DATA BUOY COOPERATION PANEL
Thirtieth Session

Weihai, China
27 – 31 October 2014

JCOMM Meeting Report No. 119

World Meteorological Organization
Weather • Climate • Water

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

NOTES

WMO Regulation 42

Recommendations of working groups shall have no status within the Organization until they have been approved by the responsible constituent body. In the case of joint working groups the recommendations must be concurred with by the presidents of the constituent bodies concerned before being submitted to the designated constituent body.

WMO Regulation 43

In the case of a recommendation made by a working group between sessions of the responsible constituent body, either in a session of a working group or by correspondence, the president of the body may, as an exceptional measure, approve the recommendation on behalf of the constituent body when the matter is, in his opinion, urgent, and does not appear to imply new obligations for Members. He may then submit this recommendation for adoption by the Executive Council or to the President of the Organization for action in accordance with Regulation 9(5).

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WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

DATA BUOY CO-OPERATION PANEL

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FINAL REPORT

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C O N T E N T S

Note: The following complementary information will be provided in the DBCP Annual Report for 2014

- Full report by the Technical Coordinator;
- Reports by the Task Teams;
- National reports;
- Full reports by the Action Groups;
- Data Management Centre reports;
- GTS status report;
- DBCP Implementation Strategy;
- Other financial and administrative papers;
- DBCP Technical Document list, including available electronic versions.

(Group picture)

EXECUTIVE SUMMARY

The thirtieth session of the Data Buoy Co-operation Panel (DBCP-30) was held in the conference room of the Nishi Haitai Hotel in Weihai, China, from 27 to 31 October 2014, at the kind invitation of the State Oceanic Administration (SOA) and its National Centre for Ocean Standards and Metrology (NCOSM).

During the technical and scientific workshop organized during the first day of the session, 11 presentations were delivered on data buoy operational and scientific applications, technology, instrumentation, buoy programme implementation, including data monitoring and quality. Approximately 77 participants from 15 countries attended the meetings. The Panel concurred with the three recommendations made by the workshop and adopted them.

The Chairperson, vice-Chairpersons and the DBCP Technical Coordinator (TC), reported on their respective activities on behalf of the Panel during the last intersessional periods. Mr Wallace, who is retiring, thanked all panel members for their support, and was confident that the Panel will continue to work together to deliver its vital work. The Panel was pleased with the completion of the recruitment of the new Technical Coordinator resulting from the departure of Ms Kelly Stroker from that position. The Panel and the Secretariat thanked Ms Stroker for her effective and pro-active quality work on behalf of the Panel since she was recruited as TC-DBCP. Ms Stroker in return thanked the Panel for their strong support during this period. The new Technical Coordinator, Ms Champika Gallage (Canada) briefly introduced herself, and the Panel warmly welcomed her.

The Panel noted the recommendation from the vice-Chairman of the International Oceanographic Commission (IOC) of UNESCO[1] Group 5 (Africa & Middle East) to enhance DBCP Capacity Building activities in the Eastern Atlantic Ocean region.

The Panel discussed the operational status of the data buoy network. During the intersessional period we saw a 22% increase in the number of active drifting buoys in the array, compared with a decrease in 2012-2013, with the current number of operational drifters on the Global Telecommunication System (GTS) for August 2014 at 1532. The number of barometer buoys continues to hold at around 50%. For the moored buoys, the number dropped through the year but has been steadily rising since April 2014. The Tropical Atmosphere Ocean (TAO) array, in particular, has had a number of maintenance cruises during the year and has increased operations to above 80%, up from 50% at this time last year.

Reports were provided by the DBCP Task Teams, the Action Groups and the Pilot Projects, and decisions were taken according to their recommendations. In particular, Panel members were encouraged to make use of the barometer drifter upgrade scheme in order to achieve the higher possible coverage of the drifter array with Sea Level Atmospheric Pressure (SLP) measurements (currently at 50%, target 100%). Excellent progress was noted with regard to the migration to Table Driven Codes (TDCs), and good progress with regard to the establishment of a moored buoy metadata collection scheme. Efforts will have to be made for the DBCP to review several World Meteorological Organization (WMO) Publications (e.g. CIMO[2] & GOS[3] Guide, WIGOS[4] Manual). The Panel welcomed the Tropical Pacific Observing System (TPOS) 2020 project initiative, and the development of new observing strategies within the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) Observations Coordination Group (OCG), and recommended to consider the connection between DBCP activities and TPOS 2020 actions, and to provide advice to OCG, as appropriate, on potential issues and/or opportunities arising from the (draft) TPOS 2020 activities.

1 UN Educational, Scientific and Cultural Organization
2 WMO Commission for Instruments and Methods of Observation
3 WMO Global Observing System
4 WMO Integrated Global Observing System

The Panel noted the continuing success of the DBCP In-Region Capacity Building workshops held in 2010-2014 and considered future support for continued activities in this regard, including (i) a fourth in-Region North Pacific Ocean and Marginal Seas Capacity Building Workshop" (NPOMS-4), (ii) exploring with the IOC Sub-Commission for Africa and the Adjacent Island States for a possible future session of a DBCP Western Indian Ocean (WIO) Capacity Building Workshop to focus on developing the contributions of WIO region to the 50th Anniversary of the International Indian Ocean Expedition (IIOE-2[5]), (iii) exploring the possibility of supporting, through the DBCP Task Team on Capacity Building (TT-CB), in 2015 the organization of the "First Pacific Islands Workshop on Ocean Observations and Data Applications" (PI-1) and (iv) exploring the possibility of supporting a future "Second In-Region Capacity Building Workshop for Asian (Asia-2) Countries".

The Panel noted the good progress with regard to the workplan of the Pilot Project on the Impact of Sea Level Pressure measurements from drifters on Numerical Weather Prediction (NWP) (PP-SLP). A contract between WMO and ECMWF [6] to run an Observing System Experiment (OSE) was signed in February 2014, and the study started in May 2014. Some preliminary results were presented to the Panel, which showed positive impact of drifter SLP data on NWP. The Panel requested the PP-SLP to finalize the results of the Pilot Project, and to publish them through peer review.

Regarding the joint DBCP-ETWCH[7] Pilot Project on Wave measurement Evaluation and Test from moored buoys (PP-WET), some progress was reported, and exciting plans are already underway for the coming year with deployments off Canada and the UK, and a "buoy farm" including a 6m NOMAD hull instrumented with all historical Canadian and US sensors and processing systems off Monterey. The Panel encouraged its member countries to participate in the inter-comparison activities that were led by this pilot project. The Panel agreed that this pilot project was still progressing well, and decided to retain the project in its current form for another year, with no additional financial support.

Regarding the DBCP/GHRSST[8] Pilot Project for High Resolution SST (PP-HRSST), the Panel noted that (i) early analyses had shown that HRSST drifters exhibited a warm bias of approx. 0.2C which was not shown in the non-HRSST population; (ii) the number of reports reaching GHRSST databases had fallen compared to 2012; and (ii) analyses had been hampered following the failure of ENVISAT mid-way through 2012 and the retirement of key GHRSST members. However, noting that PP-HRSST had now reached the end of its projected lifetime, and the absence of any concrete conclusions as to the usefulness of in situ HRSST, the Panel regretfully decided to suspend any future PP-HRSST activities pending further responses, guidance and support from the satellite community.

While recognizing that vandalism on data buoys continues to be a significant global menace to ocean observation systems, the Panel noted with appreciation some positive developments with regard to measures allowing to better preventing vandalism on data buoys.

The Panel encouraged all buoy operators to provide a website of plans and deployment information for drifting and moored buoys similar to AOML[9], NDBC[10], and Canada as well as continuing e-mail notifications as necessary.

The Panel received updates on the Argos and Iridium satellite data telecommunication systems. The Panel noted with appreciation the recent developments through the WMO

5 http://unesdoc.unesco.org/images/0022/002282/228247e.pdf
6 European Centre for Medium Range Weather Forecast
7 JCOMM Expert Team on Waves and Coastal Hazards Forecasting Systems
8 Group for High Resolution SST
9 NOAA Atlantic Oceanographic and Meteorological Laboratory
10 NOAA National Data Buoy Centre

Commission for Basic Systems (CBS) with regard to the establishment of the International forum of users of satellite data telecommunication systems.

The Panel took note of the development of the JCOMM *in situ* Observations Programmes Support Centre (JCOMMOPS) and promoted a number of actions for JCOMMOPS to improve its services to the Panel. The Panel welcomed the anticipated regrouping of the full JCOMMOPS staff in Brest/Ifremer in November 2014. The Panel recognized that the pilot–project of establishing a Ship Coordinator, Martin Kramp, during two years has shown great success and provided special support for DBCP members deployment needs. It thanked Mr Kramp for his work. The JCOMMOPS management and budget was discussed. A meeting with JCOMMOPS governance should be organized to evaluate the performance, study the budget, and draw priorities for the Centre.

The Panel was briefed on activities of the JCOMM, which impact the DBCP. JCOMM Observations Coordination Group 10-point forward look that had been presented to the eleventh Session of the JCOMM Management Committee was discussed by the Panel, and the outcomes of the meeting that translated into actions and recommendations for the DBCP. The JCOMM Co-President, Mr Johan Stander (South Africa) reported on the activities and developments of JCOMM during the last DBCP intersessional period and provided his guidance. He introduced the finalized Strategy for JCOMM 2012-2017, which is in line with WMO Strategic Plan and IOC Medium-Term Strategy, as well as JCOMM-4 guidance and decisions. The Panel noted that the issue of metrics remained of prime concern to JCOMM and awaited further guidance on this matter.

The Panel discussed the results of the Forty Seventh Session of the IOC Executive Council (Paris, France, 1-4 July 2014), and of the WMO Sixty-Sixth Session of the Executive Council (Geneva, Switzerland, 18-27 June 2014) that have been held during the intersessional period, with highlight on the relevant decisions and issues to the Panel. The outcome of the 2014 Extraordinary Session of the WMO Commission for Basic Systems (CBS Ext. (2014), Asuncion, Paraguay, 8 - 12 September 2014) was also discussed, and the Panel noted with appreciation that the CBS had adopted Recommendation 3.1(1)/3 (CBS-Ext.(2014)) – Support of Members to the implementation of the marine meteorological and oceanographic observing system in support of NWP. The recent developments of the WMO Integrated Global Observing System (WIGOS) Framework Implementation were also discussed, and its implications with regard to the work of the Panel.

The Panel discussed DBCP Trust Fund contributions, future commitments and budget related matters. The Panel noted with satisfaction the positive and secure cash balance of DBCP funds (WMO+IOC) as of 31 July 2014. The Panel agreed on its budget for the next year with the clear understanding that any budgetary figures attributed should be regarded as upper limits. In view of the increasing DBCP activities especially Capacity Building and the expenses due to securing the position of the Technical Coordinator, the Panel invited its members not currently contributing to the Trust Fund to discuss nationally whether a contribution could be made in the future. It also took the opportunity to invite contributing members to consider increasing their contributions.

Written updates of the DBCP Implementation Strategy and Operating Principles as prepared by the Chair in liaison with the Secretariat were presented to the Panel. The Panel was invited to review these documents, and provide feedback to the Chair no later than 30 November 2014.

The Panel agreed that its next Session should take place in Geneva, Switzerland, from 26 to 30 October 2015.

The Panel elected Mr Jon Turton (United Kingdom) as its Chairperson, Shannon McArthur (USA) as Vice-chairperson for North America, and re-elected Dr R Venkatesan (India) as the Vice-

chairperson for Asia, and Mr Graeme Ball (Australia) as Vice-chairperson for the Southern Hemisphere. The Panel warmly thanked Mr Wallace for his past contributions as the previous Panel Chairperson in the last few years. The Panel thanked again the Government of China, and SOA for hosting the meeting.

GENERAL SUMMARY OF THE WORK OF THE DBCP-30 SESSION

1. OPENING AND WELCOME OF THE DBCP SESSION

1.1. The Chairperson of the Panel, Mr Al Wallace (Canada), opened the Thirtieth session of the Data Buoy Co-operation Panel (DBCP) and its associated Scientific and Technical Workshop at 08:30 hours on Monday, 27 October 2014, at the conference room of the Nishi Haitai Hotel in Weihei, China.

1.2. On behalf of the Panel, Mr Wallace welcomed all participants to the session and to the workshop, and expressed his appreciation for the commitment of the Panel Members. He then conveyed his sincere appreciation to the Chinese Government, the State Oceanic Administration (SOA), and the National Centre of Ocean Standards and Metrology (NCOSM), for preparing, hosting and organizing the Session, and to the Weihai Government, and the Shandong Academy of Science Institute of Oceanographic Instrumentation (SDIOI) for co-hosting the Session.

1.3. Opening addresses were given by the following officials: Ms Dongmei Tang, Representative of the International Cooperation Department of SOA, Mr Mingqiu Bian, Secretary General, NCOSM, Mr Wei Zhang, Deputy Director of Wendeng District of Weihai Municipal Government, Mr Johan Stander, Co-President of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), Mr Etienne Charpentier, world Meteorological Organization (WMO) Secretariat, and Mr Thomas Gross, Intergovernmental Oceanographic Commission (IOC) of UNESCO Secretariat. During the opening addresses, the following points were mentioned:

- UNESCO and IOC attaches great importance to the development of the ocean observing systems. The DBCP has long been a lynchpin and best example of this effort. Through the dedication to improvement of the buoy systems the DBCP has advanced and sustained this part of the Global Ocean Observing System (GOOS) for decades.
- International speakers hoped that the participants will enjoy the exceptional hospitality of our hosts from the NCOSM and will have a great DBCP Session.
- While useful to realize socio-economic benefits, Metocean applications such as weather forecasting and operational meteorology, the monitoring, understanding and prediction of seasonal-to-interannual climate variability and climate change, marine services activities such as marine forecasting, the protection and sustainable development of the ocean and marine environment, and the efficient management of marine resources rely heavily on *in situ* and satellite meteorological and oceanographic observations.
- Through the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), the Members of WMO and Member States of IOC are contributing to providing the *in situ* ocean observations required by the WMO and IOC applications in complement of satellite data. JCOMM also provides an international coordination mechanism for addressing the required standardization, harmonization, and optimization of ocean observation implementation and operations serving the needs of WMO and IOC applications such as Numerical Weather Prediction, Marine Services, Climate Monitoring, and Climate Services.
- The Global Framework for Climate Services (GFCS) is being implemented to ensure that nations are able to develop and apply science-based climate information and prediction to planning, policy and adaptation practices. The GFCS is increasing the demand for high quality, documented, and traceable observations of known uncertainty, not only for current observations of newly deployed instruments but also for historical data. This

includes of course in particular marine meteorological and oceanographic observations.

- With the implementation of the WMO Integrated Global Observing System (WIGOS) Framework, the WMO is working with partner organizations and making efforts to establish an integrated, comprehensive and coordinated observing system that satisfies in a cost-effective and sustained manner the evolving observing requirements of WMO Members for many Application Areas, including for example climate services. WIGOS is seeking the harmonization of instrument practices and related standards, and interoperability between data systems.
- The Data Buoy Cooperation Panel plays a crucial role within JCOMM for providing the buoy observation component of the WIGOS implementation effort, including surface drifters, tropical moorings, and coastal meteorological and oceanographic buoys. The Panel provides an international coordination mechanism for addressing the required standardization, harmonization, and optimization of data buoy observation implementation and operations.
- While not well known to most of Panel members from the America or Europe, Weihai has had a long and pivotal role in China's maritime history and is therefore an appropriate place for our 30th DBCP session. It appears that the Wendeng region, which has a strong commitment to sustainable development, is attempting to build a comfortable living city while respecting the natural environment and valuing the land and ocean. It is hoped that Panel Session participants will all have a chance to see parts of the region and will appreciate what has been built here.

1.4. The WMO and IOC Secretariat representatives concluded by assuring the continued commitment of WMO and IOC to support and strengthen the work of DBCP through the Observations Programme Area (OPA) of JCOMM.

1.5. The local organizer for the session outlined various local arrangements. The session agreed its hours of work and other logistic arrangements. The Secretariat introduced the session documentation.

1.6. Mr Wallace then introduced the co-chairs for the Scientific and Technical Workshop, Mr Johan Stander (South Africa) and Mr Yong Yao (China), to lead that session.

2. SCIENTIFIC AND TECHNICAL WORKSHOP

2.1. Under this agenda item, the Panel briefly reviewed the results of the preceding scientific and technical workshop. The workshop had opened at 10:00 on Monday, 27 October 2014 in the conference room of the Nishi Haitai Hotel in Weihai, China, and ended on the same day at 17:00 hours.

2.2. The theme of the Workshop covered “Buoy Science, Technology, and Instrumentation”, and included presentations covering the following areas: (i) marine meteorological and oceanographic instrumentation, calibration, and traceability; (ii) technical development; (iii) operational enhancements; (iv) marine forecast and disaster risk reduction (DRR); and (v) research applications.

2.3. Eleven presentations were delivered to approximately 77 participants from 15 countries. These includes the following topics:

(1) Response of upper ocean currents to Typhoon Fanapi (by Verena Hormann / presenter, Luca Centurioni, Luc Rainville, Craig M. Lee, and Lancelot Braasch);

(2) An Update from AXYS Technologies Inc. on Key In-House Developments (by Mark Blaseckie);

(3) Omni Buoys close monitoring the Phailin Cyclone and the launch of new Indian Omni Buoy System (presentation provided in wring by R.Venkatesan,G Latha, Arul Muthiah, and Simi Mathew);

(4) Lagrangian Model Used to Simulate Oil Spills in the Caribbean Sea, Gulf of Mexico, and Florida Straits (by Shaun Dolk);

(5) Mooring data buoys of SDIOI, China (by Min Li)

(6) The Argos Chipset: Less Power=Longer Buoy Lifetimes (by Bill Woodward / presenter, Michel Guigue, and Yann Bernard);

(7) Global observations of persistent looping drifter trajectories (by Rick Lumpkin);

(8) Sea Surface Salinity observations from drifters during SPURS[11] (by Luca Centurioni / presenter, Verena Hormann, and Y. Chao);

(9) SIO Drogue Investigation (by Lance Curtiss / presenter, Lancelot Braasch, and Luca Centurioni);

(10) 2014 Drifter Developments at SIO (by Lancelot Braasch, Luca Centurioni); and

(11) How we calibrate the Wave Height and Period Measurements from the Gravitational Acceleration Wave Buoys in the Regional Marine Instrument Centre for the Asia Pacific region (RMIC/AP[12]) (by Jianqing Yu).

2.4. Presentations stimulated discussions. The Panel concurred with the following recommendations proposed by the workshop, and adopted them:

(1) As buoy data are valuable to WMO and IOC applications, and particularly to those applications requiring real-time observations such as Numerical Weather Prediction (NWP), typhoon and storm surge forecasting, the buoy data should be shared and distributed in real-time onto the Global Telecommunication System (GTS) of the WMO. The Panel requested data buoy operators who are not currently sharing the data to take steps to realize GTS distribution of their buoy data, noting that the Technical Coordinator of the DBCP can offer practical assistance if required.

(2) While noting substantial improvements with regard to drifter reliability and life-time, the Panel encourages SIO [13] and AOML [14] to continue working on drifter technology developments in order to improve reliability, life-time, and cost-effectiveness of the drifters; and share the results of their investigations to the community;

(3) Members/Member States are encouraged to use the calibration facilities of the RMIC/AP[12].

2.5. The Panel expressed its appreciation to all presenters for their contributions to the workshop, and the workshop co-chairpersons, Mr Stander, and Mr Yao for their excellent work in organizing and chairing the workshop. As in previous years, all presentations will be published in a DBCP Technical Document series, and will also be available on the DBCP website. All authors were invited to submit their papers via e-mail to the Workshop Chairperson, via electronic format (MS Office compatible format only), by 30 November 2014 (***action; S&T workshop authors; 30 November 2014***).

2.6. The Panel noted with appreciation that Mr Stander would continue to act as the Workshop Co-chairperson for 2015. The Panel also welcomed the offer Kai Herklotz (Germany) to act as Co-chairperson for the Workshop and assist with its organization from a regional perspective (***action; J. Stander & K. Herklotz; DBCP-31***).

11 Salinity Processes in the Upper *Ocean* Regional Study
12 WMO-IOC Regional Marine Instrument Centre (RMIC) for the Asia Pacific Region
13 Scripps Institution of Oceanography (University of California
14 NOAA Atlantic Oceanographic and Meteorological Laboratory (USA)

3. OPENING OF THE DBCP BUSINESS SESSION

3.0. Opening addresses for the main DBCP Session

Vice-Chairman of IOC Group 5

3.0.1. Prof. Adote Blim Blivi (Togo), the vice-Chairman of IOC Group 5 (Africa & Middle East) shortly addressed the meeting. While very appreciative of the activities of the Panel, he noted that only very few participants were coming from the IOC Group 5 region, and invited JCOMM to be more pro-active to support such participation. He also noted that there is no Capacity Development activity of the DBCP in the Eastern Atlantic Ocean, and suggested that such activity should be developed. He noted that the African Union Commission Head of States Summit on Maritime Security and Economic Development would be a good place for a DBCP representative to approach heads of state about buoy programme implementation for safety. He also invited DBCP Executive Board and Task Team Chairs to participate in the development of the IOC Capacity Development Strategy, which Mr Blivi is leading.

3.0.2. While the needs for operational oceanography products and services is high in the region, and although there are human resources and skilled scientists and experts in the IOC Group 5 region, there is a lack of observing equipment to support metocean research and operational applications in Africa, especially for coastal applications. Prof. Blivi therefore invited the Panel to consider providing (e.g. used) instruments to African countries, and support to the establishment of a Technical school on data buoys and Master and PhD classes on Marine science, in the framework of the concreted actions for Capacity Development of the YEOSU PROJECT called by the Yeosu declaration 2012, International Expo on Ocean. Group V scientists and experts are enthusiastic to participate in the development of new partnerships under JCOMM in order to fill the gap between developing and developed countries.

JCOMM OCG co-Chair

3.0.3. The JCOMM Observations Coordination Group (OCG) co-Chair, Dr David Legler (USA) shortly addressed the Panel on behalf of the Group. He reported that he was very pleased to attend the DBCP-30 meeting. Dr Legler is leading a team, which manages NOAA's contribution to the Global Ocean Observing System through programs such as Argo, OceanSITEs, the Global Drifter Programme (GDP), and several others. Many of these are the subject of discussions this week.

3.0.4. While he is happily serving as OCG co-Chair with Prof. David Meldrum (UK), he recalled that his role in the JCOMM Observations Programme Area (OPA) was the responsibility of Ms Candyce Clark (USA) held until she retired from NOAA. Candyce is enjoying her retirement and sends her warmest regards to the DBCP family.

3.0.5. The DBCP serves a vital role in insuring that observing data are available in real-time, discoverable, and thus catalysing a range of services. It is a vital component of the OPA and helps serve NOAA's mission and the mission of JCOMM and its parent organizations.

3.0.6. Dr Legler explained that David Meldrum and he are beginning to consider the future of OPA. The mission of OPA continues to be extremely relevant. Observing systems need constant attention, evaluation, and coordination. New requirements for observing in new areas such as the polar seas, coastal regions, and in biogeochemistry and biology present new challenges. At the same time new observing technologies such as gliders, undersea cables, and others provide new opportunities to observe more areas and observe

more effectively. Both David Meldrum and David Legler welcome the Panel members' thoughts on strategic directions the OPA should consider.

3.0.7. Lastly, Dr Legler wished to thank Al Wallace for his leadership over the past 5 years ensuring that DBCP advanced our observing enterprise.

3.1. Adoption of the agenda

3.1.1. Following the Workshop on 27 October 2014, and side meetings of the DBCP Task Teams, Pilot Projects, and some of the Action Groups on 28 October, the Thirtieth Session of the Data Buoy Co-operation Panel (DBCP) was opened by the Panel Chairperson, Mr Al Wallace, at 0930 on Wednesday 29 October 2014, in the conference room of the Nishi Haitai Hotel in Weihai, China. The Chairperson welcomed participants to the session and once more thanked SOA and NCOSM for hosting it and providing excellent facilities.

3.1.2. The Panel adopted its agenda, as reproduced in ***Annex I***.

3.2. Working arrangements

3.2.1. The Panel decided on its working hours and other arrangements for conducting the session, noting that meetings of the Task Teams, Pilot Project steering groups, and some of the Action Groups were organized on the second day of the Session (28 October 2014). The Joint Secretariat then introduced the documentation in accordance with the provisional agenda.

3.2.2. The list of participants to the session is reproduced in ***Annex II***.

4. REPORTS BY THE CHAIRPERSON, VICE CHAIRPERSONS, AND THE EXECUTIVE BOARD

4.1. Report by the Chairperson of the DBCP, and the Executive Board

4.1.1. The DBCP Chairperson, Mr Al Wallace, reported on the activities and work of the Panel during the last intersessional period. The Chairperson noted that the panel continued to deliver on its mission and objectives dealing with challenges and making progress. The Chairperson recognized the work of the Panel in working cooperatively to continue operation of this vital component for monitoring the global oceans.

4.1.2. The Executive Board of the DBCP is distributed widely around the world (India, Australia, Europe and North America), but with the help of the WMO and IOC Secretariat, and the Panel's Technical Coordinator, communications, information and decisions are made efficiently and effectively. The Chairperson expressed his appreciation for the strong support provided by the team.

4.1.3. The Chairperson recalled that the objective for the drifting buoy array is 1250 platforms distributed globally with one buoy in each 5 degree by 5 degree grid. There is a complementary objective to increase the number of buoys reporting barometric pressure from the current 50% to having this element reported by the full network. There are a number of challenges associated with these goals. It has proven difficult to maintain the number of drifting buoys in the global array at the target of 1250, but thanks to the efforts of members, notably the GDP, this target was surpassed in the past year. More problematic is meeting the goal of have the operating buoys geographically distributed. Gaps in the array continue to exist in a number of oceans. Drifting buoy lifetimes have decreased in recent years, falling short of the required 450 days. Progress is being made on improving

the timeliness of observations being distributed on the GTS. It is expected that improvements in telecommunications technologies will provide further enhancements. The Chairperson noted that Panel members are addressing these issues on an on-going basis, and continue to populate the global array with new deployments of drifting buoys.

4.1.4. The priority activity for the Secretariat and Executive Board during the intersessional period was the recruitment of a new Technical Coordinator. The Chairperson thanked Ms Kelly Stroker for her excellent work over the past year in continuing to meet the needs of Panel and its members. The success of her efforts is even more remarkable given her relocation from France to the United States. The selection board for the position included both the WMO and IOC Secretariats, the Chairperson of OceanSITESs[15], a representative from JCOMMOPS, the JCOMM OCG Chairperson, and the Chairperson of DBCP. The committee has reviewed a large international pool of candidates who applied for the post. Using an evaluation of the written submissions, the selection committee developed a short list of candidates to interview. For the first time, interviews were conducted remotely using video technology and the internet. This approach reduced costs significantly, and permitted the selection board to complete the interview process efficiently. It is recommended that a similar approach be used for future recruiting processes.

4.1.5. The Chairperson recognized the dedicated efforts of the action groups, the task teams and the pilot project teams. The dedication, enthusiasm and perseverance of these panel members promote and sustain the work of the Panel and contribute significantly to our overall success. The action groups address regional issues, and seek solutions to deployment and other challenges such as vandalism. The task teams are creative, innovative and solution oriented. It is through their efforts that problems with the networks and observing systems (e.g. buoy lifetimes, drogue loss) will be resolved and sustainable procedures and practices implemented. The pilot projects will take the Panel in new directions and ensure its relevance through working in areas such as high resolution SST, wave measurement from drifting buoys, and impacts of buoy SLP observations on NWP. The Chairperson recognized the achievements of the Capacity Building Task Team in delivering two workshops for the Western Indian Ocean (WIO), and North Pacific and Marginal Seas (NPOMS) regions respectively. He thanked the host countries (South Africa, and Japan), and their meteorological/oceanographic institutions for their assistance in the successfully hosting these vital and necessary workshops. There have now been five WIO and three NPOMS workshops, and the Task Team (TT) for Capacity Building is now evaluating options for meeting future needs. There are a number of other capacity building initiatives underway in Africa, and the DBCP will look for synergies to optimize our participation.

4.1.6. Mr Wallace explained that this meeting concludes his term as Chairperson of the DBCP, and coincidentally as a full member of the Panel. He further reported that he has thoroughly enjoyed his 5 years as Chairperson, and more than a decade as a contributing member. The camaraderie, collaboration and cooperation of all of the member countries and contributing associated countries contributed to the success of our efforts. The DBCP continues to demonstrate international leadership on meeting its objectives for observing the state of the global oceans. Mr Wallace is confident that the Panel will continue to work together to deliver this vital work. He thanked all Panel members for their support and is looking forward to seeing them again in the future.

4.2. Reports by the vice-Chairpersons of the DBCP

4.2.1. Report by the vice-Chairperson for Europe

15 OCEAN Sustained Interdisciplinary Timeseries Environment observation System

4.2.1.1. The DBCP vice-Chairperson for Europe, Mr Jon Turton (UK) reported on his activities during the last inter-sessional period. At the European level, most buoy-related activities are carried out through the Operational Service (E-SURFMAR) of the Network of European Meteorological Services (EUMETNET) Data Buoy Expert Team, of which he is the Chairperson.

4.2.1.2. For drifting buoys, regular activities are largely confined to E-SURFMAR, Météo-France and the (UK) Met Office with only occasional other deployments.

4.2.1.3. For moored buoys, in addition to UK, France and Germany, systems are also operated by Ireland (Marine Institute/Met Eireann), Spain (Puertos del Estado), Italy (ISPRA[16]), Greece (HCMR[17]) and Germany (BSH[18]). Portugal also operates a number of moored buoys and efforts, through E-SURFMAR, are being made to engage them with view to getting the data onto GTS. Norway (MET Norway[19]) is also making efforts to obtain and distribute data from moored buoys operated by offshore oil and gas operators.

4.2.1.4. On a related matter, Euro-Argo has now been formally established as an ERIC (European Research Infrastructure Consortium) by the European Commission, with its central component based at Ifremer in France. At its first Council meeting in July, Jon Turton was elected as its Vice-Chairperson, further strengthening the linkages between the European data buoy and float communities.

4.2.2. Report by the vice-Chairperson for Asia

4.2.2.1. The DBCP vice-Chairperson for Asia, Dr R. Venkatesan (India), reported on his activities during the last inter-sessional period, in particular with regard to the drifter programme pursued in this region by India.

4.2.2.2. He reported that moored buoy networks are being maintained by Japan (JAMSTEC[20]), India (NIOT[21]), USA (NOAA[22] PMEL[23]) (for the RAMA[24] array), and China (SOA[25]) for their National Ocean Buoy Observation Network.

4.2.2.3. China had reported that until August 2014, a total of twenty-two 10m-discus buoys, ten small offshore buoys, one tsunami buoy, five drifting buoys, and 108 Argo floats were in operation, observing marine environmental parameters of oceanography, marine meteorology, biology, and chemistry. The China Meteorological Administration (CMA) is currently operationally running a total twenty-five offshore moored buoys. In 2015, SOA will initiate a plan using special funds to support coastal provinces to improve their forecasting ability. In the next 2-3 years, fifteen to twenty large buoys will be deployed along the Chinese coastal provinces to further enhance the ability of coastal observations. In addition, the vandalism on data buoys remains a severe problem.

4.2.2.4. The Panel acknowledged the importance of tsunami monitoring a decade after the 2004 tsunami in South Asia, and noted that the technological advancement and preparedness level in this region have improved. The Tsunami buoy monitoring

16 Institute for Environmental Protection and Research (Italy)
17 Hellenic Centre for Marine Research (Greece)
18 Bundesamt für Seeschifffahrt und Hydrographie (Germany Federal Maritime and Hydrographic Agency)
19 Norwegian Meteorological Institute
20 Japan Agency for Marine-Earth Science and Technology
21 Indian National Institute of Ocean Technology
22 National Oceanic and Atmospheric Administration
23 Pacific Marine Environmental Laboratory
24 Research Moored Array for African-Asian-Australia Monsoon Analysis and Prediction
25 China State Oceanic Administration

network is being maintained by India, China, Thailand, Malaysia and Japan. Most of these countries are making data available through the National Data Buoy Center (NDBC) of NOAA.

4.2.2.5. The Panel also recalled its Capacity Building activities of interest to the Asia Pacific region undertaken during the last intersessional period. This included the Second Capacity Building Workshop of the WMO/IOC Data Buoy Cooperation Panel (DBCP) for the North Pacific Ocean and Its Marginal Seas (NPOMS-2), which was held during 22-24 October 2013, in Hangzhou, China, and the third NPOMS workshop (NPOMS-3), which was held in Kyoto, Japan, from 6 to 8 October 2014. China reported participation of 15 JCOMM / WMO / IOC related meetings by SOA from October 2013 to August 2014. India participated in two international meetings.

4.2.2.6. India reported that collaboration in the region is growing and getting importance. The on-going Indo US collaboration with NOAA PMEL under RAMA network is progressing well. A new initiative ASIRI[26]/OMM[27] programme to study the Monsoon in Bay of Bengal has participation of more than 15 Institutions from India and USA. Under this project Research vessels SagarNidhi (India) and Roger Revelle (USA) are being involved for joint studies. A land mark Letter of Agreement (LoA) is signed between India and Japan in the field of Ocean observation and had a mention during the visit of Indian Prime Minister to Japan.

4.2.2.7. The vice-Chairperson for Asia concluded by reporting on a very productive and interactive year in Asia. Observational activities together with expertise in this region have improved in recent years due to increased interaction and collaboration.

4.2.3. Report by the vice-Chairperson for the Southern Hemisphere

4.2.3.1. The DBCP vice-Chairperson for the Southern Hemisphere, Mr Graeme Ball (Australia), reported on his activities during the last inter-sessional period. These included activities as the Chairperson of the International Buoy Programme for the Indian Ocean (IBPIO, reported under item 7.4). Other activities were mainly conducted through the Executive Board in providing guidance to actions and issues arising at and since DBCP-29.

4.2.3.2. Mr Ball noted that DBCP-30 might be the last DBCP session that he attends, and the next inter-sessional period will be his last with DBCP involvement as he plans to retire late in 2015. In the event that Mr Ball does not attend DBCP-31, he thanked his DBCP colleagues, some of whom he had known since DBCP-6 (Melbourne, 1990) for their friendship, help and guidance.

5. REPORT BY THE TECHNICAL COORDINATOR

5.1. During the period 1 September 2011 to 31 August 2012, Ms Stroker worked as Technical Coordinator (TC) of the Data Buoy Cooperation Panel (DBCP). Ms Stroker worked in Toulouse, France, at CLS[28], and was employed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). On average, the TC spends 70% of her time on DBCP-related matters and 30% of her time as OceanSITEs Project Office.

5.2. The former Technical Coordinator, Ms Kelly Stroker (USA) reported on her activities on behalf of the Panel during the last intersessional period. During the period 1 September 2013

26 Bay of Bengal/Air-Sea Interaction Research Initiative
27 Ocean Mixing and Monsoons
28 Collecte Localisation Satellites (France)

to 31 August 2014, Ms Kelly Stroker worked as TC of the DBCP from the USA on contract to WMO. On average, the TC spends 70% of her time on DBCP-related matters and 30% of her time as OceanSITEs Project Office.

5.3. The TC reminded the panel that on October 3, 2014 her current contract ended. Ms Champika Gallage, Environment Canada, replaced Ms Stroker in her TC-DBCP duties and joined the JCOMMOPS team in Brest during October 2014.

5.4. During the previous year, Ms Stroker's time as TC was spent on the following:

- Travelling to meet with various DBCP Members, Action Groups, and Teams;
- Producing monthly maps and GTS timeliness reports;
- User assistance as needed;
- Assisting Panel members with technical and programmatic issues;
- Maintaining metadata in the JCOMMOPS database;
- Updating and maintaining DBCP and OceanSITEs websites;
- Maintaining mailing lists, contact details and user groups on DBCP, JCOMMOPS, and OceanSITEs website;
- Monitoring the Quality-Control Relay traffic;
- Tracking all buoy deployments, and mooring maintenance/installations;
- Preparing for and attending meetings;
- Preparing meeting reports and documents; and
- Developing instructional documents for the new TC-DBCP.

5.5. The TC outlined the current status of the data buoy network. During the past 12 months, the average number of drifting buoys reporting onto the GTS was 1340 per month and 406 moored buoys (Figure 1). During the intersessional period we saw a 22% **increase** in the number of active drifting buoys in the array, compared with a decrease in 2012-2013, with the current number of operational drifters on the GTS for August, 2014 at 1532 (Figure 2). The number of barometer buoys continues to hold at around 50%. For the moored buoys, the number dropped through the year but has been steadily rising since April 2014. The TAO array, in particular, has had a number of maintenance cruises during the year and has increased operations to above 80%, up from 30% at this time last year.

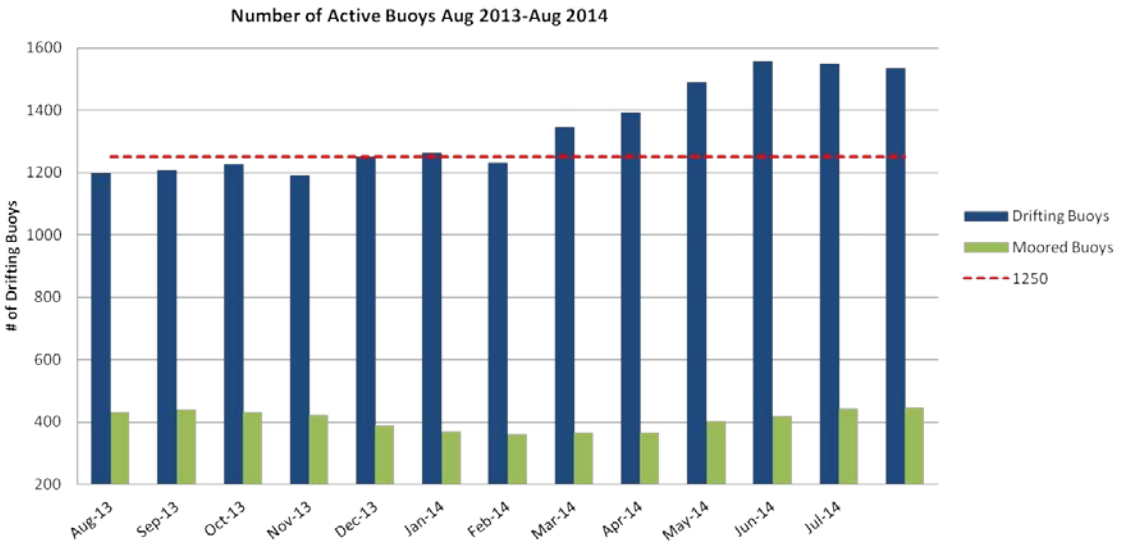

Figure 1: Number of operational drifting and moored buoys during the last intersessional period showing the increase in drifting buoys.

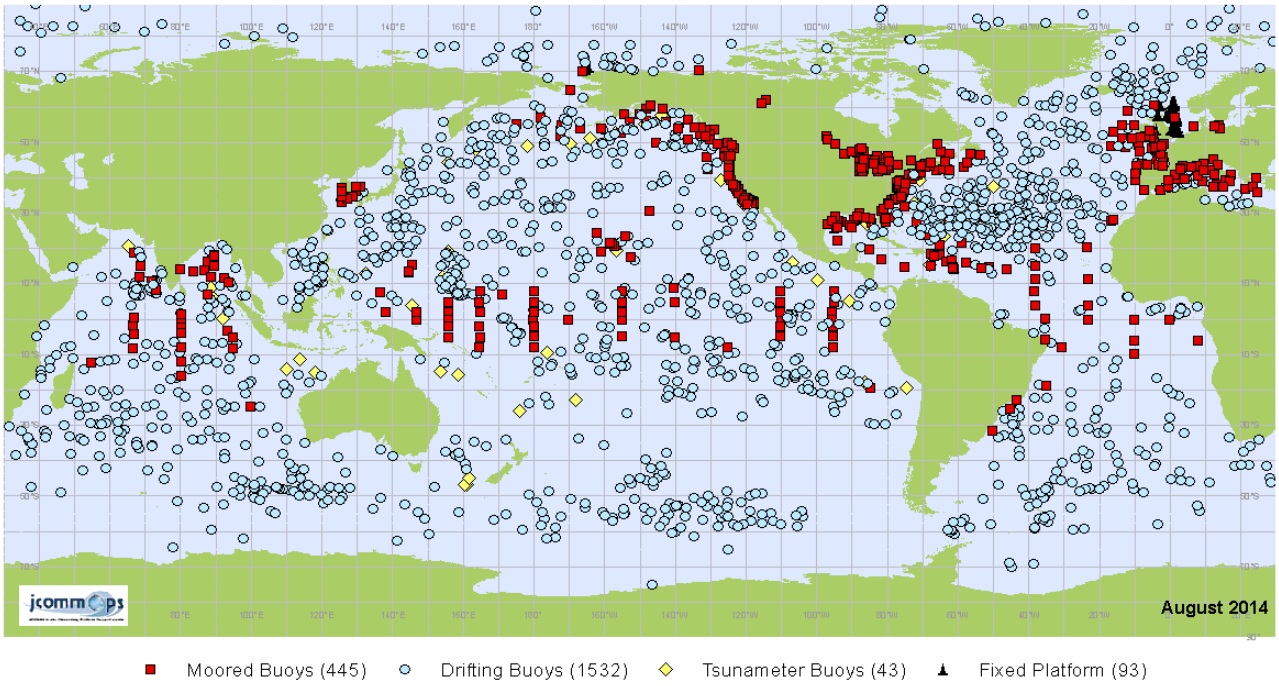

Figure 2: Status of the operational array in August 2014

5.6. The Technical Coordinator reported that among the drifting and moored buoys reporting on the GTS in BUOY[29] (or BUFR[30]) format, the following variables were measured in Aug 2014.

Variable	Any	Air P	P Tend	SST	Air T	Hum	Wind	Waves	Sub/T	SSS	Sub/Sal	Sub/Cur
Drifting Buoys	1540	771	617	1428	30	3	1	59	51	0	51	0

29 FM 18 BUOY GTS format: Report of a buoy observation
30 FM 94 BUFR GTS format: Binary Universal Form for Representation of meteorological data

Moorings	544	354	264	368	425	230	382	373	76	0	74	10

5.7. The TC reported that she created a few new monthly maps this intersessional period. Per a recommendation at DBCP-29 to include a map showing the country of deployment for drifting buoys, during the last intersessional period the TC worked closely with the Global Drifter Program (GDP) to that effect. As the GDP relies heavily on its international partnerships for the deployment of instruments, it was agreed that these should be recognized. In Jan, 2014, a new map was created to show the country of deployment (Figure 3)

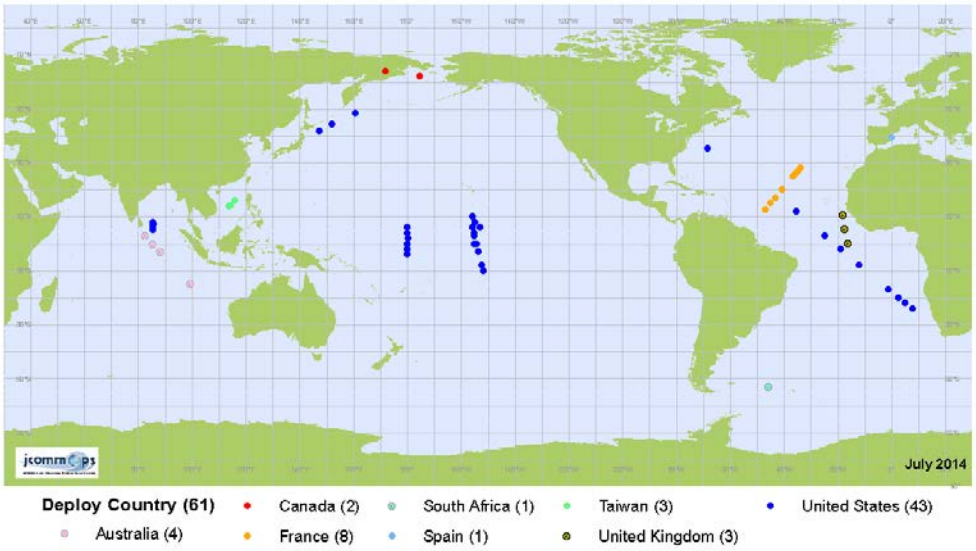

Figure 2: Map showing country of deployment during July 2014 for drifting buoys.

5.8. In addition to the new map shown above, the TC-DBCP also created two additional new monthly maps: 1) a map showing barometer upgrades and the country providing the upgrade. The data is provided by the GDP. (Figure 4), and 2) the number of drifting buoys deployed and "lost" each month (Figure 5). These can both be found on the normal maps page in the DBCP site and it is recommended that these maps continue.

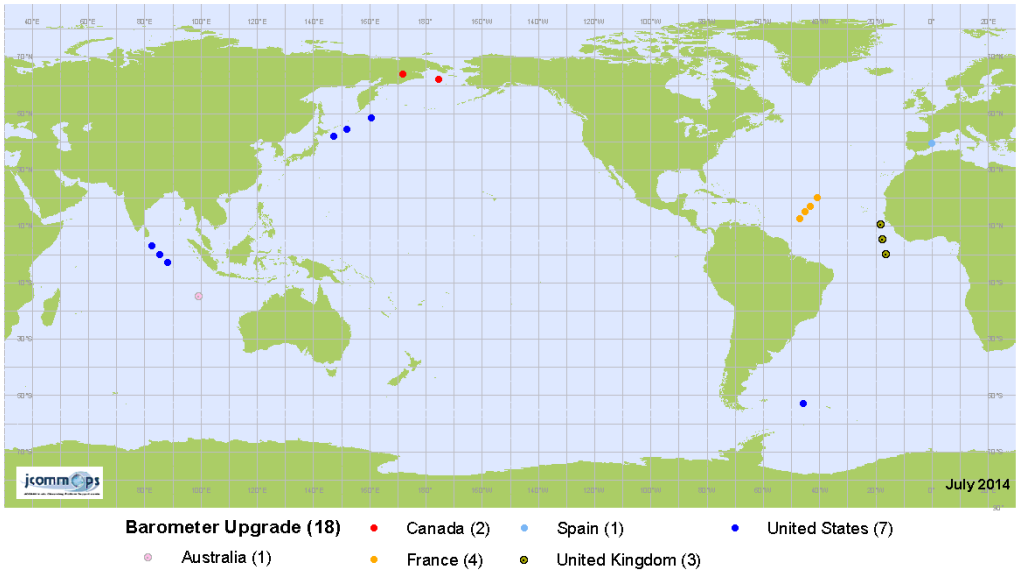

Figure 3: Barometer upgrades during July 2014.

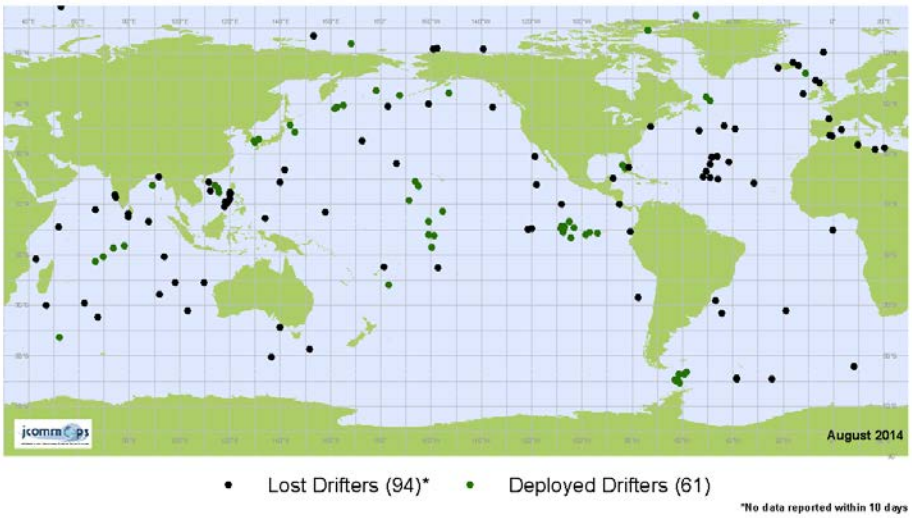

Figure 4: Number of drifters deployed and lost during August 2014.

5.9. The TC reminded the panel that Deep-Ocean Assessment and Reporting of Tsunami (DART) Buoys have been added to the JCOMMOPS database. The locations of these buoys are included on the monthly maps and in the reporting. The data for these buoys does not come through the normal GTS chains and is not collected by Météo-France or the Marine Environmental Data Section (MEDS[31]) of the Oceanography and Scientific Data branch of Fisheries and Oceans Canada. Information on the status of the tsunami buoys is received monthly from the US National Data Buoy Centre (NDBC). An automated process for receiving this information or adding the Tsunami buoys to the normal GTS chains is recommended (***action; TC, with NDBC; DBCP-31***).

5.10. The TC reported on the status of the TAO refresh buoy array and the GTS header issue that was raised during DBCP-28. The GTS headers were modified in December 2013 and in January 2014, the data flowed normally to the GTS. The TC would like to thank NDBC for making this change and informing the community. This allows for much easier monitoring of the TAO array.

5.11. The TC reported that during 2013, NDBC made the decision to reduce the resolution reporting for the TAO array as an anti-vandalism measure. The community was not informed of this change and the decision was made internally. DBCP members should be prepared to discuss any implications that this might have on data assimilation, satellite validation, and research cruises. NDBC stated that the high-resolution positions could be made available to stakeholders and members of the climate community that request this information.

5.12. The Southern Ocean Buoy Programme (SOBP), as part of the DBCP Implementation Strategy, aims to have 300 operational drifting buoys with barometers distributed across the Seas south of 40oS. As of July 2013, there were only 235 drifters in the Southern Ocean and 217 of these were barometer drifters. There were a total of 168 drifting buoys deployed in the Southern Ocean during the last year and DBCP members should continue to look for deployment opportunities in this region (***action; DBCP Members; asap***).

5.13. The TC reported again on the different numbers from the GDP and the JCOMMOPS database. At least once per year the operational drifting buoy information collected at the GDP is compared with that at JCOMMOPS. In August 2014, there were 168 drifters in the JCOMMOPS database that were not included in the GDP deployment log. The differences

31 The Marine Environmental Data Section (MEDS) of the Oceanography and Scientific Data branch of Fisheries and Oceans Canada replaces the branch previously known as Integrated Science Data Management (ISDM).

were found to be the following:

- Buoys as part of the IABP program (these should be categorized differently in the JCOMMOPS database);
- Some test iridium buoys (e.g. Norway Institute of Marine Research / IMR);
- Time frame of reporting. JCOMMOPS looks at drifting buoys active during the entire month whereas the GDP produces a snap shot of buoys for that each week; and
- Drifting buoys deployed without drogues or drogues at depths centred at other than 15-meters (e.g. JMA[32] buoys).

5.14. The Technical Coordinator reminded the panel that the migration to BUFR is scheduled to be complete at the end of Nov 2014. She provided statistics on the percentage of drifting and moored buoys currently reporting to the GTS using Table Driven Codes and mentioned that if there are questions regarding the migration to please make contact. More details on the migration to BUFR will be presented by the Task Team on Data Management in their report.

5.15. Ms Stroker reminded the panel that there is a new Technical Coordinator starting in October. Ms Champika Gallage will need some time to get caught up to speed and the TC requests the panels understanding during this time.

5.16. The outgoing Technical Coordinator, Kelly Stroker, wishes to thank the DBCP Members, Task Teams, Chairs, and Executive Board for allowing her to work in the role as TC, especially with the geographic constraints. She thanks you all for an eventful 3 years and wishes the best to all the members.

5.17. The meeting made the following recommendations:

(i.) The panel recommended for the manufacturers to provide information to JCOMMOPS on models, formats, and shipments;

(ii.) The panel recommended it's members to continue providing Iridium deployments to the Technical Coordinator in the agreed upon format;

(iii.) The Panel recommended members who are not yet transmitting moored and drifting buoy data to the GTS in BUFR format to start doing so as soon as possible following the agreed 3-15-008 and 3-15-009 templates; and

(iv.) The panel recommended that the former TC put together a detail of the TC tasks and responsibilities for the new incumbent (***action; K. Stroker; asap***).

(v.) The Panel affirmed that work to develop a system to ingest moored buoy metadata, and to make these metadata available via the JCOMMOPS web-site, was now a priority action for the Technical Coordinator and JCOMMOPS (***action; TC-DBCP; DBCP-31***).

5.18. The meeting decided on the following action items:

(i.) The TC to work with NDBC on an automated process for receiving tsunameter information. (***action; TC, NDBC; July 2015***);

(ii.) The Panel requested the Technical Coordinator to work with Iridium VARs to obtain

32 Japan Meteorological Agency

drifting and moored buoy data (***action; TC; DBCP-31***);

(iii.) DBCP members should look for deployment opportunities in the Southern Ocean (***action; DBCP Members; asap***).

5.19. The Panel and the Secretariat thanked Ms Stroker for her effective and pro-active quality work on behalf of the Panel since she was recruited as TC-DBCP. Ms Stroker in return thanked the Panel for their strong support during this period.

5.20. The new Technical Coordinator, Ms Champika Gallage briefly introduced herself, and the Panel warmly welcomed her.

5.21. The Panel encouraged its members to regularly and routinely exchange and communicate with the TC on their activities, and issues, and to submit their deployment plans and cruise information to the Ship Coordinator. The Panel also requested to TC to follow closely the development of the Global Framework for Climate Services (GFCS) and its observational data needs as the Panel is substantially contributing to such requirements (***action; TC-DBCP; ongoing***).

6. REPORTS BY THE TASK TEAMS

6.1. Task Team on Data Management (TT-DM)

6.1.1. Mrs Mayra Pazos (USA), Chairperson of the DBCP Task Team on Data Management (TT-DM) reported on the progress of the Task Team during the last intersessional period. The Task Team promoted discussion between its members revised the recommendations proposed last year to assess actions taken and proposed new recommendations.

6.1.2. The Panel noted with appreciation that good progress has been made with regard to the transition to Table Driven Codes (TDCs).

6.1.3. The meeting agreed on the following:

(i) The conversion to use 7-digits numbers instead of the 5-digit numbers must continue until all cross-reference lists are changed.

(ii) Move forward to complete, review and publish the document "An Oceanographer's Marine Meteorologist's Cookbook for submitting Data in Real Time and In Delayed Mode. Recommend that the document should be published on the JCOMM website in electronic form as a JCOMM Technical Report and requested the Technical Coordinator to coordinate with relevant JCOMM OPA Panels and Associated Programmes for completing the document and maintaining relevant sections up to date.

(iii) The trial JCOMM Global Data Assembly Centres (GDACs) for drifting buoys of Météo-France (former SOC[33]) and MEDS[31] (former RNODC/DB[34]) to continue to work towards the implementation of a routine procedure to compare GTS Bulletin Headers between the two centres (***action; Météo-France & MEDS, DBCP-31***).

(iv) Make sure all buoy manufacturers adhere to the standard and approved DBCP data formats.

33 Specialized Oceanographic Centre
34 Responsible Oceanographic Data Centre (RNODC) for Drifting Buoys

6.1.4. The Panel thanked Mrs Pazos and members of the Task Team for their efforts. It was agreed that Mrs Mayra Pazos would continue as chairperson of the Task Team for the intersessional period. The full report of the Task Team is provided in Appendix A of DBCP-30 preparatory document No. 6.1, and will be included in the DBCP annual report for 2014.

6.2. Task Team on Instrument Best Practices and Drifter Technology Development (TT-IBP)

6.2.1. Dr Luca Centurioni (USA), Chairperson of the Task Team on Instrument Best Practices & Drifter Technology Developments (TT-IBP), reported on the Task Team activities during the last inter-sessional period.

Drifter lifetime

6.2.2. The Panel recalled that the three main factors affecting the drifter lifetime were listed in the DBCP-29 Drifter Best Practices report. These were: 1) faulty battery packs 2) transition from Argos 2 to Argos 3 and more in general 3) increase in power consumption of the drifter's electronic. It was also noted that improvements of the drifter's endurance would take several months to a year to become apparent. During the DBCP-29 discussions on the drifter lifetime issue, best practices recommendations included:

1) Ruggedizing the battery pack;

2) Careful evaluation of the drifter's power budget;

3) Adopting real-time statistics for early identification of technical issues; and

4) Impact and vibration tests.

6.2.3. During the inter-sessional period, the global drifter array rebounded from 1,013 drifters as of August 1, 2013 to 1,395 drifters as of September 16, 2014. The improvement can also be appreciated from the statistics published in the Global Drifter Program Action Group Report, also reported in tables 1 and 2 below, where the "quit" category refers to drifters that did not run-aground nor were picked-up.

Manufacturer	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
DBi	*	*	*	*	25%	15%	31%
Metocean	30%	87%	37%	67%	69%	80%	54%
Pacific Gyre	53%	37%	43%	61%	51%	134%	57%
SIO	*	*	*	*	*	20%	29%

Table 1: Percentage of "quit" drifters

Manufacturer	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
DBi	*	*	*	*	364	324	>358
Metocean	402	456	445	274	221	187	>217
Pacific Gyre	262	598	336	345	236	227	>357
SIO	*	*	*	*	*	201	>303

Table 2: Half-life of "quit" drifters

6.2.4. A clear improvement in the drifter half-life can be seen in most cases. More time is needed before we can see how close we are to the target of 450 days for 2013.

6.2.5. Reasons for the improvement include: introduction of ruggedized battery packs, careful verification through bench tests of the drifter's power budget, changes in the drifter duty cycle for the high-energy demand sensors, optimization of the Argos 3 model

parameters.

6.2.6. The Panel noted that items 3 and 4 of the recommendations resulting from the DBCP-29 discussions are in progress.

Drogue detection and retention

6.2.7. As per DBCP-29 discussion, actions were taken to extend the drogue retention time. The statistics published in the in the Global Drifter Program Action Group Report and reported in tables 3 and 4 below show a moderate improvement.

Manufacturer	2007	2008	2009	2010	2011	2012	2013
DBi	*	*	*	*	279	227	>237
Metocean	>373	269	224	77	89	107	>158
Pacific Gyre	210	206	241	248	207	>228	>214
SIO	*	*	*	*	*	66	>151

Table 3: Drogue half-life (days)

Manufacturer	2007	2008	2009	2010	2011	2012	2013
DBi	*	*	*	*	0%	4%	2%
Metocean	8%	13%	6%	12%	6%	11%	9%
Pacific Gyre	8%	11%	8%	2%	4%	7%	0%
SIO	*	*	*	*	*	24%	1%

Table 4: Percentage that had drogue off < 10 days

6.2.8. The Panel noted with interest that the percentage of drifters that had the drogue off after 10 days declined dramatically for the SIO drifters and the life time increased by more than 100%, and still growing. This is the result of SIO replacing the 1/8" diameter spacelay with the ¼" diameter version. However, it should be noted that Pacific Gyre is still using the 1/8" diameter spacelay but their drogue survival after 10 days has improved too. This could be due to improvements in the tether buoy attachment. More time is needed to compute the overall endurance of the drogues using the thicker spacelay, although the forecasted lifetime is ~ 270 day.

6.2.9. Dr Centurioni explained that experimentation with different tether materials is continuing and some results will be available at DBCP-31.

6.2.10. The meeting agreed on the following:

(i) To improve the performances of drifters with respect to drogue retention;

(ii) To investigate new methods to detect the drogue presence which are more effective than the current strain gauge sensor;

(iii) To adopt a common format for the drifters specification sheet for easy upload on a searchable database and to also include the requirements of the WIGOS metadata format;

(iv) That all drifters should be retrofitted with a barometer;

(v) That al drifters should have a Sea Surface Temperature (SST) sensor with an accuracy of at least 0.05 °C;

(vi) To revise the drifter deployment instructions to remove any reference on how to test the drifter before deployment and to request that the drifters be deployed

from the lowest possible point on the ship;

(vii) That all drifters must have a drag area ratio >= 40;

(viii) That all drifters need to be individually shrink wrapped or bagged very tightly to avoid damage during shipping;

(ix) To create statistics on the lifetime of drifters retrofitted with double battery packs;

(x) To prevent impact of the surface buoy on the drifter's wheel during deployment;

(xi) To make the performance evaluation /statistics of the GDP array widely available; and

(xii) To Adhere to DBCP's data format for both Argos and Iridium drifters.

6.2.11. The Panel agreed on the following action items:

(i) SIO to run a systematic evaluation of the drogue drifter assembly (***action; SIO; DBCP-31***);

(ii) SIO to investigate the advantages of GPS[35] based drogue detection algorithms (***action; SIO; DBCP-31***);

(iii) SIO and AOML to define a specification sheet format and create web-based upload facility (***action; SIO & AOML; DBCP-31***);

(iv) All DBCP members to take advantage of the barometer upgrade program offered by the GDP and route the upgrade requests to the owners of the drifters (e.g. SIO and AOML). This should allow achieving the higher possible coverage of the drifter array with SLP measurements (currently at 50%, target 100%) (***action; DBCP members; ongoing***);

(v) Purchasers of drifters to request thermistors that satisfy the above mentioned accuracy requirement (***action; DBCP members; ongoing***);

(vi) AOML and SIO to edit the current version of the deployment instructions sheet (***action; AOML & SIO; DBCP-31***);

(vii) Manufacturers to ensure that the proper shipping arrangements are followed and on the purchasers to audit shipping arrangements (***action; Manufacturers; ongoing***);

(viii) Manufacturers to ensure that the proper DAR is used and on the purchasers to audit drifter's DAR (***action; Manufacturers; ongoing***);

(ix) AOML to create statistics on the lifetime of drifter with double battery packs (***action; AOML; DBCP-31***);

(x) SIO to investigate feasibility of introducing deployment boxes designed to minimize the adverse effects of the impact of the drifters with water (***action; SIO; DBCP-31***);

35 Global Positioning System

(xi) AOML to publish monthly/bimonthly statistics on their GDP website (***action; AOML; ASAP***); and

(xii) Manufacturers to ensure that the proper data format is used (***action; Manufacturers; ongoing***).

6.2.12. Panel thanked Mr Centurioni and members of the Task Team for the comprehensive report. The Panel re-elected Dr Centurioni to chair the Task Team during the next intersessional period. The full report of the Task Team is provided in Appendix A of DBCP-30 preparatory document No. 6.2, and will be included in the DBCP Annual Report for 2014.

6.3. Task Team on Moored Buoys (TT-MB)

6.3.1. Mr Jon Turton (UK), Chairperson of the Task Team on Moored Buoys (TT-MB), reported on the Task Team activities during the last inter-sessional period. The Task Team has been involved in the validation of the new BUFR template (3 15 008) for moored buoy data, which is now operational. A new BUFR template for data from fixed platforms (e.g. offshore rigs) was submitted to the WMO Commission for Basic Systems (CBS) Inter Programme Expert Team on Data Representation Maintenance and Monitoring (IPET-DRMM) in April 2014 and discussions on its progress are ongoing, this is desirable as neither the templates for moored buoys or ships (VOS) are really suited to fixed platforms.

6.3.2. Mr Turton explained that over recent years, the metadata needing to be collected for moored buoy systems has been defined and formats for its submission to JCOMMOPS agreed. Initial metadata submissions have been made to JCOMMOPS to enable the TC to develop the capability to ingest the metadata and make it accessible via the JCOMMOPS website, although progress in developing a system for this has been severely limited by the absence of an IT expert in JCOMMOPS. The Panel affirmed that this work is now a priority action for the Technical Coordinator and JCOMMOPS (see also Recommendation (v) under paragraph 5.17), and that once a system is in place with JCOMMOPS for the moored buoy operators to compile and submit their metadata. It was also agreed that once this is done, to look at developing a metadata submission format for fixed platforms similar to that for moored buoys.

6.3.3. The cost of ship time for servicing is an issue for many moored buoy operators and autonomous surface vehicles (ASVs) are increasingly being seen as a potential alternative to operating moored buoys. However, it is not yet known whether these are sufficiently reliable, cost effective and able to deliver data of equivalent accuracy. The TT would be looking to report on various evaluations of ASVs over the coming years. At DBCP-29, it was recognized that DBCP should take the lead, working with the JCOMM TT-TDC, on developing suitable BUFR templates for the exchange of ASV data on GTS, and it was intended to progress this during the coming year.

6.3.4. The Panel noted with appreciation that during the year a number of technical developments to the various moored buoy systems and networks have been made, including:

(i) Canada: A moored buoy was deployed during the summer of 2014 in the Beaufort Sea to assess the technical and logistical challenges as well as costs of operation. The buoy provides a suite of real time weather and ocean measurements, which in time could be expanded to include reports of sub-surface parameters.

(ii) UK: further deployment of new design moored buoys with spectral wave capability to replace legacy designs and an additional system operated in conjunction with the National Oceanography Centre in the Celtic Sea (expected to be on-station for around a year) in support of a scientific research programme.

(iii) US: two new moorings were added to the RAMA Array in the Indian Ocean, bringing

the array's implementation to 74% complete. CO_2 and other biochemical instrumentation was added to a RAMA mooring in the Bay of Bengal.

(iv) USACE[36]: There is continued development, and integration of a 6N (NOMAD) buoy (collaborative effort between NOAA/NDBC and Environment Canada), where multiple sensor, and payload packages to be used for an intra-measurement evaluation. This study is to quantify observed differences between NOAA/NDBC and EC wave measurements identified in Durrant et al. (2009). The integration portion of the work is to be completed by late fall 2014, with scheduled deployment in early spring 2015 in Monterey Bay canyon as part of the DBCP-ETWCH Joint Pilot Project on Wave Measurement Evaluation and Testing (PP-WET).

(v) NIOT[21]: The Ministry of Earth Sciences Government of India has evolved a comprehensive ocean observation network programme involving moored buoys both surface and sub surface measurements, waverider buoys, coastal meteorological ocean buoys, Automatic Weather Station (AWS) on board ships equatorial moorings, Argo floats, gliders, drifters, XBT[37], High Frequency (HF) Radar, sea level gauges, tsunami monitoring buoys and ship borne observations. NIOT has developed a new generation moored buoy for atmospheric, ocean and tsunami data collection, which was deployed in the Bay of Bengal at the 17.5N/89.5E (TB09) location and is performing well. The Panel noted the efforts taken by India in sustaining moored buoy network and OMNI Buoys are contributing to the societal applications during cyclones and under the technological developmental activities such as installation of camera on coastal buoy off Goa for live video and images through GPRS[38] (published in MTS[39] Journal October 2014), indigenization of tsunami monitoring sensor called LIDS, AIS for monitoring vessels approaching buoy, CAL VAL buoy to calibrate and validate ocean color sensors of Indian Satellite INSAT, Met -Ocean Buoy interfaced with INSAT and GPRS communication, Dual communication in Tsunami Buoy (INSAT/NMARSAT) and Deployment of Next Generation Buoy with extended period of life at sea.

6.3.5. Also, during the course of the meeting a presentation on Chinese moored buoys operated by SDIOI was given, with an action to encourage dissemination of the data on GTS (see also scientific and technical workshop recommendation (i) under paragraph 2.4); on technical developments by Axys (wind lidar buoy, Triaxys Next Wave II and remote control of buoys) and by Korea on a new modular concept for floating platforms. The Panel requested the Technical Coordinator to follow up on this matter and to report at the next Panel Session (***action; TC; DBCP-31***).

6.3.6. The Ministry of Earth Sciences Government of India has evolved a comprehensive ocean observation network programme involving moored buoys both surface and sub surface measurements, waverider buoys, coastal met ocean buoys, AWS on board ships equatorial moorings, Argo floats, gliders, drifters, XBT, HF Radar, sea level gauges, tsunami monitoring buoys and ship borne observations. NIOT has developed a new generation moored buoy for atmospheric, ocean and tsunami data collection, which was deployed in the Bay of Bengal at the 17.5N/89.5E (TB09) location and is performing well. The Panel noted the efforts taken by India in sustaining moored buoy network and OMNI Buoys are contributing to the societal applications during cyclones and under the technological developmental activities such as installation of camera on coastal buoy off Goa for live video and images through GPRS (published in MTS Journal October 2014), indigenization of tsunami monitoring sensor called LIDS, AIS for monitoring vessels approaching buoy, CAL VAL buoy to calibrate and validate ocean color sensors of Indian Satellite INSAT, Met -Ocean Buoy interfaced with INSAT and

36 United States Army Corps of Engineers
37 Expendable BathyThermograph
38 General Packet Radio Service
39 Marine Technology Society

GPRS communication, Dual communication in Tsunami Buoy (INSAT/NMARSAT) and Deployment of Next Generation Buoy with extended period of life at sea and panel appreciated these newer developments.

6.3.7. The meeting agreed on the following:

(i) When a system is in place with JCOMMOPS to ingest and display moored buoy metadata, for the moored buoy operators to compile and submit their metadata to JCOMMOPS (***action; MB operators; ongoing***).

(ii) To build on the DBCP moored buoy metadata scheme to handle metadata for fixed platforms (***action; TT-MB; DBCP-31***).

(iii) DBCP TT-MB and TT-DM, to work with the JCOMM Task Team on Table Driven Codes (TT-TDC), on developing suitable BUFR templates for the exchange of data from autonomous surface on the GTS (***action; TT-MB & TT-DM; DBCP-31***).

(iv) The Panel requested the TT-MB and the TT-IBP to review the CIMO[2] Guide, the GOS[3] Guide, and the WIGOS Manual, and to make proposals for possibly required changes at the next Panel session (***action; TT-MB, TT-IBP; DBCP-31***).

(v) The Panel invited the buoy manufacturers to actively participate in buoy data evaluations, and in the PP-WET for the wave measuring buoys. It requested the Technical Coordinator to approach the manufacturers and seek their participation in this regard, and to report at the next Panel Session (***action; TC-DBCP; DBCP-31***).

6.3.8. The Panel thanked Mr Turton and the members of the Task Team for the report, and in particular for his work with regard to Table Driven Codes. The Panel re-elected Mr Turton to Chairperson the Task Team during the next inter-sessional period. The full report of the Task Team is provided in Appendix A of DBCP-30 preparatory document No. 6.3, and will be included in the DBCP Annual Report for 2014.

6.4. Task Team on Capacity-Building (TT-CB)

6.4.1. Dr Sid Thurston (USA), Chairperson of the DBCP Task Team on Capacity Building (TT-CB), reported on the Task Team activities during the last intersessional period. In particular, he provided comprehensive information on: 1) The outcomes of the Fifth “In-region Capacity Building Workshop for Countries of the Western Indian Ocean Region” (WIO-5), Port Elizabeth, South Africa, 12-15 May 2014, 2) Outcome of the “Third North Pacific Ocean and Marginal Seas” (NPOMS-3) Capacity Building Workshop, Application of Regional Ocean Observations for Increasing Society’s Understanding and Forecasting of Typhoons, in Kyoto, Japan, 6-8 October 2014.

Second International Indian Ocean Expedition (IIOE-2)

6.4.2. The Panel was informed that the IOC Executive Council, through Resolution 1/EC-XLVII, had formally agreed to undertake, jointly with the Scientific Committee on Oceanic Research (SCOR) and Indian Ocean Global Ocean Observing System (GOOS) (IOGOOS), an IIOE-2 as a major initiative of the IOC over the period 2105-2020, timed to coincide with the 50th anniversary of the first IIOE of the early 1960s. This resolution confirmed that SCOR would take primary responsibility for preparing the science plan for the IIOE-2, and had established an Interim Planning Committee (IPC), in conjunction with SCOR and IOGOOS, to undertake initial planning for the implementation of the initiative, based on the science plan, to include key components such as data and information

management, capacity development and communication and outreach. The resolution invited partner agencies and organizations of IOC to join in the initiative, and instructed IOC's primary subsidiary bodies, including JCOMM and the IOC International Oceanographic Data and Information Exchange (IODE), to develop their own plans for involvement in and support for the IIOE-2, on the basis of the science plan, and to report on this to both the IPC and the 28th Assembly in 2015.

6.4.3. The potential value of the IIOE-2 in terms of enhanced scientific knowledge of the Indian Ocean, its interactions with other ocean basins, and the role of the Indian Ocean in the global climate system, as well as the economic and societal benefits to be derived from such enhanced knowledge, delivered in the form of data, information and services to and by panel members. The science plan is being developed by SCOR and would be available by December 2014. DBCP should support the IIOE-2, delivered within the overall scope of the science plan, should be based around existing activities in the Indian Ocean, enhanced as required and where feasible. Such activities should include at least in situ observing systems, real time data management processes, ocean modelling and forecasting and capacity development, but would likely expand as the IIOE-2 evolved.

6.4.4. After such considerations, the meeting agreed on the following for 2015:

(i) To convene the Fourth "DBCP in-Region North Pacific Ocean and Marginal Seas Capacity Building Workshop" (NPOMS-4), November 2015, Busan, South Korea. The goals for the workshop are detailed in ***Annex XI*** (***action; TT-CB; Oct. 2015***);

(ii) Noting the potential benefits that can be gained in the NPOMS region regarding the implementation of marine meteorological and oceanographic observing systems, as well as the use of the data for WMO and IOC applications, in particular typhoon forecasting, the Panel concurred with, and strongly supported the establishment of an Jeju NPOMS training centre in the Republic of Korea, and invited the Country to go ahead with such developments (***action; Korea; DBCP-31***). The Panel thanked the Republic of Korea for its commitment in this regard.

(iii) To convene the “First Pacific Islands Workshop on Ocean Observations and Data Applications” (PI-1) to be hosted by the Republic of Palau in May 2015. The South West Pacific Region is fertile ground for capacity building, particularly in ocean issues. The Region has good networks and there is a lot of interest in building the human capacity to digest and understand data from the ocean and climate observing systems. (***action; TT-CB; DBCP-30***);

(iv) To explore with the IOC Sub-Commission for Africa and the Adjacent Island States for a possible future session of a DBCP Western Indian Ocean (WIO) Capacity Building Workshop to focus on developing the contributions of WIO region to the 50th Anniversary of the International Indian Ocean Expedition (IIOE-2[40]) (***action; TT-CB; ASAP***);

(v) To explore the possibility of supporting a future “Second In-Region Capacity Building Workshop for Asian (Asia-2) Countries” in 2016;

(vi) To continue to employ recent advances in Information and Communication Technology (ICT) to help facilitate more effective DBCP TT-CB Outreach and Capacity Building Activities on a larger scale (***action; TT-CB; NPOMS-4***);

(vii) To Enhance Coordination and Cooperation between TT-CB and WMO Regional

40 http://unesdoc.unesco.org/images/0022/002282/228247e.pdf

Associations (***action; TT-CB; DBCP-30***);

(viii) To emphasize that the regional activities should create synergies and avoid duplication, at all cost, therefore requested to develop specialize activities that meet the interest of the respective regions, preferably with the identified resources within the regions. (***action; TT-CB; continuous***);

(ix) The Australian Bureau of Meteorology (BOM) has been an important partner for populating the WIO region with drifters;

(x) The Panel invited its members to review the IOC Capacity Development strategy and to provide their comments to Prof. Blivi (***action; Panel members; ASAP***);

(xi) The Panel recommended the TT-CB to consider organizing workshops in the Eastern Atlantic region, to provide graduate school training on ocean observations for the African region, and to report on proposed activities at the next Panel Session (***action; TT-CB; DBCP-31***);

(xii) Links should be established with the Coastal Inundation Forecasting Demonstration Project (CIFDM) for the PANGEA[41] workshops (***action; TT-CB; DBCP-31***);

(xiii) The Panel invited the JCOMM Management Committee (MAN) to extend recommendation through the WMO and IOC Executive Bodies for the Members/Member States to routinely keep the relevant national agencies and institutes informed about events and activities organized by JCOMM and for which the Permanent Representatives and Action Addressees have received invitation letters respectively. The Secretariat was requested to relay that recommendation to the MAN (***action; Secretariat; ASAP***);

(xiv) The Panel agreed that all future capacity building workshops must be evaluated for efficiency and effectiveness and the TT on CB can consider using the “Survey Monkey” (***action; TT-CB; Oct. 2015***); and

(xv) All future Capacity Building workshops and reports thereof must be communicated and sent to the JCOMM CB coordinator (***action; TT-CB; ongoing***).

6.4.5. The Panel thanked Dr Thurston and the members of the Task Team for the report. The Panel re-elected Dr Thurston to Chairperson the Task Team during the next intersessional period. The full report of the Task Team is provided in Appendix A of DBCP-30 preparatory document No. 6.4, and will be included in the DBCP Annual Report for 2014.

7. REPORTS BY THE ACTION GROUPS

7.1. Under this agenda item, the Panel was presented with reports by the DBCP Action Groups. Each group maintains an observational buoy program that supplies data for operational and research purposes. The implementation of buoy deployments is also coordinated through global, regional, or specialized Action Groups.

41 Partnerships for New GEOSS Applications

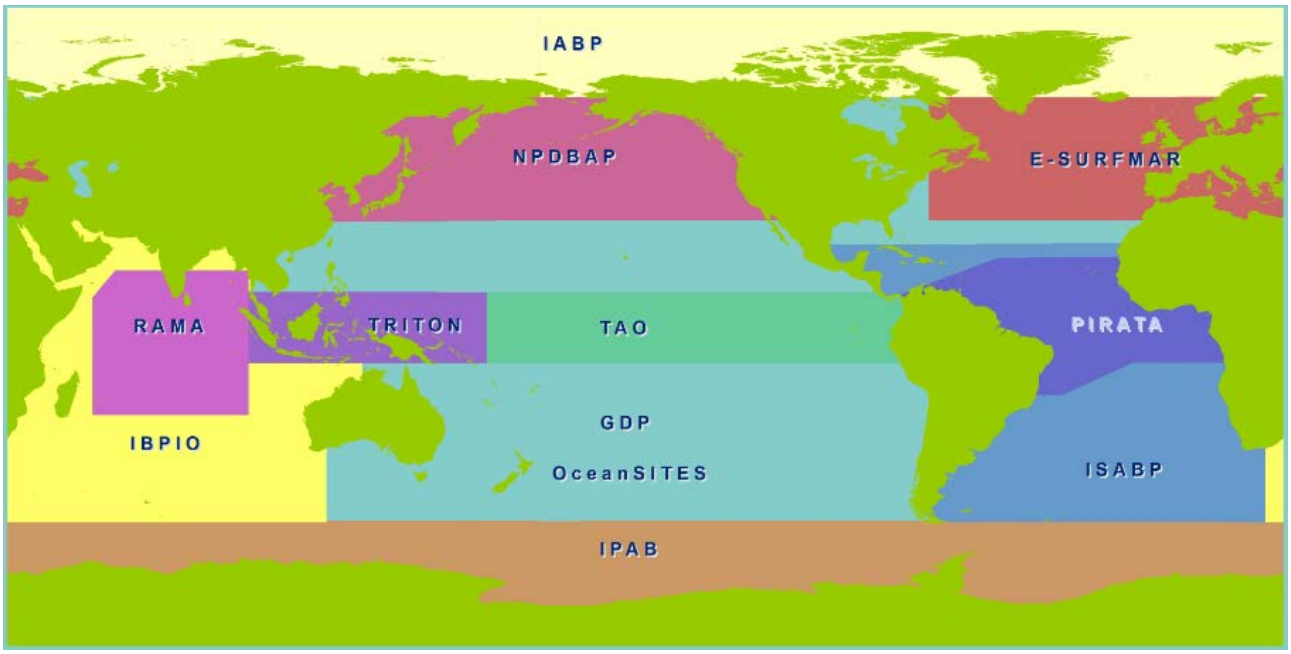

Figure 6: The regional extent of several of the DBCP Action Groups.

7.2. The reports included:

(i) **E-SURFMAR:** Operational Service E-SURFMAR of the Network of European Meteorological Services, EUMETNET (verbal presentation by Jon Turton (UK), representing the E-SURFMAR officers). 109 E-SURFMAR drifting buoys were in operation in mid-2014 (74 Iridium, 35 Iridium upgrades) plus 50 others reporting air pressure. E-SURFMAR also supported 4 moored buoys in operation, plus a further 45 others operated by members. Plans for 2015 are to maintain a network of 100 drifting buoys, and the 4 reference moored buoys in operation.

(ii) **GDP:** Global Drifter Programme (verbal presentation by Rick Lumpkin (USA) on behalf of the GDP). A total of 1660 drifters were deployed during the period 1 August 2013 through 31 July 2014, compared to 1472 drifters last year, in order to return the array above the goal of 1250 drifters. The array began this period at 1007 drifters. In the coming year, the GDP Deployment Plan is deploy 1000 drifters (800 operational, and 200 under consortium research buoy deployments). More deployments may be needed to fill gaps in the global array as they develop, and will be conducted if more drifters are available for deployment.

(iii) **IABP:** International Arctic Buoy Programme (verbal presentation by Chris Marshall (Canada) on behalf of Dr Ignatius Rigor (USA)). The IAPB has been active in the intersessional period. The Action group met in person in June 2014 in Bremerhaven, Germany with a large number of participants. 35 members are contributing to the activities of the IAPB. Christine Best from Canada continues as the Chair while Ignatius Rigor of USA (University of Washington) provides excellent support as the Technical Coordinator. 80 buoys were deployed over the past year, with ~190 reporting (most on GTS) in October 2014. Buoys in the Arctic are making a range of atmospheric, ocean and ice measurements. While many of the buoys were deployed in clusters in support of scientific field programs, the overall spatial coverage of the Arctic Basin is excellent (especially for buoys equipped with barometers), with some gaps remaining on the Eurasian Sector. The IABP web site has been upgraded with improved maps and access to buoy data. For 2015 the IABP will continue efforts to deploy buoys in the Arctic Basin. The TC will engage members to leverage deployment opportunities including planned ice breaker, air

deployment, and field research projects such as the planned Arctic Ocean Drift Study (ADOS).

(iv) **IBPIO:** International Buoy Programme for the Indian Ocean (verbal presentation by Mr Graeme Ball (Australia), Chairperson of the IBPIO). 236 drifters (213 with Air Pressure) were operational in the IBPIO area of interest in mid-2014, together with 47 moored buoys (32 for RAMA 70% of the planned 46 site array). Plans for 2015 are to maintain a network of 150 drifters at least, and maintain the moored buoy arrays. Damage to buoys and theft of instrumentation continues to be a problem, especially at sites near areas of intense fishing activity. In addition to vandalism, well-publicized piracy events have resulted in the suspension of RAMA implementation off Africa and in the Arabian Sea and declaration of high risk area by Lloyds of London. The occurrence of piracy has decreased in recent years and events have largely been limited to areas near the Somalia coast and the Gulf of Aden. Despite the decline, Lloyds of London has not reduced the size of their Exclusion Zone. Based on the reduction in risk, RAMA cruises aboard Indian research vessels in the central equatorial Indian Ocean will be conducted in 2014 without embarking sea marshals for security. The Panel noted that the use of navies to deploy drifters can help. The IBPIO acknowledges the second International Indian Ocean Experiment (IIOE-II) and the intended aims of IIOE-II, and urges members to participate (***action; Panel members; ongoing***).

(v) **IPAB:** WCRP[42]-SCAR[43] International Programme for Antarctic Buoys (verbal presentation by Chris Marshall on behalf of the IPAB Chair, Petra Heil (Australia) and Coordinator, Christian Haas (Canada)). The IPAB has been active in the last intesessional period with 7 members contributing to the work of the Action Group. Over the past year IPAB members deployed 50 buoys in the Antarctic, with an additional 10 SVPs in the Ross Sea Sector. Buoys deployed included Ice Mass Balance, Snow Buoys, and compact AWS. The buoys were all deployed as part of scientific field campaigns. Some of the observations, but not all routed to GTS. For 2015 the IPAB is planning deployments via planned cruise of the Polarstern (AWI) in December (2014) and January 2015.

(vi) **ISABP**: International South Atlantic Buoy Programme (verbal presentation by Mayra Pazos (USA), representing the ISABP). As of September 8, 2014, there were a total of 154 drifters in the South Atlantic region, (66 SVP, 88 SVPB). Plans for 2015 are to continue to address observational gap areas specially, in the Gulf of Guinea and Angola Basin; pursue recommendation of conducting studies and evaluate the impact of drifter pressure data and SST on the skills of numerical weather forecasting models for the region; continue to increase number of SVPB in the region. The Panel noted the nomination by the ISABP committee of Mr Luis Felipe Silva Santos (Brazil) as new Chair of the ISABP, and that South Africa was invited to be nominating someone as ISABP vice-Chair. The Technical Coordinator is Mayra Pazos (USA), and other committee members are Kai Herklotz (Germany), Rick Lumpkin (USA), Shawn Dolk (USA)

(vii) **NPDBAP:** DBCP North Pacific Data Buoy Advisory Panel (verbal presentation by Mr Shaun Dolk (USA), technical coordinator of the NPDBAP). From 01 August 2013 to 31 July 2014, 127 drifters were deployed in the North Pacific Ocean. Of the 127 drifter deployments, 109 units were equipped with barometer sensors and the remaining 18 drifters were standard SVP type drifters. The goal for 2015 is to deploy 100 drifters, of which, 70 drifters will be equipped with barometer sensors.

42 World Climate Research Programme
43 Scientific Committee on Antarctic Research

(viii) **OceanSITEs**: OCEAN Sustained Interdisciplinary Timeseries Environment observation System (verbal presentation by the Technical Coordinator, Ms Kelly Stroker, representing OceanSITEs project office). The OceanSITEs Network consists of over 200 reference sites in the deep-ocean plus an additional 72 standard meteorological sites (TAO, RAMA, PIRATA[44]). One of the goals of OceanSITEs is to have data freely available, in real-time if possible. Currently there are 82 sites transmitting data in real-time to a local or regional data centre. OceanSITEs will welcome a new Project Office, Ms Champika Gallage. Ms Gallage will join the JCOMMOPS team from Environment Canada. She will start in October 2014 and be stationed with the rest of JCOMMOPS in Brest, France.

(ix) **TIP:** Tropical Moored Buoys Implementation Panel (verbal presentation by Dr Iwao Ueki (Japan) on behalf of the TIP). In TAO/TRITON[45] 41 of the 55 TAO surface moorings are reporting data, and 8 of the 10 TRITON ones. In PIRATA, all of the 18 surface moorings are reporting data. In RAMA, 18 of the 27 surface moorings are reporting data. Plans for 2015 are to maintain the 68 TAO/TRITON mooring array, to retire 2 TRITON sites, to maintain 18 PIRATA sites, and to maintain 34 RAMA sites. More sites may possibly be added in RAMA if ship time is available. The Panel noted with concern that daily average data return for the period 1 July 2013 through 30 June 2014 was 38% for TAO, 84% for TRITON, 86% for PIRATA and 54% for RAMA. Abnormally low TAO data return was in large part due to delays in maintenance cruises. The average TAO mooring age (time period since deployment) was 16 months as of July 2014, with 42 of 55 TAO moorings having been deployed for more than the design lifetime of 12 months, and one having been deployed for 3 years. TAO maintenance cruises in the latter half of 2014 should result in all but one site being replaced within the past year, and all those with new ATLAS Refresh systems. Primary reasons for data loss in RAMA were a high incidence of vandalism coupled with long mooring deployment periods at some sites. Of 27 surface mooring sites in RAMA implemented by July 2014, 5 have not been maintained for more than 2 years due to lack of cruise opportunities. The survival rate for ATLAS moorings in RAMA since initial deployments in 2004 is 84%, compared to 90% for TAO (1980 to 2010) and 93% for PIRATA (1997-2014).The Panel noted that during the last intersessional period, the NDBC has implemented some changes in TAO operations, which could potentially impact the data users, in particular with regard to the reduced accuracy for reporting the tropical moored buoy positions. The Panel further noted that per dialogue with the Ocean Observations for Physics and Climate (OOPC), the NDBC is committed to working closely with all TAO array stakeholders in order to address their concerns in the best possible way. The NDBC decision to implement changes was mainly driven by needs to address the data buoy vandalism issue as the distribution of TAO higher resolution data on the GTS could potentially result in further deterioration of the performance of the TAO Array. However, the Panel noted that the NDBC will continue to provide the high resolution data to legitimate users through other channels. The Panel also noted the substantial contributions of Members and Member states in the TIP activities, and recommended that these be better reflected in future TIP reports to the Panel.

(x) **ITP**: International Tsunameter Partnership (verbal presentation by Shannon McArthur (USA) on behalf of the ITP Chair, Dr Venkatesan (India)). The global Tsunameter network now includes 60 stations operated by 8 different countries including Australia (6), Chile (2), Ecuador (2), India (5), Japan (3), Russia (2), Thailand (1) & USA (39). ITP is finalizing the ITP Tsunameter Standard with the

44 Pilot Research Moored Array in the Tropical Atlantic
45 Triangle Trans-Ocean buoy network

goal to publish it before the next Panel Session. The Panel concurred with the recommendations from the ITP as provided in ***Annex XII***. R.Venkatesan (India) was elected as ITP Chair and Stephen Cucullu (USA) as Vice Chair to continue the activities.

7.3. The Panel noted that damage to buoys and theft of instrumentation continues to be a concern, especially at sites near areas of intense fishing activity such as the far eastern and western equatorial Pacific, the Gulf of Guinea and equatorial Indian Ocean. In response, some TRITON sites, which have been vandalized heavily, are now deployed without meteorological sensors. See agenda item 9.4 for details about the data buoy vandalism issue. In addition to vandalism, well-publicized piracy events have resulted in the delay of RAMA implementation off Africa and in the Arabian Sea.

7.4. Summaries of the presentations are reproduced in Annex V. The full reports of the action groups will be reproduced in the Panel's Annual Report.

Other regional activities (agenda item 7.11)

7.5. Dr David Legler reported on the development of the Tropical Pacific Observing System (TPOS) 2020 project.

7.6. A workshop was held in January 2014, as part of a review of the Tropical Pacific Observing System, initiated by NOAA and JAMSTEC, coordinated by OOPC, and also sponsored by the Global Climate Observing System (GCOS), GOOS, as well as the Korean Institute of Ocean Science and Technology (KIOST) and SOA. The main outcome of the meeting was to recommend the formation of a Tropical Pacific Observing System for 2020 (TPOS 2020) Project to transition the observing system from a loosely coordinated set of observing activities, to a robust and integrated TPOS by 2020.

7.7. The aims of the TPOS 2020 Project Are:

- To refine and adjust the TPOS to monitor, observe and define the state of ENSO[46] and advance scientific understanding of its causes.
- To determine the most efficient and effective method to support observation and prediction systems for ocean, weather, and climate services of high societal and economic utility, including underpinning research.
- To advance/refine the degree to which the tropical Pacific (physical and biogeochemical) and its climate impacts are predictable.
- To determine how interannual to multidecadal variability and human activities impact the relation between marine biogeochemistry and biology to carbon budgets, food security, and biodiversity.

7.8. The TPOS 2020 Project is led by a steering committee, supported by a resources forum. The project will be self-supporting through the resources forum, and will report to the GOOS SC, while exercising significant autonomy. Dr William Kessler (PMEL, USA) and Dr Neville Smith (Retired, Australia) agreed to co-chair the Steering Committee and take the TPOS 2020 Project forward.

7.9. Significant work required to inform the redesign will be facilitated through focussed task

46 El Niño Southern Oscillation

teams. Four Task Teams (TT) were initially scoped at the workshop, and further refined at the first Steering Committee meeting. One of the TT's will develop advice on the backbone TPOS. The TT will advise on the elements of the backbone based on updated requirements, current knowledge base, and existing capabilities.

7.10. Prioritisation criteria for time-series climate records was also considered (consistent with the recommendation from La Jolla) and OOPC and OceanSITEs will be consulted regarding the process.

7.11. Several opportunities around the need to improve modelling and data assimilation were identified. A Workshop on systematic errors in tropical models and prediction systems has been proposed and the SC and/or Task Team will conduct some assessment of when/how this might happen. A TT will be formed to support modelling and data assimilation activities.

7.12. The TPOS-2020 project will be the subject of increased attention over the coming years. DBCP networks and activities in the Tropical Pacific will likely be the subject of TPOS-2020 deliberations and recommendations. The TPOS-2020 project is also an opportunity for developing and testing new technologies, improving approaches to data systems and pathways, and integrating across the numerous in-situ and satellite systems. There will no doubt be many opportunities in TPOS-2020 for DBCP to participate.

7.13. Further information can be found on the Project website www.tpos2020.org

7.14. The Panel welcomed the TPOS initiative, and the development of new observing strategies, and made the following recommendations:

(i) To consider the connection between DBCP activities and TPOS 2020 actions (***action; DBCP-EB; Mar. 2015***), and

(ii) To provide advice to OCG, as appropriate, on potential issues and/or opportunities arising from the (draft) TPOS 2020 activities (***action; DBCP-EB; Mar. 2015***).

8. PILOT PROJECTS

8.1. Pilot Project on the impact of SLP from drifters on NWP

8.1.1. During DBCP-29, it was stated that scientific paper describing the outcomes of the DBCP workshop on the Evaluation of the Impact of Sea Level Atmospheric Pressure (SLP) Data Over the Ocean from Drifting Buoys on Numerical Weather Prediction (NWP), Sedona, Arizona, USA, 21 May 2012, was being prepared. During the inter-sessional period it was determined that waiting for the results of the OSE simulations commissioned by Dr Centurioni to ECMWF would be more appropriate.

8.1.2. A contract between WMO and ECMWF to run an OSE experiment was signed in February 2014.

8.1.3. The Work Began in May 2014. Two control experiments (November-December, 2010 and July-August, 2012) were performed. Dr Centurioni and Mrs Kelly Stroker have interacted with Drs Cardinali and Horanyi to create an accurate list of WMO numbers corresponding exclusively to barometer drifters. Two blacklists were created for the periods corresponding to the control experiments.

8.1.4. The data denial experiments were launched at the beginning of summer 2014. They became corrupted and were re-launched in August 2014. The completion of the runs

is expected before the end of September 2014.

8.1.5. The Panel encouraged further studies to be made on the impact of timeliness, and invited the Pilot Project to document existing data assimilation schemes from that perspective (***action; PP-SLP; DBCP-31***).

8.1.6. The Panel thanked Luca Centurioni for the valuable work achieved through the Pilot Project, and which shows the substantial impact of drifter SLP data on NWP. The Panel requested PP-SLP to finalize the results of the Pilot Project, and to publish them through peer review (***action; PP-SLP; DBCP-31***).

8.2. DBCP/ETWCH Pilot Project on Wave measurement Evaluation and Test from moored buoys (PP-WET)

8.2.1. Mr Val Swail (Canada) reported on the development and current status of the joint DBCP-ETWCH[7] Pilot Project on wave measurement evaluation and test from moored and drifting buoys (PP-WET). The full report is included as a presentation accompanying the DBCP-30 meeting report.

8.2.2. Mr Swail noted that a special session on wave measurement (Session A) was held as part of the 13th International Workshop on Wave Hindcasting and Forecasting (WW-13, October 27- November 1, 2013, Banff, Canada) to present evaluation results to the scientific community and further develop guidelines and participation in the Pilot Project (http://www.waveworkshop.org). Mr Swail emphasized the importance of understanding the wave measurements, which formed the basis for calibration and validation of modelling systems in wave forecasting agencies. He encouraged the modelling and climate communities to promote the wave measurement evaluation activities within their respective countries.

8.2.3. A PP-WET Pilot Project meeting was held the day prior to the WW-13 Workshop for Pilot Project members attending the Workshop as well as any other interested people, to review progress and future plans. The meeting recommended that the Pilot Project should focus on the core networks, such as Canada, the US and the United Kingdom where some progress and plans have been reported. Other member countries were still encouraged to participate in the Pilot Project inter-comparison activities by submitting co-located spectral wave data to the Coastal Data Information Program (CDIP) at the Scripps Institution of Oceanography.

8.2.4. A meeting of the Pilot Project co-chairs and CDIP was held February 11, 2014 in La Jolla, California to discuss proposed enhancements to the evaluation tool and the graphical interface to provide more quantitative information, and to identify additional inter-comparison data sets for inclusion, including dual (or more) sensor hulls. Future evaluation opportunities, including the proposed “buoy farm” off Monterey were also defined.

8.2.5. Mr Swail also made a presentation to the JCOMM 4th Workshop on Advances in Marine Climatology (CLIMAR-4) in Asheville, NC, June 9-12, 2014 on the JCOMM Extreme Wave Data Set (EWDS). The importance of the PP-WET results to the interpretation of the results from the EWDS was noted, as was the critical understanding of the measurements in reliable estimation of historical wave trends. The availability and ready accessibility (comparable to WMO No. 47) of historical buoy metadata to support wave climate analysis, the EWDS as well as PP-WET, was described as “abysmal”. The Panel encouraged its member countries to take action to remedy this situation (**recommendation**).

8.2.6. The Panel noted that the past year, as in the one preceding it, had been a difficult one for many national agencies, due to issues of funding, personnel, logistics and ship time,

which had significantly hampered progress in the Pilot Project, particularly for the deployment of new wave buoys. The situation was made worse with the actual loss of moorings in both Canada and the United Kingdom. In spite of this, some progress was reported, and exciting plans are already underway for the coming year with deployments off Canada and the UK, and a "buoy farm" including a 6m NOMAD hull instrumented with all historical Canadian and US sensors and processing systems off Monterey. The Panel expressed its appreciation to Canada, US, United Kingdom for their continued participation in the inter-comparison projects in spite of the recent difficulties. The Panel also welcomed the continued contribution, supported by the US Army Corps of Engineers, from the Coastal Data Information Program (CDIP) at the Scripps Institution of Oceanography, in setting up the inter-comparison methodology, web site and metadata criteria, and in carrying out individual inter-comparisons. The Panel encouraged its member countries to participate in the inter-comparison activities that were led by this pilot project (**recommendation**).

8.2.7. The Panel noted that evaluation results continue to be routinely added to the inter-comparison web site http://www.jcomm.info/wet in near real time, if **spectral** data are routinely transmitted via satellite; if data must be retrieved from logging systems on the platforms, the analysis may be delayed by a year or more. Additional intercomparisons will be added to the web site once the information has been retrieved from the data storage systems on the buoys.

8.2.8. Mr Swail noted that work is also progressing on the wave measurements from drifting buoys component of the Pilot Project. Evaluation of the Scripps GPS sensor is ongoing, with some dual sensor data still to be retrieved from the Canadian 3m discus buoy. A second approach has also been investigated, using a different Scripps buoy; this drifting buoy is already operational, and has been widely used by the US Navy and the oil and gas industry. It measures spectral waves as well as currents using a GPS sensor, and sea surface temperatures. The Panel noted this with interest, and recommended that a small number of these buoys could be obtained and deployed as a complement to the regular drifter program for evaluation (**recommendation**).

8.2.9. The Panel recognized that the pilot project would contribute to JCOMM in developing standards and best practice, as well as to the relevant WIGOS exercise, and encouraged the co-chairs and Pilot Project members to actively outreach these relevant activities with the progress in the inter-comparison exercise (**recommendation**).

8.2.10. The Panel agreed that this pilot project was still progressing well, and decided to retain the project in its current form for another year, with no additional financial support. The revised work plan for the project is given in ***Annex X*** and is available at the pilot project website. The Panel thanked the PP-WET co-chairs, Mr Val Swail and Dr Robert Jensen, and Pilot Project members for their work to make progress.

8.2.11. The meeting made the following recommendations:

(i) Continue the Pilot Project for the next year, with no funding support;

(ii) Encourage the co-chairs and Pilot Project members to contribute the results of the intercomparison exercise to JCOMM and WIGOS in developing standards and best practices, possibly as a result of a technical workshop;

(iii) Encourage its member countries, and RMICs with marine responsibilities, to participate in the Pilot Project intercomparison activities;

(iv) Panel members to check their records, and make sure that the historical and present wave buoy metadata are made available to international archives (e.g.

ICOADS[47]) in a suitable exchange format such as that recently developed by the TT-MB;

(v) Panel members to consider procuring and deploying a small number of the operational SIO mini wave drifters and to inform PP-WET accordingly.

8.2.12. The meeting decided on the following recommendation and action items:

(i) Panel members to reinforce the importance of understanding critical measurement biases to agencies responsible for wave data (***recommendation***);

(ii) The future plans and membership of the Pilot Project will be reviewed, including a possible follow up technical workshop on results to date (***action; PP-WET co-chairs, Secretariat, NDBC; DBCP-31***);

(iii) Guidelines on the best practices for measurement of reliable, high-quality spectral wave measurements, including directional spectra, will be developed, possibly as an outcome of the technical workshop (***action; PP-WET co-chairs; 2017***).

8.2.13. The Panel thanked Val Swail for his contribution to this Pilot Project. The Panel also thanked its members who have investigated significantly in the Pilot Project, for example through the provision and deployment of wave buoys.

8.2.14. The Panel noted that the Regional Marine Instrument Centre (RMIC) for Regional Association IV (operated by the NOAA/NDBC in Mississippi, USA) was planning to organize a 2nd JCOMM Marine Instrument Workshop for RA-IV in late 2016. The workshop will be focusing on wave observations, contribute to PP-WET, and will tentatively be organized together with a PP-WET workshop. The Panel also noted that the Executive Board has discussed the issue, has noted the focus on wave observations and synergies with PP-WET, in which the Panel has a strong interest, and has recommended that the Panel should financially support the event to some extent. The Panel concurred with the Board's recommendation in this regard.

8.3. DBCP/GHRSST Pilot Project for High Resolution SST (PP-HRSST)

8.3.1. Mr David Meldrum presented the joint Pilot Project for High Resolution SST (PP-HRSST) between the DBCP and the Group for High Resolution Sea Surface Temperature (GHRSST). The project had been established three years previously as a result of a dialogue between the Panel and GHRSST to improve the accuracy and resolution of drifter SST. GHRSST regarded drifter SST as vital for satellite SST product validation, but further progress with algorithm improvement was ultimately hampered by the accuracy and resolution of the in situ measurements. In part, this was due to inadequate drifter SST accuracy, in part imposed by the resolution limit of 0.1C imposed by the traditional alphanumeric GTS codes.

8.3.2. In addition, the validation process required a close matchup in both space and time between hourly drifter and unevenly-spaced satellite observations. This suggested the implementation of Iridium + GPS solutions, and indeed all deployments of HRSST drifters to date had followed that route.

8.3.3. The GHRSST requirement of 0.05C accuracy and 0.01C resolution had been approached in two different ways:

47 International Comprehensive Ocean-Atmosphere Data Set (USA)

(i) Use of a conventional temperature sensor, with 0.01C resolution (but not accuracy) in the drifter message and in the data inserted onto the GTS, the so-called HRSST-1 drifters;

(ii) Implementation of a new digital-output sensor module, calibrated to better than 0.05C, and again reporting with a resolution of 0.01C, the HRSST-2 drifters.

8.3.4. To date approximately 700 HRSST-1 and 70 HRSST-2 drifters had been deployed, mainly in the North Atlantic. All GTS reports were of necessity made in BUFR code. The incremental cost of the HRSST-2 sensor module, approx. USD1000, was a key factor in limiting its deployments and, indeed, no further purchases of this variant were being planned by E-SURFMAR.

8.3.5. The Panel took note of the following feedback from the GHRSST community:

(i) Early analyses had shown that HRSST drifters exhibited a warm bias of approx. 0.2C which was not shown in the non-HRSST population;

(ii) The number of reports reaching GHRSST databases had fallen compared to 2012;

(iii) Analyses had been hampered following the failure of ENVISAT mid-way through 2012 and the retirement of key GHRSST members.

8.3.6. With regard to the first point, the Panel had urged the Pilot Project Steering Group (PP-SG) to work closely with GHRSST in resuming the analysis effort so that the value or otherwise of HRSST drifters might be established prior to any further commitment of Panel resources. However, little further analysis action had been reported by GHRSST, largely owing to the failure of ENVISAT and the AATSR-2 instrument it carried.

8.3.7. With regard to funding the rollout of HRSST drifters, the Panel noted with appreciation the considerable effort and expenditure already committed by E-SURFMAR. The Panel was again disappointed that no funds had been forthcoming from the satellite community, and that a draft proposal to the European Space Agency (ESA) had been rejected. Nonetheless, the Panel noted that ESA had recently issued an Invitation to Tender (ITT) to investigate the traceability of in situ SST measurements, with a particular focus on drifter reports. It hoped that this in due course might lead to further collaboration with and funding from the space community.

8.3.8. Noting that PP-HRSST had now reached the end of its projected lifetime, and the absence of any concrete conclusions as to the usefulness of in situ HRSST, the Panel regretfully decided to suspend any future PP-HRSST activities pending further responses, guidance and support from the satellite community.

9. ISSUES FOR THE PANEL

9.1. Information Exchange

Websites

9.1.1. The former Technical Coordinator, Ms Stroker reported on website developments during the last intersessional period. The Panel was reminded of the official address for the

DBCP website[48].

9.1.2. It was noted that JCOMMOPS also normally maintains some JCOMM Observations Programme Area content on the JCOMM web site[49] for the DBCP and OceanSITEs.

9.1.3. She reported that the following has been achieved:

(i) Review of the content of the DBCP and OceanSITEs web pages to fix broken links and outdated content; and

(ii) Significant changes made to the OceanSITEs website reorganizing content per the communities request.

News

9.1.4. Ms Stroker reported that the news item on the JCOMMOPS website was not updated. The team is working on a new website where the news features will be implemented via twitter and other more streamlined tools.

9.1.5. The Panel noted that JCOMMOPS has a twitter account (i.e. @jcommops) that users can follow.

DBCP Publications

9.1.6. Ms Stroker reported on new or updated DBCP Technical Documents, and JCOMM Meeting and Technical Reports of interest to the Panel. The following ones of interest to the DBCP have been published during the last intersessional period:

- Updates to the DBCP Implementation Strategy – DBCP Technical Document No. 15[50];
- Updated DBCP Operating Principles[51];
- DBCP Technical Document No. 47[52], Presentations at the DBCP Scientific and Technical Workshop, Paris, France, 23 September 2013;
- DBCP Technical Document No. 48[53], DBCP Annual Report for 2013;
- DBCP Technical Document No. 49[54], Second Capacity Building Workshop of the WMO/IOC Data Buoy Cooperation Panel (DBCP) for the North Pacific Ocean and Its Marginal Seas (NPOMS-2) Application of Regional Ocean Observations for Increasing Society's Understanding and Forecasting of Typhoons (NPOMS-2, 22 - 24 October 2013, Hangzhou, China);
- JCOMM Meeting Report No. 106[55], Final Report, 29th Session of the DBCP (Paris, France, 23-27 Sept. 2013).

Information Products

9.1.7. Ms Stroker then reported the following throughout the year as regular informational products to the community:

- Added the Quarterly NOAA Equivalent Buoy Density Maps to the DBCP

48: http://www.jcommops.org/DBCP/ - the following alias can also be used: http://dbcp.jcommops.org
49: http://www.jcomm.info
50: http://www.jcommops.org/doc/DBCP/DBCP_Impl_Strategy.pdf
51: http://www.jcommops.org/FTPRoot/DBCP/meetings/2012/dbcp/DBCP-Operating-Principles-2012.pdf
52: http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=11951
53: http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=13169
54: http://www.jcomm.info/index.php?option=com_oe&task=viewDoclistRecord&doclistID=115
55: http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=11748

Website[56]
- Email lists and communications:
- Maintained email lists relevant to DBCP and OceanSITEs
- Monthly emails to the DBCP list with updated maps and products available.

9.1.8. The meeting made the following recommendations:

(i) For the TC-DBCP to continue to provide regular updates on maps and statistics to the community;

(ii) For JCOMMOPS to work proactively on developing their new website and to keep the community informed of the progress;

9.1.9. The meeting decided on the following action items:

(i) DBCP Members to submit any relevant news items to the TC-DBCP (***action; DBCP members; ongoing***);

9.2. Deployment opportunities and strategies

9.2.1. The JCOMMOPS Ship Coordinator, Mr Martin Kramp, reported on activities and developments in JCOMMOPS regarding deployment opportunities and highlighted several items that may be of interest to the meeting.

9.2.2. JCOMMOPS gathers cruise and vessel information from different communities and has initialized new partnerships in the last intersessional period, with i) ship owners (e.g. Hamburg Süd, 45 owned / 58 chartered container vessels), ii) ship builders (e.g. STX, MSC liners / Queen Mary 2), iii) schedule coordinators (e.g. UNOLS) iv) ship operators (e.g. ProLarge) and v) event managers (e.g. Cornell Sailing). These agreements are established top-down, in general with the board of directors, and target long-term and wide-spread activities.

9.2.3. Synchronization mechanisms with key metadata sources from above organizations are currently set up by the new JCOMMOPS Information Technology (IT) engineer. Tools to easily provide cruise information and operation or maintenance requests are also under construction. Many deployments have been realized in the last intersessional period based on cruise information pushed by JCOMMOPS into the community, or indirectly by cruise plans made available through the JCOMMOPS Coordination for GO-SHIP, but with a number difficult to measure. This will be easier in the future by a dedicated monitoring on the GO-SHIP side.

9.2.4. Mr Kramp stressed that the Ship Coordination would become more efficient if the recommendations and decisions from the former meetings, in particular regarding the submission of deployment or maintenance plans, needs and opportunities to JCOMMOPS, would be better implemented by the community. Many and particularly free-of-cost opportunities remain unused at the moment. It would also be beneficial to have more information regarding locations and status of warehouses.

9.2.5. The Ship Coordinator further reported that Sailing Vessel Lady Amber is still available in South Africa for substantial, cross-programme and low cost operations. After training activities and some technical modifications (in particular, a crane module is now available) the vessel has in the meantime also successfully proven its capacities in the deployment and recovery of larger instruments, such as wave gliders.

56: http://wo.jcommops.org/cgi-bin/WebObjects/JCOMMOPS.woa/wa/map?type=EBD

9.2.6. Regarding further progress with the sailing community, Mr Kramp reported on a successful deployment test cruise with floats and drifters from racing yachts, established in very rough conditions during the last OceanoScientific Campaign. Based on these results and coordinated by JCOMMOPS, deployments of floats and drifters are now planned in the upcoming Barcelona World and Volvo Ocean Races. In addition to their willingness to deploy, these events are also willing to co- or fully fund the deployed instruments in the future. Such contributions would go beyond former in-kind contributions from volunteer ships and hopefully mark the beginning of a new era. While noting that there are a number of DBCP requirements to follow, the Panel welcomed this activity as a Pilot Project led by JCOMMOPS in consultation with Panel members and the GDP.

9.2.7. The Panel noted with appreciation the good progress and agreed that JCOMMOPS is able to propose continuously deployment and other operation opportunities in all sea areas, both short and long term. From the new location in Brest, and with all staff members eventually reunited there, JCOMMOPS is in an excellent strategic position for the further development of an integrated Ship Coordination.

9.2.8. The meeting made the following recommendations:

(i) The meeting recognized the success of the JCOMMOPS Ship Coordination and encouraged the panel to support a better implementation, in particular by providing deployment plans, needs and opportunities to JCOMMOPS.

(ii) The meeting recommended continuing with a mix of solutions as currently proposed, with as many opportunities from RVs as possible, enriched with other opportunities from commercial, charter and sailing vessels.

(iii) The meeting agreed that the operational opportunities in general, and the educational and communication potential of particularly Lady Amber cruises, Sailing Rallies and Races should be better exploited, in cooperation with other observing systems (***action; JCOMMOPS; DBCP-31***).

9.3. Data timeliness

9.3.1. The former Technical Coordinator, Ms Stroker presented an overview of the pattern of buoy data availability delays (timeliness) for the last year. She reported that she produced JCOMMOPS monthly maps focusing on delays. These maps are posted on the DBCP Website and show that during the year, about ½ the drifting buoys reported to the GTS in less than 60 minutes and 90% reported in less than 120 minutes after observation time.

9.3.2. The Panel is reminded that just prior to DBCP-29, the moored buoys were removed from the timeliness reports. There still has not been a proper way decided to represent the moored buoys in a timeliness map and this task should be focused on during the next intersessional period.

9.3.3. At the previous DBCP session, the panel recommended to continue to deploy Iridium drifting buoys in areas where delays are greater than 120 minutes. During the last year, 491 Iridium drifting buoys were deployed and less than 5% of those deployed in the last year were deployed in areas of long delays.

9.3.4. The Paned noted that CLS is continuing its efforts to improve the coverage of the real-time antennas in the South Atlantic and the Southwest Pacific. Concerning the South Atlantic area, new antennas are scheduled to be installed in late 2014 to early 2015 in Ascension Island and French Guyana. Concerning the Southwest Pacific area, a

collaborative installation and operation plan has been established and a new antenna is planned to be installed in the framework of the WMO Regional ATOVS[57] Retransmission Services (RARS) project on Easter Island in late 2014 to early 2015.

9.3.5. As recommended during DBCP-28, JCOMMOPS and CLS have performed regular assessments of the global buoy timeliness maps and the Argos Data Mean Disposal Time Maps. These maps are in general agreement on the areas where timeliness is of the biggest concern (e.g. South Atlantic and South Pacific).

9.3.6. JouBeh Technologies reported that in January 2014, Environment Canada revised the processing procedures for the transfer of drifting buoys messages to the GTS. This change resulted in the throughput time at their communications centre dropping from an average of 7 minutes to an average of under 1 minute. This has reduced the current average time from drifting buoy observation to transfer to the GTS to under 20 minutes. It is planned that an upgrade to the JouBeh Technologies Inc. data collection from the buoys, the encoding of the data in environmental units and transfer to Scotia Weather Services Inc. will likely reduce their processing to under 5 minutes. This upgrade is related to a move to full Direct IP communications from the Iridium gateway and is planned for release January 2015.

9.3.7. The Panel noted the following recommendation from Joubeh:

(i) The DBCP set a standard for barometric pressure errors for GTS messages above which the communications provider would automatically suppress the delivery of the barometric pressure report from the drifting buoy to the GTS; and

(ii) The DBCP set a standard for sea surface temperature errors for GTS messages above which the communications provider would automatically suppress the delivery of the sea surface temperature report from the drifting buoy to the GTS.

9.3.8. The Panel recalled that these are documented in DBCP Technical Document No. 37[58], Guide to buoy data Quality Control tests to perform in real time by a GTS data processing Centre.

9.3.9. The Panel recalled that Terminology is important, and agreed that the timeliness of buoy data should refer to the time of the observations reporting on GTS to reach the end users (i.e. received from the GTS), i.e. GTS reception time minus observation time. The panel recommended that members use this terminology when using data timeliness information (***action; DBCP members; ongoing***).

9.3.10. The meeting made the following recommendations:

(i) To continue to deploy Iridium drifting buoys in areas where delays are greater than 120 minutes (***action; DBCP members; ongoing***);

(ii) DBCP and CLS should perform regular (every 6 months) assessments of the global data buoy timeliness by comparing JCOMMOPS delay maps and Argos Data Mean Disposal Time Maps (***action; CLS assisted by TC-DBCP; ongoing/semestrial***); and

(iii) To investigate timeliness of the moored array and determine the best way to represent these in the reports (***action; TC-DBCP; DBCP-31***).

57 Advanced TIROS (Television and Infrared Observational Satellite) Operational Vertical Sounder
58: http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=5657

9.4. Vandalism

9.4.1. Shannon McArthur (USA) reported on behalf of the Chairperson of the DBCP Working Group on Vandalism, Dr Venkatesan (India), on the working group activities during the last intersessional period. He recalled that the Working Group initiated work in line with WMO Resolution 25 (Cg-16)), IOC of UNESCO Resolution XXVI-6, and the UN General Assembly urged UN Members to take necessary action to cooperate with IOC, WMO and the Food and Agriculture Organization (FAO) to address damage to ocean data buoys. The primary objective is to ensure the continuity of attention within the DBCP, WMO and IOC on the subject of buoy vandalism and to discover, share and promote counter vandalism best practices throughout the international buoy operator community. The Working Group activities are also consistent with the report on "Ocean Data Buoy Vandalism - Incidence, Impact and Responses", DBCP Technical Document No. 41, which includes in particular nine recommendations as reproduced in Appendix A of DBCP-29 doc. 8.2.

9.4.2. During the last intersessional period, the Working Group circulated the DBCP form for reporting incidents of vandalism on data buoys (Appendix A of DBCP-30 preparatory document No. 9.4) to member countries. This is to promote the collection of systematic statistics on vandalism, to increase capture and exchange of damage records and performance measures for ocean observing networks, and to conduct comprehensive cost-benefit assessments and risk-value analyses taking into account life, health, social and economic impacts of vandalism and damage to ocean observing networks and data systems. The Panel noted that thanks to this feedback mechanism, the USA (NOAA PMEL and NOAA NDBC) China, Japan, Brazil, India and Spain have reported 91 vandalism events during the last intersessional period.

9.4.3. Four meetings with participation from India, Japan, Spain, and USA were organized in USA and India during the last intersessional period to discuss the data buoy vandalism issue.

9.4.4. India has also continued its societal awareness campaign initiated in 2011 with 4 activities during the last intersessional period, including a Fishermen awareness programme in Goa; an Awareness programme with Boat owners in Chennai; a Workshop on Chennai Marine Expo 2014 organized by Fishermen Trust at Kasimedu; and a meeting with Fishermen Community at Krishnapatnam Port, Andhra Pradesh. China has informed the mariners and in particular the fishing communities on the issue through direct discussions, and the distribution of brochures. Spain has edited a brochure with buoy information explaining the uses of the information and buoys characteristics and positions. It is being disseminated to fishermen associations and many other sea users.

9.4.5. The Panel also noted the efforts made against vandalism, including (i) design of anti-vandalism camera for buoys (e.g. BuoyCAM), (ii) anti-theft hardware on some moorings (e.g. PMEL, China), (iii) reduction of the resolution of the moored buoy position on the GTS reports and the NDBC websites, (iv) real time visual observation of a moored buoy from the shore (India)

9.4.6. The Panel agreed that efforts remain to be made on anti-vandalism data buoy designs, mechanisms for the monitoring of incidents, including by using webcams, and on awareness programmes.

9.4.7. The Panel agreed with the following:

(i) Urged countries to report even if no act of vandalism in their country report;

(ii) Recorded that it would be difficult to quantify the economic loss due to vandalism

considering the complexity involving direct and indirect costs such as loss of valuable data and thereby loosing commitment to society;

(iii) Noted the continued societal awareness campaign being pursued by India with a regional working mechanism in place and relocation of routinely affected locations helped India to reduce incidents;

(iv) Appreciated the work on improvisation of design to have fool-proof design and camera mounted buoys by NOAA NDBC USA, India, and Korea to monitor buoy systems at Sea;

(v) Recognized the work and accomplishments on counter buoy vandalism by the U.S. Intergovernmental Team on Counter Buoy Vandalism and encourages the continuation of this work;

(vi) Following the UN General Assembly, IOC and WMO resolutions to involve International Maritime Organization (IMO) and FAO through IOC, which will give positive result on inadvertent damage to the buoys and not to use these buoys as Fish Aggregating Devices (FADs). The Panel agreed on the usefulness to organize a second WMO-IMO high level meeting in the next two years to safeguard the buoys at sea, and requested the Secretariat to include such recommendation in preparatory documentation for WMO 17th Congress (***action; WMO Secretariat; ASAP***);

(vii) Agreed to take the Pilot Project on awareness campaign and utilize funds provided by DBCP with the assistance of IOC. Urge countries to provide information on vandalism through country report to maintain records about vandalism;

(viii) Urged the capacity building workshops should include “Safe Guarding of Buoys” part of the agenda; and

(ix) Education and outreach should be enhanced, and the DBCP report on data buoy vandalism should be more widely distributed, including through the web.

9.5. Metadata

9.5.1. The former Technical Coordinator, Ms Kelly Stroker, reported on various activities dealing with metadata during the last intersessional period. In terms of the JCOMMOPS database, inputs are taken regularly from platform operators and telecommunication providers either on deployment or as a status report. She thanked the Moored Buoy operators that are providing regular updates to metadata and encouraged others to use similar methods. She outlined some examples of websites or email notifications that are useful for JCOMMOPS and discussed the importance of this information.

9.5.2. Ms Stroker emphasized the importance of receiving plans of deployments and defined a few metadata fields that would be necessary to have in the JCOMMOPS database. She thanked those operators that are regularly supplying JCOMMOPS with deployment plans and encouraged others to do so. Storing this information and displaying it for the community would be valuable for all operators.

9.5.3. Operators of Iridium platforms have continued to actively report metadata to each other and JCOMMOPS upon deployment. The former TC reported that JCOMMOPS is in communication with Iridium Value Added Resellers (VARs) to create a metadata feed similar to the situation with the Argos system. The TC has started to receive QA Reports in

an email from Scotia Weather that is the beginning of such reports.

9.5.4. The Panel noted that within the larger framework of Global Earth Observing System of Systems (GEOSS), the method for collecting and disseminating metadata has been defined. An important element of metadata dissemination is to follow a standard format. JCOMMOPS stores all metadata in a database and the delivery and format of this metadata can be customized through style sheets or web-services to the end user. JCOMMOPS will work with the NOAA Observing System Monitoring Center on defining ISO[59] metadata for Argo and DBCP programs.

9.5.5. The Panel agreed that the TC should continue to work with the TT-MB to define a metadata template that is useful for all moored buoy operators. A template is available on the DBCP website and will be approved at this session.

9.5.6. The DBCP Terms of Reference has been modified to include monitoring of data and metadata from rigs and platforms reporting surface marine meteorological and oceanographic data. The TC needs to devote more time to identification of the rigs and platforms and seeking out metadata (See also DBCP-doc 11.2)

9.5.7. The meeting made the following recommendations:

(i.) The Panel encouraged all buoy operators to provide a website of plans and deployment information for drifting and moored buoys similar to AOML, NDBC, and Canada as well as continuing e-mail notifications as necessary; and

(ii.) The Panel recognized that operators of Iridium platforms have continued to actively report metadata to each other upon deployment. This is valuable and it was recommended continuing to do so beyond the life of the Iridium Pilot Project.

9.5.8. The meeting decided on the following action items:

(i.) Provide JCOMMOPS with planned deployment metadata in the format specified (***action; Panel members; asap***); and

(ii.) JCOMMOPS to develop a method to ingest moored buoy metadata (provided in netCDF, tagged pairs and XML formats), to obtain these metadata from moored buoy operators and to make them available to users via their new web-site (***action; JCOMMOPS and moored buoy operators; DBCP-31***).

9.6. Other issues to be discussed, as proposed by the Task Teams

9.6.1. The Panel considered other technical issues requiring international coordination or action.

Lloyd's high risk area

9.6.2. JCOMM to write to Lloyds of London regarding high risk areas, including the Arabian Sea, encouraging it to review the situation vis-a-vis actual piracy statistics, and possibly reduce the area to allow the research activities and deployments in the DBCP / IBPIO area of interest (***action; Secretariat; end 2014***).

Coordination with other JCOMM Programme Areas

9.6.3. The Panel also agreed that more coordination was also required with the other

59 International Organization for Standardization

JCOMM Programme Areas (i.e. Services and Forecasting systems / SFSPA, and Data Management / DMPA) to better take into account their requirements regarding the provision of buoy data. It invited the DBCP Chair to contact the SFSPA and DMPA Coordinators, in the view to identify such requirements, and to propose possible recommendations and actions at the next Panel Session (***action; DBCP Chair; DBCP-31***).

Joint WMO-ITU-IOC project for the use the ITU[60] telecommunication cables

9.6.4. Mr David Meldrum updated the meeting on progress with the joint ITU/WMO/IOC initiative to instrument future subsea telecommunications cables with sensors for climate monitoring and disaster warning. Since the first workshop (Rome, 2011) a Joint Task Force (JTF) had been formed, drawing on a wide representation from the science, industry and regulatory communities. Initial industry fears that sensor-equipped cables would imperil the integrity, profitability and legal status of subsea cables had gradually subsided and all parties were now optimistic that JTF objectives could be achieved.

9.6.5. In particular, major progress had been made at the most recent workshop, held in conjunction with Submarine Networks World, (Singapore, September 2014) towards establishing a pilot project that would demonstrate the technical feasibility and societal benefit of an instrumented cable. Strong arguments were made in favour of a tsunametry pilot because of its relative ease of implementation, its immunity to the vandalism and storm damage that affected the existing network, and its potential for demonstrating important societal benefit.

9.6.6. Further information on the JTF initiative can be found on the web[61].

10. INFORMATION REPORTS

10.1. Argo

10.1.1. Jon Turton (United Kingdom) presented on behalf of the Argo Steering Team, the Argo Data Management Team and the Argo Technical Coordinator. Despite fixed or falling investment in several national programs, Argo has largely been able to maintain coverage as originally designed (largely due to longer float lifetimes). In addition, pilot deployments into sea-ice zones, enhanced boundary current and equatorial arrays, marginal seas and also deep ocean floats are also occurring, increasing the total float count beyond the original 3,000 float target. There are increasing deployments of floats with biogeochemical and optical sensors. The Argo Steering Team is considering creating Task Teams to help coordinate these enhancements, and to facilitate the sharing of technical and scientific experience within these activities and with the wider Argo and ocean community.

10.1.2. The Argo Data system continues to be challenged with the complexity of new parameters and missions within the array. The new data format is being rolled out: V3.0 is a major upgrade in format flexibility and more comprehensive and uniform meta-data. Trajectory data remain a work in progress and a challenge to many national data centres. In some nations, funding is becoming available to help with management of complex biogeochemical data streams, while remaining near-zero in others. Extensions to the Argo BUFR format to allow for additional near-surface and dissolved oxygen are presently under validation.

10.1.3. The Panel also noted that the increase in the use of high-bandwidth satellite communications is driving a change in the Argo data set from relatively low vertical (50-70

60 International Telecommunication Union
61: http://www.itu.int/en/ITU-T/climatechange/task-force-sc/Pages/default.aspx

points) to high (~500 points) vertical resolution, and more accurate surface locations.

10.2. Buoy data management centres

10.2.1. The Panel reviewed the report of the Marine Climate Data System (MCDS) trial Global Data Assembly Centres (GDACs), operated by Météo-France, presented by Mr Gilbert Emzivat (France).

10.2.2. The Panel noted that the buoy data are archived on the basis of GTS data, and that some additional quality control is done in delayed mode.

10.2.3. Mr Mathieu Ouellet (Canada) then reported on the activities of the Marine Climate Data System (MCDS) trial Global Data Assembly Centres (GDACs), operated by MEDS[31].

10.2.4. Until the functions of GDACs under the new MCDS are clarified, MEDS[31] maintains its role to acquire, processes, quality controls and archives real-time drifting and moored buoy messages reporting in FM18 Buoy Code and BUFR over the Global Telecommunications System (GTS), as well as delayed mode data acquired from other sources.

10.2.5. MEDS[31] has also defined a monthly report on data received that is being used to identify gaps and overlaps with the data received at Météo-France.

10.2.6. The Panel noted that the MEDS[31] is planning to make by updating the drifting buoy data in their archives discoverable through the IODE Ocean Data Portal (ODP), and thereby through the WMO Information System (WIS).

10.2.7. The Panel thanked both centres for their reports. The full reports, available in DBCP-30 preparatory document No. 10.2, will be included in the DBCP annual report for 2014.

10.3. Satellite data telecommunications

Argos

10.3.1. The Panel recalled that Argos is a global satellite-based location and data collection system dedicated to studying and protecting our planet's environment. CLS, is the operator of the Argos system on behalf of NOAA, CNES[62], EUMETSAT[63] and ISRO[64], and continues to maintain and improve an operational service for all Argos users, especially for the meteorology and ocean community at a >99% level of availability.

10.3.2. Scott Rogerson (USA) reported on the status and plans (including long term) of the Argos space segment. Today the Argos system is composed by a space segment of 6 operational satellites with 3 NOAA POES [65] (15, 18, 19) 2 EUMETSAT spacecrafts (METOP[66]-A & B) and 1 Indian satellite (SARAL[67]). The ground segment has 7 global receiving stations (6 in the northern polar region and 1 in Antarctica) and 65 local real-time stations worldwide.

10.3.3. Operational highlights from the last 12 months include the decommissioning, after 13+ years of service, of NOAA-16 (NOAA-L prior to launch) on June 9, 2014, due to a

62 Centre National D'Etudes Spatiales (France) / French Space Agency
63 European Organization for the Exploitation of Meteorological Satellites
64 Space Research Organization (India)
65 Polar Orbiting Environmental Satellite
66 Meteorological Operational satellites of the EUMETSAT Polar System (EPS)
67 Satellite with ARgos and ALtika (France, India)

major spacecraft communications anomaly.

10.3.4. Mr Bill Woodward (CLS America) reported on Argos operations and system improvements during 2012-2013. The Argos processing centre in Toulouse successfully replaced the Argos processing servers with virtual servers in July 2013 and also successfully upgraded the Oracle archive and real-time databases in December 2013 and January 2014. In 2013-2014, the Argos real-time stations network were quite steady (~66 stations) with 2 new local stations added in Tahiti and in Bali. The 3 stations operated by IRD (Nouméa, Cayenne, La Reunion) were removed in 2013 due to operational maintenance difficulties. These actions combined with substantial progress in implementing the Real-time Antenna Upgrade Project (11stations already upgraded, 6 scheduled for upgrade by the end of 2014 and 3 additional upgrades scheduled for 2015) all continue to improve the global timeliness for data collected using the Argos system.

10.3.5. Improved performances in terms of data mean disposal time observed during the last 12 months have been observed and they are mainly due to the 2 new satellites in the system (METOP-B & SARAL), to more HRPT Stations receiving METOP-A and B (Miami, Monterey, Hawaii, Lannion, Lima, Cape Town, Hatoyama, La Réunion, Libreville, EARS[68] Stations) and the upgraded real-time stations to track SARAL Satellite with the TM_100min capability. SARAL is downloading to compatible Argos real-time stations all datasets acquired in the last 100 minutes, which significantly improves the Argos data timeliness. CLS efforts will continue to improve the coverage of the real-time antennas in the regions where it is needed especially with 2 strategic installations: Ascension Island for the South Atlantic and Easter Island for the South Pacific.

10.3.6. Mr Woodward explained that CLS continues to provide the GTS processing for all DBCP Argos equipped drifters and moored buoys in compliance with WMO and DBCP Task Team on Data Manaement (TT-DM) recommendations. The CLS GTS processing system as well as the quality of the data and the entire Argos system performance is monitored 24/7.

10.3.7. The Panel noted that an 30 month "Argos chipset" project called SHARC (Satellite High-performance ARGOS-3/-4 Receive/transmit Communication) has been implemented by an European consortium to minimize Argos data communications power requirement. The project objective is to design, build and test a miniature, low-cost ARGOS-3/4 chipset (Asic) that enables two-way data communications and is fully backward compatible with Argos 2. Units are expected to be available for manufacturer test and evaluation by summer 2015.

10.3.8. The Panel also noted that a new Argos hand-held direction finder (called a Goniometer) manufactured by Xerius was now available for sale/lease.

10.3.9. The meeting recommended that CLS include in their future reports to the DBCP the extent and availability of the CLS airtime and data processing services with Iridium satellite data communications (***action; CLS; ongoing***).

Other satellite data telecommunication systems

10.3.10. Under this agenda item, Mr D Meldrum reviewed the current status and future plans for the Iridium 2-way satellite communications system, which was now well established within most parts of the data buoy and environmental observation community for reasons of continuous availability, data timeliness, ease of implementation, future availability and cost.

68 EUMETSAT Advanced Retransmission Service

10.3.11. The current 66-satellite constellation remained complete, but the number of on-orbit spares had fallen to two. Overall, the constellation was in a slightly healthier state than had been predicted some years ago, and was expected (as a result of a number of independent studies) to remain fully operational beyond the commencement of the rollout of the replacement constellation in mid-2015. In financial terms, revenue continued to grow, and data services, such as Short Burst Data (SBD) service used by buoy operators, were enjoying a huge increase in traffic compared with some years ago.

10.3.12. The replenishment constellation, called Iridium NEXT, was fully funded and under construction by prime contractor Thales. The rollout schedule, involving launching nine satellites at a time on board the new Falcon vehicle, had not changed significantly over the last 12 months, and appeared to be on track. The new constellation was promised to be fully backwards compatible with the current constellation, although some transitional difficulties could be expected. NEXT would additionally offer higher bandwidth services, and the possibility to embark third party payloads. A new company, AIREON, had earmarked some of this payload space to develop a truly global aviation monitoring and control service.

10.3.13. Iridium was also engaged with many partners in the development of new products and services, including its 128 kbps near-broadband product, OpenPort. This was increasingly being used by shipping companies to provide broadband services to their vessels in preference to Inmarsat and other VSAT[69] services. Of particular interest to the environmental observation community were new and smaller modems, such as the 9603, and new modem chipset, which would offer the potential to build highly integrated and miniaturised sensor/communication packages. In due course, these would be exploited by many observational communities, including animal trackers.

10.3.14. Nonetheless, the Panel noted that the 2-way architecture of Iridium of necessity dictated that the platform engage in a dialogue, lasting several seconds, with the constellation as a preamble to data transfer. This could adversely affect communication success in situations of signal disruption, as might be encountered in rough seas and by marine mammals. In such situations, 1-way systems such as Argos-2 and Argos-3 in 'pseudo-ack' mode might be preferable. There had also been some serious issues caused by a firmware bug within certain models of the 9603 SBD[70] modem, but these had now been resolved. A new version of this modem, the 9603N, was about to emerge, offering a number of performance enhancements, but unfortunately retaining the same fragile connector as the 9603.

10.3.15. The Panel also noted that for many users the costs of operating Iridium platforms was apparently much less than for Argos counterparts. However, Iridium did not offer an equivalent of the Argos service, which included a number of value-added functions, including conversion of raw data to physical units, both real-time and delayed mode Quality Control (QC), GTS formatting and insertion, archiving, and open access to all parts of this chain by the JCOMMOPS TCs. As a result, many operators had created their own 'back-office' services and took care of their own GTS insertion using their existing infrastructure. The Panel was concerned that the existence of multiple data processing centres could potentially affect data integrity and uniformity, particularly for climate applications, and restricted the TC's ability to monitor all parts of the data chain. Nor was this user community currently in any position to exert influence over future Iridium pricing policy: a situation that diverged from the current Argos Joint Tariff Agreement (JTA) arrangements. More recently, the US Defense Information Systems Agency (DISA) had offered Iridium services through the US Department of Defense (DoD) gateway to US government agencies. While this would most likely be much cheaper than the commercial service offered by the likes of CLS and Joubeh, it was very doubtful if customer support would equal that offered by the

69 Very Small Aperture Terminal
70 Short Burst Data

commercial resellers.

10.3.16. The Panel agreed to reimburse the Scottish Association for Marine Science (SAMS) the accumulated Iridium air time of surviving Iridium Pilot Project drifters up to 31 December 2014, and requested the Secretariat to facilitate the required payment to SAMS in 2015 from the DBCP Trust Fund up to USD 15 000 (***action; Secretariat; 31 Mar. 2015***).

10.3.17. The meeting thanked Mr Meldrum for his impartial and informative presentation, and asked that he report again to the next session of the Panel (***Action; D. Meldrum; DBCP-31***).

10.4. JCOMMOPS Activities

Note: for JCOMMOPS management and budget, see agenda item 11.1 below

10.4.1. The Technical Coordinator, M. Kramp, on behalf of JCOMMOPS, presented a number of activities under active developments including: new information system and website(s), development of indicators and metrics with OOPC and WMO (OSCAR[71]), partnerships with civil society, industry and sailing community, new Cruise Information Centre, global service for operations at sea, educational activities. On this regard, JCOMMOPS committed to the following key action items:

(i.) to provide the written specifications of the network metrics, outcome of the JCOMMOPS-OSMC-OOPC 2014 meeting, and clarification of the complementary nature of the three entities (***action; JCOMMOPS, OSMC, OOPC; November 2014***);
(ii.) to provide feedback to OOPC on networks specification template before forward to Steering Teams and Panels for finalization (***action; JCOMMOPS TCs; November 2014***); to meet with OSCAR representative in Brest in November 2014 in order to start technical cooperation;
(iii.) to release a beta version of the new JCOMMOPS web based dashboard for community feedback (***action; JCOMMOPS; December 2014***);
(iv.) to release the first finalized version of the website by March 2015 around JCOMMOPS inauguration (***action; JCOMMOPS; March 2015***);
(v.) to provide a detailed work plan for 2015-2017, as well as reporting templates for each program, and for the integrated structure, to be discussed at the next OCG session, and then quarterly with OCG chairs (***action; JCOMMOPS; early 2015***)

10.4.2. JCOMMOPS recalled that a substantial work will be required to feed and synchronize the new database with i) all ship related metadata and ii) DBCP platforms related metadata (***action; DBCP and Ship TC; asap***).

10.4.3. JCOMMOPS recalled that the switch to BUFR will require a special effort in capturing new metadata from GTS statistics. (***action; TC-DBCP; asap***).

10.4.4. JCOMMOPS reiterated that the registration (manual or automatic) of all platform deployments or maintenance, and cruises was essential to the Centre activities. (***action; TC-DBCP and Panel members, Ship TC; asap***).

10.4.5. JCOMMOPS highlighted the high contribution in equivalent Argo floats received from China (by more than 230 new units operating with free and standard data exchange), outcome of a strong national coordination effort, see item 10.1, and encouraged the DBCP to continue the effort with regard to drifter data not yet part of the DBCP network and not yet distributed on the GTS. The proactive chasing for ancillary contributions not formally

71 Observing System Capability Analysis and Review Tool

under the Panels umbrella is a substantial effort for the TCs but ensures a larger international and thus a long run support for the Panel, and more real-time data for operational users (***action; TC-DBCP and Panel members; on-going***).

10.4.6. JCOMMOPS recalled that the operations set up with civil society and industry (see item 9.2), including fund raising, instrument sponsoring, promotion of networks and educational activities, are highly visible given their new specificities. They result from long run vision in support of the GOOS, that has to be discussed as Member States and Countries have shown limitation in funding capacities. These activities represent however a marginal workload for the Centre but could offer interesting opportunities.

10.4.7. JCOMMOPS presented the status of the development of its new web based monitoring dashboard. The Panel mentioned he was looking forward to using and comment on this new generation of web services. The Panel requested the Technical Coordinator to gather feedback from Panel members in this regard (***action; TC-DBCP; DBCP-31***).

10.4.8. JCOMMOPS Invited the Panel to follow the Centre and community news on its twitter http://www.twitter.com/jcommops , and suggest for highlights.

10.4.9. JCOMMOPS mentioned that it is developing a mobile app to facilitate deployment management (on board ships), ancillary ship data distribution on GTS, and networks monitoring. JCOMMOPS will as well actively participate in the UNESCO/GEO [72] YouthMobile competition, “empowering youth with the skills and confidence to develop mobile Apps for sustainable development”. Data source for this contest will focus on Argo and more generally GOOS data. See http://youthmobile.org

10.4.10. JCOMMOPS mentioned that it will organize an educational workshop following up on the Argo Steering team meeting in Brest, within the Oceanopolis aquarium, to focus on “ocean voyagers”, i.e. platforms, ships, that are adopted through different national initiatives. Meeting agenda is being finalized and audience will include representatives from USA, Canada, Europe, South Africa, Pacific Islands, science and educational experts. The Panel, its TC, and the NOAA “adopt a drifter” program is invited to participate to such effort.

10.4.11. The Panel noted that we are entering a time of stability for JCOMMOPS with the new incumbent for the position of TC-DBCP, the Ship Coordinator’s position, and the move to Brest. The Panel thanked JCOMMOPS and its staff for its valuable contribution to the activities of the Panel and beyond to other JCOMM OPA observing panels and associated programmes. The Panel thanked particularly Mr Belbéoch for his leadership role in running and evolving the JCOMMOPS, including the successful migration of the Centre to Brest, and for getting financial contribution from the local government in Brittany region. The Panel also thanked CLS and IFREMER [73] for their support to JCOMMOPS in providing the required infrastructure.

10.4.12. The Panel recommended that JCOMMOPS consider providing training to developing countries, in particular to Asian countries (***action; JCOMMOPS; DBCP-31***).

10.4.13. Again the Panel agreed that the Ship Coordinator’s position has been successful, and thanked Martin Kramp for his efforts. The JCOMM Ship Observations Team (SOT) Chair recommended to transfer the VOS website from the BOM to JCOMMOPS (***action; M. Kramp; ASAP***).

10.4.14. The Panel recommended that JCOMMOPS should play a role in monitoring the quality of the BUFR message content (from a format and consistency perspective) (***action;***

72 Group on Earth Observations
73 French Research Institute for the Exploitation of the Sea

JCOMMOPS; DBCP-31).

10.4.15. The Panel requested JCOMMOPS to keep the list of GTS bulletin headers used for ocean observing platforms up to date, and to make it available via the JCOMMOPS website (***action; JCOMMOPS; mid-2015***).

11. ORGANIZATIONAL ISSUES

11.1. JCOMM activities and management

Guidance of the JCOMM OCG co-Chair

11.1.1. Mr David Meldrum, JCOMM OCG co-chair, presented an overview of the OPA 10-point forward look (***Annex XIII***) that had been presented to the eleventh Session of the JCOMM Management Committee (MAN-11, Geneva, 20-23 October 2014), and the outcomes of the meeting that translated into actions and recommendations for the DBCP. In so doing, he noted that this year was the midpoint between JCOMM-4 and JCOMM-5, and in the OceanObs decadal meeting cycle. Immediate major issues were the requirement for better management tools to monitor the status of the observing network, and the absence of a clear strategy and set of priorities for JCOMMOPS. Looking forward, there were clear needs to harmonize data management systems, evaluate emerging technologies, and to be smarter in designing and deploying the composite ocean observing system of the future.

11.1.2. For the DBCP, the requirements were as follows:

(i.) Assist OCG co-chairs in defining a strategy for JCOMMOPS which more clearly defines its areas of activity and reasserts its priorities (***action; DBCP and OCG co-chairs; OCG-6***);
(ii.) Pay close attention to succession planning and report back to OCG-6 (***action; DBCP; OCG-6***);
(iii.) Initiate a pilot project for the creation of an 'Open-Access WIS node' to allow 3rd party platform operators to have free access to the GTS and WIS for data insertion and validation (***action; DBCP and OCG co-chairs, ToRs and work plan; 31 Jan 2015***);
(iv.) Implement recommendations of Keeley Report to the extent possible (***action; DBCP; ongoing***);
(v.) Engage with emerging activities such as the IIOE-2, TPOS 2020 and the increased focus on coastal seas (***action; DBCP; ongoing***); and
(vi.) Actively horizon-scan to identify emerging technologies and methodologies that might be usefully evaluated through pilot projects (***Recommendation***).

Guidance of the JCOMM co-President

11.1.3. The JCOMM Co-President, Mr Johan Stander (South Africa) reported on the activities and developments of JCOMM during the last DBCP intersessional period.

11.1.4. The Management Committee (MAN) most recently met just prior to DBCP-30, and its recommendations and guidance will be tabled at the session. Succession planning within JCOMM remains of key concern to MAN, in particular the appointment of a sufficient number of office bearers within its Programme Areas and Expert Teams to ensure the continuity and sustainability of its mission.

11.1.5. The JCOMM co-President, Johan Stander (South Africa) emphasized "right-

sizing" the activities of JCOMM to the availability of human and financial resources, focusing on areas where we can best leverage JCOMM. Fundamentally, JCOMM worked on volunteer effort, and there was a big challenge to identify community leaders in new areas for JCOMM and convince them to participate. It was important to try to get JCOMMOPS, WMO, and IOC involved in the appropriate regional projects (such as EU projects) related to its areas of work, in order to stay relevant.

11.1.6. The Panel noted that JCOMM can promote its systematic role - in evaluating and coordinating new integrated requirements and systems - in all of its programme areas and with this is mind during the recent WMO Executive Council (EC), members were requested to work closer with the oceanographic community ensuring that platforms are shared which may result in cost sharing while data becomes real time available as Organisations are not always interested in real time data. The Panel requested the JCOMM co-President to make the same appeal at the IOC assembly for the oceanographic community to work closer and with the Marine meteorological community for the same purpose as mentioned above as well as Co-President responsibility in building awareness within the governing bodies of the importance of JCOMM (***action; J. Stander; mid-2015***).

11.1.7. We also recognized to what extent JCOMMOPS plays a crucial role in this systems view of the observing system, but a challenge for JCOMM was to have a better link between in situ and satellite systems and for all of us to showcase JCOMMOPS.

JCOMM Strategy

11.1.8. Johan Stander introduced the finalized Strategy for JCOMM 2012-2017, in line with WMO Strategic Plan and IOC Medium-Term Strategy as well as against the guidance and decisions at JCOMM-4, and revise it as appropriate. The Strategy was endorsed by MAN, to; 1) ensure Commission's priorities during the intersessional period would respond to those of WMO and IOC; and, 2) efficiently use available resources to meet the requirements of the Members/Member States.

New JCOMM Structure

Interagency Collaboration for Metocean Information Services

11.1.9. The collaboration were highlighted with IMO & IHO [74] on Maritime Safety Information and, in particular, the introduction of the IMO resolution on World-Wide

74 International Hydrographic Organization

Metocean Information & Warnings Service, but also cautioned on concerns expressed within both IMO & IHO about the timelines within which WMO/JCOMM operates and its possible impact on the regulatory timelines to which IHO and IMO operate. It is also to be noted that WMO collaborated closely with IHO in assisting them with the setting up of an online version of their regular user survey.

11.1.10. In the field of marine environmental issues, the setting up of a Task Team to consider the future strategy for support to Marine Environmental Response was also highlighted; this team is collaborating not only with IMO & IHO on the "operational" aspects of any services, but also with the IAEA[75] in the context of both their Emergency Response requirements and also their research laboratories.

Intercommission Activities

11.1.11. WMO Commission for Agricultural Meteorology (CAgM): JCOMM jointly with the WMO Commission for Agricultural Meteorology (CAgM) has established a Joint JCOMM-CAgM Task Team on Weather, Climate and Fisheries to enhance understanding and capabilities in marine climatology/oceanography and their impact on ocean fisheries.

11.1.12. WMO Commission for Basic Systems (CBS): TT Impact based forecasting, Seamless F/C as well as expected approval by Congress on Satcom Forum,

11.1.13. WMO Commission for Hydrology (CHY): Coastal Inundation Forecasting Demonstration Project (CIFDP).

11.1.14. WMO Commission for Instruments and Methods of Observation (CIMO): CIMO agreed that the development of a new CIMO Guide chapter on Measurements and Observations in Polar Regions would become one of CIMO priorities and DBCP can contribute with regard to moorings etc.

11.1.15. WMO Commission for Climatology (CCl): Joint CCl/WCRP-CLIVAR[76]/JCOMM Expert Team on Climate Change Detection and Indices (ET-CCDI).

11.1.16. Disaster Risk Reduction (DRR): JCOMM activities respond to these emerging requirement through; 1) assisting strategic planning and programmatic implementation; 2) offering best practices (e.g. CIFDP), and; 3) assisting implementation of (multi-hazard) Early Warning Systems for marine and coastal communities, and support enhancing user engagement (e.g. shipping, coastal communities). In addition, we should strive for an integrated DRR, which should include multi hazard approach.

Regional Marine Instrument Centres (RMICs) and related activities

11.1.17. The Panel noted with appreciation that the accreditation of Météo Maroc as an RMIC for Africa was progressing well, and that formal acceptance by the IOC and WMO governing bodies was expected in 2015.The creation of this RMIC would lead naturally to enhanced collaboration between Morocco, Kenya and South Africa in improving the quality and traceability of marine measurements throughout the region.

11.1.18. The Panel noted that a fourth JCOMM Marine Instrument Workshop for the Asia Pacific Region was organized in Weihai, China, from 21 to 23 October 2014, i.e. the week before this Panel Session. About 65 participants from 21 Members/Member States and international Organization attended the workshop.

75 International Atomic Energy Agency
76 Climate Variability and Predictability

11.1.19. The Panel noted that the RMIC workshop recalled the importance of ocean observations to achieve socio-economic benefits at the global, regional, national, and local (e.g. Weihai city) levels by addressing the requirements of WMO and IOC Applications, including the Global Framework for Climate Services (GFCS), and working in the multi-disciplinary frameworks of the IOC-WMO-UNEP[77]-ICSU[78] Global Ocean Observing System (GOOS) and the WMO Integrated Global Observing System (WIGOS).

11.1.20. The workshop participants had received training essentially on seawater salinity measurement techniques, calibration, and traceability. The workshop issued 12 recommendations. A workplan for RMIC/AP activities for 2015/2016 will be elaborated by the end of November 2014 on the basis of the workshop's discussions and outcome.

11.1.21. The Panel agreed that the RMIC workshop had offered the opportunity to have more participants from developing countries in the region at this Panel Session. The Panel thanked the National Centre of Ocean Standards and Metrology (NCOSM) and the State Oceanic Administration (SOA) for their efforts to organize the two events at the same location, and in a similar time-frame.

11.1.22. Mr Shannon McArthur (USA) reported on the RMIC for the WMO Regional Association IV (RA-IV) (RMIC/RA-4) activities since its establishment, and their plan to organize in late 2015 a JCOMM Marine Instrument workshop for RA-IV focusing on wave observations, and to link the workshop with the PP-WET pilot project workshop at the same venue. A comprehensive report will be provided to the Management Committee on the activities of the RMIC/AP-4. The RMIC/RA-4 has provided effective support to Members in its region of interest through specific instrument services and training activities. RMIC also provided additional training for member outside of RA-IV including Brazil, India, China, Western African nations, and the Republic of Korea. The Panel thanked the USA for its contribution to the JCOMM OPA.

JCOMM Salinity Measurement Intercomparison Pilot Project

11.1.23. The Panel noted that, following the recommendation from the Observations Coordination Group (OCG), a JCOMM salinity measurement inter-comparison pilot project had started in early 2014 under the leadership of the Regional Marine Instrument Centre (RMIC) for the Asia Pacific Region (RMIC/AP). 22 participants from 17 countries and one manufacturer (Seabird) are participating in the pilot activity. The experiment consists essentially in China sending two standard seawater samples to the participants. The salinity of these unknown standards is then to be determined by the participants. Results will then be compared, and a report produced. Details about the activity are provided on the JCOMM website[79].

JCOMM/GCOS Metrics Meeting, 28 April - 1 May 2014, Ramonville St Agne, France

11.1.24. The Panel noted that the issue of metrics remained of prime concern to JCOMM and awaited further guidance on this matter. A meeting was organized on the issue with key stakeholders, including representatives of JCOMM Observations Programme Area (OPA), the GCOS Ocean Observations for Physics and Climate (OOPC), the NOAA Observing System Monitoring Centre (OSMC), and JCOMMOPS in Ramonville Saint Agne, France, from 28 April to 1 May 2014. This meeting offered the opportunity to clarify the role and synergies between JCOMMOPS and the OSMC. A number of common indicators and metrics for the different programmes where specified from different perspectives

77 United Nations Environment Programme
78 International Council for Science
79 www.jcomm.info/ic1

(platforms/networks and EOV[80]/ECV[81]). A further detailed specification document will be provided by late 2014, and implemented by JCOMMOPS and OSMC.

Migration to table driven codes

11.1.25. The panel noted that as of May 2014 each of the Traditional Alphanumeric Codes (TACs) used to report oceanographic and marine meteorological data on the Global Telecommunications System (GTS) has a BUFR replacement. From a format definition perspective the migration can be considered complete, however, it remains for the operational centres reporting and retrieving data from the GTS to implement the BUFR templates.

11.1.26. The panel also noted that work is ongoing within the JCOMM Task Team on Table Driven Codes (TT-TDC) to define new BUFR templates as appropriate for marine platforms and observations not currently represented in BUFR. Examples include data from oil rigs and platforms and near surface values from Argo floats. A new class has also been opened up within BUFR for the definition of additional oceanographic parameters, such as those required to report bio-geochemical variables. BUFR descriptors within this class remain to be defined and it is currently planned to submit a proposal to the next meeting of the WMO CBS Inter-Programme Expert Team on Data Representation Maintenance and Monitoring (IPET-DRMM) in 2015 defining this class.

11.1.27. GTSPP

11.1.28. The Panel acknowledged the Global Temperature and Salinity Profile Programme (GTSPP) in playing an important role in the assembly and integration of oceanographic profiles (XBT[37], from Ship of Opportunity Programme (SOOP) lines among others, Conductivity Temperature and Depth measurements (CTDs)) and pseudo-profiles (thermistor chains, gliders) data circulating on the GTS. GTSPP collects data from 4 different GTS nodes (Japan, Germany, USA, Canada) in order to get complete coverage.

JCOMMOPS management and budget

Note: for JCOMMOPS activities, and panned developments, see agenda item 10.4 above.

JCOMMOPS Infrastructure & Budget

11.1.29. The Panel noted with appreciation the progress made toward a move of the office to Brest/Ifremer. It applauded the continuous support provided by Collecte Localisation Satellites (CLS) in the last decades and encouraged Ifremer to escort and further support JCOMMOPS development in the future.

11.1.30. The Panel noted that JCOMMOPS and IOC secretariat were preparing a new Memorandum of Understanding (MoU) for the hosting of JCOMMOPS in France, including office and general means rent via the French Research Institute for Exploitation of the Sea (Ifremer), and I.T. means via CLS. The IOC Executive Council requested the Executive Secretary, in cooperation with WMO, to report on the progress at its 28th session in 2015.

11.1.31. The Panel was invited to sustain and if possible lightly augment its contribution to JCOMMOPS, to support the transition to Brest and potential (new) rent requirements while all conditions with host country have not been yet fully negotiated, and needs have increased. An anticipated budget is given in Appendix B This budget is based on i) an initial services proposal by CLS and Ifremer, and ii) the principle, if agreed, to share common

80 Essential Ocean Variable
81 Essential Climate Variable

costs equally between the three pillars of JCOMMOPS: DBCP/OceanSITEs, Argo and SOT/GO-SHIP (***action; DBCP-EB; DBCP-31***).

11.1.32. The Panel noted that the support agreement between the 3 local authorities - extended city (Brest MetropoleOcéane), Département (Finistère) and Région (Bretagne) – and IOC/UNESCO will be signed in Brest in October 2014. The funding (100 k€/ year for 3 years) provided by the local partners was based on a proposal for 2014-2016 to support:

- administrative needs (full time staff)
- technical development (IT development subcontracting)
- operational activity (ship time)
- promotion and communication (to create leverage for continued support)

11.1.33. The Panel noted that the office will be formally inaugurated around March 2015. A meeting with JCOMMOPS governance could then be organized to evaluate the performance, study the budget, and draw priorities for the Centre.

11.1.34. The Panel commended JCOMMOPS for this important and strategic step forward.

11.1.35. JCOMMOPS thanked Kelly Stroker for her time spent with thin the Team and wish her good luck for the future.

11.1.36. The Panel reviewed JCOMMOPS budget management proposal, and acknowledged the complication of its structure, which has increased in recent years.

11.1.37. The Panel recalled that during DBCP-29 it had agreed that budget reporting for management purposes should be much simpler. The OCG had proposed the development of a structure that clearly labels each panel's contribution to JCOMMOPS with tracking of the country or organization that made the contribution on the income side, and identifies by panel the funds spent on salary and travel specific to the panel, and common costs including common IT staff, rent, infrastructure (software, licenses, etc.), activities, and overhead (taken by IOC and WMO on the funds they manage).

11.1.38. The IOC and WMO Secretariat have responded to these requests by devising a unified reporting tool (a fifteen page Excel spreadsheet) for contributions and expenditures on behalf of JCOMMOPS, which includes all five Funds, and specifies how activities and expenditures are allocated to each panel. The task of joining these budgets has been complicated by the variety of reporting mechanisms used by IOC, WMO and CLS auditors. Due to legal constraints, the proposed reporting tool cannot replace present audit reporting by the individual funds. Nevertheless, progress has been made and preliminary results were presented to the Panel. Further refinement of the methodology will be required and input by the DBCP-EB on the plans will be sought when the reporting tools are more fully implemented. (***action; DBCP-EB; DBCP-31***).

JCOMMOPS staff considerations, including recruitment of the new DBCP Technical Coordinator

11.1.39. The Panel reviewed the report of the Secretariat about the recruitment of the new Technical Coordinator (TC), a process which spanned most of the previous year. An evaluation committee composed of IOC secretariat (A. Fischer, T. Gross), WMO secretariat (E. Charpentier, E. Cabrera), DBCP (A. Wallace), OceanSITEs (U. Send), JCOMMOPS (M. Belbéoch), and OCG (C. Clark) selected Ms Champika Gallage (Canada) on Feb. 21, 2014. After considerable delay, visa arrangements were finalized and a start date set to Oct. 24, 2014. Regrettably, this did not allow an overlap in employment between Ms Gallage and Ms

Stroker, the out-going TC. The Panel thanked Ms Stroker for her cooperation and help during this transition period. With the recruitment process finalized at UNESCO the WMO will request to accept the position as a 'secondment' and take over financial and administrative responsibility, while IOC/UNESCO will continue to handle matters related to the host country (France), such as residence permits (***action; WMO Secr.; asap***).

11.1.40. The Panel recognized that the pilot–project of establishing a Ship Coordinator, Martin Kramp, during two years has shown great success and provided special support for DBCP members' deployment needs (see agenda item 9.2). The Ship Coordinator established in Brest since September 2013, has developed a strong professional cooperation with local partners (Météo France, Coriolis, IRD[82], SHOM[83], etc.) and assisted as appropriate request from e.g. AOML or SIO. The Panel noted with appreciation that the increased contributions from USA/NOAA and from the Global Ocean Ship-Based Hydrographic Investigations Programme (GO-SHIP) community will permit to sustain the position. A 6 months contract was offered by WMO (Special Service Agreement) to Mr Kramp to serve as Ship Coordinator as of September 2014. The plan is the to establish the Position with WMO and IOC similarly to the other coordinators, and engage a formal recruitment process through UNESCO. (***action; WMO and IOC Secr.; asap***);

11.1.41. The Panel noted that the IT expert, Damien Bourarach left JCOMMOPS in March 2014 and was replaced in August by Anthonin Lizé (FR, 22, INSA great engineering school) after a 4 months gap. A. Lizé, under unlimited duration contract by CLS, was based in Brest after a 5 weeks training period in Toulouse. He showed quickly a strong technical background and special interest for the JCOMM community, which will definitely support the Centre and coordinators services.

11.1.42. The Panel also noted that two students did an internship within JCOMMOPS between April and September 2014. One will stay 6 more months to finish the developments of the new website.

11.1.43. The Panel welcomed the anticipated regrouping of the full JCOMMOPS staff in Brest/Ifremer in November 2014.

11.1.44. The Panel noted that JCOMMOPS will certainly recruit in 2015 a secretary/communication officer for the Centre and linkage with secretariats and host country institutions.

11.1.45. The Panel finally noted that JCOMMOPS was working with the JCOMM OPA to establish a position of Regional Coordinator to focus mainly on gliders and other regional observing systems.

11.2. Report on decisions of WMO and IOC governing bodies

11.2.1. Forty-seventh Session of the IOC Executive Council

11.2.1.1. The IOC Secretariat representative reported on the proceedings of the forty-seventh IOC Executive Council (IOC-XXXVII, Paris, France, 1-4 July 2014). The Panel applauded the EC-XLVII, Decision 3.1, which recognized the Australian Integrated Marine Observing System (IMOS) as a GOOS Regional Alliance. The Panel noted the significance of the IOC Executive Council Decision EC-XLVII 3.2.2 regarding the Renewal of the JCOMMOPS Hosting Agreement. The Executive Council expressed their gratitude to CLS and the government of France for their contributions to the institutional arrangement for JCOMMOPS through the years and noted the value

82 French Institute for Research and Development
83 French National Hydrographic Service

of the IOC-WMO partnership arrangement of support for the JCOMMOPS. To encourage sustainable Member State support of JCOMMOPS the EC requested:

- IOC in cooperation with the WMO Secretariat, to clarify IOC/UNESCO and WMO's responsibilities for JCOMMOPS with a view to improving its sustainability, and report on the outcome to the IOC Assembly at its 28th session in 2015. (***action; IOC/WMO Secretariats and JCOMMOPS staff; May 2015***):

11.2.2. Sixty-sixth Session of the WMO Executive Council

11.2.2.1. The WMO Secretariat representative reported on the outcome of the sixty-sixth Session of the WMO Executive Council (WMO EC-66, Geneva, Switzerland, 18-27 June 2014). In particular, the Panel noted the following decisions of EC-66 and urged its members to take them into account when developing their activities in support of the Panel (***action; Panel members; ongoing***):

- The Council recognized the difficulties that JCOMM is facing with regard to the implementation of marine meteorological and oceanographic observing systems. In particular, noting the on-going development of the Tropical Pacific Observing System (TPOS) and related observing system network design activities, the Council urged Members to enhance their contributions in support of the implementation and operations of the tropical moored buoy arrays, in particular in the Tropical Pacific Ocean, where data availability has dropped substantially in the last two years. Of particular interest is the provision of ship time to assist in the deployment and servicing of tropical moored buoys.

- The Council also recalled the importance of sea level pressure observations from drifting buoys, and noted that such data have been shown to have a substantial positive impact in particular for global NWP, especially when measured on a per observation basis. While noting that most of the barometers installed in drifting buoys are currently funded by research, and that such funding is currently at risk of being substantially reduced, the Council urged Members and NMHSs to contribute to the funding of the barometers on drifters.

11.2.3. CBS Ext.(2014)

11.2.3.1. The Panel noted the outcome of the 2014 Extraordinary Session of the WMO Commission for Basic Systems (CBS Ext. (2014), Asuncion, Paraguay, 8 - 12 September 2014). The Panel noted in particular that the Commission had noted with concern that the completion of the initial composite ocean observing system has not progressed substantially in the last few years, and remained at a level of about 62%. The CBS requested its Members to contribute to the JCOMM Observations Programme Area Implementation Goals and to sustain the marine meteorological and oceanographic observing system as a top priority. In particular, efforts should be made to fund and install barometers on newly deployed drifters, and to improve the tropical moored buoy array data availability through enhanced partnership. Accordingly the Commission adopted Recommendation 3.1(1)/3 (CBS-Ext.(2014)) – Support of Members to the implementation of the marine meteorological and oceanographic observing system in support of NWP. The Recommendation is provided in Appendix C of DBCP-30 preparatory document No. 11.3.

Observing station Identifiers

11.2.3.2. All stations, platforms and instruments contributing to WIGOS will need identifiers in order for them to be properly referenced in the observational data records

themselves, in the associated WIGOS metadata, and for the purpose of managing and planning the networks. The Panel noted that CBS Ext. (2014) stressed that providing identifiers for any observing station or platform known to Members, regardless of the commitment of the operator regarding data quality or sustained operation, is essential for WIGOS. Potential issues regarding data quality and sustainability will be documented in the associated WIGOS metadata records. It was also noted that the structure for WIGOS identifiers should be included in the Manual on WIGOS.

11.2.3.3. The Panel noted that according to the proposal for WIGOS station identifiers, the current structure of buoy WMO numbers would be reflected in the so called “Local Identifier” part of the WIGOS station identifiers, while a specific value (yet to be decided) would be provided to the “Issue Number” part of the WIGOS station identifiers in order to indicate that the “Local Identifier” is dealing with the buoy ID number series.

Satcom Forum

11.2.3.4. See agenda item 11.4 (WIGOS) for CBS decisions related to the establishment of the International Forum of Users of Satellite Data Telecommunication Systems (Satcom Forum).

11.3. User requirements

11.3.1. GCOS / GOOS / WCRP Ocean Observations for Physics and Climate (OOPC)

11.3.1.1. The requirements for observations requested of the DBCP remain the GCOS Implementation Plan goal of even spatial coverage of 1250 drifting buoys equipped with ocean temperature sensors (5x5° grid) (GCOS-92, updated in 2010 in GCOS-138).

11.3.1.2 The Seventeenth Session of the GCOS/GOOS/WCRP Ocean Observations Panel for Climate, met 21 - 23 July 2014, in Barcelona, Spain, just prior to the Third Meeting of the GOOS Steering Committee, July 24-26 2014. The OOPC embraces the GOOS and GCOS framework for an Essential Ocean Variables (EOV) approach to defining requirements and of ongoing evaluation and assessment of observing systems. The Panel reviewed evaluations of new initiatives, including Upper Ocean Thermal Review, TPOS, Boundary Current and Inter-basin flows, and the Deep Ocean Observing Strategy. The Panel noted the following:

- Responding to the erosion of readiness of the Tropical Pacific Observation System, the TPOS 2020 Workshop (27-30 Jan. 2014, La Jolla, United States) an OOPC expert group, has emphasized the need to improve resilience and integration of observing systems and articulated the strengths of a multiplatform approach. The OOPC has suggested that a framework for risk assessment is needed which will include the evaluation of system “readiness”. This is a cross cutting activity which should be embraced by the JCOMM panels, such as GO-SHIP and DBCP.
- The OOPC recommends that evaluation of initiatives should be accompanied by a small set of performance indicators (metrics) that capture the technical performance and uptake/impact of the system data and information, particularly in terms of the ultimate socio-economic impact.

11.3.1.2. The DBCP agreed with the following:

(i) To participate in OOPC studies of the feasibility of metrics for systems evaluation. The Panel tasked Shannon McArthur to represent the Panel in such activity, and to contribute and liaise with the OOPC as needed (***action; S. McArthur; DBCP-31, OOPC-18***).

11.3.1.3. The GOOS Steering Committee at its Third Session (GOOS-SC-3, Barcelona, Spain, 24 – 26 July, 2014) continued to define the structure of GOOS, which now comprises the three ocean subject Panels: Physics (OOPC); Biogeochemistry (IOCCP[84]) and; Biology and Ecosystems. The Committee recognized that evaluating Essential Ocean Variables for "readiness" also includes an evaluation of the potential risks to continuity of extant observing systems, including funding aspects. The GOOS Steering Committee (SC), therefore, requests that JCOMM panels develop risk and vulnerabilities information for their systems and communicate to the appropriate GOOS panel. In addition, the GOOS SC elaborated a communication and outreach plan, which includes communication to the JCOMM panels of the GOOS Framework for Ocean Observing, and the new focus of GOOS on Essential Ocean Variables. The Panel agreed with the following:

(i) Shannon McArthur to develop risk and vulnerabilities information for the data buoy systems on behalf of the Panel, and communicate to GOOS SC and OOPC as needed. (***action; Shannon McArthur; DBCP-31, GOOS-SC 4***).

11.3.2. WMO Rolling Review of Requirements update

11.3.2.1. The Panel recalled the discussion under agenda item 8.2 regarding the evaluation of the impact of Sea Level Atmospheric Pressure (SLP) data over the ocean from drifting buoys on Numerical Weather Prediction (NWP), and that an impact study has been undertaken for the Panel by ECMWF in this regard (see agenda item 8.2 for the Panels decisions in this regard).

11.3.2.2. The Panel further noted that the impact of barometer drifter data, and tropical moored buoy data on NWP and other WMO Application Areas has been discussed at the first meeting of the CBS Inter Programme Expert Team on Observing System Design and Evolution (IPET-OSDE-1, Geneva, Switzerland, 31 March – 3 April 2014), and at the eighth Session of the CBS Implementation Coordination Team on the Integrated Observing System (ICT-IOS-8, Geneva, Switzerland, 7-10 April 2014). In particular, the Panel noted the following with appreciation:

- ICT-IOS-8 agreed that the impact of marine meteorological and oceanographic data on NWP should be taken into account in the list of science questions to be addressed by the CBS, and the International Workshop in the Impact of Various Observational Systems on NWP.
- ICT-IOS-8 stressed that support of National Meteorological and Hydrological Services (NMHSs) to marine meteorological and oceanographic observations should be enhanced, noting that NMHSs don't necessarily have to contribute infrastructure, but can contribute resources to such programmes. This should be highlighted in the reporting to WMO Executive Council and Congress.
- ICT-IOS-8 noted that (a) the influence of buoy surface pressure observations is particularly large on a per-observation basis and their Observing System Experiment (OSE) impact extends from the surface throughout the troposphere in mid-latitudes (see final report of the 5th NWP Obs. Impact workshop[85]), and (b) the higher impact per cost of such data compared with other observing systems, including space- and surface-based observing systems, per the UK study

84 International Ocean Carbon Coordination Project
85 http://www.wmo.int/pages/prog/www/OSY/Meetings/NWP5_Sedona2012/Final_Report.pdf

presented by the Chairperson of IPET-OSDE at the IPET-OSDE-1 meeting (see website[86]).

- ICT-IOS-8 agreed that it was important to raise awareness of Members with regard to the profile of ocean observations to address WMO applications observational user requirements, and to the issues outlined by JCOMM. It also agreed that the impact of drifters on NWP, and its cost-effectiveness should be brought to the attention of CBS, and decided to submit a formal Recommendation to CBS Ext.(2014) on Support of Members to the implementation of marine meteorological and oceanographic observing systems in support of NWP. CBS Ext.(2014) adopted that Recommendation, which is provided in Appendix C of DBCP-30 preparatory document No. 11.3.

11.3.2.3. The Panel also noted the paper provided in Appendix B of preparatory document No. 11.3 regarding the cost-effectiveness of the barometer drifter technology to address multiple user requirements.

11.3.2.4. Finally, the Panel recalled the recommendations to its members made at the previous DBCP Session regarding the planning of their national buoy programme activities (see paragraph 11.4.2.4 of JCOMM MR No. 93). The Panel agreed that these recommendations remain valid.

11.4. WMO Integrated Global Observing Systems (WIGOS)

WIGOS Framework Implementation

11.4.1. The Secretariat reported on the recent development with regard to the implementation of the WMO Integrated Global Observing System (WIGOS). The Panel noted that the WIGOS framework Implementation Plan (WIP) has been updated (see website[87]) by the Inter Commission Coordination Group on WIGOS (ICG-WIGOS) at its third meeting (Geneva, Switzerland, February 2014), and noted by the Sixty-Sixth Session of the WMO Executive Council (Geneva, Switzerland, 18-27 June 2014). The Panel recalled its contribution to the ten WIGOS framework implementation Key Activity Areas (KAAs) as agreed the previous DBCP Session (see paragraph 11.5.1 of JCOMM MR No. 106).

JCOMM Pilot Project for WIGOS legacy recommendations

11.4.2. The Panel also recalled its response made at DBCP-27 and re-iterated at DBCP-28 and DBCP-29 to the legacy recommendations of the JCOMM Pilot Project for WIGOS, which provided an excellent contribution of the Panel to WIGOS implementation (see DBCP-27 final report[88], paragraph 11.5.3).

OSCAR[89] Platform developments

11.4.3. The Panel agreed that JCOMMOPS should collaborate with WMO and MeteoSwiss in order to assure that marine observing systems capabilities will be properly reflected in OSCAR thanks to interoperable arrangements and machine to machine interfaces between the JCOMMOPS IT infrastructure and the MeteoSwiss one for OSCAR. It requested JCOMMOPS to undertake the necessary developments in this regard (***action; JCOMMOPS; ongoing***).

86 http://www.wmo.int/pages/prog/www/OSY/Meetings/IPET-OSDE1/documents/IPET-OSDE1-Doc-8.4-Cost-benefit-studies.pdf
87 http://www.wmo.int/pages/prog/www/wigos/documents.html
88 http://www.jcomm.info/components/com_oe/oe.php?task=download&id=14982&version=1.0&lang=1&format=1
89 Observing System Capability Analysis and Review (OSCAR) Tool – www.wmo.int/oscar

WIGOS station identifiers

11.4.4. The Panel discussed the new proposed WIGOS station identifier scheme, and its implication with regard to data buoy WMO numbers under paragraph 11.3.3.

International forum of Users of Satellite Data Telecommunication

11.4.5. The Panel noted that the ad hoc International Forum of users of satellite data telecommunication systems (Satcom Forum[90]) was held in Paris, from 3 to 4 October 2013 and has made a number of recommendations, which the Panel also supported. The Panel noted that EC-66 requested CBS to review the reports of the initial ad hoc Satcom meetings, for consideration by Cg-17, including assessment of budget implications associated with the organizational and operating practices should a Forum be established. Per EC-66 guidance, CBS Ext. (2014) (Asuncion, Paraguay, 8 - 12 September 2014) adopted Resolution 2.3(1)/6 - Establishment of a Satcom Users Forum. CBS Ext. (2014 also noted the potential benefits to Members of establishing a close alliance between the Satcom forum and the Argos Joint Tariff Agreement and encouraged earlier dialogue amongst the various stakeholders to consider how such an alliance could be developed.

11.5. Financial reports

11.5.1. The Panel noted with satisfaction the positive and secure cash balance of DBCP funds (WMO+IOC) totalling USD 249,354 as of 31 December 2013. It should be noted that this balance was corrected compared to the Annual Report for 2013 because the US contribution for 2012 (in principle of USD 105,000 for DBCP & SOT) and 2013 (in principle of USD 115,000 for DBCP and USD 80,000 for SOT) was, as part of the NOAA contribution to various activities, directed to the JCOMM Trust Fund and no transfer to the DBCP Trust Fund had been occurred since.

11.5.2. The 2013 Final Statement of Accounts presented to the Panel are based on the WMO Final Statement for the period 1 January to 31 December 2013 and the IOC Final Statement for the period 1 January to 31 December 2013 (see DBCP-30 preparatory document No. 11.5, Appendix H).

11.5.3. The Panel noted that in 2013, USD 24,979 was charged to the Capacity Building line item (USD 18,520 for WIO-3, Zanzibar, Tanzania, April 2013 and USD 6,459 in support to NPOMS-2, Hangzhou, China, October 2013).

11.5.4. The IOC DBCP Trust Fund Interim Statement for the period 1 January – 31 July 2014 is provided in ***Annex VII***. It shows a small positive balance of USD 26 as of 31 July 2014. During this period, no contribution was received as the US contribution, which used to be made via the IOC, is made to WMO since 2012. Verify Canadian Donation [action; Secretariat; ASAP]

11.5.5. The WMO DBCP Trust Fund Interim Statement for the period 1 January–31 July 2014 is shown in ***Annex VII***. It shows a positive balance of USD 298,346.

11.5.6. The IOC Interim Statement and the WMO Interim Statement are included in the Interim Statement of Accounts for the DBCP Trust Fund, as given in ***Annex IX***. It should be noted that, in order to compare the current expenditure level with the budget, this Interim Statement shows the actual expenditure together with the budgeted amounts as decided at DBCP-29.

11.5.7. The review of the DBCP Accounts as at 31 July 2014 and estimates for the years

90 http://www.jcomm.info/SatCom1

2015 and 2016 is given in Tables 1 and 2 of ***Annex IX***. The Panel noted the JTA budget managed within the DBCP Trust Fund, including the CLS contribution made on behalf of the JTA, and the expenditures for the JTA chair, the JTA Executive Committee, and the support of the Secretariat to the JTA, and acknowledged that it did not impact the DBCP budget. The Panel also recognized, and concurred, that some Members/Member States contributions are also targeted specifically to the JCOMM Ship Observations Team (SOT), and corresponding expenditures decided by the SOT Chair.

11.5.8. The Panel noted with appreciation the provisional table of contributions for 2015 as detailed in ***Annex VIII***. The Panel thanked contributing Panel members for their commitments.

11.5.9. The Panel recalled that expenditures from the DBCP Trust Fund are largely in Euros. Recognizing that the exchange rate between the US dollar and the Euro and the resulting Bank Charges are affecting increasingly the DBCP budget in a negative way. The Panel noted with appreciation that several Panel Members are already paying their contribution in Euros and urged Members still contributing in their national currency (other than Euro) to consider contributing to the DBCP Trust Fund in Euros (***recommendation OP/r7***).

11.5.10. As being done at DBCP-29, the Panel again urged its members to pay their contributions in a timely fashion (***recommendation OP/r8***). In the view of the increasing DBCP activities, especially in Capacity Building and pilot activities, and considering the need to secure the position of the Technical Coordinator, the Panel invited its members not contributing to the Trust Fund to discuss nationally whether a contribution could be made in the future (***recommendation OP/r9***).The Panel reiterated its invitation to members already contributing to the Trust Fund to investigate nationally whether their contribution could be increased (***recommendation OP/r10***).

11.5.11. The DBCP EB had recommended including Statement of Accounts of the JCOMM Trust Fund into the DBCP Statement of Accounts resulting in a joint presentation of the two Trust Funds. For several (financial) reasons a joint presentation, in which the JCOMM accounts were to be merged with the DBCP accounts, seemed to be impracticable, so that the accounts were presented in two separate Statements of Income and Expenditure. It was noted that only a small part of the JCOMM Trust Fund, corresponding to the US contribution to the DBCP (and JCOMMOPS) activities, was used to support the Panel's activities.

11.5.12. The 2013 JCOMM Final Statement of Accounts was presented and was representing a positive balance of CHF 286,741 (based on the 2013 WMO Final Statement for JCOMM Support).

11.5.13. The WMO Interim Statement for the Trust Fund for JCOMM Support for the period 1 January to 31 July 2014 (***Annex VII***) was included in the Interim Statement of Accounts for the JCOMM Trust Fund, as given in Table 3 of ***Annex IX***, showing a balance of CHF 549,309.

11.5.14. The Panel noted that the US contribution allocated to the DBCP Trust Fund was not physically transferred from the JCOMM Trust Fund to the DBCP Trust Fund, as indicated in ***Annex VIII***, and requested the WMO Secretariat to initiate the regular transfer of the allocated amounts, as agreed at the 28th and 29th Sessions of the DBCP and the DBCP share received annually (including for 2014), to the DBCP Trust Fund (including DBCP, JCOMMOPS, SOT and Ocean SITEs), taking in account expenditures already made as part of the DBCP budget(***action; Secretariat; Jan 2015***). The Panel further requested the Secretariat and the Financial Advisor to update the Financial Accounts for

the respective years accordingly, reflecting the US contribution to the DBCP Trust Fund (***action OP/a35; Secretariat***) (***action OP/a36; Secretariat & Financial Advisor***).

11.5.15. The status of Income and Expenditure for the JTA as of 1 October 2014 was presented in Table 4 of ***Annex IX***. The Panel noted the financial situation and was in agreement that, although the JTA Income and Expenditure was included in the DBCP Accounts, it did not have effect on the DBCP Income and Expenditure.

11.5.16. The Panel approved its budget for 2015 (maximal expenditures) as detailed in Tables 1 and 2 of ***Annex IX***. The Executive Board, authorized by the Panel, and taking in account the decisions and recommendations made at the 29th Session of the DBCP, will set a plan for the 2015 actual expenditures. The Executive Board will liaise with the Financial Advisor for updating the interim financial report with the most accurate and actual information (***action OP/a37; DBCP-EB; 31 Jan. 2015***).

11.5.17. The Panel requested the joint Secretariats and the Financial Advisor to work together to distribute the final statement for the year 2014 to the Panel members as soon as the IOC and WMO Final Statement of Accounts for the year 2014 are finalized and made available (***action OP/a38; Secretariat & Financial Advisor; 1 March 2015***).

11.5.18. Mr Frank Grooters, who was retired from the Royal Netherlands Meteorological Institute, had indicated to the Panel that he consequently had to step down as the Financial Advisor to the Data Buoy Cooperation Panel. Following a proposal made by the Executive Board, the Panel nominated Mr Eric Locklear (USA) to act as its Financial Advisor according to the DBCP operating principles. With support from the Panel, the Chairman thanked Mr Grooters warmly for his comprehensive financial reports presented to the Panel since his nomination at DBCP-21 (2005), and the Secretariat for providing timely and valuable financial information to Mr Grooters.

12. EXECUTIVE DECISIONS

12.1. Report and Recommendations from the Executive Session

12.1.1. The Chairperson reported on the outcome of the Executive Board Session (EB) that was convened during the evening of Wednesday 29 October 2014 to discuss a number of issues that had arisen during the plenary session and to make recommendations to the Panel for its consideration.

12.1.2. The Panel concurred with the Executive Board recommendations as detailed in ***Annex VI***, including approval of the proposed expenditures and budget for the next intersessional period. The Panel also noted and acknowledged with thanks the tremendous contribution of China for organizing this DBCP-30 session. The Panel also noted the tremendous contribution of China for organizing this DBCP-30 session, and was very thankful to the Country for this commitment to the Panel's activities. The following action items were agreed:

(i) IOC to consider to consider closing the DBCP Trust Fund (TF) at the IOC as it included a very small amount (<$50), and no contribution are being made to it (***action; IOC; DBCP-31***).

(ii) Coordination of glider activities, and new technological developments: the Panel must remain open to such developments, and possible collaboration with relevant groups (***action; DBCP-EB; DBCP-31***).

(iii) A proposal could be developed for using ship chartering to deploy drifters in data sparse regions using DBCP TF. The Panel tasked Johan Stander to develop such a proposal through the DBCP Executive Board (***action; J. Stander; DBCP-31***).

(iv) Per MAN-11 discussions, (i) OCG requires a report from the DBCP on succession planning; (ii) the Panel should contribute to the JCOMMOPS strategy before OCG-6; (iii) document how to promote data exchange; (iv) Keeley report on data systems a number of recommendations that the Panel needs to consider; and (v) IIOE-II, TPOS to be considered. The Panel requested the Executive Board to address these issues (***action; DBCP-EB; OCG-6***).

12.2. DBCP implementation strategy

12.2.1. As had become the custom at previous sessions, the Panel did not enter into discussion of its Implementation Strategy, but noted that the document was continuously updated by Chairperson and Secretariats, essentially to take into account the outcome and recommendations from the WMO and IOC governing bodies. The Chairperson asked the Panel to review the document (available from the web[91]) and to forward any comments to the Chairperson by the end of November 2014 (***action; Members; 30 Nov. 2014***). The Executive Board was invited to propose how the implementation strategy could be reviewed by selected Panel members (***action; DBCP EB; ASAP***).

12.3. DBCP Operating Principles

12.3.1. The Panel reviewed its operating principles and approved them. The new operating principles are provided in ***Annex IV***.

12.3.2. The Panel recalled the dynamic nature of the document and invited its members to provide the Chairperson with comments by the end of the year (***action; members; 31 December 2014***).

12.4. Review of action items from the previous DBCP Session

12.4.1. The Technical Coordinator, Ms Champika Gallage, presented the action plan from the twenty-ninth DBCP Session, Paris, France, September 2013. The tables presented focused on actions and recommendations that were still underway. The plan also included some outstanding actions from previous Panel sessions. The key items were discussed during the session. The Panel should be aware that all actions are collated in the MS Excel file at the end of each DBCP session.

12.4.2. The ongoing actions and the set of recommendations are entered into the Operating Principles as an Annex.

12.5. Workplans and priority for the Panel and the Technical Coordinator

12.5.1. As in previous years, the Panel reviewed and updated the overall work plan for itself and the Technical Coordinator for the coming intersessional period. These work plans are given in ***Annex III***. The Panel invited the Chairperson, in liaison with the Executive Board and the Secretariat, to revise the list of prioritized tasks for the Technical Coordinator as agreed at the previous Session, and discuss execution details with Mrs Gallage (***action; Chairperson; ASAP***). The Panel requested the Technical Coordinator to then undertake the tasks as proposed by the Chairperson and to report at the next Panel Session (***action; TC-DBCP; ASAP***).

91 http://www.jcommops.org/doc/DBCP/DBCP_Impl_Strategy.pdf

12.5.2. During the overall session, the Panel discussed and agreed on its priorities for the next intersessional period. These are reflected in the DBCP budget (***Annex IX***) as well as in its workplan (***Annex III***).

13. NATIONAL REPORTS

13.1. Mr Graeme Ball (Australia) chaired the National Reports Session. The Panel received written reports on current and planned buoy programmes from Australia, Brazil, Canada, China, France, Germany, India, Japan, Netherlands, New Zealand, Republic of Korea, Sweden, Turkey, United Kingdom, and the United States of America. As usual, these written reports, as well as others submitted to the Secretariat before 31 December 2014, would be published in the Panel's Annual Report. Oral presentations were made during the Session on national activities by the following countries: Australia, Brazil, China, Canada, Germany, India, Pakistan, New Zealand, the Republic of Korea, and the USA.

13.2. The Panel agreed on the following:

(i) DBCP members who had not submitted National Reports to submit their input to the Secretariat before the end of the year (***action; members; 31 Dec. 2014***).

(ii) To publish National Reports with the Panel's Annual Report (***action; Secretariat; Early-2015***);

(iii) The Panel noted that INMARSAT satellite telemetry is being by India and other countries for real time buoy data transmission and reception. The INMARSAT transmission delay is 250 msec. for transmission and reception and 90 sec. time delay between two transmissions. This is a major requirement for Tsunami buoy working with INMARSAT wherein timeliness is paramount important. Panel also noted that the cost of operating moored platforms agreed that tariff need to be standardized for such societal data transfer applications.

14. ELECTION OF THE CHAIRPERSON AND VICE CHAIRPERSON

14.1. The Panel recalled that according to its Operating Principles, the term for the members of the Executive Board is for one year during the intersessional period. They shall be eligible for re-election in their respective capacities, but would serve in principle for no more than 4 terms.

14.2. The Panel further recalled that the current core members of the Executive Board included:

- Mr Al Wallace (Canada), DBCP Chairperson, first elected at DBCP-25, October 2009;
- Mr Graeme Ball (Australia), DBCP vice-Chairperson for the Southern Hemisphere, first elected at DBCP-29, October 2013;
- Dr R. Venkatesan (India), DBCP vice-Chairperson for Asia, first elected at DBCP-26, Sept. 2010;
- Dr Jonathan Turton (UK), DBCP vice-Chairperson for Europe, first elected at DBCP-27, October 2012.
- Dr Sid Thurston (USA), appointed by Mr Wallace to serve in the Executive Board in 2010.

14.3. The Panel noted that Mr Wallace was stepping down from the Chairperson, and warmly thanked him for his excellent leadership and efficient, and pro-active contributions to the Panel as Panel member and then as Chairperson.

14.4. The JCOMM Co-President, Johan Stander, and other Panel Members thanked Mr Wallace personally for his excellent leadership throughout his involvement in DBCP and especially as chair. Mr Stander explained that he was always a personal friend and from whom he could learn a lot as the DCBP was his induction to the marine community. Mr Wallace was an excellent example of how a chair should be able to take him/her out of the discussion, leave the personal feelings aside and summarize what the panels view is. Mr Wallace did this with excellence and he set an extremely high bar for the new chair to follow and Mr Stander had no doubt that Mr Turton will be able to do this as well. Once again, he thanked Al, wished him to enjoy his retirement with Laurie, and may he be blessed with good health.

14.5. The Panel elected Mr Jon Turton as its Chairperson, to serve for first term until the end of the next Panel session.

14.6. The Panel elected Mr Shannon McArthur (USA) to serve as vice-Chairperson for North America until the end of the next Panel Session.

14.7. The Panel re-elected Dr Venkatesan and Mr Graeme Ball to serve until the end of the next Panel Session for their Fifth term as Vice-chairperson for Asia, and second term as Vice-Chairperson for the Southern Hemisphere respectively.

15. ADOPTION OF THE SESSION REPORT

15.1. The Panel reviewed and adopted the draft session report prepared by the Secretariat. The list of action items arising from this Session is provided in ***Annex III***.

16. DATES AND PLACE FOR THE NEXT SESSION

16.1. The Panel recalled its agreement – reflected in the DBCP Operating Principles – at DBCP-23 to hold DBCP sessions in either Paris or Geneva every other year as of its twenty-fifth session. The Panel agreed to organize next year's Thirty-First Session in Geneva, Switzerland, at the WMO headquarters. Tentative dates for the session were agreed to be scheduled provisionally from 26 to 30 October 2015, ensuring minimum duplication with schedules for events of other JCOMM and related programmes.

16.2. The Panel agreed in principle to hold the 2016 DBCP-32 Session in North America.

17. CLOSURE OF THE SESSION

17.1. In closing the session, the Chairperson Mr Wallace once again thanked the State Oceanic Administration (SOA), the National Centre for Ocean Standards and Metrology (NCOSM) for providing facilities, support and hospitality for the meeting. Mr Wallace especially thanked Mr Mingqiu Bian, Secretary General, NCOSM for the excellent facilities, support and hospitality that had been provided for the meeting, all of which had contributed substantially to its success. He also thanked the staff of NCOSM who has contributed to the organizing of the Session, and for their support during the Session, and particularly Mr Fan Jiang of NCOSM. He thanked also the Secretariat, the Executive Board, the Technical Coordinator, the Chairs of the Action Groups, Task Teams, and Pilot Project Steering Groups, national representatives, and all participants for their active and positive contributions to the meeting and to the work of the Panel, which allows to build the data buoy community. Finally, he also thanked the manufacturers for their contribution to the work of the Panel.

17.2. The thirtieth session of the Data Buoy Co-operation Panel closed on Friday, 31 October 2014 at 15:40.

ANNEX I

AGENDA

1 Opening and Welcome of the DBCP Session

2 Scientific and Technical Workshop

3 Opening of the DBCP Business Session

- 3.1 Adoption of the agenda
- 3.2 Working arrangements

4 Reports by the Chairperson, Vice Chairpersons, and the Executive Board

5 Report by the Technical Coordinator

6 Reports by the Task Teams

- 6.1 Task Team on Data Management (TT-DM)
- 6.2 Task Team on Instrument Best Practices and Drifter Technology Development (TT-IBPD)
- 6.3 Task Team on Moored Buoys (TT-MB)
- 6.4 Task Team on Capacity-Building (TT-CB)

7 Reports by the Action Groups

- 7.1 Surface Marine programme of the Network of European Meteorological Services, EUMETNET (E-SURFMAR)
- 7.2 Global Drifter Programme (GDP)
- 7.3 International Arctic Buoy Programme (IABP)
- 7.4 International Buoy Programme for the Indian Ocean (IBPIO)
- 7.5 WCRP-SCAR International Programme for Antarctic Buoys (IPAB)
- 7.6 International South Atlantic Buoy Programme (ISABP)
- 7.7 DBCP-PICES North Pacific Data Buoy Advisory Panel (NPDBAP)
- 7.8 OCEAN Sustained Interdisciplinary Timeseries Environment observation System (OceanSITEs)
- 7.9 Tropical Moored Buoys Implementation Panel (TIP)
- 7.10 International Tsunameter Partnership (ITP)
- 7.11 Other regional activities

8 Pilot Projects

- 8.1 Pilot Project on the impact of SLP from drifters on NWP
- 8.2 DBCP/ETWS Pilot Project on Wave measurement Evaluation and Test from moored buoys (PP-WET)
- 8.3 DBCP/GHRSST Pilot Project for High Resolution SST (PP-HRSST)

9 Issues for the Panel

- 9.1 Information Exchange
- 9.2 Deployment opportunities and strategies
- 9.3 Data timeliness
- 9.4 Vandalism

9.5 Metadata
9.7 Other issues to be discussed, as proposed by the Task Teams

10 Information Reports

10.1 Argo
10.2 Buoy data management centres
10.3 Satellite data telecommunications
10.4 JCOMMOPS Activities
10.5 Additional reports, as required

11 Organizational Issues

11.1 JCOMM activities and management
11.2 Report on decisions of WMO and IOC governing bodies
11.3 User requirements
11.4 WMO Integrated Global Observing Systems (WIGOS)
11.5 Financial reports

12 Executive decisions

12.1 Report and Recommendations from the Executive Session
12.2 DBCP implementation strategy
12.3 DBCP Operating Principles
12.4 Review of action items from the previous DBCP Session
12.5 Workplans and priority for the Panel and the Technical Coordinator

13 National Reports

14 Election of the Chairperson and Vice Chairperson

15 Adoption of the Session Report

16 Dates and Place for the Next Session

17 Closure of the Session

ANNEX II

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ANNEX III

ACTION LIST / WORKPLAN

DBCP WORKPLAN FOR THE NEXT INTERSESSIONAL PERIOD (2014)

(Ongoing actions as well as Recommendations from this and past Panel Sessions are now included in the Operating Principles)

No.	***Ref. item***	***Action item***	***By***	***Supported by***	***Deadline***
1	2.5.	to submit their papers via e-mail to the S&T Workshop Chairperson, via electronic format (MS Office compatible format only), by 30 November 2014	S&T workshop authors		30 November 2014
2	2.6.	to organize the S&T workshop in 2015 at DBCP-31	J. Stander	K. Herklotz	DBCP-31
3	5.9, 5.18(i)	to put in place an automated process for receiving information on the status of the tsunami buoys or adding the Tsunami buoys to the normal GTS chains	TC-DBCP	NDBC	July 2015
4	5.12.	to continue to look for deployment opportunities in the SOBP region	DBCP members	TC-DBCP	asap
5	5.17(iv.)	to put together a detail of the TC tasks and responsibilities for the new incumbent	K. Stroker		asap
6	5.17(v.)	to develop as high priority a system to ingest moored buoy metadata, and to make these metadata available via the JCOMMOPS web-site	TC-DBCP	JCOMMOPS	DBCP-31
7	5.18(ii)	to work with Iridium VARs to obtain drifting and moored buoy data	TC-DBCP	Iridium VARs	DBCP-31
8	5.18 (iii)	to look for deployment opportunities in the Southern Ocean	DBCP members		asap
9	6.1.3(iii)	to continue to work towards the implementation of a routine procedure to compare GTS Bulletin Headers between the two centres.	Météo France & MEDS		DBCP-31
8	6.1.3(ii)	to coordinate with relevant JCOMM OPA Panels and Associated Programmes for completing the document and maintaining relevant sections up to date. To complete, review and publish on the JCOMM website in electronic form as a JCOMM Technical Report the document “An Oceanographer’s Marine Meteorologist’s Cookbook for submitting Data in Real Time and In	TC-DBCP	Secretariat	DBCP-31

No.	Ref. item	Action item	By	Supported by	Deadline
		Delayed Mode.			
9	6.2.11(i)	to run a systematic evaluation of the drogue drifter assembly	SIO		DBCP-31
9	6.2.11(ii)	to investigate the advantages of GPS based drogue detection algorithms	SIO		DBCP-31
10	6.2.11(iii)	to define a specification sheet format and create web-based upload facility	SIO & AOML	TC-DBCP	DBCP-31
11	6.2.11(vi)	to edit the current version of the deployment instructions sheet	AOML & SIO		DBCP-31
12	6.2.11(ix)	to create statistics on the lifetime of drifter with double battery packs	AOML		DBCP-31
13	6.2.11(x)	to investigate feasibility of introducing deployment boxes designed to minimize the adverse effects of the impact of the drifters with water	SIO		DBCP-31
14	6.2.11(xi)	to publish monthly/bimonthly statistics on their GDP website	AOML		ASAP
15	6.3.5.	to encourage dissemination of the Chinese moored buoy data on GTS and to report at the next Panel Session	TC-DBCP	China	DBCP-31
16	6.3.7(ii)	to build on the DBCP moored buoy metadata scheme to handle metadata for fixed platforms	TT-MB	TC-DBCP	DBCP-31
17	6.3.7(iii)	to work with the JCOMM TT-TDC, on developing suitable BUFR templates for the exchange of data from autonomous surface on the GTS	TT-MB & TT-DM		DBCP-31
18	6.3.7(iv)	to review the CIMO Guide, the GOS Guide, and the WIGOS Manual, and to make proposals for possibly required changes at the next Panel session	TT-MB, TT-IBP	Secretariat	DBCP-31
19	6.3.7(v)	to approach the manufacturers and seek their participation in buoy data evaluations, and in the PP-WET for the wave measuring buoys, and to report at the next Panel Session	TC-DBCP	Manufacturers	DBCP-31
20	6.4.4(i)	to convene the Fourth "DBCP in-Region North Pacific Ocean and Marginal Seas Capacity Building Workshop" (NPOMS-4), November 2015, Busan,	TT-CB	Secretariat	Oct. 2015

No.	Ref. item	Action item	By	Supported by	Deadline
		South Korea			
21	6.4.4(ii)	to go ahead with the establishment of an Jeju NPOMS training centre in the Republic of Korea	Korea		DBCP-31
22	6.4.4(iii)	to exploring with the IOC Sub-Commission for Africa and the Adjacent Island States for a possible future session of a DBCP Western Indian Ocean (WIO) Capacity Building Workshop to focus on developing the contributions of WIO region to the 50th Anniversary of the International Indian Ocean Expedition (IIOE-2)	TT-CB	IOC Secr.	ASAP
23	6.4.4(iv)	to continue to employ recent advances in Information and Communication Technology (ICT) to help facilitate more effective DBCP TT-CB Outreach and Capacity Building Activities on a larger scale	TT-CB		NPOMS-4
24	6.4.4(v)	to Enhance Coordination and Cooperation between TT-CB and WMO Regional Associations	TT-CB	WMO Secr.	DBCP-30
25	6.4.4(vi)	to emphasize that the regional activities should create synergies and avoid duplication, at all cost, therefore requested to develop specialize activities that meet the interest of the respective regions, preferably with the identified resources within the regions.	TT-CB		continuous
26	6.4.4(vii)	to explore possibly supporting, through TT-CB, in 2016 for the organization of the “First Pacific Islands Workshop on Ocean Observations and Data Applications” (PI-1)	TT-CB	Secretariat	DBCP-30
27	6.4.4(ix)	to review the IOC Capacity Development strategy and to provide their comments to Prof. Blivi	DBCP members		ASAP
28	6.4.4(x)	to consider organizing workshops in the Eastern Atlantic region, to provide graduate school training on ocean observations for the African region, and to report on proposed activities at the next Panel Session	TT-CB	Secretariat	DBCP-31
29	6.4.4(xi)	Links should be established with the Coastal Inundation Forecasting Demonstration Project (CIFDM) for the PANGEA workshops	TT-CB	WMO Secretariat	DBCP-31
30	6.4.4(xii)	to relay to MAN the recommendation that through the WMO and IOC Executive Bodies, Members/Member States should routinely keep the relevant national	Secretariat		ASAP

No.	Ref. item	Action item	By	Supported by	Deadline
		agencies and institutes informed about events and activities organized by JCOMM and for which the Permanent Representatives and Action Addressees have received invitation letters respectively			
31	6.4.4(xiii)	to evaluate all future capacity building workshops for efficiency and effectiveness (e.g. can consider using the monkey survey)	TT-CB	TC-DBCP	Oct. 2015
	7.14 (i)	to consider the connection between DBCP activities and TPOS 2020 actions	DBCP-EB	OOPC	Mar. 2015
	7.14 (ii)	to provide advice to OCG, as appropriate, on potential issues and/or opportunities arising from the (draft) TPOS 2020 activities	DBCP-EB	OOPC	Mar. 2015
32	8.1.5.	to document existing NWP data assimilation schemes from the perspective that further studies are encouraged to be made on the impact of timeliness	PP-SLP	TC-DBCP	DBCP-31
33	8.1.6.	to finalize the results of the PP-SLP, and to publish them through peer review	PP-SLP		DBCP-31
34	8.2.12(ii)	to review the future plans and membership of the PP-WET, including a possible follow up technical workshop on results to date	PP-WET co-chairs	Secretariat, NDBC	DBCP-31
35	8.2.12(iii)	to develop guidelines on the best practices for measurement of reliable, high-quality spectral wave measurements, including directional spectra, possibly as an outcome of the technical workshop	PP-WET co-chairs	Secretariat	2017
36	9.2.8(iii)	to better exploit, in cooperation with other observing systems, the operational opportunities in general, and the educational and communication potential of particularly Lady Amber cruises, Sailing Rallies and Races	JCOMMOPS		DBCP-31
37	9.3.10(iii)	to investigate timeliness of the moored array and determine the best way to represent these in the reports	TC-DBCP		DBCP-31
38	9.4.7 (vi)	to include the recommendation for organizing a second WMO-IMO high level meeting in preparatory documentation for WMO 17th Congress	WMO Secretariat		ASAP
39	9.5.8(i)	to provide JCOMMOPS with planned deployment	DBCP members	TC-DBCP	asap

No.	Ref. item	Action item	By	Supported by	Deadline
		metadata in the format specified			
40	9.5.8(ii)	to develop a method to ingest moored buoy metadata (provided in netCDF, tagged pairs and XML formats), to obtain these metadata from moored buoy operators and to make them available to users via their new web-site	JCOMMOPS	Moored buoy operators	DBCP-31
41	9.6.2.	to write to Lloyds of London regarding high risk areas, including the Arabian Sea, encouraging it to review the situation vis-a-vis actual piracy statistics, and possibly reduce the area to allow the research activities and deployments in the DBCP / IBPIO area of interest	Secretariat		end 2014
42	9.6.3.	to contact the SFSPA and DMPA Coordinators, in the view to identify such requirements, and to propose possible recommendations and actions at the next Panel Session	DBCP Chair	Secretariat	DBCP-31
43	10.3.16.	to facilitate the required payment to SAMS in 2015 from the DBCP Trust Fund up to USD 15 000 of the accumulated Iridium air time of surviving Iridium Pilot Project drifters up to 31 December 2014	Secretariat	SAMS	31 Mar. 2015
44	10.3.17.	to report again to the next session of the Panel on Satellite Data Telecommunication systems, including Iridium	D. Meldrum		DBCP-31
45	10.4.1(i)	to provide the written specifications of the network metrics, outcome of the JCOMMOPS-OSMC-OOPC 2014 meeting, and clarification of the complementary nature of the three entities	JCOMMOPS, OSMC, OOPC		November 2014
46	10.4.1(ii)	to provide feedback to OOPC on networks specification template before forward to Steering Teams and Panels for finalization, and to meet with OSCAR representative in Brest in November 2014 in order to start technical cooperation	JCOMMOPS TCs		November 2014
47	10.4.1(iii)	to release a beta version of the new JCOMMOPS web based dashboard for community feedback	JCOMMOPS		December 2014
48	10.4.1(iv)	to release the first finalized version of the website by March 2015 around JCOMMOPS inauguration	JCOMMOPS		March 2015
49	10.4.1(v)	to provide a detailed work plan for 2015-2017, as well	JCOMMOPS		early 2015

No.	Ref. item	Action item	By	Supported by	Deadline
		as reporting templates for each program, and for the integrated structure, to be discussed at the next OCG session, and then quarterly with OCG chairs			
50	10.4.2.	to feed and synchronize the new database with i) all ship related metadata and ii) DBCP platforms related metadata	TC-DBCP & Ship TC		asap
51	10.4.3.	to capture new metadata from GTS statistics for migration to BUFR	TC-DBCP		asap
52	10.4.4.	to register (manual or automatic) in JCOMMOPS all platform deployments or maintenance, and cruises	TC-DBCP	DBCP members, Ship TC	asap
53	10.4.7.	to gather feedback from DBCP members regarding new web based monitoring dashboard	TC-DBCP		DBCP-31
54	10.4.12	to consider providing training to developing countries, in particular to Asian countries	JCOMMOPS		DBCP-31
55	10.4.13.	to transfer the VOS website from the BOM to JCOMMOPS	M. Kramp	BOM	ASAP
56	10.4.14.	to play a role in monitoring the quality of the BUFR message content (from a format and consistency perspective)	JCOMMOPS		DBCP-31
57	10.4.15.	to keep the list of GTS bulletin headers used for ocean observing platforms up to date, and to make it available via the JCOMMOPS website	JCOMMOPS		mid-2015
58	11.1.2(i)	to assist OCG co-chairs in defining a strategy for JCOMMOPS which more clearly defines its areas of activity and reasserts its priorities	DBCP	OCG co-chairs	OCG-6
59	11.1.2(ii)	to pay close attention to succession planning and report back to OCG-6	DBCP		OCG-6
60	11.1.2(iii)	to initiate a pilot project for the creation of an 'Open-Access WIS node' to allow 3rd party platform operators to have free access to the GTS and WIS for data insertion and validation	OCG co-chairs	DBCP members	31 Jan 2015
61	11.1.6.	to make the appeal at the IOC assembly for the oceanographic community to work closer and with the Marine meteorological community for the purpose of ensuring that platforms are shared which may result in	J. Stander	IOC Secretariat	mid-2015

No.	Ref. item	Action item	By	Supported by	Deadline
		cost sharing while data becomes real time available as organisations are not always interested in real time data			
62	11.1.31.	to sustain and if possible lightly augment its contribution to JCOMMOPS, to support the transition to Brest and potential (new) rent requirements while all conditions with host country have not been yet fully negotiated, and needs have increased	DBCP-EB		DBCP-31
63	11.1.38.	to further refine the methodology for a unified reporting tool for contributions and expenditures on behalf of JCOMMOPS and seek input by the DBCP-EB on the plans when the reporting tools are more fully implemented.	DBCP-EB		DBCP-31
64	11.1.39.	to request to accept the TC-DBCP position as a 'secondment' and take over financial and administrative responsibility, while IOC/UNESCO will continue to handle matters related to the host country (France), such as residence permits	WMO Secr.		asap
65	11.1.40.	to establish the Ship Coordinator's position with WMO and IOC similarly to the other coordinators, and engage a formal recruitment process through UNESCO	Secretariat		asap
66	11.2.1.1(1)	to clarify IOC/UNESCO and WMO's responsibilities for JCOMMOPS with a view to improving its sustainability, and report on the outcome to the IOC Assembly at its 28th session in 2015.	Secretariat	JCOMMOPS staff	May 2015
67	11.3.1.2(i)	to participate in OOPC studies of the feasibility of metrics for systems evaluation. The Panel tasked Shannon McArthur to represent the Panel in such activity, and to contribute and liaise with the OOPC as needed	S. McArthur	OOPC	DBCP-31, OOPC-18
68	11.3.1.3(i)	to develop risk and vulnerabilities information for the data buoy systems on behalf of the Panel, and communicate to GOOS SC and OOPC as needed.	Shannon McArthur	OOPC	DBCP-31, GOOS-SC 4
69	12.1.2(i)	to consider closing the DBCP TF at the IOC as it included a very small amount (<$50), and no contribution are being made to it	IOC Secr.		DBCP-31

No.	*Ref. item*	*Action item*	*By*	*Supported by*	*Deadline*
70	12.1.2(ii)	to must remain open to developments, and possible collaboration with groups involved in coordination of glider activities, and new technological developments	DBCP-EB	JCOMMOPS	DBCP-31
71	12.1.2(iii)	to develop a proposal for using ship chartering to deploy drifters in data sparse regions using DBCP TF. The Panel tasked Johan Stander to develop such a proposal through the DBCP Executive Board	J. Stander	JCOMMOPS	DBCP-31
72	12.1.2(iv)	to address the identified MAN-11 issues, i.e. (i) OCG requires a report from the DBCP on succession planning; (ii) the Panel should contribute to the JCOMMOPS strategy before OCG-6; (iii) document how to promote data exchange; (iv) Keeley report on data systems a number of recommendations that the Panel needs to consider; and (v) IIOE-II, TPOS to be considered	DBCP-EB		OCG-6
73	12.2.1.	to review the Implementation Strategy (available from the web) and to forward any comments to the Chairperson by the end of November 2014	DBCP members		30 Nov. 2014
74	12.2.1.	to propose how the implementation strategy could be reviewed by selected DBCP members	DBCP EB		ASAP
75	12.3.2.	to provide the Chairperson with comments on the DBCP Operating Principles by the end of the year	DBCP members		31 December 2014
76	12.5.1.	in liaison with the Executive Board and the Secretariat, to revise the list of prioritized tasks for the Technical Coordinator as agreed at the previous Session, and discuss execution details with Mrs Gallage	Chairperson	Secretariat	ASAP
77	12.5.1.	to undertake the tasks as proposed by the Chairperson and to report at the next Panel Session	TC-DBCP		ASAP
78	13.2(i)	DBCP members who had not submitted National Reports to submit their input to the Secretariat before the end of the year	DBCP members		31 Dec. 2014
79	13.2(ii)	to publish National Reports with the Panel's Annual Report	Secretariat		Early-2015

ANNEX IV

OPERATING PRINCIPLES OF THE DATA BUOY CO-OPERATION PANEL (DBCP)

(as adopted by DBCP-30)

1. INTRODUCTION

1.1 The Data Buoy Co-operation Panel (DBCP) is a subsidiary body of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM). The World Meteorological Organization (WMO) and Intergovernmental Oceanographic Commission of UNESCO (IOC) jointly sponsor the JCOMM, in order to undertake international / intergovernmental coordination of marine observational networks for which both organizations are mandated.

1.2 The DBCP was established in 1985 by WMO Resolution 10 (EC-XXXVII) and IOC Resolution EC-XIX.7. In 1993, the governing bodies of IOC and WMO agreed to change the name of the Panel to the Data Buoy Co-operation Panel (DBCP) with extended terms of reference, so that the Panel may provide international coordination required for both drifters and moored buoy programmes, which support major WMO and IOC programmes (IOC Resolution XVII-6 and WMO Resolution 9 (EC-XLV)). As the JCOMM was established in 1999, the Panel became a part of the JCOMM Observations Programme Area (Resolution 4 (EC-LII)). The Terms of Reference of the DBCP are reproduced in *Appendix I*.

1.3 The DBCP addresses the requirements and needs for real-time or archival data from buoys, both drifting and moored, coordinates buoy deployments worldwide, maintenance and collection of data from instrumented oceanographic and meteorological drifting buoys and moored buoys on the high seas. The Panel provides a forum for the exchange of technical and related information on buoy technology, communications systems and the applications of buoy data, to both operations and research.

1.4 The Panel coordinates its activities with related regional and global programmes of WMO and IOC, such as the World Weather Watch (WWW), the Global Ocean Observing Systems (GOOS) and the ICSU / WMO / IOC / UNEP Global Climate Observing System (GCOS) and the ICSU / WMO / IOC World Climate Research Programme (WCRP), and serve their needs for the data buoy technology and the implementation of data buoy networks.

1.5 The Panel adheres to a data policy approved by itself at DBCP Sessions. The DBCP Data Policy is reproduced in *Appendix IX*.

2. PANEL MEMBERS AND PARTICIPANTS

2.1 The Terms of Reference for the DBCP are decided by the WMO and IOC Executive Bodies through proposition by JCOMM; the Panel is reports to JCOMM and serves the needs of WMO and IOC Programmes. In this context, WMO and IOC Members / Member States designate National Focal Points for buoy programmes who become full Panel members. This is done by means of a letter from the Permanent Representative of a country with WMO to the WMO Secretary-General or by the IOC Action Addressee to the Executive Secretary of IOC. The lists of National Focal Points for buoy programmes are maintained by the WMO and IOC Secretariats, and published on the JCOMM website.

2.2 Participants in the DBCP activities can be operational agencies, meteorological and oceanographic institutes, research agencies, data centres, governmental and non-governmental organizations, and commercial services interested in the global oceans who actively contribute to the aims of the Panel. Individuals with an interest in data buoy activities are also welcome to attend as observers.

2.3 Following the outcome of last DBCP Session, a number of ongoing tasks and activities have been identified by the Panel for its members to undertake. They are to:

1. submit their national reports to the Secretariat before the end of the year (input submitted before 30 November to be published in the Panel's Annual Report;

2. take the recommendations from the IOC XXVII Assembly and the WMO 16th Congress and WMO EC-65 into account when developing their activities in support of the Panel;

3. address user requirements and particular observing systems deficiencies as expressed in the JCOMM Statement of Guidance for Ocean Applications;

4. review the DBCP Implementation Strategy document at http://www.jcommops.org/doc/DBCP/DBCP_Impl_Strategy.pdf and to forward any comments to the Chairperson by the end of November each year;

5. continue their budgetary contribution to the Trust Fund in Timely manner;

6. comply with the WMO Quality Management Framework (QMF) and quality management principles;

7. make use of the barometer drifter upgrade scheme (see http://www.jcommops.org/dbcp/platforms/barometer.html) by purchasing barometers for GDP-funded SVP drifters and negotiating their deployment positions with AOML;

8. provide GDP/AOML with manufacture dates for all buoys built within the last 5 years, as well as with barometer/SLP data;

9. provide instrument/platform metadata regarding the buoys they deploy to JCOMMOPS, using the recommended mechanisms (paying particular attention to SST and SSS data); to comply with buoy metadata collection scheme;

10. notify of all deployments of Iridium Drifters via the dedicated mailing list (iridium-pp@jcommops.org) and eventually via a notification web page on the JCOMMOPS web;

11. provide information on deployment opportunities to JCOMMOPS (preferably through a national website similar to AOML, NDBC and Canada) for all buoys, as well as to continue e-mail notifications as necessary – annual reports, action group annual planning, ship schedules, national plans, national contact points etc. Panel members also subscribe on the list and systematically post their deployment opportunities on the ships@jcommops.org mailing list as well;

12. provide info/materials for DBCP/JCOMMOPS websites (news, brochure);

13. actively communicate with national coordination for GEO to fully inform on the Panel's activities and capabilities in this;

14. start systems for record keeping for instrument calibration, replacement and validation that conform to ISO recommended specifications;

15. review best practices prior to drifter purchase for safety, and GTS data processing

purposes;

16. follow the best practices and standards eventually proposed under WIGOS, and in particular, to provide the buoy platform / instrument metadata to JCOMMOPS, and the ODAS metadata service as appropriate;

17. use the WMO-IOC Regional Marine Instrument Centres (RMIC) facilities as appropriate, and participate at future workshops;

18. encourage other centres to act as Principal Meteorological and Oceanographic Centre Responsible for Quality Control of Buoy Data (PMOC) and existing centres to invest more resources in the implementation of DBCP Quality Control (QC) guidelines;

19. contribute to feeding the JCOMM database extreme wave events when such events are observed by data buoys and are recorded by Panel Members.

2.4 Similarly, the buoy and equipment manufacturers have been invited to participate on an ongoing basis to DBCP activities as following. They:

1. collaborate with buoy operators and JCOMMOPS and submit through JCOMMOPS the instrument/platform metadata, including description of buoy models, using the recommended mechanisms (paying particular attention to SST and SSS data); to comply with buoy metadata collection scheme. JCOMMOPS to negotiate metadata formats on ad hoc basis;

2. provide Service Argos with list of most used buoy models and formats they operate;

3. investigate participating in the Association of Hydro-Meteorological Equipment Industry (HMEI - http://www.hydrometeoindustry.org/) as a way to be represented at JCOMM meetings;

4. enhance buoy safety through improved design (refer recommendations) and keep the Panel informed about related changes.

2.5 The ongoing actions for Panel members and DBCP activity participants are reflected in *Appendix XI*.

3. KEY DBCP PERSONNEL, THE EXECUTIVE BOARD AND TECHNICAL CO-ORDINATOR

3.1 The Panel elects a Chairperson and Vice-chairpersons at the end of its regular sessions with geographical representation from: (i) Asia; (ii) Europe; (iii) North America; and (iv) the Southern Hemisphere. Elections will be decided by a simple majority if a quorum of Panel members is present. A quorum will consist of six Panel members. If a quorum is not present at the regular meeting, elections will be by unanimous vote.

3.2 The elected Chairperson leads the DBCP during the next intersessional period within principles and financial limits defined by the Panel, and Chairpersons the next Panel Session. The Chairperson is supported by the WMO-IOC Joint Secretariat and the DBCP Executive Board, which is responsible for the day-to-day management of the Programme within the guidelines set at the regular meeting of Panel members. The Terms of Reference of the Executive Board are provided in *Appendix IV* to this document.

3.3 The Panel recruits a full-time Technical Co-ordinator whose position is fully financed by voluntary contributions from Panel members or other contributors. The Technical Co-ordinator acts as the focal point for the Programme and carries out the directives of the Panel, as appropriate, during the intersessional period. Upon the Panel's decision, the

Technical Co-ordinator works for other related programmes to assist their implementation. Tasks and duties of the Technical Co-ordinator are detailed under section 11 of this document, and the Terms of Reference of the Technical Co-ordinator are given in *Appendix II*.

3.4 By the decision at the 24th session, the Technical Co-ordinator works a third of his/her time on the OceanSITEs Project Office support.

3.5 The Technical Co-ordinator would be requested to inform the Chairperson and the Secretariat of his / her wish, or otherwise, to continue to work as Technical Co-ordinator of the Panel for the period 1 June "Y+1" to 31 May "Y+2". Should that information be a wish to continue, the Panel in turn would agree to retain him/her as Technical Co-ordinator, subject to the availability of funds, and subject to his / her specific contract limitations with his / her relay employer.

3.6 In case the Technical Co-ordinator wished to quit the position, he/she would be required to inform the Panel as soon as possible, and in any case preferably six months in advance, to assist in the recruitment and training of his / her successor, in order to ensure as full continuity as possible in the work of the Panel's Technical Co-ordinator.

3.7 Within one month of the conclusion of the annual session, the Chair reviews the, programme, prioritises tasks, establishes working priorities and discusses execution details with the technical coordinator as agreed at the previous Session.

3.8 The Technical Coordinator shall then undertake the tasks as proposed by the Chair and, report at the next Panel Session.

3.9 The Chair will also finalise updates to the DBCP implementation strategy including reference to the Capacity Building efforts being undertaken by the Panel and seeking feedback from Panel members.

3.10 The Chair will maintain close links with members of the Ship Observations Team (SOT) so that support on deployment opportunities can be obtained from the Ship of Opportunity Programme (SOOP) Implementation Panel (SOOPIP) and the Voluntary Observing Ship (VOS) Panel (VOSP) of the SOT.

3.11 The secretariat is maintaining a list of national contact points for the DBCP and within other relevant bodies with potential for involvement in DBCP activities.

3.12 The current contact details for key DBCP personnel are listed in *Appendix X*.

4. TASK TEAMS

4.1 Task Teams can be established to work proactively on key issues identified by the Panel, in order to ensure that the Workplan is duly implemented during the intersessional period. The Chairperson(s) of (a) Task Team(s) is / are appointed by the Panel. The Team(s) will report to the Panel on their activities at its regular sessions. The Chairs and Co-Chairs of the Task Teams should not be in a situation of conflict of interest. The Terms of Reference and Membership of the current Task Teams are provided in *Appendix V*.

4.2 From time to time, the Panel may decide to establish and fund Pilot Projects of limited duration to evaluate new technologies or procedures that might enhance its capabilities.

5. ACTION GROUPS

5.1 The implementation of buoy deployments is coordinated at the regional level through global,

regional, or specialized Action Groups. The definition of an Action Group is given in *Appendix III*.

6. IMPLEMENTATION STRATEGY

6.1 The Panel defines its Implementation Strategy and review it at its regular meetings. The Implementation Strategy is defined in such a way that it is consistent with the WMO and IOC Strategic plans.

7. WORKPLAN

7.1 The Panel established and reviews the overall Workplan for itself and the Technical Co-ordinator at its regular sessions, for the coming intersessional period.

7.2 The DBCP Chairperson and the Executive Board may update the Technical Co-ordinator's Workplan during the intersessional period, as appropriate, and report on such changes at the next Panel Session.

7.3 Ongoing actions and recommendations from the Panel, as agreed upon at previous DBCP Session are listed in *Appendix XI*.

8. FUNDING

8.1 The DBCP is self-sustaining, by contributions of equipment, services (such as communications, deployment, archiving, and scientific or technical advice), and coordination. The contributions include monetary contribution to secure employment and activities of the Technical Co-ordinator, through IOC and WMO.

8.2 Monetary contributions - on a voluntary basis - are made by Panel members to the DBCP Trust Fund at WMO and/or IOC, as appropriate. The Terms of Reference of the DBCP Trust Fund at WMO are given in *Appendix VII*. The Trust Fund at IOC follows the Financial Regulations of the IOC Special Account that are reproduced in *Appendix VIII* (Decisions in 157th Executive Board of UNESCO). The IOC Regulations follow the General rules and regulations of UNESCO on Trust Funds, which correspond to those of WMO, in principle.

8.3 The Panel can establish budget lines to implement the DBCP activities, based on its agreed Workplan. The current DBCP budget line items are provided in *Appendix VI*.

8.4 Through the present arrangement, the Technical Co-ordinator is recruited by IOC, and the employment and activities of the Technical Co-ordinator depend on the DBCP Trust Fund in IOC and in WMO - the salary and logistical support are paid within the DBCP Trust Fund in IOC, whereas the expenses incurred for the TC's activities are executed within the DBCP Trust Fund in WMO.

8.5 Timely contribution from Panel members is critical to secure the TC employment contract, considering the yearly cycle of the administration within WMO and IOC. Panel members are encouraged to ensure that their contributions are made in good time.

8.6 The logistics for the DBCP Technical Co-ordinator are currently provided by the CLS (France), of which the terms and cost are defined by a MOU between the IOC and CLS on the logistic support for JCOMMOPS – where the Technical Co-ordinator reports organizationally. The annual cost is paid to the CLS from the DBCP Trust Fund in IOC. All actual expenses incurred by the host for the logistic support of JCOMMOPS, in excess of the amount of the contract signed with IOC to that effect, is considered as a contribution by the host to the work of the Panel.

8.7 The WMO and IOC Secretariats provide finalized financial statements of account on an annual basis to the Panel in early Year+1 as soon as the organizations' fiscal year accounting is finalized. The Panel also reviews its financial situation at regular Panel sessions, with interim statements of the budget provided by the WMO and IOC Secretariats.

8.8 The WMO Secretariat shall facilitate the transfer of sufficient funds from the DBCP Trust Fund at the WMO to the DBCP Trust Fund at the IOC if needed to pay all related expenses from the IOC.

8.9 The Panel may appoint a Panel Member as finance advisor to act on its behalf of and to work with the WMO-IOC Joint Secretariat to produce a consistent, comprehensive and comprehensible set of annualized accounting reports to be presented to the Panel and its Executive Board at their regular meetings (see *Appendix X* for currently appointed person).

8.10 The joint Secretariats and the DBCP financial advisor will work together to prepare and distribute the final statement of the DBCP/SOT Trust Fund for the previous year to the Panel members as soon as the IOC and WMO Final Statement of Accounts for that year are finalized. On the basis of the IOC and WMO Final Statements and the advice of the DBCP Executive Board, the financial advisor will also prepare a revised budget estimate for the following 2 years. The IOC and WMO Final Statements and the final statement for the DBCP/SOT Trust Fund are then included in the DBCP Annual report.

8.11 The DBCP financial advisor will request IOC and WMO to provide an Interim Statement of Accounts over the period 1 January-31 July for the preparation by the Secretariat and the Financial Advisor of an interim statement of the DBCP/SOT Trust Fund, to be presented to the DBCP members at the following DBCP Session.

9. ORGANIZATION AND CONDUCT OF THE DBCP SESSIONS

9.1 In odd years, the regular session of the DBCP will be held at either the WMO or IOC Headquarters, based on the agreement and decision by the Panel and the WMO-IOC Joint Secretariat, in order to lessen travel duties of the Secretariats and to provide opportunities for extended participation of other WMO or IOC officers in the session for wide range of information exchange and cooperation.

9.2 In even years, the regular session of the DBCP will be held at an external location, upon a suitable offer for hosting sessions. This is to advocate and support the Panel's activities in regional and national levels, and to encourage regional / national staff at all levels to actively participate in the work of the Panel, in particular through presentations to the Scientific and Technical Workshop and other networking opportunities.

9.3 The agenda and timetable of the regular session will be drawn up by the Panel Chairperson, in consultation with the Executive Board, other Panel members and the Joint WMO-IOC Secretariat. In principle, the Panel discussion at the regular session is to be completed within 3 days. In order to ensure efficiency of the session as well as the comprehensive review and exchange of information, some parallel or side sessions and focused discussion may be introduced, as required. The Panel will strive to reach decisions by consensus only; no voting should in principle take place. All decisions and relevant discussion will be recorded in the session report, which will be approved by the Panel before it disperses.

10. INFORMATION EXCHANGE AND REPORTING

10.1 The Technical Co-ordinator maintains a website on behalf of the Panel. The URL for the website is: http://dbcp.jcommops.org/ .

10.2 The Technical Co-ordinator also maintains mailing lists for the Panel. The names of the

mailing lists, their objectives, and membership are detailed on the DBCP website.

10.3 The Panel may produce and update the DBCP brochure. The contents, means of publication and distribution, and funding mechanisms for related activities are to be agreed by the Panel at its regular sessions.

10.4 The Panel members who represent DBCP at various events are to use a standard Powerpoint presentation template. The template is developed and maintained by the Technical Co-ordinator, and available from the DBCP website.

10.5 The Technical Co-ordinator also maintains a document describing the Panel's achievements since its establishment.

10.6 The Panel maintains series of DBCP Technical Publications that are issued by the WMO Secretariat. These publications can be with the form of paper copy, CD-ROM, DVD-ROM, or be web-based only. The list of current DBCP Publications is available at the DBCP website. The actual costs of editing, publishing, and distributing the DBCP Publications are being recuperated from the DBCP Trust Fund.

10.7 At its regular sessions, the Panel receives reports on activities during the intersessional period, from:

- the Executive Board;
- the Technical Co-ordinator;
- the Action Groups (annual basis), and
- the Member Countries (annual).

10.8 The annual reports by Action Groups and the Member Countries are also to be included in the DBCP Annual Report. Members who had not submitted written National Reports for the year YYYY at the regular Panel Sessions shall submit their input to the Secretariat before the end of the year YYYY. The Annual Report shall be provided by the Secretariat during the year following the year of the report.

10.9 The Panel's regular session report shall be provided by the secretariat within 3 months after the last day of the session and will be consolidated into a single mailing, structured as follows:

a. A 2-page covering letter containing important information for decision makers, including:
   - Executive summary of the Panel's achievements, activities and aspirations for the current year;
   -

b. A slimmed-down paper hard copy report containing information that needs to be referenced (and possibly annotated) rather frequently and quickly. This would essentially replace the existing session final report. The material in this report would include the following:

   - Executive summary of the Panel's achievements, activities and aspirations for the current year;
   - The final report of the regular session (i.e., the usual final report without the annexes);
   - Agenda;
   - List of participants;
   - Operating Principles of the Panel (this document, as updated and agreed at the annual session);
   - Summaries of the Action Group reports;
   - Executive Board report;

- Finalised annual financial accounts, including the table of national contributions and budget for the following year;
- If necessary, selected buoy and GTS statistics (showing trends in numbers, quality, delays, plus a few maps);
- List of Actions and Workplan, and;
- List of Acronyms.

c. A CD-ROM containing the entire above, plus a complete set of meetings, and all other annexes generally attached to the two reports includes:

- A full report by the Technical Co-ordinator;
- National reports;
- Full reports by the Action Groups;
- Data Management Centre reports;
- The current status and development of satellite communications (CLS/Argos, Iridium, etc.);
- GTS report;
- National Focal Point list;
- Contracts;
- Other financial and administrative papers; and
- Technical Document list, including available electronic versions.

d. All of the above information will be available on-line via the JCOMMOPS website.

10.10 During the intersessional period, the Technical Co-ordinator provides for synthetic quarterly reports on his/her activities and the status of his/her Workplan's implementation to the DBCP Executive Board.

10.11 The Technical Co-ordinator produces monthly maps and statistical graphics on a monthly basis regarding the status of buoy programmes. This information is posted on the DBCP website and issued through the appropriate mailing lists.

10.12 Written reports to the Panel session will adhere to a format that will make clear to the Panel, by means of an Executive Summary, those issues that require discussion and decision. Similarly, presentations to the session will presume that written reports have been read by the Panel, and will concentrate solely on those issues, which require an action or decision by the Panel. Report presenters will submit a summary of their report and the ensuing discussion and actions to the secretariat for inclusion in the draft final report of the session.

10.13 The National Focal Point shall annually check the DBCP list of National Focal Points for logistical facilities and report discrepancies, changes, or additions to the WMO Secretariat.

11. ROUTINE TASKS OF THE TECHNICAL CO-ORDINATOR

The following routine tasks of the Technical Co-ordinator (TC) comply with his/her Terms of Reference (*Appendix II*).

11.1 The Technical Co-ordinator acts as a clearing house for information on all aspects of buoy data use; he/she maintains DBCP and JCOMMOPS websites as appropriate.

11.2 The Technical Co-ordinator monitors the status of the global drifting and moored buoy networks in terms of: (i) spatial density; (ii) accuracy of the measurements; (iii) real-time data distribution and data timeliness; and (iv) buoy lifetime. The TC identifies gaps in the system, and makes recommendations to the Panel as appropriate. He/she also regularly provides information on instrument performances to the WMO Database as part of the CBS Rolling Review of Requirements (RRR).

11.3 Through direct contacts with programme managers, Principal Investigators, and buoy operators, the Technical Co-ordinator advertises the DBCP Programme, encourage use of buoy data, and active participation of new participants. The TC identifies sources of buoy data not currently reported on the GTS and determines the reason for non-availability, (particularly for the Arctic Buoys IABP).The TC regularly contacts buoy programme managers of existing and new programmes in order to: (i) promote data exchange and GTS distribution of the data in real-tine, (ii) invite them, and possibly convince them, if useful, to authorise GTS distribution of their buoy data; (iii) offer technical assistance for that purpose if needed; (iv) collect information on buoy programmes, and the deployed buoys, including metadata; and (v) collect information in buoy deployment opportunities for use by other buoy operators. Programme Managers may also directly contact the Technical Co-ordinator for receiving assistance with regard to the GTS distribution of their buoy data.

11.4 The Technical Co-ordinator provides information and assists as appropriate buoy data users for accessing data and platform/instrument metadata.

11.5 The Technical Co-ordinator also participates actively in buoy quality monitoring as defined in the DBCP Quality Control Guidelines (details on the DBCP website[1]). In particular, The TC monitors the dedicated mailing list, and information posted on the dedicated web page, reviews the buoy monitoring statistics, and provides feedback to buoy operators regarding the quality of their buoy data as appropriate and recommends action for those buoys reporting erroneous data. He/she assists in the resolution of specific technical problems regarding the GTS distribution of the data as appropriate (obtaining WMO numbers, looking at technical files, calibration curves, looking at data losses, etc.).

11.6 The Technical Co-ordinator works closely with centres responsible for the collection, location, data processing, and real-time GTS distribution of the buoy data for: (i) monitoring the system and identifying possible problems; (ii) making sure these problems are corrected; and (iii) providing technical assistance as appropriate.

11.7 Upon request, the Technical Co-ordinators also provides the WMO and IOC Secretariats with status maps, statistical information and graphs, and documentation.

11.8 The Technical Co-ordinator maintains the DBCP list of buoy manufacturers and provides it on the DBCP website.

11.9 The Technical Co-ordinator liaises with the DBCP Action Group coordinators and prepares reports on DBCP activities for the regular meetings of the Action Groups. The TC represents the Panel or the Action Groups at relevant technical meetings, both inside and outside WMO and IOC, as required.

11.10 The Technical Co-ordinator assists the Chairperson and the Secretariats in the preparation of the DBCP Session, including the preparation of specific technical preparatory documents and presentations.

11.11 The Technical Co-ordinator undertakes the tasks as proposed by the Chair during the intersessional period as a matter of priority as prioritised and reports at the next Panel Session.

11.12 The Technical Co-ordinator supports, as required, existing DBCP action groups, and provides assistance on request to other internationally coordinated buoy programme developments.

11.13 The Technical Co-ordinator coordinates with the Indian Ocean Panel (IOP) implementing

1 : http://www.jcommops.org/dbcp/2qgd.html

strategy for the Indian Ocean Observing System as far as data buoys are concerned.

11.14 The Technical Co-ordinator produces on a yearly basis prior to Panel Session, a table of national commitments in the Southern Ocean, and seeks additional commitments for barometer upgrades, and deployment opportunities in the Southern Ocean to achieve a level of 300 buoys south of 40S.

11.15 The Technical Co-ordinator maintains a catalogue of existing ongoing ocean data buoy programmes, and provides information to Panel members or on its website, about where inventories of buoys are held, to aid in deployment planning.

11.16 The Technical Co-ordinator implements the JCOMMOPS work-plan – particularly with respect to Deployment opportunities.

11.17 The Technical Co-ordinator maintains a summary of requirements for buoy data to meet expressed needs of the international meteorological and oceanographic communities.

11.18 The Technical Co-ordinator coordinates the operations of DBCP Quality Control guidelines.

11.19 The Technical Co-ordinator to collect statistics and information on actual vandalism occurrences, and maintain relevant information on the DBCP website.

12. REVIEW OF THE MANAGEMENT STRUCTURE AND OPERATING PRINCIPLES

12.1 The Panel reviews and updates its management structure, and operating principles at its regular sessions. This includes, in particular, the appropriate appendices of the DBCP operating principles, i.e., definition of an Action Group, Terms of Reference of the Executive Board, budget lines, and Terms of Reference of the DBCP Trust Fund at WMO and IOC.

APPENDIX I

Terms of Reference of the Data Buoy Co-operation Panel

(as approved by the JCOMM Co-Presidents on behalf of the Commission, 24 July 2012, per Resolution 3 (JCOMM-4))

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, 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 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.

APPENDIX II

Terms of Reference for the Technical Co-ordinator of the DBCP

(as approved by the JCOMM Co-Presidents on behalf of the Commission, 24 July 2012, per Resolution 3 (JCOMM-4))

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;

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

4. Assist in the standardization of relevant observing platform 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 ~~buoy~~ relevant observing platforms operators;

7. Assist in promoting the insertion of all available and relevant observing platform 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 data into appropriate permanent archives.

APPENDIX III

Definition of a DBCP Action Group
(as approved at DBCP-X)

1. A DBCP Action Group is an independent self-funded body that maintains, as a significant element of its responsibilities, an observational buoy programme providing meteorological and oceanographic data for real-time and / or research purposes in support of the World Weather Watch (WWW), the World Climate Research Programme (WCRP), the Global Climate Observing System (GCOS), and the Global Ocean Observing System (GOOS), and other relevant WMO and IOC programmes.

2. Action Groups of the DBCP shall support the aims and objectives of the DBCP - as set out in the Terms of Reference of the DBCP - particularly with respect to:

   - Provision of good quality and timely data to users;
   - Insertion of real-time (or near real-time) data into the GTS;
   - Exchange of information on data buoy activities and development and transfer of appropriate technology.

3. An Action Group may be regional or national in nature provided that its programme benefits a regional or international community.

4. To be adopted as an Action Group of the DBCP, the Terms of Reference or operating principles of the body or programme shall be submitted to a session of the DBCP for formal approval. Once approved these shall be lodged with the Secretariats of WMO and IOC.

5. The DBCP shall support the activities of its adopted action groups especially through the assistance of its key personnel (technical co-ordinator and the Secretariats of WMO and IOC) as far as resources allow.

6. Action Groups of the DBCP shall submit annual reports of their activities to the Chairperson of the DBCP.

APPENDIX IV

Terms of Reference of the DBCP Executive Board
(as approved at DBCP-28)

The DBCP Executive Board shall:

1. Seek guidance from the Panel at its regular sessions regarding specific issues to be addressed by the Executive Board and the Tasks Teams during the intersessional period;
2. Act promptly to deal with any administrative, financial and planning issues and opportunities that might arise, within the guidelines established and reviewed regularly by the Panel;
3. Authorise the Chairperson to commit any expenditure necessary for the resolution of these issues and the promotion of the Panel's aims and objectives, up to the maximum amounts that might be agreed in advance by the Panel at its regular session;
4. Review the DBCP Implementation Strategy to ensure that it is kept up-to-date and complies with ongoing activities and users' requirements;
5. Considering the dynamic nature of the DBCP Operating Principles, in consultation with Panel members, assist the Chairperson in proposing updates to these principles on an annual basis;
6. Assist the Chairperson with regard to continuing the arrangements (including finance) to secure the services of a technical coordinator;
7. Set working priorities for the Technical Co-ordinator according to the DBCP recommendations at its regular sessions, and provide further guidance during the DBCP intersessional period;
8. Assist the Chairperson, and liaise with the Financial Advisor for updating the interim financial report with the most accurate and current information by end of each year;
9. Confer primarily regularly by e-mail, and exploit opportunities afforded by attendance at other meetings (e.g., the JCOMM OCG meeting) for face-to-face meetings;
10. Conduct meetings annually, following an agenda drawn up by the DBCP Chairperson;
11. Consult with Panel members and the Chairpersons of the DBCP Task Teams during the intersessional period if required;
12. Report its activities to the DBCP at its regular Session, and throughout the intersessional period as appropriate.

Membership:
The following individuals are members of the DBCP Executive Board:

- DBCP Chairperson, or his / her appointed deputy (Executive Board Chairperson)
- DBCP Vice-chairpersons
- DBCP member (appointed by the Chairperson)[1]
- DBCP Technical Co-ordinator (*ex officio*)
- Representative of the IOC Secretariat (*ex officio*)[2]
- Representative of the WMO Secretariat (*ex officio*)[3]
- Representative of the Manufacturers (*ex officio*)[4]

Note 1: A quorum of the Board should consist of at least three members, and must include the Chairperson or his / her appointed deputy.

1 : Mr Sidney Thurston (USA) has been appointed by the current DBCP Chairperson, Mr Jon Turton to serve in the Executive Board
2 : Currently Mr Tom Gross
3 : Currently Mr Etienne Charpentier
4: Nominated on rotating basis by the Panel. Currently Mr Andy Sybrandy (Pacific Gyre, USA)

Note 2: Any Panel Member may attend DBCP annual Executive Board meetings as an observer, subject to the availability of adequate meeting room space. If required, the Chairperson of the DBCP Executive Board will make a final decision as to which observers may attend, and may also invite other persons to attend at his / her discretion.

Note 3: The term for the members of the Executive Board is for one year during the inter-sessional period. They shall be eligible for re-election in their respective capacities, but would serve in principle for no more than 4 terms.

APPENDIX V

TERMS OF REFERENCE OF THE DBCP TASK TEAMS

TERMS OF REFERENCE OF THE TASK TEAM ON DATA MANAGEMENT

(as adopted at DBCP-29)

The DBCP Task Team on Data Management shall:

1. Receive and review reports from the Data Management Centres specializing in buoy data, i.e. (i) the Météo-France GDAC/DB, and (ii) the MEDS, Canada GDAC/DB; reconcile any overlaps with emphasis on differences.

2. Take the lead on managing table driven coding requirements for data buoy observations, for all relevant applications, and submit them in a consolidated way to the DMPA Task Team on Table Driven Codes.

3. Address issues to do with real time distribution of data, including GTS issues, timeliness and methods to improve data/flows.

4. Address issues relating to delayed mode distribution and archiving of the data.

5. Seek input from data users on which instrumental metadata is most important and how it is best managed and coordinated.

6. Review all relevant JCOMM Publications, to make sure they are kept up to date and comply with Quality Management terminology.

7. Follow up with regard to the development of the WIGOS Pilot Project for JCOMM and make sure that the developments proposed by the Task Team are consistent with the WIGOS and WIS requirements.

8. Make recommendations to the DBCP Executive Board or the DBCP for addressing the issues above.

9. Report to the DBCP Executive Board and the DBCP at its annual Sessions.

Membership:

The membership is open to all Panel members. The Chairperson[1], appointed by the Panel, has selected the following team members:

1. Mayra Pazos (TT Chairperson and GDP representative)
2. Yann Bernard (CLS Technical Manager)
3. Pierre Blouch (E-SURFMAR Service Manager, EUMETNET)
4. Bruce Bradshaw (GDAC/DB/Canada representative)
5. Tony Chedrawy (Metocean)
6. Basanta Kumar Jena (Scientist, NIOT, India)
7. Jean Rolland (GDAC/DB/France representative)
8. Johan Stander (SA Weather Service)
9. Jon Turton (UK Met Office)
10. Jeff Wingenroth (Data Buoy Instrumentation)
11. Champika Gallage (DBCP Technical Coordinator, *ex officio*)

1 The Chair and Co-Chair of the Task Team should not be in a situation of conflict of interest.

TERMS OF REFERENCE OF THETASK TEAM ON INSTRUMENT BEST PRACTICES & DRIFTER TECHNOLOGY DEVELOPMENTS
(as adopted at DBCP-28)

Note: The DBCP Evaluation Group is being merged into this Task Team.

The DBCP Task Team on Instrument Best Practices & Drifter Technology Developments shall:

On instrument best practices and quality management

1. When required by the DBCP, evaluate quality of buoy data produced by specific types of buoys, as well as functioning, efficiency;

2. Review existing practices for automatic real-time buoy data quality control, and delayed-mode buoy data quality control, and possibly suggest design changes for improvement (sensors, hardware, software, data formats) in liaison with the Task Team on technological developments;

3. Address instrument evaluation issues; suggest specific tests and / or evaluation deployments in different sea conditions to DBCP members in order to evaluate buoy quality as described in (1) above;

4. Share experience and results of evaluation with the DBCP and other interested parties;

5. Review and recommend Best Practices; work on specific technical issues in order to facilitate standardization and liaise with the other DBCP Task Teams as appropriate (e.g., DBCP recommended Argos message formats); and

6. Define specific criteria for evaluation purposes (e.g. ocean areas, definition of acceptable quality data, e.g., early failures, lifetimes, delays, accuracies, resolutions, etc.);

7. Comply with the requirements of the WMO Quality Management Framework (QMF) and quality management principles;

On drifter technology developments

8. Investigate developments in the fields of sensor technology, on-board processing, buoy hardware, hull design, energy generation and storage in order to better meet user requirements in terms of the range, reliability and quality of observed parameters and their cost-effectiveness;

9. Regularly review and document operational and upcoming satellite telemetry systems in terms of their ability to address user requirements such as bandwidth, timeliness, availability, geographical coverage, reliability, service quality, technical support, energy consumption and cost;, and make specific recommendations to the communications service providers on required / desired enhancements;

10. Review operational platform location systems, and whether they meet the user requirements;

11. Propose to the DBCP and its Executive Board any evaluation activities and pilot projects that it deems beneficial to data buoy operators;

12. Propose recommendations, both upon request and unsolicited, to the Argos Joint Tariff Agreement. Such recommendations shall be passed via the DBCP Executive Board or the DBCP as appropriate; and

13. Evaluate, test, and promote buoy designs that are resistant to vandalism;

General

14. Review all relevant JCOMM Publications to make sure they are kept up to date, comply with Quality Management terminology, and adhere to the WMO Quality Management Framework (QMF);

15. Provide the DBCP Executive Board and the DBCP, both upon request and unsolicited, with technical advice needed for addressing the issues above; and

16. Submit reports to the DBCP Executive Board and to the DBCP at its annual session that describe intersessional activities and propose a Workplan for the next intersessional period.

Membership:

The membership is open to all Panel members. The Chairperson[2], appointed by the Panel, has selected the following team members:

Dr Luca Centurioni, SIO(TT co-Chairperson)
Mr Andy Sybrandy, Pacific Gyre
Mr Pierre Blouch, Météo-France
Mr Shaun Dolk, NOAA / AOML
Mr Paul Freitag, NOAA / PMEL
Mr Michel Guigue, CLS
Mr Chris Marshall, Environment Canada
Mr Sergey Motyzhev, Marlin Yug
Ms Mayra Pazos, NOAA / AOML
Dr M Ravichandran, INCOIS
Mr Jean Rolland, Météo-France
Mr R. Venkatesan, NIOT, India
Mr David Murphy, Sea-Bird Electronics, USA
Dr Rick Lumpkin, AOML (TT co-Chairperson)
Mr Bernier Petolas, MetOcean
Mr Robert Jensen, USACE
Mr David Meldrum, SAMS
Mr Steve Piotrowicz, NOAA
Dr. Tim Richardson, Liquid Robotics
Mr Jon Turton, UK Met Office
Mr Bill Woodward, CLS America
Technical Co-ordinator, DBCP
Mr Shannon McArthur
Mr Jeffrey Wingenroth, Data Buoy Instrumentation LLC
Mr William Woodward, CLS America

The Co-chairperson is representing the manufacturers and is selected on a rotating basis.

2 The Chair and Co-Chair of the Task Team should not be in a situation of conflict of interest. Manufacturer representative may be accepted as Vice-Chair of the Task Team provided that the major drifter manufacturers agree.

TERM OF REFERENCE OF THE TASK TEAM ON MOORED BUOYS
(as adopted at DBCP-24)

The DBCP Task Team on Moored Buoys shall:

1. Review and document operational moored buoy systems and their underlying requirements;

2. Liaise with the different communities deploying moorings, including TIP, OceanSITEs, seabed observatories, as well as national moored buoy programmes (coastal and global), and promote the development of multi-disciplinary mooring systems;

3. Liaise with the GOOS Scientific Steering Committee (GSSC) and its technical sub-panel for Integrated Coastal Observations (PICO) to facilitate synergy between advances in GOOS implementation and the development of operational capabilities, in particular, for sustained coastal observations, analysis and related services by using mooring systems;

4. Liaise with the JCOMM Expert Team on Wind Waves and Storm Surges (ETWS) regarding the need for in situ wave observations;

5. Compile information on opportunities for the deployment and / or servicing of moored buoys;

6. Monitor technological developments for moored data buoys and liaise with the Task Team on Technological Developments on satellite data telecommunication aspects;

7. Review all relevant WMO and IOC Publications on Instrument Best Practices (e.g., JCOMM, CIMO) to make sure they are kept up to date, address WIGOS issues, and comply with Quality Management terminology;

8. Provide the DBCP Executive Board or the DBCP with technical advice needed for developing moored buoy programmes, including the issues above; and

9. Report to the DBCP Executive Board and the DBCP at its biennial Sessions, with periodically updated Workplans supporting implementation.

Membership:

The membership is open to all Panel members. The Chairperson[3], appointed by the Panel, has selected the following team members:

Mr Jon Turton, UK Met Office (TT Chairperson); (TT Vice-Chairperson – to be appointed)

Dr Robert Jensen, USACE
Mr Chris Meinig, NOAA / PMEL
Mr R. Venkatesan, NIOT, India
Dr Uwe Send, SIO
Mr Paul Freitag, NOAA / PMEL
Mr Chris Marshall, Environment Canada
Mr Ariel Troisi, SHN

3 The Chair and Co-Chair of the Task Team should not be in a situation of conflict of interest.

TERMS OF REFERENCE FOR THE DBCP TASK TEAM ON CAPACITY-BUILDING
(as adopted at DBCP-28)

The DBCP Task Team on Capacity-Building shall:

1. Initiate, plan and coordinate the implementation of the Training and Capacity-Building work programme including, in particular, Training Course on Buoy Programme Implementation and/or Data Management; coordinate production of relevant training materials, and identify lecturers;

2. In parallel with the organization of training programmes, keep under review existing training material (paper and electronic) and advise on updating and developing new DBCP standard material in this regard; and investigate ways to add training material from all capacity building activities to IOC/IODE OceanTeacher;

3. Review and assess national, regional, and global requirements for capacity-building and develop / improve programmes as appropriate;

4. Liaise with other capacity-building programmes in relevant areas to develop and implement integrated activities, to explore potential synergies and opportunities for efficiently using resources available; liaise in particular with the JCOMM cross-cutting Team on Capacity-Building;

5. Endeavour to mobilize the resources required for DBCP capacity-building, including those needed for the implementation of the Training Courses;

6. Make recommendations to the DBCP Executive Board and / or the DBCP for addressing the issues above;

7. Report to the DBCP Executive Board and the DBCP at its biennial Sessions;

8. Consider inviting mariners and shipping companies to the DBCP Capacity Building workshops as a way to advertise the ocean observation activities and seek their support;

9. Make sure the data buoy vandalism aspects are being addressed as part of its activities;

10. Investigate on possible cooperation with relevant Capacity Building programmes in WMO and IOC.

Membership:

The membership is open to all Panel members. The Chairperson[4], appointed by the Panel, has selected the following team members:

Dr Sidney THURSTON, NOAA/OCO
(TT-CB Chairperson)
DBCP Executive Board members, including DBCP Chairperson, Vice-chairpersons (or their respective Deputies)
Hamad Mohammed AL GHEILANI (Oman)
Rick LUMPKIN (USA)
Djoko HARTOYO (Indonesia)

Dr R. Venkatesan, NIOT/India
(TT-CB Vice-Chairperson)
DBCP Technical Coordinator

Mathieu BELBEOCH (JCOMMOPS)
Walter FLORES SERVAT (Peru)
Dr G. LATHA (India)

4 The Chair and Co-Chair of the Task Team should not be in a situation of conflict of interest.

Byung-Gul LEE (Republic of Korea)

David MELDRUM (UK)
Louise WICKS (Australia)
Representative of the IOC Secretariat
Juliet HERMES (South Africa)

Kwan-Chang LIM (Republic of Korea)
John MUNGAI (Kenya)
Lucy SCOTT (South Africa)
Jean ROLLAND (France)
Representative of the WMO Secretariat
Santjie du TOIT (South Africa)

APPENDIX VI

Current DBCP budget line items
(as approved at DBCP-29)

The DBCP budget includes the following line items:

1. Contract for the DBCP Technical Co-ordinator[1];
2. Provision for termination / transition of the Technical Co-ordinator;
3. JTA[2], including Chairperson's contract, Executive Board, and Secretariat support;
4. Consultancy;
5. JCOMMOPS logistical support[3];
6. JCOMMOPS Data/Development[4];
7. JCOMMOPS information system migration[5];
8. SOT[6];
9. SOT Ship Coordinator's position[7];
10. Travel of DBCP Chairperson[8];
11. Travel for the DBCP Technical Co-ordinator[8];
12. Travel of DBCP Representatives[8];
13. Travel for the ship coordinator's position[9];
14. Technical developments and evaluations[10];
15. Implementation support to address regional system deficiencies;[11]
16. Outreach and publication activities[12];
17. Capacity-Building[13];
18. Collaborative Arrangements[14];
19. Bank charge and support cost[15];
20. Contingency.

1: Includes the salary and benefits;
2: This expenditure is balanced by an equivalent contribution of the JTA to the DBCP Trust Fund.
3: Expenses shared with the Argo Information Centre (AIC). This includes office space and use of furniture, personal computer, licenses for basic office software, secretarial support, telephone, Internet and e-mail access, and miscellaneous office supplies;
4: Hardware and software, and host IT support for developing, running, and maintaining the JCOMMOPS Information System;
5: Provision for the migration of the JCOMMOPS Information System;
6: Expenditure in support of the JCOMM Ship Observations Team (SOT) activities to be decided by the SOT Chairperson;
7: Includes the salary and benefits;
8: Missions on behalf of the Panel;
9: Expenses to be decided by the OPE Chair in consultation with the chairs of programmes contributing to JCOMMOPS;
10: For example, the DBCP Iridium Pilot Project;
11 : For example, improving data timeliness in areas where system weaknesses are identified, Iridium, SLP;
12: DBCP and JCOMMOPS brochures and DBCP Publications;
13: Support for DBCP-related training courses: travel of trainers and / or trainees; training materials;
14: Support for collaborative arrangements with other international programmes, between Panel Members, or with private companies for the provision of coordination functions, or the deployment and / or operations of instruments; and
15: Bank charges and service charges from the WMO and IOC for supporting the DBCP Trust Fund;

APPENDIX VII

Draft Terms of Reference for the DBCP Trust Fund at WMO

(as adopted at DBCP-28 and further agreed by way of exchange of letters between the WMO Secretary General[1] and the DBCP Chairperson[2])

1. The purpose of the DBCP Fund is to support the activities of the Data Buoy Co-operation Panel (DBCP);

2. The DBCP Fund is a Trust Fund within the provisions of Articles 9.7[3], 9.8[4] and 9.9[5] of the WMO Financial Regulations (Resolution 37, Cg-XV);

3. The Fund shall be managed by WMO under its applicable rules and procedures, according to an annual budget adopted by the DBCP at its regular Sessions and any other directions provided by the DBCP;

4. The budget will be constructed according to a format agreed by the Panel, in which all income and expenditures will be identified in general articles and specific chapters. The format of the budget may be revised by the Panel as necessary. The budget may take note of other monies and resources made available for support of the DBCP activities, but which are not included as part of the Fund. Only those monies placed in the Fund, however, shall be subject to these terms of reference. The DBCP will provide WMO with details of the share to be borne by participating Members and contributors for invoicing purposes;

5. The Chairperson may authorize in writing the WMO Secretariat to commit any expenditure necessary for the resolution of these issues and the promotion of the Panel's aims and objectives, up to the maximum amounts that might be agreed in advance by the Panel at its regular session, as long as these are consistent with the DBCP Operating Principles. The Chairperson may also authorize to commit any expenditure exceeding these maximum amounts, or unplanned DBCP expenditures with the approval from the DBCP Executive Board, under its Terms of Reference;

6. The unit of account shall be the United States dollar. When commitments are made, the appropriate funds will be converted, as necessary, to the currency of commitment in at least the amount of the commitment;

7. The income of the Fund will include:

(i) Annual contributions from participating Members / Member States;

(ii) Funds deposited for specific purposes, hereafter referred to as deposits;

(iii) Other contributions from third parties;

(iv) Interest on investments as may be made by the Secretary-General in accordance with the provisions of Financial Regulation 12.2[6](Resolution 37, Cg-XV); and

(v) Miscellaneous income.

1: Letter 11106-08/OBS/WIGOS/OSD/MAR/DBCP-ADM from Michel Jarraud dated 15 December 2008
2: Letter from David Meldrum dated 5 January 2009
3: 9.7: Trust funds, reserve and special accounts may be established by the Secretary-General and shall be reported to the Executive Council.
4: 9.8: The purpose and limits of each trust fund, reserve and special account shall be clearly defined by the Executive Council. Unless otherwise provided by the Congress, such funds and accounts shall be administered in accordance with the present Financial Regulations.
5: 9.9: Income derived from investments of trust funds, reserve and special accounts shall be credited as provided in the provisions applicable to such funds or accounts or at the request of the donors at any time. In other circumstances, Regulation 10.1 shall apply.
6: 12.2: The Secretary-General may make long-term investments of moneys standing to the credit of trust funds, reserve and special accounts, except as may be otherwise provided by the appropriate authority in respect of each such fund or account and having regard to the particular requirements as to the liquidity of funds in each case.

8. The Fund will be used as agreed by the DBCP to:

(i) Finance technical and operational support services for the DBCP, including in particular for supporting its Technical Co-ordinator salary, benefits, logistical support, and missions; DBCP capacity-building activities; data buoy Technical Evaluation and DBCP Pilot Projects; consultancy and missions of experts acting on behalf of the Panel; practical arrangements for the deployment or servicing of buoys; promotion and exchange of information about the Panel activities;

(ii) Finance the share of the DBCP in supporting the activities of JCOMMOPS and the Observing Programme Support Centre (OPSC) as agreed by the Panel at its regular sessions;

(iii) Provide support to the Argos Joint Tariff Agreement within the resources set aside by the DBCP under these activities;

(iv) Assist in the establishment and operation of data buoy programmes;

(v) Meet appropriate administrative costs incurred by WMO in providing support to DBCP activities;

(vi) Meet other administrative costs including such items as meetings and consultants;

(vii) Purchase specified goods or services; and

(viii) Support other activities required to meet the basic goal of the DBCP Panel;

9. Authority for the disbursement of funds, in respect of contracts and agreements properly concluded, is delegated to the Chairman of the DBCP. The Chairperson of the DBCP will request in writing the Secretary-General of WMO, or his representative, to disburse the funds;

10. Where required by their internal regulations, individual contributors to the DBCP Fund may wish to negotiate additional conditions governing the application, conditions of deposit and disbursement of funds. Such additional conditions shall not inhibit the efficient and proper use of the Fund nor modify the intent of the Fund. They shall require the acceptance in writing by the Chairperson of the DBCP and the Secretary-General of WMO or his representative;

11. The Fund shall be maintained on a continuous basis and amounts standing to the credit of the Fund at the end of any WMO biennial period shall remain in the Fund for use in the subsequent period;

12. Upon liquidation of the Fund for any reason, the DBCP shall make provision for the payment of unliquidated obligations and estimated expenses of winding-up business. It shall then arrange for repayment - to the extent that funds are available and according to the depositors instructions - of deposits for which no equipment or services have been received;

13. At the closure of the Fund:

(i) Any remaining surplus after (12) above, shall be distributed among the then DBCP Members in proportion to their total contributions and deposits paid by them to the DBCP Fund; and

(ii) Any remaining deficit, including provision for the payment of unliquidated obligations and estimated expenses of winding-up business, shall be met by the DBCP Members in an equitable way, to be decided upon by the DBCP.

14. The Fund will be terminated not later than one year after the formal termination of the DBCP;

15. All funds credited to the DBCP Fund shall be subject to these terms of reference and to the Terms of Reference of the DBCP; and

16. Any revision or amendment to the present Terms of Reference is subject to a decision of the DBCP and the agreement of WMO.

APPENDIX VIII

Financial Regulations applicable to the Intergovernmental Oceanographic Commission (IOC)

(Excerpt from the Decisions by 157th Executive Board of the UNESCO)

Article 1 - Creation of a Special Account of UNESCO

1.1 In accordance with Article 6, paragraph 6, of the Financial Regulations of UNESCO, there is hereby created a Special Account for the Intergovernmental Oceanographic Commission, hereinafter referred to as IOC.

1.2 The following Regulations shall govern the operation of this Special Account.

Article 2 - Financial period

The financial period shall correspond to that of UNESCO.

Article 3 - Income

3.1 As provided in its Statutes, the income of IOC shall consist of:

(a) funds appropriated for this purpose by the General Conference of UNESCO;

(b) voluntary contributions from States, international agencies and organizations, as well as other entities allocated to it for purposes consistent with the policies, programmes and activities of UNESCO and IOC;

(c) such subventions, endowments, gifts and bequests as are allocated to it for purposes consistent with the policies, programmes and activities of UNESCO and IOC;

(d) fees collected in respect of the execution of projects entrusted to IOC, from the sale of publications, or from other particular activities; and

(e) miscellaneous income.

3.2 The Executive Secretary of IOC, hereinafter referred to as the Secretary, may accept income as set forth in Article 3.1 on behalf of IOC, provided that, in any case which would involve IOC in an additional financial liability, the Secretary shall obtain the prior approval of the IOC Executive Council and the consent of the Executive Board of UNESCO.

3.3 The Secretary shall report to the IOC Assembly and the IOC Executive Council on any subventions, contributions, grants, gifts or bequests accepted.

Article 4 - Budget

4.1 The Secretary shall prepare, in a form to be determined by the IOC Assembly, a biennial programme and budget and shall submit it to the IOC Assembly for approval.

4.2 The appropriations voted in the budget shall constitute an authorization to the Secretary to incur obligations and to make expenditures for the purposes for which the appropriations are voted and up to the amounts so voted.

4.3 The Secretary is authorized to transfer funds between activities under the same appropriation line. The Secretary may be authorized by the IOC Assembly to transfer funds, when necessary, between appropriation lines within the limits established by the Appropriation Resolution voted by the IOC Assembly and shall report to the IOC Executive Council on all such transfers.

4.4 The Secretary is required to maintain obligations and expenditures within the level of the actual resources that become available to the General Account mentioned in Article 5.1 below.

4.5 Appropriations shall remain available for obligation during the financial period to which they relate.

4.6 The Secretary shall make allotments and any modifications thereon, within the limits of the Appropriation Resolution, which shall be communicated, in writing, to the officials authorized to incur obligations and make payments.

4.7 Appropriations shall remain available for 12 months following the end of the financial period to which they relate to the extent that they are required to discharge obligations for goods supplied and services rendered in the financial period and to liquidate any other outstanding legal obligations of the financial period.

4.8 At the end of the 12-month period provided for in Article 4.7 above, the then remaining unspent balance of obligations retained shall revert to the General Account mentioned in Article 5.1 below.

Article 5 - The General Account

5.1 There shall be established a General Account, to which shall be credited the income of IOC as described in Article 3 above and which shall be used to finance the approved budget of IOC.

5.2 The balance remaining in this General Account shall be carried forward from one financial period to the next.

5.3 The uses to which this balance may be put shall be determined by the IOC Assembly.

Article 6 - Trust Funds, Reserve and Subsidiary Special Accounts

6.1 In addition to a Working Capital Fund, the Secretary shall establish a Reserve Fund to cover end-of-service indemnities and other related liabilities; the Fund shall be reported to the IOC Assembly at the time of the budget approval.

6.2 Trust Funds, Subsidiary Special Accounts and any other Reserve Accounts may be established by the Secretary, who shall report to the IOC Assembly and the IOC Executive Council.

6.3 The Secretary may, when necessary, in connection with the purpose of a Trust Fund, Reserve or Subsidiary Special Account, prepare special financial regulations to govern the operations of these funds or accounts and shall report thereon to the IOC Assembly and the IOC Executive Council. Unless otherwise provided these funds and accounts shall be administered in accordance with these Financial Regulations.

Article 7 - Accounts

7.1 The UNESCO Comptroller shall maintain such accounting records as are necessary and shall prepare, for submission to the IOC Assembly and the IOC Executive Council, the biennial accounts showing, for the financial period to which they relate:

(a) the income and expenditure of all funds;

(b) the budgetary situation including:

(i) original appropriations;

(ii) the appropriations as modified by any transfers;

(iii) the amounts charged against these appropriations;

(c) the assets and liabilities of IOC.

7.2 The Secretary shall also give such other information as may be appropriate to indicate the current financial position of IOC.

7.3 The biennial accounts of IOC shall be presented in dollars of the United States of America. Accounting records, may, however, be kept in such currency or currencies as the Secretary may deem necessary.

7.4 Appropriate separate accounts shall be maintained for all Trust Funds, Reserve and Subsidiary Special Accounts.

Article 8 - External audit

The audited accounts of IOC, which constitute an integral part of the statement of the financial position of UNESCO, and the report of the External Auditor of UNESCO on IOC, shall be submitted to the IOC Assembly for approval.

Article 9 - General provision

Unless otherwise provided in these Regulations this Special Account shall be administered in accordance with the Financial Regulations of UNESCO.

APPENDIX IX

DBCP DATA POLICY

(as adopted at DBCP-25, and revised at DBCP-30)

Data access policy

1. The DBCP encourages timely, free and unrestricted access to data. Real time data sharing is achieved via the Global Telecommunications System[1] of WMO. DBCP also cooperate with data contributors to ensure that data can be accepted into and be used through the NODC and WDC network of the IOC/IODE as long-term repositories for oceanographic data and associated metadata.

2. At present, all of the archiving agencies and many of the operational and research bodies make provision for the release of drifter data to scientific and other customers. In particular, many data are available via the web, either in the form of track plots or as datasets. In many cases, the policies relating to the release and use of these data are not immediately clear. The Panel is seeking clarification from these agencies, and from its action groups, with a view to developing a coordinated data access policy for drifter data within the letter and the spirit of the WMO data exchange policy defined in WMO Congress Resolution 40 (Cg-XII) and the IOC oceanographic data exchange policy defined in IOC Assembly Resolution XXII-6.

Data archiving

3. Drifter data inserted on the GTS are routinely archived by Marine Climate Data System (MCDS) Global Data Assembly Centres (GDACs) (Canada, and France). The AOML Data Assembly Centre (DAC) archives all data from the GDP, and any other drifter data that are made available to it. The Panel and its action groups will actively encourage all buoy operators to forward their data to one or other of these responsible global archives.

Instrumental Metadata

4. There has been an increasing demand for instrumental metadata in recent years to serve a number of applications - and climate studies in particular. The DBCP has established its own metadata collection system at JCOMMOPS and is contribution to the Marine Climate Data System (MCDS).

Quality control

5. Quality control procedures are in place to ensure the usefulness of real time data and also of data archives. A well-defined feedback mechanism is required to control real time data (see the DBCP QC Guidelines[2]).

More information :

- WMO data policy Resolution 40[3]
- IOC Oceanographic Data Exchange Policy[4]
- CLIVAR data policy[5]

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1 : http://www.jcommops.org/DBCP/1gtsinfo.html
2 : http://www.jcommops.org/dbcp/2qgd.html
3 : http://www.wmo.int/pages/prog/www/ois/Operational_Information/AdditionalDataProducts/02_Resolution%2040.pdf
4 : http://www.ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=338
5 : http://www.clivar.org/data/data_policy.php

APPENDIX X

Current key DBCP personnel

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1 Elected at DBCP-30, China, 27-31 Oct. 2014
2 Appointed in October 2014
3 Elected at DBCP-26, Oban, United Kingdom, 27-30 Sept. 2010
4Elected at DBCP-29, Paris, France, 23-27 Sept. 2013

APPENDIX XI

ONGOING ACTIONS AND RECOMMENDATIONS FROM THE PANEL

-1- DBCP ONGOING ACTIONS

(ongoing actions from past Panel Sessions)

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
		ADMINISTRATIVE				
1	OP/10.13 D22/8.6.1.1, D22/9.3.2	To check the DBCP list of National Focal Points for logistical facilities and report discrepancies, changes, or additions to the WMO Secretariat.	Panel members	WMO Secretariat	WMO Secretariat	Continuous
2	OP/3.5, 3.6 D22/10.3.1	To inform chairman of his/her wish or otherwise to continue to work as TC/DBCP.	TC		Chair	End of each contract
3	OP/Apx4(6) D22/10.3	Continue the arrangements (including finance) to secure the services of a technical coordinator..	Chair	Secretariat	Secretariat	Continuous
4	OP/10.9 D23/6.7.; D22/7.2.12	To consolidate and publish the Panel's session report (web only) and Annual Report (CD-ROM and web).	Chair, Secretariat	TC	Executive councils of WMO & IOC	End of each year
5	OP/10.8 D27/13.1	to publish the written national report reports, as well as others submitted to the Secretariat before 30 November of year YYYY, in the Panel's Annual Report for YYYY	Secretariat		Panel	Early YYYY+1
6	OP/10.8 D27/13.2	Members who had not submitted National Reports for the year YYYY to submit their input to the Secretariat before the end of the year YYYY	Panel members		Panel	31 Dec. YYYY
7	OP/Apx4(5) D25/11.6.2, D26/12.2.2, D27/12.2.2	The Panel recalled the dynamic nature of the DBCP Operating Principles document and invited its members to provide the Chairperson with comments by the end of the year.	Panel members	Chair	Chair, Panel	End of each year
8	D25/11.6.2	Collate Updates to the DBCP Operating Principles document.	Chair	Secretariat	Chair	End of each year
9	OP/10.13 D26/9.3.11	to check the JCOMM list of NFP for logistic facilities and submit changes to the Secretariat .	NFP	Secretariat	Secretariat	ongoing
10	OP/3.7 D22/10.4, D27/12.4.1	To review programme and establish working priorities of the technical coordinator. (DBCP-27: to revise the list of prioritized tasks for the Technical Coordinator as agreed at the previous Session, and discuss	Chair	EB, Panel members	Panel	asap after Panel Session

1 Ref item: reference to paragraph number of DBCP Operating Principles (OP/Apx4/CB(6) = Operating Principles, Appendix IV, Capacity Building part, item 6), and/or DBCP Session final reports as appropriate (e.g. D22/8.6.1.1 = Para8.6.1.1 of DBCP-22 Final Report).

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
		execution details with the Technical Coordinator)				
11	OP/3.8 OP/10.11 D29/12.4 D27/5.6, D27/12.4.2 D26/5.12 (iv),	to undertake the tasks as proposed by the Chair and to report at the next Panel Session (DBCP-27: to address during the next intersessional period as a matter of priority the high priority activities identified at DBCP-26)	TC	Panel members, EB, Secretariat	Panel	asap/ongoing
		CAPACITYBUILDING				
12	OP/Apx5/CB(22) D27/6.4.2 (viii) D23/4.3.6,	To develop and keep up to date standardized training materials in parallel with the organization of training programmes. To investigate ways to add training material from all capacity building activities to IOC/IODE OceanTeacher.	TT-CB	Secretariat	Panel	Next Panel Session
13	OP/Apx5/CB(8) D27/9.2.8	to consider inviting mariners and shipping companies to the DBCP Capacity Building workshops as a way to advertise the ocean observation activities and seek their support	TT-CB	Secretariat	Panel	DBCP-28
14	OP/Apx5/CB(1) D29/6.4 D22/2.2.1.2 (xii); D22/4.3.3; D22/4.3.5	To organize Capacity Building activities (training workshops, training materials, identifying lecturers) in coordination with regional activities.	TT-CB	Secretariat	Panel	Next Panel session
15	OP/Apx5/CB(10) D29/6.4 D22/4.3.6	To investigate on possible cooperation with relevant Capacity Building programmes in WMO and IOC.	Secretariat	Chair	Panel	Next Panel session
16	D29/6.4	To build Observation Development Team (ODT) and Modelling Development Team (MDT) with Met/Ocean Institutes around the world	TT-CB			
17	DBCP-30 / 6.4.4(xiv)	to communicate and send to the JCOMM CB coordinator all future Capacity Building workshops and reports thereof	TT-CB		JCOMM CB Coord.	Continuous
		DATA COLLECTION				
18	OP/Apx5/DM ToR	To follow up and possibly assist in implementing requirements expressed by the buoy users within the Argos system.	CLS	TC	Panel, JTA meeting	Continuous
19	OP/Apx5/DM D23/8.4.2.4	To continue review of satellite data telecommunications systems – including the Iridium system.	D. Meldrum, TC	Panel members	Panel	Continuous
20	OP/Apx5/DM D23/8.4.2.2	To share experiences regarding usage of various satellite communications systems for buoy data, including Iridium.	Panel members	Chair & TC	Chair	Continuous
21	OP/2.3(10) D23/8.4.1.10	To notify of all deployments of Iridium Drifters via a dedicated mailing list (iridium-pp@jcommops.org) and eventually via a notification web page on the JCOMMOPS web.	Participants in IPP	TC	JCOMMOPS	Continuous
22	OP/Apx5/DM	to promote standardization of data transmission formats using	TT-DM	TC	Panel	ongoing

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
	D26/6.1.5 (1) DBCP-30 / 6.2.11(xii)	DBCP-M2 concept, and to ensure that the proper data format is used. DBCP-27: TTDM has continued to encourage manufacturers to use standard DBCP-M2 formats and to add additional data if necessary as requested by buoy owners at the end of the existing data format.				
23	OP/Apx5/DM D27/4.2.2.3	to provide special attention to buoy data reception	INMARSAT		Panel members	ongoing
24	OP/Apx5/DM D27/8.1.7 (ii)	to continue seeking improvements in Iridium buoy energy efficiency through the implementation of improved power management schemes and the latest low-power GPS receivers.	Buoy Manufacturers		Panel members	ongoing
25	OP/Apx5/DM D27/9.5.9 (ii)	the operators of Iridium drifters to continue to actively report metadata to each other upon deployment beyond the life of the Iridium Pilot Project	Panel members	TC	Panel	ongoing
26	OP/Apx5/DM D22/11.1	To make recommendations to the following JTA Session.	Chair		JTA, Panel	JTA Session
27	DBCP-30 / 6.2.11(viii)	to ensure that the proper DAR is used and on the purchasers to audit drifter's DAR	Manufacturers		Panel	ongoing
		DATA EXCHANGE				
28	OP/11.3 D29/5 D23/3.3.8	To identify sources of buoy data not currently reported on the GTS and determine reason for non-availability, (particularly for the Arctic Buoys IABP)..	TC & CLS	Panel members & Secretariat	Chair & Panel for information	Continuous
29	OP/2.3(19) D25/10.2.5; D24/12.1.14 .	to contribute to feeding the JCOMM database extreme wave events when such events are observed by data buoys and are recorded by Panel Members.	Panel members	NODC	Panel	Continuous
30	OP/Apx5/DM D27/6.1.2 (iv)	to monitor GTS bulletin headers used for GTS distribution of buoy data, reconcile the differences found, and publish the list on the JCOMMOBS website and Météo-France QC tools	Météo France & MEDS, JCOMMOPS		Panel	ongoing
31	OP/11.3 D29/6.3 D27/7.3.5	to promote data exchange and GTS distribution of the data in real-time for drifting and moored buoys	Panel Members	TC	Panel	ongoing
32	DBCP-30 / 11.1.2(iv)	to implement recommendations of Keeley Report to the extent possible	DBCP members	TC-DBCP, Secretariat	Panel	ongoing
		METADATA				
33	OP/2.3 (9) OP/2.4(1) DBCP-30 / 6.3.7(i) D29/5 D27/11.5.3	Buoy operators to provide metadata to JCOMMOPS; Manufacturers to collaborate with buoy operators and JCOMMOPS and submit the instrument/platform metadata using the recommended mechanisms (paying particular attention to SST and SSS data); both to comply with buoy metadata collection	Buoy operators & manufacturers	TC	Panel	Continuous

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
	(ii), D26/6.3.3, D24/10.5.6; D23/6.14; D21/8.6.4.5.	scheme. DBCP-27: JCOMMOPS to negotiate metadata formats on ad hoc basis				
34	OP/2.3(16) D26/6.3.3	to regularly forward collected metadata to the ODAS metadata service (China) .	JCOMMOPS	Secretariat & China	Panel	Ongoing
35	OP/2.3(8) D27/6.2.4	to provide GDP/AOML with manufacture dates for all buoys built within the last 5 years.	Manufacturers	AOML	Panel	ongoing
36	OP/2.3(8) D27/6.2.4	to provide barometer/SLP data to the GDP/AOML	Met. Services	TC	Panel	ongoing
37	D27/6.2.4	to incorporate manufacture date and barometer death date into the GDP (AOML) metadata and make it available online (including creating additional columns in the GDP metadata)	AOML		Panel	ongoing
38	OP/Apx5/DM D27/11.5.3 (vi)	to make sure that discovery metadata about buoy observational data-sets are properly compiled and made available through the Ocean Data Portal (ODP) and the WMO Information System (WIS) using the required ISO-19115 profiles	Panel members	TC, Secretariat	Panel	ongoing
39	DBCP-30 / 11.4.3.	to undertake the necessary developments to assure that marine observing systems capabilities will be properly reflected in OSCAR thanks to interoperable arrangements and machine to machine interfaces between the JCOMMOPS IT infrastructure and the MeteoSwiss one for OSCAR	JCOMMOPS	WMO Secretariat, MeteoSwiss	Panel	ASAP
		FINANCES				
40	OP/Apx4(8) D27/11.6.10, D26/11.6.12 (1), D25/10.6.7	Liaise with the Financial Advisor for updating the interim financial report with the most accurate and current information..	EB	Financial Advisor		End of each year
41	OP/8.10 D27/11.6.11, D26/11.6.12 (2), D25/10.6.7	The joint Secretariats and the DBCP financial advisor to work together to distribute the final statement for the previous year to the Panel members as soon as the IOC and WMO Final Statement of accounts for that year are finalized. Statements to be included in the DBCP Annual report.	Secretariat	Financial Advisor	Panel members	Jan. each year
42	OP/2.3(5) D29/11.6 D27/11.1.3	to continue and possibly increase their budgetary contribution to the Trust Fund in timely manner, and when possible, in Euros.	Panel members			continuous
43	OP/8.8 D27/11.6.14, D26/11.1.7	to facilitate the transfer of sufficient funds from the DBCP Trust Fund at the WMO to the DBCP Trust Fund at the IOC if needed to permit covering all related expenses from the IOC	WMO Secretariat			When needed
44	OP/8.11 D22/10.1.8;	to request IOC and WMO to provide an Interim Statement of	Finance Advisor	Secretariat	Panel	March each

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
	D22/10.1.10	Accounts over the period 1 January-31 July		& Chair		year
45	OP/8.11 D22/10.1.10	To prepare an interim statement of the DBCP/SOT Trust Fund, to be presented to the DBCP members at the following DBCP Session	Secretariat and Finance Advisor		Panel	July each year
		IMPLEMENTATION				
46	OP/2.3(7) D27/5.10 DBCP-30 / 6.2.11(iv)	to make use of the barometer drifter upgrade scheme (see http://www.jcommops.org/dbcp/platforms/barometer.html) by purchasing barometers for GDP-funded SVP drifters and negotiating their deployment positions with AOML. This is to allow achieving the higher possible coverage of the drifter array with SLP measurements (currently at 50%, target 100%)	Panel members	AOML	Panel	ongoing
47	OP/2.3(2) D29/11.3.2 D27/11.3.1; D27/11.3.2.1	to take the recommendations from recent IOC and WMO governing body meetings into account when developing their activities in support of the Panel	Panel members	Secretariat, TC	Panel	ongoing
48	DBCP-30 / 6.2.11(vii)	to ensure that the proper shipping arrangements are followed and on the purchasers to audit shipping arrangements	Manufacturers		Panel	ongoing
49	DBCP-30 / 7.2(iv)	to participate in the second International Indian Ocean Experiment (IIOE-II) and the intended aims of IIOE-II	DBCP members		Panel	IIOE-II duration
50	DBCP-30 / 9.3.10(i)	to continue to deploy Iridium drifting buoys in areas where delays are greater than 120 minutes	DBCP members		Panel	ongoing
51	DBCP-30 / 10.4.5.	to chase for ancillary contributions not formally under the Panels umbrella	TC-DBCP	DBCP members	Panel	ongoing
52	DBCP-30 / 11.2.2.1.	to take WMO and IOC Executive Bodies decision into account when developing their activities in support of the Panel	DBCP members		Panel	ongoing
		IMPLEMENTATION STRATEGY				
53	OP/3.9 D25/11.1.1. 4.2.5; D23/4.3.10. 4.4.1; D22/4.2.3.	To finalise updates to the DBCP implementation strategy (DBCP TD 15) including reference to the Capacity Building efforts being undertaken by the Panel – feedback sought by members .	Chair	Panel members	Panel	End of each year
54	OP/2.3(4) D27/12.1.1, D26/12.1.1	to review the DBCP Implementation Strategy document at http://www.jcommops.org/doc/DBCP/DBCP_Impl_Strategy.pdf and to forward any comments to the Chairperson by the end of November each year	Panel members	Secretariat	Chair & Panel	Nov. each year
55	DBCP-30 / 11.1.2(v)	to engage with emerging activities such as the IIOE-2, TPOS 2020 and the increased focus on coastal seas	DBCP members		Panel	ongoing
		IMPLEMENTATION / ACTION GROUPS				

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
56	OP/11.12 ToR	To support, as required, existing DBCP action groups, and provide assistance on request to other internationally coordinated buoy programme developments..	TC & Secretariat	Chair	Panel	Continuous
57	OP/11.13 D20	To coordinate with IOP implementing strategy for the Indian Ocean Observing System as far as data buoys are concerned..	IBPIO	Chair, TC, Secretariat	Panel	Continuous
58	OP/11.14 D23/;4.2.4; D16	To produce a table of national commitments in the Southern Ocean. To seek additional commitments for barometer upgrades, and deployment opportunities in the Southern Ocean to achieve a level of 300 buoys south of 40S..	TC	Panel members	Panel	Continuous
		IMPLEMENTATION / LOGISTICS				
59	OP/2.3(11) D29/2, 7.8, 9.2 D27/9.2.3, D27/9.5.9, (i)D23/7.2.4; D23/8.6.1.1; D22/8.6.1.13	To provide information on deployment opportunities to JCOMMOPS for all buoys and cruises, as well as to continue e-mail notifications as necessary – annual reports, action group annual planning, ship schedules, national plans, national contact points etc. To subscribe on the list and systematically post their deployment opportunities on the ships@jcommops.org mailing list as well	Panel members & TT-CB	TC	JCOMMOPS & Panel	Continuous
60	OP/3.10 D19	To maintain close links with SOT members so that support on deployment opportunities can be obtained from the SOOP and VOS panels of SOT..	Chair	TC	Panel	Continuous
61	D29/9.2 D23/8.6.1.10	To provide information to Panel members or on its website, about where inventories of buoys are held, to aid in deployment planning.	GDP		Next Panel session	Continuous
62	OP/11.16 D29/9.2 D26/11.2.11, D23/8.5.1.8; D22/8.5.1.9.; D22/8.5.3.	To implement JCOMMOPS work-plan – particularly with respect to Deployment opportunities.	TC & TC/Argo	JCOMM	Next Panel session	Continuous
63	D26/9.3.7	to provide a table of inventories at its various warehouses to the Technical Coordinator before June each year, so that it can be presented to the Panel at each DBCP Session, and therefore assist Panel members of identifying how they can assist with the deployments.	R. Lumpkin	Panel members	TC	June each year
		MONITORING				
64	OP/3.11 ToR	To maintain a list of national contact points for the DBCP and within other relevant bodies with potential for involvement in DBCP activities..	Secretariat	Panel members	Chair & Panel for information	Continuous
65	OP/11.15 D23/8.4.2.4	To maintain a catalogue of existing ongoing ocean data buoy programmes.	TC	Panel members &	Chair & Panel for	Continuous

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
				Secretariat	information	
66	OP/2.4(1) D21	To provide input on buoy models for JCOMMOPS database.	Manufacturers	TC	Panel	Continuous
67	OP/2.4(2) D21	To provide Service Argos with list of most used buoy models and formats they operate.	Manufacturers	TC	Service Argos	Before deployment
		REQUIREMENTS				
68	OP/11.17 ToR	To maintain summary of requirements for buoy data to meet expressed needs of the international meteorological and oceanographic communities.	TC	Panel members & Secretariat	Chair for presentation to the Panel	Continuous
69	OP/2.3(3) D24/12.1.13	to address user requirements and particular observing systems deficiencies as expressed in the JCOMM Statement of Guidance for Ocean Applications.	Panel members		Panel	Continuous
70	DBCP-30/ 5.21.	to follow closely the development of the Global Framework for Climate Services (GFCS) and its observational data needs as the Panel is substantially contributing to such requirements	TC-DBCP	WMO Secretariat	Panel	ongoing
		INFORMATION EXCHANGE				
71	OP/2.3(12) D29/8.2 D22/7.2.3 DBCP-30 / 9.1.9 (i)	To provide info/materials for DBCP/JCOMMOPS websites (news, brochure), including findings with impacts on activities of DBCP user-groups (modellers, forecasters).	Panel members	TC	Panel	Continuous
72	OP/2.3(13) D29/11.3.1 D21	To actively communicate through member state delegations to IOC, WMO and GEO to emphasize the importance of coordination activities to the DBCP Panel activities.	Panel members		Panel	Continuous
73	OP/9.2 D23/6.7	Compile a CD-ROM of scientific and technical workshop at the last Panel Session.	Chair & Secretariat	TC	Executive councils of WMO & IOC	End of each year
74	OP/2.3(1,13) D26/13.2, D25/12.1	To submit their national reports to the Secretariat before the end of the year (input submitted before 30 November to be published in the Panel's Annual Report).	Panel members	Secretariat	Secretariat	30 Nov. each year
75	OP/9.2 D27/2.2, D26/2.7	to submit their papers via e-mail or CD-ROM to the Workshop Chairperson, via electronic format (MS Office compatible format only) .	S&T workshop authors	Secretariat	Chairperson	30-Nov each year
76	D26/6.2.6 (1)	to identify authors who are willing to provide the updates to DBCP related standards document as listed on the DBCP website.	TT-IBP	TC & Secretariat	Panel	Continuous
		INSTRUMENT PRACTICES				
77	OP/2.3(14) D27/6.2.3	to start systems for record keeping for instrument calibration, replacement and validation that conform to ISO recommended specifications	Panel members	TT-IBP	Panel	ongoing

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
78	OP/2.3(15) D21	To review best practices prior to drifter purchase for safety, and GTS data processing purposes.	Panel members	TT-IBP & TC	Panel	Continuous
79	OP/2.3(16) D24/12.6.8.4	to follow the best practices and standards eventually proposed under WIGOS, and in particular, to provide the buoy platform / instrument metadata to JCOMMOPS, and the ODAS metadata service (China) as appropriate.	Panel members	TC & Secretariat	Panel	Continuous
80	D29/6.2	to address the instrument best practices recommendations from TT-IBPD.	Manufacturers	Secretariat	Panel	ongoing
81	OP/2.3(17) D27/11.5.3 (iv), D26/11.5.5	to use the RMIC facilities as appropriate, and participate at future workshops	Panel members	Secretariat	Panel	ongoing
82	OP/2.4(3) D27/11.5.3 (v), D24/10.7.3	Investigate participating in the Association of Hydro-Meteorological Equipment Industry (HMEI - http://www.hydrometeoindustry.org/) as a way to be represented at JCOMM meetings.	Manufacturers		Panel	Continuous
		QUALITY MANAGEMENT				
83	OP/2.3(6) D27/11.5.3 (vii)	to comply with the WMO Quality Management Framework (QMF) and quality management principles	Panel members	Secretariat	Panel	ongoing
		QUALITY MANAGEMENT / INSTRUMENT EVALUATION				
84	OP/Apx5/IBP (1)(7) D26/6.2.5 D29/2	to address a number of issues (HRSST, life time of drogues, quality of pressure data, environmental impact of drifters, Using solar cells on drifters) .	TT-IBP	TC & Panel members	Panel	Ongoing
		QUALITY MANAGEMENT / INTERCOMPARISONS				
85	D29/8.2 D27/8.4.10	Reinforce the importance of critical measurement biases to agencies responsible for wave data and to assist the PP-WET Pilot Project and activities (by existing RMICs with wave capability, and particularly the RMIC for RA-IV)	Existing RMICs and Panel Members		Panel	ongoing
86	DBCP-30 / 9.3.9.	to better refer to and use the correct terminology for timeliness of buoy, i.e. the time of the observations reporting on GTS to reach the end users (i.e. received from the GTS), i.e. GTS reception time minus observation time	DBCP members		Panel	ongoing
		QUALITY MANAGEMENT / QUALITY CONTROL				
87	OP/11.18 ToR	To coordinate operations of DBCPQC guidelines..	TC	Panel members & Data Quality centres	Panel	Continuous
88	OP/2.3(18) D23/8.1.2	To encourage other centres to act as PMOC and existing centres to invest more resources in the implementation of QC guidelines.	Panel members	TC	Panel	Continuous

No	*Ref item*[1]	*Action Item*	*Who*	*Supported by*	*Reporting to*	*When*
89	DBCP-30 / 9.3.10(ii)	to perform regular (every 6 months) assessments of the global data buoy timeliness by comparing JCOMMOPS delay maps and Argos Data Mean Disposal Time Maps	CLS	TC-DBCP	Panel	Semestrial
90	DBCP-30 / 10.3.9.	to include in their future reports to the DBCP the extent and availability of the CLS airtime and data processing services with Iridium satellite data communications	CLS	TC-DBCP	Panel	Panel Session
		SAFETY / VANDALISM / SECURITY				
91	OP/2.4(4) D17	To enhance buoy safety through improved design (refer recommendations) and keep the Panel informed about related changes..	Manufacturers & Panel members	Panel members, TC	Panel	Continuous
92	OP/11.19 D27/9.4.11	to collect statistics and information on actual vandalism occurrences, and maintain relevant information on the DBCP website	TC		Panel	ongoing
93	OP/Apx5/CB(9) D27/9.4.12	to make sure the data buoy vandalism aspects are being addressed as part of its activities	TT-CB		Panel	ongoing
		TECHNOLOGY DEVELOPMENT				
94	DBCP-30 / 6.2.11(v)	to request thermistors that satisfy the above mentioned accuracy requirement	DBCP members	Manufacturers		

2- RECOMMENDATIONS

(ongoing recommendations from this and past Panel sessions; recommendations arising from this Panel Session are indicated in bold)

CAPACITYBUILDING			
No.	***Ref.***	***Recommendation***	***By***
1	DBCP-26 / 11.3.13 (i)	The Panel agreed that it should continue to be involved in Capacity Building activities, including through the provision of funding from its Trust Fund;	Panel
2	DBCP-26 11.3.10	to discuss the issue nationally in the view promote the commitments of WMO Members to PANGEA activities through the VCP	Panel members

DATA EXCHANGE			
No.	***Ref.***	***Recommendation***	***By***
3	DBCP-30 / 5.17(iii.)	DBCP members who are not yet transmitting moored and drifting buoy data to the GTS in BUFR format to start doing so as soon as possible following the agreed 3-15-008 and 3-15-009 templates	DBCP members
4	DBCP-27 / 6.1.4, DBCP-26 / 9.8.1	To keep the same WMO number for a mooring's position as long as moorings are maintained at that position. In case a mooring ceases to be maintained at a given position, the WMO number should not be re-used for another location. 7-digit WMO numbers for drifters or for moorings should not be reallocated, until available numbers are exhausted, which is not expected to happen in the foreseeable future.	Panel members
5	DBCP-26 / 11.2.15 (iii)	The Panel invited its members to contribute to the JCOMM Extreme Wave database by submitting information on extreme wave events to the US National Oceanographic Data Center (NODC).	Panel members
6	DBCP-29 / 7.8 DBCP-26 / 6.3	to consider reporting as much OceanSITEs buoy data as possible in real-time through the GTS.	OceanSITEs
7	DBCP-30 / 2.4(1)	data buoy operators who are not currently sharing the data to take steps to realize GTS distribution of their buoy data, noting that the Technical Coordinator of the DBCP can offer practical assistance if required.	Data buoy operators

FINANCES			
No.	***Ref.***	***Recommendation***	***By***
8	DBCP-27 / 11.6.8 DBCP-26 / 11.6.11 (1) DBCP-30 / 11.5.9.	to consider contributing to the DBCP/SOOP Trust Fund in Euros.	Panel members
9	DBCP-27 / 11.6.9 DBCP-26 / 11.6.11 (2) &11.1.7	Panel members should pay their contributions in a timely fashion.	Panel members
10	DBCP-27 / 11.6.9 DBCP-26 / 11.6.11 (3)	Panel members not contributing to the Trust Fund are invited to discuss nationally whether a contribution could be made in the future.	Non contributing Panel members

	DBCP-25 / 10.6.7 DBCP-30 / 11.5.10		
11	DBCP-27 / 11.6.9 DBCP-26 / 11.6.11 (4) DBCP-25 / 10.6.7 DBCP-30 / 11.5.10	Panel members contributing to the Trust Fund are invited to investigate nationally whether their contribution could be increased.	Contributing Panel members
12	DBCP-26 7.8.3 & 11.2.12	to increase its contribution to the DBCP Trust Fund.	OceanSITEs, SOT-

IMPLEMENTATION			
No.	***Ref.***	***Recommendation***	***By***
13	DBCP-29 / 9.2 DBCP-27 / 9.2.9	To consider innovative deployment and retrieval solutions, including offering awards to ships which are actively contributing deployment opportunities as a way to further encourage their participation as well at the participation of others.	Panel members JCOMMOPS
14	DBCP-27 / 9.4.2	To address the recommendations on data buoy vandalism from the DBCP Technical Document No. 41[2] – *"Ocean Data Buoy Vandalism - Incidence, Impact and Responses"* (these recommendations are also reproduced in DBCP-27/Annex XIV).	Panel members
15	DBCP-26 / 11.2.15 (iv) DBCP-25 / 6.3	The Panel urged its members to make use of the DBCP barometer upgrade scheme implemented through the Global Drifter Programme (GDP) and supported by the United States for all newly deployed drifters, including those deployed in tropical regions.	Panel members
16	DBCP-26 / 11.2.15 (vi)	The Panel agreed to develop further the JCOMMOPS proposal for the establishment of a Cruise Technical Coordinator position at JCOMMOPS to act as an international focal point on ship cruises opportunities in support of global ocean observations.	Panel
17	DBCP-25 / 6.3	Research programmes (e.g. DAMOCLES) to put real-time and/or near-real-time data on GTS to address spatial gap in Russian sector of the Arctic region.	Arctic Research Programs
18	DBCP-23 / 2.2.1.3 (xxiii) & 2.2.2.7	Encourage cooperation with OceanSITEs and the Tsunameter network at a national level.	Panel members
19	DBCP-30 / 7.2(x)	DBCP members to address the recommendations from the ITP as provided in Annex XII of DBCP-31 Final Report	DBCP members
20	DBCP-30 / 9.2.8(i)	DBCP to support a better implementation, in particular by providing deployment plans, needs and opportunities to JCOMMOPS.	DBCP-EB
21	DBCP-30 / 9.2.8(ii)	The meeting recommended continuing with a mix of solutions as currently proposed, with as many opportunities from Research Vessels as possible, enriched with other opportunities from commercial, charter and sailing vessels.	DBCP members
22	DBCP-30 / 9.5.7(i.)	The Panel encouraged all buoy operators to provide a website of plans and deployment information for drifting and moored buoys similar to AOML, NDBC, and Canada as well as continuing e-mail notifications as necessary.	DBCP members

2: http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=7150

23	DBCP-27/11.5.3 DBCP-28/11.2.2(a), 11.5.1 DBCP-29/11.5.2 DBCP-30 /11.4.2.	To address the legacy recommendations of the JCOMM Pilot Project for WIGOS (see DBCP-27 final report, paragraph 11.5.3).	DBCP members

INSTRUMENT PRACTICES/CALIBRATION			
No.	***Ref.***	***Recommendation***	***By***
24	DBCP-27 / 6.2.3 DBCP-26 / 6.3.4	The Panel recalled the importance of traceability of observations to standards and SI units, and in particular of establishing a proper certification process and procedures for the calibration. Recording the history of calibration and providing calibration certificates from instrument manufacturers was particularly important. To start systems for record keeping for instrument calibration, replacement and validation that conform to ISO recommended specifications.	Panel members
25	DBCP-26 / 11.5.8 (2)	More systematic calibration of the instruments should be performed, traceable to IS, and documented. More stringent requirements on the accuracy of drifting-buoy measurements are needed. Accuracy claims should be validated.	Panel members
26	DBCP-26 / 11.5.8 (3)	Post-calibration of drifter SST sensors should be performed as much as practicable (see the presentation “Examining the long term stability of SST measurements made by drifting buoys (R.O. Smith, J.J. Kennedy, N. Rayner)” made at the DBCP Scientific and Technical workshop).	Panel members
27	DBCP-30 / 2.4(3)	Members/Member States are encouraged to use the calibration facilities of the RMIC/AP.	DBCP members

INSTRUMENT PRACTICES/INTERCOMPARISONS			
No.	***Ref.***	***Recommendation***	***By***
28	DBCP-25 / 7.4.3 DBCP-27 / 8.4.4 DBCP-26 / 8.4.4 DBCP-26 / 8.4.8 (iii) DBCP-30 / 8.2.11(iii) DBCP-30 / 8.2.6.	The Panel encouraged its member countries to participate in the intercomparison activities that being led by the PP-WET pilot project.	DBCP members
29	DBCP-27 / 8.4.6 DBCP-26 / 8.4.6 DBCP-30 / 8.2.11(ii)	The Panel recognized that the pilot project would contribute to JCOMM in developing standards and best practice, as well as to the relevant WIGOS exercise, and encouraged the co-chairs and SC members to actively outreach these relevant activities with the progress in the inter-comparison exercise.	PP-WET
30	DBCP-26 / 8.4.8 (i)	Continue to support the PP-WET Pilot Project for the next year.	PP-WET
31	DBCP-26 / 8.4.8 (ii)	Encourage the co-chairs and SC members to contribute the results of the intercomparison exercise to JCOMM and WIGOS in developing standards and best practice.	PP-WET
32	DBCP-26 / 11.5.8 (1) DBCP-25 / 5.2.3 & 6.3	Inter-comparisons of drifting-buoy measurements for different manufacturers should be regularly performed in order to assess and improve measurement accuracy. The Panel noted the usefulness of the drogue sensor evaluation for the SVP buoys, which was conducted	AOML

		by the NOAA/AOML, and recommended to continue this valuable exercise with extended involvement of all currently operating buoy manufacturers.	
33	DBCP-25 / 7.4.6	The Panel encouraged the co-chairs and SC members to actively share outcomes of these relevant activities and progress in intercomparison exercises with the JCOMM Community.	PP WET Chair

INSTRUMENT PRACTICES/METADATA			
No.	***Ref.***	***Recommendation***	***By***
34	DBCP-29 / 9.2, 9.5 DBCP-26 / 9.6.6 (i)	JCOMMOPS would like to recommend that all buoy operators provide a website or web accessible CSV files of deployment information (as provided to the Iridium PP team) for all buoys similar to AOML, NDBC and Canada (examples provided in the report) as well as continuing email notifications as necessary. JCOMMOPS can in turn feed information from those websites into the JCOMMOPS database of metadata.	Panel members
35	DBCP-26 / 9.6.6 (iv)	Close cooperation between OceanSITEs and the rest of the DBCP Moored Buoy community is recommended when considering metadata content and standards.	OceanSITEs & Panel members
36	DBCP-26 / 9.6.6 (v)	JCOMMOPS will provide recommendation to moored buoy operators on the required content as well as possible formats (i.e. csv, XML etc.) for more effective and consistent exchange of deployments.	JCOMMOPS
37	DBCP-26 / 11.2.15 (ii) DBCP-30 / 8.2.5 DBCP-30 / 8.2.11(iv) DBCP-30 / 8.2.12(i)	Considering the importance of instrument/platform metadata for marine climatology purposes in particular, the Panel urged its members to collect, record, and make buoy instrument/platform metadata available via JCOMMOPS and to the International archives (e.g. ICOADS). DBCP members to take action to remedy the situation concerning the availability and ready accessibility (comparable to WMO No. 47) of historical buoy metadata to support wave climate analysis, the EWDS as well as PP-WET, which is described as “abysmal”. DBCP members to reinforce the importance of understanding critical measurement biases to agencies responsible for wave data.	Panel members
38	DBCP-26 / 11.3.13 (ii)	The Panel agreed that it should continue to contribute to the development of WIGOS by providing assistance, as required, on (i) instrument standards and practices issues, (ii) data and instrument/platform metadata exchange, and (iii) quality management issues.	Panel
39	DBCP-30 / 5.17(i.)	the manufacturers to provide information to JCOMMOPS on models, formats, and shipments;	Manufacturers

SATELLITE DATA TELECOMMUNICATION			
No.	***Ref.***	***Recommendation***	***By***
40	DBCP-26 / 9.4.4	The Panel was very pleased in the expected 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 future.	CLS
41	DBCP-29 / 9.5 DBCP-26 / 9.6.6 (ii) DBCP-30 / 5.17(ii.) DBCP-30 / 9.5.7(ii.)	Operators of Iridium platforms have continued to actively report metadata to each other upon deployment, which was valuable and should continue to report to TC-DBCP, beyond the life of the Iridium Pilot Project.	Panel Members, Iridium operators

42	DBCP-26 / 11.2.15 (v)	The Panel recommended to the Argos Joint Tariff Agreement to consider the DBCP requirements for timely data as a high priority and develop the new regional network of Local User Terminals in the view to minimize data availability delays in all ocean regions, including the South Atlantic, Ocean, and Southeast Pacific Oceans.	JTA
43	DBCP-29 / 9.3 DBCP-25 / 6.3	to deploy more Iridium drifters in the Indian Ocean region and other areas where the delay of data delivery is particularly an issue.	DBCP members
44	DBCP-29 / 5, 9.5	To work with satellite data telecommunication providers in the view (i) to identify status of the buoy networks and whether they report on GTS; (ii) to allow GTS distribution of data and provide technical assistance as needed.(iii) link to WMO CIMO and CBS	TC-DBCP
45	DBCP-30 / 6.1.3(iv)	Make sure all buoy manufacturers adhere to the standard and approved DBCP data formats.	Manufacturers

TECHNOLOGY DEVELOPMENT, PILOT PROJECTS			
No.	***Ref.***	***Recommendation***	***By***
46	DBCP-25 / 5.2.4	Panel agreed that it should be engaged in the future development of wave glider and invited Liquid Robotics to continue participating in future sessions and discussion.	TT IBP
47	DBCP-29 / 5 DBCP-25 / 7.1.8, 8.7.3	The notification of all Pilot Project buoy deployments (Iridium, Argos-3, waves, HRSST etc.) must be completed by the buoy operator, as soon as possible after the deployment..	Pilot Project Team members and Buoy Operators
48	DBCP-25 / 8.7.3	The Panel noted there was a need to flag HRSST and other high-performance sensors appropriately within platform metadata which would require a deployment notification to be sent to JCOMMOPS, as with other Pilot Projects.	DBCP members
49	DBCP-29/2, 8.3	Encourage manufactures to plan to add HRSST in cost effective manner to future drifter designs.	Manufacturers, DBCP Members
50	DBCP-30 / 2.4(2)	SIO and AOML to continue working on drifter technology developments in order to improve reliability, life-time, and cost-effectiveness of the drifters; and share the results of their investigations to the community;	SIO & AOML
51	DBCP-30 / 8.2.8. DBCP-30 / 8.2.11(v)	a small number of wave drifters from SIO (doing spectral waves, and currents using GPS) could be obtained and deployed as a complement to the regular drifter program for evaluation. PP-WET to be informed in that case.	DBCP members
52	DBCP-30 / 8.2.9.	The Panel recognized that PP-WET would contribute to JCOMM in developing standards and best practice, as well as to the relevant WIGOS exercise, and encouraged the co-chairs and Pilot Project members to actively outreach these relevant activities with the progress in the inter-comparison exercise.	PP-WET
53	DBCP-30 / 11.1.2 (vi.)	DBCP to actively horizon-scan to identify emerging technologies and methodologies that might be usefully evaluated through pilot projects.	DBCP-EB

ANNEX V

ACTION GROUP SUMMARIES

1. GLOBAL DRIFTER PROGRAMME (GDP)

Name of Action Group	**Global Drifter Program**
Date of report	15 September 2014
Overview and main requirements addressed	Global Drifter Program (GPD). Goals: 1. Maintain a global 5x5° array of 1250 satellite-tracked surface drifting buoys to meet the need for an accurate and globally dense set of in-situ observations of mixed layer currents, sea surface temperature, atmospheric pressure, winds and salinity; and 2. Provide a data processing system for scientific use of these data. These data support short-term (seasonal to interannual) climate predictions as well as climate research and monitoring.
Area of interest	Global ocean
Type of platform and variables measured	Lagrangian drifters measuring surface velocity, SST; some drifters also measure sea level pressure, wind, salinity, and/or sub-surface temperature profiles
Targeted horizontal resolution	5 degree x 5 degree (1250 units)
Chairperson/Managers	Dr Rick Lumpkin, NOAA/AOML, USA Dr Luca Centurioni, SIO/CIMEC, USA
Coordinator	Operations Manager: Mr Shaun Dolk, NOAA/AOML, USA
Participants	Numerous national and international institutions
Data centre(s)	GDP Data Assembly Center (DAC) – Manager: Ms Mayra Pazos, NOAA/AOML, USA
Website	http://www.aoml.noaa.gov/phod/dac/
Meetings *(meetings held in 2013/2014; and planned in 2014/2015)*	None other than DBCP
Current status summary *(mid-2013)*	Annual size of array was 1144 drifters. Current size as of 15 September 2014 is 1395 drifters.
Summary of plans for 2015	Maintain array at ~1250 drifters

2. TROPICAL MOORED BUOY IMPLEMENTATION PANEL (TIP)

Name of Action Group	The Tropical Moored Buoy Implementation Panel (TIP)
Date of report	15 September 2014
Overview and main requirements addressed	The Tropical Moored Buoy Implementation Panel (TIP) oversees the design and implementation of the following components: • The Tropical Atmosphere Ocean / Triangle Trans-Ocean Buoy Network (TAO / TRITON), a central component of the ENSO Observing System, deployed specifically for research and forecasting of El Niño and La Niña; • The Prediction and Research Moored Array in the Tropical Atlantic (PIRATA) • The Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA)
Area of interest	The tropical ocean regions as part of an integrated approach to observing the climate system to address the research needs of CLIVAR and the operational strategies of GOOS and GCOS. Pacific Ocean: 8°N to 8°S; Atlantic Ocean: 20°N to 10°S; Indian Ocean: 15°N to 25°S.
Type of platform and variables measured	Tropical moorings with surface meteorological and sub-surface oceanographic sensors measuring: Surface wind, air temperature, relative humidity, SST and SSS on all surface moorings. Air pressure, precipitation, short wave radiation, long wave radiation on some surface moorings. Sub-surface temperature profiles down to 500m-750m on all surface moorings. Salinity profiles as deep as 750m on some surface moorings. Current velocity on some moorings. Also, biogeochemical measurements, including CO_2 and O_2 on select moorings. Some moorings also have specialized instruments to measure turbulence dissipation. Subsurface ADCP moorings measuring velocity profiles in the upper few hundred meters. Some have additional single point current meters at deeper levels.
Targeted horizontal resolution	Tropical Pacific Ocean: 70 moorings ; Tropical Atlantic Ocean: 19 moorings ; Tropical Indian Ocean: 46 moorings
Chairperson/Managers	Dr. Mike McPhaden, PMEL, USA, Chairman Dr. Kentaro Ando, JAMSTEC, Japan, Vice-Chairman
Coordinator	Mr H. Paul Freitag, PMEL, USA
Participants	TAO/TRITON: NOAA National Data Buoy Center (NDBC),NOAA Pacific Marine Environmental Laboratory (PMEL), Japan Agency for Marine-Earth Science and Technology (*JAMSTEC)* PIRATA: NOAA PMEL, NOAA Atlantic Marine Oceanographic Laboratory (AOML), L'Institut de recherche pour le développement (IRD), Meteo-France, Instituto Nacional de Pesquisas Espaciais (INPE), Diretoria de Hidrografia e Navegacao (DHN**)** RAMA: NOAA PMEL, JAMSTEC, Indian National Center for Ocean Information Services (INCOIS), National Institute of Oceanography (NIO), Agency for the Assessment and Application of Technology (BPPT), Ministry of Marine Affairs and Fisheries (KKP), First Institute of Oceanography (FIO), Agulhas and Somali Current Large Marine Ecosystems (ASCLME), Bay of Bengal Large Marine Ecosystem (BOBLME) program, University of Tasmania and the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia.
Data centre(s)	PMEL, NDBC,JAMSTEC, NIO
Website	http://www.pmel.noaa.gov/tao/global/global.html

Meetings *(meetings held in 2013/2014; and planned in 2014/2015)*	• CLIVAR/GOOS Indian Ocean Panel 10th Session 8-12 July, 2013, Li Jang, China • PIRATA-18/TAV 22-25 October 2013, Venice, Italy • Tropical Pacific Observing System Review, 27-30 January 2014, La Jolla, USA. • CLIVAR GOOS Indian Ocean Panel 11th session, The Hague, Netherlands, 14-15 July 2014 • CLIVAR Pacific Ocean Panel, The Hague, Netherlands, 14-15 July 2014 • Ninth Annual Indonesia – U.S. Ocean and Climate Observations, Analysis and Applications Partnership Workshop, Jakarta, Indonesia, 20-23 August 2014 • TPOS-2020 Steering Committee 1st meeting, Ansan, Korea, 6-9 October, 2014 • IndOOS Resource Forum, Phuket, Thailand, 31 October 2014 • PIRATA-19/Tropical Atlantic Climate Variability, Recife, Brazil, 3-6 November 2014
Current status summary *(September 2014)*	TAO/TRITON: 41 of 55 TAO, 8 of 10 TRITON surface moorings reporting data. PIRATA: 18 of 18 surface moorings reporting data. RAMA: 18 of 27 surface moorings reporting data.
Summary of plans for 2015	TAO/TRITON: Maintain 68 mooring array. 2 TRITON sites to be retired. PIRATA: Maintain 18 mooring array RAMA: Maintain 34 sites. Possibly add more if ship time is available.

3. OPERATIONAL SERVICE E-SURFMAR OF THE NETWORK OF EUROPEAN METEOROLOGICAL SERVICES, EUMETNET

Name of Action Group	Operational Service of the Network of European Meteorological Services, EUMETNET (E-SURFMAR)
Date of report	31 July 2014
Overview and main requirements addressed	The EUMETNET operational service E-SURFMAR is an optional programme involving 19 out of the 31 EUMETNET members, who fund the activity on a GNI basis. Its main objectives are to coordinate, optimise and progressively integrate the European meteorological services activities for surface observations over the sea – including drifting and moored buoys, and voluntary observing ships. E-SURFMAR is responsible for coordination of buoy activities carried out by the European meteorological services, and the programme supports a Data Buoy Manager (DBM) to manage these activities. The DBM is supported and advised by the E-SURFMAR Expert Team-Data Buoy (ET-DB). E-SURFMAR ET-DB is an action group of the DBCP.
Area of interest	Ocean areas potentially affecting NWP over European countries. This covers the North Atlantic Ocean north of 10°N and the Mediterranean Sea (90°N-10°N; 70°W - 40°E).
Type of platform and variables measured	Drifting buoys: air pressure, SST, (wind) Moored buoys: air pressure, wind, air temperature, SST, waves (directional spectra), relative humidity.
Targeted horizontal resolution	250 km x 250 km, >100 drifting buoys, 4 moored buoys for satellite calibration/validation.
Chairperson/Managers	Manager E-SURFMAR: Mr Pierre Blouch, Météo-France Chairperson, Expert Team-Data Buoy (ET-DB): Mr Jon Turton, UK Met Office
Coordinator	Data buoy Manager: Mr Gilbert Emzivat, Météo-France
Participants	Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, The Netherlands, Norway, Portugal, Serbia, Spain, Sweden, Switzerland, and the United Kingdom.
Data centre(s)	Météo-France as SOC ISDM (Canada) as RNODC/DB
Website	http://www.eumetnet.eu/, http://esurfmar.meteo.fr (restricted working area web site for E-SURFMAR participants)
Meetings	ET-DB meets once a year. ET-DB11 Exeter 21-22 May 2014
Current status (mid-2014)	109 E-SURFMAR drifting buoys in operation (74 Iridium, 35 Iridium upgrades) + 50 others reporting AP. 4 E-SURFMAR supported moored buoys in operation, plus a further 45 others operated by members.
Summary of plans for 2015	Maintain a network of 100 drifting buoys, and the 4 reference moored buoys in operation.

4. INTERNATIONAL BUOY PROGRAMME FOR THE INDIAN OCEAN (IBPIO)

Name of Action Group	International Buoy Programme for the Indian Ocean (IBPIO)
Date of report	28 October 2014
Overview and main requirements addressed	The International Buoy Programme for the Indian Ocean (IBPIO) was formally established at a meeting in La Reunion in 1996. The primary objective of the IBPIO is to establish and maintain a network of platforms in the Indian Ocean to provide meteorological and oceanographic data for both real time and research purposes. More specifically, the IBPIO supports the World Weather Watch Programme (WWW); the Global Climate Observing System (GCOS); the World Climate Research Programme (WCRP); the Global Ocean Observing System (GOOS); tropical cyclone forecast and monitoring; as well as the research activities of the participating institutions. The programme is self-sustaining, supported by voluntary contributions from the participants in the form of equipment and services (such as communications, deployment, storage, archiving, co-ordination...).
Area of interest	Indian Ocean North of 55°S and between 25°E and 120°E (130°E in the North of Australia)
Type of platform and variables measured	Drifting buoys: Air pressure, SST, (wind) Moorings: air pressure, wind, air temperature, SST, waves, relative humidity, SSS, current…
Targeted horizontal resolution	500 km x 500 km
Chairperson/Managers	Mr Graeme Ball, BoM, Australia
Coordinator	Mr Gilbert Emzivat, Météo-France
Participants	Australia (ABOM), France (Météo-France), India (NIO, NIOT, INCOIS), Kenya (KMD), South Africa (SAWS), Mozambique (EMU); USA (GDP, Navoceano), TIP (Tropical Moored Buoy Implementation Panel).
Data centre(s)	ISDM (Canada) as RNODC/DB, Météo-France as SOC AOML, NOAA/PMEL
Website	http://www.shom.fr/meteo/ibpio
Meetings	Annual meetings in conjunction with DBCP meetings. IBPIO 17 in WeiHai (China) in October 2014
Current status (mid-2014)	236 drifters (213 with Air Pressure) 47 moored buoys (32 for RAMA 70% of the planned 46 site array)
Summary of plans for 2015	Maintain a network of 150 drifters at least. Maintain the moored buoy arrays.

5. NORTH PACIFIC DATA BUOY ADVISORY PANEL (NPDBAP)

Name of Action Group	North Pacific Data Buoy Advisory Panel (NPDBAP)
Date of report	31 July 2014
Overview and main requirements addressed	The goals of the NPDBAP are to deploy 60 SVPB drifters a year, and maintain 75 active buoys in the region.
Area of interest	North Pacific Ocean and marginal seas generally north of 30°N
Type of platform and variables measured	Lagrangian drifters measuring sea level pressure, SST, and sea-surface velocity
Targeted horizontal resolution	5° x 5°
Chairperson/Managers	Co-Chairperson for the NE Pacific: Chris Marshall, MSC, Canada Co-Chairperson for the NW Pacific: Position vacant and to be proposed by PICES
Coordinator	Mr Shaun Dolk, NOAA / AOML
Participants	Al Wallace, Chris Marshall, Joe Linguanti, Ignatius Rigor, and Shaun Dolk
Data centre(s)	Drifter Data Assembly Centre (DAC) Integrated Science Data Management (ISDM), Canada
Website	http://npdbap.noaa.gov/
Meetings *(meetings held in 2013/2014; and planned in 2014/2015)*	Yearly meetings usually held in conjunction with DBCP meetings. Next meeting planned 24 September, 2013 in Paris, France
Current status summary *(mid-2013)*	From 01 August 2013 to 31 July 2014, 127 drifters were deployed in the North Pacific Ocean. Of the 127 drifter deployments, 109 units were equipped with barometer sensors and the remaining 18 drifters were standard SVP type drifters.
Summary of plans for 2015	The goal for 2015 is to deploy 100 drifters, of which, 70 drifters will be equipped with barometer sensors.

6. INTERNATIONAL ARCTIC BUOY PROGRAMME (IABP)

Name of Action Group	WCRP/SCAR International Programme for Antarctic Buoys (IPAB)
Date of report	1 October 2014
Overview and main requirements addressed	Participants of the IABP continue to work together to maintain a network of drifting buoys on the ice of the Arctic Basin to provide meteorological and oceanographic data for real-time operational requirements and research purposes including support to the World Climate Research Programme (WCRP) and the World Weather Watch (WWW) Programme.
Area of interest	Central Arctic Ocean and its marginal seas, excepting Exclusive Economic Zones, where agreements of the Coastal States have not been obtained
Type of platform and variables measured	Buoys on ice and/or in water measuring: Basic meteorological variables such as atmospheric air pressure and air temperature. Other variables such as: atmospheric pressure tendency, air chemistry (e.g. ozone), snow and sea-ice properties, as well as sub-surface oceanographic characteristics (e.g. temperature and salinity)
Targeted horizontal resolution	250 km x 250 km
Chairperson/Managers	Chairperson: Christine Best, Meteorological Service Canada
Coordinator	Ignatius Rigor, Polar Science Center, University of Washington, USA
Participants	Participants range from Science Institutions to Universities to Government Agencies. http://iabp.apl.washington.edu/overview_participants.html Participant contributions are shown on this site http://iabp.apl.washington.edu/overview_contributions.html
Data centre(s)	
Website	http://iabp.apl.washington.edu/
Meetings *(meetings held in 2013/2014; and planned in 2014/2015)*	Annual meetings spring or early summer in the Northern Hemisphere. 24th Annual Meeting of the International Arctic Buoy Programme [IABP], hosted by the Alfred Wegener Institute Bremerhaven, GERMANY, May 26-28, 2014. We are tentatively planning to have our next meeting at the Polar Science Center, Applied Physics Laboratory, University of Washington in May, 2015.
Current status summary *(mid-2014)*	188 buoys were reporting, 133 of which have barometers, and/or surface temperatures sensors (Fig. 1).
Summary of plans for 2015	Summer is the primary deployment season in the Arctic. Participants will deploy 70+ buoys ranging from: SVP's providing surface air pressure, buoys providing air pressure and air temperature, Ice Mass Balance buoys, Oceanographic Profiling buoys measuring temperature and salinity to great depths and buoys that measure atmospheric air components such as ozone. Plans for future years will be similar.

7. WCRP-SCAR INTERNATIONAL PROGRAMME FORANTARCTIC BUOYS (IPAB)

Name of Action Group	WCRP/SCAR International Programme for Antarctic Buoys (IPAB)
Date of report	31 Aug 2014
Overview and main requirements addressed	The Participants of the WCRP/SCAR International Programme for Antarctic Buoys (IPAB) work together to maintain a network of drifting buoys in the Southern Ocean, in particular over sea ice, to provide meteorological and oceanographic data for real-time operational requirements and research purposes. The IPAB was established in 1994 and became an Action Group of the Panel in October 1994.
Area of interest	South of 55°S and that region of the Southern Ocean and Antarctic marginal seas within the maximum seasonal sea-ice extent.
Type of platform and variables measured	Ice buoys measuring the following: Minimum variables: Buoy position Basic variables: Buoy position, atmospheric pressure and SST Other variables: Air temperature, ice and/or snow temperature, atmospheric pressure tendency, wind speed and direction, snow accumulation, other sea-ice properties and oceanographic variables
Targeted horizontal resolution	500 km x 500 km
Chairperson/Managers	Dr Petra Heil, AAD and ACE CRC, Hobart, Australia
Coordinator	Dr Christian Haas, York University, Toronto, Canada; Dr. Ignatius Rigor, University of Washington, Seattle, USA
Participants	- Alfred Wegener Institut, Germany - Australian Antarctic Division, Australia - Bureau of Meteorology, Australia - British Antarctic Survey, UK - Finnish Institute for Marine Research, Finland - GI, University of Alaska Fairbanks, USA - IARC, University of Alaska Fairbanks, USA - National Ice Center, USA - National Snow and Ice Data Center NSIDC, USA - ISDM/MEDS, Dept. of Fisheries and Ocean, Canada - Meteorological Service NZ LTD, New Zealand - Norwegian Polar Institute, Norway - Polar Science Center, Univ. of Washington, USA - National Institute of Polar Research, Japan - JAMSTEC, Japan - Programma Nazionale di Ricerche in Antartide, Italy - DAMTP, UK - SAMS, UK - York University, Toronto, Canada - CLS/Service Argos, France - South African Weather Service, South Africa- Meteorological Office, UK - CRREL, USA
Data centre(s)	Alfred Wegener Institute for Polar and Marine Research, Germany: http://www.pangaea.de/search?q=ipab National Snow and Ice Data Center NSIDC, USA: http://nsidc.org/data/docs/daac/nsidc0084_ipab_antarctic_buoys.gd.html
Website	http://www.ipab.aq/

Meetings *(meetings held in 2013/2014; and planned in 2014/2015)*	An IPAB participants meeting was held in Hobart, Tasmania, on March 8, 2014, in conjunction with the IGS sea ice symposium. http://seaice.acecrc.org.au/igs2014/scientific_workshops/ipab-meeting/ IPAB participants reported during the annual meeting of the International Arctic Buoy Programme in Bremerhaven, Germany, on May 26-28, 2014. The next IPAB participants meeting may be held together with the annual IABP meeting, scheduled to take place in Seattle, WA, in May or June 2015.
Current status summary *(mid-2014)*	1. >50 buoys were deployed during AWI Polarstern cruises in Weddell Sea, June - Aug 2013 and Jan-Mar 2014. Buoys of various types (SVP, IMB, snow, AWS) contributed by AWI, Ant CRC, FMI, WHOI. 2. 10 SVPs were deployed by USIPAB during NPB cruise in Feb 2014, in Ross Sea sector between 140 and 150 W, 55 and 65 S The Meteorological Services of South Africa, Australia, and New Zealand continue to operationally deploy numerous SVP's in the Southern Ocean, primarily north of the sea ice edge.
Summary of plans for 2015	Main deployments will be during a German icebreaker cruises to the Weddell Sea in Dec 2014/Jan 2015, and during USIPAB cruise to Ross/Amundsen Sea in January/February 2015.

8. INTERNATIONAL SOUTH ATLANTIC BUOY PROGRAMME (ISABP)

Name of Action Group	International South Atlantic Buoy Programme
Date of report	31 July 2014
Overview and main requirements addressed	The main objective of ISABP is to establish and maintain a network of platforms in the Tropical and South Atlantic Ocean in order to provide meteorological and oceanographic data for both real-time and research purposes. The task includes support to the World Weather Watch Programme (WWW), the Global Climate Observing System (GCOS), the World Climate Research Programme (WCRP), and the Global Ocean Observing System (GOOS), as well as to the research activities of participating institutions.
Area of interest	South Atlantic Ocean north of 55S plus Tropical Atlantic Ocean up to 20N (90° W to 30° E)
Type of platform and variables measured	Lagrangian drifters measuring sea level pressure, SST, salinity and sea-surface velocity
Targeted horizontal resolution	5 degrees x 5 degrees
Chairperson/Managers	Mr Ariel Troisi, SHN, Argentina
Coordinator	Mayra Pazos, AOML-NOAA, USA Johan Stander, SAWS, South Africa, Santjie.DuToit, SAWS, SA
Participants	Countries interested in the region (Brazil, US, Argentina, South Africa, Tristan Is.)
Data centre(s)	Historical drifter data are assembled, quality controlled at AOML, Miami, then sent to ISDM for archival and further distribution. Real time data is also archived at ISDM, GTS is handled by the AOML GDP
Website	http://www.jcommops.org/dbcp/isabp/index.html http://www.oceatlan.org/isabp/en/
Meetings *(meetings held in 2013/2014; and planned in 2014/2015)*	Meetings are held every other year, normally in May-July. Last meeting, ISABP- 13 took place in Buenos Aires, Argentina, on April 19, 2010
Current status summary *(mid-2013)*	As of September 8, 2014, there were a total of 154 drifters in the South Atlantic region, (66 SVP, 88 SVPB).
Summary of plans for 2015	Continue to address observational gap areas specially, in the Gulf of Guinea and Angola Basin; pursue recommendation of conducting studies and evaluate the impact of drifter pressure data and SST on the skills of numerical weather forecasting models for the region; continue to increase number of SVPB in the region.

9. OCEAN SUSTAINED INTERDISCIPLINARY TIMESERIES ENVIRONMENT OBSERVATION SYSTEM (OceanSITEs)

Name of Action Group	**OceanSITES**
Date of report	15 August 2014
Overview and main requirements addressed	OceanSITES is a worldwide system of long-term, deepwater reference stations measuring dozens of variables and monitoring the full depth of the ocean, from air-sea interactions down to 5,000 meters.
Area of interest	Global
Type of platform and variables measured	Deep-water reference stations
Targeted horizontal resolution	Key and representative sites covering the global ocean
Chairperson/Managers	Uwe Send, SIO Bob Weller, WHOI
Coordinator	Kelly Stroker, Project Office
Participants	Executive Committee, Steering Team Members, and Data Management Team Members
Data centre(s)	2 Global Data Assembly Centers IFREMER Coriolis (FTP). ftp://ftp.ifremer.fr/ifremer/oceansites/ US NDBC (FTP). ftp://data.ndbc.noaa.gov/data/oceansites/
Website	www.oceansites.org
Meetings *(2013)* *Planned 2014*	**2013** 9th Steering Committee and 6th Data Management Team Meetings in Seoul, Korea May 27-30, 2013 http://www.oceansites.org/meetings/index.html **2014** 10th Steering Committee and 7th Data Management Team Meetings in Recife, Brazil Nov 3-6, 2014 http://www.tav-pirata19.com/index.php
Current status summary *(August-2014)*	The OceanSITES Network consists of over 200 reference sites in the deep-ocean plus an additional 72 standard meteorological sites (TAO, RAMA, PIRATA). One of the goals of OceanSITES is to have data freely available, in real-time if possible. Currently there are 82 sites transmitting data in real-time to a local or regional data centre (Figure 1). OceanSITES has an active Data Management team that works with site PIs to share data in a common NetCDF format. The format specifications have been developed by the DMT in collaboration with the Steering Committee and Exec Board. Currently only around 30% of these sites are submitting data to one of the Global Data Assembly Centers (GDAC) in this format (Figure 2). At the 2011 La Jolla OceanSITES meeting, it was decided to make use of the many existing OceanSITES platforms in deep water to make an "instant" contribution towards the gap in deep-ocean observations as identified at OceanObs09. OceanSITES at over 50 sites around the world already carry deep temperature/salinity (T/S) sensors. OceanSITES members had a goal to deploy another 50, which requires 50 sensors for the initial deployments and another 50 for swapping out and calibrations (Figure 3). OceanSITES PIs have pledged to add such

	sensors to their existing moorings and as of August 2014 another 24 sensors were installed with an additional 6 are planned in the coming year(s). In addition to the sensor contribution by PIs, OceanSITES has a pool of matching sensor for the swap-outs via donations from institutions, agencies and companies. The community has nearly 50 instruments in the "pool" for exchanging and adding to sites around the world thanks to a number of generous donations but in particular, the donation of 22 instruments by the UK National Oceanograpy Centre in Southampton (Figure 4). In 2014, the OceanSITES Data Management Team worked on version 1.3 of the Data Format Reference Manual (formerly User's Guide). The new Reference Manual was published in June 2014 and the community is encouraged to follow the new guide when preparing their data. The OceanSITES Data Management Team welcomed a new Chair, Julie Thomas of Scripps Institute of Oceanography. Dr. Thomas has stepped in to replace the departure of the previous chair nearly 3 years ago. The DMT welcomed Dr. Thomas and he leadership. The DMT then continued to hold regular monthly meetings via Webex. The OceanSITES Executive Committee set regular meeting times at once a month and held these throughout the year.
Summary of plans for 2013-2014	In November 2014, OceanSITES will hold a meeting in Recife Brazil jointly with the Tropical Atlantic Variability/PIRATA and the Brazil-European Union (EU) Dialogues in Marine Research Meeting. The OceanSITES Executive Committee will continue to meet regularly as will the Data Management Team. The DMT is still working on several new documents that will be published to assist user's of OceanSITES data and possible new contributors: 1) a new document entitled "How to Become an OceanSITES Member", 2) a new document entitled "How to work with the GDACs", 3) a new document entitled "How to Access OceanSITES Data". Finalization of concrete metrics for OceanSITES which the executive committee has been working. The 3 disciplines will have small teams to write White papers 1) Air sea flux 2) Physical time-series (ocean circulation, deep changes) 3) Biogeochemical and ecosystem Formalization of the processes and procedures for managing the deep ocean temperature/salinity program, and establishment of the next set of sites to be instrumented. Review and finalization of new products and indicators. Publish the updated *Minimalist OceanSITES Interdisciplinary Network (MOIN)* document (backbone network of minimalist identical multi-disciplinary sites) and hold a MOIN Workshop in early 2014 Work closely with other communities and attend meetings when appropriate. For example, • Hydrophone sites – LIDO • Ocean Tracking network • Deep Ocean initiative • INDEEP- Intern Network for scientific investigation of Deep sea

	ecosystems • Ocean Acidification, IOCCP Increase data holdings at the OceanSITES GDACs Finalization of OceanSITES data archive with NOAA's National Oceanographic Data Center (NODC). Formal archive to be functioning in early 2015. Participation in the Partnership for the Observation of the Global Ocean (POGO) meeting in Tenerife, Spain in January. OceanSITES will welcome a new Project Office, Ms. Champika Gallage. Ms. Gallage will join the JCOMMOPS team from Environment Canada. She will start in October 2014 and be stationed with the rest of JCOMMOPS in Brest, France.

10. INTERNATIONAL TSUNAMETER PARTNERSHIP (ITP)

Name of Action Group	**International Tsunami Partnership (ITP)**
Date of report	15 September 2014
Overview and main requirements addressed	Activity since last report (DBCP-29): status of Tsunameters; (appendix A); issues/enhancements to data sharing, technological developments, challenges, other
Area of interest	Discussion Topic 1: Develop a forum for a coordinated dialogue between IOC TOWS and JCOMM DBCP to promote a global sensing strategy for tsunamis, which identifies gaps and promotes collaboration to meet these gaps. DBCP ITP can serve as a technical collaborator in the dialog and provide a link between TOWs and DBCP Discussion Topic 2: the year's progress in partnerships -- e.g. US/Chilean discussions to enhance sensing in the Southern Chilean Trench.
Type of platform and variables measured	Surface expressions (buoys and autonomous vehicles) and deep ocean water level recording devices
Targeted horizontal resolution	IOC Tsunami Programme: http://www.ioc-tsunami.org/index.php?option=com_content&view=featured&Itemid=93&lang=en Promotes a coordinated but regionalized approach to awareness, risk assessment, observation networks and early warning systems
Chairperson/Managers	Dr. Venkatesan,; Mr. Stephen G. Cucullu
Coordinator	Kelly Stroker
Participants	DBCP Representatives
Data centre(s)	Various
Website	http://www.jcomm.info/index.php?option=com_oe&task=viewEventRecord&eventID=1504
Meetings *(meetings held in 2013/2014; and planned in 2014/2015)*	Technical information exchange between NOAA NDBC and National Institute of Ocean Technology Ministry of Earth Sciences -- April 1, 2014. Intergovernmental Oceanographic Commission Seventh Meeting of the Working Group on Tsunami and other Hazards related to Sea-Level Warning and Mitigation Systems (TOWS-WG) 12 - 13 February 2014, Paris, France TOWS-WG 2015 *to be determined*
Current status summary *(mid-2013)*	Refer to Appendix A
Summary of plans for 2015	Refer to Section 2.

ANNEX VI

REPORT FROM THE EXECUTIVE BOARD MEETING
(Weihai, China, 29 October 2014)

Participants:

DBCP EB members:
- Al Wallace (Chair)
- Graeme Ball (vice-Chair, SH, and SOT Chair)
- R. Venkatesan (vice-Chair Asia)
- Jon Turton (vice-Chair, Europe)
- Champika Gallage (TC-DBCP)
- Etienne Charpentier (WMO Secr.)
- Tom Gross (IOC Secr.)

Excused: Sid Thurston (chair, TT-CB)

Other invited participants:
- Johan Stander, JCOMM co-President
- David Meldrum, OCG co-Chair
- Kelly Stroker (former TC-DBCP)
- Frank Grooters (financial advisor)
- Eric Locklear (USA)
- Bernie Petolas (Metocean, representing the manufacturers)

1. Executive Board membership

The EB first consider membership of the executive, and noted that new members are about to be elected by the Panel for the positions of :
- Chair position
- Vice-Chair for North America

The Board is proposing to nominate Jon Turton (UK) for the Chair position.
The Board noted the outcome of discussions between Canada and USA, which resulted in the nomination of Shannon McArthur (USA) for the Vice-Chair for North America position.

2. Succession planning for the Chair, and vice-Chairs

Replacement for the Southern Hemisphere, and Asia vice-Chairs. The current vice-Chairs are invited to investigate who could replace them, and report to the Board at the next Panel Session.

According to the DBCP Operating Principles, the new Chair, once elected, will also be invited to nominate 1 additional member in the EB.

3. Panel Session format

The EB agreed that the Science and Technical workshop is effective.
The day for side meetings of the Task Team, Pilot Projects, and Action Groups is also effective although the time required for some side meetings could be adjusted (e.g. ITP, PP-SLP, PP-HRSST). The time allocated to IBPIO was adequate. DBCP Sessions should start earlier in the day. Implementation Strategy should be discussed more deeply at Panel sessions to allow appropriate evolution (not revolution) of the Panel so that it will continue to respond as closely as possible to the user requirements. Some of the issues (item 9) could be incorporated into the TC report.

The Panel needs to also better respond to new technologies (e.g. gliders, cables, etc.).

The Secretariat is invited to make a proposal to the EB for the next Panel Session.

4. Technical Coordinator's position

The Board welcomes Champika Gallage, and thanked warmly Kelly Stroker for her contribution to the work of the Panel.

The Board also discussed the SOT TC position, and noted steps taken by the Secretariat to assure continuity of the position.

5. DBCP Budget and contributions

5.1 Status of the Trust Fund

The Board reviewed the status of the Trust Fund and agreed that it was healthy.
It was noted that there has been an increase in expenditures in recent years.

The budged (i.e. maximal expenditures) should be managed closer to the actual expenditures.

The Board thanked Frank Grooters for acting as Financial Advisor in the last few years.

5.2 Contributions for next year and beyond

- US contribution is committed to the JCOMM Trust Fund. The Board recommended that the DBCP contribution made through the JCOMM Trust Fund at WMO should be transferred to the DBCP TF at WMO.
- IOC to consider to consider closing the DBCP TF at the IOC as it included a very small amount (<$50), and no contribution are being made to it.
- The Board noted substantial increased contribution of USA to DBCP, SOT, and JCOMMOPS.
- The Panel should welcome additional financial contributions to the DBCP.
- The Board recognized that there has been substantial in kind contribution of China for organizing this Panel Session.
- Having a substantial portion of the DBCP contributions coming from one single contributor is putting the DBCP budget at risk (e.g.US contribution). The risks should be better managed and contributions better balanced between contributors.

5.3 Proposed maximum expenditures for next year

The EB reviewed the budget and directed expenditure reductions in a number of areas. The EB recommends supporting a number of initiatives in the coming intersessional period as detailed in the table below.

Expense	***Maximum expenditure***	***Comment***
NPOMS-4 (Busan, Korea, Nov. 2015)	15 000	Negotiate with developed countries of the region in order to decrease DBCP commitment
First Pacific Islands CB Workshop (PI-1)	25 000	
Instrument Workshop for Asian countries (Asia/Instr-2)	0	To be organized in 2016
DBCP-WIO-6 (April/May 2015)	0	

Expense	***Maximum expenditure***	***Comment***
Co-sponsorship of the RMIC/RA-IV instrument workshop (focus on wave observations, and synergy with PP-WET)	10,000	
Retrospective and Review project of the DBCP	18,000	WMO SSA ($10k) plus travel ($8k)
Accumulated Iridium air time	15,000	Reimbursement to SAMS of past air time of PP-Iridium drifters they paid up to 31 December 2014. SAMS to provide a report
Ship Coordinator's position (DBCP)	20,000	(DBCP TF)
SOT, incl. Ship Coordinator's missions (SOT)	10,000	(DBCP TF)
Missions of the chair and other DBCP representatives at meetings of interest	20,000	
Support to missions of the Technical Coordinator	30,000	
Ship time (e.g. deployments from Lady Amber)	(in kind)	
Pilot Project on ocean observation awareness (to address vandalism)	10,000	Carry over from last year
TC-DBCP Position	70 000	DBCP TF (the other $70 come from JCOMM TF)

6. Implementation Strategy

Members are encouraged to review the strategy.

7. Attracting new Panel members

New Panel members are welcomed for whatever contribution they can make (financial contribution to the Trust Fund, hardware, telecommunication fees, participation at workshops, etc.).

The Board noted the tremendous contribution of China for organizing this DBCP-30 session.

8. Working priorities for the Technical Coordinator

Same procedure as last year is proposed for discussing the work priorities of the TC-DBCP.

The EB recognized that the TC is spending 30% of her time on OceanSITEs.

9. Other issues

- Coordination of glider activities, and new technological developments: the Panel must remain open to such developments, and possible collaboration with relevant groups.
- A proposal could be developed for using ship chartering to deploy drifters in data sparse regions using DBCP TF. The Board is suggesting that Johan Stander should develop such a proposal.
- Per MAN-11 discussions, (i) OCG requires a report from the DBCP on succession planning; (ii) the Panel should contribute to the JCOMMOPS strategy before OCG-6; (iii) document how to promote data exchange; (iv) Keeley report on data systems a number of recommendations that the Panel needs to consider; and (v) IIOE-II, TPOS to be considered.

ANNEX VII

INTERIM STATEMENTS OF ACCOUNT

IOC
INTERIM STATEMENT OF ACCOUNT
FOR THE PERIOD 1 JANUARY TO 31 JULY 2014

United Nations
Educational, Scientific and
Cultural Organization

Memo
BFM/FAS/2014/543
2 September 2014

To: ADG/IOC

From: BFM/FAS/FRA

Subject: **IOC Special Account – 193DBC2000**

As requested, please find enclosed a Financial Report as at 31 July 2014 for the above-mentioned fund.

Ebrima Sarr

cc: BFM/BMR
BSP/CFS

United Nations Educational, Scientific and Cultural Organization

193DBC2000

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

DBCP/SOOP Technical Coordinator: Salary, Missions and Other Costs

(Statement of Account from 1 January 2014 to 31 July 2014)

(Expressed in US Dollars)

Cash Balance Brought Forward as at 1 January 2014	**25.80**
Deduct:	
Disbursements	-
Programme Support Costs	-
Cash balance as at 31 July 2014	**25.80**
Unliquidated Obligations	-
Funds available as at 31 July 2014	**25.80**

United Nations Educational, Scientific and Cultural Organization

193DBC2000

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

DBCP/SOOP Technical Coordinator: Salary, Missions and Other Costs

(Statement of Account from 1 January 2013 to 31 July 2013)

(Expressed in US Dollars)

Cash Balance Brought Forward as at 1 January 2013	7,907.47
Deduct:	
Disbursements	
Salary costs	-
Statutory Travel on appointment and removal	7,165.15
IOC Logistical support JCOMMOPS	-
Programme Support Costs	716.52
Cash balance as at 31 July 2013	25.80
Unliquidated Obligations	-
Funds available as at 31 July 2013	25.80

WMO
INTERIM STATEMENTS OF ACCOUNT OF THE DBCP AND JCOMM TRUST FUNDS FOR THE PERIOD 1 JANUARY TO 31 JULY 2014

World Meteorological Organization
Organisation météorologique mondiale
Secrétariat
7 bis, avenue de la Paix – Case postale 2300 – CH 1211 Genève 2 – Suisse
Tél.: +41 (0) 22 730 81 11 – Fax: +41 (0) 22 730 81 81
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DATA BUOY CO-OPERATION PANEL

Interim Statement of income and expenditure
For the period 1 January to 31 July 2014
Amounts in United States dollars

1. Balance brought forward , 1 January 2014			249,329
1.1 Add back: GFCS 2013 expenditure incorrectly charged to DBCP Trust Fund			62,325
1.2 Add back: related support costs			1,870
1.3 Adjusted Balance, 1 January 2014			313,524
2. Income:			
2.1 Contributions[a/]			114,498
3. Total available funds during reporting period			428,022
4. Expenditure[b/]			
4.1 Direct project costs			
4.1.1 Consultant - DBCP TC (Stroker)	56,700		
4.1.2 Travel - other representatives to attend other WMO meetings	30,479		
4.1.3 CLS 2014 Logistical Support (EUR 13,750)	18,682		
4.1.4 Travel - other representatives ad hoc travel	17,107		
4.1.5 Travel of staff to other WMO meetings	2,631		
4.1.6 Postage	18		
4.1.7 Total direct costs		125,617	
4.2 Indirect project costs			
4.2.1 Support costs at 3%	3,769		
4.2.2 Bank charges	187		
4.2.3 Unrealized loss on currency exchange	102		
4.2.4 Total indirect costs		4,058	
4.3 Total project expenditure			129,675
5. Balance of fund at 31 July 2014			**298,347**

a/

Contributions	
Australia	15,918
BSH, Germany	4,965
CLS, France	28,342
India	5,051
Meteo France	54,720
South Africa	5,502
Total contributions	114,498

b/ Excluding obligations of USD 80,219 (USD 16,200 relating to consultant's fees, USD 6,799 for travel, USD 55,186 for specialised services and USD 2,034 for miscellaneous services)

Luckson Ngwira
Chief, Finance Division
27 August 2014

World Meteorological Organization
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Trust Fund for JCOMM support

Interim Statement of income and expenditure

For the period 1 January to 31 July 2014

(amounts expressed in Swiss francs)

1. Balance brought forward, 1 January 2014		286,742
2. Income		
2.1 Contributions		
2.1.1 Contribution of USD 386,000 (in CHF actual amount received on 23 June 2014) from Woods Hole Oceanographic Institute (WHOI), United States	346,628	
2.1.2 Total contributions		346,628
2.2 Interest		59
3. Total available funds during reporting period		633,429
4. Expenditure		
4.1 Direct project costs		
4.1.1 Salaries	38,155	
4.1.2 Post adjusment	27,801	
4.1.3 Contribution to pension fund	11,914	
4.1.4 Contribution to medical insurance plan	2,243	
4.1.5 Total direct costs	80,113	
4.2 Indirect project costs		
4.2.1 Support costs at 5%	4,006	
4.2.2 Total indirect costs	4,006	
4.3 Total expenditure		84,119
5. Balance of fund at 31 July 2014		**549,310**

Certified correct:

Luckson Ngwira
Chief, Finance Division
27 August 2014

ANNEX VIII

TABLE OF NATIONAL CONTRIBUTIONS FOR 2015

Budget / Country	JCOMMOPS	DBCP	OceanSITEs	SOT	JTA	COMMENT
Australia	EUR 11,700		USD 5,000			JCOMMOPS: including DBCP (50%) and SOT (50%)
Canada	CAD 30,000					JCOMMOPS, including DBCP and SOT
CLS					USD 50,000	USD 30,000 for the JTA-Executive Committee USD 10,000 for the IOC Secretariat (paid directly to IOC) USD 10,000 for the WMO Secretariat
E-SURFMAR		EUR 40,000				Belgium, Croatia, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, and the United Kingdom
Germany				EUR 3,600		Support to SOT
India		USD 5,000				
New Zealand	Eur 1,800					JCOMMOPS, including DBCP (50%) and SOT (50%)
South Africa		EUR 4,000				
USA	USD 59000	USD 70,000	USD 30,000	USD 100,000		Contribution to TC-DBCP and SOT made to WMO as of 2012 SOT contribution includes SOT TC (USD 40,000), Ship Coordinator (USD 50,000), and GO-SHIP Coordination (USD 10,000)

ANNEX IX

BUDGET FOR THE NEXT YEAR - REVIEW OF THE DBCP ACCOUNTS AS AT 31 JULY 2014 AND ESTIMATES FOR THE YEARS 2015 AND 2016

TABLE 1 - SUMMARY

Interim Statement for the 2014 DBCP Trust Fund, based on WMO and IOC Financial Information as at 31 July 2014 (budgets for 2015 and 2016 for information)

Summary								Interim Statement			based on Interim 2014 and EB review					
		Actual			**Actual**			**Actual**			**Budget**			**Budget**		
		2012			**2013**			**2014**			**2015**			**2016**		
	Receipts	**Obligations**	**Balance**	**Receipts**	**Obligations**	**Balance**	**Receipts**	**Obligations**	**Balance**	**Receipts**	**Obligation**	**Balance**	**Receipts**	**Obligation**	**Balance**
DBCP+JCOMM			**at 31 Dec**			**at 31 Dec**			**at 31 Dec**			**at 31 Dec**			**at 31 Dec**
Carried over from previous year	690,374			391,673			249,354			298,372			404,849		
Contributions	72,710			110,411			114,498			443,477			289,477		
Adjustments	9,917			6,189			64,195								
Expenditure															
TC Contract (DBCP TF)		81,967			8,100						70,000			120,000	
TC Transition		90,000			7,165										
JTA (Chair, EC, Secr. Support)		24,616			37,151			18,369			65,000			65,000	
TC Salary (JCOMM TF)															
Consultancy					4,950			56,700			18,000				
JCOMMOPS (incl. Log. Supp.SOT)		47,857			17,927			18,682							
SOT					11,097			8,677			10,000			10,000	
SOT Ship Coordinator (DBCP share)					35,000						20,000			20,000	
SOT Ship Coordinator (SOT share)															
Support of Missions ARGO TG					2,602										
Travel DBCP		39,920			37,063			13,409			50,000			50,000	
Techn. Development/Evaluations		7,066													
Ocean Observation Awareness											10,000			10,000	
SLP Pilot		6,744													
Iridium (incl. upgrades)		22,097									15,000				
Outreach and Publications		1,030			346			18			19,000			1,000	
Capacity Building		43,000			24,979			9,762			50,000			25,000	
Collaborative Arrangements					62,325										
Bank Charges/Supp. Cost/Other		17,031			10,214			4,058			10,000			10,000	
Contingency								24,000			10,000			10,000	
Total DBCP	**773,001**	**381,328**		**508,273**	**258,919**		**428,047**	**153,675**		**741,849**	**347,000**		**694,326**	**321,000**	
Unliquidated Obligations		7,857													
Balance of DBCP Trust Fund			**391,673**			**249,354**			**274,372**			**394,849**			**373,326**
Contingency carry over									24,000			10,000			10,000
Carried over			**391,673**			**249,354**			**298,372**			**404,849**			**383,326**
	US Contributions effected via JCOMM TF in 2012 Annual Report										Rough estimation			Rough estimation	

TABLE 2 – DETAILED REVIEW

Interim Statement for the 2014 DBCP Trust Fund: Income and Expediture in USD
(based on WMO and IOC Financial Information as at 31 July 2014)

after EB review DBCP-30
based on interim 2014

	Final Statement 1 January - 31 December 2011				Final Statement 1 January - 31 December 2012				Final Statement 1 January - 31 December 2013				Interim Statement 1 January - 31 July 2014				Estimated budget		Estimated budget	
	Jan - Dec		Estimated budget		Jan - Dec		Estimated budget		Jan - Dec		Estimated budget		Jan - July		Estimated budget		Jan - Dec 2015		Jan - Dec 2016	
DBCP	WMO	IOC	WMO	IOC	WMO	IOC	WMO	IOC	WMO	IOC	WMO	IOC	WMO	IOC	WMO	IOC	WMO	IOC	WMO	IOC
Receipts																				
Brought Forward	371,771	130,555	371,771	130,555	592,303	98,071	592,303	98,071	383,765	7,908	383,765	7,908	249,328	26	249,328	26	298,346	26	404,823	26
Contributions	320,615	90,000	173,710	115,000	72,710		279,477	10,000	110,411		369,477	10,000	114,498		369,477	10,000	433,477	10,000	279,477	10,000
Adjustment JCOMM TF													-							
Adjustment DBCP TF	4,687				9,917				6,189				64,195							
Total Receipts	**697,073**	**220,555**	**545,481**	**245,555**	**674,930**	**98,071**	**871,780**	**108,071**	**500,365**	**7,908**	**753,242**	**17,908**	**428,021**	**26**	**618,805**	**10,026**	**731,823**	**10,026**	**684,300**	**10,026**
Expenditure/Oblig'ns																				
TC Contract (DBCP TF)		75,603		40,000		81,967		120,000	8,100		*150,000*				*190,000*		70,000		120,000	
TC Transition		19,675	20,000		90,000					7,165	*20,000*	10,000			*1,000*					
JTA (Chair, EC, Secretariat)	24,056		55,000	10,000	24,616		55,000	10,000	37,151		55,000	10,000	18,369		55,000	10,000	55,000	10,000	55,000	10,000
TC Salary (JCOMM TF)					-															
Consultancy JCOMM																				
Consultancy DBCP	10,894			10,000					4,950				56,700				18,000			
JCOMMOPS Logistical Supp.		16,071		15,000	8,928			10,000	8,964		*9,000*		18,682		*9,000*		-		-	
JCOMMOPS Logistical Supp. SOT					8,929			5,000	8,963		*9,000*				*9,000*					
JCOMMOPS Data/Development			5,000				7,500				7,500				7,500		-		-	
JCOMMOPS IS Migration	3,380		30,000		30,000															
SOT	13,415		20,000				30,000		11,097		30,000		8,677		*15,000*		10,000		10,000	
Ship Coordinator's position(DBCP share)							20,000		35,000		*20,000*				*20,000*		20,000		20,000	
Ship Coordinator's position(SOT share)															*60,000*					
Support of Missions ARGO TC									2,602		*15,000*				*15,000*					
Travel TC			5,000		15,430		20,000		29,045		*30,000*		13,409		*30,000*		30,000		30,000	
Travel DBCP Representatives	25,543		23,000		24,490		10,000		8,018		*20,000*				*20,000*		20,000		20,000	
Techn. Dev/Evaluations/Inter-Comp			12,000		7,066		53,000				*7,000*				*7,000*		-		-	
PP Ocean Observation Awareness															*10,000*		10,000		10,000	
SLP Pilot					6,744		32,500				*45,000*				*45,000*		-		-	
Iridium and barometer upgrades			15,000		22,097		10,000				*25,000*				*15,000*		15,000		-	
Outreach, Reviews, and Publications			1,000		1,030		1,000		346		1,000		18		1,000		19,000		1,000	
Capacity Building	19,394		25,000		43,000		45,000		24,979		*30,000*		9,762		*40,000*		50,000		25,000	
Collaborative Arrangements							10,000		62,325		10,000				10,000					
Bank Charges/Supp. Cost JCOMM TF					-															
Bank Charges/Supp. Cost DBCP TF	3,440	11,135	2,500	10,000	8,835	8,196	2,500	10,000	9,497	717	2,500	1,000	4,058		2,500		10,000		10,000	
Contingency	4,648		24,000	20,000			24,000	20,000			24,000				24,000		10,000		10,000	
Total Expenditure	**104,770**	**122,484**	**237,500**	**105,000**	**291,165**	**90,163**	**320,500**	**175,000**	**251,037**	**7,882**	**510,000**	**21,000**	**129,675**	**-**	**586,000**	**10,000**	**337,000**	**10,000**	**311,000**	**10,000**
Unliquidated Obligations						7,857														
Balance of Fund	**592,303**	**98,071**	**307,981**	**140,555**	**383,765**	**7,908**	**551,280**	**-66,929**	**249,328**	**26**	**243,242**	**-3,092**	**298,346**	**26**	**32,805**	**26**	**394,823**	**26**	**373,300**	**26**
Contingency Carry Over			24,000	20,000			24,000	20,000			24,000				24,000		10,000		10,000	
Carried Over	**592,303**	**98,071**	**331,981**	**160,555**	**383,765**	**7,908**	**575,280**	**-46,929**	**249,328**	**26**	**267,242**	**-3,092**	**298,346**	**26**	**56,805**	**26**	**404,823**	**26**	**383,300**	**26**
Contributions																				
Australia	20,525		21,350		19,684		21,124		15,517		21,124		15,918		21,124		21,124		21,124	
Canada	136,187		24,250				27,905				27,905				27,905		27,905		27,905	
CLS	35,269		55,000	10,000	34,028		55,000	10,000	32,748		55,000	10,000	28,342		55,000	10,000	55,000	10,000	55,000	10,000
E-SURFMAR	108,278		58,000				54,611		54,274		54,611		54,720		54,611		54,611		54,611	
Germany	4,925		5,000		4,663		4,915				4,915		4,965		4,915		4,915		4,915	
India	5,941		3,000		5,026		3,004				3,004		5,051		3,004		3,004		3,004	
New Zealand			2,610		4,658		2,457		2,445		2,457				2,457		2,457		2,457	
Ukraine	196																			
South Africa	4,905		4,500		4,651		5,461		5,427		5,461		5,502		5,461		5,461		5,461	
USA (JCOMM TF)							105,000				195,000				*195,000*		259,000		105,000	
USA (DBCP TF)				105,000																
WMO		90,000																		
Special Contributions	4,389																			
Total	**320,615**	**90,000**	**173,710**	**115,000**	**72,710**	**-**	**279,477**	**10,000**	**110,411**		**369,477**	**10,000**	**114,498**	**-**	**369,477**	**10,000**	**433,477**	**10,000**	**279,477**	**10,000**

E=Estimate

All travel (exept TC) under one item as per DBCP-27

E

Australia: USD 5150 for OceanSITEs Project Office Effected by JCOMM TF in 2012 Annual Rreport

E

Asia CB Workshop Satcom Forum Workshop

E

Coll. Arr.: GFCS carried over WMO: rounding difference +US$ 1 with WMO Final Accounts

E

Adjustment: incorrect charge GFCS in 2013. Consultancy: DBCP TC

E

US Contribution: USD 115K DBCP USD 80K SOT

E

US Contribution: USD 70K DBCP USD 100K SOT USD 59K JCOMMOPS USD 30K OceanSITEs

E

Exchange rate as per 31 July 2013 for JCOMM TF in WMO Financial Information:
USD 1 = CHF 0.9435 (mean value from WMO Financial Information for JCOMM TF)

Table 2

TABLE 3 - SUMMARY REVIEW OF THE JCOMM ACCOUNTS UNTIL 31 DECEMBER 2013 ANDAT 31 JULY 2014

Interim Statement for the 2014 JCOMM Trust Fund: Income and Expenditure in Swiss Francs

(Based on WMO Financial Information as at 31 July 2014)

based on Interim 2014

	Jan - Dec 2012	Jan - Dec 2013	Jan - July 2014
JCOMM	WMO	WMO	WMO
Receips			
Brought Forward		223.624	286.741
Contributions	457.446	364.770	346.628
Adjustment	447	360	59
Total Receips	**457.893**	**588.754**	**633.428**
Expenditure/Obligations			
TC Salary/allowances	55.490	133.743	80.113
Consultancy OOPC	167.400	82.215	
Consultancy DBCP		74.933	
Bank Charges/Supp. Cost	11.379	11.122	4.006
Transfer to DBCP TF*			
Total Expenditures	**234.269**	**302.013**	**84.119**
Balance of Fund	**223.624**	**286.741**	**549.309**
Carry Over	**223.624**	**286.741**	**549.309**
Contributions			
USA	457.446	364.770	346.628
Total	**457.446**	**364.770**	**346.628**
(*USD 105K)			
Conversion rate 31 Dec	*$1=CHF 0.9137*	*$1=CHF 0.8882*	
Conversion rate 31 July			*$1=CHF 0.9074*
		note1:Consultancy	
		DBCP for DBCP TC	
		note2: rounding	
		difference +US$ 1	
		with WMO accounts	

TABLE 4
ARGOS JOINT TARIFF AGREEMENT (JTA) EXECUTIVE COMMITTEE BUDGET

Year	Item	Income & Expenditure	1 CHF	Income & Expenditure	Income & Expenditure for JTA	JTA balance	Income & expenditure for WMO	WMO balance	Comment
		CHF	*USD*	*USD*	*USD*	*USD*	*USD*	*USD*	
2010	**Initial JTA balance**					***0***		**0**	
	CLS Contribution to DBCP TF at WMO (2010)			55,000	45,000	45,000	10,000	10,000	
	Mission, J. Stander, JTA-EC, Sydney, 04/2010			-4,273	-4,273	40,727	0	10,000	
	Mission, E. Charpentier, JTA-EC, Sydney, 04/2010			-3,321	-3,321	37,406	0	10,000	
	Mission, J. Stander, JTA-30, Oban, 10/2010			-2,402	-2,402	35,004	0	10,000	
	Mission, Greg Reed, IPET-DMI, 4/2010			-1,823	0	35,004	-1,823	8,177	
	Frank Grooters JTA contract (SSA), 10/2010			-15,437	-15,437	19,567	0	8,177	
2011	**CLS Contribution to DBCP TF at WMO (2011)**			**35,269**	**25,269**	**44,836**	**10,000**	**18,177**	
	Mission, J. Stander, JTA-EC, Miami, 4/2011			-1,224	-1,224	43,612	0	18,177	
	Mission, D. Meldrum, RMIC2, Tianjin, 7/2011			-3,247	0	43,612	-3,247	14,930	
	Mission, S. Issara, RMIC2, Tianjin, 7/2011			-3,829	0	43,612	-3,829	11,101	
	Mission J. Trinanes, IPET/DRC, Melbourne, 9/2011			-1,638	0	43,612	-1,638	9,463	
	Mission ROC Botswana, JTA-31, Geneva, 9/2011			-4,051	-4,051	39,561	0	9,463	
	Mission J.Stander, JTA-31, Geneva, 9/2011			-3,781	-3,781	35,780	0	9,463	
	Frank Grooters JTA contract (SSA), 10/2011			-15,000	-15,000	20,780	0	9,463	
	Mission, E. Charpentier, Toulouse, 12/2011			-2,178	0	20,780	-2,178	7,285	
2012	**CLS Contribution to DBCP TF at WMO (2012)**			**34,028**	**24,028**	**44,808**	**10,000**	**17,285**	
	Mission J. Stander, JTA-EC, Toulouse, 4/2012			-3,080	-3,080	41,728	0	17,285	
	Mission E. Charpentier, JTA-EC, Toulouse, 4/2012	-2216	1.06045	-2,350	-1,175	40,553	-1,175	16,110	50% JTA support (Satcom - JTA-EC)
	Mission J. Stander, JTA-32, Fremantle, 10/2012	-3113	1.06045	-3,301	-3,301	37,252	0	16,110	
	Frank Grooters JTA contract (SSA), 10/2012			-15,000	-15,000	22,252	0	16,110	
2013	**CLS Contribution to DBCP TF at WMO (2013)**			**32,748**	**22,748**	**45,000**	**10,000**	**26,110**	
	IODE-22 (S. Woodruff, G. Rosenhagen)			-2,357	0	45,000	-2,357	23,753	
	JTA-EC 2013, Annapolis (J. Stander, T. Gross)			-2,379	0	45,000	-2,379	21,374	
	RMIC workshop for RA-I, Casablanca, 2013			-5,781	0	45,000	-5,781	15,592	
	Frank Grooters JTA contract (SSA), 10/2013			-15,000	-15,000	30,000	0	15,592	
	Satcom forum			-4,046	0	30,000	-4,046	11,546	
	JTA-33 (J. Stander, J. Linguanti)			-7,587	-7,587	22,413	0	11,546	
2014	**CLS Contribution to DBCP TF at WMO (2014)**			**28,342**	**18,342**	**40,755**	**10,000**	**21,546**	Invoice FIN13-352 (12/11/2013)
	JTA-EC-10, Hamburg, 6-8 May 2014			-11,333	-11,333	29,422	0	21,546	
	CLIMAR-4, Asheville, 9-12 June 2014			-4,236	0	29,422	-4,236	17,310	
	ETDMP-4, Ostend, 23-26 June 2014			-2,878	0	29,422	-2,878	14,432	
	JTA-34, Tianjin, 3-5 Nov. 2014			0	0	29,422	0	14,432	
2015	**CLS Contribution to DBCP TF at WMO (2015)**			**25,578**	**15,578**	45,000	**10,000**	24,432	
	PMO-5, Valparaiso, Chile, Jul. 2015			-5,000	0	45,000	-5,000	19,432	
	ETMC-5, Geneva, June 2015			-6,000	0	45,000	-6,000	13,432	
	RMIC/RA-IV			-8,000	0	45,000	-8,000	5,432	
	Satcom1			-5,000	0	45,000	-5,000	432	
	JTA-EC-12			-15,000.00	-15,000	30,000	0	432	
	JTA-35			-15,000.00	-15,000	15,000	0	432	

ANNEX X

REVISED WORKPLAN OF DBCP PILOT PROJECTS

1. PILOT PROJECT ON THE IMPACT OF SEA LEVEL PRESSURE FROM DRIFTERS ON NUMERICAL WEATHER PREDICTION (PP-SLP)

3. DBCP-ETWCH PILOT PROJECT ON WAVE MEASUREMENT EVALUATION AND TEST FROM MOORED BUOYS (PP-WET) - WORKPLAN (OCTOBER 2014 TO SEPTEMBER 2015)

1. Coordinate intercomparisons of wave measurements from different platforms, on an opportunistic basis;

2. Publish intercomparison results and updated status reports on Pilot Project web site;

3. Develop a plan for a continuous testing and evaluation program;

4. Promote widely the pilot project goals and objectives, and results, to encourage enhanced participation and additional partners;

5. Contribute, as appropriate, to the JCOMM Standards and Best Practice Guides, including a recommended approach to making reliable, high-quality spectral wave measurements, including directional spectra;

6. Decide whether to continue the pilot project for a further year and investigate follow-on mechanisms;

7. Present results to DBCP-31 and other scientific fora.

ANNEX XI

GOALS OF DBCP NPOMS-4 CAPACITY BUILDING WORKSHOPS

"Application of Regional Ocean Observations for Increasing Society's Understanding and Forecasting of Typhoons"

The Following Goals reflect the needs of this NPOMS-4 Workshop and of the long-term Ocean-Climate Monitoring Capacity for Regional Cyclogenesis and Forecasting:

- Review recent, on-going and planned regional programs on typhoon and its interaction with the ocean,
- Discuss new advances in our understanding of the processes and mechanisms of typhoon-ocean interaction,
- Explore the possibility of regional collaboration to improve typhoon observation and prediction,
- Demonstrate the crucial role of Western Pacific (WESTPAC) ocean observations, such as for understanding and predicting regional cyclogenesis,
- Build Regional and National Human, Institutional and Infrastructure Capacity Needed to Acquire, Process and Deliver Socio-Economic Benefits From Ocean Observations,
- Continue to Learn Practical Implementation Skills for the Deployment of Operational Data Buoys at Sea, the Collection of Buoy Data, and Related Data Management,
- Continue to Align with Objectives of the Global Framework for Climate Services (GFCS) to Deliver Ocean Data to the End-User,
- Enhance Coordination and Cooperation between the DBCP Task Team for Capacity Building (TT-CB), WMO Regional Associations (RA-II/V) and the IOC Regional Office for WESTPAC.

ANNEX XII

RECOMMENDATIONS OF THE INTERNATIONAL TSUNAMETER PARTNERSHIP

The ITP Action Group on side of the DBCP-30 Session, and agreed with the following topics and recommendations, which the DBCP also endorsed:

1. Noted the involvement and recognition of ITP and activities accomplished from the last meeting;
2. Appreciated NDBC for providing water level data from tsunameters in real time mode and also appreciated the member countries which are already sharing data through GTS and to encourage other countries to share their tsunameter and sea level data to the GTS and though IOC JCOMMOPS as soon as possible;
3. Approved the Tsunameter Instruments Standards document that could be uplinked in ITP web site and recommended that the DBCP approve it to be published online;
4. Appreciated technological advancements for tsunameters like the testing of the 4G DART by NOAA's PMEL and the improved performance of Indian Tsunameter network and noted the feedback about lower performance of ETD in high seas conditions and use of medium frequency buoy systems deployed by Australia;
5. Encouraged the efforts being pursued on submarine cables under the joint initiative of ITU/WMO/IOC and noted that a Joint Task force is formulated and will look to be updated on their progress;
6. Reinforced the importance of the safety in deployment and operation of moored buoys at sea as recorded in DBCP 29 and recommended it should be given highest priority as new experts are educated so they will incorporate best practices on safety;
7. Noted the need to have closer interaction with the IOC Intergovernmental Coordination Groups for Tsunami and other Coastal Hazards Warning Systems in the all the ocean basins and asked that IOC can recommend ICGs to send invitation to ITP to enable their representative to participate in ICG meetings. And similarly ICG may be invited to participate in ITP 11 meeting;
8. Urged members operating tsunameters to send the high-resolution data for long-term archival to NOAA's National Geophysical Data Center (NGDC) and co-located World Data Service for Geophysics, and
9. Reiterated their concern about continued vandalism of buoys and recommended to more efforts to safeguard the buoys including escalating this issue through IOC to International Maritime Organisation and FAO.

R.Venkatesan is elected as Chair and Stephen Cucullu as Vice Chair to continue the activities.

ANNEX XIII

FUTURE TASKS FOR THE JCOMM OBSERVATIONS COORDINATION GROUP (OCG)

(Draft by D Legler and D Meldrum, Sept 2014)

1. Develop better ways of routinely expressing the state of the observing network (possibly using the SWOT framework), including by platform type and by EOV.

2. Horizon scan for platforms, sensors, technologies and methodologies that will in due course become part of the composite observing system, and seek to establish pilot activities to help evaluate and transition them to the sustained observations arena when ready.

3. Continue to participate in new initiatives to expand ocean observing capabilities, such as the joint ITU/WMO/IOC initiative to use sub-sea communication cables for ocean observation and tsunami warning, and the increased activity in coastal regions.

4. Encourage JCOMMOPS to continue its outreach to new platform groups, such as the glider community.

5. Seek to assure the growth and continuity of the JCOMMOPS service, and its relationship with the NOAA OSMC.

6. Promote the adoption of consistent standards and practices for data management amongst the observing networks to facilitate discoverability and accessibility of integrated data for the research, forecast, and end-user communities as well as for product development. [Make full use of Keeley report].

7. Promote the creation and timely updating of JCOMM best practice documentation.

8. Strengthen links with the satellite community, especially in the field of in situ validation of EOVs/ECVs and for integrated product development.

9. Continue to guide WMO through the mind-set change that will allow them to be comfortable with data submitted by 3rd party organizations, and will allow such organizations to have access to the WIS/GTS for verification purposes.

10. Engage with other ocean and cryosphere observation groups (e.g. GOOS, OOPC, POGO, SCOR, SCAR, SOOS, …) to develop a consistent and seamless road map for ocean (including polar ocean/sea-ice) observations.

ACRONYM LIST

ADOS	Arctic Ocean Drift Study
AG	DBCP Action Groups
AOML	NOAA Atlantic Oceanographic and Meteorological Laboratory (USA)
Argo	Argo Profiling Float Pilot Project
ASIRI	Bay of Bengal/Air-Sea Interaction Research Initiative
AST	Argo Steering Team
ASV	Autonomous Surface Vehicle
ATOVS	Advanced TIROS Operational Vertical Sounder
AWS	Automatic Weather Station
BOM	Bureau of Meteorology (Australia)
BSH	Bundesamt für Seeschifffahrt und Hydrographie (Germany Federal Maritime and Hydrographic Agency)
BUFR	FM 94 BUFR GTS format: Binary Universal Form for Representation of meteorological data
BUOY	FM 18 BUOY GTS format: Report of a buoy observation
CAgM	Commission for Agricultural Meteorology (WMO)
CB	Capacity-Building
CBS	Commission for Basic Systems (WMO)
CCl	Commission for Climatology (CCl)
CDIP	Coastal Data Information Program
Cg	Congress (WMO)
CHY	Commission for Hydrology (WMO)
CIDP	Coastal Data Information Program
CIFDP	Coastal Inundation Forecasting Demonstration Project (WMO)
CIMO	Commission on Instruments and Methods of Observation (WMO)
CLIMAR	JCOMM Workshop on Advances in Marine Climatology
CLIVAR	Climate Variability and Predictability (WCRP)
CLS	Collecte Localisation Satellites (France)
CNES	Centre National D'Etudes Spatiales (France) / French Space Agency
CTD	Conductivity Temperature and Depth
DAC	Data Assembly Centre
DART	Deep-ocean Assessment and Reporting of Tsunami (Tsunameter)
DB	Data Buoy
DBCP	Data Buoy Co-operation Panel (WMO-IOC)
DCP	Data Collection Platform
DCS	Data Collection System
DISA	Defense Information Systems Agency (USA)
DMCG	Data Management Coordination Group (JCOMM)
DMPA	Data Management Programme Area (DMPA)
DoD	US Department of Defense
DRR	Disaster Risk Reduction
EARS	EUMETSAT Advanced Retransmission Service
EB	DBCP Executive Board
EBD	Equivalent Buoy Density

EC	Executive Council
ECMWF	European Centre for Medium-Range Weather Forecasts
ECV	Essential Climate Variable
EEZ	Exclusive Economic Zone
EGOS-IP	Implementation Plan for the Evolution of Global Observing Systems (WMO)
ENSO	El Niño Southern Oscillation
EOV	Essential Ocean Variable
ERIC	European Research Infrastructure Consortium
ESA	European Space Agency
E-SURFMAR	Operational Service E-SURFMAR of the Network of European Meteorological Services, EUMETNET
ET-CCDI	Joint CCl/WCRP-CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices
ETMC	Expert Team on Marine Climatology (JCOMM)
ETSI	Expert Team on Sea Ice (JCOMM)
ETWCH	Expert Team on Waves and Coastal Hazard Forecast Systems (JCOMM)
EUMETNET	Network of European Meteorological Services
EUMETSAT	European Organization for the Exploitation of Meteorological Satellites
EWDS	JCOMM Extreme Wave Data Set
FAD	Fish Aggregating Devices
FAO	Food and Agriculture Organization
FTP	File Transfer Protocol
GCOS	Global Climate Observing System
GDAC	Global Data Assembly / Acquisition Centre
GDC	Global Drifter Centre
GDP	Global Drifter Programme
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GFCS	Global Framework for Climate Services
GHRSST	Group for High-Resolution SST
GOOS	Global Ocean Observing System (IOC, WMO, UNEP, ICSU)
GOS	Global Observing System (WMO)
GO-SHIP	Global Ocean Ship-Based Hydrographic Investigations Programme (GO-SHIP)
GPRS	General Packet Radio Service
GPS	Global Positioning System
GTMBA	Global Tropical Moored Buoy Array
GTS	Global Telecommunication System (WWW)
GTSPP	Global Temperature and Salinity Profile Programme
HCMR	Hellenic Centre for Marine Research (Greece)
HRSST	High Resolution SST
IABP	International Arctic Buoy Programme
IAEA	International Atomic Energy Agency
IBPIO	International Buoy Programme for the Indian Ocean
ICG-WIGOS	Inter Commission Coordination Group on WIGOS
ICOADS	International Comprehensive Ocean-Atmosphere Data Set (USA)

ICSU	International Council for Science
ICT	Information and Communication Technology
ICT-IOS	CBS Implementation Coordination Team on the Integrated Observing System
ID	Identification Number
IFREMER	Research Institute for the Exploitation of the Sea (France)
IHO	International Hydrographic Organization
IIOE	International Indian Ocean Expedition
IMO	International Maritime Organization
IMOS	Integrated Marine Observing System
IMR	Norway Institute of Marine Research (Norway)
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCCP	International Ocean Carbon Coordination Project
IODE	International Oceanographic Data and Information Exchange (IOC)
IOGOOS	Indian Ocean GOOS
IPAB	WCRP-SCAR International Programme for Antarctic Buoys
IPET-DRMM	Inter Programme Expert Team on Data Representation Maintenance and Monitoring (CBS)
IPET-OSDE	CBS Inter Programme Expert Team on Observing System Design and Evolution
IRD	French Institute for Research and Development
ISABP	International South Atlantic Buoy Programme
ISDM	Former Integrated Science Data Management of Canada
ISO	International Organization for Standardization
ISPRA	Institute for Environmental Protection and Research (Italy)
ISRO	Space Research Organization (India)
IT	Information Technology
ITP	International Tsunameter Partnership
ITT	Invitation To Tender
ITU	International Telecommunication Union
JAMSTEC	Japan Agency for Marine-Earth Science and Technology
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM *in situ* Observations Programme Support Centre
JMA	Japan Meteorological Agency
JTA	Joint Tariff Agreement (Argos)
JTF	Joint Task Force
KHOA	Korea Hydrographic and Oceanographic Administration
KIOST	Korean Institute of Ocean Science and Technology
LoA	Letter of Agreement
LOI	Letters of Intent
MAN	JCOMM Management Committee
MCDS	Marine Climate Data System (in development by JCOMM)
MEDS	Marine Environmental Data Section (MEDS) of the Oceanography and Scientific Data branch of Fisheries and Oceans Canada , which replaces the branch previously known as Integrated Science Data Management (ISDM)
METOP	Meteorological Operational satellites of the EUMETSAT Polar System (EPS)
MOU	Memorandum of Understanding

MR	Meeting Report
MTS	Marine Technology Society
NCOSM	National Centre of Ocean Standards and Metrology (SOA, China)
NDBC	NOAA National Data Buoy Center (USA)
NFP	National Focal Point
NIOT	National Institute of Ocean Technology (India)
NMDIS	National Marine Data and Information Service (China)
NMHS	National Meteorological and Hydrological Service
NOAA	National Oceanic and Atmospheric Administration (USA)
NPDBAP	North Pacific Data Buoy Advisory Panel
NPOMS	North Pacific Ocean and Marginal Seas
NWP	Numerical Weather Prediction
OceanSITEs	OCEAN Sustained Interdisciplinary Timeseries Environment observation System
OCG	Observations Coordination Group (JCOMM)
OCO	NOAA Office of Climate Observation (USA)
ODAS	Ocean Data Acquisition Systems
ODP	Ocean Data Portal (IODE)
ODT	Observation Development Team
OMM	Ocean Mixing and Monsoons
OOPC	Ocean Observations for Physics and Climate (GCOS-GOOS-WCRP)
OPA	Observations Programme Area (JCOMM)
OSCAR	Observing System Capability Analysis and Review Tool
OSE	Observing System Experiment
OSMC	NOAA Observing System Monitoring Center (USA)
PA	Programme Area (JCOMM)
PANGEA	Partnerships for New GEOSS Applications
PI	Pacific Islands
PIRATA	Pilot Research Moored Array in the Tropical Atlantic
PMEL	NOAA Pacific Marine Environmental Laboratory (USA)
POES	Polar Orbiting Environmental Satellite
PP-HRSST	DBCP-GHRSST Pilot Project on High Resolution SST
PP-SG	Pilot Project Steering Group
PP-SLP	Pilot Project on the Impact of Sea Level Pressure measurements from drifters on Numerical Weather Prediction
PP-WET	DBCP-ETWCH Pilot Project on Wave measurement Evaluation and Test from Moored and Drifting Buoys
PTT	Platform Transmitter Terminal (Argos)
QC	Quality Control
RA	Regional Association (WMO)
RAMA	Indian Ocean Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction
RARS	Regional ATOVS Retransmission Services
RMIC	WMO-IOC Regional Marine Instrument Centre
RMIC/AP	RMIC for the Asia Pacific region
RMIC/RA-4	RMIC for WMO Regional Association IV
RMS	Root Mean Square

RNODC	Responsible Oceanographic Data Centre (IODE-JCOMM)
RNODC/DB	RNODC for Drifting Buoys
SAMS	Scottish Association for Marine Science
SARAL	Satellite with ARgos and ALtika (France, India)
Satcom	Satellite Data Telecommunication
SAWS	South African Weather Service
SBD	Short Burst Data (Iridium)
SC	Steering Committee
SCAR	Scientific Committee on Antarctic Research
SCG	Services Coordination Group (JCOMM)
SCOR	Scientific Committee on Oceanic Research (SCOR)
SDIOE	Shandong Academy of Science Institute of Oceanographic Instrumentation (China)
SFSPA	JCOMM Services and Forecasting Systems Programme Area
SG	Steering Group
SHOM	French National Hydrographic Service
SIO	Scripps Institution of Oceanography (University of California, USA)
SLP	Sea Level Atmospheric Pressure
SOA	State Oceanic Administration (China)
SOBP	Southern Ocean Buoy Programme
SOC	Specialized Oceanographic Centre (JCOMM)
SOC/DB	SOC for Drifting Buoys (operated by Météo France)
SOOP	Ship-Of-Opportunity Programme
SOT	Ship Observations Team (JCOMM)
SPURS	Salinity Processes in the Upper *Ocean* Regional Study
SSA	WMO Special Service Agreement
SSS	Sea Surface Salinity
SST	Sea-Surface Temperature
SVP	Surface Velocity Programme (of TOGA and WOCE, replaced by GDP) drifter
SVPB	SVP barometer drifter
TAO	Tropical Atmosphere Ocean Array
TC	Technical Co-ordinator
TC-DBCP	Technical Co-Ordinator of the Data Buoy Cooperation Panel
TD	Technical Document
TDC	Table Driven Code
TF	Trust Fund
TIP	Tropical Moored Buoys Implementation Panel
TIROS	Television and Infrared Observational Satellite
ToR	Terms of Reference
TPOS	Tropical Pacific Observing System
TRITON	Triangle Trans-Ocean buoy network
TT	Task Team
TT-CB	DBCP Task Team on Capacity-Building
TT-DM	DBCP Task Team on Data Management
TT-IBP	DBCP Task Team on Instrument Best Practices & Drifter Technology Developments

TT-MB	DBCP Task Team on Moored Buoys
TT-TDC	DMPA Task Team on Table Driven Codes
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	UN Educational, Scientific and Cultural Organization
USA	United States of America
USACE	United States Army Corps of Engineers
USD	United States Dollar
VAR	Value Added Reseller
VSAT	Very Small Aperture Terminal
WCRP	World Climate Research Programme
WIGOS	WMO Integrated Global Observing System
WIO	Western Indian Ocean
WIS	WMO Information System
WMO	World Meteorological Organization (UN)
WW-13	13th International Workshop on Wave Hindcasting and Forecasting (WW-13, October 27- November 1, 2013, Banff, Canada
WWW	World Weather Watch (WMO)
XBT	Expendable BathyThermograph

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