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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

**JOINT IOC-WMO TECHNICAL COMMISSION
FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)
REPORT BY JCOMM CO-PRESIDENTS ON RECENT ACTIVITIES, 2005**

This document has been prepared in view of the 23rd IOC Assembly that is taking place from 21 to 30 June 2005 in Paris, UNESCO.

Note: Also available in French.

1. Background

The WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) held its first formal meeting in 2001 in Akureyri, Iceland, following formal approval by the World Meteorological Organization (WMO) at its Thirteenth Congress (May 1999) and by the Intergovernmental Oceanographic Commission (IOC) at its 20th Assembly (July 1999). Preparations are underway for the second session, scheduled to be held in Halifax, Canada (19–27 September 2005).

Responding to increasing interdisciplinary requirements over the past several decades for marine data and services necessitated the development of ever-closer working relationships between oceanographers and marine meteorologists. This was reflected at the global level by growing collaboration between the IOC and the WMO in organizing and coordinating marine observations, data management, the provision of related services, and associated capacity-building needs. Such collaborations, and the foresight and dedication of many individuals in the two communities culminated in the establishment of JCOMM. This new body brought together the two marine communities in a common global, intergovernmental forum, charged with overall responsibility for coordinating worldwide marine meteorological and oceanographic services and their supporting observational and data management programmes.

The formation of JCOMM, and the work achieved already since its establishment, clearly demonstrates that, at the international/intergovernmental level, the appropriate mechanism is now in place to enhance cooperation and coordination and facilitate the achievement of common goals. However, it is also clear that much remains to be done at the national level, in terms of cooperation and joint activities between the meteorological and oceanographic communities, if these goals are to be truly met and the JCOMM programme fully implemented. This is an important message that all of us involved in JCOMM must take to and act on in our home countries.

2. The JCOMM Vision

The vision of JCOMM is that of an organization which coordinates, regulates and facilitates, at the global level, a fully integrated marine observing, data management and services system that uses state-of-the-art technologies and capabilities; is responsive to the evolving needs of all users of marine data and products; and includes an outreach programme to enhance the national capacity of all maritime countries. JCOMM aims to maximize the benefits for its Members/Member States in the projects, programmes and activities that it undertakes in their interest and that of the global community in general.

3. The Long-Term Objectives of JCOMM

The current long-term objectives of JCOMM are:

- (i) To enhance the provision of marine meteorological and oceanographic services in support of the safety of navigation and safe operations at sea; contribute to risk management for ocean-based economic, commercial and industrial activities; contribute to the prevention and control of marine pollution, sustainable development of the marine environment, coastal area management and recreational activities, and in support of the safety of coastal habitation and activities; and to coordinate and enhance the provision of the data, information, products and services required to support climate research and the detection and prediction of climate variability;

- (ii) To coordinate the enhancement and long-term maintenance of an integrated global marine meteorological and oceanographic observing and data management system, containing both *in situ* and remote sensing components and including data communication facilities, as part of the Global Ocean Observing System (GOOS) and the World Weather Watch (WWW), and in support of the World Climate Programme (WCP), the World Climate Research Programme (WCRP), the Global Climate Observing System (GCOS), and other major WMO and IOC Programmes;
- (iii) To coordinate and regulate the maintenance and expansion of a comprehensive database of marine meteorological, oceanographic and sea ice data, in support of marine services, operational meteorology and oceanography and the WCP;
- (iv) To manage the evolution of an effective and efficient programme through the selective incorporation of advances in meteorological and oceanographic science and technology; and to work to ensure that all countries have the capacity to benefit from and contribute to these advances, and to the work of JCOMM in general.

4. JCOMM Structure

As formally constituted, JCOMM is an intergovernmental body of experts, and is the major advisory body to the two parent Organizations (consisting of their Members/Member States, Governing Bodies and other subsidiary bodies and programmes) on all technical aspects of operational marine meteorology and oceanography. JCOMM has a current membership of approximately 250 experts, with most national delegations comprised roughly equal numbers of oceanographers and marine meteorologists. It is co-chaired by a meteorologist and an oceanographer, reflecting its integrated responsibilities for meteorological and oceanographic programmes. Under the overall direction of a Management Committee chaired by the co-presidents, the Commission is organized into four Programme Areas — Observations, Data Management, Services and Capacity-building. Each Programme Area (PA) is, in turn, managed by a Coordinator, with support from a small coordination group and with specific activities being undertaken by designated teams or panels of experts. The establishment of these four Programme Areas is intended to facilitate the delivery of JCOMM's mandated responsibilities by subdividing them into logical and coherent groupings.

5. Highlights 2001–2005

150th Anniversary of the Brussels Maritime Conference of 1853, Brussels, 17–18 November and CLIMAR-II, Brussels, 19–22 November 2003

A special two-day seminar took place, under the High Patronage of H.M. King Albert II of Belgium, to celebrate the 150th anniversary of the historical Maritime Conference, convened in Brussels in August 1853 by Lt Matthew Fontaine Maury (U.S. Navy), for the purpose of “establishing a uniform system of meteorological observations at sea, and of concurring in a general plan of observation on the winds and currents of the ocean”. The formal opening ceremony was followed by three sessions: The Maritime Conference of 1853, its antecedents and impacts; development of operational meteorology and oceanography, WMO, WWW, GOOS, GCOS, and JCOMM; and lessons learned and a future vision of operational meteorology and oceanography.

In association with the seminar, the Second JCOMM Workshop on Advances in Marine Climatology (CLIMAR-II) took place in Brussels from 19 to 22 November 2003, at the kind

invitation of the Royal Meteorological Institute of Brussels. Proceedings of these two events were published as JCOMM Technical reports Nos. 27 and 22 respectively.

OceanOPS 04: “Operational Metocean Products and Services in Support of Maritime Safety and Environmental Management”, Toulouse, France, 10 - 15, May 2004

OceanOps 04 was organized by WMO, IOC (jointly through JCOMM) and Meteo France, with additional sponsorship from U.S. NOAA, Australian Bureau of Meteorology, U.S. Office of Naval Research, IFREMER (France), CEDRE (France), CNRS (France), and EUMETSAT, with the following objectives:

1. Evaluate specific user requirements for operational metocean products;
2. Review newly developed and tested products as well as the state-of-the art of ocean modelling, and assess their suitability for operational implementation;
3. Provide a basis for restructuring and enhancing the JCOMM Electronic Products Bulletin, and contribute to the further implementation of existing JCOMM systems such as for the Marine Pollution Emergency Response Support System and the marine broadcast system for the **Global Maritime Distress and Safety System (GMDSS)**.

Many new and useful recommendations relating to the future development of operational ocean products and services within the context of JCOMM, and also a framework for this development, were put forward as a result of the discussions during the symposium. Based on these recommendations, and the large number of operational or quasi-operational real-time ocean and marine products now becoming available, and with a view to eventually developing formal guidance material under JCOMM for operational ocean products and services, the new ad hoc Task Team on Ocean Products Development will be presenting some proposals on this issue to the session.

Workshop on New Technical Developments in Sea and Land Level Observing

The importance of GLOSS to not only the integrated climate observations system but also for the global coastal network was well recognized, and consequently, a GLOSS implementation plan was developed in 1997. Subsequently, based on a review of the sea level network, data returns and availability, and requirements for climate and seasonal forecasting, a GLOSS Adequacy Report (IOC/INF-1190) was prepared in 2003. The recent tsunami disaster in Indian Ocean countries highlighted the importance of upgrading the sea-level network for faster sampling and real-time transmission, as well as of sharing the data in real-time to facilitate modelling and forecasting to support a global-regional natural disaster warning and response system around each ocean.

Fundamental to implementing and sustaining a global sea level network is developing the capacity for monitoring sea level and using the data for regional forecasts of tides and warnings in developing countries. GLOSS has always given a high priority for capacity building, and has been successful to certain extent in getting support from many developed countries for the installation of gauges and training of personnel. Recent funding as part of the Ocean Data and Information Network for Africa (ODINAFRICA III) project by the Government of Flanders (Belgium) through a grant to IOC for the acquisition of 12-15 gauges, installation and training activities for Africa is an excellent example of GLOSS capacity building.

The technological advances in sea level monitoring necessitated a review and evaluation of the various methods through inter-calibrations and modelling. The Workshop on New Technical

Developments in Sea and Land Level Observing Systems, held in Paris (October 2003), provided a forum to present the results of such inter-comparison studies and new technologies that may be useful in future (IOC Workshop Report, 193).

Performance measurements

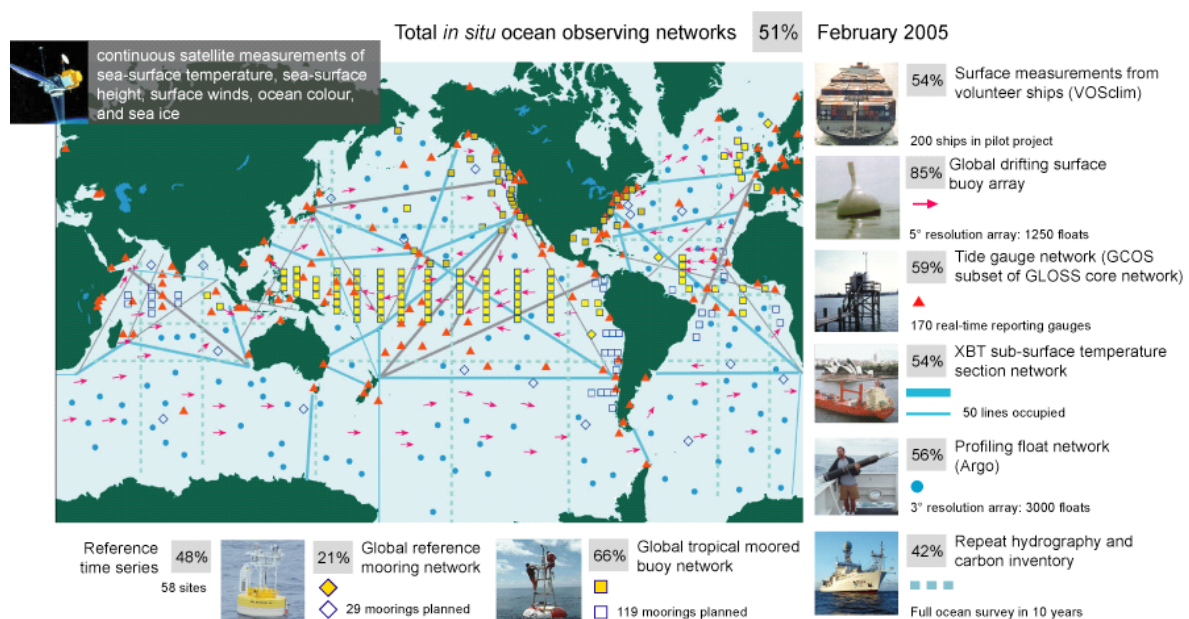
An essential component of an integrated, operational observations system is the development of easy to understand performance reports that can allow evaluation of the effectiveness of the observing system and help in efforts to convince governments to provide the funding needed to meet global implementation targets. Much work is being done by JCOMMOPS, the implementation panels, and other partners around the world to evaluate observing system status and effectiveness. The Observations Coordination Group is working to bring together elements of this work in order to develop summary reports illustrating how advancements toward global coverage improve the adequacy of the observational information that is essential for monitoring the state of the ocean and marine meteorology.

The goals of this effort are to:

- Standardize base maps across all the networks
- Show what is required for global coverage against what is presently in place
- Illustrate gaps in coverage so the gaps can be filled efficiently
- Show contributions by countries
- Provide a single access point, through JCOMMOPS, to monitoring data and statistics

A variety of performance reports are now available at the JCOMMOPS website (www.jcommops.org/network). The baseline GCOS-92 system is 51% complete:

Status against GCOS IP/JCOMM goals



It is worth noting that a significant milestone was achieved by Argo in 2004, when the half-way mark of its design goal was reached with 1,500 floats being operational globally. In addition, a major milestone will be achieved by the DBCP in 2005, when the global drifting buoy array will reach its design goal of 1,250 buoys in sustained service. Thus the global drifting buoy array will become the first component of the Global Ocean Observing System to be completed. This is an accomplishment worth celebrating.

Port Meteorological Officers Workshops

Port Meteorological Officers (PMO) represent an invaluable, but diminishing, resource in support of all marine observation programmes using volunteer observing vessels as instrument platforms. Such programmes include traditional meteorological observations, VOSCLIM, XBT lines and, increasingly, more sophisticated ocean measurements such as ocean carbon. They are also invaluable as platforms for the deployment of automated systems such as surface drifters and Argo floats. To support and strengthen the international PMO network, two international PMO training and coordination workshops were convened or planned, in London in July 2003 and Hamburg in late 2005 or 2006. More than 30 PMOs took part in the first workshop, the proceedings from which are available as JCOMM Technical report No. 25. In addition, in the light of the ongoing gradual degradation of the network, and bearing in mind the continued high importance of the PMOs to the JCOMM Observations Programme Area, the Commission will be requested to emphasise this importance to Members/Member States, and urge on them a reinforcement of the network.

6. Areas needing increased focus

The primary focus for JCOMM during its first intersessional period was to effect real integration of marine services of WMO and IOC in JCOMM. An essential first step toward achieving such integration is to recruit the members of its coordination groups and expert teams and to develop and implement a realistic workplan. JCOMM has been successful in advancing a number of areas, particularly in bringing integration among the three elements of ship-based observations, in enhancing the area of service associated with sea ice, marine pollution, waves and storm surges, in adding value in the area of data management. Much work still remains, and certain areas need additional focus.

6.1 Observations Programmes

Each of the implementation panels continues to deal with technical issues specific to their ongoing operations, however the fundamental need for global coverage by the *in situ* networks still remains to be a challenge.

There is presently significant international momentum for implementation of a composite global observing system consisting of: (i) the *in situ* networks — moored and drifting buoy arrays, profiling floats, tide gauge stations, and repeat ship lines; (ii) continuous satellite missions; (iii) data and assimilation subsystems; and (iv) system management and product delivery. The GCOS Implementation Plan for the Global Observing System for Climate in support of the UNFCCC (GCOS-92) has now been published, and endorsed by the UNFCCC.

JCOMM is particularly well positioned to provide the logistics and organizational infrastructure needed to implement the international global arrays. JCOMM is identified as the implementing agent, or a contributing implementing agent, for 26 of the actions listed in the GCOS-92 Implementation Plan. The workplan for the Observations Programme Area will focus on the implementation of these actions.

However, global coverage cannot be achieved with the resources that are presently being allocated. An added difficulty is that many countries are shifting funding from one element of the global observations system to another with no net improvement in the total system. In order to fully realise the benefits of the observational network, the member countries must recognize the importance of having a balanced and integrated observational network that will facilitate the analyses and modelling efforts, such as GODAE, and must implement such a system according to the design plans developed by GCOS and COOP.

6.2 Services

JCOMM when it was formed had already a well-defined focus in the area of sea ice and waves, and plans for activities in support of Marine Pollution Emergency Response Support System (MPERSS). There has been significant progress in these areas during the first intersessional period. OceanOps 04, CLIMAR-II and GODAE-II all provided significant guidance on the type of products and services that could be provided by JCOMM in the upcoming years. The December 2004 earthquake in the Indian Ocean and the subsequent tsunami highlighted the importance of implementing a fully operational comprehensive natural hazard warning, reduction and mitigation system around the world.

Thus JCOMM has to serve a wide variety of both direct end users and, more often, intermediate or middle users of operational ocean products, in broad areas such as:

- Natural hazards and coastal impacts
- Integrated coastal management
- Marine ecosystems management: fisheries and biogeochemistry
- Crisis management—search and rescue and marine emergency response
- Risk management—industry, engineering, defence, maritime safety and other at-sea operations
- Climate assessment and the prediction of climate variability and change

As a first step towards developing an integrated met-ocean products and services, a comprehensive User Requirement Document that details the needs, applications and scenarios for operational ocean products should be developed and maintained. The level of effort required to meet these requirements necessitates close collaboration with the GOOS Regional Alliances, UN's ISDR, IOC's ITSU and IODE, and other relevant organizations. Identifying clear objectives for marine services incorporating new and existing met-ocean products will have to be a major focus for JCOMM in the next inter-sessional period. In this regard, JCOMM has to clearly define its roles in relation to UN/ISDR and IOC/ITSU. A major challenge will be to obtain commitments from national organizations in the development of products and delivery of services in a timely fashion.

6.3 Capacity Building

JCOMM can succeed as a global organization only if it serves the critical needs of all maritime regions. At present many nations do not have the capacity to benefit from the existing programmes and services. The recent tsunami in the Indian Ocean and the storm surges in many part of the world clearly demonstrate the importance of providing met-ocean products and services to maritime nations, and of building the capacity to benefit from them.

Capacity enhancement takes many forms including education, training, technology transfer and funding support. To better focus the effort the JCOMM Capacity Building Programme Area (CBPA) and the GOOS CB Panel were merged in 2004. The structure of JCOMM itself provides the opportunities for CB activities through its Task Team on Resources and since CB is an integral part of all their activities: note the activities of GLOSS, DBCP, waves and Storm Surges, and others in this area. In addition, increasingly, opportunities are availed to implement major CB activities through cooperation with relevant partners within the UN system and outside. The following are examples of CB activities achieved through integration/collaboration with partners:

1. Tropical Ocean Waves and Storm Surge modelling, cooperation between JCOMM and the tropical Cyclone Programme (TCP, third workshop to be held in Beijing 25–29 July 2005.
2. A Digital Modelling Training Course 2005 sponsored jointly by IOC Committee on IODE and JCOMM to be held in September 2005 at the IOC Project Office for IODE, in Oostend, Belgium with the following objectives:
 - to enable attendants to implement national services for warnings of wind waves, storm surges, and potential application services such as oil spill simulations or/and search/rescue operations,
 - to develop the interaction/mutual understanding between ocean numerical modellers and ocean data managers;
3. “MILAC¹” implementation assistance for Storm Surge forecasting/mitigation assistance, Cooperation between JCOMM and IOGOOS, CAgM, Chy, adopted for leadership by IOGOOS.

Developing criteria for the selection of CB activities, assisting member countries requiring capacity enhancements to seek and obtain funding for approved projects, and finding ways and means for sustaining the expertise and activities that are developed will continue to be a major challenge.

6.4 Data Management

The ultimate aim of JCOMM is to meet the needs of all users by coordinating and regulating, and collaborating with other relevant bodies, the development and implementation of a fully integrated data management system able to deliver high-quality data and products spanning the complete spectrum of marine meteorological and oceanographic observations. Much work remains to be done.

It is recognized that considerable overlap and potential duplication still exist between the activities of the JCOMM Data Management Programme Area and the IODE, in spite of the merging of JCOMM ETDMP and IOC GETADE, the co-sponsoring of the data management pilot projects, and the transferring of the responsibility for the secretariat support for JCOMM data management to the IODE secretariat. Furthermore, it is no longer sufficient to provide access to data in real-time, near-real-time and/or delayed mode, but at many access times with version controls and often integrated with other data types (atmospheric and oceanic). Thus the original distinction of JCOMM providing real-time data and integrated products and services in marine meteorology and oceanography, while IODE deals with delayed-mode oceanographic data is no longer appropriate.

¹ Marine Impacts on Lowland Agriculture and Coastal Resources

A closer collaboration between JCOMM and IODE data management activities would enhance the JCOMM/IODE operational oceanographic data management capability to match JCOMM's operational observations and services capabilities. It would ensure that the data management facilities developed as parts of the IODE will evolve so as to serve also new operational ocean data requirements developed in the future as part of JCOMM. It would preclude possible duplication of efforts regarding data and metadata models, transport protocols, discovery methods, etc. It would likely reduce the use of resources (financial and human) relative to the present situation, both in JCOMM and IODE.

During the process of evaluating the options to better bring synergies between JCOMM data management and IODE through closer collaboration and a possible merging of activities, due diligence must be exercised to ensure that the ocean data capabilities needed by those outside the current JCOMM community and currently served by the IODE are maintained and continue to evolve.

In addition to the organizational change, a major challenge will be to define the focus in the data management for the next intersessional period and concentrate the efforts of the collective data management community to address these priorities.

Both JCOMM and IODE recommend that the Task Team established to develop an IOC Data Management Strategy give careful consideration to ways and means for ensuring such collaborations and recommend necessary organizational changes to be implemented at IOC.

7. Lessons learned and way forward

The first intersessional period of JCOMM may be considered as a pilot in terms of the organizational structure including the concept of joint secretariat, the membership of committees, the frequency of meetings and other aspects of the day-to-day activities. Many lessons were learned that will help enhance the performance of JCOMM during the next intersessional period.

Though overall the joint secretariat concept was a success, it was obvious that any change in the leadership in either of the two organizations will have a major impact on the effectiveness of the joint secretariat. Furthermore, the funding for the secretariat was insufficient and did not permit undertaking many essential tasks. JCOMM vision is ambitious, and its mandate is far reaching. It is also to be noted that the expectations from the community is well beyond the resources available, therefore, balancing between moving towards the long-term goals, while meeting the short-term requirements, and managing the expectations will be a great challenge.

Because JCOMM had strong roots in two worlds, meteorology and oceanography, considerable amount of time during the management and coordination committee meetings were devoted to reporting on the activities of the various teams. Now that JCOMM is more mature, these committees should focus more on strategies and coordination.

Communication is an essential element in the implementation of JCOMM. Though some progress was achieved in this area, through the publication of the JCOMM brochure and other brochures on the activities of JCOMM programmes, through the web site, through participation at conferences and workshops and other venues, in order to reach all key client groups of JCOMM, it would be necessary to develop and implement a communication strategy with assistance from communication experts.

The mandate of JCOMM is such that it would require implementing a complex work plan. However, as the delivery will be primarily through national agencies, all contributions are voluntary, and JCOMM has very limited resources, JCOMM has the responsibility to deliver on its mandate but no power. The member countries, as is expected, have to deal with a variety of challenges, many of them urgent, in order for JCOMM to obtain the necessary support it has to be directly relevant to all members.

In many countries there has been a shift from fully government-funded observations to partially funded by governments with additional support from industry. JCOMM must find a process where by it is supported in part by industry.

The recent tsunami in the Indian Ocean, and many natural disasters that occur every year in many parts of the world necessitates increased focus on natural disaster reduction for JCOMM during the next intersessional period. It is recommended that the theme for the next session be the development of a comprehensive natural marine hazards warning system. In terms of the JCOMM work plan and organizational structure, as recommended in the draft JCOMM Strategy document, it would be necessary to refine and define subgroups with prioritised work plans for each group.

The next four years will be critical in the development of JCOMM. In order to benefit from the synergies of other programmes such as IPY and GEOSS, JCOMM must have a team of dedicated experts who will have the time to devote to building the organization, both in the Joint Secretariat and in the JCOMM committees.