at the Royal Netherlands Meteorological Institute, Météo-France, and the Italian Meteorological Service (University of Genova). Nineteen pairs of instruments (including two from Region IV) from 18 manufacturers were used in the intercomparison, which would last until mid-2005. The WMO Intercomparison of High Quality Radiosonde Systems, held in Vacoas, Mauritius (February 2005), was vital in ensuring the homogeneity of worldwide and regional upper-air measurements. Six operational radiosonde systems (Vaisala, Sippican, Modem, MEISEI Electric Co., Graw Radiosondes and Meteolabor) and three thermistor radiosondes, participated in the intercomparison. The project team was analyzing the results and preparing a report.

4.2.16 The Association noted that WMO had started preparations for the Tenth International Pyrheliometer Comparison (IPC-X) at the World Radiation Centre in Davos, Switzerland, from 26 September to 14 October 2005. As reliable, globally homogeneous radiation measurements were fundamental to understanding the Earth's climatic system, climate variability and climate change, the Association urged the three RA IV Regional Radiation Centres to take part in IPC-X.

4.2.17 The Association underscored the importance of capacity-building and training in the field of instruments and methods of observation as a prerequisite for the uninterrupted operation of instruments and the generation of high quality data. It encouraged Members to arrange for training through national and regional training programmes, and urged Members as well as private industry, to sponsor regional instrument training events. In that regard, the WMO Web portal on Development, Maintenance and Operation of Instruments, Observing Methods and Automatic Weather Station (AWS), which had been developed and placed on the WMO web site, had contributed significantly to capacity-building and training.

4.2.18 The Association underlined the role that the Regional Instrument Centres (RICs) had played in capacity-building. The RICs had also played an important role in organizing instrument evaluations and comparisons, and in providing assistance and advice in calibration of national standards/reference instruments within their Region. In that connection, the Association noted that the Secretary-General was organizing roving visits to further strengthen the services of the RICs, especially those in developing countries. Individual RICs would be evaluated against agreed criteria and proposals for improvements would be developed. Visits to RICs in Bridgetown (Barbados) and San José (Costa Rica) were planned in May 2005 and June 2005, respectively. The Association noted with interest that a Training Workshop on Metrology for RICs would be held in Trappes, France, in October 2005, with the aim of training RIC staff in basic metrological principles, measurements and calibration of meteorological variables as well as in conducting tests and intercomparisons.

4.2.19 The Association also noted the usefulness of the *Instrument Catalogue* (the second edition of which had been produced by the China Meteorological Administration, under the auspices of CIMO), in assisting Members to select the most suitable instruments for their operational networks. The 2002 version of the *Instrument Catalogue* had been distributed to Members in June 2003. The third edition was under development and would be distributed to Members later in the year.

Upper-air Observations – Transition to the Vaisala RS92 Radiosondes

4.2.20 The Association was informed that Vaisala Oyj (Finland) had announced to WMO late in 2004 its plan to introduce the new family of RS92 radiosondes. The RS92 radiosonde would provide technological advancements, such as improved (digital) telemetry, better slant range, more reliable data link, narrow band transmission and a higher level of PTU performance, and continuous wind data availability. The RS92 radiosonde would also be able to detect the signal of the future Galileo GPS satellites, which would not have been possible with the RS80 GPS radiosonde. The purchase price of the RS92 radiosonde would be approximately the same as the RS80 radiosonde.

4.2.21 The production of the RS90 had been discontinued in the last quarter of 2004 and the RS80 /400 MHz series of radiosondes would be discontinued in the course of 2005, with the last purchase orders being accepted by Vaisala in August 2005. These measures would necessitate upgrades of currently used ground stations to ensure compatibility with RS92 sondes, or their total replacement in the case of some older systems, such as CORA (1973), MicroCORA (1981) and PC-CORA (1990), as no upgrade options would be made available.

4.2.22 The Association noted that, based on the *WMO Catalogue of Radiosondes and Upper-air wind Systems* (WMO-No. 9), Vaisala RS80 radiosondes were being used at about 447 upper-air stations and RS90 at about 78 stations, representing 45 and 7.8 per cent, respectively, of the upper-air stations worldwide. Generally, all of these stations would need different levels of upgrades, which would require funding over and above the financing necessary for the already costly operation of the network of upper-air stations. There was serious concern over the possible weakening of the worldwide network because it was likely that a number of stations would not be able to upgrade or replace their equipment in time due to lack of funds.

4.2.23. In the light of this, the Association supported the requests already put forth earlier by XIII-RA II (Hong Kong, China, 7-5 December 2004) and CBS-XIII (St. Petersburg, Russian Federation, 23 February–3 March 2005) for the Secretary-General, as a matter of urgency, to investigate the impact of this development on the upper-air network and to initiate action to alleviate the risk of a prolonged loss of upper-air data, especially in developing countries, and to increase interoperability between equipment from different suppliers. The Secretary-General was also invited to request Vaisala to provide details of their long-term strategy of radiosonde production. The Association noted that these activities were on-going and proposed that the Secretary-General should prepare a comprehensive report for review by the fifty-seventh session of the Executive Council (Geneva, Switzerland, 21 June–1 July 2005).

Report of the Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building

4.2.24 The Association noted that Mr C. Espinosa (Mexico), the Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building had left the National Meteorological Service and had been unable to provide a report to the session. In the absence of the rapporteur's report, the Secretariat, with the assistance of the Regional Office for the Americas, had prepared information on relevant activities within the Region.

4.2.25 The Association noted the difficulties in the maintenance of the observing network that had negatively affected the availability of data in some parts of the Region. In cases where performance of instruments had been unsatisfactory, inadequate funds to rehabilitate and replace the obsolete instruments and a lack of properly trained instrument specialists had often been reported. The Association also noted with concern that the high cost of consumables continued to adversely affect performance, especially of upper-air observing stations.

4.2.26 The Association agreed that the Regional Instrument Centres (RICs) were instrumental in satisfying the needs of the Region for regular calibration, standardization, instrument comparisons and evaluation, and for training instrument experts. It supported further strengthening of the RICs through the establishment of relationships between RICs in the United States and in Barbados and Costa Rica.

4.2.27 The Association noted with appreciation that the three RICs established in the Region (Barbados, Costa Rica and the United States), had continued to enhance their collaboration with Members and encouraged them to regularly inform them on their services and plans. It urged Members and invited donors to place, as a highest priority, the provision of basic calibration facilities so that they would become available at, or accessible to, all NMHSs in the Region. The Association was pleased that RIC Barbados was being refurbished under the WMO/Finland SIDS-Caribbean Project.

4.2.28 The Association also noted that the RMTC at the University of Costa Rica had offered to provide training on the operation of AWS as an independent programme or as part of existing training programmes. Around 20 graduate and postgraduate students from Costa Rica, Dominican Republic, Mexico and Venezuela, had been trained in the basics of AWS in the past four years.

4.2.29 The Association recognized the importance of instrument tests and intercomparisons and their impact on data accuracy and homogeneity. It stressed the significance of data and metadata for global understanding of the Earth's climate system. It was vital to understand how much variation in the observed data was due to climate and how much was due to varying instrumentation and observational procedures over time. In that regard, the Association requested the RICs to assist in organizing WMO intercomparisons and Members to perform overlap tests of new and old instruments. RICs may consider the possibility of providing overlap tests when new radiosonde types for worldwide and regional use were introduced.

4.2.30 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, preferably coming from one of the RICs, and adopted Resolution 4 (XIV-RA IV).

Report of the Rapporteur on Solar Radiation

4.2.31 The Association noted the report of the Rapporteur on Solar Radiation, Mr E. K. Wu (Canada), and appreciated his close collaboration with the radiation experts of the Region.

4.2.32 The Association noted its Members related activities and welcomed further improvement of the national radiation networks, although problems remained in implementation levels, 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 the national radiation standard instrument.

4.2.33 The Canadian Solar Radiation Observation Network consisted of approximately 40 stations across Canada measuring global, diffuse, reflected, longwave and net radiation. Environment Canada operated a Baseline Surface Radiation Network (BSRN) station at the Bratt's Lake Observatory in Regina, Saskatchewan. A sunphotometer network comparison of five different instruments during the summer of 2001 had generally shown consistency between instruments and methodologies. The findings had been published in 2002. The Kipp and Zonen CM21 offset experiment, comparing nine different instruments from February to April 2002, had examined the night time thermal offsets in response to five different ventilation regimes. A two-week PAR instrument comparison consisting of 20 instruments from seven different models had been held in conjunction with the 7th BSRN Workshop and Scientific Review (Regina, Canada, 28–31 May 2002).

4.2.34 The National Atmospheric Radiation Centre (NARC) (a WMO Regional Radiation Centre) in Toronto, Ontario, maintained a group of reference standard radiation instruments that were compared with recognized international standards of radiation at regular intervals. NARC provided calibration services (including cosine response and temperature dependence) for the Canadian Solar Radiation Observing Network, Canadian Research Climate Station (RCS) Network, Canadian CORE Radiation Network, government departments, universities, and private industry for a fee. On average, 100 instruments were calibrated each year. A new blackbody system to calibrate longwave radiometers was being developed.

4.2.35 The National Oceanic and Atmospheric Administration (NOAA) had hosted the second Diffuse Intensive Observation Program (IOP) campaign in October 2003. All of the data had been taken on top of the Atmospheric Radiation Measurement (ARM) Radiation Calibration Facility at the Southern Great Plains central facility near Lamont, Oklahoma (United States). The goal of the diffuse IOP was to improve the measurement uncertainty associated with the diffuse horizontal irradiance measurements. A second paper had been submitted summarizing those results.

4.2.36 The National Renewable Energy Laboratory (NREL) had hosted an annual NREL Pyrheliometer Comparisons (NPC) at the Solar Radiation Research Laboratory in Golden, Colorado - except during years of International Pyrheliometer Comparisons (IPC) at the World Radiation Comparisons (WRC). NREL maintained a Transfer Standard Group of four electronically self-calibrating absolute cavity radiometers that had participated in IPCs from 1980 to 2000. Typically, NREL hosted from 10 to 15 scientists operating 15 to 25 absolute cavity radiometers for transferring the World Radiometric Reference (WRR).

4.2.37 NREL continued to develop and perform Broadband Outdoor Radiometer Calibrations (BORCALs) based on the summation method for pyranometer calibration and direct comparison for pyrheliometers. Radiometer Calibration and Characterization (RCC) software for automating the data collection, radiometer inventory, and calibration history database was being utilized. A modified shade calibration method for determining the responsiveness of pyranometers used as reference radiometers for the BORCAL process had been developed. NREL was calibrating approximately 200 pyranometers and pyrheliometers annually for the United States Department of Energy's Atmospheric Radiation Measurement (ARM) Program at the RCF. NREL had also established a Measurement Assurance Standard set of 12 pyranometers and four pyrheliometers for the BORCAL events.

4.2.38 The Pyrgeometer Blackbody Calibration System, developed by The Eppley Laboratory, Inc. and NREL, had been assembled for use at NREL and at the RCF. Approximately 100 pyrgeometers had been calibrated since the two systems became operational in 2003. A new pyranometer characterization method for accounting for the thermal offsets had been developed. A publication had been submitted detailing this work. NREL had purchased an all-weather Hickey-Frieden (AWX) cavity radiometer from The Eppley Laboratory, Inc. to enhance the ability to maintain and transfer the WRR. NREL now had a set of nine standard lamps from the United States National Institute of Standards and Technology (NIST) for spectroradiometer calibrations.

4.2.39 The Observatorio de Radiacion Solar of the Instituto de Geofisica at the Universidad Nacional Autonoma de Mexico (WMO Regional Radiation Centre) had sponsored the National Pyrheliometric and Pyranometric Comparisons in May 2001 (20 pyranometers, four pyrheliometers), December 2002 (15 pyranometers, three pyrheliometers), and January 2004 (15 pyranometers, six pyrheliometers). Solarimetry seminars and workshops had been held in parallel with these comparisons. Numerous other seminars and courses in solarimetry methodology had been offered over the past three years with over 100 participants annually.

4.2.40 In 2004, solar radiation instruments had been installed in St. Lucia for the first time. Two sensors had been operational since July 2004 as a part of the AWSs in Hewanorra and GFL Charles Airports.

4.2.41 The Meteorological Service of Trinidad and Tobago was measuring global and diffuse solar radiation at Piarco, Trinidad. Data were submitted to the World Radiation Data Centre (WRDC). In 2004, the Service had also installed seven AWS to measure, inter alia, solar radiation and sunshine duration.

4.2.42 The Caribbean Institute for Meteorology and Hydrology (CIMH) was measuring and recording global radiation using the Kipp & Zonen pyranometer and sunshine duration with the Campbell Stokes sunshine recorder. Global radiation and sunshine duration data were submitted to the WRDC.

4.2.43 The United Kingdom reported that pyranometers would be installed in Bermuda in the course of 2005. The United States informed on the availability of scintillation measurements in the ionosphere, which were useful for determining the ability to receive Global Positioning System (GPS) signals.

4.2.44 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 a Rapporteur should continue work in this field. Resolution 5 (XIV-RA IV) — Rapporteur on Solar Radiation was adopted.

4.3 INFORMATION SYSTEM AND SERVICES, INCLUDING TELECOMMUNICATIONS, DATA MANAGEMENT AND OPERATIONAL INFORMATION SERVICE (agenda item 4.3)

TELECOMMUNICATION SYSTEM

4.3.1 The Regional Meteorological Telecommunication Network (RMTN) has been implemented mainly via two-way multipoint telecommunication services through the International Satellite Communications System (ISCS) operated by the National Weather Service of the United States. There were dedicated communication lines from RTH Washington to RSMC Miami and to RSMC Montreal.

4.3.2 The Association noted with satisfaction that the ISCS system including the RMTN portion had successfully undergone an upgrade to an IP-based system, after a transition period with parallel operations of both the old X.25 and new TCP/IP procedures, which had been extended until June 2005. All the Region IV NMCs were equipped with Transmission Control Protocol/Internet Protocal (TCP/IP) compatible PC-based workstations, and the upgrade had been supported under international cooperation projects (SIDS from Finland and the Voluntary Cooperation Programme (VCP) from the United States).

4.3.3 The Association agreed that the current transmission programme of the ISCS RMTN needed to be thoroughly reviewed given evolving requirements and the availability of new products. In that regard, it noted with appreciation the WG-PIW's intention to establish within an ad hoc subgroup entrusted with the review and coordination of the transmission programme for the satellite-based RMTN, composed of a focal point for Central America, a focal point for the Caribbean, and the coordinator of the subgroup on the GTS and DM. The ad hoc subgroup would work by correspondence and would interact with WWW centres in the Region, with the assistance of the Secretariat as required.

4.3.4 The Association noted that other communication systems were currently being used in RA IV to complement the ISCS RMTN system, as integrated elements of the RMTN. They were the Geostationary Operational Environmental Satellite (GOES) Data Collection Platform (DCP) system and Emergency Managers Weather Information Network (EMWIN), which were crucial for small islands. It noted that the current technical specifications of EMWIN would be modified in the future (2007), which would require changes or replacement of the receiving equipment. The Association requested its WG-PIW to keep NMHSs informed of developments, in order to plan the transition well in advance.

4.3.5 The Association also noted with appreciation that there were several alternate/complementary mechanisms for data exchange available to NMHSs in RA IV, which generally depended on the use of the Internet and TCP/IP technologies, that were being implemented by RTH Washington, including HyperText Transport Protocol (HTTP) and FTP Servers, E-mail Data Ingest System, RTH Web-based Bulletin Input, FTP Input Service and Dial-up Data Input. In this respect, it was pleased to note that CBS (Open Programme Area Group (OPAG) on Information Systems and Services (ISS)) had developed and was further developing guidance and recommended practices for meteorological and related data exchange over the Internet.

FUTURE WMO INFORMATION SYSTEM (FWIS)

4.3.6 The Association noted that Fourteenth Congress had endorsed the concept of FWIS as an overarching approach to meeting information exchange requirements of all WMO Programmes. Congress had requested CBS to pursue the further development of the FWIS, while emphasizing that all WMO Programmes and technical commissions should actively participate and contribute its own expertise and resources in all phases of the development of the FWIS. It also noted that the Executive Council had established an Inter-Commission Coordination Group on the FWIS (Resolution 2 (EC-LVI) — Major issues to be addressed and coordinated by the Intercommission Coordination Group on the future WMO Information System).

4.3.7 The implementation of FWIS should build upon the most successful components of existing WMO information systems in an evolutionary, smooth and coordinated process. In particular, the FWIS would build upon the GTS with respect to the requirements for highly reliable delivery of time-critical data and products. The Association noted that the actual development and implementation of FWIS would be through the

gradual introduction and evaluation of enabling technologies via pilots and prototypes. It was of the view that the Region should play an active role in the further development and planning of FWIS, so that all WMO Programmes at the regional level could benefit as soon as possible from the system.

Global Earth Observing System of Systems (GEOSS)

4.3.8 The Association noted the current development of the GEOSS, including the draft 10-year implementation plan. It supported the WMO information systems, in particular, the GTS and the FWIS, which were unique global data exchange systems for meteorological and related Earth observations and should play a leading role in the development of GEOSS (see agenda item 15.5).

Data management (DM)

4.3.9 Concerning the migration to Table Driven Code Forms (TDCF) endorsed by Fourteenth Congress, the Association emphasized that every Member country should develop a national migration plan, derived from the international plan, with analyses of impacts, costs, solutions, sources of funding (as necessary), national training, and technical planning and schedules. The actual implementation of the migration would extend over several years to ensure a smooth transition according to Members' abilities. The Association tasked its WG-PIW to urgently initiate the development of a regional plan for the migration to TDCF, which should serve as a framework for the development of a national migration plan by each Member, and to develop a pilot project for a completely migrated centre that would be able to receive and transmit data in BUFR as well as decode, handle, display and use data received in BUFR. It noted with satisfaction that BUFR and CREX encoding/decoding software was now available free-of-charge, or at minimal cost, for downloading via the Internet from several NMHSs or organizations, including National Centres for Environmental Prediction (NCEP), the European Centre for Medium-Range Weather Forecasts, United Kingdom (ECMWF), the United Kingdom Meteorological Office (UKMO), and Deutscher Wetterdienst (DWD), Germany. It noted that the new workstations installed at NMCs for the ISCS upgrade were capable of handling, displaying and processing data and products in BUFR. It therefore requested its WG-PIW to consider the implementation of a pilot project in the Region, e.g. the dissemination of upper-air data in BUFR format.

Radio frequencies for meteorological activities

4.3.10 The Association took note that Fourteenth Congress had re-affirmed the prime importance of radio frequency matters for meteorological and related environmental operations and research. In particular, it emphasized that the utmost importance should be attached to ensuring absolute protection of the special bands allocated to space-borne passive sensing (e.g. the exclusive 23.6 - 24 GHz passive band for measurement of atmospheric water vapour), which were a unique natural resource for atmospheric measurements and were increasingly important in meteorology (e.g. observation, NWP, climatology). The Association strongly urged Members to actively participate in radio frequency activities, especially in the preparation of World Radiocommunication Conferences issues, conducted by their national radio communication administrations, by regional radio communication organizations (Inter-American Telecommunication Commission (CITEL) for the Americas), and by the International Telecommunication Union (ITU). The Association also noted with appreciation the favourable outcome of the recent World Radiocommunication Conference 2003 relating to the several items of serious concern for meteorology.

Operational Information Services (OIS)

4.3.11 The Association noted with appreciation that operational information had been posted on the WMO server at: www.wmo.int/web/www/ois/ois-home.htm, and was being dispatched on a CD-ROM once a year. The Association also noted with satisfaction that these arrangements had ensured better data reliability, timeliness of distribution, and greater flexibility in Members' use of operational information. It was pleased to note that the pilot project giving interactive on-line access to the *Catalogue of Meteorological Bulletins* (WMO-No. 9) Volume C1, that had been developed by the Secretariat was being used with satisfaction by some centres in the Region.

4.3.12 The Association emphasized that the overall efficiency of the OIS was dependent on the prompt notification of changes and updated information from NMHSs. It urged NMHSs to ensure that all changes reached the World Meteorological Centre (WMC) RTH Washington (WMO-Vol. C1) and the Secretariat without delay so that they could benefit from improved OIS access to the up-to-date information required for their operations.

4.4 Data-processing and forecasting system (agenda item 4.4)

4.4.1 The Association reviewed the present status of implementation of the Global Data-processing and Forecasting System (GDPFS) in the Region. It noted that there had been considerable progress and improvements in the infrastructure and analysis/forecasting systems at WMC Washington and RSMC Montreal, including EPS and limited area modelling, post-processing and nowcasting activities, severe weather forecasting, and environmental Emergency Response Activities (ERA).

4.4.2 It was noted that the assimilation of non-conventional data, e.g. satellite radiances, atmospheric wind vectors and Aircraft Communications Addressing and Reporting System (ACARS) and Aircraft Meteorological Delay Relays (AMDARs), had resulted in remarkable improvements in the quality of global forecasts. The Ensemble Prediction Systems (EPSs) of both centres had also evolved over the four years and both global and regional EPS outputs could be used in an operational context. The Association emphasized the importance of training on EPS, in particular the need for

continuous training for forecasting staff through appropriate modern methodologies. It noted in that regard the recent production of a distance learning module on EPS, produced by COMET, which was available on the COMET web site: www.comet.edu. With respect to the requirement for a Spanish translation of the module, it welcomed the fact that Spain was considering providing such a translation. It also noted with appreciation that a 6-day workshop programme on EPS had been developed and that a RA III/IV training workshop had been held in Brasilia, Brazil, from 24 to 29 January 2005.

4.4.3 The Association addressed the fact that the current suite of products broadcast on the International Satellite Communication System (ISCS) was still based on the coordination and decision-making process that took place in the early 1990s. In view of the progress made in numerical weather prediction (NWP) during recent years, it was urgent to review the broadcast schedule based on the changing requirements for NWP products. The Association agreed on a comprehensive review of regional requirements for NWP products (e.g. hurricane tracks from different NWP models, EPS-grams over selected cities, additional GFS fields, fields from other models (e.g. MM5 and ETA runs over Central America, etc.) including development of effective feedback mechanisms on NWP performance.

4.4.4 Recalling that the thirteenth session of the Commission for Basic Systems (CBS) (St. Petersburg, Russian Federation, 23 February–3 March 2005) had endorsed the establishment of a Demonstration Project on Severe Weather Forecasting, the Association stressed the importance of severe weather warnings for the Region and agreed to participate actively in that pilot project. It tasked its WG/PIW to coordinate and monitor the participation and contributions of selected GDPFS centres and report to the Association on the outcomes relevant to the Region.

4.4.5 The Association recalled that RSMCs designated to provide atmospheric transport and dispersion modelling products in the Region were located in Montreal and Washington. It noted that RSMC Montreal and RSMC Washington were conducting monthly tests, which were also used as test platforms for the development of new approaches in the exchange of electronic files and outputs. NMHS were invited to participate and to access these products from common mirror web pages maintained by the RSMCs, to help training in Environmental Emergency Response (EER) activities and to demonstrate NMHSs' role in their respective national emergency response organizations. It was further noted that the International Atomic Energy Agency (IAEA), with the participation of WMO, was organizing a major global emergency response exercise in May 2005, referred to as CONVEX-3 (2005). The Association encouraged its Members' NMHSs to participate in that exercise, and recalled that the Secretary-General had circulated letters to that effect. Such exercises were, inter alia, seen as important opportunities for the NMHSs to work with national disaster mitigation agencies in areas outside the traditional weather domain, which could generate additional visibility and recognition. Furthermore, in the framework of the Emergency Response Activity Programme of the WWW, the Association took note of the on-going work in WMO, in collaboration with the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO), the International Civil Aviation Organization (ICAO), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO), to expand emergency response mechanisms and services to cover other transboundary atmosphere pollution emergencies, such as wildland fires, volcanic eruptions and associated ash plumes, chemical accidents, and airborne viral diseases.

4.4.6 There were three meteorological centres designated as ICAO's Volcanic Ash Advisory Centre (VAAC) in the Region: VAAC Montreal (Canada, the Northwest Atlantic, Greenland and the Arctic), VAAC Anchorage (North Pacific and Alaska), and VAAC Washington (United States, significant parts of the Atlantic and Pacific Oceans and Northern South America). The three VAACs were coordinating operational issues including regular exchanges of atmospheric transport and dispersion modelling products for volcanic ash. The Association was informed that the Preparatory Commission of the CTBTO had recently approved the provision of infrasound monitoring data in real-time from their global monitoring network for use within WMO and ICAO to improve warnings of volcanic eruptions and increase aviation safety.

4.4.7 The Association recognized the growing demand for RA IV NMCs to run local area models (LAMs) in their areas of responsibility. The increase in the power of personal computers had now reached the point where it was feasible to run LAMs in real-time, which would benefit the operational programmes and, at the same time, contribute to raising capacity building within RA IV. The Association tasked its WG-PIW to promote and assist in this development and agreed that the first step could be for some NMCs to run LAMs covering subregional areas and to make the outputs available to neighbouring NMCs.

4.5 TROPICAL CYCLONE PROGRAMME (agenda item 4.5)

4.5.1 The Association expressed its satisfaction with the achievements and the progress made in the implementation of both the general and regional components of the Tropical Cyclone Programme (TCP) towards the mitigation of tropical cyclone disasters in its Region. The Association recorded its gratitude to Mr M. Mayfield (United States), chairperson of the RA IV Hurricane Committee (HC), for his outstanding leadership in guiding the work and activities of the Committee. It commended the Members concerned and the RA IV Committee for their efforts towards the implementation of the Committee's Technical Plan, in particular for upgrading the hurricane forecasting and warning systems within the Region.

4.5.2 The Association expressed its deep gratitude to the United States for the full and effective functioning of

the RSMC Miami Hurricane Center with activity specialization in tropical cyclone analysis, tracking and forecasting, in particular during the very active hurricane season of 2004. It further commended RSMC Miami for the success of its 5-day hurricane forecasts, which it had initiated in 2003 and on its Hurricane Awareness Tours. It invited the United States to continue to make available, on a long-term basis, the specialized products and advisory information services. As a follow-up to the successful attachment of bilingual forecasters (English/Spanish) from the Members in the Region to the RSMC Miami during the past hurricane seasons, the Association invited the United States to ensure the continuation of this important training activity.

4.5.3 The Association agreed that, while no warning system was ever perfect, the tropical cyclone warning system set up by the HC in the Atlantic and Eastern Pacific basins was widely considered as probably the best being operated in any tropical ocean basin in the world. The RA IV HC system was based on: continuous improvements in systems and technologies; hurricane sciences, computer capabilities and forecast error reduction; the continuous upgrading of regional human resources capabilities in hurricane forecasting and warnings; the important use and improvement of capabilities in hurricane aircraft reconnaissance; vital collaboration between forecasting and warning centres in the Region and the RSMC Miami; and improved warning dissemination capabilities at the local level. The Association agreed that statistics had clearly shown that, while damage to property could not be avoided, there had been a major decrease in the loss of life in Region IV as a result of tropical storms, hurricanes and other severe weather hazards.

4.5.4 With the above in mind, the Association expressed great surprise and extreme disappointment that while the Caribbean Disaster Emergency Response Agency (CDERA), one of the primary agencies of its type in the Region, shared similar sentiments on the effectiveness of the RA IV hurricane warning system, it should hold the view that 'Despite the significant reduction in loss of life from hurricane events, there is a general perception of a lack of confidence in our meteorological services'. This view was expressed in an address by CDERA to the United Nations' World Conference on Disaster Reduction that took place in Kobe, Japan, from 18 to 22 January 2005. In reviewing the CDERA address, the Association found it strange that CDERA would expect a level of accuracy in hurricane warnings for very small islands that has not been attained anywhere else in the world. It agreed that the CDERA statement, which was posted on its web site (www.cdera.org) could have very negative implications for the programmes of some NMSs. The Association requested the Secretary-General to take up this matter with CDERA and the Caribbean Community (CARICOM).

4.5.5 The Association, in fact, was particularly pleased with the successful implementation of the RA IV Hurricane Operational Plan (Resolution 14 (IX-RA IV)) during 2004. It noted that, in all cases, warnings were very timely and widely distributed to the public and other special users. However, the Association noted that there were particular weaknesses in the public response to warnings in a number of Member countries that had not been affected by hurricanes for a long time. It also noted that, in the case of Haiti, the enormous loss of life was due to local factors that nullified the effects of early warnings. Notwithstanding the recent success stories evident within the regional hurricane warning process, there was a need for continuous educational and awareness programmes, including mitigation, within the Region, undertaken as a team effort by all relevant agencies, so as to further enhance public understanding and response to warnings issued.

4.5.6 In this connection, the Association noted that some of the programmes and exercises to train emergency managers undertaken in the Region by the United States military Southern Command might be too ambitious. It was felt that a greater meteorological input was needed in the design of their exercises. The Association noted that these matters were consistent with the disaster prevention and preparedness (DPP) portions of its Technical Plan (Resolution 8 (X-RA IV)).

4.5.7 The Association agreed that one of the very successful and important activities that had contributed to public awareness was the regular Latin America/Caribbean Hurricane Awareness Tour (LA/CHAT) undertaken by the United States Air Force in collaboration with RSMC Miami. LA/CHAT was successfully conveying the importance of the team effort involved in the hurricane programme and the need for advanced planning in high-risk communities. LA/CHAT had enhanced the visibility of the individual country weather forecasting and emergency management offices. The Association expressed its sincere thanks to the authorities in the United States for undertaking this important activity and hoped that the programme would continue receiving its support. The Association urged the RA IV president and individual RA IV Members to write letters of appreciation to the Permanent Representative of the United States with WMO.

4.5.8 The Association was informed that the twenty-seventh session of the Hurricane Committee (San José, Costa Rica, 31 March–5 April 2005) had had an in depth discussion on the backup arrangements between countries of the Region for watches and warnings, as provided for in the Operational Plan (see paragraph 4.5.4 above). While the backup arrangements had been in place for some time, a true test of the system had occurred in 2004 when Jamaica had assumed responsibility for the Cayman Islands as a result of damage suffered by its Forecast and Warning Office during the passage of Hurricane *Ivan*. This occurred despite the fact that Hurricane *Ivan* had also affected Jamaica. The Association noted the importance of the use of satellite telephones during this period when most of the telecommunications infrastructure had been severely damaged. It therefore strongly recommended that all Forecast and Warning Offices, should, in the first instance, be equipped with such telephones. The Association noted that backup arrangements were not easy to implement in every case or in every aspect. However, it further

recommended that countries with backup arrangements should exchange, on a bilateral basis, information on watches, warnings and agreed essential products to be produced under the circumstances, as well as message and telecommunication details for distribution of these products. The Association noted that these essential products should always include the Terminal Forecasts for main airports. It was agreed that the Operational Plan should be amended to reflect the fact that backup arrangements would include the agreed products.

4.5.9 The Association discussed the fact that the TCP covered six tropical cyclone basins around the world and served five tropical cyclone bodies, namely, the RA I Tropical Cyclone Committee, the WMO/Economic and Social Commission for Asia and the Pacific (ESCAP) Panel on Tropical Cyclones, the ESCAP/WMO Typhoon Committee, the RA IV Hurricane Committee and the RA V Tropical Cyclone Committee. In view of the vitally important role of the TCP globally and the range of activities undertaken by the programme, the Association urged the Secretary-General to maintain strong Secretariat support to the TCP in order to adequately manage the work of all these tropical cyclone bodies.

4.5.10 In view of the vitally important activities and scope of the work of the HC, the Association requested the Executive Council to provide for:

(*a*) Full financial support to the annual session of the HC in 2007;

(*b*) The holding of the 2007 Workshop on Hurricane Forecasting and Warning at the RSMC Miami Hurricane Center, with interpretation services in English and Spanish.

4.5.11 In view of the fact that the International Workshops on Tropical Cyclones (IWTC) had been highly effective in serving as forums for interaction between forecasters and researchers and in encouraging the operational application of research results, the Association was pleased to learn that the next workshop in this series would be held in Costa Rica in 2006. It urged Members to ensure effective participation in the workshop and take full advantage of the fact that it would be held in the Region.

4.5.12 The Association noted that a Hurricane Operational Plan and the Committee's Technical Plan and Implementation Programme had played an effective role in strengthening warning services for hurricanes and associated storm surges, floods and landslides, as well as disaster preparedness measures in the Region. To that effect, it decided to keep in force Resolution 14 (IX-RA IV) — Hurricane Operational Plan, and Resolution 8 (X-RA IV) — Hurricane Committee's Technical Plan and Implementation Programme.

4.5.13 In view of the vitally important role of the TCP in the International Strategy for Disaster Reduction (ISDR) and in the context of the Sustainable Development of Small Island Developing States (SDSIDS), including the work of the HC in the Region, the Association felt that there was more work yet to be done. It decided to maintain the level of very high priority to the TCP in relation to regional priorities in WMO's Sixth Long-term Plan (6LTP) (2004–2011).

4.5.14 Recognizing the great importance of the further work to be implemented by the Committee in Region IV, the Association agreed that the RA IV HC should be re-established as a Working Group of the Association. Resolution 6 (XIV-RA IV) was adopted accordingly.

5. World Climate Programme (WCP) — regional aspects (agenda item 5)

5.1 Climate Programme Coordination and Support Activities (CPCSA) (agenda item 5.1)

5.1.1 The Association was informed of the overall coordination of the World Climate Programme and noted with satisfaction the decisions made by Fourteenth Congress relating to the building of partnerships within the climatology community to improve effectiveness. The Association also noted discussions that had been held during the fifty-sixth session of the Executive Council (Geneva, 8–18 June 2004) with special emphasis on steps that should be taken to maintain WMO's leadership in climate and urged Members to develop relations with international and regional agencies involved in areas of high priority to WMO, and to strengthen linkages between climate and their high priority national issues. The Association noted with satisfaction that a special side event had been held during the Executive Council to discuss the leadership role in climate and that RA IV Members of the Executive Council had actively participated in this event. The Association requested Members to continue their support to regional coordination of the WCP.

Regional activities

Study on the Prediction and Amelioration of Socio-economic Impacts of El Niño Southern Oscillation (ENSO) in Latin America and the Caribbean

5.1.2 The Association noted that the WMO/Inter-American Development Bank (IDB) Study on the Prediction and Amelioration of Socio-economic Impacts of El Niño/Southern Oscillation (ENSO) in Latin America and the Caribbean had been concluded and that the final report had been distributed to 26 participating countries and four regional organizations. Projects on Climate Information Systems for Decision Making in Socioeconomic Sectors Affected by ENSO and other Climate Extremes had been completed for Central America, Colombia and Mexico. Final project documents had been delivered by WMO to relevant institutions in concerned countries/regions and to the IDB. The Association encouraged relevant Members to participate in this initiative.

SIDS Project for the Caribbean

5.1.3 The Association was informed that the regional project on Preparedness to Climate Variability and Global Change in Small Island Developing States, Caribbean Region, funded by the Government of Finland, had continued in 2003 with measurable success in the implementation of all components. In the area of

awareness-building, a web site had been developed for the project. Other web sites were in the process of being developed with the assistance of the National Meteorological Service of the Netherlands Antilles and Aruba. The Committee noted that WMO had continued its cooperation with the World Bank (IBRD) and IDB in areas of mutual interest that had included climate change, national disaster prevention and mitigation, the El Niño phenomenon, and integrated water resources management. In addition, contact had been established with the World Bank Institute for possible cooperation in the areas of capacity-building and training.

RA IV Ad Hoc Expert Advisory Group Meeting for the Establishment of a Regional Climate Center (RCC)

5.1.4 The Association was informed that the RA IV ad hoc Expert Advisory Group had held a meeting (Miami, United States, 22-25 July 2003) to discuss the establishment of a RCC. The Advisory Group had agreed that a RCC should consolidate climatological products, which would include seasonal and inter-annual predictions. The RCC would require access to long-range numerical weather prediction products. The current resolution of the global models was rather coarse and the outputs would have to be further processed to make them meaningful for smaller countries. The agencies performing these functions in the United States had agreed to actively collaborate with other RA IV Members and provide global analysis and forecast products. It was noted that one option could be a virtual centre which could perform the functions of an RCC by linking several nodes. In the meantime, the meeting noted that two institutions had generated seasonal outlooks for Central America and the Caribbean: the Caribbean Institute of Meteorology and Hydrology (CIMH) was producing seasonal precipitation outlooks quarterly for the Caribbean, and the Central American Regional Committee for Water Resources (CRRH) was coordinating a similar exercise among the countries of Central America.

Ibero-American Climate Project

5.1.5 The Association was informed that for the purpose of discussing the status of the Ibero-American Climate Project (CLIBER) as well as other topics related to cooperation among NMHS of Ibero-American countries, a meeting of Directors of NMHSs of Ibero-American countries had been held at the Training Centre of the Spanish Cooperation (La Antigua, Guatemala, 19-21 November 2003). The meeting had been organized by the National Meteorological Institute of Spain and co-sponsored by WMO. The meeting had reached various conclusions and recommendations, including reviewing and updating the initiative of the CLIBER with the participation of all Ibero-American countries for the execution of projects of common interest.

United Nations Framework Convention on Climate Change (UNFCCC)

5.1.6 The Association noted with satisfaction the actions taken by the Secretary-General to ensure the active and expanded participation of WMO and the NMHSs of its Member countries in the work of the UNFCCC. The Association was pleased to note that WMO, as well as GCOS, would be represented at future Subsidiary Body for Scientific and Technological Advice (SBSTA) and UNFCCC meetings. The Association was pleased to note that the GCOS had continued its interaction with the UNFCCC at the eighteenth session of SBSTA (Bonn, Germany, 4-13 June 2003), the ninth session of the Conference of the Parties (COP) and the accompanying nineteenth session of SBSTA, (Milan, Italy, 1-12 December 2003). The Association was informed that the Executive Council had stated that the development of a Global Observation System for a Climate Implementation Plan, and other current UNFCCC activities on climate impacts and adaptation, had offered significant opportunities for engagement by WMO and Gloabal Ocean Observing System (GOOS), in United Nations activities on climate. The Association also noted that the Secretary-General had participated in the ministerial session of the COP-10 (Buenos Aires, Brazil, 6–17 December 2004) to develop a more prominent role for WMO. In the meantime, WMO had arranged a booth to highlight its role in observation and climate and had also organized a side event to publicize its role in climate change activities.

International Strategy for Disaster Reduction (ISDR)

5.1.7 The Association noted that pursuant to the General Assembly of the United Nations decision through its Resolution 56/214, the Government of Japan had hosted the World Conference on Disaster Reduction (WCDR II) in Kobe, Hyogo Prefecture, from 18 to 22 January 2005. The Conference had followed up on the last World Conference on Natural Disaster Reduction held in Yokohama, Japan, from 23 to 27 May 1994.

5.1.8 The Association noted with satisfaction the outcomes of the Conference, which were presented in detail under item 11 of this report. The Association appreciated the active participation of the WMO, the United States and Canada in the Conference, particularly the organization of a number of thematic sessions on climate-related disasters, among others. The Association urged Members to promote the representation of NMHSs in disaster reduction activities at the national level, enhance early warning delivery activities to increase visibility in the Region, and identify areas of partnership and active involvement, especially in the implementation of the outcomes of the WCDR at the national level.

Coordination for WMO Commission for Climatology (CCI)

5.1.9 The Association noted that support and coordination had been provided for all aspects of the WMO CCI, including support to the CCl Management Group meetings. A CCI Core Group meeting had been held at the invitation of Météo-France in Toulouse, France, from 9 to 11 September 2003. This meeting had been a mid-intersessional event for the review and adjustment (as

necessary) of the Commission's activities. The Commission had decided to concentrate on providing guidance documents on topics of importance to WMO Members, such as standards for metadata, the calculation of Standard Normals, heat health indices, and the development of new guidelines for urban climatology. This would be undertaken while the normal support for high profile projects like the Climate Information and Prediction Services (CLIPS), data rescue and Climate Database Management System (CDMS) continued. A member of the National Climatic Data Center (NCDC) (United States) was representing RA IV in the Commission for Climatology (CCl) Management Group. The Association noted that the fourteenth session of the Commission for Climatology would be held in Beijing, China, from 3 to 10 November 2005, and that the CCl Management Group had considered including an item on regional activities in the agenda of the session. In this respect, the CCl had invited RA IV, among other regional associations, to submit a report.

United Nations Convention to Combat Desertification (UNCCD)

5.1.10 The Association expressed its appreciation to the Secretary-General for his continued support to UNCCD activities and the Convention Secretariat and for the active participation of WMO at the sixth session of the Conference of the Parties (COP-6) to the Convention (The Hague, The Netherlands, 13–24 November 2000). It noted with satisfaction that Members had been informed of the major decisions taken at COP-6.

5.1.11 The Association noted the emphasis placed by COP-6 on case studies to demonstrate the use of traditional knowledge to combat drought and desertification and on early warning systems, and urged Members to examine the possibility of undertaking such case studies with appropriate institutions in their countries. The Association was informed that a number of countries in the Region, especially the Caribbean states of the Dominican Republic, Cuba, Haiti and Jamaica, amongst others, contained arid zones, and erosion was intensifying noticeably in many Eastern Caribbean islands. The Association urged these countries to pay particular attention to the negative social, cultural, economic and environmental effects of expanding drought. It cited the frequent use of unsustainable development practices in affected areas and a sharp drop in the productivity of ecosystems as being the main consequence of desertification.

Convention on Biological Diversity (CBD)

5.1.12 The Association expressed its appreciation to the Secretary-General for the report on the ninth session of the Subsidiary Body for Scientific and Technological Advice to the Convention on Biological Diversity (Montreal, Canada, 10–14 November 2003) and the Seventh Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity (Kuala Lumpur, Malaysia, 9–20 February 2004). It noted that increasing attention was now being paid by the CBD to several important weather- and climate-related issues of the biological diversity.

5.1.13 The Association was pleased to note that WMO was a member of the Ad hoc Technical Expert Group on Biological Diversity and Climate Change, established by the CBD, and that the expert group had now published a book on the subject.

5.1.14 The Association agreed with the conclusions of SBSTA that there were opportunities to implement climate change mitigation and adaptation activities in ways that were mutually beneficial and synergistic, and that it would contribute simultaneously to the UNFCCC, the CBD and other international agreements, all within broader national development objectives. The Association took note that Canada and Mexico had hosted eight and one CBD meetings, respectively, and that non-governmental institutions from Mexico and the United States had participated in CBD's regional case studies. The Association encouraged Members to participate in CBD's regional studies through relevant national bodies.

World Climate Impact Assessment and Response Strategies Programme (WCIRP)

5.1.15 The United Nations Environment Programme (UNEP) which had responsibility for implementing the WCIRP, had made progress in its joint programmes with WMO since Fourteenth Congress. The Association noted the closer working relationship between the WCIRP and the WMO World Climate Programme (WCP) and expressed interest in joint projects on adaptation to climate change that had been prepared. The Association was informed that UNEP would expand national climate impact networking and international coordination of impact and response aspects of urban air pollution and climate programmes. The Association urged Members to continue cooperating in monitoring programmes initiated jointly by the UNEP and WMO.

El Niño and La Niña definitions and indices

5.1.16 The Association was informed that, following a request from the fifty-sixth session of the Executive Council (June, 2004), the WCP and the CCl, had decided at the recent meeting of the CCl Management Group (Geneva, Switzerland, 31 January-2 February 2005) to establish a new expert team (ET) under OPAG 2 (Monitoring and Analysis of Climate Variability and Change). The ET, with international membership, would develop a technical document on definitions and indices on El Niño and La Niña currently in use by WMO Members, to be used as a reference for stakeholders. It would prepare a report for submission to the fifty-seventh session of the Executive Council (Geneva, Switzerland, 7–17 June 2005) and to the fourteenth session of the Commission for Climatology. Subsequent to the publication of the technical document, the WCP and CCl may recommend further discussion and action on the benefits of regional cooperation prior to issuance of press releases and alerts, on the development of a strategy and common

language/terminology for public communiqués, and on the feasibility of a single globally-accepted standard WMO policy/approach on El Niño and La Niña, their evolution and prediction. A consequence of this effort could be a set of WMO recommended guidelines on procedures for Members and relevant agencies to follow in order to improve collaboration and to reduce uncertainty amongst users of information and predictions of El Niño and La Niña.

5.1.17 The Association further discussed and adopted the index and definitions proposed as the North American Consensus Index and Definitions of El Niño and La Niña as WMO RA IV Consensus Index and Definitions of El Niño and La Niña, with the understanding that the index and definitions could be revised in the future based on further scientific research and findings. The Association also urged its members to define local thresholds for impact based on the index.

5.2 World Climate Data and Monitoring Programme (WCDMP) (agenda item 5.2)

5.2.1 The Association noted the activities involved in preserving and managing climate data, and in monitoring the global climate. Through the Commission for Climatology (CCl), experts in the Region had made good progress on the three highest priority projects within the programme: Climate System Monitoring, Data Rescue and Digitization, and Climate Database Management.

5.2.2 The Association noted the urgency associated with each of the projects:

(*a*) Coordinated climate system monitoring was needed to elevate the awareness of risks, for all time-period planning; it should be noted that RA IV experts had completed the WMO annual statement on the status of the global climate in 2001, 2002 and 2003;

(*b*) Data rescue activities must prevent the irreversible loss to science and society of historical climate datasets by helping NMHSs to make computerized records of their own climate data holdings, and by finding and recording the data that are held in other datasets;

(*c*) Support activities in climate database management were urgently needed to ensure that national climate databases could provide the high quality historical data – including the rescued data – that were needed for the authoritative climate assessments produced through climate system monitoring.

Observing requirements and standards for climate

5.2.3 The Association expressed its appreciation to WCDMP for the efforts with CCl to develop *Guidelines on Climate Observation Networks and Systems* (WCDMP-No. 52). The Guidelines series provided information on how to organize and implement climate services.

5.2.4 The Association noted with appreciation the collaboration between WCP and GCOS, funded by the United States, to produce Climate Reporting (CLIREP) software to encode and decode CLIMAT and CLIMAT TEMP messages. It was informed that an expert of the Russian Federation ROSHYDROMET had developed the software, and that this CCl-led project would be completed in 2005. The software would contribute to improving the automation of the production of CLIMAT and CLIMAT TEMP messages and their transmission to the WMO Data Centres. The Association requested that training workshops on CLIREP software be organized and that the software be provided promptly to Members of the Region.

Climate Watches

5.2.5 The Association noted with appreciation the work of the CCl Expert Team to Develop Guidance on Climate Watches (chaired by an expert of the China Meteorological Administration). The terms of reference (TOR) and work plan included the development of 'Guidelines on Climate Watches'. Experts from the Region had attended a Training Workshop on Climate Early Warning Systems held in Brasilia, Brazil, from 14 to 18 February 2005.

5.2.6 The ET had defined a Climate Watch as an alert that was to be issued to heighten awareness in the user community concerning a particular state of the climate system. Climate Watches would be based on real-time monitoring of conditions and current climate outlooks, aimed to affect user decision-making and initiation of preparedness activities. A Climate Watch would be issued by individual NMHSs in the Region as needed. The Climate Watch process and output products would be developed as a result of continuous and iterative collaboration with users.

5.2.7 The Association concurred with the ET's conclusions that the NMHSs should retain exclusive responsibility for the issuance of Climate Watches for their countries and territories, as well as for meteorological warnings.

Climate analysis and monitoring techniques (including climate change detection)

5.2.8 The Association expressed its support for the activities of the CCl/Climate Variability and Predictability (CLIVAR) ET on Climate Change Detection, Monitoring and Indices. It noted with appreciation that the ET's objectives supported monitoring and understanding of the global climate system; collection, rescue and management of climate data; detection and assessment of climate variability and changes; and capacity-building, and the transfer of knowledge, techniques and guidance. It noted with appreciation the ET's plans to develop indices of climate change and variability, with emphasis on daily to seasonal extremes, and standardized software packages; and to study additional indices and their application as input data to models and homogeneity issues. It urged Members to provide daily data records from all CLIMAT and CLIMAT TEMP stations to build the data sets needed for the calculation of indices.

5.2.9 The Association endorsed the ET's intention to provide guidance to NMHSs, software to calculate indices in support of the Intergovernmental Panel on Climate Change (IPCC) process, the organization of training workshops, and the use of results in WMO

climate system monitoring programme. It noted with appreciation the workshops planned for all WMO Regions to fill gaps in the climate datasets.

Climate System Monitoring (CSM)

5.2.10 The Association noted with satisfaction the significant results that had been achieved in the CSM. The seventh Global Climate System Review (June 1996–December 2001) had assessed the climate variations across the globe, for the entire cycle of the El Niño/Southern oscillation, from neutral conditions through the most intense El Niño event of the twentieth century, to the establishment of La Niña conditions. Furthermore, the WMO annual Statement on the Status of the Global Climate was documenting annual anomalies and global impacts.

5.2.11 The Association noted with interest the collaboration of a number of the Region's experts with the NOAA National Climatic Data Centre (NCDC) to produce a 2003 Global Climate Review, which was published in the *Bulletin of the American Meteorological Society*, (Vol. 85, No. 6, June 2004). WMO would publish the review once it had been enhanced. WMO had arranged to expand the participation of international authors.

5.2.12 The Association was very pleased that the WMO Statement on the *Status of the Global Climate in 2003* (WMO-No. 966), had been produced in English, French and Spanish, and had been printed and distributed in time for the World Meteorological Day celebrations.

Data sets and metadata

5.2.13 The Association noted the imminent conclusion of the project World Weather Records for 1991-2000. It also expressed appreciation for the RA IV collection provided by the United States, and for NOAA NCDC's coordination and production of the datasets.

5.2.14 The Association expressed appreciation for the completion of the *Guidelines on Climate Metadata and Homogenization* (WCDMP-No. 53).

Guide to Climatological Practices

5.2.15 The Association was pleased to note that RA IV Members had served as principal authors of two chapters of the draft of the Third Edition of the *Guide to Climatological Practices*. In addition, a member from RA IV had served as editor of Part 1 of the updated Guide, which was available on the CCl homepage (www.wmo.ch/web/wcp/ccl/home.html).

Data Rescue (DARE), digitization and data exchange

5.2.16 The Association expressed its support to the DARE project, which had initiated national projects in Region IV. The new projects had introduced digital cameras and optical scanners to develop digital archives of the records and refresh the media holding climatological data. The Association was pleased to note that within the framework of the SIDS-Caribbean project funded by the Government of Finland, several countries had also been equipped with digital cameras, PCs, and copystands to develop digital archives of their paper records on CD-ROM. It encouraged Members of the Region to periodically refresh their data archives using current digital media and software.

Climate Database Management Systems (CDMSs)

5.2.17 The Association noted with appreciation that new CDMSs had been implemented in a number of countries, through the voluntary cooperation of six WMO Members who had offered to share their systems. The CDMSs had been demonstrated and evaluated for their performance on standard criteria. All new systems were using multi-tier, client/server relational databases. The new CDMSs were a result of bilateral as well as multilateral cooperation, frequently coordinated through the WMO Technical Cooperation Programme.

5.2.18 The Association recalled the request by Fourteenth Congress for CDMS training materials and manuals, and endorsed CCl plans for the relevant Implementation and Coordination Team to develop WCDMP Guidelines on Climate Database Management. It further noted the importance of the RA IV representative on the team.

5.2.19 The Association welcomed the accelerated transition from CLImate COMputing (CLICOM) to CDMS in the Region and noted with appreciation that through the SIDS-Caribbean project, nine countries in the Caribbean had migrated to a new Climate Database Management System. It encouraged other Members to move to these new systems.

5.2.20 The Association noted that a Seminar on Climate Data Rescue, Management, Applications and Prediction for Spanish-speaking countries in RA III and IV had been held in Guayaquil, Ecuador, from 31 March to 4 April 2003, to introduce the new strategy for DARE and the WMO CDMS. The Association endorsed the following recommendations of the seminar's participants:

(*a*) Increase awareness of Data Rescue as an activity by developing posters and brochures, and by organizing seminars, conferences and training events, as well as engaging the scientific community to support Data Rescue projects;

(*b*) Produce a complete inventory of available data and metadata for the Region;

(*c*) Identify, through surveys and seminars, the data rescue and data management priorities of WMO Members in RA IV;

(*d*) Determine procedures adapted to each country such as analogue imaging, digital imaging, conservation of records, improved physical storage techniques, etc.;

(*e*) Each Member of the Region takes initiative for CDMS/DARE;

(*f*) WMO to assist Members in their data rescue effort and restoration of their CDMS;

(*g*) WMO to conduct expert missions to Members that urgently need assistance in Climate Data Management and Data Rescue;

(*h*) WMO to ensure adequate financial support for workshops on CDMS.

5.2.21 The Association noted the importance of the recommendation of the Guayaquil seminar that Meteorological Services in the Region that had already developed CDMS in Spanish should share their systems with RA III and RA IV Members.

Regional Climate Centre (RCC)

5.2.22 The Association noted that a meeting to review activities to implement the RCC concept for RA IV had been held in Miami, the United States, on 1 May 2004. The Association welcomed interest expressed by Cuba, Mexico and France, in supporting a node for regional climate predictions. The Association acknowledged the recommendations of the consultant who had developed an operational concept for each node and its supporting centres and had addressed each Lead Centre's ability to conduct the functions of a RCC.

5.2.23 The Association inaugurated the RA IV Regional Climate Centre Pilot Project sponsored by the United States and implemented by the Central American Regional Committee of Water Resources (CRRH) in partnership with the National Meteorological Institute (IMN) of Costa Rica and the National Institute for Seismology, Volcanology, Meteorology and Hydrology (INSIVUMEH) of Guatemala. The Pilot Project would serve as the first node in the creation of a 'virtual RCC' and as a model for the Carribbean subregion focusing on data base services, R&D, and capacity-building to enhance climate forecasts produced by, and for, RA IV Members.

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 reiterated the need for the NMHSs to play a pivotal role in the provision of climate information and prediction services and recognized that a key aspect in developing this role lay in the enhancement of expertise within the services. The Association thus welcomed activities to develop expertise at all levels through the identification of CLIPS regional focal points in conjunction with the continued development of the CLIPS curriculum. The Association further recognized that the appointment of regional focal points would be of added benefit and proposed that their work continue to be coordinated by a rapporteur to RA IV designated to report on CLIPS issues. These regional focal points would also facilitate interaction with the CCl on CLIPS issues. The Association therefore adopted Resolution 7 (XIV-RA IV) through which CLIPS focal points were nominated with responsibilities in RA IV.

5.3.2 The Association recognized the continued critical impacts of climate variability on the socio-economic structures of all countries within the Region. Such variability was linked to changes in ocean surface temperatures over the Pacific (ENSO – El Niño/Southern Oscillation) and Atlantic Oceans, which could result in inter-annual adjustments to tropical atmospheric forcing and hence in rainfall levels in many parts of the Region. The Association noted the encouraging level of predictability that was emerging with respect to hurricane frequencies and rainfall totals on seasonal and inter-annual timescales as they related to the ENSO phenomena. The Association called upon Members to conduct more research and strengthen their activities in this area. In that regard, the Association welcomed the activities being promoted by the CCI's various ETs to develop a user requirement for seasonal to inter-annual prediction.

5.3.3 The Association noted the progress being made in Central America to regularly produce and disseminate climate information and products through Regional Climate Outlook Forums (RCOFs). It further noted with appreciation the effort being made by countries in Central America to develop a common methodology for producing consensus climate outlook forecasts for the Region. The Association appreciated the contribution made by countries, especially users of climate information and prediction products, to support the process and urged them to continue providing such support to sustain the RCOF process.

5.3.4 Prediction on seasonal to inter-annual timescales had continued to present challenges in terms of information presentation and interpretation, conversion into decisions within each application area, verification of predictions and effective communication with users of inherent levels of prediction skill. The Association welcomed activities such as those of CCl ETs that were directed at examining and improving capabilities in each of these areas, and requested that benefits be transferred to the Region through training, the holding of further RCOFs, and the development of pilot projects.

5.3.5 The Association noted with appreciation that NOAA's Office of Global Programs (OGP), in collaboration with the CLIPS Project Office, had supported the participation of five women from the CLIPS community in the Second WMO Conference on Women in Meteorology and Climatology (Geneva, Switzerland, 24–27 March 2003). These women had raised awareness of the impacts of climate information and applications on the activities of women in rural areas in various parts of the world. The Association urged members to continue providing similar support in future activities.

5.3.6 The Association noted the progress being made on the implementation of RCCs in RA IV. It appreciated the effort made by the Secretariat to develop new procedures and guidelines for implementing RCCs in the regional associations. It further noted the progress that had been made at the RA IV HC meetings to develop a plan of action for implementing RCCs in the Region. The Association requested Members to collaborate with the president of RA IV to ensure that the process of implementing RCCs in the Region was accomplished satisfactorily.

5.3.7 The Association noted with appreciation the work which the CCl ETs on operational Heat/Health

Warning Systems (HHWSs) and Health-Related Climate Indices and their Use in Early Warning Systems were implementing in developing guidelines on heat/health warning systems that would help NMHSs and climate services programmes to evaluate their needs for HHWSs, and to establish effective warning systems. The Association noted the involvement of experts from the Region in this work and other WMO activities and urged the Secretariat to ensure that the work was completed soon.

5.3.8 The Association noted with appreciation that the CCl ETs on Climate and Health in collaboration with the World Health Organization (WHO) and other partners had organized a successful Conference for climatologists and health professionals from the Small Island Developing States (SIDS) of the Caribbean. The Conference entitled Climate Variability and Change and their Health Effects in the Caribbean (Bridgetown, Barbados, 20-21 May 2002) was followed by a three-day workshop of multidisciplinary, national teams to explore further activities in climate and health in the Region. The Association urged Members and the Secretariat to continue with such collaboration.

5.3.9 The Association agreed that Members should develop the capacity in the Region to promote projects that addressed 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 the Pan American Health Organization (PAHO), and adopted Resolution 8 (XIV RA IV).

5.3.10 The Association noted with appreciation the work being undertaken by the CCl ET on Urban Climatology including Training, which was being led by Professor S. Grimmond (United States), and which included Members from Mexico and Canada. The ET was developing training materials for NMHS staff and local and regional planners, and producing specific guidance material aimed at local planners in developing countries covering the fundamentals of building design as they relate to local climate, and building materials that are well adapted to local climates. This information would be useful to urban planners. The Association affirmed its support for this work and requested the ET to complete it as soon as possible.

5.3.11 The Association noted the progress made by the CCl ET on Climate Services for Energy, led by Ms S. Robles-Gil (Mexico) who was assembling case studies of climate information and predictions in support of energy operations; considering enhancements to climate services in support of energy development and operations; reviewing and recommending related traditional and distance-learning training materials; and considering climate observation and instrumentation needs, among other issues. The Association commended the ET on the preparation of a poster on *Climate, Water and Weather Information for Sustainable Energy*, which had been distributed by WMO at the World Summit on Sustainable Development (Johannesburg, South Africa, 26 August–4 September 2002).

5.3.12 There was a need for urgent action 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 that 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 should carry out case studies to clarify how knowledge of climate variability and the use of seasonal to inter-annual predictions could add value to decision-making, for example in the production and use of traditional and renewable forms of energy.

5.4 World Climate Research Programme (WCRP) (agenda item 5.4)

5.4.1 The Association noted that Members continued to participate actively in many components of the WCRP, including observational projects and modelling studies. The United States, in particular, was contributing key data through its network of operational and research-oriented satellites,. Two regional atmospheric and hydrological studies in support of the Global Energy and Water Cycle Experiment (GEWEX) had been organized, namely the GEWEX Continental-scale International Project (GCIP) over the Mississippi River Basin (which was being succeeded by the GEWEX Americas Prediction Project (GAPP)), and the MacKenzie River GEWEX Study (MAGS). Nearing completion, MAGS was starting application projects in the management of water resources. The United States and Canada were also key contributors to the Coordinated Enhanced Observing Period (CEOP), providing in situ satellite and modelling data, with the United States National Aeronautics and Space Administration (NASA) hosting one of the main CEOP data centres. The Region was trying to ensure close collaboration and coordination between the relevant Climate Variability and Predictability (CLIVAR) and GEWEX projects (such as Variability of the American Monsoon System (VAMOS) and GAPP), especially in the context of the CEOP initiative. The Association was informed that NASA had renewed its support to the International GEWEX Project Office located in Washington, DC (United States).

5.4.2 The Association noted with interest the research activities under CLIVAR aimed at extending understanding of climate variability on seasonal to decadal timescales and further strengthening the scientific basis for practical climate prediction and the ongoing activities that focused on monsoonal circulations in the Region. Members of the Region were in the forefront of the planning and implementation of several of the research and field studies that were being undertaken as part of the broad VAMOS initiative. In particular the United States and Mexico were collaborating on a major WCRP investigation of the North

American Monsoon systems as part of VAMOS. A field experiment involving enhanced upper-air soundings, rain gauge networks and research aircraft flights had begun in 2004. The United States was hosting the international Argo Project Office and continued to be a major contributor to the International CLIVAR Project Office in Southampton (United Kingdom). The United States had also hosted the 1st International CLIVAR Science Conference held in Baltimore, from 21 to 25 June 2004. The Conference, which had been attended by over 640 scientists from 56 different countries, was a tremendous success. It had highlighted the many advances in CLIVAR science, assessed the progress of CLIVAR and identified the future challenges. Another highlight had been the final scientific conference for the World Ocean Circulation Experiment (WOCE), called 'WOCE and Beyond', which had been held in San Antonio, the United States, from 18 to 22 November 2002, and which had been attended by 400 participants. This celebrated the end of WOCE, the first WCRP core project, which through its planning, observational and analysis phases had lasted two decades. WOCE had provided a significant legacy of improved scientific understanding, observational technology, ocean and atmosphere-ocean modelling, and applications. The success of WOCE was due in no small part to the sustained involvement, commitment and leadership of the scientific research community in the United States and its supporting agencies. Directly related support, particularly from the United States, for the ENSO observing system in the Pacific, the Pilot Research Moored Array in the Tropical Atlantic (PIRATA), and for global array of profiling floats (Argo), had formed the foundation for many important investigations in the CLIVAR study.

5.4.3 The Region had continued to provide crucial contributions to the activities of the Arctic Climate System Study (ACSYS)/Climate and Cryosphere Programme (CC) and the Stratospheric Processes and their Role in Climate (SPARC) projects. The Region had hosted the Second Session of the ACSYS/CliC Scientific Steering Group (SSG) (Halifax, Canada, 15-19 October 2001), the ninth and twelfth sessions of the SPARC Scientific Steering Group (Honolulu, United States, 3-6 December 2001, and Sidney, BC, Canada, 9-12 August 2004). Canada and the United States had played leading roles in the implementation of the ACSYS, as well as the International Arctic Buoy Programme, and would also contribute substantially to the development of the new WCRP CliC project. The third General Assembly of SPARC (Victoria, Canada, 1-6 August 2004) had been a milestone in summarizing understanding of climate-chemistry interactions and of the state-of-work on enhancing the ability to adequately represent the stratosphere in global climate models. An Open Science Conference of the Project Surface Ocean Lower Atmosphere Study (SOLAS) had taken place in Halifax, Canada, from 3 to 16 October 2004. It had discussed advances in modelling the biogeochemical interactions between the oceans and atmosphere, which was a necessary step in expanding the scope of climate models from the traditional physical domain to more encompassing physical, chemical and biological domains. Canada and the United States were actively developing the concept of the International Polar Year 2007/08. Canada was hosting the International Project Office for SPARC at the University of Toronto, thanks to generous support from several Canadian organizations.

5.4.4 The Association indicated that there were a considerable number of other activities conducted by NMHSs in the Region in partnership with other institutions, such as the Inter American Institute for Global Change Research (IAI), IP climate research, and the implementation of the WCRP projects. In particular to improve warm season prediction over the Americas, the CLIVAR VAMOS North American Monsoon Experiment (NAME), and the Monsoon Experiment in South America (MESA), were focusing on the monsoon systems over North and South America, respectively. These projects were collaborating with GEWEX and were undertaking modelling and empirical studies and enhancing the monitoring infrastructure. The NAME involves the Mexican Meteorological Service, university scientists, hydrographers, etc. Scientists from Central America, particularly from Costa Rica, were participating in MESA. For NAME there were specific field programme plans which involve flights, cruises, enhanced atmospheric and hydrological observations over and around Mexico.

5.4.5 The Association noted the progress being made under the banner of the Earth System Science Partnership (ESSP), which had been initiated by WCRP, the International Geosphere Biosphere Programme (IGBP), the International Human Dimensions Programme on Global Environmental Change (IHDP) and an international programme of biodiversity science (DIVERSITAS) for the integrated study of the Earth System, its changes, and the implications for global sustainability. At this early stage of its development, the ESSP was undertaking three types of activity including joint projects, regional activities, and global change open science conferences. The first four ESSP joint projects were focusing on the global carbon cycle, food systems, the global water system, and global environmental change and human health. The Association encouraged WCRP to participate fully in the development and implementation of the innovative initiatives of the ESSP.

5.4.6 The Association noted the progress being made in the implementation of the WCRP and on its future scientific direction and priorities. In particular, the WMO/International Council for Science (ICSU)/International Ozone Committee (IOC) Joint Scientific Committee (JSC) for the WCRP had continued to develop the concept of Coordinated Observation and Prediction of the Earth System (COPES), with the overarching aim to facilitate prediction of climate variability and change in order to strengthen and broaden the range of dependent practical applications of direct relevance, benefit and value to society. COPES aims to:

(*a*) Provide a framework for ensuring collaboration among nations and synergy across WCRP activities;

(*b*) Build new tools to describe and analyze climate variability and change, and their combined effects;
(*c*) Assess why those effects were occurring;
(*d*) Build improved and more comprehensive climate system models;
(*e*) Make climate predictions of greater utility from weeks to centuries and on global to regional scales;
(*f*) Enable improved climate-change assessments for use in widespread applications.

5.4.7 The Association appreciated that the JSC was planning special publications and meetings to celebrate the 25th anniversary of WCRP in 2005, with the prospect of a major international conference to announce COPES in 2006.

5.5 Global Climate Observing system (GCOS) (agenda item 5.5)

5.5.1 The Association noted the overall progress achieved by GCOS since the last RA IV session in (1) implementing the GCOS Baseline Networks; (2) preparing the *Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC* (WMO/TD-No. 1143); and an *Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC* (WMO/TD-No. 1219); (3) undertaking the Regional Workshop Programme; and (4) mobilizing resources for improving GCOS stations, including the development of a GCOS Cooperation Mechanism.

5.5.2 The Association also noted that the Atmospheric Observation Panel for Climate (AOPC), in cooperation with the Commission for Basic Systems (CBS) had guided the operation of the monitoring, analysis, and archiving centres for the GCOS Surface Network (GSN) and the GCOS Upper-Air Network (GUAN). It expressed its appreciation to the NCDC for its role as the CBS lead centre for GSN and GUAN, which had given even greater insight into the operation of these networks. Members of the Association agreed to submit the historical data and metadata from their GSN stations and to continue their ongoing support for GSN and GUAN observations. Using funding from the United States, GCOS was continuing the work of the RA IV Technical Support Center (TSC) located in Curacao, Netherlands Antilles, to assist NMHSs in the Region to improve the reliability and integrity of the observing and related telecommunication networks in RA IV, especially the GUAN and GSN stations.

5.5.3 The Association welcomed GCOS efforts to utilize support provided by several WMO Members (notably, Australia, New Zealand, United Kingdom, and United States), under its National GCOS Support Programme to revitalize operations at a number of specific GUAN and GSN stations, especially in the tropical regions, as well as to support specific Global Atmosphere Watch (GAW) activities, primarily on the monitoring of such essential climate variables as aerosols, greenhouse gases and ozone. The high cost of consumables was a particularly difficult problem facing NMHSs in all Regions, and activities were underway to investigate potential solutions to the problem. The Association urged Members to continue and, where possible, strengthen their support for the GSN and GUAN networks, noting that robust, backbone networks that met the goals of GCOS could provide significant benefits for other regional objectives. In terms of the GSN and GUAN stations, referred to within the RBCN of RA IV (Resolution 3 (XIV-RA IV)), the Association urged Members to follow the recommendation to actively involve the GCOS focal points to foster a better understanding of ways to continually improve data availability from GSN and GUAN stations and to engage them in efforts to collect the required historical data and metadata for their respective stations.

5.5.4 The Association noted the collaboration between GCOS/AOPC, the CCl, and the CBS ET on Observational Data Requirements and Redesign of the GOS in developing guidance on the need for observations in support of climate applications. It also noted the collaboration between GCOS and the WCRP in the WMO Consultative Meetings on High-Level Policy on Satellite Matters on climate requirements for satellites.

5.5.5 The Association welcomed the completion, under GCOS leadership, of the *Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC* (WMO/TD-No. 1143) and the subsequent *Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC* (WMO/TD-No. 1218). It noted that these had been developed in collaboration with the climate scientific community and with other observing system initiatives such as the recently established Group on Earth Observations. The Association encouraged Members to implement the actions recommended in the Plan to the maximum.

5.5.6 The Association welcomed the decisions adopted at the ninth and tenth sessions of the UNFCCC Conference of the Parties (COP) in support of global observing systems for climate (COP-9, Milan, Italy, 1–12 December 2003; COP-10, Buenos Aires, Brazil, 6–17 December 2004) and, in particular, the Second Adequacy Report and the Implementation Plan. It noted that Decision 5/CP.10 Implementation of the global observing system for climate, had welcomed the emphasis given in the Plan to enhancing the participation of developing countries in the global observing system for climate, and had encouraged Parties to strengthen their efforts to address the priorities identified. It also noted that COP had invited GCOS to provide information to future sessions on how the actions identified in the Plan were being implemented, and recognized that ensuring such implementation would be a major priority for GCOS in the coming years.

5.5.7 The Association noted with appreciation the efforts of the GCOS Secretariat in responding to the decisions of the COP and commended the continuing interactions between GCOS, on behalf of WMO Members, the global observing systems for climate, and the UNFCCC. It encouraged GCOS to continue the strategy of engaging the UNFCCC and its subsidiary bodies to develop support for the global climate observing

systems, as had been endorsed by Resolution 10 (Cg-XIV) — Global Climate Observing System.

5.5.8 The Association reiterated its strong support for the GCOS Regional Workshop Programme and further requested Members to participate fully in the implementation of the regional action plan for Central America and the Caribbean. It noted with satisfaction that COP-9 had also re-confirmed its support, through its invitation to the Global Environment Facility, to giving appropriate consideration to the priority needs identified by non-Annex I Parties in their regional action plans relating to global observing systems for climate (Decision 4/CP.9-Additional Guidance to an operating system entity of the financial mechanism). In addition, GCOS was able to provide funding for a Regional Workshop on Climate Trend Detection and Extremes in Central America and northern South America for use by scientists involved in the IPCC Fourth Assessment Report.

5.5.9 The Association supported the establishment of the GCOS Cooperation Mechanism (GCM), aimed at addressing priority improvements in observing systems for climate, especially in developing countries. Eight countries, and WMO's Technical Co-operation Programme (TCOP) had participated in the inaugural meeting of the GCM in June 2004. The Association noted the importance of Members' support in furthering the implementation of the GCOS networks.

5.5.10 The Association recognized the efforts that GCOS had made in advancing systematic observations and requested that Members assist GCOS as much as possible, especially as regards to making progress in RA IV.

6. Atmospheric Research and Environment Programme (AREP) — regional aspects (agenda item 6)

6.1 Global Atmosphere Watch (GAW), including support to ozone and other environment-oriented conventions (agenda item 6.1)

6.1.1 The Association expressed its satisfaction with the considerable contributions of its Members in supporting GAW activities to maintain and build capacity for long-term atmospheric composition measurements for ozone, UV radiation, greenhouse gases, aerosols, reactive gases, and precipitation chemistry in RA IV. The Meteorological Service of Canada and the NOAA was supporting global observatories at 3 locations (Alert, Canada; Barrow, Alaska; and Mauna Loa, Hawaii). A large number of regional air and precipitation chemistry observatories were being operated throughout the Region. The Association acknowledged the important contribution of the United States NOAA laboratories in hosting the GAW Central Calibration Laboratory for greenhouse gases and Dobson ozone measurements as well as the World Quality Assurance and World Data Centre for Precipitation Chemistry at the State University of New York. In addition, the Association greatly appreciated the important contribution of the Meteorological Service of Canada to GAW through the maintenance of the World Ozone and UV Data Centre and the Brewer Reference Triad for ozone measurements.

6.1.2 The Association emphasized the importance of further capacity-building of the long-term GAW network in Central America utilizing partnerships between NMHSs and air chemistry research monitoring organizations. In particular, the Association encouraged the joint initiative of the Mexico Meteorological Institute (SMN) and Sistema Internacional de Monitoreo Ambiental (SIMA) to establish high altitude GAW stations in cooperation with GAW partners at NOAA/Climate Monitoring and Diagnostic Laboratory (CMDL) and the Air Quality Research Branch of the Meteorological Service of Canada. In addition, it urged Members to review and update the information on their GAW measurement activities and GAW contacts reported on the GAW Station Information System (GAWSIS) (www.empa.ch/gaw/gawsis). The new system, which had been developed to monitor the performance of the GAW networks, included a mapping facility coupled with a Geographical Information System and could be queried by country, WMO Region and parameters measured.

6.1.3 The Association urged its Members to avail themselves of the assistance offered by numerous GAW Quality Assurance and Calibration Centres to link their observations and measurements to GAW primary standards and to submit data and descriptive metadata on a regular basis to the five GAW World Data Centres, including two based with the Region (see paragraph 6.1.1).

6.1.4 The Association drew Members' attention to the new WMO/GAW-led strategy for Integrated Global Atmospheric Chemistry Observations (IGACO) approved at the fifty-sixth session of the Executive Council in June 2004. It had been developed under the Integrated Global Observing Strategy (IGOS) and represented a key component of GEOSS. IGACO involved the assimilation of chemical observations by forecast and climate models and the integration of observations of atmospheric chemical constituents from ground-based networks, aircraft and satellites. Members were encouraged to participate in the implementation phase of IGACO 2005 to 2010 by providing appropriate data in real-time and to support integrated data archiving and analysis facilities established by WMO and partners.

6.1.5 The Association acknowledged the contributions made by Members and the scientific community to GAW's support of a number of United Nations Environmental Conventions and scientific assessments during the past four years. The Vienna Convention for the Protection of the Ozone Layer and the UNFCCC as well as the WMO publication *Scientific Assessment of Ozone Depletion: 2002, Global Ozone Research and Monitoring Project*, Report No. 47, Geneva, 2003, and the IPCC 2001 Assessment Review were based on observations and analyses provided by the GAW network of ozone, UV and greenhouse gas monitoring stations. Furthermore, GAW was assigned responsibility for systematic global measurements of the Essential Climate Variables (ECV) greenhouse gases, ozone and aerosols in the implementation of the Global Observing System for Climate in support of UNFCCC (see also 5.5).

6.1.6 The Association noted the collaboration in improving air quality forecasting in Latin American cities within a new GAW Urban Research Meteorology and Environment Project (GURME) involving initially Mexico City, Sao Paolo and Santiago de Chile. The first GURME Expert Workshop on Air Quality Forecasting was held in Cuernavaca, Mexico, from 13 to 16 October 2002. The current status of operational models and their expected short-term improvements was reviewed, documented and used to update existing information on air quality modelling on the GURME web site.

6.2 World Weather Research Programme (WWRP), including THORPEX (agenda item 6.2)

6.2.1 The Association noted with satisfaction that Members from the Region had maintained an active interest in, and contributed to, the implementation of the WWRP. It was recalled that this Programme was offering the prospect of much improved weather predictions on all timescales, focussing on high impact events and socio-economic applications. Members were encouraged to continue providing input to annual WMO progress reports on numerical weather prediction and long-range forecasting as a means of reaching all WMO Member countries with information on the latest developments.

6.2.2 The Association was particularly pleased that Members continued to participate actively in WWRP activities and projects such as the Aircraft In-flight Icing Project (AIFI), the new WWRP/GAW Research and Development Programme (RDP) on Sand and Dust Storm Research, and the WWRP Beijing Olympics 2008 Project (comprising a forecast demonstration project (FDP) on nowcasting and a RDP on mesoscale data assimilation and EPS), and were developing projects on quantitative precipitation forecasting (QPF), wildfire weather, and warm season precipitation research. Members were urged to continue their active support for these and other relevant WWRP initiatives.

6.2.3 The Association noted with satisfaction that Canada and the United States were playing a leading role in THORPEX, which was holding out promise of much improved weather forecasting skill. The full name of the programme is THORPEX: A World Weather Research Programme where THORPEX means The Observing System Research and Predictability Experiment. THORPEX was developed and implemented under the leadership of the CAS International Core Steering Committee (ICSC) and International Science Steering Committee (ISSC) in cooperation with the CAS Science Steering Committee for WWRP, the WMO/IOC/ICSU Joint Scientific Committee for WCRP, the CAS/JSC Working Group on Numerical Experimentations and the WMO CBS. Regional activities were being coordinated by the North American Regional THORPEX Committee, co-chaired by Dr D. Parsons (United States) and Dr. P. Gauthier (Canada), which had set up its regional implementation plans in accordance with the national priorities of participating Members.

6.2.4 The Association was informed that the THORPEX North Atlantic Regional Campaign, which was being undertaken jointly by the North American and European THORPEX Regional Committees, had successfully completed field phases from October to December 2003. A number of storms had been targeted from the East Coast of North America through to the Mediterranean. The datasets had been completed and were freely available for research purposes through the THORPEX web site. The assessment and research phases of the campaign were underway. Canada had hosted the First THORPEX International Science Symposium (Montreal, Canada, 6-10 December 2004), which had gathered together more than 200 scientists from approximately 30 countries. At the WMO/Japan Workshop during the World Conference on Disaster Reduction (Kobe, Japan, 18-22 January 2005) (see also item 11), THORPEX and WCRP had jointly led the session Scientific and technological advancements towards the development of seamless prediction systems from hourly to climate change timescales.

6.2.5 The Association noted with appreciation that the THORPEX International Science Plan and the International Research Implementation Plan had been developed, published and prepared for circulation (detailed information was available on the web site: www.wmo.int/thorpex) with contributions from the Region and in collaboration with the WWW, WCRP, the WMO Space Programme (WMOSP), and other relevant WMO Programmes and international organizations and in connection with GEO and International Polar Year (IPY) initiatives. The Association urged Members to involve NMHSs (operational forecast and research entities), their users and national academic institutions in THORPEX research, experimentations, and demonstration projects, and especially welcomed the involvement of developing countries.

6.2.6 The Association further noted that a Trust Fund for THORPEX had been set up and the THORPEX International Programme Office (IPO) had been established in the WMO Secretariat. The Association appreciated the active support of Canada, France, the United Kingdom and the United States, among other Members. The Association urged all of its Members to provide further support to THORPEX.

6.2.7 Recognizing the importance and benefits of THORPEX research to all Members of the Region, the Association agreed to establish and appoint a Rapporteur on WWRP-THORPEX and adopted Resolution 9 (XIV-RA IV).

6.2.8 The Association recognized that weather forecasting remained the central activity for NMSs and urged Members to become more involved in their support of WWRP projects in order to speed up the development of improved and cost-effective forecasting techniques.

6.3 Tropical Meteorology Research Programme (TMRP) (agenda item 6.3)

6.3.1 Members of the Association continued to show great interest in activities related to the development of the TMRP. Experts from the Region had actively

participated in the organization of the Fifth WMO International Workshop on Tropical Cyclones (IWTC-V) (Cairns, Australia, 3-12 December 2002) and the Third WMO International Workshops on Monsoon Studies (IWM-III), (Hangzhou, China, 1-5 November 2004), which had brought operational forecasters and research scientists together in a workshop environment to discuss problems of mutual interest and to identify solutions to forecasting tropical cyclones and monsoons. The Association urged Members and all concerned to implement the recommendations made at these workshops relevant to their activities.

6.3.2 The Association was pleased to note that Costa Rica would host the Sixth International Workshop on Tropical Cyclones (IWTC-VI) in 2006. Members of the Region were urged to continue supporting the organization of the IWTC-VI and other activities under the TMRP in view of the fact that most Members of the Association were affected by tropical weather systems.

6.3.3 The Association noted a proposed Extratropical Transition Research Programme within the THORPEX Pacific Regional Campaign linked to the IPY in 2007-2008. Objectives would include improved understanding of the lifecycle of tropical cyclones, and improved understanding and prediction of the impacts associated with extratropical transition including flooding, wind damage and extreme waves. The Association encouraged the research and forecast communities to take advantage of the enhanced observations planned for IPY in 2007-2008 including the development and testing of adaptive observing strategies.

6.4 Programme on Physics and Chemistry of Clouds and Weather Modification Research (agenda item 6.4)

6.4.1 The Association noted the outcomes of the different meetings, workshops and conferences organized within the framework of the Programme and expressed its overall satisfaction of the systematic effort made by the programme in support of the continuing interest of many Members of the Region in the areas of hail suppression and precipitation enhancement, for improved parameterization of cloud processes in weather forecasting models, and better understanding of the behaviour of clouds in climate.

6.4.2 The Association noted that some Members were conducting operational and research weather modification activities on precipitation enhancement and hail suppression, and reconfirmed the need to conduct rigorous analyses of the results and to review the criteria for assessing the success of weather modification experiments.

6.4.3 The Association recalled that a number of recent peer-reviewed publications including the National Academy of Sciences Report on the future of weather modification in the United States had provided strong probabilistic evidence of a good cost/benefit ratio of precipitation enhancement. Notwithstanding some uncertainties in the broad field of weather modification, precipitation enhancement and/or hail suppression remained a real potential where proper conditions existed.

6.4.4 The Association noted the establishment of the WMO/International Union of Geodesy and Geophysics (IUGG) Science Assessment of Aerosol Effects on Precipitation on Local, Regional and Global Scales and the CAS Ad hoc International Aerosol Precipitation Science Assessment Group (IAPSAG) which included experts from the Region and which would prepare a peer-reviewed report by the next IPCC assessment in 2006.

7. Applications of Metorology Programme (AMP) — regional aspects (agenda item 7)

7.1 Public Weather Services (PWS) Programme (PWSP) (agenda item 7.1)

7.1.1 The Association was pleased to note the continuing progress and development of the PWSP and expressed appreciation of the assistance given to Members of the Region to enable them to enhance their capability to deliver high quality PWS to their national communities. In particular, the Association noted that the programme's activities related to capacity-building, media issues, keeping abreast of new technology, and improving products and services were in line with the recommendations of XIII-RA IV.

7.1.2 The Association reiterated the pressing need to provide staff with the best available training to permit the generation and delivery of the best quality PWS to facilitate everyday living, ensure safety of life, the protection of property, and national development, thereby demonstrating to governments the indispensability of the NMSs. As a result, the Association appreciated the PWS training opportunities for the Region's meteorologists since XIII-RA IV: RA IV Workshops on Hurricane Forecasting and Warning and Improvement of PWS, which had been repeated annually as follows: 23 April–5 May 2001, 15–27 April 2002, 24 March–5 April 2003, 13-24 April 2004; and the RA III/RA IV Training Seminar on Interpretation of GDPS and Improvement of PWS held in Lima, Peru, from 14 to 25 October 2002. The Association expressed gratitude to the Governments of the United States and Peru for hosting the respective training events and, furthermore, looked forward to the implementation of the recommendations of the recent Expert Meeting on Capacity Building Strategies in PWS held in San José, Costa Rica, from 30 November to 4 December 2004.

7.1.3 The Association welcomed the preparation and distribution by PWSP, since the last session of the Association, of the following Technical Documents, especially targeting developing countries, to assist with the development and improvement of national PWS efforts: *Guidelines on Performance Assessment of Public Weather Services* (WMO/TD-No. 1023); *Technical Framework for Data and Products in Support of Public Weather Services* (WMO/TD-No. 1054); *Weather on the Internet and Other New Technologies* (WMO/TD-No. 1084); *Guidelines on the Improvement of NMSs-Media Relations and Ensuring the Use of Official and Consistent Information* (WMO/TD-No. 1088); *Guidelines on Graphical Presentation of Public*

Weather Services Products (WMO/TD-No. 1080); *Guidelines on the Application of New Technology and Research to Public Weather Services* (WMO/TD-No. 1102); *Supplementary Guidelines on Performance Assessment of Public Weather Services* (WMO/TD-No. 1103); *Guide on Improving Public Understanding of and Response to Warnings* (WMO/TD-No. 1139); *Guidelines on Cross-Border Exchange of Warnings* (WMO/TD-No. 1179); and *Guidelines on Biometeorology and Air Quality Forecasts* (WMO/TD-No. 1184).

7.1.4 The Association commended the PWSP for establishing rapport with the international media on matters of mutual interest, and for efforts to better prepare NMSs to respond to media demands for information, especially on disasters of meteorological and hydrological origin. It acknowledged the importance of a strong NMS-media relationship for both partners as well as its significant impact on public safety issues. This partnership allowed NMSs to ensure effective delivery of the desired message to the public while the media received the level and quality of information they required. The Association supported the preparation of guidelines on presentation skills and dissemination technologies and requested that all PWS training events incorporate topics and exercises aimed at improving participants' communication and media skills, since acquisition of these skills had implications for NMSs' credibility and visibility.

7.1.5 The Association welcomed the success of the two web-based, award-winning WMO-sponsored pilot projects dealing with media issues that had been developed and were being managed by Hong Kong, China. Sixteen regional NMSs were participating in the World Weather Information Service (WWIS) web site that had been established as a centralized and easily accessed source of official weather information for the media and the public. Its contents included city climatological information (for 1 038 cities from 153 WMO Members), medium-term forecasts (supplied for 917 cities by 92 WMO Members) and hyperlinks to contributing Members' national web sites. The WWIS web site was initially set up in English with newer versions in Portuguese, Arabic and Chinese. Plans were under way for a French version. The Severe Weather Information Centre (SWIC) web site provided a centralized source for media access to official tropical cyclone warnings and information issued by NMSs. The project has global coverage with 20 participating NMSs (including 2 from the Region), and has expanded to include rainstorms and heavy snowfall.

7.1.6 The Association acknowledged that natural disaster prevention and mitigation and public response to warnings were major concerns of Members, especially in the light of the severe 2004 hurricane season, and appreciated the efforts of WMO and the PWSP in that regard. It supported close collaboration between the PWSP and the new cross-cutting WMO DPM to assist Members in the all-round effort to minimize severe weather impacts. Some Members needed assistance to develop strategies for effective warning services, the dissemination and presentation of warning products, enhancement of the the public's use and understanding of warnings, and for effective coordination with emergency managers. Assistance was also needed with the application of appropriate technology and meteorological research in developing and delivering quality products and services to ensure the protection of life and property and to reduce losses due to natural disasters. The Association noted that the second World Conference on Disaster Reduction had recently been held in Kobe, Japan, from 18 to 22 January 2005, and Members were awaiting the Conference results.

7.1.7 The Association welcomed the increased PWSP emphasis on the application of new technology and research, including workstation systems, integration and packaging of weather information, communication and dissemination mechanisms and Internet communications, and their impacts on PWS. Several new and exciting possibilities existed to enhance PWS including increased availability of EPS and its impact on probabilistic forecasting; digital forecasting; provision of air quality forecasts and biometeorology information; improved accuracy of operational NWP models permitting better long-range forecasts; increased opportunities for disseminating nowcasting products through the Internet and other wireless delivery channels; and the application of XML for seamless data exchange between computers. In acknowledging these opportunities, the Association strongly supported the call by Fourteenth Congress for increased cooperation between developed and developing countries to enable the latter to realize the benefits of new technologies.

7.1.8 The Association recognized the pressing need for increased bilateral and/or regional cooperation and agreements to develop and expand arrangements for cross-border exchange of warnings, forecasts and information. It appreciated the preparation of relevant guidelines to assist Members with the implementation of cross-border warnings and welcomed advice on standardized formats and content of exchange messages as well as the list of hazard types and currently-used threshold values. The Association strongly recommended that Members actively pursued programmes for cross-border warnings, and emphasized the reliance of successful exchange on the development and maintenance of efficient and reliable communication systems, and on staff with specialized training in severe weather forecasting, issuing warnings and communication skills, and with knowledge of the geography and NMS practices and procedures of nearby countries.

7.1.9 The Association appreciated the efforts of the PWSP in assisting Members to develop programmes on warnings and forecast verification and service evaluation, noting that user-based service assessment was required input for product/service upgrade and development of new products and services. Users had been seeking higher quality assurance, making it necessary to apply more precise standards and quality control to NMS products and services in order to match customers' expectations. The Association believed the proposed additional guidance on quality management and

continuous improvement, with emphasis on objectives and principles of quality management in a NMS context, as well as consideration for on-going quality management including approaches and strategies, would encourage and assist Members to develop and maintain relevant programmes.

7.1.10 The Association readily acknowledged the impact and challenge of changes in social, political and economic sectors on national, regional and global scales on the role and operations of NMSs. Services were being increasingly challenged to prove that they should be recipients of continuing government support, especially in developing countries where several other sectors also had valid and pressing claims on the public purse. In these circumstances, the Association advised that NMSs could benefit from harnessing the opportunities provided by public focus on environmental issues, new technological developments, advances in meteorological science and improved accuracy of numerical weather prediction to contribute effectively toward national development. In this way, the NMSs would be enhancing their own visibility while improving their national status.

7.1.11 The Association stressed that the provision of high quality PWS was a fundamental function of NMSs and represented the most visible and tangible benefit that national communities could derive from the work of the NMSs. In expressing appreciation for the continuing efforts of the WMO PWSP in strengthening the capacity of Members to effectively deliver the best quality public weather services, the Association requested that future high priority should be given to the following areas:

(*a*) Capacity-building and transfer of knowledge and technology;
(*b*) Application of new technology and research in NMS systems and operations;
(*c*) Increasing the adoption of verification and user-based service assessment;
(*d*) Raising the level of public awareness, understanding and response to weather warnings as part of natural disaster mitigation efforts;
(*e*) Improving relationships and coordination with emergency management and the media;
(*f*) Promoting and enhancing cross-border exchange of warnings;
(*g*) Facilitating the international exchange of public weather products and making weather information available on the Internet;
(*h*) Promoting awareness of the importance of the impact of high quality, well-delivered, public weather services on the image and visibility of the NMS;
(*i*) Improving the use of official, consistent information to facilitate the international exchange of public weather products and make weather information available on the Internet.

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.

7.2.2 The Association noted with appreciation the theme adopted by the Commission: To promote operational applications of agrometeorology using innovative technologies for services to agriculture, silviculture and aquaculture. The activities of the Implementation Coordination Teams (ICTs) of CAgM, especially in implementing the recommendations of the different ETs in their OPAGs over the next intersessional period of the Association would be crucial in promoting agrometeorological applications in the Region.

7.2.3 The Association expressed its satisfaction with the collaboration between the United States Department of Agriculture (USDA) and WMO in the organization of the Expert Group Meeting on Software for Agroclimatic Data Management (Washington D.C., United States, 16–20 October 2000). The Association noted that there were a diverse range of agrometeorological applications, which required different sets of data, ranging from hourly observations to long-term climatic records and from point-source data to spatially interpolated products. Hence, software tools for georeferenced data and remotely sensed products were becoming prerequisites for integrated agroclimatic data management. The Association stressed the need for wider use of the improved software tools in the Region to ensure more efficient data management over the next intersessional period.

7.2.4 The Association was pleased to note that WMO, in collaboration with NOAA, had organized an Interregional Workshop on Improving Agrometeorological Bulletins (Bridgetown, Barbados, 15-19 October 2001). It noted in particular that the workshop had addressed the needs of small farmers, who typically did not have direct access to advanced electronic methods to obtain information. The Association urged Members to increase their efforts to provide timely agrometeorological advisories to the farming community in the Region.

7.2.5 The Association noted with satisfaction that WMO, in cooperation with NOAA and USDA, had organized an Expert Group Meeting on Internet Applications for Agrometeorological Products in Washington DC, the United States, from 6 to 9 May 2002. The meeting had discussed the implementation strategy of the major recommendation of the Barbados Interregional Workshop on Improving Agrometeorological Bulletins for a dedicated web server for Members' agrometeorological products, and for the development of the basic framework of a World Agrometeorological Information Service (WAMIS) to disseminate Members' agrometeorological products. The Association urged Members to use the WAMIS facility to disseminate their agrometeorological products more widely, and to take advantage of the training modules offered by WAMIS.

7.2.6 The Association also noted that WMO, in cooperation with Agriculture and Agri-food Canada and Environment Canada, had successfully organized the

CAgM Expert Meeting on the Contribution of Agriculture to the State of Climate (Ottawa, Canada, 27-30 September 2004). Globally, agriculture occupied a significant percentage of total land area, i.e. cropland (15-18 Mkm^2) accounted for 12 per cent of the land area and pasture and rangeland (34 Mkm^2) for 22 per cent of the area. By altering vegetation properties, agriculture influenced the magnitude of net radiation, via surface albedo, and the partitioning of this into sensible and latent heat fluxes. Agriculture placed a serious burden on the environment in the process of providing humanity with food and fibres. It was the largest consumer of water and the main source of nitrate pollution of groundwater and surface water, as well as the principal source of ammonia pollution. It was a major contributor to the phosphate pollution of waterways and to the release of the powerful greenhouse gases methane and nitrous oxide in the atmosphere. The Association welcomed the recommendation of the meeting to establish a network on the Contribution of Agriculture to the State of Climate (CONASTAC) in order to provide an integrated approach that would help address the issue in a holistic manner and would contribute significantly to the IPCC process, policy making, education and outreach. The Association requested Members to participate actively in the CONASTAC network and undertake specific case studies on important issues relevant to their countries with regard to the contribution of agriculture to the state of the climate.

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

7.2.8 The Association noted with satisfaction that a Roving Seminar on the Application of Climatic Data for Desertification Control, Drought Preparedness and Management of Sustainable Agriculture had been held in St John's, Antigua, from 21 to 29 April 2004. The Association strongly supported the continued organization of such events for the benefit of the participants from the Region, and it urged the Secretary-General to continue providing strong support to training activities in agricultural meteorology which were helping to build the much needed capacity to address the emerging issues in agrometeorology in the Region.

7.2.9 The Association noted the WMO activities on desertification and urged Members to participate actively in the implementation of the UNCCD. The Association urged Members to benefit from the support through the Global Mechanism of the Convention for projects in the area of drought and desertification.

7.2.10 The Association complimented the chairperson and the members of the RA IV Working Group on Agricultural Meteorology for the activities carried out and for the final technical report. The Association recommended that the report be published by WMO and distributed widely.

7.2.11 The Association complimented the chairperson of the working group for his active participation in the number of activities to strengthen agrometeorological applications in the Region.

7.2.12 The Association agreed that the application of meteorology to agriculture continued to be of high importance in the Region. Hence, the activities of the Working Group on Agricultural Meteorology should be continued taking into account developments in the Region, such as the socio-economic impacts of extreme climatic events on agriculture, forestry and fisheries; the status of seasonal climate predictions and agrometeorological forecasts for improved management decisions, especially for pest and disease management and irrigation scheduling; the adequacy of the procedures currently used for the dissemination of agrometeorological information and advisories in the Region; the current status of linkages between NMHSs and the agricultural research and extension services in the Region, and ways and means of improving them; and the impacts of ENSO and climate variability on agriculture and forestry in the Region. The Association therefore re-established the Working Group on Agricultural Meteorology with renewed terms of reference and adopted Resolution 10 (XIV-RA IV) accordingly.

7.3 Aeronautical Meteorology Programme (AeMP) (agenda item 7.3)

7.3.1 The Association noted with satisfaction that Fourteenth Congress had re-emphasized the importance it attached to an expanded and vigorous AeMP to meet the needs of the worldwide aviation community and requested the Secretary-General to assist in its implementation. In particular, Fourteenth Congress had requested that high priority be given to training requirements. The Association welcomed the request by the fifty-sixth session of the Executive Council to the Commission for Aeronautical Meteorology (CAeM) and the Secretary-General to monitor closely the evolution of national and regional institutional frameworks for the provision of meteorological services for international air navigation and to report to the next Executive Council session. Furthermore, the Association welcomed the establishment in 2002 of a new CAeM structure comprising two Open Programme Area Groups (OPAGs), eight expert teams and a Rapporteur on Aircraft Meteorological Data Relay (AMDAR) activities and another on Aviation and the Environment.

7.3.2 The Association was pleased to note that training remained the highest priority of the AeMP 6LTP focussing on aviation users and improved terminal forecasting. It noted with appreciation the major contributions of Members, in particular, Canada, Mexico, the United States and the WMO Secretariat to the training of aeronautical meteorological personnel. Training events attended by participants from the Region had included the Workshop on Radar and

Satellite Imagery Interpretation and NWP Application to Aviation (Barrie, Canada, 27-31 October 2003), two AMDAR workshops (Johannesburg, South Africa, 15-17 October 2003 and Beijing, China, 11-15 October 2004), and the 2nd International Conference on Volcanic Ash and Aviation Safety (Alexandria, United States, 21-24 June 2004).

7.3.3 The Association welcomed Recommendations 4/1 and 4/2 by the twelfth CAeM session/ICAO Meteorology Divisional Meeting (Montreal, Canada, 16-20 September 2002) that called respectively for WMO, in coordination with ICAO, to continue to arrange seminars on cost recovery as a matter of priority, and for ICAO, in coordination with WMO, to update cost recovery guidance material. In that regard, the Association was pleased to note that the update of the ICAO *Manual on Air Navigation Services Economics* (Doc. 9161) had been completed during 2004. Furthermore, the Association was pleased that a priority task for CAeM remained the updating of the WMO *Guide on Aeronautical Meteorological Services Cost Recovery* (WMO-No. 904) to reflect changes already made to the ICAO Manual and experience gained in conducting cost recovery seminars attended by participants from all WMO Regions in the past few years. The Association welcomed the request of the fifty-sixth session of the Executive Council for the organization of regional cost recovery seminars and was looking forward to convening such events in the Region in the near future.

7.3.4 The Association noted with appreciation the large volume of training material available on the AeMP web site and the efforts being made by CAeM to provide new or updated guidance material to back up the training process. In that regard, the Association was pleased to note that, in 2003, the *Compendium on Tropical Meteorology for Aviation Purposes* (WMO-No. 930), and the *AMDAR Reference Manual* (WMO-No. 958) had been published in English and in English and French, respectively, and that an updated version of the *Guide to Practices for Meteorological Offices Serving Aviation* (WMO-No. 732) had been published in four languages. In 2004, the booklet on *Aviation and the Global Atmospheric Environment* that summarized the current scientific and operational knowledge on the impact of aviation on the environment had been jointly published in English by WMO and UNEP. Furthermore, the draft update of the G*uide on Meteorological Observation and Information Distribution Systems at Aerodromes* (WMO-No. 731) had been completed in 2004 and subsequently reviewed by CAeM bodies and the Secretariat.

7.3.5 The Association welcomed advances made towards the final phase of the World Area Forecast System (WAFS) which was expected on 1 July 2005. The Association was informed that each of the two World Area Forecast Centres (WAFCs) were now required to transmit satellite broadcasts of global wind and temperature and SIGWX forecasts in GRIB and BUFR coded format only. Therefore, the current wind and temperature and SIGWX forecast T4 charts would need to be produced by local services using the GRIB and BUFR coded WAFS products. The Association was reminded that, with the transition from the ISCS X.25 to the ISCS TCP/IP broadcasts, Members would need to install new workstations in replacement of STAR4 workstations, upgrade the visualization software, and ensure that their operational staff had been trained in the systems to access, decode and use the GRIB and BUFR coded WAFS products for the local preparation of T4 charts needed for flight documentation.

7.3.6 The Association noted with satisfaction that various amendment proposals to *Technical Regulations* (WMO-No. 49) Vol. II, had been approved by ICAO and WMO as part of Amendment 73 to *Technical Regulations* [C.3.1] and had become applicable on 25 November 2004. These provisions related, among others, to the WAFS final phase: prevailing visibility, aerodrome forecasts, observing and reporting of certain meteorological elements, cloud of operational significance including SIGMET, AIRMET, aerodrome warnings and the overall restructuring of Volume II.

7.3.7 The Association was informed on progress made in automating meteorological observing systems and noted with satisfaction that, as recommended by the Conjoint CAeM session/ICAO Meteorology Divisional Meeting (Montreal, Canada, 9–27 September 2002), ICAO had developed, in close coordination with WMO, a *Manual on the Use of Automatic Meteorological Observing Systems at Aerodromes*. The review of this Manual had been completed and its publication was expected by mid-2005. The Association agreed with the twelfth session of CAeM that automated systems had undeniable advantages in terms of performance, continuity and uniformity of measurements, which made them very useful when continuous human presence at the observing site was not possible.

7.3.8 The Association recalled that the AMDAR Panel had been established in 1998 to enhance the upper-air component of the WWW GOS and noted with satisfaction that since then the number of automated aircraft observations disseminated on the GTS per day had increased to over 150 000 and that this volume of data represented more than a three-fold increase since 1998. The Association noted with satisfaction that countries in the Region, in particular, Canada and the United States, had been major Panel members actively involved in the development and implementation of the WMO AMDAR programme as well as major contributors to the AMDAR Trust Fund. The Association encouraged other Members in the Region to join the Panel, and the Panel to continue its work aimed, among other things, at the development of operational humidity sensors. The Association requested the AMDAR Panel to continue to provide assistance to Members interested in implementing AMDAR programmes and convening AMDAR training events.

7.3.9 In view of the vital importance of the AeMP for the Region, the Association decided to appoint Rapporteurs on Regional Aspects of the Aeronautical Meteorology Programme and adopted Resolution 11 (XIV-RA IV).

7.4 MARINE METEOROLOGY AND OCEANOGRAPHY PROGRAMME (MMOP) (agenda item 7.4)

7.4.1 The Association noted with interest that Fourteenth Congress had emphasized the importance of the MMOP including its traditional activities in areas such as maritime safety services, the new priorities in operational oceanography, and the implementation of an integrated ocean observing system for climate. Fourteenth Congress had approved the programme as part of the 6LTP. This programme provided overall objectives as well as detailed guidelines for Members, regional associations and WMO in this field.

7.4.2 The Association noted with satisfaction that the Joint WMO/IOC Commission for Oceanography and Marine Meteorology (JCOMM-I) had taken place successfully in Akureyri, Iceland, from 19 to 29 June 2001. The Association recognized the importance of JCOMM to its Members, noted that delegates from three RA IV Members had been represented at JCOMM-I, and offered its strong and ongoing support. Further specific action in that regard is recorded in a subsequent paragraph.

7.4.3 With regard to the implementation of marine meteorological services, specifically in Region IV, the Association noted with appreciation the comprehensive report of the Rapporteur on Regional Marine Meteorological Services (Canada). The Association agreed that the further development of marine meteorological and oceanographic services, together with marine observing systems in the Region, particularly in the light of the opinions of Fourteenth Congress on the matter, should be an ongoing activity. It therefore decided to re-appoint a rapporteur and adopted Resolution 12 (XIV-RA IV).

MARINE METEOROLOGICAL AND OCEANOGRAPHIC SERVICES

7.4.4 The Association noted with satisfaction that meteorological services, through SafetyNET under the WMO marine broadcast system and under the Global Maritime Distress and Safety System (GMDSS) (forming a part of the International Convention for the Safety of Life at Sea (IMO) (SOLAS)) covering the Region were fully operational and that mariners had confirmed (through surveys of user requirements) the accuracy and usefulness of the services. The Association recalled that while the great majority of respondents emphasized the usefulness of radio facsimile products, there was also significant dissatisfaction with the quality of those services and unannounced terminations. In that regard, it noted with interest that JCOMM was conducting a project regarding possible transmission of SafetyNet graphical products via Inmarsat-C. The Association 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 exercises being undertaken to monitor the various marine meteorological services. The Association noted with interest that a new web site (weather.gmdss.org) had been established to provide real-time global marine forecasts and warnings broadcasts via satellite under the GMDSS marine broadcast system and that there had been a phenomenal increase in requests for information on Metarea IV on the GMDSS web site during September 2004 when numerous hurricanes had affected the area.

7.4.5 The Association noted with interest that a major JCOMM marine products workshop (Ocean Ops 04) had taken place in Toulouse, France, from 19 to 21 May 2004. The workshop had attracted a large number of providers and users of operational ocean products, which had resulted in important inputs for the further development of the JCOMM *Electronic Products Bulletin*, and the implementation of the Marine Pollution Emergency Response Support System (MPERSS). The Association noted with interest that a new web site dedicated to MPERSS had been established to provide information on MPERSS, its products, and contact points in Area Meteorological Oceanographic Centres.

7.4.6 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 (GTSPP) were all being continually developed to meet a wide range of operational and research users' requirements for various types of marine data. It therefore urged Members concerned in the Region to participate actively in the projects, which 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, Canada and the United States, for their substantive support to the GTSPP.

SYSTEMS FOR MARINE OBSERVATIONS AND DATA COLLECTION

7.4.7 The Association shared the view of Fourteenth Congress that JCOMM was now recognized as a primary implementation mechanism for GOOS, and for operational oceanography in general, for which it was expected to play a role equivalent to that of CBS with regard to the WWW. For this task, JCOMM would require the enhanced, active support of all maritime Members, especially as regards collaboration between NMSs and appropriate national oceanographic agencies/institutions at the national level. It therefore decided to keep in force Resolution 12 (XIII-RA IV) on the subject.

7.4.8 The Association agreed that the voluntary observing ship (VOS) climate project, the Ship-of-Opportunity Programme (SOOP), the Global Sea-Level Observing System (GLOSS), the Automated Shipboard Aerological Programme (ASAP), ocean data buoys, the Array for Real-time Geostrofic Oceanography (ARGO) Programme, and oceanographic satellites formed key components of both existing and future ocean observing systems. It agreed on the importance of Members' continued support for these activities, and, in particular, urged Members to:

(*a*) Recruit more ships to the VOS programme, improve data quality and timeliness, strengthen their Port Meteorological Officers' (PMOs) networks:

(*b*) Participate where possible in the VOS Climate Project, SOOP, the ASAP, and the ARGO programmes;

(*c*) Develop and operate drifting buoy programmes in data-sparse ocean areas; and participate in the work of the Data Buoy Cooperation Panel (DBCP) and its action groups, such as the International South Atlantic Buoy Programme (ISABP), and the North Pacific Data Buoy Advisory Panel (NPDBAP), and the International Arctic Buoy Programme (IABP).

7.4.9 The Association noted with appreciation that Members of the Association were playing a prominent role in the Argo Programme and that the Argo array was expected to reach its target of 3 000 operating floats in 2006/2007. The Association noted that the Argo Information Centre (AIC) (argo.jcommops.org/) was participating in the activities of the JCCOMM in situ Observing Platform Support Centre (JCOMMOPS), which, inter alia, provided integrated information on programme status and logistical opportunities available for marine deployment. The Association expressed its appreciation of the Members contributing to the AIC, including the United States and Canada.

7.4.10 The Association noted with satisfaction that the JCOMMOPS facility continued to expand, with new support tools and services being offered to users. It expressed its considerable appreciation to those Members that had contributed financially to the operation of JCOMMOPS.

7.4.11 The Association noted that the satellite system of the International Maritime Satellite System (INMARSAT), as well as being a key element in the GMDSS and thus in the new WMO marine broadcast system, was also now the primary means for transmitting meteorological and oceanographic reports from 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 Argo 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 subsurface floats. Non-commercial users of the system participated collectively in the ARGOS Joint Tariff Agreement, which had secured them a favourable price and conditions. The Association therefore urged Members operating such ocean platforms to participate in this agreement wherever possible, if they were not already doing so.

Programme support activities

7.4.12 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 Members to consider the possibility of hosting such activities in the future.

7.4.13 The Association noted with satisfaction that the special seminar to celebrate the 150th anniversary of the Brussels Maritime Conference of 1853, together with the second JCOMM Workshop on Advances in Marine Climatology (CLIMAR-II) (Brussels, Belgium, 17-18 November 2003), had been outstanding successes. It expressed its appreciation to the United States and Canada for its support to these events.

7.4.14 The Association noted the importance of the national/regional/international network of the PMOs. The Association also noted that experts from the Region had attended the Second International PMO Workshop (London, United Kingdom, 21-22 July 2003). It further noted with interest that a Third PMO workshop was planned in 2005.

7.4.15 The Association noted with appreciation that a training Workshop on Wind Wave and Storm Surge Analysis and Forecasting for Caribbean countries had taken place in Dartmouth, Canada, from 16 to 20 June 2003, and that it had provided 12 participants from nine countries with both technical and practical knowledge in wave and storm surge analysis and forecasting techniques. The Association expressed its appreciation to Canada for hosting the workshop and to members of the JCOMM Expert Team on Wind Waves and Storm Surge.

7.4.16 The Association noted that the second session of JCOMM was scheduled to take place in Halifax, Canada, from 19 to 27 September 2005, and expressed its appreciation to the hosting country. Detailed planning for the session was well underway. The Association noted with interest that the JCOMM-II session was to be preceded by a scientific conference on Operational Oceanography and Marine Meteorology for the Twenty-first Century and would include the celebration and ceremonial deployment during JCOMM-II of the 1250th global drifting buoy. In this connection the Association encouraged all RA IV Members to attend the JCOMM-II session.

8. Hydrology and Water Resources Programme (HWRP) — regional aspects (agenda item 8)

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 the HWRP given in WMO's Sixth Long-term Plan (6LTP) as approved by Fourteenth Congress. It examined topics in the Plan which required more emphasis and recommended aspects of particular interest to countries in Region IV to be taken into account in the future work of the Working Group on Hydrology. In addition, the Association proposed that the topic on ecological flow be considered in the 7LTP within the frame of the Programme on Sustainable Development of Water Resources (SDW). As the session considered the Programme on Hydrology and Water Resources a priority, it was recommended that in future appropriate time should be dedicated to discussing it.

8.2 The Association noted with appreciation the report of the chairperson of the Working Group on Hydrology (WGH), Mr C. Barrett (United States). The session was informed by the vice-chairperson of the WGH, Mr E. Planos (Cuba) on the activities of the working group. He also reported on the Subgroup on

Hydrological Warning Systems. Mr J. Díaz (Venezuela) and Mr S. Laporte (Costa Rica) reported on the subgroups on Training and continuing education and Transboundary Water Resources Management, respectively. The Association noted the progress made in carrying out studies of particular concern to Members through the five coordinators of the subgroups who had been given specific assignments and were supported by other members of the WGH. In particular, it noted with interest the work carried out for the preparation of the reports, including project proposals, on:

Title	Coordinators
Training and continuing education	C. Fermin/J. Díaz (Venezuela)
Hydrological warning systems	E. Planos (Cuba)
Integrated water resources management	K. Narayan (British Caribbean Territories)
Development of CARIB-Hydrological Cycle Observing System (HYCOS)	V. Schneider (United States)
Transboundary water resources management	S. Laporte (Costa Rica)

8.3 The Association noted with satisfaction that its WGH had made significant inputs to the activities within the Hydrology and Water Resources Programme (HWRP) and, as required by Congress, the Association's activities had been 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 Fourteenth Congress, and the recommendations of CHy, the Association decided to re-establish the working group, open to all Members of the Region. With respect to the working group's membership, the Association requested 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 6LTP and included it in Resolution 13 (XIV-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 so that the members could attend the session.

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

8.6 The Association noted the number of experts from the Region designated as members of CHy working groups.

Regional implementation of the HWRP

8.7 The Association was informed of the technical and administrative support that had been provided by the Secretariat 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 were one of the major areas of interest and concern. During their last sessions all the regional associations had re-established their WGHs, which are open to experts of Members. The collective membership of these groups currently stood at 157 of which 37 had been assigned specific tasks as rapporteurs or subregional/subgroup coordinators. Several of these groups had subsequently developed project-oriented work programmes.

8.8 The Association was informed on discussions held during the eleventh session of the Commission of Hydrology in relation to organizational matters and advised that CHy had considered that the structure and the organization of WMO had had an important impact on how it was viewed by its various constituent communities, of which the hydrological community was one. The corresponding organizational structure at national level was also important because it could aid or hinder contacts and cooperation with WMO. WMO Regional and Subregional Offices, as presently constituted, did not have the hydrological expertise needed to serve the hydrology and water resources communities in the Regions, something that had been noted by the Executive Council in the past.

8.9 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* (UNESCO, 1997). The Association noted that the eleventh session of the Commission for Hydrology had considered this handbook a valuable contribution to WMO's regional activities. It appreciated the efforts made by the vice-president of CHy and the Secretariat in producing a CD-ROM version of the Handbook and agreed that once it has been tested at the national level, and the feedback from NHSs taken into account, it should become a Hydrological Operational Multipurpose System (HOMS) component. The Association also noted that the Action Plan included in the Report of the Conference on Water Resources Assessment and Management Strategies in Latin America and the Caribbean had been considered by its WGH and that it continued to provide valuable guidance for the Region.

8.10 The Association reviewed in particular WMO's cooperation with UNESCO on freshwater issues. It noted that this was based on an inter-secretariat agreement established in 1972 and focussed 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 representative of UNESCO informed the session on seven projects that were being developed in the Region within the framework of UNESCO's International Hydrological Programme including FRIEND-AMIGO. The Association was pleased to learn that cooperation with UNESCO at regional level had substantially improved in the recent past.

8.11 The Association noted that the 5th edition of the *Guide to Hydrological Practices* (WMO-No. 168) was

available on a CD-ROM in four languages and that the first draft of the 6th edition was being prepared.

8.12 The Association noted that, the process of updating the HOMS Reference Manual had advanced according to the Implementation Plan approved in September 1999. The Association was informed that five training workshops had been held in three African countries, using professionals trained in the use of Canadian HOMS components.

8.13 With respect to the development of the Caribbean Hydrological Cycle Observing System (CARIB-HYCOS), the Association took note of the activities carried out by the WGH. The session was also informed that a detailed project document for the CARIB-HYCOS Island Component, had been prepared and had been discussed among representatives of all concerned countries during a workshop held in Fort de France, Martinique, from 13 to 6 December 2004, with support from the Institut de Recherche pour le Développement (IRD) of France.

8.14 The Association was pleased to learn that RA IV WGH, in cooperation with RA III WGH, had organized a Workshop on Flood Forecasting and Hydrological Warning Systems in Bogota, Colombia, from 3 to 7 December 2001. The Workshop was attended by an associate expert of the Commission for Hydrology and afforded the opportunity to promote the CHy project on short-term flood forecasting.

8.15 The Association was informed that WMO had launched a flood forecasting initiative based on the recommendations of a start-up expert meeting held in April 2003 in the WMO Secretariat. The principal objective of the initiative was to improve flood forecasting by making use of advanced weather forecasting products through enhanced cooperation between NMSs and NHSs. So far, two regional workshops had been held, one in Pretoria, South Africa, from 17 to 19 November 2003, and the other one for Ibero-American countries, in Valencia, Spain, from 29 March to 2 April 2004. Further regional workshops were being planned for other Regions.

8.16 The Association was also informed of the publication of a booklet on *Water and disasters—Be informed and be prepared* (WMO-No. 971) which was part of the public awareness campaign for World Water Day 2004. In this same context, the January 2004 issue of the WMO *Bulletin* (Vol. 53, No. 1) was dedicated to the theme *Water and Disasters*.

8.17 The Association noted the progress made in the development of the Global Terrestrial Network – Hydrology (GTN-H) as a 'network of networks' of global data centres and information providers for hydrological and relevant meteorological data and information.

8.18 The Association was pleased to learn that since its last session, two regular WMO courses in the field of hydrology and water resources hosted in the Region were organized, namely the WMO/NOAA Course on Hydrological Forecasting and the Latin-American Postgraduate Course on Hydrology. It also noted that the Latin-American course was being held for the first time as a distance-learning course. The Association was pleased to learn that in cooperation with the National Weather Service of the United States, WMO was organizing an International Workshop on Flash Floods Forecasting. This workshop would be attended by participants from the six WMO regions and would take place in San José, Costa Rica, from 19 to 23 September 2005.

8.19 The session noted that the WMO's RMTC located at the Costa Rica University had informed the WMO Secretariat of a new Master's degree programme in Applied Hydrology, which was being developed jointly with Oslo University. Information on the modalities of the course was also provided. The first group of 10 participants was being selected for the course scheduled for August 2005. It was mentioned that there were no fellowships for the participants but it was expected that in future the Norwegian Agency for Development (NORAD) would support the programme. The Association was informed that the twelfth session of the Commission of Hydrology had recommended that the WMO Strategy on Education and Training in Hydrology and Water Resources should be adopted and that the RMTC Costa Rica should consider the strategy.

8.20 The Association was pleased to learn that the *Guidelines for the Education and Training of Personnel In Meteorology and Operational Hydrology*, *Volume II: Hydrology* (WMO-No. 258) had been prepared by the Editorial Task Force – Hydrology, and covered the field of integrated water resources management. The volume had been prepared with contributions from the hydrological services from various regions, whilst CHy, UNESCO and external experts had carried out two reviews, the first by CHy and UNESCO, and the second by the two external reviewers. The English version of this volume had been sent to all Members during the first half of 2004.

8.21 The Association was informed on WMO's participation at the 3rd World Water Forum (WWF3) and on the Ministerial Conference on the occasion of the WWF3 that had been held in Kyoto, Osaka and Shiga, Japan, from 16 to 23 March 2003. It was pleased to learn that WMO had convened a joint session on 'Integrated Flood Management: IFM' along with the session on 'People, Floods and Vulnerability Reduction'. WMO also convened sessions on 'Climate Change and Variability impact on Water Resources in Africa' during the Regional Day for Africa, and on Water and Information in Osaka.

8.22 The Association noted with interest the implementation of the Associated Programme on Flood Management (APFM), funded by Japan and the Netherlands, which was of special significance to WMO and Member countries. This initiative was a joint project being undertaken by WMO and the Global Water Partnership (GWP). In the framework of this project, a Concept Paper on Integrated Flood Management had been developed, printed in several languages and circulated. Major activities of the APFM aimed at the preparation and publication of advisory material; the

collection of approximately 20 case studies and extraction of good practices; the implementation of regional pilot projects; and the dissemination of knowledge at various conferences, exhibitions and other related forums.

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

GENERAL

9.1 The Association examined the information on the implementation of the ETRP in the Region since its last session. In noting with appreciation the progress achieved and the assistance provided to Members in developing their trained manpower resources, the Association stressed that education and training activities were fundamental to the success of all WMO Programmes.

9.2 The Association was pleased to note Chapter 6.6 of the Sixth WMO Long-term Plan (2004-2011) as adopted by Fourteenth Congress and urged Members to ensure that all necessary actions were taken to meet the objectives of the Plan.

HUMAN RESOURCES DEVELOPMENT

9.3 The Association reaffirmed the importance of the human resources development programme in assisting the Secretariat and NMHSs, particularly in developing countries, to plan and mobilize the financial and other resources to meet Members training needs. In that respect, the Association noted that 48 per cent of its Members had responded to the survey questionnaire and that the results of the 2002 survey of Members' training requirements for the fourteenth financial period (2004-2007) had been published as WMO/TD-No. 1154.

9.4 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 felt that there was a need for more cooperation and coordination on education and training activities in the Region in order to better meet the expressed requirements and to effectively use available capabilities. The Association agreed that priority should be concentrated on capacity-building and the application of new technologies in performing the required services and activities. The Association agreed that an active participation of Members in the next survey of training requirements, planned for 2006, would allow a proper assessment of regional training needs and would be a basis for improvements in the ETRP.

9.5 The Association noted with concern that the ratio of professional to technicians in meteorology and hydrology in RA IV was the lowest among the Regions, and recognized the need for the NMHSs in RA IV to train/employ professional meteorologists and hydrologists in order to maintain the required standard and to contribute to capacity-building.

TRAINING ACTIVITIES

9.6 The Association noted that since its last session, WMO had organized more than 26 training events in the Region. The Members had also had the opportunity to benefit from other training events organized and hosted by national or international institutions, with WMO co-sponsorship or providing partial financial support.

9.7 In that regard, the Association expressed its appreciation to the United States for the organization of training courses, which were specially designed for senior managerial personnel in NMHSs of the Region and for the provision of fellowships for the participants to attend those courses. The Association also expressed its appreciation to the NMC of Spain for its continuous support in providing long-term fellowships in meteorology and short-term on the job-training courses.

9.8 The Association noted that the ninth WMO Symposium on Education and Training on New Perspectives of Education and Training in Meteorology and Hydrology, had been successfully held in Madrid, Spain, from 21 to 25 April 2003. 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 staff skills and knowledge through continuing education and training taking into consideration new developments to address the challenges of the twenty-first century.

9.9 The Association further noted that 20 participants from RA IV had attended the WMO Regional Training Seminar for National Instructors of RA III and RA IV held in Buenos Aires, Argentina, from 17 to 28 May 2004.

9.10 The Association expressed its gratitude to those of its Members, as well as to Members from other Regions, that 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 continue to participate actively in the provision of training services to Members 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.

9.11 The Association noted with appreciation the activities of the Standing Conference of Heads of Training Institutions of National Meteorological Services (SCHOTI), particularly the support and assistance that its Coordinating Committee (CO-COM) had provided and could continue to provide to WMO RMTCs.

9.12 The Association noted the information on the activities of the Training Library and the use made of its services by the Members. It 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 and requested that those activities should be encouraged and continued.

REGIONAL METEOROLOGICAL TRAINING CENTERS (RMTCS)

9.13 The Association noted with appreciation that WMO RMTCs in RA IV had continued to carry out

satisfactorily their basic training programmes and to organize specialized courses in response to the needs of Members in the Region as well as other Regions. In urging its Members to make the maximum use of the training programmes offered by the RTMCs, the Association agreed with the need stressed by Fourteenth Congress for more emphasis to be placed by RMTCs on meeting regional training requirements for specialized courses in various areas. In this connection, Members were requested to assist RMTCs in organizing courses, through the provision of instructors for short-term assignments and relevant training materials, as well as other sorts of assistance under bilateral or multilateral arrangements.

9.14 The Association noted that COMET/Unidata (United States) funding for the MeteoForum Project had come to an end in December 2004. It highly appreciated the assistance provided by the United States to WMO RMTCs hosted in the Region. It also noted the resulting improvement in the capabilities of these RMTCs as well as the current efforts made by some countries to translate relevant training materials into Spanish, and requested that such efforts should continue. The Association felt that assistance from developed countries was still needed to help RMTCs in the Region to function as required even though RMTCs should make all necessary efforts to ensure the sustainability of the MeteoForum Project.

9.15 In order to optimize available resources for education and training, the Association requested the Secretary-General to provide all necessary support in the application of the modern techniques like computer assisted learning (CAL), e-learning and on-line learning. In particular, support was needed for the programmes, which were being developed using e-learning for the Master's degree programmes in Hydrology and Meteorology. The Association was also informed on the new M.Sc. Programme in Hydrology starting at the RMTC in Costa Rica in August 2005.

9.16 The Association was pleased to note that a meeting of Directors/Principals of WMO RMTCs had been held in Madrid, Spain, on 26 April 2003, immediately following the WMO Symposium on Education and Training (21–26 April 2003). The Association encouraged Members to strengthen the interaction among RMTCs and with other training and educational centers, particularly from advanced countries, to their mutual benefit.

New WMO classification of meteorological and hydrological personnel

9.17 The Association noted with appreciation that a new edition of the *Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology*, (WMO-No. 258) Volume I: Meteorology with its supplement, and Volume II: Hydrology, had been published and distributed to all Members for gradual implementation of the new classification. It also noted that the translation of the Volume I Meteorology into Russian, French and Spanish had been completed and distributed.

Education and training fellowships

9.18 The Association recognized the need for long-term fellowships for training at university level. In particular they were needed in order to train personnel to replace the older senior staff at most of the NMHSs and to increment the ratio of professionals to technicians in meteorology and hydrology in RA IV as referred to in paragraph 9.5.

Rapporteur on Education and Training

9.19 In view of continued pressing needs by Members for capacity-building and human resources development in meteorology, hydrology 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 in-depth study of regional training needs and opportunities. The Association, accordingly, adopted Resolution 14 (XIV-RA IV).

9.20 The Association expressed its appreciation to the Rapporteur on Education and Training Matters, Mr W. Fernandez (Costa Rica), for his excellent report, which complied with the WMO global survey 2002 that had been published in April 2003 as WMO/TD-No. 1154. It noted that only 48 per cent of Members had responded to the related WMO questionnaire. The Association urged Members to ensure that they replied to future questionnaires in order to better assess Members' training needs from a regional perspective.

9.21 The Association noted that many NMHSs in the Region planned to increase the number of their specialized personnel in meteorology and operational hydrology at professional and technician levels.

9.22 The Association also noted that RMTCs within the Region had introduced specialized training courses, including satellite meteorology, NWP, climate change, and hydrology, and that the president of RA IV had been coordinating consultation and research on the development of an e-learning programme for a two-year Master's degree for NMHSs in the Region.

9.23 The Association noted with appreciation that a technology-intensive approach to education and training was being applied in the Region. It observed that the MeteoForum project played a very important role in that regard and also enhanced the collaboration between RMTCs, universities and NMHSs within the Region. The Association therefore thanked the United States - COMET and Unidata - for championing this approach through the provision of, and support for, the use of real-time data and multimedia modules for the training of personnel in operational meteorology. It requested Members and the Secretary-General to continue their efforts to assist in the implementation of such projects.

9.24 The Association recognized that the interaction/collaboration between RMTCs and NHMSs in the Region should be improved and expanded and requested developed country Members to provide the necessary support as appropriate. In that regard, it noted that an effective mechanism for continuing education and training for NMHSs staff could be their visit to RMTCs to

carry out specific studies and research. Furthermore, the RMTC staff members could be invited to give lectures on specific topics and recent advances in meteorology to operational personnel at the NMHSs.

9.25 The Association noted the need to speed up the implementation of the new WMO classification of personnel in meteorology and hydrology and to update the curricula for training personnel in line with the *Guidelines for the education and training of personnel in meteorology and operational hydrology* (WMO-No. 258).

9.26 The Association noted the need to train instructors from national training institutions and RMTCs to post graduate degree and Ph.D. level. It therefore called on WMO to contemplate awarding long-term fellowships for such training.

10. TECHNICAL COOPERATION PROGRAMME AND REGIONAL AND SUBREGIONAL OFFICES ACTIVITIES (agenda item 10)

10.1 TECHNICAL COOPERATION ACTIVITIES (agenda item 10.1)

10.1.1 The Association expressed satisfaction that a number of measures had been undertaken by the Secretary-General to effect structural and organizational changes in the Secretariat, especially with respect to Regional and Subregional Offices and the Technical Cooperation Department with a view to improving delivery of services to Members and enhancing partnerships with national and regional institutions and organizations. In that regard, a new Department known as Regional Technical Cooperation Activities for Development Department (RCD) had been established to ensure the smooth and efficient implementation of activities within the framework of the Regional Programme and the Technical Cooperation Programme. The new structure was being implemented in a phased manner. It requested the Secretary-General to continue his efforts to meet Members' requirements by strengthening regional and technical cooperation activities in the Region.

10.1.2 The Association noted that WMO had continued the promotion of technical co-operation activities in 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 a unique experience and advantages. Several innovative approaches for the mobilization of resources for the Programme had 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 United Nations agencies.

10.1.3 The Association recognized the importance of the establishment of strategic partnerships and alliances with NMHSs of donor countries, funding institutions, the United Nations system and regional and international organizations, as well as with the private sector, as a strategy for obtaining extrabudgetary resources for technical cooperation activities. The Association further recognized the need to strengthen the communication between WMO and NMHSs to develop join initiatives for sharing resources and avoiding duplication of efforts. The Association recommended coordinating international assistance to recipient NMHSs from multilateral and bilateral funding agencies and assisting them in the preparation and negotiation of project proposals.

10.1.4 The Association recognized the effort being made by WMO to reactivate partnerships with United Nations agencies and other relevant organizations, participate in the formulation and implementation of relevant meteorological, hydrological and environmental aspects of projects and programmes, and ensure international standards and guidelines. In this respect, the Association recommended paying special attention to the contribution and participation of WMO in the implementation of the Johannesburg Plan of Action of the World Summit on Sustainable Development (WSSD), the United Nations Millennium Declaration and the GEO.

10.1.5 The Association noted with satisfaction that the Secretariat had made efforts towards mobilizing further resources in support of the programme. In particular, WMO had concluded a Memorandum of Understanding with the European Commission in December 2003, to foster collaboration in the areas of natural disaster prevention and mitigation, climate change, water resources management, protection of the environment and others. The Association encouraged the enhancement of this type of agreement.

10.1.6 The Association was informed on the Executive Council Advisory Group of Experts on Technical Cooperation that had held sessions in 2002 and 2004, and the recommendations and actions that had led, among other things, to the establishment of a mechanism in WMO for effective coordination and promotion of the Secretariat's efforts to mobilize resources; organize an international symposium on technical cooperation to promote WMO's areas of competence and contributions to the economic and social sectors; and to support the proposed programme for least developed countries for the period 2004–2005 and the related project briefs.

10.1.7 The Association took note that WMO had continued with the implementation of the Memoranda of Understanding with the World Bank and with the Inter-American Development Bank to develop joint initiatives and projects in the areas of natural disaster prevention and mitigation, climate change, water resources management and others.

10.1.8 The Association welcomed WMO's continued efforts to assist the NMHSs and governments through coordinated efforts from the Secretariat, especially the Technical Cooperation Department and the Regional Office for the Americas in Paraguay and the Subregional Office in Costa Rica, in the mobilization of resources for the development of meteorological and hydrological services in support of the economic and social sectors.

The Association also noted that several Members had received assistance in the development of new projects in support of national and regional meteorological and hydrological projects.

Assistance provided during the period 2001-2004

10.1.9 The Association expressed its satisfaction with the results obtained in the implementation of technical cooperation projects in RA IV that were provding assistance to NMHSs in countries of the Region. During the period 2001-2004, WMO had continued developing initiatives and projects responding to the national and regional requirements of NMHSs in RA IV countries, in particular, in Central America and the Caribbean region. The Radar Networking System project supported by the European Union was being implemented and would benefit the Caribbean region by providing early warnings on hurricanes and severe weather.

10.1.10 The Association was informed that the WMO/IDB Study on the Prediction and Amelioration of Socioeconomic Impacts of El Niño/Southern Oscillation (ENSO) in Latin America and the Caribbean had been concluded in 2003 and the final report distributed to 26 participating countries and regional organizations such as the Central American Integration System (SICA), CRRH, CEPREDENAC, CMO, CDERA, and others. The report was also submitted to the IDB and NOAA/OGP, the International Research Institute for Climate Prediction (IRI), and the International Food Policy Research Institute (IFPRI), agencies that had supported and helped in the implementation of the Study. One of the products of the WMO/IDB ENSO Study was the preparation of project proposals for regions/countries interested in the implementation of such systems. Therefore, projects on Climate Information Systems for Decision Making in Socioeconomic Sectors Affected by ENSO and other Climate Extremes had also been completed in Central America, Colombia and Mexico.

10.1.11 The Association recognized the success of the regional project Preparedness to Climate Variability and Global Change in Small Island Developing States, Caribbean Region (SIDS-Caribbean Project) funded by the Government of Finland. The project had been completed in 2004 with the implementation of all major components. The Project benefited CMO countries, the Dominican Republic, Haiti and Cuba. The main achievements included the upgrading of the ISCS workstations for meteorological telecommunications. Twenty-nine automatic weather stations had been installed and were operational in 12 countries. Conventional meteorological equipment had also been installed in 11 recipient countries. Seventeen students had completed the Basic Instruction Package for Meteorological Technicians (BIP-MT) course for operational forecasters at CIMH and the University of Costa Rica. A total of 57 people had received training in various short-term training courses organized under the SIDS Project, which had covered various technical areas. Database management systems and web-pages had been developed and installed at all NMS participating in the project.

10.1.12 The Association noted that from 2001 to 2004, WMO had continued providing support to the implementation of the Programme for the Modernization of Water Resources Management in Mexico (PROMMA) funded by the World Bank. The participation of WMO in PROMMA had contributed to the modernization of water resources management and observing networks, the education and training of professional staff, the upgrading of telecommunications systems, and to the institutional development of the National Water Commission (CNA), in particular in meteorology and operational hydrology. Through the project, WMO had facilitated the transfer from other countries to Mexico of technology and successful experiences in meteorology, operational hydrology, and water resources management. WMO's key role in contributing to the successful implementation of PROMMA had been recognized both by the World Bank and CNA. At the end of 2004, 223 technical reports resulting from the project had been prepared and distributed to all CNA areas in Mexico.

10.1.13 The Association recognized the effort made by WMO to assist the National Meteorological Office (ONAMET) of the Dominican Republic in the rehabilitation and recovery of the meteorological infrastructure damaged by the Hurricane *Georges* in 1998. The assistance, which had been provided from 2001 to 2004 within the framework of a World Bank-funded project, had facilitated the implementation of a National Early Warning System at ONAMET to protect the population of the Dominican Republic against hurricanes and severe weather events.

Assistance to NMHS

10.1.14 The Association expressed its satisfaction for the support that WMO had provided to NMHS from 2001 to 2004, which included assistance in emergency situations, the development of projects and development plans for the improvement of hydrometeorological observing networks and telecommunications, and the delivery of better services and information to the community.

10.1.15 The Association expressed satisfaction for WMO's rapid response in providing assistance to Haiti and the Dominican Republic following the floods that had affected both countries in May 2004. A WMO mission had been organized in early June to identify the requirements. Another mission to Haiti with the participation of UNDP, IDB, Météo-France and WMO had also been carried out in January 2005 to prepare a project proposal for the development and establishment of an Early Warning System to prevent floods in Haiti, which would be funded by the IDB.

Voluntary Cooperation Programme (VCP)

10.1.16 The Association reaffirmed the important role of the VCP in the Region. Most of the developing country Members in RA IV had received assistance from the WMO VCP aimed at facilitating their effective participation in the WWW and other scientific and technical WMO Programmes. It noted with appreciation that

17 Members had received support for a total of 34 VCP projects for equipment during 2001-2004. Of these projects, 16 had been completed and 18 were in the process of being implemented. Eleven projects were aimed at strengthening upper-air observing stations, two at strengthening surface observing stations, one for data processing systems, 11 related to aeronautical meteorology activities, eight to hydrological activities and one to climatological activities. Among others, the Association noted with gratitude the successful completion of a coordinated project supported by the United States for the replacement of the WAFS RA IV RMTN workstations in 10 Members in Central America for the upgraded International Satellite Communication System (ISCS). In spite of support obtained during 2001-2004, seven valid projects had not received support as of 31 December 2004.

10.1.17 During the same period, 42 fellowships had been implemented under the WMO VCP. Forty fellows had completed their training while two fellows had continued their studies into 2004.

10.1.18 The Association was also informed that the fifth session of the Executive Council Advisory Group of Experts on Technical Cooperation held in March 2004 had made recommendations to the fifty-sixth session of the Executive Council on VCP coordinated programmes, allocations of the VCP Fund, and measures to improve the formulation, monitoring and evaluation processes of VCP projects. The members of the Association were encouraged to utilize the new forms when submitting VCP requests and evaluation.

10.2 Regional and Subregional Office activities (agenda item 10.2)

10.2.1 The Association reviewed the activities of the Regional Office for the Americas and the Subregional Office for North America, Central America and the Caribbean since the thirteenth session. It noted that they were continuing to fulfil their functions and responsibilities as an integral part of the Secretariat. It also noted that the Regional Office was providing effective support to the president and the vice-president and to the four working groups and rapporteurs of the Association. Mention was also made of the effective work being carried out by the Subregional Office in support of RA IV Members. The Association expressed its appreciation to the Secretary-General and the staff of the Regional and Subregional Offices for their continued support to the RA IV activities during the intersessional period.

10.2.2 The Association noted with satisfaction the increasing role of the Regional and Subregional 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 in the areas of science and technology, capacity-building, climate variability and change, water resources management and disaster mitigation, as well as other environmental issues that had been identified by the Members.

10.2.3 The Association highlighted the important contribution and support of the United States to NMHSs in RA IV, in particular, to the development of the project on Satellite Meteorological Applications for Central American countries, the replacement of RMTN workstations in ten NMHS in RA IV, the Regional Maintenance Centre in Curaçao to carry out maintenance and development of the existing observing networks, as well as to the training events in the RA IV.

10.2.4 The Association expressed satisfaction for the results of the meetings of Directors of NMHS of Ibero-American countries organized in La Antigua, Guatemala, from 19 to 21 November 2003, and in Cartagena de Indias, Colombia, from 7 to 9 July 2004. It also expressed satisfaction for the Declaration establishing a programme of cooperation in meteorology and hydrology between NMHS of Ibero-American countries. It urged WMO to continue its efforts along with the National Metrological Institute of Spain to ensure that this programme was endorsed and supported by the next summit of Heads of State to be held in Salamanca, Spain, in October 2005.

10.2.5 The Association expressed its satisfaction at the commendable efforts made by staff of the Regional and the Subregional Offices 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.

10.2.6 The Association welcomed the work done by the Regional and the Subregional Offices in support of NMHSs affected by the severe drought in Central American countries and by hurricane *Michelle* in the first semester of 2001. It is also expressed similar satisfaction for the action taken on behalf of Haiti and the Dominican Republic following floods that had affected both countries and for the continuing contact with the Members affected by the passage of Hurricanes *Charlie*, *Frances*, *Ivan* and *Jeanne* in 2004. It invited the Offices to continue working with regional intergovernmental organizations and to use those forums to promote meteorology and operational hydrology and environmental issues and raise policy-makers' awareness of the role of the NMHSs and WMO in contributing to sustainable development.

10.2.7 The Association noted that the biannual *Bulletin* of the Regional Office for the Americas 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 continue publishing the *Bulletin* and urged Members to participate actively by contributing news items and articles. The Association acknowledged the efforts made to improve the *Bulletin's* presentation in order to make it more attractive and easier to read.

10.2.8 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. The Fourth Joint Technical Conference for RA III and IV had been held in Panama City, Panama, from 13 to 15 January 2003, with the central theme Meteorology and Hydrology in the Americas-Partnership for Prosperity and Sustainable Development. The Regional Seminar for the Association had been held in Mexico DF, Mexico, from 4 to 5 April 2003, with the central theme Regional Seminar on Marketing for the RA IV NMHSs.

10.2.9 In connection with the Subregional Office for Northern and Central America and the Caribbean, the Association expressed its thanks to the Secretary-General for having ensured that the Subregional Office's activities had made an effective contribution to supporting the work of the Region's NMHSs.

10.2.10 The Association acknowledged the measures being undertaken by the Secretary-General to optimise the operation of the Regional Office. It requested the Secretary-General to continue his efforts to strengthen the Regional Office to meet the needs of Members in the Regions.

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

10.3 PROPOSED FUTURE ACTIVITIES (agenda item 10.3)

10.3.1 The Association requested the Secretary-General to continue his efforts to strengthen regional and technical cooperation activities in a proactive way to meet the requirements of Members in the Region by establishing priorities for the next four years. Specific priorities requested by the Association included:

(*a*) Development of a project to support the operation and maintenance of observing networks and systems of NMHSs in Central America and the Caribbean;

(*b*) Formulation of a multi-hazard early warning system for the Region for the prevention of the effects of natural disasters produced by hurricanes, tsunamis, floods, landslides, droughts and others of hydrometeorological origin;

(*c*) Assistance to NMHS in developing strategies and management systems on cost recovery of meteorological products, and in establishing alliances with clients aimed at obtaining additional resources to help the sustainability of projects funded initially through international assistance;

(*d*) Assistance to NMHS to identify their needs and integrate these under the national plans of countries concerned and also to ensure that these requirements were reflected in the Long-Term Strategic Plan for the Enhancement of NMHS in North America, Central America and the Caribbean, to be formulated by the Management Group for RA IV;

(*e*) Continued improvment of the formulation, implementation, monitoring and evaluation processes of VCP projects in order to make this mechanism of assistance to NMHS of developing countries of RA IV more efficient;

(*f*) Continued mobilization of resources for formulated projects, or for those under formulation, such as the Early Warning System to reduce the impact of flooding in Haiti and the Dominican Republic; the full reconstruction of the NMHS in Haiti; the modernization of meteorological and hydrological services in Panama; the SICLICA project for Central America; and the CARIB-HYCOS project (see agenda Item 8 for more information on the status of the CARIB-Hycos project);

(*g*) Finalization of the remaining activities of the SIDS-Caribbean project and support to the implementation of the second phase of such a project funded by the Government of Finland;

(*h*) Continued development of stronger partnerships with NMHSs for the development and implementation of joint projects and programmes, and for resource mobilization from bilateral and multilateral agencies, with emphasis on the desired outcomes, the meeting of societal needs, and the provision of relevant products, services and applications;

(*i*) Enhanced efforts for the approval and implementation of the programme of cooperation on meteorology and hydrology for NMHS of the Iberoamerican countries, being promoted by the NMS of Spain with the collaboration of WMO, which would benefit 11 NMHSs in RA IV.

10.3.2 The Association requested the Secretary-General to make extra efforts to assist the NMHS of Haiti to make the necessary arrangements to ensure communication with, and attendance of, representatives in future regional meetings. Furthermore, considering that Haiti was the only LDC in the American Continent, the Association strongly recommended that all efforts be made to improve the current situation. In this context, Météo-France expressed interest in continuing to support Haiti.

10.4 FOLLOW-UP TO THE INTERNATIONAL MEETING ON SIDS (agenda item 10.4)

10.4.1 The Association noted with appreciation that the Organization had been actively involved in the preparatory process and had participated in the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States (SIDS) (Port Louis, Mauritius, 10–14 January 2005). It welcomed the participation of a few NMS Directors from the Region as part of their national delegations to the Meeting. In this context, there was wide recognition for the contributions of WMO and the NMHSs in most of the 14 priority areas identified as being essential for the sustainable development of SIDS. The Association invited the Members to actively participate in relevant

follow-up events so as to enhance the contribution of WMO as well as NMHSs to the sustainable development of SIDS. The Association expressed its appreciation to the Secretary-General for the wide range of public information activities in support of NMHSs.

10.4.2 The Association was pleased to note that the meeting had adopted the Mauritius Declaration and the Mauritius Strategy for the further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. The Association urged the Members in the Region to actively participate in, and contribute to, the implementation of the Mauritius Strategy at national and regional levels. The Mauritius Strategy addressed a wide range of issues related to climate change and sea-level rise; natural and environmental disasters; management of wastes; coastal and marine resources; freshwater resources; land resources; energy resources; tourism resources; biodiversity resources; transport and communication; science and technology; graduation from least-developed country status; trade; globalization and trade liberalization; sustainable capacity-development and education for sustainable development; sustainable production and consumption; national and regional enabling environments; health; knowledge management and information for decision-making; and culture, all of which were related to the mandate of the Organization and NMHSs, especially those in SIDS.

10.4.3 The Mauritius Declaration adopted by the Meeting had reaffirmed the Barbados Programme of Action as the blue print for the implementation of the Mauritius Strategy. The Meeting expressed concern with the growth in SIDS' vulnerability, reaffirmed its commitment to supporting SIDS, and called for the establishment of a natural disaster early warning system. The Declaration also called for enhanced international cooperation and partnership, technology development and transfer, and capacity-building and expressed appreciation to the United Nations and its specialized agencies for their contributions in support of SIDS.

10.4.4 The Association welcomed the initiative of the Secretary-General to develop an Action Plan aimed at assisting the NMHSs in the implementation of the Strategy. This would include the development of relevant partnerships with the United Nations system organizations, and with relevant regional and international organizations in areas of concern to the NMHSs. The Plan would take into account WMO's Programmes and activities, the cross-cutting strategies being developed in relation to disaster mitigation, climate, water, the Global Earth Observation System of Systems and other relevant regional and global initiatives such as the Millennium Development Goals and the World Summit on Sustainable Development. Members would be invited to assist in the development and implementation of the Action Plan so that tangible results would be achieved in support of the sustainable development objectives of SIDS.

11. Natural Disaster Prevention and Mitigation Programme — regional aspects (agenda item 11)

11.1 The Association recalled Resolution 29 (Cg-XIV) — Natural Disaster Prevention and Mitigation Programme (DPM). It noted that the Secretary-General had taken measures for the development and implementation of the new programme and had established a Steering Committee on Disaster Reduction in March 2004.

11.2 The Association noted that the fifty-sixth session of the Executive Council had approved the implementation plan of the DPM and the priorities proposed and that some actions at regional level were under consideration, namely, the activities of the Regional Expert Group on Natural Disaster Prevention and Mitigation.

11.3 The Association noted the focal points on natural disaster prevention and mitigation that had been nominated by the Permanent Representatives from Region IV and invited those that had not yet nominated their national focal points to do so, as soon as possible. The Association urged the national focal points to network at subregional level according to their different requirements and interests, and stressed the need for effective collaboration between the network of focal points and the Working Group on Natural Disaster Prevention and Mitigation. The Association also stressed the role of the focal points in promoting at national level the adoption of adequate measures for natural disaster prevention and mitigation, and the importance of ensuring effective means of exchanging information.

11.4 The Association noted Resolution 5 (EC-LVI) — Advisory Group on Natural Disaster Prevention and Mitigation, which was established as an effective framework for the coordination of natural disaster risk reduction matters and a continuous mechanism to review and advise on those matters on a regular basis.

11.5 The Association noted the WMO's Secretariat activities for the preparation and participation in the World Conference on Disaster Reduction (WCDR) which was held in Kobe-Hyogo, Japan, from 18 to 22 January 2005, and recognized their contribution to the success of the Conference. The Association also noted that a number of materials had been produced including a pamphlet, a brochure, and media information material on WMO activities on disaster prevention and mitigation. The Association recognized that WMO's role as a leading international organization dealing with natural disaster reduction had been enhanced at the Conference and the activities of various WMO Programmes had been promoted, namely, the new DPM Programme. The recognition of the contribution of NMHSs in natural disaster mitigation and management at national and regional levels by decision makers, international organizations and development partners, had also been enhanced.

11.6 The Association noted the document arising out of the Conference, namely, the Hyogo Declaration and the Hyogo Framework for Action 2005-2015 (HFA). The Association acknowledged the high priority actions

related to identification and assessment, the monitoring of disaster risks, and to the enhancement of early warning of weather, climate and water-related disasters. The Association urged its Members to participate actively in the preparation of their national plans for the implementation of the outcomes of the Conference at regional and national levels.

11.7 The Association noted the development of the DPM's web page in collaboration with Hong Kong, China, and urged Members to provide support to the initiative. The Association recognized the importance of the web page in enhancing WMO's visibility in the area of natural disaster prevention and mitigation. The Association urged its Members to provide relevant information on their activities to the Secretariat to be included in the web page in order to ensure that it would become a reference page for the natural disaster risk management community.

11.8 The Association was informed of the activities of the Emergency and Disaster Response Group (EDRG) within the WMO Secretariat and noted the active involvement of the Regional and Subregional offices in the activities.

11.9 The Association adopted Resolution 15 (XIV-RA IV), which established a Working Group on Natural Disaster Prevention and Mitigation (see also agenda item 4.5). The Association requested the Secretary-General to take the necessary measures, within the available budgetary resources, to support the activities of the working group.

11.10 The Association noted the activities being developed by DPM and urged the Region IV Working Group on Natural Disaster Prevention and Mitigation, in consultation with the president of Regional Association IV and the WMO Secretariat, to take adequate action in the preparation of a regional plan to support the implementation of the DPM in the Region.

Tsunami Early Warning System (EWS)

11.11 The Association expressed its appreciation for the lectures on the topic of tsunamis and related issues, which were presented by:

(*a*) Dr P. Whitmore, Director of NOAA's Alaska Tsunami Warning Centre on 'Tsunami Science and the Indian Ocean Tsunami';

(*b*) Gen D. L. Johnson, USAF (Ret.), NOAA Assistant Administrator for Weather Services on 'U.S. Tsunami Plans'; and

(*c*) Mr W. Stolz (Costa Rica), on behalf of Mr E. Arenas (El Salvador), on 'Tsunami in Central America – A Proposal for an Early Warning System'.

The lectures focused on scientific issues, statistics and historical data on tsunami occurrence, global and regional experiences and impacts, existing Tsunami EWS in the United States and Central America, and plans to address and expand such systems to the whole of RA IV area.

11.12 The Association endorsed, and expressed its support to, the initiatives that were being taken by the International Ocean Commission (UNESCO/IOC) and WMO in order to address the Tsunami EWS. In particular, the Association agreed on the importance of the WMO GTS for the dissemination of warnings for all hazards, including tsunamis. It recognized the importance of coordinating RA IV tsunami warning activities with the UNESCO/IOC (and IOCARIBE, the regional component of IOC), the internationally recognized lead for the development of a global Tsunami EWS. It also endorsed the internationally coordinated approach to embed a Tsunami EWS into a global multi-hazard early warning strategy, which was essential in ensuring the long-term sustainability of such a warning system in view of the relatively rare occurrence of tsunamis.

11.13 The Association requested the Secretary-General, in close collaboration with UNESCO/IOC and UN/ISDR, to assist its Members in dealing effectively with the Tsunami EWS by focusing on its main components (i.e. observation infrastructure and networks, coordinated tsunami warning centre or centres, the role of national and regional disaster management and mitigation authorities, and generation of awareness in the general public at national level).

12. WMO Space Programme — regional aspects (agenda item 12)

12.1 The Association was informed that Fourteenth Congress had established a new major cross-cutting Programme, the WMO Space Programme (WMOSP) in response to the expansion in the availability of satellite data, products and services, and in recognition of the increased responsibilities of WMO. The fifty-fourth session of the Executive Council had agreed to establish a WMO Space Programme as a matter of priority and had felt that the scope, goals and objectives of the new WMO Space Programme should respond to the growth in the utilization of environmental satellite data, products and services within the expanded space-based component of the GOS that now included appropriate R&D environmental satellite missions. Fourteenth Congress had also supported the WMOSP Long-term Strategy reviewed by the Consultative Meetings on High-level Policy on Satellite Matters and agreed that it provided an excellent balance to the 6LTP and the programme and budget for 2004-2007. Thus, Fourteenth Congress believed that it was important to establish the new WMOSP as a major cross-cutting programme and had adopted Resolution 5 (Cg-XIV) — WMO Space Programme.

12.2 The Association noted that Fourteenth Congress had agreed that the main thrust of the WMO Space Programme Long-term Strategy should be to make an increasing contribution to the development of the WWW GOS, as well as to the other WMO-supported Programmes and associated observing systems (such as the Atmospheric Research and Environment Programme (AREP), GAW, GCOS, WCRP, HWR, the World Hydrological Cycle Observing System (WHYCOS), and JCOMM's implementation of GOOS) by providing continuously improved data, products and services, from both operational and R&D satellites, and facilitating and

promoting their wider availability and meaningful utilization around the globe.

12.3 The Association also noted that the main elements of the WMO Space Programme Long-term Strategy had been agreed as follows:

(*a*) Increased involvement of space agencies contributing, or with the potential to contribute, to the space-based component of the GOS;
(*b*) Promotion of a wider awareness of the availability and utilization of data, products (and their importance at levels 1, 2, 3 or 4), and services, including those from R&D satellites;
(*c*) Considerably more attention to be paid to the crucial problems connected with the assimilation of R&D and new operational data streams in nowcasting, numerical weather prediction systems, reanalysis projects, monitoring climate change, chemical composition of the atmosphere, as well as the dominance of satellite data in some cases;
(*d*) Closer and more effective cooperation with relevant international bodies;
(*e*) Additional and continuing emphasis on education and training;
(*f*) Facilitation of the transition from research to operational systems;
(*g*) Improved integration of the space component of the various observing systems throughout WMO Programmes and WMO-supported Programmes;
(*h*) Increased cooperation amongst WMO Members to develop common basic tools for the utilization of research, development and operational remote sensing systems.

12.4 The Association also noted that Fourteenth Congress had considered the progress and results from the sessions of the Consultative Meetings on High-level Policy on Satellite Matters. Congress had recalled that it had agreed to build a new and closer partnership under the auspices of WMO between the NMHSs and environmental satellite communities. It had agreed that a mechanism for such discussions should be provided through the convening of Consultative Meetings on High-level Policy on Satellite Matters. Congress had welcomed the dialogue that had been established between WMO and the environmental satellite communities through the sessions of the Consultative Meetings that had matured rapidly to the great benefit of all and had urged that such Meetings should be continued and institutionalized. Thus, Congress had considered it appropriate to institutionalize the sessions as WMO Consultative Meetings on High-level Policy on Satellite Matters in order to establish more formally the dialogue and participation of environmental satellite agencies in WMO's activities. It had urged close cooperation with the IOC and other related international organizations to ensure a coordinated and integrated approach to space-based Earth observations.

12.5 Congress had unanimously agreed that the WMO user community should be represented at the highest level at the sessions and that the space agencies should also be equally well-represented. Future sessions of the Consultative Meetings on High-level Policy on Satellite Matters should be chaired by the President of WMO as had been the case for the first three sessions. The Consultative Meetings should continue to provide advice and guidance on policy-related matters and should maintain a high level overview of the WMO Space Programme. Congress had agreed that CBS should continue the lead role in full consultation with the other technical commissions for the new WMO Space Programme. Thus, Congress had adopted Resolution 6 (Cg-XIV) — WMO Consultative Meetings on High-level Policy on Satellite Matters.

WMO Space Programme Implementation Plan

12.6 The Association noted that the WMO Space Programme Implementation Plan for 2004-2007, as contained in Section 4 and Annex III to the Report of the Fourth Session of the WMO Consultative Meeting on High-level Policy on Satellite Matters (CM-4) (www.wmo.int/hinsman/publications/CM-4_Final_Report.doc) had been approved by the fifty-fourth session of the Executive Council and that the Implementation Plan provided further details to the WMO Space Programme Long-term Strategy as approved in the WMO 6LTP by Fourteenth Congress.

12.7 The Association agreed that it would assign a rapporteur to work in the context of the WMO Space Programme for the implementation of regional aspects of the WMO Space Programme Implementation Plan and, in particular, regional Advanced Dissemination Methods (ADM) within the context of the planned Integrated Global Data Dissemination Service (IGDDS). In that regard, it appointed a Rapporteur for the WMO Space Programme with terms of reference as contained in Resolution 16 (XIV-RA IV).

12.8 The Association agreed that WMO had acted as a catalyst to greatly improve the utilization of satellite data and products. The Virtual Laboratory (VL) for Education and Training in Satellite Meteorology had already made a considerable impact throughout the Region through its Centre of Excellence co-sponsored by the NOAA/NESDIS at the RMTCs in San José, Costa Rica, and Bridgetown, Barbados. The Association was pleased to see the integration of the new R&D constellation into education and training activities. It also noted that the WMO Space Programme Long-term Strategy and associated Implementation Plan provided for increased utilization of the VL to the benefit of WMO Members especially for fuller exploitation of R&D data, products and services, as well as those from new and existing operational meteorological satellite systems.

13. Information and Public Affairs (IPA) Programme — regional aspects (agenda item 13)

13.1 The Association recalled that Resolution 23 (Cg-XIV) — Information and Public Affairs Programme, had underlined the need for greater visibility of the WMO and the NMHSs, the importance of communications in

mitigating the devastating impact of extreme weather and climate events, and the need for a WMO Global Communication Strategy to guide and enhance the process of making NMHSs and WMO more visible and better appreciated.

13.2 The Association welcomed the Global Communication Strategy of the Organization comprising five basic elements: projecting a unified and consolidated image of WMO and NMHSs; constituency-building both at national and regional levels; spreading 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 high relevance of WMO and NMHSs to the daily lives of all citizens of the world. In this context, the Association noted with appreciation the increased interaction between the WMO Information and Public Affairs Office and National IPA focal points, and Members' electronic access to the WMO quarterly press review. In that regard, the Association welcomed the initiative to consult Members on the WMO publications including the WMO *Bulletin*. In the light of the invitation by Congress to strengthen regional public outreach activities, the Association designated Mr M. Sanchez (Costa Rica) as its regional focal point to work for a short period with the IPA at WMO Headquarters in launching regionally targeted outreach activities. It also welcomed the invitation to United Nations Offices in the field for greater interaction with NMHSs.

13.3 In response to Resolution 23 (Cg-XIV), the Association invited its Members to ensure mutual assistance and support in matters related to public information and communication, including partnerships and constituency-building, and resource mobilization as well as closer cooperation with the media, non-governmental organizations and advocacy groups, academic circles, parliamentarians, schools, universities, national meteorological and hydrological societies, the private sector and corporate foundations, and other civil society institutions and public figures.

13.4 The Association recalled the request by Congress that the best possible use be made of available and extrabudgetary resources to strengthen the IPA Programme. It further noted with appreciation private sector sponsorship of WMO's greeting cards and NMHSs' electronic access to the cards, which enabled them to add their own logos.

13.5 With reference to the call by Congress for additional public awareness raising activities and products, the Association welcomed the development and dissemination of WMO greeting cards and a travel exhibition kit widely used at international and regional fairs and exhibitions. It expressed appreciation for WMO web site developments, such as the availability of a video library, the PowerPoint presentation on WMO Programmes and activities, the establishment of two news features: News from the Secretariat and the UN Conference, and News from Members, aimed at increasing international attention to NMHSs' press statements in response to the recommendation by Congress that the IPA Programme should serve as a clearinghouse for public information materials developed by NMHSs and the Secretariat. The Association called upon its Members to continue developing or establishing their web sites.

13.6 The Association recalled the need for IPA to take advantage of available technologies and welcomed the continued development of the News Centre on the WMO web site and the actions taken for establishing a linkage between WMO's web site and those of the NMHSs. The Association requested Members to take steps to set up on the front page of their web sites an entry on WMO identifying the Service as part of a world system and showing the public how the NMHSs work with WMO. The Association also welcomed the establishment of electronic access for NMHSs to artworks for major events such as World Water Day (WWD), World Meteorological Day (WMD), the Second World Conference on Disaster Reduction (WCDR-II), and the International Meeting for the Sustainable Development of Small Island Developing States (SIDS). It appreciated the availability of WMD films on DVD in addition to videotapes, and requested the Secretary-General to ensure that the videotapes and DVDs for this purpose were distributed regularly to Members. The Association commended the Secretary-General for the outstanding work and great improvements in the IPA Programme.

13.7 The Association welcomed WMO's outreach activities for radio and 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. In that context, it recognized the active involvement of WMO in the training event for television weather presenters from developing countries organized in connection with the First World Conference on Broadcast Meteorology held in Barcelona, Spain, on 3 June 2004, at the initiative of the International Association of Broadcast Meteorology (IABM), as well as in the Conference proper, which benefited from the support of the Barcelona Forum 2004. Such training enhanced the participants' skills in the effective presentation of accurate weather information on television. The Association saw great benefit in the Public Service Announcements aired by CNN International at the initiative of WMO to enhance visibility of the relevance of the activities of NMHSs. It also welcomed the fact that the films on 'Weather, Climate and Water in the Information Age', produced for WMD 2004, on 'Weather, Climate and Water and Sustainable Development' produced for WMD 2005 and SIDS, were available in the six official languages of the Organization, both on videotape and DVD. It noted that the Caribbean region featured in the WMO film produced on the occasion of the International Meeting for the Sustainable Development of SIDS

13.8 The Association noted with appreciation the comprehensive public information kit for World Water Day 2004 on the theme of 'Water and Disasters', developed and disseminated worldwide by WMO, which

jointly with ISDR, was the lead agency within the United Nations System for the global public information campaign about the Day. The attractive information folder contained a poster, a booklet and fact sheets. In addition, a message from the Secretary-General and press release were sent to all Members. A special web site (www.waterday2004.org) and e-mail address (waterday2004@wmo.int) had been set up by WMO. The Association welcomed the public information products produced and disseminated to all Members in support of national plans for the celebration of WMD 2004 on the theme of 'Weather, Climate and Water in the Information Age' and WMD 2005 on the theme of 'Weather, Climate and Water and Sustainable Development'. These included a message from the Secretary-General, a poster, a brochure and a film. It expressed its appreciation for the information kit produced by WMO for the SIDS Conference and the WCDR-II.

13.9 The Association took note of the numerous press releases and information notes issued on specific WMO topics and activities related to weather, climate and water.

13.10 The Association noted with appreciation that the activities of WMO and its Members were given visibility in the United Nations Pavilion at EXPO 2005 held in Japan in 2005 through films and information brochures.

13.11 The Association welcomed the progress made in the 'branding' of the Organization, as requested by Congress and the fact that the subtitle 'weather, climate and water' featured prominently on all official documentation, correspondence and publications as requested by Congress.

13.12 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 implement the WMO Global Communication Strategy in order to give a local voice to a global vision, and to make available to the Secretariat relevant material produced at national level.

13.13 The Association noted with satisfaction the efforts of the Subregional Office for North America, 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 Regional Office and the Subregional Office to further support the efforts of the Members of the Association in promoting public information activities.

14. Long-term Planning (LTP) — regional aspects (agenda item 14)

General considerations

14.1 The Association recalled the importance given to WMO long-term planning by Fourteenth Congress.

14.2 The Association agreed on the importance of identifying WMO's aspirations as a basis for the WMO LTP, particularly in connection with its leadership role. It also agreed on the use of the 6LTP framework (vision, desired outcomes, strategies and goals) as the basis for future LTPs. The Association further agreed that information on the issues that concerned Members would help in formulating an effective strategy on how to address them. As far as the Region was concerned, these included management of natural disasters, poverty alleviation and the sustainable use of natural resources.

14.3 The Association also agreed that cross-cutting activities such as the WMOSP and the DPM merited more in-depth consideration in the LTP process. In view of the increasing importance of cross-cutting issues, the WMO Programme structure might need to be modified in the future. This also related to developments on the further consolidation of WMO activities such as the IOS (including the GEOSS initiative) and the FWIS. In that regard, the Association considered that WMO should continue to play a leadership role in the GEOSS process and work towards involving NMHSs in its future implementation. The Association encouraged its Members to participate actively in this process.

14.4 The Association also recognized that it was necessary for WMO (and NMHSs) to further improve support to policy formulation and implementation in relation not only to natural disasters, climate, and water, but also to other sectors such as aviation, agriculture, health and planning. In addressing the essential, though difficult, challenge of how they could be more relevant to policy formulation and implementation in areas falling within their competences, the Association requested its Members to contribute to the development of programme activities that would demonstrate and propagate the involvement of NMHSs in those issues.

14.5 The Association agreed on the importance of ensuring better appreciation of the socio-economic value of the NMHSs products, including the need to measure the value of the impact of WMO's activities. It also underscored the need for WMO and NMHSs to undertake studies of the economic value of meteorological and related products as they could help to secure better recognition and more adequate resources for WMO and NMHSs (see also discussions under agenda item 15.2).

The long-term planning process

14.6 The Association reaffirmed that, with its refinements over the years, the WMO long-term planning process had served the Organization in good stead. The purposes and characteristics that had been identified for the process remained essentially valid. The WMO Long-term Plans were useful as they provided a framework for the development of corresponding plans at the national level, particularly for NMHSs. The Association acknowledged that the long-term plans could also further reflect the strategic objectives of the Region, as identified during the course of the Association's deliberations. It encouraged Members to actively participate and contribute to the LTP process as this would also enhance Members' sense of ownership and commitment to the realization of the LTPs.

14.7 The Association recognized the various changes relating to national, regional and global issues.

It agreed that consideration should be given to the significant opportunities ahead of WMO and major challenges to be met in dealing with them including those posed by globalization, the increasing wave of privatization, the rapid development in information technology, and environmental degradation.

Sixth WMO Long-term Plan (6LTP)

14.8 The Association noted the adoption of the 6LTP, covering the period 2004-2011, by Fourteenth Congress. It further noted that Regional Associations, among others, had been requested to adhere to the policies and strategies set forth in the Plan and to organize their activities in order to realize the WMO vision, desired outcomes, strategies and associated goals described in the Plan, as well as to achieve the overall and main long-term objectives associated with the WMO Programmes.

14.9 The Association expressed its appreciation for the publication of the 6LTP and for the separate summary for decision-makers, which had identified the results expected and how they would be realized. As a result, governments would better understand the way in which WMO and Member NMHSs operated, thus helping them to obtain enhanced financial and other support.

14.10 The Association agreed on the importance of ensuring the appropriate implementation of the 6LTP, as well as the related monitoring and evaluation of this implementation. The Association requested its president to ensure the provision of the relevant contribution expected from RA IV in the pertinent evaluation process.

14.11 The Association felt that in the implementation of the 6LTP, it was important to bear in mind that there were diverse interests and needs to be addressed by WMO and NMHSs and that the operating environment continued to change as well.

14.12 The Association noted that reports to future sessions of the Executive Council (particularly by presidents of regional associations and technical commissions, as well as the Secretary-General) should address the way particular programmes were contributing to the implementation of the LTP and to confirm whether the implementation of the 6LTP in that particular area was on track or not. The report should also dwell on the programmes' contribution to the realization of the six WMO desired outcomes and the nine strategies (with their associated goals) contained in the 6LTP. The Association agreed that a similar approach should be taken into account in the preparation of the future sessions of the Association.

14.13 The Association noted that the Executive Council had requested that consideration be given to how best to provide an update on the 6LTP and its implementation in the light of latest developments, such as the GEOSS initiative, the expanded satellite activities which now covered R&D satellites, and the changes in the Secretariat including those related to the way cross-cutting issues were being addressed. The Association requested that implementation of 6LTP take into account the issues arising from the GEOSS initiative.

Preparation of the Seventh WMO Long-term Plan

14.14 The Association recalled that Fourteenth Congress had decided that the Seventh WMO Long-term Plan (7LTP) should be prepared. In so doing, it had requested the regional associations:

(*a*) To 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 7LTP, including through regional analyses and assessments; and

(*b*) To coordinate, as necessary, national contributions to regional projects of the Plan.

14.15 The Association noted that Fourteenth Congress had agreed that the 7LTP should build on the WMO vision, the desired outcomes as well as on strategies and associated goals, to be realized through the major WMO Programmes, bearing in mind the purposes of WMO, which were reflected in the WMO Convention and the evolving role of the Organization. At the same time, the planning process should be simple and flexible to ensure a response to any new challenges and needs that might arise in the rapidly changing world.

14.16 The Association noted that the Executive Council had agreed that in the preparation of the 7LTP, the following issues should be taken into account, among others:

(*a*) Protection of life and property against natural disasters;

(*b*) Poverty alleviation;

(*c*) Safeguarding the environment;

(*d*) Enhancing the economic and social well-being of various sectors of society in areas such as food security, water resources, energy, health, transport, and tourism;

(*e*) Policy-making and meeting international commitments in pertinent areas through the provision of required information, assessments and advice;

(*f*) Assuring the sustainability of the scientific leadership of the Organization by ensuring increasing attention to the further development of the WMO core scientific programmes, as well as by strengthening relationships with the appropriate research communities;

(*g*) Development of strategic alliances within the United Nations system in the areas of weather, climate and water;

(*h*) Consideration of ways of strengthening partnerships with the private sector, academia, media and NGOs in the work of the Organization;

(*i*) Proactively addressing emerging issues with the aim of increasing the general responsiveness of the Organization;

(*j*) Development of innovative ways of building the capacity of operators and potential users of the meteorological, hydrological and related infrastructure and facilities, particularly enhancing those in least developed countries, as well as the products and services deriving from these;

(*k*) Improvement of WMO visibility, communication and transparency;

(*l*) Increased effectiveness and efficiency of WMO's mode of operation.

14.17 The Association agreed that the following trends, needs and developments should be taken into account in the preparation of the 7LTP:
(*a*) Increasing diversification of economies;
(*b*) Developments in science and technology;
(*c*) Responses to climate change;
(*d*) Need for relevant investments in developing countries;
(*e*) Need for capacity-building; and
(*f*) Need for greater flexibility and adaptability.

14.18 The 7LTP should also take into consideration the countries' concerns and recommendations as reflected in the United Nations Millennium Development Goals and the Johannesburg Plan of Implementation of the World Summit on Sustainable Development (WSSD).

14.19 The Association also agreed that from a global perspective, priorities should be given to poverty alleviation, rapid changes in information technology, increasing competitiveness among stakeholders in a growing market economy, changes in science and technology, and research needs to accommodate various challenges.

14.20 In terms of its regional priorities, the Association considered the following of importance:
(*a*) Building a robust and integrated observing system for weather, climate and water;
(*b*) Developing capacity to improve weather prediction over all timescales for the general public and for special user groups;
(*c*) Reinforcing basic climatological advisory services;
(*d*) Reducing the technology gap, including training and transfer of technology from developed to developing countries in the southern part of the Region;
(*e*) Mesoscale forecasting;
(*f*) Global Earth Observation System of Systems (GEOSS).

In this connection, the Association also recalled the accomplishments and future priority actions identified by the president of RA IV in his report to the session (see agenda item 3).

15 EMERGING ISSUES AND SPECIFIC CHALLENGES (agenda item 15)

15.1 EVOLVING ROLE OF WMO (agenda item 15.1)

15.1.1 The Association noted that the fifty-sixth session of the Executive Council, following consideration by Fourteenth Congress, had discussed this item and touched on the following areas of concern:
(*a*) WMO and its environment;
(*b*) WMO responsibilities;
(*c*) WMO Convention;
(*d*) Mode of operation;
(*e*) WMO structure.

15.1.2 The Association recalled that the Executive Council recognized the importance and urgency of developing a strategy for action to address the various issues of concern that had been raised, particularly relating to WMO's leadership role and ways of rendering it more responsive, proactive and relevant. There was also a need to ensure greater political awareness of its role and contribution in issues of concern to the nations it served, such as natural disasters, climate change and water resources. Parallel consideration at the national level with respect to NMHSs should also be addressed. In that regard, the Association agreed that WMO and the Association should continue to be more responsive, proactive and relevant.

15.1.3 In that connection, there was a need for a clear and proactive WMO and NMHS response to global concerns as expressed in the Millennium Development Goals adopted by the United Nations General Assembly in 2000 and the Johannesburg Plan of Implementation adopted by the World Summit on Sustainable Development in 2002. These included poverty alleviation, natural disasters mitigation, climate change, and water resources needs. The range of NMHS products and services should address these societal needs and be recognized as doing so. Account should also be taken of recent developments and initiatives such as the GEOSS initiative with its nine areas of societal benefits. The Association stressed that such societal benefits underscored the importance of ensuring government funding for essential high quality meteorological and related services. This was particularly true for the provision of public weather services necessary for the protection of life and property, since these services were by nature public goods. In the case of the Region, the Association agreed that consideration should be given to how to involve national governments and NMHSs in the structure that was expected to emerge from the ongoing GEOSS and related processes. The Association recognized the importance of interacting also with those in the social sciences (see also agenda item 15.2)

15.1.4 The Association noted that the Executive Council had agreed that, in the light of the report of the Executive Council Ad hoc Group on the Evolving Role of WMO, including the table of issues for consideration prepared by the group and its deliberations on this subject, there was sufficient material to enable action to be taken. It was recognized that WMO should evolve with urgency, but carefully and sensitively, in order to respond to Members' changing needs and expectations, including their expectations for an agreed WMO strategy and strong leadership across a wide range of Earth system science and service issues in a rapidly changing world.

15.1.5 The Association was informed of the work being carried out by the Executive Council Action Group for an Enhanced WMO, including the results from its session in January 2005. The Group's remit had included the identification and prioritization of opportunities to make WMO more proactive, responsive and relevant. The Association noted the proposals made for improvements in the sessions of the Executive Council. The Association recommended that benchmarks be identified for use in monitoring and evaluating progress towards greater flexibility and adaptability.

15.1.6 Concerning the review of the WMO Convention, the Association recalled that the Executive Council had felt that adequate preparatory work had already been undertaken, but that further progress needed

to be made to ensure appropriate consideration in time for Fifteenth Congress. That meant that specific recommendations and options should be ready for the fifty-seventh session of the Executive Council in 2005 to allow for sufficient deliberation and communication to Members (who should be able to participate in the process in the same way as during sessions of regional associations) so that proposals that would need a Fifteenth Congress decision were sufficiently mature in time for the fifty-eight session of the Executive Council in 2006, i.e. the Executive Council session before Fifteenth Congress. The Executive Council had requested that the proposal, as developed for the fifty-fourth session of the Executive Council, together with related documentation and comments, should be provided to sessions of regional associations for their consideration.

15.1.7 As requested by the Executive Council, the Association was provided with information and documentation on the work of the Executive Council Task Team to Explore and Assess the Possible Changes to the WMO Convention. The Association expressed its appreciation to the chairperson of the task team for the proposals made and expressed its views on that issue.

15.1.8 The Association considered the task team's recommendation to introduce a new preamble to the Convention to clarify the scope of the Organization and to reflect developments over the past 50 years, such as climate issues, natural disaster prevention and mitigation, contribution to sustainable development, and others. In that regard, it noted that the Geneva Declaration might be a good starting point for drafting a new preamble because the Declaration had been adopted unanimously by the Thirteenth Congress in 1999. The Association noted that, if agreed, a new preamble could be a means of introducing the relevant developments, terms and key ideas into the Convention.

15.1.9 The Association noted that the adoption of protocols was an option and Members would have to decide on the scope and implications of each protocol. It recognized the need for further reference materials such as protocols from other similar organizations and typical draft texts of protocols on subjects of interest to WMO for in-depth consideration, in order to assess any future implications of such specific protocols.

15.1.10 The Association further requested careful study of the criteria to be applied for the introduction of new subjects through the use of protocol and of the pertinent implications.

15.1.11 With regard to the mode of operation, it was felt that this was an area where there was greatest likelihood of significant progress, particularly through improved ways of addressing cross-cutting issues, including the use of matrix management, and various measures that had been proposed for achieving the more effective and efficient operation of the constituent bodies. The Association felt that its own mode of operation relating to its sessions and the intercessional activities needed to be reviewed and improved. It considered ways of doing so under relevant agenda items (see agenda item 16.2) and in connection with enhancing the role and capacity of the WMO Office in San José, Costa Rica.

15.1.12 Consideration should also be given to how Members, constituent bodies and the Secretariat could coordinate better in carrying out the work and providing relevant information, including to the general public and the media, on issues of interest such as the prevention and mitigation of natural disasters, climate change and water resources. The use of new technology for carrying out the relevant work, such as the Internet, email, teleconferencing and video-conferencing was underscored.

15.1.13 In view of the above, the Association urged its Members to contribute to the relevant discussions as they participated in the various WMO programme activities. It requested its president to ensure that appropriate views from the Region were taken into account in the pertinent processes.

15.2 ROLE AND OPERATION OF NMHSS (agenda item 15.2)

15.2.1 The Association recalled that Fourteenth Congress had had extensive discussions on the role and operation of NMHSs, including on:

(*a*) Findings from the questionnaire on the role and operation of NMSs;
(*b*) Economic framework and funding issues;
(*c*) Legal instruments;
(*d*) Aeronautical meteorological services;
(*e*) Regional cooperation;
(*f*) WMO standards for weather forecasts;
(*g*) Quality management;
(*h*) WMO statement on weather and climate forecasting;
(*i*) Mechanisms for strengthening NMSs;
(*j*) Involvement of the media, the private sector and academia;
(*k*) Cooperation with other international organizations;
(*l*) Definition of commonly used terms; and
(*m*) Role and operation of NHSs.

15.2.2 In connection with the analysis of the questionnaire, the Association noted that for the Region, the main issues faced by NMSs were the overall level of government funding, the role of NMSs at national level, modernization, relationships with the media, and commercialization. The Association requested wider dissemination of the results of the analysis of legal instruments.

15.2.3 The Association noted that the Executive Council had provided guidelines on the role and operation of NMSs and that, on the basis of this guidance, Fourteenth Congress had adopted Resolution 28 (Cg-XIV) — Role and Operation of National Meteorological and Hydrological Services, which invited Members to take relevant actions to enhance the role and operation of NMSs. The Association felt that an update of the Executive Council Statement on the Role and Operation of NMHSs should be considered.

15.2.4 The Association was informed that the Advisory Group, which had held its first session from 14 to 18 March 2005, had addressed the following major issues facing NMHSs:

(*a*) Leadership roles, contribution and visibility of NMHSs and WMO;
(*b*) Partnerships and cooperation;
(*c*) Economic and social value of NMHSs;
(*d*) Capacity-building and modernization; and
(*e*) Resource mobilization.

15.2.5 The Association was also informed that the group would develop two Executive Council statements on the role and operations of NMSs, one for decision makers, and another for directors and other senior officials of NMSs.

15.2.6 The Association recognized that the role and operation of NMHSs were intimately linked to many other issues of major interest to WMO and NMHSs. It also recognized that such links should be carefully considered and should help WMO, its Members and their NMHSs to strengthen complementarity and strategic alliances as well as to meet the major challenges and commitments facing the Organization. In that connection, the Association considered that the particular issues of interest to the Region were:

(*a*) Strengthening the activities of WMO and NMHSs to work with partners in dealing with natural disasters and poverty alleviation;
(*b*) Sustainable development;
(*c*) Partnerships with private sector; and
(*d*) Capacity-building for human resources and institutional development.

The Association stressed the importance of NHMSs contributing to society's sustainable development and ensuring their own sustainability.

15.2.7 The Association underscored the linkage between the leadership role, contribution and visibility of NMHSs at the national level, on the one hand, and of WMO at the international level, on the other. The NMHSs should be the official voice in issuing weather warnings for public safety at the national level while WMO served as the authoritative voice in the United Nations System on matters relating to weather, climate and water. Their leadership roles stemmed from their respective core competences, which should continue to be enhanced. The value of appropriate NMHSs products and services, particularly accurate, timely and useful forecasts and warnings, could not be over-emphasized. In that connection, the Association urged Members to share relevant best practices.

15.2.8 While maintaining leadership in the relevant areas, partnerships should also be a key characteristic of the work of NMHSs and WMO. These could provide opportunities which might otherwise not be available to NMHSs and WMO. The Association encouraged Members to facilitate partnerships between NMHSs and relevant institutions in their countries, such as other government agencies.

15.2.9 The Association agreed that working more closely with the media and ensuring the establishment and/or maintenance of appropriate communications with them could further improve the visibility of the NMHSs and WMO. In the Region, the hurricane season offered rich possibilities. Working closely with the media not only assisted in the dissemination of important forecasts and warnings, but in some cases, it could also be a source of revenue.

15.2.10 The Association encouraged its Members to pursue economic valuation studies to strengthen the case for the recognition of the role and contribution of NMHSs in the provision of meteorological and hydrological services. It agreed that there was a strong case for resources committed to NMHSs to be considered as investments, rather than expenditures, in view of the high benefit to cost ratio. In this regard, partnerships with other stakeholders like those in planning and economic development, disaster management communities and others, were considered critical.

15.2.11 In that connection, the Association recognized the importance of further highlighting such socio-economic benefits, particularly through regional and international Technical Conferences on the Economic and Social Benefits of Meteorological and Hydrological Services. Education and training aspects were also stressed, including training modules in meteorological economics in the training of meteorologists.

15.2.12 The Association considered that the involvement of the media, the private sector and academia continued to be of particular interest. It recalled that Fourteenth Congress had noted that there was growing recognition of the importance of cooperation with the media, the private sector and academia, and of the need to consider the opportunities that such cooperation could provide while recognizing the associated challenges. Fourteenth Congress had recognized that this included both the involvement of the media, the private sector and academia in the international programmes of WMO, and national level cooperation between these sectors and the NMHSs.

15.2.13 The Association recognized the importance and need to reinforce the capacity-building of NMHSs, particularly through training in such relatively new areas as management, partnership, networking, communication, user interaction, cost recovery, commercialization, and the valuation of the socio-economic benefits of meteorological and related services.

15.2.14 The Association also emphasized the importance of continually assessing the role and operation of NMHSs in the light of the rapid changes and of identifying appropriate actions that might be undertaken by NMHSs and WMO. The Association considered that modernization and capacity-building were of particular concern in the Region.

15.2.15 The Association agreed that it was important to address the relevant priority areas of concern that provided challenges and opportunities to its Members. It therefore called upon its Members to take appropriate action. Moreover, it felt that directors of NMHSs should be proactive in this regard.

15.3 INTERNATIONAL EXCHANGE OF DATA AND PRODUCTS (agenda item 15.3)

15.3.1 The Association recalled the discussions that had taken place during Fourteenth Congress on the

topic of international exchange of data and products. These included the following areas:

(*a*) Implementation of Resolution 40 (Cg-XII);
(*b*) Implementation of Resolution 25 (Cg-XIII);
(*c*) Exchange of climate data and products;
(*d*) Oceanographic data exchange policy;
(*e*) Exchange of aeronautical meteorological data and products;
(*f*) Exchange of agrometeorological data; and
(*g*) Database protection mechanism and the World Intellectual Property Organization.

Implementation of Resolution 40 (Cg-XII)

15.3.2 The Association noted that the experience of Resolution 40 (Cg-XII) — WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities - had been largely positive and that there was generally a strong commitment to make it work. In the case of the Region, the Association supported the continued implementation of the resolution and urged Members to work towards its effective implementation.

Implementation of Resolution 25 (Cg-XIII)

15.3.3 The Association was also pleased to note progress in the implementation of Resolution 25 (Cg-XIII) — Exchange of hydrological data and products. It recalled that Congress had welcomed the solidarity that was developing throughout the hydrological community in the adoption of the policy set out in the resolution and saw the monitoring of the exchange of hydrological data and products as an important ongoing activity to be overseen and reported on by CHy.

15.3.4 The Association was informed that, following the request by Fourteenth Congress, the questionnaire on the exchange of hydrological data and products had been circulated to River Basin Organizations (RBOs) and International Data Centres (IDCs) to obtain their comments and views on the status of the international exchange of data. The outcome of the survey had been considered by the twelfth session of the Commission for Hydrology, which had also considered future actions in the spirit of Resolution 25 (Cg-XIII). The Association was also pleased to note that, after having been reviewed by the Regional Hydrological Advisers and the Executive Council, the technical report on the exchange of hydrological data and products prepared by CHy had been published and distributed in early 2004.

Exchange of climate data and products

15.3.5 With respect to the international exchange of climate data and products, the Association noted that CCl had been requested to continue to work with CBS on the issues of the collection of CLIMAT and CLIMAT TEMP messages and their dissemination via the GTS or the Internet. The Association welcomed the development of software to encode and decode CLIMAT and CLIMAT TEMP messages. The Association was informed that Members of the Region that would like to use this software should make their interest known to the Secretary-General. The Association noted that the distribution of the software would also be organized through regional training workshops.

15.3.6 The Association urged those Members that had not yet done so to send their daily historical data for GCOS Surface Network observations to the WCD-A Asheville, as requested by the Secretary-General. The Association noted that there was a need for the essential climate variables (maximum temperature, daily precipitation, pressure, radiation, wind and humidity).

Oceanographic data exchange policy

15.3.7 The Association noted with interest that the 22nd Session of the IOC Assembly in 2003 had, inter alia, approved an IOC Oceanographic Data Exchange Policy, which both recognized and was compatible with the WMO policy and practice on the international exchange of meteorological and related data and products as expressed through Resolution 40 (Cg-XII) — WMO policy and practice for the exchange of meteorological and related data and products including guidelines in commercial meteorological activities. It recalled that the Executive Council had expressed its appreciation to IOC for its efforts in this regard, which would further serve to strengthen cooperation and coordination between the two Organizations in the exchange of relevant geophysical data. It was pleased to note that JCOMM was developing data exchange and management mechanisms and procedures within the context of the data exchange policies of both its parent Organizations, with particular focus on ensuring the full and open exchange of oceanographic data from all sources.

Exchange of aeronautical meteorological data and products

15.3.8 The Association recalled that, in accordance with Note 3 of Annex 4 to Resolution 40 (Cg-XII), aeronautical meteorological information had not been included in the application of the practice provided by that resolution. The Association noted that the Conjoint CAeM Session/ICAO Meteorology Divisional Meeting (Montreal, Canada, 9-27 September 2002) had endorsed Recommendation 4/7 that called for ICAO, in consultation with WMO, to develop guidelines for access to aeronautical meteorological information for air navigation support purposes only. The Association further noted that the ICAO Council and the WMO Executive Council had approved that Recommendation in 2003. As part of the implementation of the Conjoint Meeting Recommendation 4/6, ICAO had established the Aviation Use of the Public Internet Study Group (AUPISG) in September 2003 and WMO had agreed to participate in the work of this ICAO Group. The Association was informed that the work of the AUPISG had been completed and the document Guidelines for the Use of the Public Internet for Aeronautical Applications had been prepared. That document dealt with the use of the Internet as a means of communication for non-routine

critical aeronautical ground-to-ground applications. The Association was informed that it was in the process of being distributed to WMO Members.

15.3.9 The Association was informed that, similar to previous guidelines for authorized access to the World Area Forecasts Systems (WAFS) satellite broadcasts prepared by ICAO and already distributed to Members, ICAO had developed guidelines for access to aeronautical meteorological information that had also been distributed to WMO Members.

Recent developments

15.3.10 The Association noted that recent developments and initiatives such as on the expanded satellite activities which now covered R&D satellites and the GEOSS initiative, had implications for the free and unrestricted international exchange of meteorological and related data and products that were under consideration.

15.3.11 In view of the above, the Association requested WMO to ensure that recent initiatives took into account the WMO policy and practice on the international exchange of meteorological and related data and products.

General consideration

15.3.12 Members of the Association expressed their views and shared their relevant experiences. Among others, the Association recognized that the availability of some meteorological and related data and other information on the Internet, such as SHIP and aeronautical meteorological data, had caused some concern. The Association agreed that this aspect should continue to be given adequate attention.

15.3.13 In light of varying experiences of different RA IV Members related to the handling of requests for data from private groups and academic institutions, the Association recognized the need for regional guidance to Members on this matter. It requested that the president arrange for this topic to be addressed within the framework of the RA IV Management Group, which the Association had established (see agenda item 16.2).

15.4 WMO quality management framework (agenda item 15.4)

15.4.1 The Association recalled that Congress had decided (Resolution 27 (Cg-XIV) — Quality Management) that WMO should work towards a Quality Management Framework (QMF) for NMSs that would eventually include and develop the following distinct, though related elements, which could be addressed possibly on a phased basis:

(*a*) WMO technical standards;
(*b*) Quality management system(s) including quality control; and
(*c*) Certification procedure(s).

15.4.2 The Association noted the deliberations and decisions on the subject by the fifty-fifth and fifty-sixth sessions of the Executive Council. A survey among NMSs carried out in 2004 to assess quality management (QM) activities, plans and requirements for assistance through WMO, had revealed that more than 40 Members required technical guidance and other assistance from WMO as a matter of urgency. Some NMSs had reported that they were implementing their own QM Systems (QMSs) and audit mechanisms. Furthermore, it had been reported that several Members had had positive experiences with QMSs based on ISO 9001, which had resulted in a continuous process of improvements in the management and operation of NMSs and in the delivery of services through enhanced focus on the customer and user community. The survey had also shown that the implementation of QMSs could be pursued for separate sectors, such as aeronautical meteorological, marine meteorological and climatological services, or for the service as a whole. In this respect the Association noted that, while a sectorial approach was easier to manage, sectorial QMS certification could entail higher follow-on costs due to the need for periodic audits for each sector concerned.

15.4.3 The Association noted that the fifty-sixth session of the Executive Council had agreed to pursue the phased approach recommended by the presidents of the technical commissions, i.e. the WMO QMF should focus on the technical aspects of the operation of the NMSs and the first step should address the QM aspects of observing systems and of aeronautical meteorological services.

15.4.4 The Association noted with interest the outcome of the WMO Workshop on Quality Management held in Kuala Lumpur, Malaysia, from 26 to 28 October 2004. The workshop had further developed QM aspects related to observing systems and instrumentation and aviation meteorological services, reviewed the suitability of WMO publishing available QM documentation relevant to NMSs, developed additional guidance material, and recommended future working activities towards meeting the objectives given in Resolution 27 (Cg-XIV).

15.4.5 The Association was satisfied that guidance material in the form of the First WMO Technical Report on QMF (on CD-ROM) had already been published, which contained, inter alia, basic QM documentation offered by several Members, several technical reports and the final report of the above-mentioned workshop. Noting that some of this material had been written in national languages, the Association welcomed the fact that the English translation had been procured, where necessary. The publication also contained reports on 'QM Implications on the Instrument Sector' and on 'A QM Approach to in-situ Observing Systems', the draft 'Guide on QM Procedures and Practices for PWS' and the Quality Management section of the new edition of the *Guide to Practices of Meteorological Offices Serving Aviation* (WMO-No. 732). The Association was informed that ICAO was producing guidance material on QM related to aeronautical meteorological services, in collaboration with WMO. The publication was expected during the course of 2005.

15.4.6 While there was general concern over the potentially high costs involved, some Members preferred a WMO certification procedure, although others felt that it would lack the full international recognition that would be important in strengthening their

commercial activities and competitiveness. Others felt WMO certification could involve WMO agreement on the components of a QM system based on the WMO guidance material. Members could then establish their QMSs consistent with these guidelines and be, in effect, self-certified according to the WMO-approved practice.

15.4.7 The Association underlined that the development and implementation of a QMS was a particular challenge for, and a burden on, the scarce resources of NMSs in developing countries. It appealed to Members whose NMSs had successfully implemented a QMS, or completed a QMS certification according to ISO 9001, to share their experiences with others by making available relevant documents for information and guidance. It was seen as particularly important that the WMO QMF should provide clear and unambiguous guidance on QMS and show that the WMO QMF was complementary and not exclusive to a QMS based on ISO 9001. The WMO QMF should also identify options for pursuing ISO certifications at a reasonable cost, and it should address quality control aspects related to forecasting and warning products and services in order to achieve quality improvement in the outputs of the NMSs. It was also recognized that any QMS must be specifically designed for, or adjusted to, the individual situation of a given NMS in order to achieve its objectives.

15.4.8 The Association noted that the presidents of technical commissions had agreed at their January 2005 meeting to focus on a review of WMO Technical Regulations with a view to identifying and rectifying deficiencies, duplications, inconsistencies and errors. This should result in the relevant WMO Technical Regulations becoming viable documents of reference for use within national QMS. In view of this, the Association requested its WG-PIW to review and update the Annexes corresponding to Region IV in the WWW-related Technical Regulations in order to ensure consistency with the global sections reviewed by CBS.

15.4.9 The Association requested the Secretary-General to organize capacity-building activities to help, in particular, developing NMSs, individually or as part of regional groups, in the implementation of QMS, through seminars, workshops, conferences, etc. To that end, the Association agreed that regional technical conferences and other suitable events, for example training events held in RMTCs and those planned in the Region under various scientific/technical WMO Programmes, should, inter alia, address the WMO QMF by including this topic in their programmes or curricula, and by inviting resource persons from Members that had already implemented, or were in the process of implementing QMS (see also agenda item 16.1).

15.5 Group on Earth Observations (GEO) process (agenda item 15.5)

The first Earth Observation Summit (EOS-I)

15.5.1 The Association was informed that, resulting from the G-8 Action Plan on Science and Technology for Sustainable Development (Evian, France, 2 June 2003) and at the invitation of the United States (Washington D.C., 31 July 2003), thirty-three nations, and the European Commission, had joined together at the first Earth Observation Summit (EOS-I) to adopt a Declaration that called for action in strengthening global cooperation on Earth observations. The purpose of the Summit was to:

'Promote the development of a comprehensive, coordinated, and sustained Earth observation system or systems among governments and the international community to understand and address global environmental and economic challenges; and begin a process to develop a conceptual framework and implementation plan for building this comprehensive, coordinated, and sustained Earth observation system or systems.'

15.5.2 To that end, the Summit participants had launched an ad hoc Group on Earth Observations (GEO), with the goal of furthering the creation of a comprehensive, coordinated, and sustained Earth observing system or systems. The group, co-chaired by the United States, the European Commission, Japan, and South Africa, and joined by more than 21 international and intergovernmental organizations, had begun its work by organizing five subgroups, as well as a secretariat to support its activities. In order to promote the development of the Global Earth Observing System of Systems (GEOSS), GEO had decided that a document describing the GEOSS framework and an associated 10-Year Implementation Plan should be developed.

EOS-II

15.5.3 The Association noted that four sessions of GEO had been held followed by the second Earth Observation Summit (EOS-II) (Tokyo, Japan, 25 April 2004). A Communiqué approving the Framework Document, pointing the way forward in the GEO effort, and encouraging broad participation in and support for the GEO effort, had been approved at EOS-II on 25 April 2004. A Framework Document was also agreed at EOS-II consisting of: a high-level synopsis of the GEO effort for senior policymakers; a description of the GEOSS purpose and expected benefits; and a broad framework for developing the 10-Year Implementation Plan.

15.5.4 The Association noted that the fifty-sixth session of the Executive Council had adopted Resolution 9 (EC-LVI) — Global Earth Observation System of Systems (GEOSS), affirming its full support for the GEO process and the resulting GEOSS. That Resolution had requested the Secretary-General to keep GEO Members fully informed of WMO's long-term experience in operational observing and telecommunication systems and service provision and of its capacity to provide effective leadership in the implementation and operation of several key components of GEOSS. It had also authorized the Secretary-General to indicate WMO's readiness to host the GEOSS Secretariat.

15.5.5 In responding to a request contained in a letter in September 2004 from the Director-General for the Research Directorate-General of the European Commission, the Secretary-General had provided details on the possible hosting of the GEO Secretariat in the

WMO Building. At the GEO Special Session on Governance held in Brussels, Belgium, from 27 to 28 September 2004, hosted by the European Commission, the Secretary-General was invited by the Director-General for the Research Directorate-General of the European Commission to express WMO's willingness to host the GEO Secretariat as evidenced in the exchange of letters. The reaction of GEO Members and participating organizations at the special session had been most supportive.

15.5.6 The fifth GEO Meeting (GEO-5) (Ottawa, Canada, 29–30 November 2004) had reviewed a proposal by WMO to host the GEO Secretariat and had reached consensus in principle to consider an Agreement at GEO-6 (Brussels, Belgium, 14–15 February 2005), which was followed immediately by the Third Earth Observation Summit (EOS-III) on 16 February 2005. GEO-5 had negotiated the text of the 10-Year Implementation Plan for GEOSS.

EOS-III

15.5.7 The Association noted that three significant decisions had been taken that had a bearing on WMO: the agreement by a GEO-6 Resolution to assent to a Standing Arrangement between WMO and GEO to host the GEO Secretariat in Geneva; a Communiqué relating to support for tsunami and multi-hazard alert systems, which had been endorsed at EOS-III; and an EOS-III Resolution endorsing the 10-Year GEO Implementation Plan at ministerial level. By adopting this plan, the first phase in realizing the goal of developing a comprehensive coordinated and sustained Earth observation system had been accomplished. In addition, ministers at the Summit had agreed to establish an intergovernmental Group on Earth Observations (GEO) comprised of some 60 Member countries, the European Commission and 40 participating organizations. This new Group on Earth Observations replaced the ad hoc GEO, which had officially ended with the completion of its tasks relating to the development of the 10-Year Plan. Governments at the Summit had affirmed their intention to provide the necessary support to execute the 10-Year Implementation Plan for GEOSS and resolved to meet, at ministerial level, before the end of 2007 and to conduct a mid-term assessment by 2010.

Future development of GEOSS

15.5.8 The Association noted that 2005 was a transitional year for the GEO Secretariat. Planning had already commenced to move a portion of the GEO Secretariat Office from Washington DC (United States) to Geneva (Switzerland). There would be a core of up to eight persons serving in the transitional GEO Secretariat in Geneva starting in April 2005. The transitional GEO Secretariat would serve until the permanent GEO Secretariat was established by the end of 2005.

15.5.9 The first meeting of the new intergovernmental GEO, GEO-I, would be held at WMO Headquarters from 3 to 4 May 2005. The core transitional GEO Secretariat would make all the necessary preparations for GEO-I. Included in the core would be a 3-4 person task force, which would develop the 2006 Work Plan to be reviewed and approved at GEO-II to be held in December 2005, possibly in Geneva. A GEO Trust Fund would be established as a mechanism for paying GEO Staff Members and related GEO activities.

15.5.10 GEO-I would have several important agenda items for discussion including: a pledging session to identify US$ 1 million for 2005 and US$ 3.5 million for the 2006 GEO Secretariat support; formal acceptance of the structure and voting procedures for the election of members of a new Executive Committee; agreement on a Science and Technical Advisory Mechanism; and a User Interface Mechanism.

GEO relevance to WMO Members

15.5.11 The enabling Resolution endorsed at EOS-III on 16 February 2005 had contained points relevant to WMO including: acknowledgement of United Nations Specialized Agencies; the need to build upon and work with existing planning and coordination mechanisms; an invitation to WMO to endorse the implementation plan; a request for GEO to consult with component systems of GEOSS on progress and on issues involved in implementation; and affirmation of an intention to provide resources to implement the plan.

15.5.12 The Association also noted that the thirteenth session of the Commission for Basic Systems (St. Petersburg, Russian Federation, 23 February–3 March 2005) had discussed GEO and its associated GEOSS. The Commission viewed GEO and its associated GEOSS as one of the most important and key initiatives that would enable WMO to address the challenges of the coming decades. Several vital factors had been identified as areas where WMO should continue to play an active role within GEO to ensure that they remained aligned with the mandates of NMHSs, the objectives of WMO as an Organization, and the continued improvement of WMO components that would serve as the core for GEOSS. These included, among others, the Future WMO Information System (FWIS) and the WMO Space Programme (WMOSP). The Commission had agreed that WMO should remain as a primary catalyst to enhance GEO while maintaining WMO mandates. It had noted that GEO had proceeded at an extremely rapid pace in the previous 18 months and that WMO must be structured to work at a comparable pace if it wished to remain vibrant and relevant as GEO developed. The Commission had agreed that there were some very positive developments in the present GEO that provided a basis for a continued strong WMO role and should also prove beneficial to both GEO and WMO. Specifically, the 10-Year GEO Implementation Plan had clearly identified its role for improved observations and better products without encroaching on national mandates for service delivery. Thus, NMHSs had the potential for improved observational data and products to allow them to better serve their constituencies.

15.5.13 The Association underscored one of the stated aims of GEO, as noted in the Washington Declaration, which was to build capacity, particularly in developing

countries, to capture, exchange and process Earth observation data and to exploit the resultant information and products. It was also noted that the nine GEOSS socio-economic benefits areas included the core functions of an NMHS, which addressed weather, climate and water. It was determined that GEO presented opportunities for capacity-building in support of NMHS enhancements.

15.5.14 It was noted that, so far, of the RA IV Members, Belize, Canada, France, Honduras, Mexico, United Kingdom and the United States, were Members of GEO. Those countries had already developed, or were in the process of advancing, a national interdisciplinary GEO action and partnership plan, which had been determined as one of the major GEO-related actions at national level. The Association appealed to these Members to make available advice and share their experience with a view to assisting others to accede to GEO, and encouraged all RA IV Members to join GEO. It was also underlined in that connection that membership in GEO was, in legal terms, a non-binding arrangement of governments and that contributions to GEO were voluntary.

15.5.15 The Association agreed that it was important to build partnerships with relevant institutions, agencies, NGOs, private sector, etc., in Earth observations, both nationally and regionally, to fully address the interdisciplinary nature of the GEOSS themes. In that regard, the Association agreed to appoint a Coordinator on Regional Aspects of GEOSS to keep regional developments of the GEOSS Implementation Plan under review with Terms of Reference as given in Resolution 17 (XIV-RA IV). Furthermore, it urged the Members in the Region to establish national focal points on GEOSS to build interdisciplinary Earth observation partnerships at national and regional level. The focal points should liaise and collaborate with the coordinator and advise their governments on the socio-economic benefits that may be derived from GEOSS. Resolution 17 (XIV-RA IV) was duly adopted.

15.5.16 The Association recognized NOAA's Earth Observation Partnership of the Americas, an integrated, international approach within the context of GEO to work with partners throughout the Americas and the Caribbean to enhance availability and access to NOAA's earth observation systems. The Association noted the workshop co-sponsored by NOAA, the Argentine Space Agency (CONAE) and the WMO Space Programme (Buenos Aires, Argentina, 2-3 June 2005).

15.6 Internal matters of WMO (agenda item 15.6)

15.6.1 The Association took the opportunity of the presence of the Secretary-General at the session to have a discussion on internal matters of WMO of concern to the Members of the Region, particularly in connection with recent developments that had indicated the need for an improvement in the internal control of administrative and financial procedures.

15.6.2 The Secretary-General informed the Association of the continuing efforts to ensure that there was a high level of accountability and internal control in the management of the valuable resources put at the disposal of the Organization. He assured the Association that appropriate actions had been implemented and continued to be implemented in this respect; and where needed, legal and disciplinary actions had been taken.

15.6.3 He referred to the three-phased Secretariat action plan, which was targeted to improve integrity, transparency and efficiency, and included the setting up of a Fellowship Committee. That plan had been put in place to improve (1) internal control; (2) transparency; and (3) to promote process simplification. He also informed on the work being undertaken towards the adoption of a code of ethics for Secretariat staff. The Association was also informed on the responsibilities and work of the Audit Committee established by Resolution 15 (EC-LVI)—Establishment of an Audit Committee.

15.6.4 A wide-ranging discussion took place and the Secretary-General responded to various questions raised. The Association noted that it was possible that the introduction of enhanced internal control mechanisms might increase the time it took to process pertinent requests and transactions and requested Members' understanding during the implementation of the changes. The Secretary-General undertook to keep Members informed of relevant developments as they evolved.

15.6.5 The Association expressed its appreciation to the Secretary-General for the information provided and for the opportunity to clarify matters discussed under this agenda item.

15.7 Brainstorming session (agenda item 15.7)

15.7.1 In introducing the item, the president presented a list of areas of concern to the Region that could be addressed during the session. Most of these had also been taken up to varying degrees in pertinent agenda items as indicated below:

(*a*) Evolving role of WMO (agenda item 15.1);
(*b*) Role and operation of NMHSs/visibility of NMHSs (agenda item 15.2);
(*c*) Priorities for the establishment of RA IV working groups and the appointment of RA IV rapporteurs and focal points (agenda item 16.2);
(*d*) 2007 WMO Congress/priorities for RA IV;
(*e*) Tsunami early warning (agenda item 11, general summary paragraphs 11.11 to 11.13);
(*f*) Optimization and sustainability of the maintenance of the RA IV observation networks (general summary paragraphs 15.7.5 below);
(*g*) Upgrading of the status of the Subregional Office in San José (agenda item 10, general summary paragraphs 10.2.9; see also general summary paragraphs 15.7.4 below);
(*h*) Continuation of support to the RA IV Hurricane Committee (agenda item 4.5);
(*i*) Representation of RA IV in the WMO constituent bodies and the Secretariat;
(*j*) Participation of RA IV Members in GEO (agenda item 15.5, general summary paragraphs 15.5.14 to 15.5.16)
(*k*) Weather radars of CMO (agenda item 3, general summary paragraphs 3.7);

(*l*) WMO Programme on Natural Disaster Prevention and Mitigation in RA IV (agenda item 11);
(*m*) Future steps for the RA IV Regional Climate Centre (agenda item 5, general summary paragraphs 5.1.4, 5.2.22 to 5.2.23);
(*n*) Importance of Education and Training at the advanced levels (BSc/MSc) in RA IV/need for long-term fellowships for this purpose (agenda item 9);
(*o*) Importance of the WMO Technical Cooperation Programme in particular of the Voluntary Cooperation Programme (VCP) (agenda item 10).

15.7.2 In connection with the RA IV subsidiary bodies, it was felt that there was a need for an overall approach that would address current needs and provide for needs that may emerge later. The success associated with its subsidiary bodies, particularly the Hurricane Committee, was recognized. This matter was taken up further under agenda item 16.2 Internal Matters of the Association.

15.7.3 Developments relating to an early tsunami warning system in the Region were recognized as presenting both a challenge and opportunity for Members of the Association. Additional responsibilities associated with such a system provided a challenge while current political interest on the subject provided a window of opportunity.

15.7.4 The Association underscored the importance of enhancing the capability of the WMO Subregional Office in San José, Costa Rica. The Association noted that the functioning of this office, as well as other Regional/Subregional Offices was under review in light of the new Secretariat structure dealing with the implementation of the Technical Cooperation and Regional Programmes.

15.7.5 The Association expressed concern regarding the maintenance of the RA IV observation networks. It considered that there was a need for an effective mechanism to help ensure optimization and sustainability, and to facilitate the necessary expert services. The idea of a regional fund was proposed as a possible solution.

15.7.6 The viability of the functioning of the RMTN, including appropriate interactions with the vendors and the telecommunications service provider, was also a matter of concern.

15.7.7 The Association agreed that for the coming intersessional period, the preparation of the RA IV Regional Strategic Plan for the Enhancement of NMHSs (see agenda item 16.2) should provide an additional opportunity for further reflection on issues of interest to the Region.

16. OTHER REGIONAL ACTIVITIES

16.1 FIFTH TECHNICAL CONFERENCE ON MANAGEMENT OF NMHSS IN REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN) (agenda item 16.1)

16.1.1 The Association expressed its appreciation to the Secretary-General for assisting Members to develop their NMHSs, particularly, by organizing regional events including technical conferences on management to enable them to exchange views and share experiences in the management and operation of the services. The Association noted with appreciation that the Fourth Technical Conference on Meteorology and Hydrology in the Americas—Partnership for Prosperity and Sustainable Development, had been held in Panama City, Panama, from 13 to 15 January 2003, at the kind invitation of the Government of Panama. It expressed satisfaction that 34 of its Members had participated in the Conference and that many directors of NMHSs had presented lectures or case studies on various topics. It noted with pleasure that a similar Conference was planned during the second biennium of the fourteenth financial period.

16.1.2 The Association noted with satisfaction that Fourteenth Congress had made budgetary provisions for the organization of the Fifth Technical Conference to be held in the second biennium (2006-2007) of the fourteenth financial period. Considering that constant improvement in management techniques and practices was needed for NMHSs to increase the efficiency of their services and to improve their ability to address the challenges facing them under financial and other constraints, the Association endorsed the main subject of the forthcoming joint Technical Conference: Social and Economic Benefits of Meteorology and Hydrology, and confirmed that discussions would continue with the president of RA III to further develop the topics to be included in this theme.

16.1.3 In considering the organization of such a technical conference on management in the future, the Association recommended that the Sixth Technical Conference on Management of Meteorological and Hydrological Services to be held during the fifteenth financial period.

16.1.4 The Association noted with satisfaction that the Fourteenth World Meteorological Congress had made budgetary provisions for the organization of a regional seminar to be held in the first biennium (2004-2005) of the fourteenth financial period. Considering that constant improvement in management techniques and practices was needed for NMHSs to increase the efficiency of their services and to improve their ability to address the challenges facing them under financial and other constraints, the Association endorsed the main subject of the forthcoming Regional Seminar: Emerging Issues Affecting the Management of NMHSs in the Region. Among the issues to be discussed were globalization, commercialization, privatization, quality management framework, GEO/GEOSS, natural disasters and the requirements of environmental conventions.

16.1.5 The Association also expressed its wish that the Secretariat include during the next financial period the resources needed for the organization of a regional seminar. It agreed that the topics of the seminar should be decided by the Association.

16.2 INTERNAL MATTERS OF THE ASSOCIATION (agenda item 16.2

16.2.1 The Association recognized the need to set the objectives of the Association, ensure that they were

realized and that relevant work was carried out during the intersessional periods, taking into account and addressing evolving challenges and opportunities.

16.2.2 In this connection, the Association considered that the structure and working of its subsidiary bodies were of strategic importance in view of the new trends and developments associated with the evolving needs of the region.

16.2.3 In light of the above, the Association, with the help of an ad hoc group, reviewed the present structure and working of the subsidiary bodies of the Association and took decisions in relation to their structure.

16.2.4 The Association decided, in view of the present situation, to re-establish the following subsidiary bodies: the Working Group on the Planning and Implementation of WWW, the Hurricane Committee, the Working Group on Agrometeorology, and the Working Group on Hydrology, In addition, it decided to establish a Working Group on the Prevention and Mitigation of Natural Disasters. The terms of reference of these subsidiary bodies were given in the appropriate agenda items.

16.2.5 The Association, in recognizing the importance of coordinating its activities, and to ensure that it remains proactive, responsive and relevant as the situation evolves in the future, decided to establish the Management Group of RA IV and adopted Resolution 18 (XIV-RA IV).

16.2.6 The Management Group was expected to provide the basis for rationalizing the number, nature and activities of the subsidiary bodies, including rapporteurs, by the end of 2005. It was also expected to consider optimal use of resources that may be allocated or could be made available in connection with the activities of these subsidiary bodies.

17. Scientific lectures and discussions (agenda item 17)

17.1 The following scientific lectures were presented during the session:

(*a*) 'Tsunami Science and the Indian Ocean Tsunami' by Mr P. Whitmore (United States);

(*b*) 'Management of Emergencies derived from Severe Hydro-meteorological Phenomena in Costa Rica' by Mr W. Stolz (Costa Rica) and Mr L. Esquivel (Costa Rica).

17.2 The Association considered the lectures to be very interesting and of great quality. In addition, the Association thanked the lecturers for their presentations.

18. Review of previous resolutions and recommendations of the Association and of relevant Executive Council resolutions (agenda item 18)

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

18.2 The Association noted that most of its past resolutions had been replaced by new resolutions that had been adopted during the session. It was 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.

18.3 The Association accordingly adopted Resolution 19 (XIV-RA IV).

18.4 The Association considered that Resolution 2 (EC-XIII) on the thirteenth session of the Association need not be kept in force.

19. Election of Officers (agenda item 19)

The Association unanimously elected Mr C. Fuller (Belize) as president and Mr P. Manso (Costa Rica) as vice-president of WMO Regional Association IV (North America, Central America and the Caribbean).

20. Date and place of the fifteenth session (agenda item 20)

In accordance with Regulation 170 of the WMO General Regulations, the Association agreed that the president should determine the date and the place of the fifteenth session in agreement with the President of the World Meteorological Organization and after consultation with the Secretary-General.

21. Closure of the session (agenda item 21)

21.1 The participants expressed their gratitude to the Government of Costa Rica for hosting the session, the excellent arrangements and the warm hospitality extended. Appreciation was also expressed to the WMO Secretariat and the local Secretariat for the support that had helped in the smooth running of the session. Congratulations were extended to Messrs C. Fuller and P. Manso on their election as president and vice-president, respectively.

21.2 The representative of the Secretary-General thanked the Government and people of Costa Rica, as well as the Director of the National Institute of Meteorology and his staff for the excellent arrangements and kind hospitality. He congratulated the participants for a job well done, under the leadership of the president and vice-president. He expressed thanks for the session's willingness to try new ways to make the session more effective and efficient. He stated that the Secretariat would provide the necessary support to see to the implementation of the session's decisions.

21.3 Mr P. Manso, on behalf of the host country, expressed the hope that the participants had had a comfortable and memorable stay in Costa Rica. He expressed his thanks to all those who had done their part in ensuring the success of the session.

21.4 In his closing remarks, Mr A. Dania, president of RA IV, expressed his appreciation to the participants and the supporting staff for their cooperation, which had enabled an excellent session. He felt that a number of challenges had been addressed during the session and indeed over the eight years of his term of office. He indicated his commitment to continue working in the interests of the Region. He wished the participants a safe journey.

21.5 The fourteenth session of Regional Association IV (North America, Central America and the Caribbean) closed at 12.03 on 13 April 2005.

RESOLUTIONS ADOPTED BY THE SESSION

RESOLUTION 1 (XIV-RA IV)

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

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) Resolution 2 (Cg-XIV) — World Weather Watch Programme for 2004-2007,

(2) Resolution 5 (Cg-XIV) — WMO Space Programme,

(3) Resolution 25 (Cg-XIV) — Sixth WMO Long-term Plan (2004–2011),

(4) The report of the chairperson of the Working Group on Planning and Implementation of the WWW in Region IV,

CONSIDERING:

(1) That World Weather Watch (WWW) data and products are of vital importance to Members of RA IV to meet existing and new requirements for meteorological services,

(2) That the implementation of the WWW in the Region needs to be kept under constant review,

(3) That the introduction of the new concepts and technology into the WWW 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,

DECIDES:

(1) To establish a Working Group on Planning and Implementation of the WWW in Region IV 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 action to be carried out under the WWW and on the need for external support, where required;

(*b*) To keep under review the action taken under the Sixth WMO Long-term Plan with a view to updating and further developing the WWW 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, observing techniques, telecommunications and codes, 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 to propose measures and procedures as appropriate to meet those needs for information from within and outside the Region;

(*f*) To promote 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 Subgroup on Regional Aspects of the Global Telecommunication Systems 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 and Forecasting System;

(*d*) A Rapporteur on Regional Aspects of Public Weather Services;

(*e*) Other experts as nominated by Members;

with the terms of reference of the subgroup and rapporteurs as indicated in the annex to this resolution,

(3) To designate, in accordance with Regulation 32 of the WMO General Regulations, Mr F. Sambula (British Caribbean Territories) as chairperson of the working group and Mr F. Branski (United States) as coordinator of the subgroup,

(4) To invite:

(*a*) Mr W. Stolz (Costa Rica) to serve as Rapporteur on the Regional Aspects of the Global Observing System;

(*b*) Mr L. Lefebre (Canada) to serve as Rapporteur on the Regional Aspects of the Global Data Processing and Forecasting System;

(*c*) Mr E. Moolchan (Trinidad and Tobago) to serve as Rapporteur on the Regional Aspects of Public Weather Services;

(*d*) To invite Members to nominate experts to serve on the working group and on the subgroup;

(*e*) To request the chairperson 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 (XIII-RA IV), which is no longer in force.

ANNEX TO RESOLUTION 1 (XIV-RA IV)

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

The terms of reference of the subgroup and rapporteurs nominated under Resolution 1 (XIV-RA IV) are as follows:

(*a*) Subgroup on Regional Aspects of the Global Telecommunication System (GTS) and Data Management (DM):
- (i) To keep under review the organizational, technical and procedural aspects of the GTS in the Region;
- (ii) To keep under review the status of implementation and operation of the Regional Meteorological Telecommunication Network (RMTN), including in particular routing arrangements for the exchange of observational data and processed information within the Region and with other Regions;
- (iii) To keep under review both real-time and non real-time WWW monitoring activities pertaining to the GTS in the Region;
- (iv) To keep abreast of developments in telecommunication techniques, procedures and equipment, including in particular satellite-based telecommunication services, and to study their applicability, as appropriate, to the RMTN;
- (v) To formulate recommendations for the further development and upgrading of the RMTN;
- (vi) To formulate recommendations for the coordination of the implementation of telecommunication and data management facilities and techniques;
- (vii) To promote regional contribution in the framework of the development of the Future WMO Information System (FWIS);
- (viii) To keep under review data and information presentation, including exchange formats and codes, and conversion between formats and codes, especially the regional migration plan to Table Driven Code Forms, and make recommendations;
- (ix) To keep under review data and product selection, and presentation to recipients (NMCs);
- (x) To review procedures for the reception of WWW data and products in case of major outages of key facilities;
- (xi) To advise and report to the chairperson of the working group on all matters concerning the regional aspects of the GTS and DM in the Region;
- (xii) To represent the Region on the Commission for Basic Systems (CBS) Implementation-Coordination Team on Information Systems and Services.

(*b*) Rapporteur on Regional Aspects of the Global Observing System (GOS):
- (i) To review and advise on the observational data requirements of Members of RA IV in the context of the WWW Programme and WMO Space Programme in the Sixth WMO Long-term Plan;
- (ii) To review and advise on the design and implementation of the Regional Basic Synoptic Network (RBSN) and Regional Basic Climatological Network (RBCN) of surface and upper-air stations;
- (iii) 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 and to review the exchange of weather radar data within the Region;
- (iv) To advise and report to the chairperson of the working group on all matters concerning regional aspects of the GOS;
- (v) To represent the Region on the CBS Implementation-Coordination Team on the Integrated Observing Systems.

(*c*) Rapporteur on Regional Aspects of the Global Data-processing and Forecasting System (GDPFS):
- (i) 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;
- (ii) To formulate recommendations for coordinated implementation of data-processing and forecasting facilities and techniques at GDPFS and other centres and, if required, for multi-purpose use;
- (iii) To advise and report to the chairperson of the working group on all matters concerning data-processing and forecasting activities in the Region;
- (iv) To represent the Region on the CBS Implementation-Coordination Team on Data-processing and Forecasting Systems.

(*d*) Rapporteur on Regional Aspects of Public Weather Services (PWS):
- (i) To keep under review the implementation of the Public Weather Services Programme in Region IV;
- (ii) To advise the chairperson of the working group on matters relating to the formulation, presentation and dissemination of forecasts and warnings and to the establishment of good relations with the media and the private sector;
- (iii) To keep under review education and training requirements related to the PWS Programme;
- (iv) To keep under review, in coordination with the Rapporteur on the Regional Aspects of the GDPFS, 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.

RESOLUTION 2 (XIV-RA IV)

REGIONAL BASIC SYNOPTIC NETWORK

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) Resolution 2 (XIII-RA IV) – Regional Basic Synoptic Network,

(2) The *Manual on the Global Observing System* (WMO-No. 544), Volume I, Part III, Regulations 2.1.3.1 - 2.1.3.5 and the definition of the Regional Basic Synoptic Networks,

(3) 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 (RBSN) 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 the 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 RBSN stations in accordance with the procedures laid down in the *Manual on the Global Observing System*, Volume II – Regional Aspects, Region IV (North America, Central America and the Caribbean).

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

ANNEX TO RESOLUTION 2 (XIV-RA IV)

Index No.	Station Name	Observations
ANTIGUA AND BARBUDA		
78862	VC BIRD INTL AIRPORT ANTIGUA	S
BAHAMAS		
78062	FREEPORT, GRAND BAHAMA	S
78065	MARSH HARBOR, ABACO	S
78069	SOUTH BIMINI, BIMINI	S
78073	NASSAU AIRPORT, NEW PROVIDENCE	S
78073	NASSAU AIRPORT, NEW PROVIDENCE	W R
78075	NORTH ELEUTHERA, ELEUTHERA	S
78080	ROCK SOUND, ELEUTHERA	S
78086	THE BIGHT, CAT ISLAND	S
78089	COCKBURN TOWN, SAN SALVADOR	S
78091	MOSS TOWN, EXUMA	S
78094	DEADMAN'S CAY, LONG ISLAND	S
78101	DUNCAN TOWN, RAGGED ISLAND	S
78103	COLONEL HILL, CROOKED ISLAND	S
78120	MATTHEW TOWN, INAGUA	S
BARBADOS		
78954	GRANTLEY ADAMS	S
78954	GRANTLEY ADAMS	W R

Index No.	Station Name	Observations
BELIZE		
78583	BELIZE/PHILLIP GOLDSTON INTL AIRPORT	S
78583	BELIZE/PHILLIP GOLDSTON INTL AIRPORT	W R
78596	HUNTING CAYE	S
BERMUDA		
78016	BERMUDA INTL AIRPORT	S
78016	BERMUDA INTL AIRPORT	W R
CANADA		
71043	NORMAN WELLS A, NWT	S
71043(1)	NORMAN WELLS UA, NWT	W R
71045	TESLIN (AUT), YT	S
71050	PUNTZI MOUNTAIN (AUT), BC	S
71066	HIGH LEVEL A, ALTA	S
71068	PEACE RIVER A, ALTA	S
71069	SLAVE LAKE A, ALTA	S
71076	URANIUM CITY (AUT), SASK	S
71077	BUFFALO NARROWS (AUT), SASK	S
71078	LYNN LAKE A, MAN	S
71079	THOMPSON A, MAN	S

Index No.	Station Name	Observations
71081	HALL BEACH A, NU	S
71081(1)	HALL BEACH UA, NU	W R
71082	ALERT, NU	S
71082(1)	ALERT UA, NU	W R
71083	RANKIN INLET A, NU	S
71090	CLYDE A, NU	S
71091	LONGSTAFF BLUFF, NU	S
71092	DEWAR LAKES, NU	S
71093	CAPE HOOPER, NU	S
71094	CAPE DYER, NU	S
71095	POND INLET A, NU	S
71101	SANDSPIT A, BC	S
71104	WILLIAMS LAKE A, BC	S
71109	PORT HARDY A, BC	S
71109(1)	PORT HARDY UA, BC	W R
71114	HOPE, BC	S
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71119	EDMONTON STONY PLAIN, ALTA	W R
71120	COLD LAKE A, ALTA	S
71122	BANFF CS, ALTA	S
71123	EDMONTON INTL A, ALTA	S
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71129	KINDERSLEY A, SASK	S
71130	NIPAWIN A, SASK	S
71131	EASTEND CYPRESS (AUT), SASK	S
71135	ROCKGLEN (AUT), SASK	S
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71145	ISLAND LAKE A, MAN	S
71182	CHURCHILL FALLS, NFLD	S
71185	DANIELS HARBOUR, NFLD	S
71187	BAIE COMEAU A, QUE	S
71196	BONAVISTA, NFLD	S
71197	PORT AUX BASQUES, NFLD	S
71199	WATSON LAKE A, YT	S
71207	SQUAMISH, BC	S
71397	GREENWOOD A, NS	S
71400	BADGER (AUT), NFLD	S
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71411	WESTERN HEAD (AUT), NS	S
71421	LAC EON (AUT), QUE	S
71433	CARIBOU ISLAND (AUT), ONT	S
71435	UPSALA (AUT), ONT	S
71441	GRETNA (AUT), MAN	S
71443	SWAN RIVER (AUT), MAN	S
71447	MELITA, MAN	S
71467	SACHS HARBOUR, NWT	S
71470	LUPIN CS, NU	S
71474	CLINTON (AUT), BC	S
71510	ROSETOWN EAST, SASK	S
71600	SABLE ISLAND, NS	S
71600	SABLE ISLAND, NS	W R
71603	YARMOUTH A, NS	S
71603(1)	YARMOUTH UA, NS	W R
71607	ST STEPHEN (AUT), NB	S
71610	SHERBROOKE A, QUE	S
71621	TRENTON A, ONT	S

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71628	OTTAWA MACDONALD-CARTIER INTL A, ONT	S
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71706	CHARLOTTETOWN A, PEI	S
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71709	ILES DE LA MADELEINE A, QUE	S
71711	CHARLO A, NB	S
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71719	MISCOU ISLAND (AUT), NB	S
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71725	VAL D'OR A, QUE	S
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71728	ROBERVAL A, QUE	S
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71731	NORTH BAY A, ONT	S
71733	GORE BAY A, ONT	S
71735	EARLTON A, ONT	S
71738	WAWA A, ONT	S
71739	TIMMINS A, ONT	S
71749	THUNDER BAY A, ONT	S
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71801	ST JOHN'S A, NFLD	S
71801(1)	ST JOHN'S UA, NFLD	W R
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71803	GANDER INTL A, NFLD	S
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71810	PORT MENIER (AUT), QUE	S
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71813	NATASHQUAN A, QUE	S
71814	CHEVERY (AUT), QUE	S
71815	STEPHENVILLE A, NFLD	S
71815(1)	STEPHENVILLE UA, NFLD	W R
71816	GOOSE A, NFLD	S
71816(1)	GOOSE UA, NFLD	W R
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71821	MATAGAMI, QUE	S
71822	CHIBOUGAMAU, QUE	S
71823	LA GRANDE IV UA, QUE	W R
71825	WABUSH LAKE A, NFLD	S
71827	LA GRANDE RIVIERE A, QUE	S
71828	SCHEFFERVILLE A, QUE	S
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71834	GERALDTON A, ONT	S
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71836(1)	MOOSONEE UA, ONT	W R
71841	ARMSTRONG A AUT, ONT	S
71842	SIOUX LOOKOUT A, ONT	S

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71845	PICKLE LAKE A, ONT	S
71845(1)	PICKLE LAKE UA, ONT	W R
71850	KENORA A, ONT	S
71854	RED LAKE A, ONT	S
71855	DAUPHIN A, MAN	S
71856	GIMLI INDUSTRIAL PARK, MAN	S
71858	GRAND RAPIDS (AUT), MAN	S
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71862	ESTEVAN A, SASK	S
71864	MOOSE JAW A, SASK	S
71865	WYNYARD (AUT), SASK	S
71866	SASKATOON A, SASK	S
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71867(1)	THE PAS UA, MAN	W R
71868	HUDSON BAY, SASK	S
71869	PRINCE ALBERT A, SASK	S
71870	SWIFT CURRENT A, SASK	S
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71872	MEDICINE HAT A, ALTA	S
71874	LETHBRIDGE A, ALTA	S
71876	NORTH BATTLEFORD A, SASK	S
71876	NORTH BATTLEFORD A, SASK	W R
71877	CALGARY INTL A, ALTA	S
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71880	CRANBROOK A, BC	S
71881	EDSON A, ALTA	S
71882	REVELSTOKE, BC	S
71883	BLUE RIVER CS, BC	S
71889	PENTICTON A, BC	S
71892	VANCOUVER INTL A, BC	S
71893	COMOX A, BC	S
71894	ESTEVAN POINT CS, BC	S
71896	PRINCE GEORGE A, BC	S
71897	MCINNES ISLAND, BC	S
71898	PRINCE RUPERT A, BC	S
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71902	NAIN A, NFLD	S
71905	KUUJJUARAPIK A, QUE	S
71906	KUUJJUAQ A, QUE	S
71906(1)	KUUJJUAQ UA, QUE	W R
71907	INUKJUAK A, QUE	S
71907(1)	INUKJUAK UA, QUE	W R
71908	PRINCE GEORGE UA, BC	W R
71909	IQALUIT A, NU	S
71909(1)	IQALUIT UA, NU	W R
71910	CAPE DORSET A, NU	S
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71912	GILLAM A, MAN	S
71913	CHURCHILL A, MAN	S
71913(1)	CHURCHILL UA, MAN	W R
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71915(1)	CORAL HARBOUR UA, NU	W R
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71926(1)	BAKER LAKE UA, NU	W R
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71933	FORT CHIPEWYAN A, ALTA	S
71934	FORT SMITH A, NWT	S
71934(1)	FORT SMITH UA, NWT	W R
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71945	FORT NELSON A, BC	S
71945(1)	FORT NELSON UA, BC	W R
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71950	SMITHERS A, BC	S
71957	INUVIK A, NWT	S
71957(1)	INUVIK UA, NWT	W R
71958	DEASE LAKE, BC	S
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71964(1)	WHITEHORSE UA, YT	W R
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78384	OWEN ROBERTS AIRPORT GRAND CAYMAN	W R
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78825	CLIPPERTON	S
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80001	SAN ANDRES (ISLA)/ SESQUICENTENARIO	W R
80002	PROVIDENCIA (ISLA)/EL EMBRUJO	S
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78762	JUAN SANTAMARIA INTL AIRPORT	W R
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78324	PUNTA DEL ESTE	S
78325	CASA BLANCA, LA HABANA	S
78328	VARADERO	S
78333	PLAYA GIRON, MATANZAS	S
78344	CANTARRANA	S
78345	JUCARO	S
78348	CAIBARIEN	S
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78486	SANTO DOMINGO	W R
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78662	SAN SALVADOR	S
78663	SAN SALVADOR/ILOPANGO	S
78666	EL SALVADOR INTL AIRPORT COMALAPA	S
78670	SAN MIGUEL/UES	S
78672	LA UNION/CPI	S
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78958	POINT SALINES AIRPORT	S
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78890	LA DESIRADE	S
78894	GUSTAVIA, ST BARTHELEMY	S
78897	LE RAIZET, GUADELOUPE	S
78897	LE RAIZET, GUADELOUPE	W R
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78627	HUEHUETENANGO	S
78629	QUETZALTENANGO	S
78631	COBÁN A V	S
78637	PUERTO BARRIOS	S
78639	RETALHULEU	S
78641	AEROPUERTO LA AURORA	S
78647	SAN JOSE	S
78649	LA FRAGUA, ZACAPA	S
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78409	CAP-HAITIEN	S
78447	ES CAYES	S
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78501	ISLAS DEL CISNE	S
78701	GUANAJA	S
78705	LA CEIBA (AIRPORT)	S
78706	TELA	S
78707	YORO	S
78708	LA MESA (SAN PEDRO SULA)	S
78711	PUERTO LEMPIRA	S
78714	CATACAMAS	S
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78720	TEGUCIGALPA	S
78720	TEGUCIGALPA	W R
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78397	KINGSTON/NORMAN MANLEY	W R
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78922	CARAVELLE	S
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76342	MONCLOVA, COAH	S
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76390	SATILLO COAH	S
76393	MONTERREY, NL	S
76394	AEROP INTL MONTERREY, NL	W R
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76405	LA PAZ, BCS	S
76405	LA PAZ, BCS	W R
76412	CULIACAN, SIN	S
76423	DURANGO, DGO	S
76458	COLONIA JUAN CARRASCO MAZATLAN, SIN	S

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76491	CIUDAD VICTORIA, TAMPS	S
76499	SOTO LA MARINA, TAMPS	S
76525	ZACATECAS, ZAC(LA BUFA, ZAC)	S
76539	SAN LUIS POTOSI, SLP	S
76543	TAMUIN, SLP	S
76548	TAMPICO, TAMPS	S
76556	TEPIC, NAY	S
76577	GUANAJUATO, GTO	S
76581	RIO VERDE, SLP	S
76585	MATLAPA, SLP	S
76612	GUADALAJARA, JAL	S
76640	TUXPAN, VER	S
76644	AEROP INTL MERIDA, YUC	S
76644	AEROP INTL MERIDA, YUC	W R
76647	VALLADOLID, YUC	S
76654	MANZANILLO, COL	S
76654	MANZANILLO, COL	W R
76656	CIUDAD GUZMAN, JAL	S
76665	MORELIA, MICH	S
76675	TOLUCA, MEX	S
76679	AEROP INTL MEXICO, DF	W R
76685	PUEBLA, PUE	S
76687	JALAPA, VER	S
76692	HACIENDA YLANG YLANG VERACRUZ, VER	S
76692	HACIENDA YLANG YLANG VERACRUZ, VER	W R
76695	CAMPECHE, CAMP	S
76698	FELIPE CARRILLO PUERTO, QR	S
76726	CUERNAVACA, MOR	S
76737	ORIZABA, VER	S
76743	VILLAHERMOSA, TAB	S
76750	CHETUMAL, QR	S
76762	CHILPANCINGO, GRO	S
76805	ACAPULCO, GRO	S
76805	ACAPULCO, GRO	W R
76845	SC DE LAS CASAS, CHIS	S
76848	COMITAN, CHIS	S
76855	PUERTO ANGEL, OAX	S
76903	TAPACHULA, CHIS	S
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78866	JULIANA AIRPORT, ST MAARTEN	S
78866	JULIANA AIRPORT, ST MAARTEN	W R
78873	ROOSEVELT AIRPORT ST EUSTATIUS	S
78982	QUEEN BEATRIX AIRPORT, ARUBA	S
78988	HATO AIRPORT, CURACAO	S
78988(1)	HATO AIRPORT, CURACAO	W R
78990	FLAMINGO AIRPORT, BONAIRE	S
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78730	PUERTO CABEZAS	S
78733	RIVAS	S
78734	JINOTEGA	S
78735	JUIGALPA	S
78739	CHINANDEGA	S
78741	MANAGUA AC SANDINO	S
78741	MANAGUA AC SANDINO	W R
78745	BLUEFIELDS	S
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78792	TOCUMEN	S
78793	DAVID	S
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78526	SAN JUAN/INTL, PUERTO RICO	W R
78543	C AMALIE/TRUMAN, ST THOMAS	S
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*****	41002 (32 18N, 75 18W)	S
*****	41010 (28 54N, 78 30W)	S
*****	42001 (26 00N, 90 00W)	S
*****	42002 (25 53N, 93 34W)	S
*****	42003 (25 56N, 89 55W)	S
*****	42019 (27 54N, 95 00W)	S
*****	42036 (28 31N, 84 31W)	S
*****	42039 (28 47N, 86 02W)	S
*****	44004 (39 00N, 70 00W)	S
*****	44011 (41 05N, 66 35W)	S
*****	44137 (41 39N, 59 57W)	S
*****	44138 (44 16N, 53 37W)	S
*****	46001 (56 00N, 148 00W)	S
*****	46002 (42 30N, 130 00W)	S
*****	46003 (52 00N, 156 00W)	S
*****	46004 (51 00N, 136 00W)	S
*****	46005 (46 00N, 131 00W)	S
*****	46006 (41 00N, 138 00W)	S
*****	46014 (39 13N, 123 58W)	S
*****	46035 (59 55N, 117 49W)	S
*****	46036 (48 21N, 133 55W)	S
*****	46059 (37 59N, 130 00W)	S
*****	46184 (53 54N, 138 52W)	S
*****	46207 (50 52N, 129 55W)	S
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78947	GEORGE FL CHARLES AIRPORT	S
78948	HEWANORRA INTL AIRPORT	S
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71805	SAINT-PIERRE	S
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78970	PIARCO INTL AIRPORT, TRINIDAD	W R

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72201	KEY WEST/INTL, FL	W R
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72202(1)	MIAMI, FL	W R
72203	WEST PALM BEACH/ INTL FL	S
72205	ORLANDO/JETPORT FL	S
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72206	JACKSONVILLE/INTL, FL	W R
72207	SAVANNAH/MUNICIPAL, GA	S
72208	CHARLESTON/MUN, SC	S
72208	CHARLESTON/MUN, SC	W R
72210	TAMPA BAY AREA, FL	W R
72211	TAMPA/INT, FL	S
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72214	TALLAHASSEE/MUN, FL	W R
72215	PEACHTREE CITY, GA	W R
72217	MACON/LEWIS BWILSON, GA	S
72218	AUGUSTA/BUSH FIELD, GA	S
72219	ATLANTA/MUN, GA	S
72220	APALACHICOLA/MUN, FL	S
72223	MOBILE/BATES FIELD, AL	S
72226	MONTGOMERY/DANNELLY, AL	S
72230	SHELBY COUNTY AIRPORT, AL	W R
72231	NEW ORLEANS/MOISANT INTL, LA	S
72233	SLIDELL/MUN LA	W R
72234	MERIDIAN/KEY, MS	S
72235	JACKSON/ALLEN C THOMPSON FIELD, MS	S
72235	JACKSON/ALLEN C THOMPSON FIELD, MS	W R
72240	LAKE CHARLES/MUN, LA	S
72240	LAKE CHARLES/MUN, LA	W R
72243	HOUSTON/INTERCONTINENTAL, TX	S
72248	SHREVEPORT/REG, LA	S
72248	SHREVEPORT/REG, LA	W R
72249	FT WORTH, TX	W R
72250	BROWNSVILLE/INTL, TX	S
72250	BROWNSVILLE/INTL, TX	W R
72251	CORPUS CHRISTI/INTL, TX	S
72251	CORPUS CHRISTI/INTL, TX	W R
72253	SAN ANTONIO/INTL, TX	S
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72255	VICTORIA/VICTORIA REGIONAL, TX	S
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72261	DEL RIO/INTL, TX	S
72261	DEL RIO/INTL, TX	W R
72263	SAN ANGELO/MATHIS, TX	S
72265	MIDLAND/MIDLAND REG AIR TERM, TX	S
72265	MIDLAND/MIDLAND REG AIR TERM, TX	W R
72266	ABILENE/MUN, TX	S
72267	LUBBOCK/LUBBOCK INTL, TX	S
72268	ROSWELL/INDUSTRIAL AIR CENTER, NM	S
72270	EL PASO/INTL, TX	S
72271	TRUTH OR CONSEQUENCES, NM	S
72274	TUCSON/INTL, AZ	S
72274	TUCSON/INTL, AZ	W R
72278	PHOENIX/SKY HARBOR, INTL, AZ	S
72280	YUMA/YUMA INTL, AZ	S
72290	SAN DIEGO/LINDBERGH, CA	S
72293	SAN DIEGO/MIRAMAR, NAS, CA	W R
72295	LOS ANGELES/INTL, CA	S
72302	WILMINGTON, NC	S
72304	CAPE HATTERAS, NC	S
72305	NEWPORT, NC	W R
72308	NORFOLK/INTL, VA	S
72310	COLUMBIA, SC	S
72311	ATHENS/MUN, GA	S
72312	GREENVILLE/GREENVILLE SPARTANBURG, SC	S
72314	CHARLOTTE/DOUGLAS, NC	S
72317	GREENSBORO/G-HIGH PT, NC	S
72317	GREENSBORO/G-HIGH PT, NC	W R
72318	BLACKSBURG, VA	W R
72323	HUNTSVILLE/MADISON CO, AL	S
72324	CHATTANOOGA/LOVELL FIELD, TN	S
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72327	NASHVILLE/METROPOLITAN, TN	S
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72340	LITTLE ROCK/ADAMS FLD, AR	S
72340	LITTLE ROCK/ADAMS FLD, AR	W R
72344	FORT SMITH/MUN, AR	S
72351	WICHITA FALLS/SHEPS AFB/ WICHITA FALLS/MUN, TX	S
72353	OKLAHOMA CITY/W ROGERS WORLD, OK	S
72356	TULSA/INTL, OK	S
72357	NORMAN/MAX WESTHEIMER A, OK	W R
72360	CLAYTON/MUN, NM	S
72363	AMARILLO/INTL, TX	S
72364	SANTA TERESA, NM	W R
72365	ALBUQUERQUE/INTL, NM	S
72365	ALBUQUERQUE/INTL, NM	W R
72370	KINGMAN/MOHAVE COUNTY A, AZ	S
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72384	BAKERSFIELD/MEADOWS, CA	S
72386	LAS VEGAS/MCCARRAN, NV	S
72387	MERCURY/DESERT ROCK, NV	S
72387	MERCURY/DESERT ROCK, NV	W R
72389	FRESNO/AIR TERM, CA	S
72389	FRESNO/AIR TERM, CA	W R
72394	SANTA MARIA, CA	S
72401	RICHMOND/BYRD, VA	S
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72403	STERLING, VA	W R
72403(1)	WASHINGTON/DULLES INTL, VA	S

Index No.	Station Name	Observations
72407	ATLANTIC CITY, NJ	S
72408	PHILADELPHIA/INTL, PA	S
72411	ROANOKE/MUN, VA	S
72412	BECKLEY (RALEIGH CTY MEMORIAL AIRPORT), WV	S
72414	CHARLESTON/KANAWHA, WV	S
72417	ELKINS/ELKINS-RANDOLPH CO, WV	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
72429(1)	SULPHUR GROVE, OH	W R
72432	EVANSVILLE/REG, IN	S
72434	ST LOUIS/LAMBERT, ST LOUIS INTL, MO	S
72435	PADUCAH, KY	S
72438	INDIANAPOLIS/I-MUN/WEIR COOK, IN	S
72440	SPRINGFIELD/MUN, MO	S
72440	SPRINGFIELD/MUN, MO	W R
72445	COLUMBIA/REGIONAL, MO	S
72446	KANSAS CITY, INTL, MO	S
72450	WICHITA/MID-CONTINENT, KS	S
72451	DODGE CITY/MUN, KS	S
72451	DODGE CITY/MUN, KS	W R
72456	TOPEKA/MUN, KS	S
72456	TOPEKA/MUN, KS	W R
72458	CONCORDIA/BLOSSER MUN, KS	S
72462	ALAMOSA, CO	S
72464	PUEBLO/MEMORIAL, CO	S
72465	GOODLAND/RENNER FIELD/ GOODLAND/MUN, KS	S
72469	DENVER/STAPLETON INTL, CO	W R
72475	MILFORD MUNICIPAL, UT	S
72476	GRAND JUNCTION/WALKER FIELD, CO	S
72476	GRAND JUNCTION/WALKER FIELD, CO	W R
72480	BISHOP, CA	S
72486	ELY/YELLAND, NV	S
72488	RENO/INTL, NV	S
72489	RENO, NV	W R
72492	STOCKTON/METROPOLITAN CA	S
72493	OAKLAND/METROP OAKLAND INTL, CA	W R
72494	SAN FRANCISCO/INTL, CA	S
72501	UPTON, NY	W R
72503	NEW YORK/LA GUARDIA, NY	S
72508	HARTFORD/BRADLEY INTL, CT	S
72509	BOSTON/LOGAN INTL, MA	S
72514	WILLIAMSPORT/LYCOMING COUNTY, PA	S
72515	BINGHAMTON/BROOME CO, NY	S
72518	ALBANY COUNTY AIRPORT, NY	S
72518(1)	ALBANY, NY	W R
72519	SYRACUSE/HANCOCK, NY	S
72520	PITTSBURGH/GREATER PITTSBURGH INTL, PA	S
72520	PITTSBURGH/MOON TOWNSHIP, PA	W R
72524	CLEVELAND/CLEVELAND-HOPKINS, OH	S
72526	ERIE/INTL, PA	S
72528	BUFFALO/GREATER BUFFALO INTL, NY	S
72528	BUFFALO/GREATER BUFFALO INTL, NY	W R
72530	CHICAGO/O'HARE, IL	S
72532	PEORIA/GREATER PEORIA MUN, IL	S
72533	FORT WAYNE/MUN, BAER FLD, IN	S
72537	DETROIT/METROPOLITAN, MI	S
72546	DES MOINES/MUN, IA	S
72547	DUBUQUE/MUN, IA	S
72552	GRAND ISLAND/GR IS COUNTY, NE	S
72556	NORFOLK/KARL STEFAN, NE	S
72557	SIOUX CITY/MUN, IA	S
72558	VALLEY, NE	W R
72562	NORTH PLATTE/LEE BIRD, NE	S
72562	NORTH PLATTE/LEE BIRD, NE	W R
72564	CHEYENNE, WY	S
72565	DENVER INTL AIRPORT, CO	S
72567	VALENTINE/MILLER, NE	S
72569	CASPER/NATRONA COUNTY, INTL, WY	S
72570	CRAIG/CRAIG-MOFFAT A, CO	S
72572	SALT LAKE CITY/INTL UT	S
72572	SALT LAKE CITY/INTL UT	W R
72576	LANDER/HUNT, WY	S
72578	POCATELLO/MUN, ID	S
72582	ELKO, NV	W R
72583	WINNEMUCCA/MUN, NV	S
72591	RED BLUFF/MUN, CA	S
72594	EUREKA, CA	S
72597	MEDFORD/MEDFORD-JACKSON COUNTY, OR	S
72597	MEDFORD/MEDFORD-JACKSON COUNTY, OR	W R
72606	PORTLAND/INTL JET PORT, ME	S
72608	EASTPORT, ME	S
72617	BURLINGTON/INTL, VT	S
72632	WHITE LAKE, MI	W R
72634	GAYLORD, MI	W R
72635	GRAND RAPIDS/KENT CO, MI	S
72636	MUSKEGON/COUNTY, MI	S
72637	FLINT/BISHOP, MI	S
72638	HOUGHTON LAKE/ROSCOMMON COUNTY, MI	S
72639	ALPENA/PHELPS COLLINS, MI	S
72640	MILWAUKEE/GEN MITCHELL, WI	S
72641	MADISON/DANE COUNTY REGIONAL WI	S
72644	ROCHESTER/MUN, MN	S
72645	GREEN BAY/A-STRAUBEL, WI	S
72645	GREEN BAY/A-STRAUBEL, WI	W R
72649	CHANHASSEN, MN	W R
72651	SIOUX FALLS/FOSS FIELD, SD	S
72654	HURON/HURON REGIONAL SD	S
72655	STCLOUD/WHITNEY, MN	S
72658	MINNEAPOLIS/STPAUL INTL, MN	S
72659	ABERDEEN/REG, SD	S
72659	ABERDEEN/REG, SD	W R
72662(1)	RAPID CITY WFO, SD	W R

Index No.	Station Name	Observations
72662	RAPID CITY/REGIONAL AIRPORT, SD	S
72666	SHERIDAN/COUNTY, WY	S
72672	RIVERTON, WY	W R
72677	BILLINGS/LOGAN INTL, MT	S
72681	BOISE/MUN, ID	S
72681	BOISE/MUN, ID	W R
72683	BURNS, OR	S
72688	PENDLETON, OR	S
72693	EUGENE/MAHLON SWEET, OR	S
72694	SALEM/MCNARY, OR	S
72694	SALEM/MCNARY, OR	W R
72698	PORTLAND/INTL, OR	S
72712	CARIBOU/MUN, ME	S
72712	CARIBOU/MUN, ME	W R
72745	DULUTH/INTL, MN	S
72747	INTFALLS/FALLS INTL MN	S
72747	INTFALLS/FALLS INTL MN	W R
72753	FARGO/HECTOR FIELD, ND	S
72764	BISMARCK/MUN, ND	S
72764	BISMARCK/MUN, ND	W R
72767	WILLISTON/SLOULIN FIELD INTL, ND	S
72768	GLASGOW/INTL, MT	S
72768	GLASGOW/INTL, MT	W R
72772	HELENA/COUNTY-CITY, MT	S
72773	MISSOULA/JOHNSON-BELL FIELD, MT	S
72776	GREAT FALLS, MT	S
72776	GREAT FALLS, MT	W R
72777	HAVRE/CITY COUNTY, MT	S
72779	KALISPELL/GLACIER PARK INTL, MT	S
72781	YAKIMA/YAKIMA AIR TERMINAL, WA	S
72785	SPOKANE/INTL, WA	S
72786	SPOKANE, WA	W R
72793	SEATTLE/S-TACOMA, WA	S
72797	QUILLAYUTE, WA	S
72797	QUILLAYUTE, WA	W R
74455	DAVENPORT, IA	W R
74560	LINCOLN, IL	W R

Index No.	Station Name	Observations
UNITED STATES OF AMERICA (ALASKA)		
70026	BARROW/W POST W ROGERS	S
70026	BARROW/W POST W ROGERS	W R
70133	KOTZEBUE, RALPH WIEN	S
70133	KOTZEBUE, RALPH WIEN	W R
70174	BETTLES	S
70200	NOME	S
70200	NOME	W R
70219	BETHEL/BETHEL AIRPORT	S
70219	BETHEL/BETHEL AIRPORT	W R
70231	MCGRATH	S
70231	MCGRATH	W R
70261	FAIRBANKS/INTL	S
70261	FAIRBANKS/INTL	W R
70267	FORT GREELY/ALLEN AAF, AK	S
70271	GULKANA/INTL FLD	S
70273	ANCHORAGE/INTL	S
70273	ANCHORAGE/INTL	W R
70308	ST PAUL	S
70308	ST PAUL	W R
70316	COLD BAY	S
70316	COLD BAY	W R
70326	KING SALMON	S
70326	KING SALMON	W R
70340	ILIAMNA/ILIAMNA AIRPORT	S
70350	KODIAK	S
70350	KODIAK	W R
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 (XIV-RA IV)

REGIONAL BASIC CLIMATOLOGICAL NETWORK IN REGION IV

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) Resolution 3 (XIII-RA IV) – Regional Basic Climatological Network,

(2) The report of the fourth session of the Working Group on Planning and Implementation of the WWW in Region IV,

(3) The *Manual on the Global Telecommunication System* (WMO-No. 386), Volume I, Part I, Attachment 1-3, Section 2.4 (i),

CONSIDERING that the Fourteenth WMO Congress welcomed the establishment of Regional Basic Climatological Networks (RBCNs) in all WMO Regions and the Antarctic and urged Members to ensure that their operational observing stations compiled and transmitted the CLIMAT/CLIMAT TEMP messages according to existing regulations,

DECIDES that the stations listed in the annex to this resolution constitute the Regional Basic Climatological Network 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 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 following the procedures laid down for the RBSN in the *Manual on the Global Observing System*, Volume II – Regional Aspects, Region IV (North America, Central America and The Caribbean).

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

ANNEX TO RESOLUTION 3 (XIV-RA IV)

LIST OF STATIONS COMPRISING THE RBCN IN REGION IV

Index No.	Station Name	CLIMAT	CLIMATE TEMP	GSN	GUAN
BAHAMAS					
78073	NASSAU AIRPORT	X	X	X	
BARBADOS					
78954	GRANTLEY ADAMS	X	X	X	X
BELIZE					
78583	BELIZE/PHILLIP GOLDSTON INTL AIRPORT	X	X		X
BERMUDA					
78016	BERMUDA NAVAL	X	X	X	X
CANADA					
71043	NORMAN WELLS A, NWT	X		X	
71066	HIGH LEVEL A, ALTA	X		X	
71069	SLAVE LAKE A, ALTA	X		X	
71074	ISACHSEN (AUT), NU	X		X	
71078	LYNN LAKE A, MAN	X		X	
71079	THOMPSON A, MAN	X		X	
71081	HALL BEACH A, NU	X		X	
71082	ALERT, NU	X		X	
71082(1)	ALERT UA, NU		X		X
71090	CLYDE A, NU	X		X	
71093	CAPE HOOPER, NU	X		X	
71094	CAPE DYER, NU	X		X	
71095	POND INLET A, NU	X		X	
71101	SANDSPIT AWOS, BC	X		X	
71109	PORT HARDY A, BC	X		X	
71120	COLD LAKE A, ALTA	X		X	
71122	BANFF CS, ALTA	X		X	
71160	FORT RELIANCE (AUT), NWT	X		X	
71185	DANIELS HARBOUR, NFLD	X		X	
71197	PORT AUX BASQUES, NFLD	X		X	
71199	WATSON LAKE AUT, YT	X		X	
71467	SACHS HARBOUR, NWT	X		X	
71586	LA RONGE RCS, SASK	X		X	
71600	SABLE ISLAND, NS	X		X	
71603	YARMOUTH A, NS	X		X	
71706	CHARLOTTETOWN A, PEI	X		X	
71713	LA POCATIERE CS, QUE	X		X	
71721	MANIWAKI AIRPORT, QUE	X		X	
71727	BAGOTVILLE A, QUE	X		X	
71733	GORE BAY A, ONT	X		X	

Index No.	Station Name	CLIMAT	CLIMATE TEMP	GSN	GUAN
71803	GANDER INTL A, NFLD	X		X	
71811	SEPT-ILES A, QUE	X		X	
71813	NATASHQUAN A, QUE	X		X	
71816(1)	GOOSE UA, NFLD		X		X
71818	CARTWRIGHT, NFLD	X		X	
71822	CHIBOUGAMAU, QUE	X		X	
71828	SCHEFFERVILLE A, QUE	X		X	
71831	KAPUSKASING A, ONT	X		X	
71836	MOOSONEE A, ONT	X		X	
71836(1)	MOOSONEE UA, ONT		X		X
71842	SIOUX LOOKOUT A, ONT	X		X	
71844	BIG TROUT LAKE READAC, ONT	X		X	
71855	DAUPHIN A, MAN	X		X	
71862	ESTEVAN A, SASK	X		X	
71867	THE PAS A, MAN	X		X	
71869	PRINCE ALBERT A, SAS	X		X	
71870	SWIFT CURRENT A, SAS	X		X	
71872	MEDICINE HAT A, ALTA	X		X	
71887	KAMLOOPS A, BC	X		X	
71894	ESTEVAN POINT CS, BC	X		X	
71905	KUUJJUARAPIK A, QUE	X		X	
71906	KUUJJUAQ A, QUE	X		X	
71907	INUKJUAK A, QUE	X		X	
71909	IQALUIT A, NU	X		X	
71910	CAPE DORSET A, NU	X		X	
71913	CHURCHILL A, MAN	X		X	
71915	CORAL HARBOUR A, NU	X		X	
71917	EUREKA, NU	X		X	
71918	CAM FOUR, NU	X		X	
71924	RESOLUTE CARS, NU	X		X	
71925	CAMBRIDGE BAY A, NU	X		X	
71925(1)	CAMBRIDGE BAY UA, NU		X		X
71926	BAKER LAKE A, NU	X		X	
71932	FORT MCMURRAY A, ALTA	X		X	
71934	FORT SMITH A, NWT	X		X	
71934(1)	FORT SMITH UA, NWT		X		X
71935	HAY RIVER A, NWT	X		X	
71938	KUGLUKTUK A, NU	X		X	
71945	FORT NELSON A, BC	X		X	
71946	FORT SIMPSON A, NWT	X		X	
71950	SMITHERS A, BC	X		X	
71957	INUVIK A, NWT	X		X	
71964	WHITEHORSE A, YT	X		X	
71966	DAWSON, YT	X		X	
71989	MOULD BAY CS, NWT	X		X	
CAYMAN ISLANDS					
78384	OWN ROBERTS AIRPORT	X		X	
COLOMBIA					
80001	SAN ANDRES	X	X	X	
80002	PROVIDENCIA	X			

Index No.	Station Name	CLIMAT	CLIMATE TEMP	GSN	GUAN
COSTA RICA					
78762	JUAN SANTAMARIA	X	X		X
78767	PUERTO LIMON	X		X	
CUBA					
78325	CASABLANCA, LA HABANA	X		X	
78355	CAMAGUEY	X			
DOMINICAN REPUBLIC					
78479	PUNTA CANA	X			
78458	PUERTO PLATA	X			
78486	SANTO DOMINGO	X	X		
EL SALVADOR					
78650	ACAJUTLA	X		X	
78652	LOS ANDES	X			
78655	SANTA ANA/UNICO	X			
78662	SAN SALVADOR	X			
78663	SAN SALVADOR/ ILOPANGO	X			
78672	LA UNION/CPI	X			
GUADELOUPE, ST MARTIN, ST BARTHELEMY (AND OTHER FRENCH ISLANDS IN THE VICINITY)					
78897	LE RAIZET, GUADELOUPE	X	X	X	
78925	LAMENTIN, MARTINIQUE	X			
GUATEMALA					
78640	GUATEMALA	X			
HONDURAS					
78700	AMAPALA	X			
78705	LA CEIBA	X			
78706	TELA	X			
78707	YORO	X			
78708	LA MESA (SAN PEDRO SULA)	X			
78711	PUERTO LEMPIRA	X			
78714	CATACAMAS	X			
78717	SANTA ROSA DE COPAN	X			
78718	NUEVA OCOTOPEQUE	X			
78724	CHOLUTECA	X			
JAMAICA					
78388	MONTEGO BAY/ SANGSTER	X		X	
78397	KINGSTON/NORMAN MANLEY	X	X		X
MEXICO					
76055	SAN FELIPE, BC	X			
76225	CHIHUAHUA, CHIH	X	X		
76243	PIEDRAS NEGRAS, COAH	X			
76256	EMPALME, SON	X			
76305	LORETO, BCS	X			
76311	CHOIX, SIN	X		X	

Index No.	Station Name	CLIMAT	CLIMATE TEMP	GSN	GUAN
76323	HIDALGO DEL PARRAL CHIH	X			
76342	MONCLOVA, COAH	X			
76390	SATILLO COAH	X			
76393	MONTERREY, NL	X		X	
76394	AEROPORT INTL MONTERREY NL		X		
76402	CD CONTITUCION BCS	X			
76405	LA PAZ, BC	X	X	X	
76412	CULIACAN, SIN	X			
76423	DURANGO, DGO	X			
76458	COLONIA JUAN CARRASCO MAZATLAN, SIN	X	X	X	
76471	SOMBRERETE, ZAC	X			
76491	CD VICTORIA, TAMS	X			
76499	SOTO LA MARINA, TAMPS	X			
76525	ZACATECAS, ZAC (LA BUFA ZAC)	X			
76539	SAN LUIS POTOSI, SLP	X			
76543	TAMUIN, SLP	X			
76548	TAMPICO, TAMPS	X			
76556	TEPIC, NAY	X			
76577	GUANAJUATO, GTO	X		X	
76581	RIO VERDE, SLP	X			
76585	MATLAPA, SLP	X			
76593	PROGRESO, YUC	X			
76612	GUADALAJARA, JAL	X			
76640	TUXPAN, VER	X			
76644	AEROP INTL MERIDA YUC	X	X	X	
76647	VALLADOLID, YUC	X			
76654	MANZANILLO, COL	X	X	X	X
76656	CIUDAD GUZMAN, JAL	X			
76665	MORELIA, MICH	X			
76675	TOLUCA, MEX	X			
76679	AEROP INTL MEXICO, DF		X		
76680	MEXICO (CENTRAL), DF	X		X	
76683	TLAXCALA, TLAX	X			
76685	PUEBLA, PUE	X			
76687	JALAPA, VER	X			
76692	HACIENDA YLANG YLANG VERACRUZ, VER	X	X		
76695	CAMPECHE, CAMP	X			
76698	FELIPE CARRILLO PUERTO, Q ROO	X			
76726	CUERNAVACA, MOR	X			
76737	ORIZABA, VER	X			
76743	VILLAHERMOSA, TAB	X			
76750	CHETUMAL, Q ROO	X			
76762	CHILPANCINGO, RO	X			
76805	ACAPULCO, GRO	X	X		
76833	SALINA CRUZ, OAX	X		X	
76845	S CRISTOBAL DE LAS C CHIS	X			
76848	COMITAN, CHIS	X			
76855	PUERTO ANGEL, OAX	X			
76903	TAPACHULA, CHIS	X			
NETHERLANDS ANTILLES AND ARUBA					
78866	JULIANA AIRPORT, ST MAARTEN	X	X		
78988	HATO AIRPORT, CURACAO	X	X	X	X
NICARAGUA					
78741	MANAGUA AC SANDINO	X			
PANAMA					
78792	TOCUMEN	X			
PUERTO RICO & US POSSESSIONS IN THE CARRIBBEAN AREA					
78526	SAN JUAN/INTL, PUERTO RICO	X	X	X	X
TRINIDAD AND TOBAGO					
78970	PIARCO INTL AIRPORT	X	X		
USA					
70026	BARROW WSO AP, AK	X	X	X	X
70086	BARTER ISLAND, AK	X		X	
70133	KOTZEBUE WSO AP, AK	X	X	X	
70200	NOME WSO AP, AK	X	X	X	
70219	BETHEL AIRPORT, AR	X		X	
70231	MCGRATH WSO AP, AK	X		X	
70251	TALKEETHA WSEMO, AK	X		X	
70261	FAIRBANKS, AK	X		X	
70308	ST PAUL ISLAND, WSO, AK	X	X	X	X
70316	COLD BAY WSO AP, AK	X	X	X	
70326	KING SALMON WSO AK	X		X	
70341	HOMER WSO AP, AK	X		X	
70361	YAKUTAT WSO AP, AK	X	X	X	
70398	ANNETTE WSO AP, AK	X	X	X	X
70414	SHEMYA AFG		X		
72201	KEY WEST INTL, FL	X	X	X	X
72202	MIAMI INTL AIRPORT, FL	X			
72203	WEST PALM BEACH, FL	X			
72206	JACKSONVILLE/IMESON, FL	X	X		
72208	CHARLESTONE/ MUNICIPAL, SC	X		X	
72211	TAMPA AP, FL	X		X	
72219	ATLANTA, GA	X			
72226	MONTGOMERY/ DANNELLY, AL	X			
72231	NEW ORLEANS, LA	X		X	
72234	MERIDIAN KEY, MS	X		X	
72247	LONGVIEW, TX	X	X		
72248	SHREVEPORT, LA	X	X	X	
72250	BROWNSVILLE INTL, TX	X	X		X

Index No.	Station Name	CLIMAT	CLIMATE TEMP	GSN	GUAN
72253	SAN ANTONIO INTL, TX	X		X	
72255	VICTORIA/FOSTER, TX	X			
72261	DEL RIO INTL, TX		X		
72263	SAN ANGELO MATHIS, TX	X		X	
72266	ABILENE MUN, TX	X		X	
72270	EL PASO INTL, TX	X		X	
72274	TUCSON INTL, AZ	X		X	
72278	PHOENIX/SKY HARBOR, AZ	X		X	
72290	SAN DIEGO LINDBERGH, CA	X		X	
72293	SAN DIEGO MIRAMAR, CA		X		X
72295	LOS ANGELES INTL	X		X	
72304	CAPE HATTERAS, NC	X		X	
72306	RALEIGH, NC	X		X	
72312	GREENVILLE GR, SC	X		X	
72315	ASHEVILLE MUN, NC	X			
72324	CHATTANOOGA, TN	X		X	
72327	NASHVILLE METROPOLITAN, TN	X			
72327(1)	NASHVILLE/OLD HICKORY, TN		X		
72340	NORTH LITTLE ROCK/AR	X			
72344	FORT SMITH MU, OK	X		X	
72351	WICHITA FALLS, TX	X			
72353	OKLAHOMA CITY/W, OK	X		X	
72360	CLAYTON WSO AP, NM	X		X	
72365	ALBUQUERQUE INTL, NM	X		X	
72386	LAS VEGAS/MCCARRAN, NV	X		X	
72389	FRESNO AP, CA	X		X	
72401	RICHMOND BYRD, VA	X			
72403(1)	STERLING, VA		X		
72405	WASHINGTON NATIONAL, DC	X		X	
72428	COLOMBUS/FORT COLOMBUS, OH	X			
72429	DAYTON/COX MUN, OH	X			
72432	EVANSVILLE, IN	X		X	
72434	ST LOUIS LAMBERT, MO	X			
72438	INDIANAPOLIS, IN	X			
72445	COLUMBIA REGI, MO	X		X	
72451	DODGE CITY MU, KS	X	X	X	X
72458	CONCORDIA, KS	X		X	
72476	GRAND JUNCTION, CO	X		X	
72483	SACRAMENTO EX, CA	X		X	
72486	ELY YELLAND, NV	X		X	
72488	RENO INTL, NV	X			
72494	SAN FRANCISCO/INTL, CA	X			
72501	UPTON, NY		X		
72503	NEW YORK/LA GUARDIA, NY	X			
72507	PROVIDENCE GREEN STATE, RI	X			

Index No.	Station Name	CLIMAT	CLIMATE TEMP	GSN	GUAN
72509	BOSTON/LOGAN INTL, MA	X			
72519	SYRACUSE HANKOCK, NY	X		X	
72520	PITTSBURGH, INTL, PA	X		X	
72520(1)	PITTSBURGH/MOON TOWNSHIP, PA		X		X
72528	BUFFALO/GREATER BUFFALO INTL, NY	X	X		
72532	PEORIA, PL			X	
72535	SOUTH BEND ST JOSEP, IN	X			
72546	DES MOINES/MUN, IA	X		X	
72556	NORFOLK, NE	X		X	
72562	NORTH PLATTE/LEE BIRD, NE	X	X	X	
72569	CASPER NATRONA COUNTY INTL, WY	X			
72572	SALT LAKE MUNICIPAL, UT	X			
72576	LANDER HUNT, WY	X		X	
72578	POCATELLO MUN, ID	X		X	
72583	WINNEMUCCA/MUN, NV	X		X	
72594	EUREKA WSO, CA	X		X	
72597	MEDFORD/MEDFORD-JACKSON COUNTY, OR	X	X		X
72613	MT WASHINGTON, NH	X		X	
72617	BURLINGTON, VT	X		X	
72632	WHITE LAKE, MI		X		
72641	MADISON DONE COUNTY, WI	X			
72654	HURON, SD	X		X	
72658	MINNEAPOLIS WSFO AP, MN	X		X	
72659	ABERDEEN REG, SD		X		
72662	RAPID CITY/REGIONAL	SD	X		
72666	SHERIDAN/COUNTY,	WY	X		X
72681	BOISE/MUN, ID	X		X	
72688	PENDLETON, OR	X		X	
72698	PORTLAND/INTL, OR	X			
72712	CARIBOU/MUN, ME	X		X	
72743	MARQUETTE, MI	X		X	
72745	DULUTH/INTL, MN	X			
72747	INTL FALLS/FALLS INTL, MN	X	X		
72764	BISMARK/MUNICIPAL, N	X	X	X	
72772	HELENA WSO, MT	X		X	
72776	GREAT FALLS, MT	X	X		X
72785	SPOKANE/INTL, WA	X			
72786	SPOKANE, WA		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 (XIV-RA IV)

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

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) The General Summary of the *Abridged Final Report with Resolutions of the Thirteenth Session of Regional Association IV (North and Central America)* (WMO-No. 927),

(2) Resolution 7 (EC-LV) — Report of the thirteenth 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;

(*d*) To provide guidelines for coordination of education and training activities for instrument technicians in collaboration with the Regional Instrument Centres and the WMO Secretariat;

(*e*) To facilitate liaison between CIMO and the Regional Association on matters pertaining to capacity-building in the field of instruments and methods of observation;

(2) To invite the British Caribbean Territories 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 the Association with a copy to the president of CIMO at least six months before the next session of the Association.

Note: This resolution replaces Resolution 5 (XIII-RA IV), which is no longer in force.

RESOLUTION 5 (XIV-RA IV)

RAPPORTEUR ON SOLAR RADIATION

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) The General Summary of the *Abridged Final Report with Resolutions of the Thirteenth Session of Regional Association IV (North and Central America)* (WMO-No. 927),

(2) Resolution 7 (EC-LV) — Report of the thirteenth 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 to update 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 provide guidance to Members on radiation instrumentation, techniques and their effective application and on archiving and presentation of data in better fulfilling the needs for various applications;
(*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 enhanced collaboration with the Baseline Surface Radiation Network (BSRN) operators;
(*f*) To support the coordination of measures in the field of radiation measurement, including UV-B, in the calibration of radiation instrumentation, as well as in education and training;
(*g*) To initiate closer collaboration with the related rapporteur of RA III in fields of common concern;

(2) To invite Ms G. Leon (Colombia) to serve as Rapporteur on Solar Radiation,
(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.

RESOLUTION 6 (XIV-RA IV)

RA IV HURRICANE COMMITTEE

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) Resolution 7 (Cg-XIV) - Tropical Cyclone Programme,
(2) Resolutions of the General Assembly of the United Nations – International Strategy for Disaster Reduction (ISDR),
(3) Decisions of the United Nations Commission on the Sustainable Development of Small Island Developing States (SDSIDS),
(4) With appreciation the final reports of the sessions of the RA IV Hurricane Committee,
(5) Regulations 32 and 35 of the WMO General Regulations,
(6) Sections concerning the Tropical Cyclone Programme under Chapter 6 (WMO Programmes) of the Sixth WMO Long-term Plan (2004 - 2011),

CONSIDERING:

(1) The need for the countries affected by hurricanes to continue to work together and to increase action to reduce the loss of human life and damage caused each year by hurricanes and associated storm surges, floods and landslides,
(2) The need for coordination in the implementation of the regional cooperation programme elaborated by the Hurricane Committee,
(3) The view expressed by the Executive Council that such regional cooperation programmes are the basis for the success of the WMO Tropical Cyclone Programme,
(4) The need to implement projects in the region aimed at achieving the goals of the ISDR and the SDSIDS,

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 tropical cyclone forecast and warning operational procedures as a means of minimizing hurricane damage;
(*b*) To serve as a forum for the 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 forum 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 raising efforts on the meteorological and hydrological effects of hurricanes;

(ii) By stimulating governments to adopt measures to mitigate the potential harmful impacts of hurricanes;

(*g*) To foster cooperative efforts of WMO and other international bodies in those aspects of hurricane disaster preparedness and prevention that 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 chairperson of the RA IV Working Group on Hydrology and the chairperson 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 C. Layne (Barbados)
Mr F. Sambula (British Caribbean Territories)
Mr T. Sutherland (British Caribbean Territories)
Mr C. Fuller (Belize)
Mr M. Henriquez (Colombia)
Mr P. Manso (Costa Rica)
Mr N. Issac (Dominica)
Mr M. Campusano (Dominican Republic)
Ms L. Soriano de Cruz (El Salvador)
Mr J-M. Bonnet (France)
Mr J-N. Degrace (France)
Ms S. McGill (Jamaica)
Mr A. Hernandez Unzon (Mexico)
Mr A. Dania (Netherlands Antilles)
Mr F. Alvarado (Panamá)
Mr T. Auguste (Saint Lucia)
Mr W. Mills (Trinidad and Tobago)
Mr R. Williams (United Kingdom)
Mr L. Avila (United States)

(3) To designate, in accordance with Regulation 32 of the WMO General Regulations, Mr M. Mayfield (United States) as chairperson of the Committee,

(4) To designate Mr J. Rubiera (Cuba) and Mr P. Jeremiah (Antigua and Barbuda) as vice-chairpersons 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 Coordination Centre for Prevention of Natural Disasters in Central America (CEPREDENAC), the United States Office 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 6 (XIII-RA IV), which is no longer in force.

RESOLUTION 7 (XIV-RA IV)

CLIMATE INFORMATION AND PREDICTION SERVICES (CLIPS)

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) Resolution 8 (Cg-XIII) – Climate Information and Prediction Services Project,

(2) That Members of RA IV are contributing to a range of CLIPS activities,

(3) The climatic anomalies, and their impacts, associated with the 1997/1998 El Niño event and the subsequent La Niña event,

CONSIDERING:

(1) That inter-annual climate variability, including, but not restricted to, variability linked to ENSO, substantially impacts on socio-economic activities in the Region,

(2) That effective use of current seasonal to inter-annual 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 inter-annual 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 a Rapporteur on the implementation of the CLIPS Project in the Region, with the following terms of reference:
   (*a*) To act in support of all CLIPS activities within the Region;
   (*b*) To act as Coordinator of defined subregional networks of national CLIPS Focal Points;
   (*c*) To keep abreast of research activities on climate variability in the Region, including especially the activities and plans of World Climate Research Programme (WCRP)/Climate Variability and Predictability (CLIVAR);
   (*d*) To keep abreast of applications research pertaining to climate information and prediction services;
(2) To request the rapporteur to submit annual progress reports to the president of the Association, and final reports not later than six months before XV-RA IV;
(3) To invite Mr S. Burton (British Caribbean Territories) to serve as the Rapporteur on CLIPS,

URGES:

(1) Members to appoint national focal points for CLIPS and to provide them with the facilities necessary to undertake their roles,
(2) 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 rapporteur on the implementation of CLIPS in the Region and to the national CLIPS focal points,
(2) To bring this resolution to the attention of all concerned.

RESOLUTION 8 (XIV-RA IV)

SHOWCASE PROJECTS ON CLIMATE AND HUMAN HEALTH

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

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 the Showcase Project by the Commission for Climatology (CCl) Advisory Working Group (Mauritius, 16–18 February 1998; Reading, United Kingdom, 3–7 April 2000),
(3) The request by Thirteenth Congress to ensure progress in organizing showcase projects as a matter of urgency,
(4) The need to develop and implement climate applications for the protection of life and property,

AGREES THAT:

(1) There is a need to promote the development and implementation of climate and health services, based on proven methodologies, within the Region,
(2) There should be close collaboration and cooperation between the Regional Association and CCl on the activities of the Showcase Projects on Climate and Health,

URGES:

(1) Member countries to identify national contacts on matters concerning the effects of climate on human health,
(2) Donor countries to consider funding showcase projects on climate and health in the Region,

DECIDES:

(1) To appoint three subregional Rapporteurs on Climate and Human Health with the following terms of reference:
   (*a*) To identify potential cities in their subregion for inclusion in the Showcase Projects on Climate and Health and promote the need for such projects to be funded;
   (*b*) To advise on the development of climate and human health projects at the national and regional levels;
   (*c*) To keep abreast of developments of showcase projects in other Regions;
   (*d*) To liaise, as appropriate, with national technical and operational focal points, and relevant bodies involved in the development of the Showcase Projects, including the CCI;
   (*e*) 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 invite Mr J. Garcia (Colombo), Ms A. Gordon (Belize) and Mr P. Ortiz (Cuba) to serve as the rapporteurs.

RESOLUTION 9 (XIV-RA IV)

RAPPORTEUR ON THE WORLD WEATHER RESEARCH PROGRAMME—THORPEX

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

CONSIDERING:

(1) The wide interest in participating in the development and implementation of the THORPEX Programme in the Region,

(2) That the Region should be kept informed of the progress of THORPEX regional plans and activities coordinated by a THORPEX Regional Committee,

DECIDES:

(1) To appoint a Rapporteur on WWRP-THORPEX with the following terms of reference:

(*a*) To serve as a focal point for WWRP-THORPEX in RA IV (North America, Central America and the Caribbean);

(*b*) To encourage and facilitate the participation of the National Meteorological Services (NMS), academia and related agencies of the Region in the activities of North America, Central America and the Caribbean THORPEX Regional Committee;

(*c*) To keep the Association informed on THORPEX activities in the Region in accordance with the THORPEX International Science Plan and the THORPEX International Research Implementation Plan and specific regional activities;

(*d*) To advise and promote, within the Region, an exchange of information and publications relating to THORPEX activities;

(2) To invite Mr D. Parsons (United States) to serve as Rapporteur on WWRP-THORPEX,

(3) To request the rapporteur to submit annual reports, as appropriate, to the president of the Association and a final report not later than six months before the next session of the Association.

RESOLUTION 10 (XIV-RA IV)

WORKING GROUP ON AGRICULTURAL METEOROLOGY

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) Resolution 14 (Cg-XIV) – Agricultural Meteorology Programme,

(2) The General Summary of the *Abridged Final Report with Resolutions and Recommendations of the Thirteenth Session of the Commission for Agricultural Meteorology* (WMO-No. 951),

(3) Resolution 10 (XIII-RA IV) - Working Group on Agricultural Meteorology,

(4) The recommendations made by the session of the RA IV Working Group on Agricultural Meteorology (Bridgetown, Barbados, 14–17 December 2004),

CONSIDERING:

(1) The economic importance of agriculture to the countries in Region IV (North America, Central America and the Caribbean),

(2) That meteorological extreme events continue to increase in frequency and affect the productivity of agriculture, forestry and fisheries in the Region,

(3) That the production and effective dissemination of agrometeorological information and advisories is crucial to enhance the productivity of cereal and cash crops in the Region,

(4) That interpretation of the climate predictor and near real-time weather information is important in improving management decisions, especially irrigation scheduling, for the important crops in the different Caribbean countries, i.e. sugarcane, bananas and vegetables,

(5) That strengthening the linkages with agriculture research and extension services in the Region is crucial in promoting more efficient use of weather and climate information in the Region,

(6) The impact of El Niño Southern Oscillation (ENSO) on agriculture and forestry in the Region,

URGES members:

(1) To undertake studies on applications of seasonal to inter-annual 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,

DECIDES:

(1) To establish a Working Group on Agricultural Meteorology with the following terms of reference:

(*a*) 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;

(*b*) To review and summarize the status of seasonal climate predictions and agrometeorological forecasts to improve management

decisions, especially for pest and disease management and irrigation scheduling, for the important crops in the different Caribbean countries, i.e. sugarcane, bananas and vegetables, and suggest ways and means of enhancing them;

(*c*) To assess the adequacy of the procedures currently used for the dissemination of agrometeorological information and advisories in the Region and suggest the steps to be taken for improvements;

(*d*) To review the current status of linkages between NMHSs and the agriculture research and extension services in the Region and suggest ways and means of improving these linkages to promote the more efficient use of weather and climate information in the Region;

(*e*) To review the impacts of ENSO and climate variability on agriculture and forestry in the Region;

(2) To invite the following experts to serve as members of the working group:
Mr K. Meade (Antigua and Barbuda)
Ms S. Nurse (Barbados)
Mr A. Trotman (British Caribbean Territories)
Mr R. Frutos (Belize)
Mr G. Hurtado (Colombia)
Mr J.A. Retana (Costa Rica)
Ms E. Villegas (Dominican Republic)
Mr R. Zimmermann (El Salvador)
Mr A. Brisson (France)
Mr J. Spooner (Jamaica)
Mr S. Rosalia (Netherlands Antilles)
Ms B. Olmedo (Panamá)
Ms A. Aaron (Trinidad and Tobago)
Mr M. Brusperg (United States of America)
Ms A. Cortez (Venezuela)

(3) To invite Mr O. Solano (Cuba) to act as chairperson of the Working Group on Agricultural Meteorology,

(4) To request the chairperson to allocate responsibilities in consultation with the members of the working group for the various tasks contained in the terms of reference,

(5) To request the chairperson to submit a final report comprising individual reports from members to the president of the Regional Association not later than six months before the next session of the Association.

RESOLUTION 11 (XIV-RA IV)

RAPPORTEURS ON REGIONAL ASPECTS OF THE AERONAUTICAL METEOROLOGY PROGRAMME IN REGION IV

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) The need for monitoring and keeping under review developments in aeronautical meteorology in the Region,

(2) The need for coordination among RA IV Members of activities related to aeronautical meteorology and for reporting these activities to the Region and to the Commission for Aeronautical Meteorology (CAeM),

CONSIDERING that the monitoring, review and coordination of aeronautical meteorological issues would be of great benefit to Members in the Region,

DECIDES:

(1) To appoint Rapporteurs on Regional Aspects of the Aeronautical Meteorological Programme (AeMP) with the following terms of reference:

(*a*) To review and advise on observational data and product requirements of countries in the Region in the context of the AeMP;

(*b*) To review the status of the implementation of the AeMP in the Region, including observing systems at aerodromes, aircraft data collection, and services provided under the World Area Forecast System (WAFS), and to formulate proposals through the WMO Secretariat to the appropriate International Civil Aviation Organization (ICAO) bodies for its future development and implementation;

(*c*) To monitor and promote capacity-building activities related to the AeMP within the Region and to identify training requirements;

(*d*) To keep abreast of matters related to the implementation of the Aircraft Meteorological Data Relay (AMDAR) programmes and projects in the Region;

(*e*) To liaise by correspondence with the CAeM, the Open Programme Area Group (OPAG) and the International Civil Aviation Organization (ICAO) meteorological groups through their respective Secretariats on specific regional matters, in particular, those related to cost recovery of aeronautical meteorological services;

(*f*) To provide advice to the president of RA IV on aeronautical meteorology matters and to take actions in this regard;

(2) To invite Mr F. Hidalgo (Colombia) and Mr M. Perdomo (Venezuela) to serve as Rapporteurs on Regional Aspects of the Aeronautical Meteorology Programme, and

(3) To request the rapporteurs to submit annual reports on their activities to the president of the Association as well as final reports six months before the next session of the Association, copied to the WMO Secretariat.

RESOLUTION 12 (XIV-RA IV)

RAPPORTEUR ON REGIONAL MARINE METEOROLOGICAL AND OCEANOGRAPHIC SERVICES

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

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 the Joint WMO/IOC Commission for Oceanography and Marine Meteorology (JCOMM), in particular, through its programme on Education, Training and Implementation Support, with regard to matters affecting the Region,

DECIDES:

(1) To appoint a Rapporteur on Regional Marine Meteorological and Oceanographic Services with the following terms of reference:

(*a*) To continuously review the status of the implementation of marine meteorological and oceanographic 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 subgroups, in particular, within the programme area of Education, Training and Implementation Support, on specific matters concerning Region IV;

(2) To invite Mr J. Melo (Colombia) to serve as the Rapporteur on Regional Marine Meteorological and Oceanographic 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 thirteenth session of the Association,

REQUESTS the Secretary-General to assist the rapporteur in his work as appropriate.

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

RESOLUTION 13 (XIV-RA IV)

WORKING GROUP ON HYDROLOGY

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) The report of its Working Group on Hydrology,

(2) Resolution 17 (Cg-XIV) - Hydrology and Water Resources Programme,

(3) Resolution 37 (Cg-XIII) – Terms of Reference of the Technical Commissions,

(4) The Sixth WMO Long-term Plan (2004-2011),

(5) Resolution 13 (XIII-RA IV) – Working Group on Hydrology,

CONSIDERING:

(1) That Regional Association IV plays an important and active role in conducting regional WMO activities relating to the Hydrology and Water Resources Programme (HWRP),

(2) That the HWRP is a priority for the Region,

(3) That the Working Group on Hydrology of RA IV has developed important work within the framework of its various subgroups, participating actively during the last intersessional period,

(4) That the Working Group on Hydrology proposed, at its eighth session, continuing with the same activities with the addition of some new topics during the next intersessional period,

DECIDES:

(1) To re-establish the Working Group on Hydrology with the following terms of reference:

(*a*) To provide assistance and advice to the president of the Regional Association on all issues relating to the regional aspects of 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 the resolution in close cooperation with the Commission for Hydrology (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 Hydrological Cycle Observing System (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 Hydrological Operational Multipurpose System (HOMS) national reference centers and of other

bodies working in the field of water, to participate in the Working Group on Hydrology on an ongoing basis and attend its meetings. In selecting such participants, 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. Barrett (United States) 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 J. Mwansa (Barbados)
Mr K. Narayan (British Caribbean Territories)
Mr R. Williams (Belize)
Mr H. Rivera (Colombia)
Mr S. Laporte (Costa Rica)
Ms G. Ceballos (Dominican Republic)
Ms D. López (El Salvador)
Mr B. Thebe (France)
Mr B. Fernández (Jamaica)
Mr A. Acosta (México)
Ms D. Martínez (Panamá)
Mr A. Martis (Netherlands Antilles)
Mr R. Ramdin (Trinidad and Tobago)
Mr J. Diaz (Venezuela)

(5) To establish subgroups 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 subgroups, complementing the annex to the present resolution,

(2) To propose to the president of RA IV nominations for coordinators of the subgroups,

(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 subgroups,

(4) In conjunction with the coordinators of the subgroups, to propose to the president of RA IV those who should become core members of the subgroups,

(5) To participate in Executive Council sessions, if invited, representing the regional interests in relation to hydrology and water resources and to coordinate 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 fifteenth 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 during the whole intersessional period,

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 (XIV-RA IV)

TERMS OF REFERENCE OF THE SUBGROUPS

1 Training and continuing education

(*a*) To define the regional needs in relation to education and training activities;

(*b*) To cooperate in the development of distance learning courses and the use of the Internet for training in the field of hydrology and water resources at different levels (hydrologists and hydrological technicians);

(*c*) To consider training in Integrated Water Resources Management and in Automated System Technology.

2 Hydrological warning systems

(*a*) To organize activities on hydrological forecasting in cooperation with CHy. To prepare a report on the use of flash floods forecasting systems based on global data;

(*b*) To update the report on mathematical models for hydrological forecasting prepared in the previous intersessional period;

(*c*) To promote the standardization of hydrological formats, including the preparation of a report on the various formats used in the Region.

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 with respect to the involvement of various partners identified in the above-mentioned meeting;

(*b*) To cooperate on the implementation of this WHYCOS component taking into account the Guidelines for the development, implementation and governance of components;

(*c*) To prepare a report on sustainability of observing Systems and Hydrological Services in general and to consider these two aspects when cooperating in the development of CARIB-HYCOS.

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;

(*b*) To promote international agreements for the management of transboundary water resources.

RESOLUTION 14 (XIV-RA IV)

RAPPORTEURS ON EDUCATION AND TRAINING MATTERS

THE REGIONAL ASSOCIATION FOR NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN,

NOTING:

(1) Resolution 17 (Cg-XIV) – Education and Training Programme,

(2) The General Summary of the *Abridged Final Report with Resolutions of the Forty-eight Session of the Executive Council* (WMO-No. 846) paragraph 8.6 on the role of rapporteurs appointed by regional associations on education and training matters,

(3) Report of the twenty-first session of the Executive Council Panel of Experts on Education and Training,

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 two Rapporteurs 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 Regional Meteorological Training Centres (RMTCs);

(*c*) To advise on how the identified regional training needs may be satisfied by RMTCs and how to monitor the effectiveness of RMTCs by measurable indicators;

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

(*e*) To identify and prioritize requirements for training materials and recommend the preparation of new training publications;

(*f*) To assess the needs in the training of trainers at national training institutions and WMO RMTCs;

(*g*) To advise on the implementation of the new WMO Classification of Personnel in meteorology and operational hydrology and related curricula;

(*h*) To assist in the development of WMO long-term plans for the implementation of the Education and Training Programme;

(2) To invite Mr H. Burton (British Caribbean Territories) and Ms V. Castro (Costa Rica) to serve as Rapporteurs on Education and Training Matters,

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

RESOLUTION 15 (XIV-RA IV)

WORKING GROUP ON NATURAL DISASTER PREVENTION AND MITIGATION IN REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND CARIBBEAN)

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) Resolution 29 (Cg-XIV) – Natural Disaster Prevention and Mitigation Programme,

(2) The General Summary, paragraphs 7.4.1 to 7.4.21 and 3.4.1.23, of the *Abridged Final Report with Resolutions of the Fourteenth World Meteorological Congress* (WMO-No. 960),

(3) The General Summary, paragraphs 11.1 to 11.13, of the *Abridged Final Report with Resolutions of the Fifty-sixth Session of the Executive Council* (WMO-No. 977),

CONSIDERING:

(1) That natural disaster prevention and mitigation is a major regional concern for human socio-economic activities and environment protection,

(2) That natural disaster reduction activities cover a wide range of programmes of WMO,

(3) That there is a need to establish an effective framework for support regional activities on natural disaster prevention and mitigation,
(4) That there is a need to adequately reflect issues relating to natural disasters of hydrometeorological origin in the World Conference on Disaster Reduction, and to follow-up events thereafter,

DECIDES:
(1) To establish a Working Group on Natural Disaster Prevention and Mitigation in RA IV with the following terms of reference:
   (*a*) To consider natural disaster prevention and mitigation problems within the context of the specific characteristics and needs of the Region and then make recommendations and contribute to the preparation of appropriate and targeted regional plans of action;
   (*b*) To identify and evaluate best practices at regional level on policy and activities related to natural disaster prevention and mitigation;
   (*c*) To coordinate the exchange of information on current best practices at regional and sub-regional levels with the respective network of focal points in natural disasters;
   (*d*) To propose/review regional contingency plans in case of emergency and disaster;
   (*e*) To contribute to the establishment of mechanisms of regional interest;
   (*f*) To evaluate capacity-building needs and priorities at regional level and propose adequate actions;
   (*g*) To contribute actively to the project Disaster Risk Management of Hazards of Hydrometeorological Origin, proposing regional activities, namely, case studies;
   (*h*) To propose mechanisms to coordinate its actions with other regional teams working in natural disaster prevention and mitigation, including tropical cyclone committees, networks of focal points, etc.;
(2) To invite all RA IV Member countries to serve as members of the working group,
   (*a*) To invite Mr C. Costa (Colombia) to act as chairperson and Mr J-M. Bonnet (France) as vice-chairperson;
   (*b*) To request the chairperson to allocate responsibilities in consultation with the members of the working group for the various tasks contained in the terms of reference;
   (*c*) To request the chairperson to submit annual reports, as appropriate, to the president of the Regional Association with a final report to be presented six months prior to the fifteenth session of the Association,

REQUESTS the Secretary-General to take the relevant actions to support the activities of the working group within the available budget.

RESOLUTION 16 (XIV-RA IV)

RAPPORTEUR FOR THE WMO SPACE PROGRAMME

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),
NOTING:
(1) Resolution 5 (Cg-XIV) establishing the WMO Space Programme as a new and major cross-cutting Programme,
(2) Resolution 6 (Cg-XIV) establishing the WMO Consultative Meetings on High-level Policy on Satellite Matters,

RECOGNIZING the importance and great potential available through exploitation of satellite data, products and services from the expanded space-based component of the Global Observing System (GOS) as described in the WMO Space Programme Implementation Plan 2004-2007,
FURTHER RECOGNIZING the need to involve Members in regional implementation activities for the WMO Space Programme,
DECIDES:
(1) To appoint a Rapporteur for the WMO Space Programme with the following terms of reference:
   (*a*) To coordinate with the WMO Space Programme Office on regional aspects of the WMO Space Programme Implementation Plan;
   (*b*) To evaluate the WMO Space Programme Implementation Plan and advise Members on regional activities that will contribute fully to the exploitation of satellite data, products and services;
   (*c*) To coordinate with other Regional WMO Space Programme rapporteurs on relevant Space Programme activities; and
   (*d*) To provide the president of the Association with appropriate information, advice and recommendations for presentation under appropriate agenda items in sessions of technical commissions, joint sessions of the presidents of technical commissions and presidents of regional associations, and the Executive Council;
(2) To invite Dr K. Schrab (United States) to serve as the Rapporteur for the WMO Space Programme,
(3) To request the rapporteur to submit annual reports, as appropriate, to the president of the Association and a final report six months before the next session of the Association.

RESOLUTION 17 (XIV-RA IV)

COORDINATOR ON REGIONAL ASPECTS OF THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS (GEOSS)

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) The G-8 Action Plan on Science and Technology for Sustainable Development (Evian, France, June 2003),

(2) The Declaration from the First Earth Observation Summit held in Washington, D.C., the United States, on 31 July 2003, for improved coordination of observing systems towards a comprehensive, coordinated and sustained Earth Observing System or Systems,

(3) The Communiqué from the Second Earth Observation Summit held in Tokyo, Japan, on 25 April 2004, adopting the Framework Document that describes the principal benefits of Earth observations to a broad range of user communities and the fundamental elements to be included in the 10-Year Implementation Plan for what will henceforth be called a Global Earth Observation System of Systems (GEOSS); and the invitation to the governing bodies of international and regional organizations sponsoring existing Earth observing systems to support the action of the Summit,

(4) Resolution 9 (EC-XLVI) concerning the Global Earth Observation System of Systems (GEOSS),

(5) The Resolution of the Third Earth Observation Summit held in Brussels, Belgium, on 16 February 2005, that endorsed the 10-Year Implementation Plan as the basis for developing the GEOSS to fulfil user requirements among specific socio-economic benefit areas, and established the intergovernmental Group on Earth Observations (GEO) to take those steps necessary to implement GEOSS,

RECOGNIZING the significant opportunity for GEOSS to provide societal benefits, capacity-building and sustainable development through improved observations and a better understanding of the Earth system; its atmosphere; ocean; land surface and fresh water; geology; natural resources; ecosystems; and natural and human-induced hazards; and the vast experience and considerable expertise throughout the Region,

STRESSES the importance of assisting the National Meteorological and Hydrological Services (NMHSs) of developing countries in the Region to participate fully in GEOSS through the provision of information on GEO and GEOSS to their governments, the strengthening of their observing networks, and through the enhancement of their provision of services in support of national social and economic commitments,

URGES:

(1) All Members to build Earth observation partnerships with relevant institutions and agencies both nationally and regionally and to become fully involved in the planning and implementation of GEOSS and to consider becoming a Member of GEO,

(2) WMO Members who are also Members of GEO to provide information on their experiences to date and their future plans with GEO,

(3) All Members in the Region to establish national focal points on GEOSS who should serve as national contacts providing advice and assistance to their governments in their participation in GEOSS and the development of their GEOSS action plans,

ENCOURAGES the Permanent Representatives of Members to work closely with other Earth observation agencies and other relevant bodies at the national level to ensure the development of well-coordinated national plans for GEOSS implementation,

DECIDES:

(1) To appoint a Coordinator on Regional Aspects of GEOSS with the following Terms of Reference:

   (*a*) To keep under review the regional developments relating to GEO and the implementation of GEOSS;

   (*b*) In working with and through national focal points on GEOSS, coordinate the provision of advice to Members on the mechanism to join GEO and to develop their national and international action plan in the framework of the GEOSS 10-year Implementation Plan including the building Earth observation partnerships;

   (*c*) To evaluate the GEOSS Implementation Plan and advise Members in the Region on regional activities that will contribute to the development and implementation of GEOSS, including enhanced operation of the World Weather Watch and other WMO-sponsored and jointly-sponsored observing systems and components relevant to GEOSS;

   (*d*) To coordinate with other Regional GEOSS rapporteurs/coordinators on relevant GEOSS activities;

   (*e*) To provide the president of the Association with appropriate information, advice and recommendations for presentation under appropriate agenda items in sessions of technical commissions, joint sessions of the presidents of technical commissions and presidents of regional associations, and the Executive Council; and

   (*f*) To inform the WMO Secretariat on a regular basis of regional GEOSS activities;

(2) To invite Mr N. Kawas (Honduras) to serve as the Coordinator on the Regional Aspects of GEOSS,

(3) To request the coordinator to submit annual reports, as appropriate, to the president of the Association and a final report six months before the next session of the Association.

RESOLUTION 18 (XIV-RA IV)

MANAGEMENT GROUP OF THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN) (RA IV MG)

REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING:

(1) The General Summary of the *Abridged Final Report with Resolutions of the Fourteenth World Meteorological Congress* (WMO-No. 960),

(2) The *Abridged Final Report with Resolutions of the Thirteenth Session of Regional Association IV (North America and Central America)* (WMO-No. 927),

CONSIDERING the need to review the structure and working of its subsidiary bodies as a most strategic task to enhance the work of the Association, and render it more flexible and adaptable,

RECOGNIZING the need to have a mechanism by which to address issues not handled by other working groups or rapporteurs,

DECIDES:

(1) To establish the Management Group of the Regional Association IV (North America, Central America and the Caribbean) (RA IV MG) with the following terms of reference:

(*a*) To advise the president on matters related to the work of the Association, in particular, on new developments and matters requiring actions which cannot await the next regular session of the Association;

(*b*) To advise the president in planning and coordinating the work of the Association and its subsidiary bodies;

(*c*) To review the structure and working of the subsidiary bodies of the Association, including providing advice on the implementation of their recommendations and taking into account financial and other resources needed in the work of these bodies;

(*d*) To address other issues not covered by working groups or rapporteurs;

(*e*) To assist the president to develop the Regional Strategic Plan for the Enhancement of the National Meteorological and Hydrological Services (NMHSs) in North America, Central America and the Caribbean (2006-2009), and to prepare the draft Regional Strategic Plan for 2010-2013;

(*f*) To assess and evaluate the implementation of the Regional Programme related to the activities of RA IV as per the WMO Long-term Plan;

(*g*) To advise the president on the requirements and priorities of events to be organized in the Region;

(*h*) To advise the president on ways and means of enhancing technical cooperation activities for Members in the Region in the implementation of WMO Programmes and activities;

(2) To invite the president to act as chairperson of the Management Group which is composed of the president, the vice-president and five Permanent Representatives of RA IV to be invited by the president,

(3) That the president may invite as appropriate other Permanent Representatives of RA IV, chairpersons of RA IV working groups or rapporteurs as well as other experts and stakeholders to participate in the work and meetings of the RA IV MG, subject to availability of financial resources;

REQUESTS the president to ensure appropriate balance in the membership of this group taking into account geographical and other relevant considerations.

AUTHORIZES the president to take necessary decisions on behalf of the Association, after consultation with the Management Group, on important matters,

REQUESTS the president to report to the Association during the intersessional period, as necessary, and at the next session of the Association, on the activities of the Management Group and on relevant decisions taken on behalf of the Association.

RESOLUTION 19 (XIV-RA IV)

REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION

THE REGIONAL ASSOCIATION IV (NORTH AMERICA, CENTRAL AMERICA AND THE CARIBBEAN),

NOTING The General Summary, paragraph 3.7.1 of the *Abridged Report with Resolutions of the Ninth Session of the Executive Council* (WMO-No. 67),

CONSIDERING:

(1) That a number of its resolutions adopted before its fourteenth session have been revised and incorporated in resolutions of the fourteenth 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 (see Annex) 25 (VI-RA IV); 7 (VII-RA IV); 4 (X-RA IV), 4 (XII-RA IV); 14 (IX-RA IV); 8 (X-RA IV); 16 (VIII-RA IV); 11 (XII-RA IV); 12 (XIII-RA IV); 13 (XII-RA IV), 9 (VIII-RA IV),

(2) Not to keep in force the other resolutions adopted before its fourteenth session,

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

ANNEX TO RESOLUTION 19 (XIV-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 is 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.

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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.

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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.

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* 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) — Intercomparison 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.

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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.

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.

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

ANNEX

Annex to paragraph 4.1.6 of the general summary

SPECIFIC WG-PIW TASKS

Intentegrated Observing Systems (IOS)

1. Promote projects aimed at improving, restoring, replacing and building the upper-air observational capacities of the RBSNs. The activities should focus on the activation of silent upper-air observing stations comprised in the RBSNs.
2. Improve data quality and coverage of surface observations of the RBSN and RBCN. Highest priority should be given to activities that focus on the activation of the silent surface and upper-air observing stations comprised in the RBSN and on the operation of RBCN stations.
3. Promote projects related to the deployment and/or use of new and cost-effective observing systems like surface-based Automatic Weather Stations (AWSs), Aircraft Meteorological Delay Relay (AMDAR), Automated Shipboard Aerological Programme (ASAP) and drifting buoys, and inform the airlines about the AMDAR programme in Central America and the Caribbean. In collaboration with the Commission for Instruments and Methods of Observation (CIMO) experts, study and make proposals on the operational use of AWS to reliably measure extremely high wind speeds (hurricane-force winds).
4. Promote a radar network project for Central America.
5. Support the regional part of the new WMO Volume A and actual updating by RA IV Members, in particular for RBSN stations.
6. Study and develop an adaptable observation programme and its impact on the specifications of the RA IV RBSN, taking account of operational requirements and constraints, including seasonal variations in observation schedules. Consider the subsequent impact on WWW monitoring procedures for RBSN stations.
7. Promote regional exchange of observational data not yet internationally exchanged but potentially useful in Numerical Weather Prediction (NWP), e.g. radar measurements to provide information on precipitation and wind, surface observations, including those from local or regional mesonets and wave buoys. Encourage WMO Members in the Region where these data are collected to make them available via WMO real-time information systems.
8. Promote the availability and exchange of all observational data made routinely but not distributed (for example, data with high temporal frequency should be distributed at least hourly). Recent studies have shown that 4d-var data assimilation system or analysis system can make excellent use of hourly data, e.g. SYNOPs, buoys, profilers, aircraft (AMDAR). For SYNOPs (land and marine), buoys, and profilers, encourage RA IV Members to implement this exchange at the earliest possible date.

Global Telecommunication System (GTS) & Data Management (DM)

9. Review the Region's data exchange requirements, and then adjust the transmissions programmes of the RMTN and other data exchange mechanisms. Two specific data requirements focal points should be named, one each for the Central American countries and for the Caribbean countries. These focal points would coordinate and consolidate their respective area requirements and would work with the Regional Telecommunication Hub (RTH) focal point to adjust RMTN transmissions programmes and data availability through alternative means such as File Transfer Protocol (FTP) servers.
10. Ascertain the status of operation of the RMTN, in particular ensure a coordinated transition from X.25 protocol to Transmission Control Protocol/Internet Protocol (TCP/IP) .
11. Review regional requirements and use of the Emergency Managers Weather Information Network (EMWIN) system and work to facilitate a successful transition and keep the NMHSs informed about the technical modifications in order to assist their planning for changes.
12. Consider the creation of a communication mechanism such as a List server to facilitate regional coordination.
13. Establish and coordinate as soon as possible a regional Migration Plan to Table Driven Code Forms (TDCF). Coordinate implementation of the operational exchange of upper-air data in BUFR in parallel to the TEMP code as a test case to identify issues and to fine-tune the Plan. Promote the development of national plans.
14. Establish a pilot project for a completely migrated centre that would be able to receive and transmit data in BUFR as well as decode, handle, display and use data received in BUFR.
15. Further explore possible exchange mechanisms for radar images between stations of the Caribbean Radar Project and other radar stations, specifically in Central America.
16. Promote the involvement of the Region in Future WMO Information System (FWIS) development.
17. Endorse, promote and coordinate the regional implementation of relevant recommendations by the

Commission for Basic Systems (CBS) related to GTS and DM, in particular to:

- Complete the development of descriptors and templates to support code migration, specifically to support regional and national practices;
- Complete the rewriting of observing practices in the code manual consistent with their use in binary code forms;
- Make changes to the Manual on the GTS regarding message length and segmentation;
- Draft Attachment II-16: Procedures for transmitting and collecting meteorological bulletins on the Internet;
- Coordinate and review mechanisms for Migration to Table Driven Code Forms (MTDCF).

Data-processing and Forecasting System (DPFS)

18. Comprehensive review of regional requirements for NWP products (e.g. hurricane tracks from different NWP models, Ensemble Prediction System (EPS)-grams over selected cities, additional United States Global Forecast System (GFS) fields, fields from other models (e.g. MM5 and ETA runs over Central America, etc.) and develop effective feedback mechanisms on NWP performance between user National Meteorological Centres (NMCs) and provider RSMCs.

19. Coordinate and monitor the participation and contributions of Global Data-processing and Forecasting System (GDPFS) centres in the Region to the Demonstration Project on Severe Weather Forecasting carried out under the auspices of CBS and report on the outcomes relevant to the Region.

20. Promote and assist in the introduction of PC-based local area models (LAM) at RA IV NMCs for their area of responsibility. A first step could be for some NMCs to run LAM that would cover subregional areas and make the outputs available to neighbouring NMCs.

21. Further develop DPFS training material, in particular on EPS. New Cooperative Programme for Operational Meteorology Education and Training (COMET) modules are seen to be very helpful as a training mechanism in RA IV. Promote their availability in Spanish and French.

Public Weather Services (PWS)

22. Development of material on the economic aspects of PWS.

23. Organization of Public Weather Services (PWS) regional training workshops and seminars highlighting aspects of the Programme that are of special concern and interest to the Region and which are outlined above such as the upgrading of media presentation skills.

24. Preparation of guidance on standardized formats for publicly disseminated forecasts, warnings and information.

25. Preparation of guidance on quality management and continuous improvement, with emphasis on objectives and principles of quality management in a National Meteorological or Hydrometeorological Service (NMS) context.

26. Preparation of guidance on the use of probabilistic forecasting techniques such as those using EPS and on the development of effective communication of the concepts of uncertainty and confidence in PWS products and services.

27. Preparation of guidance material to enhance public understanding of the impact of weather and climate on local and national economies, on the safety of life and protection of property, and of the role and ability of NMHSs.

APPENDIX A

LIST OF PERSONS ATTENDING THE SESSION

A. Officers of the session

J. Dania	President
C.C. Fuller	Vice-president

B. Representatives of WMO Members

Member	*Name*	*Capacity*
Antigua and Barbuda	P. Jeremiah	Principal delegate
Bahamas	A. Rolle	Principal delegate
Barbados	C. Layne	Principal delegate
Belize	C. Fuller	Principal delegate
British Carribbean Territories	T. Sutherland F. Sambula	Principal delegate Alternate
Canada	M. D. Everell B. Angle C. McLeod	Principal delegate Alternate Delegate
Costa Rica	P. Manso W. Stolz S. Laporte M. Sanchez J.C. Fallas	Principal delegate Alternate Delegate Delegate Delegate
Cuba	T. Gutierrez	Principal delegate
Dominica	C.A. Depradine	Principal delegate
Dominican Republic	G. Ceballos (Ms)	Principal delegate
El Salvador	A. Arenas	Principal delegate
France	J-M. Bonnet M. Reyal J-N. Degrace	Principal delegate Alternate Observer
Honduras	N. Kawas	Principal delegate
Jamaica	S. McGill (Ms)	Principal delegate
Mexico	M. Rosengaus-Moshinsky	Principal delegate
Netherlands Antilles and Aruba	A.J. Dania	Principal delegate
Nicaragua	M. Castro	Principal delegate
Panama	L.G. Calzadilla (Ms) D. Martinez (Ms) F. Alvarado	Principal delegate Delegate Delegate
Trinidad and Tobago	G. de Souza	Principal delegate
United Kingdom of Great Britain and Northern Ireland	R. Williams M. Gray T. Butcher	Principal delegate Alternate Delegate
United States of America	J.J. Kelly, Jr. D. Johnson R. Masters E. Madsen F. Horsfall (Ms) M.A. Kutny (Ms) K. Turner (Ms) C. Barrett	Principal delegate Alternate Alternate Delegate Delegate Delegate Delegate Observer
Venezuela	R. J Viñas-Garcia A. Piñero-Diaz	Principal delegate Delegate

C. Representatives of WMO Members outside Region IV

	R.Michelini	President of RA III
Germany	U. Gärtner	Observer
Spain	F. Cadalso J. Segovia	Observer Observer

D. Lecturers

L. Esquivel
W. Stolz
P. Whitmore

E. Representatives of international organizations

Organization	*Name*
Panamerican Health Organization (OPS/OMS)	R. Torres
United Nations Development Programme (UNDP)	J.M. Hermida
United Nations Educational Scientific and Cultural Organization (UNESCO)	E. Planos
United Nations International Strategy for Disaster Reduction (ISRD)	E. Palm
Caribbean Institute for Meteorology and Hydrology	C.A. Depradine
Caribbean Meteorological Organization (CMO)	T. Sutherland
Comité Regional de Recursos Hidráulicos (CRRH)	M.C. Ortiz P. Ramírez (Ms) E. Zárate
Cooperative Meteorology Education and Training (COMET), University Corporation for Atmospheric Research, USA (UCAR)	T. Spangler
Latin American Energy Organization (OLADE)	G. Castillo
Regional Meteorological Training Centre, University of Costa Rica	V. Castro (Ms)
WMO Hurricane Committee	J. Rubiera Torres

APPENDIX B
LIST OF ABBREVIATIONS

6LTP	Sixth WMO Long-term Plan
ACARS	Aircraft Communications Addressing and Reporting System
ACSYS	Arctic Climate System Study
ADM	Advanced Dissemination Method
AeMP	Aeronautical Meteorology Programme
AgMP	Agricultural Meteorology Programme
AIC	Argo Information Centre
AIFI	Aircraft In-flight Icing Project
AMDAR	Aircraft Meteorological Delay Relay
AMP	Applications of Meteorology Programme
AOPC	Atmospheric Observation Panel for Climate
APFM	Associated Programme on Flood Management
AREP	Atmospheric Research and Environment Programme
ARGO	Array for Real-time Geostrofic Oceanography
ARM	Atmospheric Radiation Measurement
ASAP	Automated Shipboard Aerological Programme
AUPISG	Aviation Use of the Public Internet Study Group
AWS	Automatic Weather Station
BIP-MT	Basic Instruction Package for Meteorological Technicians
BSRN	Baseline Surface Radiation Network
BORCAL	Broadband Outdoor Radiometer Calibration
CAeM	Commission for Aeronautical Meteorology
CAgM	Commission for Agricultural Meteorology
CAL	Computer-assisted learning
CARIB-HYCOS	Caribbean Hydrological Cycle Observing System
CARICOM	Caribbean Community
CAS	Commission for Atmospheric Sciences
CBD	Convention on Biological Diversity
CBS	Commission for Basic Systems
CCI	Commission for Climatology
CDERA	Caribbean Disaster Emergency Response Agency
CDMS	Climate Database Management Systems
CEOP	Coordinated Enhanced Observing Period
CEPREDENAC	Coordination Centre for the Prevention of Natural Disasters in Central America
CHy	Commission for Hydrology
CIMO	Commission for Instruments and Methods of Observation
CIMH	Caribbean Institute for Meteorology and Hydrology
CITEL	Inter-American Telecommunication Commission
CLIBER	Ibero-American Climate Project
CliC	Climate and Cryosphere Programme
CLICOM	Climate Computing
CLIPS	Climate Information and Prediction Services
CLIVAR	Climate Variability and Predictability
CMDL	Climate Monitoring and Diagnostic Laboratory
CMO	Caribbean Meteorological Organization
CNA	National Water Commission (Mexico)
COMET	Cooperative Programme for Operational Meteorology Education and Training
CONASTAC	Contribution of Agriculture to the State of Climate
COP	Conference of the Parties
COPES	Coordinated Observation and Prediction of the Earth System
CPCSA	Climate Programme Coordination and Support Activities

CRRH	Regional Committee for Water Resources
CSM	Climate System Monitoring
CTBTO	Comprehensive Nuclear Test Ban Treaty Organization
DARE	Data Rescue
DBCP	Data Buoy Cooperation Panel
DCP	Data Collection Platform
DIVERSITAS	International Programme of Biodiversity Science
DM	Data Management
DPFS	Data-processing and Forecasting System
DPM	Natural Disaster Prevention and Mitigation Programme
DPP	Disaster prevention and preparedness
DWD	Deutscher Wetterdienst
ECMWF	European Centre for Medium-Range Weather Forecasts
ECV	Essential Climate Variables
EDRG	Emergency and Disaster Response Group
EER	Environmental Emergency Response
EMWIN	Emergency Managers Weather Information Network
ENSO	*El Niño*/Southern Oscillation
EPS	Ensemble Prediction System
ERA	Emergency Response Activities
ESCAP	Economic and Social Commission for Asia and the Pacific
ESSP	Earth System Science Partnership
ET	Expert Team
ETRP	Education and Training Programme
FDP	Forecast demonstration project
FTP	File Transfer Protocol
FWIS	Future WMO Information System
GAPP	GEWEX Americas Prediction Project
GAW	Global Atmosphere Watch
GAWSIS	GAW Station Information System
GCIP	GEWEX Continental-scale International Project
GCM	GCOS Cooperation Mechanism
GCOS	Global Climate Observing System
GDPFS	Global Data-processing and Forecasting System
GDSIDB	Global Digital Sea-Ice Data Bank
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems
GEWEX	Global Energy and Water Cycle Experiment
GFS	Global Forecast System (USA)
GLOSS	Global Sea-Level Observing System
GMDSS	Global Maritime Distress and Safety System
GOES	Geostationary Operational Environmental Satellite
GOOS	Global Ocean Observing System
GOS	Global Observing System
GPS	Global Positioning System
GSN	GCOS Surface and Upper-Air Networks
GTN-H	Global Terrestrial Network – Hydrology
GTS	Global Telecommunication System
GTSPP	Global Temperature Salinity Profile Programme (IGOSS-IODE)
GUAN	GCOS Upper-Air Network
GURME	GAW Urban Research Meteorology and Environment Project
GWP	Global Water Partnership
HC	Hurricane Committee
HFA	Hyogo Framework for Action 2005–2015
HHWS	Heat/Health Warning System (CLIPS)

HOMS	Hydrological Operational Multipurpose System
HWRP	Hydrology and Water Resources Programme
HYCOS	Hydrological Cycle Observing System
IABM	International Association of Broadcast Meteorology
IABP	International Arctic Buoy Programme
IAEA	International Atomic Energy Agency
IAI	Inter American Institute for Global Change Research
IAPSAG	Ad hoc International Aerosol Precipitation Science Assessment Group
IBRD	World Bank
ICAO	International Civil Aviation Organization
ICSU	International Council for Science
ICT	Information and Communication Technology
IDB	Inter-American Development Bank
IDC	International Data Centre
IFPRI	International Food Policy Research Institute
IFRC	International Federation of Red Cross and Red Crescent Societies
IGACO	Integrated Global Atmospheric Chemistry Observations
IGBP	International Geosphere-Biosphere Programme (ICSU)
IGDDS	Integrated Global Data Dissemination Service
IGOS	Integrated Global Observing Strategy
IHDP	International Human Dimensions Programme on Global Environmental Change
IMOP	Instruments and Methods of Observation Programme
IMSO	International Mobile Satellite Organization
INMARSAT	International Maritime Satellite System
INSIVUMEH	National Institute for Seismology, Volcanology, Meteorology and Hydrology
IOC	International Ozone Committee
IOP	Diffuse Intensive Observation Program
IOS	Integrated Observing Systems
IPA	Information and Public Affairs (WMO Programme)
IPC	International Pyrheliometer Comparisons
IPO	THORPEX International Programme Office
IPPC	Intergovernmental Panel on Climate Change
IPY	International Polar Year
IRI	International Research Institute for Climate Prediction
ISS	Information Systems and Services
ISSC	International Science Steering Committee
ISABP	International South Atlantic Buoy Programme
ISCS	International Satellite Communication Systems
ISDR	International Strategy for Disaster Reduction
ITU	International Telecommunication Union
IUGG	International Union of Geodesy and Geophysics
IWTC	International Workshop on Tropical Cyclones
JCOMM	Joint WMO/IOC Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM In Situ Observing Platform Support Centre
JSC	WMO/IOC/ICSU Joint Scientific Committee (for the World Climate Research Programme, WCRP)
LA/CHAT	Latin America/Caribbean Hurricane Awareness Tour
LAM	Limited area model
LDC	Least developed country
MAGS	MacKenzie River GEWEX Study
MESA	Monsoon Experiment in South America
MCSS	Marine Climatological Summaries Scheme
MMOP	Marine Meteorology and Oceanography Programme
MPERSS	Marine Pollution Emergency Response Support System
MTDCF	Migration to Table Driven Code Forms
MTN	Main telecommunication network

NAME	North American Monsoon Experiment
NARC	National Atmospheric Radiation Centre, CAN
NASA	National Aeronautics and Space Administration
NCDC	National Climatic Data Center (USA)
NCEP	National Centres for Environmental Prediction
NESDIS	National Environmental Satellite, Data and Information Service (of NOAA)
NIST	National Institute of Standards and Technology
NMC	National Meteorological Centre
NMHS	National Meteorological and Hydrological Service
NMS	National Meteorological or Hydrometeorological Service
NOAA	National Oceanic and Atmospheric Administration
NORAD	Norwegian Agency for Development
NPDBAP	North Pacific Data Buoy Advisory Panel
NRC	National Radiation Centres
NREL	National Renewable Energy Laboratory
NWP	Numerical Weather Prediction
OFDA	Office of Foreign Disaster Assistance (USA)
OGP	Office of Global Program (NOAA)
OIS	WWW Operational Information Service
ONAMET	National Meteorological Office (Dominican Republic)
OPAG	Open Programme Area Group
PAHO	Pan American Health Organization
PIRATA	Pilot Research Moored Array in the Tropical Atlantic
PMO	Port Meteorological Officer
PROMMA	Programme for the Modernization of Water Resources Management (Mexico)
PWS	Public Weather Services
PWSP	Public Weather Services Programme
QMF	Quality Management Framework
QMS	Quality Management System
QPF	Quantitative precipitation forecasting
RAMSDIS	Regional and Mesoscale Meteorology Advanced Meteorological Satellite Demonstration Interpretation System
RBCN	Regional Basic Climatological Network
RBO	River Basin Organization
RBSN	Regional Basic Synoptic Network
RCC	Regional Climate Centre
RCD	Regional Activities and Technical Cooperation for Development Department
RCF	Radiometer Calibration Facility
RCOF	Regional Climate Outlook Forum
RCS	Research Climate Station
RDP	Research and Development Programme
RIC	Regional Instrument Centre
RMTC	Regional Meteorological Training Centre
RMTN	Regional Meteorological Telecommunication Network
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
SICA	Central American Integration System
SIDS	Small Island Developing States
SIMN	Mexico Meteorological Institute
SMM	Special MTN Monitoring

SOLAS	Surface Ocean Lower Atmosphere Study
SOOP	Ship-of-Opportunity Programme
SPARC	Stratospheric Processes and their Role in Climate
SWIC	Severe Weather Information Centre
TCP/IP	Transmission Control Protocol/Internet Protocol
TCP	Tropical Cyclone Programme
TCOP	Technical Co-operation Programme
TDCF	Table Driven Code Forms
THORPEX	Observing System Research and Predictability Experiment
TMRP	Tropical Meteorology Research Programme (WMO)
TSC	Technical Support Center
UKMO	United Kingdom Meteorological Office
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USDA	United States Department of Agriculture
VAAC	Volcanic Ash Advisory Centre
VAMOS	American Monsoon System
VCP	Voluntary Cooperation Programme
VCP(F)	Voluntary Co-operation Programme (Fund)
VL	Virtual Laboratory (VL) for Education and Training in Satellite Meteorology
VOS	Voluntary observing ship
VTL	Virtual Training Library
WAFC	World Area Forecast Centre
WAFS	World Area Forecast System
WAMIS	World Agrometeorological Information Service
WCASP	World Climate Applications and Services Programme
WCDMP	World Climate Data and Monitoring Programme
WCDR	World Conference on Disaster Reduction
WCIRP	World Climate Impact Assessment and Response Strategies Programme
WCP	World Climate Programme
WCRP	World Climate Research Programme
WG-PIW	Working Group on Planning and Implementation of the WWW
WGH	Working Group on Hydrology
WHO	World Health Organization
WHYCOS	World Hydrological Cycle Observing System
WMC	World Meteorological Centre
WMD	World Meteorological Day
WMO	World Meteorological Organization
WMOSP	WMO Space Programme
WOCE	World Ocean Circulation Experiment
WRC	World Radiation Centre
WRDC	World Radiation Data Centre
WRR	World Radiometric Reference
WSSD	World Summit on Sustainable Development
WWD	World Water Day
WWIS	World Weather Information Service
WWRP	World Weather Research Programme
WWW	World Weather Watch