

WORLD METEOROLOGICAL ORGANIZATION

**REGIONAL ASSOCIATION V
(SOUTH-WEST PACIFIC)**

THIRTEENTH SESSION

MANILA, 21–28 MAY 2002

ABRIDGED FINAL REPORT WITH RESOLUTIONS

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Congress and Executive Council

- 883 — Executive Council. Fiftieth session, Geneva, 16–26 June 1998.
902 — Thirteenth World Meteorological Congress. Geneva, 4–26 May 1999.
903 — Executive Council. Fifty-first session, Geneva, 27–29 May 1999.
915 — Executive Council. Fifty-second session, Geneva, 16–26 May 2000.
929 — Executive Council. Fifty-third session, Geneva, 5–15 June 2001.
932 — Thirteenth World Meteorological Congress. Proceedings, Geneva, 4–26 May 1999.

Regional associations

- 890 — Regional Association V (South–West Pacific). Twelfth session, Denpasar, 14–22 September 1998.
891 — Regional Association I (Africa). Twelfth session, Arusha, 14–23 October 1998.
924 — Regional Association II (Asia). Twelfth session, Seoul, 19–27 September 2000.
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.

Technical commissions

- 881 — Commission for Instruments and Methods of Observation. Twelfth session, Casablanca, 4–12 May 1998.
893 — Commission for Basic Systems. Extraordinary session, Karlsruhe, 30 September–9 October 1998.
899 — Commission for Aeronautical Meteorology. Eleventh session, Geneva, 2–11 March 1999.
900 — Commission for Agricultural Meteorology. Twelfth session, Accra, 18–26 February 1999.
921 — Commission for Hydrology. Eleventh session, Abuja, 6–16 November 2000.
923 — Commission for Basic Systems. Twelfth session, Geneva, 29 November–8 December 2000.
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.
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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION (agenda item 1)

1.1 The thirteenth session of Regional Association V (South-West Pacific) was held in Manila, Philippines, from 21 to 28 May 2002. The opening ceremony took place in Pasig City in Manila at 10.00 a.m. on 21 May 2002.

1.2 Mr R. Sri Diharto, acting president of RA V expressed his appreciation to the Government of the Philippines, represented by PAGASA, for hosting the session in Manila. He said that the session would review the activities of the Association during the past four years, in particular the implementation in the Region of WMO Programmes. The acting president mentioned that the Region was characterized by islands and groups of islands, mostly isolated from one another by vast ocean, and that many of the activities of Members in the Region, particularly tourism, agriculture and fishing, were highly sensitive to weather and climate. In addition, he said, the Region was prone to extreme adverse weather patterns such as tropical cyclones, floods and droughts, often associated with El Niño/La Niña phenomena. Mr Diharto expressed his appreciation to all Members for their cooperation in implementing the activities of the Association. He acknowledged the roles of the regional centres such as the ASMC and RSMC Nadi. He expressed his appreciation for the continuing support of the WMO Secretariat under the leadership of the Secretary-General, Professor G.O.P. Obasi.

1.3 Mr L.A. Amadore, Director of PAGASA, extended a warm welcome to the participants and expressed his appreciation for the continued cooperation among NMHSs in the Region. He expressed his conviction that the session would be an effective forum for the formulation of decisions and concerted actions on relevant issues for the improvement and development of meteorology and hydrology in the Region. He extended his wishes for fruitful deliberations.

1.4 In addition, Ms S.C. Eusebio, Mayor of Pasig City, joined Mr Amadore and the staff of PAGASA in extending a warm welcome to all participants from the City of Pasig. She said she was pleased that the session was convened in her city. She emphasized the global importance of the event and expressed her hope that the support and cooperation of the Members would be beneficial to the international community. She wished the participants a pleasant and memorable stay in the Philippines.

1.5 Mr E.A. Adug, Officer-in-Charge, Office of the Deputy Director for Operations and Services of PAGASA, introduced Professor G.O.P. Obasi, the Secretary-General of WMO.

1.6 The Secretary-General expressed to the Government and people of Philippines his and WMO's sincere appreciation for their hosting this session as well as the ninth session of the RA V TCC for the South

Pacific and the South-East Indian Ocean. He extended a very warm welcome to all the participants and delegates. He thanked Mr L.J. Tick, former president, and Mr Diharto, acting president of the Association, for their leadership and contributions. He also thanked the chairpersons, rapporteurs and members of the working groups for their valuable service during the inter-sessional period.

1.7 The Secretary-General emphasized the most important events since the twelfth session of the Association in Bali in 1998. These included the impact of the 1997–1998 El Niño and the 1999 La Niña phenomena, and the rapid advance in science and technology, especially in satellite, computer, information and communication technology. He recalled that the World Summit on Sustainable Development would be held in Johannesburg, South Africa in August 2002 and that the Summit would review, among other things, the progress made in the implementation of UNCED's Agenda 21. Foremost among the issues to be addressed by the Summit were poverty alleviation, changes in consumption patterns and the protection of global commons, including atmosphere, oceans, freshwater and ecosystems. He said that most of these issues were at the core of the activities and mandate of WMO. He stressed their importance to highlight the contributions of NMHSs to sustainable development as well as to brief national delegations to the Summit.

1.8 The Secretary-General also mentioned that Member countries in the South-West Pacific, in particular Small Island States, were highly vulnerable to natural disasters such as tropical cyclones and associated storm surges, floods, droughts and forest fires, which claimed lives and caused damage to property. He said that WMO would continue to give high priority to issues related to the mitigation of natural disasters through the implementation of its relevant Programmes and through the ISDR. He encouraged the NMHSs in the Region to be involved in the implementation of ISDR-related activities. In addition, he said that WMO would continue to provide the necessary support to activities of the ESCAP/WMO Typhoon Committee and the RA V TCC in their work to develop strategies for coordinated actions to upgrade tropical cyclone forecasts and warning services.

1.9 The Secretary-General emphasized that freshwater availability was one of the major challenges that would confront humanity in the first few decades of the 21st century. In that regard, WMO would continue to strengthen its HWRP and enhance cooperation with relevant organizations and institutions such as SPREP and SOPAC. He urged Member countries in the Region to continue to support WMO initiatives, including Resolution 25 (Cg-XIII) on the free and unrestricted exchange of hydrological data and products, and to

enhance their contribution to WMO's water-related activities.

1.10 The Secretary-General stated that in order to successfully implement many of WMO's Programmes and activities, it was essential that WWW operate at an optimum level. He informed the session that WMO would organize a Regional Seminar on Cost Recovery and Administration in RA V in 2003, and was also planning to organize a global conference on the socio-economic benefits of NMHSs. He urged RA V Member countries to continue to assist and make full use of the WMO Regional Office for Asia and the South-West Pacific as well as the Subregional Office for the South-West Pacific. In that regard, he expressed thanks to the Government of Samoa and the Secretariat of SPREP for hosting the WMO Subregional Office for the South-West Pacific in Apia.

1.11 Ms L.G. Angeles, Deputy Director for Administration and Field Services, PAGASA, introduced Mr F.O. Tesoro, the Philippines' Undersecretary to the Department of Science and Technology.

1.12 Mr Tesoro, joining Ms Eusebio and Mr Amadore, welcomed the delegates on behalf of the Government of the Philippines and expressed appreciation to WMO for accepting the Philippines' invitation to host the session in Manila. He mentioned that his Government acknowledged the role of WMO in promoting cooperation among Members and in enhancing and improving meteorological and hydrological services in the Region. He noted that NMHSs throughout the Region had similar responsibilities for providing weather, climate and related environmental services to the public, hence underscoring the importance of regional and international cooperation. Furthermore, Mr Tesoro looked forward to the fruitful outcome from the session in further enhancing the capacities and capabilities of NMHSs in providing adequate meteorological services, in particular severe weather warnings and information on climate events. He also emphasized the importance of convening the session at this time in light of current concern over the possible onset of a new El Niño event. He assured the session that his Government was committed to promoting the development of meteorology and hydrology in the Philippines, and that regional cooperation was a vital component of national policy for the protection of the population and the environment from potentially disastrous natural phenomena.

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 therefore decided that it would not be necessary to establish a Credentials Committee.

2.1.2 There were 43 participants at the session from 20 Members of the Association, six observers from Members outside the Region, three observers from non-

WMO Members, six observers from international and regional organizations and three experts. 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 adopted unanimously. It is reproduced in [Appendix B](#) to this report.

2.3 ESTABLISHMENT OF COMMITTEES (agenda item 2.3)

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

NOMINATION COMMITTEE

2.3.1 A Nomination Committee was established, composed of the principal delegates of Australia, Brunei Darussalam and Tonga.

WORKING COMMITTEES

2.3.2 Two Working Committees, A and B, were established to deal with the various agenda items as follows:

- (a) Working Committee A was assigned agenda items 4, 6, 7.1, 7.3 and 7.4. Messrs L.A. Amadore (Philippines) and A. Ngari (Cook Islands) were elected to serve as co-chairpersons of the committee;
- (b) Working Committee B was assigned agenda items 5, 7.2, 8, 9, 10 and 11. Messrs W.S. Lai (Singapore) and R. Prasad (Fiji) were elected to serve as co-chairpersons of the committee;
- (c) It was further decided that agenda items 12, 13, 14, 15, 16, 17 and 18 would be considered by the Committee of the Whole chaired by the acting president. The remaining agenda items would be considered at the plenary meetings.

COORDINATION COMMITTEE

2.3.3 A Coordination Committee, composed of the acting president, the co-chairpersons of the two working committees, the representative of the Secretary-General and the secretaries of the working committees, 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 on special items.

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

2.4.3 The Association designated Mr T.R. Gabi (Papua New Guinea) as rapporteur on agenda item 19 — 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 V, 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 participants expressed deep sadness at the untimely passing of Mr S. Karjoto (Indonesia), the former president of RA V; Mr M. Ariki (Solomon Islands), the former Director of the Meteorological Service; and Mr R. Hagemeyer (United States), Director, Pacific Region, NWS. They had devoted large parts of their lives to developing and enhancing their national services and regional cooperation.

3.3 The Association commended its former president, Mr L.J. Tick (Malaysia), and the acting president, Mr R.S. Diharto (Indonesia) for the dedication, enthusiasm and initiative with which they had conducted the affairs of the Association, thus contributing to the development of meteorology and hydrology in the Region. It also expressed its appreciation to the chairpersons and members of the working groups, and to the rapporteurs, all of whom had effectively collaborated in carrying out the activities of the Association in the Region.

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

3.5 The Association gave its full support to the priorities and future work programme presented by the president for the intersessional period, in particular those related to the WMO scientific and technical programmes which focused on 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 the regional needs related to the future work plan of the Association when organizing activities and events in the Region.

3.6 The Association felt that although WMO had a strong ETRP, there was still a need to reinforce cooperation and coordination of training and education activities in the Region to better meet the needs of the Members. In that regard, the Association encouraged Members to use the RMTC in the Philippines, as well as other facilities, such as those in Australia, Fiji, New Zealand and the United States. The Association also felt there was a need for training in modern management techniques for the senior staff of NMSS.

3.7 The Association noted that NMHSs should have adequate and trained human resources to attain the appropriate technical and professional levels required to meet their national, regional and international obligations.

3.8 The Association noted that developing NMHSs were facing the challenges of the rapid advancement of technology, and requested the Secretary-General to provide guidance in that regard in order to ensure that full advantage be taken for the improvement of their Services.

3.9 The Association felt there was potential for more effective regional partnership within the Regional

Association framework and through other appropriate regional and subregional bodies such as ASEAN, SPREP and SOPAC, to demonstrate the socio-economic benefits of weather and climate services.

3.10 The Association noted with appreciation the increasingly close collaboration between WMO and ASCMG, SPREP, SOPAC, and UNESCO's IOC. The Association encouraged WMO, through its Regional Office for Asia and the South-West Pacific and its Subregional Office for the South-West Pacific, to further strengthen its collaboration with these bodies and to establish links with the IOC offices in the Region, in particular IOC WESTPAC in Bangkok.

3.11 The Association noted that Professor G.O.P. Obasi was attending the RA V session for the last time in his capacity as WMO Secretary-General. The Members of the Association expressed their appreciation to him for his outstanding contribution to the work of WMO and for the support provided to Region V.

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 ON PLANNING AND IMPLEMENTATION OF THE WWW (WG/PIW) IN REGION V (agenda item 4.1)

REPORT OF THE CHAIRPERSON OF THE WG/PIW

4.1.1 The Association received with appreciation the report of the chairperson of the WG/PIW in Region V, Mr R.R. Brook (Australia). It was noted that the working group had addressed many of the problems and challenges as regards the implementation of the WWW in the Region, and had made good progress towards accomplishing the many tasks assigned to it. These were discussed in detail under the relevant agenda items of the session.

4.1.2 Noting with particular satisfaction that the working group had successfully held its third session in December 2001 in Sydney, the Association expressed its thanks to Australia's BOM for providing the host facilities and services, and to the chairperson for the work accomplished in the intersessional period.

THE WWW PROGRAMME

4.1.3 The WWW Programme, as approved by Thirteenth Congress as part of 5LTP, was given particular attention by the Association. It was noted that the WWW remained the core activity of the Organization and that its maintenance and strengthening was considered essential for an effective response of the Association to the challenges presented by the issues of environment and development, climate variability and climate change.

4.1.4 It was recalled that Congress expected the regional associations to play active roles in the implementation and further development of the WWW and to keep the WWW Programme under continuous review and recommend adjustments in the light of Members'

changing requirements, as well as developments in science and technology. In Region V, specific attention was given to the Needs Analysis for the Strengthening of Pacific Island Meteorological Services (August 2000) related to the Strategic Action Plan for the Development of Meteorology in the Pacific Region.

4.1.5 The Association agreed to use the Needs Analysis for guidance in determining the work programme of the regional WG/PIW. In particular, it invited the working group to identify those projects in the analysis that were relevant to its terms of reference, develop an implementation plan for the most important and achievable projects, and pursue implementation of those projects. In this connection, the Association agreed on the following issues and tasks, along with their associated priorities:

REGIONAL ASPECTS OF INTEGRATED OBSERVING SYSTEMS

- (a) Monitor the performance of the surface and upper-air observational networks and support initiatives to enhance the Programme, such as through identifying needs and priorities, and providing background information and advice in support of requests for financial assistance (high priority);
- (b) Contribute regional views to the CBS/OPAG on the IOS, particularly in relation to the redesign of the GOS (high priority);
- (c) Review the analysis and reporting procedures of the WWW monitoring to ensure that the results of the monitoring accurately reflect the actual observations made, and not just those made at standard hours (medium priority);
- (d) Promote the use of a broader range of satellite data for operational purposes, such as through promoting the strategies identified at relevant forums such as the meetings on Asia-Pacific Satellite Data Exchange and Utilization;
- (e) Cooperate with other related agencies and programmes in developing the capabilities of the GOS in support of marine meteorological services and GCOS; and
- (f) Continue to explore options for incorporating non-NMS surface observations in support of the GOS.

REGIONAL ASPECTS OF INFORMATION SYSTEMS AND SERVICES

- (a) Continue to upgrade telecommunications circuits in the Region (high priority);
- (b) Examine the requirement for re-rendering the Frame Relay Network in the Region (high priority);
- (c) Determine the implications for NMSs in the Region of the planned migration to table-driven data representation forms and assist NMSs to plan resources (staff and finances) to nominate a national migration focal point, and develop a national migration project and schedule based on approved CBS guidelines (medium priority);
- (d) Contribute to the CBS effort to develop guidelines for use of the Internet and Virtual Private Networks;
- (e) Investigate possible sources of funding for additional EMWIN installations and upgrades to

existing installations in response to modifications to the broadcast; and

- (f) Investigate possible sources of funding for additional ISCS systems and upgrades to existing systems in response to planned changes in the broadcast.

REGIONAL ASPECTS OF DATA-PROCESSING AND FORECASTING SYSTEMS

- (a) Review the products available from NWP centres providing guidance for forecasting of severe weather, including tropical cyclones, and provide suggestions on appropriate products in support of the needs of countries in the Region (high priority);
- (b) Keep informed on the developing infrastructure in support of seasonal to inter-annual predictions, and collaborate with other programmes and groups such as the climate working group in promoting the understanding and informed use of these products, and advise on the appropriate regional infrastructure (high priority);
- (c) Develop advice on standard software to be used in the preparation and delivery of meteorological products, and investigate means of assisting NMSs in acquiring this software;
- (d) Monitor developments in the EER system and contribute suggestions to enhance its effectiveness in meeting the needs of Members in the Region, including the possibility of a direct user interface;
- (e) Assess the ensemble prediction products which are becoming available for both medium-range and short-range prediction, and provide comments to producing centres on ways of enhancing the usefulness of such products in the Region; and
- (f) Review the techniques and models available for providing trajectory and dispersion forecasts in cases of release of chemical or biological agents, and make recommendations on the range of options available to Members for this purpose.

REGIONAL ASPECTS OF PUBLIC WEATHER SERVICES (PWS)

(see also agenda item 7.1)

- (a) Monitor the concerns of NMSs regarding the activity of the international media in the provision of official weather information, especially warnings (high priority);
- (b) Strengthen training activities in the Region, especially through roving seminars (high priority);
- (c) Contribute to the development and practical implementation of the trial Web sites for city forecasts and warnings;
- (d) Formulate and provide a regional perspective on development of standard formats for the exchange of PWS products;
- (e) Monitor the development of the use of the Internet for delivery of services to the public and promote increased awareness among NMSs; and
- (f) Monitor and provide advice on emerging service delivery issues, specifically air quality forecasts and the use of weather information in GISs for emergency management.

4.1.6 The Association noted with interest the results of CBS-XII, held in Geneva in 2000. It was pleased that the chairperson of the WG/PIW in RA V and several experts from the Region were able to attend both the session and the associated Technical Conference on Information Systems and Services.

4.1.7 The Association agreed that, taking into account the many tasks indicated above, it was necessary to re-establish the WG/PIW. The Association, recognizing a need to revise the composition of the working group to correspond to the CBS structure of the four Open Programme Areas (IOS, ISS, DPFS and PWS), agreed that the working group should comprise a subgroup on regional aspects of ISS and rapporteurs on the regional aspects of IOS, DPFS and PWS. [Resolution 1 \(XIII-RA V\)](#) was adopted.

4.2 OBSERVING SYSTEM, INCLUDING INSTRUMENTS AND METHODS OF OBSERVATION PROGRAMME (IMOP) (agenda item 4.2)

REGIONAL BASIC SYNOPTIC NETWORK

4.2.1 The Association recalled that in accordance with Resolution 2 (XII-RA V) the RBSN in the Region consisted of 398 surface and 124 upper-air stations. It noted with appreciation the activities of Members to implement the RBSN in compliance with recommended priorities. It also appreciated the work done by the lead centres on data quality monitoring for improving the procedures for monitoring and for the presentation and distribution of results on monitoring the availability and quality of surface-based observational data.

4.2.2 The Association noted that 65 per cent of the SYNOP reports, 60 per cent of the TEMP reports and 47 per cent of the PILOT reports for main synoptic hours, as well as 38 per cent of the CLIMAT reports and 66 per cent of the CLIMAT TEMP reports requested from the RBSN stations located in Region V, were received at MTN centres during the 2001 annual global monitoring. During the period of 1998 to 2001, there was an increase in the availability of SYNOP reports (from 52 to 65 per cent) and TEMP reports (from 52 to 60 per cent).

4.2.3 The Association considered the difficulty in acquiring upper-air information across the Region. It noted that many NMHSs within the Region had been adversely affected by the loss of the Omega radio navigation network. The Association expressed concern at the state of the upper-air network, particularly the extensive areas with poor coverage. It noted that without financial support for consumables, in many developing countries the observation programme could not meet the requirements for either weather forecasting or climate monitoring. Noting the large differences in the prices for radiosondes, and with a view to assisting Members in attaining lower costs for instrument consumables, spare parts and repair services, in particular for radiosonde systems, the Association decided to task its WG/PIW to carry out a survey to assess the situation in the countries in the Region with respect to prices and conditions of

delivery and services for observing equipment, and to make the findings available to Members.

4.2.4 The Association noted that CBS-XII had invited regional associations to develop objective criteria for the selection of RBSN stations, based on factors such as spatial distribution, performance and availability of data. It recognized the value in such a set of criteria, but felt that it would not apply to much of Region V, where stations were widely distributed and very few alternative stations were available to replace non-performing RBSN stations.

4.2.5 The Association noted that the RBSN provided a useful long-range goal for the observing network within the Region, but felt it might not be the most useful measure to be used in the monitoring. It was noted that some stations on the list were not yet implemented and that others could not commit to the standard observing programme expected for an RBSN station. Other stations were reporting at non-standard times or only for some times of the year. The Association agreed with the WG/PIW's proposal that the RBSN list should reflect the actual commitment of Members, and that the monitoring should measure the number of reports received against this practical target, rather than against an ideal. The Association felt that the RBSN list should have an extra column, listing exceptions to standard practice that were expected to be a long-term characteristic of the observing programme at a station. Exceptions to standard practice included:

- (a) Station planned (not yet implemented);
- (b) Reduced daily observing program (e.g. daylight hours only, one sounding per day);
- (c) Variations in availability throughout the year; and
- (d) Non-standard reporting hours.

4.2.6 The Association noted that, in order for monitoring results to be comparable between Regions, all Regions should follow consistent and similar procedures. The Association agreed to submit the proposal of its WG/PIW given in the previous paragraph to CBS so that CBS might consider changes in the existing procedures for their possible application on a global scale.

4.2.7 Finally, the Association agreed to update the existing RBSN and adopted [Resolution 2 \(XIII-RA V\)](#).

OTHER OBSERVING SYSTEMS

4.2.8 The Association reiterated that because of the expanse of ocean within the Region, the observing network was very sparse. Since additional observations were needed, the Association was pleased that there had been increased emphasis on and availability of marine observations over the past decade, and expected this trend to continue.

4.2.9 The Association noted with satisfaction that the Region continued to play an active role in the drifting buoy programme through chairing the DBCP and the Drifting Buoy Panel for the Indian Ocean. The XBT network continued to operate successfully. Ten Argo floats had been deployed in the Indian Ocean between Australia and Indonesia by Australia's government

research agency CSIRO. The data from the floats were being distributed in TESAC code on the GTS in near-real time.

4.2.10 The Association also noted that a new activity had been the commencement of the ASAP in the Southern Hemisphere. In particular, the M.V. Palliser Bay (call sign GWAN), operating out of the United Kingdom, had started providing twice-daily upper-air soundings in April 2001.

4.2.11 The Association noted with particular interest that SOPAC had defined a GOOS strategy for the Pacific. In addition, SOPAC called for stronger coordination between GOOS and GCOS for the Pacific in order to define a single coordinated observing network. The Association was pleased to note that a representative from SOPAC had been invited to attend the next GCOS meeting in the Pacific. The Association also noted that coordination should be easier with the location of the IOC Regional Office in Perth.

4.2.12 In supporting a recommendation of CBS-XII, the Association tasked the Co-rapporteurs on Regional Aspects of Integrated Observing Systems and the Co-rapporteurs on Regional Aspects of Oceanographic and Marine Meteorological Services to coordinate their work closely to ensure cross-programme cooperation between CBS and JCOMM on the maritime observing systems implementation programme at the regional oceanic basin level.

4.2.13 The Association noted that AMDAR reports were not being processed by many developing countries despite their general availability and usefulness in providing profiles and overflight information. Within the previous year, AMDAR reports had become available within geographically segmented bulletins, making it easier for smaller centres to use these data. The Association agreed that AMDAR provided a valuable addition to the observing network, and noted that there was an opportunity for expanded regional cooperation to arrange for additional collection of these observations.

4.2.14 The Association was informed that CTBTO was installing a worldwide monitoring network that included meteorological observations, and was pleased that WMO and CTBTO had signed an agreement to exchange data. Since the CTBTO network was expected to grow to nearly 300 sites, with many in remote areas, it was felt there would certainly be many sites within the Region. The observations provided by CTBTO were to be collected by Canada and distributed on the GTS in the near future.

4.2.15 The Association considered that the public visibility of the NMSs could be affected by the location of observing systems. Observing networks had traditionally been designed according to the need for balanced geographical coverage. However, users expected observations to be available for high-profile locations, and it was felt that this could affect the public perception of NMSs. The Association therefore urged NMSs to balance these competing requirements when determining the most appropriate locations for observing stations within their territories.

CLIMAT AND CLIMAT TEMP REPORTING

4.2.16 The Association noted that the concept of an RBCN had been adopted by several regional associations and was supported by CBS and CCL. This development recognized that it was not practicable to have the network of CLIMAT reporting stations identical to the RBSN. Some CLIMAT reporting stations were not in the RBSN, including some GSN stations, and could not meet RBSN requirements. Conversely, some RBSN stations were not ideally suited for climate reporting.

4.2.17 The Association agreed that the RBCN was intended to provide a comprehensive network of CLIMAT and CLIMAT TEMP reporting stations. It was based primarily on RBSN stations and should include GSN and GUAN stations, supplemented by other CLIMAT and CLIMAT TEMP reporting stations needed for description of regional climate features. It was felt that these supplemental stations should be selected under the same criteria used for GSN stations. Non-RBSN stations reporting CLIMAT messages should be considered, particularly those with long records, as well as any RCSs.

4.2.18 Following the positive experience gained in Regions II, III, IV and VI, the Association agreed to define an RBCN for Region V. It also noted the statement of CBS-XII that such a network would provide valuable justification for maintaining a minimum number of CLIMAT reporting stations and could also serve as a target list for WWW monitoring. Accordingly, [Resolution 3 \(XIII-RA V\)](#) on establishing the RBCN in Region V was adopted.

INSTRUMENTS AND METHODS OF OBSERVATION PROGRAMME (IMOP)

4.2.19 The Association noted with interest the results of CIMO-XII, held in Casablanca, Morocco in 1998. It was pleased that several experts from the Region were able to attend the technical conference and the TECO-98/METEOREX-98 exhibitions, which were held in conjunction with CIMO-XII, as well as TECO-2000/METEOREX-2000, held in Beijing, China in October 2000.

4.2.20 The Association emphasized the value of close links and active exchange of experience with manufacturers and instrument developers in solving technical problems. It was noted with appreciation that, as a result of a recent initiative by the Secretary-General, based on the request by Thirteenth Congress to strengthen collaboration between instrument manufacturers and WMO, the constitutional meeting of the Association of the HydroMeteorological Equipment Industry took place in September 2001. That association had applied for consultative status within WMO, and the fifty-fourth session of the Executive Council was scheduled to consider this matter in June 2002. Such a status would greatly facilitate the involvement of members of the private instrument and equipment sector through their association as observers in the work of WMO bodies, which would be especially important for CIMO.

4.2.21 The Association agreed that the needs of NMHSs in the field of instrumentation consisted mainly

of long-term stability, maintenance and repair, and calibration of sensors and equipment. Members were encouraged to develop capabilities for the maintenance and servicing of the operationally-used instruments. In this connection, the Association welcomed that the president of CIMO, Mr S.K. Srivastava (India), initiated an Expert Meeting on Capacity Building Related to Instruments and Methods of Observation (Beijing, China, 1999) at which recommendations for enhancing the collaboration on matters related to IMOP within the Regions and strengthening the links between CIMO and the regional associations had been developed. It agreed that activities should be enhanced to take greater advantage of this collaboration.

4.2.22 The Association urged Members to carry out inspections of their networks of stations at frequent intervals to ensure the correct functioning and calibration of instruments according to the procedures contained in the *WMO Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8). It added that specific attention should be given to the frequent calibration of operationally-used barometers.

4.2.23 The Association confirmed the value of RICs in guaranteeing proper calibration of equipment and in training instrument operators. Noting with appreciation that two RICs had been established in Melbourne, Australia and Manila, Philippines, and had successfully begun their work, the Association invited the centres to continue their efforts to enhance their collaboration for better using the resources available and sharing the workload. The RICs were encouraged to reach out to Members to inform them of their services and plans. Members were invited to take advantage of these services, especially for calibration of national standard instruments and assisting in preparation and running workshops for instrument specialists.

4.2.24 The Association expressed its concern that only the standard pyrhemometers of the Melbourne, Australia RRC could be calibrated at WMO's IPC-IX at the WRC (Davos, Switzerland, 2000).

4.2.25 To further the enhanced collaboration with ISO concerning meteorological instruments, the Association was briefed that a close collaboration had been established between WMO and the Paris-based BIPM. A related agreement had already been approved by CIPM, which was intended to be submitted to the fifty-fourth session of the Executive Council. It might then be elevated to a working arrangement, which would be beneficial for both organizations, especially for CIMO.

4.2.26 The Association reiterated the great value of education and training of instrument operators for achieving the required high quality and reliability of observations for various operational and research applications. All NMHSs were encouraged to train and retrain their own staffs as necessary, and to consider training facilities of other Members and the RIC if their own resources were not sufficient. Donors were invited to maintain strong support to training programmes in instrumentation.

4.2.27 The Association expressed its appreciation that the China Meteorological Administration had compiled, published, and distributed the CIMO Instrument Catalogue on behalf of WMO. It was agreed that this Catalogue would significantly facilitate the work of NMHSs in selecting instruments and equipment for procurement and that a regular update should be done.

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

4.2.28 The Association noted with appreciation the report of Ms J.O. Warne (Australia), Rapporteur on Regional Aspects of Instrument Development, Related Training and Capacity Building. The session was informed that the RIC of RA V, operated by Australia's BOM (RIC Melbourne) continued its calibration activities and standardization of methods for atmospheric pressure, humidity, temperature and development of new methods in the areas of rainfall and wind measurement, as well as solar radiation measurements. The last was carried out at the RRC, a part of the Australian RIC.

4.2.29 The Association recognized that the RIC carried out calibrations of pressure and temperature standards for Members of RA V during the intersessional period. An intercomparison with the other RIC of RA V, established by the Philippines, was carried out in 1998, and discussions of changes to standard instruments had occurred. The RIC ran training courses on basic meteorology, calibration methods and quality control and assurance. Representatives from a number of RA V Members, including Indonesia, Papua New Guinea, Malaysia and New Zealand, attended these courses. Of particular note were the lectures given to the International Workshop for Port Meteorological Officers from Regions II and V in Melbourne, Australia, in November 1999.

4.2.30 The Association noted with appreciation the significant contribution of Mr B. Forgan and the staff of the RA V RRC in Melbourne to IPC-IX. Mr Forgan was both heavily involved in the operation of the intercomparison and the training sessions. The Association noted that the RRC also hosted an intercomparison of solar radiation and spectral devices for Members of Regions II and V at Alice Springs, Australia in 2000 as a follow-up to IPC-IX.

4.2.31 The Association expressed its appreciation for the RIC's involvement in calibration and training in the areas of ozone measurements; the Dobson Intercomparison at Lauder, New Zealand, held in December 2001; and the significant support and advice provided to the Korea Meteorological Service on the repair of its Dobson instrument.

4.2.32 The Association expressed its appreciation for the facilitation of visits of the Region's experts to the BOM. Staff from Malaysia (in 1998 and 2001), Indonesia and the Republic of Korea (in 2001) spent periods of between a few days and several weeks working with RIC staff and other experts of the BOM, thus obtaining information and training in a wide variety of observations and engineering matters.

4.2.33 The Association noted with appreciation the efforts made to increase the reliability and accuracy of instruments and observations, particularly in the areas of high-quality pressure measurement and the ongoing upgrading of the Australian Network of pressure standards and ultimately the RA V standard. It also noted the efforts the RIC put into improving both laboratory and field rainfall calibration methods.

4.2.34 The Association learned with satisfaction that RIC Melbourne had prepared and distributed reports on investigations of instruments to interested experts in RA V, and was in the process of establishing a Web-based library of instrument reports.

4.2.35 The Association was informed that the RIC had established consolidated links during the interseasonal period with non-meteorological organizations, especially with bodies in the field of meteorology. This would ensure that the RIC would be kept up to date on the latest issues and developments in the areas of meteorology, and could transfer the acquired knowledge and skills to the other Members of RA V. In this connection, the Association recognized that these efforts assisted in the development of international standards of instrument design and calibration, and their use for the broader meteorological community. The Association encouraged the development of these types of links with external bodies related to meteorology as means of building the capacity and broadening the knowledge base of the RIC.

4.2.36 The Association encouraged its Members to make arrangements for continuously reviewing the performance of the instruments commonly in use in the Region. It felt that particular attention should be paid to long-term stability, the need for ease of maintenance and repair, the requirement for frequency of calibration, and the development of cost-effective instruments suitable for operation under extreme weather conditions.

4.2.37 The Association noted the importance of information on instrument development as guidance for improving the equipment of surface-based observing stations, the need for technology transfer among Members, and the wide range of requirements for meteorological variables to be measured. It also noted the need for coordinating education and training measures for observers, station inspectors and technicians in the field of operation, maintenance and calibration of meteorological

instruments. Consequently, the Association decided to appoint Co-rapporteurs on Regional Aspects of Instrument Development, Related Training and Capacity Building, and adopted [Resolution 4 \(XIII-RA V\)](#).

4.3 REGIONAL SATELLITE ACTIVITIES (agenda item 4.3)

POLAR-ORBITING SATELLITES

4.3.1 The Association welcomed the fact that China had very recently launched the FY-1D satellite and looked forward to the successful commissioning into operational service of that satellite. The Association noted that the polar-orbiting meteorological satellite FY-1C, launched on 10 May 1999, had been operating since that time. It also noted that NOAA-16 had been designated as the operational replacement for NOAA-14 in March 2001. As such, it was operating in an orbit with a 13:53 p.m. ascending node (afternoon orbit) and utilizing a similar set of instruments as NOAA-14. NOAA-15 had been launched on 13 May 1998, and designated as the operational replacement for NOAA-12 in July 1998. As such, it was operating in an orbit with a 7:30 a.m. descending node (morning orbit) and utilizing the same set of instruments as NOAA-16 except for the SBUV. NOAA-15 had anomalous instrument behaviour in the HIRS and AVHRR and the on-orbit failure of three high-gain downlink antennas. The AVHRR was rephased once per day to assist the scan motor to maintain synchronization.

4.3.2 Two satellites of the METEOR-2 and METEOR-3 series were being operated in circular orbit inclined at approximately 82.5° as shown in Table 1. These satellites had operated far beyond their expected lifetimes and their capabilities were limited.

GEOSTATIONARY SATELLITES

4.3.3 The Association noted that the first Chinese GMS FY-2A had been launched on 10 June 1997. On 26 April 2000, FY-2A had been moved to the backup position of 86.5°E. The second Chinese GMS, FY-2B, had been launched on 25 June 2000 and was stationed at 1 050°E.

4.3.4 The Association further noted that GMS-5 had been launched on 18 March 1995 and had since been in continuous operation at 1 400°E in geostationary orbit. Although it was noted GMS-5 was operating beyond its

Table 1

<i>Satellite series and number</i>	<i>Launch date</i>	<i>APT radio signal characteristics</i>			
		<i>Carrier frequency (MHz)</i>	<i>Modulation</i>	<i>Allocated bandwidth (KHz)</i>	<i>Radio transmitter output power (W)</i>
METEOR-2 N21*	31/08/1991	137.3	FM	100	5
METEOR-3 N5	15/08/1991	137.85	FM	100	5
RESURS-01 N4**	10/07/1998	137.75	FM	100	5

* Meteor-2 N21 limited APT transmission of visible images.

** Resurs-01 N4 was temporarily out of operation.

designed lifetime of five years, it was to continue to operate until the MTSAT-1R assumed the meteorological mission of GMS-5 in the summer of 2003.

4.3.5 MTSAT was to have taken over the meteorological missions of GMS-5 in the spring of 2000. However, due to the failure of the launch vehicle, the Japan Meteorological Agency (JMA) and the Japan Civil Aviation Bureau (JCAB) of the Ministry of Land, Infrastructure and Transport (MLIT) settled on a new plan to launch MTSAT-1R as a replacement of MTSAT in early 2003, and MTSAT-2 in 2004. The Association noted with satisfaction the Implementing Agreement that was signed on 10 May 2002 between Japan and the United States regarding the establishment of the backup of the GMS-5 satellite with the NOAA GOES-9 satellite. This agreement called for NOAA to move the GOES-9 satellite from 105°W above the equator (its standby position) to 155°E to cover the Western Pacific area, and NOAA would transmit the Earth images to the JMA Meteorological Satellite Centre for redistribution via the GMS-5 WEFAX broadcast. The backup arrangement was foreseen to start in the first quarter of 2003 and last until MTSAT-1R became operational.

GROUND SEGMENT

4.3.6 The Association noted that 14 of the 21 Members in the Region were equipped with low-resolution polar-orbiting receivers but only seven were equipped with high-resolution polar-orbiting receivers. Eighteen of the 21 were equipped with at least one polar-orbiting receiver. With regard to the geostationary receivers, 19 of the Members had low-resolution WEFAX receivers while 11 had high-resolution receivers. In all, 19 Members had at least one geostationary receiver. In the Region, 18 had at least one polar-orbiting receiver as well as one geostationary receiver. The percentage of implementation of WWW goals increased from 48 to 86 per cent since 1999, as referenced in *Satellite Ground Receiving Equipment in WMO Regions, Status Report 2000* (WMO/TD-No.1021).

4.3.7 The Association noted that once MTSAT-1R became operational in 2003, many NMCs within the Region would not have access to its high-resolution products unless some specific actions were taken. It recommended that either funding be found to purchase new receiving equipment and workstations, or that these products be made available for access via the Internet.

4.3.8 The Association expressed its appreciation and deep gratitude to the operators of the environmental satellites, which continued to provide vital services in the Region, in particular forecasting and warning of tropical cyclones and other severe weather events, and monitoring the climate system and the environment.

4.4 TELECOMMUNICATION SYSTEM (agenda item 4.4)

4.4.1 The Association noted that significant progress had been made in the implementation and operation of all components of the RMTN.

POINT-TO-POINT RMTN CIRCUITS

4.4.2 The Association noted with appreciation that the plan for upgrades to RMTN point-to-point links and introduction of TCP/IP procedures as adopted by XII-RA V had mostly been implemented. TCP/IP, the recommended protocol for the GTS, was operating on 12 of the 23 implemented circuits of the RMTN. A Frame Relay Network, the first such network in operation as part of the GTS, linked WMC/RTH Melbourne and NMCs Jakarta and Singapore, and also provided the interregional link Melbourne–Bracknell. It was noted that the Frame Relay Network had proven to be reliable, flexible and very cost-effective.

4.4.3 Four regional and one interregional GTS circuits were being implemented through the Internet. The WMC/RTH Melbourne–RTH Wellington circuit, implemented via the Internet, had an ISDN backup, which was activated when required. RTH Wellington was also using the Internet for the collection of observational reports from several Pacific islands.

4.4.4 The Association noted that the additional circuits Melbourne–Honiara, Honolulu–Guam, Honolulu–Pago-Pago and Honolulu–Pohnpei (Federated States of Micronesia), that were not yet included in the RMTN, were playing an important role in the operation of the GTS in Region V. It also took note of the Frame Relay links Toulouse–NMC Noumea and Toulouse–NMC Tahiti.

RADIO BROADCASTS

4.4.5 From 1 July 2002, RTH Melbourne was to implement a comprehensive voice and facsimile HF broadcast system using ground stations at Wiluna and Charleville. RTH Wellington was operating one radio facsimile broadcast from Auckland, and Honolulu was also operating another. The Association noted that these radio facsimile broadcasts were mainly used by maritime users, and that the two RTHs and Honolulu were planning to continue operation of their broadcasts for the foreseeable future.

4.4.6 The Association took note of the ISCS, a one-way multipoint telecommunication service via satellite operated by the United States to support WAFS distribution. The ISCS system over the Pacific included one channel carrying GTS data, mainly relating to Regions III and IV, and some spare capacity to accommodate additional Region V data and products. Ten ISCS systems had been installed in the Region in Honolulu, Wellington, Melbourne, Noumea, Port Moresby, Port Vila, Nadi, Jakarta, Manila and Singapore, although a few of these systems were not yet operational.

4.4.7 The Association was pleased to note that plans were in place for the further development of the ISCS beyond September 2003. These included plans to provide additional capacity for the distribution of data and products, including separate data streams over the Atlantic Ocean region and Pacific Ocean region satellites, and support for TCP/IP procedures.

4.4.8 The Association noted with appreciation the current status and future plans for the United States'

EMWIN. This network shared the WEFAX channel of the GOES satellites for the distribution of meteorological information related to emergency situations, including warnings. More than 30 EMWIN systems were implemented in 18 Pacific countries, and additional installations were planned for the future, subject to funding. The relatively low cost of the equipment and its simple installation, operation and maintenance had greatly facilitated its implementation. The EMWIN implementation had dramatically improved the distribution of meteorological information and warnings of vital importance for the Pacific countries.

4.4.9 The Association noted with appreciation that the United States NWSPR, in agreement with the University of Hawaii PEACESAT Project, had uplinked the EMWIN broadcast from GOES-10 onto GOES-7 to provide the EMWIN signal to receiving sites outside the GOES-10 footprint. It noted that a NWSPR contractor had developed a prototype auto-tracking antenna for receiving EMWIN transmissions from GOES-7 at the United States NWS Weather Forecast Office Guam, and the weather offices in Chuuk and Yap (Federated States of Micronesia), and Koror (Republic of Palau). It noted further that additional EMWIN receiving stations had been installed at state EMOs on Pohnpei and Kosrae (Federated States of Micronesia), and that the United States would install EMWIN systems at EMOs in Chuuk, Yap, Koror, Guam and the Commonwealth of the Northern Mariana Islands in the near future.

4.4.10 The Association recognized that EMWIN was providing products that were essential to the operation of NMHSs in the Region, and was pleased to note that the United States considered EMWIN a fully operational system with an assured long-term future in subsequent GOES series. It noted the technical developments that were planned within a few years, and recommended that EMWIN systems procured in the future should ensure long-term and reliable operation, in particular in the prevailing tropical marine environment. It also noted with interest the development of a mini-EMWIN terminal with a manual entry DCP platform for use at remote sites.

4.4.11 It was noted that an increasing number of DCPs were being implemented in Region V, transmitting via the GMS satellite operated by Japan, or via the GOES satellite operated by the United States. The DCP messages were being relayed to Region V and the originating NMC via the GTS.

4.4.12 The Inmarsat system, and in particular Inmarsat C ship Earth stations, were being increasingly used for the collection of ship reports from voluntary observing ships. At the same time, the number of ship reports collected through the coastal radio stations was decreasing regularly. The Perth and Singapore Land Earth Stations were receiving ship reports from Inmarsat C and A stations at no cost to ships.

GTS OPERATION

4.4.13 The Association noted with appreciation that WMC/RTH Melbourne had implemented the necessary

arrangements, as the responsible MTN centre, for maintaining the part of the catalogue of meteorological bulletins related to Region V, in accordance with the new procedures. The necessary coordination on bulletins headers and content was carried out between WMC/RTH Melbourne and NMCs in the Region. The Association urged all NMCs in the Region to promptly notify WMC/RTH Melbourne of any planned and actual changes of bulletins (header and content).

4.4.14 The Association expressed its appreciation to the United States for its procurement and placement into operation of hand-held Iridium satellite telephones for the weather offices in Pohnpei, Chuuk and Yap (Federated States of Micronesia); Majuro (Republic of the Marshall Islands); Koror (Republic of Palau); and Pago Pago (American Samoa); and for the technicians who service the offices and remote tide and meteorological automatic stations. It also acknowledged that an Inmarsat unit had been installed at the United States NWS Weather Forecast Office Guam, and that this satellite telephone capability would enhance backup communications at these offices.

4.4.15 The Association was pleased to note that the GTS links Singapore–Kuala Lumpur and Singapore–Bangkok had been upgraded to Frame Relay, and that the GTS link Apia–Pago Pago had been implemented.

4.4.16 The two RTHs in the Region were providing their routing catalogues on their FTP servers. The routing catalogues were important for ensuring and monitoring the efficient exchange of GTS data, and for the NMCs to easily access the information on the availability of bulletins at RTHs.

FURTHER DEVELOPMENT OF THE RMTN

4.4.17 Based on recommendations from its WG/PIW in Region V, the Association decided that the circuits Melbourne–Port Vila, Melbourne–Honiara, Honolulu–Guam, Honolulu–Pago Pago, Honolulu–Pohnpei and Pago Pago–Apia be included in the RMTN. It requested the Secretary-General to make the relevant amendments to the *Manual on the Global Telecommunication System* (WMO-No. 386), Volume II, Regional Aspects, Region V (South-West Pacific).

4.4.18 The importance of the interregional circuit Nadi–Washington, which was included in the RMTN plan, was also underlined, in particular for facilitating the insertion of RSMC Nadi warnings and other products into the ISCS and EMWIN, and for serving as backup to the GTS. RSMC Nadi and WMC/RTH Washington were invited to consider its possible implementation.

4.4.19 The Association endorsed the following plans for further upgrade of the RMTN, and encouraged the Members concerned to expedite the implementation:

- (a) Upgrade of the link Melbourne–Nadi to Frame Relay;
- (b) Upgrade of the link Melbourne–Noumea to TCP/IP;
- (c) Upgrade of the link Singapore–Manila to Frame Relay;
- (d) Implementation of the interregion link Nadi–Washington.

4.4.20 The Association noted the general advances of information and communication technology, including data-communication network services and the Internet. It recognized that the use of the Internet, implemented with adequate protection and security measures, was an acceptable and cost-effective option for several GTS links, as well as for complementary data links. It noted that the use of Virtual Private Networks, with the Internet Protocol Security appeared to provide adequate security and protection. The Association invited the CBS to urgently develop guidelines for the implementation of Internet-based links, in particular Virtual Private Networks, as part of the GTS.

4.4.21 The Association underlined that, while several NMHSs in the Region had reliable and affordable communication links, for several others the costs of communications were a tremendous burden. It noted that the Council of Regional Organizations in the Pacific had established an ICT/WG to improve ICT services in the Pacific, in particular the Internet, and recommended that WMO be involved in the work of this group.

4.4.22 The Association also noted that managed data-communication network services remained a highly efficient and secure option for a dedicated RMTN. This option would require extensive technical and administrative coordination between the participating Members, in particular for the tendering process and contractual arrangements. The Association noted that WMO Secretariat assistance might be requested at a future time to facilitate the related administrative and procurement process for an RMTN based on commercial managed data-communication networks.

RADIO FREQUENCIES FOR METEOROLOGICAL ACTIVITIES

4.4.23 The Association noted that meteorological radio frequencies for operation and research were facing a continuing threat as a result of the pressure on radio frequency bands from the increasing development and expansion of new radiocommunication systems, in particular from the MSS industry. WRC 2000 (Istanbul, May 2000) had a favourable outcome as regards the several items of concern to meteorology. The active participation of WMO in the ITU preparatory activities was instrumental in ensuring that meteorological requirements were recognized and supported.

4.4.24 The Association re-emphasized the importance of continuing to defend the frequency allocations to meteorological systems and environmental satellites. The agenda of the following conference (WRC-2003) contained items of importance for meteorology, including the band 1670–1690 MHz, a main band for worldwide meteorological satellite operation and radiosonde operation by many NMHSs. The possible allocation of part of the band to the MGS industry, which had been debated since 1992, might in particular hamper the development of GOES/GVAR and GMS/S-VISSR stations that were especially important for Region V. WMO was taking an active role in ITU's radiocommunications activities in preparation for WRC-2003. The Association invited NMHSs to keep drawing the attention of their national

radiocommunication authorities to the crucial importance of safeguarding radio frequency bands allocated for meteorological operations, and to participate, to the largest extent possible, in the relevant radiocommunication activities at the global level through ITU, and the regional level through APT.

4.5 DATA-PROCESSING SYSTEM (agenda item 4.5)

4.5.1 The Association noted that GDPS centres in the Region were continuing to enhance and improve their forecasting systems and computer facilities. WMC Melbourne and NMC Singapore (also the ASMC) were running global models. In addition, WMC Melbourne was running LAMs over Australia (tropics and extra-tropics) as well as a mesoscale model. Singapore was also running two LAMs (127-km and 63-km resolution). RSMC Wellington was running an operational mesoscale model over New Zealand.

4.5.2 The Association noted that EPS products had proven to be of great value. It was pleased that EPS products from ECMWF would be made available to NMCs in the Region in the near future, and that WMC Melbourne had implemented an operational EPS early in 2002. Products from WMC Melbourne would be made available as soon as practicable, but the initial configuration did not contain perturbations in tropical latitudes.

4.5.3 The RSMCs with geographical specialization — Darwin, Melbourne, and Wellington — provided regional products to assist NMCs in the forecasting of small, mesoscale and large-scale meteorological systems. The Association noted that Darwin and Melbourne had been expanding the number of products available to NMCs in the Region to make specific products available to individual NMCs through their 'registered users' pages via the Internet.

4.5.4 RSMC Melbourne, as the regional centre for the provision of transport model products in case of nuclear emergencies, implemented the regional and global arrangements for the provision of such products. Melbourne was providing, upon request, specialized transport/dispersion/deposition model products, and the Association was pleased to note that NMCs in the Region were very happy with the responsiveness and level of service provided by the Melbourne centre. The Association was pleased that the ASMC Singapore had implemented a transport model for the generation and provision of forecasts of haze/smoke caused by wild-land fires.

4.5.5 The Association noted that RSMC Hawaii had been designated for tropical cyclone forecasting and was providing tropical cyclone forecasts for the Pacific north of the equator from 140°W to 180°W. RSMC Nadi had fully upgraded its capabilities (telecommunications, satellite imagery and data processing) and was fully operational to provide tropical cyclone forecasts over its area of responsibility. Steady progress was observed in all centres for the tropical cyclone track forecasting, but much more remained to be done in research and development with respect to forecasting the intensity of cyclones. Statistical models were being used to supplement the results of the numerical models.

4.5.6 The Association noted that the computer hardware at RSMC Nadi was nearing the end of its operational life and that any further upgrades of software would require replacement of the hardware. It urged donors to consider, as a matter of highest priority, requests related to the upgrade and/or replacement of computing facilities for the centre.

4.5.7 Noting that the ASMC Singapore had strengthened its capabilities for the provision of technology transfer and capacity building, the Association felt that such issues were of particular concern within the Region, particularly those related to assuring the availability of processing and post-processing equipment and other facilities at NMCs for:

- (a) Accessing EPS products, including medium-range severe weather occurrence guidance and long-range forecast products, which were or would become available at Web sites of major Data Processing and Forecasting Centres on either a routine or scheduled quasi-operational basis;
- (b) Provision of transport and dispersion model products for response to nuclear incident and other emergencies such as large-scale forest fires and/or haze;
- (c) Implementation at NMCs of relevant relocatable models for response to releases of chemical and biological agents; and
- (d) Establishing strong collaborative linkage between the NMHS and national disaster management agency, and assuring mechanisms were put in place for coordinated community response to severe weather forecasts and warnings.

4.5.8 The Association agreed that equipment and facilities required for capacity building and establishing the access, processing and forecasting functions of NMHSs for the above activities should be given a high priority in technical cooperation.

4.5.9 The Association recalled the continuing importance of the services provided by the RSMC Nadi for the Region, and appealed to Members to reinforce their commitment to support the centre with respect to technical equipment as well as training of staff. It expressed the hope that innovative arrangements for support and collaboration could be found to strengthen and sustain the important functions of RSMC Nadi.

4.6 DATA MANAGEMENT, INCLUDING MATTERS RELATED TO CODES (agenda item 4.6)

4.6.1 The Association considered with great interest the proposal for the Future WMO Information System, developed by the Inter-programme Task Team on Future WMO Information Systems. It recognized that the proposed system would require major changes in operational and institutional arrangements, but agreed that it offered significant benefits and opportunities for improved services. The Association recommended that NMHSs within the Region participate in its further development.

4.6.2 Regarding codes, the Association noted that GRIB Edition 2 had been recommended for use as of November 2001, particularly for the exchange of EPS products. The Association also noted that migration to

table-driven codes to replace the traditional character codes, and a timetable for implementation, had been proposed. It recognized that the migration to table-driven codes would be a complex task and would take many years. However, given that codes were essential to the operations of NMSs, it emphasized that the introduction of table-driven codes must be approached with deliberation and caution. The Association noted that the potential impact and implications for the Region must be determined once the implementation schedule became better defined.

4.6.3 The Association noted that the CREX format was starting to be used within the Region, with RSMC Nadi issuing cyclone trajectory forecasts and the United States NWS issuing automated rainfall reports in CREX. The Association noted that the use of CREX by some Members represented an opportunity to gain experience in the use and flexibility of the CREX table-driven format.

4.7 WWW SYSTEM SUPPORT ACTIVITIES AND OPERATIONAL INFORMATION SERVICE (OIS) (agenda item 4.7)

4.7.1 The Association recalled that the objective of the OIS was to collect from and distribute to WMO Members and WWW centres detailed and up-to-date information on facilities, services and products made available in the day-to-day operation of the WWW. This service included *Weather Reporting* (WMO-No. 9), Volumes A, B, C1, C2 and D, as well as the *International List of Selected, Supplementary and Auxiliary Ships* (WMO-No. 47), METNO messages and the Operational Newsletter. Several elements of the operational information related to *Weather Reporting*, Volumes A and C1; the *International List of Selected, Supplementary and Auxiliary Ships*; and RBSN lists were available on the WMO home page (www.wmo.ch).

4.7.2 The Association agreed that WMO Publications No. 9 (excluding Volume B) and No. 47 should continue to be made available via the WMO Internet server, and should also be distributed to NMHSs on a CD-ROM as from 2002. WMO Members, who still preferred to receive the paper format, should continue to receive a paper copy if they so requested. It was also noted that these publications would no longer be distributed on diskettes.

4.7.3 The Association noted plans to distribute the Operational Newsletter via e-mail, preferably as an announcement that the latest edition was available on the WMO Internet server.

4.7.4 The Association noted that the *Manual on the Global Data-processing System* (WMO-No. 485), the *Manual on the Global Observing System* (WMO-No. 544), the *Manual on the Global Telecommunication System* (WMO-No. 386) and *Manual on Codes* (WMO-No. 306), annexes to the *WMO Technical Regulations* (WMO-No. 49), were not available in electronic format. This made it difficult for experts to work on changes to the *Manuals*, including experts from regional working groups. It agreed that the availability of the *Manuals* in a word processor format would greatly facilitate this work.

4.8 TROPICAL CYCLONE PROGRAMME (TCP) (agenda item 4.8)

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

4.8.2 The Association noted with appreciation the informative report submitted by Mr S.C. Ready (New Zealand), chairperson of the RA V/TCC. In recognizing the importance of regional cooperation and coordination to establish regionally-coordinated early warning systems, the Association commended the Members concerned, the RA V/TCC and the intergovernmental ESCAP/WMO Typhoon Committee for their contributions and efforts, particularly towards improvement of capability in providing accurate tropical cyclone forecasts and timely early warning services in Region V.

4.8.3 Regarding the report of the ninth session of the RA V/TCC, held in Manila from 16 to 20 May 2002 in association with XIII-RA V, the Association expressed its appreciation to the members of the committee for their substantial contributions to the implementation of the programme, and commended them for the formulation of a new Technical Plan for 2003–04.

4.8.4 The Association expressed its appreciation to Australia, China, the European Union, Japan, New Zealand and the United States for their invaluable contributions to the substantial upgrading of the facilities, equipment and staff support for the RSMC Nadi, TCC and NMSs in the Region. It also thanked the United Kingdom and France for providing support for upgrading the capabilities of the NMSs in the Region.

4.8.5 Noting their importance as a means of technology transfer and providing guidance and information for tropical cyclone forecasters and researchers, the Association invited Members to make full use of reports in the TCP series, such as *Global Perspectives on Tropical Cyclones* (WMO/TD-No. 693, TCP Report No. 38) and *Estimating the Amount of Rainfall Associated with Tropical Cyclones Using Satellite Techniques* (WMO/TD-No. 693, TCP Report No. 42). It also invited Members to take advantage of relevant training events such as the Southern Hemisphere Training Courses on Tropical Cyclones, organized by Australia in cooperation with WMO, the Pacific Desk Training (Honolulu) and the Australian Mentor Training. The Association requested the Secretary-General to continue providing maximum support for training activities, including attachment of forecasters to advanced centres in the Region under the programmes of both committees, within the available budgetary resources. It noted the request of Malaysia that due to the recent occurrence of a tropical storm in the equatorial region, it wished to be included in training courses on tropical cyclones in order to improve its staff's forecasting skills and ability to issue appropriate warnings.

4.8.6 The Association agreed to continue to use the interim cyclone warning areas as endorsed by XII-RA V, and that Australia would maintain responsibility for tropical cyclone warning around Indonesia until such time as its BOM and Geophysics Indonesia operational staff had received sufficient training to provide the service, tentatively at the close of the 2004–05 tropical cyclone season.

4.8.7 In view of the fact that the IWTC served as a forum for the interaction between forecasters and researchers, and encouraged the application of research results to operational usage, the Association was pleased to learn that IWTC-V would be held in Cairns, Australia, from 3 to 12 December 2002. The Association felt that Members should send one operational forecaster and one tropical cyclone researcher to participate in the workshop. It requested WMO, within available resources and prospective donors, to provide funding support for maximum participation of RA V/TCC member countries at the workshop.

4.8.8 Recognizing the great importance of the continuing work of the RA V/TCC, the Association decided to re-establish the committee, and adopted [Resolution 5 \(XIII-RA V\)](#).

4.8.9 The Association decided to keep in force Resolution 10 (X-RA V) — Tropical Cyclone Operational Plan for the South Pacific and South-East Indian Ocean, since it was playing an effective role in strengthening the warning services of tropical cyclones in the Region towards the mitigation of tropical cyclone disasters. The plan was being updated at each of the TCC's biennial sessions. The Association expressed its full support to the request of the committee for the formulation of a project by WMO to address the pressing needs of TCC members and facilitate the implementation of the Technical Plan.

4.8.10 In view of the vitally important role of the TCP in the ISDR and the SDSIDS, including specifically that under the work of the RA V/TCC and RA V Typhoon Committee, the Association decided to maintain the level of very high priority to the TCP in relation to regional priorities in the WMO LTP.

4.8.11 The Association was gratified by the valuable assistance provided by the European Union South Pacific Tropical Cyclone Warning Upgrade Project, the WMO VCP and donor countries. It requested the Secretary-General to continue his efforts to work for the realization of the second phase of the project and to seek other potential external resources at the regional level in the implementation of the RA V/TCC's Regional Cooperation Programme within a reasonable timeframe.

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

5.1 COORDINATION OF THE WORLD CLIMATE PROGRAMME INCLUDING OUTCOMES OF CCI-XIII (agenda item 5.1)

5.1.1 The Association was informed of the overall coordination of the WCP. In that regard, it noted with satisfaction the decisions made by Thirteenth Congress

and the Executive Council relating to the enhancement of the activities within the framework of the Climate Agenda. The Association also noted the establishment of an EC-AGCE, and requested that the Members of the Association be kept informed. The Association was informed by Mr A.M. Noorian, chairperson of the EC-AGCE, that the third session of the advisory group was held at the WMO Secretariat from 30 April to 1 May 2002. The EC-AGCE addressed a number of important issues, including the interactions between WMO's climate programmes and non-climate programmes in key areas relating to environmental matters. These interactions were categorized into four areas:

- (a) Matters relating to infrastructure, including observation, analysis and prediction;
- (b) Matters relating to services and service delivery to different sectors;
- (c) Matters relating to technical support and training; and
- (d) Matters relating to regional implementation.

The Association was informed that there were a number of areas that required a coordinated approach across several WMO programmes, as follows:

- (a) The development of services for timescales relevant to climate, including the provision and application of seasonal prediction;
- (b) Water resource issues; and
- (c) Natural disasters.

The Association was further informed that the advisory group considered these matters in light of the forthcoming WSSD. It was noted by the group's chairperson that the results of the Summit could provide an opportunity for a review and assessment of the activities under the WCP, GCOS and the Climate Agenda.

5.1.2 The Association noted with satisfaction the actions taken by the Secretary-General to ensure the active participation of WMO and the NMHSs of its Member countries in the work of the UNFCCC. It also noted that WMO, on its own and in collaboration with other organizations and agencies participating in the Climate Agenda, provided scientific and technical reports and information to various sessions of UNFCCC's COP and to its SBSTA. The Association appreciated the information provided by the Secretary-General through regular circular letters to the Members on the decisions and activities of the UNFCCC and its bodies on research and systematic observation of the climate system. The Association urged its Members to continue to involve their NMHSs in the various processes related to the UNFCCC at the national, regional and international levels, including the implementation of the relevant decisions of the COP.

5.1.3 The Association noted the preparations underway within the United Nations System for the WSSD, which was planned to take place in Johannesburg, South Africa in August and September 2002. The Association recognized the importance of this 10-year review of the outcomes of UNCED held in Rio de Janeiro in 1992. It agreed that the NMHSs of its Members should participate to the fullest extent possible in their national preparations for the conference. The Association

requested the Secretary-General to keep Members informed of specific activities being planned by the United Nations System and to facilitate the active participation of the meteorological community wherever possible within current budget resources. The Association noted in particular that the Region's fourth and final preparatory committee (Prepcom) session was taking place in Bali, Indonesia. The Association further noted that extensive information about events and activities leading up to the summit was available on the World Wide Web. The Association stressed the importance of strengthening the role and visibility of NMHSs in the WSSD preparatory process and ensuring that the follow-up to Johannesburg built on and reinforced the essential role of the WWW and other meteorological and related WMO observing networks in contributing to the goal of sustainable development. The Association urged its Members to ensure that their national delegations to the WSSD were fully briefed to draw attention to the vital role of NMHSs and of WMO in contributing to national and regional programmes in support of natural disaster reduction and sustainable development.

5.1.4 The Association noted the successful outcome of CCI-XIII (Geneva, 21 to 30 November 2001) and the restructuring into OPAGs, ETs and Rapporteurs. The Association commended the Commission on the near completion of Part I of the *Guide to Climatological Practices* (WMO-No. 100) and on its efforts to begin work on Part II. The Association noted that Part I of the *Guide* contained general information and was available on the WMO/CCI Web site. Part II was to contain detailed information for climate applications and their relationship to various socio-economic sectors. The Association was pleased to note the active participation of many Members from Region V in the CCI session.

5.1.5 The Association noted with appreciation the report that the Working Group on Climate Matters in RA V presented on behalf of the chairperson, Ms M. Voice. The Association agreed with the working group that the following major areas needed further coordination and attention:

- (a) CLICOM/CDMS and DARE — These continued to be a high priority for climate in the Region and it was felt that efforts must be balanced between data rescue, support of existing CLICOM installations, and future CDMSS;
- (b) Observations, networks and GCOS — Strengthening of cooperative efforts and links between NMHSs, climate services and GCOS activities were needed. It was felt that best practices should be elaborated on in a number of areas in the observing systems of the Region;
- (c) Communications/Internet — Regional and national capability in communication and use of the Internet was thought to be fundamental to the ability to upgrade climate services. The Association expressed the belief that the working group should work closely with RA V subgroups of the WG/PIW to make a consolidated effort to get maximum benefit from existing infrastructure and to upgrade systems;

- (d) WMO RCCs — It was felt that one or more RCCs would benefit the Region, and that an RA V Task Team on the Provision of Seasonal to Inter-annual Forecasts and Regional Climate Services should be established, as referenced in [Resolution 6 \(XIII-RA V\)](#);
- (e) CLIPS and future *El Niño* events — There was a strong desire by NMHSs to update their skills to enable them to enhance their services to their users. The Association felt that the capabilities initiated with national CLIPS Focal Points should be encouraged, and a regional monitoring workshop should be held as a matter of urgency (using the APN workshop model). Other aspects of future work included capacity building and Climate Outlook Forums;
- (f) Monitoring and indices and related support to the ISDR — It was noted that technical tools (including software) required upgrading to better support disaster mitigation efforts. Thus, the Association felt that regional capability should be upgraded through training and capacity building for use of GIS, and that information sharing capability and linkages with user agencies should be strengthened;
- (g) Education/training/showcasing — The Association felt that training should be linked to the six subject areas above, and that some new efficient training modules and a showcase project in air quality and haze should be launched.

5.1.6 The Association considered the recommendations made by the Working Group on Climate Matters. Based on the needs and recommendations identified, it decided to re-establish the group for Region V, with the specific terms of reference and composition as contained in [Resolution 7 \(XIII-RA V\)](#). It requested the president to liaise with the president of CCI to ensure appropriate regional representation in the work of the respective ITCs of the CCI.

5.1.7 The Association noted with concern that the Region had experienced some difficulty in participating effectively in the climate change assessment activities of the WMO/UNEP IPCC over the previous six years, during which the IPCC had prepared its Third Assessment Report (TAR). While three RA V Members (Australia, Indonesia and New Zealand) served on the IPCC Bureau during the preparation of the TAR, they had found it difficult to maintain effective linkage with the RA V IPCC contacts and NMHSs, and had not been very successful in increasing the involvement of RA V scientists in the IPCC process. The Association urged the Permanent Representatives of its Members to take whatever steps they could to enhance national coordination on IPCC and other climate change-related matters of concern to the NMHSs, and to work with the RA V Members of the IPCC Bureau to ensure more effective participation of the Region in the preparation of the IPCC's Fourth Assessment Report. The Association urged its Working Group on Climate Matters to give high priority to enhancing the contribution of the Region to future work of the IPCC.

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

5.2.1 The Association recalled the request of Thirteenth Congress for Members to make available to both the World Data Centres A and B for Meteorology historical monthly and daily data for stations designated as part of the GSN. As these data were essential for ongoing monitoring and assessments of global climate change and variability, the Association urged all Members to respond to this request as soon as possible. Regarding current station reporting, the Association recommended that the data available at the German and Japanese monitoring centres be used to analyze overall CLIMAT reporting performance and that this information should then be made available to Members. The Association urged all Members to attempt to improve this transmission. This information was available on the Deutscher Wetterdienst Web page (http://www.dwd.de/research/klis/gsn_mc/).

5.2.2 The Association noted the progress made by the CCI/CLIVAR Joint Working Group on Climate Change Detection on developing indices, and the success of regional workshops held in Kingston, Jamaica (January 2001) and Casablanca, Morocco (February 2001). These workshops provided practical training on climate indices and statistical techniques, and produced data sets of climate monitoring indices based on data provided by participants from their home countries. Hence, the data were especially relevant for the respective regions. The Association was pleased to note that an ASEAN compendium of climate statistics through the year 2000 would be completed in 2003. This effort was sponsored by Japan, and the statistics were to be made available in digital form, along with access software.

5.2.3 The Association noted the expanding use of AWSs in the meteorological observing networks of many countries, and recognized the likely continuation of this trend in both the establishment of new observing sites and the replacement of existing manual observing sites. The Association noted that special attention was required to ensure that the recording and storage of data covered the full range of parameters essential for climate purposes. The Association urged Members to maintain accurate metadata for AWSs, noting the importance of applying appropriate calibration practices whenever individual sensors were changed.

5.2.4 The Association welcomed the efforts of CCI to develop a questionnaire on homogeneity tests, the homogenization of climatological time series, and on metadata. It noted that the results of the survey would facilitate the development of guidelines to help NMHSs upgrade their data records and improve the international comparability of climatological time series. The Association stressed that the lack of homogeneity in climatological data records was a very important issue and the value of data records for climate change and variability studies in many instances had been severely diminished as a result of insufficiently documented site and instrument changes.

5.2.5 The Association noted with satisfaction the efforts of the Secretary-General to facilitate access via the WMO Web site to an increasing number of global, regional and national CSM products, and expressed its appreciation to those Members who had responded positively to the request to provide Web page addresses for this purpose. In addition to increasing the availability of CSM products to a huge number of users, and increasing the visibility of NMHSs, this also served to stimulate Members in developing the scope and quality of their own sites.

5.2.6 The Association noted with satisfaction that the evolution to the final generation of the software developed for CLICOM (Version 3.1) was well under way in the NMHSs of the many WMO Members using CLICOM. Although many Members were planning to move to more powerful database systems based on well-tested proprietary software, or had already done so, it was anticipated that the existing CLICOM system software would remain in use for some time to come. The Association noted the work of the CCI Task Team on Future WMO CDMSs and as the findings of the team's work were to become available in August 2002, Members would be able to examine which of the systems might best meet their needs, and as necessary seek funding through the VCP. The Association encouraged potential VCP donors to give a high priority to this activity. It noted that this CDMS initiative by CCI was a significant step towards the recommendation of the presidents of technical commissions that an integrated approach to data archiving and data management be adopted by all concerned in WMO.

5.2.7 The Association expressed its appreciation to NCDC in Asheville, United States, for its continuing work in compiling the World Weather Records. Recognizing the need for the preparation of the 1991–2000 series, the Association urged Members to cooperate in the timely provision of data to NCDC in digital form. Malaysia agreed to collect data from Region V and forward these data to NCDC.

5.2.8 The Association noted recent efforts to utilize new technology for data rescue, including the pilot project in Region IV (Jamaica and Honduras). The Association welcomed the proposal for an international DARE meeting to harmonize the data rescue initiatives in the different regions and the trend towards developing digital archives using new technology. The Association noted that there was an urgent need in many countries in the Region for data rescue activities, and urged that the project be expanded to the Region.

5.2.9 The Association was informed of activities within the framework of the ARCHISS project for discovering historical meteorological data in public archives and expressed its support for extending the ARCHISS activities to Region V. The Association concurred with the concept of merging this project with the DARE project, but noted that there was valuable information in the national archives that needed to be recovered urgently.

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 recognized the critical impacts of climate variability on the socio-economic structures of all countries within various regions of the world, and noted that a number of centres in Region V were producing climate products. The Association called upon Members to strengthen their activities in this area in view of the encouraging level of predictability that was emerging with respect to climate anomalies and of rainfall totals on seasonal to inter-annual timescales. In that regard, the Association welcomed the activities being promoted by the Secretary-General to develop a user requirement for seasonal to inter-annual prediction. This was a prerequisite for further development of an infrastructure for the provision of prediction information, and for the support of other activities that would carry substantial benefits for the Region.

5.3.2 The Association also called upon Members to strengthen their activities with respect to documenting the socio-economic impacts of climate variability. The documentation should distinguish between the needs of NMHSs and the needs of end users, and should be Region-wide. In a similar fashion, the Association urged Members of the Region to undertake a capabilities analysis. The Association urged the Secretary-General to ensure that the CLIPS Project Office assisted Members to improve their understanding of climate change and variability, and its relationships to extreme weather events. This should be done in coordination with the PWSP.

5.3.3 The Association expressed the opinion that the NMHSs should take 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 levels through the identification of CLIPS Focal Points in combination with the creation of the CLIPS Curriculum. The Association urged Members to support the identified Focal Points and to provide them with the facilities necessary to undertake their roles.

5.3.4 The Association noted the levels of success achieved in CLIPS-related training workshops held for Region V. It endorsed the integration of CLIPS Focal Point Training with workshops on specific applications. In that regard, it took special note of the CLIPS Focal Point Training and Applications Workshop (Auckland, New Zealand, 29 November to 15 December 2000), which specifically focused on climate applications for health, water resources and fisheries. It noted with satisfaction the follow-up training for Focal Points from Region V that was arranged through the CLIPS Project Office and provided by the Cooperative Institute for Mesoscale Meteorological Studies at the University of Oklahoma (United States). The Association urged that similar training workshops, with enhanced focus on urban and energy applications, be arranged as resources permitted.

5.3.5 It was noted that prediction on seasonal to inter-annual time scales presented challenges in terms of information presentation and interpretation, and conversion into decisions within each application area, as well as in verification of predictions and elucidation to users of different levels of prediction skill. The Association welcomed activities directed at examining and improving capabilities in each of these areas, and requested that benefits be transferred to the Region through training, holding additional Regional Climate Outlook Forums, and developing pilot projects. It requested the Secretary-General to continue to provide the necessary support to the CLIPS project in order to ensure improvement in the provision of climate information for better applications in planning. The Association noted with appreciation the support on ENSO-related matters provided by the United States, New Zealand and Australia.

5.3.6 The Association, noting the importance of the CLIPS project, decided to establish CLIPS rapporteurs within the Working Group on Climate Matters, as contained in [Resolution 7 \(XIII-RA V\)](#).

5.3.7 The Association noted the activities being undertaken through the Executive Council and technical commissions to consider the possible roles of RCCs in the provision of climate information and prediction services. The Association requested its Members to support the establishment of RCCs by continuing to provide information on how they might be identified and evolve to the mutual benefit of all countries within Region V. The Association approved [Resolution 6 \(XIII-RA V\)](#) — Provision of Seasonal to Inter-Annual Forecasts and Regional Climate Centres Services. This Team was to provide guidance and assistance in the designation and implementation process as it ensured that the entire Region was involved.

5.3.8 The Association noted the attention that had been given to weather, climate and health as the theme of World Meteorological Day 1999, as noted in various publications. The Association stressed that aspects of bioclimatology relating to human health needed to be emphasized in the development of climate information and prediction services.

5.3.9 Noting that the methodology used in the Showcase Projects in Human Health was based on the Heat/Health Warning Systems employed in Regions II, IV and VI, the Association requested the Secretary-General to ensure provision of assistance in organizing similar showcase projects within Region V.

5.3.10 The Association noted that several developments in the area of UBC had been progressing in the last few years. The Plan of Action for TRUCE, as endorsed by CCI-XII, was considered a firm basis for actions in this sector and it was suggested that TRUCE be considered in the further development of CLIPS-related projects.

5.3.11 The Association noted the importance of promoting a broader understanding of the relationship of climate and energy, based on the knowledge that national and international cross-discipline activities

could apply climate information, including predictions, to improve energy decisions. The Association recommended that Members conduct case studies to illuminate the decision value of knowledge of climate variability and the use of seasonal to inter-annual predictions in energy production and use in both traditional and renewable forms. The Association noted the CCI-XIII decision that its ET on Climate Services for Energy would assemble an energy poster in preparation for the forthcoming WSSD in Johannesburg.

5.4 GLOBAL CLIMATE OBSERVING SYSTEM (GCOS) (agenda item 5.4)

5.4.1 The Association noted that a GCOS Regional Workshop for Pacific Island Countries was held in Samoa in August 2000. It also noted that one of the principal concerns of workshop participants was stabilizing and strengthening the meteorological observing networks (in particular, the GSN and GUAN) that formed an important part of the fundamental support structure for GCOS. The Association urged Members to take the necessary actions required to address gaps and deficiencies in these observing systems. The Association further urged Members to nominate GCOS Focal Points to facilitate coordination with the GCOS Programme Office, and encouraged them to advise the office of any inaccuracies in the current GCOS station lists, as well as routinely advise of changes in station metadata, and comply with the request for historical GSN data and metadata. The Association urged close coordination between GCOS and NMHSs on data, observing networks and other related matters.

5.4.2 The Association welcomed the decision reached at the GCOS Regional Workshop for Pacific Island Countries to develop an Action Plan to address priority observing system needs in the Region. It noted with appreciation the roles of SPREP, the GCOS Secretariat and a number of Region V Members, especially New Zealand, in developing the Action Plan and creating an Implementation Plan with specific goals and actions at a meeting held in Nadi, Fiji in March 2002. The Association requested the IT to seek wide input from the GCOS community to ensure that all aspects of GCOS were addressed by the Plan, and requested the Secretary-General to assist in the formulation of a full-scale programme proposal to mobilize the required resources (see paragraph 10.4).

5.4.3 The Association welcomed and appreciated the interest of SBSTA of UNFCCC's COP in the development of Regional Action Plans, noting that SBSTA had invited the GCOS Secretariat to present the Pacific GCOS Action Plan at its 16th session in June 2002, with a view to recommending a draft decision for further consideration at COP-8. It recognized the importance of support by SBSTA for improvements in climate observing systems and therefore encouraged its Members to support the timely implementation of the Pacific GCOS Implementation Plan.

5.4.4 The Association recognized that detecting and understanding the impacts of climate variability and

change would require long-term measurement of atmospheric constituents (as carried out in the GAW), physical impacts (such as river flows and sea level), phenology, and data-sensitive oceanic, coastal and terrestrial ecosystems. The Association encouraged its Members to facilitate coordination between plans for strengthening traditional climate observations with plans for monitoring atmospheric constituents, physical impacts and sensitive oceanic, coastal and terrestrial ecosystems.

5.4.5 The Association noted that GCOS was planning to hold a regional workshop for South-east Asian countries in 2002. It encouraged its Members to support this workshop.

5.5 WORLD CLIMATE RESEARCH PROGRAMME (WCRP) (agenda item 5.5)

5.5.1 Members of the Association continued to participate actively in many components of the WCRP. They strongly supported, in particular, studies of the Asian-Australian monsoon system, a dominant monsoon system of the world. The Association noted that this system constituted a major component of the low-latitude atmospheric heating field and the seasonally-varying, zonally-averaged Hadley Circulation. During most of the year, the dominant feature of the low-latitude Hadley Circulation was a single direct cell linking the two hemispheres (descending motion in the winter hemisphere, ascending motion in the summer hemisphere). Similarly, the regional monsoonal component of the Hadley Circulation linked the winter monsoon circulation of one hemisphere with its summer monsoon counterpart.

5.5.2 The Association recognized that the development of the CLIVAR research study would extend understanding of climate variability on seasonal to decadal timescales, and further strengthen the scientific basis for practical climate prediction. The Association was pleased to note that scientists from the Region remained very active in CLIVAR activities. Monsoons were a major focus of CLIVAR research and it was noted that several important meetings had been held recently to plan future activities, including the recent meeting of the AAMP in Reading, United Kingdom, with active participation of scientists from the Region.

5.5.3 The Association was informed that studies of ENSO and ENSO prediction were high priorities for CLIVAR. The ENSO observing system, including moored buoys on and near the equator, floats and ship of opportunity measurements, was critical for the success of these activities. The Association noted with satisfaction that important elements of the ENSO observing system were deployed in the Region.

5.5.4 The Association was further informed that CLIVAR also focused on decadal climate variability. A workshop had been held in Honolulu, Hawaii, United States in February 2001 to identify topics of high priority for investigations of decadal variability in the Pacific and to begin to make plans for such studies. The Association noted the major contributions of the United

States and Japan in deploying the ARGO floats in the Region. These floats would contribute to the success of future studies. The Association was pleased to note that many scientists from the Region had participated in the workshop.

5.5.5 The Association recognized that studies of anthropogenic climate change and climate change detection were also important for CLIVAR. Three workshops sponsored by the APN were held in Melbourne, Australia to develop climate indices using daily meteorological data. The Association was pleased to note that these workshops had served as models for other regional indices workshops sponsored by the CLIVAR/CCI WGCCD, which were held in Africa and the Caribbean. Two workshops sponsored by the APN on Climate Variability and Trends in Oceania were held in Auckland, New Zealand. These enabled participants from small island nations to process data they had brought to the workshop to obtain variability and trend information for their countries. It was further noted that a very successful JCP meeting had been held in Hobart, Australia in March 2002, which mapped out a coordinated approach to WCRP and IGBP to work more closely on the impacts of climate variability.

5.5.6 The Association was informed that sustained ocean observations in the Region, and in particular in the Indonesian throughflow, had been identified as critical to advancing understanding of climate variability in the Region. The Association therefore encouraged Members to participate actively in developing plans for such observations, using them in their own national activities, and making them available to the international community. The Association noted that plans were also being developed for field activities, process studies and theoretical investigations in support of CLIVAR's Asian-Australian Monsoon principal research area. The Association agreed that scientists from the Region had a keen interest in these research activities, and encouraged them to participate actively in appropriate activities at a national and international level.

5.5.7 The Association noted the attention being given by the WCRP GEWEX to the importance of the Region for its research. It was in the Region that one set of validation data was being collected in support of global monthly mean rainfall estimates being produced by the GEWEX GPCP. The GPCP products were providing climate researchers with conveniently accessible global precipitation statistics. Part of the work carried out in GPCP was done by the SRDC. Since satellites estimated rainfall through received radiance, it was felt that the estimates must be verified using samples of accurate surface rainfall measurements. The SRDC, through Internet access, provided researchers with samples of gridded, time-space rain-gauge measurements over various regions of the globe. The PACRAIN, as instituted by the NMSs, was one of the core SRDC data sets and was being used to produce the $2.5^\circ \times 2.5^\circ$ monthly products. The PACRAIN consisted of daily rainfall records from many sites located on atolls and islands. The PACRAIN project was supplemented by an extensive collection of rainfall

data from schools across the Pacific in the SPaRCE project. SPaRCE was made possible with the help of more than 175 participating schools located in Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Mariana Islands, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau Islands, Tonga and Vanuatu.

5.5.8 The Association recognized that WCRP research activities should be complemented by systematic, sustained and reinforced observations of all key climate variables, and by capacity building involving all nations in climate research activities. The Association noted that a joint project between the ASEAN member countries and NOAA/OGP was under way in the development of seasonal to inter-annual climate forecast and applications capability in the ASEAN region. This project included training workshops and the development and use of dynamic and statistical downscaling techniques to generate climate outlooks and impacts in the ASEAN region.

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

6.0.1 The Association noted the activities and initiatives that had taken place in support of the AREP since its previous session. It recorded its specific comments on the various components in the following paragraphs.

6.0.2 The Association, noting that very few candidates from the Region had ever been submitted for consideration for the WMO Research Award for Young Scientists, urged Members to make every effort to nominate eligible scientists from their countries.

6.1 SUPPORT TO OZONE AND OTHER ENVIRONMENT-ORIENTED CONVENTIONS (agenda item 6.1)

6.1.1 The Association recalled that atmospheric composition information provided by the GAW network in the Region constituted a major contribution to the implementation of the UNFCCC and the Vienna Convention for the Protection of the Ozone Layer. In that regard, the Association noted that its Members operated a number of GAW stations providing atmospheric ozone and greenhouse gas information for use by both scientists and government policy makers. The Association also noted with satisfaction that in the ongoing effort to maintain high-quality global ozone data sets, the Association had staged an intercomparison of seven regionally-based Dobson spectrophotometers in November and December 2001. The Association strongly recommended that such intercomparisons be held in the Region every few years.

6.1.2 The Association was pleased that Members had made substantial contributions to the 2002 WMO International Scientific Assessment of Ozone Depletion and that this assessment fed directly into discussion of the Parties to the Montreal Protocol and its amendments.

6.1.3 The Association noted with appreciation the report of its Rapporteur on Atmospheric Ozone and commended him for the information concerning ozone activities in the Region.

6.1.4 The Association was pleased that Australia, Indonesia, Malaysia, New Zealand, the Philippines, Singapore and the United States all maintained active ozone observing programmes for both total column ozone and its vertical profile. In that regard, the Association noted with satisfaction that a successful four-year research programme of weekly ozonesondes from the Macquarie Island in the data-sparse Southern Ocean had been incorporated into Australia's ongoing observations programme. The Association noted that various types of ozonesondes were in use by Members, and was therefore pleased that draft Standard Operating Procedures for these instruments had been developed.

6.1.5 With respect to maintaining the quality of ozone data originating in the Region, the Association noted that appropriate Members were participating in the periodic Dobson intercomparisons, such as the one in Lauder, New Zealand in November and December 2001, as well as through exchanges of technical expertise from advanced centres. In order to maintain ongoing quality and continuity of the observing programme, the Association urged WMO to provide technical and financial assistance, to the extent possible, to developing countries in the Region.

6.1.6 The Association was aware of the importance of satellite data as an additional tool in monitoring stratospheric ozone. It therefore welcomed the initiative within WMO of developing an integrated global atmospheric composition strategy within the framework of the multi-agency IGOS.

6.1.7 In view of the importance of the ozone issue to Members of the Association, it reappointed a Rapporteur on Atmospheric Ozone in adopting [Resolution 8 \(XIII-RA V\)](#).

6.2 GLOBAL ATMOSPHERE WATCH (GAW) (agenda item 6.2)

6.2.1 The Association commended the considerable support provided by its Members to the GAW Programme and noted that it remained a priority activity in the Region. Members were urged to continue their support for GAW, and those with no current involvement were encouraged to consider participating, particularly in view of the increasing pollution problems in some of the quickly expanding urban centres and the periodic regional smoke problems. In that regard, the Association recalled that Thirteenth Congress had endorsed the establishment of a GURME project within GAW and that pilot projects were already underway in both Beijing and Moscow. The Association was pleased that the first WMO GURME workshop on urban pollution forecasting had been held in Malaysia in August 2000.

6.2.2 The Association expressed its appreciation to the scientific community outside the NMHSs for their close interaction with GAW, especially for the support given by IAMAP's CACGP and IOC, and ICSU's IGBP. Equally important, interactions with various national institutions. In addition, the close collaboration between GAW and WHO on the health-related aspects of urban and regional pollution was recognized. In that regard, the Association was pleased with the outcome of

the WMO/WHO Task Force Meeting on Forest Fires (Peru, 1998) which had resulted in the issuing of guidelines for use by Members to address environmental aspects of regional forest burning.

6.2.3 The Association, fully aware of the recurrent smoke and haze problems affecting some countries in the Region, strongly encouraged interested Members to continue to play leading roles in the RHAP of ASEAN member countries. It noted with satisfaction the leadership of both the WMO Secretariat and several NMHSs, working with ESCAP, who were reviewing the existing atmospheric monitoring network, identifying additional sites and determining current transport models and future requirements. The Association noted NOAA's PARTS programme. The objective of PARTS was to enhance the capacity and capability of the ASEAN community to monitor and model haze episodes, as well as other episodic transboundary pollution events. PARTS supported the monitoring component of the ASEAN RHAP.

6.2.4 The Association acknowledged the importance for GAW to provide high quality atmospheric data to its various user communities. Members had made significant contributions in this matter by effectively working through QA/SAC for the Pacific at the Japan Meteorological Agency in Tokyo. The Association further noted that the United States was also providing quality-assured data on precipitation chemistry, collected under the regional programmes of GAW and in collaboration with EANET.

6.2.5 The essential international infrastructure of GAW included a number of WDCs where information was stored and made freely available to scientists and decision-makers. The Association was pleased that GAW stations in the Region were making substantial contributions to this vital activity by regularly submitting their measurements to the appropriate data centres. The Association urged Members to ensure that this data flow was maintained in the future. The Association was informed that the International Rice Research Institute had been measuring ozone, NO_x and SO₂ concentrations since August 2001. Initial analysis of the data showed a pattern of accumulation with relaxed wind characteristics.

6.2.6 The Association was aware of the tremendous training requirements necessary to maintain such a complex system. It expressed its deep appreciation to those institutions and Member countries, from both within and external to the Region, who had provided capacity building initiatives to address the issue. The Association strongly urged Members to take advantage of all opportunities for further training, for example through twinning arrangements with individual scientists and appropriate institutions, and through seeking attendance at courses at the GAW-TEC in Germany.

6.2.7 The Association was informed of a major initiative within GAW to update its existing database on its Regional and Global Stations. The initiative would gather information on each station's work programme, including measurements taken and where the data could

be accessed. The Association strongly urged its Members to participate in this effort to greatly increase the utility of data holdings around the world.

6.2.8 The Association noted with appreciation the report of its Rapporteur on GAW, which contained detailed information on GAW activities in Australia, Indonesia and Malaysia. The Association noted that several Members were operating GAW Regional Stations with GAW Global Stations located in Australia (Cape Grim), Indonesia (Bukit Koto Tabang), New Zealand (Lauder), American Samoa (Pago Pago) and the United States (Mauna Loa), where greenhouse gases, aerosol parameters, reactive gases, ozone and UV formed the core of the measurement programmes.

6.2.9 The Association agreed with the rapporteur that the measurement programmes being carried out in the Region were essential to understanding atmospheric processes in the tropics and subtropics and, when combined with data from other regions, provided scientists with the means to study changes in the global environment.

6.2.10 Despite an improvement in the number and quality of measurements and stations operated by Members, the numbers were still inadequate to document fully the chemical composition of the atmosphere and detect and predict changes. The Association therefore welcomed the initiative to establish a new station in Sabah, Malaysia that would measure greenhouse gases including surface ozone, reactive gases, aerosol information and precipitation chemistry. The Association stressed the need for WMO involvement in this development. The Association noted that some Members who were not active in GAW had also expressed an interest in establishing stations.

6.2.11 The Association also noted that regional GAW activities would be strengthened by improved contacts between those responsible for the measurements and data, and scientists and users of these data. The Association was pleased that a number of centres in advanced countries were actively involved in providing instrument calibrations and operational audits at GAW stations in the Region. It expressed its gratitude to those countries in helping maintain a high-quality network in the Region. The Association emphasized the importance for station operators to submit their measurement data, including any metadata, to the appropriate GAW WDC.

6.2.12 The Association reappointed a Rapporteur on the Global Atmosphere Watch with [Resolution 9 \(XIII-RA V\)](#) in order to assist and advise Members on this important activity.

6.3 WORLD WEATHER RESEARCH PROGRAMME (WWRP) (agenda item 6.3)

6.3.1 The Association noted that Members from the Region had maintained an interest in and contributed to the implementation of the WWRP, a new CAS initiative endorsed by the fiftieth session of the Executive Council in 1998. It was recalled that this Programme offered the prospect of much-improved weather predictions on all time scales, while emphasizing high-impact events and

socio-economic applications. Members' contributions included hosting the WWRP FDP surrounding the Sydney Olympics, as well as providing output to the annual WMO progress reports on NWP and long-range forecasting.

6.3.2 The Association noted with satisfaction the success of the WMO Training Workshop on Nowcasting held in Sydney, Australia in October and November 2000 in conjunction with the Sydney 2000 FDP. The Executive Council encouraged WWRP to continue its activities in organizing training workshops and scientific conferences in order to ensure that more Members could benefit from WWRP projects.

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

6.4 TROPICAL METEOROLOGY RESEARCH PROGRAMME (TMRP) (agenda item 6.4)

6.4.1 The Association was pleased that its Members continued to make important contributions in the development and activities of the TMRP. For example, the Region was represented at the Fourth WMO International Workshop on Tropical Limited Area Modelling in December 1999, and provided the chairperson of the CAS WGTMR. The Association urged Members to identify candidates who could attend IWTC-V, planned for Cairns, Australia in December 2002.

6.4.2 Members of the Region were urged to continue their support of the TMRP in view of its benefits to the majority of countries of the Association who were affected by tropical weather systems.

6.4.3 The Association acknowledged that skill in forecasting in the tropics continued to lag well behind that in mid-latitudes and strategies were needed to improve this situation. The Association recommended that the Programme place more emphasis on day-to-day forecasting skills in the tropics. It was suggested that the recommendations of the International Workshop on the Dynamics and Forecasting of Tropical Weather Systems, held in Darwin in January 2001, provided a strategic direction for incorporation into the Programme.

6.5 PROGRAMME ON PHYSICS AND CHEMISTRY OF CLOUDS AND WEATHER MODIFICATION RESEARCH (PCCWMR) (agenda item 6.5)

6.5.1 The Association was aware of the interesting hygroscopic seeding results that had been reported in experiments in Mexico, South Africa and Thailand in recent years. It strongly urged Members to remain current with future scientific developments in this area, which held the potential for effective warm cloud precipitation enhancement. The Association encouraged its Members to continue to support other components of the Programme and participate in the organized events. In that regard, Members noted that the Eighth WMO Scientific Conference on Weather Modification was to be held in 2003.

6.5.2 When responding to questions or when contemplating weather modification experiments or activities in their countries, Members were advised to make reference to the new WMO Statement on the Status of Weather Modification as well as to the Guidelines for Advice and Assistance Related to the Planning of Weather Modification Activities, both of which had been revised by the relevant Executive Council panel and approved by the fifty-third session of the Executive Council in 2001.

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

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

7.1.1 The Association expressed satisfaction with the continued progress and development of the PWSP. In particular, it noted that the needs of Members of the Region were adequately reflected as high-priority issues in the PWSP.

7.1.2 The Association was informed that following the restructuring of CBS in 1998, the OPAG on PWS replaced the WG on PWS. The chairperson of the OPAG on PWS was Mr K. O'Loughlin (Australia). Three ETs and an ICT contributed to the work of the Programme, with valuable input from the Region's experts. The Association expressed gratitude to the CBS OPAG on PWS and to the WMO Secretariat for their significant contributions to the Programme's activities.

7.1.3 The Association was pleased at the preparation of the following publications:

- (a) The second edition of the *Guide to Public Weather Services Practices* (WMO-No. 834), which emphasized user-focused service delivery and was distributed along with a set of four complementary CD-ROMs containing additional examples of national practices and guidance to Members for developing their own country programmes;
- (b) *Public Weather Services in Focus* (WMO/TD-No. 974), in which eight of the Region's 18 Members participated, containing the report and analysis of the 1997 WMO global survey on the status of Members' PWS;
- (c) *Technical Framework for Data and Products in Support of Public Weather Services* (WMO/TD-No. 1054);
- (d) *Guidelines on Graphical Presentation of Public Weather Services Products* (WMO/TD-No. 1080);
- (e) *Guidelines on Performance Assessment of Public Weather Services* (WMO/TD-No. 1023);
- (f) *Weather on the Internet and Other New Technologies* (WMO/TD-No. 1084); and
- (g) *Guidelines on the Improvement of NMS-Media Relations and Ensuring the Use of Official and Consistent Information* (WMO/TD-No. 1088).

7.1.4 The Association recognized the value of high-quality PWS in ensuring the safety of life and property, as well as in demonstrating the value of government investment in NMSs. It stressed the urgent requirement that NMSs in the Region be equipped with the best

available training, technology and techniques to carry out their mandates whilst boosting their visibility and status. In that regard, the Association appreciated the following PWSP capacity building activities for Members of the Region since XII-RA V:

- (a) PWS Workshop for Typhoon Committee Members from RA II and RA V, (29–30 November 1999, Seoul, Republic of Korea);
- (b) Training Workshop on PWS and Warning Services (with European Union support), for Members of the South Pacific Tropical Cyclone Warning Upgrade Project, (4–14 October 1999, Nadi, Fiji);
- (c) Regional PWS Workshop for Small Island Developing States (SIDS) from RA I and RA V (9–13 October 2000, Melbourne, Australia); and
- (d) Regional PWS Workshop for Small Island Developing States from RA I and RA V, scheduled for Melbourne, Australia, 7–11 October 2002.

7.1.5 The Association endorsed the continuing dialogue with international media representatives on issues of strengthening partnerships and addressing the needs and concerns of the NMSs and media organizations concerning easy access to forecast and warning information, and the use of official forecasts and warnings, with due recognition of NMSs as the official authorities for the preparation of those forecasts and warnings. In that regard, the Association was pleased to note that separate guidelines were being prepared by PWS experts on best practices covering media relations and the use of the Internet in communicating PWS products (see paragraph 7.1.3).

7.1.6 The Association noted with appreciation the information provided to the session by Mr H.K. Lam (Hong Kong, China) that two pilot projects dealing with official information exchange utilizing the Internet were being tested and further developed by Hong Kong Observatory with a view to early implementation. The first would facilitate access to official NMS warnings through a centralized Web site, and was initially tested as a display of tropical cyclone warnings in the WMO/ESCAP Typhoon Committee region. The Association was informed that the CBS ET on Warnings and Forecasts Exchange Issues had expressed the opinion that it would be useful to expand the scope of the Web site to cover tropical cyclones in the South-west Pacific as the next step. It noted that Hong Kong, China was requested to consult with Australia on the technical aspects of this concept. The second project was a proposed solution to counter the proliferation of unofficial forecasts broadcast by the international media. It involved generating a global city-forecast collective and making it available to the media and the public, also through a centralized Web site that would identify the NMS as the issuing authority. The Association expressed its appreciation to Hong Kong, China for leading the development and implementation of these two pilot projects.

7.1.7 The Association reiterated that effective coordination with emergency management was essential in the dissemination of timely warnings to mitigate life and property losses caused by natural disasters. It

encouraged Members to endeavour for more efficient communication between NMSs and emergency management for the benefit of the public.

7.1.8 The Association endorsed efforts to improve cross-border warnings exchange by the introduction or expansion of bilateral and/or regional cooperation and agreements. In that regard, it noted with appreciation the information provided by French Polynesia on the pilot project that had recently been initiated in Region VI to improve cross-border warnings-exchange. The Association requested the Secretariat to inform RA V Members on the status of the implementation of this pilot project. It agreed that Members should develop and maintain efficient and reliable communication methods, and that NMS staff should be specially trained in severe weather forecasting and the issuing of warnings. It also agreed that they should improve their communication skills and become familiar with the practices and procedures of neighbouring NMSs. The Association welcomed the preparation of relevant guidelines on this issue.

7.1.9 The Association deliberated the impacts of changing local, regional and global socio-economic and political factors on the roles and operations of NMSs. It agreed that opportunities should be seized to meet challenges for Members to continue to provide effective, high-quality PWS. To do this, the Association recommended that future focuses of the PWSP in the Region should incorporate:

- (a) Capacity building activities, including transfer of knowledge and technology;
- (b) User-focused service provision and delivery, harnessing new technologies and techniques for product improvement, design, development, presentation and dissemination;
- (c) Performance evaluation, including verification of warnings and forecasts;
- (d) Raising the level of public awareness and response to the PWS of the NMS as part of national efforts on natural disaster mitigation;
- (e) Improving relationships with the media and emergency management; and
- (f) Studies aimed at evaluating and demonstrating the social and economic benefits of PWS to the national communities.

(See also paragraphs 4.1.5 and 5.3.2.)

7.1.10 As regards capacity building activities, the Association requested the Secretary-General to investigate the possibility of initiating a project in the Region to strengthen the capabilities of NMSs in the implementation of PWS. It also proposed to establish a network of national focal points who could assist the Rapporteur on Regional Aspects of PWS in programme implementation.

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

7.2.1 The Association complimented the Secretary-General and 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 agrometeorology and agrometeorological applications for efficient, sustainable agriculture, silviculture and aquaculture for an increasing world population in rapidly changing environments'. It also stressed the need to increase the awareness of the users to the economic, environmental and health benefits of the application of meteorological, climatological and hydrological information to agriculture to meet the food, fodder and fuel needs of the growing populations in the South-west Pacific. The Association considered the theme to be very important to the Region. It noted with interest CAGM's interessional activities, and agreed that they would contribute greatly to the economic development of the countries in the South-west Pacific.

7.2.3 The Association further noted the main topics discussed at CAGM-XII, among which were the applications of seasonal to inter-annual climate forecasts and the products and services that were becoming available based on these forecasts. The Association supported the decision of the Commission to promote surveys and summarize, using case studies, the current applications of climate forecasts in agriculture, forestry and livestock management, and recommend ways and means to use more optimally climate forecasts in operational agriculture, with emphasis on user needs, especially in the developing countries. In this context, the Association was pleased to note the initiative taken by the Programme to collaborate closely with IGBP's START programme and CLIMAG's project IHOP. It congratulated the Secretariat on the successful organization of the International Workshop on CLIMAG in September 1999 in Geneva. The Association was pleased to note at the conclusion of the CLIMAG workshop that there were specific areas in the South-west Pacific where CLIMAG demonstration projects could be developed from existing pilot activities, and that multi-disciplinary teams including experts in climate, crop and economic modelling, as well as agronomic experts at various levels, including local farmers, would be involved in these regional CLIMAG demonstration projects. Noting that the partnership between START, WMO, IRI, APN, IAI and other relevant organizations was an essential ingredient underpinning the efforts of these multi-disciplinary teams, the Association encouraged WMO's continued participation in the activities of the CLIMAG Steering Committee.

7.2.4 The Association was pleased to note that a number of experts from the Region had participated in the International Workshops organized by WMO in other Regions. The Association considered that such opportunities for exchange of experiences between Regions would help strengthen the agrometeorological activities in the Region, and urged the Secretary-General to continue to enhance interregional cooperation in agrometeorology. The Association was informed that the IRRI had completed a database of daily weather from more than 250 sites in rice-growing areas of the world. The database contained data for an average of 10 years from each station and was in CLICOM format. It was

noted that the database might be requested through the Director General of the IRRI.

7.2.5 The Association noted with satisfaction that preparations were under way for the organization of CAGM-XIII and an International Workshop on Reducing the Vulnerability of Agriculture and Forestry to Climate Variability and Climate Change, to be held in Ljubljana, Slovenia in October 2002. The Association encouraged the active participation of all Members in these two important events.

7.2.6 The Association was pleased to note that a WMO Roving Seminar on GIS and Agroecological Zoning was held in Kuala Lumpur, Malaysia, from 8 to 19 May 2000, and that the seminar had resulted in a very fruitful exchange of scientific information and ideas. The Association complimented the Secretariat for making available to all participants at the seminar a Training Manual on GIS Techniques, including a full collection of practical exercises. The Association strongly supported the continued organization of such events for the benefit of the participants from the Region, and requested the Secretary-General to continue to provide support for training in the Region.

7.2.7 The Association noted WMO activities on combating desertification and drought, and urged Members to participate actively in the implementation of the UNCCD. The Association requested the Secretary-General to provide appropriate guidelines to Members in that regard. The Association further urged Members to benefit from the support of the Global Mechanism of the Convention for projects in this area.

REPORT OF THE RAPPORTEUR ON AGRICULTURAL METEOROLOGY

7.2.8 The Association noted that information on priorities for agricultural meteorology in the Region had been collected through a survey conducted among countries in the Region, as well as through direct personal contacts. The Association agreed that, regarding activities in agricultural meteorology in the Region, emphasis should be placed on modern technology and know-how for using remotely-sensed information, particularly new data from satellite-borne instruments such as MODIS. Impacts of ENSO and climate variability on agriculture and forestry in the Region, and seasonal climate prediction and applications in agriculture, should receive greater attention, especially the communication of seasonal predictions to agricultural users. In view of the events associated with the 1997-98 El Niño, in particular the transboundary haze caused by widespread forest fires, the Association agreed that information on fire weather and risk, and their applications in forestry management, was a priority for the Region. It agreed that greater emphasis should be placed on developing client-oriented agrometeorological services.

7.2.9 The Association reaffirmed its view that the application of meteorology to agriculture continued to be of high importance to the Region. It therefore adopted [Resolution 10 \(XIII-RA V\)](#), Working Group on Agricultural Meteorology.

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

7.3.1 The Association noted with satisfaction that Thirteenth Congress had re-emphasized the importance it attached to an expanded and vigorous AeMP to meet the needs of the worldwide aviation community, and decided that the AeMP should be further strengthened.

7.3.2 The Association was grateful to WMO and to ICAO for jointly organizing two training seminars: The Processing, Manipulation and Display of WAFS Data and Products, in Kuala Lumpur, Malaysia; and Cost Recovery for Aeronautical Meteorological Service in Bali, Indonesia. Both seminars were held in November 1999. The Association expressed its appreciation to the United Kingdom and the United States for providing support to both training events.

7.3.3 The Association noted that the two RAFCs, namely Wellington, New Zealand and Melbourne, Australia, had closed on 1 March 2001. The Association welcomed the progress made towards the final phase of WAFS, including the handover of high-level SIGWX production to WAFS Washington. The Association noted that the two WAFCs had improved backup procedures to ensure the continued global availability of aviation data and products to users in case of a WAFS failure. Other measures implemented by the two WAFCs included the addition of two extra aviation NWP model runs per day, the broadcast of GRIB relative humidity fields up to 500 hPa to meet aviation operational requirements, and the successful BUFR-coded SIGWX forecast transmission trials.

7.3.4 The Association noted that, although some RA V Members had access to the United States ISCS broadcasts, a few operational problems — e.g. the use of the VSAT/STAR 4, missing products and delays in receiving GRIB data — still remained to be addressed. The cost of VSAT equipment for ISCS reception was the major factor that did not allow the NMSs in the smaller countries in the Region to fully benefit from the ISCS service.

7.3.5 As a result, many countries were using the EMWIN terminals to receive real-time information via the GOES 10 satellite. The information available did not include standard WAFS products, but did include minimal United States AVN model information. EMWIN also retrieved some meteorological bulletins from the GTS. The Association recalled that the current EMWIN system in use to fill the gap would need significant changes when the current satellite used by EMWIN was replaced. The ICAO observer emphasized that the EMWIN system, though providing very useful service, should not be considered as an option for the ICAO-approved ISCS service. He pointed out that, although fully understanding the financial problems of the smaller countries, it was strongly recommended to use the standard ICAO communication systems where possible, in order to provide high-quality WAFS information to the international air navigation in the Region.

7.3.6 The Association urged RA V Members to ensure that progress in the implementation of the final phase of WAFS, expected by the end of 2004, in particular the

phasing out of FAX-formatted charts and their replacement by BUFR- and GRIB-coded products, was implemented as agreed. In that regard, it was highlighted that as much as possible the use of GRIB- and BUFR-coded products as replacement for the FAX-formatted would allow a much greater flexibility in the generation of WAFS products. Members would need to be able to receive and use the GRIB- and BUFR-coded WAFS information that would require adequate equipment, software and training. The ICAO observer informed the Association that as a part of the ICAO regional programme for the transition to the final phase of WAFS, a GRIB Training Workshop was scheduled to be held in November 2002 in the ICAO Regional Office for Asia and Pacific in Bangkok. This workshop would be conducted by the SADIS Provider State and was aimed to assist the SADIS User States in the conversion of WAFS GRIB-coded information into aviation charts. In addition, if the software vendors finalized their BUFR application as planned by mid-2002, the workshop might also deal with the conversion of BUFR code into significant weather charts.

7.3.7 The Association was informed that the control of airspace over Samoa and Tonga was being transferred from Fiji to New Zealand effective 8 August 2001. Initial consideration of weather support for this change was not made. Negotiations between Samoa, Tonga, New Zealand and Fiji were under way to determine who would provide the required weather support.

7.3.8 The Association recognized that significant progress had been made in recent years on the establishment of the ICAO IAVW, and welcomed the provision of transport model products depicting volcanic ash by various WMO RSMCs that were also VAACs, including Darwin and Wellington. The Association noted with satisfaction that the Handbook on IAVW and the Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds had been published by ICAO in 2000 and 2001, respectively. However, the Association noted with concern that episodes of volcanic ash activity in the RA V area were not being passed onto Darwin VAAC. The Association also noted the concern expressed by the ICAO observer in regard to the deficiencies in the implementation of the IAVW in the Region. The main problem was identified to be missing or incorrectly formatted SIGMET information from the MWOs during the volcanic ash events. Since this was identified as a serious deficiency related to flight safety, ICAO planned to establish a regional Special Implementation Project to assist those countries that had difficulties in implementing the required segment of the IAVW.

7.3.9 The Association welcomed the adoption by CAeM-XI in March 1999 of the definition of visibility for aeronautical purposes, and the guidance material for precipitation intensity and well-developed dust/sand whirls (dust devils) and funnel clouds. It noted with satisfaction the positive role played by the CAeM Working Group on PROMET in developing various amendments to ICAO Annex 3/WMO Technical

Regulation [C.3.1], in close cooperation with ICAO and relevant CBS and CIMO working groups. Some of these amendments were included in Amendment 71 that became applicable on 5 November 1998. Other amendments, such as WAFS operational requirements, definition of visibility, information on volcanic ash, turbulence reporting, SIGMET information and the global exchange of OPMET information, were implemented as part of Amendment 72 that became applicable on 1 November 2001.

7.3.10 The Association welcomed the establishment by ICAO of the AMOSSG to examine operational requirements for AOSs at aerodromes, in which WMO and four Members from the Region were actively involved. The Association noted with interest that the group had held three meetings: in Montreal, Canada, in May 2000; in De Bilt, The Netherlands, in February 2001; and in Miami, Florida, United States, in January 2002. The Association noted with satisfaction the progress made by the study group in updating the current requirements for meteorological observations and reports at aerodromes, as contained in WMO Technical Regulation [C.3.1], that would form part of Amendment 73 expected to be implemented around 2004. The Association noted with interest the assessment by the group of the current capability of AOS stations to meet future aeronautical meteorological requirements, and welcomed the group's intention to develop a Manual on Automated Observing Systems at Aerodromes.

7.3.11 The Association noted with concern the aviation requirement in ICAO Annex 3 for SIGMET locations to be given in degrees and minutes of latitude and longitude, whereas all other weather products listed latitude and longitude locations in degrees and tenths of degrees. It also noted that several MWOs in the Region were not following the Annex 3 requirement. The Association therefore requested the Secretariat to address this issue at the forthcoming Joint CAeM/ICAO Divisional Meteorology Meeting (Montreal, Canada, 9–27 September 2002).

7.3.12 The Association was informed that, in line with the decision of CAeM-XI, a TAF Verification Expert Group had been established within the CAeM Working Group on TREND. The Association noted with satisfaction that an expert from the Region was taking the lead within this Expert Group. The TREND session held in Hong Kong, China in October 2000 discussed progress thus far achieved in TAF verification, and asked the group to continue its work with a view to presenting a report to the next session of CAeM in 2002.

7.3.13 The Association recognized the positive role played by the AMDAR Panel in enhancing the upper-air component of the WWW GOS, particularly over data-sparse areas, including oceans. The Association noted with satisfaction that more than 130 000 AMDAR observations per day were being exchanged over the GTS, representing more than a 2.5-fold increase in AMDAR reports compared to 1998. The Association noted with satisfaction that four Members from the Region had attended the third and fourth

AMDAR Panel meetings that were held respectively at the WMO Secretariat in Geneva in September 2000 and in Melbourne, Australia, in September 2001. The panel was informed about the advances made in the implementation of the AMDAR programmes in Australia; Hong Kong, China; and New Zealand. It was also informed of the interest shown by other Members in the Region to implement operational national programmes. The panel was pleased to note that the New Zealand contribution had enabled about 10 000 AMDAR observations per month to be made available to the international community via the GTS.

7.3.14 The Association urged RA V Members to support the implementation of the WMO AMDAR programme, which was providing significant benefits to various WMO Programmes, AeMP, by contributing financially to the AMDAR trust fund established to support AMDAR activities.

7.3.15 The Association congratulated the CAeM Working Group on ATEAM, predecessor of the current TREND Working Group, for the updated publication of WMO Technical Note No. 195, *Methods of Interpreting Numerical Weather Prediction Output for Aeronautical Meteorology* (WMO-No. 770). The Association was pleased to note that the French version of this Technical Note had been published in the second half of 2000, and that all Members in the Region would benefit from this publication. The Association welcomed the publication in 1999 of the *Guide on Aeronautical Meteorological Services Cost Recovery — Principles and Guidance* (WMO-No. 904) in four languages. The Association was informed that the preparation of the Compendium on Tropical Meteorology was finalized, and that the WMO Secretariat expected to publish it in the near future.

7.3.16 The Association was informed about the results of the ICAO Global Conference on the Economics of Airports and Air Navigation Services held in June 2000. It noted with concern the request to the conference by the IATA to limit cost recovery for aeronautical meteorological service to facilities and services exclusively serving aviation, excluding a contribution to the core services of the NMSs (i.e. surface and upper-air stations, remote-sensing by radars, satellite activities, NWP modeling). The Association was informed that the WMO position was that existing ICAO guidance, developed by all stakeholders setting out policy with regard to meteorological cost recovery, including IATA and the WMO, should be retained. The Association noted with satisfaction that the WMO position that was supported by 30 countries, including countries from RA V, was endorsed by the conference. However, it felt that the problem was not completely solved and that a similar tendency might appear in the future. The Association therefore urged the WMO, ICAO and IATA secretariats to enhance cooperation aimed at continuing improvement of the quality of service to aviation and increased transparency of meteorological costs. The Association urged Members to ensure closer contacts with aviation authorities at the national level to avoid any misunderstanding regarding the vital role played by NMSs in the

provision of meteorological service to air navigation. Noting that ICAO had reactivated the panel tasked to review the current guidance on cost recovery, the Association invited Members who would have experts on the panel to encourage collaboration between those experts and the WMO representative. The Association encouraged Members to ensure that national delegations to the forthcoming joint CAEm/ICAO Divisional Meteorology Meeting were well briefed on the issues relating to their national interests in cost recovery for aviation meteorological service.

7.3.17 In view of the vital importance of the AeMP for the Region, the Association decided to appoint a Rapporteur on Regional Aspects of the Aeronautical Meteorology Programme in Region V and adopted [Resolution 11 \(XIII-RA V\)](#).

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

7.4.1 The Association noted with interest that Thirteenth Congress had approved the MMAOAP as part of the 5LTP. This programme provided overall objectives in this field as well as detailed guidelines for Members, regional associations and WMO as a whole. The Association further noted with interest that Thirteenth Congress had approved the establishment of JCOMM, primarily through the merger of the former CMM and the Joint IOC/WMO Committee for IGOSS. JCOMM subsequently also received the formal approval of the 20th Assembly of the IOC (Paris, July 1999). The first session of JCOMM took place in Akureyri, Iceland, from 19 to 29 June 2001. As agreed by Congress and the Assembly, and confirmed during the session, JCOMM had become the coordinating and reporting body for all operational marine activities of WMO and IOC, and the primary implementation mechanism for an ocean observing system for climate in support of GOOS and GCOS. The Association recognized the potential importance of JCOMM to its Members and to WMO, noted that delegates from a number of countries in RA V had participated in JCOMM-I, and offered its strong and ongoing support. Further specific action in that regard is recorded in a subsequent paragraph.

7.4.2 The IOC observer stressed in his statement that the establishment of JCOMM was the cornerstone of the building of new and ambitious projects such as GCOS and GOOS, as well as improving current activities, such as those relating to waves and storm surges. JCOMM offered the possibility to integrate oceanographic and marine meteorological efforts, for example in the area of observations and services. However, the key sector where integration was crucial was that of data management, and a large amount of work was being undertaken on this topic between IOC and WMO.

7.4.3 With regard to the implementation of marine meteorological services, specifically in Region V, the Association noted with appreciation the report of the Rapporteur on Regional Marine Meteorological Services, Mr Lim Tian Kuay (Singapore). Actions taken on various

points raised in this report are recorded in subsequent paragraphs. The Association agreed that the further development of marine meteorological services, together with marine observing systems in the Region, particularly in the light of the decisions of Thirteenth Congress and JCOMM on the matter, should be extended to cover as well the oceanographic services. Bearing this in mind, the Association decided to appoint two Co-rapporteurs on Regional Oceanographic and Marine Meteorological Services to monitor a wide range of oceanographic and marine meteorological activities over the Region. The Association also proposed that IOC WESTPAC, as a body representing the oceanographic community in the Region, be invited to co-sponsor co-rapporteurs' activities. The Association adopted [Resolution 12 \(XIII-RA V\)](#), Co-rapporteurs on Regional Oceanographic and Marine Meteorological Services.

MARINE METEOROLOGICAL AND OCEANOGRAPHIC SERVICES

7.4.4 The Association noted that the new WMO marine broadcast system under the GMDSS (forming a part of SOLAS) had been fully implemented as planned on 1 February 1999. In particular, the Association noted with satisfaction that meteorological services through SafetyNET for the four Metareas covering the Region were operational, and expressed its considerable appreciation to all the NMSs concerned (Australia; China; Fiji; Hong Kong, China; Japan; New Zealand; and the United States). At the same time, it recognized the need to review continually these services, including in particular the views of users, and therefore urged Members in the Region operating VOSs to participate actively in the various marine meteorological services' monitoring exercises being undertaken.

7.4.5 The Association recalled that a globally-coordinated MPERSS had been adopted by CMM-XI and, with the approval of the forty-fifth session of the Executive Council, implemented on a trial basis as from 1 January 1994. The Association noted that JCOMM-I had emphasized that a capability for operational response and the operational delivery of data and products was an essential criteria in the provision of meteorological and oceanographic support for many types of marine environmental protection in coastal waters and regional seas, as it was in high seas areas, and agreed that the MPERSS trials should continue during its coming inter-session period. The Association urged Members with agreed responsibilities under the MPERSS to continue to make every effort to contribute to the trials and to report the results of these trials to JCOMM.

7.4.6 The Association expressed its appreciation to RTHs Melbourne and Wellington, as well as to RSMC Honolulu, for their radio facsimile broadcasts, which were being used extensively by maritime users, and for their commitment to continue these operations into the foreseeable future.

7.4.7 The Association noted with appreciation that the MCSS, the GDSIDB and the GTSP were all being continually developed to meet requirements for various types of marine climate data to support global climate

studies, GCOS and the provision of marine services. It therefore urged concerned Members in the Region to participate actively in these projects, which all formed part of the JCOMM Data Management Programme Area.

SYSTEMS FOR MARINE OBSERVATIONS AND DATA COLLECTION

7.4.8 The Association shared the view of Thirteenth Congress that the development and implementation of GOOS was of considerable importance to WMO and to NMSs, in view of the need for enhanced ocean data to support meteorological and oceanographic services and global climate studies, and also because of their existing experience and facilities in this field. It further noted that a major initial task for JCOMM would be the implementation, international coordination and regulation of an operational ocean observing system for climate, in support of GOOS and GCOS. For this task, JCOMM would require the enhanced, active support of all maritime Members. The Association therefore adopted [Resolution 13 \(XIII-RA V\)](#), Support for JCOMM.

7.4.9 The Association recognized the importance of regional activities of GOOS. It noted with interest that a workshop had been held in conjunction with the Fifth IOC/WESTPAC International Scientific Symposium (Seoul, Republic of Korea, August 2001) to formally establish SEAGOOS.

7.4.10 The Association shared the view of JCOMM-I that coordinated physical, biological and chemical measurements of the ocean and atmosphere were needed to obtain a comprehensive view of the behaviour of coastal seas and their responses to natural and anthropogenic forcing, in support of sustainable development. JCOMM-I also recognized that virtually all marine data users were requiring highly integrated data streams, including meteorological and oceanographic, physical and non-physical data. The Association noted that JCOMM would assess the requirements for implementation of non-physical measurements and work to prepare for and contribute to the implementation of the coastal component of GOOS, considering as appropriate the inclusion of required non-physical measurements, products and services in JCOMM activities.

7.4.11 The Association noted with interest the work already underway to implement the VOSclim project to provide high-quality marine meteorological data and associated metadata, to serve as a reference data set to support global climate studies. The Association also noted that a WRAP had been initiated to provide much-needed upper-air sounding data, from the Southern Ocean in particular. The first WRAP voyage began in April 2000, with support from Australia, the United Kingdom, the United States and EUMETNET. The Association encouraged its other Members to participate in this project if at all possible, ideally through the provision of consumables so that the soundings might be extended to other parts of RA V waters.

7.4.12 The Association agreed that the VOS, the SOOP, the GLOSS and the ASAP programmes, as well as ocean data buoys and oceanographic satellites, formed

key components of both existing and future ocean observing systems. They would be coordinated under JCOMM and contribute directly to GOOS and GCOS. It therefore agreed on the importance of continued support by Members of the Association for those activities. The Association in particular urged its Members to:

- (a) Recruit more ships to the VOS programme, improve data quality and timeliness, strengthen their PMO networks, and participate where possible in the VOSclim project;
- (b) Participate whenever possible in the implementation and long-term maintenance of the operational SOOP plan;
- (c) Participate in and support the implementation of the ASAP programme, including WRAP, and the work of the ASAP Panel wherever possible; and
- (d) Develop and operate drifting buoy programmes in data-sparse ocean areas; and participate in the work of the DBCP and its regional action groups such as the IBPIO and the IPAB.

7.4.13 The Association noted that the satellite system of Inmarsat, as well as being a key element in the GMDSS and thus in the new WMO marine broadcast system, was also the primary means for transmitting meteorological and oceanographic reports from the VOS, SOOP and ASAP ships 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. It therefore decided to keep in force [Resolution 10 \(XI-RA V\)](#) on the subject.

7.4.14 The Association noted and endorsed the support of Congress and the Executive Council for the new ARGO project to implement a global network of autonomous sub-surface ocean floats to provide temperature and salinity profiles of vital importance to climate monitoring and prediction. In this context, it recognized that ARGO constituted a component of the WCRP, GOOS and GCOS, and that it would also become part of an integrated operational ocean observing system coordinated and regulated through JCOMM. The Association noted with approval the efforts being made jointly by WMO and IOC to inform Members of ARGO float deployments, to facilitate access to ARGO data (which would be freely available in real time on the GTS) and information, and to facilitate participation in the project. It agreed that an effective way of implementing these actions, as well as of addressing technical aspects of data distribution and assisting in the integration of ARGO with other ocean observation networks, would be through a technical coordinator who worked in close collaboration with the existing DBCP/SOOP coordinator. The Association endorsed the establishment of a JCOMMOPS centre, based initially upon existing DBCP, SOOP and ARGO international coordination mechanisms. It therefore urged Members of the Association to commit the resources required to support JCOMMOPS. The Association recalled that an ARGO Implementation Planning meeting had taken place for the Pacific Ocean in Tokyo in April 2000, and had developed concrete

plans for the deployment of floats in the Region as well as addressing applications of the data. Several experts from RA V participated in this meeting. Extensive briefings on ARGO were also undertaken in conjunction with a GCOS workshop in the Region in August 2000. It expressed the desire that further such briefings on the applications of ARGO data in the Region might take place at the Workshop on Potential Applications of Ocean Observations for Pacific Islands, planned to be held in Fiji in October 2002.

7.4.15 The Association expressed its appreciation to the United States for the information provided on the development of its DART project, part of that country's NTHMP, to implement a new capability for the early detection and real-time reporting of tsunamis in the open ocean. The Association noted with interest the placement of three DART buoys off the Aleutian Islands, two DART buoys off the United States-Canada West Coast, one DART buoy in the equatorial eastern Pacific, and a future DART buoy to be deployed off the coast of Chile. Since these DART buoys utilized an anchored seafloor bottom pressure recorder package attached to a surface buoy, it was noted that it was possible to retrofit them with meteorological sensors, thus increasing meteorological information available from existing ocean platforms.

PROGRAMME SUPPORT ACTIVITIES

7.4.16 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 possibilities for hosting such activities in the future.

7.4.17 The Association noted with appreciation that experts from a number of Members of the Association had participated in an International Workshop for PMOs from Regions II and V (Melbourne, Australia, November 1999). The Association expressed its appreciation to Australia for hosting this workshop and to the United States' NWS and NOAA for providing support. The Association recognized the value to JCOMM members of the scientific lectures on the theme of operational oceanography, which had taken place at JCOMM-I.

7.4.18 The Association noted with appreciation the further refinement, jointly with IOC, of the project proposal for the SEACAMP project. This project aimed for the cooperative development and enhancement of marine observing systems, data exchange, modelling and services in the South-east Asia region. A finalized project document for the SEACAMP project had been prepared and the project had been formally adopted by the ASEAN Subcommittee on Meteorology and Geophysics. It was submitted to a number of aid agencies for funding. The Association expressed its ongoing support for the project concept, and urged that efforts be made to secure the funds necessary for its implementation.

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

GENERAL

8.1 The Association appreciated that, in general, the needs of the Region's Members were adequately reflected in the priority activities of WMO in hydrology and water resources given in WMO's 5LTP. It examined those topics in the Plan which were new, and was pleased to note that the needs of the small islands had been given appropriate emphasis.

8.2 The Association noted with much appreciation the report of the chairperson of the WGH, Mr R. Raj (Fiji). It noted the progress that had been made in carrying out the various tasks assigned to the six rapporteurs of the group. For two of the tasks, the chairperson himself had served as the rapporteur. The results of the work by the rapporteurs were draft technical reports on:

- (a) Research results on the hydrological aspects of ENSO in the Region, and their application to water management — Mr C. Pearson (New Zealand);
- (b) Needs of Small Island States in the area of operational hydrology — Mr R. Raj (Fiji);
- (c) Research results on the hydrological effect of climate variability and change in the Region and their application to water management — Mr R. James (Australia);
- (d) Development of a WHYCOS proposal for Region V — Mr R. Raj (Fiji);
- (e) Applications of HOMS and opportunities of enhancing its utility — Mr A.M. Jafri (Malaysia); and
- (f) Appropriate education and training needs in accordance with the guidelines endorsed by the forty-eighth session of the Executive Council — Mr J. Loebis (Indonesia).

The Association recommended that the draft reports be compiled and circulated to the Members of the Region.

8.3 The Association welcomed the initiative that had been taken by the working group, in collaboration with the WMO Secretariat, in developing project proposals for the training of hydrological technicians and for the development of a Pacific-HYCOS. These proposals were included among the priority recommendations of the Meeting of Experts on the Hydrological Needs of Small Islands.

8.4 The Association noted that the project proposals had been submitted to AusAid and to the New Zealand Overseas Development Agency to be considered for funding.

8.5 The Association noted the results of the Meeting of Experts and fully endorsed its recommendations. It requested that the recommendations be incorporated into the regional aspects of the HWRP and serve as a basis for future work in this field in the Region.

8.6 The Association further noted that the WGH had held its fifth session from 16 to 22 January 2002 in Wellington, hosted by the Meteorological Service of New Zealand. In addition to reviewing the status of its work and agreeing on actions and a schedule to complete the

various assignments, the group had in-depth discussions on the future activities that should be undertaken in the Region. In this connection, it took into account the recommendations of the Meeting of Experts (see paragraph 8.3) and proposed a set of 10 activities, listed in order of priority, for consideration by the Association.

8.7 The Association appreciated that the WGH had devoted one and a half days of its session to a HOMS Workshop on Flood Forecasting and Warning, a subject of major concern in the Region. A number of systems in operational use in the Region and relevant HOMS components were presented and discussed. This included the URBS Rainfall Runoff Model, a HOMS component, and also a presentation of technology and models developed and used in Australia and New Zealand which were to be proposed for inclusion in HOMS in the near future. The workshop focused on several different aspects of the total flood warning system, including data collection systems, data transmission systems, flood forecasting models and methods of interpreting the potential impacts of floods. The needs of the small islands for technology transfer in this area were reviewed with the aim of identifying areas in which HOMS components could be applied in Region V.

8.8 In discussing future activities, the WGH confirmed training as the highest priority need of the Region. The Association endorsed the training proposal (see paragraph 8.3) and recommended that efforts by the Secretariat be intensified to secure funding for its implementation as early as possible.

8.9 The Association noted that much discussion during the WGH session had focused on improving the cooperation between NMSs and NHSs. In many of the smaller countries where there were no well-developed Hydrological Services, the role of the NMSs was seen as crucial in promoting hydrological activities in collaboration with the appropriate water agencies. The Association therefore urged its Members to make every effort to further strengthen or develop appropriate links with the NHSs.

8.10 On the basis of the recommendations of the WGH, and taking into account the decisions of Thirteenth Congress and the recommendations of CHy-XI, the Association decided by its [Resolution 14 \(XIII-RA V\)](#) to re-establish the Working Group on Hydrology, open to all Members of the Region, with a core membership composed of a chairperson and seven expert members. The Association considered the future programme of work proposed by the WGH, and approved the activities as set out in [Resolution 14 \(XIII-RA V\)](#). It further recommended that at least one session of the working group be arranged during the following intersessional period, and that financial assistance be provided by WMO so that the core members could attend the session.

8.11 In accordance with General Regulation 167(b), the Association designated its RHA, as recorded in [Resolution 14 \(XIII-RAV\)](#).

8.12 The Association was pleased to note that its WGH had made significant inputs to the HWRP and

that its activities were well coordinated with those of CHy. In this connection, Mr B. Stewart (Australia), vice-president of the Commission, had participated in the fifth session of the WGH and had worked with the group in identifying areas of common interest for inputs by the two WMO bodies.

8.13 In accordance with a recommendation of XII-RA V, the chairperson of the working group had circulated periodic newsletters to keep Members informed on hydrological matters of both regional and global interest. The Association appreciated the value of the newsletters and recommended that the practice be continued.

8.14 The Association noted that Thirteenth Congress had recognized the increasing pressure being put on the world's limited resources of freshwater and had considered that WMO would have a major long-term role to play in responding to ensuing problems through the HWRP and associated activities. It appreciated that the work of the Organization in hydrological and water resources needed more visibility and noted that the Executive Council was giving consideration to reflecting this responsibility in an appropriate subtitle to the name of the Organization.

COMMISSION FOR HYDROLOGY (CHy) AND REGIONAL ACTIVITIES

8.15 The Association was informed that Thirteenth Congress had adopted revised terms of reference for CHy. The revised terms of reference would shift the focus of CHy activities from regulation and standardization of methods and instruments of observation and data exchange to a broader approach to hydrology and water resources problems in the context of socio-economic development and environmental protection. New emphasis was put on international exchange of experience and technology; the international dissemination of hydrological information, forecasts and warnings and on raising public awareness of the social, economic and environmental significance of water.

8.16 The Association was informed about the outcome of CHy-XI. CHy had emphasized that future activities under the HWRP needed to consider more output-oriented objectives. The Commission had also expressed concern that Regional and Subregional Offices, as then constituted, did not include the hydrological expertise needed to serve the hydrology and water resources communities of the Regions.

8.17 The Association also noted the proposal of CHy for the establishment of national committees which could serve as platforms for hydrological data-collecting agencies to coordinate their activities. It recognized that coordination of water-related matters was a major issue in the Region and endorsed the WGH proposal that all international and regional agencies within the Region which carried out programmes in hydrology and water resources should coordinate their activities through integrated work programmes. It felt that formation of national committees to coordinate the water-related activities of the regional (SOPAC, SPREP) and international (WMO, UNESCO) organizations and provide guidance in the formulation of national inputs

to regional programmes would contribute substantially to improving the situation. It appreciated that such committees might contribute to increasing WMO's visibility in hydrology and water resources and could eventually be followed by the formation of joint committees with those of UNESCO's IHP to coordinate water-related activities of WMO and UNESCO and other organizations and global programmes.

EXCHANGE OF HYDROLOGICAL DATA

8.18 The Association was informed that Thirteenth Congress had adopted Resolution 25 (Cg-XIII) on the Exchange of Hydrological Data and Products. In this connection, the Association welcomed the publication of the brochure *Exchanging Hydrological Data and Information — WMO Policy and Practice* (WMO-No. 925) and the Technical Document *Exchange of Hydrological Data and Products* (WMO/TD-No. 1097), explaining the background and the intent of the Resolution. It noted the recommendation of CHy that a mechanism be established for systematic sampling of data transfer at national, regional and international levels as a means of monitoring the response to the implementation of Resolution 25.

GUIDE TO HYDROLOGICAL PRACTICES (WMO-No. 168)

8.19 The Association was pleased to note that the fifth edition of the WMO *Guide to Hydrological Practices* (WMO-No. 168) was available in electronic form. A CD-ROM containing the English and French versions had been issued in September 2001, and the Russian and Spanish versions were expected later in the year. The Association appreciated that the *Guide* in this format would facilitate distribution and access.

PROGRAMME ON BASIC SYSTEMS IN HYDROLOGY

WATER RESOURCES ASSESSMENT

8.20 The Association noted the continued efforts of the WMO Secretariat to promote the use of the methodology contained in the WMO/UNESCO handbook on *Water Resources Assessment — Review of National Capabilities*. The handbook was available in English, French, Spanish and Russian, also in PDF format freely downloadable from the WMO or UNESCO Web sites. To promote the use of the handbook, WMO organized a series of workshops on the subject in the various Regions. The Association noted with appreciation that one such workshop had been held in Fiji in October 1999, and had attracted participants from 10 countries in the Region.

WORLD HYDROLOGICAL CYCLE OBSERVING SYSTEM (WHYCOS)

8.21 The Association was informed of the continuing progress in the development and implementation of the WHYCOS programme. It noted that three projects had been implemented in the Mediterranean region and Africa, and that 15 others were at various stages of development. One such project was the Pacific-HYCOS.

8.22 The Association was informed that the Meeting of Experts on Hydrological Needs of Small Islands had made a recommendation for the development of a Pacific-HYCOS a priority activity. The WMO Secretariat had acted immediately on this recommendation and engaged the services of two experts from the Region, Messrs R. Raj (Fiji) and P. Mosley (New Zealand), to prepare a draft project proposal. Between them, the two consultants visited nine countries (Cook Islands, Fiji, French Polynesia, New Caledonia, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu) for discussion with national experts and to gather additional information on the status of hydrological activities and on priority needs of the countries. The draft proposal was circulated for comments to the WMO Member countries in the Region. Positive comments supporting further development and implementation of the project had been received from seven countries (Cook Islands, Fiji, French Polynesia, New Caledonia, Niue, Papua New Guinea and Vanuatu). The Association was pleased to note that WMO had been collaborating with SOPAC on this project and that the proposal had been submitted to donor agencies in the Region for consideration. It noted that further work still needed to be done in developing the detailed design of the various components of the project. It felt that, in view of the contribution which this project could make to water resources assessment and management in the Region, efforts should be intensified to obtain funding for its detailed design and early implementation.

8.23 The Association noted that, on the recommendation of CHy-X, the Secretary-General had established a coordination mechanism to guide the development and implementation of the WHYCOS programme. The mechanism consisted of two components — an Internal Coordination Mechanism to link the inputs of the various departments concerned in the WMO Secretariat, and an External Coordination Mechanism to ensure worldwide operational linkage amongst the various HYCOS components and advise on all technical aspects of the programme.

TECHNOLOGY IN OPERATIONAL HYDROLOGY

8.24 The Association noted with interest that the first phase of updating the HRM initiated in 1998 had culminated in July 2000 when Version 2000 became available online at (<http://www.wmo.ch/web/homs/homshome.html>).

8.25 The Association was informed that an International Workshop on HOMS in the 21st Century had been held in Geneva in September 1999. Five representatives of HNRCs in the Region participated in the event. The Workshop developed an Implementation Plan for HOMS in the 21st Century, which was then reviewed and adopted by the Steering Committee and distributed to all HNRCs.

8.26 The Association was informed that in June 2001, a CD-ROM containing Version 2000 of the HRM, together with promotional material on HOMS in the form of a brochure and a slide presentation with related

text, were distributed to the 121 HNRCs and to seven HRFPs. Steps had been taken to distribute future versions of the HRM via e-mail in order to make the updating process as dynamic as possible. The Association recognized the value of HOMS to the Region and recommended that the CD-ROM version be distributed widely to ensure that it was available to all potential users. In that regard, it welcomed the offer of SOPAC to serve as a HOMS Regional Centre for the Small Island States to distribute HOMS material within the Region as it became available, and to promote its use. The Association requested that the WMO Secretariat take appropriate action for the establishment of the above-mentioned Regional Centre.

PROGRAMME ON FORECASTING AND APPLICATIONS IN HYDROLOGY

HYDROLOGICAL ASPECTS OF DISASTERS

8.27 The Association noted that, within the framework of the GWP, a WMO/GWP Associated Programme on Flood Management–Global Coordination had been launched in August 2001, funded by Japan and the Netherlands, and that a project technical support unit had been established in WMO Headquarters.

8.28 While appreciating the current activities being undertaken regarding floods, the Association felt that droughts also needed greater emphasis. It noted that CHy was developing guidelines for drought management, which would be of much value to the Region. It therefore recommended that the WGH collaborate closely with CHy in this field.

HYDROLOGY IN THE CONTEXT OF GLOBAL ENVIRONMENTAL ISSUES

8.29 The Association was advised that WMO and UNESCO had convened the first meeting of the restructured WCP-Water Steering Committee in Geneva in October 2000. This had resulted in a revision of the programme objective and the identification of priority areas for future work.

8.30 The Association was informed of the proposal emanating from the Fifth WMO/UNESCO International Conference on Hydrology (February 1999) for the establishment of an IGRAC. CHy-XI and WMO's Executive Council, as well as UNESCO's Inter-governmental Council of the IHP had endorsed the proposal. Plans were progressing for the establishment of the centre in the Netherlands.

PROGRAMMES ON SUSTAINABLE DEVELOPMENT OF WATER RESOURCES AND CAPACITY BUILDING IN HYDROLOGY AND WATER RESOURCES

8.31 The Association was informed of plans to organize during 2002 Expert Meetings on the Hydrology of Urban Areas and on the Management of NHSs. Experts from the Region were expected to be invited to contribute to these meetings.

8.32 The Association noted that the Executive Council Panel of Experts on Education and Training had

established an Editorial Task Force on Hydrology which was nearing completion of the preparation of the fourth edition of Volume II — Hydrology, of *Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology* (WMO-No. 258).

PROGRAMME ON WATER-RELATED ISSUES

8.33 It was recorded that the ACC Subcommittee on Water Resources had met in October 2000 and September 2001, with WMO chairing both meetings. Attention had concentrated on the preparation of the first edition of the WWDR, which would be the major occupation of a WWAP, the secretariat of which was hosted and funded by UNESCO from extrabudgetary sources.

8.34 It was noted that Germany had convened a very successful International Conference on Freshwater in Bonn from 3 to 7 December 2001, with the purpose of developing recommendations for action for submission to the WSSD.

8.35 The Association noted that WMO maintained its membership in the WWC and its Board of Governors under whose auspices the Third World Water Forum would be held in Japan in March 2003.

8.36 The Association reviewed in particular the cooperation between WMO and UNESCO in matters concerning freshwater. It noted that this focused on activities in water resources assessment, the preparation of the International Glossary of Hydrology, WCP-Water and education and training in hydrology and water resources.

8.37 The Association was informed that WMO had continued to co-sponsor relevant scientific meetings of NGOs and had co-sponsored the IAHS Sixth Scientific Assembly, held in July 2001 in Maastricht, the Netherlands.

8.38 The Association also noted that the Organization had maintained its long-standing cooperation with the IAHS and ISO, and had recently strengthened its links with the International Association of Hydraulic Engineering and Research.

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 for the success of all WMO Programmes.

9.2 The Association was pleased to note Chapter 6.6 of the *Fifth WMO Long-term Plan (2000–2009)* (WMO-No. 909) as adopted by Thirteenth Congress and urged its Members to ensure that all necessary actions were taken to meet the objectives of the Plan.

EXECUTIVE COUNCIL PANEL OF EXPERTS ON EDUCATION AND TRAINING

9.3 The Association noted the views and recommendations of the Executive Council Panel of Experts on Education and Training on the activities of the WMO regional associations in these areas. It also noted the panel's proposed guidelines on the roles of working groups and rapporteurs established or appointed by regional associations and technical commissions on education and training matters.

HUMAN RESOURCES DEVELOPMENT

9.4 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 financial and other resources to meet Members' training needs. With respect to the next global survey of Members' training requirements planned for 2002, the Association expressed the hope that an active participation of Members would allow a proper assessment of regional training needs, and be a basis for modifications and improvements in the ETRP. In this respect, the Association invited its Members to identify and prioritize their training requirements and to provide this information as soon as possible to the WMO Secretariat for use by the Rapporteur on Education and Training Matters and his two co-rapporteurs (see paragraph 9.20). The Association recommended that the requirements of Members in new subject areas and technologies also be properly identified.

9.5 Noting the identified increase in the number of personnel to be trained, the Association encouraged its Members to make every effort to become self-reliant in the basic training of meteorological and operational hydrological personnel. The Association also felt that there was a need for the cooperation and coordination of education and training activities in the Region to better meet the expressed requirements, and to use available capabilities effectively.

TRAINING ACTIVITIES

9.6 The Association noted that since its previous session, WMO had organized 13 training events held in the Region. The Members of the Association also had the opportunity to benefit from other training events organized and hosted by national or international institutions, with WMO acting as co-sponsor or providing partial financial support. Those events, which were listed in WMO Annual Reports, covered a wide range of subject areas of interest to the Region. In this respect, the Association indicated the importance of training in management of NMHSs as one of the future priority subject areas for group training on a regional basis, and noted that the Asian Institute of Management in the Philippines was one of the institutions offering such training in the Region.

9.7 The Association noted with satisfaction that the quadrennial WMO Symposium on Continuing Education and Training in Meteorology and Operational Hydrology had been held successfully in Tehran, Islamic

Republic of Iran in November 1999. The Association agreed that the recommendations of the Symposium were of considerable value as a guide to Members in their efforts to strengthen their human resources by improving their staffs' skills and knowledge through continuing education and training. The Association noted that the next WMO Symposium on New Perspectives of Education and Training was planned to be held in Madrid, Spain during April 2003, and encouraged its Members to participate in this important training event.

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

9.9 The Association noted with appreciation the activities of the SCHOTI, in particular CALMet-01 (Brazil, July 2001), organized by the SCHOTI Working Group on CAL. The Association highlighted the importance of CAL and Distance Learning in meteorology, and requested its Rapporteur on Education and Training Matters and his two co-rapporteurs to keep under review and provide advice in these areas, among other priority subject requirements, for regional and specialized education and training. The Association noted with appreciation that the Fifth Meeting of SCHOTI had endorsed the creation of a new working group to assist and promote the initiation of a Web-based network that would link the WMO RMTCs and other national training institutions.

9.10 The Association also noted that the fifth meeting of Directors/Principals of WMO RMTCs, held in Tehran, Islamic Republic of Iran in November 1999, had nominated a representative and an alternate to serve as members of the CO-COM of the SCHOTI.

9.11 The Association noted with satisfaction the information on the activities of the Training Library and the use made of its services by the Members. It also appreciated the continuous updating of the VTL in an effort to provide the latest and most suitable available training material through the Internet, and recommended that those actions be encouraged and continued.

REGIONAL METEOROLOGICAL TRAINING CENTRES (RMTCS)

9.12 The Association noted with appreciation that the WMO RMTC in the Philippines continued to carry out satisfactorily its routine training programmes and organize specialized courses in response to the needs of Members in the Region, as well as those in other Regions. In urging its Members to make maximum use of the training programmes offered by this RMTC, the Association agreed with the need, stressed by Thirteenth

Congress, for more emphasis to be placed by this RMTC on regional training requirements for specialized courses in various areas. In this connection, Members were requested to assist RMTCs in organizing courses, using such ways and means as the provision of instructors for short-term assignments, the provision of relevant training materials, and other sorts of assistance under bilateral or multilateral arrangements.

9.13 The Association was pleased to note the meeting of Directors/Principals of WMO RMTCs in Tehran, Islamic Republic of Iran (see paragraph 9.10). It encouraged Members to strengthen the interaction among RMTCs and with other training and educational centres, particularly from advanced countries, to bridge the current scientific and technological gap. The Association endorsed the establishment and maintenance of the RMTC's Web pages, and requested Members to explore eventual external support for the provision of hardware and software to establish Internet connections.

9.14 The Association noted that the 20th session of the Executive Council Panel of Experts in Education and Training (Philippines, April 2002) had encouraged the regional associations to take a much stronger role in formulating the training needs of their respective Regions to assist RMTCs in better planning their training programmes to meet these needs. In this context, it requested its Rapporteur on Education and Training Matters and his two co-rapporteurs to give priority to assisting the RMTC in the Philippines and other national training institutions in the Region to develop a coordinated programme of training activities, especially in the important emerging area of training in the management of NMHSs.

NEW WMO CLASSIFICATION OF METEOROLOGICAL AND HYDROLOGICAL PERSONNEL

9.15 The Association noted that Thirteenth Congress had endorsed the new classification and agreed that its implementation should be gradual, recognizing that some Members might require a longer transition period, but that it should not exceed four years.

9.16 The Association noted that the new edition of *Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology* (WMO-No. 258), Volume I — Meteorology, was about to be finalized and issued for distribution to all WMO Members. It also noted that Volume II — Hydrology, was under way and expected to be reviewed and prepared for distribution by the end of 2002.

EDUCATION AND TRAINING FELLOWSHIPS

9.17 The Association noted with appreciation that many donor Members in Region V and in other Regions had continued to provide training fellowships and arrange study programmes and tours for the benefit of the Members of the Region.

9.18 The Association noted with appreciation the accomplishment achieved by the Micronesian Meteorologist Training Programme sponsored by the United States. Three individuals from the Federated

States of Micronesia, and one from the Republic of Palau, completed bachelor of science degrees in Meteorology at the University of Hawaii, followed by one-year internships at the Guam Forecast Office. After short on-the-job training, they became meteorologists-in-charge of their respective weather service offices. The Association also noted with interest that three Micronesians were enrolled at the University of Hawaii for the second round of the Programme, which aimed to have a second Micronesian meteorologist at each weather service office. The long-term goal was to develop an expanded local forecast and warning programme for each jurisdiction. In addition, the Association expressed appreciation to the United States for beginning a two-month fellowship programme at the RSMC/Honolulu for RA V Members. In addition to the two-month training, the trainees were to receive the computers they were working on during the training to take back to their NMS offices to train other members of their respective NMSs.

9.19 The Association also noted with appreciation the generous contributions of several VCP donor Members who continued to provide VCP fellowships to the satisfaction of all concerned, and appealed to other Member countries who had not already contributed to the VCP fellowship programme to do so. However, in noting that the available financial resources did not meet all the needs of the Region, in particular for long-term fellowships, the Association requested Members to consider possibilities of meeting their requirements by using to the maximum the available facilities in the Region (including the WMO RMTC in the Philippines) and by strengthening cooperation between countries through bilateral and multilateral schemes, in particular through TCDC arrangements.

RAPORTEURS ON EDUCATION AND TRAINING

9.20 In view of the continued pressing needs by Members for capacity building and human resources development in meteorology and specialized subjects essential to economic and social development in the Region, the Association agreed to designate a Rapporteur on Education and Training Matters, assisted by two co-rapporteurs, and adopted [Resolution 15 \(XIII-RA V\)](#) to that effect.

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

10.1 The Association reviewed the technical cooperation activities carried out during the reporting period and expressed its appreciation to the donor community and to Members for the support provided to the NMHSs of the Region. The Association noted the considerable efforts made by the WMO Subregional Office for the South-west Pacific since its previous session to enhance technical cooperation activities, especially through resource mobilization activities, for funding national and regional projects. In this respect, the Association acknowledged the role of the Office in project development and resource mobilization activities.

10.2 The Association noted that project proposals on climate issues for four countries in the Region in the framework of UNDP SPPD had been submitted to the UNDP Office in Samoa in 2001. As emphasized by Thirteenth Congress, the Association reiterated the importance of the role of the Permanent Representatives of Member countries in mobilizing resources from UNDP, and requested the Secretary-General to continue collaborating with UNDP to enhance its funding for meteorological and hydrological services.

10.3 The Association noted with satisfaction the completion of the GEF-financed project Global Monitoring of Greenhouse Gases Including Ozone within the framework of which a GAW station had been established at Bukit Koto Tabang in Indonesia. It also noted the establishment of a new trust fund in the WMO Secretariat to continue supporting the established GAW stations.

10.4 The Association also noted that, following the resolution of the GCOS Regional Workshop held in August 2000 in Apia, Samoa, a Regional Action Plan had been developed by New Zealand, the GCOS Secretariat, SPREP and SOPAC with the participation of Members in the Region. The plan addressed priority climate observing systems, RCCs, and other climate needs for the Region. Furthermore, the GCOS Secretariat and SPREP, with the participation of Members in the Region, held a meeting in Nadi, Fiji in March 2002 which studied this Regional Action Plan and created an Implementation Plan with specific goals and actions. The meeting also established a team to coordinate the implementation. The Association requested the Secretary-General to assist in the formulation of a full-scale programme proposal to mobilize the required resources (see paragraph 5.4.2).

10.5 The Association was pleased to note that an MOU was concluded between WMO and ESCAP on the project Support to the Implementation of the Regional Haze Action Plan of ASEAN Member Countries in 2000, with financial support from the Government of Australia. The Association noted with appreciation that NOAA, in collaboration with WMO, was implementing through ASEAN a PARTS programme. This activity would contribute to the implementation of the RHAP's monitoring component to provide early warning of forest fires and the prediction of smoke and haze transportation. The objectives of the project were to enhance capacities in the participating ASEAN countries for monitoring smoke and haze to provide early warnings of forest fires, organize an ASEAN regional aerosol transport study, and provide responses for urban health issues and prepare for emergency response through a selected number of monitoring and modeling activities. An Expert Consultative Meeting on Monitoring/Modeling Activities for the project was held in Singapore in September 2001. The Association requested the Secretary-General to continue working with ESCAP to develop new joint initiatives in areas of common interest.

10.6 The Association was pleased to note that, within the framework of the VCP, 12 Members in RA V had received support for a total of 28 VCP projects (training projects excluded) during the period 1998–2001, in

particular for strengthening WWW operational facilities, for climatological activities, and for aeronautical meteorological activities through the provision of satellite-based distribution systems for WAFS data and products. The Association noted that there was still some need in the Region to provide support to Members in order to ensure that a minimum basic infrastructure was kept in operation. It expressed its appreciation to the VCP donor Members and urged others to participate actively in that scheme. The Association adopted [Resolution 16 \(XIII-RA V\)](#), the WMO Voluntary Cooperation Programme.

10.7 The Association expressed its satisfaction with the number of short- and long-term fellowships that were awarded through the VCP and the WMO Regular Budget, and requested the Secretary-General to continue his efforts to secure more funding under the VCP, in order to meet the increasing demand of Member countries for training of meteorological and hydrological staff for the development of their services.

10.8 The Association recognized the importance of trust funds for WMO TCO activities for the development of NMHSs in the Region. The Association encouraged Members to make use of such arrangements, which had proved to be cost-effective for their NMHSs.

10.9 The Association reiterated the importance of TCDC as a means of promoting regional and international cooperation. It expressed its gratitude to Members such as Samoa, the United States (American Samoa) and others who had participated in TCDC activities, and urged them to take an active part in this important activity.

10.10 The Association also noted the importance of bilateral and multilateral arrangements for the promotion of meteorological and hydrological services, and urged Members to provide the WMO Secretariat with information pertaining to this type of assistance. In this respect, the Association noted that SPREP and AusAID had participated in the Informal Planning Meeting on the VCP and related TCO programmes held in March 2001 in Melbourne, Australia, to enhance the dialogue between aid agencies, regional organizations and WMO Members on TCO activities.

10.11 The Association noted with satisfaction that an MOU had been concluded between the World Bank and WMO. The main objective of the MOU was to strengthen cooperation in areas of common interest between the two institutions, particularly natural disaster prevention and mitigation, climate change and water resources management. The Association also noted that the Secretary-General was negotiating similar arrangements with other banks, including the Asian Development Bank. The Association encouraged Members to participate in national and regional initiatives related to bank-funded programmes.

10.12 The Association noted with appreciation that following the approval of Thirteenth Congress, the Secretary-General had established a Trust Fund for Technical Cooperation Programme Development Activities for assisting Members in the identification of

their requirements and in the formulation of meteorological development plans and project proposals. Members were encouraged to contribute to the Fund.

10.13 The Association noted that following the development of the Strategic Action Plan for the Development of Meteorology in the Pacific Region (2000–09) in 2000, SPREP undertook the Pacific Meteorological Services Needs Analysis Project with the financial support of the Government of Australia. The project was a team effort of WMO, Australia's BOM, *Météo-France*, Meteorological Service of New Zealand, the United States NWS and all NMHSs in the Region. The report of the project, *Pacific Meteorological Services: Meeting the Challenges*, was prepared and development project concepts were identified and proposed under the following themes:

- (a) Strengthening Observing Systems;
- (b) Strengthening Telecommunication Networks;
- (c) Improving Severe Weather Warnings;
- (d) Climate Data Management, Analysis and Application; and
- (e) Institutional Strengthening, Including Infrastructure Support.

10.13.1 The Association expressed its appreciation for the achievements and progress being made towards the implementation of both the Strategic Action Plan and the projects identified in the 'Needs Analysis for the Strengthening of Pacific Islands Meteorological Services: Meeting the Challenges' report.

10.13.2 The Association expressed its appreciation to Australia, Fiji, France, New Zealand, the United States, SPREP, the WMO Subregional Office for the South-west Pacific, and other development partners for their invaluable contributions to development of the Strategic Action Plan and the Pacific Islands Meteorological Services: Meeting the Challenge report, and for providing support for their implementation.

10.13.3 Whilst complimenting the role of WWW and in view of the importance that the Strategic Action Plan and Pacific Islands Meteorological Services: Meeting the Challenge had in forming a basis for strengthening Pacific NMHSs, the Association requested the Secretary-General to continue efforts with resource mobilization and in particular to seek potential external resources to implement the development projects identified.

10.13.4 The Association requested the Secretary-General to continue working closely with the SPREP Secretariat to mobilize resources to meet the needs of the countries.

10.14 The Association noted that one of the major concerns was the lack of funding support for TCO activities. The session was reminded of the following avenues for resource mobilization:

- (a) Bilateral projects — both government-to-government and NMS-to-NMS TCO through proper official channels;
- (b) Regional projects;
- (c) VCP; and
- (d) Grants and/or soft loans of regional and international funding agencies.

10.15 The Association requested the Permanent Representatives of WMO Member countries and other senior officials of NMHSs to play more active roles in resource mobilization to meet the future requirements through strong partnerships with possible sources of funding, including government agencies, bilateral/multilateral sources, the private sector and United Nations programmes such as UNDP. The Association also requested the Secretary-General to continue assisting Members in the mobilization of resources for this purpose. The Association encouraged the Members to work closely with the WMO Subregional Office for the South-west Pacific in Apia in the formulation of project proposals.

10.16 The Association noted that a few affected countries in other Regions had received support within the framework of the WMO Disaster Assistance Fund for Meteorological and Hydrological Services and through donations of Member countries and private companies, for rehabilitating networks of stations and associated facilities destroyed by natural disasters. The Association encouraged Members to apply to this fund when they needed emergency assistance for rehabilitation. It also urged Members to contribute to the Fund.

10.17 The Association noted that, on the day before the opening of the session, East Timor had become a new independent nation within the Region. Conscious of the impact of weather and climate influences on the developing economy of the new nation and the importance of ensuring coordinated international assistance to East Timor in the establishment of its meteorological service capability, the Association expressed its hope that East Timor would become a Member of WMO and thereafter a Member of RA V. It urged East Timor's neighbouring countries and other development partners, with the support of the WMO Secretariat, to take whatever steps they could to assist East Timor in the development of its national meteorological infrastructures and services.

11. INFORMATION AND PUBLIC AFFAIRS (IPA) PROGRAMME — REGIONAL ASPECTS (agenda item 11)

11.1 The Association recalled that Resolution 22 (Cg-XIII) had underlined the need for greater visibility of the Organization and NHMSs, for giving increased importance to communication aspects in mitigating the devastating impact of extreme weather and climate events, and for the establishment of a WMO Global Communication Strategy to guide and enhance the process of making NMHSs and WMO more visible and better appreciated.

11.2 The Association noted with satisfaction the number of public information products developed and distributed to all Members in support of national plans for the celebration of the 50th Anniversary of WMO, including a message from the Secretary-General, a calendar, a series of posters, a brochure on World Meteorological Day 2000, an information kit containing media briefs on WMO Programmes, a WMO50 video, a

WMO radio programme, public service announcement spots and a comprehensive brochure for youngsters. The Association noted with appreciation the contributions of Members of the Region to the celebration of the 50th Anniversary and follow-up celebrations of World Meteorological Day 2001 and World Water Day 2001 through the organization of commemorative events and the production of commemorative items.

11.3 The Association took note of the 2001 World Meteorological Day theme, 'Volunteers for Weather, Water and Climate'; and the World Water Day 2001 theme, 'Water and Health', and their celebration among a large number of NMHSs and at the WMO Secretariat in collaboration with the UNV. The Association noted with appreciation WMO's participation in the ISDR and in the global launch of its campaign on International Day for Disaster Reduction on 17 October 2001. This also contributed to the preparation for the celebration of World Meteorological Day 2002 with its theme, 'Reducing Vulnerability to Weather and Climate Extremes'; and the 2002 World Day for Water with its theme, 'Water and Development'. The Association welcomed the inclusion of WMO media products in the global campaign of ISDR. The Association noted that the United Nations General Assembly had proclaimed 2002 as the International Year of Mountains and 2003 as the International Year for Freshwater. The Association took note of the theme for World Meteorological Day 2003, 'Our Future Climate'. The Association invited its Members to celebrate these events in a way that would promote the NMHSs and enhance their visibility towards the public, the decision makers and the media. The Association requested the Secretary-General to provide the Members with guides and brochures on how to deal effectively with the media.

11.4 The Association welcomed the emphasis on media training to reflect the current trends in climate change, climate variability and other phenomena such as El Niño/La Niña, ozone layer depletion and increasing water scarcity. The Association expressed satisfaction with the IPA Programme media training efforts, such as the organization of Media Training Workshops, and requested the Secretary-General, in collaboration with Members and other relevant bodies, to continue to organize similar events in the future. In this connection, the Association requested the Secretary-General to organize media training for NMHSs on how to effectively use the media to disseminate correct and relevant information.

11.5 The Association noted with appreciation the development of a special WMO50 Web site (www.wmo.ch/WMO50) with links to home pages of Members' NMHSs. The Association called for the establishment of specific pages on public information activities of the Regions as part of the IPA home page, and the establishment of direct links on home pages of Members' NMHSs to the WMO Web site.

11.6 The Association welcomed the initiative taken by the Secretary-General to develop the SECS. The communication strategy included a comprehensive model

plan for action and an outline of guidelines for NMHSs, in order to reach maximum synergy between the Secretariat and the Members. The Association noted the WMO vision with the following theme: 'WMO: Bringing the World's Communities Together in Weather, Water and Climate'. This theme was meant to ensure the promotion of WMO, the NMHSs and their work through a comprehensive key message to be communicated at a variety of events and activities at all levels.

11.7 The Association noted with appreciation the expressed support for the IPA Programme. In this respect, it welcomed the significant number of replies received from NMHSs to the questionnaire of the External Communications Strategy. The information submitted on communications policies at the regional and national levels was important for the appropriate formulation of the SECS, its model plan of action, and its outline of guidelines to ensure a unified communications policy.

11.8 The Association invited its Members to ensure mutual assistance and support in matters related to public information and communication, including partnerships and constituency building, resource mobilization and closer cooperation with the media, NGOs, meteorological and hydrological societies, advocacy groups, academic institutions, parliamentarians, the private sector, corporate foundations, and other civil society institutions and public entities.

11.9 The Association noted with satisfaction the efforts of the Regional Office for Asia and the South-west Pacific, as well as the Subregional Office for the South-west Pacific, as information focal points of the WMO Secretariat for the Region. In order to enhance WMO's IPA Programme in the Region, the Association requested the Regional and Subregional Offices to further strengthen their links with the Members of the Association in this area and invited them to update their list of IPA focal points.

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

12.1 The Association noted the adoption by Thirteenth Congress of the 5LTP covering the period 2000–09. It further noted that regional associations, among others, were requested to adhere to the policies and strategies set forth in the Plan and to organize their activities to achieve the main long-term objectives as defined therein.

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

12.3 The Association recalled that Thirteenth Congress had decided that the 6LTP should be prepared. In so doing, Thirteenth Congress 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 6LTP; and

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

12.4 The Association also recalled that the Executive Council had established its WGLTP to assist it in connection with long-term planning and the Task Team on WMO Structure, and that both had reported to the Council.

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

VISION, DESIRED OUTCOMES, STRATEGIES AND ASSOCIATED GOALS

12.5 The Association endorsed the view of the Executive Council that the vision, desired outcomes, strategies and associated goals, as well as the programme structure of the 6LTP, provided a suitable framework for the elaboration of the Plan. Also, this framework would serve as a clear basis for the programme and budget. The achievement of expected results defined in the programme and budget would contribute to the realization of 6LTP strategies and associated goals. These would establish the meaningful link between the 6LTP and the programme and budget. In this connection, the Association wished to emphasize the tasks and activities under the responsibility of the Association, which were expected to contribute to the realization of the WMO vision, desired outcomes, strategies and associated goals.

REGIONAL AREAS OF CONCERNS

12.6 On the basis of the draft 6LTP framework, the Association identified the following as areas of concerns of particular interest to the Region and which should also be addressed in the Strategic Action Plan for the Development of Meteorology in the Region (see paragraph 12.11):

- (a) Natural disaster reduction through: the provision of more reliable and effective warning of tropical cyclones, monsoons, depressions and other extreme weather events, including associated storm surges and flash floods, as well as El Niño; technical support and advice to implement the Tropical Cyclone Operational Plan for the Region; and the organization of workshops such as on PWS, to increase public awareness and response to disaster mitigation and related warnings:
- (i) Improvement of the quality of data, products and services, using more effective management, should make use of new information technology, in particular the Internet and regional Intranet, Web sites and television presentations, for the distribution of data and information to users and the general public;
 - (ii) Strengthening of the observation network of stations (including GCOS) and exerting best efforts so that key upper-air stations were maintained in operation, including through

the establishment of special funding to cover spares and consumables as required;

- (iii) Strengthening the role and services of the RSMCs and Nadi Tropical Cyclone Centre;
 - (iv) Development of reliable seasonal and inter-annual forecasting capability to ensure an effective drought warning system and application of forecasts to water resources management, agriculture and other key socio-economic sectors;
- (b) Improved understanding of the nature of, and extent of potential threat from, climate change and variability, as well as extreme weather events in the Region, especially with respect to the impact of sea-level rise on low-lying islands and countries with extensive coastlines:
- (i) Assistance to and advice on the implementation of the climate monitoring network, and completion of a definitive historical climate data set for the Region;
 - (ii) Strengthening of the regional component of GCOS and the RCCs;
 - (iii) Assistance in fully implementing the GAW stations in the Region, including the one in Indonesia;
 - (iv) Provision of timely and reliable advice to governments on the state of the global and regional climate on various timescales;
 - (v) Enhancement of awareness and use of assessments of climate change, its impact and options for response strategies, especially through the IPCC and participation in the activities of the UNFCCC;
- (c) Enhanced capacity building and regional cooperation:
- (i) Enhancement of human resources development through relevant education and training activities, with particular emphasis on continuing education and training;
 - (ii) Organization of regional seminars and/or technical conferences on environmental issues and sustainable development;
 - (iii) Effective application of meteorological and hydrological information and knowledge to achieve sustainable development and capacity building actions in this area;
 - (iv) Promoting the role and activities of WMO and NMHSs in the Region and in the development of NMHSs by providing appropriate advice, guidance and support for resource mobilization such as through the Subregional Office for the South Pacific;
 - (v) Strengthening the collaboration with relevant regional bodies, especially SPREP, IOC-WESTPAC, ESCAP, ASEAN, SOPAC, the South Pacific Commission and the South Pacific Forum;
 - (vi) Full integration of all countries in the Region, including new and potential Members, in the work of WMO;

- (d) Implementation of operational hydrology activities in the Region through:
- (i) Introducing effective systems and technologies for safeguarding the limited amounts of groundwater resources, in particular of Small Island States (atolls);
 - (ii) Fostering the establishment of a Pacific HYCOS through external financial support from ADB, SPREP or UNDP to prevent increasing scarcity, gradual destruction and increased pollution of freshwater resources;
 - (iii) Providing an additional venue for the exchange of information and experience among representatives of Small Island States outside the normal cycle of RA V sessions and WGH meetings to define and address their urgent needs.

The Association underscored that to address appropriately the above regional areas of concern, it would be necessary to ensure the proper implementation of the Strategic Action Plan for the Development of Meteorology in the Region.

MONITORING AND EVALUATION OF THE SIXTH WMO LONG-TERM PLAN (6LTP)

12.7 The Association noted that the Executive Council recalled that in the preparation of the 6LTP, the monitoring and evaluation approach, including performance indicators and milestones, should be clearly outlined to facilitate its subsequent monitoring and evaluation. It also noted that the Council had recognized the need to identify at which level(s) and how the monitoring and/or evaluation were to be carried out, and who would have responsibility for the related tasks (e.g. the roles of Members, Congress, Executive Council, Regional Associations, Technical Commissions and the Secretary-General). The goal was to have the guidelines for the monitoring and evaluation of the 6LTP be considered at the same time as the Plan itself.

12.8 The Association recognized that it had a role to play in the implementation of the 6LTP as well as in its monitoring and evaluation. It requested its president to ensure the appropriate participation of the Region.

MONITORING AND EVALUATION OF THE FIFTH WMO LONG-TERM PLAN (5LTP)

12.9 The Association took note that the monitoring and evaluation of the first four years (2000–03) of the 5LTP would be considered by the fifty-fourth session of the Executive Council and subsequently by Fourteenth Congress. It requested its president to continue to ensure the provision of the appropriate contributions in this connection. With respect to the implementation of the 5LTP, the Association emphasized the importance of ensuring the implementation of the Region's priorities, in particular those relating to the mitigation of natural disasters.

STRATEGIC ACTION PLAN FOR THE DEVELOPMENT OF METEOROLOGY IN THE REGION

12.10 The Association agreed that each Member should prepare its development plans for the NMSs to meet relevant challenges and opportunities. It was felt that these should take into account the national plan; guidance available from WMO, including that reflected in the WMO LTP; and the Strategic Action Plan for the Development of Meteorology in the Pacific Region, to ensure the long-term sustainability of the NMSs. The Association requested the Secretary-General to assist Members in the preparation of their NMSs' development plans. It also requested its president to ensure a continuing linkage between WMO long-term planning and the further elaboration of the Region's Strategic Action Plan.

12.11 In further elaborating the Region's Strategic Action Plan and the NMS development plans, the Association underscored the need to take into account the regional areas of concern agreed on by the Association (see paragraph 12.6).

12.12 The Association encouraged its Members to send copies of their NMS development plan to other Members of the Region, to the president of RA V and to the Secretary-General to facilitate exchange of relevant experiences.

GENERAL CONSIDERATION

12.13 The Association recalled that the Executive Council had recognized that the role of regional associations should be strengthened, and that the collaboration between technical commissions and regional associations should be improved. The Association was pleased to note the attendance of the president of CHy at the session. It was felt that particular attention should be given to ensuring that the intersessional activities of the regional associations were effectively carried out. In this connection, the Association emphasized that its participation and contribution in the long-term planning process during the intersessional period was a matter of utmost importance.

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

13.1 The Association recalled that Thirteenth Congress had extensive discussions on the role and operation of NMHSs, and had requested the Executive Council to keep this matter under review, and that the Council, in turn, had established its Advisory Group on the Role and Operation of NMHSs to assist it in this area. Congress, among others issues, considered:

- (a) The NMSs and alternative service delivery;
- (b) Legal instruments;
- (c) Status and visibility of NMHSs;
- (d) Capacity building;
- (e) Provision of aeronautical meteorological services; and
- (f) Partnership and cooperation (with the media, private sector and academia).

13.2 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, Congress had adopted Resolution 26 (Cg-XIII), which invited Members to take relevant actions to enhance the role and operation of NMSs.

13.3 The Association also recalled that Cg-XIII had felt the need to draw the attention of States and Governments to various areas of concern relating to the functioning of NMSs, and adopted the Geneva Declaration of the Thirteenth World Meteorological Congress. All the Members of RA V were provided with copies of the Geneva Declaration.

13.4 The Association also noted the discussions and decisions made at the fifty-second and fifty-third sessions of the Executive Council on the role and operation of NMHSs. These covered the following areas:

- (a) Major issues facing NMSs;
- (b) Cooperation with related data and service providers;
- (c) Involvement of the media, the private sector and academia in the work of WMO and the NMHSs;
- (d) Cooperation with other international organizations and representatives;
- (e) Definition of relevant terms;
- (f) Questionnaire on the Role and Operation of National Meteorological Services;
- (g) High-level conferences;
- (h) Role and operation of NMSs;
- (i) Policy statement on weather and climate forecasting;
- (j) Possible changes in the WMO Convention;
- (k) Aeronautical meteorological services;
- (l) WMO standards for weather forecasts; and
- (m) Quality management certification

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

- (a) A WMO Policy Statement on the Role and Operation of NMSs, which would either confirm, update and/or refine the Executive Council Statement of April 1999 on the NMS and Alternative Service Delivery, and would elaborate on the Geneva Declaration adopted by Thirteenth Congress;
- (b) A consolidated set of 'Guidelines on the Role and Operation of NMSs', making use when possible of relevant WMO materials already available;
- (c) A comprehensive Executive Council report to Fourteenth Congress on action taken in response to Resolution 26 (Cg-XIII), possibly including proposals for modification of the WMO Convention, and regulations to more clearly represent the essential role and primary responsibilities of NMSs in carrying out the purposes of WMO.

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

13.6 The Association recalled that in order to provide an adequate factual database for its analysis of the many issues affecting the role and operation of NMSs, a questionnaire had been sent to all Members.

13.7 Members of the Association expressed their views and shared their relevant experiences on the role and operation of NMSs. Among others, the Association recognized that NMSs should continue their efforts towards responding to major challenges such as the process of globalization, the introduction of market-led economies, the rapid advances in science and technology, commercialization, cost recovery, changing political/economic frameworks, alternative services delivery, regional cooperation and capacity building. The Association re-emphasized that NMSs should be the single official national voice in issuing warnings for tropical cyclones and severe/extreme weather phenomena, as well as being an authoritative scientific voice in relevant issues such as aeronautical and marine meteorology, climate change and variability, natural disaster mitigation and international exchange of meteorological and related data and products. The Association noted that similar considerations applied to NMSs.

13.8 In connection with the various related topics such as those identified in paragraph 13.4, the Association expressed the following views:

- (a) A major issue facing NMHSs in the Region was governmental financing and support. The Association agreed that NMHSs should establish close working arrangements and promote strategic alliances and cooperation with relevant institutions within their respective countries and between NMHSs in the Region;
- (b) The Association recognized that the involvement of the media, the private sector and academia in the work of WMO (including their collaboration with the NMHSs) was of great importance to WMO and the Association, and that appropriate guidance should be developed. In general terms, the relations with the three sectors did not present problems in the Region;
- (c) The Association agreed that it was important to intensify the cooperation with the international representatives of the different relevant sectors, and that the sectors in which cooperation should be intensified should be defined. In that regard, the Association requested that the regional and sub-regional offices take a very active role;
- (d) The Association considered of vital importance the holding of a high-level conference, especially because it felt the NMSs should continue to enhance their visibility and demonstrate to decision makers their irreplaceable contributions to national sustainable development goals. The Association requested the Secretary-General to make all efforts necessary to ensure the participation of the largest number of high-level government officials;
- (e) The Association took note of the preparation of a draft WMO policy statement on the scientific basis for and limitation of weather and climate forecasting, and asked that it be provided to the Members as soon as it was completed;
- (f) The Association considered with great interest the topic of possible changes in the WMO Convention,

and noted that the fifty-third session of the Executive Council had requested the Task Team for Possible Changes/Amendments to the WMO Legal Base to study the matter and report to the fifty-fourth session of the Executive Council;

- (g) The Association considered the topic of provision of aeronautical meteorological services, and requested its president and the Secretary-General to keep Members of the Region informed of relevant developments, especially for the cost recovery of meteorological services provided for aeronautical activities;
- (h) The Association considered that the topic of WMO standards for weather forecasts was very important albeit complex, given the differences among NMHSs and the possible difficulty in reaching satisfactory agreements;
- (i) The Association expressed interest in the topic of quality management certification, as the process of 'certification' could be a possible approach to the improvement in the management of NMSs. The Association recognized that, in general, it was a process that involved significant investment.

13.9 The Association agreed that for the Region, the relevant priority areas of concern which provided challenges and opportunities to its Members related to the following:

- (a) Natural disasters of severe intensity in the countries of the Region were making governmental authorities more conscious of the need to give more attention to the mitigation of their effects. It was felt that the NMHSs should take advantage of this situation through the improved provision of accurate, timely and useful forecasts and other products and services, especially those relating to severe weather warning and climate conditions, as well as other useful input to the various socio-economic sectors;
- (b) The Association felt that NMHSs should continuously improve the quality of data, products and services, using more effective management, and should make use of new information technology, in particular the Internet, regional Intranet, Web sites and television presentations, for the distribution of data and information to users and the general public;
- (c) The Association also felt that the capacity of RSMC-Nadi and ASMC to serve the Region should be further strengthened to enhance services and products to NMCs in the Region, and that NMSs should develop or strengthen the concept of focal points or specialists for specific operational and non-operational activities;
- (d) It was felt that NMSs should further develop the capacity to take initiatives and show leadership at the national level in matters related to climate change and variability, to ensure that the appropriate scientific information, assessments and advice were made available to policy makers and decision makers, in order to assist the countries in the

Region to develop suitable policies and participate in appropriate negotiations on climate change issues;

- (e) The Association expressed the opinion that NMSs should further improve data availability, particularly over the oceans and remote regions, and climate predictions at the regional level, including through enhanced climate models;
- (f) It was felt that the role and operation of NMHSs should be redefined and new models of operation developed, taking into account globalization and interaction with the private and academic sectors and the media;
- (g) In the light of the redefinition of NMHSs' role, it was felt that the legal basis for their functioning should be revised to better enable them to assert leadership, with WMO providing guidance to NMHSs on matters related to legal instruments that required such support and direction;
- (h) In view of the above, the opinion was expressed that directors of NMHSs should recognize their important task of strengthening further their institutions through development strategies which were economically sustainable, based on regional cooperation.

13.10 Moreover, the Association underscored the importance of regional and subregional cooperation among its Members, particularly their NMHSs, that could facilitate the provision of the relevant products and services to the various groups of users.

13.11 In connection with the guidelines to be produced (see paragraph 13.5(b)), the Association offered to have them tested on a pilot basis by its Members. The possibility of using a pertinent event, such as a regional technical conference, was discussed.

13.12 The Association noted that a statement adopted by the Eighth SPREP Regional Meteorological Services Directors Meeting (Nadi, Fiji, March 2002) expressed views which were pertinent to the role and operation of NMHSs. It was requested to circulate this statement to Members of the Association for their information.

13.13 In view of the situation and requirements of its Members, the Association emphasized the need for the education and training of NMHSs' personnel, as well as the assistance and cooperation required to meet this need.

14. DISASTER PREVENTION AND MITIGATION ACTIVITIES (agenda item 14)

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

14.2 The Association particularly expressed its appreciation to the Secretary-General for the leading

role played by WMO through its major scientific and technical programmes in support of the IDNDR efforts regarding mitigation of natural disasters and preparedness for the effects of natural hazards of meteorological and hydrological origin. The Association was informed that an IDNDR Programme Forum had been successfully held in July 1999 as the consolidation and closing event of the Decade under the title 'A Safer World in the 21st Century: Disaster and Risk Reduction'. The Association noted with satisfaction that WMO and UNESCO, as the two principal United Nations agencies concerned with the scientific and technological aspects of disaster reduction, had convened a 'Sub-forum on Science and Technology in Support of Natural Disaster Reduction' as a special contribution to the Forum. The participants at the Sub-forum, which included several experts from RA V, came from both the natural and social sciences, with both research and operational backgrounds, from both developing and developed countries. The Sub-forum reviewed the various ways in which science and technology contributed to the disaster reduction process, in particular through:

- (a) Assessment of vulnerability and enhancement of community awareness of the nature of risk;
- (b) Operation of integrated warning systems; and
- (c) Preparedness and education programmes.

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

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

14.4 The Association also noted that the United Nations General Assembly had passed, in the context of natural disaster reduction, a further resolution relating to International Cooperation to Reduce the Impact of the El Niño Phenomenon (A/RES/56/194). The Association recalled the important role that WMO had

played in the work of the United Nations Task Force on El Niño in reviewing the effects of the 1997–98 El Niño event, and in the implementation of earlier United Nations General Assembly resolutions (A/RES/52/200, A/RES/53/185 and A/RES/54/220).

14.5 The Association noted that WMO had been designated a member of the IATF for the ISDR and endorsed a lead role for WMO in the Task Force. It was also noted that the Secretary-General had taken various initiatives, including those at the level of the Chief Executive Board for Coordination (formerly the United Nations ACC) and the United Nations Secretary-General, on the structure of the ISDR, to ensure a prominent role for science and technology and the operational activities of NMHSs in the implementation of the strategy.

14.6 The Association was informed that the ISDR IATF, as part of its Framework for Action, had established four ad hoc working groups to initiate its work programme, and that WMO was a member of all four groups. The first working group on Climate and Disasters had taken over the responsibilities of the United Nations Task Force on El Niño with an expanded mandate to consider all climate-related aspects of disasters. The group was led by WMO. The second working group considered early warning systems for disasters, with UNEP as the lead agency. UNDP led the third working group, dealing with risk, vulnerability and impact assessment. The fourth working group dealt with the problem of wildland fires. The Association encouraged its Members to contribute to the work of these groups and to regional activities initiated under the ISDR. In this respect, the Association noted that there was ongoing activity in the Region related to disaster preparedness and mitigation within the framework of the ISDR. It agreed that there would be considerable advantages for NMHSs in developing close relationships with relevant regional groupings, including the collaboration on joint projects to mitigate the effects of natural disasters.

14.7 The Association noted the decisions of the Executive Council with respect to the incorporation of natural disaster issues into the WMO LTP and the Programme and Budget, and urged its Members to contribute to these forward-planning processes. The Association requested the Secretary-General to continue to promote the role of NMHSs in disaster preparedness and mitigation through a variety of means. Such means included creation of awareness among senior government officials, maintaining close relationships with disaster response agencies, conducting joint exercises and drills with disaster response government agencies, the preparation of promotional material, and the organization of forums in which experiences of different countries in the preparation and dissemination of early warnings could be exchanged. The Association noted that disasters of long duration and extensive impacts, especially those that severely affected less developed regions of the world, frequently became issues of worldwide attention. It was common in such cases for several agencies of the United Nations System and

non-governmental aid agencies to become involved. The Association noted that this globalization of disaster response activities was making increasing demands on WMO, and agreed that it was appropriate for the Organization to develop modalities to respond to the challenges.

14.8 The Association also commended the initiative of the Secretary-General in establishing the EDRG within the WMO Secretariat, to assist in particular in the rehabilitation of meteorological and hydrological infrastructure in Member countries following a disaster.

14.9 The Association was informed on the international activities and efforts in the fields of landslide research, landslide risk mitigation and protection and on the establishment of the ICL. In that regard, the Association requested the Secretary-General to maintain WMO's high profile and leading role in major aspects of disaster reduction, including landslides.

14.10 The Association was informed on new initiatives related to a possible coordination role for WMO in the field of seismology. It was noted that this initiative was being given support not only from many NMHSs, but also from regional groups such as the ASEAN Subcommittee on Meteorology and Geophysics, and by the United States Tsunami Warning Centre, as it looked at seismic activity relating to tsunamis.

14.11 The Association also noted that disasters could occur on a wide range of timescales and could be initiated by many forms of severe or unusual weather and climate-related events. Early warning systems, therefore, needed to be tailored to meet particular circumstances. However, it was felt to be essential that different systems worked together effectively when necessary, for example flood warning systems and tropical cyclone warning systems. The Association took note of the increasing value in the field of disaster preparedness that could accrue from early warnings on longer timescales derived from seasonal to inter-annual climate predictions. It agreed that the subregional forums that were being regularly convened to develop outlooks for various seasons provided an excellent opportunity for cooperation between NMHSs and user communities. The Association requested the Secretary-General to continue his support for improving the scope and effectiveness of these forums, which were being implemented within the framework of CLIPS. The Association endorsed the recommendation of the RA V Working Group on Climate Matters and encouraged Members to perform real-time updates of indices developed in the CLIPS Workshops on Climate Variability and Extremes.

14.12 Since natural disaster reduction would be an important item for the WSSD in Johannesburg, the Association requested the Secretary-General to ensure that the potential for WMO to contribute to discussions on this issue in this context be fully realized. The Association also invited NMHSs to ensure that national delegations to the summit were briefed on their critical role and that of WMO in disaster reduction activities.

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

15.1 The Association recalled the discussions which took place at Thirteenth Congress in connection with the topic of international exchange of data and products. It was aware that the EC/AGE was addressing these developments and other related issues.

15.2 The Association noted that Congress had recognized that the experience with Resolution 40 (Cg-XII) had been largely positive and that there was generally a strong commitment to make it work. It further noted that the fifty-third session of the Executive Council had concurred that the policy and practice on the free and unrestricted exchange of meteorological and related data and products as contained in the resolution had continued to be applied in a generally satisfactory manner, despite some difficulties encountered.

15.3 The Association requested its Members to continue to observe the letter and spirit of Resolution 40 (Cg-XII) and to help increase the volume of data and products being exchanged, consistent with the WMO principle of free and unrestricted international exchange of meteorological and related data and products.

15.4 The Association recalled that every April and October, circular letters had been disseminated when necessary concerning the implementation of Resolution 40 (Cg-XII) and that information provided by Members and relevant international organizations on their additional data and products was also being published in the WWW Newsletter and the WMO Web site. The Association requested its Members to provide the WMO Secretariat with information relating to the implementation of the resolution.

15.5 The Association noted that the Executive Council had agreed that it had not been easy to establish the direct link between the quantity of data and products being exchanged (as measured by the monitoring of the bulletin headers in the GTS) and Resolution 40 (Cg-XII), and that there was no perceivable signal that the resolution had influenced, either in a positive or negative manner, the flow of data and products measured in the above way. Nonetheless, there had been some indication of increased willingness to make more data and products available in the period after the adoption of the resolution. In the case of RA V, the Association felt that the resolution had been beneficial in encouraging increased data and products from and to its Members.

15.6 The Association was informed that in relation to the free and unrestricted access to all data and products exchanged for the research and education communities for their non-commercial activities, certain experiences had resulted in difficulties for some NMSs, while others indicated the development of opportunities, which were also beneficial to NMSs. In this connection, the Association considered that a dialogue involving the broader non-governmental sector could be helpful. In this respect, the role of the Permanent Representatives of Members of WMO, whose responsibilities encompassed the interests of the larger meteorological community in his or her country, was emphasized.

15.7 In connection with the relationship between NMSs and private companies regarding the data and products exchanged, the Association requested its Regional Office, through the Secretary-General, to compile the experiences of the countries in that regard and disseminate them to the countries in the Region.

15.8 Overall, the Association agreed with the Executive Council that Resolution 40 (Cg-XII) should be maintained in force and that relevant concerns should be addressed in some other way, e.g. through separate resolutions of Congress resolutions, declarations or guidelines.

15.9 Regarding the possibility of putting the principle of free and unrestricted exchange of meteorological and related data and products on a firmer legal basis, such as by incorporating it into the WMO Convention, the Association noted that the chairperson of the EC/AGE had been requested to keep this topic under review.

15.10 Regarding Resolution 25 (Cg-XIII) – Exchange of Hydrological Data and Products, the Association urged the Members to make available on a free and unrestricted basis data on water quality, together with data on discharge and water levels. It welcomed that a brochure had been prepared explaining the background and intent of Resolution 25 (Cg-XIII), similar to that issued for Resolution 40 (Cg-XII), together with a technical note describing the types of hydrological data exchanged.

15.11 The Association requested its Members to continue to observe the letter and spirit of Resolution 25 (Cg-XIII) and to help increase the volume of data and products being exchanged, consistent with the WMO principle of free and unrestricted international exchange of hydrological data and products.

15.12 The Association also recalled the discussions and decisions of the fifty-third session of the Executive Council on the international exchange of climate data and products. In this connection, the Association noted that the Executive Council had adopted a statement that would be helpful in clarifying the status of climatological data and products exchanged.

15.13 The Association also took note that the Executive Council had agreed that the distinction between data exchanged before and after the adoption of Resolution 40 (Cg-XII) should not result in a discontinuity in the availability or distribution of climatological data to meet the needs of WMO Programmes and those of the UNFCCC and other environmental conventions.

15.14 The Association also recalled the discussions and decisions of the fifty-third session of the Executive Council on the international exchange of oceanographic data and products, exchange of aeronautical data and products, and exchange of agrometeorological data and products.

15.15 The Association noted that in the questionnaire on the role and operation of NMSs, RA V had identified data and products exchange as the most important issue currently facing its NMSs. The

Association requested the Secretary-General to keep track of relevant developments, as well as to inform and advise Members as appropriate.

16. OTHER REGIONAL ACTIVITIES (agenda item 16)

16.1 FOURTH TECHNICAL CONFERENCE ON THE MANAGEMENT OF METEOROLOGICAL SERVICES IN REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC) (agenda item 16.1)

16.1.1 The Association expressed its appreciation to the Secretary-General for assisting Members in developing their NMHSs, particularly by organizing regional events including technical conferences on management, to enable them to exchange views on and share experience in the management and operation of their Services.

16.1.2 The Association noted with satisfaction that Thirteenth Congress had acknowledged the importance of seminars, workshops, study tours and technical conferences. Considering that constant improvement of management techniques and practices was needed for NMHSs to increase the efficiency of their Services and to improve their ability to address challenges facing them under financial and other constraints, the Association agreed that the following topics, among others, should be discussed at the Conference:

- (a) Roles and operations of NMHSs;
- (b) Legal basis of NMSs;
- (c) Accountability and transparency of NMSs;
- (d) Organizational models of NMSs;
- (e) Planning, performance and quality management;
- (f) Management training for NMS staff; and
- (g) Evaluation of economic and social benefits of NMSs.

16.1.3 In considering the organization of such a technical conference on management in the future, the Association recommended that the Fourth Technical Conference on Management of Meteorological Services in RA V (South-West Pacific) be held during the fourteenth financial period.

16.1.4 The Association also expressed its appreciation to the Secretary-General for planning to organize a Regional Seminar on Cost Recovery and Administration during the second biennium (2002–03) of the thirteenth financial period. It agreed that the topics of the Seminar could include the following:

- (a) Structure and organization of NMSs;
- (b) Funding models of meteorological services;
- (c) Cost recovery mechanisms and practices;
- (d) Mobilization of financial resources; and
- (e) Raising the profile of NMSs.

16.1.5 The Association welcomed the invitation extended by the representative of Vanuatu to host the Regional Seminar, subject to final approval by his government.

16.2 INTERNAL MATTERS OF THE ASSOCIATION (agenda item 16.2)

16.2.1 The Association noted with appreciation the report of its acting president on the subsidiary bodies of the Association. It further noted the guidance given by

the Executive Council on the establishment of the subsidiary bodies of regional associations. It therefore agreed that working groups and rapporteurs should be established to address issues of concern to the Region and undertake specific and achievable tasks, and that the established working groups should be able to meet, and that the rapporteurs should be able to participate in the Organization's activities relevant to their work. The Association further agreed that the terms of reference of its subsidiary bodies should include some aspects of education, training and technical cooperation.

16.2.2 The Association examined the re-establishment of relevant working groups and rapporteurs, and recorded its decisions under the relevant agenda items. In view of the limited budget available for meetings of the working groups, the Association suggested that efforts should be made to minimize the costs for these meetings through such measures as combining them with other events organized in the Region, electronic means, etc.

16.2.3 The Association, in recognizing the importance of coordinating its activities, agreed to establish an RA V Advisory Working Group and adopted [Resolution 17 \(XIII-RA V\)](#).

16.2.4 In view of the significant increase in RA V membership over recent years, the Association strongly believed that the number of Executive Council members from the Region should increase from three to four. It requested its president to bring this very important matter to the attention of the Executive Council.

16.2.5 The Association requested its president to inform its Members of the major outcomes of the sessions of the Executive Council which were of relevance to the Region.

16.2.6 The Association noted that several island countries in the Region were not yet Members of WMO. It encouraged them to apply for membership as soon as possible, in order to fully benefit from the Programmes and activities of the Organization. In this respect, it requested the Secretary-General to provide assistance as appropriate.

17. WMO REGIONAL OFFICE FOR ASIA AND THE SOUTH-WEST PACIFIC INCLUDING SUBREGIONAL OFFICE FOR THE SOUTH-WEST PACIFIC (agenda item 17)

17.1 The Association reviewed the activities of the Regional Office for Asia and the South-West Pacific since its twelfth session, and the Subregional Office for the South-West Pacific since its establishment in April 1999. It noted that the Offices were continuing their functions and responsibilities effectively as integral parts of the WMO Secretariat. It noted also the assistance provided by the Offices to the president, vice-president, various working groups and rapporteurs of the Association in discharging their responsibilities. It expressed its appreciation to the Secretary-General and the staff of the Regional Office and the Subregional Office for their continued support to the activities of the Association during the intersessional period.

17.2 The Association noted with satisfaction the increasing role of the Regional Office as a focal point and information centre for regional activities and in assisting Members to develop their NMHSs and implement WMO Programmes and other activities with a regional focus. It recognized the efforts of the Regional Office to contribute to the new high-priority areas in the Region.

17.3 The Association expressed satisfaction with the commendable efforts of the Regional Office and the Subregional Office in maintaining close contact with Members through visits and in supporting regional events in order to ensure the strengthening of WMO activities in the developments of meteorology and operational hydrology, both nationally and regionally. The Association agreed that the staffs of the Offices should continue to make every effort to further strengthen contact with Members and facilitate the implementation of regional activities.

17.4 The Association recognized the efforts of the Offices in maintaining close liaison and collaboration with regional intergovernmental bodies such as ESCAP, SPREP, SOPAC and ASCMG. It invited the Offices to continue this type of activity and to use these institutions to promote meteorology and operational hydrology, as well as related environmental issues, and to increase the awareness of policy makers on the roles of NMHSs and WMO in contributing to sustainable development.

17.5 The Association noted that the biannual newsletter provided a vehicle for the exchange and dissemination of regional news and a means of maintaining close liaison between the Regional Office and Members of RA II and RA V. The Association requested the Regional Office to continue the distribution of the newsletter in both paper and electronic versions, and urged Members to actively contribute news items and articles on a regular basis.

17.6 The Association noted that a study had been carried out to assess the operation of the Subregional Offices, which was considered by the fifty-second session of the Executive Council. The Association also expressed its thanks to the Secretary-General for having ensured that the Subregional Offices' activities made an effective contribution in supporting the work of the NMHSs in the Regions. It also appreciated and supported the assessment carried out by the Executive Council.

17.7 The Association acknowledged the measures taken by the Secretary-General to optimize the operation of the Regional and Subregional offices. It requested the Secretary-General to continue his efforts to strengthen the Regional Office for Asia and the South-West Pacific and the Subregional Office for the South-West Pacific for meeting the requirements of Members in the Regions.

17.8 The Association recognized the importance of the HWRP for the SIDS in the Pacific region, and pointed out that it was important to raise the profile of NHS activities. It requested the Secretary-General to explore the possibilities of making resources available to recruit a hydrologist (at least part time) to assist the Subregional

Office for the South-West Pacific in the implementation of HWRPs.

17.9 The Association expressed its appreciation to the Government of Samoa and SPREP for hosting the Subregional Office for the South-West Pacific at the SPREP Headquarters in Apia.

17.10 The Association took into consideration views expressed with regard to the location of the Regional Office for Asia and the South-West Pacific, and agreed that the issue would be addressed after the establishment of the Subregional Office for Asia.

18. SCIENTIFIC LECTURES AND DISCUSSIONS (agenda item 18)

18.1 The following scientific lectures were presented during the session:

- (a) The impact of climate change and sea level rise on Cook Islands, presented by Mr A. Ngari (Cook Islands);
- (b) Climate change and the role of NMHSs of the developing countries, presented by Mr Y.P. Wing (Malaysia) on behalf of Mr C.K. Kee (Malaysia);
- (c) Seasonal and inter-annual climate prediction in the Region, presented by Mr L.T. Kuay (Singapore); and
- (d) Application of climate information to socio-economic sectors in the Philippines, presented by Mr L.A. Amadore (Philippines) (co-authors Ms A.M. Jose (Philippines) and Ms L.V. Tibig (Philippines)).

18.2 The lectures were followed by fruitful discussions. The Association expressed its appreciation to the lecturers for their interesting and informative papers.

18.3 The Association requested the Secretary-General to arrange for similar scientific lectures during the next RA V session.

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

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

19.2 The Association noted that most of its past resolutions had been replaced by new resolutions adopted during the session. It was further noted that while a few resolutions had been incorporated in the appropriate WMO publications, some of the previous resolutions were still required to be kept in force.

19.3 The Association accordingly adopted [Resolution 18 \(XIII-RA V\)](#).

19.4 The Association considered that Resolution 7 (EC-LI) on the report of the twelfth session of the Association need not to be kept in force.

20. ELECTION OF OFFICERS (agenda item 20)

The Association unanimously elected Mr W.S. Lai (Singapore) as president and Mr A. Ngari

(Cook Islands) as vice-president of WMO Regional Association V (South-West Pacific).

21. DATE AND PLACE OF THE FOURTEENTH SESSION OF REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC) (agenda item 21)

21.1 In accordance with Regulation 170 of the WMO General Regulations, the date and place of the fourteenth session would be determined by the president of the Association in agreement with the President of WMO after consultation with the Secretary-General.

21.2 The Association noted with appreciation the offer from the representative of Australia to host the fourteenth session of the Association subject to the approval of the Australian Government. It further noted that the actual date and place of the session would be finalized following the procedures mentioned in paragraph 21.1.

22. CLOSURE OF THE SESSION (agenda item 22)

22.1 The participants expressed their gratitude to the Government of the Philippines for hosting the session with excellent arrangements and generous hospitality extended to all participants. They also expressed their appreciation to the WMO Secretariat and the local secretariat for the support that helped the smooth running of the session. They also congratulated Messrs W.S. Lai and A. Ngari on their election as president and vice-president of the Association, respectively, and wished them every success in discharging their new duties.

22.2 The representative of the Secretary-General thanked the Government and the people of the Philippines and the Director of PAGASA and his staff for their commendable support, the excellent arrangements and the kind hospitality. He extended his appreciation to the participants for their fruitful contributions and the high spirit of cooperation when discussing the implementation of WMO Programmes and development in the Region. He also thanked the acting president, and the co-chairpersons of the working committees for the manner in which they had carried out their tasks, which led to a successful session. He congratulated the newly elected president and vice-president and expressed his conviction that the Secretariat would look forward to working with them in the coming years.

22.3 On behalf of the host country, Mr L.A. Amadore, the Director of PAGASA, thanked the participants and stated that the session had been extremely successful and he hoped that the participants had a comfortable and memorable stay in the Philippines. He also expressed his thanks to the Secretary-General and the staff of the WMO Secretariat for their efficient support.

22.4 In his closing address, Mr S. Diharto, acting president of the Association, thanked the participants for their support and cooperation, which had helped in the important decisions taken for further development

of meteorology, climate and hydrology in the Region. He expressed his gratitude to the Government of the Philippines for hosting the session in Manila. He also thanked Mr L.A. Amadore and his staff, the co-chairpersons of the working committees, and the WMO Secretariat and local secretariat for their contributions to

the success of the session. He wished the Association all success in the continuation of its future work in supporting its Members.

22.5 The thirteenth session of Regional Association V (South-West Pacific) closed at 10.10 am on 28 May 2002.

RESOLUTIONS ADOPTED BY THE SESSION

RESOLUTION 1 (XIII-RA V)

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

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 2 (Cg-XIII) — World Weather Watch Programme for 2000–2003,
- (2) Resolution 2 (CBS-Ext.(98)) — Working Structure of the Commission for Basic Systems,
- (3) Resolution 1 (CBS-XII) — Working Structure of the Commission for Basic Systems,
- (4) That major developments in science and technology have taken place which need to be introduced into the WWW system,
- (5) That WWW data and products are of vital importance to Members of RA V for meeting the increasing requirements of users for meteorological services and for tailored products,

CONSIDERING:

- (1) That the implementation of the WWW in the Region should be kept under constant review,
- (2) That the introduction of new WWW concepts will be of great benefit to all Members in the Region,
- (3) That full integration of the WWW functional components requires careful coordination among Members of RA V and constant evaluation of the related projects,
- (4) That the range of applications of the products of the WWW to socio-economic life and development and to the physical environment in the Region is continually evolving,
- (5) That the WMO Long-term Plan needs regular updating from the point of view of regional requirements,

DECIDES:

- (1) To establish a Working Group on Planning and Implementation of the WWW in Region V (RA V/WG-PIW) with the following terms of reference:
 - (a) To monitor the progress made in the implementation and operation of the WWW in the Region and advise on possible improvements and priorities for appropriate actions to be carried out under the WWW Programme and the need for external support, where required;
 - (b) To keep under review the actions taken under the required WWW implementation programme of the Fifth and Sixth WMO Long-term Plans with a view to updating and further developing the WWW Programme relating to RA V;

- (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 Public Weather Services (PWS) and to make recommendations for their application in the Region;
- (e) To study the possible impact of new methods and techniques on the regional structure and functions of the WWW with a view to developing proposals for optimizing the Global Data-processing System (GDPS), the Global Observing System and the Global Telecommunication System in the Region;
- (f) To develop an action programme for the improved exchange of WWW data and products on the basis of stated regional requirements, which would include provisions for the generation of high-quality products by GDPS centres in the Region as well as making available data and products from other Regions;
- (g) To keep abreast of developments in PWS and develop proposals for regional activities to improve the provision of PWS by National Meteorological Services (NMSs) in the Region;
- (h) To advise the president of the Association on all matters concerning the WWW;
- (i) To keep under review education and training requirements related to the implementation and operation of the WWW and PWS in the Region;
- (j) To keep under constant review the Regional Telecommunication Plan and its implementation, including developments in the use of satellites and the Internet for data collection and distribution;
- (k) To maintain close liaison with those bodies responsible for the implementation of the Integrated Global Ocean Services System (IGOSS) and related oceanographic programmes, and other WWW-related coordination bodies in the Region, such as

the South Pacific Regional Environment Programme (SPREP) and the South Pacific Applied Geoscience Commission (SOPAC) and the Pacific Islands Forum;

- (2) That the working group should be composed of the following core members:
- (a) The chairperson;
 - (b) The coordinator of a Subgroup on Regional Aspects of Information Systems and Services;
 - (c) The Co-rapporteurs on Regional Aspects of Integrated Observing Systems;
 - (d) The Rapporteur on Regional Aspects of Data-processing and Forecasting Systems;
 - (e) The Co-rapporteurs on Regional Aspects of Public Weather Services;

The terms of reference of the subgroup, the rapporteurs and co-rapporteurs are indicated in the annex to this resolution;

- (3) To designate, in accordance with Regulation 32 of the WMO General Regulations, Mr T. Hart (Australia) as chairperson of the working group;
- (4) To designate Mr K. Alder (New Zealand) as coordinator of the subgroup;
- (5) To invite:
 - (a) Mr C. Iroi (Solomon Islands) and Mr J.L. Maridet (French Polynesia) to serve as

Co-rapporteurs on Regional Aspects of Integrated Observing Systems;

- (b) Mr Choo Huat Aik (Singapore) to serve as Rapporteur on Regional Aspects of Data-processing and Forecasting Systems;
 - (c) Ms I.I. Valeroso (Philippines) and Mr F. Malele (Samoa) to serve as Co-rapporteurs on Regional Aspects of Public Weather Services;
- (6) To invite Members of the Association to nominate experts to serve on the working group and on the subgroup;
 - (7) To request the working group to review, at an early stage, the priority tasks given in paragraph 4.1.5 of the general summary and the terms of reference given in this resolution and its annex, for consideration by the president of the Association;
 - (8) 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 (XII-RA V), which is no longer in force.

ANNEX TO RESOLUTION 1 (XIII-RA V)

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

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

- (a) Subgroup on Regional Aspects of Information Systems and Services:
 - (i) To keep under review the status of implementation and operation the Regional Meteorological Telecommunication Network, particularly as regards developments in the capabilities of satellites for data collection and distribution, and formulate recommendations with a view to remedying shortcomings;
 - (ii) To study problems and develop improved and cost-effective arrangements relating to the exchange of observational data and processed information, both in pictorial and digital form, within and outside of Region V, and formulate recommendations for the coordination of the implementation of telecommunication facilities and techniques;
 - (iii) To keep under review data and information representation including character and bit-oriented exchange formats and codes and conversion between formats and codes as required, to keep under review the existing

regional meteorological codes for Region V, and to develop new codes or recommend changes to existing regional codes as required;

- (iv) To keep under review data and product generation, selection and presentation to recipients' National Meteorological Centres, including storage and retrieval of data and products, and recovery procedures in case of major outages of key facilities;
- (v) To keep abreast of developments in information and telecommunication technology, procedures, services and equipment, including in particular satellite-based telecommunication services, the Internet and related equipment, and to advise on their applicability, as appropriate, to the Region;
- (vi) To keep under review and coordinate both real-time and non-real-time monitoring of the WWW Programme in the Region, including quantity and quality aspects;
- (vii) To identify the training requirements of Members in the Region relating to relevant information and communication techniques;

<p>(viii) To advise and report to the chairperson of the working group on all matters concerning regional aspects of the Global Telecommunication System (GTS) and Data Management (DM);</p> <p>(ix) To represent RA V on the Commission for Basic Systems (CBS) Implementation/Coordination Team on Information Systems and Services.</p> <p>(b) Co-rapporteurs on Regional Aspects of Integrated Observing Systems:</p> <p>(i) To review and advise on the observational data requirements of Members of RA V in the context of the WWW Programme in the Fifth WMO Long-term Plan;</p> <p>(ii) To review and advise on the design of observing systems in the Region, in particular the Regional Basic Synoptic Network (RBSN) of surface and upper-air stations and the Regional Basic Climatological Network (RBCN), including the Global Climate Observing System (GCOS);</p> <p>(iii) To keep abreast of matters related to the development and introduction of new observing systems and advise on their application in the Region;</p> <p>(iv) To advise and report to the chairperson of the working group on all matters concerning regional aspects of the Global Observing System (GOS) ;</p> <p>(v) To liaise with the Co-rapporteurs on Regional Aspects of Oceanographic and Marine Meteorological Services on the development and operation of the GOS in support of marine services;</p> <p>(vi) To represent the Region on the CBS Implementation/Coordination Team on Integrated Observing Systems.</p> <p>(c) Rapporteur on Regional Aspects of Data-processing and Forecasting Systems:</p> <p>(i) To keep abreast of developments in data-processing equipment and techniques which could be beneficially introduced at</p>	<p>national and regional centres to improve their forecast and warning capabilities;</p> <p>(ii) To formulate recommendations for coordinated implementation of data-processing facilities and techniques at the GDPS, GTS and other centres and, if required, for these facilities to serve both GDPS and telecommunication purposes;</p> <p>(iii) To identify the training requirements of Members in the Region relating to relevant data-processing and forecasting techniques;</p> <p>(iv) To advise and report to the chairperson of the working group on all matters concerning data-processing and forecasting activities in the Region;</p> <p>(v) To represent the Region on the CBS Implementation/Coordination Team on Data-Processing and Forecasting Systems.</p> <p>(d) Co-rapporteurs on Regional Aspects of Public Weather Services:</p> <p>(i) To keep under review the implementation of the PWS Programme in Region V;</p> <p>(ii) To advise the chairperson of the working group on matters relating to formulation, presentation and dissemination of forecasts and warnings, and establishing good relations with emergency managers, the media and the private sector;</p> <p>(iii) To keep abreast of activities in the Region related to broadcast of weather information by international media, and advise on issues such as consistency with official information;</p> <p>(iv) To keep under review education and training requirements related to the PWS Programme;</p> <p>(v) To keep under review, in coordination with the Rapporteur on Regional Aspects of the GDPS, aspects relating to improved regional exchange of PWS;</p> <p>(vi) To represent the Region on the CBS Implementation/Coordination Team on PWS.</p>
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RESOLUTION 2 (XIII-RA V)

REGIONAL BASIC SYNOPTIC NETWORK

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 2 (XII-RA V) — Regional Basic Synoptic Network,
- (2) The *Manual on the Global Observing System* (WMO-No. 54), Volume I, Part III, Regulations 2.1.4, 2.1.5 and 2.1.6 and the definition of the Regional Basic Synoptic Networks (RBSNs),

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

CONSIDERING that the establishment and maintenance of an RBSN of surface and upper-air synoptic stations, adequate to meet the requirements of Members and of the World Weather Watch (WWW), 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 RBSN in Region V;

URGES Members:

- (1) To spare no effort in their endeavours to secure, at the earliest date possible, full implementation of the network of stations and observational programmes set forth in the annex to this resolution;
- (2) To comply fully with the standard times of observation, the global and regional coding procedures and data collection standards, as laid down in the *WMO Technical Regulations* (WMO-No. 49) and the

Manual on the Global Observing System (WMO-No. 544), the *Manual on Codes* (WMO-No. 306) and the *Manual on the Global Telecommunication System* (WMO-No. 386);

AUTHORIZES the president of the Association to approve, at the request of the Members concerned and in consultation with the Secretary-General, minor amendments to the list of stations in accordance with the procedures laid down in the *Manual on the Global Observing System* (WMO-No. 544), Volume II – Regional Aspects, Region V (South-West Pacific).

NOTE: This resolution replaces Resolution 2 (XII-RA V), which is no longer in force.

ANNEX TO RESOLUTION 2 (XIII-RA V)

LIST OF STATIONS COMPRISING THE RBSN IN REGION V

<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>	<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>
AMERICAN SAMOA					
91764	CAPE TAPUTAPU AWS	S	94255	CAMOOWEAL TOWNSHIP	S
91765	PAGO PAGO	S	94268	KOWANYAMA AIRPORT	S
91765	PAGO PAGO	W R	94275	GEORGETOWN	S
91766	CAPE MATATULA AWS	S	94283	COOKTOWN MISSION STRIP	S
91768	TA'U AWS	S	94287	CAIRNS AIRPORT	S
AUSTRALIA					
94102	TROUGHTON ISLAND	S	94287	CAIRNS AIRPORT	W
94103	BROWSE ISLAND AWS	S	94290	FLINDERS REEF	S
94120	DARWIN AIRPORT	S	94294	TOWNSVILLE AERO	S
94120	DARWIN AIRPORT	W R	94294	TOWNSVILLE AERO	W R
94122	CAPE FOURCROY	S	94296	LIHOU REEF	S
94131	TINDAL AWS	S	94298	MARION REEF	S
94147	CAPE WESSEL AWS	S	94299	WILLIS ISLAND	S
94150	GOVE AIRPORT	S	94299	WILLIS ISLAND	W R
94150	GOVE AIRPORT	W R	94300	CARNARVON AIRPORT	S
94151	NORTH EAST ISLAND	S	94300	CARNARVON AIRPORT	W
94170	WEIPA AMO	S	94302	LEARMONTH AIRPORT	S
94170	WEIPA AMO	W	94302	LEARMONTH AIRPORT	W R
94184	COEN AIRPORT AWS	S	94312	PORT HEDLAND AMO	S
94200	MANDORA AWS	S	94312	PORT HEDLAND AMO	W R
94203	BROOME AMO	S	94313	WITTENOOM	S
94203	BROOME AMO	W R	94317	NEWMAN AERO	S
94206	FITZROY CROSSING AERO	S	94319	TELFER AERO	S
94207	ROWLEY SHOALS AWS	S	94324	YUENDUMU	S
94211	MOUNT BARNETT MOUNT ELIZABETH	S	94326	ALICE SPRINGS AERO	S
94212	HALLS CREEK AMO	S	94326	ALICE SPRINGS AERO	W R
94212	HALLS CREEK AMO	W	94327	JERVOIS AWS	S
94216	KUNUNURRA AERO	S	94332	MOUNT ISA AMO	S
94236	ELLIOTT	S	94332	MOUNT ISA AMO	W R
94238	TENNANT CREEK MET OFFICE	S	94333	BOULIA AIRPORT	S
94238	TENNANT CREEK MET OFFICE	W	94341	RICHMOND AIRPORT	S
94248	CENTRE ISLAND AWS	S	94346	LONGREACH AMO	S
			94346	LONGREACH AMO	W
			94363	EMERALD AIRPORT	S
			94366	BOWEN AIRPORT	S

<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>	<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>
94367	MACKAY MO	S	94767	SYDNEY AIRPORT AMO AWS	S
94367	MACKAY MO	W	94776	WILLIAMTOWN AMO RAAF	S
94374	ROCKHAMPTON AERO	S	94776	WILLIAMTOWN AMO RAAF	W
94374	ROCKHAMPTON AERO	W R	94791	COFFS HARBOUR MO/AWS	S
94388	LADY ELLIOT ISLAND AWS	S	94791	COFFS HARBOUR MO/AWS	W
94393	FREDERICK REEF	S	94802	ALBANY AIRPORT	S
94394	CATO ISLAND	S	94802	ALBANY AIRPORT	W R
94403	GERALDTON AMO	S	94804	NEPTUNE ISLAND	S
94403	GERALDTON AMO	W R	94821	MOUNT GAMBIER AERO	S
94429	MT MAGNET AERO	S	94821	MOUNT GAMBIER AERO	W R
94430	MEEKATHARRA AMO	S	94842	CAPE OTWAY LIGHTHOUSE	S
94430	MEEKATHARRA AMO	W R	94850	KING ISLAND AIRPORT	S
94449	LAVERTON AWS	S	94866	MELBOURNE AIRPORT	S
94451	CARNEGIE (CARNEGIE)	S	94866	MELBOURNE AIRPORT	W R
94461	GILES	S	94875	SHEPPARTON AIRPORT	S
94461	GILES	W R	94893	WILSONS PROMONTORY LIGHTHOUSE	S
94462	YULARA AERO	S	94907	EAST SALE AIRPORT	S
94477	MARLA POLICE STATION	S	94907	EAST SALE AIRPORT	W
94488	WINDORAH	S	94910	WAGGA WAGGA AMO/AWS	S
94500	CUNNAMULLA POST OFFICE	S	94910	WAGGA WAGGA AMO/AWS	W R
94510	CHARLEVILLE AMO	S	94926	CANBERRA AMO AWS	S
94510	CHARLEVILLE AMO	W R	94926	CANBERRA AMO AWS	W
94515	ROMA AIRPORT	S	94935	MALLACOOTA	S
94552	OAKEY AERO	S	94954	CAPE GRIM B.A.P.S.	S
94578	BRISBANE AIRPORT AERO	S	94956	STRAHAN AERODROME	S
94578	BRISBANE AIRPORT AERO	W R	94968	LAUNCESTON AIRPORT	S
94584	DOUBLE ISLAND POINT LIGHTHOUSE	S	94968	LAUNCESTON AIRPORT	W
94601	AUGUSTA CAPE LEEUWIN	S	94975	HOBART AIRPORT	S
94610	PERTH AIRPORT	S	94975	HOBART AIRPORT	W R
94610	PERTH AIRPORT	W R	94983	EDDYSTONE POINT	S
94637	KALGOORLIE-BOULDER AMO	S	94995	LORD HOWE ISLAND	S
94637	KALGOORLIE-BOULDER AMO	W R	94995	LORD HOWE ISLAND	W R
94638	ESPERANCE MO	S	94996	NORFOLK ISLAND AERO	S
94638	ESPERANCE MO	W R	94996	NORFOLK ISLAND AERO	W R
94642	BALLADONIA	S	94997	HEARD ISLAND (THE SPIT)	S
94643	RAWLINNA BALGAIR	S	94998	MACQUARIE ISLAND	S
94647	EUCLA AMO	S	94998	MACQUARIE ISLAND	W R
94647	EUCLA AMO	W R	95111	PORT KEATS AERO	S
94651	NULLARBOR	S	95146	NARAWILLI AWS	S
94653	CEDUNA AMO	S	95205	DERBY AERO	S
94653	CEDUNA AMO	W	95322	RABBIT FLAT AWS	S
94659	WOOMERA AERODROME MO	S	95448	LEINSTER AERO	S
94659	WOOMERA AERODROME MO	W R	95458	COOPER PEDY AIRPORT	S
94672	ADELAIDE AIRPORT	S	95480	MARREE AERO	S
94672	ADELAIDE AIRPORT	W R	95481	MOOMBA AIRPORT	S
94691	BROKEN HILL AIRPORT	S	95482	BIRDSVILLE AIRPORT AWS	S
94693	MILDURA AIRPORT	S	95485	TIBOOBURRA AIRPORT	S
94693	MILDURA AIRPORT	W	95492	THARGOMINDAH AIRPORT	S
94700	HILLSTON AIRPORT	S	95527	MOREE MO	S
94703	BOURKE AIRPORT AWS	S	95527	MOREE MO	W R
94710	COBAR AIRPORT	S	95634	SOUTHERN CROSS AIRFIELD	S
94711	COBAR MO	W R	95637	LAKE GRACE	S
94729	BATHURST AIRPORT AWS	S	95646	FORREST	S
94750	NOWRA RAN AIR STATION	S	95666	PORT AUGUSTA ARID LANDS	S
94750	NOWRA RAN AIR STATION	W R	95719	DUBBO AIRPORT	S

<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>	<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>
95762	TAMWORTH AIRPORT AWS	S	91691	LAKEBA AWS	S
95839	HORSHAM AERODROME	S	91693	VUNISEA	S
96995	CHRISTMAS ISLAN AERO	S	91697	MATUKU AWS	S
96996	COCOS ISLAND AERO	S	91699	ONO-I-LAU AWS	S
96996	COCOS ISLAND AERO	W R			
BRUNEI DARUSSALAM			FRENCH POLYNESIA		
96315	BRUNEI AIRPORT	S	91925	ATUONA	S
96315	BRUNEI AIRPORT	W R	91925	ATUONA	W R
COOK ISLANDS			91929	BORA-BORA	S
91802	PENRHYN	S	91938	TAHITI-FAAA	S
91802	PENRHYN	W	91938	TAHITI-FAAA	W R
91809	MANIHIKI AWS	S	91943	TAKAROA	S
91812	PUKAPUKA AWS	S	91943	TAKAROA	W R
91831	AITUTAKI AWS	S	91944	HAO AWS	S
91841	MAUKE AWS	S	91945	HEREHERETUE	S
91843	RAROTONGA	S	91948	RIKITEA	S
91843	RAROTONGA	W	91948	RIKITEA	W R
91848	MANGAIA AWS	S	91954	TUBUAI	S
EAST TIMOR			91954	TUBUAI	W R
97385	OE-CUSSIE	S	91958	RAPA	S
97390	DILLI/DILLI AIRPORT	S	91958	RAPA	W R
FEDERATED STATES OF MICRONESIA			GUAM		
91203	FALALOP ISLAND, ULITHI ATOLL	S	91212	NWSO AGANA, GUAM.	S
91204	ULITHI ATOLL AWS	S	91212	NWSO AGANA, GUAM.	W R
91317	WOLEAI ATOLL	S	INDONESIA		
91328	ULUL AWS	S	96009	LHOKSEUMAWE/MALIKUSSALEH	S
91334	CHUUK	S	96011	BANDA ACEH/BLANG BINTANG	S W
91334	CHUUK	W R	96035	MEDAN/POLONIA	S R
91338	SATAWAN ATOLL AWS	S	96073	SIBOLGA/PINANGSORI	S
91339	LUKUNOR ATOLL	S	96091	TANJUNG PINANG/KIJANG	S
91343	OROLUK ATOLL AWS	S	96109	PEKAN BARU/SIMPANGTIGA	S
91348	PONAPE	S	96145	TAREMPA	S
91348	PONAPE	W R	96147	RANAI	S W
91352	PINGELAP ATOLL AWS.	S	96163	PADANG/TABING	S R
91355	KOSRAE ATOLL AWS	S	96179	SINGKEP/DABO	S
91356	LELU, KOSRAE ATOLL	S	96195	JAMBI/SULTAN TAHA	S
91411	NGULU AWS	S	96221	PALEMBANG/ST. M. BADARUDIN II	S
91413	YAP	S	96237	PANGKAL PINANG	S R
91413	YAP	W R	96249	TANJUNG PANDAN/BULUH	
91425	NUKUORO ATOLL	S		TUMBANG	S
FIJI			96253	BENGKULU/PADANG KEMILING	S
91650	ROTUMA	S	96295	TANJUNG KARANG/RADIN	
91652	UDU POINT AWS	S		INTEN II	S
91659	NABOUWALU	S	96509	TARAKAN/JUWATA	S W
91660	YASAWA-I-RARA AWS	S	96581	PONTIANAK/SUPADIO	S
91670	VIWA AWS	S	96633	BALIKPAPAN/SEPINGGAN	S
91676	VANUA BALAVU AWS	S	96645	PANGKALAN BUN/ISKANDAR	S W
91680	NADI AIRPORT	S	96655	PALANGKA RAYA/TJILIK RIWUT	S
91680	NADI AIRPORT	W R	96685	BANJARMASIN/SYAMSUDIN NOOR	S
91683	NAUSORI	S	96749	JAKARTA/SOEKARNO-HATTA	S R
			96781	BANDUNG/HUSEIN	S
			96805	CILACAP	S
			96839	SEMARANG/AHMAD YANI	S

<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>	<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>
96933	SURABAYA/PERAK I	S	48647	KUALA LUMPUR/SUBANG	S
96935	SURABAYA/JUANDA	S W	48650	SEPANG	W R
97014	MENADO/SAM RATULANGI	S W	48657	KUANTAN	S
97028	TOLI-TOLI/LALOS	S	48657	KUANTAN	W R
97048	GORONTALO/JALALUDDIN	S	48665	MALACCA	S
97072	PALU/MUTIARA	S R	96413	KUCHING	S
97086	LUWUK/BUBUNG	S	96413	KUCHING	W R
97096	POSO/KASIGUNCU	S	96421	SIBU	S
97120	MAJENE	S	96441	BINTULU	S
97146	KENDARI/WOLTER MONGINSIDI	S	96441	BINTULU	W R
97180	UJUNG PANDANG/HASANUDDIN	S R	96449	MIRI	S
97192	BAU-BAU/BETO AMBARI	S	96465	LABUAN	S
97230	DENPASAR/NGURAH RAI	S	96471	KOTA KINABALU	S
97260	SUMBAWA BESAR/BRANGBIJI	S	96471	KOTA KINABALU	W R
97270	BIMA/M.SALAHUDDIN	S	96481	TAWAU	S
97300	MAUMERE/WAI OTI	S	96481	TAWAU	W R
97340	WAINGAPU/MAU HAU	S	96491	SANDAKAN	S
97372	KUPANG/ELTARI	S R			
97430	TERNATE/BABULLAH	S	MARSHALL ISLANDS		
97460	LABUHA/OESMAN SADIK	S	91251	ENIWETAK ATOLL AWS.	S
97502	SORONG/JEFMAN	S W	91258	UTIRIK ATOLL AWS.	S
97530	MANOKWARI/RENDANI	S	91365	UJAE ATOLL AWS	S
97560	BIAK/FRANS KAISIEPO	S R	91366	KWAJALEIN/BUCHOLZ AAF	S
97580	SARMI/MARARENA	S	91366	KWAJALEIN/BUCHOLZ AAF	W R
97600	SANANA	S	91367	AILINGLAPALAP ATOLL	S
97686	WAMENA	S	91369	JALUIT ATOLL	S
97690	JAYAPURA/SENTANI	S	91371	WOTJE ATOLL	S
97724	AMBON/PATTIMURA	S R	91374	MALOELAP ATOLL AWS	S
97748	GESER	S	91376	MAJURO	S
97760	KAIMANA/UTAROM	S	91376	MAJURO	W R
97796	TIMIKA	S	91377	MILI ATOLL AWS	S
97810	TUAL/DUMATUBUN	S	91442	EBON ATOLL AWS	S
97876	TANAH MERAH	S			
97900	SAUMLAKI/OLILIT	S	NAURU		
97980	MERAUKE/MOPAH	S R	91530	NAURU AIRPORT	W R
			91531	NAURU	S
KIRIBATI					
91490	CHRISTMAS ISLAND	S	NEW CALEDONIA		
91487	FANNING ISLAND	S	91570	ILE SURPRISE AWS	S
91533	BANABA	S	91574	CHESTERFIELD	S
91601	BUTARITARI	S	91577	KOUMAC	S
91610	TARAWA	S	91582	OUANAHAM (ILE LIFOU)	S
91610	TARAWA	W R	91592	NOUMEA	S
91612	TARAWA (AERODROME)	S	91592	NOUMEA	W R
91623	BERU	S	91598	MATTHEW AWS	S
91629	ARORAE	S			
91701	KANTON ISLAND	S	WALLIS AND FUTUNA		
91701	KANTON ISLAND	W R	91753	HIHIFO (ILE WALLIS)	S
			91754	MAOPOPO (ILE FUTUNA)	S
MALAYSIA					
48601	PENANG/BAYAN LEPAS	S	NEW ZEALAND		
48601	PENANG/BAYAN LEPAS	W R	93004	CAPE REINGA AWS	S
48615	KOTA BHARU	S	93023	PURERUA AWS	S
48615	KOTA BHARU	W R	93069	MOKOHINAU AWS	S
48620	SITIAWAN	S	93110	AUCKLAND AERO AWS	S

<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>	<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>
93112	WHENUAPAI	W R	92044	MOMOTE W. O.	W R
93186	TAURANGA AERO AWS	S	92047	NADZAB W.O.	S
93196	HICKS BAY AWS	S	92076	KAVIENG W.O.	S
93245	TAUPO AWS	S	92077	GURNEY W.O.	S
93291	GISBORNE AERODROME	W	92087	MISIMA W.O.	S
93292	GISBORNE AERODROME AWS	S	92100	TOKUA W.O.	S
93305	MAUI A PLATFORM	S			
93308	NEW PLYMOUTH AERODROME	W	PHILIPPINES		
93309	NEW PLYMOUTH AWS	S	98133	CALAYAN	S
93373	NAPIER AERODROME AWS	S	98135	BASCO	S
93404	PALMERSTON NORTH AWS	S	98223	LAOAG	S
93417	PARAPARAUMU AERODROME	W R	98223	LAOAG	W R
93420	PARAPARAUMU AWS	S	98232	APARRI	S
93498	CASTLEPOINT AWS	S	98325	DAGUPAN	S
93527	FAREWELL SPIT AWS	S	98328	BAGUIO	S
93614	HOKITIKA AERODROME	W	98328	BAGUIO	W
93615	HOKITIKA AERODROME AWS	S	98329	MUNOZ	S
93678	KAIKOURA AWS	S	98336	CASIGURAN	S
93709	HAAST AWS	S	98429	NINOY AQUINO INTERNATIONAL AIRPORT	S
93773	TIMARU AERODROME AWS	S	98429	NINOY AQUINO INTERNATIONAL AIRPORT	W R
93781	CHRISTCHURCH AERO AWS	S	98431	CALAPAN	S
93800	SECRETARY ISLAND AWS	S	98440	DAET	S
93805	PUYSEGUR POINT AWS	S	98444	LEGASPI	S
93831	QUEENSTOWN AERODROME AWS	S	98444	LEGASPI	W
93844	INVERCARGILL AERODROME	W R	98526	CORON	S
93845	INVERCARGILL AIRPORT AWS	S	98531	SAN JOSE	S
93891	DUNEDIN AIRPORT AWS	S	98536	ROMBLON	S
93909	SOUTH WEST CAPE AWS	S	98543	MASBATE	S
93929	ENDERBY ISLAND AWS	S	98550	TACLOBAN	S
93947	CAMPBELL ISLAND AWS	S	98618	PUERTO PRINCESA	S
93986	CHATHAM ISLAND	W R	98618	PUERTO PRINCESA	W
93987	CHATHAM ISLANDS AWS	S	98630	CUYO	S
93994	RAOUL ISLAND, KERMADEC IS. AWS	S	98637	ILOILO	S
93997	RAOUL ISLAND, KERMADEC IS.	W R	98646	MACTAN	S
			98646	MACTAN	W R
			98653	SURIGAO	S
NIUE			98741	DIPOLOG	S
91824	HANNAN AIRPORT	S	98747	LUMBIA AIRPORT	S
			98748	CAGAYAN DE ORO	S
NORTHERN MARIANA ISLANDS			98753	DAVAO AIRPORT	S
91221	ROTA	S	98753	DAVAO AIRPORT	W
91222	PAGAN ISLAND AWS	S	98755	HINATUAN	S
91231	TINIAN	S	98836	ZAMBOANGA	S
PALAU			SAMOA		
91408	KOROR	S	91762	APIA	S
91408	KOROR	W R			
			SINGAPORE		
PAPUA NEW GUINEA			48698	SINGAPORE/CHANGI AIRPORT	S
92001	KIUNGA W.O.	S	48698	SINGAPORE/CHANGI AIRPORT	W R
92003	DARU W.O.	S			
92004	WEWAK W.O.	S	SOLOMON ISLANDS		
92014	MADANG W.O.	S	91503	MUNDA	S
92014	MADANG W.O.	W R	91507	AUKI	S
92035	PORT MORESBY W.O.	S			
92035	PORT MORESBY W.O.	W R			
92044	MOMOTE W. O.	S			

<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>	<i>Index No.</i>	<i>Station name</i>	<i>Observations</i>
91517	HONIARA	W R	91159	KEKAHA, KAUAI	S
91520	HONIARA/HENDERSON	S	91163	PORT ALLEN AIRPORT, KAUAI	S
91541	SANTA CRUZ	S	91165	LIHUE, KAUAI	S
			91165	LIHUE, KAUAI	W R
	TOKELAU		91166	MAKAHUENA POINT, KAUAI	S
91720	ATAFU	S	91168	KAPAA, KAUAI	S
91723	NUKUNONU AWS	S	91182	HONOLULU, OAHU	S
91724	NUKUNONO	S	91190	KAHULUI AIRPORT, MAUI	S
91727	FENUAFALA/FAKAOFO	S	91194	KAHOOLawe	S
	TONGA		91275	JOHNSTON ISLAND	S
91776	KEPPEL	S	91285	HILO/GEN. LYMAN	S
91780	VAVAU	S	91285	HILO/GEN. LYMAN	W R
91784	HAAPAI	S	91287	CAPE KUMUKAHI	S
91792	FUA'AMOTU	S	91294	SOUTH POINT	S
91792	FUA'AMOTU	W			
	TUVALU		VANUATU		
91631	NANUMEA	S	91551	SOLA (VANUA LAVA)	S
91636	NUI	S	91554	PEKOA AIRPORT (SANTO)	S
91643	FUNAFUTI	S	91555	LAMAP (MALEKULA)	S
91643	FUNAFUTI	W R	91557	BAUERFIELD (EFATE)	S
91648	NIULAKITA	S	91557	BAUERFIELD (EFATE)	W R
	UNITED KINGDOM		91565	WHITE GRASS AIRPORT	S
91961	PITCAIRN ISLAND AWS	S	91568	ANEITYUM	S
	UNITED STATES			Legend:	
91066	MIDWAY ISLAND	S		S = Surface observations	
91158	PRINCEVILLE, KAUAI	S		W = Radiowind observations	
				R = Radiosonde observations	

RESOLUTION 3 (XIII-RA V)

REGIONAL BASIC CLIMATOLOGICAL NETWORK

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) The WMO *Technical Regulations* (WMO-No. 49), Regulation (B.1) 3.1.1.2,
- (2) Resolution 4 (XII-RA II) — Regional Basic Climatological Network in Region II,
- (3) Resolution 3 (XIII-RA III) — Regional Basic Climatological Network in Region III,
- (4) Resolution 3 (XIII-RA IV) — Regional Basic Climatological Network in Region IV,
- (5) Resolution 3 (XIII-RA VI) — Regional Basic Climatological Network in Region VI,
- (6) The approval of lists of Global Climate Observing System (GCOS) Surface Network (GSN) and GCOS Upper-Air Network (GUAN) stations by the president of the Association,

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

CONSIDERING FURTHER that the Global Observing System (GOS) of the World Weather Watch (WWW) provides the foundation on which the capacity for climate monitoring in the Region continues to be built and that most WWW observing stations will function as part of both the Regional Basic Synoptic Network (RBSN) and the Regional Basic Climatological Network (RBCN),

DECIDES that the stations listed in the annex to this resolution constitute the RBCN in Region V;

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 *Manual on the Global Observing System* (WMO-No. 544), the *Manual on Codes* (WMO-No. 306), and the *Manual on the Global Telecommunication System* (WMO-No. 386) when operating the RBCN;

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

REQUESTS the Secretary-General:

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

ANNEX TO RESOLUTION 3 (XIII-RA V)

LIST OF STATIONS COMPRISING THE RBCN IN REGION V

<i>Index No.</i>	<i>Station name</i>	<i>GSN</i>	<i>GUAN</i>	<i>CLIMAT</i>	<i>CLIMAT TEMP</i>	<i>Index No.</i>	<i>Station name</i>	<i>GSN</i>	<i>GUAN</i>	<i>CLIMAT</i>	<i>CLIMAT TEMP</i>
AMERICAN SAMOA						94517	ST GEORGE AIRPORT	X		X	
91765	PAGO PAGO	X	X	X	X	94541	INVERELL RESEARCH CENTRE	X		X	
AUSTRALIA						94570	TEWANTIN	X		X	
94101	KALUMBURU	X		X		94578	BRISBANE AIRPORT			X	X
94120	DARWIN AIRPORT	X	X	X	X	94589	YAMBA PILOT STATION	X		X	
94131	TINDAL AWS	X		X		94601	AUGUSTA CAPE LEEUWIN	X		X	
94150	GOVE AIRPORT	X		X	X	94610	PERTH AIRPORT		X	X	X
94170	WEIPA AMO	X		X	X	94626	CUNDERDIN	X		X	
94203	BROOME AIRPORT	X	X	X	X	94637	KALGOORLIE-BOULDER AIR	X		X	X
94212	HALLS CREEK A.M.O.	X		X		94638	ESPERANCE	X		X	X
94238	TENNANT CREEK AIRPORT	X		X		94647	EUCLA AMO			X	X
94259	BURKETOWN POST OFFICE	X		X		94653	CEDUNA AMO	X		X	
94275	GEORGETOWN	X		X		94659	WOOMERA AERODROME		X	X	X
94287	CAIRNS AERO	X		X		94672	ADELAIDE AIRPORT			X	X
94294	TOWNSVILLE AERO		X	X	X	94689	BROKEN HILL	X		X	
94299	WILLIS ISLAND	X		X	X	94693	MILDURA AIRPORT	X		X	
94300	CARNARVON AIRPORT	X		X	X	94711	COBAR MO	X		X	X
94302	LEARMONTH AIRPORT	X	X	X	X	94767	SYDNEY AIRPORT			X	X
94312	PORT HEDLAND AIRPORT	X		X	X	94776	WILLIAMTOWN RAAF			X	X
94317	NEWMAN AERO	X		X		94784	TAREE	X		X	
94326	ALICE SPRINGS AIRPORT	X		X	X	94791	COFFS HARBOUR MO/AWS			X	
94332	MOUNT ISA AERO	X		X	X	94802	ALBANY AIRPORT	X		X	X
94340	RICHMOND POST OFFICE	X		X		94805	CAPE BORDA LIGHTSTATION	X		X	
94346	LONGREACH AERO	X		X		94821	MOUNT GAMBIER AERO	X		X	X
94367	MACKAY MO	X		X		94842	CAPE OTWAY LIGHTHOUSE	X		X	
94374	ROCKHAMPTON AERO			X	X	94866	MELBOURNE AIRPORT			X	X
94380	GLADSTONE	X		X	X	94869	DENILQUIN POST OFFICE	X		X	
94403	GERALDTON AIRPORT	X		X	X	94907	EAST SALE AIRPORT	X		X	
94430	MEEKATHARRA AIRPORT	X		X	X	94910	WAGGA WAGGA AMO/AWS	X		X	X
94461	GILES	X	X	X	X	94926	CANBERRA AIRPORT			X	
94476	ODDNADATTA AIRPORT	X		X		94937	MORUYA HEADS PILOT STATION	X		X	
94480	MARREE	X		X		94967	CAPE BRUNY LIGHTHOUSE	X		X	
94482	BIRDSVILLE POLICE STATION	X		X		94968	LAUNCESTON AIRPORT			X	
94485	TIBOOBURRA POST OFFICE	X		X		94975	HOBART AIRPORT		X	X	X
94492	THARGOMINDAH POST OFFICE	X		X		94995	LORD HOWE ISLAND AERO	X	X	X	X
94510	CHARLEVILLE AERO	X	X	X	X	94996	NORFOLK ISLAND AERO	X	X	X	X
						94998	MACQUARIE ISLAND	X	X	X	X

<i>Index No.</i>	<i>Station name</i>	<i>GSN</i>	<i>GUAN</i>	<i>CLIMAT</i>	<i>CLIMAT TEMP</i>	<i>Index No.</i>	<i>Station name</i>	<i>GSN</i>	<i>GUAN</i>	<i>CLIMAT</i>	<i>CLIMAT TEMP</i>
95322	RABBIT FLAT	X		X		96249	TANJUNG PANDAN/BULUH				
95527	MOREE AERO			X	X		TUMBANG				X
95646	FORREST	X		X		96745	JAKARTA/OBSERVATORY	X			
95670	RAYVILLE PARK	X				96253	BENGKULU/PADANG				
95719	DUBBO AIRPORT	X		X			KEMILING				X
95753	RICHMOND RAAF	X		X		96805	CILACAP	X		X	
95916	CABRAMURRA	X		X		96839	SEMARANG/AHMAD YANI				X
95964	LOW HEAD	X		X		96925	SANGKAPURA/BAWEAN IS.	X			
96995	CHRISTMAS ISLAND AERO	X		X		96935	SURABAYA/JUANDA		X	X	
96996	COCOS ISLAND AERO	X	X	X	X	96633	BALIKPAPAN/SEPINGGAN				X
	BRUNEI DARUSSALAM					96645	PANGKALAN BUN/ ISKANDAR				X
96315	BRUNEI AIRPORT		X	X	X	97014	MENADO/SAM RATULANGI	X		X	
	COOK ISLANDS					97072	PALU/MUTIARA				X
91802	PENRHYN AWS	X	X			97086	LUWUK/BUBUNG				X
91812	PUKAPUKA AWS	X		X		97120	MAJENE				X
91831	AITUTAKI AWS	X		X		97146	KENDARI/WOLTER				
91843	RAROTONGA	X		X			MONGINSIDI	X		X	
91848	MANGAIA AWS			X		97192	BAU-BAU/BETO AMBARI				X
	EAST TIMOR					97230	DENPASAR/NGURAH RAI				
97385	OE-CUSSIE			X		97240	AMPENAN SELAPARRANG	X		X	
97390	DILLI AIRPORT			X		97340	WAINGAPU/MAU HAU	X		X	
97395	BAUCAU NUS	X				97430	TERNATE/BABULLAH				X
	FEDERATED STATES OF MICRONESIA					97502	SORONG/JEFMAN	X		X	
91334	CHUUK	X		X	X	97530	MANOKWARI/RENDANI				X
91348	PONAPE	X		X	X	97560	BIAK/FRANS KAISIEPO	X		X	X
91413	YAP	X		X	X	97600	SANANA				X
	FIJI					97686	WAMENA	X		X	
91650	ROTUMA	X		X		97690	JAYAPURA/SENTANI	X		X	
91652	UDU POINT AWS	X		X		97724	AMBON/PATTIMURA	X		X	X
91680	NADI AIRPORT	X	X	X	X	97796	TIMIKA				X
91683	NAUSORI			X		97900	SAUMLAKI/OLILIT	X		X	
91699	ONO-I-LAU AWS	X		X		97980	MERAUKE/MOPAH	X		X	X
	FRENCH POLYNESIA						KIRIBATI				
91925	ATUONA	X	X	X	X	91490	CHRISTMAS ISLAND	X			
91929	BORA-BORA AWS	X		X		91487	FANNING	X			
91938	TAHITI-FAAA	X	X	X	X	91601	BUTARITARI	X			
91943	TAKAROA	X		X	X	91610	TARAWA	X	X	X	X
91945	HEREHERETUE	X		X		91623	BERU	X			
91948	RIKITEA	X		X	X	91629	ARORAE	X			
91954	TUBUAI	X		X	X	91701	KANTON ISLAND	X			
91958	RAPA	X	X	X	X		MALAYSIA				
	GUAM					48601	PENANG/BAYAN LEPAS				X
91212	WFO, GUAM	X				48615	KOTA BHARU				X
91217	WSMO, GUAM		X	X		48620	SITIAWAN	X		X	
	INDONESIA					48647	KUALA LUMPUR/SUBANG				X
96073	SIBOLGA/PINANGSORI	X		X		48650	SEPANG				X
96109	PEKAN BARU/SIMPANGTIGA			X		48657	KUANTAN	X		X	X
96145	TAREMPA	X				48665	MALACCA				X
96163	PADANG/TABING	X				96413	KUCHING	X		X	X
96195	JAMBI/SULTAN TAHA			X		96421	SIBU				X
						96441	BINTULU	X		X	X
						96449	MIRI				X
						96465	LABUAN	X		X	
						96471	KOTA KINABALU				X

<i>Index No.</i>	<i>Station name</i>	<i>GSN</i>	<i>GUAN</i>	<i>CLIMAT</i>	<i>CLIMAT TEMP</i>	<i>Index No.</i>	<i>Station name</i>	<i>GSN</i>	<i>GUAN</i>	<i>CLIMAT</i>	<i>CLIMAT TEMP</i>
96481	TAWAU			X	X	92076	KAVIENG W.O.				X
96491	SANDAKAN	X		X		92077	GURNEY W.O.				X
MARSHALL ISLANDS						92087	MISIMA W.O.				X
91366	KWAJALEIN	X		X	X	PHILIPPINES					
91376	MAJURO	X	X	X	X	98223	LAOAG		X	X	
NAURU						98232	APARRI	X		X	
91531	NAURU			X		98430	SCIENCE GARDEN	X		X	
NEW CALEDONIA						98444	LEGASPI	X		X	
91577	KOUMAC	X		X		98637	ILOILO	X		X	
91592	NOUMEA	X	X	X	X	98755	HINATUAN	X		X	
WALLIS AND FUTUNA						98836	ZAMBOANGA	X		X	
91753	HIHIFO (ILE WALLIS)	X				98851	GENERAL SANTOS	X		X	
NEW ZEALAND						SINGAPORE					
93012	KAITAIA	X				48698	SINGAPORE/CHANGI AIRPORT		X	X	X
93110	AUCKLAND AERO AWS			X		SAMOA					
93112	WHENUAPAI				X	91762	APIA				X
93292	GISBORNE AERODROME AWS	X		X		SOLOMON ISLANDS					
93309	NEW PLYMOUTH AWS	X		X		91503	MUNDA	X			
93417	PARAPARAUMU AERODROME	X	X		X	91517	HONIARA	X	X		
93420	PARAPARAUMU AWS			X		TOKELAU					
93615	HOKITIKA AERODROME AWS	X		X		91724	NUKUNONO	X			
93678	KAIKOURA			X		TONGA					
93747	OMARAMA TARA HILLS	X				91779	LUPEPAU'U	X			
93844	INVERCARGILL AERODROME	X	X		X	91780	VAVAU	X			
93945	CAMPBELL ISLAND	X				91788	NULUALOFA	X			
93947	CAMPBELL ISLAND AWS			X		TUVALU					
93986	CHATHAM ISLAND		X		X	91631	NANUMEA	X			
93987	CHATHAM ISLANDS AWS	X		X		91643	FUNAFUTI	X	X	X	
93994	RAOUL ISLAND, KERMADEC ISLAND	X		X		UNITED KINGDOM					
93997	RAOUL ISLAND, KERMADEC ISLAND		X		X	91960	PITCAIRN ISLAND	X			
NIUE						UNITED STATES					
91824	HANNAN AIRPORT	X				91165	LIHUE	X	X	X	X
PALAU						91285	HILO	X	X	X	X
91408	KOROR	X	X	X	X	91182	HONOLULU	X		X	X
PAPUA NEW GUINEA						91190	KAHULUI	X		X	X
92001	KIUNGA W.O.			X		VANUATU					
92003	DARU W.O.			X		91554	PEKOA AIRPORT (SANTO)	X			
92004	WEWAK W.O.			X		91557	BAUERFIELD (EFATE)		X	X	
92014	MADANG W.O.	X		X		91568	ANEITYUM	X			
92035	PORT MORESBY W.O.	X	X	X		91555	LAMAP (MALEKULA)				X
92044	MOMOTE W.O.	X		X							
92047	NADZAB W.O.			X							

RESOLUTION 4 (XIII-RA V)

CO-RAPPORTEURS ON REGIONAL ASPECTS OF INSTRUMENT DEVELOPMENT,
RELATED TRAINING AND CAPACITY BUILDING

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) The *Abridged Final Report with Resolutions of the Twelfth Session of Regional Association V* (South-West Pacific) (WMO-No. 890),
- (2) The *Abridged Final Report with Resolutions and Recommendations of the Twelfth Session of the Commission for Instruments and Methods of Observation* (WMO-No. 881),
- (3) Resolution 4 (EC-L) — Report of the Twelfth Session of the Commission for Instruments and Methods of Observation,

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 technology transfer among Members,
- (3) The wide range of requirements for meteorological variables to be measured,
- (4) The need for updating information on the status of instrumentation used at meteorological stations and on maintenance and calibration of instruments,
- (5) The need for coordinating education and training measures for observers, station inspectors and technicians in the field of operation, maintenance and calibration of meteorological instruments,

DECIDES:

- (1) To appoint Co-rapporteurs 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 use of meteorological instrumentation;
 - (c) To keep abreast of all matters related to instrument development;
 - (d) To support the coordination of education and training measures for instrument technicians in collaboration with the Regional Instrument Centres and the WMO Secretariat;
 - (e) To facilitate communications between the Commission for Instruments and Methods of Observation (CIMO) and the regional association on matters pertaining to capacity building in the field of instruments and methods of observation;
 - (f) To collaborate with the CIMO Rapporteur on Capacity Building;
- (2) To invite Mr B. Forgan (Australia) and Mr C.S. Doctor (Philippines) to serve as Co-rapporteurs;
- (3) To request the Co-rapporteurs to submit annual progress reports and a final report to the president of RA V with a copy to the president of CIMO at least six months before the next session of the Association.

RESOLUTION 5 (XIII-RA V)

REGIONAL ASSOCIATION V TROPICAL CYCLONE COMMITTEE FOR THE
SOUTH PACIFIC AND SOUTH-EAST INDIAN OCEAN

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 5 (Cg-XIII) — Tropical Cyclone Programme,
- (2) United Nations General Assembly Resolution 2816 (XXVI) — Assistance in case of natural disaster and other disaster situations,
- (3) United Nations General Assembly Resolution 2914 (XXVII) — International action for the mitigation of the harmful effects of storms,
- (4) United Nations General Assembly Resolution 3234 (XXIX) — International cooperation in the peaceful uses of outer space,
- (5) United Nations General Assembly Resolutions on the International Strategy for Natural Disaster Reduction (ISDR),
- (6) Decisions of the United Nations Commission on the Sustainable Development of Small Island Developing States (SDSIDS),

- (7) The reports of the sessions of the Regional Association V Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean,
- (8) Sections concerning the Tropical Cyclone Programme of the *Fifth WMO Long-term Plan (2000–2009)* (WMO-No. 908),

CONSIDERING the need for the countries in the South Pacific and adjacent areas affected by tropical cyclones to continue to work together to accelerate action, particularly within the context of the SDSIDS, to reduce the loss of human life and damage caused each year by tropical cyclones and associated phenomena,

DECIDES:

- (1) To re-establish a working group to be known as the Regional Association V Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean with the following terms of reference:

- (a) To promote and coordinate the planning and implementation of measures for the improvement of cyclone warning systems and related meteorological services and the facilitation of efforts to minimize loss of life, human suffering and damage caused by tropical cyclones and related natural hazardous phenomena in the tropical part of Region V south of the Equator;
- (b) To review regularly the status of tropical cyclone and flood warning systems in the South Pacific and South-East Indian Ocean and recommend measures for the development or improvement of these systems;
- (c) To coordinate its activities with those of other international bodies concerned with disaster mitigation and economic development in the South Pacific;
- (d) To seek through appropriate channels financial and technical support for the programme activities;
- (e) To coordinate its activities with all other activities carried out as a part of, or in conjunction with, the WMO Tropical Cyclone Programme, specifically with the RA I Tropical Cyclone Committee for the South-West Indian Ocean and, in respect of flood warnings, with the RA V Working Group on Hydrology;
- (2) To invite the following Members of RA V to nominate experts to serve on the Committee:
- | | |
|--------------------------------|------------------|
| Australia | Niue |
| Cook Islands | Papua New Guinea |
| Federated States of Micronesia | Samoa |
| Fiji | Solomon Islands |
| French Polynesia | Tonga |
| Indonesia | United Kingdom |
| New Caledonia | United States |
| New Zealand | Vanuatu |
- (3) To invite the following countries to designate experts to participate in the work of the Committee:
- | | |
|------------|------------------|
| Kiribati | Marshall Islands |
| Tokelau | Palau |
| Tuvalu | Nauru |
| East Timor | |
- (4) To invite the chairperson of the Regional Association I Tropical Cyclone Committee for the South-West Indian Ocean to serve as an ex-officio member;
- (5) To designate, in accordance with Regulation 32 of the WMO General Regulations, Mr S. Ready (New Zealand) as chairperson of the Committee;
- REQUESTS** the chairperson of the Committee to submit a report to the fourteenth session of RA V;
- REQUESTS** the Secretary-General:
- To convene biennial sessions of the Committee;
 - To continue to take the necessary steps to assist the Committee and to ensure the provision of appropriate Secretariat support to its activities.
- NOTE: This resolution replaces Resolution 6 (XII-RA V), which is no longer in force.

RESOLUTION 6 (XIII-RA V)

PROVISION OF SEASONAL TO INTER-ANNUAL FORECASTS AND REGIONAL CLIMATE CENTRES SERVICES

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- The recommendations of Resolution 8 (Cg-XIII) requesting the president of the Commission for Climatology (CCI), the Commission for Basic Systems (CBS) and the Commission for Atmospheric Sciences (CAS) to develop jointly the concept of regional centres specializing in the provision of seasonal and inter-annual forecast services,
- The conclusions and recommendations of the Inter-Commission Task Team on Regional Climate Centres (ICTT/RCC) and the relevant decisions of the fifty-third session of the Executive Council,
- The Pacific Island Global Climate Observing System (GCOS) Action and Implementation Plans to establish a robust and sustainable Pacific Island GCOS,
- The document presented to the session on the scope and concept of South-West Pacific RCCs as

prepared at the request of the Eighth South Pacific Regional Environment Programme (SPREP) meeting of Regional Meteorological Services Directors (RMSDs),

- The willingness of some Members and centres in RA V to provide operational Seasonal to Inter-annual (SI) forecast services to other members of RA V,

CONSIDERING:

- The requirements for SI forecast products to be provided operationally under the WMO Programmes,
- That a number of centres and institutes outside the framework of the World Weather Watch (WWW) are making available their SI forecast products on an experimental basis,
- That Members are increasingly using such products to provide services to their end users,
- That a partnership already exists to produce and disseminate certain SI products through the Island

Climate Update and the Australian National Climate Centre's South Pacific Seasonal Outlook,

CONCLUDES:

- (1) That appropriate action for the provision of SI and Regional Climate Services be taken by RA V in close collaboration with the relevant global planning and implementation groups of CBS and CCI;
- (2) That the provision of SI and Regional Climate Services be coordinated with various Members of RA V and recognize the current capabilities within the Region;

DECIDES:

- (1) To invite the Co-rapporteurs identified in Resolution 7 (XIII-RA V) to co-chair a task team on SI Forecasts and RCC Services for RA V with the following terms of reference:
 - (a) To compile a statement of requirements for SI forecasts and related RCC services for RA V referring to the Pacific National Meteorological Services Needs Analysis Plan (PNMSNAP) and GCOS action and implementation plans;
 - (b) To confirm the capabilities of Members and centres within the Region to provide SI

forecast products and meet RCC requirements (including training) as required by Members of the Region;

- (c) To advise on suitable infrastructures and organizational settings for meeting Members' requirements for SI forecast and RCC services, giving consideration to virtual RCCs;
- (d) To prepare a recommended mechanism for consideration by the RA V Working Group on Climate-Related Matters (WG-CRM) by mid-2003 and approval by the RA V president based upon the recommendations of WG-CRM;
- (e) To liaise closely with the relevant Open Programme Area Groups of CBS and CCI dealing with the implementation of SI forecasts and RCC services;

Invites Australia, Fiji, French Polynesia, Samoa, Tonga, Cook Islands and other RA V Members concerned to nominate members to the task team;

REQUESTS the president of RA V to take into account any additional instruction from other relevant constituent bodies.

RESOLUTION 7 (XIII-RA V)

WORKING GROUP ON CLIMATE MATTERS

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) The reports of its rapporteurs and chairperson on climate matters,
- (2) The Fifth WMO Long-term Plan,
- (3) The *Abridged Final Report with Resolutions and Recommendations of the Thirteenth Session of the Commission for Climatology* (WMO-No. 938),
- (4) The discussions on climate-related issues by Thirteenth Congress (1999) and the fifty-third session of the Executive Council,

CONSIDERING the need for the Association to strengthen its activities in climate activities of particular importance to the Region,

DECIDES:

- (1) To re-establish the Working Group on Climate Matters with the following terms of reference:
 - (a) To provide advice on methods to strengthen and improve climate observations, data management (including Data Rescue), monitoring and provision of data sets, and to coordinate observational concerns and requirements with the Global Climate Observing System (GCOS) office;
 - (b) To provide advice on and to assist in the implementation of various climate data and

climate application projects in RA V, including Climate Information and Prediction Services (CLIPS) and especially in agricultural meteorology, renewable energy, bioclimatic indices, urban and building climatology, air quality and health;

- (c) To examine and report on the use of Geographical Information Systems (GIS) in the provision of climate services;
- (d) To report on regional activities concerning climate extremes, indices and indicators for climate change detection in RA V, and to keep abreast of Intergovernmental Panel on Climate Change (IPCC) activities and regional involvement in the IPCC process;
- (e) To provide advice on and to assist in identifying climate-related education and training needs in the Region, including information technology and management training;
- (f) To evaluate the role and provide suggestions to the Task Team on Regional Climate Centres (RCCs) of the RA V in the implementation of their functions within the Region;

- (2) To select the following experts to serve on the working group in the capacities indicated:

Mr S. Lellyett (Australia) to serve as Rapporteur on Observations and Data Management and of GCOS Activities;

Mr L. Maitrepiere (New Caledonia) to serve as Rapporteur on Climate System Monitoring, Analyses, Indices and the IPCC process within the Region;

Messrs L. Talia (Samoa), Chan Ah Kee (Malaysia) and R. Nicholls (Cook Islands) to serve as Focal Points for CLIPS activities for RA V;

Mr S. McGree (Fiji) to serve as Rapporteur on Geographical Information Systems (GIS) in the provision of climate services;

Mr D. Yee (Solomon Islands) to serve as Rapporteur on Climate Support to Disaster Reduction with special emphasis on extreme meteorological events;

Ms V. Biukoto (Fiji) to serve as Rapporteur on Climate-Related Education and Training Needs, Including CLIPS activities in the Region;

Messrs J. Salinger (New Zealand) and L.T. Kuay (Singapore) to serve as Co-rapporteurs on RCC and CLIPS and to co-chair the RA V Task Team on the Provision of Seasonal to Inter-annual Forecasts and Regional Climate Services;

(3) To select Mr J. Weyman (United States) to chair the working group;

(4) That Members may nominate other experts to serve on the working group as required;

REQUESTS:

- (1) The working group chairperson and members to liaise with the chairpersons of related Open Programme Area Groups of the Commission for Climatology, Commission for Basic Systems and other WMO technical commissions; GCOS; and relevant regional groups such as the South Pacific Regional Environment Programme, the South Pacific Applied Geoscience Commission, the Intergovernmental Oceanographic Commission Sub-Commission for the Western Pacific and the Association of the South-East Asian Nations Sub-Committee on Meteorology and Geophysics;
- (2) The working group chairperson to submit annual progress reports 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 8 (XII-RA V), which is no longer in force.

RESOLUTION 8 (XIII RA-V)

RAPPORTEUR ON ATMOSPHERIC OZONE

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 10 (Cg-XIII) — Atmospheric Research and Environment Programme,
- (2) The approved outline by the forty-first session of the Executive Council of the objectives, components, partial listing of variables to be measured and the summary of an appropriate role for WMO in the creation of Global Atmosphere Watch,

CONSIDERING:

- (1) The present impetus of scientific research on environmental issues, in particular on matters concerning the depletion of the ozone layer,
- (2) The wide interest of Members in the monitoring of variables of atmospheric composition and related physical characteristics, including ozone and related trace gases, that Members participating in existing networks already have,

DECIDES:

- (1) To appoint a Rapporteur on Atmospheric Ozone with the following terms of reference:
 - (a) To survey and report on Members' efforts in establishing ozone stations;

(b) To advise on the conduct of comparisons and calibrations between both the Dobson and Brewer spectrophotometers in Region V and other Regions;

(c) To advise on the establishment of new ozone sonde stations in the Region and on matters relating to the monitoring of stratospheric ozone by meteorological satellites and the monitoring of surface ozone;

(d) To assist Members in the exchange of information and experience;

(e) To assist in carrying out cooperative research projects on ozone within Region V;

(f) To maintain liaison with the Dobson and Brewer Central Laboratories;

(2) To invite Mr A. Downey (Australia) to serve as Rapporteur on Atmospheric Ozone;

(3) To request the rapporteur to submit annual reports, as appropriate, to the president of the Association with a final report six months before the fourteenth session of the Association.

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

RESOLUTION 9 (XIII-RA V)

RAPPORTEUR ON THE GLOBAL ATMOSPHERE WATCH

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),
NOTING Resolution 10 (Cg-XIII) — Atmospheric Research and Environment Programme,

CONSIDERING:

- (1) The present impetus of scientific research on environmental issues,
- (2) The wide interest of Members in the monitoring of variables of atmospheric composition and related physical characteristics,
- (3) That the twelfth session of the Association had appointed a Rapporteur on the Global Atmosphere Watch,

DECIDES:

- (1) To appoint a Rapporteur on the Global Atmosphere Watch with the following terms of reference:
 - (a) To follow and report on Members' activities concerning the smoke and haze phenomena prevalent in the Region;
 - (b) To survey and report on Members' efforts in establishing new Global Atmosphere Watch (GAW) stations;

- (c) To encourage coordination of agencies' monitoring programmes and to encourage cooperation between agencies and National Meteorological Services in monitoring atmospheric composition and related physical characteristics;

- (d) To advise on matters relating to the monitoring of atmospheric composition and related physical characteristics;

- (e) To assist Members in the exchange of information and experience;

- (2) To invite Mr H. Haryanto (Indonesia) to serve as Rapporteur on the GAW;

- (3) To request that the rapporteur submit annual reports, as appropriate, to the president of the Association with a final report six months before the next session of the Association.

NOTE: This resolution replaces Resolution 9 (XII-RA V), which is no longer in force.

RESOLUTION 10 (XIII-RA V)

WORKING GROUP ON AGRICULTURAL METEOROLOGY

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 12 (Cg-XIII) — Agricultural Meteorology Programme,
- (2) The *Abridged Final Report with Resolutions and Recommendations of the Twelfth Session of the Commission for Agricultural Meteorology* (WMO-No. 900),
- (3) Resolution 11 (XII-RA V) — Rapporteur on Agricultural Meteorology,
- (4) The recommendations made by the experts in Agricultural Meteorology from the Region,

CONSIDERING:

- (1) The economic importance of agriculture to the countries in RA V (South-West Pacific),
- (2) The impact of El Niño/Southern Oscillation (ENSO) and climate variability on Agriculture and Forestry in the Region,
- (3) That extreme meteorological events continue to increase in frequency and affect the productivity of agriculture, forestry and fisheries in the Region,
- (4) The potential for improved applications of Geographical Information Systems (GIS) and Environmental Information Systems (EIS) in the development and dissemination of products to meet the user requirements for agrometeorological services,

URGES Members:

- (1) To undertake studies on applications of seasonal to inter-annual climate forecasts in developing sustainable agricultural strategies;

- (2) To make more efficient use of remotely-sensed information in agrometeorological applications;

DECIDES:

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

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

- (b) To describe seasonal climate prediction applications in agriculture, especially the communication of seasonal predictions to agricultural users;

- (c) To assess how modern technology and know-how on remotely sensed information, particularly new data such as MODIS, could be used in agrometeorological applications;

- (d) To review and summarize information on models describing the relationship between weather variables and agricultural pests and diseases for use in operational management dealing with them;

- (e) To describe the agrometeorology of sugar cane in Australia and Fiji;

- (f) To elaborate on the development of client-oriented agrometeorological services;
- (g) To describe the parameters and network coverage required for agrometeorological applications and the use of automatic weather stations;
- (2) (a) To invite the following experts to serve as members of the working group:
 Mr B.P. Pajuelas (Philippines) as Rapporteur on Agricultural Pests/Disease Models for Use in Operational Management;
 Ms F.D. Hilario (Philippines) as Rapporteur on Use of Remotely Sensed Information in Agrometeorological Applications;
 Mr K. Inape (Papua New Guinea) as Rapporteur on Impacts of ENSO and Climate Modelling on Agriculture and Forestry;
 Mr R. Stringer (Australia) as Rapporteur on Seasonal Climate Prediction and Applications in Agriculture, Especially the Communication of Seasonal Predictions to Agriculture Users;
 Mr S. McGree (Fiji) as Rapporteur on Agrometeorology of Sugar Cane in Australia and Fiji;
- Mr K. Nimhei (Vanuatu) as Rapporteur on Developing Client-oriented Agrometeorological Services;
 Mr T.L. Seng (Malaysia) as Rapporteur on Parameters and Network Coverage Required for Agrometeorological Applications and the Use of Automatic Weather Stations;
- (b) To invite Mr R. Boer (Indonesia) to act as chairperson of the Working Group on Agricultural Meteorology;
- (3) (a) To request the chairperson to allocate responsibilities in consultation with the members of the group for the various tasks contained in the terms of reference;
- (b) To request the chairperson to submit a final report comprising individual reports of the members to the president of the Regional Association not later than six months before the next session of the Association.

NOTE: This resolution replaces Resolution 11 (XII-RA V), which is no longer in force.

RESOLUTION 11 (XIII-RA V)

RAPPORTEUR ON REGIONAL ASPECTS OF THE AERONAUTICAL METEOROLOGICAL PROGRAMME IN REGION V

REGIONAL ASSOCIATION V (South-West Pacific),

NOTING:

- (1) The need for monitoring and keeping under review developments in aeronautical meteorological in the Region,
- (2) The need for coordination among RA V 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 a Rapporteur 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 and aircraft data collection, as well as services provided by the World Area Forecast System (WAFS), Volcanic Ash Advisory Centres (VAACs) and Tropical Cyclone Advisory Centres (TCACs), and to formulate proposals through the WMO Secretariat to the appropriate International Civil Aviation Organization

- (ICAO) bodies for their future development and implementation;
- (c) To monitor and promote capacity building activities related to the AeMP area within the Region and to identify training requirements;
- (d) To keep abreast of matters related to the implementation of Aircraft Meteorological Data Relay (AMDAR) projects in the Region;
- (e) To liaise by correspondence with the WMO CAeM Working Groups and the ICAO aeronautical meteorological working groups in the Asia and Pacific Regions of ICAO through the respective Secretariats on specific matters concerning the Region, in particular on matters related to cost recovery of aeronautical meteorological services;
- (f) To monitor the relations between NMSs and aviation authorities and to provide advice where needed to strengthen those relationships;
- (g) To provide advice to the president of RA V on aeronautical meteorology matters and to take actions in this regard;
- (2) To invite Mr S.H. Ooi (Malaysia) to serve as the Rapporteur on Regional Aspects of the Aeronautical Meteorology Programme;
- (3) To request the Rapporteur to submit annual reports on his activities to the president of the Association and a final report six months before the next session of the Association.

RESOLUTION 12 (XIII-RA V)

CO-RAPPORTEURS ON REGIONAL OCEANOGRAPHIC AND MARINE METEOROLOGICAL SERVICES

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),
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 V,
- (2) The need to continue close liaison with the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), in particular through its programme areas on Services and Capacity Building, with regard to matters affecting the Region,

DECIDES:

- (1) To appoint two Co-rapporteurs on Regional Oceanographic and Marine Meteorological Services with the following terms of reference:
 - (a) To continuously review the status of the implementation of oceanographic and marine meteorological services, observing systems and programme support activities in Region V, and to formulate suggestions for their further development;
 - (b) To take action on oceanographic and marine meteorological matters assigned by the president of RA V;

(c) To liaise with the appropriate JCOMM subsidiary bodies, in particular within the Services and Capacity Building Programme Areas, on specific matters concerning Region V;

- (2) To invite the Intergovernmental Oceanographic Commission (IOC) Western Pacific Experiment (WESTPAC) to co-sponsor the co-rapporteurs' activities in the Region;
- (3) To invite Messrs L.T. Kuay (Singapore) and M. Vaiimene (Cook Islands) to serve as Co-rapporteurs on Regional Oceanographic and Marine Meteorological Services;
- (4) To request the co-rapporteurs to submit annual reports, as appropriate, to the president of the Association, with a final report to be presented six months prior to the fourteenth session of the Association;

REQUESTS the Secretary-General to assist the co-rapporteurs in their work as appropriate.

NOTE: This resolution replaces Resolution 12 (XII-RA V), which is no longer in force.

RESOLUTION 13 (XIII-RA V)

SUPPORT FOR JCOMM

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

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 (J-COMM),
- (3) The *Abridged Final Report with Resolutions and Recommendations of the first session of JCOMM* (WMO-No. 931),

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 World Weather Watch (WWW), Global Climate Observing

- System (GCOS) and Global Ocean Observing System (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 International Maritime Satellite System (INMARSAT) and Argos systems;

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

NOTE: This resolution replaces Resolution 13 (XII-RA V), which is no longer in force.

RESOLUTION 14 (XIII-RA V)

WORKING GROUP ON HYDROLOGY

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) The report of its Working Group on Hydrology,
- (2) Resolution 16 (Cg-XIII) — Hydrology and Water Resources Programme (HWRP),
- (3) Resolution 37 (Cg-XIII) — Terms of Reference of the Technical Commissions,
- (4) The *Fifth WMO Long-term Plan (2000–2009)* (WMO-No. 908),
- (5) Resolution 20 (Cg-XII) — World Hydrological Cycle Observing System (WHYCOS),

CONSIDERING that Regional Association V should continue to play an important and active role in the implementation of WMO's regional activities relating to hydrology and water resources,

DECIDES:

- (1) To re-establish the Working Group on Hydrology with the work programme as set out below:
 - (a) Hydrological Training:
 - (i) To review and revise, as appropriate, the Programme to meet Hydrological Training Needs of Small Island Countries in the Pacific;
 - (ii) To review the identified hydrological training needs in RA V and prepare long-term proposals to meet these needs;
 - (iii) To identify areas of collaboration between WMO, the United Nations Educational, Scientific and Cultural Organization (UNESCO), South Pacific Applied Geoscience Commission (SOPAC) and South Pacific Regional Environment Programme (SPREP) in addressing training needs;
 - (iv) To assist in the hydrological training activities at the implementation stage;

- (v) To assist in the organization of training activities as required, including roving seminars with the services of experts from within the Region;
- (b) Technology and Data Standards:
 - (i) To identify and review current standards for hydrological data collection and processing, including quality control, in use in the Region;
 - (ii) To compile references of standards used in the Region;
 - (iii) To assist in identifying relevant training requirements;
 - (iv) To assist in ensuring that regional projects (e.g. Hydrological Cycle Observing System (HYCOS)) address the requirements to meet these standards;
 - (v) To provide inputs to the *Guide to Hydrological Practices* (WMO-No. 168) and *Technical Regulations* (WMO-No. 49);
- (c) Hydrological Network Maintenance Support:
 - (i) To survey the annual funding requirements for hydrological networks in the Region;
 - (ii) To assess and report on the possibility of donor support to establish a fund for network maintenance;
 - (iii) To explore interest of regional organizations to assist in the establishment and management of such a fund;
 - (iv) To develop proposals for the structure, terms of reference and operational procedures for such a fund;
 - (v) To assist, as required, in organizing meetings of National Hydrological Services (NHSs) to promote the proposal;

- (d) Integrated Water Resources Management (IWRM):
- (i) To compile references on case studies of IWRM;
 - (ii) To compile Best Practice Guidelines for IWRM;
 - (iii) To coordinate and collaborate with other international and regional initiatives on IWRM;
 - (iv) To assist in the development of the HYCOS component associated with IWRM;
- (e) Public Awareness of the Value of Hydrological Data and Products:
- (i) To identify and report on hydrological data and products used and/or required within the Region;
 - (ii) To compile case studies that show the value of these hydrological data and products;
 - (iii) To identify and report on promotional activities for hydrological data and products by Members of RA V;
 - (iv) To identify potential new data and products that use hydrological data and analyses (e.g. streamflow bulletins, annual statistics, etc.);
 - (v) To develop guidelines for determining the value of data and products and promoting the use of these data and products within user communities;
- (f) Climate Change and Variability (including El Niño/Southern Oscillation (ENSO)):
- (i) To assess the impact of climate change and variability on water resources in the Region, taking account of the relevant work of the Intergovernmental Panel on Climate Change (IPCC);
 - (ii) To liaise with the RA V Working Group on Climate Matters in developing these activities;
 - (iii) To assist the Commission for Hydrology (CHy) expert concerned in these activities where possible, in particular in providing of regional information (liaise with South-east Asia and Pacific-Flow Regimes from International Experimental and Network Data Sets (FRIEND));
- (g) Regional Information and Communication System:
- (i) To survey and identify the types of hydrological information that National Meteorological Services (NMSs) and NHSs in RA V wish to access via the Internet;
 - (ii) To develop a structure and plan for the collection and presentation of this material (making use of existing Web-based information through hyperlinks);
- (iii) To assist in the development of a revised Hydrological Information Referral Service (INFOHYDRO) meta database pilot project;
 - (iv) To assist the Regional Office for Asia and the South-West Pacific in the development of a Regional Web site and ensure that the hydrological requirements of such a site are met;
 - (v) To develop a strategy to regularly update the information on the Web site;
- (h) Numerical Weather Products for Operational Hydrology:
- (i) To survey and report on the numerical weather prediction (NWP) products that have applications in hydrology within the Region (e.g. Quantitative Precipitation Forecasts) in cooperation with CHy;
 - (ii) To assist in promoting and distributing products to NHSs;
 - (iii) To make recommendations for modification to products for future use in the Region;
- (i) Application of the Hydrological Observation Multipurpose System (HOMS):
- (i) To promote and assist in the establishment of HOMS National and Regional Reference Centres;
 - (ii) To identify and promote the use of HOMS components of value to the Region;
 - (iii) To identify and solicit new components for HOMS that would be useful to the Region;
 - (iv) To assist in the organization of HOMS training activities in the Region;
- (j) Linkages with the Typhoon Committee and the RA V Tropical Cyclone Committee (TCC):
- (i) To participate as focal point for coordination of tropical cyclone/typhoon and Working Group on Hydrology activities;
 - (ii) To circulate relevant information from the Typhoon and Tropical Cyclone Committees to members of the Working Group on Hydrology;
 - (iii) To provide inputs to activities of the Typhoon and Tropical Cyclone Committees from Working Group on Hydrology members;
 - (iv) To report to Working Group on Hydrology meetings on the activities of the Typhoon and Tropical Cyclone Committees and vice versa;
- (2) To invite all Members in the Region to designate national hydrological experts to serve on the working group and attend its meetings. To appoint as members of the working group the following experts who were nominated during the thirteenth session:

Mr C. Pearson (New Zealand)
 Mr R. James (Australia)
 Mr A.C. Hai (Singapore)
 Mr V. Gentien (New Caledonia)
 Mr K. Kodama (United States)
 Ms V. Laurent (French Polynesia)
 Mr B. Parakoti (Cook Islands)
 Mr A. Siohame (Niue)
 Mr C. Bepapa (Solomon Islands)
 Mr S. Helu (Tonga)
 Mr C. Ioan (Vanuatu)
 Ms M.P. Bautista (Philippines)
 Mr M. Virobo (Papua New Guinea)
 Mr J. Loebis (Indonesia)
 Mr I. Eti (Samoa)

(3) To designate, in accordance with General Regulations 167(b) and 32 respectively, Mr R. Raj (Fiji) as Regional Hydrological Adviser and chairperson of the Working Group on Hydrology;

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

- (1) To establish, in consultation with the president of RA V, the working group's top five priorities from among the work programme listed above for implementation during the intersessional period. For the top five priority activities, specific objectives, implementation strategies and success criteria should be developed;
- (2) In his capacity as Adviser, to assist the president of RA V in accordance with the duties stipulated in WMO General Regulation 167(b);

(3) As chairperson of the working group, to prepare an implementation plan and to designate, in consultation with the president of the Regional Association, appropriate members from the working group to undertake work in the areas specified under **DECIDES** (1) above;

(4) To participate in Executive Council sessions, when invited, representing the regional interests in relation to hydrology and water resources and to coordinate the RA V WGH activities with CHy and other regional WGHs;

(5) To submit to the president of the Regional Association an annual report by 31 December every year and a final report no later than six months before the fourteenth session of RA V;

URGES the Members concerned to give full support to the Regional Hydrological Adviser and the rapporteurs from their countries so that they may carry out the tasks entrusted to them;

REQUESTS the Secretary-General:

- (1) To provide assistance in promoting hydrological activities in the Region, including seeking funds to implement projects that are prepared as part of the activities of the WGH;
- (2) To publish in the technical document series selected technical reports prepared by the working group, and distribute them to all concerned.

NOTE: This resolution replaces Resolution 14 (XII-RA V), which is no longer in force.

RESOLUTION 15 (XIII-RA V)

RAPPORTEUR ON EDUCATION AND TRAINING MATTERS

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 17 (Cg-XIII) — Education and Training Programme,
- (2) Paragraph 8.6 of the general summary of the *Abridged Final Report with Resolutions of the Forty-eighth Session of the Executive Council* (WMO-No. 846) on the role of rapporteurs appointed by regional associations on education and training matters,

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

DECIDES:

- (1) To designate a Rapporteur on Education and Training Matters with the following terms of reference:
 - (a) To keep under review and provide advice on priority subject requirements for regional

and specialized education and training, in particular Computer-Aided Learning (CAL) and Distance Learning in meteorology;

- (b) To assist the Regional Meteorological Training Centre (RMTTC) in the Philippines and other national training institutions in the Region to develop a coordinated programme of training activities, especially in the important emerging area of training in management of National Meteorological and Hydrological Services (NMHSs);
- (c) To examine the feasibility of introducing more specialized training courses at the WMO RMTTC in the Philippines;
- (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 initiate the preparation of new training publications;

- (f) To assess the needs in the training of instructors at national training institutions and the WMO RMTC in the Philippines;
- (g) To assist in the development of the WMO Long-term Plan for the implementation of the Education and Training Programme;
- (2) To invite Mr P. Riley (Australia) to serve as Rapporteur on Education and Training Matters;
- (3) To invite Mr B.M. Soriano (Philippines) and Mr K. Waters (United States) to serve as Co-rapporteurs to assist the Rapporteur on Education and Training Matters with his terms of reference indicated in **DECIDES** (1) above and as requested by the Rapporteur;
- (4) To request the Rapporteur to submit to the president of the Association annual activity reports and to submit to him a final report six months prior to the fourteenth session of the Association.

RESOLUTION 16 (XIII-RA V)

THE WMO VOLUNTARY COOPERATION PROGRAMME

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 18 (Cg-XIII) — The WMO Voluntary Cooperation Programme,
- (2) That urgent and essential support has to be provided for the implementation of the World Weather Watch (WWW) and the other WMO Scientific and Technical Programmes to Member and non-Member Island States in the Region,

CONSIDERING the importance of maintaining the basic synoptic and climatological networks in the Region for the benefit of all WMO Programmes,

RECOMMENDS that support directed to the Region under the WMO Voluntary Cooperation Programme (VCP) should be further enhanced;

URGES:

- (1) Members of the Association to take more active roles in and contribute to the VCP, to the maximum extent possible, in support of funds, equipment and services, including fellowships;
- (2) Members of the Association to identify their requirements and to seek, as appropriate, support through the WMO VCP;

REQUESTS the Secretary-General of WMO to make an urgent appeal to potential donors (including donors outside the Region) to provide support specifically for the Region, under the VCP or otherwise.

NOTE: This resolution replaces Resolution 20 (X-RA V), which is no longer in force.

RESOLUTION 17 (XIII-RA V)

REGIONAL ASSOCIATION V ADVISORY WORKING GROUP

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) The *Abridged Final Report with Resolution of the Forty-ninth Session of the Executive Council* (WMO-No. 867),
- (2) The report of the Executive Council Working Group on Long-term Planning to the fiftieth session of the Executive Council,
- (3) The *Abridged Final Report with Resolutions of the Fiftieth Session of the Executive Council* (WMO-No. 883),
- (4) The *Abridged Final Report with Resolutions of the Thirteenth World Meteorological Congress* (WMO-No. 902),

CONSIDERING the proposal of the acting president of the Association,

RECOGNIZING that due to budgetary constraints the number of working groups to be established or re-established by the Association would have to be limited,

RECOGNIZING FURTHER the need to have a mechanism to address issues not handled by other working groups or rapporteurs,

DECIDES:

- (1) To establish the Regional Association V Advisory Working Group with the following terms of reference:
 - (a) To advise the president on matters related to the work of the Association, in particular on 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 implementation of their recommendations;

- (d) To address other issues not covered by working groups or rapporteurs;
- (e) To assess and evaluate the implementation of the Regional Programme related to the activities of RA V as per the WMO Long-term Plan;
- (f) To advise the president on the requirements and priorities of events to be organized in the Region;
- (2) To invite the president to act as chairperson of the Advisory Working Group which is composed of the president, the vice-president and two Directors of National Meteorological and Hydrological Services (NMHSs) to be invited by the president;
- (3) The president may invite as appropriate other directors of NMHSs, chairpersons of RA V working groups or rapporteurs to the meetings of the Advisory Working Group subject to availability of financial resources;
- REQUESTS** the president to ensure that subregions are represented on the Advisory Working Group;
- URGES** the president and vice-president to take all available opportunities to make two-way communication with the chairpersons of the other working groups and rapporteurs of the Region and facilitate coordination across the working groups and rapporteurs;
- REQUESTS FURTHER** the president to report to Members of the Region on the activities of the Advisory Working Group, following its meetings.

RESOLUTION 18 (XIII-RA V)

REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),
NOTING paragraph 3.7.1 of the *Abridged Final Report with Resolutions of the Ninth Session of the Executive Committee* (WMO-No. 67),

CONSIDERING:

- (1) That a number of its resolutions adopted before its thirteenth session have been revised and incorporated in resolutions of the twelfth 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 5 (X-RA V), 10 (X-RA V), 10 (XI-RA V), 4 (XII-RA V) and 7 (XII-RA V);
- (2) Not to keep in force the other resolutions adopted before its thirteenth session;
- (3) To publish the text of the resolutions kept in force in the annex to this resolution.

ANNEX TO RESOLUTION 18 (XIII-RA V)

RESOLUTIONS OF RA V ADOPTED PRIOR TO ITS THIRTEENTH SESSION AND MAINTAINED IN FORCE

Resolution 5 (X-RA V)

FURTHER DEVELOPMENT OF THE GLOBAL OBSERVING SYSTEM

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

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

CONSIDERING:

- (1) That large parts of the Region are data-sparse areas,
- (2) The importance of an effective Regional Basic Synoptic Network and the essential need to integrate the RBSN 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 Ships 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 are 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.

Resolution 10 (X-RA V)

TROPICAL CYCLONE OPERATIONAL PLAN FOR THE SOUTH PACIFIC AND SOUTH-EAST INDIAN OCEAN

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) A series of resolutions by the General Assembly of the United Nations calling for international cooperation and action by WMO for the mitigation of the harmful effects of storms, in particular in connection with the International Decade for Natural Disaster Reduction (IDNDR),
- (2) Resolution 5 (Cg-X) — Tropical Cyclone Programme,
- (3) With appreciation the final report of the second session of the RA V Tropical Cyclone Committee for the South Pacific,
- (4) Resolution 11 (X-RA V) — Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean,

CONSIDERING:

- (1) The need to enhance cooperative efforts by countries in the South Pacific and adjacent areas affected by tropical cyclones in effectively carrying out their roles in coordinated arrangements for preparing 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 tropical cyclone operational plan for the South Pacific and the South-East Indian Ocean which describes the coordinated arrangements and defines the observing, forecasting and warning responsibilities of all cooperating countries,

DECIDES to adopt the Tropical Cyclone Operational Plan for the South Pacific and South-East Indian Ocean published in Tropical Cyclone Programme Report No. TCP-24 (WMO/TD-No. 292) — Tropical Cyclone Operational Plan for the South Pacific and South-East Indian Ocean,

AUTHORIZES the president of RA V to approve, on behalf of the Association, amendments to this Tropical Cyclone Operational Plan, as recommended by the RA V Tropical Cyclone Committee for the South Pacific;

REQUESTS the Secretary-General to inform all Members and islands States and Territories concerned of any amendments to, and updating of, the Operational Plan.

Resolution 10 (XI-RA V)

USE OF INMARSAT FOR THE COLLECTION OF SHIPS' METEOROLOGICAL AND OCEANOGRAPHIC REPORTS

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Resolution 19 (Cg-XI) — The collection and dissemination of marine meteorological and oceanographic information using INMARSAT,
- (2) The operation of Coast Earth Stations (CES) of INMARSAT in Region V,
- (3) The equipping of an increased number of ships participating in the WMO Voluntary Observing Ships (VOS) scheme with Ship Earth Stations (SES) of INMARSAT, in particular with the INMARSAT-C facility,

CONSIDERING:

- (1) The need to increase the number of ships' meteorological and oceanographic reports from most of the sea areas of Region V,
- (2) The considerable improvements to be expected in the receipt of marine meteorological and oceanographic observations from ships at sea through the enhanced use of the INMARSAT system,
- (3) The cost-savings which will accrue to those Members collecting such reports through INMARSAT by the increased use of the new INMARSAT-C facility for this purpose,

RECOGNIZING WITH APPRECIATION that certain Members operating INMARSAT CES have already arranged through their CES to accept ships' meteorological and oceanographic reports that are of general value to all Members of WMO,

BEING CONCERNED, however, that problems continue to be related to the timely redistribution to the countries closest to their geographical origin of reports collected through INMARSAT,

URGES:

- (1) Members concerned to make every effort to ensure the timely redistribution of reports collected through INMARSAT to countries in the areas of the geographical origins of those reports;
- (2) All Members in the Region operating VOS equipped with INMARSAT-C to make every effort for these ships to be supplied with the new software package for the compilation and transmission of meteorological reports through INMARSAT-C, to ensure the maximum efficiency and cost-effectiveness of such an operation;

REQUESTS the Secretary-General to assist Members in the implementation of this resolution.

Resolution 4 (XII-RA V)

REGIONAL INSTRUMENT CENTRES (RICs)

REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) The *Abridged Final Report with Resolutions of the Eleventh Session of Regional Association V (South-West Pacific)* (WMO-No. 811),

- (2) The sixth edition of the *Guide to Meteorological Instruments and Methods of Observation* (WMO-No. 8),

CONSIDERING:

- (1) The need for regular calibration and maintenance of meteorological instruments to meet the increasing needs for high quality meteorological and hydrological data,
- (2) The requirements of Members in the Region for standardization of meteorological instruments,
- (3) The need for international instrument inter-comparisons and evaluations,

NOTING with appreciation the offers made by Australia and the Philippines to provide facilities to the NICs to perform the function of RICs,

DESIGNATES the NIC Manila, Philippines as an RIC for RA V with the following functions:

- (a) To keep a set of meteorological standard instruments linked with recognized international or national standards and to log their performance and elements of comparison;
- (b) To assist Members of the Region in calibrating their national standard meteorological instruments or in comparing them with standard instruments and to keep the Members of the Region and the WMO Secretariat informed on the availability of standard instruments;
- (c) To be prepared to certify the instruments' conformity with the standards with reference to WMO recommendations;
- (d) To organize instrument evaluations and comparisons, following standard methods;
- (e) To advise Members of the Region concerned on their enquiries regarding instrument performance and on the availability of relevant guidance material;
- (f) To assist WMO in organizing regional symposia, seminars or workshops on the maintenance, calibration and comparison of meteorological instruments by providing laboratory and field installations, as well as to provide assistance with regard to demonstration equipment and expert advice;
- (g) To keep a library of books and periodicals on instrument theory and practices;
- (h) To cooperate with other RICs to provide standardization of meteorological instruments;

DESIGNATES also the Australian RIC in Melbourne with the following functions:

- (a) To keep a set of meteorological standard instruments with traceability to recognized international or national standards and to document their performance and elements of comparison;
- (b) To assist Members of Region V to calibrate those national standards meteorological instruments or compare them with the standard instruments maintained by the RIC, and to keep the Members

of RA V and the WMO Secretariat informed on the available standard instruments and their traceability;

- (c) To provide documentation, when required by WMO, to certify traceability of all standard instruments used for RIC functions;
- (d) To organize instrument evaluations and comparisons based on proven methodologies;
- (e) To provide advice to Members of RA V on instrument performance and availability of relevant guidance material;
- (f) To keep a library of books and periodicals on meteorology and methods of measurement in meteorology, that can be referred to on request from Members of RA V;
- (g) To cooperate with other RICs to provide better links to international standards;
- (h) To inform Members of RA V and WMO when relevant training courses, seminars and symposia on meteorological metrology are to be conducted; and
- (i) To include the operations of the RA V Radiation Centre (also based in the Australian Bureau of Meteorology) in its activities;

REQUESTS the Secretary-General to include the content of this resolution in the *Manual on the Global Observing System* (WMO-No. 544), Volume II, Regional Aspects, Region V (South-West Pacific).

Resolution 7 (XII-RA V)

CLIMATE CHANGE IN THE SOUTH-WEST PACIFIC REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC),

NOTING:

- (1) Article 10 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change,
- (2) The plans of the WMO-UNEP Intergovernmental Panel on Climate Change (IPCC) for the preparation of its Third Assessment Report,
- (3) The continuing high level of public concern within the Region about the possible impacts of climate change,
- (4) The uncertainty about the likely nature and magnitude of human-induced climate change in the Region,
- (5) The vital role of the NMSs of the Region in providing scientific data and advice to their Governments on climate matters,
- (6) Its own responsibility, under Article 18 of the WMO Convention, for coordination of meteorological (including climatological) and related activities in the Region,

ADOPTS the summary statement entitled Climate Change in the South-West Pacific as set down in the annex to this resolution;

REQUESTS the president of the Association and the Secretary-General to bring the statement to the attention of all concerned.

Annex to Resolution 7 (XII-RA V)

CLIMATE CHANGE IN THE SOUTH-WEST PACIFIC

At its twelfth session in Bali, Indonesia, (September 1998), the World Meteorological Organization (WMO) Regional Association for the South-West Pacific (RA V) reviewed the substantial recent global and regional action in connection with possible human-induced climate change. It noted that, despite considerable progress in the scientific study of possible climate change in the Region, there are great uncertainties about the nature and likely magnitude of future change and only modest progress has been made in establishing or upgrading the meteorological and related observing systems needed to detect and monitor climate variability and change in the Region.

Conscious of its role as the established intergovernmental body responsible for coordination of meteorological (including climatological) and related activities in the Region, the Association identified a number of important initiatives for priority attention. In particular, the Association agreed that:

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| <ul style="list-style-type: none"> (a) Those Members with the capability to do so should accelerate their efforts to develop scientifically-sound regional assessments of future climate change for the South-West Pacific for a range of greenhouse gas emission scenarios; (b) Necessary support should be sought to enable scientists from the developing countries in the Region to participate fully in the scientific studies in order to ensure that expert advice is available to their Governments on the nature, scientific basis and reliability of the projections of possible future change; (c) Members should be encouraged to participate as fully as possible in the work of the IPCC, including especially the preparation of its Third Assessment Report; | <ul style="list-style-type: none"> (d) The attention of all Members should be drawn to the fundamental role of the WWW and its RBSN as the observational foundation for climate monitoring in the Region and to the critical need for upgrading both the coverage and the performance standards of these networks, in line with the interest of Article 10 of the Kyoto Protocol; (e) Close coordination should be maintained at both the national and regional levels between the WWW networks and the related observational initiatives such as GCOS; (f) The existing routine climate monitoring systems for the Region should be upgraded in respect of both their content and timeliness, and training opportunities should be provided in their use for staff from the NMHSs of Members of the developing countries in the Region; (g) Members should be encouraged to cooperate in annual assessments of observed climate variations and trends in the Region; (h) In undertaking studies of the scope for adaptation to future climate change in the Region, Members and international organizations should pay greater attention to the very large natural variability of the climate of the South-West Pacific and, in particular, to the role of the various existing programmes on tropical cyclone, flood and other national disaster mitigation; (i) There are still significant scientific uncertainties about the operation of the climate system, which add uncertainty to predictions of climate variability and change. Members were encouraged to participate in the planning and implementation of research programmes, such as CLIVAR, ensuring that they address global and regional processes important to South-West Pacific countries. |
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APPENDIX A

LIST OF PERSONS ATTENDING THE SESSION

1. OFFICERS OF THE SESSION

R.S. Diharto	Acting president
Vacant	Vice-president

2. REPRESENTATIVES OF WMO MEMBERS

<i>Member</i>	<i>Name</i>	<i>Capacity</i>
Australia	J.W. Zillman	Principal delegate
	V.K. Tsui	Alternate
	R.R. Brook	Delegate
	G. Foley	Delegate
Brunei Darussalam	M.H. Aji	Principal delegate
	M. Yunus Tahir	Delegate
Cook Islands	A. Ngari	Principal delegate
Fiji	R. Prasad	Principal delegate
	A. Waqaicelua	Alternate
French Polynesia	J.-P. Beysson	Principal delegate
	R. Watrin	Delegate
Indonesia	R.S. Diharto	Principal delegate
	I. Gunawan	Delegate
	H. Haryanto	Delegate
Malaysia	Y.P. Wing	Principal delegate
	L.C. Peng (Ms)	Alternate
Micronesia, Federated States of	D. Nelber	Principal delegate
New Caledonia	A. Le Trocquer-Bédiot (Ms)	Principal delegate
New Zealand	J.R. Lumsden	Principal delegate
Niue	S. Pulehetoa	Principal delegate
	G. Foley	Delegate
Papua New Guinea	T.R. Gabi	Principal delegate
Philippines	L.A. Amadore	Principal delegate
	R.D. Mateo	Delegate
	C. Ferraris	Delegate
	E.A. Adug	Delegate
	B.M. Soriano, Jr	Delegate
	I. Valeroso (Ms)	Delegate
	R.P. Encarnacion	Delegate
	A.M. Jose (Ms)	Delegate
	C.S. Doctor	Delegate
	R.T. Perez (Ms)	Delegate
	L.G. Angeles (Ms)	Delegate
Samoa	F. Malele	Principal delegate

<i>Member</i>	<i>Name</i>	<i>Capacity</i>
Singapore	W.S. Lai	Principal delegate
	L.T. Kuay	Delegate
	W.C. Ling (Ms)	Delegate
Solomon Islands	C. Iroi	Principal delegate
Tonga	O. Fa'anunu	Principal delegate
United Kingdom of Great Britain and Northern Ireland	P. Evans	Principal delegate
United States of America	J.C. Weynam	Principal delegate
	W.C. Bolhofer	Alternate
Vanuatu	J. Napat	Principal delegate
3. REPRESENTATIVES OF MEMBERS OF WMO OUTSIDE REGION V		
China	C. Zhenlin	Observer
Hong Kong, China	H.K. Lam	Observer
Iran, Islamic Republic of	A.M. Noorian	Observer
	L.P. Salimabadi (Ms)	Observer
	M.B. Behyar	Observer
Saudi Arabia	A.Y.A. Hussain	Observer
4. EXPERTS		
D. Rutashobya	President of the Commission for Hydrology	
S. Ready	Chairperson of the RA V Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean	
P. Lefale	National Institute of Water and Atmospheric Research Ltd. (NIWA)	
5. REPRESENTATIVES OF INTERNATIONAL AND REGIONAL ORGANIZATIONS		
<i>Organization</i>	<i>Name</i>	
Intergovernmental Oceanographic Commission (IOC)	V. Tsui	
International Rice Research Institute (IRRI)	H.G.S. Centeno (Ms)	
South Pacific Regional Environment Programme (SPREP)	K. Nitschke	
United Nations Development Programme (UNDP) Office in Manila, Philippines	M.G. Francisco	
International Air Transport Association (IATA)	H.-R. Sonnabend	
International Civil Aviation Organization (ICAO)	D.H. Ivanov	

6. REPRESENTATIVES OF NON-WMO MEMBERS

Kiribati	T. Teitiba	Observer
Palau	M. Ngemaes (Ms)	Observer
Tokelau	G. Clarke	Observer

7. LOCAL SECRETARIAT

C.C. Ferraris	Chairperson, Local Organizing Committee
V.R. Valdemoro (Ms)	Coordinator/Action Officer
V.G. Leañó	
C.P. Calimbas	
B.P. Pajuelas	
M.T.M. Pajarillo (Ms)	
R.C. Pagulayan (Ms)	
D.G. Villanueva	
F.B. Pascual (Ms)	
N.E. de la Cruz (Ms)	
F. Punzalan (Ms)	
L.S. Mercado (Ms)	
L.D. Lirios (Ms)	
J.D. Bomediano (Ms)	
R.A. Adora	
J. Ioiz	
E.M. Maunahan (Ms)	
R.K. Lirios	
E.D. Jermia	
L.A. Ruazol	

8. WMO SECRETARIAT*Part time*

G.O.P. Obasi	Secretary-General
E.L. Sarukhanian	Acting Director, World Weather Watch – Applications Department
M.E. Hassan	Chief, Fellowship Division
J. Bassier	Chief, Hydrology Division
N. Lomarda (Ms)	Scientific Officer, Tropical Cyclone Programme Division

Full time

M. Jarraud	Deputy Secretary-General
R.A. de Guzman	Director, Strategic Planning Office
E.H. Al-Majed	Regional Director for Asia and the South-West Pacific
D.C. Schiessl	Director, World Weather Watch – Basic System Department
K. Davidson	Director, World Climate Programme
H. Taiki	Programme Officer, Subregional Office for the South-West Pacific
M. Peeters	Conference Officer
J.S. Lee	Junior Professional Officer, Regional Office for Asia and the South-West Pacific

APPENDIX B

AGENDA

<i>Agenda item</i>	<i>Document No.</i>	<i>PINK No., submitted by</i>	<i>Resolutions adopted</i>
1. OPENING OF THE SESSION		1, Acting president of RA V	
2. ORGANIZATION OF THE SESSION		2, Acting president of RA V	
2.2 Adoption of the agenda	2.2(1); 2.2(2)		
2.3 Establishment of committees			
2.4 Other organizational matters			
3. REPORT BY THE PRESIDENT OF THE ASSOCIATION	3	3, Acting president of RA V	
4. WORLD WEATHER WATCH PROGRAMME — REGIONAL ASPECTS	4		
4.1 WWW Planning and Implementation Programme, including the report of the chairperson of the Working Group on Planning and Implementation of the WWW in Region V	4	4.1, Co-chairperson of Committee A	1
4.2 Observing system, including Instruments and Methods of Observation Programme (IMOP)	4; 4.2		2, 3, 4
4.3 Regional satellite activities	4		
4.4 Telecommunication system	4	4.2, Co-chairperson of Committee A	
4.5 Data-processing system	4		
4.6 Data Management, including matters related to codes	4		
4.7 WWW system support activities and Operational Information Service (OIS)	4		
4.8 Tropical Cyclone Programme (TCP)	4.8	4.8, Co-chairperson of Committee A	5
5. WORLD CLIMATE PROGRAMME (WCP) — REGIONAL ASPECTS	5(1); 5(1), REV. 1; 5(1), ADD. 1; 5(3)		
5.1 Coordination of the World Climate Programme including outcomes of CCI-XIII	5(1); 5(1), REV. 1; 5(1), ADD. 1; 5(3)	5.1, Co-chairperson of Committee B	6, 7
5.2 World Climate Data and Monitoring Programme (WCDMP)	5(1); 5(1), REV. 1; 5(1), ADD. 1; 5(3)		
5.3 World Climate Applications and Services Programme (WCASP), including Climate Information and Prediction Services (CLIPS)	5(1); 5(1), REV. 1; 5(1), ADD. 1; 5(3)		
5.4 Global Climate Observing System (GCOS)	5.4	5.4, Co-chairperson of Committee B	
5.5 World Climate Research Programme (WCRP)	5.5	5.5, Acting president of RA V	
6. ATMOSPHERIC RESEARCH AND ENVIRONMENT PROGRAMME (AREP)	6	6, Co-chairperson of Committee A	8, 9
6.1 Support to ozone and other environment-oriented conventions	6; 6.1		
6.2 Global Atmosphere Watch (GAW)	6; 6.2(1)		
6.3 World Weather Research Programme (WWRP)	6		
6.4 Tropical Meteorology Research Programme (TMRP)	6		
6.5 Programme on Physics and Chemistry of Clouds and Weather Modification Research (PCCWMR)	6		

<i>Agenda item</i>	<i>Document No.</i>	<i>PINK No., submitted by</i>	<i>Resolutions adopted</i>
7. APPLICATIONS OF METEOROLOGY PROGRAMME (AMP) — REGIONAL ASPECTS			
7.1 Public Weather Services Programme (PWSP)	7.1	7.1, Co-chairperson of Committee A	
7.2 Agricultural Meteorology Programme (AgMP)	7.2(1); 7.2(2)	7.2(1); 7.2(2), Acting president of RA V	10
7.3 Aeronautical Meteorology Programme (AeMP)	7.3	7.3, Co-chairperson of Committee A	11
7.4 Marine Meteorology and Associated Oceanographic Activities Programme (MMAOAP)	7.4(1); 7.4(2)	7.4, Co-chairperson of Committee A	12, 13
8. HYDROLOGY AND WATER RESOURCE PROGRAMME (HWRP) — REGIONAL ASPECTS	8(1); 8(2)	8, Acting president of RA V	14
9. EDUCATION AND TRAINING PROGRAMME (ETRP) — REGIONAL ASPECTS	9	9, Co-chairperson of Committee B	15
10. TECHNICAL COOPERATION PROGRAMME (TCOP) — REGIONAL ASPECTS	10	10, Co-chairperson of Committee B	16
11. INFORMATION AND PUBLIC AFFAIRS PROGRAMME (IPA) — REGIONAL ASPECTS	11	11, Co-chairperson of Committee B	
12. LONG-TERM PLANNING (LTP) — REGIONAL ASPECTS	12	12, Acting president of RA V	
13. ROLE AND OPERATION OF NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES (NMHSs)	13	13, Acting president of RA V	
14. DISASTER PREVENTION AND MITIGATION	14	14, Acting president of RA V	
15. INTERNATIONAL EXCHANGE OF DATA AND PRODUCTS	15	15, Acting president of RA V	
16. OTHER REGIONAL ACTIVITIES			
16.1 Fourth Technical Conference on Management of Meteorological Services in Regional Association V (South-West Pacific)	16.1	16.1, Acting president of RA V	
16.2 Internal matters of the Association	16.2	16.2, Acting president of RA V	17
17. WMO REGIONAL OFFICE FOR ASIA AND THE SOUTH-WEST PACIFIC INCLUDING THE SUBREGIONAL OFFICE FOR THE SOUTH-WEST PACIFIC	17	17, Acting president of RA V	
18. SCIENTIFIC LECTURES AND DISCUSSIONS		18, Acting president of RA V	
19. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE ASSOCIATION AND OF AND OF RELEVANT EXECUTIVE COUNCIL RESOLUTIONS	19	19, Rapporteur	18
20. ELECTION OF OFFICERS	20	20, Acting president of RA V	
21. DATE AND PLACE OF THE FOURTEENTH SESSION OF REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)	21	21, Acting president of RA V	
22. CLOSURE OF THE SESSION	22	22, Acting president of RA V	

APPENDIX C

LIST OF ABBREVIATIONS

5LTP	Fifth WMO Long-term Plan
6LTP	Sixth WMO Long-term Plan
AeMP	Aeronautical Meteorological Programme
AMDAR	Aircraft Meteorological Data Relay
AMOSSG	Aerodrome Meteorological Observing Systems Study Group
AOS	Automated Observing System
APN	Asia-Pacific Network for Global Change Research
APT	Asia-Pacific Telecommunity
ARCHISS	Archival Climate History Project
AREP	Atmospheric Research and Environment Programme
ARGO	Array for Real-time Geostrophic Oceanography
ASAP	Automated Shipboard Aerological Programme
ASCMG	ASEAN Subcommittee on Meteorology and Geophysics
ASDAR	Aircraft to Satellite Data Acquisition and Relay
ASEAN	Association of South-East Asian Nations
ASMC	ASEAN Specialized Meteorological Centre
ATEAM	Advanced Techniques Applied to Aeronautical Meteorology
AUSAID	Australian Agency for International Development
AVHRR	Advanced Very High Resolution Radiometer
AWS	Automatic Weather Station
BIPM	International Bureau of Weights and Measures (original French)
BOM	Australian Bureau of Meteorology
CACGP	Commission on Atmospheric Chemistry and Global Pollution
CAeM	Commission for Aeronautical Meteorology
CAGM	Commission for Agricultural Meteorology
CAL	Computer-aided Learning
CALMET	International Conference on Computer-aided Learning and Distance Learning in Meteorology
CAS	Commission for Atmospheric Sciences
CBS	Commission for Basic Systems
CCI	Commission for Climatology
CDMS	Climate Database Management System
CHy	Commission for Hydrology
CIMO	Commission for Instruments and Methods of Observation
CIPM	International Committee for Weights and Measures (original French)
CLICOM	Climate Computing
CLIMAG	Task Force on Climate Prediction and Agriculture
CLIPS	Climate Information and Prediction Services
CLIVAR	World Climate Variability and Predictability
CMM	Commission for Marine Meteorology
CO-COM	Coordinating Committee (of SCHOTI)
COP	Conference of the Parties
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)
CSM	Commission for Synoptic Meteorology
CTBTO	Comprehensive Nuclear Test Ban Treaty Organization
DARE	Data Rescue
DBCP	Data Buoy Cooperation Panel
DCP	Data Collection Platform
DPFS	Data-processing and Forecasting Systems
DWD	Deutscher Wetterdienst

EANET	Acid Deposition Monitoring Network in East Asia
EC	Executive Council
EC-AGCE	Executive Council Advisory Group on Climate and Environment
EC/AGE	Executive Council Advisory Group on the Exchange of Meteorological and Related Data and Products
ECMWF	European Centre for Medium Range Weather Forecasts
ECOSOC	Economic and Social Council (United Nations)
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
ESCAP	Economic and Social Commission for Asia and the Pacific
ET	Expert Team
ETRP	Education and Training Programme
EUMETNET	European Meteorological Services Network
FDP	Forecast Demonstration Project
GAW	Global Atmosphere Watch
GAW-TEC	GAW Training and Education Center
GCOS	Global Climate Observing System
GDPS	Global Data-processing System
GDSIDB	Global Digital Sea-Ice Data Bank
GEF	Global Environment Facility
GEWEX	Global Energy and Water Cycle Experiment (within WCRP)
GIS	Geographical Information System
GLOSS	Global Sea-level Observing System
GMDSS	Global Maritime Distress and Safety System
GMS	Geostationary Meteorological Satellite
GOES	Geostationary Operational Environmental Satellite
GOOS	Global Ocean Observing System
GOS	Global Observing System
GPCP	Global Precipitation Climatology Project
GPS	Global Positioning System
GSN	GCOS Surface and Upper-Air Networks
GTS	Global Telecommunication System
GTSP	Global Temperature Salinity Profile Programme
GUAN	GCOS Upper-Air Network
GURME	GAW Urban Research Meteorological Environment Project
GWP	Global Water Partnership
HF	High Frequency
HIRS	High Resolution Infra-red Sounder
HNRC	HOMS National Reference Centre
HOMS	Hydrological Operational Multipurpose System
hPa	Hectopascal
HRFP	HOMS Regional Focal Point
HWRP	Hydrology and Water Resources Programme
HYCOS	Hydrological Cycle Observing System
IAHS	International Association of Hydrological Sciences
IAI	Inter-American Institute for Global Change Research
IAMAP	International Association of Meteorology and Atmospheric Physics
IATA	International Air Transport Association
IATF	Inter-Agency Task Force
IAVW	International Airways Volcano Watch
IBPIO	International Buoy Programme for the Indian Ocean
ICAO	International Civil Aviation Organization
ICL	International Consortium on Landslides
ICSU	International Council for Science

ICT	Implementation/Coordination Team
ICUC	International Conference on Urban Climates
IDNDR	International Decade for Natural Disaster Reduction
IGBP	International Geosphere-Biosphere Programme (ICSU)
IGOS	Integrated Global Observing Strategy
IGOSS	Integrated Global Ocean Station System
IGRAC	International Groundwater Resources Assessment Centre
IHDP	International Human Dimensions Programme on Global Environmental Change
IHP	International Hydrological Programme (UNESCO)
IMO	International Maritime Organization
IMOP	Instruments and Methods of Observation Programme
Inmarsat	International Mobile Satellite Organization
INMARSAT	International Maritime Satellite System
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IOC-WESTPAC	IOC Sub-Commission for the Western Pacific
IOS	IGOSS Observing System
IPA	Information and Public Affairs (WMO)
IPAB	International Programme for Antarctic Buoys
IPC	International Precipitation Climatology Project
IPC	International Pyrheliometer Comparison
IPCC	Intergovernmental Panel on Climate Change
IRI	International Research Institute for Climate Prediction
IRRI	International Rice Research Institute (Manila, Philippines)
ISCS	International Satellite Communication System
ISDN	Integrated Services Digital Network
ISDR	International Strategy for Disaster Reduction
ISO	International Organization for Standardization
ISS	Integrated WWW System Study
IT	Information Technology
ITU	International Telecommunication Union
IWTC	International Workshop on Tropical Cyclones
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
Khz	Kilohertz
LAM	Limited Area Model
LTP	Long-term Plan
MCSS	Marine Climatological Summaries Scheme
METEOREX	Exhibition of Meteorological Instruments, Equipment and Services
Mhz	Megahertz
MMAOAP	Marine Meteorology and Associated Oceanographic Activities Programme
MOU	Memorandum of Understanding
MPERSS	Marine Pollution Emergency Response Support System
MSS	Mobile-Satellite Service
MTN	Main Telecommunication Network
MTSAT	Multifunctional Transport Satellite (Japan)
MWO	Meteorological Watch Office
NCDC	National Climatic Data Center (USA)
NGO	Non-governmental Organization
NHS	National Hydrological Service
NMC	National Meteorological Centre
NMHS	National Meteorological and Hydrological Service
NMS	National Meteorological or Hydrometeorological Service
NOAA	National Oceanic and Atmospheric Administration
NWP	Numerical Weather Prediction
NWS	National Weather Service (United States)
NWSPR	National Weather Service Pacific Region

OGP	Office of Global Programs (NOAA)
OIS	Operational Information Service
OPAG	Open Programme Area Group
OPMET	Operational Meteorological Information
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Association
PARTS	Programme to Address ASEAN Regional Transboundary Smoke
PCCWMR	Physics and Chemistry of Clouds and Weather Modification Research
PDF	Portable Document Format
PEACESAT	Pan-Pacific Education and Communication Experiment by Satellite
PMO	Port Meteorological Officer
PROMET	Provision of Meteorological Information Required by Civil Aviation
PWS	Public Weather Services
PWSP	Public Weather Services Programme
QA/SAC	Quality Assurance/Science Activity Centre
RA	Regional Association
RAFC	Regional Area Forecast Centre
RBCN	Regional Basic Climatological Network
RBSN	Regional Basic Synoptic Network
RCC	Regional Climate Centre
RCS	Reference Climatological Station
RHA	Regional Hydrological Advisor
RHAP	Regional Haze Action Plan
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
SADIS	(WAFS) Satellite Distribution System (ICAO)
SBSTA	Subsidiary Body for Scientific and Technological Advice
SBUV	solar backscatter ultraviolet instrument
SCHOTI	Standing Conference of Heads of Training Institutions of National Meteorological Services
SDSIDS	Sustainable Development of Small Island Developing States
SEACAMP	South-East Asian Centre for Atmospheric and Marine Prediction
SEAGOOS	Global Ocean Observing System for the Wider South-East Asian Region
SECS	Secretariat External Communications Strategy
SIDS	Small Island Developing States
SIGWX	Significant Weather
SOLAS	International Convention for the Safety of Life at Sea (IMO)
SOPAC	South Pacific Applied Geoscience Commission
SOOP	Ship-of-Opportunity Programme
SPaRCE	Schools of the Pacific Rainfall Climate Experiment
SPPD	Support for Policy and Programme Development
SPREP	South Pacific Regional Environment Programme
SRDC	Surface Reference Data Center
STAR 4	Satellite Telecommunication and Analysis for Region IV
START	SysTem for Analysis, Research and Training
S-VISSR	Stretched VISSR
TAF	Terminal Aerodrome Forecast
TCC	Tropical Cyclone Committee
TCDC	Technical Cooperation among Developing Countries
TCO	Technical Cooperation
TCOP	Technical Cooperation Programme
TCP	Tropical Cyclone Programme
TCP/IP	Transmission Control Protocol/Internet Protocol

TECO	Technical Conference on Instruments and Methods of Observation
TESAC	Temperature, Salinity and Current Report from a Sea Station
TMRP	Tropical Meteorology Research Programme
TREND	Training, the Environment and New Developments
TRUCE	Tropical Urban Climate Experiment
UBC	Urban and Building Climatology
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNV	United Nations Volunteers
UTC	Universal Time Coordinated
UV	Ultraviolet
VAAC	Volcanic Ash Advisory Centre
VCP	Voluntary Cooperation Programme
VISSR	Visible and Infra-red Spin-Scan Radiometer
VOS	Voluntary Observing Ship
VSAT	Very Small Aperture Terminal
VTL	Virtual Training Library
WAFC	World Area Forecast Centre
WAFS	World Area Forecast System
WCASP	World Climate Applications and Services Programme
WCDMP	World Climate Data and Monitoring Programme
WCP	World Climate Programme
WCRP	World Climate Research Programme
WEFAX	Weather Facsimile Experiment
WG	Working Group
WGCCD	Working Group on Climate Change Detection
WGH	Working Group on Hydrology
WGLTP	Working Group on Long-term Planning
WG/PIW	Working Group on Planning and Implementation of the WWW
WGTMR	Working Group on Tropical Meteorology Research
WHO	World Health Organization
WHYCOS	World Hydrological Cycle Observing System
WMC	World Meteorological Centre
WMO	World Meteorological Organization
WRAP	Worldwide Recurring ASAP Project
WRC	World Radiation Centre
WRC	World Radiocommunication Conference (ITU)
WSSD	World Summit on Sustainable Development
WWAP	World Water Assessment Programme
WWC	World Water Council
WWDR	World Water Development Report
WWRP	World Weather Research Programme
WWW	World Weather Watch
XBT	Expendable Bathythermograph
