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**REGIONAL ASSOCIATION II
(ASIA)**

ITEM: 3

**WORKING GROUP ON PLANNING AND
IMPLEMENTATION OF THE WWW IN REGION II
*Fifth Session***

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**CONSIDERATION OF THE DECISIONS OF XIII- RA II, CBS-EXT.06, CG-XV AND EC-LIX,
INCLUDING REQUIREMENTS FOR WWW SUPPORT TO OTHER PROGRAMMES**

(Submitted by the Secretariat)

Summary and purpose of document

This document provides information on the decision of the above constituent bodies relevant to WWW Programme.

ACTION PROPOSED

The group is invited to take into account the information provided in the document when considering individual agenda items.

**CONSIDERATION OF THE DECISIONS OF XIII- RA II, CBS-EXT.06, CG-XV AND EC-LIX,
INCLUDING REQUIREMENTS FOR WWW SUPPORT TO OTHER PROGRAMMES**

Decisions of the Fifteenth WMO Congress (Cg-XV)

1. Congress appreciated and supported recent proposals of CBS in the context of the operations and development of the future composite GOS which aimed to contribute markedly to alleviating deficiencies in the surface and upper-air data coverage. Congress reaffirmed that GOS should continue its fundamental mission in providing, through coordinated efforts of Members, timely, reliable and consistent meteorological data to meet the national, regional and global requirements. In view of the growing significance of the GOS operations, Congress adopted Resolution 3.1/2 (Cg-XV), see Annex I.
2. Congress noted with appreciation the work of the Executive Council through its Working Group on Antarctic Meteorology (WG AM) in coordinating the implementation of meteorological programmes in the Antarctic. It particularly appreciated that, despite the hostile environmental conditions and the logistic problems, the basic WWW systems and other applications programmes have been implemented at a high degree of sustainability thanks to individual and collective Member's efforts. The Antarctic Basic Synoptic (ABSN) and Antarctic Basic Climatological (ABCN) Networks have been further expanded by inclusion of automatic weather stations (AWSs) together with an increased number of drifters, expanded deployment opportunities, data collection and processing, and sea level measurements on the Antarctic continent. Congress adopted Resolution 3.1.7/1 (Cg-XV), Annex II.
3. Congress strongly urged Members to actively participate in radio frequency activities, especially the preparation of WRC issues, conducted by their national telecommunication administrations, by regional radiocommunication organizations (CEPT for Europe, APT for Asia-Pacific, CITEL for the Americas, PATU and the Arab League for Africa and the Middle East), and by the ITU. It urged Members to involve experts from their Meteorological Services in the work of the ITU Radiocommunication Sector (ITU-R), especially ITU-R Study Group 7 on Science Services and Conference Preparatory Meetings. It requested CBS to pursue the continuous review of regulatory and technical radio-frequency matters and the development of guidance and information materials for NMHSs, and the Secretary-General to ensure that the active role of the Secretariat be pursued as a matter of high priority in coordinating and supporting radio frequency activities. Congress re-affirmed the prime importance of radio frequency matters for meteorological and related environmental operations and research, and adopted Resolution 3.1/2 (Cg-XV), Annex III.
4. Congress recognizing a need to better allow NMSs to work towards target goals for GCOS, to better determine requirements to support other initiatives such as GEOSS and UNFCCC requirements, and to better understand how to optimize efforts given the increasingly integrated nature of WMO observing systems, urged the Secretary-General and Members to support wherever possible observation system and data impact studies with a view to producing software tools that can be used by NMSs to optimize the spatial and temporal design of their observation networks into the future. Congress adopted draft Resolution 3.2.3/1 (Cg-XV), Annex IV.
5. Congress was pleased to note: (a) the regional organization of THORPEX in Regional Associations (RAs) II, IV and VI and the rapid development of the THORPEX partnership in the Southern hemisphere involving countries in RA I, RA III and RA V; (b) the importance of the emphasis placed by THORPEX on social and economic benefits; (c) the strong developing cooperation between THORPEX, WCRP, GEO and IPY. It also endorsed the THORPEX Pacific Asian Regional Campaign (T-PARC) as an important international research activity that would advance understanding of meteorology in the Pacific region and lead to better weather forecasts. Congress adopted draft Resolution 3.3/1 (Cg-XV), Annex V.
6. Congress emphasized that public weather services were the public face of and major channel for, the delivery of immense social and economic benefits to the entire community from all the investments which governments make in meteorological infrastructure and technology. It noted that public weather services were at the cutting edge of the contribution made by NMHSs to

national goals in relation to the safety of life and livelihood, sustainable development, the quality of life, and the preservation of the quality of the environment. Congress recognized that in pursuing these goals, some Members had expanded the scope of their PWS programmes to areas of service delivery related to climate and water due to the recognition of the contribution of PWS to effective dissemination and communication of information in these areas. Congress adopted Resolution 3.4.1/1(Cg-XV), Annex VI.

7. Congress emphasized the importance of the Marine Meteorology and Oceanography Programme, including its traditional activities in areas such as Maritime Safety Services, as well as the new priorities in operational oceanography and the implementation of an integrated ocean observing system for climate, including space-based systems as well as surface and subsurface measurements. Congress requested the WMO Secretary-General and the Co-presidents of JCOMM to work with the IOC to develop mechanisms for enhanced coordination of JCOMM with the Intergovernmental Coordination Groups (ICG) of the different Tsunami Warning and Mitigation Systems, in order to sustain the systems initiated through the IOC as an integral component of a comprehensive multi-purpose global ocean observing system. This coordination should commence initially with the IOC Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System because needs for long term maintenance, data management and archiving have been articulated clearly by Members in that region. Congress adopted Resolution 3.4.4/1 (Cg-XV), Annex VII.

8. Congress recognized that after the disastrous tsunami on 26 December 2004, the setting up of an effective and sustainable tsunami warning system became an important task for riparian countries around the Indian Ocean. In most of these countries, NMHSs were the designated authorities for issuing tsunami warnings. In this regard, Congress requested the Secretary-General to assist Members in establishing multi-hazard early warning systems.

9. Congress emphasized that WMO and National Meteorological and Hydrological Services (NMHSs) contribute to all components of disaster risk reduction, including prevention and mitigation, preparedness, response, recovery and reconstruction. Congress highlighted the need for strengthening partnerships with the users in this sector with the goal to better understand their requirements for meteorological, hydrological and climate services in support of different components of disaster risk reduction. Congress stressed that the central focus of the Programme was to enhance contributions of NMHSs' towards the protection of lives, livelihoods and property through strengthening their capacities and cooperation in disaster risk reduction at national to international levels. Congress urged NMHSs to take proactive action to further strengthen their collaboration with civil protection and disaster risk management authorities and agencies. Congress adopted Resolution 3.9/1 (Cg-XV), Annex VIII.

10. Congress appreciated that a number of guidance documents addressing quality management and the implementation of quality management systems had been developed and made available to Members. It encouraged Members who were planning to, or in the process of implementing, a quality management system (QMS) to make best use of these documents to reduce their development costs and to benefit from the expertise gained by other Members. Congress requested Members to quality control on-site observations and ensure the traceability of measurements to recognized world standards approved for Members' use by WMO. Congress decided to adopt Resolution 7.4/2 (Cg-XV), Annex IX.

11. Concerning the legacy of observing systems established during the IPY, Congress stressed the need to establish a mechanism for early assessment of benefits acquired from new observations in order to prepare for supporting the long-term reinforcement of networks in polar regions. This mechanism should consist of representatives from the main partners involved in IPY as well as representatives of the Group on Earth Observation, GCOS, GOOS, WCRP, the Arctic Council and Antarctic Treaty Consultative Meeting. Congress supported the organization of an IPY legacy workshop in 2008 when detailed information on the implementation of the IPY projects in the field during the first IPY year would be available. In this context, Congress also noted with interest the developing plans for an Integrated Arctic Ocean Observing System (IAOOS) and a Southern Ocean Observing System (SOOS) as an IPY legacy. It supported the direct involvement

of JCOMM in this activity, in view of the important enhancements in the oceanographic and marine meteorological observing networks in the Arctic and Southern Oceans that were likely to be developed. Congress adopted Resolution 9.3/1(Cg-XV), Annex X.

12. Congress agreed to work towards enhanced integration between the WMO observing systems and decided to refer to it as WIGOS (WMO Integrated Observing Systems). Congress identified a number of possible projects that could be used to test concepts, identify problem areas and to help in elaborating the WIGOS over-arching Development and Implementation Plan. These include: Integration of WWW/GOS and GAW, Integration of AMDAR into the GOS, Integration of WHYCOS into WIGOS, Integration of marine meteorological and other appropriate oceanic observations into the WIGOS. See separate working document Doc. 3(2) for details.

Decisions of the Fifty-ninth Executive Council (EC-LIX)

13. The Council noted with appreciation the *Abridged Final Report with Resolutions and Recommendations of the Extraordinary Session (2006) of the Commission for Basic Systems* (WMO-No. 1017) (9-16 November 2006, Seoul, Republic of Korea) and the activities of the Commission. Taking into account the views and directives of Fifteenth Congress, the Council considered the recommendations submitted by the extraordinary session (2006) of CBS concerning the adoption of a positioning reference system for meteorological applications; the review of the *Guide on the Global Observing System*; amendments to the *Manual on the GTS* (WMO-No. 386), the *Manual on Codes* (WMO-No. 306) and the *Manual on the GDPFS* (WMO-No. 485). The recommendations comprised:

- (a) A standard geodetic reference system for 3-D positioning for meteorology;
- (b) Publication of a revised *Guide on the GOS*;
- (c) Updates to telecommunication functions and procedures;
- (d) Amendments to table-driven code forms to meet new requirements;
- (e) Amendments to alphanumeric codes to meet requirements for aeronautical meteorology;
- (f) Amendments related to Ensemble Prediction Systems, Long-range Forecasts activities and Emergency Response Activities;
- (g) Designation of Global Producing Centres for Long-range Forecasts.

The Executive Council recorded its decisions on the recommendations adopted by the session in Resolution 4/4 (EC-LIX), Annex XI.

14. The Council considered the revised list of stations comprising Antarctic Basis Synoptic Network (ABSN) and Antarctic Basis Climatological Network (ABCN) proposed by the ninth session of the WG AM and adopted Resolution 5/2 (EC-LIX), Annex XII, and Resolution 5/3 (EC-LIX), Annex XIII, accordingly.

15. The Council reiterated the importance of sustainable observations from ships and aircraft operating in the Antarctic and adopted Resolution 5/4 (EC-LIX), Annex XIV.

16. The Council noted the progress in implementing new observing systems and technologies in the Antarctic. It stressed the importance of an effective basic synoptic network in the Antarctic and the need to integrate the network with the overall GOS to more fully meet requirements of WWW and other WMO Programmes. Accordingly, it adopted Resolution 5/5 (EC-LIX), Annex XV.

17. To respond growing needs in data quality and availability, by adopting Resolution 5/6 (EC-LIX), Annex XVI, the Council invited Operators running permanently occupied stations in the Antarctic to continue their efforts to keep manned stations running in the long-term, and where possible restore observing programmes that have ceased.

18. The Council stressed the importance of the WCRP/SCAR International Programme for Antarctic Buoys (IPAB) observations in the Antarctic sea-ice zone for the WWW, WCRP, GCOS, GOOS, JCOMM and SCAR and adopted Resolution 5/7 (EC-LIX), Annex XVII.

19. The Council agreed to the WG AM proposal to update the GOS regulatory material related to the Antarctic taking into account developments in observing programmes and adopted Resolution 5/8 (EC-LIX), Annex XVIII.

Res. 3.1/2 (Cg-XV) – GLOBAL OBSERVING SYSTEM (GOS)

THE CONGRESS,

Noting:

- (1) Article 2 of the Convention of the WMO,
- (2) Resolution 6.2/1 (Cg-XV) – WMO Strategic Plan,
- (3) Resolution 3.1/1 (Cg-XV) — World Weather Watch Programme for 2008-2011,
- (4) Resolution 40 (Cg-XII) — WMO policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in meteorological commercial activities,

Considering:

- (1) That GOS is a unique international observing system consisting of surface-based and space-based components owned and operated by Members which provides unique and sustainable observational data and information on the state of the Earth and its atmosphere to meet evolving requirements of various users,
- (2) That GOS is a backbone for the implementation of other WMO observational programmes and projects,
- (3) That investments of Members to the development of GOS have ensured a provision of operational data for weather analysis, forecasts and warnings on the national, regional and global levels,
- (4) That forecasts, warnings and risk assessments of dangerous meteorological phenomena would be more accurate on the basis of GOS data of better quality,
- (5) That GOS ensures a continuous acquisition of Essential Climate Variables for the monitoring and forecasts of climate changes and also can meet the observational requirements of other international initiatives, including GEO,

Reaffirms:

- (1) That sustainable operation of the GOS has a vital role and highest priority for WMO in providing observational data to meet the requirements of weather forecasts and warnings, climate monitoring and other strategic tasks of the Organization;
- (2) The need for strengthening the GOS to meet the evolving requirements of various users and in particular, provision of a timely and reliable information for natural disaster prevention and mitigation;
- (3) That GOS through coordinated efforts of Members should continue its fundamental mission in providing timely, reliable and consistent meteorological data to meet the requirements of various users worldwide and ensure its essential role in the planning and implementation of an integrated WMO global observation system concept;

Urges Members:

- (1) To give all possible support to the implementation of national observational programmes contributing to the GOS;
- (2) To ensure sustainable operation of the GOS and encourage activities with respect to the optimization of observing elements and development and deployment of the advanced composite system; the highest priority should be given to:
 - (a) Maintaining the RBSN and RBCN, with a special emphasis on GSN/GUAN stations which, in accordance with GCOS requirements should provide full and timely data sets to the relevant Global Data Centres;
 - (b) Rehabilitating observing sites in critical locations, with a special attention to the Least Developed Countries and countries not able to keep the pace with the rapid development of technology;
 - (c) Maintaining and, where possible, expanding contributions to the Voluntary Observing Ships scheme;
- (3) To follow guidelines and recommendations contained in the Implementation Plan for Evolution of Space and Surface-Based Sub-systems of the GOS (EGOS-IP), published as WMO/TD-No. 1267 and nominate a national point of contact responsible for reporting progress and plans in their country related to EGOS-IP;

Encourages Members:

- (1) To keep supporting the studies of observation targeting strategies based on the THORPEX, AMMA and IPY results;
- (2) To communicate historical data and metadata from their GCOS network stations to newly established CBS Lead Centres for GCOS;
- (3) Based on the guidance given in the Implementation Plan for Evolution of Space and Surface-Based Sub-systems of the GOS, to pursue, especially in developing countries a wider use of observing systems (satellite, AMDAR, and AWSs) that were less dependent on infrastructure, expertise and funding;
- (4) To increase the use of automatic weather observing systems that enable cost effective real-time measurements, compatible with data from conventional systems, of quality and reliability suitable to all climate conditions;

Invites the regional associations to promote the coordinated implementation of the GOS in the Regions through sustainable functioning of RBSNs/RBCNs and to keep under continuous review related regional requirements;

Requests the Executive Council to continue its review and constructive guidance in the development of the GOS for the benefits of all Members;

Requests the Commission for Basic Systems to pursue its leading role in the technical planning and development of the GOS in close collaboration with CIMO in support of all WMO and related international Programmes;

Requests the Secretary-General:

- (1) To assist Members, within the budgetary resources available, in the implementation of the GOS Programme during the fifteenth financial period;
 - (2) To keep the Members informed of progress and developments in the planning and implementation of the GOS;
 - (3) To promote, in collaboration with Members and private industry, a development of software aimed at the improvement of data quality from automatic observing systems;
 - (4) To submit a report to the Sixteenth World Meteorological Congress on the implementation and development of the GOS with proposals for the future activities.
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Res. 3.1.7/1 (Cg-XIV) - WMO ANTARCTIC ACTIVITIES

THE CONGRESS,

Noting:

- (1) Resolution 6 (Cg-XII) – WMO Antarctic Activities,
- (2) Resolution 10 (EC-LI) - Executive Council Working Group on Antarctic Meteorology,
- (3) The WMO Strategic Plan,

Considering:

- (1) That there is a continuing need for meteorological and other environmental data from the Antarctic for the implementation of the World Weather Watch (WWW) and for monitoring climate change and the ozone layer over the Antarctic,
- (2) That there is a continuing need to coordinate meteorological programmes in the Antarctic;
- (3) The important contribution of Antarctic observing networks to the objectives of the WMO/IOC/UNEP/ICSU Global Climate Observing System (GCOS);

Invites Members, particularly those which are Parties to the Antarctic Treaty:

- (1) To continue and expand their meteorological programmes in the Antarctic and in particular, link to the activities of International Polar Year 2007-09 and ensure subsequent continuity of activities;
- (2) To participate in the deployment of new observing and telecommunication systems in the Antarctic;
- (3) To provide additional observations in the Antarctic by using automatic weather stations and geophysical observatories on land, by recruiting additional voluntary observing ships, by equipping aircraft with appropriate instrumentation and by deploying drifting buoys at sea and on the ice;
- (4) To consider the possibility of cooperating with other Members in sharing the costs of re-opening and operating previously functioning stations;

Requests the Executive Council to promote the coordination of meteorological activities in the Antarctic:

- (1) By maintaining a Working Group on Antarctic Meteorology;
- (2) By arranging that recommendations of the working group be transmitted to Members that are Parties to the Antarctic Treaty for information and comments;
- (3) By maintaining close collaboration with other international organizations concerned such as the Antarctic Treaty Consultative Meeting (ATCM), the Scientific Committee for

Antarctic Research (SCAR), the Council of Managers of National Antarctic Programmes, and the Intergovernmental Oceanographic Commission (IOC);

- (4) By ensuring that WMO Antarctic Activities are consistent with the WMO Strategic Plan 2008-2011 adopted under Resolution 6.2/1 (Cg-XV), with its major contributions focussed on the following expected results (ER):

ER-I Enhanced capabilities of members to produce better weather forecasts and warnings;

ER-II Enhanced capabilities of Members to produce better climate predictions; and assessments;

ER-IV Integration of WMO Observing Systems;

Requests the Secretary-General to maintain close liaison with the Antarctic Treaty Consultative Meeting (ATCM) and ensure, within the available resources, representation of the Working Group on Antarctic Meteorology at ATCM and other related international meetings.

Res. 3.1/2 (Cg-XV) - RADIO FREQUENCIES FOR METEOROLOGICAL AND RELATED ENVIRONMENTAL ACTIVITIES

THE CONGRESS,

NOTING:

- (1) The WMO Strategic Plan and the Millennium Development Goals,
- (2) Resolution 3 (Cg-XIV) – Radio-frequencies for meteorological and related environmental activities,
- (3) The current radio frequency allocations and regulatory provisions related to the meteorological aids, meteorological satellite, Earth exploration-satellite and radiolocation (weather and wind profiler radars) services in the Radio Regulations of ITU,
- (4) The outcome of the ITU World Radiocommunication Conferences (especially WRC-2000 and WRC-03),
- (5) The agenda of the forthcoming ITU World Radiocommunication Conference (WRC-07) and related WMO positions submitted during the ITU preparatory process,

CONSIDERING:

- (1) The prime importance of the specific radiocommunication services for meteorological and related environmental activities required for the prevention, detection, early warning and mitigation of natural and technological (man-made) disasters, the safety of life and property, the protection of the environment, climate change studies and scientific research,
- (2) The importance of information provided by the Earth-exploration systems including meteorological systems for a wide range of economic activities such as agriculture, transportation, construction, tourism, etc,
- (3) The crucial importance of the allocation of suitable radio-frequency bands for the operation of surface-based meteorological observing systems, including in particular radiosondes, weather radars, wind profiler radars,
- (4) The crucial importance of the allocation of suitable radio-frequency bands for the operation of Meteorological and R&D satellites, including remote sensing, data collection and data distribution links,

STRESSING that some radio-frequency bands are a unique natural resource due to their special characteristics and natural radiation enabling spaceborne passive sensing of the atmosphere and the Earth surface, that deserve adequate allocation to the Earth exploration satellite service (passive) and absolute protection from interference,

EXPRESSES its serious concern at the continuing threat to several frequency bands allocated to the meteorological aids, meteorological satellite, Earth exploration-satellite and radiolocation (weather and wind profiler radars) services posed by the development of other radiocommunication services;

REQUESTS the Commission for Basic Systems to pursue the continuous review of regulatory and technical matters related to radio-frequencies for operational and research meteorological and related environmental activities, and preparation of guidance and information for NMHSs, in coordination with

other technical commissions, especially CIMO, and in liaison with other relevant international bodies, in particular the Coordination Group for Meteorological Satellites;

URGES all Members to do their utmost to ensure the availability and protection of suitable radio frequency bands required for meteorological and related environmental operations and research, and in particular:

- (1) To ensure that their national radiocommunication administrations are fully aware of the importance of and requirements for radio frequencies for meteorological and related activities, and to seek their support in the ITU World Radiocommunication Conferences and Radiocommunication Sector activities;
- (2) To participate actively in the national, regional and international activities on relevant radiocommunication regulatory issues and, in particular, to involve experts from their Services in the work of relevant regional radiocommunication organizations and of ITU-R, especially ITU-R Study Group 7 on Science Services;
- (3) To register adequately with their national radiocommunication administrations all radiocommunication stations and radio frequencies used for meteorological and related environmental operations and research;

APPEALS to ITU and its Member Administrations:

- (1) To ensure the availability and absolute protection of the radio-frequency bands which, due to their special physical characteristics, are a unique natural resource for spaceborne passive sensing of the atmosphere and the Earth surface; In this regard, the exclusive 23.6 - 24 GHz passive band that is associated with a water vapour absorption line is of crucial importance for weather, water and climate research and operations;
- (2) To give due consideration to the WMO requirements for radio frequency allocations and regulatory provisions for meteorological and related environmental operations and research;
- (3) To pay special attention to the WMO positions related to WRC-07 agenda, in the light of Appeals (1) and (2) above;

REQUESTS the Secretary-General:

- (1) To bring this resolution to the attention of all concerned, including the International Telecommunication Union;
 - (2) To pursue as a matter of high priority the coordination role of the Secretariat in radio frequency matters, especially with ITU-R, including participation of WMO in ITU-R Radiocommunication Study Groups, conference preparatory meetings and World Radiocommunication Conferences;
 - (3) To facilitate the coordination between National Meteorological and Hydrological Services and their national radiocommunication administrations, particularly in preparing the ITU World Radiocommunication conferences, by providing appropriate information and documentation;
 - (4) To assist the Commission for Basic Systems in the implementation of this resolution.
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Res. 3.2.3/1 (Cg-XV) - GLOBAL CLIMATE OBSERVING SYSTEM (GCOS)

THE CONGRESS,

Noting:

- (1) The 1998 Memorandum of Understanding (MoU) between WMO, IOC of UNESCO, UNEP, and ICSU concerning the Global Climate Observing System,
- (2) The Terms of Reference for GCOS National Coordinators (Annex XII of *Summary Report of the Eleventh Session of the WMO-IOC-UNEP-ICSU Steering Committee for GCOS*, GCOS-87, WMO/TD-No. 1189),
- (3) Resolution 9 (Cg-XIV) - GCOS Climate Monitoring Principles,
- (4) Resolution 10 (Cg-XIV) - Global Climate Observing System,
- (5) Decisions 11/CP.9 – Global observing systems for climate, and 5/CP.10 - Implementation of the global observing system for climate, of the Ninth and Tenth Sessions, respectively, of the Conference of the Parties to the UN Framework Convention on Climate Change (UNFCCC),
- (6) The *Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC* (GCOS-92, WMO/TD-No. 1219),
- (7) *Systematic Observation Requirements for Satellite-based Products for Climate* (GCOS-107, WMO/TD-No. 1338),
- (8) *Climate Information for Development Needs: An Action Plan for Africa – Report and Implementation Strategy* ('ClimDev Africa', GCOS-108, WMO/TD-No. 1358),
- (9) Decision on 'Climate Change and Development in Africa', African Union Assembly/AU/Dec.134 (VIII), January 2007,

Considering:

- (1) The increasing needs of Members and international organizations for comprehensive, continuous, reliable climate and climate-related data and information in support of:
 - (a) Climate system monitoring;
 - (b) Climate change detection and attribution;
 - (c) Research to improve understanding, modelling and prediction of the climate system;
 - (d) Operational climate prediction on seasonal-to-interannual timescales;
 - (e) Assessment of the impacts of, and vulnerability and adaptation to, natural climate variability and human-induced climate change;
 - (f) Applications and services for sustainable economic development;
 - (g) Requirements of the UNFCCC and other international conventions and agreements,

- (2) The specific observational needs of the WCRP, the IGBP, the IHDP and Diversitas; the requirements for comprehensive observations in support of the assessment processes of the IPCC,
- (3) The objectives of GCOS as identified in the MoU to support all aspects of the World Climate Programme and relevant aspects of other climate-related global programmes, and its essential role in underpinning the full range of climate applications and services provided by NMHSs and other organizations,,
- (4) The deficiencies, and in many parts of the world the decline, in the number and availability of systematic observations of climate,
- (5) The need to implement and, as necessary, to update the Regional Action Plans developed through the GCOS Regional Workshop Programme,
- (6) The need to incorporate climate information into social and economic decision-making, particularly in support of the Millennium Development Goals in developing countries, with a special focus on Africa,

Recognizing:

- (1) The importance of efficient coordination and interoperability across the various component observing systems of GCOS and effective integration of *in situ* and space-based observations in meeting user needs,
- (2) The unique opportunities for coordinated national and international observation of Essential Climate Variables across the atmospheric, oceanic and terrestrial domains provided through the joint sponsorship of GCOS by WMO, IOC, UNEP and ICSU,
- (3) The new opportunities for increased international support, enhanced interoperability, and improved integration opened up by the prospect of embedding the GCOS system of systems within the emerging operational structure of the Global Earth Observation System of Systems,

Recognizing with appreciation:

- (1) The important contribution of the GCOS Steering Committee and its Panels in providing scientific and technical guidance to WMO and other sponsoring and participating organizations for the planning, implementation and further development of GCOS,
- (2) The critical role of the Executive Council, technical commissions and regional associations in coordinating the implementation of the WMO component systems of GCOS,
- (3) The substantial achievements of Members in implementing their climate observing systems in support of both national needs and the international objectives of GCOS,
- (4) The close collaboration among the co-sponsors of GCOS and with the Steering Committees and Secretariats of their other jointly-sponsored observing systems, GOOS and GTOS,
- (5) The support provided by a range of other national and international organizations for GCOS planning and implementation and, in particular, the support of the African Union, the UN Economic Commission for Africa, the UK Department for International Development, and the African Development Bank for the ClimDev Africa Programme,

Reaffirms WMO's continuing strong commitment to the objectives of GCOS and support for its implementation in order to meet the full range of user needs;

Decides to maintain GCOS as a priority programme of the Organization, in partnership with IOC, UNEP and ICSU and such other international sponsors as might be agreed by the Executive Council;

Urges Members:

- (1) To strengthen their national atmospheric, hydrological and related oceanic and terrestrial climate observing networks and systems within the framework of GCOS and in support of user needs;
- (2) To assist developing country Members to strengthen their observing networks, to improve their capacity to acquire climate-relevant data, and to enhance their provision of climate services by implementing projects in the ten GCOS Regional Action Plans, and by contributing to the implementation of the ClimDev Africa Programme and to similar initiatives in other regions;
- (3) To submit, if they have not already done so, historical daily data from all GCOS Surface Network (GSN) stations to the GSN archive, in digital form where possible;
- (4) To ensure, to the extent possible, the long-term continuity of the critical space-based components of GCOS, including the generation and dissemination of the satellite-based climate data and products based on the Essential Climate Variables that are required to meet the needs of the UNFCCC;
- (5) To establish GCOS National Committees and to identify GCOS National Coordinators in order to facilitate coordinated national action on observing systems for climate, taking into account the joint international sponsorship of GCOS and the evolving international arrangements for GEOSS;
- (6) To ensure that their delegations to sessions of the UNFCCC/COP and its subsidiary bodies are properly informed of the key role played by NMHSs in implementing and operating observing systems necessary to meet national obligations under the Convention, for example through the inclusion in national delegations of representatives of NMHSs;
- (7) To encourage their NMHSs to provide effective leadership in the preparation of national reports to the UNFCCC on their activities with regard to systematic observation of the global climate system, including the identification of gaps, using revised UNFCCC reporting guidelines on global climate observing systems which reflect the priorities of the 2004 Implementation Plan and which incorporate reporting on the Essential Climate Variables identified therein;
- (8) To enhance their support to the GCOS Secretariat, through secondment of experts and/or contributions to the Climate Observing System Fund or to specific planning and implementation mechanisms, so as to enable the Secretariat to and support the full range of implementation agents in their efforts to establish an effectively-operating GCOS;

Requests the Executive Council:

- (1) To keep the progress of GCOS under regular review and to provide support and guidance on its further development and implementation;
- (2) To advise and assist Members, sponsoring bodies, and other international organizations in the implementation of global observing systems for climate;

Requests the technical commissions:

- (1) To lead the development and implementation of the networks for which they are responsible in the light of advice and guidance from the GCOS Steering Committee;

- (2) To contribute to the UNFCCC 5-year 'Nairobi Work Programme on Impacts, Vulnerability, and Adaptation to climate change', in particular to the elements of the programme related to data and observations;

Requests the regional associations:

- (1) To foster effective, coordinated implementation of GCOS at the regional level, in close consultation with the regional counterparts of the other international sponsors of GCOS;
- (2) To undertake efforts to assist Members in providing effective leadership in the preparation of national reports to the UNFCCC on their activities with regard to systematic observation of the global climate system;

Requests the GCOS Steering Committee to continue to provide broadly-based strategic advice and guidance to all relevant WMO bodies on the implementation and further development of GCOS;

Requests in particular the GCOS Steering Committee and the technical commissions to continue their interaction and cooperation in the further development and implementation of GCOS;

Requests the Secretary-General, as appropriate and within the programme and budget approved by Congress, and using whatever access might be possible to additional external funding mechanisms:

- (1) To support the further planning, development and implementation of GCOS, including the actions in response to the needs of the UNFCCC/COP and the recommendations of the 2004 Implementation Plan;
 - (2) To encourage and assist Permanent Representatives of Members to take the lead in the establishment of GCOS National Committees and the designation of GCOS National Coordinators;
 - (3) To articulate, at all appropriate fora, the need for broad support by nations of the observational and resource requirements for implementing GCOS;
 - (4) To provide all support possible for the work of the GCOS Steering Committee and its Panels and Secretariat.
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Res. 3.3/1 (Cg-XV) – ATMOSPHERIC RESEARCH AND ENVIRONMENT PROGRAMME

THE CONGRESS:

Noting:

- (1) The *Abridged Final Report with Resolutions and Recommendations of the Fourteenth Session of the Commission for Atmospheric Sciences* (WMO-No. 1002),
- (2) Resolution 10 (Cg-XII) - Atmospheric Research and Environment Programme, and related actions taken by Fourteenth Congress and Executive Council,
- (3) Resolution 12 (Cg-XIV) - THORPEX: A Global Atmospheric Research Programme,
- (4) The WMO Strategic Plan: 2008-2011 - Atmospheric Research and Environment Programme,
- (5) That the skilful prediction of high-impact weather is one of the greatest scientific and societal challenges of the twenty-first century,
- (6) The Vienna Convention for the Protection of the Ozone Layer, the Montreal Protocol on Substances that Deplete the Ozone Layer and its subsequent amendments, the United Nations Framework Convention on Climate Change and the United Nations Economic Commission for Europe Convention on Long Range Transboundary Air Pollution and other environment-oriented conventions,

Considering:

- (1) The heightened public awareness and concerns for global, regional and local climate, weather and environmental issues in general,
- (2) That a major task of NMHSs is weather prediction and, in particular, forecasting events with high societal and economic impacts,
- (3) The responsibility of WMO within the United Nations system to provide the authoritative scientific voice on the state and behaviour of the atmosphere, weather and climate of our planet,
- (4) The central role played by the atmosphere in environmental issues, which has been foremost among societal concerns during the past years and will continue well into this century, such as, the global increase of greenhouse gases and effect of aerosols on weather and climate, stratospheric ozone depletion and related increase in ultraviolet radiation, long range pollutant transport, air quality and impacts of pollutant deposition,
- (5) The increasing demand by numerical weather prediction (NWP) research and operations for support in adding aerosols, ozone and their gaseous precursors to improve forecasting accuracy as well as enhance products and services,
- (6) The increasing need to move towards environmental predictions, using as a core driver the traditional NWP systems, coupled with other modelling subsystems, with a consideration of the socio-economic impacts, as distinct from strictly traditional weather-only predictions,
- (7) The implementation of the WMO Global Atmosphere Watch (GAW) Programme with the mission of taking into account the Integrated Global Atmospheric Chemistry Observations (IGACO) strategy to: reduce environmental risks to society and meet the requirements of environmental conventions; strengthen capabilities to predict climate, weather and air

quality; contribute to scientific assessments in support of environmental policy; through maintaining and applying global, long-term observations of the chemical composition and selected physical characteristics of the atmosphere; emphasizing quality assurance and quality control; delivering integrated products and services of relevance to user needs,

- (8) The focus of the GAW integrated atmospheric chemistry observations is primarily on greenhouse gases, ozone, UV, aerosols, selected reactive gases and precipitation chemistry with additional support for other IGACO variables,
- (9) The potential of the National Meteorological and Hydrological Services (NMHSs) to contribute substantially to integrated observations via their extensive monitoring system infrastructures and specific scientific expertise in areas such as numerical modeling with four-dimensional data assimilation techniques and real-time data delivery,
- (10) That greenhouse gases, aerosols and ozone are designated “Essential Climate Variables (ECVs)” in the GCOS Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC and that the GAW Global CO₂ and CH₄ Monitoring Network is a comprehensive network of GCOS,
- (11) The international coordination role of WMO in environmental issues that are becoming more extensive and complex not only because of greater activity levels, but also because of the need to encompass a broader range of scientific disciplines (meteorology, atmospheric chemistry, hydrology, oceanography, biosphere sciences and human health) and partner organizations in the resolution of sustainable environmental development issues,
- (12) That the Thirteenth Congress and CAS-XIV concurred with the need for the GAW Urban Research Meteorology and Environment (GURME) activities aimed at improving air quality forecasting, expansion of GAW measurements and strengthening partnerships of NMHSs with key sectors including health,
- (13) That despite the substantial increase in the forecast skill achieved by improvements in atmospheric observing technology, data-assimilation methods, new numerical model formulations, the use of ensemble techniques, the ability to forecast high impact weather events still falls below that required by society,
- (14) The decision of CAS-XIV and its Management Group to develop and implement, under the CAS Open Programme Area Group on World Weather Research Programme (WWRP), a strategic plan for a new WWRP that integrates WMO Member activities in THORPEX, tropical meteorology, mesoscale weather forecasting, nowcasting, verification and societal and economic benefits with those of partners in global forecast research and Earth observations,
- (15) The need of NMHSs for support in practicing sound weather modification research,

Decides:

- (1) That the substance of the Atmospheric Research and Environment Programme shall comply with the WMO Strategic Plan 2008-2011 adopted under Resolution 6.2/1 (Cg-XV), with its major contributions focused on the following Expected Results:
 - 1 Enhanced capabilities of Members to produce better weather forecasts and warnings;
 2. Enhanced capabilities of Members to provide more accurate climate predictions and assessments
 4. Integration of WMO observing systems;
 6. Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness;

7. Enhanced capabilities of Members to provide and use weather, climate, water and environmental applications and services
 8. Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations
 9. Enhanced capabilities of Members in developing countries, particularly Least Developed Countries, to fulfil their mandates;
- (2) That AREP should focus on: WWRP including THORPEX; GAW including IGACO implementation; and the related transfer of appropriate technology and proven methodologies among Members as indicated in the WMO Strategic Plan 2008-2011;
 - (3) That education and training aspects be included in all components of the Atmospheric Research and Environment Programme (AREP);
 - (4) That, in the implementation of AREP, WMO should continue to cooperate, as appropriate, with the United Nations Environment Programme (UNEP), the World Health Organization (WHO), the United Nations Development Programme (UNDP) and other relevant agencies;

Requests Members:

- (1) To give all possible support to the implementation of AREP, with high priority to GAW and WWRP including THORPEX, for example through contributions to the appropriate trust fund such as the THORPEX trust fund;
- (2) To support the central role of GAW in the development of a WMO Integrated Global Observing System;

Requests the president of CAS:

- (1) To arrange for the development and implementation of WMO activities in GAW and WWRP including THORPEX using technical strategic plans;
- (2) To encourage CAS Members to participate in and contribute to THORPEX, and its Trust Fund, and to facilitate the activities of the International Core Steering Committee for THORPEX;
- (3) To coordinate activities in the implementation of AREP with other relevant WMO Programmes, in particular WCRP and international organizations;
- (4) To ensure that CAS continues to assist Members through the CAS Expert Team on Weather Modification in practicing sound weather modification research;
- (5) To arrange provision of assistance and advice with respect to the Education and Training Programme;
- (6) To stimulate and coordinate socio-economic research and development activities and studies to increase the value of environmental prediction outputs for the benefit of WMO members;

Requests the Executive Council:

- (1) To take, within available budgetary resources, all necessary actions towards the fullest possible implementation of AREP, in accordance with the WMO Strategic Plan: 2008-2011;
- (2) To support the work of CAS, and other bodies concerned, in the development of component programmes of AREP;

- (3) To continue its coordinating role regarding GAW and WWRP with other relevant WMO activities through the CAS Open Programme Area Groups on Environmental Pollution and Atmospheric Chemistry and on the World Weather Research Programme.

Requests the Secretary-General:

- (1) To take all necessary action, within available budgetary resources, for the implementation of the programme;
 - (2) To support the THORPEX international programme office, to assist WMO Members in the international coordination of THORPEX, and to assist Members from developing nations in their utilization of THORPEX-related forecast products;
 - (3) To devote particular attention to the education and training aspects of AREP;
 - (4) To assist Members participating in the programme, particularly developing Member countries, by facilitating the training and exchange of scientists, and the provision of advice, guidance, and services, as required, within available budgetary resources;
 - (5) To take all necessary actions to develop and maintain collaboration of WMO through AREP with agencies, groups and institutions such as GEO, ICSU, UNEP, UNDP and others, which can contribute to the further development and implementation of the research based programmes of AREP and to seek further financial support from such agencies and other national and international institutions and from Members.
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Res. 3.4.1/1 (Cg-XV) — PUBLIC WEATHER SERVICES PROGRAMME

THE CONGRESS,

Noting:

- (1) Resolution 13 (Cg-XIV) - Public Weather Services,
- (2) Resolution 28 (Cg-XIV) - Role and Operation of National Meteorological and Hydrological Services,
- (3) The *Abridged Final Report with Resolutions of the Fifty-eighth Session of the Executive Council* (WMO-No. 1007),
- (4) The *Abridged Final Report with resolutions and Recommendations of the Extraordinary Session (2006) of the Commission for Basic Systems* (WMO-No. 1017),

Considering:

- (1) That the provision of PWS is one of the most fundamental functions of NMHSs and an important channel through which national communities can benefit from the work of the NMHS,
- (2) That there is an increasing demand on NMHSs for accurate, timely and understandable warnings and forecasts for the safety of life and protection of property and for contribution to sustainable development,
- (3) That there is continuing need to strengthen the capability of Members' capability to deliver high quality services,
- (4) That the ability of decision makers to understand and translate warnings into effective actions is an essential component for the achievement of disaster risk reduction,

Decides that the substance of the PWSP be as indicated in WMO Strategic Plan (2008-2011) adopted under Resolution 6.2/1 (Cg-XV);

Urges Members:

- (1) To continue to collaborate and support the implementation of the PWSP and take all possible steps to strengthen their national PWS through ensuring effective service delivery and raising the level of public awareness of, and response to, these services;
- (2) To improve coordination and communication with user communities and stakeholders;
- (3) To measure the contribution of PWS to the social and economic benefits provided to users through the work of NMHSs, and demonstrate such benefits to governments with the aim of securing due support for NMHSs;

Requests the Secretary-General:

- (1) To continue to assist Members in their efforts to implement PWS activities at the national level and in particular to give high priority to training requirements;
 - (2) To ensure the further development and implementation of the PWSP, and that the Programme is enabled to contribute fully to the realization of the WMO Strategic goals across the areas of weather, water and climate;
 - (3) To coordinate the relevant WMO Programmes to contribute effectively to the objectives of the PWSP and to promote collaboration with relevant international organizations.
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Res. 3.4.4/1 (Cg-XV) – MARINE METEOROLOGY AND OCEANOGRAPHY PROGRAMME

THE CONGRESS,

Noting:

- (1) Resolution 16 (Cg-XIV) – Marine Meteorology and Oceanography Programme,
- (2) The *Abridged Final Report with Resolutions and Recommendations of the Second Session of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology* (WMO-No. 995),
- (3) Recommendation 2 (JCOMM-II) – The Development of Operational Oceanographic Products and Services under JCOMM,
- (4) The request by EC-LVIII, paragraph 3.4.4.2 to the JCOMM to continue working in the ongoing WMO priority areas, including the new area of tsunami monitoring and mitigation systems and services, in close cooperation with the various Intergovernmental Coordination Groups for the Tsunami Warning and Mitigation Systems of IOC,

Considering:

- (1) That a continuing concerted effort by National Meteorological Services is needed, in association with national oceanographic agencies and institutions as appropriate, in order that marine meteorological and oceanographic services meet national, regional and international requirements,
- (2) That the provision of marine meteorological and oceanographic services contribute substantially to national economies as well as being essential to safety of life at sea,
- (3) That these goals, as well as supporting global ocean and climate monitoring and research programmes, require a multi-disciplinary ocean data management, in accordance with the international standards for processing, quality control and archiving,
- (4) That these targets can only be achieved by continuing and enhancing collaborations with international organizations and other entities representing users' interests, such as the IMO, IHO, OGP, ICS, INTERCARGO AND INTERTANKO, etc.,
- (5) That these goals should be addressed through application of a vigorous training and capacity building strategy based on different stages of development that, appropriately applied to each Member, result in a fully functioning suite of met-ocean services satisfying national, regional and international needs,
- (6) That progress in developing and implementing marine meteorological and oceanographic products and services will be achieved through best use of adequate technology and opportunities such as *in situ* met-ocean data, emerging remote sensing platforms, and operational models,
- (7) That the Marine Meteorology and Oceanography Programme (MMOP) has an important role to play in WMO cross-cutting activities such as WMO Information System (WIS), Disaster Prevention and Mitigation (DPM), and support for Least Developed Countries and the Small Island Developing States, for whom marine resources are a key development factor, as well as in assess coastal vulnerability to marine-related hazards,
- (8) That present Members' contributions to the implementation of the initial global observing system for climate constitute only about 58% of what is needed, and that global coverage

by the component ocean systems cannot be achieved with the level of resources presently being contributed,

Decides:

- (1) That the substance of the Marine Meteorology and Oceanography Programme shall comply with the WMO Strategic Plan for 2008-2011 adopted under Resolution 6.2/1 (Cg-XV), with its major contributions focused on the following Expected Results:
 - I. Enhanced capabilities for Members to produce better weather forecasts and warnings;
 - II. Enhanced capabilities for Members to provide better climate predictions and assessments;
 - IV. Integration of WMO observing systems;
 - V. Development and implementation of the new WMO Information System (WIS);
 - VI. Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness;
 - VII. Enhanced capabilities for Members to provide and use weather, climate, water and environmental applications and services;
 - VIII. Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations;
 - IX. Enhanced capabilities of Members in developing countries, particularly least developing countries, to fulfil their mandates;
- (2) That detailed planning and implementation of the MMOP should form an integral part of the new WMO Strategic Plan, in accordance with the above Expected Results, and assist Members to arrange for enhanced services provision, including:
 - (a) New operational ocean forecast and warning systems, to be developed in close coordination with users;
 - (b) Regional tsunami warning systems, in coordination with Members concerned and within the Intergovernmental framework and structures established by IOC;
 - (c) Maintenance and operation strategies for these systems, in coordination with Members concerned;
- (3) That the MMOP should be strengthened and expanded to address new and urgent challenges and issues, especially on Disaster Risk Reduction and associated marine hazard dimensions of Coastal Management in collaboration with IOC;
- (4) That additional funding be sought, from within the budget framework approved by Cg-XV and extrabudgetary resources, for high-priority activities in the field of training, capacity building and support for Least Developed Countries and Small Island Developing States;

Requests the Executive Council, with the assistance of the JCOMM and other relevant technical commissions, and regional associations, to promote, guide, and assist in the implementation of the MMOP, and to seek additional extrabudgetary support for the Secretariat for JCOMM. In the event funds become available through donor contributions, the Executive Council should consider requesting the Secretary-General to establish a trust fund or other appropriate mechanism that can be used for ocean observing system maintenance;

Urges Members concerned to collaborate actively, by making time and expertise of their staff available, and by giving all possible support, both direct resources and in-kind, to the implementation of the MMOP and the work of JCOMM through:

- (1) Strengthening their marine meteorological and oceanographic services, including both basic services in support of the safety of life and property at sea as required under SOLAS, and also specialized services for various marine user groups;
- (2) Continuing and/or expanding their contribution to met-ocean data collection and archival, including associated metadata, making use of modern telecommunication facilities for the collection and dissemination of information, within the concept and developing structure of the WMO Information System;
- (3) Expanding the application of remotely-sensed ocean data to the provision of services and to global climate studies, and assisting developing countries to access and make best use of these data;
- (4) Assisting developing countries to fulfil their responsibilities under, and gain full benefit from, the Marine Meteorology and Oceanography Programme, in particular through strengthening specialized training facilities and programmes in marine meteorology and oceanography;
- (5) Facilitating national involvement in the JCOMM through support and encouragement of experts and relevant officers to participate in and contribute to intersessional activities, such as the work of the JCOMM expert teams and main subsidiary bodies, or national activities being developed or undertaken in support of the JCOMM work programme;
- (6) Using part of the resources obtained by the marine meteorology and oceanography services providers in local programmes of research and enhancement of services;
- (7) Supporting the implementation of regional demonstration projects promoted by the WMO and IOC, in areas such preparedness for marine coastal hazards as part of Integrated Coastal Area Management, in particular, in case of extreme events (e.g., storm surges, and high and/or long waves), as well as the analysis of the impacts of oceanic response to climate variability and change;
- (8) Increasing their contributions to the implementation of the initial global ocean observing system, and managing such contributions in cooperation with JCOMM;

Requests the Co-presidents of JCOMM:

- (1) To ensure that the Commission takes the lead in satisfying the technical needs of Members in the area of marine meteorology and oceanography, including by continuing its policy of preparing and updating guidance material in various aspects of marine meteorology and oceanography management, through the collaborative efforts of its experts;
- (2) To continue the efforts of the Commission in enhancing the collaboration between WMO and IOC in the field of marine meteorology and oceanography;
- (3) To arrange for contributions from the JCOMM to other WMO Programmes, as appropriate;

Requests the Secretary General:

- (1) To assist in the implementation of the programme, and in particular, to give high priority to training and capacity building requirements;
- (2) To foster the overall integration of the programme in the cross-cutting activities of the WMO, in accordance with the Strategic Plan for WMO;

- (3) To arrange for the coordination of activities under the MMOP, with relevant programme activities of the IOC and other international organizations, in particular to coordinate the sustained observing platform and data delivery operations of the international tsunami warning systems, through JCOMM, as integral components of a comprehensive global ocean observing system;
 - (4) To work with Members and space agencies to ensure better continuity and overlap of relevant space-based and in situ ocean observing systems, and to move experimental observing systems into operational status;
 - (5) To assist in the implementation of these activities;
 - (6) To seek for further enhancement of cooperation between the MMOP and other WMO Programmes and technical commissions;
 - (7) To seek extrabudgetary resources, as necessary, to facilitate the implementation of the programme and the work of the JCOMM;
 - (8) To bring this resolution to the attention of all concerned.
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Res. 3.9/1 (Cg-XV) — NATURAL DISASTER PREVENTION AND MITIGATION PROGRAMME

THE CONGRESS,

Noting:

- (1) The *Abridged Final Report with Resolutions of the Fourteenth World Meteorological Congress* (WMO-No. 960), general summary paragraphs 7.4.1 to 7.4.21 and 3.4.1.23, and Resolution 29 (Cg-XIV) — Natural Disaster Prevention and Mitigation Programme,
- (2) The *Abridged Final Report with Resolutions of the Fifty-sixth Session of the Executive Council* (WMO-No. 977), general summary paragraphs 11.1 to 11.13, Resolution 5 (EC-LVI) — Executive Council Advisory Group on Natural Disaster Prevention and Mitigation, and Annex 4 to paragraph 3.9.5 – Revised Implementation Plan 2005 – 2007,
- (3) The *Abridged Final Report with Resolutions of the Fifty-seventh Session of the Executive Council* (WMO-No. 988), general summary paragraphs 3.9.1 to 3.9.13, and Resolution 9 (EC-LVII) — Natural Disaster Prevention and Mitigation,
- (4) The *Abridged Final Report with Resolutions of the Fifty-eighth Session of the Executive Council* (WMO-No. 1007), general summary paragraphs 3.9.1 to 3.9.20,
- (5) The Report of the Second Session of the Executive Advisory Group on Disaster Prevention and Mitigation,
- (6) The outcome documents of the World Conference on Disaster Reduction (Kobe, Hyogo, Japan, 18-22 January 2005), including the Hyogo Declaration and the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (HFA),
- (7) The IPCC Fourth Assessment Reports,

Noting further:

- (1) That disasters pose a serious threat to safety, security and sustainable development,
- (2) The increasing concern within the international community on issues relating to disaster risk reduction,
- (3) The significant loss of life and property associated with weather-, water- and climate-related hazards,
- (4) The potential increase in hydrometeorological disasters associated with climate variability and change,
- (5) The critical role of WMO and NMHSs in all components of disaster risk reduction,

Stressing that investment in meteorological, hydrological and climate services is critical to protection of life, livelihood, property and achievement of sustainable development,

Considering:

- (1) That the WMO DPM Programme is a crosscutting Programme spanning WMO Programmes, technical commissions, regional associations and the Secretariat,
- (2) That successful implementation of the Programme requires a clear programmatic focus, effective governance and strong cooperation at national to international levels,
- (3) That the name, "WMO Natural Disaster Prevention and Mitigation Programme," may not adequately reflect the complete scope of activities of WMO and NMHSs in disaster risk reduction,

Reaffirming that protection of lives, livelihoods and property are a key strategic thrust of WMO,

Recognizing the strengthened International Strategy for Disaster Risk Reduction (ISDR) System as the primary collaboration mechanism across the United Nations System and other international and regional agencies and networks involved in disaster risk reduction,

Decides that the implementation of the Natural Disaster Prevention and Mitigation Programme should comply with the WMO Strategic Plan 2008-2011, adopted under Resolution 6.2/1 (Cg-XV), with its major contributions focused on the following Expected Results:

- VI: Enhanced capabilities of Members in multi-hazard early warning and disaster prevention and preparedness;
- VII: Enhanced capabilities of Members to provide and use weather, climate, water and environmental applications and services;
- VIII: Broader use of weather, climate and water outputs for decision-making and implementation by Members and partner organizations;
- IX: Enhanced capabilities of Members in developing countries, particularly Least Developed Countries, to fulfil their mandates;

Requests Executive Council:

- (1) With the assistance of technical commissions and regional associations to prioritize and provide further guidance for the implementation of the Programme in line with the WMO Strategic Plan 2008-2011, during the intersessional period;
- (2) To re-establish with updated Terms of Reference, its EC Advisory Group on Disaster Risk Reduction;

Requests presidents of technical commissions to coordinate inter-commission projects and activities to meet WMO Strategic Goals in disaster risk reduction;

Requests presidents of regional associations, to ensure that regional association's strategic plans are aligned with the regional components of Hyogo Framework for Action and with WMO's Strategic Goals in disaster risk reduction;

Requests the Secretary-General, in reference to the DPM Programme vision statement, strategic goals and in response to Members' requirements and priorities:

- (1) To give high priority to the implementation of the Programme within available budgetary resources;
- (2) To ensure that the Programme is implemented with clear roles and responsibilities among WMO Programmes, technical commissions, regional associations, Members and external partners to better leverage their resources, capacities and expertise for enhanced benefits to the Members;

- (3) To further define and implement a set of prioritized national and regional DPM-related projects;
- (4) To assist with strengthening of international cooperation in disaster risk reduction, by facilitating coordination among Members' bi-lateral and multi-lateral capacity development activities and by fostering collaboration with ISDR System Partners and other relevant governmental and non-governmental Organizations;
- (5) To prepare standard methodology for collection of information from NMHSs on meteorological, hydrological and climate-related hazards and their impacts, when possible and available, and coordinate collection of such information from NMHSs to prepare statistical reports to inform specialized agencies of the United Nations;

Invites the ISDR System Partners and ISDR Secretariat to continue strengthening their partnerships with WMO;

Urges Members:

- (1) To implement HFA at the national level;
 - (2) To participate proactively in the planning and decision processes in disaster risk reduction, including through support of related national Committees and Platforms;
 - (3) To strengthen collaboration of NMHSs with the civil protection agencies and disaster risk management authorities.
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Res. 7.4/2 (Cg-XV) –WMO QUALITY MANAGEMENT FRAMEWORK

THE CONGRESS,

Recalling Resolution 27 (Cg-XIV) on the WMO Quality Management Framework,

Affirms that the WMO Quality Management Framework (QMF) is aimed at addressing a wide range of quality management (QM) issues of importance to WMO operations, including both the needs of its Members and the implementation of WMO Programmes and activities;

Expresses satisfaction with the progress achieved in the development of the WMO QMF, the expertise gained in the implementation of quality management systems (QMS) based on ISO quality management standards, in particular, to the guidance material on QM which was developed and provided to Members and to the capacity building activities (training seminars), that have been carried out;

Noting that users/customers of meteorological, climatological, hydrological, marine and related environmental data, products and services are increasingly requesting that a QMS be in place to help provide assurance of the quality of those data, products and services,

Recognizing:

- (1) That quality of data had been the primary goal of WMO activities throughout its existence as made explicit by the WMO technical publications, which provide a number of requirements, procedures and practices that can be used as reference and guidance in quality management systems implemented by its Members;
- (2) That the quality of products and services depends substantially on the quality of data internationally exchanged through WMO-coordinated systems;
- (3) That the implementation of the WMO QMF should result in the exchange of data and products of known quality and appropriate for their intended use;
- (4) That quality control, as an integral component of quality management, rests primarily with the Members;

Taking into account the relevant work undertaken by the Executive Council, the technical commissions, the Inter-Commission Task Team on Quality Management Framework and the Secretary General on the quality management initiative;

Decides:

- (1) That the WMO QMF is an appropriate holistic approach to the delivery of meteorological, climatological, hydrological, marine and related environmental data, products and services that is based on the eight principles of quality management and can be implemented through structured quality management systems;
- (2) That the aim of the WMO QMF is to ensure the development, use and maintenance of the WMO technical documentation, supporting QMSs for meteorological, climatological, hydrological, marine and related environmental data, products and services;
- (3) That the WMO QMF will consist of the following key elements:
 - (a) A WMO quality policy;

- (b) Objectives aligned with the WMO strategic plan;
- (c) Technical documentation and the procedures relevant to their development, review and adoption;

Decides further to approve the WMO quality policy as stated in the Annex to this resolution;

Requests:

- (1) The Executive Council:
 - (a) To lead and guide the further development and implementation of the QMF;
 - (b) To finalize the formal working arrangement between WMO and ISO for the development of joint ISO-WMO technical standards;
 - (c) To provide overall coordination for the further development of the Volume IV on Quality Management of the Technical Regulations;
 - (d) To retain the inter-commission mechanism to coordinate the further development of the WMO QMF and the plan for its implementation;
 - (e) To coordinate (through the inter-commission mechanism) the quality-related activities of the technical commissions;
- (2) Technical commissions:
 - (a) To maintain an up-to-date catalogue of all technical publications applicable to the WMO QMF and review these publications according to quality management principles;
 - (b) To provide, following the guidance of EC, necessary contributions to a Volume IV of WMO Technical Regulations for adoption at the earliest possible date;
 - (c) To provide quality-related technical guidance, advice, review and assessment, as appropriate;
- (3) Regional associations:
 - (a) To promote capacity-building activities and bilateral activities to assist Members in the implementation of quality management systems;
 - (b) To provide advice and feedback on this matter;
- (4) Members:
 - (a) To quality control on-site observations and ensure the traceability of measurements to recognized world standards approved for Members' use by WMO;
 - (b) To develop QMS, share relevant experience and cooperate with one another, including providing assistance to Members with specific QMS-implementation needs;
 - (c) To provide expertise to support the development of the WMO QMF;
- (5) The Secretary General:

- (a) To provide Secretariat support and take appropriate initiatives for the implementation of relevant actions;
 - (b) To expedite consultations with the ISO Secretariat for the preparation of the formal working arrangement between WMO and ISO for the development of joint ISO-WMO technical standards
 - (c) To ensure appropriate financial resources for the further development and implementation of the WMO QMF.
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Res. 9.3/1 (Cg-XV) – INTERNATIONAL POLAR YEAR 2007-2008

THE CONGRESS:

Noting:

- (1) Resolution 34 (Cg-XIV) - Holding of a Third International Polar Year in 2007-2008,
- (2) That ICSU/WMO Joint Committee for IPY and its Sub-Committees made significant progress in the preparation of IPY that resulted in over 200 international, interdisciplinary projects addressing a wide range of environmental and social research topics in the Polar Regions with active participation of more than 60 nations,
- (3) That WMO Inter-commission Task Group, technical commissions and a large number of NMHS provided substantial contributions to the IPY preparation,

Considering:

- (1) That the polar regions are of great significance in the global climate system and that changes at high latitudes can have an impact on ecosystems and human society through factors such as sea-level rise and variations in atmospheric and oceanic circulation,
- (2) That scientific and operational results of the IPY will be offering benefits to all WMO Programmes by generating comprehensive data sets and authoritative knowledge to ensure the further development of environmental monitoring and forecasting systems as well as better assessment of climate change and its impacts,
- (3) That IPY projects when implemented would provide a great opportunity for the integrated observations of polar atmosphere and oceans,

Requests Members:

- (1) To ensure the provision of resources sufficient to meet this scientific and international challenge both at national level and through international funding agencies;
- (2) To support activities of NMHS at the IPY implementation stage, when the existing elements of global observing systems which are at present within their areas of responsibility would be in use, as well as beyond IPY, when the major role of NMHSs should be to ensure the legacy of observing systems established during the IPY;
- (3) To make freely available data obtained from special observations carried out during the IPY at stations, research vessels, and other platforms via the GTS;
- (4) To contribute to the IPY Trust Fund to the extent possible to support further activities of the Joint Committee and its Sub-Committees to ensure the successful implementation of IPY;

Requests the Secretary-General:

- (1) To secure necessary funding to continue support to the IPY implementation process and the activities of the Joint Committee on the cost-sharing basis agreed between ICSU and WMO;

- (2) To facilitate the possibility for all relevant Members to make available IPY observations on the GTS.

ANNEX XI

Res. 4/4 (EC-LIX) - REPORT OF THE EXTRAORDINARY SESSION (2006) OF THE COMMISSION FOR BASIC SYSTEMS

THE EXECUTIVE COUNCIL,

Having considered the *Abridged Final Report with Resolutions and Recommendations of the Extraordinary Session (2006) of the Commission for Basic Systems* (WMO-No. 1017),

Noting:

- (1) Resolutions 1 and 2 (CBS-Ext.(06)),
- (2) Recommendations 1 to 9 (CBS-Ext.(06)),
- (3) The progress made in the CBS work programme, including further planning,

Decides to take action on each of the recommendations as follows:

Rec. 1 (CBS-Ext.(06)) - ADOPTION OF A WORLD GEODETIC SYSTEM AND A GLOBAL GEOID MODEL AS REFERENCES FOR POSITIONING THE OBSERVING STATION

- (a) Approves this recommendation;
- (b) Requests the Secretary-General to ensure with relevant WMO bodies that the *WMO Technical Regulations* (WMO-No. 49) and the appropriate WMO Manuals and Guides are updated accordingly;

Rec. 2 (CBS-Ext.(06)) - REVIEW OF THE GUIDE ON THE GLOBAL OBSERVING SYSTEM (WMO-No. 488)

- (a) Approves this recommendation;
- (b) Requests the Secretary-General to make arrangements for publishing the revised *Guide on the GOS* as soon as possible;

Rec. 3 (CBS-Ext.(06)) - AMENDMENTS TO THE MANUAL ON THE GLOBAL TELECOMMUNICATION SYSTEM (WMO-No. 386), VOLUME I, GLOBAL ASPECTS, PARTS I AND II

- (a) Approves this recommendation to take effect for operational use from 7 November 2007;
- (b) Requests the Secretary-General to incorporate the amendments in the *Manual on the GTS*;
- (c) Authorizes the Secretary-General, in consultation with the president of CBS, to make any consequent purely editorial amendments to the *Manual on the GTS*;

Rec. 4 (CBS-Ext.(06)) - AMENDMENTS TO THE MANUAL ON CODES (WMO-No. 306), VOLUME I.2, FOR FM XIII GRIB 2, FM XIII BUFR AND FM XIII

- (a) Approves this recommendation to take effect for operational use from 7 November 2007;
- (b) Requests the Secretary-General to incorporate these amendments in the *Manual on Codes* (WMO-No. 306);

Rec. 5 (CBS-Ext.(06)) - AMENDMENTS TO THE MANUAL ON CODES (WMO-No. 306), VOLUME I.1

- (a) Approves this recommendation to take effect for operational use from 5 November 2008;
- (b) Requests the Secretary-General to incorporate these amendments in the *Manual on Codes* (WMO-No. 306);

Rec. 6 (CBS-Ext.(06)) - AMENDMENTS TO THE *MANUAL ON CODES* (WMO-No. 306), VOLUME I.2, PART C, COMMON FEATURES TO BINARY AND ALPHANUMERIC CODES

- (a) Approves this recommendation to take effect for operational use from 7 November 2007;
- (b) Requests the Secretary-General to incorporate these amendments in the *Manual on Codes* (WMO-No. 306), to be made available on the WMO Web server;

Rec. 7 (CBS-Ext.(06)) - AMENDMENTS TO THE *MANUAL ON THE GLOBAL DATA-PROCESSING AND FORECASTING SYSTEM* (WMO-No. 485)

- (a) Approves this recommendation to take effect from 1 July 2007;
- (b) Requests the Secretary-General to incorporate the amendments in the *Manual on the GDPFS*;
- (c) Authorizes the Secretary-General, in consultation with the president of CBS, to make any consequent purely editorial amendments to the *Manual on the GDPFS*;

Rec. 8 (CBS-Ext.(06)) - DESIGNATION OF GLOBAL PRODUCING CENTRES FOR LONG-RANGE FORECASTS

- (a) Approves this recommendation to take effect from 1 July 2007;
- (b) Requests the Secretary-General to incorporate the newly designated GPCs in the *Manual on the GDPFS*;

Rec. 9 (CBS-Ext.(06)) - REVIEW OF RESOLUTIONS OF THE EXECUTIVE COUNCIL BASED ON PREVIOUS RECOMMENDATIONS OF CBS OR RELATED TO THE WWW

- (a) Approves this recommendation;
 - (b) Agrees to keep in force Resolutions 14 and 15 (EC-LV), Resolutions 2 and 9 (EC-LVI), Resolution 2 (EC-LVII), Resolutions 3, 13 and 15 (EC-LVIII).
-

Res. 5/2 (EC-LIX) - ANTARCTIC BASIC SYNOPTIC NETWORK

THE EXECUTIVE COUNCIL,

Noting:

- (1) Resolution 12 (EC-LV) - Antarctic Basic Synoptic Network,
- (2) WMO Strategic Plan as it relates to the World Weather Watch and to the Antarctic,
- (3) The *Manual on the Global Observing System* (WMO-No. 544), Volume I, Part III, paragraphs 2.1.3 and 2.1.4,

Considering:

- (1) That the establishment and maintenance of a basic synoptic network of surface and upper-air stations in the Antarctic, adequate to meet the requirements of Members and of the World Weather Watch, constitutes one of the most important obligations of Members under Article 2 of the WMO Convention,
- (2) That the density of the current network of surface and upper-air stations is generally much less than that desirable,
- (3) That global models can at present identify biases in station elevation measurements and are being rerun on past observations,

Recommends:

- (1) That the stations and the observational programmes listed in the Annex to this resolution constitute the Antarctic Basic Synoptic Network;
- (2) That Members be urged:
 - (a) To spare no effort in their endeavours to secure full implementation of the network of stations and observational programmes set forth in the Annex to this resolution;
 - (b) To seek to maintain, and where possible restore, radiosonde stations in Antarctica;
 - (c) To consider the possibility of cooperating with other Members in sharing the costs of re-opening and operating previously functioning stations;
 - (d) To comply fully with the standard times of observation, the coding procedures and the data-collection standards, as laid down in the *WMO Technical Regulations* and the *Manuals on the GOS, on Codes, on the GTS and on the GDPS*;
 - (e) To validate station positions and elevations using modern surveying techniques against those given in *Weather Reporting* (WMO-No. 9) Volume A and to communicate the results of these measurements to the WMO Secretariat;

Requests the Secretary-General of WMO to bring any changes to the Antarctic Basic Synoptic Network to the attention of the Members of WMO.

Annex to draft Resolution 5/2 (EC-LIX)

PROPOSED LIST OF STATIONS COMPRISING THE ANTARCTIC BASIC SYNOPTIC NETWORK (ABSN)

STATIONS OPERATED BY ARGENTINA		OBSERVATIONS
88963	BASE ESPERANZA	S
88968	BASE ORCADAS	S
89034	BASE BELGRANO II	S
89053	BASE JUBANY	S
89055	BASE MARAMBIO (CENTRO MET. ANTARTICO)	S / W R
89066	BASE SAN MARTIN	S
STATIONS OPERATED BY AUSTRALIA		
89564	MAWSON	S / W R
89568	LAMBERT GLACIER BASIN, LGB 35 AWS	S
89570	DAVIS (WHOOOP WHOOOP)	S
89571	DAVIS	S / W R
89576	LGB 69 AWS	S
89577	DOME A	S
89578	EAGLE	S
89586	MT. BROWN-A	S
89610	CASEY (CAPE POINSETT)	S
89611	CASEY	S / W R
89612	CASEY AIRSTRIP AWS 2	S
89614	CASEY (PETERSON)	S
89767	AMERY ICE SHELF AWS (G3)	S
89773	AM01	S
89775	AM02	S
89803	WILKES LAND, GF 08 AWS	S
89807	SNYDER ROCKS	S
89811	LAW DOME SUMMIT AWS	S
89815	HAUPT NUNATAKS	S
STATIONS OPERATED BY BRAZIL		
89253	JOINVILLE ISLAND	S
STATIONS OPERATED BY CHILE		
89056	CENTRO MET.ANTARTICO "PDTE.EDUARDO FREI"	S
89059	BASE BERNARDO O'HIGGINS	S
STATIONS OPERATED BY CHINA		
89058	GREAT WALL	S
89573	ZHONGSHAN	S
STATIONS OPERATED BY FINLAND		
89014	NORDENSKIOLD BASE	S
STATIONS OPERATED BY FRANCE		
89642	DUMONT D'URVILLE	S / W R

STATIONS OPERATED BY GERMANY

89002 NEUMAYER S / W R

STATIONS OPERATED BY THE NETHERLANDS

89016 WASA EP5 S
 89018 SVEA EP6 S
 89507 KOHNEN EP9 S
 A3823 HALVFARRYGGEN EP11 S

STATIONS OPERATED BY INDIA

89514 MAITRI S

STATIONS OPERATED BY ITALY

89625 CONCORDIA S / W R
 89646 SITRY POINT S
 89648 MID POINT S
 89659 PRIESTLY GLACIER S
 89661 CAPE PHILLIPS S
 89662 MARIO ZUCHELLI STATION S / W R
 89666 CAPE ROSS S

STATIONS OPERATED BY JAPAN

89532 SYOWA S / W R

STATIONS OPERATED BY THE REPUBLIC OF KOREA

89251 KING SEJONG AWS S

STATIONS OPERATED BY NORWAY

89504 TROLL AWS S

STATIONS OPERATED BY THE RUSSIAN FEDERATION

89050 BELLINGSHAUSEN S
 89512 NOVOLAZAREVSKAJA S / W R
 89574 PROGRESS S
 89592 MIRNYJ S / W R
 89606 VOSTOK S

STATIONS OPERATED BY SOUTH AFRICA

89004 S.A.N.A.E. S

STATIONS OPERATED BY SPAIN

89064 JUAN CARLOS 1 AWS S

STATIONS OPERATED BY UKRAINE

89063 VERNADSKY S

STATIONS OPERATED BY THE UNITED KINGDOM

89020 BRUNT ICE SHELF S (Until 2007)
 89022 HALLEY S / W R
 89062 ROTHERA S / W R
 89065 FOSSIL BLUF S

STATIONS OPERATED BY URUGUAY

89054 DINAMET-URUGUAY S

STATIONS OPERATED BY THE USA

89009	AMUNDSEN-SCOTT	S / W R
89061	PALMER STATION	S
89664	MCMURDO	S / W R

STATIONS MAINTAINED BY UNIVERSITY OF WISCONSIN, USA

89108	UNIV. WI ID 8985 (HENRY)	S
89208	UNIV. WI ID 8987 (CLEAN AIR)	S
89257	UNIV. WI ID 8925 (LIMBERT)	S
89262	UNIV. WI ID 8926 (LARSEN ICE SHELF)	S
89266	UNIV. WI ID 8902 (BUTLER ISLAND)	S
89269	UNIV. WI ID 8923 (BONAPARTE POINT)	S
89272	UNIV. WI ID 8917 (SKY-BLU)	S
89314	UNIV. WI ID 21358 (THERESA)	S
89324	UNIV. WI ID 8903 (BYRD STATION)	S
89327	UNIV. WI ID 8981 (MOUNT SIPLE)	S
89329	UNIV. W. ID 8900 (HARRY)	S
89332	UNIV. WI ID 21361 (ELIZABETH)	S
89345	UNIV. WI ID 8900 (SIPLE DOME)	S
89376	UNIV. WI ID 8911 (GILL)	S
89377	UNIV. WI ID 8908 (LETTAU)	S
89528	UNIV WI ID 20654 (AGO-3)	S
89667	UNIV. WI ID 8927 (PEGASUS NORTH)	S
89734	UNIV WI ID 8904 (DOME FUJI)	S
89744	UNIV. WI ID 8918 (RELAY STATION)	S
89768	UNIV WI ID 8939 (MINNA BLUFF)	S
89799	UNIV. WI ID 8924 (NICO)	S
89828	UNIV. WI ID 8989 (DOME C II)	S
89834	UNIV. WI ID 8916 (D-47)	S
89864	UNIV. WI ID 8905 (MANUELA)	S
89866	UNIV. WI ID 8906 (MARBLE POINT)	S
89868	UNIV. WI ID 8913 (SCHWERDTFEGER)	S
89869	UNIV. WI ID 8931 (MARILYN)	S
89872	UNIV. WI ID 8929 (FERRELL)	S
89873	UNIV. WI ID 8915 (ELAINE)	S
89879	UNIV. WI ID 8984 (POSSESSION IS.)	S
AAPET	UNIV. WI ID 8933 (PETER I OYA)	S

NOTE: S indicates a SYNOP station, W an upper-air wind station and R a radiosonde station. All Antarctic upper-air stations produce TEMP messages which include winds; however some also produce PILOT messages.

ANNEX XIII

Res. 5/3 (EC-LIX) - ANTARCTIC BASIC CLIMATOLOGICAL NETWORK

THE EXECUTIVE COUNCIL,

Noting:

- (1) The *WMO Technical Regulations* (WMO-No. 49), Regulation (B.1) 3.1.1.2,
- (2) Resolution 13 (EC-LV) - Antarctic Basic Climatological Network,
- (3) The *Manual on the Global Observing System* (WMO-No. 544), Volume II, The Antarctic, paragraph 7.2,

Considering:

- (1) That the ABCN is established to provide a comprehensive network of CLIMAT and CLIMAT TEMP reporting stations based on ABSN stations and including all GCOS (GSN and GUAN) stations needed for description of climate features,
- (2) That ABCN concept facilitates applying more fully WWW monitoring procedures for climatological data,

Recommends:

- (1) That the stations listed in the Annex to this resolution constitute the Antarctic Basic Climatological Network (ABCN) in the Antarctic;
- (2) That Members be urged:
 - (a) To spare no effort in their endeavours to secure full implementation of the network of ABCN stations set forth in the Annex to this resolution;
 - (b) 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* and the *Manuals on the GOS, on Codes, and on the GTS* when operating the ABCN;

Requests the Secretary-General of WMO to bring any changes to the Antarctic Basic Climatological Network to the attention of the Members of WMO.

Annex to draft Resolution 5/3 (EC-LIX)

PROPOSED LIST OF STATIONS COMPRISING THE ANTARCTIC BASIC CLIMATOLOGICAL NETWORK (ABCN)

INDEX	STATION NAME	CLIMAT	CLIMAT TEMP	GSN	GUAN
STATIONS OPERATED BY ARGENTINA					
88963	BASE ESPERANZA	X		X	
88968	BASE ORCADAS	X		X	
89034	BASE BELGRANO II	X			
89053	BASE JUBANY	X			
89055	BASE MARAMBIO (CENTRO MET. ANTARTICO)	X	X	X	X
89066	BASE SAN MARTIN	X			
STATIONS OPERATED BY AUSTRALIA					
89564	MAWSON	X	X	X	X
89571	DAVIS	X	X	X	X
89577	DOME A AWS	X		X	
89611	CASEY	X	X	X	X
STATIONS OPERATED BY CHILE					
89056	CENTRO MET. ANTARTICO "PDTE. EDUARDO FREI"	X		X	
89059	BASE BERNARDO O'HIGGINS	X			
STATIONS OPERATED BY CHINA					
89058	GREAT WALL	X			
89573	ZHONGSHAN	X		X	
STATIONS OPERATED BY FRANCE					
89642	DUMONT D'URVILLE	X	X	X	X
STATIONS OPERATED BY GERMANY					
89002	NEUMAYER	X	X	X	X
STATIONS OPERATED BY INDIA					
89514	MAITRI	X		X	
STATIONS OPERATED BY ITALY					
89625	CONCORDIA	X	X	X	
89662	MARIO ZUCHELLI STATION	X	X	X	
STATIONS OPERATED BY JAPAN					
89532	SYOWA	X	X	X	X
STATIONS OPERATED BY NORWAY					
89504	TROLL AWS	X			
STATIONS OPERATED BY THE RUSSIAN FEDERATION					
89050	BELLINGSHAUSEN	X		X	
89512	NOVOLAZAREVSKAJA	X	X	X	X
89574	PROGRESS	X		X	
89592	MIRNYJ	X	X	X	X
89606	VOSTOK	X		X	
STATIONS OPERATED BY SOUTH AFRICA					
89004	SANAE	X			
STATIONS OPERATED BY UKRAINE					
89063	VERNADSKY	X		X	
STATIONS OPERATED BY UNITED KINGDOM					
89022	HALLEY	X	X	X	X
89062	ROTHERA	X	X	X	
89065	FOSSIL BLUFF AWS	X		X	
STATIONS OPERATED BY URUGUAY					
89054	DINAMET-URUGUAY	X			

STATIONS OPERATED BY THE USA					
89009	AMUNDSEN-SCOTT	X	X	X	X
89061	PALMER STATION AWS	X			
89664	MCMURDO	X	X	X	X
STATIONS MAINTAINED BY UNIVERSITY OF WISCONSIN, USA					
89108	UNIV. WI ID 8985 (HENRY)	X			
89257	UNIV. WI ID 8925 (LIMBERT)	X			
89262	UNIV. WI ID 8926 (LARSEN ICE SHELF)	X		X	
89266	UNIV. WI ID 8902 (BUTLER ISLAND)	X		X	
89272	UNIV. WI ID 8917 (SKY-BLU)	X		X	
89324	UNIV. WI ID 8903 (BYRD STATION)	X		X	
89327	UNIV. WI ID 8981 (MOUNT SIPLE)	X		X	
89329	UNIV. W. ID 8900 (HARRY)	X		X	
89345	UNIV. WI ID 8900 (SIPLE DOME)	X		X	
89376	UNIV. WI ID 8911 (GILL)	X		X	
89377	UNIV. WI ID 8908 (LETTAU)	X		X	
89667	UNIV. WI ID 8927 (PEGASUS NORTH)	X			
89744	UNIV. WI ID 8918 (RELAY STATION)	X		X	
89799	UNIV. WI ID 8924 (NICO)	X			
89828	UNIV. WI ID 8989 (DOME C II)	X		X	
89865	UNIV. WI ID 8921 (WHITLOCK)	X		X	
89866	UNIV. WI ID 8906 (MARBLE POINT)	X		X	
89869	UNIV. WI ID 8931 (MARILYN)	X		X	
89872	UNIV. WI ID 8929 (FERRELL)	X		X	
89879	UNIV. WI ID 8984 (POSSESSION IS.)	X		X	
NOTE: Those stations which are AWS are often visited at infrequent intervals, and consequently data from them may be out of calibration.					

Res. 5/4 (EC-LIX) - OBSERVATIONS FROM SHIPS AND AIRCRAFT OPERATIONS IN THE
ANTARCTIC

THE EXECUTIVE COUNCIL,

Noting:

- (1) That supply ships operating in the Antarctic have adequate communication facilities and may carry meteorological staff,
- (2) That research ships frequently operate in the Antarctic,
- (3) That aircraft are extensively used for the supplying of bases in the Antarctic,

Considering:

- (1) That supply ships do not at present always make and transmit meteorological observations,
- (2) That most supply ships are also suitable for the carrying out of upper-air observations,
- (3) That additional marine observations are required for improved forecast capability,
- (4) That aircraft reports are of particular importance in the area south of 60°S to supplement data from radiosonde/radiowind stations,

Urges Members to ensure that:

- (1) All research vessels, supply vessels and tourist ships operating in the Antarctic make regular surface synoptic observations at main synoptic hours, and transmit these data to appropriate radio or coastal ground stations in accordance with the procedures presented in the *Manual on the GTS*, Volume I, Part I, Attachment I-1 and WMO Publication No. 9 TP:4, Volume D;
- (2) Supply vessels, whenever practicable, also make upper-air observations and transmit these reports on a real-time basis;
- (3) Research vessels make additional observations such as ocean currents and sub-surface temperature and salinity to 500m;
- (4) Aircraft operating south of 60°S make observations as a matter of routine and transmit them to the appropriate radio stations or satellites for further distribution on the GTS in an agreed format;

Requests the Secretary-General to invite Members, in particular Parties to the Antarctic Treaty, to obtain the maximum collaboration from operators of ships and aircraft in implementing this resolution.

Res. 5/5 (EC-LIX) - FURTHER DEVELOPMENT OF THE GLOBAL OBSERVING SYSTEM IN THE ANTARCTIC

THE EXECUTIVE COUNCIL,

Noting:

- (1) Resolution 6 (Cg-XII) — WMO Antarctic Activities,
- (2) Resolution 12 (EC-XLVI) — Further development of the Global Observing System in the Antarctic,
- (3) The progress being made in the implementation of the AMDAR, ASAP and drifting buoy programmes,
- (4) The requirements of the WMO Strategic Plan,
- (5) The report of the Scientific Committee on Antarctic Research (SCAR) on “The Role of Antarctica in Global Change, Part II — An International Plan for a Regional Research Programme”,

Considering:

- (1) That the density of observing stations in the Antarctic is generally much less than that desirable,
- (2) The importance of an effective basic synoptic network in the Antarctic and the need to integrate the network with the overall GOS for World Weather Watch purposes,
- (3) The importance of Antarctic observational data in climate research,
- (4) The need to have comprehensive and realistic information on the operational value of new observing systems in Antarctica, their cost and their interfaces with other parts of the regional programme,

Invites Members, particularly those which are Parties to the Antarctic Treaty:

- (1) To participate in the deployment and use of new observing systems and to evaluate the effectiveness of these systems and their integration in the WWW;
- (2) To install automatic weather stations when staffed stations have to be closed in order to maintain the climatic records;
- (3) To provide additional surface observations in the Antarctic by using automatic weather stations and automatic geophysical observatories on land, by recruiting additional voluntary observing ships, by equipping aircraft with suitable instrumentation and by deploying drifting buoys at sea;
- (4) To provide extended surface observations in the Antarctic to meet the needs of sophisticated forecast models;
- (5) To arrange for the transmission of additional and extended surface observations obtained from weather stations and geophysical observatories as well as from ships and drifting buoys on the Global Telecommunication System;

- (6) To consider the possibility of deploying automated meteorological data reporting systems on aircraft flying suitable routes over the Antarctic;
 - (7) To examine the communication facilities and data quality control procedures to ensure that the data are of high quality and received at the data-processing centres in a timely fashion.
-

Res. 5/6 (EC-LIX) - MAINTENANCE OF MANNED METEOROLOGICAL AND CLIMATOLOGICAL STATIONS IN THE ANTARCTIC

THE EXECUTIVE COUNCIL,

Noting:

- (1) The sensitivity of Antarctica to global climate change,
- (2) The importance of manned stations in order to maintain a continual record of meteorological and climatological data from Antarctica,
- (3) The progress also made to develop and to run GSN and GUAN stations at coastal and continental areas during recent years,
- (4) The need for meteorological data as an input for global numerical models (such as ECMWF and others) in order to keep the quality of those models that force regional high resolution forecast models in Antarctica,
- (5) The need for high quality climate data over the Antarctic as an input for climate analysis and prediction,

Considering:

- (1) The growing need of high quality (high resolution) weather forecast products to support increasing logistic activities such as intercontinental and intra-continental aircraft operations (among them NSF, ANAP, DROMCAN) as well as long distance continental field expeditions,
- (2) The quality of forecast products for selected Antarctic regions also significantly depends on the data quality and number of synoptic and upper air stations currently operated in the Antarctic region,

Invites:

Members, particularly those currently running permanently occupied stations:

- (1) To continue their efforts to keep staffed stations running in the long-term, and where possible restore observing programmes that have ceased, and by so doing to keep the quality of global and regional forecast models at the necessary level for demanding operations in Antarctica and monitor the progress of global change in Antarctica;

Requests the Secretary-General to bring this resolution to the attention of the Antarctic Treaty Members.

Res. 5/7 (EC-LIX) - MAINTENANCE OF, AND SUPPORT TO, THE INTERNATIONAL PROGRAMME FOR ANTARCTIC BUOYS OF THE WORLD CLIMATE RESEARCH PROGRAMME AND THE SCIENTIFIC COMMITTEE FOR ANTARCTIC RESEARCH

THE EXECUTIVE COUNCIL,

Noting:

- (1) Resolution 11 (EC-XLVI) – Organization of an International Programme for Antarctic Buoys (IPAB),
- (2) Resolution 15 (EC-LV) - Maintenance of, and Support to, the International Programme for Antarctic Buoys of the World Climate Research Programme,
- (3) The report of the third session of the WCRP ACSYS/ClC Scientific Steering Group (Beijing, 21-25 October 2002),
- (4) The report of the ninth session of the Executive Council Working Group on Antarctic Meteorology (St. Petersburg, 28-30 November 2006),
- (5) That IPAB is an Action Group of the Data Buoy Cooperation Panel (DBCP),

Considering the importance of IPAB observations in the Antarctic sea-ice zone for the World Weather Watch, the World Climate Research Programme, the Global Climate Observing System, the Global Ocean Observing System, the programme activities of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology, and as well for the research activities of the Scientific Committee for Antarctic Research (SCAR),

Recognizing:

- (1) The positive impact of existing IPAB observations on operational weather prediction as shown in the twenty-first WWW Status Report (WMO-No. 957),
- (2) That the desired density of the buoy array in the Antarctic sea-ice zone with a spacing of 500 km has never been achieved despite the efforts of the Programme participants,
- (3) That shortage or lack of atmospheric pressure and temperature observations will lead to detrimental consequences for satellite gravity measurements with subsequent implications for meteorological and oceanographic uses,
- (4) The limited lifetime of drifting buoys in the Antarctic sea-ice zone,

Urges Members in particular those which have active meteorological and oceanographic programmes in the Antarctic and that use satellite gravity and altimetry data in their operational and research activities:

- (1) To participate actively in the WCRP and SCAR IPAB programme by provision and/or deployment of sea-ice buoys capable of measuring sea-level atmospheric pressure, air temperature and sea ice drift, or to support the Programme through other appropriate means;

- (2) To spare no efforts in the maintenance of the drifting buoy network in the Antarctic sea-ice zone, particularly through using internationally-coordinated deployment opportunities with the goal that buoys are more frequently deployed in areas of minimal data coverage;
 - (3) To undertake necessary actions to ensure that observations from buoys deployed in the area of IPAB interest are reported through the GTS.
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ANNEX XVIII

**Res. 5/8 (EC-LIX) - AMENDMENTS TO THE *MANUAL ON THE GLOBAL OBSERVING SYSTEM*
– VOLUME II – REGIONAL ASPECTS – THE ANTARCTIC**

THE EXECUTIVE COUNCIL,

Noting:

- (1) Resolution 6 (Cg-XII) – WMO Antarctic Activities,
- (2) Resolution 2 (EC-LVIII) – Amendments to the *Manual on the Global Observing System* (WMO-No. 544), Volume I – Global Aspects,
- (3) The WMO Strategic Plan as it relates to the World Weather Watch and to the Antarctic,

Recommends adoption of the amendments to the *Manual on the Global Observing System* – Volume II – Regional Aspects – The Antarctic, given in the Annex to this resolution;

Requests the Secretary-General to make the appropriate amendments as given in the Annex to this resolution.

Annex: 1

Annex to draft Resolution 5/8 (EC-LIX)

**DRAFT AMENDMENTS TO THE *MANUAL ON THE GLOBAL OBSERVING SYSTEM*
(WMO-No. 544), VOLUME II – REGIONAL ASPECTS – THE ANTARCTIC**

To replace the text of section 7 “THE ANTARCTIC” by the following:

7.1 Basic Synoptic Network of surface and upper-air observing stations in the Antarctic

7.1.1 *Composition of the Basic Synoptic Network in the Antarctic (ABSN)*

The ABSN of surface and upper-air observing stations is reviewed at each session of the Executive Council Panel of Experts on Antarctic Meteorology (EC-PEAM) and adopted by resolution of the WMO Executive Council on the recommendation of the EC-PEAM. The list of stations constituting the ABSN is given in the annex to a Resolution approved by the EC. Changes are announced in the monthly “Operational Newsletter” issued by the Secretariat (see paragraph 7.1.4 below).

Staffed surface land stations included in the ABSN shall conform to the specifications laid down for land stations in Volume I of this Manual.

7.1.2 *Surface synoptic observations*

All staffed surface stations included in the ABSN should make surface observations at the four main standard times of observation, i.e. 0000, 0600, 1200 and 1800 UTC. Whenever possible and desirable observations should also be made at some or all of the four intermediate standard times of observation, i.e. 0300, 0900, 1500 and 2100 UTC. The carrying out of the observations at the main standard times of observations should be given first priority.

7.1.3 *Upper-air synoptic observations*

All upper-air stations included in the ABSN should make radiosonde and/or radiowind observations at 0000 and 1200 UTC. Other considerations permitting, those stations which are unable to carry out the full upper-air observing programme should give priority to the observations that maintain the historic record. Stations which are separated by no more than about 250 km may wish to consider bilateral arrangements whereby each undertakes one of the ascents so as to complete between them the full observing programme required.

7.1.4 *Arrangements and procedures for updating and amending the ABSN*

Certain minor changes in the ABSN of surface and upper-air synoptic stations which do not affect the data requirements for the Antarctic as a whole are inevitable from time to time. To provide a simple and rapid means of effecting such changes proposed by the Members concerned, the following procedure shall be followed:

- (a) The WMO Executive Council authorizes the President of the Organization to approve, at the request of the Member concerned and in consultation with the Secretary-General, minor changes to the ABSN/ABCN as may be required. Any change of substance would still require a formal notification to the WMO Members operating in the Antarctic;
- (b) The Secretary-General shall notify all Members of WMO by circular letter of changes agreed with the President of the WMO.

7.2 Basic Climatological Network of surface and upper-air observing stations in the Antarctic

7.2.1 Composition of the Basic Climatological Network in the Antarctic (ABCN)

7.2.1.1 The ABCN is established to provide a comprehensive network of CLIMAT and CLIMAT TEMP reporting stations. It is based on ABSN stations and includes all GCOS (GSN and GUAN) stations supplemented by other CLIMAT and CLIMAT TEMP reporting stations needed for description of climate features. These supplemental surface stations should be selected under the same criteria used for GSN stations.

7.2.1.2 Members are urged to comply fully with the global coding procedures and data collection standards in accordance with procedures laid down in the WMO Technical Regulations and the Manuals on the GOS, on Codes, and on the GTS when operating the ABCN stations.

7.2.1.3 The WMO Executive Council authorizes the President of the Organization to approve, at the request of the Members concerned and in consultation with the Secretary-General, minor amendments to the list of ABCN stations without a formal consultation between WMO Members operating in the Antarctic, following similar procedures to those specified for the ABSN.

CLIMAT and CLIMAT TEMP reports from ABCN stations shall be regarded as essential data in the sense of Cg-XII Resolution 40.

7.2 Weather reporting by traverse parties

Members operating stations in the Antarctic are encouraged to instruct all traverse parties to make surface observations wherever circumstances permit when they are more than 200 km away from their base. The observations, which should be carried out as close as possible to the standard times of observations, should be transmitted at least once a day.

7.4 Automatic weather stations in the Antarctic

Members are encouraged to use automatic weather stations as a part of the basic synoptic network of stations, taking advantage of the data-collection capabilities of the near –polar-orbiting satellites and, in some case, of the geostationary meteorological satellites.

7.5 Aircraft reports

Members are encouraged to arrange for making, recording and distributing AIREP, AMDAR and BUFR reports from all flights into and within the Antarctic.

7.6 Additional and extended observations

Members are encouraged to arrange for making, recording and distributing additional and extended observations from ships and stations in the Antarctic.
