WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

DATA BUOY COOPERATION PANEL

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TWENTY-SEVENTH SESSION

ITEM: 11.2

GENEVA, SWITZERLAND
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ENGLISH ONLY

JCOMM ACTIVITIES, INCLUDING JCOMMOPS

(Submitted by the Secretariat)

Summary and purpose of the document

This document provides information on JCOMM activities of interest to the DBCP, including the JCOMM Observations Programme Area (OPA), the Services and Forecasting Systems Programme Area (SFSPA), and the Data Management Programme Area (DMPA). Of particular interest will be the preparation for the forthcoming JCOMM fourth Session in the Republic of Korea in May 2012. The document also provides information on the activities of JCOMMOPS during the intersessional period.

ACTION PROPOSED

The Panel will review the information contained in this report and comment and make decisions or recommendations as appropriate. See part A for the details of recommended actions.

References:

Latest JCOMMOPS report for the JCOMM Observations Coordination Group fourth Session (Hobart, Australia, 18-20 April 2011):
http://www.ioc-cd.org/index.php?option=com_oe&task=viewDocumentRecord&docID=7164

Appendices:

A. JCOMM meetings between September 2010 and July 2011
B. Terms of Reference of JCOMMOPS
C. “Ship Logistics Coordinator” proposal
D. JCOMMOPS Operation Budget proposal for 2011 and 2012
E. Proposed new Terms of Reference of the DBCP and the Technical Coordinator

-A- DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT

11.2 JCOMM Activities

11.2.1 The Secretariat reported briefly on activities under or associated with JCOMM that had taken place since DBCP-XXVI, and were of direct interest to the Panel. Several meetings had taken place during the intersessional period, involving JCOMM Panels and Programmes, as well as other relevant bodies (see Appendix A for details). Of primary interest to the Panel, the following was noted:

(i) Eighth session of the JCOMM Management Committee, Paris, France, 16-19 November 2010. The Management Committee reviewed progress since JCOMM-III, and defined a clear pathway for the next 12 months to achieve these results. Continuing efforts within Observations Programme Area (OPA) to implement the initial ocean observing system specified by GCOS and endorsed by the OceanObs'09 were noted. A new cross-cutting Team on Satellite Data Requirements was established to incorporate the existing Programme Area satellite rapporteurs. The Management Committee concurred with the process proposed by the JCOMM Pilot Project for WIGOS for the adoption of a WMO/IOC Regional Marine Instrument Centre (see item 11.5). A procedure for regular web reporting of the Commission's capacity building activities, to better publicise the breadth and depth of its achievements in this vital area, will be developed.

(ii) Fourth Session of the JCOMM Observations Coordination Group (OCG), Hobart, Australia, 18-20 April 2011. OCG recognized its role in coordinating observing networks within the post-OceanObs'09 Framework for Ocean Observations. Highlights of the Session included:

- OCG stressed the role of the observing networks in engaging in a dialogue with the requirements-setting process, providing information on feasibility. See agenda item 11.4 for the Panel's discussion in this regard.
- OCG asked relevant teams to continue providing feedback to GHRSST on feasibility and cost of improved SST measurements from their platforms (SOT: radiometers on ships, underway SST; Argo, DBCP, OceanSITES: temperature profiles in upper 2 m). See agenda item 8.5 for the Panel's discussion in this regard.
- The Group agreed to take some action to improve linked understanding of satellite and in situ observing needs, coordination needs.
- It recognized a clear role for itself in advancing the feedback loop on requirements by feeding back information on cost and feasibility, and in engaging in pilot projects exploring feasibility/cost and impact where sponsorship can be identified.
- OCG chair and the secretariat will be working with each observing network to clarify their overall system goal metric(s) and any metrics of network efficiency, intensity of yearly effort, data timeliness and quality that should be reported for high-level systems overview.
- OCG recommended continued effort on sensor development for Argo, surface drifters, moorings (focus on ocean carbon system).
- The Group recommended to maintain communication on DBCP tender process for telecommunications with the rest of the interested teams in OCG.
- The Group endorsed the legacy recommendations of the JCOMM Pilot Project for WIGOS and invited OPA panels and associated programmes to address them as appropriate. OPA Panels and associated programmes were invited to compile and document their instrument practices and make recommendations whether they should be promoted through specific guides, JCOMM TRs, or WMO & IOC Publications. See agenda item 11.5 for the Panel's discussion in this regard.
- On the "ship" coordinator proposal from JCOMMOPS, the OCG was generally supportive of the idea as a pilot, but encouraged further refinement in the terms of reference with the panels, to increase possibility for success. OCG members

emphasized that the coordinator has first priority to serve the individual networks, before working on cross-platform actions, but that they believed integration would bring benefits. OCG encouraged all panels to consider working through JCOMMOPS for technical coordination. See the JCOMMOPS section below for the Panel's discussion in this regard.

- Second DBCP Africa/Western Indian Ocean Capacity Building Workshop, Mauritius, 2-7 May 2011. See agenda item 6.4 for the Panel's discussion in this regard.

Rigs and Platform metadata

11.2.2 The Panel recalled its recommendation at its previous Session that the DBCP eventually take over full responsibility for all types of Rigs and Platforms reporting meteorological and/or oceanographic measurements, and for all related aspects. The proposal was discussed at the eight Session of the JCOMM Management Committee meeting (Paris, France, 16-19 November 2010) and agreed upon. It was further accepted by the Ship Observations Team at its sixth Session (Hobart, Australia, April 2011). This will lead in particular to the DBCP proposing formats and procedures for managing rigs and platforms metadata. To reflect these decisions, the Panel agreed with the changes proposed in Appendix E for its Terms of Reference, and those of the Technical Coordinator. It requested the Secretariat to make that sure these are submitted to JCOMM-IV for endorsement (***action; Secretariat; end 2011***).

Codes

11.2.3 The Panel recalled that WMO Commission for Basic Systems (CBS) migration to table driven codes shall be completed by the end of 2012. The Panel noted that the *BUFR Template for buoy data, including directional and non directional wave data*[1] is still undergoing validation.

11.2.4 Due to the TC position beingcant during most of the last intersessional period, and to the JCOMM Task Team on Table Driven Codes (TT-TDC) focusing on the XBT and VOS templates, there has been no progress regarding proposals to be made for updating the BUFR template for buoy data to take into account requirements for (i) Instrument/Platform metadata required in real-time, and (ii) Wave observations – e.g. wave property data, directional (or partial directional) and non-directional spectral wave data (by frequency, and wavenumber).
11.2.5 BUFR templates for XBTs, drifting buoys, VOS and buoys were last updated by the JCOMM Task Team on Table Driven Codes (TT-TDC) in 2010. A new version of the BUFR Master Table for Oceanographic Data (Master Table 10) was updated and brought into conformance with the present WMO and IOC rules. Testing continues on the BUFR templates – and inconsistencies have been found within the templates, including:

- For VOS, element 0-01-044 should cover the actual ship's heading in degrees. The value (the direction towards which the bow of the ship points) is needed to calculate the true wind on a moving ship. The ship's heading is not per se the same as the ship's course over ground (element 0-01-012). Unfortunately, confusion exists in the reporting of both values.
- In the BUFR code manual and in the "marine template sequences" document, visibility (0-20-001) and the height of base of the cloud (0-20-013) appear to be physical values expressed in metres. However in the VOS template, these elements refer to tables formerly used in FM13: tables 4377 and 1600, respectively.

11.2.6 Other issues have been discovered, and the TT-TDC will conduct an extensive review of the BUFR templates in 2011 to resolve these issues.

11.2.7 The Panel also recalled that after the migration to Table Driven Codes, the moored buoys currently reporting on GTS in FM-13 SHIP format[2] will have to use an updated BUFR Template for

1: http://www.wmo.int/pages/prog/www/WMOCodes/Ref_Templates/BUOY_wave.doc
2 : FM-13 SHIP GTS format: Report of surface observation from a sea station

buoy data or a new BUFR Template for Moored Buoy data, yet to be developed. These changes should include requirements expressed by the DBCP Task Team on Moored Buoys, as well as those of the OceanSITEs.

11.2.8 The Panel requested the Technical Coordinator to work on these issues in close coordination with the chair of the JCOMM Task Team on Table Driven Codes (TT-TDC), Mr Bill Burnett (USA), the Chair of the DBCP Task Team on Moored Buoys, Mr Jon Turton (UK), the Chair of the JCOMM Expert Team on Wind Waves and Storm Surges (ETWS), Mr Val Swail (Canada), Panel Members as appropriate, and OceanSITEs Science Team Co-chair, Dr Uwe Send (USA) (***action; TC; DBCP-28***).

11.2.9 The Panel recommended the development of a new BUFR Template for profiling and sub-surface gliders, and requested the Task Team on Data Management (TT-DM) to work on this during the next intersessional period, and to liaise with the JCOMM Task Team on Table Driven Codes (TT-TDC), with a view to circulating a draft version at DBCP-28 (***action; TT-DM; DBCP-28***).

11.2.10 The Panel invited its members to participate actively in the JCOMM Task Team on Table Driven Codes and to work more closely on the testing and use of BUFR templates for marine platforms (***action; Panel members; DBCP-28***).

Integration of data management centres

11.2.11 See item 10.2.

Regional Marine Instrument Centres

11.2.12 See item 11.5 for details, as well as outcome of the JCOMM Marine Instrumentation workshop for the Asia Pacific Region (Tianjin, China, 11-13 July 2011) in Appendix A, item (xii)).

JCOMM in situ Observations Programme Support Centre (JCOMMOPS)

11.2.13 Mr Mathieu Belbéoch presented an update on the JCOMMOPS activities and challenges. The panel took note of the progress in the development of the Centre and on the fact that, already in a transition period, JCOMMOPS was impacted by the lack of a DBCP Technical Coordinator during a year.

11.2.14 The Panel noted that following a request from the OCG, JCOMMOPS was preparing a “strategy paper” to clarify a number of items including budget, deliverables, performance and scenarios for its expansion with detailed and budgeted proposals. The paper will be circulated to the OCG, including the DBCP chair, targeting a final version for JCOMM-IV. This document will be also important in the process of renewal of the MoU with UNESCO (and its WMO partner) for the hosting of a Programme Office in France, according to the IOC guidelines on decentralized offices, and initiated by the IOC secretariat in 2011.

11.2.15 Thanks to the arrival of the new DBCP Technical Coordinator (TC), the team will compile a complete catalog of products and services (web based, bulletins, statistics, etc.) that will be the base specifications for the production phase in 2012, and that will document the proposals for the Centre performance evaluation and expansion. JCOMMOPS classifies its services offer in three levels: *Advanced* (e.g. for DBCP or Argo), *Core* (for SOT and OceanSITES and potentially gliders) *and basic* for emerging programmes *(e.g. Bio or coastal Argo, GO-SHIP, etc.)* corresponding to three levels of needs and means for the panels involved. The TC mentioned that the expansion of the DBCP activities with recently adopted Action Groups (e.g. the ITP with the Tsunamis systems) will also have to go with new means for JCOMMOPS.

11.2.16 Mr Belbéoch presented the finalized proposal for a new "*Ship Logistics Coordinator*" at JCOMMOPS, and invited the Panel to address participation to the funding for such a position given the fact that (i.) DBCP specific needs are now reflected in the terms of reference for the position, (ii.) 75% of the position is already funded via an SOT agreed contribution, and income generated by JCOMMOPS services, and that (iii.) the CLS CEO accepted to run a pilot experiment with the setting up of a limited duration contract in 2012 dedicated to this activity. The Panel agreed to support the 2012 pilot experiment at the level of *[exact USD amount to be decided by the Panel]*.

11.2.17 Mr Belbéoch presented the proposed JCOMMOPS budget for 2011 and 2012. The Panel encouraged the SOT and OceanSITES to increase and sustain their contributions in order for these programmes to be properly supported. The TC mentioned that after ten years of fixed yearly budget for software/hardware needs it will now be needed to slightly augment it in order to align with current related costs. As budgeted at the DBCP-26, and at SOT-VI, the punctual increment for GIS licences (30k$) is being addressed to the DBCP/SOT trust fund. Mr Belbéoch finally thanked CLS for the faultless support to the center development, including in a context of arrival of new telecommunication systems on the global arrays.

11.2.18 The Panel finally noted the optimism of JCOMMOPS in serving the JCOMM/GOOS component, with a team close to be complete, successful experiments, and foundations of the infrastructure strengthened, a decade of enhanced integrated services is in sight.

11.2.19 The Panel finally thanked Mr Belbéoch for his report and pro-active actions to further develop JCOMMOPS, including in transitional period, and promote positive synergies between the different components of the global ocean observing system. The panel also thanked him for welcoming and supporting the arrival of a new DBCP technical coordinator, and whished the JCOMMOPS team a fruitful cooperation. Ms Kelly Stroker, the newly appointed DBCP Technical Coordinator, thanked the panel for giving her this opportunity to work with the DBCP and OceanSITES. She is excited to be in the position and thanks everyone for their time and understanding as she comes up to speed on tasks related to the post. She realizes that there has been a long gap in support from the TC and is optimistic for a fairly quick transition.

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Appendices: 5

APPENDIX A

JCOMM MEETINGS BETWEEN SEPTEMBER 2010 AND JULY 2011

The following JCOMM-related meetings or meetings where JCOMM has been represented have taken place during the last DBCP intersessional period:

(i) ***Twenty-sixth Session of the Data Buoy Cooperation Panel, Oban, United Kingdom, 27-30 September 2010***. Major outcome of this Session include the following:

- A technical and scientific workshop was organized during the first day of the session with 23 presentations.
- The Panel acknowledged Ms Hester Viola's decision not to continue with UNESCO as of July 2010. The Panel endorsed the recruitment process, under UNESCO, for a new Technical Coordinator and noted that there would be a few months gap after October 2010.
- The Panel reviewed the JCOMM OPA high priority activities, discussed their implications for the Panel, and made relevant decisions in this regard. DBCP Implementation Strategy was updated.
- The Panel agreed to organize and convene a second Capacity Building workshop for the Western Indian Ocean region (in Mauritius, in Spring 2011).
- The Panel concurred with the proposal to establish a "Joint DBCP/GHRSST Pilot Project to Upgrade Elements of the Global Drifting Buoy Fleet to Allow the Reporting of Higher Resolution SST and Position".
- DBCP Technical Document entitled "Guide to Data Quality Control Tests to Perform by a GTS Processing Center" has been finalized. A new document entitled "Draft document of Sea Surface Salinity Quality Control processes for potential use on Data Buoy observations" has been submitted to the Panel for comments.
- The Panel reviewed the status of buoy data timeliness, noted improvements in the Central Pacific and the Indian Ocean, but encouraged CLS to consider how it could improve the situation in the southern Atlantic or Western Pacific.
- The Panel agreed to finalize a report on data buoy vandalism for submission to the upcoming WMO Congress in 2011.
- The Panel concurred with the legacy recommendations from the JCOMM Pilot Project for WIGOS, in particular regarding the establishment of an international forum of satellite data telecommunication users within International Organizations such as WMO, IOC and FAO.
- The Panel recalled the importance of collecting instrument/platform metadata for marine climatology purposes, as well as JCOMM-III recommendations regarding the management of rigs and platforms metadata; and discussions resulting from the third Session of the JCOMM Expert Team on Marine Climatology (ETMC). The Panel proposed that the DBCP eventually takes over full responsibility for all types of Rigs and Platforms taking meteorological and/or oceanographic measurements, and for all related aspects, and to submit that proposal to the forthcoming JCOMM Management Committee meeting (Paris, France, 16-19 November 2010).

(ii) ***Third session of the JCOMM Expert Team on Maritime Safety Services (ETMSS), Saint Petersburg, Russian Federation, 4-8 October 2010.*** Major outcome of this Session include the following:

- The meeting reviewed the expected results of the WMO, as given at JCOMM-III, for SFSPA and included them in its workplan.
- The meeting reviewed reports from the IMO, the IHO, and Inmarsat on overall activities and actions in relation with the safety at sea and marine services.
- The meeting agreed to incorporate the QM principles into the regulatory documents on Met-ocean Services, including into the WMO-No.558 and coordinate the support to NHMS for implementation of MSI Issuing Services.

- Significant progress has been made on the planned implementation of the Global Maritime Distress and Safety system (GMDSS) for Arctic Ocean by all three Issuing Services (Canada, Russia, and Norway), covering the five new Arctic Ocean METAREAs. The 1 July 2010 date for extended testing of GMDSS broadcasts has been met. The 1 June 2011 target implementation date is on track to be met.
- An ongoing challenge in coordination among issuing services for consistency of meteorological and ice maritime safety information (MSI) across common boundaries between METAREAs and preparation services will remain. Continuing collaboration and coordination will be required, and the JCOMM Expert Team on Maritime Safety Services (ETMSS) will continue to play an important coordination role.
- The assessment on the usefulness and impacts of the provision of MSI services is a complex and multi-faceted process. The JCOMM Services and Forecasting Systems Programme Area (SFSPA) is undertaking a survey of mariners on the quality and impacts of marine weather and sea ice safety information. It is a joint efforts by WMO, International Maritime Orgamization (IMO) and International Hydrographic Organization (IHO), and will be carried out through IMO and the WMO Port Meteorological Officers (PMOs). The result of the survey, planned for 2011, will be presented to JCOMM-IV in 2012.
- The Team noted the absence of several parameters in the Rolling Review of Requirements (RRR) Database at WMO which are critical to the issue of MSI and agreed to review and revise as necessary, the stated requirements and provide comments to the focal point and Secretariat by the end of October 2010.

(iii) ***Third meeting of the JCOMM Expert Team for Operational Ocean Forecast Systems, Tokyo, Japan, 7-9 October 2010***. Major outcomes of this meeting include the following:

- Development of a work plan for "The guide to operational ocean forecast systems" with a primary focus in terms of audience on the operators, and secondarily on expert users, as a resource for new operators of ocean forecast systems.
- Development of input for the WMO Rolling Review of Requirements on the observational requirements for operational ocean forecast systems, in cooperation with the GODAE OceanView Observing System Evaluation task team.
- Agreement on a direction to develop operational performance metrics for ocean forecast systems, on a volunteer basis, with a central server hosting products. This could form the basis of a future ability to develop consensus ocean forecast products based on multiple model outputs.
- Sharing amongst ocean forecast systems of their best practices in developing ocean services and in identifying user requirements.

(iv) ***Third Meeting of the Joint Steering Group for the IODE Ocean Data Portal and the WIGOS Pilot Project for JCOMM, Ostend, Belgium, 1-3 November 2010***. Major outcome of this meeting include the following:

- The meetings reviewed the status of the WIGOS and of the JCOMM Pilot Project for WIGOS itself, and addressed outstanding issues, including (i) interoperability of ocean data systems with the IODE Ocean Data Portal and/or the WMO Information System (WIS), (ii) instrument practices and the review of WMO and IOC Technical Publications, (iii) quality management, and (iv) Capacity Building.
- Considering the successful achievements of the Pilot Project, and realization of the test of concept for the integration of marine meteorological and other appropriate oceanographic observations into WIGOS, the meeting agreed that the Pilot Project should now come to an end by the end of this year. Practical achievements of the Pilot Project include the following:
    1. Establishment of a network of Regional Marine Instrument Centres in USA, China, and Morocco;
    2. Review of marine chapters of key WMO Publications;

3. Enhanced links with the Association of Hydro-Meteorological Equipment Industry (HMEI) and the manufacturers of ocean instruments;
4. Connection of key ocean data sets to the IODE Ocean Data Portal;
5. Interoperability between the ODP and the WMO Information System (WIS);
6. Establishment of a standards process for ocean data management and submission of several standards through that process;
7. Organization of several training courses on instruments and data management.

- A Project Report was drafted and reviewed by the joint Steering Group. The report which was published in January 2011 includes information on the achievements of the Pilot Project, test of concept, pending issues, lessons learned, benefits and impacts on Members/Member States regarding the integration of marine meteorological and other appropriate oceanographic observations into WIGOS, as well as Pilot Project legacy recommendations.

(v) ***Eighth session of the JCOMM Management Committee, Paris, France, 16-19 November 2010.*** The Management Committee reviewed progress since JCOMM-III, and defined a clear pathway for the next 12 months to achieve these results. Some of the highlights include:

- Continuing efforts within Observations Programme Area (OPA) to implement the initial ocean observing system specified by Global Climate Observing System (GCOS) and endorsed by the OceanObs09, including development of a strategy to better express and document trends and regional gaps in the observing system, as well as the impacts of these on Members/Member States, in order to better address any issues to funding agencies;
- Implementation of the five new Arctic Metareas;
- Increased emphasis on facilitating coastal storm surge and inundation forecasting capabilities in response to increased risks associated with global climate change;
- Development of new metrics to better evaluate the long-term trend in marine service quality within the JCOMM mandate, to facilitate continuing improvements;
- Establishment of a new cross-cutting Team on Satellite Data Requirements, to incorporate the existing Programme Area satellite rapporteurs;
- Establishment of a process for adopting a WMO/IOC Regional Marine Instrument Centre, following approval of the concept by JCOMM-III; two such centres have already been approved, in China and the USA;
- Development of a procedure for regular web reporting of the Commission's capacity building activities, to better publicise the breadth and depth of its achievements in this vital area;
- Ongoing work towards the adoption within JCOMM of a quality management approach to the delivery of marine weather and ocean services;
- Agreement to cosponsor, with Commission for Agricultural Meteorology (CAgM), a workshop on climate and oceanic fisheries, focused on Pacific Island Countries.

(vi) ***Fourth International workshop of Port Meteorological Officers, and support to global ocean observations using ship logistics, Orlando, USA, 8-10 December 2010***. Major aims for the workshop were to convey important recent developments (e.g. regarding WMO publication No. 47, enhanced PMO communications), promoting global standards of service for the VOS Scheme, as well as building synergies between the different ocean observing system components relying on ship logistics (e.g. deployment of drifters and Argo floats, serving of moorings, etc). 67 participants from 24 countries attended the workshop, assisted by a panel of 17 trainers. The workshop has been very active and productive resulting in good understanding of international requirements from the participants. The workshop made 17 PMO related recommendations, 1 advisory to PMOs, and 13 recommendations in terms of ship support to global ocean observation. The list of recommendations from the workshop is provided in Appendix F.

(vii) ***Sixth Session of the JCOMM Ship Observations Team (SOT), Hobart, Australia, 11-15 April 2011***. A technical and scientific workshop focusing on new initiatives and / or new developments in shipboard meteorological or oceanographic instrumentation, observing practices, data management procedures, and quality control and ocean products was organized during the first day of the meeting. Highlights of the SOT Session include:

- The Team reviewed requirements for ship-based observations in support of WMO and IOC applications, including GCOS, and the WMO Rolling Review of Requirements.
- The meeting reviewed the collaboration with associated programmes (IOCCP, SAMOS, FeeryBox, GO-SHIP, OceanScope WG133, GHRSST).
- Issues of common interest were discussed, including logistical aspects, and the sharing of the data.
- The SOT Task Teams reported on their activities and made a number of recommendations to the Team.
- The VOS Panel reviewed the status of Voluntary Observing Fleet.
- The Panel reviewed and agreed with the recommendations from the Fourth International PMO workshop (Dec. 2010), including in particular the VOS Donation Programme (VOS-DP) and the “Buddy” PMO programme. The Team proposed action for promoting those two programmes.
- Key Performance Indicators (KPI) were proposed for the VOS and VOSClim.
- The Ship of Opportunity Programme Implementation Panel session focused on the technical coordination of the XBT, transect network and the growing Thermosalinograph (TSG) network.
- The Panel made a number of recommendations on resolving XBT errors and biases, improving real-time data transmission and quality control procedures, coordinating with other groups working towards improved commercial ship observations of the ocean.

(viii) ***Fourth Session of the JCOMM Observations Coordination Group (OCG), Hobart, Australia, 18-20 April 2011***. OCG recognized its role in coordinating observing networks within the post-OO'09 Framework for Ocean Observations. Highlights of the Session include:

- OCG stressed the role of the observing networks in engaging in a dialogue with the requirements-setting process, providing information on feasibility.
- OCG asked relevant teams to continue providing feedback to GHRSST on feasibility and cost of improved SST measurements from their platforms (SOT: radiometers on ships, underway SST; Argo, DBCP, OceanSITES: temperature profiles in upper 2 m).
- The Group agreed to take some action to improve linked understanding of satellite and in situ observing needs, coordination needs.
- It recognized a clear role for itself in advancing the feedback loop on requirements by feeding back information on cost and feasibility, and in engaging in pilot projects exploring feasibility/cost and impact where sponsorship can be identified.
- OCG chair and the secretariat will be working with each observing network to clarify their overall system goal metric(s) and any metrics of network efficiency, intensity of yearly effort, data timeliness and quality that should be reported for high-level systems view.
- OCG recommended continued effort on sensor development for Argo, surface drifters, moorings (focus on ocean carbon system).
- The Group recommended to maintain communication on DBCP tender process for telecommunications with the rest of the interested teams in OCG.
- The Group endorsed the legacy recommendations of the JCOMM Pilot Project for WIGOS and invited OPA Panels and Associated Programme to address them as appropriate. OPA Panels and associated programmes were invited to compile and document their instrument practices and make recommendations whether they should

be promoted through specific guides, JCOMM TRs, or WMO & IOC Publications.

- On the "ship" coordinator proposal from JCOMMOPS the OCG was generally supportive of the idea as a pilot, but encouraged further refinement in the terms of reference with the panels, to increase possibility for success. OCG members emphasized that the coordinator has first priority to serve the individual networks, before working on cross-platform actions, but that they believed integration would bring benefits. OCG encouraged all panels to consider working through JCOMMOPS for technical coordination.

(ix) ***Second DBCP Africa/Western Indian Ocean Capacity Building Workshop, Mauritius, 2-7 May 2011***. There was a variety of presentations under both modeling and observations, ranging from the technical and logistical to the scientific. Most of the attending countries gave presentations on the buoy/marine observations network activities in their countries. Highlights of the workshop include:

- The workshop recognized the growing partnerships within the WIO region in terms of Ocean-Atmosphere observations and the importance of effective coordination and sharing of resources to achieve the mutual aims and objectives in terms of data collection, analysis and its application for management and governance.
- The workshop recognized the importance of collecting ocean and weather observations in data sparse areas such as the coast of Somalia where piracy precludes the security of research cruises and the placement of moorings, and currents preclude the placement of drifters. It recommended that appropriate glider technology be used in a pilot project to see if real-time weather observations can be collected within this data sparse area.
- The workshop recognized the importance of links between remote sensing and in-situ observations, for long term monitoring, and modelling purposes. The UNDP/GEF ASCLME Project and the Mauritius Oceanography Institute (MOI) will pursue a collaborative agreement building on ASCLME activities in the WIO, AMESD and the proposed AMESD follow-on projects.
- The workshop recognized the importance of collecting ocean and weather observations in data sparse areas such as the Indian Ocean as well as the fact that members indicating willingness to become part of the International Buoys Deployment community. The workshop recommended that drifting weather buoys be supplied to African countries as a pilot project and results be provided during the next Capacity Building Workshop.

(x) ***Second JCOMM Marine Instrumentation Workshop for the Asia Pacific Region, Tianjin, China, 11-13 July 2011***. The workshop was hosted by the newly established Regional Marine Instrument Centre (RMIC) for the Asia Pacific Region, operated by the National Centre of Ocean Standards and Metrology (NCOSM) of China. The workshop participants received background information regarding the establishment of WMO-IOC Regional Marine Instrument Centres (RMICs). A visit of the NCOSM facilities was organized. The participants acknowledged the importance of standards and quality management when making ocean observations, and received comprehensive information on instrument standards, instrument calibration and inter-comparisons (for waves observations), real-time and delayed-mode data exchange, Quality Management Systems, and Quality Control best practices for realizing the integration of ocean observations in GOOS and WIGOS frameworks, and achieving the WMO and IOC Applications requirements. The workshop issued series of recommendations detailed in Annex V of the workshop's report.

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APPENDIX B

TERMS OF REFERENCE FOR AN EXPANDED JOINT WMO/IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM) *IN SITU* OBSERVATIONS PROGRAMME SUPPORT CENTRE (JCOMMOPS)

(Annex to Recommendation 2 (JCOMM-III))

Under the overall guidance of the JCOMM Observations Coordination Group and following the direction of the Data Buoy Cooperation Panel, the Ship Observations Team, the Argo Steering Team, the OceanSITES Science Team, the Global Sea Level Observing System Group of Experts, the International Ocean Carbon Coordination Project and the Commission for Basic Systems Expert Team on Satellite Utilization and Products, and under the supervision of the WMO and UNESCO/IOC Secretariats, and executing the workplan provided by the Observations Coordination Group and relevant panels, and associated programmes, the JCOMM *In Situ* Observing Platform Support Centre (JCOMMOPS) shall promote an integrated framework for deployment and further development of ocean observing networks.

Specifically, JCOMMOPS shall:

(a) Act as a focal point for implementation and coordination of observing programmes by clarifying and assisting in resolving technical issues between platform operators, data centres, manufacturers and satellite data telecommunication providers;
(b) Assist in demonstrating the scientific value of global ocean observing programmes in support of WMO and UNESCO/IOC Programmes and co-sponsored Programmes by compiling materials and assisting ocean observation science teams as appropriate;
(c) Maintain information on relevant observational requirements in support of the Global Ocean Observing System, the Global Climate Observing System and the World Weather Watch as provided by the appropriate international scientific panels, JCOMM experts participating in the Commission for Basic Systems Expert Team on Satellite Utilization and Products, and other JCOMM expert teams and groups;
(d) Routinely collect and distribute information on: (i) the performance of the observing system networks relative to requirements, in cooperation with the Observing System Monitoring Centre; (ii) instrumentation and telecommunication systems; and (iii) functional status and data quality of individual observing platforms;
(e) Act as a focal point for instrument and data management standardization by collecting and distributing information on current and best practices from across all elements of the observing system and by representing the observing system interest in international standardization processes;
(f) Facilitate free and unrestricted data and metadata exchange in real time, by providing appropriate technical assistance to platform operators, and serving as a collection and distribution point for select platform/instrument metadata and as a source of information on other metadata and data distribution services;
(g) Facilitate the flow of data and metadata to the archiving centres;
(h) Provide a gateway for information on observing platform deployment plans and servicing opportunities, and on operator contact information, to maximize deployment opportunities and sharing of resources;
(i) Encourage cooperation between communities, observing programmes and Members/Member States to develop synergies between and to promote the observing systems.

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APPENDIX C

"SHIP LOGISTICS COORDINATOR" PROPOSAL

1. Introduction

1.1 Ships are the common denominator of all observing systems. They are used as deployment and maintenance platforms for floats, drifters, moorings, XBTs, and also provide observations via on-board instrumentation or punctual deployments.

1.2 There is an ongoing need to optimize the use of existing resources (in particular below 40°S) and identify new opportunities to address regional gaps. While finding opportunities is an endless effort for operations managers, it is impossible to operate global arrays without a strong cooperative effort.

1.3 When some ships go off line without warning and key opportunities disappear, when manufacturing or shipping issues accumulate instruments in storage rooms, when it is needed to send a technical expert worldwide to clear an issue or transfer technology, operations managers would appreciate some help.

1.4 In a global economical context under pressure, where ship time funding is substantial for some countries, the use of low cost, green, flexible, dedicated platform for deployments or retrieval when needed will be more and more required.

1.5 The key issue is that there is no international central node to gather cruise plans enough in advance, even though there are many national resources. A strict minimum of 2 months is required to organize properly the deployment of instruments, making the timeliness of information crucial.

1.6 Following up on a couple of years of discussion amongst the GOOS/JCOMM community, JCOMMOPS is elaborating the terms of reference for a new technical coordinator position, that would be the international focal point on ship logistics, assisting global or regional programmes, in an integrated way, in their operations, managing metadata required, developing services to share the information, and assisting where appropriate the teams in place.

2. Operations

2.1 JCOMMOPS, according to its Terms of Reference, wishes to assist further the initiatives and scientists in charge of the maintenance of these arrays. Can we help oceanographers, when needed, to answer that trivial question: *"How can I deploy my instruments to fill the gap identified or anticipated?"*

2.2 JCOMMOPS has been providing information on deployment opportunities on an *ad-hoc* basis, without any strong commitment and means. It has also an experience in retrieving beached instruments all over the world with some specific monitoring, warning tools and procedures. JCOMMOPS has an experience in providing a technical assistance (e.g. on deployment methods) to new countries in the GOOS and developing countries.

2.3 JCOMMOPS has also started to operate and charter a ship and its crew for assisting national programmes in deploying their instruments, and in particular in areas where there are no regular opportunities, within a JCOMM integrated perspective. The *Lady Amber* (a 20m sailing ship) has deployed about 60 floats for the CSIRO via three cruises in the Indian ocean (Track the ship on line here). Such activity – experimented in 2011 – is a success going beyond expectations. It shows (see budget section) a net benefit of about 43k$ so far. Such benefit is to be reinvested fully on a non lucrative basis in the coordination activity itself via the establishment of a dedicated resource. It is to be noted that in a context of on-going pressure on national budgets, the

development of alternative and cheap deployment resources is desirable and welcome.

2.4 In addition, the need for the retrieval of instruments (becoming more and more expensive with additional sensors, and more interactive with the satellites downlinks) is also growing and greener platforms such as sailing ships, will be ideal to retrieve instruments for low cost and minimal environmental footprint.

2.5 Specific research initiatives, or pilot projects, or vandalism or piracy issues might need some more targeted and flexible arrangements.

2.6 The ship chartering activity would deserve to be continued and expanded so that JCOMMOPS continue to assist were needed and develop its operational expertise. This will requires proactively seeking new partners and in particular including private and non-profit based charters, NGOs, tourist cruises, sailing races, sailing schools, humanitarian supply ships, etc. The possibilities here are almost unlimited …

2.7 The experience has shown as well the enormous outreach potential of those multi-disciplinary activities that might bring the JCOMM/GOOS network at another level of visibility.

3. Metadata and information services

3.1 There is a lack of information (data and metadata) about research vessels and ship of opportunity cruises, and about planned cruises in particular. Information exists at national or regional level, but it needs to be aggregated in a way it can be used efficiently by the community, and coupled to the existing information systems that focus on the global arrays implementation.

3.2 JCOMMOPS provides already some limited coordination for the Ship Observation Team (SOOP and VOS) and believes this program deserves some more support. The monitoring tools and support services for those ~3-5000 ships need to be developed further.

3.3 There is also a pressing need for the identification of future research cruises, and CTD data essential to quality control, in cooperation with POGO and CCHDO initiatives.

3.4 Maintaining this information within the JCOMMOPS information system makes sense and GIS based tools in place will be appropriate to update and communicate the information.

4. Communication and cooperation

4.1 Assembling and distributing the information within the community requires on-going efforts of communication and can't be done properly and sustainably without any focus spirit. Some international issues will have to be addressed; for example, for security reasons, some information made available to the public will probably have to be degraded, and clarifications given to some Member States. As for any technical coordinator activity it will require time before a focal point is known, appreciated by the community, so that critical information can be gathered in a timely manner and reliable contact points identified.

4.2 In line with the IOC and WMO capacity building initiatives and regional activities (e.g. GOOS regional alliances, WMO Regional Marine Instrumentation Centres, PANGEA concept), JCOMMOPS wishes to develop further the concept of "Donor programmes" and foster the participation of new Member States in the GOOS/JCOMM networks implementation. Such initiatives are very time demanding for important, but rather modest results. A dedicated resource ready to help, organize those activities, with some technical expertise to transfer would be more

than welcome.

4.3 Exploiting fully a new deployment opportunity needs time, renewed human contacts and experiences so that one can expect a routine and reliable use. In particular, a close cooperation with SOT Port Meteorological Officers is anticipated as they are routinely recruiting ships for VOS observations primarily but also to help Argo/DBCP.

5. Examples

5.1 If some programmes do not need much assistance (e.g. feedback from E-SURFMAR where many opportunities are available in the North Atlantic), some other would appreciate some support as they have larger volumes to deal with in areas that are more problematic. More ambitious worldwide capacity building progammes may also require similar support.

5.2 As an example the Coriolis deployment unit, which is also supporting other European entities (gradually developing) from the float ordering, testing, and shipping, to the deployment, has reached a critical mass where the unique deployment manager would really need support. Major Argo players (deploying more than 100 units per year) will also need this assistance and information source.

5.3 Large programmes like the Global Drifter Program could benefit from assistance in many areas such as; implementing South Indian/Pacific or Gulf of Nigeria deployments, developing cooperation with Africa, solving punctual technical issues that can occur, checking a batch of drifters stuck in a remote place where contacts are difficult, etc).

5.4 The DBCP Task Team in Capacity Building is also developing its regional activities, and such focal point would be a great source of help for the organization and running of the workshops.

6. Conclusion

6.1 To summarize, such focal point will focus:

- **Operations and Logistics** (recruit ships, charters for deployment or retrieval or pilot projects, to assist programmes where needed and create new logistics to fill gaps or address piracy/vandalism issues; assist in recovering instruments at sea or found by third parties)

- **Technical support and expertise** (on platforms, self training with time at sea, deployment methods, technology transfer, etc)

- **Metadata and information** (gather, integrate and maintain all ship metadata useful for those operations with JCOMMOPS I.S., develop appropriate tools and service, seeking, identifying deployment opportunities for the deployment of instruments from ships)

- **Communication** (serve this information to the community regularly, document and communicate on activities, develop relational network)

- **International cooperation** (partnerships, clearing house, training workshops, donor programmes, assist as appropriate with national, regional, international initiatives, ...)

6.2 The establishment of such position would proactively encourage the integration of the GOOS/JCOMM components, at the implementation level, encourage the free and unrestricted

exchange of data gathered via cruises, and assemble a rigorous status of this backbone element of the GOOS, developing day to day links with national focal points, and assist initiatives and data centres that are designated to serve this information to the community.

6.3 With more than 20 years of experience in international and technical coordination on main ocean observing systems, JCOMMOPS (since 2001) and its predecessor embryo centre (since 1986 through DBCP & SOOP technical coordinators) believes that there are enough needs and funding for a full time position, working on a day to day basis with the other coordinators. Recalling the JCOMM III meeting report, inviting JCOMMOPS to *"(…) make available a more integrated framework for the deployment and further development of ocean observing networks (…)" ,* we believe that this cruise information centre is the next development step for JCOMMOPS in support of the global ocean observing system community.

7. Location

7.1 Such position would be ideally established close to the programmes operations centres, and close to a large port. Ifremer or CLS offices in Brest seems ideal opportunities for the position. Regular connections with the Toulouse office will be required anyway.

8. Budget

8.1 Required resources to initiate a ship coordinator's position are estimated as following:

- 80k$ are required to start a limited duration contract with CLS.
- 100k$ are required for a P2 position within UNESCO.
- 10-20k$ are required for the mission budget.

8.2 JCOMMOPS has started to assemble a 60k$ budget targeting a full time position as follow via JCOMMOPS Chartering (45k$, mainly Argo source) and 15k$ via SOT (agreed to participate at 6th session).

8.3 The position is already assured to be self-funded at a level of 50%. This could be regarded as the minimum for a viable position. **The DBCP executive board is invited to support the position so that JCOMMOPS can close a budget and start a pilot experiment in 2012.**

8.4 Some other sources of funding – to be confirmed – are in sight to sustain the activity. **The "Strategy Paper" being prepared by JCOMMOPS will detail the different options to sustain the position.**

8.5 A contract through CLS would have the advantage to be flexible and quickly established. A disadvantage would be to imply specific rules or bureaucratic routes according to the candidates nationalities (no problem for European Union). JCOMMOPS believes this position has to be stable enough and with a clear international contract and mandate. An international call for a UNESCO position would also be more attractive but longer to set up. In any case, JCOMMOPS wishes to call internationally for this position.

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APPENDIX D

JCOMMOPS OPERATIONS BUDGET PROPOSAL FOR 2011 AND 2012

2011	**Expenses**	**Incomes**				
In k$	**2011**	**DBCP**	**ARGO**	**SOT**	**OCEANSITES**	**JCOMMOPS**
Logistic *	-30	15	15			
I.T. software/hardware	-10	5	5			
One-off increment for GIS	-30	15		15		
I.T. full time resource	-30				30	
JCOMMOPS Chartering Services						45
TOTAL	**-103**	**35**	**20**	**15**	**30**	**30**
BALANCE	**45**					

2012	**Expenses**	**Incomes**				
In k$	**2012**	**DBCP**	**ARGO**	**SOT**	**OCEANSITES**	**JCOMMOPS**
Logistic *	-30	15	15			
I.T. software/hardware	-15	*7.5*	*7.5*			
I.T. full time resource *	-30				30	
Ship Logistics Coordinator	-80	*20*		15		45
JCOMMOPS Services						***?***
TOTAL	**-155**	**22.5**	**22.5**	**15**	**30**	
BALANCE						

To be confirmed by the panels executive boards

Programmes contribution into JCOMMOPS (k$ cash) regular budget					Host contribution (k$ in-kind)	Full JCOMMOPS operating budget/year in k$
	Argo	DBCP	SOT	OceanSITES		
Coordinators (2.5)	120	100			30	250
Mission	20	20	5		10	55
Infrastructure	15	15	*15*	30	120	195
Total	**155**	**135**	**20**	**30**	**160**	**500k$**
% over total budget	**31**	**33**	**4**	**6**	**32**	**100%**

Draft version of the overall JCOMMOPS budget to be developed in the "Strategy Paper"

APPENDIX E

Proposed new Terms of Reference of the Data Buoy Co-operation Panel
(track-changes version based on approved by WMO Resolution 4(EC-LXII) and UNESCO/IOC Resolution XVII-6)

Part A

The Data Buoy Co-operation Panel shall:

Consider the expressed needs of the international meteorological and oceanographic communities for real-time or archival data from ocean-data buoys on the high seas, as well as rigs and platforms reporting surface marine meteorological and oceanographic data and request action from its members, the Technical Co-ordinator or Action Groups to meet these needs;

1. Co-ordinate activity on existing programmes so as to optimize the provision and timely receipt of good quality data and metadata from them;

2. Propose, organize and implement, through the co-ordination of national contributions, the expansion of existing programmes or the creation of new ones to supply such data;

3. Support and organize as appropriate such Action Groups as may be necessary to implement the deployment of data gathering buoys to meet the expressed needs of oceanographic and meteorological programmes such as WWW, WCRP, GOOS, ~~and~~ GCOS, GFCS, WIS, and WIGOS;

4. Encourage the initiation of national contributions to data buoy programmes from countries which do not make them;

5. Promote data exchange, including the insertion of all available and ~~appropriate buoy~~relevant platform data and metadata into the Global Telecommunication System, and the submission of data and metadata to the appropriate archives;

6. Promote the exchange of information on data buoy activities and encourage the development and transfer of appropriate technology;

7. Ensure that other bodies actively involved in buoy use are informed of the workings of the Panel and encourage, as appropriate, their participation in the Panel deliberations;

8. Make and regularly review arrangements to secure the services of a Technical Co-ordinator with the terms of reference given in Part B;

9. Report formally to the Joint WMO / IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), and participate in and contribute to an integrated global operational ocean observing system, implemented and co-ordinated through JCOMM; and

10. Submit annually to the Executive Councils of the WMO and the IOC, to JCOMM and to other appropriate bodies of WMO and IOC, a report that shall include summaries of the existing and planned buoy deployments and data flow.

Part B

Terms of Reference for the Technical Co-ordinator of the DBCP (Approved by WMO Resolution 4 (WMO EC-LXII) and UNESCO/IOC Resolution XVII-6)

The Technical Co-ordinator of the Data Buoy Co-operation Panel shall:

1. Under the direction of the Data Buoy Co-operation Panel take all possible steps within the competence of the Panel to assist in the successful achievement of its aims;

2. Assist in the development, implementation, and management of quality control procedures for relevant observing platforms~~data buoy systems~~;

3. Assist in setting up suitable arrangements for notifying the appropriate user communities of changes in the functional status of relevant operational observing platforms~~buoys~~;

4. Assist in the standardization of relevant observing platform~~buoy data~~ formats, sensor accuracy, etc.;

5. Assist when requested with the development of cooperative arrangements for buoy deployment;

6. Assist in the clarification and resolution of issues between Service Argos and relevant observing platforms~~buoy~~ operators;

7. Assist in promoting the insertion of all available and ~~appropriate~~ relevant observing platform~~buoy~~ data into the Global Telecommunications System;

8. Supply information about buoy developments and applications to the WMO and IOC Secretariats and assist the Data Buoy Co-operation Panel to promote an international dialogue between oceanographers and meteorologists;

9. Coordinate and monitor the flow of relevant observing platform~~buoy~~ data into appropriate permanent archives.
