

**CAPACITY BUILDING PROGRAMME AREA
COORDINATION GROUP (CBCG)
FIRST SESSION**

Geneva, Switzerland, 24-27 June 2002

FINAL REPORT

JCOMM Meeting Report No. 14

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NOTE

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariats of the Intergovernmental Oceanographic Commission (of UNESCO), and the World Meteorological Organization concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. Opening of the session

1.1. Opening

1.1.1 The first session of the Capacity Building Coordination Group of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was opened at 0930 hours on Monday, 24 June 2002, in conference room 7L of the WMO headquarters building, Geneva, by Ms Miriam Andrioli, chairperson of the group and Capacity Building Programme Area Coordinator. The opening ceremony took place jointly with the opening of the first session of the GOOS Capacity Building Panel. Ms Andrioli welcomed participants, recalled the importance of the two meetings, both separately and in the joint sessions, and expressed her thanks to WMO for hosting the meetings. She then called on the Assistant Secretary-General of WMO, Professor Hong Yan, to address the meeting.

1.1.2 On behalf of the Secretary-General of WMO, Professor G.O.P. Obasi, and the Executive Secretary IOC, Dr P. Bernal, Professor Yan welcomed participants to both meetings, to WMO and to Geneva. He noted that WMO and IOC were now entering into a new era of inter-organizational scientific collaboration, which was at the same time exciting and complicated. It was exciting because, for the first time, there was the opportunity to address important issues, such as the provision of an integrated and stable ocean database for global climate studies and the implementation of operational oceanography, at the intergovernmental level, in a multi-disciplinary and multi-institutional way. At the same time, it was complicated primarily because of this multi-disciplinary approach.

1.1.3 Professor Yan stressed that both JCOMM and GOOS would only succeed in this enterprise if all maritime countries were able both to contribute to and benefit from work undertaken to support the two bodies. This had been clearly recognized at JCOMM-I and in many GOOS meetings, and the capacity building strategies for both JCOMM and GOOS recognized the high priority to be given to this integral part of the programmes. At the same time, it was important that the capacity building work of JCOMM and GOOS should be complementary, reflecting the complementarity of the overall programmes and making the most effective use of the resources available. The present concurrent meetings, with some joint sessions, had been planned to this end.

1.1.4 Professor Yan then reviewed briefly a number of specific priorities to be addressed during the two meetings. These included, for JCOMM, the need to develop a strategic overview of capacity building requirements to support the Commission, and then to provide advice to other programme areas, and the Secretariat, on specific actions to address these. For GOOS, priorities were to build a global network of regional GOOS organizations, and also to develop capacity building for non-physical, non-climate aspects of ocean observations. Professor Yan concluded by assuring the meeting of the full and ongoing support of the JCOMM and GOOS Secretariats, both during the present meetings and throughout the intersessional period. He then wished participants very successful sessions, and an enjoyable stay in Geneva.

1.1.5 The list of participants in the JCOMM meeting is given in *Annex I*.

1.2 Adoption of the agenda

1.2.1 The meeting adopted the agenda for the session on the basis of the provisional agenda prepared by the Secretariat. This agenda is given in *Annex II*.

1.3 Working arrangements

1.3.1 The meeting agreed its hours of work and other practical session arrangements. The documentation for the meeting was introduced by the Secretariat.

2. Reports

2.1 The group was presented with brief reports by the chairperson and Secretariats on their activities in support of JCOMM capacity building since JCOMM-I, as well as a summary report on the JCOMM-I session itself, and relevant follow-up actions during the past year. Under this item, the meeting also reviewed the JCOMM Capacity Building Strategy adopted at JCOMM-I, as well as brief reports from group members.

Report by the chair

2.2 The Capacity Building Programme Area Coordinator, and chair of the group, Ms Miriam Andrioli, reported on her activities in support of the work of the group since her appointment by the Management Committee in February 2002. These included the development of a comprehensive work strategy, participation in the work of other programme areas, review of planned capacity building activities, and the development of future plans. The full report of the chairperson is in *Annex III*. The group expressed its appreciation to Ms Andrioli for her report, and especially for the work she had accomplished in support of JCOMM in such a short time.

Report by the Secretariat and report on JCOMM-I

2.3 The group recalled that JCOMM was formally established in 1999 by Thirteenth Congress (WMO) and the Twentieth Session of the IOC Assembly, through a merger of the Commission for Marine Meteorology (CMM) and the Joint IOC/WMO Committee for IGOSS. JCOMM is the reporting and coordinating mechanism for all operational marine activities in both WMO and IOC. As such, it is charged with the international coordination, regulation and management of an integrated, operational, oceanographic observing, data management and services system which will eventually become the ocean equivalent of the World Weather Watch.

2.4 The first session of JCOMM took place in Akureyri, Iceland, from 19 to 29 June 2001. The session was attended by 113 participants from 42 Members/Member States and 11 international organizations. A summary report of the main results of the session of relevance to the group is given in *Annex IV*.

2.5 The group was informed that the JCOMM Management Committee had held its first session in Geneva in February 2002. Among the many issues addressed, those of interest to the group included:

- (i) A thorough review of the Programme Area work plans and implementation strategies;
- (ii) The appointment of Ms Andrioli as CB Coordinator;
- (iii) The identification of integration and overarching issues for JCOMM, and the development of an overall strategy;

2.6 The group noted all these developments with interest, and agreed that they provided an appropriate framework and overall objectives for its own work, both during the coming week and in the future.

2.7 The group further noted with appreciation the various actions taken by the JCOMM Secretariat in support of the Commission, and in particular the Capacity Building Programme Area, since JCOMM-I. Members of the group were urged to:

- (i) Visit the UN Atlas of the Oceans (<http://www.oceansatlas.org/>) and offer comments and suggestions as appropriate regarding its enhancement, within the context of JCOMM and its work;

- (ii) Also visit the new JCOMM web portal being hosted by IOC (<http://www.jcomm.net/>), provide comments and suggestions as appropriate, and also make use of the portal as a means for information exchange in support of JCOMM;
- (iii) Provide the Secretariat with suggestions regarding a JCOMM logo. (**Actions:** Group members and Secretariat)

JCOMM Capacity Building Strategy

2.8 The group recalled that, at the request of the interim JCOMM Management Committee, a comprehensive JCOMM Capacity Building Strategy document had been prepared. The strategy recognizes, and is fully compatible with the capacity building strategy of GOOS. The Executive Summary of the JCOMM strategy was reviewed and adopted by JCOMM-I, and the full strategy has been published as a JCOMM technical report. The group reviewed and strongly supported the strategy, which it agreed should be used as the framework for its own work, and for developing proposals for specific capacity building activities.

Reports by group members

2.9 The group reviewed brief reports by its members on their activities to date in support of JCOMM. These included, in particular, preparations for regional capacity building surveys, along the lines of that already conducted by the chairperson for Latin America. Summaries of these reports are given in *Annex V*. In discussions on the reports, points noted included:

- (i) The requirement for a regional storm surge project for West Africa (see actions under agenda item 4.4);
- (ii) The potential value of the OceanTeacher Project of IODE for JCOMM, and the need for national focal points for the project;
- (iii) The value of joint capacity building projects and programmes, and the possibilities to expand these through VCP and similar support;
- (iv) The potential value of the Floating University concept to JCOMM and GOOS, and the possibilities to extend the existing universities to other countries and regions, and to include disciplines of direct interest to JCOMM;
- (v) The value of the results of the IOCARIBE-GOOS survey to complement the regional requirements survey for South America undertaken by the group chair;
- (vi) A general requirement to better coordinate WMO and IOC training activities in support of JCOMM, and a possible involvement of JCOMM training for tsunami warnings.

Specific actions taken on these issues are recorded under subsequent agenda items.

3. Review of related capacity building programmes

3.1 The group recognized that substantial capacity building activities of direct relevance to JCOMM are undertaken under a number of other WMO and IOC programmes, including GOOS, GCOS, IOC TEMA and IODE, and the WMO Education and Training, Technical Cooperation, Voluntary Cooperation and satellite programmes. Based on reports from these programmes, the meeting reviewed such activities, with a view to identifying specific actions which might be undertaken jointly, as well as general areas where coordination and cooperation would be of direct benefit to JCOMM. Enhanced coordination with GOOS is considered in detail under agenda item 6.

GOOS

3.2 The meeting was informed that the objectives of the GOOS CB Panel meeting are to explore the development of a framework for the short to medium term objectives of a capacity building programme, in the context of the long term goals published in the Implementation Plan for CB, following the Principles of GOOSCB. In this context JCOMM and GOOS are complementary organizations and should develop complementary plans for CB. GOOS is designed to develop a global system that is akin to the World Weather Watch, but for the ocean, while JCOMM is the implementing arm for GOOS and other bodies. JCOMM will, at least initially, focus on the physical aspects of the ocean. GOOS has a broader remit, covering all aspects of ocean science. Thus the eventual plans will differ in some important respects. However, in some areas there is considerable commonality, especially in the areas of (i) in situ measurements, such as sea level from tide gauges, or other measurements from ships and buoys, (ii) remotely sensed measurements from space, and numerical modelling that will take the in situ and remotely sensed data and integrate them to produce new products and forecasts. In this context JCOMM's efforts will be close to the end products and services, while GOOS's CB training efforts may be focused further upstream. GOOS is building a network of national GOOS bodies to help build GOOS at the national level, and regional GOOS alliances that will build GOOS at the regional level. Much capacity building is needed to raise the level of ability both of individual countries and of whole regions to contribute to and benefit from GOOS. In this context, the regional surveys that JCOMM was undertaking should be of use to the developers of a GOOS CB programme as well as to JCOMM. It will be important, as GOOS and JCOMM progress, to ensure that the activities developed by the two groups are complementary. It will also be evident that in some areas GOOS and JCOMM will need joint working groups to take forward specific developments, for example in remote sensing and modelling.

GCOS

3.3 William Westermeyer of the Global Climate Observing System (GCOS) Secretariat reviewed the GCOS Regional Workshop Programme. GCOS initiated this 10-workshop programme in response to the invitation of the Conference of the Parties to the United Nations Framework Convention on Climate Change to organize regional workshops "to identify the priority capacity-building needs related to participation in systematic observation." GCOS created the Programme as a means to bring attention to needed improvements in observing systems for climate and to facilitate the development of Regional Action Plans to address priority needs. Other objectives include educating workshop participants about the status of observing systems in each region, including gaps and deficiencies in networks; improving communication between directors of meteorological services and national climate change coordinators; and helping participants understand guidelines for reporting to the UNFCCC on systematic observations.

3.4 Three regional workshops have been held thus far, including those for the Pacific Islands, for Eastern and Southern Africa, and for Central America and the Caribbean. Action Plans for the first two regions have been completed thus far, with that for Central America and the Caribbean expected by late summer 2002. The next scheduled workshop is for the countries of East and Southeast Asia in September 2002.

3.5 GCOS receives support from the Global Environment Facility to fund 60 percent of the Regional Workshop Programme. It must raise the remaining funds from individual donor countries and international organizations on a workshop-by-workshop basis. The implementation of Action Plans is beyond the scope of the Programme, but as part of its broader mission GCOS is committed to helping regions identify sources of funding for the priorities identified in the Plans. The Conference of the Parties to the UNFCCC remains very interested in the Regional Workshop Programme and Action Plans, and this high-level interest enhances the possibilities for support for real improvements in observing systems.

WMO programmes

3.6 The group was informed that Education and Training and Technical Cooperation constitute separate programme areas within the overall WMO programme structure, and that both programmes undertake various activities which directly support JCOMM. A summary of these activities is given in *Annex VI*. They include: the award of short-term and long-term fellowships in marine fields; the publication of guidelines and syllabi for education and training in marine fields; various marine support projects through the voluntary cooperation programme; and expert missions to advise on the development of marine observing systems and marine services in a number of countries. The group agreed that it should maintain a close liaison with both these major WMO programmes. (**Action:** Chair and Secretariat)

3.7 Dr Donald Hinsman, Senior Scientific Officer for the WMO Satellite Activities Office, briefed the joint meeting on WMO's Strategy to Improve the Utilization of Satellite Systems, WMO's Strategy for Education and Training in Satellite Meteorology as well as the Virtual Laboratory for Education and Training in Satellite Meteorology and its associated Focus Group. He described the process whereby WMO Members provided input to the Strategy to Improve the Utilization of Satellite Systems through the use of a biennial questionnaire. An analysis of the questionnaire provided guidance to WMO Members on a regional and national basis on how best to exploit better the available satellite systems. He noted that the strategy for education and training approved by WMO's Executive Council followed the principle to "train the trainers". Several "Centres of Excellence" had been identified and cosponsored by the CGMS satellite operators (Niamey and Nairobi by EUMETSAT, Barbados and Costa Rica by NOAA/NESDIS, Nanjing by CMA and the BMTC by JMA).

3.8 Recently the "Centres of Excellence" have been linked through the use of Internet to provide the possibility for near continuous education and training. The system of linked "Centres" was called the Virtual Laboratory for Education and Training in Satellite Meteorology (VL). Dr Hinsman described some advancements in the VL that allowed for lectures to be given remotely through new capabilities such as VisitVIEW and through the use of Internet. He proposed that the VL could provide similar training opportunities for the oceanographic community. He also informed the joint meeting of the recent decision by WMO to expand the space-based component of the Global Observing System to include Research and Development satellites and that NASA, ESA and the Russian Space Agency had already confirmed their participation.

3.9 The group noted this information with considerable interest. It specifically requested that the VL programme should be expanded to include ocean satellites and ocean remote sensing, with the possible addition of new centres of excellence, devoted to oceanography. (**Action:** Secretariat and Management Committee, with GOOS)

IODE

3.10 Mr Peter Pissierssens, Head Ocean Services IOC, informed the meeting on capacity building activities of the IOC's International Oceanographic Data and Information Exchange (IODE) programme. He explained that, whereas in the past IODE's capacity building programme had focused mainly on advisory missions, internships and training courses, IODE had since the late 1980s embarked on a new strategy based on linking equipment, training and operational support. This new concept was put into place through the development of 'Ocean Data and Information Networks' (ODINs) in the Africa (ODINAFRICA) and the Caribbean & South America regions (ODINCARSA). These networks have the following capacity building elements in common: (i) provide assistance with the development and operation of National Oceanographic Data and Information Centres, as well as their networking; (ii) provide training opportunities in ocean data and information management applying standard formats and methodologies as defined by IODE; (iii) assist with the development and maintenance of national and regional metadata, information and data holding databases; and (iv) assist with the development and dissemination of ocean data and information products responding to the needs of a wide variety of user groups using national and regional networks. Mr Pissierssens pointed out that the ODIN networks should be seen as

multi-purpose ocean data and information management platforms of which the scope will gradually expand from mainly delayed-mode data to operational oceanography data focusing on developing services and products as required by a wide variety of users.

3.11 Mr Pissierssens then proceeded with an overview of the OceanTeacher system. The objective of OceanTeacher is to provide training tools for oceanographic data and information management and exchange. These tools are used during IODE Training Courses but can also be used for self-training and continuous professional development. The OceanTeacher system is composed of three elements: (i) the Resource Kit; (ii) the Training Manual; and (iii) Data CD. The Resource Kit contains a range of ocean data and information management materials such as software, quality control and analysis strategies, training manuals and other relevant documents. The Training Manual is a collection of outlines, notes, examples and other materials to be used in conjunction with the Resource Kit to organize IODE training courses at the national or regional level. The Data CD is prepared for specific training courses covering data specific for a particular region. Data include data sets obtained from relevant NODCs or WDCs in the IODE system. After the training events, participants are urged to start the collection of national metadata, data and information to develop national data holdings. Where possible this is done within the framework of an ODIN project. OceanTeacher is available through the web site <http://www.oceanteacher.org> and on CD-ROM (available upon request from the IOC/IODE Secretariat).

3.12 Mr Pissierssens invited JCOMM and GOOS to contribute training material to the OceanTeacher to make it a comprehensive training system covering delayed-mode as well as operational oceanography (and possibly marine meteorology in cooperation with WMO's distance learning system).

3.13 The group recommended that stocks of the OceanTeacher CD-ROM should be made available at the national level through ODIN or IODE national coordinators. (**Action:** IODE Secretariat) The group welcomed the call for cooperation and recommended that, in particular, collaboration should be established with BILKO. It was further agreed that Mrs Regina Folorunsho would assist with the scoping of JCOMM relevant content that could be considered for inclusion in a joint IODE/GOOS/JCOMM OceanTeacher. (**Action:** Regina Folorunsho)

3.14 The group recommended cooperation between ODINs, GOOS, WIOMAP and other relevant IOC and WMO projects and programmes. The group further recommended that ODINs should be established in other regions, if interest for such an endeavour was expressed by Member States in such regions. It was hoped that the success of the existing ODINs would facilitate identifying necessary funding for these networks. (**Action:** Secretariat)

BILKO

3.15 The group was informed that the UNESCO Bilko project (coordinated by UNESCO CSI) provides a comprehensive distance learning capability for marine remote sensing. The project has over 15 years experience with a current registered user community of over 1800 students, in 500 institutions and 40 countries. Bilko has been used extensively in many hands-on international training workshops and by a large number of Universities as a core component of marine remote sensing training.

3.16 The Bilko project provides, free of charge, a comprehensive image processing software package (called Bilko2000) that continues to evolve based on coordinated user requests. Bilko2000 is unique in its approach and capability having been built on extensive user testing and research. The application provides support for many different file formats (including HDF and flat binary 16 and 32 bit data) and functionality ranging from simple image display through to complex mathematical operations handling multiple image data sets and navigation of image data. Complex geophysical and atmospheric correction algorithms are exposed in easy to use text files that explain clearly each operation performed. An extensive introductory tutorial is provided presenting new users with an easy to understand functional review of the functionality offered by Bilko2000.

3.17 The Bilko2000 software is supported by a suite of distance learning pedagogical materials that present, at various levels, a broad spectrum of image data sets, image processing tools and techniques, geophysical algorithms and concepts. Lesson topics include sea surface temperature, chlorophyll concentration, mapping of marine habitat, ocean winds, ocean waves, subsurface acoustic Doppler current profiler time series data, time series analysis of ocean station data, ocean model output data visualization and fisheries research. A variety of different image data sets are used including synthetic aperture radar, infrared, microwave and, colour sensors. In addition to a series of structured lessons that consider fundamental remote sensing concepts, collections of lessons provide series of thematic modules that have an application or regional focus.

3.18 A strict review procedure is used to ensure that all lesson material adopts best practices in terms of distance learning devices, style and structure as well as assuring the quality of scientific content. In particular, an extensively researched lesson format is strictly adopted by all Bilko lessons that provides students with a clearly stated lesson aim, a number of objectives, background material and structures self assessment questions. Each lesson provides a structured learning experience that is very much hands, on as students interact with satellite data using the Bilko200 software. Many lessons are available in different languages including Spanish, Russian, and English. All material is available free of charge, on request to the Bilko secretariat, as a CD ROM and in colour hard copy bound workbooks. Full details of the Bilko project may be found at <http://www.unesco.bilko.org>.

International Ocean Institute

3.19 Dr I. Oliounine, IOI Executive Director, presented information on the International Ocean Institute, which was established in 1972 as an international non-governmental organization with the Headquarters in Malta. The mission of the Institute is to promote education, training and research, enhance peaceful and sustainable use of ocean and coastal spaces and their resources, their management and regulation, and facilitate the protection and conservation of marine environment. This mission is being implemented by 22 IOI Operational Centers (OC) (usually co-located with universities or national research centers) scattered all over the world. Each OC has its own strength - some in law and policy, some in oceanography and coastal management, some in technology, etc.

3.20 During the past 30 years the Institute gained a worldwide reputation in providing advice, consultancy, evaluation and assessment and information exchange services. Achievements include support to the formulation and realization of the articles of the Convention of the Law of the Sea, organization of Pacem in Maribus conferences, seminars and workshops on ocean governance, socio-economic issues, risk assessment and management, publication of the Ocean Yearbook, development work among coast communities, etc. The IOI plays a role of a think tank which helps generate incentives and contact between authorities, integrate social, environmental economic and scientific issues and develop projects with involvement of all sectors.

3.21 The IOI past experience includes projects on eco-villages and biodiversity, sustainable livelihoods and coastal management and protection. Today one of the IOI flagship programmes is the IOI Virtual University (IOIVU) which integrates the IOI experience in long-term training gained during the last two decades. The mission of IOIVU is to enhance the abilities of developing countries to develop and govern their own marine and coastal resources and environments sustainably, in harmony with related international conventions and agreements. IOI will offer this programme as a major contribution to holistic capacity building in the years after WSSD.

3.22 Dr Oliounine emphasized that in implementing IOIVU as all other projects, IOI is looking for cooperation and partnership with other governmental and non-governmental organizations and considers IOC and WMO as important potential partners. IOI will be pleased in its turn to provide the teaching and training needed at the level of middle management and decision makers as well as its expertise and experience which will be useful to meet GOOS and JCOMM objectives.

3.23 The strength of the capacity building concept resides in its capacity to have the current JCOMM evolve towards a sustainable global system ensuring development of observing/data collection systems, technically appropriate and modern, economically viable and socially acceptable to meet the needs of the users in developed as well as developing countries, and provision of services and products for the benefit of the mankind.

3.24 Dr Oliounine noted that in capacity building there are areas where the IOI experience can be very useful for JCOMM and can complement JCOMM activities. IOI may be interested in helping to develop internal/external policies that are best adapted to the real situation regarding local environments in assisting in the dissemination of results of JCOMM projects, in promoting JCOMM goals, in assisting in fund raising campaigns and in increasing public awareness and support. The group expressed its appreciation to Dr Oliounine and the IOI for the offer of collaboration, which it accepted. It requested the Secretariat to liaise further with the IOI on this issue. (**Action:** Secretariat)

JAMSTEC

3.25 The group noted with interest a presentation by Dr Kazu Kitazawa and Ms M. Ohashi on a JAMSTEC training programme for an Asia-Western Pacific Ocean Research Network. This training programme, conducted in Japan and onboard research vessels, covered user training and public awareness related to the maintenance of observing systems in this region, including the TRITON buoys and Argo floats. The programme, which had been underway for less than two years, had so far shown very positive results in many different aspects of public awareness.

4. Regional and national capacity building

4.1 Regional requirement surveys

4.1.1 The group agreed that, in planning details of a coherent and attainable capacity building programme in support of JCOMM, it was important to determine what are national and regional requirements for such capacity building in marine meteorology and oceanography. To this end, the chairperson of the group had initiated a series of regional surveys of such requirements, along the lines of the one she undertook herself in 2000/2001 for South America. The meeting reviewed the background to and conclusions from this survey, and agreed that it provided an excellent starting point for determining overall JCOMM priorities in capacity building.

4.1.2 The group noted that the requirements survey for the South-West Pacific region (WMO Region V) was now underway, with the questionnaire distributed by the WMO Secretariat, but that it was still too early to expect responses. As yet, the surveys for Africa, Asia, Europe and the Wider Caribbean had not been initiated. However, the group noted that IOCARIBE-GOOS had already undertaken a survey in this region, and it requested that the results of this should be made available to JCOMM. (**Action:** GOOS Project Office and Secretariat) The group therefore requested the Secretariat to also distribute the questionnaire to these regions, on behalf of the group members concerned, by means of JCOMM joint circular letters. (**Action:** Secretariat) Responses should be returned to the group members for analysis, with the results of the analysis to be then passed to the chair and the Secretariat for compilation and the preparation of an initial list of priority requirements. (**Action:** Group members)

4.2 Regional priorities for capacity building

4.2.1 Based on the results of the regional requirements surveys, the group agreed that it should determine a set of regional and/or national priorities for capacity building in support of JCOMM, which were both practical and attainable in the context of available resources, and for which measurable success criteria might be specified. An initial set of such priorities should be prepared by the group chair and Secretariat, for circulation to all group members for review and further input. (**Action:** Chair and Secretariat) These priorities would then be used to develop specific advice

and/or projects for JCOMM capacity building. They should also be passed to the GOOS CB Panel. (**Action:** Secretariat)

4.3 Interaction with existing regional programmes and activities

4.3.1 The group recognized that both WMO and IOC have regional bodies, which are of potential value to JCOMM in developing its regional capacity building programme. The meeting therefore considered how best to develop links to these bodies, including through the WMO Regional Rapporteurs on Marine Meteorological Services, whose responsibilities now also cover oceanographic issues. Specifically with regard to the regional rapporteurs, the group agreed that they could be of most value to JCOMM in the development of regional and national interactions with users (see also agenda item 4.5).

4.3.2 The group agreed at the outset that it would greatly benefit JCOMM if reciprocal links and meeting representation were developed among the different WMO and IOC regional bodies. To assist in this process, the group requested the chair and Secretariat to prepare a standard briefing paper on JCOMM capacity building, including regional requirements, for use by the relevant representatives in these regional body meetings. (**Action:** Chair and Secretariat) The Secretariat was also requested to arrange for the appropriate meeting representation. (**Action:** Secretariat)

4.3.3 The group noted that there were, in addition, a number of existing regional programmes and associated activities outside of WMO and IOC, such as the Regional Seas Conventions of UNEP or regional groupings such as CPPS, which were of potential value to JCOMM capacity building. The group reviewed the status and activities of these, with a view to identifying and establishing appropriate links with these programmes. Group members were requested to investigate the status of the Action Plans in their individual regions, to summarize their activities, to develop appropriate links (including with their secretariats if these existed), and, if possible to propose possible collaboration with JCOMM in capacity building. Eventually, summary reports on these Action Plans, and possible JCOMM interaction, should be submitted to the chair and Secretariat. (**Action:** Group members). In this context, the group noted with interest the enhanced collaboration between IOC and UNEP in the Caribbean region, through IOCARIBE and the Caribbean Action Plan, as well as in the Mediterranean and the Northwest Pacific.

4.4 Regional cooperative projects

4.4.1 The group noted that there were currently two regional cooperative development projects being developed/implemented under the auspices of JCOMM and GOOS: The South-East Asian Centre for Atmospheric and Marine Prediction (SEACAMP) and the Western Indian Ocean Marine Applications Project (WIOMAP). It reviewed the status of these, recognizing that SEACAMP was now quite mature, and into its implementation phase, while the draft WIOMAP Project Document was to be reviewed and hopefully approved at a meeting in Mauritius in October/November 2002, to take place in conjunction with the IOGOOS Conference.

4.4.2 The group recognized the likely value of these two projects to the regions and countries concerned, and expressed its appreciation to all concerned for the work which had gone into their development. It further agreed on the value of the concept of regional cooperative development projects in general, bearing in mind the limitations of financial and personnel resources which could be devoted to their initiation and development. Specifically, the group agreed that the next priority for such a project should be to develop capacity for storm surge monitoring, modelling and forecasting for West African countries, as identified by Regina Folorunsho. It therefore requested Ms Folorunsho to develop a draft conceptual outline for such a project, making use of some ideas already prepared for a more general West African Project by Sachooda Ragoonaden. This conceptual outline should then be forwarded to the chair and Secretariat for review and further action. (**Action:** Regina Folorunsho, chair and Secretariat)

4.4.3 In the context of such regional projects, the group agreed on the need to develop public awareness of the benefits of these projects, as well as of involving as many other partners as

possible in their development and implementation. It therefore welcomed the offer of the representative of IOI for his institute to cooperate, in particular in such aspects as exercises to raise public awareness. (**Action:** Secretariat and IOI)

4.5 Regional user interactions

4.5.1 The group recognized that interaction with and the training of users was an important aspect of capacity building. JCOMM-I had suggested that regional user forums might be organized, as a means of enhancing this interaction. However, it was important that such forums should be properly targeted and structured, and the group recognized that it could learn from the experiences of Coastal GOOS in this regard.

4.5.2 The group agreed that, in general, user interaction should be an extensive, one-on-one, iterative process, often undertaken over a long time period, to ensure maximum effectiveness and mutual benefit. In this context, it was therefore best undertaken at the national, or limited regional level. This type of interaction would then be most effective in promoting JCOMM data, products and services, not just among specific users, but also at a more political level. In this context, the group noted with interest the information provided by the representative of IOI regarding the "Leadership Seminars" that the IOI had undertaken in different regions. These seminars were designed both to provide information to high level people on marine environmental issues, and also to formulate conclusions for national development. It welcomed the offer for the IOI to consider the organization of a future such seminar related to JCOMM, GOOS and operational oceanography. (**Action:** Secretariat, GPO and IOI)

4.5.3 To encourage and enhance user interactions at the national level, the group agreed that a short information leaflet should be prepared, to provide advice and guidance to national meteorological and oceanographic agencies on the implementation and maintenance of such interactions. It requested the co-president, Johannes Guddal, as well as all group members as appropriate, to provide the chair and Secretariat with any existing national material which might assist in the preparation of this leaflet. (**Action:** Johannes Guddal, group members) The chair and Secretariats were requested to then prepare a draft of the leaflet, for review by group members prior to distribution to Members/Member States. (**Action:** Chair and Secretariat)

4.6 Monitoring the effectiveness of capacity building programmes

4.6.1 The group agreed that a successful capacity building programme must have a means of assessing the short and long-term effectiveness of the activities carried out under that programme. In this context, it reviewed existing methodologies and procedures for evaluating different types of capacity building within WMO. It agreed that these, while more complex than might be required for JCOMM, nevertheless provided some good guidelines for JCOMM evaluations. The group therefore formulated a general conceptual outline of a capacity building evaluation programme for JCOMM, for three different categories of such capacity building: training workshops, large-scale projects, and VCP and similar projects. This outline is given in *Annex VII*. The meeting requested Qi Ping, Sachooda Ragoonaden and the Secretariat to work together to fully develop the evaluation procedures, which would then be applied in the future by the Secretariat to all JCOMM capacity building activities. (**Action:** Qi Ping, Sachooda Ragoonaden, Secretariat and GPO)

5. Specific capacity building activities

5.1 Support for other JCOMM Programme Areas

5.1.1 The group recognized that all the other JCOMM Programme Areas (Services, Observations and Data Management) undertake or plan a variety of capacity building activities, within the context of their ongoing work programmes. These included the preparation of specialized guidance material and the sponsoring or convening of technical workshops and seminars. In reviewing what was already being done, and what were priority requirements, the group particularly emphasized the value of making available as freeware, software packages for use on PCs and workstations for

modelling and forecasting ocean elements such as waves, surges, oil spill trajectories/dispersion, ocean thermal structure, etc. Such software should be easily adaptable to local institutional and environmental conditions, and software delivery should also include training in adaptation and use. It was further recognized that the quality and value of the modelling depended on the amount and quality of the input data available locally. In this context, any project delivering models should also consider linkages to relevant satellite and in situ data. (**Action:** Secretariat and Services Programme Area) (See also the action in paragraph 6.3.)

5.2 Training and guidance material

5.2.1 The group noted that there existed already, within both WMO and IOC, a variety of training and guidance material, in printed, video and electronic form, of direct relevance to JCOMM. The group reviewed this existing material, with a view to determining requirements for updating or replacement as necessary. No specific requirements were identified during the meeting. However, the group requested Regina Folorunsho to keep all relevant training and guidance material under review, and make proposals for updating and replacement as necessary. The Secretariat was requested to pass a comprehensive list of this material, and the publications themselves, to Ms Folorunsho. (**Action:** Secretariat and Regina Folorunsho)

5.3 Workshops and other short-term training

5.3.1 The group noted that both WMO and IOC have convened, over the past few years, a number of workshops and similar short-term training events in fields now falling within the mandate of JCOMM. These include series of workshops for GLOSS, for PMOs and on wave and surge forecasting. The meeting reviewed both past and planned events in these series, with a view to determining their effectiveness and value, making proposals for future modifications, and eventually making proposals for similar training events in other specialized topics and/or for specific regions. The group particularly supported the concept for such training that it should be focussed, and directed specifically to supporting JCOMM operational objectives. The group specifically identified as high priority areas for such training:

- (i) Remote sensing, including data access, data management and applications;
- (ii) Sea level measurements and sea surface topography, particularly in Africa and the Caribbean. Such training, where possible, should also be accompanied by the provision of equipment and long-term maintenance assistance.

It was recognized that both these latter topics were also of direct interest to GOOS, and specific actions are identified under agenda item 6.

5.3.2 The group noted with interest information provided by the co-president of JCOMM, Johannes Guddal, concerning the recent Hanoi training workshop on waves and storm surges (January 2002), on the interconnections with GOOS in this region, and on plans for the continuation of this workshop series for countries in the South China Sea region. These plans included a second workshop in Malaysia, tentatively in mid-2003. The group agreed on the value of this activity, on its direct relevance to JCOMM capacity building, and also on the interactions it was forging with GOOS in the region, and therefore strongly supported its continuation. (**Action:** Johannes Guddal)

6. Integration with GOOS capacity building

6.1 The group recognized that the overall JCOMM Capacity Building Strategy had been developed to be fully compatible with that of GOOS, and it was clear that many of the objectives and activities of the capacity building programmes of JCOMM and GOOS were interrelated and complementary. Based on the discussions under preceding agenda items, which formed part of the joint session with the GOOS Capacity Building Panel or otherwise, the JCOMM CBCG and the

GOOS Panel jointly reviewed the requirements and possibilities for enhanced coordination of the two programmes.

6.2 Resulting from the ensuing extensive discussions, the following specific issues of common interest and/or requiring enhanced coordination, were identified:

- (i) The continuation and expansion of the storm surge pilot projects currently underway or planned in East Asia and Eastern South America; (**Action:** Johannes Guddal, GOOS/COOP and Secretariat);
- (ii) Enhanced coordination of specific training workshops, bearing in mind that the objectives of such workshops for JCOMM and GOOS were often different. The JCOMM workshops are generally to support operational agencies, directed to specific operational services such as wave forecasting, while GOOS workshops may be more general in nature, covering other disciplines. (**Action:** Secretariat);
- (iii) The development and distribution, as freeware, of software for modelling and forecasting various ocean elements such as waves, surges, currents, oil spills, etc. (see also paragraph 5.1.1 above);
- (iv) The development and distribution of guidelines relating to user interactions and public awareness. It was recognized that there was much material already available via the web, in particular directed to awareness raising among school children, which might also be exploited. The importance of the involvement of children as a target audience in the awareness and education process was stressed. It was noted that other organizations such as the IOI were also involved in this process. The IOI would invite JCOMM/GOOS to participate in its programme on Children and the Sea. The group accepted this offer with appreciation, at the same time stressing the need for JCOMM in particular to concentrate on operational ocean issues in its public interactions. (**Action:** IOI and Secretariat);
- (v) Linked web pages to provide information regarding JCOMM and GOOS capacity building resources (training courses and materials, freeware, technical information, etc). It was agreed that Ruben Aparicio should join a GOOS Panel intersessional task team on this topic. (**Action:** Ruben Aparicio);
- (vi) It was recognized that GLOSS supports both JCOMM and GOOS, and that therefore there was a direct interest from both the CBCG and the GOOS Panel to ensure that GLOSS training and technical assistance meets all requirements. It was agreed that JCOMM and GOOS should work with and support the GLOSS Group of Experts in their capacity building work, both to ensure that requirements were adequately addressed, and also that, to the extent possible, adequate resources were available for this work. (**Action:** Chairs and Secretariat)
- (vii) GOOS was considering the need and possibilities for preparing guidance material relating to observational instrument evaluations, standards, best practices, QC, etc. An evaluation of the way forward in this important area was already underway within JCOMM, through a Task Team on Instrument Testing and Intercalibration established by the Ship Observations Team at its session in Goa, February 2002. It was agreed that GOOS and IODE would nominate experts to join this task team. (**Action:** GSC chair, IODE and Secretariat);
- (viii) There may be value for both JCOMM and GOOS capacity building in the establishment of links between JCOMM and the GOOS Regional Alliances. It was agreed that a first step in this regard should be made at the GOOS Regional Alliance Forum in Athens in December 2002. (**Action:** Secretariat);
- (ix) Both JCOMM and GOOS have a strong interest in greatly enhanced training in satellite ocean remote sensing, in terms of data access, data management, product preparation and

applications. It was recognized that JCOMM and GOOS should jointly coordinate with the WMO satellite programme, as well as external activities such as the Bilko project, to implement facilities and projects for capacity building in ocean remote sensing (see also paragraph 3.9 above). To this end, it was agreed that the JCOMM and GOOS CB groups should jointly establish a technical working group on remote sensing, to develop a status overview of existing facilities and projects, and assessment of future expectations and an outline training programme proposal. (**Action:** Chairs, JCOMM satellite rapporteur and Secretariat)

6.3 The group agreed that the opportunity to interact directly with the GOOS Panel, including in particular in the joint sessions, had been very valuable. It requested the chairs and the Secretariat, if at all possible, to make similar arrangements for future meetings of the two bodies. (**Action:** Chairs and Secretariat)

7. Task Team on Resources

7.1 The Capacity Building Programme Area includes a Task Team on Resources, charged with developing links to international and national funding bodies and programmes of potential value to JCOMM, and eventually developing a plan for obtaining resources for JCOMM capacity building, in collaboration with GOOS and GCOS. The group noted some proposals for the membership of this group, and recommended to the Management Committee the list of persons given in *Annex VIII*. (**Action:** Co-presidents and Secretariat)

7.2 The group agreed that the overall work strategy of the Task Team on Resources, within the context of the terms of reference given by JCOMM-I, should include:

- (i) Preparation of general information on potential funding agencies for JCOMM support activities, including priorities, regions of interest, procedures, formats, contacts, etc. This work will be undertaken in parallel with the continuation of the CB coordination group work to compile regional requirements and overall priorities for capacity building;
- (ii) Eventual merging, by the task team, of requirements with potential funding sources, to determine a strategy for matching requirements with the resources to address these, and also identify potential gaps in these resources;
- (iii) Assistance in the preparation of projects and related proposals for funding or in-kind resourcing.

7.3 The group urged that the task team should be formally established as soon as possible, so that it could begin its work in parallel to the regional requirements surveys, and if possible meet soon after establishment. (**Action:** TT chairman and Secretariat) The group also urged that the task team should collaborate and coordinate closely with the resources team established by the Intergovernmental Committee for GOOS (IGOOS), recognizing that Jan Stel was a member of both teams. Such coordination was needed again to avoid duplication of effort, and also to ensure that common approaches were made to funding bodies, as appropriate. (**Action:** Task Team chair and Secretariat)

8. Capacity building work programme

8.1 The group requested the chairperson, Miriam Andrioli, and the Secretariat, to review and update the capacity building work programme and strategy for the remainder of the intersessional period, based on discussions and decisions under previous agenda items. (**Action:** Miriam Andrioli and Secretariat) This updated work programme is given in *Annex IX*. Under this agenda item, the group also requested the Secretariat to identify one potential new member of the group, preferably from Europe, and to request the co-presidents to agree to the appointment of this additional member, whose presence would be essential to the successful accomplishment of the work

programme. An expert from Portugal was particularly recommended, if possible. (**Action:** Secretariat)

8.2 The group was informed that, as part of an overall strategy to enhance continuing education and training in specialized aspects of meteorology and hydrology, the WMO Education and Training Department is planning a new publication series – *Continuing Education and Training in Meteorology and Hydrology (CET-MH)*. One proposed topic for a new publication in this series is **Marine Meteorology and Physical Oceanography**. The group agreed that such a publication would provide a very valuable contribution in support of JCOMM capacity building requirements. It therefore supported its preparation, and requested group members to provide the Secretariat with names for possible authors, as soon as possible. (**Action:** Group members, Secretariat and GPO)

9. Closure

9.1 The group recommended that its next session should take place once more in conjunction with a session of the GOOS CB Panel, if possible in 2004. (**Action:** Secretariat and GPO).

9.2 In closing the meeting, the chairperson, Ms Miriam Andrioli, expressed her thanks to all group members for their hard work and very valuable input, both in preparation for and during the session, which had contributed greatly to its success. She also expressed appreciation to the chairman and members of the GOOS CB Panel, for the opportunity to meet concurrently, and for the high level of cooperation and coordination achieved, especially through the joint sessions. She concluded by thanking the Secretariat for its support, and wished everyone a safe journey home and a successful continuation of the work of the group.

9.2 The first session of the JCOMM Capacity Building Coordination Group closed at 1215 hours on Thursday, 27 June 2002.

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 - 1.1 Opening
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 - 2.1 Reports of the chair and Secretariat
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Report of the Chairperson

Introduction

1. The atmosphere of willingness and enthusiasm that prevailed during JCOMM-1 was repeated during the first session of the JCOMM Management Committee (MAN-1), which took place in February 2002. In that occasion, all Programme Areas were encouraged to develop synergies to respond, with a spirit of full cooperation, to the vision and objectives of the JCOMM Work Plan.

Structure of the Capacity Building Coordination Group

2. Though the structure of the CB Coordination Group and the experts to participate in its activities were confirmed during JCOMM-1, the decision of Mr. Héctor Soldi to resign his position of Coordinator led to changes in the composition of the Group. In this regard, the JCOMM Management Committee elected a new CB Programme Area Coordinator (Ms. Miriam Andrioli) and appointed a new Group member (Mr. Ehrlich Desa).

Activities of the CB Group Coordinator in support of JCOMM Capacity Building

3. Under the direction of the former Coordinator Mr. Héctor Soldi, the Capacity Building Coordination Group (CBCG) carried out a revision of the entry on "Marine Meteorology" -extract from Chapter 8, Preliminary Issue of the Fourth Edition of WMO N° 258, "Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology", Volume I, June 2000-, as requested by JCOMM-1.

4. The Capacity Building Programme Area (CBPA) Coordinator Miriam Andrioli developed a work strategy for implementing the work programme of the Capacity Building Programme Area. The work strategy was submitted to, approved and adopted by the JCOMM Management Committee (MAN-1/Doc. 4.4). The **Work Strategy for JCOMM Capacity Building** was constructed in accordance with the guidelines stated by the JCOMM Capacity Building Strategy (document WMO/TD N° 1063, 2001, JCOMM Technical Report 11). Both the Strategy and its work plan are compatible with and implemented in concert with the capacity building programmes of WMO, IOC, GOOS and GCOS. In particular, the work plan includes specific actions oriented to enforce integration with the GOOS Capacity Building Programme and its Implementation Strategy for the future coordination of the planning and enforcement of projects of mutual interest. In this regard, it was agreed by the JCOMM Management Committee that both the GOOS Capacity Building Panel and the JCOMM Capacity Building Group should hold their meetings at the same time at the WMO Headquarters. This would then facilitate the sharing of sessions and the development of links, an idea reinforced by the presence of Mr. Ehrlich Desa, already a member of the GOOS Capacity Building Panel.

5. The Work Strategy for JCOMM Capacity Building comprises two main phases, which are to be carried out by the six Capacity Building Coordination Group members:

(i) Phase A, consists of a work programme for implementation prior to the first meeting of the Capacity Building Group. Its action plan includes a) surveys of all maritime countries, on the basis of WMO regions, to establish their requirements; b) identifying WMO and IOC capacity building activities relevant to JCOMM; and c) determining regional capacity building priorities.

(ii) Phase B, consists of a parallel action plan that begins at the same time as Phase A but continues until the end of 2002. This Phase has been designed to establish links with other capacity building programmes, to develop links with GOOS and GCOS and to assist the Expert Team on Sea Ice to build its capacity to develop specialized educational material.

6. The six members of the Capacity Building Coordination Group were identified and contacted immediately after the JCOMM Management Committee Session by the CBPA Coordinator in order to inform them of the tasks that had been assigned to them under the Work Strategy. Full agreement, along with a great sense of commitment and willingness was shown by all Group members, and an ongoing communication was established and maintained up to the present meeting.

7. In relation to Phase A, the Group Coordinator and the Secretariat received the first Capacity Building questionnaire duly completed by the end of February 2002. The material, kindly sent by the Director of the Mauritius Meteorological Services (Mr. Beebeejaun) was immediately retransmitted to the Group member responsible of the analysis of WMO Regional Association I, for its inclusion in the correspondent study.

8. Documents such as MAN-1/Doc. 4.4 – Work Strategy for JCOMM Capacity Building- and its annexed questionnaire were distributed to all six Group members, along with a personalized explanation on the working criteria to accomplish the assignments. Information was provided to the Group members in order to facilitate their linkage with the programs, projects and key persons involved to their respective tasks. Interaction among Group members and between task partners was strongly encouraged by the Coordinator.

9. Some members stated the need of specific WMO publications; such requests were transmitted to the Secretariat.

10. In another aspect and according to the decision of the JCOMM Management Committee, it is expected that the Coordinators of the Observations and Services Programme Areas communicate to the Capacity Building Coordination Group the needs on capacity building for their respective areas. No communications were received in this regard from the Panels since MAN-1.

11. The Coordinator stated during MAN-1 the importance of organizing User For a, which are included in the structure of the CBPA. It has been agreed during MAN-1 that this task should be developed by the CB Coordination Group during CBCG-1, along with the investigation of ways to enhance interaction with and the training of users. MAN-1 also decided that the Coordinators of the Observations and Services PA establish user requirements for capacity building by means of the User For a, and convey them to the Capacity Building Coordination Group. No communications were received in relation to this subject up to the preparation of this document.

12. During the session of the JCOMM Management Committee, the Coordinator requested the appointment of members to the Task Team on Resources (TTR); as a result, members of the Committee submitted names of possible candidates to the Secretariat during the past months, though no final decision has been reached yet. It was also agreed during MAN-1 that the requirement for resources for capacity building came from nations or regions and that the Capacity Building Panel and the TTR should work in accordance to this policy.

13. Coordinator Andrioli, participated in the JCOMM Ship Observations Team (SOT-1) meeting, in Goa, India, in February/March 2002 (Final Report at <http://www.wmo.ch/web/aom/marprog/>). The meeting was attended by 17 (seventeen) Member countries of the six WMO Regions. During this meeting, the assistance of the JCOMM Capacity Building PA was requested on matters related to ship observations. The requirements for assistance could be summarized in the three following groups:

a) National reports: Capacity building assistance was highlighted in many of the national presentations. The Coordinator suggested Group members to review the national reports of their respective Regions in order to include the CB requirements in the CB Regional/National analysis (refer to Item 5. SOT-1 Final Report) for future action.

b) SOT Programmes: the VOS (Voluntary Observing Ship) Programme; the ASAP (Automated Shipboard Aerological Programme) and the SOOP (Ship-of-Opportunity Programme) requested

CB support, particularly in data sparse areas, where there is the need for local support to increase related activities. In this aspect, the VOS Panel also and specifically requested the Group's assistance to "Develop and implement activities oriented to enhance ship recruitment, including promotional brochures, training videos, etc." (SOT-1/Doc.3, appendix, p.5). Group members were encouraged to review and analyze these topics.

c) CB assistance was required to increase and enhance the international PMO activities and network (SOT-1/Doc.5, Item 6.1). In this aspect, the national report from Kenya produced by its representative, Mr. Ali Mafimbo, included a proposal entitled "provision of shipboard equipment for VOS Scheme and training of PMO". The Coordinator considered this sub-regional project for the western Indian ocean (RA-I) a valuable example of a capacity building activity in marine meteorology and oceanography and suggested to Ms. R. Folorunsho to consider it when analyzing the CB priorities for RA I.

14. The requests for CB assistance stated above were transmitted to the CB Group members for evaluation and, as appropriate, for their inclusion in the set of regional and/or national priorities for Capacity Building and/or for advice on additional actions in support of the SOT programs under the auspices of JCOMM.

15. The Coordinator was informed by the WMO Secretariat of the plan for a "WMO Workshop on wind waves and storm surge analysis and forecasting for Caribbean countries". The organization of the mentioned training workshop was approved by EC-LIII and it is planned to take place in Miami, Florida in February 2003 under the auspices of the U.S. National Weather Service, which will host and support the workshop. The Coordinator considers this proposal will greatly assist the capacity building programme being implemented under JCOMM and will be of the utmost importance to developing the capacity of meteorologists of the Caribbean countries of RA IV. The workshop has been designed to provide both technical and practical knowledge on wave and storm surge analysis and forecast modelling techniques, as well as to provide hands-on experience in manipulating and running local and regional scale models on PCs and workstations.

16. Group members did not report any objections, obstacles or impediments that might have resulted in the failure of and/or that might have prevented the fulfillment of the tasks respectively assigned within the frame of the Work Strategy for JCOMM Capacity Building. Nevertheless, Mr. S. Ragoonaden has requested special assistance in order to initiate the distribution of the RA V regional requirements survey.

The way forward

17. The concrete proposal for the convening of the "WMO Workshop on wind waves and storm surge analysis and forecasting for Caribbean countries" mentioned in the above paragraphs requires the consideration of the CB Coordination Group and calls for immediate actions to ensure its realization in RA IV and subsequent success. It is considered necessary that the CB Coordination Group evaluate possible ways to extend this Workshop to other WMO Regions. Given the particular nature of the workshop, the Coordinator will suggest that Group members Ms. Folorunsho and Ms. Ambar include this proposal in their evaluations of needs for training in marine meteorology and oceanography within the Work Strategy for JCOMM Capacity Building. The Coordinator will also propose Mr. Aparicio to become acquainted with this undertaking and to take the necessary measures in order to provide the workshop with the appropriate Capacity Building framework and support.

18. It is expected that the CB Coordination Group will set the basis for further interactions with the Observations and Services Programme Areas in the fields noted in this report; also with the Task Team on Resources (TTR) from the time it is effectively established.

19. Strong interaction with GOOS will be sought by the CB Coordination Group. The Coordinator suggests that the role of Mr. Ehrlich Desa, member of the GOOS Capacity Building Panel and of the JCOMM CB Coordination Group, be defined during CBCG-1, in order to take

advantage of his expertise in the field and to facilitate and ensure a continuous linkage with GOOS. In this context the Group should also define ways to integrate the requirements and possibilities of the two Capacity Building Programmes. Concrete examples of linkage with other programs of WMO, IOC and GCOS should be also established by the Group.

20. It is considered necessary to review and assess specific ways to maintain momentum intersessionally, to report on and monitor progress. The JCOMM capacity building work programme should be reviewed, amended and updated in the light of these discussions and of the status of the tasks that had been assigned to each of the Group members in February 2002 by the Coordinator. It will also have to include concrete follow-up actions of the decisions adopted by CBCG-1 under each Agenda item, with more specific assignments, deadlines and targets. The new fine-tuned work programme will be effective during the remaining intersessional period.

21. Finally, a report including milestones achieved and future actions and/or recommendations should be prepared by the end of 2002 by the Coordination Group, for submission to the JCOMM Management Committee.

Summary Report on the Results of JCOMM-I

Introduction

1. The Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was formally established in 1999 by Thirteenth Congress and the Twentieth Session of the IOC Assembly, through a merger of the Commission for Marine Meteorology (CMM) and the Joint IOC/WMO Committee for IGOSS. JCOMM is the reporting and coordinating mechanism for all operational marine activities in both WMO and IOC. As such, it is charged with the international coordination, regulation and management of an integrated, operational, oceanographic observing, data management and services system which will eventually become the ocean equivalent of the World Weather Watch.

2. The first session of JCOMM took place in Akureyri, Iceland, from 19 to 29 June 2001. Substantial support for the meeting, as well as warm and generous hospitality, was provided by the Icelandic Meteorological Office and by the City and University of Akureyri. At the opening ceremony, participants were welcomed by Ms Siv Fridleifsdottir, Minister for the Environment; Mr Magnus Jonsson, Permanent Representative of Iceland with WMO; Mr Kristjan Thor Juliusson, Mayor of Akureyri; Professor G. O. P. Obasi, Secretary-General of WMO; and Dr Patricio Bernal, Executive Secretary of IOC. The Commission was also honoured by a visit during the second week of the session by Dr Olafur Ragnar Grimsson, President of Iceland, and by Dr John Zillman, President of WMO.

3. While the membership of JCOMM is still growing, at the time of the session the Commission had approximately 250 members from 122 Members of WMO and Member States of IOC. The session was attended by 113 participants from 42 Members/Member States and 11 international organizations. It was particularly pleasing to note that almost all the national delegations included approximately equal numbers of meteorologists and oceanographers. This was an indication of the importance which both communities placed on JCOMM, and it also ensured a good balance in the debates during the session and in the priority issues to be addressed by the Commission. The DBCP was represented at the session by David Meldrum, vice-chairman, and Etienne Charpentier, Technical coordinator.

4. In their report to the session, the interim co-presidents, Mr Johannes Guddal and Professor Dieter Kohnke, firstly recalled the dramatic progress which had been made since CMM-XII (Havana, March 1997) in developing the JCOMM concept, in its acceptance by the governing bodies of WMO and IOC, and in the transition to the new institutional and working arrangements. They then briefly outlined the substantive achievements during the past intersessional period, under CMM, IGOSS and also all the other groups now reporting to JCOMM. These included further consolidation in the marine broadcasting system for the GMDSS, the Marine Pollution Emergency Response Support System (MPERSS) and the Global Digital Sea Ice Data Bank (GDSIDB); implementation of the VOSclim Project and of an operational Ship-of-Opportunity Programme; substantial enhancements to global data buoy deployments and the commencement of the Argo Project of sub-surface profiling floats; the implementation of the electronic JCOMM Products Bulletin; and major capacity building activities. The interim co-presidents continued by outlining a vision for the future of JCOMM, as well as major issues to be addressed during the coming intersessional period. These included in particular the phased implementation of a fully integrated, operational ocean observing, data management and services system; implementation of a JCOMM in situ Observing Platform Support Centre (JCOMMOPS); close collaboration with GOOS and GCOS, in particular in ocean observations and data management for climate; and implementation of the new JCOMM Capacity Building Strategy.

Scientific input and requirements

5. There was full agreement at the session that a major priority for the coming intersessional period would be the implementation and maintenance of an operational ocean observing system to provide the data required to support global climate studies. Detailed requirements for these data have been developed and will be maintained by the Ocean Observations Panel for Climate of GOOS, GCOS and the WCRP, which thus becomes one of the primary scientific advisory bodies for JCOMM. In reviewing the report of the OOPC to the session, the Commission recognized a number of priority requirements, including the implementation and long-term maintenance of Argo and its integration with the SOOP; operational implementation of VOSCLIM; long-term resources for system maintenance; and integrated data management.

Marine meteorological and oceanographic services

6. The Commission noted with satisfaction that the WMO marine broadcast system for the GMDSS of IMO had been fully implemented prior to the final implementation date for the GMDSS of 1 February 1999, and congratulated all concerned for this outstanding work. It adopted a number of small amendments to the regulations covering the GMDSS marine broadcast system as given in the Manual on Marine Meteorological Services (WMO-No. 558), which included two new Metareas (17 and 18) to allow for the extension of SafetyNET services in Arctic waters. At the same time, the Commission recognized the ongoing need for terrestrial maritime safety broadcasts to some coastal waters and for shipping not subject to SOLAS, and therefore agreed to maintain the existing terrestrial broadcast component of the Manual pending a major revision by the Expert Team on Maritime Safety Services. The Commission further recognized the importance to mariners of meteorological information in graphical form, and therefore urged the early completion of the project for the delivery of such graphical information through Inmarsat C, as part of SafetyNET. The Commission reviewed the status of the project for the harmonisation of meteorological services delivered by NAVTEX in the Baltic Sea region, urged rapid formal acceptance of the guidelines developed under the project, and commended the rapporteur (Dr Michal Ziemianski, Poland) and his co-workers for their efforts in preparing and testing these guidelines.

7. The Commission recognized that the wave programme had continued to provide valuable support to many Members/Member States in their provision of wave related services to users. It noted a detailed revised programme of action for the coming four years, and agreed that the programme should be extended to cover also the analysis, modelling and forecast of storm surges. The Commission also recognized the considerable importance of ongoing work on sea ice and polar region issues, in particular to maritime safety and global climate studies. It noted with appreciation the substantial ongoing development of the Global Digital Sea Ice Data Bank, which it agreed was an important resource supporting the WCP, as well as the work undertaken on ice codes, formats and nomenclature. The Commission fully supported enhanced involvement with external sea ice groups such as the Baltic Sea Ice Meeting and the International Ice Charting Working Group.

8. The Commission strongly supported the full implementation of the Marine Pollution Emergency Response Support System, as a means of providing coordinated and timely meteorological and oceanographic data and services to support operations in response to major pollution emergencies originating outside territorial waters. It expressed appreciation for the seminar and workshop on MPERSS held in Townsville, Australia, in 1998, and agreed that another such event in support of MPERSS implementation should take place in 2002 or 2003. The Commission recognized the considerable value of the JCOMM Electronic Products Bulletin, as a means of making easily available to Members/Member States both data sets and tailored oceanic products on an operational basis. It agreed on the importance of securing the resources needed to ensure its long-term maintenance, and further supported the concept of a specialized workshop on "JCOMM Products in Support of Operational Oceanography and Marine Meteorology", to provide a

catalyst for further development of the Bulletin. Finally, the Commission acknowledged the continuing importance, to both service providers and users, of the regular monitoring of user responses to marine meteorological services. It reviewed the results of the most recent such survey and urged their wide distribution. It agreed that the next survey of this type should take place in 2004.

Observing systems

9. Existing and future operational ocean observing networks involve a complementary mix of in situ and remote sensing technologies and platforms. These include ship-based systems (the traditional VOS, the XBT ship-of-opportunity programme, ASAP and future non-physical measurements), autonomous unmanned devices (drifting and moored buoys, floats, other sub-surface vehicles), tide gauges and coastal stations, satellites, aircraft and ground-based radars. The increasing requirement of all users for the delivery of fully integrated data and product streams is, in turn, increasing pressure for a more integrated approach to the observing systems themselves. As a first step towards such enhanced integration, the Commission agreed to establish a Ship Observations Team, grouping the existing ship-based observing panels (VOS, SOOP and ASAP), and creating a mechanism to deal more easily with new observation requirements and technologies. Further with regard to ship-based observations, the Commission was particularly appreciative of the expansion of the ASAP network through the Eumetnet ASAP Project (E-ASAP) and the Worldwide Recurring ASAP Project (WRAP); the implementation of the VOSclim Project, to establish a high-quality reference subset of VOS meteorological data; and the restructuring of the SOOP XBT network in response to the upper ocean thermal review recommendations.

10. The Commission recognized that both drifting and moored ocean data buoys now constitute a major component of the integrated ocean observing system, and that the DBCP had been instrumental both in enhancing the coordination of national and regional buoy programmes, and also in improving the quantity and quality of buoy data available on the GTS. At the same time, the Commission noted the substantial ongoing problem caused through the vandalism of data buoys, and adopted a recommendation designed to address this problem. The Commission further recognized that the Argo project represents a significant development in large-scale oceanography, and agreed that it should eventually become a part of the overall operational ocean observing system coordinated through JCOMM.

11. Oceanographic satellites constitute an essential component of the present and future operational ocean observing system. The Commission recognized that it is of fundamental importance to identify the observational requirements of JCOMM in relation to continuing satellite missions and to establish a dialogue on the complementary value of in situ data and products to satellite agencies. In this context, an immediate challenge is to work with operators, through various mechanisms, to develop continuity and sustained operation, as discussed in the IGOS Oceans Theme document. To this end, the Commission agreed that several different paths to the operators could and should be used, provided that the message conveyed is consistent and coherent. These include: with GOOS through the IGOS Partners and the Oceans Theme; through the CBS processes, such as the Rolling Requirements Review; CGMS; and the Consultative Meetings on High Level Policy on Satellite Matters.

12. The Commission strongly supported the proposal to establish a JCOMM in situ Observing Platform Support Centre (JCOMMOPS), based initially on the existing DBCP/SOOP and Argo coordination mechanisms. It recognized that the centre is already operational, and a review is to be undertaken to assess the benefits and efficiency that might be achieved by extending the terms of reference of JCOMMOPS to include also support for VOS and ASAP.

Data management

13. The Commission undertook a thorough review of the status of existing marine data management activities falling within its area of responsibility, including in particular those for VOS data (the Marine Climatological Summaries Scheme, MCSS), for sub-surface temperature and salinity (the Global Temperature and Salinity Profile Programme, GTSP), and for buoy and float data (managed through the DBCP and Argo, respectively). The Commission adopted the comprehensive metadata format for ocean data acquisition systems, developed by the DBCP and the former CMM Subgroup on Marine Climatology.

14. At a general level, the Commission agreed that a fundamental principle for its data management was to integrate meteorological and ocean measurements and to provide multi-parameter products and services in response to user needs. It therefore charged its Data Management Coordination Group, together with the Expert Team on Data Management Practices, with reviewing and assessing overall JCOMM requirements for end-to-end data management, and with developing a strategy for the Commission in this regard. The Commission also recognized that there was a considerable amount of related work, in particular using Internet and other new technologies, being undertaken or planned elsewhere. This included the future WMO information systems project within CBS, the development of standard metadata languages such as XML, and a proposed ocean and marine meteorology data and information technology project. It agreed that JCOMM should follow all this work very closely, and be involved where appropriate, and requested the Data Management Coordination Group to undertake this task.

Capacity building

15. The Commission noted with appreciation the large number of specialized training workshops which had been conducted during the intersessional period, in topics such as remote sensing, marine pollution, wave and surge forecasting, sea level measurements and the work of PMOs, as well as the fellowships for long-term marine training awarded by WMO. It urged that these activities should be continued in support of JCOMM, and at the same time requested its new Task Team on Resources to investigate potential new sources of funding for training. The Commission reviewed and adopted an overall JCOMM Capacity Building Strategy document, which it agreed provided a blueprint and general framework for the conduct of all future JCOMM capacity building activities.

External relations

16. While JCOMM needs to interact in various ways with most of the other major programmes and bodies of WMO and IOC, it will continue to have particularly close relations and interactions with GOOS, GCOS, CBS and IODE. One aspect of such interactions which engendered considerable debate concerned the developing requirements under GOOS for the international operational collection, exchange and management of non-physical ocean data (ocean chemistry and biology). It was recognized that JCOMM is most probably the appropriate mechanism to undertake this work, but at the same time the Commission presently has no expertise or capabilities in these disciplines. The Management Committee was therefore requested to interact with GOOS on this subject, with a view to eventually developing some formal proposals for the Commission.

17. Outside WMO and IOC, JCOMM will continue to work closely with international organizations and bodies such as IMO, IHO, UNEP, ICSU/SCOR, etc. in a number of areas of common interest and concern. The Commission also supported the continuing involvement of WMO and IOC in various inter-agency coordination activities relating to the oceans, including in particular preparations for and participation in the World Conference on Sustainable Development, Johannesburg, September 2002. It noted with satisfaction that both WMO and IOC had actively supported and contributed to the development of the UN Atlas of the Oceans project.

Scientific lectures

18. One half-day of the session was devoted to a set of scientific lectures on the general theme of “operational oceanography”. The texts of these will be published as a JCOMM Technical Report, and similar scientific lectures are planned for JCOMM-II.

JCOMM sub-structure

19. The Commission decided that its work and sub-structure would be organized within four Programme Areas, each managed by a Coordinator and small Coordination Group – Services, Observations, Data Management and Capacity Building. Within each Programme Area, specific activities will be undertaken by a number of Expert Teams, Task Teams and Panels. Overall guidance and oversight for the work of the Commission will be provided by a Management Committee, chaired by the two co-presidents of JCOMM, and including the four Programme Area Coordinators and a small number of other selected experts. The nine members of the Committee include four meteorologists, four oceanographers and one polar region expert. The agreed JCOMM structure is illustrated in Appendix A. The DBCP, with its Action Groups, constitutes an essential component of the Observations Programme Area, for which the coordinator is Dr Stan Wilson (USA). The DBCP chairman is an ex-officio member of the Observations Coordination Group, but the panel itself will continue, for the time being at least, to maintain its statutory and functional autonomy from JCOMM. The members of the Management Committee are given in Appendix B.

Elections

20. The Commission elected Mr Johannes Guddal (Norway) as its co-president for meteorology and Dr Savi Narayanan (Canada) as its co-president for oceanography.

Next session

21. The Commission was pleased to accept the offer from Canada to host its second session in the year 2005.

JCOMM MANAGEMENT COMMITTEE

Ordinary members

Miriam Andrioli
Capacity Building PA Coordinator
Argentinian Meteorological Service

Philippe Dandin
Météo-France

Ivan Frolov
Arctic and Antarctic Research Institute (AARI)

Johannes Guddal
Co-president
Norwegian Meteorological Institute

Ian Hunter
South African Weather Bureau

Lin Shaohua
Data Management PA Coordinator
Deputy Director-General, National Marine Data and Information Service, China

Savi Narayanan
Co-president
Marine Environmental Data Service, Canada

Phillip Parker
Services PA Coordinator
Bureau of Meteorology, Australia

Stan Wilson
Observations PA Coordinator
NOAA, USA

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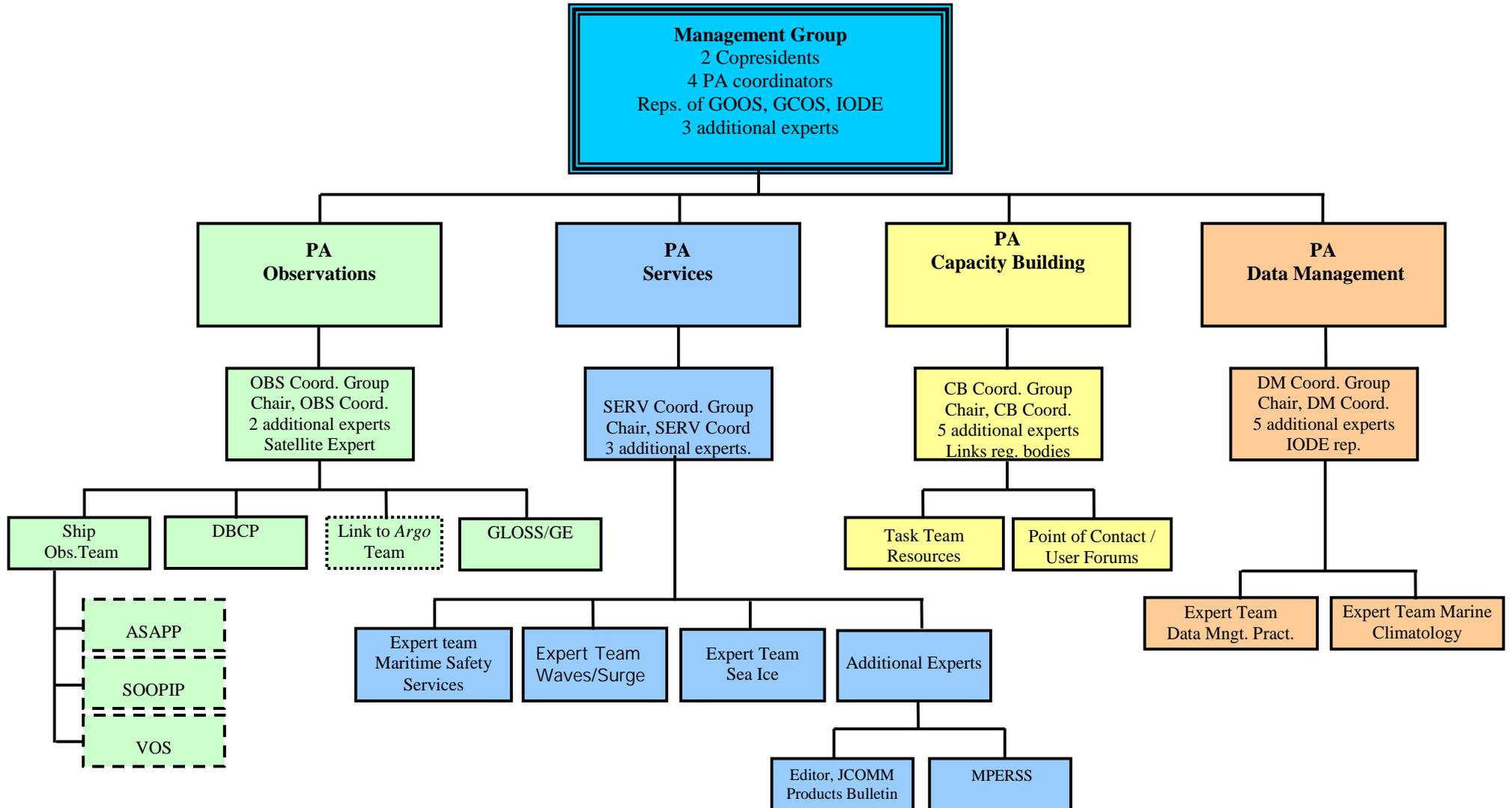
Ex-Officio Members

Paul Mason
Chairman of the GCOS Steering Committee

Worth Nowlin
Chairman of the GOOS Steering Committee

Ben Searle
Chairman of the IOC Committee on International Oceanographic Data and Information Exchange (IODE)

JCOMM STRUCTURE



Reports by Members of the Capacity Building Coordination Group

S. Ragoonaden

1. Specific tasks were assigned by the Coordinator of the JCOMM CB Programme Area to each member of the group for completion by June 2002 under Phase A of the JCOMM CB strategic plan, as well as some actions towards Phase B (February-December 2002). A brief report is submitted for RA V countries.

Phase A – June 2002

Survey among RA V Countries

2. The questionnaire used for conducting a survey among RA III countries to identify their needs was sent to all RA V members on 30 May 2002 by the Secretariat. A report will be prepared if enough completed questionnaires are received in time for the meeting. Otherwise, the needs identified in RA III by the Chairperson of the CBCG could be used in the immediate. RA III and RA V Members are mostly developing countries, where gaps and deficiencies in CB are similar and requirements almost identical.

Capacity Building Current Policies

3. One of the four modules of the SEACAMP project is capacity building. When implemented, this will give a boost to the capabilities of the RA V countries to enhance their participation in various WMO/IOC marine programmes in the region.

Education and Training

4. In order to enable RA V Members, with responsibilities agreed under the Marine Pollution Emerging Response Support System (MPERSS), to contribute to the trials of the system, an international seminar/workshop on MPERSS was organized in July 1998 in Townsville, Australia. This has provided an impetus to MPERSS implementation.

Action Proposed

5. On the basis of the experience gained on the MPERSS workshop, a similar workshop could be envisaged in other regions.

Phase B – (February – December 2002)

Requirements for Co-operative Projects

6. Sub-regional projects have been prepared for South-east Asia – SEACAMP. The ASEAN subcommittee on meteorology and geophysics has already recommended its formal acceptance as an ASEAN project. With regards to WIOMAP, the original document proposal prepared following a study mission in the West Indian Ocean region countries has been reviewed on the basis of comments received from WMO/IOC and some experts. It is being submitted to the PRs of countries concerned and oceanographic institutions in the region. The document will be updated once more and finalized at the WIOMAP Second Implementation Planning Meeting (Mauritius, 31 October 2002). It will then be submitted to donors/funding agencies by one country on behalf of all participating countries. The Indian Ocean Commission (IOC) and Southern African Development Committee (SADC) have, in principle, given their support to the project.

Action Proposed

7. It is high time that similar projects were initiated for other regions/sub-regions. This is an issue which could be discussed at the meeting. Western Africa, the Caribbean and South West Atlantic are potential candidates.

Links with GOOS Regional Alliances for Mutually Supportive CB Projects

8. Several GOOS regional/sub-regional bodies have been established including GOOS-Africa, MedGOOS, Black-Sea GOOS, NEAR-GOOS, SEAGOOS and EuroGOOS. The formation of an IOGOOS will soon be formalized (Mauritius, November 2002). GOOS-Africa is submitting a project proposal – Regional Ocean Observing and Forecasting System for Africa (ROOFS-Africa) to the African process for discussion and approval at the World Summit for Sustainable Development (Johannesburg, September 2002). Other regional GOOS bodies have also developed project proposals, which include CB components.

Proposal

9. The interaction with the GOOS CB group, which is also meeting at WMO headquarters, will be a good opportunity to discuss crosscutting issues and mutually supporting CB projects. A common strategy could thus be developed.

10. Most international and regional programmes on GOOS seem to converge on the needs for capacity building in remote sensing and modelling activities. The organisation of regional workshops for the purpose should be one focus for discussion.

ODINAFRICA Network for JCOMM Regional Requirements

11. A programme funded by IOC and the Government of Flanders to implement a Data and Information management project in Africa is underway. Progress is much more advanced in East Africa, where most countries have established National Oceanographic Data Centres (NODC), than West Africa.

12. Discussion could be held with IOC on possibilities to use ODINAFRICA network as a tool to fulfill relevant JCOMM CB Regional requirements in data management.

R. Aparicio

Due to the very low rate of response to the questionnaire electronically distributed, according to the requirements established by our coordinator, Ms Miriam Andrioli, this modest report pretends to show a general and basic information to the Group trying to characterize the Capacity Building situation in the whole American continent (exception of Canada and USA).

It could be assumed that the information here presented is more reliable in the case of the Oceanography matter, given the inclusion of the author in this scientific community since 1980, specifically paying more attention to the Wider Caribbean area.

The section "Programme Considerations" of the JCOMM Technical Report No. 11 (JCOMM Capacity Building Strategy) has been considered as a guideline for achieving the purpose already mentioned.

1. EDUCATION

Basic educational deficiencies in Earth Sciences, and even more in the case of Oceanography and Marine Meteorology, have been revealed for the whole area (with a logical degree of heterogeneity) as the most serious problem in preventing full use of the data within the region.

Even though, this topic has been a permanent theme of argument in an infinite number of meetings, there is a recent conclusion about this matter that should be taken into account for this CBCG.

The results of the Pan American Climate Studies Sounding Network (PACS-SONET, <http://www.nssl.noaa.gov/projects/pacs>)¹, funded by the NOAA Office of Global Programs, since 1997, with a regional coverage from Southern Mexico to Northern Peru (including Mexico, Nicaragua, Costa Rica, Colombia, Panama, Ecuador and Peru) and based on the use of inexpensive pilot balloon stations (instead of radiosonde stations) as basic instrumentation for generating data from the lower atmosphere, show that the critical problem in those countries is the lack of educated personnel at all levels within both the National Meteorological Services and the University community.

Another conclusive statement from that experience is that opportunities for advanced education of forecasters is very limited anywhere in Latin America.

When the question arose as to whether the PACS-SONET, or some version of it, after a period of NOAA support, could be sustained independent of USA funding, the PI of the project, Dr Michael Douglas, NSSL/NOAA wrote the following statement²:

"I think that the most effective way for the project to evolve in the long term is to increasingly offer educational opportunities and development, in return for operational support for the observations. Instead of paying observers, internet providers, and suppliers of balloon gas, we should move towards covering the costs of in-country or foreign training and education activities".

Without any doubt, the PACS-SONET experience should offer valuable directions for any CB programme to be developed in the region.

¹ As presented in the XXIII Meeting of the Hurricanes Committee for the RA IV, Maracay, Venezuela, April 2001.

² The PACS-SONET. "A summary of recent activities, status of the network and ideas for the future", page 28.

2. MATERIALS

In this item, we have a precise inventory of needs for the whole region thanks to the extensive consultation undertaken by our coordinator (see Annex C, JCOMM Technical Report No. 11) in the RA III. Most of the responses, reported in that valuable exercise, come from the South American navies and from national weather services operated by the national Air Forces of those countries. The needs revealed for that sub-region look very common to those typical from other actors such as environmental agencies, hydropower sector and the academical community operating in the whole continent.

3. TRAINING

The needs for training in the region cover a very broad range. Those needs come from the need for the prediction of the track of the oil slick movement in the undesirable case of any oil spill (as it has been requested already by Mr Beebeejaun for the south west Indian Ocean in his national report for Mauritius, February 2002) which is the biggest single environmental threat to the marine environment of the Caribbean small islands - to training courses addressed to more precise topics like use of quality control software, elaboration of sea surface current charts, methodologies in the use of numerical models for coastal areas, all of them extracted from the work done by Ms Andrioli in RA III.

With regard to this item, JCOMM should base its CB strategy on supporting preferably regional training courses. The additional benefit gained from the interaction of regional experts and the mutual sharing of experience would reduce the CB disparity among countries, such as it has already been pointed out by the coordinator of this Group in her report about RA III.

With regard to the use of INTERNET, already recommended in the JCOMM Technical Report No. 11, it should be mentioned that the leaders of PACS-SONET concluded that for many weather services in Latin America, a fast and reliable INTERNET connection could be an alternative to the lack of specialized equipment needed to receive satellite imagery, observations and numerical model output.

Another option for increasing the transfer of knowledge through training, so far ignored, would consist in convincing to the very high technologically developed countries (VHTD) of the continent in enhancing their several versions of "visitor support program" (VSP), so graduate students in Physical Oceanography, Tropical Meteorology, etc. from other countries in the region, could apply for training in specific topics and receive financial support for short visits (4 or 6 weeks). The interaction between WHOI (USA) and the IOV (Venezuela) and the kind offer of the Office of Naval Research of USA through its VSP, will permit this idea to become a reality before the end of this year.

Also JCOMM could support the old interest shown by the scientific community of Latin America in convincing Labs of VHTD countries, responsible for scientific cruises, for including graduate students from the countries that usually have to clearance the cruise in their territorial waters. Traditionally, the national request is, basically, having an "observer" onboard while the cruise is occupying national marine spaces. As a matter of fact, Venezuela has been making use of this idea during the last two years, dealing with scientific cruises originated in USA, France and Germany. So far, it has been considered successfully by all the ports.

Finally, besides the training courses requested by the South American countries whose inventory has already been done by Ms Andrioli, the Caribbean countries have a strong interest in participating in courses whose purpose could help those countries to face the following deficits and threats:

- Increase and refine coastal dynamics modelling capability.
- Ocean circulation related to larval distribution of pelagic fisheries

- Early warning in relation to a possible TSUNAMI originated by the submarine volcano Kick'em Jenny off Grenada
- Information/Data management and dissemination via INTERNET

4. TRANSFER OF KNOWLEDGE

Although some ideas have been discussed in the previous issue (training) as a national experience, it must be emphasized the strong governmental character of this matter. If the VHTD countries of the continent do not "open" their academical programmes, investing more money in educational activities at all levels with the purpose, for example, of having more Latin American geo-scientists as visitors either on land or onboard during cruises, the area will continue frustratingly being unable to develop and effective CB in Oceanography and Marine Meteorology.

5. HARDWARE AND MAINTENANCE

In this topic, it could be useful for the Group to consider another "experience" in the region, specifically developed in Central America. Paying attention to RONMAC (The water level observation network for Central America, involving El Salvador, Guatemala, Honduras and Nicaragua) we discover that this Project, executed from June 2000 to December 2001 installed "state of the art" sea level and meteorological monitoring stations in those countries with the purpose of developing a national and regional capacity to install and maintain the stations and to conduct data acquisition, analysis, archiving and dissemination by using automated data base management technology and to improve technical skills of host country agencies and national and regional institutions through technology transfer and capacity building (see <http://www.oas.org/RONNMAC/FinalReport/Default.htm>). Devised by the US Government in direct response to the impact of Hurricane Mitch (1998) on those countries, the RONMAC project was funded by USAID and executed by the Unit for Sustainable Development and Environment of the OAS (OAS/USDE). The RONMAC project also included the Comité Regional de Recursos Hidraulicos (CRRH) of Costa Rica as Regional Coordinating Agency and national agencies in the participating countries as direct counterparts and beneficiaries of the project.

With regard to the performance of RONMAC, some questions were sent to Dr Alejandro Gutierrez (gechever@samara.una.ac.cr), Physical Oceanographer from Costa Rica, who acted as Project Coordinator by the CRRH. His answers could be summarized as follows:

Even though the technical component (installation and maintenance) is complicated, it is not the most serious problem. The critical point is the governmental decision of keeping a policy of national interest in favour of making durable an investment plan in an operational system with direct benefits to coastal resources management, coastal hazard mitigation and emergency planning, design and development of coastal infrastructure and coastal navigation. The investment already mentioned refers also to Education.

This regional experience must be taken into account at the time of considering the feeling expressed in the JCOMM Technical Report No. 11, which, in this issue, calls the attention toward the idea of establishing funding support for regional centres dealing with training, maintenance and replacement abilities to help national agencies, instead of responding to requests for the provision of hardware.

6. TECHNICAL ASSISTANCE

This issue is expressed in the region, actually, through many ways. Two recent cases will be mentioned involving countries of the South American region with coasts in the Caribbean Sea, showing different spatial coverages and institutional strategies. In Colombia, a private organization, the DHI-Water and Environment, settled in The Netherlands and has been technically assisting the Colombian Navy in the installation and maintenance of sophisticated equipment operating in the Cartagena Bay, for the last two years, under the context of the Coastal GOOS.

In Venezuela, the VENEHMET project (acronym for Venezuela, Hydrology and Meteorology) recently has agreed to a commitment of technical assistance with the National Weather Service of Australia. It will let VENEHMET count on foreign high quality expertise to be used in national human resources development for successfully dealing with modern instrumentation including Doppler meteorological radars (eight in total, three of them covering the whole national coastal area in the Caribbean, see <http://www.oiamericas.com>).

These two cases show that JCOMM must be prepared to satisfy demands on several spatial scales, linked to projects with different strategies and purposes in the region.

7. DATA MANAGEMENT AND INFORMATION

The precise needs about this matter were very well discussed in the JCOMM Technical Report No. 11. The Wider Caribbean area and the South American countries, lack in general, with some differences, an efficient infrastructure that gives them access to regional and global satellite data. In this sense, it would be very useful for the region to count on programs addressed to the improving of satellite system utilization.

Fortunately, the concept of the Virtual Laboratory for Training in Satellite Meteorology, being implemented in the Wider Caribbean region (training centres located in Costa Rica and Barbados), will enhance the CB of nations in this part of the world, with regard to the satellite data management issue.

Specific demands of Latin American countries, in this matter, were expressed and reviewed during the First Planning Workshop for the "Ocean Data and Information Network for the IOCARIBE and South America regions (ODINCARSA)". This workshop was held in Guayaquil, Ecuador in October 2001 (see IOC Workshop Report No. 177, UNESCO 2001). Fourteen countries attended that meeting, and they identified national and regional CB requirements. The annexes IV and V of that report show tabulated information of great interest for this Group, so they have been included as an appendix in this contribution.

A FINAL COMMENT

Any degree of success our CB strategy could have in the future, depends very strongly on an efficient level of integration between the national meteorological and oceanographical communities. Advances in this integration, if any, are occurring very slowly in Latin America.

R. Folorunsho

REGIONAL PROFILE WITH AN ANALYSIS OF CAPACITY NEEDS

A. *Introduction*

The WMO regional Association 1 encompassing Africa is unique in the sense that the region is composed of developing countries with vast resources for economic and social development. In the past decade population growth has shown a sporadic trend especially in the coastal areas. The rapid population growth has resulted on pressures on resources and the environment. Sustainable management of environment and resources especially along the coast requires adequate knowledge of the physical environment and the parameters, which have impacts on the environment. Such include meteorological and oceanographic parameters.

The region lacks behind virtually all other regions in technology, human resources and infrastructure in the areas of marine meteorology and oceanography. This is so due to the following reasons:

1. Lack of commitment by International agencies to involve regional scientists in planning, implementation and monitoring of marine met and oceanographic related project.
2. Lack of local and national financial resources to acquire technology, training and resources in the areas of oceanography and marine meteorology
3. Lack of adequate communication facilities for local and regional scientist.
4. Lack of International funding /sponsoring agencies to ensure capability development through technology cooperation rather than technology transfer.
5. Lack of funds for regional institutions to implement marine met and oceanographic programmes and capacity development programmes

B. *On-Going Capacity building activities*

On going capacity building activities with regional approach include:

1. ODINAFRICA
2. Ocean Portal
3. There are various national programmes which also have in built capacity building activities:

C. *Experience already obtained by WMO/IOC*

IOC through its TEMA programme in affiliation with other IOC activities has modules for capacity activities

- a. *Identify On-progress Capacity-B Policies in WMO/IOC Member states in areas of Education*
ODINAFRICA
OCEAN PORTAL
- b. *Materials*
OMM/IOC manuals and guides, codes, formats, up-coming training events, meetings and workshops.
- c) *Training, Knowledge*
Training courses in the use of quality control, Software's, use of codes, courses on marine

climatology, e.g. training in wave and tidal analysis, tidal predictions and storm surges. Training of scientist in numeric models for oceanographic/meteorology, in collection, analysis and verification of wave models.

d) *Technical Assistance*

In courses and workshops on Tropical meteorology and oceanography, on GLOSS and VOS.

Provision of scholarships (long and short terms) for advance training, establishment of University degree course in Marine Meteorology and Oceanography at National University.

e) *Hardware and Maintenance*

Provision of acoustic tide gauges with met stations at coastal stations.

Provision of wave buoys

Provision of computer hardware for data analysis

Moored buoy installations and platform for data collection, Installation and maintenance of two platforms to transmit data via Argos, installation of three tide gauges in different locations, and a high resolution Internet server for data exchanges.

f) *Monetary support*

- Financial support for maintenance of computer hardware,
- Financial support for local logistics
- Financial support for scientists to attend International meetings and training.
- Financial support for local activities

g) *Data and Information*

Information on wave models, models for meteorology/oceanographic forecast, access to satellite information and Internet services

h) *Infrastructure*

Communication lines. Institutions involved with meteorology/oceanographic activities need assistance in acquiring extra communication line for Internet services

Exchange of Assistance already in Progress among WMO/IOC in areas mentioned above.

ODINAFRICA

Identify existing monitoring and auditing procedures that address the accountability and results of the on-going exchange assistance among WMO/IOC member state

- Local/ national procedures for financial disbursement
- UNECSO rules of financial accountability.
- National/civil service rules on financial accountability
- National Banking policies on transfer and withdrawal of funds.

In view of the above needs in the region, I propose a project that will integrate oceanography and meteorology. The attached project when executed will enhance the capacity of both meteorologist and oceanographers. This project will also assist both parties in developing a joint database.

PROJECT PROPOSAL:

STORM SURGE MONITORING; HINDCASTING AND FORECASTING FOR THE EASTERN ATLANTIC

By

Regina Folorunsho

1.0 INTRODUCTION

The Atlantic Ocean storm surge is an annual occurrence, which floods the immediate kilometer or two, of the surrounding coast, and considerably affect lives, destroy coastal installations and disrupt socio-economic activities along the coast. Countries affected by this menace include, Ghana, Nigeria, Benin, Togo, Cameroon, Angola, Congo/Zarie etc. These countries are all developing and struggling through serious economic pressures with limited capacity to tackle the menace of storm surge even though their resources are at stake.

2.0 AIM OF THE PROJECT

The project aims at reducing loss of lives, properties and damage to coastal infrastructure by having in place storm surge warning system and hence strengthening warning response mechanism and effective disaster preparedness and prevention measures.

3.0 RATIONALE FOR OCEAN STORM SURGE MONITORING AND FORECASTING

The need, to carry out effective research into the causes of storm surge is paramount and illustrated by the fact that:

A large portion of the population of the countries in the region is found along the coastal areas. In particular, there are mega cities such as Lagos in Nigeria, Abidjan in Cote 'd'Ivoire, and Accra - Tema in Ghana. These cities have population densities of between 750 and 1000 people per square km. Other lesser cities with a population density of about 500 people per square km include Cotonou in Benin, Lome in Togo as well as Port Harcourt, and Warri in Nigeria.

The Gulf of Guinea coastal areas are characterised by abundant marine resources, aesthetic beaches and intrinsic values that have long motivated coastal urbanisation and tourism. These coastal areas are in particular, important for fisheries, oil and gas, forestry and wildlife, including many endangered species.

These coastal areas contain mineral resources of tremendous values to the national economy. An example is the case of Nigeria, where abundant petroleum resources have played significant part in the economy of the country, contributing about 95% of foreign exchange earnings.

4.0 BENEFITS OF THE PROJECT

It is clear from the above background that ocean storm surges causes a lot of damage to property and disrupt socio-economic activities and also threaten lives in the region. Everything possible has to be done from an economic and social point of view to minimize the disastrous effect of storms surges.

Potential benefits to be derived from this project include:

- Reduction in loss of lives and property
- Reduction in damage to infrastructure
- Improvement of cost effective design of local coastal defences
- Increased scientific and technical capacity
- Improve knowledge of marine and tropical storms
- Strengthening of existing institution, facilities and programmes
- Disaster prevention and preparedness

5.0 PROJECT SCOPE

The project will require the involvement of meteorologist and oceanographers of all countries bordering the East Atlantic Ocean. In particular this project will involve the active participation of Ghana, Benin, Togo, Nigeria, Cameroon, Senegal/Gambia, Namibia, Angola and Congo/Zarie.

6.0 CONCLUSIONS

Capacity building and human resource development is the most important aspect of this project. Capacity building will involve technology transfer through specialize education and training in all facets of storm surge problem through workshops, training courses and Fellowships attachments to Advance centers. It is only by capacity building that the region could achieve self-sufficiency in the protection of lives, pr5operties and be well prepared for future disaster.

Qi Ping

The WMO/IOC Joint Technical Commission on Oceanography and Marine Meteorology, JCOMM, is committed to improving and expanding the availability of operational marine data necessary for monitoring, understanding and forecasting both short and long term meteorological variations.

In most cases, the developing countries with the lowest capacity in marine activities are the ones, which are most vulnerable to marine pollution, and natural disasters. The capacity building is important to them. The transfer of knowledge and technology to improve observational systems and predictive capabilities in developing countries will raise the living standards of all peoples. The additional contribution of those countries will also improve the accuracy and dependability of regional and global systems around the globe. Jcomm, through training, transfer of technology and provision of equipment, can assist all countries to become involved in the implementation of jcomm programmes and to share in the benefits produced.

Capacity Building programmes come in a huge variety of forms. Priority must be given to those programmes that are aimed at the expansion and improvement of JCOMM.

Training: In any way, training is the easiest way to address capacity building efforts. We can pay more attention on the high quality of the instructors, the training material and the quality of the participants in regional courses to make the training course more helpful. Each course should specify its intended goals before the activity take place. These goals would specify the results and expected schedule against which the success of the activity can be judged. Participants would be expected to know and accept the goals before attending the course and should agree to report at an appropriate future date on progress.

Knowledge: Capacity building programmes must not ignore the need for the involvement of scientists from all countries in the planning and execution of global and regional programmes. The transfer of knowledge may take different forms. Mutual trust and interaction can be built up between and amongst institutions. A regional Internet network for the exchange of data, products, procedures, software, publications, etc. it would be important to promote and encourage the transfer of knowledge and technology within the region, from countries with the appropriate capacity and expertise in a given field towards the most unprivileged.

Technical assistance: Technical assistance is the practical requirement. Software sharing necessary to interpret and analyze data or the secondment of technicians to help set up operational systems.

Infrastructure: infrastructure is needed in all countries.

Next, let's see the needs for capacity building in the field of data and information management.

- **Training:** training course should be establishment and management is needed. Unified formats and standard for metadata management should be developed. Workshop or training course on new type data processing and management should be organized.
- A workshop is needed on capacity building related to data management within end-to-end systems. Participation should be by invitation to international organizations that have data programmes in developing countries. (e.g.IODE, UNEP, World Bank, etc)
- Jcomm should approach to the problem of helping developing countries to benefit from the international systems and to become contributors of data to the system.
- **Materials:** Technical publications; methodology to exchange information in a more effective way
- **Knowledge:** courses oriented to research; programmes and instructors on quality control and analysis; maintenance of data.

- Technical Assistance: professionals trained on the processing of data; establishment of quality control codes; Software and models; webmasters and programmers; professionals to manage the marine database.
- Hard ware and maintenance: laboratory equipment; Communication equipment; Equipment for data collection; Radio and telecommunication equipment

In the other field like observations, services and so on, the needs are the same.

Action proposal: capacity building in the field of red tide should be pay more attention: training , workshop, technical assistance, monetary support.

To oversee the capacity building programme, the JCOMM should establish a panel of experts drawn appropriately from recipient and donor communities. The JCOMM capacity building panel should carry the responsibilities of managing the programme by ensuring that accepted programme comply with the principles and objectives set out, that partnership opportunities are pursued, that resources are sought and that national responsibilities are carried out.

National organization and governments must devote more attention to these responsibilities and make efforts to contribute materials, facilities, personnel, financial assistance, etc to further the global capacity of the JCOMM programme.

S. Priamikov

1. The situation in Russia concerning JCOMM Capacity Building (CB) is in that now it has all the necessary elements to support this area of the JCOMM programme, with one exception - the required national funding for providing complete CB activities. It seems that there are some other countries with a similar potential.
 2. Specifically in the area of high quality specialists for marine hydrology and meteorology:
 - Roshydromet established a special institute for education and further training of personnel providing observations of hydrological and meteorological parameters in the Roshydromet network;
 - The Russian State HydroMeteorological University (RSHMU) has wide experience for education and/or further training of specialists in the area of hydrology and meteorology for foreign and, especially, developing countries;
 - Lomonosov Moscow State University established a special international centre "The Floating University" in the framework of which, young scientists and senior students are training for implementing shipboard marine research (the idea of "Training through research");
 - The Arctic and Antarctic Research Institute of Roshydromet (AARI), together with the Alfred Wegener Institute for Polar and Marine Research (AWI), have established the joint German - Russian Otto Schmidt Laboratory for polar and marine research (OSL), for supporting young scientists and specialists with modern research equipment. It gives them, and in particular members of the OSL Fellowship Program from Russia and students from St Petersburg Universities, good opportunities to qualify and increase their knowledge in practical situations.
 - Additional opportunities in this direction are appearing due to the development of a joint German-Russian Master Students Course for polar and marine research, established jointly by St Petersburg University and the University of Bremen. An essential element of that initiative is the training of students in using modern research equipment and systems for implementation of actual marine observing hydrological and meteorological programmes.
 3. The implementation of joint projects related to observation systems in the ocean is very effective for CB. With this approach, the solution of problems concerning the education and further training of personnel, with the required financial support to achieve programme goals successfully, is very realistic, and thus, as a rule, very successful.
 4. As an example, in the framework of joint activities in the implementation of the International Arctic Buoy Programme (IABP), aimed to provide for the operation of a network of meteorological observations in the Arctic with a density not less than 500 x 500 km, the AARI developed, constructed and deployed during recent years about 20 automatic meteorological buoys in the Arctic Ocean on the Russian Arctic shelf, with the financial support of German and American IABP participants. Within this programme, the US Interagency WG for Arctic drifting buoys delivered to AARI, on a loan basis, the LUT, and trained the personnel of AARI Roshydromet to use it. All of this contributed to a successful IABP implementation.
 5. The conclusion can thus be made that Russia (as with some other countries) has the potential for the successful implementation of JCOMM strategy concerning CB. It can provide the required level and scale of education and re-education of specialists, and other substructure elements for the realization of marine observation programmes and projects with specified financial and material support. An important aspect is the development of contacts with the WMO VCP and the IOC TEMA programme.
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WMO Education and Training Technical Cooperation Programmes

Introduction

1. Education and Training and Technical Cooperation constitute separate programmes within the overall programme structure. The general purpose and objectives of these programmes are laid down in the WMO Long-Term Plan, relevant extracts from which are in the Appendix to this document. The following paragraphs summarise recent activities under these programmes which support on some way the work of JCOMM and the implementation of its own objectives, in particular as outlined in the JCOMM Capacity Building Strategy.

Education and Training

2. During the decade 1990-1999 WMO has awarded 23 short-term and 3 long-term (more than a year) fellowships in the subject of marine meteorology and general oceanography.

3. The recently released fourth edition of the WMO Publication No 258 "Guidelines for the education and training of personnel in meteorology and operational hydrology", Volume I - Meteorology, 2002, aims at assisting educators, as well training managers, in designing and implementing education and training programmes, particularly for the NMHSs from developing countries. Two categories of personnel are defined: Meteorologists (Graduate professionals) and Meteorological Technicians. The underlying Basic Instruction Packages for Meteorologists focus in completing requisite topics in basic sciences, compulsory topics in atmospheric sciences and elective fields of specialization. Among the latter the subject of "General Oceanography and Marine Meteorology " has been included.

4. An essential element of this new classification is the continuing education and training (CET) of personnel. Within the Education and Training Technical Documents, a "Continuing Education and Training in Meteorology and Operational Hydrology" (CET-MH) Series has been initiated aiming at promoting CET and assisting trainers in constantly updating their knowledge and skills in different areas of specialization. It is planned to include the subject of "Marine Meteorology" in a future release.

5. The syllabus for specialized training at technician level was covered in the WMO training publication WMO No 424, "Compendium of lecture notes in marine meteorology for Class II and Class IV personnel", second edition, 1991.

Technical Cooperation

6. In recent years, WMO has assisted many Members in developing countries in obtaining the technical expertise and equipment for the development of their National Meteorological and Hydrological Services in the field of oceanography and marine meteorology.

7. Within the framework of the WMO Voluntary Co-operation Programme (VCP), seven Member countries submitted requests for assistance in the provision of automatic marine meteorological stations; hydrometeorological and oceanographic instruments for coastal stations; and shipboard equipment for the VOS scheme and training of Port Meteorological Officers. One automatic marine meteorological station was provided to Mauritania in 1999-2000 with the support of the VCP(F).

8. At the request of Egypt, Lebanon and Syrian Arab Republic, Mr S. Ragoonaden, WMO Consultant on Marine Meteorology and Physical Oceanography visited the above three countries in January and February 2002. The consultant assessed the current status of marine meteorological services and identified needs and requirements for the marine meteorological services in each

country. Project proposals were formulated including the upgrading of the infrastructure and the human resources development.

Appendix: 1

Extracts from the Draft Sixth WMO Long-Term Plan

6. 6 – Education and Training Programme

Purpose and scope

6.6.1 One of the primary aims of WMO, as laid down in its Convention, is to encourage training in meteorology and operational hydrology, and to assist in coordinating the international aspects of such training.

6.5.2 The purpose of Education and Training Programme is to assist Members in obtaining adequately educated and trained personnel for the continued development of their Meteorological and Hydrological Services so as to enable them to discharge their operational responsibilities, as well as meet the challenges of new functions.

6.6.3 The actual education and training of meteorological and hydrological personnel is generally carried out in, and with contributions by, the Member countries themselves. It is expected that a clear commitment from Members to the continuing education and training of their staff, would assist the NMHSs in becoming, as much as possible, a learning organization.

6.6.4 The institutions, in which the education and training activities are carried out, include research centres and universities, WMO Regional Meteorological Training Centres (RMTCs), national meteorological training institutions, and the training units of Meteorological Services. The Education and Training Programme has links with various institutions, and such links vary with circumstances from the management of a short-duration training event by the Secretariat to the close monitoring and interaction with the training programme of an RMTTC, the provision of guidance materials and training aids to a national training unit, and the placement of fellows for training outside their home countries.

6.6.5 As personnel are to be educated and trained in subjects and functions, which are pertinent to all WMO Strategies, the education and training activities will be an integral part of the implementation of all these Strategies, particularly Strategies 7 and 8, with respect to enhancing the NMHSs capabilities and more effective international partnership.

Overall objectives

6.6.6 The overall objectives of the Education and Training Programme are:

- (a) To ensure the availability of adequately trained staff to meet Members' responsibilities for providing meteorological, hydrological and related information and services;
- (b) To promote capacity building by assisting NMHSs in the attainment of an appropriate level of self-sufficiency in meeting their training needs and developing their human resources;
- (c) To promote and strengthen the exchange of training knowledge, resources and expertise between Members making particular use of relevant new and emerging technologies and techniques;
- (d) To promote high-quality continuing education in meteorology, climatology, hydrology and related disciplines so as to keep the knowledge and skill of Members' relevant staff up-to-date with the latest scientific advances and technological innovations, and to provide the competence and skills needed in additional fields.

Programme structure

6.6.7 The Education and Training Programme consists of four interdependent components. They are:

- Assessment of human resources;
- Training activities;
- Education and training fellowships;
- Support to training events under other WMO major Programmes.

6.7 TECHNICAL COOPERATION PROGRAMME

3 Purpose and scope

6.7.1 The purpose of the Technical Cooperation Programme (TCOP) is to ensure, through collaborative efforts of Members and for their mutual benefit, the enhancement and development of the capabilities of the National Meteorological and Hydrological Services (NMHSs), as envisaged in Strategy 7, so that they can contribute to and participate effectively and efficiently in the implementation of WMO Programmes, for the benefit of the global community and in support of national socio-economic development. Therefore the Programme makes a major contribution to the implementation, through the WMO Programmes, of all WMO Strategies and their associated goals.

6.7.2 The Programme helps to ensure that the NMHSs have the required technical and financial means. While the access to and competition for financial resources are increasingly becoming difficult, the Programme will endeavour to meet this objective. In view of the changing world economic situation, and noting the overall decrease of technical assistance globally, WMO has been exploring new sources of funding for its technical cooperation activities. WMO Member countries and in particular their NMHSs are being advised on the potential sources of funding of technical cooperation activities and on how they can be tapped.

6.7.3 The analyses of national and regional needs and the development of the WMO Long-term Plan provide a basis for developing priorities in technical co-operation programmes managed by WMO. These programmes are to contribute effectively to development activities through: (a) the achievement of suitable levels of meteorological and hydrological services in Member countries; (b) the creation of the required component of the infrastructure for sustainable development; and (c) the realization of the collective goals of the agreed WMO Programmes. This strategic approach will allow Members and partners to meet the most important needs, help the countries receiving assistance to identify and obtain support for technical co-operation projects and programmes that will yield maximum benefits, and assist the WMO, including the Secretariat, in assigning priorities in its activities.

Overall objectives

6.7.4 The overall objectives of the Programme are, in close collaboration with the Regional Programme and other WMO scientific and technical Programmes, to:

- (a) Assist Members in identifying their requirements for the development and enhancement of their NMHSs and the appropriate external support necessary to meet those requirements;
- (b) Assist Members in formulating appropriate project/programme proposals to meet the requirements of NMHSs;

- (c) Facilitate the exchange of information on the needs of potential recipient Members, on the possibilities offered by potential donor Members and institutions, and mobilize the required resources through contacts with relevant funding institutions;
- (d) Assist Members in the implementation of technical cooperation projects and programmes, as required;
- (e) Provide Members with the necessary support in the areas of technical cooperation and ensure that all relevant scientific and technical aspects of projects are in line with the established standards and guidelines;
- (f) Assist Members in building up the capacities of their NMHSs and of relevant national and regional institutions so that they can participate efficiently in national development activities and meet their international obligations;
- (g) Assist Members in developing and implementing regional projects and programmes in the areas of meteorology, hydrology, the environment and other related issues in particular through appropriate political and economic support from Members; and
- (h) Ensure, through the establishment of dynamic and synergistic partnership with funding institutions and regional and international organizations such as those of the UN system, that the relevant meteorological, hydrological and environmental aspects of proposed projects and programmes are developed and implemented according to the recognized standards and guidelines.

4 Programme structure

6.7.5 The Technical Cooperation Programme will continue to be structured, planned and implemented, on a national, regional and global basis, taking into account the characteristics of the funding sources of the Programme, namely:

- (a) WMO Voluntary Cooperation Programme (VCP);
 - (b) Regular budget cooperation activities; and
 - (c) Other components of the Programme.
-

Evaluation of JCOMM Capacity Building

I. Evaluation of the effectiveness of training workshops

A series of questionnaire surveys should be made

- 1) At the end of a training event, to monitor the immediate reaction, outcome, specific comments to be used for future improvement of similar events.
 - a) A questionnaire to be filled out by participants

A JCOMM Capacity Building questionnaire should be developed on the basis of the WMO questionnaire (CBCG-I/Doc4.6 Appendix E) and a similar questionnaire used by IOC (if it exists). Such questionnaires used by other organizations such as JMA could also be referred to.

- b) A questionnaire to be filled out by lecturers and organizers
- 2) One year after the training event (or some appropriate timing)

A questionnaire should be sent to institutes/organization from which trainees participated. The purpose of the questionnaire is to know the eventual outcome of the training event.

II. Monitoring projects related to (or under) JCOMM (e.g. the WIOMAP project)

1. A rapporteur to monitor the project should be identified among the recipient countries.
2. Recipient countries are requested to submit a status report on the project to the rapporteur every six months (or another appropriate timing)
3. The rapporteur should submit the reports with comment to the JCOMM CBPA Coordinator
4. The CBPA Coordinator circulate the report to the members of the CBCG as appropriate

III. VCP or similar projects to be implemented under a different mechanism

1. Members requested to inform the JCOMM Secretariat when they submit proposals to VCP and when any progress is made.
 2. Such information is passed to the appropriate Regional Rapporteur on MMS so that the Rapporteur can monitor what kind of proposals are submitted, what kind of proposals are supported, what kind of proposals cannot get donors, etc.
 3. The Regional Rapporteurs are requested to submit a report to the JCOMM CBPA Coordinator as appropriate.
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Membership of the JCOMM Task Team on Resources

Chairman

Dr Sergey Priamikov (Russian Federation) – appointed by JCOMM-I

Members

Dr Lennox Hinds (Canada)
Dr Gunnar Kullenberg (Sweden)
Dr Iouri Oliounine (Malta)
Dr Tom Spence (USA)
Dr Jan Stel (Netherlands)

JCOMM Capacity Building Coordination Group

(1) Terms of Reference

The Capacity Building Coordination Group, in close cooperation with WMO ET/TCO, IOC-TEMA, GOOS, GCOS, IGOS and other relevant organizations and bodies involved in Capacity Building, shall:

- (a) Plan, initiate and implement the ETCB work programme, including in particular the JCOMM Capacity Building Strategy;
- (b) Keep under review existing training and guidance material (paper and electronic) and advise on procedures for updating, as well as for the development of new material;
- (c) Review and assess regional requirements for capacity building and develop regional projects as appropriate;
- (d) Develop and implement integrated training and support activities, in collaboration with other programme areas and external bodies and programmes (e.g.);
- (e) Review and assess the resources needed for capacity building activities of JCOMM in light of the resource plan of the Task Team on resources;
- (f) Endeavour to mobilize the resources required for JCOMM capacity building, including those needed for the implementation of the work programme of the Programme Area for Services.

(2) Work Plan 2001-2005

Capacity Building

Priority	Reference	Task	With whom	Target
High Priority	Para 11.1.8	Review as a matter of urgency the entry on "Marine Meteorology" in the preliminary version of the WMO Publication No. 258, Fourth Edition, Volume 1, Meteorology.		October 2001
	Res. 16/5	Implement the JCOMM Capacity Building Strategy.		Intersessional
Medium Priority	Para 11.2.9	Discuss with IODE the possibility to expand the scope of OceanTeacher to cater for JCOMM training requirements.		Intersessional
	Para 11.3.5	Review the requirements for cooperative projects in ocean regions and sub-regions and assist in the development of detailed proposals as appropriate.		Intersessional

	Para 11.3.5	Develop close links with all GOOS regional alliances, with a view to implementing mutually supportive capacity building projects.	ET on SI	Continuing
	Para 11.3.9	Investigate with IODE possibilities to use the ODINAFRICA (and other existing or planned ODIN networks) network as a mechanism for relevant aspects of JCOMM regional capacity building.		Intersessional
	Para 12.1.7	Work with the GCOS, GOOS and the JCOMM Secretariats in organizing regional workshops, so that ocean observations and related services are included to the extent possible.		Intersessional
	Res. 16/2	Develop technical guidance material, software exchange, specialized training and other capacity building support with regard to sea ice observations and services.		Continuing
	Res. 16/5	Keep under review existing training and guidance material and advise on updating and the development of new material.		Intersessional
	Res. 16/5	Review and assess the resources needed for capacity building actions in light of the resources plan of Task Team on Resources.		Intersessional

Work Strategy for JCOMM Capacity Building

The WMO/IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) has the commitment to improve and expand the availability of operational marine data necessary for monitoring, understanding and forecasting both short and long-term meteorological and oceanographic variations.

Objectives of the Capacity Building Programme Area

The Capacity Building (CB) Programme under JCOMM has the responsibility to increase the capability of countries in the area of marine forecasting and management and to help countries with less capacity in marine activities to become involved in the various JCOMM Programmes through the training, transfer of technology and provision of equipment with the objective to improve operational ocean and meteorological services to the users and the peoples of all countries.

To achieve these aims the JCOMM Capacity Building Programme must operate within, and draw upon, the overall principles of its governing bodies (JCOMM CB Strategy - WMO/TD-N° 1063, 2001- Technical Report N° 11, General Principles); it must be also compatible to, and work with, WMO/IOC programmes, particularly with those devoted to observational objectives such as the World Weather Watch (WWW), the Global Climate Observing System (GCOS) and the Global Ocean Observing System (GOOS).

Objectives of the Task Team on Resources

- a) Monitor the existence, fields of interest and procedures of international and national aid programmes, foundations and all other possible sources of funding and advice on proposal development;
- b) Where possible, develop links and contacts to funding sources and aid programme management;
- c) Develop a plan for obtaining resources for JCOMM Capacity Building, in collaboration with GOOS and GCOS (Res. 16/5).

According to the tasks assigned to the Capacity Building Programme Area by the First Meeting of WMO/IOC JCOMM (JCOMM-I), the following tentative CB working strategy has been developed for the intersessional period JCOMM-I/JCOMM-II:

Implementation of the JCOMM Capacity Building Strategy (Res. 16/5)

In accordance to the Priorities already defined by the JCOMM CB Strategy, it is suggested that the plan be arranged in two phases:

Phase A: The maximum efforts should be focused in fulfilling the *Priorities and Actions* addressed in Item 7. of the JCOMM Capacity Building Strategy.

Phase B: This phase is oriented to accomplish other relevant issues to the general principles of the strategy, including those stated in the JCOMM WORK PLAN 2001-2005 adopted at the first formal session of the Commission (JCOMM-1).

Group members will be expected to accomplish the tasks assigned in phase A and B and to provide brief reports on their status and on relevant follow-up actions to the CB Coordinator and the Secretariat when so required. Complete summary reports should be submitted to the CB Coordinator and the Secretariat prior to each JCOMM Management Committee sessions and prior to CBCG-II.

Phase A -
Regional and National Levels

The accomplishment of the following tasks should depict the Regional and National scenarios the CB Programme will confront with. From the analysis of these studies it is expected to determine the CB needs or the requirements to build on and/or improve existing operational systems.

1. Conduct a survey among the maritime countries of the WMO Regional Associations I, II, IV, V and VI, similar to the study already carried out in RA III. The questionnaires will be sent to the mentioned Regional Associations by the Secretariat on behalf of the group members concerned, by means of JCOMM joint circular letters. Responses to the questionnaire should be returned to the group members for their analysis.

CB Group members then should:

- a) Identify the CB needs of each Region country in the areas of Education, Materials, Training, Knowledge, Technical assistance, Hardware and maintenance, Monetary support, Data and Information and Infrastructure in the context of JCOMM CB Strategy.
- b) Portray a Regional profile with an analysis of the regional needs.
- c) The results of the analysis will have to be submitted to the CB Coordinator and the Secretariat for compilation and for the preparation of an initial list of priority requirements. Such initial set of priorities should then be circulated to all group members for review and further input.

(Task 1. is assigned as follows: For WMO RA I, **Ms Folorunsho**; WMO RA II, **Ms Qi**; WMO RA IV, **Mr Aparicio**; WMO RA V, **Mr Ragoonaden** and for WMO RA VI, **To be appointed**).

Additionally, the following proposed tasks should provide an overview of the on-going capacity building activities performed at national level. The experience already obtained by WMO/IOC Member States and identified by this process will be extremely useful to maximize the resources and focus the future efforts of the JCOMM CB Programme.

2. Identify on-progress *Capacity Building Policies* in the WMO/IOC Member States in the areas of Education, Materials, Training, Knowledge, Technical assistance, Hardware and maintenance, Monetary support, Data and Information and Infrastructure in the context of JCOMM CB Strategy.
3. Identify the *exchange of assistance already in progress* among the WMO/IOC Member States in the areas mentioned above and under the umbrella of such international Organizations.
4. Investigate the status of the Action Plans of the existing regional programmes and associated activities outside of WMO and IOC in the individual Region assigned, summarize their activities, develop appropriate links and propose possible collaboration with JCOMM capacity building, submit these results to the CB Coordinator and the Secretariat.

(Tasks 2. to 4. are assigned as follows: For WMO RA I, **Ms Folorunsho**; WMO RA II, **Ms Qi**; WMO RA III and IV, **Mr Aparicio**; WMO RA V, **Mr Ragoonaden** and for WMO RA VI, **To be appointed**).

The information collected in the above items should be used to:

5. Determine Regional CB priority requirements and actions. **(CB Coordinator and Secretariat)**
6. Make an analysis of the Identified needs for Training in marine meteorology and oceanography activities and the proposals for contributions from WMO/IOC Member countries in this aspect. Prepare a project for future Training Events. **(Ms Folorunsho)**
7. Address how national educational, observational and information resources can be best used to mutual advantage at the Regional Level. **(CB Coordinator, CB Group members and Secretariat)**
8. Continue the development of the project **Evaluation of JCOMM Capacity Building** outlined in Annex **XX** of the CBCG-1 Final Report oriented to create an integrated audit system to address the results and accountability of the CB activities. Submit a final document to the Group's Coordinator and to the Secretariat. The evaluation system has to ensure the maintenance and upgrading of the infrastructure created by the CB transfer and the long term participation of receiving countries in JCOMM activities. **(Mr Ragoonaden and Ms Qi)**

Task Team on Resources

9. Formally establish, in the very short term, the Task Team on Resources. **(TTR Chairman and Secretariat)**
10. It is expected that the TTR investigate new sources for funding JCOMM training activities (para 11.1.4.). **(TTR)**
11. Collaborate and coordinate with the resources team established by the Intergovernmental Committee for GOOS (IGOOS). **(TTR Chairman and Secretariat)**
12. Include the objectives stated in item 7.2 i); ii) and iii) of the CBCG-1 Final Report in the work strategy of the Task Team on Resources. **(TTR)**

Phase B -

1. Discuss with IODE (International Oceanographic Data and Information Exchange) the possibilities to expand the scope of Ocean Teacher to meet JCOMM training requirements (para 11.2.9). **(Ms Folorunsho)**
2. Review the requirements for cooperative projects in ocean regions and sub regions and provide assistance in the development of detailed proposals (para 11.3.5). **(Mr Aparicio and Mr Ragoonaden)**
3. Develop links with GOOS (Global Ocean Observing System) regional alliances oriented to implement mutually supportive CB projects (para 11.3.5). **(Mr Aparicio and Mr Ragoonaden)**
4. Investigate with IODE the possibilities to use ODINAFRICA network as a tool to fulfill relevant JCOMM CB Regional requirements (para 11.3.9). **(Mr Aparicio and Mr Ragoonaden)**
5. Work with GCOS (Global Climate Observing System) and GOOS in the organization of regional workshops in order to include to the maximum extent possible ocean observations and related services (para 12.1.7). **(Ms Folorunsho)**

6. Keep under review existing training and guidance material and advise on the updating and development of new material; make proposals for updating and replacement if necessary (Res. 16/5). **(Ms Folorunsho)**
7. Prepare a standard briefing paper on JCOMM Capacity Building, including regional requirements **(CB Coordinator)**.
8. Work on the build of capacity for storm surge monitoring, modelling and forecasting for West African countries; develop a draft project on the basis of the work carried out by Mr Ragoonaden on this particular subject. **(Ms Folorunsho)**. Forward it to the CB Coordinator and Secretariat for review and further action.
9. Provide the CB Coordinator and Secretariat any existent national material that might assist them in the preparation of a draft for a short information leaflet to encourage and enhance user interactions at the national level and to provide advice and guidance to national meteorological and oceanographic sciences in this regard **(CB Group members)**. Review the draft of the leaflet prior to distribution to Members/Member States. **(CB Group members)**.
10. Provide with names of possible authors for a new publication in the series of "Marine Meteorology and Physical Oceanography" **(CB Group members)**.
11. Develop links to both WMO and IOC regional bodies, including through the WMO Regional Rapporteurs on Marine Meteorological Services, in order to establish interaction with existing regional programmes and activities and to develop regional and national interactions with users. **(CB Group members)**.

Interaction with GOOS

A combination of both WMO and IOC roles will be essential to ensure the complete success of the JCOMM CB Programme. It is therefore, of the utmost importance that the maximum efforts be made to find creative and proactive ways of integration between the meteorological and oceanographic activities in order to achieve the common goals of both disciplines.

In this aspect, the GOOS Capacity Building Programme and its Implementation Strategy will constitute referential documents of remarkable value to the accomplishment of the CB Coordination Group's tasks and to the successful planning and implementation of projects of mutual interest. The following are some suggested actions oriented to enforce such integration:

- Study the compatibilities between the JCOMM and GOOS National, Regional and Global objectives.
- Study possible actions oriented to the implementation of mutually supportive Capacity Building projects.
- Establish possible coordinated actions compatible with Annex 5 of the GOOS Implementation Strategy – GOOS Capacity Building for Developing Countries – when developing Phase A of the present work plan.
- Establish coordinated actions with GOOS, GCOS and IODE when accomplishing Phase B of the present work plan (this include: Training events, Cooperative projects, Regional alliances and priorities, Training and guidance material, etc.).
- Investigate possible future ways of interaction with the GOOS Project Office and National GOOS Coordinating Committees.

- Actively contribute to the current activities involving GOOS-related capacity building through JCOMM and/or WMO (Table 3 of the GOOS Implementation Strategy) in the fields of Direct Training, Building Global Systems and Capabilities, Regional Development Projects and Voluntary Cooperation Programmes.
- Investigate the potential benefits of working through partnerships with GOOS.
- Work on the development of guidelines related to user interactions and public awareness on operational ocean issues **(Mr Aparicio and Ms Folorunsho)**
- Join the GOOS Panel intersessional task team devoted to develop linked web pages oriented to provide information on JCOMM and GOOS capacity building resources **(Mr Aparicio)**
- Continuously search for a coordinated interaction with the GOOS CB Panel. Arrange for joint sessions during GOOS CB Panel and JCOMM CBCG future meetings.
- Work with the GOOS CB Panel in support of the GLOSS Group of Experts.
- Work with the GOOS CB Panel to establish a technical working group on remote sensing to assess the present status of existing facilities and projects and to establish future plans and training projects.

Working Relations between the CB Coordination Group and the Task Team on Resources

The CB Coordination Group will provide any information it might possess on existing funding resources at Regional and National levels as well as on the needs for monetary support to perform the JCOMM programmed activities; the TTR should provide financial solutions by searching and defining sources for funding (e.g. partnerships, international or bilateral funding aids, resources from funding agencies, etc.).

Examples of some coordinated actions between the CB Coordination Group and the TTR:

Establish a close link with the TTR and feed it in with the information collected during the surveys conducted by the CB Coordination Group in Phase A.

Also provide TTR information on the exchange of assistance already in progress among the WMO/IOC Member States identified in item 3. of Phase A.

Provide information on the Identified needs for Training in marine meteorology and oceanography activities and the proposals for contributions from WMO/IOC Member countries in this aspect.

Review and assess the resources needed for Capacity Building actions in light of the resources plan of the Task Team on Resources (Res. 16/5)

Working Relations between the CB Coordination Group and the WMO Education and Training Programme (ET), the Technical Cooperation Programme (TCO) and the IOC Training Education and Mutual Assistance Programme (TEMA)

Establish a liaison with WMO ET/TCO and IOC TEMA and feed it in with the information it might possess on needs of Education, Instructional Material, Training and Transfer of Knowledge at Regional and National levels.

The CB Coordination Group should ask for advice and/or assistance to WMO ET/TCO and IOC TEMA when working on tasks related to the Education and Training areas, including the preparation of Training Events, Workshops, Bibliography (electronic and paper), the reviewing of existing training and guidance material, etc.

Working Relations between the CB Coordination Group and the ET on Sea Ice

The CB Coordination Group should assist the Expert Team on Sea Ice of the Services Programme Area when required, in the development of guidance material, software exchange, specialized training and CB support with regard to sea ice observations and services.

Working mechanism of the CB Coordination Group

The tasks will be assigned to the Coordination Group members as proposed in this document. The Chairperson of the CB Programme Area will organize, coordinate and monitor the accomplishment of the tasks enunciated and will collect the documentation prepared by the group members.

The CB Programme Area should seek for establishing routine coordinating mechanisms and permanent, cooperative relations with the WMO/IOC subsidiary bodies (IODE;GCOS;GOOS; etc.) as well as with other JCOMM Programme Areas.

The CB Coordination Group will use electronic means (e-mail) for their communication and exchange throughout the intersessional period.

REFERENCE	SUBJECT	ACTION REQUIRED	TARGET DATE	EXECUTION
		<i>projects for JCOMM capacity building to be passed to the GOOS CB Panel.</i>		
<i>FR Para 4.3.2</i>	<i>Paper on JCOMM capacity building</i>	<p>(i) <i>To prepare a standing briefing paper on JCOMM capacity building, including regional requirements, for use by the relevant representatives in WMO and IOC regional body meetings;</i></p> <p>(ii) <i>To arrange the appropriate meeting representation.</i></p>	<p>???????????????</p> <p>???????????????</p>	<p><i>Chair, Secretariat</i></p> <p><i>Secretariat</i></p>
<i>FR Para 4.3.3</i>	<i>Potential value to JCOMM capacity building</i>	<i>To submit to the chair and Secretariat summary reports on Action Plans of existing regional programmes and associated activities outside of WMO and IOC which are of potential value to JCOMM capacity building, and to propose possible collaboration with JCOMM in this field.</i>	???????????????????	<i>Group members</i>
<i>FR Para 4.4.2</i>	<i>Project for West African countries</i>	(i) <i>To develop a draft conceptual outline for storm surge monitoring, modelling and forecasting for West African countries;</i>	???????????	<i>Regina Folorunsho, chair, Secretariat</i>

REFERENCE	SUBJECT	ACTION REQUIRED	TARGET DATE	EXECUTION
		<i>(ii) To forward this conceptual outline to the chair and Secretariat for review and future action.</i>		
<i>FR Para 4.4.3</i>	<i>Public awareness</i>	<i>To develop public awareness of the benefits of regional projects and of involving other partners in their development and implementation.</i>		<i>Secretariat, IOI</i>
<i>FR Para 4.5.2</i>	<i>"Leadership Seminar"</i>	<i>To consider the organization of a future IOI "Leadership Seminar" related to JCOMM, GOOS and operational Oceanography</i>		<i>Secretariat, GPO, IOI</i>
<i>FR Para 4.5.3</i>	<i>Information leaflet</i>	<i>(i) To provide the chair and Secretariat with national material to be assisted in the preparation of a short information leaflet for guidance to user interactions; (ii) To prepare a draft of the leaflet, for review by group members prior to distribute to Members/Member States..</i>		<i>Johannes Guddal, group members Chair, Secretariat</i>
<i>FR Para 4.6</i>	<i>Monitoring the effectiveness of capacity building programmes</i>	<i>To fully develop the evaluation procedures to all JCOMM capacity building activities to have a means of</i>		<i>Qi Ping, Sachooda Ragoonaden, Secretariat, GPO</i>

REFERENCE	SUBJECT	ACTION REQUIRED	TARGET DATE	EXECUTION
		<i>assessing effectiveness of the activities carried out under the capacity building programme.</i>		
<i>FR Para 5.1</i>	<i>Support for other JCOMM Programme Area</i>	<i>To consider linkages to relevant satellite and in situ data for any project delivering models.</i>		<i>Secretariat, Services Programme Area</i>
<i>FR Para 5.2</i>	<i>Training and guidance material</i>	<i>To keep all JCOMM relevant training and guidance material under review, and make proposals for updating and replacement as necessary.</i>		<i>Secretariat, Regina Folorunsho</i>
<i>FR Para 5.3</i>	<i>Workshops and other short-term training</i>	<i>To continue support and participation in the region workshop series which are direct relevance to JCOMM capacity building.</i>		<i>Johannes Guddal</i>
<i>FR Para 6</i>	<i>Integration with GOOS capacity building</i>	<p><i>(i) To support the continuation and expansion of the storm surge pilot projects currently underway or planned in East Asia and Eastern South America;</i></p> <p><i>(ii) To coordinate specific training workshops for JCOMM and GOOS;</i></p> <p><i>(iii) To take part in the participation of IOI programme "Children and</i></p>	<p><i>Continuous</i></p> <p><i>Continuous</i></p>	<p><i>Johannes Guddal, GOOS/COOP, Secretariat</i></p> <p><i>Secretariat</i></p> <p><i>IOI, Secretariat</i></p>

REFERENCE	SUBJECT	ACTION REQUIRED	TARGET DATE	EXECUTION
		<p><i>the Sea" ;</i></p> <p>(iv) <i>To joint a GOOS Panel intersessional task team involved in activities on JCOMM and GOOS capacity building resources;</i></p> <p>(v) <i>JCOMM and GOOS work with and support the GLOSS Group Of Experts in their capacity building activities;</i></p> <p>(vi) <i>To nominate GOOS and IODE experts to joint the Task Team on Instrument Testing and Intercalibration established by SOT;</i></p> <p>(vii) <i>To establish links between JCOMM and the GOOS Regional Alliances;</i></p> <p>(viii) <i>To establish, jointly JCOMM and GOOS CB groups, a technical working group on remote sensing;</i></p>	<p></p> <p><i>Continuous</i></p> <p><i>ASAP</i></p> <p><i>December 2002</i></p>	<p><i>Ruben Aparicio</i></p> <p><i>Chairs, Secretariat</i></p> <p><i>GSC chair, IODE, Secretariat</i></p> <p><i>Secretariat</i></p> <p><i>Chairs, JCOMM satellite reporter and Secretariat</i></p>

REFERENCE	SUBJECT	ACTION REQUIRED	TARGET DATE	EXECUTION
		(ix) <i>To make similar arrangements for future meetings of GOOS Panel and JCOMM in their capacity building work;</i>		<i>Chairs, Secretariat</i>
<i>FR Para 7</i>	<i>Task Team on Resources (TTR)</i>	(i) <i>To recommend to the Management Committee the list of persons for the membership of TTR;</i> (ii) <i>To establish formally TTR which should collaborate and coordinate closely with resources team of IGOOS</i>	<i>ASAP</i>	<i>Co-presidents, Secretariat</i> <i>TTR chair, Secretariat</i>
<i>FR Para 8</i>	<i>Capacity building work programme</i>	(i) <i>To review and update the capacity building work programme and strategy for the intersessional period;</i> (ii) <i>To request the co-presidents to agree to the appointment of an expert from Portugal as f an additional member of the group;</i> (iii) <i>To proposed possible authors for the preparation of a topic "Marine Meteorology and Physical</i>	<i>ASAP</i> <i>ASAP</i>	<i>Miriam Andrioli, Secretariat</i> <i>Secretariat</i> <i>Group members, Secretariat, GPO</i>

REFERENCE	SUBJECT	ACTION REQUIRED	TARGET DATE	EXECUTION
		<i>Oceanography" to be published in a new WMO series "Continuing Education and Training in Meteorology and Hydrology (CET-MH).</i>		
<i>FR Para 9.1</i>	<i>Next group session</i>	<i>To organize the next group session in conjunction with a session of the GOOS CB Panel</i>	<i>2004</i>	<i>Secretariat, GPO</i>

List of Acronyms and Other Abbreviations

ARGO	Array for Real-time Geostrophic Oceanography programme
BMTC	Bureau Meteorological Centre
CBCG	Capacity Building Programme Area Coordination Group
CET-MH	Continuing Education and Training in Meteorology and Hydrology
CGMS	Coordination on Geostationary Meteorological Satellites
CMA	China Meteorological Administration
CMM	Commission for Marine Meteorology (WMO)
COOP	CLIVAR Ocean Observations Panel
CPPS	Permanent Commission for the South Pacific
CSI	Centre Seismologic International
GCOS	Global Climate Observing System
GLOSS	Global Sea-Level Observing System
GOOS	Global Ocean Observing System
GPO	GOOS Project Office
GSC	GOOS Steering Committee
IGOOS	Intergovernmental Committee for GOOS
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IODE	International Data and Information Exchange (IOC)
IOI	International Ocean Institute
IOIVU	IOI Virtual University
JAMSTEC	Japan Marine Science and Technology Centre
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
NESDIS	National Environmental Satellite, Data and Information Service
NOAA	National Oceanographic and Atmospheric Administration (USA)
NODC	National Oceanographic Data Centre
ODIN	Ocean Data and Information Network
ODINCARA	ODIN Caribbean and South America
ODINAFRICA	Ocean Data and Information Network for Africa
ODINEA	Ocean Data and Information Network for East Africa
PMO	Port Meteorological Officer
QC	Quality Control
SEACAMP	South-East Asian Centre for Atmospheric and Marine Prediction
TEMA	Committee for Training, Education and Mutual Assistance (IOC)
TRITON	Triangle Trans-Ocean Buoy Network
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
VCP	Voluntary Cooperation Programme (WMO)
WDC	World Data Center
WIOMAP	Western Indian Ocean Marine Applications Project
WMO	World Meteorological Organization
WSSD	World Summit on Sustainable Development