

World Meteorological Organization

XV-RA IV/Doc. 4.7

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

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Nassau, Bahamas
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Agenda Item: 4.7

Expected Result 7

ENHANCED CAPABILITIES OF MEMBERS TO PROVIDE AND USE WEATHER AND CLIMATE, WATER AND ENVIRONMENTAL APPLICATIONS AND SERVICES

Strategic Thrust 2: Service Delivery

SUMMARY

ISSUES TO BE DISCUSSED:

1. User focus
2. Improved products and services
3. Service delivery
4. Socio-economic issues related to weather, climate and environmental applications
5. Quality management
6. Human resource capacity building in service delivery

ADDITIONAL FINANCIAL IMPLICATION:

None

DECISIONS/ACTIONS REQUIRED:

Adoption of the draft text for inclusion in the general summary of XIV-RA IV.

REFERENCES:

1. *Abridged Final Report with Resolutions of the Fifteenth World Meteorological Congress* (WMO-No. 1026)
2. *Abridged Final Report of the Sixtieth Session of the Executive Council* (WMO-No. 1032)
3. *Abridged Final Report with Resolutions of the Thirteenth Session of Regional Association IV (North America, Central America and the Caribbean)* (WMO-No. 987)

CONTENT OF DOCUMENT:

Appendix for inclusion in the final report:

Draft text for inclusion in the general summary of XV-RA IV

Appendix for information:

XV-RA IV/Rep. 4.7: Progress/Activity Report

DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF XV-RA IV

4.7 ENHANCED CAPABILITIES OF MEMBERS TO PROVIDE AND USE WEATHER AND CLIMATE, WATER AND ENVIRONMENTAL APPLICATIONS AND SERVICES (*agenda item 4.7*)

User focus

Public Weather Services (PWS)

4.7.1 The Association urged its Members to enhance focus on user needs in service delivery. It observed that NMHSs could do this by enhancing interactions with users through user requirement assessments and creation of feedback mechanisms to gauge user satisfaction with their products and services thus enabling them to better focus on their needs.

4.7.2 The Association considered the outcome of the PWS Survey on Severe Weather Warning Services, which was carried out by the PWS Expert Teams in 2006. The Survey had indicated that the main obstacles in the provision of alerts and warnings for all hazards were insufficient accuracy of forecasts and insufficient understanding of warnings by the public. The Association requested the WMO Secretariat to pay particular attention to assisting NMHSs in the Region to improve in these areas.

Agricultural Meteorology (AGM)

4.7.3 The Association observed that climate change and extreme climatic events increase agricultural production risks and uncertainty, thus impacting the performance of agricultural systems and management. It therefore welcomed the strategies proposed at the International Workshop on Agrometeorological Risk Management: Challenges and Opportunities (New Delhi, 2006), and encouraged Members to use a combination of locally adapted traditional farming technologies, seasonal weather forecasts and warning methods for improving yields and incomes, as a means of meeting end-user needs.

4.7.4 The Association encouraged its Members to use the outcomes of the Workshop on Management of Natural and Environmental Resources for Sustainable Agricultural Development (Portland, USA, 2006). The outcomes of the workshop included recommendations on assessment and reporting on the appropriate agrometeorological criteria to conserve and manage natural and environmental resources for the benefit of agriculture, rangelands, forestry and fisheries; to document case studies of successful measures on land use management and to establish practical agrometeorological guidelines for the conservation of natural and environmental resources in harmony with agricultural production systems.

4.7.5 The Association noted the outcomes of the Symposium on Climate Change and Biodiversity in the Americas (Panama City, Panama, 25 to 29 February 2008) whose focus was to address regional themes on climate change and biodiversity as well as approaches, techniques and integrated studies. It urged its Members to collaborate with users especially managers of climate and forest biodiversity monitoring networks, share local strategies, learn latest advances in adaptation and thus gain an understanding of threats and impacts to biodiversity, so as to better respond to user needs.

Marine Meteorology and Oceanography (MMO)

4.7.6 The Association stressed the need for user-focused marine meteorological and oceanographic products and services and urged RA IV Members to enhance collaboration with marine users at national and regional levels by collecting and assessing marine users'

requirements. This would allow the expansion and improvement of the service delivery functions of NMHSs to meet user requirements, including those for increased safety and efficiency of marine operations and better protection of the marine environment.

Improved products and services

PWS

4.7.7 The Association welcomed the PWS strategy for improvement of products and services as proposed by the PWS Implementation and Coordination Team which emphasized capacity building, public outreach activities; improving the reach of NMHS products and services, and promoting the application of the science meteorology and related technologies to improve products and services. It urged RA IV Members to apply these strategies in the implementation of their PWS plans.

4.7.8 The Association agreed that there were emerging information technology systems used to deliver PWS products. It pointed out that mobile communication devices effectively aid delivery of PWS products. Similarly, next-generation forecast workstations enable easy retrieval of observations, nowcast and prognostic information from databases, and assist in PWS product preparation and delivery through multiple communication pathways. It urged its Members to apply such emerging technology in order to continuously improve on products and services.

4.7.9 The Association noted the increased application of probabilistic forecasts and stressed the need to develop probabilistic forecast skills. It emphasized the need for effective communication of uncertainty of the forecast to users in order to allow them make better decisions. In this regard, it urged RA IV Members to make maximum use of the recently published WMO Guidelines on Communicating Forecast Uncertainty (WMO/TD-No. 1422).

4.7.10 The Association agreed that verification results are a powerful tool for assessing performance and encouraged its Members to use them to improve PWS products and services.

4.7.11 The Association expressed the need to improve nowcasting services and products and welcomed steps taken by WMO in this regard, including the formation of the PWSP/WWRP JOint Nowcasting Applications & Services (JONAS) Steering Committee, and the establishment of the PWS Nowcasting Applications Framework whose overall mission is to increase the capacity of NMHSs to deliver reliable nowcasts to enable informed decision-making in mitigating the effects of high-impact weather. It encouraged RA IV Members to participate and take advantage of these WMO initiatives in order to enhance their nowcasting capabilities.

4.7.12 The Association requested that results of the Shanghai Multi-Hazard Early Warning Services (MHEWS) project, which is designed to demonstrate how nowcasting applications can enhance short-range forecasts of high-impact weather, using the opportunity afforded by the Shanghai World EXPO 2010, be availed to its Members so that they can benefit from the experience.

4.7.13 The Association requested that results and lessons learned in improved service delivery to users from the Severe Weather Forecasting Demonstration Project (SWFDP) be available to Members in RA IV with a view to initiating a similar project as required by Members. The PWS component of the project had resulted in improved coordination with the media, public education and outreach activities, public understanding of the products and their application, and coordination between the NMHSs and disaster management authorities.

Atmospheric Research and Environment (ARE)

4.7.14 The Association recommended that its Members develop Air Quality Forecasting (AQF) and dissemination skills as part of expanding and improving their products to decision-makers and the general public. It requested the Secretary-General to continue the GAW Urban Research Meteorology and Environment (GURME) project and to assist Members in developing capability in air quality forecasting and delivering related services to users.

AGM

4.7.15 The Association urged its Members to make maximum use of the quality deliverables including special issues of four scientific journals and two books, which were authored by Commission members following the fourteenth session of the Commission for Agricultural Meteorology (New Delhi, 2006).

4.7.16 The Association encouraged climate experts to collaborate with local, national and international food providers, to develop sustainable food production strategies. It further urged its Members to use outcomes of the Workshop on Climate Change Impacts and Adaptation to Agriculture, Forestry and Fisheries at The National and Regional Levels (Orlando, USA, 2008) which was organized to discuss how the integration of climate information can improve land-resource management and secure food supply.

4.7.17 The Association observed that efforts to develop fire danger rating systems have been driven by a concern about large fires, especially in the context of managing agricultural and forest ecosystems within a changing climate. The International Workshop on Advances in Operational Weather Systems for Fire Danger Rating, and the Commission for Agricultural Meteorology Expert Team on Agrometeorological Aspects of Sustainable Agricultural Development (Edmonton, Canada, 2008) developed several useful recommendations. In this regard, the Association urged its Members to make maximum use of the WMO Operational Guidelines for Fire Weather Agrometeorology and Proceedings of the Workshop.

Service delivery

PWS

4.7.18 The Association observed that several of its Members had attended the "International Symposium on Public Weather Services: A Key to Service Delivery" (Geneva, 2007). It urged its Members to implement the recommendations resulting from the event and to use its outcomes which were intended to guide future evolution of their public weather services, especially in the implementation of the Madrid Action Plan (http://www.wmo.int/pages/prog/amp/pwsp/PWS_Symposium_en.htm).

4.7.19 The Association welcomed the new approach initiated by the PWSP to implement projects within the framework of 'Learning through Doing' concept. The initiative involves building capacity of NMHSs using a coordinated training and mentoring programme. It is implemented with the aim of developing new and/or improved range of products and services to benefit targeted social and economic sectors identified by the countries themselves. The Association noted that the approach was endorsed by the sixtieth session of the Executive Council (June 2008), and that projects are already underway in other Regions. It requested the Secretary-General to initiate projects based on the concept in RA IV according to their individual requirements.

4.7.20 The Association commended the WMO Website 'World Weather Information Service (WWIS)' (<http://worldweather.wmo.int/>), for winning the Stockholm Challenge Award - Environmental Category in 2008. The Website which is in Arabic, Chinese, English, French,

Portuguese and Spanish languages, is coordinated by Hong Kong, China. The Association agreed that this Website provided a useful source of official weather forecasts from NMHSs and urged its Members to promote the use of the information on the Website, as well as increase their contribution of information to the Website.

MMO

4.7.21 The Association recalled the coordinated initiative by WMO, the International Maritime Organization (IMO) and the International Hydrographic Organization (IHO) to expand the Global Maritime Distress and Safety System (GMDSS) and the World-Wide Navigational Warning Service (WWNWS) into the Arctic waters. In this context, the Association noted that the sixtieth session of the Executive Council (June 2008) had approved the establishment of five new METAREAs for the Arctic region with the same boundary limits as the corresponding NAVAREAs. The Association further noted the commitment by the Environment Canada to serve as METAREA Issuing Service for METAREA XVII and XVIII, and the potential interest of NOAA to act as Preparation Service for portions of the proposed Arctic METAREA XVII and possibly METAREA XVIII. It requested the Environment Canada, in collaboration with NOAA, to report on the progress of the implementation of Maritime Safety Information Services to the next RA IV session.

4.7.22 The Association noted with appreciation the expansion of the GMDSS-Weather Website to include navigational warnings in the various NAVAREAs (<http://weather.gmdss.org/navareas.html>), and the establishment of the Sea Ice Services Website (<http://ipy-ice-portal.com/>) for the global sea ice operational information, as an initiative for IPY. The Association thanked all the contributors from the Region and encouraged Members to make optimum use of these tools. It requested the Secretary-General to promote resource mobilization to ensure continued operation and development of these portals.

4.7.23 Noting the continuing importance to mariners at sea of receiving graphical products, the gradual demise of HF radiofax as a means of disseminating those products, including for the Arctic region, and the request by the Executive Council to JCOMM to continue researching methods for transmitting graphical products to marine users, the Association noted with appreciation the successful development of standards for ice information in Electronic Navigation Chart Systems by RA IV Members, especially the Canadian Ice Service (Environment Canada), under the general direction of JCOMM. The Association encouraged its Members to make use of these essential tools in order to enable NMHSs to develop products specifically for Electronic Navigation Chart Systems. The Association stressed the need to develop similar standards for other met-ocean variables and requested the WMO Secretariat to address this issue as a matter of priority. It urged Members of RA IV to consider participating in the development of standards for other met-ocean variables), under the general guidance of JCOMM.

Aeronautical Meteorology (AEM)

4.7.24 Regarding collaboration between NMHSs and various users of aeronautical meteorological services in order to strengthen NMHSs in their service delivery capabilities and to sustain cost recovery from these services, the Association encouraged those Members in the Region who required external funding for their continued operations to develop and improve, in close collaboration with CAeM and its Expert Team on Customer Relations, the working relationships with all relevant partners and user groups, and to cooperate closely in the development of future service provision on a more regionalized basis. In particular, the provision of SIGMET and AIRMET required close coordination between all Meteorological Watch Offices of the Region.

AGM

4.7.25 The Association noted that the World AgroMeteorological Information Service (WAMIS-www.wamis.org) has products from over 40 countries and provides tools and resources to help countries improve their AgroMeteorological bulletins and services. It urged Members to disseminate their products to the global community through these bulletins in both real-time and from a historical perspective. The Association appreciated the support of NOAA and the US Department of Agriculture to the WAMIS project.

Socio-economic issues related to weather, climate and environmental applications

PWS

4.7.26 The Association welcomed the setting up by the Secretary-General of a 'Task Force on Social and Economic Applications of Meteorology and Hydrology' (subsequently renamed as "WMO Forum: Social and Economic Applications and Benefits of Weather, Climate, and Water Services"). The purpose of the Forum is to improve interactions between providers and users of weather, climate and water services, and to contribute to the implementation of the Madrid Action Plan, which was a product of the Madrid Conference (Madrid, 2007). The Forum membership covers a wide spectrum including NMHSs, government departments, NGOs, the World Bank, academia and the media. The USA and Canada participate in the work of the Forum. The Association encouraged its Members to participate in the Forum as a mechanism to address socio-economic applications of their services.

4.7.27 The Association recognized that with respect to assessing, quantifying and demonstrating benefits of weather, climate and water services to user sectors such as health, energy, tourism, transport and urban environment, many NMHSs would require assistance and guidance. In this regard, it recommended that its Members make optimum use of the decision-support tools provided at: <http://www.wmo.int/pages/prog/amp/pwsp/socioeconomictools.htm>. The Association further requested that training workshops on the assessment of socio-economic benefits of meteorological and hydrological services which had been organized in other Regions also be organized in RA IV.

Quality management

AEM

4.7.28 The Association requested both developing and developed Members in RA IV to make best use of the Pilot Project for the Implementation of a Quality Management System, recently started in Tanzania, where templates and relevant software for the formulation and documentation of processes would be made available at no cost, in their own implementation of this ICAO required system. Further information on the subject of ISO compliant Quality Management Systems is given under agenda item in 6.x "Emerging Issues".

Human resource capacity building in service delivery

PWS

4.7.29 The Association recognized that NMHSs need to strengthen their abilities in communicating information and knowledge to user communities including government officials and decision-makers. It requested the Secretary-General to provide opportunities to managers of NMHSs to benefit from training in effective communication with government officials, politicians and decision-makers in different user communities; educate NMHS staff on better communication skills with end-users; and educate users on understanding products, services and information

provided by NMHSs and their application to decision-making. The Association expressed satisfaction with the annual PWS workshop held in Miami, Florida and thanked the USA for hosting them.

AEM

4.7.30 The Association noted with concern the need to organize and support training and capacity building events for the Region given the continued decrease in staff members due to staff retirement and lack of training institutions providing academic training in aeronautical meteorology in both languages of the Region. It strongly encouraged all the Members to follow examples of some Members who organize such training events. The initiative by the AEMP to build a web-based training library both in English and Spanish with the support of the UCAR COMET/MetEd programme was warmly welcomed, but the Association requested Members to consider providing translation resources to this end.

4.7.31 The issue of the required qualifications for aeronautical meteorologists as defined by WMO No. 258 Supp. 1 is dealt with in detail in agenda item 6.x (Emerging Issues)

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Strategic Thrust: Service Delivery

PROGRESS/ACTIVITY REPORT

SUMMARY

Reference: XV-RA IV/Doc. 4.7

CONTENT OF DOCUMENT:

1. User focus
2. Improved products and services
3. Service delivery
4. Socio-economic issues related to weather, climate and environmental applications
5. Quality Management
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Appendix:

- Progress/Activity Report

PROGRESS ACTIVITY REPORT

ENHANCED CAPABILITIES OF MEMBERS TO PROVIDE AND USE WEATHER AND CLIMATE, WATER AND ENVIRONMENTAL APPLICATIONS AND SERVICES

User focus

PWS

1. Informative materials on the user focus concept, targeting NMHSs regarding: the importance of user focus; how to assess user requirements; how to raise NMHSs commitment to serve users; how to establish liaison with end-users; and how to assess user satisfaction and perception have been made available on the Public Weather Services (PWS) Website (www.wmo.int/pws).

MMO

2. Guidelines for promulgation of maritime safety information to mariners at sea are under preparation. These materials will assist Members in their training activities on marine meteorological services. The Guidelines will be submitted to IMO for wide dissemination among its Members.

AGM

3. WMO, in collaboration with a number of co-sponsors, organized an International Workshop on Agrometeorological Risk Management: Challenges and Opportunities (New Delhi, 2006). The workshop was attended by 188 participants from 78 countries. Proceedings of the workshop were published by Springer.

4. A Workshop on Management of Natural and Environmental Resources for Sustainable Agricultural Development was held in Portland, USA in 2006. The workshop, which was hosted by the United States Department of Agriculture Natural Resource Conservation Service (USDA/NRCS) brought together members of the Commission of Agricultural Meteorology (CAgM) Expert Team of the same name and several experts from USA. Twenty-five participants from nine countries attended the workshop. Proceedings of this workshop were published by USDA and WMO.

5. The Climate Change and Biodiversity Symposium was held in 2008 at the Smithsonian Tropical Research Institute (STRI) in Panama City, Panama and was sponsored by Environment Canada, Smithsonian Institution, Canadian International Development Agency (CIDA), Inter-American Institute for Global Change Research (IAI), The H. John Heinz III Center For Science, Economics and the Environment, Convention on Biological Diversity (CBD), International Union of Forest Research Organizations (IUFRO), WMO, Caribbean Community Climate Change Center, and UNESCO. One hundred and twenty-four participants from 28 countries attended the symposium.

6. WMO co-sponsored and participated in the 1st Venezuelan Congress and 5th Latin-American Meeting on Agrometeorology held in Maracay, Venezuela from 27 to 29 November 2007.

Improved products and services

PWS

7. Since the fourteenth session of RA IV (San Jose, 5-15 April 2005), WMO has produced the following publications to assist NMHSs improve weather services to the public. They are available

on the WMO Website:

http://www.wmo.int/pages/prog/amp/pwsp/publicationsguidelines_en.htm:

- (a) Guidelines on Communicating Forecast Uncertainty (PWS-18, WMO/TD-No. 1422);
- (b) Examples of Best Practice in Communicating Weather Information (PWS-17, WMO/TD-No. 1409);
- (c) Supplement to Guidelines on Meteorology and Air Quality Forecasts (PWS-16, WMO/TD-No. 1400);
- (d) Guidelines on Capacity Building Strategies in Public Weather Services (PWS-15, WMO/TD-No. 1385);
- (e) Strategy for Developing Public Education and Outreach (PWS-14, WMO/TD-No. 1354);
- (f) Guidelines on Integrating Severe Weather Warnings into Disaster Risk Management (PWS-13, WMO/TD-No. 1292);
- (g) Guidelines on Weather Broadcasting and the Use of Radio for the Delivery of Weather Information (PWS-12, WMO/TD-No. 1278);
- (h) Guidelines on Quality Management Procedures and Practices for Public Weather Services (PWS-11, WMO/TD-No. 1256).

8. A meeting of the PWS Implementation Coordination Team in 2005 addressed key points arising from a review of decisions of CBS-XIII. It identified strategic areas of interest to the PWS Programme, outlined a work plan for the Programme, and defined the “essential” and “recommended” elements of a national PWS Programme. These included the need for NMHSs to take advantage of emerging technology to improve on products and service delivery, verification of products and user satisfaction, etc.

9. WMO has taken advantage of the opportunity afforded by the World EXPO 2010 to work closely with the Shanghai Meteorological Bureau (SMB) on the Multi-Hazard Early Warning Services (MHEWS) project, which aims at implementing a mechanism for the provision of advanced high impact weather services to the public during that event. It is planned to demonstrate how nowcasting applications can enhance short-range forecasts of high-impact weather. The results of the project will be shared with other WMO Members.

ARE

10. Experts on air quality forecasting from the Region, specifically the United States, have assisted in developing improved air quality forecasting products and services for use by Members through GURME. They have also provided guidance materials and assisted in training. Joint workshops with the US AIRNow International are planned starting in 2009 and will encourage collaboration in Member countries between NMHSs and local EPAs.

MMO

11. The following events were organized to improve the capabilities of NMHSs to enhance service provision:

- (a) The First JCOMM Scientific and Technical Symposium on Storm Surges (Seoul, Republic of Korea, 2007);

(b) The Ice Analysts Workshop (Rostock, Germany, 2008).

Several Members of RA IV participated in these events. Proceedings are available on the WMO Website: <http://www.wmo.int/pages/prog/amp/mmop/publications.html>.

12. The Guide to Storm Surge Forecasting is under preparation. This publication will assist Members in developing an operational storm surge forecasting system.

Agricultural Meteorology (AGM)

13. The fourteenth session of the Commission for Agricultural Meteorology (CAgM-XIV) was held in New Delhi, India in 2006. A total of 88 participants from 55 Member countries and five international organizations participated. The Commission evaluated its performance over the thirteenth intersessional period and noted that the new working structure was effective and enabled the Commission to address a number of emerging issues such as the locust invasion of 2004, natural disasters, etc.

14. A Workshop on Climate Change Impacts and Adaptation to Agriculture, Forestry and Fisheries at the National and Regional Levels was held in Orlando, USA in 2008, organized by WMO, the United States Department of Agriculture (USDA), and the Southeast Climate Consortium (SECC) of USA. The workshop was held in conjunction with the meeting of the WMO CAgM Implementation/Coordination Team (ICT) on Climate Change/Variability and Natural Disasters in Agriculture and meeting of the SECC members. The workshop was attended by over 60 participants from 10 countries.

15. An International Workshop on Advances in Operational Weather Systems for Fire Danger Rating was organized in Edmonton, Canada in 2008 and brought together over 50 experts from different parts of the world. After this workshop, the Commission for Agricultural Meteorology (CAgM) Expert Team on Agrometeorological Aspects of Sustainable Agricultural Development (ETASAD) was held with 10 participants.

Service delivery

PWS

16. The "International Symposium on Public Weather Services: A Key to Service Delivery" (Geneva, December 2007) formulated a number of recommendations focusing the attention of NMHSs and other partners particularly on strengthening user focus, effective communication, responding to climate change issues, partnership building, capability building, engagement of social sciences in responding to societal needs, as well as maximizing the results of advances in science and technology, all of which would aid the enhancement of the range, quality and relevance of public weather services.

17. WMO has started implementing projects modelled on the 'Learning through Doing' concept, which focuses on participative learning involving NMHSs, equipping them with skills to develop and improve their service delivery. It is planned to establish 'Learning through Doing' projects in all WMO Regions.

18. The Severe Weather Information Centre (SWIC) Website (<http://severe.worldweather.wmo.int/>) continued to disseminate official warnings on tropical cyclones for all the tropical cyclones basins, supplied by the participating Members. It also disseminated information on heavy rain, snow and thunderstorms.

19. The World Weather Information Service (WWIS) site (<http://worldweather.wmo.int/>) experienced continued growth. By 1 January 2009, 119 Members supplied official weather forecasts for 1273 cities. One thousand two hundred and seventy-five (1275) cities from 161 WMO Members also have their climatological data presented in this Website. The Website is in Arabic, Chinese, English, French, Spanish and Portuguese. It is hosted respectively by Oman; China; Hong Kong, China; France; Spain and Portugal, with the overall coordination provided by Hong Kong, China.

AEM

20. Cooperation between the Central American and Island Members in service provision is already established e.g. through the Caribbean Met Institute, and will benefit from further integration of services particularly in the provision of SIGMET/AIRMET message including Tropical Cyclones and Volcanic Ash SIGMETS.

21. A seminar/workshop held in December 2006 in Santo Domingo/Dominican Republic on Cost Recovery and Quality Management Systems was well attended, but renewed efforts by Members will be required to implement ISO compliant QMS in the Region.

22. The issue of staff qualifications in light of the WMO-No. 258 Supp 1 and its expected role as a quasi-Standard used by ICAO Safety Oversight Audits of aeronautical meteorological service provision has been a major cause for concern and will be addressed separately under agenda item 6.x (Emerging Issues and Specific Challenges).

MMO

23. WMO participated in several IMO and IHO meetings to coordinate the expansion of the Global Maritime Distress and Safety System (GMDSS) into the Arctic waters, including the World-Wide Navigational Warning Service (WWNWS).

24. The WMO marine broadcast system under the GMDSS Website (<http://weather.gmdss.org>) continued to disseminate official maritime safety information and warnings supplied by US NOAA for the existing METAREAs in RA IV (high seas). The inclusion of maritime safety information prepared for NAVTEX dissemination (coastal waters) is under preparation. IHO has been collaborating with WMO and its JCOMM Expert Team on Maritime Safety Services to include navigational warnings on this Website.

25. The sea ice services Website (<http://ipy-ice-portal.com/>) for the global sea ice operational information has been in operation since May 2007.

26. An Ice Objects Catalogue, defining 23 ice "object classes" (with formal definitions and enumerations, in accordance with WMO-No. 259 – WMO Sea Ice Nomenclature) was produced in consistency with the existing International Maritime Organization (IMO), International Hydrographic Organization (IHO) and the International Electrotechnical Commission (IEC) standards and specifications for Marine Information Objects (MIO), and progress has been done in its implementation into the IHO Registry and development of an S-57 Product Specification for ice information. This Catalogue would provide the essential tool to enable NMHSSs, in particular their National Ice Services, to develop products specifically for Electronic Navigation Chart Systems and would allow the implementation of software to decode and display ice information by the manufacturers of these systems, using the S-57 chart data exchange standard. It is expected that within several months, some Sea Ice Services will begin offering S-57 products to the electronic chart community. Pilot projects are currently underway to demonstrate its feasibility.

Socio-economic issues related to weather, climate and environmental applications

PWS

27. During its the Second Meeting, the Task Force on Socio-Economic Applications of Meteorological and Hydrological Services (Geneva, 2007), was renamed as “WMO Forum: Social and Economic Applications and Benefits of Weather, Climate, and Water Services” with modified Terms of Reference to, among other functions, provide WMO with recommendations for assisting NMHSs to more fully assess and enhance the socio-economic benefits of weather, climate and water information through the full range of user communities and to provide guidance in implementing the Madrid Action Plan (MAP).

28. Through the work of the Forum, an inventory of decision support tools and case studies on socio-economic applications of meteorological and hydrological services has been developed, and made available to NMHSs on the WMO Website (<http://www.wmo.int/pages/prog/amp/pwsp/socioeconomictools.htm>).

29. Guidelines on socio-economic related issues such as improving user-provider dialogue and assessment of benefits of meteorological and hydrological services to the public and user sectors are under preparation. These materials will form the basis of training activities on the above subjects, requested by Members as part of the implementation of the MAP. The PWS Programme is also organizing training workshops in various Regions on the assessment of socio-economic benefits of meteorological and hydrological services.

Quality Management

MMO

30. A catalogue on marine meteorological and oceanographic best practices and standards is under preparation by JCOMM in accordance with the recommendations from ICT-QMF and Resolution 32 (Cg-XV, May 2007). This catalogue should assist Members in developing quality management systems for marine meteorological forecasts and services.

Human resource capacity building in service delivery

PWS

31. Various PWS ICT meetings have recommended that PWS training should be formalized in the WMO education and training structure and that, trainers should receive training in PWS-related subjects in addition to other applications of meteorology areas. The planned approach will include consideration of Regional Training Centre trainers participating in appropriate PWS training workshops from 2010 onwards.
